

NOAA's National Climatic Data Center

World's Largest Archive of Climate and Weather Data

**Presented to: Quarterly Meeting,
Subcommittee of Hydrology, ACWI
23 October 2014**



**Dongsoo Kim, Ph.D.
Project Scientist
STATMOS node**

Protecting the past... Revealing the future

NCDC Strategic Vision

MISSION

Steward the Nation's Climate Information

NCDC is responsible for preserving, monitoring, assessing, and providing public access to the Nation's treasure of climate and historical weather data and information.

VISION

Be the Nation's Trusted Authority on Climate and Historical Weather Information

NCDC will be the most comprehensive, accessible, and trusted source of state-of-the-art climate and historical weather data, information, and climate monitoring.



Rising Demand for Climate Information



Sustainability of Marine Ecosystems



Coasts and Climate Resilience



Climate Impacts on Water Resources



Changes in Extremes of Weather and Climate



Agriculture



Energy



Health

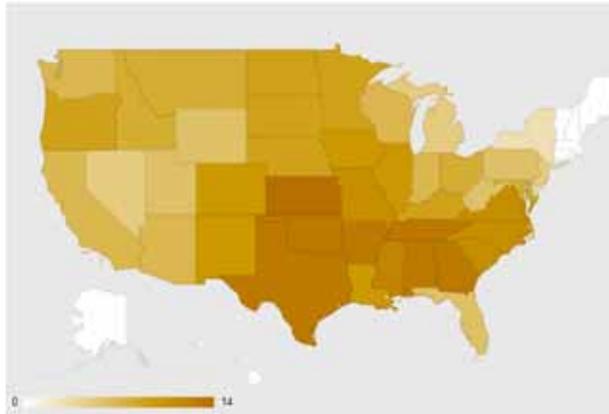


Transportation

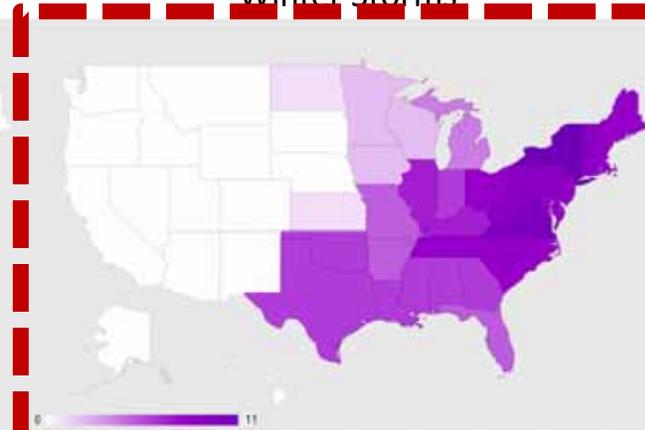
The Nation Is Climate-Conscious...for Good Reason

U.S. Billion-Dollar Weather and Climate Disasters: 1980 – 2013*

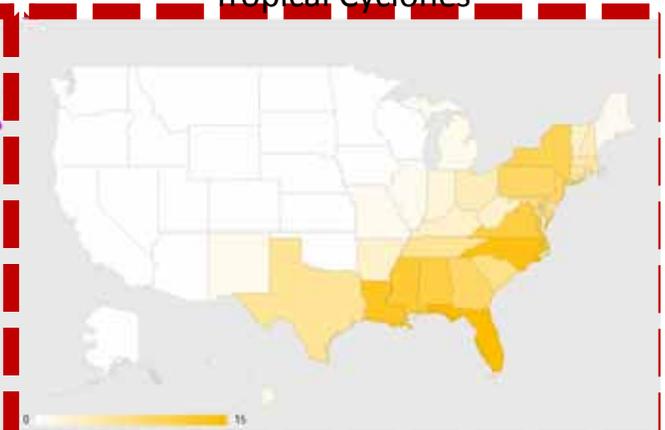
Droughts and Heat Waves



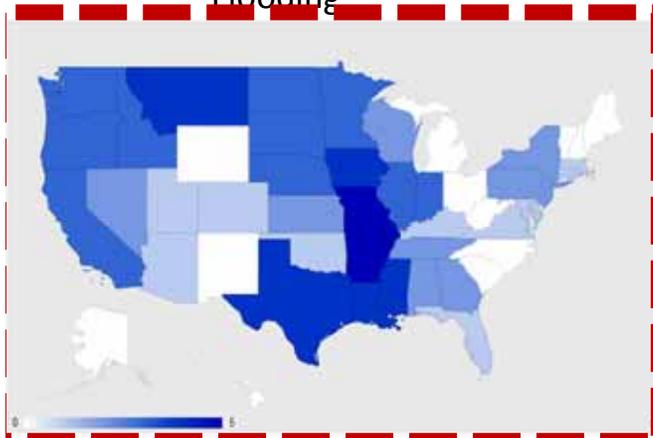
Winter Storms



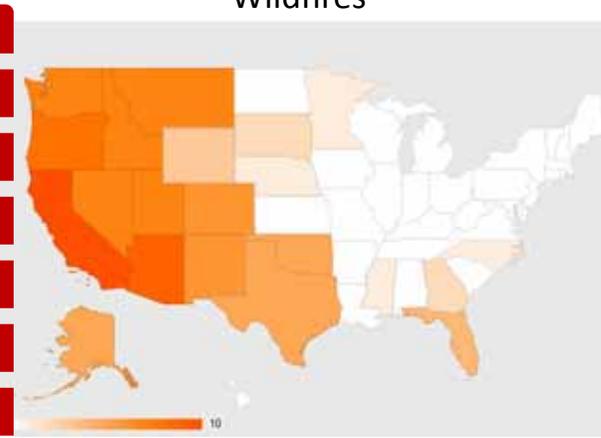
Tropical Cyclones



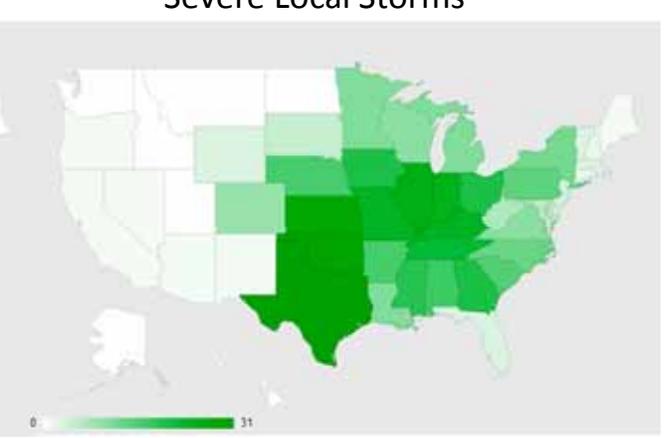
Flooding



Wildfires



Severe Local Storms



*170 weather and climate disasters reached or exceeded \$1 billion during this period (CPI-adjusted)

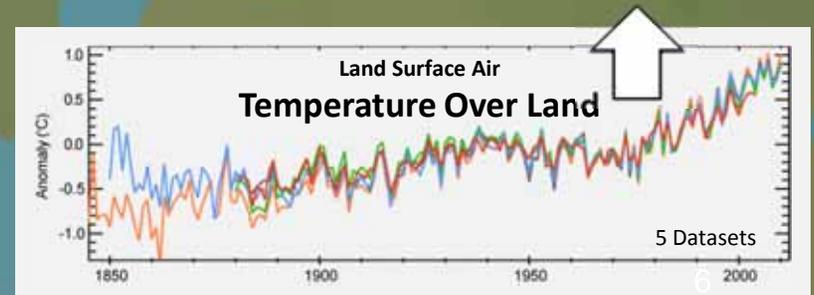
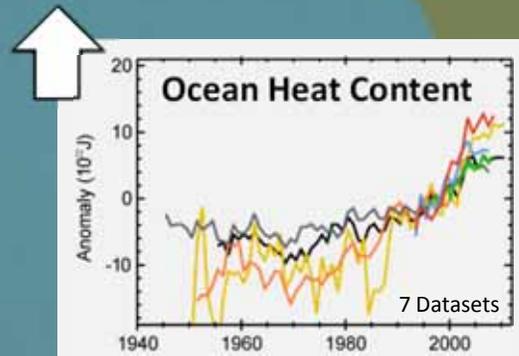
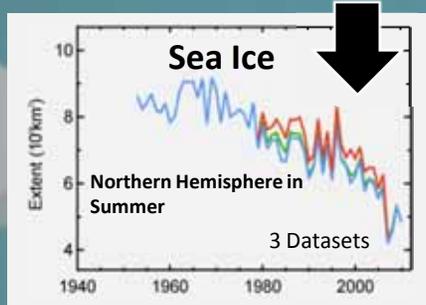
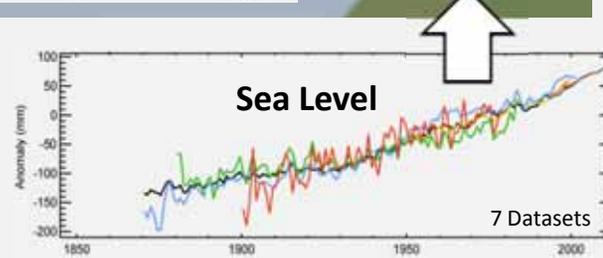
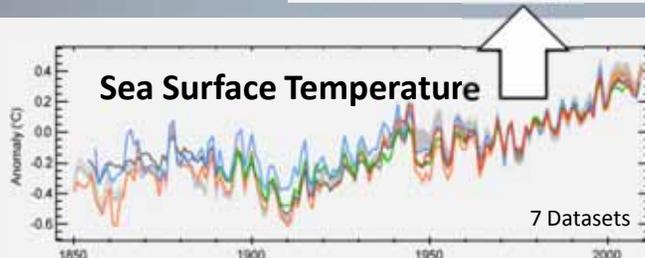
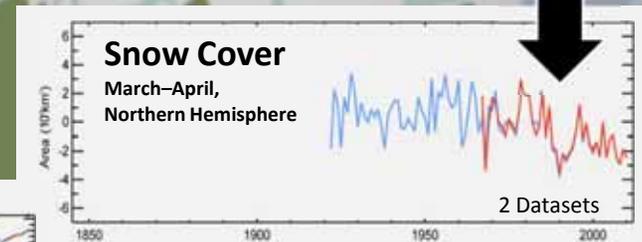
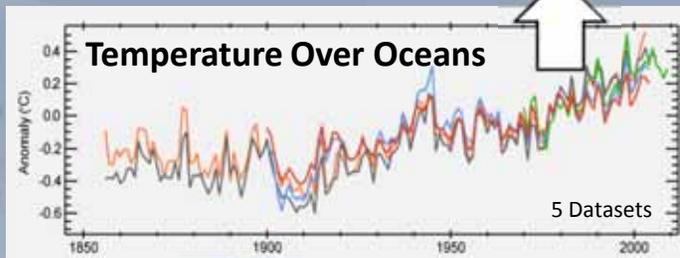
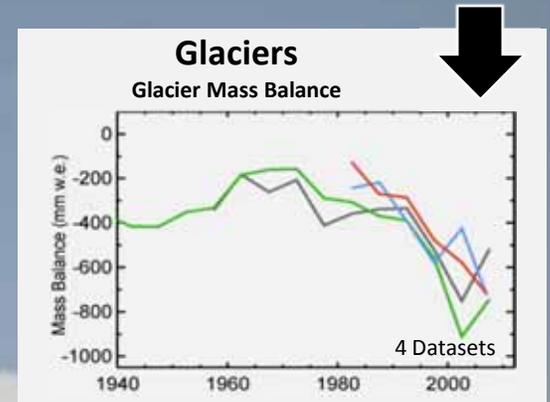
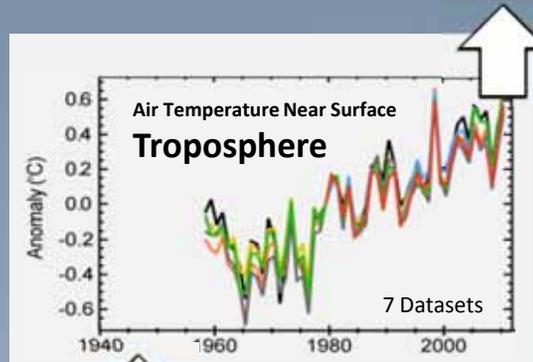
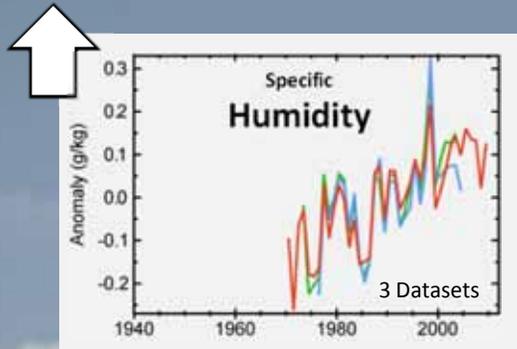
Please note that the map reflects a summation of billion-dollar events for each state affected (i.e., it does not mean that each state shown suffered at least \$1 billion in losses for each event).



Climate Products and Services



State of the Climate



Acquire and Archive Climate Data from U.S. and International Sources

Data spans stone-age to space-age... and across the globe

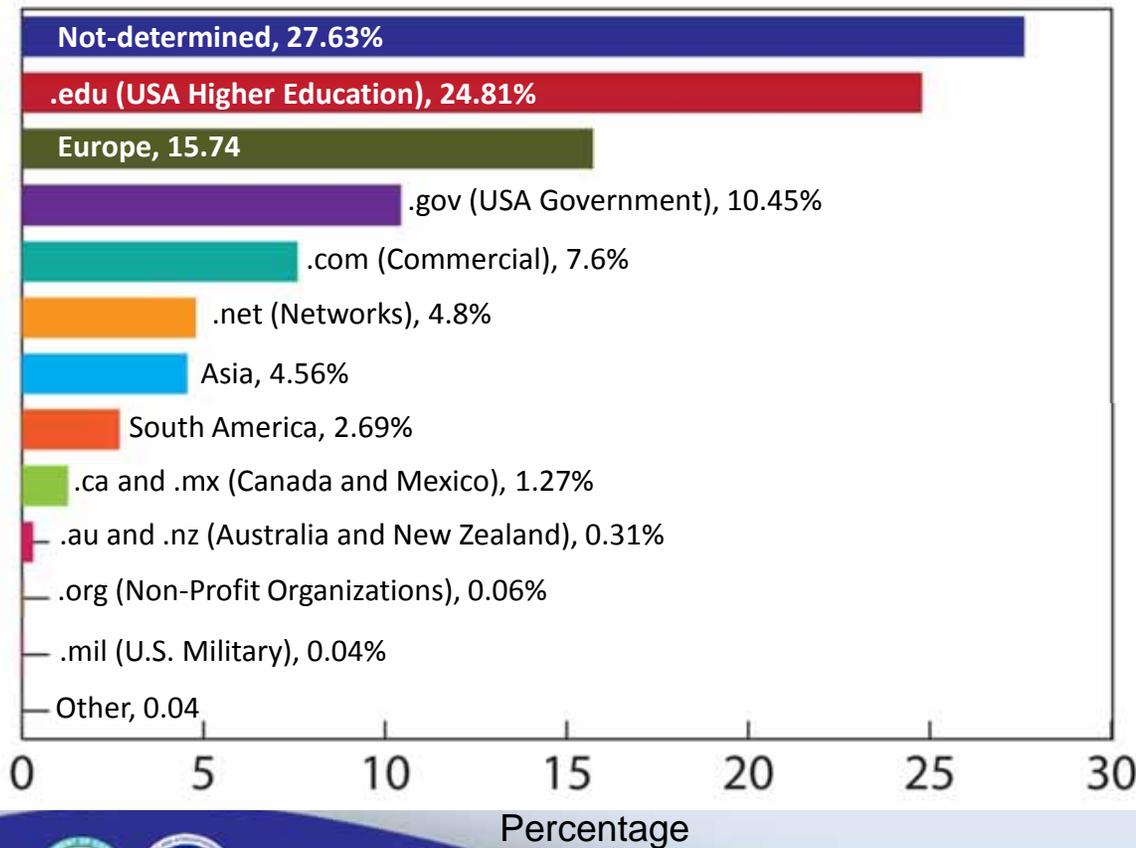


Users of Weather and Climate Data

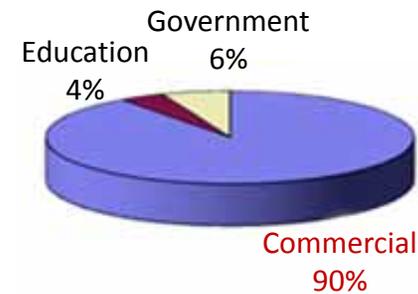
For past 12 months:

- Calls: 15,588
- E-Mails: 7,056
- Faxes: 223
- Letters: 236

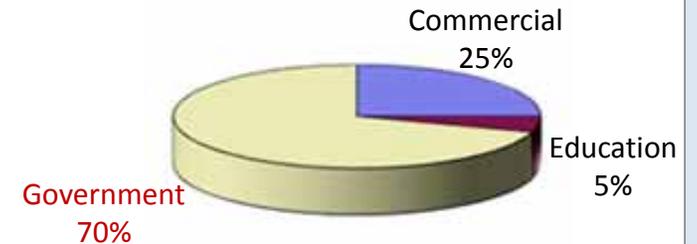
Online User Profile



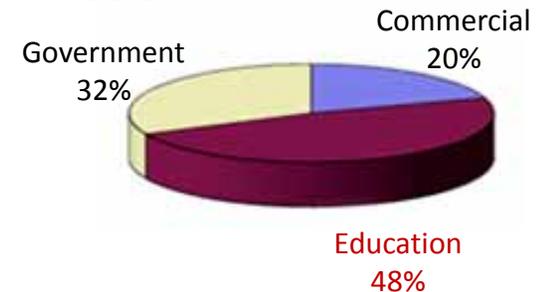
Earth (*In Situ*) Platform



Satellite Platform



Radar Platform



Serving Wide Range of Customers

Federal Government

State/Local Government

Consulting Meteorologist

Agriculture

Contractor

Utilities

Research

Media

University

Insurance

Engineering

Individual

Legal

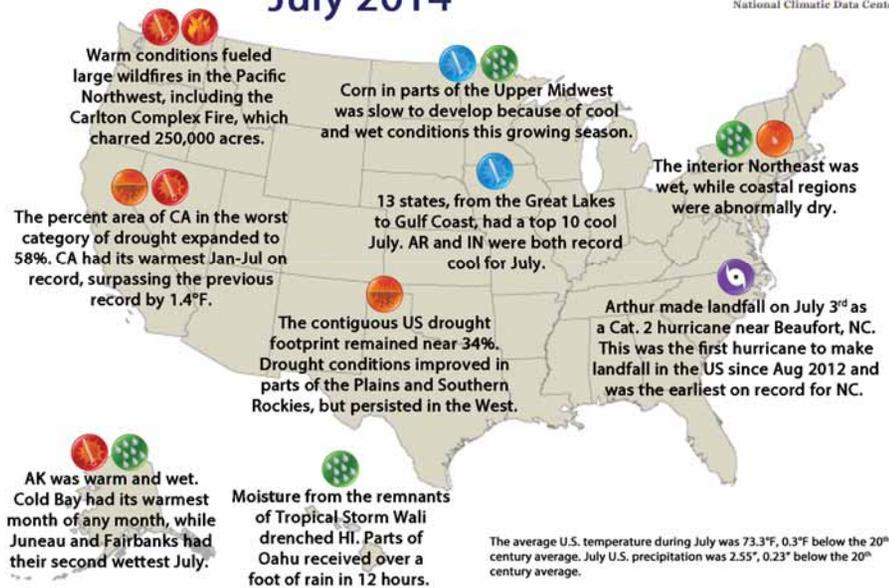
Business Sector



Monitoring

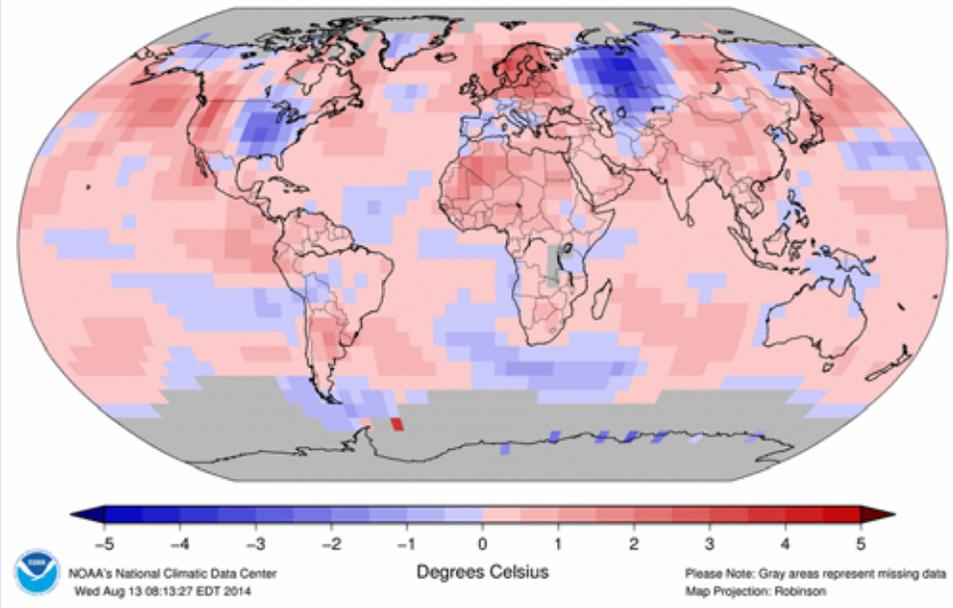
Produce weekly, monthly, seasonal, and annual climate analyses

Significant Events for July 2014



Land & Ocean Temperature Departure from Average Jul 2014 (with respect to a 1981–2010 base period)

Data Source: GHCN–M version 3.2.2 & ERSST version 3b



Drought

North American Drought Monitor

August 31, 2014

Released: Friday, September 12, 2014

<http://www.ncdc.noaa.gov/nadm.html>

Analysts:

Canada - Trevor Haden
 Brianna Kelly
 Mexico - Reynaldo Pascual
 Adelina Albanil
 U.S.A. - Mark Svoboda*
 David Simera†

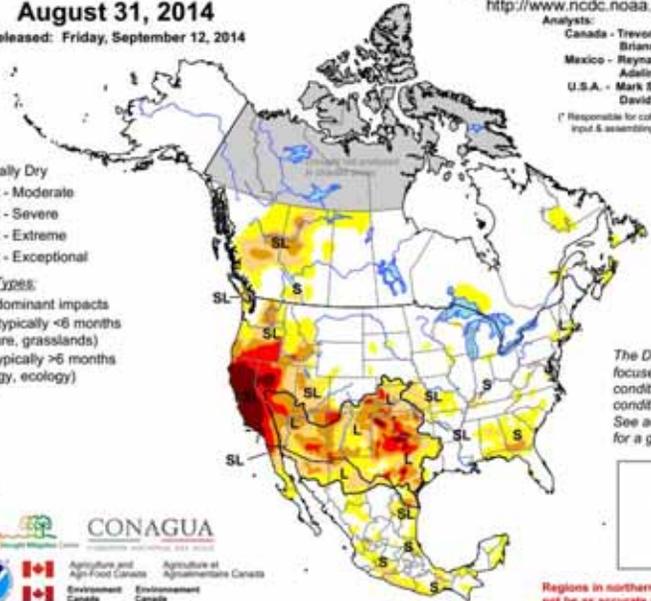
* Responsible for collecting analysts' input & assembling the NA-DM map

Intensity:

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

Drought Impact Types:

- ~ Delineates dominant impacts
- S = Short-Term, typically <6 months (e.g. agriculture, grasslands)
- L = Long-Term, typically >6 months (e.g. hydrology, ecology)



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



Regions in southern Canada may not be as accurate as other regions due to limited information.

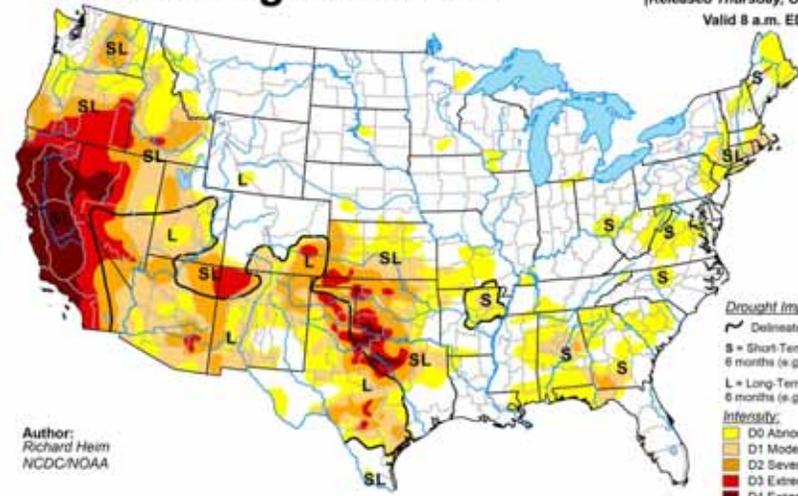


U.S. Drought Monitor

September 30, 2014

(Released Thursday, Oct. 2, 2014)

Valid 8 a.m. EDT



Drought Impact Types:

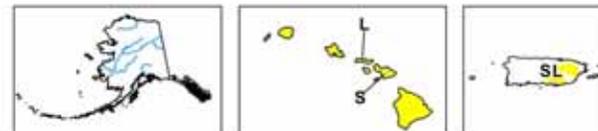
- ~ Delineates dominant impacts
- S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)
- L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

Intensity:

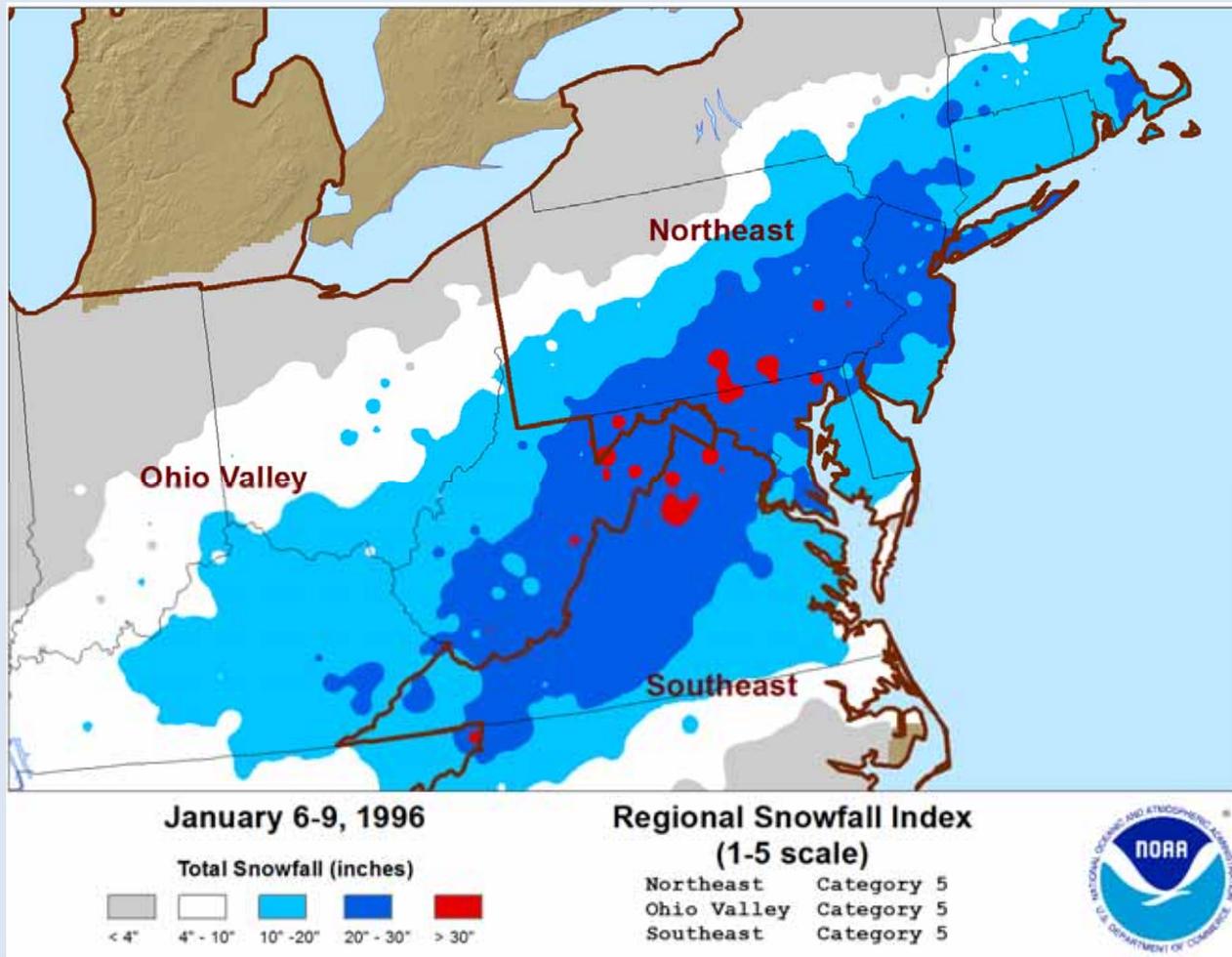
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

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

Author:
 Richard Heim
 NCDC/NOAA



Snow Extremes

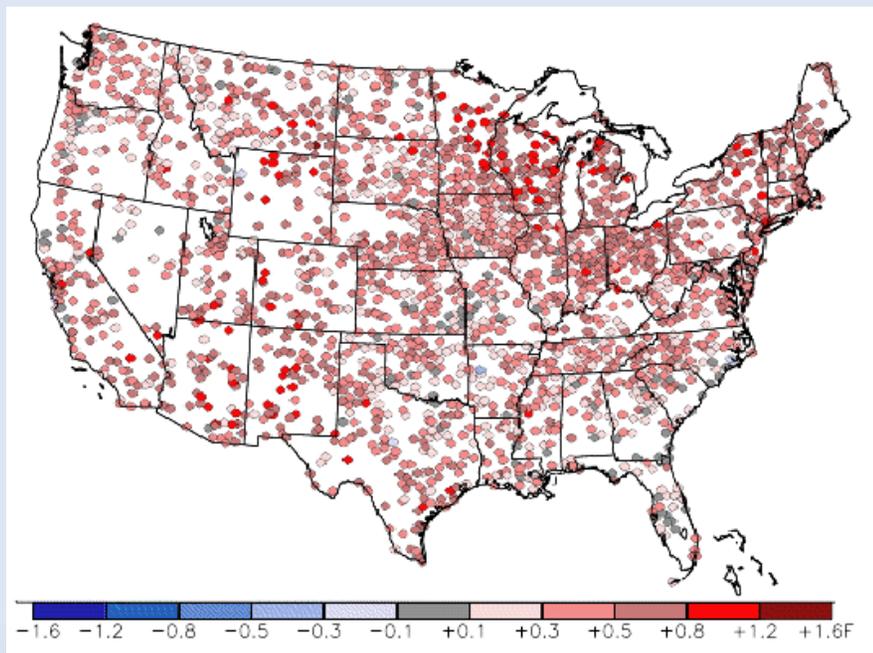


- Assessments of snow conditions across the U.S.
- Analysis of economic impact of snow storms

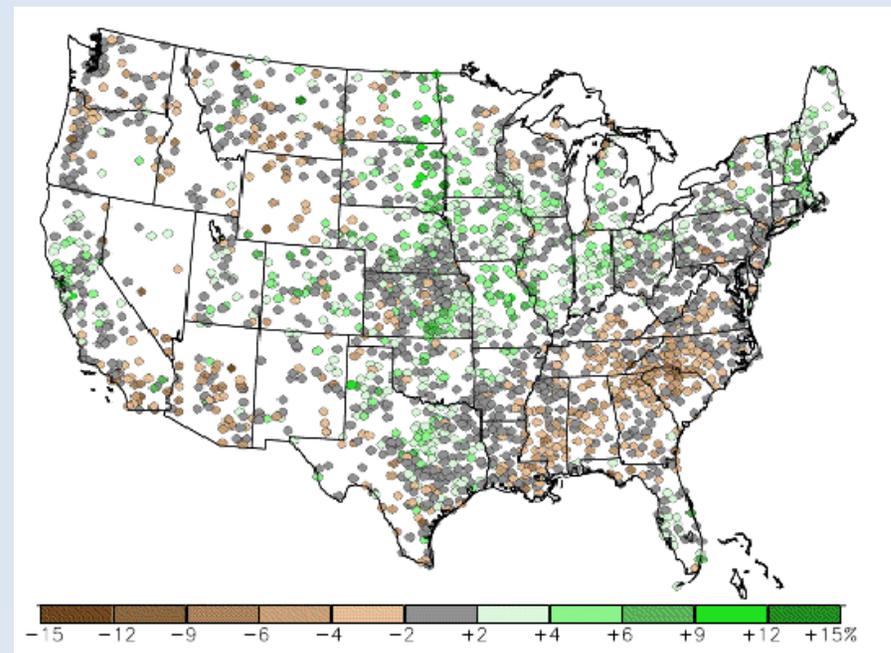
Climate Normals

Released the 1981-2010 statistical Climate Normals

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

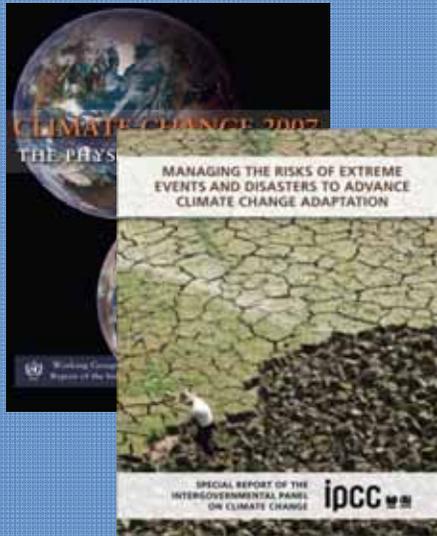


Precipitation Percentage Difference for
1981-2010 Normals Minus 1971-2000 Normals



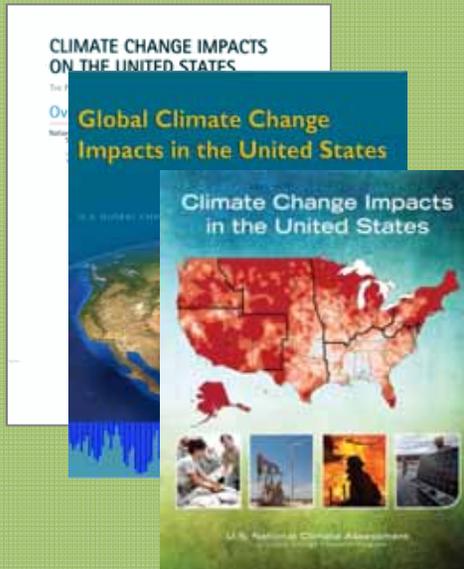
Assess the Earth's Climate: International, National, Annual Assessments

Over 50 peer-reviewed papers every year



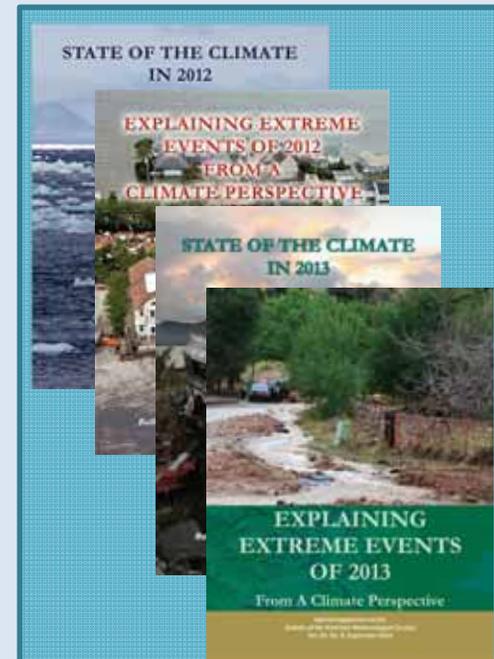
International Assessments

- 3 NCDC lead authors and review editors on Fourth Assessment Report
- 2 NCDC lead authors on Fifth Assessment Report
- 2 NCDC lead authors on Special Report on Extremes



National Assessments

- NCDC provides leadership for all National Climate Assessments
- NCDC hosts National Assessment's Technical Support Unit



Annual Assessments

- NCDC coordinates 378 authors from 48 countries
- Covered by all major news networks, briefed to Hill staff



NCDC Web Site



NOAA NATIONAL CLIMATIC DATA CENTER
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION



[Home](#) [Climate Information](#) [Data Access](#) [Customer Support](#) [Contact](#) [About NCDC](#)

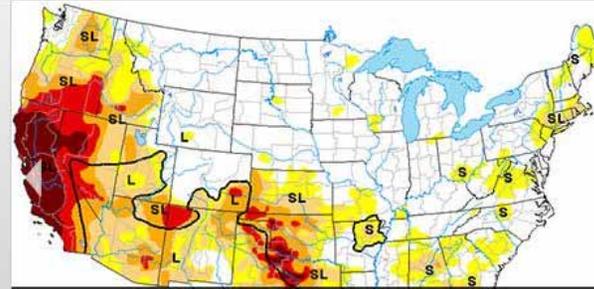
Search NCDC



NOAA's National Climatic Data Center (NCDC) is responsible for preserving, monitoring, assessing, and providing public access to the Nation's treasure of climate and historical weather data and information. [Learn more about NCDC »](#)

How may we assist you?

- I want to search for data at a particular location.
- I want quick access to your products.
- I want to see your monthly climate reports.
- I want to find a specific dataset.
- I want to know about climate change and variability.



U.S. Drought Monitor Update for September 30, 2014

According to the September 30 U.S. Drought Monitor, moderate to exceptional drought covers 30.6% of the contiguous U.S.

1 2 3 4 5

Highlights

Upcoming Events, Products, and Services

View a complete listing of the upcoming products and services.

State of the Climate in 2013 Report Release

NCDC is announcing the release of the State of the Climate in 2013 report, an assessment of the world's climate system.

2014 Products and Services

Newsroom



This Month in Climate History: Hurricane Ivan 2004

Ten years ago, on September 16, 2004, Hurricane Ivan slammed into the United States near Gulf Shores, Alabama.

State Annual and Seasonal Time Series

NCDC is announcing the release of a new tool that allows users to graphically depict historical temperature averages for the United States.

NCDC Hosts International Marine Data Workshops

NCDC hosted the fourth JCOMM Workshop on Advances in Marine Climatology and the first ICOADS Value-Added Database Workshop.

NCDC Partners



Portal for NCDC Data and Information



So, where are (precip) data?

- **Daily**

The Global Historical Climatology Network (GHCN) is an integrated database of climate summaries from land surface stations across the globe that have been subjected to a common suite of quality assurance reviews. The data are obtained from more than 20 sources. Some data are more than 175 years old while others are less than an hour old.

- **Hourly via ISD**

The Integrated Surface Database (ISD) consists of global hourly and synoptic observations compiled from numerous sources into a single common ASCII format and common data model. ISD integrates data from over 100 original data sources. The database comprises over 20,000 stations worldwide, with some having data as far back as 1901. Currently there are over 11,000 stations "active" and updated daily.

- **Storm Events**

NCDC receives Storm Data from the National Weather Service. The National Weather Service receives their information from a variety of sources, which include but are not limited to: county, state and federal emergency management officials, local law enforcement officials, skywarn spotters, NWS damage surveys, newspaper clipping services, the insurance industry and the general public, among others.



FTP directory /pub/data/ at ftp.ncdc.noaa.gov

To view this FTP site in File Explorer: press Alt, click View, and then click **Open FTP Site in File Explorer**.

```
***** WARNING ** WARNING ** WARNING ** WARNING ** WARNING *****
** This is a United States Department of Commerce computer      **
** system, which may be accessed and used only for              **
** official Government business by authorized personnel.        **
** Unauthorized access or use of this computer system may       **
** subject violators to criminal, civil, and/or administrative   **
** action. All information on this computer system may be       **
** intercepted, recorded, read, copied, and disclosed by and    **
** to authorized personnel for official purposes, including     **
** criminal investigations. Access or use of this computer     **
** system by any person, whether authorized or unauthorized,    **
** constitutes consent to these terms.                          **
***** WARNING ** WARNING ** WARNING ** WARNING ** WARNING *****
```

Up to higher level directory

```
06/11/2014 03:11PM      Directory 15min\_precip-3260
04/16/1997 12:00AM      5,772,891 96300w60
09/16/2014 03:17PM      Directory aewc-v1
08/19/2014 02:58PM      Directory airsea
06/20/2014 09:18AM      Directory annualreports
09/06/2012 12:00AM      Directory anomalie
05/27/2014 02:27PM      Directory anomalies
06/24/2014 07:06AM      Directory asos-fivemin
06/23/2014 05:37PM      Directory asos-onemin
04/03/2014 12:00AM      Directory ASOS\_Station\_Photos
06/27/2014 12:56PM      Directory blizzard
04/01/2014 12:00AM      Directory ccd-data
07/02/2014 12:12PM      Directory cdmp
06/10/2014 03:40PM      Directory cdo
10/14/2014 10:42AM      Directory cei
08/18/2014 09:29AM      Directory cirs
10/13/2014 06:29PM      Directory cmb
09/30/2014 02:33PM      Directory coastal
07/07/2014 10:42AM      Directory cpo
05/14/2014 03:16PM      Directory crdr
06/23/2014 07:13PM      Directory documentlibrary
05/25/2011 12:00AM      11 download
07/02/2014 09:26AM      Directory ecosystems
03/21/2014 12:00AM      Directory EngineeringWeatherData\_CDROM
01/10/2014 12:00AM      Directory extremeevents
10/08/2014 08:52AM      Directory gcos
02/27/2013 12:00AM      Directory ghcn
10/10/2014 03:38PM      Directory globaldatabank
```

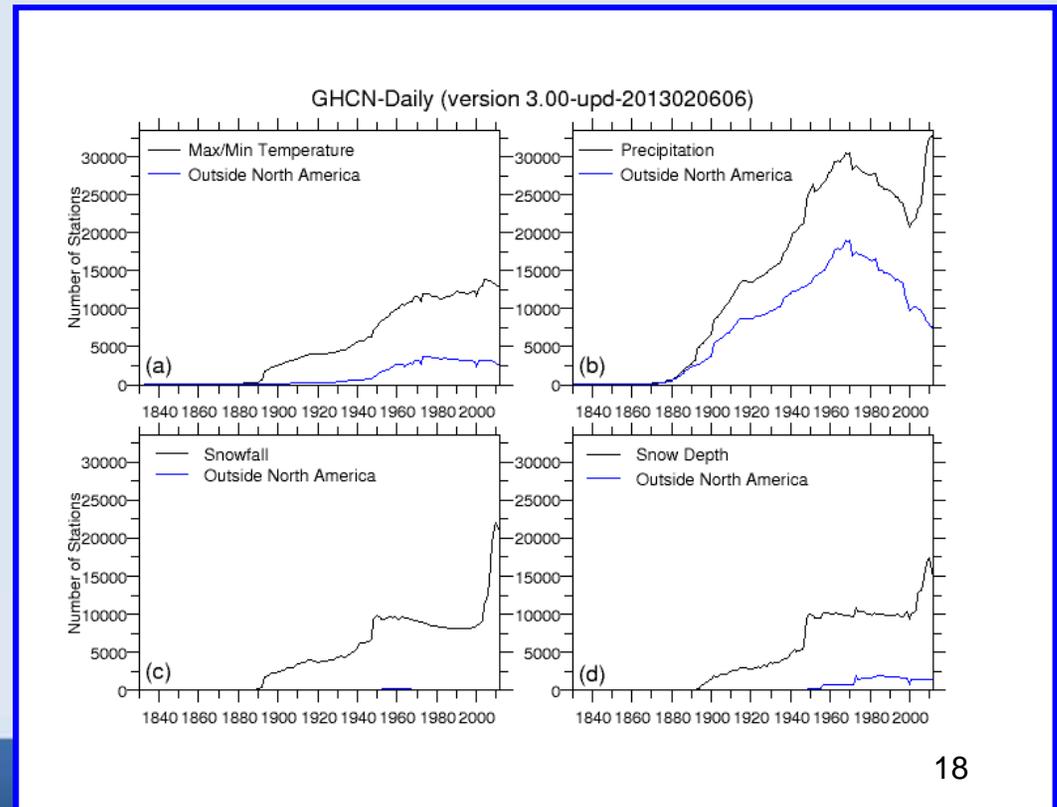


GHCN-Daily (COOP+)

cd ghcn/daily/by_year/
The earliest record is in year 1763.
From GHCND inventory.txt and stations.txt

ITE00100554 45.4717 9.1892 TMAX 1763 2008
ITE00100554 45.4717 9.1892 TMIN 1763 2008
ITE00100554 45.4717 9.1892 PRCP 1858 2008

Increase in 2000s are thanks to
CoCoRaH observations

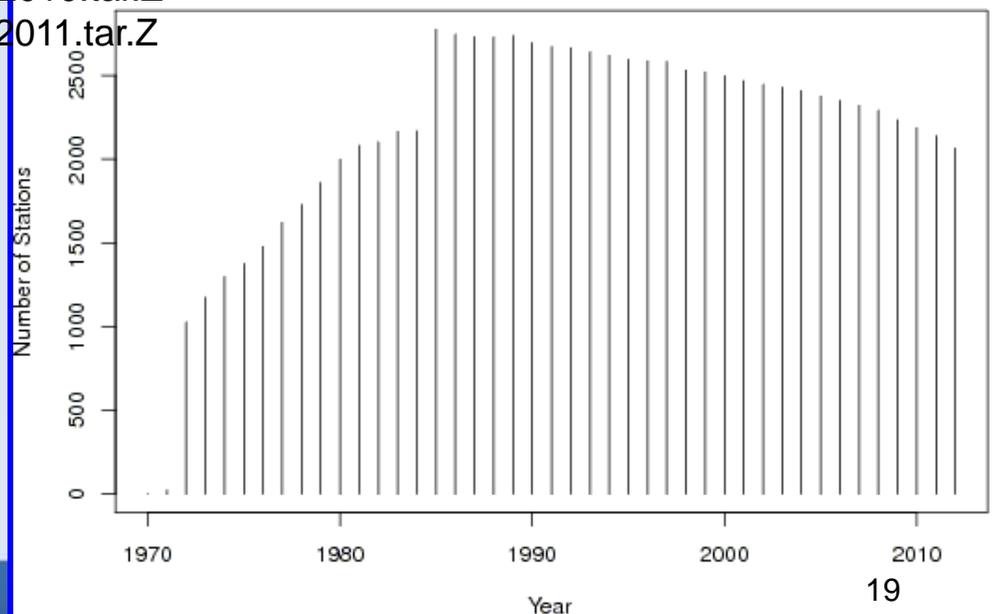


cd hourly_precip-3240/18 #for Maryland
The earliest record is in year 1948

HPD (DSI 3260+)

08/02/2012 12:00AM	1,238,625	3240_18_1948-1998.tar.Z
08/02/2012 12:00AM	11,318	3240_18_1999-1999.tar.Z
08/02/2012 12:00AM	9,539	3240_18_2000-2000.tar.Z
08/02/2012 12:00AM	9,950	3240_18_2001-2001.tar.Z
08/02/2012 12:00AM	10,324	3240_18_2002-2002.tar.Z
08/02/2012 12:00AM	12,934	3240_18_2003-2003.tar.Z
08/02/2012 12:00AM	10,264	3240_18_2004-2004.tar.Z
08/02/2012 12:00AM	9,489	3240_18_2005-2005.tar.Z
08/02/2012 12:00AM	11,205	3240_18_2006-2006.tar.Z
08/02/2012 12:00AM	11,081	3240_18_2007-2007.tar.Z
08/02/2012 12:00AM	11,387	3240_18_2008-2008.tar.Z
08/02/2012 12:00AM	13,779	3240_18_2009-2009.tar.Z
08/02/2012 12:00AM	10,126	3240_18_2010-2010.tar.Z
10/03/2012 12:00AM	8,881	3240_18_2011-2011.tar.Z

Number of 15-min Stations U.S.



Storm Events

Storm Events Database | National Climatic Data Center - Internet Explorer
http://www.ncdc.noaa.gov/stormevents/

NOAA NATIONAL CLIMATIC DATA CENTER
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

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NCDC > Storm Events Database

Storm Events Database

The Storm Events Database contains the records used to create the official [NOAA Storm Data publication](#), documenting:

- The occurrence of storms and other significant weather phenomena having sufficient intensity to cause loss of life, injuries, significant property damage, and/or disruption to commerce;
- Rare, unusual, weather phenomena that generate media attention, such as snow flurries in the San Diego coastal area; and
- Other significant meteorological events, such as record maximum or minimum temperatures that occur in connection with another event.

The database currently contains data from **January 1950 to June 2014**, as entered by NOAA Weather Service (NWS). Due to changes in the data collection and processing procedures over unique periods of record available depending on the event type. NCDC has performed data standardization of event types but has not changed any data values for locations, fatalities, impact narratives and any other event specific information. Please refer to the [Database Details page](#) for more information.

Select State or Area
-- All States and Areas --
Search

Narrative Text Search
Text Search

[\[help and examples\]](#)

The Storm Events Database has changed greatly over time. Please refer to the [version information page](#) for detailed version information and release dates. If you have questions, please [Contact NCDC](#).

Storm Events Database

Data available from 01/1950 to 06/2014

State/Area: Maryland

Begin Date: 06 / 01 / 2013

End Date: 06 / 30 / 2014

Event Type(s):
Marine Thunderstorm Wind
Rip Current
Seiche
Sleet
Storm Surge/Tide
Strong Wind
Thunderstorm Wind
Tornado
Tropical Depression
Tropical Storm
Tsunami
Volcanic Ashfall
Waterspout
Wildfire
Winter Storm
Winter Weather

County:
 [Advanced Search and Filter Options](#)

Search



Flooding Events in Maryland, 2004;
Digitization prior to **1996** is in progress.

Storm Events

Sort By: <input type="text" value="Date/Time (Oldest)"/>											
Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								1	2	8.022M	0.00K
GARRETT (ZONE)	GARRETT (ZONE)	MD	02/06/2004	08:00	EST	Flood		0	0	0.00K	0.00K
MONTGOMERY (ZONE)	MONTGOMERY (ZONE)	MD	02/06/2004	14:00	EST	Flood		0	0	0.00K	0.00K
FREDERICK (ZONE)	FREDERICK (ZONE)	MD	02/06/2004	14:00	EST	Flood		0	0	0.00K	0.00K
HARFORD (ZONE)	HARFORD (ZONE)	MD	02/06/2004	14:00	EST	Flood		0	0	0.00K	0.00K
CARROLL (ZONE)	CARROLL (ZONE)	MD	02/06/2004	14:00	EST	Flood		0	0	0.00K	0.00K
SOUTHERN BALTIMORE (ZONE)	SOUTHERN BALTIMORE (ZONE)	MD	02/06/2004	14:00	EST	Flood		0	0	0.00K	0.00K
NORTHERN BALTIMORE (ZONE)	NORTHERN BALTIMORE (ZONE)	MD	02/06/2004	14:00	EST	Flood		0	0	0.00K	0.00K
HOWARD (ZONE)	HOWARD (ZONE)	MD	02/06/2004	14:00	EST	Flood		0	0	0.00K	0.00K
GARRETT (ZONE)	GARRETT (ZONE)	MD	03/06/2004	04:05	EST	Flood		0	0	0.00K	0.00K
ALLEGANY (ZONE)	ALLEGANY (ZONE)	MD	04/13/2004	05:00	EST	Flood		0	0	0.00K	0.00K
GARRETT (ZONE)	GARRETT (ZONE)	MD	09/08/2004	18:00	EST	Flood		0	0	0.00K	0.00K
ALLEGANY (ZONE)	ALLEGANY (ZONE)	MD	09/08/2004	20:30	EST	Flood		0	0	100.00K	0.00K
GARRETT (ZONE)	GARRETT (ZONE)	MD	09/17/2004	21:00	EST	Flood		0	0	0.00K	0.00K
CECIL (ZONE)	CECIL (ZONE)	MD	09/18/2004	17:00	EST	Flood		0	0	1.000M	0.00K
WASHINGTON (ZONE)	WASHINGTON (ZONE)	MD	09/28/2004	16:30	EST	Flood		0	0	0.00K	0.00K
FREDERICK (ZONE)	FREDERICK (ZONE)	MD	09/28/2004	16:30	EST	Flood		0	0	0.00K	0.00K
DORCHESTER (ZONE)	DORCHESTER (ZONE)	MD	10/25/2004	11:00	EST	Flood		0	0	0.00K	0.00K
FREDERICK (ZONE)	FREDERICK (ZONE)	MD	01/14/2005	05:30	EST	Flood		0	0	0.00K	0.00K
MONTGOMERY (ZONE)	MONTGOMERY (ZONE)	MD	01/14/2005	06:15	EST	Flood		0	0	0.00K	0.00K
CARROLL (ZONE)	CARROLL (ZONE)	MD	01/14/2005	06:30	EST	Flood		0	0	0.00K	0.00K
NORTHERN BALTIMORE (ZONE)	NORTHERN BALTIMORE (ZONE)	MD	01/14/2005	07:30	EST	Flood		0	0	0.00K	0.00K
HOWARD (ZONE)	HOWARD (ZONE)	MD	01/14/2005	08:00	EST	Flood		0	0	0.00K	0.00K
CALVERT (ZONE)	CALVERT (ZONE)	MD	01/14/2005	09:45	EST	Flood		0	0	0.00K	0.00K





NEXRAD Inventory

Inventory Data Access

- [Home](#)
- [Select By Map](#)
- [Select By List](#)
- [Statistics](#)

Alternate Data Access

- [Climate Data Online](#)
- [GIS Map Application](#)
- [HAS \(Bulk Order\)](#)

Documentation

- [NCDC Radar Archive](#)
- [NEXRAD Product List](#)
- [Network Metadata](#)
- [Radar Operations Center](#)

External Resources

- [NOAA/NWS Current Radar](#)
- [NOAA Training \(WDTB\)](#)

NEXRAD Data Archive, Inventory and Access



[Select By Map](#)

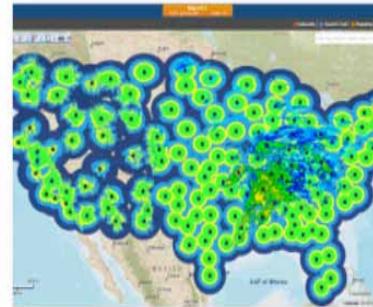
- KPDT - PENDLETON, OR (04/20/1995 / 12/18/2013)
- KPOE - FORT POLK, LA (06/28/1995 / 12/18/2013)
- KPUX - PUEBLO, CO (06/13/1995 / 12/18/2013)
- KRAX - RALEIGH/DUR, NC (05/30/1994 / 12/17/2013)
- KRGX - RENO, NV (02/24/1995 / 12/18/2013)
- KRIW - RIVERTON, WY (10/02/1995 / 12/18/2013)
- KRLX - CHARLESTON, WV (08/20/1994 / 12/18/2013)
- KRMX - GRIFFISS AFB, NY (07/11/1995 / 06/30/1997)
- KRTX - PORTLAND, OR (03/13/1995 / 12/18/2013)
- KSFY - POCATELLO, ID (09/27/1995 / 12/18/2013)
- KSGF - SPRINGFIELD, MO (04/24/1995 / 12/18/2013)
- KSHV - SHREVEPORT, LA (08/28/1995 / 12/18/2013)
- KSTX - SAN ANGELO, TX (04/07/1995 / 12/18/2013)

[Select By Site List](#)

(WSR-88D and TDWR sites)

Climate Data Online

[Climate Data Online \(CDO\) Search Tool](#)
(Order multiple sites using a shopping cart. Search based on counties, cities, zipcodes.)



[GIS Map Application](#)

(Historical 5-minute Reflectivity from 1995-present, Coverage Maps, Range Rings)

NEXRAD +

Q2 soon



ReproHADS soon

National Weather Service
Hydrometeorological Automated Data System

Site Map News Organization Search

HADS |
Hydrometeorological Automated Data System

The Hydrometeorological Automated Data System (HADS) is a real-time data acquisition and data distribution system operated by the Office of Hydrologic Development of the National Weather Service.

HADS web pages are structured to provide necessary system information and site meta-data to National Weather Service Offices.

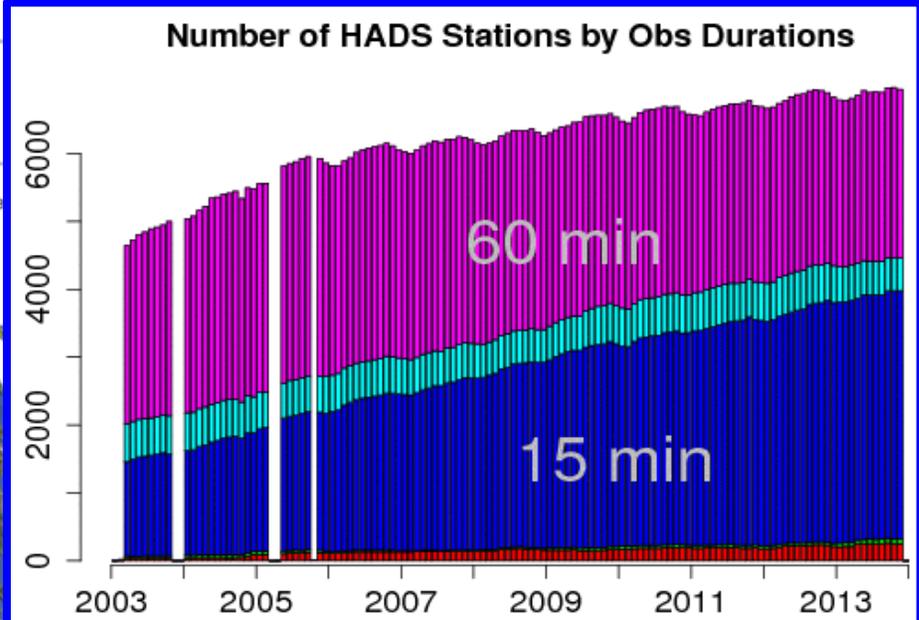
Data values presented on HADS web pages are **PROVISIONAL** and **HAVE NOT** been reviewed nor evaluated through quality control tests.

Site Search

Enter NESDIS ID <input type="text"/> <input type="button" value="Go"/>	Enter NWSLI ID <input type="text"/> <input type="button" value="Go"/>
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More than 15,100 data points on the image below represent the locations at which river are observed and subsequently processed by HADS.

Click map image for additional displays



Extreme Precip Study

A New Initiative

Hypothesis:

“The anthropogenically-forced future **changes to the frequency and intensity of extreme precipitation** are likely to be large and driven primarily by large-scale changes in **water vapor concentrations** and the **weather system characteristics**”

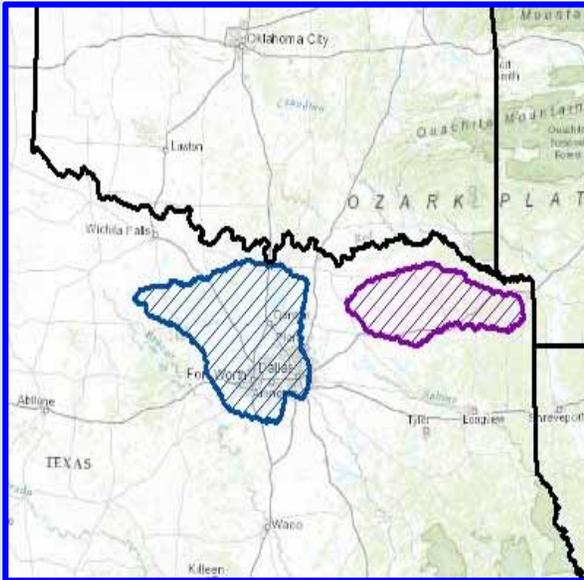
(PI: K. Kunkel, T. Karl, D. Easterling, CI: D. Kim)

will employ a Generalized Extreme Value (GEV) model with inclusion of time covariate, i.e., trend;

$$F(x) = \exp\left[-\left\{1 + \xi \frac{(x - \mu)}{\psi}\right\}^{-1/\xi}\right],$$
$$\mu = \mu_o + \mu_1 t, \quad \psi = \psi_o, \quad \xi = \xi_o.$$

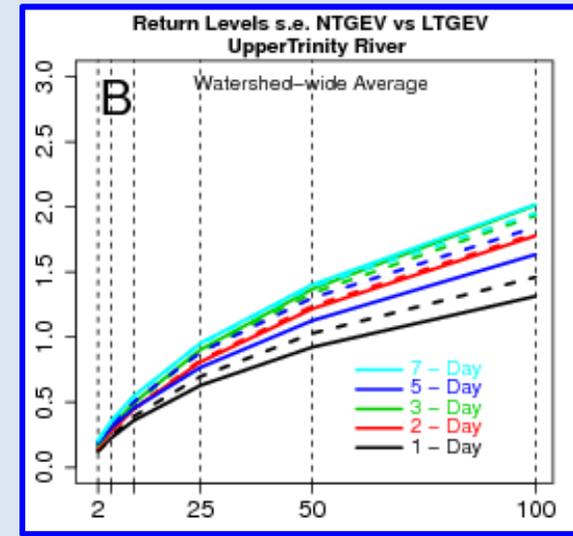
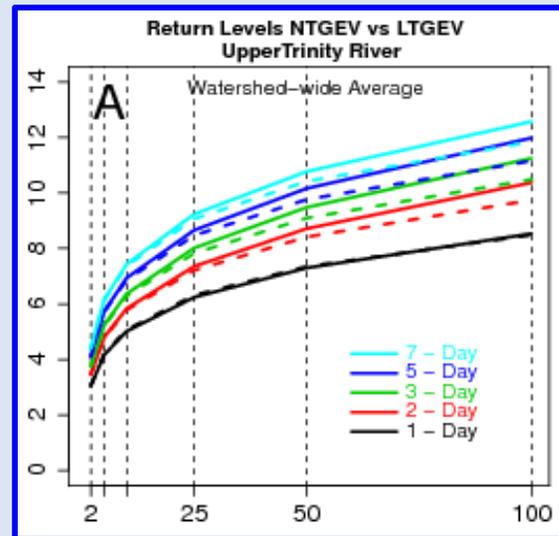


Extreme Precip Study



In Progress – a watershed average

Texas-Testbed: Collaboration with Benson (USACE, TX) and Seo (UT-Arlington). There were 8 good COOP data with 60-yr record.



A: Precip Depth of 5 durations. Solid: linear-trend GEV model, Dashed: no-trend GEV model.
B: Standard errors associated with curves in A.

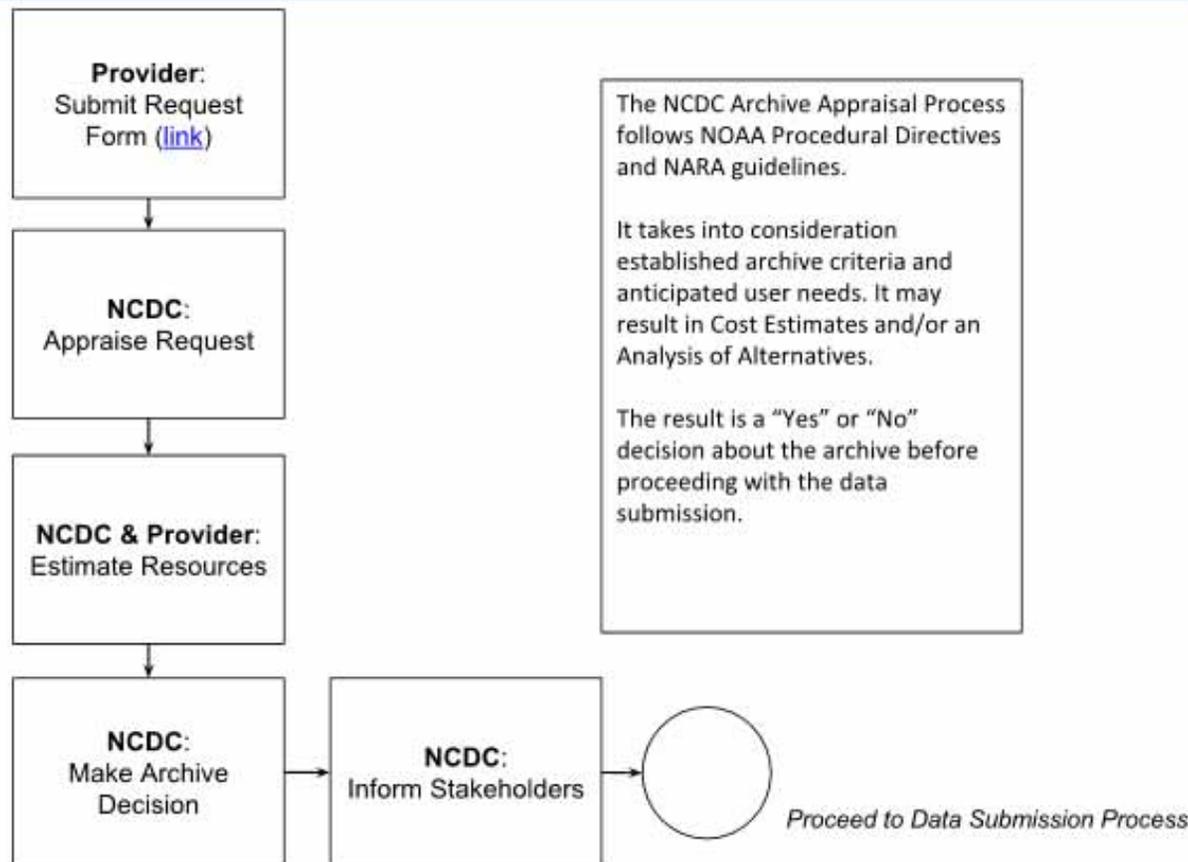
Would you share your data?



NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION



Archive Appraisal Process



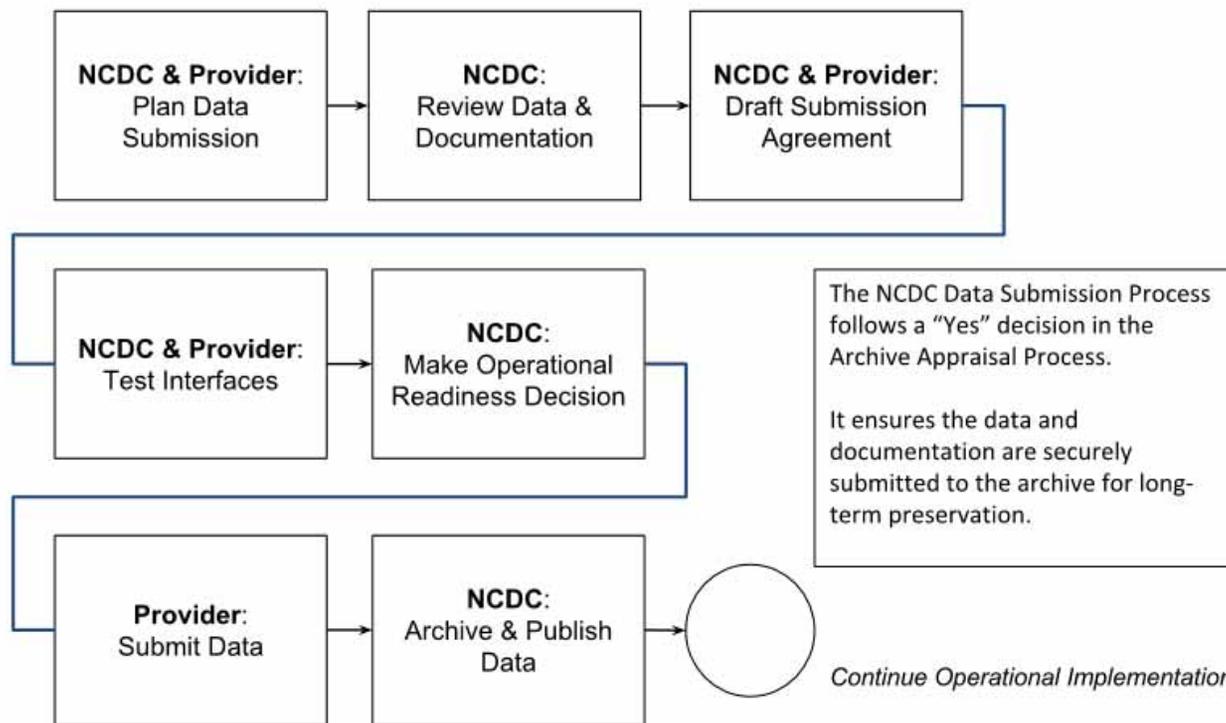
Would you share your data?



NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION



Data Submission Process



NOAA's Weather and Climate Toolkit (Viewer and Data Exporter) - Internet Explorer

http://www.ncdc.noaa.gov/wct/

NOAA National Climatic Data Center
National Oceanic And Atmospheric Administration

DOC > NOAA > NESDIS > NCDC

Search Field: Search NCDC

NOAA's Weather and Climate Toolkit

Quick Links

- Weather and Climate Toolkit Home
- Order NEXRAD Data
- NCDC Radar Resources
- NOAA Radar Operations Center
- NCDC's Storm Events Database

Toolkit

- Download/Installation
- Find Data
- Image Gallery
- Java Requirements
- Export Formats
- Batch Processing
- Credits
- API / Source Code

Documentation

- User Guide/Tutorials
- FAQ
- Presentations

Introduction

NOAA's Weather and Climate Toolkit (WCT) is free, platform independent software distributed from NOAA's National Climatic Data Center (NCDC). The WCT allows the visualization and data export of weather and climate data, including Radar, Satellite and Model data. The WCT also provides access to weather/climate web services provided from NCDC and other organizations.

The WCT provides tools for background maps, animations and basic filtering. The export of images and movies is provided in multiple formats. The data export feature supports conversion of data to a variety of common formats including KMZ, Shapefile, Well-Known Text, GeoTIFF, ESRI Grid and Gridded NetCDF. These data export features promote the interoperability of weather and climate information with various scientific communities and common software packages such as ArcGIS, Google Earth, MatLAB, QGIS, R and many more. Advanced data export support for Google Earth enables the 2-D and 3D export of rendered data and isosurfaces.

Current data types supported:

- CF-compliant Gridded NetCDF
- Generic CF-compliant Irregularly-Spaced/Curvilinear Gridded NetCDF/HDF
- GRIB1, GRIB2, GINI, GEMPAK, HDF (CF-compliant) and more gridded formats
- GOES Satellite AREA Files
- NEXRAD Radar Data (Level-II and Level-III)
- U.S. Drought Monitor Service (from the National Drought Mitigation Center (NDMC))
- OPeNDAP support for Gridded Datasets

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NOAA's Climate.gov created an [article and video introduction to the Weather and Climate Toolkit](#). If you are a first time user, please check out this video for more information on the Toolkit's capabilities.




NOAA's National Climatic Data Center

Thank you!

www.ncdc.noaa.gov

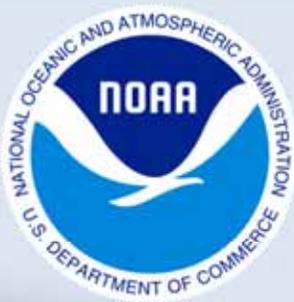
www.climate.gov



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Protecting the past... Revealing the future