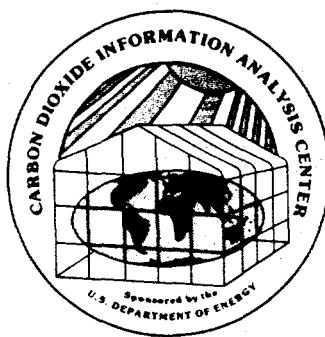


NDP-008/R1



RECEIVED
OCT 15 1997
OSTI

CDIAC NUMERIC DATA COLLECTION

Annual and Seasonal Global Temperature Anomalies in the Troposphere and Low Stratosphere, 1958–Summer 1986

MASTER

MARTIN MARIETTA ENERGY SYSTEMS, INC.

operating the

Oak Ridge National Laboratory
Oak Ridge Gaseous Diffusion Plant

Oak Ridge Y-12 Plant
Paducah Gaseous Diffusion Plant
Portsmouth Gaseous Diffusion Plant

for the U.S. Department of Energy

P.O. Box X Oak Ridge, Tennessee 37831 Telephone (615) 574-0390 or FTS 624-0390

Telex No. 8105721076 USDOE OKRE

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

Legal Notice: This document was prepared as an account of Government-sponsored work and describes a numeric data package, which is one of a series collected by the Carbon Dioxide Information Analysis Center (CDIAC).^{*} This technology was developed by various Government and private organizations who contributed it to CDIAC for distribution; it did not originate at CDIAC. CDIAC is informed that these data have been evaluated by the contributor, and some checking has been done by CDIAC. Neither the United States Government, the Department of Energy (DOE), Martin Marietta Energy Systems, Inc., nor any person acting on behalf of the Department of Energy or Energy Systems, makes any warranty, expressed or implied, or assumes any legal liability or responsibility for the accuracy, completeness, usefulness or functioning of any information, data, and related material or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government, the Department of Energy, Energy Systems, or any person acting on behalf of the Department of Energy or Energy Systems.

^{*}Sponsored by the Carbon Dioxide Research Division (CDRD), Office of Basic Energy Sciences (BES), Office of Energy Research, U.S. Department of Energy.

**ANNUAL AND SEASONAL GLOBAL TEMPERATURE ANOMALIES IN
THE TROPOSPHERE AND LOW STRATOSPHERE, 1958 - SUMMER 1986**

Contributed by
J.K. Angell
J. Korshover
Air Resources Laboratory
National Oceanic and Atmospheric Administration
Silver Spring, Maryland 20910

MASTER

April 1987

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED *ph*

Prepared by
T.A. Boden
Carbon Dioxide Information Analysis Center
Environmental Sciences Division
Oak Ridge National Laboratory
Oak Ridge, Tennessee 37831
operated by
Martin Marietta Energy Systems, Inc.
for the
U.S DEPARTMENT OF ENERGY
under contract No. DE-AC05-84OR21400

DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.

TABLE OF CONTENTS

	<u>Page</u>
List of Figures	v
List of Tables	vii
Abstract	1
Magnetic Tape Contents	6
Magnetic Tape Descriptive File	7
FORTTRAN IV Data Retrieval Program Listing	9
Pertinent Literature	23
Angell, J.K. 1986. Annual and seasonal global temperature changes in the troposphere and low stratosphere, 1960-85. <u>Monthly Weather Review</u> 114:1922-1930. Angell, J.K., and J. Korshover. 1983. Global temperature variations in the troposphere and stratosphere, 1958-1982. <u>Monthly Weather Review</u> 111:901-921.	

LIST OF FIGURES

<u>Figure</u>		<u>Page</u>
1.	Location of radiosonde stations used for the temperature anomaly analysis	2

LIST OF TABLES

<u>Table</u>		<u>Page</u>
1.	Seasonal and annual global temperature anomalies for tropospheric and stratospheric layers, 1958 - 1986 (summer)	11

CDIAC NUMERIC DATA PACKAGE

ABSTRACT

1. NUMERIC DATA PACKAGE NAME

Annual and Seasonal Global Temperature Anomalies in the Troposphere and Low Stratosphere, 1958 - Summer 1986.

2. CONTRIBUTORS

J. K. Angell
J. Korshover
Air Resources Laboratory
National Oceanic and Atmospheric Administration
Silver Spring, Maryland 20910

3. CITATION OF THE PACKAGE

The Carbon Dioxide Information Analysis Center (CDIAC) recommends the following citation for those citing or referencing this package:

Angell, J.K., and J. Korshover. 1987. Annual and seasonal global temperature anomalies in the troposphere and low stratosphere, 1958 - summer 1986. NDP-008/R1, Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, Oak Ridge, Tennessee.

4. HISTORICAL BACKGROUND INFORMATION

Surface temperatures and thickness-derived temperatures from a network of 63 well-distributed radiosonde stations (Fig. 1) have been used to estimate global and zonal annual and seasonal temperature anomalies for the period 1958 through the summer of 1986. These anomaly estimates were made using a 1958-1977 reference period mean. Anomaly estimates are provided for surface, troposphere (850-300 mb), tropopause layer (300-100 mb), and low stratosphere (100-50 mb; 100-30mb) layers and for polar (60° - 90°), temperate (30° - 60°), subtropical (10° - 30°), and equatorial (10° N - 10° S) zones, as well as the tropics, both hemispheres, and the world.

5. SOURCE AND SCOPE OF THE DATA

Most of the temperature values used to estimate the temperature anomalies are column-mean temperatures, obtained from the differences in height (thickness) between constant-pressure surfaces at individual radiosonde stations. The pressure-height data before 1980 were obtained from published values in Monthly Climatic Data for the World. Recently, temperature values have been based both on these data and on teletype data assembled at

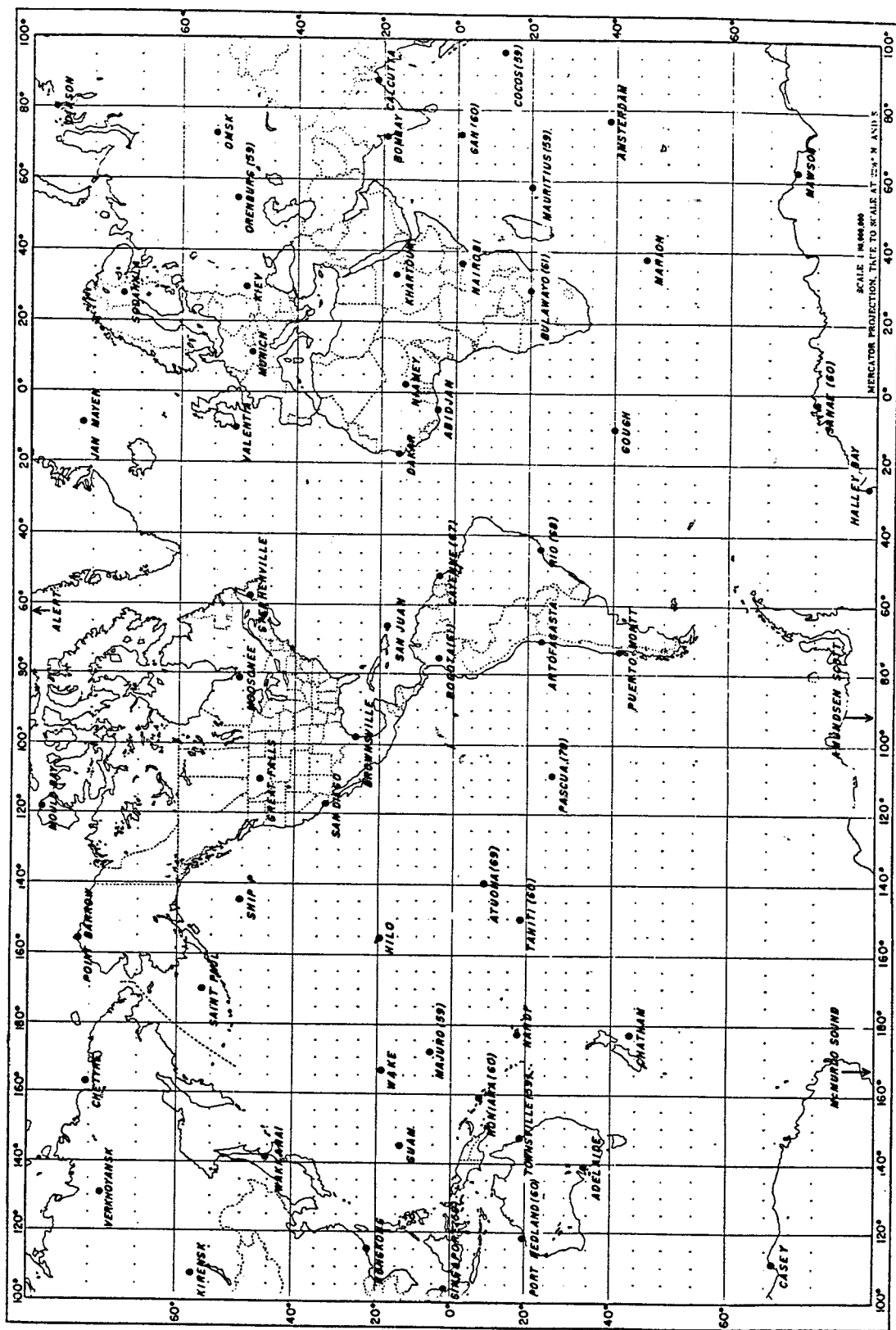


Fig. 1. Location of radiosonde stations used for the temperature anomaly analysis.

the National Meteorological Center. The data are evaluated as deviations from the mean based on the interval 1958-1977 except in the south temperate stratosphere and the Southern Hemisphere stratosphere where the mean is based on the interval 1964-1977 (Angell and Korshover 1983). The data have been summarized to seasonal and annual values where the seasons are defined as:

Winter	December - February
Spring	March - May
Summer	June - August
Autumn	September - November

Tropical averages have been obtained from an equal weighting of north subtropical (10° - 30° N), equatorial (10° S - 10° N) and south subtropical (10° - 30° S) zones. Hemispheric averages were obtained from a 1:2:2:1 weighting of averages for polar, temperate, subtropical, and equatorial zones. Global averages were obtained from hemispheric averages.

Based on the data from this 63-station radiosonde network, in both hemispheres there has been a warming at the surface and in the troposphere, and a cooling in the tropopause and low stratosphere layers. These cooling trends in the upper layers and warming in the lower layers are more pronounced in the Southern Hemisphere than in the Northern Hemisphere. At the surface, warming has been greatest in the winter season in the Northern Hemisphere, but the warming has been above average in both autumn and winter seasons in the Southern Hemisphere. The south-polar surface and troposphere have generally warmed relative to the tropics, but the north-polar surface and troposphere have not. Further discussion of the data results are given in the pertinent literature included in this package.

6. APPLICATIONS OF THE DATA

This temperature anomaly data can be used for comparison with other surface air temperature anomaly datasets and can be applied to climatic trend studies. The patterns exhibited by this data support many of the conclusions drawn from the general circulation models such as a warming of the troposphere and cooling of the stratosphere, warming of the Southern Hemisphere extratropics relative to the tropics, and greater surface warming in the cool season than in the warm season. Although the length of record for these data are insufficient to provide conclusive evidence for the possible detection of a carbon dioxide induced climate change, the format of showing the temperature variation as a function of latitude, height, and season will aid future studies aimed at detecting such influences.

7. LIMITATIONS AND RESTRICTIONS

The temperature anomaly estimates presented are based on a relatively sparse (63 stations) radiosonde network. A denser network might yield results that differ from the values presented. However, comparisons of the surface estimates

obtained from this 63-station network with the Northern Hemisphere anomaly estimates obtained from the more extensive gridded network of Jones et al. (1982) yielded a correlation of 0.86. Hence, for the Northern Hemisphere at least, this relatively sparse network seems to provide reasonable temperature estimates. The representativeness for the Southern Hemisphere is less certain.

Temperature deviations are expressed in hundredths of a degree Celsius but are probably accurate to only the nearest 0.1°C. Deviations are expressed in hundredths of a degree in order to avoid round-off error when averaging by hemisphere.

8. KEYWORDS

TEMPERATURE ANOMALIES, RADIOSONDE DATA, TROPOSPHERE, TROPOPAUSE, STRATOSPHERE, NORTHERN HEMISPHERE, SOUTHERN HEMISPHERE.

9. CONTENTS OF THE PACKAGE

The package contains global and zonal, annual and seasonal temperature deviation estimates for 1958 - 1986 along with reprints of pertinent literature (a) describing and discussing the data.

a. Included in the package:

Angell, J.K. 1986. Annual and seasonal global temperature changes in the troposphere and low stratosphere, 1960-85. Monthly Weather Review 114:1922-1930.

Angell, J.K., and J. Korshover. 1983. Global temperature variations in the troposphere and stratosphere, 1958-1982. Monthly Weather Review 111:901-921.

b. Background information:

Angell, J.K. 1982. Trend in surface and upper air temperatures. pgs. 241-245 In Interpretation of Climate and Photochemical Models, Ozone and Temperature Measurements, R.A. Reck and J.R. Hummel, Editors, Proceedings of the Workshop on the Responsible Interpretation of Atmospheric Models and Related Data, CONF-810396, American Institute of Physics, New York.

Angell, J.K. and J. Korshover. 1983. Comparison of stratospheric warmings following Agung and Chichon. Monthly Weather Review 111:2129-2135.

Epstein, E.S., 1982. Detecting climate change. Journal of Applied Meteorology 21:1172-1182.

- Jones, P.D., T.M.L. Wigley, and P.M. Kelly. 1982. Variations in surface air temperatures: Part 1. Northern Hemisphere, 1881-1980. Monthly Weather Review 110:59-70.
- Manabe, S., 1983. Carbon dioxide and climate change. Advances in Geophysics Vol.25, Academic Press, 39-82.
- Parker, D.E., 1980. Climatic change or analysts' artifice? - a study of grid-point upper-air data. Meteorological Magazine 109:129-152.
- Parker, D.E., 1985. On the detection of temperature changes induced by increasing atmospheric carbon dioxide. Quarterly Journal of the Royal Meteorological Society 111:587-601.
- Wigley, T.M.L., and P.D. Jones. 1981. Detecting CO₂-induced climate change. Nature 292:205-208.

10. HOW TO OBTAIN THE PACKAGE

The document contains a tabular listing (Table 1) of the anomaly data for the use of requesters who may not need the automated data. Digitized data are available on request from CDIAC on magnetic tape. The magnetic tape will contain a descriptive file (pg. 7), a FORTRAN data retrieval code to read and list the temperature anomalies (pg. 9), and the seasonal and annual tropospheric and stratospheric temperature anomaly data for the period 1958 - August 1986. Requests for magnetic tapes should include any specific instructions for transmitting the data required by the user to access the data. Requests should be addressed to:

Carbon Dioxide Information Analysis Center
Oak Ridge National Laboratory
Post Office Box X
Oak Ridge, Tennessee 37831-6050
Telephone: (615) 574-0390
FTS 624-0390

11. DATE OF ABSTRACT

March 1987

Each numeric data package (NDP) assembled by CDIAC goes through a process of assuring the quality of the data. This process includes review(s) by the contributors of the data to ensure that, in compiling the data, CDIAC does not misrepresent or inaccurately describe the data. NDPs are not distributed without the written consent of the contributors.

MAGNETIC TAPE CONTENTS

Package NDP-008/R1
Date Packaged: 9/24/84
Most Recent Update: 4/6/87

File Number & Description	Mode	Logical Records	Record Length	Block Size	Record Format
1. General Descriptive Information File	EBCDIC	102	80	8000	FB
2. FORTRAN IV Data Retrieval Program	EBCDIC	60	80	8000	FB
3. Tropospheric and Stratospheric Temperature Anomaly Data (1958 - Summer 1986)	EBCDIC	1287	80	8000	FB
Total Records		1449			

MAGNETIC TAPE DESCRIPTIVE FILE

DATASET TITLE: Annual and seasonal global temperature anomalies in the troposphere and low stratosphere, 1958 - Summer 1986.

CONTRIBUTORS: J.K. Angell
J. Korshover
Air Resources Laboratory
National Oceanic and Atmospheric Administration
Silver Spring, Maryland 20910

SCOPE OF THE DATA: Surface temperatures and thickness-derived temperatures from a network of 63 radiosonde stations have been used to estimate global and zonal, annual and seasonal temperature anomalies from 1958 through the summer of 1986. These estimates were made using a 1958-1977 reference period mean. Anomaly estimates are provided for surface, troposphere (850-300 mb), tropopause layer (300-100 mb), and low stratosphere (100-50 mb; 100-30 mb) layers and for polar (60° - 90°), temperate (30° - 60°), subtropical (10° - 30°), and equatorial (10° N- 10° S) zones as well as the tropics, both hemispheres, and the world.

DATA FORMAT: The anomaly estimates data (File 3) file contains seasonal and annual anomalies for the period 1958 - 1986 (summer) for seven climatic zones, both hemispheres, and the globe. In each of these zones and regions, data are presented for six atmospheric heights. All estimates are given to the nearest 0.01 $^{\circ}$ C and missing values are represented by 9.99. The data and header record preceding each zone are formatted and read as follows:

```
15      READ(5,15,END=99) HEADER
        FORMAT(20A4)
        DO 20 J=1,NYEARS
          READ(5,100) IYEAR1(J),WINSUR(J),SPRSUR(J),SUMSUR(J),
1      AUTSUR(J),WIN850(J),SPR850(J),SUM850(J),AUT850(J),
2      WINSUR300(J),SPR300(J),SUM300(J)
          READ(5,101) AUT300(J),ANNSUR(J),ANN850(J),ANN300(J)
          READ(5,100) IYEAR2(J),WINSFC(J),SPRSFC(J),SUMSFC(J),
1      AUTSFC(J),WIN050(J),SPR050(J),SUM050(J),AUT050(J),
2      WIN030(J),SPR030(J),SUM030(J)
          READ(5,101) AUT030(J),ANNSFC(J),ANN050(J),ANN030(J)
100     FORMAT(I4,11F6.2)
101     FORMAT(4F6.2)
20      CONTINUE
```

The variables listed in the above READ statements represent the following:

IYEAR1	-	the year on card 1					
IYEAR2	-	the year on card 2					
WINSUR	-	winter temperature anomaly estimate at the surface					
SPRSUR	-	spring	"	"	"	"	"
SUMSUR	-	summer	"	"	"	"	"
AUTSUR	-	autumn	"	"	"	"	"
ANNSUR	-	annual	"	"	"	"	"
WIN850	-	winter temperature anomaly estimate at the 850-300 mb layer					
SPR850	-	spring	"	"	"	"	"
SUM850	-	summer	"	"	"	"	"
AUT850	-	autumn	"	"	"	"	"
ANN850	-	annual	"	"	"	"	"
WIN300	-	winter temperature anomaly estimate at the 300-100 mb layer					
SPR300	-	spring	"	"	"	"	"
SUM300	-	summer	"	"	"	"	"
AUT300	-	autumn	"	"	"	"	"
ANN300	-	annual	"	"	"	"	"
WINSFC	-	winter temperature anomaly estimate at the surface-100 mb layer					
SPRSFC	-	spring	"	"	"	"	"
SUMSFC	-	summer	"	"	"	"	"
AUTSFC	-	autumn	"	"	"	"	"
ANNSFC	-	annual	"	"	"	"	"
WIN050	-	winter temperature anomaly estimate at the 100-50 mb layer					
SPR050	-	spring	"	"	"	"	"
SUM050	-	summer	"	"	"	"	"
AUT050	-	autumn	"	"	"	"	"
ANN050	-	annual	"	"	"	"	"
WIN030	-	winter temperature anomaly estimate at the 100-30 mb layer					
SPR030	-	spring	"	"	"	"	"
SUM030	-	summer	"	"	"	"	"
AUT030	-	autumn	"	"	"	"	"
ANN030	-	annual	"	"	"	"	"

REFERENCES

- Angell, J.K. 1986. Annual and seasonal global temperature changes in the troposphere and low stratosphere, 1960-85. Monthly Weather Review 114:1922-1930.
- Angell, J.K., and J. Korshover. 1983. Global temperature variations in the troposphere and stratosphere, 1958-1982. Monthly Weather Review 111:901-921.

FORTRAN IV Data Retrieval Program Listing

```

      DIMENSION A(20)
      DIMENSION HEADER(20), WINSFC(30), SPRSFC(30), SUMSFC(30),
1  AUTSFC(30), WIN050(30), SPR050(30), SUM050(30), AUT050(30),
2  WIN030(30), SPR030(30), SUM030(30), AUT030(30), WINSUR(30),
3  SPRSUR(30), SUMSUR(30), AUTSUR(30), WIN850(30), SPR850(30),
4  SUM850(30), AUT850(30), WIN300(30), SPR300(30), SUM300(30),
5  AUT300(30), IYEAR1(30), IYEAR2(30),
6  ANNSUR(30), ANN850(30), ANN300(30), ANN050(30), ANN030(30),
7  ANNSFC(30)
      NYEARS=29

C
C
C
C
C
C
5      CONTINUE
      DO 10 I=1,11
      READ(5,15,END=99) HEADER
15     FORMAT(20A4)
      DO 20 J=1, NYEARS
      READ(5,100) IYEAR1(J), WINSUR(J), SPRSUR(J), SUMSUR(J),
1  AUTSUR(J), WIN850(J), SPR850(J), SUM850(J), AUT850(J),
2  WIN300(J), SPR300(J), SUM300(J)
      READ(5,101) AUT300(J), ANNSUR(J), ANN850(J), ANN300(J)
      READ(5,100) IYEAR2(J), WINSFC(J), SPRSFC(J), SUMSFC(J),
1  AUTSFC(J), WIN050(J), SPR050(J), SUM050(J), AUT050(J),
2  WIN030(J), SPR030(J), SUM030(J)
      READ(5,101) AUT030(J), ANNSFC(J), ANN050(J), ANN030(J)
100    FORMAT(I4,11F6.2)
101    FORMAT(4F6.2)
20     CONTINUE
      WRITE(20,200) HEADER
200    FORMAT(1H1,39X,20A4)
      WRITE(20,201)
201    FORMAT(1H0,22X,'SURFACE',29X,'850 - 300 MB',
1  30X,'300 - 100 MB')
      WRITE(20,210)
210    FORMAT(1H0,'YEAR', ' WINTER ', ' SPRING ', ' SUMMER ',
1  ' AUTUMN ', ' ANNUAL ', ' WINTER ', ' SPRING ', ' SUMMER ',
2  ' AUTUMN ', ' ANNUAL ', ' WINTER ', ' SPRING ', ' SUMMER ',
3  ' AUTUMN ', ' ANNUAL ')

```

```

DO 30 K=1,NYEARS
WRITE(20,260)IYEAR1(K),WINSUR(K),SPRSUR(K),SUMSUR(K),
1 AUTSUR(K),ANNSUR(K),WIN850(K),SPR850(K),SUM850(K),AUT850(K),
1 ANN850(K),WIN300(K),SPR300(K),SUM300(K),AUT300(K),ANN300(K)
260 FORMAT(1H ,I4,1X,15(F6.2,2X))
30 CONTINUE
WRITE(20,220)
220 FORMAT(1H0,21X,'SFC - 100 MB',26X,'100 - 50 MB',
1 31X,'100- 30 MB')
WRITE(20,210)
DO 40 K=1,NYEARS
WRITE(20,260)IYEAR2(K),WINSFC(K),SPRSFC(K),SUMSFC(K),AUTSFC(K),
1 ANNSFC(K),WIN050(K),SPR050(K),SUM050(K),AUT050(K),ANN050(K),
2 WIN030(K),SPR030(K),SUM030(K),AUT030(K),ANN030(K)
40 CONTINUE
10 CONTINUE
99 CONTINUE
STOP
END

```

TABLE 1. Seasonal and annual global temperature anomalies for tropospheric and stratospheric layers, 1958 - 1986 (summer). Anomalies are with respect to a 1958-1977 reference period mean and are expressed in degrees Celsius. Missing values are represented by 9.99.

North Polar Zone (60N - 90N) Zone 1

YEAR	SURFACE					850 - 300 MB					300 - 100 MB				
	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL
1958	-0.45	-0.95	0.18	0.16	0.27	-0.88	-0.14	0.18	0.21	0.16	0.60	1.12	-0.21	0.56	0.52
1959	0.93	0.41	0.18	0.85	0.59	1.02	0.95	0.42	1.47	0.97	-0.39	1.47	0.04	-0.28	0.21
1960	-0.78	0.0	0.54	-0.51	-0.19	-0.07	0.88	0.84	0.0	0.41	3.47	-0.70	-0.32	0.77	0.81
1961	1.85	-0.56	0.11	1.28	0.67	1.89	-0.42	-0.63	0.49	0.33	0.60	3.05	1.47	0.46	1.40
1962	1.06	0.69	0.21	0.44	0.60	-0.14	-0.07	-0.07	-0.32	-0.15	-2.63	-1.68	-0.81	-0.18	-1.33
1963	-0.08	-0.09	-0.39	0.19	-0.09	-0.04	0.25	-0.25	-0.21	-0.06	-0.11	0.28	0.53	-0.53	0.04
1964	0.15	-0.55	-0.18	-0.60	-0.30	0.07	-0.56	-0.70	-0.70	-0.47	-2.91	1.61	0.04	0.74	-0.13
1965	-0.55	0.18	-0.10	0.54	0.02	-0.21	-0.39	-0.88	0.84	-0.16	-1.09	-1.61	0.04	-0.38	-0.76
1966	-3.41	-1.44	0.0	-0.96	-1.45	-1.47	-0.42	0.11	0.21	-0.39	2.49	0.42	0.81	0.49	1.05
1967	-0.28	1.35	-0.66	0.78	0.30	-0.46	0.07	-0.39	0.42	-0.09	-1.40	-3.89	-0.21	-1.47	-1.74
1968	0.0	0.58	-0.25	-0.91	-0.15	-0.18	-0.32	0.0	-0.42	-0.23	1.36	-4.34	-0.49	-0.42	-0.97
1969	-0.70	-0.48	0.01	0.58	-0.15	0.07	0.11	0.49	0.32	0.25	2.98	0.18	0.28	-0.14	0.83
1970	1.31	0.44	-0.36	-0.71	0.17	1.02	-0.21	0.14	-0.18	0.19	2.87	0.28	-0.11	0.18	0.81
1971	-0.82	0.05	0.64	-0.06	-0.05	-0.53	-0.21	-0.11	-1.30	-0.54	0.32	0.53	-0.18	-0.73	-0.02
1972	-0.11	-0.29	-0.20	-0.75	-0.34	-0.25	0.07	0.21	-0.35	-0.08	-3.15	-0.46	-0.49	0.32	-0.95
1973	1.57	-0.25	0.83	-0.14	0.50	0.63	-0.35	0.77	0.11	0.29	0.49	1.26	-0.21	0.32	0.47
1974	0.53	0.14	-0.21	0.14	0.15	0.18	0.74	0.0	-0.28	0.16	-2.63	0.98	-0.28	0.88	-0.26
1975	-0.13	0.91	-0.33	-0.41	0.01	-0.67	0.25	-0.14	-0.21	-0.19	-0.77	1.40	0.04	-0.49	0.05
1976	0.30	0.28	-0.45	-0.93	-0.20	-0.56	-0.21	-0.28	0.48	-0.14	-4.03	-2.24	-1.02	-1.13	-2.11
1977	0.18	-0.79	0.19	-0.55	-0.24	0.78	0.06	0.83	-0.15	0.38	3.27	1.42	-0.88	-0.77	0.76
1978	0.60	0.55	-0.36	-0.18	0.15	0.03	0.54	0.36	-0.38	0.14	-0.65	0.49	-0.14	-1.17	-0.37
1979	-0.46	-0.23	-0.91	-0.18	-0.45	-0.39	0.16	0.25	0.0	0.01	-0.36	0.54	-0.10	0.09	0.04
1980	1.12	0.30	0.0	-0.84	0.15	0.38	0.35	0.17	-0.40	0.13	-2.36	1.15	0.09	-0.23	-0.34
1981	1.85	0.48	-0.45	1.10	0.75	-0.27	0.76	-0.22	0.56	0.21	-1.72	-0.90	-0.02	-0.63	-0.82
1982	0.80	-0.06	-0.19	-1.71	-0.29	0.25	-0.38	0.18	-0.71	-0.17	-0.45	-0.33	-0.12	-1.09	-0.50
1983	0.38	0.52	-0.08	-0.34	0.12	-0.46	0.48	0.56	-0.01	0.14	-4.43	0.23	-0.65	-1.28	-1.53
1984	1.18	0.49	-0.10	0.17	0.44	0.10	0.40	0.07	0.58	0.29	-3.25	1.61	-0.18	-0.93	-0.69
1985	0.13	-0.33	-0.54	-0.51	-0.31	0.43	-0.78	-0.86	-0.04	-0.31	3.75	1.71	-0.02	0.04	1.37
1986	-0.10	-0.19	-0.02	9.99	9.99	0.38	-0.59	-0.01	9.99	9.99	-1.43	0.20	-0.89	9.99	9.99

YEAR	SFC - 100 MB					100 - 50 MB					100- 30 MB				
	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL
1958	-0.48	0.02	0.09	0.28	-0.02	2.60	-1.60	0.23	2.77	1.00	2.35	-2.47	0.31	3.92	1.03
1959	0.69	0.98	0.30	0.98	0.74	-3.03	6.25	1.08	-1.30	0.75	-2.18	5.95	1.30	-1.27	0.95
1960	0.60	0.38	0.53	0.09	0.40	6.05	4.16	0.28	2.12	3.15	9.25	-0.41	0.09	2.95	2.97
1961	1.60	0.33	-0.04	0.62	0.63	1.32	2.12	-0.21	1.14	1.09	1.17	2.87	0.16	1.18	1.35
1962	-0.49	-0.30	-0.19	-0.16	-0.29	-5.08	-4.23	-1.30	-0.09	-2.68	-6.31	-4.86	-1.67	-0.20	-3.26
1963	-0.06	0.20	-0.10	-0.21	-0.04	-0.19	-3.14	0.97	-1.02	-0.85	1.34	-4.03	0.93	-0.69	-0.61
1964	-0.58	-0.08	-0.45	-0.36	-0.37	-4.29	2.28	0.13	0.35	-0.38	-4.55	3.35	-0.07	0.06	-0.30
1965	-0.46	-0.57	-0.55	0.52	-0.27	-2.68	-2.73	-0.37	-1.02	-1.70	-4.63	-1.78	-0.47	-1.56	-2.11
1966	-0.91	-0.40	0.25	0.08	-0.25	3.18	-0.71	0.33	0.09	0.72	1.49	-0.55	0.06	0.17	0.29
1967	-0.55	-0.60	-0.40	0.06	-0.37	-3.30	-5.61	0.30	-0.99	-2.40	-4.17	-1.94	0.07	-2.15	-2.05
1968	0.19	-1.06	-0.15	-0.50	-0.38	0.25	-4.63	0.10	0.08	-1.05	-3.96	-2.19	0.29	0.41	-1.36
1969	0.59	0.03	0.36	0.26	0.31	1.28	-0.81	-1.76	-0.35	-0.41	-0.59	-0.43	0.02	-0.57	-0.39
1970	1.48	0.01	0.0	-0.19	0.33	2.76	-0.24	0.69	1.62	1.21	3.03	-0.39	0.75	0.02	0.85
1971	-0.39	0.0	0.0	-0.97	-0.34	2.35	-0.84	0.06	-0.33	0.31	0.85	-1.17	-0.12	-0.41	-0.21
1972	-0.87	-0.11	-0.01	-0.27	-0.32	-2.06	0.76	0.06	-0.46	-0.43	-1.91	1.88	-0.11	-0.02	-0.04
1973	0.76	0.02	0.56	0.12	0.37	1.90	-0.65	-0.67	-0.58	0.0	4.09	-1.48	-0.73	-0.35	0.38
1974	-0.39	0.69	-0.10	0.05	0.06	-2.47	2.85	0.02	1.42	0.46	-0.97	3.05	0.01	0.63	0.68
1975	-0.60	0.62	-0.13	-0.31	-0.11	0.57	1.59	-0.11	-0.94	0.28	1.45	0.18	0.26	0.27	0.54
1976	-1.19	-0.58	-0.47	-0.10	-0.59	-4.38	1.40	-0.15	-0.66	-0.95	1.62	1.26	0.03	-0.49	-0.21
1977	1.23	0.22	0.34	-0.36	0.36	2.94	0.95	1.30	0.95	1.54	0.07	0.74	0.62	0.28	0.43
1978	-0.08	0.52	0.13	-0.52	0.01	-1.10	0.30	-1.09	-2.42	-1.08	-0.91	0.15	-0.91	-0.88	-0.64
1979	-0.39	0.05	-0.03	-0.01	-0.10	2.10	0.49	-0.33	0.23	0.62	0.26	0.48	-0.29	-0.89	-0.11
1980	-0.09	0.52	0.20	-0.24	0.10	-0.12	0.87	0.10	0.41	0.32	1.05	0.83	0.06	0.05	0.50
1981	-0.34	0.28	-0.22	0.34	0.02	-0.13	-1.52	-0.43	-0.18	-0.57	0.47	-2.35	-0.18	-0.21	-0.57
1982	0.17	-0.20	0.03	-0.91	-0.23	1.11	0.42	0.52	-1.08	0.24	0.92	0.96	0.54	-1.90	0.13
1983	-0.98	0.48	0.21	-0.29	-0.15	-4.36	-0.01	-0.81	-0.98	-1.54	-4.00	0.15	-0.90	-1.33	-1.52
1984	-0.47	0.68	-0.01	0.19	0.10	-1.73	1.01	-0.45	-0.76	-0.48	-1.37	0.72	-0.22	-0.42	-0.32
1985	1.12	-0.15	-0.62	-0.10	0.06	3.34	0.22	-0.69	-0.50	0.59	2.13	0.10	-0.43	-0.55	0.31
1986	-0.12	-0.32	-0.24	9.99	9.99	-1.54	1.10	-0.62	9.99	9.99	-0.79	0.86	-0.41	9.99	9.99

TABLE 1. (continued)

North Temperate Zone (30N - 60N) Zone 2

YEAR	SURFACE					850 - 300 MB					300 - 100 MB				
	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL
1958	1.67	0.03	0.12	0.33	0.54	1.61	0.70	-0.07	0.14	0.60	-0.46	-0.35	0.39	0.98	0.14
1959	0.48	0.31	0.55	-0.49	0.21	0.25	0.95	0.42	0.14	0.44	0.35	0.88	0.63	0.28	0.54
1960	0.52	-0.88	0.10	-0.34	-0.15	-0.04	-0.70	0.14	-0.07	-0.17	0.84	0.60	0.25	0.53	0.56
1961	0.92	0.82	0.25	0.21	0.55	0.42	0.56	0.21	0.67	0.47	0.53	0.42	0.53	-0.28	0.30
1962	0.94	0.39	-0.09	-0.31	0.23	0.46	0.56	0.18	0.04	0.31	-0.70	-0.21	-0.28	0.28	-0.23
1963	0.26	-0.11	0.03	0.97	0.29	0.53	-0.18	0.21	0.81	0.34	-0.53	-0.14	0.56	0.67	0.14
1964	0.12	-0.83	-0.19	-0.17	-0.27	-0.04	0.32	0.21	-0.07	0.11	0.14	0.07	-0.07	0.18	0.08
1965	-0.47	-0.32	-0.20	-0.60	-0.40	0.18	-0.35	-0.39	-0.49	-0.26	0.56	0.14	-0.39	0.25	0.14
1966	0.39	0.37	-0.36	-0.05	0.09	0.0	0.04	0.18	0.56	0.20	-0.25	-0.46	0.77	0.0	0.02
1967	-0.47	0.48	0.64	0.85	0.38	-0.35	0.46	0.46	0.60	0.29	-0.07	0.42	-0.88	-0.67	-0.30
1968	-0.42	1.07	-0.31	-0.16	0.05	0.74	0.42	-0.67	-0.28	0.05	0.0	-0.84	-0.32	-0.04	-0.30
1969	-2.27	-0.93	-0.10	-0.03	-0.83	-0.98	-0.49	0.07	0.14	-0.32	-0.46	0.25	0.21	-0.32	-0.08
1970	0.0	-0.29	-0.23	0.21	-0.08	-0.42	-0.35	0.07	0.18	-0.13	-0.39	-0.42	0.32	-0.21	-0.18
1971	-0.67	-0.35	-0.25	0.65	-0.16	-0.53	-0.60	-0.21	0.14	-0.30	-0.04	0.04	0.07	-0.11	-0.01
1972	-0.90	-0.25	-0.06	-0.60	-0.45	-0.95	-0.35	-0.28	-0.49	-0.52	0.42	-0.46	-0.53	-0.35	-0.23
1973	-0.19	-0.02	0.12	-0.43	-0.13	0.0	-0.21	-0.21	-0.67	-0.27	0.14	0.35	0.0	-0.49	0.0
1974	-0.02	-0.32	-0.47	-0.24	-0.26	-0.39	-0.81	-0.63	-1.12	-0.74	-0.25	-0.11	-0.53	-0.25	-0.29
1975	0.52	0.58	0.51	0.0	0.40	-0.42	0.04	0.32	-0.21	-0.07	0.07	-0.21	-0.77	-0.21	-0.28
1976	0.02	-0.80	-0.05	-0.82	-0.41	-0.25	-1.09	-0.46	-1.03	-0.71	-0.14	-0.46	-1.09	-0.52	-0.55
1977	-0.96	0.53	-0.08	0.17	-0.09	-0.96	0.44	-0.11	0.14	-0.12	-0.12	0.51	0.05	0.14	0.15
1978	-0.20	-0.53	0.07	0.10	-0.14	-0.66	-0.22	-0.05	-0.13	-0.27	0.42	-0.30	0.16	-0.21	0.02
1979	-0.54	0.33	0.16	0.01	-0.01	-0.43	0.73	0.22	0.44	0.24	-0.28	-0.25	-0.31	0.10	-0.19
1980	0.65	-0.14	-0.47	0.03	0.02	0.21	-0.31	0.29	-0.24	-0.01	-0.51	0.92	0.84	0.46	0.43
1981	1.06	1.06	0.31	0.40	0.71	0.73	0.71	0.37	-0.03	0.45	-0.76	-0.79	0.01	0.23	-0.33
1982	0.21	-0.22	-0.05	0.28	0.06	-0.32	-0.28	-0.01	0.20	-0.10	0.69	0.50	0.09	-0.33	0.24
1983	2.92	0.60	0.34	0.57	1.11	0.93	0.98	0.45	0.39	0.69	-0.23	-0.95	-0.11	0.04	-0.31
1984	1.02	0.03	0.26	-0.19	0.28	0.05	-0.25	0.27	-0.61	-0.14	-0.40	-0.32	0.0	0.43	-0.07
1985	-1.29	-0.27	-0.20	-0.99	-0.69	-0.51	-0.26	-0.25	-0.46	-0.37	0.22	0.80	0.01	0.32	0.34
1986	0.14	0.51	-0.40	9.99	9.99	-0.07	0.52	-0.06	9.99	9.99	0.31	-0.31	-0.20	9.99	9.99
YEAR	SFC - 100 MB					100 - 50 MB					100 - 30 MB				
	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL
1958	1.16	0.36	0.06	0.36	0.49	1.40	1.22	0.89	1.93	1.36	0.36	0.83	1.37	1.94	1.13
1959	0.31	0.83	0.49	0.07	0.43	1.48	2.18	1.32	0.64	1.41	0.60	1.48	0.99	1.21	1.07
1960	0.25	-0.44	0.16	0.02	0.0	1.19	1.33	1.00	0.37	0.97	0.69	1.02	0.77	0.34	0.71
1961	0.53	0.57	0.29	0.38	0.44	-1.30	0.23	0.78	-1.11	-0.35	0.15	-0.04	0.74	-0.33	0.06
1962	0.28	0.36	0.03	0.06	0.18	0.53	-0.23	-0.80	0.23	-0.07	1.27	-0.53	-1.02	0.11	-0.04
1963	0.25	-0.16	0.26	0.81	0.29	-1.11	0.01	0.70	1.01	0.15	0.56	-1.25	0.41	0.68	0.10
1964	0.03	0.07	0.08	-0.03	0.04	-0.09	0.56	-0.16	-0.91	-0.15	0.70	1.40	-0.22	-0.70	0.30
1965	0.16	-0.24	-0.36	-0.34	-0.20	-0.46	0.07	-0.02	0.19	-0.06	-0.68	1.40	0.14	0.02	0.22
1966	0.01	-0.02	0.22	0.33	0.14	0.59	-0.85	0.24	0.80	0.20	-0.16	-0.50	0.27	0.90	0.13
1967	-0.31	0.45	0.19	0.36	0.17	0.85	0.23	-1.21	-0.28	-0.10	0.09	0.42	-0.44	-0.41	-0.09
1968	0.38	0.25	-0.53	-0.21	-0.03	-0.99	-0.74	0.18	-0.10	-0.41	-1.58	-0.91	0.12	-0.35	-0.68
1969	-1.08	-0.40	0.07	0.01	-0.35	-1.37	0.03	-0.04	1.15	-0.06	-2.03	-0.43	-0.07	-0.63	-0.79
1970	-0.34	-0.36	0.08	0.10	-0.13	0.05	0.37	0.33	-0.27	0.12	-0.28	0.46	0.31	-0.08	0.10
1971	-0.44	-0.42	-0.15	0.17	-0.21	0.03	-0.78	0.0	-0.11	-0.22	-0.75	-0.96	0.02	-0.50	-0.55
1972	-0.64	-0.36	-0.30	-0.48	-0.45	-0.33	0.12	0.30	0.19	0.07	1.26	0.27	-0.45	0.13	0.30
1973	0.0	-0.05	-0.11	-0.59	-0.19	0.56	-0.94	-0.60	-0.38	-0.34	0.49	-1.58	-0.58	-0.89	-0.64
1974	-0.30	-0.57	-0.56	-0.78	-0.55	-0.09	0.46	-0.07	-0.38	-0.02	0.66	0.54	-0.14	0.11	0.29
1975	-0.15	0.07	0.11	-0.29	-0.07	-0.16	-0.09	-0.29	-0.82	-0.34	-0.66	-0.62	-0.12	-0.09	-0.37
1976	-0.18	-0.90	-0.53	-0.88	-0.62	0.04	0.38	-0.58	0.27	0.03	0.72	0.43	-0.35	0.29	0.27
1977	-0.77	0.47	-0.04	0.14	-0.05	-0.17	-0.08	0.42	0.17	0.09	-0.25	-0.30	0.12	-0.13	-0.14
1978	-0.34	-0.09	0.02	-0.10	-0.13	0.24	-1.35	-0.78	-0.29	-0.55	-0.58	-1.29	-0.56	-0.09	-0.63
1979	-0.36	0.45	0.09	0.31	0.12	0.18	0.60	-0.16	0.27	0.22	0.47	0.06	0.0	-0.02	0.13
1980	0.14	0.04	0.27	-0.07	0.10	-0.21	1.02	0.03	1.08	0.48	-0.93	0.41	0.39	0.79	0.17
1981	0.49	0.42	0.28	0.10	0.32	0.52	0.04	-0.09	0.53	0.25	0.45	0.36	0.11	0.83	0.44
1982	-0.02	-0.09	0.03	0.09	0.0	0.93	0.64	0.91	0.24	0.68	1.78	0.68	0.77	0.36	0.90
1983	1.02	0.50	0.28	0.33	0.53	0.28	0.18	-0.39	-0.02	0.01	0.51	0.23	-0.57	0.31	0.12
1984	0.11	-0.22	0.21	-0.34	-0.06	0.0	0.59	-0.79	0.40	0.05	0.23	0.34	-0.49	0.26	0.09
1985	-0.48	-0.03	-0.18	-0.37	-0.27	-0.44	-1.09	-0.65	-0.01	-0.55	-0.26	-0.82	-0.46	-0.04	-0.40
1986	0.05	0.34	-0.15	9.99	9.99	1.07	-0.26	-0.39	9.99	9.99	0.80	-0.09	-0.28	9.99	9.99

TABLE 1. (continued)

North Subtropics Zone (10N - 30N) Zone 3

YEAR	SURFACE					850 - 300 MB					300 - 100 MB				
	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL
1958	0.22	0.40	0.12	0.30	0.26	0.28	0.77	0.81	0.88	0.69	0.31	0.18	0.56	0.77	0.46
1959	0.05	0.08	-0.02	-0.07	0.01	0.53	0.63	0.42	0.39	0.49	0.67	0.32	0.35	0.70	0.51
1960	0.05	0.0	0.05	-0.47	-0.09	0.49	0.07	0.49	0.18	0.31	0.53	0.11	0.39	-0.21	0.21
1961	-0.07	-0.24	-0.17	-0.38	-0.22	0.18	0.11	0.0	0.04	0.08	0.11	0.28	0.56	0.25	0.30
1962	-0.21	-0.12	-0.12	0.02	-0.11	0.28	-0.14	-0.11	0.18	0.05	0.60	0.35	0.25	0.25	0.36
1963	0.42	0.17	0.10	0.34	0.26	-0.07	-0.25	-0.21	-0.21	-0.19	-0.11	0.18	0.11	0.46	0.16
1964	-0.67	-0.39	-0.14	-0.39	-0.40	0.07	0.07	-0.07	-0.46	-0.10	0.63	0.53	0.14	-0.35	0.24
1965	-0.15	-0.38	-0.18	-0.08	-0.20	-0.91	-0.53	-0.60	-0.25	-0.57	-0.67	-0.49	-0.28	0.07	-0.34
1966	-0.35	0.09	0.06	0.08	-0.03	0.14	0.32	0.25	0.14	0.21	1.02	0.56	0.67	0.24	0.62
1967	-0.31	-0.17	-0.07	-0.47	-0.26	0.25	-0.35	0.14	-0.11	-0.02	0.0	0.11	0.21	0.14	0.12
1968	-0.29	-0.37	0.02	0.01	-0.16	-0.46	-0.60	-0.39	-0.32	-0.44	-0.49	-0.95	-1.02	-0.91	-0.84
1969	0.39	0.42	0.44	0.24	0.37	-0.14	0.11	0.28	0.04	0.07	-0.56	0.39	-0.46	-0.42	-0.26
1970	0.55	0.19	0.28	0.0	0.26	0.11	0.18	0.25	0.07	0.15	-0.21	0.35	0.39	0.28	0.20
1971	-0.11	0.06	-0.27	-0.27	-0.15	-0.25	-0.70	-0.67	-0.60	-0.56	-0.42	-0.74	-1.05	-0.95	-0.79
1972	-0.19	-0.32	0.27	0.30	0.02	-0.67	-0.35	-0.04	-0.11	-0.29	-0.98	-0.77	0.0	0.21	-0.39
1973	0.47	0.62	0.28	0.35	0.43	0.53	0.39	0.07	0.11	0.28	1.05	0.60	0.18	-0.14	0.42
1974	0.12	0.20	-0.32	0.02	0.01	-0.18	-0.21	-0.28	-0.11	-0.20	-0.53	-0.63	-0.53	-0.21	-0.48
1975	0.17	0.12	-0.08	0.09	0.08	-0.25	0.04	-0.32	0.0	-0.13	-0.60	-0.14	-0.11	0.11	-0.19
1976	0.09	-0.23	0.08	0.48	0.10	-0.49	-0.49	-0.49	-0.34	-0.45	-0.35	-0.35	-0.39	-0.40	-0.37
1977	0.09	0.45	0.40	0.71	0.41	0.31	-0.13	-0.20	0.19	0.04	-0.05	-0.15	-0.17	-0.69	-0.27
1978	0.44	-0.14	0.43	0.63	0.34	-0.01	0.08	-0.02	-0.16	-0.03	0.0	-0.64	-0.70	-0.76	-0.53
1979	0.19	0.38	0.16	0.44	0.29	-0.51	-0.02	-0.03	0.08	-0.12	-0.58	0.05	-0.76	-0.88	-0.54
1980	0.71	0.96	0.45	0.56	0.67	0.06	0.14	0.36	0.21	0.19	-0.34	0.12	0.0	-0.24	-0.12
1981	0.54	0.71	0.68	0.33	0.57	0.05	-0.11	0.06	0.18	0.05	-0.56	-0.79	-0.63	-0.74	-0.68
1982	0.57	0.05	0.40	0.45	0.37	-0.17	-0.27	0.10	-0.34	-0.17	-0.53	-0.82	-0.22	-0.67	-0.56
1983	-0.37	-0.13	0.59	0.64	0.18	-0.25	0.12	0.10	0.04	0.0	0.35	0.20	0.21	-0.56	0.05
1984	-0.19	0.48	0.11	0.36	0.19	0.05	0.07	-0.35	-0.19	-0.11	-1.02	-0.87	-0.71	-1.23	-0.96
1985	-0.17	0.02	0.22	0.34	0.10	-0.05	-0.19	-0.28	-0.51	-0.26	-0.74	-0.53	-0.97	-1.03	-0.82
1986	0.07	0.21	0.28	9.99	9.99	0.25	0.07	0.11	9.99	9.99	-0.77	-1.02	-0.60	9.99	9.99
YEAR	SFC - 100 MB					100 - 50 MB					100 - 30 MB				
	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL
1958	0.28	0.58	0.64	0.76	0.57	0.60	0.60	-0.47	0.13	0.22	0.71	1.50	-0.19	0.33	0.59
1959	0.48	0.47	0.33	0.41	0.42	0.01	-0.22	0.14	-0.39	-0.12	0.12	-0.73	-0.11	0.33	-0.10
1960	0.43	0.07	0.39	-0.02	0.22	-0.41	-0.48	0.14	0.71	-0.01	-0.48	-0.21	0.11	0.64	0.02
1961	0.12	0.17	0.10	0.02	0.10	-0.38	-0.64	1.38	1.99	0.59	-1.01	-1.17	1.54	1.37	0.18
1962	0.27	-0.03	-0.03	0.17	0.10	0.63	0.08	-0.49	-0.15	0.02	0.83	0.39	-0.39	0.16	0.25
1963	0.0	-0.08	-0.09	0.03	-0.04	0.05	0.81	1.99	0.86	0.93	-0.33	0.84	1.81	1.12	0.86
1964	0.07	0.10	-0.04	-0.42	-0.07	1.19	0.77	1.47	0.18	0.90	1.28	0.72	1.35	0.74	1.02
1965	-0.73	-0.50	-0.46	-0.15	-0.46	1.15	0.55	1.06	1.39	1.04	1.39	1.34	0.79	1.24	1.19
1966	0.25	0.34	0.31	0.15	0.26	-0.09	-0.08	-0.27	-0.08	-0.13	-0.71	-0.53	-0.34	0.46	-0.28
1967	0.10	-0.22	0.12	-0.11	-0.03	0.09	0.57	-0.49	-1.42	-0.31	0.45	0.73	-0.37	-0.67	0.04
1968	-0.44	-0.64	-0.46	-0.40	-0.49	-0.34	1.16	0.0	-0.11	0.18	-0.03	1.04	-0.02	-0.53	0.12
1969	-0.08	-0.22	0.14	-0.03	-0.05	-0.18	0.11	-0.10	0.67	0.13	-1.16	-0.78	-0.84	0.22	-0.64
1970	0.11	0.22	0.29	0.11	0.18	-0.83	-0.57	-0.06	0.03	-0.36	-0.94	-0.20	0.40	0.42	-0.08
1971	-0.26	-0.58	-0.69	-0.62	-0.54	-0.13	-0.05	-0.17	0.01	-0.09	-0.46	-0.32	0.05	-0.32	-0.26
1972	-0.66	-0.44	0.02	0.03	-0.26	0.56	-0.55	-1.62	-0.48	-0.52	0.20	-0.41	-1.61	-1.10	-0.73
1973	0.64	0.48	0.13	0.09	0.34	-0.48	-0.54	-0.18	-0.15	-0.34	-1.72	-1.26	-0.36	-0.55	-0.97
1974	-0.21	-0.24	-0.34	-0.11	-0.23	0.18	-0.77	-0.58	-0.55	-0.43	0.83	-0.69	-0.48	-1.16	-0.38
1975	-0.26	0.01	-0.23	0.04	-0.11	-0.20	0.39	-0.22	-0.09	-0.03	-0.47	0.02	-0.03	-0.35	-0.21
1976	-0.36	-0.42	-0.37	-0.22	-0.34	1.15	0.49	0.77	-0.13	0.57	1.29	0.05	0.16	-0.39	0.28
1977	0.20	-0.04	-0.11	0.09	0.04	-1.57	1.00	0.30	0.06	-0.05	-1.89	0.53	-1.16	-1.23	-0.94
1978	0.0	-0.12	-0.08	-0.16	-0.09	-0.89	-0.66	-0.76	-0.77	-0.77	-2.17	-1.87	-1.13	-1.33	-1.63
1979	-0.41	0.07	0.22	0.02	-0.03	-0.10	0.13	-0.21	-0.24	-0.11	0.06	0.11	-0.31	-0.86	-0.25
1980	0.07	0.26	0.22	0.19	0.19	0.28	-0.52	-0.27	-0.20	-0.18	-0.14	-1.44	0.07	-0.24	-0.44
1981	-0.01	-0.12	0.12	0.06	0.01	-0.22	-0.78	-0.75	-0.31	-0.52	0.04	-1.00	-0.88	-0.59	-0.61
1982	-0.22	-0.33	0.07	-0.29	-0.19	0.04	0.28	0.71	0.90	0.48	-0.67	0.43	0.89	1.14	0.45
1983	-0.14	0.07	0.18	0.09	0.05	1.14	-0.14	-0.37	0.61	0.31	0.22	-1.13	-0.69	0.56	-0.26
1984	-0.22	-0.07	-0.31	-0.22	-0.21	0.29	-0.99	-0.93	-0.26	-0.47	0.35	-0.75	-0.74	-0.32	-0.37
1985	-0.20	-0.21	-0.32	-0.48	-0.30	-1.07	-0.81	-0.39	0.23	-0.51	-0.92	-0.91	-0.50	-0.13	-0.62
1986	-0.01	-0.18	0.02	9.99	9.99	-1.26	-0.54	-1.65	9.99	9.99	-0.89	-0.80	-1.26	9.99	9.99

TABLE 1. (continued)

Equatorial Zone (10S - 10N) Zone 4

YEAR	SURFACE					850 - 300 MB					300 - 100 MB				
	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL
1958	0.45	-0.30	-0.90	0.30	-0.11	0.25	-0.30	-0.60	-0.22	-0.22	0.68	-1.65	-0.05	0.37	-0.16
1959	0.15	-0.45	-0.18	0.25	-0.06	-0.04	-0.09	-0.27	-0.27	-0.17	-0.13	-0.19	-0.02	-0.25	-0.15
1960	-0.07	-0.07	0.0	0.23	0.02	-0.03	-0.11	0.15	0.06	0.02	0.11	-0.19	0.38	0.23	0.13
1961	0.12	0.17	0.13	0.02	0.11	-0.11	-0.05	-0.03	-0.35	-0.14	-0.03	-0.12	-0.55	-0.03	-0.18
1962	-0.02	-0.18	-0.12	-0.13	-0.11	-0.14	-0.25	-0.22	0.20	-0.10	0.32	0.21	-0.06	0.29	0.19
1963	-0.22	-0.23	0.07	0.22	-0.04	-0.24	-0.10	0.13	0.19	-0.01	-0.11	0.20	-0.26	-0.07	-0.06
1964	-0.23	-0.09	-0.11	-0.39	-0.21	0.49	0.28	-0.32	0.47	-0.01	0.21	0.0	-0.34	-0.78	-0.23
1965	-0.64	-0.01	-0.31	0.07	-0.22	-0.76	-0.20	-0.32	0.06	-0.31	-1.08	-0.94	-0.40	0.15	-0.57
1966	-0.10	0.13	0.20	-0.03	0.05	0.30	0.23	0.20	-0.33	0.10	0.35	0.21	0.01	-0.37	0.05
1967	-0.08	-0.09	-0.06	-0.38	-0.15	-0.34	-0.39	-0.10	-0.17	-0.25	-0.20	-0.33	0.21	0.0	-0.08
1968	-0.13	-0.20	0.08	0.09	-0.04	-0.17	-0.35	-0.11	-0.19	-0.21	-0.57	-1.01	0.15	-0.26	-0.42
1969	0.17	0.36	-0.01	0.32	0.21	0.19	0.68	0.25	0.24	0.34	0.30	0.92	-0.13	0.39	0.37
1970	0.38	0.14	-0.11	-0.37	0.01	0.55	0.62	0.38	0.43	0.50	0.41	1.30	0.69	0.57	0.74
1971	-0.14	-0.20	-0.33	-0.47	-0.29	-0.21	-0.55	-0.43	-0.57	-0.44	0.06	-0.82	-0.60	-0.76	-0.53
1972	-0.10	-0.24	0.19	0.24	0.02	-0.55	-0.13	0.45	0.64	0.10	-0.85	-0.46	0.18	0.45	-0.17
1973	0.59	0.37	0.16	0.36	0.37	1.15	0.64	0.39	0.35	0.63	1.13	0.87	0.76	0.37	0.78
1974	0.03	-0.30	0.26	0.12	0.03	-0.37	-0.02	0.08	0.16	-0.04	-0.29	-0.02	0.35	-0.20	-0.04
1975	0.13	0.19	-0.10	-0.27	-0.01	0.18	0.20	-0.02	-0.06	0.08	0.15	0.18	-0.10	0.28	0.13
1976	-0.31	0.08	-0.20	0.07	-0.09	-0.18	-0.34	-0.16	0.37	-0.08	-0.02	-0.42	0.15	0.55	-0.07
1977	-0.02	0.43	0.37	0.33	0.28	0.45	0.32	0.44	0.47	0.42	0.36	0.16	0.26	0.33	0.28
1978	0.51	0.26	0.30	0.39	0.37	0.50	0.78	0.11	0.05	0.36	0.10	0.35	-0.29	-0.36	-0.05
1979	0.54	0.60	0.54	0.61	0.57	0.52	0.22	0.50	0.42	0.42	0.36	0.09	-0.01	-0.51	-0.02
1980	0.40	0.49	0.06	0.33	0.32	0.35	0.44	0.57	0.50	0.47	-0.84	-0.60	-0.11	-0.44	-0.50
1981	0.13	0.43	0.15	0.07	0.20	0.31	0.45	0.09	0.37	0.31	-0.89	-0.91	-0.73	-0.54	-0.77
1982	0.26	0.28	0.62	0.33	0.37	0.53	0.24	0.57	0.21	0.39	-0.56	-0.98	-0.40	-0.86	-0.70
1983	0.52	0.58	0.61	0.14	0.46	1.21	1.21	0.77	-0.10	0.77	0.06	0.31	0.21	-0.47	0.03
1984	0.63	-0.01	-0.32	0.13	0.11	-0.04	0.08	-0.04	-0.07	-0.02	-0.86	-0.89	-0.99	-1.20	-0.99
1985	0.56	0.06	0.05	0.28	0.24	0.26	0.08	-0.19	0.11	0.07	-1.04	-1.13	-1.34	-1.25	-1.19
1986	0.35	0.39	0.29	9.99	9.99	0.20	0.02	-0.05	9.99	9.99	-0.90	-0.77	-0.81	9.99	9.99
YEAR	SFC - 100 MB					100 - 50 MB					100 - 30 MB				
	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL
1958	0.37	-1.43	-0.59	-0.21	-0.47	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99
1959	-0.02	-0.11	-0.20	-0.04	-0.09	-1.87	-2.65	-2.81	1.25	-1.52	9.99	9.99	9.99	9.99	9.99
1960	-0.01	-0.10	0.18	0.13	0.05	0.21	-1.07	-2.00	-1.72	-1.15	-0.14	-1.23	-5.18	-4.66	-2.80
1961	-0.06	0.01	-0.28	-0.21	-0.14	-5.23	-2.29	0.83	2.63	-1.02	-4.97	-4.80	-0.56	-1.47	-2.95
1962	-0.01	-0.13	-0.24	0.05	-0.08	0.59	-0.88	-1.21	-2.17	-0.92	-0.37	-2.04	-3.64	-3.12	-2.29
1963	-0.20	-0.05	0.02	0.13	-0.03	-1.45	-2.03	-0.47	1.02	-0.73	-3.99	-3.46	0.72	3.89	-0.71
1964	0.37	0.19	-0.28	-0.49	-0.05	1.38	2.27	1.70	1.50	1.71	0.62	1.99	1.49	0.64	1.19
1965	-0.81	-0.41	-0.33	0.08	-0.37	0.99	0.51	-0.55	-0.83	0.03	0.57	-0.09	-1.14	-1.37	-0.51
1966	0.15	0.21	0.12	-0.29	0.05	-1.86	-1.97	-0.48	2.23	-0.52	-2.34	-0.93	1.72	2.30	0.19
1967	-0.31	-0.32	-0.01	-0.15	-0.20	1.49	2.12	0.33	0.23	1.04	2.04	2.03	0.88	0.14	1.27
1968	-0.25	-0.47	-0.01	-0.15	-0.22	-0.30	1.14	-0.91	-1.16	-0.31	-1.06	0.09	-0.95	-0.48	-0.60
1969	0.21	0.63	0.09	0.29	0.31	-1.18	-1.59	0.34	0.57	-0.47	-1.25	-0.38	1.22	1.59	0.30
1970	0.49	0.69	0.37	0.40	0.49	0.28	0.20	0.39	0.69	0.39	-0.70	-0.55	0.10	0.65	-0.13
1971	-0.19	-0.56	-0.45	-0.59	-0.45	0.20	-0.63	1.09	1.25	0.48	1.67	1.66	1.14	-0.42	1.01
1972	-0.54	-0.22	0.36	0.52	0.03	1.84	1.26	-0.82	-2.22	0.02	1.80	0.54	-1.36	-0.72	0.07
1973	0.94	0.65	0.43	0.36	0.60	-1.74	-0.79	0.89	0.71	-0.23	-1.80	-0.22	0.51	0.37	-0.29
1974	-0.29	-0.16	0.17	0.08	-0.05	1.64	0.46	-1.01	-1.59	-0.13	1.27	-0.72	-2.05	-2.32	-0.96
1975	0.17	0.19	-0.05	-0.01	0.08	-0.78	-0.53	0.76	1.24	0.17	-0.54	-0.11	0.26	1.44	0.26
1976	-0.16	-0.29	-0.10	0.36	-0.05	3.31	1.44	0.91	1.22	1.72	2.51	0.50	0.48	-1.53	0.49
1977	0.35	0.30	0.39	0.41	0.36	-1.34	-0.72	-0.65	-1.21	-0.98	-3.83	-1.59	-1.40	1.22	-1.40
1978	0.43	0.58	0.06	0.01	0.27	-0.52	0.52	2.34	1.41	0.94	-0.03	0.80	1.19	0.60	0.64
1979	0.49	0.25	0.40	0.31	0.36	0.60	-0.10	-0.96	-2.24	-0.68	-0.42	-0.63	-0.81	-2.08	-0.99
1980	0.16	0.34	0.34	0.24	0.27	-0.79	-1.93	0.05	1.60	-0.27	-1.14	-2.53	0.69	1.37	-0.40
1981	-0.01	0.14	-0.11	0.08	0.03	1.33	0.55	-0.12	-0.07	0.42	1.44	-0.23	-1.32	-1.11	-0.31
1982	0.23	0.03	0.36	0.0	0.16	-0.98	-0.41	-0.32	1.92	0.05	-2.76	-2.23	0.44	2.42	-0.53
1983	0.89	0.98	0.62	-0.06	0.61	1.55	1.19	0.60	0.76	1.03	0.87	0.55	-0.87	-1.10	-0.14
1984	-0.16	-0.17	-0.32	-0.29	-0.24	0.45	-1.10	-2.11	-2.44	-1.30	-0.94	-1.40	-1.49	-1.68	-1.38
1985	0.02	-0.19	-0.41	-0.16	-0.19	-2.86	-1.42	-0.05	0.38	-0.99	-1.74	-0.76	0.13	-0.27	-0.66
1986	-0.01	-0.10	-0.16	9.99	9.99	-0.92	-1.16	-1.82	9.99	9.99	-1.01	-1.30	-1.62	9.99	9.99

TABLE 1. (continued)

South Subtropics Zone (30S - 10S) Zone 5

YEAR	SURFACE					850 - 300 MB					300 - 100 MB				
	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL
1958	1.10	1.00	-0.10	0.40	0.60	0.70	0.04	0.56	0.53	0.46	-0.14	0.04	0.0	-1.51	-0.40
1959	0.47	0.50	0.67	0.52	0.54	0.21	0.07	0.32	0.28	0.22	-0.63	-0.21	-0.53	-0.56	-0.48
1960	0.34	0.20	0.01	0.37	0.23	0.46	0.07	0.55	0.32	0.35	0.53	-0.18	0.0	0.18	0.13
1961	0.06	0.15	-0.08	0.26	0.10	-0.04	0.49	0.13	0.11	0.19	-0.18	0.39	-0.11	-0.32	-0.06
1962	0.08	0.04	-0.04	0.26	0.09	0.18	-0.28	-0.04	-0.04	-0.05	-0.07	0.07	0.11	0.28	0.10
1963	-0.13	0.0	-0.16	-0.10	-0.10	-0.18	-0.14	0.07	-0.14	-0.10	-0.56	0.07	0.25	0.07	-0.04
1964	-0.13	-0.01	-0.23	0.05	-0.08	0.0	0.07	-0.42	-0.56	-0.23	0.42	0.04	-0.32	-0.67	-0.13
1965	-0.08	-0.28	-0.09	-0.28	-0.18	-1.16	-0.60	-0.63	-0.28	-0.67	-1.19	-0.60	-0.49	0.04	-0.56
1966	-0.08	-0.25	-0.16	-0.25	-0.19	0.04	-0.18	0.04	-0.18	-0.07	0.25	0.42	0.0	0.11	0.20
1967	0.09	0.09	-0.16	0.10	0.03	-0.28	-0.04	-0.07	-0.18	-0.14	-0.42	-0.42	-0.25	-0.32	-0.35
1968	0.17	-0.72	-0.60	-0.21	-0.34	-0.23	-0.35	-0.14	0.07	-0.16	-0.11	-0.67	0.04	0.14	-0.15
1969	0.12	0.28	0.02	-0.03	0.10	0.28	0.60	0.53	0.32	0.43	0.14	0.98	0.39	0.35	0.47
1970	0.03	-0.14	-0.09	-0.24	-0.11	0.35	0.53	0.49	0.28	0.41	0.49	0.53	0.63	0.77	0.61
1971	-0.16	-0.23	-0.17	-0.25	-0.20	-0.21	-0.63	-0.56	-0.67	-0.52	0.77	-0.42	-0.46	-0.60	-0.18
1972	-0.13	-0.21	0.20	-0.06	-0.05	-0.39	0.0	0.21	0.60	0.11	0.46	-0.46	0.04	0.18	0.06
1973	0.48	0.59	0.51	0.02	0.40	0.95	0.95	0.35	0.28	0.63	0.91	0.35	0.42	0.39	0.52
1974	-0.41	-0.15	0.10	-0.05	-0.13	0.07	-0.32	-0.32	-0.14	-0.18	-0.18	-0.25	-0.21	0.04	-0.15
1975	-0.45	0.11	0.15	-0.09	-0.07	0.25	-0.21	-0.35	-0.25	-0.14	-0.14	0.11	-0.02	-0.11	-0.04
1976	-0.57	-0.32	-0.26	-0.19	-0.34	-0.32	-0.32	-0.46	-0.35	-0.36	-0.70	-0.35	-0.53	0.0	-0.40
1977	0.16	0.36	0.24	0.16	0.23	0.38	0.62	0.80	0.47	0.57	-0.07	0.03	-0.37	0.20	-0.05
1978	-0.09	0.12	-0.02	0.04	0.01	0.33	0.24	0.46	0.26	0.32	0.21	-0.04	0.07	0.13	0.09
1979	-0.24	0.14	0.10	0.03	0.01	0.17	0.51	0.45	0.28	0.35	0.07	0.18	-0.15	-0.03	0.02
1980	0.49	0.97	0.53	0.44	0.61	0.61	0.88	0.75	0.41	0.66	-0.27	-0.09	0.23	0.31	0.05
1981	0.01	0.26	-0.31	0.55	0.13	0.53	0.23	0.28	0.21	0.31	-0.19	-0.22	-0.46	-0.34	-0.30
1982	0.38	0.87	0.51	0.38	0.54	0.62	-0.04	0.33	0.35	0.32	-0.07	-0.01	-0.20	-0.05	-0.08
1983	0.47	0.76	0.58	0.79	0.65	0.78	1.22	0.40	0.03	0.61	0.41	0.59	0.02	-0.10	0.23
1984	0.40	0.71	0.81	0.84	0.69	0.42	0.89	0.26	0.31	0.47	-1.24	-0.88	-0.91	-0.82	-0.96
1985	-0.24	0.29	0.57	0.20	0.21	0.39	0.53	0.12	0.45	0.37	-1.22	-0.79	-0.79	-0.63	-0.86
1986	-0.70	0.49	0.59	9.99	9.99	0.60	0.23	0.04	9.99	9.99	-0.86	-0.10	-0.23	9.99	9.99
YEAR	SFC - 100 MB					100 - 50 MB					100 - 30 MB				
	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL
1958	0.58	0.44	0.33	-0.48	0.22	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99
1959	0.07	0.08	0.19	0.13	0.12	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99
1960	0.46	0.04	0.34	0.30	0.29	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99
1961	-0.05	0.41	0.07	0.04	0.12	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99
1962	-0.03	-0.34	-0.01	0.08	-0.08	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99
1963	-0.26	-0.07	0.14	-0.09	-0.07	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99
1964	0.07	0.05	-0.37	-0.10	-0.09	1.15	1.97	1.30	0.75	1.29	0.27	1.09	1.78	-0.07	0.77
1965	-0.99	-0.55	-0.51	-0.21	-0.57	1.58	0.33	1.20	1.63	1.19	0.43	-0.26	0.78	2.13	0.77
1966	0.18	-0.06	-0.01	-0.13	-0.01	-0.12	0.05	-0.85	0.22	-0.18	-0.12	-0.16	-0.72	0.33	-0.17
1967	-0.25	-0.10	-0.13	-0.02	-0.13	1.00	0.41	0.94	-0.10	0.56	0.39	0.67	0.14	-0.21	-0.25
1968	-0.15	-0.48	0.11	-0.27	-0.20	-0.81	0.49	0.60	0.72	0.25	-0.62	0.75	0.68	0.32	0.28
1969	0.22	0.71	0.41	0.27	0.40	-0.16	-0.04	-1.20	0.19	-0.30	-0.42	-0.81	-1.41	0.65	-0.50
1970	0.45	0.23	0.42	0.36	0.37	-0.52	-0.29	1.48	0.10	0.19	-0.77	0.24	1.51	1.16	0.54
1971	0.02	-0.52	-0.47	-0.58	-0.39	1.17	0.25	-1.16	-0.33	-0.02	1.46	-0.32	-1.12	-0.62	-0.15
1972	-0.27	-0.08	0.25	0.40	0.08	-0.14	-0.56	0.42	-0.35	-0.16	0.05	0.06	-0.74	-1.05	-0.42
1973	0.86	0.76	0.29	0.26	0.54	-0.77	-0.23	-0.59	-0.66	-0.56	-0.67	-0.67	-0.64	-0.49	-0.62
1974	-0.07	-0.04	-0.23	-0.09	-0.11	0.40	-0.10	0.50	-0.03	0.19	-0.18	-0.07	1.05	-0.44	0.09
1975	-0.26	0.02	-0.20	-0.19	-0.16	-0.38	0.09	-0.35	0.03	-0.15	-0.31	0.35	-1.56	-0.83	-0.59
1976	-0.34	-0.33	-0.44	-0.25	-0.34	0.72	-0.06	-0.18	-0.18	0.08	0.27	-0.34	0.91	-0.30	0.14
1977	0.24	0.43	0.45	0.36	0.37	-2.32	-0.63	-0.13	-0.28	-0.85	-2.91	-0.63	-0.08	-0.88	-1.13
1978	0.23	0.23	0.29	0.19	0.24	-0.33	-0.25	-0.38	-1.25	-0.55	-1.45	-1.13	-0.64	-1.54	-1.19
1979	0.05	0.38	0.26	0.17	0.22	-0.82	0.19	0.05	-0.30	-0.22	-1.80	0.41	0.43	-1.03	-0.50
1980	0.53	0.90	0.64	0.46	0.63	-0.37	-1.76	-1.20	-0.06	-0.85	0.19	-2.28	-1.73	-0.56	-1.10
1981	0.18	0.10	0.05	0.17	0.13	-0.41	-0.82	-0.12	0.46	-0.22	-0.78	-0.45	1.23	0.49	0.26
1982	0.43	0.10	0.24	0.26	0.26	-0.58	0.01	1.16	1.16	0.44	-0.78	0.08	0.69	-0.09	-0.03
1983	0.66	1.01	0.39	0.15	0.55	0.99	-0.99	-0.03	0.87	0.21	0.66	-0.73	0.47	1.56	0.49
1984	0.04	0.49	0.08	0.13	0.19	0.20	-1.30	0.13	-0.19	-0.28	-0.87	-0.95	-0.20	-0.61	-0.66
1985	-0.07	0.17	-0.12	0.17	0.04	-1.36	-1.61	-1.75	-1.15	-1.47	-1.10	-1.44	-1.36	-1.20	-1.28
1986	0.06	0.20	0.07	9.99	9.99	-2.21	-2.53	-2.57	9.99	9.99	-1.80	-1.79	-1.64	9.99	9.99

TABLE 1. (continued)

South Temperate Zone (60S - 30S) Zone 6

YEAR	SURFACE					850 - 300 MB					300 - 100 MB				
	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL
1958	0.63	0.70	0.73	0.70	0.69	-0.12	-0.06	0.33	0.89	0.26	-0.34	-0.68	0.08	-0.45	-0.35
1959	1.10	0.63	0.78	0.68	0.80	0.47	0.0	1.11	1.19	0.69	-0.47	0.51	0.53	-0.35	0.06
1960	0.68	0.63	0.67	0.10	0.52	0.90	0.22	0.03	0.42	0.39	-0.71	-0.41	1.68	0.25	0.20
1961	0.60	0.42	0.70	0.54	0.57	0.28	0.06	0.0	0.37	0.18	-0.05	0.56	-0.21	-1.02	-0.18
1962	0.95	0.65	0.55	0.55	0.68	0.62	0.44	0.38	0.18	0.41	-0.54	-1.72	0.06	0.40	-0.45
1963	0.55	0.28	0.13	0.12	0.27	0.47	0.02	-0.58	-0.46	-0.14	-0.40	0.43	1.00	2.20	0.81
1964	-0.45	-0.23	0.03	0.28	-0.09	-1.07	-0.36	-0.95	-0.64	-0.76	0.93	1.12	1.21	0.62	0.97
1965	0.38	-0.17	-0.08	0.66	0.20	-0.86	-0.75	0.30	0.43	-0.22	0.47	0.19	-0.84	-0.45	-0.16
1966	0.65	0.10	-0.15	0.18	0.20	-0.02	-0.17	-0.19	-0.20	-0.15	0.15	0.08	0.18	0.28	0.17
1967	-0.15	-0.22	-0.48	0.40	-0.11	-0.12	0.15	0.01	0.29	0.08	0.48	0.59	-0.16	-0.06	0.21
1968	0.35	0.47	-0.20	-0.18	0.11	0.10	0.29	-0.40	-0.70	-0.18	0.20	-0.38	-0.52	0.75	0.01
1969	-0.93	-0.93	-0.50	-0.36	-0.68	-0.10	-0.09	0.76	0.10	0.17	0.78	0.78	-0.16	-0.69	0.18
1970	-0.28	-0.53	-0.28	-0.80	-0.47	-0.16	-0.39	-0.13	-0.46	-0.29	-0.55	-0.25	-0.33	-0.38	-0.38
1971	-0.55	-0.53	-0.45	-0.65	-0.55	0.43	-0.12	-0.30	-0.36	-0.09	-0.12	0.42	-0.29	-0.62	-0.15
1972	-0.98	-0.47	-0.50	-0.53	-0.62	-0.48	0.03	0.26	0.49	0.08	-0.12	-0.57	-0.39	-0.37	-0.36
1973	-0.63	-0.32	-0.50	-0.47	-0.48	0.57	0.58	0.34	-0.40	0.27	-0.59	-0.12	-0.69	-0.14	-0.39
1974	-0.74	0.20	-0.17	-0.75	-0.37	0.78	0.58	-0.14	-0.19	0.26	-0.37	-1.18	-0.90	-0.74	-0.80
1975	-0.75	-0.50	-0.32	-0.50	-0.52	-0.06	-0.03	-0.32	0.07	-0.09	-0.11	0.06	-0.08	-0.41	-0.14
1976	-0.97	-0.62	-0.08	-0.28	-0.49	0.38	0.35	0.26	-0.90	0.02	0.12	-0.63	-0.51	-0.50	-0.38
1977	-0.55	0.05	-0.13	0.08	-0.14	-0.38	0.87	-0.31	0.0	0.05	-0.26	-0.04	0.63	-0.24	0.02
1978	0.15	0.12	0.0	-0.15	0.03	0.15	0.11	0.77	0.16	0.30	-0.19	-0.32	-0.26	-0.18	-0.24
1979	0.0	0.12	0.48	0.05	0.16	0.49	1.23	1.10	0.36	0.80	0.25	-0.05	0.25	0.45	0.23
1980	0.03	0.23	0.29	-0.07	0.12	0.43	0.74	0.61	0.25	0.51	-0.22	0.33	-0.48	0.03	-0.09
1981	-0.13	0.28	0.31	-0.20	0.07	0.93	0.73	0.71	0.42	0.70	-0.78	-0.82	-0.89	0.0	-0.62
1982	-0.02	0.28	-0.02	0.02	0.07	0.83	0.64	0.77	0.32	0.64	-0.28	-0.06	0.01	0.80	0.12
1983	-0.67	-0.32	-0.42	-0.03	-0.36	-0.29	0.86	0.65	0.83	0.51	-0.11	0.50	0.0	-0.38	0.0
1984	-0.43	0.14	-0.45	-0.11	-0.21	0.23	0.23	0.02	0.25	0.18	-0.71	-0.56	0.80	0.15	-0.08
1985	0.06	0.43	0.58	-0.44	0.16	0.14	0.85	0.81	0.12	0.48	-0.70	-0.39	-0.94	-1.30	-0.83
1986	-0.40	0.32	-0.28	9.99	9.99	0.29	0.09	0.43	9.99	9.99	-1.66	-0.70	-0.21	9.99	9.99
YEAR	SFC - 100 MB					100 - 50 MB					100 - 30 MB				
	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL
1958	-0.04	-0.03	0.34	0.56	0.21	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99
1959	0.44	0.23	0.93	0.76	0.59	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99
1960	0.45	0.15	0.41	0.33	0.34	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99
1961	0.26	0.23	0.07	-0.01	0.14	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99
1962	0.42	0.02	0.34	0.30	0.27	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99
1963	-0.10	-0.17	-0.11	0.23	-0.04	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99
1964	-0.28	-0.01	-0.31	-0.21	-0.20	1.90	0.55	-0.29	0.22	0.60	1.12	0.46	1.06	0.47	0.78
1965	-0.36	-0.44	0.01	0.17	-0.16	0.89	0.92	1.03	0.86	0.93	1.10	0.59	1.43	1.31	1.11
1966	0.18	-0.07	-0.09	-0.03	0.0	-0.28	0.08	-1.14	-0.88	-0.56	-0.94	1.03	-1.45	0.77	-0.15
1967	-0.04	0.18	-0.11	0.22	0.06	0.10	-0.10	0.97	0.27	0.31	0.28	0.13	-0.05	0.47	0.21
1968	0.16	0.13	-0.37	-0.29	-0.09	-0.63	-0.67	0.21	-0.32	-0.35	0.52	0.33	-0.19	-0.34	0.08
1969	0.17	-0.04	0.35	-0.15	0.08	1.04	0.47	0.71	0.37	0.65	0.61	0.98	1.57	0.63	0.95
1970	-0.44	-0.38	-0.15	-0.50	-0.37	0.02	0.26	0.23	-0.08	0.11	0.27	1.36	0.37	1.24	0.81
1971	0.12	-0.10	-0.33	-0.47	-0.20	0.0	-0.40	-0.40	-0.89	-0.42	-0.20	-1.53	-1.14	-0.94	-0.95
1972	-0.48	-0.74	-0.09	0.13	-0.30	-0.37	-0.64	0.42	0.59	0.0	0.40	0.29	1.22	1.21	0.78
1973	0.11	0.28	0.17	-0.36	0.05	0.92	0.82	-1.39	-0.45	-0.03	1.23	0.04	-1.50	-0.52	-0.19
1974	0.27	0.12	-0.33	-0.39	-0.08	-1.77	-1.57	-0.29	-0.57	-1.05	-1.55	-1.56	-0.33	-1.25	-1.17
1975	-0.18	-0.14	-0.24	-0.12	-0.17	0.18	0.01	1.64	-1.76	0.02	-0.39	-0.71	-0.45	-2.10	-0.91
1976	0.04	-0.03	-0.52	-0.71	-0.31	-1.72	-0.87	-1.13	0.90	-0.71	-2.05	-0.75	-0.38	0.73	-0.61
1977	-0.38	0.53	-0.07	-0.04	0.01	-0.82	-0.18	0.10	0.25	-0.16	-0.47	-0.21	-0.31	0.50	-0.12
1978	0.07	-0.09	0.36	0.04	0.10	0.10	0.30	0.31	-0.50	0.05	-0.29	0.08	0.22	0.49	0.13
1979	0.30	0.76	0.80	0.32	0.55	0.52	0.47	0.38	0.41	0.45	0.35	0.77	0.90	0.13	0.54
1980	0.23	0.56	0.31	0.16	0.32	0.77	-0.11	-0.91	-0.85	-0.28	0.76	-0.28	-1.25	-0.39	-0.29
1981	0.45	0.28	0.26	0.23	0.31	-0.64	0.07	-0.94	0.16	-0.34	-0.48	-0.19	-0.99	0.03	-0.41
1982	0.44	0.42	0.49	0.37	0.43	-0.22	0.53	0.13	1.05	0.37	-0.53	0.36	-0.09	0.39	0.03
1983	-0.31	0.62	0.33	0.42	0.27	1.72	0.23	0.32	0.56	0.71	1.26	0.32	0.62	0.25	0.61
1984	-0.09	0.03	0.12	0.17	0.06	0.42	-0.66	0.14	-0.31	-0.10	-0.01	-0.42	-0.14	-0.47	-0.26
1985	0.06	0.55	0.39	-0.29	0.18	-1.09	-1.05	-1.71	-1.87	-1.43	-0.97	-0.61	-1.06	-0.72	-0.84
1986	-0.26	-0.05	0.17	9.99	9.99	-1.44	-0.99	0.24	9.99	9.99	-0.84	-0.65	-0.09	9.99	9.99

TABLE 1. (continued)

South Polar Zone (90S - 60S) Zone 7

YEAR	SURFACE					850 - 300 MB					300 - 100 MB				
	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL
1958	0.68	0.36	-0.58	-0.22	0.06	0.11	0.34	1.01	-0.83	0.16	0.56	0.69	-0.41	-0.55	0.07
1959	-0.60	0.84	-0.66	-2.02	-0.61	-0.86	1.12	-0.16	-1.50	-0.35	0.26	1.56	0.25	-2.04	0.01
1960	-1.02	-0.38	-1.88	-0.12	-0.85	-0.09	-0.45	-0.35	-0.23	-0.28	-0.58	2.61	-0.83	-0.92	0.07
1961	-0.65	0.86	-0.61	1.36	0.24	0.10	0.13	0.06	1.10	0.35	0.50	0.96	0.40	-1.49	0.09
1962	-0.58	-0.91	-0.78	-0.37	-0.66	-0.99	-0.65	-0.40	0.06	-0.50	-1.72	-0.89	-0.62	1.93	-0.33
1963	-0.38	-1.36	0.28	0.53	-0.23	-0.23	-0.55	-0.33	-0.56	-0.42	1.06	0.78	0.68	-1.44	0.27
1964	0.10	-1.94	0.71	-0.93	-0.52	0.21	-1.40	0.83	-0.30	-0.17	-0.63	-1.45	-0.90	3.50	0.13
1965	-0.03	-0.37	-0.22	-1.10	-0.43	0.23	-0.34	-0.59	-0.31	-0.25	0.73	-0.46	0.57	-1.59	-0.19
1966	0.40	1.39	0.32	0.30	0.60	0.16	0.74	-0.48	-0.20	0.06	-0.48	0.33	0.64	-0.57	-0.02
1967	1.15	-0.51	1.51	-0.60	0.39	0.58	-0.12	0.26	0.12	0.21	0.27	-0.86	0.26	1.61	0.32
1968	-0.58	0.80	-0.37	-0.96	-0.28	0.0	0.62	-0.48	-0.42	-0.07	0.60	-0.89	-0.52	2.97	0.54
1969	0.35	0.68	-1.05	0.50	0.12	-0.45	-0.03	-0.38	0.12	-0.19	1.66	0.19	0.11	-2.27	-0.08
1970	-0.28	-0.27	-0.53	1.31	0.06	-0.59	0.63	-0.16	0.77	0.16	-1.77	0.09	0.96	0.12	-0.15
1971	0.66	0.0	0.18	-0.46	0.10	0.03	0.15	-0.19	0.16	0.04	-1.07	0.75	0.68	0.44	0.20
1972	0.10	-0.32	1.73	-0.71	0.20	0.41	-0.01	0.75	0.06	0.30	-0.43	-0.55	-0.88	0.65	-0.30
1973	-0.52	1.12	0.08	1.45	0.53	-0.26	0.55	0.29	1.01	0.40	-0.35	-0.60	0.26	-0.44	-0.28
1974	-0.15	1.10	1.20	1.87	1.01	0.09	-0.58	1.26	0.33	0.28	0.56	0.20	0.35	0.91	0.51
1975	1.85	1.80	0.75	-0.05	1.09	0.89	-0.28	-0.37	-0.12	0.03	0.58	-0.26	-0.28	-0.81	-0.19
1976	0.57	-1.59	0.0	-0.05	-0.27	0.54	-0.38	-0.34	-0.51	-0.17	-0.32	-1.20	-0.65	-0.17	-0.59
1977	1.03	1.13	1.93	-1.30	0.70	1.15	0.70	1.30	-0.24	0.73	-0.34	-1.05	-0.24	0.02	-0.40
1978	-1.00	0.50	0.04	-0.10	-0.14	-0.96	1.06	-0.44	0.34	0.0	1.50	1.07	-1.06	1.08	0.65
1979	0.31	0.73	-0.53	1.20	0.43	0.52	0.81	-1.17	0.20	0.09	0.87	-0.12	-1.85	0.95	-0.04
1980	0.70	1.36	1.75	0.06	0.97	0.79	0.54	0.86	0.67	0.72	1.76	0.84	1.54	-1.58	0.64
1981	0.25	0.82	2.88	-0.10	0.96	0.44	0.03	0.77	0.28	0.38	0.75	-0.18	0.98	-0.24	0.33
1982	0.33	-1.26	-0.06	0.71	-0.07	0.72	-0.79	-0.20	-0.17	-0.11	-0.11	-1.07	0.56	-1.07	-0.42
1983	0.77	2.57	0.54	0.0	0.97	0.60	1.18	0.90	0.21	0.72	-1.19	0.60	-0.62	0.22	-0.25
1984	0.18	2.66	-0.08	0.96	0.93	0.14	0.67	-0.23	0.29	0.22	-1.17	-1.72	-0.47	-1.03	-1.10
1985	0.77	0.30	1.59	-0.54	0.53	0.90	-0.21	0.67	-0.30	0.27	-1.25	-0.06	-0.04	-3.36	-1.18
1986	0.92	0.70	0.68	9.99	9.99	1.06	0.43	0.52	9.99	9.99	-2.50	-0.72	0.34	9.99	9.99
YEAR	SFC - 100 MB					100 - 50 MB					100 - 30 MB				
	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL
1958	0.41	0.42	0.43	-0.67	0.15	-0.52	1.17	2.42	0.42	0.87	-0.41	-0.14	1.56	0.56	0.39
1959	-0.57	1.18	-0.14	-1.71	-0.31	1.38	1.61	-1.02	-6.63	-1.17	0.88	1.04	-0.75	-5.10	-0.98
1960	-0.35	0.26	-0.63	-0.36	-0.27	-0.29	0.39	1.04	2.06	0.80	0.47	1.18	2.29	1.84	1.45
1961	0.06	0.44	0.06	0.78	0.34	1.43	0.28	1.66	-6.10	-0.68	1.07	0.57	1.12	-3.09	-0.08
1962	-1.08	-0.75	-0.39	0.41	-0.45	2.11	-0.33	0.78	1.91	1.12	1.12	-0.62	2.95	1.20	1.16
1963	0.04	-0.39	0.0	-0.57	-0.23	1.79	1.39	-1.13	0.81	0.72	1.14	0.57	-1.31	0.47	0.22
1964	0.06	-1.51	0.43	0.44	-0.15	-0.85	-1.30	-0.90	4.73	0.42	-0.41	-1.04	-1.22	3.37	0.18
1965	0.30	-0.38	-0.27	-0.73	-0.27	-1.34	1.27	-1.42	3.99	0.63	-1.14	0.28	-1.22	2.79	0.18
1966	0.06	0.76	-0.02	-0.20	0.15	-1.19	-1.73	1.80	-1.28	-0.60	-0.59	-2.23	1.69	0.11	-0.26
1967	0.63	-0.35	0.47	0.26	0.25	-0.34	0.14	-1.61	1.03	-0.20	-0.17	-0.23	-0.81	1.50	0.07
1968	0.04	0.32	-0.45	0.26	0.04	0.14	0.38	-1.57	0.39	-0.17	-0.18	0.01	0.46	0.13	0.11
1969	0.15	0.18	-0.38	-0.35	-0.10	1.00	0.39	-2.00	-3.30	-0.98	0.44	0.59	0.04	-2.14	-0.27
1970	-0.80	0.36	0.10	0.74	0.10	-0.08	-0.27	0.53	-3.74	-0.89	0.85	-1.13	0.62	-1.22	-0.22
1971	-0.05	0.22	0.06	0.16	0.10	0.26	1.21	-1.44	0.34	0.09	0.07	0.23	-1.55	0.05	-0.30
1972	0.22	0.28	0.62	0.05	0.29	-0.60	-0.24	-0.04	-0.20	-0.27	-0.52	0.03	-0.35	-0.71	-0.39
1973	0.03	0.45	0.27	0.94	0.42	-0.51	0.47	0.07	-0.94	-0.23	-0.53	0.11	-0.96	-0.70	-0.52
1974	-0.09	0.14	1.02	0.76	0.46	-0.22	0.86	-1.55	0.13	-0.20	0.01	1.52	-1.28	0.55	0.20
1975	1.01	0.15	-0.09	-0.03	0.26	0.28	-0.78	-1.19	-2.63	-1.08	-0.15	-0.68	1.16	-0.96	-0.16
1976	0.40	-0.72	-0.32	-0.35	-0.25	-0.46	0.31	-0.04	0.98	0.20	-0.81	1.41	0.77	0.84	0.55
1977	0.80	0.38	1.06	-0.36	0.47	0.37	0.10	-1.63	4.22	0.77	0.19	-0.25	-1.54	0.65	-0.24
1978	-0.42	0.97	-0.50	0.44	0.12	0.28	3.27	-0.19	-3.94	-0.15	0.32	1.21	-0.13	-2.64	-0.31
1979	0.57	0.59	-1.21	0.54	0.12	-0.21	-0.15	-0.78	-2.35	-0.87	0.26	0.41	-3.61	-1.18	-1.03
1980	1.11	0.78	1.16	0.16	0.80	-0.34	2.29	1.59	-3.69	-0.04	-0.04	1.50	-0.75	-1.41	-0.18
1981	0.51	0.12	1.33	0.10	0.52	0.71	1.67	-2.82	-0.66	-0.28	0.52	1.15	-1.91	-0.45	-0.17
1982	0.38	-0.93	0.08	-0.23	-0.18	1.63	-0.53	-4.65	-3.49	-1.76	1.10	-0.32	-6.27	-2.35	-1.96
1983	0.21	1.34	0.49	0.22	0.57	0.35	0.52	-2.91	-2.53	-1.14	0.23	-0.20	-1.96	-1.71	-0.91
1984	-0.07	0.47	-0.28	0.11	0.06	0.26	0.45	-2.03	-2.03	-0.22	0.21	9.99	9.99	9.99	9.99
1985	0.40	-0.09	0.71	-1.02	0.0	-1.50	-0.68	-6.11	-6.16	-3.69	9.99	9.99	9.99	9.99	9.99
1986	0.25	0.22	0.72	9.99	9.99	-1.30	1.02	0.82	9.99	9.99	9.99	9.99	9.99	9.99	9.99

TABLE 1. (continued)

Tropical Zone (30S - 30N) Zone 8

YEAR	SURFACE					850 - 300 MB					300 - 100 MB				
	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL
1958	0.59	0.37	-0.29	0.33	0.25	0.41	0.17	0.26	0.40	0.31	0.28	-0.48	0.17	-0.12	-0.04
1959	0.22	0.04	0.16	0.23	0.15	0.23	0.20	0.16	0.13	0.18	-0.03	-0.03	-0.07	-0.04	-0.04
1960	0.11	0.04	0.02	0.04	0.05	0.31	0.01	0.40	0.19	0.23	0.39	-0.09	0.26	0.07	0.16
1961	0.04	0.03	-0.04	-0.03	0.0	0.01	0.18	0.05	-0.07	0.04	-0.03	0.18	-0.03	-0.03	0.02
1962	-0.05	-0.09	-0.09	0.05	-0.05	0.11	-0.22	-0.12	0.11	-0.03	0.28	0.21	0.10	0.27	0.22
1963	0.02	-0.02	0.0	0.15	0.04	-0.16	-0.16	0.0	-0.05	-0.09	-0.26	0.15	0.03	0.15	0.02
1964	-0.34	-0.16	-0.16	-0.24	-0.23	0.19	0.14	-0.27	-0.50	-0.11	0.42	0.19	-0.17	-0.60	-0.04
1965	-0.29	-0.22	-0.19	-0.10	-0.20	-0.94	-0.44	-0.52	-0.16	-0.52	-0.98	-0.68	-0.39	0.09	-0.49
1966	-0.18	-0.01	0.03	-0.07	-0.06	0.16	0.12	0.16	-0.12	0.08	0.54	0.40	0.23	-0.01	0.29
1967	-0.10	-0.06	-0.10	-0.25	-0.13	-0.12	-0.26	-0.01	-0.15	-0.14	-0.21	-0.21	0.06	-0.06	-0.11
1968	-0.08	-0.43	-0.17	-0.04	-0.18	-0.29	-0.43	-0.21	-0.15	-0.27	-0.39	-0.88	-0.28	-0.34	-0.47
1969	0.23	0.35	0.15	0.18	0.23	0.11	0.46	0.35	0.20	0.28	-0.04	0.76	-0.07	0.11	0.19
1970	0.32	0.06	0.03	-0.20	0.05	0.34	0.44	0.37	0.26	0.35	0.23	0.73	0.57	0.54	0.52
1971	-0.14	-0.12	-0.26	-0.33	-0.22	-0.22	-0.63	-0.55	-0.61	-0.50	0.14	-0.66	-0.70	-0.77	-0.50
1972	-0.14	-0.26	0.22	0.16	-0.01	-0.54	-0.16	0.21	0.38	-0.03	-0.46	-0.56	0.07	0.28	-0.17
1973	0.51	0.53	0.32	0.24	0.40	0.88	0.66	0.27	0.25	0.52	1.03	0.61	0.45	0.21	0.58
1974	-0.09	-0.08	0.01	0.03	-0.03	-0.16	-0.18	-0.17	-0.03	-0.14	-0.33	-0.30	-0.13	-0.12	-0.22
1975	-0.05	0.14	-0.01	-0.09	0.0	0.06	0.01	-0.23	-0.10	-0.07	-0.20	0.05	-0.08	0.09	-0.04
1976	-0.27	-0.16	-0.13	0.12	-0.11	-0.33	-0.38	-0.37	-0.11	-0.30	-0.36	-0.37	-0.26	0.05	-0.24
1977	0.08	0.41	0.34	0.40	0.31	0.38	0.27	0.35	0.38	0.35	0.08	0.01	-0.09	-0.05	-0.01
1978	0.29	0.08	0.24	0.35	0.24	0.27	0.37	0.18	0.05	0.22	0.10	-0.11	-0.31	-0.33	-0.16
1979	0.16	0.37	0.27	0.36	0.29	0.06	0.24	0.31	0.26	0.22	-0.05	0.11	-0.31	-0.47	-0.18
1980	0.53	0.81	0.35	0.44	0.53	0.34	0.49	0.56	0.37	0.44	-0.48	-0.19	0.04	-0.12	-0.19
1981	0.23	0.47	0.17	0.32	0.30	0.30	0.19	0.14	0.25	0.22	-0.55	-0.64	-0.61	-0.54	-0.59
1982	0.40	0.40	0.51	0.39	0.43	0.33	-0.02	0.33	0.07	0.18	-0.39	-0.60	-0.27	-0.53	-0.45
1983	0.21	0.40	0.59	0.52	0.43	0.58	0.85	0.42	-0.01	0.46	0.27	0.37	0.15	-0.38	0.10
1984	0.28	0.39	0.20	0.44	0.33	0.14	0.35	-0.04	0.02	0.12	-1.04	-0.88	-0.87	-1.08	-0.97
1985	0.05	0.12	0.28	0.27	0.18	0.20	0.14	-0.12	0.02	0.06	-1.00	-0.82	-1.03	-0.97	-0.96
1986	-0.09	0.36	0.39	9.99	9.99	0.35	0.11	0.03	9.99	9.99	-0.84	-0.63	-0.55	9.99	9.99
YEAR	SFC - 100 MB					100 - 50 MB					100 - 30 MB				
	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL
1958	0.41	-0.22	0.13	0.20	0.13	0.60	0.60	-0.47	0.13	0.22	0.71	1.50	-0.19	0.33	0.59
1959	0.18	0.15	0.11	0.17	0.15	-0.93	-1.52	-1.34	0.43	-0.84	0.12	-0.73	-0.11	0.33	-0.10
1960	0.29	0.0	0.30	0.14	0.18	-0.10	-0.78	-0.93	-0.51	-0.58	-0.31	-0.72	-2.54	-2.01	-1.40
1961	0.0	0.20	-0.04	-0.05	0.03	-2.81	-1.47	1.11	2.31	-0.22	-2.99	-2.99	0.49	-0.05	-1.39
1962	0.12	-0.10	-0.09	0.10	0.01	0.61	-0.40	-0.95	-1.16	-0.45	0.23	-0.83	-2.02	-1.48	-1.03
1963	-0.15	-0.07	0.0	0.02	-0.05	-0.70	-0.61	0.76	0.94	0.10	-2.16	-1.31	1.27	2.51	0.08
1964	0.17	0.11	-0.23	-0.46	-0.10	1.24	1.67	1.49	0.81	1.30	0.72	1.27	1.54	0.44	0.99
1965	-0.84	-0.49	-0.43	-0.09	-0.46	1.24	0.46	0.57	0.73	0.75	0.80	0.33	0.14	0.67	0.49
1966	0.16	0.16	0.14	-0.09	0.09	-0.69	-0.67	-0.54	0.79	-0.28	-1.06	-0.54	0.22	1.03	-0.09
1967	-0.15	-0.21	-0.01	-0.14	-0.13	0.86	1.03	0.26	-0.43	0.43	0.96	1.14	0.22	-0.25	0.52
1968	-0.18	-0.53	-0.22	-0.17	-0.28	-0.48	0.93	-0.10	-0.18	0.04	-0.57	0.63	-0.10	-0.23	-0.07
1969	0.12	0.35	0.21	0.18	0.22	-0.51	-0.51	-0.32	0.48	-0.22	-0.94	-0.66	-0.35	0.82	-0.28
1970	0.31	0.44	0.36	0.27	0.35	-0.36	-0.22	0.60	0.27	0.07	-0.80	-0.17	0.67	0.74	0.11
1971	-0.14	-0.55	-0.54	-0.60	-0.46	0.41	-0.14	-0.08	0.31	0.13	0.89	0.34	0.02	-0.45	0.20
1972	-0.52	-0.27	0.18	0.32	-0.07	0.75	0.05	-0.67	-1.02	-0.22	0.68	0.06	-1.24	-0.76	-0.37
1973	0.81	0.63	0.32	0.24	0.50	-1.00	-0.52	0.04	-0.03	-0.38	-1.40	-0.72	-0.16	-0.22	-0.63
1974	-0.19	-0.23	-0.13	-0.04	-0.15	0.74	-0.14	-0.36	-0.72	-0.12	0.64	-0.49	-0.49	-1.31	-0.41
1975	-0.12	0.07	-0.16	-0.05	-0.07	-0.45	-0.02	0.06	0.39	-0.01	-0.44	0.09	-0.44	0.09	-0.18
1976	-0.32	-0.35	-0.30	-0.04	-0.25	1.73	0.62	0.50	0.30	0.79	1.36	0.07	0.52	-0.74	0.30
1977	0.26	0.23	0.24	0.29	0.26	-1.74	-0.12	-0.18	-0.48	-0.64	-2.66	-0.56	-0.88	-0.30	-1.10
1978	0.22	0.23	0.09	0.01	0.14	-0.58	-0.13	0.40	-0.20	-0.13	-1.20	-0.73	-0.19	-0.76	-0.72
1979	0.04	0.23	0.29	0.17	0.18	-0.11	0.07	-0.37	-0.93	-0.34	-0.72	-0.04	-0.23	-1.30	-0.57
1980	0.25	0.50	0.40	0.30	0.36	-0.29	-1.40	-0.47	0.45	-0.43	-0.36	-2.08	-0.32	0.19	-0.64
1981	0.05	0.04	0.02	0.10	0.05	0.23	-0.35	-0.33	0.03	-0.11	0.42	-0.56	-0.32	-0.40	-0.22
1982	0.15	-0.07	0.22	-0.01	0.07	-0.51	-0.04	0.52	1.33	0.33	-1.40	-0.57	0.67	1.16	-0.04
1983	0.47	0.69	0.40	0.06	0.41	1.23	0.02	0.07	0.75	0.52	0.58	-0.44	-0.36	0.34	0.03
1984	-0.11	0.08	-0.18	-0.13	-0.09	0.31	-1.13	-0.95	-0.96	-0.68	-0.49	-1.03	-0.81	-0.87	-0.80
1985	-0.08	-0.08	-0.28	-0.16	-0.15	-1.76	-1.28	-0.73	-0.18	-0.99	-1.25	-1.04	-0.58	-0.53	-0.85
1986	0.01	-0.03	-0.02	9.99	9.99	-1.46	-1.41	-2.01	9.99	9.99	-1.23	-1.30	-1.51	9.99	9.99

TABLE 1. (continued)

Northern Hemisphere (0 - 90N) Zone 9

YEAR	SURFACE					850 - 300 MB					300 - 100 MB				
	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL
1958	0.63	-0.06	-0.04	0.29	0.21	0.53	0.42	0.18	0.34	0.37	0.16	-0.15	0.27	0.74	0.26
1959	0.36	0.12	0.18	0.0	0.16	0.42	0.67	0.31	0.38	0.45	0.25	0.61	0.33	0.24	0.36
1960	0.05	-0.30	0.14	-0.32	-0.11	0.13	-0.08	0.38	0.05	0.12	1.05	0.09	0.22	0.27	0.41
1961	0.61	0.13	0.07	0.16	0.24	0.50	0.15	-0.04	0.26	0.22	0.31	0.72	0.52	0.06	0.40
1962	0.42	0.18	-0.05	-0.04	0.12	0.20	0.09	-0.03	0.05	0.08	-0.42	-0.20	-0.16	0.20	-0.15
1963	0.18	-0.03	-0.01	0.50	0.16	0.11	-0.12	-0.02	0.20	0.04	-0.25	0.09	0.27	0.28	0.09
1964	-0.20	-0.51	-0.16	-0.35	-0.31	0.10	0.08	-0.12	-0.37	-0.08	-0.19	0.47	-0.03	-0.06	0.05
1965	-0.41	-0.21	-0.20	-0.13	-0.24	-0.41	-0.39	-0.53	-0.10	-0.36	-0.40	-0.54	-0.28	0.07	-0.29
1966	-0.57	-0.07	-0.07	-0.16	-0.22	-0.15	0.09	0.20	0.21	0.09	0.73	0.14	0.62	0.10	0.40
1967	-0.32	0.31	0.07	0.19	0.06	-0.17	-0.02	0.12	0.21	0.04	-0.29	-0.53	-0.22	-0.42	-0.37
1968	-0.26	0.30	-0.13	-0.19	-0.07	0.04	-0.17	-0.37	-0.30	-0.20	-0.03	-1.49	-0.50	-0.43	-0.61
1969	-0.71	-0.19	0.11	0.22	-0.14	-0.33	0.01	0.24	0.15	0.02	-0.21	0.40	-0.06	-0.21	0.09
1970	0.47	0.06	-0.06	-0.11	0.09	0.16	0.01	0.19	0.13	0.12	0.35	0.24	0.33	0.15	0.27
1971	-0.42	-0.12	-0.12	0.04	-0.16	-0.38	-0.56	-0.38	-0.47	-0.45	-0.09	-0.28	-0.46	-0.60	-0.36
1972	-0.40	-0.28	0.07	-0.19	-0.20	-0.67	-0.24	0.0	-0.15	-0.27	-0.85	-0.56	-0.23	0.08	-0.39
1973	0.45	0.22	0.30	0.01	0.25	0.47	0.11	0.15	-0.11	0.16	0.67	0.67	0.15	-0.10	0.35
1974	0.13	-0.07	-0.26	-0.03	-0.06	-0.22	-0.22	-0.29	-0.43	-0.29	-0.75	-0.09	-0.34	-0.04	-0.31
1975	0.23	0.42	0.07	-0.08	0.16	-0.31	0.10	-0.03	-0.12	-0.09	-0.28	0.15	-0.30	-0.07	-0.13
1976	0.03	-0.28	-0.10	-0.26	-0.15	-0.37	-0.62	-0.39	-0.32	-0.43	-0.84	-0.71	-0.64	-0.40	-0.65
1977	-0.26	0.27	0.20	0.26	0.12	-0.01	0.17	0.11	0.16	0.11	0.55	0.38	-0.14	-0.26	0.13
1978	0.27	-0.09	0.16	0.28	0.16	-0.14	0.17	0.06	-0.15	-0.02	0.05	-0.17	-0.25	-0.58	-0.24
1979	-0.10	0.30	0.05	0.22	0.12	-0.29	0.30	0.19	0.24	0.11	-0.29	0.04	-0.38	-0.33	-0.24
1980	0.71	0.41	0.0	0.11	0.31	0.21	0.08	0.34	0.01	0.16	-0.82	0.44	0.28	-0.04	-0.04
1981	0.86	0.74	0.28	0.44	0.58	0.27	0.40	0.12	0.21	0.25	-0.88	-0.83	-0.33	-0.37	-0.60
1982	0.44	-0.02	0.19	0.01	0.16	-0.03	-0.21	0.16	-0.13	-0.05	-0.12	-0.33	-0.13	-0.66	-0.31
1983	1.00	0.34	0.40	0.37	0.53	0.35	0.65	0.41	0.13	0.39	-0.69	-0.16	-0.04	-0.47	-0.34
1984	0.58	0.25	0.05	0.11	0.25	0.04	0.02	-0.02	-0.18	-0.04	-1.16	-0.28	-0.43	-0.62	-0.62
1985	-0.37	-0.13	-0.08	-0.26	-0.21	-0.07	-0.27	-0.35	-0.31	-0.25	0.28	0.19	-0.55	-0.44	-0.13
1986	0.11	0.27	0.01	9.99	9.99	0.16	0.10	0.01	9.99	9.99	-0.54	-0.54	-0.55	9.99	9.99
YEAR	SFC - 100 MB					100 - 50 MB					100 - 30 MB				
	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL
1958	0.46	0.08	0.15	0.39	0.27	1.32	0.41	0.21	1.38	0.83	0.90	0.44	0.53	1.69	0.89
1959	0.38	0.58	0.29	0.32	0.39	-0.32	1.25	0.20	0.07	0.30	-0.15	1.49	0.61	0.36	0.58
1960	0.33	-0.08	0.30	0.04	0.15	1.30	0.80	0.09	0.43	0.66	1.59	0.0	-0.57	0.04	0.27
1961	0.47	0.30	0.08	0.20	0.26	-1.22	-0.16	0.82	0.92	0.09	-1.02	-0.73	0.69	0.30	-0.19
1962	0.10	0.04	-0.07	0.06	0.03	-0.36	-0.90	-0.85	-0.35	-0.62	-0.41	-1.20	-1.36	-0.46	-0.86
1963	0.04	-0.06	0.04	0.27	0.07	-0.63	-0.59	0.98	0.62	0.10	-0.37	-1.39	1.02	1.13	0.10
1964	0.0	0.08	-0.11	-0.29	-0.08	-0.12	1.20	0.74	0.06	0.47	0.01	1.60	0.61	0.13	0.59
1965	-0.40	-0.41	-0.42	-0.06	-0.32	-0.05	-0.16	0.19	0.22	0.05	-0.44	0.60	0.04	-0.07	0.03
1966	-0.04	0.08	0.24	0.13	0.10	0.38	-0.76	-0.03	0.63	0.06	-0.43	-0.59	0.27	0.87	0.03
1967	-0.21	-0.38	0.04	0.07	-0.12	0.01	-0.31	-0.46	-0.69	-0.36	-0.18	0.40	-0.11	-0.70	-0.15
1968	-0.03	-0.39	-0.36	-0.31	-0.27	-0.45	-0.44	-0.07	-0.25	-0.30	-1.37	-0.31	-0.08	-0.31	-0.52
1969	-0.25	-0.12	0.17	0.10	-0.03	-0.50	-0.35	-0.28	0.64	-0.12	-1.37	-0.54	-0.10	0.03	-0.50
1970	0.30	0.08	0.22	0.13	0.18	0.24	-0.07	0.27	0.31	0.19	-0.02	-0.07	0.38	0.23	0.13
1971	-0.40	-0.51	-0.43	-0.49	-0.46	0.39	-0.52	0.14	0.12	0.03	0.02	-0.35	0.19	-0.41	-0.14
1972	-0.80	-0.39	-0.04	-0.13	-0.34	0.04	0.19	-0.57	-0.54	-0.22	0.47	0.36	-0.93	-0.45	-0.14
1973	0.60	0.31	0.21	-0.10	0.26	0.05	-0.73	-0.22	-0.15	-0.26	-0.03	-1.23	-0.35	-0.48	-0.52
1974	-0.34	-0.22	-0.25	-0.33	-0.29	-0.10	0.45	-0.38	-0.34	-0.11	0.55	0.34	-0.55	-0.28	0.02
1975	-0.25	0.19	-0.08	-0.16	-0.08	-0.16	0.28	-0.06	-0.25	-0.05	-0.23	-0.19	0.04	0.14	-0.06
1976	-0.49	-0.70	-0.57	-0.32	-0.52	0.22	0.76	0.19	0.14	0.33	1.82	0.45	0.02	-0.37	0.23
1977	0.07	0.23	0.07	0.09	0.12	-0.31	0.35	0.35	0.03	0.11	-1.34	-0.07	-0.48	-0.20	-0.52
1978	-0.05	0.11	0.01	-0.17	-0.03	-0.49	-0.53	-0.31	-0.52	-0.46	-1.05	-0.90	-0.52	-0.52	-0.75
1979	-0.24	0.22	0.17	0.16	0.08	0.48	0.31	-0.34	-0.33	0.03	0.15	0.03	-0.29	-0.77	-0.22
1980	0.08	0.24	0.25	0.04	0.15	-0.12	-0.01	-0.06	0.63	0.11	-0.37	-0.63	0.28	0.42	-0.08
1981	0.10	0.17	0.08	0.12	0.12	0.30	-0.41	-0.37	0.03	-0.11	0.48	-0.64	-0.51	-0.14	-0.20
1982	-0.01	-0.17	0.10	-0.22	-0.08	0.35	0.31	0.57	0.52	0.44	0.06	0.16	0.72	0.59	0.38
1983	0.28	0.43	0.29	0.09	0.27	0.0	0.21	-0.29	0.16	0.03	-0.45	-0.18	-0.72	-0.12	-0.37
1984	-0.14	-0.01	-0.09	-0.20	-0.11	-0.12	-0.15	-1.00	-0.49	-0.44	-0.19	-0.25	-0.70	-0.37	-0.38
1985	-0.04	-0.14	-0.34	-0.33	-0.21	-0.42	-0.83	-0.47	0.05	-0.42	-0.33	-0.69	-0.37	-0.19	-0.40
1986	-0.01	-0.02	-0.11	9.99	9.99	-0.47	-0.28	-1.09	9.99	9.99	-0.33	-0.37	-0.85	9.99	9.99

TABLE 1. (continued)

Southern Hemisphere (0 - 90S) Zone 10

YEAR	WINTER	SPRING	SURFACE			ANNUAL	WINTER	850 - 300 MB			ANNUAL	WINTER	SPRING	300 - 100 MB			ANNUAL
			SUMMER	AUTUMN				SUMMER	AUTUMN	SUMMER				AUTUMN			
1958	0.76	0.58	-0.04	0.38	0.42	0.25	0.0	0.37	0.30	0.23	0.05	-0.37	-0.05	-0.68	-0.26		
1959	0.45	0.44	0.34	0.11	0.34	0.08	0.20	0.41	0.20	0.22	-0.35	0.33	0.04	-0.69	-0.17		
1960	0.16	0.20	-0.09	0.18	0.11	0.43	0.0	0.16	0.22	0.20	-0.14	0.21	0.49	0.03	0.15		
1961	0.13	0.36	0.13	0.50	0.28	0.08	0.20	0.07	0.29	0.16	0.0	0.46	-0.13	-0.70	-0.09		
1962	0.24	0.05	0.02	0.19	0.13	0.08	-0.10	0.01	0.09	0.02	-0.44	-0.66	-0.06	0.60	-0.14		
1963	0.04	-0.17	0.05	0.13	0.01	0.02	-0.15	-0.20	-0.26	-0.15	-0.16	0.33	0.49	0.51	0.29		
1964	-0.21	-0.42	0.03	-0.11	-0.18	-0.24	-0.28	-0.37	-0.53	-0.36	0.38	0.15	0.09	0.44	0.27		
1965	-0.01	-0.21	-0.15	-0.04	-0.10	-0.76	-0.54	-0.26	0.01	-0.39	-0.30	-0.37	-0.42	-0.38	-0.37		
1966	0.24	0.20	-0.02	0.02	0.11	0.08	0.05	-0.10	-0.22	-0.05	0.11	0.26	0.17	-0.03	0.13		
1967	0.16	-0.14	0.03	0.0	0.01	-0.09	-0.05	0.01	0.03	-0.03	0.03	-0.14	-0.06	0.14	-0.01		
1968	0.05	0.02	-0.31	-0.28	-0.13	-0.07	0.03	-0.28	-0.31	-0.16	0.04	-0.67	-0.22	0.75	-0.02		
1969	-0.18	-0.04	-0.34	0.01	-0.14	0.02	0.28	0.41	0.20	0.23	0.63	0.77	0.07	-0.43	0.26		
1970	-0.07	-0.25	-0.23	-0.19	-0.19	0.06	0.26	0.16	0.14	0.16	-0.25	0.33	0.38	0.25	0.17		
1971	-0.15	-0.29	-0.23	-0.46	-0.29	0.04	-0.31	-0.39	-0.41	-0.27	0.05	-0.01	-0.24	-0.46	-0.17		
1972	-0.37	-0.32	0.22	-0.28	-0.19	-0.31	-0.01	0.36	0.48	0.13	-0.10	-0.51	-0.23	0.12	-0.19		
1973	-0.04	0.34	0.05	0.15	0.13	0.66	0.71	0.34	0.19	0.48	0.24	0.12	0.08	0.07	0.13		
1974	-0.40	0.15	0.22	0.06	0.01	0.24	-0.01	0.07	-0.03	0.07	-0.14	-0.45	-0.25	-0.12	-0.24		
1975	-0.07	0.20	0.05	-0.25	-0.02	0.24	-0.09	-0.29	-0.09	-0.06	0.04	0.04	-0.10	-0.26	-0.07		
1976	-0.47	-0.56	-0.15	-0.15	-0.33	0.08	-0.11	-0.15	-0.44	-0.16	-0.25	-0.60	-0.43	-0.10	-0.35		
1977	0.04	0.40	0.42	-0.08	0.20	0.27	0.67	0.45	0.20	0.40	-0.11	-0.15	0.09	0.05	-0.03		
1978	-0.06	0.21	0.06	0.01	0.06	0.08	0.42	0.36	0.21	0.27	0.27	0.12	-0.29	0.10	0.06		
1979	0.06	0.31	0.20	0.33	0.23	0.39	0.75	0.41	0.32	0.47	0.31	0.04	-0.28	0.21	0.07		
1980	0.36	0.71	0.58	0.19	0.46	0.54	0.70	0.69	0.42	0.59	-0.01	0.12	0.16	-0.22	0.01		
1981	0.02	0.39	0.51	0.11	0.26	0.61	0.40	0.47	0.32	0.45	-0.35	-0.53	-0.41	-0.24	-0.38		
1982	0.22	0.22	0.26	0.31	0.25	0.69	0.11	0.43	0.23	0.37	-0.23	-0.37	-0.04	-0.07	-0.18		
1983	0.15	0.67	0.25	0.28	0.34	0.47	1.10	0.63	0.31	0.63	-0.09	0.52	-0.06	-0.20	0.04		
1984	0.13	0.73	0.05	0.43	0.34	0.23	0.50	0.05	0.22	0.25	-0.99	-0.92	-0.28	-0.60	-0.70		
1985	0.16	0.30	0.66	-0.12	0.25	0.37	0.44	0.39	0.16	0.34	-1.02	-0.59	-0.81	-1.41	-0.96		
1986	-0.16	0.45	0.27	9.99	9.99	0.51	0.18	0.24	9.99	9.99	-1.41	-0.52	-0.23	9.99	9.99		
YEAR	WINTER	SPRING	SFC - 100 MB			ANNUAL	WINTER	100 - 50 MB			ANNUAL	WINTER	SPRING	100- 30 MB			ANNUAL
			SUMMER	AUTUMN				SUMMER	AUTUMN					SUMMER	AUTUMN		
1958	0.31	-0.11	0.20	0.06	0.12	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	
1959	0.07	0.28	0.32	0.01	0.17	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	
1960	0.24	0.09	0.18	0.17	0.17	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	
1961	0.07	0.29	0.01	0.11	0.12	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	
1962	-0.01	-0.19	0.01	0.20	0.0	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	
1963	-0.15	-0.15	-0.01	-0.03	-0.09	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	9.99	
1964	0.0	-0.21	-0.20	-0.24	-0.16	1.11	1.00	0.47	1.36	0.99	0.50	0.68	0.99	0.80	0.74		
1965	-0.54	-0.46	-0.27	-0.12	-0.35	0.77	0.71	0.42	1.36	0.82	0.42	0.14	0.34	1.38	0.57		
1966	0.10	0.12	-0.02	-0.14	0.02	-0.64	-0.57	-0.45	-0.06	-0.43	-0.84	-0.24	-0.16	1.15	-0.02		
1967	-0.04	-0.09	0.0	0.04	-0.02	0.56	0.48	0.42	0.27	0.43	0.54	0.57	0.04	0.36	0.38		
1968	0.07	-0.14	-0.26	-0.07	-0.10	-0.50	0.19	-0.14	0.0	-0.11	-0.24	0.38	0.08	-0.07	0.04		
1969	0.19	0.33	0.21	0.03	0.19	0.26	-0.05	-0.44	-0.27	-0.13	-0.07	0.09	0.25	0.34	0.15		
1970	-0.09	0.19	0.17	0.12	0.10	-0.13	-0.02	0.72	-0.50	0.02	-0.14	0.25	0.75	0.71	0.39		
1971	0.01	-0.26	-0.33	-0.42	-0.25	0.47	0.05	-0.58	-0.14	-0.05	0.71	-0.30	-0.82	-0.58	-0.25		
1972	-0.33	-0.28	0.19	0.19	-0.06	0.04	-0.23	0.14	-0.32	-0.09	0.36	0.21	-0.13	-0.18	0.06		
1973	0.49	0.53	0.30	0.18	0.38	-0.33	0.14	-0.50	-0.41	-0.28	-0.20	-0.23	-0.79	-0.39	-0.40		
1974	0.0	-0.06	0.01	-0.02	-0.02	-0.22	-0.34	-0.36	-0.44	-0.34	-0.36	-0.41	-0.32	-0.86	-0.49		
1975	0.05	0.02	-0.17	-0.11	-0.05	-0.15	-0.19	0.36	-0.81	-0.20	-0.35	-0.25	-0.43	-0.40	-0.48		
1976	-0.10	-0.29	-0.39	-0.32	-0.28	0.14	-0.02	-0.30	0.61	0.11	-0.31	-0.05	0.39	0.03	0.02		
1977	0.14	0.43	0.37	0.12	0.27	-1.21	-0.37	-0.41	0.49	-0.38	-1.52	-0.59	-0.62	0.19	-0.64		
1978	0.10	0.31	0.14	0.15	0.18	-0.12	0.65	0.34	-1.01	-0.04	-0.53	-0.02	0.04	-0.69	-0.30		
1979	0.29	0.52	0.22	0.31	0.34	-0.04	0.18	-0.15	-0.73	-0.19	-0.51	0.36	-0.29	-0.84	-0.32		
1980	0.47	0.67	0.57	0.27	0.50	-0.06	-0.56	-0.43	-0.65	-0.43	0.12	-1.03	-1.00	-0.32	-0.56		
1981	0.29	0.17	0.31	0.16	0.23	-0.01	0.12	-0.84	0.09	-0.16	0.09	-0.06	-0.46	-0.09	-0.13		
1982	0.39	0.02	0.32	0.17	0.23	-0.16	0.02	-0.40	0.48	-0.02	-0.71	-0.28	-0.77	0.11	-0.41		
1983	0.30	0.93	0.43	0.22	0.47	1.22	0.03	-0.29	0.18	0.29	0.82	-0.08	-0.11	0.14	0.19		
1984	-0.06	0.22	-0.03	0.07	0.05	0.33	-0.76	-0.17	-0.91	-0.38	-0.42	-0.62	-0.29	-0.98	-0.58		
1985	0.07	0.19	0.14	-0.24	0.04	-1.54	-1.24	-2.23	-1.97	-1.75	-1.23	-0.92	-1.85	-1.71	-1.43		
1986	-0.03	0.07	0.17	9.99	9.99	-1.59	-1.20	-0.94	9.99	9.99	-1.27	-0.86	-0.71	9.99	9.99		

TABLE 1. (concluded)

Global (90N - 90S) Zone 11

YEAR	SURFACE					850 - 300 MB					300 - 100 MB				
	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL
1958	0.70	0.26	-0.04	0.33	0.31	0.39	0.21	0.27	0.32	0.30	0.11	-0.26	0.11	0.03	0.0
1959	0.40	0.28	0.26	0.05	0.25	0.25	0.43	0.36	0.29	0.33	-0.05	0.47	0.19	-0.22	0.10
1960	0.10	-0.05	0.03	-0.07	0.0	0.28	-0.04	0.27	0.13	0.16	0.46	0.15	0.35	0.15	0.28
1961	0.37	0.25	0.10	0.33	0.26	0.29	0.17	0.01	0.27	0.19	0.16	0.59	0.19	-0.32	0.16
1962	0.33	0.11	-0.02	0.07	0.12	0.14	-0.01	-0.01	0.07	0.05	-0.43	-0.43	-0.11	0.40	-0.14
1963	0.11	-0.10	0.02	0.32	0.09	0.07	-0.14	-0.11	-0.03	-0.05	-0.21	0.21	0.38	0.39	0.19
1964	-0.21	-0.47	-0.06	-0.23	-0.24	-0.07	-0.10	-0.25	-0.45	-0.22	0.09	0.31	0.03	0.19	0.16
1965	-0.21	-0.21	-0.17	-0.09	-0.17	-0.58	-0.47	-0.40	-0.04	-0.37	-0.35	-0.46	-0.35	-0.15	-0.33
1966	-0.17	0.07	-0.04	-0.07	-0.05	-0.03	0.07	0.05	0.0	0.02	0.42	0.20	0.39	0.04	0.25
1967	-0.08	0.08	0.05	0.10	0.04	-0.13	-0.03	0.06	0.12	0.01	-0.13	-0.33	-0.14	-0.14	-0.19
1968	-0.10	0.16	-0.22	-0.23	-0.10	-0.02	-0.07	-0.33	-0.31	-0.18	0.0	-1.07	-0.36	0.16	-0.31
1969	-0.45	-0.12	-0.11	0.11	-0.14	-0.16	0.14	0.32	0.18	0.12	0.42	0.58	0.01	-0.32	0.17
1970	0.20	-0.09	-0.15	-0.15	-0.05	0.11	0.13	0.18	0.13	0.14	0.05	0.28	0.35	0.20	0.22
1971	-0.28	-0.20	-0.18	-0.21	-0.22	-0.17	-0.44	-0.39	-0.44	-0.36	0.02	-0.15	-0.35	-0.53	-0.26
1972	-0.38	-0.30	0.14	-0.23	-0.19	-0.49	-0.13	0.18	0.16	-0.07	-0.48	-0.54	-0.23	0.10	-0.28
1973	0.21	0.28	0.17	0.08	0.19	0.56	0.41	0.25	0.04	0.32	0.45	0.40	0.12	-0.01	0.24
1974	-0.14	0.04	-0.02	0.02	-0.03	0.01	-0.12	-0.11	-0.23	-0.11	-0.44	-0.26	-0.30	-0.08	-0.26
1975	0.08	0.31	0.06	-0.17	0.07	-0.03	0.0	-0.16	-0.10	-0.07	-0.12	0.10	-0.20	-0.17	-0.10
1976	-0.22	-0.42	-0.12	-0.21	-0.24	-0.15	-0.36	-0.27	-0.38	-0.29	-0.54	-0.66	-0.53	-0.25	-0.50
1977	-0.11	0.33	0.31	0.09	0.16	0.13	0.42	0.28	0.18	0.25	0.22	0.12	-0.03	-0.11	0.05
1978	0.10	0.06	0.11	0.15	0.10	-0.03	0.30	0.21	0.03	0.13	0.16	-0.03	-0.27	-0.24	-0.10
1979	-0.02	0.30	0.12	0.28	0.18	0.05	0.53	0.30	0.28	0.29	0.01	0.04	-0.33	-0.06	-0.09
1980	0.53	0.56	0.29	0.15	-0.38	0.37	0.39	0.52	0.21	0.37	-0.41	0.28	0.22	-0.13	-0.01
1981	0.44	0.57	0.39	0.28	0.42	0.44	0.40	0.30	0.26	0.35	-0.61	-0.68	-0.37	-0.30	-0.49
1982	0.33	0.10	0.22	0.16	0.20	0.33	-0.05	0.29	0.05	0.16	-0.17	-0.35	-0.08	-0.37	-0.24
1983	0.57	0.51	0.32	0.32	0.43	0.41	0.87	0.52	0.22	0.51	-0.39	0.18	-0.05	-0.33	-0.15
1984	0.35	0.49	0.05	0.27	0.30	0.14	0.26	0.01	0.02	0.11	-1.07	-0.60	-0.36	-0.61	-0.66
1985	-0.11	0.09	0.29	-0.19	0.02	0.15	0.09	0.02	-0.08	0.05	-0.37	-0.20	-0.68	-0.93	-0.55
1986	-0.02	0.36	0.14	9.99	9.99	0.33	0.14	0.12	9.99	9.99	-0.97	-0.53	-0.39	9.99	9.99
YEAR	SFC - 100 MB					100 - 50 MB					100 - 30 MB				
	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL	WINTER	SPRING	SUMMER	AUTUMN	ANNUAL
1958	0.39	-0.02	0.17	0.22	0.19	1.01	0.53	0.58	1.22	0.84	0.68	0.34	0.71	1.50	0.81
1959	0.22	0.43	0.30	0.16	0.28	-0.30	0.81	-0.33	-0.62	-0.11	0.02	1.42	0.39	-0.55	0.32
1960	0.28	0.01	0.24	0.10	0.16	1.04	0.51	-0.05	0.36	0.47	1.23	-0.01	-0.78	-0.32	0.03
1961	0.27	0.30	0.04	0.15	0.19	-1.38	-0.38	0.93	0.26	-0.14	-1.25	-1.07	0.59	-0.35	-0.52
1962	0.05	-0.08	-0.03	0.13	0.02	0.07	-0.83	-0.69	-0.30	-0.44	-0.22	-1.23	-1.10	-0.59	-0.79
1963	-0.05	-0.10	0.02	0.12	0.0	-0.43	-0.52	0.54	0.70	0.07	-0.63	-1.40	0.76	1.40	0.03
1964	0.0	-0.07	-0.16	-0.26	-0.12	0.49	1.10	0.61	0.71	0.73	0.25	1.14	0.80	0.47	0.67
1965	-0.47	-0.44	-0.34	-0.09	-0.34	0.36	0.28	0.30	0.79	0.43	-0.01	0.37	0.19	0.66	0.30
1966	0.03	0.10	0.11	-0.01	0.06	-0.13	-0.66	-0.24	0.28	-0.19	-0.64	-0.41	0.06	0.82	-0.04
1967	-0.13	-0.08	0.02	0.05	-0.04	0.28	0.08	-0.02	-0.21	0.03	0.18	0.48	-0.04	-0.17	0.11
1968	0.02	-0.26	-0.31	-0.19	-0.19	-0.48	-0.12	-0.11	-0.12	-0.21	-0.81	0.04	0.0	-0.19	-0.24
1969	-0.03	0.12	0.18	0.06	0.08	-0.12	-0.20	-0.36	0.19	-0.12	-0.72	-0.22	0.08	0.18	-0.17
1970	0.08	0.13	0.18	0.11	0.13	0.06	-0.05	0.50	-0.10	0.10	-0.08	0.09	0.56	0.47	0.26
1971	-0.16	-0.35	-0.34	-0.42	-0.32	0.43	-0.24	-0.22	-0.01	-0.02	0.36	-0.32	-0.31	-0.50	-0.19
1972	-0.50	-0.30	0.08	0.04	-0.17	0.04	-0.02	-0.22	-0.43	-0.16	0.42	0.28	-0.53	-0.31	-0.04
1973	0.49	0.39	0.24	0.05	0.29	-0.14	-0.30	-0.36	-0.28	-0.27	-0.12	-0.73	-0.57	-0.43	-0.46
1974	-0.14	-0.12	-0.14	-0.15	-0.14	-0.16	0.06	-0.37	-0.39	-0.22	0.09	-0.04	-0.43	-0.75	-0.28
1975	-0.08	0.09	-0.12	-0.12	-0.06	-0.15	0.05	0.15	-0.53	-0.12	-0.29	-0.22	-0.20	-0.38	-0.27
1976	-0.25	-0.44	-0.39	-0.32	-0.35	-0.18	0.37	-0.05	0.37	0.22	0.26	0.20	0.20	-0.17	0.12
1977	0.11	0.33	0.22	0.10	0.19	-0.76	-0.01	-0.03	0.26	-0.14	-1.43	-0.33	-0.55	0.28	-0.51
1978	0.02	0.21	0.08	-0.01	0.08	-0.30	0.06	0.02	-0.76	-0.25	-0.79	-0.46	-0.26	-0.61	-0.53
1979	0.03	0.37	0.19	0.23	0.21	0.22	0.24	-0.24	-0.53	-0.08	-0.13	0.19	-0.29	-0.81	-0.26
1980	0.27	0.46	0.41	0.16	0.33	-0.09	-0.29	-0.25	-0.01	-0.15	-0.13	-0.83	-0.36	0.05	-0.32
1981	0.20	0.17	0.19	0.14	0.18	0.15	-0.15	-0.61	0.06	-0.14	0.29	-0.35	-0.48	-0.11	-0.16
1982	0.19	-0.07	0.21	-0.02	0.08	0.10	0.17	0.09	0.50	0.22	-0.33	-0.06	-0.03	0.35	-0.02
1983	0.29	0.68	0.36	0.15	0.37	0.62	0.12	-0.29	0.17	0.16	0.19	-0.13	-0.41	0.01	-0.09
1984	-0.10	0.11	-0.06	-0.07	-0.03	0.10	-0.46	-0.59	-0.70	-0.41	-0.30	-0.43	-0.49	-0.67	-0.47
1985	0.02	0.03	-0.10	-0.28	-0.08	-0.98	-1.04	-1.35	-0.96	-1.08	-0.78	-0.81	-1.11	-0.95	-0.91
1986	-0.02	0.03	0.03	9.99	9.99	-1.03	-0.74	-1.02	9.99	9.99	-0.80	-0.62	-0.78	9.99	9.99