

**National Climatic Data Center**

**DATA DOCUMENTATION**

**FOR**

**DATA SET 3901 (DSI-3901)**

**NOAA Surface & Upper Air Weather Charts**

**March 24, 2003**

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1. **Abstract:** The National Climatic Data Center's three-disc set of NOAA weather charts contains the charts most commonly used by researchers and the general public. This set is the first National Climatic Data Center (NCDC) CD-ROM product available on a monthly subscription basis and will serve as a continuation of the microfilm archive.

#### The NCDC Weather Chart Archive

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In addition to providing a quick historical reference about weather conditions on selected dates, weather charts can be used to quickly geographically locate and date a series of similar weather phenomena and events. Using such charts saves researchers tremendous amounts of time in studying and isolating the dates of weather phenomena. Because of these uses, the NCDC has long maintained an archive of the weather charts and analyses produced by the U.S. [National Centers for Environmental Prediction](#) (NCEP), formerly the National Meteorological Center (NMC).

#### NCDC Microfilm Archive

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NCDC's archive for weather charts extends back as early as 1899 for the U.S. Daily Weather Map series. The archive for Constant Pressure (Upper Air) and North American Surface charts begins in March 1942. Subsequent charts have been added or deleted since then. The original archive consisted of paper charts which were later placed on microfilm. This was the official archive media through September 1994. Specific details about the microfilm archive for each chart are provided under the heading "Microfilm Archive File Structure" in the chart description files provided on each CD-ROM. (See files: A-SFC&UA.TXT, B-FORCST.TXT, and C-PRCWX.TXT)

#### NCDC CD-ROM Set

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NCDC's NOAA Weather Charts CD-ROM set consists of three closely-related series of charts. These charts are but a subset of all the charts produced by NCEP. However, all the charts in NCDC's microfilm archive (which are current NOAA charts) are included, as well as the NOAA forecast charts. Some charts which were dropped from the microfilm archive have been reintroduced.

All charts on the three CD-ROM set are officially archived in a digital database, from which NCDC has the capacity to produce paper copies. NCDC acquires the charts from NCEP and ingests the data. The digital database contains the same charts as those on the CD-ROM set, though in a different format. The use of CD-ROM media allows NCDC to present data on a media that is being increasingly used by the public, libraries, and researchers.

The chart series names and lists of charts on each CD-ROM are provided below. For more information about the directory tree structure and naming conventions for files, please consult the READ\_1ST.TXT file. Included in this file are hardware/software requirements and suggestions for viewing and printing charts. For detailed information about particular charts in each chart series, consult the corresponding files. These files provide general information about the production of the charts and present a list of each chart name plus a narrative description of each chart, the CD-ROM directory, names of the charts, time period covered by the NCDC archive, geographic coverage, format, and microfilm archive file structure.

1) Chart Series A: Surface and Upper Air Weather Charts  
Description File: A-SFC&UA.TXT

A) North America: Constant Pressure

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- B) N. Hemisphere: Constant Pressure
  - C) North America: Surface
  - D) N. Hemisphere: Surface
  - E) S. Hemisphere: Constant Pressure
- 2) Chart Series B: Initial Analysis and Forecast Charts  
Description File: B-FORCST.TXT
- A) North America: 500 mb Heights/Vorticity
  - B) N. Hemisphere: 500 mb Heights/Vorticity
  - C) N. Hemisphere: Mean Relative Humidity/Vertical Velocity
  - D) N. Hemisphere: Surface Analysis/1000-500 mb Thickness
  - E) S. Hemisphere: Surface Analysis/1000-500 mb Thickness
- 3) Chart Series C: Tropical Strip/Precipitation and Observed Weather Charts  
Description File: C-PRCWX.TXT
- A) Tropical Strip: Constant Pressure
  - B) Tropical Strip: Surface
  - C) Composite Moisture Index
  - D) Observed Precipitation, Snowfall, and Temperature
  - E) Radar Summary
  - F) Weather Depiction
  - G) Winds Aloft

#### Viewing and Printing the Charts

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NOTE: These instructions are intended for Microsoft Windows users. Other systems, such as the MacIntosh, will have a slightly different method for viewing/printing these chart images.

To view these PCX files, double-click on the file icon in File Manager and Paintbrush will automatically be loaded with the image. You can scroll and zoom as well as cut and paste into other documents using the Clipboard. In addition, the images can be printed at different sizes using the tools in Paintbrush.

If another graphics program is launched when you double click in File Manager, then another program has been "associated" with PCX files. To create an association in File Manager for a preferred graphics program, consult your Windows documentation.

If you need the files in other graphic formats (ie., \*.bmp, \*.tif, etc.) or somehow altered, excellent conversion utilities exist as shareware products.

2. **Element Names and Definitions:** Please see Appendices A, B, and C
3. **Start Date:** Please see Appendices A, B, and C
4. **Stop Date:** Please see Appendices A, B, and C
5. **Coverage:** Please see Appendices A, B, and C

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**6. How to Order Data:**

Ask NCDC's Climate Services about the cost of obtaining this data set.  
Phone: 828-271-4800  
FAX: 828-271-4876  
E-mail: [NCDC.Orders@noaa.gov](mailto:NCDC.Orders@noaa.gov)

**7. Archiving Data Center:**

National Climatic Data Center  
Federal Building  
151 Patton Avenue  
Asheville, NC 28801-5001  
Phone: (828) 271-4800.

**8. Technical Contact:**

National Climatic Data Center  
Federal Building  
151 Patton Avenue  
Asheville, NC 28801-5001  
Phone: (828) 271-4800.

**9. Known Uncorrected Problems:**

PROBLEM: When the image is displayed in Paintbrush, it comes up as all black.

SOLUTION: What you are actually seeing is a black image on a black background. Some applications alter the color palette when they are started and do not reset it back when exited. This is only a problem for PC systems with an SVGA driver with 256 colors selected. Under such conditions, the color palette remains altered for the entire Windows session. Solutions include exiting and restarting Windows (making sure the offending application(s) do not automatically restart), using another graphics program instead of Paintbrush or changing video driver and/or color palette combinations.

PROBLEM: When the image is displayed, it appears as all white.

SOLUTION: The problem here is that a few of the charts have a large amount of white space along some of the edges. This is true only for the following charts:

Series C: Tropical Strip /Precipitation and Observed Weather Charts

- \* Tropical Strip Constant Pressure (trop\_str.con), all descriptions (250mb, 500mb, and 700mb), and all UTC times (00z and 12z). These charts all have a large margin along the top edge.
- \* Winds Aloft (winds.aft), Second Standard Level 14k, 24k, 34k ft. (14\_24\_34.2sl) for 00 UTC (00z). This chart has a large top and left edge margin.

The solution to this problem for viewing is to maximize the viewing window and/or scroll the view area to the desired portion of the chart. See the descriptions for these charts in their respective "readme" files for more information.

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PROBLEM: The image appears with "noise" (ie, unexpected vertical lines running through the chart), oriented upside-down or sideways, and/or truncated.

SOLUTION: These are all symptoms of a scanned image. While certain measures have been used to catch corrupt images, some charts will escape notice. For those that are caught, we have indicated that these are the "Best Copy Available." In either case, this represents the most complete image available for that chart.

10. **Quality Statement:** None available.

11. **Essential Companion Datasets:**

The other files stored in the README.DIR directory are provided for additional help in understanding and using this CD product. All these files are best viewed and printed with 1 inch margin settings. Here is a listing of these files and a brief explanation of each:

\*\* A-SFC&UA.TXT gives detailed information about the weather charts included in the Surface and Upper Air Weather Charts series.

\* ABBREV.TXT is a listing of the abbreviations used in the naming of the directories. It is designed to serve as a "cheat sheet" that expands the directory names to their original titles.

\*\* B-FORCST.TXT gives detailed information about the weather charts included in the Initial Analysis and Forecast series.

\*\* C-PRCWX.TXT gives detailed information about the weather charts included in the Tropical Strip/Precipitation and Observed Weather Charts series.

INTRO.TXT is a description of the NCDC weather charts archive.

\* SUBSET.TXT contains a listing of all the charts available on CD-ROM and is grouped by their respective series' and subset numbers. Each series is available on a separate CD.

\* Although all the above text files can be printed, it is especially recommended that these two files be printed and made available for easy access while the user is navigating the CD.

\*\* These files are included only on the appropriate CD. Therefore, if you have the Surface and Upper Air series, you should only have the A-SFC&UA.TXT file.

12. **References:** No information provided with original documentation.

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## Appendix A

### Chart Series A: Surface and Upper Air Weather Charts

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Note: The NCDC CD-ROM archive will ultimately begin with October 1994 data.

#### Introduction

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Current weather and analyses products are produced from a global observing and telecommunications network which funnels observations to the NCEP. In earlier years, the primary function of the NCEP's operational analyses programs was to provide information from which initial atmospheric conditions for numerical forecast models could be derived. The charts in this series document the basic weather data that enter into forecasts and present the surface and upper air weather conditions up to eight times per day in chart form.

In some cases, an element of human interpretation is used by meteorologists at the NCEP to make both objective and subjective adjustments. Both the North American and Northern Hemisphere surface charts on the CD-ROM set prior to October 1995 do NOT contain the human interpretations, but they are available on the microfilm archive through that date.

#### Description of NOAA Charts

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**(A&B) CHART NAMES:**           **NORTH AMERICAN CONSTANT PRESSURE CHARTS.**  
                                  **NORTHERN HEMISPHERE CONSTANT PRESSURE CHARTS.**

DIRECTORY NAMES:           N America:        n\_amerca.con  
                                  N Hemisphere:  n\_hemis.con

#### Levels:

hite\_tmp.xxx where   N Amer xxx = 850, 700, 500  
  N Hem  xxx = 850, 700, 500, 100,  
  50, 30, 10  
hite\_iso.jjj where   N Amer jjj = 300, 250, 200, 100  
  N Hem  jjj = 300, 250, 200

Tropopause:  trpopaus.anl (N Hemisphere)

TIME PERIOD:                January 1, 1946 through the present.

GEOGRAPHIC COVERAGE:     North American Continent or Northern Hemisphere.

FORMAT:                     Twice daily analyzed constant pressure charts

1.   January 1, 1946 through December 31, 1949 for 0400 and 1600 UTC for 1000-, 850-, 700-, 500-, 300-, and 200-millibars,
2.   January 1, 1950 through May 31, 1957 for 0300 and 1500 UTC for 1000-, 850-, 700-, 500-, 300-, 200-, and 150-millibars,

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3. June 1, 1957 through December 31, 1966 for 0000 and 1200 UTC for 850-, 700-, 500-, 300-, 200-, and 150-millibars. For 1200 UTC only, 100-millibars.
4. January 1, 1967 through the present for 0000 and 1200 UTC for 850-, 700-, 500-, 300-, and 200-millibars. For 1200 UTC only: 100-, 50-, 30-, and 10-millibars (plus 4- and 1-millibars on a sporadic basis).

All levels 100-mb and above end January 13, 1997, 1200 UTC.

CONTENTS: Analyzed heights (decameters) for each constant pressure chart are drawn as solid lines at 60-meter intervals. Isotachs at 20-knot intervals are drawn as dashed lines. High and low pressure centers, troughs, ridges, and jet streams (sometimes) are depicted. Station observational data with wind-barbs are also plotted.

**(C) CHART NAME: NORTH AMERICAN SURFACE CHARTS.**

DIRECTORY NAME: n\_amerca.sfc

TIME PERIOD: March 1, 1942 through the present.

GEOGRAPHIC COVERAGE: North America; 20 degrees North to 70 degrees North latitude.

FORMAT: Analyzed surface weather charts as follows:

1. 0000, 0600, 1200, and 1800 UTC from March 1, 1942 through September 30, 1953,
2. 0000, 0300, 0600, 0900, 1200, 1500, 1800, and 2100 UTC from October 1, 1953 through the present.

CONTENTS: These surface weather charts contain isobaric analyses at 4-millibar intervals. They also depict high and low pressure areas, tropical cyclones, and the various types of fronts (cold, warm, etc.) Surface land and surface marine observational data are plotted. Some of the charts from 1942 through 1953 are analyses of the United States only.

**(D) CHART NAME NORTHERN HEMISPHERE SURFACE CHARTS.  
MODIFIED NORTHERN HEMISPHERE SURFACE CHARTS.**

DIRECTORY NAME: n\_hemis.sfc  
n\_hemis.sfm

TIME PERIOD: May 1, 1954 through the present.

GEOGRAPHIC COVERAGE: Northern Hemisphere : pole to approximately 10 degrees North latitude.

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FORMAT: Surface weather charts as follows:

1. Analyzed 0000, 0600, 1200, and 1800 UTC from May, 1954 through May 1989;
2. Analyzed 0000 and 1200 UTC from June 1989 through January 1994 and October 1995 through January 7, 1997
3. Modified (Unanalyzed) Northern Hemisphere Surface charts for 0000, 0600, 1200, and 1800 UTC from February 1994 through September 1995 and January 17 1997 to the present (Note: Charts for July through September 1995 are missing on the CD-ROM set. Contact the NCDC for details about obtaining them). These charts are operational NCEP charts and rarely contain isobaric analyses, frontal positions, or pressure centers

MICROFILM ARCHIVE  
FILE STRUCTURE: Chart Series: MF-917  
This file of surface weather charts is stored on 4 reels of 35-millimeter microfilm each year through September 1995. Charts available on microfilm after January 1994 usually do not contain frontal analyses and pressure centers. In addition, isobaric analyses may be incomplete. The film is filed in the NCDC archives and is available for purchase.

CONTENTS: These surface weather charts contain isobaric analyses at 4-millibar intervals. The analyzed Northern Hemisphere charts also depict high and low pressure areas, tropical cyclones, and the various types of fronts (cold, warm, etc.) Surface land and surface marine observational data are plotted.

**(E) CHART NAME: SOUTHERN HEMISPHERE CONSTANT PRESSURE CHARTS.**

DIRECTORY NAMES: s\_hemis.con, hite\_isoxxx where xxx = 250, 300, 500

TIME PERIOD: November 1, 1975 through the present.

GEOGRAPHIC COVERAGE: Southern Hemisphere; pole to 10 degrees South latitude.

FORMAT: Twice daily, 0000 and 1200 UTC, computer plotted and analyzed charts for constant pressure levels of 500-, 300-, and 250-millibars.

CONTENTS: Analyzed heights (decameters) for each pressure chart are drawn as solid lines at 60-meter intervals. Isotachs at 20-knot intervals are drawn as dashed lines. High and low pressure centers are depicted and the station observational data with wind-barbs are plotted.

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## Appendix B

### Chart Series B: Initial Analysis and Forecast Charts

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Note: The NCDC CD-ROM archive will ultimately begin with October 1994 data.

### A Note about Directory Times

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North American and Northern Hemisphere charts on the Chart Series B (Initial Analysis and Forecast Charts) CD-ROM represent initial analyses, plus 12-, 24-, 36-, and 48-hour forecasts for each twelve hour period. The directory tree for this CD-ROM lists the dates and times when charts are ISSUED by NCEP. The times in this directory are NOT the times for which the charts are VALID. On Chart Series A and C CD-ROM's, the issued and valid times for charts are the same.

Example: \n\_hemis.mrh\36hr\01\00z\ is the directory listing for a Northern Hemisphere Relative Humidity/Vertical Velocity 36-hour Forecast Chart ISSUED at 00 UTC on the first day of the month, and is VALID at 12 UTC on the second day of the month (36 hours after the issue time). The directory for this chart lists the ISSUED time; the chart is labelled with the VALID time.

### Introduction

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The NCEP has long produced several series of forecast charts, dependent upon the area covered and their use. The NCDC microfilm archive includes only a limited number of such charts and these were primarily from the production run that is now known as the Aviation Run. The charts presented on this CD-ROM are all derived from the Aviation Run.

Forecast charts are products of the various computer models operated by the Environmental Modeling Center (EMC) for weather prediction at the NCEP. In general, analysis programs assign values of meteorological parameters to grid points using spatially interpolated available observations. In addition, first guess fields, usually in the form of a numerical forecast made from a previous analysis and valid at the time of the current analysis, were also used to make the initial analysis. Once the analysis was complete, the process moved to the forecast model in use.

In some cases, human interpretation is introduced into the forecasts by meteorologists at the NCEP. These meteorologists make both objective and subjective adjustments. These adjustments improve the forecasts based upon the knowledge of tendencies and systematic errors known to exist in the forecast models.

### History of the Aviation Run

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The basic primitive equation model used at the NCEP was implemented operationally in June 1966. This model was the ancestor of the Limited Fine Mesh (LFM) and of the 7-layer Primitive Equations (7L PE) model. The LFM model was introduced into routine operations in 1971. After changes in the grid spacing and an additional forecast layer was added in the stratosphere, the new model was designated the 7L PE in January, 1978. On August 12, 1980, NCEP's Global Spectral Model replaced the 7L PE coarse mesh as NCEP's primary operational hemispheric/global model. This Spectral Model had 12 layers and

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used a finite differencing scheme to formulate the model in the vertical. Up to 30 waves or modes could be incorporated. Whenever the 30 mode resolution for the Spectral Model was used, it approached that of the 7L PE that it replaced.

The status of the NCEP model runs continues to evolve. The most recently introduced model is the Eta Model (Eta), which is unique in its treatment of orography as a set of steps, each of which corresponds to a level of the model's vertical coordinate, which is referred to as Eta.

The NCEP now runs four different models to service the five standard production runs. The runs and the currently used models to produce them are: 1) Early Look (ERL) Run using the LFM and Eta Models; 2) Regional Run (RGL) using the Nested Grid Model (NGM); and 3) The Aviation Run (AVN); Medium Range Forecast Run (MRF), and the Final (FNL), all run under the Global Spectral Model (GSM).

#### Global Spectral Model/Aviation Run

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The wind and mass variables in the current Global Spectral Model are represented by triangularly truncated series of surface spherical harmonics on each of 28 vertical layers defined in sigma coordinates. The series are truncated at wave number 126 (T126), equivalent to a globally homogeneous grid resolution of 105-km. The AVN model forecasts are issued twice per day and are initiated approximately three hours after the principal synoptic hours 0000 and 1200 UTC.

Additional information about NCEP modeling can be obtained by accessing the Internet homepage of the Global Modeling Branch of NCEP's Environmental Modeling Center. The URL is:

<http://nic.fb4.noaa.gov:8000/research/global2.html>

To obtain information about the model status, access "Model Status as of October 25, 1995" whose URL is:

<http://nic.fb4.noaa.gov:8000/research/mrf.html>

(URL's current as of March 1997.)

#### Description of NOAA Charts

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**(A&B) CHART NAMES:**           **NORTH AMERICAN 500 mb HEIGHTS/VORTICITY CHARTS.**  
                                  **NORTHERN HEMISPHERE 500 mb HEIGHTS/VORTICITY CHARTS.**

DIRECTORY NAMES:                n\_amerca.500 and n\_hemis.500, xxhr where  
                                  xx = 12, 24, 36, 48; analysis

TIME PERIOD:                    May 1, 1961 through the present.

GEOGRAPHIC COVERAGE:         Northern Hemisphere/North America.

FORMAT:                         Twice daily, 0000 and 1200 UTC, computer-produced  
                                  initial analysis and 12-, 24-, 36-, and 48-hour  
                                  prognoses.

CONTENTS:                       The basis for these computer-produced charts is the  
                                  numerical prediction model being used at the time.  
                                  The 500-millibar contours are depicted as dashed  
                                  lines at 60 meter intervals and are labeled by  
                                  three-digit white numbers on a black background.  
                                  Circulation centers are indicated by "H" for high and  
                                  "L" for low. Centers are located by an X within

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a circle and labeled by three-digit hollow numbers in decameters. The location points of 500-millibar absolute vorticity isopleths are drawn as solid lines at intervals of  $2 \times 10^{-5} \text{sec}^{-1}$ . Absolute vorticity isopleths are labeled 2, 4, 6, etc., in multiples of  $10^{-5} \text{sec}^{-1}$ . Centers of positive absolute vorticity are indicated by an "x" and negative absolute vorticity by an "N". Both Northern Hemisphere and North American charts are on the CD-ROM.

**(C) CHART NAME:** **NORTHERN HEMISPHERE MEAN RELATIVE HUMIDITY/VERTICAL-VELOCITY CHARTS.**

DIRECTORY NAMES: n\_hemis.mrh, xxhr where xx = 12, 24, 36, 48; analysis

TIME PERIOD: May 1, 1961 through the present.

GEOGRAPHIC COVERAGE: Northern Hemisphere/North America.

FORMAT: Twice daily, 0000 and 1200 UTC, computer-produced initial analysis and 12-, 24-, 36-, and 48-hour prognoses.

CONTENTS: The mean relative humidity is defined for a column through the lower layers of the numerical prediction model being used at the time. This has varied from the surface or 1000-mb to approximately 450- to 500-millibars. The ratio of precipitable water in a column to that which would exist if the water vapor was at its saturation level is a measure of the mean relative humidity. Mean relative humidity isopleths are drawn as solid lines for 10, 30, 50, 70 and 90% and are labeled with one-digit hollow numbers. Centers of maximum and minimum relative humidity are depicted by an x within a circle with two-digit hollow numbers. The areas with relative humidity above 70% are hatched.

Vertical velocity isopleths are depicted as solid lines with labels at intervals of 1-microbar per second (1-microbar = .001 millibars). These values may be converted approximately to centimeters per second at 700 mb by multiplying by 1.12. Centers of maximum upward and downward motion are interpolated and printed as + or -, respectively. Vertical velocity values are at the 700-millibar level. Only Northern Hemisphere charts are on the CD-ROM.

**(D) CHART NAME:** **NORTHERN HEMISPHERE SURFACE ANALYSIS/1000-500 mb THICKNESS CHARTS**

DIRECTORY NAMES: n\_hm1000.500, xxhr where xx = 12, 24, 36, 48; analysis

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TIME PERIOD: February 1, 1983 through the present.(with breaks)

GEOGRAPHIC COVERAGE: Northern Hemisphere.

FORMAT: Twice daily, 0000 and 1200 UTC, computer-produced initial analysis and 12-, 24-, 36-, and 48-hour prognoses.

CONTENTS: The basis for these computer-generated charts is the NCEP numerical prediction model being used at the time. Isobaric analyses at 4-millibar intervals of the mean sea level pressure are shown in solid lines. Pressure centers are labeled with their respective values. One thousand to 500 mb thickness analyses in 60 decameter intervals are depicted as dashed lines. There are no plotted station data.

**(E) CHART NAME: SOUTHERN HEMISPHERE SURFACE ANALYSIS/1000-500 mb THICKNESS CHARTS.**

DIRECTORY NAME: s\_hm1000.500

TIME PERIOD: January 1, 1966 through June 30, 1971 and November 1, 1975 through the present.

GEOGRAPHIC COVERAGE: Southern Hemisphere; pole to 20 degrees South latitude.

FORMAT: Computer analyzed charts for 0000 and 1200 UTC.

CONTENTS: These computer-analyzed charts depict isobaric analyses at 4-millibar intervals and thickness analyses in decameters. High and low pressure areas are also depicted. There are no plotted station data.

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## Appendix C

### Chart Series C: Tropical Strip/Precipitation and Observed Weather Charts

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Note: The NCDC CD-ROM archive will ultimately begin with October 1994 data.

#### Introduction

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The ingest of data by NCEP for the production of these charts is similar to that described for the surface and upper air charts; i.e., a global observing and telecommunications network funnels observations to the NCEP. This series contains charts providing information about tropical strip surface and upper air data, daily recorded precipitation, temperatures, and snowfall; current observed weather conditions (radar summary and weather depiction charts); and forecast moisture conditions and winds (composite moisture and winds aloft) charts.

#### Description of NOAA Charts

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**(A) CHART NAME: TROPICAL STRIP CONSTANT PRESSURE CHARTS.**

DIRECTORY NAMES: trop\_str.con, xxxmb where xxx = 250, 500, 700

TIME PERIOD: August 1, 1975 through the present.

GEOGRAPHIC COVERAGE: Global; 60 degrees North to 50 degrees S. latitude.

FORMAT: Analyzed constant pressure charts for 0000 and 1200 UTC for the 700-, 500-, and 250-millibar levels. The 850- and 150-millibar levels were added 1 Jan, 1985.

CONTENTS: Analyzed flow fields for each constant pressure level are depicted by solid streamlines drawn to show the direction of flow. Isotachs are drawn as dashed lines at 20 knot intervals. Grid point winds from the analyzed field and station observational winds are plotted in wind-barb form.

Note: Due to constraints on the files as received from NCEP, these charts will appear with significant blank space at the top.

**(B) CHART NAME: TROPICAL STRIP SURFACE CHARTS.**

DIRECTORY NAME: trop\_str.sfc

TIME PERIOD: March 1, 1969 through the present.

GEOGRAPHIC COVERAGE: Global; 30 degrees North to 50 degrees S. latitude.

FORMAT: These charts are analyzed in two sections, one for the Western Hemisphere and one for the Eastern Hemisphere. They include 0000 and 1200 UTC charts

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from March 1, 1969 through December 31, 1978 and 0000, 0600, 1200, and 1800 UTC charts from January 1, 1979 through the present.

CONTENTS: The Western and Eastern Hemisphere charts depict wind flow patterns by solid streamlines, fronts, troughs, ridges, and high and low pressure areas. Plotted data include surface land and surface marine stations and satellite winds from low cloud motions. Extra surface marine data are plotted at the bottom of each chart.

**(C) CHART NAME: COMPOSITE MOISTURE INDEX CHARTS.**

DIRECTORY NAMES: 

<u>Dataset</u>	<u>cmpmoist.ndx</u>
1. Average Relative Humidity	avg_sfc.500
2. Freezing Level	freezing.lev
3. Lifted Index/K Index	lifted_k.ndx
4. Precipitable Water	pre_h20

TIME PERIOD: January 1, 1962 through the present.

GEOGRAPHIC COVERAGE: Conterminous United States, Southern Canada, and Northern Mexico.

FORMAT: Twice daily (0000 and 1200 UTC) computer plotted and hand analyzed four panel charts.

CONTENTS: 

1. Lifted Index/K Index (Upper-Left Panel); Isopleths of lifted index are drawn for intervals of 4 units for index values of +4 and lower. Areas of index values less than +4 are labeled unstable (u) - areas of high index values above +4 are labeled stable (s). The zero isopleth is drawn as a heavier solid line. Station circles are blacked-in for index values of zero or less. Values of K will be plotted below the values of lifted index for each raob (upper air) station. High K unstable, low values of K (or negative) are stable. No analyses of the K-index are made.
2. Precipitable Water (Upper-Right Panel). The precipitable water is analyzed for intervals of .50 inch with .25 inch (dashed isopleths) used to define the pattern when necessary. Station circles are blacked-in for values of 1.00 inch or greater.
3. Freezing Level (Lower-Left Panel). Several freezing levels may occur on an upper air sounding, but only the lowest 3 levels are plotted. The lowest level is plotted below the station circle and the others above. Only the lowest freezing level is analyzed. The surface intersection (32 Deg F) is a dashed line and the free-air contours are drawn as solid lines for 4000-foot intervals. The free-air contours are

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shown as discontinuous where they intersect smoothed terrain contours in the western United States.

4. Average Relative Humidity (Lower-Right Panel). The average relative humidity (surface to 500-millibars) is analyzed for intervals of 10% for humidities 50% and higher. Station circles are blacked-in for humidities of 50% and higher with the average relative humidity (%) plotted above the station circle.

**(D1) CHART NAME: OBSERVED 24-HOUR PRECIPITATION CHARTS.**

DIRECTORY NAMES: pr\_sn\_tm.obs, 24h\_prec.obs

TIME PERIOD: January 1, 1962 through the present (updated annually).

GEOGRAPHIC COVERAGE: Conterminous United States, Southern Canada, and Northern Mexico.

FORMAT: Computer plotted chart for 1200 UTC daily.

CONTENTS: These charts present plotted 24-hour precipitation amounts to one-hundredth inch and traces (less than one-hundredth inch). When a station reported no 24-hour precipitation, the 1200 UTC 6-hour accumulated precipitation amount is plotted instead. This substitution is denoted by the symbol, "A" in place of the decimal point. Additional reports, for which there is no space at station location, are listed in a column along right edge of the chart and are identified by station number, call letters, or name.

**(D2) CHART NAME: OBSERVED SNOW COVER CHARTS.**

DIRECTORY NAMES: pr\_sn\_tm.obs, sno\_covr.obs

TIME PERIOD: March 1, 1966 through the present.

GEOGRAPHIC COVERAGE: Conterminous United States and Southern Canada.

FORMAT: Computer plotted chart for 1200 UTC daily.

CONTENTS: The major parameters plotted on these charts are total snow depth and 6-hour increase of snow to the nearest whole inch. Trace amounts are also plotted. Total snow depth is plotted to the right of a blacked-in station circle. When there has been snow in the last six hours, this amount is plotted centered on the station circle using white numbers on a black background. Additional reports, for which there is no space at the station location, are listed in a column along the right edge of the chart and are identified by station number, call letter, or

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name. These computer-plotted charts are from the automatically processed data sets which have as their source the 1200 UTC observations of the National Weather Service. These charts are prepared only for those days that snow cover exists, normally October through April.

**(D3) CHART NAME:** **MAXIMUM AND MINIMUM TEMPERATURE CHART (12-Hour).**

DIRECTORY NAMES: pr\_sn\_tm.obs, 12hr\_max.tmp, 12hr\_min.tmp

TIME PERIOD: April 1, 1966 through the present.

GEOGRAPHIC COVERAGE: United States, except Alaska and Hawaii, and Southern Canada.

FORMAT: Computer plotted charts of observed temperatures, one for maximum and one for minimum, during the 12 hours ending at 0000 and 1200 UTC, respectively.

CONTENTS: The data plotted on these charts are from the automatically processed surface data sets from the National Weather Service. The maximum or minimum temperatures (Deg. F) are plotted above the station circles. When both a city office and an airport office send temperatures, the city office temperature is plotted on-station and the airport temperature is in the printed box, labeled AIRPORT TEMP, on the right edge of the chart. The RECORD TEMPS box printed in the Gulf of Mexico is filled in from the fifth group of the SM (Hi-Lo report) for all records reported on each set of data:

Contraction -----	Type of Temperature Record -----
HIXFM	Highest eXceeded For the Month
LOXFM	LOwest eXceeded For the Month
Spring temperatures (March, April, May)	
HIXSE	HIGhest eXceeded So Early
LOXSL	LOwest eXceeded So Late
HIESE	HIGhest Equaled So Early
LOESL	LOwest Equaled So Late
Autumn Temperatures (September, October, November)	
HIXSL	HIGhest eXceeded So Late
LOXSE	LOwest eXceeded So Early
HIESL	HIGhest Equaled So Late
LOESE	LOwest Equaled So Early
All time records (since observations began)	
HIXAT	HIGhest eXceeded for All Time
LOXAT	LOwest eXceeded for All Time
HIEAT	HIGhest Equaled for All Time
LOEAT	LOwest Equaled for All Time

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**(E) CHART NAME: RADAR SUMMARY CHARTS.**

DIRECTORY NAME: radar.sum

TIME PERIOD: March 1, 1957 through the present.

GEOGRAPHIC COVERAGE: United States, except Alaska and Hawaii.

FORMAT: Hourly analyzed charts.

CONTENTS: These charts present analyzed areas, lines, and cells of precipitation formations. The speed and direction of cell movement and/or line echoes, tops and bases of clouds, precipitation type, any watch/warning boxes, and status of radar at each station are included. Shaded areas give an indication of areal coverage and contours are used to depict each of the Digital Video Integrator Processor (DVIP) levels (1 and 2; 3 and 4; 5 and 6). Echo heights are in hundreds of feet above to mean sea level as a three digit number and echo movements are indicated by arrows. Precipitation types and change of intensity (+ is new or increasing, - is decreasing) are also plotted as one entry close to the activity to which they apply (see chart below). Severe weather watch boxes with labels indicating the type and time of expiration are also included. The time of these charts are 35 minutes past the hour for all 24 hours (UTC) of the day. The NCDC rounds up the time to the next hour (e.g., 1635 UTC is the 17 UTC Chart).

PRECIPITATION TYPE -----	CONTRACTION -----
Thunderstorm (with rain shower)	TRW
Thunderstorm (with snow shower)	TSW
Thunderstorm (with freezing rain shower)	TZRW
Thunderstorm (with ice pellet shower)	TIPW
Rain	R
Rain Shower	RW
Freezing Rain	ZR
Freezing Rain Shower	ZRW
Snow	S
Snow Shower	SW
Drizzle	L
Freezing Drizzle	ZL
Ice Pellet	IP
Ice Pellet Shower	IPW

**(F) CHART NAME: WEATHER DEPICTION ANALYSIS CHARTS.**

DIRECTORY NAME: weather.dep

TIME PERIOD: January 1, 1976 through the present.

GEOGRAPHIC COVERAGE: Conterminous United States, Southern Canada, and Northern Mexico.

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FORMAT: Computer plotted and manually analyzed air terminal weather conditions on charts for 0100, 0400, 0700, 1000, 1300, 1600, 1900, and 2200 UTC daily.

CONTENTS: The data plotted on these charts are from the automatically processed surface data set of the National Weather Service. The plotting model on each station circle is an abbreviated version of the complete aviation observation and includes significant weather, visibility, total sky cover, and ceiling height. When the total sky cover is 5/10 or less, the height of the lowest scattered layer is plotted. Visibilities over 6 miles are not plotted. Areas with IFR conditions (ceiling below 1000 feet and/or visibility less than 3 miles) are enclosed by solid lines and are shaded. Areas with MVFR conditions (ceiling 1000 feet to 3000 feet inclusive and visibility 3 miles to 5 miles inclusive) are enclosed by scalloped lines without shading. All other areas on the chart are VFR conditions (ceiling greater than 3000 feet and visibility more than 5 miles). High and low pressure centers, fronts, troughs, and squall lines from the previous hour are also depicted.

**(G) CHART NAME: WINDS ALOFT CHARTS.**

DIRECTORY NAMES: winds.aft, 14\_24\_34.251

TIME PERIOD: March 1, 1942 through the present.

GEOGRAPHIC COVERAGE: United States, except Alaska and Hawaii.

FORMAT: Plotted 6-hourly, or 12-hourly, United States charts. The charts were plotted for 0300 and 1500 UTC (some years had additional 0900 and 2100 UTC) from March 1942 through May 1957. From June 1957 through the present, charts were plotted for 0000 and 1200 UTC (some years had additional 0600 and 1800 UTC). The altitude of the plotted winds vary, almost year to year.

CONTENTS: These charts present plotted stations wind direction speed (knots) as wind-barbs for various altitudes from 3,000 feet to 47,000 feet. Currently, the altitudes are for the second standard level, 14,000, 24,000, and 34,000 feet.

Note: Due to constraints on the files as received NCEP, the 0000 UTC charts appear in the lower right corner.

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