

NOAA's National Climatic Data Center

The World's Largest Archive of Climate and Weather Data



Timothy Owen
Operations Planning Officer
March 2013

Protecting the past... Revealing the future

NCDC's Mission

Steward of the Nation's Climate Information

NCDC provides long-term preservation, stewardship, and access to the Nation's resource of global climate and historical weather data, and continuously monitors and assesses climate variation and change.



Data Received from Many Sources



NCDC Statistics

FY 2012:

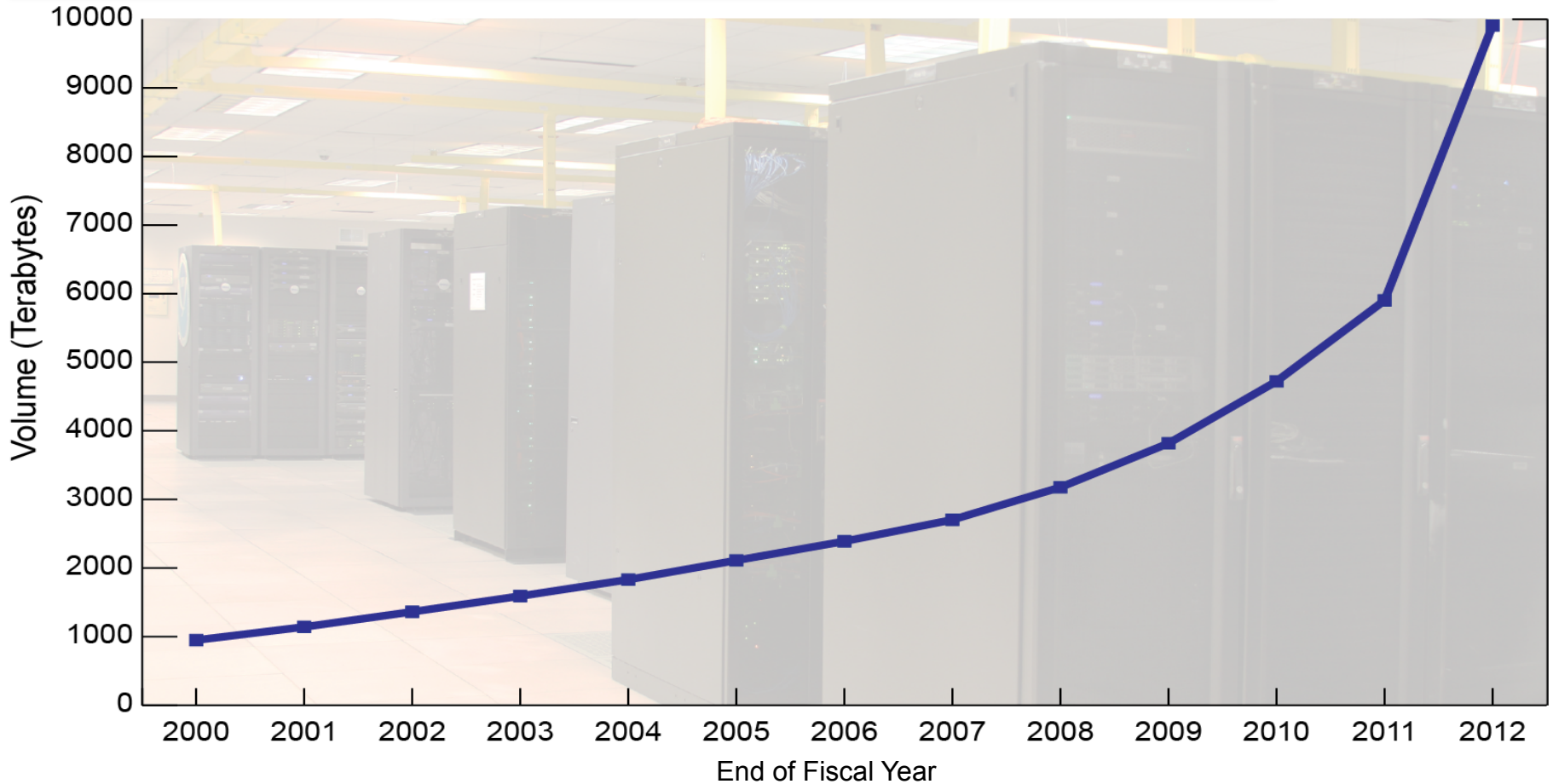
- Safe storage of nearly 10,000 terabytes of climate data
 - Equal to 12 billion Kindle books
- Data download of 1.9 petabytes
 - Forty-fold increase since 2005
 - Equal to six million Kindle book downloads daily



Storage Volume and Ingest Rate



Total Archive Volume: 9.9 Petabytes at the end of FY 2012

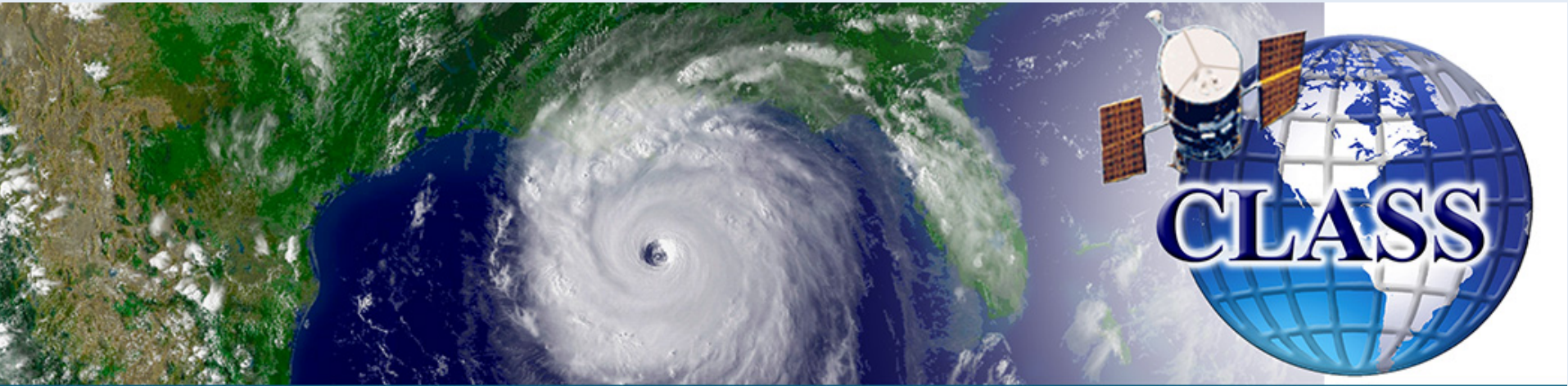


NCDC's Premier Data Archive System



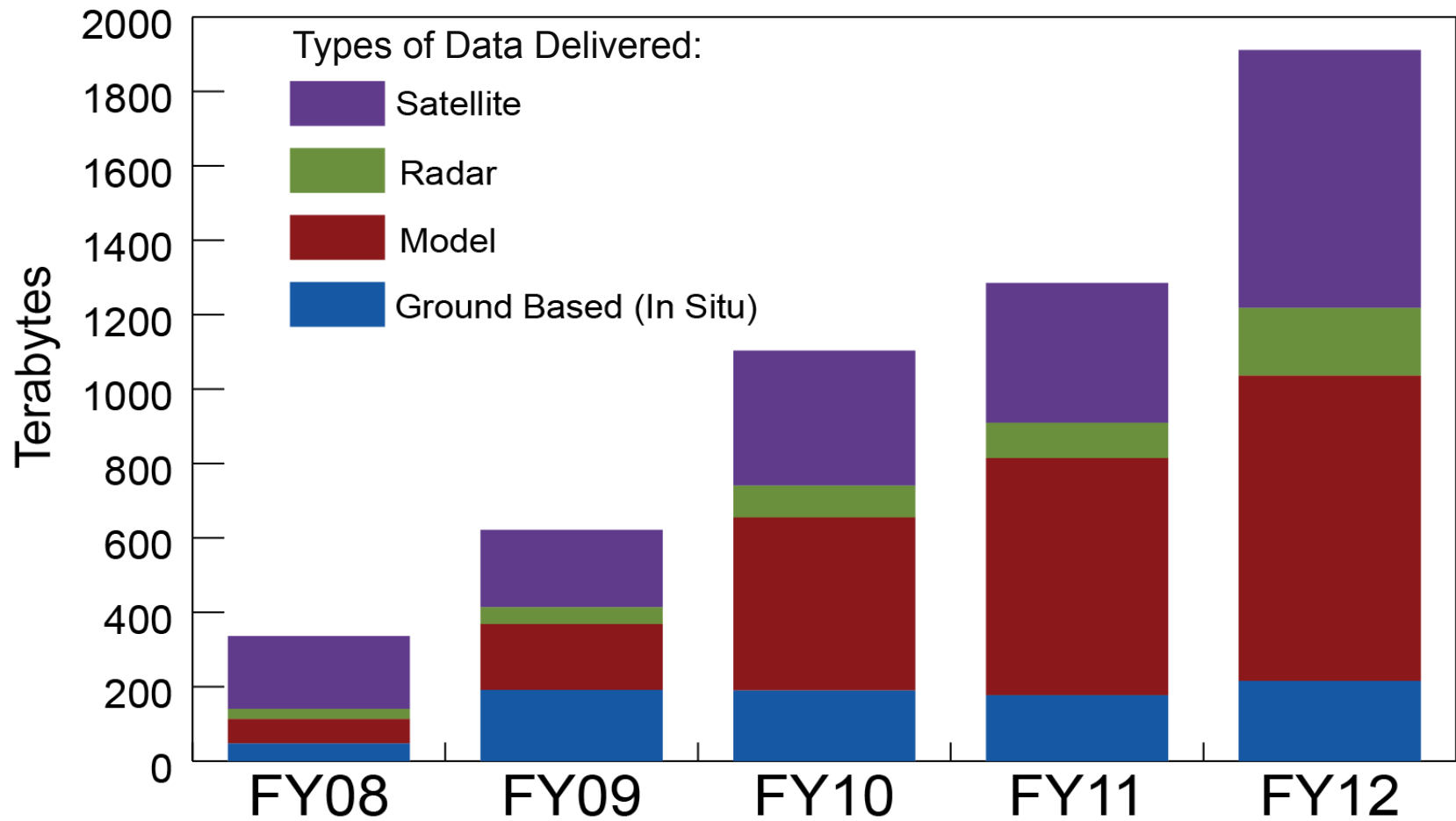
Comprehensive Large Array-data Stewardship System (CLASS)

- Secure storage for NOAA's rapidly expanding holdings of ground-based and remotely-sensed data for a wide range of scientific and commercial applications



Hurricane Katrina GOES 08/28/05

Demand for NCDC Data Continues to Grow



Serving Wide Range of Customers



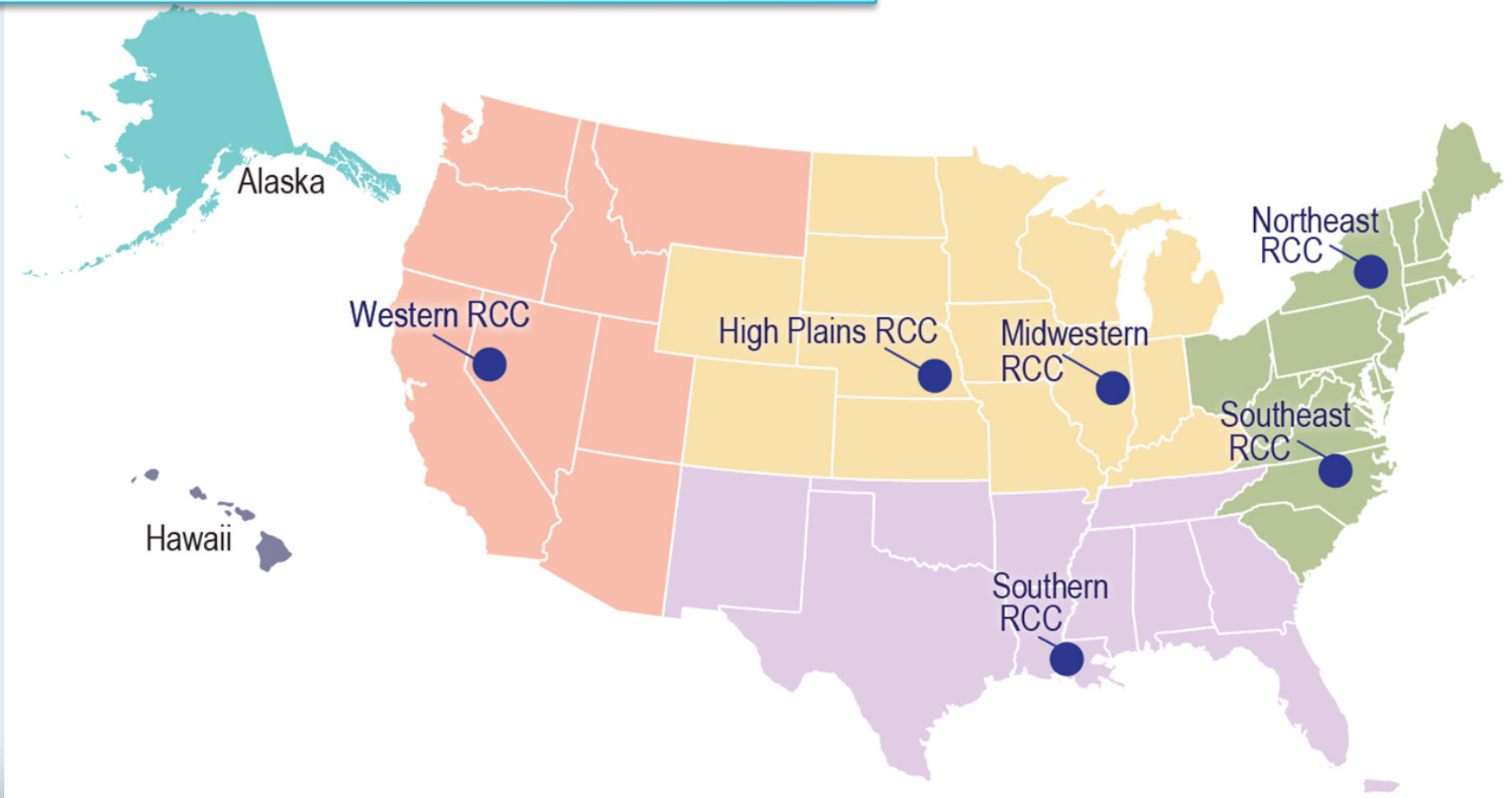
Consulting Meteorologist
Agriculture
Contractor
Utilities
Federal Government
State/Local Government
Research
Media
University
Insurance
Engineering
Individual
Legal
Other Business



Regional Collaboration



NOAA Regional Climate Services Directors
and Regional Climate Centers



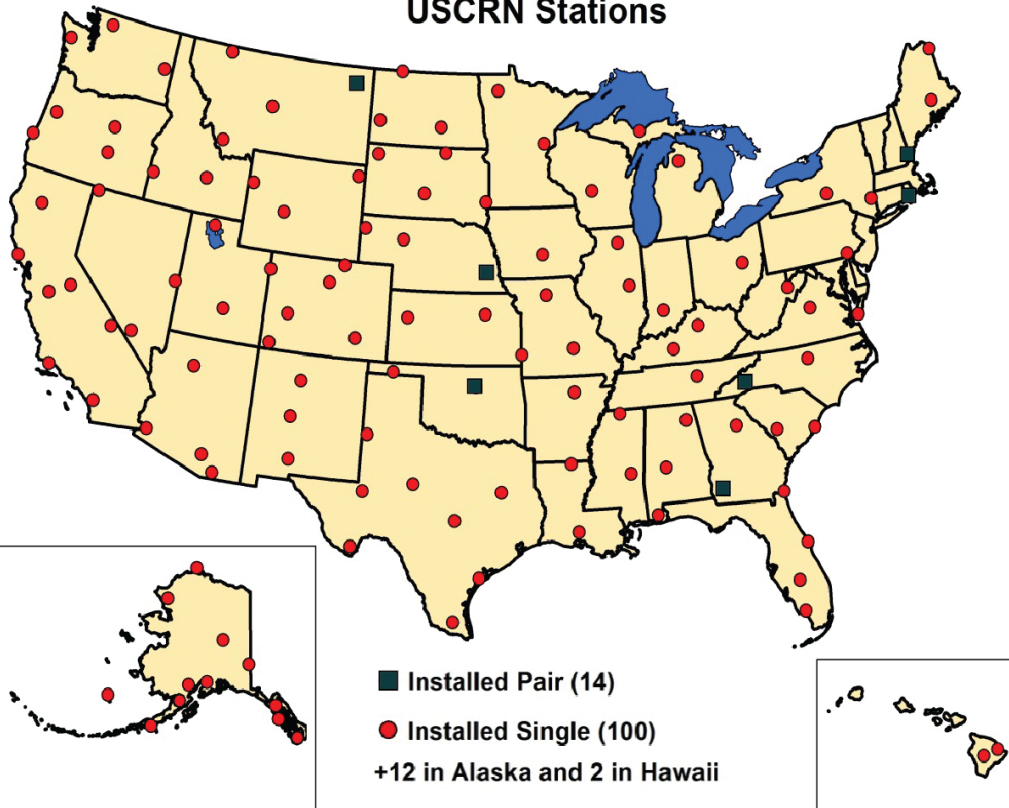
Colors represent six NOAA Regional Climate Services Director regions



U.S. Climate Reference Network (USCRN)



USCRN Stations



Reference Networks offer climate-quality information for assessing long-term climate change and variability

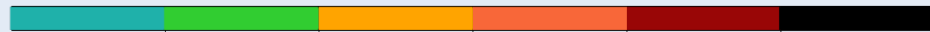
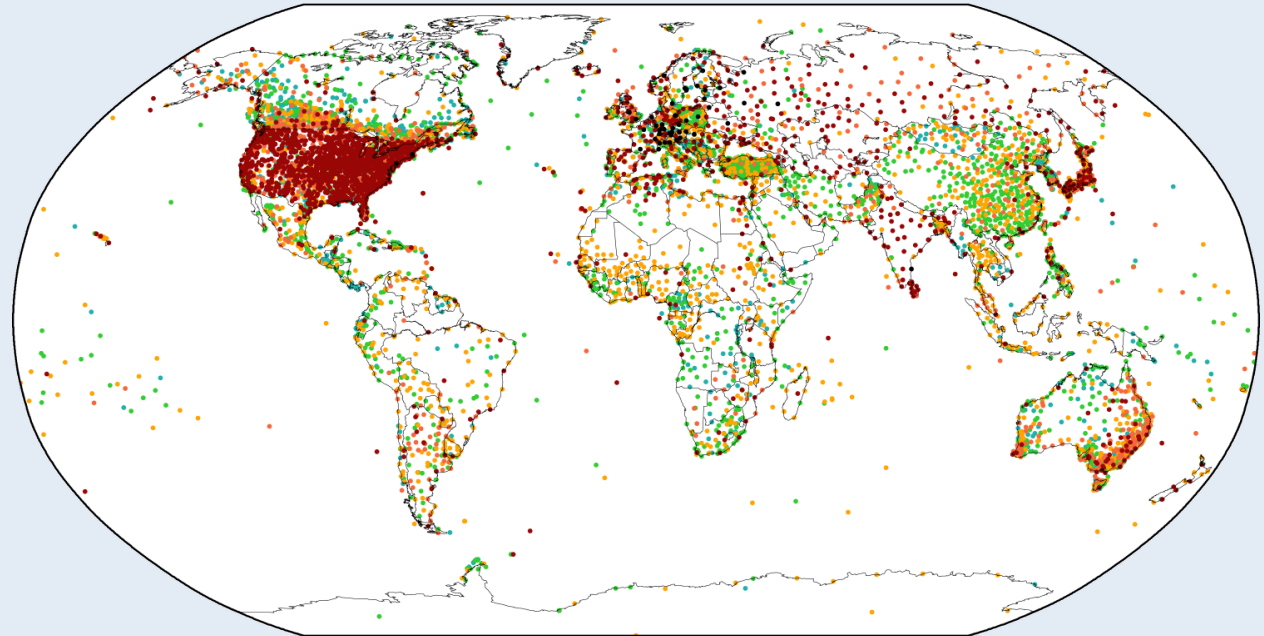


Climate Reference Network Site: Montrose, Colorado

Dataset: Land Surface Temperature



- NCDC monitors changes in global land surface temperature using the Global Historical Climatology Network-Monthly (GHCN-M) dataset
- This dataset provides monthly average temperatures from 7,280 stations, some of which contain records back more than 300 years.



25 50 75 100 200

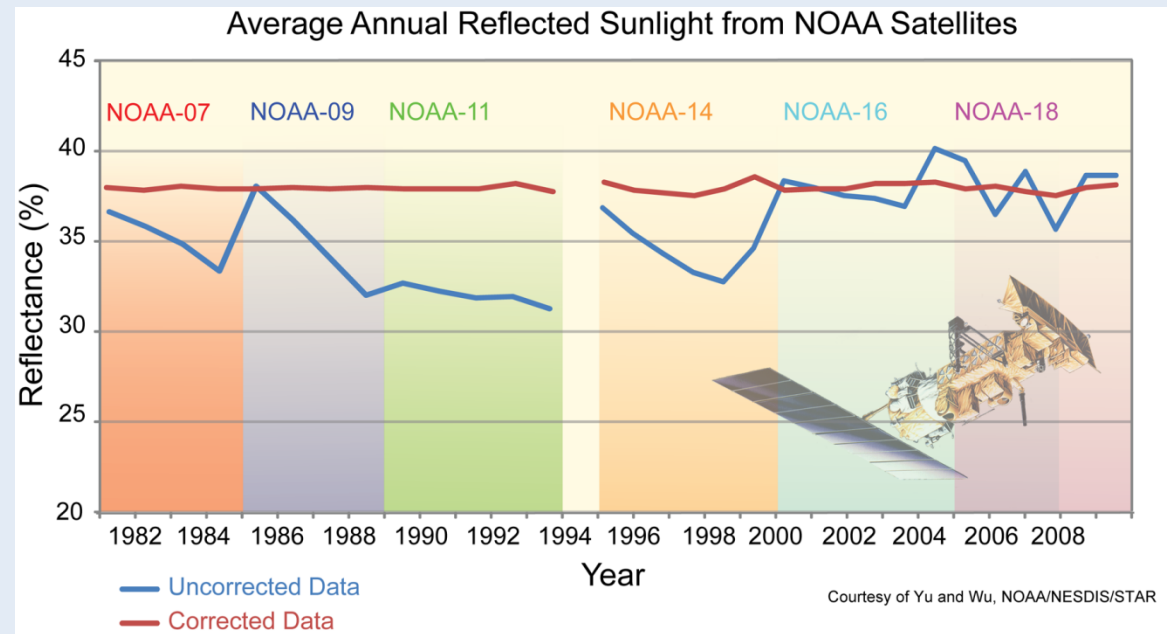
Number of years of data for each station



Climate Data Records



- Useful and reliable records of Earth's weather and climate
- Merge data from surface, atmosphere, and space-based systems across decades
- Reveal Earth's short- and longer-term environmental changes and variations
- Initially focusing on data from satellites

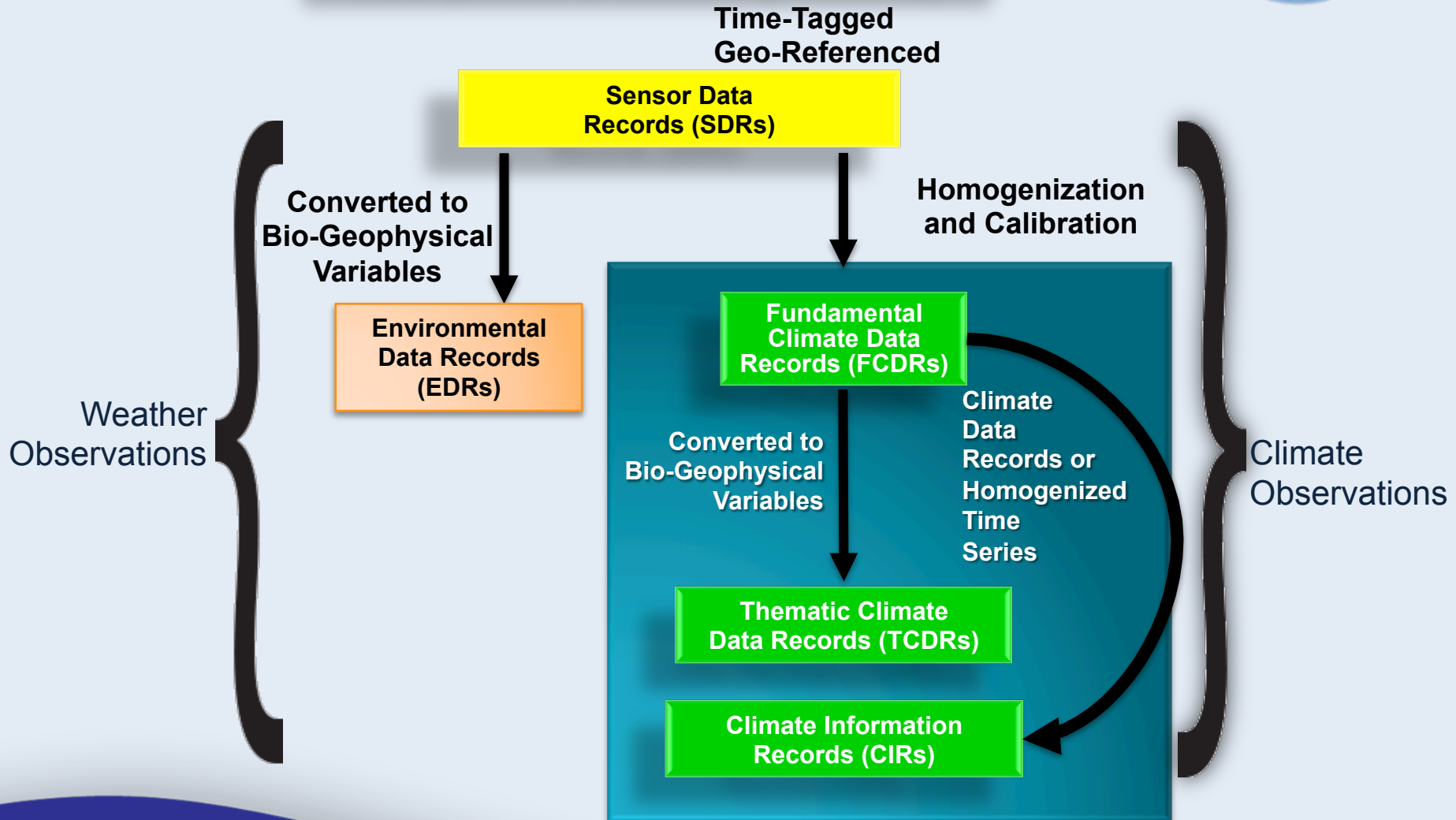


Uncorrected versus corrected reflected sunlight satellite measurements

Climate Data Records



Data (Direct & Remotely Sensed)



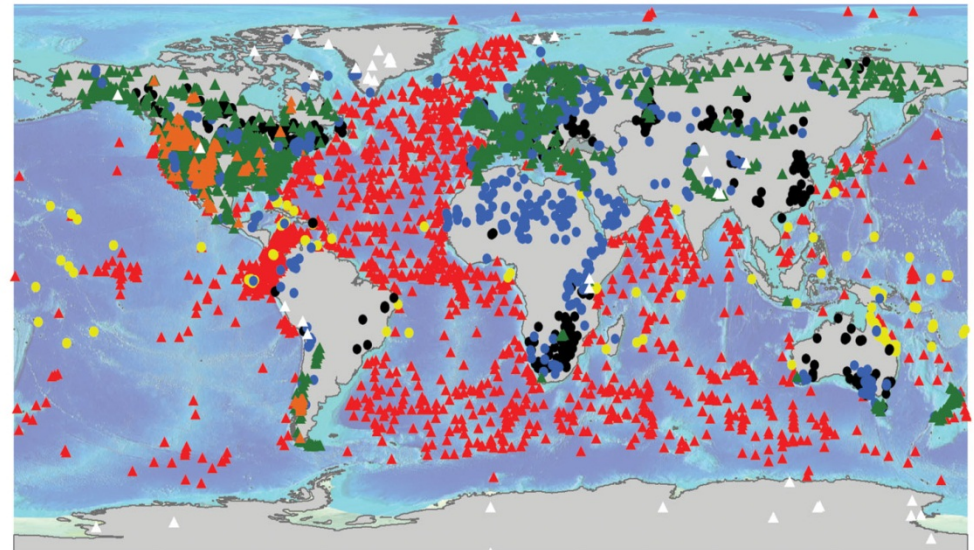
Paleoclimatology



- The study of past climate prior to instrumental weather measurements
- Uses information from natural recorders such as
 - Tree rings
 - Ice cores
 - Corals
 - Ocean and lake sediment



Paleoclimate Site Locations



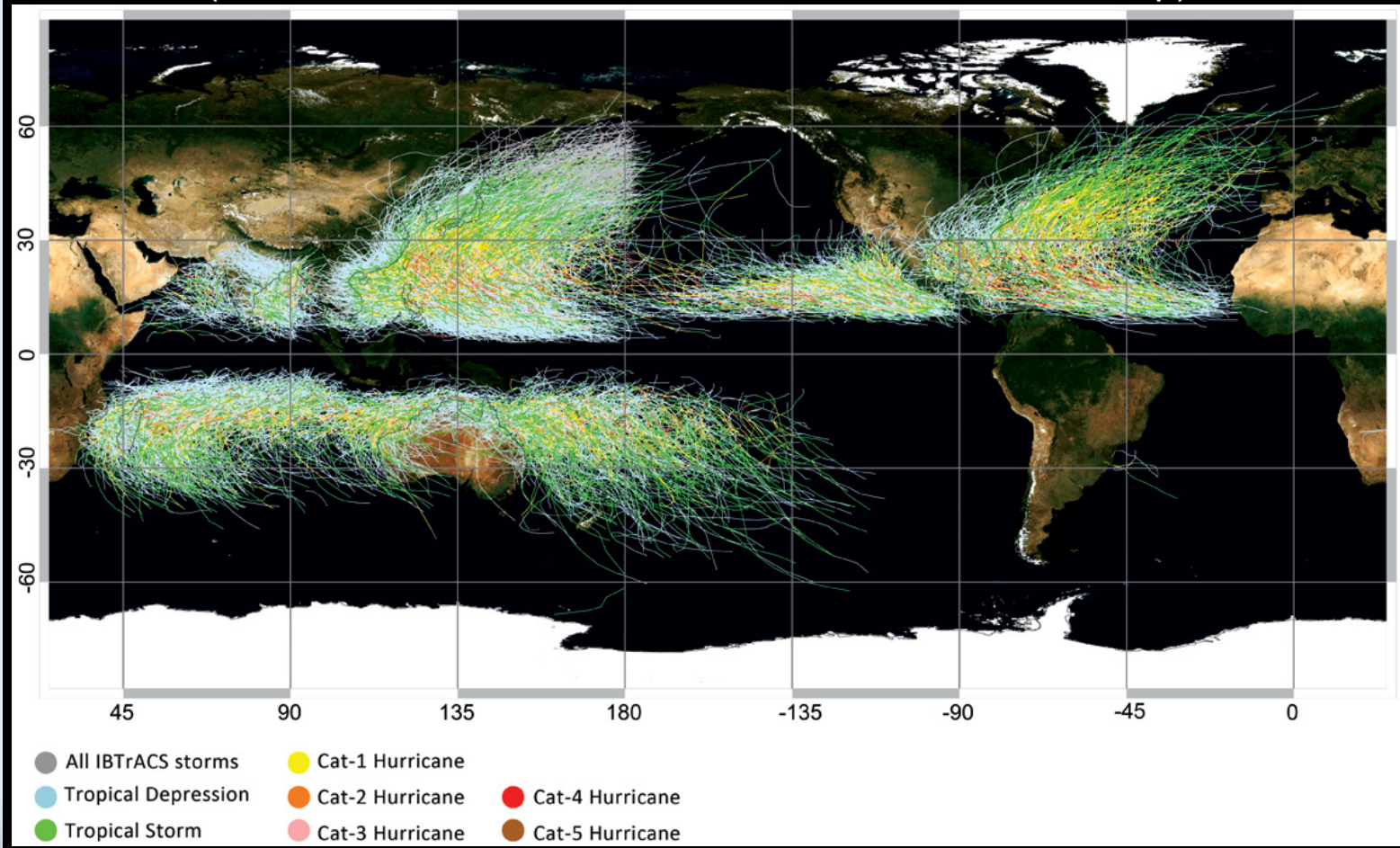
Location Descriptions
● Coral ● Lake ● Borehole ▲ Ocean ▲ Fire History ▲ Tree Ring △ Ice Core

Extends the record length back hundreds to millions of years

International Partnerships



IBTrACS (International Best Track Archive for Climate Stewardship) 1842-2011



Extremes: Drought



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North American Drought Monitor

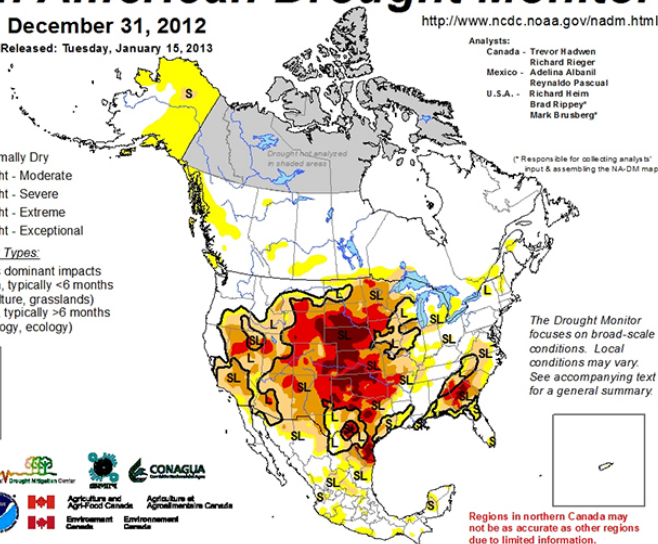
December 31, 2012
Released: Tuesday, January 15, 2013
<http://www.ncdc.noaa.gov/nadm.html>

Analysts:
Canada: Trevor Hadwen, Richard Rieger
Mexico: Adeline Albanil, Reynaldo Pascual
U.S.A.: Richard Heim, Brad Rippey, Mark Brusberg

(* Responsible for collecting analysts' input & assembling the NA-D0 map)

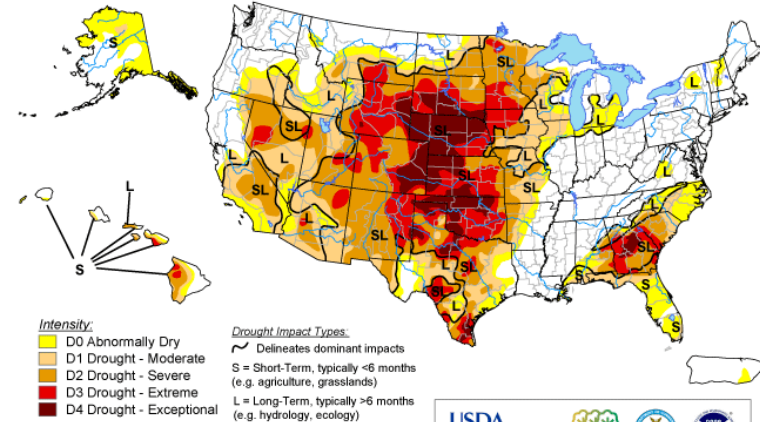
- Intensity:**
- D0 Abnormally Dry
 - D1 Drought - Moderate
 - D2 Drought - Severe
 - D3 Drought - Extreme
 - D4 Drought - Exceptional

- Drought Impact Types:**
- S = Short-Term, typically <6 months (e.g. agriculture, grasslands)
 - L = Long-Term, typically >6 months (e.g. hydrology, ecology)



U.S. Drought Monitor

February 5, 2013
Valid 7 a.m. EST



The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

<http://droughtmonitor.unl.edu/>



Released Thursday, February 7, 2013
Author: Michael Brewer/L. Love-Brotak, NOAA/NESDIS/NCDC

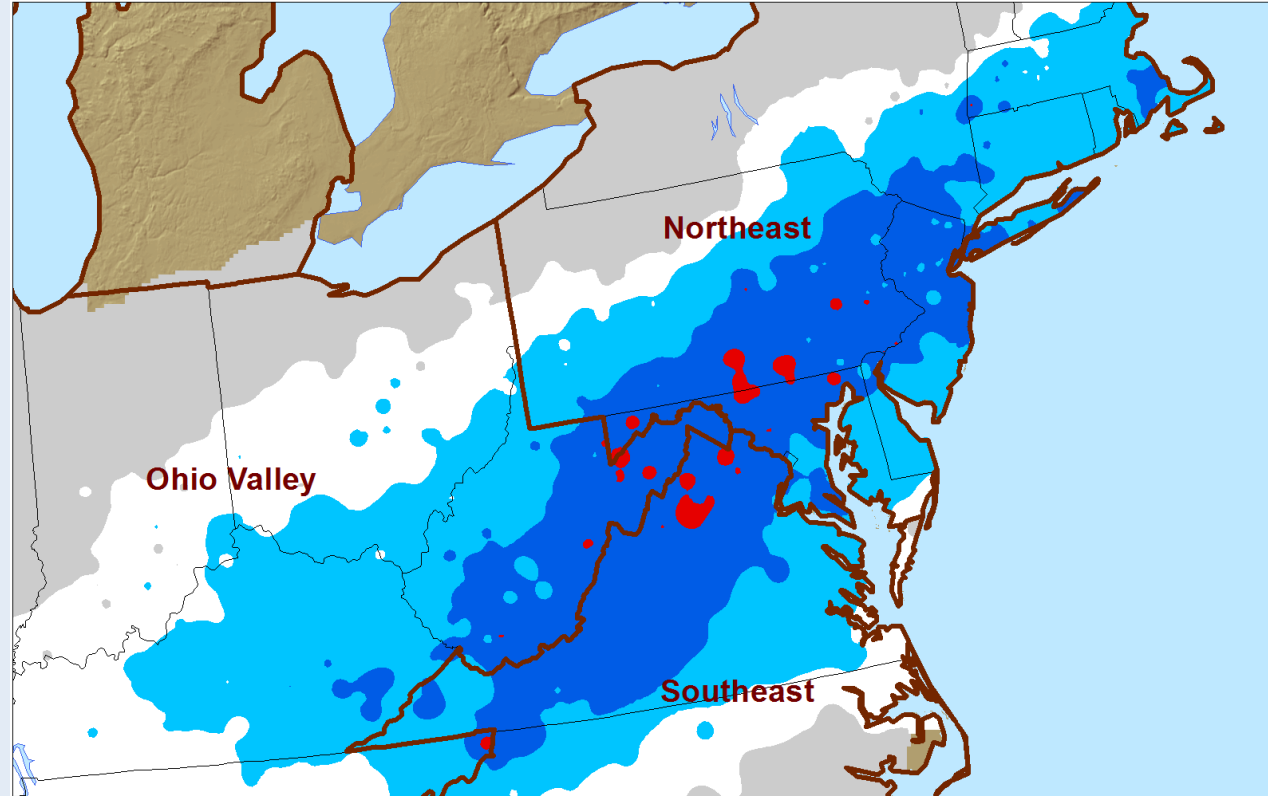


Monitoring Extremes: Snow



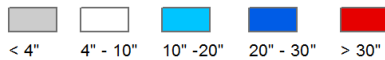
NCDC produces:

- Assessments of snow conditions across the U.S.
- Analysis of economic impact of snow storms



January 6-9, 1996

Total Snowfall (inches)



Regional Snowfall Index
(1-5 scale)

Northeast	Category 5
Ohio Valley	Category 5
Southeast	Category 5

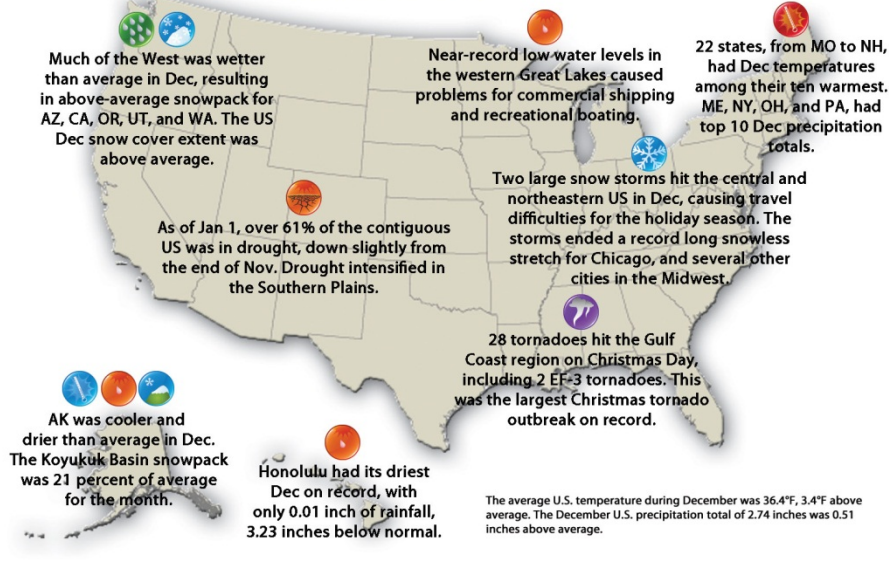


Monitoring

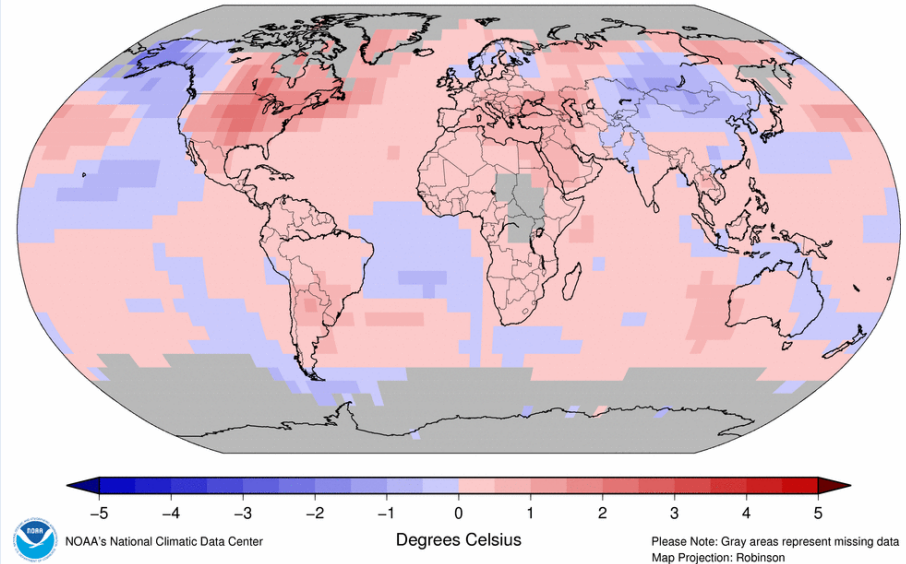


NCDC produces weekly, monthly, seasonal, and annual climate analyses

Significant Events for December 2012



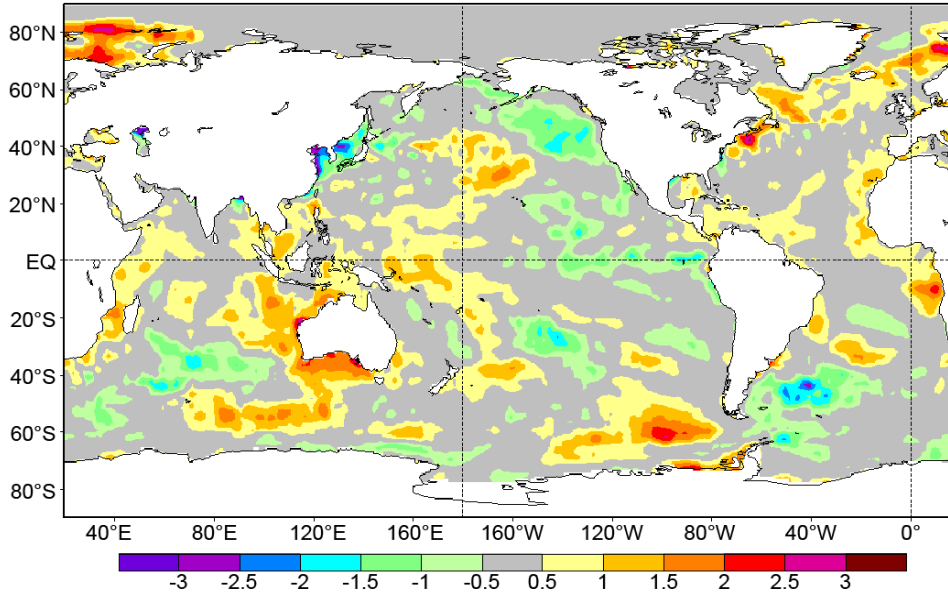
Land & Ocean Temperature Anomalies Jan–Dec 2012
(with respect to a 1981–2010 base period)
Data Source: GHCN–M version 3.2.0 & ERSST version 3b



Monitoring: Sea Surface Temperatures



Sea Surface Temperature Anomaly ($^{\circ}\text{C}$), Base Period 1971-2000
Week of 9 Jan 2013



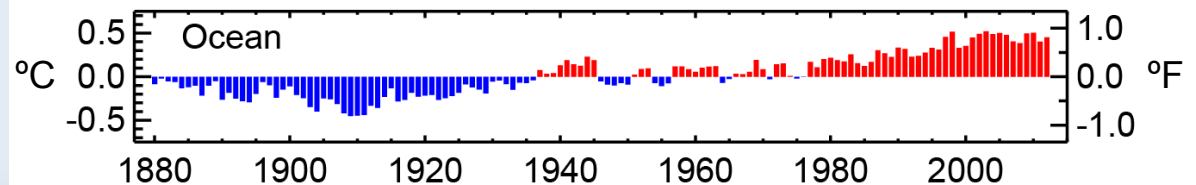
NCDC analyzes data to show departure from normal climate conditions



Jan-Dec Ocean Surface Mean Temp Anomalies

NCDC/NESDIS/NOAA

Analysis is based upon Smith et al. (2008) methodology

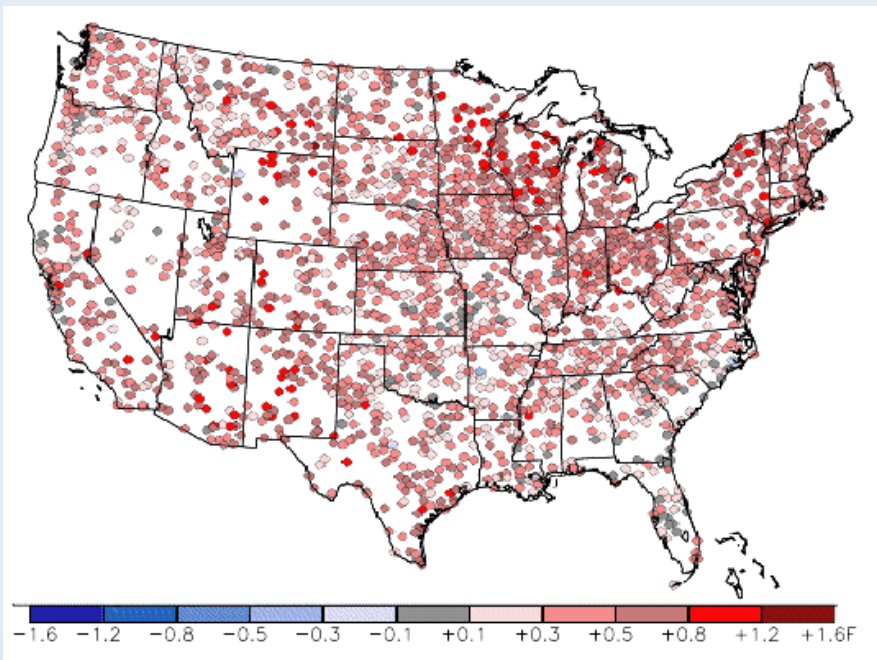


Monitoring: Climate Normals

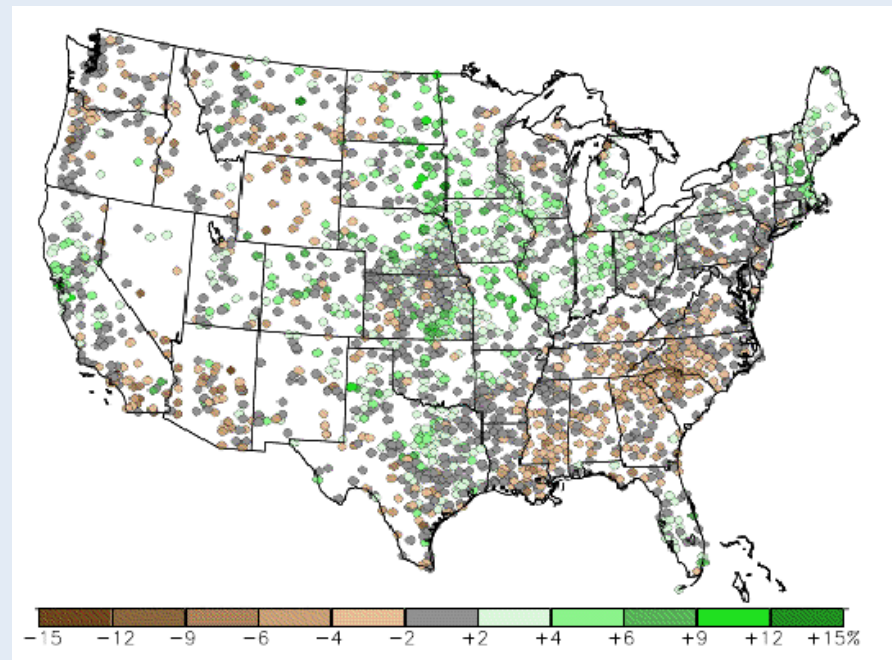


NCDC released the 1981-2010 statistical Climate Normals

Temperature Difference for 1981-2010 Normals Minus 1971-2000 Normals



Precipitation Percentage Difference for 1981-2010 Normals Minus 1971-2000 Normals





Portal for NOAA-wide Data and Information


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Articles



Speaking of the Arctic

Featured Article, December 06, 2012
Brian Kahn
From rising sea level, to U.S. and European weather, to bird migrations, NOAA Administrator Jane Lubchenco describes how Arctic climate change can influence the rest of the planet.
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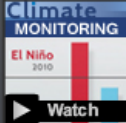
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Meet NOAA's climate scientists and get their perspectives on climate.

 **Extreme Events of 2012**

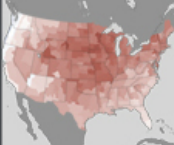
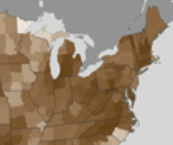

 **The Pushy Pacific: Variability and Change in Global Temperature**


 **Water Waning into Winter**

Images

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National Assessments



Nov 1990

The Global Change Research Act is incorporated



2000

First National Assessment



2009

Global Climate Change Impacts Report



2014

The National Climate Assessment: Draft out for public review, Jan-Apr 2013 with final report scheduled for release in 2014



1990s

2000s

2010s

1997-2003

Workshops and assessment reports for 14 regions

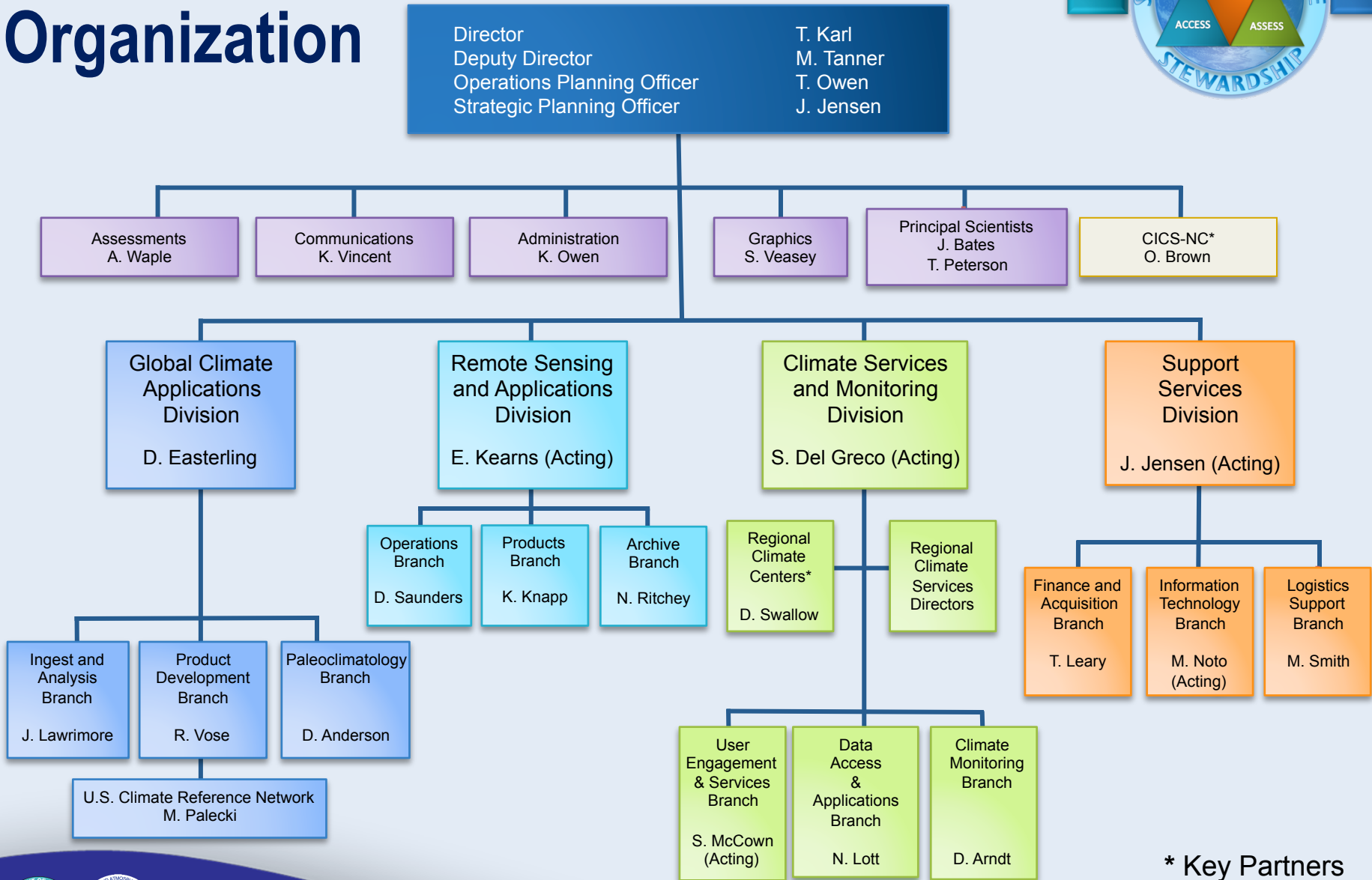


2004-2008

21 Synthesis and Assessment Products



NOAA's National Climatic Data Center Organization



* Key Partners



Questions?

www.ncdc.noaa.gov

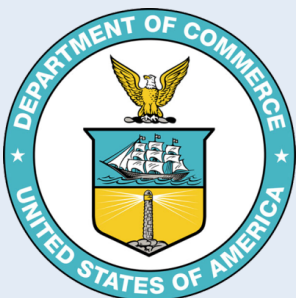
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