

NOAA's National Climatic Data Center Datasets For Use in Climate Applications

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For.....

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Short Course on Datasets for Use in Climate Applications
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Discussion Topics

- **NOMADS and Model Data**
- **In-situ Data and GIS Services**
- **NIDIS and Drought-related Data**
- **Satellite Data**
 - **Datasets in each category**
 - **Online tools/applications**
 - **Sample products/data visualizations**



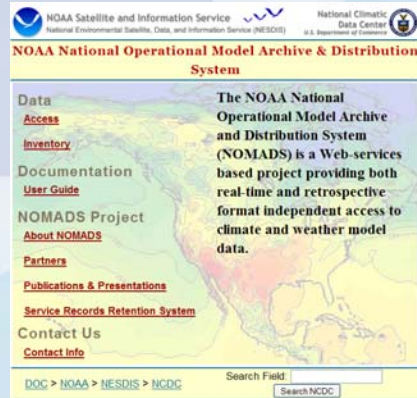
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The NOAA Operational Model Archive and Distribution System (NOMADS)

<http://nomads.ncdc.noaa.gov/>

NOMADS is a distributed data access project for access to real-time and retrospective high volume numerical weather prediction and climate models.



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NOMADS and Model Data

Model

- ▶ Global Forecast System (GFS), 1 and ½ degree
March 2004 – Present, October 2006 - Present
- ▶ NCEP Spectral Statistical Interpolation (SSI) Global Data
Assimilation System (GDAS) w/ restart files
January 2001 - Present
- ▶ North American Mesoscale (NAM, formally Eta) 12km
February 2005 - Present
- ▶ Rapid Update Cycle (RUC) 20km and 13km
January 2006 – Present, March 2007 - Present
- ▶ NCEP North American Regional Reanalysis (NARR) 32km
January 1979 - Present
- ▶ NCEP/NCAR/DOE R1 & R2 Global Reanalysis
January 1948 – Present, January 1979 - Present
- ▶ NCEP Global Ensembles
December 2007 - Present
- ▶ NCEP Climate Forecast System Reanalysis & Reforecast (CFSRR)
January 1979 – Present
- ▶ NCEP/CPC Climate Prediction Center Reanalysis (CPCR)
January 1944 – Present
- ▶ NCEP 20th Century Reanalysis
January 1891 - Present

In situ

- ▶ NCDC Global Historical Climate Network (GHCN) Temp/Precip
January 1880 – Present, January 1900 - Present
- ▶ NCDC Integrated Global Radiosonde Archive (IGRA) Upper Air
Varies by station
- ▶ NCDC Smith-Reynolds Extended Reconstructed and OI ¼ SST's
January 1854 – Present, January 1985 – Present
- ▶ National Weather Service Graphical Products
April 2001 - Present

Climate Models / Coupled AOGCM

- ▶ Limited GFDL CM2.0 and CM2.1 Climate Experiments
- ▶ Paleoclimate Model Intercomparison Project (PMIP)



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NOMADS Ensemble Probability Tool

The NOMADS Ensemble Probability Tool is a tool that is designed to allow users to interrogate the NCEP Global Ensemble model. The tool allows the user to describe a set of conditions and determine the probability that that set of conditions will occur at a given location.

The NOMADS Ensemble Probability Tool queries the 21 member GFS ensemble dataset located on the NCEP NOMADS High Availability server. The data is passed via OpenDAP back to the application, where it is read using the Java NetCDF library, and then the probabilities are calculated.

For more information, please see our [help page](#).

Where

Station ID
 Lat (80 to 90) Lon (-180 to 180)

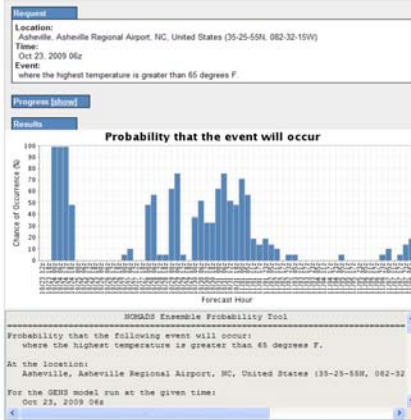
When

Latest model run (2009 Oct 23 06z)
 Year Month Date Model Run

What

Air Temperature at 2 meter height
 6 hour Highest temperature
 6 hour Lowest temperature
 Precipitation
 Wind at 10 meter height
 Cloud Cover
 Air Temperature at 850 millibar pressure level
 Convective Available Potential Energy (CAPE)

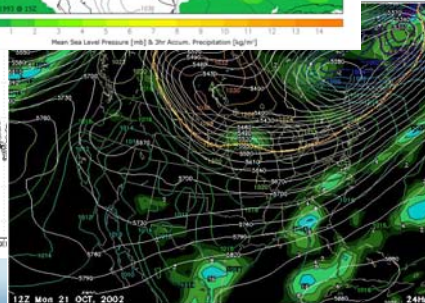
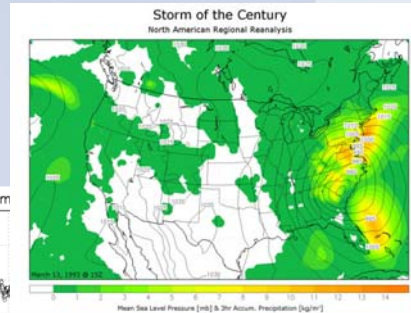
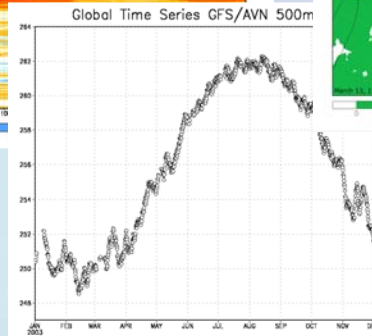
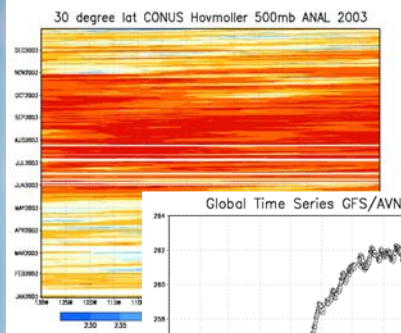
NOMADS Ensemble
 Probabilities on the fly:
 20 model runs
 30 fcst projections
 10 days of forecast



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NOMADS Output Samples



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In-situ Data and GIS Services

<http://gis.ncdc.noaa.gov>
<http://www.ncdc.noaa.gov/oa/land.html>

- GHCN Daily and Monthly Surface Data (1800s-present)
- Global Surface Summary of the Day (1901-present)
- Global Integrated Surface Data (1901-present)
- Monthly Climatic Data for the World (1986-present)
- Global ICOADS Marine Data (1662-present)
- Global IGRA Upper Air Data (1940's-present)
- International Tropical Cyclone Best Tracks (1842-2008)
- U.S. Drought Indices (1895-present)
- U.S. Monthly Extremes (1831-present)
- U.S. Hourly Precipitation Data (1900-present)
- U.S. 15 Minute Precipitation Data (1970-present)
- U.S. Local Climatological Data - LCD (2005-present)
- U.S. Surface Summary of the Month (1831-present)
- U.S. Daily Surface Data (1850-present)
- U.S. Daily Snowfall (last 6 months in GIS Services)
- U.S. Historical Monthly & Seasonal Snowfall (1886-present)
- U.S. NEXRAD Level II (1992-present)
- U.S. NEXRAD Level III (1992-present)



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Surface Data, Hourly Global

**This map uses popups. Please disable any popup blockers. [What's New?](#) [Map Help](#) ?

Basic Tools | **Advanced Tools**

Zoom In | Zoom Out | Zoom to World | Zoom to Last Map | Locator Map | Shift Map | Identify Location | Online Data | Classify Summary | Summary | Wind Rose | Graph

20 Year Summary: Temperature Mean July

Temperature (°C) scale: -60, -50, -40, -30, -20, -10, 0, 10, 20, 30, 40

To reset map, click here [Reset Map](#)

Map generated by NOAA's National Climatic Data Center, 2009

Classify Summary: Select a category, type, summary, and click "Classify Map". The map will then be redrawn.

Temperature | Mean July | 20 Year | [Classify Map](#) | [Help](#)

The Summary tool requires the map to be classified.
The Wind Rose tool requires the map to be classified by Wind Speed.

Map Search | **Data Types** | **Imagery** | **Select Area**

Enter a location name or zipcode, etc. - help (e.g. Asheville or 28801) [Search](#)

NCDC Data / Products

Select a product...(* free for all users)

- **Surface Data, Hourly Global**
Click here for information about this data type.

User Hints - Map Search allows users to quickly drill down to areas of interest.

Step 1: Enter in a location above and click **Search**

Step 2: Choose **NCDC Data / Products** from above

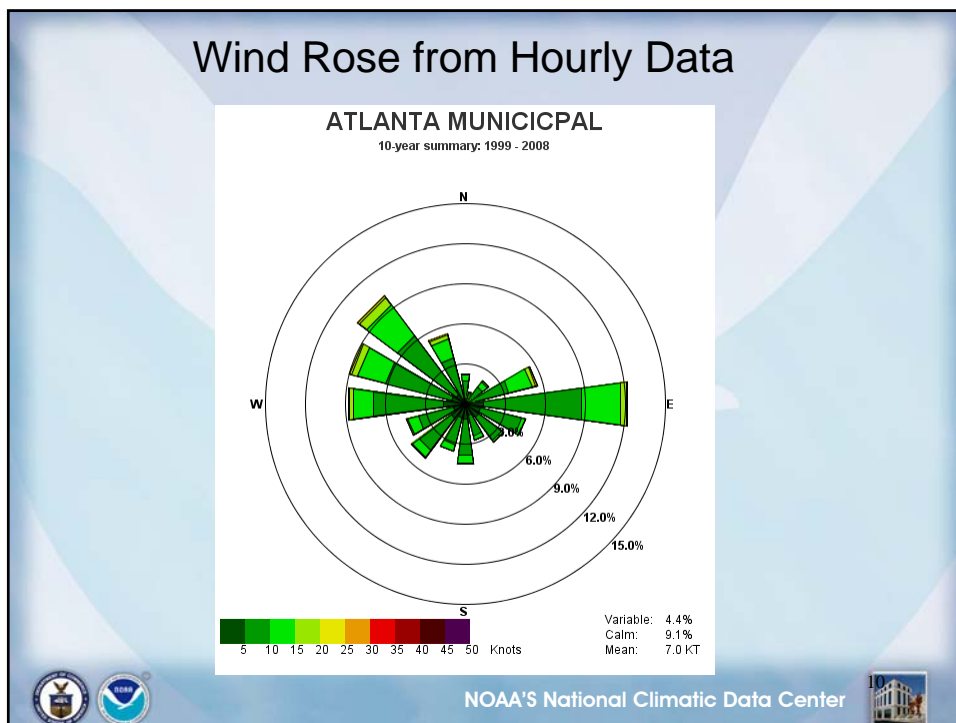
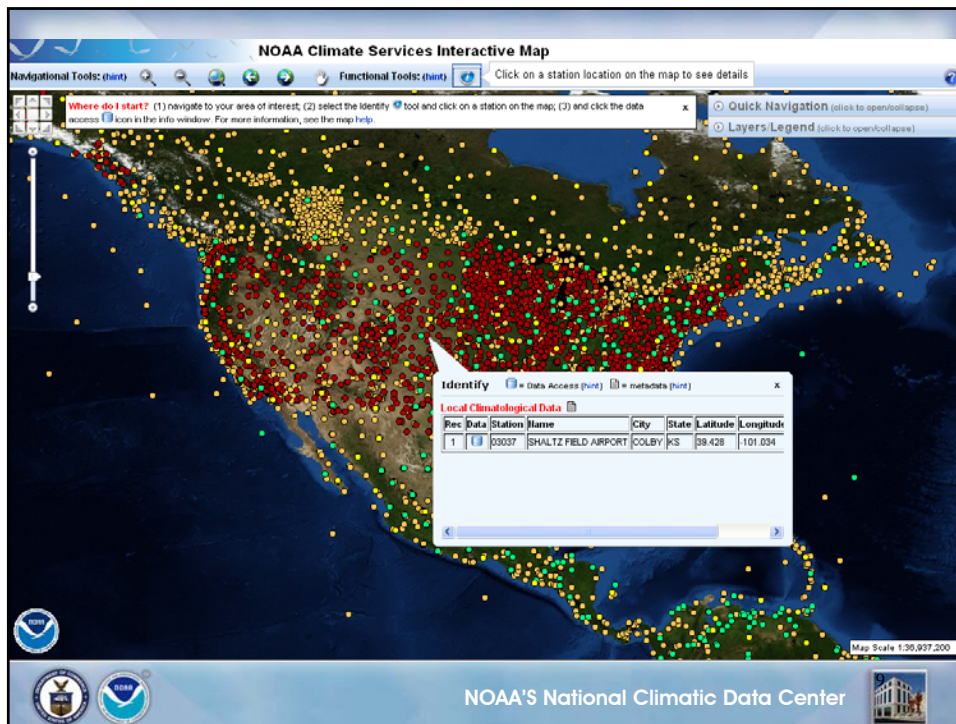
Or

Step 1: Use the GIS tools above map for navigation and to select stations to display related information

GIS Resources - Click here for additional NCDC GIS services (WMS/WFS, metadata, etc.)

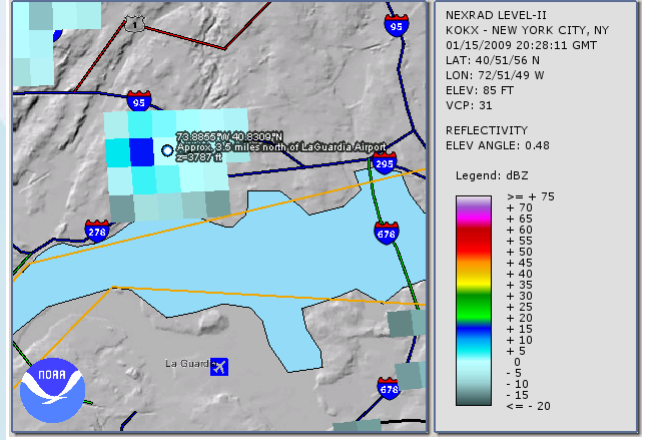
Prefer No Map? - Click here to use a traditional web page to get access to climate data.

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Radar Data Output Sample

Image from the NOAA Weather and Climate Toolkit showing reflectivity signature:



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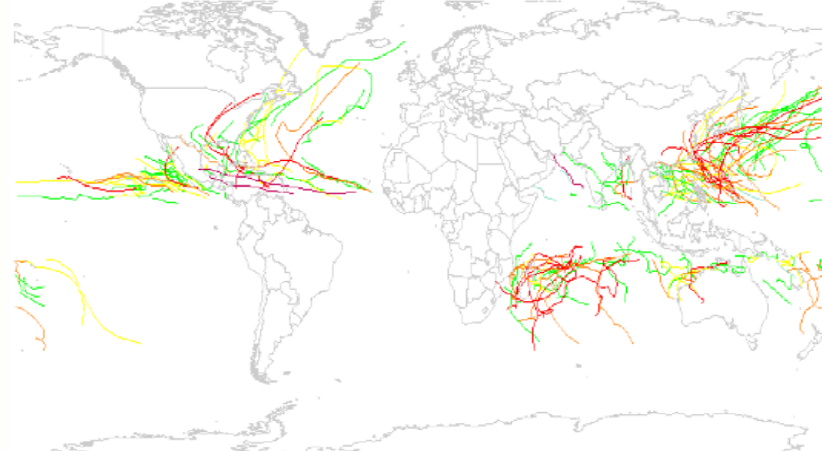
IBTrACS interactive WMS map tool

This tool is based on the **WMS line layer** of the IBTrACS dataset.

From: 2007 Thru: 2008 Basin: All Category: All Storms

[Get Map](#)

Default map shows all storm tracks and basins for 2008 season



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National Integrated Drought Information System...US Drought Portal

<http://www.drought.gov>

Data Sets

- The USDP includes over 50 data sets and operational products

Some Examples include:

- U.S. and North American Drought Monitors
- SNOTEL (SNOW TElemetry) from the USDA's NRCS
- Reservoir and streamflow levels from US Dept. of Interior and U.S. Army Corps of Eng.
- River forecasts from the National Weather Service
- U.S. Drought Outlook from the Climate Prediction Center
- Drought Indicators – PDSI, PHDI, PMDI, PZI (Divisional and station based) - NCDC
- Daily and Monthly Anomalies, Totals and Percentages for Precipitation, Temperature, Evaporation, Runoff and Soil Moisture – Climate Prediction Center
- VegDRI – Vegetation Drought Response Index – USGS & NDMC
- Soil Moisture and Temperature Observations – Climate Reference Network - NCDC

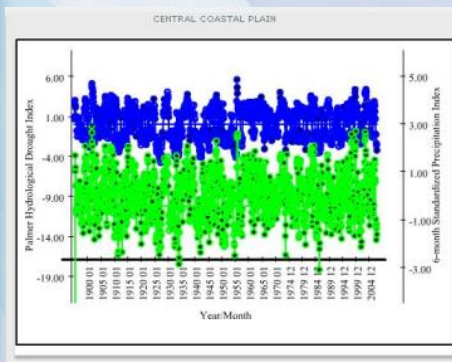


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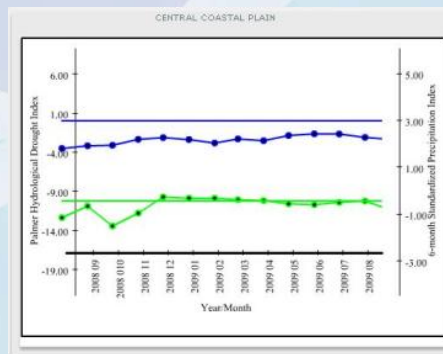


U.S. Drought Portal – Data Services

Period of Record



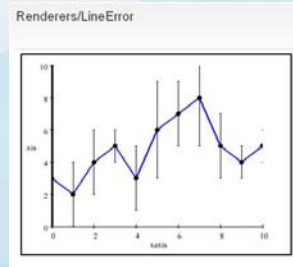
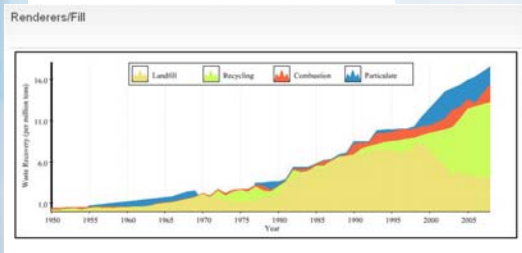
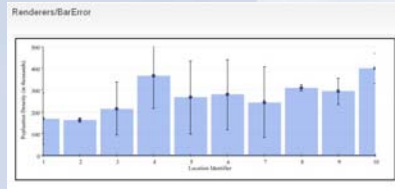
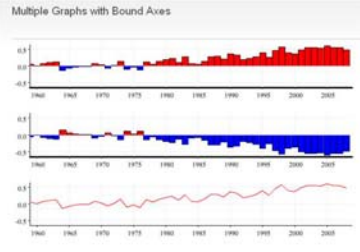
Most Recent Data



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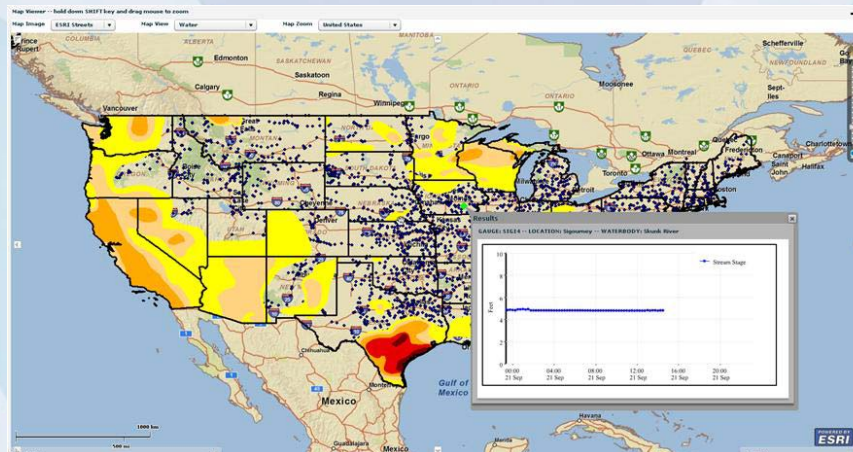
U.S. Drought Portal – Visualizations



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U.S. Drought Portal – Data Services Tied To Map Viewer

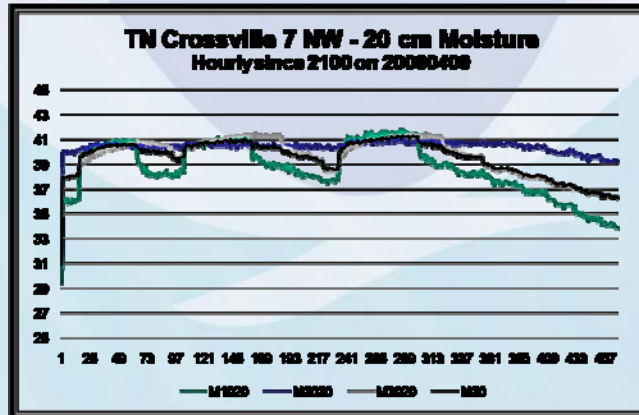


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U.S. Drought Portal – New Sources of Information

Soil Moisture and Temperature Observations from USCRN



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Key Satellite Datasets

<http://www.ncdc.noaa.gov/oa/satellite.html>

- Level 1 data (radiance data)
 - GOES – 1979 to current
 - POES – 1978 to current (includes Metop)
 - DMSP – 1987 to current
- Level 2+ climate products from NCDC
 - Optimum Interpolation 1/4 Degree Daily SST Analysis – 1981 to current
 - Blended Sea Winds – 1987 to current
 - DMSP Temperature Data Records (TDR) – NetCDF – 1987 -current
 - HIRS Upper Tropospheric Water Vapor – 1978 - current
 - Hurricane Satellite Data – HURSAT – 1978 – 2006



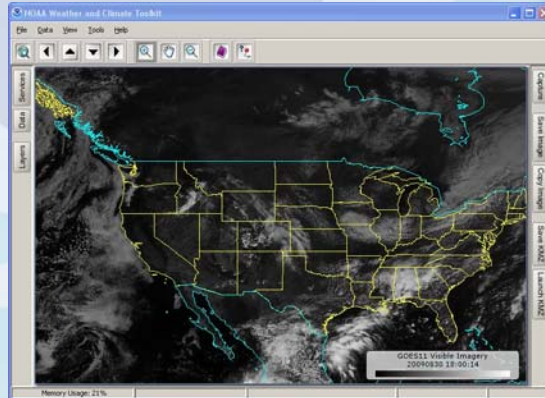
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Climate and Weather Toolkit (CWT) Usage with Satellite Data

JAVA Based Visualization Toolkit

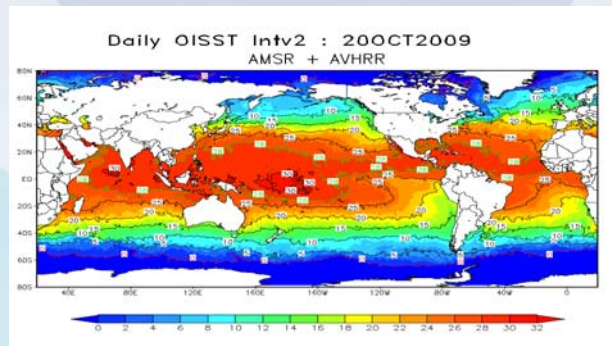
- Imports GOES AREA files directly
- Maps, displays, and animates
- Exports data to various formats
- Can choose various overlays and map backgrounds



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Daily SST Analysis



The 1/4 degree AMSR+AVHRR or AVHRR-only data are available in NetCDF format in: <ftp://eclipse.ncdc.noaa.gov/pub/OI-daily-v2/NetCDF>

The IEEF files can be found in: <ftp://eclipse.ncdc.noaa.gov/pub/OI-daily-v2/IEEF>



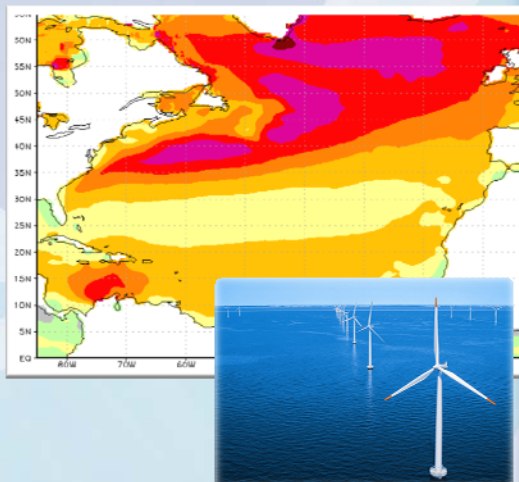
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Blended Seawinds

NCDC Blended Seawinds useful in wind climatology applications

- Renewable energy resource support
- Pilot projects started in several US coastal states: ME, MA, RI and OR
- Available in NetCDF and IEEG format

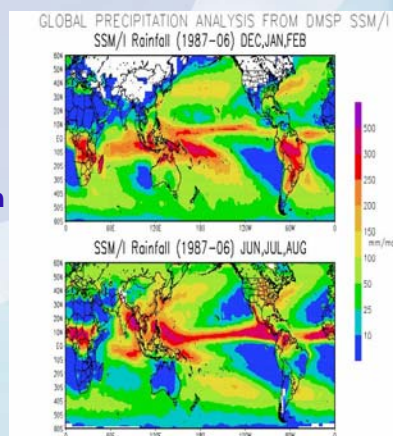


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Microwave Imager/Sounder Data from DMSP

- Reprocessed and quality controlled product with many climate applications
- Data converted to netCDF format with quality flags from July 1987-present.
- Applications include precipitation and land-surface geophysical variables



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Questions?

www.ncdc.noaa.gov



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