NOAA Technical Report NWS 40

An Eight-Year Climatology of Meteorological and SBUV Ozone Data

Camp Springs, MD
March 1988

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Weather Service

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WB 10 Hemispheric Teleconnections of Mean Circulation Anomalies at 700 Millibars. James F. O'Connor, National Meteorological Center, February 1969, 103 p.

WB 11 Monthly Mean 100-, 50-, 30-, and 10-Millibar Charts and Standard Deviation Maps, 1966-1967. Staff, Upper Air Branch, National Meteorological Center, April 1969, 124 p.

WB 12 Weekly Synoptic Analyses, 5-, 2-, and 0.4-Millibar Surfaces for 1967. Staff, Upper Air Branch, National Meteorological Center, January 1970, 169 p.

NOAA Technical Reports

NWS 13 The March-April 1969 Snowmelt Floods in the Red River of the North, Upper Mississippi, and Missouri Basins. Joseph L. H. Paulhus, Office of Hydrology, October 1970, 92 p. (COM-71-50269)

NWS 14 Weekly Synoptic Analyses, 5-, 2-, and 0.4-Millibar Surfaces for 1968. Staff, Upper Air Branch, National Meteorological Center, May 1971, 169 p. (COM-71-50383)

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NWS 17 Estimation of Hurricane Storm Surge in Apalachicola Bay, Florida. James E. Overland, June 1975. 66 p. (COM-75-11332)

(Continued on inside back cover)

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An Eight-Year Climatology of Meteorological and SBUV Ozone Data

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Climate Analysis Center
National Meteorological Center

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U.S. DEPARTMENT OF COMMERCE
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AN EIGHT-YEAR CLIMATOLOGY OF METEOROLOGICAL AND SBUV OZONE DATA

Ronald M. Nagatani, Alvin J. Miller,

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ABSTRACT

An eight-year climatology of stratospheric height and temperature analyses from radiosondes and TIROS Operational Vertical Sounding (TOVS) retrievals is presented on maps, cross-sections, and tables. A similar climatology of stratospheric ozone from the Nimbus 7 Solar Backscatter Ultraviolet (SBUV) instrument is also shown. The period of analysis is November, 1978 to October, 1986.

While some questions have been raised on the long-term trends depicted by the SBUV data, comparisons with other data suggest that the problems are independent of latitude. Therefore, the overall climatological patterns remain intact and form a basis from which we can show the overall ozone climatological charts with meteorological charts.

I. INTRODUCTION

Stratospheric heights and temperatures at 70-, 50-, 30-, 10-, 5-, 2-, 1-, and 0.4- mb have been analyzed on a daily basis at the National Meteorological Center (NMC) since 24 September 1979. Ozone Solar Backscatter Ultraviolet (SBUV) data from Nimbus 7 have also been analyzed in cooperation with NASA personnel at Goddard Space Flight Center. Both meteorological and ozone maps are analyzed by the successive corrections technique described by Cressman (1959) and applied to the stratospheric maps (Gelman and Nagatani, 1977).

The near coincidence in the start of the NMC stratospheric analyses and the SBUV ozone data presented us with an opportunity to summarize both datasets over a period of eight years from November, 1978 through October,

1986. While recognizing that both datasets have their limitations and problems, we also recognize a need and use for such a summary. While this report does not deal in general circulation statistics, it will serve as a complement to others that calculated general circulation statistics such as Randel (1987), where he did a global climatology of dynamical quantities and planetary wave statistics using the NMC meteorological maps from 1000 to 1 mb. Geller et al. (1983) also did some general circulation statistics for the Northern Hemisphere winter for four years and Wu et al. (1985) used the NMC stratospheric and ozone maps to compute ozone transports for a Northern Hemisphere winter period.

II. DATA

Meteorological data used are from the daily stratospheric maps produced by the Climate Analysis Center (CAC) of NMC. While many changes have occurred in the meteorological analyses between the beginning and end of the period, the largest discontinuities occur with the change of satellites. Gelman et al. (1986) have proposed adjustments to NMC temperature fields for the different satellites at levels from 5 mb and above to conform with rocketsonde data. These bias adjustments have been applied in all temperature data used in this report. Quality control of the maps consist of eliminating questionable maps if the map is judged to be of poor quality by an experienced synoptician. Note that the Southern Hemisphere months of July and August, 1986, were not included in the climatology because of a problem with the TOVS satellite data for the two months.

The SBUV ozone data have recently been under review for long-term trends shown by the data. Fleig et al. (1986) show a long-term drift in the SBUV total ozone data compared with Dobson total ozone data on the order of about

.38 percent per year over the first six years of Nimbus 7 operations. Figure 1 shows an update to their figure for the first eight years of data showing a drift of about .46 percent per year. No correction has been applied to any of the ozone data shown in this report. Indications from comparisons with other ground-based data show that the long-term drift is independent of latitude so the overall climatological patterns should remain intact.

III. STATISTICAL TABLES

Table 1 shows temperature statistics compiled from the NMC temperature maps at 70-, 50-, 30-, 10-, 5-, 2-, and 1- mb. The statistics consist of mean latitudinal averages and standard deviations. The standard deviations are the pooled monthly standard deviations from all the years that went into the climatology, so the year to year variations are not included in the standard deviations. Included in the standard deviations are the instrument errors, sampling errors, and the natural variations.

The ozone statistics for Table 2 were compiled from all available soundings from the SBUV instrument. The data were binned in ten degree latitudinal bands centered at ten degree increments from 80S to 80N. The means are shown only for total ozone, 10-, 5-, 2-, and 1- mb. As with the temperature data, pooled standard deviations were chosen to represent the variations in the data, eliminating the year to year variations because the long-term characteristics of the SBUV remain in question. The monthly means are straight averages from the original data so the polar latitudes are limited by the poleward extent of the data. The latitudinal averages for the northern- or southern-most points are also biased toward a lower latitude average because most of the data fall in the low-latitude region of the 10-degree latitudinal band.

IV. MEAN MAPS

The eight-year average ozone (total ozone, 10-, 5-, and 2- mb) and temperature (70-, 10-, 5-, and 2- mb) maps are shown in the set of figures labeled Figure 2 for the Northern Hemisphere and Figure 3 for the Southern Hemisphere. Temperature maps are shown with the corresponding ozone maps for all twelve months of the year. Figure 4 shows the set of geopotential height maps for the Northern Hemisphere and Figure 5 for the Southern Hemisphere.

A note of caution when looking at the SBUV ozone maps. The analyses in the polar regions are extrapolated because the data are limited by the range of the satellite or because there are no night-time observations in the polar night. Table 3 gives the average poleward extent of the SBUV data for all twelve months.

V. CROSS SECTIONS

Ozone and temperature cross-sections for all twelve months are also shown in Figure 6. The scales are the same for temperature and ozone cross-sections, however, the temperature cross-sections start at 70- mb and the ozone cross-sections start at 30- mb. The northern- and southern-most latitudes remain at -80 and 80 for the temperature cross-sections while the ozone latitudes change because, as in the previous datasets, the northern- and southern-most ozone data points are limited in extent.

ACKNOWLEDGMENTS

We gratefully acknowledge the efforts of D. H. Heath, A. J. Fleig, and P. K. Bhartia in providing us with the SBUV data. We also thank J. A. Fleming for his programming efforts in averaging and adjusting the NMC data. This work was funded in part by NASA and NESDIS.

REFERENCES

Cressman, G. P., 1959: "An Operational Objective Analysis System," Mon. Wea. Rev., Vol. 87, No. 10, pp. 367-374.

Fleig, A. J., P. K. Bhartia, and D. S. Silberstein, 1986: "An Assessment of the Long-Term Drift in SBUV Total Ozone Data Based on Comparison with the Dobson Network," Geophys. Res. Let., Vol. 13, No. 12, November Supplement, pp. 1359-1362.

Geller, M. A., Mao-Fou Wu, M. E. Gelman, 1983: "Troposphere-Stratosphere (Surface - 55 km) Monthly Winter General Circulation Statistics for the Northern Hemisphere - Four Year Averages," J. Atmos. Sci., Vol. 40, No. 5, pp. 1334-1351.

Gelman, M. E., A. J. Miller, K. W. Johnson, and R. M. Nagatani, 1986: "Detection of Long-Term Trends in Global Stratospheric Temperature from NMC Analyses Derived from NOAA Satellite Data," Adv. Space Res., Vol. 6, No. 10, pp. 17-26.

Gelman, M. E., and R. M. Nagatani, 1977: "Objective Analyses of Height and Temperature at the 5-, 2-, and 0.4-mb Levels using Meteorological Rocketsonde and Satellite Radiation Data, Adv. Space Res., Vol. XVII, pp. 117-122.

Randel, W. J., 1987: "Global Atmospheric Circulation Statistics, 1000-1 mb," NCAR Technical Note NCAR/TN-295+STR, December 1987, 245 pp.

Wu, Mao-Fou, M. A. Geller, J. G. Olson, A. J. Miller, and R. M. Nagatani, 1985: "Computations of Ozone Transport Using Nimbus 7 Solar Backscatter Ultraviolet and NOAA/National Meteorological Cetner Data," J. Geophys. Res., Vol. 90, No. D3, pp. 5745-5755.

Figure 1. An update of Figure 1 from Fleig et al. (1986), showing a drift over the eight year period between Dobson and SBUV total ozone of about .46 percent per year.

SBUV MINUS DOBSON (%)

1979 -1986

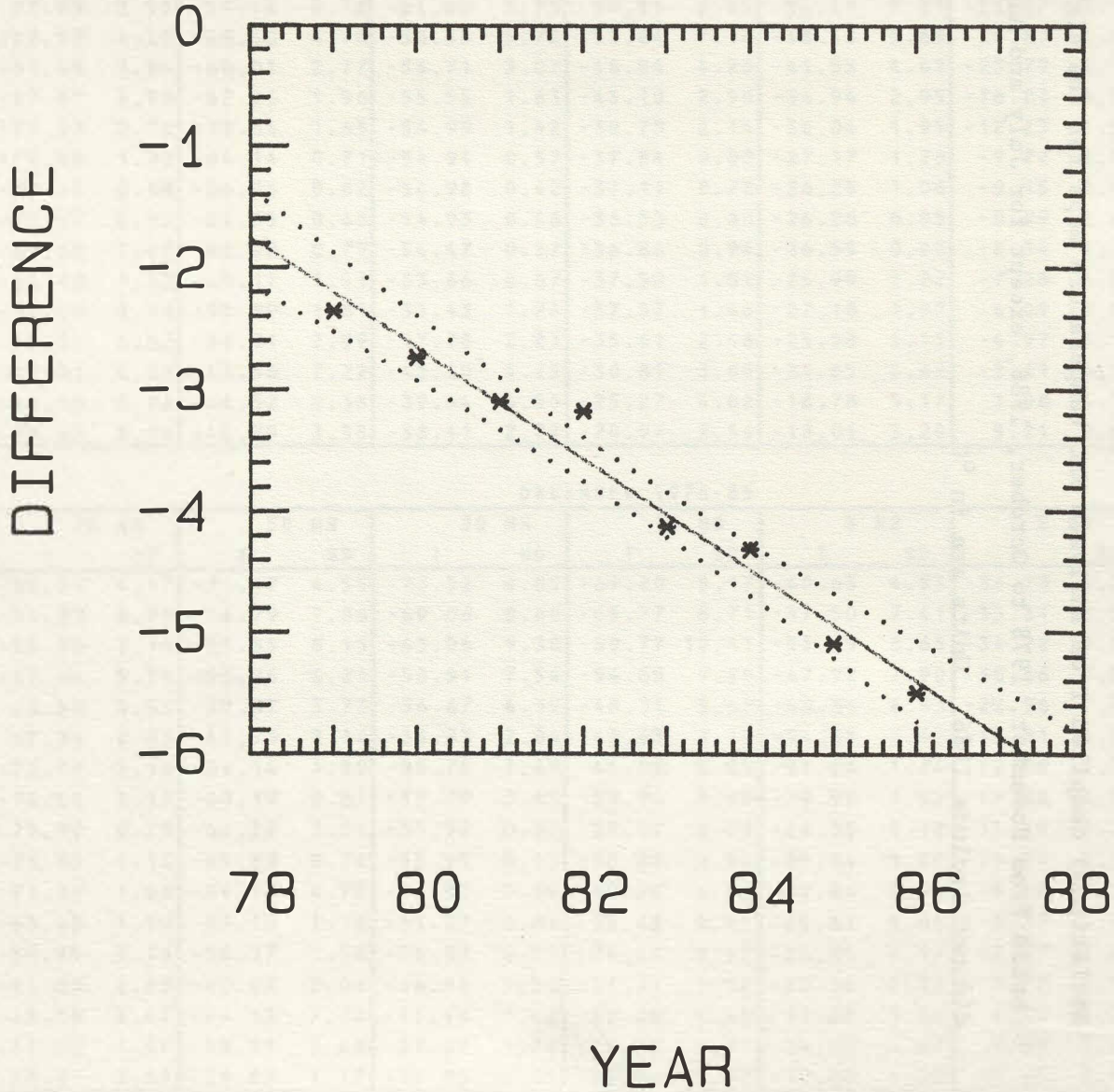


Table 1. Temperature statistics (latitudinal means and standard deviations) compiled from analyzed NMC temperature maps for the eight-year period from November, 1978 to October, 1986, except for July and August, which did not include 1986. Units are in ^{o}C.

Table 1

NOVEMBER 1978-85

	70 MB		50 MB		30 MB		10 MB		5 MB		2 MB		1 MB	
LAT	T	SD	T	SD	T	SD	T	SD	T	SD	T	SD	T	SD
80	-63.35	3.48	-66.15	3.96	-68.85	4.46	-67.26	4.25	-62.16	4.06	-40.51	4.46	-24.51	4.59
70	-60.34	5.50	-62.61	6.39	-65.10	7.50	-64.07	7.48	-58.80	6.75	-38.36	6.82	-23.56	6.62
60	-57.93	5.51	-59.44	6.38	-61.09	7.73	-59.54	8.84	-54.17	7.21	-35.57	7.10	-22.58	6.74
50	-57.97	4.38	-58.50	4.78	-58.36	5.72	-53.84	7.14	-48.13	5.65	-30.87	5.80	-20.21	5.55
40	-61.49	3.06	-60.01	2.77	-56.71	3.07	-48.04	4.20	-41.53	4.02	-23.79	4.79	-15.06	4.88
30	-67.57	2.93	-62.36	1.96	-55.55	1.63	-43.10	2.90	-34.94	2.95	-16.83	3.36	-10.12	3.45
20	-71.91	2.76	-63.64	1.65	-54.99	1.42	-39.70	2.14	-30.04	1.95	-12.13	1.91	-7.14	1.92
10	-72.54	1.02	-64.14	0.71	-54.94	0.57	-37.84	0.80	-27.17	1.20	-9.77	1.21	-5.98	1.48
0	-72.42	0.69	-64.34	0.62	-54.98	0.42	-37.11	0.72	-26.25	1.06	-9.15	1.15	-5.78	1.58
-10	-71.97	0.97	-64.35	0.63	-54.93	0.46	-36.50	0.80	-26.26	0.95	-8.99	1.02	-5.54	1.43
-20	-69.58	1.42	-62.98	0.79	-54.47	0.57	-36.86	0.94	-26.55	0.90	-8.54	1.10	-4.68	1.52
-30	-64.40	1.83	-60.17	1.11	-53.66	0.67	-37.59	1.01	-26.99	1.22	-7.26	1.50	-2.54	1.94
-40	-58.09	2.36	-55.89	1.81	-51.43	1.24	-37.57	1.46	-27.18	1.92	-6.09	2.01	-0.33	2.12
-50	-52.11	3.52	-50.91	2.99	-47.78	2.23	-35.41	2.48	-25.58	3.15	-4.97	3.11	1.04	2.43
-60	-47.91	4.98	-46.56	7.22	-43.50	3.25	-30.81	3.69	-21.65	4.62	-2.61	4.16	2.94	2.84
-70	-48.18	5.76	-44.52	5.33	-39.64	4.00	-25.27	4.02	-16.78	5.17	1.08	4.36	6.70	2.80
-80	-50.63	3.76	-45.25	3.55	-38.41	2.72	-20.97	2.56	-12.01	3.20	5.21	2.90	10.07	2.43

DECEMBER 1978-85

	70 MB		50 MB		30 MB		10 MB		5 MB		2 MB		1 MB	
LAT	T	SD	T	SD	T	SD	T	SD	T	SD	T	SD	T	SD
80	-68.25	4.17	-71.17	4.55	-73.52	4.85	-69.20	5.17	-60.63	4.53	-36.73	5.26	-20.47	5.76
70	-64.38	6.99	-66.79	7.86	-69.06	8.60	-65.77	8.71	-57.50	7.41	-35.31	8.54	-20.25	9.19
60	-59.80	7.19	-61.35	8.15	-63.06	9.38	-60.77	10.41	-53.45	8.65	-34.22	9.82	-21.21	9.92
50	-57.64	5.53	-58.24	6.23	-58.51	7.54	-54.65	9.20	-47.92	7.90	-30.66	9.61	-19.94	9.17
40	-60.50	3.65	-59.37	3.73	-56.67	4.39	-48.31	5.68	-40.84	6.03	-22.96	7.74	-14.31	7.26
30	-67.34	2.85	-62.73	2.14	-56.23	2.04	-43.63	3.39	-34.65	3.57	-15.81	4.24	-8.94	4.18
20	-72.97	3.15	-64.54	1.88	-55.78	1.40	-41.06	2.23	-31.26	1.74	-12.55	1.76	-6.90	1.96
10	-74.01	1.17	-65.19	0.83	-55.79	0.63	-39.94	0.83	-29.92	1.02	-11.68	1.09	-6.62	1.36
0	-73.99	0.79	-65.52	1.01	-55.92	0.51	-39.37	0.72	-29.33	1.12	-11.49	1.23	-6.72	1.46
-10	-73.65	1.12	-65.68	0.72	-55.90	0.51	-38.69	0.84	-29.14	1.00	-11.14	1.16	-6.39	1.40
-20	-71.22	1.50	-64.14	0.78	-54.97	0.59	-37.78	1.21	-27.84	0.92	-9.46	1.14	-5.02	1.42
-30	-66.08	1.90	-61.10	1.10	-53.37	0.63	-36.43	0.85	-25.81	1.05	-6.37	1.42	-2.14	1.71
-40	-59.25	2.16	-56.27	1.58	-50.37	0.95	-34.47	0.92	-23.25	1.14	-2.47	1.62	1.80	1.87
-50	-51.65	2.65	-50.02	2.06	-46.00	1.32	-31.71	1.10	-20.16	1.23	0.97	1.55	5.39	1.79
-60	-45.18	2.42	-44.13	2.04	-41.46	1.43	-28.49	1.45	-17.08	1.50	4.30	1.29	9.51	1.59
-70	-41.06	1.99	-39.51	1.68	-37.57	1.26	-25.61	1.77	-14.82	1.67	7.59	1.03	14.69	1.32
-80	-38.66	1.50	-36.87	1.17	-35.38	0.91	-23.84	1.32	-12.88	1.22	10.65	0.83	18.65	0.99

Table 1 (Continued)

JANUARY 1979-86

	70 MB		50 MB		30 MB		10 MB		5 MB		2 MB		1 MB	
LAT	T	SD	T	SD	T	SD	T	SD	T	SD	T	SD	T	SD
80	-70.08	4.77	-71.71	5.43	-71.43	6.18	-61.42	6.51	-49.85	5.66	-27.08	5.83	-14.14	6.42
70	-65.65	8.23	-66.94	9.21	-66.69	10.17	-57.80	10.26	-47.69	9.49	-27.45	9.69	-15.98	9.77
60	-59.64	8.49	-60.35	9.65	-60.42	10.92	-53.72	11.89	-45.13	10.84	-27.89	11.47	-18.14	10.70
50	-56.16	6.52	-56.44	7.41	-56.16	8.64	-49.58	10.02	-41.86	9.16	-25.82	10.58	-17.38	9.60
40	-58.66	4.09	-57.79	4.17	-55.38	4.74	-46.24	5.79	-37.82	5.99	-20.33	7.48	-12.93	6.79
30	-66.75	2.82	-62.51	2.20	-56.66	2.07	-44.16	3.25	-34.61	3.11	-15.39	3.91	-8.65	3.74
20	-73.84	3.01	-65.52	1.91	-57.08	1.38	-42.93	1.99	-32.86	1.46	-13.12	1.70	-6.65	1.82
10	-74.94	1.14	-66.26	0.83	-56.94	0.66	-42.21	0.73	-32.40	0.95	-12.43	1.05	-5.85	1.32
0	-74.89	0.79	-66.52	0.69	-57.01	0.70	-41.89	0.82	-32.07	1.16	-12.26	1.14	-5.80	1.40
-10	-74.59	1.15	-66.70	0.73	-57.04	0.61	-41.16	0.91	-31.62	1.11	-11.94	1.30	-5.75	1.61
-20	-72.49	1.57	-65.13	0.84	-55.83	0.62	-39.52	0.94	-29.70	1.00	-10.63	1.24	-5.41	1.62
-30	-67.56	1.81	-61.83	1.17	-53.45	0.63	-37.02	0.78	-26.93	1.02	-7.77	1.39	-3.32	1.73
-40	-60.02	2.25	-56.38	1.61	-49.71	0.96	-34.02	0.74	-23.71	1.01	-3.80	1.61	0.40	1.87
-50	-51.58	2.44	-49.84	1.80	-45.36	1.15	-30.95	0.81	-20.29	0.99	0.04	1.52	4.44	1.86
-60	-45.16	1.84	-44.42	1.48	-41.64	1.03	-28.44	0.79	-17.51	0.82	3.60	1.15	8.90	1.49
-70	-41.59	1.11	-40.61	1.03	-38.80	0.84	-26.75	0.86	-15.84	0.62	6.69	0.81	13.72	1.09
-80	-39.68	0.81	-38.65	0.70	-37.45	0.59	-25.86	0.60	-14.39	0.46	9.60	0.67	17.63	0.79

FEBRUARY 1979-86

	70 MB		50 MB		30 MB		10 MB		5 MB		2 MB		1 MB	
LAT	T	SD	T	SD	T	SD	T	SD	T	SD	T	SD	T	SD
80	-65.11	6.67	-65.15	7.39	-62.89	8.06	-51.76	7.11	-42.12	5.81	-24.95	6.60	-16.17	6.59
70	-61.01	10.11	-61.09	11.09	-59.80	11.68	-50.34	10.15	-42.76	9.30	-26.55	10.39	-17.56	9.83
60	-56.95	9.41	-57.06	10.22	-56.52	10.78	-49.02	10.77	-42.41	10.13	-27.14	11.05	-18.35	9.92
50	-55.04	6.38	-55.20	6.80	-54.72	7.36	-47.31	8.22	-40.18	8.03	-24.57	9.20	-16.65	7.96
40	-58.41	3.74	-57.65	3.61	-55.33	3.68	-45.72	4.38	-36.60	5.06	-19.27	6.04	-12.72	4.96
30	-66.97	2.95	-62.81	2.17	-56.90	1.75	-43.62	2.90	-33.17	2.67	-14.59	3.18	-9.12	2.84
20	-74.25	2.92	-66.14	1.93	-57.32	1.46	-42.10	1.99	-31.10	1.28	-11.98	1.59	-6.96	1.61
10	-75.16	1.06	-66.90	0.82	-57.41	0.65	-41.52	0.74	-30.38	0.90	-10.42	1.00	-5.14	1.23
0	-75.07	0.68	-67.17	0.54	-57.62	0.47	-41.36	0.67	-30.19	1.00	-9.98	1.03	-4.59	1.32
-10	-74.71	1.06	-67.24	0.66	-57.47	0.47	-40.45	0.77	-29.72	1.03	-10.17	1.07	-5.26	1.30
-20	-72.82	1.47	-65.63	0.83	-56.01	0.49	-38.84	0.83	-28.91	0.95	-10.76	1.09	-6.65	1.28
-30	-68.04	1.69	-62.17	1.01	-53.51	0.60	-36.77	0.71	-27.65	1.02	-10.23	1.35	-6.55	1.46
-40	-60.80	2.14	-56.99	1.50	-50.15	0.91	-34.78	0.73	-26.08	1.11	-8.31	1.60	-4.25	1.69
-50	-53.04	2.53	-51.31	1.85	-46.86	1.14	-33.42	0.90	-24.50	1.23	-6.06	1.70	-1.34	1.75
-60	-47.19	1.91	-46.84	1.52	-44.33	1.06	-32.90	0.95	-23.90	1.13	-4.41	1.50	1.60	1.61
-70	-44.29	1.09	-43.96	1.02	-42.54	0.90	-32.94	0.89	-24.44	0.94	-3.81	1.13	4.12	1.20
-80	-42.89	0.74	-42.61	0.65	-41.86	0.62	-33.25	0.66	-24.72	0.65	-2.74	0.77	6.64	0.75

Table 1 (Continued)

MARCH 1979-86

	70 MB		50 MB		30 MB		10 MB		5 MB		2 MB		1 MB	
LAT	T	SD	T	SD	T	SD	T	SD	T	SD	T	SD	T	SD
80	-55.33	5.17	-54.80	5.53	-53.02	5.40	-46.46	4.47	-41.46	3.53	-26.91	5.21	-16.81	5.10
70	-54.06	7.34	-53.95	7.75	-53.11	7.53	-46.92	6.69	-41.38	6.13	-25.92	8.18	-16.01	7.69
60	-53.69	6.59	-53.91	7.00	-53.74	7.19	-47.93	7.44	-40.69	6.94	-23.93	8.16	-14.23	7.31
50	-54.91	4.79	-55.06	5.03	-54.66	5.28	-47.59	6.17	-38.58	5.73	-20.34	6.28	-11.41	5.43
40	-59.14	3.09	-58.25	2.95	-55.77	3.01	-45.14	3.81	-34.48	3.75	-15.55	3.97	-8.67	3.33
30	-67.12	2.68	-62.80	2.01	-56.43	1.71	-41.46	3.06	-30.34	2.10	-12.21	2.27	-7.38	2.15
20	-74.07	2.91	-65.83	1.93	-56.39	1.48	-39.26	2.15	-27.63	1.17	-9.82	1.24	-6.18	1.32
10	-74.89	1.07	-66.67	0.81	-56.48	0.66	-38.47	0.88	-25.84	0.89	-7.41	0.84	-4.40	1.12
0	-74.72	0.98	-66.84	0.67	-56.70	0.56	-38.26	0.90	-25.33	1.01	-6.59	0.91	-3.81	1.27
-10	-74.25	1.46	-66.79	0.96	-56.54	0.68	-37.61	0.90	-25.77	0.89	-7.52	0.91	-4.61	1.20
-20	-72.20	1.48	-65.26	0.95	-55.35	0.67	-37.55	0.81	-27.60	0.86	-10.08	1.01	-6.34	1.15
-30	-67.15	1.83	-61.75	1.22	-53.34	0.76	-37.53	0.91	-29.35	0.99	-12.12	1.24	-7.30	1.43
-40	-60.63	2.33	-57.33	1.68	-51.38	1.10	-37.98	1.21	-30.44	1.27	-12.77	1.56	-6.93	1.66
-50	-54.60	2.61	-53.34	2.05	-50.02	1.57	-39.23	1.75	-31.84	1.90	-13.67	2.20	-6.79	2.01
-60	-50.64	2.23	-50.74	1.95	-49.34	1.81	-41.24	2.25	-34.78	2.66	-16.24	3.15	-7.68	2.71
-70	-49.52	1.65	-50.09	1.69	-49.70	1.78	-43.64	2.29	-38.83	2.59	-19.99	3.07	-9.05	2.81
-80	-49.61	0.97	-50.38	1.03	-50.63	1.17	-45.75	1.59	-41.86	1.61	-22.82	2.06	-10.24	2.04

APRIL 1979-86

	70 MB		50 MB		30 MB		10 MB		5 MB		2 MB		1 MB	
LAT	T	SD	T	SD	T	SD	T	SD	T	SD	T	SD	T	SD
80	-48.43	2.29	-48.54	2.17	-48.52	1.98	-42.83	2.58	-37.12	2.51	-18.09	2.92	-7.16	2.41
70	-50.11	3.37	-50.42	3.25	-50.57	2.92	-44.20	3.32	-36.21	3.84	-16.19	4.49	-5.86	3.81
60	-52.64	3.59	-52.92	3.55	-52.89	3.36	-45.65	3.76	-34.64	4.02	-13.48	4.64	-4.11	4.06
50	-55.48	3.23	-55.46	3.16	-54.46	3.13	-45.44	3.52	-32.49	3.08	-10.95	3.61	-3.07	3.26
40	-59.88	2.69	-58.52	2.53	-54.93	2.42	-42.47	2.95	-29.97	1.85	-9.75	2.35	-3.91	2.28
30	-66.82	2.90	-62.09	2.07	-54.71	1.54	-38.67	2.74	-27.91	1.45	-10.21	1.63	-5.91	1.77
20	-73.10	2.85	-64.61	1.80	-54.69	1.37	-36.74	1.90	-26.28	0.99	-9.77	1.06	-6.58	1.23
10	-74.40	1.08	-65.79	0.79	-55.02	0.62	-36.04	0.78	-24.68	0.87	-8.01	0.86	-5.70	1.15
0	-74.42	0.79	-66.23	0.58	-55.41	0.56	-35.82	0.73	-24.07	1.01	-7.14	0.90	-5.24	1.31
-10	-74.01	0.91	-66.23	0.59	-55.32	0.42	-35.62	0.65	-25.19	0.89	-8.68	0.93	-6.28	1.24
-20	-71.41	1.27	-64.53	0.76	-54.52	0.50	-37.21	0.75	-28.68	1.02	-12.05	1.17	-7.97	1.32
-30	-65.77	1.99	-61.10	1.32	-53.54	0.80	-39.67	1.20	-33.03	1.45	-15.74	1.79	-9.64	1.81
-40	-59.98	2.44	-57.64	1.76	-53.20	1.34	-42.74	2.21	-37.04	2.56	-19.41	2.83	-11.82	2.44
-50	-55.90	2.51	-55.41	2.17	-53.91	2.26	-46.96	3.72	-41.98	4.36	-24.30	4.61	-15.19	3.73
-60	-54.51	2.46	-55.25	2.44	-55.78	2.83	-52.22	4.61	-48.23	5.39	-29.82	5.77	-18.52	4.82
-70	-56.71	2.39	-58.27	2.52	-59.64	2.78	-57.49	4.03	-54.08	4.60	-34.25	5.01	-20.45	4.63
-80	-59.67	1.63	-61.67	1.76	-63.39	1.79	-61.33	2.22	-57.74	2.61	-37.05	3.11	-21.79	3.13

Table 1 (Continued)

MAY 1979-86

LAT	70 MB T	70 MB SD	50 MB T	50 MB SD	30 MB T	30 MB SD	10 MB T	10 MB SD	5 MB T	5 MB SD	2 MB T	2 MB SD	1 MB T	1 MB SD
80	-45.91	1.10	-45.70	1.02	-45.08	1.15	-36.33	1.89	-25.67	0.72	-2.78	0.74	6.76	0.74
70	-47.99	1.54	-47.91	1.35	-47.40	1.31	-37.52	2.22	-25.96	1.12	-3.62	1.18	5.08	1.12
60	-51.01	1.97	-50.92	1.76	-50.12	1.57	-39.27	2.66	-25.94	1.47	-4.25	1.78	3.08	1.67
50	-54.57	2.34	-54.04	2.08	-52.08	1.91	-39.72	2.62	-25.78	1.58	-4.68	2.10	1.23	2.00
40	-59.67	2.65	-57.48	2.17	-52.81	1.78	-38.90	2.83	-25.87	1.41	-6.18	1.87	-1.43	1.94
30	-66.25	3.21	-60.76	2.15	-52.97	1.38	-37.50	2.55	-26.32	1.23	-8.70	1.49	-4.77	1.62
20	-71.66	2.76	-63.16	1.71	-53.46	1.30	-36.57	1.79	-26.33	0.90	-9.89	1.03	-6.65	1.21
10	-73.12	1.00	-64.48	0.79	-54.02	0.58	-36.02	0.76	-25.45	0.85	-9.30	0.86	-6.85	1.14
0	-73.34	0.58	-65.00	0.45	-54.36	0.37	-35.77	0.60	-25.03	0.84	-8.83	0.81	-6.74	1.17
-10	-72.84	0.73	-64.99	0.49	-54.42	0.36	-35.98	0.69	-26.42	1.01	-10.23	0.96	-7.48	1.14
-20	-69.96	1.26	-63.25	0.78	-53.84	0.49	-38.03	1.05	-30.23	1.58	-13.62	1.73	-9.10	1.67
-30	-64.24	1.97	-60.11	1.20	-53.55	0.83	-42.02	1.58	-36.52	2.06	-19.43	2.82	-12.32	2.86
-40	-58.82	2.36	-57.38	1.84	-54.61	1.78	-47.87	2.76	-44.10	2.92	-27.37	3.94	-17.87	3.82
-50	-56.71	2.90	-57.24	2.94	-57.58	3.32	-55.15	4.52	-52.53	4.15	-35.72	4.51	-23.88	4.24
-60	-59.21	3.47	-60.78	3.57	-62.81	3.86	-62.83	5.02	-59.82	4.75	-40.16	4.89	-25.94	4.58
-70	-66.36	3.49	-68.85	3.61	-70.70	3.41	-68.50	3.81	-64.15	4.09	-40.53	4.57	-24.16	4.49
-80	-71.78	2.04	-74.47	2.05	-75.64	1.85	-71.08	1.85	-66.39	2.29	-40.87	2.90	-23.40	3.06

JUNE 1979-86

LAT	70 MB T	70 MB SD	50 MB T	50 MB SD	30 MB T	30 MB SD	10 MB T	10 MB SD	5 MB T	5 MB SD	2 MB T	2 MB SD	1 MB T	1 MB SD
80	-43.36	1.08	-42.62	0.94	-41.52	1.01	-30.28	1.87	-17.95	0.44	5.36	0.56	12.65	0.64
70	-46.07	1.27	-45.32	1.08	-43.95	1.14	-31.93	2.22	-19.23	0.71	2.95	0.88	9.48	0.88
60	-49.49	1.65	-48.82	1.37	-47.05	1.29	-34.51	2.56	-20.94	1.02	0.19	1.32	5.84	1.19
50	-53.74	2.07	-52.54	1.70	-49.57	1.44	-36.20	2.50	-23.02	1.19	-2.51	1.67	2.60	1.54
40	-60.18	2.82	-56.75	1.93	-51.24	1.40	-37.21	2.78	-24.90	1.11	-5.81	1.55	-1.39	1.65
30	-66.86	3.82	-60.28	2.26	-52.44	1.34	-37.47	2.60	-26.53	1.04	-9.53	1.32	-5.85	1.52
20	-70.38	3.03	-62.28	1.77	-53.31	1.29	-37.48	1.83	-27.66	0.82	-11.47	1.02	-7.98	1.25
10	-71.20	0.96	-63.16	0.75	-53.78	0.63	-37.09	0.74	-27.48	0.82	-11.43	0.90	-8.35	1.25
0	-71.41	0.76	-63.61	0.61	-54.01	0.35	-36.74	0.55	-27.15	0.85	-11.14	0.88	-8.33	1.27
-10	-70.94	0.81	-63.62	0.56	-54.06	0.39	-36.79	0.72	-28.24	0.97	-12.21	0.95	-8.85	1.26
-20	-68.63	1.50	-62.30	0.98	-53.61	0.67	-38.28	1.35	-31.05	1.78	-14.34	1.82	-9.50	1.89
-30	-63.36	1.92	-59.65	1.25	-53.56	1.08	-42.41	2.41	-37.20	3.21	-19.43	3.94	-11.88	3.61
-40	-58.81	2.68	-57.75	2.08	-55.49	1.85	-50.11	3.30	-47.12	4.46	-29.27	6.27	-18.50	5.81
-50	-59.02	3.68	-60.06	3.74	-61.07	3.58	-59.96	3.71	-58.03	4.36	-38.83	6.41	-24.91	6.06
-60	-64.69	5.18	-66.74	5.31	-68.80	4.80	-67.84	3.72	-64.17	3.91	-40.34	6.12	-24.26	6.15
-70	-73.42	5.10	-76.18	5.22	-77.37	4.52	-72.24	3.05	-66.23	3.26	-38.28	5.29	-20.70	5.95
-80	-78.71	2.54	-81.59	2.59	-81.97	2.35	-74.45	1.87	-68.05	2.03	-38.29	3.16	-19.78	3.81

Table 1 (Continued)

JULY 1979-85

	70 MB		50 MB		30 MB		10 MB		5 MB		2 MB		1 MB	
LAT	T	SD	T	SD	T	SD	T	SD	T	SD	T	SD	T	SD
80	-43.11	1.05	-42.44	0.88	-41.53	0.98	-29.73	1.87	-17.39	0.43	5.03	0.50	11.74	0.52
70	-45.53	1.37	-44.83	1.22	-43.42	1.30	-31.01	2.44	-18.78	0.75	2.40	0.98	8.37	0.88
60	-49.00	1.53	-48.21	1.33	-46.18	1.38	-33.53	2.69	-20.79	1.06	-0.84	1.46	4.33	1.28
50	-53.88	2.10	-52.13	1.66	-48.66	1.47	-35.74	2.49	-23.72	1.19	-4.54	1.71	0.50	1.62
40	-60.66	3.08	-56.42	2.11	-50.66	1.42	-37.28	2.67	-26.21	1.16	-8.55	1.59	-4.10	1.62
30	-66.35	3.74	-59.77	2.05	-52.38	1.34	-38.18	2.52	-28.12	1.05	-11.71	1.41	-7.78	1.49
20	-68.65	2.47	-61.46	1.51	-53.36	1.22	-38.40	1.71	-29.26	0.84	-12.83	1.11	-8.77	1.21
10	-69.17	0.83	-61.96	0.68	-53.69	0.60	-38.19	0.63	-29.32	0.79	-12.41	0.90	-8.35	1.15
0	-69.33	0.65	-62.35	0.50	-53.91	0.32	-38.25	0.54	-29.06	0.83	-12.12	0.84	-8.28	1.11
-10	-68.85	0.81	-62.34	0.60	-54.02	0.40	-38.53	0.70	-29.83	0.87	-12.90	0.89	-8.66	1.11
-20	-67.04	1.33	-61.34	0.81	-53.65	0.61	-39.24	1.31	-31.49	1.70	-14.48	1.67	-9.47	1.68
-30	-62.64	1.88	-59.22	1.34	-53.53	1.34	-42.12	2.72	-35.77	3.72	-18.25	4.47	-11.50	3.93
-40	-58.75	3.08	-57.65	2.65	-55.23	2.78	-48.92	4.55	-43.88	6.27	-25.74	8.28	-16.36	7.23
-50	-60.23	4.19	-61.30	4.32	-62.17	4.53	-59.46	5.56	-54.05	7.25	-32.63	9.80	-19.98	8.73
-60	-68.51	4.63	-70.65	4.69	-72.42	4.41	-67.97	4.82	-59.88	6.27	-32.03	8.26	-16.84	7.73
-70	-79.40	3.67	-82.02	3.66	-82.35	3.16	-71.88	3.12	-62.54	4.05	-29.84	5.49	-12.12	5.65
-80	-84.75	1.81	-87.41	1.71	-86.86	1.49	-73.89	1.81	-65.35	2.28	-31.45	3.25	-12.41	3.56

AUGUST 1979-85

	70 MB		50 MB		30 MB		10 MB		5 MB		2 MB		1 MB	
LAT	T	SD	T	SD	T	SD	T	SD	T	SD	T	SD	T	SD
80	-44.89	1.06	-44.98	0.95	-44.61	0.94	-35.10	1.80	-25.73	0.62	-4.25	0.76	4.54	0.68
70	-46.84	1.43	-46.84	1.30	-46.18	1.49	-35.69	2.38	-25.83	1.01	-5.51	1.34	2.10	1.17
60	-49.80	1.86	-49.44	1.61	-47.98	1.64	-36.93	2.53	-26.29	1.27	-7.08	1.74	-0.66	1.54
50	-54.37	2.12	-52.78	1.76	-49.58	1.62	-38.20	2.29	-27.93	1.24	-9.51	1.77	-3.51	1.67
40	-60.57	2.91	-56.46	1.93	-51.02	1.36	-39.13	2.43	-29.40	1.20	-12.19	1.62	-6.85	1.57
30	-65.60	3.45	-59.48	1.80	-52.60	1.29	-39.36	2.32	-30.08	1.11	-13.70	1.38	-9.08	1.44
20	-67.93	2.22	-61.17	1.44	-53.61	1.26	-39.11	1.66	-29.94	0.87	-13.14	1.08	-8.66	1.18
10	-68.46	0.70	-61.50	0.60	-53.87	0.59	-38.68	0.62	-29.26	0.81	-11.68	0.84	-7.42	1.08
0	-68.48	0.52	-61.76	0.40	-54.01	0.26	-38.71	0.49	-29.02	0.83	-11.33	0.76	-7.27	1.09
-10	-68.02	0.65	-61.74	0.42	-54.01	0.33	-38.71	0.59	-29.58	0.81	-12.11	0.79	-7.80	1.12
-20	-66.28	1.16	-60.75	0.64	-53.50	0.49	-38.93	1.04	-30.84	1.41	-13.82	1.51	-9.07	1.64
-30	-61.71	1.75	-58.32	1.26	-52.78	1.25	-40.53	2.46	-34.08	3.21	-17.18	3.92	-11.15	3.62
-40	-57.48	2.84	-56.12	2.54	-53.23	2.96	-44.71	4.89	-39.09	5.89	-22.09	7.03	-14.58	6.11
-50	-59.48	4.29	-59.77	4.59	-59.05	5.43	-51.80	7.27	-44.27	7.85	-23.59	8.40	-14.33	7.22
-60	-69.50	4.35	-70.45	4.59	-69.93	5.08	-58.44	7.08	-46.35	7.70	-18.40	7.40	-7.48	6.41
-70	-81.54	2.78	-82.86	2.77	-81.38	2.72	-64.02	4.60	-49.39	5.65	-15.32	5.66	-0.85	5.20
-80	-86.86	1.37	-88.21	1.30	-86.27	1.30	-68.44	2.54	-54.53	3.38	-17.80	3.94	-0.59	3.98

Table 1 (Continued)

SEPTEMBER 1979-86

LAT	70 MB T	70 MB SD	50 MB T	50 MB SD	30 MB T	30 MB SD	10 MB T	10 MB SD	5 MB T	5 MB SD	2 MB T	2 MB SD	1 MB T	1 MB SD
80	-50.18	1.10	-51.33	1.08	-52.23	1.17	-47.15	1.87	-42.06	1.32	-22.54	1.90	-11.27	1.90
70	-50.68	1.71	-51.64	1.66	-52.22	1.84	-45.69	2.64	-39.23	2.20	-19.87	2.90	-9.83	2.73
60	-52.00	2.18	-52.47	2.11	-52.13	2.23	-44.10	2.71	-36.17	2.43	-17.35	3.16	-8.83	2.88
50	-55.30	2.53	-54.54	2.24	-52.28	2.12	-42.71	2.33	-34.12	2.02	-15.64	2.54	-8.29	2.26
40	-60.91	2.43	-57.41	1.82	-52.41	1.41	-41.76	2.19	-33.03	1.40	-14.85	1.82	-8.30	1.98
30	-65.96	2.93	-59.98	1.61	-53.22	1.18	-40.60	2.22	-31.86	1.10	-14.07	1.44	-8.41	1.79
20	-68.56	2.14	-61.74	1.38	-53.99	1.25	-39.31	1.71	-30.07	0.90	-12.38	1.08	-7.60	1.45
10	-69.09	0.71	-62.19	0.61	-54.26	0.58	-38.15	0.66	-28.20	0.90	-10.46	0.92	-6.61	1.46
0	-69.05	0.48	-62.40	0.35	-54.40	0.28	-37.82	0.58	-27.76	0.97	-10.11	0.91	-6.54	1.56
-10	-68.55	0.67	-62.34	0.44	-54.39	0.40	-37.67	0.69	-28.48	0.92	-10.98	0.93	-7.04	1.52
-20	-66.44	1.12	-61.00	0.67	-53.77	0.50	-38.50	1.01	-30.33	1.37	-12.69	1.45	-7.96	1.70
-30	-61.40	1.81	-57.94	1.33	-52.43	1.16	-40.20	2.03	-33.75	2.75	-15.59	3.22	-9.26	2.96
-40	-56.23	3.23	-54.47	2.93	-50.99	3.01	-41.88	4.18	-36.92	4.74	-19.45	5.63	-12.00	4.96
-50	-56.20	5.89	-55.40	6.11	-52.91	6.53	-43.66	7.34	-37.77	6.80	-19.61	7.75	-12.31	6.99
-60	-64.18	7.27	-63.46	7.83	-60.48	8.37	-45.61	9.06	-35.05	8.06	-13.50	8.03	-7.41	7.49
-70	-76.69	4.69	-76.14	5.47	-72.32	6.00	-49.68	7.59	-33.95	7.28	-7.43	5.94	0.07	5.79
-80	-82.87	1.84	-82.71	2.21	-78.82	2.72	-54.68	4.85	-37.28	5.16	-6.09	3.85	4.34	3.54

OCTOBER 1979-86

LAT	70 MB T	70 MB SD	50 MB T	50 MB SD	30 MB T	30 MB SD	10 MB T	10 MB SD	5 MB T	5 MB SD	2 MB T	2 MB SD	1 MB T	1 MB SD
80	-56.97	1.66	-59.48	1.87	-62.18	2.22	-60.83	2.83	-57.54	3.55	-37.46	4.20	-23.42	3.83
70	-55.50	2.60	-57.40	3.04	-59.38	3.87	-56.71	5.17	-53.06	5.79	-33.67	6.60	-20.81	5.83
60	-54.96	3.19	-56.01	3.52	-56.70	4.31	-52.29	5.60	-47.27	6.23	-28.87	6.93	-17.91	6.01
50	-56.92	3.13	-56.83	3.00	-55.60	3.23	-48.34	4.12	-41.62	4.88	-23.41	5.44	-14.38	4.69
40	-61.31	2.56	-59.02	2.08	-55.00	1.99	-45.07	2.55	-37.24	2.91	-18.48	3.37	-10.71	3.07
30	-66.59	3.01	-61.09	1.79	-54.46	1.33	-42.05	2.32	-33.61	1.85	-15.11	2.08	-8.66	2.14
20	-70.14	2.62	-62.81	1.46	-54.58	1.28	-39.26	1.85	-29.95	1.20	-12.20	1.32	-7.36	1.52
10	-70.81	0.89	-63.60	0.59	-54.81	0.56	-37.12	0.73	-26.81	0.94	-9.74	0.99	-6.41	1.42
0	-70.83	0.52	-63.72	0.36	-54.81	0.28	-36.49	0.61	-25.90	0.91	-9.03	0.94	-6.16	1.51
-10	-70.48	0.79	-63.63	0.49	-54.74	0.40	-36.29	0.70	-26.44	0.87	-9.55	0.94	-6.40	1.42
-20	-67.89	1.24	-62.08	0.76	-54.22	0.54	-37.41	0.90	-28.21	1.13	-10.52	1.20	-6.42	1.50
-30	-62.27	1.84	-58.67	1.29	-52.92	0.91	-39.27	1.57	-31.18	2.23	-11.75	2.15	-5.73	2.08
-40	-56.10	3.09	-54.28	2.78	-50.71	2.38	-40.45	2.71	-33.65	3.68	-13.79	4.08	-6.16	3.24
-50	-52.69	5.75	-51.65	5.61	-49.00	5.17	-39.47	4.44	-33.22	5.15	-14.12	6.48	-6.47	5.08
-60	-54.84	8.48	-53.37	8.34	-49.62	7.60	-35.69	6.07	-28.09	6.74	-10.09	8.06	-4.50	6.33
-70	-63.96	8.47	-60.91	8.94	-54.70	8.33	-32.37	6.25	-21.06	6.43	-2.88	7.35	0.91	6.46
-80	-71.45	4.10	-67.85	4.67	-59.89	4.89	-31.57	4.70	-16.98	4.03	3.47	4.02	6.85	4.42

Table 2. Ozone statistics (latitudinal means, standard deviations, maximum value, and minimum value) compiled from individual satellite sounding data for the eight-year period from November, 1978 to October, 1986. Units for total ozone are in Dobson Units and profile mixing ratios are in μgm/gm.

Table 2

NOVEMBER 1978-85

	TOTAL OZONE				10 MB				5 MB				2 MB				1 MB			
LAT	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN
70	299.6	47.6	491.3	182.7	8.74	1.393	12.56	3.74	9.29	1.752	14.08	4.28	9.20	1.171	13.38	4.51	6.37	0.689	9.63	3.79
60	314.1	47.7	485.6	192.1	8.90	1.468	13.93	3.85	9.66	1.271	15.95	5.02	9.99	1.009	17.09	4.92	6.52	0.744	12.27	3.29
50	313.0	39.8	469.3	206.8	9.47	1.062	13.59	5.57	11.02	0.867	15.26	7.13	10.64	0.755	16.48	5.98	6.41	0.654	11.80	3.30
40	288.3	28.0	445.4	213.9	10.63	1.030	14.42	7.37	12.12	0.696	15.23	9.52	10.19	0.772	13.38	6.43	5.82	0.606	8.89	3.45
30	264.2	17.5	355.6	200.1	12.39	0.945	15.62	8.52	13.02	0.611	15.76	10.29	9.17	0.666	12.50	6.50	5.13	0.425	8.12	3.41
20	254.0	10.6	324.7	204.4	13.94	0.829	17.33	9.92	13.48	0.523	15.60	11.13	8.37	0.398	11.07	6.67	4.79	0.204	6.36	3.54
10	250.4	9.5	294.2	212.3	15.18	0.795	18.24	11.80	13.66	0.294	15.43	11.82	8.00	0.210	9.49	6.75	4.75	0.113	5.58	3.87
0	251.1	9.6	296.5	204.1	15.66	0.687	18.93	12.64	13.88	0.241	15.38	12.11	7.94	0.177	9.06	6.76	4.76	0.102	5.58	3.97
-10	260.7	10.7	314.3	217.1	15.64	0.722	19.27	13.30	14.29	0.267	15.84	12.56	7.93	0.163	9.17	6.57	4.69	0.104	5.53	3.81
-20	276.5	11.7	330.8	231.0	14.78	0.595	18.35	12.33	14.42	0.258	16.13	12.77	7.90	0.175	9.00	6.57	4.60	0.105	5.42	3.72
-30	295.3	15.5	388.5	228.5	13.75	0.571	15.99	10.56	14.11	0.317	16.38	11.46	7.73	0.246	9.41	6.30	4.45	0.128	5.24	3.49
-40	317.6	23.7	452.3	230.7	12.50	0.852	14.93	8.57	13.60	0.530	15.92	10.55	7.56	0.368	9.66	5.98	4.32	0.159	5.46	3.35
-50	344.7	32.8	490.6	217.4	11.39	0.979	14.65	7.62	12.83	0.728	15.57	9.47	7.41	0.469	9.79	5.61	4.21	0.207	5.60	3.16
-60	363.2	43.4	500.5	180.3	10.45	1.051	14.21	7.49	11.82	0.835	14.78	8.65	7.17	0.506	9.68	5.20	4.05	0.240	5.59	2.93
-70	344.3	53.9	503.7	180.2	9.74	1.041	13.22	7.33	10.74	0.771	13.99	8.03	6.81	0.457	9.32	4.92	3.80	0.238	5.08	2.80
-80	315.7	51.3	471.7	178.2	9.44	0.936	13.14	7.23	10.15	0.581	12.44	7.87	6.77	0.386	8.92	4.92	3.71	0.241	5.19	2.47

DECEMBER 1978-85

	TOTAL OZONE				10 MB				5 MB				2 MB				1 MB			
LAT	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN
60	330.9	52.9	547.5	196.6	9.50	1.221	14.54	5.74	9.56	1.175	14.59	5.72	8.90	1.247	14.35	4.38	5.95	1.029	12.21	2.63
50	336.9	47.6	528.4	219.0	9.42	1.152	14.81	5.83	10.35	0.931	14.62	6.21	9.82	1.113	14.18	5.42	6.11	0.931	12.22	3.26
40	308.5	37.6	513.5	213.9	10.17	1.038	14.15	6.60	11.47	0.772	15.32	7.95	9.69	1.026	14.56	5.70	5.71	0.771	9.84	3.48
30	268.8	23.0	402.2	200.9	11.62	1.022	15.59	8.12	12.40	0.665	15.56	8.91	8.97	0.693	13.74	6.77	5.07	0.466	8.76	3.57
20	248.1	12.9	322.2	197.5	13.23	0.900	17.02	9.50	13.21	0.554	15.58	10.47	8.52	0.399	11.65	6.89	4.82	0.221	6.59	3.65
10	243.3	9.6	283.2	197.7	14.70	0.866	18.95	11.10	13.81	0.420	15.62	11.80	8.39	0.287	9.99	6.82	4.83	0.138	5.83	3.90
0	245.3	9.8	283.2	208.4	15.65	0.786	18.75	12.72	14.32	0.372	16.51	12.51	8.41	0.280	9.86	6.72	4.88	0.129	5.86	3.89
-10	255.4	10.3	301.4	210.5	15.92	0.792	18.87	13.17	14.76	0.346	16.76	12.93	8.32	0.257	9.81	6.83	4.80	0.129	5.75	3.92
-20	268.3	10.3	325.7	223.4	14.99	0.704	19.54	12.81	14.56	0.317	16.44	12.72	8.03	0.238	9.35	6.63	4.64	0.125	5.62	3.74
-30	283.3	12.8	361.6	229.3	14.01	0.415	16.67	11.69	13.96	0.267	16.10	12.16	7.56	0.224	8.75	6.09	4.44	0.124	5.47	3.50
-40	299.4	18.8	407.3	233.1	12.94	0.545	15.03	9.98	13.24	0.316	15.06	11.39	7.06	0.204	8.29	5.73	4.19	0.116	4.99	3.35
-50	324.4	25.4	426.7	223.6	11.65	0.575	14.01	8.69	12.38	0.375	14.25	10.37	6.66	0.184	7.85	5.44	3.93	0.107	4.71	3.10
-60	340.2	24.5	429.4	223.4	10.20	0.690	12.80	7.99	11.25	0.455	13.25	9.33	6.36	0.192	7.61	5.06	3.68	0.105	4.41	2.79
-70	337.2	21.9	426.4	219.9	8.88	0.566	12.21	7.47	10.22	0.288	11.90	8.93	6.07	0.183	7.45	4.61	3.38	0.124	4.21	2.30
-80	330.5	21.0	416.1	228.8	8.28	0.428	11.47	7.38	9.93	0.181	11.33	8.73	5.99	0.215	7.51	4.35	3.20	0.137	4.03	2.10

Table 2 (Continued)

JANUARY 1979-86

	TOTAL OZONE				10 MB				5 MB				2 MB				1 MB			
LAT	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN
70	371.6	60.1	552.9	202.4	10.40	0.947	15.22	7.80	10.06	1.351	14.45	6.25	8.15	1.192	11.83	4.57	5.81	0.973	8.83	3.34
60	368.5	59.4	579.3	183.0	9.87	1.257	15.95	5.95	9.74	1.264	14.20	5.54	8.58	1.238	12.96	3.99	5.92	1.016	10.09	2.62
50	370.8	56.3	603.6	205.3	9.61	1.165	15.52	6.07	10.50	1.019	14.88	6.13	9.39	1.081	13.90	4.89	6.07	0.875	10.05	3.27
40	335.6	44.0	532.5	199.3	10.20	0.999	14.80	6.80	11.53	0.817	15.42	8.06	9.46	0.835	14.06	6.11	5.78	0.677	9.22	3.65
30	277.7	25.7	493.2	198.2	11.47	1.010	15.59	7.71	12.52	0.724	16.39	9.33	9.08	0.606	12.43	6.95	5.20	0.440	7.88	3.90
20	247.1	14.2	327.3	192.6	13.27	0.976	17.08	9.37	13.64	0.645	16.69	10.77	8.74	0.388	11.55	7.14	4.86	0.232	6.33	3.77
10	240.4	9.3	285.9	205.5	15.00	0.891	18.60	11.09	14.62	0.473	16.77	12.29	8.66	0.285	10.16	7.06	4.79	0.167	5.92	3.83
0	244.2	9.4	284.8	206.7	16.16	0.804	19.20	13.30	15.30	0.398	17.27	13.46	8.65	0.286	10.21	6.85	4.77	0.181	5.72	3.86
-10	253.2	9.9	288.3	214.3	16.47	0.851	19.78	13.35	15.53	0.339	17.64	13.45	8.53	0.279	10.02	6.91	4.74	0.177	5.87	3.84
-20	262.6	9.5	306.2	221.2	15.47	0.783	19.26	13.10	14.94	0.372	16.97	12.83	8.24	0.259	9.75	6.68	4.74	0.156	5.95	3.87
-30	275.1	11.1	352.2	224.1	14.26	0.469	17.81	12.41	14.07	0.326	15.80	12.27	7.78	0.245	9.25	6.46	4.64	0.154	5.82	3.75
-40	291.2	17.4	381.5	226.3	13.05	0.502	15.63	11.17	13.19	0.321	14.90	11.41	7.26	0.238	8.79	6.00	4.39	0.157	5.47	3.55
-50	314.6	24.5	407.5	229.9	11.64	0.492	13.86	9.77	12.28	0.323	13.96	10.68	6.81	0.205	8.16	5.67	4.09	0.144	5.00	3.30
-60	324.8	22.4	400.9	235.8	10.06	0.581	12.02	8.12	11.17	0.397	12.85	9.65	6.47	0.194	7.62	5.37	3.81	0.126	4.57	3.02
-70	312.6	18.7	383.9	240.0	8.42	0.466	10.29	6.86	10.00	0.274	11.54	8.67	6.19	0.189	7.22	4.97	3.54	0.153	4.27	2.54
-80	304.2	15.3	364.5	245.2	7.60	0.355	8.87	6.45	9.59	0.174	10.64	8.41	6.11	0.242	7.41	4.52	3.33	0.190	4.17	2.08

FEBRUARY 1979-86

	TOTAL OZONE				10 MB				5 MB				2 MB				1 MB			
LAT	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN
80	419.4	52.9	577.8	253.1	10.30	0.893	13.69	7.32	9.93	1.459	13.45	6.77	8.13	1.306	12.13	4.68	5.83	0.771	8.35	3.00
70	399.3	64.8	639.2	199.6	10.15	1.222	15.52	5.96	9.88	1.333	14.88	5.88	8.64	1.229	13.42	4.57	6.01	0.976	10.32	3.06
60	401.8	60.8	622.9	206.9	9.54	1.227	15.48	5.82	10.17	1.154	15.07	5.93	9.41	1.241	13.69	4.84	6.19	0.994	10.30	3.02
50	398.1	55.4	598.7	217.4	9.79	0.987	15.63	5.88	11.25	0.980	15.28	7.17	9.78	1.126	14.05	5.66	6.06	0.812	9.39	3.30
40	353.6	46.6	556.2	218.6	10.61	0.935	14.70	7.43	12.25	0.819	15.56	8.65	9.51	0.862	13.54	6.14	5.55	0.570	8.69	3.46
30	288.2	29.7	469.1	204.3	12.17	1.009	16.21	8.76	13.18	0.635	16.38	9.84	8.89	0.578	12.05	6.73	5.03	0.335	7.53	3.75
20	254.0	15.8	358.9	198.0	14.18	0.937	18.63	10.37	14.10	0.531	16.90	11.05	8.40	0.351	10.58	6.85	4.74	0.181	6.16	3.81
10	242.1	9.4	279.0	207.9	15.66	0.834	19.39	11.79	14.84	0.407	17.15	12.97	8.21	0.281	9.85	6.80	4.59	0.130	5.59	3.79
0	245.9	8.9	279.7	208.4	16.68	0.758	19.62	13.60	15.42	0.349	18.98	13.56	8.10	0.282	9.54	6.64	4.49	0.120	5.26	3.72
-10	253.0	9.4	287.3	216.5	16.79	0.838	19.85	13.86	15.50	0.348	19.36	13.37	8.12	0.260	9.59	6.66	4.54	0.131	5.47	3.68
-20	258.4	8.8	292.6	221.3	15.74	0.789	19.54	13.41	14.81	0.381	18.76	12.51	8.16	0.204	9.60	6.85	4.73	0.145	5.73	3.81
-30	268.0	10.0	324.3	226.9	14.28	0.585	17.10	12.16	13.93	0.314	17.78	12.18	8.06	0.216	9.64	6.68	4.83	0.137	5.76	3.94
-40	282.2	16.1	384.2	224.9	12.85	0.537	15.63	10.58	13.14	0.277	14.73	11.45	7.78	0.267	9.37	6.44	4.70	0.153	5.59	3.81
-50	300.8	24.4	391.2	211.1	11.37	0.539	13.59	9.15	12.38	0.286	13.91	10.79	7.49	0.314	9.09	6.11	4.46	0.173	5.32	3.56
-60	311.7	23.3	389.5	221.6	9.74	0.624	11.72	7.34	11.46	0.377	13.20	9.78	7.31	0.385	9.35	5.89	4.25	0.203	5.34	3.38
-70	300.6	20.6	381.5	225.4	7.89	0.724	10.17	5.35	10.04	0.551	12.21	8.03	7.17	0.462	9.32	5.67	4.13	0.266	5.41	3.01
-80	287.0	17.5	368.9	230.6	6.50	0.552	8.66	4.80	8.81	0.498	10.87	6.73	7.21	0.432	9.12	5.26	4.17	0.385	6.13	2.34

Table 2 (Continued)

MARCH 1979-86

	TOTAL OZONE				10 MB				5 MB				2 MB				1 MB			
LAT	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN
80	443.1	48.7	598.2	256.6	10.20	1.269	15.17	5.46	10.07	1.287	14.60	5.68	8.53	0.938	13.61	4.36	5.88	0.627	9.08	3.31
70	439.6	57.1	626.1	235.5	9.64	1.306	15.77	5.57	10.32	1.174	17.55	5.97	9.23	1.043	18.11	4.77	5.89	0.778	11.60	3.10
60	426.1	56.0	608.1	216.7	9.69	1.057	15.09	5.89	11.39	1.099	14.44	7.01	9.66	1.082	14.32	5.63	5.71	0.777	9.23	3.08
50	403.4	50.2	603.0	238.7	10.40	0.927	14.97	7.04	12.51	0.940	15.71	8.15	9.56	0.950	13.97	6.23	5.36	0.600	8.78	3.35
40	358.7	42.4	573.6	221.2	11.47	0.829	15.12	7.81	13.33	0.673	15.83	9.47	9.14	0.700	13.00	6.64	5.07	0.375	7.63	3.59
30	300.3	29.2	482.3	201.6	13.02	0.858	16.48	9.39	13.73	0.455	16.40	11.00	8.61	0.436	11.41	6.93	4.93	0.216	6.75	3.88
20	265.8	15.9	412.0	194.9	14.72	0.769	18.22	11.03	14.12	0.370	16.39	11.97	8.12	0.298	10.12	6.62	4.76	0.155	5.89	3.89
10	251.0	10.3	304.5	214.2	15.97	0.772	19.11	13.46	14.42	0.341	16.44	12.97	7.72	0.215	9.10	6.47	4.54	0.111	5.36	3.77
0	250.1	9.2	290.1	210.6	16.74	0.726	19.71	13.87	14.65	0.356	17.19	12.69	7.53	0.182	8.72	6.37	4.43	0.091	5.17	3.64
-10	252.5	8.9	292.9	215.1	16.76	0.765	19.92	14.19	14.73	0.368	17.15	12.90	7.65	0.201	9.07	6.37	4.50	0.109	5.36	3.72
-20	256.1	8.4	301.9	217.5	15.59	0.785	19.01	13.08	14.44	0.319	16.61	12.48	8.10	0.233	9.78	6.69	4.72	0.136	5.74	3.90
-30	265.4	10.2	343.9	226.9	13.91	0.661	17.09	11.72	13.82	0.297	15.57	12.09	8.47	0.237	9.92	7.06	4.94	0.126	5.81	4.07
-40	276.8	17.3	394.9	221.6	12.30	0.694	14.97	9.30	13.12	0.305	14.94	11.49	8.58	0.338	10.99	6.86	5.00	0.156	6.01	4.03
-50	291.9	25.4	428.9	212.2	10.70	0.719	13.21	7.73	12.41	0.357	14.28	10.41	8.70	0.516	11.74	6.64	5.04	0.285	7.04	3.83
-60	303.2	26.7	428.1	200.4	9.04	0.891	12.15	4.97	11.39	0.619	13.58	7.79	8.96	0.650	11.91	6.76	5.20	0.451	7.74	3.81
-70	295.6	25.3	431.5	192.8	7.26	1.072	11.26	3.47	9.63	1.073	12.57	4.68	9.00	0.608	12.02	6.53	5.49	0.580	8.06	3.89
-80	276.7	23.5	378.8	194.4	6.33	0.988	11.04	3.13	7.87	1.078	11.66	3.94	8.35	0.608	11.16	4.57	5.83	0.590	8.31	4.06

APRIL 1979-86

	TOTAL OZONE				10 MB				5 MB				2 MB				1 MB			
LAT	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN
80	440.1	32.2	574.5	323.1	8.24	1.283	14.31	5.21	9.42	0.963	13.22	5.65	8.23	0.460	11.28	5.46	5.09	0.497	7.30	3.87
70	440.7	39.6	581.8	288.1	8.93	1.116	13.73	5.29	10.90	1.026	14.12	6.53	8.60	0.668	11.90	6.12	4.91	0.494	6.92	3.75
60	420.4	45.4	570.6	288.4	10.20	0.935	14.02	6.26	12.39	0.783	15.13	7.72	8.56	0.662	11.57	6.43	4.69	0.398	6.63	3.61
50	393.0	45.8	572.4	266.6	11.38	0.747	14.45	7.88	13.39	0.530	15.50	9.20	8.36	0.536	10.93	6.57	4.56	0.285	6.08	3.57
40	354.3	39.1	570.6	231.2	12.44	0.576	14.87	9.03	13.85	0.342	15.63	11.01	8.27	0.393	10.74	6.63	4.65	0.200	5.91	3.65
30	310.0	26.0	471.6	235.7	13.54	0.579	16.04	11.14	13.94	0.331	15.90	12.06	8.24	0.287	10.07	6.77	4.83	0.158	5.90	3.85
20	280.5	15.0	386.1	224.9	14.63	0.575	17.92	11.98	14.10	0.277	15.85	12.25	8.03	0.215	9.49	6.62	4.79	0.117	5.71	3.96
10	261.8	10.7	313.0	221.0	15.70	0.774	19.06	12.49	14.07	0.266	15.58	12.59	7.69	0.181	9.06	6.41	4.65	0.099	5.38	3.80
0	253.0	8.7	291.5	213.1	16.43	0.681	19.32	14.02	13.97	0.241	15.79	12.21	7.51	0.148	8.54	6.25	4.60	0.098	5.24	3.76
-10	252.0	8.0	284.4	215.2	16.27	0.690	19.49	14.11	14.02	0.291	15.73	12.29	7.66	0.199	9.02	6.32	4.65	0.108	5.36	3.79
-20	255.7	8.6	294.5	218.3	15.05	0.780	18.42	11.84	14.08	0.346	16.04	11.95	8.27	0.331	10.69	6.74	4.84	0.148	6.04	3.88
-30	266.3	12.7	353.8	216.5	13.22	0.824	16.34	9.34	13.66	0.453	16.09	11.30	9.04	0.429	11.79	7.21	5.16	0.228	6.91	4.19
-40	277.3	20.3	419.1	214.6	11.37	0.898	14.25	8.17	12.82	0.538	15.24	10.49	9.72	0.609	13.71	7.53	5.60	0.379	8.06	4.16
-50	295.1	27.4	417.1	214.0	9.90	0.866	13.37	6.77	11.91	0.605	14.35	9.07	10.34	0.748	14.01	7.69	6.15	0.569	9.10	4.37
-60	305.8	30.1	440.9	211.4	8.44	1.075	12.95	4.64	10.59	1.016	13.64	6.04	10.68	0.642	13.76	6.92	6.68	0.645	9.97	4.41
-70	288.6	29.1	422.6	193.1	7.10	1.159	11.81	3.80	8.62	1.369	13.74	4.33	9.81	1.025	13.75	5.23	6.99	0.525	10.39	4.71
-80	264.6	23.5	382.5	197.0	6.54	0.978	10.26	3.90	7.51	1.354	11.82	3.85	8.53	1.124	12.36	4.60	6.99	0.367	9.40	4.78

Table 2 (Continued)

MAY 1979-86

	TOTAL OZONE				10 MB				5 MB				2 MB				1 MB			
LAT	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN
80	398.6	26.7	506.1	285.7	7.55	0.479	10.61	6.09	9.71	0.289	11.85	8.29	7.24	0.389	8.98	5.83	3.96	0.260	5.15	2.83
70	401.9	33.2	523.6	265.0	8.74	0.761	11.61	6.61	10.62	0.554	13.57	9.04	7.07	0.372	8.91	5.83	3.93	0.201	4.92	3.13
60	392.9	35.2	543.6	266.7	10.53	0.678	12.94	7.91	12.13	0.502	14.29	10.15	7.26	0.355	9.07	5.92	4.06	0.167	5.07	3.35
50	377.2	35.3	518.1	248.3	11.88	0.494	14.02	9.32	13.11	0.336	15.76	11.46	7.40	0.283	9.74	6.14	4.25	0.149	6.20	3.47
40	345.3	32.7	504.1	250.2	12.87	0.407	15.21	10.67	13.57	0.257	15.45	11.92	7.59	0.236	9.36	6.36	4.46	0.129	5.51	3.69
30	310.2	21.9	448.0	239.7	13.77	0.437	17.59	11.59	13.87	0.261	19.05	12.09	7.84	0.202	12.13	6.63	4.67	0.118	7.78	3.82
20	284.8	13.5	358.6	240.4	14.57	0.473	17.80	11.58	14.07	0.222	17.13	12.24	7.96	0.161	10.21	6.71	4.76	0.093	6.53	3.91
10	265.2	10.6	309.7	225.2	15.49	0.759	18.76	11.68	13.93	0.258	15.63	12.41	7.84	0.171	9.04	6.44	4.76	0.096	5.51	3.88
0	252.0	8.0	303.4	213.8	15.89	0.660	18.94	12.77	13.64	0.212	15.40	12.11	7.77	0.176	8.99	6.41	4.77	0.103	5.69	3.94
-10	250.5	7.8	289.7	216.6	15.40	0.690	18.74	12.79	13.60	0.293	15.54	12.03	7.90	0.220	9.60	6.48	4.81	0.111	5.74	3.97
-20	256.1	9.0	309.9	215.8	14.10	0.821	17.10	10.27	13.61	0.415	15.99	11.21	8.51	0.431	10.91	6.76	4.99	0.189	6.22	4.01
-30	269.0	16.1	429.1	201.2	12.29	0.955	15.69	8.63	13.20	0.507	15.93	10.71	9.66	0.647	13.18	7.35	5.51	0.372	8.07	4.24
-40	289.9	25.2	444.6	213.9	10.57	0.978	14.27	7.28	12.34	0.642	15.66	9.60	10.93	0.699	14.15	8.25	6.42	0.580	9.62	4.60
-50	308.2	32.2	462.8	225.9	9.18	1.121	14.60	5.44	11.04	0.905	14.69	7.31	11.80	0.644	14.74	8.25	7.49	0.715	11.77	4.95
-60	305.2	34.4	470.9	192.9	8.19	1.109	14.37	4.59	9.36	1.169	14.18	5.27	11.02	1.197	14.73	5.75	7.85	0.873	12.41	4.50
-70	283.5	29.5	457.4	182.1	7.79	0.813	12.83	4.68	8.68	1.217	13.71	4.96	9.71	1.279	14.12	5.45	7.48	0.813	11.09	4.73

JUNE 1979-86

	TOTAL OZONE				10 MB				5 MB				2 MB				1 MB			
LAT	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN
80	358.6	22.5	446.8	275.2	7.69	0.234	9.00	6.90	9.73	0.136	11.23	8.73	6.29	0.236	7.53	4.44	3.34	0.188	4.02	1.98
70	355.8	26.2	472.1	272.6	8.63	0.485	10.78	7.27	10.19	0.286	11.89	9.15	6.33	0.163	7.35	4.67	3.54	0.135	4.24	2.23
60	358.7	27.2	474.9	270.8	10.33	0.590	12.18	8.39	11.44	0.479	13.40	9.86	6.59	0.176	7.80	5.40	3.82	0.106	4.54	2.92
50	355.8	28.6	459.4	248.6	11.80	0.409	13.49	10.21	12.65	0.317	14.33	11.08	6.98	0.167	8.23	5.88	4.14	0.122	4.93	3.41
40	326.2	28.2	461.7	240.6	12.88	0.404	14.81	11.25	13.30	0.223	14.90	12.06	7.37	0.179	8.63	6.26	4.45	0.124	5.30	3.65
30	298.6	17.3	396.1	239.3	13.80	0.413	16.06	11.71	13.76	0.234	15.23	12.40	7.80	0.195	9.07	6.54	4.71	0.126	5.66	3.82
20	283.5	11.2	353.3	242.1	14.56	0.507	17.64	12.01	14.10	0.211	15.40	12.47	8.11	0.177	9.33	6.85	4.86	0.117	5.69	3.97
10	267.4	10.9	311.6	226.8	15.32	0.716	18.71	11.70	14.01	0.250	15.39	12.60	8.09	0.191	9.29	6.71	4.86	0.114	5.70	3.94
0	254.1	9.3	305.4	213.8	15.32	0.701	18.28	11.81	13.70	0.232	15.46	12.13	8.11	0.197	9.42	6.60	4.90	0.111	5.95	3.93
-10	249.8	8.6	292.5	204.0	14.59	0.745	17.80	11.51	13.46	0.312	15.32	11.25	8.21	0.226	9.82	6.65	4.94	0.121	5.94	3.98
-20	257.3	10.8	355.3	201.0	13.22	0.807	16.20	10.03	13.21	0.430	15.13	10.99	8.66	0.417	11.41	6.73	5.09	0.212	6.60	3.94
-30	277.0	19.3	413.5	208.8	11.64	0.839	14.82	8.01	12.76	0.435	15.09	10.52	9.64	0.791	13.48	6.85	5.51	0.447	8.49	3.86
-40	304.3	28.0	430.9	212.1	10.13	0.935	13.80	6.51	11.99	0.569	14.56	8.77	11.22	1.000	15.07	7.02	6.57	0.819	10.82	3.86
-50	317.5	34.0	486.5	202.3	8.65	1.127	14.31	5.64	10.24	0.955	13.86	6.70	11.89	0.965	15.45	7.25	7.74	0.992	12.25	3.99
-60	303.3	35.2	503.1	182.0	8.18	0.948	13.79	5.52	8.96	0.912	13.56	6.24	10.40	1.342	15.01	6.06	7.58	1.226	13.10	3.85

Table 2 (Continued)

JULY 1979-86

	TOTAL OZONE				10 MB				5 MB				2 MB				1 MB			
LAT	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN
80	319.4	20.3	392.2	255.0	7.33	0.321	8.62	6.00	9.33	0.239	10.40	8.10	6.17	0.210	7.18	4.49	3.29	0.232	4.08	1.99
70	323.0	22.2	420.0	240.5	8.37	0.516	10.09	6.83	9.91	0.333	11.47	8.65	6.27	0.159	7.32	4.78	3.57	0.172	4.34	2.30
60	333.8	23.6	437.0	255.4	10.19	0.568	12.00	8.23	11.31	0.456	13.00	9.67	6.66	0.205	8.07	5.43	3.90	0.135	4.73	2.99
50	331.2	24.7	431.6	247.6	11.69	0.426	13.32	10.17	12.53	0.324	14.16	11.01	7.13	0.229	8.60	5.92	4.28	0.164	5.49	3.41
40	307.9	22.0	420.0	236.3	12.87	0.426	14.68	11.25	13.31	0.247	15.13	11.91	7.66	0.258	9.41	6.32	4.67	0.178	6.27	3.75
30	291.6	14.4	370.6	233.1	13.81	0.425	16.91	11.37	13.88	0.236	15.50	12.50	8.13	0.248	9.88	6.75	4.94	0.157	6.40	3.96
20	281.8	10.7	327.8	237.6	14.63	0.556	17.49	11.45	14.28	0.214	16.01	12.99	8.39	0.206	9.84	7.14	4.97	0.137	6.10	4.08
10	269.8	10.4	313.4	227.2	15.37	0.675	18.79	11.52	14.31	0.246	15.95	12.88	8.31	0.197	10.03	6.96	4.89	0.134	5.82	3.95
0	258.4	10.3	305.0	215.4	15.26	0.721	18.21	11.89	14.07	0.259	16.32	12.57	8.29	0.192	10.01	6.98	4.89	0.130	5.99	3.98
-10	252.5	10.0	301.4	210.2	14.50	0.797	17.66	11.38	13.78	0.329	15.48	11.82	8.40	0.227	10.42	7.00	4.93	0.136	5.98	4.04
-20	262.1	11.7	336.5	215.3	12.88	0.813	16.35	9.62	13.27	0.448	15.29	11.25	8.79	0.408	11.76	7.21	5.12	0.227	7.10	4.00
-30	286.7	22.7	458.6	216.2	11.51	0.748	14.65	8.52	12.69	0.453	15.15	10.45	9.47	0.728	13.87	7.35	5.48	0.447	9.08	4.04
-40	319.1	31.9	491.4	228.1	10.19	0.906	13.96	6.55	12.08	0.568	15.21	9.40	10.52	1.097	15.69	7.42	6.14	0.798	11.07	3.92
-50	326.8	37.0	488.3	208.4	8.65	1.183	14.29	5.87	10.61	1.001	14.11	7.09	10.97	1.217	16.01	6.48	6.62	1.002	12.63	3.78
-60	309.0	34.2	502.7	188.4	7.94	0.910	14.17	5.22	9.02	0.972	13.63	6.60	9.53	1.424	15.43	5.01	6.19	1.052	12.99	3.40
-70	284.6	24.5	376.8	151.3	8.71	0.415	11.03	6.90	9.07	0.787	12.74	6.55	8.01	1.059	13.76	5.10	5.49	0.713	8.82	3.36

AUGUST 1979-86

	TOTAL OZONE				10 MB				5 MB				2 MB				1 MB			
LAT	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN
80	292.0	18.2	376.0	228.7	6.40	0.512	9.00	4.60	8.29	0.510	10.38	6.25	6.67	0.235	8.46	5.07	3.90	0.312	5.28	2.18
70	302.9	21.7	409.7	222.8	7.98	0.754	10.32	5.63	9.83	0.651	12.47	7.61	7.02	0.435	8.95	5.41	4.08	0.264	5.14	2.82
60	315.3	23.7	411.7	228.5	9.98	0.596	11.92	7.70	11.56	0.433	13.32	9.84	7.39	0.367	9.10	5.94	4.28	0.195	5.23	3.35
50	313.3	22.0	399.6	242.5	11.50	0.483	13.48	9.41	12.67	0.322	14.19	11.15	7.76	0.311	9.35	6.33	4.56	0.172	5.50	3.70
40	297.5	17.2	394.2	237.7	12.82	0.456	14.72	10.66	13.50	0.271	15.06	12.01	8.24	0.271	9.69	6.73	4.92	0.150	5.95	3.96
30	286.7	13.1	346.8	233.8	13.81	0.434	16.25	11.13	14.11	0.241	15.95	12.73	8.59	0.224	10.03	7.17	5.08	0.130	6.02	3.93
20	278.3	10.4	321.1	235.6	14.75	0.638	18.33	11.20	14.47	0.240	16.25	13.09	8.58	0.220	9.95	6.85	4.96	0.134	5.93	3.90
10	270.9	9.7	308.5	228.3	15.58	0.651	18.81	11.48	14.51	0.264	16.18	12.70	8.29	0.216	9.86	6.49	4.82	0.116	5.77	3.88
0	262.6	10.5	310.0	217.7	15.57	0.720	18.93	12.06	14.37	0.239	15.75	12.41	8.17	0.197	9.86	6.57	4.78	0.109	5.65	3.89
-10	257.6	11.5	307.7	219.7	14.94	0.848	18.38	11.42	14.19	0.295	16.17	12.54	8.30	0.236	10.32	6.64	4.83	0.122	5.85	3.91
-20	267.6	12.5	336.5	220.5	13.25	0.943	16.73	9.64	13.78	0.449	16.05	11.51	8.73	0.412	11.47	6.80	5.00	0.228	6.75	3.87
-30	297.0	22.3	428.0	230.4	11.77	0.759	15.47	8.77	13.17	0.507	15.69	10.70	9.37	0.650	13.48	6.99	5.39	0.444	8.12	3.84
-40	333.0	30.0	494.1	225.3	10.77	0.783	14.69	6.39	12.64	0.585	15.72	9.23	10.02	0.880	15.02	6.82	5.88	0.651	10.60	3.70
-50	342.7	39.6	495.3	226.1	9.60	1.273	14.37	5.86	11.73	1.027	15.77	7.24	10.10	1.057	15.63	6.07	5.96	0.729	10.89	3.38
-60	323.1	38.9	501.4	203.5	8.07	1.245	14.01	5.61	9.81	1.401	14.66	6.34	8.99	1.173	15.30	5.23	5.46	0.670	9.65	3.36
-70	279.5	26.3	453.1	177.9	8.18	0.791	12.86	5.66	8.41	1.097	13.96	5.61	7.62	1.003	13.55	4.61	5.12	0.558	9.67	3.25
-80	256.9	15.9	312.5	185.6	8.29	0.494	10.01	6.79	8.10	1.145	11.69	5.58	7.01	0.826	9.81	4.85	5.01	0.400	6.77	3.74

Table 2 (Continued)

SEPTEMBER 1979-86

	TOTAL OZONE				10 MB				5 MB				2 MB				1 MB			
LAT	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN
80	271.7	22.6	355.6	200.2	6.32	1.042	10.00	3.79	7.36	1.027	11.23	4.15	7.28	0.644	10.38	4.21	5.07	0.463	7.27	3.65
70	292.6	24.0	390.7	214.0	7.56	1.039	11.29	4.12	9.55	1.009	12.40	5.44	8.49	0.516	11.09	6.44	5.13	0.417	6.99	3.71
60	305.4	26.0	406.6	220.1	9.36	0.791	11.69	6.23	11.41	0.586	13.33	8.78	8.75	0.512	11.17	6.75	5.04	0.341	6.71	3.81
50	302.8	25.1	394.7	233.9	10.89	0.670	13.09	8.11	12.55	0.391	14.18	10.58	8.70	0.388	10.81	6.98	4.97	0.202	6.35	3.93
40	288.9	17.4	376.9	229.2	12.46	0.607	14.93	9.73	13.41	0.318	14.90	11.57	8.72	0.231	10.27	7.16	4.98	0.116	5.98	4.07
30	278.3	11.8	343.1	231.3	13.69	0.526	17.02	11.17	14.09	0.283	15.68	12.26	8.72	0.190	9.98	7.23	4.96	0.126	5.80	3.97
20	272.8	9.5	311.6	234.0	14.78	0.637	18.07	11.45	14.42	0.245	15.95	12.98	8.46	0.231	9.96	6.96	4.83	0.119	5.73	3.92
10	268.8	9.4	307.6	228.1	15.66	0.635	18.64	11.67	14.36	0.271	15.97	12.67	8.06	0.219	9.50	6.64	4.72	0.106	5.50	3.95
0	264.6	10.0	313.3	222.3	15.69	0.701	19.04	11.84	14.25	0.247	15.92	12.34	7.90	0.191	9.38	6.59	4.67	0.099	5.49	3.94
-10	263.9	11.7	316.6	219.9	15.24	0.802	18.94	12.33	14.27	0.274	16.01	12.56	8.01	0.227	9.71	6.64	4.69	0.111	5.60	3.90
-20	277.2	12.9	359.5	227.9	13.82	0.845	17.57	10.91	14.23	0.365	16.15	12.31	8.43	0.377	10.95	6.68	4.80	0.174	6.39	3.72
-30	306.4	20.8	415.0	240.9	12.43	0.744	15.87	9.60	13.85	0.503	16.36	11.45	9.04	0.600	12.71	6.63	5.07	0.348	7.30	3.63
-40	341.6	30.0	465.4	238.2	11.44	0.751	15.34	7.90	13.39	0.670	17.21	9.86	9.62	0.834	14.17	6.33	5.47	0.547	9.05	3.42
-50	358.6	43.0	553.4	219.6	10.69	1.124	15.40	6.63	12.70	0.926	16.18	8.26	9.68	0.989	13.94	5.89	5.59	0.671	9.07	3.25
-60	339.1	56.6	567.7	187.7	9.42	1.582	15.03	5.82	11.35	1.391	15.39	6.36	8.94	1.011	13.47	5.60	5.20	0.646	8.97	3.01
-70	269.9	43.3	506.4	153.1	8.39	1.348	15.33	4.59	9.38	1.518	14.53	5.45	8.00	0.783	11.99	5.08	4.83	0.468	7.14	3.02
-80	233.1	20.5	373.9	151.5	8.38	0.871	13.98	5.92	8.23	1.241	14.16	4.87	7.47	0.607	10.42	4.65	4.89	0.398	7.06	3.07

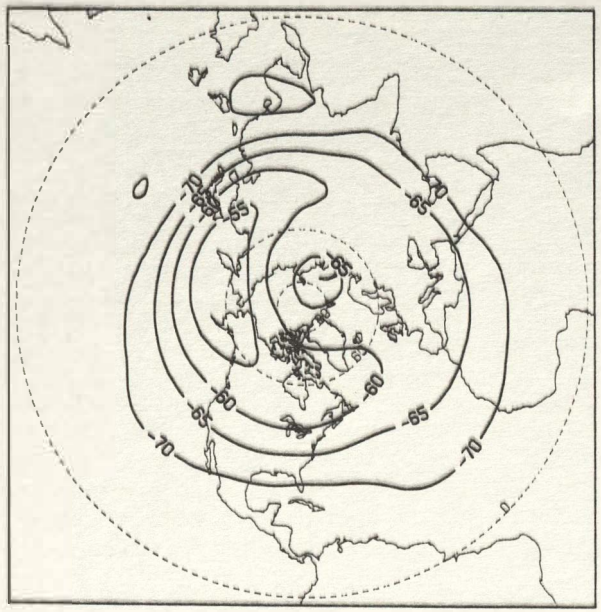
OCTOBER 1979-86

	TOTAL OZONE				10 MB				5 MB				2 MB				1 MB			
LAT	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN	MEAN	SD	MAX	MIN
80	268.2	30.0	376.0	195.7	6.88	1.387	11.29	3.13	7.43	1.795	12.15	3.09	7.77	1.233	11.18	3.40	6.02	0.375	7.83	3.67
70	290.4	33.7	437.2	177.8	7.66	1.505	12.33	3.21	8.70	1.556	13.57	3.57	9.05	0.893	12.08	3.84	6.19	0.464	8.78	3.48
60	307.3	33.4	425.6	173.3	8.86	1.114	12.28	4.03	10.58	1.005	13.43	4.86	9.94	0.529	13.05	6.17	6.07	0.511	8.83	4.60
50	300.9	30.4	421.9	199.1	10.04	0.838	13.19	5.94	11.83	0.660	14.85	7.26	9.87	0.615	12.97	7.87	5.73	0.481	8.11	4.31
40	281.2	21.6	398.5	218.8	11.47	0.939	15.36	7.85	12.82	0.590	15.57	10.25	9.39	0.538	12.46	7.46	5.25	0.319	7.36	4.09
30	270.0	13.6	359.0	218.6	13.25	0.742	16.61	9.79	13.67	0.443	15.74	11.07	8.80	0.378	11.13	6.98	4.90	0.180	6.18	3.83
20	263.2	9.3	302.1	223.7	14.54	0.678	18.48	11.72	14.00	0.311	15.65	12.27	8.33	0.274	10.21	6.82	4.77	0.122	5.62	3.81
10	259.2	9.5	298.0	220.7	15.53	0.720	18.71	11.85	13.95	0.260	15.80	12.31	7.91	0.202	9.42	6.70	4.68	0.105	5.47	3.89
0	258.4	9.6	301.5	224.4	15.72	0.673	18.94	12.22	13.95	0.194	15.84	12.29	7.75	0.138	8.87	6.62	4.63	0.090	5.42	3.93
-10	263.6	11.2	315.6	223.4	15.38	0.748	18.81	12.88	14.19	0.261	16.18	12.54	7.84	0.171	9.39	6.61	4.62	0.096	5.37	3.83
-20	280.0	12.8	353.3	230.4	14.36	0.698	17.79	11.79	14.39	0.313	16.25	12.67	8.08	0.265	10.17	6.71	4.64	0.120	5.72	3.70
-30	305.8	18.8	430.3	239.7	13.14	0.711	16.67	10.27	14.20	0.461	16.42	11.61	8.38	0.427	10.78	6.60	4.69	0.205	6.11	3.61
-40	337.9	27.2	540.8	246.8	12.03	0.828	15.87	8.23	13.79	0.696	16.46	10.33	8.66	0.644	11.53	6.17	4.80	0.338	6.69	3.38
-50	363.5	41.2	550.4	205.1	11.34	1.043	15.31	6.98	13.13	0.940	15.92	9.05	8.68	0.855	11.98	5.72	4.85	0.468	7.50	3.13
-60	361.8	64.2	584.7	182.6	10.62	1.312	15.35	6.25	12.14	1.222	15.54	7.79	8.27	0.979	11.74	5.40	4.68	0.544	7.33	2.94
-70	297.2	73.7	561.9	153.7	10.01	1.400	15.42	6.32	10.80	1.356	14.74	6.86	7.59	0.874	11.30	5.18	4.36	0.491	6.86	2.89
-80	239.7	43.6	508.8	150.1	9.75	1.294	16.33	6.19	9.63	1.157	14.47	5.84	7.27	0.578	10.37	5.32	4.30	0.400	6.77	2.98

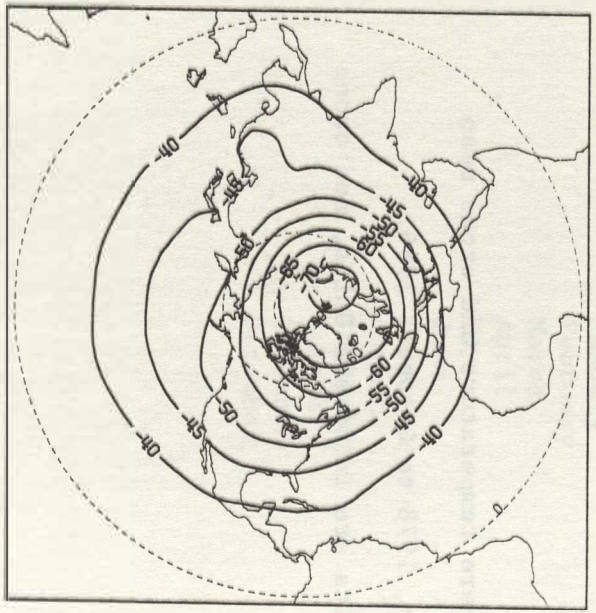
Table 3. Average poleward extent of the SBUV data for all twelve months of the year.

	NH	SH
January	65	80
February	72	80
March	79	80
April	80	75
May	80	68
June	80	63
July	80	65
August	80	72
September	80	79
October	75	80
November	68	80
December	63	80

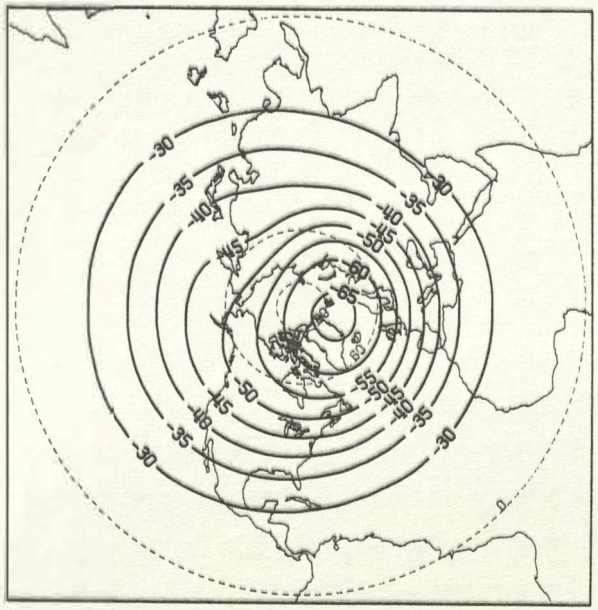
Figure 2. Alternating Northern Hemisphere temperature and ozone mean maps for the eight-year period from November, 1978 to October, 1986. Temperature units are in ^{o}C, total ozone units are in Dobson Units, and ozone mixing ratios are in μ gm/gm.



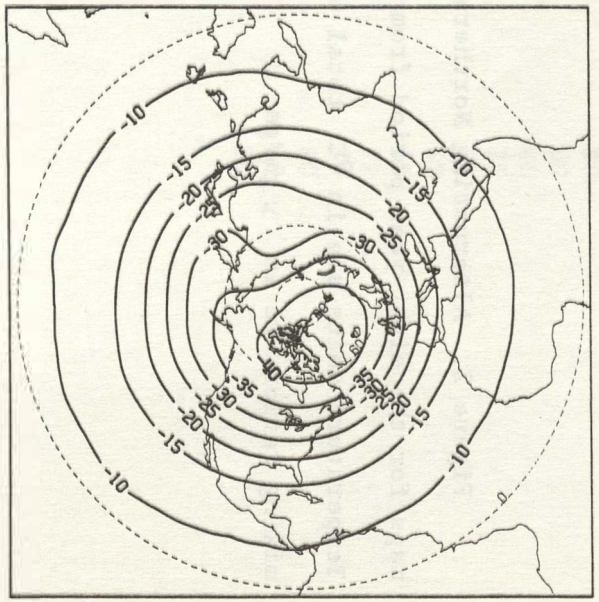
70 MB NOVEMBER 1978-85 TEMP (C)



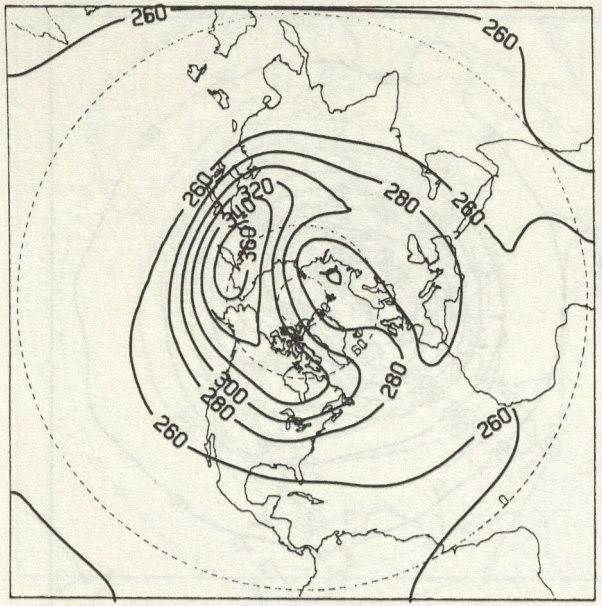
10 MB NOVEMBER 1978-85 TEMP (C)



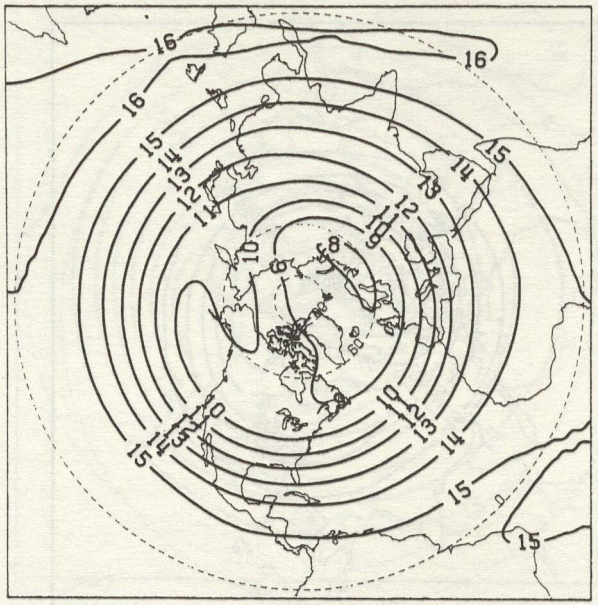
5 MB NOVEMBER 1978-85 TEMP (C)



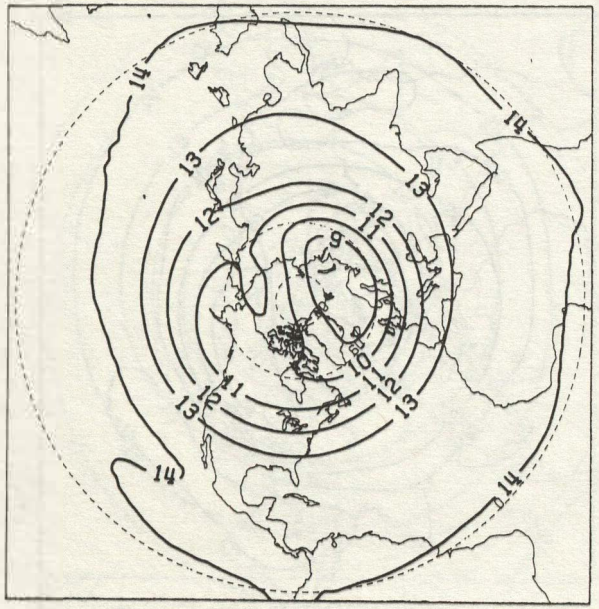
2 MB NOVEMBER 1978-85 TEMP (C)



TOTAL OZONE NOVEMBER 1978-85



10 MB NOVEMBER 1978-85



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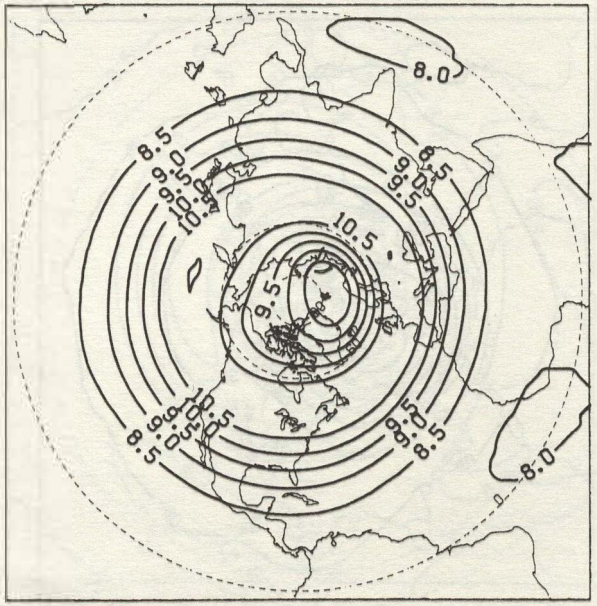
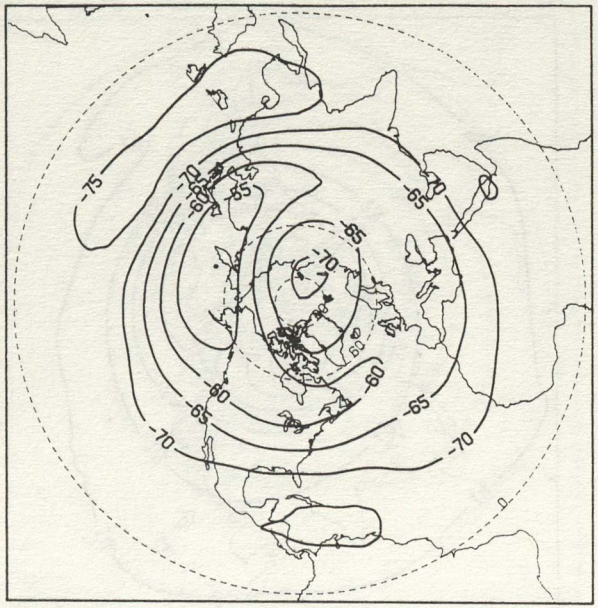
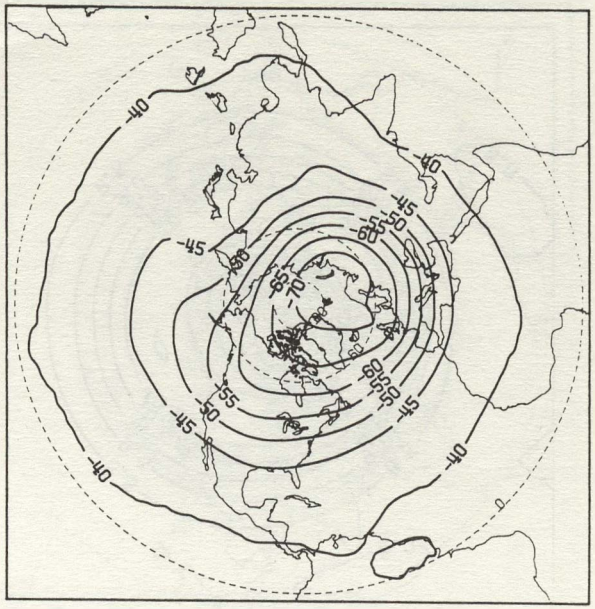


2 MB NOVEMBER 1978-85



70 MB DECEMBER 1978-85 TEMP (C)



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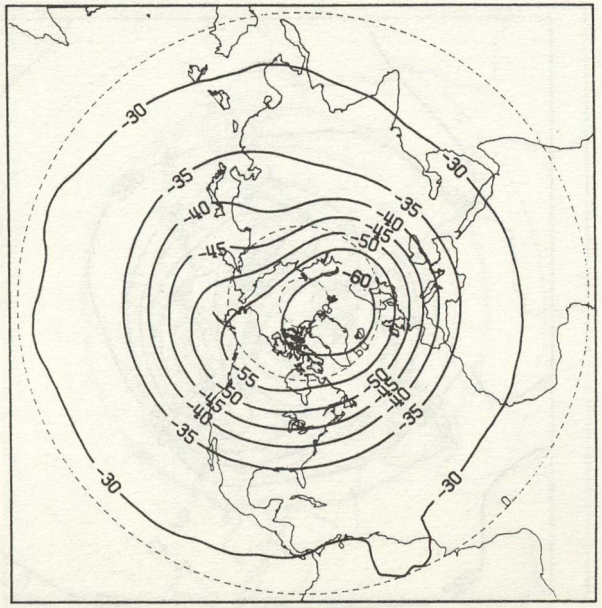
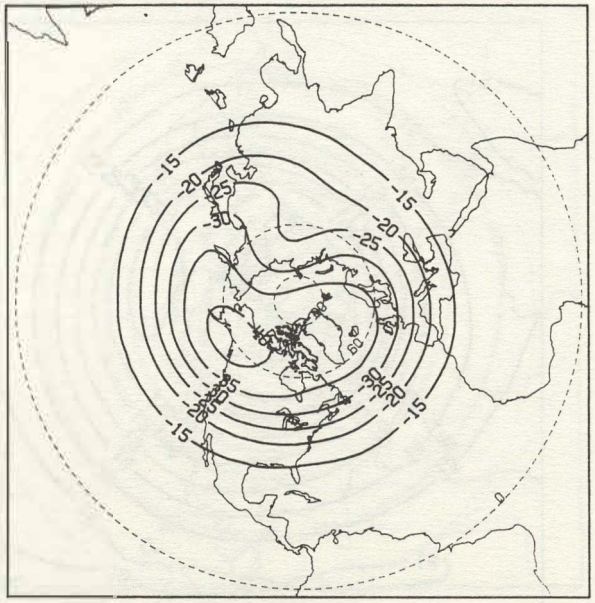
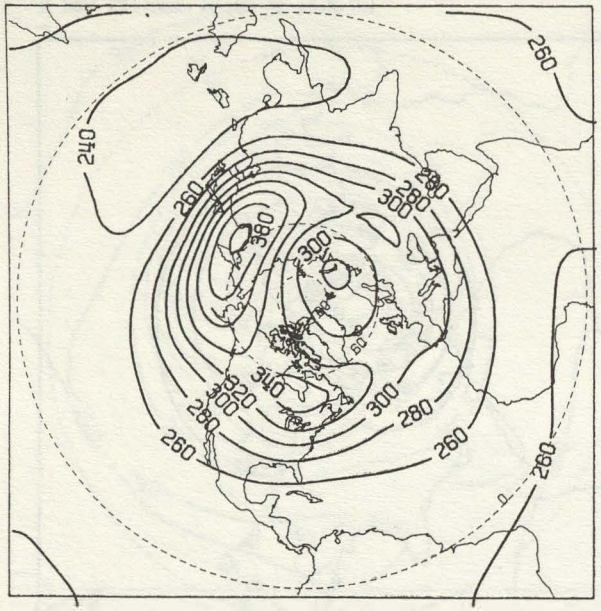


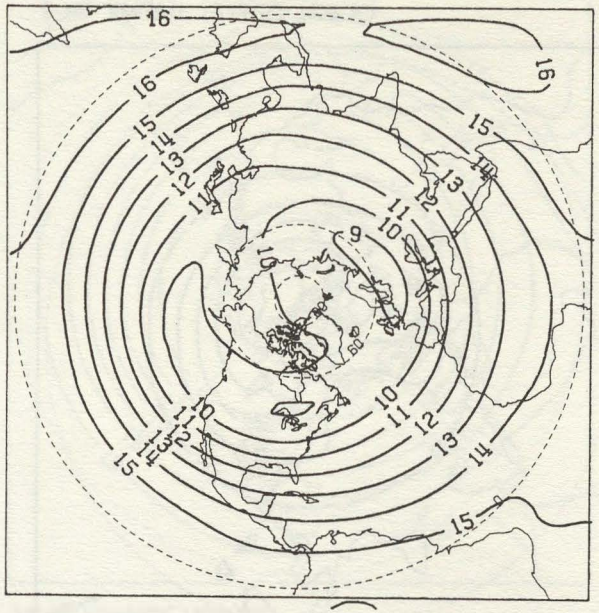
5 MB DECEMBER 1978-85 TEMP (C)



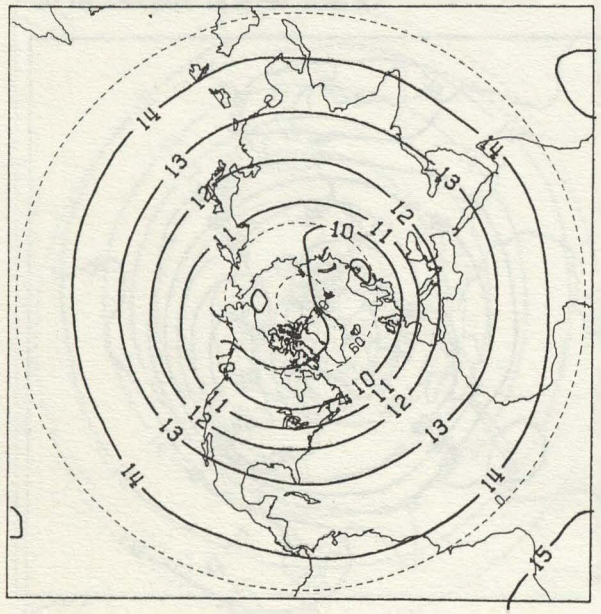
2 MB DECEMBER 1978-85 TEMP (C)



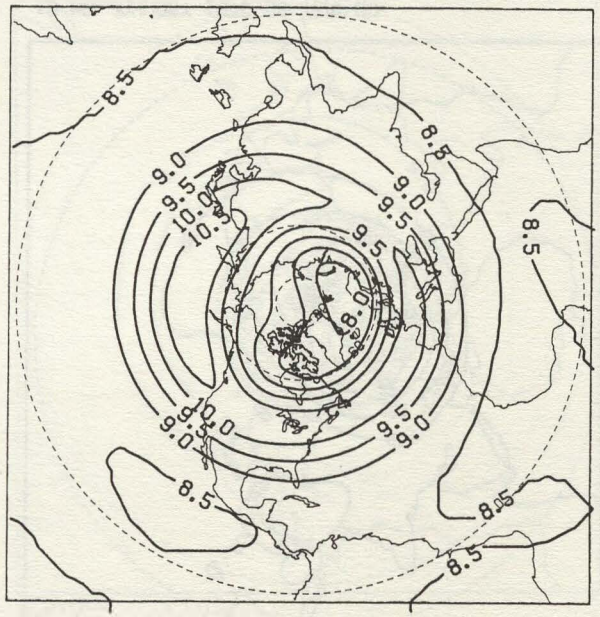
TOTAL OZONE DECEMBER 1978-85



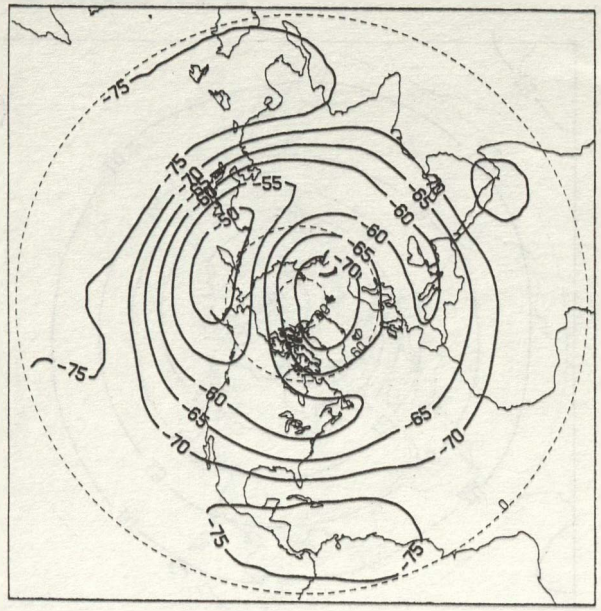
10 MB DECEMBER 1978-85



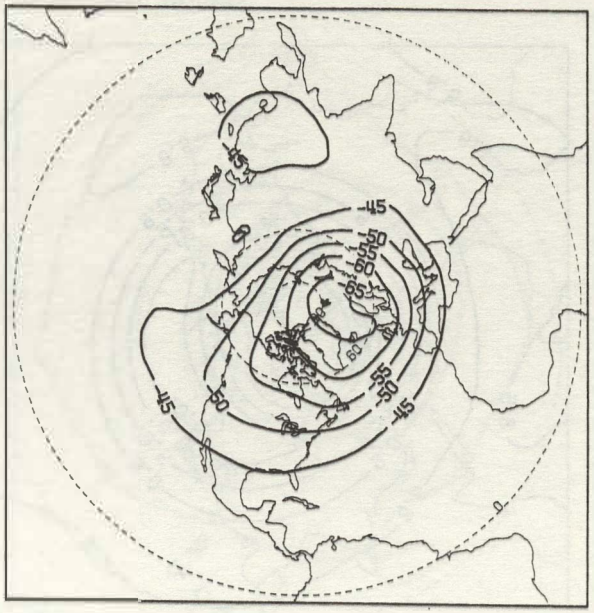
5 MB DECEMBER 1978-85



2 MB DECEMBER 1978-85



70 MB JANUARY 1979-86 TEMP (C)



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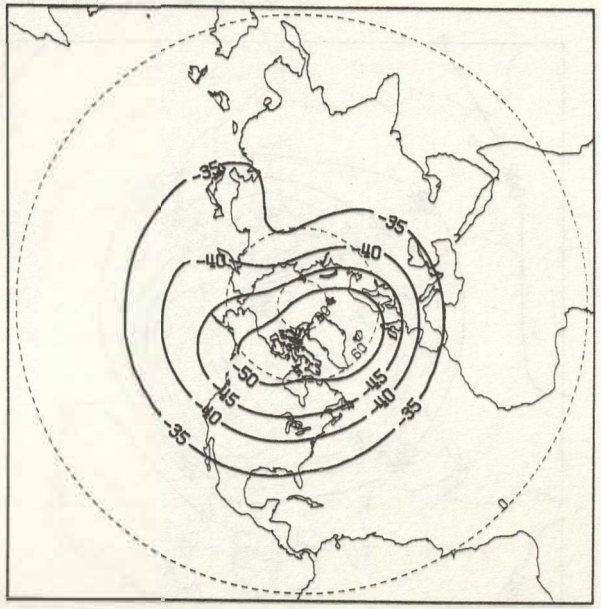
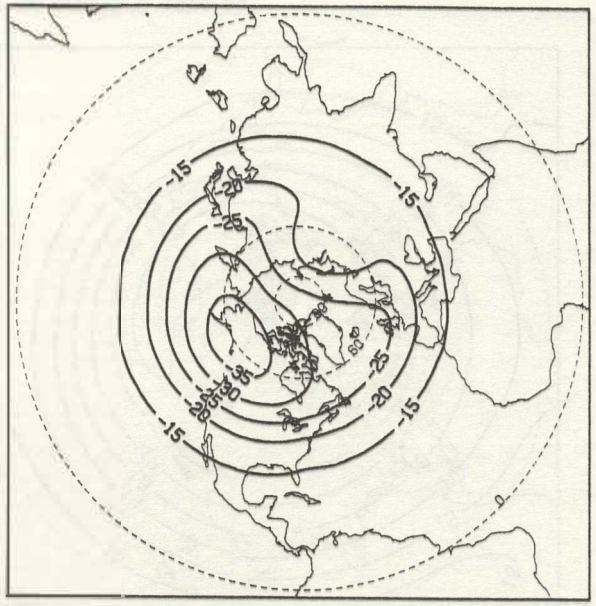


5 MB JANUARY 1979-86 TEMP (C)



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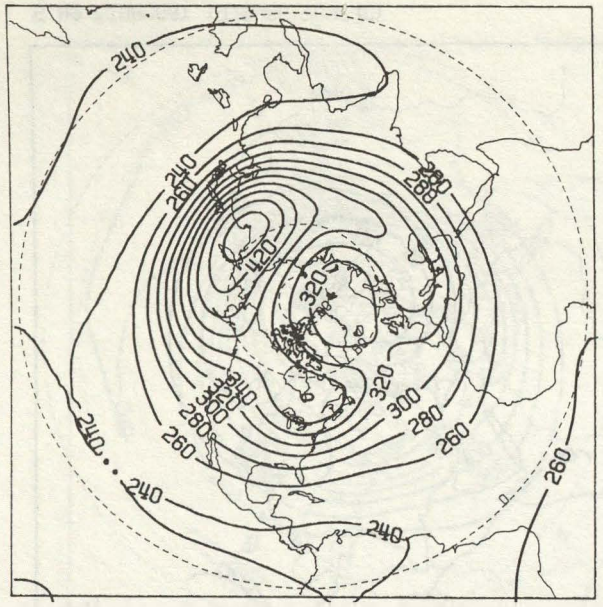
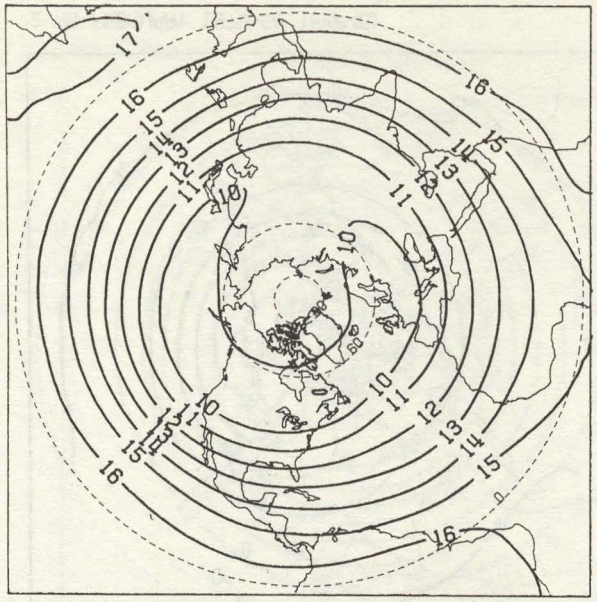
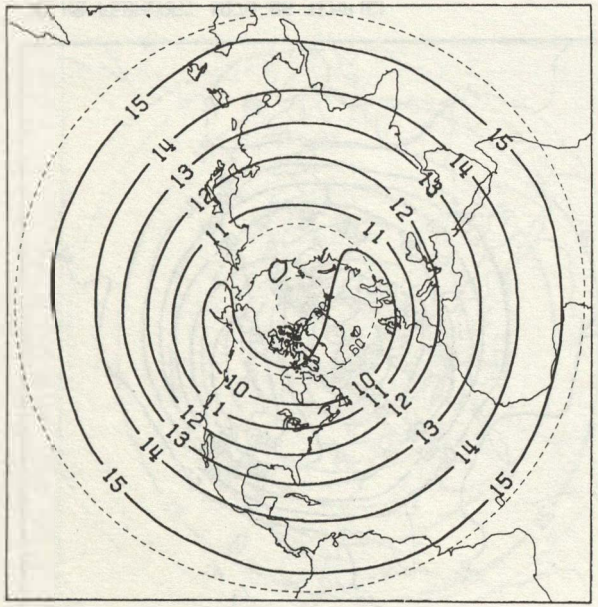


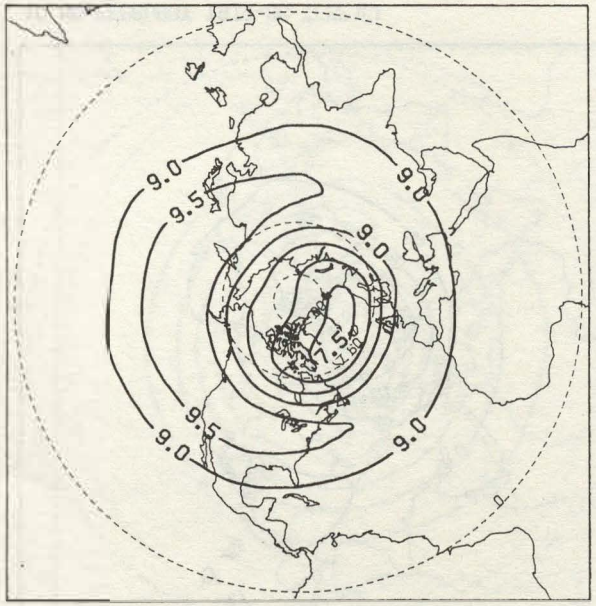
TOTAL OZONE JANUARY 1979-86



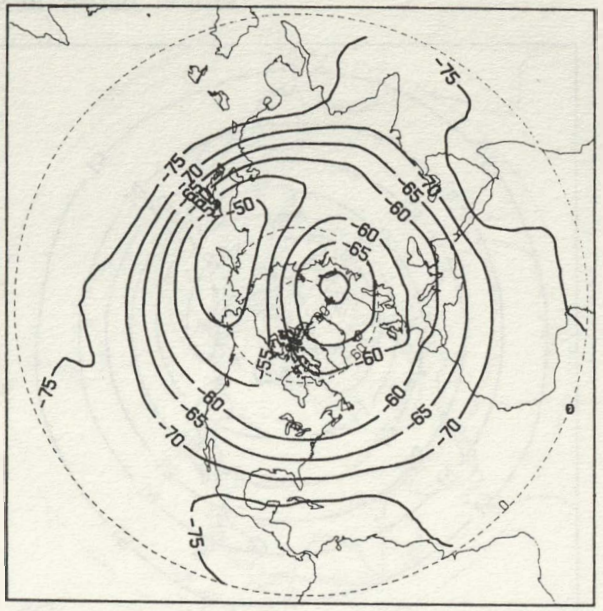
10 MB JANUARY 1979-86



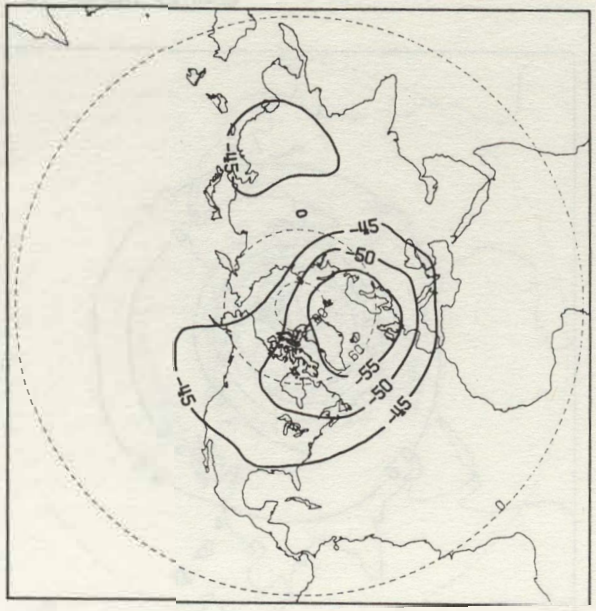
5 MB JANUARY 1979-86



2 MB JANUARY 1979-86



70 MB FEBRUARY 1979-86 TEMP (C)



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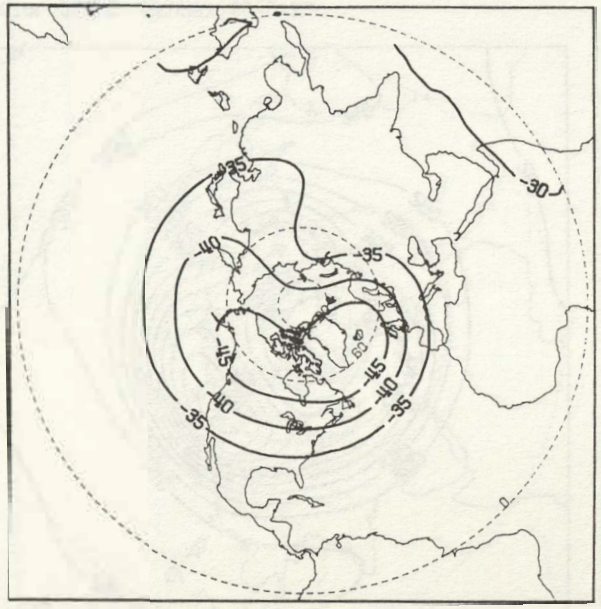

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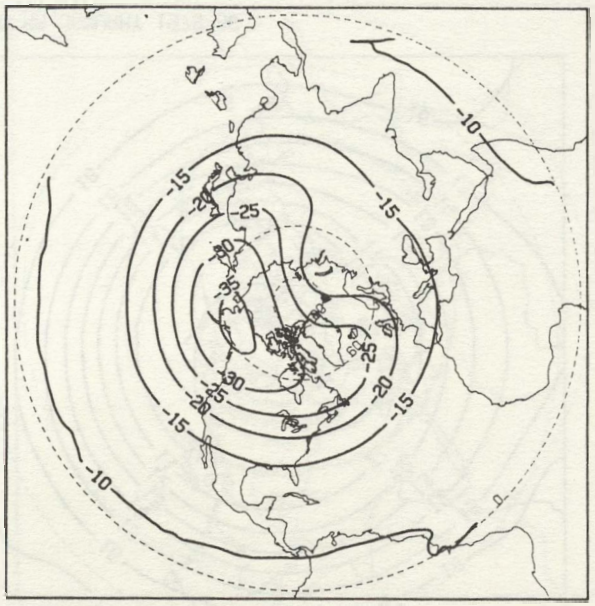
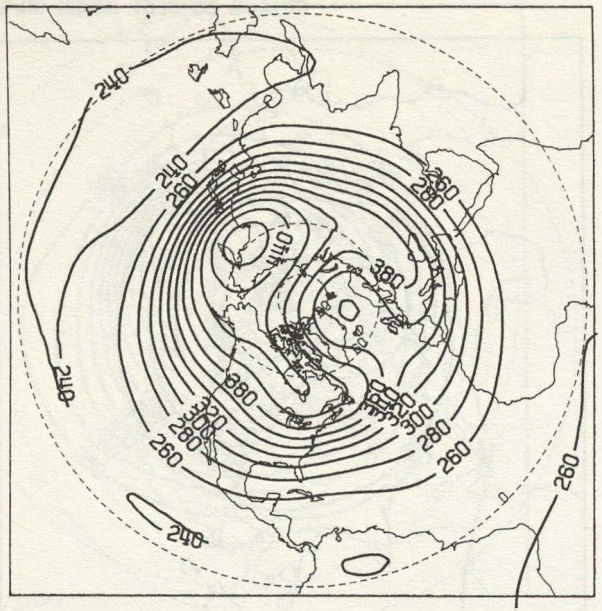
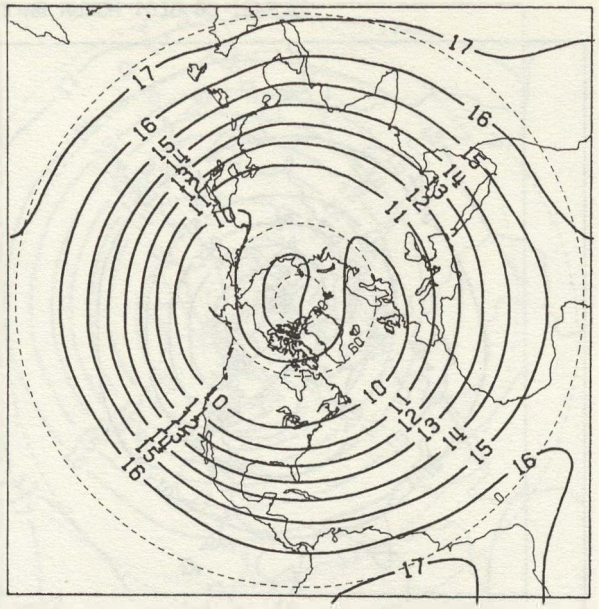


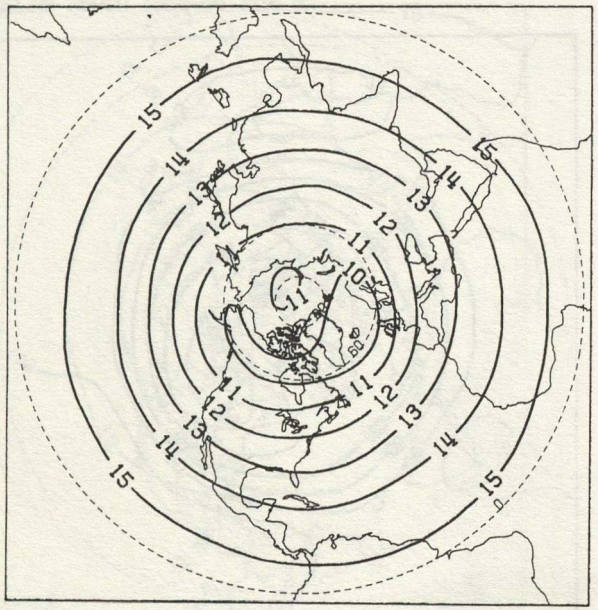
2 MB FEBRUARY 1979-86 TEMP (C)



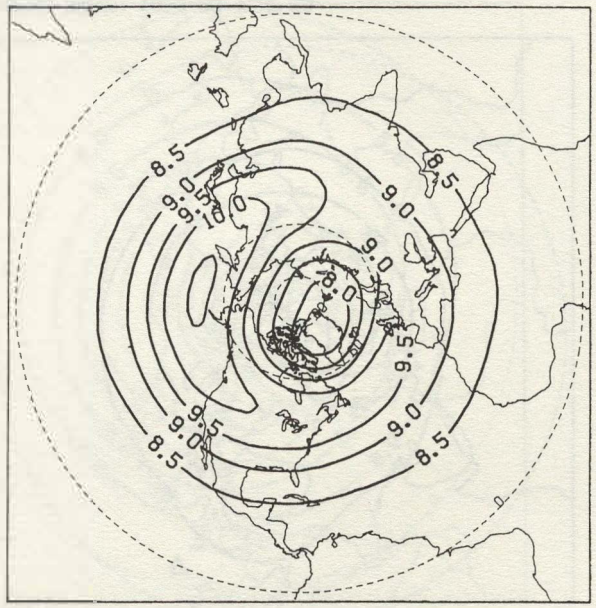
TOTAL OZONE FEBRUARY 1979-86



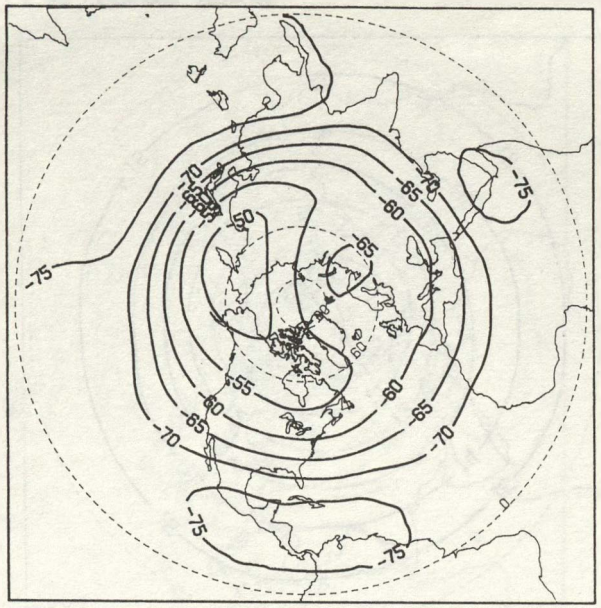
10 MB FEBRUARY 1979-86



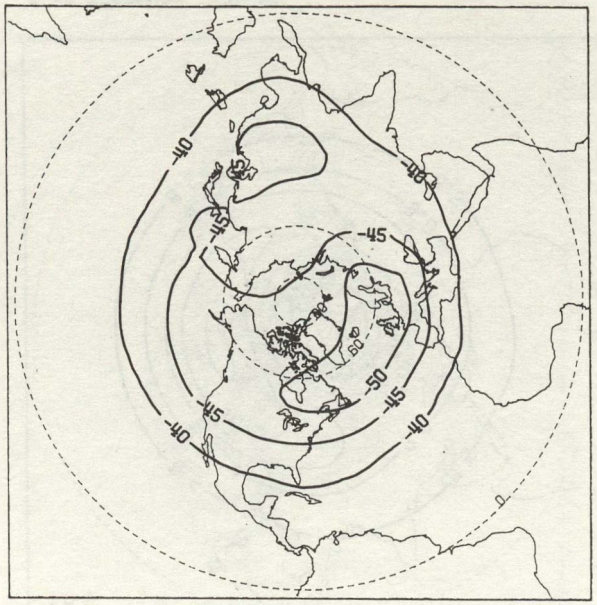
5 MB FEBRUARY 1979-86



2 MB FEBRUARY 1979-86



70 MB MARCH 1979-86 TEMP (C)



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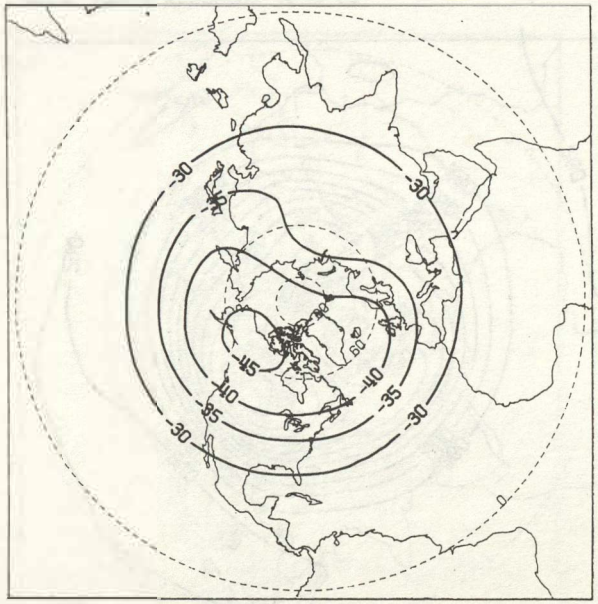
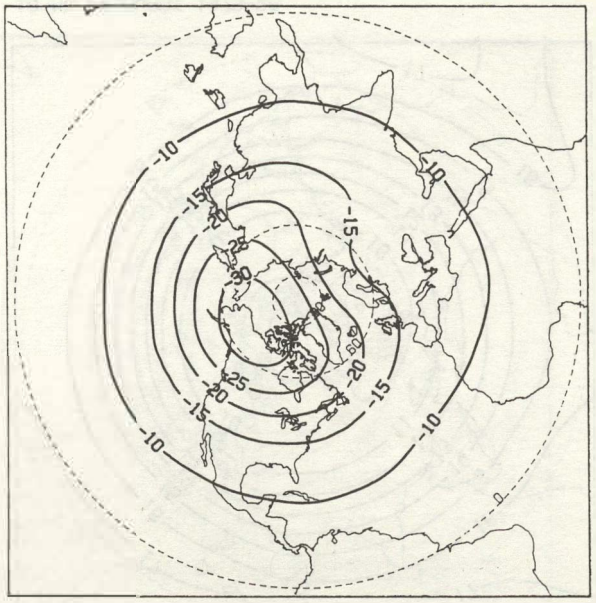


5 MB MARCH 1979-86 TEMP (C)



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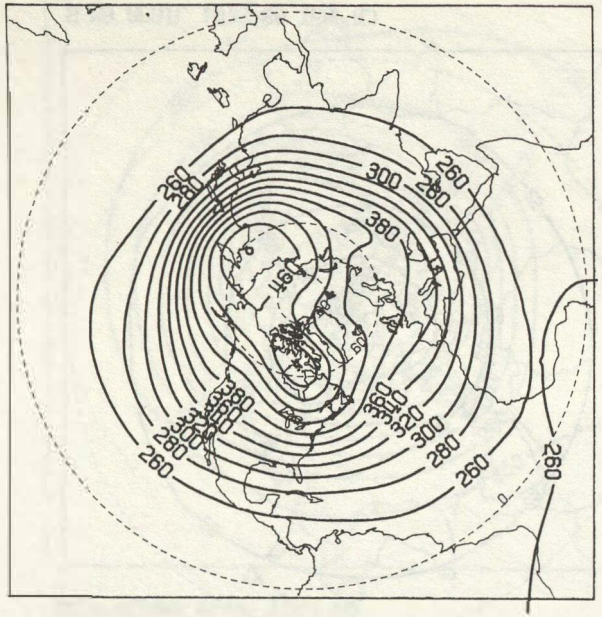
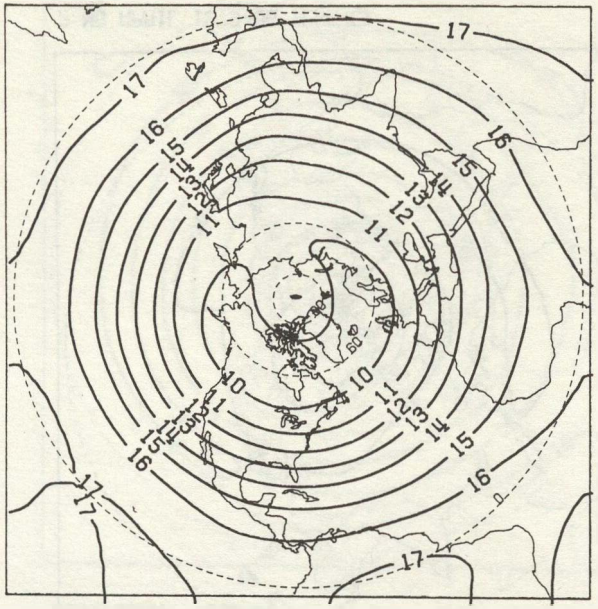


TOTAL OZONE MARCH 1979-86



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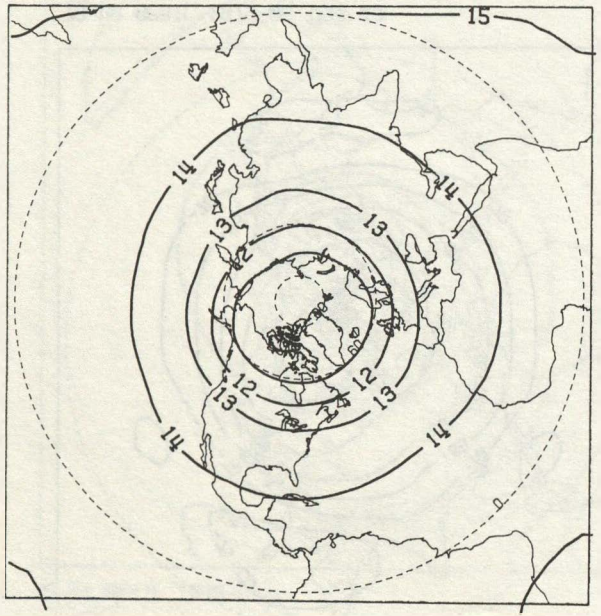

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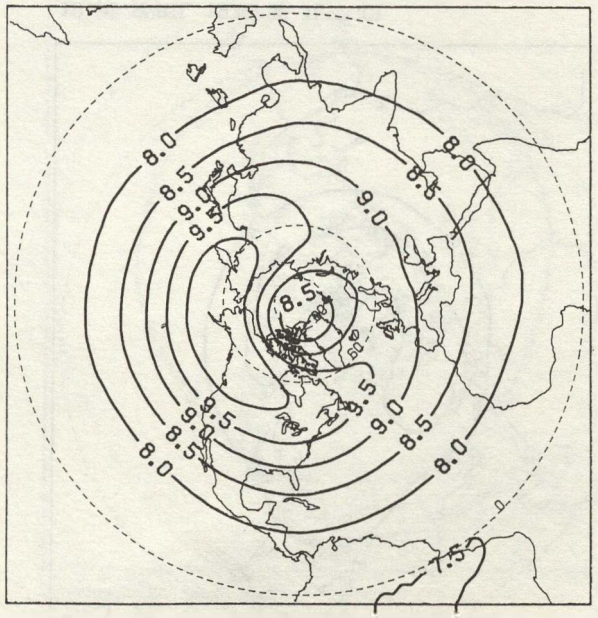

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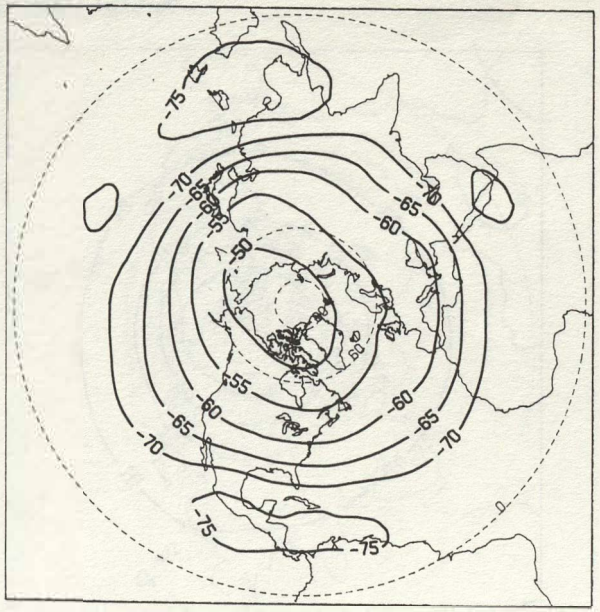
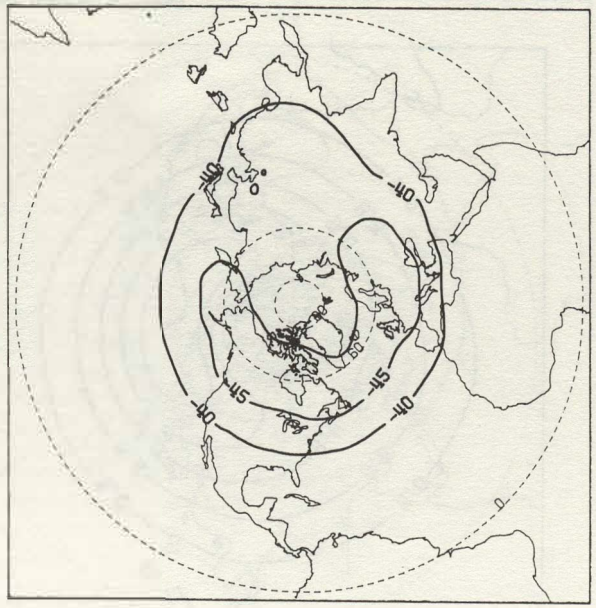


70 MB APRIL 1979-86 TEMP (C)



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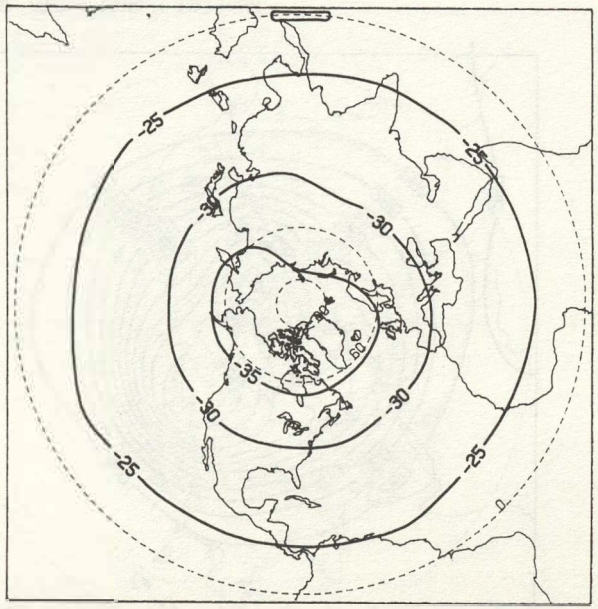

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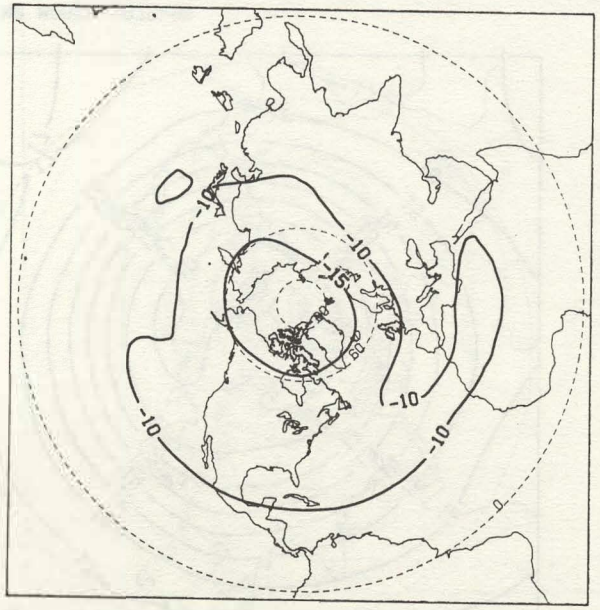

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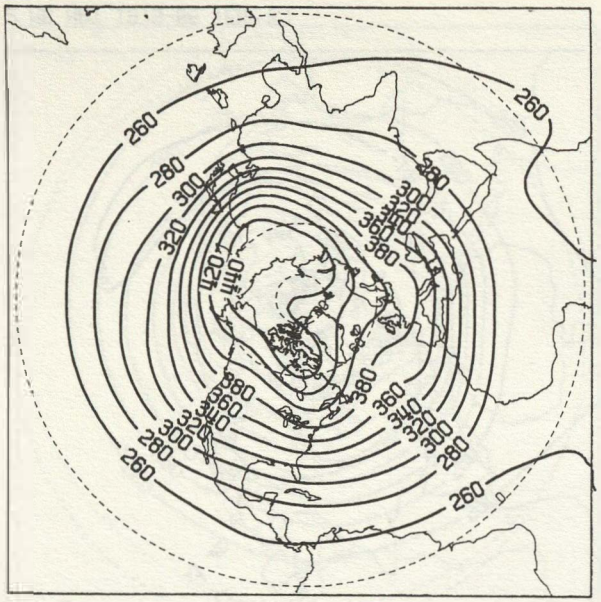
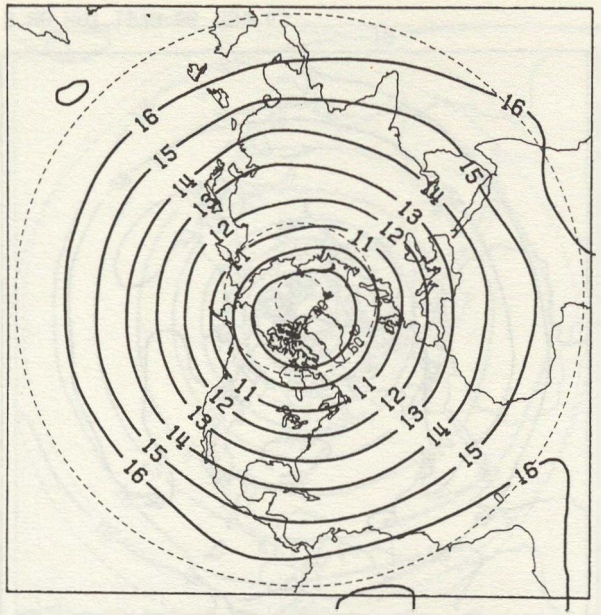


TOTAL OZONE APRIL 1979-86



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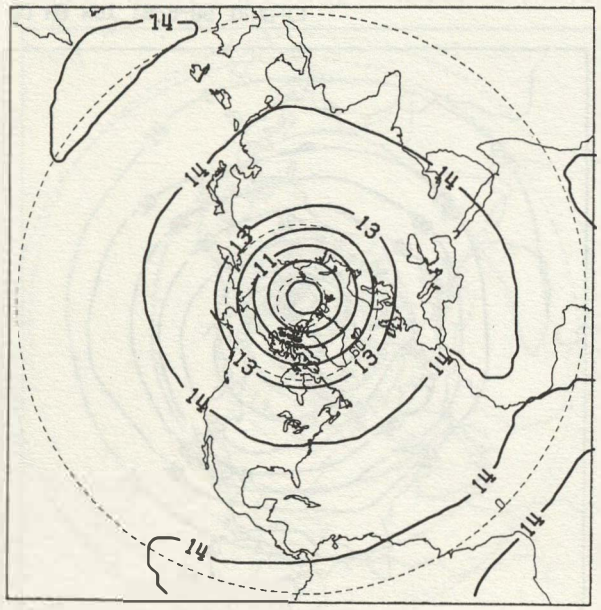

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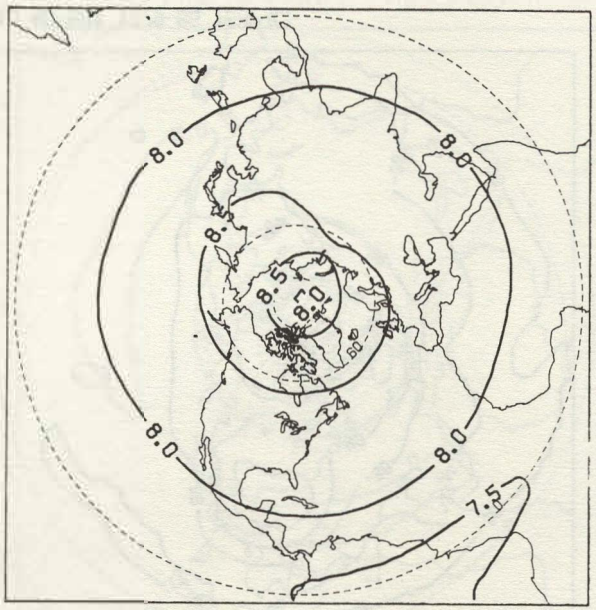

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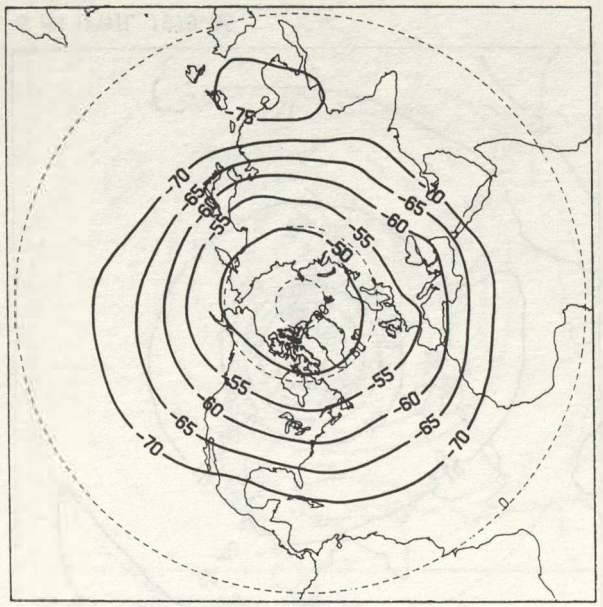

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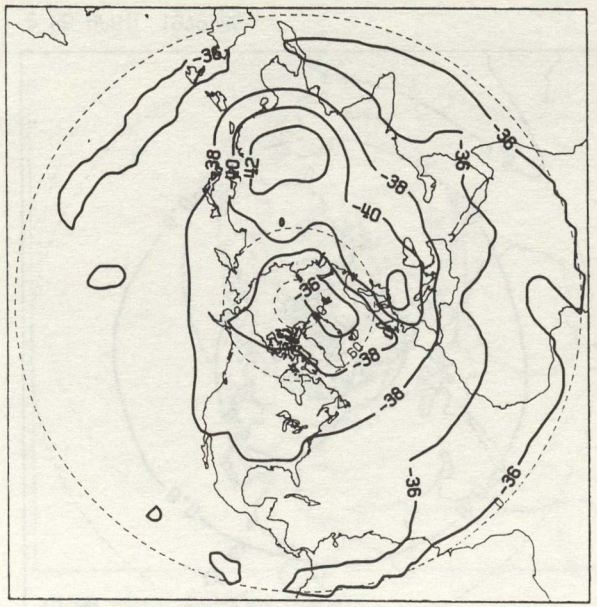

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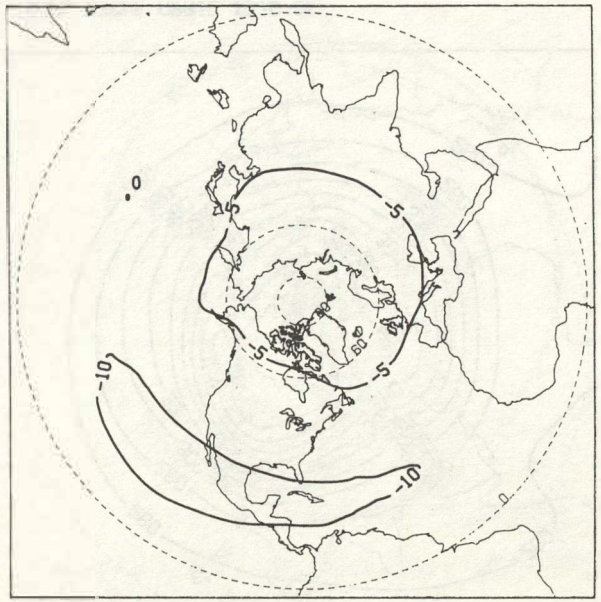

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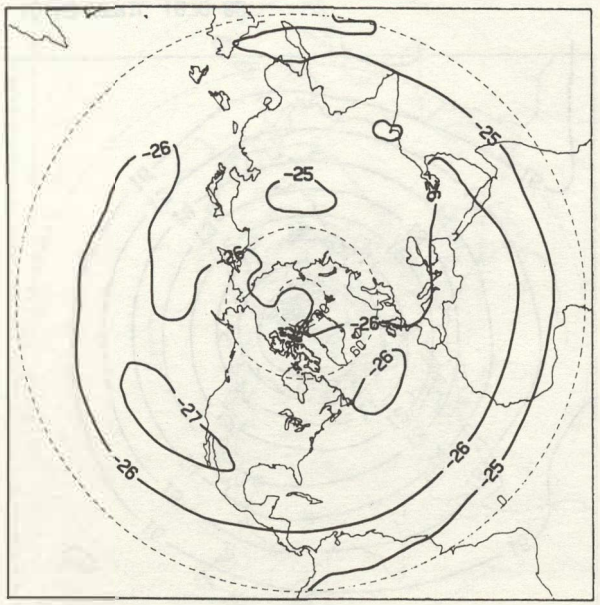

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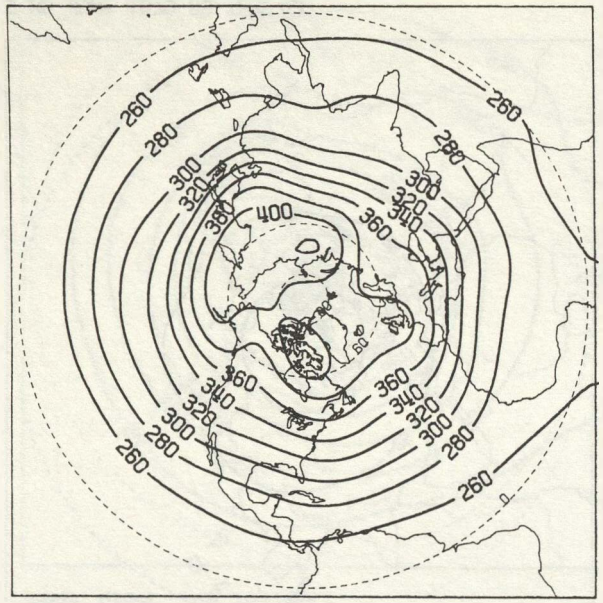
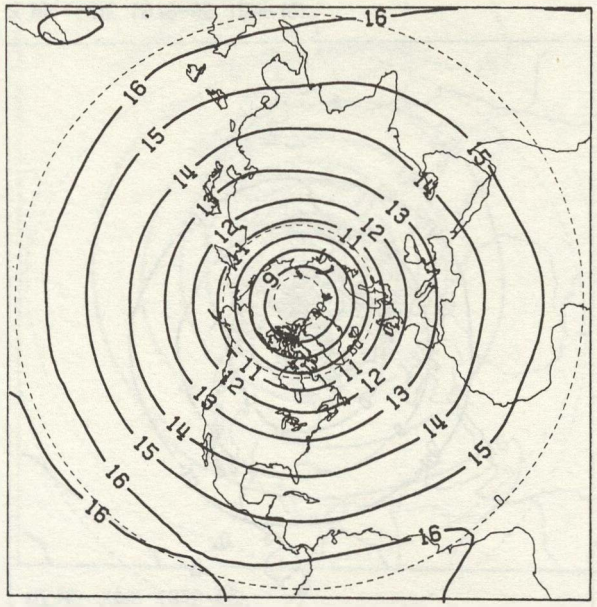


TOTAL OZONE MAY 1979-86



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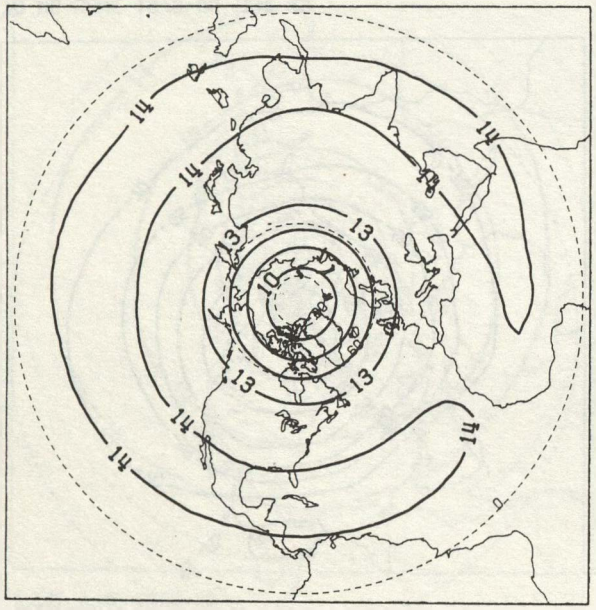

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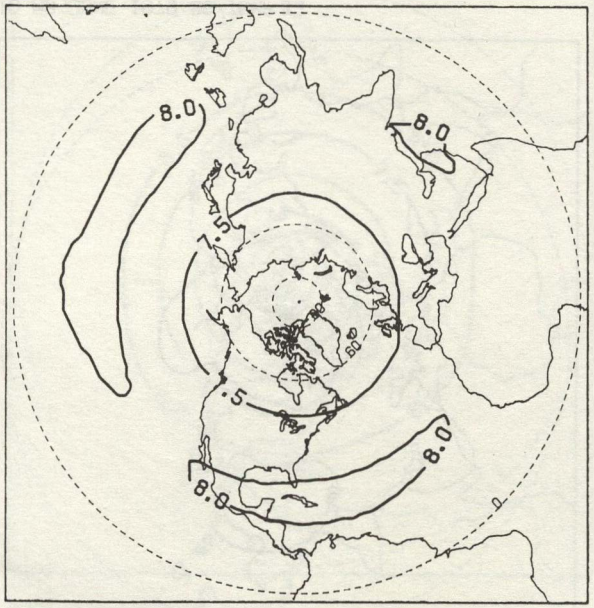

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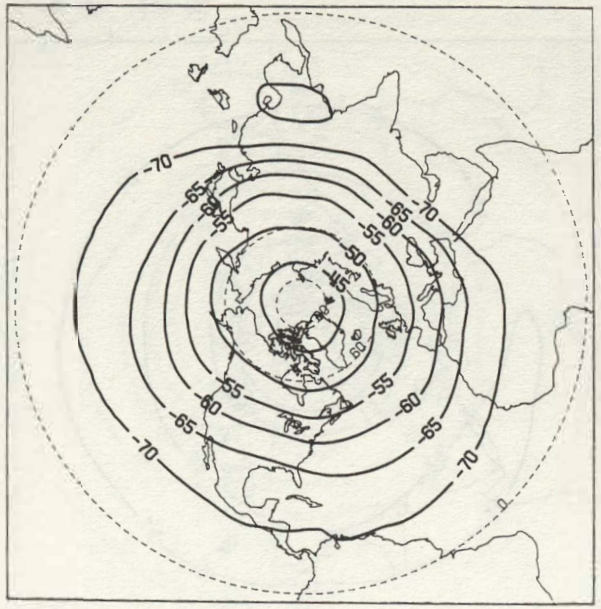
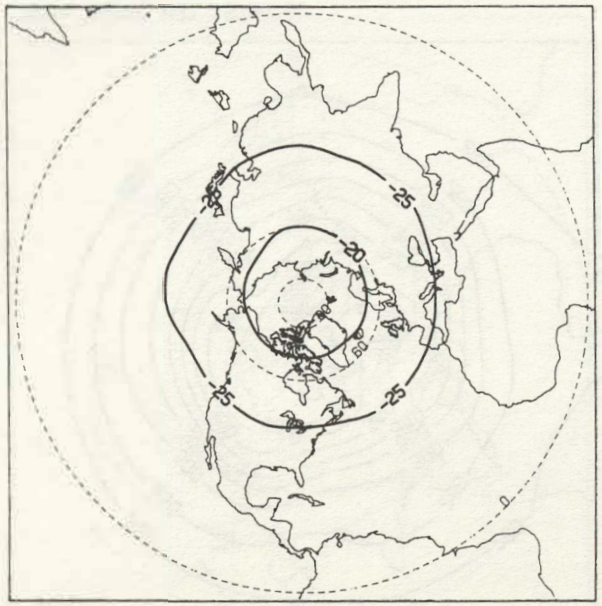


70 MB JUNE 1979-86 TEMP (C)

10 MB JUNE 1979-86 TEMP (C)



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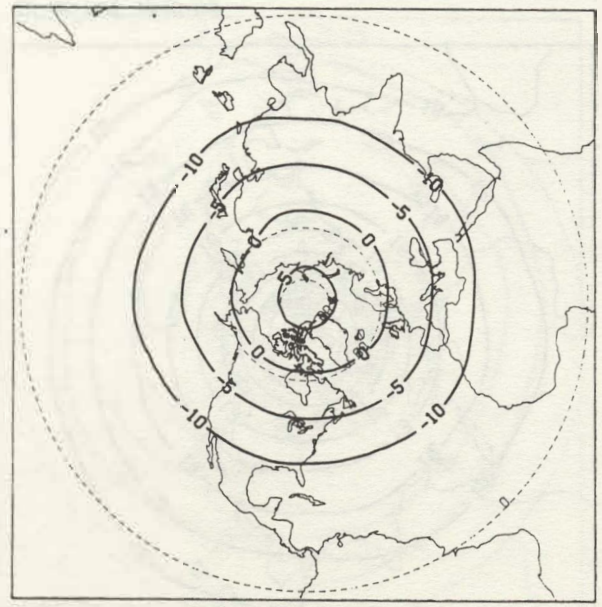

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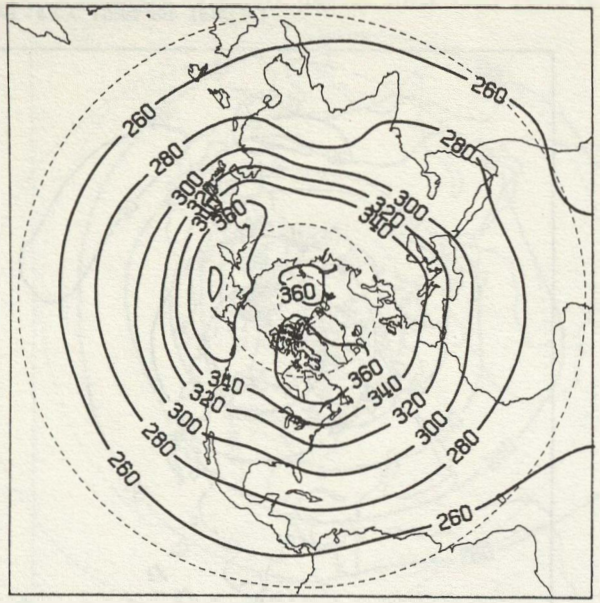
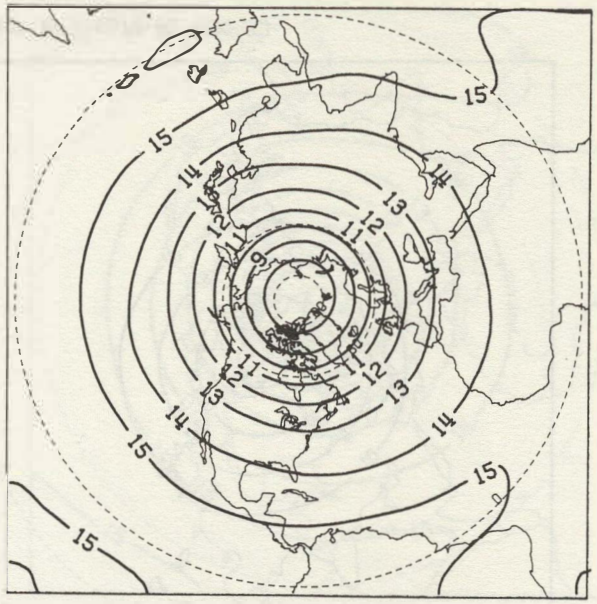


TOTAL OZONE JUNE 1979-86



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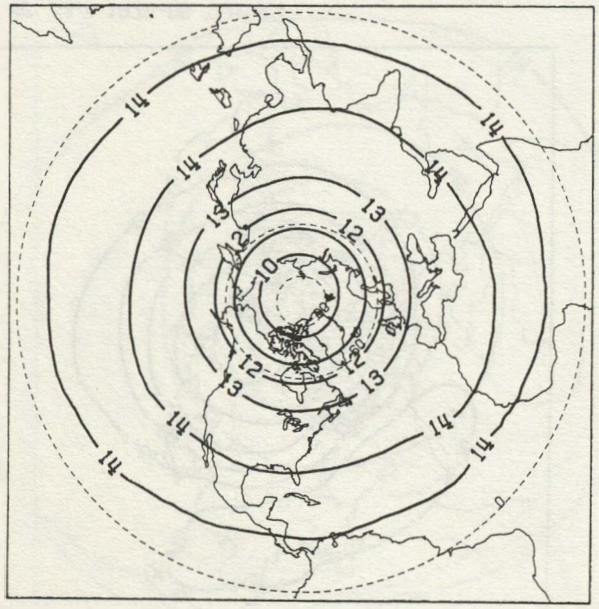

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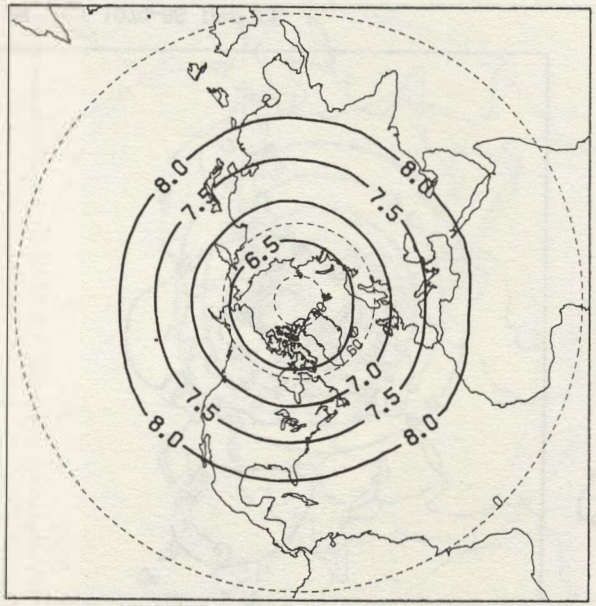

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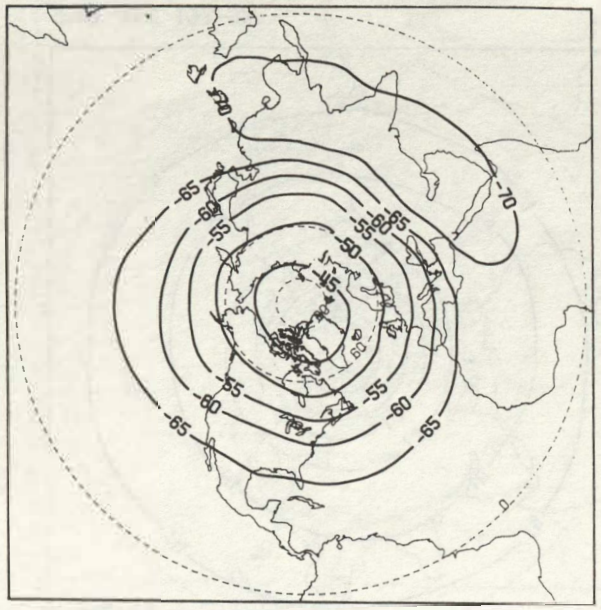
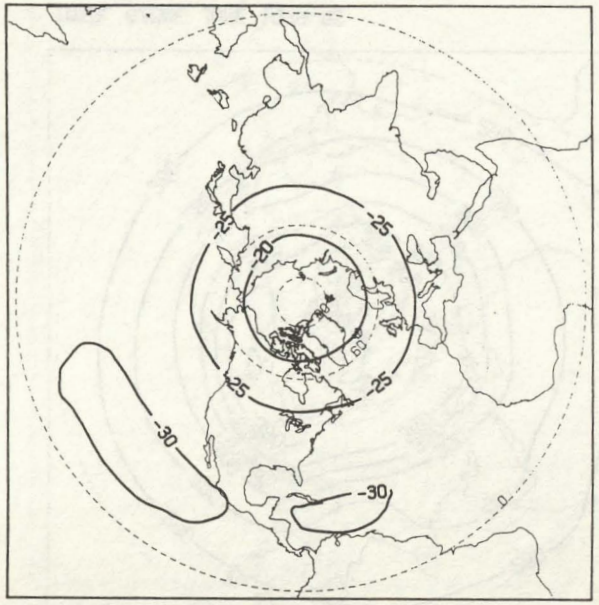


70 MB JULY 1979-86 TEMP (C)

10 MB JULY 1979-86 TEMP (C)



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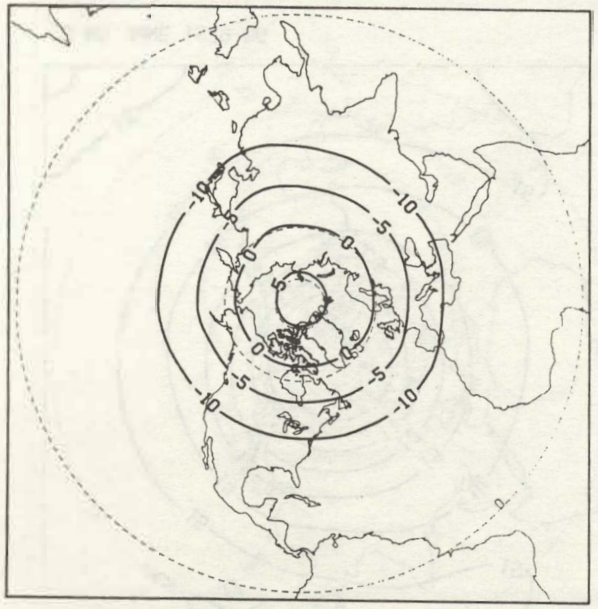

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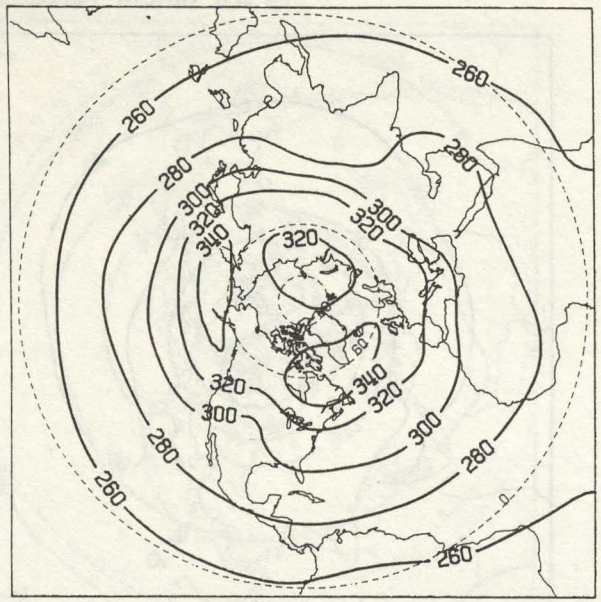
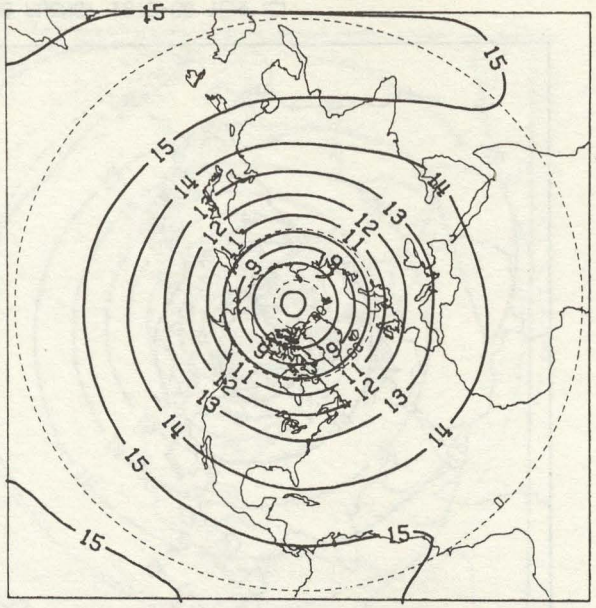


TOTAL OZONE JULY 1979-86



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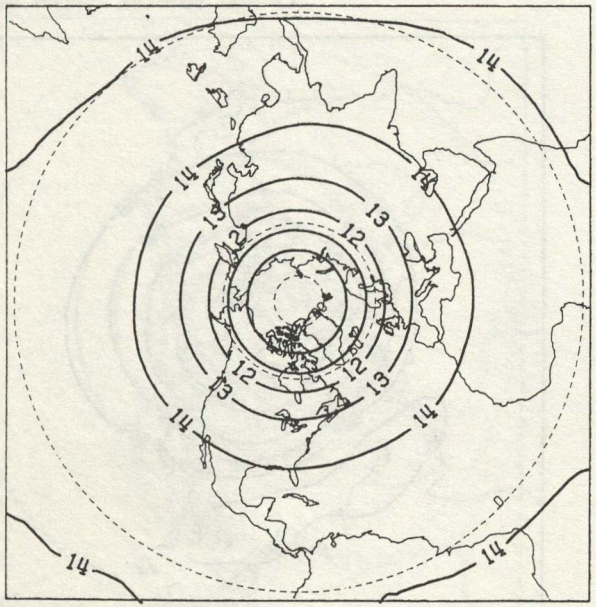

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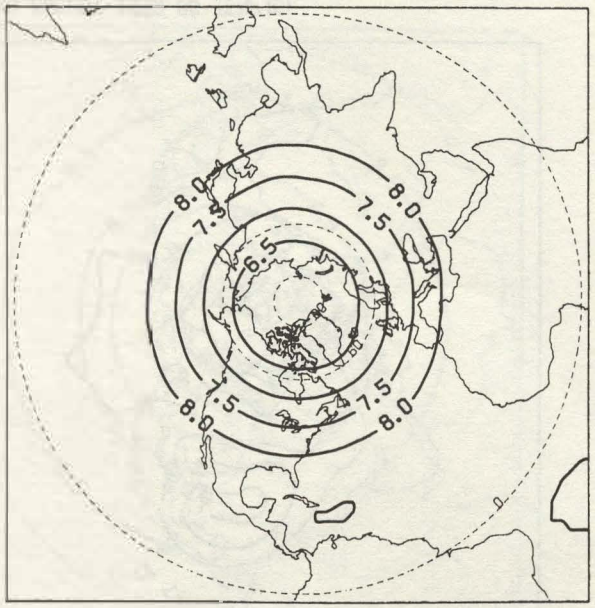

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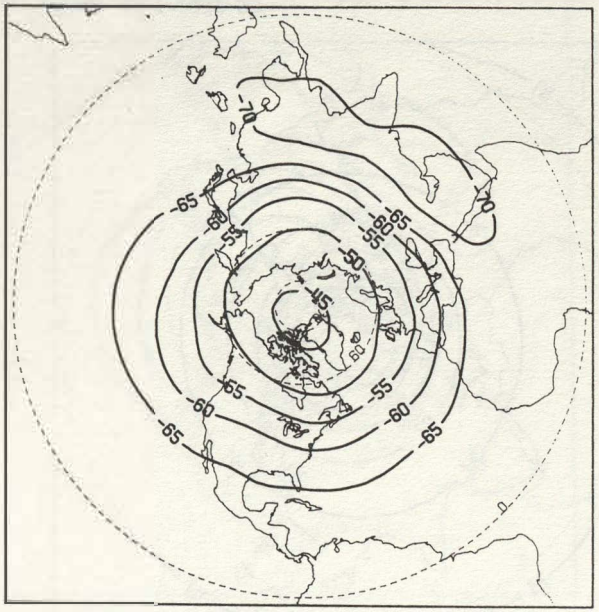
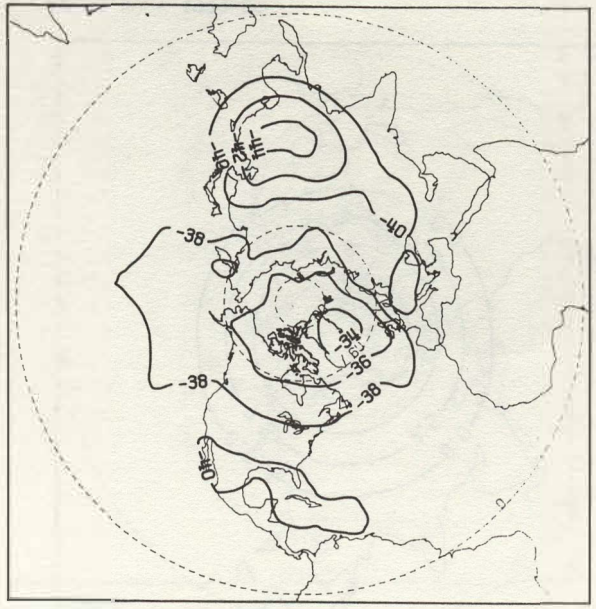
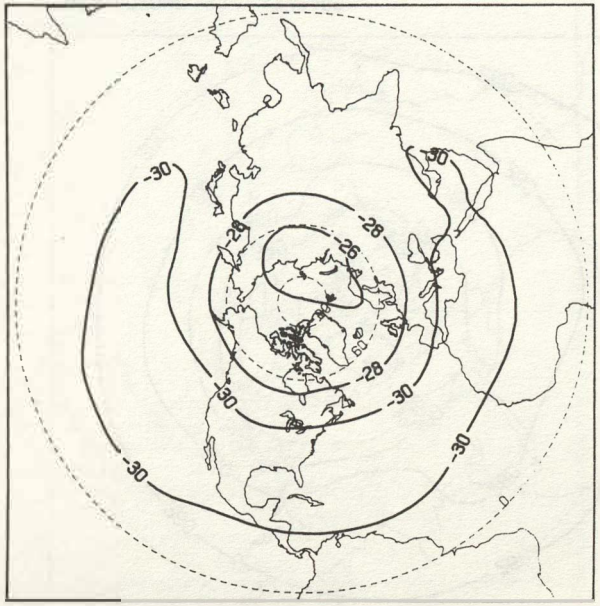


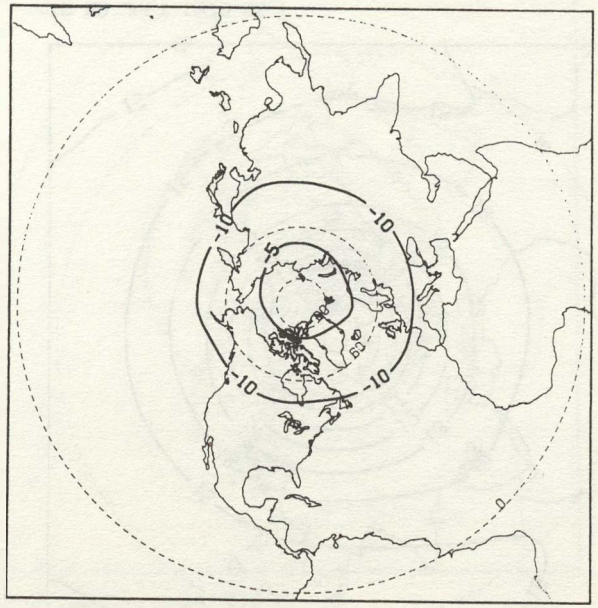
70 MB AUGUST 1979-86 TEMP (C)



10 MB AUGUST 1979-86 TEMP (C)



5 MB AUGUST 1979-86 TEMP (C)



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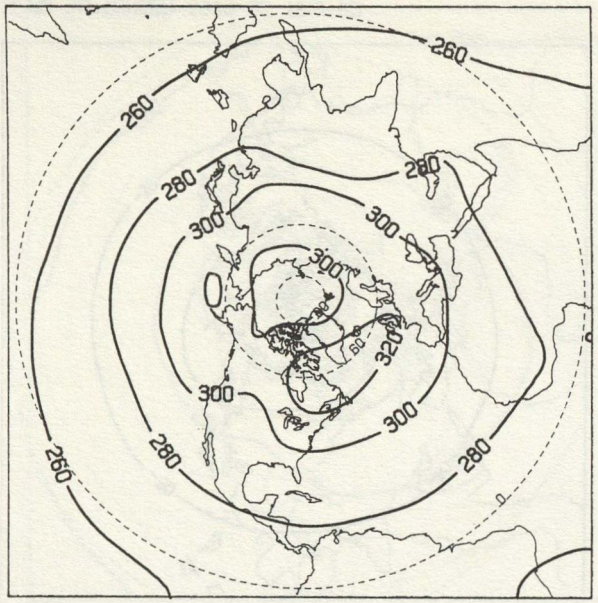
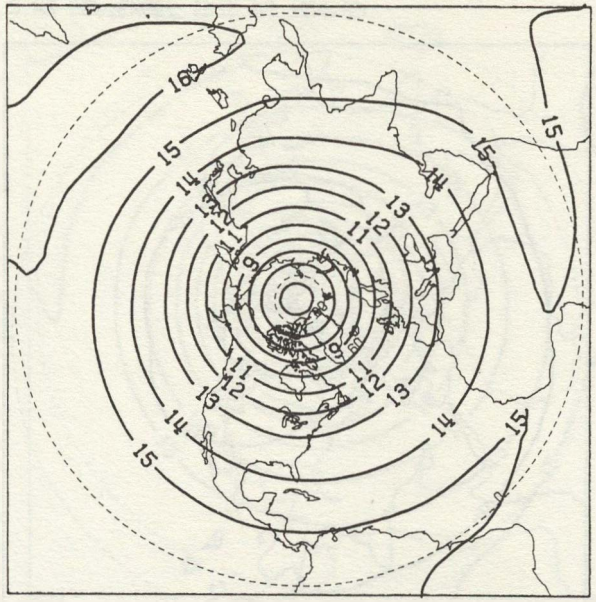


TOTAL OZONE AUGUST 1979-86



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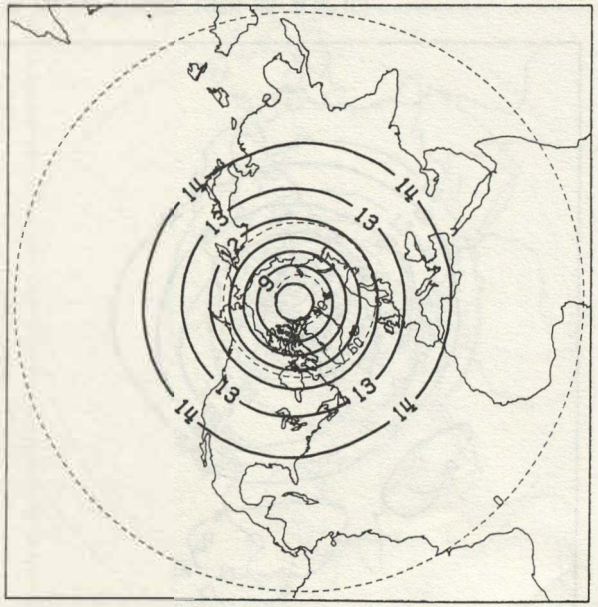

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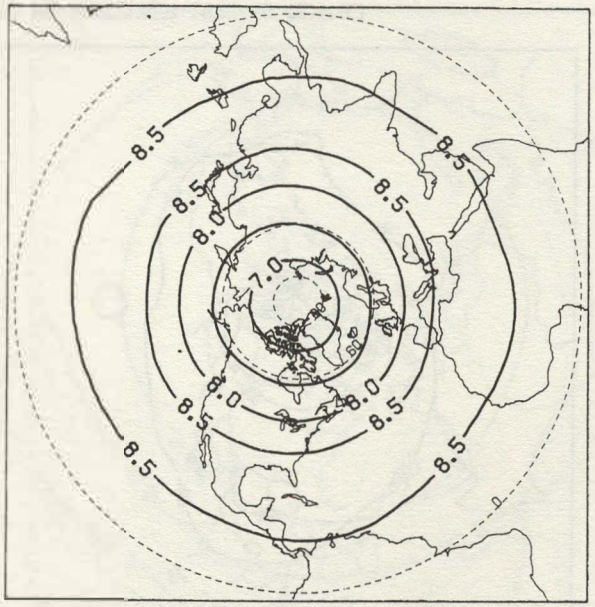

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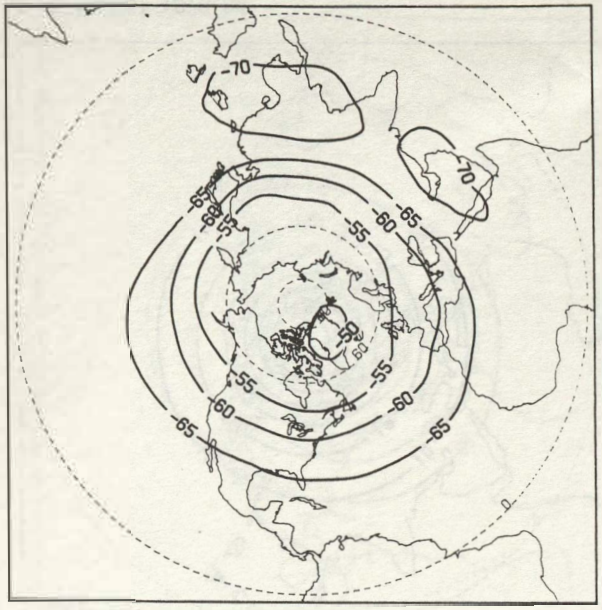
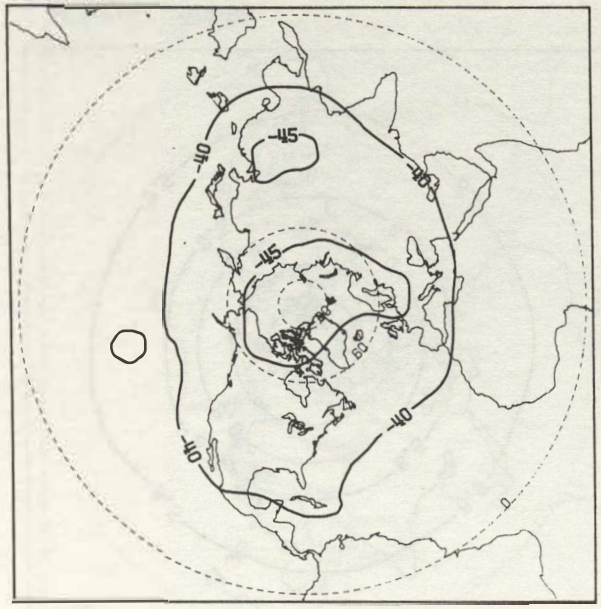
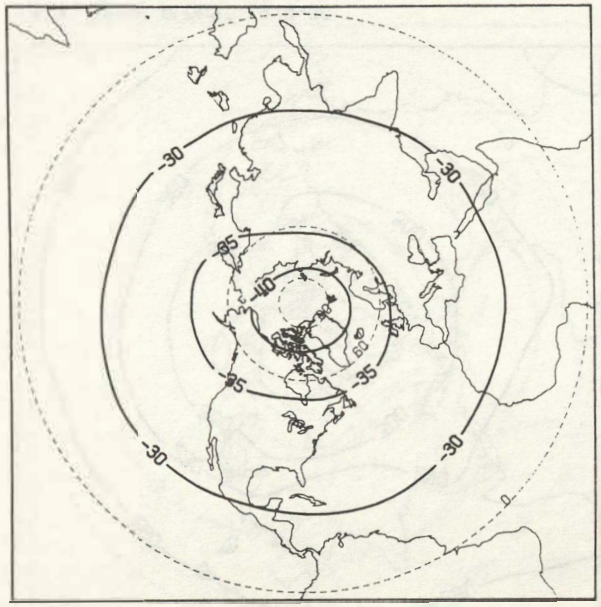


70 MB SEPTEMBER 1979-86 TEMP (C)



10 MB SEPTEMBER 1979-86 TEMP (C)



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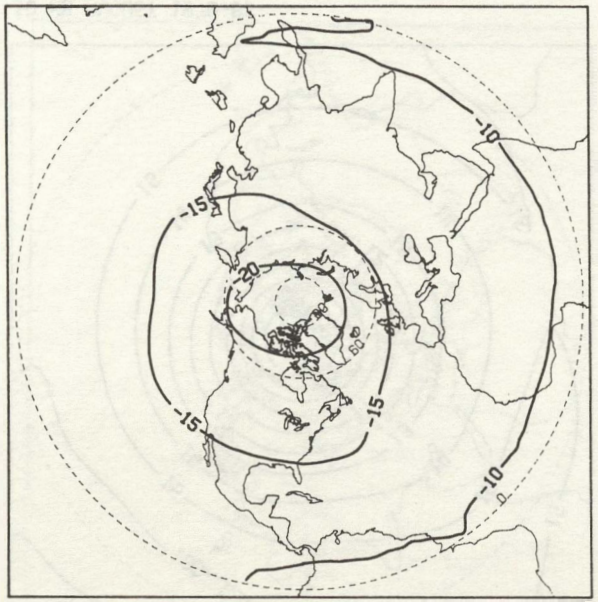

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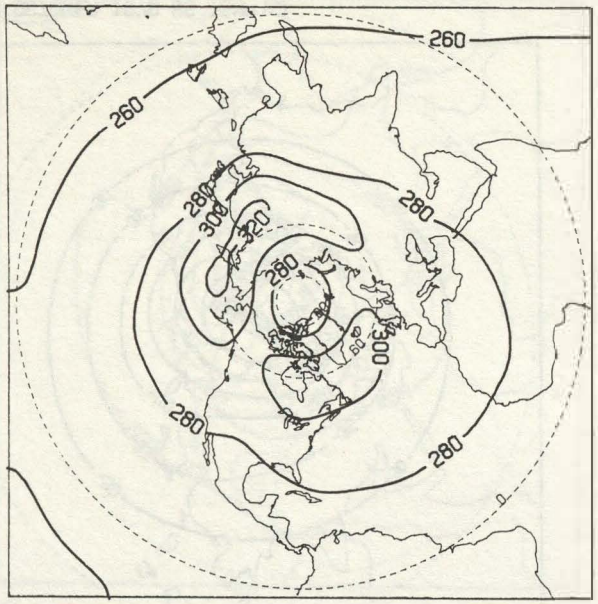
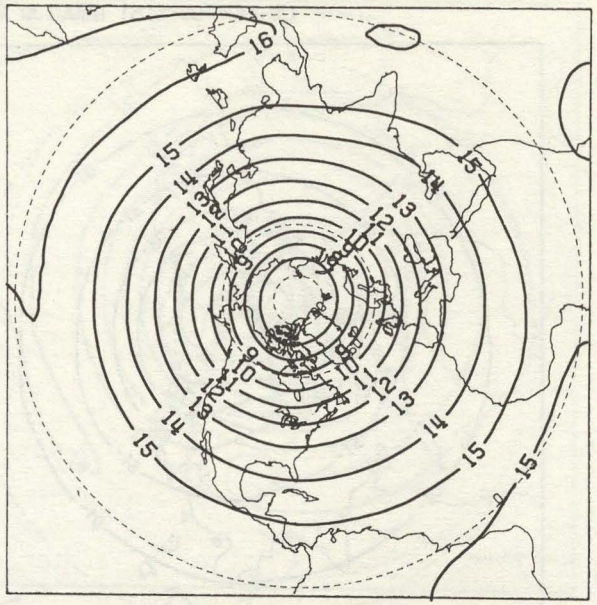
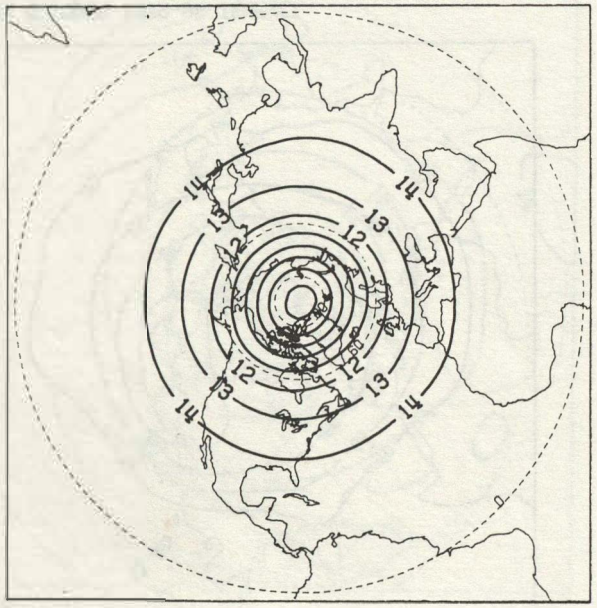


TOTAL OZONE SEPTEMBER 1979-86



10 MB SEPTEMBER 1979-86



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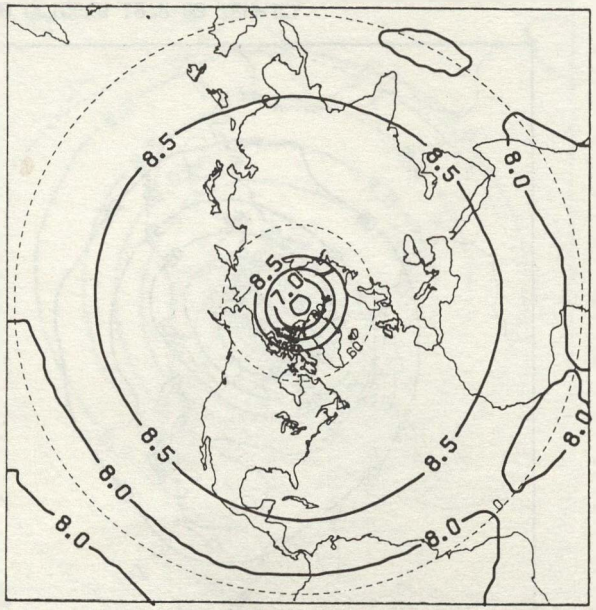

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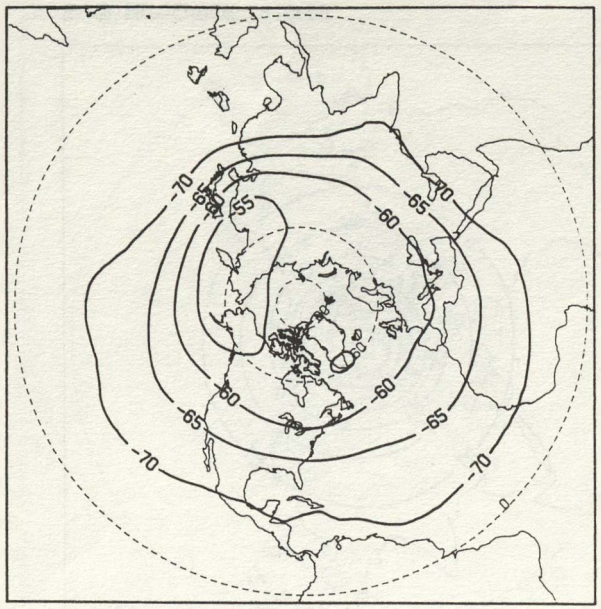
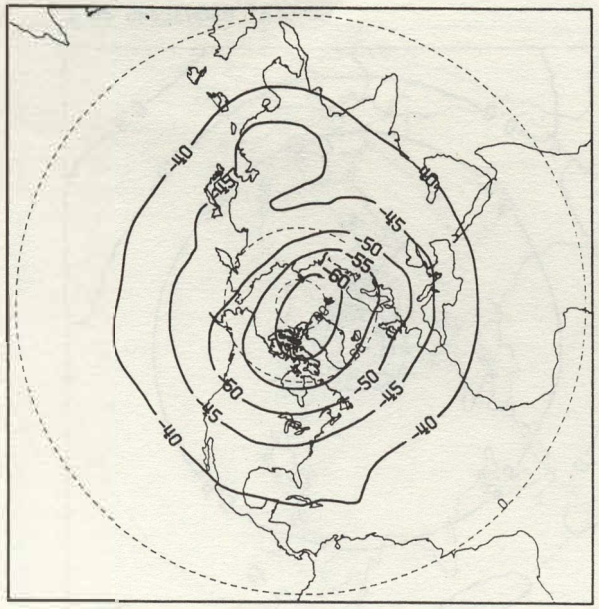


70 MB OCTOBER 1979-86 TEMP (C)



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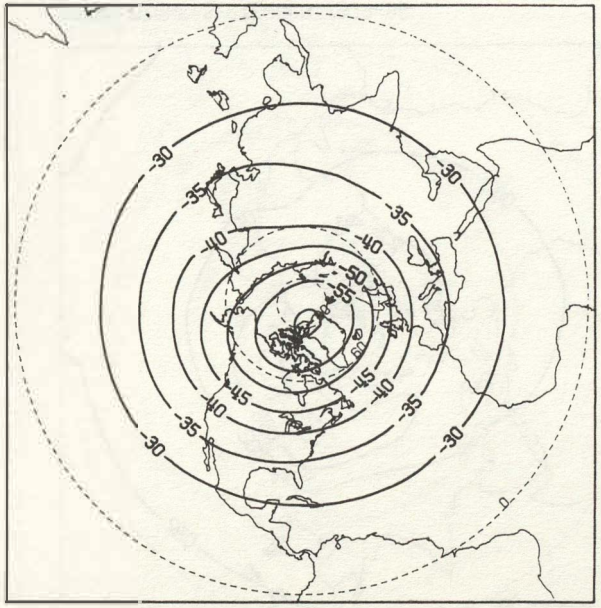
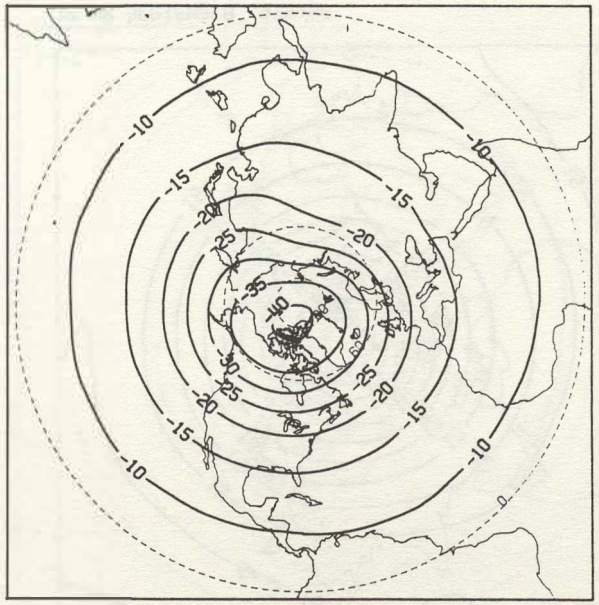


5 MB OCTOBER 1979-86 TEMP (C)



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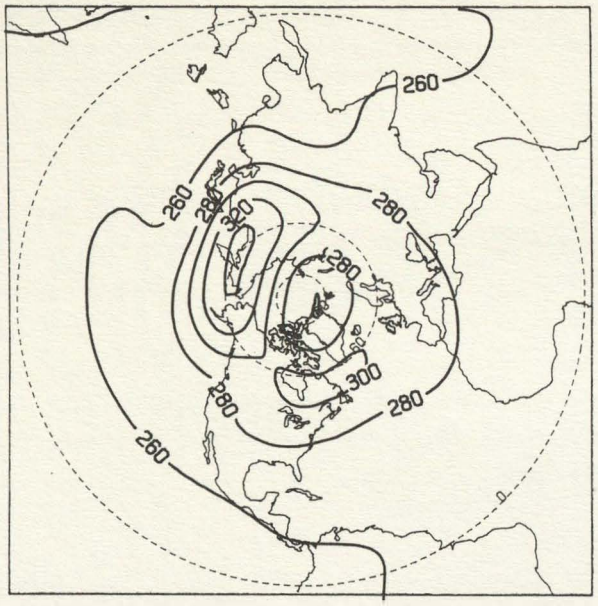
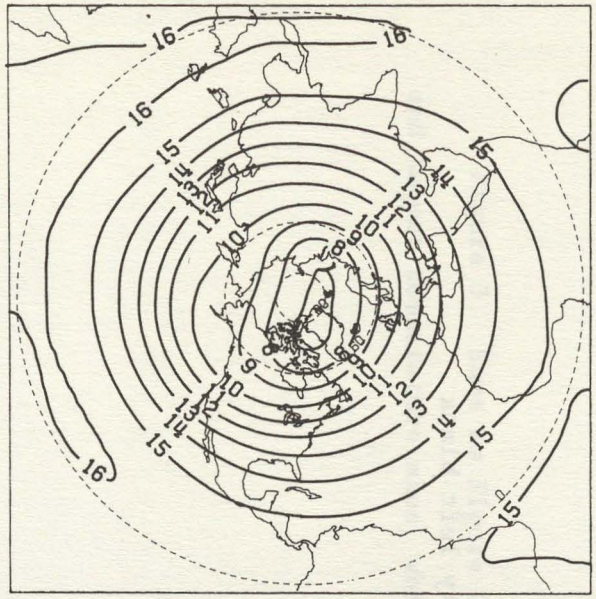
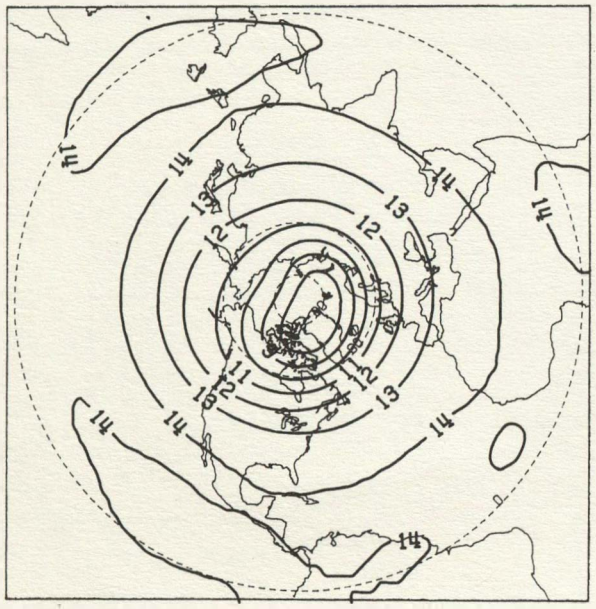


TOTAL OZONE OCTOBER 1979-86



10 MB OCTOBER 1979-86



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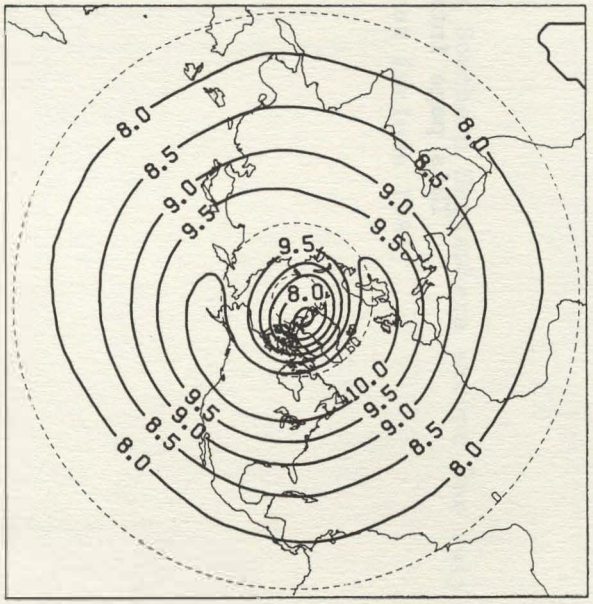

2 MB OCTOBER 1979-86

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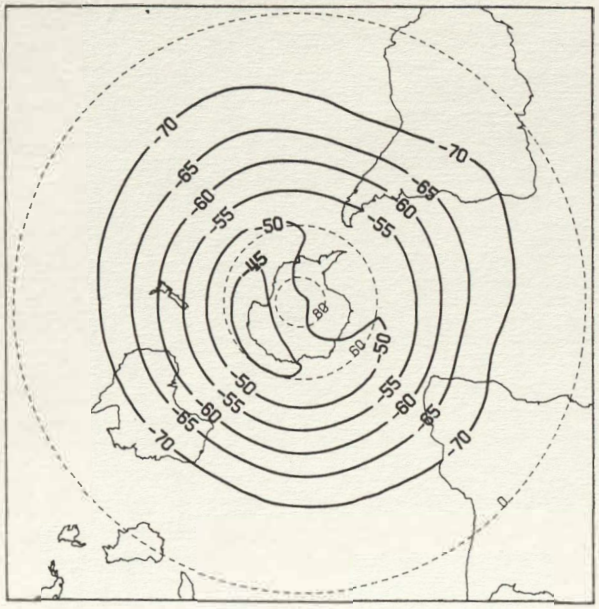
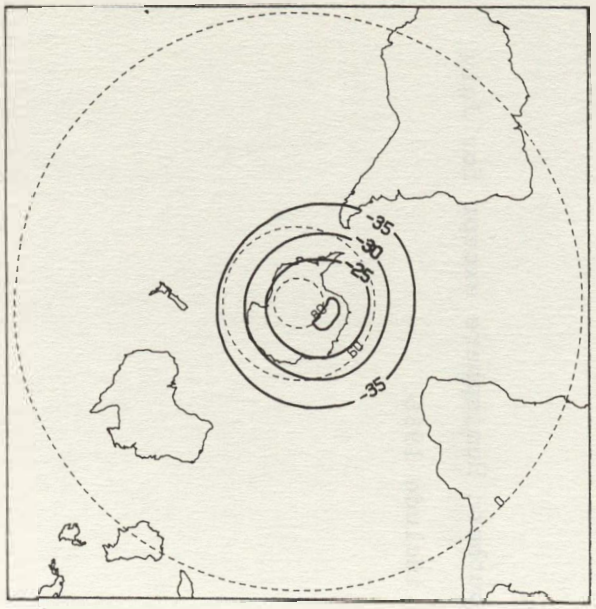
Figure 3. Same as Figure 2 for the Southern Hemisphere except for July and August temperature maps, which did not include 1986.



70 MB NOVEMBER 1978-85 TEMP (C)



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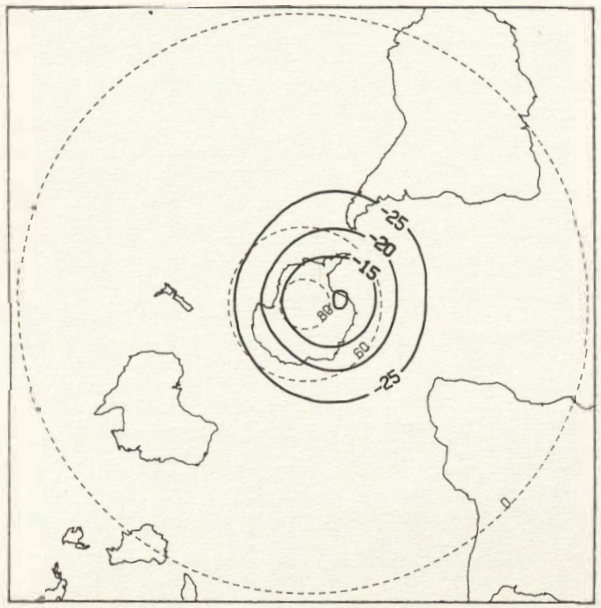

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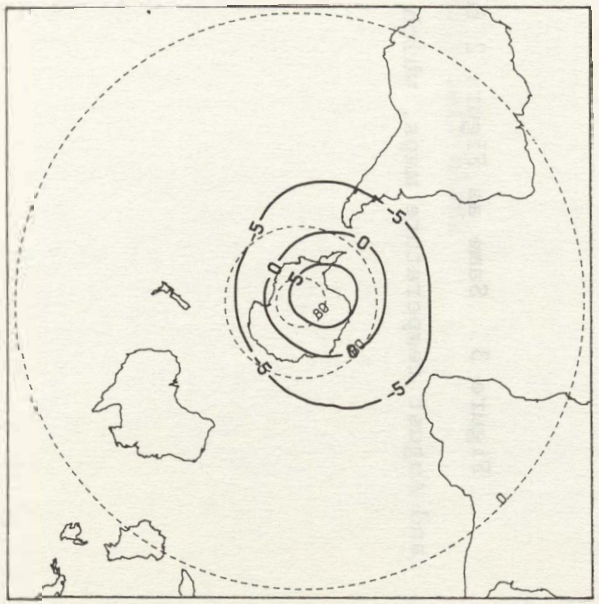

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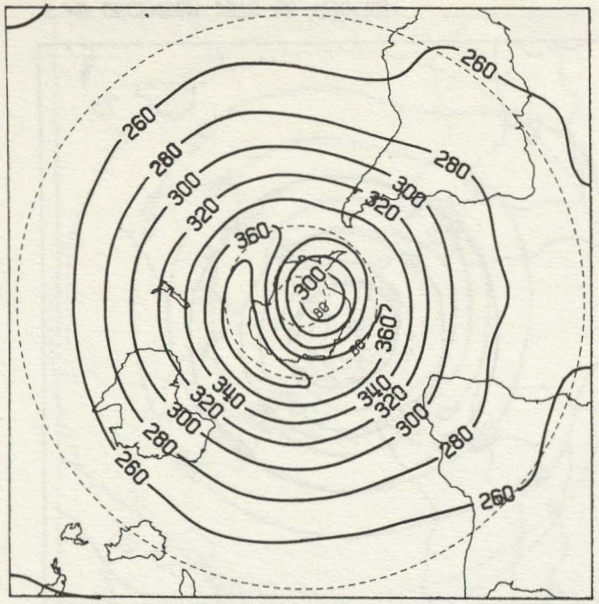
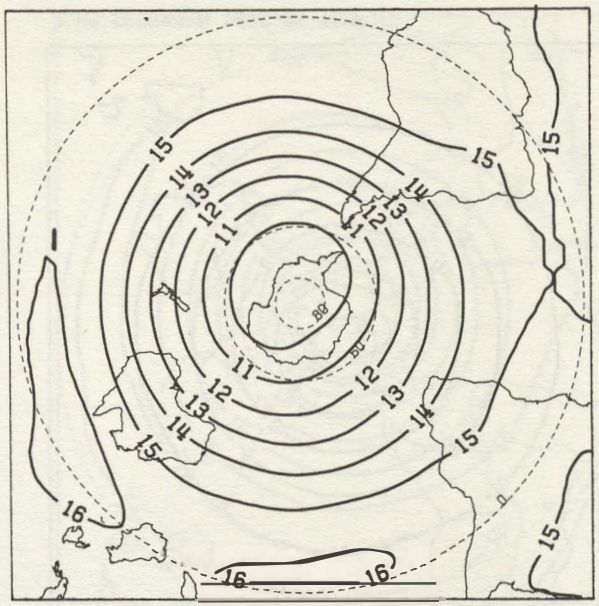


TOTAL OZONE NOVEMBER 1978-85



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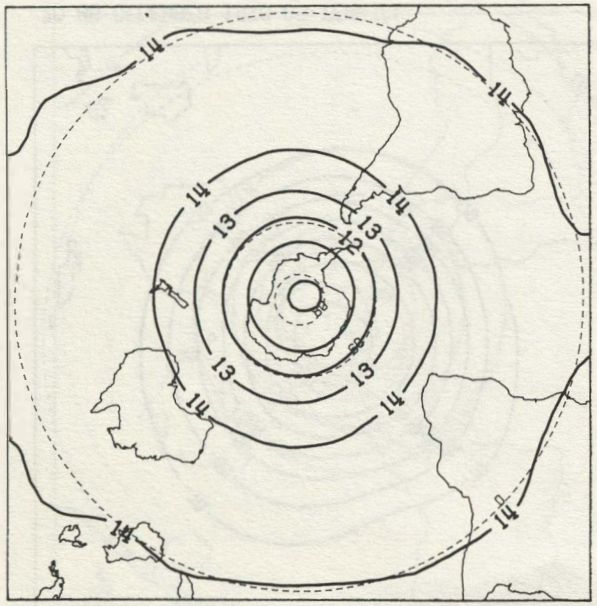

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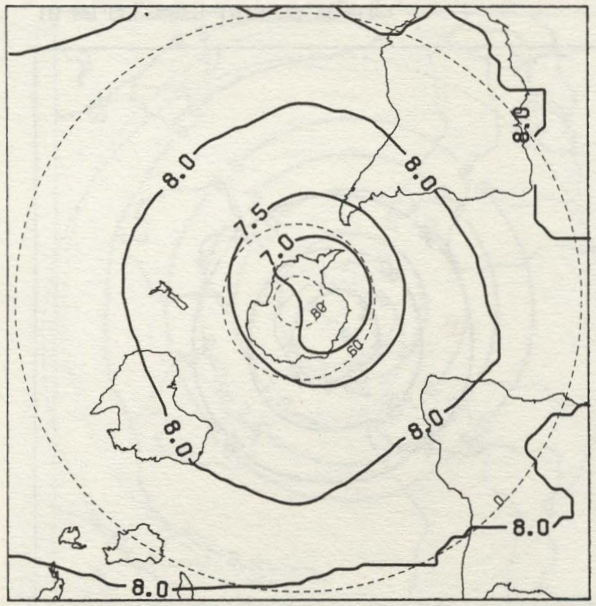

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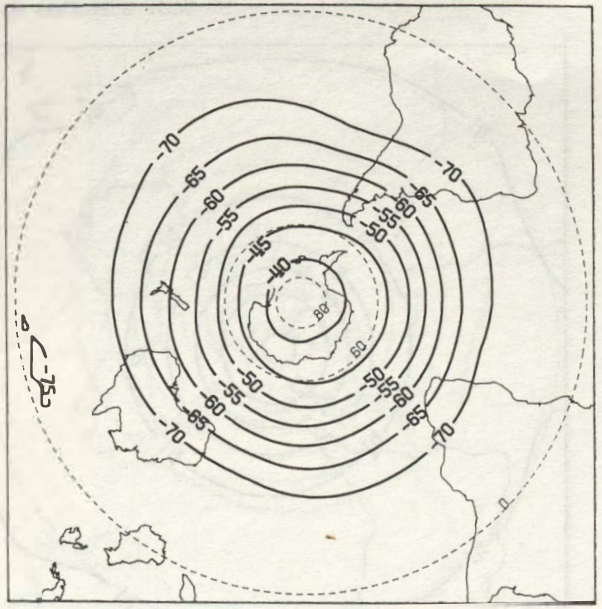
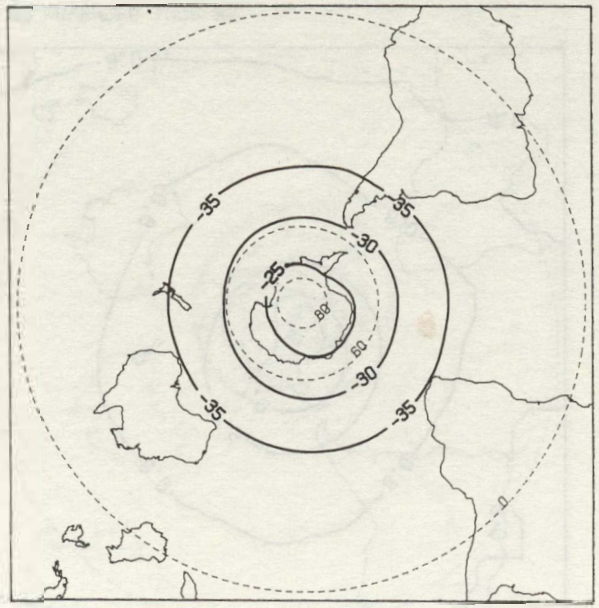


70 MB DECEMBER 1978-85 TEMP (C)



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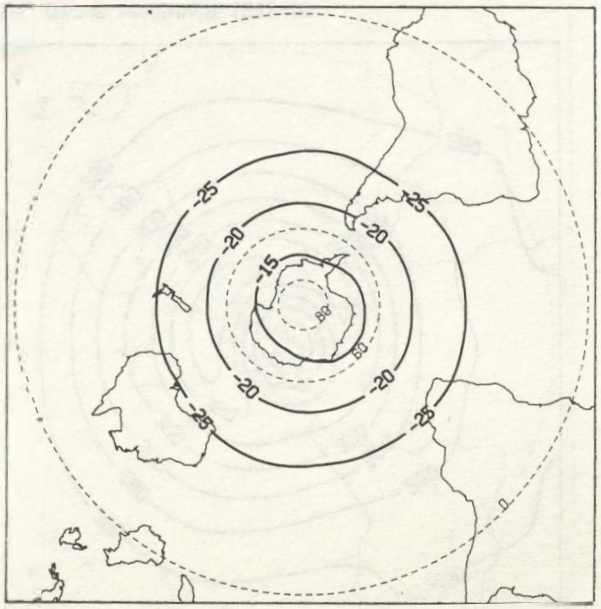

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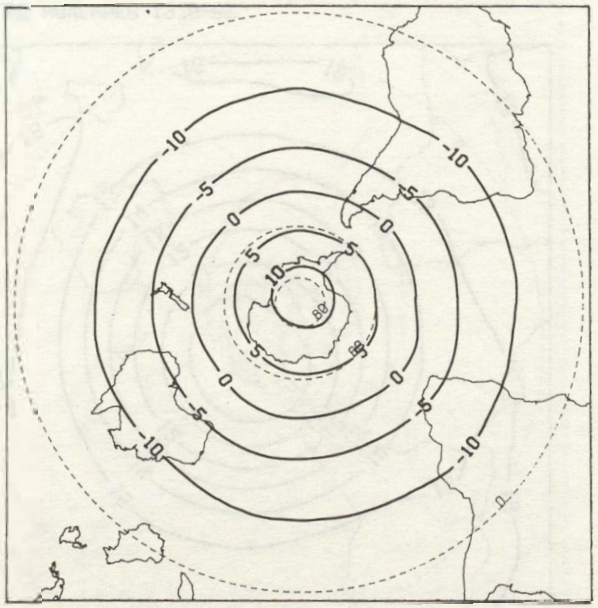

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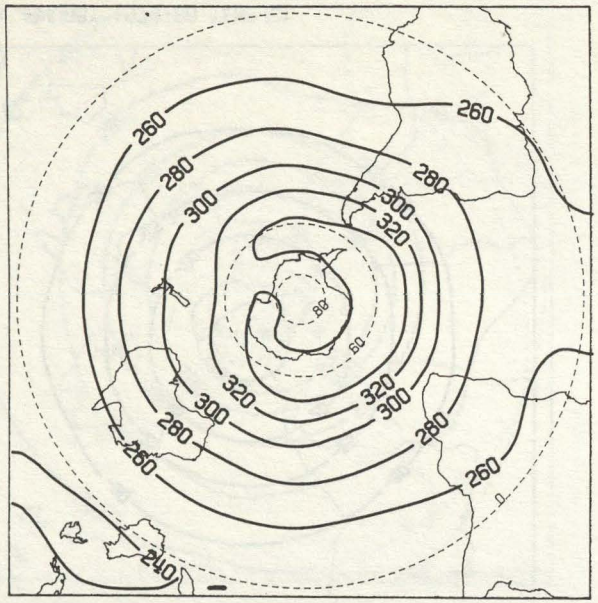
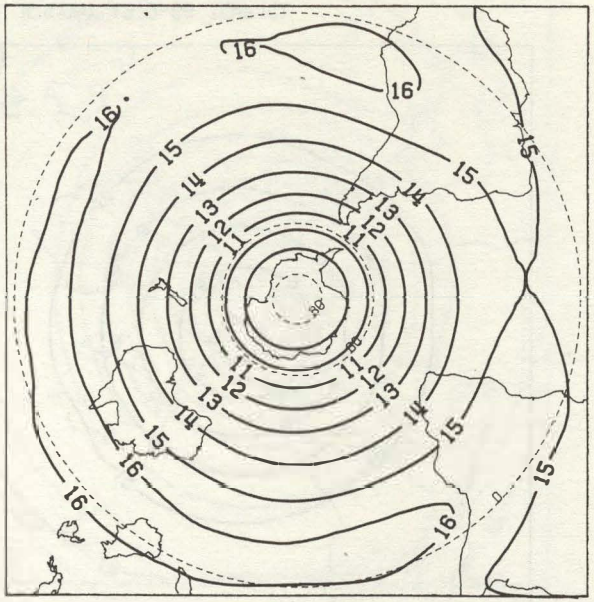


TOTAL OZONE DECEMBER 1978-85



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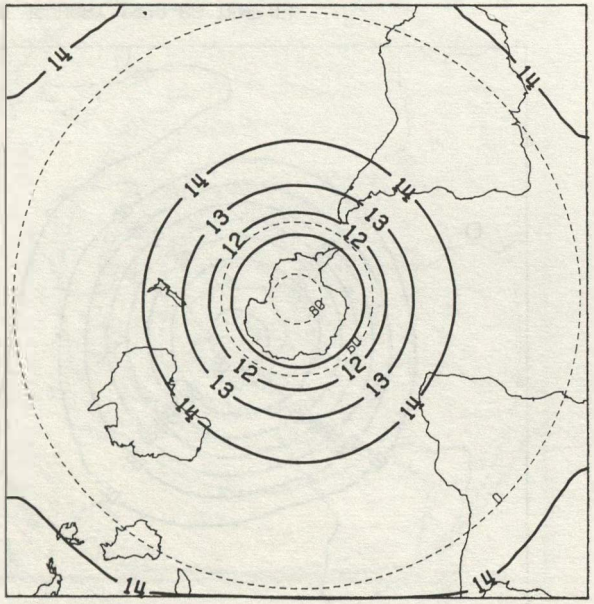

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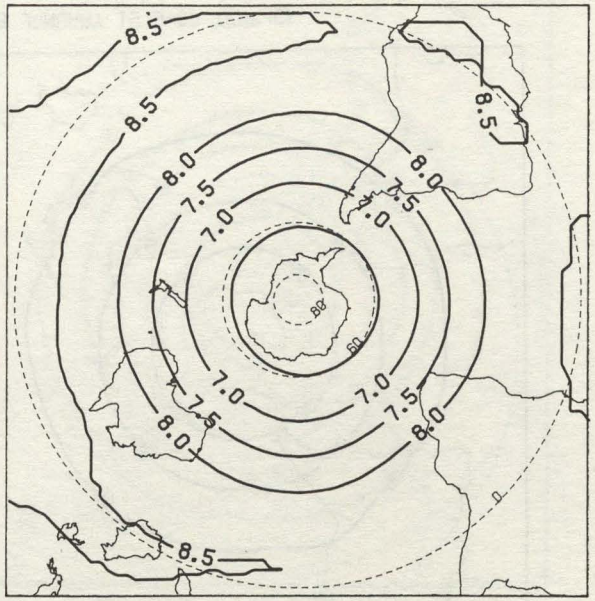

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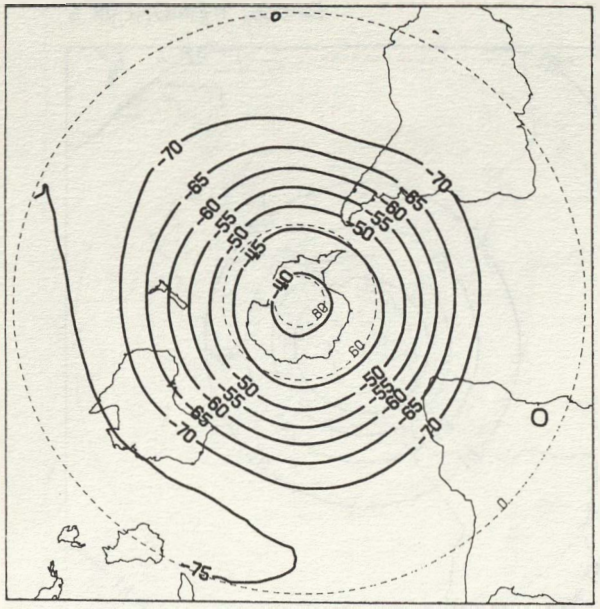
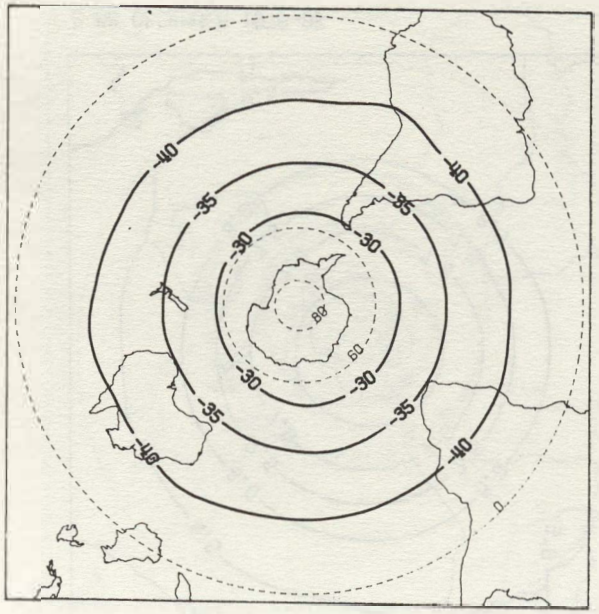


70 MB JANUARY 1979-86 TEMP (C)



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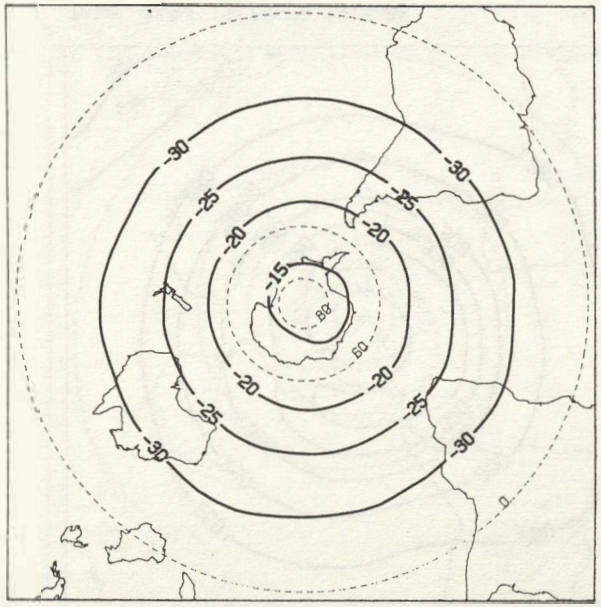

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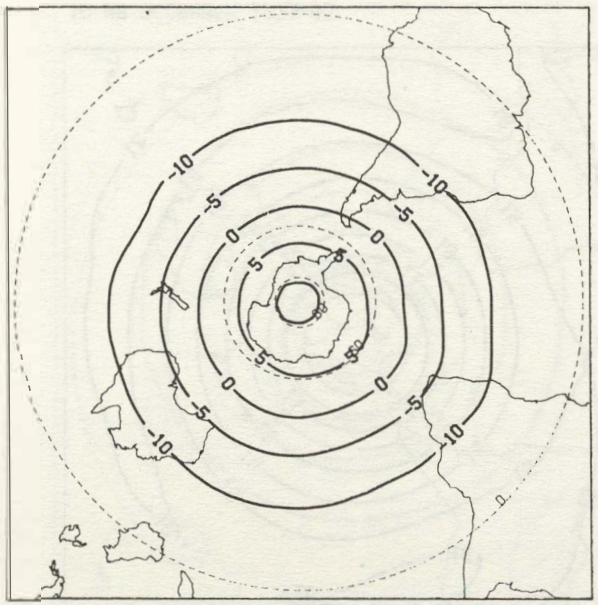

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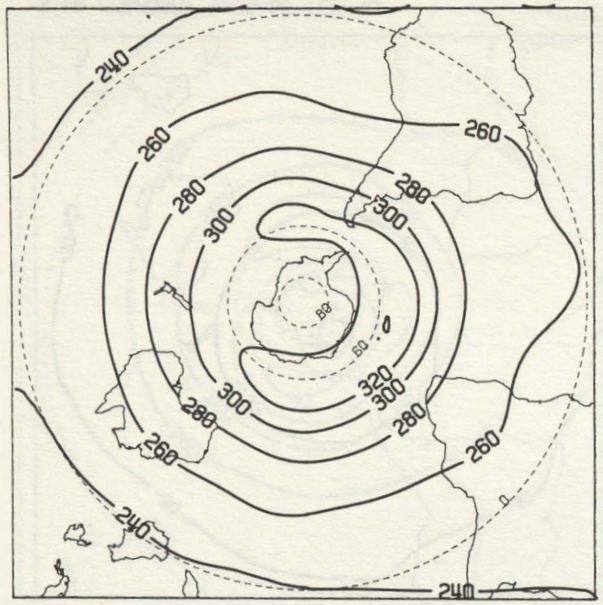

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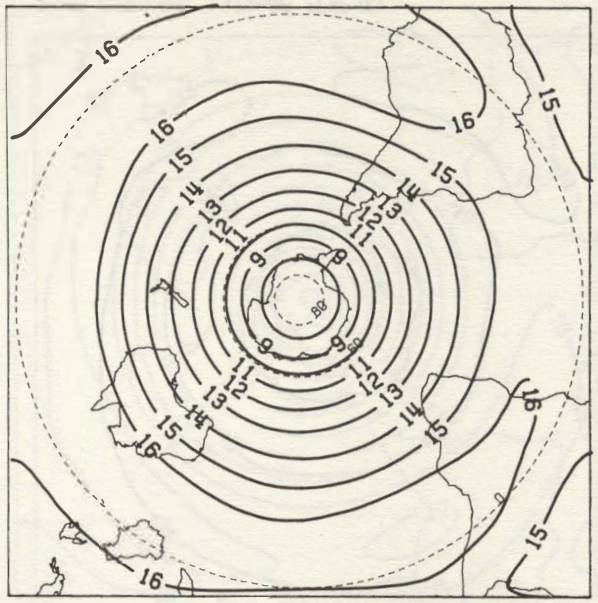

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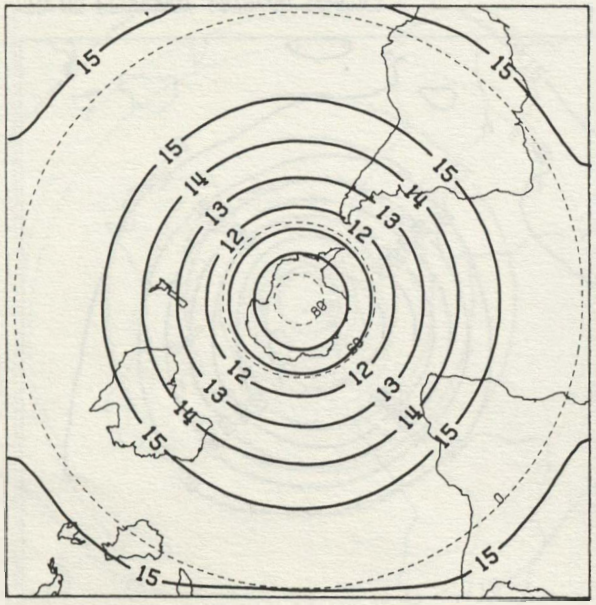

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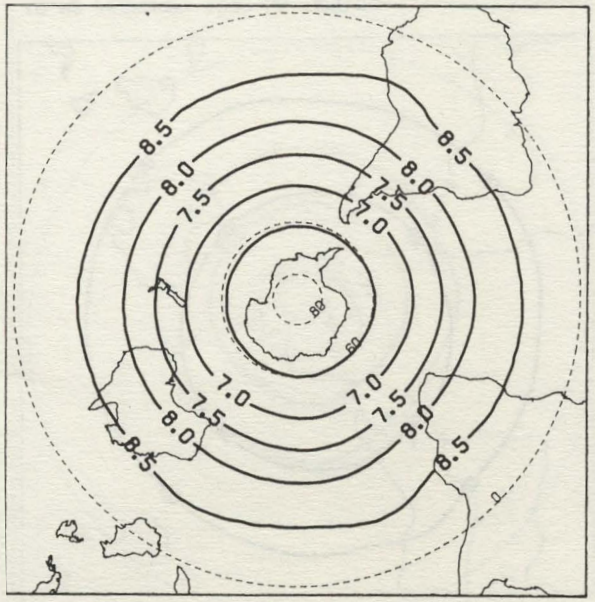

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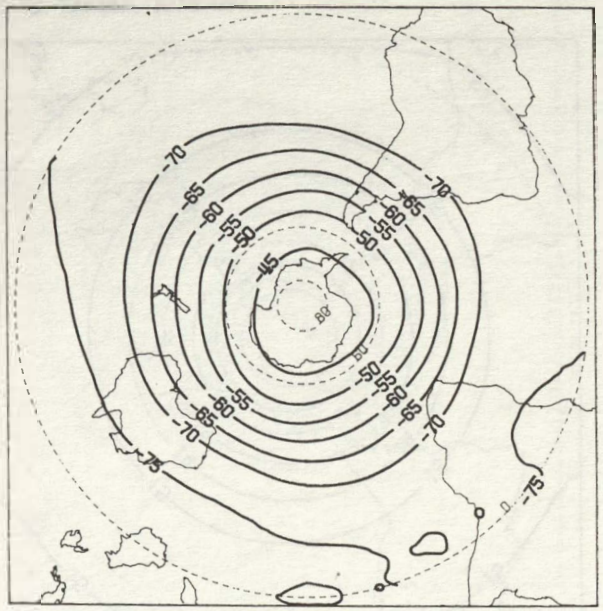

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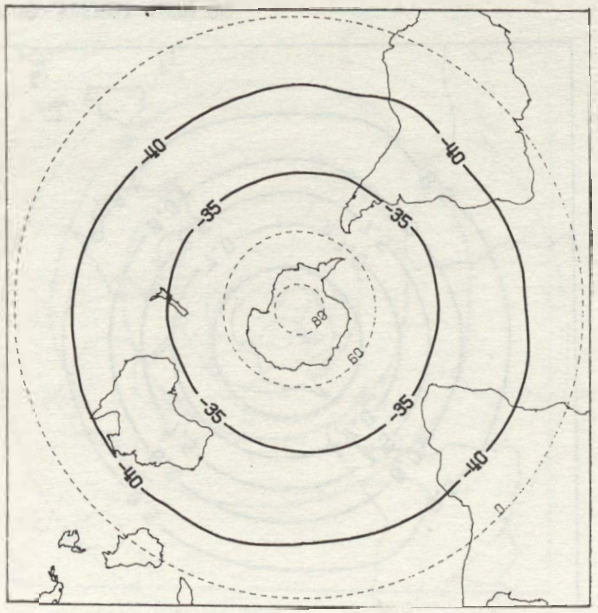

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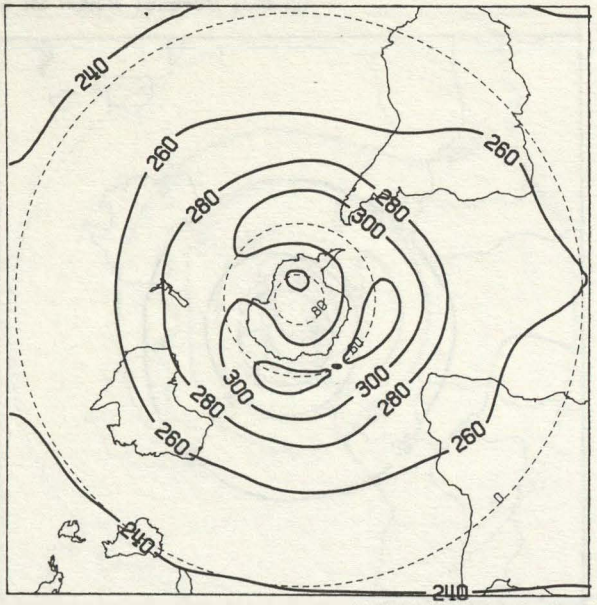

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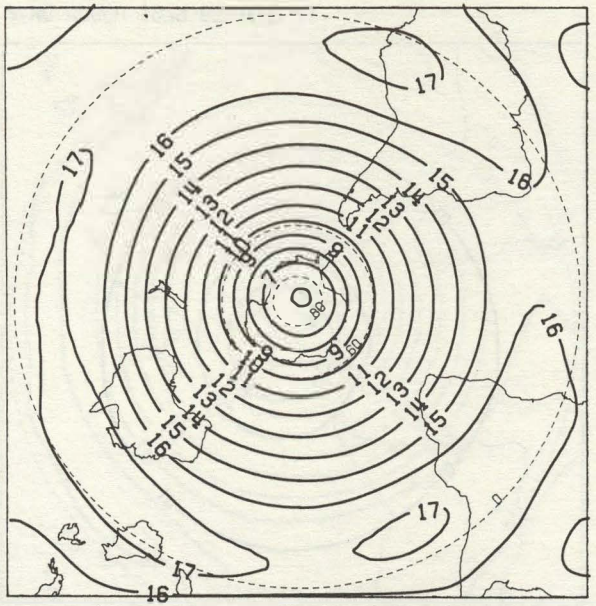

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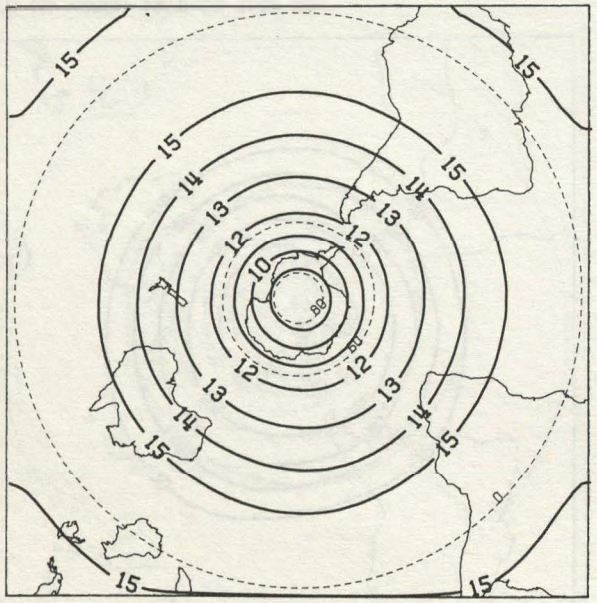

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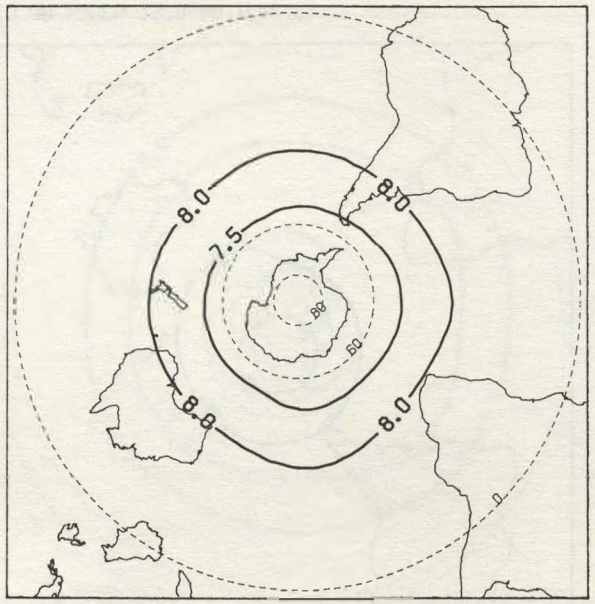

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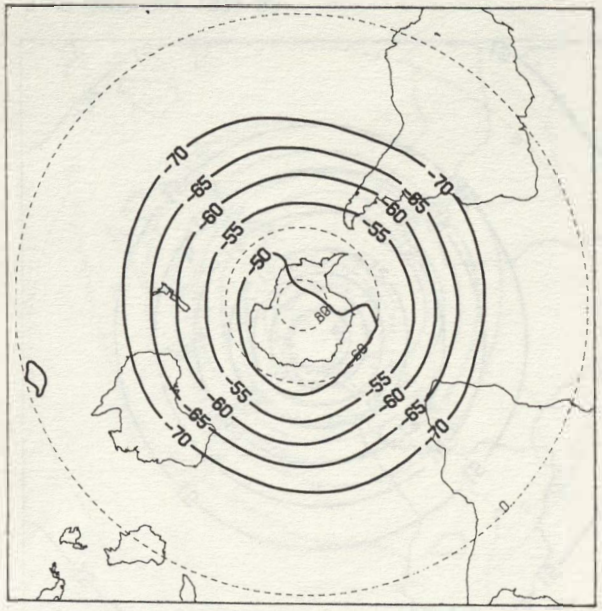
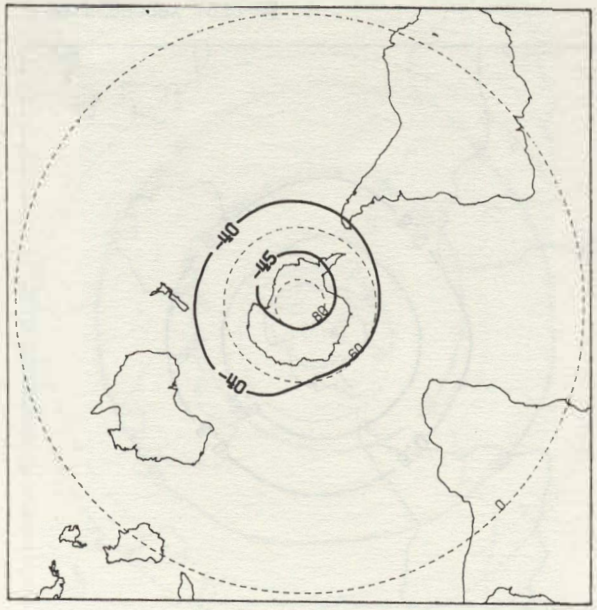


70 MB MARCH 1979-86 TEMP (C)



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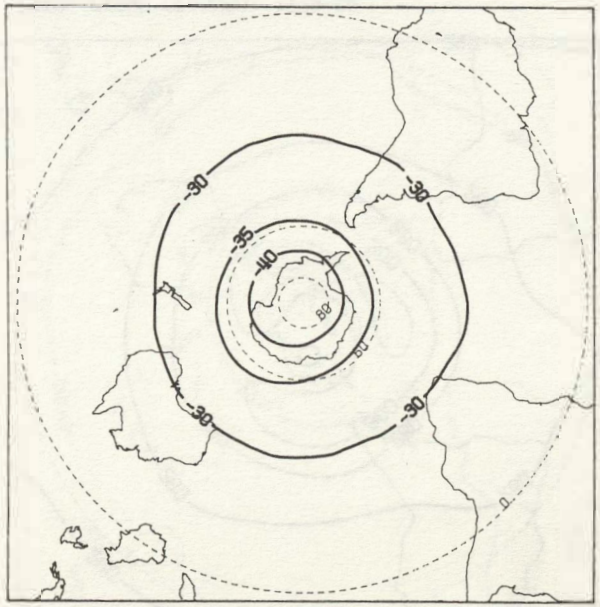

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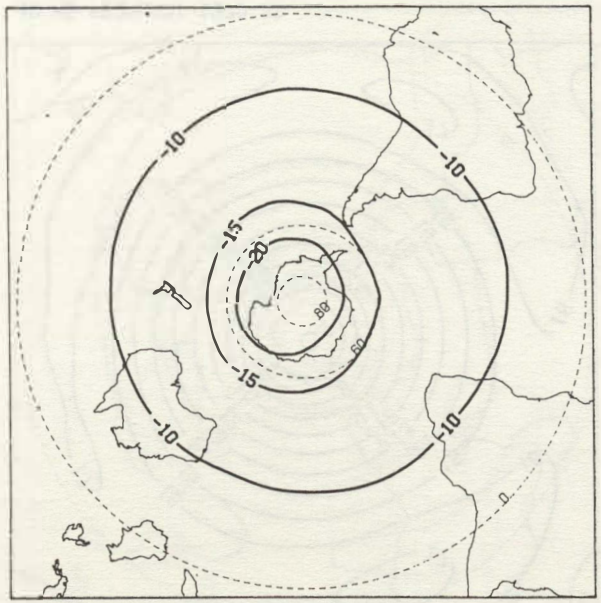

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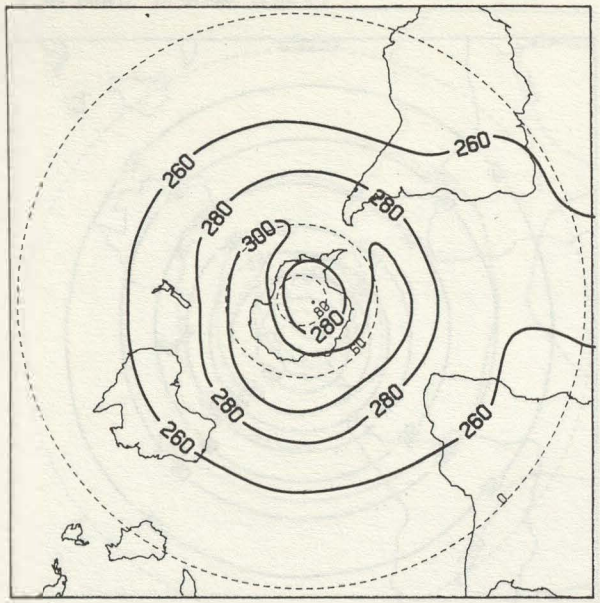
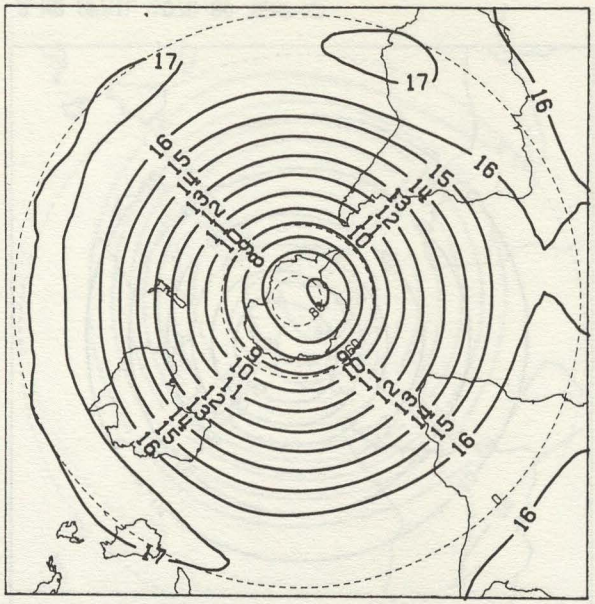


TOTAL OZONE MARCH 1979-86



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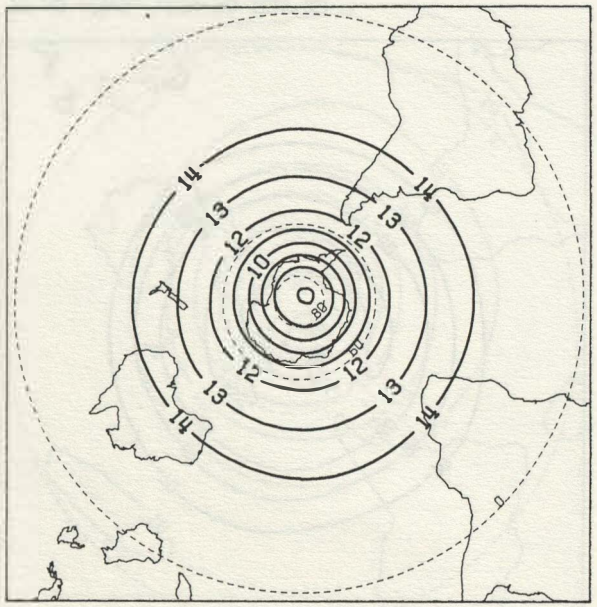

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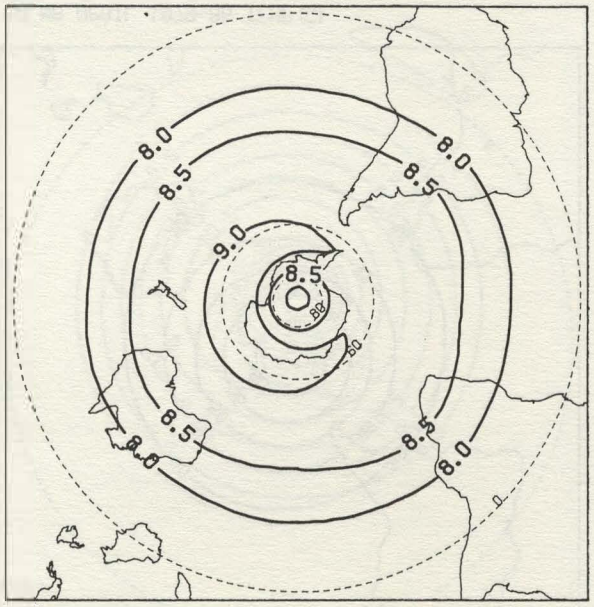

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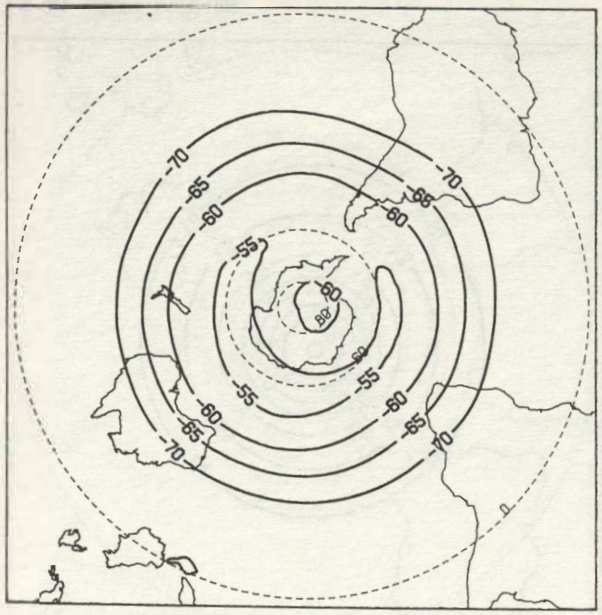

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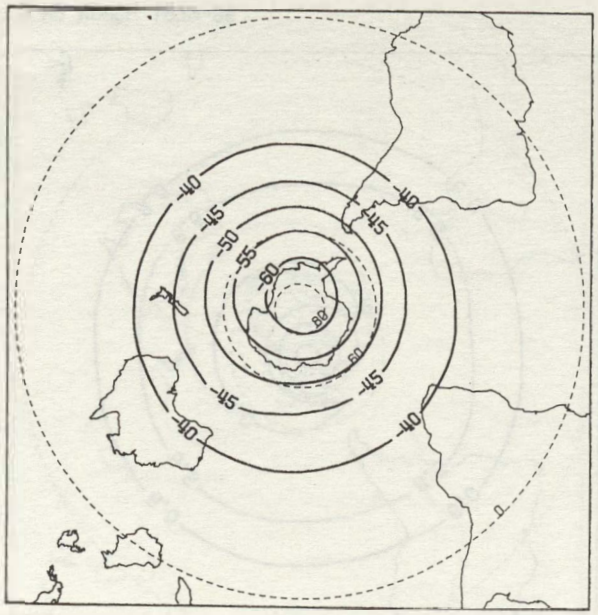

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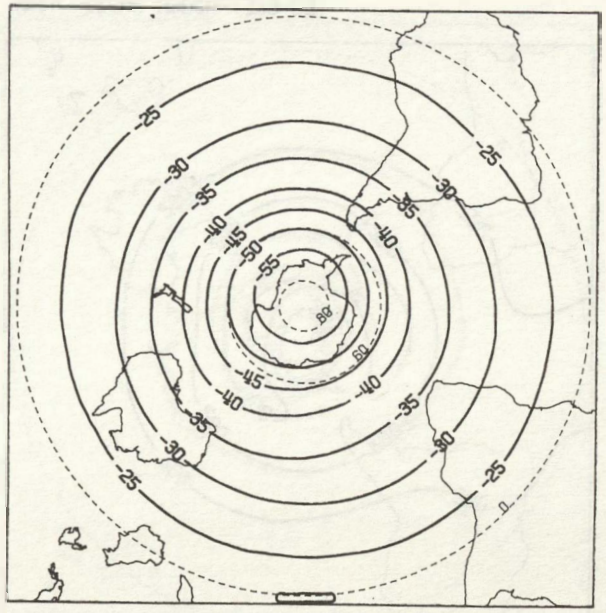

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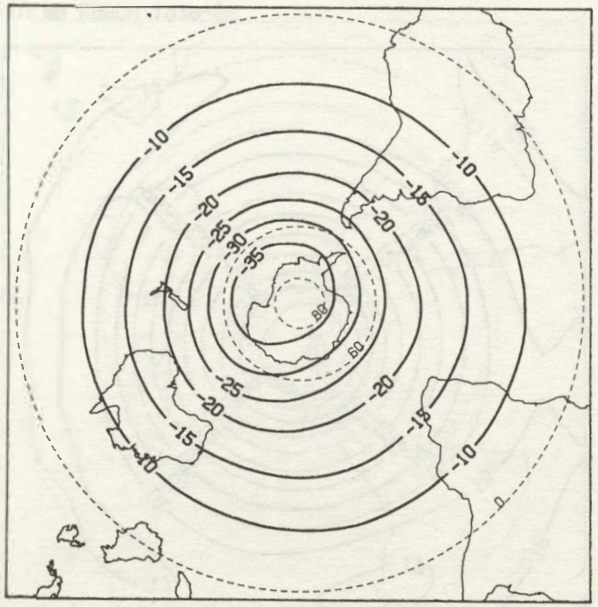

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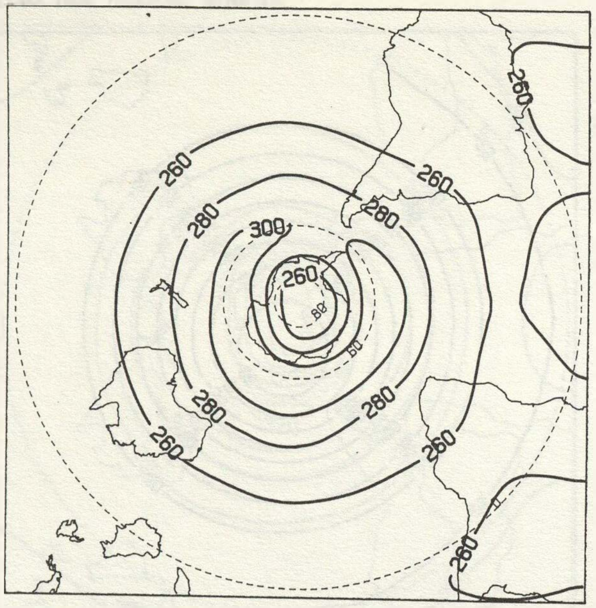
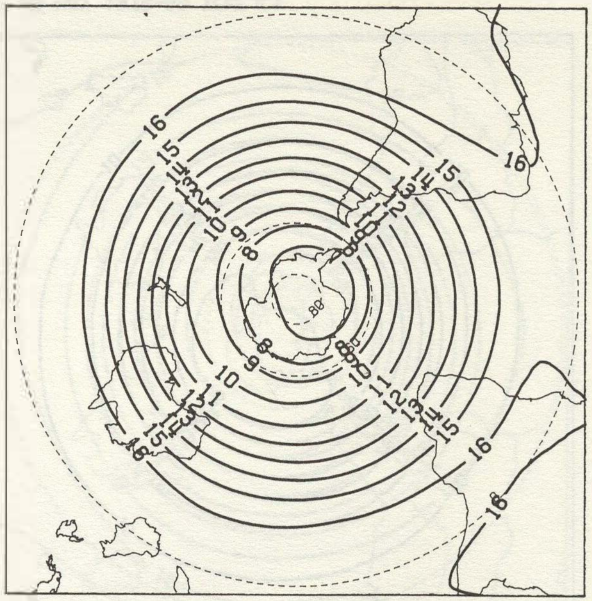


TOTAL OZONE APRIL 1979-86



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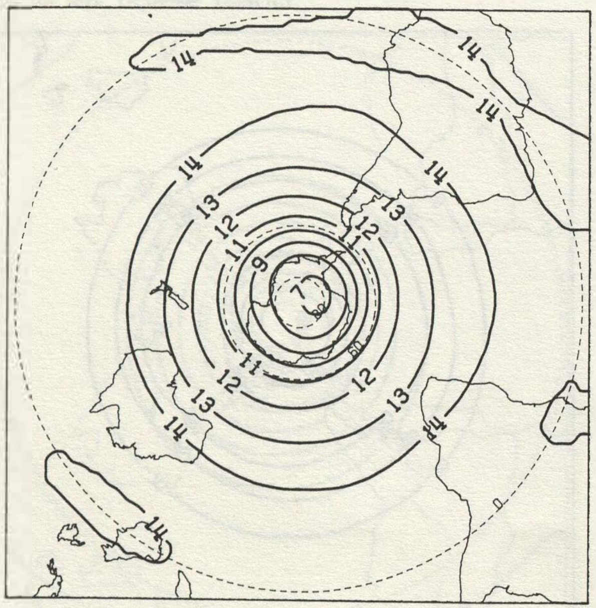

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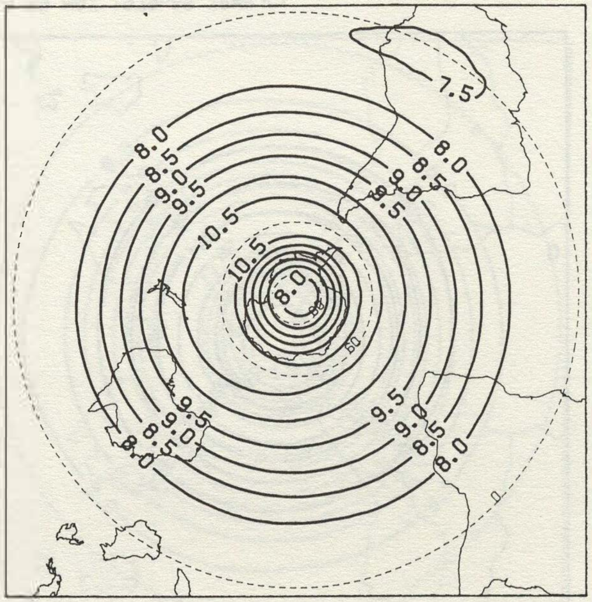

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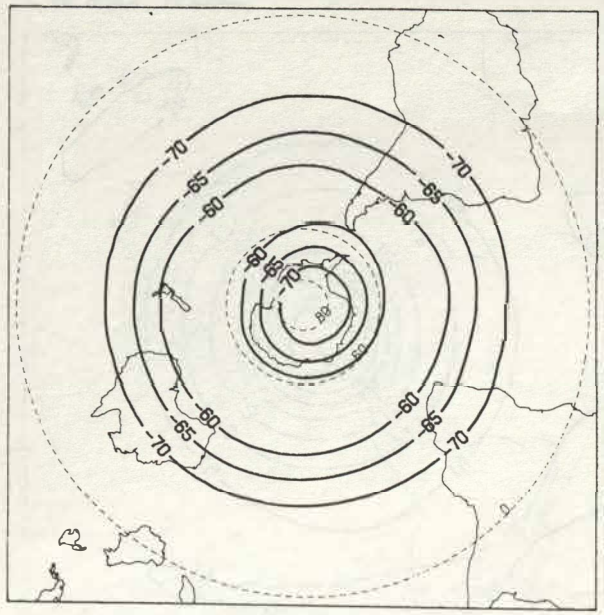
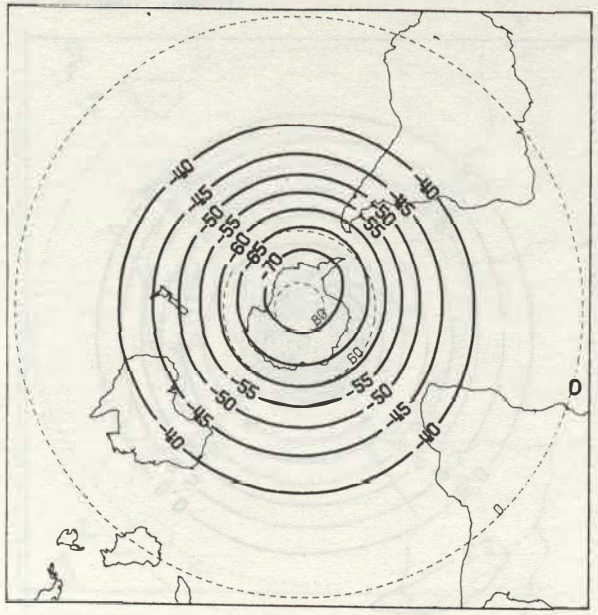


70 MB MAY 1979-86 TEMP (C)



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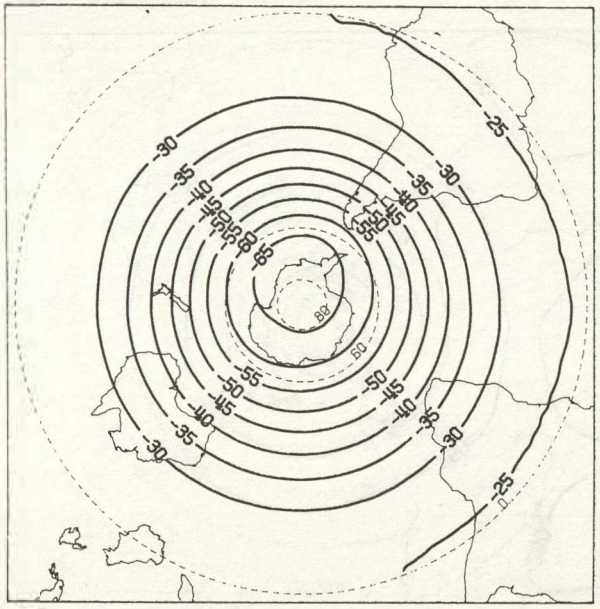

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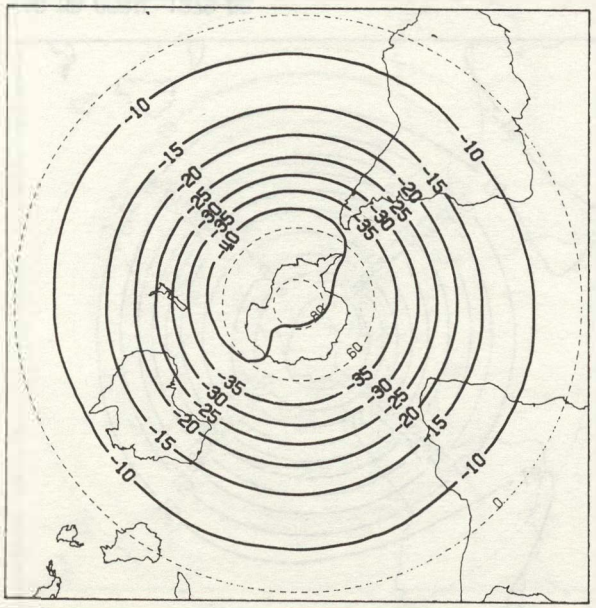
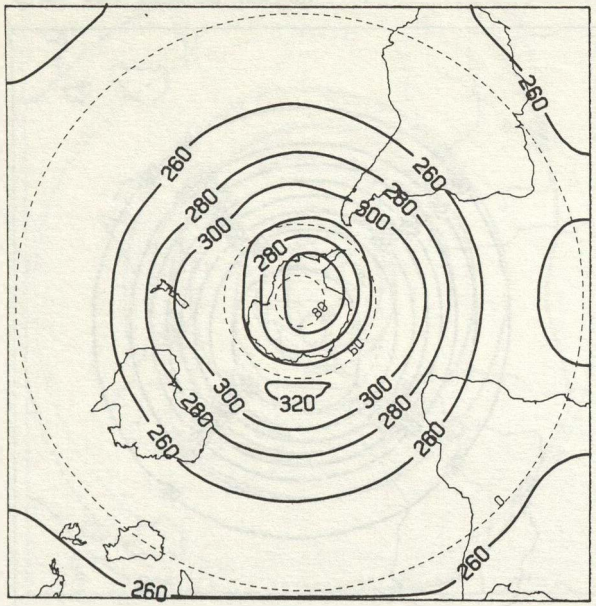
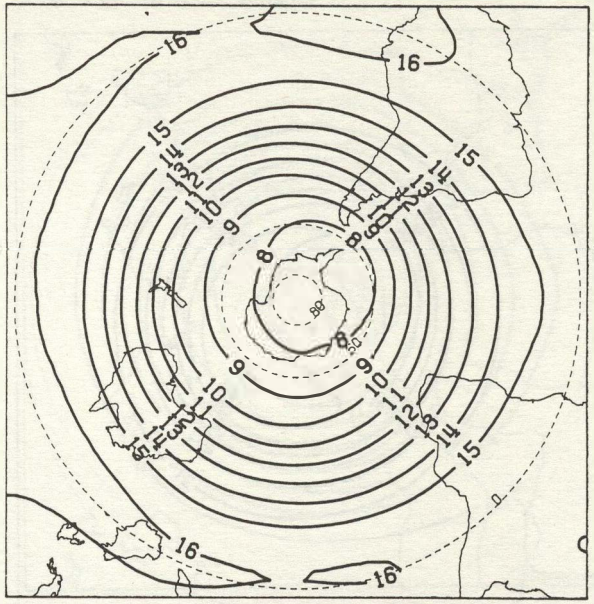


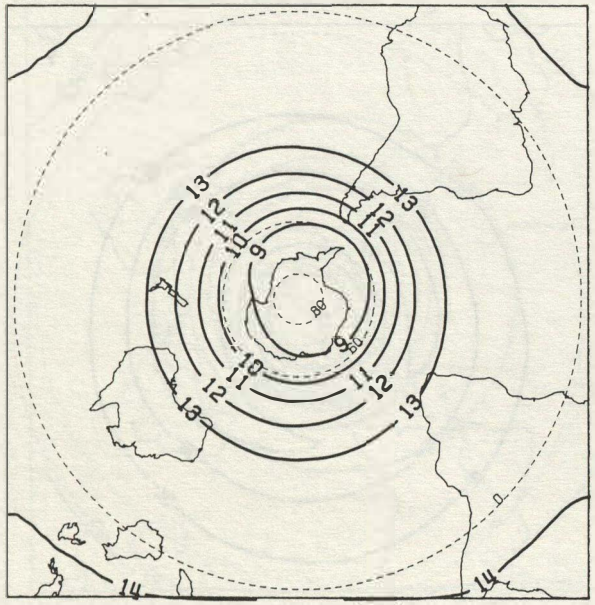
2 MB MAY 1979-86 TEMP (C)



TOTAL OZONE MAY 1979-86



10 MB MAY 1979-86



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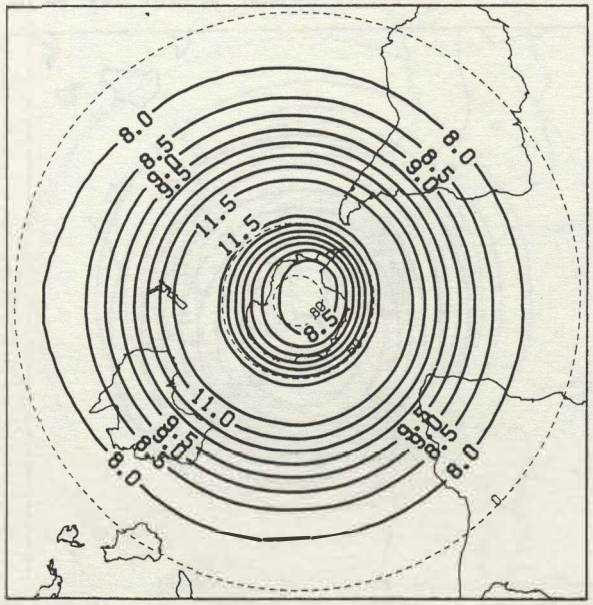

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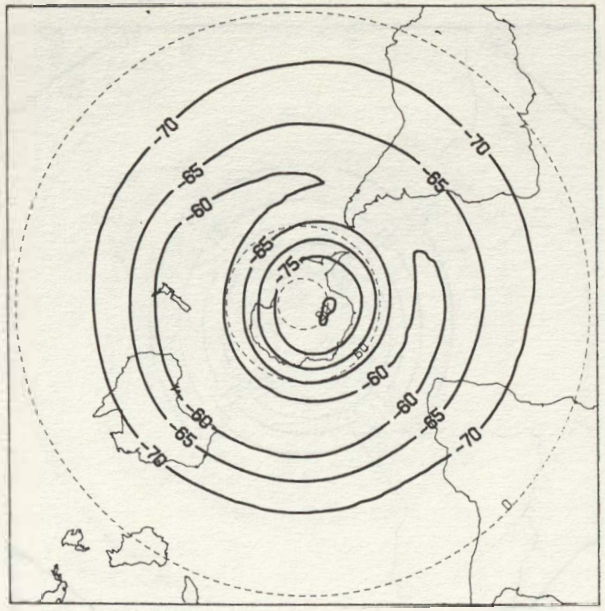

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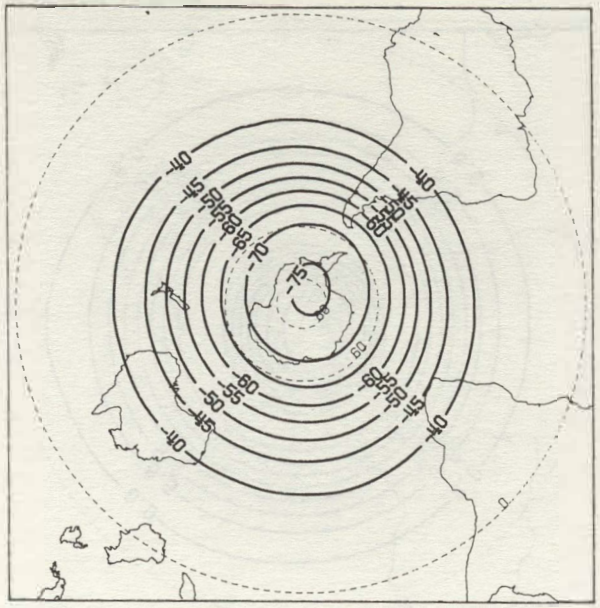

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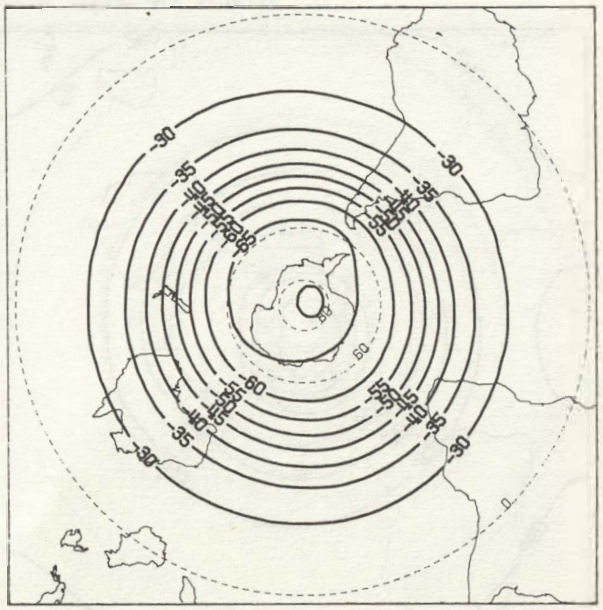

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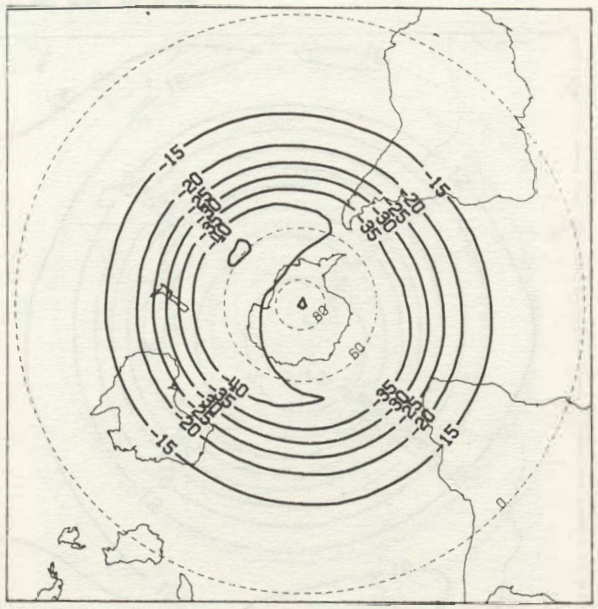

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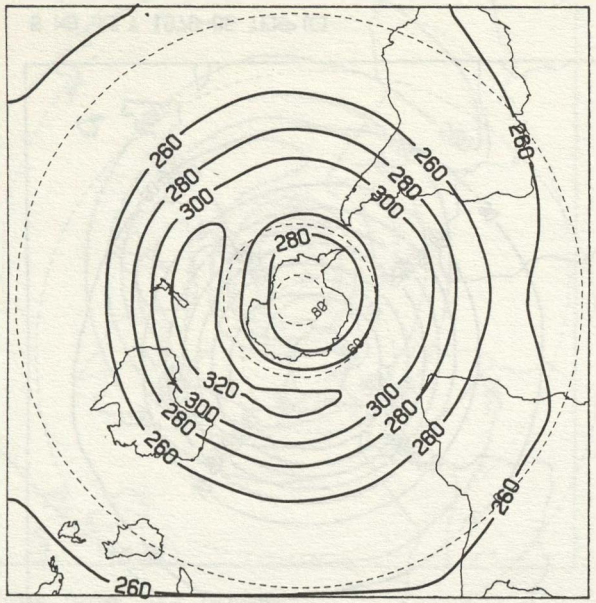
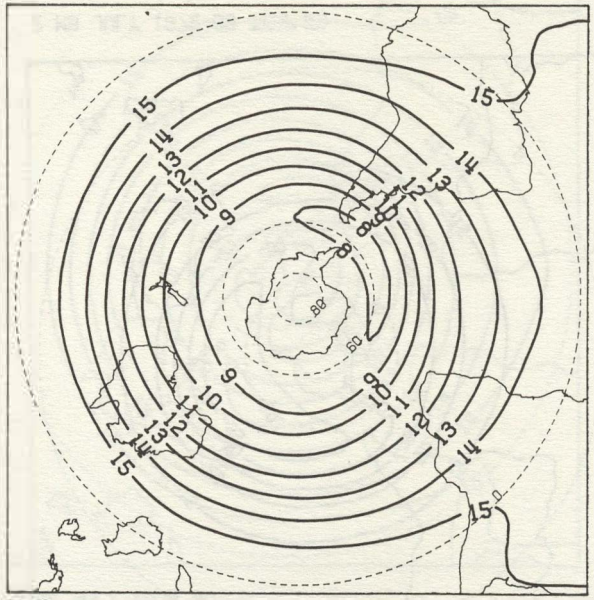


TOTAL OZONE JUNE 1979-86



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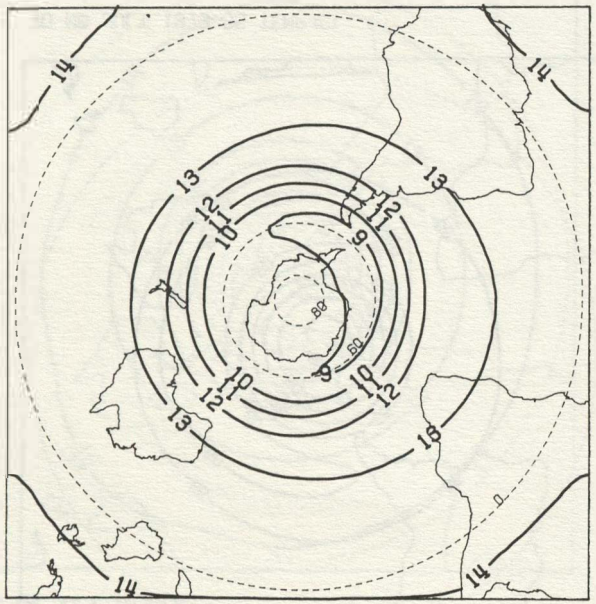

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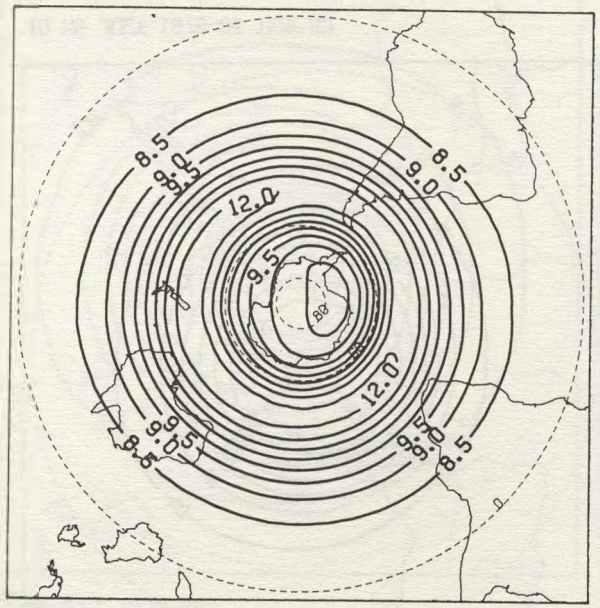

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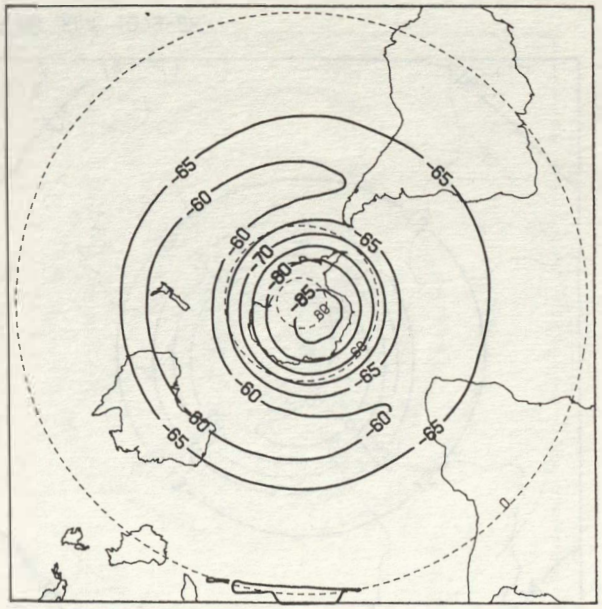

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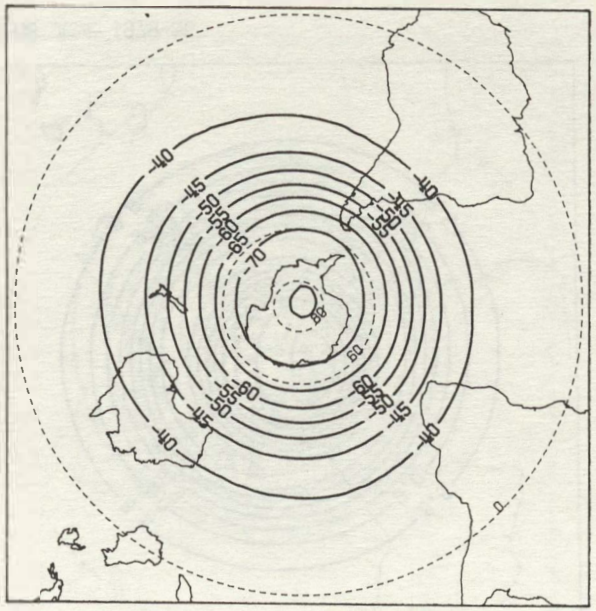

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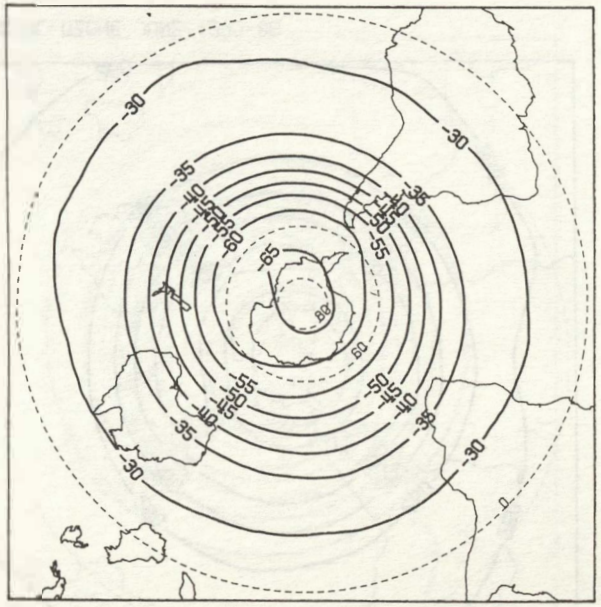

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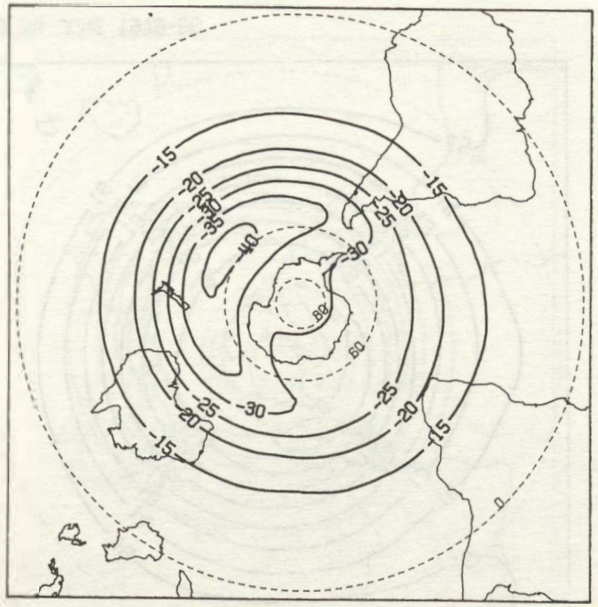

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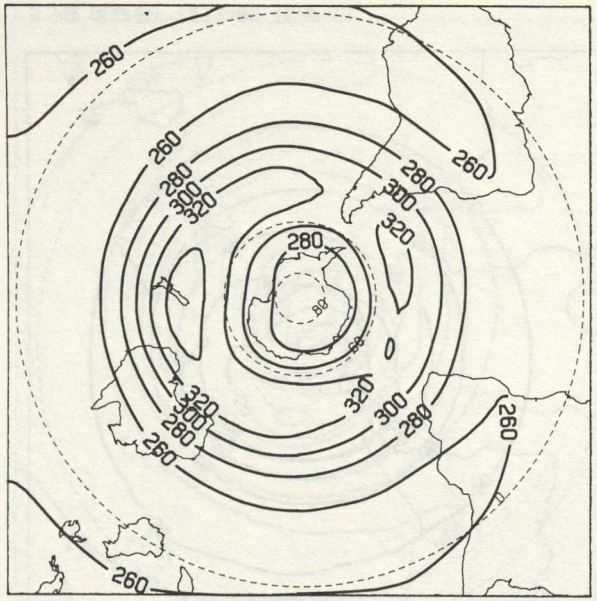

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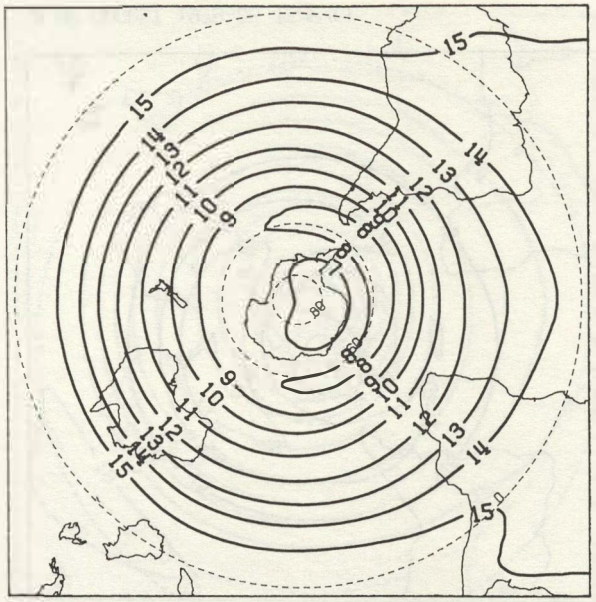

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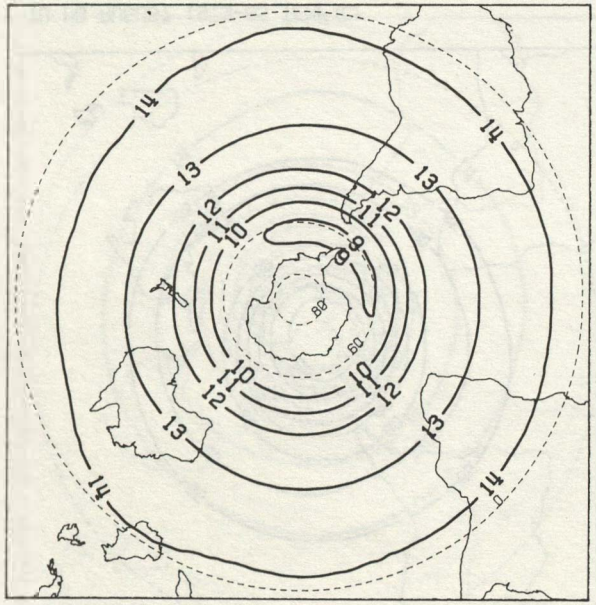

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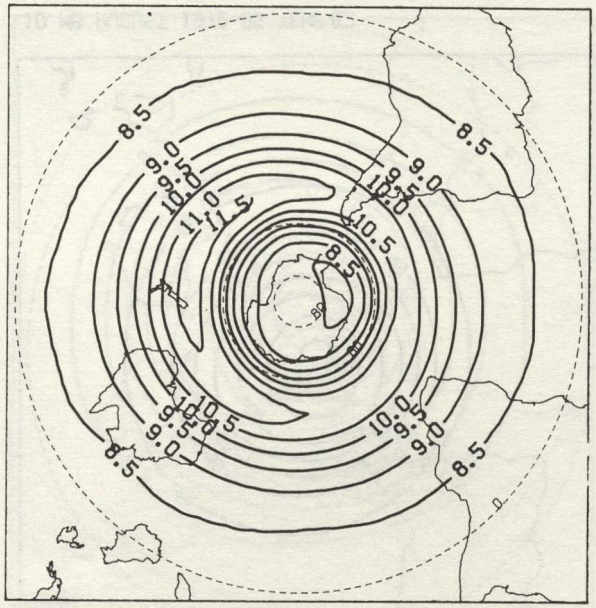

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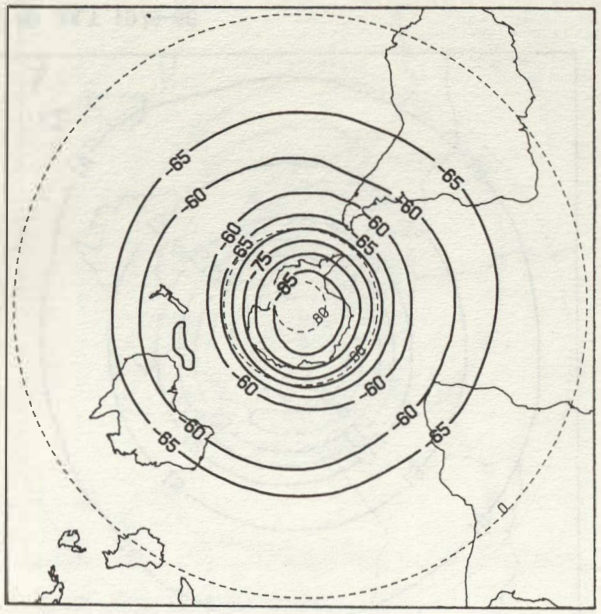
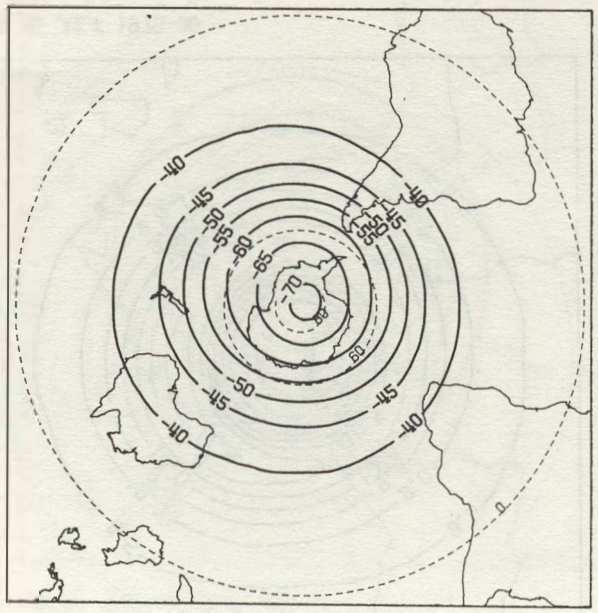


70 MB AUGUST 1979-85 TEMP (C)



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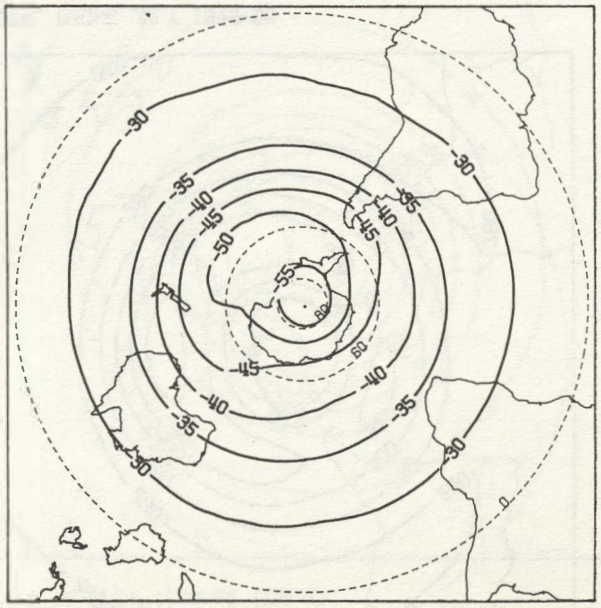

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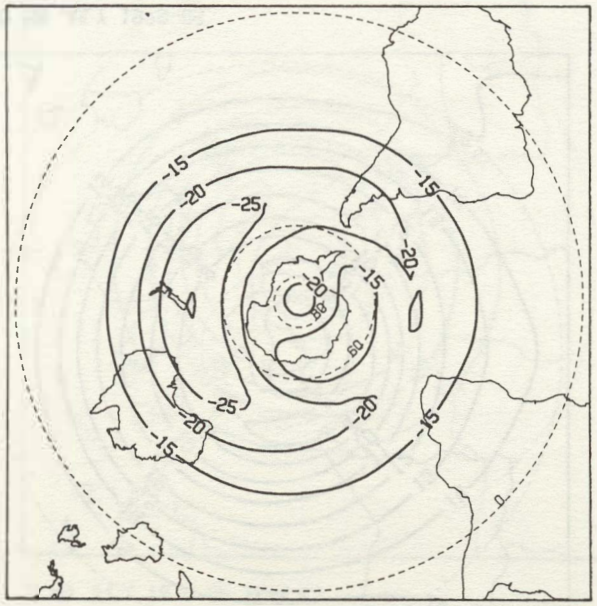

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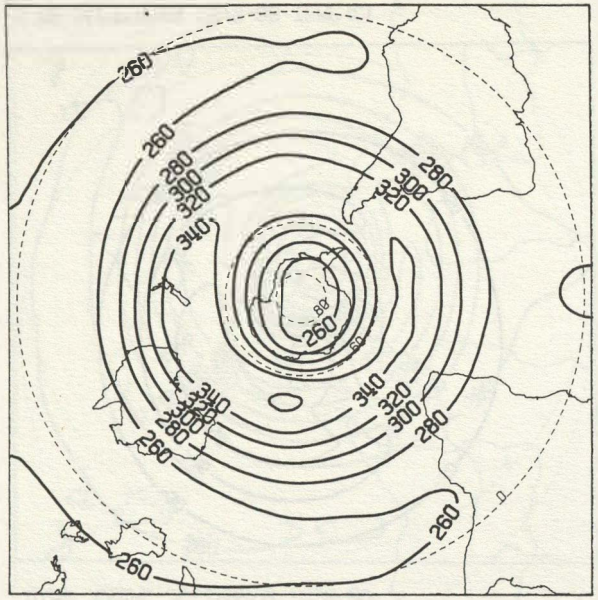
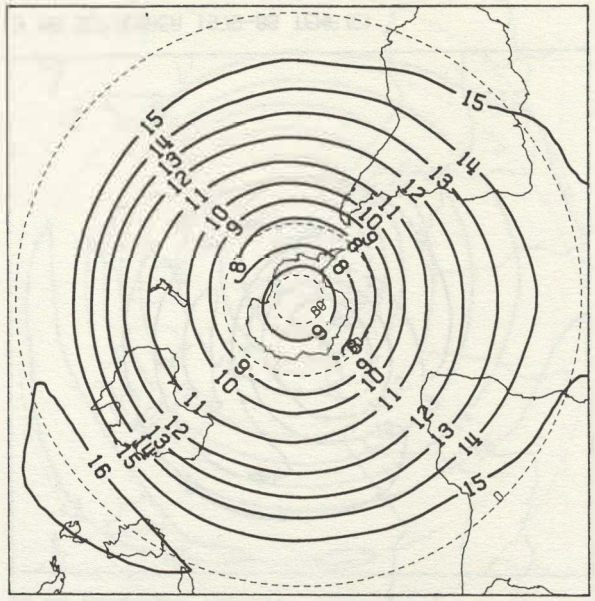


TOTAL OZONE AUGUST 1979-86



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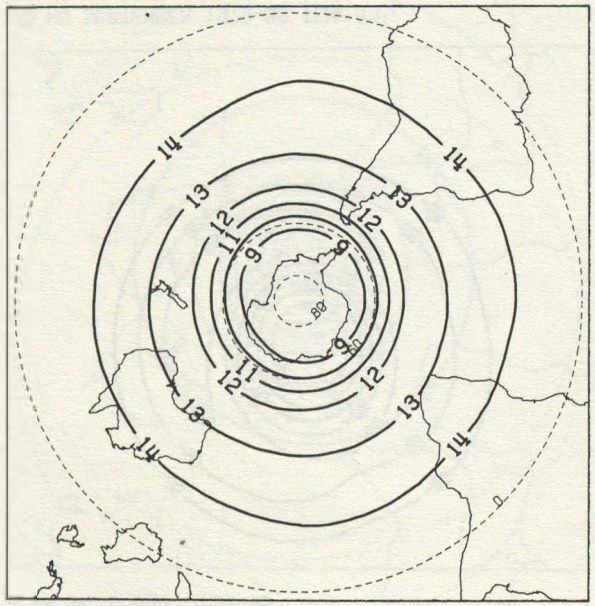

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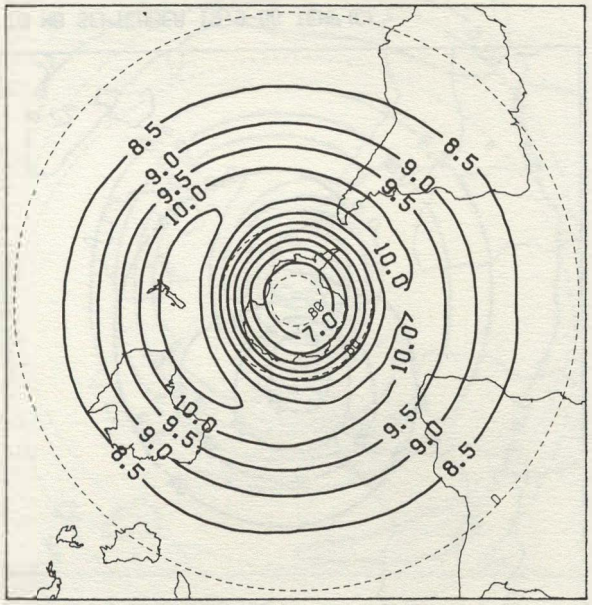

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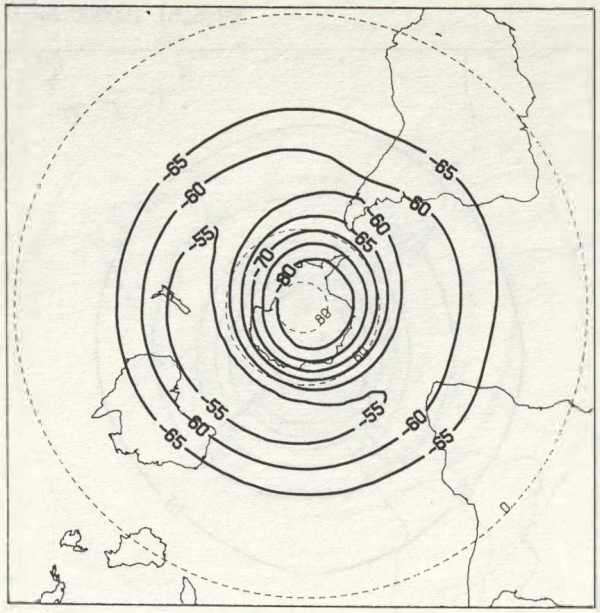
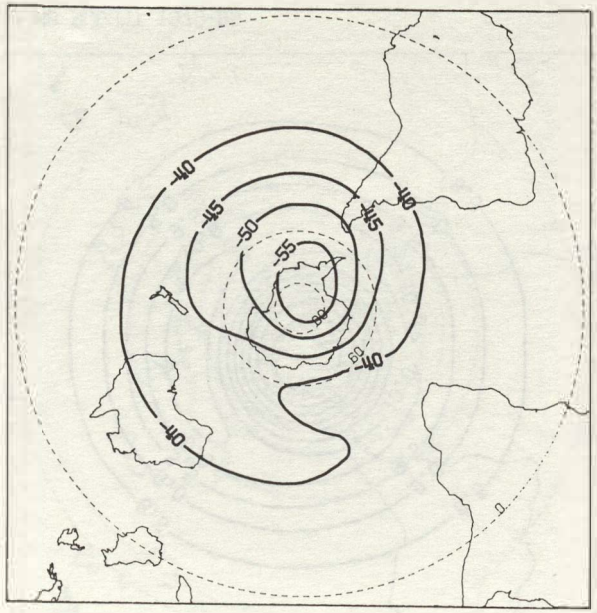


70 MB SEPTEMBER 1979-86 TEMP (C)



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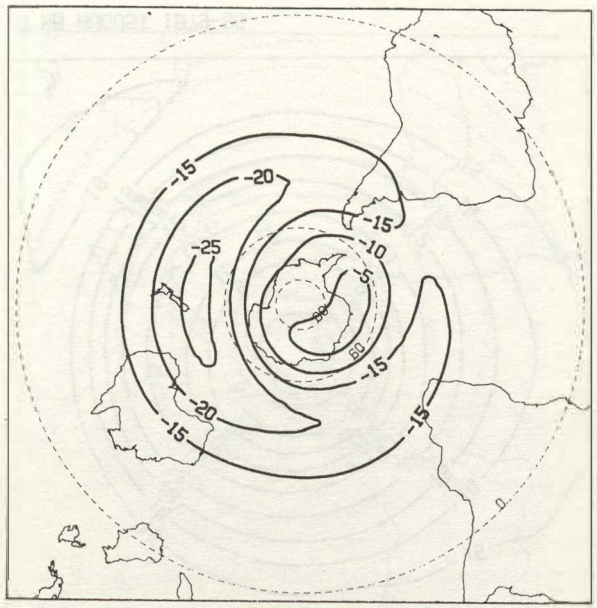

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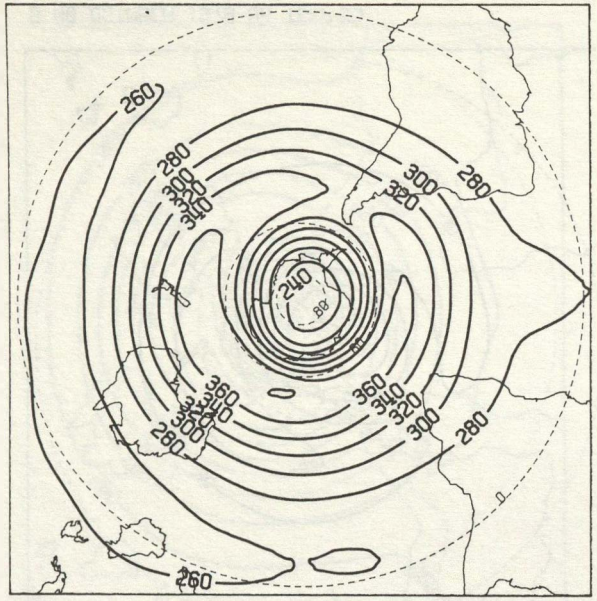
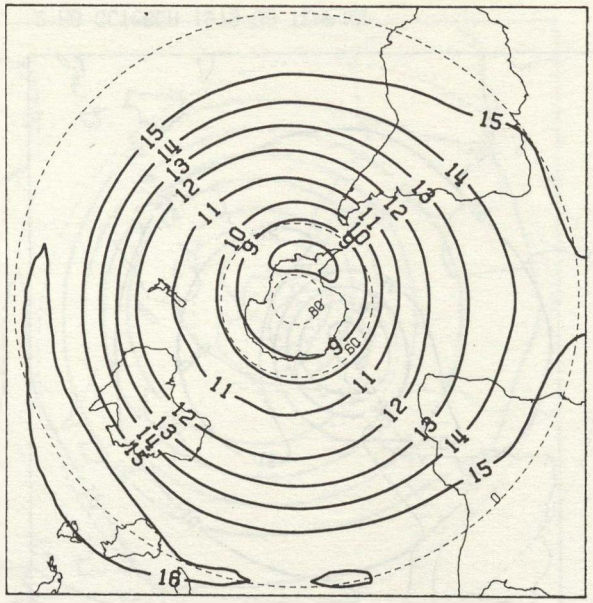


TOTAL OZONE SEPTEMBER 1979-86



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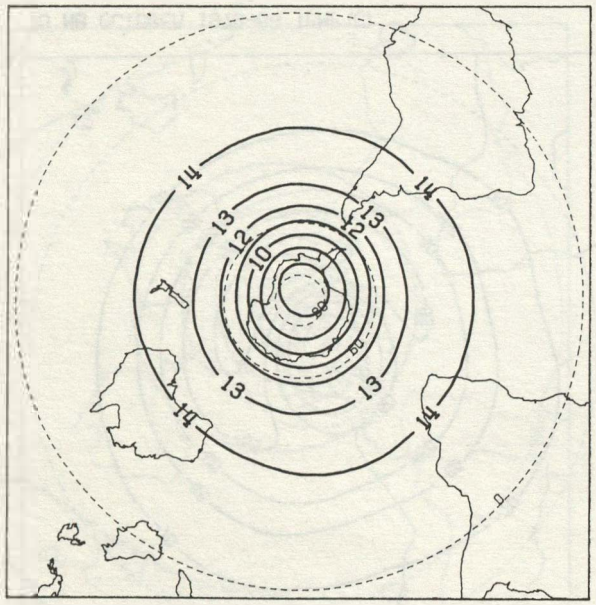

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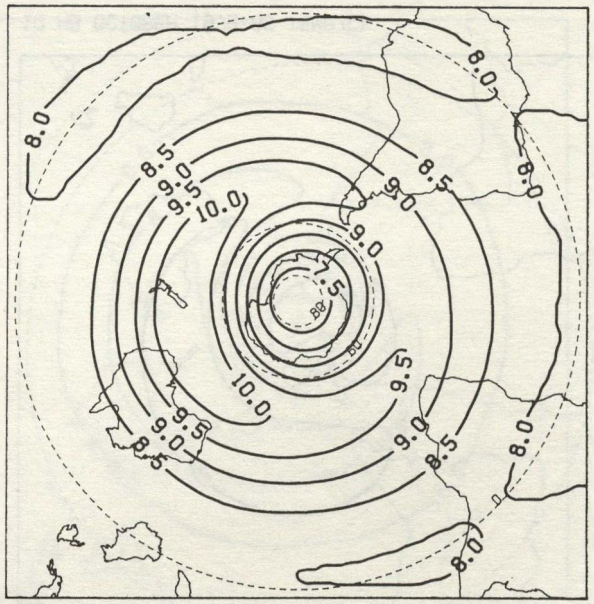

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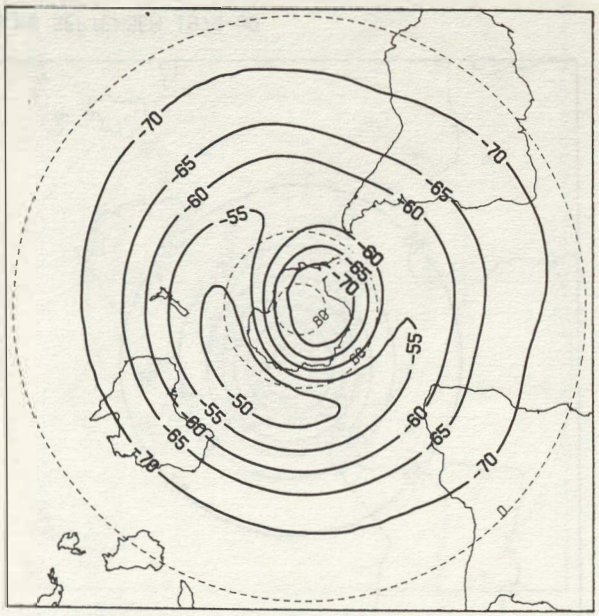
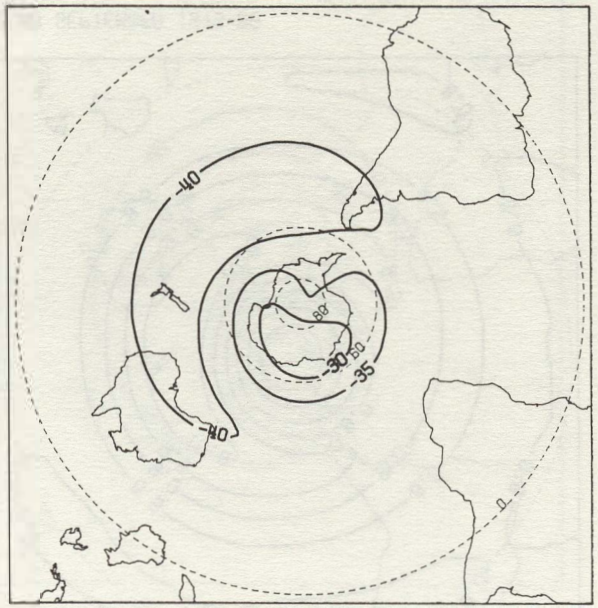


70 MB OCTOBER 1979-86 TEMP (C)



10 MB OCTOBER 1979-86 TEMP (C)

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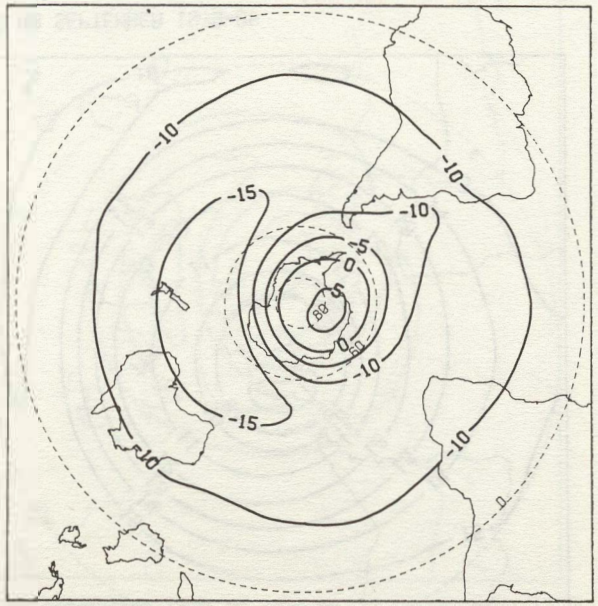

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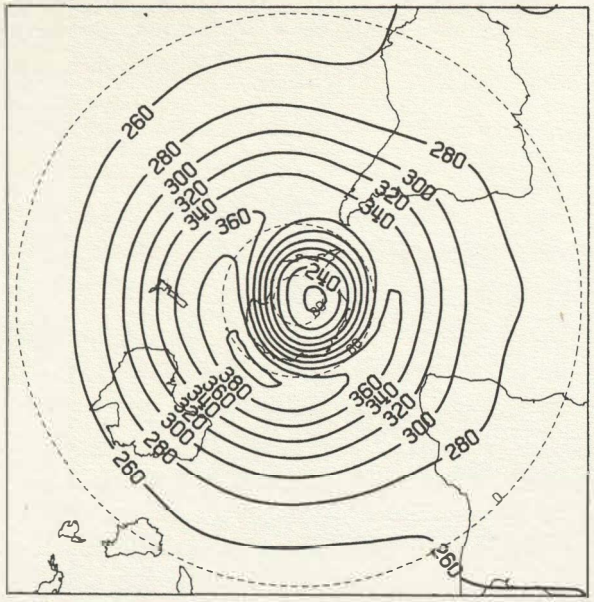
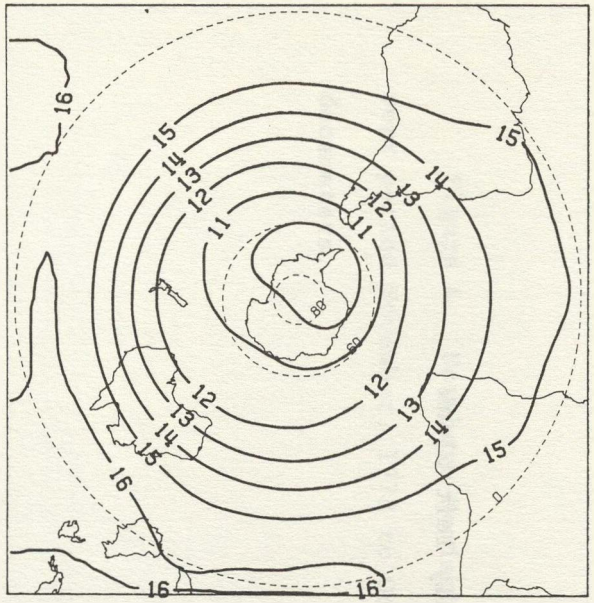


TOTAL OZONE OCTOBER 1979-86



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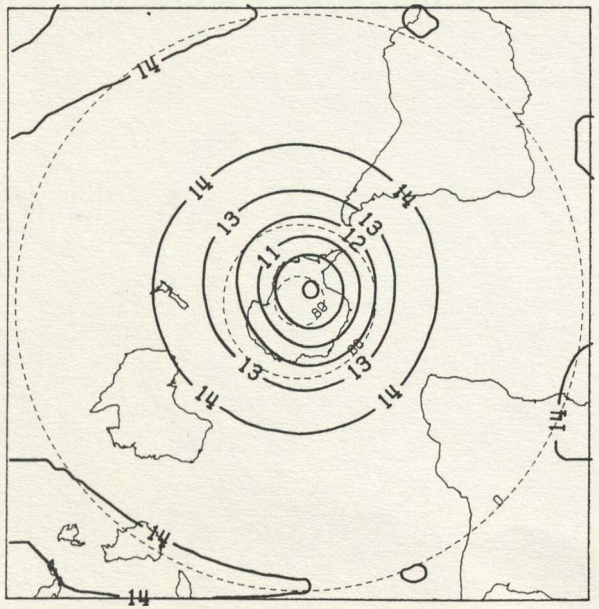

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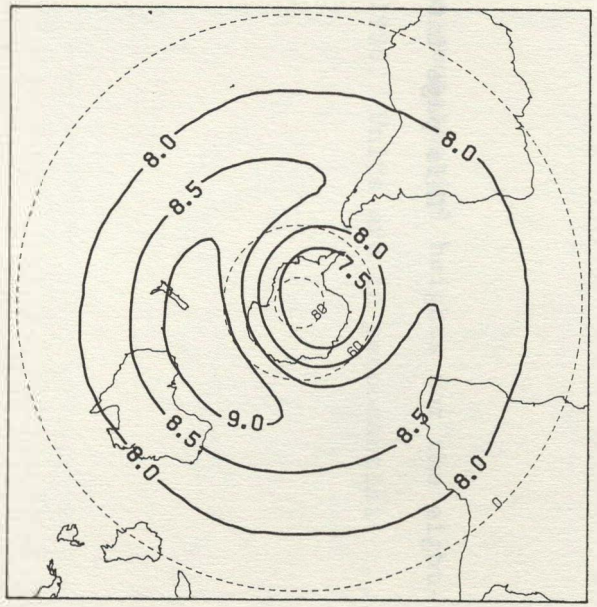

2 MB OCTOBER 1979-86

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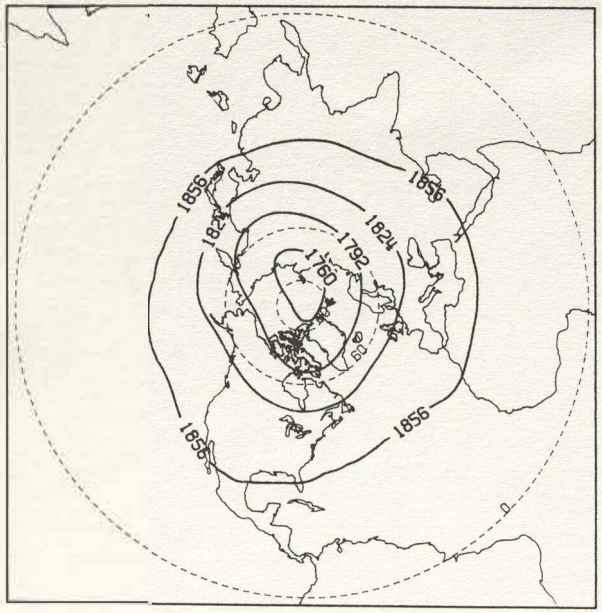
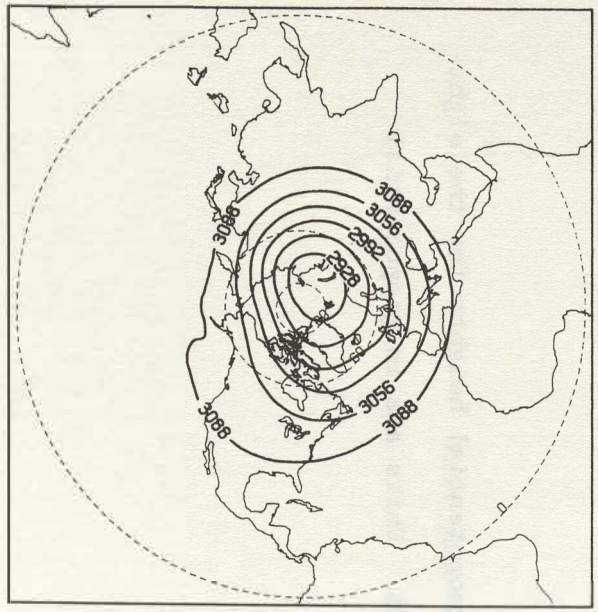
Figure 4. Northern Hemisphere mean geopotential heights for the eight-year period November, 1978 to October, 1986. Units are in geopotential decameters.



70 MB NOVEMBER 1978-85 (GP DM, INTERVAL: 320 M)



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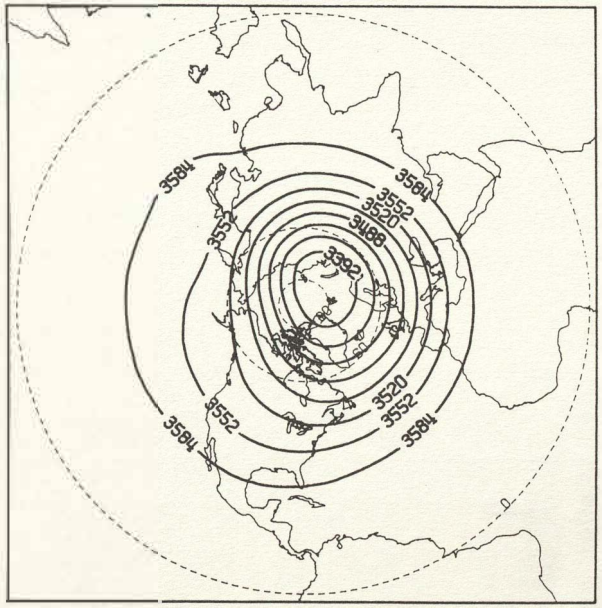

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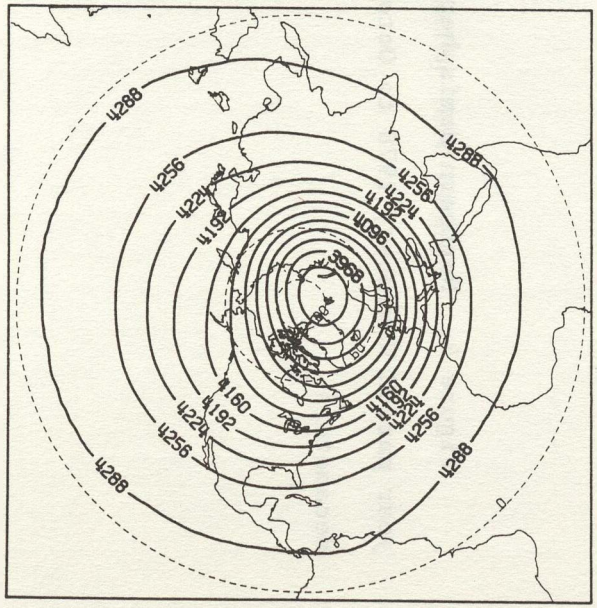

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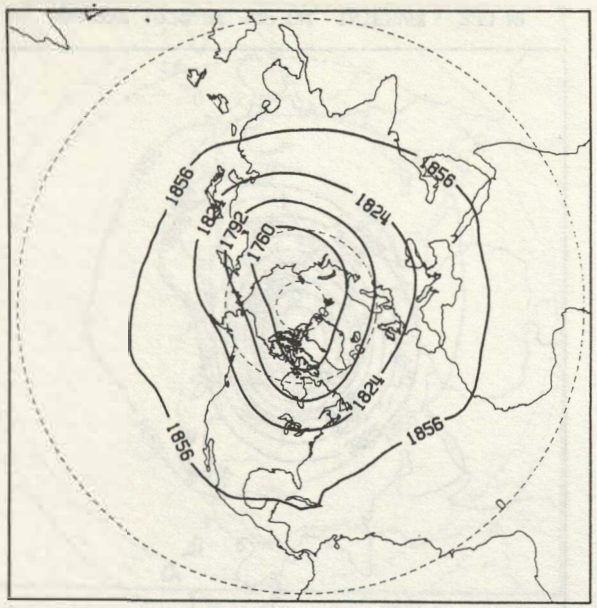
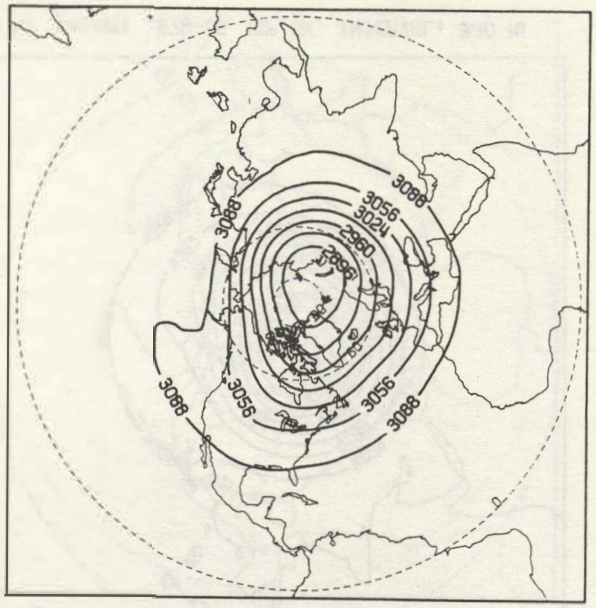


70 MB DECEMBER 1978-85 (GP DM, INTERVAL: 320 M)



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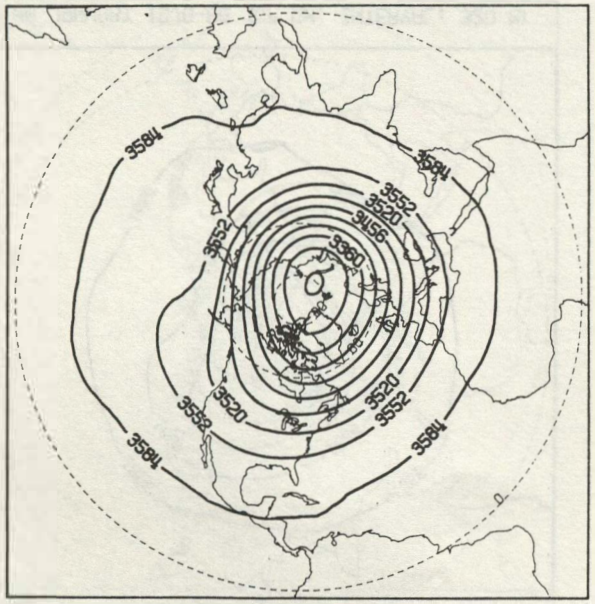

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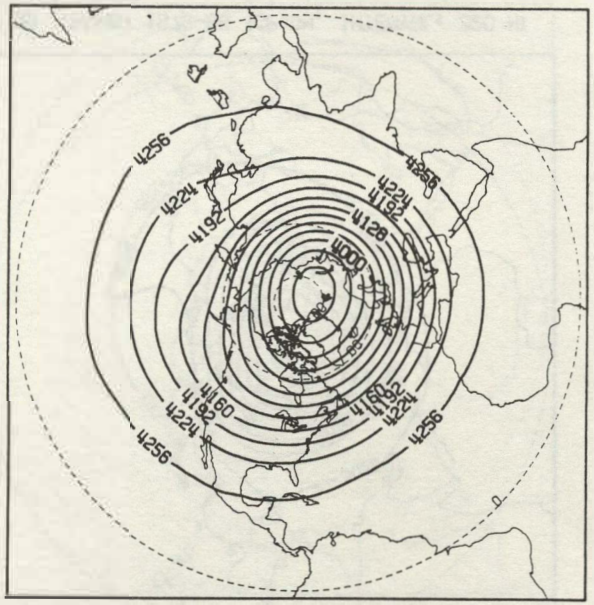

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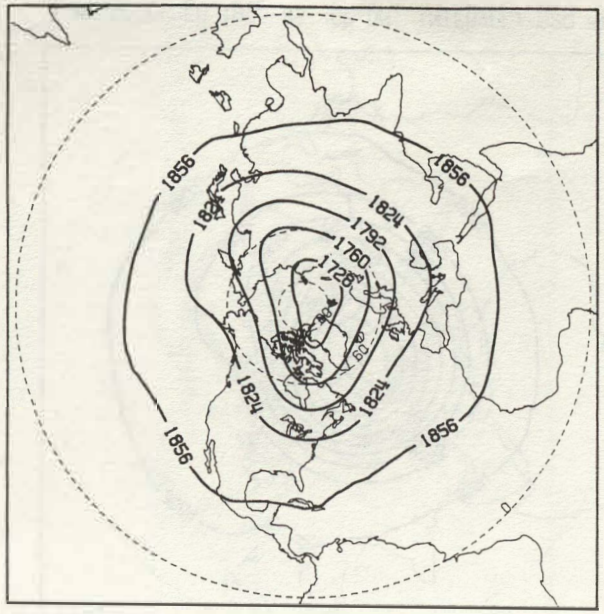
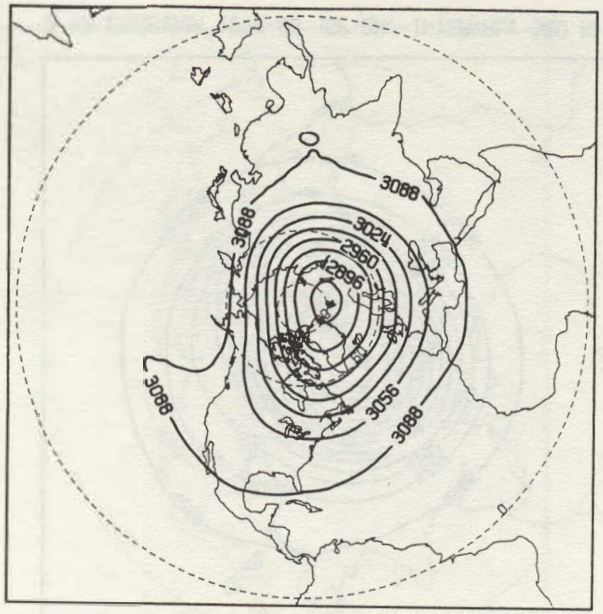


70 MB JANUARY 1979-86 (GP DM, INTERVAL: 320 M)



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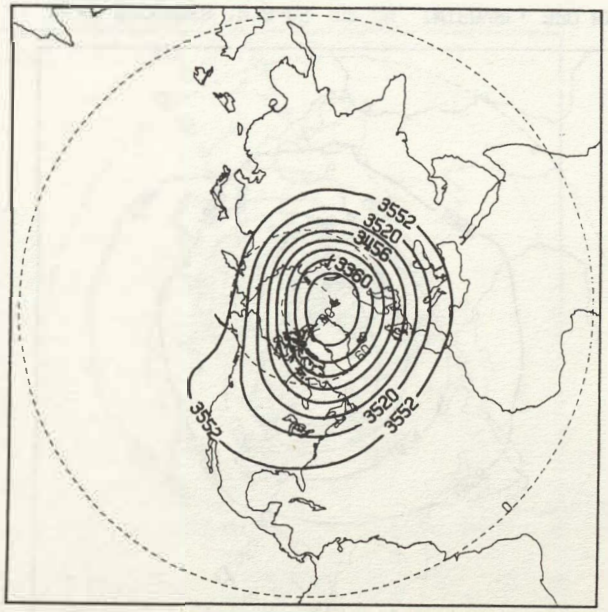

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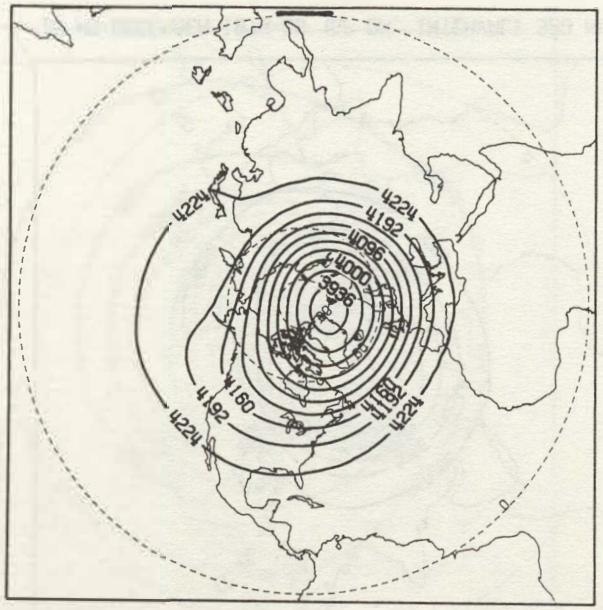

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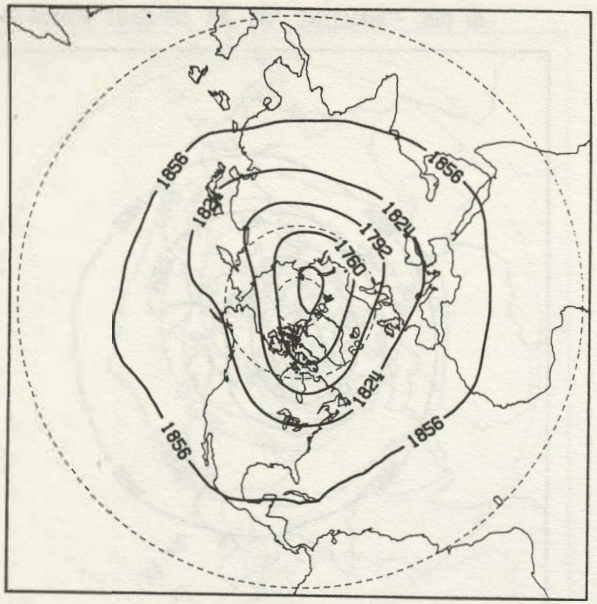
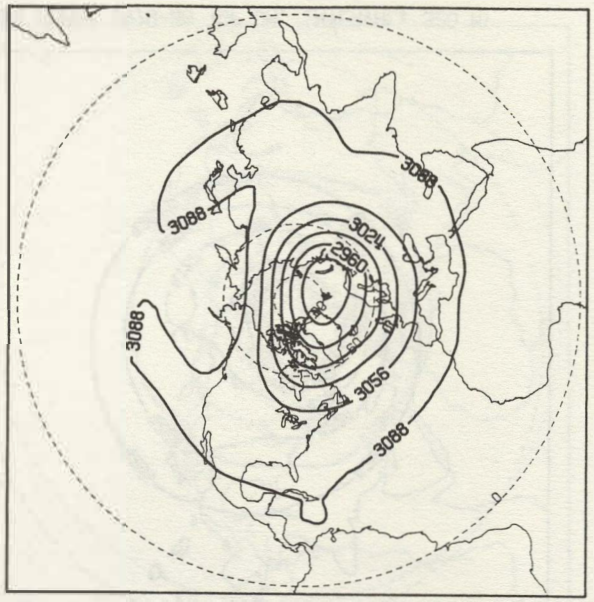


70 MB FEBRUARY 1979-86 (GP DM, INTERVAL: 320 M)



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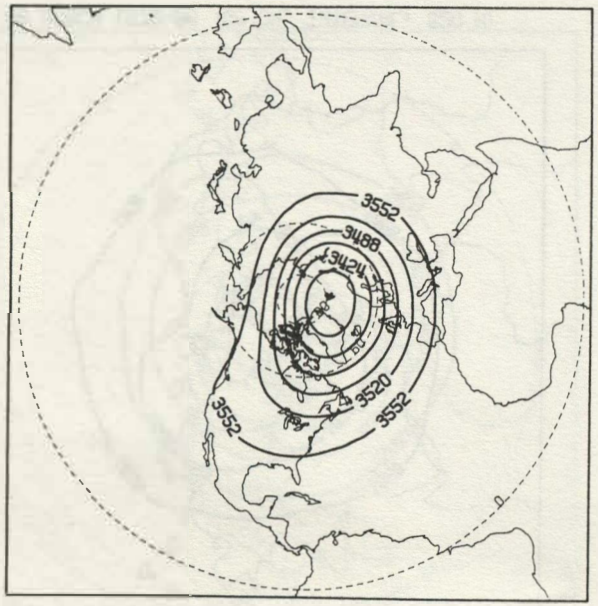
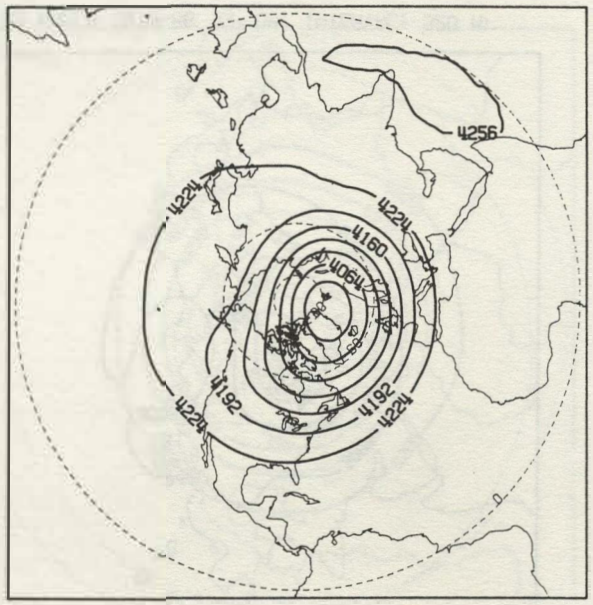
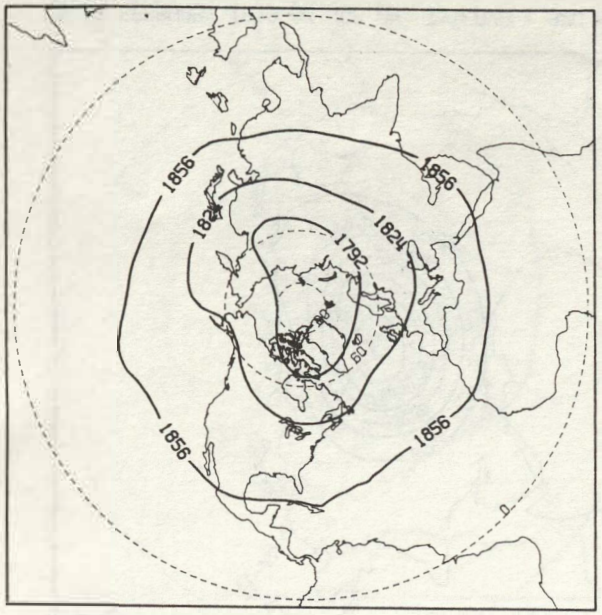


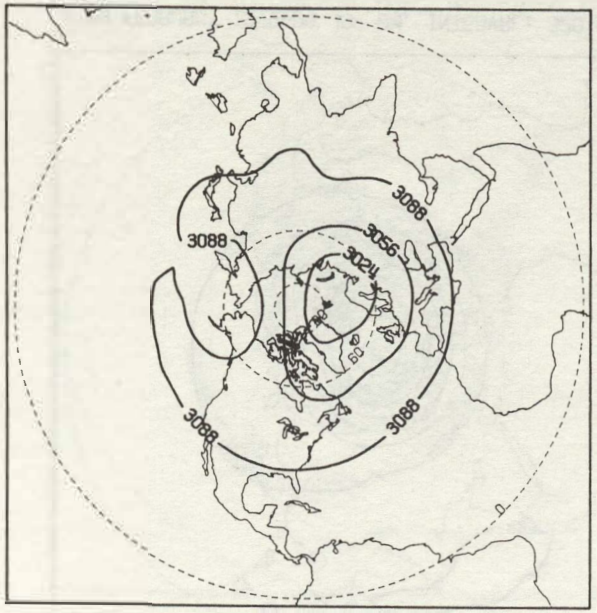
5 MB FEBRUARY 1979-86 (GP DM, INTERVAL: 320 M)



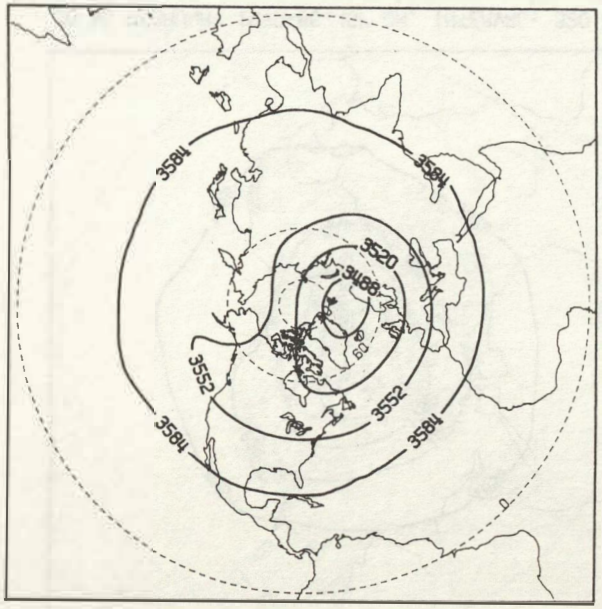
2 MB FEBRUARY 1979-86 (GP DM, INTERVAL: 320 M)



70 MB MARCH 1979-86 (GP DM, INTERVAL: 320 M)



10 MB MARCH 1979-86 (GP DM, INTERVAL: 320 M)



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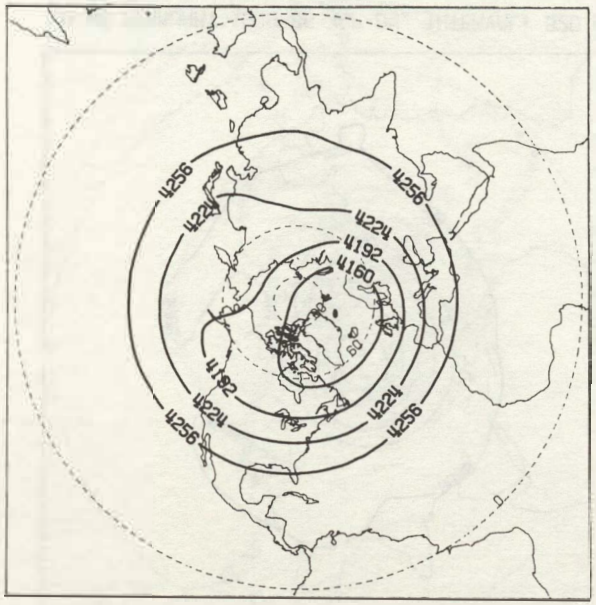

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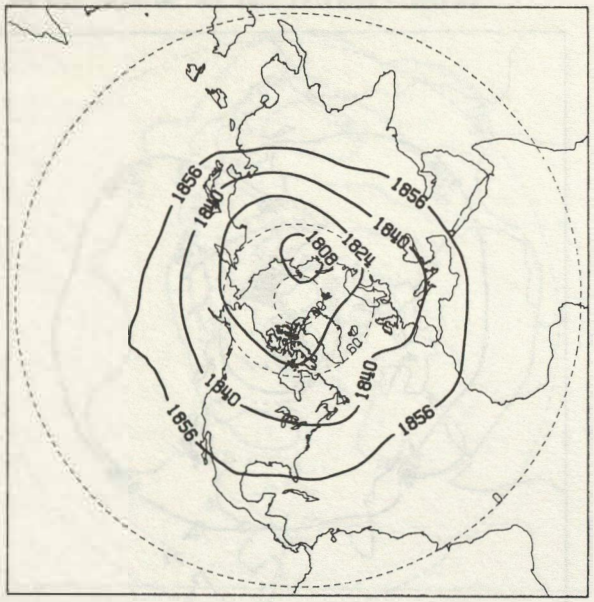
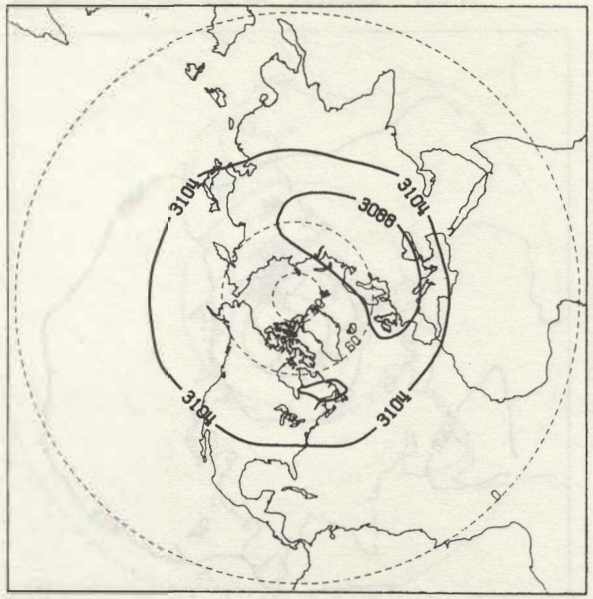


70 MB APRIL 1979-86 (GP DM, INTERVAL: 160 M)



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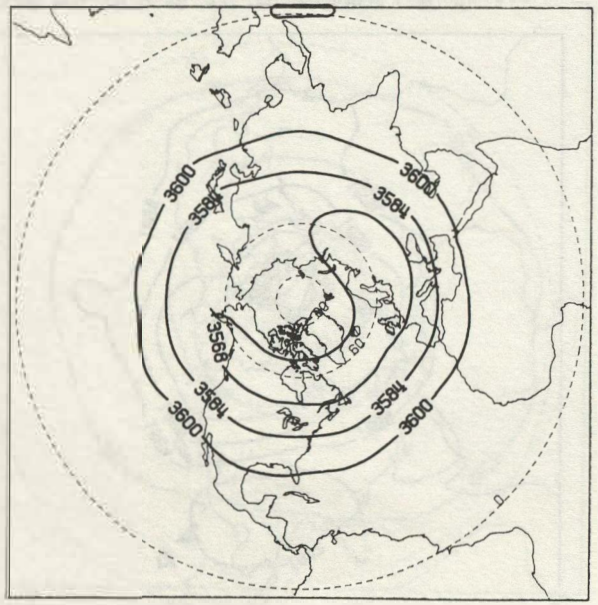

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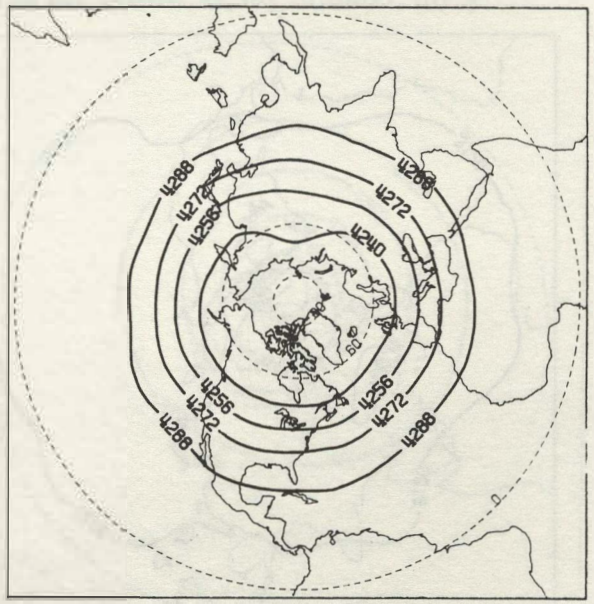

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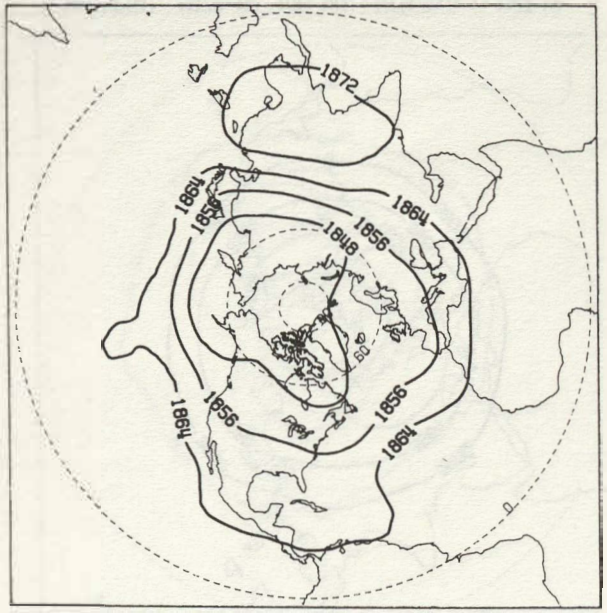
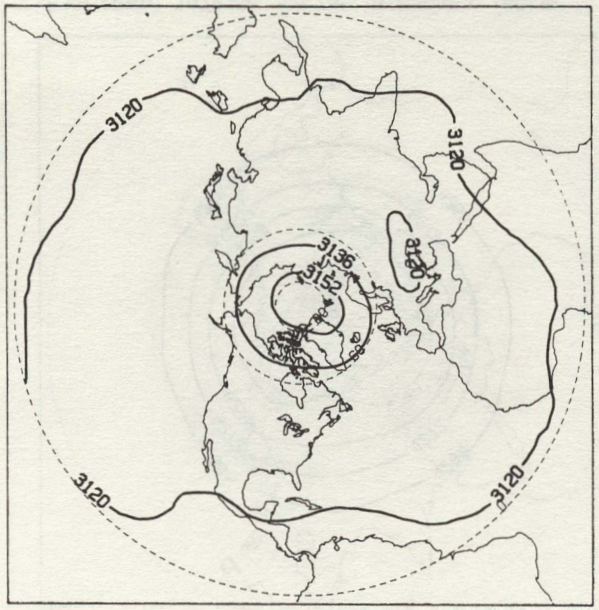


70 MB MAY 1979-86 (GP DM, INTERVAL: 80 M)



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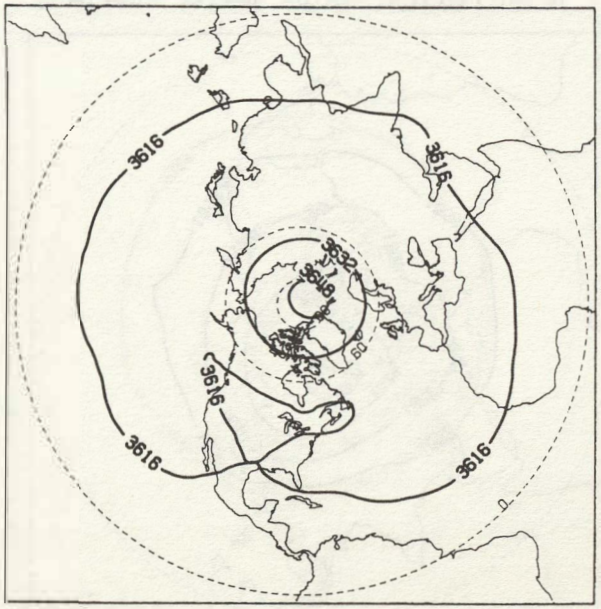

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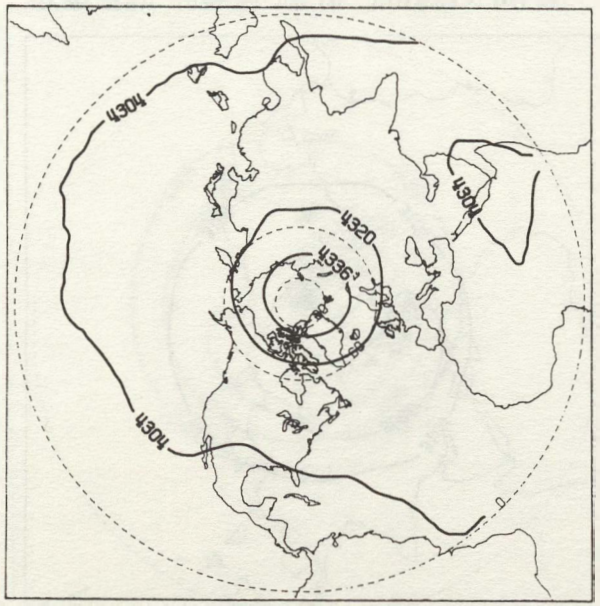

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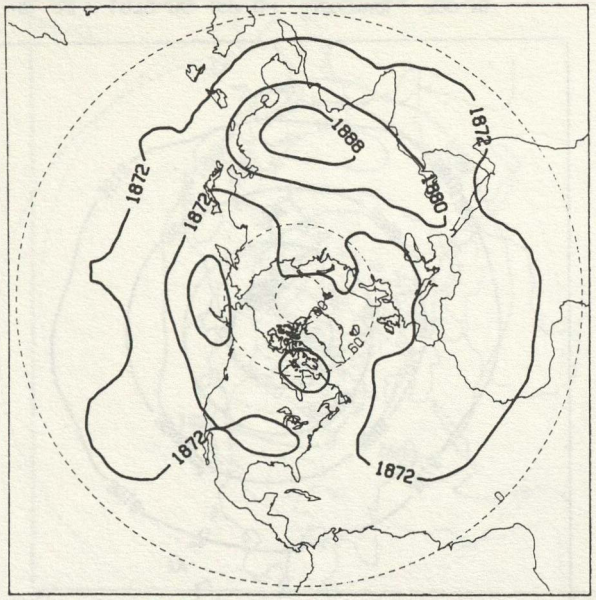
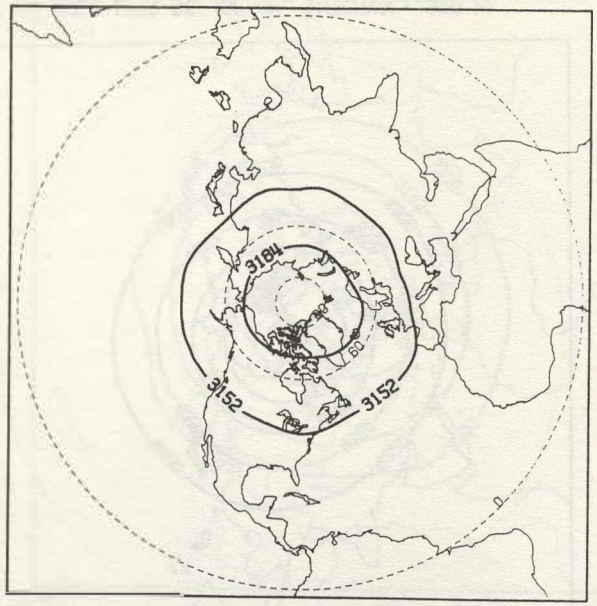
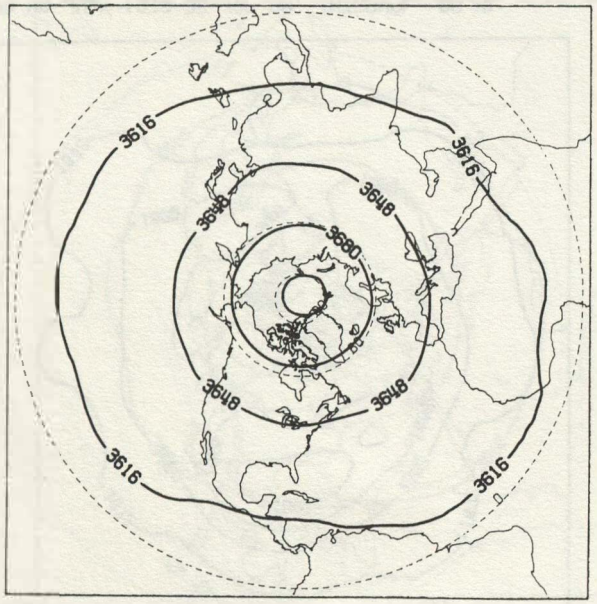


70 MB JUNE 1979-86 (GP DM, INTERVAL: 80 M)



10 MB JUNE 1979-86 (GP DM, INTERVAL: 320 M)



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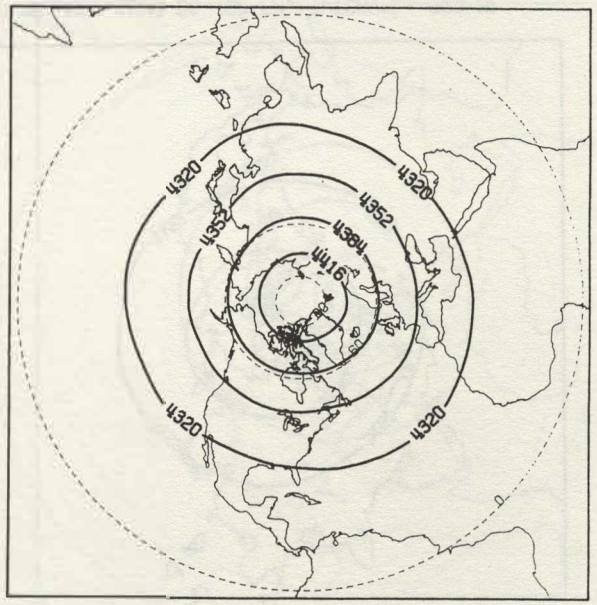

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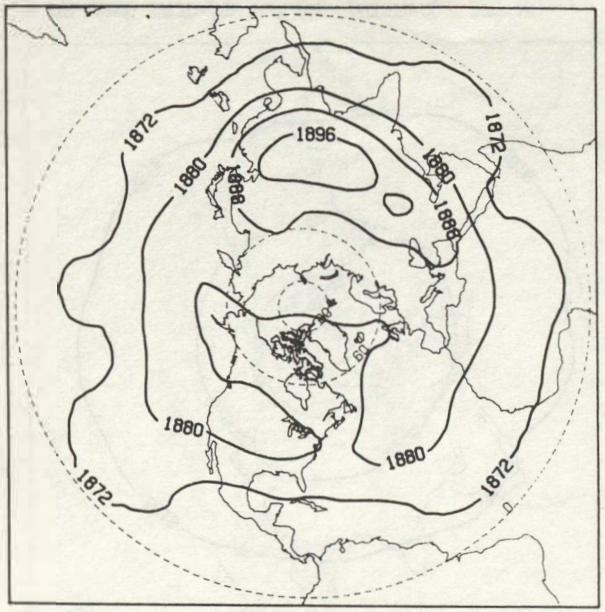
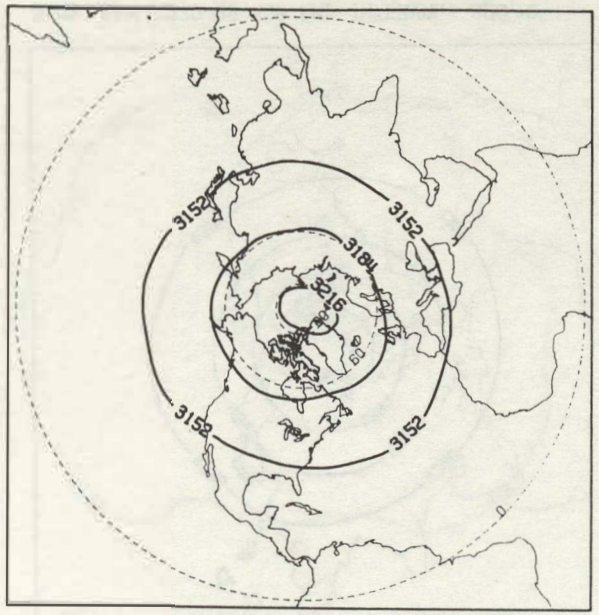


70 MB JULY 1979-86 (GP DM, INTERVAL: 80 M)



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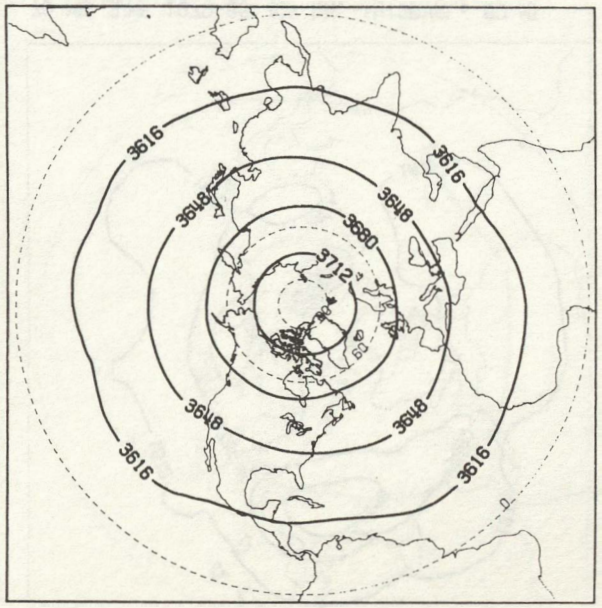

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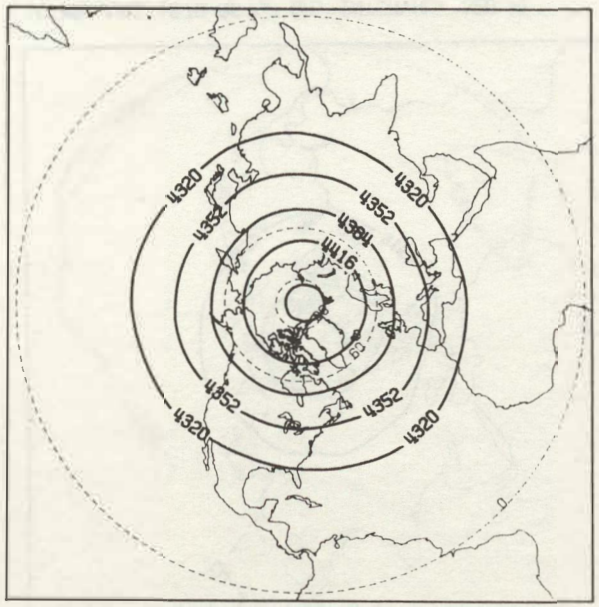
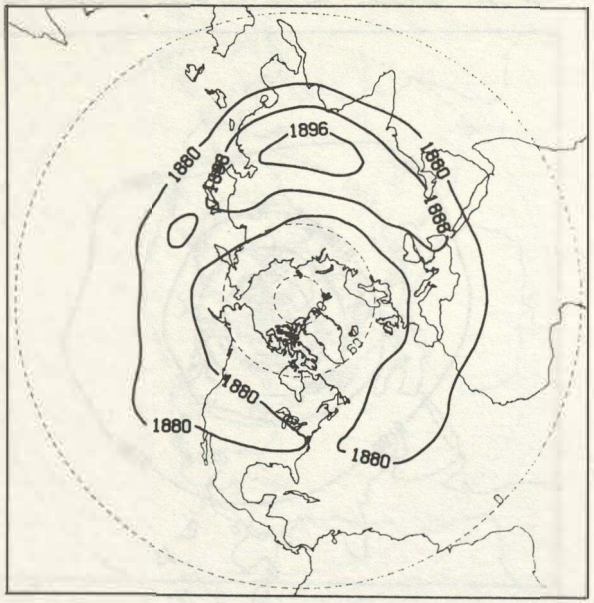
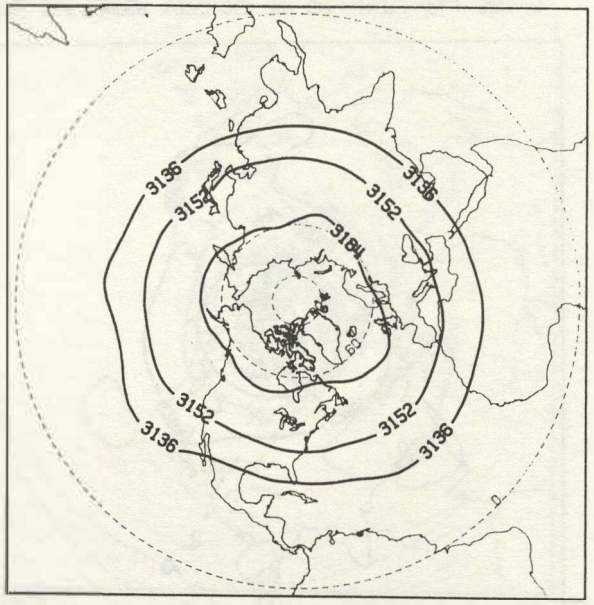


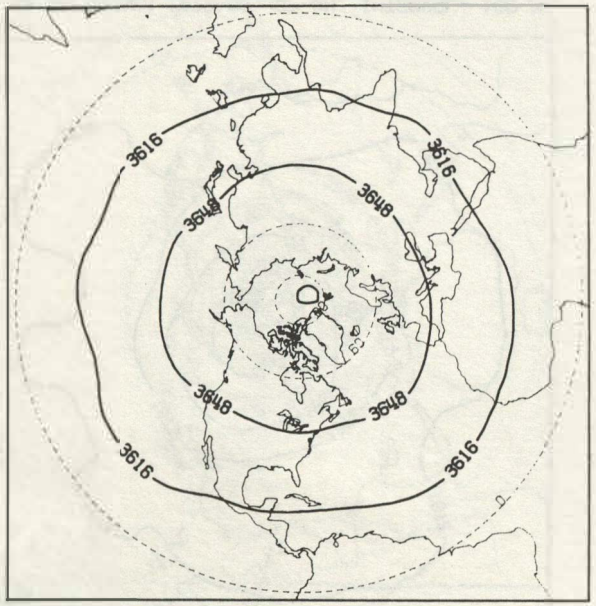
2 MB JULY 1979-86 (GP DM, INTERVAL: 320 M)



70 MB AUGUST 1979-86 (GP DM, INTERVAL: 80 M)



10 MB AUGUST 1979-86 (GP DM, INTERVAL: 160 M)



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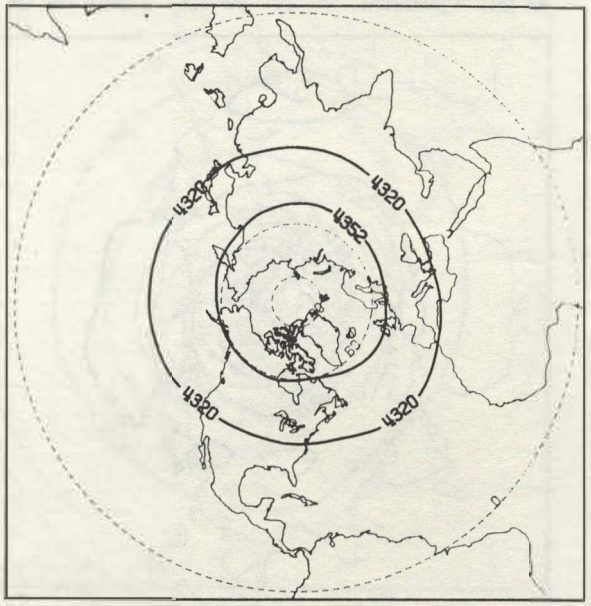
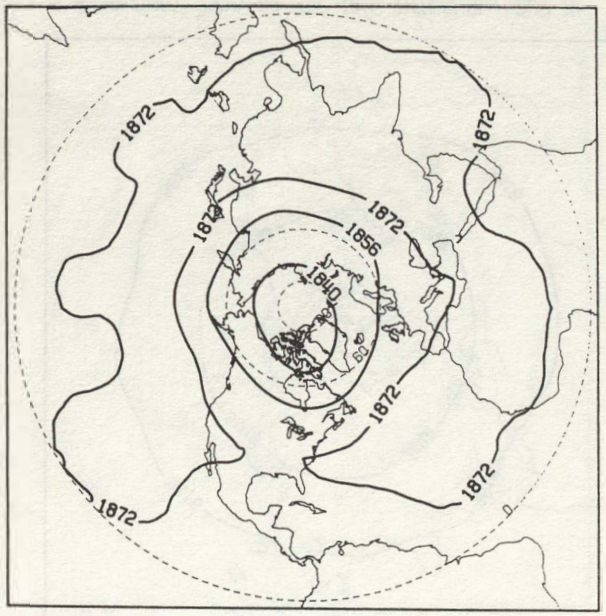
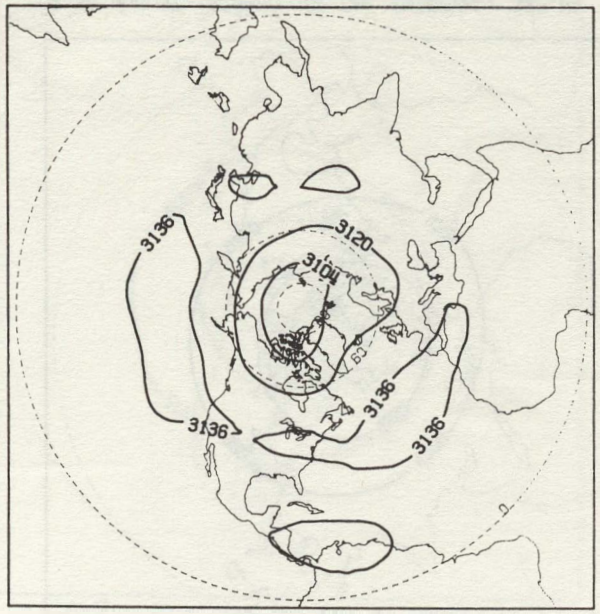


2 MB AUGUST 1979-86 (GP DM, INTERVAL: 320 M)



70 MB SEPTEMBER 1979-86 (GP DM, INTERVAL: 160 M)



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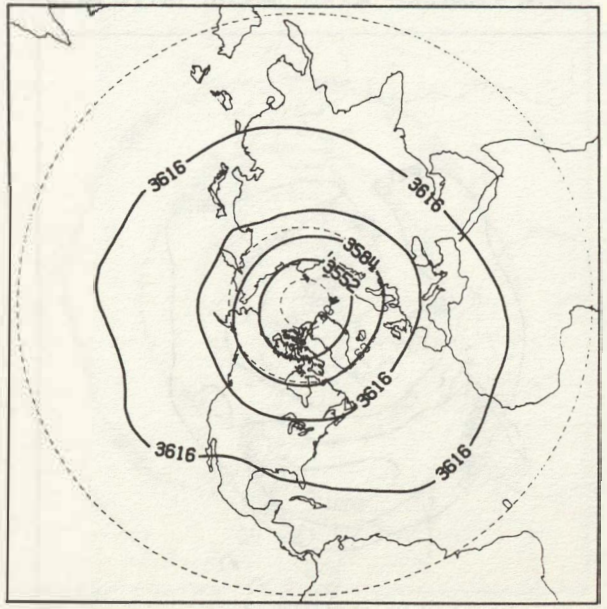

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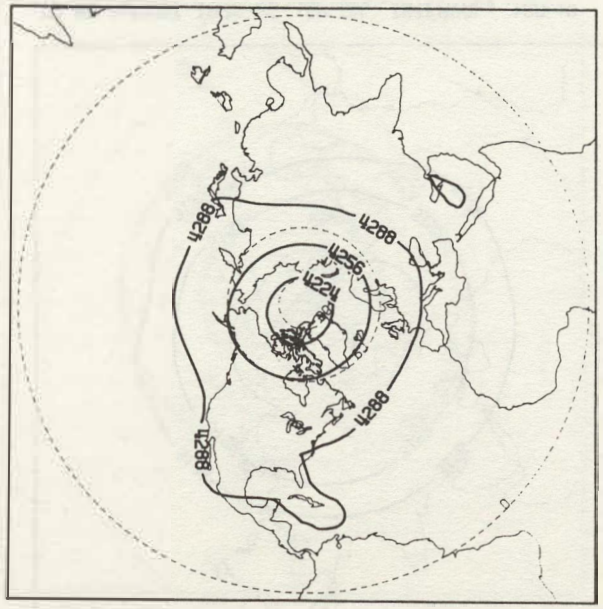

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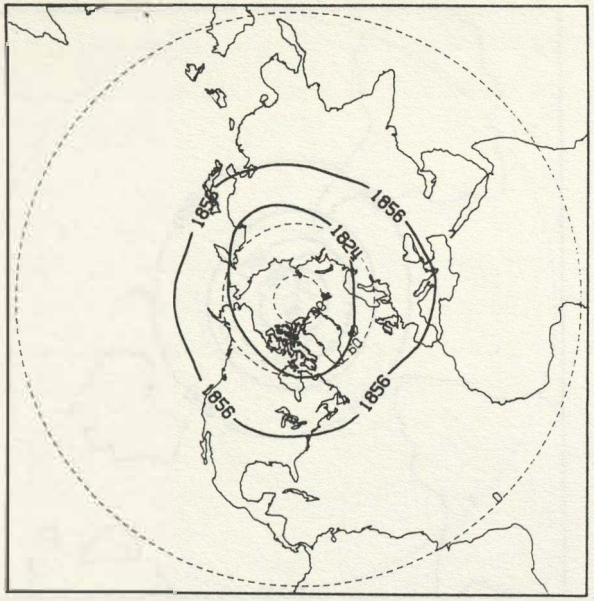
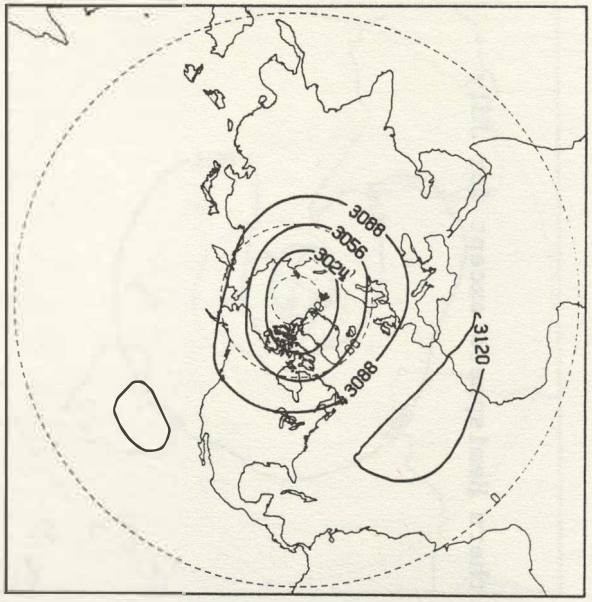


70 MB OCTOBER 1979-86 (GP DM, INTERVAL: 320 M)



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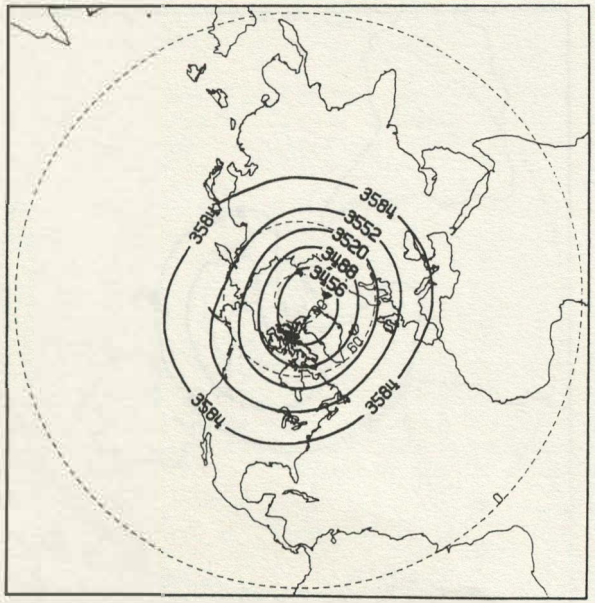

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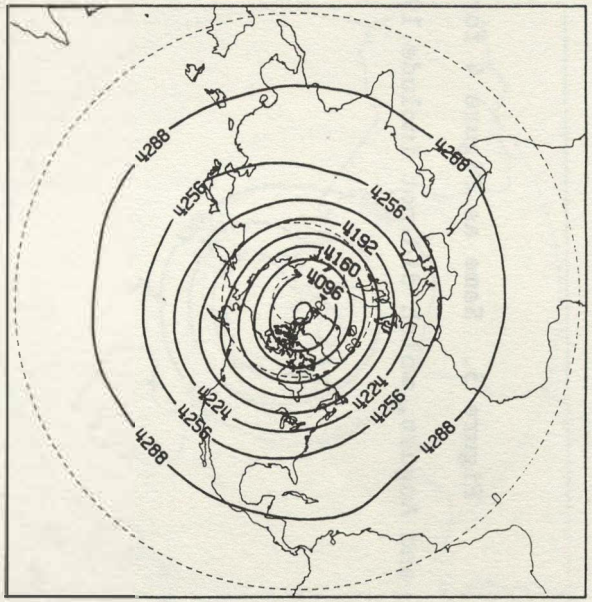
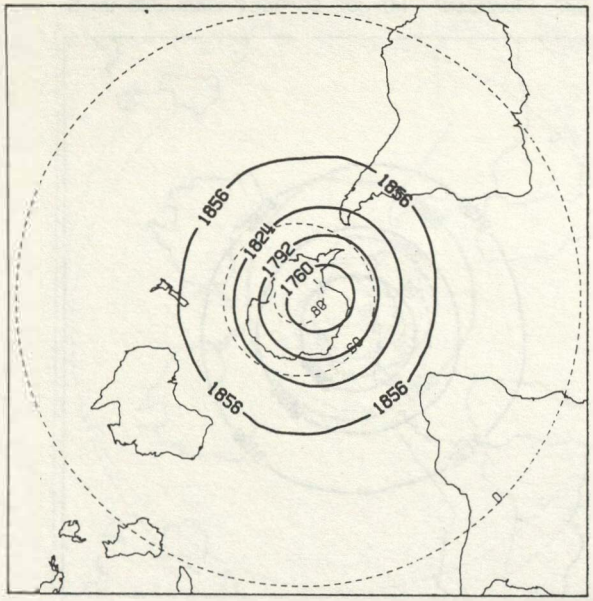
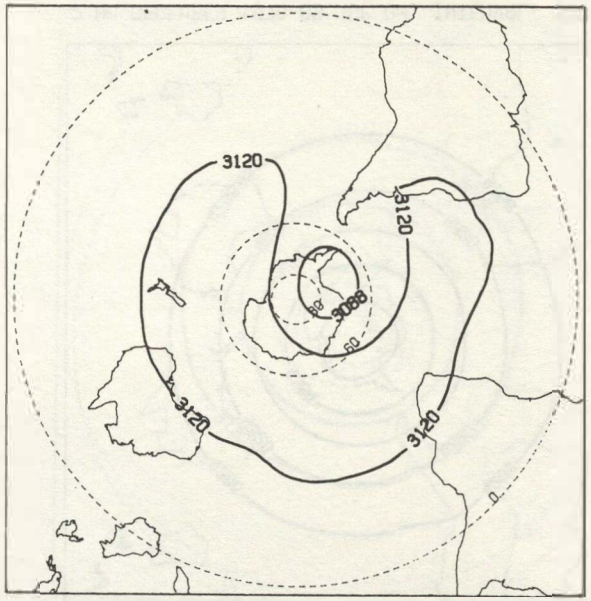


2 MB OCTOBER 1979-86 (GP DM, INTERVAL: 320 M)

Figure 5. Same as Figure 4 for the Southern Hemisphere except for July and August, which did not include 1986.



70 MB NØVEMBER 1978-85 (GP DM, INTERVAL: 320 M)



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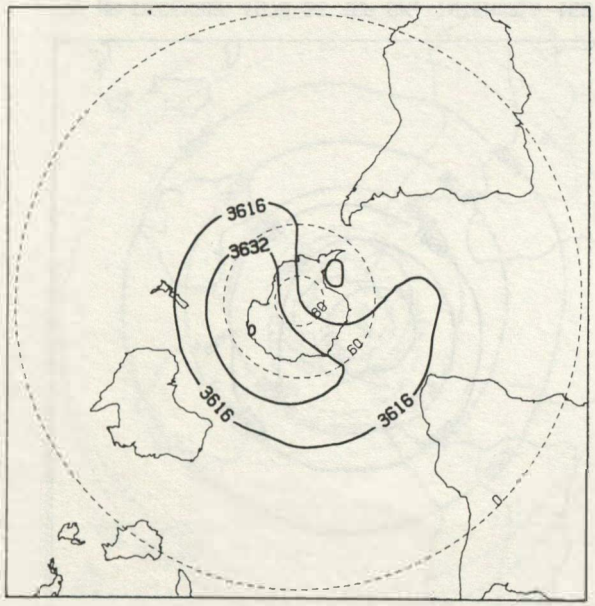

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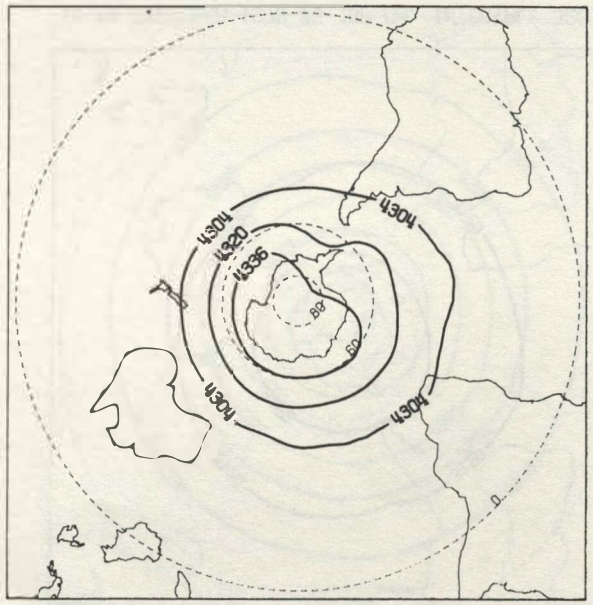
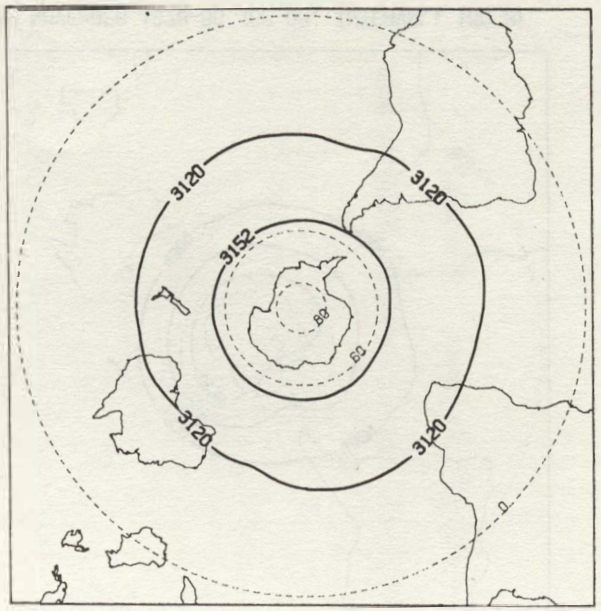


2 MB NØVEMBER 1978-85 (GP DM, INTERVAL: 160 M)

70 MB DECEMBER 1978-85 (GP DM, INTERVAL: 160 M)



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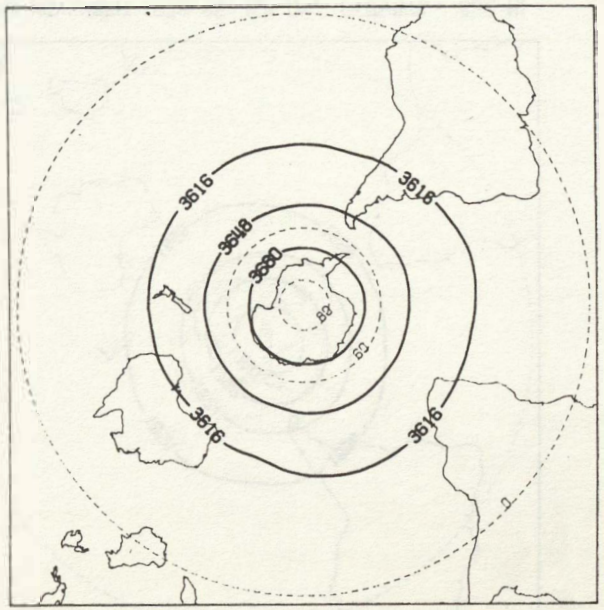

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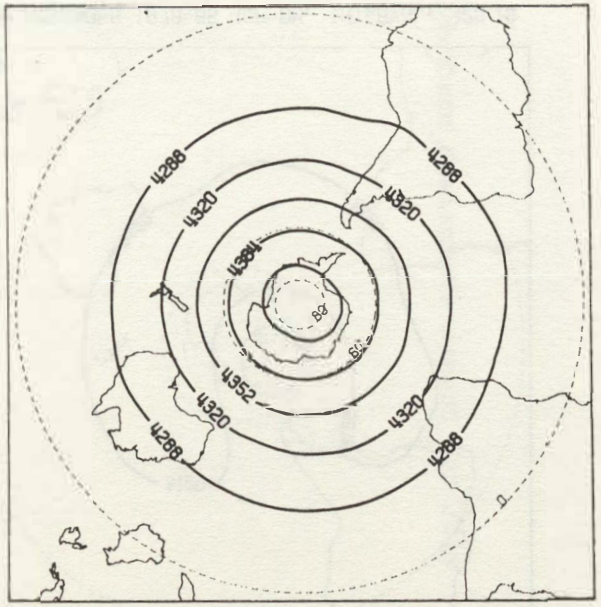

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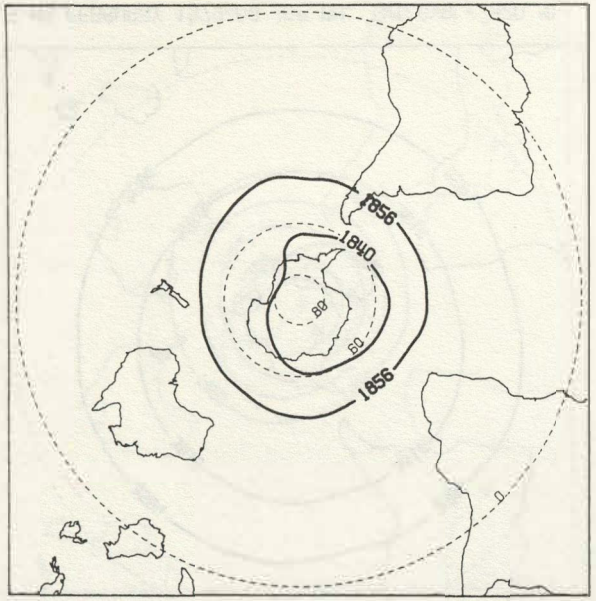
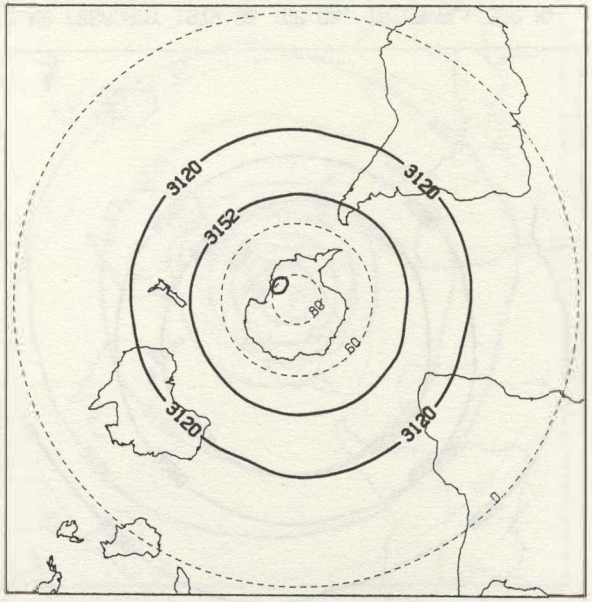


70 MB JANUARY 1979-86 (GP DM, INTERVAL: 160 M)



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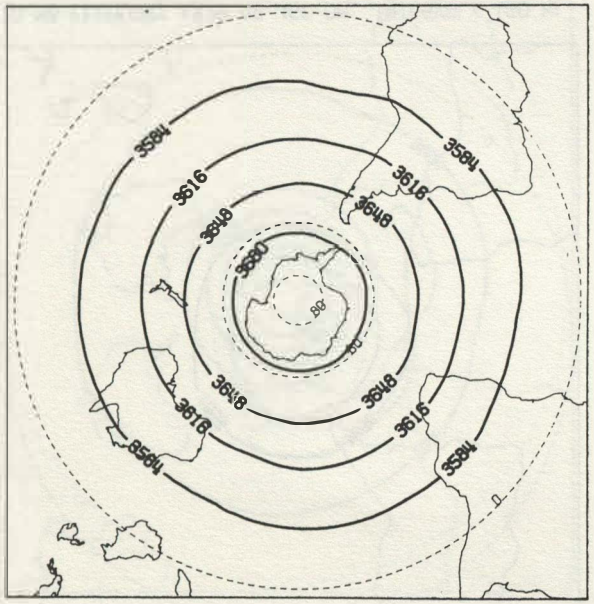

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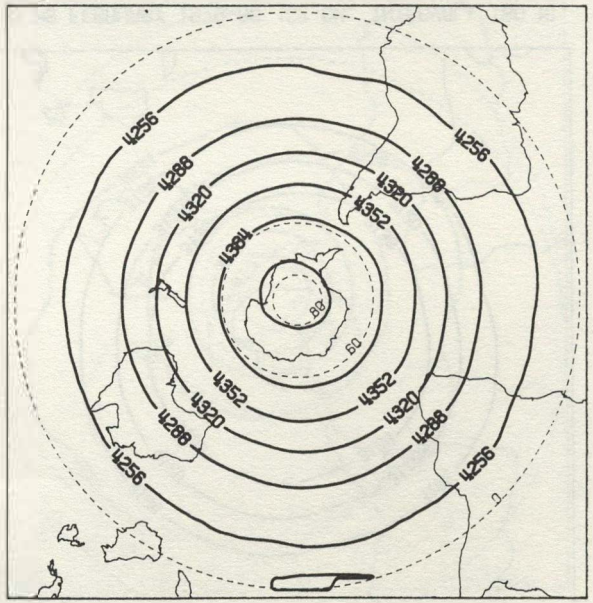

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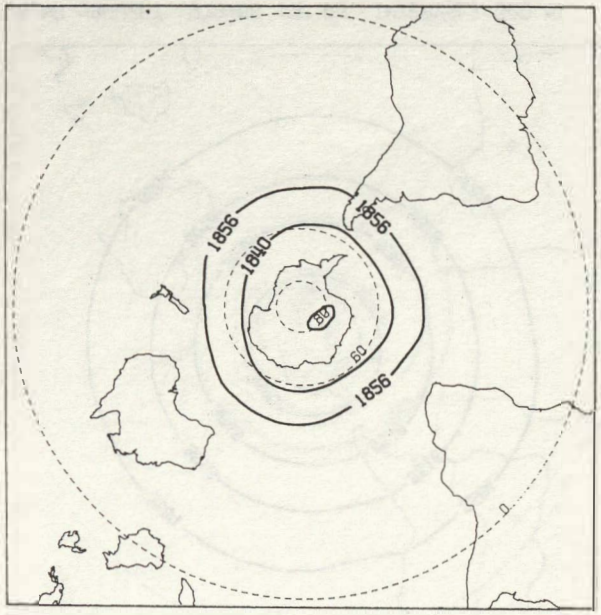

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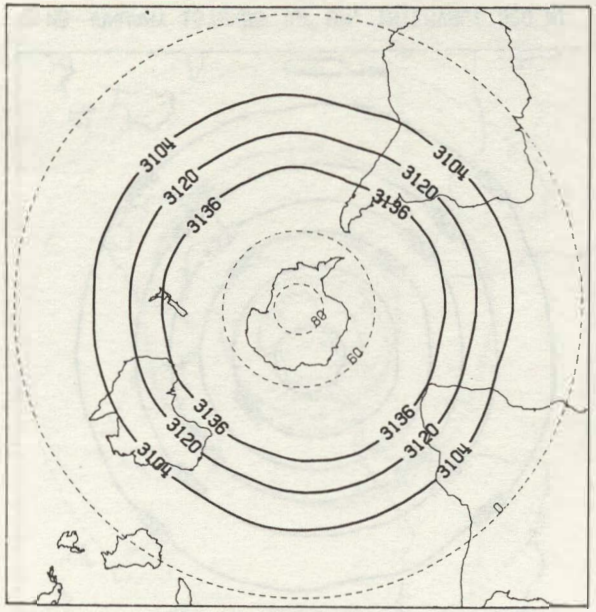

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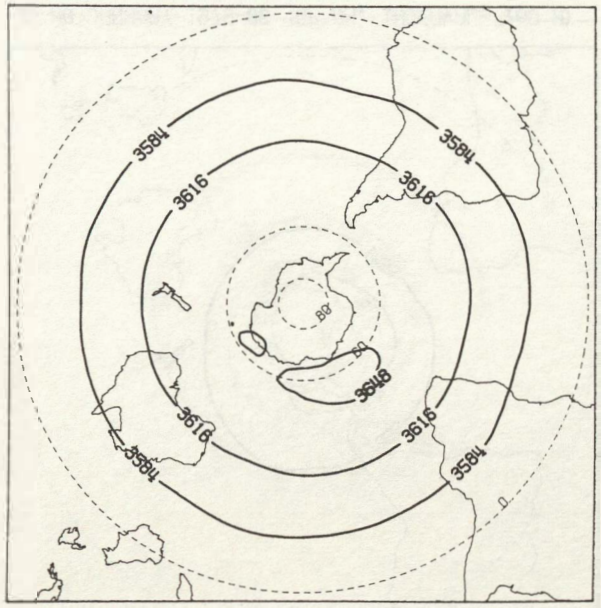

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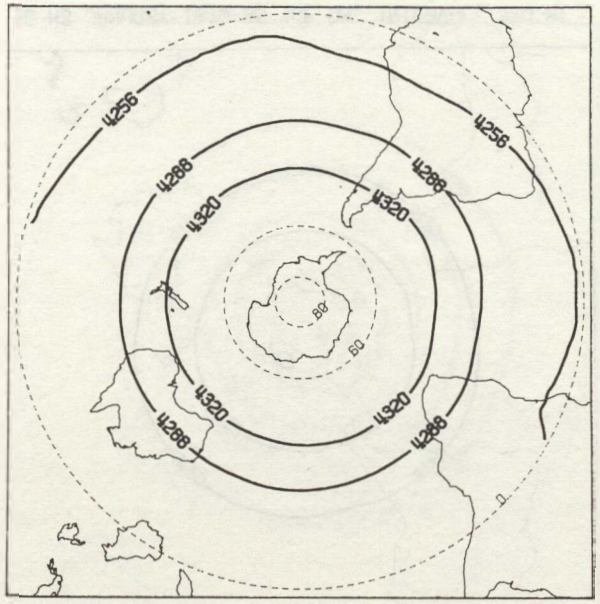

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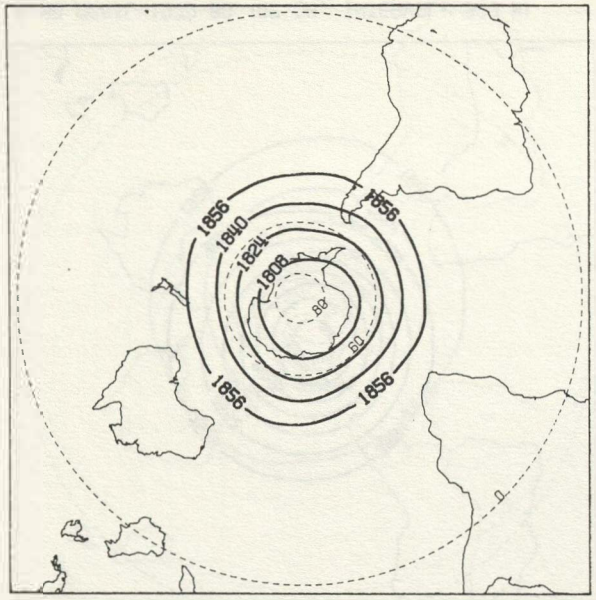
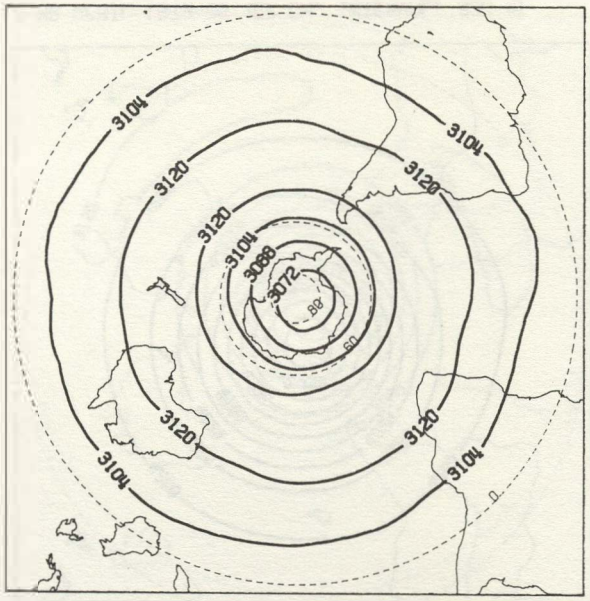


70 MB MARCH 1979-86 (GP DM, INTERVAL: 160 M)



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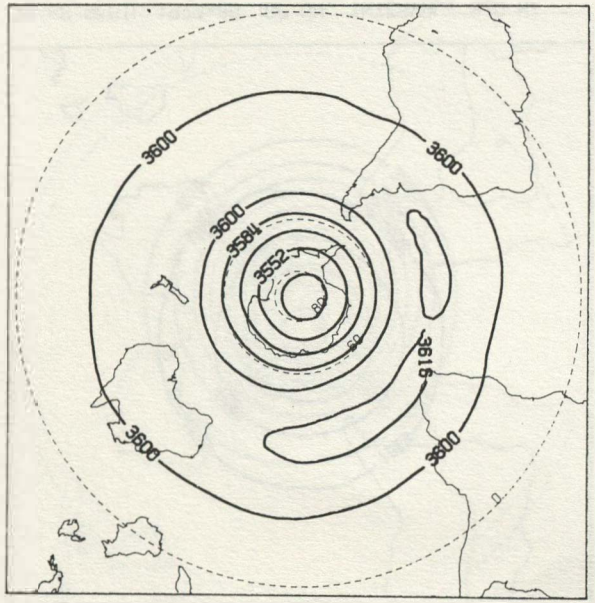

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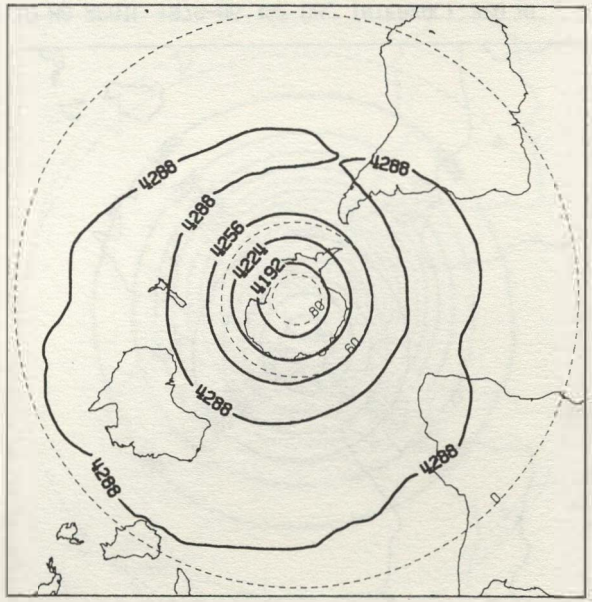

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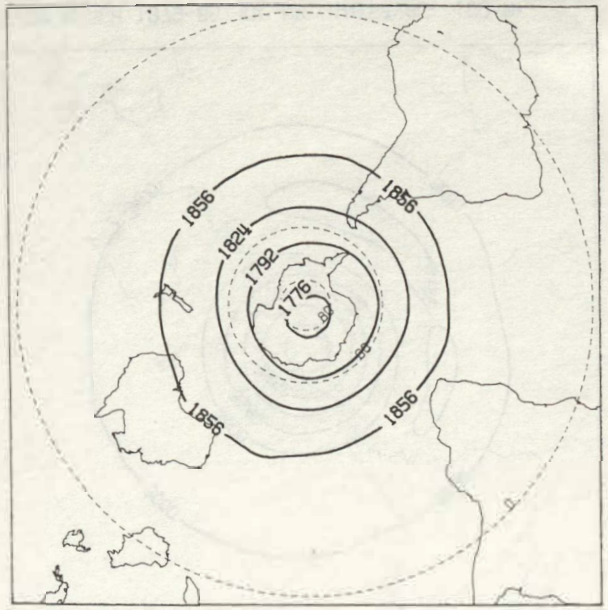

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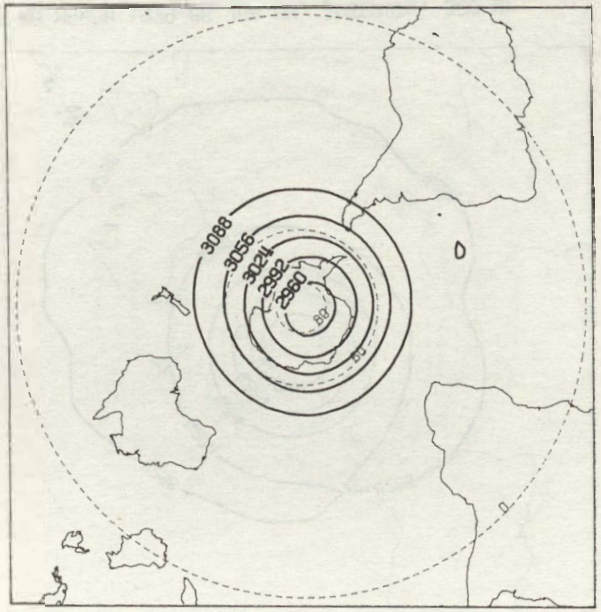
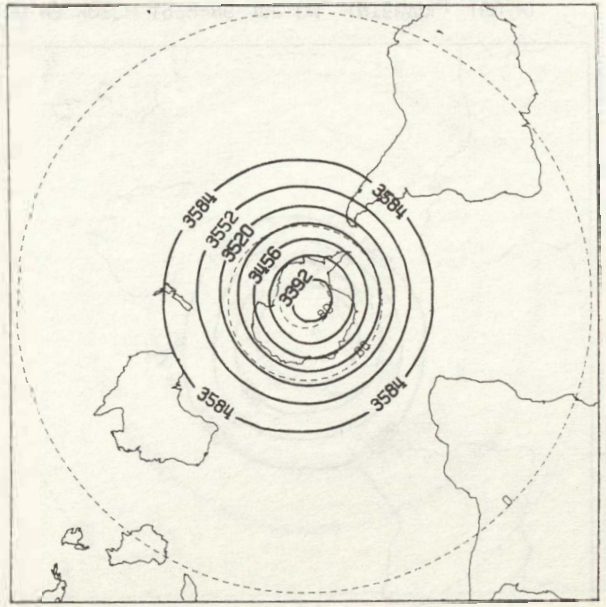
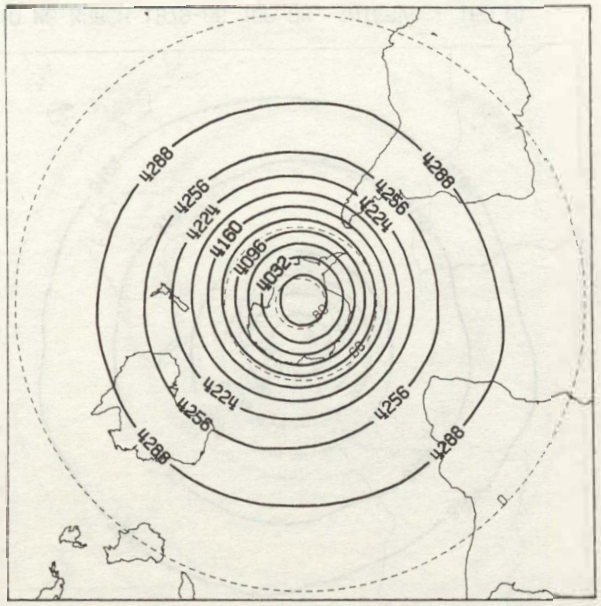


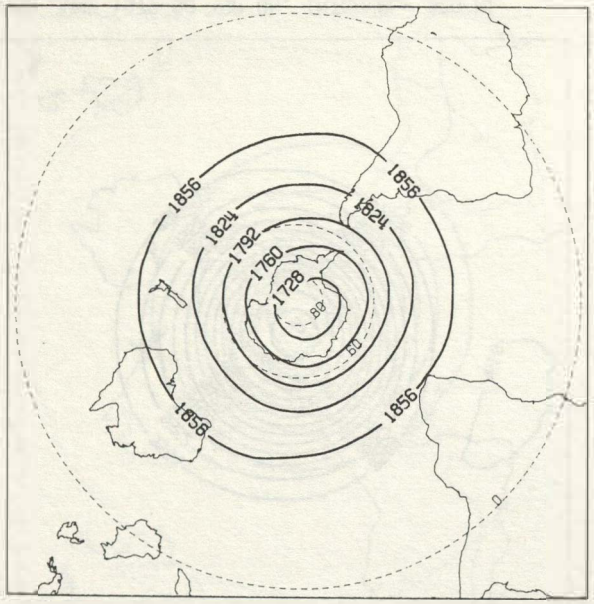
10 MB APRIL 1979-86 (GP DM, INTERVAL: 320 M)



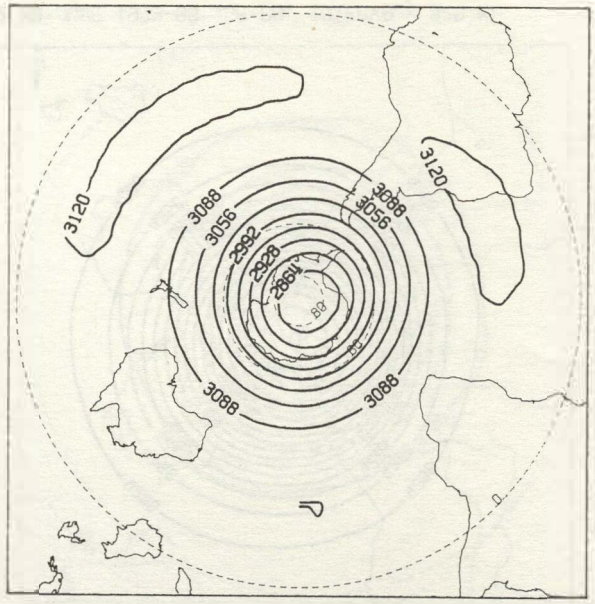
5 MB APRIL 1979-86 (GP DM, INTERVAL: 320 M)



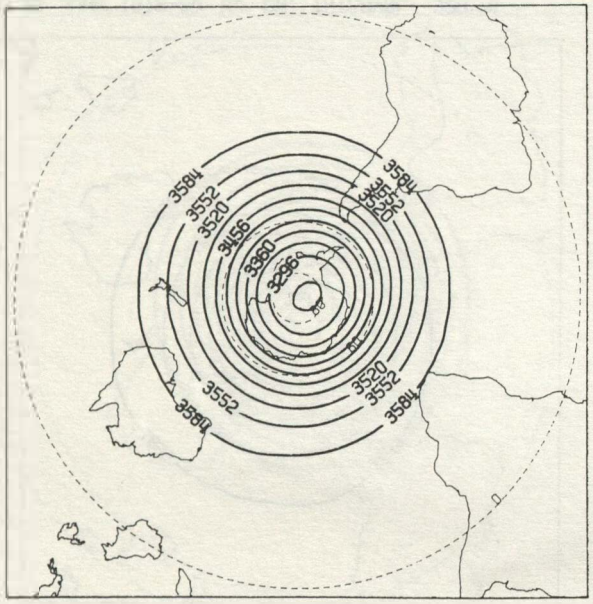
2 MB APRIL 1979-86 (GP DM, INTERVAL: 320 M)



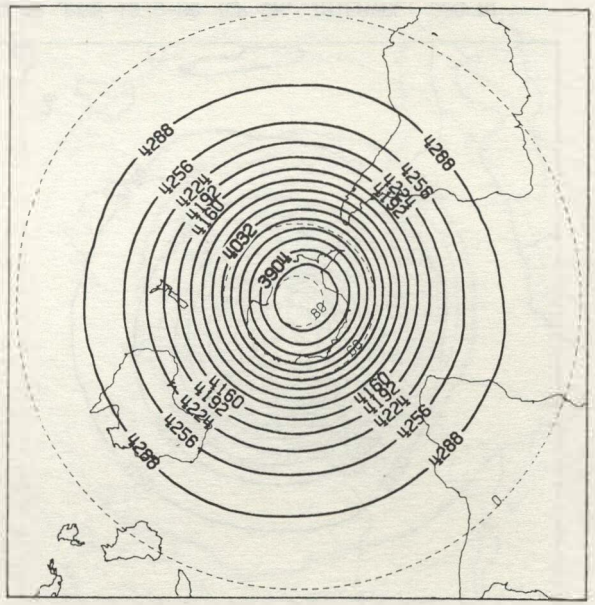
70 MB MAY 1979-86 (GP DM, INTERVAL: 320 M)



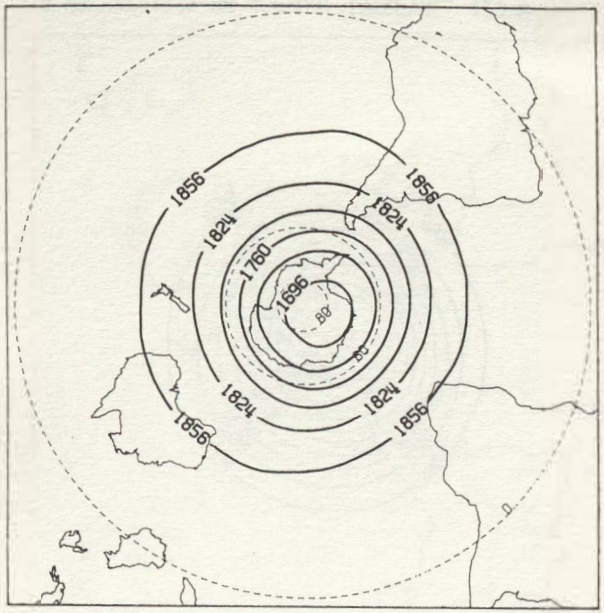
10 MB MAY 1979-86 (GP DM, INTERVAL: 320 M)



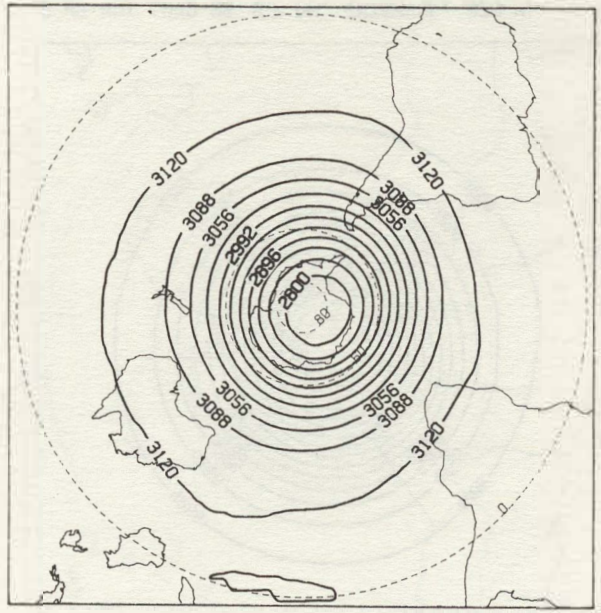
5 MB MAY 1979-86 (GP DM, INTERVAL: 320 M)



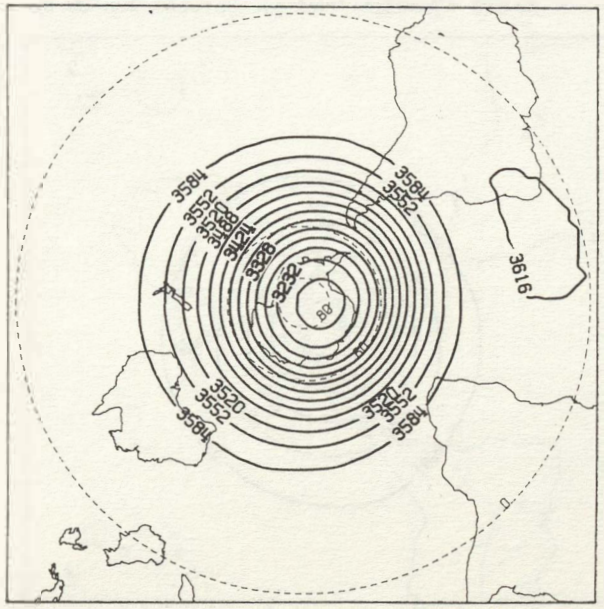
2 MB MAY 1979-86 (GP DM, INTERVAL: 320 M)



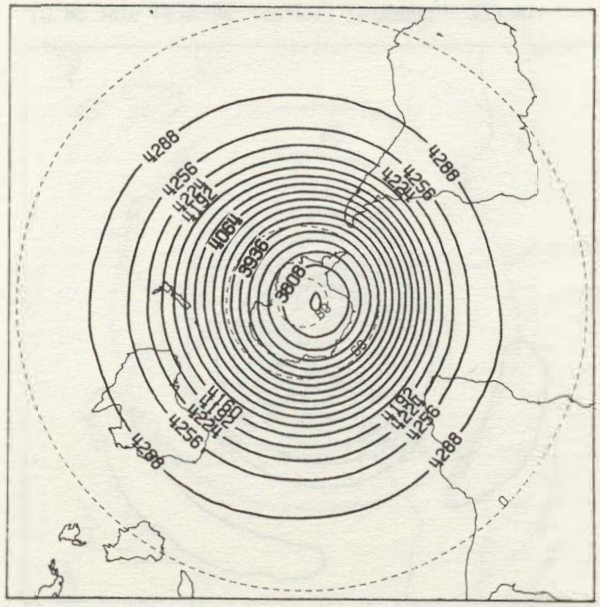
70 MB JUNE 1979-86 (GP DM, INTERVAL: 320 M)



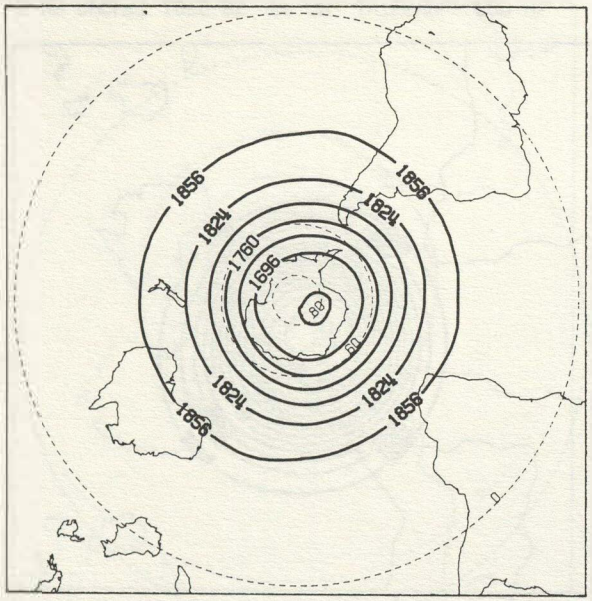
10 MB JUNE 1979-86 (GP DM, INTERVAL: 320 M)



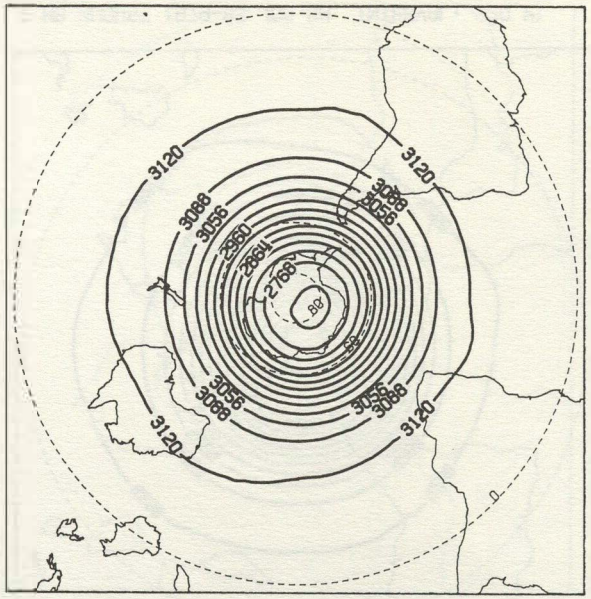
5 MB JUNE 1979-86 (GP DM, INTERVAL: 320 M)



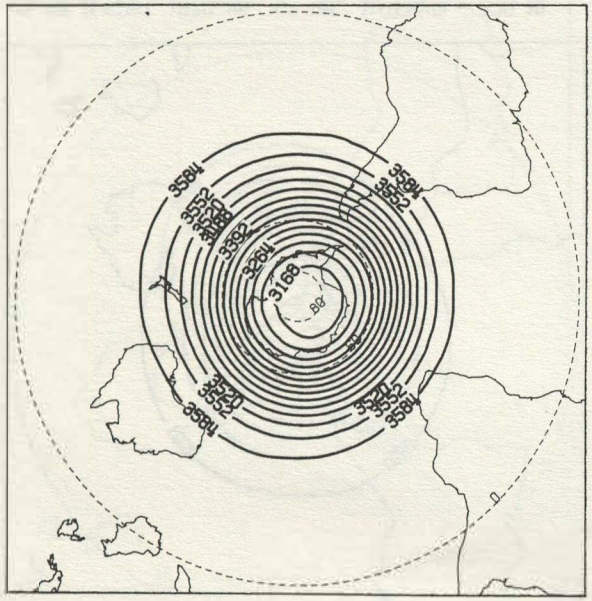
2 MB JUNE 1979-86 (GP DM, INTERVAL: 320 M)



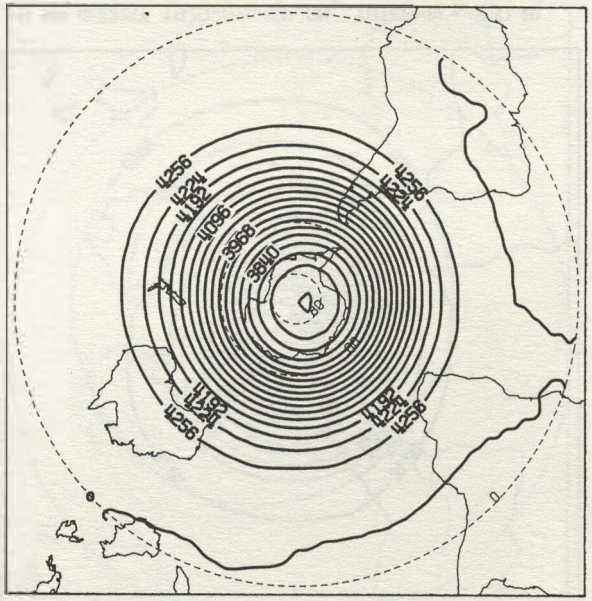
70 MB JULY 1979-85 (GP DM, INTERVAL: 320 M)



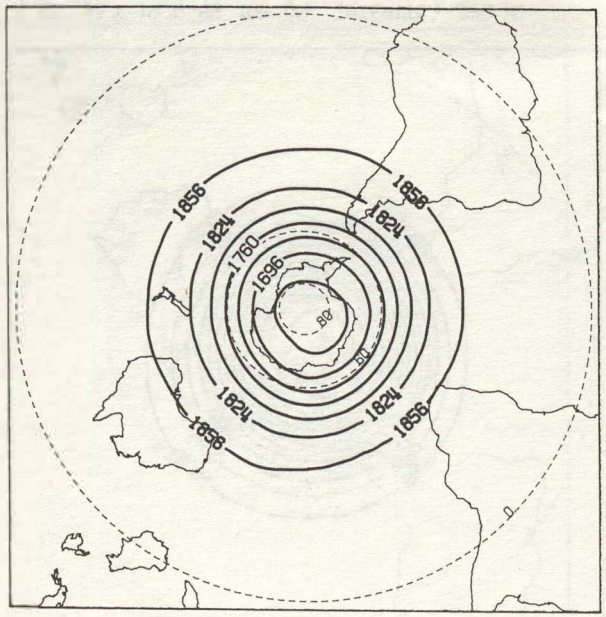
10 MB JULY 1979-85 (GP DM, INTERVAL: 320 M)



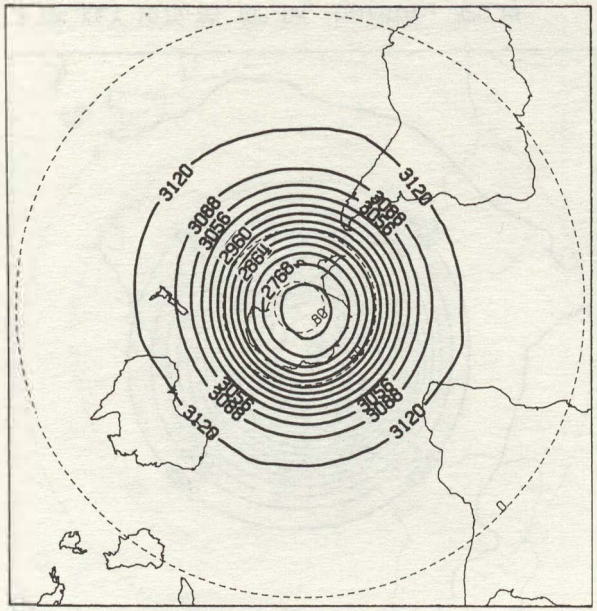
5 MB JULY 1979-85 (GP DM, INTERVAL: 320 M)



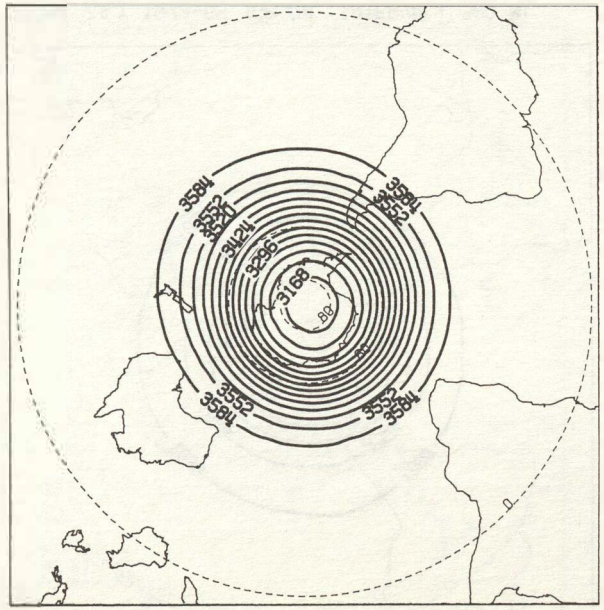
2 MB JULY 1979-85 (GP DM, INTERVAL: 320 M)



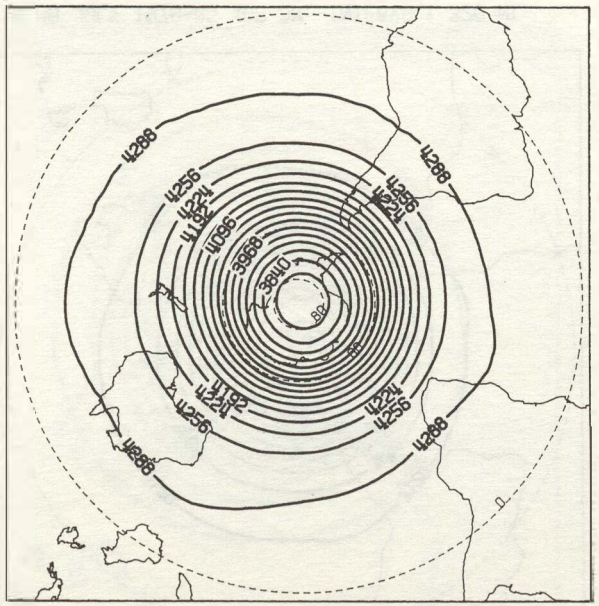
70 MB AUGUST 1979-85 (GP DM, INTERVAL: 320 M)



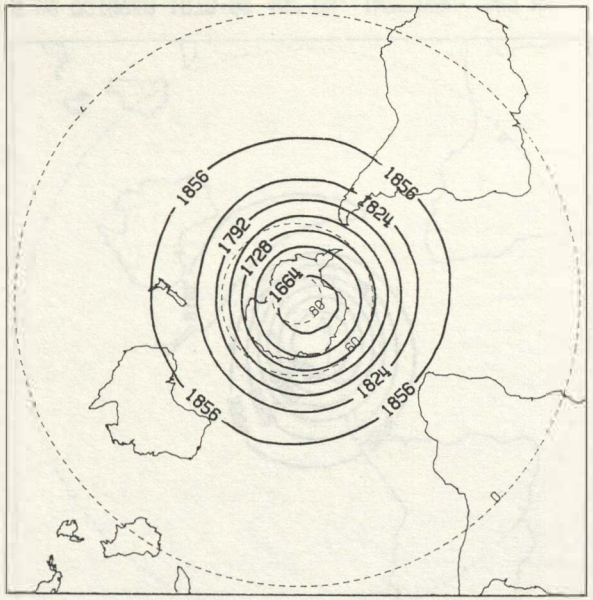
10 MB AUGUST 1979-85 (GP DM, INTERVAL: 320 M)



5 MB AUGUST 1979-85 (GP DM, INTERVAL: 320 M)



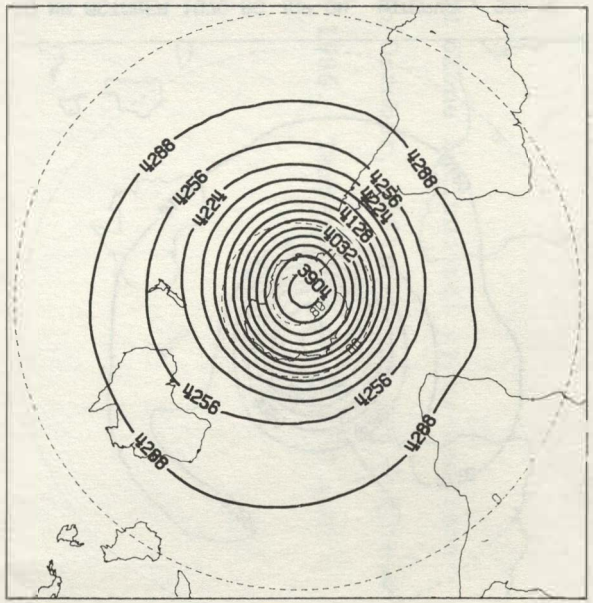
2 MB AUGUST 1979-85 (GP DM, INTERVAL: 320 M)



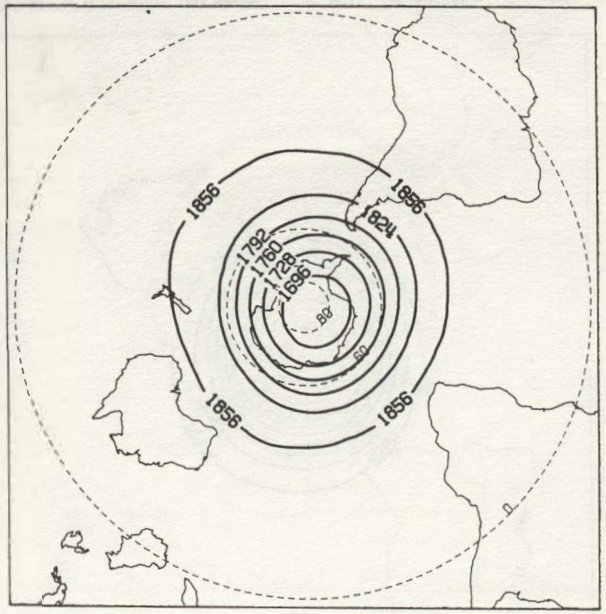
70 MB SEPTEMBER 1979-86 (GP DM, INTERVAL: 320 M)

10 MB SEPTEMBER 1979-86 (GP DM, INTERVAL: 320 M)

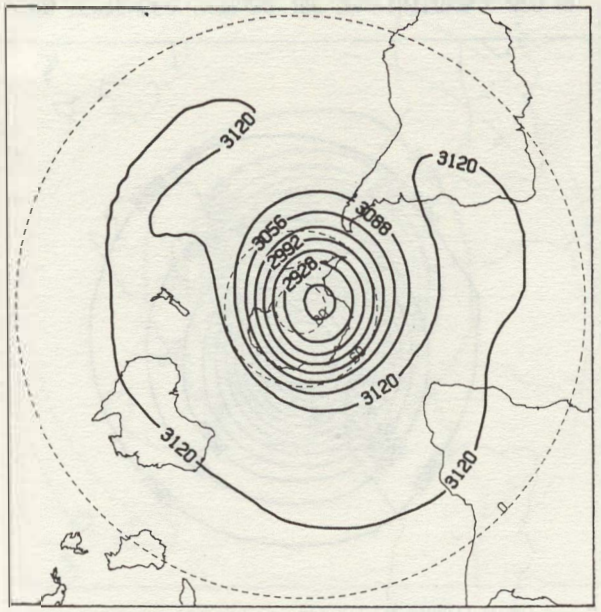
5 MB SEPTEMBER 1979-86 (GP DM, INTERVAL: 320 M)



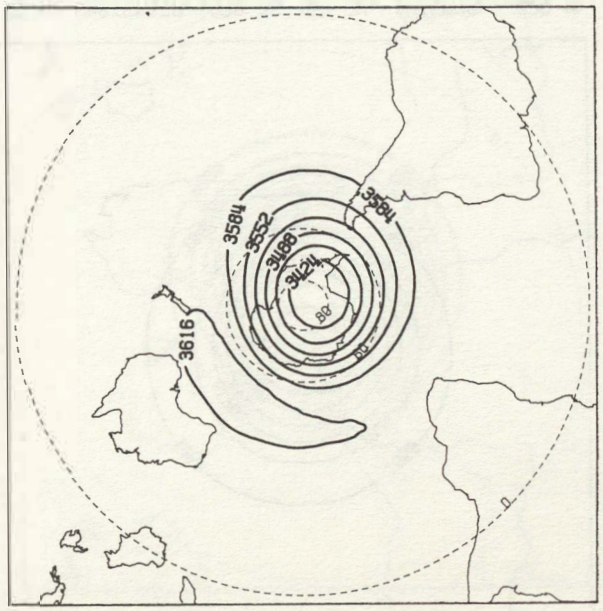
2 MB SEPTEMBER 1979-86 (GP DM, INTERVAL: 320 M)



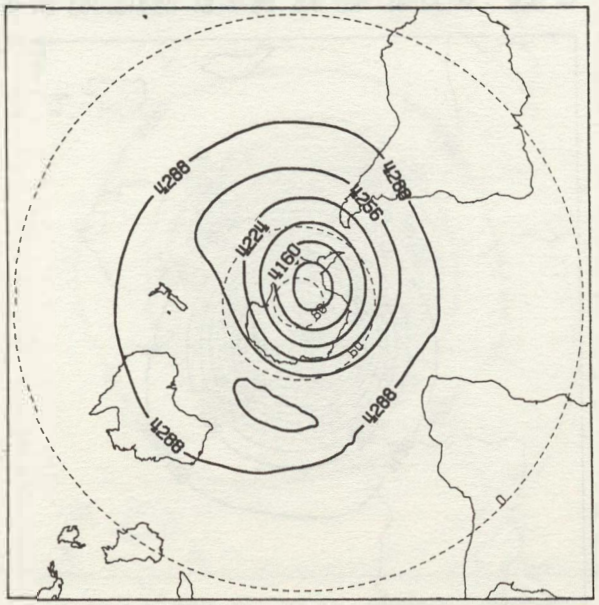
70 MB OCTOBER 1979-86 (GP DM, INTERVAL: 320 M)



10 MB OCTOBER 1979-86 (GP DM, INTERVAL: 320 M)

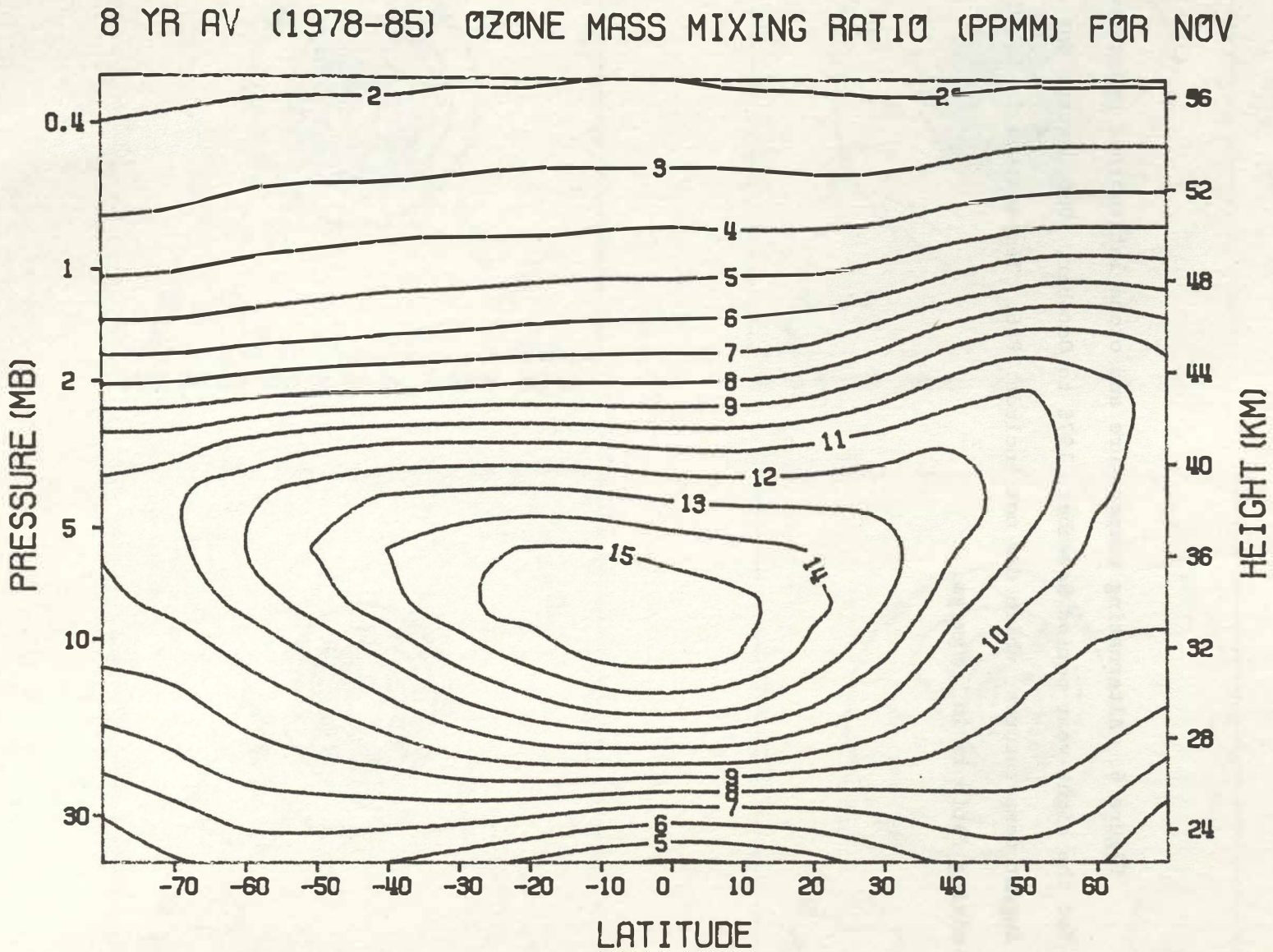


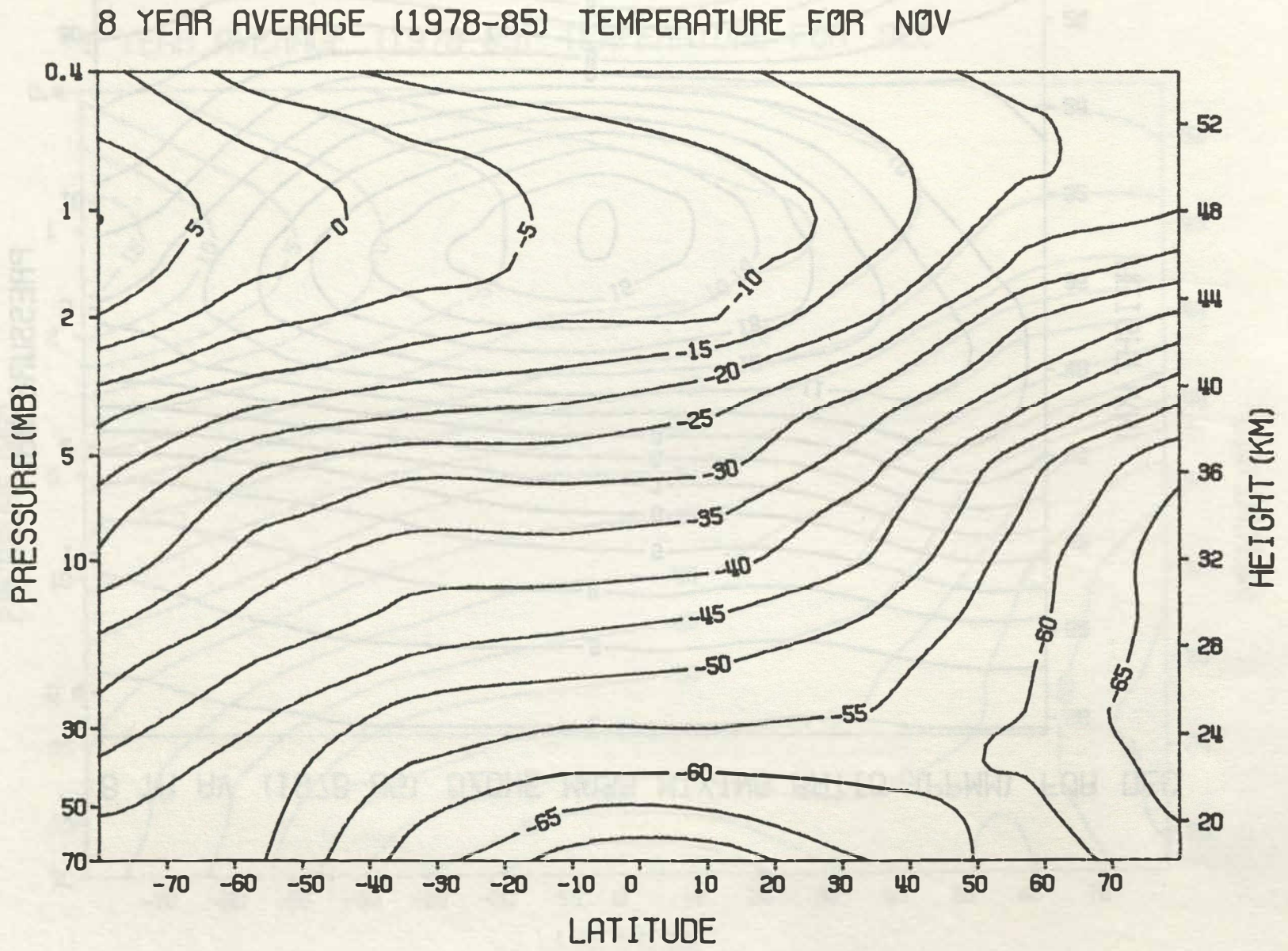
5 MB OCTOBER 1979-86 (GP DM, INTERVAL: 320 M)



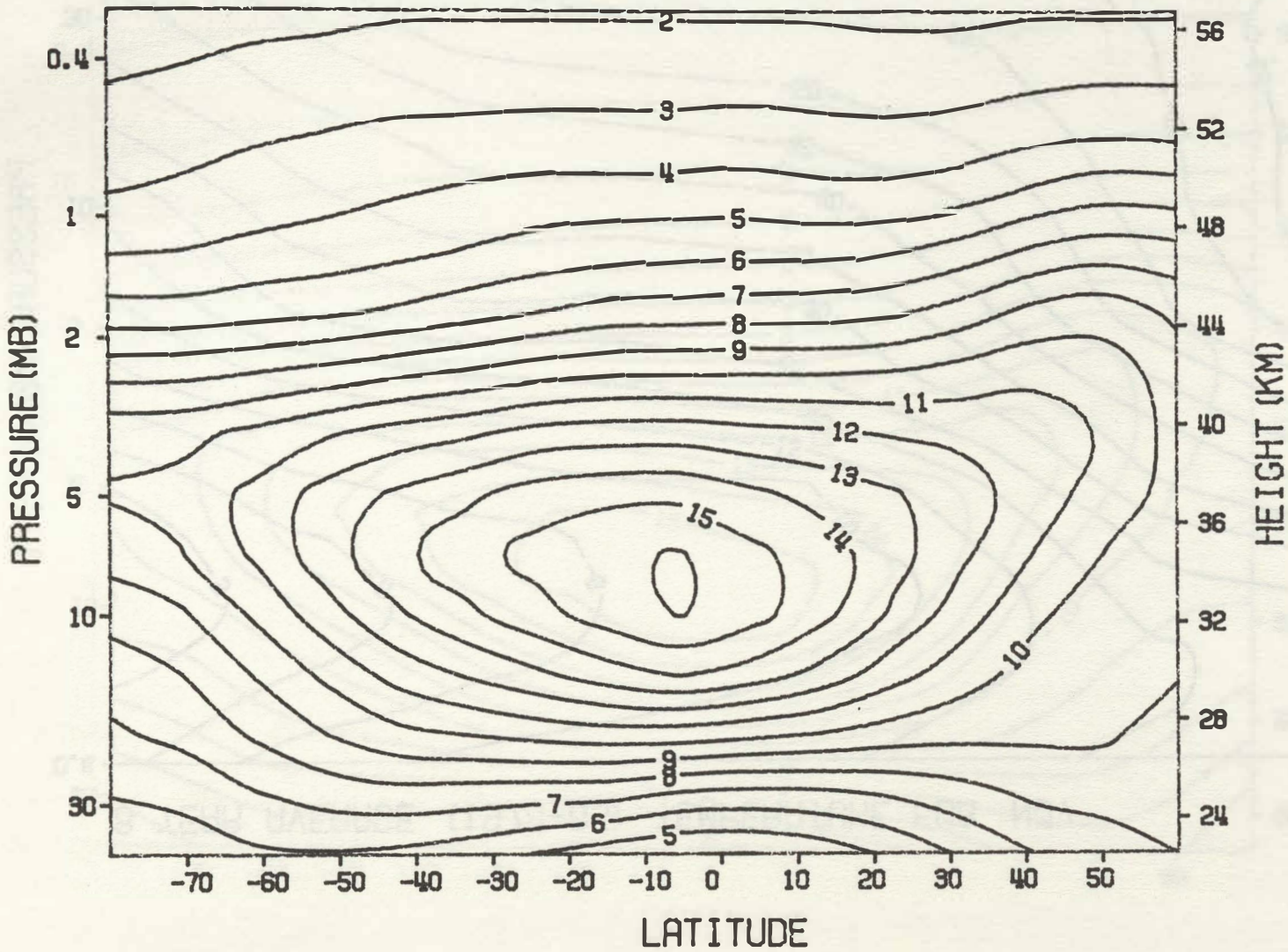
2 MB OCTOBER 1979-86 (GP DM, INTERVAL: 320 M)

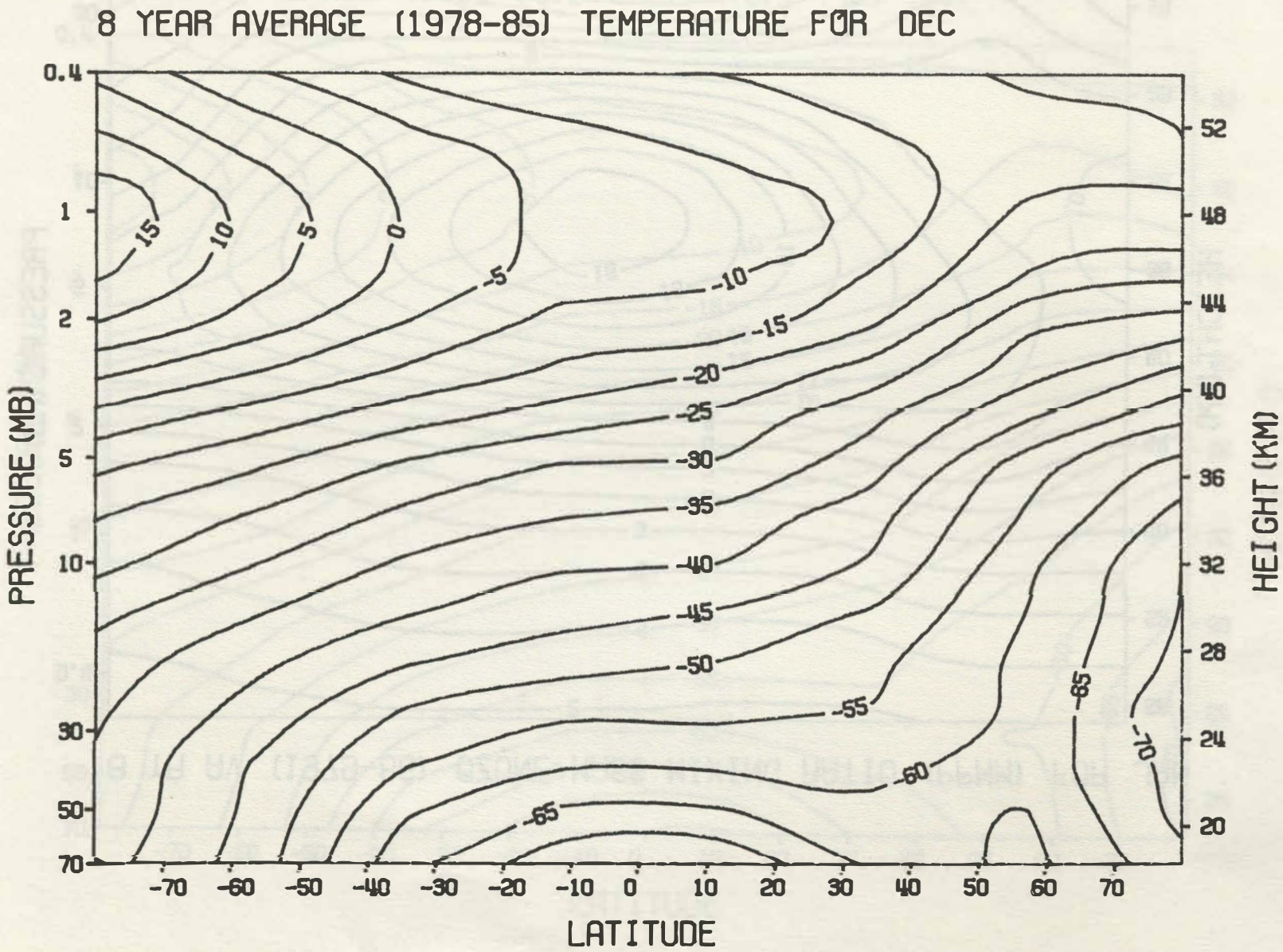
Figure 6. Alternating temperature and ozone latitudinal cross-sections for the eight-year period November, 1978 to October, 1986, except for July and August temperatures, which did not include 1986. Temperature is in ^{o}C and mixing ratio is in $\mu gm/gm$.


8 YR AV (1978-85) OZONE MASS MIXING RATIO (PPMM) FOR NOV
PRESSURE (MB)
0.4
1
2
5
10
30
HEIGHT (KM)
56
52
48
44
40
36
32
28
24
LATITUDE
-70
-60
-50
-40
-30
-20
-10
0
10
20
30
40
50
60
2
3
4
5
6
7
8
9
11
12
13
14
15
10
9
8
7
6
5

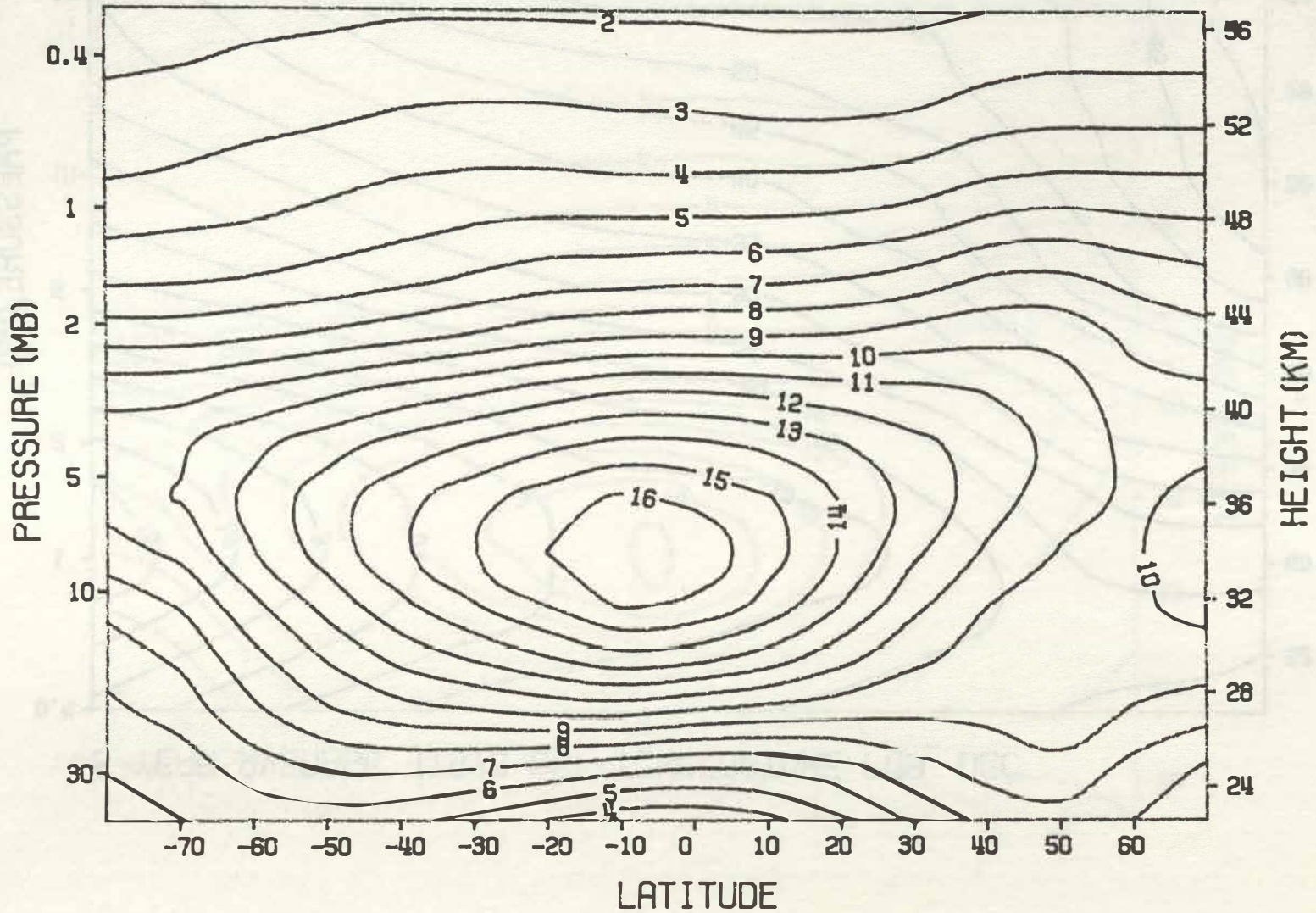

8 YEAR AVERAGE (1978-85) TEMPERATURE FOR NOV
PRESSURE (MB)
0.4
1
2
5
10
30
50
70
HEIGHT (KM)
52
48
44
40
36
32
28
24
20
LATITUDE
-70 -60 -50 -40 -30 -20 -10 0 10 20 30 40 50 60 70
5
0
-5
-10
-15
-20
-25
-30
-35
-40
-45
-50
-55
-60
-65

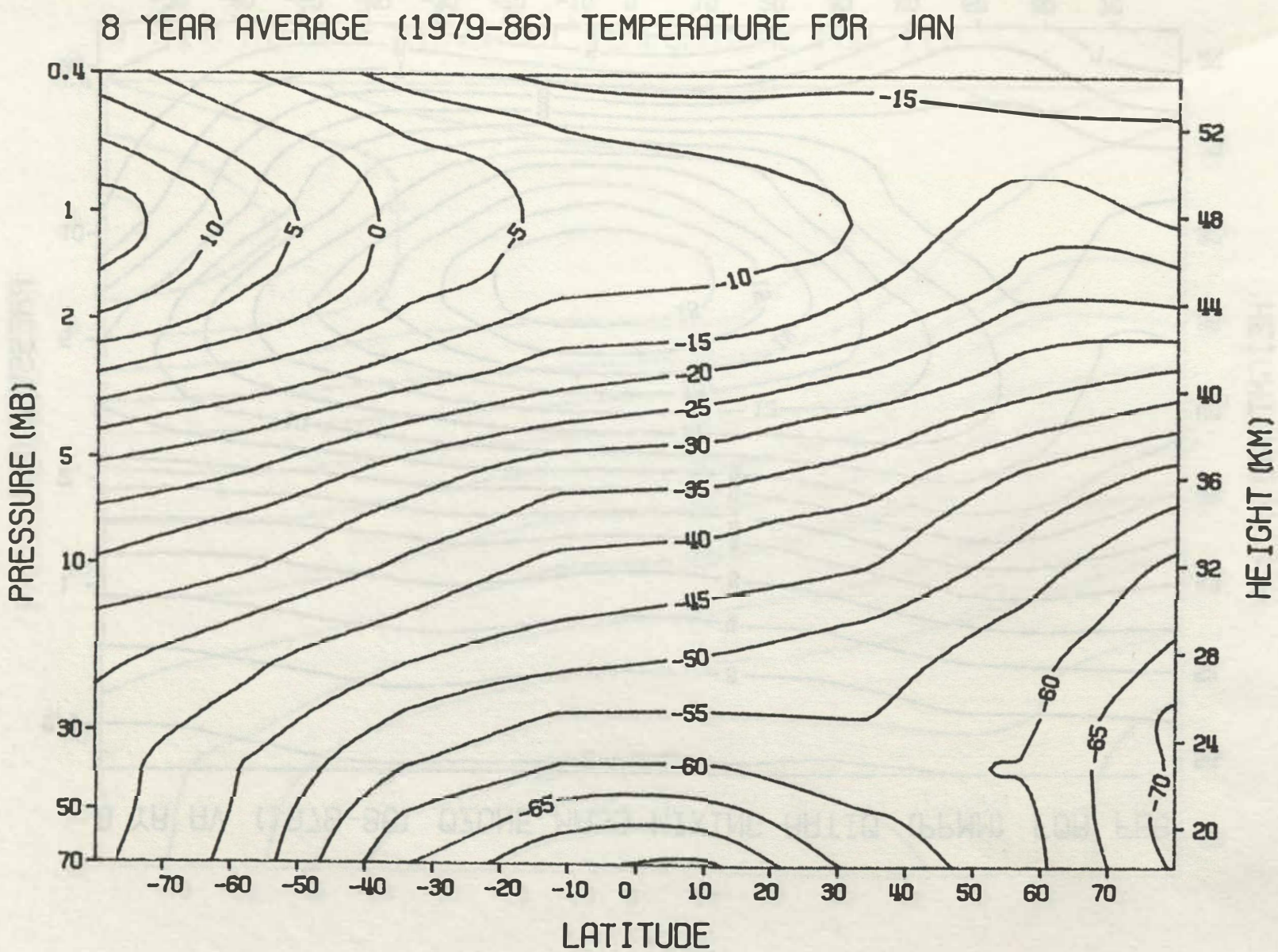
8 YR AV (1978-85) OZONE MASS MIXING RATIO (PPMM) FOR DEC

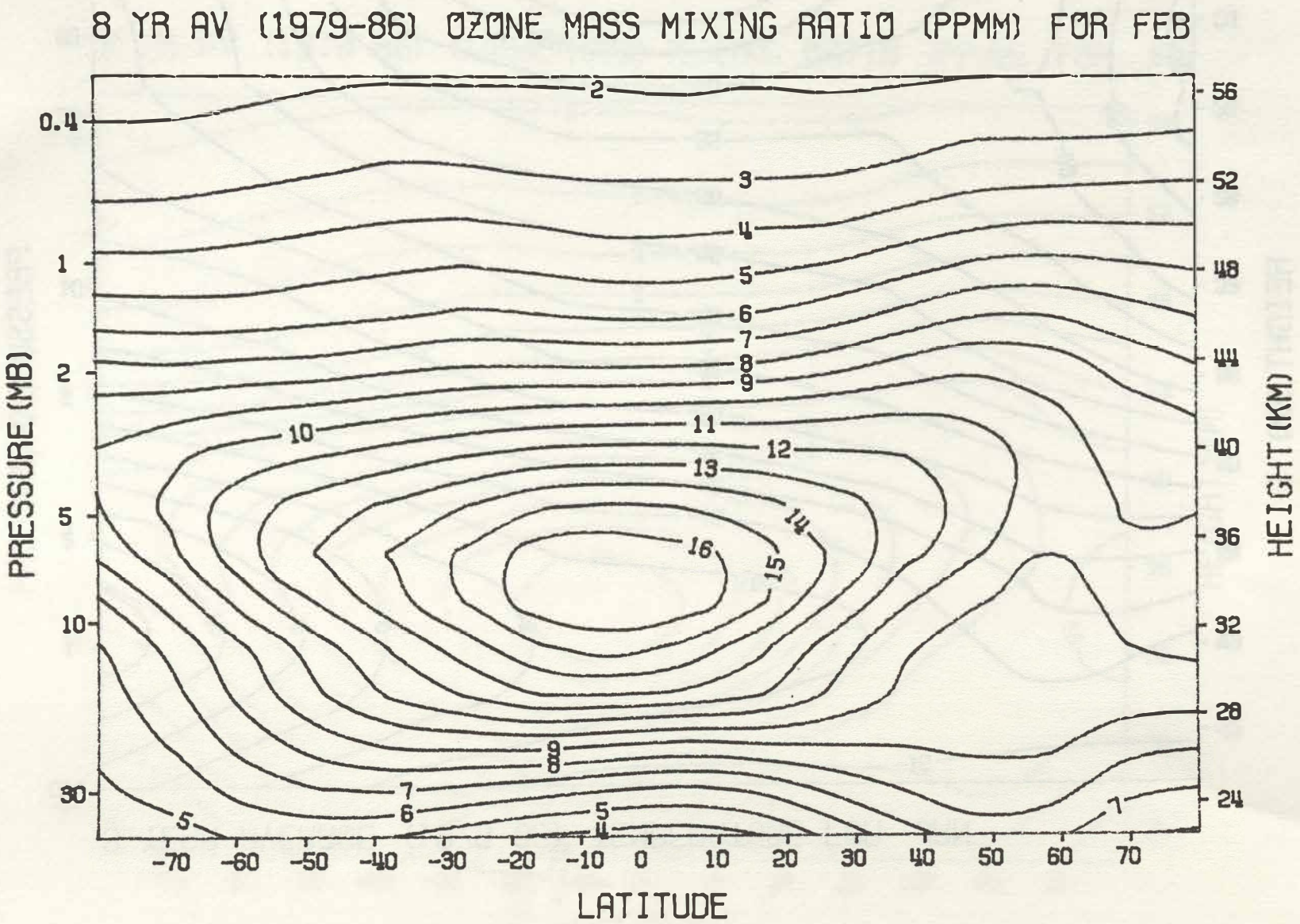


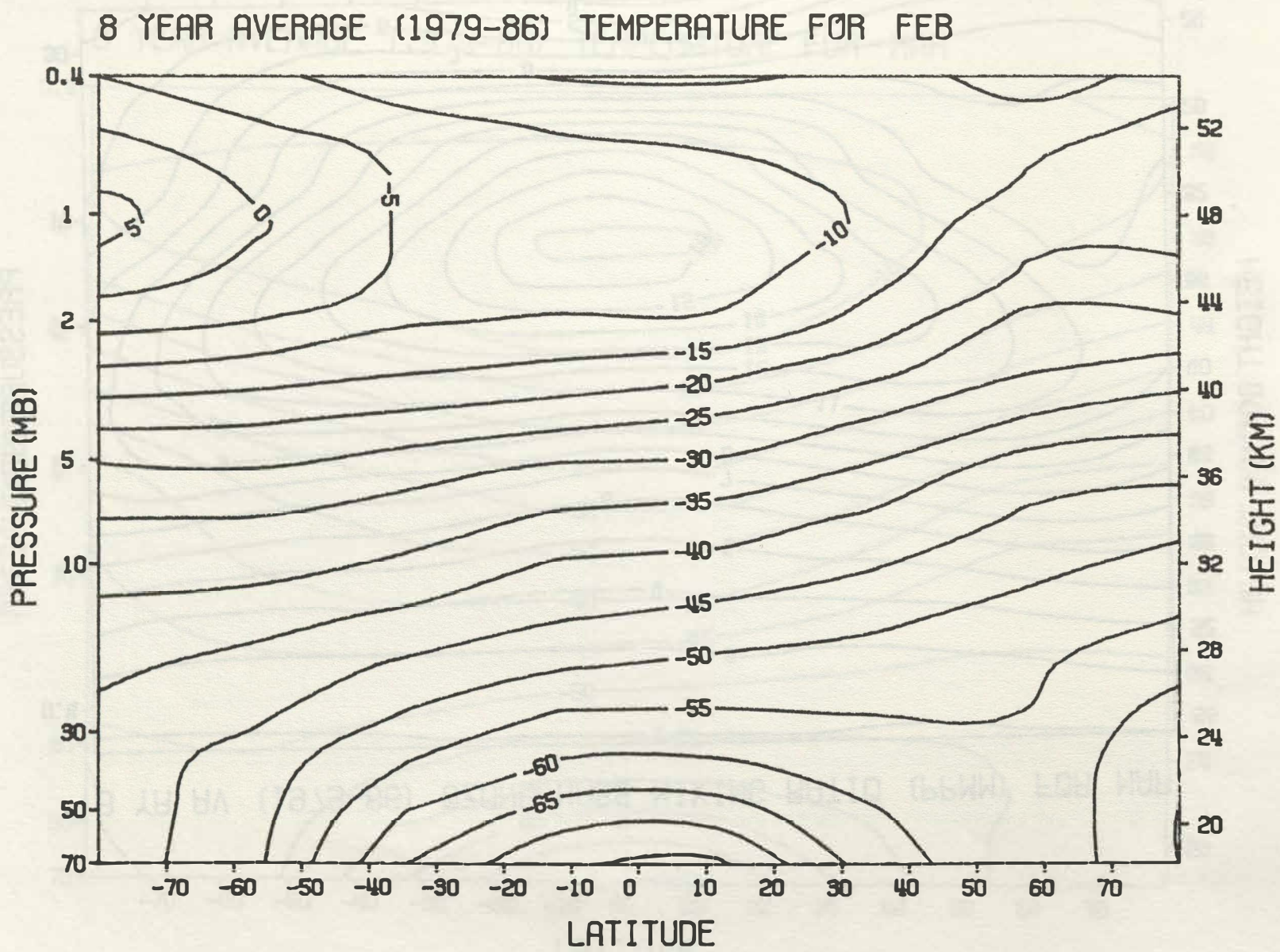

8 YEAR AVERAGE (1978-85) TEMPERATURE FOR DEC
PRESSURE (MB)
0.4
1
2
5
10
30
50
70
HEIGHT (KM)
52
48
44
40
36
32
28
24
20
LATITUDE
-70
-60
-50
-40
-30
-20
-10
0
10
20
30
40
50
60
70
15
10
5
0
-5
-10
-15
-20
-25
-30
-35
-40
-45
-50
-55
-60
-65
-70
-65

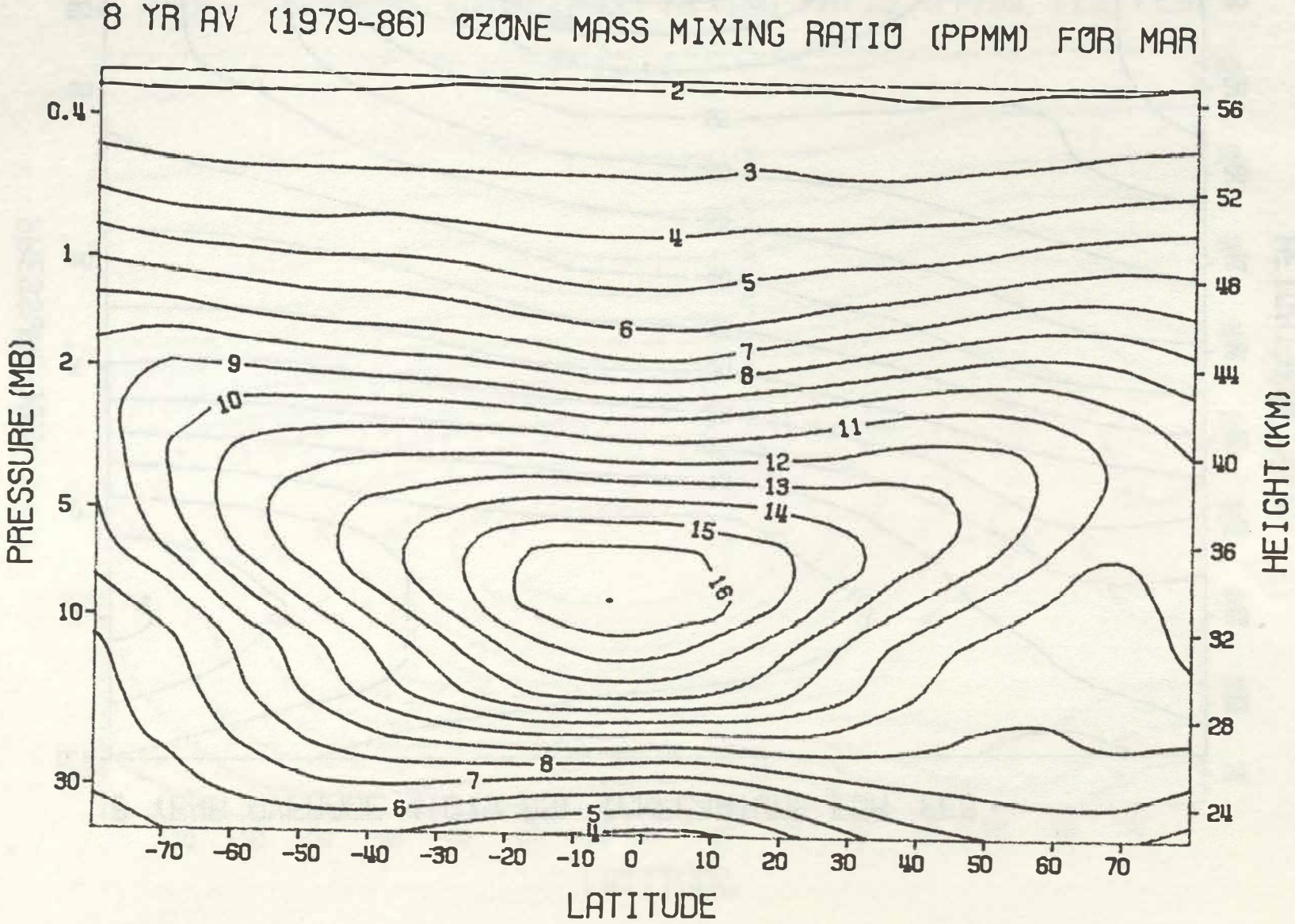
8 YR AV (1979-86) OZONE MASS MIXING RATIO (PPMM) FOR JAN

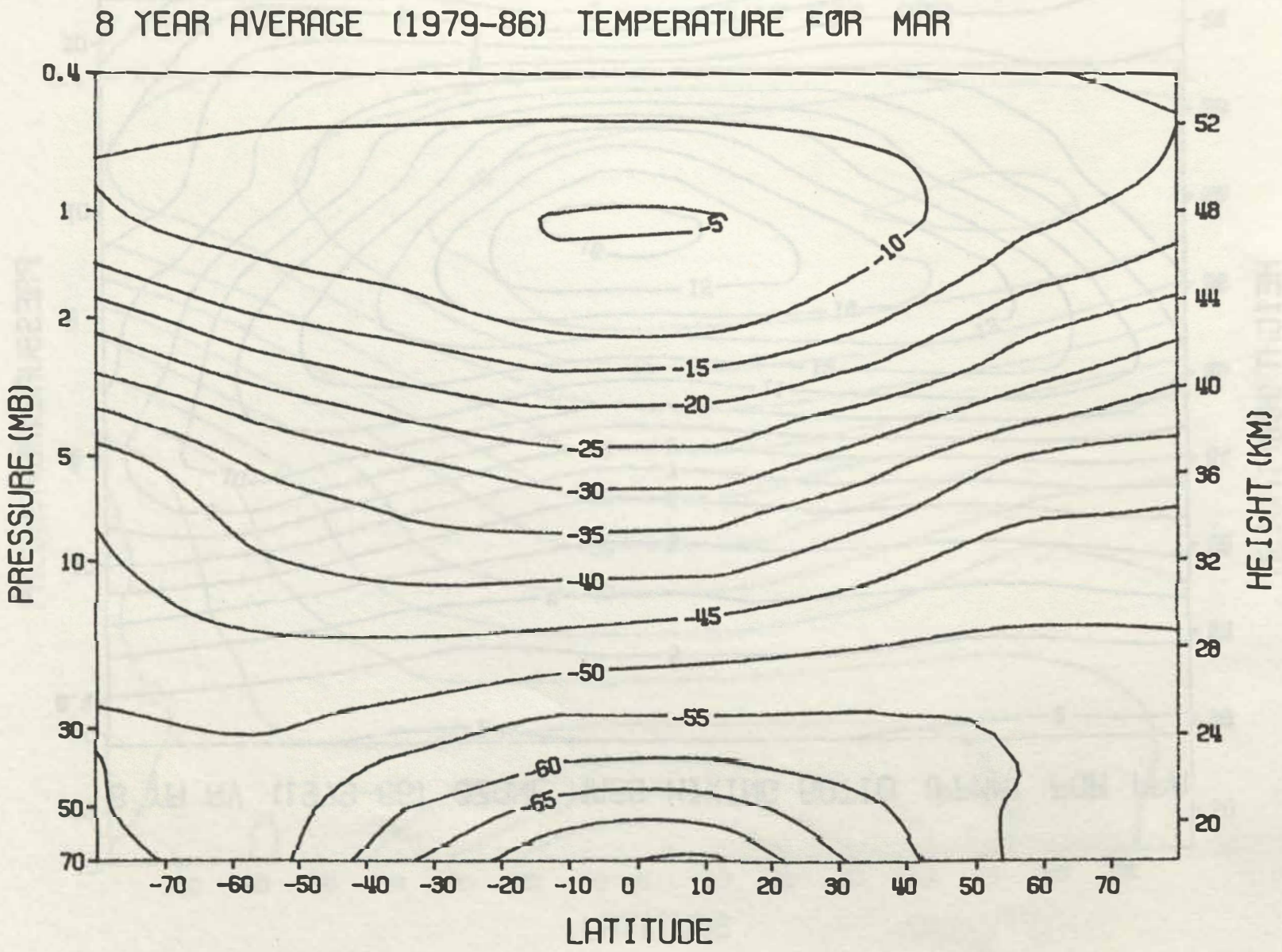


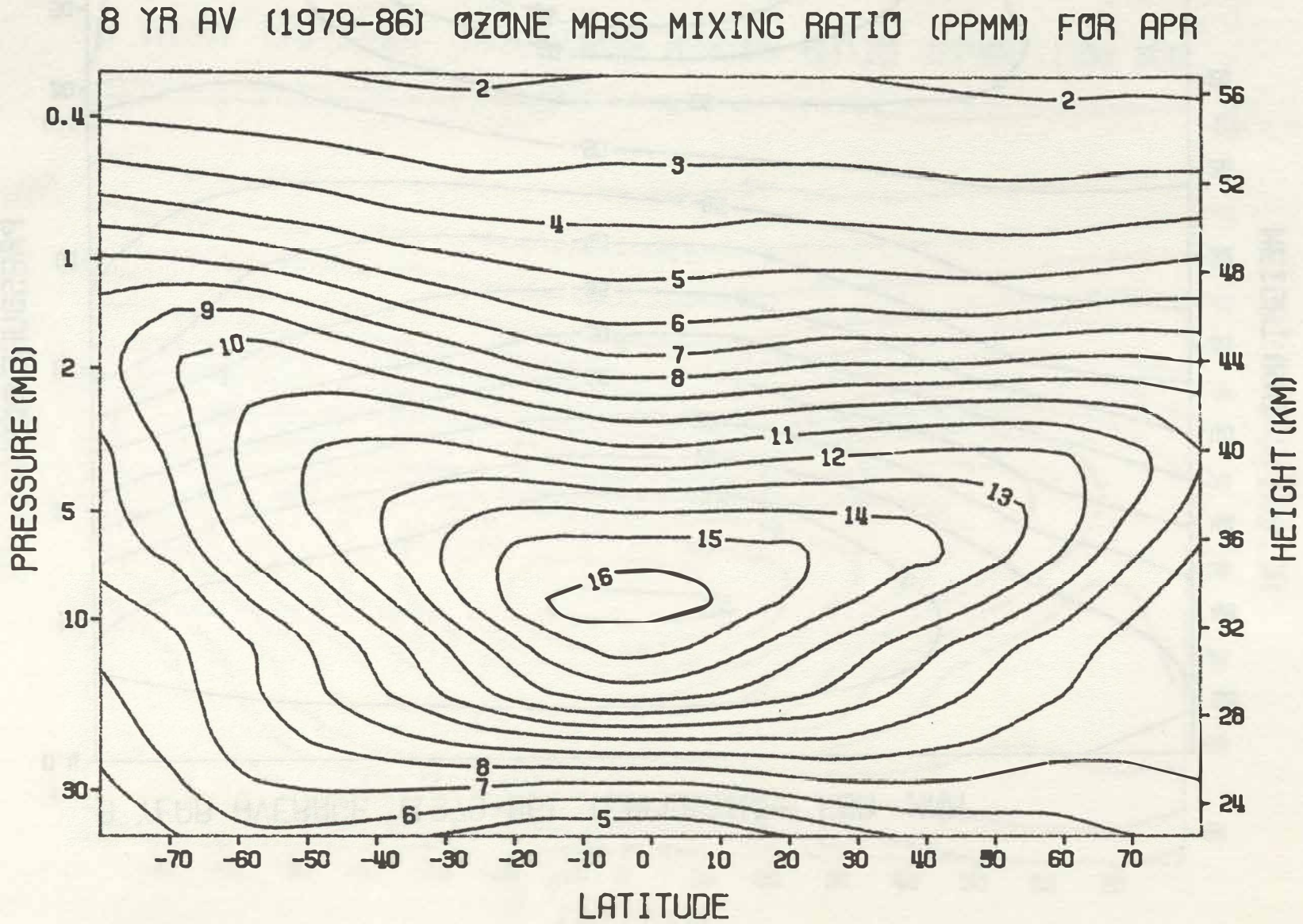

8 YEAR AVERAGE (1979-86) TEMPERATURE FOR JAN
PRESSURE (MB)
0.4
1
2
5
10
30
50
70
HEIGHT (KM)
52
48
44
40
36
32
28
24
20
LATITUDE
-70
-60
-50
-40
-30
-20
-10
0
10
20
30
40
50
60
70
10
5
0
-5
-10
-15
-20
-25
-30
-35
-40
-45
-50
-55
-60
-65
-70


8 YR AV (1979-86) OZONE MASS MIXING RATIO (PPMM) FOR FEB
PRESSURE (MB)
0.4
1
2
5
10
30
HEIGHT (KM)
56
52
48
44
40
36
32
28
24
LATITUDE
-70
-60
-50
-40
-30
-20
-10
0
10
20
30
40
50
60
70
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
9
8
7
6
5
4
5
7

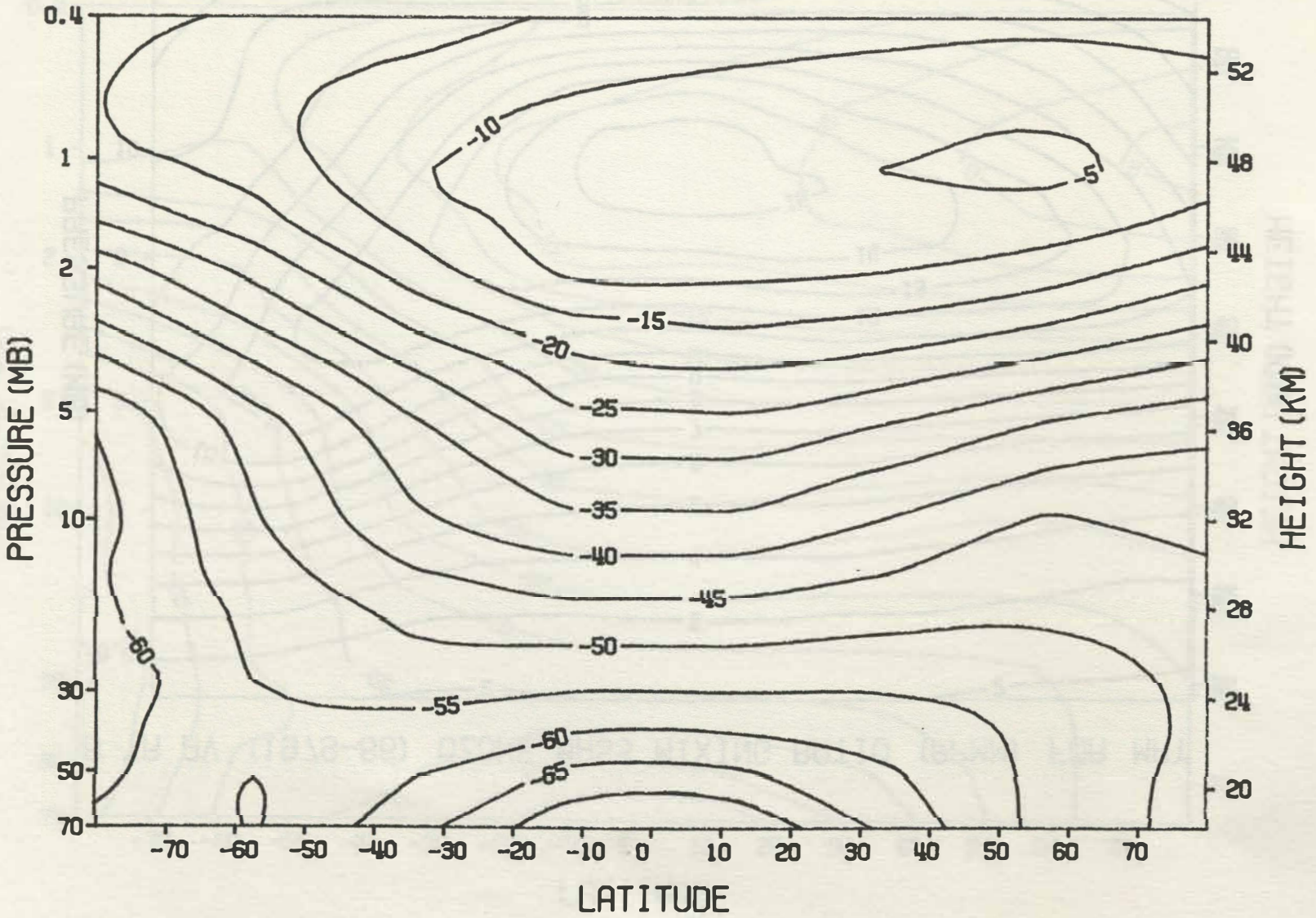

8 YEAR AVERAGE (1979-86) TEMPERATURE FOR FEB
PRESSURE (MB)
0.4
1
2
5
10
30
50
70
HEIGHT (KM)
52
48
44
40
36
32
28
24
20
LATITUDE
-70 -60 -50 -40 -30 -20 -10 0 10 20 30 40 50 60 70
5
0
-5
-10
-15
-20
-25
-30
-35
-40
-45
-50
-55
-60
-65

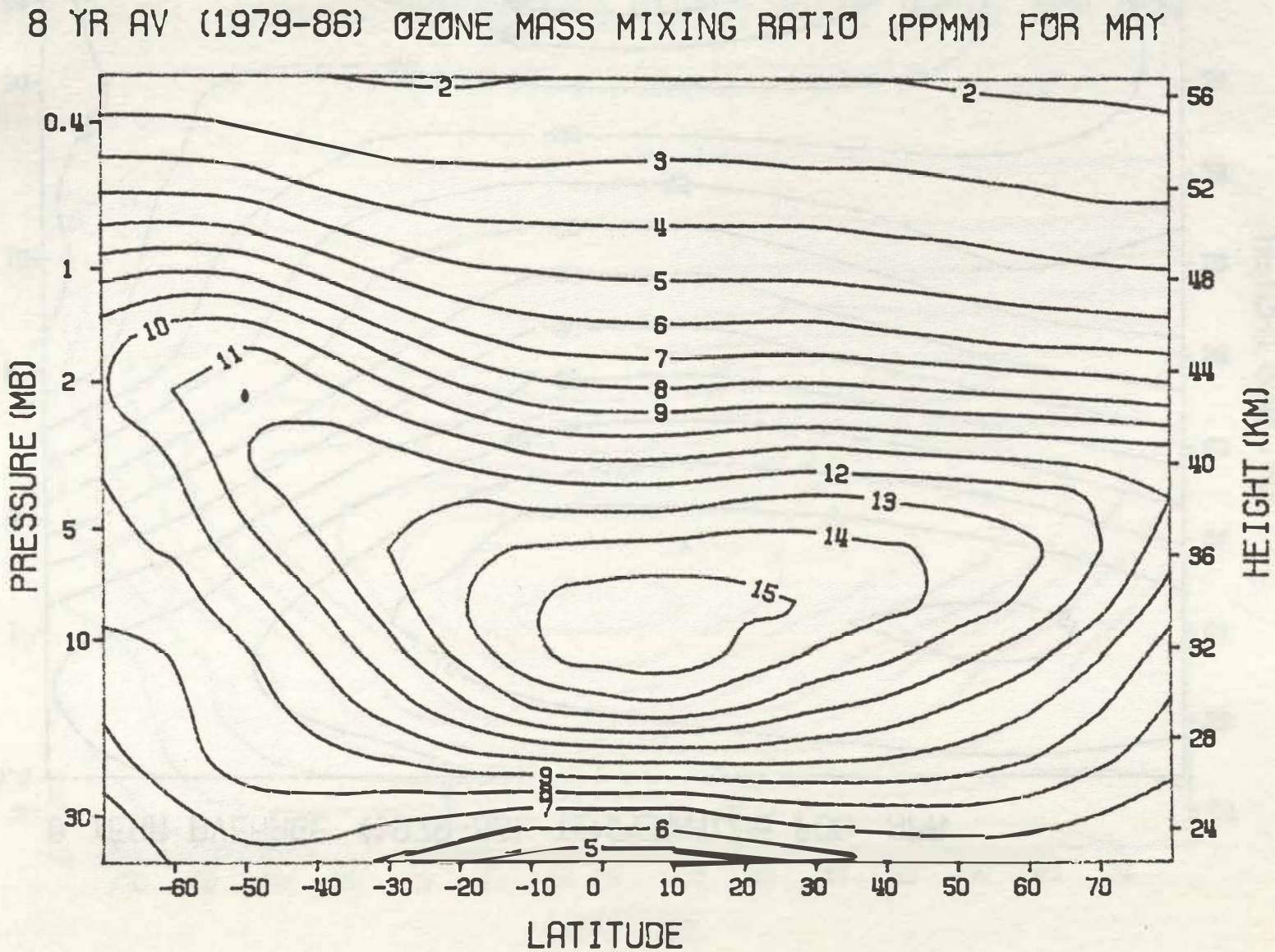

8 YR AV (1979-86) OZONE MASS MIXING RATIO (PPMM) FOR MAR
PRESSURE (MB)
0.4
1
2
5
10
30
HEIGHT (KM)
56
52
48
44
40
36
32
28
24
LATITUDE
-70
-60
-50
-40
-30
-20
-10
0
10
20
30
40
50
60
70
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

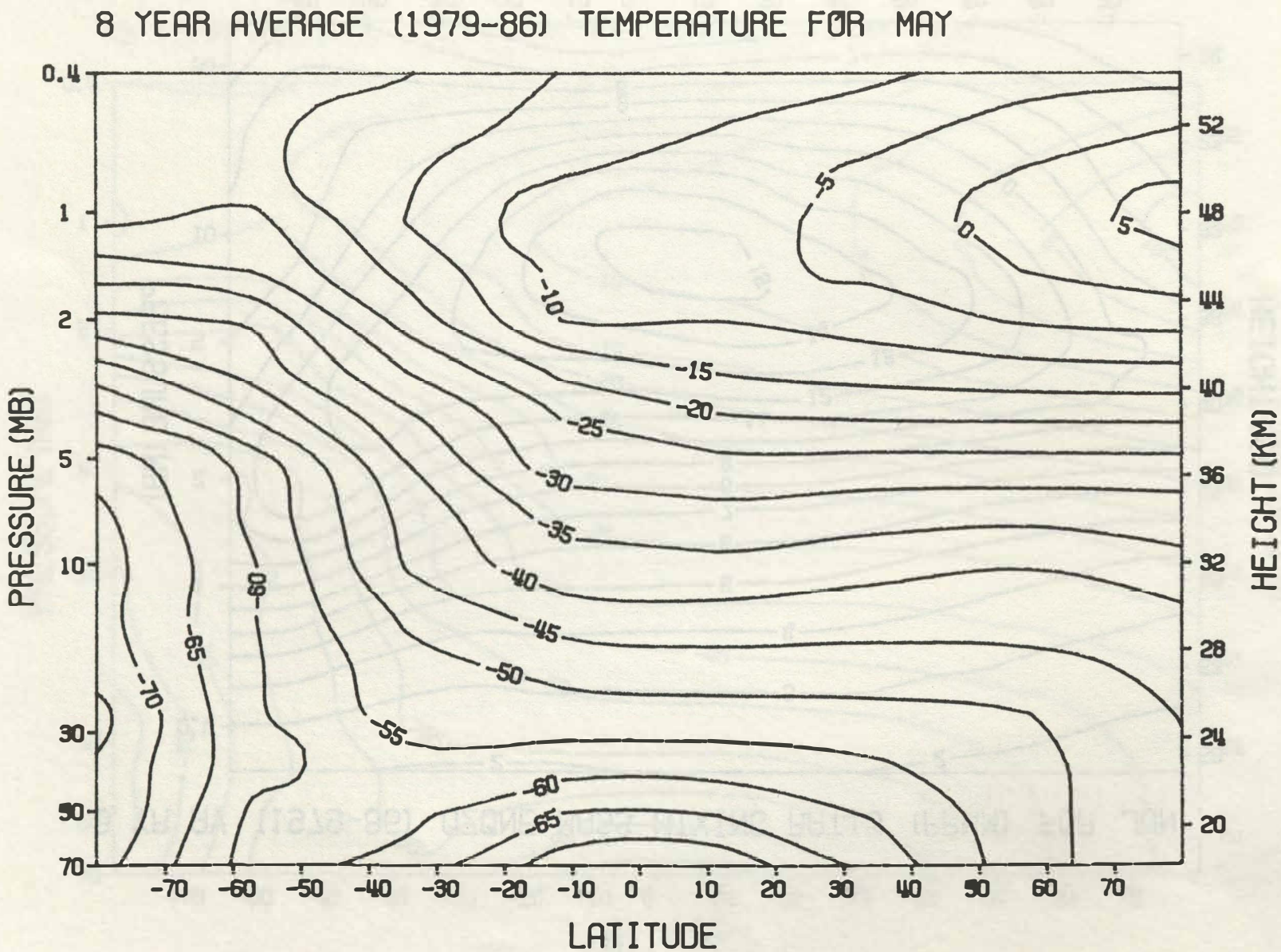

8 YEAR AVERAGE (1979-86) TEMPERATURE FOR MAR
PRESSURE (MB)
0.4
1
2
5
10
30
50
70
HEIGHT (KM)
52
48
44
40
36
32
28
24
20
LATITUDE
-70 -60 -50 -40 -30 -20 -10 0 10 20 30 40 50 60 70
-5
-10
-15
-20
-25
-30
-35
-40
-45
-50
-55
-60
-65


8 YR AV (1979-86) OZONE MASS MIXING RATIO (PPMM) FOR APR
PRESSURE (MB)
0.4
1
2
5
10
30
HEIGHT (KM)
56
52
48
44
40
36
32
28
24
LATITUDE
-70
-60
-50
-40
-30
-20
-10
0
10
20
30
40
50
60
70
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

8 YEAR AVERAGE (1979-86) TEMPERATURE FOR APR




8 YR AV (1979-86) OZONE MASS MIXING RATIO (PPMM) FOR MAY
PRESSURE (MB)
0.4
1
2
5
10
30
HEIGHT (KM)
56
52
48
44
40
36
32
28
24
LATITUDE
-60
-50
-40
-30
-20
-10
0
10
20
30
40
50
60
70
2
3
4
5
6
7
8
9
10
11
12
13
14
15


8 YEAR AVERAGE (1979-86) TEMPERATURE FOR MAY
PRESSURE (MB)
HEIGHT (KM)
LATITUDE
0.4
1
2
5
10
30
50
70
52
48
44
40
36
32
28
24
20
-70
-60
-50
-40
-30
-20
-10
0
10
20
30
40
50
60
70
-5
0
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-15
-20
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-30
-35
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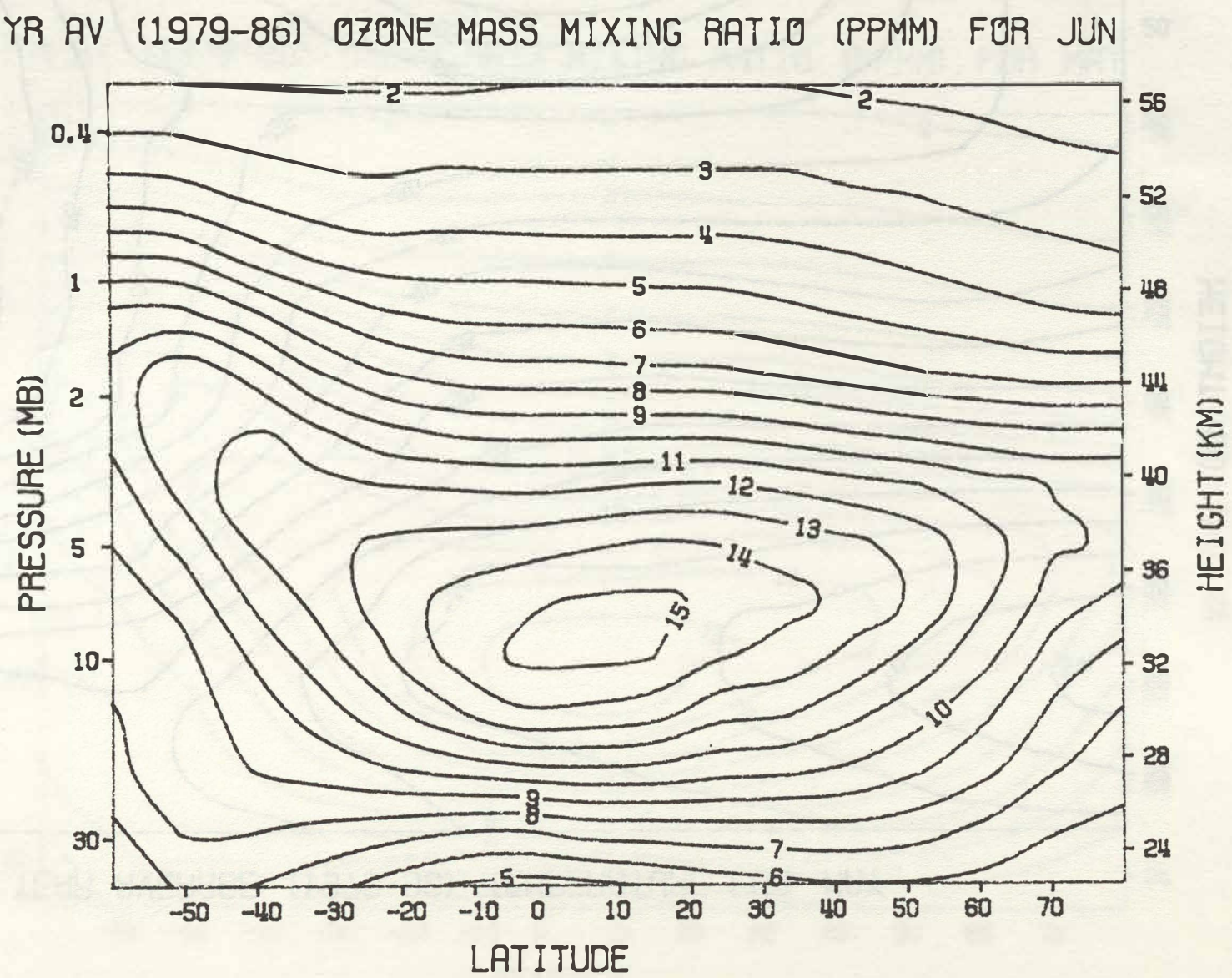
-45
-50
-55
-60
-65
-70


8 YR AV (1979-86) OZONE MASS MIXING RATIO (PPMM) FOR JUN
PRESSURE (MB)
0.4
1
2
5
10
30
HEIGHT (KM)
56
52
48
44
40
36
32
28
24
LATITUDE
-50
-40
-30
-20
-10
0
10
20
30
40
50
60
70
2
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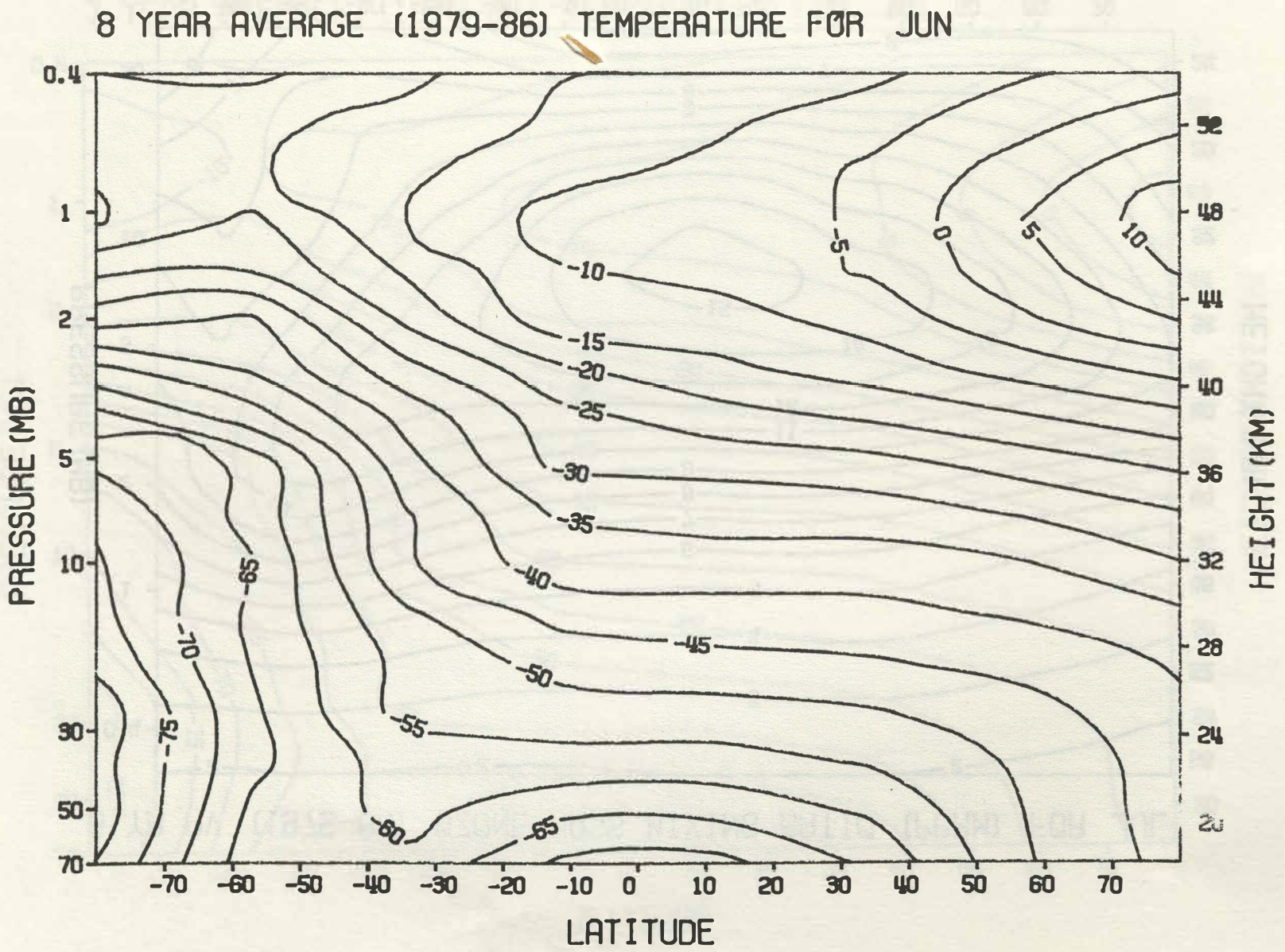
5
6
7
8
9
11
12
13
14
15
10
9
8
7
6
5


8 YEAR AVERAGE (1979-86) TEMPERATURE FOR JUN
PRESSURE (MB)
0.4
1
2
5
10
30
50
70
HEIGHT (KM)
52
48
44
40
36
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LATITUDE
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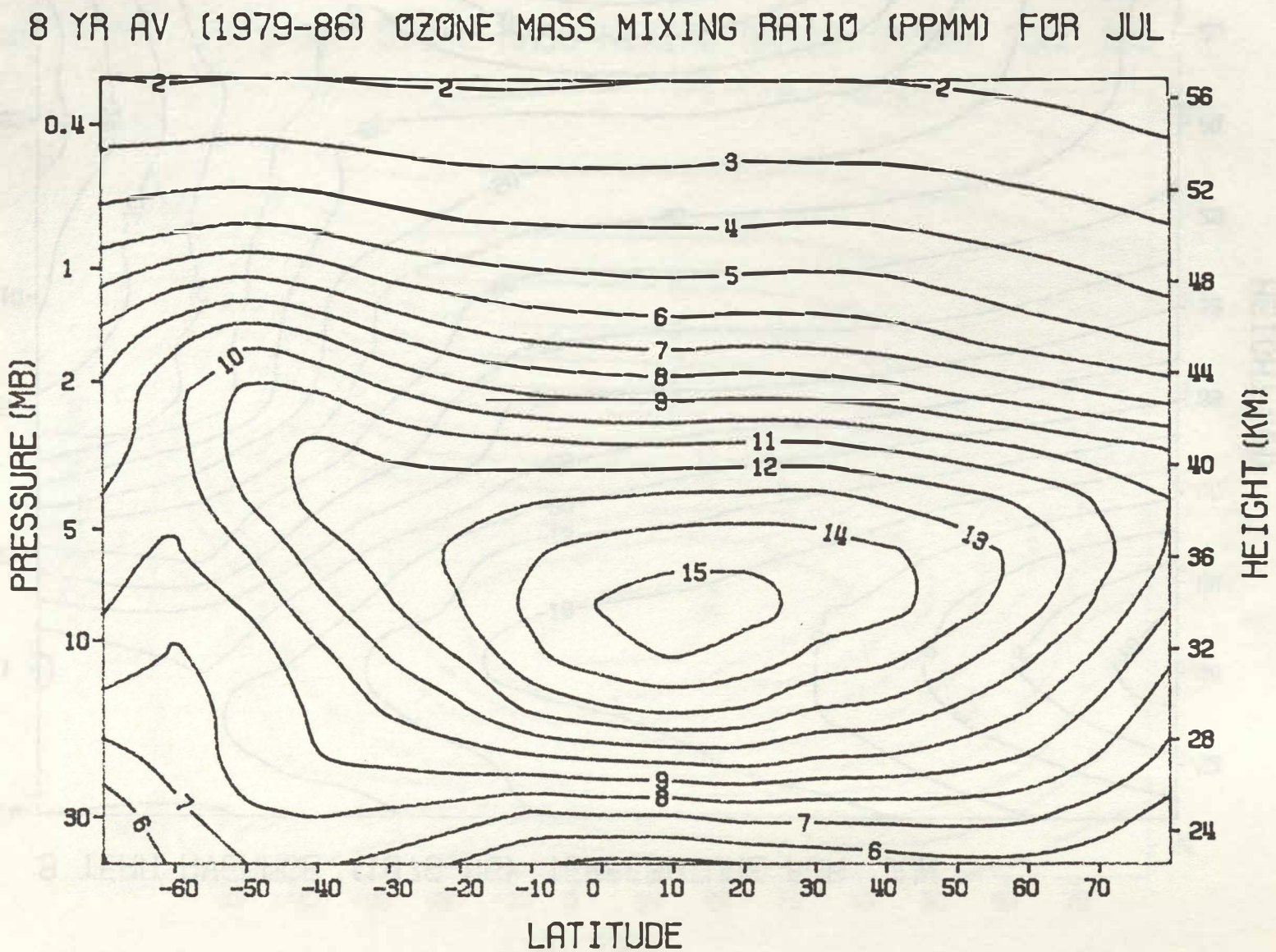
8 YR AV (1979-86) OZONE MASS MIXING RATIO (PPMM) FOR JUL
PRESSURE (MB)
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1
2
5
10
30
HEIGHT (KM)
56
52
48
44
40
36
32
28
24
LATITUDE
-60
-50
-40
-30
-20
-10
0
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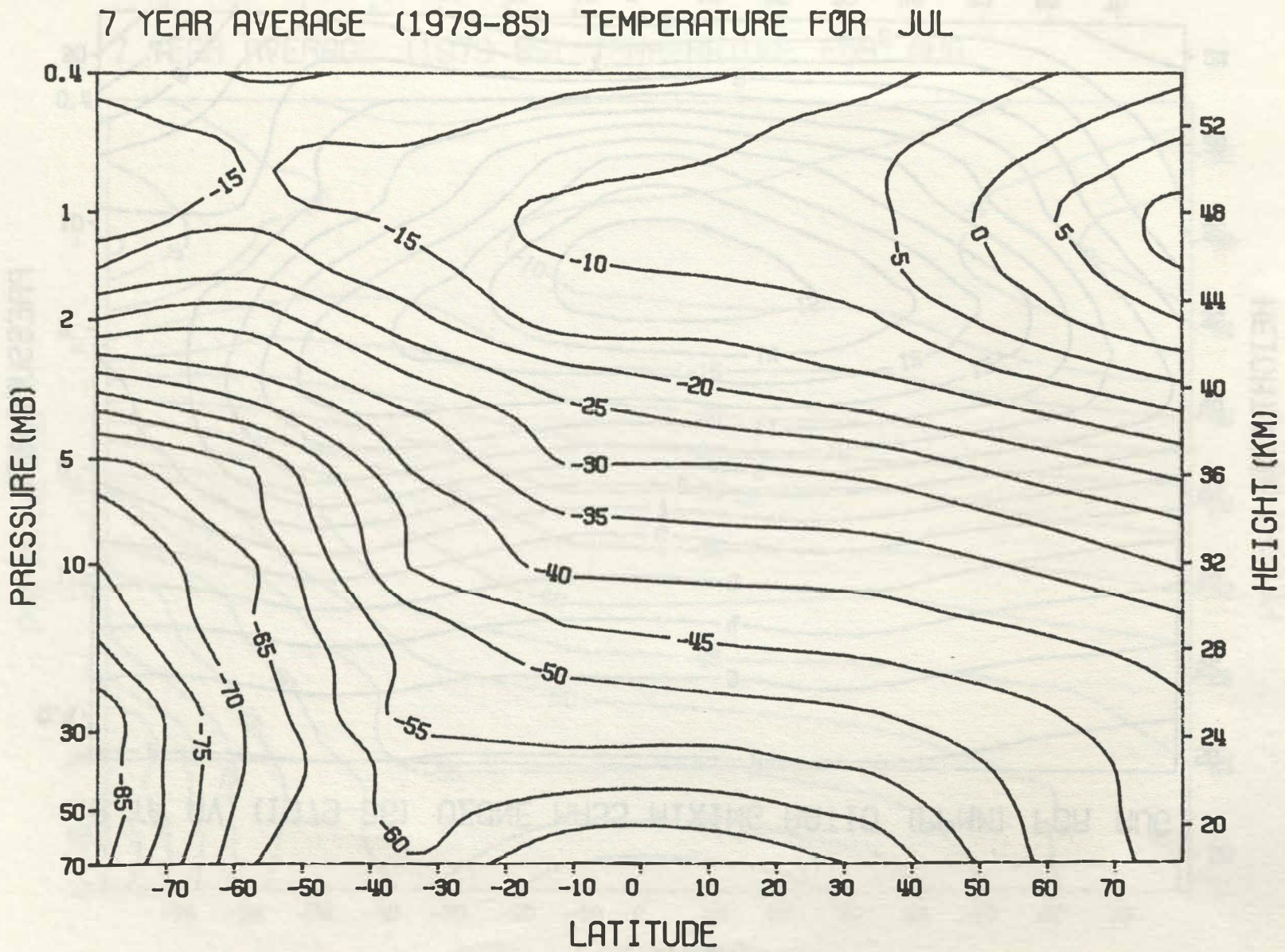
7 YEAR AVERAGE (1979-85) TEMPERATURE FOR JUL
PRESSURE (MB)
0.4
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2
5
10
30
50
70
HEIGHT (KM)
52
48
44
40
36
32
28
24
20
LATITUDE
-70 -60 -50 -40 -30 -20 -10 0 10 20 30 40 50 60 70
-15
-15
-10
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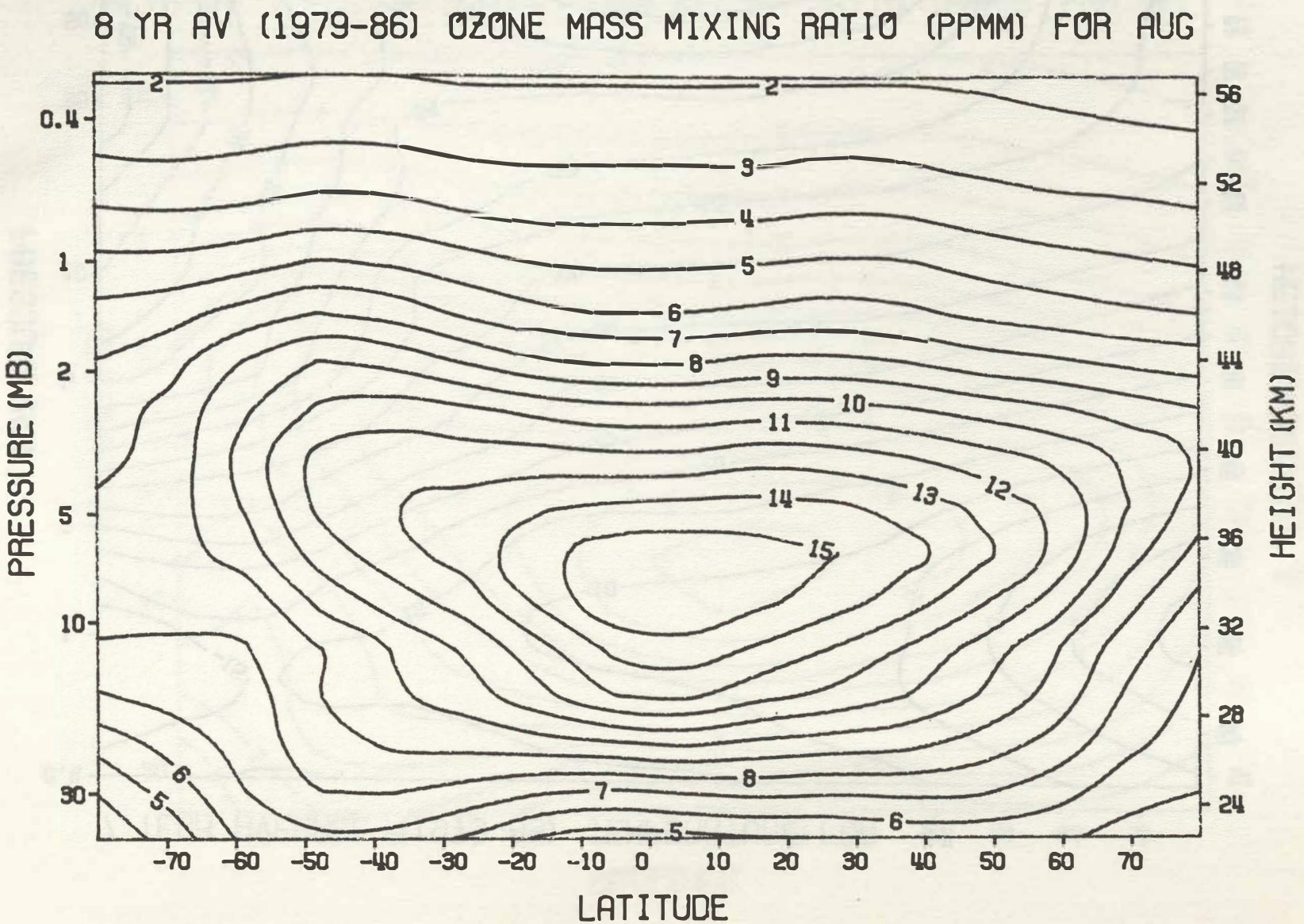
8 YR AV (1979-86) OZONE MASS MIXING RATIO (PPMM) FOR AUG
PRESSURE (MB)
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10
30
HEIGHT (KM)
56
52
48
44
40
36
32
28
24
LATITUDE
-70
-60
-50
-40
-30
-20
-10
0
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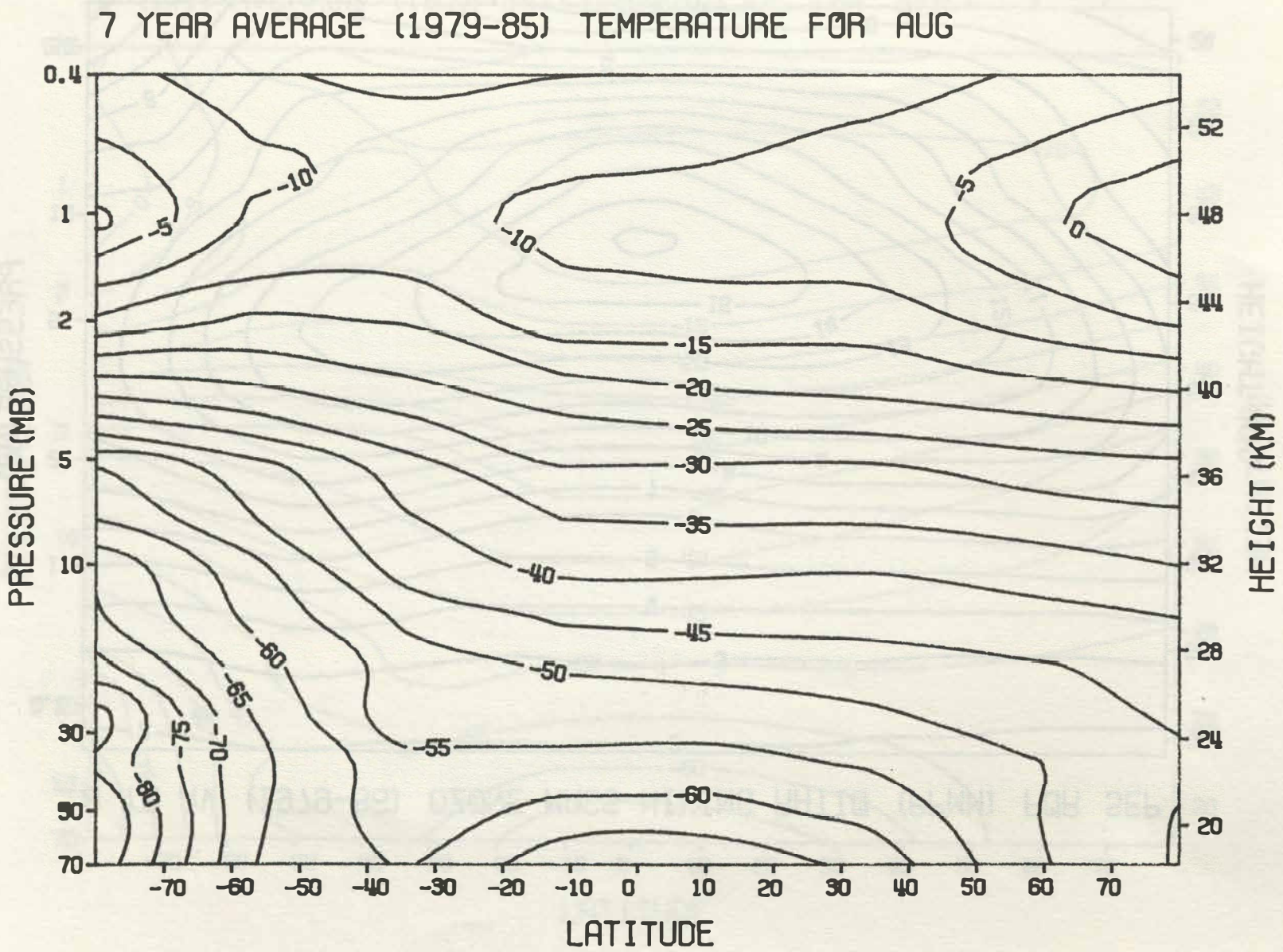
7 YEAR AVERAGE (1979-85) TEMPERATURE FØR AUG
PRESSURE (MB)
HEIGHT (KM)
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1
2
5
10
30
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52
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40
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24
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-70
-60
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-10
0
10
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50
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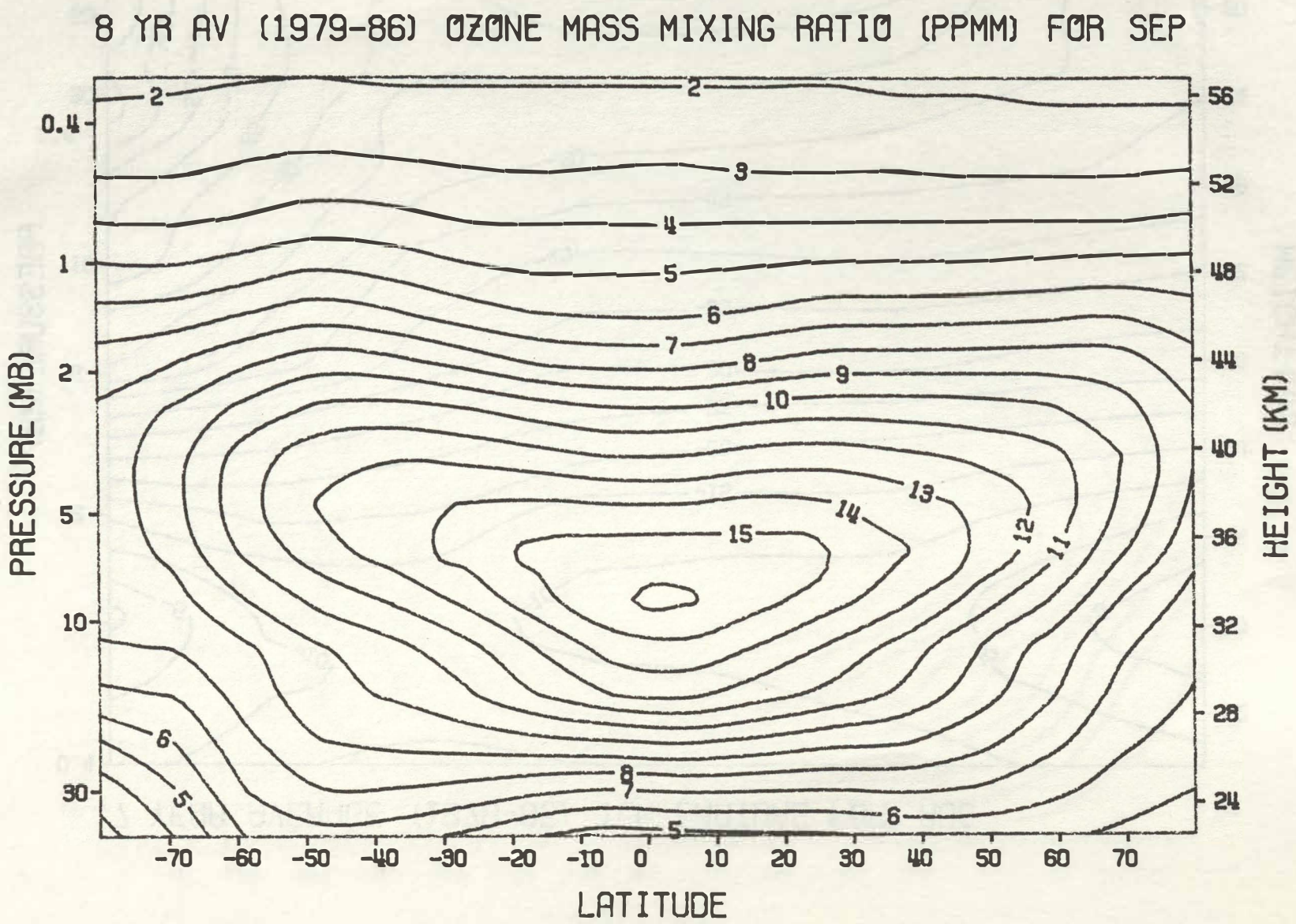
8 YR AV (1979-86) OZONE MASS MIXING RATIO (PPMM) FOR SEP
PRESSURE (MB)
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1
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5
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30
HEIGHT (KM)
56
52
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44
40
36
32
28
24
LATITUDE
-70
-60
-50
-40
-30
-20
-10
0
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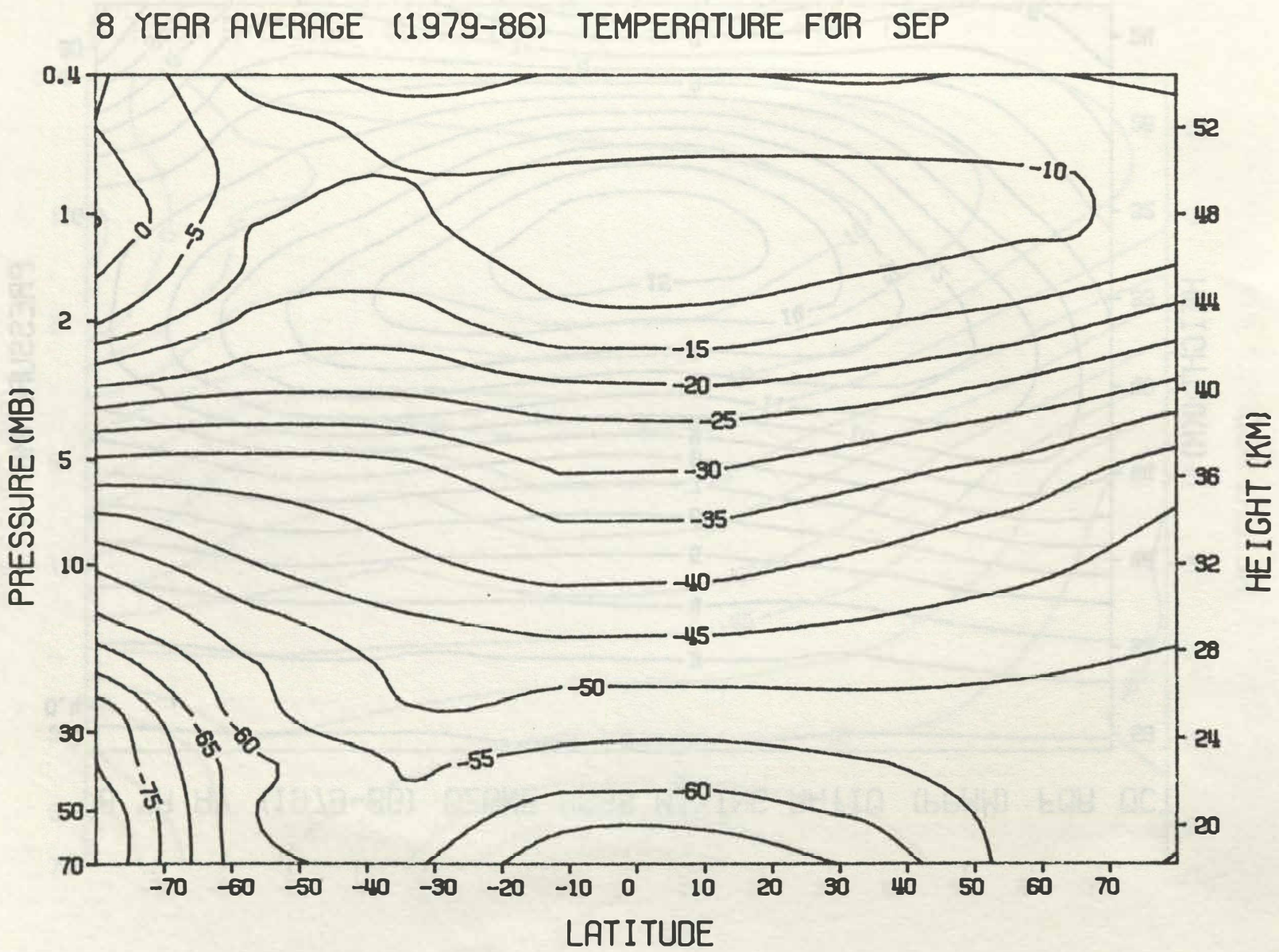
8 YEAR AVERAGE (1979-86) TEMPERATURE FOR SEP
PRESSURE (MB)
HEIGHT (KM)
LATITUDE
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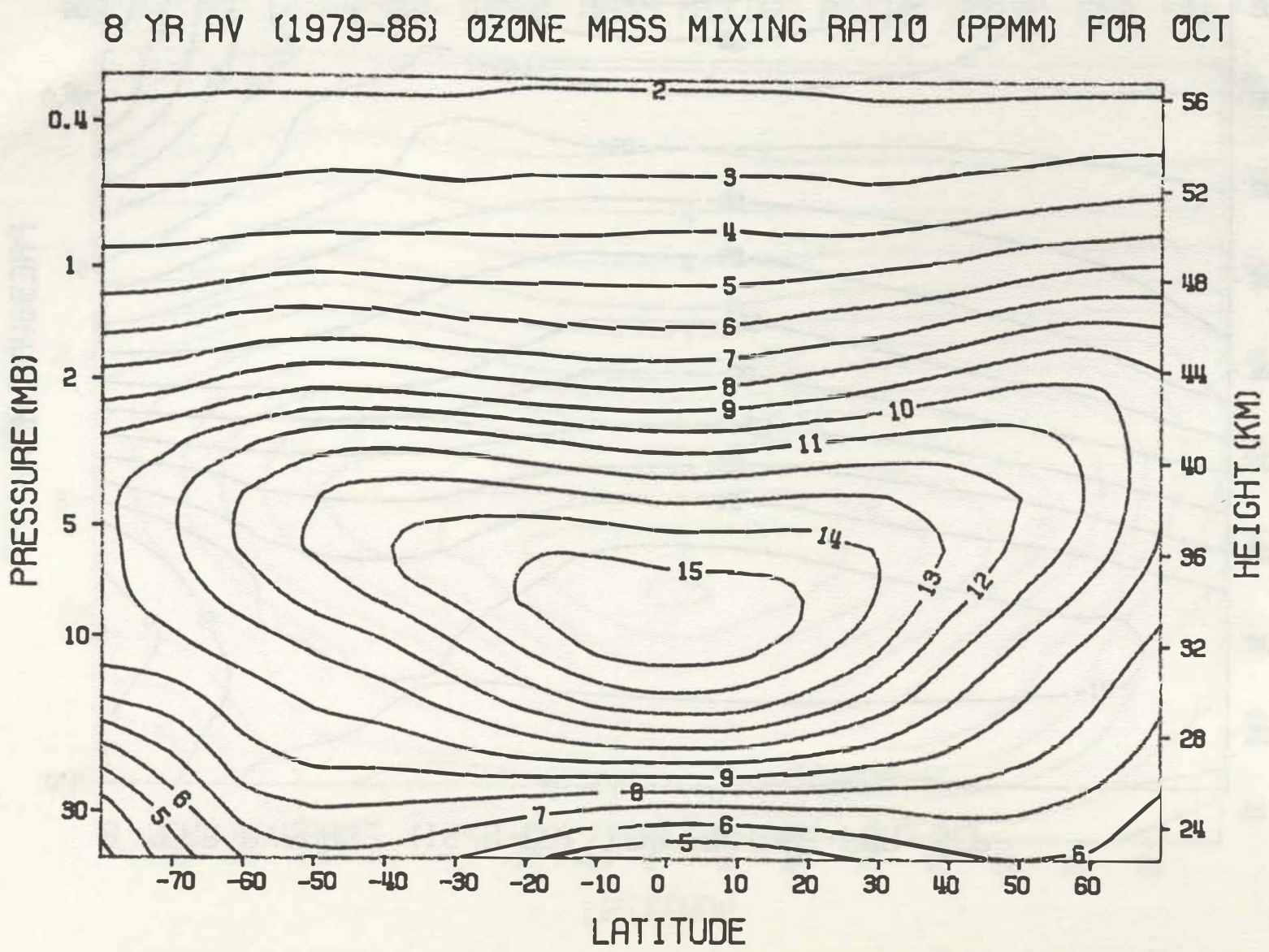
8 YR AV (1979-86) OZONE MASS MIXING RATIO (PPMM) FOR OCT
PRESSURE (MB)
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1
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10
30
HEIGHT (KM)
56
52
48
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36
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24
LATITUDE
-70
-60
-50
-40
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-20
-10
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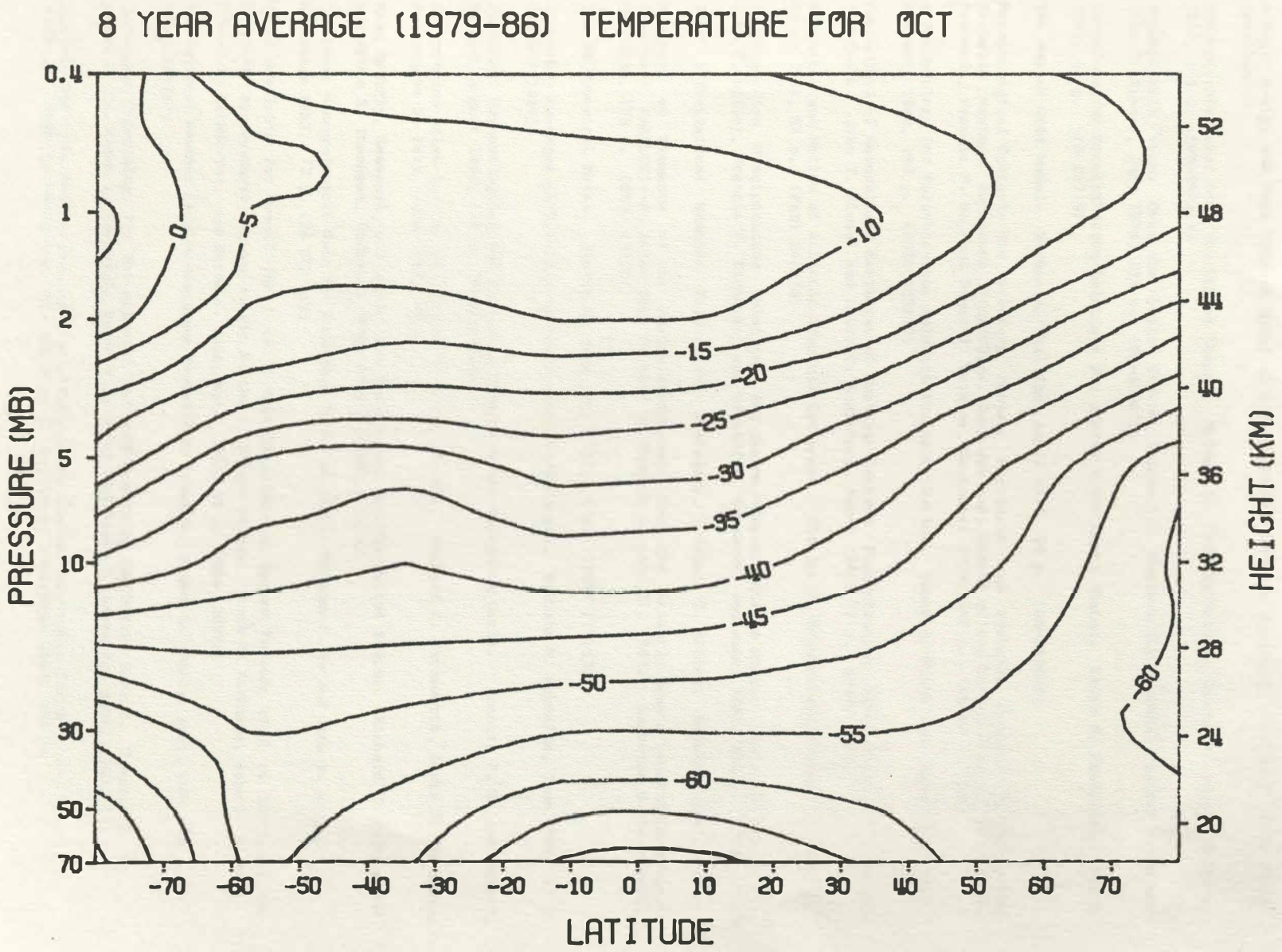
8 YEAR AVERAGE (1979-86) TEMPERATURE FOR OCT
PRESSURE (MB)
0.4
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70
HEIGHT (KM)
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LATITUDE
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(Continued from inside front cover)

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