

An Analysis of the Concentration of Atmospheric Carbon Dioxide
at Fixed Land Stations and over the Oceans

based on

Discrete Samples and Daily Averaged Continuous Measurements

by

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June, 1986

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EXPLANATION OF THE TABLES

Introduction

This report presents original observational data and computer processed data used by Keeling et al. (1986a) in a study of the global transport of atmospheric carbon dioxide. In the first section of this report are listed daily averaged concentrations of atmospheric carbon dioxide at fixed stations and from an ice floe in the Arctic Ocean. Following these, in a second section, are listed data obtained from sample collections and direct observations on oceanic vessels. A third section lists a detailed analysis of the data of the first section. A final section lists a FORTRAN program which generates this data analysis from the daily averaged data of the first section. An explanation for each of the sections is furnished below as an aid in their use.

All data were calibrated to be consistent with the 1985 WMO/Scripps manometric mole fraction scale of Keeling et al. (1985b). The data, all obtained by non-dispersive infrared gas analysis, were first computed as an adjusted index, defined to be linear with respect to the response of the gas analyzer used (Keeling et al. 1976). They were converted to the 1985 mole fraction scale by the formulation of Keeling et al. (1985b). An additional variable adjustment, made to adjusted index values measured before A.D. 1970, is described by Keeling (1985).

An earlier version of much of the data presented here (Keeling et al. 1986b) was published in connection with an article by Keeling and Heimann (1986). It appears in the microform edition of that article.

Section 1: Table of Daily Averages

Daily averaged concentrations of atmospheric carbon dioxide are tabulated in the format adopted by the Environmental Pollution Monitoring and Research Programme of the World Meteorological Organization. Data are listed separately, with identified authors, for each station. All original data are listed. They are expressed as mole fractions in ppmv (parts per million by volume referred to dry air). Flags indicate data which were rejected in computing the smoothed values of section 3. Three kinds of flags are used, as now described.

(1) *Rejection for poor replicate flask agreement:* For pairs of samples of air obtained by exposing evacuated glass flasks consecutively, the daily average is flagged if the analyses differ by more than 0.40 ppmv. If three or more flasks were exposed together, each analysis was compared with the lowest value, thus treating the set as multiple pairs. All analyses differing by more than 0.40 ppmv from the lowest value were discarded. If no pair was found to agree within 0.40 ppmv, the average of all analyses is listed with a flag. If one or more flask analyses agree within 0.40 ppmv with the lowest concentration, these and the lowest value were averaged and appear in the table without a flag. The original flask averages and the program to select the data are on file at the Scripps Institution of Oceanography. For data measured at station Hilo during 1960-1963 the cutoff criterion was relaxed to 0.60 ppmv.

(2) *Rejection because the daily average exceeds 3 sigma of fit to smoothed data:* The daily averages, whether from flask sampling or continuous analysis and after omitting data flagged by the cutoff criterion described above, were fitted to a smooth function of time consisting of a periodic function and a long term trend function by the computer program listed in section 4. Any points, representing daily averages, which failed to agree with the fit to within three times the fitting parameter (called "sigma" in section 3) appear in section 1 with flags. These data were rejected in making the final fits which produced the data listed in Section 3.

(3) *Peremptory rejection of data:* In cases where there appeared to be a valid reason to reject additional data, these are specifically flagged. For Ocean Station 'P' all peremptorily rejected data are individually discussed in a data report by Keeling et al. (1984b). It is intended similarly to explain all peremptorily rejected data for other stations when detailed reports are completed for each station. These data were omitted from the data sets before determining the 3-sigma flags discussed above.

The data of Ocean Station 'P' and the Line Islands were corrected for an apparent increase in concentration related to storage of the samples in flasks after collection. For Station 'P' this correction was estimated by Keeling et al. (1984b) from differences in concentration of air collected over short time intervals in flasks with similar or identical greased stopcock closures but different volumes. Air collected in two liter flasks was found to have drifted upward in concentration with respect to air collected in five liter flasks. The authors assumed that only the two liter flasks drifted. Thus only a differential correction was applied.

That the air samples in five liter flasks from Station 'P' maintained a nearly constant concentration was indicated by a storage study in open air carried out at the Scripps Institution of Oceanography by Lancaster (1985) over approximately 100 days. Since storage temperatures for the Station 'P' flasks were typically lower than for flasks storage at Scripps, it is likely that the 5 liter flask samples from Station 'P' also did not drift appreciably.

In the case of data for the Line Islands (Fanning and Christmas Island data combined into a single set), nearly all samples were collected in five liter flasks. To determine a storage correction, the departures in concentration in ppmv from a fitted curve with seasonal and interannual terms as described in section 3 below, were fit to an exponential function of time

$$ST = C_1 - C_2 \exp(-Rt) \quad (1)$$

where t denotes the time, and where C_1 , C_2 , and R are constants determined by a least squares fit to the departures ($C_1 = 0.198$ ppmv, $C_2 = 0.373$ ppmv, $R = 0.005319$ per day). The curve of ST versus t intersected zero storage time with a value of -0.175 ppmv and attained a value of zero for 120 days of storage. An exponential function was used, because the departures appear to become essentially constant in time after about 300 days. For t approaching infinity the computed departure is 0.373 ppmv higher than for zero time. In applying a correction it has been assumed that the storage correction should be zero for zero storage time. Thus the amount to be subtracted from the original concentration value is:

$$CORR = ST(t) - ST(t=0) \quad (2)$$

For several other stations a similar analysis was carried out. The computed storage corrections were smaller for other stations than for the Line Islands, a circumstance attributed to their all having lower storage temperatures than for the Line Islands (near 28°C).

Section 2: Ship Profile Data

In this section are listed the individual flask data and continuous analyzer data obtained on oceanographic expeditions and from Weathership 'N', which together contribute to the 1960-1963, 1967-1968, and 1979-1980 data sets used by Keeling et al. (1986a). Most of these data have hitherto been published only in summary form or as abbreviated listings (Bolin and Keeling, 1963; Keeling et al., 1965; 1984a). The data for 1967 and 1968 are unpublished, although some were used in connection with ocean water measurements by Keeling (1968).

The 1962-1963 data are arranged in order of latitude, from south to north, in groups which were averaged to produce the data of Table 1 of Keeling and Heimann (1986). Expedition code names refer to the following expeditions of the Scripps Institution of Oceanography:

HIX: Hilo
LUH: Lusiad-Horizon
MON: Monsoon
PRO: Proa
RIS: Risepac
TET: Tethys

The code name, STN, refers to U.S. Weathership 'N'.

The cutoff and peremptory rejection flags have the same meaning as in section 1. In two cases data flagged according to the 0.40 ppmv cutoff parameter were accepted back into the data set. Data for air over South Pacific ocean on Monsoon expedition were obtained in a region

where little variation in CO₂ concentration is expected owing to the vigorous winds and lack of nearby sources or sinks capable of altering the concentration locally to a significant extent. Thus the data could be considered to belong to a single statistical set. Since the rejected flask analyses, with one exception, appeared to be consistent with the single pair agreeing within 0.40 ppmv, these analyses could be expected to produce an average statistically more valid than that of a single pair of observations. At Weathership 'N', at 30°N in the North Pacific ocean, a large number of analyses were available at a single location, again providing a basis for considering these data as a single statistical set. The rejection criterion was relaxed to 0.60 ppmv. Two pairs were rejected peremptorily because the samples were stored for two years before analysis.

Data with sample numbers prefixed with a 'C' are latitudinal interval averages of continuous data obtained with an infrared gas analyzer on board ship during Monsoon Expedition. They are derived from adjusted index values listed in Table 2 of Keeling et al. (1965). These data are given twice the weight of an individual flask datum. This is indicated in the table by printing each value twice as though they were flask pairs (a convenience in setting up the computer file which was used in the computations as well as to print the table).

The 1967-1968 data are treated in a similar manner to the 1960-1963 data. Code names refer to the following expeditions:

ELT: Cruises of the Eltanin
EST: Eastropac Expedition
NOV: Nova Expedition

The Eltanin cruises were carried out by the U.S. National Science Foundation mainly in the southern oceans. The vessel made a return visit to San Francisco in the fall of 1967 which provided two long north-south transects during which air samples were collected. The other two above listed expeditions were conducted by the Scripps Institution of Oceanography.

Data for 1967 and 1968 with sample number prefixes with a 'C' are twelve hour averages of continuous data obtained with the same analyzer that was used to measure atmospheric CO₂ on Monsoon expedition in 1960. The data were processed in a manner similar to the published data of Keeling et al., (1965) and Keeling and Waterman (1968), except that digital processing was used after obtaining the initial output of the infrared analyzer on a strip chart. Only preliminary data processing occurred during the expeditions. Final processing was carried out by one of us (T. P. W.) in 1983. The resulting adjusted index values (essentially 15 minute averages), were then combined into 12 hour averages and converted to mole fractions. The coordinates listed in the table are for the midpoints of the 12 hour intervals as determined from computer listing of the ship logs obtained from the SIO Geological Data Center (private communication from Stuart M. Smith).

The CO₂ concentration expressed on the 1985 WMO/Scripps mole fraction scale is listed in the 10th column for both the 1960-1963 and 1967-1968 data. The interannual trend computed for the data and latitude of sampling is listed in the 11th column, and in the 12th column the seasonal adjustment. The latter two entries are as described by Keeling et al. (1986a). The final column of data lists the CO₂ concentration after adjustment for trend and season. The group averages from this column provide the data of Tables 1 and 2 of Keeling et al. (1986a).

The 1979-1980 data, obtained on the FGGE Shuttle Expedition and used in the preparation of Table 3 of Keeling et al. (1986a), are listed in chronological order of sampling. The data are discussed in a report by Keeling et al. (1985a). The concentrations are listed here with respect to three different calibrations. A 1980 calibration was used by Heimann and Keeling (1986), a 1981 calibration by Keeling et al. (1984a) and the 1985 WMO/Scripps calibration by Keeling and Heimann (1986) and Keeling et al. (1986a).

In the table of 1979-1980 data, flags appear in two columns. The flags in the first of these columns indicate flask pairs in which the analyses fail to agree to within 0.25 ppmv. These flask analyses were rejected unless overridden by an acceptance flag in the next column. In the

second of these columns appear flags with a two letter code. These have the following significance:

- RP: rejected peremptorily.
- RG: rejected on the basis of poor agreement with unpublished gas chromatographic data obtained underway at the same time on the same ship by Dr. Ray Weiss of the Scripps Institution of Oceanography.
- AI: accepted on the basis of close agreement with an estimated concentration obtained by interpolation of data from nearby latitudes.
- AP: accepted peremptorily.
- AG: accepted on the basis of close agreement with unpublished gas chromatographic data obtained underway at the same time on the same ship by Dr. Ray Weiss.

More detailed explanations for these flags are furnished by Keeling et al. (1985a).

Section 3: Output to "STATION FIT" Program

For each station the daily averaged data listed in section 1 were successively fit to a series of functions to smooth the data and to reveal systematic features of each time series. The methodology is discussed by Bacastow et al. (1985). The FØRTRAN program to make the fits by both linear and nonlinear least squares techniques is listed in section 4. The output presented in section 3 is an abbreviated and somewhat rearranged version of the output called for in the FØRTRAN program.

On the first page of the listing for each station is first printed a series of more or less self-explanatory parameters mainly derived from information listed in section 1. For example, *the calibration* scale indicates the year of calibration of the data from section 1 for that station. An entry "1985" indicates use of 1985 WMO/Scripps mole fraction scale, an entry "1983" or "1984" indicates a scale negligibly different from the 1985 scale.

The *number of harmonics* refers to a portion of the fitting function which involves sinusoidal terms with a fundamental period of one year plus higher order Fourier components. Thus, 2 harmonics indicates that terms with periods of 1 year and 6 months were fit, 4 harmonics indicates additional terms with periods of 4 and 3 months.

If the *computed spline RMS* (root mean square) *second derivative* is indicated to be zero, the long term trend was expressed solely by an exponential function

$$E = C_1 + C_2 \exp(C_3 T) \quad (3)$$

where the C_i are constants and T denotes time in years. In other cases the long term trend was expressed by the sum of function E of equation (3) and a cubic spline function generated by subroutine ICSSCU of IMSL, (1982). The spline stiffness was set such that the square of the second derivative over the spline attained the listed value (in units of ppmv yr^{-2}). The spline stiffness has been found to depend on the density of data points in the fit. To produce comparable stiffnesses for stations with different densities of points, the stiffness was recomputed for a second spline made to agree exactly with the original spline for the 15th of each month i.e. a single node per month, irrespective of the original density of data points. By iteration of the computation which produced both spline fits, the stiffness of this second spline was adjusted until the square of the second derivative attained a value of 30 ppmv yr^{-2} .

The computed *gain factor* refers to a factor, A , which causes the Fourier coefficients of the harmonic function to vary linearly in time, according to the function, $(1+AT)$, where T denotes the time in years after an indicated base year. For short records a gain factor was not computed (equivalent to $A=0$).

The computed *spline stiffness parameter* (σ), refers to the standard error of fit for an individual data point. It is not actually the parameter used in the IMSL (1982) subroutine, but is closely related as discussed by Bacastow et al. (1985, p. 10,534).

Input parameters list data already quoted above, but reexpressed in a coded form.

Following the first page for each station, most of the data are listed in the order called for in the FØRTRAN program. A few further rearrangements are indicated in that program by comment statements.

1. *Fit of cubic + harmonics* refers to an initial linear fit to the daily averaged data in which the long term trend is expressed by a power series in time, T . This fit allows initial estimates of the harmonic coefficients to be computed efficiently. The terms can be deduced from the heading given. Errors for each coefficient are listed immediately below the value of that coefficient.

2. *Fit of exponential + harmonics* refers to a preliminary nonlinear fit where equation (3) is substituted for the cubic power series. As a computing aid, this exponential function is subtracted from the data before carrying out further nonlinear fits in order that the spline function have no overall upward or downward trend or very low frequency oscillation.

3. The next fit is either to a *straight line spline + harmonics* or a *chi square-type spline + harmonics*. The first version is used for short station records. The stiffness parameter is set to be so large that the computed spline degenerates into a straight line with a near-zero slope. The fit is nevertheless made and the program afterwards continues, as in the case of a non-straight line. (The final trend function is not a straight line because it still includes the exponential function E of equation (3)). The second version permits the spline to vary with the prescribed stiffness set by a non-zero RMS second derivative. (The printed output in this report omits a considerable amount of output optionally called in the FØRTRAN program as an aid in following the course of the nested iteration loops which produce the final values).

The final fit includes two representations of the seasonal cycle. The first is obtained by computing the fitted value for the 15th of each month according to the oscillatory function based solely on the Fourier coefficients. The gain function, $(1+AT)$, is set for the midpoint of the record. The second version is obtained by first obtaining monthly averages, as described below, and then removing the long term trend expressed by the sum of the spline and exponential functions. Finally, the detrended monthly averages are averaged for each month to obtain the data listed as "average over months."

The *spline fit to exponentially and seasonally adjusted data* lists monthly values of the spline at the 15th of each month, and is included in the printed output unless the spline function has been set to give a straight line.

The *gain for each year* refers to an amplitudinal factor, computed for each calendar year of data, which increases or decreases the value of all of the harmonic coefficients for that year to produce a best fit to the trend adjusted monthly data. This factor is explained in greater detail by Bacastow et al. (1985, caption to Figure 14, p. 10,539).

The final pages of each section list chronological data after specified kinds of data processing.

1. *Averages of data adjusted to the 15th of the month* were obtained as described by Keeling et al. (1985c, p. 10,517). The seasonal variation, given by the final set of computed Fourier coefficients, with the gain factor and long term trend also taken into account, was computed for 00:00 hr of the specified sampling date and for 00:00 hr of the 15th of the same month. The difference was then applied to the original concentration value to produce a concentration value adjusted to the 15th of that month. All data for a given month, so adjusted, were then averaged to produce the entries.

2. *Averages of data adjusted to the 15th of each month and seasonally adjusted* were obtained from the previous averages by subtracting the seasonal variations, as in 1. above, and again taking into account the gain factor, A .

3. *Fitted function (exponential + spline + harmonics) at 15th of month* refers to computations from the final complete fit to the data. "JANO" refers to the function value at the commencement of the specified calendar year.

4. *Trend (exponential + spline) at 15th of the month* refers to the above fitted function with the harmonic seasonal cycle removed.

Section 4: FØRTRAN program

This program, written to run on a Digital Equipment Corporation VAX 11-750 computer, is listed in the exact form used to compute the output of section 3, except that the printed outputs have been rearranged and some headings changed to increase readability. The interested reader is advised to run the program and print the output as called for in the FØRTRAN program. This output can then be readily matched to the version shown in Section 3. The original output is likely to be useful in comprehending the program.

A few minor changes from the version used by Keeling et al. (1986b) are cited as "modifications from version 1" beginning on the second page of the program listing.

References

Bacastow, R. B., C. D. Keeling, and T. P. Whorf, Seasonal amplitude increase in atmospheric CO₂ concentration at Mauna Loa, Hawaii, 1959-1982, *J. Geophys. Res.*, *90*, 10,529-10,540, 1985.

Bolin, B., and C. D. Keeling, Large-scale atmospheric mixing as deduced from the seasonal and meridional variations of carbon dioxide, *J. Geophys. Res.*, *68*, 3899-3920, 1963.

Heimann, M., and C. D. Keeling, Meridional eddy diffusion model of the transport of atmospheric carbon dioxide, 1. Seasonal carbon cycle over the tropical Pacific Ocean, *J. Geophys. Res.*, in press, 1986.

IMSL, Reference Manual to IMSL Library, Edition 9 (a collection of mathematical and statistical routines written in FØRTRAN), IMSL, Houston, Tex., 1982.

Keeling, C. D., Adjustments to Applied Physics infrared analyzer data to allow for differences in response of the various detectors used, report, 71 pp., Scripps Inst. of Oceanogr., La Jolla, Calif., 1985.

Keeling, C. D., Carbon dioxide in surface ocean waters 4. Global distribution, *J. Geophys. Res.*, *73*, 4543-4553, 1968.

Keeling, C. D., N. W. Rakestraw, and L. S. Waterman, Carbon dioxide in surface waters of the Pacific Ocean 1. Measurements of the distribution, *J. Geophys. Res.*, *70*, 6087-6097, 1965.

Keeling, C. D., and L. S. Waterman, Carbon dioxide in surface ocean waters 3. Measurements on Lusiad expedition 1962-1963, *J. Geophys. Res.*, *73*, 4529-4541, 1968.

- Keeling, C. D., R. B. Bacastow, A. E. Bainbridge, C. A. Ekdahl, Jr., P. R. Guenther, and L. S. Waterman, Atmospheric carbon dioxide variations at Mauna Loa Observatory, Hawaii, *Tellus*, 28, 538-551, 1976.
- Keeling, C. D., A. F. Carter, and W. G. Mook, Seasonal, latitudinal, and secular variations in the abundance and isotopic ratios of atmospheric CO₂, 2. Results from oceanographic cruises in the tropical Pacific ocean, *J. Geophys. Res.*, 89, 4615-4628, 1984a.
- Keeling, C. D., T. P. Whorf, and C. S. Wong, Weather station 'P' carbon dioxide project, report, 100 pp., Scripps Inst. of Oceanogr., La Jolla, Calif., 1984b.
- Keeling, C. D., A. F. Carter, and P. R. Guenther, Seasonal and meridional variations of atmospheric carbon dioxide over the tropical Pacific Ocean, report, 58 pp., Scripps Inst. Oceanogr., La Jolla, Calif., 1985a.
- Keeling, C. D., P. R. Guenther, and D. J. Moss, Scripps reference gas calibration system for carbon dioxide-in-air standards: Revision of 1985, report, 34 pp., Scripps Inst. of Oceanogr., La Jolla, Calif., 1985b.
- Keeling, C. D., T. P. Whorf, C. S. Wong, and R. D. Bellegay, The concentration of atmospheric carbon dioxide at ocean weather station 'P' from 1969 to 1981, *J. Geophys. Res.*, 90, 10,511-10,528, 1985c.
- Keeling, C. D. and M. Heimann, Meridional eddy diffusion model of the transport of atmospheric carbon dioxide 2. Mean annual carbon cycle, *J. Geophys. Res.*, in press, 1986.
- Keeling, C. D., M. Heimann, and W. G. Mook, A three dimensional model of atmospheric CO₂ transport based on observed winds: 1. Observational data and preliminary analysis, submitted to *Tellus*, 1986a.
- Keeling, C. D., P. R. Guenther, and T. P. Whorf, Daily averaged concentrations of atmospheric carbon dioxide at fixed land stations and from air collection over the oceans, report, 259 pp., Scripps Inst. Oceanogr., La Jolla, Calif., 1986b.
- Lancaster, J., Atmospheric carbon dioxide variations; Ocean air sampling near Hawaii and Southern California from July, 1983 to September, 1984, 179 pp., Thesis, Univ. of Calif., San Diego, La Jolla, Calif., 1985.

Section 1: Table of Daily Averages

ARLIS ICE FLOE STATION

Author: Charles D. Keeling and John J. Kelley

Organizations: Scripps Institution of Oceanography and Department of Atmospheric Sciences of the University of Washington

Address of first organization: University of California, San Diego, La Jolla, California 92093, USA

Site position and description: Variable location between 77°N and 89°N in the Arctic Ocean basin, elevation 2 m, on floating sea ice

Sampling method, frequency and measurement technique: Evacuated glass flasks exposed in pairs approximately twice monthly. 5 liter flasks were used in Aug and Sept, 1961 and throughout 1963; 2 liter flasks were used Dec 1961 - Dec 1962 and Jan - Sept 1964. Flask samples measured at the Scripps Institution of Oceanography with an Applied Physics Corporation non-dispersive infrared gas analyzer.

Scientific aims and scope of measurements: Observe seasonal and interannual variations in atmospheric CO₂

Data selection procedures used: Concentration of replicate flasks must agree within 0.40 ppmv to be accepted.

Calibration gases used: CO₂-in-N₂

Scale of reported data: 1985 WMO/Scripps mole fraction scale

Literature references to programme:

Atmospheric carbon dioxide measurements at station: ARLIS EXPEDITION
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1961
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2													2
3													3
4													4
5													5
6													6
7													7
8													8
9													9
10													10
11												20.7	11
12													12
13													13
14													14
15													15
16													16
17												22.1	17
18									12.7				18
19								13.0*					19
20													20
21													21
22													22
23													23
24													24
25													25
26													26
27													27
28													28
29													29
30													30
31													31

Monthly values

Xm		12.7		21.4	Xm
N		2		4	N
s					s

Annual mean 317.0 ppmv
 (based on 2 monthly means)

Xm = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: ARLIS EXPEDITION
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1962
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1			22.6	22.4									1
2		24.4			23.7	24.0	20.3	12.9	10.1	15.3*	18.6	21.6	2
3	22.9											20.4	3
4													4
5													5
6													6
7													7
8													8
9													9
10													10
11													11
12													12
13													13
14													14
15		23.2*											15
16	23.5*		22.0	22.5	23.5	24.1	18.6	10.8	10.5	17.7	18.8		16
17													17
18													18
19													19
20													20
21													21
22													22
23													23
24													24
25													25
26													26
27													27
28													28
29													29
30													30
31													31

Monthly values

Xm	22.9	24.4	22.3	22.4	23.6	24.0	19.4	11.8	10.3	17.7	18.7	21.0	Xm
N	2	2	4	4	4	4	4	4	4	2	4	4	N
s													s

Annual mean 319.9 ppmv
 (based on 12 monthly means)

Xm = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: ARLIS EXPEDITION
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1963
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1								17.4*	12.0*	14.2*		27.1*	1
2	25.4		22.9*		25.1	28.1*	23.3						2
3				24.4									3
4		25.0*											4
5													5
6													6
7													7
8													8
9													9
10													10
11													11
12													12
13													13
14													14
15									13.8	15.5	21.9		15
16	35.1*		23.4			25.3*	28.5*	14.4*					16
17					24.7								17
18				24.0								23.4*	18
19													19
20		24.8											20
21													21
22													22
23													23
24													24
25													25
26													26
27													27
28													28
29													29
30													30
31													31

Monthly values

Xm	25.4	24.8	23.4	24.2	24.9		23.3		13.8	15.5	21.9		Xm
N	2	2	2	4	4		2		2	2	2		N
s													s

Annual mean 321.9 ppmv
 (based on 9 monthly means)

Xm = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: ARLIS EXPEDITION
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1964
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	26.1*												1
2							23.1*	17.9*	20.3*				2
3			24.7	25.3		27.5*							3
4													4
5													5
6													6
7													7
8													8
9													9
10													10
11													11
12													12
13													13
14													14
15									14.7*				15
16			33.3*	33.3*	26.5	59.7*							16
17													17
18							19.5*						18
19													19
20													20
21													21
22													22
23													23
24													24
25													25
26													26
27													27
28													28
29													29
30													30
31													31

Monthly values

Xm	24.7	25.3	26.5	Xm
N	2	2	2	N
s				s

Annual mean 325.5 ppmv
 (based on 3 monthly means)

Xm = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)

POINT BARROW, ALASKA

Author: Charles D. Keeling and John J. Kelley

Organizations: Scripps Institution of Oceanography and Department of Atmospheric Sciences of the University of Washington

Address of first organization: University of California, San Diego, La Jolla, California 92093, USA

Site position and description: 71°19'N; 156°36'W, elevation 11 m, on the coast of the Arctic ocean

Sampling method, frequency and measurement technique: Continuous measuring using an Analytic Systems Corporation non-dispersive infrared gas analyzer with water vapor freeze trap (Jul 1961 - Sept 1967) 2 liter evacuated glass flasks exposed in triplicate biweekly (Jan 1974 - Feb 1982); 5 liter evacuated glass flasks exposed in pairs, weekly (Mar 1982 - Sept 1985). Flask samples measured at the Scripps Institution of Oceanography with an Applied Physics Corporation non-dispersive infrared gas analyzer.

Scientific aims and scope of measurements: Observe seasonal and interannual variations in atmospheric CO₂

Data selection procedures used: Concentrations of replicate flask samples must agree within 0.40 ppmv to be accepted.

Calibration gases used: CO₂-in-N₂ until May 1983, then CO₂-in-air

Scale of reported data: 1985 WMO/Scripps mole fraction scale

Literature references to programme:

Kelley, J. J., Jr., "An Analysis of Carbon Dioxide in the Arctic Atmosphere Near Barrow, Alaska 1961 to 1967, Scientific Report of the United States Office of Naval Research, Contract N00014-67-A-0013-0007 NR 307-252 172 pp., (1969).

C. D. Keeling, "Atmospheric and Oceanographic Measurements Needed for Establishment of a Data Base for Carbon Dioxide from Fossil Fuels", in The Potential Effects of Carbon Dioxide-Induced Climatic Changes in Alaska. The Proceedings of a Conference. Fairbanks, Alaska, April 7-8, 1982. School of Agriculture and Land Resources Management, University of Alaska, Fairbanks, Miscellaneous Publications 83-1, pp 11-22 (1984).

Atmospheric carbon dioxide measurements at station: POINT BARROW
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1961
Final CO₂ concentration values in ppmv above 300.0
(continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1								5.6	10.5	13.2	20.1	19.5	1
2								12.3	11.7	13.4	20.7	19.7	2
3								12.8		13.4	22.0	19.8	3
4								14.2		13.9	20.1	19.7	4
5								10.9	14.1		17.5	20.5	5
6								10.0	19.6		17.7	20.4	6
7								10.0	11.2		18.3	20.6	7
8								9.5		15.1	13.0	20.1	8
9									10.6	15.6	18.1	19.7	9
10							16.8		10.4	16.0	19.5	19.9	10
11							18.0	10.4		15.5	19.3		11
12							14.9			14.4	19.5	20.3	12
13							17.2		11.2	15.5	18.7	20.7	13
14							17.2	10.0	10.7	18.5	16.1	21.0	14
15							14.9	8.6	11.6	17.0			15
16							15.2	8.3	11.6	18.8		20.4	16
17							14.2	10.9	11.9	17.0			17
18								8.8	10.7	18.7			18
19							14.8	13.3		20.2			19
20							14.6			19.0			20
21							15.2	8.8	13.3	22.3			21
22							15.1	9.3	14.0	23.6			22
23							12.1	10.0	14.8	22.2			23
24							12.2	10.8	13.5	23.3			24
25							12.2		12.6	22.1	19.6		25
26							12.8		15.8	18.4			26
27							11.9	10.1	18.7	18.9	20.2		27
28							11.7	9.8	15.8	20.1	20.1		28
29							9.2	9.7	15.0	19.5	20.7		29
30							8.4	10.0	13.1	20.3			30
31							11.6	10.6		20.3			31

Monthly values

X _m		13.8	10.2	13.1	18.1	19.0	20.2	X _m
N		21	24	23	28	18	14	N
s		2.6	1.8	2.6	3.1	2.0	0.5	s

Annual mean 315.7 ppmv
(based on 6 monthly means)

X_m = average monthly concentration

N = number of daily values accepted

s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: POINT BARROW
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1962
 Final CO₂ concentration values in ppmv above 300.0
 (continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1		25.9	22.1	22.2	23.8	23.4	17.3	13.0	10.5	14.7	20.0	21.1	1
2		25.4	22.5	21.7	23.2	23.2	20.1	10.6	10.0	15.0	20.1	20.2	2
3	22.9	25.8	22.4	22.2	23.0	23.5	20.3	9.3	10.0	14.7	20.2	21.5	3
4	24.4	26.0	22.2	21.2	23.4	23.5	19.3	9.1	11.7	14.9	20.3	23.3	4
5	25.8	26.5	23.2	22.2	24.2	23.8	19.4	10.6		16.1	19.7	23.7	5
6		26.6	22.6	22.6	23.6	22.9	16.6	9.6	9.7	14.4	19.8	22.8	6
7	19.6	26.4	22.7	22.6	24.0	23.3	18.5	8.8	11.2	14.1	19.2	23.9	7
8		25.8	22.4	22.7	23.7	24.0	16.0	9.7	11.7	14.0	18.5	22.8	8
9		25.8	21.6	23.8	23.6	25.0	18.0	9.0	15.7	13.0	18.2	22.2	9
10	27.3	26.1	22.8	22.7	23.8	24.0	18.0		14.3	13.7	19.2	22.1	10
11	27.2	27.2	22.5	22.1	23.9	25.3	17.4	7.0	11.4	14.5	19.5	22.0	11
12	27.4	26.7	21.4	22.7	23.9	22.6	16.8	11.5	12.4	14.5	19.4	21.5	12
13	27.4	25.9	21.3	22.4	23.9	20.4	15.9	9.2	12.6	14.8	19.3	21.7	13
14	27.1	25.5	22.0	22.5	23.5	20.3	14.4	5.5	13.5	14.5	20.7	21.4	14
15	26.8	25.4	21.9	22.7	24.1	21.0	15.5	8.7	13.5	15.0	21.5	21.2	15
16	27.3	25.0	22.0	22.7	24.0	20.7	12.3	7.4	14.0	14.7	20.6	21.2	16
17	26.9	22.6	22.3	22.5	23.8	22.4	9.4	9.0	12.6		19.8	21.2	17
18	27.6	23.1	22.3	23.0	23.0	22.8	9.8	10.6	15.2	15.3	20.0	21.0	18
19	27.8	23.1	22.3	22.9	23.6	19.3	11.3	11.1	12.2	15.7	19.3	21.4	19
20	27.3	23.1	22.4	22.5	23.5	18.6	10.8	11.7	12.0	16.6	19.1	21.3	20
21	26.1	23.0	22.1	22.6	24.1	21.4	16.8	11.2	11.7	17.6	19.5	21.5	21
22	24.6	22.8	22.6	23.1	23.5	21.8	16.2	11.1		17.1	19.6	20.9	22
23	26.0	22.3	22.6	22.9	23.4	22.0	15.5	11.7	12.5	17.6	19.5	21.0	23
24	24.6	22.3	22.6	23.4	24.0	21.5	14.3	11.4	13.1	17.6	20.7	21.8	24
25	24.8	22.5		23.5	23.8	21.0	15.2	10.5	13.2	18.2	21.4	21.9	25
26	25.0	22.7		23.2	23.8	21.1	13.0		13.4	18.6	22.8	21.2	26
27	25.4	21.7	22.4	23.6	24.1	21.0	12.8	9.5	13.6	21.0	22.8	21.3	27
28	24.3	22.1	21.8	22.5	24.0	20.9	9.6	10.0	13.9	18.0	21.9	22.1	28
29	25.1		22.0	23.7	23.5	20.8	12.8	10.8	13.6	20.8	21.4	21.9	29
30	26.0		22.1	23.2	23.5	19.4	12.8	9.7	13.5	21.2	21.1	21.2	30
31	26.3		22.0		24.7		13.1	9.9		20.1		21.6	31

Monthly values

X _m	25.8	24.5	22.2	22.7	23.7	22.0	15.1	9.9	12.6	16.3	20.2	21.7	X _m
N	26	28	29	30	31	30	31	29	28	30	30	31	N
s	1.8	1.8	0.4	0.6	0.4	1.7	3.1	1.6	1.5	2.3	1.1	0.8	s

Annual mean 319.7 ppmv
 (based on 12 monthly means)

X_m = average monthly concentration
 N = number of daily values accepted
 s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: POINT BARROW
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1963
Final CO2 concentration values in ppmv above 300.0
(continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	22.0	24.3	23.0	24.2	24.4	23.2	20.4	14.6	13.4	15.1			1
2		23.9	24.0	23.4	24.3	22.9	21.0	14.3	13.3	14.9			2
3	21.5	23.8	24.0	23.6	24.8	22.8	20.5	14.1					3
4	22.1	24.9	24.7		24.5	22.8	20.6	15.1					4
5	22.0	25.9	24.9		24.9	22.9	20.5	14.5					5
6		25.6	24.8		24.5	23.0	19.8	13.0	11.3				6
7	23.5	25.5	24.4		24.6	22.6	18.7	12.2	11.4				7
8	23.1	25.0	24.3		24.6		19.5	11.6	11.7				8
9	22.3	23.8	24.4		24.8		19.2	12.4	11.7				9
10	22.2	24.7	24.3		24.9		19.8	13.0	11.8				10
11	23.0	24.3	24.2		24.9		19.0	12.3	12.6				11
12	23.0	23.5	24.2		24.9	22.6	19.5	11.5	11.5				12
13	22.5	23.3	26.0		25.1	22.6	20.0	11.5	12.1				13
14	22.1	23.0	26.1		24.5	22.4	20.3	11.2	15.3				14
15	22.3	22.8	25.8		24.6	22.1	20.0	12.2	13.3				15
16	23.2	23.9	26.4		25.3	22.3	18.9	12.3	14.7				16
17	21.9	23.3	25.4		24.6	21.8	17.5	11.5	13.5				17
18	22.3	22.6	26.0		24.9	21.5	16.9	12.7	13.6				18
19	22.6	22.6	25.2	23.7	25.3	22.2	17.4	12.3	13.6				19
20	22.8	23.3	25.5	24.0	25.0	22.5	15.8	11.8	14.8				20
21	23.7	24.9	24.1	24.1	24.0	22.5	15.8	10.4	13.1				21
22	22.2	24.2	24.7	23.9	24.1	22.3	15.8	9.7	12.5				22
23		23.6	24.8	23.9	24.1	21.5	13.6	10.7	12.5				23
24		23.6	24.5	23.9	24.3	21.2	13.7	14.8	16.3				24
25	22.0	23.3	24.1	23.9	24.5	21.6	11.3	12.2	21.3				25
26	22.2	22.8	23.8	23.4	24.3	22.3	11.9	11.9	16.4				26
27	21.4	23.0		24.0	24.4	22.0	13.9	15.0	15.6				27
28	21.2	23.1	23.9	24.4	24.3	21.5	11.6	14.4	18.6				28
29	21.1		24.3	24.6	24.4	21.6	15.4	15.1	17.0				29
30	24.5		23.8	24.5	23.4	20.6	15.8	13.4	15.4				30
31	23.8		24.1		22.6		14.6	13.1					31

Monthly values

X _m	22.5	23.9	24.7	24.0	24.5	22.2	17.4	12.7	14.0	15.0			X _m
N	27	28	30	15	31	26	31	31	27	2			N
s	0.8	0.9	0.8	0.4	0.5	0.6	3.0	1.5	2.4				s

Annual mean 320.1 ppmv
(based on 10 monthly means)

X_m = average monthly concentration

N = number of daily values accepted

s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: POINT BARROW
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1965
 Final CO₂ concentration values in ppmv above 300.0
 (continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	23.1		26.6	27.9	28.2	28.3	22.0	14.2	12.9	16.0	20.3	23.7	1
2			27.6	28.3	28.1		21.9	11.8	12.9	16.2	21.5	23.3	2
3	24.3		28.1	27.9	27.9		22.2	15.6	13.1	18.5	24.3	24.8	3
4	24.0		28.0	27.5	28.4		22.4	14.7	13.0	17.7	20.8	22.0	4
5	23.3		28.8	27.3			21.6	15.7	13.2	17.0	21.0	21.8	5
6	23.4		28.5	27.5			22.4	15.0	13.1	16.6	20.9	22.3	6
7	23.6		26.2	27.7	29.0		20.0	14.3	12.9	17.7	22.3	22.3	7
8	23.9		25.6	27.6	28.9		20.4	14.6	13.1	22.5	22.7	22.5	8
9	24.1		26.0	27.6	29.0		20.4	13.5	17.9	21.7	22.4	22.6	9
10	23.1	26.0	27.3	27.9	29.5	24.7	18.2	11.4	15.9	23.8	22.2	22.2	10
11	23.3	26.5	27.1	27.7	29.9	25.0	19.1	13.5	12.7	20.7	22.6	22.3	11
12	23.6	28.3	26.3	27.7	29.9	24.9	19.5	13.4	13.9	18.4	22.1	22.4	12
13	26.7	26.6	27.0	28.2	29.9	24.9	19.9	13.2	14.6	22.0	22.0	22.7	13
14	27.4		27.3	27.4	30.1	25.7	20.5	13.5	13.7	26.8	21.5	22.7	14
15	28.1	26.7	27.5		29.3	24.7	19.2	13.2	14.2	24.9	21.6	22.5	15
16	26.7	27.9	26.8		27.6	24.8	17.6	12.7	14.5	23.9	21.8	22.4	16
17	27.1	26.1	26.6		28.7	24.5	17.6	14.6	14.0	20.5	22.3	22.2	17
18	27.2	25.0	26.5		29.4	24.5	18.7	15.1	14.0	18.7	22.5	22.3	18
19	24.9	25.2	26.5		27.6		18.2	13.0	13.7	20.0	22.6	22.3	19
20	25.0	27.4	26.4	25.5	27.3		18.8	14.8	13.3	20.8	21.7	22.9	20
21	26.8	25.7	26.1	26.7	27.9		18.5	13.1	13.5	21.3	21.5	22.7	21
22	27.7	24.9	26.1	28.1	29.9	24.7	18.2	13.8	13.9	23.3	21.9	23.0	22
23	28.7	27.3	26.0	26.9	28.6	24.7	18.4	13.1	13.5	21.3	22.7	23.0	23
24	29.7	29.3		27.0	28.9	24.1	17.8	12.9	13.4	21.1	23.1	23.0	24
25	32.6	26.8		26.7	28.0	24.1	17.6	13.6	13.6	20.9	22.4	23.6	25
26		30.0		26.7	27.6	24.7	17.0	13.4	16.3	20.1	22.5	23.6	26
27		26.9	28.7	24.9	28.3	24.4	15.7	12.9	15.3	19.8	21.9	23.2	27
28		23.9	28.5	27.3	27.5	24.5	16.3	13.3	14.7	19.7	21.2	23.5	28
29			28.4	27.5	27.4	24.8	17.2	13.1	15.5	19.5	23.1	24.1	29
30			28.1	27.7	27.5	24.3	17.0	13.0	15.7	19.6	25.0	23.9	30
31			28.0		27.6		16.5	12.9		19.6		24.2	31

Monthly values

X _m	25.8	26.7	27.2	27.3	28.6	24.9	19.1	13.6	14.1	20.3	22.1	22.9	X _m
N	24	18	28	25	29	19	31	31	30	31	30	31	N
s	2.5	1.5	1.0	0.8	0.9	0.9	1.9	1.0	1.2	2.6	1.0	0.7	s

Annual mean 322.7 ppmv
 (based on 12 monthly means)

X_m = average monthly concentration
 N = number of daily values accepted
 s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: POINT BARROW
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1966
 Final CO2 concentration values in ppmv above 300.0
 (continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	24.2	25.6	24.5	25.4	26.5		22.6	15.9	13.8	18.1	21.7	23.4	1
2	23.9	25.2	24.5	25.5			23.9	16.2	13.5	17.0	22.5	23.1	2
3	23.9	24.6	24.5	26.0			24.0	16.0	13.5	18.0		23.4	3
4	23.6	24.7	25.0	25.9			23.5	15.6	13.1	19.0	22.2	24.0	4
5	24.0	24.8	25.3	25.8			23.9	15.0	14.5	19.7	22.4	25.2	5
6	23.4	24.8	24.8	25.7			23.7	15.2	15.2	19.0	23.7	25.9	6
7	24.3	24.6	25.7	25.6			22.2	15.5	13.3	19.9	24.4	23.7	7
8	24.2	24.6	25.8	25.6			20.5	15.8	15.0	19.0	23.0	24.0	8
9	24.0	25.4	25.5	25.5			19.0	15.1	13.9	17.3	22.0	25.5	9
10		24.6	25.6	26.7			21.2	15.3	14.5	18.8	22.6	25.2	10
11		24.5	24.9	25.9			18.8	14.8	14.4	20.1	22.6	25.2	11
12		24.4	25.3	25.9			18.6	14.7	16.8	19.9	22.3	26.0	12
13		24.3	25.9	26.1			18.1	14.8	17.5	18.8	21.9	25.0	13
14		23.6	25.7	25.5			17.6	14.8	16.1	21.1	23.6	25.4	14
15	26.7	23.9	25.1	26.6			15.8	13.6	14.3	21.9	24.5	25.0	15
16	27.0	24.3	25.5	26.1			16.4	14.0	14.9	21.2	23.7	25.6	16
17	25.0	24.4	25.3	25.6			17.5	13.7	14.6	19.9	23.6	25.5	17
18	24.6	24.5	25.2	25.6			19.0	13.7	15.1	20.6	23.4	25.9	18
19	26.2	25.2	25.1	26.0			17.7	13.8	15.1	20.9	23.3	26.1	19
20	26.8	25.5	25.1	25.7			16.5	14.4	14.8	19.9	23.3	25.9	20
21	25.7	25.3	25.2	25.5			14.5	15.1	16.8	20.6	23.0	25.7	21
22	25.6	24.9	25.4	25.5			18.5	14.5	19.8	20.2	23.3	25.5	22
23	25.9	24.6	26.1	26.5			18.1	14.6	17.1		23.0	25.7	23
24	26.2	24.6	26.1	26.6			17.5	14.4	16.8	19.9	22.1	26.2	24
25	26.2	24.4	26.4	26.1			18.3	14.5	16.5	20.4	22.6	25.8	25
26	25.3	24.9	26.2	26.4			18.4	15.7	16.7	20.8	22.8	25.4	26
27	24.5	24.4	25.9	26.5			18.6	14.8	15.9	23.8	23.1	25.1	27
28	24.3	24.4	25.7	26.3			18.5	13.6	16.1	21.6	22.8	25.0	28
29	24.6		25.8	26.4		24.2	17.6	13.6	22.3	19.9	22.4	25.6	29
30	23.9		25.5	26.5		22.7	17.0	13.8	23.9	20.6	24.3	25.6	30
31	25.1		25.4				14.5	13.8		21.6		25.6	31

Monthly values

Xm	25.0	24.7	25.4	26.0	26.5	23.5	19.1	14.7	15.9	20.0	23.0	25.2	Xm
N	26	28	31	30	1	2	31	31	30	30	29	31	N
s	1.1	0.5	0.5	0.4			2.7	0.8	2.5	1.4	0.7	0.8	s

Annual mean 322.4 ppmv
 (based on 12 monthly means)

Xm = average monthly concentration
 N = number of daily values accepted
 s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: POINT BARROW
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1967
Final CO₂ concentration values in ppmv above 300.0
(continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	26.1	25.3	27.3	25.4	28.7	26.0	24.4	17.9	15.3				1
2	28.0	25.5	27.0	24.9	29.1	25.7	24.3	15.4	15.3				2
3	27.9	25.4	27.0	25.8	29.4	26.7	23.1	17.3	15.9				3
4	27.7	25.5	26.9	25.7	28.8	26.7	24.3	15.8	15.6				4
5	26.8	27.3	27.5	25.0	28.9	27.2	24.0	16.5	16.0				5
6	26.7	28.2	27.3	23.4	28.6	26.6	23.9	16.9	16.1				6
7	26.4	27.6	27.0	24.2	28.9	23.7	24.3	16.8	15.9				7
8	26.6	26.3	28.6	24.8	29.4	23.6	23.6	17.0	16.1				8
9	26.2	26.3	28.1	26.0	30.5	22.2	23.3	16.9	15.9				9
10	26.8	26.6	28.2	25.5	29.7	31.6	22.1	17.4	15.9				10
11	26.1	25.8	27.0	26.6	30.6		20.5	18.1	16.0				11
12	25.8	25.2	27.6	25.0	30.2	28.0	20.0	17.4	16.3				12
13	25.5	25.5	27.2	25.5	28.4	27.8	20.5	17.2	16.5				13
14	25.1	26.5	25.7	25.9	27.4	28.1	18.1	16.5	16.7				14
15	24.3	27.2	26.0	30.9	26.8	28.7	15.4	16.7	16.7				15
16	25.1	25.3	26.9	31.6	27.2	26.0	16.8	16.7					16
17	25.5	26.5	25.8	28.8	26.8	25.3	17.1	18.0					17
18	25.8	25.5	26.6	28.2	27.9	26.2	17.1	20.6					18
19	25.7	25.4	26.3	29.0	27.7	27.2	19.3	16.0					19
20	24.9	25.0	26.1	27.7	27.1	26.7	21.1	16.0					20
21	25.5	25.2	26.9	28.4	27.0	26.4	21.0	16.1					21
22	24.9	25.6	27.2	29.0	27.4	24.6	20.1	17.4					22
23	24.7	27.3	25.7	28.4	26.8	26.3	20.1	16.6					23
24	26.2	28.6	26.0	29.1	26.9	25.9	20.1	15.5					24
25	25.8	28.0	25.9	28.8	26.8	26.0	19.8	15.2					25
26	25.4	26.3	24.6	29.5	26.7	25.3	19.5	16.5					26
27	25.8	27.5	25.2	28.8	27.4	23.6	19.5	15.8					27
28	26.0	27.4	25.5	28.9	27.9	21.8	19.5	16.0					28
29	25.7		24.5	28.5	28.1	23.9	19.4	15.1					29
30	25.5		25.1	28.0	27.0	23.4	18.3	15.1					30
31	25.2		24.5		27.2		18.5	15.3					31

Monthly values

X _m	25.9	26.4	26.5	27.2	28.1	25.9	20.6	16.6	16.0				X _m
N	31	28	31	30	31	29	31	31	15				N
s	0.9	1.1	1.1	2.1	1.2	2.1	2.5	1.1	0.4				s

Annual mean 323.7 ppmv
(based on 9 monthly means)

X_m = average monthly concentration

N = number of daily values accepted

s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: POINT BARROW
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1974
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1		40.0*											1
2							34.0						2
3	34.3											33.0*	3
4													4
5													5
6													6
7													7
8					37.0*								8
9													9
10									23.5				10
11										34.8& 31.9			11
12													12
13													13
14								22.9					14
15						36.3							15
16	37.8*												16
17													17
18												35.7	18
19													19
20											33.1*		20
21			37.1*										21
22										28.6			22
23													23
24									24.9*				24
25				36.5*									25
26													26
27								29.2*					27
28													28
29													29
30			36.9										30
31							24.3*					36.0	31

Monthly values

Xm	34.3		36.9			36.3	34.0	22.9	23.5	28.6	31.9	35.9	Xm
N	2		2			3	3	2	2	3	2	6	N
s													s

Annual mean 331.6 ppmv
 (based on 9 monthly means)

Xm = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: POINT BARROW
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1975
Final CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2													2
3								25.4					3
4						35.8							4
5													5
6									23.7				6
7													7
8													8
9					37.0					28.3			9
10													10
11		37.7											11
12											33.1		12
13													13
14			36.1					19.4*					14
15							29.8*						15
16	36.5											35.5	16
17													17
18						35.7			24.3				18
19													19
20					37.4								20
21										29.9			21
22													22
23													23
24													24
25			36.5	37.3									25
26		39.5							27.3				26
27													27
28	37.7												28
29													29
30												36.2	30
31													31

Monthly values

Xm	37.1	38.6	36.3	37.3	37.2	35.8		25.4	25.1	29.1	33.1	35.8	Xm
N	4	6	4	3	6	6		2	9	6	3	5	N
s													s

Annual mean 333.7 ppmv
(based on 11 monthly means)

Xm = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: POINT BARROW
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1976
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2			38.0										2
3							34.1					37.0	3
4													4
5													5
6													6
7							32.9		25.2				7
8						37.4							8
9													9
10													10
11													11
12					39.0			25.3					12
13	38.1												13
14													14
15										29.8			15
16											33.5		16
17		37.2											17
18													18
19			38.6	38.9									19
20												36.8	20
21							29.0						21
22													22
23									26.9*				23
24													24
25					37.9								25
26										30.7			26
27	35.9							23.1					27
28												38.7	28
29				39.8									29
30													30
31			38.0										31

Monthly values

Xm	37.0	37.2	38.2	39.3	38.4	37.4	32.0	24.2	25.2	30.2	33.5	37.5	Xm
N	6	3	9	6	6	2	8	5	3	6	3	8	N
s													s

Annual mean 334.2 ppmv
 (based on 12 monthly means)

Xm = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: POINT BARROW
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1977
Final CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1											33.0		1
2					40.1								2
3													3
4													4
5								25.9					5
6									26.2				6
7										34.6&			7
8				37.4*									8
9			37.7			38.6							9
10													10
11	37.8												11
12													12
13													13
14											33.5		14
15		37.1											15
16								27.9					16
17												40.5	17
18										31.4			18
19													19
20													20
21													21
22													22
23													23
24			37.9		40.0								24
25	39.8*												25
26													26
27													27
28									28.1		37.4	39.6	28
29													29
30													30
31													31

Monthly values

Xm	37.8	37.1	37.8		40.0	38.6		26.9	27.2	31.4	34.7	40.0	Xm
N	3	3	5		5	3		5	5	3	9	5	N
s													s

Annual mean 335.1 ppmv
(based on 10 monthly means)

Xm = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: POINT BARROW
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1978
Final CO₂ concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1												38.4	1
2													2
3													3
4													4
5													5
6													6
7													7
8			42.5										8
9		40.9											9
10													10
11													11
12	38.9												12
13													13
14													14
15													15
16													16
17													17
18													18
19												37.9*	19
20													20
21													21
22													22
23		40.1											23
24													24
25											40.3		25
26													26
27	39.4												27
28													28
29													29
30													30
31												39.7	31

Monthly values

X _m	39.2	40.5	42.5							40.3	39.0	X _m
N	6	6	2							3	6	N
s												s

Annual mean 340.3 ppmv
(based on 5 monthly means)

X_m = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: POINT BARROW
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1979
Final CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1							38.6*	26.4*	27.0*	31.7		39.4	1
2			43.7										2
3				41.8		43.9							3
4													4
5											36.6		5
6													6
7													7
8		40.6											8
9													9
10													10
11													11
12													12
13													13
14								25.3*					14
15	40.3				43.3	43.0			29.0		37.1		15
16			42.3							33.2			16
17				42.0									17
18												43.1	18
19							28.3&						19
20		42.2											20
21													21
22													22
23													23
24													24
25													25
26													26
27													27
28													28
29													29
30				43.2									30
31													31

Monthly values

Xm	40.3	41.4	43.0	42.4	43.3	43.4		29.0	32.4	36.9	41.3	Xm
N	2	6	5	8	3	6		3	6	5	5	N
s												s

Annual mean 339.3 ppmv
(based on 10 monthly means)

Xm = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: POINT BARROW
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1980
Final CO₂ concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1			44.0				39.9			35.2	40.6		1
2						43.4							2
3													3
4	52.0*								31.1			42.5	4
5		42.1			44.1								5
6													6
7													7
8													8
9													9
10													10
11													11
12													12
13													13
14							37.0						14
15	41.5				43.4			31.6		42.6&	40.3	45.8	15
16						43.3		31.5					16
17													17
18									32.1				18
19		44.0											19
20													20
21													21
22													22
23													23
24													24
25						40.3							25
26													26
27													27
28													28
29													29
30													30
31													31

Monthly values

X _m	41.5	43.1	44.0		43.7	42.3	38.4	31.6	31.6	35.2	40.4	44.1	X _m
N	3	6	2		6	8	5	5	7	3	5	6	N
s													s

Annual mean 339.6 ppmv
(based on 11 monthly means)

X_m = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: POINT BARROW
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1981
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1										34.7			1
2		44.0	45.0										2
3	44.9								30.1		39.5		3
4													4
5													5
6								31.5*					6
7													7
8									31.7	35.5			8
9											39.9		9
10								30.5		39.1			10
11													11
12													12
13				45.8									13
14					46.2							44.1	14
15	43.6						35.1		35.8				15
16			43.9			43.1							16
17													17
18													18
19		48.8*									41.9		19
20								31.1		43.4&			20
21									33.2			44.2	21
22													22
23											42.6		23
24								28.4					24
25													25
26										39.8			26
27													27
28				46.2									28
29						41.2							29
30			44.5		45.5		31.5				42.4	44.5	30
31													31

Monthly values

Xm	44.2	44.0	44.5	46.0	45.9	42.2	33.3	30.0	32.7	37.3	41.3	44.3	Xm
N	5	2	8	6	6	5	5	8	15	13	20	10	N
s									2.4	2.6	1.4		s

Annual mean 340.5 ppmv
 (based on 12 monthly means)

Xm = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: POINT BARROW
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1982
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1						48.1	42.0				40.1		1
2			47.9										2
3												43.6	3
4	43.1												4
5							40.9						5
6										35.7			6
7					47.7			29.9				43.0	7
8				47.6									8
9			47.9					34.6	32.1		42.8		9
10						45.8							10
11		46.2											11
12				47.0	47.1		39.7						12
13													13
14												44.4	14
15											42.0		15
16						45.6							16
17		49.5	51.7*		47.0								17
18													18
19	46.0								32.6				19
20				47.4						38.6*			20
21								31.3	32.8				21
22			46.9								43.4	47.5	22
23							39.3*			41.3			23
24					47.1								24
25		47.2											25
26	44.5*			47.2		43.1							26
27								31.7				45.2	27
28									35.8				28
29			46.6				35.4*			40.0			29
30								31.9					30
31	50.1&												31

Monthly values

Xm	44.6	47.7	47.3	47.3	47.3	45.7	40.9	31.9	33.3	39.0	42.1	44.7	Xm
N	6	8	13	8	8	8	6	10	8	6	8	10	N
s			0.7	0.3	0.3	2.0		1.7	1.7		1.4	1.8	s

Annual mean 342.6 ppmv
 (based on 12 monthly means)

Xm = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: POINT BARROW
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1983
Final CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1		46.2		47.3		50.7							1
2											43.6		2
3													3
4										41.1			4
5					47.7		42.3						5
6				47.8								45.1	6
7													7
8		46.3						31.3&					8
9											44.9		9
10					48.4								10
11			47.6										11
12									33.2				12
13			48.2										13
14	46.1			47.7		47.3	41.0*						14
15		46.5						34.0*			46.4		15
16													16
17					47.8								17
18													18
19				47.6			38.6*			39.7		47.4	19
20													20
21	47.6												21
22		47.2											22
23			46.8			46.0					47.5		23
24	46.5				47.8								24
25								32.7*					25
26							37.5		39.3	44.2*			26
27				48.5		46.0						46.3	27
28													28
29													29
30											45.9		30
31													31

Monthly values

Xm	46.7	46.5	47.5	47.8	47.9	47.5	39.9	31.3	36.2	40.4	45.7	46.3	Xm
N	6	8	6	10	8	8	4	2	4	4	10	6	N
s		0.5		0.5	0.3	2.2					1.5		s

Annual mean 343.6 ppmv
(based on 12 monthly means)

Xm = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: POINT BARROW
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1984
Provisional CO₂ concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1		51.6								39.0			1
2							44.3*						2
3	49.7			49.3					35.5			46.6	3
4						49.3							4
5			49.5*								44.0		5
6													6
7													7
8										39.9			8
9	48.5						39.5	35.0					9
10									36.4			46.8	10
11				49.5		50.0							11
12			50.5								44.4		12
13													13
14		50.1											14
15					51.0								15
16								35.0*		47.2&			16
17	47.0								41.2&			47.6	17
18				49.7		47.5							18
19			49.9								44.5*		19
20													20
21													21
22		50.1								42.6			22
23				49.5				35.2*					23
24					50.7		37.7		49.8&			50.0	24
25	51.5					47.8							25
26											44.8		26
27													27
28		51.5											28
29			50.0					36.3		49.2*			29
30				50.3	50.0		38.2						30
31													31

Monthly values

X _m	49.2	50.8	50.2	49.7	50.5	48.6	38.5	35.7	35.9	40.5	44.4	47.7	X _m
N	8	8	6	10	6	8	6	4	4	6	6	8	N
s	1.9	0.8		0.4		1.2						1.6	s

Annual mean 345.1 ppmv
(based on 12 monthly means)

X_m = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: POINT BARROW
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1985
Provisional CO₂ concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1			49.8		53.0								1
2													2
3									36.9				3
4				50.7									4
5						50.3		37.5					5
6			50.5*						36.5				6
7	50.3	48.8					45.8						7
8					52.3*								8
9													9
10	50.1			50.7									10
11							45.7		37.1				11
12						49.9							12
13		49.2	50.6					37.7					13
14													14
15					52.5								15
16	49.4												16
17				51.6									17
18							42.6						18
19						50.2							19
20								37.2					20
21			50.1										21
22													22
23	49.2							37.4					23
24				51.4			41.1						24
25					52.7								25
26						48.0*							26
27													27
28													28
29					51.3								29
30	48.5												30
31			51.6										31

Monthly values

X _m	49.5	49.0	50.5	51.1	52.4	50.1	43.8	37.4	36.9		X _m
N	10	4	8	8	8	6	8	8	6		N
s	0.7		0.8	0.4	0.7		2.3	0.2			s

Annual mean 346.7 ppmv
(based on 9 monthly means)

X_m = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)

OCEAN STATION P

Authors: Charles D. Keeling and C. S. Wong

Organization: Scripps Institution of Oceanography (SIO) and Institute of Ocean Sciences (IOS)

Addresses: University of California, San Diego, La Jolla, California 92093, USA and Institute of Ocean Sciences, Sidney, B.C., Canada V8L 4B2

Site position and description: 50°00'N; 145°00'W, elevation 10 m, on ocean weather ship P

Sampling method, frequency and measurement technique: 2 liter evacuated glass flasks exposed in pairs weekly (May 1969 - Jun 1981); additional 5 liter flasks exposed in singlets or pairs (Dec 1977 - Jun 1981). Some flask samples measured at the Scripps Institution of Oceanography with an Applied Physics Corporation non-dispersive infrared gas analyzer, the remainder at IOS with a Hartmann and Braun URAS-2T non-dispersive infrared gas analyzer. The SIO and IOS data sets of flask analyses were combined into one data set as described by Keeling et al. (1984).

Scientific aims and scope of measurements: Observe seasonal and interannual variations in atmospheric CO₂

Data selection procedures used: Concentrations of replicate flask samples must agree with 0.40 ppmv to be accepted.

Calibration gases used: CO₂-in-N₂

Scale of reported data: 1983 WMO/Scripps mole fraction scale

Literature references to programme:

Bacastow, R. B., J. A. Adams, C. D. Keeling, D. J. Moss, T. P. Whorf, and C. S. Wong, "Atmospheric Carbon Dioxide, the Southern Oscillation, and the Weak 1975 El Niño", *Science*, Vol. 210, pp 66-68 (1980).

Keeling, C. D., T. Whorf, and C. S. Wong, "Weather Station P Carbon Dioxide Project Report", 97 pp., Scripps Institution of Oceanography, La Jolla, CA (1984). This information has been deposited with ASIS as NAPS document 04315. Order from ASIS-NAPS, c/o Microfiche Publications, P.O. Box 3513, Grand Central Station, New York, NY 10163.

Keeling, C. D., "The Global Carbon Cycle: What We Know and Could Know from Atmospheric, Biospheric, and Oceanic Observations", prepared for CO₂ *Research Conference: Carbon Dioxide, Science, and Consensus*, pp II.3-II.62 (1982).

Keeling, C. D., "Atmospheric and Oceanographic Measurements Needed for Establishment of a Data Base for Carbon Dioxide from Fossil Fuels", in *The Potential Effects of Carbon Dioxide-Induced Climatic Changes in Alaska. The Proceedings of a Conference*. Fairbanks, Alaska, April 7-8, 1982. School of Agriculture and Land Resources Management, University of Alaska,

Fairbanks, Miscellaneous Publications 83-1, pp 11-22 (1984).

Keeling, C. D., T. P. Whorf, C. S. Wong, and R. D. Bellagay, "The Concentration of Atmospheric Carbon Dioxide at Ocean Weather Station 'P' from 1969 to 1981", *Journal of Geophysical Research*, Vol. 90, pp 10511-10528 (1985).

Atmospheric carbon dioxide measurements at station: STATION P
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1969
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2													2
3													3
4													4
5								19.0					5
6							22.9						6
7													7
8												26.6	8
9												26.1	9
10													10
11													11
12										21.1			12
13													13
14									18.1				14
15												26.8	15
16											25.1		16
17								17.3					17
18													18
19													19
20													20
21							20.3		20.5				21
22						27.1							22
23												26.7	23
24					30.1								24
25								16.7					25
26										25.0			26
27													27
28													28
29						26.0	22.3						29
30											25.8		30
31					28.6							25.0	31

Monthly values

X _m		29.4	26.5	21.9	17.7	19.3	23.0	25.5	26.2	X _m
N		4	4	6	6	4	4	4	10	N
s									0.7	s

Annual mean 323.7 ppmv
 (based on 8 monthly means)

X_m = average monthly concentration
 N = number of daily values accepted
 s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: STATION P
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1970
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1									22.5		25.5		1
2													2
3					31.1								3
4										22.9			4
5			27.7				24.0						5
6													6
7						29.6							7
8		27.3									25.6		8
9								20.7					9
10					31.3								10
11	25.6		28.2					17.9		23.5			11
12							25.6						12
13													13
14													14
15		27.5							19.6		26.6		15
16													16
17						29.0							17
18	27.0				31.0			18.8					18
19				31.4			21.8			24.0			19
20													20
21												26.6	21
22		29.5											22
23						27.9							23
24													24
25								20.0					25
26	27.7			31.6						26.2			26
27									21.3				27
28						25.1						28.8	28
29													29
30													30
31					29.6								31

Monthly values

Xm	26.8	28.1	28.0	31.5	30.7	27.9	23.8	19.4	21.1	24.2	25.9	27.7	Xm
N	6	6	4	4	8	8	6	8	6	8	6	4	N
s					0.8	2.0		1.2		1.4			s

Annual mean 326.3 ppmv
 (based on 12 monthly means)

Xm = average monthly concentration
 N = number of daily values accepted
 s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: STATION P
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1971
Final CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1								25.5			25.7		1
2													2
3													3
4	28.7			31.0	31.2					22.9			4
5												28.1	5
6													6
7						29.4					27.0		7
8													8
9													9
10	28.4				31.1								10
11										22.4			11
12				30.5								25.7	12
13						30.1	25.6						13
14		28.5	29.1								28.1		14
15								24.0					15
16													16
17	28.0				30.6								17
18										25.4			18
19				31.4					20.3				19
20		28.5											20
21			29.6								27.1		21
22								17.2					22
23													23
24	27.8												24
25										25.3			25
26				30.5			24.9					28.0	26
27									21.2				27
28		28.6	30.4								27.4		28
29								16.3					29
30					31.9								30
31	29.1												31

Monthly values

X _m	28.4	28.5	29.7	30.8	31.2	29.7	25.3	20.8	20.8	24.0	27.1	27.3	X _m
N	10	6	6	8	8	4	4	8	4	8	10	6	N
s	0.5			0.4	0.5			4.6		1.6	0.9		s

Annual mean 327.0 ppmv
(based on 12 monthly means)

X_m = average monthly concentration
N = number of daily values accepted
s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: STATION P
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1972
 Final CO₂ concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1					32.8					24.0			1
2	27.0			31.5			28.4						2
3									19.6				3
4						31.8							4
5			30.5										5
6								25.5					6
7													7
8					31.7					25.0			8
9							27.1						9
10									20.6				10
11				30.8		30.0						27.9	11
12													12
13													13
14					33.1								14
15													15
16							25.2						16
17				32.6						26.1			17
18						28.5						30.8	18
19													19
20								20.5					20
21					33.4								21
22													22
23							24.0			25.7			23
24				32.7					22.5			30.1	24
25						28.5							25
26			30.5										26
27		30.1						18.5					27
28					32.4					26.6			28
29													29
30							25.9						30
31													31

Monthly values

X _m	27.0	30.1	30.5	31.9	32.7	29.7	26.1	21.5	20.9	25.5		29.6	X _m
N	2	2	4	8	10	8	10	6	6	10		6	N
s				0.9	0.7	1.6	1.7			1.0			s

Annual mean 327.8 ppmv
 (based on 11 monthly means)

X_m = average monthly concentration
 N = number of daily values accepted
 s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: STATION P
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1973
Final CO₂ concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	30.6			32.8			29.5						1
2													2
3									21.4	26.3			3
4			31.8										4
5		33.2				34.0					29.1		5
6					33.4			27.0					6
7	29.9									26.6			7
8				34.5									8
9													9
10										26.8		31.2	10
11			32.2						22.5				11
12		31.2									31.1		12
13					33.8	33.1		21.2					13
14													14
15	30.4			34.5						29.3			15
16									24.5				16
17						32.6							17
18			33.1										18
19		31.6									29.8		19
20					34.9			27.7					20
21										29.3			21
22	29.3			34.0					24.1				22
23						31.4	26.3						23
24													24
25		31.8	32.4									32.1	25
26											31.5		26
27								24.0					27
28					34.0								28
29				32.8									29
30												32.7	30
31													31

Monthly values

X _m	30.1	32.0	32.4	33.7	34.0	32.8	27.9	25.0	23.1	27.7	30.4	32.0	X _m
N	8	8	8	10	8	8	4	8	8	10	8	7	N
s	0.6	0.9	0.5	0.9	0.6	1.1		3.0	1.4	1.5	1.1		s

Annual mean 330.1 ppmv
(based on 12 monthly means)

X_m = average monthly concentration

N = number of daily values accepted

s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: STATION P
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1974
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1												32.9	1
2						35.3			23.6				2
3													3
4													4
5		32.1	35.6										5
6													6
7													7
8				34.3									8
9	31.1					34.6							9
10													10
11	31.2	33.2											11
12													12
13										27.4			13
14				34.1			28.5						14
15													15
16						33.2							16
17													17
18		32.7											18
19										29.9			19
20	31.8		33.5					26.4					20
21									25.0				21
22						32.7	29.9						22
23				35.4									23
24													24
25													25
26								27.8					26
27	32.2				35.2					29.2			27
28							25.9						28
29				34.2									29
30													30
31													31

Monthly values

X _m	31.6	32.7	34.5	34.5	35.2	34.0	28.1	27.1	24.3	28.8		32.9	X _m
N	9	6	4	12	2	8	6	4	4	6		2	N
s	0.5			0.6		1.2							s

Annual mean 331.2 ppmv
 (based on 11 monthly means)

X_m = average monthly concentration
 N = number of daily values accepted
 s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: STATION P
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1975
Final CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1						35.9							1
2		34.1	35.3								32.0		2
3								23.4					3
4					36.8								4
5										28.8			5
6				36.5			30.6						6
7													7
8						34.6							8
9		35.3									35.9		9
10			35.1					27.9					10
11					36.6								11
12	33.7									30.3			12
13				36.3			29.3						13
14									25.0				14
15						34.5						34.3	15
16		35.0											16
17			35.8										17
18													18
19	33.8									32.0			19
20				35.5			25.9						20
21						33.5			25.6				21
22												33.4	22
23											32.9		23
24		35.4	35.8										24
25					35.5								25
26	33.6									30.9			26
27				36.6			26.5						27
28									27.9			35.1	28
29						32.5							29
30											33.2		30
31								24.8					31

Monthly values

Xm	33.7	34.9	35.5	36.2	36.3	34.2	28.1	25.4	26.2	30.5	33.5	34.3	Xm
N	6	8	8	8	6	10	8	6	6	8	9	6	N
s		0.6	0.4	0.5		1.3	2.2			1.3	1.7		s

Annual mean 332.4 ppmv
(based on 12 monthly means)

Xm = average monthly concentration
N = number of daily values accepted
s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: STATION P
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1976
Final CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1				38.6							31.5	33.0	1
2		35.4						25.3					2
3										28.9			3
4	34.5						33.2						4
5				38.0									5
6						36.5			23.0			31.1	6
7			33.3										7
8		35.1		37.9				27.2			30.8		8
9					38.8								9
10										28.8			10
11				38.6			31.3						11
12												34.0	12
13									24.9				13
14			35.6			35.0							14
15		33.4									33.5		15
16		36.0						23.9					16
17					39.1					30.7			17
18							30.6						18
19									26.2			34.3	19
20	32.0					35.3							20
21													21
22			37.3								33.3		22
23					38.6			21.2					23
24										32.8			24
25							27.7						25
26						34.5			26.3				26
27												35.0	27
28			34.8										28
29													29
30			36.9		38.3								30
31													31

Monthly values

X _m	33.3	35.0	35.6	38.3	38.7	35.3	30.7	24.4	25.1	30.3	32.2	33.5	X _m
N	4	8	10	8	8	8	8	8	10	8	8	11	N
s		1.1	1.6	0.4	0.4	0.9	2.3	2.5	1.6	1.9	1.3	1.5	s

Annual mean 332.7 ppmv
(based on 12 monthly means)

X_m = average monthly concentration
N = number of daily values accepted
s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: STATION P
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1977
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1							34.8	24.4	27.1			35.8	1
2	34.1				39.5					31.2	35.3		2
3								32.6					3
4				35.6					25.7			36.0	4
5						37.6				30.5			5
6													6
7		35.7						28.5				36.2	7
8							34.1						8
9	34.6				40.5				27.2	31.5			9
10									28.7				10
11				39.6			32.1	25.8				36.4	11
12						36.9				32.6			12
13			37.3										13
14												36.9	14
15					38.5		32.3						15
16													16
17	34.0							28.0		32.0			17
18									28.4			36.4	18
19												36.9	19
20		35.5	37.3								36.0		20
21								30.9				37.2	21
22					39.2		26.9		30.0				22
23										32.5			23
24	34.1					36.8					35.5		24
25				38.2			28.2	27.3				36.1	25
26									30.6			36.1	26
27													27
28								25.6	31.0		36.0	36.5	28
29					39.1		32.6						29
30													30
31	35.3												31

Monthly values

X _m	34.4	35.6	37.3	37.8	39.4	37.1	31.6	27.9	28.6	31.7	35.7	36.4	X _m
N	12	4	4	6	10	6	14	16	16	12	8	25	N
s	0.5				0.7		3.0	2.8	1.9	0.8	0.4	0.4	s

Annual mean 334.5 ppmv
 (based on 12 monthly means)

X_m = average monthly concentration
 N = number of daily values accepted
 s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: STATION P
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1978
Final CO₂ concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	36.4										36.1		1
2	37.0		38.3	41.1			36.5						2
3		38.1							27.2			39.1	3
4	37.4				41.3	39.3				32.6			4
5			38.6	40.8							34.1		5
6		37.7			43.1			33.9	26.6	32.2			6
7	36.8					38.4							7
8	37.6									32.8			8
9			39.1	40.5				29.5					9
10		37.7			40.8		36.0		26.6	33.5			10
11						38.6							11
12			39.5	39.7			36.5		26.5		35.9		12
13	36.8	37.8								33.5		39.5	13
14					40.4	38.3		27.8					14
15			39.5						27.5	33.1	36.1	38.6	15
16	38.5			40.7			35.7						16
17					41.0			30.5	27.8			38.0	17
18						38.5				33.6			18
19		38.4	39.5								35.6		19
20	38.1						36.1	26.9				38.8	20
21					41.0	38.4				33.2			21
22		38.3											22
23	35.5		39.1	41.2			35.3	25.4					23
24					40.6				29.7			40.3	24
25						37.7				33.5			25
26							27.2				36.0		26
27	36.7	37.8		41.8				27.3				38.8	27
28					40.0								28
29			39.9			35.6	30.8			34.3	36.9		29
30	37.9			41.5				26.0	33.6			36.9	30
31					39.3								31

Monthly values

X _m	37.2	38.0	39.2	40.9	40.9	38.1	34.3	28.4	28.2	33.2	35.8	38.8	X _m
N	27	18	19	21	20	21	22	20	22	24	18	19	N
s	0.9	0.3	0.5	0.7	1.1	1.1	3.4	2.8	2.4	0.6	0.8	1.0	s

Annual mean 336.1 ppmv
(based on 12 monthly means)

X_m = average monthly concentration

N = number of daily values accepted

s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: STATION P
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1979
Final CO₂ concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1								30.0					1
2					42.5				28.0			39.5	2
3		36.9				41.4				33.7			3
4			40.6	41.8			37.8				36.1		4
5					42.1							37.7	5
6			39.6					29.3	28.5	33.7			6
7	40.2	39.2		42.2		41.3	34.0				38.0		7
8								31.2				41.2	8
9					42.6				29.2				9
10		39.8								34.3			10
11			40.4	42.0			33.4				36.8		11
12								29.1	30.5				12
13	38.2					39.9				35.6			13
14			40.3	42.0			32.6				37.4		14
15								29.5	30.2				15
16												38.2	16
17	38.1									35.7			17
18		40.5	38.8	41.4			34.2				37.5		18
19								30.0	31.1			38.7	19
20	38.4					37.9				34.8			20
21			40.9	41.7			32.4				37.7		21
22								31.6	31.9			39.2	22
23					42.3	39.1							23
24	38.0									36.0			24
25		40.0	41.2	41.0			32.3				37.5		25
26									32.2			40.5	26
27	37.5				42.4	37.4							27
28				39.6			31.3			36.7	38.3		28
29			39.8					30.7	32.9			40.2	29
30					41.2	38.5							30
31	37.6		39.3							37.5			31

Monthly values

X _m	38.3	39.3	40.1	41.5	42.2	39.4	33.5	30.2	30.5	35.3	37.4	39.4	X _m
N	18	15	22	16	12	14	16	16	18	18	16	16	N
s	0.9	1.4	0.8	0.8	0.5	1.6	2.0	0.9	1.7	1.3	0.7	1.2	s

Annual mean 337.2 ppmv
(based on 12 monthly means)

X_m = average monthly concentration
N = number of daily values accepted
s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: STATION P
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1980
Final CO₂ concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1			41.1										1
2	39.3			42.6			40.4				38.2		2
3		40.6						34.7	30.5				3
4					42.8	42.5							4
5	39.0		42.0	43.4						35.7	39.6		5
6		41.3					39.3	36.8	32.6			39.6	6
7						42.9							7
8			40.8							36.2			8
9							39.8						9
10		40.3						37.0	32.0			41.1	10
11					44.0	41.6							11
12	40.5				44.0					36.9			12
13		40.3		44.4			36.6	32.2	32.7			40.2	13
14						43.1						38.9	14
15			41.7							37.5	40.2		15
16	41.1						37.0	35.4					16
17		41.6							34.9			41.1	17
18					44.3	42.5							18
19			43.7							38.1	40.4		19
20	38.4	40.8		43.1			34.7	30.9	34.7				20
21					44.0	40.5						41.5	21
22			42.0							38.9	40.6		22
23	40.7							34.9					23
24		41.1			44.6		31.9		35.0			40.8	24
25						40.8							25
26			41.9							37.6			26
27				43.9			34.1	33.6			40.1		27
28					43.1	40.5			36.7			40.7	28
29			40.9							39.0			29
30	39.0						32.5	36.5					30
31					44.1							39.8	31

Monthly values

X _m	39.7	40.9	41.8	43.5	43.9	41.8	36.2	34.7	33.6	37.5	39.8	40.4	X _m
N	14	14	16	10	22	16	18	18	16	16	12	18	N
s	1.0	0.5	0.9	0.7	0.6	1.1	3.2	2.1	2.0	1.2	0.9	0.8	s

Annual mean 339.5 ppmv
(based on 12 monthly means)

X_m = average monthly concentration

N = number of daily values accepted

s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: STATION P
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1981
Final CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2			43.8		47.0								2
3													3
4	40.9			45.2									4
5													5
6													6
7	42.4	41.9				43.3							7
8			43.6										8
9	41.6		43.6		45.6								9
10													10
11	41.9			44.8									11
12													12
13													13
14	41.7	42.1				42.9							14
15			43.9										15
16													16
17					45.0								17
18	41.8			44.6									18
19													19
20													20
21		44.3				41.0							21
22			44.6										22
23													23
24	42.3				44.3								24
25				45.5									25
26													26
27													27
28													28
29			44.0										29
30													30
31					45.3								31

Monthly values

Xm	41.8	42.8	43.9	45.0	45.4	42.4		Xm
N	14	6	21	14	17	9		N
s	0.5		0.4	0.4	1.0			s

Annual mean 343.6 ppmv
(based on 6 monthly means)

Xm = average monthly concentration
N = number of daily values accepted
s = standard deviation (ppmv), based on daily means

LA JOLLA PIER, CALIF.

Author: Charles D. Keeling

Organization: Scripps Institution of Oceanography

Address: University of California, San Diego, La Jolla, California 92093, USA

Site position and description: 32°52'N; 117°15'W, elevation 10 m, at end of the Scripps pier on the coast of the north Pacific ocean

Sampling method, frequency and measurement technique: Continuous measurements using an Applied Physics Corporation non-dispersive infrared gas analyzer with water vapor freeze trap (Nov 1972 - Oct 1975). 5 liter evacuated glass flasks exposed 4 to 12 at a time (Feb 1969 - Oct 1985). Flask sampling, when wind trajectory was favorable, approximately biweekly until Sept 1983; then weekly or more frequent (Sept 1983 - Oct 1985). Flask samples measured at the Scripps Institution of Oceanography with an Applied Physics Corporation non-dispersive infrared gas analyzer.

Scientific aims and scope of measurements: Observe seasonal and interannual variations in atmospheric CO₂

Data selection procedures used: Continuous data, selected for periods when CO₂ data was steady over a 5-hour period to within 0.5 ppmv. Concentrations of replicate flask samples must agree within 0.40 ppmv to be accepted.

Calibration gases used: CO₂-in-N₂

Scale of reported data: 1985 WMO/Scripps mole fraction scale

Literature references to programme:

Keeling, C. D., "The Global Carbon Cycle: What We Know and Could Know from Atmospheric, Biospheric, and Oceanic Observations", prepared for CO₂ Research Conference: Carbon Dioxide, Science, and Consensus, pp II.3-II.62 (1982).

Keeling, C. D., "Atmospheric and Oceanographic Measurements Needed for Establishment of a Data Base for Carbon Dioxide from Fossil Fuels", in The Potential Effects of Carbon Dioxide-Induced Climatic Changes in Alaska. The Proceedings of a Conference. Fairbanks, Alaska, April 7-8, 1982. School of Agriculture and Land Resources Management, University of Alaska, Fairbanks, Miscellaneous Publications 83-1, pp 11-22 (1984).

Heimann, M. and C. D. Keeling, "Meridional Eddy Diffusion Model of the Transport of Atmospheric Carbon Dioxide 1. The Seasonal Carbon cycle over the Tropical Pacific Ocean", *Journal of Geophysical Research*, in press, (1986).

Atmospheric carbon dioxide measurements at station: LA JOLLA
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1972
 Final CO2 concentration values in ppmv above 300.0
 (continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2													2
3													3
4											27.2	28.1	4
5											27.6	28.8	5
6													6
7												28.3	7
8											27.3	28.6	8
9												30.8	9
10													10
11											27.7		11
12											28.4		12
13													13
14													14
15													15
16													16
17													17
18													18
19													19
20													20
21													21
22													22
23													23
24													24
25													25
26													26
27													27
28													28
29													29
30													30
31													31

Monthly values

X _m			27.7	28.9	X _m
N			5	5	N
s			0.5	1.1	s

Annual mean 328.3 ppmv
 (based on 2 monthly means)

X_m = average monthly concentration
 N = number of daily values accepted
 s = standard deviation (ppmv), based on daily means

* : flag indicating peremptory rejection of data

Atmospheric carbon dioxide measurements at station: LA JOLLA
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1973
 Final CO₂ concentration values in ppmv above 300.0
 (continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1					33.3	32.5							1
2						32.5	30.4		23.6	28.2	29.6		2
3	28.7				33.6	33.7	30.6	27.7			29.9		3
4	29.4		31.5	32.9		33.6	31.3	25.9	23.0				4
5			31.6		33.5			27.5					5
6					32.0			27.6					6
7				33.5			31.4	27.6					7
8					33.4		30.5		26.4	27.4			8
9	29.5					33.4	32.4		26.0				9
10						35.5			24.3				10
11		30.5	31.6		35.2	33.3		27.5					11
12		30.6	30.9		35.1	33.3			26.2				12
13		33.1	32.0	32.0	34.3			23.8	26.9				13
14		30.6		32.2	34.8	32.2		24.5	28.1				14
15		30.6		32.0	35.4	32.2		25.4					15
16	29.0			34.4		32.5		28.2	28.7				16
17	29.5		31.0	31.8		31.3	29.5	24.5	27.6		29.1		17
18			31.2	32.5	33.7	33.1	29.5				30.0		18
19					32.5		27.7						19
20			31.9	34.9	32.4		27.9						20
21			32.0		34.6	35.3*	27.4	24.8	24.9	27.7	32.4		21
22			32.4		34.0			22.6	26.2			31.5	22
23	30.8				33.6			21.5	25.3				23
24				33.0	33.3								24
25	30.1		31.3	35.1	33.6	33.2							25
26	30.2		31.3		33.7	31.8	27.4	24.1					26
27			31.3			31.3		24.7					27
28		33.9	32.1	32.3		32.4	28.0	25.2					28
29				32.6	33.7	32.6	29.1		33.9*				29
30			32.3	32.5		32.3	29.4		31.8*				30
31	31.3		33.2		33.0		29.0	23.8					31

Monthly values

X _m	29.8	31.6	31.7	33.0	33.7	32.8	29.5	25.4	25.9	27.8	30.2	31.5	X _m
N	9	6	16	14	21	19	16	18	13	3	5	1	N
s	0.8	1.6	0.6	1.1	0.9	1.0	1.5	1.9	1.7		1.3		s

Annual mean 330.2 ppmv
 (based on 12 monthly means)

X_m = average monthly concentration
 N = number of daily values accepted
 s = standard deviation (ppmv), based on daily means

* : flag indicating peremptory rejection of data

Atmospheric carbon dioxide measurements at station: LA JOLLA
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1974
Final CO₂ concentration values in ppmv above 300.0
(continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	30.8			33.2	32.4	34.5	30.1	30.9			30.2		1
2			33.7	33.0	35.1	34.3	32.3	29.2	27.7	26.5			2
3			33.8		34.4	35.6	32.3	29.6		27.4			3
4					34.2	35.8				27.6		30.5	4
5	32.6				33.6					28.7			5
6				33.7	33.6		32.4	28.6		28.6			6
7								28.9	29.1	28.4			7
8				34.7		33.5		25.9	29.7*	28.4		32.1	8
9			35.0	34.0		34.2	30.1			28.3			9
10			34.6	34.6		35.5	30.6	25.9	30.7*				10
11					35.3	35.1	27.9	27.9					11
12		32.5				35.0	29.4	28.1	24.9				12
13		32.6		33.8	35.5	35.3	30.2	28.5	25.2				13
14					36.0		30.0	27.6	26.1				14
15							29.9	26.5	26.7				15
16		32.7		33.9	35.6	33.0	29.6						16
17		33.0		32.9	36.3	32.8	28.4	25.1	28.1				17
18			33.1	33.2	35.3	32.2	30.5	23.9	27.6				18
19			32.6	35.4	35.0	32.4		25.7	29.6				19
20	31.5		34.8	33.6		32.3	30.2	26.1	31.2*	35.1*			20
21	31.7		34.8			33.3	30.0						21
22			33.3		35.0		28.7			28.9			22
23			33.1	33.3	34.6		28.4	28.4					23
24			32.6	34.2	35.4	33.0	29.2	29.6*					24
25			32.5	35.3			29.3		30.4*	28.3			25
26			32.4		36.7		29.6		32.5*	28.0			26
27			32.9		35.7		29.1	28.0		28.3			27
28			33.1		34.3		29.4	27.7		28.6		33.0	28
29					34.1	31.7		29.4*		28.7		33.0	29
30			33.0		34.8	31.6	28.2						30
31			32.9				29.5			31.8			31

Monthly values

X _m	31.7	32.7	33.4	33.9	34.9	33.7	29.8	27.5	27.2	28.4	30.2	32.2	X _m
N	4	4	17	15	21	19	25	19	9	15	1	4	N
s	0.7	0.2	0.9	0.8	1.0	1.4	1.2	1.8	1.6	1.1		1.2	s

Annual mean 331.3 ppmv
(based on 12 monthly means)

X_m = average monthly concentration

N = number of daily values accepted

s = standard deviation (ppmv), based on daily means

* : flag indicating peremptory rejection of data

Atmospheric carbon dioxide measurements at station: LA JOLLA
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1975
Final CO2 concentration values in ppmv above 300.0
(continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1				35.7	36.4	34.7							1
2			33.3			34.1	30.7						2
3		32.6		34.6	35.9	34.2	30.5	27.8	26.0				3
4				33.9		34.0	29.9	28.0	25.9				4
5				34.7		34.4		27.4	28.4	31.3			5
6				35.2					28.1				6
7	30.6				36.2	34.3	32.1		27.2	28.5			7
8	32.2		33.2		35.1	34.0	30.8		28.0				8
9	32.7		33.9	34.6		34.4	32.1	25.0					9
10		32.5	33.8				30.3						10
11				34.4				26.7		28.2			11
12						33.3	29.5	26.0	29.6	28.7			12
13				36.5	35.8	34.0	31.5	26.8	36.0*				13
14		33.1		35.4		35.3	30.6	27.0	36.2*				14
15				34.2	34.8	33.3	31.2						15
16			34.9	35.0	35.5	35.3	31.0	27.1					16
17				35.2	35.5	33.6	30.0	26.7	32.7*				17
18				35.2	36.0	32.9	29.9		27.5	34.9*			18
19					36.1	31.0	30.4						19
20		34.3			36.5	31.3							20
21			34.7		35.6		30.0			33.3*			21
22		34.8	34.5		34.6	33.5	31.2			35.4*			22
23						32.1	29.4						23
24				34.5	34.8	31.9	29.9						24
25			32.6	35.9	34.6		29.6						25
26				36.2	36.0		29.3			31.3			26
27	34.6			36.3	36.0	31.6	28.9	24.1	31.0*				27
28					36.0	32.5	29.5		27.5				28
29						31.9	30.1		29.4				29
30							30.4		28.5				30
31			34.2				29.9						31

Monthly values

Xm	32.5	33.4	33.9	35.1	35.6	33.4	30.3	26.6	27.8	29.6		Xm
N	4	5	9	17	18	23	26	11	11	5		N
s	1.6	1.0	0.8	0.8	0.6	1.3	0.8	1.2	1.2	1.5		s

Annual mean 331.8 ppmv
(based on 10 monthly means)

Xm = average monthly concentration

N = number of daily values accepted

s = standard deviation (ppmv), based on daily means

* : flag indicating peremptory rejection of data

Atmospheric carbon dioxide measurements at station: LA JOLLA
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1969
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1				27.5									1
2										23.3			2
3													3
4													4
5													5
6													6
7													7
8													8
9													9
10													10
11													11
12													12
13	32.8*												13
14													14
15													15
16													16
17	31.3*												17
18		26.3				25.8							18
19													19
20													20
21		26.4											21
22													22
23										27.0*			23
24													24
25													25
26													26
27													27
28													28
29	30.4*												29
30													30
31													31

Monthly values

Xm	26.4	27.5	25.8	23.3	Xm
N	11	4	2	3	N
s					s

Annual mean 325.7 ppmv
 (based on 4 monthly means)

Xm = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

- * : flag indicating rejection for poor replicate flask agreement
- & : flag indicating rejection because exceeds 3 sigma of fit (see text)
- # : flag indicating peremptory rejection of data

Atmospheric carbon dioxide measurements at station: LA JOLLA
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1970
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2													2
3													3
4													4
5													5
6													6
7													7
8													8
9													9
10													10
11					31.6								11
12													12
13													13
14				29.0					22.1				14
15													15
16													16
17						27.7							17
18													18
19													19
20													20
21												27.3	21
22													22
23													23
24													24
25													25
26													26
27													27
28													28
29						26.4							29
30													30
31													31

Monthly values

Xm		29.0	31.6	27.1		22.1		27.3	Xm
N		4	2	4		2		3	N
s									s

Annual mean 327.4 ppmv
 (based on 5 monthly means)

Xm = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)
 ‡ : flag indicating peremptory rejection of data

Atmospheric carbon dioxide measurements at station: LA JOLLA
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1971
Final CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1			31.8&				26.2						1
2													2
3						30.5							3
4													4
5			34.8&										5
6													6
7				30.0									7
8													8
9													9
10													10
11													11
12													12
13													13
14				30.1									14
15													15
16													16
17		28.4											17
18													18
19													19
20													20
21						29.5							21
22		30.3											22
23													23
24					30.2								24
25	86.7&	30.8	29.0										25
26													26
27				30.6									27
28													28
29													29
30													30
31													31

Monthly values

Xm	29.8	29.0	30.2	30.2	30.0	26.2		Xm
N	7	6	12	3	10	4		N
s								s

Annual mean 329.3 ppmv
(based on 6 monthly means)

Xm = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)
: flag indicating peremptory rejection of data

Atmospheric carbon dioxide measurements at station: LA JOLLA
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1972
Final CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2													2
3							32.9&						3
4										28.6&			4
5													5
6													6
7				30.5							28.0		7
8													8
9													9
10													10
11											27.7		11
12													12
13													13
14													14
15													15
16													16
17					32.0				22.7				17
18													18
19										25.7			19
20										25.6			20
21							25.5						21
22													22
23													23
24													24
25													25
26													26
27													27
28												30.6	28
29													29
30										29.2			30
31			34.0&										31

Monthly values

X _m		30.5	32.0		25.5		22.7	26.8	27.9	30.6	X _m
N		3	2		2		2	24	12	6	N
s											s

Annual mean 328.0 ppmv
(based on 7 monthly means)

X_m = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)
‡ : flag indicating peremptory rejection of data

Atmospheric carbon dioxide measurements at station: LA JOLLA
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1973
Final CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	29.2												1
2													2
3													3
4													4
5													5
6													6
7													7
8													8
9													9
10													10
11							29.0						11
12		31.2											12
13			31.3										13
14													14
15											37.9&		15
16													16
17													17
18													18
19	30.8												19
20													20
21													21
22													22
23								21.9&		29.4			23
24													24
25													25
26													26
27													27
28			32.8										28
29													29
30				33.9									30
31													31

Monthly values

Xm	30.0	31.2	32.1	33.9		29.0		29.4		Xm
N	12	6	12	6		6		6		N
s										s

Annual mean 330.9 ppmv
(based on 6 monthly means)

Xm = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)
‡ : flag indicating peremptory rejection of data

Atmospheric carbon dioxide measurements at station: LA JOLLA
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1974
Final CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1											30.4		1
2													2
3										27.6			3
4													4
5													5
6													6
7													7
8													8
9													9
10													10
11													11
12													12
13		33.5											13
14								27.3					14
15													15
16													16
17													17
18													18
19													19
20													20
21										33.1&			21
22													22
23													23
24													24
25					35.7								25
26													26
27													27
28													28
29			33.8										29
30													30
31													31

Monthly values

X _m	33.5	33.8	35.7		27.3		27.6	30.4		X _m
N	12	2	5		6		6	6		N
s										s

Annual mean 331.4 ppmv
(based on 6 monthly means)

X_m = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)
‡ : flag indicating peremptory rejection of data

Atmospheric carbon dioxide measurements at station: LA JOLLA
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1975
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2							31.4						2
3													3
4				34.3									4
5													5
6													6
7										27.8			7
8													8
9													9
10													10
11												35.5&	11
12												33.6	12
13													13
14													14
15													15
16													16
17													17
18													18
19													19
20						36.7							20
21													21
22													22
23													23
24													24
25													25
26													26
27	34.4												27
28													28
29													29
30													30
31													31

Monthly values

Xm	34.4		34.3	36.7		31.4		27.8		33.6	Xm
N	6		6	6		6		5		2	N
s											s

Annual mean 333.0 ppmv
 (based on 6 monthly means)

Xm = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)
 ‡ : flag indicating peremptory rejection of data

Atmospheric carbon dioxide measurements at station: LA JOLLA
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1976
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2													2
3								29.4					3
4													4
5													5
6													6
7													7
8													8
9		34.7											9
10			37.1‡										10
11						35.0							11
12													12
13													13
14													14
15				38.3									15
16								26.2					16
17													17
18													18
19													19
20													20
21													21
22													22
23													23
24													24
25													25
26													26
27													27
28													28
29										40.6&			29
30													30
31												34.7	31

Monthly values

Xm	34.7	38.3	35.0	29.4	26.2	34.7	Xm
N	6	6	5	6	6	4	N
s							s

Annual mean 333.1 ppmv
 (based on 6 monthly means)

Xm = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)
 ‡ : flag indicating peremptory rejection of data

Atmospheric carbon dioxide measurements at station: LA JOLLA
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1977
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1		35.1	40.7&										1
2									30.8				2
3	35.8												3
4													4
5													5
6													6
7													7
8													8
9													9
10													10
11							33.6						11
12										59.8&			12
13													13
14										50.3&			14
15													15
16													16
17													17
18											38.3&		18
19													19
20										34.5			20
21													21
22													22
23													23
24													24
25			36.9		38.1								25
26													26
27													27
28													28
29													29
30													30
31													31

Monthly values

Xm	35.8	35.1	36.9		38.1		33.6		30.8	34.5			Xm
N	2	6	5		6		6		6	3			N
s													s

Annual mean 335.0 ppmv
 (based on 7 monthly means)

Xm = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)
 ‡ : flag indicating peremptory rejection of data

Atmospheric carbon dioxide measurements at station: LA JOLLA
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1978
Final CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1				39.1							35.6		1
2													2
3													3
4													4
5													5
6												39.6#	6
7									29.4				7
8						41.0#							8
9													9
10													10
11													11
12													12
13													13
14													14
15													15
16										36.0			16
17													17
18													18
19													19
20													20
21													21
22					38.9			31.1					22
23													23
24	40.1#												24
25													25
26													26
27						34.8							27
28													28
29													29
30													30
31													31

Monthly values

Xm		39.1	38.9	34.8		31.1	29.4	36.0	35.6		Xm
N		9	6	4		13	18	11	12		N
s											s

Annual mean 335.0 ppmv
(based on 7 monthly means)

Xm = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)
: flag indicating peremptory rejection of data

Atmospheric carbon dioxide measurements at station: LA JOLLA
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1979
Final CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1						46.3&							1
2													2
3													3
4													4
5													5
6													6
7									42.0&				7
8		40.9											8
9													9
10													10
11													11
12													12
13													13
14													14
15													15
16													16
17	40.4			41.2						38.1			17
18									35.9‡				18
19									49.2&		39.5		19
20				42.3									20
21													21
22			41.1										22
23		39.2											23
24													24
25	38.7												25
26		40.3											26
27													27
28													28
29						41.5&		33.0					29
30													30
31													31

Monthly values

Xm	39.6	40.1	41.1	41.8				33.0		38.1	39.5		Xm
N	10	26	3	19				12		6	18		N
s													s

Annual mean 339.0 ppmv
(based on 7 monthly means)

Xm = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)
‡ : flag indicating peremptory rejection of data

Atmospheric carbon dioxide measurements at station: LA JOLLA
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1980
Final CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2													2
3													3
4													4
5												40.4	5
6													6
7													7
8													8
9													9
10													10
11													11
12			40.9					33.9					12
13													13
14					41.5								14
15										37.6			15
16													16
17													17
18													18
19													19
20													20
21													21
22										58.5&			22
23	62.5&												23
24													24
25													25
26													26
27													27
28													28
29													29
30								49.6&					30
31													31

Monthly values

Xm	40.9	41.5	33.9	37.6	40.4	Xm
N	11	6	13	12	12	N
s						s

Annual mean 338.9 ppmv
(based on 5 monthly means)

Xm = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)
: flag indicating peremptory rejection of data

Atmospheric carbon dioxide measurements at station: LA JOLLA
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1981
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1							39.9						1
2													2
3													3
4													4
5										38.0			5
6											39.4		6
7													7
8	52.2&												8
9													9
10													10
11													11
12													12
13													13
14													14
15					45.8								15
16													16
17													17
18													18
19													19
20					44.4					45.6&			20
21												42.3	21
22													22
23													23
24									37.7				24
25													25
26		43.8											26
27	43.6												27
28										40.6			28
29													29
30	42.4												30
31								36.1					31

Monthly values

Xm	43.0	43.8		45.1		39.9	36.1	37.7	39.3	39.4	42.3	Xm
N	25	12		24		6	12	9	21	6	12	N
s												s

Annual mean 340.7 ppmv
 (based on 9 monthly means)

Xm = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)
 ‡ : flag indicating peremptory rejection of data

Atmospheric carbon dioxide measurements at station: LA JOLLA
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1982
Final CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2				47.2*									2
3													3
4													4
5													5
6													6
7													7
8							41.0						8
9													9
10											41.3		10
11									36.0				11
12			43.6										12
13													13
14													14
15													15
16													16
17													17
18						41.8				45.2*			18
19	43.9										41.5		19
20													20
21													21
22													22
23												43.2	23
24													24
25													25
26													26
27									36.0				27
28					45.8								28
29													29
30													30
31													31

Monthly values

Xm	43.9		43.6		45.8	41.8	41.0		36.0		41.4	43.2	Xm
N	12		12		23	6	5		18		11	6	N
s													s

Annual mean 342.1 ppmv
(based on 8 monthly means)

Xm = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)
: flag indicating peremptory rejection of data

Atmospheric carbon dioxide measurements at station: LA JOLLA
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1983
Final CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1						45.6							1
2						45.9					55.7*		2
3										42.8*			3
4												48.0*	4
5										40.1			5
6					47.8								6
7													7
8													8
9													9
10													10
11										76.0*			11
12													12
13													13
14													14
15							40.6						15
16													16
17											42.2		17
18													18
19	45.2							36.6					19
20									41.1				20
21			45.5	47.0					42.1*				21
22									39.6			45.1	22
23									40.1		48.4*		23
24													24
25		44.5									44.2		25
26													26
27	44.0									49.0*			27
28				47.6					40.2				28
29									39.0				29
30													30
31													31

Monthly values

Xm	44.6	44.5	45.5	47.3	47.8	45.7	40.6	36.6	40.0	40.1	43.2	45.1	Xm
N	11	6	6	18	5	24	12	12	17	3	16	9	N
s									0.8				s

Annual mean 343.4 ppmv
(based on 12 monthly means)

Xm = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)
‡ : flag indicating peremptory rejection of data

Atmospheric carbon dioxide measurements at station: LA JOLLA
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1984
Provisional CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1						49.0							1
2		47.4								41.1			2
3													3
4				47.5									4
5				48.3		48.7	45.0						5
6				51.6&		48.1					44.4		6
7						47.7			40.2		44.0		7
8								40.4			43.8		8
9				51.0‡							49.0&		9
10		55.2&			50.7			40.8					10
11							42.1			42.1			11
12									40.7			48.1	12
13						44.6	42.4				45.0	47.1	13
14	45.7		47.3			45.3							14
15					50.2								15
16		47.2			49.7								16
17				49.4						42.4		50.5&	17
18				48.9									18
19				49.0			42.0			46.2&			19
20				50.9		47.4	44.6		42.3			46.9	20
21								40.6					21
22											45.3		22
23							42.2						23
24							40.7	38.8	40.1				24
25				50.0					41.6	46.3‡			25
26				50.9									26
27													27
28				50.7				38.8				49.9&	28
29							42.1						29
30					48.3			39.7					30
31								40.4		45.4			31

Monthly values

Xm	45.7	47.3	47.3	49.5	49.7	47.3	42.7	39.9	41.0	42.7	44.5	47.4	Xm
N	5	12	6	32	18	22	34	25	19	13	15	10	N
s				1.2	1.0	1.7	1.4	0.8	1.0	1.8	0.6		s

Annual mean 345.4 ppmv
(based on 12 monthly means)

Xm = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)
‡ : flag indicating peremptory rejection of data

Atmospheric carbon dioxide measurements at station: LA JOLLA
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1985
Provisional CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1			48.7			50.3		41.6					1
2			49.1										2
3					49.0				38.2				3
4		52.8*											4
5			48.2										5
6			50.6						39.7				6
7					50.2					43.0			7
8	46.8				50.1			41.3					8
9		48.5							41.1				9
10					50.8					48.5*			10
11			48.7										11
12													12
13						51.4*		40.2					13
14						48.9							14
15								38.2					15
16				47.4*									16
17				47.9*	50.8								17
18			49.1				46.7*		39.3				18
19							45.9						19
20						48.2							20
21						48.3							21
22				48.7									22
23													23
24					50.7	48.3							24
25													25
26					50.0		64.4*		42.5				26
27									42.3				27
28			49.9										28
29	49.0						42.5						29
30	52.1*												30
31													31

Monthly values

Xm	47.9	48.5	49.2	48.7	50.2	48.8	44.2	40.3	40.5	43.0		Xm
N	8	4	32	4	32	19	8	16	24	4		N
s			0.8		0.6	0.9		1.5	1.7			s

Annual mean 346.1 ppmv
(based on 10 monthly means)

Xm = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)
‡ : flag indicating peremptory rejection of data

HILO, HAWAII

Author: Charles D. Keeling

Organization: Scripps Institution of Oceanography

Address: University of California, San Diego, La Jolla, California 92093, USA

Site position and description: 19°42'N; 155°6'W, elevation 3 m, on a rocky beach approximately 1 km east of the city of Hilo

Sampling method, frequency and measurement technique: 5 liter evacuated glass flasks exposed in pairs approximately twice monthly. Flask samples measured at the Scripps Institution of Oceanography with an Applied Physics Corporation non-dispersive infrared gas analyzer.

Scientific aims and scope of measurements: Observe seasonal and interannual variations in atmospheric CO₂

Data selection procedures used: Concentration of replicate flasks must agree within 0.60 ppmv to be accepted.

Calibration gases used: CO₂-in-N₂

Scale of reported data: 1985 WMO/Scripps mole fraction scale

Literature references to programme:

Pales, J. C., and C. D. Keeling, "The Concentration of Atmospheric Carbon Dioxide in Hawaii," *Journal of Geophysical Research*, Vol. 70, pp 6053-6076 (1965).

Atmospheric carbon dioxide measurements at station: HILO, HAWAII
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1960
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1												18.0	1
2													2
3							18.6						3
4								14.9			15.1		4
5													5
6										15.6*			6
7													7
8													8
9													9
10													10
11				18.9									11
12													12
13													13
14													14
15							17.1						15
16													16
17													17
18								12.5					18
19													19
20												18.0	20
21													21
22													22
23													23
24													24
25											16.1		25
26													26
27													27
28													28
29													29
30			18.7										30
31													31

Monthly values

Xm		18.7	18.9			17.8	13.7			15.6	18.0	Xm
N		3	3			4	4			4	4	N
s												s

Annual mean 317.1 ppmv
 (based on 6 monthly means)

Xm = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: HILO, HAWAII
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1961
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1			32.6*	21.6*			20.4*	16.9*	14.4*				1
2		18.7				21.8				16.0*			2
3											18.4		3
4	17.7												4
5													5
6													6
7													7
8													8
9													9
10													10
11													11
12													12
13													13
14													14
15			20.4		21.0	21.0	19.3*	17.0*	13.1*	17.8*	18.2		15
16													16
17	24.0&	18.1											17
18													18
19												17.5	19
20													20
21													21
22													22
23													23
24													24
25													25
26													26
27													27
28													28
29													29
30													30
31													31

Monthly values

X _m	17.7	18.4	20.4		21.0	21.4				18.3	17.5	X _m
N	2	4	2		2	4				4	2	N
s												s

Annual mean 319.2 ppmv
 (based on 7 monthly means)

X_m = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: HILO, HAWAII
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1962
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1		21.3	18.0				19.0				16.8*		1
2								17.3*					2
3													3
4												18.7	4
5					23.4								5
6													6
7													7
8													8
9													9
10													10
11													11
12													12
13													13
14												18.4	14
15					21.7*	21.0		16.8*		25.5*			15
16				22.0*									16
17		19.4											17
18							17.6*		20.5*				18
19													19
20													20
21													21
22													22
23													23
24													24
25													25
26													26
27													27
28													28
29													29
30													30
31													31

Monthly values

X _m	20.3	18.0		23.4	21.0	19.0					18.6	X _m
N	4	2		2	2	2					4	N
s												s

Annual mean 320.1 ppmv
 (based on 6 monthly means)

X_m = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: HILO, HAWAII
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1963
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1								16.4		16.8			1
2				21.6*					18.0				2
3	20.1*		21.3		24.4		21.5						3
4		22.4									18.0		4
5						22.5*							5
6													6
7													7
8													8
9													9
10													10
11													11
12													12
13													13
14													14
15		19.8	20.5*		24.5	22.8*	20.5			20.0*			15
16													16
17	20.0							18.3					17
18									15.8				18
19													19
20				22.6									20
21													21
22													22
23													23
24													24
25													25
26													26
27													27
28													28
29													29
30													30
31													31

Monthly values

Xm	20.0	21.1	21.3	22.6	24.4		21.0	17.4	16.9	16.8	18.0		Xm
N	2	4	2	2	4		4	4	4	2	2		N
s													s

Annual mean 319.9 ppmv
 (based on 10 monthly means)

Xm = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)

MAUNA LOA OBSERVATORY

Author: Charles D. Keeling

Organization: Scripps Institution of Oceanography

Address: University of California, San Diego, La Jolla, California 92093, USA

Site position and description: 19°32'N; 155°35'W, elevation 3397 m, at Mauna Loa Observatory on a barren lava field of an active volcano on an island in the tropical Pacific ocean

Sampling method, frequency and measurement technique: Continuous measurement using an Applied Physics Corporation non-dispersive infrared gas analyzer with water vapor freeze trap (Mar 1958 - Dec 1985).

Scientific aims and scope of measurements: Observe seasonal and interannual variations in atmospheric CO₂

Data selection procedures used: Data selected for periods of steady hourly data to within about 0.5 ppmv; at least 6 consecutive hours of steady data required to form a daily average.

Calibration gases used: CO₂-in-N₂ until Dec 1983, then CO₂-in-air

Scale of reported data: 1985 WMO/Scripps mole fraction scale

Literature references to programme:

Keeling, C. D., "The Concentration and Isotopic Abundance of Carbon Dioxide in the Atmosphere", *Tellus*, Vol. 12, pp 200-203 (1960).

Bolin, B. and C. D. Keeling, "Large-Scale Atmospheric Mixing as Deduced from the Seasonal and Meridional Variations of Carbon Dioxide", *Journal of Geophysical Research*, Vol. 68, pp 3899-3920 (1963).

Keeling, C. D. and J. C. Pales, "Mauna Loa Carbon Dioxide Project", *Report 3*, 180 pp., Scripps Institution of Oceanography, La Jolla, CA (1965). This information has been deposited with ASIS as NAPS document 04315. Order from ASIS-NAPS, c/o Microfiche Publications. P.O. Box 3513. Grand Central Station, New York, NY 10163.

Pales, J. C. and C. D. Keeling, "The Concentration of Atmospheric Carbon Dioxide in Hawaii", *Journal of Geophysical Research*, Vol. 70, pp 6053-6076 (1965).

Ekdahl, C. A., Jr., P. R. Guenther, and C. D. Keeling, "Mauna Loa Carbon Dioxide Project", *Report 4*, 349 pp., Scripps Institution of Oceanography, La Jolla, CA (1971). This information has been deposited with ASIS as NAPS document 04315. Order from ASIS-NAPS, c/o Microfiche Publications. P.O. Box 3513. Grand Central Station, New York, NY 10163.

- Ekdahl, C. A., Jr. and C. D. Keeling, "Atmospheric Carbon Dioxide and Radiocarbon in the Natural Carbon Cycle: I. Quantitative Deductions from the Records of Mauna Loa Observatory and at the South Pole", Brookhaven Symposium in Biology No. 24, *Carbon and the Biosphere*, edited by G. M. Woodwell and E. V. Pecan, United States Atomic Energy Commission, pp 51-85 (1973).
- Bacastow, R. B., "Modulation of Atmospheric Carbon Dioxide by the Southern Oscillation", *Nature*, Vol. 261, pp 116-118 (1976).
- Keeling, C. D., R. B. Bacastow, A. E. Bainbridge, C. A. Ekdahl, Jr., P. R. Guenther, L. S. Waterman, and J. F. S. Chin, "Atmospheric Carbon Dioxide Variations at Mauna Loa Observatory, Hawaii", *Tellus*, Vol. 28, pp 538-551 (1976).
- Bacastow, R., "Southern Oscillation Index and Atmospheric Carbon Dioxide", *Nature*, Vol. 267, p 650 (1977).
- Bacastow, R., "Influence of the Southern Oscillation on Atmospheric Carbon Dioxide", in *Fate of Fossil Fuel CO₂ in the Oceans*, edited by N. R. Andersen and A. Malahoff, Plenum Publishing Corp., New York, pp 33-43 (1977).
- Keeling, C. D., "The Influence of Mauna Loa Observatory on the Development of Atmospheric CO₂ Research", in *Mauna Loa Observatory 20th Anniversary Report*, edited by J. Miller, National Oceanographic and Atmospheric Administration, Special Report, pp 36-54 (1978).
- Bacastow, R., "Dip in the Atmospheric CO₂ Level During the Mid-1960's", *Journal of Geophysical Research*, Vol. 84, pp 3108-3114 (1979).
- Bacastow, R. B., J. A. Adams, C. D. Keeling, D. J. Moss, T. P. Whorf, and C. S. Wong, "Atmospheric Carbon Dioxide, the Southern Oscillation, and the Weak 1975 El Niño", *Science*, Vol. 210, pp 66-68 (1980).
- Bacastow, R. B. and C. D. Keeling, "Atmospheric Carbon Dioxide Concentration and the Observed Airborne Fraction", *SCOPE 16: Carbon Cycle Modelling*, John Wiley & Sons, New York, pp 103-112 (1981).
- Keeling, C. D., R. B. Bacastow, and T. P. Whorf, "Measurements of the Concentration of Carbon Dioxide at Mauna Loa Observatory, Hawaii," in *Carbon Dioxide Review: 1982*, William C. Clark, editor, Oxford University Press, pp 377-385 (1982).
- Keeling, C. D., "The Global Carbon Cycle: What We Know and Could Know from Atmospheric, Biospheric, and Oceanic Observations", prepared for *CO₂ Research Conference: Carbon Dioxide, Science, and Consensus*, pp II.3-II.62 (1982).
- Mook, W. G., M. Koopmans, A. F. Carter, and C. D. Keeling, "Seasonal, Latitudinal, and Secular Variations in the Abundance and Isotopic Ratios of Atmospheric Carbon Dioxide 1. Results from Land Stations", *Journal of Geophysical Research*, Vol. 88, pp 10915-10933 (1983).
- Keeling, C. D., "Atmospheric and Oceanographic Measurements Needed for Establishment of a Data Base for Carbon Dioxide from Fossil Fuels", in *The Potential Effects of Carbon Dioxide-Induced Climatic Changes in Alaska. The Proceedings of a Conference*. Fairbanks, Alaska, April 7-8, 1982. School of Agriculture and Land Resources Management, University of Alaska, Fairbanks, Miscellaneous Publications 83-1, pp 11-22 (1984).
- Bacastow, R. B., C. D. Keeling, and T. P. Whorf, "Seasonal Amplitude Increase in Atmospheric CO₂ Concentration at Mauna Loa, Hawaii, 1959-1982", *Journal of Geophysical Research*, Vol. 90, pp 10529-10540 (1985).
- Elliott, W. P., L. Machta, and C. D. Keeling, "An Estimate of the Biotic Contribution to the Atmospheric CO₂ Increase Based on Direct Measurements at Mauna Loa Observatory", *Journal of Geophysical Research*, Vol. 90, pp 3741-3746 (1985).

Atmospheric carbon dioxide measurements at station: MAUNA LOA
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1958
 Provisional CO₂ concentration values in ppmv above 300.0
 (continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1									14.5			14.4	1
2				18.0	17.1				13.8			14.3	2
3				17.9	16.4				13.8				3
4				17.3	17.1		16.0	15.5				14.6	4
5				17.7	17.9							14.7	5
6				17.5	18.1			15.8				14.6	6
7				17.1				15.0				14.8	7
8							16.3	15.2			13.4	14.8	8
9											13.6	14.5	9
10				16.8							13.1	14.0	10
11				17.1			15.5				12.8	14.4	11
12							15.8	15.3			13.6	14.6	12
13				17.9				15.0			13.1	14.6	13
14							16.4	15.4			13.2	14.7	14
15				19.1			16.7	15.6			13.5	14.8	15
16				18.9			15.0				13.6	14.5	16
17				17.7			15.6				13.5	14.7	17
18				17.8							13.6		18
19							15.7				13.2		19
20				16.8	17.9		16.4				13.4		20
21				17.3	18.5						14.1	14.9	21
22				17.5	18.5						13.9	14.8	22
23				17.0	18.2		15.9				14.2	14.8	23
24					18.5		16.3						24
25					18.3		15.7						25
26							15.5				14.1		26
27							15.7				13.9		27
28			16.4				15.7				14.4		28
29			16.1	16.5			15.8	15.0			13.9	15.1	29
30			16.4	16.8			16.3	14.5			14.0	15.3	30
31			16.9				15.8	14.1				15.4	31

Monthly values

X _m		16.4	17.5	17.9		15.9	15.1	14.0		13.6	14.7	X _m
N		4	19	11		19	11	3		21	22	N
s		0.3	0.7	0.7		0.4	0.5			0.4	0.3	s

Annual mean 315.6 ppmv
 (based on 8 monthly means)

X_m = average monthly concentration

N = number of daily values accepted

s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: MAUNA LOA
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1959
Provisional CO₂ concentration values in ppmv above 300.0
(continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	15.3		17.0	17.3			17.4	15.5		12.6	14.7	15.1	1
2				18.3			17.5	16.2	15.4	12.4	14.7		2
3				18.2		18.6	17.9	15.5	15.0	13.6	14.9	15.1	3
4			17.0	18.3	18.0	18.9	17.9	15.1					4
5	15.0		17.1	17.7	18.6	18.8	15.7	14.2		12.9	14.6		5
6			16.8	17.3	18.9	18.6	15.8		14.1	14.0		15.1	6
7	15.1		16.8	17.7		18.3	16.6	15.5	14.4	14.1	14.8	15.2	7
8	15.4		17.0	17.0		18.5	16.9	15.6	14.3			15.2	8
9	15.7		17.4	17.1		18.7	16.5		14.1				9
10	15.6		16.9	17.5		17.5	16.7		14.1	12.8			10
11	15.7			17.0		18.1	17.3			13.1		15.5	11
12	15.5			17.2		18.5	17.1				14.8	15.5	12
13	15.4			17.1	18.5	18.1	17.1				15.2	15.8	13
14	15.7			17.6	18.8	18.6	17.0			14.0	14.7	16.0	14
15	16.2				18.4		16.9		14.1	13.8		15.9	15
16	15.9			17.4	17.9		17.0		14.1	13.8	15.4		16
17	15.6	16.9		16.9	17.7		16.8		14.2	13.5	15.4	15.8	17
18	15.5	16.6		17.4	17.7		15.9		14.1	13.5	15.1	15.9	18
19	15.2	16.4		18.1	18.1	17.9			13.0	13.3	15.7	16.0	19
20	15.9	16.2		18.5	18.7	18.0			13.2	13.3	15.6	15.8	20
21	15.8	16.0	17.1	18.3	18.8	18.0	16.3			13.1	15.4	16.0	21
22	16.0	16.8	17.1	18.2	18.7	17.9				14.0	15.0	16.7	22
23	15.6	17.1	16.4			17.9			13.8	13.8		15.9	23
24	16.0	15.9	16.7		18.2	17.8		15.2	13.8	13.1	15.5	16.1	24
25	16.0		16.6	18.6	18.2	17.9	16.6			13.7	15.6	15.9	25
26			16.7	18.6			16.5			13.9	15.4	16.0	26
27		16.6	16.6	18.4			16.1	14.3		14.0		16.2	27
28	15.3	16.7	17.2	18.3			16.1	14.6	13.6	14.1	15.3		28
29	15.6		17.5	18.5			16.4	14.2	13.6	13.4	15.0	15.9	29
30							16.1	14.3	13.8	14.1		15.8	30
31			16.3				15.9			14.8			31

Monthly values

X _m	15.6	16.5	16.9	17.8	18.3	18.2	16.7	15.0	14.0	13.6	15.1	15.8	X _m
N	23	10	18	26	15	19	26	12	18	26	20	23	N
s	0.3	0.4	0.3	0.6	0.4	0.4	0.6	0.7	0.6	0.6	0.4	0.4	s

Annual mean 316.1 ppmv
(based on 12 monthly means)

X_m = average monthly concentration
N = number of daily values accepted
s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: MAUNA LOA
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1960
Provisional CO2 concentration values in ppmv above 300.0
(continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1				19.1		20.2	18.2	17.2	13.5			15.9	1
2		16.2	17.0	18.8			17.6	17.6	15.0	13.9	14.3		2
3	16.0	16.7	17.2	18.9		19.3	17.9		15.1	14.0	14.7		3
4	16.1		17.1	18.3		19.2			15.1		14.7	15.8	4
5	15.8		17.3		20.4		18.6		14.8	14.1	14.5	15.7	5
6	16.0		17.2		20.1			16.6	15.1		14.6	16.1	6
7	16.2		17.2	19.7	20.4		18.6	17.0	14.9	13.5	14.4	16.4	7
8	16.7	16.9	17.0	19.3	20.0		18.9	16.5	15.1	13.2	14.8	16.1	8
9	16.9		17.3		19.6				15.0	13.5	15.1	15.9	9
10			17.5		19.7	20.5		16.7	15.2			16.1	10
11		17.5	18.2		20.1	20.3	18.7	17.2	14.2		15.0	16.0	11
12	16.7	17.7	18.3	19.5		20.3	18.7	17.0	14.3	14.1	15.2	16.0	12
13	16.6	16.8	18.5	19.5		19.9		16.9	14.0	14.2	15.5	16.0	13
14	16.7	16.6	18.0	19.0	20.0	20.0		16.4		14.2	15.1	16.1	14
15		16.9	18.2	19.2	19.7	19.7	18.5	16.4	15.4	14.0	15.0	16.4	15
16	16.7	17.2	17.8	19.0	19.6	19.5	18.6		13.5	14.3	15.0	16.5	16
17	17.0	17.1		19.1	19.9	19.3	18.7	16.1	14.6		15.0	16.2	17
18	17.0			19.7	20.3		18.3	14.8	14.9		15.0	16.1	18
19	16.8			18.9	20.5		18.4	14.1	13.9	14.6	15.2	16.4	19
20		17.5	18.8	19.4	20.3		18.1		13.8		15.1	16.0	20
21	16.4	17.8	18.4	18.9	20.2		18.1		13.7	15.2	15.2		21
22	16.8		18.1	19.1	19.7		18.2	15.4	13.0	15.1	15.4	16.5	22
23		17.8	17.5	19.0			17.8	15.5	13.6	14.1	15.6	16.5	23
24	16.5	17.4	18.1	19.2	19.6			15.6	13.3	13.3	15.4		24
25	16.6	16.7	17.9	19.0	19.8	19.3	18.0			14.1	15.2	16.3	25
26	16.7	16.7		19.8	20.2		17.8	14.5	13.5	14.4	15.2	16.4	26
27	16.7	17.1	17.7	19.9	20.2		17.9	15.3			15.3	16.6	27
28	16.8		18.8		19.6	19.1		14.9		14.2	15.4	16.7	28
29	16.7	17.6	17.8		20.2	19.1				14.6	15.9	16.5	29
30	17.2				20.7		17.0	14.0			15.7	16.4	30
31	17.0		18.9		20.2		17.4	15.1				16.5	31

Monthly values

Xm	16.6	17.1	17.8	19.2	20.0	19.7	18.2	16.0	14.4	14.1	15.1	16.2	Xm
N	24	17	25	22	24	14	22	22	24	20	28	27	N
s	0.4	0.5	0.6	0.4	0.3	0.5	0.5	1.1	0.7	0.5	0.4	0.3	s

Annual mean 317.0 ppmv
(based on 12 monthly means)

Xm = average monthly concentration
N = number of daily values accepted
s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: MAUNA LOA
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1961
 Provisional CO₂ concentration values in ppmv above 300.0
 (continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	17.0	17.1	17.9	19.2	19.5		19.7	18.1	16.6	16.0	16.4	16.5	1
2	17.0	17.3	18.0	19.5	19.5	20.1	19.5	18.3	16.0	16.0	16.4	16.6	2
3	16.9		18.0	19.9	20.5	20.3		18.4	15.4	15.2	15.8	16.4	3
4	17.0	17.1	18.1	20.1	21.2	20.2		18.2	14.4	14.8	15.7	16.8	4
5		16.9		19.9	20.3	20.0	19.4	17.9	14.8		15.8	17.2	5
6	16.9	17.0		19.6	20.8	20.1	19.3	17.8	14.9			17.5	6
7	16.5	17.4	17.9	19.6	20.8	20.5	19.3	18.0	14.9	15.2	15.2		7
8	16.5	17.3		19.5	20.6	20.3	19.3	17.9	15.1	15.4	15.6		8
9	16.9	17.5		19.6	20.5					15.3	15.7	17.4	9
10	16.9	17.7	18.2	19.2			18.8	18.0	15.2	15.1	15.5	16.9	10
11	17.0	18.4				20.0	18.9		15.5	15.3	15.9	16.9	11
12	17.1	18.0	17.9	18.8	20.4	19.8		17.0		15.3		17.2	12
13	17.0		18.9	19.0	20.8	19.9				15.5		17.0	13
14	16.6	18.2	19.0	19.2		19.8	18.6			15.2	16.0	17.0	14
15	17.1	18.0	19.4	18.7		19.8	18.6		15.9	15.5	16.3	17.5	15
16	17.4	17.7	19.2	18.9	20.4	19.7	18.7	17.6	14.5	16.4	16.4	17.0	16
17	17.4	17.8	19.2	19.0	20.8	19.7	18.6	17.2	14.4	16.1	16.1	17.1	17
18	17.3	18.1		18.9	20.9	19.6	18.5	17.2	14.3	16.0	16.3		18
19	17.0	18.2	18.6	19.0	20.9	19.7		15.5	14.5	15.8	16.2	17.0	19
20	16.9	18.1	18.2	19.6	20.6	19.6			14.7	15.5	15.9		20
21	16.9	18.2	19.0	20.1	20.4	19.6				16.0	16.5		21
22	17.1	18.0	18.9	20.2		19.8		17.1		15.4	16.9		22
23	17.1	18.0	19.1	19.8	20.6	19.6			15.2	15.5	16.9		23
24	17.0	18.3	18.0		20.5	19.6	17.2	17.2	15.3	15.3	16.7	17.3	24
25	16.9	18.2	18.0	19.8	20.1	19.3		15.5	15.7	15.3	16.6	17.3	25
26	16.9	18.1	18.6	20.0	20.8			14.5		15.3	16.6	17.4	26
27	17.5	17.6	19.2	19.8	20.9	19.4		14.6		15.7		17.5	27
28	17.3	18.0	19.3		20.8	19.2		15.0		15.8	16.6	17.4	28
29	16.8		18.8	20.0	20.1	18.7		15.6				17.8	29
30	16.8		19.0	19.1	20.0	19.6	18.3		16.0	16.3		17.9	30
31	17.0		19.3		20.2		18.0			16.5		17.5	31

Monthly values

X _m	17.0	17.8	18.6	19.5	20.5	19.8	18.8	17.0	15.2	15.6	16.2	17.2	X _m
N	30	26	25	27	26	26	16	21	20	28	24	24	N
s	0.2	0.4	0.5	0.5	0.4	0.4	0.6	1.3	0.6	0.4	0.4	0.4	s

Annual mean 317.8 ppmv
 (based on 12 monthly means)

X_m = average monthly concentration
 N = number of daily values accepted
 s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: MAUNA LOA
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1962
Provisional CO₂ concentration values in ppmv above 300.0
(continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	17.4	18.3	19.6	20.2		21.1	19.8			16.3		17.1	1
2	17.6	18.4	19.6	20.3		20.9	19.8	18.9		15.7	15.8	17.6	2
3	17.8	18.4	19.5	20.3	21.1	21.0	20.0	18.9				17.6	3
4		18.1	19.3	20.9	21.0	21.4	20.2	18.7			16.1	17.5	4
5		18.1	19.3		21.1	21.4	20.0			15.2	16.3		5
6	18.1	18.5	19.2			21.0	20.5			15.4	16.5	17.2	6
7	17.9	18.3	19.4			21.1				15.1	16.6	17.8	7
8	18.5	18.6			21.5	21.3	20.6	18.4		15.3	16.6	17.5	8
9	18.5	18.4	19.6	19.9	21.3	21.3	20.6	18.5		15.4	16.4	17.5	9
10	18.5	18.7	19.3	20.2	21.0		20.3			15.4		17.4	10
11	18.4		19.6		20.5			16.1		15.4	16.6		11
12	18.2		19.8	21.5	20.5	21.2		16.7		15.5	16.4	17.7	12
13	18.3		19.7	21.1		21.3		17.1			17.3	18.0	13
14	18.2		20.0	20.9		21.3	20.3	17.6	16.7		17.5	17.9	14
15	18.3		20.1	21.2	21.9	21.0	19.9	17.6	16.8		17.4	17.7	15
16	18.3		20.1	21.0			20.0	17.7	17.0	16.0	17.2	17.8	16
17	18.3	18.8	20.2	20.8	21.5	20.2		17.7	16.8	16.2	16.8	18.0	17
18	18.3	19.0	20.0		21.4	20.6			16.9	16.3	16.9	17.9	18
19	18.5	19.0	20.0			20.5	19.1		16.5		16.9	18.1	19
20		19.5	20.0	21.1	21.3				15.9		17.0	18.4	20
21	18.0	19.5	20.0		21.2	20.9			15.5	15.6	17.3	18.2	21
22			19.9		21.2	20.9				15.6	17.4	18.8	22
23	18.3			20.5	21.3	20.8				15.7	17.4		23
24	18.3		19.8		21.6	19.9	19.2				17.1		24
25	17.5			20.8	21.2	19.9	19.5		15.8	16.3	17.2		25
26	17.9		19.8	20.2	21.1	20.1	19.5		16.8		17.3		26
27	18.0			20.2	21.9	20.5	18.8		15.8	16.0	17.1		27
28	18.1					21.1	18.7		15.8	15.9	17.4		28
29	18.2		20.5	20.9		21.2	18.7		16.0	15.8	17.2		29
30	17.6		20.5	20.8		21.0	18.5		16.3	15.8	17.2		30
31	17.9				21.1		18.7			15.8			31

Monthly values

X _m	18.1	18.6	19.8	20.7	21.2	20.9	19.7	17.8	16.3	15.7	16.9	17.8	X _m
N	27	15	25	19	20	26	21	12	14	22	27	20	N
s	0.3	0.4	0.4	0.4	0.3	0.5	0.7	0.9	0.5	0.3	0.5	0.4	s

Annual mean 318.6 ppmv
(based on 12 monthly means)

X_m = average monthly concentration
N = number of daily values accepted
s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: MAUNA LOA
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1963
 Provisional CO₂ concentration values in ppmv above 300.0
 (continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1		19.0	19.7				19.7			16.2		17.6	1
2		19.0	19.6				19.9					17.7	2
3		18.9	19.6	20.0		22.1	20.4	19.5					3
4	18.5	19.0	19.6	20.7		22.5	20.2		17.2	16.6	16.9	17.8	4
5	18.5	19.0		21.0		22.5	20.5	18.3	17.3	16.8	16.9		5
6	18.6	19.1	19.8				20.7	18.3	17.1	16.5	16.8	18.0	6
7	18.8	19.5	19.8				20.2	18.6	16.9		16.9	17.9	7
8	18.9	19.2	20.0		22.1		20.0	18.5	17.0		16.8	18.0	8
9	19.0	18.8	20.0		22.1		19.9	18.5	16.8	16.2	16.5	18.3	9
10	18.8	19.0	20.0			22.0	19.8	18.5	16.1	16.2	17.0	18.4	10
11	18.8	19.2	20.2	20.7			20.0	17.9	16.1	16.4			11
12	18.6	18.9		20.7			19.9	18.3	16.5	15.9	17.5		12
13	18.7			20.5		22.3	19.9	18.3	16.0	16.0	17.2		13
14	19.1			21.2	21.9	22.1		18.0	15.3	15.6		18.1	14
15	19.0		20.1	21.8	22.1	22.1		18.1	16.1	16.0		18.7	15
16	18.6		20.1	21.5	22.0	22.3	20.0	17.4	16.4	16.0		18.3	16
17	19.5		20.1	21.5	22.2	21.9	19.5		16.2			18.2	17
18	19.3		20.3	21.9		21.3	19.0		16.4	16.1		18.3	18
19	19.2		19.7			21.3	19.6			16.3		18.4	19
20	18.5		20.4	22.2	22.7		20.8			16.1		18.5	20
21	18.7		20.6	22.6	22.9	21.2	19.6	16.8	16.3	16.8		18.8	21
22	19.0		20.9	22.5	22.4	21.0	19.6	18.0	16.1	16.6		18.6	22
23	19.1		20.7	22.1	22.5		19.4	17.5	16.0	16.3		19.5	23
24	19.0		20.6	22.0	22.5		19.4	17.1	16.0	16.8		19.1	24
25	19.1	19.4	20.5		22.7	20.7	19.2	17.5		16.9		18.9	25
26	19.1	19.6	20.7	21.8		21.3	19.1	17.3		15.8		18.8	26
27	19.3	19.5	20.7	21.8	22.0	21.0	18.8	16.3	16.0	15.8		18.9	27
28	18.8		20.6	22.1	22.2	21.1			16.4	16.9	17.5	19.2	28
29	18.6		20.5	22.1	22.6	20.8	18.8	17.2		16.6	17.6	19.1	29
30	18.8		20.7	22.2		20.8	19.6	15.9	16.2	16.3	17.6	18.7	30
31	18.8		20.2					16.6		16.8		18.8	31

Monthly values

X _m	18.9	19.2	20.2	21.6	22.3	21.6	19.8	17.8	16.4	16.3	17.1	18.5	X _m
N	28	15	27	21	15	19	27	23	22	26	12	26	N
s	0.3	0.3	0.4	0.7	0.3	0.6	0.5	0.8	0.5	0.4	0.4	0.5	s

Annual mean 319.1 ppmv
 (based on 12 monthly means)

X_m = average monthly concentration
 N = number of daily values accepted
 s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: MAUNA LOA
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1964
 Provisional CO₂ concentration values in ppmv above 300.0
 (continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	18.9					21.9	21.0		17.8	16.6	17.9	18.3	1
2						22.2				17.6	17.9	18.5	2
3	19.5					21.6			16.8	17.4	17.8		3
4	19.0					22.0	21.2		17.6	17.5	17.7	18.3	4
5	19.3					22.1	21.4				17.7	18.7	5
6	19.0					22.5	21.0		17.8		18.0	18.8	6
7	18.9								17.6	17.2	18.0	18.8	7
8	19.2								17.4	16.8	18.2	18.7	8
9	19.0								17.2	16.9	18.0	18.7	9
10	19.4								17.0	16.9	18.5	18.5	10
11	19.5									17.0	18.2	18.5	11
12	19.9							19.4	16.6	16.3	18.0	18.9	12
13	20.0						20.3	18.7		16.6	17.9	19.1	13
14							19.7			16.8	17.5	18.7	14
15	19.8						20.7		15.4	16.9	17.8	18.9	15
16	20.0						20.2		15.4	17.3	18.1	18.9	16
17	20.0						20.1	18.0	15.8	17.1	17.7	18.8	17
18	20.0						19.9	17.9		16.6	17.7	19.1	18
19							20.5	18.6		17.2	18.0	19.1	19
20	19.7						20.6	18.3		17.8	17.5	19.3	20
21	19.7						19.9	18.4		17.2	17.8	19.4	21
22							20.0	18.5		17.4	17.7	19.3	22
23							20.0				18.0		23
24								17.1	17.7			19.2	24
25								17.9	17.1			19.2	25
26						21.2	20.0				17.9	19.3	26
27							19.9				18.4	19.1	27
28						21.8	20.0	18.1			18.4	19.1	28
29						21.9	19.7	18.2		17.6	18.6	19.1	29
30								18.0		17.9	18.5	19.4	30
31							18.4	18.0		18.3		19.4	31

Monthly values

X _m	19.5					21.9	20.2	18.2	16.9	17.2	18.0	18.9	X _m
N	18					9	20	14	14	23	28	29	N
s	0.4					0.4	0.7	0.5	0.9	0.5	0.3	0.3	s

Annual mean 318.9 ppmv
 (based on 8 monthly means)

X_m = average monthly concentration
 N = number of daily values accepted
 s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: MAUNA LOA
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1965
Provisional CO₂ concentration values in ppmv above 300.0
(continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1		20.8	20.9	22.1	23.0	22.9	22.6	20.5	18.0	17.0	18.4	19.6	1
2	19.1	20.7	20.8	22.3	23.3	22.5	22.6	19.8	18.4	17.0	18.2	19.8	2
3	19.4	20.7	21.0	21.9	22.6	22.3	22.4	19.8	18.5		17.8	19.6	3
4	19.4	20.8	21.1	22.3	22.9	22.5	22.3	19.7	18.8	16.9	18.4	19.8	4
5		20.7	21.8	23.0	22.7	22.6	22.7	19.5	18.8	17.4	18.6	19.6	5
6	19.4	20.5		22.5	22.6	22.5	22.1	19.6	19.0	17.1	18.6	19.7	6
7	19.4	20.5	21.7	23.0	22.4	22.3		20.0	20.1	17.4	18.9	20.1	7
8	19.3	20.4	21.3	22.3		21.9	22.2	19.9		17.7	19.4		8
9	19.5	20.4			22.7	21.9	22.1	19.8	18.8	17.2	19.7		9
10	19.5	20.2	21.3		22.7	22.1	22.6	20.2		17.9	19.6	19.2	10
11	19.6	20.4	21.4		22.5	22.5	21.9	19.9		17.9	20.1	19.2	11
12	19.4	20.8	21.4	22.6	22.6	22.4	22.5	18.6	18.3	18.7	19.9	18.4	12
13	19.5	21.3	21.3	22.6	22.8	22.5	22.4	17.7	18.9	19.3	19.8	19.4	13
14	19.4	20.5	21.1	23.1	22.3	22.3	22.4	17.6	17.9	18.9	19.6	19.8	14
15	19.8	20.1	21.3	23.1	21.9	22.2	22.1		17.3	18.1	19.5		15
16	19.2	20.5	21.4	22.8	21.9	22.0			18.7	18.0	19.4	18.9	16
17	19.3	20.7	21.3	23.0	22.5	22.3	22.1	18.1	18.7	18.2	19.3	18.9	17
18	19.5	21.2	20.9	22.1	22.8	22.2		18.1		18.4	19.5	19.4	18
19	19.3	21.2	20.2	21.8	22.6	22.4		18.5	19.1	17.5	19.0	19.4	19
20		21.2	20.1	21.8	22.7	22.4		19.5	19.5	18.6	19.6	19.5	20
21		21.0	21.3		21.7	22.1		19.6	18.7	18.2	19.3	19.3	21
22		21.1	21.0	22.2	22.0	22.3	21.3	19.7	18.7	18.2	19.6	19.2	22
23	20.4	20.7	21.2	21.9	22.0	22.7	21.2		17.4	17.8	19.7	19.3	23
24	20.0	20.9	21.5	22.2	22.2	22.5	21.4	19.7	17.3	17.7	19.8	19.8	24
25	20.3	21.4	21.9		22.1	22.3	20.7	20.1	17.3	17.9	20.0	19.8	25
26	19.9	21.8	22.4	22.5	22.5	22.1	20.4		16.9	17.9	20.0		26
27	20.2	21.4	21.8	22.3	23.0	22.6	19.9		16.1	17.9	19.6	19.6	27
28	20.0		21.5	22.5		22.5	19.6			18.0	19.5	19.6	28
29	20.3		21.4	22.8	22.7		19.5		16.6	18.3	19.5	19.6	29
30	20.9		21.8	22.8		22.3		19.1	17.2	17.8	20.0	19.2	30
31	20.6		22.0		22.7			18.2		18.1		19.5	31

Monthly values

X _m	19.7	20.8	21.3	22.5	22.5	22.3	21.7	19.3	18.2	17.9	19.3	19.5	X _m
N	26	27	29	25	28	29	23	24	25	30	30	27	N
s	0.5	0.4	0.5	0.4	0.4	0.2	1.0	0.8	1.0	0.6	0.6	0.3	s

Annual mean 320.4 ppmv
(based on 12 monthly means)

X_m = average monthly concentration
N = number of daily values accepted
s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: MAUNA LOA
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1966
 Provisional CO₂ concentration values in ppmv above 300.0
 (continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	19.7	21.4	21.4	23.4		23.4					17.7		1
2	19.6	20.4	21.5	23.2	23.8	23.8	22.0			17.2			2
3	19.6	20.7	21.9	23.0	23.0	23.8				17.6		20.7	3
4	19.6	21.4		23.9	23.7	23.9	22.6	21.3	19.5	17.5			4
5	19.9	21.2		24.0	23.5	23.9	22.4	21.4	19.2	17.8		20.0	5
6	20.4	21.2			23.6	24.0	22.0	21.0	19.4	17.3		20.6	6
7	20.9	20.8	22.2	23.5		23.6	22.5	20.6		17.5		20.3	7
8	19.5	20.8	22.2	23.7	23.9	23.6	22.8			17.5		20.7	8
9	20.1	21.3	22.1		23.9	23.7	23.1		17.6	17.7		20.6	9
10	20.5	21.2	21.9		23.6	23.7	22.7		17.7	17.3		20.6	10
11	20.3	21.5	21.8		24.0	23.8	22.7			17.3		20.6	11
12	20.5		22.1	23.0	23.4	23.6		20.5		17.7	19.3	20.6	12
13	20.4	22.0	21.9	23.2	23.3	23.5			18.3		19.0	20.4	13
14	20.2	21.6		23.4	24.3	23.6			18.3	17.7	19.3	20.3	14
15	20.7	21.6		23.7	23.9	23.6		20.6	18.6		19.5	20.4	15
16	20.0	21.4		23.8	24.0	23.8		20.6	17.5	17.8		21.0	16
17	20.1	21.6	21.6	23.4	23.9	23.7			17.7	18.0	19.9		17
18	20.5	20.9	22.1	23.6	24.1	23.9			18.6		19.1	21.1	18
19	20.4	21.6	22.3	24.1	23.8	23.6		18.8	18.5		19.4		19
20	20.9	21.8	22.8	23.7	23.2	23.1		19.4	17.4		20.1	21.3	20
21	21.3	22.0	22.6	23.7	23.1	22.8			17.6	18.4		21.2	21
22	20.8	21.6	22.9	23.3	23.4	23.4				18.5	19.9		22
23	20.7	21.6	22.7	23.8	23.1	23.1		18.5	17.9				23
24	20.9	21.6	23.1		23.5	23.3		17.9	17.9	17.9	19.9		24
25	20.5	21.2			23.9	23.1		17.5	18.3	17.9	19.9	20.7	25
26	20.7	21.5	22.5		23.8	22.5		19.3	17.9	18.2	20.0	21.0	26
27	20.4	22.1	22.6	23.5	24.4			20.4		18.0	20.1	21.0	27
28	20.8	22.0	22.5	23.0	24.0	23.1		20.3	17.2	17.7	19.8	20.7	28
29	20.7			23.0	24.4	22.8		19.9	17.6		19.7	20.7	29
30	20.8		22.9	23.2	24.1	23.0		20.1	17.7	17.8		20.8	30
31	21.2		23.3		23.8			20.4		18.2		20.7	31

Monthly values

X _m	20.4	21.4	22.3	23.5	23.7	23.5	22.5	19.9	18.1	17.8	19.6	20.7	X _m
N	31	27	23	23	29	29	9	18	21	23	16	23	N
s	0.5	0.4	0.5	0.3	0.4	0.4	0.4	1.1	0.7	0.3	0.6	0.3	s

Annual mean 321.1 ppmv
 (based on 12 monthly means)

X_m = average monthly concentration
 N = number of daily values accepted
 s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: MAUNA LDA
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1967
 Provisional CO₂ concentration values in ppmv above 300.0
 (continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	21.5	21.8			24.6	24.5		21.5	19.9	17.5	19.8	21.2	1
2	21.3		22.7		25.0		22.8	22.3	19.8	18.4	20.1	21.4	2
3	21.5		22.8		24.9		22.9	21.2	20.1	18.2	20.1	20.9	3
4	21.5	21.5	22.8	23.7		24.3	22.7	22.0		18.1	18.8	21.4	4
5	21.5	21.8	22.8	24.1		24.6	22.7	21.8		18.3	19.3	21.0	5
6	21.6	21.8	22.4	23.9		24.9	22.6	21.5	19.8	17.9	19.9	21.1	6
7	21.5	22.5	22.6	23.7		24.4	22.4	21.0	19.5	17.9	19.5	21.5	7
8	21.5	22.3	22.0	23.8		24.1	22.6	20.3	19.8	18.8	19.3	21.2	8
9		21.8	22.0	24.0		24.3	22.7	20.8		19.1	19.5	21.4	9
10	22.3	21.8	22.6	23.9		24.2	23.0		18.8	19.1	20.2	21.3	10
11	22.7		22.3	24.0	24.5	24.3	22.2	21.9	18.7	19.1	20.3	22.3	11
12	22.6			24.1	24.4	24.2	21.9		18.6	19.2	20.1	22.5	12
13		22.0	22.6	24.3	24.5			21.0	18.8	19.1	20.3	22.9	13
14		21.8	22.5	24.2	24.4			20.9	18.2	19.2	20.1	22.5	14
15		22.4				22.8	22.4	21.4	19.3	19.6	20.2	22.0	15
16		22.5	23.3	23.9	24.3		22.2	20.9	20.1	20.5	20.2	21.7	16
17		22.5	23.1	23.8	24.3	23.3	22.7	20.6	19.7		21.2	22.1	17
18			23.3		25.1	23.0	22.3	20.5	18.9	19.1	20.6	22.0	18
19		22.4		24.4		23.3		20.7	18.9	19.1	20.5	21.7	19
20		22.9	22.6						18.9	19.4	20.9	21.9	20
21		22.9			24.7		22.1		18.9	18.8	21.0	21.6	21
22		23.0		23.6	25.0	23.3	22.4	18.7	19.0	19.0	21.4	21.2	22
23					24.6	22.9	21.7	18.9	19.0	19.0	21.4	21.6	23
24		22.7	23.6		24.2	23.2	22.6	19.0	18.7	19.2	21.3	21.7	24
25				24.7	24.8	23.6	22.5	20.1	18.2	19.3	21.0	21.7	25
26		21.9		24.8		23.3	22.4	21.1	18.7	19.4	21.3	22.1	26
27		21.9		24.8	24.4	23.2	21.9		18.6	19.7	21.3	21.8	27
28			22.4	24.8	24.9	21.7	22.2	20.1	18.9	19.4	21.4	22.0	28
29			22.5	24.8	24.6	23.0			18.9	19.0	20.6	22.4	29
30			22.5			22.8	21.1		18.6	19.5	20.8	22.4	30
31							22.0	19.5		20.0		21.8	31

Monthly values

X _m	21.8	22.2	22.7	24.2	24.6	23.6	22.4	20.7	19.1	19.0	20.4	21.7	X _m
N	11	20	20	20	18	23	25	24	27	30	30	31	N
s	0.5	0.5	0.4	0.4	0.3	0.8	0.4	1.0	0.6	0.6	0.7	0.5	s

Annual mean 321.9 ppmv
 (based on 12 monthly means)

X_m = average monthly concentration
 N = number of daily values accepted
 s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: MAUNA LOA
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1968
 Provisional CO₂ concentration values in ppmv above 300.0
 (continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	21.9	22.3	23.5		25.2	25.9	24.6	21.6	20.7	20.5	20.0	22.1	1
2	21.8	22.5	22.4		25.0	25.5	24.0	21.9	20.9	20.1	20.1	21.8	2
3	21.9	22.4	22.9	24.4	25.5	25.6	24.5		20.7	20.6	20.4	21.8	3
4	22.2	22.5	22.9	24.5	25.4	25.3	24.6		20.7	20.6	20.6	21.8	4
5	22.2	22.0	22.5	24.4	25.3	25.5	24.5	22.4	20.2	20.1			5
6	22.3	22.6		24.3	25.0	25.5	24.3	22.3	19.3	19.8	20.5		6
7	22.4	22.7	23.5	24.5	25.2	25.5	24.5	22.2	20.1	20.0	20.6		7
8	22.4	22.9	23.5	24.4	24.8	25.5	24.3		20.2	20.1	20.1	21.8	8
9	21.9	23.9	23.9	24.7	25.3	25.5			19.9	20.0	20.3	21.9	9
10	22.2	23.1		25.0	25.1	25.5	23.8	22.1	20.4		20.6	22.3	10
11	22.1	22.5		24.7	24.8	25.5	23.9	22.1	21.8	20.9	20.5	22.0	11
12	22.1	22.5	23.2	24.3	24.0	25.4	24.3	22.0	21.1	19.9	20.8	22.0	12
13	21.9	22.8			24.5	25.7	23.9	21.4	20.6	20.0	21.4	22.4	13
14	22.3	23.3	23.2	24.9	24.4	25.5	23.8		20.7	20.1	20.8	22.3	14
15	22.6	22.7	23.8	24.7	25.2		23.7	22.0	20.8	20.0	21.0	22.2	15
16	22.5	23.3	23.6	24.5	25.4	24.7	23.7		20.8	19.7	21.0	22.9	16
17	22.2	22.9	23.2	24.5	25.0		23.8	21.8	20.1	19.7	20.9	23.0	17
18	22.5	23.8	23.7	24.2			24.1		19.3	20.2	20.9	22.8	18
19	22.5	23.5	23.6		25.5		23.8		19.5	20.0	21.0	23.0	19
20	22.2	23.0	23.3		25.6	24.5	23.8	21.4	19.3	19.9	20.7	23.1	20
21	22.6	22.9	24.0	24.4	25.7	24.9	23.6	21.5	19.3	19.8	21.0	22.4	21
22		22.9		24.4	25.8	24.7	23.5	21.5	19.7	19.9	21.5	22.6	22
23	22.0	23.2	23.7	25.0	25.8	24.8	23.1	21.4	19.3	19.6	21.3		23
24	22.5	23.0	24.4	25.0	25.7		23.3		19.5	19.5	21.5		24
25	22.6	23.1	23.8	25.0	25.6		23.0	21.4	19.9	19.0	21.7	22.6	25
26	22.4	22.5	24.1	25.1	25.9		23.4	21.2	18.9	19.5	21.6	22.4	26
27	22.7	22.8	24.1	25.1	26.0		23.3	21.4	19.4	19.6		22.7	27
28	22.3	23.1	24.4	25.5	25.4	24.7	23.1	21.5	19.9	19.7	20.7	22.4	28
29	22.8		24.6	24.7		24.4	23.1		18.5	19.6	21.1	22.8	29
30	22.5		24.6	24.8	25.3	24.3	22.8	21.0	19.6	20.3	22.0	22.8	30
31	22.5		24.5				22.8	21.6					31

Monthly values

X _m	22.3	22.9	23.7	24.7	25.3	25.2	23.8	21.7	20.0	20.0	20.9	22.4	X _m
N	30	28	26	25	28	22	30	21	30	29	28	25	N
s	0.3	0.4	0.6	0.3	0.5	0.5	0.5	0.4	0.7	0.4	0.5	0.4	s

Annual mean 322.7 ppmv
 (based on 12 monthly means)

X_m = average monthly concentration
 N = number of daily values accepted
 s = standard deviation (ppmv), based on daily means.

Atmospheric carbon dioxide measurements at station: MAUNA LOA
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1969
Provisional CO₂ concentration values in ppmv above 300.0
(continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	22.9	23.4	25.0	25.9	27.2	27.2	25.9	23.5	22.4	21.4	21.4	23.5	1
2	22.4	24.5	24.6	26.1	27.1	26.8	25.4	22.8	22.5	21.0	21.6	23.7	2
3	22.9	24.3	24.5	26.0	26.8	27.2	24.7		21.5	21.4	21.9	23.5	3
4	22.9	23.8	24.6	25.7	26.9	27.1	25.5		21.3	21.1	22.0	23.3	4
5	22.9		25.1	26.1	27.7	26.5		24.6	22.6	20.9	22.1	23.5	5
6		23.8	25.9	25.8	27.6	26.2	26.1	24.8	21.4	20.1	21.8	23.5	6
7	22.8		25.0	25.5	27.4		25.8	25.1		21.3	22.3	23.6	7
8	23.0	24.0	25.1	26.5	27.1	26.1	26.5	23.6	21.7	21.3	22.4	23.6	8
9	23.0	23.7	26.0	26.8	28.0	25.0	26.3	23.1	21.7	21.3	22.0	23.6	9
10	23.2	23.2	25.1	26.9	27.8	25.8	25.8	23.7	22.6	21.3	22.2	23.3	10
11	23.5	23.9	24.9	26.9	28.2	27.0	25.7	24.0	22.3	21.8	22.1	23.7	11
12			25.1	26.9	27.0	27.2	26.0	24.1	22.5	21.8	22.3	23.8	12
13	23.7	23.7	25.3	27.0	27.0		25.3	22.5		21.1	22.5	23.7	13
14	24.1		26.1	26.8	26.3		25.1	23.3	22.1	20.9	22.1	23.3	14
15	24.1	23.9	25.7	26.5	26.1		24.9	22.7	22.0	21.6	22.0	23.6	15
16		23.7	25.7	26.5		25.2	25.7	23.7	22.0	21.2	22.3	23.9	16
17	24.3	24.2	25.0		26.8	25.8	25.3	22.6	22.8	21.2	22.4	23.6	17
18	24.0	25.3	25.0	26.4	26.7	26.1		22.8	22.9	21.0	22.1	23.8	18
19	24.2	24.7	25.1	26.3	26.7	26.0	24.7	20.8	22.1	21.7	22.5	23.1	19
20	24.3	25.0	25.2	26.2	26.7	26.3	25.2	21.3		21.9	22.2	24.3	20
21	24.0	24.9	25.6	25.8	25.7	26.4	25.4	22.0		22.2	22.5	24.0	21
22	24.3	24.3	25.5	26.2	26.8	26.5	25.0			21.4	22.3	24.2	22
23	24.0				25.0		25.3		21.5	21.9	22.7	24.0	23
24	24.1		26.4	25.9	26.4			22.4	21.4	21.7	22.7	24.1	24
25	23.8	24.2	26.0	25.9	27.1	26.3		22.3	21.6	21.5	23.2	24.3	25
26	24.0	24.5	26.0	25.9	27.6	25.5	25.5	22.1	21.9	21.4	21.9	24.3	26
27	23.9	25.6	25.7	26.3	27.4	25.6		23.1	21.6	21.4	22.9	24.1	27
28	23.7	25.2	25.8	26.6	27.5	26.2	24.5	22.8	21.2	20.8	23.2	24.1	28
29	24.1		24.7	26.7		26.0	24.6	22.5	21.3	21.7	23.1	24.0	29
30	24.0		25.4	26.8		25.7	24.8	22.8	21.3	21.6	23.1	24.0	30
31	23.9		25.4		26.7		24.4	22.2		21.6		24.4	31

Monthly values

X _m	23.6	24.3	25.4	26.3	27.0	26.2	25.4	23.0	21.9	21.4	22.3	23.8	X _m
N	28	22	30	28	28	24	26	27	25	31	30	31	N
s	0.6	0.7	0.5	0.4	0.7	0.6	0.6	1.0	0.5	0.4	0.5	0.3	s

Annual mean 324.2 ppmv
(based on 12 monthly means)

X_m = average monthly concentration
N = number of daily values accepted
s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: MAUNA LOA
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1970
Provisional CO₂ concentration values in ppmv above 300.0
(continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	23.9	24.3	25.9	27.1	27.7	28.2	27.2	24.5	23.0		23.8	24.8	1
2	24.2	25.1	26.0	27.1	27.8		27.1		22.9	23.5	23.2	24.7	2
3	24.2	25.6	26.0	27.3	27.1	27.0	26.8		23.2	23.9		25.0	3
4	24.1	25.9	26.1	28.4	27.3	27.5	27.2	26.0	23.2	22.9	24.0	24.5	4
5	24.5	25.7	26.3	28.4	27.5	27.5	27.8	26.1	23.6	22.4	22.9	24.9	5
6	24.9	24.5	26.2	27.9	27.4	27.2	27.4		22.8	23.5	23.2	24.7	6
7	25.2	25.7	26.1	28.6		27.4			22.3	23.5	23.7	24.6	7
8	24.9	25.0	26.6	28.0	27.1	27.6	26.3		22.8	23.4	23.8	24.6	8
9	25.1	24.4	27.0	28.1	27.1	27.2	26.4		24.0	23.6	24.1	25.0	9
10	24.7	25.8	27.1	27.3	27.5	27.3	25.9	24.6	23.3	23.9	24.0	24.8	10
11	25.0	25.8	26.2	27.1	27.3	27.4	26.4	24.9		23.5	23.6	24.9	11
12	24.8	25.5	26.6	27.6		27.5		25.3	23.2	23.7	24.2	24.7	12
13	24.8	24.7	26.5	27.1	27.7	27.3	26.4	24.8	24.0		23.8	24.9	13
14	24.5	25.5	26.5	27.4	27.9	28.0	26.0	24.6			23.9	25.0	14
15	24.6	26.1	26.7	26.9		28.8	26.3	24.8			23.3	25.4	15
16	24.6	25.9	26.1	27.7		27.8	26.3			22.3		25.8	16
17	24.6	25.8	26.3	27.1	28.0	28.0		25.0	24.0			25.7	17
18	24.7	26.0	27.3	26.8	27.8	27.9	26.6	24.6	24.0	23.2	24.3	25.1	18
19	24.7	25.7	26.8	27.5	27.5	27.8	26.7	24.5	22.6	22.8	24.3	24.8	19
20	24.3	25.7	27.4	28.3	27.4	26.5	26.3	25.2		23.5	24.2	25.2	20
21	23.8	25.9	27.9	28.2	27.6	27.6	24.9	25.1	22.3	22.8	24.0	25.0	21
22	24.2		26.8	28.1	27.8	27.8	26.1			23.0	24.1	25.2	22
23	24.6	26.0	27.0	28.5	28.5	27.8	26.6		23.0	23.1	24.3	25.4	23
24	24.3	26.1	26.7	28.3	27.7		26.6	25.0	22.7	22.7	24.4		24
25	24.3	25.7	26.4	28.0	28.9	27.0	24.7	24.3		23.1	24.4	26.1	25
26	24.3	25.7	26.2	28.3	28.9	27.4	24.6	24.0		23.1	24.6		26
27	25.0	25.5	27.1	28.6	28.2	26.3	25.3		23.2	23.4	24.8		27
28	24.9	25.7	26.9	28.1	28.0	27.9	25.1		24.2		24.9		28
29	25.1		26.5	28.3	27.5	27.0	24.0	24.3	22.8	23.0	24.8	25.1	29
30	25.2		26.5	28.3	26.3	27.5	26.2	22.4		23.2	24.5	25.9	30
31	25.5		26.3		28.4		25.4	22.8		22.8		25.4	31

Monthly values

X _m	24.6	25.5	26.6	27.8	27.7	27.5	26.2	24.6	23.2	23.2	24.0	25.1	X _m
N	31	27	31	30	27	28	28	20	21	25	27	27	N
s	0.4	0.5	0.5	0.6	0.5	0.5	0.9	0.9	0.6	0.4	0.5	0.4	s

Annual mean 325.5 ppmv
(based on 12 monthly means)

X_m = average monthly concentration

N = number of daily values accepted

s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: MAUNA LOA
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1971
 Provisional CO2 concentration values in ppmv above 300.0
 (continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1		26.4	27.3		27.7	28.6	27.9		23.2	23.2	24.4	25.6	1
2	25.4	26.5	26.8	27.5	28.6	28.4	27.7	27.0	23.7	23.1	24.2	25.7	2
3	25.9	26.3		27.3	29.2	28.6	27.9	26.8	23.8	23.5	24.1	25.7	3
4	26.0	26.4	27.9	27.5	29.3	29.1	28.0	26.8	24.7	23.5	24.6	25.6	4
5	26.1	26.7	27.1	27.0	29.3	29.1	28.8	26.6	24.4	23.7	24.3	25.7	5
6	26.7	27.0	26.8	27.3	29.5	29.2	28.3	26.1	23.9		24.5	26.0	6
7	26.7	26.4	27.2	27.3	29.6		27.6	26.5	23.7		24.8	25.8	7
8	26.3	26.3	26.9	26.9	29.2	28.2	28.4	26.1	23.3		25.0	25.6	8
9	25.6	26.3	26.9	27.0	29.1	28.9	29.0	25.7	23.6		24.7	25.8	9
10	25.3	26.2		27.4	29.0	29.5		26.4	22.8		24.8	26.2	10
11	25.3	25.9	27.3	27.5	29.4	29.4	28.3	26.0	24.2		24.7	26.2	11
12	25.2	26.2	27.5		29.8	29.2	27.4		24.5	23.2	24.8	26.2	12
13	25.3	26.9	27.3	27.6	29.2	29.6	27.5	25.6	23.7	23.7	24.8	26.5	13
14	25.9	26.5	26.8	28.1	29.7	28.2	27.6		24.1	23.8	24.8	26.7	14
15	26.4	26.3	27.0	27.3	29.5	28.5	27.5		24.0	23.8	25.1	26.6	15
16	26.1	26.8	28.0	27.4	30.0	28.6	27.3		24.5	22.9	25.2	26.2	16
17	26.0	26.7	27.2	27.7	29.0	28.5	28.4		23.3	23.7	25.7	26.5	17
18	25.8	26.6	26.9	27.8	29.2	27.6	27.8	25.7		24.0	25.3	26.4	18
19	25.8	26.8	27.2	28.4	29.2	28.8	27.8	25.8		24.4	25.0	26.7	19
20	26.5	26.5	27.4	28.8	29.4	28.4	27.6	26.1		24.3	24.9	26.6	20
21	27.0	26.8	27.2	28.0	29.0	28.2	27.3	26.0	22.3	24.0	25.6	26.5	21
22		27.2	26.9	29.4	29.0	28.8	26.7	25.9	22.9	23.8	25.5	26.6	22
23	26.5	26.7	26.7	29.2	29.0	28.7	26.2	24.3	23.3	23.9	25.7	26.5	23
24	26.5	26.8	25.5	29.1	29.2	28.7	26.0		23.2	23.8	26.0	26.5	24
25	26.5	27.1	26.5	28.8	29.1	29.6	25.9	24.8	22.9	23.6	26.0	26.5	25
26	26.8	26.9	28.7	28.3	29.0	29.3	26.0	24.9	23.3	23.7	25.8	26.7	26
27	26.6	27.3	27.5	28.7	29.2	28.7		24.2	25.3	24.5	25.9	26.5	27
28	25.8	27.0	28.8	28.9	29.8	28.0		23.4	23.9	24.8	25.7	26.6	28
29	27.0		27.6	28.2	28.8	28.0		23.8	23.9	24.7	25.9	26.7	29
30	27.0		27.5	27.3	28.7	28.5		24.6	24.0	25.5	25.9	26.7	30
31	26.9		27.9							24.2		26.7	31

Monthly values

Xm	26.2	26.6	27.2	27.9	29.2	28.7	27.5	25.6	23.7	23.9	25.1	26.3	Xm
N	29	28	29	28	30	29	25	23	27	25	30	31	N
s	0.6	0.3	0.6	0.7	0.4	0.5	0.8	1.0	0.7	0.6	0.6	0.4	s

Annual mean 326.5 ppmv
 (based on 12 monthly means)

Xm = average monthly concentration
 N = number of daily values accepted
 s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: MAUNA LOA
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1972
Provisional CO₂ concentration values in ppmv above 300.0
(continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	26.4	27.4	27.5		30.3	30.2	28.7	27.9	25.4	24.3	25.8	26.8	1
2	27.2	27.4	27.3	29.5	30.4	29.8	29.0	27.9	25.6		25.9	26.8	2
3	27.1	27.5	27.3	27.9	30.4	30.0	29.0	27.3	25.8	24.6	26.5	27.3	3
4		27.1	27.9	28.0	30.3	29.7	29.2	26.7	25.5	24.7	26.5	27.3	4
5	26.9	27.8	28.7	28.4	30.3	29.8	29.0	27.0	25.8	24.4	26.2	27.2	5
6	26.9	28.0	28.2	28.7	30.5	29.4	28.8	26.8	25.8	24.4	26.5	27.2	6
7	26.9	27.5	27.9	29.4	30.0	29.3	27.9	26.9	25.8	24.5	26.8	27.1	7
8	26.9	27.8	27.7	30.1	30.1	29.4	27.9	26.7	26.1			27.1	8
9	26.8	27.7	27.2	30.4	30.0	29.2	28.1	26.7	26.4	26.0	25.8	27.6	9
10	26.7	27.8		30.6	29.9		28.5	26.1	26.2	25.9	25.7	27.5	10
11	26.8	28.0	27.2	30.4	30.1		28.1	25.6	25.0	25.8	26.9	27.4	11
12	26.8	28.1	27.4	30.5	30.2	29.5	28.3	27.0	25.9		26.5	27.4	12
13	26.8	28.4	27.4	30.0	29.4	29.2	27.9	27.2	25.5		26.2	27.8	13
14	26.8	28.5	27.3	30.0	29.7	29.1	27.7	27.3	25.8	25.6	26.1	27.7	14
15	26.7	28.6	27.8	30.0	29.8	29.4	27.8	27.3	25.7	25.6	26.9	27.5	15
16	26.8	28.2	28.3	30.1	30.4	29.6	27.0	27.3	24.9	26.0	26.9	27.8	16
17	26.7	27.9	28.3	29.7	30.3	29.5	27.9	27.3	24.3	25.1	26.1	27.9	17
18	26.8	28.1	28.1	29.9	30.3	29.4	28.2	26.8	24.5	25.1	26.5	27.8	18
19	26.7	28.4	28.3	29.7	30.2	29.2	28.3	26.4	24.0	24.8	26.4	27.8	19
20	27.0	28.1	27.6	29.9	30.2	28.3	28.3	26.5	24.0	25.3	26.5	28.3	20
21	26.6	27.8	27.5	29.7	30.3	28.4	28.6	26.3	23.7	25.5	26.4	28.4	21
22	26.8	27.8	27.6	29.9	30.3	28.3	28.2	26.2	24.1	25.2	26.6	28.3	22
23	26.8	27.2	27.4	30.7	30.4	28.7	27.9	25.2	24.4	25.2	26.8		23
24	26.8	27.6	30.0	31.1	30.4	28.7		24.1	24.4	25.3	26.9	27.8	24
25	26.9	27.6	30.2	31.2	30.4	28.6		24.2	25.4	25.4	27.0	27.9	25
26	27.1	28.3			30.4	28.7	26.7	24.6	24.9	25.4	27.5	28.0	26
27	27.1	27.7		30.0	30.4	28.8	27.9	25.9	24.4	25.5	27.5	28.4	27
28	27.2	27.5		30.1	30.5	28.1	27.9	26.5	24.5	25.8	27.1	28.3	28
29	27.7	27.7	29.4	30.3	30.5	28.4		25.4	24.1	26.5	26.9	28.1	29
30	27.5		30.3	30.2	30.3	28.4		25.0	24.3	26.4	27.2	28.1	30
31	28.0		30.0		30.3		27.6	25.2		26.4		28.5	31

Monthly values

X _m	26.9	27.8	28.1	29.9	30.2	29.1	28.2	26.4	25.1	25.4	26.6	27.7	X _m
N	30	28	27	28	31	28	27	31	30	27	29	30	N
s	0.3	0.4	1.0	0.8	0.2	0.6	0.6	1.0	0.8	0.6	0.5	0.5	s

Annual mean 327.6 ppmv
(based on 12 monthly means)

X_m = average monthly concentration
N = number of daily values accepted
s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: MAUNA LOA
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1973
 Provisional CO₂ concentration values in ppmv above 300.0
 (continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	28.8	29.1	29.5	30.5	32.1	32.3		30.5	28.6		27.5	29.2	1
2	29.0			30.6	32.5	32.1		30.2	28.6		27.9	29.5	2
3		29.1	30.0	31.0	32.0	32.8			28.5	27.0	27.7	29.4	3
4		29.4	30.8	32.1	32.1	32.6	31.3		28.0	26.8		29.1	4
5	28.3	29.5	30.5	31.7	32.3	32.5	31.7		27.7	27.8		29.1	5
6	28.3	29.7	30.5	31.5	32.8	32.9	31.7	29.7	27.8	26.9		28.7	6
7	28.9	29.8	30.8	31.1	32.8	32.6	32.2	30.1	27.4	27.0	27.9		7
8	28.5	29.4	30.0	31.3	32.2	32.5	31.8		27.4	26.9	28.3		8
9	29.0	29.7	30.0	31.3	32.3	32.8	31.5			27.5	28.0		9
10	28.9	29.9	30.1	30.8	32.2	32.7		30.3			28.1		10
11	28.8	29.7	30.0	31.2	32.8	32.7	31.0	29.0	28.3	27.7	28.3		11
12	28.4	29.6	30.4	31.1	32.5	33.0	31.4	29.2		27.4		29.1	12
13	28.8	29.7	30.7	31.5	32.8	32.7	31.7	29.9	27.9	27.6		28.6	13
14	28.7	30.0		31.4	32.8	32.0		29.7	28.2	27.3	27.8	28.8	14
15	28.5	29.9	30.3	31.3	32.3	32.1	31.1		27.7			29.1	15
16	28.5	29.1	30.4	31.4	33.0	32.3	31.0	29.7	27.6		28.3	28.3	16
17	28.5	29.7	31.2	31.3	33.0	32.3		29.0	28.0	27.4	28.5	28.8	17
18		30.1		32.2	32.9	32.2				27.5	28.7	28.7	18
19	28.9	30.2	31.0	33.1	32.8	31.5	29.6	29.4		27.6	28.5	28.6	19
20	28.6	29.6	30.7		32.4	31.9	29.9	29.7		27.4	28.5	28.2	20
21	29.1	29.8	30.5	32.1	32.8	32.2	30.7		27.6	27.9	28.3	28.4	21
22		30.0		32.2	32.8	31.7	30.7	27.6	27.6	27.6	28.5	28.5	22
23	29.0	29.8		31.7	33.1	31.2	30.4	28.8	27.1	27.6	28.5	28.5	23
24	29.0	30.0		31.5		31.3		29.6	26.9	27.8		28.3	24
25	29.0	30.1	30.6	31.8	32.9	32.0		28.5	26.8	27.1		28.5	25
26	29.0	29.7	30.8	32.6	32.8	32.1			26.8	26.9	29.4	29.0	26
27	29.1	29.3	32.2		32.6	31.6	30.4	28.3	26.6	27.0	28.9	28.7	27
28	29.0	29.3	31.6		32.7	31.5	30.2	28.9			28.8	28.9	28
29	29.1		30.7		32.5	31.5	30.0	29.0		27.4		28.9	29
30	29.0		31.0	32.9		31.6				27.5	29.3	28.9	30
31	29.3		30.5		32.5					27.6			31

Monthly values

X _m	28.8	29.7	30.6	31.6	32.6	32.2	31.0	29.3	27.7	27.4	28.4	28.8	X _m
N	27	27	25	26	29	30	19	20	21	25	21	25	N
s	0.3	0.3	0.6	0.6	0.3	0.5	0.7	0.7	0.6	0.3	0.5	0.3	s

Annual mean 329.8 ppmv
 (based on 12 monthly means)

X_m = average monthly concentration
 N = number of daily values accepted
 s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: MAUNA LOA
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1974
Provisional CO₂ concentration values in ppmv above 300.0
(continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1		31.0	30.6	32.6	33.0	33.0	31.6	29.8	28.4	27.7	28.4		1
2	29.0	30.8	30.8	33.3	33.0	33.3	31.7	30.0	27.8	27.9	28.2		2
3	28.9	30.8	31.3	33.0	33.2	33.3	32.1	30.3	28.4	27.9	28.3		3
4	29.2	30.4	31.2	32.9	33.4	32.8	31.8	30.5	28.2	27.3	28.3		4
5	28.9	30.8	31.0	32.9	33.3	32.7	31.8	29.6	28.2	27.1	28.2		5
6	28.7	30.2	31.2	32.6	33.1	32.3	32.0	30.4	28.1	27.6	28.3		6
7	29.1	30.7	31.4	32.5	33.2	32.2			28.1	27.5	28.4		7
8	29.5	31.1	31.5	32.5	33.2	32.3	32.0	30.8	28.2		27.9		8
9	29.5	31.3	31.3	32.3	33.4	32.5	31.8	30.1	28.1	27.1	27.9	29.8	9
10	29.4	31.4		31.9	33.5		31.9		28.2	27.2	27.9	29.4	10
11	29.3	31.3	31.2	32.0	33.5	31.4	31.8	30.0	28.3	27.2	28.3		11
12	29.2	31.2	31.2	32.0	33.2	32.2	31.5	30.0	28.3	27.3	28.5	29.8	12
13	29.4	31.5	31.7	32.1	33.3		31.5	30.0	28.2	27.3	28.6	29.8	13
14	29.6	31.2	32.0	32.3	33.0	31.9	31.3		27.1	27.3	28.4		14
15	29.3	30.9	32.0	33.0	33.0	32.1	31.3	28.9	26.9		29.2		15
16	29.3	30.6	32.5	33.1	33.3	32.2	30.8	29.7	26.7	27.9	29.3	29.7	16
17	29.3	30.5	32.4	33.3	33.1	32.6	30.4	29.9	27.0	27.7	29.5	30.3	17
18		30.5	32.2	33.1	33.4		31.1	29.7	27.2	27.9		29.9	18
19	29.3	30.5	32.5	32.6	33.9		31.3	29.7	27.5	27.8	28.4	29.8	19
20	29.4	30.8	32.2	33.1	33.8	33.1		29.5	26.8	28.0	28.9	30.3	20
21	29.7	30.9	31.9	33.1	33.5	32.8	29.7	29.8	26.8	27.6	28.7	30.0	21
22	30.0	31.0	31.4	33.5	33.3	32.7	30.7		27.0	27.5	28.8	30.3	22
23	29.5	30.9	31.7	33.3	33.3	32.1		29.0	27.5	27.5	28.8	29.9	23
24	29.8	30.5	32.8	33.5	33.5	31.6	31.3	29.1	26.6	27.9		29.5	24
25	29.5	30.6	33.5	33.5	33.1	32.3	31.2	29.2	27.0	27.8	28.5	29.9	25
26	30.4	30.8	31.9	33.4	33.0			29.1	27.4	27.9	28.7	29.9	26
27		31.1	31.4	33.6	32.6			28.8	27.6	28.2	28.9	29.8	27
28	30.0	30.3	30.9	33.4	32.5	31.9		28.3	27.5	28.0	28.8	29.9	28
29	30.5		31.3	33.1	33.1	32.1		28.5	27.4	27.9	28.7	29.8	29
30	30.3		31.3	33.1	33.2	32.2	30.9	28.3	27.8	28.1		30.2	30
31	31.0		31.6		33.2			28.5		27.9		29.9	31

Monthly values

X _m	29.5	30.8	31.7	32.9	33.2	32.4	31.4	29.5	27.6	27.7	28.5	29.9	X _m
N	28	28	30	30	31	24	23	27	30	29	27	20	N
s	0.5	0.3	0.6	0.5	0.3	0.5	0.6	0.7	0.6	0.3	0.4	0.2	s

Annual mean 330.4 ppmv
(based on 12 monthly means)

X_m = average monthly concentration

N = number of daily values accepted

s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: MAUNA LOA
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1975
 Provisional CO2 concentration values in ppmv above 300.0
 (continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	30.3	30.8	31.7	33.0	33.5	34.4	33.3	30.6	29.2	28.0	29.7	30.3	1
2	30.0	30.7	31.8	33.0	33.6	34.1	33.0	30.6	29.7		29.4		2
3		30.1	31.8	32.9	33.8	34.2		30.8	29.6	28.0	29.1	30.3	3
4	30.6	31.4	31.7	32.6	33.4	33.8	32.9	30.9	29.6	28.0		30.1	4
5	29.3	31.4	31.3	32.5	33.5	34.3	32.8	30.8	29.9	28.0	29.3	30.4	5
6		31.4	31.2	32.5	33.5	34.1	32.7	30.7	29.6	28.1		30.4	6
7		31.2	31.1	32.3	33.7	33.9		30.9		27.9	29.3	30.1	7
8	30.0	31.3	31.2	32.4	33.5	33.8	32.1	30.7	29.8		28.9	30.2	8
9	29.7	30.9	31.1	32.0	33.6	33.5	32.3	30.9	28.6		28.9	30.3	9
10	29.8	30.5	31.3	32.7	33.5	33.2	32.1	30.9	28.9	28.2	29.2	30.6	10
11		30.4	31.2	33.4	33.4	33.9	32.0	30.1		27.5	29.3	30.3	11
12		30.5	31.6		33.5		32.1	30.5	29.0	27.6	29.1	30.4	12
13	30.0	30.5	31.6	34.6	33.6	32.7	31.9	30.2	29.1	28.3	29.0	30.3	13
14		30.4	32.0	33.1	34.1	32.9	32.1	30.7	28.4	28.6	29.1	30.2	14
15		30.2	31.1	33.1	34.2	33.1	31.9	30.8	27.9	28.5	29.0	30.5	15
16		30.6	31.3	33.5	33.2	33.5	31.5	30.5	28.0	28.3	29.4	30.8	16
17	29.7	30.8	31.6	32.7	33.0	33.7			27.8	28.4		30.9	17
18	30.4	30.9	31.7	33.5	33.0	33.2	31.1		28.0	28.6		31.1	18
19	31.0		32.1	32.9	33.0	33.4	31.1	29.7	28.0	28.4		31.2	19
20			31.9	32.8	33.1	33.3		29.9	28.3	28.9	29.7	31.0	20
21	30.3	30.8	31.8	33.1	33.0	33.2	30.5	29.6	28.1		29.3		21
22	30.1	31.2	31.8	33.4	33.0	33.0	30.9	29.6	28.2		29.4	30.5	22
23	30.4	31.8	31.8	33.4	33.3	34.0	31.5	29.2	28.4	28.9			23
24	30.6	31.4	31.8	33.2	33.1	33.7	31.6	29.5		28.8			24
25	31.4	31.3	31.8	32.4	33.7	33.3	31.8	28.4	28.3	28.6		31.3	25
26	31.5	31.2	31.8	32.3	33.8	33.6	31.8		28.0	28.9		31.2	26
27	31.6	31.1	31.4	32.6	33.5	33.0		28.5	27.9	28.7	30.0		27
28	32.2	31.1		32.3	33.8	33.0	31.3	28.4	28.5	28.7	30.3	30.9	28
29			32.2	32.5	34.0	32.9	31.4	28.8	28.4	29.0	29.9	31.0	29
30	31.0		31.9	33.4	34.0	33.1	31.1		28.4		29.9	31.1	30
31	30.6		32.7		34.1		31.0	29.2				31.0	31

Monthly values

X _m	30.5	30.9	31.6	32.9	33.5	33.5	31.8	30.0	28.6	28.4	29.4	30.6	X _m
N	21	26	30	29	31	29	26	27	27	24	21	26	N
s	0.7	0.4	0.4	0.5	0.4	0.5	0.7	0.8	0.7	0.4	0.4	0.4	s

Annual mean 331.0 ppmv
 (based on 12 monthly means)

X_m = average monthly concentration
 N = number of daily values accepted
 s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: MAUNA LOA
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1976
Provisional CO₂ concentration values in ppmv above 300.0
(continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	31.2	32.7	32.0	34.2	34.4	34.4	33.5	32.1	30.7	28.8	28.6	30.8	1
2	31.1	32.8	32.0	34.3	34.5	34.5	33.4	31.7	30.8		29.4	30.9	2
3	31.2	32.3	33.2	34.8	34.3	34.4	33.5	32.0		29.5	29.5	31.0	3
4	31.6	32.1	32.1	34.6	34.5	34.4	34.0	32.2	28.6	28.6	29.9	30.8	4
5	31.8	31.9	32.7	34.2		34.4	33.9	32.0	28.9	28.2	29.8	31.3	5
6	31.7	32.0	32.8	35.1		34.1	33.8	31.6		28.6	29.4	31.3	6
7	31.6	32.0	32.5	35.2	33.7	34.1	33.7	31.5	29.3		30.0	30.9	7
8	31.1	32.2	32.6		33.6	34.4	33.6		29.6	28.8		31.1	8
9	31.3		32.7	34.9	34.6	34.5	33.2	31.4	30.2			31.1	9
10	31.3	32.4	32.9	33.2	34.7	34.5	33.2	31.4		29.5		31.1	10
11	31.3	32.5	33.3	33.9	34.7	35.0			29.9	29.0		31.1	11
12	31.4	32.0	33.1	33.2	35.1	34.5	33.1	31.6	30.4		30.6	31.1	12
13	31.8	32.2	33.6	34.1	33.7	34.5	33.7	30.2			30.2	31.3	13
14	31.8	32.8	34.2	34.1	33.9	34.6	33.5	30.0			30.2		14
15	31.6	32.6	33.5		34.3	34.5		30.9	30.3		30.2	31.9	15
16	31.8	32.5	33.6	34.4	34.9	34.4	32.4	30.3	29.4	29.3	30.4	32.3	16
17	31.6	32.3	32.8	34.2	35.1	34.3	32.8	30.6	29.3	29.1	30.4		17
18	31.6	32.7	32.9	34.4	35.1	34.3		30.4	29.4	30.0	30.1	31.9	18
19	31.6	32.9		34.6		34.3		31.1	29.4		30.4	31.9	19
20	31.5			34.4	35.3	34.1	32.8		29.0		30.3	31.2	20
21	32.0	32.8		34.7	36.0	34.3	32.4		28.1	29.3	30.5	31.1	21
22	31.6	33.8		34.8	35.6		32.3	30.5	28.1	29.5	30.9	31.4	22
23	31.5	33.8	33.3	34.3	34.8		32.5	30.6		29.0	30.7	31.8	23
24	31.6	33.1	33.9	34.2	35.4		32.5	30.4	29.6	28.6	30.5	31.7	24
25	31.8		34.2	34.5	35.5		32.9	30.0		29.1	30.6	32.3	25
26	32.1		34.3	34.4	35.0		32.2		27.8	28.6	30.5	32.3	26
27	31.7	32.8	34.4		35.3		32.4		28.2	29.0	30.6	32.0	27
28	31.3	32.6	34.3		35.1		32.3		28.0	29.5	30.3	32.4	28
29		32.3	34.1	35.2	34.5					28.6	30.6	32.5	29
30			34.5	34.9	34.9		32.2			28.7	30.7	32.3	30
31	31.9		34.6		34.7		32.2			28.8		32.3	31

Monthly values

X _m	31.6	32.6	33.3	34.4	34.8	34.4	33.0	31.1	29.3	29.0	30.2	31.6	X _m
N	29	24	27	26	28	21	26	21	21	22	26	29	N
s	0.3	0.5	0.8	0.5	0.6	0.2	0.6	0.7	0.9	0.4	0.5	0.6	s

Annual mean 332.1 ppmv
(based on 12 monthly means)

X_m = average monthly concentration

N = number of daily values accepted

s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: MAUNA LOA
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1977
 Provisional CO2 concentration values in ppmv above 300.0
 (continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	32.1	33.3	33.7	34.6	36.7	36.9	35.1		31.8			32.4	1
2	32.3	33.1		35.0	37.2	36.3	35.4						2
3	32.4	33.1		35.6	36.7	36.2	35.4	33.0	31.8			33.1	3
4	32.6	34.3	34.3	36.4	37.3	36.3	34.6	33.4		30.0	31.2	33.5	4
5	32.5		34.9	35.8	37.0	35.4		32.5		30.1	31.7	33.1	5
6	32.2	33.3	34.5	35.8	36.2	36.0	34.9	32.5		30.6	32.1	33.0	6
7	32.3	33.2	33.8	35.8	36.1	36.2	34.8	32.4	31.0	30.6		32.9	7
8	32.1		33.9	36.2	36.2	36.1	34.5	32.8		30.9	32.1	33.2	8
9	32.2		34.5	35.9	36.2	35.9		32.2			31.7	33.4	9
10	32.0	33.9	34.1	35.8	36.6		34.5				31.6	33.5	10
11	32.1	33.4	34.3	35.3	35.7	36.0	35.0			30.5			11
12	32.2	32.8	34.1	35.1	35.8	36.0	35.1	32.5				33.2	12
13	32.8	32.9	34.5	35.8	36.1	36.2	35.4					33.1	13
14	33.5	33.0	34.7	35.7	36.5	35.9		32.7	31.0			33.0	14
15		32.8	34.9	35.9	36.4	36.7	34.6		32.6	30.8		33.5	15
16	33.5	33.4	34.4	36.4	36.3	35.8	34.6			31.5		33.4	16
17	33.0	33.4	34.5	35.3	36.5	35.5	34.8			30.9		33.3	17
18		33.3	34.5	35.6	36.7	35.3				31.2		33.9	18
19	33.1	32.9	35.1	35.6	36.1	35.3				31.2	32.4	33.7	19
20	33.2	32.8	35.4	35.6	36.5	36.0					32.2	34.0	20
21	33.4	33.2	35.3	35.8	36.3	36.5	34.8					33.9	21
22	33.3	33.4	34.7	36.0	36.9	36.5						33.8	22
23	33.6	33.1	34.8	36.1	36.5	36.5	34.3	32.5				34.5	23
24	33.0	33.1	34.8	35.6	36.8	36.0	34.1					34.2	24
25	33.2	33.3	34.4	35.9	36.7	35.2	34.2				32.5	33.6	25
26		33.1	34.4	36.0	36.4	35.1	34.3		30.3		32.4	33.8	26
27	33.0	33.6	34.6	36.1	36.2	35.3			30.8		32.5		27
28	33.1	33.7	35.6	35.7	36.4	35.6		32.1		30.4	32.6	34.0	28
29	33.4		34.9	36.1	36.4	35.6	33.3	32.9	30.1	32.4	32.6	34.4	29
30			34.8	37.0	36.3	35.7	33.5		29.9		32.2	33.9	30
31	33.3		34.8		36.6		33.6	32.1				34.0	31

Monthly values

Xm	32.8	33.3	34.6	35.8	36.5	35.9	34.6	32.6	31.0	30.8	32.1	33.5	Xm
N	27	25	30	30	31	29	22	13	9	13	14	28	N
s	0.5	0.4	0.5	0.5	0.4	0.5	0.6	0.4	0.9	0.6	0.4	0.5	s

Annual mean 333.6 ppmv
 (based on 12 monthly means)

Xm = average monthly concentration
 N = number of daily values accepted
 s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: MAUNA LOA
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1978
Provisional CO₂ concentration values in ppmv above 300.0
(continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	34.3	35.2	35.2		38.0			35.2	33.8	32.1			1
2	34.7	35.0	36.6		38.0			34.9		32.3	32.9		2
3	35.0	35.2	36.7		37.9			35.5		32.3	33.2		3
4	34.9	35.0	36.0	36.5	37.5			35.1			33.2	34.4	4
5	33.9	34.1	36.0	37.0	37.8		36.3	34.9	33.4	31.8	33.6	34.4	5
6	34.0	34.0	36.1	37.6			35.9	35.0		31.8	33.5	34.6	6
7	33.7	34.2	35.1		38.1			34.4	32.8		33.3	34.4	7
8	33.5	34.4	35.3	37.7	37.5		36.5	34.4	33.0	31.6	33.5		8
9	34.0	35.0	35.6	38.0	37.5		36.7	34.7	33.2	31.9	33.5	34.9	9
10	33.8	35.2	35.9	37.5	37.3		36.9	34.2		31.5	33.5	34.6	10
11	34.4		35.8	37.9	37.8		36.7	34.4				34.5	11
12	34.2	34.8	35.9	37.5	38.1	37.9	36.5	34.8	31.3			34.9	12
13	34.1	34.6	35.9	37.7	38.0	37.9	36.7	34.9			33.5	35.3	13
14	34.1	34.7	36.0	37.7	37.6	37.8	36.4	34.4		31.8	33.7	35.0	14
15	34.5	35.2	35.6		37.7	37.4	36.1	34.5	32.3	32.3		35.0	15
16	34.3	35.4	36.9	37.7	37.6	37.5	36.7		32.2	32.2		34.9	16
17	34.5	35.7	37.1	37.5	38.0	37.3	36.6		31.6	32.5	33.2	34.9	17
18	35.5	36.2		37.3	37.0		35.9		31.6		33.5	35.0	18
19	35.1	35.5	36.2	36.8	37.1		35.5		31.4		33.5		19
20	34.5	34.8	36.5	36.5	37.4		35.4		31.9	32.9	34.1	35.5	20
21	35.0	34.5		37.2	37.6		35.8	34.0				34.9	21
22	35.8	35.0	36.3	37.8	37.8		35.9	34.2		32.6	34.0		22
23	34.9	35.6	36.6	37.1	37.5	37.1	35.8		31.8	33.0		34.7	23
24	35.3	35.7	37.0		37.4	37.1	35.7	34.1	32.3	32.4	33.7	34.9	24
25	35.1	35.7	37.6		36.8	37.3	35.5	34.0		32.7	34.2	35.0	25
26		34.6	37.3	37.1	37.1	36.9	35.4	34.2			34.0	35.0	26
27	35.7	36.1	37.6	37.4	37.3	37.0	35.7				33.5	35.2	27
28	36.2	34.9	37.1	37.4	37.8				32.8			34.7	28
29			35.8	38.1	38.3	37.4	35.5	34.0	32.8	33.0		34.9	29
30	35.5		36.8	37.8	38.5	37.4	35.6	33.4	32.2	32.9		34.8	30
31	35.6		37.9		38.2		35.0	33.7				35.4	31

Monthly values

X _m	34.7	35.1	36.4	37.4	37.7	37.4	36.0	34.5	32.4	32.3	33.6	34.9	X _m
N	29	27	29	23	30	13	25	23	17	19	20	25	N
s	0.7	0.6	0.7	0.4	0.4	0.3	0.5	0.5	0.7	0.5	0.3	0.3	s

Annual mean 335.2 ppmv
(based on 12 monthly means)

X_m = average monthly concentration

N = number of daily values accepted

s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: MAUNA LOA
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1979
 Provisional CO₂ concentration values in ppmv above 300.0
 (continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	35.0	36.5	36.4	38.7	39.6	39.8			34.3	33.9		36.0	1
2	35.0	36.8	36.9	38.4	39.2			37.2	34.3	33.7	34.4	35.8	2
3	34.9		36.6	37.9	38.8	39.6		36.9	33.4		34.7		3
4	34.9	36.5		37.2	38.8	39.2		36.7	33.8	33.4	34.7	36.1	4
5	34.9	36.5	37.3		38.8	39.3	38.3		33.3	33.9	34.5	36.3	5
6	35.0	36.3	37.1	36.9	39.0	39.1		36.3	33.1	34.0	34.4		6
7	35.5		37.4		39.0	39.2	37.9	36.2					7
8	35.1		37.5	38.6	38.9	39.3		36.1		34.2	34.5	36.1	8
9	34.9	35.9		38.7		39.3	37.9	36.4			34.8		9
10	35.1	36.1	37.6			39.0	37.8	36.4			34.6	36.3	10
11	35.2	36.4		38.2	38.4	39.1	37.7	36.3	34.8	34.1	34.3	36.5	11
12	35.7	36.4	37.4	38.5	38.4			36.3	34.5	33.9	34.6	36.6	12
13	35.9	36.4	37.1	38.1	38.2	38.2	37.6	35.9	34.2	33.6	34.9	36.6	13
14		36.2		37.9	38.5		37.2	36.0		33.6	35.0	36.6	14
15	35.8	35.9		38.4	39.1	38.5	37.4	35.8	33.3	33.6		36.7	15
16	36.1	36.1	38.1	38.8	39.4	38.5	37.8	35.8	33.7	33.7	35.6	36.4	16
17	36.3	36.2		38.2			37.5	36.1		33.7	35.6	36.5	17
18	36.3	36.9	36.6	38.5	39.6	38.8	37.6	35.9		33.8	35.4		18
19	36.0	36.8	36.6	38.6	39.5	38.6	37.5	36.1	33.4	33.6	35.3		19
20	36.4	36.7	37.0	38.8	39.4	38.7				33.6	35.4	36.8	20
21	36.8	36.9		38.8	39.3	38.8	37.0	35.1	32.7	33.5	35.4	36.8	21
22	36.8	36.2	38.5	38.8			37.0	34.5	32.7	33.2	35.5	36.8	22
23	37.0	35.7		39.5	39.7	38.2	36.8	34.0	33.0	33.4		36.4	23
24	36.4	36.6	39.4	39.2	38.8	38.5	36.0	33.8		33.7		36.6	24
25	36.1	36.6	38.9	38.9	39.3	38.6	36.1	33.5	33.2	33.9	35.6	36.8	25
26	36.4	36.7	38.1	38.7	39.0					34.1	35.5	37.6	26
27		36.5	38.5	38.8	39.1		35.5				35.3	37.1	27
28		36.2	38.0		39.1	38.6		35.2	33.9	33.9	35.4	37.0	28
29	37.4		38.3	39.6	39.1		36.6	34.4	34.1		35.7	36.9	29
30	36.7		39.1	39.8		38.7	37.1	34.6	33.7	34.2	35.6	37.0	30
31	36.8		38.8				37.0	34.6		34.3		37.3	31

Monthly values

X _m	35.9	36.4	37.7	38.6	39.0	38.9	37.2	35.6	33.7	33.8	35.1	36.6	X _m
N	28	25	23	26	25	22	21	26	19	25	25	25	N
s	0.8	0.3	0.9	0.7	0.4	0.4	0.7	1.0	0.6	0.3	0.5	0.4	s

Annual mean 336.5 ppmv
 (based on 12 monthly means)

X_m = average monthly concentration
 N = number of daily values accepted
 s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: MAUNA LOA
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1980
 Provisional CO2 concentration values in ppmv above 300.0
 (continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	37.5	37.6	39.9	40.5	41.1	41.9	40.1	38.2	36.5		36.2	36.9	1
2	37.4	38.0	40.4	40.2	41.4	41.8	40.4	38.0	35.8		36.4	37.0	2
3	37.7	38.4	39.5	40.0	41.3	41.2	40.2	37.0			36.3		3
4	37.6	38.1		40.3	41.5	41.3	40.2	36.6	35.8	35.2	36.4		4
5	37.4						40.2		36.7	35.4	36.8	37.2	5
6	37.5	38.0	39.5		41.4	41.0	40.0	36.5	36.4	35.5	36.7	37.6	6
7	37.5	38.6	39.6		41.5				36.1	35.4	36.5		7
8	37.3	38.8	39.0	40.4	41.3		40.2	37.5		35.2	36.1	37.3	8
9	36.8		39.2	40.1	40.9		39.9	37.4		35.1	36.4	37.3	9
10	37.3	37.0	39.4		40.4	41.0	39.3	38.1		35.3	36.6	37.5	10
11	37.4	37.1	39.6		40.6	41.0	38.7	37.8	34.9	35.1	37.1	37.6	11
12	37.5		39.7	41.1	41.7	40.8			35.5	35.8	37.1	37.4	12
13	37.5	37.9	40.0	40.8		41.0			36.4	35.7	36.8	37.5	13
14	37.3	38.6	40.1		41.1	41.0	39.7			35.5		37.8	14
15		38.9	39.8	41.1	41.1	41.5	39.8	37.1		35.5	36.4	37.9	15
16	37.3	38.6	39.8			41.2	38.5	38.0	35.5	35.6	36.6	38.0	16
17	37.9	38.6		40.2	41.1	41.3		37.0	35.5	35.7	36.6	38.0	17
18	38.2	38.4	39.5	40.4	41.0	41.4	38.1			35.4	37.0	38.1	18
19	38.6	38.6		40.6	41.4	40.7		37.5	35.0	35.5	37.0	38.0	19
20	37.9	38.3	39.8	40.7		40.5		37.8	34.6	35.6	36.7	37.7	20
21	38.0	38.0	40.4	40.6		40.3	38.0		35.2	36.0	36.7	37.5	21
22	39.5	37.9	40.5	40.9	40.9	40.4			35.1		36.8	38.2	22
23	39.0	37.9	40.5	41.0	40.8	40.5	39.2	37.0		36.1	37.1	38.2	23
24	38.6	38.0	40.3	40.7	40.3		38.9			36.0	37.2	38.0	24
25	38.5		40.4	40.5	40.4		38.6	37.5		36.1	37.0	38.1	25
26	38.1	38.7	40.7	40.9	41.0		38.0			36.0	37.2	38.0	26
27	38.4	38.5	40.4	41.0		40.3			36.0		37.0	38.4	27
28	38.0	37.8	41.2	40.9	41.3		38.6		35.9	35.5	37.0	38.4	28
29	37.5	39.1	41.1		41.5		38.3	37.7	35.8	35.8	37.1	38.6	29
30	37.4		41.0		41.4	40.0	38.0		35.8	36.3	36.9	38.5	30
31	37.5		40.5		41.3		38.2			36.5		38.3	31

Monthly values

X _m	37.8	38.2	40.1	40.6	41.1	41.0	39.2	37.5	35.7	35.7	36.7	37.8	X _m
N	30	24	27	21	25	21	23	17	19	26	29	28	N
s	0.6	0.5	0.6	0.3	0.4	0.5	0.9	0.5	0.6	0.4	0.3	0.5	s

Annual mean 338.4 ppmv
 (based on 12 monthly means)

X_m = average monthly concentration
 N = number of daily values accepted
 s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: MAUNA LOA
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1981
 Provisional CO₂ concentration values in ppmv above 300.0
 (continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	37.8	39.1	40.7		43.1	42.0		39.0	37.2		36.9		1
2	38.0	38.9		41.8	42.9	42.1	40.2	38.9	37.2	35.9	36.7		2
3	37.9	39.0	40.4	42.0	43.1	42.0	40.0	39.0	36.6	35.8		38.7	3
4	39.2	39.2	40.1	41.6	42.5	42.1	40.8		36.2	36.0		38.9	4
5	39.2	39.2			42.7	42.3			36.6	35.9	37.5	38.8	5
6	39.2	40.6	40.4	42.1	42.9	42.4	40.8		36.8	35.8	37.1	38.5	6
7	38.5	40.1	40.4	42.2	42.7	42.2	40.9	38.5	37.0		37.4		7
8	38.4	40.6	40.4	41.9	42.6	42.3	40.7	38.8	36.4	35.9	37.3	38.6	8
9	38.5	41.0		42.2	42.8	42.0	40.4	38.7		36.0	37.0	39.0	9
10	38.5	40.4		41.9	42.8	42.2	40.5	38.3			37.4	39.1	10
11	38.6	39.9	40.1	41.9	42.8	42.1	40.2	37.9			37.8	38.7	11
12	39.0	39.8	41.4	42.1	42.8	42.1	40.6	38.5	37.0	36.3	37.9	38.6	12
13	39.2		39.7	42.0	42.8	42.1	40.2		36.5	36.1	37.6	38.8	13
14	39.0				42.8	42.4	40.0	38.2	36.1	36.3	37.6	39.0	14
15	38.6	39.4	40.6	41.9	42.6	42.0	39.9	37.9		36.9	37.3	38.7	15
16	38.5	39.5	41.0	42.6	42.5	41.8		38.0	35.7	36.5	37.1	39.0	16
17	39.0		40.8	43.2	42.5	41.5	38.7	37.8	35.7	36.8		38.8	17
18	39.4			42.2	42.5	41.2	38.7	37.3	36.3	36.4		39.1	18
19	39.0		41.1	42.0	42.3	41.3		37.6	36.9	36.4	37.9	39.2	19
20	39.0	39.7	41.0	42.1	42.3	41.8		37.6	36.5	36.6	37.9		20
21	39.2	39.1	41.2	42.1	42.3	41.3	39.9		36.3	36.7	37.9	39.2	21
22	39.2	39.6		41.9	42.4	41.2	39.9	36.5	36.3			39.3	22
23	39.1	40.0	41.7	41.7	42.5	41.2	39.8	36.9	35.8		38.1	39.4	23
24	38.6	40.6	42.2	41.5	42.5	41.1		36.7	35.0	36.3			24
25	38.7	40.8	42.2	41.7	42.5		39.8			36.5	38.8	39.6	25
26	38.7	41.0	41.8	41.5	42.8					36.9	38.6		26
27	38.9	40.6	41.2	42.0	42.9	41.0	39.5		35.7	36.8	38.4	40.0	27
28	39.4	40.7	42.0	42.1	42.8	41.7			35.4	37.1	38.5		28
29	39.6		41.6	41.8	42.6	41.6		37.1	35.0	37.2	39.1	39.7	29
30			41.5	42.2	42.6	40.5	39.4	37.3	35.0	37.1	39.0	39.9	30
31	38.9				42.5		39.2	37.2		37.0		39.6	31

Monthly values

X _m	38.8	39.9	41.0	42.0	42.7	41.8	40.0	37.9	36.2	36.5	37.8	39.1	X _m
N	30	23	23	27	31	28	22	22	24	25	24	24	N
s	0.4	0.7	0.7	0.3	0.2	0.5	0.6	0.8	0.7	0.4	0.7	0.4	s

Annual mean 339.5 ppmv
 (based on 12 monthly means)

X_m = average monthly concentration
 N = number of daily values accepted
 s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: MAUNA LOA
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1982
 Provisional CO₂ concentration values in ppmv above 300.0
 (continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	39.7	40.5		42.1			42.0	40.6	38.7	37.4	38.8		1
2		40.8		42.5	43.5		42.4	41.4	39.0	37.4	38.1	39.6	2
3	39.8	41.3	41.9	42.4	43.1	43.1	42.3	40.5			38.2	39.6	3
4	39.8	41.5	42.2	42.6	43.2	42.8	42.0	40.6	39.2	37.0	38.4	39.6	4
5		41.4	42.3	42.5	43.2	43.0	42.1		38.4			39.9	5
6	39.7	41.6	42.1	42.2		43.0	42.2	40.1	37.9			39.8	6
7	39.8	41.6		42.1		43.0	41.8	40.2			38.5	40.1	7
8	39.9	41.0	41.9			43.1	42.1	40.1	38.4	38.0	38.3	40.6	8
9	40.0	41.1	42.1	42.8		43.8	41.8	40.2	38.7	37.6	38.3		9
10	39.9	41.2	42.2	42.8		43.2		40.3	38.2	37.7			10
11	39.9	40.0	42.3	43.0		42.8	41.7	39.7	38.3	38.1	38.9	40.3	11
12	39.8	40.4	41.7	43.1		42.7	40.9	39.8	38.3	38.1	38.9	40.3	12
13		40.5		42.5	43.5	42.5	41.7				38.9	40.2	13
14	40.2	40.5		42.9	43.8	43.0	41.5	39.6	38.4	37.0	39.3	40.2	14
15	40.0	40.6		42.9		43.3	41.9	39.7			39.0	40.5	15
16	40.3		42.1	43.0				39.6			39.3	40.6	16
17	39.9							40.2	38.5	37.4	39.1	40.4	17
18		40.6		43.1	44.1		41.8			37.7		40.6	18
19	40.3	40.5	42.2	42.8	43.3	43.2	41.7			37.6	39.5	40.4	19
20	40.2	40.5		43.0	43.5	43.1	41.6			37.8	39.2	40.8	20
21		40.7		43.2	43.5	42.7		39.9	36.7	37.9	39.5	40.9	21
22	40.0			44.0	43.6			39.6	36.3	37.8	40.2	40.5	22
23	40.5			43.9	43.8		41.8	38.8	36.6	37.7	40.1	40.6	23
24	40.5	41.4		43.9	44.0	42.5			36.7		39.9		24
25	41.0	41.8		43.9			41.5	38.1	36.7		40.4		25
26	41.0	41.5	42.4		43.9	42.6	41.3	38.0	37.2			40.7	26
27	41.0	41.5	42.2		43.9	42.6	41.4			39.0		41.1	27
28	40.8	41.9	42.4		43.7	42.3		38.4	36.8			40.6	28
29	40.6		42.2		43.8		41.0	38.2	36.7		39.5	40.8	29
30	40.5			43.6	43.2	42.0	41.3	37.6		38.5	39.3		30
31	40.8				43.2		41.1			38.4		40.9	31

Monthly values

X _m	40.2	41.0	42.2	42.9	43.6	42.9	41.7	39.6	37.8	37.8	39.1	40.4	X _m
N	26	24	15	24	19	21	24	23	20	19	23	25	N
s	0.4	0.5	0.2	0.6	0.3	0.4	0.4	1.0	0.9	0.5	0.7	0.4	s

Annual mean 340.8 ppmv
 (based on 12 monthly means)

X_m = average monthly concentration

N = number of daily values accepted

s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: MAUNA LOA
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1983
 Provisional CO₂ concentration values in ppmv above 300.0
 (continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	41.0	42.1	41.7	43.9	44.9	45.8	44.4	43.0		39.6	40.4	41.8	1
2		42.2	42.4	44.4	45.1	45.6	44.7	42.8		39.5	40.6	41.8	2
3	41.0	42.0	42.3	44.4	45.3		44.5		39.9		40.8	41.9	3
4	40.9	41.9	41.9	44.0			44.9	42.8	40.1	39.8	40.6	42.0	4
5	41.6	42.0	42.0	44.0	44.3	45.4	44.9	42.9		39.7	40.8	41.9	5
6	41.5		43.2		45.9	45.7	44.9	43.5	39.9	39.7	40.9		6
7	41.3	41.8	42.5	44.7	45.9	45.9	44.8	43.2	39.8	39.7	41.2		7
8		41.7	42.0	44.5	45.6	45.9	44.8		40.3	39.9	41.0		8
9	41.4	42.7	41.9	45.3	45.7	45.6		42.9	39.9	40.0	41.0		9
10		42.9	41.9	45.0					40.0	39.9	41.1		10
11	41.4	42.7	41.9	44.9		45.7			40.1	39.8	41.0		11
12	41.8	42.8	42.3	44.8	45.8	45.4	43.8			39.8	40.9	42.6	12
13	41.5	42.6	42.8	44.7	45.4	45.4	43.5			39.7	40.9	42.7	13
14	42.3	42.5	43.3	44.7	45.8		44.1	41.4		40.0	41.2	43.0	14
15	42.4	42.8	43.7	44.8	45.9	45.6		42.0	40.3	40.2	41.1	43.1	15
16				45.1	45.9	45.2			39.8	40.3	41.2	43.1	16
17	40.9	42.7	43.9	45.2	46.0	45.0		42.0	39.5			42.9	17
18	40.5	42.6	43.2	45.4	46.0	45.0		42.2		41.1	41.2	43.2	18
19	40.6	42.4	43.4	45.3	45.9	44.6	43.6	42.3	39.8	40.3	41.5	43.6	19
20	41.6	42.4	44.7	45.3	45.9	44.6	43.5		40.0		41.2	43.5	20
21	41.2	42.3	44.9	45.0	46.1	45.1	43.8			40.2	41.2	43.2	21
22	41.3	42.1		45.2	46.2	44.9	43.7		39.9	40.2	41.0	44.0	22
23	41.2	43.1	44.4	45.4	45.2	44.8			40.3	40.3	41.7	43.4	23
24	40.9	43.0		45.5		45.3	43.6	42.0		40.4	41.6	43.3	24
25	41.4		45.1	45.4	46.0	45.4	43.8	42.3		40.3	41.6	43.1	25
26	41.5	43.3	43.5	45.2	46.0	45.0	43.4	41.3	39.8	40.4	41.4	43.1	26
27	42.2	42.9	42.7	45.5	45.9	44.4		42.1	40.2	40.3	41.7	43.5	27
28	41.7	42.6	43.2	45.7	45.5		41.9	42.0	40.2	40.4	41.9	43.5	28
29	41.3			45.8	45.7				40.4	40.3	42.2	43.6	29
30	41.2		44.4	45.8	45.6	44.9	42.6	41.2	40.0	40.4	42.1	43.5	30
31	41.6		43.1		45.6					40.7		43.3	31

Monthly values

X _m	41.4	42.5	43.0	45.0	45.7	45.2	44.0	42.3	40.0	40.1	41.2	43.0	X _m
N	27	25	27	29	27	24	20	18	20	28	29	25	N
s	0.5	0.4	1.0	0.5	0.4	0.4	0.8	0.7	0.2	0.4	0.4	0.6	s

Annual mean 342.8 ppmv
 (based on 12 monthly means)

X_m = average monthly concentration
 N = number of daily values accepted
 s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: MAUNA LOA
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1984
 Provisional CO₂ concentration values in ppmv above 300.0
 (continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	43.3	44.0	44.8		47.6		46.0		41.6		41.7	43.2	1
2	43.3	44.3	44.9		47.7		46.4			40.7	41.9		2
3	43.3	44.6	45.0		47.6	46.3			41.8		41.7		3
4	43.6	44.5	45.0		47.6	46.7	45.9		41.3		42.0	43.2	4
5	43.9	44.5	44.9			47.3		43.9	40.6	41.3	41.9	43.1	5
6	44.0		45.1		47.1	47.2		44.1	40.4	41.2		43.0	6
7	43.9		45.3		47.4	46.4	45.9		40.2	41.0		43.3	7
8	43.8	44.7	45.3		47.3		45.8		40.3	40.9	42.4	43.8	8
9	43.7	44.6	44.9			47.0		44.4		40.9	42.5		9
10	43.6	44.7				47.1	45.5	43.7	41.2	40.7	42.3	44.5	10
11	43.7	44.5	44.8			47.0			40.9	40.8	42.5	44.0	11
12		44.6	44.7			47.0	45.5		41.3	41.5	42.5		12
13	43.3	44.7	44.9		47.7	46.9	45.4		40.8		42.4		13
14	43.3	44.5			47.7						42.5	43.7	14
15	43.5		45.7		47.7		45.4		41.7		43.3	43.8	15
16		44.4	45.5				45.3	43.6	41.5	41.7	43.0		16
17	43.5	44.2	45.2		47.8		45.6		41.1		42.7	44.3	17
18		43.9	45.3		46.7	46.5	45.3	43.6	41.3		42.9	44.3	18
19		44.3	45.5		47.5	47.1	45.4	43.5	41.7		43.4	44.8	19
20	43.5		45.3		47.2			42.6	41.4	41.8			20
21	43.5	45.1	45.5		47.3	46.2		42.1	41.0		42.9	44.4	21
22	43.7	45.2	45.4								43.1	44.0	22
23	43.9	45.1	45.7		46.9	46.3	44.9	41.8	41.0		43.2		23
24	43.8	44.8	46.1		47.0	46.4		42.3	41.0		44.0	44.4	24
25	44.0	44.3	45.5			46.3	44.6		41.1	41.4	43.8	44.2	25
26	43.9	44.2			46.6	46.3	44.2			41.4	43.9		26
27	44.5	44.8				46.3	44.1		40.9	41.5			27
28	44.6				47.1	46.4	44.7	41.7		41.7		44.4	28
29	44.3	44.6			47.2	46.1	44.6		40.6	41.6	43.4	44.2	29
30				47.2	47.4	46.0					43.5		30
31					47.4		44.5						31

Monthly values

X _m	43.7	44.6	45.2	47.2	47.3	46.6	45.2	43.1	41.1	41.2	42.8	43.9	X _m
N	25	23	23	1	22	21	20	12	23	16	25	19	N
s	0.4	0.3	0.4		0.3	0.4	0.6	0.9	0.5	0.4	0.7	0.5	s

Annual mean 344.3 ppmv
 (based on 12 monthly means)

X_m = average monthly concentration

N = number of daily values accepted

s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: MAUNA LOA
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1985
 Provisional CO2 concentration values in ppmv above 300.0
 (continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	44.5	45.9	46.8	47.8	48.3		46.9		43.2	41.7	42.9		1
2	44.2	45.9	46.5	48.3	48.6		46.9		43.3	41.7		44.7	2
3	44.5	45.8	46.6	48.0		48.5	46.4		43.3		43.0	44.8	3
4	45.2			48.0	48.7	48.5	46.5				43.2		4
5	44.7	45.5	46.8	47.5	48.8	48.3	46.7		44.1	42.1	43.3		5
6	44.7		46.9	47.8		48.4	46.4		44.4	42.3	43.2	44.8	6
7	44.5	45.5	47.2	48.0	48.5	48.2		45.1	44.1	42.3		44.9	7
8	44.5			47.6		48.1	46.4	44.5			43.3	45.4	8
9	44.6	45.3	46.6	47.5	49.6	48.2	46.5	44.1	44.1		43.4	45.4	9
10	44.7	45.2	46.8	48.2		48.0			43.8	42.4	43.7	45.0	10
11	44.9		46.9		49.5	48.0	46.5	44.5	42.4			44.8	11
12	45.3	45.4	46.7	47.8	48.8		46.5	43.8	43.1		43.8	45.0	12
13	44.9	45.3	47.0	47.4	48.6		46.7	44.5	43.4	42.2	43.6	45.0	13
14	44.7	45.0	46.9		48.6		46.6			42.3	43.9	46.6	14
15			47.1		48.7		46.4		43.2	42.2	44.0		15
16	44.9	45.7	47.9	47.7	48.8	47.8			43.4	42.5	43.9	45.4	16
17	44.5	46.1	47.6		48.9	47.9			43.2	42.8	44.0	45.4	17
18	44.7	45.9	47.4	48.0	49.1	48.0	46.1	44.1		43.0	44.1	45.1	18
19	45.1		47.1	48.0	49.0		46.1	44.3	42.4	42.7	44.1	44.8	19
20	45.0	45.9	47.4	48.0	49.0	47.6		44.1	42.6	43.0	44.6		20
21	44.9				48.8	47.5	46.1	43.9		43.1	44.5	44.7	21
22	44.7		47.4	48.4		47.5		43.9	42.2	43.1	44.2	44.9	22
23	44.8	46.1		48.9	48.0			43.9	42.1			44.8	23
24		46.3	47.2		47.4	47.5		44.5	41.7	42.8	44.1	44.8	24
25		46.1			47.4	47.4	45.7			42.9	44.0	46.2	25
26	44.8	46.4	47.7	48.6	47.5	47.4	45.8		41.8	43.1	44.8	46.0	26
27	45.0	46.0	47.8	48.5	48.5		45.6	44.6	42.0	42.9	45.5	45.6	27
28	45.0	46.7		48.5	48.5	47.1	45.6	44.7		43.1	45.7	45.1	28
29	44.8				48.9	47.0	45.4		41.8	43.0	44.9	46.0	29
30			48.0	48.6		46.9	44.7		41.9		44.7	46.4	30
31	45.6		48.1		49.1			43.2		43.1		46.5	31

Monthly values

X _m	44.8	45.8	47.2	48.0	48.6	47.8	46.2	44.2	42.9	42.6	44.0	45.3	X _m
N	27	20	24	22	25	21	22	16	23	23	26	26	N
s	0.3	0.4	0.5	0.4	0.6	0.5	0.5	0.4	0.9	0.4	0.7	0.6	s

Annual mean 345.6 ppmv
 (based on 12 monthly means)

X_m = average monthly concentration
 N = number of daily values accepted
 s = standard deviation (ppmv), based on daily means

CAPE KUMUKAHI, HAWAII

Author: Charles D. Keeling

Organization: Scripps Institution of Oceanography

Address: University of California, San Diego, La Jolla, California 92093, USA

Site position and description: 19°31'N; 154°49'W, elevation 3 m, on a rocky coastal cliff of an island of the tropical Pacific ocean

Sampling method, frequency and measurement technique: 5 liter evacuated glass flasks exposed primarily in pairs biweekly (Mar 1979 - Aug 1981), then weekly (Aug 1981 - Sept 1985). Flask samples measured at the Scripps Institution of Oceanography with an Applied Physics Corporation non-dispersive infrared gas analyzer.

Scientific aims and scope of measurements: Observe seasonal and interannual variations in atmospheric CO₂.

Data selection procedures used: Concentrations of replicate flask samples must agree within 0.40 ppmv to be accepted.

Calibration gases used: CO₂-in-N₂ until Mar 1983, then CO₂-in-air

Scale of reported data: 1985 WMO/Scripps mole fraction scale

Literature references to programme:

Mook, W. G., M. Koopmans, A. F. Carter, and C. D. Keeling, "Seasonal, Latitudinal, and Secular Variations in the Abundance and Isotopic Ratios of Atmospheric Carbon Dioxide 1. Results from Land Stations", *Journal of Geophysical Research*, Vol. 88, pp 10915-10933 (1983).

Atmospheric carbon dioxide measurements at station: CAPE KUMUKAHI
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1979
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1										33.9*			1
2				39.1									2
3												37.3	3
4									34.4				4
5													5
6								36.0					6
7													7
8													8
9													9
10													10
11						40.5*							11
12													12
13											37.1*		13
14					41.4*								14
15													15
16				39.6			37.4*			37.0*			16
17												39.0	17
18									32.6				18
19													19
20								36.3					20
21													21
22													22
23													23
24													24
25													25
26						39.0							26
27			39.1										27
28													28
29					43.1								29
30				40.6*						35.5			30
31													31

Monthly values

Xm	39.1	39.4	43.1	39.0	36.2	33.5	35.5	38.2	Xm
N	2	4	2	2	4	4	2	4	N
s									s

Annual mean 338.0 ppmv
 (based on 8 monthly means)

Xm = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: CAPE KUMUKAHI
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1980
Final CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2									34.4			38.4	2
3			40.7				39.4				39.0		3
4		40.1											4
5													5
6													6
7	39.8*												7
8													8
9													9
10													10
11													11
12					42.8*								12
13													13
14				42.4			40.2*			36.0			14
15												39.0*	15
16						41.3			35.1				16
17													17
18								36.3			38.0		18
19		44.5*											19
20			40.5										20
21	41.0*												21
22													22
23							37.2						23
24													24
25													25
26													26
27					42.9								27
28				43.3*			35.4						28
29									35.8				29
30						40.7							30
31			40.6										31

Monthly values

X _m	40.1	40.6	42.4	42.9	41.0	37.3	36.3	35.1	36.0	38.5	38.4	X _m
N	2	6	2	2	9	16	2	6	2	4	2	N
s												s

Annual mean 339.0 ppmv
(based on 11 monthly means)

X_m = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: CAPE KUMUKAHI
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1981
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1												40.4*	1
2		40.8									37.9		2
3			42.1										3
4								36.8					4
5	39.3												5
6										36.3			6
7												40.0*	7
8									35.9				8
9											38.6		9
10								37.1					10
11													11
12					43.9*								12
13				42.8			38.2			37.5			13
14												39.3*	14
15									37.0				15
16			42.9			43.9*					39.3*		16
17		40.5						38.4*					17
18													18
19	42.2									38.9			19
20													20
21									36.5			40.0*	21
22													22
23											42.5*		23
24								37.1					24
25													25
26					46.9*					38.0			26
27				42.5									27
28									36.1				28
29						41.8*						41.8	29
30			43.1										30
31								35.7					31

Monthly values

Xm	40.8	40.7	42.7	42.6		38.2	36.7	36.4	37.7	38.3	41.8	Xm
N	4	4	6	4		2	8	8	8	4	2	N
s							0.7	0.5	1.1			s

Annual mean 339.6 ppmv
 (based on 10 monthly means)

Xm = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: CAPE KUMUKAHI
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1982
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1						44.6					38.7*		1
2		41.3	42.8					39.9					2
3					46.2*								3
4	41.1									35.6			4
5				43.8									5
6							42.0					40.7	6
7						44.4			38.5*				7
8											39.3		8
9		41.9						38.6					9
10			43.8		44.8								10
11													11
12				44.5						37.5			12
13							41.2		36.8*			41.0	13
14						43.9							14
15			42.7								40.0		15
16		41.3						37.9					16
17					44.6								17
18										37.9			18
19				44.1			38.8						19
20									38.5*			42.3	20
21						43.2							21
22			43.3								39.4*		22
23								37.6					23
24					45.0								24
25													25
26	42.8									38.5			26
27				44.3			39.8		36.1*				27
28												40.8	28
29			43.5			41.7					40.4*		29
30													30
31								36.7					31

Monthly values

Xm	42.0	41.5	43.2	44.2	44.8	43.6	40.5	38.2		37.4	39.6	41.2	Xm
N	4	6	12	8	6	10	8	10		8	4	8	N
s			0.4	0.3		1.2	1.4	1.2		1.2		0.7	s

Annual mean 341.5 ppmv
 (based on 11 monthly means)

Xm = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: CAPE KUMUKAHI
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1983
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1								41.9					1
2					46.2								2
3										39.1			3
4	42.7*			44.5									4
5							43.9						5
6									38.5			43.3	6
7		42.7	44.8			45.5					42.5		7
8								41.3					8
9													9
10	41.2				45.8								10
11							43.1			40.5			11
12				44.9					37.0			43.1	12
13						45.2							13
14		43.9									42.6*		14
15			45.4					37.9					15
16													16
17	42.0				46.1					40.2			17
18				45.5			46.7*						18
19									39.2			44.7	19
20						44.1							20
21			44.9								41.9		21
22		47.8&						38.2					22
23					45.7								23
24	41.6												24
25							40.2			41.8*			25
26				46.0					39.1				26
27						43.7						43.5	27
28		44.0	44.4										28
29								38.4			47.1&		29
30													30
31	43.2				45.9					41.3			31

Monthly values

Xm	42.0	43.5	44.9	45.2	46.0	44.6	42.4	39.6	38.4	40.3	42.2	43.6	Xm
N	8	6	8	8	10	8	6	10	8	8	4	8	N
s	0.8		0.4	0.7	0.2	0.8		1.9	1.0	0.9		0.7	s

Annual mean 342.7 ppmv
 (based on 12 monthly means)

Xm = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: CAPE KUMUKAHI
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1984
Provisional CO₂ concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1					47.9					40.8			1
2				47.5			46.2						2
3	43.1											43.1	3
4						47.8			39.0				4
5			47.0*								42.1		5
6		46.5*						39.1&					6
7					47.3								7
8													8
9	44.1			47.4			45.5			41.0			9
10									39.8			45.2	10
11						47.1							11
12			44.9										12
13		45.6*						41.5			42.5		13
14					48.0								14
15										41.8			15
16	45.3			48.5			43.2						16
17									40.5			44.8*	17
18						46.1							18
19			46.4								43.0		19
20		45.5						41.4					20
21					48.1								21
22										42.2			22
23	43.8*			48.3									23
24									41.3			44.7	24
25						45.6							25
26			46.4										26
27		46.0						39.5					27
28											43.9		28
29					47.6					42.2			29
30	45.3						41.1						30
31												45.0	31

Monthly values

X _m	44.4	45.8	45.9	47.9	47.8	46.7	44.0	40.8	40.2	41.6	42.9	44.5	X _m
N	8	4	6	8	10	8	8	6	8	10	8	8	N
s	1.1			0.6	0.3	1.0	2.3		1.0	0.6	0.8	0.9	s

Annual mean 344.4 ppmv
(based on 12 monthly means)

X_m = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: CAPE KUMUKAHI
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1985
Provisional CO₂ concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1				47.6			46.5						1
2													2
3						49.4			41.6				3
4		46.0	47.8										4
5								43.6					5
6					49.0								6
7	45.5												7
8				48.4			46.8						8
9									45.0&				9
10						48.7							10
11		46.2											11
12			47.3					40.7					12
13					49.5								13
14													14
15	47.0			47.9			46.3						15
16									40.7				16
17						48.6							17
18			47.9										18
19		45.9						43.0					19
20					51.1								20
21	46.4												21
22				48.2			44.3						22
23									40.7				23
24						48.2							24
25		46.6	47.6										25
26								43.5					26
27													27
28	45.9				49.8*								28
29				49.2			44.8						29
30													30
31													31

Monthly values

X _m	46.2	46.2	47.7	48.3	49.9	48.7	45.7	42.7	41.0			X _m
N	8	8	8	10	6	8	10	8	6			N
s	0.6	0.3	0.3	0.6		0.5	1.1	1.4				s

Annual mean 346.3 ppmv
(based on 9 monthly means)

X_m = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)

FANNING ISLAND

Author: Charles D. Keeling

Organization: Scripps Institution of Oceanography

Address: University of California, San Diego, La Jolla, California 92093, USA

Site position and description: 3°55'N; 159°19'W, elevation 2 m, on a coral beach of an island of the tropical Pacific ocean

Sampling method, frequency and measurement technique: 5 liter evacuated glass flasks exposed in triplicate biweekly (Jul 1972 - Aug 1983). Flask samples measured at the Scripps Institution of Oceanography with an Applied Physics Corporation non-dispersive infrared gas analyzer.

Scientific aims and scope of measurements: Observe seasonal and interannual variations in atmospheric CO₂.

Data selection procedures used: Concentrations of replicate flasks must agree within 0.40 ppmv to be accepted.

Calibration gases used: CO₂-in-N₂ until May 1983, then CO₂-in-air

Scale of reported data: 1985 WMO/Scripps mole fraction scale

Literature references to programme:

Bacastow, R. B., J. A. Adams, C. D. Keeling, D. J. Moss, T. P. Whorf, and C. S. Wong, "Atmospheric Carbon Dioxide, the Southern Oscillation, and the Weak 1975 El Niño, *Science*, Vol. 210, pp 66-68 (1980).

Keeling, C. D. "The Global Carbon Cycle: What We Know and Could Know from Atmospheric, Biospheric, and Oceanic Observations", prepared for CO₂ *Research Conference: Carbon Dioxide, Science, and Consensus*, pp II.3-II.62 (1982).

Mook, W. G., M. Koopmans, A. F. Carter, and C. D. Keeling, "Seasonal, Latitudinal, and Secular Variations in the Abundance and Isotopic Ratios of Atmospheric Carbon Dioxide 1. Results from Land Stations", *Journal of Geophysical Research*, Vol. 88, pp 10915-10933 (1983).

Keeling, C. D., "Atmospheric and Oceanographic Measurements Needed for Establishment of a Data Base for Carbon Dioxide from Fossil Fuels", in *The Potential Effects of Carbon Dioxide-Induced Climatic Changes in Alaska. The Proceedings of a Conference. Fairbanks, Alaska, April 7-8, 1982. School of Agriculture and Land Resources Management, University of Alaska, Fairbanks, Miscellaneous Publications 83-1, pp 11-22 (1984).*

Atmospheric carbon dioxide measurements at station: FANNING IS.
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1972
Final CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2								27.5		27.1		28.1	2
3													3
4													4
5													5
6											26.3		6
7									28.1				7
8													8
9													9
10													10
11													11
12													12
13													13
14													14
15													15
16										26.5	26.8		16
17													17
18									27.6				18
19													19
20													20
21							27.8						21
22							27.8					28.3*	22
23							27.9						23
24													24
25													25
26													26
27													27
28													28
29								26.6					29
30													30
31													31

Monthly values

Xm	27.8	27.1	27.8	26.8	26.5	28.1	Xm
N	15	6	6	4	6	3	N
s							s

Annual mean 327.4 ppmv
(based on 6 monthly means)

Xm = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: FANNING IS.
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1973
Final CO₂ concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1					30.6*			30.5					1
2													2
3													3
4				31.5								29.3	4
5			29.7				30.1						5
6						30.1							6
7													7
8		29.3									28.8		8
9	28.3												9
10													10
11													11
12													12
13						50.7*							13
14													14
15					31.4								15
16								30.4					16
17													17
18													18
19							30.1*					29.1	19
20			31.0										20
21	28.9	29.9											21
22											29.0		22
23													23
24				31.8									24
25													25
26													26
27													27
28													28
29													29
30													30
31													31

Monthly values

X _m	28.6	29.6	30.3	31.7	31.4	30.1	30.1	30.5		28.9	29.2	X _m
N	5	5	5	6	3	2	2	6		6	6	N
s												s

Annual mean 330.0 ppmv
(based on 10 monthly means)

X_m = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: FANNING IS.
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1974
Final CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1					64.9&								1
2							30.3						2
3													3
4	29.4*												4
5				32.3		30.8		30.1		29.1			5
6											30.5*	31.9&	6
7									29.4				7
8													8
9													9
10		30.5											10
11			30.9										11
12													12
13													13
14													14
15					30.4								15
16													16
17		30.3											17
18						30.0	65.0*		29.0	29.2		30.1	18
19								30.3*					19
20				32.9							30.1		20
21													21
22	30.3		30.1*										22
23													23
24													24
25													25
26													26
27													27
28													28
29													29
30													30
31													31

Monthly values

Xm	30.3	30.4	30.9	32.6	30.4	30.4	30.3	30.1	29.2	29.2	30.1	30.1	Xm
N	3	5	2	6	3	6	3	2	6	5	2	3	N
s													s

Annual mean 330.3 ppmv
(based on 12 monthly means)

Xm = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: FANNING IS.
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1975
Final CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2													2
3													3
4						32.7		31.3					4
5		62.5*							31.0		30.2*		5
6			39.5*		34.9&							31.4	6
7	31.2												7
8				32.5						29.8			8
9							30.8						9
10													10
11													11
12													12
13													13
14													14
15								31.3					15
16				33.5	33.2							31.3	16
17	30.1*	38.6*				31.7	31.4			30.3			17
18			48.9&										18
19									30.6*				19
20											30.6		20
21													21
22													22
23													23
24													24
25													25
26													26
27													27
28													28
29													29
30													30
31													31

Monthly values

Xm	31.2		33.0	33.2	32.2	31.1	31.3	31.0	30.0	30.6	31.4	Xm
N	3		5	2	6	5	6	2	5	3	4	N
s												s

Annual mean 331.5 ppmv
(based on 10 monthly means)

Xm = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: FANNING IS.
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1976
Final CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1						32.9							1
2													2
3		32.7*						32.3		31.4			3
4											50.1*	31.5	4
5			33.2		35.3								5
6	31.9			33.9					31.7				6
7							33.6						7
8													8
9													9
10													10
11													11
12													12
13													13
14													14
15									30.5				15
16												36.3*	16
17		31.6											17
18			33.1			32.8		32.0			32.5*		18
19	32.1*				33.4		32.6						19
20													20
21													21
22				33.1									22
23													23
24													24
25													25
26			34.0										26
27													27
28										31.0			28
29													29
30													30
31													31

Monthly values

Xm	31.9	31.6	33.4	33.5	34.3	32.9	33.1	32.1	31.1	31.2		31.5	Xm
N	2	2	8	5	5	6	4	5	6	5		2	N
s													s

Annual mean 332.4 ppmv
(based on 11 monthly means)

Xm = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: FANNING IS.
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1977
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2								34.1					2
3			40.5*		35.7					32.9			3
4	32.9												4
5									33.8			32.9	5
6						35.4	34.9*					65.2*	6
7													7
8		34.6								33.6*			8
9													9
10													10
11													11
12													12
13													13
14													14
15											33.3	33.8	15
16							34.0						16
17								34.0					17
18	43.0*	34.6*											18
19										32.7			19
20						35.3							20
21													21
22									33.5				22
23													23
24					35.7*								24
25													25
26													26
27													27
28													28
29													29
30													30
31													31

Monthly values

Xm	32.9	34.6		35.7	35.3	34.0	34.1	33.6	32.8	33.3	33.3	Xm
N	2	3		2	4	2	6	6	5	2	6	N
s												s

Annual mean 334.0 ppmv
 (based on 10 monthly means)

Xm = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: FANNING IS.
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1978
Final CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2					37.5								2
3													3
4									34.9				4
5				37.5						34.6			5
6						36.1						34.7	6
7							36.8*				34.0		7
8								35.6*					8
9													9
10													10
11													11
12													12
13				37.6*									13
14			35.9										14
15													15
16	35.0							35.6			35.0		16
17		35.9			36.2					35.9*			17
18				36.2*			35.7		35.1				18
19													19
20													20
21						36.0						35.4	21
22													22
23													23
24													24
25													25
26													26
27													27
28													28
29													29
30													30
31													31

Monthly values

Xm	35.0	35.9	35.9	37.5	36.9	36.0	35.7	35.6	35.0	34.6	34.5	35.0	Xm
N	3	3	3	2	6	5	2	3	4	2	5	5	N
s													s

Annual mean 335.7 ppmv
(based on 12 monthly means)

Xm = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: FANNING IS.
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1979
Final CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2													2
3					38.8								3
4									36.7			37.4*	4
5		36.7		38.1						36.5*			5
6			37.2*			37.8							6
7													7
8	35.8*										36.4		8
9							37.2*	37.0*					9
10													10
11													11
12													12
13													13
14													14
15													15
16										36.2*	36.7		16
17													17
18		37.2					37.4						18
19						37.8			35.7				19
20												37.1*	20
21			37.2		39.1			36.6					21
22													22
23	36.0			37.8									23
24													24
25													25
26													26
27													27
28													28
29													29
30													30
31													31

Monthly values

X _m	36.0	37.0	37.2	37.9	38.9	37.8	37.4	36.6	36.2		36.5		X _m
N	2	4	3	5	5	4	3	3	6		6		N
s													s

Annual mean 337.1 ppmv
(based on 10 monthly means)

X_m = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: FANNING IS.
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1980
Final CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2													2
3										37.9			3
4					46.0*				37.9				4
5			38.7*			40.3*						40.8*	5
6													6
7		38.5						39.6*					7
8													8
9				41.7*									9
10	38.1*												10
11													11
12													12
13													13
14							39.8						14
15													15
16						39.7						38.9	16
17	41.2*			47.4*					38.7		38.8*		17
18										39.3*			18
19					43.0*								19
20								40.6*					20
21													21
22													22
23													23
24													24
25		38.5	40.1										25
26													26
27													27
28													28
29													29
30													30
31													31

Monthly values

Xm	38.5	40.1		39.7	39.8		38.3	37.9		38.9	Xm
N	4	2		2	7		4	2		3	N
s											s

Annual mean 339.0 ppmv
(based on 7 monthly means)

Xm = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: FANNING IS.
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1981
Final CO₂ concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1					72.2*		40.9						1
2	39.4*								41.4*	38.8			2
3		39.7									39.5*		3
4			41.5*			48.0*		39.5					4
5													5
6													6
7				47.9*									7
8													8
9													9
10													10
11													11
12													12
13													13
14												42.7*	14
15					45.3*		40.5						15
16						43.5*				38.8			16
17													17
18		40.3		43.3*				40.3*	39.4				18
19	39.9*		51.7*										19
20													20
21													21
22													22
23													23
24													24
25													25
26													26
27													27
28													28
29													29
30													30
31													31

Monthly values

X _m	40.0		40.7	39.5	39.4	38.8	X _m
N	5		5	2	3	4	N
s							s

Annual mean 339.7 ppmv
(based on 5 monthly means)

X_m = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: FANNING IS.
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1982
Final CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1					44.1*		50.1*			53.5*			1
2								46.0*				40.4	2
3									40.3				3
4	41.1*												4
5		41.6*							40.2				5
6													6
7			55.6*			43.4*			40.1				7
8				42.9*					49.1*				8
9													9
10											40.8*		10
11													11
12													12
13													13
14													14
15	40.4*	50.4*				60.1*	43.7*		40.7			41.2	15
16				57.6*									16
17											41.1*		17
18													18
19			45.4&										19
20					41.9								20
21													21
22													22
23													23
24													24
25													25
26													26
27													27
28													28
29													29
30													30
31													31

Monthly values

X _m		41.9		40.3		40.8	X _m
N		2		13		5	N
s				0.2			s

Annual mean 341.0 ppmv
(based on 3 monthly means)

X_m = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: FANNING IS.
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1983
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1								43.4					1
2													2
3													3
4													4
5													5
6													6
7		42.5	43.2*										7
8													8
9					44.5	48.7*							9
10													10
11													11
12													12
13													13
14													14
15								43.3					15
16													16
17		43.4*	52.4*			45.9*							17
18													18
19													19
20													20
21													21
22													22
23													23
24													24
25													25
26					44.8								26
27													27
28													28
29													29
30													30
31													31

Monthly values

Xm	Feb	May	Aug	Xm
N	2	5	5	N
s				s

Annual mean 343.5 ppmv
 (based on 3 monthly means)

Xm = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)

CHRISTMAS ISLAND

Author: Charles D. Keeling

Organization: Scripps Institution of Oceanography

Address: University of California, San Diego, La Jolla, California 92093, USA

Site position and description: 1°59'N; 157°19'W, elevation 2 m, on a coral beach of an island of the tropical Pacific ocean

Sampling method, frequency and measurement technique: 5 liter evacuated glass flasks exposed in triplicate biweekly (Jan 1977 - Mar 1984); exposed in pairs weekly (Mar 1984 - Nov 1985). Flask samples measured at the Scripps Institution of Oceanography with an Applied Physics Corporation non-dispersive infrared gas analyzer.

Scientific aims and scope of measurements: Observe seasonal and interannual variations in atmospheric CO₂

Data selection procedures used: Concentrations of replicate flasks must agree within 0.40 ppmv to be accepted.

Calibration gases used: CO₂-in-N₂ until May 1983, then CO₂-in-air

Scale of reported data: 1985 WMO/Scripps mole fraction scale

Literature references to programme:

Keeling, C. D., "The Global Carbon Cycle: What We Know and Could Know from Atmospheric, Biospheric, and Oceanic Observations", prepared for CO₂ *Research Conference: Carbon Dioxide, Science, and Consensus*, pp II.3-II.62 (1982).

Keeling, C. D., "Atmospheric and Oceanographic Measurements Needed for Establishment of a Data Base for Carbon Dioxide from Fossil Fuels", in *The Potential Effects of Carbon Dioxide-Induced Climatic Changes in Alaska. The Proceedings of a Conference*. Fairbanks, Alaska, April 7-8, 1982. School of Agriculture and Land Resources Management, University of Alaska, Fairbanks, Miscellaneous Publications 83-1, pp 11-22 (1984).

Atmospheric carbon dioxide measurements at station: CHRISTMAS IS.
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1977
Final CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1		32.9		35.2			35.1		33.3				1
2					34.3	33.1*		33.3					2
3	33.0									33.5	32.9		3
4													4
5													5
6													6
7													7
8													8
9													9
10			34.9										10
11													11
12													12
13													13
14													14
15	32.5	33.5		36.2		34.7	33.9	33.9	33.4	33.2	33.2		15
16					36.2								16
17													17
18			34.8										18
19													19
20												34.3	20
21													21
22													22
23													23
24													24
25													25
26													26
27													27
28													28
29													29
30											34.1	34.2	30
31													31

Monthly values

Xm	32.7	33.2	34.8	35.7	35.3	34.7	34.5	33.6	33.3	33.3	33.4	34.3	Xm
N	6	6	6	6	5	3	6	5	5	4	7	5	N
s													s

Annual mean 334.1 ppmv
(based on 12 monthly means)

Xm = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: CHRISTMAS IS.
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1978
Final CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1		35.1				35.2		36.0			37.0*		1
2			35.5										2
3												35.3	3
4				36.5*					35.0				4
5										35.2*			5
6													6
7													7
8													8
9													9
10													10
11													11
12													12
13													13
14		35.5											14
15					36.0	36.1		35.5			34.9		15
16										35.3			16
17							35.9						17
18	35.0												18
19													19
20			35.6										20
21				35.7									21
22													22
23													23
24													24
25				35.4								35.9	25
26													26
27													27
28													28
29													29
30						35.9							30
31													31

Monthly values

X _m	35.0	35.3	35.6	35.5	36.0	35.7	35.9	35.8	35.0	35.3	34.9	35.6	X _m
N	3	4	6	9	3	8	3	5	3	2	2	4	N
s													s

Annual mean 335.5 ppmv
(based on 12 monthly means)

X_m = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: CHRISTMAS IS.
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1979
Final CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2													2
3		36.3								36.2			3
4													4
5				37.5									5
6													6
7		36.7											7
8													8
9													9
10					41.1*								10
11													11
12													12
13													13
14											36.6		14
15		37.0	37.4	39.0*		37.8				36.1			15
16													16
17													17
18									36.3			37.4	18
19													19
20						37.6							20
21													21
22				39.5									22
23	36.2									36.1			23
24													24
25													25
26													26
27													27
28													28
29													29
30					38.1						36.9	37.6	30
31													31

Monthly values

Xm	36.2	36.7	37.4	38.5	38.1	37.7		36.3	36.1	36.8	37.5	Xm
N	3	7	2	4	2	5		3	7	4	6	N
s												s

Annual mean 337.1 ppmv
(based on 10 monthly means)

Xm = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: CHRISTMAS IS.
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1980
Final CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1								41.8*	38.4*				1
2													2
3													3
4													4
5											38.4		5
6													6
7													7
8													8
9					39.6								9
10						39.5	40.3*						10
11							40.1						11
12				40.2									12
13													13
14													14
15										46.4*		45.8*	15
16													16
17													17
18								39.0					18
19													19
20											40.5*		20
21													21
22													22
23													23
24													24
25													25
26									40.1&				26
27													27
28													28
29					39.7								29
30						39.1					51.6*		30
31												45.5*	31

Monthly values

X _m	40.2	39.6	39.3	40.1	39.0	38.4	X _m
N	2	4	6	8	2	3	N
s							s

Annual mean 339.4 ppmv
(based on 6 monthly means)

X_m = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: CHRISTMAS IS.
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1981
Final CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1											39.8		1
2							43.4*						2
3													3
4													4
5													5
6													6
7													7
8													8
9													9
10													10
11													11
12													12
13											39.0		13
14													14
15	40.4		41.2		40.9	48.6*	42.8*		38.8				15
16										39.1			16
17													17
18													18
19													19
20													20
21													21
22													22
23													23
24							40.2						24
25													25
26													26
27													27
28		40.8											28
29	51.3*			40.9									29
30			44.5*				40.2		38.5		55.9*	40.8	30
31					40.4			39.4					31

Monthly values

Xm	40.4	40.8	41.2	40.9	40.6		40.2	39.4	38.6	39.1	39.4	40.8	Xm
N	2	4	2	3	4		7	2	4	2	4	2	N
s													s

Annual mean 340.1 ppmv
(based on 11 monthly means)

Xm = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: CHRISTMAS IS.
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1982
Final CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2									45.7*				2
3											46.6*		3
4													4
5							52.1*						5
6													6
7													7
8													8
9									39.9				9
10													10
11									40.5				11
12													12
13								44.5*	40.6				13
14													14
15	40.9*	65.1*		42.8	42.1*				40.5				15
16						47.2*	49.6*						16
17										44.8*			17
18													18
19													19
20													20
21													21
22													22
23													23
24													24
25													25
26													26
27													27
28			41.9										28
29	55.1*						48.0*						29
30			42.4										30
31													31

Monthly values

Xm	41.9	42.4	42.8		40.4		Xm
N	2	2	3		14		N
s					0.3		s

Annual mean 341.9 ppmv
(based on 4 monthly means)

Xm = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: CHRISTMAS IS.
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1983
Final CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1												42.1	1
2				46.2*	45.1								2
3													3
4							57.5*				40.8		4
5													5
6						47.8*					41.3*		6
7													7
8													8
9													9
10	41.5	42.5*											10
11												42.2*	11
12													12
13													13
14			43.1						53.0*				14
15											42.1		15
16													16
17				45.0									17
18					45.4		48.1*			41.7*			18
19													19
20													20
21													21
22													22
23													23
24													24
25													25
26													26
27	41.5												27
28		43.2							42.6*				28
29													29
30										61.7*			30
31													31

Monthly values

X _m	41.5	43.2	43.1	45.0	45.2					41.4	42.1	X _m
N	4	2	2	2	4					5	2	N
s												s

Annual mean 343.1 ppmv
(based on 7 monthly means)

X_m = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: CHRISTMAS IS.
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1984
Provisional CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2										42.8	43.4*		2
3						46.2							3
4		43.6											4
5							45.0*						5
6								44.4					6
7	43.2		45.4	46.3*									7
8												44.3*	8
9					46.9*						43.8		9
10						45.1			47.4*				10
11													11
12			45.1*										12
13							45.0	44.2		43.0			13
14												44.6	14
15		44.0											15
16					45.9						43.7		16
17									46.4*				17
18	43.8					45.4				47.5*			18
19				46.6									19
20							44.8	43.7*					20
21			46.0*									44.6	21
22													22
23					45.6								23
24									43.1				24
25				50.7*		45.3							25
26							44.6			45.9*			26
27								44.2					27
28												44.8	28
29		44.8											29
30											43.9		30
31							44.1						31

Monthly values

Xm	43.5	43.8	45.4	46.6	45.8	45.5	44.6	44.3	43.1	42.9	43.8	44.7	Xm
N	6	5	2	2	4	8	8	6	2	5	6	6	N
s						0.5	0.4						s

Annual mean 344.5 ppmv
(based on 12 monthly means)

Xm = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: CHRISTMAS IS.
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1985
Provisional CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1							46.0		48.5*				1
2		45.6*									44.6		2
3													3
4		45.1	46.7										4
5													5
6	44.8			46.1*				46.0		44.5			6
7							46.4						7
8									44.6				8
9					46.4*								9
10		45.2	46.8										10
11											44.5		11
12								45.6					12
13										44.9*			13
14	45.3			47.8									14
15						46.7*			44.7				15
16			46.7		46.6								16
17											45.1		17
18													18
19		45.4											19
20	45.9			46.9						44.4*			20
21							46.0						21
22					46.7								22
23			46.9			46.8							23
24													24
25								44.7					25
26													26
27		46.2*											27
28				46.4*	47.0		46.1						28
29	44.9*												29
30			46.1								45.1		30
31	45.2												31

Monthly values

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Xm	45.3	45.2	46.6	47.3	46.8	46.8	46.2	45.4	44.6	44.5	44.8		Xm
N	12	8	11	4	6	2	8	7	4	2	9		N
s	0.5		0.3				0.2				0.3		s

Annual mean 345.8 ppmv
(based on 11 monthly means)

Xm = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)

SAMOA

Author: Charles D. Keeling

Organization: Scripps Institution of Oceanography

Address: University of California, San Diego, La Jolla, California 92093, USA

Site position and description: 14°15'S; 170°34'W, elevation 30 m, on a rocky coastal promontory of an island of the tropical Pacific ocean

Sampling method, frequency and measurement technique: 5 liter evacuated glass flasks exposed in triplicate weekly (Sept 1981 - Sept 1985). Flask samples measured at the Scripps Institution of Oceanography with an Applied Physics Corporation non-dispersive infrared gas analyzer.

Scientific aims and scope of measurements: Observe seasonal and annual variations in atmospheric CO₂

Data selection procedures used: Concentrations of replicate flasks must agree within 0.40 ppmv to be accepted.

Calibration gases used: CO₂-in-N₂ until May 1983, then CO₂-in-air

Scale of reported data: 1985 WMO/Scripps mole fraction scale

Literature references to programme:

Atmospheric carbon dioxide measurements at station: SAMOA IS.
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1981
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2										38.9			2
3													3
4									39.0			39.3	4
5													5
6											39.1		6
7													7
8													8
9													9
10										38.6			10
11									38.8*			39.5	11
12													12
13											39.8		13
14													14
15													15
16													16
17										38.5			17
18									38.7			40.0	18
19													19
20											39.6		20
21													21
22													22
23													23
24										38.8			24
25													25
26									38.9			40.1	26
27													27
28													28
29													29
30													30
31										39.5			31

Monthly values

X _m					38.8	38.9	39.5	39.7	X _m
N					9	12	6	10	N
s						0.4		0.4	s

Annual mean 339.2 ppmv
 (based on 4 monthly means)

X_m = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: SAMOA IS.
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1982
Final CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1			39.8										1
2				40.4			41.0						2
3													3
4						39.9							4
5			40.2*								40.5	40.4	5
6								41.5					6
7		41.1			38.9								7
8													8
9									40.1	39.7			9
10							41.8						10
11						40.1							11
12											40.5		12
13			40.3										13
14													14
15	40.3									40.1			15
16				39.8	39.1		40.5	41.1					16
17												40.8	17
18									40.5				18
19											40.5		19
20													20
21					40.5	40.0							21
22	40.1*	40.4								40.1			22
23				40.9									23
24												41.3	24
25								41.1	40.3				25
26			41.2*			40.8*	41.4				40.1		26
27													27
28					40.4								28
29	40.9												29
30				41.6			40.0	41.0					30
31										40.0		40.7	31

Monthly values

X _m	40.6	40.8	40.1	40.7	39.7	40.0	40.9	41.2	40.3	40.0	40.4	40.8	X _m
N	5	6	6	11	11	7	15	10	8	12	12	11	N
s				0.7	0.8		0.7	0.2		0.2	0.2	0.4	s

Annual mean 340.5 ppmv
(based on 12 monthly means)

X_m = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: SAMOA IS.
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1983
Final CO₂ concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1							42.2						1
2									42.4			43.0*	2
3				41.6		42.2							3
4		40.9									42.6		4
5													5
6													6
7										42.2			7
8	42.3*			41.6									8
9							41.6						9
10									41.4				10
11			40.8										11
12		41.1											12
13						41.5							13
14										42.4			14
15							42.0	42.4					15
16									42.0			42.5	16
17													17
18													18
19			41.5*										19
20					41.6			42.6					20
21	40.5												21
22				41.9									22
23							42.5		42.2*				23
24						42.9						42.4	24
25											42.9		25
26			43.4					41.8					26
27		40.5											27
28										42.9			28
29							42.7						29
30				43.7	42.1								30
31													31

Monthly values

X _m	40.5	40.8	42.1	42.2	41.9	42.2	42.2	42.3	41.9	42.5	42.8	42.4	X _m
N	2	9	6	10	6	9	12	8	7	9	5	5	N
s				1.0			0.4						s

Annual mean 342.0 ppmv
(based on 12 monthly means)

X_m = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: SAMOA IS.
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1984
Provisional CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1						43.5			43.8			43.9	1
2	43.4										44.0*		2
3								51.8*					3
4					42.6								4
5													5
6	43.1	45.3		43.5			43.0			43.5			6
7									44.0			44.4	7
8						43.0							8
9											44.3*		9
10								43.8					10
11					42.4								11
12										47.8*			12
13							43.3						13
14	44.2								45.4*				14
15						43.0						44.5	15
16			42.6								44.0		16
17		44.0						43.6					17
18					43.1								18
19										44.4			19
20							43.9						20
21									45.0				21
22						43.0							22
23	43.7										43.8		23
24		43.5	44.2										24
25								43.6					25
26										44.1			26
27	44.5*			47.0&			42.9						27
28									44.5			45.5	28
29													29
30						42.3							30
31			44.9										31

Monthly values

X _m	43.6	44.3	43.9	43.5	42.7	43.0	43.3	43.7	44.4	44.0	43.9	44.6	X _m
N	12	8	8	3	8	13	12	9	8	8	4	11	N
s	0.5					0.4	0.5		0.5			0.7	s

Annual mean 343.7 ppmv
(based on 12 monthly means)

X_m = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: SAMOA IS.
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1985
Provisional CO₂ concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1			46.0										1
2		44.4						45.1					2
3													3
4					47.4&								4
5				45.4			46.0		47.1				5
6													6
7						43.8*							7
8		45.3	45.5					46.5*					8
9													9
10													10
11	44.8				45.1*								11
12				46.1			44.4		46.1				12
13													13
14													14
15		45.4	45.9					47.4					15
16													16
17					44.2								17
18	45.1												18
19							44.6		48.7&				19
20				45.4									20
21													21
22			44.6			45.0		57.9*					22
23		45.5											23
24					43.8								24
25	44.4												25
26				43.9			45.0						26
27													27
28						44.6							28
29			44.1					47.6*					29
30													30
31					45.9								31

Monthly values

X _m	44.8	45.1	45.2	45.2	44.6	44.8	45.0	46.2	46.6		X _m
N	7	11	15	11	9	5	11	4	4		N
s		0.5	0.8	0.9			0.7				s

Annual mean 345.3 ppmv
(based on 9 monthly means)

X_m = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)

RAOUL ISLAND, KERMADEC ISLANDS

Author: Charles D. Keeling

Organization: Scripps Institution of Oceanography

Address: University of California, San Diego, La Jolla, California 92093, USA

Site position and description: 29°15'S; 177°55'W, elevation 2 m, at base of coastal cliff on a beach of Raoul Island in the south Pacific ocean

Sampling method, frequency and measurement technique: 5 liter evacuated glass flasks exposed in pairs approximately biweekly (Dec 1982 - Jul 1984). Flask samples measured at the Scripps Institution of Oceanography with an Applied Physics Corporation non-dispersive infrared gas analyzer.

Scientific aims and scope of measurements: Observe seasonal and interannual variations in atmospheric CO₂

Data selection procedures used: Concentrations of replicate flasks must agree within 0.40 ppmv to be accepted.

Calibration gases used: CO₂-in-N₂ until May 1983, then CO₂-in-air

Scale of reported data: 1985 WMO/Scripps mole fraction scale

Literature references to programme:

Atmospheric carbon dioxide measurements at station: KERMADEC IS.
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1982
Final CO₂ concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2													2
3													3
4													4
5													5
6													6
7													7
8												39.7	8
9													9
10													10
11													11
12												40.2	12
13													13
14													14
15													15
16													16
17													17
18													18
19													19
20													20
21													21
22													22
23													23
24													24
25													25
26												40.5	26
27													27
28													28
29													29
30													30
31													31

Monthly values

X _m	40.1	X _m
N	7	N
s		s

Annual mean 340.1 ppmv
(based on 1 monthly means)

X_m = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: KERMADEC IS.
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1983
Final CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2													2
3													3
4													4
5													5
6													6
7													7
8													8
9											41.9		9
10							41.3						10
11													11
12													12
13												41.9	13
14													14
15													15
16													16
17													17
18													18
19													19
20													20
21											42.3		21
22													22
23													23
24													24
25													25
26													26
27					40.9								27
28										41.6			28
29													29
30													30
31					41.1								31

Monthly values

X _m		40.9	41.1	41.3		41.6	42.1	41.9	X _m
N		4	4	4		2	6	2	N
s									s

Annual mean 341.5 ppmv
(based on 6 monthly means)

X_m = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: KERMADEC IS.
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1984
Provisional CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2													2
3													3
4							41.9						4
5													5
6													6
7			42.3										7
8													8
9			41.8										9
10													10
11													11
12													12
13													13
14			42.5										14
15													15
16				43.0*									16
17													17
18			42.3										18
19					42.5*								19
20													20
21													21
22						42.6							22
23													23
24													24
25													25
26													26
27													27
28													28
29				42.9									29
30						42.4							30
31													31

Monthly values

Xm	42.2	42.9	42.5	41.9	Xm
N	8	2	4	2	N
s	0.3				s

Annual mean 342.4 ppmv
(based on 4 monthly means)

Xm = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)

BARING HEAD, NEW ZEALAND

Author: Martin R. Manning and K. P. Pohl

Organization: Institute of Nuclear Sciences

Address: Private Bag, Lower Hutt, New Zealand

Site position and description: 41°25'S, 174°52'E, elevation 85 m, on a coastal cliff facing south west into the Cook Straits between the north and south islands of New Zealand

Sampling method, frequency and measurement technique: Continuous measurement using a Hartmann and Braun non-dispersive infrared gas analyzer with water vapor freeze trap. Model URAS-1 used Jan 1973 - Dec 1975; Model URAS-2T Jan 1976 - Dec 1984.

Scientific aims and scope of measurements: Observe seasonal and interannual variations in atmospheric CO₂

Data selection procedures used: Data selected where the wind is from the southerly quarter and the standard deviation of minute by minute concentration values is less than 0.1 ppmv for 6 hours or more

Calibration gases used: CO₂-in-N₂ gases prepared by Scripps Institution of Oceanography (SIO) and CO₂-in-air gases prepared by both SIO and AIRCO. In all cases gases are calibrated by SIO before and after use

Scale of reported data: 1984 WMO/Scripps mole fraction scale

Literature references to programme:

Lowe, D. C., Guenther, P. R., and C. D. Keeling, "The Concentration of Atmospheric Carbon Dioxide at Baring Head, New Zealand", *Tellus*, Vol. 31, pp 58-67 (1978).

Atmospheric carbon dioxide measurements at station: BARING HEAD, N.Z.
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1973
Provisional CO₂ concentration values in ppmv above 300.0
(continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1				27.5			27.6	28.0					1
2				27.1			27.8		28.5				2
3				27.0									3
4				27.1									4
5				27.1									5
6	26.4	27.6		27.1			28.2	28.4				28.4	6
7			26.6				27.6	28.2	28.6				7
8		25.9						28.0	28.6				8
9	26.4		26.5	26.9				27.8			28.9	28.5	9
10			26.5				27.8				28.9		10
11		26.4		26.7			27.8					28.4	11
12	26.5	26.1	26.8				28.0					28.8	12
13	25.5	25.8	26.8	27.4	27.0	27.3	27.5						13
14		26.0		27.2	27.1	27.3	27.5				28.4		14
15					27.2	27.2	27.6				28.7		15
16						27.3		28.4	28.4		29.5		16
17	26.1	26.7	26.6			27.3		28.5		29.0			17
18		26.2						28.6				28.7	18
19								28.4				28.6	19
20												28.5	20
21		27.4	27.1					29.0				28.5	21
22		26.7						28.7					22
23		26.5						28.5		28.7			23
24			27.4					28.3		28.7			24
25			27.3				28.3			28.4			25
26			27.1				28.0						26
27			26.9				28.0			28.2			27
28							28.0						28
29							28.2						29
30							28.2						30
31							28.0						31

Monthly values

X _m	26.2	26.5	26.9	27.1	27.1	27.3	27.9	28.4	28.5	28.6	28.9	28.5	X _m
N	5	11	11	10	3	5	17	13	4	5	5	8	N
s	0.4	0.6	0.3	0.2			0.3	0.3	0.1	0.3	0.4	0.1	s

Annual mean 327.7 ppmv
(based on 12 monthly means)

X_m = average monthly concentration
N = number of daily values accepted
s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: BARING HEAD, N.Z.
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1974
Provisional CO₂ concentration values in ppmv above 300.0
(continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1			27.4								29.7		1
2			27.4			28.8					29.8		2
3			27.9		28.1	28.5	29.1		29.6		29.6		3
4	27.8				28.3	28.6	29.1		29.4		29.3		4
5							28.9		29.3		29.3		5
6				27.9			28.9		29.3				6
7			27.7	28.0			28.9	29.3					7
8					28.5		28.9	29.1					8
9	28.7							29.7	29.6	29.2			9
10	28.5	28.9		27.6			29.5	29.1	30.6	29.7		29.6	10
11		28.2		27.9				29.2	29.6			29.5	11
12	28.7					28.5		29.1	29.7				12
13	28.6				28.2	28.6		29.1	29.6	29.6			13
14						28.6		29.1	29.6			29.9	14
15		27.7	28.3					29.1				29.7	15
16	28.3	27.9	28.2			28.6						29.5	16
17	28.5	27.9	28.1			28.5							17
18		27.9	28.0			28.6		29.5		28.7			18
19	28.4					28.4		29.5	29.1				19
20	29.0					28.5		29.0	29.3				20
21		28.0	28.1	27.8						30.7	29.6		21
22			27.7	27.8				29.3		29.9	29.5		22
23			27.8	27.8				29.6		29.3	29.4	29.5	23
24	28.5		27.3	27.8				29.7				29.5	24
25	28.6							29.4		29.4			25
26		27.7	27.8	28.2				29.6			30.0		26
27		27.7		28.0				29.4	28.4				27
28				27.8				29.6	29.4	29.8			28
29				27.9	28.6			29.2	29.5	29.1			29
30					28.8			29.2	29.4	29.7			30
31	28.6									29.7			31

Monthly values

X _m	28.5	28.0	27.8	27.9	28.4	28.6	29.0	29.3	29.5	29.6	29.6	29.6	X _m
N	12	9	13	12	6	11	7	21	16	12	9	7	N
s	0.3	0.4	0.3	0.1	0.3	0.1	0.2	0.2	0.4	0.5	0.2	0.2	s

Annual mean 328.8 ppmv
(based on 12 monthly means)

X_m = average monthly concentration

N = number of daily values accepted

s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: BARING HEAD, N.Z.
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1975
Provisional CO₂ concentration values in ppmv above 300.0
(continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1		29.2	29.2		29.3	29.9							1
2								30.1			30.5		2
3							30.0	30.1			30.4		3
4							29.9		30.2		30.6		4
5		29.0							30.4		30.6		5
6		29.0	29.0						30.7				6
7					29.4	29.8							7
8						29.8					30.8		8
9	29.8		29.3								30.8		9
10	29.7					29.6							10
11	29.7		28.8										11
12	29.9		28.9						30.1				12
13													13
14				29.0		30.6					30.9		14
15						30.2							15
16						30.3							16
17	29.5	28.8					30.4				30.4		17
18	29.3	28.9											18
19	29.3										30.8		19
20	29.3							30.9			30.8		20
21	29.3						30.0	30.4			30.3		21
22						29.9	29.8	30.3					22
23						29.7	30.0	30.8					23
24						30.1							24
25		29.0		29.5		30.3							25
26		29.4		29.5	29.6	29.9							26
27		29.6			29.6	29.7							27
28		29.0			29.8	29.8							28
29	29.5				30.0	30.5						30.1	29
30	29.3			29.1								30.1	30
31	29.0				29.8							29.9	31

Monthly values

X _m	29.5	29.1	29.0	29.3	29.6	30.0	30.0	30.4	30.4		30.6	30.0	X _m
N	12	9	5	4	7	15	6	6	4		11	3	N
s	0.3	0.3	0.2	0.3	0.2	0.3	0.2	0.3	0.3		0.2		s

Annual mean 329.8 ppmv
(based on 11 monthly means)

X_m = average monthly concentration

N = number of daily values accepted

s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: BARING HEAD, N.Z.
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1976
Provisional CO₂ concentration values in ppmv above 300.0
(continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1		30.7		30.1									1
2			30.3	30.1						31.9			2
3			30.3							31.7			3
4										31.5			4
5			30.5					31.6		30.1			5
6								31.4					6
7		30.5						31.6	30.3				7
8		30.5					32.3		30.4				8
9		30.5	30.4										9
10			30.4		30.5								10
11					30.5								11
12		30.4			30.6					31.5	31.7		12
13		31.0			30.6						31.6		13
14		30.5		30.4						31.5	31.6		14
15		30.5							31.6	31.8	31.7	32.1	15
16		30.9		29.4			30.5	32.5	31.4		31.9		16
17		30.4		29.4				32.5	31.0				17
18						30.9					31.4		18
19									31.6	31.5	31.6		19
20				30.3		30.4			32.1		32.6		20
21				30.2	30.3							32.2	21
22				30.2	30.3				31.0			31.5	22
23					30.3				31.3	31.6		31.3	23
24						30.6						31.2	24
25						30.6							25
26		30.5								31.5			26
27		30.5	30.5					31.1	31.3				27
28								31.2	31.2				28
29													29
30													30
31	30.7		30.3				31.7						31

Monthly values

X _m	30.7	30.6	30.4	30.0	30.4	30.6	31.5	31.7	31.2	31.5	31.8	31.7	X _m
N	1	12	7	8	7	4	3	7	11	10	8	5	N
s		0.2	0.1	0.4	0.1	0.2		0.6	0.5	0.5	0.4	0.5	s

Annual mean 331.0 ppmv
(based on 12 monthly means)

X_m = average monthly concentration

N = number of daily values accepted

s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: BARING HEAD, N.Z.
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1977
Provisional CO₂ concentration values in ppmv above 300.0
(continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1								32.8		33.3	33.1		1
2			31.3					32.9			33.1		2
3					31.7		32.3	33.0			33.1		3
4			31.2		32.0		32.3	32.9	32.7		33.1		4
5				31.3	31.8	31.7		32.6	32.7				5
6					31.9	32.0			32.7				6
7		31.5			32.1	31.6			32.7				7
8		31.5			31.8	31.9	31.8		33.0				8
9					32.0	31.9			32.8				9
10								33.1	32.7				10
11		31.3		32.9			32.7		32.5	33.1			11
12		31.6		32.9						33.1			12
13										33.0			13
14										33.0		32.4	14
15									33.2				15
16				31.4					33.1				16
17				31.3		32.4			33.2				17
18				31.3	31.9	31.8			33.0				18
19			31.3	32.0	31.9	31.7			32.9				19
20	31.1		31.2	32.2	31.9				32.8				20
21	31.2								33.3				21
22	31.5	31.4					33.5		33.4				22
23		31.4											23
24		31.5	30.8										24
25		31.4											25
26					31.7				32.8				26
27					31.8				32.8				27
28							32.5						28
29							32.6	32.4					29
30					32.8			33.4	33.1				30
31					32.8								31

Monthly values

Xm	31.3	31.4	31.2	31.9	32.0	31.9	32.5	32.9	32.9	33.1	33.1	32.4	Xm
N	3	8	5	8	14	8	7	8	19	5	4	1	N
s		0.1	0.2	0.7	0.4	0.2	0.5	0.3	0.2	0.1			s

Annual mean 332.2 ppmv
(based on 12 monthly means)

Xm = average monthly concentration

N = number of daily values accepted

s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: BARING HEAD, N.Z.
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1978
Provisional CO₂ concentration values in ppmv above 300.0
(continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2				32.9								33.6	2
3				33.0								33.7	3
4				33.0	33.2							33.8	4
5												33.8	5
6													6
7					33.0								7
8					32.5								8
9													9
10													10
11									34.1				11
12									34.1				12
13													13
14						33.6	33.4					33.8	14
15				32.8		33.4	33.8					33.5	15
16						33.4							16
17				33.3	33.7								17
18				33.3	33.4	33.2							18
19					34.0	33.3							19
20					33.6	33.5							20
21					33.2	33.5				35.0			21
22				32.8	33.2								22
23				32.8	33.2	33.3							23
24			32.7			33.3							24
25									34.2				25
26									34.2				26
27						33.6							27
28								34.3					28
29								34.3					29
30													30
31							34.5						31

Monthly values

X _m		32.7	33.0	33.3	33.4	33.9	34.3	34.2	35.0		33.7	X _m
N		1	8	10	10	3	2	4	1		6	N
s			0.2	0.4	0.1			0.1			0.1	s

Annual mean 333.7 ppmv
(based on 9 monthly means)

X_m = average monthly concentration
N = number of daily values accepted
s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: BARING HEAD, N.Z.
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1979
Provisional CO₂ concentration values in ppmv above 300.0
(continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2									35.3	35.9			2
3									35.3	35.8			3
4									35.3	35.6			4
5							34.6			35.6			5
6							34.6						6
7												35.9	7
8												35.9	8
9													9
10													10
11													11
12													12
13				34.3		35.3							13
14			33.5			35.3		35.4					14
15			33.6				35.0	35.4					15
16			33.7					35.4	36.8				16
17			33.7										17
18													18
19				33.9				35.5					19
20			33.7	33.9				35.5					20
21					34.4								21
22		33.8			34.4			35.1					22
23		33.7			34.5	34.6		35.1		35.9			23
24		33.7			34.5	34.6			35.8	35.6			24
25								36.5	35.8	35.6			25
26						34.3			36.0				26
27								35.2					27
28		33.8						35.2				35.5	28
29												35.5	29
30							35.7					35.5	30
31													31

Monthly values

X _m	33.8	33.6	34.0	34.4	34.8	35.0	35.4	35.8	35.7		35.7	X _m
N	4	5	3	4	5	4	10	7	7		5	N
s	0.1	0.1		0.1	0.5	0.5	0.4	0.5	0.1		0.2	s

Annual mean 334.8 ppmv
(based on 10 monthly means)

X_m = average monthly concentration

N = number of daily values accepted

s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: BARING HEAD, N.Z.
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1980
 Provisional CO₂ concentration values in ppmv above 300.0
 (continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1			35.6										1
2			35.7										2
3			35.7										3
4										37.5			4
5													5
6												37.6	6
7													7
8								37.2			37.9	37.6	8
9											37.9	37.6	9
10					35.5						38.0	37.6	10
11					35.5							37.8	11
12													12
13													13
14													14
15													15
16								36.6					16
17								36.6					17
18								36.5					18
19													19
20									37.7				20
21													21
22													22
23													23
24								36.7					24
25								36.7					25
26													26
27		34.8			36.2								27
28		35.1						37.5					28
29		35.6											29
30													30
31													31

Monthly values

Xm		34.9	35.7	35.5	36.2	36.6		37.5		37.5	37.9	37.6	Xm
N		2	3	2	1	5		3		1	3	5	N
s						0.1						0.1	s

Annual mean 336.6 ppmv
 (based on 9 monthly means)

Xm = average monthly concentration
 N = number of daily values accepted
 s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: BARING HEAD, N.Z.
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1981
 Provisional CO₂ concentration values in ppmv above 300.0
 (continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1									38.6				1
2													2
3			37.3					38.6					3
4								38.6					4
5					37.5	37.9		38.6					5
6						37.9		38.9					6
7						37.9		38.5			38.3		7
8						37.9		38.5			38.3		8
9						37.9					38.2		9
10						38.2	38.4				38.2		10
11						38.0	38.4	38.7			38.3		11
12				37.4			38.4						12
13				37.4			38.7						13
14							38.5		38.8				14
15					37.6				38.8				15
16									39.0				16
17	37.4								39.0	38.8			17
18			37.3				38.6			38.8		38.6	18
19			37.3		37.8		38.6			38.7			19
20					37.5								20
21						38.1							21
22					37.5	38.1							22
23					37.5	38.2							23
24		36.8			37.5	38.3				38.5			24
25					37.5					38.5			25
26								38.6					26
27								38.6		38.8			27
28								38.7		38.8			28
29								38.7					29
30	37.5							38.7					30
31	37.5							38.6					31

Monthly values

X _m	37.5	36.8	37.3	37.4	37.5	38.0	38.5	38.6	38.8	38.7	38.3	38.6	X _m
N	3	1	3	2	8	11	7	13	5	7	5	1	N
s					0.1	0.2	0.1	0.1	0.2	0.1	0.1		s

Annual mean 338.0 ppmv
 (based on 12 monthly means)

X_m = average monthly concentration
 N = number of daily values accepted
 s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: BARING HEAD, N.Z.
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1982
Provisional CO₂ concentration values in ppmv above 300.0
(continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1									40.4			40.0	1
2		38.7		39.3					40.4	40.3			2
3		38.7		39.3						40.3		39.8	3
4							39.6						4
5													5
6										40.3			6
7										40.3			7
8	38.8												8
9	38.8					39.5							9
10		38.6				39.5							10
11		38.6											11
12		38.8							40.2				12
13		38.8				39.5							13
14			38.8			39.5		40.0	39.9				14
15			38.8	38.8		39.5		40.0	40.2				15
16				38.8		39.4			40.3				16
17						39.2							17
18						39.2				40.2			18
19						39.4							19
20				38.8		39.4	39.6		40.2				20
21				38.8			39.6		40.2				21
22				38.8			39.6						22
23				38.8									23
24				38.9									24
25						39.3							25
26						39.4		41.0					26
27									40.4				27
28													28
29											40.2		29
30											40.1		30
31													31

Monthly values

X _m	38.8	38.7	38.8	38.9		39.4	39.6	40.3	40.2	40.3	40.2	39.9	X _m
N	2	6	2	9		12	4	3	9	5	2	2	N
s		0.1		0.2		0.1			0.2				s

Annual mean 339.6 ppmv
(based on 11 monthly means)

X_m = average monthly concentration
N = number of daily values accepted
s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: BARING HEAD, N.Z.
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1983
Provisional CO₂ concentration values in ppmv above 300.0
(continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2													2
3								41.9	41.9	42.1			3
4				39.4				41.9	41.9	42.1			4
5													5
6													6
7						40.5							7
8						40.5							8
9				39.9								41.7	9
10				39.9								41.8	10
11			39.7				41.7			41.9		41.9	11
12							41.2			42.1			12
13							41.2			42.0			13
14										42.0			14
15										41.8			15
16			39.8	40.1									16
17							41.8						17
18							41.1						18
19					40.6		41.2						19
20					40.7	40.6							20
21		39.7		40.1	41.2	40.9							21
22				40.1	40.4						41.9		22
23				40.1	40.4						41.9		23
24					40.4		41.6				41.9		24
25							41.6	42.1			42.0		25
26	39.6							42.1					26
27	39.6			40.3							41.9		27
28				40.3							41.9		28
29													29
30													30
31													31

Monthly values

X _m	39.6	39.7	39.8	40.0	40.6	40.6	41.4	42.0	41.9	42.0	41.9	41.8	X _m
N	2	1	2	9	6	4	8	4	2	7	6	3	N
s				0.3	0.3	0.2	0.3	0.1		0.1			s

Annual mean 340.9 ppmv
(based on 12 monthly means)

X_m = average monthly concentration
N = number of daily values accepted
s = standard deviation (ppmv), based on daily means

Atmospheric carbon dioxide measurements at station: BARING HEAD, N.Z.
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1984
Provisional CO₂ concentration values in ppmv above 300.0
(continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1										43.1		42.7	1
2										43.2		42.7	2
3										43.0			3
4										43.0			4
5	41.7												5
6	41.6	41.8							42.9				6
7		41.6					42.7		43.6				7
8							42.7		43.0				8
9										43.1			9
10					41.7								10
11					41.7								11
12													12
13													13
14	41.7								42.9				14
15	41.7								42.9				15
16	41.8								42.9				16
17							42.6		42.9				17
18							42.6		42.8				18
19		41.6	41.6		42.0				42.6				19
20		41.6			41.8				42.5				20
21				41.5	41.8								21
22			41.5	41.5	41.9		42.9			43.2			22
23			41.5			42.2	42.7			43.2			23
24			41.5			42.2	42.6						24
25											43.1		25
26											43.1		26
27													27
28						42.2							28
29												42.8	29
30					41.8							42.7	30
31					41.8								31

Monthly values

X _m	41.7	41.7	41.5	41.5	41.8	42.2	42.7		42.9	43.1	43.1	42.7	X _m
N	5	4	4	2	8	3	7		10	7	2	4	N
s	0.1	0.1	0.1		0.1		0.1		0.3	0.1			s

Annual mean 342.3 ppmv
(based on 11 monthly means)

X_m = average monthly concentration

N = number of daily values accepted

s = standard deviation (ppmv), based on daily means

BARING HEAD, NEW ZEALAND

Author: Charles D. Keeling and Martin R. Manning

Organizations: Scripps Institution of Oceanography and Institute of Nuclear Sciences

Address of first organization: University of California, San Diego, La Jolla, California 92093, USA

Site position and description: 41°25'S, 174°52'E, elevation 85 m, on a coastal cliff facing south west into the Cook Straits between the north and south islands of New Zealand

Sampling method, frequency and measurement technique: 2 liter evacuated glass flasks exposed when strong southerly winds indicated favorable conditions. Flask samples measured at the Scripps Institution of Oceanography with an Applied Physics Corporation non-dispersive infrared gas analyzer.

Scientific aims and scope of measurements: Observe seasonal and interannual variations in atmospheric CO₂

Data selection procedures used: Concentration of replicate flasks must agree within 0.40 ppmv to be accepted.

Calibration gases used: CO₂-in-N₂ until May 1983, then CO₂-in-air

Scale of reported data: 1985 WMO/Scripps mole fraction scale

Literature references to programme:

Atmospheric carbon dioxide measurements at station: BARING HEAD, N.Z.
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1977
Final CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2													2
3											33.5		3
4							32.4						4
5									32.6				5
6													6
7													7
8													8
9													9
10												33.1*	10
11										32.2			11
12													12
13													13
14												33.5	14
15												32.2	15
16													16
17													17
18													18
19													19
20													20
21									32.3				21
22												33.0	22
23													23
24													24
25													25
26									32.1				26
27													27
28													28
29													29
30													30
31												33.9	31

Monthly values

Xm		32.4	32.3	32.2	33.5	33.1	Xm
N		5	7	2	2	8	N
s						0.7	s

Annual mean 332.7 ppmv
(based on 5 monthly means)

Xm = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)
: flag indicating peremptory rejection of data

Atmospheric carbon dioxide measurements at station: BARING HEAD, N.Z.
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1978
Final CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2											34.2		2
3													3
4												33.8*	4
5		33.6*			33.2								5
6	66.8*		32.6										6
7													7
8					32.7								8
9													9
10													10
11									35.6				11
12													12
13						34.0*						34.2*	13
14						33.7	34.1*						14
15								33.9				33.6*	15
16											35.2*		16
17													17
18													18
19						33.6							19
20		32.6					35.1		36.5*				20
21													21
22					33.9*								22
23										34.4*			23
24		33.7											24
25													25
26									34.6*				26
27	37.9*												27
28													28
29													29
30	33.3					33.9*							30
31							34.6						31

Monthly values

X _m	33.3	33.2	32.6		33.0	33.6	34.8	33.9	35.6		34.2		X _m
N	2	4	2		4	4	4	2	4		2		N
s													s

Annual mean 333.8 ppmv
(based on 9 monthly means)

X_m = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)
‡ : flag indicating peremptory rejection of data

Atmospheric carbon dioxide measurements at station: BARING HEAD, N.Z.
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1979
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2													2
3													3
4	33.5								36.2				4
5							35.4						5
6													6
7								35.9					7
8												35.3	8
9		35.0											9
10													10
11													11
12													12
13													13
14													14
15											34.4*		15
16			34.9		34.5				37.7&				16
17													17
18													18
19													19
20								36.4					20
21													21
22													22
23		35.1											23
24					33.2&								24
25													25
26													26
27													27
28												35.5	28
29													29
30							36.6						30
31										38.1*		34.9	31

Monthly values

Xm	33.5	35.1	34.9		34.5		36.0	36.1	36.2		35.2	Xm
N	2	4	2		2		4	4	3		7	N
s												s

Annual mean 335.2 ppmv
 (based on 8 monthly means)

Xm = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)
 ‡ : flag indicating preemptory rejection of data

Atmospheric carbon dioxide measurements at station: BARING HEAD, N.Z.
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1980
Final CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1												36.8	1
2													2
3			36.0										3
4													4
5													5
6													6
7						36.6		40.3*					7
8													8
9												37.4*	9
10										36.9*			10
11				36.1								37.6	11
12													12
13													13
14						36.5							14
15													15
16						37.5				37.2			16
17													17
18								37.3					18
19													19
20													20
21													21
22													22
23												38.9*	23
24							38.5						24
25													25
26											37.6		26
27		35.9			37.1								27
28													28
29		35.5											29
30													30
31													31

Monthly values

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Xm		35.9	36.0	36.1	37.1	36.8	38.5	37.3		37.2	37.6	37.2	Xm
N		3	3	3	2	8	3	2		3	3	7	N
s													s

Annual mean 337.0 ppmv
(based on 10 monthly means)

Xm = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
‡ : flag indicating rejection because exceeds 3 sigma of fit (see text)
‡ : flag indicating peremptory rejection of data

Atmospheric carbon dioxide measurements at station: BARING HEAD, N.Z.
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1981
Final CO₂ concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2													2
3			47.3*										3
4													4
5													5
6													6
7													7
8													8
9						38.3							9
10						38.8							10
11													11
12		37.2		37.5									12
13					38.6								13
14													14
15							39.7*						15
16													16
17													17
18													18
19													19
20													20
21													21
22													22
23						38.7							23
24		36.9				38.2							24
25													25
26													26
27													27
28										37.3‡			28
29			37.1										29
30													30
31													31

Monthly values

X _m	37.1	37.1	37.5	38.6	38.5	X _m
N	6	2	3	3	11	N
s					0.3	s

Annual mean 337.8 ppmv
(based on 5 monthly means)

X_m = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
‡ : flag indicating rejection because exceeds 3 sigma of fit (see text)
‡ : flag indicating peremptory rejection of data

Atmospheric carbon dioxide measurements at station: BARING HEAD, N.Z.
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1982
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2									39.9				2
3			38.5					40.1					3
4							39.2						4
5						39.4							5
6													6
7													7
8													8
9													9
10				38.9									10
11													11
12											39.8		12
13													13
14													14
15			38.3						39.6				15
16													16
17													17
18													18
19													19
20													20
21													21
22													22
23													23
24													24
25													25
26													26
27													27
28													28
29													29
30											39.9		30
31													31

Monthly values

X _m		38.4	38.9		39.4	39.2	40.1	39.7		39.9		X _m
N		6	3		2	3	3	9		6		N
s												s

Annual mean 339.4 ppmv
 (based on 7 monthly means)

X_m = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)
 ‡ : flag indicating peremptory rejection of data

Atmospheric carbon dioxide measurements at station: BARING HEAD, N.Z.
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1983
 Final CO₂ concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2													2
3						40.7	41.0						3
4													4
5													5
6													6
7													7
8													8
9													9
10													10
11			39.9										11
12													12
13								41.9					13
14													14
15													15
16													16
17													17
18						41.0							18
19													19
20													20
21													21
22													22
23											41.3		23
24													24
25													25
26													26
27													27
28													28
29													29
30			40.5										30
31													31

Monthly values

X _m	40.2	40.9	41.0	41.9	41.3	X _m
N	8	5	3	3	2	N
s						s

Annual mean 341.0 ppmv
 (based on 5 monthly means)

X_m = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)
 ‡ : flag indicating peremptory rejection of data

Atmospheric carbon dioxide measurements at station: BARING HEAD, N.Z.
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1984
 Provisional CO₂ concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2													2
3													3
4													4
5													5
6	41.3												6
7							42.7						7
8													8
9													9
10													10
11													11
12													12
13													13
14													14
15													15
16									42.6				16
17													17
18													18
19					41.7								19
20		41.4											20
21													21
22				40.9									22
23			41.3										23
24													24
25											42.7		25
26													26
27													27
28													28
29													29
30													30
31					42.1								31

Monthly values

X _m	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	X _m
N	3	3	3	3	5	3	3	2	3				N
s													s

Annual mean 341.8 ppmv
 (based on 8 monthly means)

X_m = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)
 ‡ : flag indicating peremptory rejection of data

Atmospheric carbon dioxide measurements at station: BARING HEAD, N.Z.
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1985
Provisional CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2													2
3		42.7											3
4													4
5													5
6													6
7													7
8			42.3										8
9		42.1											9
10													10
11													11
12		42.2											12
13													13
14					43.0								14
15													15
16													16
17													17
18													18
19													19
20													20
21													21
22													22
23						44.5*							23
24													24
25													25
26													26
27													27
28							44.0*						28
29				42.9									29
30													30
31													31

Monthly values

Xm	42.3	42.3	42.9	43.0	Xm
N	8	3	3	5	N
s					s

Annual mean 342.6 ppmv
(based on 4 monthly means)

Xm = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)
‡ : flag indicating peremptory rejection of data

SOUTH POLE

Author: Charles D. Keeling

Organization: Scripps Institution of Oceanography

Address: University of California, San Diego, La Jolla, California 92093, USA

Site position and description: 89°59'S; 24°48'W, elevation 2810 m, at the geographic South Pole on an ice plateau

Sampling method, frequency and measurement technique: Continuous Applied Physics Corporation non-dispersive infrared gas analyzer with water vapor freeze trap (May 1960 - Oct 1963). 5 liter glass flasks exposed as singlets or pairs biweekly May 1957 to Oct 1963, exposed as triplets biweekly (Feb 1965 - Feb 1985). Flask samples measured at the Scripps Institution of Oceanography with an Applied Physics Corporation non-dispersive infrared gas analyzer.

Scientific aims and scope of measurements: Observe seasonal and interannual variations in atmospheric CO₂

Data selection procedures used: Concentrations of replicate flasks must agree within 0.40 ppmv to be accepted.

Calibration gases used: CO₂-in-N₂ until Mar 1983, then CO₂-in-air

Scale of reported data: 1985 WMO/Scripps mole fraction scale

Literature references to programme:

Keeling, C. D., "The Concentration and Isotopic Abundance of Carbon Dioxide in the Atmosphere", *Tellus*, Vol. 12, pp 200-203 (1960).

Bolin, B. and C. D. Keeling, "Large-Scale Atmospheric Mixing as Deduced from the Seasonal and Meridional Variations of Carbon Dioxide", *Journal of Geophysical Research*, Vol. 68, pp 3899-3920 (1963).

Brown, C. W. and C. D. Keeling, "The Concentration of Atmospheric Carbon Dioxide in Antarctica", *Journal of Geophysical Research*, Vol. 70, pp 6077-6085 (1965).

Keeling, C. D., "Antarctic Carbon Dioxide Project", *Report 4*, 165 pp., Scripps Institution of Oceanography, La Jolla, CA (1965). This information has been deposited with ASIS as NAPS document 04315. Order from ASIS-NAPS, c/o Microfiche Publications, P.O. Box 3513, Grand Central Station, New York, NY 10163.

Ekdahl, C. A., Jr. and C. D. Keeling, "Atmospheric Carbon Dioxide and Radiocarbon in the Natural Carbon Cycle: I. Quantitative Deductions from the Records of Mauna Loa Observatory and at the South Pole", Brookhaven Symposium in Biology No. 24, *Carbon and the Biosphere*, edited by G. M. Woodwell and E. V. Pecan, United States Atomic Energy Commission,

pp 51-85 (1973).

Bacastow, R. B., "Modulation of Atmospheric Carbon Dioxide by the Southern Oscillation", *Nature*, Vol. 261, pp 116-118 (1976).

Keeling, C. D., J. A. Adams, Jr., C. A. Ekdahl, Jr., and P. R. Guenther, "Atmospheric Carbon Dioxide Variations at the South Pole", *Tellus*, Vol. 28, pp 552-564 (1976).

Keeling, C. D., J. A. Adams, and C. A. Ekdahl, Jr., "Antarctic Carbon Dioxide Project", *Report 5*, 94 pp., Scripps Institution of Oceanography, La Jolla, CA (1976). This information has been deposited with ASIS as NAPS document 04315. Order from ASIS-NAPS, c/o Microfiche Publications, P.O. Box 3513, Grand Central Station, New York, NY 10163.

Bacastow, R., "Southern Oscillation Index and Atmospheric Carbon Dioxide", *Nature*, Vol. 267, p 650 (1977).

Bacastow, R., "Influence of the Southern Oscillation on Atmospheric Carbon Dioxide", in *The Fate of Fossil Fuel CO₂ in the Oceans*, edited by N. R. Andersen and A. Malahoff, Plenum Publishing Corp., New York (1977).

Bacastow, R., "Dip in the Atmospheric CO₂ Level During the Mid-1960's", *Journal of Geophysical Research*, Vol. 84, pp 3108-3114 (1979).

Bacastow, R. B., J. A. Adams, C. D. Keeling, D. J. Moss, T. P. Whorf, and C. S. Wong, "Atmospheric Carbon Dioxide, the Southern Oscillation, and the Weak 1975 El Niño", *Science*, Vol. 210, pp 66-68 (1980).

Bacastow, R. B. and C. D. Keeling, "Atmospheric Carbon Dioxide Concentration and the Observed Airborne Fraction", *SCOPE 16: Carbon Cycle Modelling*, John Wiley & Sons, New York, pp 103-112 (1981).

Keeling, C. D., "The Global Carbon Cycle: What We Know and Could Know from Atmospheric, Biospheric, and Oceanic Observations", prepared for CO₂ *Research Conference: Carbon Dioxide, Science, and Consensus*, pp II.3-II.62 (1982).

Mook, W. G., M. Koopmans, A. F. Carter, and C. D. Keeling, "Seasonal, Latitudinal, and Secular Variations in the Abundance and Isotopic Ratios of Atmospheric Carbon Dioxide 1. Results from Land Stations", *Journal of Geophysical Research*, Vol. 88, pp 10915-10933 (1983).

Keeling, C. D., "Atmospheric and Oceanographic Measurements Needed for Establishment of a Data Base for Carbon Dioxide from Fossil Fuels", in *The Potential Effects of Carbon Dioxide-Induced Climatic Changes in Alaska. The Proceedings of a Conference*. Fairbanks, Alaska, April 7-8, 1982. School of Agriculture and Land Resources Management, University of Alaska, Fairbanks, Miscellaneous Publications 83-1, pp 11-22 (1984).

Atmospheric carbon dioxide measurements at station: SOUTH POLE
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1960
 Final CO₂ concentration values in ppmv above 300.0
 (continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1						17.4*	16.5						1
2						16.5	16.9	17.4					2
3						16.8	17.1	17.3					3
4						16.9	16.8	16.9					4
5						16.6	17.1	17.4					5
6						16.6	16.6	17.1					6
7						17.3*		17.2					7
8						17.9*		17.1					8
9						15.5*		17.2					9
10						15.0*		17.3					10
11						16.0*							11
12						15.4*							12
13						14.6*							13
14						15.5*		17.0					14
15						17.2*		17.0					15
16						18.1*		17.0					16
17						16.8*		17.2					17
18						15.6*		17.1					18
19						15.6*		17.0					19
20						16.3*		16.9					20
21						16.6*		16.9					21
22						17.5*		16.8					22
23						15.6*							23
24						18.0*	17.8*						24
25						16.9*	17.5*						25
26						18.3*	17.4*						26
27						17.4*	17.3*						27
28					17.1*	17.1							28
29					16.1*	16.9							29
30					17.1*	17.1							30
31					17.4*								31

Monthly values

X _m	16.8	16.9	17.1	X _m
N	8	6	18	N
s	0.2	0.3	0.2	s

Annual mean 316.9 ppmv
 (based on 3 monthly means)

X_m = average monthly concentration
 N = number of daily values accepted
 s = standard deviation (ppmv), based on daily means

* : flag indicating peremptory rejection of data

Atmospheric carbon dioxide measurements at station: SOUTH POLE
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1961
 Final CO₂ concentration values in ppmv above 300.0
 (continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1						16.9	17.3	17.8	17.8		17.9	18.0	1
2						17.4	17.1	17.8	17.6		17.9	18.6	2
3						17.6	17.0	17.7	18.6		17.8	18.3	3
4						17.8	17.1	17.4	18.8		17.7	18.0	4
5						17.3	17.4	17.7	18.8		17.8	18.0	5
6						17.2	17.3	17.8	18.3		17.9	18.2	6
7						17.4	17.5	17.5	17.9		17.9	18.1	7
8						17.4	17.1	17.5	18.4		18.4	18.2	8
9						16.6	17.3	17.7	17.8		18.3	18.0	9
10						16.3	17.4	17.3	18.0		18.2	17.8	10
11						16.4	17.2	17.3	17.9		18.2	17.9	11
12						16.8	17.1	17.5	17.7		18.4	18.0	12
13						17.0	17.2	17.6	17.7		18.3	18.0	13
14						17.1	17.2	17.6	18.2	18.0	18.4	18.0	14
15						16.9	16.9		17.9	18.2	18.3	18.2	15
16						16.5	17.0		18.0	18.1	18.5	18.2	16
17						16.7	17.0		17.3	18.1	18.8	18.1	17
18						17.0	17.4		17.7	18.1	18.4	18.2	18
19					17.2	17.3	17.6		18.0	18.7	18.5	18.1	19
20					17.4	17.0	17.3			18.8	18.4	18.0	20
21					16.9	17.8	17.0			18.4	18.4	17.8	21
22					17.6	17.8	17.1			18.2	18.3	17.9	22
23					17.5	17.2	17.3	17.5		18.3	18.3	18.0	23
24					17.1	18.0	17.3	17.5		17.9	18.2	17.8	24
25					17.0	17.9	17.2	17.9		17.8	18.0	17.7	25
26					16.7	17.5	17.2	17.8		17.9	18.2	17.8	26
27					17.5	17.9	17.8	18.0		17.7	18.4	17.8	27
28					17.7	17.2	17.4	17.6		17.8	18.2	17.8	28
29					17.3	17.2	17.7	17.9		17.9	18.1	17.9	29
30					16.9	17.4	17.6	18.2		17.7	18.1	17.8	30
31					16.8		18.0	18.3		17.7			31

Monthly values

X _m		17.2	17.2	17.3	17.7	18.0	18.1	18.2	18.0	X _m
N		13	30	31	23	19	18	30	30	N
s		0.3	0.5	0.2	0.2	0.4	0.3	0.2	0.2	s

Annual mean 317.7 ppmv
 (based on 8 monthly means)

X_m = average monthly concentration
 N = number of daily values accepted
 s = standard deviation (ppmv), based on daily means

* : flag indicating peremptory rejection of data

Atmospheric carbon dioxide measurements at station: SOUTH POLE
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1962
Final CO2 concentration values in ppmv above 300.0
(continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1				18.4	17.3	17.8	17.5	18.0	18.8	18.9	19.8	19.3	1
2		17.6	17.4	17.9	17.2	17.4	17.5	17.9	18.4	19.5	20.0	19.3	2
3		17.7	17.1	17.7	17.4	17.4	18.6*	17.7	18.2	19.3	19.6	19.3	3
4		17.6	17.4	17.3	17.7	17.6	19.7*	17.8	17.8	19.2	19.7	19.2	4
5	18.1	17.7	17.5	17.8	18.1	17.8	18.0*	17.9	17.9	19.0	21.4*	19.0	5
6	17.9	17.7	17.5	17.3	17.8	18.4	17.4	17.7	18.0	20.3*	21.1*	19.0	6
7	18.0	17.8	17.5	17.2	17.7	18.1	17.5	17.7	18.0	19.1	21.1*	19.1	7
8	17.7	17.7	17.7	17.0	17.6	17.6	17.6	17.7	18.5	18.6	19.8*	19.1	8
9	17.8	17.7	17.6	17.0	17.3	17.6	17.6	17.6	18.6	18.6	20.1*	19.0	9
10	17.8	17.7	17.5	17.1	17.0	18.0	17.6	17.8	18.5	18.8	21.0*	19.0	10
11	17.8	17.7	17.5	17.3	17.1	17.4	17.5	18.0	18.3	18.9	20.6*	18.8	11
12	17.7	17.6	17.5	17.1	17.3	17.2	17.4	18.0	18.8	18.8	19.7	18.7	12
13	17.8	17.6	17.4	17.1	17.3	17.7	17.5	18.1		18.9	19.8	18.7	13
14	17.8	17.7	17.4	17.1	17.3	17.5	17.4	18.1		18.0*		19.3	14
15	17.6	17.5	17.0	17.2	17.4	17.5	17.5	18.1	18.5	18.9		18.8	15
16		17.5	17.0	17.1	18.2	17.6	17.6	17.8	18.2	19.1		18.6	16
17		17.5	17.3	17.1	17.8	17.5	17.7	17.7	18.2	18.7		18.9	17
18		17.5	17.4	17.1	17.3	18.0*	18.1	17.7	18.5	18.8	20.5*	18.9	18
19		17.6	17.4	17.3	17.6	18.3*	18.2	17.9	19.2	19.4	20.5*	18.8	19
20		17.6	17.1	18.0	17.5	18.9*	17.6	17.9	18.9	20.0	20.1	19.0	20
21		17.5	17.2	17.9	17.7	19.3*	17.6	17.8	19.0	19.4		18.8	21
22		17.6	17.3	18.2	17.4	19.3*	17.7	17.7	18.7	19.6	19.5	18.6	22
23		17.6	17.4	17.6	17.4	19.3*	17.7	17.9	18.4	18.8	19.0	18.7	23
24		17.5	17.3	17.2	17.4	18.7*	18.2	18.4	18.1	19.5	18.9	19.1	24
25		17.5	17.8	17.3	17.3	18.7*	17.7	18.3	18.2	20.6	18.9	18.9	25
26		17.6	17.5	17.3	17.7	18.8*	17.5	18.4	18.2	19.9	18.9	19.0	26
27		17.5	17.3	17.7	17.8	18.1*	17.5	17.8	18.2	20.8	19.4	19.1	27
28		17.7	17.1	17.9	17.6	17.4	17.7	18.2	18.3	20.2	19.4	19.1	28
29			17.3	17.8	18.6*	17.6	17.7	18.2	18.5	18.6	19.3	19.0	29
30			17.6	17.7	19.5*	17.6	17.5	18.3	18.7	18.7	19.4	18.9	30
31			17.9		18.5*		17.9	19.2		19.5		18.9	31

Monthly values

X _m	17.8	17.6	17.4	17.5	17.5	17.6	17.6	18.0	18.4	19.2	19.5	19.0	X _m
N	11	27	30	30	28	20	28	31	28	29	16	31	N
s	0.1	0.1	0.2	0.4	0.3	0.3	0.2	0.3	0.3	0.6	0.4	0.2	s

Annual mean 318.1 ppmv
(based on 12 monthly means)

X_m = average monthly concentration

N = number of daily values accepted

s = standard deviation (ppmv), based on daily means

* : flag indicating peremptory rejection of data

Atmospheric carbon dioxide measurements at station: SOUTH POLE
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1963
 Final CO2 concentration values in ppmv above 300.0
 (continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	18.8	18.1	17.9		17.8	17.8	18.3	18.2	17.9	18.3			1
2	18.8	17.9	18.0		17.8	18.0	18.4	18.5	18.3	17.5*			2
3	18.8	18.2			17.5	18.1	18.5	20.0*	18.2	19.8*			3
4	18.8	18.2	18.4		17.4	18.0	18.9	20.7*	18.3	21.0*			4
5	18.8	18.3	18.0		18.0	18.8	18.9	19.7*	18.0	20.9*			5
6	18.7	18.2	18.1		18.5	17.9	18.0	19.5*	17.3	21.8*			6
7	18.8	18.3	18.1		18.3	18.2	18.1	18.5	18.1	20.6*			7
8	18.6	18.4	17.9		18.0	17.7	17.8	18.1	19.1*	18.5			8
9	18.8	18.4	17.9		18.4	17.4	18.0	18.7	19.2*	18.3			9
10	18.8	18.5	17.9		19.0	19.6*	17.9	19.5*	18.2	18.2			10
11	18.5	18.5	17.9		18.5	21.1*	17.8	19.1*	17.8	18.6			11
12	18.4	18.0	17.7	17.5	18.3	18.8*	17.6	18.1	18.2	19.5			12
13	18.5	18.0	17.6	17.4	18.1	19.3*		18.4	19.0*	19.2			13
14	18.3	18.2	17.9	17.7	18.4	20.6*	17.7	19.4*	19.4*	18.7			14
15	18.5	18.2	17.8	17.5	18.4	18.1	17.7	18.5	19.9*	19.2			15
16	18.4	18.1	17.8	17.4	18.3	17.9	18.1	18.3	18.9*	18.8			16
17	18.5	18.3	17.7	17.7	18.2	17.8	18.0	19.2	18.3	18.5			17
18	18.4	18.2	17.7	17.6	17.9	17.7	18.4	18.1	17.8	18.5			18
19	18.5	18.1	17.7	17.3	18.0	17.2	19.0*	17.8	17.9	18.9			19
20	18.2	18.4	17.8	17.7	17.7	17.6	19.0*	17.7	17.8	19.3			20
21	18.4	18.2	17.8	17.9	17.4	17.7	17.5	17.7	18.4	19.3			21
22	18.3	18.3	17.5	18.0	17.4	17.7	17.4	18.0	19.1	19.0			22
23	18.3	18.3	17.6	18.1	17.7	18.4	17.6	18.6	18.7	19.7*			23
24	18.2	18.2	17.6	18.0	18.5	18.2	17.9	18.0	19.4*	20.5*			24
25	18.1	18.2	17.6	18.0	18.3	18.3	18.0	17.8	20.4*	20.3*			25
26	18.0	18.2	17.6	18.0	17.9	18.2	18.0	17.8	18.7	19.8*			26
27	17.9	18.1	17.8	17.9	18.6	18.3	18.1	17.7	18.9	19.8*			27
28	18.2	18.0	17.7		18.0	18.6	18.2	17.7	18.3	20.2*			28
29	18.4		17.9	17.8	17.8	18.5	18.1	17.7	18.5	19.8*			29
30	18.4		17.6	17.7	18.0	18.3	18.3	17.8	18.5	19.6*			30
31	18.3						18.5	17.7		19.5*			31

Monthly values

Xm	18.5	18.2	17.8	17.7	18.1	18.0	18.1	18.1	18.2	18.8			Xm
N	31	28	29	18	30	25	28	24	22	16			N
s	0.3	0.2	0.2	0.2	0.4	0.4	0.4	0.4	0.4	0.4			s

Annual mean 318.1 ppmv
 (based on 10 monthly means)

Xm = average monthly concentration
 N = number of daily values accepted
 s = standard deviation (ppmv), based on daily means

* : flag indicating peremptory rejection of data

Atmospheric carbon dioxide measurements at station: SOUTH POLE
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1957
 Final CO₂ concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2									13.3				2
3													3
4													4
5													5
6													6
7													7
8													8
9													9
10													10
11													11
12													12
13													13
14													14
15													15
16													16
17						13.2							17
18													18
19													19
20													20
21													21
22												14.3	22
23									13.8			14.3	23
24													24
25													25
26													26
27													27
28													28
29													29
30													30
31													31

Monthly values

X _m	13.2	13.6	14.3	X _m
N	1	6	2	N
s				s

Annual mean 313.7 ppmv
 (based on 3 monthly means)

X_m = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: SOUTH POLE
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1958
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2													2
3													3
4													4
5													5
6													6
7													7
8													8
9													9
10													10
11													11
12													12
13													13
14													14
15													15
16													16
17													17
18													18
19													19
20						14.4							20
21			14.1										21
22			14.0										22
23													23
24													24
25													25
26													26
27									15.1				27
28									15.2				28
29													29
30													30
31													31

Monthly values

X _m	14.1	14.4	15.2	X _m
N	3	1	2	N
s				s

Annual mean 314.5 ppmv
 (based on 3 monthly means)

X_m = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: SOUTH POLE
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1959
 Final CO₂ concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2													2
3													3
4													4
5													5
6													6
7													7
8	14.8												8
9											16.3		9
10											16.1		10
11											16.3		11
12	15.0										16.2		12
13											16.4		13
14											15.9		14
15		14.9	15.0								16.1		15
16													16
17											16.0		17
18									16.1		16.0		18
19													19
20													20
21													21
22													22
23													23
24													24
25											15.9		25
26													26
27													27
28	14.9												28
29													29
30			14.8					15.9	16.0				30
31													31

Monthly values

X _m	14.9	14.9	14.9			15.9	16.1		16.1		X _m
N	3	2	4			1	2		20		N
s									0.2		s

Annual mean 315.5 ppmv
 (based on 6 monthly means)

X_m = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: SOUTH POLE
 supplied by the Scripps Institution of Oceanography

15-Day mean values for the year 1960
 Final CO2 concentration values in ppmv above 300.0
 (continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2							16.9						2
3													3
4						16.7							4
5													5
6													6
7								17.2					7
8													8
9													9
10													10
11													11
12													12
13													13
14													14
15													15
16													16
17													17
18													18
19								17.0					19
20													20
21													21
22													22
23													23
24													24
25													25
26													26
27													27
28													28
29													29
30													30
31													31

Monthly values

Xm		16.7	16.9	17.1		Xm
N		1	1	2		N
s						s

Annual mean 316.9 ppmv
 (based on 3 monthly means)

Xm = average monthly concentration
 N = number of daily values accepted
 s = standard deviation (ppmv), based on daily means

* : flag indicating peremptory rejection of data

Atmospheric carbon dioxide measurements at station: SOUTH POLE
 supplied by the Scripps Institution of Oceanography

15-Day mean values for the year 1961
 Final CO2 concentration values in ppmv above 300.0
 (continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2													2
3													3
4													4
5									18.2				5
6													6
7								17.6					7
8						17.1	17.2				18.1	18.1	8
9													9
10													10
11													11
12													12
13													13
14													14
15									17.8				15
16													16
17													17
18										18.3			18
19													19
20													20
21													21
22													22
23						17.4	17.4				18.3	17.9	23
24													24
25					17.2								25
26													26
27								17.9		17.9			27
28													28
29													29
30													30
31													31

Monthly values

Xm	17.2	17.2	17.3	17.7	18.0	18.1	18.2	18.0	Xm
N	1	2	2	2	2	2	2	2	N
s									s

Annual mean 317.7 ppmv
 (based on 8 monthly means)

Xm = average monthly concentration
 N = number of daily values accepted
 s = standard deviation (ppmv), based on daily means

* : flag indicating peremptory rejection of data

Atmospheric carbon dioxide measurements at station: SOUTH POLE
 supplied by the Scripps Institution of Oceanography

15-Day mean values for the year 1962
 Final CO2 concentration values in ppmv above 300.0
 (continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2													2
3											19.8*		3
4													4
5													5
6													6
7									18.3				7
8		17.6	17.4	17.4	17.4	17.7		17.9		19.0*		19.0	8
9							17.5						9
10	17.8												10
11													11
12													12
13													13
14													14
15													15
16													16
17													17
18													18
19													19
20													20
21													21
22		17.6			17.6								22
23			17.4	17.5			17.8	18.1	18.5	19.5*		18.9	23
24													24
25											19.3*		25
26													26
27													27
28						17.6							28
29													29
30													30
31													31

Monthly values

Xm	17.8	17.6	17.4	17.5	17.5	17.6	17.6	18.0	18.4		19.0	Xm
N	1	2	2	2	2	2	2	2	2		2	N
s												s

Annual mean 317.8 ppmv
 (based on 10 monthly means)

Xm = average monthly concentration

N = number of daily values accepted

s = standard deviation (ppmv), based on daily means

* : flag indicating peremptory rejection of data

Atmospheric carbon dioxide measurements at station: SOUTH POLE
 supplied by the Scripps Institution of Oceanography

15-Day mean values for the year 1963
 (and flask daily means for Oct 1963)
 Final CO2 concentration values in ppmv above 300.0
 (continuous analyzer)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1													1
2													2
3													3
4													4
5						18.0			18.0				5
6													6
7							18.1						7
8	18.6	18.2	17.9		18.2			18.4					8
9													9
10													10
11										18.7			11
12													12
13													13
14													14
15													15
16				17.5									16
17													17
18													18
19										18.9			19
20													20
21													21
22		18.2							18.4				22
23	18.3		17.7		18.0	18.0		18.0					23
24							18.0						24
25				17.9									25
26													26
27													27
28													28
29										19.0&			29
30										18.7&			30
31										18.7&			31

Monthly values

Xm	18.5	18.2	17.8	17.7	18.1	18.0	18.1	18.2	18.2	18.8		Xm
N	2	2	2	2	2	2	2	2	2	5		N
s										0.1		s

Annual mean 318.2 ppmv
 (based on 10 monthly means)

Xm = average monthly concentration
 N = number of daily values accepted
 s = standard deviation (ppmv), based on daily means

* : flag indicating peremptory rejection of data
 & : flask daily means included

Atmospheric carbon dioxide measurements at station: SOUTH POLE
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1965
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1		18.7	18.4	18.5	18.5		20.3*	19.4	20.2*	20.8	22.3&		1
2												20.1	2
3													3
4													4
5													5
6		18.7*											6
7													7
8			18.4										8
9													9
10													10
11													11
12													12
13													13
14													14
15		18.4	18.4	18.5	18.8	19.2*	19.6*	19.5	20.6*	22.5&	20.0		15
16												20.1	16
17		18.5*											17
18													18
19													19
20													20
21							19.3			21.8*			21
22						18.7*			22.5*				22
23													23
24													24
25													25
26													26
27													27
28													28
29													29
30													30
31													31

Monthly values

Xm	18.6	18.4	18.5	18.7	19.3	19.4	20.8	20.0	20.1	Xm
N	4	8	5	4	2	5	2	2	4	N
s										s

Annual mean 319.3 ppmv
 (based on 9 monthly means)

Xm = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: SOUTH POLE
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1966
Final CO₂ concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	20.3						43.0*		21.0	21.4	21.5		1
2								20.7					2
3					20.2							21.0	3
4		36.2*											4
5		20.0											5
6													6
7						20.2							7
8													8
9		20.1											9
10				20.1									10
11													11
12													12
13													13
14													14
15							21.3*	21.0	21.2	21.2	21.4		15
16		19.6										20.9	16
17					20.9								17
18													18
19	20.1												19
20						48.8*							20
21													21
22													22
23			19.9										23
24													24
25													25
26													26
27													27
28													28
29													29
30													30
31													31

Monthly values

X _m	20.2	19.9	19.9	20.1	20.6	20.2		20.8	21.1	21.3	21.4	20.9	X _m
N	5	10	3	3	5	2		6	5	6	6	4	N
s													s

Annual mean 320.6 ppmv
(based on 11 monthly means)

X_m = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: SOUTH POLE
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1967
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1		20.9	22.2*	20.7	20.8	20.8	20.9	21.4		21.6	21.6	21.7	1
2									21.8				2
3													3
4													4
5													5
6													6
7													7
8													8
9													9
10													10
11													11
12													12
13													13
14													14
15			48.0*	20.6	20.8	20.7	20.8			21.6	21.7	22.3*	15
16								21.9					16
17													17
18									22.0				18
19													19
20													20
21													21
22													22
23													23
24													24
25													25
26													26
27											21.6		27
28													28
29													29
30													30
31													31

Monthly values

Xm	20.9	20.7	20.8	20.8	20.8	21.6	21.9	21.6	21.7	21.7	Xm
N	5	6	6	6	4	5	5	5	6	2	N
s											s

Annual mean 321.3 ppmv
 (based on 10 monthly means)

Xm = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: SOUTH POLE
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1968
Final CO₂ concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	21.9*	23.0&	22.0	21.4	24.8*	92.7*	24.6*	43.3*	21.3&	23.5*			1
2													2
3													3
4												24.4*	4
5													5
6													6
7													7
8													8
9													9
10	21.4												10
11													11
12												22.3	12
13													13
14													14
15		21.9	22.0*	25.3*	21.3	21.3	21.3	56.5*	24.9*	23.7*			15
16													16
17													17
18												22.8	18
19													19
20												42.2*	20
21													21
22													22
23													23
24													24
25												22.3	25
26													26
27													27
28													28
29													29
30													30
31												23.5*	31

Monthly values

X _m	21.4	21.9	22.0	21.4	21.3	21.3	21.3					22.5	X _m
N	2	3	3	2	3	3	2					9	N
s													s

Annual mean 321.6 ppmv
(based on 8 monthly means)

X_m = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: SOUTH POLE
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1969
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1												24.8&	1
2						55.7*							2
3													3
4											23.2		4
5					22.8*								5
6										23.2			6
7				21.5									7
8	22.2*								23.2				8
9													9
10		23.6*	21.5										10
11								22.8					11
12													12
13	31.0*												13
14							22.5						14
15											23.2	24.7&	15
16						22.0							16
17													17
18													18
19					21.9								19
20	22.3												20
21				25.1*									21
22													22
23									23.6				23
24		22.4*	24.7*										24
25								23.4*					25
26													26
27													27
28							22.6						28
29													29
30	22.0					22.2							30
31													31

Monthly values

Xm	22.2		21.5	21.5	21.9	22.1	22.6	22.8	23.4	23.2	23.2		Xm
N	4		3	2	3	5	5	3	5	2	4		N
s													s

Annual mean 322.4 ppmv
 (based on 10 monthly means)

Xm = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: SOUTH POLE
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1970
 Final CO₂ concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1		23.4								25.0		26.8*	1
2	23.6				23.6	23.9	24.2						2
3			23.4						24.9				3
4								24.3			25.0*		4
5													5
6													6
7													7
8													8
9													9
10													10
11													11
12													12
13													13
14													14
15	23.5	23.4					24.2				25.1	27.1*	15
16				23.5	23.5				25.5				16
17			23.3			24.0		24.7					17
18										25.0			18
19													19
20													20
21													21
22													22
23													23
24													24
25													25
26													26
27													27
28			23.2										28
29													29
30													30
31													31

Monthly values

X _m	23.6	23.4	23.3	23.5	23.6	24.0	24.2	24.5	25.2	25.0	25.1		X _m
N	6	6	9	3	5	6	6	5	6	5	2		N
s													s

Annual mean 324.1 ppmv
 (based on 11 monthly means)

X_m = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: SOUTH POLE
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1971
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	24.8	25.6*	24.2	24.3	34.9*	24.6	34.4*	26.0*	25.5	30.0*	25.6	36.7*	1
2													2
3													3
4													4
5													5
6													6
7											30.7&		7
8													8
9													9
10													10
11													11
12													12
13													13
14													14
15	24.5	24.4	27.7*	24.3	24.5	24.8	25.0	79.7*	25.6	43.6*	31.7*		15
16													16
17													17
18												44.3*	18
19													19
20													20
21													21
22													22
23													23
24													24
25													25
26													26
27													27
28													28
29													29
30													30
31													31

Monthly values

Xm	24.7	24.4	24.2	24.3	24.5	24.7	25.0		25.6		25.6		Xm
N	6	3	3	5	2	5	2		5		2		N
s													s

Annual mean 324.8 ppmv
 (based on 9 monthly means)

Xm = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: SOUTH POLE
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1972
 Final CO₂ concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	27.0*		25.7*	24.9	25.0	25.4	26.1						1
2		26.0*						25.0		26.6			2
3									26.4				3
4												26.7	4
5													5
6													6
7													7
8													8
9													9
10													10
11											26.7		11
12													12
13													13
14													14
15	27.0*	27.2*	24.9	25.0	25.1	25.8	25.6	26.7	26.3				15
16													16
17													17
18													18
19										25.1&			19
20											27.0	26.6	20
21													21
22													22
23													23
24													24
25													25
26													26
27													27
28													28
29													29
30													30
31													31

Monthly values

X _m		24.9	25.0	25.1	25.6	25.9	25.9	26.3	26.6	26.9	26.6	X _m
N		3	5	6	6	6	6	6	3	8	5	N
s												s

Annual mean 325.9 ppmv
 (based on 10 monthly means)

X_m = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: SOUTH POLE
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1973
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1		25.8	26.2	26.4	26.8		27.4		28.4	28.5	28.5		1
2						27.1						28.5	2
3								28.2					3
4	26.6												4
5													5
6													6
7													7
8													8
9													9
10													10
11													11
12													12
13													13
14													14
15		26.2	26.2	26.8	26.9	27.3	27.6			28.4			15
16								28.1					16
17	26.5								28.5				17
18													18
19													19
20													20
21													21
22													22
23													23
24													24
25													25
26													26
27													27
28													28
29													29
30													30
31													31

Monthly values

Xm	26.6	26.0	26.2	26.6	26.9	27.2	27.5	28.2	28.5	28.4	28.5	28.5	Xm
N	5	5	5	6	6	5	6	6	6	6	3	2	N
s													s

Annual mean 327.4 ppmv
 (based on 12 monthly means)

Xm = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: SOUTH POLE
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1974
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	28.3						28.2						1
2				27.7				28.4	28.8	28.9		28.9	2
3			28.0			27.7							3
4											29.1		4
5													5
6													6
7													7
8													8
9		28.0											9
10													10
11													11
12													12
13													13
14													14
15	28.1			27.7	27.8	27.6	28.3					28.8	15
16									28.7		28.9		16
17								28.6		28.9			17
18													18
19													19
20													20
21													21
22													22
23			27.9										23
24													24
25													25
26													26
27													27
28													28
29													29
30													30
31													31

Monthly values

Xm	28.2	28.0	27.9	27.7	27.8	27.7	28.2	28.5	28.7	28.9	29.0	28.8	Xm
N	6	4	5	5	3	6	6	6	6	5	8	6	N
s													s

Annual mean 328.3 ppmv
 (based on 12 monthly means)

Xm = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: SOUTH POLE
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1975
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1		28.8	28.7		28.8	28.8	29.0	29.5	29.9	30.2	30.3	30.1	1
2													2
3													3
4													4
5				28.7									5
6	28.7												6
7													7
8													8
9													9
10													10
11													11
12													12
13													13
14													14
15	28.8	28.7	28.7	28.8	28.6	28.9	29.1	29.7				30.2	15
16										30.5			16
17									30.1				17
18													18
19													19
20													20
21													21
22													22
23													23
24													24
25													25
26													26
27													27
28											30.2		28
29													29
30													30
31													31

Monthly values

Xm	28.7	28.8	28.7	28.7	28.7	28.8	29.1	29.6	30.0	30.4	30.3	30.1	Xm
N	6	5	6	6	6	6	6	5	6	6	5	6	N
s													s

Annual mean 329.3 ppmv
 (based on 12 monthly means)

Xm = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: SOUTH POLE
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1976
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	30.2		29.8		29.7	29.8	30.2	30.7		31.5	31.5	31.4	1
2		30.0		29.3					31.1				2
3		30.0											3
4													4
5		30.0											5
6		29.7											6
7													7
8													8
9													9
10													10
11													11
12													12
13													13
14													14
15		29.9		29.5	29.7	29.7	30.2	30.8				31.2	15
16	32.7*		28.9*						31.2	31.6			16
17													17
18											31.7		18
19													19
20													20
21													21
22													22
23													23
24													24
25													25
26													26
27													27
28													28
29													29
30													30
31													31

Monthly values

X _m	30.2	29.9	29.8	29.4	29.7	29.8	30.2	30.8	31.2	31.5	31.6	31.3	X _m
N	2	16	3	5	5	4	6	6	6	6	5	6	N
s		0.1											s

Annual mean 330.4 ppmv
 (based on 12 monthly means)

X_m = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: SOUTH POLE
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1977
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	31.0		30.6	31.1		31.3	31.7	32.1	32.5		33.2		1
2					31.1							33.1	2
3										32.8			3
4		30.8											4
5		30.8											5
6		30.8											6
7		30.9											7
8													8
9													9
10													10
11													11
12													12
13													13
14										33.0			14
15		31.0	30.7	31.1		31.5	31.9	32.3	32.8		33.1		15
16	31.1												16
17					31.3								17
18												33.0	18
19													19
20													20
21													21
22													22
23													23
24													24
25													25
26													26
27													27
28													28
29													29
30													30
31													31

Monthly values

X _m	31.1	30.9	30.7	31.1	31.2	31.4	31.8	32.2	32.6	32.9	33.1	33.0	X _m
N	9	15	5	6	6	5	6	6	6	6	6	5	N
s		0.1											s

Annual mean 331.8 ppmv
 (based on 12 monthly means)

X_m = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: SOUTH POLE
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1978
Final CO2 concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1		32.4			43.4*	33.0	33.5	34.0	34.5	34.7		34.3	1
2													2
3	32.6		32.5	32.8							34.5		3
4													4
5													5
6													6
7													7
8													8
9													9
10													10
11													11
12													12
13													13
14													14
15					39.6*			34.1		34.6	34.4		15
16	32.8	32.7					33.6		34.5			34.0	16
17						33.3							17
18													18
19			32.8	32.8									19
20													20
21													21
22													22
23													23
24													24
25													25
26													26
27													27
28													28
29													29
30													30
31													31

Monthly values

Xm	32.7	32.5	32.7	32.8		33.1	33.6	34.0	34.5	34.7	34.4	34.1	Xm
N	6	5	5	6		5	5	6	6	5	6	5	N
s													s

Annual mean 333.6 ppmv
(based on 11 monthly means)

Xm = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: SOUTH POLE
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1979
 Final CO₂ concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	34.0	34.0	33.5				34.8	35.3	35.6	35.9		35.9	1
2				33.9	34.0	34.3							2
3											36.1		3
4													4
5													5
6													6
7													7
8													8
9													9
10													10
11													11
12													12
13													13
14													14
15	33.8	33.9	33.8		34.2	34.3	35.0	35.6	35.7	35.8	36.3	35.9	15
16				34.0									16
17													17
18													18
19													19
20													20
21													21
22													22
23													23
24													24
25													25
26													26
27													27
28													28
29													29
30													30
31													31

Monthly values

X _m	33.9	33.9	33.7	34.0	34.1	34.3	34.9	35.4	35.6	35.8	36.2	35.9	X _m
N	6	6	6	6	5	5	5	6	6	4	5	6	N
s													s

Annual mean 334.8 ppmv
 (based on 12 monthly means)

X_m = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: SOUTH POLE
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1980
 Final CO₂ concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	36.0	35.6	35.9*	47.0*	35.9	52.4*	37.1	37.1	37.6	37.6			1
2													2
3												37.8	3
4													4
5													5
6													6
7											37.9		7
8													8
9													9
10													10
11													11
12													12
13													13
14													14
15	35.8	56.8*	35.9*	35.9	50.9*	36.7	37.3	37.5	37.7	37.8		38.0	15
16											37.8		16
17													17
18													18
19													19
20													20
21													21
22													22
23													23
24													24
25													25
26													26
27													27
28													28
29													29
30													30
31													31

Monthly values

X _m	35.9	35.6		35.9	35.9	36.7	37.2	37.3	37.6	37.7	37.8	37.9	X _m
N	6	5		3	2	3	6	5	5	5	4	6	N
s													s

Annual mean 336.9 ppmv
 (based on 11 monthly means)

X_m = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: SOUTH POLE
supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1981
Final CO₂ concentration values in ppmv above 300.0
(flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	37.7	37.4	37.1	37.3		38.0	38.2			39.0			1
2								38.5	38.6				2
3					37.4						38.7		3
4													4
5													5
6													6
7													7
8											38.7*		8
9													9
10													10
11													11
12													12
13												38.8	13
14													14
15	37.6	51.0*	37.4	37.4	37.5				38.6		52.6*		15
16						37.9	38.1	38.6		38.9			16
17													17
18													18
19													19
20													20
21													21
22													22
23													23
24													24
25													25
26													26
27												38.7	27
28													28
29											38.7		29
30													30
31													31

Monthly values

X _m	37.6	37.4	37.3	37.3	37.5	37.9	38.1	38.5	38.6	39.0	38.7	38.7	X _m
N	8	3	5	6	5	5	5	6	6	5	5	6	N
s													s

Annual mean 338.1 ppmv
(based on 12 monthly means)

X_m = average monthly concentration, accepted data
N = number of flask samples having accepted data
s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
& : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: SOUTH POLE
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1982
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1				38.4	38.7	39.0	39.0	40.0	40.0	40.2		39.8	1
2			38.2										2
3													3
4													4
5		38.3											5
6													6
7											40.1		7
8													8
9													9
10													10
11													11
12													12
13													13
14													14
15	46.2*	38.6	38.2	38.6	38.8	38.9	39.2	39.7	40.1		39.7	39.8	15
16										42.5*			16
17													17
18													18
19													19
20													20
21													21
22													22
23													23
24													24
25													25
26													26
27													27
28													28
29													29
30													30
31										40.1			31

Monthly values

Xm	38.5	38.2	38.5	38.8	39.0	39.1	39.8	40.1	40.1	39.9	39.8	Xm
N	5	5	6	5	5	6	6	6	6	5	6	N
s												s

Annual mean 339.3 ppmv
 (based on 11 monthly means)

Xm = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: SOUTH POLE
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1983
 Final CO2 concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1		39.7	39.6	46.5*	40.3	40.7	41.1	41.4	42.0	42.0	43.0*	42.2	1
2	39.7												2
3													3
4													4
5		51.4*											5
6													6
7													7
8													8
9													9
10													10
11													11
12													12
13													13
14													14
15	39.7	39.7	50.3*	40.1	40.5	40.8	41.2	41.8	42.2	42.1	42.4	42.2	15
16													16
17													17
18													18
19													19
20													20
21													21
22													22
23													23
24													24
25													25
26													26
27													27
28													28
29													29
30													30
31													31

Monthly values

Xm	39.7	39.7	39.6	40.1	40.4	40.8	41.1	41.6	42.1	42.1	42.4	42.2	Xm
N	6	5	3	2	6	5	6	6	6	5	2	4	N
s													s

Annual mean 341.0 ppmv
 (based on 12 monthly means)

Xm = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: SOUTH POLE
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1984
 Provisional CO₂ concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1												43.0	1
2				41.6	41.5	41.7		42.8		43.3	43.3		2
3			41.5*						43.1				3
4	42.0	50.6*											4
5							42.5						5
6													6
7													7
8													8
9													9
10													10
11													11
12													12
13													13
14													14
15	41.7	48.5*	41.5								43.1	43.0	15
16						42.5*		43.1		43.3			16
17				41.7	41.8				43.3				17
18							43.2*						18
19													19
20													20
21													21
22													22
23	41.9												23
24													24
25													25
26													26
27													27
28													28
29													29
30													30
31													31

Monthly values

X _m	41.9		41.5	41.6	41.7	41.7	42.5	42.9	43.2	43.3	43.2	43.0	X _m
N	8		2	6	6	2	3	5	6	6	5	6	N
s													s

Annual mean 342.4 ppmv
 (based on 11 monthly means)

X_m = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)

Atmospheric carbon dioxide measurements at station: SOUTH POLE
 supplied by the Scripps Institution of Oceanography

Daily mean values for the year 1985
 Provisional CO₂ concentration values in ppmv above 300.0
 (flask samples)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Day
1	42.8	42.7											1
2													2
3													3
4													4
5													5
6													6
7													7
8													8
9													9
10													10
11													11
12													12
13													13
14													14
15	42.9												15
16													16
17													17
18													18
19													19
20													20
21													21
22													22
23													23
24	42.9												24
25													25
26													26
27													27
28													28
29													29
30													30
31													31

Monthly values

X _m	42.8	42.7											X _m
N	8	8											N
s													s

Annual mean 342.8 ppmv
 (based on 2 monthly means)

X_m = average monthly concentration, accepted data
 N = number of flask samples having accepted data
 s = standard deviation (ppmv), based on daily means

* : flag indicating rejection for poor replicate flask agreement
 & : flag indicating rejection because exceeds 3 sigma of fit (see text)

Section 2: Ship Profile Data

ATMOSPHERIC CARBON DIOXIDE MEASUREMENTS, SCRIPPS INSTITUTE OF OCEANOGRAPHY
SHIP PROFILE DATA, 1960-1963

SAMPLE NO.	FIELD SHEET NO.	ANAL. SHEET NO.	DATE OF OBSERVATION	LATI-TUDE	LONGI-TUDE	EXPEDITION	CO2 CONCEN. (ppm)	TREND ON OBS DATE (ppm)	TREND ON 1/1/62 (ppm)	SEASONAL ADJ'MENT (ppm)	ADJ'D CO2 CONCEN. (ppm)	FLAGS
160	30	188	11FEB61	63.0S	178.0W	MON	316.94	317.27	317.78	-0.33	317.78	
161	30	188	11FEB61	63.0S	178.0W	MON	316.94	317.27	317.78	-0.33	317.78	A
168	29	188	8FEB61	58.2S	169.0E	MON	316.94	317.27	317.80	-0.31	317.78	A
169	29	188	8FEB61	58.2S	169.0E	MON	316.25	317.27	317.80	-0.31	317.80	A
167	27	189	4FEB61	49.8S	170.7E	MON	316.94	317.27	317.83	-0.28	317.79	A
168	27	189	4FEB61	49.8S	170.7E	MON	357.11	317.27	317.83	-0.28	357.96	*
165	26	188	12JAN61	49.5S	132.3E	MON	316.94	317.23	317.83	-0.11	317.65	A
166	26	188	12JAN61	49.5S	132.3E	MON	317.51	317.23	317.83	-0.11	318.22	A
164	25	188	10JAN61	43.5S	125.0E	MON	316.12	317.23	317.86	-0.14	316.89	A
163A	25	188	10JAN61	43.5S	125.0E	MON	316.81	317.23	317.86	-0.14	317.58	A
163B	25	188	10JAN61	43.5S	125.0E	MON	317.05	317.23	317.86	-0.14	317.82	A
209	2	228	30DEC61	17.0S	147.2W	RIS	318.75	318.00	318.01	0.00	318.76	
210	2	228	30DEC61	17.0S	147.2W	RIS	318.62	318.00	318.01	0.00	318.63	
L-9	2	283	6JAN63	16.0S	155.0E	LUH	321.37	318.64	318.01	0.06	320.69	*
L-10	2	283	6JAN63	16.0S	155.0E	LUH	320.27	318.64	318.01	0.06	319.59	*
L-37	2	283	6JAN63	15.0S	155.8E	LUH	319.60	318.65	318.02	0.09	318.88	
L-38	2	283	6JAN63	15.0S	155.8E	LUH	319.60	318.65	318.02	0.09	318.88	
211	2	228	5JAN62	14.7S	145.7W	RIS	318.75	318.03	318.02	0.09	318.65	
212	2	228	5JAN62	14.7S	145.7W	RIS	318.40	318.03	318.02	0.09	318.30	*
205	2	227	19DEC61	14.1S	120.4W	RIS	319.39	318.00	318.03	-0.01	319.43	*
206	2	227	19DEC61	14.1S	120.4W	RIS	318.58	318.00	318.03	-0.01	318.62	*
207	2	227	26DEC61	14.0S	135.0W	RIS	318.46	318.02	318.03	0.03	318.45	
208	2	227	26DEC61	14.0S	135.0W	RIS	318.46	318.02	318.03	0.03	318.57	
203	2	226	8DEC61	13.3S	100.8W	RIS	319.04	317.98	318.03	-0.13	319.22	*
204	2	226	8DEC61	13.3S	100.8W	RIS	318.35	317.98	318.03	-0.13	318.53	*
L-43	2	283	7JAN63	12.5S	157.3E	LUH	319.60	318.67	318.04	0.00	318.97	
L-44	2	283	7JAN63	12.5S	157.3E	LUH	319.46	318.67	318.04	0.00	318.83	
C-25			25MAR61	11.3S	152.0W	MON	318.57	317.40	318.04	0.16	319.05	
C-25			25MAR61	11.3S	152.0W	MON	318.57	317.40	318.04	0.16	319.05	
L-47	2	283	8JAN63	11.0S	158.2E	LUH	319.33	318.68	318.05	-0.04	318.73	
L-48	2	283	8JAN63	11.0S	158.2E	LUH	319.60	318.68	318.05	-0.04	319.00	
197	2	259	7AUG62	10.4S	169.7W	PRO	320.35	318.43	318.05	0.36	319.61	
198	2	259	7AUG62	10.4S	169.7W	PRO	320.35	318.43	318.05	0.36	319.61	
49	5	42	25MAR61	10.0S	151.2W	MON	318.18	317.40	318.05	0.29	318.54	
50	5	42	25MAR61	10.0S	151.2W	MON	318.18	317.40	318.05	0.29	318.54	
L-53	2	283	8JAN63	10.0S	158.9E	LUH	319.19	318.69	318.05	-0.07	318.62	*
L-54	2	283	8JAN63	10.0S	158.9E	LUH	319.60	318.69	318.05	-0.07	319.03	*
C-26			26MAR61	8.8S	152.0W	MON	318.68	317.41	318.06	0.37	318.96	
C-26			26MAR61	8.8S	152.0W	MON	318.68	317.41	318.06	0.37	318.96	

FLAGS: * REJECTED BECAUSE NO FLASK PAIR EXISTS FOR THIS DAY THAT AGREES TO WITHIN .40 PPM
REJECTED PEREMPTORILY
A ACCEPTED FLASK PREVIOUSLY REJECTED BY FLASK REPEATABILITY CRITERION OF .40 PPM

ATMOSPHERIC CARBON DIOXIDE MEASUREMENTS, SCRIPPS INSTITUTE OF OCEANOGRAPHY
SHIP PROFILE DATA, 1960-1963

SAMPLE NO.	FIELD SHEET NO.	ANAL. SHEET NO.	DATE OF OBSERVATION	LATI-TUDE	LONGI-TUDE	EXPEDITION	C02 CONCEN. (ppm)	TREND ON OBS DATE (ppm)	TREND ON 1/1/62 (ppm)	SEASONAL ADJ'MENT (ppm)	ADJ'D C02 CONCEN. (ppm)	FLAGS
213	9	228	10JAN62	8.6S	138.3W	RIS	319.08	318.08	318.06	-0.08	319.14	
214	9	228	10JAN62	8.6S	138.3W	RIS	318.97	318.08	318.06	-0.08	319.03	
51	43	183	26MAR61	7.7S	161.6W	MON	318.42	317.41	318.07	0.47	318.61	*
52	5	43	26MAR61	7.7S	161.6W	MON	318.47	317.41	318.07	0.47	319.06	*
L-85	2	283	11JAN63	7.5S	161.4E	LUH	319.46	318.71	318.07	-0.07	318.88	
L-86	2	283	11JAN63	7.5S	161.4E	LUH	319.72	318.71	318.07	-0.07	319.14	
199	2	259	8AUG62	7.4S	167.5W	PRO	320.95	318.46	318.07	0.22	320.33	*
200	2	259	8AUG62	7.4S	167.5W	PRO	320.23	318.46	318.07	0.22	319.61	*
C-27	2		27MAR61	6.3S	152.0W	MON	318.97	317.41	318.08	0.56	319.07	
C-27	2		27MAR61	6.3S	152.0W	MON	318.97	317.41	318.08	0.56	319.07	
53	5	186	28MAR61	5.9S	149.6W	MON	321.40	317.42	318.08	0.58	321.48	#
54	5	186	28MAR61	5.9S	149.6W	MON	321.17	317.42	318.08	0.58	321.25	#
201	2	3	10AUG62	5.0S	166.1W	PRO	320.35	318.49	318.08	0.08	319.87	
202	2	259	10AUG62	5.0S	166.1W	PRO	320.23	318.49	318.08	0.08	319.75	
215	2	228	12JAN62	5.0S	135.0W	RIS	319.31	318.11	318.08	-0.09	319.38	*
216	2	228	12JAN62	5.0S	135.0W	RIS	320.38	318.11	318.08	-0.09	320.45	*
L-97	7	284	13JAN63	5.0S	167.0E	LUH	320.00	318.74	318.08	-0.08	319.42	
L-98	2	284	13JAN63	5.0S	167.0E	LUH	319.86	318.74	318.08	-0.08	319.28	
43	7	139	1JUL60	4.9S	135.6W	TET	318.43	316.95	318.09	0.47	319.09	
44	7	139	1JUL60	4.9S	135.6W	TET	318.19	316.95	318.09	0.47	318.85	
C-28	5		28MAR61	3.8S	150.0W	MON	318.58	317.42	318.09	0.66	318.60	
C-28	5		28MAR61	3.8S	150.0W	MON	318.58	317.42	318.09	0.66	318.60	
55	5	183	29MAR61	3.4S	149.2W	MON	318.64	317.42	318.09	0.68	318.63	
56	5	183	29MAR61	3.4S	149.2W	MON	318.87	317.42	318.09	0.68	318.86	
203	2	4	13AUG62	2.9S	164.6W	PRO	320.59	318.52	318.10	-0.01	320.18	
204	2	259	13AUG62	2.9S	164.6W	PRO	320.35	318.52	318.10	-0.01	319.94	
217	2	11	13JAN62	2.8S	133.0W	RIS	319.31	318.12	318.10	-0.19	319.47	
218	2	11	13JAN62	2.8S	133.0W	RIS	319.64	318.12	318.10	-0.19	319.80	
L-105	2	285	14JAN63	2.5S	169.4E	LUH	320.55	318.76	318.10	-0.19	320.08	
L-106	2	285	14JAN63	2.5S	169.4E	LUH	320.66	318.76	318.10	-0.19	320.19	
41	5	139	28JUN60	1.6S	133.6W	TET	318.67	316.96	318.11	0.51	319.31	
42	5	139	28JUN60	1.6S	133.6W	TET	318.32	316.96	318.11	0.51	318.96	
58	5	48	30MAR61	1.4S	148.6W	MON	318.42	317.43	318.11	0.74	318.36	*
C-29	5		30MAR61	1.3S	150.0W	MON	318.97	317.43	318.11	0.74	318.91	
C-29	5		30MAR61	1.3S	150.0W	MON	318.97	317.43	318.11	0.74	318.91	
59	5	183	31MAR61	0.2S	147.5W	MON	318.99	317.43	318.12	0.78	318.89	
60	5	183	31MAR61	0.2S	147.5W	MON	319.10	317.43	318.12	0.78	319.00	
205	2	259	14AUG62	0.2S	162.9W	PRO	319.87	318.54	318.12	-0.07	319.52	
206	2	259	14AUG62	0.2S	162.9W	PRO	319.87	318.54	318.12	-0.07	319.52	
45	5	139	3JUL60	0.1S	138.7W	TET	318.43	316.98	318.12	0.42	319.15	*

FLAGS: * REJECTED BECAUSE NO FLASK PAIR EXISTS FOR THIS DAY THAT AGREES TO WITHIN .40 PPM
REJECTED PEREMPTORILY
A ACCEPTED FLASK PREVIOUSLY REJECTED BY FLASK REPEATABILITY CRITERION OF .40 PPM

ATMOSPHERIC CARBON DIOXIDE MEASUREMENTS, SCRIPPS INSTITUTE OF OCEANOGRAPHY
SHIP PROFILE DATA, 1960-1963

SAMPLE NO.	FIELD SHEET NO.	ANAL. SHEET NO.	DATE OF OBSERVATION	LATI-TUDE	LONGI-TUDE	EXPEDITION	C02 CONCN. (ppm)	TREND ON OBS DATE (ppm)	TREND ON 1/1/62 (ppm)	SEASONAL ADJ'MENT (ppm)	ADJ'D C02 CONCN. (ppm)	FLAGS
46	5	8	3JUL60	0.1S	138.7W	TET	319.40	316.98	318.12	0.42	320.12	*
197	2	9	14JAN63	0.0S	169.4E	LUH	320.21	318.78	318.12	-0.26	319.81	
198	2	285	14JAN63	0.0S	169.4E	LUH	320.09	318.78	318.12	-0.26	319.69	
219	2	228	15JAN62	0.0S	131.5W	RIS	319.64	318.15	318.12	-0.25	319.86	
220	2	228	15JAN62	0.0S	131.5W	RIS	319.64	318.15	318.12	-0.25	319.86	
C-30			31MAR61	0.0S	148.0W	MON	318.07	317.43	318.12	0.79	317.96	
C-30			31MAR61	0.0S	148.0W	MON	318.07	317.43	318.12	0.79	317.96	
C-31			1APR61	1.3N	147.0W	MON	319.29	317.44	318.13	0.85	319.12	
C-31			1APR61	1.3N	147.0W	MON	319.29	317.44	318.13	0.85	319.12	
25	5	48	1APR61	1.6N	147.1W	MON	319.45	317.44	318.13	0.87	319.27	*
26	5	48	1APR61	1.6N	147.1W	MON	319.45	317.44	318.13	0.87	319.27	*
199	2	10	15JAN63	2.5N	168.4E	LUH	319.86	318.80	318.13	-0.27	319.46	
200	2	10	15JAN63	2.5N	168.4E	LUH	319.86	318.80	318.13	-0.27	319.46	
207	2	6	15AUG62	2.5N	166.6W	PRO	319.75	318.57	318.13	-0.21	319.52	
208	2	6	15AUG62	2.5N	166.6W	PRO	319.75	318.57	318.13	-0.21	319.52	
C-32			2APR61	3.8N	146.0W	MON	319.09	317.45	318.14	1.00	318.78	
C-32			2APR61	3.8N	146.0W	MON	319.09	317.45	318.14	1.00	318.78	
181	2	13	16JAN62	4.0N	133.2W	RIS	319.64	318.18	318.14	-0.23	319.83	*
182	2	13	16JAN62	4.0N	133.2W	RIS	319.64	318.18	318.14	-0.23	319.83	*
27	5	49	2APR61	4.8N	146.4W	MON	319.91	317.45	318.15	1.07	319.54	
28	5	49	2APR61	4.8N	146.4W	MON	319.91	317.45	318.15	1.07	319.54	
201	2	11	16JAN63	5.0N	168.5E	LUH	319.29	318.82	318.15	-0.19	318.80	
202	2	11	16JAN63	5.0N	168.5E	LUH	319.40	318.82	318.15	-0.19	318.91	
209	2	7	16AUG62	5.0N	170.2W	PRO	320.23	318.60	318.15	-0.49	320.27	
211	2	7	16AUG62	5.0N	170.2W	PRO	320.23	318.60	318.15	-0.49	320.27	
53	5	141	23JUL60	5.1N	160.3W	TET	318.23	317.02	318.15	0.10	319.26	
54	5	141	23JUL60	5.1N	160.3W	TET	318.46	317.02	318.15	0.10	319.49	
L-37	2	137	26JUN60	5.2N	130.6W	TET	318.98	316.98	318.15	0.78	319.35	
L-38	2	137	26JUN60	5.2N	130.6W	TET	319.19	316.98	318.15	0.78	319.58	
L-55	2	9	6JUL60	5.4N	143.2W	TET	318.59	317.00	318.15	0.56	319.19	
L-56	2	9	6JUL60	5.4N	143.2W	TET	318.71	317.00	318.15	0.56	319.31	
C-33			3APR61	6.3N	146.0W	MON	319.39	317.45	318.16	1.21	318.88	
C-33			3APR61	6.3N	146.0W	MON	319.39	317.45	318.16	1.21	318.88	
30	5	50	3APR61	6.5N	145.8W	MON	321.18	317.45	318.16	1.23	320.66	*
203	2	12	16JAN63	7.5N	167.8E	LUH	318.51	318.85	318.17	-0.02	317.85	
204	2	12	16JAN63	7.5N	167.8E	LUH	318.74	318.85	318.17	-0.02	318.08	
210	2	8	18AUG62	7.5N	171.0W	PRO	320.35	318.62	318.17	-0.95	320.85	*
212	2	8	18AUG62	7.5N	171.0W	PRO	319.50	318.62	318.17	-0.95	320.00	*

FLAGS: * REJECTED BECAUSE NO FLASK PAIR EXISTS FOR THIS DAY THAT AGREES TO WITHIN .40 PPM
REJECTED PEREMPTORILY
A ACCEPTED FLASK PREVIOUSLY REJECTED BY FLASK REPEATABILITY CRITERION OF .40 PPM

ATMOSPHERIC CARBON DIOXIDE MEASUREMENTS, SCRIPPS INSTITUTE OF OCEANOGRAPHY
SHIP PROFILE DATA, 1969-1963

SAMPLE NO.	FLASK SIZE	FIELD SHEET NO.	ANAL. SHEET NO.	DATE OF OBSERVATION	LATI-TUDE	LONGI-TUDE	EXPEDITION	C02 CONCEN. (ppm)	TREND ON OBS DATE (ppm)	TREND ON 1/1/62 (ppm)	SEASONAL ADJ'MENT (ppm)	ADJ'D C02 CONCEN. (ppm)	FLAGS
211	2	16	287	27JAN63	7.6N	176.2W	LUH	319.23	318.86	318.17	0.68	318.46	
212	2	16	287	27JAN63	7.6N	176.2W	LUH	319.36	318.86	318.17	0.68	318.58	
C-34				4APR61	8.8N	145.6W	MON	319.60	317.46	318.17	1.49	318.83	
C-34				4APR61	8.8N	145.6W	MON	319.60	317.46	318.17	1.49	318.83	
35	5	51	197	4APR61	9.6N	145.2W	MON	320.27	317.46	318.18	1.50	319.48	
36	5	51	197	4APR61	9.6N	145.2W	MON	320.50	317.46	318.18	1.50	319.71	
261	2	3	226	4NOV61	9.8N	117.7W	RIS	316.96	318.03	318.18	-2.20	319.30	*
34	5	52	197	5APR61	10.6N	145.6W	MON	319.81	317.46	318.18	1.63	318.90	*
40	5	4	139	24JUN60	10.6N	128.6W	TET	319.65	317.00	318.18	1.80	319.04	*
47	5	10	139	8JUL60	10.6N	147.0W	TET	318.43	317.02	318.18	1.06	318.53	
48	5	10	139	8JUL60	10.6N	147.0W	TET	318.67	317.02	318.18	1.06	318.77	
205	2	13	285	23JAN63	10.6N	173.6E	LUH	318.97	318.87	318.18	0.24	318.04	
206	2	13	285	23JAN63	10.6N	173.6E	LUH	318.97	318.87	318.18	0.24	318.04	
209	2	15	287	26JAN63	10.6N	180.0W	LUH	319.12	318.88	318.18	0.27	318.15	
210	2	15	287	26JAN63	10.6N	180.0W	LUH	319.36	318.88	318.18	0.27	318.38	
213	2	9	259	20AUG62	10.6N	167.1W	PRO	317.10	318.65	318.18	-1.51	318.14	
214	2	9	259	20AUG62	10.6N	167.1W	PRO	316.76	318.65	318.18	-1.51	317.80	
L-3	2	15	138	21JUL60	10.8N	162.3W	TET	318.22	317.04	318.19	0.29	319.09	
L-4	2	15	138	21JUL60	10.8N	162.3W	TET	318.34	317.04	318.19	0.29	319.20	
L-31	2	17	138	27JUL60	10.9N	155.9W	TET	317.49	317.05	318.19	-0.13	318.76	*
L-43	2	17	138	27JUL60	10.9N	155.9W	TET	319.07	317.05	318.19	-0.13	320.34	*
L-44	2	17	138	27JUL60	10.9N	155.9W	TET	381.38	317.05	318.19	-0.13	382.65	*
C-35				6APR61	11.3N	144.0W	MON	319.60	317.47	318.19	1.79	318.53	
C-35				6APR61	11.3N	144.0W	MON	319.60	317.47	318.19	1.79	318.53	
31	5	53	197	7APR61	11.6N	141.2W	MON	320.15	317.47	318.19	1.87	319.00	
32	5	53	197	7APR61	11.6N	141.2W	MON	320.04	317.47	318.19	1.87	318.89	
207	2	14	285	24JAN63	12.5N	174.8E	LUH	319.54	318.90	318.20	0.43	318.41	
208	2	14	285	24JAN63	12.5N	174.8E	LUH	319.31	318.90	318.20	0.43	318.18	
213	2	17	287	31JAN63	12.5N	167.7W	LUH	319.12	318.91	318.20	0.52	317.89	
214	2	17	287	31JAN63	12.5N	167.7W	LUH	319.35	318.91	318.20	0.52	318.12	
216	2	10	260	25AUG62	12.5N	172.9W	PRO	319.03	318.68	318.20	-2.18	320.72	*
216	2	10	260	25AUG62	12.5N	172.9W	PRO	326.30	318.68	318.20	-2.18	327.99	*
131	5	54	193	8APR61	13.4N	138.7W	MON	319.54	317.48	318.20	2.06	318.20	
132	5	54	193	8APR61	13.4N	138.7W	MON	319.77	317.48	318.20	2.06	318.43	
C-36				8APR61	13.8N	143.0W	MON	319.39	317.48	318.21	2.07	318.05	
C-36				8APR61	13.8N	143.0W	MON	319.39	317.48	318.21	2.07	318.05	
55	5	18	139	28JUL60	14.2N	155.1W	TET	316.38	317.06	318.21	-0.26	317.79	
56	5	18	139	28JUL60	14.2N	155.1W	TET	316.61	317.06	318.21	-0.26	318.02	
217	2	11	260	28AUG62	15.6N	167.5W	PRO	315.56	318.71	318.21	-2.34	317.41	

FLAGS: * REJECTED BECAUSE NO FLASK PAIR EXISTS FOR THIS DAY THAT AGREES TO WITHIN .40 PPM
REJECTED PEREMPTORILY
A ACCEPTED FLASK PREVIOUSLY REJECTED BY FLASK REPEATABILITY CRITERION OF .40 PPM

ATMOSPHERIC CARBON DIOXIDE MEASUREMENTS, SCRIPPS INSTITUTE OF OCEANOGRAPHY
SHIP PROFILE DATA, 1960-1963

SAMPLE NO.	FIELD SHEET NO.	ANAL. SHEET NO.	DATE OF OBSERVATION	LATI-TUDE	LONGI-TUDE	EXPEDITION	CO2 CONCEN. (ppm)	TREND ON OBS DATE (ppm)	TREND ON 1/1/62 (ppm)	SEASONAL ADJ'MENT (ppm)	ADJ'D CO2 CONCEN. (ppm)	FLAGS
218	2	11	28AUG62	15.0N	167.5W	PRO	315.32	318.71	318.21	-2.34	317.17	*
L-5	2	137	22JUN60	15.0N	126.4W	TET	318.96	317.01	318.21	2.28	317.88	*
L-6	2	137	22JUN60	15.0N	126.4W	TET	319.81	317.01	318.21	2.28	318.73	*
L-91	2	136	11JUL60	15.0N	151.7W	TET	317.70	317.04	318.21	1.00	317.82	*
L-92	2	136	11JUL60	15.0N	151.7W	TET	317.22	317.04	318.21	1.00	317.34	*
215	2	18	1FEB63	15.1N	164.7W	LUH	320.51	318.93	318.21	0.66	319.14	*
216	2	18	1FEB63	15.1N	164.7W	LUH	322.25	318.93	318.21	0.66	320.88	*
129	5	193	9APR61	15.3N	136.6W	MON	319.77	317.48	318.22	2.13	318.37	*
130	5	193	9APR61	15.3N	136.6W	MON	319.31	317.48	318.22	2.13	317.91	*
51	5	141	19JUL60	15.7N	162.1W	TET	318.23	317.05	318.22	0.41	318.99	*
52	5	141	19JUL60	15.7N	162.1W	TET	317.74	317.05	318.22	0.41	318.50	*
183	2	14	22JAN62	16.0N	133.7W	RIS	319.20	318.27	318.22	0.51	318.64	*
184	2	14	22JAN62	16.0N	133.7W	RIS	319.42	318.27	318.22	0.51	318.86	*
199	2	226	1NOV61	16.0N	117.2W	RIS	316.85	318.06	318.22	-2.87	319.89	*
200	2	226	1NOV61	16.0N	117.2W	RIS	317.31	318.06	318.22	-2.87	320.35	*
C-37	2	2	10APR61	16.3N	140.0W	MON	319.80	317.49	318.22	2.24	318.30	*
C-37	2	2	10APR61	16.3N	140.0W	MON	319.80	317.49	318.22	2.24	318.30	*
217	2	19	2FEB63	17.5N	162.0W	LUH	320.39	318.95	318.23	0.97	318.70	*
218	2	19	2FEB63	17.5N	162.0W	LUH	320.39	318.95	318.23	0.97	318.70	*
219	2	12	29AUG62	17.5N	164.0W	PRO	314.96	318.73	318.23	-2.66	317.11	*
220	2	12	29AUG62	17.5N	164.0W	PRO	314.12	318.73	318.23	-2.66	316.27	*
L-25	2	19	31JUL60	18.6N	157.6W	TET	318.71	317.07	318.24	-1.18	321.05	*
L-26	2	19	31JUL60	18.6N	157.6W	TET	317.61	317.07	318.24	-1.18	319.95	*
127	5	56	12APR61	18.7N	132.6W	MON	319.88	317.50	318.24	2.52	318.10	*
128	5	56	12APR61	18.7N	132.6W	MON	321.02	317.50	318.24	2.52	319.24	*
L-53	2	13	18JUL60	18.7N	159.8W	TET	316.85	317.06	318.24	-0.16	318.19	*
L-54	2	13	18JUL60	18.7N	159.8W	TET	317.45	317.06	318.24	-0.16	318.79	*
C-38	2	136	12APR61	18.8N	138.0W	MON	320.21	317.50	318.24	2.52	318.43	*
C-38	2	136	12APR61	18.8N	138.0W	MON	320.21	317.50	318.24	2.52	318.43	*
37	5	2	20JUN60	18.9N	124.4W	TET	320.37	317.02	318.24	1.86	319.73	*
38	5	2	20JUN60	18.9N	124.4W	TET	321.11	317.02	318.24	1.86	320.47	*
49	5	12	13JUL60	19.7N	156.1W	TET	317.95	317.05	318.24	-0.09	319.23	*
50	5	12	13JUL60	19.7N	156.1W	TET	318.92	317.05	318.24	-0.09	320.20	*
121	5	57	12APR61	19.9N	131.2W	MON	319.77	317.50	318.24	2.60	317.91	*
122	5	57	12APR61	19.9N	131.2W	MON	320.00	317.50	318.24	2.60	318.14	*
186	2	15	24JAN62	20.0N	133.1W	RIS	320.77	318.30	318.24	1.07	319.64	*
187	2	15	24JAN62	20.0N	133.1W	RIS	320.77	318.30	318.24	1.07	319.64	*
219	2	20	3FEB63	20.1N	159.1W	LUH	320.39	318.97	318.24	1.34	318.33	*
220	2	20	3FEB63	20.1N	159.1W	LUH	321.06	318.97	318.24	1.34	319.61	*
187	2	4	18APR62	21.3N	153.2W	HIX	321.96	318.51	318.24	2.82	318.87	*
188	2	4	18APR62	21.3N	153.2W	HIX	321.84	318.51	318.24	2.82	318.75	*

FLAGS: * REJECTED BECAUSE NO FLASK PAIR EXISTS FOR THIS DAY THAT AGREES TO WITHIN .40 PPM
REJECTED PEREMPTORILY
A ACCEPTED FLASK PREVIOUSLY REJECTED BY FLASK REPEATABILITY CRITERION OF .40 PPM

ATMOSPHERIC CARBON DIOXIDE MEASUREMENTS, SCRIPPS INSTITUTE OF OCEANOGRAPHY
SHIP PROFILE DATA, 1960-1963

SAMPLE NO.	FIELD SHEET NO.	ANAL. SHEET NO.	DATE OF OBSERVATION	LATI-TUDE	LONGI-TUDE	EXPEDITION	CO2 CONCEN. (ppm)	TREND ON OBS DATE (ppm)	TREND ON 1/1/62 (ppm)	SEASONAL ADJ'MENT (ppm)	ADJ'D CO2 CONCEN. (ppm)	FLAGS
C-39			13APR61	21.3N	135.0W	MON	320.21	317.50	318.24	2.72	318.23	
C-39	5	199	13APR61	21.3N	135.0W	MON	320.21	317.50	318.24	2.72	318.23	
57	2	247	4AUG60	21.5N	157.1W	TET	315.28	317.08	318.24	-2.43	318.87	*
185	2	247	13APR62	21.5N	152.0W	HIX	320.79	318.50	318.24	2.73	317.81	
186	2	247	13APR62	21.5N	152.0W	HIX	320.56	318.50	318.24	2.73	317.58	
123	5	193	13APR61	22.9N	128.1W	MON	320.33	317.50	318.24	2.82	318.25	
124	5	193	13APR61	22.9N	128.1W	MON	320.33	317.50	318.24	2.82	318.25	
191	2	247	28MAR62	23.0N	146.9W	HIX	320.79	318.46	318.24	2.47	318.11	
192	2	247	28MAR62	23.0N	146.9W	HIX	320.91	318.46	318.24	2.47	318.23	
C-40			14APR61	23.8N	132.0W	MON	320.11	317.51	318.24	2.90	317.95	
C-40	6	247	14APR61	23.8N	132.0W	MON	320.11	317.51	318.24	2.90	317.95	
183	2	247	30APR62	23.9N	134.0W	HIX	321.96	318.53	318.24	3.08	318.59	
184	2	247	30APR62	23.9N	134.0W	HIX	321.96	318.53	318.24	3.08	318.59	
125	5	193	14APR61	24.3N	126.5W	MON	320.46	317.51	318.24	2.93	318.26	
126	5	193	14APR61	24.3N	126.5W	MON	320.68	317.51	318.24	2.93	318.48	
223	2	247	2MAY62	24.4N	129.6W	HIX	321.96	318.54	318.24	3.10	318.57	
224	2	247	2MAY62	24.4N	129.6W	HIX	321.96	318.54	318.24	3.10	318.57	
189	2	247	24MAR62	24.8N	134.5W	HIX	321.38	318.45	318.24	2.50	318.68	
190	2	247	24MAR62	24.8N	134.5W	HIX	321.38	318.45	318.24	2.50	318.68	
197	2	226	29OCT61	24.8N	117.3W	RIS	317.89	318.07	318.24	-1.57	319.64	
198	2	226	29OCT61	24.8N	117.3W	RIS	317.76	318.07	318.24	-1.57	319.51	
L-35	2	137	8AUG60	25.1N	145.7W	TET	311.43	317.08	318.24	-3.56	316.15	#
L-36	2	137	8AUG60	25.1N	145.7W	TET	311.30	317.08	318.24	-3.56	316.02	#
L-1	2	137	17JUN60	26.0N	126.6W	TET	320.06	317.02	318.24	0.94	320.35	#
L-2	2	137	17JUN60	26.0N	126.6W	TET	319.94	317.02	318.24	0.94	320.23	#
221	2	247	4MAY62	26.1N	124.8W	HIX	321.96	318.54	318.24	3.16	318.50	
222	2	247	4MAY62	26.1N	124.8W	HIX	321.73	318.54	318.24	3.16	318.27	
37	5	192	15APR61	26.3N	124.6W	MON	320.94	317.51	318.24	3.08	318.60	
38	5	192	15APR61	26.3N	124.6W	MON	320.71	317.51	318.24	3.08	318.37	
C-41			15APR61	26.3N	129.0W	MON	320.72	317.51	318.24	3.08	318.38	
C-41	2	248	15APR61	26.3N	129.0W	MON	320.72	317.51	318.24	3.08	318.38	
181	2	248	25APR62	26.5N	149.8W	HIX	321.49	318.52	318.24	3.20	318.01	
182	2	248	25APR62	26.5N	149.8W	HIX	321.38	318.52	318.24	3.20	317.90	
187	2	230	27JAN62	27.2N	132.5W	RIS	319.15	318.31	318.24	1.61	317.47	
188	2	230	27JAN62	27.2N	132.5W	RIS	319.37	318.31	318.24	1.61	317.69	
39	5	192	15APR61	27.6N	122.7W	MON	321.28	317.51	318.24	3.16	318.86	
40	5	192	15APR61	27.6N	122.7W	MON	320.94	317.51	318.24	3.16	318.52	
189	2	230	1FEB62	28.2N	130.6W	RIS	320.99	318.32	318.24	1.74	319.17	*

FLAGS: * REJECTED BECAUSE NO FLASK PAIR EXISTS FOR THIS DAY THAT AGREES TO WITHIN .40 PPM
REJECTED PEREMPTORILY
A ACCEPTED FLASK PREVIOUSLY REJECTED BY FLASK REPEATABILITY CRITERION OF .40 PPM

ATMOSPHERIC CARBON DIOXIDE MEASUREMENTS, SCRIPPS INSTITUTE OF OCEANOGRAPHY
SHIP PROFILE DATA, 1960-1963

SAMPLE NO.	FLASK SIZE	FIELD SHEET NO.	ANAL. SHEET NO.	DATE OF OBSERVATION	LATI-TUDE	LONGI-TUDE	EXPEDITION	CO2 CONCEN. (ppm)	TREND ON OBS DATE (ppm)	TREND ON 1/1/62 (ppm)	SEASONAL ADJ'MENT (ppm)	ADJ'D CO2 CONCEN. (ppm)	FLAGS
190	2	17	230	1FEB62	28.2N	130.6W	RIS	320.53	318.32	318.24	1.74	318.71	*
191	2	18	230	3FEB62	28.8N	123.5W	RIS	320.07	318.33	318.24	1.79	318.20	
192	2	18	230	3FEB62	28.8N	123.5W	RIS	320.42	318.33	318.24	1.79	318.55	
C-42				16APR61	28.8N	125.0W	MON	321.44	317.51	318.24	3.24	318.93	
C-42				16APR61	28.8N	125.0W	MON	321.44	317.51	318.24	3.24	318.93	
41	5	62	192	16APR61	29.2N	121.0W	MON	321.63	317.51	318.24	3.27	319.10	
42	5	62	192	16APR61	29.2N	121.0W	MON	321.39	317.51	318.24	3.27	318.86	
L-83	2	1	255	10AUG62	30.0N	140.0W	STN	316.59	318.73	318.24	-4.41	320.51	
L-84	2	1	255	10AUG62	30.0N	140.0W	STN	316.23	318.73	318.24	-4.41	320.15	
L-47	2	2	255	25AUG62	30.0N	140.0W	STN	313.88	318.75	318.24	-4.97	318.34	
L-48	2	2	255	25AUG62	30.0N	140.0W	STN	314.24	318.75	318.24	-4.97	318.70	
L-41	2	3	279	15JAN63	30.0N	140.0W	STN	319.95	318.95	318.24	1.33	317.92	
L-42	2	3	279	15JAN63	30.0N	140.0W	STN	320.21	318.95	318.24	1.33	318.18	
L-25	2	5	299	2FEB63	30.0N	140.0W	STN	320.10	318.97	318.24	1.77	317.60	*
L-26	2	5	299	2FEB63	30.0N	140.0W	STN	320.75	318.97	318.24	1.77	318.25	*
L-19	2	6	298	18FEB63	30.0N	140.0W	STN	320.84	318.99	318.24	2.01	318.09	A
L-20	2	6	298	18FEB63	30.0N	140.0W	STN	320.37	318.99	318.24	2.01	317.62	A
L-21	2	7	298	1MAR63	30.0N	140.0W	STN	320.83	319.00	318.24	2.21	317.86	
L-22	2	7	298	1MAR63	30.0N	140.0W	STN	320.59	319.00	318.24	2.21	317.62	
L-18	2	8	299	15MAR63	30.0N	140.0W	STN	321.28	319.02	318.24	2.51	317.99	
L-3	2	10	299	1APR63	30.0N	140.0W	STN	321.41	319.02	318.24	2.51	318.12	
L-4	2	10	299	1APR63	30.0N	140.0W	STN	321.28	319.04	318.24	2.97	317.24	
L-5	2	11	299	17APR63	30.0N	140.0W	STN	323.52	319.06	318.24	3.33	319.37	*
L-6	2	11	299	17APR63	30.0N	140.0W	STN	322.34	319.06	318.24	3.33	318.19	*
L-43	2	12	304	1MAY63	30.0N	140.0W	STN	323.86	319.08	318.24	3.39	319.63	
L-44	2	12	304	1MAY63	30.0N	140.0W	STN	323.86	319.08	318.24	3.39	319.63	
L-51	2	13	306	15MAY63	30.0N	140.0W	STN	324.13	319.09	318.24	3.10	320.18	*
L-52	2	13	306	15MAY63	30.0N	140.0W	STN	341.43	319.09	318.24	3.10	337.48	*
L-53	2	14	305	1JUN63	30.1N	139.6W	STN	324.79	319.11	318.24	2.21	321.71	*
L-54	2	14	305	1JUN63	30.1N	139.6W	STN	322.76	319.11	318.24	2.21	320.68	*
L-47	2	15	356	15JUN63	30.0N	140.0W	STN	322.62	319.13	318.24	1.09	320.64	*
L-48	2	15	356	15JUN63	30.0N	140.0W	STN	322.92	319.13	318.24	1.09	320.94	*
L-19	2	18	356	15AUG63	30.0N	140.0W	STN	315.94	319.18	318.24	-4.68	319.68	*
L-20	2	18	356	15AUG63	30.0N	140.0W	STN	316.38	319.18	318.24	-4.68	320.12	*
L-3	2	16	340	16SEP63	30.0N	140.0W	STN	316.22	319.21	318.24	-4.33	319.58	*
L-4	2	16	340	16SEP63	30.0N	140.0W	STN	316.97	319.21	318.24	-4.33	319.33	*
L-57	2	17	340	10CT63	30.0N	140.0W	STN	316.58	319.23	318.24	-3.18	318.77	A
L-58	2	17	340	10CT63	30.0N	140.0W	STN	316.10	319.23	318.24	-3.18	318.29	A
L-11	2	19	317	15OCT63	30.0N	140.0W	STN	318.07	319.24	318.24	-2.01	319.08	A
L-12	2	19	317	15OCT63	30.0N	140.0W	STN	317.56	319.24	318.24	-2.01	318.57	A

FLAGS: * REJECTED BECAUSE NO FLASK PAIR EXISTS FOR THIS DAY THAT AGREES TO WITHIN .40 PPM
REJECTED PEREMPTORILY
A ACCEPTED FLASK PREVIOUSLY REJECTED BY FLASK REPEATABILITY CRITERION OF .40 PPM

ATMOSPHERIC CARBON DIOXIDE MEASUREMENTS, SCRIPPS INSTITUTE OF OCEANOGRAPHY
SHIP PROFILE DATA, 1960-1963

SAMPLE NO.	FIELD SHEET NO.	ANAL. SHEET NO.	FLASK SIZE	DATE OF OBSERVATION	LATI-TUDE	LONGI-TUDE	EXPEDITION	CO2 CONCEN. (ppm)	TREND ON OBS DATE (ppm)	TREND ON 1/1/62 (ppm)	SEASONAL ADJ'MENT (ppm)	ADJ'D CO2 CONCEN. (ppm)	FLAGS
43	63	192	5	16APR61	30.6N	120.1W	MON	320.02	317.51	318.24	3.31	317.44	
44	63	192	5	16APR61	30.6N	120.1W	MON	320.02	317.51	318.24	3.31	317.44	
59	22	139	5	18AUG60	30.6N	128.9W	TET	310.96	317.09	318.24	-4.84	316.95	#
L-42	22	137	2	18AUG60	30.6N	128.9W	TET	311.06	317.09	318.24	-4.84	317.05	#
229	9	247	2	6MAY62	30.5N	119.7W	HIX	322.43	318.55	318.24	3.36	318.77	
230	9	247	2	6MAY62	30.5N	119.7W	HIX	322.32	318.55	318.24	3.36	318.66	
221	19	230	2	4FEB62	31.6N	119.9W	RIS	319.61	318.33	318.24	1.81	317.71	
222	19	230	2	4FEB62	31.6N	119.9W	RIS	319.83	318.33	318.24	1.81	317.93	
C-43				17APR61	31.3N	121.0W	MON	320.31	317.51	318.24	3.40	317.64	
C-43				17APR61	31.3N	121.0W	MON	320.31	317.51	318.24	3.40	317.64	
46	64	193	5	17APR61	31.4N	118.7W	MON	320.91	317.51	318.24	3.41	318.23	
47	65	193	5	17APR61	31.4N	118.7W	MON	321.25	317.51	318.24	3.41	318.57	
48	65	193	5	17APR61	33.6N	118.6W	MON	323.77	317.51	318.24	3.53	320.97	*
48	65	193	5	17APR61	33.6N	118.6W	MON	321.59	317.51	318.24	3.53	318.79	*

FLAGS: * REJECTED BECAUSE NO FLASK PAIR EXISTS FOR THIS DAY THAT AGREES TO WITHIN .40 PPM
REJECTED PEREMPTORILY
A ACCEPTED FLASK PREVIOUSLY REJECTED BY FLASK REPEATABILITY CRITERION OF .40 PPM

ATMOSPHERIC CARBON DIOXIDE MEASUREMENTS, SCRIPPS INSTITUTE OF OCEANOGRAPHY
SHIP PROFILE DATA, 1967-1968

SAMPLE NO.	FIELD SHEET NO.	ANAL. SHEET NO.	DATE OF OBSERVATION	LATI-TUDE	LONGI-TUDE	EXPED-ITION	CO2 CONCEN. (ppm)	TREND ON OBS DATE (ppm)	TREND ON 1/1/68 (ppm)	SEASONAL ADJ'MENT (ppm)	ADJ'D CO2 CONCEN. (ppm)	FLAGS
13	225	631	31JAN68	77.7S	176.0W	ELT	321.14	321.63	321.57	-0.22	321.30	*
14	225	631	31JAN68	77.7S	176.0W	ELT	320.69	321.63	321.57	-0.22	320.85	*
71	224	631	25JAN68	77.7S	177.3E	ELT	321.25	321.62	321.57	-0.15	321.35	
72	224	631	21JAN68	77.7S	177.3E	ELT	321.25	321.62	321.57	-0.15	321.35	*
10	167	532	6FEB68	76.5S	167.9E	ELT	364.22	320.98	321.57	-0.10	364.92	
15	226	631	6FEB68	75.0S	174.7W	ELT	321.03	321.65	321.57	-0.29	321.24	
16	226	631	6FEB68	75.0S	174.7W	ELT	320.92	321.65	321.57	-0.29	321.13	
69	223	631	17JAN68	75.0S	177.0E	ELT	321.25	321.61	321.57	-0.08	321.27	
70	223	631	17JAN68	75.0S	177.0E	ELT	321.25	321.61	321.57	-0.08	321.27	
11	168	532	28JAN67	74.6S	175.6W	ELT	321.67	320.99	321.57	-0.19	322.45	*
67	222	631	10JAN68	72.0S	172.2E	ELT	321.80	321.60	321.58	0.02	321.78	*
68	222	631	10JAN68	72.0S	172.2E	ELT	321.69	321.60	321.58	0.02	321.65	*
17	227	632	14FEB68	70.8S	176.3E	ELT	320.92	321.68	321.59	-0.37	321.20	
18	227	632	14FEB68	70.8S	176.3E	ELT	321.03	321.68	321.59	-0.37	321.31	
259	234	672	15APR68	70.0S	120.0W	ELT	321.37	321.78	321.59	-0.51	321.69	
260	234	672	15APR68	70.0S	120.0W	ELT	321.37	321.78	321.59	-0.51	321.69	
257	233	672	9APR68	68.4S	133.7W	ELT	321.05	321.78	321.59	-0.53	321.40	
258	233	672	9APR68	68.4S	133.7W	ELT	321.05	321.78	321.59	-0.53	321.40	
255	232	670	1APR68	68.3S	158.5W	ELT	321.19	321.77	321.59	-0.55	321.58	
256	232	670	1APR68	68.3S	158.5W	ELT	321.19	321.77	321.59	-0.55	321.58	
19	228	632	21FEB68	64.2S	176.5E	ELT	320.58	321.72	321.61	-0.43	320.90	*
20	228	632	21FEB68	64.2S	176.5E	ELT	321.03	321.72	321.61	-0.43	321.35	*
5	155	531	7JAN67	63.0S	177.5E	ELT	321.81	320.99	321.61	0.03	322.41	*
6	155	531	7JAN67	63.0S	177.5E	ELT	388.34	320.99	321.61	0.03	388.94	*
261	235	672	22APR68	62.0S	119.8W	ELT	321.82	321.82	321.62	-0.48	322.10	
262	235	672	22APR68	62.0S	119.8W	ELT	321.82	321.82	321.62	-0.48	322.10	
66	221	631	3JAN68	60.1S	171.0E	ELT	321.14	321.63	321.63	0.05	321.08	*
93	241	700	12JUN68	60.1S	162.6E	ELT	321.91	321.89	321.63	-0.23	321.87	
94	241	700	12JUN68	60.1S	162.6E	ELT	321.91	321.89	321.63	-0.23	321.87	
263	236	673	29APR68	55.3S	122.3W	ELT	321.49	321.87	321.65	-0.44	321.72	
264	236	673	29APR68	55.3S	122.3W	ELT	321.49	321.87	321.65	-0.44	321.72	
95	242	700	19JUN68	53.0S	160.2E	ELT	321.91	321.95	321.66	-0.15	321.77	
96	242	700	19JUN68	53.0S	160.2E	ELT	321.60	321.95	321.66	-0.15	321.46	
91	240	699	5JUN68	52.6S	169.4E	ELT	321.60	321.93	321.67	-0.24	321.57	
92	240	699	5JUN68	52.6S	169.4E	ELT	321.60	321.93	321.67	-0.24	321.57	
253	231	670	25MAR68	52.5S	169.2E	ELT	321.41	321.83	321.67	-0.51	321.75	
254	231	670	25MAR68	52.5S	169.2E	ELT	321.52	321.83	321.67	-0.51	321.88	
85	237	699	6MAY68	52.3S	252.0W	ELT	321.45	321.90	321.67	-0.41	321.88	
86	237	699	6MAY68	52.3S	252.0W	ELT	321.60	321.90	321.67	-0.41	321.78	
23	230	632	18MAR68	49.1S	172.0E	ELT	320.92	321.84	321.69	-0.49	321.25	
24	230	632	18MAR68	49.1S	172.0E	ELT	321.14	321.84	321.69	-0.49	321.47	

FLAGS: * REJECTED BECAUSE NO FLASK PAIR EXISTS FOR THIS DAY THAT AGREES TO WITHIN .40 PPM
REJECTED PEREMPTORILY

ATMOSPHERIC CARBON DIOXIDE MEASUREMENTS, SCRIPPS INSTITUTE OF OCEANOGRAPHY
SHIP PROFILE DATA, 1967-1968

SAMPLE NO.	FIELD SHEET NO.	ANAL. SHEET NO.	DATE OF OBSERVATION	LATI-TUDE	LONGI-TUDE	EXPEDITION	CO2 CONCEN. (ppm)	TREND ON OBS DATE (ppm)	TREND ON 1/1/68 (ppm)	SEASONAL ADJ'MENT (ppm)	ADJ'D CO2 CONCEN. (ppm)	FLAGS
21	2	229	27FEB68	46.7S	176.9E	ELT	321.14	321.82	321.70	-0.41	321.43	
22	2	229	27FEB68	46.7S	176.9E	ELT	321.03	321.82	321.70	-0.41	321.32	*
4	2	164	1JAN67	46.5S	176.3E	ELT	338.67	321.05	321.71	-0.07	339.39	*
128	2	162	25FEB67	46.0S	147.3E	ELT	336.40	321.13	321.71	-0.39	337.37	*
87	2	238	13MAY68	43.5S	170.8W	ELT	321.29	321.97	321.72	-0.33	321.37	
88	2	238	13MAY68	43.5S	170.8W	ELT	321.00	321.97	321.72	-0.33	321.08	
243	2	166	5APR67	43.3S	167.9W	ELT	320.84	321.19	321.72	-0.44	321.81	
244	2	166	5APR67	43.3S	167.9W	ELT	320.84	321.19	321.72	-0.44	321.81	
245	2	167	12APR67	43.3S	148.0W	ELT	320.40	321.20	321.72	-0.43	321.36	
246	2	167	12APR67	43.3S	148.0W	ELT	320.27	321.20	321.72	-0.43	321.23	
249	2	169	21APR67	43.3S	120.7W	ELT	321.27	321.21	321.72	-0.42	322.20	
250	2	169	21APR67	43.3S	120.7W	ELT	321.12	321.21	321.72	-0.42	322.05	
253	2	171	27APR67	43.3S	101.7W	ELT	321.15	321.22	321.72	-0.40	322.05	
254	2	171	27APR67	43.3S	101.7W	ELT	321.15	321.22	321.72	-0.40	322.05	
255	2	172	1MAY67	43.3S	90.8W	ELT	321.15	321.22	321.72	-0.39	322.04	
256	2	172	1MAY67	43.3S	90.8W	ELT	321.44	321.22	321.72	-0.39	322.33	
259	2	174	7MAY67	43.3S	76.4W	ELT	320.57	321.23	321.72	-0.36	321.42	
260	2	174	7MAY67	43.3S	76.4W	ELT	320.57	321.23	321.72	-0.36	321.42	
129	2	163	15MAR67	43.2S	156.2E	ELT	397.11	321.16	321.72	-0.42	398.10	
241	2	165	30MAR67	43.2S	174.0E	ELT	321.12	321.18	321.72	-0.44	322.10	
242	2	165	30MAR67	43.2S	174.0E	ELT	321.27	321.18	321.72	-0.44	322.25	
247	2	168	16APR67	43.2S	134.4W	ELT	320.84	321.20	321.72	-0.43	321.79	
248	2	168	16APR67	43.2S	134.4W	ELT	320.99	321.20	321.72	-0.43	321.94	
251	2	170	23APR67	43.2S	114.9W	ELT	320.99	321.21	321.72	-0.41	321.91	
252	2	170	23APR67	43.2S	114.9W	ELT	321.12	321.21	321.72	-0.41	322.04	
257	2	173	4MAY67	43.2S	81.7W	ELT	321.29	321.23	321.72	-0.37	322.16	
258	2	173	4MAY67	43.2S	81.7W	ELT	321.29	321.23	321.72	-0.37	322.16	
132	2	164	22MAR67	42.5S	163.1E	ELT	392.27	321.17	321.73	-0.42	393.25	
64	2	220	18DEC67	41.0S	174.9E	ELT	323.38	321.70	321.74	-0.02	323.43	
25	2	243	26JUN68	38.5S	159.1E	ELT	322.01	322.08	321.75	0.02	321.66	
26	2	243	26JUN68	38.5S	159.1E	ELT	322.17	322.08	321.75	0.02	321.82	
261	2	175	11MAY67	35.8S	82.8W	ELT	321.00	321.28	321.77	-0.26	321.75	
262	2	175	11MAY67	35.8S	82.8W	ELT	321.15	321.28	321.77	-0.26	321.90	
263	2	176	14MAY67	35.3S	74.3W	ELT	320.85	321.29	321.78	-0.24	321.58	
264	2	176	14MAY67	35.3S	74.3W	ELT	320.57	321.29	321.78	-0.24	321.30	
89	2	239	29MAY68	35.0S	174.3E	ELT	321.29	322.07	321.78	-0.16	321.15	
90	2	239	29MAY68	35.0S	174.3E	ELT	321.29	322.07	321.78	-0.16	321.15	
C-192			9SEP67	34.7S	178.9W	NOV	321.46	321.51	321.78	0.38	321.35	
C-193			9SEP67	34.6S	177.8W	NOV	321.62	321.51	321.78	0.38	321.51	
61	2	219	10DEC67	34.3S	171.4E	ELT	321.69	321.75	321.79	-0.09	321.82	*
C-194			10SEP67	34.2S	178.1W	NOV	321.66	321.52	321.79	0.37	321.56	

FLAGS: * REJECTED BECAUSE NO FLASK PAIR EXISTS FOR THIS DAY THAT AGREES TO WITHIN .40 PPM
REJECTED PEREMPTORILY

ATMOSPHERIC CARBON DIOXIDE MEASUREMENTS, SCRIPPS INSTITUTE OF OCEANOGRAPHY
SHIP PROFILE DATA, 1967-1968

SAMPLE NO.	FLASK SIZE	FIELD SHEET NO.	ANAL. SHEET NO.	DATE OF OBSERVATION	LATI-TUDE	LONGI-TUDE	EXPEDITION	CO2 CONCN. (ppm)	TREND ON OBS DATE (ppm)	TREND ON 1/1/68 (ppm)	SEASONAL ADJ'MENT (ppm)	ADJ'D CO2 CONCN. (ppm)	FLAGS
167	2	30	574	10SEP67	34.1S	178.1W	NOV	321.77	321.52	321.79	0.37	321.67	
168	2	30	574	10SEP67	34.1S	178.1W	NOV	321.92	321.52	321.79	0.37	321.82	
C-191				8SEP67	33.3S	179.6W	NOV	321.64	321.52	321.79	0.35	321.56	
C-190				8SEP67	32.4S	179.7W	NOV	321.81	321.53	321.80	0.33	321.76	*
C-189				7SEP67	32.3S	179.6E	NOV	321.60	321.53	321.80	0.32	321.55	
C-188				7SEP67	32.0S	179.3E	NOV	321.63	321.53	321.80	0.31	321.59	
186	2	29	574	7SEP67	31.7S	179.2E	NOV	321.92	321.53	321.81	0.31	321.89	
83	2	218	638	15DEC67	31.2S	173.8E	ELT	321.25	321.77	321.81	-0.11	321.40	
84	2	218	638	15DEC67	31.2S	173.8E	ELT	321.37	321.77	321.81	-0.11	321.52	
C-187				6SEP67	31.1S	179.3E	NOV	321.62	321.53	321.81	0.29	321.61	
C-186				6SEP67	30.1S	177.7E	NOV	321.75	321.54	321.82	0.26	321.77	
77	2	185	564	15JUL67	29.9S	176.4W	ELT	320.75	321.43	321.82	0.15	320.99	
78	2	185	564	15JUL67	29.9S	176.4W	ELT	320.75	321.43	321.82	0.15	320.99	
C-185				5SEP67	29.4S	175.9E	NOV	321.58	321.54	321.82	0.23	321.63	
C-173				30AUG67	28.6S	164.1E	NOV	321.54	321.54	321.83	0.20	321.63	
79	2	186	564	21JUL67	28.4S	176.5E	ELT	320.75	321.45	321.83	0.15	320.98	
80	2	186	564	21JUL67	28.4S	176.5E	ELT	320.75	321.45	321.83	0.15	320.98	
159	2	26	574	31AUG67	28.4S	165.7E	NOV	321.62	321.54	321.83	0.19	321.72	
160	2	26	574	31AUG67	28.4S	165.7E	NOV	321.92	321.54	321.83	0.19	322.02	
C-169				28AUG67	28.4S	159.8E	NOV	321.30	321.53	321.83	0.19	321.41	
73	2	183	563	5JUL67	28.3S	168.3W	ELT	321.04	321.42	321.83	0.11	321.34	
74	2	183	563	5JUL67	28.3S	168.3W	ELT	321.04	321.42	321.83	0.11	321.34	
81	2	187	565	25JUL67	28.3S	166.7E	ELT	321.18	321.46	321.83	0.16	321.39	
82	2	187	565	25JUL67	28.3S	166.7E	ELT	321.18	321.46	321.83	0.16	321.39	
85	2	177	563	5JUN67	28.3S	73.7W	ELT	320.46	321.37	321.83	-0.02	320.94	
86	2	177	563	5JUN67	28.3S	73.7W	ELT	320.46	321.37	321.83	-0.02	320.94	
87	2	178	563	10JUN67	28.3S	84.8W	ELT	320.75	321.38	321.83	0.01	321.20	
88	2	178	563	10JUN67	28.3S	84.8W	ELT	321.04	321.38	321.83	0.01	321.49	
91	2	180	563	20JUN67	28.3S	114.5W	ELT	321.04	321.40	321.83	0.05	321.42	
C-172				20JUN67	28.3S	114.5W	ELT	321.04	321.40	321.83	0.05	321.42	
92	2	180	563	20JUN67	28.3S	114.5W	ELT	321.04	321.40	321.83	0.05	321.42	
93	2	181	563	25JUN67	28.3S	129.8W	ELT	321.04	321.41	321.83	0.07	321.39	
94	2	181	563	25JUN67	28.3S	129.8W	ELT	321.33	321.41	321.83	0.07	321.68	
95	2	182	563	30JUN67	28.3S	144.5W	ELT	321.04	321.41	321.83	0.09	321.36	
96	2	182	563	30JUN67	28.3S	144.5W	ELT	321.04	321.41	321.83	0.09	321.36	
C-171				30AUG67	28.3S	162.7E	NOV	321.86	321.54	321.83	0.19	321.76	
75	2	184	563	11JUL67	28.2S	173.4W	ELT	320.69	321.44	321.83	0.13	321.16	*
76	2	184	563	11JUL67	28.2S	173.4W	ELT	320.46	321.44	321.83	0.13	320.73	*
83	2	188	565	30JUL67	28.2S	155.5E	ELT	321.18	321.47	321.83	0.16	321.38	
84	2	188	565	30JUL67	28.2S	155.5E	ELT	321.33	321.47	321.83	0.16	321.53	
89	2	179	563	16JUN67	28.2S	101.8W	ELT	321.33	321.39	321.83	0.04	321.74	*

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ATMOSPHERIC CARBON DIOXIDE MEASUREMENTS, SCRIPPS INSTITUTE OF OCEANOGRAPHY
SHIP PROFILE DATA, 1967-1968

SAMPLE NO.	FIELD ANAL. SHEET NO.	FLASK SIZE	FIELD SHEET NO.	DATE OF OBSERVATION	LATI-TUDE	LONGI-TUDE	EXPEDITION	C02 CONCN. (ppm)	TREND ON OBS DATE (ppm)	TREND ON 1/1/68 (ppm)	SEASONAL ADJ'MENT (ppm)	ADJ'D C02 CONCN. (ppm)	FLAGS
98	2	179	563	16 JUN 67	28.2S	161.8W	ELT	320.75	321.39	321.83	0.04	321.16	*
C-171				29 AUG 67	28.2S	162.8E	NOV	321.85	321.54	321.83	0.19	321.76	
C-184				5 SEP 67	28.2S	174.8E	NOV	321.54	321.55	321.83	0.19	321.63	
C-167				27 AUG 67	28.1S	158.4E	NOV	320.97	321.53	321.83	0.18	321.69	
C-170				29 AUG 67	28.1S	161.2E	NOV	321.50	321.54	321.83	0.18	321.61	
C-168				29 AUG 67	27.9S	158.9E	NOV	321.40	321.54	321.84	0.17	321.62	
C-174				31 AUG 67	27.9S	166.0E	NOV	321.37	321.54	321.84	0.18	321.48	
163	2	28	574	5 SEP 67	27.8S	174.2E	NOV	321.62	321.56	321.84	0.18	321.72	
164	2	28	574	5 SEP 67	27.8S	174.2E	NOV	321.92	321.56	321.84	0.18	322.02	
157	2	25	574	28 AUG 67	27.7S	158.9E	NOV	321.18	321.54	321.84	0.17	321.31	*
158	2	25	574	28 AUG 67	27.7S	158.9E	NOV	322.20	321.54	321.84	0.17	322.33	*
C-165				22 AUG 67	27.5S	155.1E	NOV	321.53	321.53	321.84	0.16	321.68	
C-183				4 SEP 67	27.5S	173.6E	NOV	321.73	321.56	321.84	0.17	321.86	
C-178				2 SEP 67	27.4S	169.0E	NOV	321.86	321.55	321.84	0.16	321.99	
C-182				4 SEP 67	27.3S	172.7E	NOV	321.84	321.56	321.84	0.16	321.77	
C-166				23 AUG 67	27.1S	153.9E	NOV	321.53	321.53	321.84	0.14	321.70	
C-175				31 AUG 67	27.1S	166.8E	NOV	321.43	321.55	321.84	0.15	321.58	
C-181				3 SEP 67	27.0S	172.0E	NOV	321.62	321.56	321.84	0.14	321.76	
C-176				1 SEP 67	26.8S	167.5E	NOV	321.80	321.55	321.84	0.14	321.95	
C-177				1 SEP 67	26.8S	168.2E	NOV	321.54	321.56	321.84	0.14	321.69	
C-179				2 SEP 67	26.8S	169.8E	NOV	321.58	321.56	321.84	0.14	321.73	
C-183				20 AUG 67	26.7S	159.4E	NOV	321.48	321.53	321.84	0.13	321.67	
C-164				21 AUG 67	26.7S	158.2E	NOV	321.46	321.53	321.84	0.13	321.65	
161	2	27	574	3 SEP 67	26.4S	170.3E	NOV	321.62	321.56	321.85	0.12	321.79	
162	2	27	574	3 SEP 67	26.4S	170.3E	NOV	321.33	321.56	321.85	0.12	321.60	
C-180				3 SEP 67	26.4S	170.6E	NOV	321.42	321.56	321.85	0.12	321.59	
C-162				20 AUG 67	26.0S	160.4E	NOV	321.61	321.53	321.85	0.10	321.83	
81	2	217	638	13 DEC 67	25.5S	178.4E	ELT	321.62	321.81	321.85	-0.13	322.00	
82	2	217	638	13 DEC 67	25.5S	178.4E	ELT	321.48	321.81	321.85	-0.13	321.66	
C-161				19 AUG 67	25.5S	162.1E	NOV	321.37	321.54	321.85	0.08	321.61	
1	2	189	565	13 AUG 67	24.9S	156.4E	ELT	321.47	321.53	321.86	0.08	321.74	*
2	2	189	565	13 AUG 67	24.9S	155.4E	ELT	321.63	321.53	321.86	0.08	321.30	*
C-154				16 AUG 67	24.0S	167.7E	NOV	321.43	321.54	321.87	0.02	321.73	
C-160				19 AUG 67	24.0S	162.1E	NOV	321.57	321.56	321.87	0.02	321.67	
C-155				16 AUG 67	23.9S	167.3E	NOV	321.14	321.54	321.87	0.02	321.45	
C-153				16 AUG 67	23.8S	170.7E	NOV	321.66	321.54	321.87	0.01	321.96	
C-152				15 AUG 67	23.7S	171.5E	NOV	321.33	321.54	321.87	0.01	321.65	
C-157				17 AUG 67	23.4S	166.1E	NOV	321.52	321.55	321.87	-0.01	321.85	
C-156				17 AUG 67	23.2S	167.3E	NOV	321.35	321.55	321.87	-0.02	321.69	

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SHIP PROFILE DATA, 1967-1968

SAMPLE NO.	FIELD SHEET NO.	ANAL. SHEET NO.	DATE OF OBSERVATION	LATI-TUDE	LONGI-TUDE	EXPEDITION	CO2 CONCN. (ppm)	TREND ON OBS DATE (ppm)	TREND ON 1/1/68 (ppm)	SEASONAL ADJ'MENT (ppm)	ADJ'D CO2 CONCN. (ppm)	FLAGS
C-158			18AUG67	23.2S	165.2E	NOV	321.64	321.55	321.87	-0.02	321.98	
C-159			18AUG67	23.1S	163.5E	NOV	321.61	321.55	321.87	-0.02	321.96	
143	24	573	18AUG67	23.0S	165.0E	NOV	321.92	321.55	321.88	-0.03	322.27	
144	24	573	18AUG67	23.0S	165.0E	NOV	321.62	321.55	321.88	-0.03	321.97	
C-151			14AUG67	22.7S	171.6E	NOV	321.59	321.55	321.88	-0.03	321.95	
C-148			13AUG67	22.5S	169.5E	NOV	321.54	321.55	321.88	-0.04	321.91	
C-147			12AUG67	22.4S	168.2E	NOV	321.54	321.54	321.88	-0.04	321.91	
C-149			13AUG67	22.0S	171.1E	NOV	321.54	321.55	321.88	-0.07	321.94	
C-150			14AUG67	21.7S	171.9E	NOV	321.79	321.55	321.89	-0.08	322.21	
141	23	573	7AUG67	21.4S	164.1E	NOV	322.20	321.54	321.89	-0.07	322.62	*
142	23	573	7AUG67	21.4S	164.1E	NOV	322.93	321.54	321.89	-0.07	323.35	*
C-146			6AUG67	20.2S	161.4E	NOV	321.52	321.55	321.90	-0.13	323.00	
141	23	518	14FEB67	20.0S	119.0W	EST	321.67	321.26	321.90	0.14	322.17	
142	23	518	14FEB67	20.0S	119.0W	EST	321.38	321.26	321.90	0.14	321.88	
143	24	518	15FEB67	20.0S	120.7W	EST	321.38	321.26	321.90	0.14	321.88	
144	24	518	15FEB67	20.0S	120.7W	EST	321.52	321.26	321.90	0.14	322.02	
157	25	519	16FEB67	20.0S	124.3W	EST	321.10	321.26	321.90	0.15	321.59	
158	26	519	16FEB67	20.0S	124.3W	EST	321.10	321.26	321.90	0.15	321.59	
159	26	519	17FEB67	20.0S	126.0W	EST	321.52	321.26	321.90	0.15	322.00	
160	26	519	17FEB67	20.0S	126.0W	EST	321.52	321.26	321.90	0.15	322.00	
183	27	629	5MAR68	20.0S	117.4W	EST	321.94	322.05	321.90	0.22	321.57	
184	27	629	5MAR68	20.0S	117.4W	EST	321.60	322.05	321.90	0.22	321.23	
C-145			6AUG67	19.9S	160.3E	NOV	321.82	321.55	321.90	-0.14	322.31	
139	22	518	14FEB67	19.1S	119.0W	EST	321.52	321.26	321.91	0.18	321.99	
140	22	518	14FEB67	19.1S	119.0W	EST	321.38	321.26	321.91	0.18	321.85	
177	27	629	7MAR68	19.0S	111.9W	EST	324.31	322.06	321.91	0.27	323.88	*
178	27	629	7MAR68	19.0S	111.9W	EST	321.94	322.06	321.91	0.27	321.51	*
181	27	629	4MAR68	18.8S	118.9W	EST	321.94	322.06	321.91	0.27	321.52	*
182	27	629	4MAR68	18.8S	118.9W	EST	322.39	322.06	321.91	0.27	321.97	*
80	216	638	10DEC67	18.6S	176.3W	ELT	322.04	321.86	321.91	-0.09	322.18	*
161	27	521	17FEB67	18.6S	126.1W	EST	321.52	321.27	321.91	0.21	321.95	
162	27	521	17FEB67	18.6S	126.1W	EST	321.38	321.27	321.91	0.21	321.81	
C-144			5AUG67	18.5S	158.9E	NOV	321.72	321.56	321.91	-0.20	322.27	
71	18	573	18JUL67	18.0S	170.5E	NOV	322.20	321.53	321.92	-0.08	322.67	
72	18	573	18JUL67	18.0S	170.5E	NOV	321.92	321.53	321.92	-0.08	322.39	
C-118			17JUL67	18.0S	172.8E	NOV	321.78	321.53	321.92	-0.07	322.24	
C-119			17JUL67	18.0S	171.2E	NOV	321.54	321.53	321.92	-0.07	322.00	
C-120			18JUL67	18.0S	169.3E	NOV	321.14	321.53	321.92	-0.08	321.61	
C-122			19JUL67	17.9S	165.3E	NOV	321.64	321.53	321.92	-0.09	322.11	
C-121			18JUL67	17.8S	166.9E	NOV	321.47	321.53	321.92	-0.08	321.94	

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SAMPLE NO.	FLASK SIZE	FIELD SHEET NO.	ANAL. SHEET NO.	DATE OF OBSERVATION	LATI-TUDE	LONGI-TUDE	EXPEDITION	C02 CONCN. (ppm)	TREND ON OBS DATE (ppm)	TREND ON 1/1/68 (ppm)	SEASONAL ADJ'MENT (ppm)	ADJ'D C02 CONCN. (ppm)	FLAGS
C-123				19JUL67	17.7S	164.1E	NOV	321.61	321.53	321.92	-0.08	322.08	
C-125	2	190	565	20JUL67	17.6S	162.2E	NOV	321.78	321.53	321.92	-0.09	322.26	
3	2	190	565	15AUG67	17.5S	159.5E	ELT	322.20	321.59	321.92	-0.27	322.81	
4	2	190	565	15AUG67	17.6S	159.5E	ELT	321.90	321.59	321.92	-0.27	322.51	
133	2	19	573	21JUL67	17.4S	161.1E	NOV	321.62	321.54	321.92	-0.09	322.10	
134	2	19	573	21JUL67	17.4S	161.1E	NOV	321.92	321.54	321.92	-0.09	322.40	
C-124				20JUL67	17.3S	163.4E	NOV	321.81	321.54	321.92	-0.08	322.28	
C-143				5AUG67	17.1S	167.6E	NOV	321.86	321.57	321.93	-0.19	322.39	
C-117				7JUL67	16.8S	179.4W	NOV	321.52	321.51	321.93	0.01	321.92	
C-126				21JUL67	16.8S	160.2E	NOV	321.61	321.54	321.93	-0.07	322.07	
179	2	80	629	8MAR68	16.6S	111.9W	EST	328.39	322.09	321.93	0.29	327.94	*
180	2	80	629	8MAR68	16.6S	111.9W	EST	322.84	322.09	321.93	0.29	322.39	*
171	2	76	629	3MAR68	16.5S	118.0W	EST	322.28	322.08	321.93	0.29	321.85	
172	2	76	629	3MAR68	16.5S	118.0W	EST	322.50	322.08	321.93	0.29	322.07	
137	2	21	518	13FEB67	16.4S	119.0W	EST	321.80	321.28	321.93	0.24	322.21	
138	2	21	518	13FEB67	16.4S	119.0W	EST	321.52	321.28	321.93	0.24	321.93	
C-142				4AUG67	16.0S	156.0E	NOV	322.05	321.58	321.93	-0.08	322.49	
163	2	28	521	18FEB67	15.7S	126.0W	EST	321.52	321.29	321.94	0.24	321.92	
164	2	28	521	18FEB67	15.7S	126.0W	EST	321.38	321.29	321.94	0.24	321.78	
77	2	215	638	30DEC67	15.5S	175.1W	ELT	322.04	321.87	321.94	-0.08	322.19	
78	2	215	638	30DEC67	15.5S	175.1W	ELT	321.70	321.87	321.94	-0.08	321.85	
C-116				7JUL67	15.5S	178.8W	NOV	321.92	321.53	321.94	0.09	322.24	
C-127				21JUL67	15.4S	158.2E	NOV	321.93	321.55	321.94	0.08	322.23	
C-141				4AUG67	14.8S	154.8E	NOV	322.27	321.59	321.95	0.16	322.47	
C-53				16MAY67	14.5S	170.9W	NOV	322.09	321.44	321.95	-0.22	322.81	
C-140				3AUG67	14.4S	153.4E	NOV	322.34	321.59	321.95	0.25	322.45	
135	2	20	518	12FEB67	14.1S	119.0W	EST	321.52	321.29	321.95	0.21	321.96	
136	2	20	518	12FEB67	14.1S	119.0W	EST	321.38	321.29	321.95	0.21	321.82	
139	2	22	573	3AUG67	14.1S	152.8E	NOV	322.05	321.59	321.95	0.30	322.10	
140	2	22	573	3AUG67	14.1S	152.8E	NOV	322.20	321.59	321.95	0.30	322.25	
C-128				22JUL67	14.1S	156.5E	NOV	322.11	321.57	321.95	0.30	322.19	
C-54				19MAY67	14.0S	170.8W	NOV	321.60	321.45	321.95	-0.28	322.38	
173	2	81	629	9MAR68	13.8S	111.9W	EST	321.94	322.11	321.95	0.07	321.71	
174	2	81	629	9MAR68	13.8S	111.9W	EST	321.83	322.11	321.95	0.07	321.60	
C-139				3AUG67	13.8S	152.5E	NOV	322.18	321.59	321.95	0.35	322.19	
135	2	20	573	25JUL67	13.6S	149.9E	NOV	322.20	321.58	321.96	0.35	322.23	
136	2	20	573	25JUL67	13.6S	149.9E	NOV	321.92	321.58	321.96	0.35	321.95	
C-131				23JUL67	13.6S	153.1E	NOV	321.79	321.57	321.96	0.34	321.83	
C-132				24JUL67	13.6S	152.6E	NOV	321.83	321.57	321.96	0.35	321.86	

FLAGS: * REJECTED BECAUSE NO FLASK PAIR EXISTS FOR THIS DAY THAT AGREES TO WITHIN .40 PPM
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ATMOSPHERIC CARBON DIOXIDE MEASUREMENTS, SCRIPPS INSTITUTE OF OCEANOGRAPHY
SHIP PROFILE DATA, 1967-1968

SAMPLE NO.	FLASK SIZE	FIELD SHEET NO.	ANAL. SHEET NO.	DATE OF OBSERVATION	LATI-TUDE	LONGI-TUDE	EXPEDITION	CO2 CONCEN. (ppm)	TREND ON OBS DATE (ppm)	TREND ON 1/1/68 (ppm)	SEASONAL ADJ'MENT (ppm)	ADJ'D CO2 CONCEN. (ppm)	FLAGS
C-133	2	75	629	24 JUL 67	13.6S	150.9E	NOV	321.83	321.57	321.96	0.35	321.86	
169	2	76	629	2 MAR 68	13.5S	119.0W	EST	322.17	322.10	321.96	0.12	321.91	
170	2	76	629	2 MAR 68	13.5S	119.0W	EST	322.17	322.10	321.96	0.12	321.91	
5	2	191	585	17 AUG 67	13.4S	162.2E	ELT	321.62	321.63	321.96	0.34	321.61	
6	2	191	585	17 AUG 67	13.4S	162.2E	ELT	321.77	321.63	321.96	0.34	321.76	
C-52				16 MAY 67	13.4S	171.5W	NOV	322.24	321.45	321.96	-0.33	323.08	
C-134				25 JUL 67	13.4S	149.2E	NOV	321.99	321.58	321.96	0.38	322.01	
C-56				20 MAY 67	13.2S	170.9W	NOV	321.84	321.46	321.96	-0.31	322.66	
C-115				6 JUL 67	13.2S	178.4W	NOV	322.05	321.54	321.96	0.22	322.25	
35	2	6	550	15 MAY 67	13.0S	171.8W	NOV	322.74	321.45	321.96	-0.33	323.59	*
36	2	6	550	15 MAY 67	13.0S	171.8W	NOV	322.31	321.45	321.96	-0.33	323.16	*
C-51				16 MAY 67	12.6S	171.9W	NOV	322.25	321.45	321.96	-0.32	323.08	
C-138				2 AUG 67	12.6S	150.8E	NOV	322.01	321.60	321.96	0.41	321.96	
C-129				22 JUL 67	12.5S	155.0E	NOV	322.05	321.58	321.97	0.37	322.07	
C-137				2 AUG 67	12.5S	148.9E	NOV	322.09	321.60	321.97	0.41	322.04	
C-135				25 JUL 67	12.4S	147.6E	NOV	321.94	321.59	321.97	0.39	321.93	
C-130				23 JUL 67	12.3S	154.2E	NOV	322.10	321.58	321.97	0.38	322.10	
C-136				26 JUL 67	12.1S	147.3E	NOV	322.07	321.59	321.97	0.40	322.05	
C-59				27 MAY 67	11.5S	168.8W	NOV	320.96	321.48	321.97	-0.16	321.61	
C-60				27 MAY 67	11.5S	165.5W	NOV	322.37	321.48	321.97	-0.16	323.02	
133	2	19	518	11 FEB 67	11.4S	118.9W	EST	322.09	321.31	321.97	0.27	322.48	*
134	2	19	518	11 FEB 67	11.4S	118.9W	EST	321.67	321.31	321.97	0.27	322.06	*
203	2	74	628	1 MAR 68	11.4S	118.9W	EST	322.36	322.12	321.97	0.29	321.92	
204	2	74	628	1 MAR 68	11.4S	118.9W	EST	322.48	322.12	321.97	0.29	322.04	
C-58				26 MAY 67	11.4S	168.7W	NOV	320.96	321.48	321.97	-0.15	321.61	
C-56				20 MAY 67	11.3S	171.1W	NOV	321.89	321.47	321.98	-0.16	322.56	
165	2	29	521	19 FEB 67	11.2S	126.0W	EST	321.80	321.33	321.98	0.31	322.14	
166	2	29	521	19 FEB 67	11.2S	126.0W	EST	321.52	321.33	321.98	0.31	321.86	
37	2	7	550	25 MAY 67	11.1S	171.1W	NOV	320.71	321.48	321.98	-0.12	321.33	
38	2	7	550	25 MAY 67	11.1S	171.1W	NOV	320.71	321.48	321.98	-0.12	321.33	
39	2	8	550	27 MAY 67	11.1S	164.0W	NOV	323.77	321.48	321.98	-0.11	324.37	#
40	2	8	550	27 MAY 67	11.1S	164.0W	NOV	324.06	321.48	321.98	-0.11	324.66	#
C-50				16 MAY 67	11.1S	172.5W	NOV	322.55	321.48	321.98	-0.15	323.21	
C-57				26 MAY 67	11.1S	170.5W	NOV	320.89	321.48	321.98	-0.11	321.50	
C-61				28 MAY 67	11.1S	163.8W	NOV	323.74	321.49	321.98	-0.10	324.33	#
C-114				6 JUL 67	11.1S	178.3W	NOV	321.94	321.56	321.98	0.27	322.09	#
C-62				28 MAY 67	10.7S	161.8W	NOV	323.09	321.49	321.98	-0.06	323.64	#
137	2	21	573	29 JUL 67	9.8S	145.4E	NOV	321.33	321.62	321.99	0.39	321.31	
138	2	21	573	29 JUL 67	9.8S	145.4E	NOV	321.18	321.62	321.99	0.39	321.16	
167	2	30	521	20 FEB 67	9.7S	126.1W	EST	321.80	321.34	321.99	0.37	322.09	

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SHIP PROFILE DATA, 1967-1968

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168	2	36	521	20FEB67	9.7S	126.1W	EST	321.80	321.34	321.99	0.37	322.09	
C-113				6JUL67	9.6S	178.5W	NOV	322.33	321.57	321.99	0.33	322.42	
C-63				3JUN67	9.4S	161.0W	NOV	322.41	321.51	321.99	0.12	322.78	*
76	2	214	638	29NOV67	9.2S	164.3W	ELT	321.93	321.91	321.99	-0.61	322.62	
C-49				14MAY67	8.9S	173.4W	NOV	322.82	321.48	322.00	0.14	323.20	
71	2	18	518	10FEB67	8.7S	119.0W	EST	322.23	321.33	322.00	0.30	322.60	
72	2	18	518	10FEB67	8.7S	119.0W	EST	321.94	321.33	322.00	0.30	322.31	
7	2	192	565	19AUG67	8.6S	164.6E	ELT	323.08	321.67	322.00	0.19	323.22	
8	2	192	565	19AUG67	8.6S	164.6E	ELT	323.08	321.67	322.00	0.19	323.22	
201	2	73	628	29FEB68	8.5S	118.9W	EST	322.70	322.14	322.00	0.42	322.14	
202	2	73	628	29FEB68	8.5S	118.9W	EST	322.59	322.14	322.00	0.42	322.03	
59	2	62	572	20AUG67	8.4S	119.2W	EST	321.88	321.68	322.00	0.16	322.05	
60	2	62	572	20AUG67	8.4S	119.2W	EST	321.88	321.68	322.00	0.16	322.05	
181	2	31	521	20FEB67	8.3S	126.0W	EST	321.80	321.35	322.00	0.38	322.07	
182	2	31	521	20FEB67	8.3S	126.0W	EST	321.67	321.35	322.00	0.38	321.94	
C-112				6JUL67	8.1S	178.6W	NOV	323.11	321.58	322.00	0.40	323.13	
175	2	82	629	11MAR68	8.0S	111.9W	EST	322.39	322.17	322.01	0.47	321.75	
176	2	82	629	11MAR68	8.0S	111.9W	EST	322.28	322.17	322.01	0.47	321.64	
C-111				4JUL67	7.8S	178.5W	NOV	322.98	321.58	322.01	0.41	323.00	
69	2	17	573	4JUL67	7.7S	178.6W	NOV	322.79	321.58	322.01	0.41	322.80	
70	2	17	573	4JUL67	7.7S	178.6W	NOV	323.08	321.58	322.01	0.41	323.09	
C-64				3JUN67	7.3S	160.8W	NOV	322.60	321.53	322.01	0.38	322.70	
C-110				4JUL67	7.2S	178.4W	NOV	323.28	321.59	322.01	0.43	323.27	
185	2	83	630	22MAR68	7.1S	97.9W	EST	322.17	322.21	322.01	0.54	321.44	*
186	2	83	630	22MAR68	7.1S	97.9W	EST	330.34	322.21	322.01	0.54	329.61	*
C-48				14MAY67	6.7S	174.3W	NOV	322.90	321.50	322.02	0.47	322.95	
183	2	32	521	21FEB67	6.6S	126.1W	EST	321.94	321.36	322.02	0.42	322.18	
184	2	32	521	21FEB67	6.6S	126.1W	EST	321.80	321.36	322.02	0.42	322.04	
69	2	17	518	9FEB67	6.3S	119.0W	EST	322.09	321.34	322.02	0.30	322.47	
70	2	17	518	9FEB67	6.3S	119.0W	EST	322.09	321.34	322.02	0.30	322.47	
9	2	193	565	21AUG67	5.8S	167.6E	ELT	323.36	321.70	322.02	-0.09	323.77	*
10	2	193	565	21AUG67	5.8S	167.6E	ELT	322.79	321.70	322.02	-0.09	323.20	*
11	2	194	565	23AUG67	5.6S	172.1E	ELT	322.93	321.71	322.03	-0.14	323.39	*
12	2	194	565	23AUG67	5.6S	172.1E	ELT	322.49	321.71	322.03	-0.14	322.95	*
215	2	72	628	28FEB68	5.4S	118.1W	EST	323.04	322.17	322.03	0.45	322.44	
216	2	72	628	28FEB68	5.4S	118.1W	EST	323.27	322.17	322.03	0.45	322.67	
57	2	61	572	19AUG67	5.2S	118.9W	EST	322.74	321.70	322.03	-0.08	323.15	
58	2	61	572	19AUG67	5.2S	118.9W	EST	322.74	321.70	322.03	-0.08	323.15	
185	2	33	521	21FEB67	5.2S	126.0W	EST	322.51	321.37	322.03	0.38	322.79	
186	2	33	521	21FEB67	5.2S	126.0W	EST	322.51	321.37	322.03	0.38	322.79	

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SAMPLE NO.	FIELD SHEET NO.	ANAL. SHEET NO.	DATE OF OBSERVATION	LATI-TUDE	LONGI-TUDE	EXPEDITION	CO2 CONCN. (ppm)	TREND ON OBS DATE (ppm)	TREND ON 1/1/68 (ppm)	SEASONAL ADJ'MENT (ppm)	ADJ'D CO2 CONCN. (ppm)	FLAGS
C-109			3 JUL 67	5.1S	178.7W	NOV	323.40	321.60	322.03	0.48	323.35	
C-47			13 MAY 67	4.8S	175.1W	NOV	323.30	321.51	322.03	0.67	323.15	
C-65			4 JUN 67	4.7S	160.5W	NOV	322.71	321.55	322.03	0.61	322.58	
169	195	567	25 AUG 67	4.5S	176.4E	ELT	322.46	321.72	322.04	-0.22	323.00	*
170	195	567	25 AUG 67	4.5S	176.4E	ELT	322.90	321.72	322.04	-0.22	323.44	*
187	84	630	23 MAR 68	4.3S	98.0W	EST	323.97	322.24	322.04	0.64	323.13	*
188	84	630	23 MAR 68	4.3S	98.0W	EST	324.42	322.24	322.04	0.64	323.58	*
67	2	16	2 JUL 67	4.0S	178.7W	NOV	323.61	321.61	322.04	0.52	323.53	*
68	2	16	2 JUL 67	4.0S	178.7W	NOV	323.18	321.61	322.04	0.52	323.10	*
C-108			3 JUL 67	4.0S	178.8W	NOV	323.35	321.61	322.04	0.51	323.27	*
51	60	571	18 AUG 67	3.9S	118.8W	EST	322.74	321.71	322.04	-0.09	323.16	
52	60	571	18 AUG 67	3.9S	118.8W	EST	322.45	321.71	322.04	-0.09	322.87	
187	2	34	22 FEB 67	3.7S	126.0W	EST	322.51	321.38	322.04	0.33	322.84	
188	2	34	22 FEB 67	3.7S	126.0W	EST	322.38	321.38	322.04	0.33	322.71	
67	2	16	8 FEB 67	3.5S	119.0W	EST	322.21	321.36	322.05	0.15	322.75	
68	2	16	8 FEB 67	3.5S	119.0W	EST	322.21	321.36	322.05	0.15	322.75	
C-107			2 JUL 67	3.0S	178.9W	NOV	323.35	321.62	322.05	0.53	323.25	
C-46			13 MAY 67	2.6S	175.9W	NOV	323.77	321.53	322.05	0.86	323.44	
189	2	35	23 FEB 67	2.3S	126.0W	EST	322.80	321.39	322.06	0.28	323.18	
190	2	35	23 FEB 67	2.3S	126.0W	EST	322.94	321.39	322.06	0.28	323.32	
C-66			4 JUN 67	2.1S	160.1W	NOV	322.93	321.57	322.06	0.74	322.67	
C-100			2 JUL 67	1.7S	179.1W	NOV	323.60	321.63	322.06	0.50	323.53	
60	212	638	27 NOV 67	1.6S	158.6W	ELT	322.60	321.97	322.06	-0.80	323.49	*
65	2	15	7 FEB 67	1.2S	119.0W	EST	322.35	321.37	322.07	0.02	323.02	*
66	2	15	7 FEB 67	1.2S	119.0W	EST	322.21	321.37	322.07	0.02	322.88	*
49	2	59	17 AUG 67	0.9S	118.8W	EST	323.48	321.73	322.07	-0.11	323.93	*
50	2	59	17 AUG 67	0.9S	118.8W	EST	323.33	321.73	322.07	-0.11	323.78	*
191	2	36	23 FEB 67	0.8S	126.1W	EST	323.22	321.40	322.07	0.23	323.65	*
192	2	36	23 FEB 67	0.8S	126.1W	EST	322.80	321.40	322.07	0.23	323.23	*
189	2	85	25 MAR 68	0.5S	96.0W	EST	325.44	322.28	322.07	0.74	324.50	*
190	2	85	25 MAR 68	0.5S	96.0W	EST	326.23	322.28	322.07	0.74	325.29	*
213	2	71	27 FEB 68	0.5S	118.9W	EST	323.72	322.21	322.07	0.29	323.29	*
214	2	71	27 FEB 68	0.5S	118.9W	EST	323.60	322.21	322.07	0.29	323.17	*
C-105			1 JUL 67	0.4S	179.1W	NOV	323.69	321.64	322.07	0.48	323.65	*
171	2	196	27 AUG 67	0.2S	179.3E	ELT	322.75	321.76	322.08	-0.31	323.37	*
172	2	196	27 AUG 67	0.2S	179.3E	ELT	322.75	321.76	322.08	-0.31	323.37	*
C-45			12 MAY 67	0.2S	176.2W	NOV	324.01	321.54	322.08	0.98	323.56	*
211	2	70	26 FEB 68	0.0S	118.9W	EST	324.39	322.22	322.08	0.26	323.99	*
212	2	70	26 FEB 68	0.0S	118.9W	EST	326.19	322.22	322.08	0.26	325.79	*
65	2	15	30 JUN 67	0.0	179.1W	NOV	323.84	321.64	322.08	0.48	323.00	*

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66	2	15	30JUN67	0.0	179.1W	NOV	323.61	321.64	322.08	0.48	323.57	*
193	2	37	23FEB67	0.0N	126.1W	EST	322.80	321.41	322.08	0.21	323.26	
194	2	37	23FEB67	0.0N	126.1W	NOV	322.51	321.41	322.08	0.21	322.97	
41	2	9	4JUN67	0.1N	159.9W	NOV	323.04	321.59	322.08	0.78	322.75	
42	2	9	4JUN67	0.1N	159.9W	NOV	322.89	321.59	322.08	0.78	322.00	
63	2	14	6FEB67	0.1N	119.0W	EST	322.79	321.38	322.08	-0.04	323.52	
64	2	14	6FEB67	0.1N	119.0W	EST	322.79	321.38	322.08	-0.04	323.52	
C-67			5JUN67	0.4N	159.8W	NOV	323.27	321.59	322.08	0.78	322.98	
C-104			1JUL67	0.4N	179.1W	NOV	323.66	321.64	322.08	0.47	323.63	
61	2	13	6FEB67	0.8N	119.1W	EST	322.64	321.39	322.08	-0.06	323.40	
62	2	13	6FEB67	0.8N	119.1W	EST	322.79	321.39	322.08	-0.06	323.55	
33	2	5	11MAY67	1.1N	176.4W	NOV	324.06	321.55	322.09	1.08	323.52	
34	2	5	11MAY67	1.1N	176.4W	NOV	323.92	321.55	322.09	1.08	323.38	
C-44			12MAY67	1.1N	176.3W	NOV	324.18	321.55	322.09	1.07	323.64	
C-43			11MAY67	1.4N	176.7W	NOV	323.81	321.55	322.09	1.10	323.24	
56	2	58	16AUG67	1.6N	119.0W	EST	323.33	321.75	322.09	-0.18	323.85	*
47	2	12	5FEB67	1.8N	119.2W	EST	322.64	321.39	322.09	-0.08	323.43	
48	2	12	5FEB67	1.8N	119.2W	EST	322.50	321.39	322.09	-0.08	323.29	
195	2	38	24FEB67	2.1N	126.0W	EST	322.80	321.43	322.10	0.20	323.27	
196	2	38	24FEB67	2.1N	126.0W	EST	322.65	321.43	322.10	0.20	323.12	
C-103			30JUN67	2.3N	179.0W	NOV	323.55	321.65	322.10	0.50	323.50	
C-102			30JUN67	2.4N	178.9W	NOV	323.67	321.66	322.10	0.50	323.61	
C-42			11MAY67	2.5N	178.5W	NOV	324.09	321.56	322.10	1.21	323.33	
209	2	69	25FEB68	2.8N	118.9W	EST	323.15	322.24	322.10	0.23	322.79	
210	2	69	25FEB68	2.8N	118.9W	EST	322.82	322.24	322.10	0.23	322.46	
C-08			5JUN67	3.1N	159.5W	NOV	323.79	321.61	322.11	0.97	323.32	
53	2	57	15AUG67	3.6N	119.2W	EST	322.89	321.76	322.11	-0.32	323.55	*
54	2	57	15AUG67	3.6N	119.2W	EST	322.17	321.76	322.11	-0.32	322.83	*
173	2	197	28AUG67	3.7N	177.8W	ELT	322.31	321.80	322.11	-0.60	323.23	
174	2	197	28AUG67	3.7N	177.8W	ELT	322.46	321.80	322.11	-0.60	323.38	
C-101			29JUN67	3.8N	178.8W	NOV	323.89	321.67	322.11	0.61	323.73	
63	2	14	29JUN67	3.9N	178.8W	NOV	323.61	321.67	322.11	0.61	323.44	
64	2	14	29JUN67	3.9N	178.8W	NOV	323.76	321.67	322.11	0.61	323.59	
C-41			10MAY67	3.9N	179.7E	NOV	323.62	321.57	322.11	1.40	322.76	
C-100			29JUN67	3.9N	178.8W	NOV	323.96	321.67	322.11	0.61	323.79	
197	2	39	25FEB67	4.6N	126.0W	EST	322.80	321.45	322.12	0.27	323.21	
198	2	39	25FEB67	4.6N	126.0W	EST	322.80	321.45	322.12	0.27	323.21	
C-40			10MAY67	4.7N	178.4E	NOV	323.48	321.58	322.12	1.54	322.49	
C-99			26JUN67	4.7N	178.9W	NOV	323.97	321.67	322.12	0.72	323.69	
43	2	10	5JUN67	5.3N	159.2W	NOV	325.37	321.63	322.12	1.34	324.52	#

FLAGS: * REJECTED BECAUSE NO FLASK PAIR EXISTS FOR THIS DAY THAT AGREES TO WITHIN .40 PPM
REJECTED PEREMPTORILY

ATMOSPHERIC CARBON DIOXIDE MEASUREMENTS, SCRIPPS INSTITUTE OF OCEANOGRAPHY
SHIP PROFILE DATA, 1967-1968

SAMPLE NO.	FLASK SIZE	FIELD SHEET NO.	ANAL. SHEET NO.	DATE OF OBSERVATION	LATI-TUDE	LONGI-TUDE	EXPEDITION	CO2 CONCN. (ppm)	TREND ON OBS DATE (ppm)	TREND ON 1/1/68 (ppm)	SEASONAL ADJ'MENT (ppm)	ADJ'D CO2 CONCN. (ppm)	FLAGS
44	2	10	551	5 JUN67	5.3N	159.2W	NOV	325.67	321.63	322.12	1.34	324.92	#
57	2	211	638	26 NOV67	5.3N	153.6W	ELT	322.04	322.03	322.12	-0.99	323.13	
58	2	211	638	26 NOV67	5.3N	153.6W	ELT	322.15	322.12	322.12	-0.99	323.24	*
323	2	56	571	14 AUG67	5.5N	119.0W	EST	326.54	321.78	322.13	-0.52	327.41	*
324	2	56	571	14 AUG67	5.5N	119.0W	EST	322.89	321.78	322.13	-0.52	323.76	*
C-69	2	11	517	6 JUN67	5.5N	159.2W	NOV	325.63	321.63	322.13	1.37	324.76	#
45	2	11	517	4 FEB67	6.1N	119.0W	EST	322.92	321.42	322.13	0.04	323.59	
46	2	11	517	4 FEB67	6.1N	119.0W	EST	323.21	321.42	322.13	0.04	323.88	
191	2	86	630	28 MAR68	6.1N	97.8W	EST	324.65	322.35	322.13	1.11	323.32	
192	2	86	630	28 MAR68	6.1N	97.8W	EST	324.42	322.35	322.13	1.11	323.09	
C-98	2	10	517	28 JUN67	6.2N	178.9W	NOV	324.37	321.68	322.13	0.95	323.87	
43	2	10	517	3 FEB67	7.5N	119.0W	EST	322.92	321.43	322.14	0.13	323.50	
44	2	10	517	3 FEB67	7.5N	119.0W	EST	322.92	321.43	322.14	0.13	323.50	
C-39	2	40	522	9 MAY67	7.6N	177.9E	NOV	323.67	321.60	322.15	2.16	322.05	
199	2	40	522	26 FEB67	7.7N	126.1W	EST	322.51	321.47	322.15	0.43	322.76	
200	2	40	522	26 FEB67	7.7N	126.1W	EST	322.51	321.47	322.15	0.43	322.76	
C-97	2	68	627	27 JUN67	7.8N	179.1W	NOV	324.27	321.69	322.15	1.31	323.41	
207	2	68	627	23 FEB68	7.9N	118.9W	EST	323.04	322.28	322.15	0.40	322.51	
208	2	68	627	23 FEB68	7.9N	118.9W	EST	323.04	322.28	322.15	0.40	322.51	
321	2	55	571	13 AUG67	7.9N	119.2W	EST	322.17	321.80	322.15	-0.85	323.37	*
322	2	55	571	13 AUG67	7.9N	119.2W	EST	322.60	321.80	322.15	-0.85	323.80	*
C-70	2	210	637	6 JUN67	8.0N	158.9W	NOV	325.59	321.65	322.15	2.03	324.05	#
55	2	210	637	24 NOV67	8.0N	151.0W	ELT	323.28	322.06	322.15	-1.38	324.75	*
56	2	210	637	24 NOV67	8.0N	151.0W	ELT	323.28	322.06	322.15	-1.38	323.85	*
C-96	2	198	567	27 JUN67	8.6N	179.1W	NOV	324.16	321.70	322.15	1.49	323.13	#
175	2	198	567	30 AUG67	8.8N	173.4W	ELT	322.31	321.84	322.16	-1.80	324.43	#
176	2	198	567	30 AUG67	8.8N	173.4W	ELT	322.16	321.84	322.16	-1.80	324.28	#
C-65	2	41	523	27 FEB67	8.8N	126.0W	EST	322.72	321.48	322.16	0.53	322.87	
C-38	2	41	523	9 MAY67	8.9N	177.9E	NOV	323.80	321.61	322.16	2.48	321.86	
201	2	41	523	27 FEB67	9.2N	126.0W	EST	322.64	321.48	322.16	0.55	322.77	
202	2	41	523	27 FEB67	9.2N	126.0W	EST	322.50	321.48	322.16	0.55	322.63	
31	2	4	550	8 MAY67	9.3N	177.9E	NOV	324.49	321.61	322.16	2.56	322.48	
32	2	4	550	8 MAY67	9.3N	177.9E	NOV	324.21	321.61	322.16	2.56	322.20	
315	2	54	571	12 AUG67	9.4N	119.1W	EST	322.02	321.81	322.16	-1.02	323.39	
316	2	54	571	12 AUG67	9.4N	119.1W	EST	322.02	321.81	322.16	-1.02	323.39	
C-95	2	9	517	26 JUN67	9.4N	179.2W	NOV	324.46	321.70	322.16	1.71	323.21	
41	2	9	517	2 FEB67	9.6N	119.0W	EST	322.79	321.44	322.16	0.31	323.21	
42	2	9	517	2 FEB67	9.6N	119.0W	EST	322.79	321.44	322.16	0.31	323.21	
C-66	2	9	517	27 FEB67	9.8N	126.0W	EST	322.79	321.49	322.16	0.59	322.88	
C-93	2	9	517	25 JUN67	9.8N	179.1W	NOV	324.69	321.71	322.17	1.86	323.29	

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ATMOSPHERIC CARBON DIOXIDE MEASUREMENTS, SCRIPPS INSTITUTE OF OCEANOGRAPHY
SHIP PROFILE DATA, 1967-1968

SAMPLE NO.	FIELD FLASK SIZE	FIELD SHEET NO.	ANAL. SHEET NO.	DATE OF OBSERVATION	LATI-TUDE	LONGI-TUDE	EXPEDITION	CO2 CONCENT. (ppm)	TREND ON OBS DATE (ppm)	TREND ON 1/1/68 (ppm)	SEASONAL ADJ'MENT (ppm)	ADJ'D CO2 CONCENT. (ppm)	FLAGS
C-94				26 JUN 67	9.9N	179.2W	NOV	324.62	321.71	322.17	1.81	323.27	
C-37				9 MAY 67	10.1N	178.0E	NOV	324.61	321.62	322.17	2.73	322.44	
45	2	11	551	6 JUN 67	10.4N	158.9W	NOV	325.67	321.67	322.17	2.68	323.49	
46	2	11	551	6 JUN 67	10.4N	158.9W	NOV	325.96	321.67	322.17	2.68	323.78	
203	2	42	523	27 FEB 67	10.5N	126.0W	EST	322.79	321.49	322.17	0.64	322.83	
204	2	42	523	27 FEB 67	10.5N	126.0W	EST	322.79	321.49	322.17	0.64	322.83	
C-71				7 JUN 67	10.5N	158.9W	NOV	325.46	321.68	322.17	2.68	323.28	
205	2	67	627	22 FEB 68	10.6N	118.9W	EST	331.20	322.31	322.17	0.58	330.49	*
206	2	67	627	22 FEB 68	10.6N	118.9W	EST	323.38	322.31	322.17	0.58	322.67	*
C-92				25 JUN 67	11.1N	179.1W	NOV	324.84	321.72	322.18	2.08	323.22	
39	2	8	516	1 FEB 67	11.2N	119.3W	EST	322.64	321.45	322.18	0.44	322.93	
40	2	8	516	1 FEB 67	11.2N	119.3W	EST	322.64	321.45	322.18	0.44	322.93	
C-36				8 MAY 67	11.4N	177.9E	NOV	324.70	321.62	322.18	2.98	322.28	
C-67				28 FEB 67	11.6N	126.0W	EST	322.66	321.60	322.18	0.77	322.57	
313	2	53	571	11 AUG 67	11.9N	119.1W	EST	321.29	321.82	322.18	-1.25	322.90	
314	2	53	571	11 AUG 67	11.9N	119.1W	EST	321.68	321.82	322.18	-1.25	323.19	
C-91				24 JUN 67	12.4N	179.1W	NOV	324.87	321.72	322.19	2.31	323.02	
C-72				7 JUN 67	13.0N	158.6W	NOV	325.39	321.69	322.19	3.10	322.79	
177	2	199	567	1 SEP 67	13.2N	169.5W	ELT	321.01	321.88	322.20	-2.72	324.04	*
178	2	199	567	1 SEP 67	13.2N	169.5W	ELT	320.42	321.88	322.20	-2.72	323.45	*
C-68				28 FEB 67	13.2N	126.0W	EST	323.08	321.51	322.20	0.93	322.84	
199	2	66	627	21 FEB 68	13.4N	119.0W	EST	323.27	322.33	322.20	0.83	322.30	
200	2	66	627	21 FEB 68	13.4N	119.0W	EST	323.27	322.33	322.20	0.83	322.30	
205	2	43	523	28 FEB 67	13.5N	126.0W	EST	323.35	321.51	322.20	0.94	323.10	
206	2	43	523	28 FEB 67	13.5N	126.0W	EST	323.06	321.51	322.20	0.94	322.81	
C-90				24 JUN 67	13.5N	179.2W	NOV	324.79	321.73	322.20	2.38	322.87	
37	2	7	516	31 JAN 67	13.8N	119.0W	EST	322.21	321.46	322.20	0.59	322.36	
38	2	7	516	31 JAN 67	13.8N	119.0W	EST	322.50	321.46	322.20	0.59	322.65	
C-35				7 MAY 67	14.3N	177.9E	NOV	325.04	321.64	322.20	3.18	322.42	
C-69				1 MAR 67	14.4N	126.0W	EST	322.97	321.52	322.21	1.01	322.65	
319	2	52	570	10 AUG 67	14.6N	119.1W	EST	321.88	321.84	322.21	-1.24	323.48	
320	2	52	570	10 AUG 67	14.6N	119.1W	EST	321.58	321.84	322.21	-1.24	323.18	
47	2	12	551	7 JUN 67	15.1N	158.4W	NOV	325.23	321.71	322.21	3.05	322.68	
48	2	12	551	7 JUN 67	15.1N	158.4W	NOV	325.37	321.71	322.21	3.05	322.82	
C-89				23 JUN 67	15.2N	179.3W	NOV	324.79	321.74	322.21	2.37	322.89	
C-73				8 JUN 67	15.3N	168.4W	NOV	325.26	321.71	322.21	3.01	322.75	
207	2	44	523	1 MAR 67	15.5N	126.0W	EST	323.35	321.53	322.22	1.15	322.89	
208	2	44	523	1 MAR 67	15.5N	126.0W	EST	323.21	321.53	322.22	1.15	322.75	
C-70				1 MAR 67	15.7N	126.0W	EST	323.25	321.53	322.22	1.18	322.76	
C-88				23 JUN 67	15.8N	179.2W	NOV	324.87	321.75	322.22	2.32	323.02	

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SHIP PROFILE DATA, 1967-1968

SAMPLE NO.	FIELD SHEET NO.	ANAL. SHEET NO.	DATE OF OBSERVATION	LATI-TUDE	LONGI-TUDE	EXPEDITION	CO2 CONCEN. (ppm)	TREND ON OBS DATE (ppm)	TREND ON 1/1/68 (ppm)	SEASONAL ADJ.'MENT (ppm)	ADJ.'D CO2 CONCEN. (ppm)	FLAGS
C-87			22 JUN67	15.9N	179.1W	NOV	325.27	321.75	322.22	2.36	323.38	
61	13	572	22 JUN67	16.0N	179.2W	NOV	324.78	321.75	322.22	2.35	322.90	
62	13	572	22 JUN67	16.0N	179.2W	NOV	325.08	321.75	322.22	2.35	323.20	
C-86			22 JUN67	16.0N	178.8W	NOV	325.17	321.75	322.22	2.35	323.29	
53	209	637	22 NOV67	16.1N	145.7W	ELT	320.81	322.12	322.22	-2.28	323.19	*
35	6	516	30 JAN67	16.5N	119.1W	EST	323.35	321.48	322.22	0.80	323.29	
36	6	516	30 JAN67	16.5N	119.1W	EST	323.35	321.48	322.22	0.80	323.29	
197	2	65	20 FEB68	16.5N	119.0W	EST	323.27	322.35	322.22	1.17	321.97	
198	2	65	20 FEB68	16.5N	119.0W	EST	323.27	322.35	322.22	1.17	321.97	
C-34			7 MAY67	16.5N	178.0E	NOV	325.26	321.68	322.22	3.13	322.69	
C-85			21 JUN67	16.5N	177.0W	NOV	325.01	321.75	322.22	2.36	323.13	
C-84			21 JUN67	16.9N	174.9W	NOV	325.13	321.75	322.23	2.32	323.29	
C-74			8 JUN67	17.1N	158.3W	NOV	325.45	321.73	322.23	2.88	323.07	
179	2	567	3 SEP67	17.2N	165.7W	ELT	319.55	321.92	322.23	-2.93	322.79	*
180	2	567	3 SEP67	17.2N	165.7W	ELT	320.14	321.92	322.23	-2.93	323.38	*
C-71			2 MAR67	17.3N	126.0W	EST	323.59	321.54	322.23	1.44	322.84	
C-83			20 JUN67	17.5N	172.9W	NOV	325.23	321.76	322.23	2.29	323.42	
C-33			6 MAY67	18.1N	177.8E	NOV	325.35	321.67	322.24	3.16	322.76	
C-82			20 JUN67	18.1N	170.7W	NOV	325.27	321.76	322.24	2.18	323.56	
C-75			9 JUN67	18.4N	158.1W	NOV	325.53	321.74	322.24	2.68	323.35	
195	2	64	19 FEB68	18.5N	118.9W	EST	323.38	322.37	322.24	1.46	321.79	
196	2	64	19 FEB68	18.5N	118.9W	EST	323.49	322.37	322.24	1.46	321.90	
C-81			19 JUN67	18.5N	169.0W	NOV	325.39	321.76	322.24	2.15	323.72	
33	5	516	29 JAN67	18.6N	119.0W	EST	323.06	321.49	322.24	1.07	322.74	
34	5	516	29 JAN67	18.6N	119.0W	EST	323.35	321.49	322.24	1.07	323.03	
C-72			2 MAR67	18.8N	126.0W	EST	323.60	321.55	322.24	1.66	322.63	
C-80			19 JUN67	18.9N	166.9W	NOV	325.31	321.76	322.24	2.06	323.73	
317	2	51	8 AUG67	19.3N	118.9W	EST	321.29	321.88	322.25	-2.02	323.68	
318	2	51	8 AUG67	19.3N	118.9W	EST	321.29	321.88	322.25	-2.02	323.68	
51	2	637	21 NOV67	19.4N	142.9W	ELT	322.27	322.14	322.25	-1.90	324.28	*
209	2	45	2 MAR67	19.5N	126.1W	EST	323.64	321.56	322.25	1.74	322.59	
210	2	45	2 MAR67	19.5N	126.1W	EST	323.64	321.56	322.25	1.74	322.59	
C-79			18 JUN67	19.5N	165.1W	NOV	325.61	321.77	322.25	1.98	324.12	
C-78			18 JUN67	19.9N	163.4W	NOV	325.89	321.77	322.25	1.88	324.49	
31	2	4	28 JAN67	20.0N	119.0W	EST	324.20	321.50	322.25	1.23	323.72	#
32	2	4	28 JAN67	20.0N	119.0W	EST	323.91	321.50	322.25	1.23	323.43	#
211	2	46	2 MAR67	20.0N	126.0W	EST	323.77	321.56	322.25	1.80	322.66	
212	2	46	2 MAR67	20.0N	126.0W	EST	323.64	321.56	322.25	1.80	322.53	
C-73			3 MAR67	20.4N	125.9W	EST	323.92	321.56	322.25	1.86	322.75	
C-32			6 MAY67	20.5N	177.1E	NOV	325.48	321.68	322.25	3.15	322.90	

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SAMPLE NO.	FIELD SHEET NO.	ANAL. SHEET NO.	DATE OF OBSERVATION	LATI-TUDE	LONGI-TUDE	EXPEDITION	C02 CONCEN. (ppm)	TREND ON OBS DATE (ppm)	TREND ON 1/1/68 (ppm)	SEASONAL ADJ'MENT (ppm)	ADJ'D C02 CONCEN. (ppm)	FLAGS
C-77			17JUN67	20.6N	160.9W	NOV	325.51	321.77	322.25	1.79	324.21	
C-76			17JUN67	20.9N	159.6W	NOV	325.96	321.77	322.25	1.73	324.72	
29	3	516	28JAN67	21.0N	117.4W	EST	323.06	321.50	322.25	1.35	322.47	
30	3	516	27JAN67	21.2N	118.9W	EST	323.21	321.50	322.25	1.34	322.62	
27	2	516	27JAN67	21.2N	118.9W	EST	323.06	321.50	322.25	1.34	322.47	*
28	2	627	18FEB68	21.3N	118.6W	EST	325.29	322.38	322.25	1.78	323.39	*
193	2	63	18FEB68	21.3N	118.6W	EST	324.28	322.38	322.25	1.78	322.38	*
194	2	63										
C-31			5MAY67	21.4N	176.8E	NOV	325.53	321.68	322.25	3.15	322.95	*
13	201	567	5SEP67	21.7N	162.0W	ELT	319.70	321.95	322.25	-3.83	323.83	*
14	201	567	5SEP67	21.7N	162.0W	ELT	319.27	321.95	322.25	-3.83	323.40	*
C-74			3MAR67	22.1N	125.5W	EST	324.45	321.56	322.25	2.02	323.12	
213	2	523	3MAR67	22.3N	125.4W	EST	324.49	321.56	322.25	2.03	323.15	
214	2	523	3MAR67	22.3N	125.4W	EST	324.49	321.56	322.25	2.03	323.15	
C-75			4MAR67	23.1N	124.3W	EST	323.91	321.56	322.25	2.11	322.49	
C-30			5MAY67	23.2N	176.3E	NOV	325.80	321.68	322.25	3.18	323.19	
215	2	523	4MAR67	23.9N	122.8W	EST	323.92	321.56	322.25	2.16	322.45	
216	2	523	4MAR67	23.9N	122.8W	EST	323.77	321.56	322.25	2.16	322.30	
C-76			4MAR67	24.0N	122.7W	EST	323.82	321.56	322.25	2.16	322.35	
217	2	524	4MAR67	24.5N	121.7W	EST	324.35	321.56	322.25	2.19	322.85	
218	2	524	4MAR67	24.5N	121.7W	EST	324.35	321.56	322.25	2.19	322.85	
C-77			5MAR67	25.6N	121.4W	EST	324.35	321.56	322.25	2.23	322.77	
15	202	567	7SEP67	25.3N	158.3W	ELT	319.55	321.95	322.25	-4.37	324.22	
16	202	567	7SEP67	25.3N	158.3W	ELT	319.27	321.95	322.25	-4.37	323.94	
25	2	516	26JAN67	25.3N	118.3W	EST	323.35	321.49	322.25	1.60	322.51	
26	2	516	26JAN67	25.3N	118.3W	EST	323.35	321.49	322.25	1.60	322.51	
C-29			4MAY67	25.3N	176.0E	NOV	325.64	321.68	322.25	3.26	322.95	
C-28			4MAY67	25.7N	176.1E	NOV	325.56	321.68	322.25	3.27	322.86	
29	3	550	3MAY67	25.8N	176.0E	NOV	325.52	321.68	322.25	3.29	322.81	*
30	3	550	3MAY67	25.8N	176.0E	NOV	325.96	321.68	322.25	3.29	323.25	*
C-27			3MAY67	26.0N	176.6E	NOV	325.63	321.68	322.25	3.30	322.91	
C-26			3MAY67	26.7N	178.8E	NOV	325.33	321.68	322.25	3.33	322.57	
C-78			5MAR67	27.3N	120.3W	EST	324.27	321.57	322.25	2.32	322.63	
C-25			2MAY67	27.4N	179.3W	NOV	325.11	321.68	322.25	3.38	322.31	
219	2	524	5MAR67	27.8N	120.0W	EST	324.49	321.57	322.25	2.34	322.84	
220	2	50	5MAR67	27.8N	120.0W	EST	324.35	321.57	322.25	2.34	322.70	
17	2	568	9SEP67	27.9N	152.6W	ELT	318.40	321.96	322.25	-4.65	323.35	*
18	2	568	9SEP67	27.9N	152.6W	ELT	317.97	321.96	322.25	-4.65	322.92	*
C-24			2MAY67	28.1N	177.6W	NOV	325.18	321.68	322.25	3.42	322.34	
C-23			1MAY67	28.7N	176.1W	NOV	325.89	321.67	322.25	3.46	323.01	

FLAGS: * REJECTED BECAUSE NO FLASK PAIR EXISTS FOR THIS DAY THAT AGREES TO WITHIN .40 PPM
REJECTED PEREMPTORILY

ATMOSPHERIC CARBON DIOXIDE MEASUREMENTS, SCRIPPS INSTITUTE OF OCEANOGRAPHY
SHIP PROFILE DATA, 1967-1968

SAMPLE NO.	FIELD SHEET NO.	ANAL. SHEET NO.	DATE OF OBSERVATION	LATI-TUDE	LONGI-TUDE	EXPEDITION	CO2 CONCEN. (ppm)	TREND ON OBS DATE (ppm)	TREND ON 1/1/68 (ppm)	SEASONAL ADJ'MENT (ppm)	ADJ'D CO2 CONCEN. (ppm)	FLAGS
C-79			6MAR67	29.2N	119.2W	EST	324.78	321.57	322.25	2.39	323.07	
C-22			1MAY67	29.6N	173.8W	NOV	326.47	321.67	322.25	3.51	323.53	
19	204	568	11SEP67	30.2N	146.7W	ELT	320.72	321.98	322.25	-4.83	325.84	#
20	2	568	11SEP67	30.2N	146.7W	ELT	320.57	321.98	322.25	-4.83	325.69	#
C-21			30APR67	30.4N	171.6W	NOV	326.73	321.67	322.25	3.57	323.74	
C-20			30APR67	31.6N	169.3W	NOV	326.89	321.67	322.25	3.61	323.86	
C-19			29APR67	31.5N	167.3W	NOV	326.75	321.67	322.25	3.65	323.69	
27	2	549	28APR67	31.6N	166.6W	NOV	326.83	321.67	322.25	3.66	323.76	
28	2	549	28APR67	31.6N	166.6W	NOV	326.83	321.67	322.25	3.66	323.76	
C-17			28APR67	31.6N	166.1W	NOV	326.06	321.67	322.25	3.66	322.99	
C-18			29APR67	31.6N	166.8W	NOV	326.69	321.67	322.25	3.65	323.62	
C-16			28APR67	32.2N	163.4W	NOV	325.35	321.67	322.25	3.69	322.24	
21	205	570	13SEP67	32.3N	140.2W	ELT	319.27	321.97	322.25	-4.95	324.50	*
22	2	570	13SEP67	32.3N	140.2W	ELT	320.14	321.97	322.25	-4.95	325.37	*
C-15			27APR67	32.6N	160.3W	NOV	325.46	321.67	322.25	3.72	322.33	
C-14			27APR67	33.1N	158.4W	NOV	325.29	321.67	322.25	3.75	322.12	
49	207	637	17NOV67	33.2N	130.3W	ELT	322.15	322.13	322.25	-0.12	322.39	*
C-13			26APR67	33.4N	156.5W	NOV	325.06	321.66	322.25	3.77	321.88	
C-12			26APR67	33.7N	154.5W	NOV	324.47	321.66	322.25	3.79	321.27	
C-11			25APR67	33.9N	151.8W	NOV	325.45	321.66	322.25	3.79	322.25	
C-10			25APR67	34.1N	149.6W	NOV	326.27	321.66	322.25	3.81	323.05	
C-1			20APR67	34.2N	130.4W	NOV	326.08	321.65	322.25	3.76	322.92	
25	2	548	23APR67	34.3N	146.1W	NOV	327.12	321.66	322.25	3.80	323.91	
26	2	548	23APR67	34.3N	146.1W	NOV	326.98	321.66	322.25	3.80	323.77	
C-2			21APR67	34.3N	131.8W	NOV	325.61	321.66	322.25	3.78	322.43	
C-8			24APR67	34.3N	146.3W	NOV	327.16	321.66	322.25	3.81	323.94	
C-9			24APR67	34.4N	147.6W	NOV	326.52	321.66	322.25	3.81	323.30	
C-7			23APR67	34.4N	145.7W	NOV	326.58	321.66	322.25	3.81	323.36	
C-3			21APR67	34.5N	134.6W	NOV	326.12	321.66	322.25	3.79	322.92	
C-6			23APR67	34.5N	143.2W	NOV	326.10	321.66	322.25	3.82	322.88	
C-4			22APR67	34.6N	137.6W	NOV	326.02	321.66	322.25	3.81	322.80	
C-5			22APR67	34.6N	140.5W	NOV	325.90	321.66	322.25	3.81	322.68	
23	206	570	16SEP67	34.9N	132.2W	ELT	317.98	321.97	322.25	-5.00	323.25	*
24	2	570	16SEP67	34.9N	132.2W	ELT	319.57	321.97	322.25	-5.00	324.84	*

FLAGS: * REJECTED BECAUSE NO FLASK PAIR EXISTS FOR THIS DAY THAT AGREES TO WITHIN .40 PPM
REJECTED PEREMPTORILY

ATMOSPHERIC CARBON DIOXIDE MEASUREMENTS, SCRIPPS INSTITUTE OF OCEANOGRAPHY
 FGGE SHUTTLE EXPEDITION, 1979-1980

SAMPLE NO.	FLASK SIZE	FIELD SHEET NO.	ANAL. SHEET NO.	DATE OF OBSERVATION	LATI-TUDE	LONGI-TUDE	EXPEDITION	LEG	CO2 CONCENTRATION			FLAGS
									1980 CALIB. (ppm)	1981 CALIB. (ppm)	1985 CALIB. (ppm)	
I-397	5	1	1383	6FEB79	18.0N	154.0W	FGE	1S	337.14	337.12	337.18	•
I-398	5	1	1383	6FEB79	18.0N	154.0W	FGE	1S	358.34	358.33	358.42	•
I-399	5	2	1383	7FEB79	16.0N	150.0W	FGE	1S	337.71	337.70	337.75	• RP
I-400	5	2	1383	7FEB79	16.0N	150.0W	FGE	1S	337.71	337.70	337.75	• RP
I-401	5	3	1383	8FEB79	14.0N	150.0W	FGE	1S	337.47	337.46	337.51	• RP
I-402	5	3	1384	8FEB79	14.0N	150.0W	FGE	1S	337.55	337.54	337.60	• RP
I-403	5	4	1384	9FEB79	12.0N	150.0W	FGE	1S	337.50	337.49	337.55	• RP
I-404	5	4	1384	9FEB79	12.0N	150.0W	FGE	1S	337.50	337.49	337.55	• RP
I-405	5	6	1384	9FEB79	10.0N	150.0W	FGE	1S	336.19	336.18	336.23	•
I-406	5	5	1384	9FEB79	10.0N	150.0W	FGE	1S	336.14	336.12	336.18	•
I-407	5	6	1384	10FEB79	8.0N	150.0W	FGE	1S	346.94	346.92	347.00	•
I-408	5	6	1384	10FEB79	8.0N	150.0W	FGE	1S	352.56	352.54	352.62	•
I-409	5	7	1384	11FEB79	6.0N	150.0W	FGE	1S	336.09	336.07	336.12	•
I-410	5	7	1385	11FEB79	6.0N	150.0W	FGE	1S	336.16	336.15	336.20	•
I-411	5	8	1385	12FEB79	4.0N	150.0W	FGE	1S	336.16	336.15	336.20	•
I-412	5	8	1386	12FEB79	4.0N	150.0W	FGE	1S	336.16	336.14	336.19	•
I-413	5	9	1386	12FEB79	3.0N	150.0W	FGE	1S	336.15	336.14	336.19	•
I-414	5	9	1386	12FEB79	3.0N	150.0W	FGE	1S	336.05	336.03	336.09	•
I-415	5	10	1386	12FEB79	2.0N	150.0W	FGE	1S	336.05	336.03	336.09	•
I-416	5	10	1386	13FEB79	2.0N	150.0W	FGE	1S	338.10	336.08	336.14	•
I-417	5	11	1386	13FEB79	1.0N	150.0W	FGE	1S	341.73	341.72	341.78	• AI
I-418	5	11	1387	13FEB79	1.0N	150.0W	FGE	1S	336.17	336.16	336.21	•
I-419	5	12	1387	14FEB79	0.0N	150.0W	FGE	1S	336.50	336.49	336.54	•
I-420	5	12	1387	14FEB79	0.0N	150.0W	FGE	1S	336.45	336.44	336.49	•
I-421	5	12	1387	15FEB79	0.0N	152.0W	FGE	1N	336.26	336.25	336.30	•
I-422	5	13	1387	15FEB79	0.0N	152.0W	FGE	1N	336.17	336.16	336.21	•
I-423	5	14	1387	15FEB79	1.0N	153.0W	FGE	1N	336.35	336.33	336.39	•
I-424	5	14	1388	15FEB79	2.0N	153.0W	FGE	1N	336.35	336.33	336.39	•
I-425	5	15	1388	15FEB79	2.0N	153.0W	FGE	1N	336.35	336.33	336.39	•
I-426	5	15	1388	15FEB79	2.0N	153.0W	FGE	1N	336.35	336.33	336.39	•
I-427	5	16	1388	16FEB79	3.0N	153.0W	FGE	1N	336.55	336.53	336.58	•
I-428	5	16	1388	16FEB79	3.0N	153.0W	FGE	1N	336.49	336.48	336.54	•
I-429	5	17	1388	16FEB79	4.0N	153.0W	FGE	1N	336.55	336.53	336.58	•
I-430	5	17	1388	16FEB79	4.0N	153.0W	FGE	1N	336.40	336.39	336.44	•
I-431	5	18	1389	17FEB79	6.0N	153.0W	FGE	1N	336.58	336.56	336.62	•
I-432	5	18	1389	17FEB79	6.0N	153.0W	FGE	1N	336.62	336.60	336.67	•
I-433	5	19	1389	18FEB79	8.0N	153.0W	FGE	1N	336.81	336.79	336.85	•
I-434	5	19	1389	18FEB79	8.0N	153.0W	FGE	1N	336.94	336.93	339.00	•
I-435	5	20	1389	18FEB79	10.0N	153.0W	FGE	1N	336.53	336.51	336.57	•
I-436	5	20	1390	18FEB79	10.0N	153.0W	FGE	1N	336.44	336.43	336.49	•
I-437	5	21	1390	19FEB79	12.0N	153.0W	FGE	1N	336.63	336.62	336.67	•
I-438	5	21	1390	19FEB79	12.0N	153.0W	FGE	1N	336.44	336.43	336.49	•
I-439	5	22	1390	20FEB79	14.0N	153.0W	FGE	1N	336.82	336.80	336.86	• AI

REJECTED BECAUSE NO FLASK PAIR EXISTS FOR THIS DAY THAT AGREES TO WITHIN .26 PPM
 (FOR LETTER CODES SEE LAST PAGE OF TABLE)

ATMOSPHERIC CARBON DIOXIDE MEASUREMENTS, SCRIPPS INSTITUTE OF OCEANOGRAPHY
 FGCE SHUTTLE EXPEDITION, 1979-1980

SAMPLE NO.	FIELD SHEET NO.	ANAL. SHEET NO.	DATE OF OBSERVATION	LATI-TUDE	LONGI-TUDE	EXPEDITION	LEG	CO2 CONCENTRATION			FLAGS
								1980 CALIB. (ppm)	1981 CALIB. (ppm)	1985 CALIB. (ppm)	
I-440	5	22	20FEB79	14.0N	153.0W	FGE	1N	337.10	337.08	337.14	*
I-441	5	23	20FEB79	16.0N	153.0W	FGE	1N	337.10	337.08	337.14	
I-442	5	23	20FEB79	16.0N	153.0W	FGE	1N	337.10	337.08	337.14	
I-443	5	24	23FEB79	16.0N	158.0W	FGE	1N	336.91	336.90	336.96	
I-444	5	24	23FEB79	16.0N	158.0W	FGE	1N	337.08	337.04	337.10	
I-445	5	25	24FEB79	18.0N	158.0W	FGE	1N	337.18	337.17	337.23	
I-446	5	25	24FEB79	18.0N	158.0W	FGE	1N	337.10	337.08	337.14	
I-447	5	26	25FEB79	20.0N	158.0W	FGE	1N	336.70	336.69	336.76	
I-448	5	26	25FEB79	20.0N	158.0W	FGE	1N	336.59	336.57	336.63	
I-451	5	27	3MAR79	20.0N	158.0W	FGE	2	337.62	337.60	337.66	
I-452	5	27	3MAR79	20.0N	158.0W	FGE	2	337.62	337.60	337.66	
I-453	5	28	4MAR79	18.0N	158.0W	FGE	2	337.62	337.60	337.66	
I-454	5	28	4MAR79	18.0N	158.0W	FGE	2	337.66	337.65	337.71	
I-455	5	29	4MAR79	16.0N	158.0W	FGE	2	339.84	339.83	339.90	*
I-456	5	29	4MAR79	16.0N	158.0W	FGE	2	337.57	337.55	337.61	
I-457	5	30	5MAR79	14.0N	158.0W	FGE	2	337.58	337.56	337.62	
I-458	5	30	5MAR79	14.0N	158.0W	FGE	2	337.71	337.70	337.76	
I-459	5	31	13MAR79	2.0S	153.0W	FGE	2	337.07	337.05	337.11	
I-460	5	31	1418	2.0S	153.0W	FGE	2	337.11	337.09	337.15	
I-462	5	32	1418	1.0S	153.0W	FGE	2	337.02	337.01	337.06	
I-465	5	33	1420	1.0N	153.0W	FGE	2	336.72	336.71	336.76	
I-465	5	33	1420	1.0N	153.0W	FGE	2	336.54	336.52	336.58	
I-466	5	34	1420	0.0N	153.0W	FGE	2	337.32	337.30	337.36	
I-467	5	34	1420	0.0N	153.0W	FGE	2	337.09	337.07	337.12	
I-467	5	35	1420	2.0N	153.0W	FGE	2	336.86	336.84	336.90	
I-469	5	36	1420	3.0N	153.0W	FGE	2	336.81	336.79	336.84	
I-470	5	36	1420	3.0N	153.0W	FGE	2	346.36	346.35	346.41	*
I-471	5	37	1421	4.0N	153.0W	FGE	2	337.28	337.26	337.31	*
I-472	5	37	1421	4.0N	153.0W	FGE	2	356.32	356.31	356.40	*
I-473	5	38	1421	6.0N	153.0W	FGE	2	337.71	337.71	337.76	
I-474	5	38	1421	6.0N	153.0W	FGE	2	337.53	337.51	337.57	
I-475	5	39	1421	8.0N	153.0W	FGE	2	337.24	337.23	337.30	
I-476	5	39	1421	8.0N	153.0W	FGE	2	337.30	337.28	337.35	
I-477	5	40	1421	10.0N	153.0W	FGE	2	337.63	337.61	337.67	
I-478	5	40	1421	12.0N	153.0W	FGE	2	337.98	337.97	338.04	
I-479	5	41	1422	12.0N	153.0W	FGE	2	337.75	337.74	337.80	
I-480	5	41	1422	12.0N	153.0W	FGE	2	337.94	337.93	337.99	
I-481	5	42	1422	4.0S	150.0W	FGE	2	336.65	336.64	336.69	
I-482	5	42	1422	4.0S	150.0W	FGE	2	336.74	336.73	336.78	
I-483	5	43	1422	6.0S	150.0W	FGE	2	336.65	336.64	336.69	
I-484	5	43	1422	6.0S	150.0W	FGE	2	336.46	336.45	336.50	
I-485	5	44	1422	8.0S	150.0W	FGE	2	336.18	336.17	336.22	

FLAGS: * REJECTED BECAUSE NO FLASK PAIR EXISTS FOR THIS DAY THAT AGREES TO WITHIN .25 PPM
 (FOR LETTER CODES SEE LAST PAGE OF TABLE)

ATMOSPHERIC CARBON DIOXIDE MEASUREMENTS, SCRIPPS INSTITUTE OF OCEANOGRAPHY
 FGCE SHUTTLE EXPEDITION, 1979-1980

SAMPLE NO.	FLASK SIZE	FIELD SHEET NO.	ANAL. SHEET NO.	DATE OF OBSERVATION	LATI-TUDE	LONGI-TUDE	EXPEDITION	LEG	CO2 CONCENTRATION			FLAGS
									1980 CALIB. (ppm)	1981 CALIB. (ppm)	1985 CALIB. (ppm)	
I-486	5	44	1422	25MAR79	8.0S	150.0W	FGCE	2	336.18	336.17	336.22	
I-487	5	45	1423	26MAR79	10.0S	150.0W	FGCE	2	335.65	335.64	335.69	
I-488	5	45	1423	26MAR79	10.0S	150.0W	FGCE	2	335.69	335.68	335.73	
I-489	5	46	1423	27MAR79	12.0S	150.0W	FGCE	2	335.69	335.68	335.73	
I-490	5	46	1423	27MAR79	12.0S	150.0W	FGCE	2	335.69	335.69	335.64	
I-491	5	47	1423	27MAR79	14.0S	150.0W	FGCE	2	335.14	335.13	335.19	
I-492	5	47	1423	27MAR79	14.0S	150.0W	FGCE	2	335.66	335.65	335.10	
I-493	5	48	1423	28MAR79	16.0S	150.0W	FGCE	2	335.29	335.28	335.32	
I-494	5	48	1423	28MAR79	16.0S	150.0W	FGCE	2	335.24	335.22	335.27	
I-495	5	49	1424	28MAR79	17.0S	150.0W	FGCE	2	335.50	335.48	335.53	
I-496	5	49	1424	28MAR79	17.0S	150.0W	FGCE	2	335.32	335.31	335.35	
I-499	5	50	1424	3APR79	17.0S	150.0W	FGCE	3	335.42	335.40	335.44	
I-500	5	50	1424	3APR79	17.0S	150.0W	FGCE	3	335.42	335.40	335.44	
I-501	5	51	1424	4APR79	16.0S	150.0W	FGCE	3	343.29	343.28	343.30	* AP
I-502	5	51	1424	4APR79	16.0S	150.0W	FGCE	3	335.04	335.03	336.07	
I-505	5	52	1424	5APR79	13.0S	150.0W	FGCE	3	336.53	336.51	336.58	* RP
I-506	5	52	1424	5APR79	13.0S	150.0W	FGCE	3	336.72	336.70	336.75	* RP
I-507	5	53	1425	6APR79	8.0S	150.0W	FGCE	3	336.53	336.51	336.56	
I-508	5	53	1425	6APR79	8.0S	150.0W	FGCE	3	336.53	336.51	336.56	
I-509	5	54	1425	7APR79	6.0S	150.0W	FGCE	3	337.18	337.17	337.21	*
I-510	5	54	1425	7APR79	6.0S	150.0W	FGCE	3	369.89	369.87	369.89	*
I-511	5	55	1425	18APR79	4.0N	153.0W	FGCE	3	338.96	338.94	338.98	*
I-512	5	55	1425	18APR79	4.0N	153.0W	FGCE	3	339.33	339.32	339.36	*
I-513	5	56	1427	18APR79	3.0N	153.0W	FGCE	3	338.10	338.09	338.13	*
I-514	5	56	1427	18APR79	3.0N	153.0W	FGCE	3	353.15	353.13	353.17	*
I-515	5	57	1428	19APR79	2.0N	153.0W	FGCE	3	337.72	337.70	337.74	*
I-516	5	57	1428	19APR79	2.0N	153.0W	FGCE	3	337.86	337.84	337.89	*
I-517	5	58	1428	19APR79	1.0N	153.0W	FGCE	3	338.40	338.39	338.44	* RP
I-518	5	58	1428	19APR79	1.0N	153.0W	FGCE	3	338.32	338.31	338.35	* RP
I-521	5	59	1428	20APR79	0.0N	153.0W	FGCE	3	337.10	337.09	337.13	
I-522	5	59	1428	20APR79	0.0N	153.0W	FGCE	3	337.66	337.65	337.69	
I-519	5	60	1428	20APR79	1.0S	153.0W	FGCE	3	337.34	337.33	337.37	
I-520	5	60	1428	20APR79	1.0S	153.0W	FGCE	3	337.34	337.33	337.37	
I-523	5	61	1429	21APR79	2.0S	153.0W	FGCE	3	337.66	337.65	337.68	
I-524	5	61	1429	21APR79	2.0S	153.0W	FGCE	3	337.61	337.60	337.63	
I-525	5	62	1429	21APR79	4.0S	153.0W	FGCE	3	337.24	337.22	337.26	
I-526	5	62	1429	21APR79	4.0S	153.0W	FGCE	3	337.24	337.22	337.26	
I-527	5	63	1429	27APR79	6.0N	158.0W	FGCE	3	338.31	338.30	338.34	
I-528	5	63	1430	27APR79	6.0N	158.0W	FGCE	3	338.57	338.56	338.60	* AP
I-529	5	64	1430	27APR79	8.0N	158.0W	FGCE	3	338.49	338.48	338.51	
I-530	5	64	1430	27APR79	8.0N	158.0W	FGCE	3	338.39	338.37	338.41	*
I-531	5	65	1430	28APR79	10.0N	158.0W	FGCE	3	340.21	340.20	340.24	*
I-532	5	65	1430	28APR79	10.0N	158.0W	FGCE	3	338.76	338.75	338.79	*

FLAGS: * REJECTED BECAUSE NO FLASK PAIR EXISTS FOR THIS DAY THAT AGREES TO WITHIN .25 PPM
 (FOR LETTER CODES SEE LAST PAGE OF TABLE)

ATMOSPHERIC CARBON DIOXIDE MEASUREMENTS, SCRIPPS INSTITUTE OF OCEANOGRAPHY
 FCGE SHUTTLE EXPEDITION, 1979-1980

SAMPLE NO.	FLASK SIZE	FIELD SHEET NO.	ANAL. SHEET NO.	DATE OF OBSERVATION	LATI-TUDE	LONGI-TUDE	EXPEDITION	LEG	CO2 CONCENTRATION			FLAGS
									1980 CALIB. (ppm)	1981 CALIB. (ppm)	1985 CALIB. (ppm)	
I-533	5	66	1430	29APR79	12.0N	158.0W	FGE	3	338.67	338.65	338.69	
I-534	5	66	1430	29APR79	12.0N	158.0W	FGE	3	338.63	338.61	338.65	
I-535	5	67	1431	30APR79	14.0N	158.0W	FGE	3	339.65	339.64	339.67	
I-536	5	67	1431	30APR79	14.0N	158.0W	FGE	3	339.65	339.64	339.67	AI
I-537	5	68	1431	30APR79	16.0N	158.0W	FGE	3	339.80	339.78	339.82	*
I-538	5	68	1431	30APR79	16.0N	158.0W	FGE	3	342.06	342.05	342.09	*
I-539	5	69	1431	1MAY79	18.0N	158.0W	FGE	3	340.03	340.01	340.06	
I-540	5	69	1431	1MAY79	18.0N	158.0W	FGE	3	339.94	339.93	339.97	
I-31	5	70	1431	2MAY79	20.0N	158.0W	FGE	3	341.40	341.39	341.42	RP
I-32	5	70	1431	2MAY79	20.0N	158.0W	FGE	3	341.58	341.57	341.61	RP
I-397	5	71	1447	11MAY79	20.0N	158.0W	FGE	4	340.17	340.16	340.20	
I-398	5	71	1447	11MAY79	20.0N	158.0W	FGE	4	340.26	340.25	340.30	
I-401	5	72	1447	12MAY79	16.0N	158.0W	FGE	4	340.37	340.36	340.39	
I-402	5	72	1447	12MAY79	16.0N	158.0W	FGE	4	340.45	340.44	340.48	
I-399	5	73	1447	13MAY79	13.0N	158.0W	FGE	4	341.11	341.10	341.14	*
I-400	5	73	1447	13MAY79	13.0N	158.0W	FGE	4	341.39	341.37	341.43	*
I-403	5	74	1448	22MAY79	3.0S	153.0W	FGE	4	337.11	337.10	337.15	
I-404	5	74	1448	22MAY79	3.0S	153.0W	FGE	4	337.11	337.10	337.15	
I-405	5	75	1448	23MAY79	1.0S	153.0W	FGE	4	337.53	337.51	337.57	
I-406	5	75	1448	23MAY79	1.0S	153.0W	FGE	4	337.39	337.38	337.43	
I-407	5	76	1448	24MAY79	0.0S	153.0W	FGE	4	337.63	337.62	337.66	
I-408	5	76	1448	24MAY79	0.0S	153.0W	FGE	4	337.81	337.80	337.85	
I-409	5	77	1449	24MAY79	1.0N	153.0W	FGE	4	337.61	337.60	337.64	
I-410	5	77	1449	24MAY79	1.0N	153.0W	FGE	4	337.47	337.45	337.50	
I-411	5	78	1449	24MAY79	2.0N	153.0W	FGE	4	337.98	337.96	338.02	
I-412	5	78	1449	24MAY79	2.0N	153.0W	FGE	4	337.65	337.64	337.69	AI
I-413	5	79	1449	25MAY79	3.0N	153.0W	FGE	4	337.56	337.55	337.59	
I-414	5	79	1449	25MAY79	3.0N	153.0W	FGE	4	337.37	337.36	337.41	
I-415	5	80	1449	25MAY79	4.0N	153.0W	FGE	4	338.22	338.20	338.25	
I-416	5	80	1449	25MAY79	4.0N	153.0W	FGE	4	338.07	338.06	338.11	
I-417	5	81	1450	26MAY79	7.0N	153.0W	FGE	4	340.06	340.04	340.09	*
I-418	5	81	1450	26MAY79	7.0N	153.0W	FGE	4	339.68	339.67	339.72	*
I-419	5	82	1451	27MAY79	8.0N	153.0W	FGE	4	340.14	340.13	340.18	*
I-420	5	82	1451	27MAY79	8.0N	153.0W	FGE	4	340.75	340.73	340.78	*
I-421	5	83	1451	27MAY79	10.0N	153.0W	FGE	4	339.99	339.98	340.02	
I-422	5	83	1451	27MAY79	10.0N	153.0W	FGE	4	340.09	340.07	340.12	
I-423	5	84	1451	28MAY79	12.0N	153.0W	FGE	4	340.37	340.36	340.41	AP
I-424	5	84	1451	28MAY79	12.0N	153.0W	FGE	4	355.14	355.13	355.15	*
I-425	5	85	1451	6JUN79	6.0S	150.0W	FGE	4	338.69	338.67	338.72	*
I-426	5	85	1451	6JUN79	6.0S	150.0W	FGE	4	336.59	336.58	336.63	AP
I-427	5	86	1451	6JUN79	8.0S	150.0W	FGE	4	336.31	336.30	336.35	
I-428	5	86	1452	6JUN79	8.0S	150.0W	FGE	4	336.32	336.31	336.35	
I-429	5	87	1452	7JUN79	10.0S	150.0W	FGE	4	336.76	336.75	336.81	

FLAGS: * REJECTED BECAUSE NO FLASK PAIR EXISTS FOR THIS DAY THAT AGREES TO WITHIN .25 PPM
 (FOR LETTER CODES SEE LAST PAGE OF TABLE)

ATMOSPHERIC CARBON DIOXIDE MEASUREMENTS, SCRIPPS INSTITUTE OF OCEANOGRAPHY
 FGGE SHUTTLE EXPEDITION, 1979-1980

SAMPLE NO.	FLASK SIZE	FIELD SHEET NO.	ANAL. SHEET NO.	DATE OF OBSERVATION	LATI-TUDE	LONGI-TUDE	EXPEDITION	LEG	CO2 CONCENTRATION			FLAGS
									1980 CALIB. (ppm)	1981 CALIB. (ppm)	1985 CALIB. (ppm)	
I-430	5	87	1452	7 JUN79	10.0S	150.0W	FGE	4	335.76	335.75	335.81	
I-431	5	88	1452	8 JUN79	12.0S	150.0W	FGE	4	335.86	335.84	335.90	
I-432	5	88	1452	8 JUN79	12.0S	150.0W	FGE	4	336.76	336.75	336.81	
I-433	5	89	1453	8 JUN79	14.0S	150.0W	FGE	4	335.50	335.49	335.54	
I-434	5	89	1453	8 JUN79	14.0S	150.0W	FGE	4	335.55	335.54	335.59	
I-435	5	90	1453	9 JUN79	16.0S	150.0W	FGE	4	335.05	335.03	335.09	
I-436	5	90	1453	9 JUN79	16.0S	150.0W	FGE	4	335.05	335.03	335.09	*
I-437	5	91	1453	9 JUN79	17.0S	150.0W	FGE	4	336.74	336.73	336.78	*
I-438	5	91	1453	9 JUN79	17.0S	150.0W	FGE	4	336.43	336.41	336.46	
I-49	5	92	1453	17 JUN79	17.0S	150.0W	FGE	5	335.00	335.58	335.64	
I-50	5	92	1454	17 JUN79	17.0S	150.0W	FGE	5	335.46	335.45	335.50	
I-51	5	93	1454	18 JUN79	16.0S	150.0W	FGE	5	335.33	335.31	335.36	
I-52	5	93	1454	18 JUN79	16.0S	150.0W	FGE	5	335.33	335.31	335.36	
I-53	5	94	1455	19 JUN79	14.0S	150.0W	FGE	5	336.16	336.14	336.20	
I-54	5	94	1455	19 JUN79	14.0S	150.0W	FGE	5	336.26	336.25	336.30	
I-439	5	95	1455	19 JUN79	12.0S	150.0W	FGE	5	336.16	336.14	336.20	
I-440	5	95	1455	19 JUN79	12.0S	150.0W	FGE	5	336.07	336.06	336.11	
I-441	5	96	1455	20 JUN79	10.0S	150.0W	FGE	5	336.54	336.53	336.57	
I-442	5	96	1455	20 JUN79	10.0S	150.0W	FGE	5	336.44	336.42	336.48	
I-443	5	97	1455	21 JUN79	8.0S	150.0W	FGE	5	336.91	336.89	336.95	AI
I-444	5	97	1455	21 JUN79	8.0S	150.0W	FGE	5	337.37	337.36	337.40	*
I-445	5	98	1455	21 JUN79	6.0S	150.0W	FGE	5	337.19	337.17	337.23	
I-446	5	98	1457	21 JUN79	6.0S	150.0W	FGE	5	337.40	337.38	337.44	
I-447	5	99	1458	29 JUN79	10.0N	153.0W	FGE	5	337.00	337.88	337.94	
I-448	5	99	1458	29 JUN79	10.0N	153.0W	FGE	5	337.99	337.98	338.03	
I-449	5	100	1458	30 JUN79	8.0N	153.0W	FGE	5	337.81	337.80	337.84	
I-450	5	100	1458	30 JUN79	8.0N	153.0W	FGE	5	337.67	337.65	337.71	
I-1	5	101	1458	1 JUL79	6.0N	153.0W	FGE	5	336.42	336.40	336.45	* RP
I-2	5	101	1458	1 JUL79	6.0N	153.0W	FGE	5	336.55	336.54	336.60	* RP
I-3	5	102	1459	2 JUL79	4.0N	153.0W	FGE	5	337.07	337.06	337.11	
I-4	5	102	1459	2 JUL79	4.0N	153.0W	FGE	5	336.89	336.87	336.92	
I-5	5	103	1459	2 JUL79	3.0N	153.0W	FGE	5	337.36	337.34	337.38	*
I-6	5	103	1459	2 JUL79	3.0N	153.0W	FGE	5	337.07	337.06	337.11	*
I-25	5	104	1459	2 JUL79	2.0N	153.0W	FGE	5	337.72	337.71	337.76	AP
I-26	5	104	1459	2 JUL79	2.0N	153.0W	FGE	5	337.16	337.14	337.20	*
I-27	5	105	1459	3 JUL79	1.0N	153.0W	FGE	5	337.53	337.52	337.57	
I-28	5	105	1460	3 JUL79	1.0N	153.0W	FGE	5	337.65	337.63	337.67	
I-29	5	106	1460	4 JUL79	0.0N	153.0W	FGE	5	337.73	337.72	337.77	
I-30	5	106	1460	4 JUL79	0.0N	153.0W	FGE	5	337.73	337.72	337.77	
I-55	5	107	1460	4 JUL79	1.0S	153.0W	FGE	5	337.31	337.30	337.35	
I-56	5	107	1460	4 JUL79	1.0S	153.0W	FGE	5	337.37	337.35	337.39	
I-57	5	108	1460	5 JUL79	2.0S	153.0W	FGE	5	337.26	337.25	337.30	
I-58	5	108	1460	5 JUL79	2.0S	153.0W	FGE	5	337.46	337.45	337.50	

FLAGS: * REJECTED BECAUSE NO FLASK PAIR EXISTS FOR THIS DAY THAT AGREES TO WITHIN .25 PPM
 (FOR LETTER CODES SEE LAST PAGE OF TABLE)

ATMOSPHERIC CARBON DIOXIDE MEASUREMENTS, SCRIPPS INSTITUTE OF OCEANOGRAPHY
 FGGE SHUTTLE EXPEDITION, 1978-1980

SAMPLE NO.	FLASK SIZE	FIELD SHEET NO.	ANAL. SHEET NO.	DATE OF OBSERVATION	LATI-TUDE	LONGI-TUDE	EXPEDITION	LEG	CO2 CONCENTRATION			FLAGS
									1980 CALIB. (ppm)	1981 CALIB. (ppm)	1985 CALIB. (ppm)	
I-59	5	109	1460	12 JUL 79	12.0N	158.0W	FGE	5	338.52	339.51	338.56	
I-60	5	109	1460	12 JUL 79	12.0N	158.0W	FGE	5	338.71	338.70	338.75	
I-97	5	110	1461	12 JUL 79	14.0N	158.0W	FGE	5	338.58	338.56	338.60	
I-98	5	110	1461	12 JUL 79	14.0N	158.0W	FGE	5	338.58	338.56	338.60	
I-99	5	111	1461	13 JUL 79	16.0N	158.0W	FGE	5	338.38	338.36	338.42	
I-100	5	111	1461	13 JUL 79	16.0N	158.0W	FGE	5	338.43	338.42	338.47	
I-101	5	112	1461	14 JUL 79	18.0N	158.0W	FGE	5	338.58	338.56	338.60	AI
I-102	5	112	1461	14 JUL 79	18.0N	158.0W	FGE	5	338.94	338.93	338.98	*
I-169	5	113	1461	14 JUL 79	20.0N	158.0W	FGE	5	338.43	338.42	338.47	
I-170	5	113	1461	14 JUL 79	20.0N	158.0W	FGE	5	338.47	338.46	338.51	
I-193	5	114	1467	20 JUL 79	20.0N	158.0W	FGE	6	336.22	336.20	336.27	*
I-194	5	114	1467	20 JUL 79	20.0N	158.0W	FGE	6	336.71	336.69	336.75	*
I-196	5	115	1467	21 JUL 79	18.0N	158.0W	FGE	6	336.98	336.96	337.02	
I-198	5	116	1467	21 JUL 79	18.0N	158.0W	FGE	6	336.93	336.92	336.98	
I-197	5	116	1467	21 JUL 79	16.0N	158.0W	FGE	6	337.33	337.32	337.37	
I-199	5	117	1467	22 JUL 79	14.0N	158.0W	FGE	6	337.42	337.41	337.47	
I-200	5	117	1467	22 JUL 79	14.0N	158.0W	FGE	6	337.33	337.32	337.37	*
I-201	5	118	1468	30 JUL 79	4.0S	153.0W	FGE	6	337.92	337.91	337.97	*
I-202	5	118	1468	30 JUL 79	4.0S	153.0W	FGE	6	337.65	337.64	337.69	* RP
I-203	5	119	1468	30 JUL 79	2.0S	153.0W	FGE	6	337.83	337.82	337.87	* RP
I-204	5	119	1468	30 JUL 79	2.0S	153.0W	FGE	6	337.87	337.86	337.92	* RP
I-451	5	120	1468	31 JUL 79	1.0S	153.0W	FGE	6	338.05	338.04	338.10	* RP
I-452	5	120	1468	31 JUL 79	1.0S	153.0W	FGE	6	337.42	337.41	337.47	
I-453	5	121	1469	31 JUL 79	0.0N	153.0W	FGE	6	337.24	337.22	337.29	
I-454	5	121	1469	31 JUL 79	0.0N	153.0W	FGE	6	336.97	336.95	337.00	
I-455	5	122	1469	31 JUL 79	1.0N	153.0W	FGE	6	337.18	337.17	337.23	
I-456	5	122	1469	31 JUL 79	1.0N	153.0W	FGE	6	337.14	337.13	337.18	
I-457	5	123	1469	1 AUG 79	2.0N	153.0W	FGE	6	337.06	337.05	337.09	
I-458	5	123	1469	1 AUG 79	2.0N	153.0W	FGE	6	337.01	336.99	337.05	
I-459	5	124	1470	1 AUG 79	3.0N	153.0W	FGE	6	336.87	336.86	336.92	
I-460	5	124	1470	1 AUG 79	3.0N	153.0W	FGE	6	336.95	336.93	336.99	
I-461	5	125	1470	1 AUG 79	4.0N	153.0W	FGE	6	336.98	336.89	336.94	
I-462	5	125	1470	1 AUG 79	4.0N	153.0W	FGE	6	337.08	337.07	337.13	
I-463	5	126	1471	2 AUG 79	6.0N	153.0W	FGE	6	337.04	337.02	337.09	
I-464	5	126	1471	2 AUG 79	6.0N	153.0W	FGE	6	336.90	336.89	336.94	
I-465	5	127	1471	3 AUG 79	8.0N	153.0W	FGE	6	336.90	336.89	336.94	
I-466	5	127	1471	3 AUG 79	8.0N	153.0W	FGE	6	336.73	336.71	336.76	
I-467	5	128	1472	4 AUG 79	10.0N	153.0W	FGE	6	336.82	336.81	336.85	
I-468	5	128	1472	4 AUG 79	10.0N	153.0W	FGE	6	336.02	336.02	336.07	
I-469	5	129	1472	5 AUG 79	12.0N	153.0W	FGE	6	336.03	336.02	336.07	
I-470	5	129	1472	5 AUG 79	12.0N	153.0W	FGE	6	336.03	336.02	336.07	*
I-471	5	130	1472	11 AUG 79	6.0S	150.0W	FGE	6	335.66	335.64	335.71	*
									336.43	336.41	336.48	*

FLAGS: * REJECTED BECAUSE NO FLASK PAIR EXISTS FOR THIS DAY THAT AGREES TO WITHIN .26 PPM
 (FOR LETTER CODES SEE LAST PAGE OF TABLE)

ATMOSPHERIC CARBON DIOXIDE MEASUREMENTS, SCRIPPS INSTITUTE OF OCEANOGRAPHY
 FGGE SHUTTLE EXPEDITION, 1979-1980

SAMPLE NO.	FIELD FLASK SIZE	FIELD SHEET NO.	ANAL. SHEET NO.	DATE OF OBSERVATION	LATITUDE	LONGITUDE	EXPEDITION	LEG	CO2 CONCENTRATION			FLAGS
									1980 CALIB. (ppm)	1981 CALIB. (ppm)	1985 CALIB. (ppm)	
I-472	5	130	1472	11AUG79	6.0S	150.0W	FGE	6	336.75	336.73	336.79	*
I-473	5	131	1473	12AUG79	8.0S	150.0W	FGE	6	336.48	336.46	336.52	
I-474	5	131	1473	12AUG79	8.0S	150.0W	FGE	6	336.70	336.68	336.75	
I-475	5	132	1473	12AUG79	10.0S	150.0W	FGE	6	336.48	336.46	336.52	
I-476	5	132	1473	12AUG79	10.0S	150.0W	FGE	6	336.44	336.42	336.47	
I-478	5	133	1473	13AUG79	12.0S	150.0W	FGE	6	336.03	336.02	336.08	*
I-479	5	134	1474	13AUG79	14.0S	150.0W	FGE	6	336.41	336.39	336.45	*
I-480	5	134	1474	13AUG79	14.0S	150.0W	FGE	6	336.13	336.11	336.18	*
I-481	5	135	1474	14AUG79	16.0S	150.0W	FGE	6	340.68	340.67	340.72	*
I-482	5	135	1474	14AUG79	16.0S	150.0W	FGE	6	335.42	335.40	335.46	AP
I-483	5	136	1474	14AUG79	17.0S	150.0W	FGE	6	335.28	335.27	335.32	
I-484	5	136	1474	14AUG79	17.0S	150.0W	FGE	6	335.33	335.31	335.37	
I-487	5	137	1475	19AUG79	17.0S	150.0W	FGE	7	335.27	335.25	335.32	
I-488	5	137	1475	19AUG79	17.0S	150.0W	FGE	7	335.22	335.21	335.27	
0-209	3	137	1475	19AUG79	17.0S	150.0W	FGE	7	335.48	335.47	335.54	*
I-489	5	138	1475	19AUG79	16.0S	150.0W	FGE	7	335.58	335.56	335.61	
I-490	5	138	1475	19AUG79	16.0S	150.0W	FGE	7	335.48	335.47	335.54	
0-210	3	138	1475	19AUG79	16.0S	150.0W	FGE	7	335.48	335.47	335.54	
I-491	5	139	1475	19AUG79	14.0S	150.0W	FGE	7	336.36	336.34	336.40	
I-492	5	139	1476	19AUG79	14.0S	150.0W	FGE	7	336.45	336.43	336.49	
0-211	3	139	1476	19AUG79	14.0S	150.0W	FGE	7	336.63	336.61	336.66	*
I-493	5	140	1476	20AUG79	12.0S	150.0W	FGE	7	336.49	336.48	336.54	
I-494	5	140	1476	20AUG79	12.0S	150.0W	FGE	7	336.53	336.52	336.58	
0-212	3	140	1476	20AUG79	12.0S	150.0W	FGE	7	336.53	336.52	336.58	
I-495	5	141	1476	21AUG79	10.0S	150.0W	FGE	7	336.41	336.39	336.45	
I-496	5	141	1476	21AUG79	10.0S	150.0W	FGE	7	336.41	336.39	336.45	
0-213	3	141	1477	21AUG79	10.0S	150.0W	FGE	7	336.50	336.49	336.55	
I-497	5	142	1477	21AUG79	8.0S	150.0W	FGE	7	336.31	336.30	336.37	
I-498	5	142	1477	21AUG79	8.0S	150.0W	FGE	7	336.33	336.32	336.37	
0-214	3	142	1477	21AUG79	8.0S	150.0W	FGE	7	336.33	336.32	336.37	
I-499	5	143	1477	22AUG79	6.0S	150.0W	FGE	7	336.50	336.49	336.55	
I-500	5	143	1477	22AUG79	6.0S	150.0W	FGE	7	336.42	336.40	336.46	
0-215	3	143	1477	22AUG79	6.0S	150.0W	FGE	7	336.50	336.49	336.55	
I-501	5	144	1477	28AUG79	12.0N	153.0W	FGE	7	334.25	334.23	334.30	
I-502	5	144	1477	28AUG79	12.0N	153.0W	FGE	7	334.25	334.23	334.30	
I-503	5	144	1477	28AUG79	12.0N	153.0W	FGE	7	334.43	334.41	334.48	
I-504	5	144	1478	28AUG79	12.0N	153.0W	FGE	7	334.49	334.48	334.54	
0-216	3	144	1477	28AUG79	12.0N	153.0W	FGE	7	334.25	334.23	334.30	
I-505	5	145	1478	29AUG79	10.0N	153.0W	FGE	7	334.12	334.10	334.17	
I-506	5	145	1479	29AUG79	10.0N	153.0W	FGE	7	334.08	334.06	334.13	
I-507	5	145	1479	29AUG79	10.0N	153.0W	FGE	7	334.46	334.45	334.51	*
0-217	3	145	1478	29AUG79	10.0N	153.0W	FGE	7	334.08	334.06	334.13	
I-508	5	146	1483	29AUG79	8.0N	153.0W	FGE	7	334.58	334.56	334.63	

FLAGS: * REJECTED BECAUSE NO FLASK PAIR EXISTS FOR THIS DAY THAT AGREES TO WITHIN .25 PPM
 (FOR LETTER CODES SEE LAST PAGE OF TABLE)

ATMOSPHERIC CARBON DIOXIDE MEASUREMENTS, SCRIPPS INSTITUTE OF OCEANOGRAPHY
 FGGE SHUTTLE EXPEDITION, 1979-1980

SAMPLE NO.	FIELD SHEET NO.	ANAL. SHEET NO.	DATE OF OBSERVATION	LATI-TUDE	LONGI-TUDE	EXPEDITION	LEG	CO2 CONCENTRATION			FLAGS
								1980 CALIB. (ppm)	1981 CALIB. (ppm)	1985 CALIB. (ppm)	
I-509	5	146	29AUG79	8.0N	153.0W	FGE	7	335.00	334.99	335.05	*
I-510	5	146	29AUG79	8.0N	153.0W	FGE	7	335.00	334.99	335.05	*
O-218	3	146	29AUG79	8.0N	153.0W	FGE	7	334.33	334.31	334.38	
I-514	5	147	30AUG79	6.0N	153.0W	FGE	7	336.48	336.47	336.53	
I-515	5	147	30AUG79	6.0N	153.0W	FGE	7	336.53	336.51	336.57	
I-516	5	147	30AUG79	6.0N	153.0W	FGE	7	336.77	336.75	336.81	*
O-219	3	147	30AUG79	6.0N	153.0W	FGE	7	336.44	336.43	336.49	
I-511	5	148	31AUG79	4.0N	153.0W	FGE	7	336.55	336.53	336.60	*
I-512	5	148	31AUG79	4.0N	153.0W	FGE	7	336.59	336.57	336.64	
I-513	5	148	31AUG79	4.0N	153.0W	FGE	7	336.34	336.32	336.39	
O-302	3	148	31AUG79	4.0N	153.0W	FGE	7	336.44	336.43	336.49	
I-517	5	149	31AUG79	3.0N	153.0W	FGE	7	336.93	336.92	336.97	*
I-518	5	149	31AUG79	3.0N	153.0W	FGE	7	336.85	336.83	336.89	*
I-519	5	149	31AUG79	3.0N	153.0W	FGE	7	336.57	336.55	336.61	
I-520	5	150	1SEP79	2.0N	153.0W	FGE	7	336.51	336.49	336.56	
I-521	5	150	1SEP79	2.0N	153.0W	FGE	7	336.72	336.71	336.77	
I-522	5	150	1SEP79	2.0N	153.0W	FGE	7	336.55	336.53	336.60	
O-221	3	150	1SEP79	2.0N	153.0W	FGE	7	336.68	336.67	336.72	
I-523	5	151	1SEP79	1.0N	153.0W	FGE	7	336.55	336.53	336.60	
I-524	5	151	1SEP79	1.0N	153.0W	FGE	7	336.77	336.75	336.81	
I-525	5	151	1SEP79	1.0N	153.0W	FGE	7	336.55	336.53	336.60	
I-526	5	152	1SEP79	0.0N	153.0W	FGE	7	336.52	336.50	336.56	
I-527	5	152	1SEP79	0.0N	153.0W	FGE	7	336.59	336.57	336.64	*
I-528	5	152	1SEP79	0.0N	153.0W	FGE	7	336.77	336.75	336.81	
I-529	5	153	2SEP79	1.0S	153.0W	FGE	7	336.58	336.57	336.63	
I-530	5	153	2SEP79	1.0S	153.0W	FGE	7	336.49	336.47	336.54	
I-531	5	154	2SEP79	1.0S	153.0W	FGE	7	336.72	336.70	336.77	
I-532	5	154	2SEP79	2.0S	153.0W	FGE	7	336.63	336.62	336.68	
I-533	5	154	2SEP79	2.0S	153.0W	FGE	7	336.76	336.74	336.81	
I-534	5	154	2SEP79	2.0S	153.0W	FGE	7	336.76	336.74	336.81	
O-223	3	154	2SEP79	2.0S	153.0W	FGE	7	336.52	336.50	336.55	
I-535	5	155	3SEP79	4.0S	153.0W	FGE	7	336.85	336.84	336.90	*
I-536	5	155	3SEP79	4.0S	153.0W	FGE	7	336.76	336.74	336.81	
I-537	5	155	3SEP79	4.0S	153.0W	FGE	7	336.67	336.66	336.72	
O-224	3	155	3SEP79	4.0S	153.0W	FGE	7	336.52	336.50	336.55	
I-538	5	156	10SEP79	14.0N	158.0W	FGE	7	334.17	334.16	334.23	
I-539	5	156	10SEP79	14.0N	158.0W	FGE	7	334.13	334.12	334.18	
I-540	5	156	10SEP79	14.0N	158.0W	FGE	7	334.09	334.08	334.14	
O-227	3	156	10SEP79	14.0N	158.0W	FGE	7	334.06	334.04	334.12	
I-265	5	157	10SEP79	16.0N	158.0W	FGE	7	333.79	333.78	333.84	
I-266	5	157	10SEP79	16.0N	158.0W	FGE	7	343.13	343.12	343.16	*
O-228	3	157	10SEP79	16.0N	158.0W	FGE	7	333.65	333.63	333.70	

FLAGS: * REJECTED BECAUSE NO FLASK PAIR EXISTS FOR THIS DAY THAT AGREES TO WITHIN .25 PPM
 (FOR LETTER CODES SEE LAST PAGE OF TABLE)

ATMOSPHERIC CARBON DIOXIDE MEASUREMENTS, SCRIPPS INSTITUTE OF OCEANOGRAPHY
 FGGE SHUTTLE EXPEDITION, 1979-1980

SAMPLE NO.	FLASK SIZE	FIELD SHEET NO.	ANAL. SHEET NO.	DATE OF OBSERVATION	LATITUDE	LONGITUDE	EXPEDITION	LEG	CO2 CONCENTRATION			FLAGS
									1980 CALIB. (ppm)	1981 CALIB. (ppm)	1986 CALIB. (ppm)	
I-267	5	158	1486	11SEP79	18.0N	158.0W	FGE	7	333.50	333.49	333.56	AP
I-268	5	158	1486	11SEP79	18.0N	158.0W	FGE	7	362.23	362.21	362.21	*
O-225	3	158	1482	11SEP79	18.0N	158.0W	FGE	7	334.06	334.04	334.12	*
I-269	5	159	1486	11SEP79	20.0N	158.0W	FGE	7	368.32	368.29	368.29	*
I-270	5	159	1486	11SEP79	20.0N	158.0W	FGE	7	362.24	362.22	362.25	*
O-226	3	159	1482	11SEP79	20.0N	158.0W	FGE	7	335.00	334.99	335.05	*
I-541	5	160	1512	29SEP79	20.0N	158.0W	FGE	8	333.84	333.82	333.90	*
I-542	5	160	1512	29SEP79	20.0N	158.0W	FGE	8	334.12	334.10	334.17	*
I-543	5	161	1512	30SEP79	18.0N	158.0W	FGE	8	340.60	340.59	340.64	*
I-544	5	161	1512	30SEP79	18.0N	158.0W	FGE	8	334.21	334.20	334.27	*
I-545	5	162	1512	30SEP79	16.0N	158.0W	FGE	8	333.00	332.99	333.05	*
I-546	5	162	1512	30SEP79	16.0N	158.0W	FGE	8	334.31	334.29	334.36	*
I-397	5	163	1526	10CT79	14.0N	158.0W	FGE	8	333.21	333.19	333.28	*
I-398	5	163	1526	10CT79	14.0N	158.0W	FGE	8	333.30	333.29	333.38	*
I-399	5	164	1526	80CT79	4.0S	152.0W	FGE	8	336.30	336.28	336.35	*
I-400	5	164	1526	80CT79	4.0S	152.0W	FGE	8	336.25	336.24	336.30	*
I-401	5	165	1527	80CT79	2.0S	152.0W	FGE	8	336.22	336.21	336.27	*
I-402	5	165	1527	80CT79	2.0S	152.0W	FGE	8	336.32	336.30	336.37	*
I-403	5	166	1527	90CT79	1.0S	152.0W	FGE	8	336.26	336.25	336.32	*
I-404	5	166	1527	90CT79	1.0S	152.0W	FGE	8	336.21	336.20	336.27	*
I-405	5	167	1527	130CT79	0.0N	152.0W	FGE	8	336.26	336.25	336.32	*
I-406	5	167	1527	130CT79	0.0N	152.0W	FGE	8	336.21	336.20	336.27	*
I-407	5	168	1528	140CT79	1.0N	152.0W	FGE	8	336.47	336.46	336.52	*
I-408	5	168	1528	140CT79	1.0N	152.0W	FGE	8	336.38	336.36	336.42	*
I-409	5	169	1528	160CT79	2.0N	152.0W	FGE	8	336.18	336.17	336.23	*
I-410	5	169	1528	160CT79	2.0N	152.0W	FGE	8	336.28	336.26	336.33	*
I-411	5	170	1528	170CT79	3.0N	152.0W	FGE	8	336.13	336.11	336.18	*
I-412	5	170	1528	170CT79	3.0N	152.0W	FGE	8	336.22	336.21	336.28	*
I-413	5	171	1528	170CT79	4.0N	152.0W	FGE	8	335.85	335.83	335.90	*
I-414	5	171	1528	170CT79	4.0N	152.0W	FGE	8	335.94	335.93	335.99	*
I-415	5	172	1529	170CT79	6.0N	152.0W	FGE	8	336.48	336.47	336.53	RP
I-416	5	172	1529	170CT79	6.0N	152.0W	FGE	8	336.71	336.70	336.77	RP
I-417	5	173	1529	180CT79	8.0N	152.0W	FGE	8	336.43	336.42	336.48	*
I-418	5	173	1529	180CT79	8.0N	152.0W	FGE	8	336.96	336.94	336.01	*
I-419	5	174	1529	190CT79	10.0N	152.0W	FGE	8	333.69	333.67	333.74	*
I-420	5	174	1529	190CT79	10.0N	152.0W	FGE	8	333.83	333.82	333.88	*
I-421	5	175	1530	250CT79	6.0S	150.0W	FGE	8	336.34	336.32	336.40	*
I-422	5	175	1530	250CT79	6.0S	150.0W	FGE	8	336.34	336.32	336.40	*
I-425	5	176	1530	250CT79	8.0S	150.0W	FGE	8	335.87	335.86	335.91	*
I-426	5	176	1530	250CT79	8.0S	150.0W	FGE	8	335.97	335.95	336.01	RP
I-423	5	177	1530	260CT79	10.0S	150.0W	FGE	8	336.34	336.32	336.40	RP
I-424	5	177	1530	260CT79	10.0S	150.0W	FGE	8	336.44	336.43	336.49	RP
I-427	5	178	1531	260CT79	12.0S	150.0W	FGE	8	335.84	335.83	335.89	*

FLAGS: * REJECTED BECAUSE NO FLASK PAIR EXISTS FOR THIS DAY THAT AGREES TO WITHIN .25 PPM
 (FOR LETTER CODES SEE LAST PAGE OF TABLE)

ATMOSPHERIC CARBON DIOXIDE MEASUREMENTS, SCRIPPS INSTITUTE OF OCEANOGRAPHY
 FGGE SHUTTLE EXPEDITION, 1979-1980

SAMPLE NO.	FIELD SHEET NO.	ANAL. SHEET NO.	DATE OF OBSERVATION	LATI-TUDE	LONGI-TUDE	EXPEDITION	LEG	CO2 CONCENTRATION			FLAGS
								1980 CALIB. (ppm)	1981 CALIB. (ppm)	1985 CALIB. (ppm)	
I-428	5	178	260CT79	12.0S	150.0W	FGE	8	335.74	335.72	335.80	
I-429	5	179	270CT79	14.0S	150.0W	FGE	8	335.84	335.83	335.89	AI
I-430	5	179	270CT79	14.0S	150.0W	FGE	8	336.12	336.11	336.17	AI
I-431	5	180	270CT79	16.0S	150.0W	FGE	8	336.03	336.01	336.08	
I-432	5	180	270CT79	16.0S	150.0W	FGE	8	336.07	336.05	336.13	
I-433	5	181	270CT79	17.0S	150.0W	FGE	8	336.31	336.29	336.36	* RP
I-434	5	181	270CT79	17.0S	150.0W	FGE	8	336.31	336.29	336.36	* RP
I-435	5	182	1N0V79	17.0S	150.0W	FGE	9	336.40	336.39	336.43	* RP
I-436	5	182	1N0V79	17.0S	150.0W	FGE	9	335.79	335.77	335.82	
I-437	5	183	1N0V79	17.0S	150.0W	FGE	9	335.73	335.71	335.77	
I-438	5	183	1N0V79	17.0S	150.0W	FGE	9	335.74	335.72	335.78	
0-229	3	182	1N0V79	17.0S	150.0W	FGE	9	336.59	336.57	336.62	* RP
242	2	183	1N0V79	16.0S	150.0W	FGE	9	335.63	335.62	335.69	* AI
I-437	5	183	1N0V79	16.0S	150.0W	FGE	9	335.97	335.96	336.01	
I-438	5	183	1N0V79	16.0S	150.0W	FGE	9	337.71	337.70	337.75	* RP
0-230	3	183	1N0V79	16.0S	150.0W	FGE	9	370.08	370.06	370.03	* RP
243	2	184	1N0V79	14.0S	150.0W	FGE	9	336.26	336.24	336.30	
I-439	5	184	1N0V79	14.0S	150.0W	FGE	9	336.30	336.28	336.35	
I-440	5	184	1N0V79	14.0S	150.0W	FGE	9	336.61	336.59	336.65	
0-231	3	184	1N0V79	14.0S	150.0W	FGE	9	337.18	337.17	337.22	* RP
245	2	185	2N0V79	12.0S	150.0W	FGE	9	336.32	336.30	336.36	
I-441	5	185	2N0V79	12.0S	150.0W	FGE	9	336.14	336.13	336.17	
I-442	5	185	2N0V79	12.0S	150.0W	FGE	9	336.42	336.41	336.46	
0-232	3	185	2N0V79	12.0S	150.0W	FGE	9	362.56	362.54	362.54	* RP
246	2	186	2N0V79	10.0S	150.0W	FGE	9	336.04	336.02	336.08	
I-443	5	186	2N0V79	10.0S	150.0W	FGE	9	336.28	336.26	336.32	
I-444	5	186	2N0V79	10.0S	150.0W	FGE	9	336.23	336.22	336.27	
0-233	3	186	2N0V79	10.0S	150.0W	FGE	9	336.31	336.29	336.35	* RP
247	2	187	3N0V79	8.0S	150.0W	FGE	9	336.20	336.19	336.24	
I-445	5	187	3N0V79	8.0S	150.0W	FGE	9	335.92	335.91	335.97	
I-446	5	187	3N0V79	8.0S	150.0W	FGE	9	335.83	335.81	335.88	
0-234	3	187	3N0V79	8.0S	150.0W	FGE	9	336.67	336.66	336.71	* RP
248	2	188	3N0V79	6.0S	150.0W	FGE	9	335.73	335.71	335.79	
I-447	5	188	3N0V79	6.0S	150.0W	FGE	9	335.83	335.81	335.88	
I-448	5	188	3N0V79	6.0S	150.0W	FGE	9	336.11	336.09	336.15	
I-449	5	188	3N0V79	6.0S	150.0W	FGE	9	336.03	336.01	336.07	
I-450	5	188	3N0V79	6.0S	150.0W	FGE	9	335.83	335.81	335.88	
0-235	3	188	3N0V79	6.0S	150.0W	FGE	9	335.84	335.82	335.88	* RP
249	2	189	10N0V79	12.0N	153.0W	FGE	9	335.57	335.56	335.62	
I-1	5	189	10N0V79	12.0N	153.0W	FGE	9	335.25	335.23	335.29	
I-2	5	189	10N0V79	12.0N	153.0W	FGE	9	335.36	335.35	335.41	
0-236	3	189	10N0V79	12.0N	153.0W	FGE	9	336.03	336.01	336.07	* RP
250	2	190	11N0V79	10.0N	153.0W	FGE	9	335.57	335.55	335.61	
I-3	5	190	11N0V79	10.0N	153.0W	FGE	9	335.57	335.55	335.61	

FLAGS: * REJECTED BECAUSE NO FLASK PAIR EXISTS FOR THIS DAY THAT AGREES TO WITHIN .25 PPM
 (FOR LETTER CODES SEE LAST PAGE OF TABLE)

ATMOSPHERIC CARBON DIOXIDE MEASUREMENTS, SCRIPPS INSTITUTE OF OCEANOGRAPHY
 FGGE SHUTTLE EXPEDITION, 1979-1980

SAMPLE NO.	FLASK SIZE	FIELD SHEET NO.	ANAL. SHEET NO.	DATE OF OBSERVATION	LATI-TUDE	LONGI-TUDE	EXPEDITION	LEG	CO2 CONCENTRATION			FLAGS
									1980 CALIB. (ppm)	1981 CALIB. (ppm)	1985 CALIB. (ppm)	
I-4	5	190	1520	11NOV79	10.0N	153.0W	FGE	9	335.34	335.32	335.38	*
0-237	3	190	1516	11NOV79	10.0N	153.0W	FGE	9	335.74	335.72	335.79	*
I-5	5	191	1520	11NOV79	8.0N	153.0W	FGE	9	336.88	336.86	336.92	RP
I-6	5	191	1520	11NOV79	8.0N	153.0W	FGE	9	335.57	335.55	335.62	*
0-238	3	191	1516	11NOV79	8.0N	153.0W	FGE	9	335.57	335.55	335.62	*
I-25	5	192	1520	12NOV79	6.0N	153.0W	FGE	9	349.22	349.21	349.22	RP
I-26	5	192	1520	12NOV79	6.0N	153.0W	FGE	9	336.22	336.21	336.28	*
0-239	3	192	1516	12NOV79	6.0N	153.0W	FGE	9	336.31	336.30	336.37	*
301	2	193	1521	12NOV79	4.0N	153.0W	FGE	9	336.31	336.29	336.35	RP
I-27	5	193	1521	12NOV79	4.0N	153.0W	FGE	9	338.20	338.19	338.24	*
I-28	5	193	1521	12NOV79	4.0N	153.0W	FGE	9	336.90	336.88	336.94	RG
0-240	3	193	1516	12NOV79	4.0N	153.0W	FGE	9	336.55	336.54	336.61	RG
302	2	194	1521	13NOV79	3.0N	153.0W	FGE	9	336.77	336.76	336.81	RP
I-29	5	194	1521	13NOV79	3.0N	153.0W	FGE	9	337.80	337.79	337.85	*
I-30	5	194	1521	13NOV79	3.0N	153.0W	FGE	9	345.43	345.42	345.45	*
I-49	5	195	1522	13NOV79	2.0N	153.0W	FGE	9	336.13	336.11	336.17	AG
I-50	3	195	1522	13NOV79	2.0N	153.0W	FGE	9	336.72	336.71	336.77	*
0-241	3	196	1517	13NOV79	2.0N	153.0W	FGE	9	335.67	335.66	335.72	AG
I-51	5	196	1522	13NOV79	1.0N	153.0W	FGE	9	336.14	336.13	336.18	*
I-52	5	196	1522	13NOV79	1.0N	153.0W	FGE	9	335.58	335.56	335.63	*
305	2	197	1517	14NOV79	0.0N	153.0W	FGE	9	335.87	335.85	335.91	RP
I-53	5	197	1522	14NOV79	0.0N	153.0W	FGE	9	348.62	348.62	348.65	*
I-54	5	197	1522	14NOV79	0.0N	153.0W	FGE	9	336.16	336.14	336.20	*
0-242	3	197	1517	14NOV79	0.0N	153.0W	FGE	9	336.63	336.61	336.67	AG
306	2	198	1526	14NOV79	1.0S	153.0W	FGE	9	336.61	336.59	336.66	AG
I-55	5	198	1523	14NOV79	1.0S	153.0W	FGE	9	338.51	338.50	338.55	RP
I-56	5	198	1523	14NOV79	1.0S	153.0W	FGE	9	336.93	336.91	336.96	*
I-57	5	199	1523	15NOV79	2.0S	153.0W	FGE	9	336.78	336.77	336.83	*
I-58	5	199	1523	15NOV79	2.0S	153.0W	FGE	9	338.62	338.60	338.66	RP
0-243	3	199	1517	15NOV79	2.0S	153.0W	FGE	9	336.65	336.63	336.68	*
308	2	200	1517	15NOV79	2.0S	153.0W	FGE	9	336.54	336.53	336.58	*
I-59	5	200	1523	15NOV79	2.0S	153.0W	FGE	9	336.71	336.70	336.75	RP
I-60	5	200	1523	15NOV79	4.0S	153.0W	FGE	9	338.70	338.69	338.74	*
0-244	3	200	1517	15NOV79	4.0S	153.0W	FGE	9	336.84	336.82	336.87	*
309	2	201	1526	23NOV79	4.0S	153.0W	FGE	9	336.99	336.98	337.03	RP
I-97	5	201	1524	23NOV79	14.0N	158.0W	FGE	9	338.32	338.31	338.36	*
I-98	5	201	1524	23NOV79	14.0N	158.0W	FGE	9	335.67	335.66	335.72	*
I-99	5	201	1524	23NOV79	14.0N	158.0W	FGE	9	335.72	335.71	335.77	*
0-245	3	201	1517	23NOV79	14.0N	158.0W	FGE	9	336.38	336.37	336.42	*
310	2	202	1526	23NOV79	16.0N	158.0W	FGE	9	339.12	339.10	339.16	RP

FLAGS: * REJECTED BECAUSE NO FLASK PAIR EXISTS FOR THIS DAY THAT AGREES TO WITHIN .25 PPM
 (FOR LETTER CODES SEE LAST PAGE OF TABLE)

ATMOSPHERIC CARBON DIOXIDE MEASUREMENTS, SCRIPPS INSTITUTE OF OCEANOGRAPHY
 FGGE SHUTTLE EXPEDITION, 1979-1980

SAMPLE NO.	FIELD SHEET NO.	ANAL. SHEET NO.	DATE OF OBSERVATION	LATI-TUDE	LONGI-TUDE	EXPEDITION	LEG	CO2 CONCENTRATION			FLAGS
								1980 CALIB. (ppm)	1981 CALIB. (ppm)	1985 CALIB. (ppm)	
I-100	5	202	23NOV79	16.0N	158.0W	FGE	9	335.82	335.80	335.86	
I-101	5	202	23NOV79	16.0N	158.0W	FGE	9	335.87	335.85	335.91	
I-102	5	202	23NOV79	16.0N	158.0W	FGE	9	336.40	336.38	336.43	*
0-246	3	202	23NOV79	16.0N	158.0W	FGE	9	335.85	335.84	335.90	
311	2	203	24NOV79	18.0N	158.0W	FGE	9	339.12	339.10	339.16	* RP
I-169	5	203	24NOV79	18.0N	158.0W	FGE	9	336.09	336.07	336.14	* RG
I-170	5	203	24NOV79	18.0N	158.0W	FGE	9	356.30	356.28	356.27	*
I-171	5	203	24NOV79	18.0N	158.0W	FGE	9	336.47	336.46	336.52	*
0-247	3	203	24NOV79	18.0N	158.0W	FGE	9	335.85	335.84	335.90	* AG
312	2	204	24NOV79	20.0N	158.0W	FGE	9	363.28	363.26	363.28	* RP
I-172	5	204	24NOV79	20.0N	158.0W	FGE	9	336.42	336.41	336.47	*
I-173	5	204	24NOV79	20.0N	158.0W	FGE	9	336.42	336.41	336.46	*
I-174	5	204	24NOV79	20.0N	158.0W	FGE	9	336.18	336.17	336.23	*
0-248	3	204	24NOV79	20.0N	158.0W	FGE	9	335.85	335.84	335.90	*
I-451	5	205	8DEC79	20.0N	158.0W	FGE	10	336.47	336.45	336.52	
I-452	5	205	8DEC79	20.0N	158.0W	FGE	10	336.27	336.25	336.33	
I-453	5	206	9DEC79	18.0N	158.0W	FGE	10	336.13	336.12	336.19	
I-454	5	206	9DEC79	18.0N	158.0W	FGE	10	336.94	336.92	336.99	
I-455	5	207	9DEC79	16.0N	158.0W	FGE	10	336.37	336.36	336.42	
I-456	5	207	9DEC79	16.0N	158.0W	FGE	10	336.17	336.16	336.24	
I-457	5	208	10DEC79	14.0N	158.0W	FGE	10	336.08	336.07	336.14	
I-458	5	208	10DEC79	14.0N	158.0W	FGE	10	336.17	336.16	336.24	
I-459	5	209	18DEC79	4.0S	153.0W	FGE	10	337.22	337.21	337.28	
I-460	5	209	18DEC79	4.0S	153.0W	FGE	10	337.27	337.25	337.32	
I-461	5	210	19DEC79	2.0S	153.0W	FGE	10	337.32	337.30	337.37	
I-462	5	210	19DEC79	2.0S	153.0W	FGE	10	337.21	337.20	337.27	
I-463	5	211	19DEC79	1.0S	153.0W	FGE	10	337.37	337.36	337.42	
I-464	5	211	19DEC79	1.0S	153.0W	FGE	10	337.21	337.20	337.27	
I-465	5	212	20DEC79	0.0N	153.0W	FGE	10	337.27	337.25	337.32	
I-466	5	212	20DEC79	0.0N	153.0W	FGE	10	337.12	337.11	337.17	
I-467	5	213	20DEC79	1.0N	153.0W	FGE	10	337.35	337.33	337.40	
I-468	5	213	20DEC79	1.0N	153.0W	FGE	10	337.36	337.35	337.41	
I-469	5	1214	20DEC79	2.0N	153.0W	FGE	10	337.64	337.63	337.69	* AI
I-470	5	1214	20DEC79	2.0N	153.0W	FGE	10	337.41	337.40	337.47	
I-471	5	1215	21DEC79	3.0N	153.0W	FGE	10	337.26	337.24	337.31	
I-472	5	1215	21DEC79	3.0N	153.0W	FGE	10	337.16	337.15	337.22	
I-473	5	1216	21DEC79	4.0N	153.0W	FGE	10	337.63	337.61	337.67	
I-474	5	216	21DEC79	4.0N	153.0W	FGE	10	337.28	337.26	337.33	
I-475	5	217	22DEC79	6.0N	153.0W	FGE	10	336.91	336.90	336.95	
I-476	5	217	22DEC79	6.0N	153.0W	FGE	10	337.10	337.09	337.14	
I-477	5	218	22DEC79	8.0N	153.0W	FGE	10	337.28	337.26	337.33	AI
I-478	5	218	22DEC79	8.0N	153.0W	FGE	10	336.81	336.79	336.86	*
I-479	5	219	23DEC79	10.0N	153.0W	FGE	10	337.19	337.18	337.24	

FLAGS: * REJECTED BECAUSE NO FLASK PAIR EXISTS FOR THIS DAY THAT AGREES TO WITHIN .25 PPM
 (FOR LETTER CODES SEE LAST PAGE OF TABLE)

ATMOSPHERIC CARBON DIOXIDE MEASUREMENTS, SCRIPPS INSTITUTE OF OCEANOGRAPHY
 FGCE SHUTTLE EXPEDITION, 1979-1980

SAMPLE NO.	FLASK SIZE	FIELD SHEET NO.	ANAL. SHEET NO.	DATE OF OBSERVATION	LATITUDE	LONGITUDE	EXPEDITION	LEG	CO2 CONCENTRATION			FLAGS
									1980 CALIB. (ppm)	1981 CALIB. (ppm)	1985 CALIB. (ppm)	
I-480	5	219	1555	23DEC79	10.0N	153.0W	FGE	10	337.39	337.38	337.45	
I-481	5	220	1555	23DEC79	12.0N	153.0W	FGE	10	337.11	337.10	337.17	*
I-482	5	220	1555	23DEC79	12.0N	153.0W	FGE	10	337.44	337.43	337.50	*
I-483	5	221	1555	30DEC79	6.0S	150.0W	FGE	10	337.06	337.05	337.12	
I-484	5	221	1555	30DEC79	6.0S	150.0W	FGE	10	337.11	337.10	337.17	
I-485	5	222	1555	31DEC79	8.0S	150.0W	FGE	10	337.11	337.10	337.17	
I-486	5	222	1555	31DEC79	8.0S	150.0W	FGE	10	336.91	336.90	336.98	
I-487	5	223	1556	31DEC79	10.0S	150.0W	FGE	10	336.91	336.90	336.98	
I-488	5	223	1556	31DEC79	10.0S	150.0W	FGE	10	336.82	336.81	336.88	
I-489	5	224	1556	2JAN80	12.0S	150.0W	FGE	10	336.78	336.76	336.84	
I-490	5	224	1556	2JAN80	12.0S	150.0W	FGE	10	336.53	336.51	336.60	
I-491	5	225	1556	2JAN80	14.0S	150.0W	FGE	10	336.82	336.81	336.88	
I-492	5	225	1556	2JAN80	14.0S	150.0W	FGE	10	336.78	336.76	336.84	
I-493	5	226	1557	3JAN80	16.0S	150.0W	FGE	10	336.73	336.71	336.78	
I-494	5	226	1557	3JAN80	16.0S	150.0W	FGE	10	336.82	336.81	336.88	
I-495	5	227	1557	3JAN80	17.0S	150.0W	FGE	10	336.82	336.81	336.88	
I-496	5	227	1557	3JAN80	17.0S	150.0W	FGE	10	336.82	336.81	336.88	
I-497	5	228	1557	8JAN80	17.0S	150.0W	FGE	11	336.34	336.33	336.40	
I-498	5	228	1557	8JAN80	17.0S	150.0W	FGE	11	336.49	336.47	336.55	
I-499	5	229	1558	8JAN80	16.0S	150.0W	FGE	11	336.63	336.62	336.69	AI
I-500	5	229	1558	8JAN80	16.0S	150.0W	FGE	11	336.35	336.34	336.40	AI
I-501	5	230	1558	9JAN80	14.0S	150.0W	FGE	11	336.82	336.81	336.88	
I-502	5	230	1558	9JAN80	14.0S	150.0W	FGE	11	336.78	336.77	336.83	
I-503	5	231	1558	9JAN80	12.0S	150.0W	FGE	11	337.97	337.95	338.01	*
I-504	5	231	1558	9JAN80	12.0S	150.0W	FGE	11	336.82	336.81	336.88	AI
I-509	5	232	1559	10JAN80	10.0S	150.0W	FGE	11	337.01	337.00	337.06	
I-510	5	232	1559	10JAN80	10.0S	150.0W	FGE	11	337.20	337.18	337.25	
I-507	5	233	1559	10JAN80	8.0S	150.0W	FGE	11	337.01	337.00	337.06	
I-508	5	233	1559	10JAN80	8.0S	150.0W	FGE	11	337.73	337.71	337.78	*
I-505	5	234	1558	11JAN80	6.0S	150.0W	FGE	11	337.21	337.19	337.26	AP
I-506	5	234	1558	11JAN80	6.0S	150.0W	FGE	11	337.68	337.66	337.73	
I-511	5	235	1559	18JAN80	12.0N	153.0W	FGE	11	337.53	337.52	337.59	
I-512	5	235	1559	18JAN80	12.0N	153.0W	FGE	11	337.69	337.67	337.74	AI
I-513	5	236	1560	19JAN80	10.0N	153.0W	FGE	11	339.36	339.34	339.41	*
I-514	5	236	1560	19JAN80	10.0N	153.0W	FGE	11	337.78	337.77	337.83	
I-515	5	237	1560	20JAN80	8.0N	153.0W	FGE	11	337.59	337.58	337.64	
I-516	5	237	1560	20JAN80	8.0N	153.0W	FGE	11	337.74	337.72	337.79	
I-517	5	238	1560	21JAN80	4.0N	153.0W	FGE	11	337.59	337.58	337.64	
I-518	5	238	1560	21JAN80	4.0N	153.0W	FGE	11	337.74	337.72	337.79	
I-519	5	239	1560	22JAN80	2.0N	153.0W	FGE	11	338.54	338.53	338.60	AI
I-520	5	239	1560	22JAN80	2.0N	153.0W	FGE	11	337.88	337.87	337.93	*
I-521	5	240	1561	22JAN80	1.0N	153.0W	FGE	11	337.88	337.87	337.93	
I-522	5	240	1561	22JAN80	1.0N	153.0W	FGE	11	337.88	337.87	337.93	

FLAGS: * REJECTED BECAUSE NO FLASK PAIR EXISTS FOR THIS DAY THAT AGREES TO WITHIN .25 PPM
 (FOR LETTER CODES SEE LAST PAGE OF TABLE)

ATMOSPHERIC CARBON DIOXIDE MEASUREMENTS, SCRIPPS INSTITUTE OF OCEANOGRAPHY
 FGGE SHUTTLE EXPEDITION, 1979-1980

SAMPLE NO.	FIELD SHEET NO.	ANAL. SHEET NO.	DATE OF OBSERVATION	LATITUDE	LONGITUDE	EXPEDITION	LEG	CO2 CONCENTRATION			FLAGS
								1980 CALIB. (ppm)	1981 CALIB. (ppm)	1985 CALIB. (ppm)	
I-523	5	241	22JAN80	0.0N	153.0W	FGE	11	338.03	338.02	338.08	
I-524	5	241	22JAN80	0.0N	153.0W	FGE	11	337.79	337.78	337.84	
I-525	5	242	23JAN80	1.0S	153.0W	FGE	11	337.60	337.59	337.65	
I-526	5	243	23JAN80	1.0S	153.0W	FGE	11	337.69	337.67	337.74	
I-527	5	243	23JAN80	2.0S	153.0W	FGE	11	337.36	337.35	337.41	
I-528	5	243	23JAN80	2.0S	153.0W	FGE	11	337.46	337.44	337.51	
I-529	5	244	24JAN80	4.0S	153.0W	FGE	11	337.79	337.78	337.84	
I-530	5	244	24JAN80	4.0S	153.0W	FGE	11	337.60	337.59	337.67	
I-531	5	245	28JAN80	3.0N	150.0W	FGE	11	337.94	337.92	337.99	
I-532	5	245	28JAN80	3.0N	150.0W	FGE	11	337.98	337.96	338.03	
I-533	5	246	30JAN80	6.0N	150.0W	FGE	11	337.79	337.78	337.84	
I-534	5	246	30JAN80	6.0N	150.0W	FGE	11	337.98	337.96	338.03	
I-535	5	247	1FEB80	14.0N	158.0W	FGE	11	338.71	338.70	338.75	
I-536	5	247	1FEB80	14.0N	158.0W	FGE	11	338.75	338.74	338.80	
I-537	5	248	1FEB80	16.0N	158.0W	FGE	11	339.08	339.06	339.13	
I-538	5	248	1FEB80	16.0N	158.0W	FGE	11	339.13	339.11	339.18	
I-539	5	249	3FEB80	18.0N	158.0W	FGE	11	338.94	338.93	338.99	*
I-540	5	249	3FEB80	18.0N	158.0W	FGE	11	338.61	338.59	338.66	*
I-265	5	250	15FEB80	20.0N	158.0W	FGE	12	339.61	339.59	339.66	
I-267	5	250	15FEB80	20.0N	158.0W	FGE	12	339.56	339.54	339.62	
I-1	5	251	16FEB80	18.0N	158.0W	FGE	12	339.73	339.72	339.78	
I-2	5	251	16FEB80	18.0N	158.0W	FGE	12	339.68	339.67	339.74	
I-268	5	252	16FEB80	16.0N	158.0W	FGE	12	339.11	339.09	339.16	
I-270	5	252	16FEB80	16.0N	158.0W	FGE	12	338.97	338.96	339.04	
I-3	5	253	17FEB80	14.0N	158.0W	FGE	12	339.50	339.49	339.56	
I-4	5	253	17FEB80	14.0N	158.0W	FGE	12	339.46	339.45	339.52	
I-5	5	254	28FEB80	4.0S	153.0W	FGE	12	338.27	338.26	338.32	
I-6	5	254	28FEB80	4.0S	153.0W	FGE	12	338.33	338.31	338.37	
I-26	5	255	28FEB80	2.0S	153.0W	FGE	12	338.79	338.78	338.86	
I-29	5	255	28FEB80	2.0S	153.0W	FGE	12	338.62	338.60	338.73	
I-30	5	256	29FEB80	1.0S	153.0W	FGE	12	338.66	338.64	338.68	
I-27	5	256	29FEB80	1.0S	153.0W	FGE	12	338.66	338.64	338.73	
I-28	5	257	29FEB80	0.0S	153.0W	FGE	12	338.70	338.69	338.77	
I-49	5	257	29FEB80	0.0S	153.0W	FGE	12	338.53	338.52	338.59	
I-50	5	258	1MAR80	1.0N	153.0W	FGE	12	338.50	338.49	338.56	
I-51	5	259	1MAR80	1.0N	153.0W	FGE	12	338.27	338.26	338.34	
I-52	5	259	1MAR80	2.0N	153.0W	FGE	12	338.14	338.12	338.21	
I-53	5	260	1MAR80	3.0N	153.0W	FGE	12	338.27	338.26	338.34	
I-54	5	260	1MAR80	3.0N	153.0W	FGE	12	338.27	338.26	338.34	
I-56	5	261	2MAR80	4.0N	153.0W	FGE	12	338.63	338.61	338.69	*
I-56	5	261	2MAR80	4.0N	153.0W	FGE	12	362.16	362.14	362.12	*
I-57	5	262	2MAR80	6.0N	153.0W	FGE	12	338.63	338.61	338.69	*

FLAGS: * REJECTED BECAUSE NO FLASK PAIR EXISTS FOR THIS DAY THAT AGREES TO WITHIN .25 PPM
 (FOR LETTER CODES SEE LAST PAGE OF TABLE)

ATMOSPHERIC CARBON DIOXIDE MEASUREMENTS, SCRIPPS INSTITUTE OF OCEANOGRAPHY
 FGE SHUTTLE EXPEDITION, 1979-1980

SAMPLE NO.	FLASK SIZE	FIELD SHEET NO.	ANAL. SHEET NO.	DATE OF OBSERVATION	LATI-TUDE	LONGI-TUDE	EXPEDITION	LEG	CO2 CONCENTRATION			FLAGS
									1980 CALIB. (ppm)	1981 CALIB. (ppm)	1985 CALIB. (ppm)	
I-58	5	262	1592	2MAR80	6.0N	153.0W	FGE	12	338.45	338.44	338.52	
I-59	5	263	1593	3MAR80	8.0N	153.0W	FGE	12	338.68	338.67	338.74	
I-60	5	263	1593	3MAR80	8.0N	153.0W	FGE	12	338.45	338.44	338.52	
I-97	5	264	1593	3MAR80	10.0N	153.0W	FGE	12	338.72	338.71	338.78	
I-98	5	264	1593	3MAR80	10.0N	153.0W	FGE	12	338.86	338.84	338.92	
I-99	5	265	1593	4MAR80	12.0N	153.0W	FGE	12	338.94	338.93	339.01	
I-100	5	265	1593	4MAR80	12.0N	153.0W	FGE	12	338.86	338.84	338.92	
I-101	5	266	1594	11MAR80	6.0S	150.0W	FGE	12	337.95	337.94	338.02	
I-102	5	266	1594	11MAR80	6.0S	150.0W	FGE	12	338.13	338.11	338.20	
I-199	5	267	1594	11MAR80	8.0S	150.0W	FGE	12	337.69	337.68	337.75	
I-200	5	267	1594	11MAR80	8.0S	150.0W	FGE	12	337.77	337.76	337.84	
I-201	5	268	1594	12MAR80	10.0S	150.0W	FGE	12	337.87	337.85	337.93	*
I-202	5	268	1594	12MAR80	10.0S	150.0W	FGE	12	340.06	340.05	340.12	*
I-203	5	269	1595	12MAR80	12.0S	150.0W	FGE	12	337.36	337.33	337.42	
I-204	5	269	1595	12MAR80	12.0S	150.0W	FGE	12	337.30	337.28	337.38	
I-397	5	270	1595	12MAR80	14.0S	150.0W	FGE	12	337.17	337.16	337.25	
I-398	5	270	1595	12MAR80	14.0S	150.0W	FGE	12	337.13	337.12	337.20	
I-399	5	271	1595	13MAR80	16.0S	150.0W	FGE	12	337.01	336.99	337.07	
I-400	5	271	1595	13MAR80	16.0S	150.0W	FGE	12	336.91	336.90	336.98	
I-401	5	272	1595	13MAR80	17.0S	150.0W	FGE	12	337.39	337.38	337.45	* RP
I-402	5	272	1595	13MAR80	17.0S	150.0W	FGE	12	337.57	337.55	337.63	* RP
I-403	5	273	1574	18MAR80	17.0S	150.0W	FGE	12	337.18	337.17	337.25	
I-404	5	273	1574	18MAR80	17.0S	150.0W	FGE	13	337.14	337.13	337.21	
O-322	3	273	1574	18MAR80	17.0S	150.0W	FGE	13	337.10	337.09	337.16	
I-405	5	274	1574	18MAR80	16.0S	150.0W	FGE	13	337.10	337.09	337.17	
I-406	5	274	1574	18MAR80	16.0S	150.0W	FGE	13	337.14	337.13	337.21	
O-339	3	274	1574	18MAR80	16.0S	150.0W	FGE	13	337.14	337.13	337.21	
I-407	5	275	1574	19MAR80	14.0S	150.0W	FGE	13	337.18	337.17	337.25	
I-408	5	275	1574	19MAR80	14.0S	150.0W	FGE	13	337.36	337.35	337.42	*
O-327	3	275	1575	19MAR80	14.0S	150.0W	FGE	13	337.14	337.13	337.21	
I-409	5	276	1575	19MAR80	12.0S	150.0W	FGE	13	337.10	337.09	337.16	
I-410	5	276	1575	19MAR80	12.0S	150.0W	FGE	13	337.24	337.22	337.29	
O-331	3	276	1575	19MAR80	12.0S	150.0W	FGE	13	337.40	337.39	337.47	
I-411	5	277	1575	20MAR80	10.0S	150.0W	FGE	13	337.18	337.17	337.25	
I-412	5	277	1575	20MAR80	10.0S	150.0W	FGE	13	337.62	337.61	337.68	
O-319	3	277	1575	20MAR80	10.0S	150.0W	FGE	13	337.70	337.69	337.77	
I-413	5	278	1575	20MAR80	8.0S	150.0W	FGE	13	337.70	337.69	337.77	
O-321	3	278	1575	20MAR80	8.0S	150.0W	FGE	13	337.84	337.83	337.90	
I-414	5	278	1575	20MAR80	8.0S	150.0W	FGE	13	337.97	337.96	338.04	
I-415	5	279	1576	21MAR80	6.0S	150.0W	FGE	13	338.06	338.04	338.12	
I-416	5	279	1576	21MAR80	6.0S	150.0W	FGE	13	338.81	338.80	338.88	
O-323	3	279	1576	21MAR80	6.0S	150.0W	FGE	13	338.86	338.85	338.92	
I-417	5	280	1576	23MAR80	0.0S	150.0W	FGE	13	338.81	338.80	338.88	
I-417	5	280	1576	23MAR80	0.0S	150.0W	FGE	13	339.96	339.94	340.01	* RG

FLAGS: * REJECTED BECAUSE NO FLASK PAIR EXISTS FOR THIS DAY THAT AGREES TO WITHIN .25 PPM
 (FOR LETTER CODES SEE LAST PAGE OF TABLE)

ATMOSPHERIC CARBON DIOXIDE MEASUREMENTS, SCRIPPS INSTITUTE OF OCEANOGRAPHY
 FGGE SHUTTLE EXPEDITION, 1979-1980

SAMPLE NO.	FLASK SIZE	FIELD SHEET NO.	ANAL. SHEET NO.	DATE OF OBSERVATION	LATI-TUDE	LONGI-TUDE	EXPEDITION	LEG	CO2 CONCENTRATION			FLAGS
									1980 CALIB. (ppm)	1981 CALIB. (ppm)	1985 CALIB. (ppm)	
I-418	5	280	1576	23MAR80	0.6S	150.0W	FGE	13	339.74	339.73	339.79	* RG
I-419	5	281	1576	24MAR80	4.0N	150.0W	FGE	13	339.30	339.29	339.36	
I-420	5	281	1576	24MAR80	4.0N	150.0W	FGE	13	339.51	339.50	339.57	
I-421	5	282	1577	27MAR80	12.0N	153.0W	FGE	13	339.82	339.81	339.87	
I-422	5	282	1577	27MAR80	12.0N	153.0W	FGE	13	339.96	339.94	340.01	
O-341	3	282	1577	27MAR80	12.0N	153.0W	FGE	13	339.82	339.81	339.87	
I-423	5	283	1577	28MAR80	10.0N	153.0W	FGE	13	339.78	339.77	339.83	
I-424	5	283	1577	28MAR80	10.0N	153.0W	FGE	13	339.73	339.71	339.78	
O-344	3	283	1577	28MAR80	10.0N	153.0W	FGE	13	339.82	339.81	339.87	
I-425	5	284	1577	28MAR80	8.0N	153.0W	FGE	13	341.90	341.88	341.94	*
I-426	5	284	1577	28MAR80	8.0N	153.0W	FGE	13	339.73	339.71	339.78	
O-330	3	284	1578	28MAR80	8.0N	153.0W	FGE	13	339.65	339.63	339.69	
I-427	5	285	1578	29MAR80	6.0N	153.0W	FGE	13	339.76	339.75	339.83	
I-428	5	285	1578	29MAR80	6.0N	153.0W	FGE	13	339.00	339.59	339.66	
O-342	3	285	1578	29MAR80	6.0N	153.0W	FGE	13	339.65	339.63	339.69	
I-429	5	286	1578	30MAR80	4.0N	153.0W	FGE	13	339.10	339.09	339.17	
I-430	5	286	1578	30MAR80	4.0N	153.0W	FGE	13	339.24	339.22	339.30	*
O-332	3	286	1578	30MAR80	4.0N	153.0W	FGE	13	338.93	338.91	338.99	
I-431	5	287	1579	30MAR80	3.0N	153.0W	FGE	13	339.12	339.11	339.17	
I-432	5	288	1579	30MAR80	3.0N	153.0W	FGE	13	339.21	339.19	339.26	
I-434	5	288	1579	30MAR80	2.0N	153.0W	FGE	13	339.47	339.45	339.53	*
O-206	3	288	1578	30MAR80	2.0N	153.0W	FGE	13	339.10	339.09	339.17	
I-435	5	288	1579	30MAR80	2.0N	153.0W	FGE	13	339.21	339.19	339.26	
I-436	5	288	1579	30MAR80	2.0N	153.0W	FGE	13	339.28	339.27	339.35	
I-437	5	288	1579	30MAR80	2.0N	153.0W	FGE	13	339.91	339.89	339.96	*
I-438	5	288	1579	30MAR80	2.0N	153.0W	FGE	13	339.96	339.95	340.01	*
O-326	3	288	1579	30MAR80	2.0N	153.0W	FGE	13	339.73	339.72	339.78	*
O-335	3	288	1579	30MAR80	2.0N	153.0W	FGE	13	339.82	339.81	339.87	*
O-338	3	288	1579	30MAR80	2.0N	153.0W	FGE	13	339.82	339.81	339.87	*
I-439	5	289	1580	31MAR80	1.0N	153.0W	FGE	13	339.42	339.40	339.48	*
I-440	5	289	1580	31MAR80	1.0N	153.0W	FGE	13	339.16	339.14	339.21	*
I-441	5	290	1580	31MAR80	0.0N	153.0W	FGE	13	339.11	339.10	339.17	*
I-442	5	290	1580	31MAR80	0.0N	153.0W	FGE	13	339.11	339.10	339.17	*
O-313	3	290	1580	31MAR80	0.0N	153.0W	FGE	13	338.98	338.96	339.03	
I-443	5	291	1580	31MAR80	1.0S	153.0W	FGE	13	339.37	339.36	339.44	
I-444	5	291	1580	31MAR80	1.0S	153.0W	FGE	13	339.16	339.14	339.21	
I-445	5	292	1581	1APR80	2.0S	153.0W	FGE	13	339.43	339.41	339.49	
I-446	5	292	1581	1APR80	2.0S	153.0W	FGE	13	339.47	339.45	339.53	
O-347	3	292	1581	1APR80	2.0S	153.0W	FGE	13	339.43	339.41	339.49	
I-447	5	293	1581	2APR80	4.0S	153.0W	FGE	13	339.74	339.73	339.79	*
I-448	5	293	1581	2APR80	4.0S	153.0W	FGE	13	340.40	340.39	340.45	*
O-201	3	293	1581	2APR80	4.0S	153.0W	FGE	13	339.26	339.25	339.31	AG

FLAGS: * REJECTED BECAUSE NO FLASK PAIR EXISTS FOR THIS DAY THAT AGREES TO WITHIN .25 PPM
 (FOR LETTER CODES SEE LAST PAGE OF TABLE)

ATMOSPHERIC CARBON DIOXIDE MEASUREMENTS, SCRIPPS INSTITUTE OF OCEANOGRAPHY
 FGGE SHUTTLE EXPEDITION, 1979-1980

SAMPLE NO.	FLASK SIZE	FIELD SHEET NO.	ANAL. SHEET NO.	DATE OF OBSERVATION	LATI-TUDE	LONGI-TUDE	EXPEDITION	LEG	CO2 CONCENTRATION			FLAGS
									1980 CALIB. (ppm)	1981 CALIB. (ppm)	1985 CALIB. (ppm)	
I-449	5	294	1581	3APR80	4.0S	158.0W	FGE	13	344.79	344.78	344.82	
I-450	5	294	1582	3APR80	4.0S	158.0W	FGE	13	339.45	339.43	339.50	AG
I-541	5	296	1582	3APR80	2.0S	158.0W	FGE	13	339.71	339.70	339.77	AG
I-544	5	296	1582	4APR80	1.0S	158.0W	FGE	13	355.37	355.37	355.36	
I-545	5	297	1582	4APR80	0.0S	158.0W	FGE	13	339.63	339.61	339.68	
I-546	5	297	1582	4APR80	0.0S	158.0W	FGE	13	339.75	339.74	339.82	
I-271	5	298	1583	5APR80	1.0N	158.0W	FGE	13	339.57	339.56	339.63	
I-272	5	298	1583	5APR80	1.0N	158.0W	FGE	13	339.57	339.56	339.63	
I-273	5	299	1583	5APR80	2.0N	158.0W	FGE	13	339.40	339.38	339.45	
I-274	5	299	1583	5APR80	2.0N	158.0W	FGE	13	339.17	339.15	339.24	
I-275	5	300	1583	5APR80	3.0N	158.0W	FGE	13	339.22	339.20	339.27	
I-276	5	300	1583	5APR80	3.0N	158.0W	FGE	13	339.04	339.03	339.11	
I-277	5	301	1584	6APR80	4.0N	158.0W	FGE	13	339.31	339.30	339.38	AG
I-278	5	302	1584	6APR80	4.0N	158.0W	FGE	13	339.94	339.93	339.99	AG
I-279	5	302	1584	6APR80	6.0N	158.0W	FGE	13	339.76	339.75	339.81	
I-280	5	302	1584	7APR80	8.0N	158.0W	FGE	13	339.94	339.93	339.99	
I-281	5	303	1584	7APR80	8.0N	158.0W	FGE	13	369.13	369.11	369.09	
I-307	5	304	1585	7APR80	10.0N	158.0W	FGE	13	341.01	340.99	341.06	
I-308	5	304	1585	7APR80	10.0N	158.0W	FGE	13	340.58	340.56	340.63	
I-309	5	305	1585	8APR80	12.0N	158.0W	FGE	13	340.44	340.43	340.50	
I-310	5	305	1585	8APR80	12.0N	158.0W	FGE	13	340.44	340.43	340.50	
I-311	5	306	1585	8APR80	14.0N	158.0W	FGE	13	341.01	340.99	341.06	
I-312	5	306	1585	8APR80	14.0N	158.0W	FGE	13	340.91	340.90	340.97	
O-203	3	306	1585	8APR80	14.0N	158.0W	FGE	13	341.10	341.09	341.15	
I-349	5	307	1586	9APR80	16.0N	158.0W	FGE	13	341.02	341.01	341.07	
I-350	5	307	1586	9APR80	16.0N	158.0W	FGE	13	340.89	340.88	340.94	
O-348	3	307	1586	9APR80	16.0N	158.0W	FGE	13	341.10	341.09	341.16	
I-351	5	308	1586	9APR80	18.0N	158.0W	FGE	13	341.02	341.01	341.07	
I-352	5	308	1586	9APR80	18.0N	158.0W	FGE	13	341.20	341.18	341.25	
O-204	3	308	1586	9APR80	18.0N	158.0W	FGE	13	341.54	341.53	341.60	
I-353	5	309	1586	10APR80	20.0N	158.0W	FGE	13	341.02	341.01	341.07	
I-354	5	309	1586	10APR80	20.0N	158.0W	FGE	13	341.02	341.01	341.07	
O-346	3	309	1586	10APR80	20.0N	158.0W	FGE	13	341.05	341.04	341.11	
I-451	5	310	1601	21APR80	20.0N	158.0W	FGE	14	341.05	341.04	341.11	
I-452	5	310	1601	21APR80	20.0N	158.0W	FGE	14	341.10	341.08	341.16	
I-453	5	311	1602	21APR80	18.0N	158.0W	FGE	14	341.53	341.51	341.60	
I-454	5	311	1602	21APR80	18.0N	158.0W	FGE	14	341.39	341.38	341.46	
I-455	5	312	1602	22APR80	16.0N	158.0W	FGE	14	341.53	341.51	341.60	
I-456	5	312	1602	22APR80	16.0N	158.0W	FGE	14	341.70	341.69	341.78	
I-457	5	313	1602	22APR80	14.0N	158.0W	FGE	14	341.03	341.02	341.10	
I-458	5	313	1602	22APR80	14.0N	158.0W	FGE	14	341.03	341.02	341.10	
I-459	5	314	1602	23APR80	12.0N	158.0W	FGE	14	340.68	340.66	340.74	

FLAGS: * REJECTED BECAUSE NO FLASK PAIR EXISTS FOR THIS DAY THAT AGREES TO WITHIN .25 PPM
 (FOR LETTER CODES SEE LAST PAGE OF TABLE)

ATMOSPHERIC CARBON DIOXIDE MEASUREMENTS, SCRIPPS INSTITUTE OF OCEANOGRAPHY
 FGCE SHUTTLE EXPEDITION, 1979-1980

SAMPLE NO.	FIELD FLASK SIZE	FIELD SHEET NO.	ANAL. SHEET NO.	DATE OF OBSERVATION	LATI-TUDE	LONGI-TUDE	EXPEDITION	LEG	CO2 CONCENTRATION			FLAGS
									1980 CALIB. (ppm)	1981 CALIB. (ppm)	1985 CALIB. (ppm)	
I-460	5	314	1603	23APR80	12.0N	158.0W	FGE	14	340.71	340.70	340.77	
I-461	5	315	1603	29APR80	4.0S	153.0W	FGE	14	338.53	338.51	338.59	
I-462	5	316	1603	29APR80	4.0S	153.0W	FGE	14	338.53	338.51	338.59	
I-463	5	316	1603	30APR80	1.0S	153.0W	FGE	14	340.14	340.12	340.20	*
I-464	5	316	1603	30APR80	1.0S	153.0W	FGE	14	339.78	339.77	339.84	*
I-465	5	317	1603	30APR80	0.0S	153.0W	FGE	14	338.70	338.69	338.77	*
I-466	5	317	1603	30APR80	0.0S	153.0W	FGE	14	338.40	338.39	338.46	*
I-467	5	318	1604	1MAY80	1.0N	153.0W	FGE	14	339.40	339.39	339.47	*
I-468	5	318	1604	1MAY80	1.0N	153.0W	FGE	14	338.92	338.91	338.98	*
I-469	5	319	1604	1MAY80	2.0N	153.0W	FGE	14	339.23	339.21	339.29	*
I-470	5	319	1604	1MAY80	2.0N	153.0W	FGE	14	339.01	338.99	339.07	RP
I-471	5	320	1604	1MAY80	3.0N	153.0W	FGE	14	339.58	339.57	339.65	RP
I-472	5	320	1604	1MAY80	3.0N	153.0W	FGE	14	342.55	342.53	342.58	*
I-473	5	321	1604	2MAY80	4.0N	153.0W	FGE	14	340.03	340.02	340.09	*
I-474	5	321	1604	2MAY80	4.0N	153.0W	FGE	14	340.07	340.06	340.14	*
I-475	5	322	1605	2MAY80	6.0N	153.0W	FGE	14	340.23	340.22	340.30	*
I-476	5	322	1605	2MAY80	6.0N	153.0W	FGE	14	341.39	341.38	341.45	*
I-477	5	323	1605	3MAY80	8.0N	153.0W	FGE	14	341.53	341.51	341.59	RP
I-478	5	323	1605	3MAY80	8.0N	153.0W	FGE	14	341.35	341.34	341.40	RP
I-479	5	324	1605	3MAY80	10.0N	153.0W	FGE	14	341.57	341.56	341.63	*
I-480	5	324	1605	3MAY80	10.0N	153.0W	FGE	14	341.83	341.82	341.89	*
I-481	5	325	1606	9MAY80	2.0S	150.0W	FGE	14	338.96	338.94	339.03	*
I-482	5	325	1606	9MAY80	2.0S	150.0W	FGE	14	338.91	338.90	338.98	*
I-483	5	326	1606	10MAY80	6.0S	150.0W	FGE	14	342.37	342.35	342.42	*
I-484	5	326	1606	10MAY80	6.0S	150.0W	FGE	14	340.55	340.54	340.62	*
I-485	5	327	1606	11MAY80	8.0S	150.0W	FGE	14	338.22	338.20	338.28	RP
I-486	5	327	1606	11MAY80	8.0S	150.0W	FGE	14	338.42	338.41	338.50	RP
I-487	5	328	1607	11MAY80	10.0S	150.0W	FGE	14	358.16	358.14	358.14	*
I-488	5	328	1607	11MAY80	10.0S	150.0W	FGE	14	338.65	338.64	338.72	*
I-489	5	329	1607	12MAY80	12.0S	150.0W	FGE	14	343.16	343.14	343.20	*
I-490	5	329	1607	12MAY80	12.0S	150.0W	FGE	14	338.25	338.23	338.32	*
I-491	5	330	1607	12MAY80	14.0S	150.0W	FGE	14	337.73	337.71	337.78	*
I-492	5	330	1607	12MAY80	14.0S	150.0W	FGE	14	340.57	340.55	340.62	*
I-493	5	331	1608	13MAY80	16.0S	150.0W	FGE	14	336.74	336.72	336.82	*
I-494	5	331	1608	13MAY80	16.0S	150.0W	FGE	14	337.01	336.99	337.09	*
I-495	5	332	1608	13MAY80	17.0S	150.0W	FGE	14	337.19	337.17	337.26	*
I-496	5	332	1608	13MAY80	17.0S	150.0W	FGE	14	337.01	336.99	337.09	*
0-309	3	333	1611	18MAY80	17.0S	150.0W	FGE	15	337.34	337.33	337.42	*
I-497	5	333	1610	18MAY80	17.0S	150.0W	FGE	16	340.08	340.07	340.15	*
I-498	5	333	1610	18MAY80	17.0S	150.0W	FGE	16	337.34	337.33	337.42	*
0-306	3	334	1611	18MAY80	16.0S	150.0W	FGE	15	337.43	337.41	337.49	*
I-499	5	334	1611	18MAY80	16.0S	150.0W	FGE	15	337.43	337.41	337.49	*
I-500	5	334	1611	18MAY80	16.0S	150.0W	FGE	15	337.52	337.51	337.58	*

FLAGS: * REJECTED BECAUSE NO FLASK PAIR EXISTS FOR THIS DAY THAT AGREES TO WITHIN .25 PPM
 (FOR LETTER CODES SEE LAST PAGE OF TABLE)

ATMOSPHERIC CARBON DIOXIDE MEASUREMENTS, SCRIPPS INSTITUTE OF OCEANOGRAPHY
 FGGE SHUTTLE EXPEDITION, 1979-1980

SAMPLE NO.	FLASK SIZE	FIELD SHEET NO.	ANAL. SHEET NO.	DATE OF OBSERVATION	LATI-TUDE	LONGI-TUDE	EXPEDITION	LEG	CO2 CONCENTRATION			FLAGS
									1980 CALIB. (ppm)	1981 CALIB. (ppm)	1985 CALIB. (ppm)	
0-310	3	335	1611	18MAY80	14.0S	150.0W	FGE	15	337.07	337.06	337.15	AG
I-501	5	335	1611	18MAY80	14.0S	150.0W	FGE	15	349.38	349.36	349.40	*
I-502	5	336	1611	18MAY80	14.0S	150.0W	FGE	15	337.34	337.33	337.41	AG
0-308	3	336	1611	19MAY80	12.0S	150.0W	FGE	15	336.90	336.88	336.97	*
I-503	5	336	1611	19MAY80	12.0S	150.0W	FGE	15	337.07	337.06	337.15	*
I-504	5	336	1611	19MAY80	12.0S	150.0W	FGE	15	337.39	337.37	337.46	*
0-337	3	337	1612	20MAY80	10.0S	150.0W	FGE	15	337.25	337.24	337.33	*
I-505	5	337	1612	20MAY80	10.0S	150.0W	FGE	15	337.43	337.41	337.49	*
0-340	3	338	1612	20MAY80	8.0S	150.0W	FGE	15	337.34	337.33	337.42	*
I-506	5	338	1612	20MAY80	8.0S	150.0W	FGE	15	337.60	337.59	337.67	AG
I-507	5	338	1612	20MAY80	8.0S	150.0W	FGE	15	338.13	338.11	338.20	AG
I-508	5	338	1612	20MAY80	8.0S	150.0W	FGE	15	338.08	338.04	338.72	*
0-324	3	339	1612	21MAY80	6.0S	150.0W	FGE	15	338.71	338.69	337.94	*
I-509	5	339	1612	21MAY80	6.0S	150.0W	FGE	15	338.68	338.64	338.72	*
I-510	5	339	1612	21MAY80	6.0S	150.0W	FGE	15	338.71	338.69	338.77	*
0-250	3	340	1612	6JUN80	4.0S	158.0W	FGE	15	339.55	339.54	339.61	*
0-329	3	340	1613	6JUN80	4.0S	158.0W	FGE	15	339.36	339.34	339.42	*
I-511	5	340	1613	6JUN80	4.0S	158.0W	FGE	15	339.41	339.39	339.47	*
I-512	5	340	1613	6JUN80	4.0S	158.0W	FGE	15	339.59	339.57	339.66	*
0-334	3	341	1613	7JUN80	2.0S	158.0W	FGE	15	339.71	339.70	339.78	*
I-513	5	341	1613	7JUN80	2.0S	158.0W	FGE	15	339.94	339.93	339.99	*
I-514	5	341	1613	7JUN80	2.0S	158.0W	FGE	15	339.86	339.84	339.91	*
I-515	5	341	1614	7JUN80	1.0S	158.0W	FGE	15	339.91	339.90	339.97	*
I-516	5	342	1614	7JUN80	1.0S	158.0W	FGE	15	339.69	339.68	339.76	*
0-208	3	343	1614	7JUN80	0.0S	158.0W	FGE	15	339.56	339.54	339.62	*
0-312	3	343	1614	7JUN80	0.0S	158.0W	FGE	15	339.56	339.54	339.62	*
I-517	5	343	1614	7JUN80	0.0S	158.0W	FGE	15	339.87	339.86	339.93	*
I-518	5	343	1614	7JUN80	0.0S	158.0W	FGE	15	339.56	339.54	339.62	*
I-519	5	344	1615	8JUN80	1.0N	158.0W	FGE	15	340.51	340.49	340.56	*
0-386	3	345	1615	8JUN80	2.0N	158.0W	FGE	15	339.57	339.55	339.63	*
I-521	5	345	1615	8JUN80	2.0N	158.0W	FGE	15	339.85	339.84	339.92	*
I-211	5	346	1616	9JUN80	3.0N	158.0W	FGE	15	340.01	339.99	340.07	*
I-212	5	346	1616	9JUN80	3.0N	158.0W	FGE	15	339.79	339.77	339.85	*
0-311	3	347	1616	9JUN80	4.0N	158.0W	FGE	15	339.69	339.68	339.76	*
I-213	5	347	1616	9JUN80	4.0N	158.0W	FGE	15	339.65	339.64	339.72	*
I-214	5	347	1616	9JUN80	4.0N	158.0W	FGE	15	339.85	339.84	339.92	*
0-315	3	348	1616	10JUN80	6.0N	158.0W	FGE	15	339.65	339.64	339.72	*
I-215	5	348	1616	10JUN80	6.0N	158.0W	FGE	15	340.05	340.03	340.11	AG
I-216	5	348	1616	10JUN80	6.0N	158.0W	FGE	15	340.50	340.48	340.56	*
0-338	3	349	1617	10JUN80	8.0N	158.0W	FGE	15	360.61	360.59	360.68	*
I-13	5	349	1617	10JUN80	8.0N	158.0W	FGE	15	341.22	341.21	341.27	AG
I-14	5	349	1617	10JUN80	8.0N	158.0W	FGE	15	341.53	341.52	341.59	*
0-318	3	350	1618	11JUN80	10.0N	158.0W	FGE	15	341.62	341.60	341.68	*
									341.49	341.48	341.54	AG

FLAGS: * REJECTED BECAUSE NO FLASK PAIR EXISTS FOR THIS DAY THAT AGREES TO WITHIN .25 PPM
 (FOR LETTER CODES SEE LAST PAGE OF TABLE)

ATMOSPHERIC CARBON DIOXIDE MEASUREMENTS, SCRIPPS INSTITUTE OF OCEANOGRAPHY
 FGGE SHUTTLE EXPEDITION, 1979-1980

SAMPLE NO.	FLASK SIZE	FIELD SHEET NO.	ANAL. SHEET NO.	DATE OF OBSERVATION	LATI-TUDE	LONGI-TUDE	EXPEDITION	LEG	CO2 CONCENTRATION			FLAGS
									1980 CALIB. (ppm)	1981 CALIB. (ppm)	1985 CALIB. (ppm)	
I-15	5	350	1617	11JUN80	10.0N	158.0W	FGE	15	341.89	341.88	341.95	*
O-207	3	351	1618	12JUN80	12.0N	158.0W	FGE	15	342.30	342.29	342.35	*
O-307	3	351	1618	12JUN80	12.0N	158.0W	FGE	15	341.67	341.66	341.72	
I-17	5	351	1618	12JUN80	12.0N	158.0W	FGE	15	341.67	341.66	341.72	
O-343	3	352	1620	12JUN80	14.0N	158.0W	FGE	15	341.01	341.00	341.06	
I-169	5	352	1618	12JUN80	14.0N	158.0W	FGE	15	341.40	341.38	341.45	*
I-170	5	352	1618	12JUN80	14.0N	158.0W	FGE	15	341.14	341.12	341.18	
I-171	5	352	1618	12JUN80	14.0N	158.0W	FGE	15	341.18	341.16	341.23	
O-316	3	353	1618	13JUN80	16.0N	158.0W	FGE	15	341.40	341.38	341.45	
I-172	5	353	1618	13JUN80	16.0N	158.0W	FGE	15	341.36	341.34	341.40	
I-173	5	353	1619	13JUN80	16.0N	158.0W	FGE	15	341.37	341.35	341.43	
I-174	5	353	1619	13JUN80	16.0N	158.0W	FGE	15	341.23	341.22	341.30	
O-325	3	354	1619	13JUN80	18.0N	158.0W	FGE	15	341.45	341.44	341.52	AG
O-260	3	355	1619	14JUN80	20.0N	158.0W	FGE	15	341.72	341.71	341.78	AG

 FLAGS: * REJECTED BECAUSE NO FLASK PAIR EXISTS FOR THIS DAY THAT AGREES TO WITHIN .25 PPM

- RP REJECTED PEREMPTORILY
- AP ACCEPTED PEREMPTORILY
- RG REJECTED BY GAS CHROMATOGRAPH
- AG ACCEPTED BY GAS CHROMATOGRAPH
- AI ACCEPTED BY INTERPOLATION



Section 3: Output to "STATION FIT" Program



SCRIPPS INSTITUTION OF OCEANOGRAPHY
ATMOSPHERIC CARBON DIOXIDE PROGRAM
ANALYSIS OF STATION DATA USING PROGRAM "STATION FIT"

STATION: ICE FLOE STATION ARLIS RUN NO. ARL-04

COORDINATES : 77N TO 89N IN ARCTIC OCEAN

ELEVATION ABOVE SEA LEVEL : 2 METERS

BEGINNING DATE : 18-SEP-1961
FINAL DATE : 16-MAY-1964

TYPE OF DATA PROCESSED : FLASK DAILY AVERAGES

CALIBRATION SCALE : 1985

NUMBER OF HARMONICS : 2

COMPUTED SPLINE RMS SECOND DERIVATIVE : 0.00

COMPUTED GAIN FACTOR FOR SEASONAL CYCLE
REFERENCED TO BASE YEAR = 1960 : NOT COMPUTED

COMPUTED SPLINE STIFFNESS PARAMETER (SIGMA) : 1.2513 PPM

DATE OF RUN : 26-NOV-1985

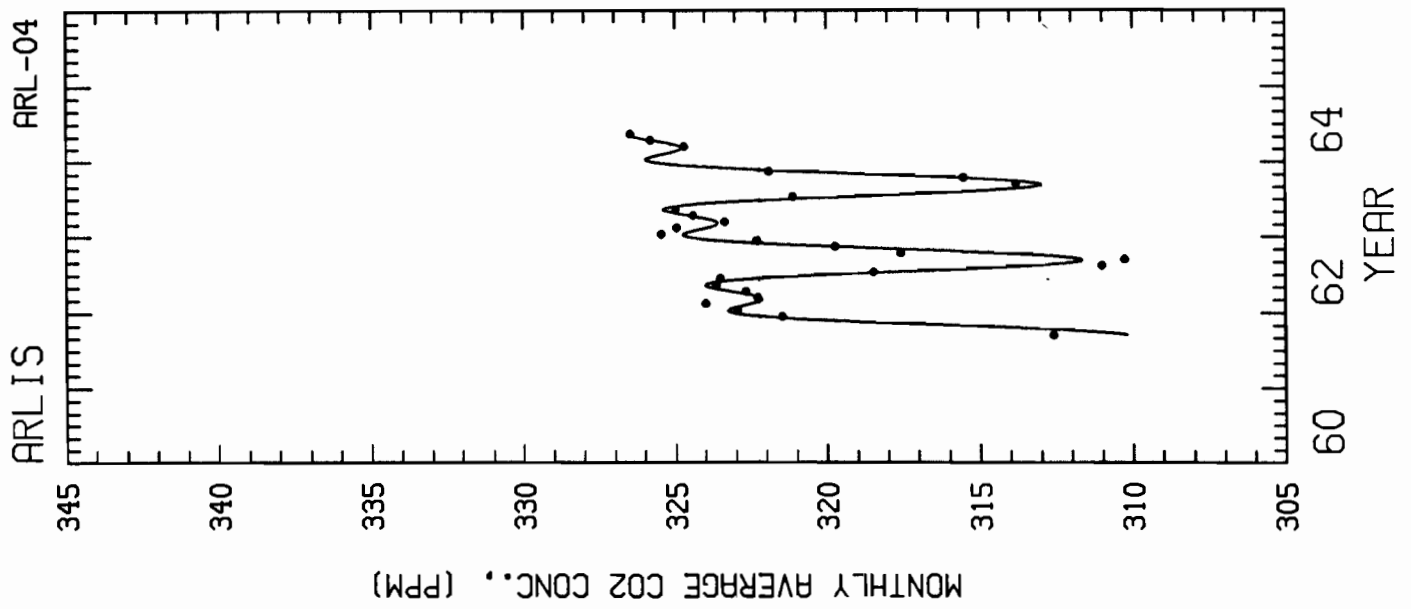
BASE YEAR MIDDLE YEAR
60 63.0447

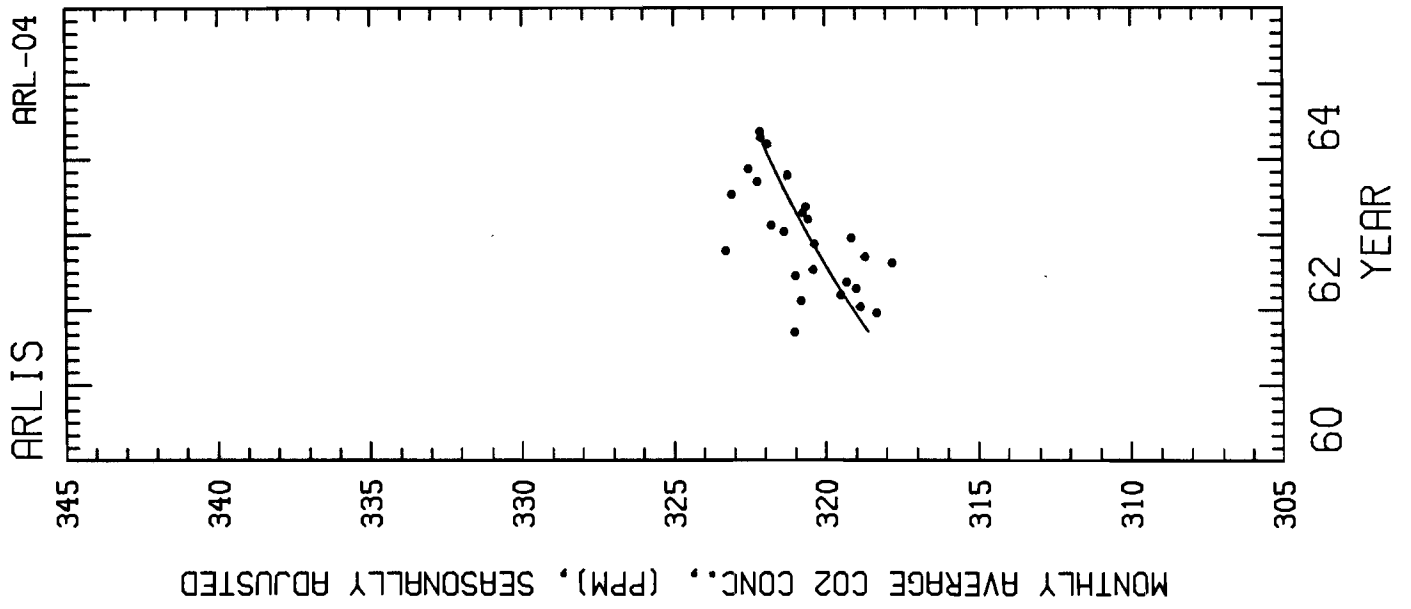
FIRST AND LAST 5 DATA POINTS ARE :

NO.	MEAS	SYMB	YEAR	CONC (PPM)
1	2	1	1.7151	312.71
2	2	1	1.9452	320.67
3	2	1	1.9616	322.09
4	2	1	2.0082	322.88
5	2	1	2.0904	324.39
34	2	1	3.7890	315.54
35	2	1	3.8740	321.91
36	2	1	4.1721	324.68
37	2	1	4.2568	325.33
38	2	1	4.3743	326.47

INPUT PARAMETERS :

STATION	NO.	HARMONICS	GAIN	SOUTHERN HEM.	SQ2D
ARL		2	NO	NO	0





1. FIT OF CUBIC + HARMONICS

FITTED COEFFICIENTS / ERROR :

CONST	T	T**2	T**3
0.34517E+03	-0.28282E+02	0.98020E+01	-0.10411E+01
0.16114E+02	0.16838E+02	0.56814E+01	0.61891E+00
SIN(2*PI*T)	COS(2*PI*T)	SIN(4*PI*T)	COS(4*PI*T)
0.53788E+01	0.16863E+01	-0.18886E+01	0.22396E+01
0.29323E+00	0.32042E+00	0.30416E+00	0.31006E+00

STANDARD ERROR OF FIT: DEL = 0.12558E+01

SEASONAL CYCLE FIT (PPM):

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
4.02	3.10	2.72	3.70	4.51	2.79	-1.72	-6.74	-8.53	-5.89	-0.78	3.06

2. FIT OF EXPONENTIAL + HARMONICS

FIT TO NON-LINEAR TERMS :

ITER	CHISQ	FL
1	0.22065E+02	0.10000E-03
2	0.49522E+01	0.10000E-04
3	0.44265E+01	0.10000E-03
4	0.20136E+01	0.10000E-02
18	0.17197E+01	0.10000E-02
19	0.17191E+01	0.10000E-02
20	0.17185E+01	0.10000E-02

FINAL VALUES LISTED ABOVE APPLY TO FIT

FIT IS TO C1 + C2*EXP(R*T) + HARMONICS

FITTED COEFFICIENTS / ERROR :

(ERRORS COMPUTED FROM MATRIX ELEMENTS INCLUDE (1 + FL) AS A FACTOR)

C1	C2	R	
0.32768E+03	-0.12372E+02	-0.18420E+00	
0.17294E+01	0.19692E+01	0.61182E-01	
SIN(2*PI*T)	COS(2*PI*T)	SIN(4*PI*T)	COS(4*PI*T)
0.53090E+01	0.18534E+01	-0.18847E+01	0.21344E+01
0.29292E+00	0.32008E+00	0.31383E+00	0.31342E+00

STANDARD ERROR OF FIT: DEL = 0.13109E+01

SEASONAL CYCLE FIT (PPM):

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
4.07	3.17	2.80	3.69	4.35	2.52	-1.96	-6.82	-8.41	-5.69	-0.62	3.14

3. FIT OF STRAIGHT LINE SPLINE + HARMONICS TO EXPONENTIALLY ADJUSTED DATA

SPLINE-HARMONICS ITERATION NUMBER 2

CHISQ FOR HARMONIC FIT = 0.15657E+01

FIT IS TO CHISQUARED-TYPE-SPLINE + HARMONICS

FITTED COEFFICIENTS / ERROR :

(ERRORS COMPUTED FROM MATRIX ELEMENTS INCLUDE (1 + FL) AS A FACTOR)

SIN(2*PI*T)	COS(2*PI*T)	SIN(4*PI*T)	COS(4*PI*T)
0.53074E+01	0.18571E+01	-0.18757E+01	0.21470E+01
0.27988E+00	0.30597E+00	0.29239E+00	0.29030E+00

DEL	SQ2D
0.12513E+01	0.00000E+00

CONCENTRATION OF ATMOSPHERIC CO2 (PPM)

FITTED SEASONAL FUNCTION (HARMONICS) :

SEASONAL CYCLE (PPM) :

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
4.09	3.18	2.79	3.67	4.34	2.52	-1.95	-6.81	-8.42	-5.71	-0.62	3.15

CONCENTRATION OF ATMOSPHERIC CO2 (PPM)

AVERAGE OVER MONTHS OF AVERAGES AT 15TH OF MONTH, ADJUSTED FOR TREND :

SEASONAL CYCLE (PPM) :

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
4.31	4.46	2.68	3.42	4.05	3.72	-0.79	-9.03	-7.85	-4.37	-0.21	2.13

GAIN FOR EACH YEAR :

YEAR	PTS	DEL	GAIN ERROR
1961	3	0.54	0.7259 0.0580
1962	21	1.35	1.0761 0.0684
1963	11	0.85	0.9771 0.0607
1964	3	0.06	0.9775 0.0106

STATION: ARL
CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
AVERAGES OF DATA ADJUSTED TO THE 15TH OF EACH MONTH :

MONTH	YEAR			
	1961	1962	1963	1964
JAN	0.00	322.95	325.46	0.00
FEB	0.00	324.00	324.96	0.00
MAR	0.00	322.29	323.37	324.71
APR	0.00	322.68	324.42	325.82
MAY	0.00	323.65	324.99	326.48
JUN	0.00	323.52	0.00	0.00
JUL	0.00	318.48	321.13	0.00
AUG	0.00	311.01	0.00	0.00
SEP	312.60	310.28	313.82	0.00
OCT	0.00	317.59	315.54	0.00
NOV	0.00	319.74	321.91	0.00
DEC	321.48	322.31	0.00	0.00
AVE	0.00	319.87	0.00	0.00

STATION: ARL
CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
AVERAGES OF DATA ADJUSTED TO THE 15TH OF EACH MONTH AND SEASONALLY ADJUSTED :

MONTH	YEAR			
	1961	1962	1963	1964
JAN	0.00	318.86	321.37	0.00
FEB	0.00	320.82	321.78	0.00
MAR	0.00	319.50	320.58	321.91
APR	0.00	319.01	320.75	322.12
MAY	0.00	319.31	320.65	322.15
JUN	0.00	320.99	0.00	0.00
JUL	0.00	320.43	323.08	0.00
AUG	0.00	317.82	0.00	0.00
SEP	321.02	318.69	322.24	0.00
OCT	0.00	323.30	321.25	0.00
NOV	0.00	320.37	322.53	0.00
DEC	318.33	319.16	0.00	0.00
AVE	0.00	319.86	0.00	0.00

STATION: ARL
 CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
 FITTED FUNCTION (EXPONENTIAL + SPLINE + HARMONICS) AT 15TH OF MONTH :
 (JANO REFERS TO VALUE AT BEGINNING OF YEAR)

MONTH	YEAR			
	1961	1962	1963	1964
JAN	0.00	323.25	324.72	325.96
FEB	0.00	322.47	323.92	325.15
MAR	0.00	322.20	323.64	324.85
APR	0.00	323.21	324.63	325.84
MAY	0.00	324.01	325.40	326.56
JUN	0.00	322.32	323.69	0.00
JUL	0.00	317.97	319.32	0.00
AUG	0.00	313.24	314.57	0.00
SEP	310.18	311.75	313.06	0.00
OCT	313.03	314.58	315.87	0.00
NOV	318.26	319.78	321.05	0.00
DEC	322.17	323.67	324.93	0.00
AVE	0.00	319.87	321.23	0.00
JANO	0.00	323.09	324.58	325.83

STATION: ARL
 CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
 TREND (EXPONENTIAL + SPLINE) AT 15TH OF MONTH :
 (JANO REFERS TO VALUE AT BEGINNING OF YEAR)

MONTH	YEAR			
	1961	1962	1963	1964
JAN	0.00	319.15	320.63	321.87
FEB	0.00	319.29	320.75	321.96
MAR	0.00	319.41	320.85	322.05
APR	0.00	319.54	320.96	322.14
MAY	0.00	319.67	321.06	322.23
JUN	0.00	319.80	321.17	0.00
JUL	0.00	319.92	321.27	0.00
AUG	0.00	320.04	321.38	0.00
SEP	318.60	320.17	321.48	0.00
OCT	318.74	320.28	321.58	0.00
NOV	318.88	320.40	321.68	0.00
DEC	319.02	320.52	321.77	0.00
AVE	0.00	319.85	321.22	0.00
JANO	0.00	319.09	320.58	321.82

SCRIPPS INSTITUTION OF OCEANOGRAPHY
ATMOSPHERIC CARBON DIOXIDE PROGRAM
ANALYSIS OF STATION DATA USING PROGRAM "STATION FIT"

STATION: POINT BARROW, ALASKA

RUN NO. PAB-15

COORDINATES : 71.3N 156.6W

ELEVATION ABOVE SEA LEVEL : 11 METERS

BEGINNING DATE : 12-JUL-1961

FINAL DATE : 11-SEP-1985

TYPE OF DATA PROCESSED : CONTINUOUS: 7 CALENDAR-DAY AVERAGES
(12-JUL-1961 TO 13-SEP-1967)
FLASK : DAILY AVERAGES
(3-JAN-1974 TO 11-SEP-1985)

CALIBRATION SCALE : 1985

NUMBER OF HARMONICS : 4

COMPUTED SPLINE RMS SECOND DERIVATIVE : MONTHLY NODES : 0.00
DATA POINT NODES : 0.00

COMPUTED GAIN FACTOR FOR SEASONAL CYCLE
REFERENCED TO BASE YEAR = 1960 : 1.0217 % PER YEAR

COMPUTED SPLINE STIFFNESS PARAMETER (SIGMA) : 1.2450 PPM

DATE OF RUN : 04-MAR-1986

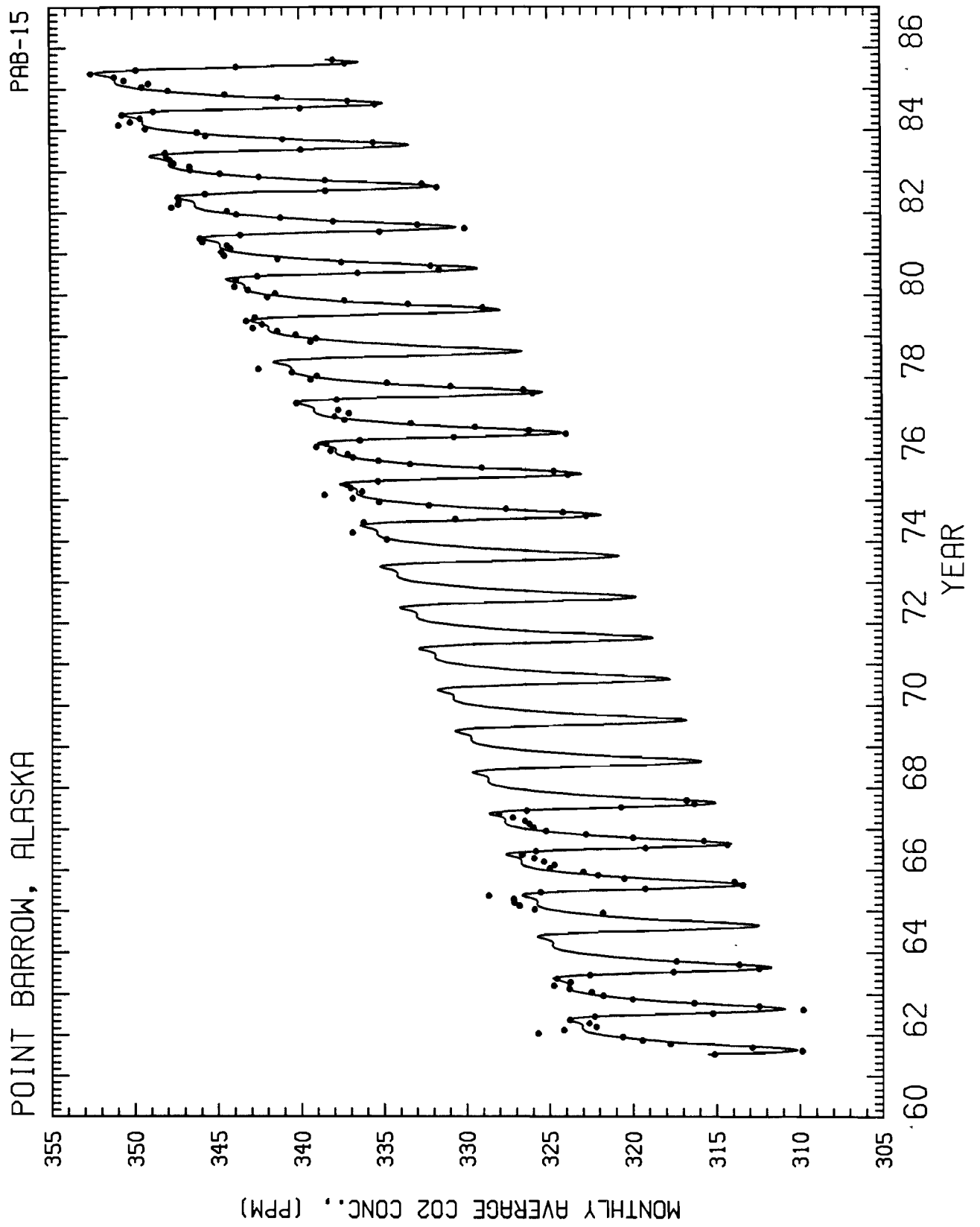
BASE YEAR MIDDLE YEAR
60 73.6123

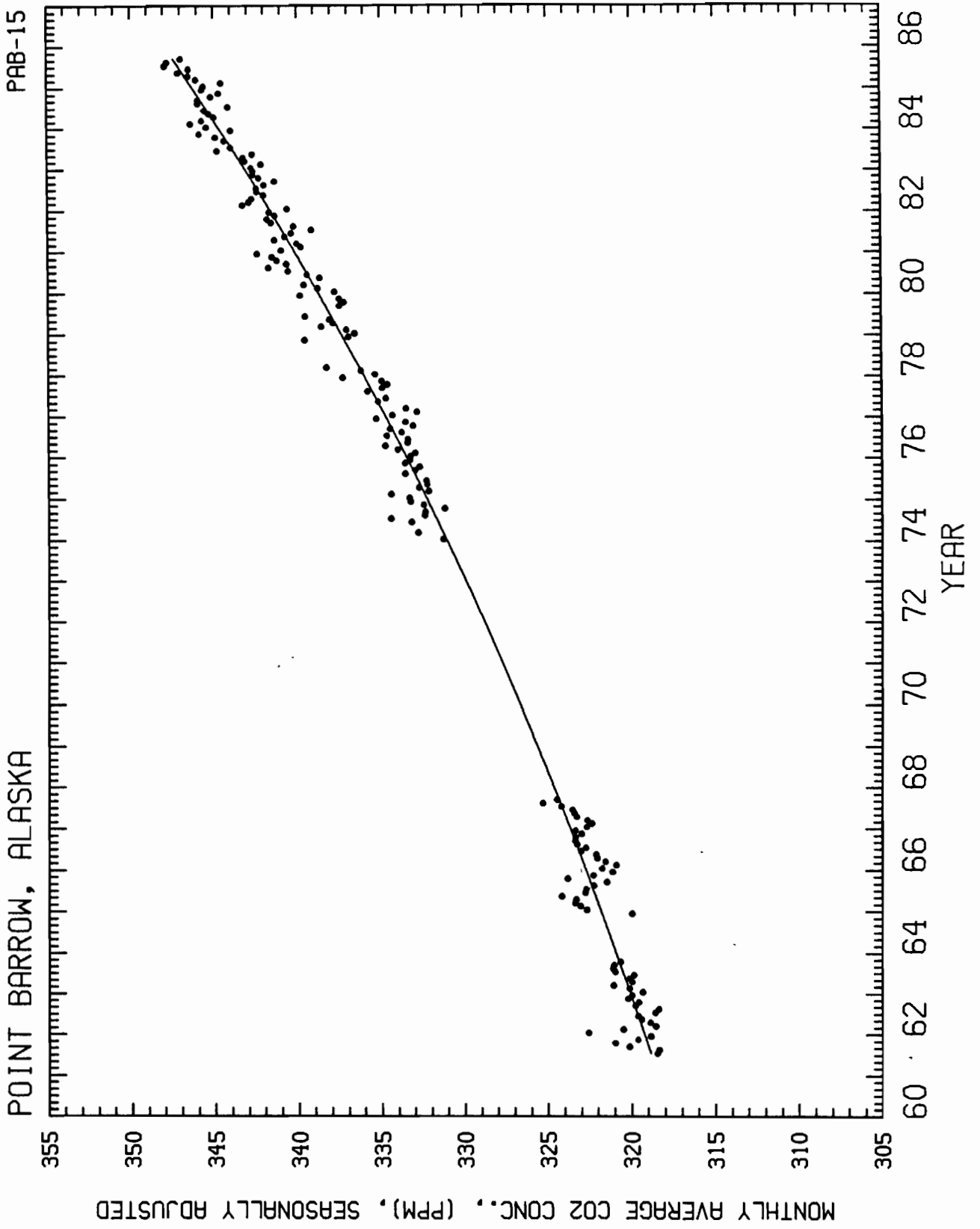
FIRST AND LAST 5 DATA POINTS ARE :

NO.	MEAS	SYMB	YEAR	CONC (PPM)
1	6	0	1.5288	316.48
2	6	0	1.5479	314.84
3	7	0	1.5671	311.71
4	7	0	1.5863	310.83
5	4	0	1.6055	309.98
548	2	1	25.6356	337.24
549	2	1	25.6438	337.35
550	2	1	25.6740	336.90
551	2	1	25.6822	336.54
552	2	1	25.6959	337.12

INPUT PARAMETERS :

STATION	NO.	HARMONICS	GAIN	SOUTHERN HEM.	SQ2DI
PAB		4	YES	NO	0





1. FIT OF CUBIC + HARMONICS

FITTED COEFFICIENTS / ERROR :

CONST	T	T**2	T**3
0.31858E+03	0.44710E+00	0.38637E-01	-0.50012E-03
0.28787E+00	0.96075E-01	0.79184E-02	0.18875E-03
SIN(2*PI*T)	COS(2*PI*T)	SIN(4*PI*T)	COS(4*PI*T)
0.57558E+01	0.22783E+01	-0.25407E+01	0.10800E+01
0.78078E-01	0.78315E-01	0.77874E-01	0.78170E-01
SIN(6*PI*T)	COS(6*PI*T)	SIN(8*PI*T)	COS(8*PI*T)
0.87750E+00	-0.70828E+00	-0.80393E-01	0.20509E+00
0.78656E-01	0.77157E-01	0.78275E-01	0.77529E-01

STANDARD ERROR OF FIT: DEL = 0.12910E+01

SEASONAL CYCLE FIT (PPM):

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
3.50	4.06	4.00	4.19	4.90	2.99	-3.68	-9.47	-8.14	-3.61	-0.27	1.92

2. FIT OF EXPONENTIAL + HARMONICS

FIT TO NON-LINEAR TERMS :

ITER	CHISQ	FL
1	0.16561E+01	0.10000E-03
2	0.16245E+01	0.10000E-03
3	0.15959E+01	0.10000E-03
4	0.15813E+01	0.10000E-03
14	0.15512E+01	0.10000E-05
15	0.15501E+01	0.10000E-06
16	0.15501E+01	0.10000E-07

FINAL VALUES LISTED ABOVE APPLY TO FIT

FIT IS TO C1 + C2*EXP(R*T) + (1 + A*T)*HARMONICS

FITTED COEFFICIENTS / ERROR :

A	C1	C2	R
0.10218E-01	0.29080E+03	0.26835E+02	0.29028E-01
0.15787E-02	0.29666E+01	0.28474E+01	0.21590E-02
SIN(2*PI*T)	COS(2*PI*T)	SIN(4*PI*T)	COS(4*PI*T)
0.50487E+01	0.20362E+01	-0.22478E+01	0.93785E+00
0.11827E+00	0.75397E-01	0.78596E-01	0.68722E-01
SIN(6*PI*T)	COS(6*PI*T)	SIN(8*PI*T)	COS(8*PI*T)
0.77194E+00	-0.63957E+00	-0.93665E-01	0.18185E+00
0.67769E-01	0.65961E-01	0.66017E-01	0.65348E-01

STANDARD ERROR OF FIT: DEL = 0.12450E+01

SEASONAL CYCLE FIT (PPM):

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
3.48	4.08	4.05	4.16	4.87	2.99	-3.74	-9.53	-8.13	-3.58	-0.21	1.97

3. FIT OF STRAIGHT LINE SPLINE + HARMONICS TO EXPONENTIALLY ADJUSTED DATA

SPLINE-HARMONICS ITERATION NUMBER 3

FIT OF NON-LINEAR GAIN :

ITER	CHISQ	FL
1	0.15415E+01	0.10000E-03
2	0.15415E+01	0.10000E-04

FIT IS TO CHISQUARED-TYPE-SPLINE + (1 + A*T)*HARMONICS
FITTED COEFFICIENTS / ERROR :

A			
0.10217E-01			
0.15722E-02			
SIN(2*PI*T)	COS(2*PI*T)	SIN(4*PI*T)	COS(4*PI*T)
0.50488E+01	0.20362E+01	-0.22479E+01	0.93787E+00
0.11789E+00	0.74992E-01	0.78138E-01	0.68686E-01
SIN(6*PI*T)	COS(6*PI*T)	SIN(8*PI*T)	COS(8*PI*T)
0.77196E+00	-0.63956E+00	-0.93707E-01	0.18185E+00
0.67696E-01	0.65869E-01	0.65892E-01	0.65341E-01
DEL	SQ2D	SQ2DI	
0.12450E+01	0.10300E-12	0.53567E-08	

CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
FITTED SEASONAL FUNCTION (HARMONICS) EVALUATED AT MIDDLE YEAR :

SEASONAL CYCLE (PPM) :

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
3.48	4.08	4.05	4.16	4.87	2.99	-3.74	-9.53	-8.13	-3.58	-0.21	1.97

CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
AVERAGE OVER MONTHS OF AVERAGES AT 15TH OF MONTH, ADJUSTED FOR TREND :

SEASONAL CYCLE (PPM) :

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
3.45	3.97	4.29	4.27	4.83	3.10	-3.70	-9.42	-8.23	-3.67	-0.13	2.04

GAIN FOR EACH YEAR :

YEAR	PTS	DEL	GAIN ERROR				
1961	23	1.52	0.8614 0.0533	1983	37	1.13	0.9923 0.0469
1962	52	1.44	1.0142 0.0410	1984	40	1.18	1.1548 0.0401
1963	39	0.78	0.8624 0.0230	1985	33	0.90	1.0450 0.0281
1965	51	1.49	1.0287 0.0427				
1966	45	0.98	0.8611 0.0292				
1967	37	1.13	0.8066 0.0346				
1974	9	1.38	1.0317 0.0947				
1975	21	0.92	1.0538 0.0419				
1976	23	0.91	1.0507 0.0400				
1977	17	1.35	0.9935 0.0653				
1978	7	1.35	1.1016 0.1534				
1979	19	1.00	1.1704 0.0570				
1980	20	1.26	0.9220 0.0553				
1981	33	1.09	1.0973 0.0363				
1982	45	1.09	1.1835 0.0331				

STATION: PAB
CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
AVERAGES OF DATA ADJUSTED TO THE 15TH OF EACH MONTH :

MONTH	YEAR							
	1961	1962	1963	1964	1965	1966	1967	1968
JAN	0.00	325.71	322.51	0.00	325.93	325.02	326.00	0.00
FEB	0.00	324.18	323.85	0.00	326.85	324.74	326.24	0.00
MAR	0.00	322.23	324.76	0.00	327.15	325.36	326.50	0.00
APR	0.00	322.64	323.78	0.00	327.19	325.95	327.24	0.00
MAY	0.00	323.81	324.59	0.00	328.71	326.70	328.06	0.00
JUN	0.00	322.32	322.61	0.00	325.57	325.86	326.39	0.00
JUL	315.14	315.24	317.59	0.00	319.27	319.27	320.71	0.00
AUG	309.88	309.81	312.46	0.00	313.43	314.36	316.33	0.00
SEP	312.87	312.46	313.65	0.00	313.94	315.77	316.79	0.00
OCT	317.79	316.37	317.42	0.00	320.53	320.00	0.00	0.00
NOV	319.45	320.04	0.00	0.00	322.10	322.83	0.00	0.00
DEC	320.64	321.78	0.00	321.82	322.99	325.24	0.00	0.00
AVE	0.00	319.71	0.00	0.00	322.80	322.59	0.00	0.00

MONTH	YEAR							
	1969	1970	1971	1972	1973	1974	1975	1976
JAN	0.00	0.00	0.00	0.00	0.00	334.84	336.89	336.86
FEB	0.00	0.00	0.00	0.00	0.00	0.00	338.59	337.18
MAR	0.00	0.00	0.00	0.00	0.00	336.91	336.32	338.20
APR	0.00	0.00	0.00	0.00	0.00	0.00	337.01	339.08
MAY	0.00	0.00	0.00	0.00	0.00	0.00	337.26	338.47
JUN	0.00	0.00	0.00	0.00	0.00	336.25	335.36	336.45
JUL	0.00	0.00	0.00	0.00	0.00	330.70	0.00	330.77
AUG	0.00	0.00	0.00	0.00	0.00	322.81	323.90	324.00
SEP	0.00	0.00	0.00	0.00	0.00	324.21	324.74	326.20
OCT	0.00	0.00	0.00	0.00	0.00	327.63	329.09	329.48
NOV	0.00	0.00	0.00	0.00	0.00	332.29	333.41	333.36
DEC	0.00	0.00	0.00	0.00	0.00	335.28	335.32	337.37
AVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	333.95

MONTH	YEAR							
	1977	1978	1979	1980	1981	1982	1983	1984
JAN	337.96	339.02	340.27	341.50	344.72	344.37	346.56	349.25
FEB	337.10	340.50	341.39	343.14	344.17	347.70	346.61	350.85
MAR	337.74	342.53	342.86	343.94	344.39	347.30	347.55	350.15
APR	0.00	0.00	342.29	0.00	345.85	347.25	347.77	349.56
MAY	340.26	0.00	343.26	343.86	346.00	347.31	348.00	350.64
JUN	337.84	0.00	342.74	342.56	343.58	345.67	348.06	348.76
JUL	0.00	0.00	0.00	336.52	335.19	338.43	339.92	339.95
AUG	325.98	0.00	0.00	331.59	330.04	331.72	0.00	335.43
SEP	326.56	0.00	328.96	332.11	332.88	332.60	335.53	337.06
OCT	330.95	0.00	333.48	337.50	337.98	338.45	341.00	341.29
NOV	334.78	339.39	337.32	341.34	341.15	342.44	345.64	344.48
DEC	339.39	339.05	341.96	344.54	343.81	344.80	346.14	347.88
AVE	0.00	0.00	0.00	0.00	340.81	342.34	0.00	345.44

MONTH	YEAR							
	1977	1978	1979	1980	1981	1982	1983	1984
JAN	334.37	335.40	336.62	337.82	341.00	340.62	342.78	345.44
FEB	332.89	336.26	337.11	338.82	339.82	343.31	342.19	346.39
MAR	333.56	338.31	338.60	339.66	340.06	342.94	343.15	345.72
APR	0.00	0.00	337.92	0.00	341.40	342.77	343.25	345.00
MAY	335.22	0.00	338.14	338.69	340.79	342.06	342.70	345.30
JUN	334.74	0.00	339.59	339.48	340.39	342.44	344.81	345.57
JUL	0.00	0.00	0.00	340.62	339.19	342.47	344.00	344.18
AUG	335.86	0.00	0.00	341.75	340.26	342.02	0.00	345.93
SEP	334.99	0.00	337.54	340.71	341.60	341.40	344.40	345.96
OCT	334.66	0.00	337.26	341.28	341.83	342.33	344.91	345.20
NOV	335.00	339.61	337.55	341.55	341.37	342.67	345.87	344.70
DEC	337.34	336.99	339.88	342.45	341.69	342.66	343.99	345.71
AVE	0.00	0.00	0.00	0.00	340.78	342.31	0.00	345.43

MONTH	YEAR
	1985
JAN	345.61
FEB	344.56
MAR	346.06
APR	346.51
MAY	347.12
JUN	346.49
JUL	347.92
AUG	347.79
SEP	346.97
OCT	0.00
NOV	0.00
DEC	0.00
AVE	0.00

STATION: PAB
 CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
 FITTED FUNCTION (EXPONENTIAL + SPLINE + HARMONICS) AT 15TH OF MONTH :
 (JANO REFERS TO VALUE AT BEGINNING OF YEAR)

MONTH	YEAR							
	1961	1962	1963	1964	1965	1966	1967	1968
JAN	0.00	322.40	323.27	324.16	325.09	326.03	327.00	328.00
FEB	0.00	323.01	323.88	324.79	325.71	326.67	327.65	328.66
MAR	0.00	323.05	323.93	324.83	325.76	326.71	327.70	328.71
APR	0.00	323.22	324.10	325.02	325.94	326.90	327.88	328.91
MAY	0.00	323.93	324.82	325.75	326.68	327.65	328.64	329.67
JUN	0.00	322.31	323.19	324.01	325.01	325.97	326.95	327.88
JUL	315.53	316.32	317.14	317.87	318.85	319.74	320.66	321.50
AUG	310.43	311.17	311.94	312.71	313.55	314.39	315.27	316.14
SEP	311.74	312.50	313.28	314.12	314.92	315.78	316.67	317.62
OCT	315.87	316.67	317.49	318.37	319.22	320.12	321.05	322.04
NOV	318.95	319.78	320.64	321.53	322.43	323.37	324.33	325.33
DEC	320.97	321.82	322.70	323.61	324.54	325.49	326.48	327.49
AVE	0.00	319.68	320.53	321.40	322.31	323.24	324.19	325.16
JANO	0.00	321.81	322.68	323.56	324.48	325.42	326.38	327.38

MONTH	YEAR							
	1969	1970	1971	1972	1973	1974	1975	1976
JAN	329.03	330.09	331.18	332.30	333.46	334.64	335.86	337.11
FEB	329.69	330.76	331.86	332.98	334.15	335.34	336.57	337.83
MAR	329.75	330.82	331.91	333.04	334.21	335.40	336.63	337.90
APR	329.94	331.01	332.11	333.26	334.41	335.61	336.85	338.13
MAY	330.71	331.80	332.91	334.06	335.23	336.43	337.68	338.96
JUN	328.99	330.06	331.16	332.20	333.45	334.64	335.87	337.05
JUL	322.59	323.60	324.64	325.60	326.82	327.95	329.13	330.21
AUG	317.10	318.06	319.05	320.04	321.12	322.21	323.33	324.46
SEP	318.53	319.50	320.51	321.58	322.61	323.72	324.86	326.07
OCT	323.00	324.02	325.06	326.17	327.26	328.41	329.59	330.84
NOV	326.34	327.39	328.48	329.60	330.74	331.92	333.13	334.39
DEC	328.53	329.61	330.71	331.85	333.02	334.22	335.46	336.73
AVE	326.18	327.23	328.30	329.39	330.54	331.71	332.91	334.14
JANO	328.40	329.45	330.53	331.65	332.79	333.97	335.18	336.43

MONTH	YEAR							
	1977	1978	1979	1980	1981	1982	1983	1984
JAN	338.40	339.73	341.10	342.50	343.95	345.43	346.96	348.54
FEB	339.13	340.46	341.84	343.25	344.71	346.20	347.74	349.32
MAR	339.20	340.54	341.91	343.33	344.79	346.29	347.83	349.41
APR	339.42	340.76	342.15	343.58	345.03	346.53	348.08	349.69
MAY	340.27	341.62	343.01	344.45	345.92	347.43	348.99	350.60
JUN	338.44	339.77	341.15	342.48	344.03	345.53	347.07	348.57
JUL	331.58	332.86	334.18	335.41	336.94	338.38	339.87	341.27
AUG	325.69	326.92	328.19	329.47	330.85	332.25	333.69	335.14
SEP	327.24	328.49	329.78	331.15	332.47	333.88	335.34	336.88
OCT	332.06	333.35	334.68	336.09	337.47	338.92	340.42	342.00
NOV	335.67	337.00	338.36	339.78	341.21	342.70	344.24	345.83
DEC	338.04	339.39	340.78	342.21	343.67	345.19	346.74	348.35
AVE	335.43	336.74	338.09	339.48	340.92	342.39	343.91	345.47
JANO	337.71	339.03	340.39	341.79	343.23	344.71	346.23	347.80

MONTH	YEAR
	1985
JAN	350.16
FEB	350.95
MAR	351.05
APR	351.31
MAY	352.23
JUN	350.29
JUL	342.98
AUG	336.70
SEP	338.38
OCT	0.00
NOV	0.00
DEC	0.00
AVE	0.00
JANO	349.41

STATION: PAB
 CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
 TREND (EXPONENTIAL + SPLINE) AT 15TH OF MONTH :
 (JANO REFERS TO VALUE AT BEGINNING OF YEAR)

MONTH	YEAR							
	1961	1962	1963	1964	1965	1966	1967	1968
JAN	0.00	319.28	320.12	320.98	321.87	322.78	323.73	324.70
FEB	0.00	319.35	320.19	321.05	321.95	322.86	323.81	324.78
MAR	0.00	319.41	320.25	321.12	322.02	322.93	323.88	324.86
APR	0.00	319.48	320.33	321.20	322.09	323.01	323.96	324.94
MAY	0.00	319.55	320.40	321.27	322.17	323.09	324.04	325.02
JUN	0.00	319.62	320.47	321.35	322.24	323.17	324.12	325.11
JUL	318.86	319.69	320.54	321.42	322.32	323.25	324.20	325.19
AUG	318.93	319.76	320.62	321.49	322.40	323.33	324.29	325.27
SEP	319.00	319.83	320.69	321.57	322.48	323.41	324.37	325.36
OCT	319.07	319.90	320.76	321.64	322.55	323.49	324.45	325.44
NOV	319.14	319.98	320.83	321.72	322.63	323.57	324.53	325.52
DEC	319.21	320.04	320.91	321.79	322.71	323.64	324.61	325.61
AVE	0.00	319.66	320.51	321.38	322.28	323.21	324.17	325.15
JANO	0.00	319.24	320.08	320.94	321.83	322.75	323.69	324.65

MONTH	YEAR							
	1969	1970	1971	1972	1973	1974	1975	1976
JAN	325.69	326.72	327.78	328.87	329.99	331.14	332.33	333.55
FEB	325.78	326.81	327.87	328.96	330.09	331.24	332.43	333.66
MAR	325.86	326.89	327.95	329.05	330.17	331.33	332.53	333.76
APR	325.94	326.98	328.04	329.14	330.27	331.43	332.63	333.86
MAY	326.03	327.07	328.13	329.23	330.36	331.53	332.73	333.97
JUN	326.11	327.15	328.23	329.33	330.46	331.63	332.83	334.07
JUL	326.20	327.24	328.31	329.42	330.56	331.73	332.93	334.17
AUG	326.29	327.33	328.41	329.52	330.65	331.83	333.04	334.28
SEP	326.37	327.42	328.50	329.61	330.75	331.93	333.14	334.39
OCT	326.46	327.51	328.59	329.70	330.85	332.03	333.24	334.49
NOV	326.55	327.60	328.68	329.80	330.95	332.13	333.35	334.60
DEC	326.63	327.69	328.77	329.89	331.04	332.23	333.45	334.70
AVE	326.16	327.20	328.27	329.38	330.51	331.68	332.89	334.13
JANO	325.65	326.68	327.73	328.82	329.94	331.09	332.28	333.50

MONTH	YEAR							
	1977	1978	1979	1980	1981	1982	1983	1984
JAN	334.81	336.11	337.44	338.82	340.23	341.69	343.18	344.73
FEB	334.92	336.22	337.56	338.93	340.35	341.81	343.31	344.86
MAR	335.02	336.32	337.66	339.05	340.46	341.93	343.43	344.98
APR	335.13	336.43	337.78	339.16	340.59	342.05	343.56	345.12
MAY	335.23	336.54	337.89	339.28	340.70	342.17	343.69	345.25
JUN	335.34	336.66	338.01	339.40	340.83	342.30	343.82	345.38
JUL	335.45	336.77	338.12	339.51	340.95	342.42	343.94	345.51
AUG	335.56	336.88	338.24	339.63	341.07	342.55	344.08	345.65
SEP	335.67	336.99	338.35	339.75	341.19	342.68	344.21	345.78
OCT	335.78	337.10	338.47	339.87	341.32	342.80	344.33	345.91
NOV	335.89	337.22	338.58	339.99	341.44	342.93	344.47	346.05
DEC	336.00	337.33	338.70	340.11	341.56	343.06	344.59	346.18
AVE	335.40	336.71	338.07	339.46	340.89	342.37	343.88	345.45
JANO	334.76	336.05	337.39	338.76	340.17	341.63	343.12	344.66

MONTH	1985
JAN	346.32
FEB	346.45
MAR	346.58
APR	346.71
MAY	346.85
JUN	346.99
JUL	347.12
AUG	347.26
SEP	347.40
OCT	0.00
NOV	0.00
DEC	0.00
AVE	0.00
JANO	346.25

YEAR

SCRIPPS INSTITUTION OF OCEANOGRAPHY
ATMOSPHERIC CARBON DIOXIDE PROGRAM
ANALYSIS OF STATION DATA USING PROGRAM "STATION FIT"

STATION: POINT BARROW, ALASKA

RUN NO. PTB-37

COORDINATES : 71.3N 156.6W

ELEVATION ABOVE SEA LEVEL : 11 METERS

BEGINNING DATE : 3-JAN-1974

FINAL DATE : 11-SEP-1985

TYPE OF DATA PROCESSED : FLASK DAILY AVERAGES

CALIBRATION SCALE : 1985

NUMBER OF HARMONICS : 4

COMPUTED SPLINE RMS SECOND DERIVATIVE : MONTHLY NODES : 30.00
DATA POINT NODES : 50.11

COMPUTED GAIN FACTOR FOR SEASONAL CYCLE
REFERENCED TO BASE YEAR = 1973 : 0.7945 % PER YEAR

COMPUTED SPLINE STIFFNESS PARAMETER (SIGMA) : 1.0382 PPM

DATE OF RUN : 04-MAR-1986

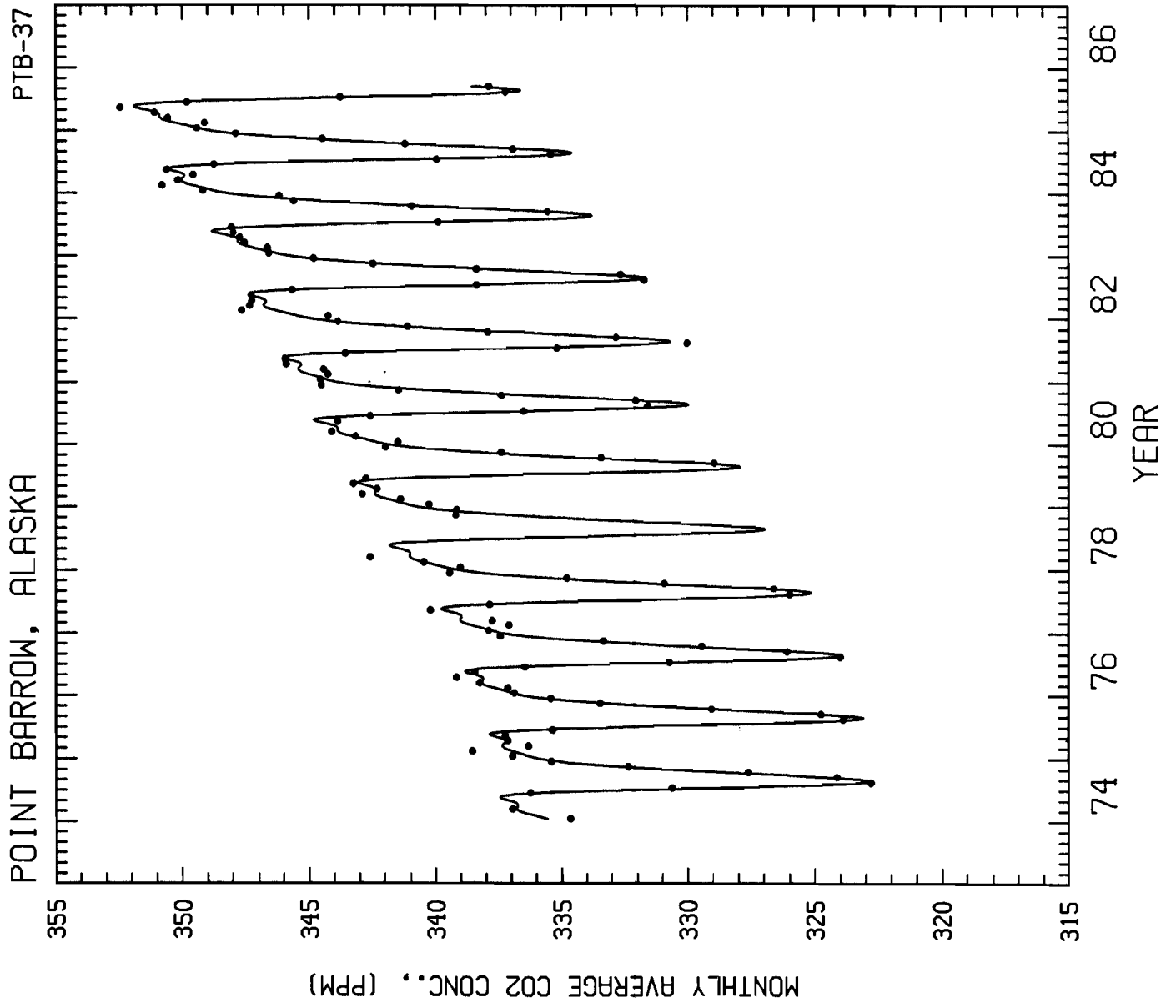
BASE YEAR MIDDLE YEAR
73 79.8521

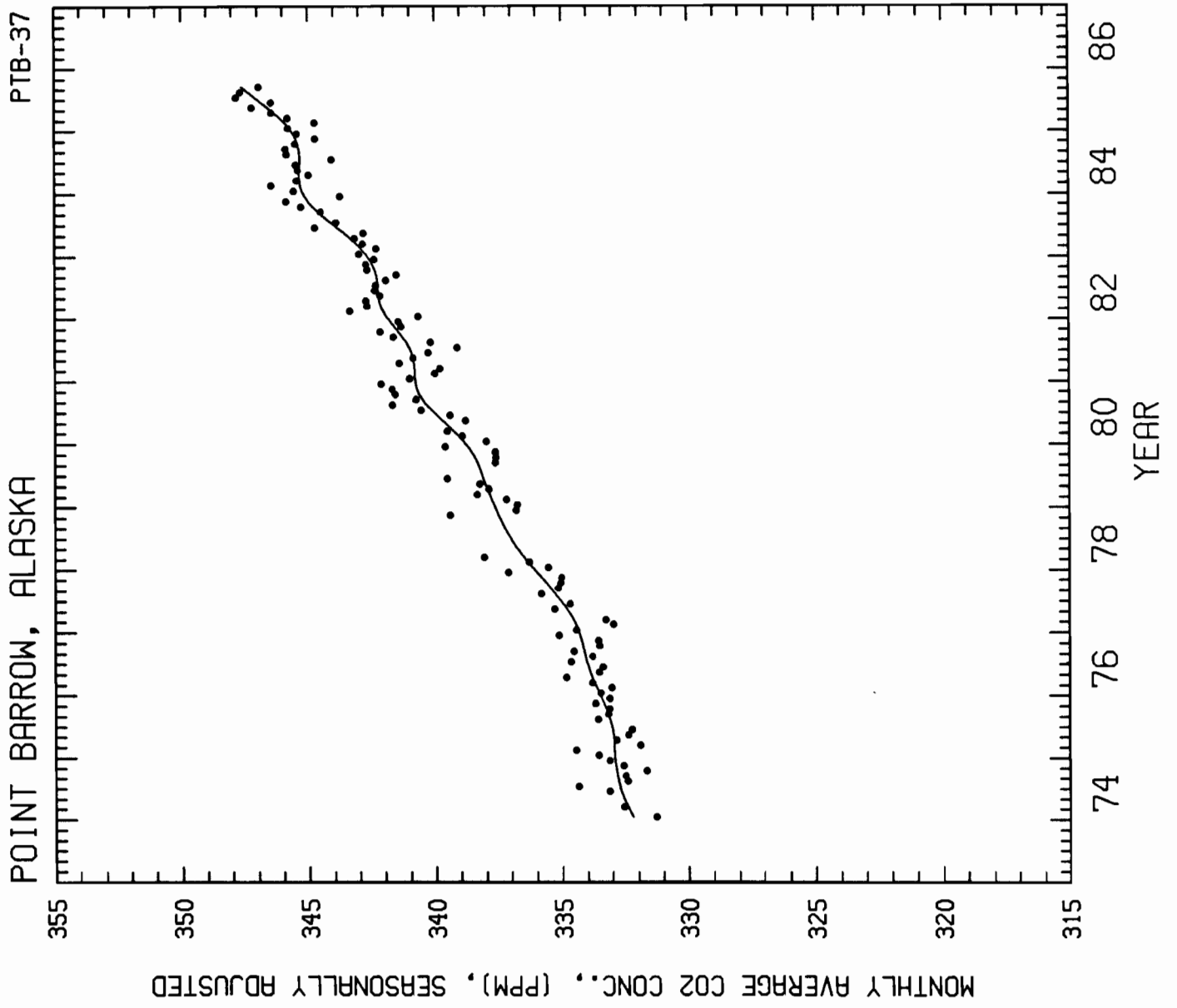
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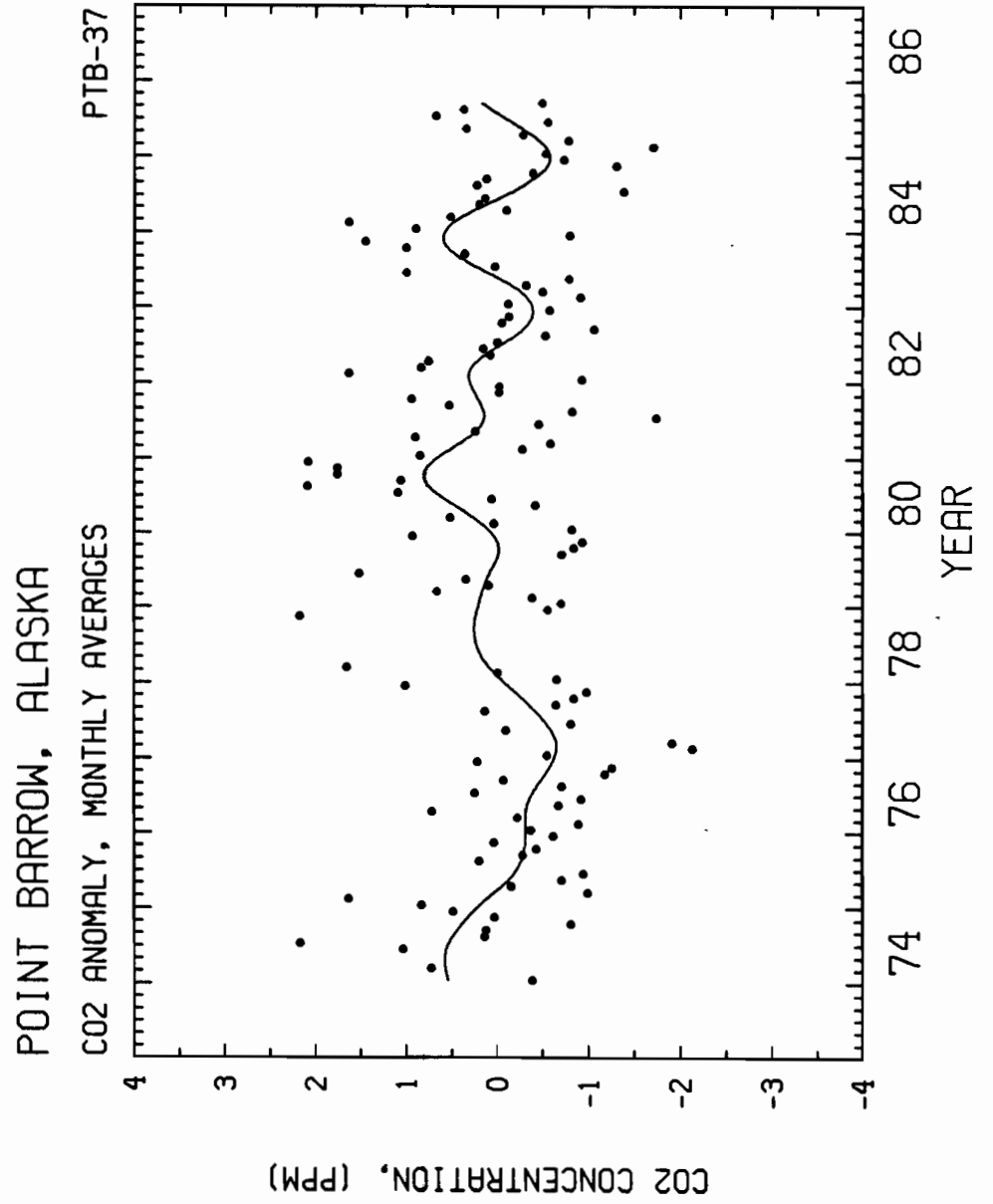
NO.	MEAS	SYMB	YEAR	CONC (PPM)
1	2	1	1.0082	334.32
2	2	1	1.2438	336.92
3	3	1	1.4548	336.25
4	3	1	1.5014	333.99
5	2	1	1.6192	322.89
300	2	1	12.6356	337.24
301	2	1	12.6438	337.35
302	2	1	12.6740	336.90
303	2	1	12.6822	336.54
304	2	1	12.6959	337.12

INPUT PARAMETERS :

STATION	NO. HARMONICS	GAIN	SOUTHERN HEM.	SQ2DI
PTB	4	YES	NO	30







1. FIT OF CUBIC + HARMONICS

FITTED COEFFICIENTS / ERROR :

CONST	T	T**2	T**3
0.33139E+03	0.40134E+00	0.12835E+00	-0.49952E-02
0.67604E+00	0.35546E+00	0.52923E-01	0.23707E-02
SIN(2*PI*T)	COS(2*PI*T)	SIN(4*PI*T)	COS(4*PI*T)
0.62379E+01	0.24352E+01	-0.26993E+01	0.12200E+01
0.92801E-01	0.93712E-01	0.92667E-01	0.93389E-01
SIN(6*PI*T)	COS(6*PI*T)	SIN(8*PI*T)	COS(8*PI*T)
0.74420E+00	-0.77221E+00	-0.27916E+00	0.25922E+00
0.94534E-01	0.91284E-01	0.93763E-01	0.92043E-01

STANDARD ERROR OF FIT: DEL = 0.11356E+01

SEASONAL CYCLE FIT (PPM):

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
3.54	4.26	4.64	4.49	5.08	3.32	-3.88	-10.08	-8.78	-4.28	-0.27	2.39

2. FIT OF EXPONENTIAL + HARMONICS

FIT TO NON-LINEAR TERMS :

ITER	CHISQ	FL
1	0.23255E+01	0.10000E-03
2	0.13600E+01	0.10000E-03
3	0.13524E+01	0.10000E-03
4	0.13449E+01	0.10000E-03
18	0.13137E+01	0.10000E-03
19	0.13129E+01	0.10000E-03
20	0.13122E+01	0.10000E-03

FINAL VALUES LISTED ABOVE APPLY TO FIT

FIT IS TO $C1 + C2 \cdot \exp(R \cdot T) + (1 + A \cdot T) \cdot \text{HARMONICS}$

FITTED COEFFICIENTS / ERROR :

A	C1	C2	R
0.70982E-02	0.30762E+03	0.22991E+02	0.43236E-01
0.43390E-02	0.73909E+01	0.71256E+01	0.10270E-01
SIN(2*PI*T)	COS(2*PI*T)	SIN(4*PI*T)	COS(4*PI*T)
0.58886E+01	0.23186E+01	-0.25623E+01	0.11465E+01
0.22020E+00	0.11955E+00	0.12861E+00	0.95476E-01
SIN(6*PI*T)	COS(6*PI*T)	SIN(8*PI*T)	COS(8*PI*T)
0.70949E+00	-0.74071E+00	-0.26785E+00	0.25158E+00
0.93913E-01	0.90750E-01	0.89546E-01	0.88018E-01

STANDARD ERROR OF FIT: DEL = 0.11455E+01

SEASONAL CYCLE FIT (PPM):

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
3.51	4.22	4.61	4.44	5.02	3.29	-3.87	-10.03	-8.70	-4.21	-0.24	2.39

3. FIT OF CHISQUARE-TYPE SPLINE + HARMONICS TO EXPONENTIALLY ADJUSTED DATA

FINAL VALUE FOR SIGMA IS 1.0382
FINAL COEFFICIENTS ARE BELOW

SPLINE-HARMONICS ITERATION NUMBER 1

FIT OF NON-LINEAR GAIN :

ITER	CHISQ	FL
1	0.10668E+01	0.10000E-03
2	0.10668E+01	0.10000E-04

FIT IS TO CHISQUARED-TYPE-SPLINE + (1 + A*T)*HARMONICS
FITTED COEFFICIENTS / ERROR :

A			
0.79454E-02			
0.39673E-02			
SIN(2*PI*T)	COS(2*PI*T)	SIN(4*PI*T)	COS(4*PI*T)
0.58440E+01	0.23134E+01	-0.25459E+01	0.11282E+01
0.19839E+00	0.10725E+00	0.11594E+00	0.85737E-01
SIN(6*PI*T)	COS(6*PI*T)	SIN(8*PI*T)	COS(8*PI*T)
0.70760E+00	-0.72300E+00	-0.25081E+00	0.23967E+00
0.84308E-01	0.81504E-01	0.80291E-01	0.79135E-01
DEL	SQ2D	SQ2DI	
0.10382E+01	0.50110E+02	0.29999E+02	

CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
FITTED SEASONAL FUNCTION (HARMONICS) EVALUATED AT MIDDLE YEAR :

SEASONAL CYCLE (PPM) :

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
3.52	4.22	4.58	4.45	5.03	3.24	-3.89	-10.00	-8.68	-4.18	-0.23	2.38

CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
AVERAGE OVER MONTHS OF AVERAGES AT 15TH OF MONTH, ADJUSTED FOR TREND :

SEASONAL CYCLE (PPM) :

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
3.26	4.10	4.53	4.69	4.94	3.22	-3.95	-9.88	-8.82	-4.26	-0.17	2.50

SPLINE FIT TO EXPONENTIALLY AND SEASONALLY ADJUSTED DATA (PPM):

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
74	0.54	0.56	0.57	0.58	0.57	0.56	0.53	0.49	0.44	0.39	0.33	0.26
75	0.19	0.11	0.04	-0.05	-0.12	-0.18	-0.23	-0.26	-0.28	-0.30	-0.31	-0.31
76	-0.31	-0.31	-0.31	-0.32	-0.33	-0.36	-0.39	-0.43	-0.48	-0.53	-0.57	-0.61
77	-0.64	-0.65	-0.65	-0.63	-0.59	-0.54	-0.48	-0.42	-0.35	-0.28	-0.20	-0.12
78	-0.04	0.04	0.09	0.15	0.19	0.22	0.24	0.25	0.25	0.25	0.24	0.22
79	0.20	0.19	0.17	0.15	0.12	0.09	0.05	0.01	-0.01	-0.02	0.00	0.04
80	0.10	0.18	0.26	0.36	0.47	0.58	0.67	0.75	0.80	0.81	0.78	0.71
81	0.62	0.51	0.42	0.32	0.24	0.18	0.15	0.15	0.18	0.21	0.25	0.29
82	0.31	0.32	0.29	0.23	0.14	0.03	-0.08	-0.19	-0.28	-0.34	-0.38	-0.39
83	-0.37	-0.32	-0.25	-0.15	-0.03	0.11	0.24	0.37	0.47	0.55	0.59	0.59
84	0.56	0.49	0.39	0.26	0.12	-0.02	-0.16	-0.28	-0.39	-0.48	-0.54	-0.57
85	-0.57	-0.53	-0.47	-0.37	-0.27	-0.15	-0.04	0.07	99.99	99.99	99.99	99.99

GAIN FOR EACH YEAR :

YEAR	PTS	DEL	GAIN ERROR
1974	9	0.81	1.0017 0.0520
1975	21	0.85	0.9533 0.0362
1976	23	0.84	0.9851 0.0348
1977	17	1.18	0.9419 0.0533
1978	7	1.14	1.0229 0.1238
1979	19	0.96	1.0644 0.0505
1980	20	0.95	0.9126 0.0393
1981	33	1.16	1.0201 0.0362
1982	45	1.06	1.0790 0.0302
1983	37	1.08	0.9778 0.0419
1984	40	1.09	1.0388 0.0349
1985	33	0.82	1.0319 0.0242

STATION: PTB
CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
AVERAGES OF DATA ADJUSTED TO THE 15TH OF EACH MONTH :

MONTH	YEAR							
	1974	1975	1976	1977	1978	1979	1980	1981
JAN	334.65	336.96	336.89	337.90	339.03	340.27	341.50	344.57
FEB	0.00	338.54	337.15	337.10	340.48	341.40	343.17	344.28
MAR	336.95	336.34	338.26	337.77	342.60	342.91	344.13	344.45
APR	0.00	337.15	339.18	0.00	0.00	342.33	0.00	345.92
MAY	0.00	337.25	338.45	340.24	0.00	343.26	343.88	345.97
JUN	336.25	335.38	336.47	337.87	0.00	342.76	342.59	343.58
JUL	330.63	0.00	330.75	0.00	0.00	0.00	336.52	335.19
AUG	322.81	323.89	324.02	326.00	0.00	0.00	331.59	330.04
SEP	324.15	324.77	326.11	326.61	0.00	328.96	332.06	332.85
OCT	327.63	329.07	329.46	330.94	0.00	333.43	337.40	337.94
NOV	332.36	333.47	333.34	334.80	339.21	337.41	341.48	341.12
DEC	335.42	335.44	337.45	339.46	339.17	341.99	344.53	343.88
AVE	0.00	0.00	333.96	0.00	0.00	0.00	0.00	340.81

MONTH	YEAR			
	1982	1983	1984	1985
JAN	344.26	346.60	349.20	349.44
FEB	347.66	346.65	350.81	349.14
MAR	347.35	347.56	350.19	350.58
APR	347.26	347.75	349.59	351.09
MAY	347.30	348.00	350.63	352.46
JUN	345.69	348.07	348.77	349.83
JUL	338.38	339.91	339.97	343.78
AUG	331.74	0.00	335.45	337.23
SEP	332.67	335.58	336.94	337.89
OCT	338.40	340.97	341.22	0.00
NOV	342.50	345.63	344.50	0.00
DEC	344.84	346.20	347.91	0.00
AVE	342.34	0.00	345.43	0.00

STATION: PTB
CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
AVERAGES OF DATA ADJUSTED TO THE 15TH OF EACH MONTH AND SEASONALLY ADJUSTED :

MONTH	YEAR							
	1974	1975	1976	1977	1978	1979	1980	1981
JAN	331.29	333.57	333.47	334.45	335.56	336.77	337.98	341.02
FEB	0.00	334.47	333.05	332.97	336.31	337.20	338.95	340.01
MAR	332.57	331.92	333.81	333.28	338.07	338.35	339.53	339.82
APR	0.00	332.85	334.84	0.00	0.00	337.89	0.00	341.42
MAY	0.00	332.39	333.54	335.30	0.00	338.25	338.82	340.88
JUN	333.14	332.24	333.40	334.69	0.00	339.53	339.42	340.30
JUL	334.36	0.00	334.66	0.00	0.00	0.00	340.56	339.13
AUG	332.42	333.58	333.80	335.84	0.00	0.00	341.68	340.18
SEP	332.49	333.19	334.55	335.16	0.00	337.63	340.77	341.65
OCT	331.65	333.13	333.52	335.06	0.00	337.61	341.58	342.18
NOV	332.59	333.69	333.55	335.03	339.44	337.64	341.70	341.35
DEC	333.13	333.13	335.12	337.12	336.81	339.61	342.14	341.47
AVE	0.00	0.00	333.94	0.00	0.00	0.00	0.00	340.78

MONTH	YEAR			
	1982	1983	1984	1985
JAN	340.68	343.00	345.57	345.78
FEB	343.37	342.33	346.46	344.75
MAR	342.69	342.86	345.46	345.81
APR	342.73	343.18	344.98	346.45
MAY	342.18	342.83	345.42	347.22
JUN	342.38	344.74	345.51	346.45
JUL	342.35	343.91	344.13	347.83
AUG	341.95	0.00	345.85	347.67
SEP	341.54	344.52	345.90	346.96
OCT	342.68	345.28	345.53	0.00
NOV	342.73	345.87	344.72	0.00
DEC	342.41	343.75	345.44	0.00
AVE	342.31	0.00	345.41	0.00

STATION: PTB
 CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
 FITTED FUNCTION (EXPONENTIAL + SPLINE + HARMONICS) AT 15TH OF MONTH :
 (JANO REFERS TO VALUE AT BEGINNING OF YEAR)

MONTH	YEAR							
	1974	1975	1976	1977	1978	1979	1980	1981
JAN	335.57	336.32	336.95	337.81	339.65	341.18	342.42	344.34
FEB	336.35	337.01	337.73	338.58	340.52	341.97	343.31	345.07
MAR	336.79	337.37	338.17	339.03	341.03	342.41	343.87	345.44
APR	336.77	337.26	338.15	339.03	341.06	342.38	343.97	345.34
MAY	337.41	337.83	338.80	339.74	341.78	343.03	344.77	345.96
JUN	335.77	336.14	337.04	338.14	340.15	341.33	343.10	344.22
JUL	328.99	329.29	330.11	331.29	333.22	334.29	336.11	337.09
AUG	323.16	323.43	324.29	325.45	327.28	328.26	330.25	331.01
SEP	324.47	324.77	325.69	326.91	328.69	329.66	331.80	332.49
OCT	328.82	329.21	330.12	331.51	333.25	334.26	336.44	337.21
NOV	332.66	333.12	334.02	335.58	337.27	338.34	340.50	341.38
DEC	335.19	335.74	336.62	338.33	339.95	341.09	343.16	344.18
AVE	332.66	333.12	333.97	335.12	336.99	338.18	339.98	341.14
JANO	0.00	335.92	336.51	337.38	339.16	340.73	341.93	343.93

MONTH	YEAR			
	1982	1983	1984	1985
JAN	345.50	346.34	348.87	349.40
FEB	346.34	347.24	349.66	350.31
MAR	346.80	347.80	350.06	350.88
APR	346.74	347.91	349.95	350.99
MAY	347.36	348.75	350.54	351.84
JUN	345.56	347.19	348.59	350.24
JUL	338.29	340.12	341.17	343.06
AUG	332.07	334.09	334.95	336.93
SEP	333.45	335.68	336.41	338.55
OCT	338.11	340.52	341.11	0.00
NOV	342.24	344.77	345.27	0.00
DEC	345.02	347.58	348.07	0.00
AVE	342.29	344.00	345.39	0.00
JANO	345.02	345.86	348.41	348.91

STATION: PTB
 CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
 TREND (EXPONENTIAL + SPLINE) AT 15TH OF MONTH :
 (JANO REFERS TO VALUE AT BEGINNING OF YEAR)

MONTH	YEAR							
	1974	1975	1976	1977	1978	1979	1980	1981
JAN	332.21	332.93	333.53	334.37	336.17	337.68	338.89	340.79
FEB	332.31	332.94	333.63	334.45	336.35	337.77	339.08	340.80
MAR	332.41	332.95	333.72	334.54	336.50	337.85	339.28	340.82
APR	332.50	332.95	333.81	334.67	336.66	337.94	339.49	340.84
MAY	332.59	332.97	333.89	334.80	336.81	338.02	339.71	340.88
JUN	332.66	333.01	333.96	334.95	336.94	338.10	339.93	340.94
JUL	332.72	333.05	334.02	335.11	337.07	338.17	340.14	341.02
AUG	332.77	333.11	334.08	335.28	337.19	338.25	340.34	341.15
SEP	332.81	333.18	334.13	335.45	337.30	338.33	340.50	341.30
OCT	332.85	333.26	334.18	335.63	337.40	338.44	340.63	341.45
NOV	332.88	333.35	334.23	335.81	337.50	338.57	340.71	341.62
DEC	332.91	333.44	334.30	335.99	337.59	338.72	340.77	341.77
AVE	332.64	333.09	333.96	335.09	336.96	338.15	339.96	341.11
JANO	0.00	332.92	333.49	334.33	336.09	337.63	338.81	340.78

MONTH	YEAR			
	1982	1983	1984	1985
JAN	341.92	342.74	345.24	345.74
FEB	342.05	342.92	345.30	345.92
MAR	342.14	343.11	345.33	346.12
APR	342.20	343.34	345.34	346.36
MAY	342.23	343.59	345.33	346.60
JUN	342.25	343.86	345.32	346.86
JUL	342.26	344.12	345.32	347.11
AUG	342.28	344.38	345.34	347.37
SEP	342.32	344.62	345.37	347.62
OCT	342.38	344.83	345.42	0.00
NOV	342.48	345.00	345.49	0.00
DEC	342.59	345.14	345.60	0.00
AVE	342.26	343.97	345.37	0.00
JANO	341.85	342.66	345.19	345.67

SCRIPPS INSTITUTION OF OCEANOGRAPHY
ATMOSPHERIC CARBON DIOXIDE PROGRAM
ANALYSIS OF STATION DATA USING PROGRAM "STATION FIT"

STATION: OCEAN WEATHER STATION P

RUN NO. STP-09

COORDINATES : 50.0N 145.0W

ELEVATION ABOVE SEA LEVEL : 10 METERS

BEGINNING DATE : 24-MAY-1969

FINAL DATE : 21-JUN-1981

TYPE OF DATA PROCESSED : FLASK DAILY AVERAGES

CALIBRATION SCALE : 1983

NUMBER OF HARMONICS : 4

COMPUTED SPLINE RMS SECOND DERIVATIVE : MONTHLY NODES : 30.00
DATA POINT NODES : 72.63

COMPUTED GAIN FACTOR FOR SEASONAL CYCLE
REFERENCED TO BASE YEAR = 1968 : 0.9403 % PER YEAR

COMPUTED SPLINE STIFFNESS PARAMETER (SIGMA) : 1.1881 PPM

DATE OF RUN : 14-FEB-1986

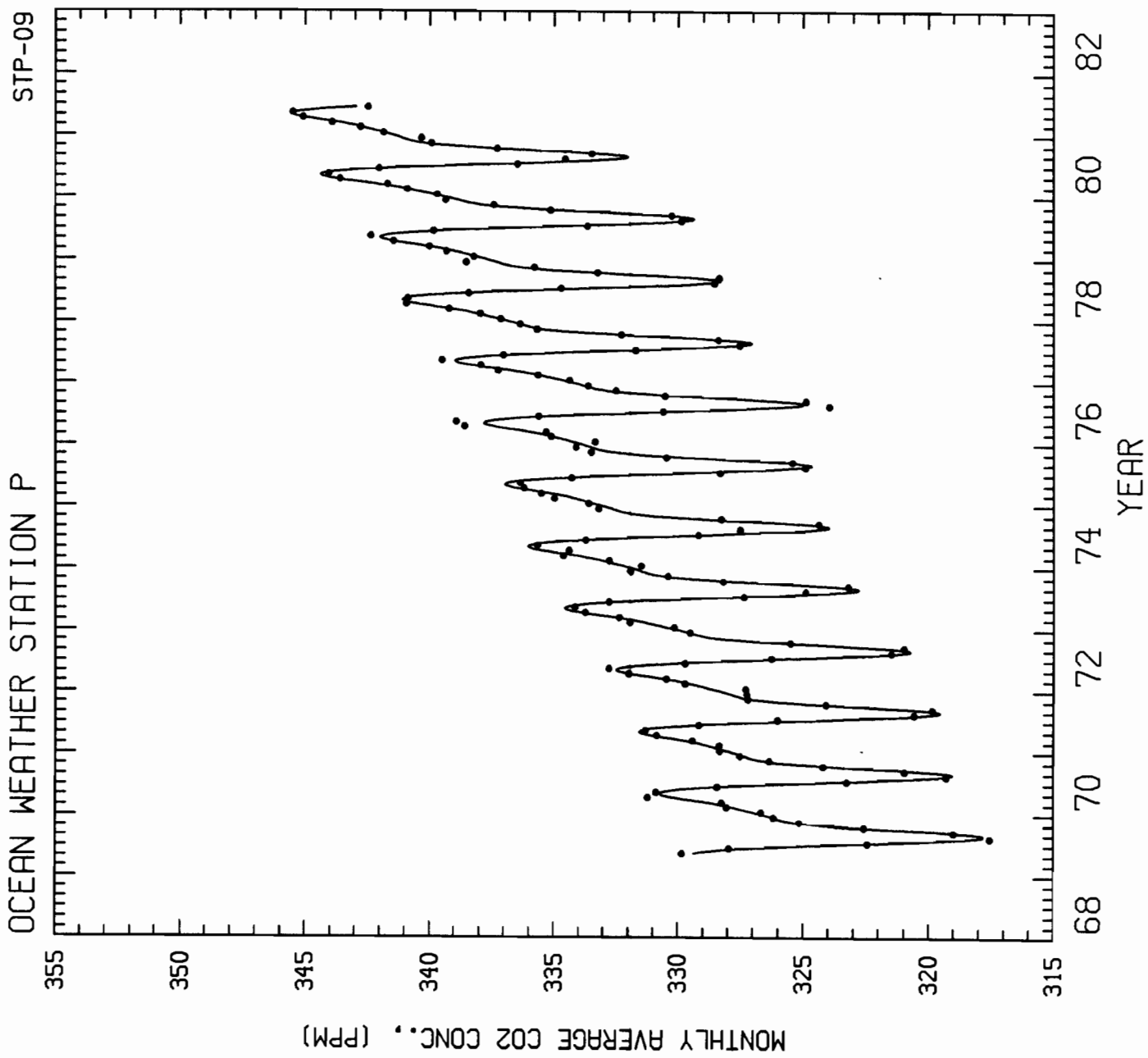
BASE YEAR MIDDLE YEAR
68 75.4329

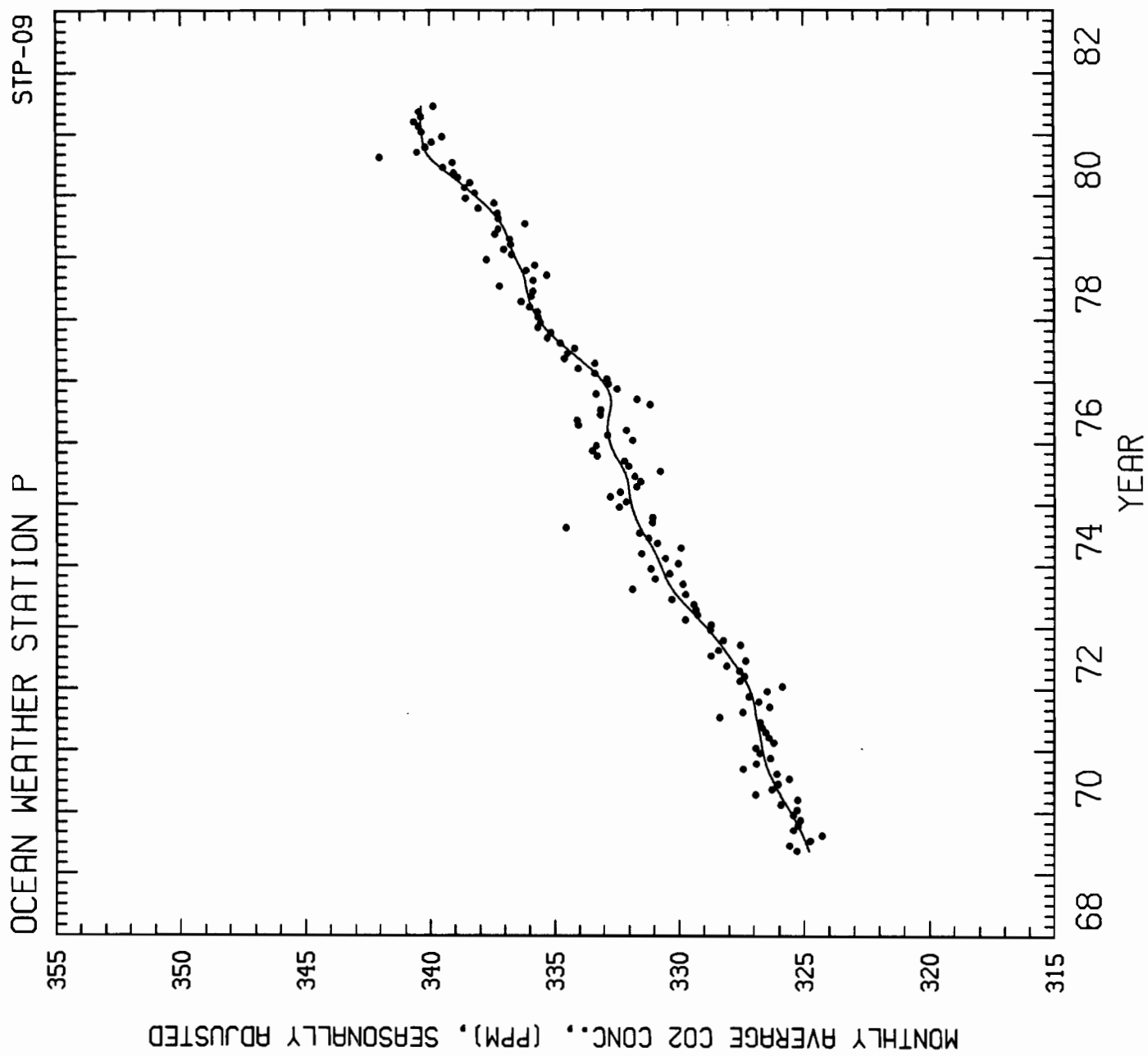
FIRST AND LAST 5 DATA POINTS ARE :

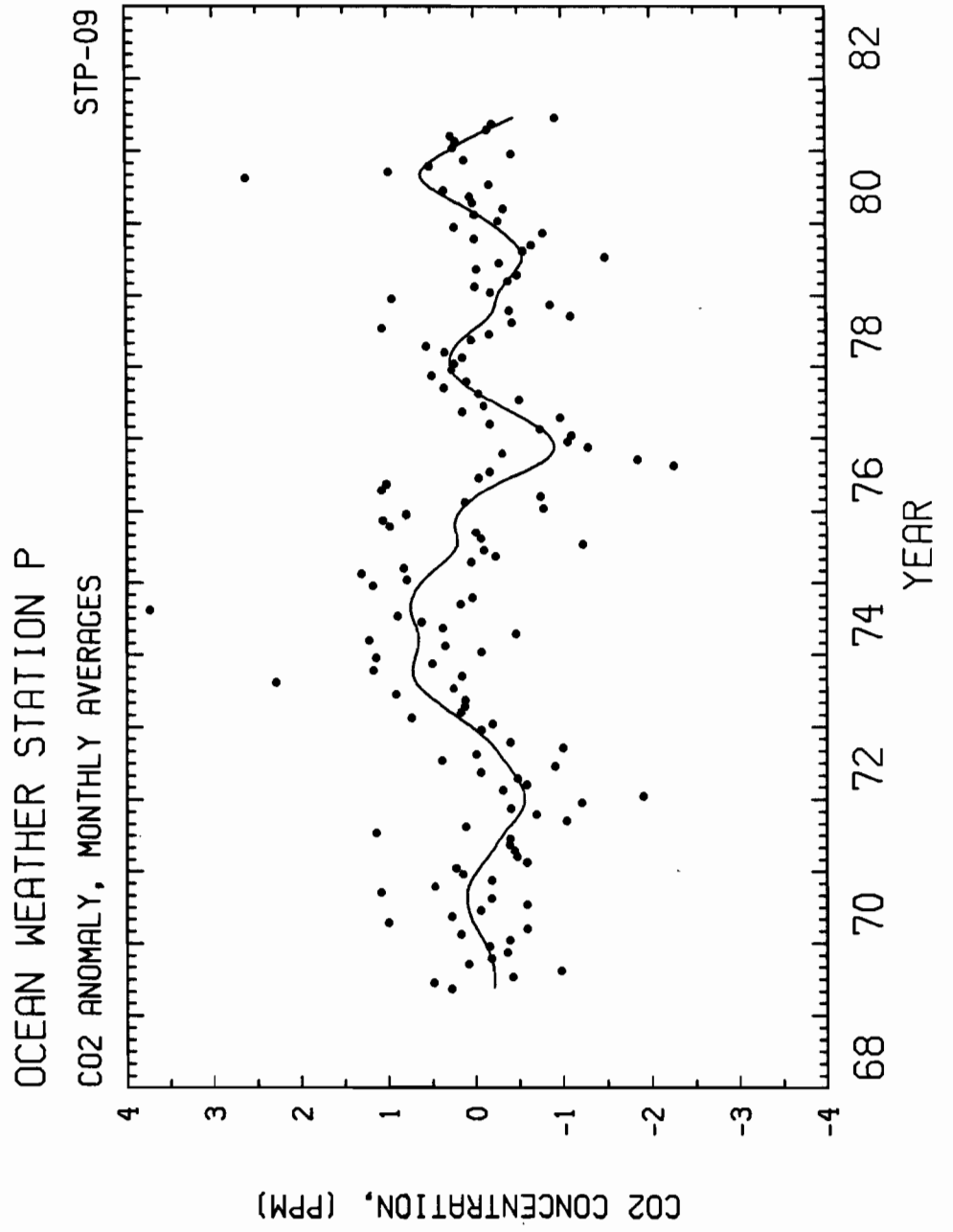
NO.	MEAS	SYMB	YEAR	CONC (PPM)
1	2	1	1.3945	330.09
2	2	1	1.4137	328.62
3	2	1	1.4740	327.08
4	2	1	1.4932	326.02
5	2	1	1.5123	322.90
675	4	1	13.3945	344.28
676	4	1	13.4137	345.27
677	2	1	13.4329	343.33
678	5	1	13.4521	342.91
679	2	1	13.4712	341.02

INPUT PARAMETERS :

STATION NO. HARMONICS GAIN SOUTHERN HEM. SQ2DI
STP 4 YES NO 30







1. FIT OF CUBIC + HARMONICS

FITTED COEFFICIENTS / ERROR :

CONST	T	T**2	T**3
0.32246E+03	0.16089E+01	-0.80770E-01	0.47656E-02
0.50630E+00	0.25010E+00	0.35596E-01	0.15304E-02
SIN(2*PI*T)	COS(2*PI*T)	SIN(4*PI*T)	COS(4*PI*T)
0.47299E+01	0.11203E+01	-0.24241E+01	0.52282E+00
0.69695E-01	0.68978E-01	0.70635E-01	0.68043E-01
SIN(6*PI*T)	COS(6*PI*T)	SIN(8*PI*T)	COS(8*PI*T)
0.34370E+00	-0.56064E+00	0.13070E+00	0.48549E-01
0.69057E-01	0.69411E-01	0.68957E-01	0.69522E-01

STANDARD ERROR OF FIT: DEL = 0.12718E+01

SEASONAL CYCLE FIT (PPM):

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1.53	2.31	3.18	4.48	4.82	2.52	-2.46	-7.16	-6.82	-2.87	-0.04	0.78

2. FIT OF EXPONENTIAL + HARMONICS

FIT TO NON-LINEAR TERMS :

ITER	CHISQ	FL
1	0.22922E+01	0.10000E-03
2	0.16708E+01	0.10000E-04
3	0.16329E+01	0.10000E-04
4	0.16286E+01	0.10000E-04
9	0.16271E+01	0.10000E-05
10	0.16270E+01	0.10000E-06
11	0.16270E+01	0.10000E-07

FINAL VALUES LISTED ABOVE APPLY TO FIT

FIT IS TO C1 + C2*EXP(R*T) + (1 + A*T)*HARMONICS

FITTED COEFFICIENTS / ERROR :

A	C1	C2	R
0.78153E-02	0.30337E+03	0.20346E+02	0.45268E-01
0.41703E-02	0.47756E+01	0.45706E+01	0.74299E-02
SIN(2*PI*T)	COS(2*PI*T)	SIN(4*PI*T)	COS(4*PI*T)
0.44452E+01	0.10512E+01	-0.22814E+01	0.47769E+00
0.16431E+00	0.74386E-01	0.10091E+00	0.65816E-01
SIN(6*PI*T)	COS(6*PI*T)	SIN(8*PI*T)	COS(8*PI*T)
0.33060E+00	-0.52122E+00	0.12126E+00	0.48220E-01
0.65509E-01	0.67884E-01	0.64894E-01	0.65333E-01

STANDARD ERROR OF FIT: DEL = 0.12756E+01

SEASONAL CYCLE FIT (PPM):

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1.51	2.29	3.16	4.47	4.81	2.51	-2.46	-7.12	-6.76	-2.84	-0.05	0.76

3. FIT OF CHISQUARE-TYPE SPLINE + HARMONICS TO EXPONENTIALLY ADJUSTED DATA

FINAL VALUE FOR SIGMA IS 1.1881
FINAL COEFFICIENTS ARE BELOW

SPLINE-HARMONICS ITERATION NUMBER 1

FIT OF NON-LINEAR GAIN :

ITER	CHISQ	FL
1	0.14052E+01	0.10000E-03
2	0.14052E+01	0.10000E-04

FIT IS TO CHISQUARED-TYPE-SPLINE + (1 + A*T)*HARMONICS
FITTED COEFFICIENTS / ERROR :

A			
0.94034E-02			
0.39741E-02			
SIN(2*PI*T)	COS(2*PI*T)	SIN(4*PI*T)	COS(4*PI*T)
0.43759E+01	0.10259E+01	-0.22841E+01	0.46786E+00
0.15219E+00	0.68323E-01	0.94303E-01	0.60526E-01
SIN(6*PI*T)	COS(6*PI*T)	SIN(8*PI*T)	COS(8*PI*T)
0.30209E+00	-0.51898E+00	0.12411E+00	0.47402E-01
0.60107E-01	0.62488E-01	0.59633E-01	0.59958E-01
DEL	SQ2D	SQ2DI	
0.11881E+01	0.72628E+02	0.29999E+02	

CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
FITTED SEASONAL FUNCTION (HARMONICS) EVALUATED AT MIDDLE YEAR :

SEASONAL CYCLE (PPM) :

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1.45	2.22	3.14	4.49	4.81	2.50	-2.44	-7.11	-6.77	-2.81	0.01	0.78

CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
AVERAGE OVER MONTHS OF AVERAGES AT 15TH OF MONTH, ADJUSTED FOR TREND :

SEASONAL CYCLE (PPM) :

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1.16	2.34	3.12	4.50	4.94	2.47	-2.53	-6.75	-6.99	-2.71	-0.12	0.92

SPLINE FIT TO EXPONENTIALLY AND SEASONALLY ADJUSTED DATA (PPM) :

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
69	99.99	99.99	99.99	99.99	99.99	-0.21	-0.21	-0.20	-0.19	-0.17	-0.15	-0.12
70	-0.08	-0.04	0.00	0.03	0.06	0.08	0.10	0.10	0.10	0.09	0.06	0.02
71	-0.03	-0.08	-0.13	-0.18	-0.23	-0.27	-0.32	-0.38	-0.44	-0.49	-0.53	-0.55
72	-0.55	-0.54	-0.51	-0.47	-0.42	-0.37	-0.32	-0.27	-0.22	-0.15	-0.08	0.01
73	0.10	0.20	0.29	0.38	0.48	0.56	0.63	0.69	0.72	0.72	0.72	0.70
74	0.68	0.66	0.66	0.66	0.68	0.71	0.73	0.75	0.75	0.73	0.70	0.66
75	0.60	0.53	0.46	0.37	0.30	0.25	0.22	0.22	0.23	0.24	0.24	0.21
76	0.16	0.09	0.00	-0.11	-0.24	-0.39	-0.54	-0.69	-0.80	-0.87	-0.90	-0.88
77	-0.83	-0.75	-0.66	-0.54	-0.41	-0.28	-0.16	-0.04	0.08	0.16	0.23	0.27
78	0.29	0.29	0.27	0.23	0.16	0.08	0.00	-0.09	-0.16	-0.20	-0.23	-0.24
79	-0.27	-0.32	-0.37	-0.43	-0.48	-0.52	-0.54	-0.53	-0.48	-0.41	-0.33	-0.24
80	-0.14	-0.03	0.08	0.20	0.33	0.45	0.55	0.61	0.61	0.56	0.47	0.36
81	0.25	0.12	0.00	-0.14	-0.29	-0.45	99.99	99.99	99.99	99.99	99.99	99.99

GAIN FOR EACH YEAR :

YEAR	PTS	DEL	GAIN ERROR
1969	20	0.89	1.0050 0.0495
1970	38	1.05	0.9484 0.0437
1971	41	1.29	0.9263 0.0537
1972	36	1.10	0.9825 0.0434
1973	47	1.13	0.9277 0.0414
1974	29	1.12	0.8571 0.0529
1975	44	1.12	1.0196 0.0468
1976	48	1.19	1.1519 0.0454
1977	64	1.34	1.0192 0.0403
1978	100	1.31	1.0943 0.0338
1979	92	0.99	1.0601 0.0266
1980	91	1.19	0.9449 0.0317
1981	29	0.69	1.0668 0.0400

STATION: STP
 CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
 AVERAGES OF DATA ADJUSTED TO THE 15TH OF EACH MONTH :

MONTH	YEAR							
	1969	1970	1971	1972	1973	1974	1975	1976
JAN	0.00	326.69	328.35	327.31	330.17	331.50	333.60	333.34
FEB	0.00	328.07	328.37	329.75	331.95	332.77	334.99	335.12
MAR	0.00	328.27	329.45	330.49	332.37	334.64	335.52	335.32
APR	0.00	331.23	330.87	332.00	333.76	334.41	336.21	338.62
MAY	329.86	330.90	331.33	332.79	334.17	335.67	336.36	338.96
JUN	327.96	328.45	329.19	329.73	332.79	333.73	334.30	335.63
JUL	322.46	323.28	326.04	326.28	327.38	329.20	328.33	330.61
AUG	317.55	319.30	320.59	321.49	324.91	327.52	324.93	323.96
SEP	319.01	320.97	319.86	320.98	323.21	324.39	325.43	324.89
OCT	322.58	324.23	324.11	325.53	328.21	328.28	330.48	330.54
NOV	325.17	326.37	327.23	0.00	330.42	0.00	333.50	332.51
DEC	326.19	327.53	327.26	329.54	331.93	333.20	334.12	333.63
AVE	0.00	326.27	326.89	0.00	330.11	0.00	332.31	332.76

MONTH	YEAR				
	1977	1978	1979	1980	1981
JAN	334.39	337.16	338.23	339.71	341.87
FEB	335.65	337.98	339.34	340.92	342.79
MAR	337.26	339.24	340.03	341.70	343.94
APR	337.95	340.96	341.46	343.61	345.09
MAY	339.52	340.89	342.38	344.05	345.50
JUN	337.04	338.44	339.85	342.04	342.49
JUL	331.72	334.72	333.66	336.48	0.00
AUG	327.54	328.55	329.89	334.56	0.00
SEP	328.40	328.36	330.27	333.48	0.00
OCT	332.29	333.24	335.14	337.29	0.00
NOV	335.69	335.81	337.43	339.94	0.00
DEC	336.37	338.54	339.37	340.34	0.00
AVE	334.49	336.16	337.25	339.51	0.00

STATION: STP
 CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
 AVERAGES OF DATA ADJUSTED TO THE 15TH OF EACH MONTH AND SEASONALLY ADJUSTED :

MONTH	YEAR							
	1969	1970	1971	1972	1973	1974	1975	1976
JAN	0.00	325.30	326.95	325.90	328.75	330.06	332.15	331.88
FEB	0.00	325.95	326.23	327.59	329.77	330.58	332.78	332.89
MAR	0.00	325.27	326.42	327.41	329.30	331.54	332.39	332.13
APR	0.00	326.94	326.54	327.60	329.35	329.96	331.72	334.06
MAY	325.30	326.30	326.69	328.12	329.44	330.90	331.55	334.12
JUN	325.59	326.06	326.77	327.36	330.33	331.25	331.80	333.17
JUL	324.77	325.61	328.40	328.74	329.77	331.62	330.77	333.16
AUG	324.30	326.11	327.46	328.45	331.91	334.58	332.05	331.18
SEP	325.44	327.46	326.41	327.56	329.87	331.11	332.21	331.71
OCT	325.26	326.93	326.83	328.25	330.98	331.08	333.31	333.36
NOV	325.16	326.37	327.22	0.00	330.42	0.00	333.50	332.50
DEC	325.45	326.79	326.51	328.77	331.16	332.43	333.34	332.84
AVE	0.00	326.26	326.87	0.00	330.09	0.00	332.30	332.75

MONTH	YEAR				
	1977	1978	1979	1980	1981
JAN	332.91	335.67	336.73	338.20	340.34
FEB	333.39	335.70	337.04	338.60	340.45
MAR	334.07	336.02	336.78	338.40	340.64
APR	333.39	336.35	336.81	338.89	340.36
MAY	334.62	335.95	337.39	339.05	340.44
JUN	334.50	335.87	337.26	339.50	339.85
JUL	334.20	337.22	336.19	339.12	0.00
AUG	334.79	335.86	337.26	342.03	0.00
SEP	335.30	335.32	337.30	340.53	0.00
OCT	335.17	336.14	338.07	340.21	0.00
NOV	335.68	335.80	337.42	339.93	0.00
DEC	335.58	337.73	338.56	339.52	0.00
AVE	334.47	336.14	337.23	339.50	0.00

STATION: STP
 CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
 FITTED FUNCTION (EXPONENTIAL + SPLINE + HARMONICS) AT 15TH OF MONTH :
 (JANO REFERS TO VALUE AT BEGINNING OF YEAR)

MONTH	YEAR							
	1969	1970	1971	1972	1973	1974	1975	1976
JAN	0.00	326.99	328.09	328.66	330.46	332.23	333.41	334.27
FEB	0.00	327.85	328.87	329.51	331.41	333.08	334.21	335.08
MAR	0.00	328.84	329.78	330.56	332.49	334.08	335.15	336.07
APR	0.00	330.26	331.13	332.00	334.01	335.53	336.53	337.43
MAY	329.38	330.69	331.49	332.42	334.52	335.97	336.89	337.69
JUN	327.27	328.59	329.31	330.26	332.44	333.81	334.64	335.27
JUL	322.66	323.96	324.57	325.58	327.75	329.04	329.77	330.22
AUG	318.32	319.58	320.09	321.22	323.31	324.52	325.20	325.53
SEP	318.73	319.98	320.45	321.76	323.77	324.96	325.66	325.93
OCT	322.59	323.84	324.31	325.77	327.77	328.97	329.74	329.97
NOV	325.38	326.61	327.09	328.68	330.64	331.85	332.67	332.89
DEC	326.23	327.40	327.91	329.61	331.48	332.68	333.53	333.80
AVE	0.00	326.22	326.92	328.00	330.00	331.39	332.28	332.85
JANO	0.00	326.59	327.72	328.26	330.01	331.84	333.02	333.88

MONTH	YEAR				
	1977	1978	1979	1980	1981
JAN	334.65	337.21	338.14	339.84	341.86
FEB	335.63	338.12	339.02	340.88	342.69
MAR	336.76	339.15	340.03	342.11	343.66
APR	338.38	340.62	341.50	343.78	345.08
MAY	338.95	341.01	341.91	344.33	345.42
JUN	336.85	338.69	339.62	342.13	342.98
JUL	332.06	333.65	334.60	337.17	0.00
AUG	327.54	328.88	329.91	332.54	0.00
SEP	328.12	329.28	330.43	333.10	0.00
OCT	332.35	333.43	334.73	337.32	0.00
NOV	335.42	336.44	337.87	340.30	0.00
DEC	336.37	337.34	338.90	341.13	0.00
AVE	334.42	336.15	337.22	339.55	0.00
JANO	334.20	336.77	337.72	339.35	341.47

STATION: STP
 CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
 TREND (EXPONENTIAL + SPLINE) AT 15TH OF MONTH :
 (JANO REFERS TO VALUE AT BEGINNING OF YEAR)

MONTH	YEAR							
	1969	1970	1971	1972	1973	1974	1975	1976
JAN	0.00	325.61	326.69	327.25	329.04	330.80	331.96	332.81
FEB	0.00	325.73	326.73	327.36	329.23	330.89	331.99	332.85
MAR	0.00	325.85	326.76	327.48	329.41	330.97	332.02	332.87
APR	0.00	325.97	326.80	327.61	329.60	331.08	332.04	332.87
MAY	324.82	326.08	326.84	327.75	329.79	331.20	332.08	332.85
JUN	324.90	326.19	326.89	327.89	329.98	331.33	332.13	332.82
JUL	324.98	326.29	326.93	328.04	330.15	331.46	332.21	332.77
AUG	325.07	326.39	326.96	328.18	330.30	331.58	332.32	332.74
SEP	325.16	326.47	327.00	328.34	330.43	331.68	332.44	332.75
OCT	325.26	326.54	327.04	328.49	330.54	331.77	332.56	332.79
NOV	325.37	326.60	327.09	328.67	330.63	331.85	332.67	332.88
DEC	325.48	326.65	327.16	328.84	330.71	331.91	332.75	333.01
AVE	0.00	326.20	326.91	327.99	329.99	331.38	332.26	332.83
JANO	0.00	325.55	326.67	327.20	328.94	330.76	331.93	332.78

MONTH	YEAR				
	1977	1978	1979	1980	1981
JAN	333.17	335.72	336.64	338.32	340.34
FEB	333.37	335.84	336.72	338.57	340.35
MAR	333.58	335.93	336.79	338.80	340.36
APR	333.82	336.01	336.86	339.07	340.36
MAY	334.06	336.07	336.93	339.32	340.35
JUN	334.30	336.12	337.02	339.58	340.34
JUL	334.54	336.15	337.13	339.81	0.00
AUG	334.79	336.19	337.28	340.01	0.00
SEP	335.02	336.24	337.46	340.15	0.00
OCT	335.23	336.33	337.65	340.24	0.00
NOV	335.42	336.43	337.87	340.29	0.00
DEC	335.58	336.54	338.09	340.31	0.00
AVE	334.41	336.13	337.20	339.54	0.00
JANO	333.09	335.65	336.59	338.21	340.33

SCRIPPS INSTITUTION OF OCEANOGRAPHY
ATMOSPHERIC CARBON DIOXIDE PROGRAM
ANALYSIS OF STATION DATA USING PROGRAM "STATION FIT"

STATION: LA JOLLA, CALIFORNIA (SCRIPPS PIER)

RUN NO. LJO-33

COORDINATES : 32.9N 117.3W

ELEVATION ABOVE SEA LEVEL : 10 METERS

BEGINNING DATE : 18-FEB-1969

FINAL DATE : 7-OCT-1985

TYPE OF DATA PROCESSED : CONTINUOUS: 7 CALENDAR-DAY AVERAGES
(12-NOV-1972 TO 26-OCT-1975)
FLASK : DAILY AVERAGES
(18-FEB-1969 TO 7-OCT-1985)

CALIBRATION SCALE : 1985

NUMBER OF HARMONICS : 4

COMPUTED SPLINE RMS SECOND DERIVATIVE : MONTHLY NODES : 29.99
DATA POINT NODES : 42.18

COMPUTED GAIN FACTOR FOR SEASONAL CYCLE
REFERENCED TO BASE YEAR = 1968 : 1.7162 % PER YEAR

COMPUTED SPLINE STIFFNESS PARAMETER (SIGMA) : 0.7916 PPM

DATE OF RUN : 27-FEB-1986

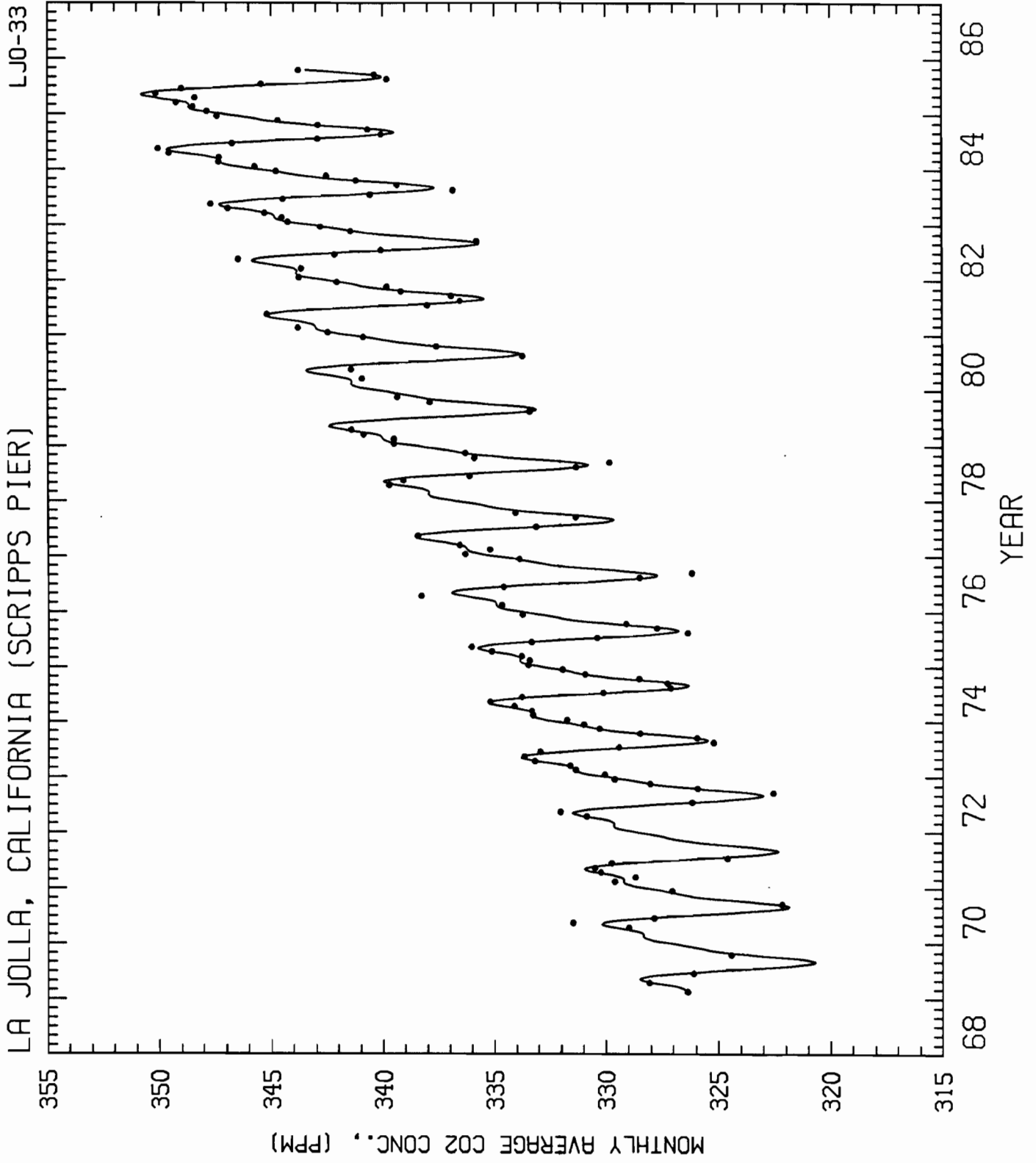
BASE YEAR MIDDLE YEAR
68 77.4507

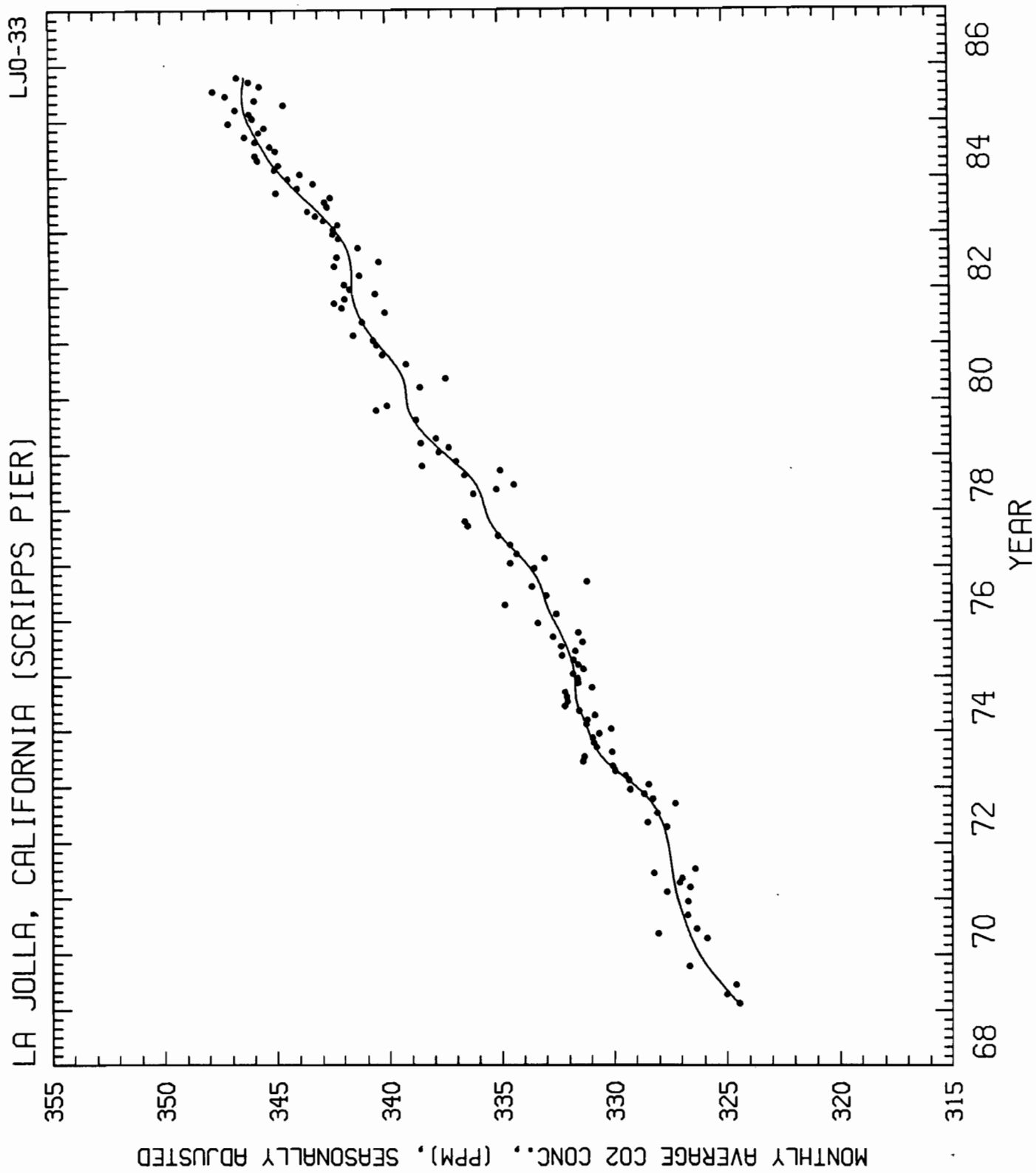
FIRST AND LAST 5 DATA POINTS ARE :

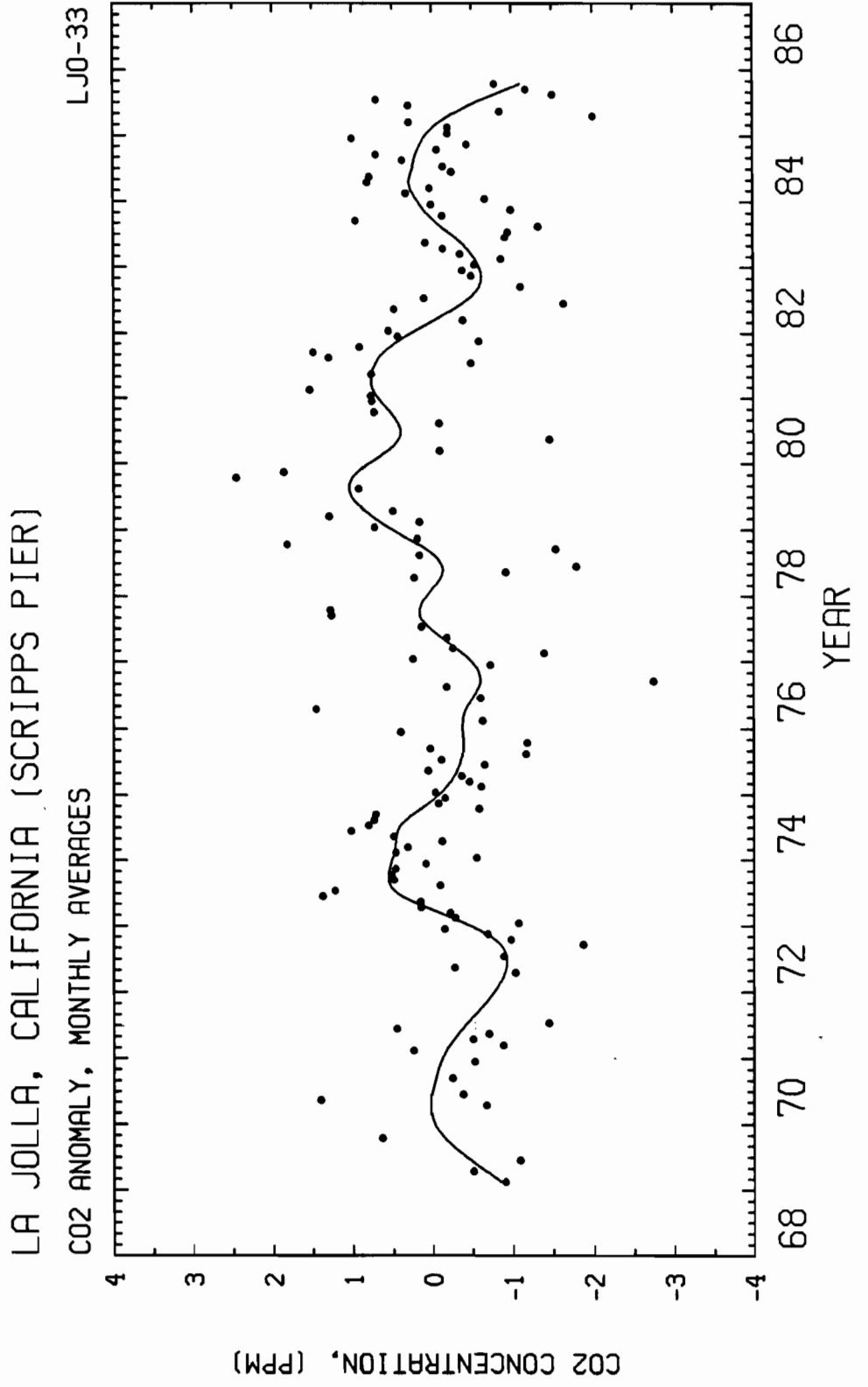
NO.	MEAS	SYMB	YEAR	CONC (PPM)
1	3	1	1.1342	326.33
2	8	1	1.1425	326.41
3	4	1	1.2493	327.45
4	2	1	1.4630	325.84
5	3	1	1.7534	323.32
346	4	1	17.6904	341.15
347	4	1	17.7151	339.27
348	4	1	17.7370	342.47
349	4	1	17.7397	342.31
350	4	1	17.7671	342.97

INPUT PARAMETERS :

STATION	NO. HARMONICS	GAIN	SOUTHERN HEM.	SQ2DI
LJO	4	YES	NO	30







1. FIT OF CUBIC + HARMONICS

FITTED COEFFICIENTS / ERROR :

CONST	T	T**2	T**3
0.32363E+03	0.98358E+00	0.32110E-01	-0.76777E-03
0.49604E+00	0.18237E+00	0.20283E-01	0.67846E-03
SIN(2*PI*T)	COS(2*PI*T)	SIN(4*PI*T)	COS(4*PI*T)
0.39213E+01	0.83357E+00	-0.16324E+01	0.46629E+00
0.78112E-01	0.87583E-01	0.81403E-01	0.81564E-01
SIN(6*PI*T)	COS(6*PI*T)	SIN(8*PI*T)	COS(8*PI*T)
0.40283E+00	-0.24068E+00	0.23471E+00	-0.92440E-01
0.82169E-01	0.80738E-01	0.81505E-01	0.78533E-01

STANDARD ERROR OF FIT: DEL = 0.92487E+00

SEASONAL CYCLE FIT (PPM):

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1.67	2.28	2.38	3.62	4.08	1.78	-1.97	-5.28	-5.39	-2.64	-0.59	0.28

2. FIT OF EXPONENTIAL + HARMONICS

FIT TO NON-LINEAR TERMS :

ITER	CHISQ	FL
1	0.10097E+01	0.10000E-03
2	0.91230E+00	0.10000E-03
3	0.89356E+00	0.10000E-03
4	0.88079E+00	0.10000E-03
18	0.82849E+00	0.10000E-03
19	0.82722E+00	0.10000E-03
20	0.82606E+00	0.10000E-03

FINAL VALUES LISTED ABOVE APPLY TO FIT

FIT IS TO C1 + C2*EXP(R*T) + (1 + A*T)*HARMONICS
FITTED COEFFICIENTS / ERROR :

A	C1	C2	R
0.23176E-01	0.29492E+03	0.29355E+02	0.32650E-01
0.54209E-02	0.60298E+01	0.57805E+01	0.48097E-02
SIN(2*PI*T)	COS(2*PI*T)	SIN(4*PI*T)	COS(4*PI*T)
0.30828E+01	0.70396E+00	-0.12607E+01	0.34447E+00
0.16825E+00	0.75707E-01	0.93320E-01	0.67339E-01
SIN(6*PI*T)	COS(6*PI*T)	SIN(8*PI*T)	COS(8*PI*T)
0.32518E+00	-0.16071E+00	0.18529E+00	-0.49584E-01
0.65580E-01	0.63923E-01	0.63769E-01	0.61605E-01

STANDARD ERROR OF FIT: DEL = 0.90888E+00

SEASONAL CYCLE FIT (PPM):

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1.70	2.21	2.31	3.50	3.85	1.61	-1.97	-5.09	-5.10	-2.50	-0.61	0.31

3. FIT OF CHISQUARE-TYPE SPLINE + HARMONICS TO EXPONENTIALLY ADJUSTED DATA

FINAL VALUE FOR SIGMA IS 0.7916
 FINAL COEFFICIENTS ARE BELOW

SPLINE-HARMONICS ITERATION NUMBER 1

FIT OF NON-LINEAR GAIN :

ITER	CHISQ	FL
1	0.62119E+00	0.10000E-03
2	0.62119E+00	0.10000E-04

FIT IS TO CHISQUARED-TYPE-SPLINE + (1 + A*T)*HARMONICS
 FITTED COEFFICIENTS / ERROR :

A			
0.17162E-01			
0.40823E-02			
SIN(2*PI*T)	COS(2*PI*T)	SIN(4*PI*T)	COS(4*PI*T)
0.32382E+01	0.74021E+00	-0.13399E+01	0.39121E+00
0.14061E+00	0.67549E-01	0.82608E-01	0.61661E-01
SIN(6*PI*T)	COS(6*PI*T)	SIN(8*PI*T)	COS(8*PI*T)
0.36249E+00	-0.15829E+00	0.17303E+00	-0.24555E-01
0.59875E-01	0.58328E-01	0.58335E-01	0.56514E-01
DEL	SQ2D	SQ2DI	
0.79165E+00	0.42175E+02	0.29991E+02	

CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
 FITTED SEASONAL FUNCTION (HARMONICS) EVALUATED AT MIDDLE YEAR :

SEASONAL CYCLE (PPM) :

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1.74	2.17	2.28	3.47	3.86	1.69	-1.98	-5.16	-5.08	-2.52	-0.65	0.38

CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
 AVERAGE OVER MONTHS OF AVERAGES AT 15TH OF MONTH, ADJUSTED FOR TREND :

SEASONAL CYCLE (PPM) :

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1.65	2.04	2.21	3.37	3.91	1.48	-2.02	-5.53	-5.26	-2.27	-0.89	0.49

SPLINE FIT TO EXPONENTIALLY AND SEASONALLY ADJUSTED DATA (PPM) :

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
69	99.99	99.99	-0.76	-0.66	-0.57	-0.47	-0.38	-0.29	-0.21	-0.14	-0.09	-0.04
70	-0.01	0.01	0.02	0.03	0.03	0.02	0.00	-0.01	-0.03	-0.05	-0.07	-0.10
71	-0.13	-0.16	-0.21	-0.26	-0.31	-0.37	-0.43	-0.50	-0.56	-0.62	-0.68	-0.74
72	-0.79	-0.83	-0.87	-0.90	-0.91	-0.92	-0.92	-0.89	-0.84	-0.77	-0.67	-0.55
73	-0.40	-0.23	-0.08	0.10	0.25	0.39	0.48	0.53	0.55	0.55	0.54	0.52
74	0.50	0.49	0.47	0.46	0.46	0.44	0.40	0.34	0.25	0.16	0.06	-0.03
75	-0.10	-0.17	-0.22	-0.27	-0.30	-0.33	-0.35	-0.37	-0.38	-0.39	-0.38	-0.37
76	-0.37	-0.38	-0.39	-0.41	-0.45	-0.49	-0.54	-0.57	-0.59	-0.59	-0.56	-0.52
77	-0.46	-0.38	-0.29	-0.20	-0.10	-0.01	0.06	0.12	0.16	0.17	0.15	0.11
78	0.06	0.00	-0.05	-0.09	-0.12	-0.12	-0.08	-0.01	0.08	0.19	0.31	0.43

79	0.56	0.67	0.76	0.85	0.93	0.99	1.03	1.05	1.04	1.01	0.95	0.86
80	0.76	0.66	0.57	0.48	0.43	0.41	0.41	0.43	0.48	0.53	0.60	0.65
81	0.71	0.75	0.77	0.77	0.77	0.75	0.72	0.68	0.62	0.54	0.44	0.34
82	0.22	0.09	-0.02	-0.15	-0.26	-0.37	-0.45	-0.53	-0.58	-0.61	-0.61	-0.60
83	-0.57	-0.53	-0.49	-0.43	-0.36	-0.29	-0.20	-0.11	-0.02	0.05	0.11	0.16
84	0.20	0.25	0.27	0.29	0.28	0.26	0.24	0.23	0.21	0.18	0.15	0.12
85	0.06	-0.01	-0.09	-0.20	-0.32	-0.45	-0.60	-0.77	-0.94	99.99	99.99	99.99

GAIN FOR EACH YEAR :

YEAR	PTS	DEL	GAIN ERROR				
1969	5	0.39	0.7730 0.0673	1984	56	0.96	1.1112 0.0384
1970	6	0.74	0.9570 0.0980	1985	36	1.01	1.1390 0.0476
1971	11	0.88	0.9243 0.0998				
1972	14	0.84	1.0594 0.0996				
1973	52	0.95	0.9818 0.0429				
1974	46	0.82	0.8825 0.0372				
1975	46	0.79	0.9960 0.0364				
1976	5	1.11	1.2179 0.1388				
1977	8	0.58	0.8388 0.0727				
1978	7	1.21	1.0344 0.1288				
1979	11	0.85	0.9966 0.0889				
1980	5	0.93	0.9134 0.1302				
1981	12	0.75	1.0141 0.0717				
1982	10	0.68	1.1612 0.0812				
1983	20	0.86	1.0462 0.0578				

STATION: LJO
CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
AVERAGES OF DATA ADJUSTED TO THE 15TH OF EACH MONTH :

MONTH	YEAR							
	1969	1970	1971	1972	1973	1974	1975	1976
JAN	0.00	0.00	0.00	0.00	330.08	331.78	333.51	0.00
FEB	326.37	0.00	329.63	0.00	331.37	333.30	333.45	334.69
MAR	0.00	0.00	328.71	0.00	331.63	333.36	333.81	0.00
APR	328.08	328.99	330.25	330.89	333.21	334.15	335.16	338.30
MAY	0.00	331.50	330.51	332.06	333.68	335.24	336.06	0.00
JUN	326.11	327.86	329.78	0.00	332.97	333.80	333.36	334.62
JUL	0.00	0.00	324.62	326.18	329.45	330.16	330.43	0.00
AUG	0.00	0.00	0.00	0.00	325.23	327.15	326.38	328.53
SEP	0.00	322.17	0.00	322.57	325.97	327.29	327.75	326.17
OCT	324.44	0.00	0.00	325.94	328.51	328.55	329.13	0.00
NOV	0.00	0.00	0.00	328.05	330.33	330.97	0.00	0.00
DEC	0.00	327.07	0.00	329.64	331.03	331.97	333.76	333.91
AVE	0.00	0.00	0.00	0.00	330.29	331.48	0.00	0.00

MONTH	YEAR							
	1977	1978	1979	1980	1981	1982	1983	1984
JAN	336.34	0.00	339.53	0.00	342.47	343.76	344.25	345.73
FEB	335.23	0.00	339.53	0.00	343.81	0.00	344.51	347.33
MAR	336.59	0.00	340.88	340.95	0.00	343.66	345.28	347.31
APR	0.00	339.74	341.43	0.00	0.00	0.00	346.92	349.55
MAY	338.46	339.11	0.00	341.43	345.20	346.47	347.69	350.04
JUN	0.00	336.14	0.00	0.00	0.00	342.16	344.47	346.73
JUL	333.16	0.00	0.00	0.00	338.01	340.08	340.57	342.92
AUG	0.00	331.36	333.43	333.74	336.54	0.00	336.85	340.07
SEP	331.38	329.85	0.00	0.00	336.94	335.80	339.35	340.68
OCT	334.08	335.92	337.91	337.61	339.20	0.00	341.19	342.89
NOV	0.00	336.32	339.37	0.00	339.83	341.44	342.52	344.69
DEC	0.00	0.00	0.00	340.89	342.06	342.79	344.77	347.41
AVE	0.00	0.00	0.00	0.00	0.00	0.00	343.20	345.44

MONTH	YEAR
	1985
JAN	347.86
FEB	348.48
MAR	349.23
APR	348.41
MAY	350.14
JUN	349.00
JUL	345.44
AUG	339.82
SEP	340.38
OCT	343.78
NOV	0.00
DEC	0.00
AVE	0.00

STATION: LJO
 CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
 AVERAGES OF DATA ADJUSTED TO THE 15TH OF EACH MONTH AND SEASONALLY ADJUSTED :

MONTH	YEAR							
	1969	1970	1971	1972	1973	1974	1975	1976
JAN	0.00	0.00	0.00	0.00	328.46	330.13	331.83	0.00
FEB	324.47	0.00	327.67	0.00	329.34	331.24	331.36	332.57
MAR	0.00	0.00	326.63	0.00	329.49	331.18	331.60	0.00
APR	325.03	325.89	327.10	327.66	329.95	330.85	331.80	334.86
MAY	0.00	328.04	326.99	328.51	330.05	331.55	332.32	0.00
JUN	324.62	326.34	328.23	0.00	331.38	332.19	331.72	333.01
JUL	0.00	0.00	326.42	328.07	331.32	332.06	332.36	0.00
AUG	0.00	0.00	0.00	0.00	330.10	332.09	331.41	333.65
SEP	0.00	326.74	0.00	327.28	330.77	332.17	332.70	331.18
OCT	326.67	0.00	0.00	328.28	330.90	330.97	331.59	0.00
NOV	0.00	0.00	0.00	328.65	330.94	331.59	0.00	0.00
DEC	0.00	326.73	0.00	329.28	330.67	331.61	333.39	333.53
AVE	0.00	0.00	0.00	0.00	330.28	331.47	0.00	0.00

MONTH	YEAR							
	1977	1978	1979	1980	1981	1982	1983	1984
JAN	334.61	0.00	337.74	0.00	340.63	341.90	342.36	343.82
FEB	333.08	0.00	337.30	0.00	341.52	0.00	342.17	344.95
MAR	334.31	0.00	338.54	338.56	0.00	341.22	342.80	344.78
APR	0.00	336.23	337.86	0.00	0.00	0.00	343.15	345.70
MAY	334.60	335.20	0.00	337.42	341.11	342.33	343.49	345.80
JUN	0.00	334.42	0.00	0.00	0.00	340.34	342.63	344.93
JUL	335.14	0.00	0.00	0.00	340.11	342.21	342.73	345.17
AUG	0.00	336.61	338.75	339.17	342.02	0.00	342.48	345.81
SEP	336.49	335.03	0.00	0.00	342.34	341.28	344.91	346.29
OCT	336.61	338.50	340.52	340.24	341.89	0.00	343.95	345.66
NOV	0.00	336.98	340.04	0.00	340.52	342.14	343.23	345.41
DEC	0.00	0.00	0.00	340.49	341.66	342.38	344.36	346.98
AVE	0.00	0.00	0.00	0.00	0.00	0.00	343.19	345.44

MONTH	YEAR
	1985
JAN	345.93
FEB	346.07
MAR	346.69
APR	344.54
MAY	345.83
JUN	347.11
JUL	347.66
AUG	345.60
SEP	346.08
OCT	346.61
NOV	0.00
DEC	0.00
AVE	0.00

STATION: LJO
 CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
 FITTED FUNCTION (EXPONENTIAL + SPLINE + HARMONICS) AT 15TH OF MONTH :
 (JANO REFERS TO VALUE AT BEGINNING OF YEAR)

MONTH	YEAR							
	1969	1970	1971	1972	1973	1974	1975	1976
JAN	0.00	327.84	328.78	329.23	330.75	332.83	333.44	334.42
FEB	326.43	328.33	329.23	329.67	331.42	333.32	333.89	334.94
MAR	326.70	328.52	329.38	329.85	331.77	333.51	334.04	335.16
APR	327.93	329.68	330.49	331.02	333.16	334.73	335.25	336.42
MAY	328.45	330.12	330.89	331.42	333.78	335.20	335.70	336.83
JUN	326.72	328.26	328.95	329.46	331.98	333.22	333.67	334.72
JUL	323.65	325.03	325.63	326.15	328.70	329.76	330.18	331.16
AUG	321.01	322.24	322.75	323.35	325.85	326.75	327.17	328.12
SEP	321.24	322.37	322.84	323.60	326.03	326.83	327.33	328.32
OCT	323.66	324.74	325.21	326.14	328.55	329.29	329.93	330.96
NOV	325.46	326.50	326.96	328.07	330.41	331.09	331.86	332.94
DEC	326.50	327.49	327.93	329.24	331.46	332.10	332.98	334.10
AVE	0.00	326.76	327.42	328.10	330.32	331.55	332.12	333.18
JANO	0.00	327.21	328.18	328.62	330.03	332.19	332.81	333.74

MONTH	YEAR							
	1977	1978	1979	1980	1981	1982	1983	1984
JAN	335.63	337.48	339.35	340.98	342.39	343.42	344.20	346.59
FEB	336.24	337.97	340.02	341.44	343.01	343.89	344.84	347.24
MAR	336.54	338.14	340.34	341.60	343.27	344.01	345.13	347.55
APR	337.94	339.41	341.77	342.90	344.66	345.29	346.61	349.03
MAY	338.53	339.90	342.37	343.32	345.19	345.73	347.24	349.54
JUN	336.57	337.82	340.32	341.12	343.01	343.43	345.10	347.22
JUL	333.08	334.23	336.69	337.40	339.21	339.52	341.31	343.28
AUG	330.06	331.18	333.54	334.25	335.91	336.15	338.06	339.93
SEP	330.27	331.46	333.73	334.54	336.06	336.31	338.36	340.17
OCT	332.96	334.29	336.45	337.39	338.82	339.17	341.36	343.11
NOV	334.94	336.44	338.45	339.53	340.85	341.31	343.60	345.28
DEC	336.04	337.72	339.55	340.79	341.96	342.57	344.91	346.52
AVE	334.90	336.33	338.55	339.60	341.19	341.73	343.39	345.46
JANO	334.91	336.80	338.58	340.31	341.64	342.74	343.43	345.80

MONTH	YEAR
	1985
JAN	348.12
FEB	348.67
MAR	348.85
APR	350.21
MAY	350.67
JUN	348.26
JUL	344.14
AUG	340.55
SEP	340.60
OCT	343.45
NOV	0.00
DEC	0.00
AVE	0.00
JANO	347.37

STATION: LJO
CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
TREND (EXPONENTIAL + SPLINE) AT 15TH OF MONTH :
(JANO REFERS TO VALUE AT BEGINNING OF YEAR)

MONTH	YEAR							
	1969	1970	1971	1972	1973	1974	1975	1976
JAN	0.00	326.29	327.21	327.63	329.12	331.18	331.76	332.71
FEB	324.53	326.39	327.26	327.67	329.39	331.26	331.79	332.82
MAR	324.69	326.49	327.30	327.73	329.63	331.33	331.84	332.90
APR	324.87	326.58	327.34	327.79	329.90	331.42	331.89	332.98
MAY	325.05	326.66	327.37	327.86	330.15	331.52	331.96	333.05
JUN	325.23	326.74	327.41	327.95	330.38	331.60	332.03	333.11
JUL	325.40	326.81	327.43	328.04	330.57	331.66	332.11	333.17
AUG	325.58	326.88	327.46	328.16	330.72	331.70	332.19	333.24
SEP	325.75	326.95	327.49	328.31	330.84	331.71	332.29	333.33
OCT	325.90	327.02	327.52	328.47	330.93	331.71	332.39	333.44
NOV	326.04	327.09	327.55	328.67	331.02	331.72	332.50	333.57
DEC	326.17	327.15	327.58	328.88	331.10	331.73	332.61	333.72
AVE	0.00	326.75	327.41	328.10	330.31	331.54	332.11	333.17
JANO	0.00	326.23	327.18	327.61	329.00	331.14	331.74	332.66

MONTH	YEAR							
	1977	1978	1979	1980	1981	1982	1983	1984
JAN	333.90	335.72	337.57	339.17	340.56	341.57	342.31	344.68
FEB	334.09	335.78	337.80	339.19	340.72	341.57	342.49	344.86
MAR	334.27	335.83	338.00	339.21	340.86	341.57	342.65	345.02
APR	334.47	335.90	338.21	339.25	340.99	341.58	342.85	345.17
MAY	334.68	335.98	338.40	339.31	341.11	341.59	343.04	345.30
JUN	334.88	336.10	338.57	339.41	341.21	341.61	343.25	345.42
JUL	335.06	336.24	338.73	339.53	341.31	341.65	343.47	345.53
AUG	335.23	336.43	338.87	339.68	341.39	341.71	343.69	345.66
SEP	335.38	336.64	338.98	339.85	341.46	341.79	343.92	345.78
OCT	335.49	336.86	339.06	340.02	341.51	341.89	344.12	345.89
NOV	335.59	337.10	339.12	340.21	341.54	342.01	344.31	346.00
DEC	335.66	337.33	339.15	340.38	341.56	342.15	344.50	346.10
AVE	334.89	336.33	338.54	339.60	341.18	341.72	343.38	345.45
JANO	333.81	335.69	337.46	339.16	340.48	341.56	342.23	344.59

MONTH	YEAR
	1985
JAN	346.19
FEB	346.26
MAR	346.30
APR	346.34
MAY	346.36
JUN	346.37
JUL	346.36
AUG	346.34
SEP	346.31
OCT	346.29
NOV	0.00
DEC	0.00
AVE	0.00
JANO	346.15

SCRIPPS INSTITUTION OF OCEANOGRAPHY
ATMOSPHERIC CARBON DIOXIDE PROGRAM
ANALYSIS OF STATION DATA USING PROGRAM "STATION FIT"

STATION: HILO, HAWAII

RUN NO. HIL-06

COORDINATES : 19.7N 155.1W

ELEVATION ABOVE SEA LEVEL : 2 METERS

BEGINNING DATE : 30-MAR-1960

FINAL DATE : 4-NOV-1963

TYPE OF DATA PROCESSED : FLASK DAILY AVERAGES

CALIBRATION SCALE : 1985

NUMBER OF HARMONICS : 2

COMPUTED SPLINE RMS SECOND DERIVATIVE : 0.00

COMPUTED GAIN FACTOR FOR SEASONAL CYCLE
REFERENCED TO BASE YEAR = 1959 : NOT COMPUTED

COMPUTED SPLINE STIFFNESS PARAMETER (SIGMA) : 1.0234 PPM

DATE OF RUN : 26-NOV-1985

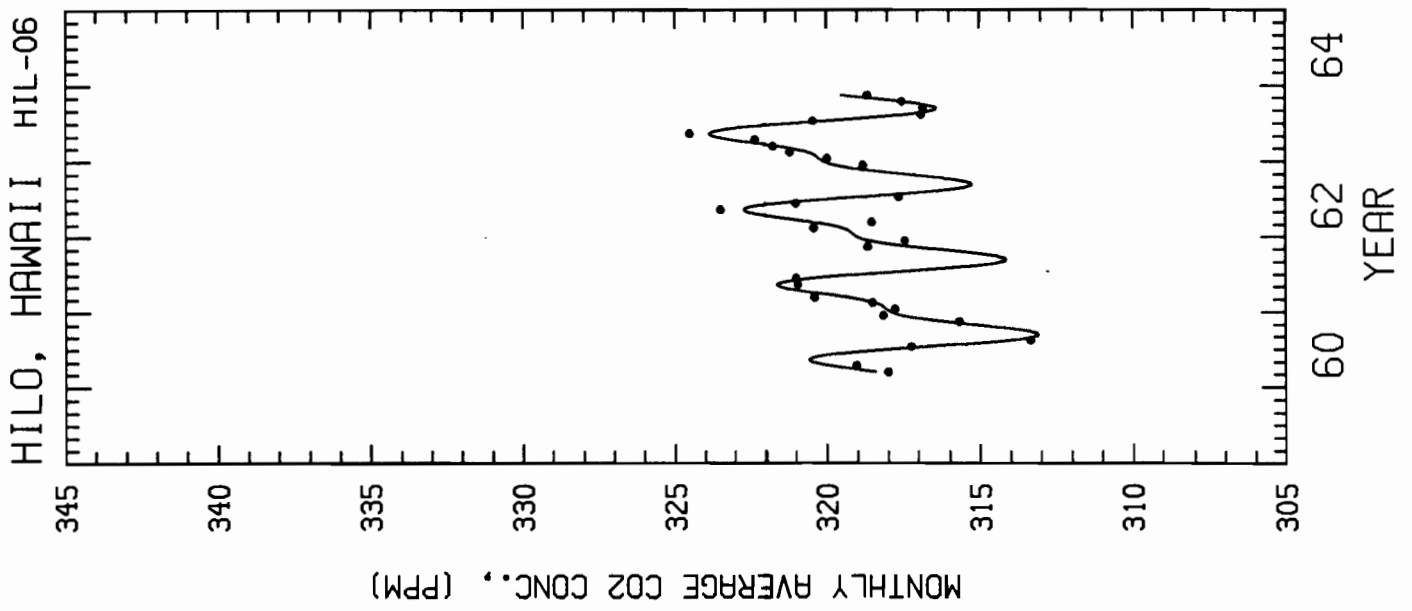
BASE YEAR MIDDLE YEAR
59 62.0449

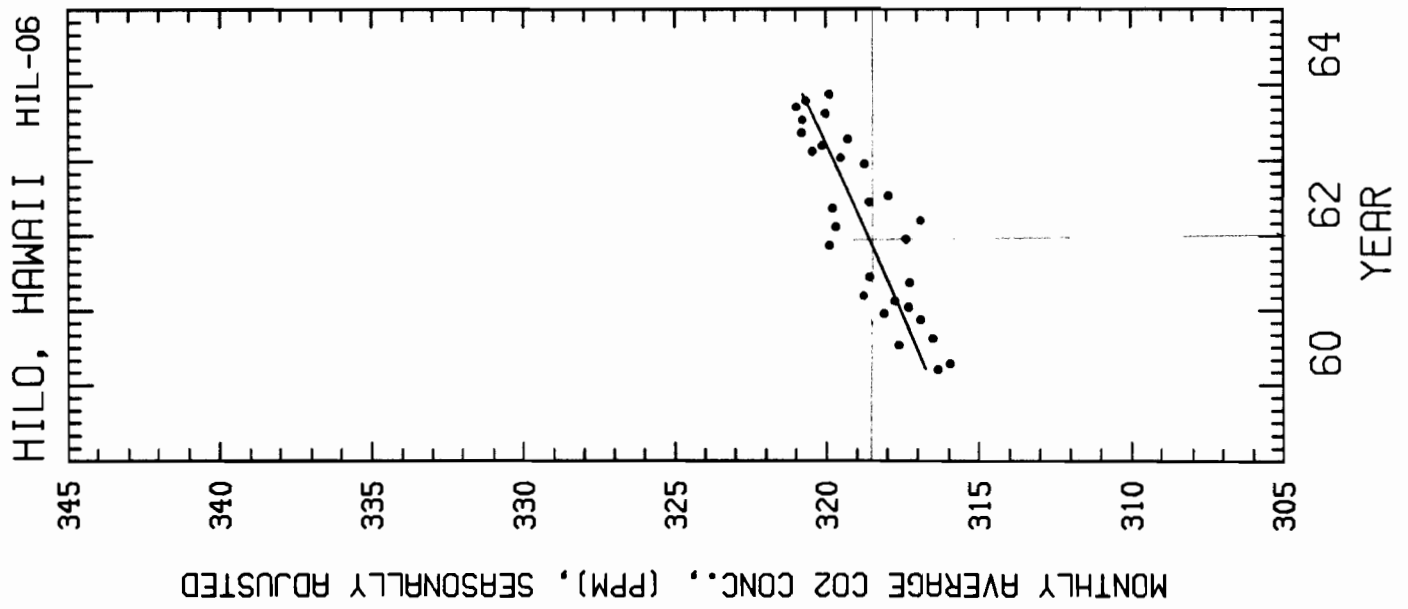
FIRST AND LAST 5 DATA POINTS ARE :

NO.	MEAS	SYMB	YEAR	CONC (PPM)
1	3	1	1.2459	318.73
2	3	1	1.2787	318.85
3	2	1	1.5055	318.59
4	2	1	1.5383	317.07
5	2	1	1.5929	314.87
39	2	1	4.6274	318.34
40	2	1	4.6712	318.01
41	2	1	4.7151	315.80
42	2	1	4.7507	316.82
43	2	1	4.8438	317.95

INPUT PARAMETERS :

STATION NO. HARMONICS GAIN SOUTHERN HEM. SQ2D
HIL 2 NO NO 0





1. FIT OF CUBIC + HARMONICS

FITTED COEFFICIENTS / ERROR :

CONST	T	T**2	T**3
0.31090E+03	0.60165E+01	-0.16434E+01	0.17064E+00
0.44667E+01	0.50682E+01	0.17928E+01	0.19904E+00
SIN(2*PI*T)	COS(2*PI*T)	SIN(4*PI*T)	COS(4*PI*T)
0.31776E+01	-0.39039E+00	-0.11957E+01	0.64668E+00
0.32319E+00	0.23672E+00	0.22458E+00	0.28975E+00

STANDARD ERROR OF FIT: DEL = 0.10623E+01

SEASONAL CYCLE FIT (PPM):

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0.41	0.78	1.72	3.15	3.74	2.45	-0.31	-3.09	-4.13	-3.18	-1.35	-0.06

2. FIT OF EXPONENTIAL + HARMONICS

FIT TO NON-LINEAR TERMS :

ITER	CHISQ	FL
1	0.13866E+01	0.10000E-03
2	0.11382E+01	0.10000E-04
3	0.11374E+01	0.10000E-04
4	0.11370E+01	0.10000E-04
18	0.11348E+01	0.10000E-04
19	0.11347E+01	0.10000E-04
20	0.11347E+01	0.10000E-04

FINAL VALUES LISTED ABOVE APPLY TO FIT

FIT IS TO C1 + C2*EXP(R*T) + HARMONICS

FITTED COEFFICIENTS / ERROR :

(ERRORS COMPUTED FROM MATRIX ELEMENTS INCLUDE (1 + FL) AS A FACTOR)

C1	C2	R	
0.29376E+03	0.21792E+02	0.43959E-01	
0.10620E+02	0.10541E+02	0.20031E-01	
SIN(2*PI*T)	COS(2*PI*T)	SIN(4*PI*T)	COS(4*PI*T)
0.31215E+01	-0.33312E+00	-0.12278E+01	0.68782E+00
0.25613E+00	0.21800E+00	0.21842E+00	0.25824E+00

STANDARD ERROR OF FIT: DEL = 0.10652E+01

SEASONAL CYCLE FIT (PPM):

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0.47	0.75	1.63	3.06	3.69	2.43	-0.33	-3.12	-4.14	-3.14	-1.24	0.06

3. FIT OF STRAIGHT LINE SPLINE + HARMONICS TO EXPONENTIALLY ADJUSTED DATA

SPLINE-HARMONICS ITERATION NUMBER 2

CHISQ FOR HARMONIC FIT = 0.10474E+01

FIT IS TO CHISQUARED-TYPE-SPLINE + HARMONICS

FITTED COEFFICIENTS / ERROR :

(ERRORS COMPUTED FROM MATRIX ELEMENTS INCLUDE (1 + FL) AS A FACTOR)

SIN(2*PI*T)	COS(2*PI*T)	SIN(4*PI*T)	COS(4*PI*T)
0.31224E+01	-0.33270E+00	-0.12282E+01	0.68858E+00
0.23987E+00	0.20788E+00	0.20866E+00	0.23903E+00

DEL	SQ2D
0.10234E+01	0.33203E-18

CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
FITTED SEASONAL FUNCTION (HARMONICS) :

SEASONAL CYCLE (PPM) :

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0.47	0.75	1.63	3.06	3.69	2.44	-0.33	-3.13	-4.14	-3.14	-1.24	0.06

CONCENTRATION OF ATMOSPHERIC CO2 (PPM)

AVERAGE OVER MONTHS OF AVERAGES AT 15TH OF MONTH, ADJUSTED FOR TREND :

SEASONAL CYCLE (PPM) :

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0.19	1.27	1.34	2.25	3.93	2.44	-0.44	-3.68	-3.73	-3.13	-1.23	-0.46

GAIN FOR EACH YEAR :

YEAR	PTS	DEL	GAIN ERROR
1960	10	0.73	1.0605 0.1221
1961	10	0.95	0.9257 0.1521
1962	8	1.34	0.9613 0.2812
1963	15	1.03	1.0152 0.1004

STATION: HIL
CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
AVERAGES OF DATA ADJUSTED TO THE 15TH OF EACH MONTH :

MONTH	YEAR			
	1960	1961	1962	1963
JAN	0.00	317.77	0.00	319.99
FEB	0.00	318.50	320.44	321.21
MAR	317.99	320.40	318.52	321.76
APR	319.03	0.00	0.00	322.35
MAY	0.00	320.95	323.48	324.50
JUN	0.00	321.01	321.02	0.00
JUL	317.24	0.00	317.63	320.45
AUG	313.35	0.00	0.00	316.90
SEP	0.00	0.00	0.00	316.84
OCT	0.00	0.00	0.00	317.53
NOV	315.67	318.66	0.00	318.66
DEC	318.15	317.44	318.80	0.00
AVE	0.00	0.00	0.00	0.00

STATION: HIL
CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
AVERAGES OF DATA ADJUSTED TO THE 15TH OF EACH MONTH AND SEASONALLY ADJUSTED :

MONTH	YEAR			
	1960	1961	1962	1963
JAN	0.00	317.31	0.00	319.53
FEB	0.00	317.75	319.68	320.45
MAR	316.33	318.77	316.89	320.13
APR	315.94	0.00	0.00	319.29
MAY	0.00	317.26	319.79	320.81
JUN	0.00	318.57	318.58	0.00
JUL	317.62	0.00	317.96	320.78
AUG	316.50	0.00	0.00	320.03
SEP	0.00	0.00	0.00	320.98
OCT	0.00	0.00	0.00	320.67
NOV	316.90	319.89	0.00	319.89
DEC	318.09	317.38	318.74	0.00
AVE	0.00	0.00	0.00	0.00

STATION: HIL
CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
FITTED FUNCTION (EXPONENTIAL + SPLINE + HARMONICS) AT 15TH OF MONTH :
(JANO REFERS TO VALUE AT BEGINNING OF YEAR)

MONTH	YEAR			
	1960	1961	1962	1963
JAN	0.00	318.06	319.13	320.26
FEB	0.00	318.43	319.51	320.64
MAR	318.39	319.39	320.47	321.60
APR	319.90	320.91	322.00	323.13
MAY	320.58	321.63	322.72	323.86
JUN	319.38	320.47	321.56	322.70
JUL	316.69	317.79	318.89	320.03
AUG	314.00	315.08	316.19	317.34
SEP	313.10	314.16	315.26	316.42
OCT	314.20	315.25	316.36	317.52
NOV	316.19	317.25	318.36	319.53
DEC	317.56	318.63	319.75	0.00
AVE	0.00	318.09	319.18	0.00
JANO	0.00	317.90	318.98	320.10

STATION: HIL
CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
TREND (EXPONENTIAL + SPLINE) AT 15TH OF MONTH :
(JANO REFERS TO VALUE AT BEGINNING OF YEAR)

MONTH	YEAR			
	1960	1961	1962	1963
JAN	0.00	317.59	318.67	319.79
FEB	0.00	317.68	318.76	319.89
MAR	316.73	317.76	318.84	319.97
APR	316.81	317.85	318.94	320.07
MAY	316.90	317.94	319.03	320.17
JUN	316.98	318.03	319.12	320.27
JUL	317.07	318.12	319.22	320.36
AUG	317.16	318.21	319.31	320.46
SEP	317.24	318.30	319.41	320.56
OCT	317.33	318.39	319.50	320.66
NOV	317.42	318.48	319.60	320.76
DEC	317.50	318.57	319.69	0.00
AVE	0.00	318.08	319.17	0.00
JANO	0.00	317.55	318.62	319.74

SCRIPPS INSTITUTION OF OCEANOGRAPHY
ATMOSPHERIC CARBON DIOXIDE PROGRAM
ANALYSIS OF STATION DATA USING PROGRAM "STATION FIT"

STATION: MAUNA LOA, HAWAII

RUN NO. MLO-80

COORDINATES : 19.5N 155.6W

ELEVATION ABOVE SEA LEVEL : 3397 METERS

BEGINNING DATE : 29-MAR-1958

FINAL DATE : 14-DEC-1985

TYPE OF DATA PROCESSED : CONTINUOUS: 7 CALENDAR-DAY AVERAGES

CALIBRATION SCALE : 1985

NUMBER OF HARMONICS : 4

COMPUTED SPLINE RMS SECOND DERIVATIVE : MONTHLY NODES : 30.00
DATA POINT NODES : 62.28

COMPUTED GAIN FACTOR FOR SEASONAL CYCLE
REFERENCED TO BASE YEAR = 1957 : 0.8224 % PER YEAR

COMPUTED SPLINE STIFFNESS PARAMETER (SIGMA) : 0.3452 PPM

DATE OF RUN : 13-FEB-1986

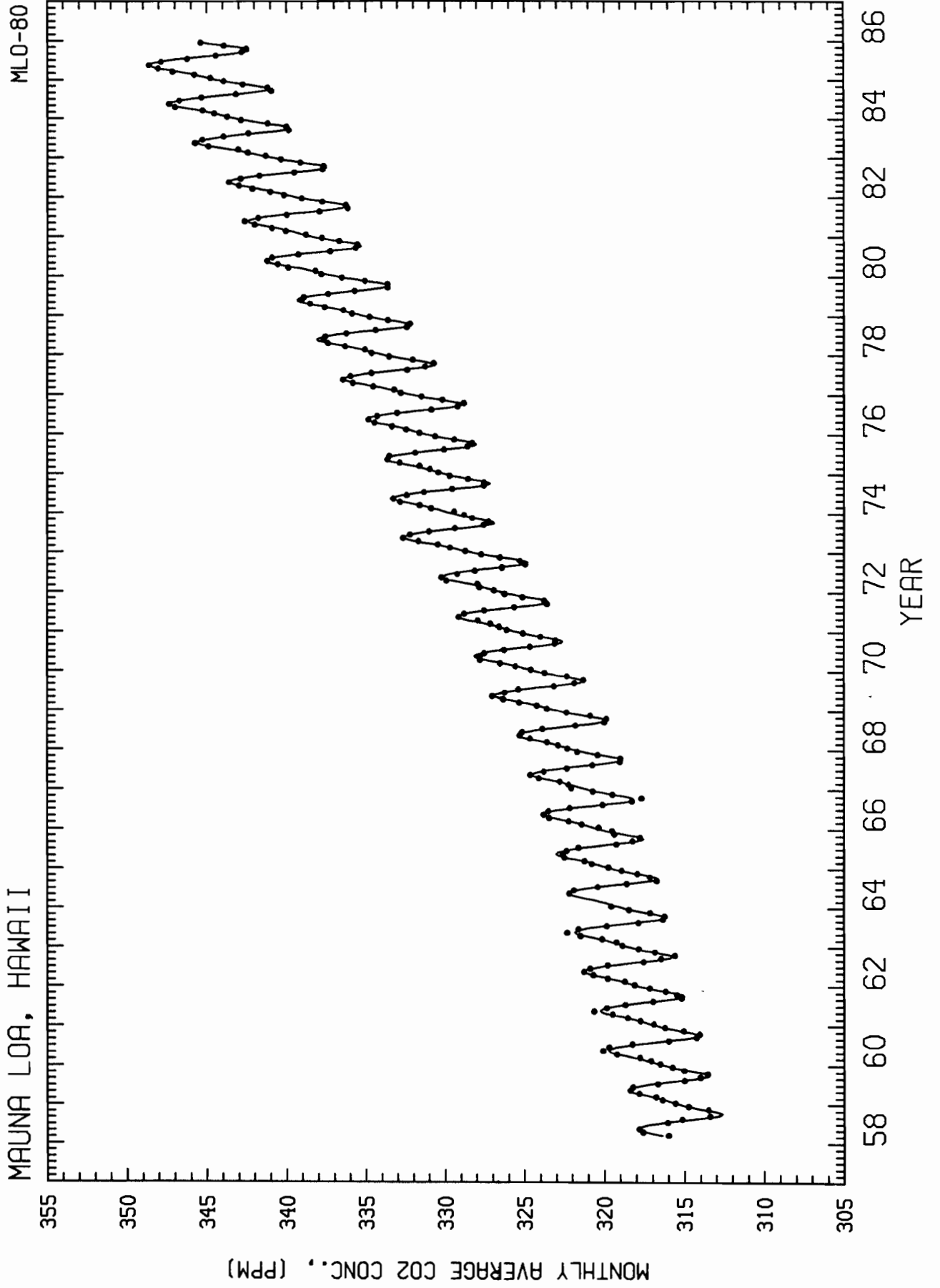
BASE YEAR MIDDLE YEAR
57 72.0973

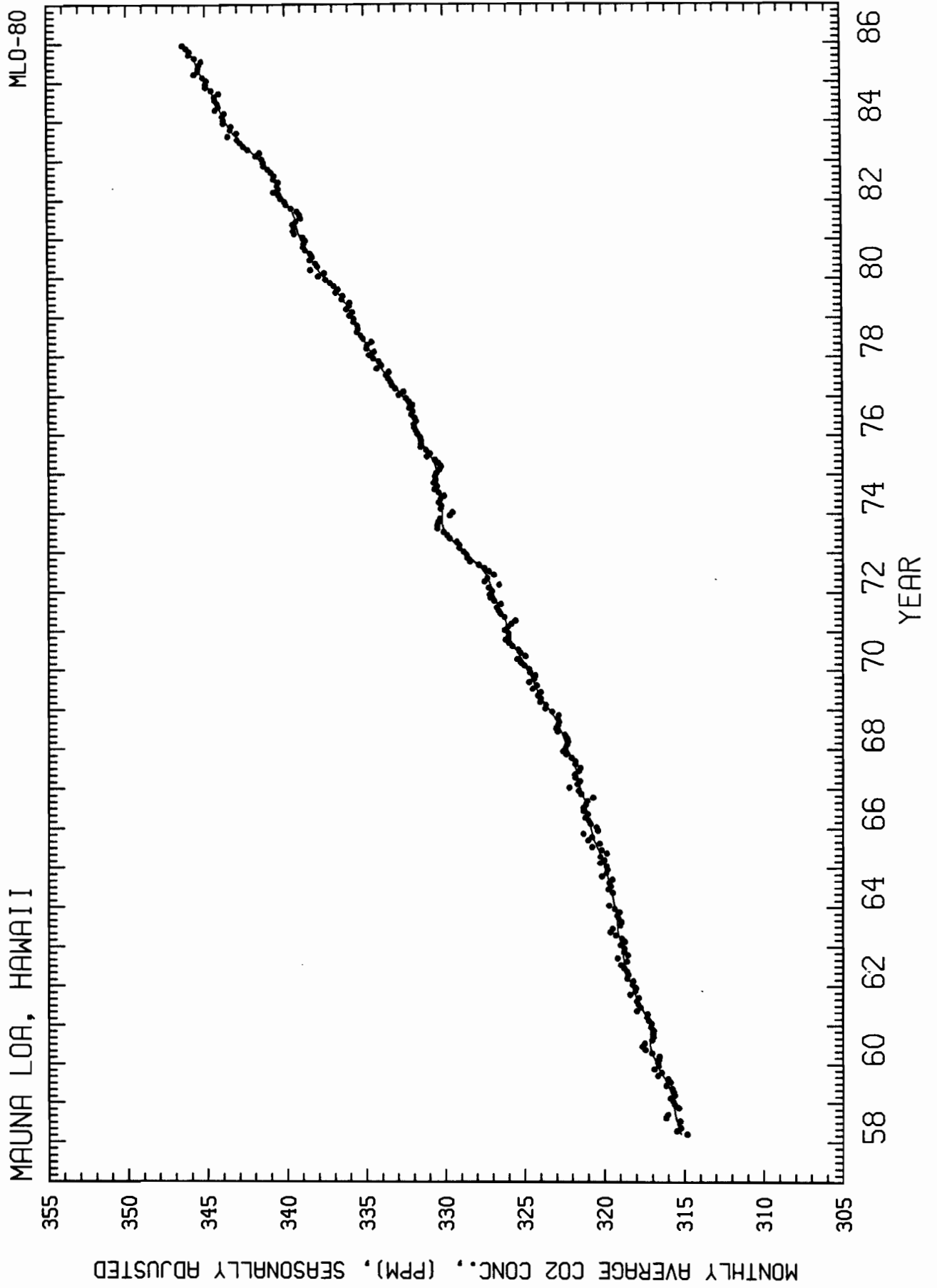
FIRST AND LAST 5 DATA POINTS ARE :

NO.	MEAS	SYMB	YEAR	CONC (PPM)
1	4	0	1.2411	316.46
2	6	0	1.2603	317.60
3	4	0	1.2795	317.74
4	6	0	1.2986	317.64
5	2	0	1.3178	316.73
1384	7	0	28.8767	343.93
1385	6	0	28.8959	344.37
1386	6	0	28.9151	345.04
1387	5	0	28.9342	345.09
1388	6	0	28.9534	345.35

INPUT PARAMETERS :

STATION NO. HARMONICS GAIN SOUTHERN HEM. SQ2DI
MLO 4 YES NO 30

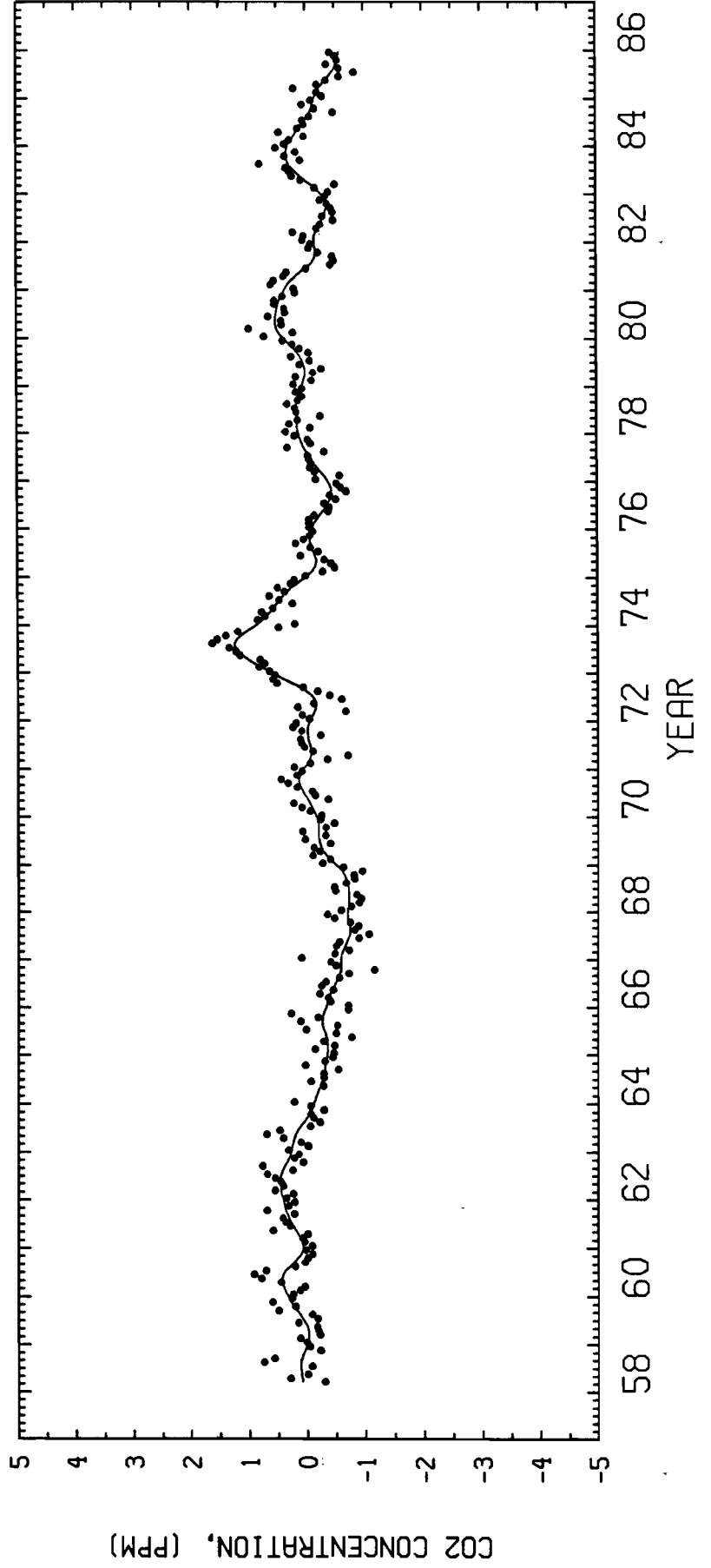


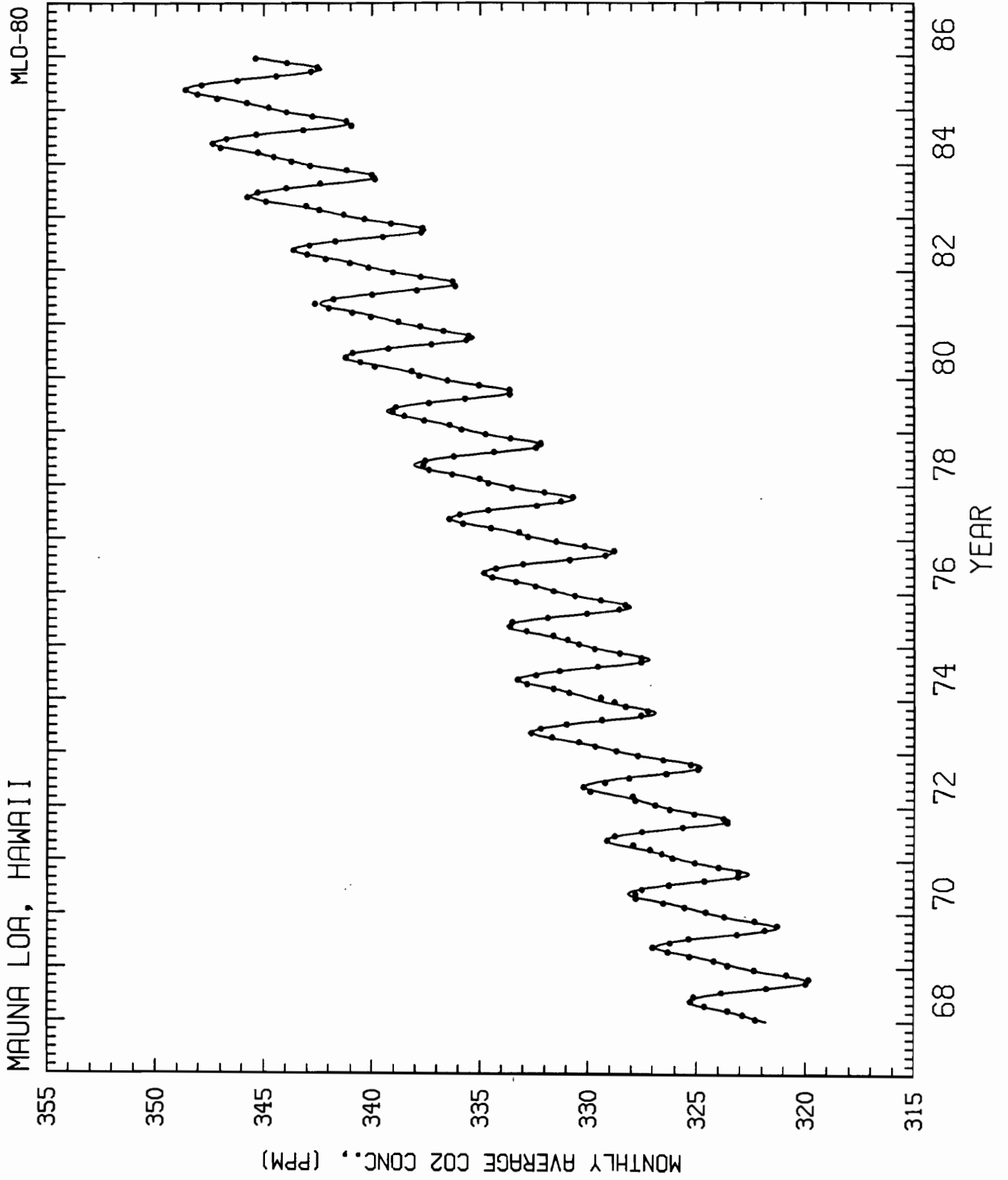


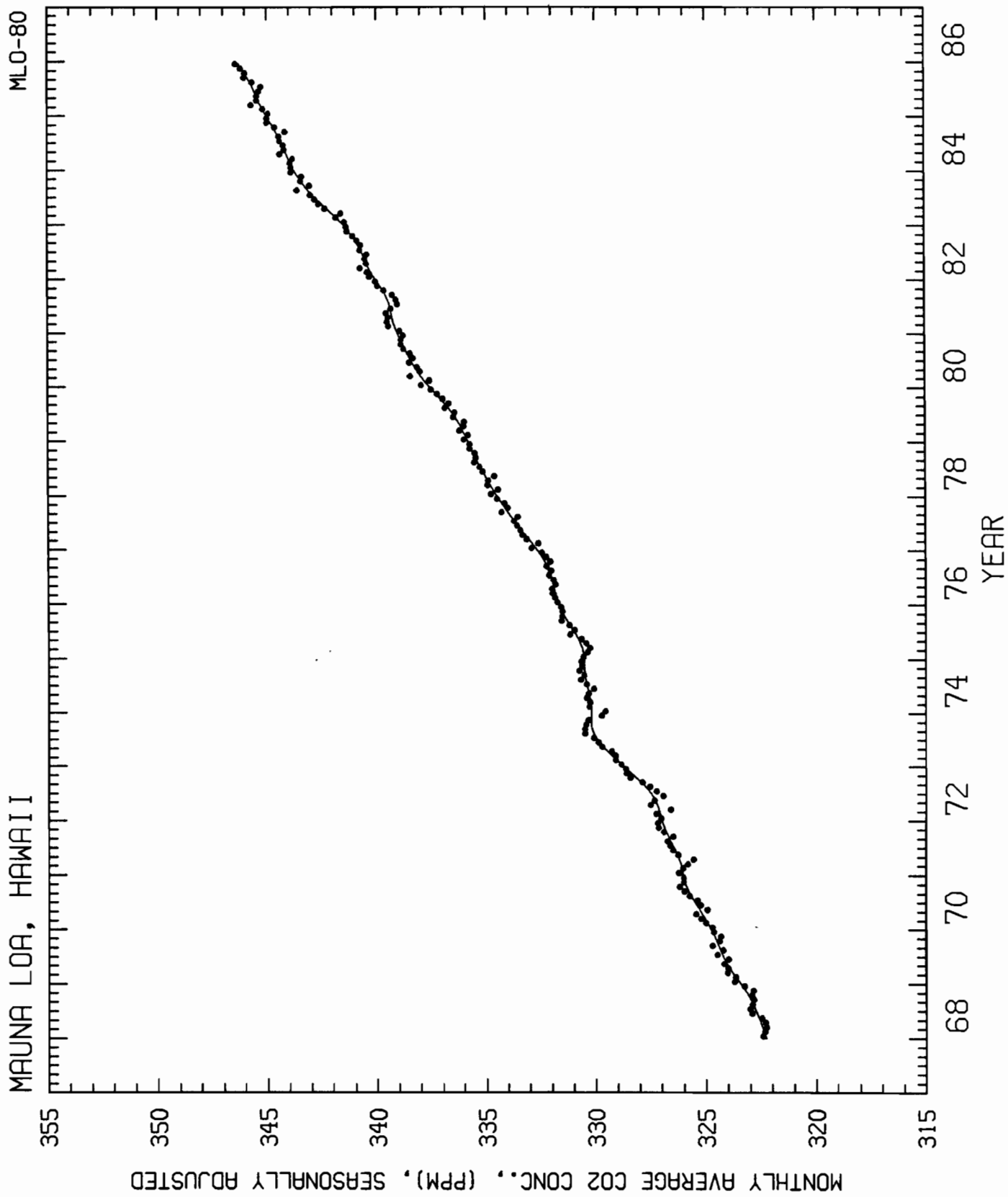
MAUNA LOA, HAWAII

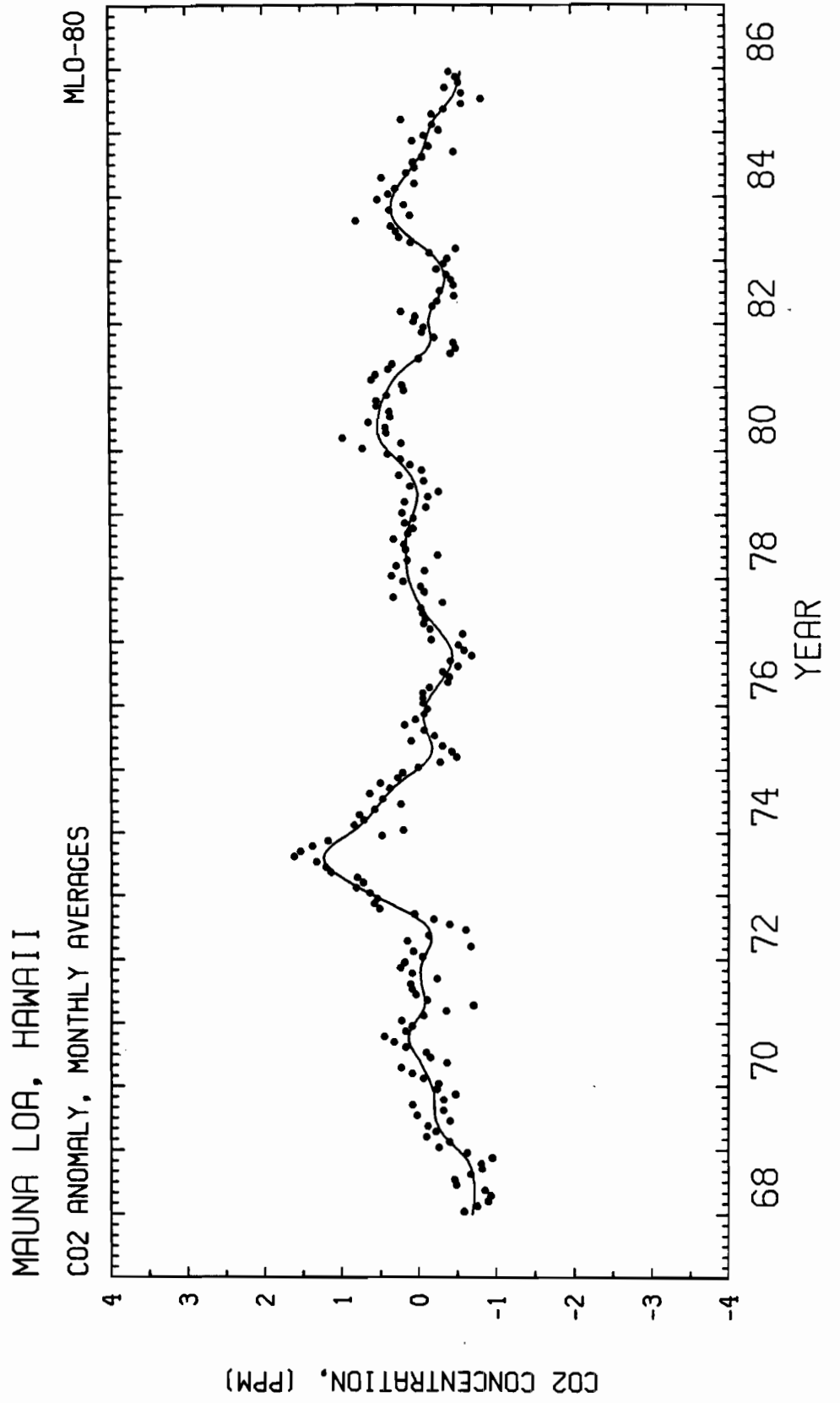
CO2 ANOMALY, MONTHLY AVERAGES

ML0-80









1. FIT OF CUBIC + HARMONICS

FITTED COEFFICIENTS / ERROR :

CONST	T	T**2	T**3
0.31512E+03	0.40134E+00	0.28859E-01	-0.18575E-03
0.81963E-01	0.22051E-01	0.16410E-02	0.35523E-04
SIN(2*PI*T)	COS(2*PI*T)	SIN(4*PI*T)	COS(4*PI*T)
0.24726E+01	-0.10878E+01	-0.37215E+00	0.62756E+00
0.19718E-01	0.19619E-01	0.19671E-01	0.19636E-01
SIN(6*PI*T)	COS(6*PI*T)	SIN(8*PI*T)	COS(8*PI*T)
-0.10471E+00	0.29494E-01	0.20513E-01	-0.64046E-01
0.19667E-01	0.19657E-01	0.19668E-01	0.19643E-01

STANDARD ERROR OF FIT: DEL = 0.51756E+00

SEASONAL CYCLE FIT (PPM):

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
-0.13	0.58	1.32	2.35	2.90	2.32	0.91	-1.11	-2.92	-3.16	-2.04	-0.94

2. FIT OF EXPONENTIAL + HARMONICS

FIT TO NON-LINEAR TERMS :

ITER	CHISQ	FL
1	0.30599E+00	0.10000E-03
2	0.29478E+00	0.10000E-03
3	0.28887E+00	0.10000E-03
4	0.28883E+00	0.10000E-04
5	0.28255E+00	0.10000E-05
6	0.28250E+00	0.10000E-06
7	0.28250E+00	0.10000E-07

FINAL VALUES LISTED ABOVE APPLY TO FIT

FIT IS TO $C1 + C2 \cdot \exp(R \cdot T) + (1 + A \cdot T) \cdot \text{HARMONICS}$

FITTED COEFFICIENTS / ERROR :

A	C1	C2	R
0.83546E-02	0.29636E+03	0.17976E+02	0.35665E-01
0.11634E-02	0.40766E+00	0.36897E+00	0.45422E-03
SIN(2*PI*T)	COS(2*PI*T)	SIN(4*PI*T)	COS(4*PI*T)
0.22016E+01	-0.96338E+00	-0.32787E+00	0.55217E+00
0.40200E-01	0.23744E-01	0.18607E-01	0.20204E-01
SIN(6*PI*T)	COS(6*PI*T)	SIN(8*PI*T)	COS(8*PI*T)
-0.10044E+00	0.32376E-01	0.26381E-01	-0.54950E-01
0.17923E-01	0.17852E-01	0.17852E-01	0.17878E-01

STANDARD ERROR OF FIT: DEL = 0.53150E+00

SEASONAL CYCLE FIT (PPM):

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
-0.12	0.58	1.32	2.38	2.90	2.30	0.91	-1.11	-2.93	-3.16	-2.05	-0.94

3. FIT OF CHISQUARE-TYPE SPLINE + HARMONICS TO EXPONENTIALLY ADJUSTED DATA

FINAL VALUE FOR SIGMA IS 0.3452
FINAL COEFFICIENTS ARE BELOW

SPLINE-HARMONICS ITERATION NUMBER 1

FIT OF NON-LINEAR GAIN :

ITER	CHISQ	FL
1	0.11891E+00	0.10000E-03
2	0.11891E+00	0.10000E-04

FIT IS TO CHISQUARED-TYPE-SPLINE + (1 + A*T)*HARMONICS
FITTED COEFFICIENTS / ERROR :

A
0.82237E-02
0.75393E-03

SIN(2*PI*T)	COS(2*PI*T)	SIN(4*PI*T)	COS(4*PI*T)
0.21964E+01	-0.96532E+00	-0.33243E+00	0.54854E+00
0.26071E-01	0.15442E-01	0.12113E-01	0.13118E-01

SIN(6*PI*T)	COS(6*PI*T)	SIN(8*PI*T)	COS(8*PI*T)
-0.10105E+00	0.34177E-01	0.20237E-01	-0.55041E-01
0.11658E-01	0.11616E-01	0.11615E-01	0.11632E-01

DEL	SQ2D	SQ2DI
0.34521E+00	0.62282E+02	0.29999E+02

CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
FITTED SEASONAL FUNCTION (HARMONICS) EVALUATED AT MIDDLE YEAR :

SEASONAL CYCLE (PPM) :

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
-0.13	0.57	1.32	2.37	2.90	2.30	0.90	-1.11	-2.91	-3.15	-2.04	-0.93

CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
AVERAGE OVER MONTHS OF AVERAGES AT 15TH OF MONTH, ADJUSTED FOR TREND :

SEASONAL CYCLE (PPM) :

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
-0.10	0.55	1.30	2.40	2.88	2.32	0.88	-1.12	-2.89	-3.16	-2.03	-0.95

SPLINE FIT TO EXPONENTIALLY AND SEASONALLY ADJUSTED DATA (PPM) :

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
58	99.99	99.99	99.99	0.09	0.10	0.11	0.11	0.11	0.10	0.07	0.04	0.01
59	-0.01	-0.02	-0.03	-0.02	0.00	0.03	0.07	0.13	0.18	0.23	0.28	0.31
60	0.35	0.38	0.41	0.44	0.44	0.42	0.38	0.31	0.23	0.16	0.11	0.08
61	0.08	0.09	0.11	0.15	0.20	0.24	0.28	0.32	0.35	0.37	0.39	0.41
62	0.43	0.44	0.46	0.47	0.47	0.47	0.45	0.43	0.39	0.36	0.32	0.29
63	0.27	0.26	0.24	0.23	0.21	0.17	0.11	0.06	0.01	-0.03	-0.07	-0.09
64	-0.12	-0.15	-0.17	-0.20	-0.22	-0.25	-0.27	-0.29	-0.30	-0.31	-0.32	-0.33
65	-0.34	-0.35	-0.35	-0.35	-0.33	-0.31	-0.29	-0.27	-0.26	-0.26	-0.28	-0.31
66	-0.34	-0.36	-0.38	-0.40	-0.43	-0.46	-0.50	-0.53	-0.56	-0.58	-0.58	-0.57
67	-0.58	-0.60	-0.62	-0.65	-0.68	-0.71	-0.73	-0.74	-0.73	-0.71	-0.70	-0.69
68	-0.69	-0.70	-0.71	-0.72	-0.72	-0.71	-0.70	-0.69	-0.67	-0.64	-0.60	-0.54
69	-0.46	-0.39	-0.33	-0.28	-0.25	-0.22	-0.21	-0.20	-0.20	-0.19	-0.19	-0.17
70	-0.15	-0.12	-0.09	-0.05	-0.02	0.02	0.07	0.11	0.13	0.14	0.12	0.09
71	0.04	-0.01	-0.04	-0.07	-0.07	-0.06	-0.04	-0.03	-0.02	-0.01	-0.02	-0.04
72	-0.07	-0.10	-0.13	-0.15	-0.15	-0.13	-0.08	0.01	0.12	0.25	0.39	0.52
73	0.66	0.79	0.90	1.01	1.11	1.19	1.23	1.24	1.21	1.14	1.05	0.94
74	0.85	0.76	0.70	0.63	0.57	0.52	0.47	0.41	0.34	0.26	0.17	0.08
75	-0.01	-0.09	-0.14	-0.17	-0.17	-0.15	-0.13	-0.10	-0.07	-0.06	-0.06	-0.08
76	-0.10	-0.14	-0.18	-0.23	-0.28	-0.33	-0.38	-0.41	-0.43	-0.44	-0.43	-0.40
77	-0.36	-0.30	-0.25	-0.19	-0.14	-0.09	-0.04	0.00	0.03	0.06	0.09	0.12
78	0.13	0.15	0.15	0.16	0.16	0.16	0.16	0.16	0.15	0.13	0.11	0.08
79	0.06	0.03	0.02	0.01	0.01	0.02	0.05	0.09	0.14	0.21	0.28	0.34
80	0.41	0.46	0.49	0.51	0.52	0.51	0.50	0.49	0.48	0.45	0.42	0.39
81	0.35	0.30	0.25	0.18	0.09	0.00	-0.08	-0.14	-0.17	-0.18	-0.17	-0.16
82	-0.15	-0.16	-0.18	-0.21	-0.25	-0.29	-0.33	-0.35	-0.36	-0.36	-0.34	-0.30
83	-0.25	-0.17	-0.10	0.00	0.09	0.17	0.24	0.28	0.31	0.33	0.33	0.32
84	0.29	0.25	0.21	0.16	0.11	0.05	0.00	-0.04	-0.08	-0.10	-0.12	-0.14
85	-0.17	-0.20	-0.24	-0.29	-0.35	-0.41	-0.46	-0.50	-0.53	-0.55	-0.56	99.99

GAIN FOR EACH YEAR :

YEAR	PTS	DEL	GAIN ERROR				
1958	25	0.45	0.8453 0.0489	1973	52	0.32	0.9642 0.0222
1959	48	0.29	0.8708 0.0210	1974	52	0.33	0.9802 0.0232
1960	52	0.33	0.9972 0.0229	1975	52	0.31	0.9787 0.0216
1961	53	0.36	0.9290 0.0250	1976	51	0.31	1.0495 0.0216
1962	48	0.28	0.9485 0.0207	1977	52	0.28	1.0519 0.0200
1963	49	0.29	1.0049 0.0210	1978	53	0.31	1.0272 0.0220
1964	31	0.41	0.9252 0.0358	1979	52	0.35	1.0621 0.0246
1965	52	0.47	0.8909 0.0327	1980	52	0.35	1.0535 0.0245
1966	48	0.34	1.0331 0.0243	1981	52	0.32	1.1271 0.0221
1967	51	0.38	0.9625 0.0269	1982	52	0.32	1.0884 0.0224
1968	52	0.32	0.9996 0.0221	1983	52	0.32	1.1022 0.0226
1969	52	0.35	1.0008 0.0242	1984	49	0.28	1.1166 0.0205
1970	52	0.34	0.9245 0.0236	1985	49	0.34	1.1005 0.0242
1971	52	0.35	0.9588 0.0247				
1972	53	0.37	0.9715 0.0261				

STATION: MLO
 CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
 AVERAGES OF DATA ADJUSTED TO THE 15TH OF EACH MONTH :

MONTH	YEAR							
	1958	1959	1960	1961	1962	1963	1964	1965
JAN	0.00	315.58	316.52	316.92	318.12	318.87	319.57	319.73
FEB	0.00	316.39	317.10	317.76	318.72	319.25	0.00	320.78
MAR	316.01	316.79	317.79	318.54	319.79	320.13	0.00	321.23
APR	317.60	317.82	319.22	319.49	320.68	321.49	0.00	322.49
MAY	317.84	318.39	320.08	320.64	321.28	322.34	322.20	322.59
JUN	0.00	318.22	319.70	319.85	320.89	321.62	321.90	322.35
JUL	316.08	316.68	318.27	318.70	319.79	319.85	320.42	321.61
AUG	315.16	315.01	315.99	316.96	317.56	317.87	318.60	319.24
SEP	313.41	314.02	314.24	315.17	316.46	316.36	316.73	318.23
OCT	0.00	313.55	314.05	315.47	315.59	316.24	317.15	317.76
NOV	313.51	315.02	315.05	316.19	316.85	317.13	317.94	319.36
DEC	314.75	315.75	316.23	317.17	317.87	318.46	318.91	319.50
AVE	0.00	316.10	317.02	317.74	318.63	319.13	0.00	320.41

MONTH	YEAR							
	1966	1967	1968	1969	1970	1971	1972	1973
JAN	320.35	322.06	322.30	323.59	324.61	326.12	326.93	328.73
FEB	321.40	322.23	322.89	324.23	325.58	326.62	327.84	329.70
MAR	322.22	322.78	323.59	325.34	326.55	327.16	327.96	330.46
APR	323.45	324.10	324.65	326.33	327.81	327.94	329.93	331.70
MAY	323.80	324.63	325.30	327.03	327.82	329.15	330.25	332.66
JUN	323.50	323.79	325.15	326.24	327.53	328.79	329.24	332.22
JUL	322.16	322.34	323.88	325.39	326.29	327.53	328.13	331.02
AUG	320.09	320.73	321.80	323.16	324.66	325.65	326.42	329.39
SEP	318.26	319.00	319.99	321.87	323.12	323.60	324.97	327.58
OCT	317.66	318.99	319.86	321.31	323.09	323.78	325.29	327.27
NOV	319.47	320.41	320.88	322.34	324.01	325.13	326.56	328.30
DEC	320.70	321.68	322.36	323.74	325.10	326.26	327.73	328.81
AVE	321.09	321.89	322.72	324.21	325.51	326.48	327.60	329.82

MONTH	YEAR							
	1974	1975	1976	1977	1978	1979	1980	1981
JAN	329.44	330.45	331.62	332.80	334.65	335.88	337.82	338.79
FEB	330.89	330.98	332.45	333.22	335.06	336.43	338.19	340.06
MAR	331.62	331.63	333.36	334.54	336.32	337.61	339.89	340.93
APR	332.85	332.88	334.46	335.82	337.39	338.53	340.56	342.02
MAY	333.29	333.63	334.84	336.45	337.66	339.06	341.22	342.65
JUN	332.44	333.53	334.29	335.97	337.56	338.92	340.92	341.80
JUL	331.35	331.90	333.04	334.65	336.24	337.39	339.26	340.01
AUG	329.58	330.08	330.88	332.40	334.39	335.72	337.27	337.94
SEP	327.58	328.59	329.23	331.28	332.43	333.64	335.66	336.17
OCT	327.55	328.31	328.83	330.73	332.22	333.65	335.54	336.28
NOV	328.56	329.44	330.18	332.05	333.61	335.07	336.71	337.76
DEC	329.73	330.64	331.50	333.54	334.78	336.53	337.79	339.05
AVE	330.41	331.00	332.06	333.62	335.19	336.54	338.40	339.46

MONTH	YEAR			
	1982	1983	1984	1985
JAN	340.18	341.32	343.74	344.79
FEB	341.04	342.45	344.55	345.79
MAR	342.16	343.05	345.28	347.16
APR	343.01	344.91	347.00	348.06
MAY	343.64	345.77	347.37	348.63
JUN	342.91	345.30	346.74	347.89
JUL	341.72	343.98	345.36	346.24
AUG	339.52	342.41	343.19	344.45
SEP	337.75	339.89	340.97	342.83
OCT	337.68	340.03	341.20	342.54
NOV	339.14	341.19	342.76	343.95
DEC	340.37	342.87	343.96	345.40
AVE	340.76	342.76	344.34	345.64

STATION: MLD
 CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
 AVERAGES OF DATA ADJUSTED TO THE 15TH OF EACH MONTH AND SEASONALLY ADJUSTED :

MONTH	YEAR							
	1958	1959	1960	1961	1962	1963	1964	1965
JAN	0.00	315.70	316.64	317.04	318.24	318.99	319.70	319.85
FEB	0.00	315.88	316.58	317.23	318.19	318.72	0.00	320.24
MAR	314.82	315.59	316.56	317.33	318.56	318.90	0.00	319.98
APR	315.47	315.68	317.03	317.31	318.48	319.27	0.00	320.24
MAY	315.23	315.76	317.43	317.97	318.59	319.62	319.47	319.83
JUN	0.00	316.14	317.62	317.73	318.76	319.47	319.75	320.17
JUL	315.27	315.86	317.47	317.87	318.96	319.01	319.60	320.76
AUG	316.15	316.02	317.03	317.98	318.59	318.91	319.67	320.29
SEP	316.03	316.66	316.92	317.85	319.17	319.09	319.49	321.00
OCT	0.00	316.42	316.93	318.39	318.53	319.20	320.13	320.77
NOV	315.36	316.88	316.92	318.07	318.75	319.05	319.86	321.30
DEC	315.60	316.60	317.09	318.04	318.74	319.34	319.80	320.39
AVE	0.00	316.10	317.02	317.73	318.63	319.13	0.00	320.40

MONTH	YEAR							
	1966	1967	1968	1969	1970	1971	1972	1973
JAN	320.48	322.18	322.43	323.72	324.73	326.25	327.06	328.86
FEB	320.85	321.69	322.34	323.67	325.02	326.06	327.27	329.13
MAR	320.96	321.51	322.28	324.05	325.25	325.85	326.62	329.13
APR	321.18	321.81	322.33	324.01	325.48	325.59	327.53	329.30
MAY	321.03	321.83	322.48	324.19	324.96	326.27	327.34	329.74
JUN	321.30	321.57	322.93	323.99	325.26	326.50	326.96	329.90
JUL	321.30	321.48	323.03	324.51	325.40	326.64	327.26	330.12
AUG	321.15	321.80	322.90	324.24	325.76	326.76	327.56	330.51
SEP	321.06	321.82	322.83	324.73	326.00	326.50	327.90	330.52
OCT	320.69	322.04	322.93	324.41	326.21	326.92	328.45	330.46
NOV	321.43	322.39	322.87	324.35	326.03	327.16	328.61	330.36
DEC	321.60	322.58	323.27	324.66	326.03	327.19	328.66	329.75
AVE	321.09	321.89	322.72	324.21	325.51	326.47	327.60	329.82

MONTH	YEAR							
	1974	1975	1976	1977	1978	1979	1980	1981
JAN	329.58	330.58	331.76	332.93	334.78	336.02	337.96	338.93
FEB	330.32	330.39	331.87	332.63	334.47	335.83	337.59	339.46
MAR	330.28	330.28	331.97	333.17	334.94	336.22	338.47	339.52
APR	330.44	330.45	331.99	333.36	334.91	336.04	338.03	339.49
MAY	330.34	330.66	331.85	333.44	334.63	336.01	338.15	339.56
JUN	330.10	331.18	331.94	333.59	335.16	336.50	338.50	339.34
JUL	330.44	330.98	332.14	333.72	335.30	336.44	338.34	339.05
AUG	330.70	331.22	332.04	333.55	335.55	336.88	338.47	339.12
SEP	330.55	331.57	332.25	334.31	335.48	336.71	338.76	339.28
OCT	330.77	331.54	332.08	334.02	335.53	336.98	338.89	339.66
NOV	330.64	331.54	332.29	334.18	335.76	337.23	338.87	339.95
DEC	330.68	331.60	332.47	334.52	335.76	337.51	338.78	340.05
AVE	330.40	331.00	332.05	333.62	335.19	336.53	338.40	339.45

MONTH	YEAR			
	1982	1983	1984	1985
JAN	340.32	341.47	343.88	344.94
FEB	340.43	341.84	343.94	345.17
MAR	340.74	341.62	343.82	345.71
APR	340.46	342.35	344.40	345.46
MAY	340.52	342.63	344.21	345.45
JUN	340.44	342.81	344.25	345.37
JUL	340.75	343.01	344.41	345.26
AUG	340.71	343.60	344.43	345.66
SEP	340.88	343.04	344.16	346.03
OCT	341.08	343.45	344.64	346.00
NOV	341.34	343.40	344.99	346.19
DEC	341.38	343.88	344.98	346.43
AVE	340.75	342.76	344.34	345.64

STATION: MLO
 CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
 FITTED FUNCTION (EXPONENTIAL + SPLINE + HARMONICS) AT 15TH OF MONTH :
 (JANO REFERS TO VALUE AT BEGINNING OF YEAR)

MONTH	YEAR							
	1958	1959	1960	1961	1962	1963	1964	1965
JAN	0.00	315.57	316.63	317.08	318.18	318.81	319.22	319.84
FEB	0.00	316.24	317.35	317.80	318.91	319.51	319.92	320.57
MAR	316.39	316.98	318.15	318.57	319.68	320.27	320.70	321.35
APR	317.40	317.99	319.19	319.64	320.73	321.30	321.73	322.42
MAY	317.94	318.55	319.72	320.24	321.29	321.84	322.25	323.01
JUN	317.47	318.10	319.20	319.79	320.80	321.31	321.71	322.54
JUL	316.27	316.93	317.93	318.60	319.55	320.01	320.43	321.30
AUG	314.52	315.22	316.09	316.86	317.73	318.15	318.60	319.49
SEP	312.94	313.69	314.43	315.28	316.08	316.47	316.96	317.85
OCT	312.75	313.58	314.22	315.15	315.88	316.27	316.80	317.69
NOV	313.78	314.70	315.25	316.26	316.95	317.35	317.92	318.80
DEC	314.80	315.80	316.29	317.36	318.01	318.43	319.02	319.90
AVE	0.00	316.11	317.04	317.72	318.65	319.14	319.61	320.40
JANO	0.00	315.22	316.25	316.72	317.81	318.45	318.86	319.47

MONTH	YEAR							
	1966	1967	1968	1969	1970	1971	1972	1973
JAN	320.71	321.37	322.19	323.39	324.70	325.93	326.90	328.74
FEB	321.43	322.11	322.94	324.23	325.51	326.67	327.65	329.67
MAR	322.20	322.88	323.76	325.10	326.36	327.46	328.49	330.63
APR	323.26	323.94	324.86	326.26	327.52	328.57	329.62	331.90
MAY	323.82	324.50	325.43	326.90	328.16	329.18	330.21	332.62
JUN	323.29	323.97	324.92	326.42	327.70	328.69	329.71	332.19
JUL	321.98	322.67	323.63	325.15	326.45	327.40	328.44	330.92
AUG	320.10	320.81	321.78	323.27	324.59	325.51	326.62	329.00
SEP	318.42	319.15	320.13	321.59	322.92	323.82	325.03	327.25
OCT	318.24	319.01	320.02	321.43	322.77	323.66	325.02	327.03
NOV	319.39	320.18	321.23	322.62	323.94	324.86	326.37	328.16
DEC	320.53	321.34	322.45	323.80	325.09	326.04	327.70	329.27
AVE	321.11	321.83	322.78	324.18	325.48	326.48	327.65	329.78
JANO	320.35	320.99	321.81	322.96	324.29	325.55	326.51	328.27

MONTH	YEAR							
	1974	1975	1976	1977	1978	1979	1980	1981
JAN	330.08	330.42	331.57	332.61	334.43	335.74	337.52	338.94
FEB	330.81	331.16	332.36	333.50	335.29	336.57	338.43	339.77
MAR	331.60	331.98	333.22	334.43	336.19	337.45	339.41	340.64
APR	332.70	333.13	334.36	335.69	337.40	338.66	340.66	341.81
MAY	333.28	333.77	334.94	336.40	338.07	339.34	341.32	342.42
JUN	332.72	333.28	334.36	335.94	337.56	338.85	340.79	341.82
JUL	331.34	331.97	332.97	334.64	336.21	337.52	339.41	340.37
AUG	329.34	330.05	330.98	332.72	334.23	335.57	337.40	338.30
SEP	327.54	328.33	329.21	330.99	332.45	333.84	335.60	336.47
OCT	327.31	328.19	329.07	330.87	332.29	333.76	335.46	336.32
NOV	328.46	329.44	330.35	332.17	333.55	335.12	336.74	337.65
DEC	329.59	330.67	331.62	333.46	334.80	336.48	338.00	338.98
AVE	330.40	331.03	332.08	333.62	335.21	336.57	338.39	339.46
JANO	329.72	330.05	331.16	332.16	333.99	335.31	337.05	338.51

MONTH	YEAR			
	1982	1983	1984	1985
JAN	339.98	341.48	343.66	344.92
FEB	340.85	342.44	344.53	345.80
MAR	341.76	343.46	345.47	346.72
APR	342.99	344.83	346.70	347.97
MAY	343.65	345.63	347.34	348.64
JUN	343.10	345.20	346.76	348.07
JUL	341.69	343.88	345.31	346.63
AUG	339.65	341.90	343.23	344.54
SEP	337.83	340.12	341.38	342.68
OCT	337.70	340.00	341.25	342.53
NOV	339.05	341.35	342.59	343.89
DEC	340.42	342.68	343.92	345.25
AVE	340.72	342.75	344.35	345.64
JANO	339.52	340.99	343.22	344.46

STATION: MLO
 CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
 TREND (EXPONENTIAL + SPLINE) AT 15TH OF MONTH :
 (JANO REFERS TO VALUE AT BEGINNING OF YEAR)

MONTH	YEAR							
	1958	1959	1960	1961	1962	1963	1964	1965
JAN	0.00	315.69	316.75	317.20	318.30	318.93	319.35	319.96
FEB	0.00	315.73	316.84	317.27	318.39	318.98	319.39	320.03
MAR	315.21	315.78	316.92	317.36	318.46	319.03	319.43	320.10
APR	315.27	315.84	317.01	317.46	318.53	319.08	319.48	320.17
MAY	315.34	315.92	317.07	317.57	318.60	319.13	319.52	320.26
JUN	315.40	316.01	317.12	317.68	318.66	319.16	319.56	320.35
JUL	315.46	316.11	317.13	317.78	318.71	319.17	319.61	320.45
AUG	315.52	316.22	317.12	317.88	318.75	319.18	319.67	320.54
SEP	315.56	316.34	317.11	317.97	318.79	319.20	319.73	320.62
OCT	315.59	316.45	317.10	318.06	318.82	319.23	319.78	320.69
NOV	315.62	316.55	317.11	318.14	318.85	319.26	319.84	320.75
DEC	315.65	316.65	317.14	318.22	318.89	319.30	319.90	320.79
AVE	0.00	316.11	317.04	317.72	318.65	319.14	319.61	320.39
JANO	0.00	315.67	316.70	317.17	318.26	318.91	319.33	319.93

MONTH	YEAR							
	1966	1967	1968	1969	1970	1971	1972	1973
JAN	320.84	321.50	322.32	323.52	324.83	326.06	327.03	328.87
FEB	320.89	321.56	322.39	323.67	324.95	326.10	327.09	329.10
MAR	320.94	321.61	322.46	323.81	325.06	326.15	327.15	329.30
APR	320.99	321.65	322.53	323.94	325.18	326.21	327.22	329.51
MAY	321.04	321.70	322.61	324.06	325.30	326.30	327.31	329.70
JUN	321.08	321.75	322.70	324.17	325.43	326.40	327.43	329.87
JUL	321.12	321.81	322.79	324.27	325.56	326.51	327.57	330.01
AUG	321.16	321.88	322.88	324.36	325.69	326.61	327.75	330.12
SEP	321.21	321.97	322.98	324.45	325.80	326.72	327.96	330.19
OCT	321.27	322.06	323.09	324.53	325.89	326.81	328.18	330.22
NOV	321.35	322.16	323.22	324.62	325.97	326.90	328.41	330.22
DEC	321.43	322.24	323.36	324.72	326.02	326.97	328.64	330.22
AVE	321.11	321.82	322.78	324.18	325.47	326.48	327.65	329.78
JANO	320.82	321.46	322.28	323.44	324.78	326.04	327.00	328.76

MONTH	YEAR							
	1974	1975	1976	1977	1978	1979	1980	1981
JAN	330.22	330.56	331.71	332.74	334.57	335.87	337.66	339.08
FEB	330.23	330.58	331.78	332.91	334.70	335.97	337.83	339.16
MAR	330.26	330.63	331.84	333.06	334.81	336.06	337.98	339.23
APR	330.29	330.70	331.89	333.23	334.93	336.17	338.13	339.28
MAY	330.33	330.80	331.95	333.39	335.04	336.29	338.25	339.32
JUN	330.38	330.93	332.01	333.56	335.16	336.43	338.37	339.36
JUL	330.43	331.05	332.07	333.71	335.28	336.57	338.48	339.41
AUG	330.47	331.19	332.14	333.87	335.39	336.73	338.60	339.48
SEP	330.50	331.32	332.23	334.02	335.49	336.91	338.71	339.58
OCT	330.53	331.43	332.33	334.16	335.59	337.09	338.81	339.70
NOV	330.54	331.54	332.45	334.30	335.69	337.28	338.90	339.84
DEC	330.55	331.63	332.59	334.43	335.78	337.47	338.99	339.98
AVE	330.39	331.03	332.08	333.61	335.20	336.57	338.39	339.45
JANO	330.21	330.55	331.67	332.67	334.50	335.83	337.57	339.04

MONTH	YEAR			
	1982	1983	1984	1985
JAN	340.12	341.62	343.81	345.06
FEB	340.24	341.83	343.91	345.18
MAR	340.35	342.03	344.00	345.28
APR	340.45	342.26	344.10	345.37
MAY	340.54	342.49	344.18	345.46
JUN	340.63	342.71	344.27	345.55
JUL	340.73	342.91	344.37	345.64
AUG	340.84	343.10	344.46	345.75
SEP	340.96	343.27	344.57	345.88
OCT	341.10	343.42	344.69	346.00
NOV	341.26	343.57	344.81	346.14
DEC	341.43	343.69	344.94	346.27
AVE	340.72	342.74	344.34	345.63
JANO	340.05	341.52	343.75	345.00



SCRIPPS INSTITUTION OF OCEANOGRAPHY
ATMOSPHERIC CARBON DIOXIDE PROGRAM
ANALYSIS OF STATION DATA USING PROGRAM "STATION FIT"

STATION: CAPE KUMUKAHI, HAWAII

RUN NO. KUM-26

COORDINATES : 19.5N 154.8W

ELEVATION ABOVE SEA LEVEL : 3 METERS

BEGINNING DATE : 27-MAR-1979

FINAL DATE : 23-SEP-1985

TYPE OF DATA PROCESSED : FLASK DAILY AVERAGES

CALIBRATION SCALE : 1985

NUMBER OF HARMONICS : 4

COMPUTED SPLINE RMS SECOND DERIVATIVE : MONTHLY NODES : 29.96
DATA POINT NODES : 46.62

COMPUTED GAIN FACTOR FOR SEASONAL CYCLE
REFERENCED TO BASE YEAR = 1978 : NOT COMPUTED

COMPUTED SPLINE STIFFNESS PARAMETER (SIGMA) : 0.7089 PPM

DATE OF RUN : 14-FEB-1986

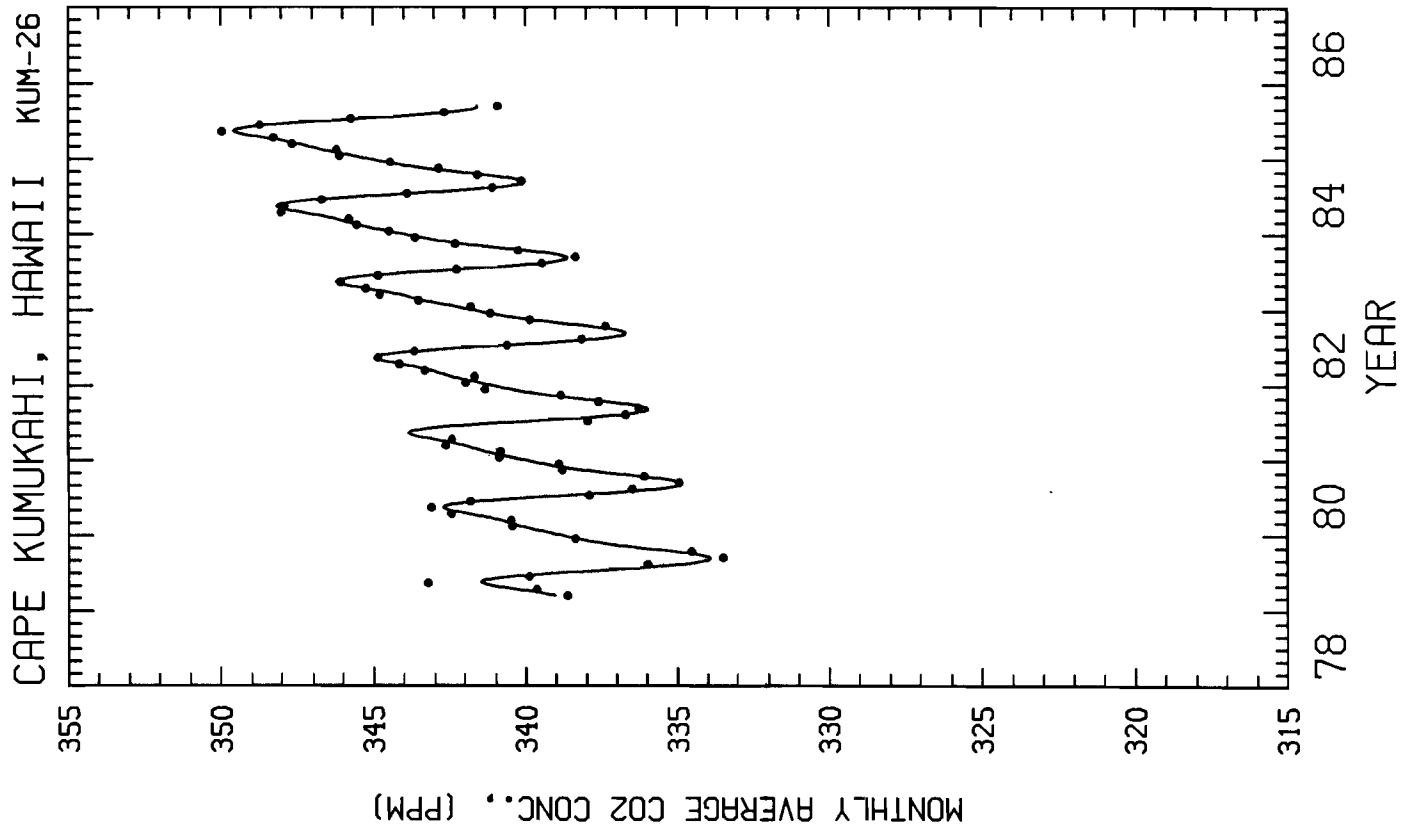
BASE YEAR MIDDLE YEAR
78 82.4822

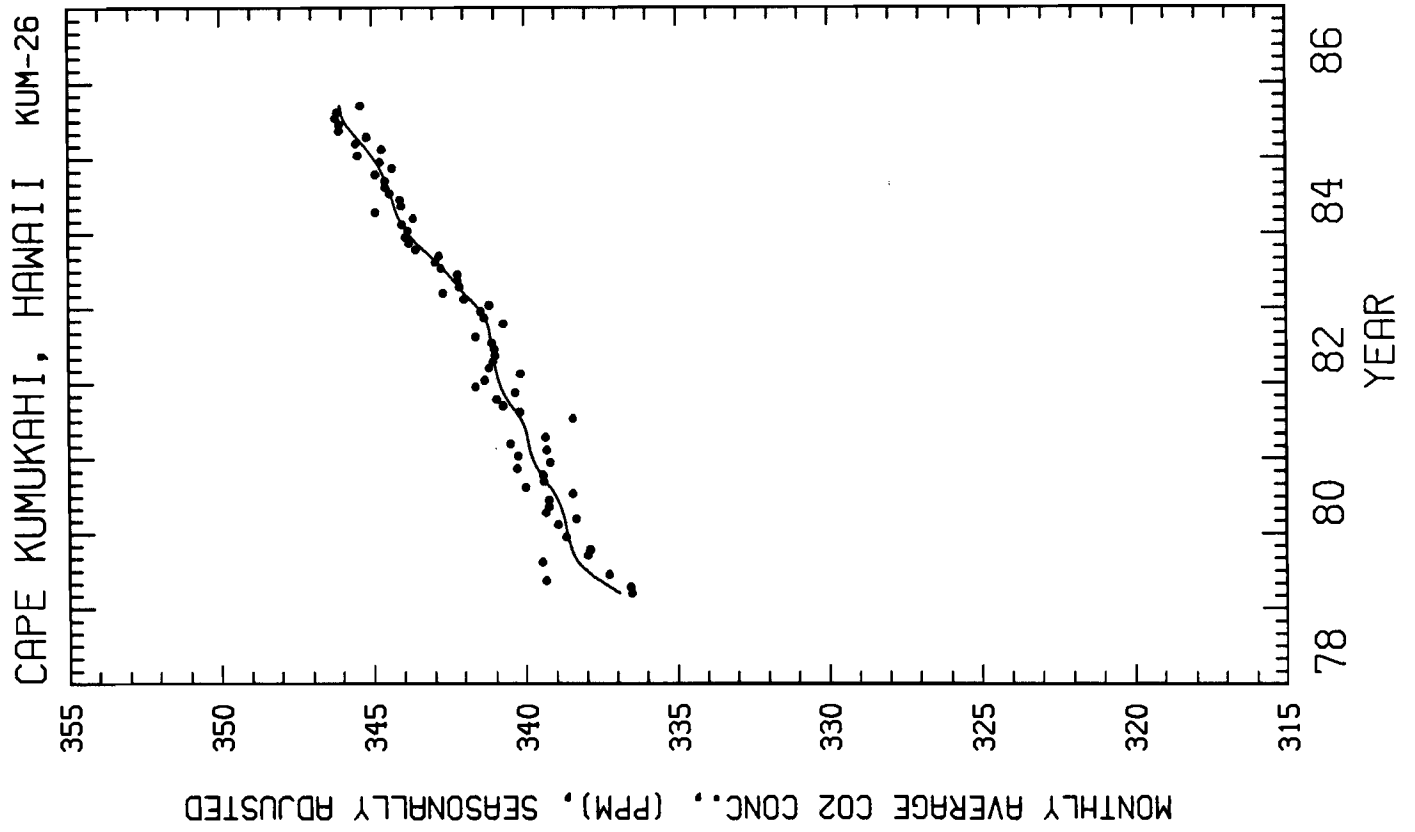
FIRST AND LAST 5 DATA POINTS ARE :

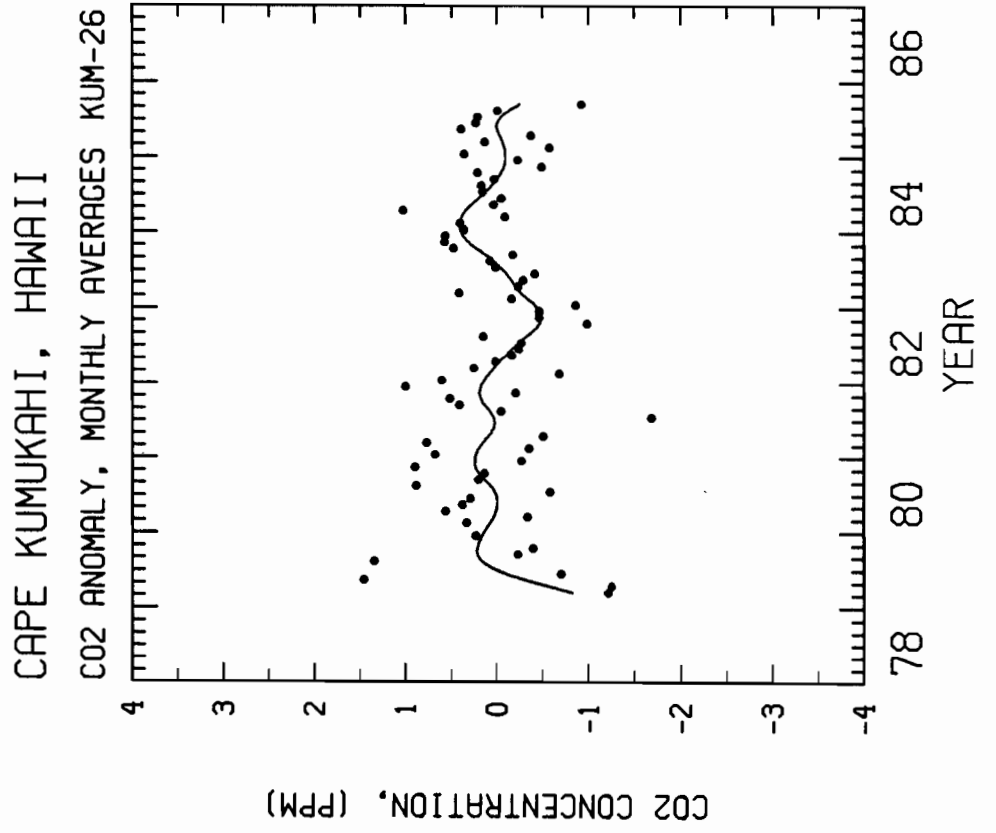
NO.	MEAS	SYMB	YEAR	CONC (PPM)
1	2	1	1.2356	339.07
2	2	1	1.2521	339.11
3	2	1	1.2904	339.60
4	2	1	1.4082	343.11
5	2	1	1.4849	338.96
221	2	1	7.6329	342.96
222	2	1	7.6521	343.51
223	2	1	7.6740	341.58
224	2	1	7.7096	340.68
225	2	1	7.7288	340.71

INPUT PARAMETERS :

STATION	NO. HARMONICS	GAIN	SOUTHERN HEM.	SQ2DI
KUM	4	NO	NO	30







1. FIT OF CUBIC + HARMONICS

FITTED COEFFICIENTS / ERROR :

CONST	T	T**2	T**3
0.33661E+03	0.87964E+00	0.18702E-01	0.39713E-02
0.82751E+00	0.63412E+00	0.14695E+00	0.10490E-01
SIN(2*PI*T)	COS(2*PI*T)	SIN(4*PI*T)	COS(4*PI*T)
0.34962E+01	-0.24209E+00	-0.11195E+01	0.66325E+00
0.71221E-01	0.75389E-01	0.75198E-01	0.71641E-01
SIN(6*PI*T)	COS(6*PI*T)	SIN(8*PI*T)	COS(8*PI*T)
0.19043E+00	-0.16025E+00	-0.32080E-01	-0.75135E-01
0.73302E-01	0.72793E-01	0.72836E-01	0.72570E-01

STANDARD ERROR OF FIT: DEL = 0.76232E+00

SEASONAL CYCLE FIT (PPM):

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0.64	1.51	2.10	3.06	3.86	2.62	-0.55	-3.52	-4.44	-3.33	-1.49	-0.29

2. FIT OF EXPONENTIAL + HARMONICS

FIT TO NON-LINEAR TERMS :

ITER	CHISQ	FL
1	0.23350E+01	0.10000E-03
2	0.58273E+00	0.10000E-04
3	0.58075E+00	0.10000E-04
4	0.57947E+00	0.10000E-04
8	0.57865E+00	0.10000E-05
9	0.57864E+00	0.10000E-06
10	0.57864E+00	0.10000E-07

FINAL VALUES LISTED ABOVE APPLY TO FIT

FIT IS TO C1 + C2*EXP(R*T) + HARMONICS
FITTED COEFFICIENTS / ERROR :

C1	C2	R	
0.32963E+03	0.70897E+01	0.11103E+00	
0.29137E+01	0.26295E+01	0.26282E-01	
SIN(2*PI*T)	COS(2*PI*T)	SIN(4*PI*T)	COS(4*PI*T)
0.34955E+01	-0.24245E+00	-0.11183E+01	0.66313E+00
0.70859E-01	0.75188E-01	0.74456E-01	0.71483E-01
SIN(6*PI*T)	COS(6*PI*T)	SIN(8*PI*T)	COS(8*PI*T)
0.19076E+00	-0.16072E+00	-0.31672E-01	-0.75456E-01
0.73054E-01	0.72535E-01	0.72537E-01	0.72357E-01

STANDARD ERROR OF FIT: DEL = 0.76069E+00

SEASONAL CYCLE FIT (PPM):

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0.64	1.51	2.10	3.06	3.86	2.62	-0.55	-3.52	-4.44	-3.33	-1.49	-0.29

3. FIT OF CHISQUARE-TYPE SPLINE + HARMONICS TO EXPONENTIALLY ADJUSTED DATA

FINAL VALUE FOR SIGMA IS 0.7089
FINAL COEFFICIENTS ARE BELOW

SPLINE-HARMONICS ITERATION NUMBER 1

CHISQ FOR HARMONIC FIT = 0.49565E+00

FIT IS TO CHISQUARED-TYPE-SPLINE + HARMONICS
FITTED COEFFICIENTS / ERROR :

SIN(2*PI*T)	COS(2*PI*T)	SIN(4*PI*T)	COS(4*PI*T)
0.35041E+01	-0.26411E+00	-0.11108E+01	0.66978E+00
0.65996E-01	0.69078E-01	0.69091E-01	0.66223E-01

SIN(6*PI*T)	COS(6*PI*T)	SIN(8*PI*T)	COS(8*PI*T)
0.17411E+00	-0.16672E+00	-0.19887E-01	-0.75041E-01
0.67845E-01	0.67526E-01	0.67470E-01	0.67291E-01

DEL	SQ2D	SQ2DI
0.70894E+00	0.46627E+02	0.29961E+02

CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
FITTED SEASONAL FUNCTION (HARMONICS) :

SEASONAL CYCLE (PPM) :

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0.62	1.51	2.11	3.08	3.86	2.62	-0.49	-3.49	-4.47	-3.35	-1.50	-0.31

CONCENTRATION OF ATMOSPHERIC CO2 (PPM)

AVERAGE OVER MONTHS OF AVERAGES AT 15TH OF MONTH, ADJUSTED FOR TREND :

SEASONAL CYCLE (PPM) :

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0.79	1.27	2.18	3.03	4.21	2.49	-0.85	-3.12	-4.65	-3.40	-1.47	-0.24

SPLINE FIT TO EXPONENTIALLY AND SEASONALLY ADJUSTED DATA (PPM) :

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
79	99.99	99.99	99.99	-0.55	-0.31	-0.09	0.07	0.17	0.21	0.22	0.20	0.17
80	0.13	0.08	0.04	0.01	0.00	0.00	0.03	0.08	0.14	0.20	0.24	0.25
81	0.23	0.20	0.16	0.10	0.05	0.03	0.04	0.08	0.14	0.18	0.19	0.18
82	0.14	0.09	0.04	-0.02	-0.09	-0.16	-0.24	-0.32	-0.40	-0.46	-0.48	-0.46
83	-0.41	-0.33	-0.26	-0.20	-0.15	-0.10	-0.04	0.04	0.13	0.23	0.32	0.37
84	0.40	0.40	0.39	0.34	0.28	0.20	0.13	0.06	0.01	-0.04	-0.08	-0.09
85	-0.09	-0.08	-0.06	-0.03	0.00	0.00	-0.04	-0.13	-0.25	99.99	99.99	99.99

GAIN FOR EACH YEAR :

YEAR	PTS	DEL	GAIN ERROR
1979	12	1.01	0.9790 0.0980
1980	19	0.73	0.9893 0.0609
1981	25	0.79	0.9694 0.0536
1982	41	0.58	0.9983 0.0355
1983	46	0.68	1.0143 0.0365
1984	45	0.63	1.0027 0.0336
1985	37	0.73	1.0187 0.0451

STATION: KUM
 CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
 AVERAGES OF DATA ADJUSTED TO THE 15TH OF EACH MONTH :

MONTH	YEAR						
	1979	1980	1981	1982	1983	1984	1985
JAN	0.00	0.00	340.86	341.96	341.79	344.47	346.09
FEB	0.00	340.44	340.82	341.66	343.50	345.53	346.20
MAR	338.62	340.47	342.62	343.30	344.78	345.79	347.65
APR	339.64	342.44	342.42	344.14	345.23	348.01	348.26
MAY	343.20	343.09	0.00	344.84	346.06	347.90	349.94
JUN	339.89	341.81	0.00	343.64	344.83	346.68	348.71
JUL	0.00	337.90	337.95	340.60	342.26	343.89	345.72
AUG	335.97	336.48	336.70	338.13	339.45	341.07	342.66
SEP	333.49	334.94	336.27	0.00	338.34	340.12	340.91
OCT	334.53	336.09	337.59	337.36	340.23	341.57	0.00
NOV	0.00	338.78	338.82	339.84	342.30	342.85	0.00
DEC	338.36	338.90	341.32	341.14	343.61	344.44	0.00
AVE	0.00	0.00	0.00	0.00	342.70	344.36	0.00

STATION: KUM
 CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
 AVERAGES OF DATA ADJUSTED TO THE 15TH OF EACH MONTH AND SEASONALLY ADJUSTED :

MONTH	YEAR						
	1979	1980	1981	1982	1983	1984	1985
JAN	0.00	0.00	340.24	341.33	341.17	343.85	345.47
FEB	0.00	338.93	339.31	340.16	341.99	344.03	344.69
MAR	336.52	338.35	340.51	341.19	342.68	343.66	345.54
APR	336.56	339.33	339.34	341.06	342.15	344.91	345.18
MAY	339.34	339.23	0.00	340.98	342.21	344.05	346.09
JUN	337.26	339.23	0.00	341.01	342.21	344.10	346.08
JUL	0.00	338.45	338.44	341.09	342.75	344.43	346.21
AUG	339.47	340.00	340.19	341.62	342.94	344.59	346.15
SEP	337.96	339.41	340.74	0.00	342.81	344.59	345.38
OCT	337.88	339.43	340.94	340.71	343.58	344.90	0.00
NOV	0.00	340.28	340.33	341.35	343.81	344.34	0.00
DEC	338.67	339.21	341.63	341.45	343.93	344.75	0.00
AVE	0.00	0.00	0.00	0.00	342.69	344.35	0.00

STATION: KUM
 CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
 FITTED FUNCTION (EXPONENTIAL + SPLINE + HARMONICS) AT 15TH OF MONTH :
 (JANO REFERS TO VALUE AT BEGINNING OF YEAR)

MONTH	YEAR						
	1979	1980	1981	1982	1983	1984	1985
JAN	0.00	339.26	340.42	341.49	342.24	344.51	345.65
FEB	0.00	340.19	341.36	342.43	343.33	345.53	346.69
MAR	339.02	340.85	342.01	343.08	344.11	346.26	347.44
APR	340.33	341.88	343.02	344.09	345.26	347.33	348.60
MAY	341.43	342.71	343.84	344.91	346.20	348.14	349.55
JUN	340.49	341.52	342.68	343.71	345.14	346.93	348.47
JUL	337.61	338.50	339.67	340.63	342.20	343.86	345.46
AUG	334.79	335.67	336.81	337.66	339.41	340.96	342.53
SEP	333.94	334.87	335.99	336.71	338.64	340.09	341.59
OCT	335.14	336.15	337.25	337.88	339.99	341.32	0.00
NOV	337.05	338.12	339.21	339.82	342.05	343.26	0.00
DEC	338.29	339.40	340.49	341.14	343.42	344.57	0.00
AVE	0.00	339.09	340.23	341.13	342.67	344.40	0.00
JANO	0.00	338.79	339.92	341.01	341.70	343.98	345.12

STATION: KUM
 CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
 TREND (EXPONENTIAL + SPLINE) AT 15TH OF MONTH :
 (JANO REFERS TO VALUE AT BEGINNING OF YEAR)

MONTH	YEAR						
	1979	1980	1981	1982	1983	1984	1985
JAN	0.00	338.64	339.80	340.87	341.62	343.89	345.03
FEB	0.00	338.68	339.86	340.93	341.82	344.03	345.18
MAR	336.91	338.72	339.90	340.97	342.00	344.13	345.34
APR	337.25	338.78	339.94	341.01	342.18	344.22	345.52
MAY	337.57	338.85	339.98	341.05	342.34	344.29	345.69
JUN	337.86	338.94	340.06	341.09	342.52	344.35	345.85
JUL	338.10	339.05	340.16	341.12	342.70	344.41	345.95
AUG	338.29	339.19	340.31	341.15	342.90	344.48	346.02
SEP	338.41	339.34	340.46	341.18	343.12	344.56	346.06
OCT	338.49	339.49	340.60	341.23	343.34	344.65	0.00
NOV	338.55	339.62	340.72	341.32	343.55	344.76	0.00
DEC	338.60	339.71	340.81	341.45	343.73	344.88	0.00
AVE	0.00	339.09	340.22	341.11	342.65	344.39	0.00
JANO	0.00	338.63	339.76	340.84	341.54	343.82	344.96



SCRIPPS INSTITUTION OF OCEANOGRAPHY
ATMOSPHERIC CARBON DIOXIDE PROGRAM
ANALYSIS OF STATION DATA USING PROGRAM "STATION FIT"

STATION: FANNING/CHRISTMAS IS. (COMBINED) RUN NO. LIN-36

COORDINATES : 3.9N 159.3W/ 2.0N 157.3W

ELEVATION ABOVE SEA LEVEL : 2/2 METERS

BEGINNING DATE : 21-JUL-1972
FINAL DATE : 30-NOV-1985

TYPE OF DATA PROCESSED : FLASK DAILY AVERAGES

CALIBRATION SCALE : 1985

NUMBER OF HARMONICS : 4

COMPUTED SPLINE RMS SECOND DERIVATIVE : MONTHLY NODES : 30.00
DATA POINT NODES : 39.39

COMPUTED GAIN FACTOR FOR SEASONAL CYCLE
REFERENCED TO BASE YEAR = 1971 : 1.2620 % PER YEAR

COMPUTED SPLINE STIFFNESS PARAMETER (SIGMA) : 0.4356 PPM

DATE OF RUN : 27-FEB-1986

BASE YEAR MIDDLE YEAR
71 79.2349

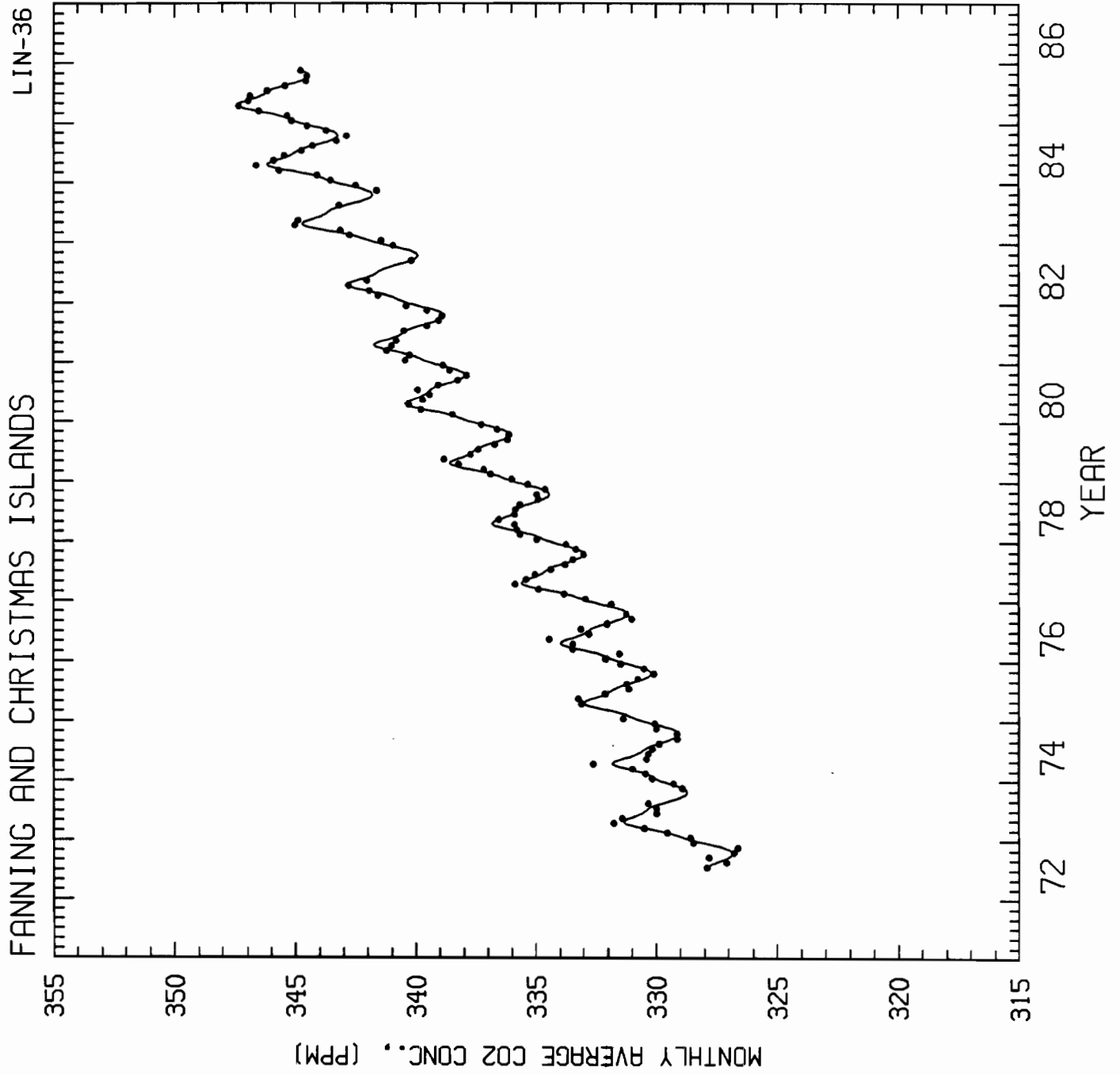
FIRST AND LAST 5 DATA POINTS ARE :

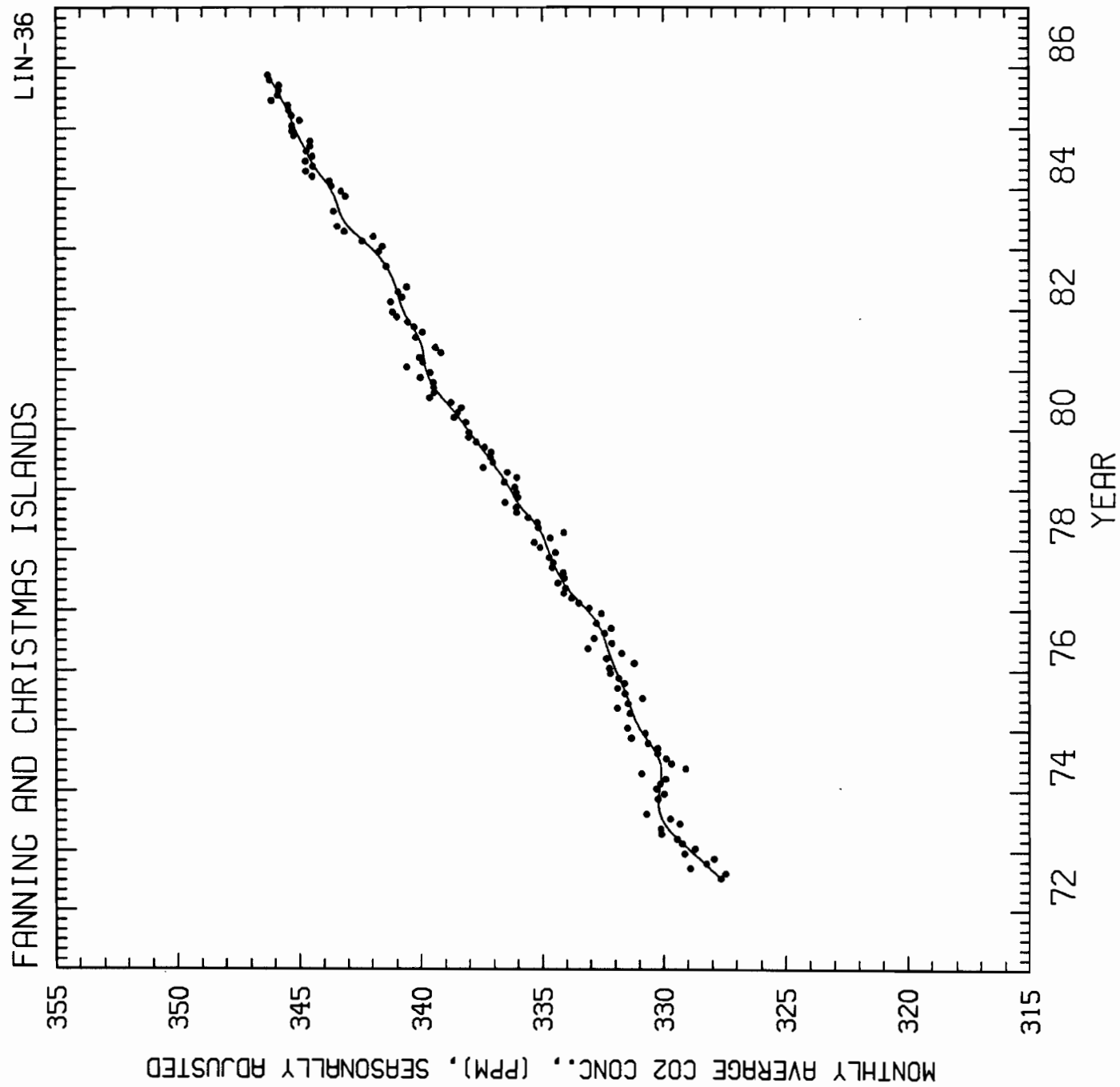
NO.	MEAS	SYMB	YEAR	CONC (PPM)
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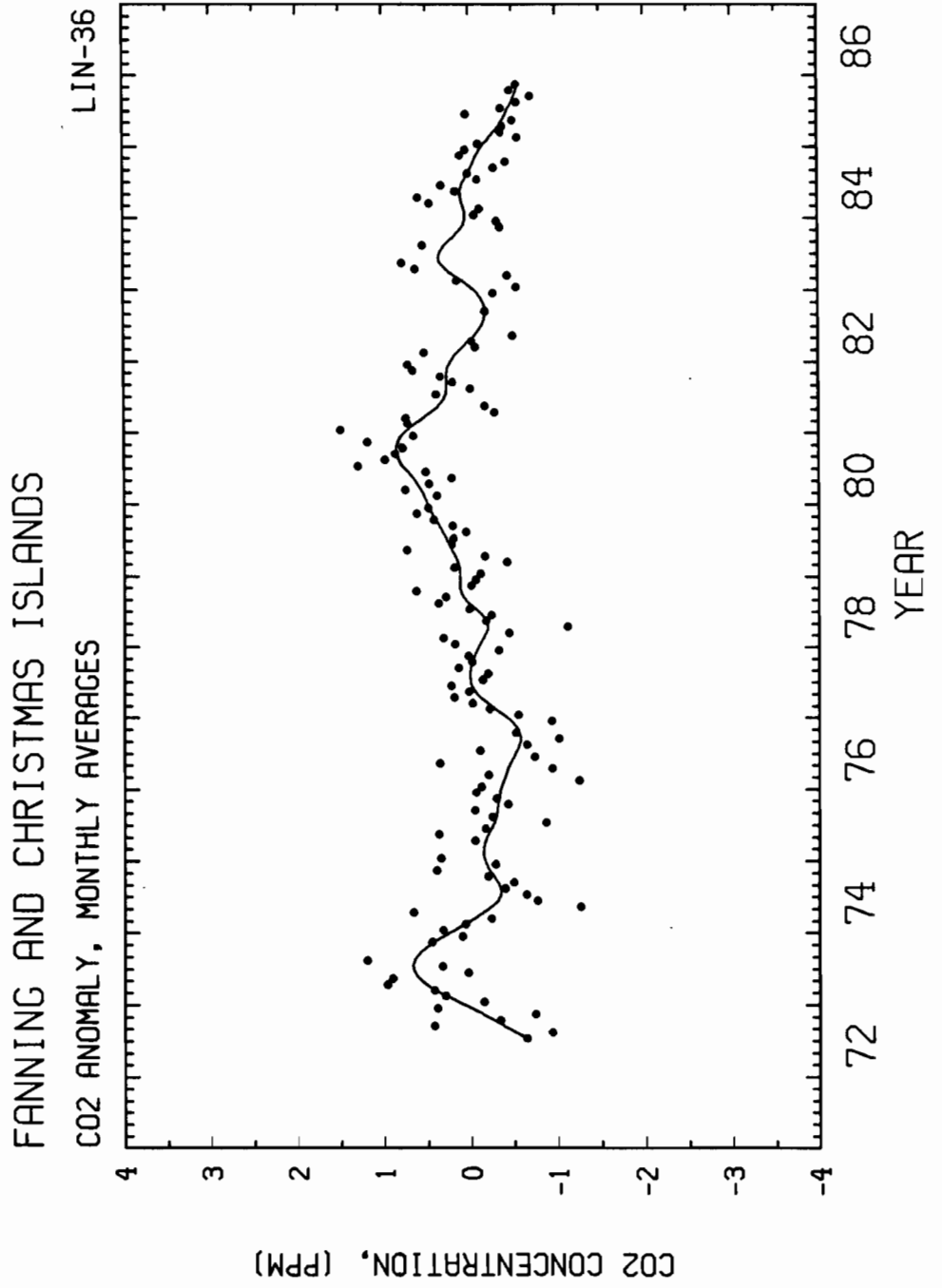
1	6	1	1.5546	327.81
2	4	1	1.5574	327.79
3	5	1	1.5601	327.94
4	3	1	1.5874	327.52
5	3	1	1.6612	326.62
309	2	1	14.7644	344.55
310	2	1	14.8384	344.63
311	3	1	14.8630	344.49
312	2	1	14.8795	345.12
313	2	1	14.9151	345.08

INPUT PARAMETERS :

STATION	NO.	HARMONICS	GAIN	SOUTHERN HEM.	SQ2DI
LIN		4	YES	NO	30







1. FIT OF CUBIC + HARMONICS

FITTED COEFFICIENTS / ERROR :

CONST	T	T**2	T**3
0.32762E+03	0.38473E+00	0.12183E+00	-0.42829E-02
0.25407E+00	0.11947E+00	0.16304E-01	0.65627E-03
SIN(2*PI*T)	COS(2*PI*T)	SIN(4*PI*T)	COS(4*PI*T)
0.14103E+01	-0.55017E+00	-0.42648E-01	-0.20708E-02
0.42204E-01	0.41657E-01	0.41188E-01	0.42831E-01
SIN(6*PI*T)	COS(6*PI*T)	SIN(8*PI*T)	COS(8*PI*T)
-0.15129E+00	0.11693E+00	0.58112E-01	0.33500E-01
0.41632E-01	0.42517E-01	0.41866E-01	0.42161E-01

STANDARD ERROR OF FIT: DEL = 0.52118E+00

SEASONAL CYCLE FIT (PPM):

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
-0.15	0.35	1.13	1.78	1.42	0.72	0.26	-0.46	-1.29	-1.60	-1.36	-0.74

2. FIT OF EXPONENTIAL + HARMONICS

FIT TO NON-LINEAR TERMS :

ITER	CHISQ	FL
1	0.91687E+00	0.10000E-03
2	0.44195E+00	0.10000E-03
3	0.41003E+00	0.10000E-03
4	0.39070E+00	0.10000E-03
18	0.33128E+00	0.10000E-03
19	0.33008E+00	0.10000E-03
20	0.32899E+00	0.10000E-03

FINAL VALUES LISTED ABOVE APPLY TO FIT

FIT IS TO C1 + C2*EXP(R*T) + (1 + A*T)*HARMONICS
FITTED COEFFICIENTS / ERROR :

A	C1	C2	R
0.11318E-01	0.29801E+03	0.28672E+02	0.35796E-01
0.99064E-02	0.36129E+01	0.34878E+01	0.33637E-02
SIN(2*PI*T)	COS(2*PI*T)	SIN(4*PI*T)	COS(4*PI*T)
0.12804E+01	-0.50615E+00	-0.28799E-01	-0.14759E-01
0.10764E+00	0.57259E-01	0.41258E-01	0.43029E-01
SIN(6*PI*T)	COS(6*PI*T)	SIN(8*PI*T)	COS(8*PI*T)
-0.11221E+00	0.11613E+00	0.46912E-01	0.28427E-01
0.42292E-01	0.43452E-01	0.42181E-01	0.42291E-01

STANDARD ERROR OF FIT: DEL = 0.57358E+00

SEASONAL CYCLE FIT (PPM):

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
-0.14	0.37	1.11	1.75	1.43	0.72	0.23	-0.45	-1.23	-1.58	-1.39	-0.77

3. FIT OF CHISQUARE-TYPE SPLINE + HARMONICS TO EXPONENTIALLY ADJUSTED DATA

FINAL VALUE FOR SIGMA IS 0.4356
FINAL COEFFICIENTS ARE BELOW

SPLINE-HARMONICS ITERATION NUMBER 1

FIT OF NON-LINEAR GAIN :

ITER	CHISQ	FL
1	0.18784E+00	0.10000E-03
2	0.18784E+00	0.10000E-04

FIT IS TO CHISQUARED-TYPE-SPLINE + (1 + A*T)*HARMONICS
FITTED COEFFICIENTS / ERROR :

A			
0.12620E-01			
0.77277E-02			
SIN(2*PI*T)	COS(2*PI*T)	SIN(4*PI*T)	COS(4*PI*T)
0.12496E+01	-0.50958E+00	-0.81483E-02	-0.19251E-01
0.81055E-01	0.43686E-01	0.30890E-01	0.32323E-01
SIN(6*PI*T)	COS(6*PI*T)	SIN(8*PI*T)	COS(8*PI*T)
-0.13560E+00	0.13276E+00	0.51450E-01	0.43733E-01
0.31971E-01	0.32868E-01	0.31665E-01	0.31701E-01
DEL	SQ2D	SQ2DI	
0.43557E+00	0.39390E+02	0.30000E+02	

CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
FITTED SEASONAL FUNCTION (HARMONICS) EVALUATED AT MIDDLE YEAR :

SEASONAL CYCLE (PPM):

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
-0.14	0.32	1.11	1.78	1.38	0.67	0.26	-0.40	-1.19	-1.59	-1.42	-0.75

CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
AVERAGE OVER MONTHS OF AVERAGES AT 15TH OF MONTH, ADJUSTED FOR TREND :

SEASONAL CYCLE (PPM):

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
-0.08	0.29	1.06	1.77	1.39	0.60	0.23	-0.40	-1.18	-1.57	-1.36	-0.79

SPLINE FIT TO EXPONENTIALLY AND SEASONALLY ADJUSTED DATA (PPM):

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
72	99.99	99.99	99.99	99.99	99.99	99.99	99.99	-0.51	-0.38	-0.26	-0.13	0.00
73	0.15	0.29	0.41	0.52	0.60	0.65	0.67	0.66	0.61	0.53	0.43	0.32
74	0.20	0.08	-0.03	-0.14	-0.24	-0.31	-0.34	-0.34	-0.31	-0.26	-0.21	-0.18
75	-0.15	-0.14	-0.15	-0.17	-0.19	-0.23	-0.27	-0.29	-0.30	-0.31	-0.32	-0.33
76	-0.35	-0.38	-0.40	-0.43	-0.46	-0.49	-0.53	-0.56	-0.57	-0.56	-0.52	-0.46
77	-0.38	-0.28	-0.19	-0.11	-0.05	-0.01	0.01	0.01	0.00	-0.01	-0.04	-0.07
78	-0.10	-0.14	-0.18	-0.20	-0.18	-0.13	-0.05	0.02	0.08	0.11	0.12	0.12
79	0.12	0.13	0.15	0.18	0.22	0.25	0.29	0.32	0.36	0.40	0.44	0.47

80	0.50	0.53	0.57	0.61	0.66	0.72	0.78	0.82	0.85	0.86	0.84	0.80
81	0.73	0.64	0.55	0.45	0.37	0.32	0.29	0.27	0.27	0.27	0.27	0.24
82	0.21	0.15	0.09	0.02	-0.05	-0.11	-0.14	-0.17	-0.18	-0.16	-0.13	-0.08
83	-0.01	0.09	0.18	0.27	0.34	0.36	0.34	0.29	0.22	0.15	0.09	0.06
84	0.05	0.06	0.08	0.10	0.10	0.09	0.06	0.02	-0.02	-0.05	-0.08	-0.12
85	-0.17	-0.23	-0.28	-0.34	-0.38	-0.42	-0.45	-0.49	-0.52	-0.55	-0.57	99.99

GAIN FOR EACH YEAR :

YEAR	PTS	DEL	GAIN ERROR
1972	12	0.52	0.9554 0.1420
1973	17	0.37	1.0186 0.0905
1974	17	0.49	0.9412 0.1088
1975	16	0.45	0.9678 0.1031
1976	20	0.55	1.0639 0.1108
1977	36	0.46	1.0204 0.0751
1978	35	0.50	0.8400 0.0811
1979	32	0.37	0.9859 0.0594
1980	17	0.35	0.9071 0.0831
1981	22	0.41	0.9015 0.0845
1982	13	0.30	1.0095 0.0719
1983	15	0.47	1.3023 0.1082
1984	29	0.29	1.1649 0.0590
1985	32	0.35	1.0386 0.0627

STATION: LIN
 CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
 AVERAGES OF DATA ADJUSTED TO THE 15TH OF EACH MONTH :

MONTH	YEAR							
	1972	1973	1974	1975	1976	1977	1978	1979
JAN	0.00	328.58	330.17	331.36	332.10	332.92	334.95	335.99
FEB	0.00	329.54	330.44	0.00	331.51	333.81	335.65	336.87
MAR	0.00	330.49	330.98	0.00	333.45	334.88	335.77	337.16
APR	0.00	331.75	332.60	333.09	333.45	335.85	335.88	338.21
MAY	0.00	331.41	330.40	333.22	334.44	335.39	336.53	338.81
JUN	0.00	329.98	330.33	332.12	332.78	335.02	335.88	337.71
JUL	327.90	329.99	330.16	331.13	333.12	334.37	335.84	337.39
AUG	327.09	330.33	329.88	331.22	332.04	333.76	335.66	336.70
SEP	327.81	0.00	329.13	330.76	331.00	333.43	334.90	336.17
OCT	326.77	0.00	329.15	330.09	331.22	332.99	334.95	336.11
NOV	326.62	328.91	329.99	330.49	0.00	333.32	334.60	336.60
DEC	328.45	329.28	330.05	331.47	331.84	333.73	335.33	337.25
AVE	0.00	0.00	330.27	0.00	0.00	334.12	335.49	337.08

MONTH	YEAR					
	1980	1981	1982	1983	1984	1985
JAN	0.00	340.43	0.00	341.44	343.53	345.15
FEB	338.46	340.25	341.57	342.75	344.10	345.33
MAR	339.77	341.20	341.92	343.12	345.67	346.51
APR	340.27	340.99	342.78	345.01	346.62	347.34
MAY	339.71	340.81	342.02	344.88	345.89	346.94
JUN	339.42	0.00	0.00	0.00	345.46	346.87
JUL	339.91	340.48	0.00	0.00	344.74	346.17
AUG	339.05	339.53	0.00	343.18	344.29	345.42
SEP	338.25	339.05	340.19	0.00	343.29	344.56
OCT	337.88	338.91	0.00	0.00	342.87	344.51
NOV	338.58	339.53	0.00	341.62	343.72	344.77
DEC	338.85	340.39	340.94	342.49	344.51	0.00
AVE	0.00	0.00	0.00	0.00	344.56	0.00

STATION: LIN
 CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
 AVERAGES OF DATA ADJUSTED TO THE 15TH OF EACH MONTH AND SEASONALLY ADJUSTED :

MONTH	YEAR							
	1972	1973	1974	1975	1976	1977	1978	1979
JAN	0.00	328.71	330.30	331.49	332.23	333.06	335.09	336.13
FEB	0.00	329.25	330.14	0.00	331.21	333.50	335.33	336.55
MAR	0.00	329.45	329.93	0.00	332.35	333.79	334.68	336.05
APR	0.00	330.10	330.92	331.39	331.72	334.11	334.12	336.43
MAY	0.00	330.12	329.10	331.90	333.12	334.05	335.16	337.43
JUN	0.00	329.35	329.69	331.47	332.13	334.36	335.21	337.03
JUL	327.66	329.74	329.91	330.87	332.87	334.11	335.58	337.13
AUG	327.47	330.70	330.26	331.60	332.43	334.15	336.05	337.10
SEP	328.91	0.00	330.26	331.90	332.17	334.60	336.08	337.37
OCT	328.24	0.00	330.65	331.62	332.77	334.56	336.53	337.71
NOV	327.93	330.24	331.34	331.85	0.00	334.71	336.01	338.03
DEC	329.15	329.98	330.76	332.19	332.57	334.47	336.08	338.01
AVE	0.00	0.00	330.27	0.00	0.00	334.12	335.49	337.08

MONTH	YEAR					
	1980	1981	1982	1983	1984	1985
JAN	0.00	340.57	0.00	341.59	343.68	345.30
FEB	338.14	339.92	341.24	342.42	343.76	344.99
MAR	338.62	340.06	340.77	341.96	344.47	345.32
APR	338.47	339.17	340.94	343.15	344.73	345.44
MAY	338.33	339.40	340.59	343.43	344.44	345.46
JUN	338.75	0.00	0.00	0.00	344.75	346.15
JUL	339.65	340.21	0.00	0.00	344.47	345.88
AUG	339.46	339.94	0.00	343.60	344.72	345.85
SEP	339.46	340.27	341.43	0.00	344.56	345.84
OCT	339.49	340.54	0.00	0.00	344.56	346.22
NOV	340.02	340.99	0.00	343.11	345.23	346.30
DEC	339.62	341.17	341.72	343.28	345.30	0.00
AVE	0.00	0.00	0.00	0.00	344.56	0.00

STATION: LIN
 CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
 FITTED FUNCTION (EXPONENTIAL + SPLINE + HARMONICS) AT 15TH OF MONTH :
 (JANO REFERS TO VALUE AT BEGINNING OF YEAR)

MONTH	YEAR							
	1972	1973	1974	1975	1976	1977	1978	1979
JAN	0.00	328.87	330.04	330.86	331.86	333.09	334.66	336.23
FEB	0.00	329.53	330.45	331.41	332.38	333.74	335.18	336.81
MAR	0.00	330.48	331.18	332.25	333.25	334.70	336.04	337.72
APR	0.00	331.31	331.80	332.97	333.95	335.55	336.79	338.54
MAY	0.00	331.10	331.42	332.66	333.62	335.32	336.52	338.29
JUN	0.00	330.59	330.78	332.05	333.02	334.78	335.99	337.74
JUL	327.91	330.32	330.46	331.72	332.69	334.51	335.77	337.48
AUG	327.51	329.79	329.94	331.17	332.12	333.97	335.31	336.97
SEP	327.00	329.09	329.31	330.50	331.45	333.29	334.69	336.33
OCT	326.85	328.73	329.07	330.20	331.18	332.99	334.43	336.08
NOV	327.23	328.88	329.38	330.46	331.49	333.24	334.73	336.41
DEC	328.07	329.49	330.15	331.19	332.30	333.98	335.50	337.23
AVE	0.00	329.85	330.33	331.45	332.44	334.10	335.47	337.15
JANO	0.00	328.52	329.82	330.56	331.58	332.75	334.37	335.92

MONTH	YEAR					
	1980	1981	1982	1983	1984	1985
JAN	338.00	339.66	340.64	341.97	343.64	345.08
FEB	338.61	340.17	341.19	342.68	344.27	345.66
MAR	339.59	341.01	342.06	343.73	345.29	346.58
APR	340.40	341.72	342.81	344.66	346.13	347.39
MAY	340.15	341.35	342.46	344.43	345.83	347.06
JUN	339.62	340.70	341.81	343.85	345.21	346.41
JUL	339.39	340.37	341.47	343.53	344.89	346.08
AUG	338.88	339.81	340.89	342.93	344.29	345.49
SEP	338.23	339.12	340.19	342.16	343.55	344.75
OCT	337.95	338.83	339.92	341.80	343.24	344.44
NOV	338.23	339.13	340.26	342.06	343.53	344.75
DEC	338.99	339.92	341.13	342.87	344.34	0.00
AVE	339.00	340.15	341.24	343.06	344.52	0.00
JANO	337.67	339.39	340.34	341.61	343.31	344.77

STATION: LIN
 CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
 TREND (EXPONENTIAL + SPLINE) AT 15TH OF MONTH :
 (JANO REFERS TO VALUE AT BEGINNING OF YEAR)

MONTH	YEAR							
	1972	1973	1974	1975	1976	1977	1978	1979
JAN	0.00	329.00	330.17	330.99	332.00	333.23	334.79	336.37
FEB	0.00	329.24	330.15	331.10	332.08	333.43	334.87	336.49
MAR	0.00	329.44	330.13	331.19	332.15	333.61	334.94	336.61
APR	0.00	329.65	330.12	331.27	332.23	333.81	335.03	336.76
MAY	0.00	329.82	330.12	331.34	332.30	333.97	335.15	336.91
JUN	0.00	329.96	330.15	331.40	332.37	334.12	335.32	337.07
JUL	327.67	330.07	330.21	331.47	332.44	334.25	335.51	337.21
AUG	327.89	330.16	330.31	331.55	332.52	334.36	335.70	337.37
SEP	328.11	330.20	330.44	331.64	332.61	334.46	335.87	337.52
OCT	328.32	330.22	330.58	331.73	332.72	334.55	336.01	337.68
NOV	328.54	330.21	330.73	331.82	332.87	334.64	336.14	337.84
DEC	328.76	330.20	330.87	331.91	333.03	334.72	336.25	337.99
AVE	0.00	329.85	330.33	331.45	332.44	334.10	335.46	337.15
JANO	0.00	328.88	330.18	330.93	331.96	333.13	334.76	336.31

MONTH	YEAR					
	1980	1981	1982	1983	1984	1985
JAN	338.14	339.81	340.78	342.12	343.79	345.23
FEB	338.29	339.84	340.86	342.35	343.94	345.32
MAR	338.43	339.87	340.91	342.57	344.09	345.39
APR	338.60	339.90	340.97	342.80	344.25	345.48
MAY	338.77	339.94	341.03	342.99	344.38	345.58
JUN	338.95	340.01	341.11	343.15	344.51	345.69
JUL	339.13	340.10	341.20	343.26	344.61	345.80
AUG	339.30	340.21	341.30	343.34	344.72	345.91
SEP	339.45	340.34	341.43	343.41	344.82	346.03
OCT	339.57	340.47	341.57	343.47	344.93	346.14
NOV	339.67	340.59	341.73	343.55	345.04	346.27
DEC	339.75	340.69	341.91	343.66	345.14	0.00
AVE	339.00	340.15	341.23	343.05	344.52	0.00
JANO	338.07	339.78	340.74	342.02	343.72	345.19

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ATMOSPHERIC CARBON DIOXIDE PROGRAM
ANALYSIS OF STATION DATA USING PROGRAM "STATION FIT"

STATION: CAPE MATATULA, SAMOA

RUN NO. SAM-29

COORDINATES : 14.2S 170.6W

ELEVATION ABOVE SEA LEVEL : 30 METERS

BEGINNING DATE : 4-SEP-1981

FINAL DATE : 12-SEP-1985

TYPE OF DATA PROCESSED : FLASK DAILY AVERAGES

CALIBRATION SCALE : 1985

NUMBER OF HARMONICS : 4

COMPUTED SPLINE RMS SECOND DERIVATIVE : MONTHLY NODES : 29.97
DATA POINT NODES : 53.75

COMPUTED GAIN FACTOR FOR SEASONAL CYCLE
REFERENCED TO BASE YEAR = 1980 : NOT COMPUTED

COMPUTED SPLINE STIFFNESS PARAMETER (SIGMA) : 0.6317 PPM

DATE OF RUN : 14-FEB-1986

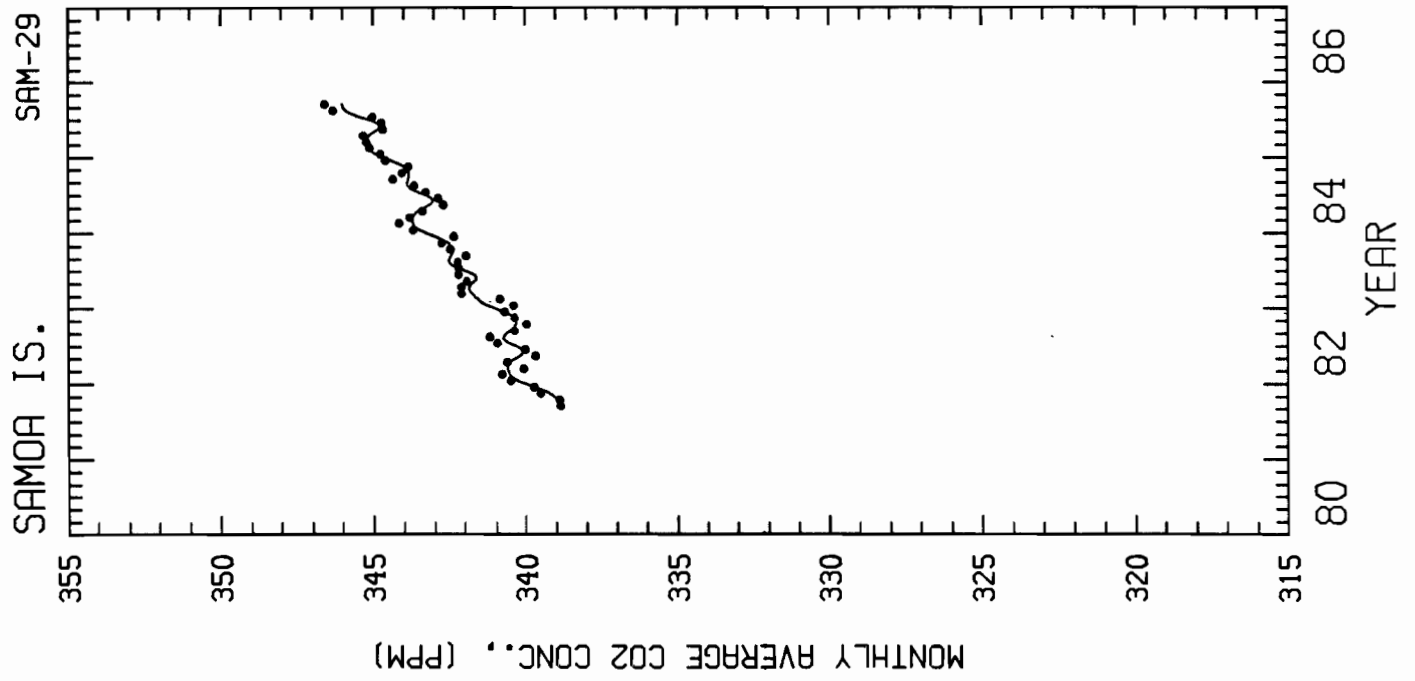
BASE YEAR MIDDLE YEAR
80 83.6877

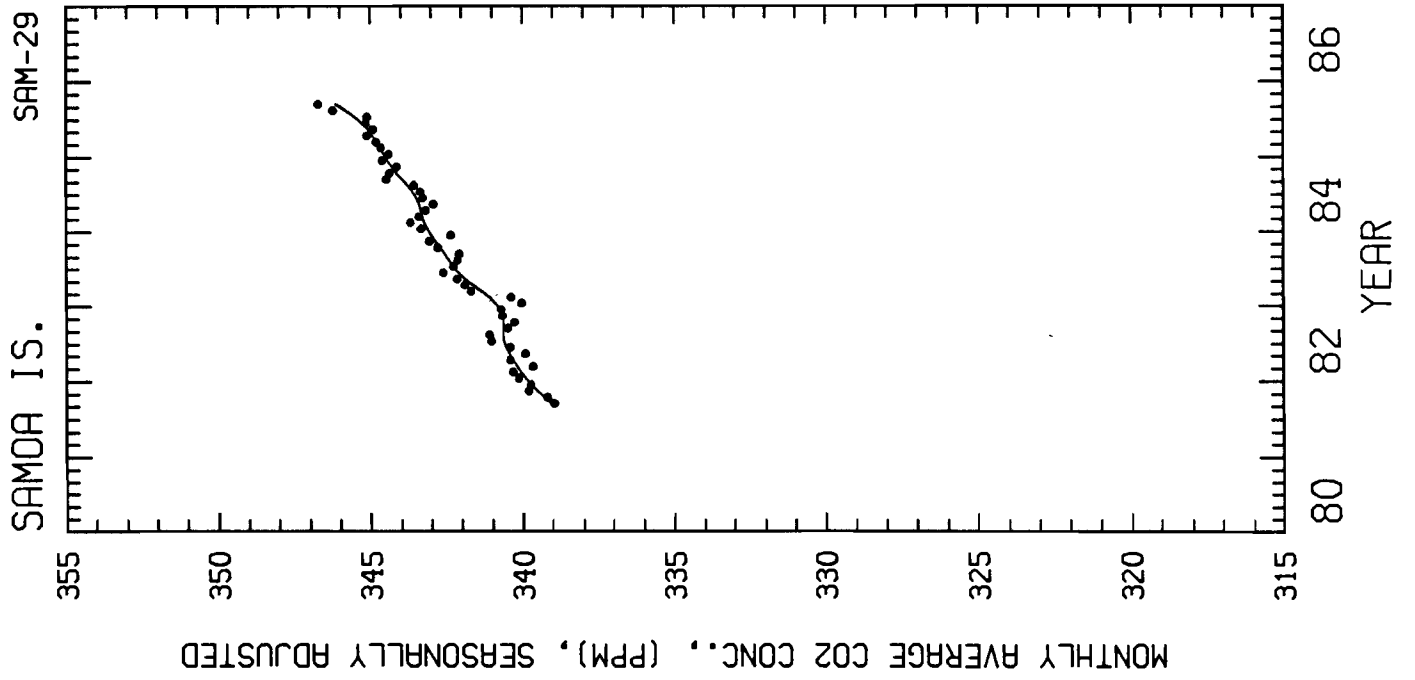
FIRST AND LAST 5 DATA POINTS ARE :

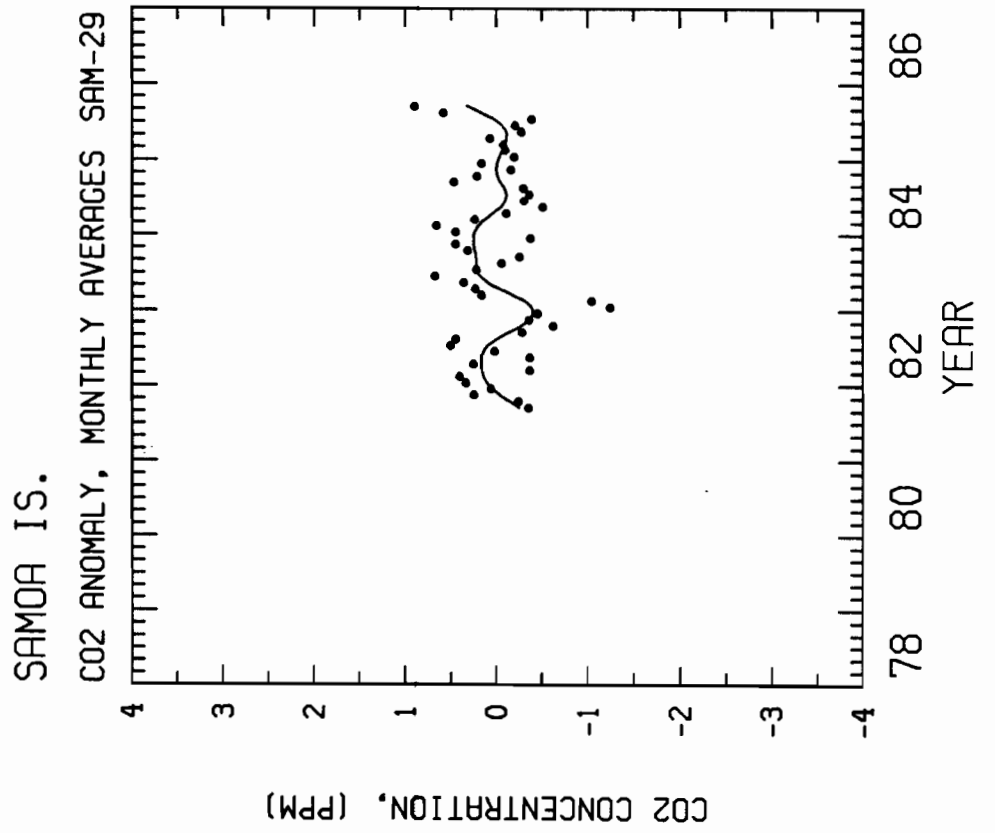
NO.	MEAS	SYMB	YEAR	CONC (PPM)
1	3	1	1.6767	338.97
2	3	1	1.7151	338.72
3	3	1	1.7370	338.86
4	2	1	1.7534	338.90
5	3	1	1.7753	338.59
153	2	1	5.5671	344.95
154	2	1	5.5863	345.07
155	2	1	5.6219	347.42
156	2	1	5.6795	347.06
157	2	1	5.6986	346.09

INPUT PARAMETERS :

STATION	NO. HARMONICS	GAIN	SOUTHERN HEM.	SQ2DI
SAM	4	NO	NO	30







1. FIT OF CUBIC + HARMONICS

FITTED COEFFICIENTS / ERROR :

CONST	T	T**2	T**3
0.33707E+03	0.11772E+01	0.79459E-01	-0.33455E-02
0.19567E+01	0.17708E+01	0.50386E+00	0.45484E-01
SIN(2*PI*T)	COS(2*PI*T)	SIN(4*PI*T)	COS(4*PI*T)
0.24106E+00	0.12189E+00	0.29969E+00	-0.12603E-01
0.79450E-01	0.80187E-01	0.79012E-01	0.77836E-01
SIN(6*PI*T)	COS(6*PI*T)	SIN(8*PI*T)	COS(8*PI*T)
-0.64508E-01	0.79779E-01	0.47659E-01	-0.28867E-03
0.78325E-01	0.77827E-01	0.77844E-01	0.77641E-01

STANDARD ERROR OF FIT: DEL = 0.68358E+00

SEASONAL CYCLE FIT (PPM):

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0.37	0.45	0.38	0.22	-0.18	-0.37	-0.03	0.15	-0.13	-0.40	-0.40	-0.06

2. FIT OF EXPONENTIAL + HARMONICS

FIT TO NON-LINEAR TERMS :

ITER	CHISQ	FL
1	0.23457E+01	0.10000E-03
2	0.47674E+00	0.10000E-04
3	0.46673E+00	0.10000E-04
4	0.46588E+00	0.10000E-04
18	0.46450E+00	0.10000E-04
19	0.46447E+00	0.10000E-04
20	0.46445E+00	0.10000E-04

FINAL VALUES LISTED ABOVE APPLY TO FIT

FIT IS TO C1 + C2*EXP(R*T) + HARMONICS

FITTED COEFFICIENTS / ERROR :

C1	C2	R	
0.31949E+03	0.17578E+02	0.70746E-01	
0.17928E+02	0.17441E+02	0.56392E-01	
SIN(2*PI*T)	COS(2*PI*T)	SIN(4*PI*T)	COS(4*PI*T)
0.24231E+00	0.12328E+00	0.29991E+00	-0.11081E-01
0.78721E-01	0.77585E-01	0.78644E-01	0.77325E-01
SIN(6*PI*T)	COS(6*PI*T)	SIN(8*PI*T)	COS(8*PI*T)
-0.63983E-01	0.80323E-01	0.47193E-01	0.26287E-03
0.77578E-01	0.77545E-01	0.77583E-01	0.77190E-01

STANDARD ERROR OF FIT: DEL = 0.68150E+00

SEASONAL CYCLE FIT (PPM):

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0.37	0.46	0.38	0.22	-0.18	-0.36	-0.03	0.15	-0.13	-0.40	-0.40	-0.05

3. FIT OF CHISQUARE-TYPE SPLINE + HARMONICS TO EXPONENTIALLY ADJUSTED DATA

FINAL VALUE FOR SIGMA IS 0.6317
FINAL COEFFICIENTS ARE BELOW

SPLINE-HARMONICS ITERATION NUMBER 1

CHISQ FOR HARMONIC FIT = 0.39100E+00

FIT IS TO CHISQUARED-TYPE-SPLINE + HARMONICS
FITTED COEFFICIENTS / ERROR :

SIN(2*PI*T)	COS(2*PI*T)	SIN(4*PI*T)	COS(4*PI*T)
0.21736E+00	0.17301E+00	0.27424E+00	-0.37690E-01
0.71750E-01	0.71241E-01	0.71963E-01	0.71244E-01

SIN(6*PI*T)	COS(6*PI*T)	SIN(8*PI*T)	COS(8*PI*T)
-0.67477E-01	0.55820E-01	0.42527E-01	0.41253E-02
0.71780E-01	0.71808E-01	0.71884E-01	0.71507E-01

DEL	SQ2D	SQ2DI
0.63169E+00	0.53750E+02	0.29973E+02

CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
FITTED SEASONAL FUNCTION (HARMONICS) :

SEASONAL CYCLE (PPM) :

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0.36	0.46	0.40	0.20	-0.23	-0.41	-0.09	0.08	-0.12	-0.31	-0.30	-0.02

CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
AVERAGE OVER MONTHS OF AVERAGES AT 15TH OF MONTH, ADJUSTED FOR TREND :

SEASONAL CYCLE (PPM) :

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0.21	0.45	0.39	0.30	-0.46	-0.40	-0.15	0.18	-0.05	-0.35	-0.22	-0.14

SPLINE FIT TO EXPONENTIALLY AND SEASONALLY ADJUSTED DATA (PPM) :

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
81	99.99	99.99	99.99	99.99	99.99	99.99	99.99	99.99	-0.25	-0.14	-0.04	0.05
82	0.11	0.14	0.16	0.16	0.16	0.15	0.09	0.00	-0.14	-0.26	-0.35	-0.40
83	-0.38	-0.30	-0.18	-0.03	0.10	0.18	0.22	0.22	0.23	0.24	0.25	0.25
84	0.24	0.20	0.13	0.04	-0.04	-0.09	-0.11	-0.08	-0.04	-0.01	0.00	-0.01
85	-0.03	-0.06	-0.09	-0.11	-0.11	-0.06	0.03	0.17	99.99	99.99	99.99	99.99

GAIN FOR EACH YEAR :

YEAR	PTS	DEL	GAIN ERROR
1981	15	0.30	1.0384 0.3194
1982	40	0.56	1.1556 0.3237
1983	34	0.63	0.1655 0.3904
1984	39	0.58	1.4385 0.3353
1985	29	0.76	1.1275 0.4465

STATION: SAM
CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
AVERAGES OF DATA ADJUSTED TO THE 15TH OF EACH MONTH :

MONTH	YEAR				
	1981	1982	1983	1984	1985
JAN	0.00	340.49	340.40	343.69	344.76
FEB	0.00	340.78	340.84	344.14	345.11
MAR	0.00	340.07	342.10	343.80	345.22
APR	0.00	340.61	342.10	343.39	345.32
MAY	0.00	339.68	341.93	342.69	344.69
JUN	0.00	340.01	342.20	342.87	344.73
JUL	0.00	340.93	342.19	343.27	345.02
AUG	0.00	341.18	342.23	343.66	346.32
SEP	338.85	340.37	341.96	344.35	346.59
OCT	338.88	339.97	342.47	344.06	0.00
NOV	339.51	340.37	342.75	343.84	0.00
DEC	339.72	340.69	342.36	344.60	0.00
AVE	0.00	340.43	341.96	343.70	0.00

STATION: SAM
CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
AVERAGES OF DATA ADJUSTED TO THE 15TH OF EACH MONTH AND SEASONALLY ADJUSTED :

MONTH	YEAR				
	1981	1982	1983	1984	1985
JAN	0.00	340.13	340.04	343.33	344.40
FEB	0.00	340.32	340.38	343.68	344.66
MAR	0.00	339.67	341.70	343.40	344.82
APR	0.00	340.41	341.90	343.19	345.11
MAY	0.00	339.91	342.16	342.93	344.92
JUN	0.00	340.42	342.61	343.28	345.14
JUL	0.00	341.03	342.28	343.36	345.11
AUG	0.00	341.09	342.14	343.57	346.23
SEP	338.97	340.50	342.08	344.48	346.71
OCT	339.20	340.28	342.79	344.37	0.00
NOV	339.81	340.67	343.06	344.14	0.00
DEC	339.74	340.71	342.37	344.61	0.00
AVE	0.00	340.43	341.96	343.70	0.00

STATION: SAM
CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
FITTED FUNCTION (EXPONENTIAL + SPLINE + HARMONICS) AT 15TH OF MONTH :
(JANO REFERS TO VALUE AT BEGINNING OF YEAR)

MONTH	YEAR				
	1981	1982	1983	1984	1985
JAN	0.00	340.26	341.26	343.48	344.93
FEB	0.00	340.52	341.57	343.68	345.15
MAR	0.00	340.59	341.76	343.69	345.20
APR	0.00	340.52	341.85	343.53	345.13
MAY	0.00	340.21	341.67	343.16	344.85
JUN	0.00	340.13	341.71	343.08	344.88
JUL	0.00	340.52	342.19	343.53	345.44
AUG	0.00	340.73	342.51	343.86	345.90
SEP	338.94	340.52	342.44	343.84	346.01
OCT	338.98	340.33	342.39	343.83	0.00
NOV	339.22	340.37	342.55	344.00	0.00
DEC	339.71	340.74	342.98	344.42	0.00
AVE	0.00	340.45	342.07	343.68	0.00
JANO	0.00	340.01	341.02	343.26	344.70

STATION: SAM
CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
TREND (EXPONENTIAL + SPLINE) AT 15TH OF MONTH :
(JANO REFERS TO VALUE AT BEGINNING OF YEAR)

MONTH	YEAR				
	1981	1982	1983	1984	1985
JAN	0.00	339.90	340.90	343.12	344.57
FEB	0.00	340.06	341.11	343.22	344.69
MAR	0.00	340.19	341.36	343.28	344.80
APR	0.00	340.32	341.64	343.34	344.93
MAY	0.00	340.44	341.90	343.40	345.08
JUN	0.00	340.54	342.12	343.49	345.29
JUL	0.00	340.61	342.28	343.61	345.53
AUG	0.00	340.64	342.42	343.78	345.82
SEP	339.07	340.64	342.56	343.97	346.13
OCT	339.29	340.64	342.71	344.14	0.00
NOV	339.52	340.67	342.86	344.30	0.00
DEC	339.72	340.76	342.99	344.44	0.00
AVE	0.00	340.45	342.07	343.68	0.00
JANO	0.00	339.82	340.82	343.06	344.51



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ATMOSPHERIC CARBON DIOXIDE PROGRAM
ANALYSIS OF STATION DATA USING PROGRAM "STATION FIT"

STATION: RAOUL IS., KERMADEC IS.

RUN NO. KER-06

COORDINATES : 29.2S 177.9W

ELEVATION ABOVE SEA LEVEL : 2 METERS

BEGINNING DATE : 8-DEC-1982

FINAL DATE : 4-JUL-1984

TYPE OF DATA PROCESSED : FLASK DAILY AVERAGES

CALIBRATION SCALE : 1985

NUMBER OF HARMONICS : 2

COMPUTED SPLINE RMS SECOND DERIVATIVE : 0.00

COMPUTED GAIN FACTOR FOR SEASONAL CYCLE
REFERENCED TO BASE YEAR = 1981 : NOT COMPUTED

COMPUTED SPLINE STIFFNESS PARAMETER (SIGMA) : 0.2788 PPM

DATE OF RUN : 25-NOV-1985

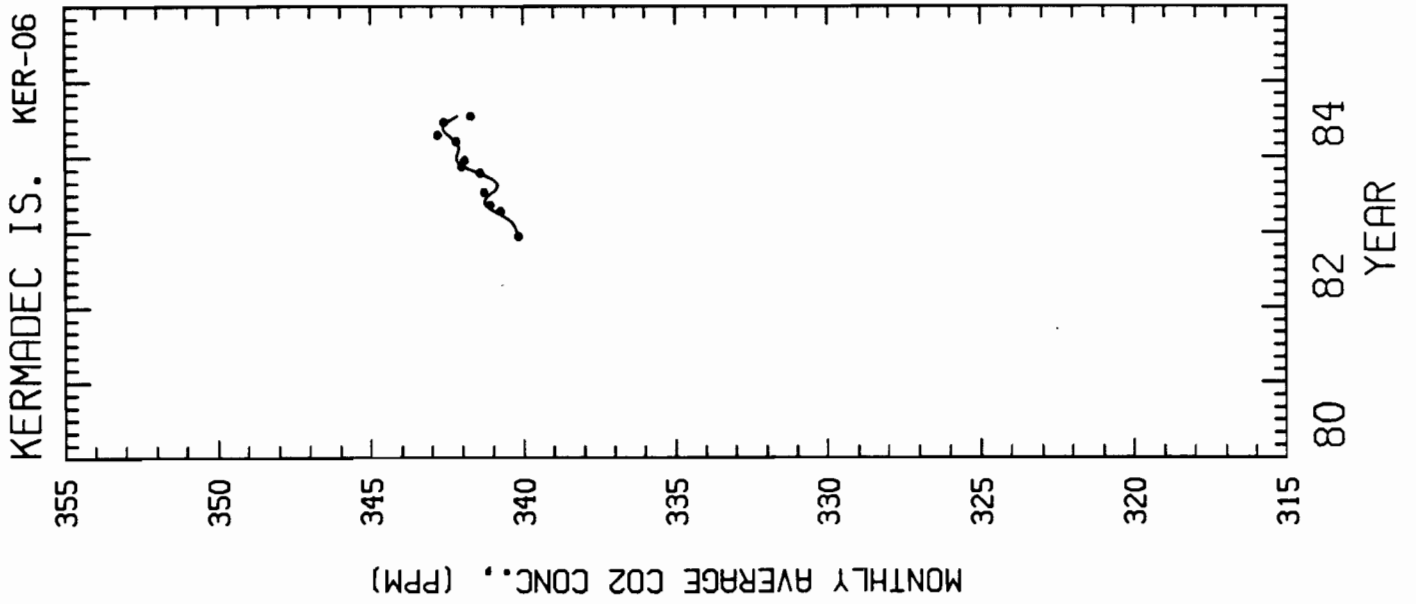
BASE YEAR MIDDLE YEAR
81 83.7226

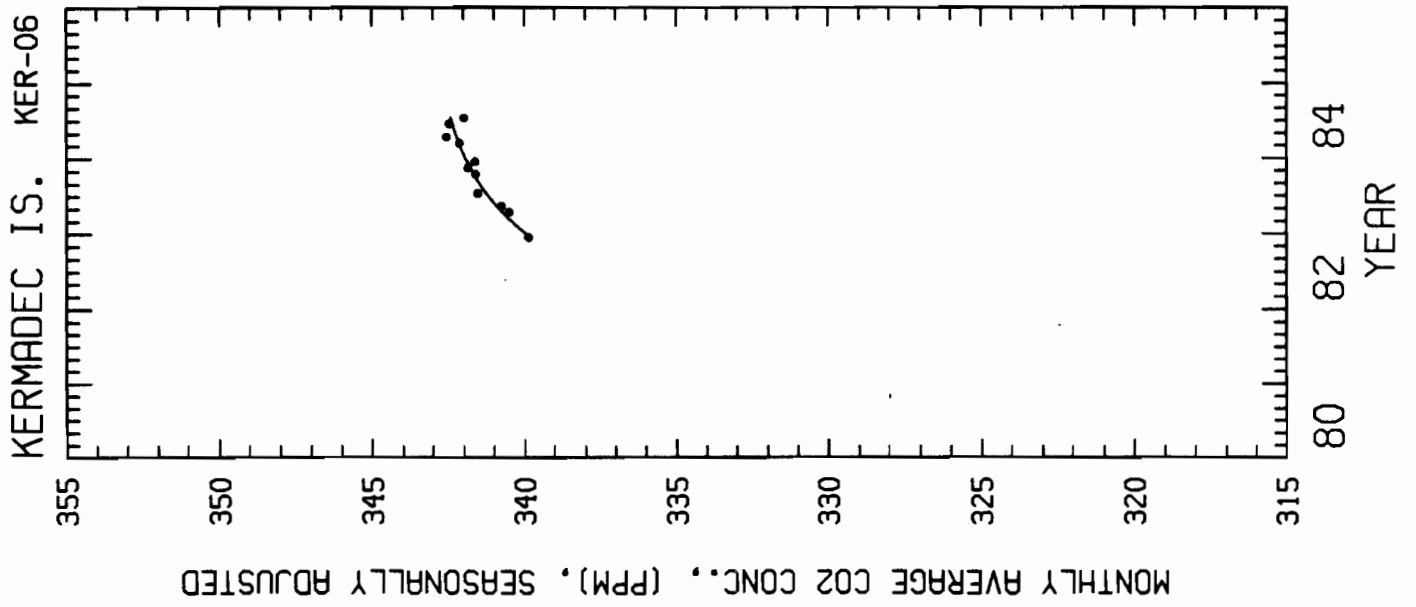
FIRST AND LAST 5 DATA POINTS ARE :

NO.	MEAS	SYMB	YEAR	CONC (PPM)
1	2	1	1.9370	339.72
2	2	1	1.9479	340.20
3	3	1	1.9863	340.46
4	4	1	2.3205	340.89
5	4	1	2.4137	341.13
14	2	1	3.2131	342.31
15	2	1	3.3279	342.91
16	2	1	3.4754	342.58
17	2	1	3.4973	342.42
18	2	1	3.5082	341.86

INPUT PARAMETERS :

STATION	NO.	HARMONICS	GAIN	SOUTHERN HEM.	SQ2D
KER		2	NO	NO	0





1. FIT OF CUBIC + HARMONICS

FITTED COEFFICIENTS / ERROR :

CONST	T	T**2	T**3
0.37663E+03	-0.46669E+02	0.19100E+02	-0.24570E+01
0.42133E+02	0.48501E+02	0.18229E+02	0.22409E+01
SIN(2*PI*T)	COS(2*PI*T)	SIN(4*PI*T)	COS(4*PI*T)
0.24380E+00	-0.16457E+00	-0.30409E+00	0.16348E+00
0.20708E+00	0.30495E+00	0.16943E+00	0.18419E+00

STANDARD ERROR OF FIT: DEL = 0.30795E+00

SEASONAL CYCLE FIT (PPM):

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
-0.10	-0.25	-0.12	0.27	0.58	0.53	0.11	-0.35	-0.49	-0.28	0.01	0.07

2. FIT OF EXPONENTIAL + HARMONICS

FIT TO NON-LINEAR TERMS :

ITER	CHISQ	FL
1	0.39772E+02	0.10000E-03
2	0.61711E+01	0.10000E-04
3	0.91491E+00	0.10000E-04
4	0.24087E+00	0.10000E-03
6	0.10137E+00	0.10000E-05
7	0.98901E-01	0.10000E-06
8	0.98901E-01	0.10000E-07

FINAL VALUES LISTED ABOVE APPLY TO FIT

FIT IS TO C1 + C2*EXP(R*T) + HARMONICS

FITTED COEFFICIENTS / ERROR :

(ERRORS COMPUTED FROM MATRIX ELEMENTS INCLUDE (1 + FL) AS A FACTOR)

C1	C2	R	
0.34308E+03	-0.23993E+02	-0.10162E+01	
0.81117E+00	0.19495E+02	0.51207E+00	
SIN(2*PI*T)	COS(2*PI*T)	SIN(4*PI*T)	COS(4*PI*T)
0.26514E+00	0.16225E+00	-0.25695E+00	0.98758E-01
0.20883E+00	0.15056E+00	0.16862E+00	0.17977E+00

STANDARD ERROR OF FIT: DEL = 0.31448E+00

SEASONAL CYCLE FIT (PPM):

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0.18	0.04	0.08	0.25	0.33	0.14	-0.25	-0.55	-0.52	-0.18	0.18	0.30

3. FIT OF STRAIGHT LINE SPLINE + HARMONICS TO EXPONENTIALLY ADJUSTED DATA

SPLINE-HARMONICS ITERATION NUMBER 2

CHISQ FOR HARMONIC FIT = 0.77707E-01

FIT IS TO CHISQUARED-TYPE-SPLINE + HARMONICS

FITTED COEFFICIENTS / ERROR :

(ERRORS COMPUTED FROM MATRIX ELEMENTS INCLUDE (1 + FL) AS A FACTOR)

SIN(2*PI*T)	COS(2*PI*T)	SIN(4*PI*T)	COS(4*PI*T)
0.26489E+00	0.16158E+00	-0.25647E+00	0.98298E-01
0.12874E+00	0.96501E-01	0.11152E+00	0.10488E+00

DEL	SQ2D
0.27876E+00	0.00000E+00

CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
FITTED SEASONAL FUNCTION (HARMONICS) :

SEASONAL CYCLE (PPM) :

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0.18	0.04	0.08	0.25	0.33	0.14	-0.25	-0.55	-0.52	-0.18	0.18	0.30

CONCENTRATION OF ATMOSPHERIC CO2 (PPM)

AVERAGE OVER MONTHS OF AVERAGES AT 15TH OF MONTH, ADJUSTED FOR TREND :

SEASONAL CYCLE (PPM) :

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0.00	0.00	0.07	0.30	0.18	0.25	-0.32	0.00	0.00	-0.24	0.25	0.21

GAIN FOR EACH YEAR :

YEAR	PTS	DEL	GAIN ERROR
1982	3	0.31	1.1063 0.6097
1983	7	0.18	0.4854 0.3029
1984	8	0.25	2.1534 0.6659

STATION: KER
CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
AVERAGES OF DATA ADJUSTED TO THE 15TH OF EACH MONTH :

MONTH	YEAR		
	1982	1983	1984
JAN	0.00	0.00	0.00
FEB	0.00	0.00	0.00
MAR	0.00	0.00	342.22
APR	0.00	340.76	342.81
MAY	0.00	341.10	0.00
JUN	0.00	0.00	342.61
JUL	0.00	341.30	341.73
AUG	0.00	0.00	0.00
SEP	0.00	0.00	0.00
OCT	0.00	341.43	0.00
NOV	0.00	342.04	0.00
DEC	340.17	341.94	0.00
AVE	0.00	0.00	0.00

STATION: KER
CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
AVERAGES OF DATA ADJUSTED TO THE 15TH OF EACH MONTH AND SEASONALLY ADJUSTED :

MONTH	YEAR		
	1982	1983	1984
JAN	0.00	0.00	0.00
FEB	0.00	0.00	0.00
MAR	0.00	0.00	342.14
APR	0.00	340.51	342.56
MAY	0.00	340.77	0.00
JUN	0.00	0.00	342.48
JUL	0.00	341.54	341.98
AUG	0.00	0.00	0.00
SEP	0.00	0.00	0.00
OCT	0.00	341.61	0.00
NOV	0.00	341.86	0.00
DEC	339.87	341.63	0.00
AVE	0.00	0.00	0.00

STATION: KER
CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
FITTED FUNCTION (EXPONENTIAL + SPLINE + HARMONICS) AT 15TH OF MONTH :
(JANO REFERS TO VALUE AT BEGINNING OF YEAR)

MONTH	YEAR		
	1982	1983	1984
JAN	0.00	340.25	342.17
FEB	0.00	340.36	342.12
MAR	0.00	340.60	342.23
APR	0.00	340.98	342.48
MAY	0.00	341.25	342.63
JUN	0.00	341.24	342.50
JUL	0.00	341.01	342.17
AUG	0.00	340.86	0.00
SEP	0.00	341.03	0.00
OCT	0.00	341.49	0.00
NOV	0.00	341.97	0.00
DEC	340.10	342.19	0.00
AVE	0.00	341.10	0.00
JANO	0.00	340.20	342.20

STATION: KER
CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
TREND (EXPONENTIAL + SPLINE) AT 15TH OF MONTH :
(JANO REFERS TO VALUE AT BEGINNING OF YEAR)

MONTH	YEAR		
	1982	1983	1984
JAN	0.00	340.07	341.99
FEB	0.00	340.32	342.08
MAR	0.00	340.52	342.16
APR	0.00	340.73	342.23
MAY	0.00	340.92	342.30
JUN	0.00	341.10	342.36
JUL	0.00	341.26	342.42
AUG	0.00	341.41	0.00
SEP	0.00	341.55	0.00
OCT	0.00	341.67	0.00
NOV	0.00	341.79	0.00
DEC	339.79	341.89	0.00
AVE	0.00	341.10	0.00
JANO	0.00	339.94	341.94



SCRIPPS INSTITUTION OF OCEANOGRAPHY
ATMOSPHERIC CARBON DIOXIDE PROGRAM
ANALYSIS OF STATION DATA USING PROGRAM "STATION FIT"

STATION: BARING HEAD, NEW ZEALAND

RUN NO. NZA-11

COORDINATES : 41.4S 174.9E

ELEVATION ABOVE SEA LEVEL : 85 METERS

BEGINNING DATE : 6-JAN-1973

FINAL DATE : 30-DEC-1984

TYPE OF DATA PROCESSED : CONTINUOUS: 1 DAY AVERAGES

CALIBRATION SCALE : 1984

NUMBER OF HARMONICS : 4

COMPUTED SPLINE RMS SECOND DERIVATIVE : MONTHLY NODES : 30.00
DATA POINT NODES : 82.04

COMPUTED GAIN FACTOR FOR SEASONAL CYCLE
REFERENCED TO BASE YEAR = 1972 : NOT COMPUTED

COMPUTED SPLINE STIFFNESS PARAMETER (SIGMA) : 0.3062 PPM

DATE OF RUN : 26-FEB-1986

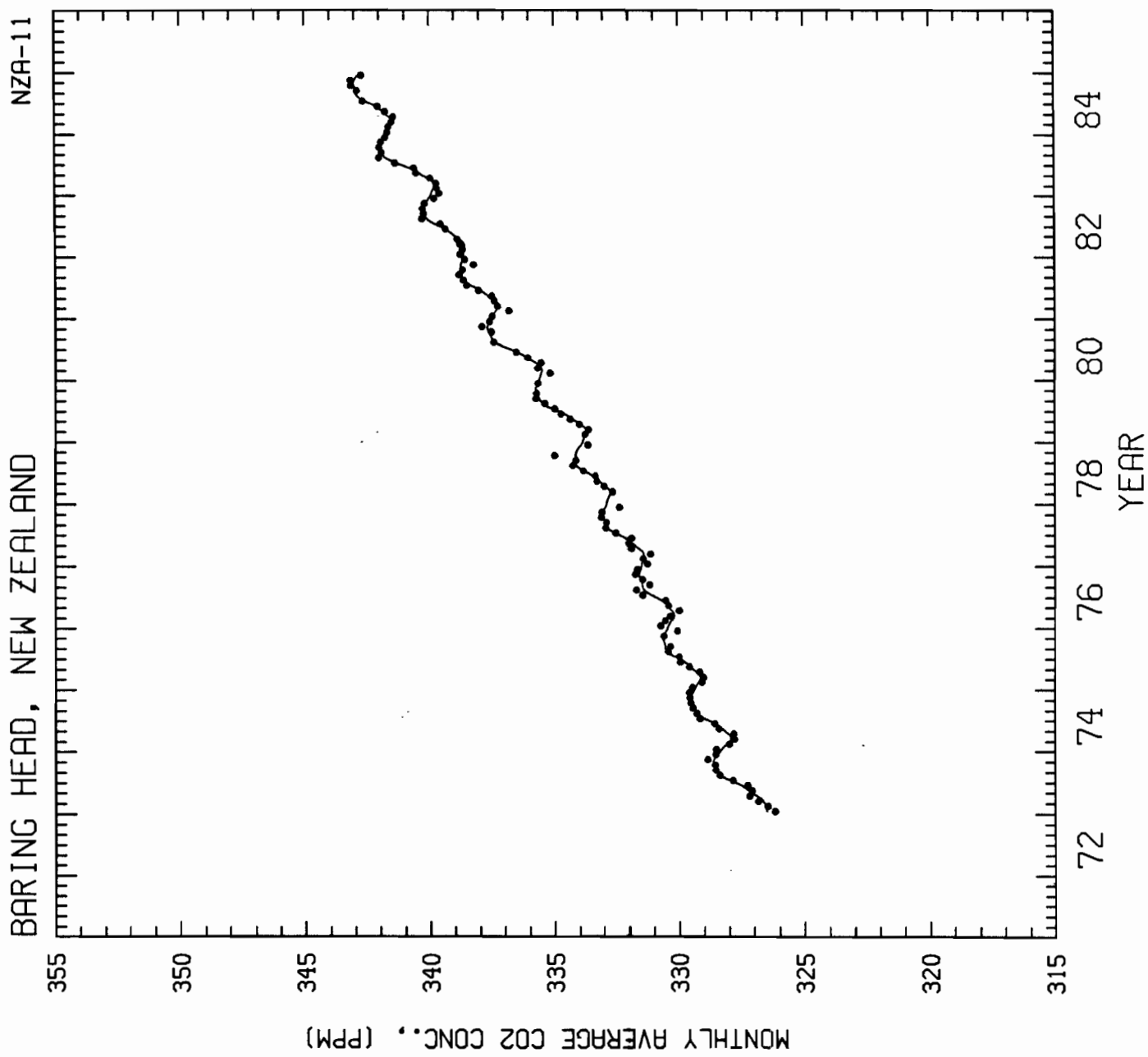
BASE YEAR MIDDLE YEAR
72 79.0069

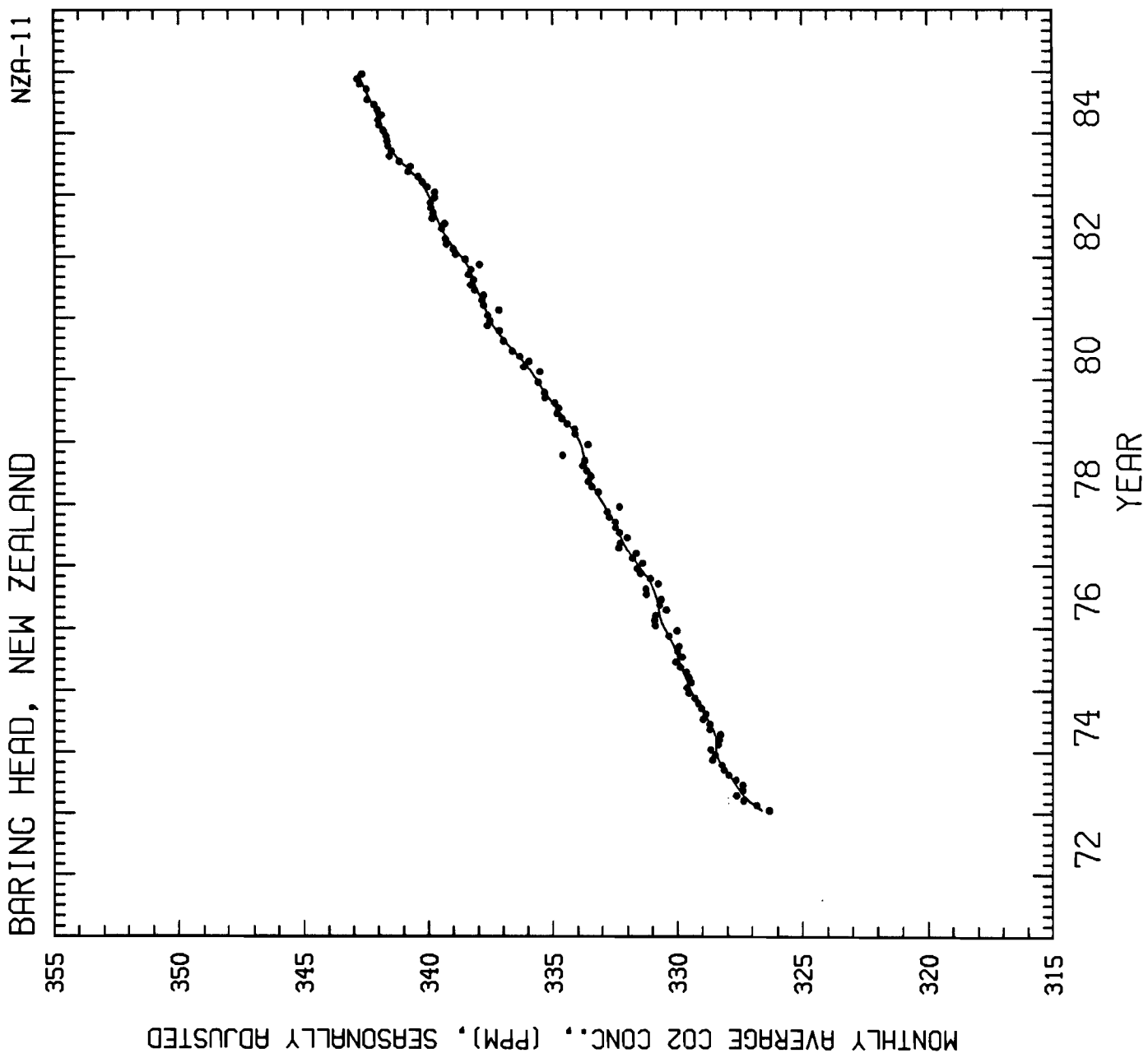
FIRST AND LAST 5 DATA POINTS ARE :

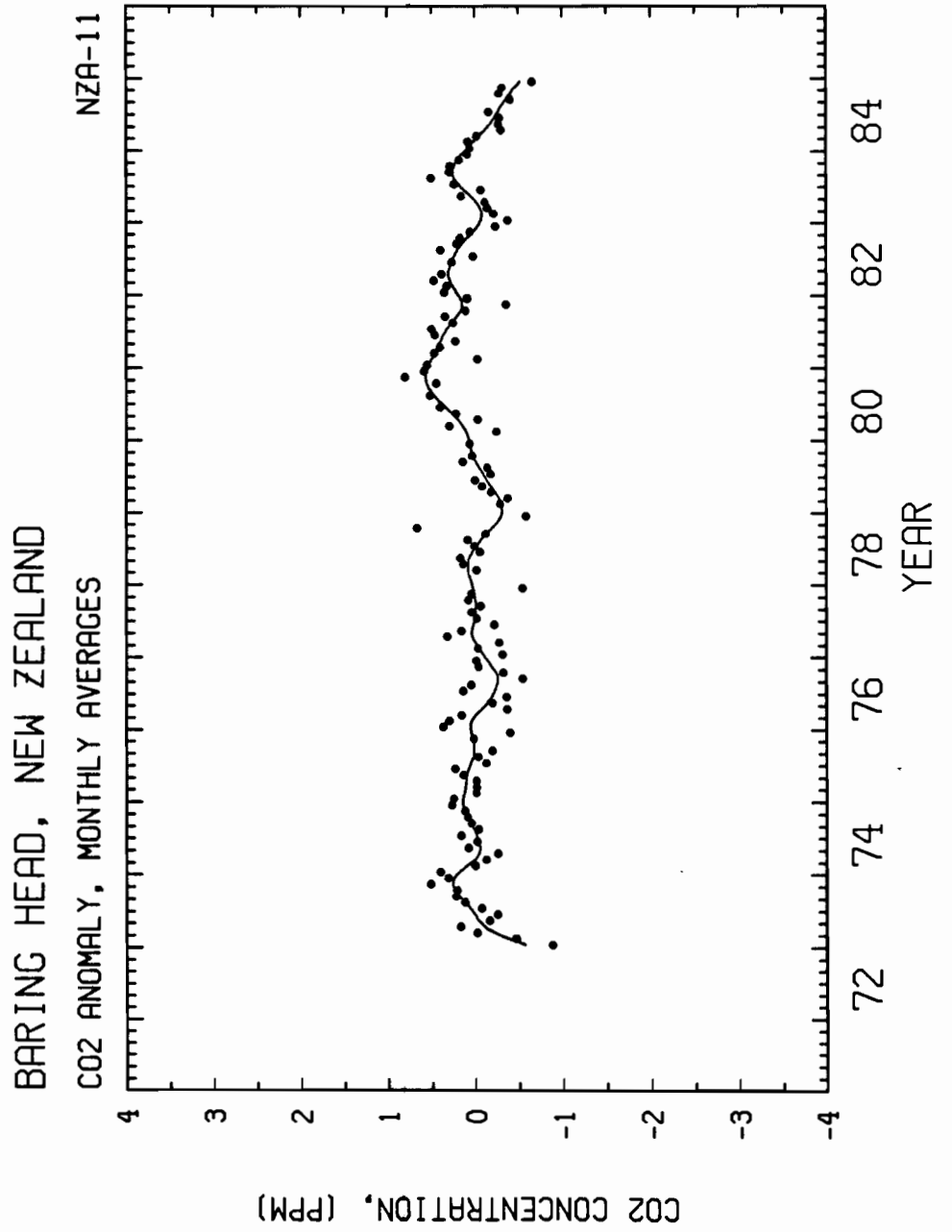
NO.	MEAS	SYMB	YEAR	CONC (PPM)
1	1	1	1.0164	326.40
2	1	1	1.0247	326.40
3	1	1	1.0329	326.50
4	1	1	1.0356	325.50
5	1	1	1.0466	326.10
840	1	1	12.9044	343.10
841	1	1	12.9180	342.70
842	1	1	12.9208	342.70
843	1	1	12.9945	342.80
844	1	1	12.9973	342.70

INPUT PARAMETERS :

STATION	NO. HARMONICS	GAIN	SOUTHERN HEM.	SQ2DI
NZA	4	NO	YES	30







1. FIT OF CUBIC + HARMONICS

FITTED COEFFICIENTS / ERROR :

CONST	T	T**2	T**3
0.32644E+03	0.76513E+00	0.66636E-01	-0.20463E-02
0.81096E-01	0.48256E-01	0.79875E-02	0.38696E-03
SIN(2*PI*T)	COS(2*PI*T)	SIN(4*PI*T)	COS(4*PI*T)
-0.47317E+00	-0.65590E-01	0.70263E-02	0.64409E-01
0.17655E-01	0.18759E-01	0.18023E-01	0.18320E-01
SIN(6*PI*T)	COS(6*PI*T)	SIN(8*PI*T)	COS(8*PI*T)
-0.20232E-01	0.18474E-01	0.36223E-01	-0.45520E-01
0.18212E-01	0.17857E-01	0.17765E-01	0.17962E-01

STANDARD ERROR OF FIT: DEL = 0.35992E+00

SEASONAL CYCLE FIT (PPM):

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
-0.12	-0.36	-0.57	-0.47	-0.26	-0.10	0.23	0.46	0.37	0.36	0.33	0.09

2. FIT OF EXPONENTIAL + HARMONICS

FIT TO NON-LINEAR TERMS :

ITER	CHISQ	FL
1	0.11909E+01	0.10000E-03
2	0.17683E+00	0.10000E-03
3	0.16921E+00	0.10000E-03
4	0.16194E+00	0.10000E-03
18	0.13996E+00	0.10000E-03
19	0.13958E+00	0.10000E-03
20	0.13936E+00	0.10000E-04

FINAL VALUES LISTED ABOVE APPLY TO FIT

FIT IS TO C1 + C2*EXP(R*T) + HARMONICS
FITTED COEFFICIENTS / ERROR :

C1	C2	R	
0.30301E+03	0.23140E+02	0.42822E-01	
0.11950E+01	0.11582E+01	0.18534E-02	
SIN(2*PI*T)	COS(2*PI*T)	SIN(4*PI*T)	COS(4*PI*T)
-0.46323E+00	-0.76740E-01	0.11505E-01	0.63609E-01
0.18185E-01	0.19447E-01	0.18602E-01	0.18994E-01
SIN(6*PI*T)	COS(6*PI*T)	SIN(8*PI*T)	COS(8*PI*T)
-0.25798E-01	0.13796E-01	0.32309E-01	-0.47758E-01
0.18827E-01	0.18504E-01	0.18426E-01	0.18629E-01

STANDARD ERROR OF FIT: DEL = 0.37331E+00

SEASONAL CYCLE FIT (PPM):

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
-0.14	-0.35	-0.55	-0.47	-0.26	-0.09	0.25	0.47	0.36	0.34	0.32	0.08

3. FIT OF CHISQUARE-TYPE SPLINE + HARMONICS TO EXPONENTIALLY ADJUSTED DATA

FINAL VALUE FOR SIGMA IS 0.3062
FINAL COEFFICIENTS ARE BELOW

SPLINE-HARMONICS ITERATION NUMBER 1

CHISQ FOR HARMONIC FIT = 0.93452E-01

FIT IS TO CHISQUARED-TYPE-SPLINE + HARMONICS
FITTED COEFFICIENTS / ERROR :

SIN(2*PI*T)	COS(2*PI*T)	SIN(4*PI*T)	COS(4*PI*T)
-0.45952E+00	-0.68248E-01	0.24863E-01	0.27951E-01
0.14824E-01	0.15518E-01	0.15083E-01	0.15491E-01

SIN(6*PI*T)	COS(6*PI*T)	SIN(8*PI*T)	COS(8*PI*T)
-0.15985E-01	0.18203E-01	0.23622E-01	-0.26326E-01
0.15406E-01	0.15153E-01	0.15048E-01	0.15222E-01

DEL	SQ2D	SQ2DI
0.30625E+00	0.82051E+02	0.29997E+02

CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
FITTED SEASONAL FUNCTION (HARMONICS) :

SEASONAL CYCLE (PPM) :

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
-0.14	-0.35	-0.50	-0.44	-0.28	-0.11	0.21	0.45	0.42	0.37	0.28	0.06

CONCENTRATION OF ATMOSPHERIC CO2 (PPM)

AVERAGE OVER MONTHS OF AVERAGES AT 15TH OF MONTH, ADJUSTED FOR TREND :

SEASONAL CYCLE (PPM) :

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
-0.15	-0.43	-0.51	-0.47	-0.27	-0.15	0.23	0.52	0.40	0.46	0.31	-0.06

SPLINE FIT TO EXPONENTIALLY AND SEASONALLY ADJUSTED DATA (PPM):

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
73	-0.57	-0.38	-0.22	-0.10	-0.04	0.01	0.06	0.12	0.19	0.24	0.26	0.24
74	0.18	0.09	0.02	-0.04	-0.05	-0.04	-0.01	0.02	0.05	0.09	0.12	0.14
75	0.14	0.13	0.12	0.11	0.10	0.08	0.05	0.03	0.02	0.02	0.03	0.05
76	0.06	0.04	0.00	-0.07	-0.14	-0.19	-0.22	-0.25	-0.26	-0.24	-0.19	-0.14
77	-0.09	-0.04	0.00	0.03	0.04	0.02	0.01	0.00	-0.01	0.00	0.01	0.03
78	0.05	0.07	0.08	0.08	0.07	0.03	-0.01	-0.06	-0.13	-0.19	-0.25	-0.29
79	-0.31	-0.30	-0.27	-0.23	-0.18	-0.13	-0.09	-0.05	0.00	0.03	0.05	0.06
80	0.08	0.10	0.14	0.20	0.27	0.34	0.41	0.47	0.52	0.55	0.57	0.56
81	0.53	0.50	0.47	0.43	0.40	0.37	0.32	0.27	0.21	0.17	0.15	0.17
82	0.21	0.26	0.29	0.31	0.30	0.27	0.24	0.20	0.15	0.10	0.03	-0.03
83	-0.06	-0.07	-0.06	-0.01	0.06	0.13	0.19	0.24	0.26	0.24	0.21	0.16
84	0.09	0.02	-0.04	-0.11	-0.17	-0.21	-0.26	-0.30	-0.35	-0.40	-0.45	-0.51

GAIN FOR EACH YEAR :

YEAR	PTS	DEL	GAIN ERROR
1973	45	0.40	0.7435 0.1551
1974	115	0.28	1.1156 0.0781
1975	124	0.31	1.0198 0.0841
1976	69	0.29	0.8480 0.1020
1977	90	0.48	0.9411 0.1461
1978	73	0.28	0.9442 0.0928
1979	37	0.30	1.0530 0.1454
1980	47	0.33	1.0966 0.1307
1981	40	0.16	1.2173 0.0872
1982	69	0.21	0.8396 0.0750
1983	49	0.23	1.1607 0.0935
1984	56	0.14	1.1646 0.0625
1985	30	0.21	1.0725 0.1156

STATION: NZA
 CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
 AVERAGES OF DATA ADJUSTED TO THE 15TH OF EACH MONTH :

MONTH	YEAR							
	1973	1974	1975	1976	1977	1978	1979	1980
JAN	326.19	328.53	329.48	330.75	331.27	0.00	0.00	0.00
FEB	326.48	328.01	329.11	330.57	331.45	0.00	333.77	335.19
MAR	326.85	327.81	329.03	330.37	331.15	332.67	333.64	335.69
APR	327.20	327.84	329.20	330.01	331.91	333.00	334.01	335.55
MAY	327.11	328.42	329.60	330.44	332.01	333.29	334.38	336.07
JUN	327.28	328.59	329.96	330.55	331.91	333.36	334.75	336.54
JUL	327.86	329.18	330.02	331.46	332.53	333.84	335.00	0.00
AUG	328.38	329.31	330.45	331.71	332.94	334.27	335.39	337.45
SEP	328.54	329.46	330.36	331.19	332.91	334.15	335.76	0.00
OCT	328.58	329.55	0.00	331.47	333.11	335.00	335.73	337.54
NOV	328.88	329.58	330.62	331.76	333.09	0.00	0.00	337.93
DEC	328.55	329.60	330.08	331.67	332.40	333.66	335.67	337.61
AVE	327.66	328.82	0.00	331.00	332.22	0.00	0.00	0.00

MONTH	YEAR			
	1981	1982	1983	1984
JAN	337.50	338.80	339.63	341.69
FEB	336.84	338.69	339.72	341.64
MAR	337.29	338.80	339.75	341.51
APR	337.42	338.91	339.99	341.45
MAY	337.52	0.00	340.54	341.77
JUN	338.05	339.38	340.64	342.07
JUL	338.53	339.58	341.39	342.66
AUG	338.65	340.32	342.03	0.00
SEP	338.84	340.24	341.93	342.90
OCT	338.69	340.29	342.01	343.13
NOV	338.25	340.21	341.95	343.14
DEC	338.61	339.83	341.78	342.72
AVE	338.02	0.00	340.95	0.00

STATION: NZA
 CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
 AVERAGES OF DATA ADJUSTED TO THE 15TH OF EACH MONTH AND SEASONALLY ADJUSTED :

MONTH	YEAR							
	1973	1974	1975	1976	1977	1978	1979	1980
JAN	326.33	328.67	329.62	330.89	331.41	0.00	0.00	0.00
FEB	326.83	328.36	329.46	330.92	331.80	0.00	334.12	335.54
MAR	327.36	328.32	329.54	330.87	331.66	333.18	334.14	336.19
APR	327.64	328.28	329.64	330.45	332.35	333.44	334.45	335.98
MAY	327.39	328.70	329.88	330.72	332.29	333.58	334.66	336.35
JUN	327.39	328.70	330.07	330.66	332.02	333.47	334.86	336.65
JUL	327.66	328.97	329.81	331.25	332.33	333.63	334.79	0.00
AUG	327.93	328.86	330.00	331.26	332.49	333.82	334.95	337.00
SEP	328.12	329.04	329.94	330.78	332.50	333.73	335.34	0.00
OCT	328.21	329.18	0.00	331.10	332.74	334.62	335.35	337.17
NOV	328.60	329.30	330.35	331.49	332.81	0.00	0.00	337.65
DEC	328.49	329.54	330.02	331.61	332.34	333.60	335.61	337.55
AVE	327.66	328.83	0.00	331.00	332.23	0.00	0.00	0.00

MONTH	YEAR			
	1981	1982	1983	1984
JAN	337.64	338.94	339.77	341.82
FEB	337.19	339.04	340.06	341.99
MAR	337.80	339.31	340.26	342.02
APR	337.86	339.35	340.43	341.88
MAY	337.80	0.00	340.83	342.05
JUN	338.16	339.49	340.74	342.18
JUL	338.32	339.37	341.18	342.45
AUG	338.21	339.88	341.58	0.00
SEP	338.42	339.83	341.51	342.48
OCT	338.31	339.92	341.64	342.75
NOV	337.97	339.94	341.67	342.86
DEC	338.54	339.77	341.71	342.66
AVE	338.02	0.00	340.95	0.00

STATION: NZA
 CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
 FITTED FUNCTION (EXPONENTIAL + SPLINE + HARMONICS) AT 15TH OF MONTH :
 (JANO REFERS TO VALUE AT BEGINNING OF YEAR)

MONTH	YEAR							
	1973	1974	1975	1976	1977	1978	1979	1980
JAN	326.50	328.31	329.37	330.44	331.50	332.89	333.84	335.60
FEB	326.57	328.10	329.24	330.32	331.44	332.81	333.76	335.54
MAR	326.65	327.95	329.16	330.21	331.42	332.77	333.73	335.53
APR	326.92	328.05	329.31	330.31	331.62	332.94	333.96	335.78
MAY	327.23	328.29	329.56	330.50	331.89	333.19	334.27	336.11
JUN	327.53	328.57	329.81	330.72	332.15	333.44	334.61	336.48
JUL	327.99	329.00	330.20	331.11	332.56	333.82	335.08	336.99
AUG	328.38	329.36	330.51	331.41	332.89	334.12	335.48	337.40
SEP	328.51	329.46	330.56	331.48	332.97	334.14	335.61	337.55
OCT	328.60	329.54	330.62	331.55	333.03	334.14	335.71	337.65
NOV	328.62	329.58	330.63	331.61	333.06	334.10	335.75	337.69
DEC	328.48	329.48	330.53	331.54	332.96	333.95	335.67	337.59
AVE	327.66	328.81	329.96	330.93	332.29	333.53	334.79	336.66
JANO	0.00	328.39	329.42	330.48	331.51	332.92	333.88	335.62

MONTH	YEAR			
	1981	1982	1983	1984
JAN	337.49	338.66	339.94	341.72
FEB	337.36	338.62	339.85	341.58
MAR	337.29	338.62	339.83	341.49
APR	337.44	338.82	340.08	341.63
MAY	337.69	339.10	340.44	341.87
JUN	337.95	339.38	340.82	342.14
JUL	338.35	339.80	341.34	342.55
AUG	338.66	340.13	341.76	342.89
SEP	338.71	340.18	341.89	342.96
OCT	338.74	340.21	341.96	343.00
NOV	338.76	340.18	341.97	342.99
DEC	338.68	340.04	341.84	342.86
AVE	338.09	339.48	340.98	342.31
JANO	337.53	338.66	339.98	341.77

STATION: NZA
CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
TREND (EXPONENTIAL + SPLINE) AT 15TH OF MONTH :
(JANO REFERS TO VALUE AT BEGINNING OF YEAR)

MONTH	YEAR							
	1973	1974	1975	1976	1977	1978	1979	1980
JAN	326.63	328.45	329.51	330.58	331.64	333.03	333.98	335.74
FEB	326.92	328.45	329.59	330.66	331.79	333.16	334.11	335.88
MAR	327.15	328.45	329.67	330.71	331.92	333.27	334.24	336.03
APR	327.36	328.49	329.75	330.74	332.06	333.38	334.40	336.21
MAY	327.51	328.57	329.84	330.78	332.17	333.47	334.56	336.39
JUN	327.64	328.68	329.92	330.83	332.26	333.55	334.72	336.59
JUL	327.78	328.79	329.99	330.89	332.35	333.61	334.87	336.77
AUG	327.93	328.91	330.06	330.97	332.45	333.67	335.03	336.96
SEP	328.09	329.04	330.15	331.06	332.55	333.72	335.19	337.13
OCT	328.23	329.17	330.24	331.18	332.66	333.77	335.34	337.28
NOV	328.34	329.30	330.36	331.33	332.78	333.82	335.48	337.41
DEC	328.41	329.41	330.47	331.48	332.90	333.89	335.60	337.52
AVE	327.67	328.81	329.96	330.93	332.29	333.53	334.79	336.66
JANO	0.00	328.44	329.47	330.52	331.56	332.96	333.93	335.67

MONTH	YEAR			
	1981	1982	1983	1984
JAN	337.62	338.79	340.07	341.85
FEB	337.71	338.97	340.20	341.93
MAR	337.79	339.12	340.34	341.99
APR	337.88	339.26	340.52	342.07
MAY	337.97	339.38	340.72	342.15
JUN	338.06	339.49	340.93	342.24
JUL	338.15	339.59	341.13	342.34
AUG	338.22	339.68	341.31	342.44
SEP	338.29	339.76	341.47	342.54
OCT	338.37	339.83	341.59	342.63
NOV	338.48	339.90	341.69	342.72
DEC	338.62	339.98	341.78	342.80
AVE	338.10	339.48	340.98	342.31
JANO	337.58	338.71	340.02	341.82

SCRIPPS INSTITUTION OF OCEANOGRAPHY
ATMOSPHERIC CARBON DIOXIDE PROGRAM
ANALYSIS OF STATION DATA USING PROGRAM "STATION FIT"

STATION: BARING HEAD, NEW ZEALAND

RUN NO. NZD-18

COORDINATES : 41.4S 174.9E

ELEVATION ABOVE SEA LEVEL : 85 METERS

BEGINNING DATE : 4-JUL-1977

FINAL DATE : 14-MAY-1985

TYPE OF DATA PROCESSED : FLASK DAILY AVERAGES

CALIBRATION SCALE : 1985

NUMBER OF HARMONICS : 4

COMPUTED SPLINE RMS SECOND DERIVATIVE : MONTHLY NODES : 30.00
DATA POINT NODES : 36.41

COMPUTED GAIN FACTOR FOR SEASONAL CYCLE
REFERENCED TO BASE YEAR = 1976 : NOT COMPUTED

COMPUTED SPLINE STIFFNESS PARAMETER (SIGMA) : 0.4130 PPM

DATE OF RUN : 03-MAR-1986

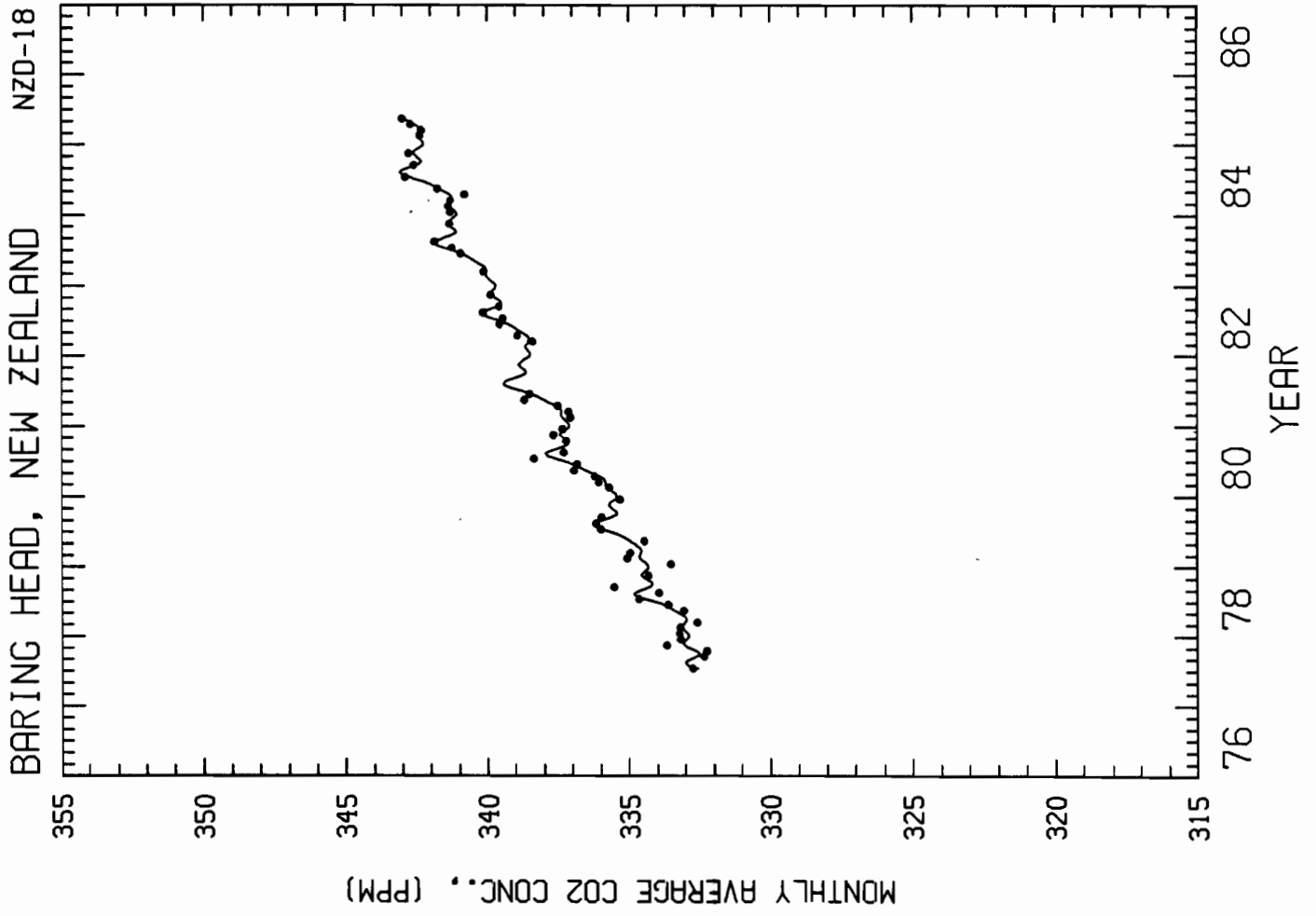
BASE YEAR MIDDLE YEAR
76 81.4370

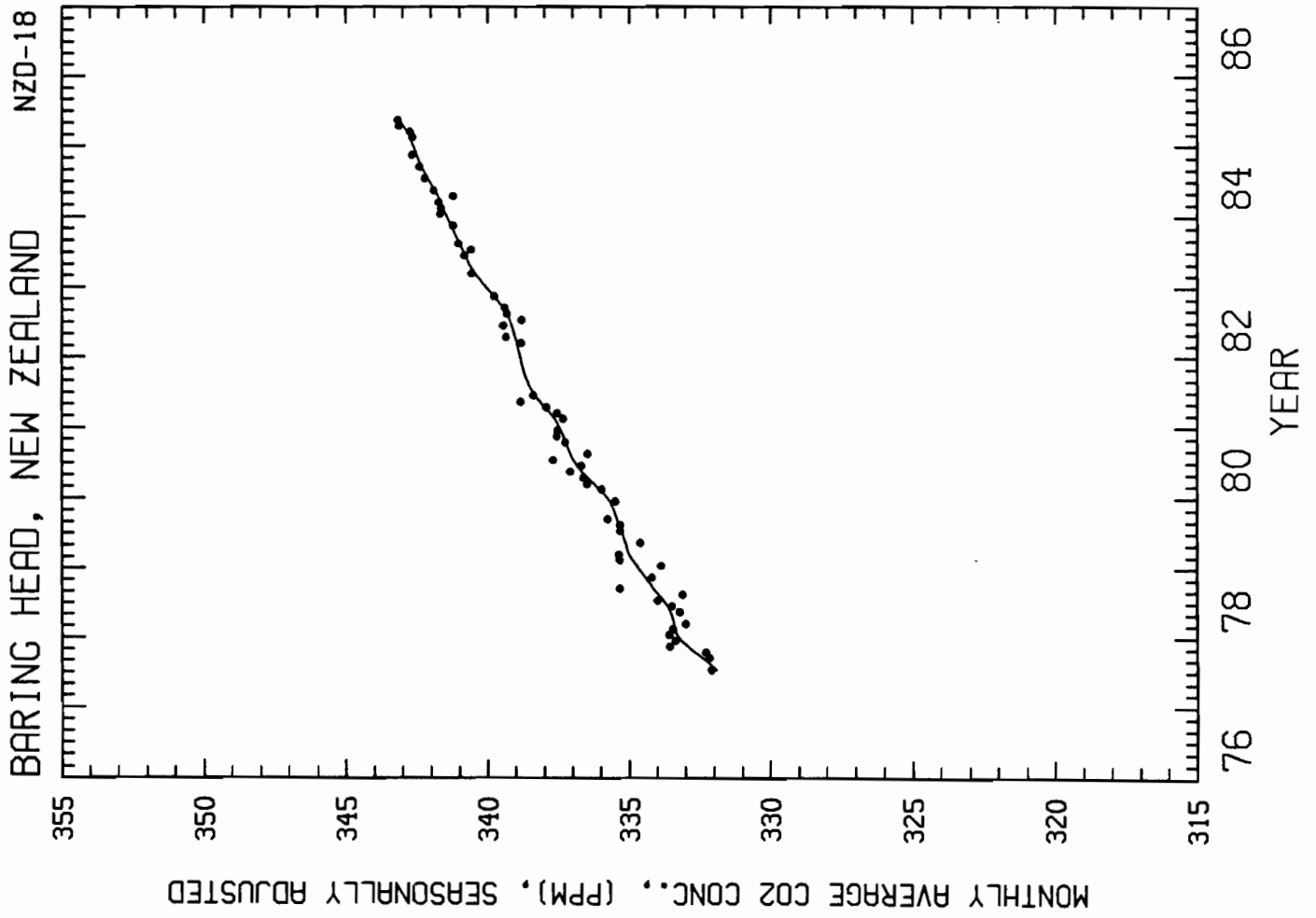
FIRST AND LAST 5 DATA POINTS ARE :

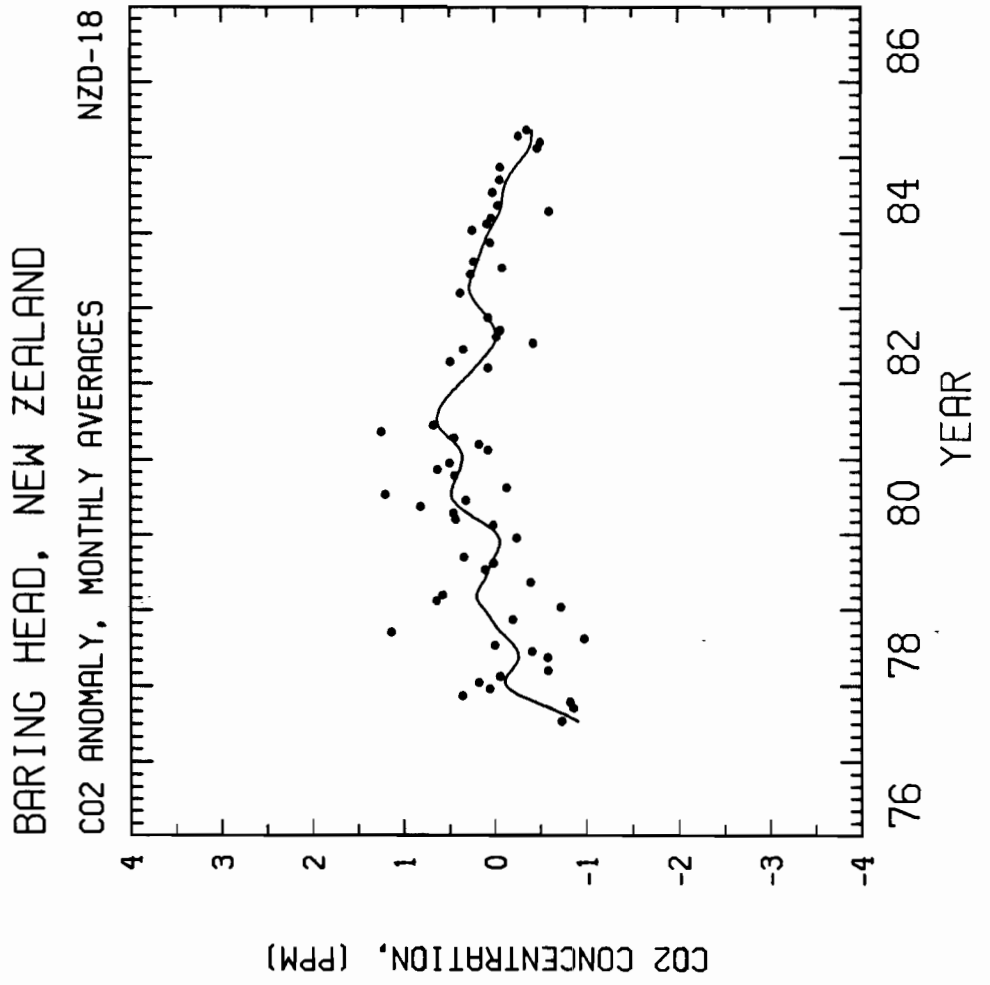
NO.	MEAS	SYMB	YEAR	CONC (PPM)
1	5	1	1.5068	332.44
2	3	1	1.6795	332.56
3	2	1	1.7233	332.29
4	2	1	1.7370	332.14
5	2	1	1.7781	332.19
87	3	1	9.1096	342.10
88	2	1	9.1178	342.21
89	3	1	9.1836	342.34
90	3	1	9.3260	342.88
91	5	1	9.3671	342.99

INPUT PARAMETERS :

STATION	NO. HARMONICS	GAIN	SOUTHERN HEM.	SQ2DI
NZD	4	NO	NO	30







1. FIT OF CUBIC + HARMONICS

FITTED COEFFICIENTS / ERROR :

CONST	T	T**2	T**3
0.32963E+03	0.18128E+01	-0.61026E-01	0.22097E-02
0.63228E+00	0.44206E+00	0.90607E-01	0.56127E-02
SIN(2*PI*T)	COS(2*PI*T)	SIN(4*PI*T)	COS(4*PI*T)
-0.29678E+00	-0.32191E+00	0.10834E+00	0.16021E+00
0.81852E-01	0.71415E-01	0.71745E-01	0.76900E-01
SIN(6*PI*T)	COS(6*PI*T)	SIN(8*PI*T)	COS(8*PI*T)
-0.10715E+00	-0.51013E-01	0.25154E-01	-0.12154E+00
0.77641E-01	0.73372E-01	0.78060E-01	0.73768E-01

STANDARD ERROR OF FIT: DEL = 0.46393E+00

SEASONAL CYCLE FIT (PPM):

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
-0.35	-0.25	-0.41	-0.41	-0.10	0.18	0.63	0.72	0.10	-0.07	0.11	-0.18

2. FIT OF EXPONENTIAL + HARMONICS

FIT TO NON-LINEAR TERMS :

ITER	CHISQ	FL
1	0.12054E+01	0.10000E-03
2	0.33938E+00	0.10000E-03
3	0.33162E+00	0.10000E-03
4	0.32388E+00	0.10000E-03
18	0.28685E+00	0.10000E-03
19	0.28570E+00	0.10000E-03
20	0.28463E+00	0.10000E-03

FINAL VALUES LISTED ABOVE APPLY TO FIT

FIT IS TO C1 + C2*EXP(R*T) + HARMONICS

FITTED COEFFICIENTS / ERROR :

C1	C2	R	
0.30675E+03	0.24371E+02	0.43897E-01	
0.12563E+02	0.12308E+02	0.18310E-01	
SIN(2*PI*T)	COS(2*PI*T)	SIN(4*PI*T)	COS(4*PI*T)
-0.24415E+00	-0.40365E+00	0.96088E-01	0.18937E+00
0.91638E-01	0.82091E-01	0.82115E-01	0.87453E-01
SIN(6*PI*T)	COS(6*PI*T)	SIN(8*PI*T)	COS(8*PI*T)
-0.21898E+00	-0.81143E-01	-0.64914E-01	-0.13845E+00
0.89282E-01	0.83568E-01	0.89159E-01	0.81773E-01

STANDARD ERROR OF FIT: DEL = 0.53351E+00

SEASONAL CYCLE FIT (PPM):

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
-0.58	-0.32	-0.25	-0.38	-0.08	0.32	0.73	0.81	0.01	-0.31	0.14	-0.11

3. FIT OF CHISQUARE-TYPE SPLINE + HARMONICS TO EXPONENTIALLY ADJUSTED DATA

FINAL VALUE FOR SIGMA IS 0.4130
FINAL COEFFICIENTS ARE BELOW

SPLINE-HARMONICS ITERATION NUMBER 1

CHISQ FOR HARMONIC FIT = 0.16437E+00

FIT IS TO CHISQUARED-TYPE-SPLINE + HARMONICS
FITTED COEFFICIENTS / ERROR :

SIN(2*PI*T)	COS(2*PI*T)	SIN(4*PI*T)	COS(4*PI*T)
-0.34702E+00	-0.33537E+00	0.14326E+00	0.13833E+00
0.67836E-01	0.61202E-01	0.62889E-01	0.66808E-01

SIN(6*PI*T)	COS(6*PI*T)	SIN(8*PI*T)	COS(8*PI*T)
-0.12786E+00	-0.35794E-01	0.26127E-01	-0.12079E+00
0.65903E-01	0.64372E-01	0.63539E-01	0.62309E-01

DEL	SQ2D	SQ2DI
0.41296E+00	0.36414E+02	0.29996E+02

CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
FITTED SEASONAL FUNCTION (HARMONICS) :

SEASONAL CYCLE (PPM) :

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
-0.38	-0.28	-0.43	-0.42	-0.16	0.12	0.65	0.82	0.19	-0.05	0.10	-0.19

CONCENTRATION OF ATMOSPHERIC CO2 (PPM)

AVERAGE OVER MONTHS OF AVERAGES AT 15TH OF MONTH, ADJUSTED FOR TREND :

SEASONAL CYCLE (PPM) :

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
-0.50	-0.26	-0.44	-0.41	-0.10	0.14	0.73	0.54	0.44	-0.23	0.22	-0.14

SPLINE FIT TO EXPONENTIALLY AND SEASONALLY ADJUSTED DATA (PPM):

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
77	99.99	99.99	99.99	99.99	99.99	99.99	-0.90	-0.76	-0.60	-0.43	-0.27	-0.16
78	-0.11	-0.13	-0.17	-0.23	-0.26	-0.25	-0.20	-0.13	-0.06	-0.01	0.04	0.09
79	0.14	0.19	0.20	0.17	0.13	0.10	0.07	0.04	0.01	-0.03	-0.05	-0.05
80	0.01	0.10	0.20	0.31	0.40	0.45	0.48	0.47	0.44	0.41	0.38	0.36
81	0.36	0.38	0.42	0.50	0.57	0.62	0.63	0.62	0.59	0.54	0.48	0.42
82	0.35	0.28	0.22	0.16	0.10	0.05	0.00	-0.01	0.00	0.03	0.08	0.13
83	0.19	0.24	0.27	0.28	0.26	0.24	0.21	0.19	0.16	0.14	0.11	0.09
84	0.05	0.01	-0.03	-0.06	-0.08	-0.08	-0.09	-0.11	-0.14	-0.17	-0.22	-0.28
85	-0.34	-0.38	-0.40	-0.41	99.99	99.99	99.99	99.99	99.99	99.99	99.99	99.99

GAIN FOR EACH YEAR :

YEAR	PTS	DEL	GAIN ERROR
1977	9	0.45	1.1526 0.6146
1978	14	0.60	0.8694 0.3622
1979	12	0.44	1.0726 0.2505
1980	15	0.43	1.0943 0.3036
1981	9	0.37	1.2070 0.4236
1982	10	0.21	0.8531 0.1626
1983	7	0.21	0.8048 0.1816
1984	9	0.22	1.1729 0.2384
1985	6	0.23	1.1325 0.3225

MONTH	1985
JAN	0.00
FEB	342.66
MAR	342.75
APR	343.12
MAY	343.16
JUN	0.00
JUL	0.00
AUG	0.00
SEP	0.00
OCT	0.00
NOV	0.00
DEC	0.00
AVE	0.00

STATION: NZD
 CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
 FITTED FUNCTION (EXPONENTIAL + SPLINE + HARMONICS) AT 15TH OF MONTH :
 (JANO REFERS TO VALUE AT BEGINNING OF YEAR)

MONTH	YEAR							
	1977	1978	1979	1980	1981	1982	1983	1984
JAN	0.00	332.92	334.36	335.48	337.13	338.49	339.76	341.11
FEB	0.00	333.09	334.61	335.77	337.36	338.63	340.02	341.29
MAR	0.00	332.99	334.57	335.82	337.37	338.54	340.02	341.23
APR	0.00	333.04	334.65	336.06	337.56	338.60	340.16	341.34
MAY	0.00	333.37	334.97	336.51	338.01	338.92	340.53	341.71
JUN	0.00	333.76	335.32	336.96	338.44	339.26	340.91	342.11
JUL	332.57	334.44	335.93	337.63	339.10	339.87	341.54	342.77
AUG	332.98	334.78	336.18	337.89	339.38	340.15	341.81	343.04
SEP	332.60	334.32	335.62	337.33	338.83	339.64	341.28	342.51
OCT	332.62	334.23	335.45	337.18	338.66	339.56	341.14	342.37
NOV	333.04	334.54	335.68	337.41	338.87	339.88	341.40	342.60
DEC	332.95	334.39	335.50	337.21	338.62	339.76	341.20	342.38
AVE	0.00	333.82	335.24	336.77	338.28	339.28	340.81	342.04
JANO	0.00	332.88	334.31	335.42	337.10	338.49	339.69	341.09

MONTH	1985
JAN	342.28
FEB	342.46
MAR	342.42
APR	342.55
MAY	342.94
JUN	0.00
JUL	0.00
AUG	0.00
SEP	0.00
OCT	0.00
NOV	0.00
DEC	0.00
AVE	0.00
JANO	342.26

STATION: NZD
 CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
 TREND (EXPONENTIAL + SPLINE) AT 15TH OF MONTH :
 (JANO REFERS TO VALUE AT BEGINNING OF YEAR)

MONTH	YEAR							
	1977	1978	1979	1980	1981	1982	1983	1984
JAN	0.00	333.29	334.74	335.85	337.51	338.87	340.13	341.49
FEB	0.00	333.37	334.89	336.05	337.64	338.92	340.30	341.58
MAR	0.00	333.42	335.00	336.26	337.79	338.97	340.45	341.66
APR	0.00	333.46	335.07	336.47	337.98	339.02	340.58	341.75
MAY	0.00	333.53	335.14	336.67	338.17	339.08	340.69	341.86
JUN	0.00	333.64	335.20	336.84	338.33	339.14	340.79	341.99
JUL	331.91	333.79	335.28	336.97	338.45	339.22	340.89	342.11
AUG	332.16	333.96	335.36	337.07	338.56	339.33	340.99	342.22
SEP	332.41	334.13	335.43	337.15	338.64	339.46	341.09	342.33
OCT	332.67	334.28	335.50	337.23	338.71	339.61	341.19	342.42
NOV	332.94	334.43	335.58	337.31	338.77	339.78	341.29	342.50
DEC	333.14	334.58	335.69	337.40	338.82	339.95	341.39	342.58
AVE	0.00	333.82	335.24	336.77	338.28	339.28	340.82	342.04
JANO	0.00	333.23	334.66	335.77	337.46	338.84	340.04	341.44

MONTH	YEAR
	1985
JAN	342.65
FEB	342.74
MAR	342.85
APR	342.97
MAY	343.11
JUN	0.00
JUL	0.00
AUG	0.00
SEP	0.00
OCT	0.00
NOV	0.00
DEC	0.00
AVE	0.00
JANO	342.61

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ATMOSPHERIC CARBON DIOXIDE PROGRAM
ANALYSIS OF STATION DATA USING PROGRAM "STATION FIT"

STATION: SOUTH POLE

RUN NO. SP0-72

COORDINATES : 90.05 -

ELEVATION ABOVE SEA LEVEL : 2810 METERS

BEGINNING DATE : 17-JUN-1957

FINAL DATE : 1-FEB-1985

TYPE OF DATA PROCESSED : CONTINUOUS: 15 CALENDAR-DAY AVERAGES
(4-JUN-1960 TO 19-OCT-1963)
FLASK : DAILY AVERAGES
(17-JUN-1957 TO 1-FEB-1985)

CALIBRATION SCALE : 1985

NUMBER OF HARMONICS : 4

COMPUTED SPLINE RMS SECOND DERIVATIVE : MONTHLY NODES : 30.00
DATA POINT NODES : 39.75

COMPUTED GAIN FACTOR FOR SEASONAL CYCLE
REFERENCED TO BASE YEAR = 1956 : 2.9962 % PER YEAR

COMPUTED SPLINE STIFFNESS PARAMETER (SIGMA) : 0.1775 PPM

DATE OF RUN : 25-FEB-1986

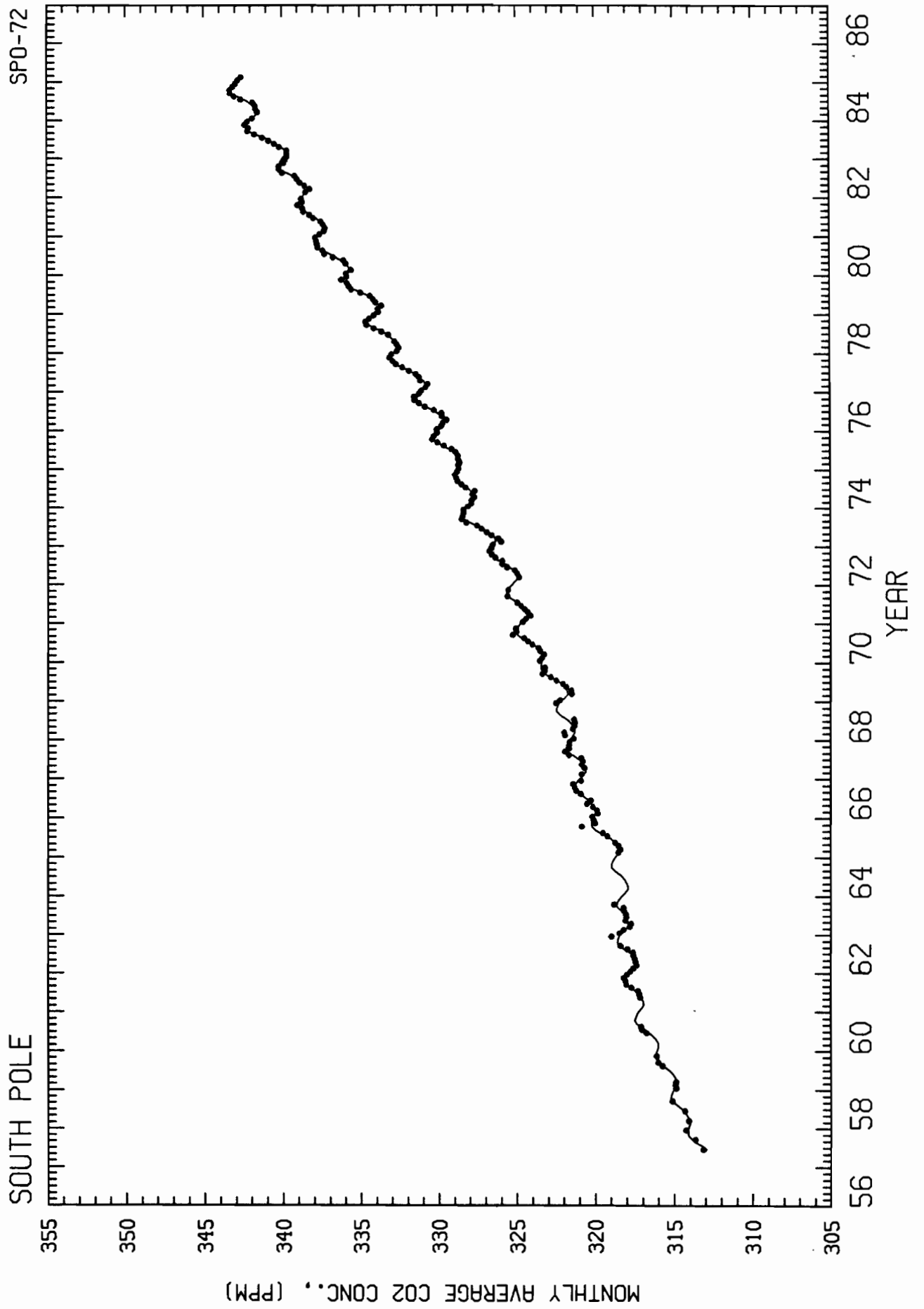
BASE YEAR MIDDLE YEAR
56 71.2740

FIRST AND LAST 5 DATA POINTS ARE :

NO.	MEAS	SYMB	YEAR	CONC (PPM)
1	1	1	1.4603	313.17
2	2	1	1.6712	313.34
3	4	1	1.7288	313.82
4	1	1	1.9753	314.25
5	1	1	1.9781	314.25
492	3	1	28.9563	342.96
493	3	1	29.0027	342.80
494	3	1	29.0411	342.89
495	2	1	29.0658	342.85
496	8	1	29.0877	342.71

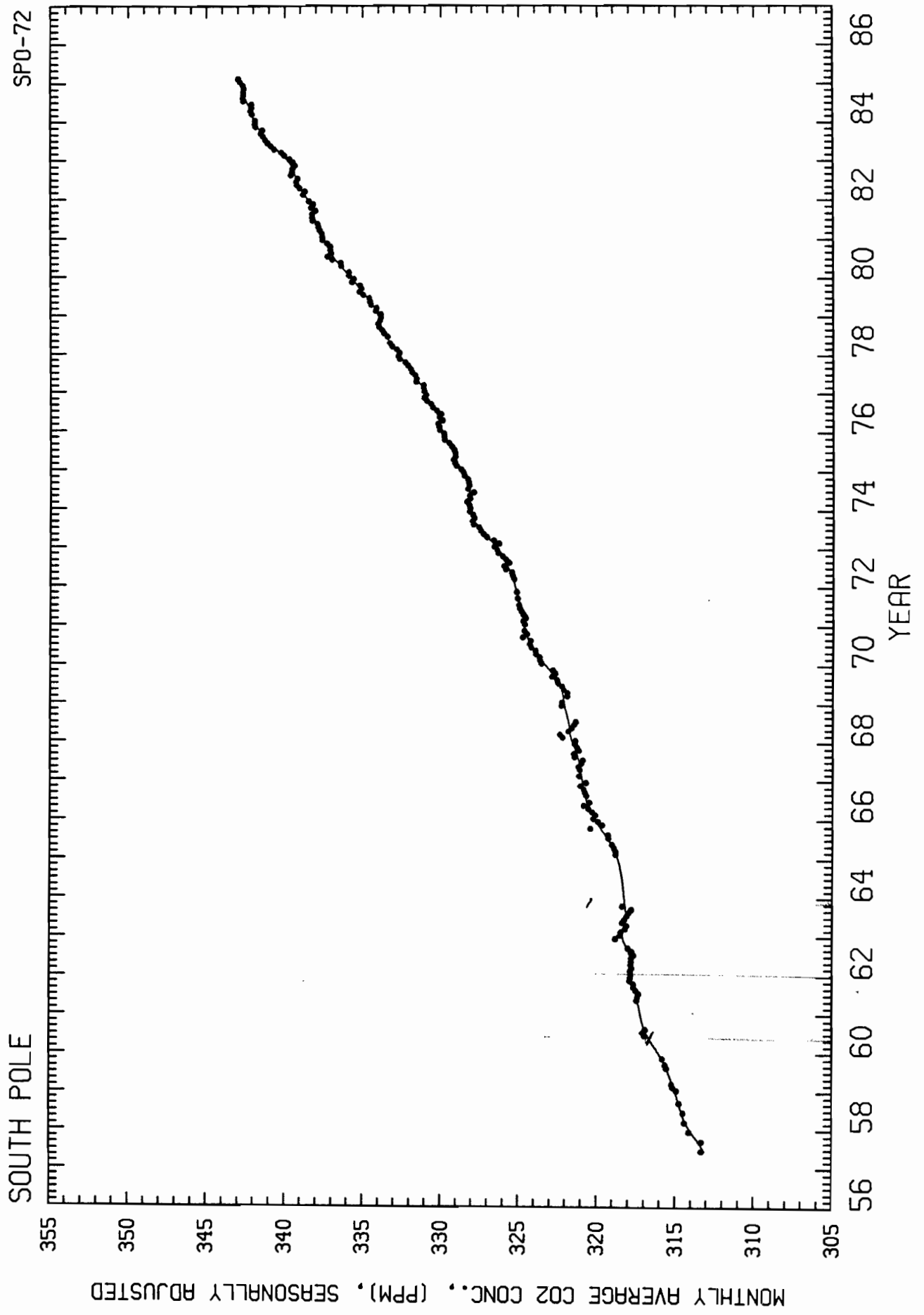
INPUT PARAMETERS :

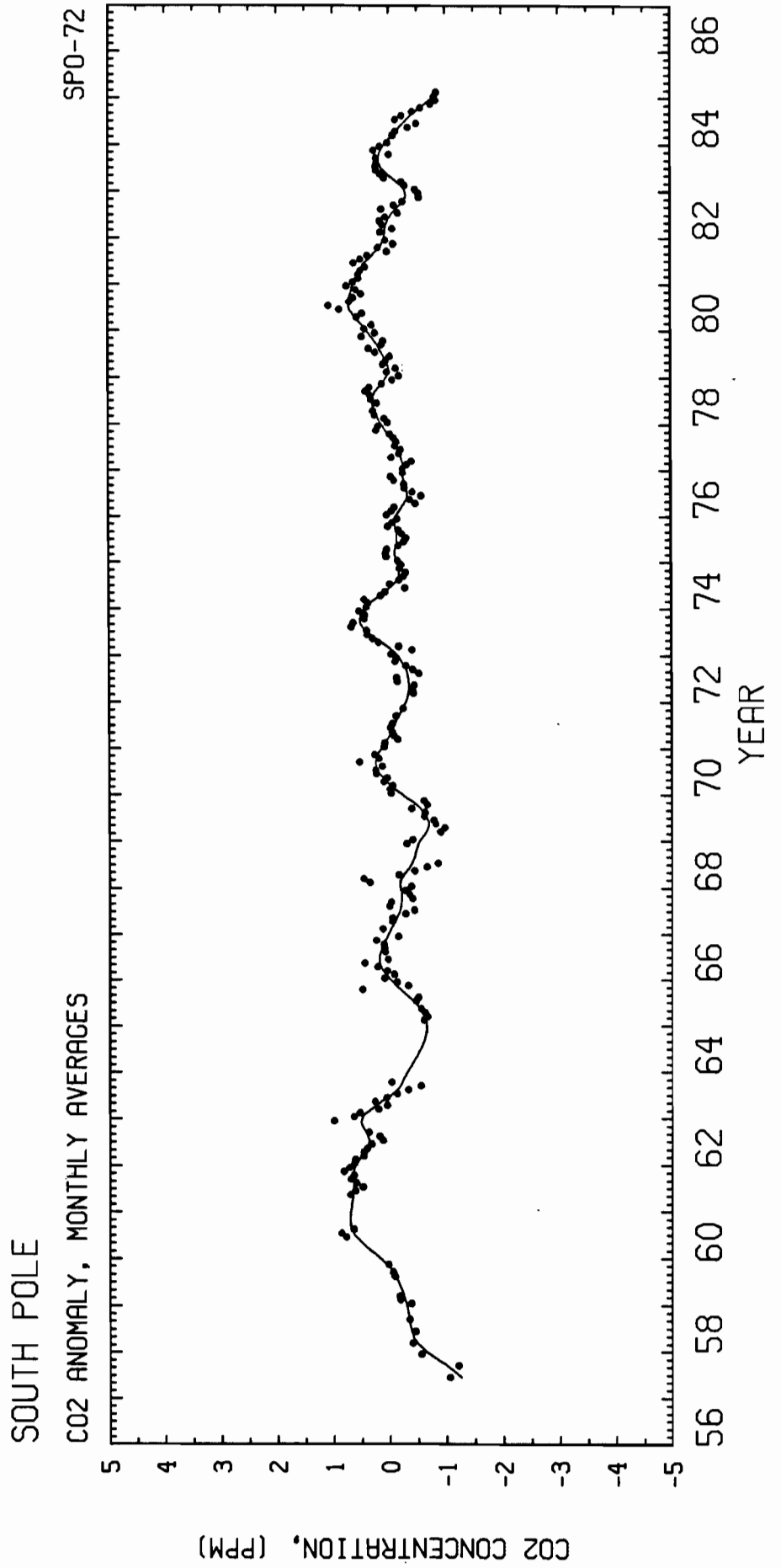
STATION	NO. HARMONICS	GAIN	SOUTHERN HEM.	SQ2DI
SP0	4	YES	YES	30

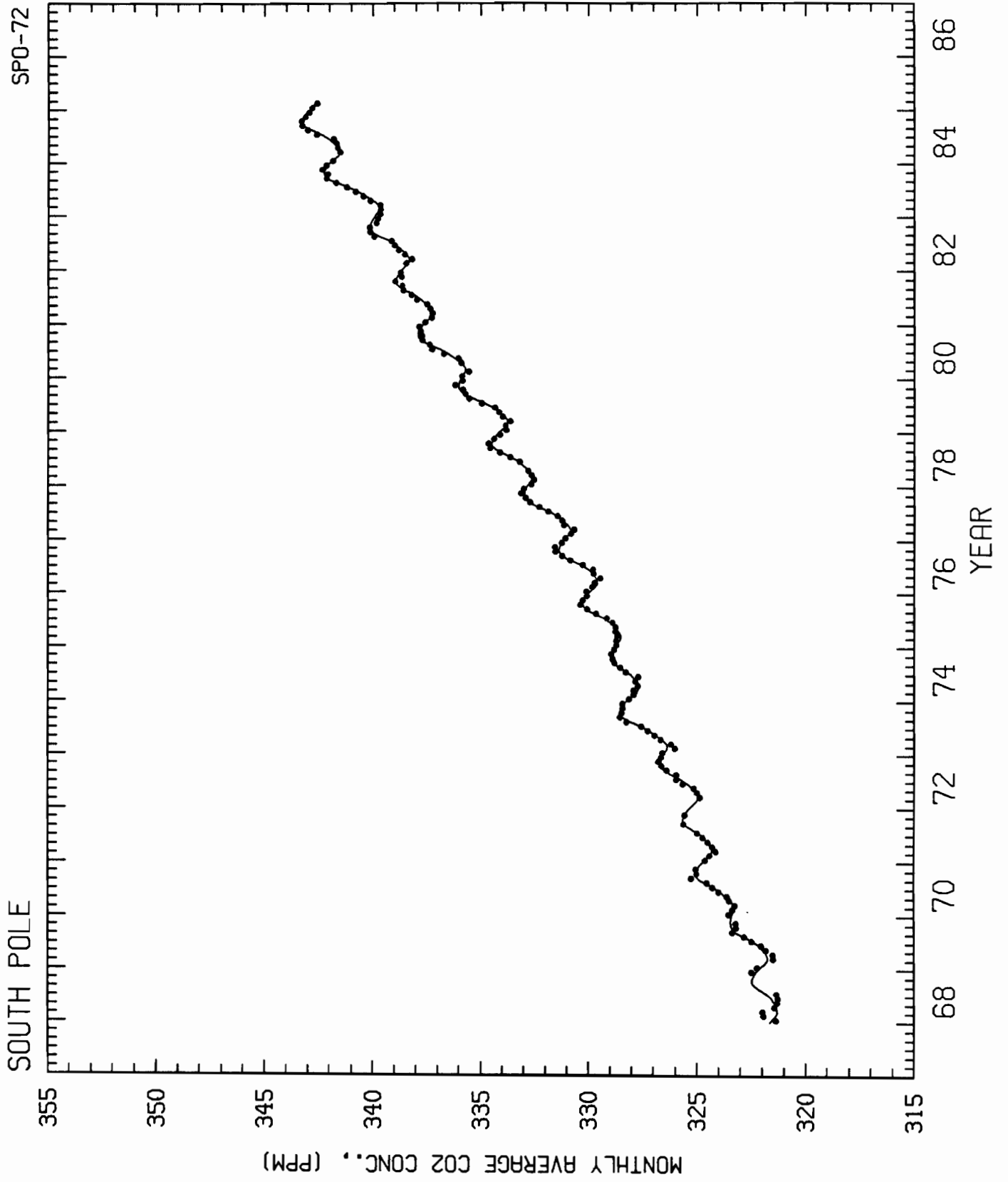


SOUTH POLE

SPO-72





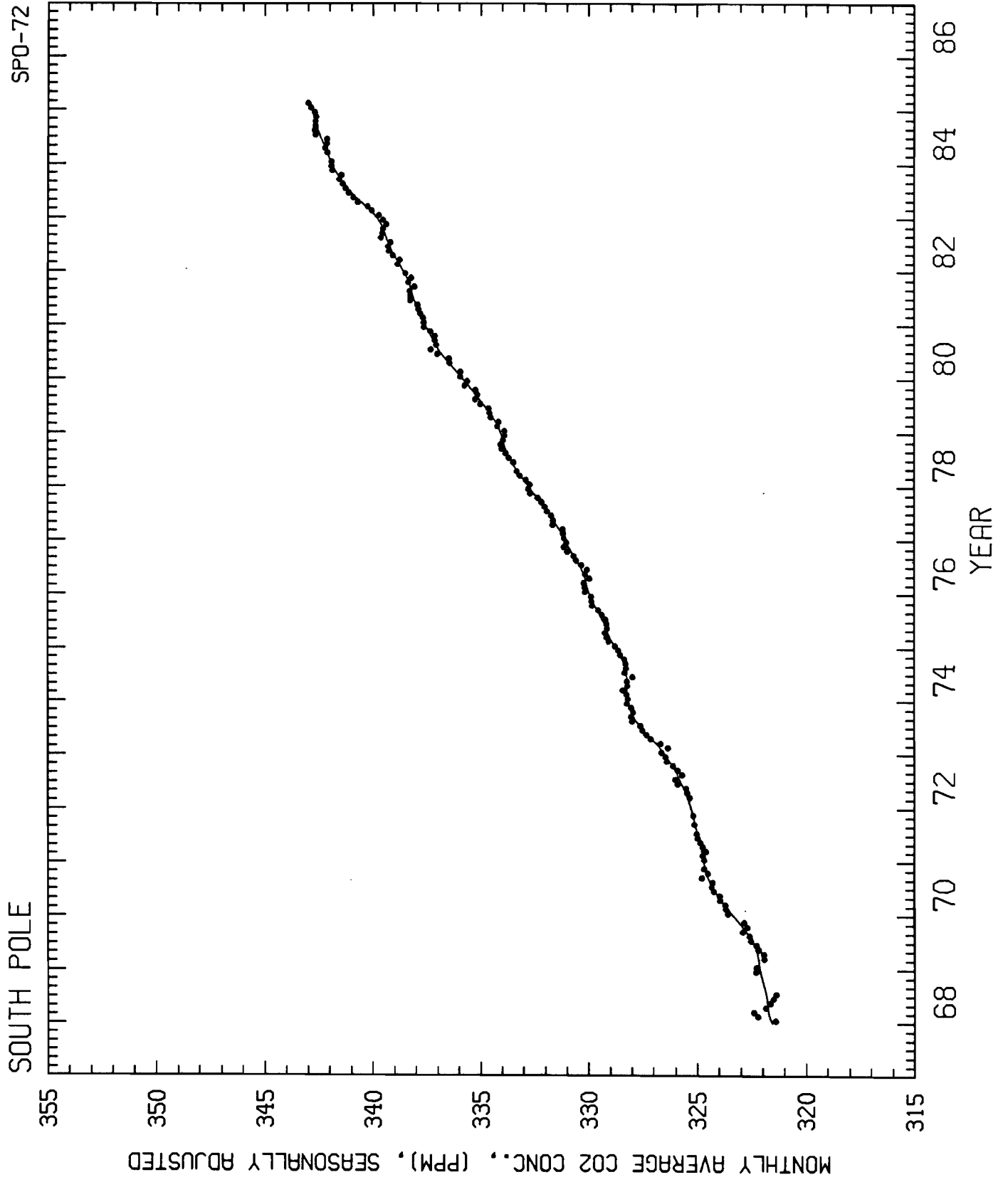


SOUTH POLE

SPO-72

MONTHLY AVERAGE CO2 CONC., (PPM)

YEAR

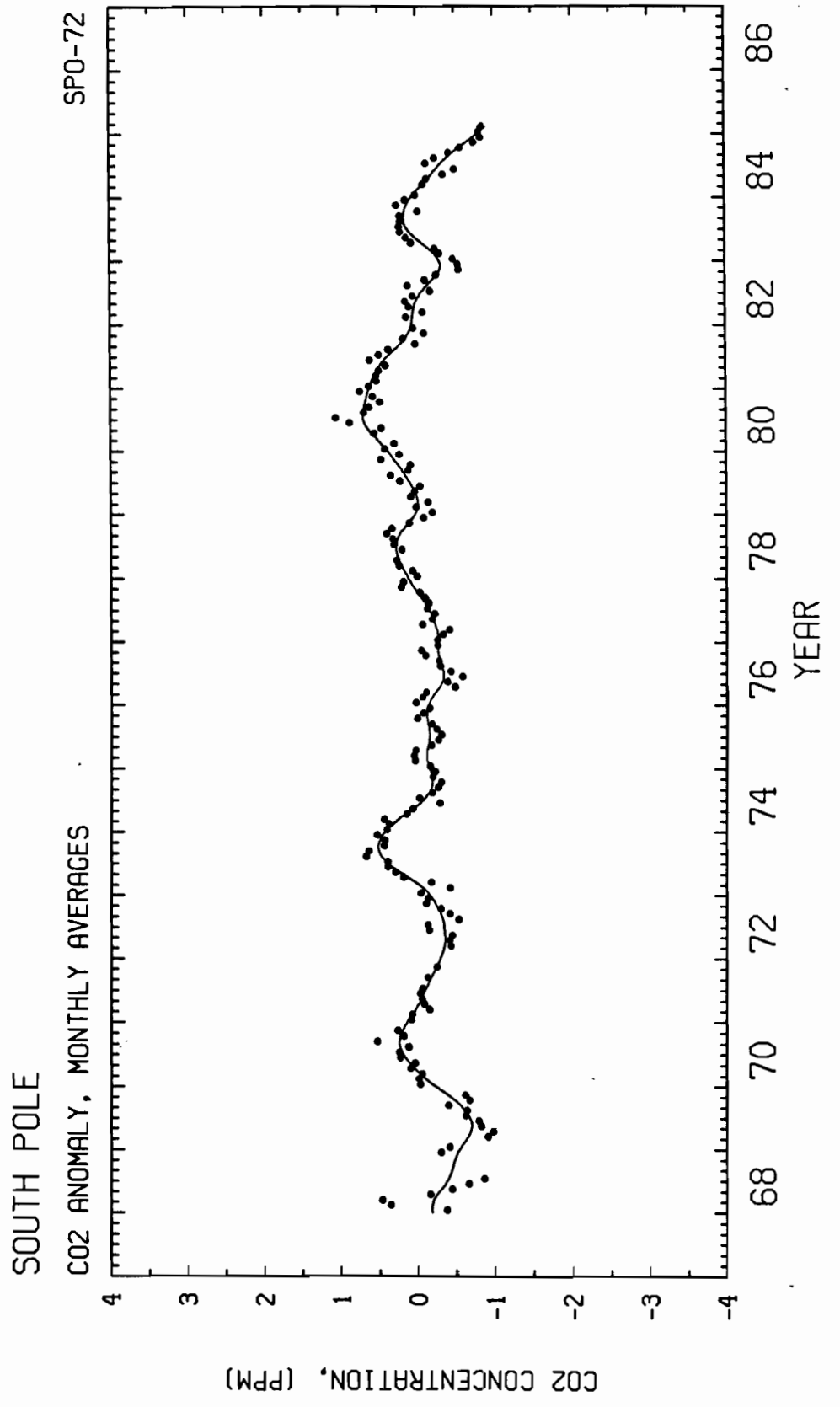


SOUTH POLE

SP0-72

MONTHLY AVERAGE CO2 CONC., (PPM), SEASONALLY ADJUSTED

YEAR



1. FIT OF CUBIC + HARMONICS

FITTED COEFFICIENTS / ERROR :

CONST	T	T**2	T**3
0.31372E+03	0.49576E+00	0.11181E-01	0.24824E-03
0.13818E+00	0.33690E-01	0.23381E-02	0.48234E-04
SIN(2*PI*T)	COS(2*PI*T)	SIN(4*PI*T)	COS(4*PI*T)
-0.51099E+00	0.54418E-01	-0.29452E-01	-0.24149E-01
0.25791E-01	0.25555E-01	0.25433E-01	0.25795E-01
SIN(6*PI*T)	COS(6*PI*T)	SIN(8*PI*T)	COS(8*PI*T)
0.36347E-02	0.33289E-01	-0.22225E-02	-0.78009E-02
0.25336E-01	0.25938E-01	0.26190E-01	0.25184E-01

STANDARD ERROR OF FIT: DEL = 0.40201E+00

SEASONAL CYCLE FIT (PPM):

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
-0.09	-0.37	-0.50	-0.46	-0.34	-0.22	0.00	0.31	0.51	0.52	0.41	0.20

2. FIT OF EXPONENTIAL + HARMONICS

FIT TO NON-LINEAR TERMS :

ITER	CHISQ	FL
1	0.18754E+00	0.10000E-03
2	0.16862E+00	0.10000E-04
3	0.16408E+00	0.10000E-05
4	0.16407E+00	0.10000E-06
5	0.16407E+00	0.10000E-07

FINAL VALUES LISTED ABOVE APPLY TO FIT

FIT IS TO C1 + C2*EXP(R*T) + (1 + A*T)*HARMONICS

FITTED COEFFICIENTS / ERROR :

A	C1	C2	R
0.23602E-01	0.30161E+03	0.11990E+02	0.43234E-01
0.13019E-01	0.38345E+00	0.32538E+00	0.65590E-03
SIN(2*PI*T)	COS(2*PI*T)	SIN(4*PI*T)	COS(4*PI*T)
-0.36723E+00	0.34895E-01	-0.19435E-01	-0.19970E-01
0.62837E-01	0.19037E-01	0.18370E-01	0.18705E-01
SIN(6*PI*T)	COS(6*PI*T)	SIN(8*PI*T)	COS(8*PI*T)
0.12889E-02	0.22983E-01	-0.22288E-02	-0.24066E-02
0.18035E-01	0.18768E-01	0.18554E-01	0.18001E-01

STANDARD ERROR OF FIT: DEL = 0.40505E+00

SEASONAL CYCLE FIT (PPM):

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
-0.10	-0.37	-0.48	-0.45	-0.34	-0.21	0.00	0.31	0.50	0.51	0.40	0.19

3. FIT OF CHISQUARE-TYPE SPLINE + HARMONICS TO EXPONENTIALLY ADJUSTED DATA

FINAL VALUE FOR SIGMA IS 0.1775
FINAL COEFFICIENTS ARE BELOW

SPLINE-HARMONICS ITERATION NUMBER 1

FIT OF NON-LINEAR GAIN :

ITER	CHISQ	FL
1	0.31297E-01	0.10000E-03
2	0.31297E-01	0.10000E-04

FIT IS TO CHISQUARED-TYPE-SPLINE + (1 + A*T)*HARMONICS
FITTED COEFFICIENTS / ERROR :

A			
0.29962E-01			
0.67534E-02			
SIN(2*PI*T)	COS(2*PI*T)	SIN(4*PI*T)	COS(4*PI*T)
-0.32865E+00	0.57278E-01	-0.13348E-01	-0.19871E-01
0.26985E-01	0.86527E-02	0.74048E-02	0.76063E-02
SIN(6*PI*T)	COS(6*PI*T)	SIN(8*PI*T)	COS(8*PI*T)
0.11445E-01	0.19862E-01	0.26264E-03	-0.11459E-03
0.73481E-02	0.76084E-02	0.74911E-02	0.72987E-02
DEL	SQ2D	SQ2DI	
0.17746E+00	0.39750E+02	0.30000E+02	

CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
FITTED SEASONAL FUNCTION (HARMONICS) EVALUATED AT MIDDLE YEAR :

SEASONAL CYCLE (PPM):

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
-0.04	-0.31	-0.45	-0.44	-0.35	-0.24	-0.04	0.26	0.49	0.51	0.39	0.20

CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
AVERAGE OVER MONTHS OF AVERAGES AT 15TH OF MONTH, ADJUSTED FOR TREND :

SEASONAL CYCLE (PPM):

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
-0.04	-0.29	-0.47	-0.46	-0.37	-0.26	-0.04	0.26	0.49	0.55	0.41	0.23

GAIN FOR EACH YEAR :

YEAR	PTS	DEL	GAIN ERROR				
1958	7	0.18	0.4458 0.1827	1973	23	0.31	1.1223 0.1960
1959	8	0.10	0.6567 0.0960	1974	20	0.15	1.0797 0.0931
1960	14	0.15	0.7032 0.1011	1975	24	0.10	0.8950 0.0586
1961	6	0.15	0.6287 0.2561	1976	25	0.15	1.2055 0.0921
1962	23	0.14	0.8683 0.0817	1977	27	0.13	1.2721 0.0718
1963	20	0.24	0.9154 0.1646	1978	22	0.13	1.1723 0.0790
1964	11	0.29	0.8275 0.2155	1979	24	0.13	1.2828 0.0789
1965	9	0.10	0.9377 0.0826	1980	18	0.15	1.1776 0.1090
1966	17	0.27	0.9394 0.2077	1981	23	0.16	1.0635 0.0952
1967	17	0.13	0.8709 0.0852	1982	22	0.13	1.0384 0.0798
1968	18	0.28	0.7398 0.1876	1983	22	0.18	1.1301 0.1175
1969	11	0.22	1.5487 0.2613	1984	20	0.12	1.3205 0.0814
1970	20	0.14	0.9267 0.0889	1985	15	0.11	1.2419 0.0905
1971	18	0.15	1.1481 0.1033				
1972	11	0.12	1.0841 0.0972				

STATION: SPO
 CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
 AVERAGES OF DATA ADJUSTED TO THE 15TH OF EACH MONTH :

MONTH	YEAR							
	1957	1958	1959	1960	1961	1962	1963	1964
JAN	0.00	0.00	314.88	0.00	0.00	317.79	318.48	0.00
FEB	0.00	0.00	314.92	0.00	0.00	317.60	318.21	0.00
MAR	0.00	314.07	314.87	0.00	0.00	317.40	317.81	0.00
APR	0.00	0.00	0.00	0.00	0.00	317.45	317.73	0.00
MAY	0.00	0.00	0.00	0.00	317.16	317.52	318.07	0.00
JUN	313.15	314.32	0.00	316.75	317.22	317.59	318.02	0.00
JUL	0.00	0.00	0.00	317.04	317.30	317.61	318.06	0.00
AUG	0.00	0.00	315.74	317.11	317.71	317.98	318.17	0.00
SEP	313.66	315.10	316.00	0.00	318.04	318.41	318.21	0.00
OCT	0.00	0.00	0.00	0.00	318.07	0.00	318.81	0.00
NOV	0.00	0.00	316.11	0.00	318.20	0.00	0.00	0.00
DEC	314.26	0.00	0.00	0.00	318.01	318.97	0.00	0.00
AVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

MONTH	YEAR							
	1965	1966	1967	1968	1969	1970	1971	1972
JAN	0.00	320.18	0.00	321.37	322.23	323.54	324.63	0.00
FEB	318.53	319.84	320.85	321.93	0.00	323.38	324.44	0.00
MAR	318.41	319.89	0.00	321.97	321.49	323.27	324.14	324.88
APR	318.52	320.15	320.69	321.43	321.51	323.51	324.31	325.00
MAY	318.73	320.52	320.84	321.31	321.83	323.63	324.51	325.14
JUN	0.00	320.28	320.79	321.28	322.05	324.02	324.74	325.65
JUL	319.23	0.00	320.89	321.34	322.48	324.30	324.99	325.96
AUG	319.52	320.91	321.67	0.00	322.83	324.56	0.00	325.95
SEP	0.00	321.20	321.93	0.00	323.37	325.27	325.62	326.39
OCT	320.86	321.30	321.65	0.00	323.21	325.03	0.00	326.62
NOV	320.01	321.40	321.66	0.00	323.22	325.07	325.57	326.78
DEC	320.11	320.90	321.63	322.50	0.00	0.00	0.00	326.65
AVE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

MONTH	YEAR							
	1973	1974	1975	1976	1977	1978	1979	1980
JAN	326.58	328.13	328.72	330.11	331.09	332.67	333.84	335.89
FEB	326.02	327.91	328.73	329.84	330.83	332.54	333.86	335.57
MAR	326.19	327.91	328.68	329.73	330.68	332.65	333.65	0.00
APR	326.66	327.73	328.77	329.47	331.15	332.81	334.00	335.92
MAY	326.95	327.84	328.76	329.77	331.23	0.00	334.18	336.05
JUN	327.26	327.70	328.90	329.81	331.45	333.20	334.36	336.73
JUL	327.56	328.28	329.17	330.29	331.87	333.65	334.97	337.27
AUG	328.24	328.53	329.66	330.86	332.30	334.12	335.56	337.38
SEP	328.54	328.79	330.07	331.23	332.72	334.58	335.72	337.71
OCT	328.47	328.88	330.39	331.54	332.93	334.66	335.84	337.73
NOV	328.42	328.95	330.28	331.57	333.14	334.41	336.20	337.80
DEC	328.42	328.82	330.10	331.25	333.01	334.13	335.87	337.87
AVE	327.44	328.29	329.35	330.46	331.87	0.00	334.84	0.00

MONTH	YEAR							
	1973	1974	1975	1976	1977	1978	1979	1980
JAN	326.63	328.18	328.77	330.16	331.14	332.72	333.89	335.94
FEB	326.34	328.24	329.06	330.18	331.17	332.89	334.22	335.93
MAR	326.66	328.39	329.17	330.23	331.19	333.17	334.17	0.00
APR	327.12	328.20	329.25	329.96	331.65	333.31	334.52	336.44
MAY	327.32	328.21	329.15	330.16	331.63	0.00	334.59	336.47
JUN	327.51	327.96	329.15	330.07	331.71	333.47	334.64	337.01
JUL	327.60	328.32	329.21	330.32	331.92	333.69	335.01	337.31
AUG	327.97	328.25	329.38	330.57	332.01	333.82	335.26	337.07
SEP	328.03	328.27	329.54	330.69	332.17	334.02	335.15	337.13
OCT	327.93	328.33	329.83	330.97	332.34	334.06	335.24	337.12
NOV	328.01	328.54	329.86	331.14	332.70	333.96	335.74	337.33
DEC	328.21	328.61	329.88	331.03	332.78	333.89	335.63	337.63
AVE	327.44	328.29	329.35	330.46	331.87	0.00	334.84	0.00

MONTH	YEAR				
	1981	1982	1983	1984	1985
JAN	337.64	0.00	339.73	341.93	342.88
FEB	337.67	338.85	340.05	0.00	342.99
MAR	337.80	338.76	340.24	342.12	0.00
APR	337.89	339.08	340.69	342.22	0.00
MAY	337.93	339.26	340.90	342.14	0.00
JUN	338.27	339.30	341.12	342.14	0.00
JUL	338.28	339.20	341.27	342.66	0.00
AUG	338.29	339.63	341.40	342.70	0.00
SEP	338.07	339.55	341.55	342.67	0.00
OCT	338.36	339.54	341.46	342.67	0.00
NOV	338.22	339.38	341.88	342.64	0.00
DEC	338.49	339.53	341.92	342.70	0.00
AVE	338.07	0.00	341.02	0.00	0.00

STATION: SPO
 CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
 FITTED FUNCTION (EXPONENTIAL + SPLINE + HARMONICS) AT 15TH OF MONTH :
 (JANO REFERS TO VALUE AT BEGINNING OF YEAR)

MONTH	YEAR							
	1957	1958	1959	1960	1961	1962	1963	1964
JAN	0.00	314.06	314.96	316.07	317.19	317.74	318.31	318.22
FEB	0.00	313.99	314.84	316.00	317.02	317.54	318.09	318.02
MAR	0.00	313.98	314.79	316.02	316.94	317.42	317.94	317.91
APR	0.00	314.09	314.88	316.17	316.99	317.44	317.91	317.95
MAY	0.00	314.23	315.02	316.36	317.11	317.53	317.95	318.05
JUN	312.96	314.39	315.19	316.57	317.25	317.65	318.00	318.17
JUL	313.22	314.60	315.42	316.82	317.46	317.86	318.14	318.37
AUG	313.57	314.88	315.73	317.14	317.76	318.18	318.37	318.66
SEP	313.88	315.11	316.00	317.39	318.01	318.46	318.57	318.90
OCT	314.04	315.19	316.12	317.47	318.09	318.58	318.62	318.96
NOV	314.10	315.16	316.14	317.43	318.03	318.57	318.54	318.90
DEC	314.11	315.08	316.12	317.34	317.92	318.49	318.41	318.80
AVE	0.00	314.56	315.43	316.73	317.48	317.96	318.24	318.41
JANO	0.00	314.09	315.03	316.10	317.27	317.84	318.41	318.32

MONTH	YEAR							
	1965	1966	1967	1968	1969	1970	1971	1972
JAN	318.65	320.10	320.91	321.57	322.08	323.38	324.66	325.25
FEB	318.49	319.98	320.70	321.39	321.86	323.29	324.44	325.05
MAR	318.45	319.96	320.60	321.30	321.75	323.30	324.33	324.96
APR	318.56	320.08	320.64	321.34	321.80	323.47	324.38	325.06
MAY	318.75	320.25	320.76	321.45	321.95	323.70	324.52	325.24
JUN	318.97	320.43	320.91	321.58	322.15	323.95	324.69	325.45
JUL	319.28	320.67	321.14	321.80	322.45	324.26	324.94	325.75
AUG	319.68	320.99	321.48	322.13	322.86	324.66	325.29	326.16
SEP	320.03	321.24	321.75	322.39	323.22	324.98	325.58	326.50
OCT	320.20	321.31	321.84	322.47	323.40	325.08	325.65	326.65
NOV	320.22	321.23	321.80	322.41	323.45	325.01	325.58	326.65
DEC	320.19	321.10	321.71	322.28	323.44	324.87	325.45	326.60
AVE	319.29	320.61	321.19	321.84	322.53	324.16	324.96	325.78
JANO	318.73	320.15	321.01	321.65	322.19	323.42	324.77	325.35

MONTH	YEAR							
	1973	1974	1975	1976	1977	1978	1979	1980
JAN	326.49	328.13	328.74	329.94	331.08	332.79	334.05	335.87
FEB	326.38	327.87	328.57	329.71	330.89	332.64	333.84	335.74
MAR	326.39	327.73	328.51	329.60	330.84	332.62	333.78	335.75
APR	326.60	327.74	328.62	329.67	330.98	332.77	333.92	335.95
MAY	326.89	327.83	328.80	329.84	331.22	333.01	334.17	336.23
JUN	327.21	327.97	329.02	330.06	331.49	333.28	334.46	336.54
JUL	327.58	328.20	329.33	330.38	331.86	333.62	334.85	336.91
AUG	328.05	328.57	329.76	330.83	332.35	334.06	335.37	337.39
SEP	328.42	328.88	330.12	331.21	332.77	334.40	335.80	337.78
OCT	328.54	328.99	330.26	331.37	332.96	334.50	336.00	337.92
NOV	328.49	328.96	330.23	331.35	332.98	334.41	336.03	337.88
DEC	328.35	328.88	330.13	331.25	332.92	334.26	335.98	337.76
AVE	327.45	328.31	329.34	330.43	331.86	333.53	334.85	336.81
JANO	326.55	328.25	328.82	330.04	331.17	332.86	334.16	335.93

MONTH	YEAR				
	1981	1982	1983	1984	1985
JAN	337.58	338.59	339.87	341.90	342.82
FEB	337.36	338.39	339.74	341.65	342.55
MAR	337.28	338.33	339.76	341.55	0.00
APR	337.38	338.46	340.00	341.65	0.00
MAY	337.58	338.68	340.34	341.85	0.00
JUN	337.79	338.93	340.70	342.08	0.00
JUL	338.10	339.25	341.13	342.42	0.00
AUG	338.52	339.70	341.67	342.87	0.00
SEP	338.86	340.05	342.11	343.23	0.00
OCT	338.96	340.16	342.28	343.33	0.00
NOV	338.89	340.10	342.24	343.23	0.00
DEC	338.77	340.00	342.11	343.06	0.00
AVE	338.09	339.22	341.00	342.40	0.00
JANO	337.68	338.68	339.94	342.01	342.94

STATION: SPD
 CONCENTRATION OF ATMOSPHERIC CO2 (PPM)
 TREND (EXPONENTIAL + SPLINE) AT 15TH OF MONTH :
 (JANO REFERS TO VALUE AT BEGINNING OF YEAR)

MONTH	YEAR							
	1957	1958	1959	1960	1961	1962	1963	1964
JAN	0.00	314.10	315.00	316.10	317.22	317.78	318.35	318.26
FEB	0.00	314.22	315.07	316.24	317.26	317.79	318.35	318.28
MAR	0.00	314.32	315.14	316.37	317.30	317.79	318.32	318.30
APR	0.00	314.41	315.21	316.51	317.35	317.80	318.28	318.33
MAY	0.00	314.49	315.29	316.64	317.39	317.82	318.24	318.35
JUN	313.13	314.56	315.36	316.75	317.44	317.85	318.20	318.37
JUL	313.25	314.63	315.45	316.85	317.49	317.89	318.17	318.40
AUG	313.38	314.69	315.53	316.94	317.55	317.97	318.16	318.44
SEP	313.52	314.75	315.63	317.01	317.62	318.06	318.16	318.47
OCT	313.67	314.81	315.73	317.07	317.67	318.16	318.19	318.52
NOV	313.82	314.87	315.84	317.13	317.72	318.25	318.21	318.57
DEC	313.96	314.93	315.96	317.18	317.76	318.32	318.24	318.62

317.48

AVE	0.00	314.56	315.43	316.73	317.48	317.96	318.24	318.41
JANO	0.00	314.03	314.96	316.03	317.20	317.77	318.34	318.25

MONTH	YEAR							
	1965	1966	1967	1968	1969	1970	1971	1972
JAN	318.69	320.14	320.95	321.61	322.13	323.42	324.71	325.30
FEB	318.77	320.26	320.99	321.68	322.15	323.60	324.75	325.36
MAR	318.84	320.37	321.02	321.73	322.18	323.75	324.78	325.43
APR	318.94	320.48	321.05	321.76	322.23	323.90	324.83	325.51
MAY	319.05	320.57	321.09	321.78	322.29	324.04	324.88	325.60
JUN	319.18	320.64	321.13	321.80	322.38	324.18	324.93	325.69
JUL	319.31	320.70	321.18	321.83	322.48	324.30	324.98	325.78
AUG	319.45	320.76	321.24	321.88	322.61	324.41	325.03	325.89
SEP	319.60	320.80	321.30	321.93	322.75	324.50	325.09	326.00
OCT	319.74	320.84	321.37	321.99	322.90	324.57	325.14	326.12
NOV	319.88	320.88	321.44	322.04	323.07	324.63	325.19	326.25
DEC	320.01	320.92	321.52	322.09	323.25	324.67	325.24	326.39

AVE	319.29	320.61	321.19	321.84	322.54	324.16	324.96	325.78
JANO	318.66	320.08	320.94	321.57	322.11	323.34	324.69	325.27

MONTH	YEAR							
	1973	1974	1975	1976	1977	1978	1979	1980
JAN	326.53	328.18	328.79	329.98	331.13	332.84	334.10	335.92
FEB	326.70	328.20	328.90	330.05	331.24	333.00	334.20	336.11
MAR	326.87	328.21	329.00	330.10	331.35	333.14	334.30	336.29
APR	327.06	328.21	329.10	330.16	331.48	333.28	334.44	336.47
MAY	327.26	328.21	329.18	330.22	331.62	333.42	334.58	336.65
JUN	327.45	328.22	329.27	330.31	331.76	333.55	334.74	336.81
JUL	327.62	328.25	329.37	330.42	331.90	333.66	334.90	336.95
AUG	327.78	328.29	329.48	330.54	332.06	333.76	335.06	337.08
SEP	327.90	328.36	329.59	330.67	332.22	333.84	335.23	337.20
OCT	328.00	328.44	329.70	330.80	332.37	333.91	335.39	337.30
NOV	328.08	328.55	329.81	330.91	332.54	333.96	335.57	337.41
DEC	328.14	328.66	329.90	331.02	332.69	334.02	335.74	337.52

AVE	327.45	328.31	329.34	330.43	331.86	333.53	334.85	336.81
JANO	326.46	328.16	328.73	329.95	331.08	332.77	334.06	335.84

MONTH	YEAR				
	1981	1982	1983	1984	1985
JAN	337.63	338.64	339.92	341.95	342.87
FEB	337.73	338.77	340.12	342.04	342.95
MAR	337.82	338.88	340.32	342.12	0.00
APR	337.92	339.01	340.56	342.21	0.00
MAY	338.00	339.12	340.78	342.29	0.00
JUN	338.08	339.22	340.99	342.38	0.00
JUL	338.14	339.30	341.18	342.46	0.00
AUG	338.20	339.38	341.35	342.54	0.00
SEP	338.26	339.45	341.50	342.61	0.00
OCT	338.34	339.53	341.63	342.67	0.00
NOV	338.42	339.62	341.75	342.74	0.00
DEC	338.52	339.75	341.86	342.80	0.00
AVE	338.09	339.22	341.00	342.40	0.00
JANO	337.58	338.58	339.83	341.91	342.84



Section 4: FØRTRAN program

C PROGRAM QSTFIT (STATION FIT) VERSION 2 (FROM QSTFIT.FOR.69)
C
C PURPOSE
C MAKES CURVE FITS TO ATMOSPHERIC CO2 CONCENTRATIONS
C MEASURED AT VARIOUS FIELD STATIONS
C THE PRINCIPAL FIT IS OF THE FORM
C
C $C1 + C2 \cdot \exp(R \cdot T) + (1 + A \cdot T) \cdot \text{HARMONICS} + \text{CUBIC SPLINE}$
C
C WHERE THE CUBIC SPLINE IS A REINSCH SMOOTHING SPLINE
C
C SEE [REINSCH, C.H., SMOOTHING BY SPLINE FUNCTIONS,
C NUMERISCHE MATHEMATIK 10, 177-183, 1967.]
C
C AUTHORSHIP
C ROBERT BACASTOW, MODIFIED BY TIMOTHY WHORF (1985)
C SCRIPPS INSTITUTION OF OCEANOGRAPHY
C CODE
C WRITTEN IN FORTRAN-77 FOR VAX 11/750
C
C DESCRIPTION OF PARAMETERS
C DAV(I) - AVERAGE CO2 CONCENTRATIONS IN PPM (E.G. DAILY OR
C WEEKLY), FOR A SPECIFIED DATE
C YR(I) - DECIMAL YEAR OF CO2 DATA RELATIVE TO YEAR NYMIN
C MEAS(I) - NUMBER OF MEASUREMENTS FOR A SPECIFIED DATE
C (NO. OF FLASKS OR NO. OF DAILY MEANS)
C NSYMB(I) - DESIGNATES TYPE OF MEASUREMENT (FLASK, CONTINUOUS)
C NSQ - RUN NUMBER OF FIT FOR GIVEN STATION
C
C IDATE - YEAR, MONTH, DAY OF SPECIFIED DATE (E.G. 850325)
C (YEARS ARE RELATIVE TO 1900 IF NOT OTHERWISE STATED)
C NYMIN - START YEAR MINUS 1 (INTEGER)
C NYMAX - END YEAR PLUS 1 RELATIVE TO NYMIN (INTEGER)
C NYPT - END YEAR RELATIVE TO NYMIN (INTEGER)
C YMID - DECIMAL MIDDLE YEAR OF DATA
C NSTA - STATION NAME (3 LETTER CODE)
C NSTAT - LONGER STATION NAME UP TO 24 CHARACTERS
C NAT - INDICATES IF SEASONAL GAIN FACTOR DESIRABLE
C 1 - FOR NO SEASONAL GAIN INCREASE
C 0 - IF SEASONAL GAIN FACTOR DESIRED
C NSHEMP - SETS HEMISPHERE FOR SEASONAL AMPLITUDE CALCULATION
C 1 - SOUTHERN HEMISPHERE
C 0 - NORTHERN HEMISPHERE
C IPRT - INDICATES FINAL ITERATION OF FIT TO CHISQUARED
C TYPE SPLINE + HARMONICS
C NH - NUMBER OF HARMONICS (TYPICALLY NH = 4)
C MAXIMUM NH IS 8 WITH COEFF. ARRAY DIMENSION AE(20)
C AE(I) - ARRAY FOR STORING EXPONENTIAL AND HARMONIC FIT
C COEFFICIENTS (ALSO INITIAL CUBIC FIT COEFFS.)
C AH(I) - ARRAY FOR STORING SEASONAL GAIN FACTOR (AH(1))
C AND HARMONIC COEFFICIENTS
C AG(I) - ARRAY FOR STORING HARMONIC COEFFICIENTS OF
C AVERAGE SEASONAL CYCLE AND RELATIVE SEASONAL
C AMPLITUDES AND OFFSETS
C SIGM - SPLINE STIFFNESS PARAMETER OF BEST FIT CHISQUARED
C SPLINE THAT GIVES A DESIRED VALUE OF SQ2D
C SQ2D - SQUARE ROOT OF THE AVERAGE INTEGRAL OF THE SQUARED
C SECOND DERIVATIVE OF CHISQUARED SPLINE
C SQ2DI - SQUARE ROOT OF THE AVERAGE INTEGRAL OF THE SQUARED
C SECOND DERIVATIVE OF INTERPOLATING SPLINE

C SIGT(I) - ESTIMATE OF SPLINE STIFFNESS PARAMETER IN PPM
C SQ2DT(I) - VALUE OF SQ2D CORRESPONDING TO SIGT(I)
C
C SPQF(I) - CHISQUARED CUBIC SPLINE 0TH ORDER COEFFICIENTS
C RETURNED FROM IMSL
C SPQC(I) - CHISQUARED CUBIC SPLINE 1ST,2ND,3RD ORDER
C COEFFICIENTS RETURNED FROM IMSL
C SPKF(I) - KNOTS TYPE SPLINE 0TH ORDER COEFFS. FROM IMSL
C SPKC(I) - KNOTS TYPE SPLINE 1ST,2ND,3RD ORDER IMSL COEFFS.
C SPMF(I) - INTERPOLATING CUBIC SPLINE 0TH ORDER COEFFS.
C SPMC(I) - INTERPOLATING CUBIC SPLINE 1ST,2ND,3RD ORDER COEFFS.

C COMMENTS

C ARRAY SIZE OF DAV(I),YR(I), ... ALLOWS FOR 11000 DATA POINTS
C (MAUNA LOA DAILIES NUMBER 8000 AS OF APRIL 1986)
C WORK AREA SIZE OF WK(I) IS 140000 FOR SPLINE COMPUTATIONS
C ARRAY SIZE OF NY(I),YR15(I), ... IS SET FOR 40 YEARS OF DATA
C (SOUTH POLE DATA STARTS IN 1957, SO HAVE 29 YRS NOW)

C FUNCTIONS REQUIRED

C HRM0(Y) ; HRMS(Y) ; HRMSE(Y) ; TRE(Y)
C EXP0(Y) ; SPQN(Y) ; SPKN(Y)
C HRM(T,I,A) ; HRMC(T,I,A) ; HRMEL(T,I,A)
C HR(T,I,A) ; STR(T,I,A) ; GRNG(X,Y,XV)
C SQ2DF(NK,YK,C,IND)
C SPLINT(N,X,YS,C,IND,LI,T)
C FCHISQ(Y,SIGMAY,NPTS,NFREE,MODE,YFIT)

C SUBROUTINES REQUIRED

C CUBFIT ; EXPFIT ; TBL(STD,STB)
C DHRM(T,I,A,DA,NT,DV)
C DHRMC(T,I,A,DA,NT,DV)
C DHRMEL(T,I,A,DA,NT,DV)
C DSTR(T,I,A,DA,NT,DV)
C SPKFIT(DMNTH,SQ2D,IPRT,ITER,DEL,NSQ)
C SPQFIT(SIGM,SQ2D,IPRT,ITER,DEL,NSQ)
C MATINV(ARRAY,NORDER,DET)
C CURFIT(X,Y,SIGMAY,NPTS,NTERMS,MODE,A,DELTA,
C SIGMAA,FLAMDA,YFIT,CHISQR,FUNCTN,FDERIV,NAT)

C IMSL ROUTINES REQUIRED

C ICSFKU(YR,DAVT,ID,MO,YK,NYK,SPKF,SPKC,40,ERROR,WK,IER)
C LEAST SQUARES APPROX. BY CUBIC SPLINES - FIXED KNOTS
C ICSSCU(YR,DAVT,SIG,ID,SM,SPQF,SPQC,11000,WK,IER)
C CUBIC SMOOTHING SPLINE
C 2ND DERIVATIVE IS ZERO AT END POINTS
C ICSICU(YM,SPMF,JM,BM,SPMC,480,IER)
C INTERPOLATING APPROXIMATION BY CUBIC SPLINES WITH
C ARBITRARY 2ND DERIVATIVE END CONDITIONS

C LINK WITH IMSLD/LIBRARY

C MODIFICATIONS FROM VERSION 1

- C 1) ERROR MATRIX IN CURFIT MODIFIED SO AS TO GIVE
C CORRECTED ERROR MATRIX UNAFFECTED BY FLAMDA
C 2) SQ2D IS NOW CALCULATED FROM SPLINE INTERPOLATED
C AT 15TH OF MONTHS (SQ2DI)
C 3) FOR STATION LJO (LA JOLLA, CA) UNEQUAL WEIGHTING
C USED; WEEKLY CONTINUOUS DATA WEIGHTED BY NO. OF

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C          DAYS IN WEEK (MODE = 1 IN SUBROUTINE CURFIT)
C          4) PARAMETER DEL CORRECTED BY SQRT((ID-9)/(ID-12)) FOR
C          3 EXTRA DEGREES OF FREEDOM FROM EXPONENTIAL FIT
C
C
C          UNIT 8: (INPUT) AVERAGE CO2 VALUES (FLASK OR CONTINUOUS DATA)
C          UNIT 9: (OUTPUT) SAVED HARMONIC AND SPLINE COEFFICIENTS
C          UNIT 10: (OUTPUT) STATION FIT PRINTOUT OF FITS AND TABLES
C
C *****
C
C          IMPLICIT REAL*8 (A-H,O-Z)
C          COMMON/DAT/ YR(11000),DAV(11000),DAVFT(11000)
C          COMMON/NSY/ MEAS(11000),NSYMB(11000)
C          COMMON/SPL/ SIG(11000),DAVS(11000),DAVT(11000),WK(140000)
C          COMMON/SPQ/SPQF(11000),SPQC(11000,3)
C          COMMON/GB/DAVB(366,40),YRB(366,40),NY(40),AG(20)
C          COMMON/SE/SEA15(12),SEA(12),SIGD(1),SIGA(20),DA(1),
X          YR15(12,40),NSHEMP,LABL(2)
C          COMMON/CON/NYMIN,NYMAX,NYPT,NH,MODE,ID,NSTA(1),YMID,NAT,
X          AE(20),AH(20)
C          COMMON/INT/YM(480),SPMF(480),SPMC(480,3),BM(4),DM(480),IS,IF,JM
C          COMMON/MON/MONTH(12),MONT(14)
C          DIMENSION IDATE(3),DA15(12,40),NS15(12,40),NA15(12,40),
X          STB(40),ST15(12,40)
C          DIMENSION SIGT(3),SQ2DT(3)
C          DIMENSION YESNO(2)
C          CHARACTER NSTAT*24
C          EXTERNAL HRMS,HRMSE,TRE,EXPO
C          LOGICAL BEG
C
C          DATA MONTH/31,28,31,30,31,30,31,31,30,31,30,31/
C          DATA MONT/' JAN',',', ' FEB',',', ' MAR',',', ' APR',',', ' MAY',',', ' JUN',',',
X          ' JUL',',', ' AUG',',', ' SEP',',', ' OCT',',', ' NOV',',', ' DEC',',', ' JANO',',', ' AVE'/'
C          DATA LABL/'KNT=',',', 'SIG='/'
C          DATA NBLNK/'',',', ' /
C          DATA YESNO/'YES',',', ' NO'/'
C
C          1002 FORMAT(1H0,'ENTER STATION NAME, NUMBER OF'
X          ' HARMONICS TO REPRESENT SEASONAL CYCLE,')/
C          Y 1H ,',', '1 IF SEASONAL CYCLE GAIN IS TO BE SET TO 0.'
C          Z ',', ' AND 0 IF NOT,')/
C          1 1H ,',', '1 IF STATION IS IN SOUTHERN HEM. AND'
C          2 ',', ' 0 IF IN NORTHERN HEM.,')/
C          3 1H ,',', 'AND SEQUENCE NO.OF FIT;')/
C          4 1H ,',', 'FORMAT A3,1X,I1,1X,I1,1X,I1,1X,I2')
C          1010 FORMAT(A3,1X,I1,1X,I1,1X,I1,1X,I2)
C          1012 FORMAT(1H0,'STATION NO. HARMONICS GAIN SOUTHERN HEM.'
X          ' SEQ. NO.')
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W 1H , ' SIGMA IS THE SPLINE STIFFNESS PARAMETER; A'
X ' REASONABLE'/1H , ' ESTIMATE OF SIGMA IS THE AVERAGE'
Y ' ERROR PER DATUM.'/
Z 1H , ' IF SIGMA IS 99.99 THEN (REPEAT OF) FIT '
1 ' WILL BE SKIPPED.'
2 /1H , ' TO CHECK CONVERGENCE, COMPARE FINAL FIT RESULTS'
3 ' TO NEXT TO FINAL RESULTS.')
```

1062 FORMAT(2F10.4)

1064 FORMAT(1H0,' SIGMA')

1066 FORMAT(1H ,2F10.4)

1070 FORMAT(1H1,'3. FIT OF KNOTS-TYPE SPLINE'

```
W ' + HARMONICS TO EXPONENTIALLY ADJUSTED DATA.'/
X 1H , ' ENTER APPROX. KNOT SPACING, DMNTH (MONTHS), '
Y ' FORMAT F10.4 .'/
Z 1H , ' IF SPACING IS 99.99 THEN (REPEAT OF) FIT WILL BE'
2 ' SKIPPED.'/
3 1H , ' TO CHECK CONVERGENCE, COMPARE FINAL FIT RESULTS'
2 ' TO NEXT TO FINAL RESULTS.')
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1074 FORMAT(1H0,' DMNTH')

1076 FORMAT(1H0,' ENTER NUMBER OF ITERATIONS OF SPLINE'

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X ' AND HARMONICS TO BE DONE.'/
Y 1H , ' ENTER NEGATIVE NUMBER OF ITERATIONS IF'
Z ' COEFFICIENTS ARE NOT TO BE RESET.'/
W 1H , ' FORMAT I2')
```

1078 FORMAT(I2)

1082 FORMAT(I1)

1120 FORMAT(1H0,' SEASONAL CYCLE :'/

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W 1H , ' JAN FEB MAR APR MAY JUN',
X ' JUL AUG SEP OCT NOV DEC')
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1122 FORMAT(1H ,12F6.2)

1130 FORMAT(1H0,' YEAR OUTSIDE ALLOWED RANGE, YEAR = ',E14.5)

1150 FORMAT(1H , ' AVERAGES OF DATA ADJUSTED TO THE 15TH OF',

```
X ' EACH MONTH :')
```

1160 FORMAT(1H , ' FITTED FUNCTION (EXPONENTIAL + SPLINE + ',

```
X ' HARMONICS) AT 15TH OF MONTH :'/1H ,
Y ' (JANO REFERS TO VALUE AT BEGINNING OF YEAR)')
```

1180 FORMAT(1H , ' AVERAGE OVER MONTHS OF AVERAGES AT 15TH'

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X ' OF MONTH, ADJUSTED FOR TREND :')
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1182 FORMAT(1H , ' FITTED SEASONAL FUNCTION (HARMONICS)'

```
X ' EVALUATED AT MIDDLE YEAR :')
```

1183 FORMAT(1H , ' FITTED SEASONAL FUNCTION (HARMONICS) :')

1185 FORMAT(1H , ' AVERAGES OF DATA ADJUSTED TO THE 15TH'

```
X ' OF EACH MONTH AND SEASONALLY ADJUSTED :')
```

1188 FORMAT(1H , ' TREND (EXPONENTIAL + SPLINE) AT'

```
X ' 15TH OF MONTH :'/,1H ,
Y ' (JANO REFERS TO VALUE AT BEGINNING OF YEAR)')
```

1201 FORMAT(1H ,6E13.5)

1202 FORMAT(4(1H ,6E13.5/))

1203 FORMAT(1H ,9X,A3,1X,3I13,2E13.5)

1220 FORMAT(1H1,'5. FIT OF CHISQUARED-TYPE SPLINE'

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V ' + HARMONICS TO EXPONENTIALLY ADJUSTED DATA'/1H ,
W ' TO GIVE A PARTICULAR VALUE OF SQ2D.'/1H ,
X ' ENTER DESIRED SQ2D AND ESTIMATE OF SIGMA,'
Y ' FORMAT 2F10.4 .',/1H ,
Z ' SQ2D IS THE SQUARE ROOT OF THE ANNUAL AVERAGE INTEGRAL'
1 ' OF THE SQUARED'/1H ,
2 ' SECOND DERIVATIVE OF THE SPLINE.'/1H ,
3 ' SIGMA IS THE SPLINE STIFFNESS PARAMETER IN PPM.'/1H ,
4 ' IF SQ2D=0., FIT WILL BE SKIPPED;'/1H , ' IF SIGMA=0.,'
5 ' ESTIMATE WILL BE FROM KNOTS-TYPE SPLINE'
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2 /1H , ' TO CHECK CONVERGENCE, COMPARE FINAL FIT RESULTS'
3 ' TO NEXT TO FINAL RESULTS.' )
1224 FORMAT(1H0, ' SQ2D SIGMA' )
1230 FORMAT(1H0, ' FIND SIGMA (MAXIMUM) THAT GIVES STRAIGHT LINE' )
1232 FORMAT(1H1, ' FIND REASONABLE SIGMA WITH KNOTS-TYPE SPLINE'
X ' + HARMONICS FIT' )
1234 FORMAT(1H1, ' TRY SIGMA = ', F10.4)
1235 FORMAT(1H1, ' FINAL VALUE FOR SIGMA IS ', F10.4/1H ,
X ' FINAL COEFFICIENTS ARE BELOW' )
1250 FORMAT(1H1, 'THE FOLLOWING DATA ARE PROVISIONAL'
U ' AND SHOULD NOT BE REPRODUCED'
V ' WITHOUT THE' /1H , 'PERMISSION OF DR. C. D. KEELING'
W ' OF THE SCRIPPS INSTITUTION'
X ' OF OCEANOGRAPHY' )
1252 FORMAT(1H0, ' STATION: ', A3, /1H ,
X ' CONCENTRATION OF ATMOSPHERIC CO2 (PPM)' )
1320 FORMAT(1H1, ' STATION: ', A)
1322 FORMAT(1H0, ' FIRST YEAR : ', I4)
1324 FORMAT(1H0, ' LAST YEAR : ', I4)
1326 FORMAT(1H0, ' NUMBER OF HARMONICS : ', I1)
1328 FORMAT(1H0, ' INCREASE FACTOR FOR SEASONAL CYCLE : ', A3)
1330 FORMAT(1H0, ' SPLINE STIFFNESS PARAMETER (SIGMA) : ', F8.4)
1332 FORMAT(1H0, ' INTERPOL. SPLINE RMS SECOND DERIVATIVE : ', E13.5)
1350 FORMAT(1H0, 'ENTER STATION NAME, FORMAT A16' )
1352 FORMAT(A)
1354 FORMAT(1H0, ' STATION: ', A)
C
OPEN(UNIT=8, FILE='MDAV', STATUS='OLD' )
OPEN(UNIT=9, FILE='SPL', STATUS='NEW' )
OPEN(UNIT=10, FILE='STAPRT', STATUS='NEW' )
C
C READ INPUT DATA: DATE (YR,MO,DY), NO. OF MEASUREMENTS,
C DATA TYPE CODE AND A CO2 CONCENTRATION
C
N=0
10 N=N+1
READ(8, 1030, END=20) IDATE, MEAS(N), NSYMB(N), DAV(N)
YR(N)=YEAR(IDATE)
GO TO 10
20 ID=N-1
C
C TIME MEASURED FROM NYMIN TO NYMIN + NYMAX
C (SET UP THIS WAY ORIGINALLY FOR PLOTS)
C
NYMIN=YR(1) - 1.
DO 30 I=1, ID
30 YR(I)=YR(I)-NYMIN
NYMAX=YR(ID) + 1.
YMID=NYMIN+(YR(1)+YR(ID))/2.
WRITE(6, 1032)
WRITE(6, 1034) NYMIN, YMID
WRITE(10, 1032)
WRITE(10, 1034) NYMIN, YMID
YMID=YMID-NYMIN
C
C TABLES WILL GO FROM NYMIN+1 TO NYPT
NYPT=YR(ID)
C
C PRINT FIRST AND LAST 5 DATA POINTS
WRITE(6, 1040)
WRITE(10, 1040)
```

```
DO 31 I=1,5
WRITE(10,1044)I,MEAS(I),NSYMB(I),YR(I),DAV(I)
31 WRITE(6,1044)I,MEAS(I),NSYMB(I),YR(I),DAV(I)
DO 32 I=ID-4,ID
WRITE(10,1044)I,MEAS(I),NSYMB(I),YR(I),DAV(I)
32 WRITE(6,1044)I,MEAS(I),NSYMB(I),YR(I),DAV(I)
C
C FILL SEA15 WITH FRACTION OF YEAR FOR 15TH OF MONTH
IDATE(1)=1
IDATE(3)=15
DO 33 I=1,12
IDATE(2)=I
33 SEA15(I)=YEAR(IDATE)-1.
C
C FILL YR15(MONTH,IYEAR) WITH YEAR RELATIVE TO
C NYMIN FOR 15TH OF EACH MONTH
IDATE(3)=15
DO 34 K=1,40
IDATE(1)=NYMIN+K
DO 34 I=1,12
IDATE(2)=I
YR15(I,K)=YEAR(IDATE)-NYMIN
34 CONTINUE
C
C FIND YEAR AND MONTH OF DATA
C SAVE INDEX OF YR15 FOR BEGINNING AND END OF ADJUSTED DATA
C FOR INTERPOLATING SPLINE IN SPQFIT (INSERTED FEB 1986)
BEG=.TRUE.
DO 55 I=1,ID
DO 49 K=1,40
YD=15./365.
N=NYMIN+K
IF(MOD(N,4).EQ.0)YD=15./366.
DO 49 J=1,12
Y=YR15(J,K)-YD
IF(Y.GE.YR(I))GO TO 50
49 CONTINUE
WRITE(6,1130)YR(I)
WRITE(10,1130)YR(I)
50 IF(J.EQ.1)GO TO 52
J=J-1
GO TO 53
52 J=12
K=K-1
53 IF(.NOT.BEG)GO TO 54
IS=12*(K-1)+J
BEG=.FALSE.
54 IF=12*(K-1)+J
55 CONTINUE
C
C READ STATION NAME (NSTA), NUMBER OF HARMONICS TO REPRESENT
C SEASONAL CYCLE (NH), NAT = 1 IF SEASONAL GAIN IS TO
C BE SET TO 0. AND 0 OTHERWISE, NSHEMP = 1 FOR SOUTHERN
C HEMISPHERE AND 0 FOR NORTHERN HEMISPHERE, AND SEQUENCE NO.
C OF FIT.
C MAXIMUM NUMBER OF HARMONICS IS 8 WITH COEF. DIMENSION 20
WRITE(6,1002)
READ(5,1010)NSTA(1),NH,NAT,NSHEMP,NSQ
I=NAT+1
J=2-NSHEMP
```

```
WRITE(6,1012)
WRITE(6,1014)NSTA,NH,YESNO(I),YESNO(J),NSQ
WRITE(10,1012)
WRITE(10,1014)NSTA,NH,YESNO(I),YESNO(J),NSQ
C READ LONGER STATION NAME
WRITE(6,1350)
READ(5,1352)NSTAT
WRITE(6,1354)NSTAT
WRITE(10,1354)NSTAT
C
C IN GENERAL, ALL POINTS IN FITS WILL HAVE EQUAL WEIGHT
C FOR LJO: USE WEEKLIES FOR CONTINUOUS DTA AND USE NO. OF
C DAYS FOR THE WEIGHT FACTOR; MODE =1 IN CURFIT
MODE=0
DO 38 I=1,ID
SIG(I)=1.
IF(NSTA(1).EQ.'LJO'.AND.NSYMB(I).EQ.0)THEN
SIG(I)=SQRT(7./MEAS(I)*1.)
MODE=1
ENDIF
38 CONTINUE
C
C ZERO COEFFICIENT ARRAYS
DO 40 I=1,20
AG(I)=0.
AH(I)=0.
40 AE(I)=0.
C
C *****
C 1. 1ST FIT IS CUBIC + HARMONICS
C
C STORE RESULTING COEFFICIENTS IN AE
CALL CUBFIT
C
C *****
C 2. 2ND FIT IS EXPONENTIAL + HARMONICS
C
C STORE RESULTING COEFFICIENTS IN AE
AE(2)=AE(1)
AE(1)=0.
AE(3)=17.
AE(4)=.04
SIGA(1)=0.
C OTHER COEFFICIENTS AE ARE AS FROM CUBIC + HARMONICS FIT
CALL EXPFIT
C
C SUBTRACT EXPONENTIAL FIT FROM DATA
DO 90 I=1,ID
90 DAV(I)=DAV(I)-AE(2)-AE(3)*EXP(AE(4)*YR(I))
C
C *****
C 3. 3RD FIT IS CHISQUARED TYPE CUBIC SPLINE
C
C START FIT WITH FIT TO KNOTS TYPE SPLINE + HARMONIC
C STORE RESULTING COEFFICIENTS IN AH.
C INITIALLY SET GAIN AND HARMONIC COEFFICIENTS TO EXPONENTIAL
C FIT VALUES.
AH(1)=AE(1)
DO 102 I=2,17
102 AH(I)=AE(I+3)
```

```
105 CONTINUE
C READ APPROX. KNOT SPACING IN MONTHS. ACTUAL SPACING (DMNTH)
C WILL BE ADJUSTED GEQ SO THAT SPACING IS UNIFORM.
C IF SPACING IS 99.99 THEN SKIP (REPEAT OF) FIT AND GO ON.
  WRITE(6,1070)
  WRITE(10,1070)
  READ(5,1062)DMNTH
  IF(DMNTH.EQ.99.99)GO TO 120
  WRITE(6,1074)
  WRITE(6,1066)DMNTH
  WRITE(10,1074)
  WRITE(10,1066)DMNTH
C READ NUMBER OF ITERATIONS, NEGATIVE NUMBER OF ITERATIONS
C IF GAIN AND HARMONIC COEFFICIENTS ARE NOT TO BE RESET
C TO EXPONENTIAL FIT VALUES.
  WRITE(6,1076)
  READ(5,1078)ITER
  IF(ITER.GT.0)GO TO 110
  ITER=-ITER
  GO TO 114
C RESET COEFFICIENTS
110 AH(1)=AE(1)
  DO 112 I=2,17
112 AH(I)=AE(I+3)
114 CONTINUE
  IPRT=0
  CALL SPKFIT(DMNTH,SQDUM,IPRT,ITER,DEL,NSQ)
  GO TO 105
120 CONTINUE
  WRITE(6,1074)
  WRITE(6,1066)DMNTH
  WRITE(10,1074)
  WRITE(10,1066)DMNTH
C
C FIT CHISQUARED TYPE SPLINE + HARMONIC
  SIGM=99.99
C INITIALLY SET GAIN AND HARMONIC COEFFICIENTS TO EXPONENTIAL
C FIT VALUES.
  AH(1)=AE(1)
  DO 128 I=2,17
128 AH(I)=AE(I+3)
130 CONTINUE
C READ SPLINE SIGMA (SIGN). IF SIGN IS 99.99,
C THEN SKIP (REPEAT OF) FIT AND GO ON.
  WRITE(6,1060)
  WRITE(10,1060)
  READ(5,1062)SIGN
  WRITE(6,1064)
  WRITE(6,1066)SIGN
  WRITE(10,1064)
  WRITE(10,1066)SIGN
  IF(SIGN.EQ.99.99)GO TO 140
C READ NUMBER OF ITERATIONS, NEGATIVE NUMBER OF ITERATIONS
C IF GAIN AND HARMONIC COEFFICIENTS ARE NOT TO BE RESET
C TO EXPONENTIAL FIT VALUES.
  WRITE(6,1076)
  READ(5,1078)ITER
  IF(ITER.GT.0)GO TO 132
  ITER=-ITER
  GO TO 136
```



```
C RESET COEFFICIENTS
132 AH(1)=AE(1)
    DO 134 I=2,17
134 AH(I)=AE(I+3)
136 CONTINUE
    IPRT=0
    CALL SPQFIT(SIGN,SQDUM,IPRT,ITER,SIGM,NSQ)
    GO TO 130
140 CONTINUE
C
C FIT CHISQUARED TYPE SPLINE + HARMONICS TO GIVE PARTICULAR SQ2D
C READ DESIRED SQ2D AND GOOD ESTIMATE OF CORRESPONDING
C SIGM (IF 0. THEN ESTIMATE FROM KNOTS TYPE SPLINE FIT).
C IF SQ2D IS 0. THEN SKIP (REPEAT OF) FIT.
    WRITE(6,1220)
    WRITE(10,1220)
    READ(5,1062)SQ2D,SIGN
    WRITE(6,1224)
    WRITE(6,1066)SQ2D,SIGN
    WRITE(10,1224)
    WRITE(10,1066)SQ2D,SIGN
    IF(SQ2D.EQ.0.)GO TO 200
C INITIALLY SET GAIN AND HARMONIC COEFFICIENTS TO
C EXPONENTIAL FIT VALUES.
    AH(1)=AE(1)
    DO 150 I=2,17
150 AH(I)=AE(I+3)
    IPRT=0
C FIND VALUE OF STIFFNESS PARAMETER SIG THAT MAKES SPLINE
C A STRAIGHT LINE.
    WRITE(6,1230)
    WRITE(10,1230)
    ITER=1
    SIGM=10.
    CALL SPQFIT(SIGM,SQ2DT(3),IPRT,ITER,SIGMAX,NSQ)
    SIGT(3)=SIGMAX
    IF(SIGN.NE.0.)GO TO 154
C ESTIMATE SIG THROUGH KNOTS TYPE SPLINE FIT (IF INPUT 0.)
    WRITE(6,1232)
    WRITE(10,1232)
    DMNTH=13.
    CALL SPKFIT(DMNTH,SQDUM,IPRT,ITER,SIGN,NSQ)
154 SIGT(2)=SIGN
    WRITE(6,1234)SIGN
    WRITE(10,1234)SIGN
    ITER=2
    CALL SPQFIT(SIGT(2),SQ2DT(2),IPRT,ITER,DEL,NSQ)
C SIGT(1)=SIGT(2)+(SIGT(2)-SIGT(3))/(SQ2DT(2)-SQ2DT(3))*
C X (SQ2D-SQ2DT(2))
156 SIGT(3)=SIGT(2)*1.10
    SIGT(1)=SIGT(2)*.90
157 WRITE(6,1234)SIGT(1)
    WRITE(10,1234)SIGT(1)
    ITER=1
    CALL SPQFIT(SIGT(1),SQ2DT(1),IPRT,ITER,DEL,NSQ)
    DO 160 J=1,16
    SIGM=GRNG(SQ2DT,SIGT,SQ2D)
    IF(SIGM.GT.SIGMAX)SIGM=SIGMAX
    IF(SIGM.LT.0.)GOTO 156
    SIGT(3)=SIGT(2)
```

```
SQ2DT(3)=SQ2DT(2)
SIGT(2)=SIGT(1)
SQ2DT(2)=SQ2DT(1)
SIGT(1)=SIGM
WRITE(6,1234)SIGM
WRITE(10,1234)SIGM
CALL SPQFIT(SIGT(1),SQ2DT(1),IPRT,ITER,DEL,NSQ)
IF(ABS(SQ2DT(1)-SQ2D).LT.0.05)GO TO 170
160 CONTINUE
170 WRITE(6,1234)SIGM
WRITE(10,1234)SIGM
ITER=1
CALL SPQFIT(SIGM,SQ2D,IPRT,ITER,DEL,NSQ)
WRITE(6,1235)SIGM
WRITE(10,1235)SIGM

C *****
C OUTPUT OF SPLINE FIT
C PRINTS TABLE OF MONTHLY VALUES OF CHISQUARED TYPE SPLINE
C AND RELATIVE SEASONAL AMPLITUDES FOR EACH YEAR
C
C IPRT=1
C CALL SPQFIT(SIGM,SQ2D,IPRT,ITER,DEL,NSQ)
200 CONTINUE
C
C FROM HERE ON, CHISQUARED TYPE SPLINE WITH SIGMA OF
C LAST FIT IS USED FOR CO2 ANOMALY. IF NO CHISQUARED TYPE
C SPLINE WAS FIT, THIS WILL BE 99.99.
C
C ADJUST DATA TO 15TH OF MONTH AND MAKE AVERAGES
C ZERO ARRAYS
C DO 205 K=1,40
C DO 205 J=1,12
C NS15(J,K)=0
C NA15(J,K)=0
205 DA15(J,K)=0.
C FIND YEAR AND MONTH OF DATA
C BEG=.TRUE.
C DO 250 I=1,ID
C DO 210 K=1,40
C YD=15./365.
C N=NYMIN+K
C IF(MOD(N,4).EQ.0)YD=15./366.
C DO 210 J=1,12
C Y=YR15(J,K)-YD
C IF(Y.GE.YR(I))GO TO 220
210 CONTINUE
C WRITE(6,1130)YR(I)
C WRITE(10,1130)YR(I)
220 IF(J.EQ.1)GO TO 230
C J=J-1
C GO TO 232
230 J=12
C K=K-1
C SAVE INDEX OF YR15 FOR BEGINNING AND END OF ADJUSTED DATA
232 IF(.NOT.BEG)GO TO 234
C IS=12*(K-1)+J
C BEG=.FALSE.
234 IF=12*(K-1)+J
C ADJUST DATA TO 15TH AND SUM
```

```
T=HRMS(YR15(J,K))-HRMS(YR(I))
DA15(J,K)=DA15(J,K)+(DAV(I)+T)*MEAS(I)
NA15(J,K)=NA15(J,K)+MEAS(I)
NS15(J,K)=NSYMB(I)
250 CONTINUE
C MAKE AVERAGES
  DO 260 K=1,40
  DO 260 J=1,12
  IF(NA15(J,K).NE.0)DA15(J,K)=DA15(J,K)/NA15(J,K)
260 CONTINUE
C
C CALC. AVERAGE OVER MONTHS
  DO 262 J=1,12
262 SEA(J)=0.
  DO 266 J=1,12
  NSEA=0
  DO 264 K=1,40
  IF(DA15(J,K).EQ.0.)GO TO 264
  SEA(J)=SEA(J)+DA15(J,K)-SPQN(YR15(J,K))
  NSEA=NSEA+1
264 CONTINUE
  IF(NSEA.EQ.0)GOTO 266
  SEA(J)=SEA(J)/NSEA
266 CONTINUE
C
C FILL ARRAYS FOR INTERPOLATING SPLINE CALC.
  J=0
  DO 268 I=IS,IF
  J=J+1
  YM(J)=YR15(I,1)
  SPMF(J)=SPQN(YR15(I,1))
  DM(J)=DA15(I,1)
268 CONTINUE
  JM=J
C
C *****
C FIT INTERPOLATING SPLINE TO VALUES OF CHISQUARED SPLINE AT
C 15TH OF EACH MONTH. (REDUCES NUMBER OF SPLINE COEFFS.)
C ARRANGE THAT 2ND DERIVATIVE BE ZERO AT ENDS OF SPLINE
  DO 270 I=1,4
270 BM(I)=0.
  CALL ICSICU(YM,SPMF,JM,BM,SPMC,480,IER)
  SQ2DI=SQ2DF(JM,YM,SPMC,480)
C
C *****
C WRITE SPLINE COEFFICIENT FILE
C
C SAVE STATION NAME AND CONTROL PARAMETERS
  WRITE(9,1203)NSTA(1),NH,NYMIN,NYMAX,YMID,SIGM
C SAVE EXPONENTIAL COEFFICIENTS
  WRITE(9,1202)(AE(I),I=1,20)
C SAVE HARMONIC COEFFICIENTS
C SAVE HARMONIC COEFFICIENTS
  WRITE(9,1202)(AH(I),I=1,17)
C SAVE AVERAGES AT 15TH OF MONTH AND SPLINE COEFFICIENTS
  DO 290 I=1,JM-1
290 WRITE(9,1201)DM(I),YM(I),SPMF(I),(SPMC(I,J),J=1,3)
  WRITE(9,1201)DM(JM),YM(JM),SPMF(JM)
C
C RESTORE EXPONENTIAL TO MONTHLY ADJUSTED DATA
```

```
DO 300 K=1,40
DO 300 J=1,12
IF(DA15(J,K).EQ.0.)GO TO 300
DA15(J,K)=DA15(J,K)+AE(2)+AE(3)*EXP(AE(4)*YR15(J,K))
300 CONTINUE
C
C *****
C 1. MAKE 1ST CO2 CONCENTRATION TABLE: DATA ADJUSTED TO THE 15TH
C OF MONTH
C
DO 330 K=1,40
330 STB(K)=0.
WRITE(6,1250)
WRITE(6,1252)NSTA(1)
WRITE(6,1150)
WRITE(10,1250)
WRITE(10,1252)NSTA(1)
WRITE(10,1150)
CALL TBL(DA15,STB)
C
C *****
C 2. MAKE 2ND CO2 TABLE: DATA AT 15TH OF MONTH ADJUSTED FOR THE
C SEASONAL EFFECT
C
WRITE(6,1250)
WRITE(6,1252)NSTA(1)
WRITE(6,1185)
WRITE(10,1250)
WRITE(10,1252)NSTA(1)
WRITE(10,1185)
DO 335 K=1,40
DO 335 J=1,12
IF(DA15(J,K).EQ.0.)GO TO 335
DA15(J,K)=DA15(J,K)-HRMO(YR15(J,K))
335 CONTINUE
CALL TBL(DA15,STB)
C
C *****
C 3. MAKE 3RD CO2 TABLE: FIT (EXPONENTIAL + SPLINE + HARMONICS)
C AT 15TH OF MONTH
C
DO 340 K=1,40
DO 340 J=1,12
340 ST15(J,K)=0.
DO 350 I=IS,IF
350 ST15(I,1)=HRMSE(YR15(I,1))
C FILL STB WITH FIT AT BEGINNING OF YEAR
DO 360 K=1,40
IF(K.LT.YR15(IS,1).OR.K.GT.YR15(IF,1))GO TO 360
YYK=K
STB(K)=HRMSE(YYK)
360 CONTINUE
WRITE(6,1250)
WRITE(6,1252)NSTA(1)
WRITE(6,1160)
WRITE(10,1250)
WRITE(10,1252)NSTA(1)
WRITE(10,1160)
CALL TBL(ST15,STB)
C
```

C THE FOLLOWING TWO TABLES ARE CALCS. OF THE SEASONAL CYCLE
C - IN THE PUBLISHED OUTPUTS FOR EACH STATION, THESE ARE
C PRINTED AT THE END OF THE THIRD FIT SECTION (SPLINE FIT)
C
C MAKE TABLE OF AVERAGES OVER MONTHS OF SEASONAL CYCLE
C

```
WRITE(6,1250)
WRITE(6,1252)NSTA(1)
WRITE(6,1180)
WRITE(6,1120)
WRITE(6,1122)(SEA(I),I=1,12)
WRITE(10,1250)
WRITE(10,1252)NSTA(1)
WRITE(10,1180)
WRITE(10,1120)
WRITE(10,1122)(SEA(I),I=1,12)
```

C
C MAKE TABLE OF SEASONAL CYCLE FIT (ADJUSTED TO MIDDLE YEAR
C OF DATA RECORD IF THERE IS GAIN)
C

```
DO 365 I=1,12
365 SEA(I)=HR(SEA15,I,AG)
WRITE(6,1252)NSTA(1)
WRITE(10,1252)NSTA(1)
IF(NAT.EQ.1)GO TO 366
WRITE(6,1182)
WRITE(10,1182)
GO TO 367
366 WRITE(6,1183)
WRITE(10,1183)
367 CONTINUE
WRITE(6,1120)
WRITE(6,1122)(SEA(I),I=1,12)
WRITE(10,1120)
WRITE(10,1122)(SEA(I),I=1,12)
```

C
C *****
C 4. MAKE 4TH AND FINAL CO2 TABLE: TREND (EXPONENTIAL + SPLINE)
C AT 15TH OF MONTH
C

```
DO 370 I=IS,IF
ST15(I,1)=ST15(I,1)-HRMO(YR15(I,1))
370 CONTINUE
DO 380 K=1,40
IF(STB(K).EQ.0.)GO TO 380
YK=K
STB(K)=STB(K)-HRMO(YK)
380 CONTINUE
WRITE(6,1250)
WRITE(6,1252)NSTA(1)
WRITE(6,1188)
WRITE(10,1250)
WRITE(10,1252)NSTA(1)
WRITE(10,1188)
CALL TBL(ST15,STB)
```

C
C *****
C MAKE FINAL SUMMARY TABLE OF INPUT AND OUTPUT PARAMETERS
C - IN THE PUBLISHED OUTPUTS FOR EACH STATION THIS
C SUMMARY IS PRINTED AT THE BEGINNING OF THE STATION OUTPUT

```
C
WRITE(6,1320)NSTAT
WRITE(10,1320)NSTAT
I=1900+NYMIN+1
J=1900+NYMIN+YR(ID)
WRITE(6,1322)I
WRITE(6,1324)J
WRITE(6,1326)NH
WRITE(6,1328)YESNO(NAT+1)
WRITE(6,1330)SIGM
WRITE(6,1332)SQ2D
WRITE(10,1322)I
WRITE(10,1324)J
WRITE(10,1326)NH
WRITE(10,1328)YESNO(NAT+1)
WRITE(10,1330)SIGM
WRITE(10,1332)SQ2D

C
END

C
C *****
C * FUNCTIONS AND SUBROUTINES NECESSARY TO RUN QSTFIT *
C *****
C
C REAL*8 FUNCTION YEAR(IDATE)
C CALCULATE YEAR RELATIVE TO 1900 FROM DATE
C IMPLICIT REAL*8 (A-H,0-Z)
C DIMENSION IDATE(3)
C COMMON/MON/MONTH(12),MONT(14)

C
C NDAYS=0
C J=MOD(IDATE(1),4)
C YRDAY=365.
C IF(J.EQ.0)YRDAY=366.
C M=IDATE(2)-1
C IF(M.LT.1)GO TO 30
C DO 20 I=1,M
C NDAYS=NDAYS+MONTH(I)
C IF(I.EQ.2.AND.J.EQ.0)NDAYS=NDAYS+1
20 CONTINUE
30 NDAYS=NDAYS+IDATE(3)
C YEAR=IDATE(1)+NDAYS/YRDAY
C RETURN
C END

C
C
C SUBROUTINE TBL(STD,STB)
C TBL MAKES TABLE OF MONTHLY DATA
C IMPLICIT REAL*8 (A-H,0-Z)
C DIMENSION STD(12,40),STB(40)
C COMMON/MON/MONTH(12),MONT(14)
C COMMON/CON/NYMIN,NYMAX,NYPT,NH,MODE,ID,NSTA(1),YMID,NAT,
C X AE(20),AH(20)
C DIMENSION NYEAR(8),AV(40)

C
1001 FORMAT(1H1)
1002 FORMAT(1HO,' MONTH YEAR')
1004 FORMAT(1H ,6X,8I8)
1006 FORMAT(1H ,2X,A4,8F8.2)
1010 FORMAT(1H )
```

```
C      NT=NYPT/8
      NM=NYPT-8*NT
C
C      PREPARE TO WRITE JANO ONLY IF ARRAY STB IS NOT ALL 0.
      NW=0
      DO 5 I=1,40
      IF(STB(I).NE.0.)NW=1
      5 CONTINUE
C
C      MAKE YEARLY AVERAGES
C      IF DATA FOR ANY MONTH IS MISSING (0.), SET AVERAGE TO 0.
      DO 10 I=1,40
10     AV(I)=0.
      DO 30 K=1,NYPT
      NAV=0
      DO 20 J=1,12
      IF(STD(J,K).EQ.0.)GO TO 25
      AV(K)=AV(K)+STD(J,K)
      NAV=NAV+1
20     CONTINUE
      AV(K)=AV(K)/NAV
      GO TO 30
25     AV(K)=0.
30     CONTINUE
C
C      MAKE NT TABLES WITH 8 COLUMNS OF DATA
      DO 100 N=1,NT
      IF(N.EQ.3.OR.N.EQ.5)WRITE(6,1001)
      WRITE(6,1002)
      IF(N.EQ.3.OR.N.EQ.5)WRITE(10,1001)
      WRITE(10,1002)
C      FILL YEAR ARRAY
      DO 40 I=1,8
40     NYEAR(I)=1900+NYMIN+8*(N-1)+I
      WRITE(6,1004)(NYEAR(I),I=1,8)
      WRITE(10,1004)(NYEAR(I),I=1,8)
      DO 50 J=1,12
      WRITE(10,1006)MONT(J),(STD(J,8*(N-1)+I),I=1,8)
50     WRITE(6,1006)MONT(J),(STD(J,8*(N-1)+I),I=1,8)
      WRITE(6,1010)
      WRITE(6,1006)MONT(14),(AV(8*(N-1)+I),I=1,8)
      IF(NW.EQ.1)
      X WRITE(6,1006)MONT(13),(STB(8*(N-1)+I),I=1,8)
      WRITE(10,1010)
      WRITE(10,1006)MONT(14),(AV(8*(N-1)+I),I=1,8)
      IF(NW.EQ.1)
      X WRITE(10,1006)MONT(13),(STB(8*(N-1)+I),I=1,8)
100    CONTINUE
C
C      MAKE TABLE WITH REMAINING COLUMNS
      IF(NM.EQ.0)GO TO 170
      WRITE(6,1002)
      WRITE(10,1002)
      DO 140 I=1,NM
140    NYEAR(I)=1900+NYMIN+8*NT+I
      WRITE(6,1004)(NYEAR(I),I=1,NM)
      WRITE(10,1004)(NYEAR(I),I=1,NM)
      DO 150 J=1,12
```

```
      WRITE(10,1006)MONT(J), (STD(J,8*NT+I), I=1, NM)
150  WRITE(6,1006)MONT(J), (STD(J,8*NT+I), I=1, NM)
      WRITE(6,1010)
      WRITE(6,1006)MONT(14), (AV(8*NT+I), I=1, NM)
      IF(NW.EQ.1)
X    WRITE(6,1006)MONT(13), (STB(8*NT+I), I=1, NM)
      WRITE(10,1010)
      WRITE(10,1006)MONT(14), (AV(8*NT+I), I=1, NM)
      IF(NW.EQ.1)
X    WRITE(10,1006)MONT(13), (STB(8*NT+I), I=1, NM)
170  CONTINUE
C
      RETURN
      END
C
C
      SUBROUTINE CUBFIT
C  PGM FITS CUBIC + HARMONIC TERMS TO THE DATA
      IMPLICIT REAL*8 (A-H,O-Z)
      COMMON/DAT/ YR(11000), DAV(11000), DAVFT(11000)
      COMMON/SPL/ SIG(11000), DAVS(11000), DAVT(11000), WK(140000)
      COMMON/SE/SEA15(12), SEA(12), SIGD(1), SIGA(20), DA(1),
X    YR15(12,40), NSHEMP, LABL(2)
      COMMON/CON/NYMIN, NYMAX, NYPT, NH, MODE, ID, NSTA(1), YMID, NAT,
X    AE(20), AH(20)
      COMMON/GB/DAVB(366,40), YRB(366,40), NY(40), AG(20)
      EXTERNAL HRMC, DHRMC
C
1050  FORMAT(1H1, '1. FIT OF CUBIC + HARMONICS ', //,
X    1H, ' FITTED COEFFICIENTS / ERROR :')
1060  FORMAT(1H, 4E14.5, /, 1H, 4E14.5)
1064  FORMAT(1H0, ' STANDARD ERROR OF FIT: DEL = ', E14.5)
1120  FORMAT(1H0, ' SEASONAL CYCLE FIT :'/
X    W    1H, ' JAN FEB MAR APR MAY JUN',
X    ' JUL AUG SEP OCT NOV DEC')
1122  FORMAT(1H, 12F6.2)
1302  FORMAT(1H0, '          1          T          T**2'
X    '          T**3')
1303  FORMAT(1H0, ' SIN(2*PI*T) COS(2*PI*T) SIN(4*PI*T)'
X    ' COS(4*PI*T)')
1304  FORMAT(1H0, ' SIN(6*PI*T) COS(6*PI*T) SIN(8*PI*T)'
X    ' COS(8*PI*T)')
1305  FORMAT(1H0, ' SIN(10*PI*T) COS(10*PI*T) SIN(12*PI*T)'
X    ' COS(12*PI*T)')
1306  FORMAT(1H0, ' SIN(14*PI*T) COS(14*PI*T) SIN(16*PI*T)'
X    ' COS(16*PI*T)')
C
      NT=4+2*NH
      FL=0.
      CALL CURFIT(YR, DAV, SIG, ID, NT, MODE, AE, DA, SIGA, FL,
X    DAVFT, CHISQR, HRMC, DHRMC, 0)
      DEL=SQRT(CHISQR)
      DO 50 I=1, NT
50  SIGA(I)=SIGA(I)*DEL
      WRITE(6,1050)
      WRITE(6,1302)
      WRITE(6,1060) (AE(I), I=1, 4), (SIGA(I), I=1, 4)
      WRITE(10,1050)
      WRITE(10,1302)
      WRITE(10,1060) (AE(I), I=1, 4), (SIGA(I), I=1, 4)
```



```
NM=(NH+1)/2
DO 60 N=1,NM
I=4*N
GO TO (54,55,56,57),N
54 WRITE(6,1303)
   WRITE(10,1303)
   GO TO 59
55 WRITE(6,1304)
   WRITE(10,1304)
   GO TO 59
56 WRITE(6,1305)
   WRITE(10,1305)
   GO TO 59
57 WRITE(6,1306)
   WRITE(10,1306)
59 WRITE(6,1060) (AE(I+J), J=1,4), (SIGA(I+J), J=1,4)
   WRITE(10,1060) (AE(I+J), J=1,4), (SIGA(I+J), J=1,4)
60 CONTINUE
   WRITE(6,1064)DEL
   WRITE(6,1120)
   WRITE(10,1064)DEL
   WRITE(10,1120)
   DO 90 I=1,12
90 SEA(I)=HR(SEA15,I,AE(5))
   WRITE(6,1122)SEA
   WRITE(10,1122)SEA
   RETURN
   END
```

C

C

```
      SUBROUTINE EXPFIT
C PGM FITS EXPONENTIAL + HARMONIC TERMS TO THE DATA
  IMPLICIT REAL*8 (A-H,O-Z)
  COMMON/DAT/ YR(11000),DAV(11000),DAVFT(11000)
  COMMON/SPL/ SIG(11000),DAVS(11000),DAVT(11000),WK(140000)
  COMMON/SE/SEA15(12),SEA(12),SIGD(1),SIGA(20),DA(1),
  X  YR15(12,40),NSHEMP,LABL(2)
  COMMON/CON/NYMIN,NYMAX,NYPT,NH,MODE,ID,NSTA(1),YMID,NAT,
  X  AE(20),AH(20)
  COMMON/GB/DAVB(366,40),YRB(366,40),NY(40),AG(20)
  EXTERNAL HRMEL,DHRMEL,STR,DSTR
```

C

```
1060 FORMAT(1H ,4E14.5,/,1H ,4E14.5)
1062 FORMAT(1H ,3E14.5,/,1H ,3E14.5)
1064 FORMAT(1HO,' STANDARD ERROR OF FIT: DEL = ',E14.5)
1070 FORMAT(1HO,' FIT TO NON-LINEAR TERMS :'/
  X   1H ,', ITER          CHISQ          FL')
1072 FORMAT(1H1,'2. FIT OF EXPONENTIAL + HARMONICS')
1074 FORMAT(1H ,I5,2E14.5)
1082 FORMAT(1HO,' FINAL VALUES OF CHISQ AND FL ABOVE'
  X  ' APPLY TO FIT'/1H ,', FINAL FL SHOULD BE LESS THAN'
  Y  ' 0.1 OR CALCULATED ERRORS WILL BE TOO SMALL')
1120 FORMAT(1HO,' SEASONAL CYCLE FIT :'/
  W   1H ,', JAN  FEB  MAR  APR  MAY  JUN',
  X  ' JUL  AUG  SEP  OCT  NOV  DEC')
1122 FORMAT(1H ,12F6.2)
1140 FORMAT(1H1,' GAIN FOR EACH YEAR :'/1H ,
  X   ' YEAR  PTS  DEL  GAIN',
  Y  ' OFFSET',/,1H ,20X,'ERROR  ERROR')
1142 FORMAT(1HO,I5,2X,I4,1X,F5.2,2(1X,F8.4))
```

```

1144 FORMAT(1H ,17X,2(1X,F8.4))
1201 FORMAT(1H0,' MORE THAN 366 POINTS IN YEAR ', I5)
1301 FORMAT(1H0,' FIT IS TO C1 + C2*EXP(R*T) +'
      W ' (1 + A*T)*HARMONICS'/1H ,
      X ' FITTED COEFFICIENTS / ERROR :'/1H0,
      Y '          A          C1          C2'
      Z '          R')
1302 FORMAT(1H0,' FIT IS TO C1 + C2*EXP(R*T) +'
      W ' HARMONICS'/1H ,
      X ' FITTED COEFFICIENTS / ERROR :'/1H0,
      Y '          C1          C2          R')
1303 FORMAT(1H0,' SIN(2*PI*T) COS(2*PI*T) SIN(4*PI*T)'
      X ' COS(4*PI*T)')
1304 FORMAT(1H0,' SIN(6*PI*T) COS(6*PI*T) SIN(8*PI*T)'
      X ' COS(8*PI*T)')
1305 FORMAT(1H0,' SIN(10*PI*T) COS(10*PI*T) SIN(12*PI*T)'
      X ' COS(12*PI*T)')
1306 FORMAT(1H0,' SIN(14*PI*T) COS(14*PI*T) SIN(16*PI*T)'
      X ' COS(16*PI*T)')

```

C

```

      WRITE(6,1072)
      WRITE(10,1072)
      NT=4+2*NH-NAT
      FL=.001
      CHISQ1=0.
      WRITE(6,1070)
      WRITE(10,1070)
      DO 18 I=1,20
      CALL CURFIT(YR,DAV,SIG,ID,NT,MODE,AE,DA,SIGA,FL,
      X DAVFT,CHISQ2,HRMEL,DHRMEL,NAT)
      WRITE(6,1074)I,CHISQ2,FL
      WRITE(10,1074)I,CHISQ2,FL
      IF(ABS(CHISQ2-CHISQ1)/CHISQ2.LT..00001)GO TO 32
      CHISQ1=CHISQ2
18 CONTINUE
32 WRITE(6,1082)
   WRITE(10,1082)
   DEL=SQRT(CHISQ2)
   DO 50 I=1,4+2*NH
50 SIGA(I)=SIGA(I)*DEL
   IF(NAT.EQ.1)GO TO 52
   WRITE(6,1301)
   WRITE(6,1060)(AE(I),I=1,4),(SIGA(I),I=1,4)
   WRITE(10,1301)
   WRITE(10,1060)(AE(I),I=1,4),(SIGA(I),I=1,4)
   GO TO 53
52 WRITE(6,1302)
   WRITE(6,1062)(AE(I),I=2,4),(SIGA(I),I=2,4)
   WRITE(10,1302)
   WRITE(10,1062)(AE(I),I=2,4),(SIGA(I),I=2,4)
53 CONTINUE
   NM=(NH+1)/2
   DO 76 N=1,NM
   I=4*N
   GO TO (54,55,56,57),N
54 WRITE(6,1303)
   WRITE(10,1303)
   GO TO 59
55 WRITE(6,1304)
   WRITE(10,1304)

```

```
GO TO 59
56 WRITE(6,1305)
   WRITE(10,1305)
   GO TO 59
57 WRITE(6,1306)
   WRITE(10,1306)
59 WRITE(6,1060) (AE(I+J), J=1,4), (SIGA(I+J), J=1,4)
   WRITE(10,1060) (AE(I+J), J=1,4), (SIGA(I+J), J=1,4)
76 CONTINUE
   WRITE(6,1064)DEL
   WRITE(6,1120)
   WRITE(10,1064)DEL
   WRITE(10,1120)
C DISPLAY AVERAGE SEASONAL CYCLE
  FA=1.+AE(1)*YMID
  DO 77 I=1,2*NH
77 AG(I)=FA*AE(I+4)
  DO 78 I=1,12
78 SEA(I)=HR(SEA15,I,AG)
   WRITE(6,1122)SEA
   WRITE(10,1122)SEA
C
C PUT TREND ADJUSTED DATA INTO YEARLY ARRAY ROWS
C 366 POINTS IS MAXIMUM FOR ANY YEAR
  DO 130 I=1,40
130 NY(I)=0
  DO 140 I=1,ID
  K=YR(I)
C WE WISH TO MEASURE FALL IN CONC. SO FOR THE SOUTHERN HEMISPHERE
C BEGIN YEAR JUL 0 INSTEAD OF JAN 0.
  IF(NSHEMP.EQ.0)GO TO 132
  YD=184./365.
  N=NYMIN+YR(I)
  IF(MOD(N,4).EQ.0)YD=184./366.
  K=YR(I)+YD
132 CONTINUE
  NY(K)=NY(K)+1
  J=NY(K)
  IF(J.LE.366)GO TO 135
  K=K+NYMIN
  WRITE(6,1201)K
  WRITE(10,1201)K
  GO TO 140
135 CONTINUE
  YRB(J,K)=YR(I)
  YRB(J,K)=YR(I)
140 CONTINUE
C
C FIT G1*S + G2 TO TREND ADJUSTED DATA FOR EACH YEAR,
C WHERE S IS AN AVERAGE SEASONAL CYCLE.
  NT=2
  FL=0.
  WRITE(6,1140)
  WRITE(10,1140)
  DO 160 I=1,NYMAX
  J=NY(I)
  IF(J.LT.3)GO TO 160
  AG(19)=0.
  AG(20)=0.
  CALL CURFIT(YRB(1,I),DAVB(1,I),SIGD,J,NT,0,AG,
```

```
X DA,SIGA,FL,DAVFT,CHISQR,STR,DSTR,18)
DEL=SQRT(CHISQR)
DO 155 L=19,20
155 SIGA(L)=DEL*SIGA(L)
M=1900+NYMIN+I
WRITE(6,1142)M,J,DEL,(AG(L),L=19,20)
WRITE(6,1144)(SIGA(L),L=19,20)
WRITE(10,1142)M,J,DEL,(AG(L),L=19,20)
WRITE(10,1144)(SIGA(L),L=19,20)
160 CONTINUE
RETURN
END
```

C
C

```
      SUBROUTINE SPKFIT(DMNTN,SQ2D,IPRT,ITER,DEL,NSQ)
C PGM FITS KNOTS TYPE SPLINE + HARMONIC TERMS TO DATA
  IMPLICIT REAL*8 (A-H,O-Z)
  COMMON/DAT/ YR(11000),DAV(11000),DAVFT(11000)
  COMMON/NSY/ MEAS(11000),NSYMB(11000)
  COMMON/SPL/ SIG(11000),DAVS(11000),DAVT(11000),WK(140000)
  COMMON/SPK/NYK,YK(40),SPKF(40),SPKC(40,3)
  COMMON/SE/SEA15(12),SEA(12),SIGD(1),SIGA(20),DA(1),
X  YR15(12,40),NSHEMP,LABL(2)
  COMMON/CON/NYMIN,NYMAX,NYPT,NH,MODE,ID,NSTA(1),YMID,NAT,
X  AE(20),AH(20)
  COMMON/GB/DAVB(366,40),YRB(366,40),NY(40),AG(20)
  EXTERNAL HRM,DHRM,STR,DSTR,SPKN
```

C

```
1060 FORMAT(1H ,4E14.5,/,1H ,4E14.5)
1062 FORMAT(1H ,E14.5,/,1H ,E14.5)
1064 FORMAT(1HO,'          DEL          SQ2D')
1066 FORMAT(1H ,3E14.5)
1070 FORMAT(1HO,' FIT OF NON-LINEAR GAIN :'/1H ,
X  ' ITER          CHISQ          FL')
1072 FORMAT(1HO,' CHISQ FOR HARMONIC FIT = ',E14.5)
1074 FORMAT(1H ,I5,2E14.5)
1110 FORMAT(1HO,' FIT OF KNOTS-TYPE SPLINE + HARMONICS')
1112 FORMAT(1HO,' SPLINE-HARMONICS ITERATION NUMBER ',I2)
1120 FORMAT(1HO,' SEASONAL CYCLE FIT :'/
W  ' 1H ,' JAN FEB MAR APR MAY JUN',
X  ' JUL AUG SEP OCT NOV DEC')
1122 FORMAT(1H ,12F6.2)
1130 FORMAT(1H1,' SPLINE FIT TO EXPONENTIALLY AND '
X  ' SEASONALLY ADJUSTED DATA :')
1132 FORMAT(1HO,'YEAR JAN FEB MAR APR MAY JUN'
X  ' JUL AUG SEP OCT NOV DEC')
1134 FORMAT(1H ,I4,1X,12F6.2)
1140 FORMAT(1HO,' YEAR PTS DEL GAIN',/,22X,' ERR')
1142 FORMAT(1H ,I5,2X,I4,1X,F5.2,1X,F7.4)
1144 FORMAT(1H ,18X,F7.4)
1160 FORMAT(1HO,' SEPARATION BETWEEN KNOTS =',F8.3,' MONTHS')
1201 FORMAT(1HO,' MORE THAN 366 POINTS IN YEAR ',I5)
1301 FORMAT(1HO,' FIT IS TO KNOTS-TYPE-SPLINE +'
X  '(1 + A*T)*HARMONICS'/1H ,
Y  ' FITTED COEFFICIENTS / ERROR :'/1HO,'          A')
1302 FORMAT(1HO,' FIT IS TO KNOTS-TYPE-SPLINE +'
X  ' HARMONICS'/1H ,
Y  ' FITTED COEFFICIENTS / ERROR :'/1HO)
1303 FORMAT(1HO,' SIN(2*PI*T) COS(2*PI*T) SIN(4*PI*T)'
X  ' COS(4*PI*T)')
```

```
1304 FORMAT(1H0,' SIN(6*PI*T) COS(6*PI*T) SIN(8*PI*T)'  
X ' COS(8*PI*T)')  
1305 FORMAT(1H0,' SIN(10*PI*T) COS(10*PI*T) SIN(12*PI*T)'  
X ' COS(12*PI*T)')  
1306 FORMAT(1H0,' SIN(14*PI*T) COS(14*PI*T) SIN(16*PI*T)'  
X ' COS(16*PI*T)')  
C  
    WRITE(6,1110)  
    WRITE(10,1110)  
C  
C FILL KNOT ARRAY WITH EVENLY SPACED KNOTS SUCH THAT  
C SEPARATION IS GEQ DMNTH MONTHS INITIAL VALUE.  
    DY=DMNTH/12.  
    NYK=(YR(ID)-YR(1))/DY  
    DY=(YR(ID)-YR(1))/NYK  
    YK(1)=YR(1)  
    DO 9 I=2,NYK  
9 YK(I)=YK(I-1)+DY  
    NYK=NYK+1  
    YK(NYK)=YR(ID)  
    DMNTH=12.*DY  
    WRITE(6,1160)DMNTH  
    WRITE(10,1160)DMNTH  
C  
C ITERATIVELY FIT TREND AND SEASONAL EFFECT  
    NT=1-NAT+2*NH  
    DO 120 J=1,ITER  
    WRITE(6,1112)J  
    WRITE(10,1112)J  
C REMOVE SEASONAL EFFECT  
    DO 11 I=1,ID  
11 DAVT(I)=DAV(I)-HRM(YR,I,AH)  
C FIT TREND  
    MO=0  
    CALL ICSFKU(YR,DAVT,ID,MO,YK,NYK,SPKF,SPKC,40,  
X ERROR,WK,IER)  
    SQ2D=SQ2DF(NYK,YK,SPKC,40)  
C REMOVE TREND  
    DO 15 I=1,ID  
15 DAVS(I)=DAV(I)-SPLINT(NYK,YK,SPKF,SPKC,40,LI,YR(I))  
C FIT SEASONAL EFFECT  
    IF(NAT.EQ.1)GO TO 30  
    FL=.001  
    CHISQ1=0.  
    WRITE(6,1070)  
    WRITE(10,1070)  
    DO 18 K=1,20  
    CALL CURFIT(YR,DAVS,SIG,ID,NT,MODE,AH,DA,SIGA,  
X FL,DAVFT,CHISQ2,HRM,DHRM,NAT)  
    WRITE(6,1074)K,CHISQ2,FL  
    WRITE(10,1074)K,CHISQ2,FL  
    IF(ABS(CHISQ2-CHISQ1)/CHISQ2.LT..00001)GO TO 34  
    CHISQ1=CHISQ2  
18 CONTINUE  
    GO TO 34  
30 CONTINUE  
    FL=0.  
    CALL CURFIT(YR,DAVS,SIG,ID,NT,MODE,AH,DA,SIGA,  
X FL,DAVFT,CHISQ2,HRM,DHRM,NAT)  
    WRITE(6,1072)CHISQ2
```

```
      WRITE(10,1072)CHISQ2
34  CONTINUE
C
C  PRINT RESULTS OF FIT
      DEL=SQRT(CHISQ2)
      DO 40 I=1,1+2*NH
40  SIGA(I)=DEL*SIGA(I)
      IF(NAT.EQ.1)GO TO 52
      WRITE(6,1301)
      WRITE(6,1062)AH(1),SIGA(1)
      WRITE(10,1301)
      WRITE(10,1062)AH(1),SIGA(1)
      GO TO 53
52  WRITE(6,1302)
      WRITE(10,1302)
53  CONTINUE
      NM=(NH+1)/2
      DO 76 N=1,NM
      I=4*N-3
      GO TO (54,55,56,57),N
54  WRITE(6,1303)
      WRITE(10,1303)
      GO TO 59
55  WRITE(6,1304)
      WRITE(10,1304)
      GO TO 59
56  WRITE(6,1305)
      WRITE(10,1305)
      GO TO 59
57  WRITE(6,1306)
      WRITE(10,1306)
59  WRITE(6,1060)(AH(I+L),L=1,4),(SIGA(I+L),L=1,4)
      WRITE(10,1060)(AH(I+L),L=1,4),(SIGA(I+L),L=1,4)
76  CONTINUE
116 CONTINUE
      WRITE(6,1064)
      WRITE(6,1066)DEL,SQ2D
      WRITE(6,1120)
      WRITE(10,1064)
      WRITE(10,1066)DEL,SQ2D
      WRITE(10,1120)
C  DISPLAY AVERAGE SEASONAL CYCLE
      FA=1.+AH(1)*YMID
      DO 117 I=1,2*NH
117  AG(I)=FA*AH(I+1)
      DO 118 I=1,12
118  SEA(I)=HR(SEA15,I,AG)
      WRITE(6,1122)SEA
      WRITE(10,1122)SEA
120 CONTINUE
C
C  SKIP PRINTOUT OF MONTHLY SPLINE TREND AND CALCULATION OF
C  RELATIVE SEASONAL AMPLITUDES, IF IPRT IS 0
      IF(IPRT.EQ.0)GO TO 200
C
C  PRINT MONTHLY VALUES OF SPLINE TREND
      WRITE(6,1130)
      WRITE(6,1132)
      WRITE(10,1130)
      WRITE(10,1132)
```

```
DO 126 J=1,NYPT
DO 124 I=1,12
SEA(I)=99.99
Y=YR15(I,J)
IF(Y.LT.YR(1).OR.Y.GT.YR(ID))GO TO 124
SEA(I)=SPLINT(NYK,YK,SPKF,SPKC,40,LI,Y)
124 CONTINUE
M=NYMIN+J
WRITE(10,1134)M,(SEA(I),I=1,12)
126 WRITE(6,1134)M,(SEA(I),I=1,12)
C
C PUT TREND ADJUSTED DATA INTO YEARLY ARRAY ROWS
C 366 POINTS IS MAXIMUM FOR ANY YEAR
DO 130 I=1,40
130 NY(I)=0
DO 140 I=1,ID
K=YR(I)
C WE WISH TO MEASURE FALL IN CONC. SO FOR THE SOUTH POLE
C BEGIN YEAR JUL 0 INSTEAD OF JAN 0.
IF(NSHEMP.EQ.0)GO TO 132
YD=184./365.
N=NYMIN+YR(I)
IF(MOD(N,4).EQ.0)YD=184./366.
K=YR(I)+YD
132 CONTINUE
NY(K)=NY(K)+1
J=NY(K)
IF(J.LE.366)GO TO 135
K=K+NYMIN
WRITE(6,1201)K
WRITE(10,1201)K
GO TO 140
135 CONTINUE
DAVB(J,K)=DAV(I)-SPLINT(NYK,YK,SPKF,SPKC,40,LI,YR(I))
YRB(J,K)=YR(I)
140 CONTINUE
C
C FIT G*S TO TREND ADJUSTED DATA FOR EACH YEAR,
C WHERE S IS AN AVERAGE SEASONAL CYCLE.
NT=1
FL=0.
WRITE(6,1140)
WRITE(10,1140)
AG(20)=0.
DO 160 I=1,NYMAX
J=NY(I)
AG(19)=0.
CALL CURFIT(YRB(1,I),DAVB(1,I),SIGD,J,NT,0,AG,
X DA,SIGA,FL,DAVFT,CHISQR,STR,DSTR,18)
DELL=SQRT(CHISQR)
SIGA(19)=DELL*SIGA(19)
M=1900+NYMIN+I
WRITE(6,1142)M,J,DELL,AG(19)
WRITE(6,1144)SIGA(19)
WRITE(10,1142)M,J,DELL,AG(19)
WRITE(10,1144)SIGA(19)
160 CONTINUE
C
200 CONTINUE
RETURN
```

END

C
C

```

SUBROUTINE SPQFIT(SIGM,SQ2D,IPRT,ITER,DEL,NSQ)
C PGM FITS CHISQUARED TYPE SPLINE + HARMONIC TERMS TO DATA
IMPLICIT REAL*8 (A-H,O-Z)
COMMON/DAT/ YR(11000),DAV(11000),DAVFT(11000)
COMMON/NSY/ MEAS(11000),NSYMB(11000)
COMMON/SPL/ SIG(11000),DAVS(11000),DAVT(11000),WK(140000)
COMMON/SPQ/SPQF(11000),SPQC(11000,3)
COMMON/SE/SEA15(12),SEA(12),SIGD(1),SIGA(20),DA(1),
X YR15(12,40),NSHEMP,LABL(2)
COMMON/CON/NYMIN,NYMAX,NYPT,NH,MODE,ID,NSTA(1),YMID,NAT,
X AE(20),AH(20)
COMMON/INT/YM(480),SPMF(480),SPMC(480,3),BM(4),DM(480),IS,IF,JM
COMMON/GB/DAVB(366,40),YRB(366,40),NY(40),AG(20)
COMPLEX CWK
DIMENSION XFF(480),YFF(1),PSX(33),PSY(1),XPS(1),
X IWK(6),WWK(32),CWK(66)
EXTERNAL HRM,DHRM,STR,DSTR,SPQN

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C

```

1060 FORMAT(1H ,4E14.5,/,1H ,4E14.5)
1062 FORMAT(1H ,E14.5,/,1H ,E14.5)
1064 FORMAT(1HO,'          DEL          SQ2D          SQ2DI')
1066 FORMAT(1H ,3E14.5)
1070 FORMAT(1HO,' FIT OF NON-LINEAR GAIN :'/1H ,
X ' ITER          CHISQ          FL')
1072 FORMAT(1HO,' CHISQ FOR HARMONIC FIT = ',E14.5)
1074 FORMAT(1H ,I5,2E14.5)
1110 FORMAT(1HO,' FIT OF CHISQUARE-TYPE SPLINE + HARMONICS')
1112 FORMAT(1HO,' SPLINE-HARMONICS ITERATION NUMBER ',I2)
1120 FORMAT(1HO,' SEASONAL CYCLE FIT :'/
W ' 1H , ' JAN FEB MAR APR MAY JUN',
X ' JUL AUG SEP OCT NOV DEC')
1122 FORMAT(1H ,12F6.2)
1130 FORMAT(1HO,' SPLINE FIT TO EXPONENTIALLY AND '
X 'SEASONALLY ADJUSTED DATA :')
1132 FORMAT(1HO,'YEAR JAN FEB MAR APR MAY JUN'
X ' JUL AUG SEP OCT NOV DEC')
1134 FORMAT(1H ,I4,1X,12F6.2)
1140 FORMAT(1H1,' GAIN FOR EACH YEAR :'/1H ,
Y ' YEAR PTS DEL GAIN',/,1H ,20X,'ERROR')
1142 FORMAT(1HO,I5,2X,I4,1X,F5.2,1X,F8.4)
1144 FORMAT(1H ,18X,F8.4)
1201 FORMAT(1HO,' MORE THAN 366 POINTS IN YEAR ', I5)
1301 FORMAT(1HO,' FIT IS TO CHISQUARED-TYPE-SPLINE +'
X ' (1 + A*T)*HARMONICS'/1H ,
Y ' FITTED COEFFICIENTS / ERROR :'/1HO,' A')
1302 FORMAT(1HO,' FIT IS TO CHISQUARED-TYPE-SPLINE +'
X ' HARMONICS'/1H ,
Y ' FITTED COEFFICIENTS / ERROR :'/1HO)
1303 FORMAT(1HO,' SIN(2*PI*T) COS(2*PI*T) SIN(4*PI*T)'
X ' COS(4*PI*T)')
1304 FORMAT(1HO,' SIN(6*PI*T) COS(6*PI*T) SIN(8*PI*T)'
X ' COS(8*PI*T)')
1305 FORMAT(1HO,' SIN(10*PI*T) COS(10*PI*T) SIN(12*PI*T)'
X ' COS(12*PI*T)')
1306 FORMAT(1HO,' SIN(14*PI*T) COS(14*PI*T) SIN(16*PI*T)'
X ' COS(16*PI*T)')

```

C


```
      WRITE(6,1110)
      WRITE(10,1110)
C   ITERATIVELY FIT TREND AND SEASONAL EFFECT
      NT=2*NH + (1-NAT)
C   3 IS FOR EXP PARAMETERS
      SM=(ID-NT-3)*SIGM**2
      DO 120 J=1,ITER
      WRITE(6,1112) J
      WRITE(10,1112) J
C   REMOVE SEASONAL EFFECT
      DO 10 I=1, ID
10   DAVT(I)=DAV(I)-HRM(YR,I,AH)
C   FIT TREND
      CALL ICSSCU(YR,DAVT,SIG,ID,SM,SPQF,SPQC,11000,WK,IER)
      SQ2D=SQ2DF(ID,YR,SPQC,11000)
C   REMOVE TREND
      DO 15 I=1, ID
15   DAVS(I)=DAV(I)-SPLINT(ID,YR,SPQF,SPQC,11000,LI,YR(I))
C   FIT SEASONAL EFFECT
      IF(NAT.EQ.1)GO TO 30
      FL=.001
      CHISQ1=0.
      WRITE(6,1070)
      WRITE(10,1070)
      DO 18 K=1,20
      CALL CURFIT(YR,DAVS,SIG,ID,NT,MODE,AH,DA,SIGA,
X     FL,DAVFT,CHISQ2,HRM,DHRM,NAT)
      WRITE(6,1074)K,CHISQ2,FL
      WRITE(10,1074)K,CHISQ2,FL
      IF(ABS(CHISQ2-CHISQ1)/CHISQ2.LT..00001)GO TO 34
      CHISQ1=CHISQ2
18   CONTINUE
      GO TO 34
30   CONTINUE
      FL=0.
      CALL CURFIT(YR,DAVS,SIG,ID,NT,MODE,AH,DA,SIGA,
X     FL,DAVFT,CHISQ2,HRM,DHRM,NAT)
      WRITE(6,1072)CHISQ2
      WRITE(10,1072)CHISQ2
34   CONTINUE
C
C   PRINT RESULTS OF FIT
      DEL=SQRT(CHISQ2*(ID-NT)/(ID-NT-3))
      DO 40 I=1,1+2*NH
40   SIGA(I)=DEL*SIGA(I)
      IF(NAT.EQ.1)GO TO 52
      WRITE(6,1301)
      WRITE(6,1062)AH(1),SIGA(1)
      WRITE(10,1301)
      WRITE(10,1062)AH(1),SIGA(1)
      GO TO 53
52   WRITE(6,1302)
      WRITE(10,1302)
53   CONTINUE
      NM=(NH+1)/2
      DO 76 N=1,NM
      I=4*N-3
      GO TO (54,55,56,57),N
54   WRITE(6,1303)
      WRITE(10,1303)
```

```
GO TO 59
55 WRITE(6,1304)
   WRITE(10,1304)
   GO TO 59
56 WRITE(6,1305)
   WRITE(10,1305)
   GO TO 59
57 WRITE(6,1306)
   WRITE(10,1306)
59 WRITE(6,1060) (AH(I+L),L=1,4), (SIGA(I+L),L=1,4)
   WRITE(10,1060) (AH(I+L),L=1,4), (SIGA(I+L),L=1,4)
76 CONTINUE
C
C FILL ARRAYS FOR INTERPOLATING SPLINE CALC.
  JJ=0
  DO 80 I=IS,IF
    JJ=JJ+1
    YM(JJ)=YR15(I,1)
    SPMF(JJ)=SPQN(YR15(I,1))
80 CONTINUE
  JM=JJ
C
C FIT INTERPOLATING SPLINE TO VALUES OF CHISQUARED SPLINE AT
C 15TH OF EACH MONTH.
C ARRANGE THAT 2ND DERIVATIVE BE ZERO AT ENDS OF SPLINE
  DO 85 I=1,4
85 BM(I)=0.
  CALL ICSICU(YM,SPMF,JM,BM,SPMC,480,IER)
  SQ2DI=SQ2DF(JM,YM,SPMC,480)
C
  WRITE(6,1064)
  WRITE(6,1066)DEL,SQ2D,SQ2DI
  WRITE(6,1120)
  WRITE(10,1064)
  WRITE(10,1066)DEL,SQ2D,SQ2DI
  WRITE(10,1120)
C
C DISPLAY AVERAGE SEASONAL CYCLE
  FA=1.+AH(1)*YMID
  DO 117 I=1,2*NH
117 AG(I)=FA*AH(I+1)
  DO 118 I=1,12
118 SEA(I)=HR(SEA15,I,AG)
  WRITE(6,1122)SEA
  WRITE(10,1122)SEA
120 CONTINUE
C
C SKIP PRINTOUT OF MONTHLY SPLINE TREND AND CALCULATION OF
C RELATIVE SEASONAL AMPLITUDE, IF IPRT IS 0
C
  IF(IPRT.EQ.0)GO TO 200
C
C PRINT MONTHLY VALUES OF SPLINE TREND
  WRITE(6,1130)
  WRITE(6,1132)
  WRITE(10,1130)
  WRITE(10,1132)
  DO 126 J=1,NYPT
  DO 124 I=1,12
  SEA(I)=99.99
```

```
Y=YR15(I, J)
IF(Y.LT.YR(1).OR.Y.GT.YR(ID))GO TO 124
SEA(I)=SPLINT(ID, YR, SPQF, SPQC, 11000, LI, Y)
124 CONTINUE
M=NYMIN+J
WRITE(10, 1134)M, (SEA(I), I=1, 12)
126 WRITE(6, 1134)M, (SEA(I), I=1, 12)
C
C PUT TREND ADJUSTED DATA INTO YEARLY ARRAY ROWS
C 366 POINTS IS MAXIMUM FOR ANY YEAR
DO 130 I=1, 40
130 NY(I)=0
DO 140 I=1, ID
K=YR(I)
C WE WISH TO MEASURE FALL IN CONC. SO FOR THE SOUTH POLE
C BEGIN YEAR JUL 0 INSTEAD OF JAN 0.
IF(NSHEMP.EQ.0)GO TO 132
YD=184./365.
N=NYMIN+YR(I)
IF(MOD(N, 4).EQ.0)YD=184./366.
K=YR(I)+YD
132 CONTINUE
NY(K)=NY(K)+1
J=NY(K)
IF(J.LE.366)GO TO 135
K=K+NYMIN
WRITE(6, 1201)K
WRITE(10, 1201)K
GO TO 140
135 CONTINUE
DAVB(J, K)=DAV(I)-SPLINT(ID, YR, SPQF, SPQC, 11000, LI, YR(I))
YRB(J, K)=YR(I)
140 CONTINUE
C
C FIT G*S TO TREND ADJUSTED DATA FOR EACH YEAR,
C WHERE S IS AN AVERAGE SEASONAL CYCLE.
NT=1
FL=0.
WRITE(6, 1140)
WRITE(10, 1140)
AG(20)=0.
DO 160 I=1, NYMAX
J=NY(I)
IF(J.LT.2)GO TO 160
AG(19)=0.
CALL CURFIT(YRB(1, I), DAVB(1, I), SIGD, J, NT, 0, AG,
X DA, SIGA, FL, DAVFT, CHISQR, STR, DSTR, 18)
DELL=SQRT(CHISQR)
SIGA(19)=DELL*SIGA(19)
M=1900+NYMIN+I
WRITE(6, 1142)M, J, DELL, AG(19)
WRITE(6, 1144)SIGA(19)
WRITE(10, 1142)M, J, DELL, AG(19)
WRITE(10, 1144)SIGA(19)
160 CONTINUE
C
200 CONTINUE
SQ2D=SQ2DI
RETURN
END
```

C
C

```
REAL*8 FUNCTION HRMO(Y)
  IMPLICIT REAL*8 (A-H,0-Z)
  COMMON/CON/NYMIN, NYMAX, NYPT, NH, MODE, ID, NSTA(1), YMID, NAT,
X  AE(20), AH(20)
  DIMENSION T(1)
  T(1)=Y
  HRMO=HRM(T, 1, AH)
  RETURN
  END
```

C
C

```
REAL*8 FUNCTION HRMS(Y)
  IMPLICIT REAL*8 (A-H,0-Z)
  HRMS=HRMO(Y)+SPQN(Y)
  RETURN
  END
```

C
C

```
REAL*8 FUNCTION HRMSE(Y)
  IMPLICIT REAL*8 (A-H,0-Z)
  COMMON/CON/NYMIN, NYMAX, NYPT, NH, MODE, ID, NSTA(1), YMID, NAT,
X  AE(20), AH(20)
  HRMSE=AE(2)+AE(3)*EXP(AE(4)*Y)+HRMS(Y)
  RETURN
  END
```

C
C

```
REAL*8 FUNCTION TRE(Y)
  IMPLICIT REAL*8 (A-H,0-Z)
  COMMON/CON/NYMIN, NYMAX, NYPT, NH, MODE, ID, NSTA(1), YMID, NAT,
X  AE(20), AH(20)
  TRE=AE(2)+AE(3)*EXP(AE(4)*Y)+SPQN(Y)
  RETURN
  END
```

C
C

```
REAL*8 FUNCTION EXP0(Y)
  IMPLICIT REAL*8 (A-H,0-Z)
  COMMON/CON/NYMIN, NYMAX, NYPT, NH, MODE, ID, NSTA(1), YMID, NAT,
X  AE(20), AH(20)
  EXP0=AE(2)+AE(3)*EXP(AE(4)*Y)
  RETURN
  END
```

C
C

```
REAL*8 FUNCTION SPQN(Y)
  IMPLICIT REAL*8 (A-H,0-Z)
  COMMON/DAT/ YR(11000), DAV(11000), DAVFT(11000)
  COMMON/SPQ/SPQF(11000), SPQC(11000,3)
  COMMON/CON/NYMIN, NYMAX, NYPT, NH, MODE, ID, NSTA(1), YMID, NAT,
X  AE(20), AH(20)
  SPQN=SPLINT(ID, YR, SPQF, SPQC, 11000, LI, Y)
  RETURN
  END
```

C
C

```
REAL*8 FUNCTION SPKN(Y)
  IMPLICIT REAL*8 (A-H,0-Z)
```

```
COMMON/SPK/NYK, YK(40), SPKF(40), SPKC(40,3)
SPKN=SPLINT(NYK, YK, SPKF, SPKC, 40, LI, Y)
RETURN
END
```

C
C

```
REAL*8 FUNCTION SPMN(Y)
IMPLICIT REAL*8 (A-H, O-Z)
COMMON/INT/YM(480), SPMF(480), SPMC(480,3), BM(4), DM(480), IS, IF, JM
SPMN=SPLINT(JM, YM, SPMF, SPMC, 480, LI, Y)
RETURN
END
```

C

```
REAL*8 FUNCTION SQ2DF(NK, YK, C, IND)
IMPLICIT REAL*8 (A-H, O-Z)
DIMENSION YK(1), C(IND,3)
```

C PGM EVALUATES THE SQUARE ROOT OF THE AVERAGE OF THE SECOND
C DERIVATIVE SQUARED OVER A SPLINE.
C

```
S=0.
IT=NK-1
DO 10 I=1, IT
D=YK(I+1)-YK(I)
10 S=S+4.*C(I,2)**2+12.*C(I,2)*C(I,3)*D
X +12.*(C(I,3)*D)**2
IF(S.LT.0.)S=0.
SQ2DF=SQRT(S)
RETURN
END
```

C
C

```
REAL*8 FUNCTION GRNG(X, Y, XV)
IMPLICIT REAL*8 (A-H, O-Z)
DIMENSION X(1), Y(1)
```

C LAGRANGE QUADRATIC INTERPOLATION FUNCTION

```
GRNG=(XV-X(2))/(X(1)-X(2))*(XV-X(3))/(X(1)-X(3))*Y(1)+
X (XV-X(1))/(X(2)-X(1))*(XV-X(3))/(X(2)-X(3))*Y(2)+
Y (XV-X(1))/(X(3)-X(1))*(XV-X(2))/(X(3)-X(2))*Y(3)
```

C WRITE(6,10) (Y(I), X(I), I=1,3), GRNG
10 FORMAT(8X,7F10.4)
RETURN
END

C
C

```
REAL*8 FUNCTION SPLINT(N, X, YS, C, IND, LI, T)
IMPLICIT REAL*8 (A-H, O-Z)
DIMENSION X(1), YS(1), C(IND,3)
```

C

C THIS PGM EVALUATES THE SPLINE AT THE ARGUMENT T.
C T MAY BE OUTSIDE RANGE OF SPLINE TO ALLOW EXTRAPOLATION
C TO 15TH OF MONTH IF NEEDED.
C LI IS THE LAST FOUND INDEX OF THE SPLINE. SEARCH IS STARTED
C AT LI TO SPEED UP PGM.

C

```
IF(LI.LT.1.OR.LI.GT.N)LI=1
IF(T.GE.X(LI))GO TO 30
DO 10 I=2, LI
IF(T.LT.X(I))GO TO 50
10 CONTINUE
30 DO 40 I=LI+1, N-1
```

```
IF(T.LT.X(I))GO TO 50
40 CONTINUE
I=N
50 LI=I-1
D=T-X(LI)
SPLINT=((C(LI,3)*D+C(LI,2))*D+C(LI,1))*D+YS(LI)
RETURN
END
```

C
C

```
REAL*8 FUNCTION HRMC(T,I,A)
IMPLICIT REAL*8 (A-H,0-Z)
DIMENSION T(1),A(1)
COMMON/CON/NYMIN,NYMAX,NYPT,NH,MODE,ID,NSTA(1),YMID,NAT,
X AE(20),AH(20)
TR=((A(4)*T(I)+A(3))*T(I)+A(2))*T(I)+A(1)
S=2.*3.1415926536D0*T(I)
SS=0.
DO 10 N=1,NH
J=3+2*N
10 SS=SS+A(J)*SIN(N*S)+A(J+1)*COS(N*S)
HRMC=TR+SS
RETURN
END
```

C
C

```
SUBROUTINE DHRMC(T,I,A,DA,NT,DV)
IMPLICIT REAL*8 (A-H,0-Z)
DIMENSION T(1),A(1),DA(1),DV(1)
COMMON/CON/NYMIN,NYMAX,NYPT,NH,MODE,ID,NSTA(1),YMID,NAT,
X AE(20),AH(20)
S=2.*3.1415926536D0*T(I)
DV(1)=1.
DV(2)=T(I)
DV(3)=T(I)**2
DV(4)=T(I)**3
DO 10 N=1,NH
J=3+2*N
DV(J)=SIN(N*S)
DV(J+1)=COS(N*S)
10 CONTINUE
RETURN
END
```

C
C

```
REAL*8 FUNCTION HRMEL(T,I,A)
IMPLICIT REAL*8 (A-H,0-Z)
DIMENSION T(1),A(1)
COMMON/CON/NYMIN,NYMAX,NYPT,NH,MODE,ID,NSTA(1),YMID,NAT,
X AE(20),AH(20)
S=2.*3.1415926536D0*T(I)
EX=EXP(A(4)*T(I))
TR=A(2)+A(3)*EX
SS=0.
DO 10 N=1,NH
J=3+2*N
10 SS=SS+A(J)*SIN(N*S)+A(J+1)*COS(N*S)
HRMEL=TR+(1.+A(1)*T(I))*SS
RETURN
END
```

C
C

```
      SUBROUTINE DHRMEL(T,I,A,DA,NT,DV)
      IMPLICIT REAL*8 (A-H,O-Z)
      DIMENSION T(1),A(1),DA(1),DV(1)
      COMMON/CON/NYMIN,NYMAX,NYPT,NH,MODE,ID,NSTA(1),YMID,NAT,
X   AE(20),AH(20)
      S=2.*3.1415926536D0*T(I)
      EX=EXP(A(4)*T(I))
      SS=0.
      DO 10 N=1,NH
      J=3+2*N
10   SS=SS+A(J)*SIN(N*S)+A(J+1)*COS(N*S)
      DV(2)=1.
      DV(3)=EX
      DV(4)=A(3)*T(I)*EX
      DV(1)=T(I)*SS
      DO 20 N=1,NH
      J=3+2*N
      DV(J)=(1.+A(1)*T(I))*SIN(N*S)
      DV(J+1)=(1.+A(1)*T(I))*COS(N*S)
20  CONTINUE
      RETURN
      END
```

C
C

```
      REAL*8 FUNCTION HRM(T,I,A)
      IMPLICIT REAL*8 (A-H,O-Z)
      DIMENSION T(1),A(1)
      COMMON/CON/NYMIN,NYMAX,NYPT,NH,MODE,ID,NSTA(1),YMID,NAT,
X   AE(20),AH(20)
      S=2.*3.1415926536D0*T(I)
      SS=0.
      DO 10 N=1,NH
      J=2*N
10   SS=SS+A(J)*SIN(N*S)+A(J+1)*COS(N*S)
      HRM=(1.+A(1)*T(I))*SS
      RETURN
      END
```

C
C

```
      SUBROUTINE DHRM(T,I,A,DA,NT,DV)
      IMPLICIT REAL*8 (A-H,O-Z)
      DIMENSION T(1),A(1),DA(1),DV(1)
      COMMON/CON/NYMIN,NYMAX,NYPT,NH,MODE,ID,NSTA(1),YMID,NAT,
X   AE(20),AH(20)
      S=2.*3.1415926536D0*T(I)
      SS=0.
      DO 10 N=1,NH
      J=2*N
10   SS=SS+A(J)*SIN(N*S)+A(J+1)*COS(N*S)
      DV(1)=SS*T(I)
      DO 20 N=1,NH
      J=2*N
      DV(J)=(1.+A(1)*T(I))*SIN(N*S)
      DV(J+1)=(1.+A(1)*T(I))*COS(N*S)
20  CONTINUE
      RETURN
      END
```

C

C

```
REAL*8 FUNCTION HR(T,I,A)
IMPLICIT REAL*8 (A-H,O-Z)
DIMENSION T(1),A(1)
COMMON/CON/NYMIN,NYMAX,NYPT,NH,MODE,ID,NSTA(1),YMID,NAT,
X AE(20),AH(20)
S=2.*3.1415926536D0*T(I)
SS=0.
DO 10 N=1,NH
J=2*N-1
10 SS=SS+A(J)*SIN(N*S)+A(J+1)*COS(N*S)
HR=SS
RETURN
END
```

C

C

```
REAL*8 FUNCTION STR(T,I,A)
IMPLICIT REAL*8 (A-H,O-Z)
DIMENSION T(1),A(1)
COMMON/CON/NYMIN,NYMAX,NYPT,NH,MODE,ID,NSTA(1),YMID,NAT,
X AE(20),AH(20)
S=2.*3.1415926536D0*T(I)
SS=0.
DO 10 N=1,NH
J=2*N-1
10 SS=SS+A(J)*SIN(N*S)+A(J+1)*COS(N*S)
STR=A(19)*SS+A(20)
RETURN
END
```

C

C

```
SUBROUTINE DSTR(T,I,A,DA,NT,DV)
IMPLICIT REAL*8 (A-H,O-Z)
DIMENSION T(1),A(1),DA(1),DV(1)
COMMON/CON/NYMIN,NYMAX,NYPT,NH,MODE,ID,NSTA(1),YMID,NAT,
X AE(20),AH(20)
S=2.*3.1415926536D0*T(I)
SS=0.
DO 10 N=1,NH
J=2*N-1
10 SS=SS+A(J)*SIN(N*S)+A(J+1)*COS(N*S)
DV(19)=SS
DV(20)=1.
RETURN
END
```

C

C

C

C

C

C

C

C

C

C

C

C

C

C

C

C

```
REAL*8 FUNCTION FCHISQ
```

```
PURPOSE
```

```
EVALUATE REDUCED CHI SQUARE FOR FIT TO DATA
```

```
FCHISQ = SUM ((Y-YFIT)**2/SIGMA**2) / NFREE
```

```
USAGE
```

```
RESULT = FCHISQ (Y, SIGMAY, NPTS, NFREE, MODE, YFIT)
```

```
DESCRIPTION OF PARAMETERS
```

```
Y - ARRAY OF DATA POINTS
```

```
SIGMAY - ARRAY OF STANDARD DEVIATIONS FOR DATA POINTS
```

```
NPTS - NUMBER OF DATA POINTS
```



```
C      NFREE - NUMBER OF DEGREES OF FREEDOM
C      MODE  - DETERMINES METHOD OF WEIGHTING LEAST-SQUARES FIT
C              +1 (INSTRUMENTAL) WEIGHT(I) =1./SIGMAY(I)**2
C              0 (NO WEIGHTING) WEIGHT(I) =1.
C              -1 (STATISTICAL) WEIGHT(I) =1./Y(I)
C      YFIT  - ARRAY OF CALCULATED VALUES OF Y
C
```

```
REAL*8 FUNCTION FCHISQ (Y, SIGMAY, NPTS, NFREE, MODE, YFIT)
IMPLICIT REAL*8 (A-H,O-Z)
DOUBLE PRECISION CHISQ, WEIGHT
DIMENSION Y(1), SIGMAY(1), YFIT(1)
CHISQ=0.
IF (NFREE) 13, 13, 20
13 FCHISQ=0.
GO TO 40
```

```
C      ACCUMULATE CHI SQUARE
```

```
C
C      DO 30 I=1, NPTS
C      IF (MODE) 22, 27, 29
C      22 IF (Y(I)) 25, 27, 23
C      23 WEIGHT=1./Y(I)
C      GO TO 30
C      25 WEIGHT=1./(-Y(I))
C      GO TO 30
C      27 WEIGHT=1.
C      GO TO 30
C      29 WEIGHT=1./SIGMAY(I)**2
C      30 CHISQ=CHISQ + WEIGHT*(Y(I)-YFIT(I))**2
```

```
C      DIVIDE BY NUMBER OF DEGREES OF FREEDOM
```

```
C      FREE=NFREE
C      FCHISQ=CHISQ/FREE
40 RETURN
END
```

```
C
C      SUBROUTINE CURFIT
```

```
C      FROM BEVINGTON, MODIFIED BY BACASTOW
C      PURPOSE
C      MAKE A LEAST-SQUARES FIT TO A NON-LINEAR FUNCTION
C      WITH A LINEARIZATION OF THE FITTING FUNCTION
```

```
C      DESCRIPTION OF PARAMETERS
C      X      - ARRAY OF DATA POINTS FOR INDEPENDENT VARIABLE
C      Y      - ARRAY OF DATA POINTS FOR DEPENDENT VARIABLE
C      SIGMAY - ARRAY OF STANDARD DEVIATIONS FOR Y DATA POINTS
C      NPTS   - NUMBER OF PAIRS OF DATA POINTS
C      NTERMS - NUMBER OF PARAMETERS
C      MODE   - DETERMINES METHOD OF WEIGHTING LEAST-SQUARES FIT
C              +1 (INSTRUMENTAL) WEIGHT(I) = 1./SIGMAY(I)**2
C              0 (NO WEIGHTING) WEIGHT(I) = 1.
C              -1 (STATISTICAL) WEIGHT(I) = 1./Y(I)
C      A      - ARRAY OF PARAMETERS
C      DELTAA - ARRAY OF INCREMENTS FOR PARAMETERS A
C      SIGMAA - ARRAY OF STANDARD DEVIATIONS FOR PARAMETERS A
C      FLAMDA - PROPORTION OF GRADIENT SEARCH INCLUDED
C      YFIT   - ARRAY OF CALCULATED VALUES OF Y
```

```
C      CHISQR - REDUCED CHI SQUARE FOR FIT
C      NAT   - NO. OF ELEMENTS AT BEGINNING OF PARAMETER ARRAY
C              THAT ARE TO BE IGNORED IN FIT
C
C      SUBROUTINES AND FUNCTION SUBPROGRAMS REQUIRED
C      FUNCTN (X, I, A)
C          EVALUATES THE FITTING FUNCTION FOR THE ITH POINT
C      FCHISQ (Y, SIGMAY, NPTS, NFREE, MODE, YFIT)
C          EVALUATES REDUCED CHI SQUARE FOR FIT TO DATA
C      FDERIV (X, I, A, DELTAA, NTERMS, DERIV)
C          EVALUATES THE DERIVATIVES OF THE FITTING FUNCTION
C          FOR THE ITH POINT WITH RESPECT TO EACH PARAMETER
C      MATINV (ARRAY, NTERMS, DET)
C          INVERTS A SYMMETRIC TWO-DIMENSIONAL MATRIX OF DEGREE NTERMS
C          AND CALCULATES ITS DETERMINANT
C
C      COMMENTS
C      DIMENSION STATEMENT VALID FOR NTERMS UP TO 20
C      SET FLAMDA = 0.001 AT BEGINNING OF SEARCH
C
C      SUBROUTINE CURFIT (X,Y,SIGMAY,NPTS,NTERMS,MODE,A,DELTAA,
1 SIGMAA,FLAMDA,YFIT,CHISQR,FUNCTN,FDERIV,NAT)
C      IMPLICIT REAL*8 (A-H,O-Z)
C      DOUBLE PRECISION ARRAY,ALPHA,BETA
C      DIMENSION X(1), Y(1), SIGMAY(1), A(1), DELTAA(1), SIGMAA(1),
1 YFIT(1)
C      DIMENSION WEIGHT(11000), ALPHA(20,20), BETA(20), DERIV(20),
1 ARRAY(20,20), B(20), ARRAY1(20,20)
C
C      NFREE=NPTS-NTERMS
C      IF (NFREE) 13,13,20
13 CHISQR=0.
C      GO TO 110
C
C      EVALUATE WEIGHTS
C
C      20 DO 30 I=1, NPTS
C          IF (MODE) 22,27,29
C      22 IF (Y(I)) 25,27,23
C      23 WEIGHT(I)=1./Y(I)
C          GO TO 30
C      25 WEIGHT(I)=1./(-Y(I))
C          GO TO 30
C      27 WEIGHT(I)=1.
C          GO TO 30
C      29 WEIGHT(I)=1./SIGMAY(I)**2
C      30 CONTINUE
C
C      EVALUATE ALPHA AND BETA MATRICES
C
C      DO 34 J=1, NTERMS
C          BETA(J)=0.
C      DO 34 K=1, J
134 ALPHA(J,K)=0.
C      DO 50 I=1, NPTS
C          YFIT(I)=FUNCTN(X,I,A)
C          CALL FDERIV (X,I,A,DELTAA,NTERMS,DERIV)
C      DO 46 J=1, NTERMS
C          BETA(J)=BETA(J)+WEIGHT(I)*(Y(I)-YFIT(I))*DERIV(J+NAT)
C      DO 46 K=1, J
```

```
46 ALPHA(J,K)=ALPHA(J,K)+WEIGHT(I)*DERIV(J+NAT)*DERIV(K+NAT)
50 CONTINUE
   DO 53 J=1, NTERMS
   DO 53 K=1, J
53 ALPHA(K,J)=ALPHA(J,K)
C
C     EVALUATE CHI SQUARE AT STARTING POINT
C
C     CHISQ1=FCHISQ(Y,SIGMAY,NPTS,NFREE,MODE,YFIT)
1000 FORMAT(1H,' CHISQ1=',E12.5)
1002 FORMAT(1H,' CHISQ2=',E12.5)
C     WRITE(6,1000)CHISQ1
C
C     INVERT MODIFIED CURVATURE MATRIX TO FIND NEW PARAMETERS
C
C     71 DO 74 J=1, NTERMS
C     DO 73 K=1, NTERMS
C     73 ARRAY(J,K)=ALPHA(J,K)/SQRT(ALPHA(J,J)*ALPHA(K,K))
C     74 ARRAY(J,J)=1.+FLAMDA
C (NEXT 5 LINES ADDED 2-JAN-1986 TO GIVE PROPER ERROR MATRIX)
C     DO 75 K=1,NTERMS
C     DO 75 J=1,NTERMS
C     75 ARRAY1(J,K)=ARRAY(J,K)
C     DO 76 J=1,NTERMS
C     76 ARRAY1(J,J)=1.
C     CALL MATINV (ARRAY,NTERMS,DET)
C
C     INSERTED TO PERMIT USE OF PARAMETERS ABOVE AND BELOW
C     NTERMS FOR PARAMETERS WHICH ARE NOT FITTED IN THIS FIT
C     DO 85 J=1,20
C     85 B(J)=A(J)
C
C     DO 84 J=1, NTERMS
C     DO 84 K=1, NTERMS
C     84 B(J+NAT)=B(J+NAT)+BETA(K)*ARRAY(J,K)/SQRT(ALPHA(J,J)*ALPHA(K,K))
C
C     IF CHI SQUARE INCREASED, INCREASE FLAMDA AND TRY AGAIN
C
C     DO 92 I=1, NPTS
C     92 YFIT(I)=FUNCTN(X,I,B)
C     CHISQR=FCHISQ(Y,SIGMAY,NPTS,NFREE,MODE,YFIT)
C     WRITE(6,1002)CHISQR
C     IF (CHISQ1-CHISQR) 95,101,101
C     95 FLAMDA=10.*FLAMDA
C     GO TO 71
C
C     EVALUATE PARAMETERS AND UNCERTAINTIES
C (NEXT 5 LINES INSERTED 2-JAN-1986 TO GIVE PROPER ERROR MATRIX
C UNAFFECTED BY FLAMDA)
C     101 CONTINUE
C     DO 102 K=1,NTERMS
C     DO 102 J=1,NTERMS
C     102 ARRAY(J,K)=ARRAY1(J,K)
C     CALL MATINV(ARRAY,NTERMS,DET)
C     DO 103 J=1, NTERMS
C     A(J+NAT)=B(J+NAT)
C     103 SIGMAA(J+NAT)=DSQRT(ARRAY(J,J)/ALPHA(J,J))
C     FLAMDA=FLAMDA/10.
C     110 RETURN
C     END
```

```
C
C
C      SUBROUTINE MATINV
C
C      PURPOSE
C          INVERT A SYMMETRIC MATRIX AND CALCULATE ITS DETERMINANT
C
C      USAGE
C          CALL MATINV (ARRAY, NORDER, DET)
C
C      DESCRIPTION OF PARAMETERS
C          ARRAY - INPUT MATRIX WHICH IS REPLACED BY ITS INVERSE
C          NORDER - DEGREE OF MATRIX (ORDER OF DETERMINANT)
C          DET    - DETERMINANT OF INPUT MATRIX
C
C      COMMENTS
C          DIMENSION STATEMENT VALID FOR NORDER UP TO 20
C
C      SUBROUTINE MATINV (ARRAY, NORDER, DET)
C      IMPLICIT REAL*8 (A-H,O-Z)
C      DOUBLE PRECISION ARRAY, AMAX, SAVE
C      DIMENSION ARRAY(20,20), IK(20), JK(20)
C      DET=1.
C      DO 100 K=1, NORDER
C
C          FIND LARGEST ELEMENT ARRAY(I,J) IN REST OF MATRIX
C
C          AMAX=0.
C      21 DO 30 I=K, NORDER
C          DO 30 J=K, NORDER
C          IF (DABS(AMAX)-DABS(ARRAY(I,J))) 24, 24, 30
C      24 AMAX=ARRAY(I,J)
C          IK(K)=I
C          JK(K)=J
C      30 CONTINUE
C
C          INTERCHANGE ROWS AND COLUMNS TO PUT AMAX IN ARRAY(K,K)
C
C          IF (AMAX) 41, 32, 41
C      32 DET=0.
C          GO TO 140
C      41 I=IK(K)
C          IF (I-K) 21, 51, 43
C      43 DO 50 J=1, NORDER
C          SAVE=ARRAY(K,J)
C          ARRAY(K,J)=ARRAY(I,J)
C      50 ARRAY(I,J)=-SAVE
C      51 J=JK(K)
C          IF (J-K) 21, 61, 53
C      53 DO 60 I=1, NORDER
C          SAVE=ARRAY(I,K)
C          ARRAY(I,K)=ARRAY(I,J)
C      60 ARRAY(I,J)=-SAVE
C
C          ACCUMULATE ELEMENTS OF INVERSE MATRIX
C
C      61 DO 70 I=1, NORDER
C          IF (I-K) 63, 70, 63
C      63 ARRAY(I,K)=-ARRAY(I,K)/AMAX
C      70 CONTINUE
```

```
DO 80 I=1, NORDER
DO 80 J=1, NORDER
IF (I-K) 74, 80, 74
74 IF (J-K) 75, 80, 75
75 ARRAY(I, J)=ARRAY(I, J)+ARRAY(I, K)*ARRAY(K, J)
80 CONTINUE
DO 90 J=1, NORDER
IF (J-K) 83, 90, 83
83 ARRAY(K, J)=ARRAY(K, J)/AMAX
90 CONTINUE
ARRAY(K, K)=1./AMAX
100 CONTINUE
C THE DET CALC. HAS BEEN DISABLED BECAUSE IT SOMETIMES CAUSES
C FLOATING POINT OVERFLOWS. 17 JUL 83, RB.
C 100 DET=DET*AMAX
C
C RESTORE ORDERING OF MATRIX
C
DO 130 L=1, NORDER
K=NORDER-L+1
J=IK(K)
IF (J-K) 111, 111, 105
105 DO 110 I=1, NORDER
SAVE=ARRAY(I, K)
ARRAY(I, K)=-ARRAY(I, J)
110 ARRAY(I, J)=SAVE
111 I=JK(K)
IF (I-K) 130, 130, 113
113 DO 120 J=1, NORDER
SAVE=ARRAY(K, J)
ARRAY(K, J)=-ARRAY(I, J)
120 ARRAY(I, J)=SAVE
130 CONTINUE
140 RETURN
END
```

