Daily Series SYNOPTIC WEATHER MAPS Part I

HISTORICAL BACKGROUND

The first series of historical sea-level weather maps for the Northern Hemisphere began with January 1899 and extended through June 1957. Upper-air maps of the 500-millibar pressure surface were added beginning with the month of December 1944 and also extended through June 1957.

A special series of sea-level and 500-millibar maps was prepared for the period July 1957 through December 1958 in connection with the International Geophysical Year. The analyses were based on checked data on microcards prepared by the World Meteorological Organization as a primary data source, and were coordinated with similar maps for the remainder of the world. Together they resulted in a set of IGY World Weather Maps. The Northern Hemisphere sea-level and 500-millibar maps were published for this period under the title of "International Geophysical Year World Weather Maps, Part I, Northern Hemisphere."

The Post-IGY series of Northern Hemisphere Weather Maps covers the period from January 1959 through December 1963, and is similar to the series which begins with maps for January 1949[1]. Beginning with January 1961, the 500-millibar charts were prepared from computer-analyzed charts produced at the National Meteorological Center[2], except for a few of the earlier issues for which machine-analyzed charts were not available. During the months of January through April 1961, isotherms were not included on the machine-analyzed charts, so they were added by reference to observations and comparisons with other hand-drawn charts.

Data tabulations were added to the synoptic map series beginning with the October 1945 issue. Except for two gaps, November and December 1945, and January 1954 through June 1955, these monthly data listings are complete and are available in published form through December 1963 and in the form of microfilm beginning with data for January 1964.

INTRODUCTION

The present series of Northern Hemisphere Weather Maps begins with January 1964. In this series, with the exception of the sea-level map for May 1964, whose preparation was identical with the maps in the 1959-1963 series, each map is prepared for publication directly from the maps drawn daily for operational use at the National Meteorological Center. Each volume consists of Northern Hemisphere charts for one month, there being one sea-level and one 500-millibar map for each day at 1200 GMT.*

Data tabulations of the following are also available; synoptic surface reports for 1200 GMT for selected stations; radiosonde and rawinsonde reports for 0000 GMT and 1200 GMT for North America (WMO Region IV), the Atlantic and Pacific Ocean weather stations, and for stations outside Region IV for which data are available, including Greenland and the North Pacific Ocean; radiosonde and rawinsonde reports for 0000 GMT for the remainder of the Northern Hemisphere; and upper wind reports for 0000 GMT for selected stations.[3]

SEA LEVEL MAPS

The sea-level maps in this series were prepared from data observed at or near 1200 GMT providing continuity with other series of Northern Hemisphere Weather Maps that have already been completed, or that are in the process of being completed. Synoptic reports were plotted from all available areas of the Northern Hemisphere.

An abbreviated International Plotting Code model was used in plotting the maps. The positions of the elements in relation to the land and ship station circles have been printed on each map. More complete synoptic reports of the stations plotted as well as many additional stations in the Northern Hemisphere may be found in Part II, and a description of the elements plotted and/or listed may be found in the WMO Publication No. 9, TP. 4, Volume B in effect at the time of the observations.

The first analysis of the sea-level maps in this series was done at the National Meteorological Center, and wherever possible, the original analyses remain basically unchanged. Additions were made in areas of sparse coverage; and adjustments, modifications, and other additions were made at the National Climatic Center as necessary on the basis of information that later became available. The maps that appear in the publication are a direct reproduction of the original NMC maps after the additions, adjustments, and modifications have been made. Where additional plotting was done, in areas where coverage on the original maps was sparse, the data were gathered from every available source; special forms or listings furnished for this publication by cooperating National Meteorological Services; data and charts published by those Services; weather logs of commercial ships; and collections of radio and teletypewriter reports from all available areas of the Northern Hemisphere. In particular, data usually are added on all maps for wide areas of Africa, the Middle East, India, Southeast Asia, and the Pacific Ocean. Final analyses of the sea-level (and upper-air) charts were aided by careful study of weather maps published by various National Meteorological Services, and by study of intermediate charts prepared by the National Meteorological Center. The original observation forms of the weather reporting ships at sea, in addition to transocean flight reports, were available for use by the analysts as an aid to continuity.

Isobars were drawn at 5 millibar intervals from the beginning of the earliest series through December 1963 and at 4 millibar intervals from January 1964 onward, except for the volume for May 1964 in which a 5 millibar interval is used.

500-MILLIBAR MAPS

The large amount of data available for these maps permitted a more detailed analysis than had been possible on maps in the earlier series. All of the major circulation systems were shown together with a large percentage of the lesser systems which could be logically identified on consecutive maps.

The first analysis of the 500-millibar maps in this series was also done at the National Meteorological Center, with adjustments, modifications, and additions made as necessary at the National Climatic Center on the basis of information that later became available. To the original area covered by the NMC analysis, an additional area was added in the Eastern Hemisphere, where no data were plotted on the original maps. This added area covers that part of the globe shown on the maps as Equatorward from the straight line connecting the points at 10° N. Latitude, 5° W. Longitude; 56° N. Latitude, 70° E. Longitude; and 15° N. Latitude, 130° E. Longitude.

Height contours were drawn as solid lines at intervals of 200 feet from the beginning of the earliest series through June 1957. After that time, an interval of 80 meters was used from July 1957 through December 1958; an interval of 200 feet from January 1959 through February 1963; an interval of 60 meters from March 1963 onward. Isotherms at 5° C. intervals have been drawn as single dashed lines. Representation of troughs by a double solid line was discontinued with the June 1953 volume.

Surface and upper-air analyses have been closely coordinated, particularly in areas where data were sparse, in order to insure that the final analysis would be the best possible in view of the limited data and would be completely consistent with the surface analysis.

1. (a) U. S. Weather Bureau. Daily Synoptic Series Historical Weather Maps, Northern Hemisphere Sea Level, January 1899 to June 1939, inclusive.
   (b) U. S. Weather Bureau. Daily Series Synoptic Weather Maps, Northern Hemisphere Sea Level Charts, July 1939 to November 1944, inclusive.
   (c) U. S. Weather Bureau. Daily Series Synoptic Weather Maps, Northern Hemisphere Sea Level and 500-Millibar Charts, December 1944 to September 1945, inclusive.
   (d) Headquarters, Air Weather Service, AAF. Northern Hemisphere Historical Weather Maps, Sea Level and 500-Millibars, October 1945 to December 1948, inclusive.
   (e) U. S. Weather Bureau. Daily Series Synoptic Weather Maps, Northern Hemisphere Sea Level and 500-Millibar Charts, January 1949 to June 1957, inclusive.
   (f) U. S. Weather Bureau. IGY World Weather Maps, Part I, Northern Hemisphere, Sea Level and 500-Millibar Charts, July 1957 to December 1958, inclusive.
   (g) U. S. Weather Bureau. Daily Series Synoptic Weather Maps, Part I, Northern Hemisphere Sea Level and 500-Millibar Charts, January 1959 to January 1960, inclusive.

2. (a) Environmental Science Services Administration. Daily Series Synoptic Weather Maps, Part I, Northern Hemisphere Sea-Level and 500-Millibar Charts, February 1960 to September 1962, inclusive.
   (b) National Oceanic and Atmospheric Administration. Daily Series Synoptic Weather Maps, Part I, Northern Hemisphere Sea-Level and 500-Millibar Charts, October 1962 to December 1963, inclusive.
   (c) Environmental Science Services Administration. Daily Series Synoptic Weather Maps, Part I, Northern Hemisphere Sea-Level and 500-Millibar Charts, January 1964 to December 1964, inclusive.
   (d) National Oceanic and Atmospheric Administration. Daily Series, Synoptic Weather Maps, Part I, Northern Hemisphere Sea Level and 500-Millibar Charts, January 1965, et seq.

3. (a) U. S. Weather Bureau. Daily Series Synoptic Weather Maps, Part II, Northern Hemisphere Data Tabulations, July 1955 to September 1964, inclusive.
   (b) Environmental Science Services Administration. Daily Series Synoptic Weather Maps, Part II, Northern Hemisphere Data Tabulations, October 1964 to November 1969, inclusive.
   (c) National Oceanic and Atmospheric Administration. Daily Series Synoptic Weather Maps, Part II, Northern Hemisphere Data Tabulations, December 1969, et seq.

* Beginning with the maps for April 1, 1957, all observations are 1200 GMT except those for stations operated by Canada and the United States. Time of these observations changes from 1230 GMT for sea-level and 1500 GMT for 500-millibars, to 1200 GMT for both levels on June 1, 1957, unless otherwise indicated.

LIST OF SYMBOLS USED ON MAPS

SEA-LEVEL MAPS

- COLD FRONT -- SURFACE
- COLD FRONT ALOFT
- WARM FRONT -- SURFACE
- WARM FRONT ALOFT
- QUASI-STATIONARY FRONT -- SURFACE
- OCCLUDED FRONT -- SURFACE
- OCCLUDED FRONT ALOFT
- FRONTOGENESIS, RESULTING IN THE FORMATION OF A COLD FRONT AT THE SURFACE
- FRONTOGENESIS, RESULTING IN THE FORMATION OF A WARM FRONT AT THE SURFACE

SEA-LEVEL MAPS

- FRONTOGENESIS, RESULTING IN THE FORMATION OF A QUASI-STATIONARY FRONT AT THE SURFACE
- COLD FRONT AT THE SURFACE, UNDERGOING FRONTOLYSIS
- WARM FRONT AT THE SURFACE, UNDERGOING FRONTOLYSIS
- QUASI-STATIONARY FRONT AT THE SURFACE, UNDERGOING FRONTOLYSIS
- OCCLUDED FRONT AT THE SURFACE, UNDERGOING FRONTOLYSIS
- INSTABILITY LINE (NON-FRONTAL LINE ALONG WHICH SQUALLS OR OTHER EVIDENCES OF MARKED INSTABILITY EXIST)
- TROUGH LINE
- INTERTROPICAL CONVERGENCE ZONE

500-MILLIBAR MAPS

- HEIGHT CONTOUR
- ISOTHERM
- 1--2 KNOT WIND
- 3--7 KNOT WIND
- 10 KNOT WIND
- 55 KNOT WIND