

# INTRODUCTION TO USING THE NCEP /NCAR REANALYSIS DATASET

<http://www.cdc.noaa.gov/cdc/data.nmc.reanalysis.html>

*Data are available from Jan 1948 to the present for most variables and is updated the first or 2nd week of the month with the previous month's data. Some variables are only available for certain time periods, etc.*

## Simple Black & White Composite Plots

Go to the class webpage & click on **"Direct to Reanalysis Links."** Note that many "entryways" or starting points into the NCEP data are provided for you here. A good place to begin to familiarize yourself with the dataset is under: **CLIMATIC GRIDDED DATA - Visualize NCEP Data:**

<http://www.cdc.noaa.gov/cgi-bin/DataMenus.pl?stat=mon.mean&dataset=NCEP>

### *When you get to this page:*

Select a **statistic** (e.g. Monthly Longterm Mean or Individual Monthly Mean)

Select a **variable** to plot (e.g. Geopotential Height) (then click "Continue Image Specification")

On next page check to see if what you've selected is what you want; keep lat and lon selected for the two dimensions, then click "Continue Image Specification"

On next page select the following for your Image Specification for a B&W plot:

- \* lat & lon, 0 N - 90N 0 - 360E for whole N. Hemisphere

- \* pick a level (e.g. 700 mb)

- \* pick beginning and ending periods (e.g. for winter season pick Dec - Feb)

- \* Select: **create plot**, under Plot Output Options select: **plot on WHITE background**, uncheck **Color Plot**, check **Polar stereographic**

- \* Click on "Create Plot or Subset of Data"

- \* wait patiently for plot to come out!

## Plotting regions

To plot over the dateline, use values from 0 to 720. For example, to plot 180W eastward to 180W, use 180 to 540. Be sure that the western most longitude is less than the eastern., For example, to plot 100W to 70W, use -100 to -70 or 260 to 290 and NOT 100 to 70.

There are 6 custom projections:

**Northern Hemisphere:** 0-90N, 0-360W in using a polar stereographic projection

**Globe:** 90S-90N 0E-360W

**United States:** 20N-65N; 235-285 polar stereographic projection

**Tropics:** 60S-60N

**Tropical Pacific:** 35N-35S 100E to 60W

**Indio-Pacific** (20S-20N,60E-160W)

**4 Corner Region US** (xxS-xxN,xxE-xxW)

## To rotate polar stereographic plots (e.g., so N. America is at bottom of plot)

To rotate map, choose "custom" map projection and then choose either northern or southern polar stereographic projection. For lat range, enter 0 to 90 (for northern hemisphere) or -90 to 0 for southern. For longitude, the center of the longitude range input will be at the **bottom** of the plot. To center along 0E, choose -180 to 180, for example. To center at 90E, choose -90 to 270. You can plot sectors as well. The longitudes -90 to 90 in the NH will plot the half hemisphere from the US across the Atlantic to Europe.

## More Guidelines For Plotting Maps On The Reanalysis Webpages

Lat begin box: *always* start with the **southernmost** latitude

Lon begin box: *always* start with the **westernmost** latitude

You can use a minus sign (-) to indicate longitude **degrees W** and latitude **degrees S**. (Positive values are used for degrees E and degrees N)

You can also enter *west longitudes* in positive degrees going EAST from **0° E in a full circle of 360°** as in the chart below.

For **Polar Stereographic Projections**, the beginning longitude will be plotted at the *top* of the circular projection; see the chart below for beginning and ending longitudes to center a given location at the *bottom* of the circular projection.

| Equivalent ways to express the same west longitude: |      |       |     |
|-----------------------------------------------------|------|-------|-----|
|                                                     |      |       |     |
| 10 W                                                | -10  | 350 E | 350 |
| 20 W                                                | -20  | 340 E | 340 |
| 30 W                                                | -30  | 330 E | 330 |
| 40 W                                                | -40  | 320 E | 320 |
| 50 W                                                | -50  | 310 E | 310 |
| 60 W                                                | -60  | 300 E | 300 |
| 70 W                                                | -70  | 290 E | 290 |
| 80 W                                                | -80  | 280 E | 280 |
| 90 W                                                | -90  | 270 E | 270 |
| 100 W                                               | -100 | 260 E | 260 |
| 110 W                                               | -110 | 250 E | 250 |
| 120 W                                               | -120 | 240 E | 240 |
| 130 W                                               | -130 | 230 E | 230 |
| 140 W                                               | -140 | 220 E | 220 |
| 150 W                                               | -150 | 210 E | 210 |
| 160 W                                               | -160 | 200 E | 200 |
| 170 W                                               | -170 | 190 E | 190 |
| 180 W                                               | -180 | 180 E | 180 |

| Beginning & Ending Longitudes (polar stereographic or cylindrical full-globe maps) to center on: |       |     |
|--------------------------------------------------------------------------------------------------|-------|-----|
|                                                                                                  | Begin | End |
| 0° E (Greenwich, Prime Meridian)                                                                 | -180  | 180 |
| 100 W (center lon. of North America)                                                             | -280  | 80  |
| 25E (center lon. of Europe)                                                                      | -155  | 205 |
| 90E (center lon. of Asia)                                                                        | -90   | 270 |
| 60 W (center lon. of South America)                                                              | -240  | 120 |
| 20E (center lon. of Africa)                                                                      | -160  | 200 |
| 135E (center lon. of Australia)                                                                  | -45   | 315 |
| 170W (center lon. of Pacific Ocean)                                                              | -350  | 10  |
| 40W (center lon of N. Atlantic Ocean)                                                            | -220  | 140 |
| 20W (center lon. of S. Atlantic Ocean)                                                           | -200  | 160 |
| 75 E (center lon of Indian Ocean)                                                                | -105  | 255 |
| 90 E (center lon of Antarctica)                                                                  | -90   | 270 |

**For Maps Centered on Specific Continents or Regions** *(may need to be adjusted somewhat)*

| Continent / Region         | Projection * | "Center"<br>Lat/Lon | Longitude |     | Latitude |     |
|----------------------------|--------------|---------------------|-----------|-----|----------|-----|
|                            |              |                     | Begin     | End | Begin    | End |
| North America              | polar        | 45 N / 100 W        | -180      | -20 | 10       | 90  |
| United States (contiguous) | polar        | 35 N / 100 W        | -150      | -50 | 20       | 60  |
| Central America            | cylindrical  | 20 N / 100 W        | -120      | -65 | 5        | 35  |
| Europe                     | polar        | 45 N / 25 E         | -25       | 50  | 30       | 75  |
| Asia                       | polar        | 40 N / 90 E         | 35        | 175 | 0        | 80  |
| South America              | cylindrical  | 20 S / 60 W         | -95       | -25 | -60      | 20  |
| Africa                     | cylindrical  | 0 N / 20 E          | -25       | 65  | -40      | 45  |
| Oceania                    | cylindrical  | 25 S / 135 E        | 100       | 180 | 5        | 100 |
| Antarctica                 | polar        | 90 S / 90 E         | -180      | 180 | -90      | -55 |
| N. Pacific Ocean           | cylindrical  | 25 N / 170 W        | -260      | -80 | -10      | 60  |
| S. Pacific Ocean           | cylindrical  | 25 S / 170 W        | -240      | -60 | -70      | 10  |
| N. Atlantic Ocean          | cylindrical  | 25 N / 40 W         | -100      | 20  | -10      | 80  |
| S. Atlantic Ocean          | cylindrical  | 25 S / 20 W         | -70       | 30  | -70      | 15  |
| Indian Ocean               | cylindrical  | 20 S / 75 E         | 20        | 130 | -60      | 30  |

\* polar = **polar stereographic projection** (for single hemisphere maps of areas poleward of ~20°N or S latitude )  
 cylindrical = **cylindrical equidistant projection** (default; for mapping low latitudes & in both N & S hemispheres)