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## NCEP/NCAR Reanalysis 1: Surface

Other Grid Types: [NCEP Reanalysis Main Page](#) | [Pressure Level Data](#) | [Surface Data](#) | [Surface Flux Data](#) | [Other Flux Data](#) | [Spectral Coefficients Data](#) | [Tropopause Data](#)

### Brief Description:

- NCEP/NCAR Reanalysis 1

### Temporal Coverage:

- 4-times daily, daily and monthly values for 1948/01/01 to present
- Long term monthly means, derived from data for years 1981 - 2010
- These variables are instantaneous values at the reference time.

### Spatial Coverage:

- 2.5 degree latitude x 2.5 degree longitude global grid (144x73)
- 90N - 90S, 0E - 357.5E























### Levels:

- Surface or near the surface (.995 sigma level), or entire atmosphere (eatm)
- Also, precipitable water is included here, because it is a 3-D file on a 2.5 degree grid, but it is not a surface value, but rather for the entire atmospheric column

### Update Schedule:

- Daily

Variable	Statistic	Level	Download File	Create Plot/Subset
Air Temperature	4-times Daily	sig995	<a href="#">see list</a>	
Air Temperature	Daily	sig995	<a href="#">see list</a>	
Air Temperature	Monthly Mean	sig995	<a href="#">air.mon.mean.nc</a>	
Surface lifted index	4-times Daily	surface	<a href="#">see list</a>	
Surface lifted index	Daily	surface	<a href="#">see list</a>	
Best (4-layer) lifted inde	4-times Daily	surface	<a href="#">see list</a>	
Best (4-layer) lifted index	Daily	surface	<a href="#">see list</a>	
Omega (vertical velocity)	4-times Daily	sig995	<a href="#">see list</a>	
Omega (vertical velocity)	Daily	sig995	<a href="#">see list</a>	

<b>Potential temperature</b>	4-times Daily	sig995	<a href="#">see list</a>	
<b>Potential temperature</b>	Daily	sig995	<a href="#">see list</a>	
<b>Precipitable water</b>	4-times Daily	eatm	<a href="#">see list</a>	
<b>Precipitable water</b>	Daily	eatm	<a href="#">see list</a>	
<b>Precipitable water</b>	Monthly Mean	eatm	<a href="#">pr_wtr.mon.mean.nc</a>	
<b>Pressure</b>	4-times Daily	surface	<a href="#">see list</a>	
<b>Pressure</b>	Daily	surface	<a href="#">see list</a>	
<b>Pressure</b>	Monthly Mean	surface	<a href="#">pres.mon.mean.nc</a>	
<b>Relative humidity</b>	4-times Daily	sig995	<a href="#">see list</a>	
<b>Relative humidity</b>	Daily	sig995	<a href="#">see list</a>	
<b>Relative humidity</b>	Monthly Mean	sig995	<a href="#">rhum.mon.mean.nc</a>	
<b>Sea level pressure</b>	4-times Daily	sea-lvl	<a href="#">see list</a>	
<b>Sea level pressure</b>	Daily	sea-lvl	<a href="#">see list</a>	
<b>Sea level pressure</b>	Monthly Mean	sea-lvl	<a href="#">slp.mon.mean.nc</a>	
<b>U-wind</b>	4-times Daily	sig995	<a href="#">see list</a>	
<b>U-wind</b>	Daily	sig995	<a href="#">see list</a>	
<b>U-wind</b>	Monthly Mean	sig995	<a href="#">uwnd.mon.mean.nc</a>	
<b>V-wind</b>	4-times Daily	sig995	<a href="#">see list</a>	
<b>V-wind</b>	Daily	sig995	<a href="#">see list</a>	
<b>V-wind</b>	Monthly Mean	sig995	<a href="#">vwnd.mon.mean.nc</a>	
<b>Geopotential hgt</b>	time invariant	Surface	<a href="#">hgt.sfc.nc</a>	
<b>Land-sea mask</b>	time invariant	Surface	<a href="#">land.nc</a>	

**Usage Restrictions:**

- None

**Detailed Description:**

- The NCEP/NCAR Reanalysis 1 project is using a state-of-the-art analysis/forecast system to perform data assimilation using past data from 1948 to the present. A large subset of this data is available from PSD in its original 4 times daily format and as daily averages. However, the data from 1948-1957 is a little different, in the

regular (non-Gaussian) gridded data. That data was done at 8 times daily in the model, because the inputs available in that era were available at 3Z, 9Z, 15Z, and 21Z, whereas the 4x daily data has been available at 0Z, 6Z, 12Z, and 18Z. These latter times were forecasted and the combined result for this early era is 8x daily. The local ingestion process took only the 0Z, 6Z, 12Z, and 18Z forecasted values, and thus only those were used to make the daily time series and monthly means here.

**Caveats:**

- Please read the [problem list](#) before using the data.

**Related File Naming & Structure Information:**File Names:

**Archive parameters:** File names are composed of variable abbreviations, level, and year: (variable).(level).(year).nc

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Dataset Format and Size:

- PSD standard [NetCDF](#) most are ([packed](#)).
- All data are stored in netCDF files
- The data are divided by variable and year into separate files
- There are 450 files currently
- Files are 30 Mbytes per variable per year
- Current total of 13.8 Gbytes for 4xDaily and 3.4 Gbytes for daily averages

Missing Data:

- Missing data is flagged with a value of 32767s or 9.36e36f..

**Citation:**

- For dataset source, please cite: Kalnay et al., The NCEP/NCAR 40-year reanalysis project, *Bull. Amer. Meteor. Soc.*, 77, 437-470, 1996.
- **Please note:** If you acquire NCEP Reanalysis data products from PSD, we ask that you acknowledge us in your use of the data. This may be done by including text such as *NCEP Reanalysis data provided by the NOAA/OAR/ESRL PSD, Boulder, Colorado, USA, from their Web site at <http://www.esrl.noaa.gov/psd/>* in any documents or publications using these data. We would also appreciate receiving a copy of the relevant publications. This will help PSD to justify keeping the NCEP Reanalysis data set freely available online in the future. Thank you!

**References:**

- March, 1996 BAMS

**Original Source:**

- NOAA National Center for Environmental Prediction

**Contact:**

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