

# NOAA's Weather and Climate Information Services

Ellen L. Mecray

National Oceanic and Atmospheric Administration (NOAA)

Eastern Region Climate Services Director

Taunton, MA



# Rising Demand for Climate Information- People are experiencing the impacts of a changing climate at regional to local scales



Sustainability of Marine Ecosystems



Coasts and Climate Resilience



Climate Impacts on Water Resources



Changes in Extremes of Weather and Climate



Agriculture



Energy

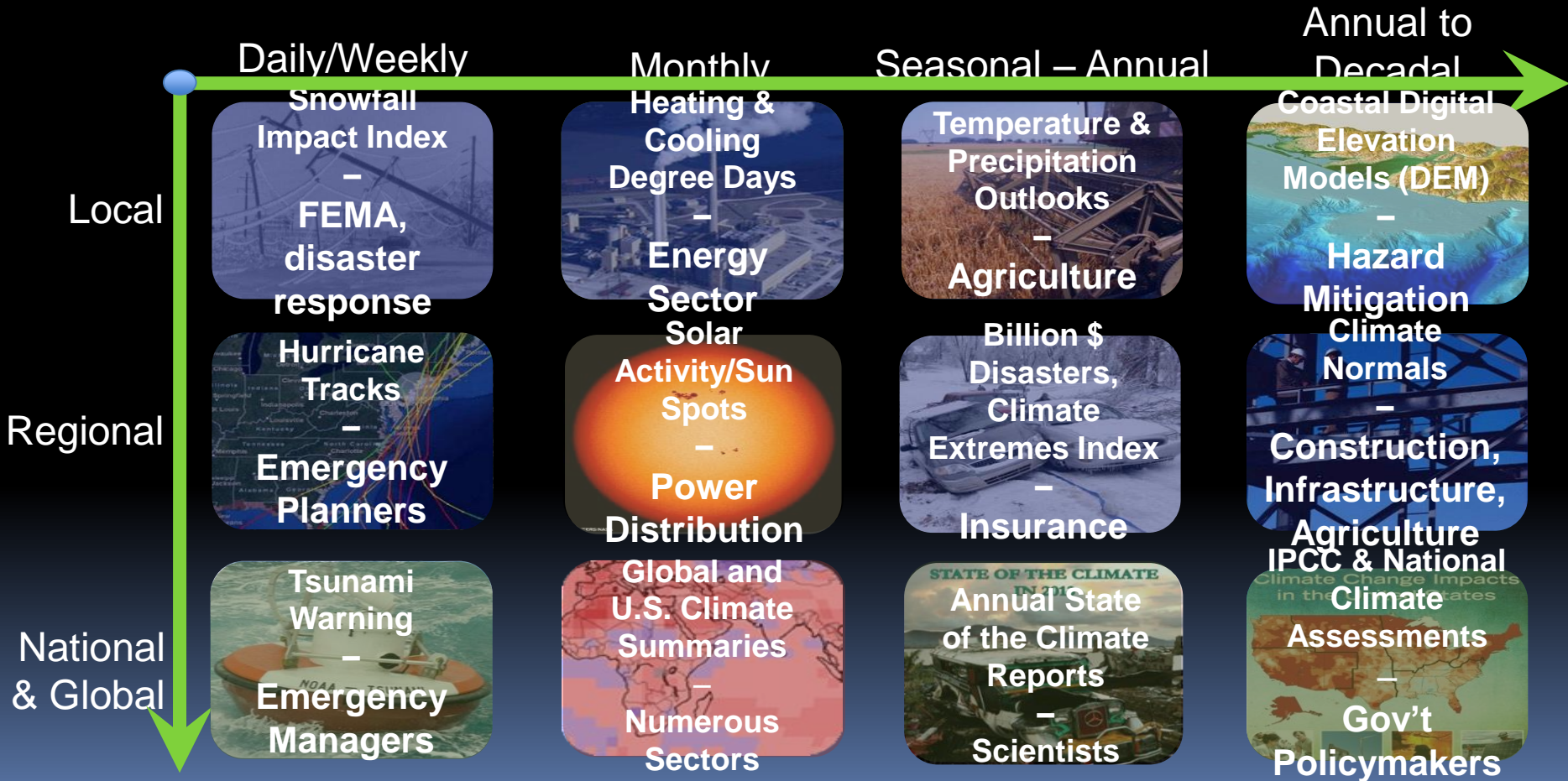


Health



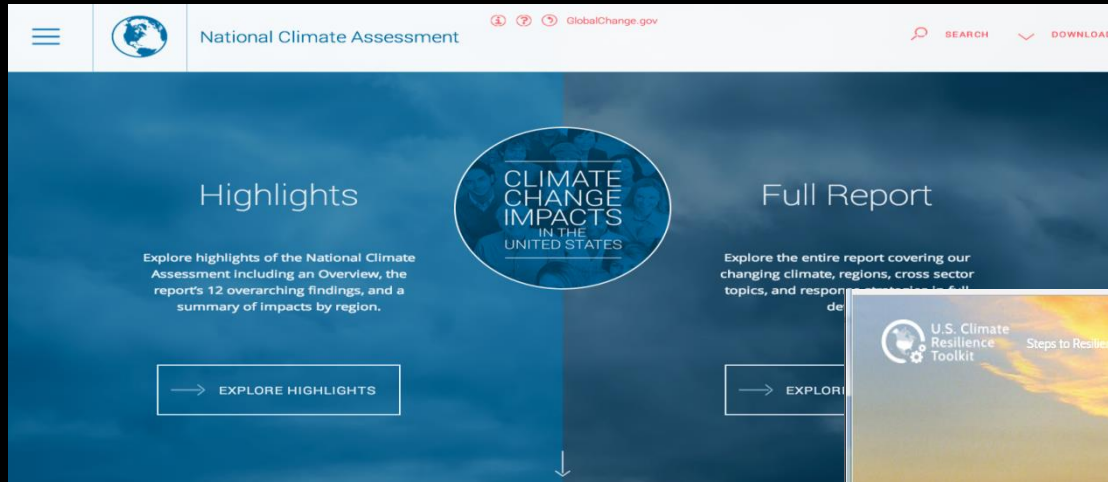
Transportation

# NOAA Services: Temporal and Spatial Scales



# National Resources

## The US National Climate Assessment

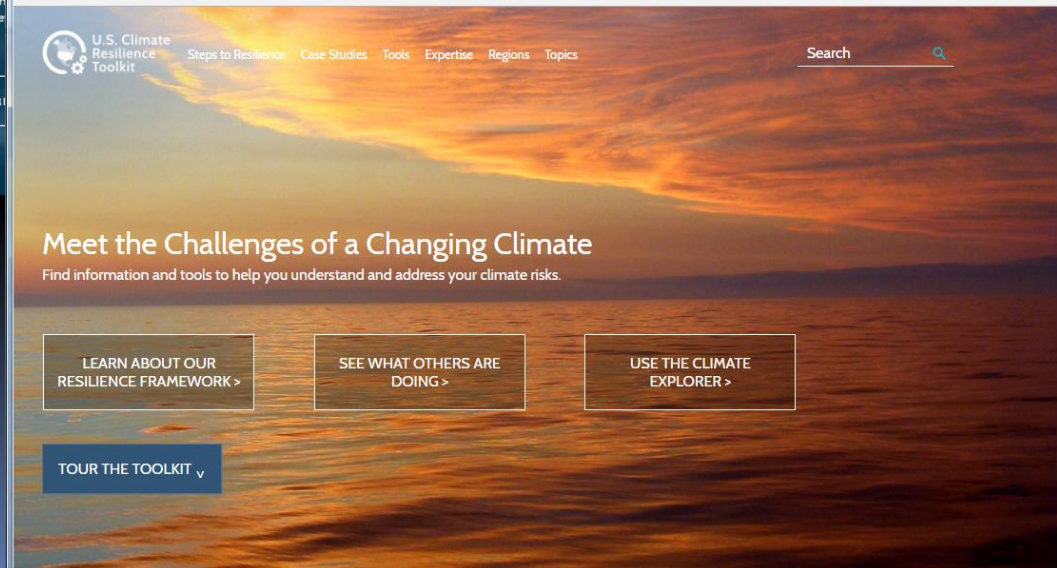


The screenshot shows the homepage of the National Climate Assessment website. The header includes a hamburger menu, a globe icon, the text "National Climate Assessment", and a "GlobalChange.gov" link. There are also "SEARCH" and "DOWNLOAD" buttons. The main content area is split into two columns. The left column is titled "Highlights" and contains the text: "Explore highlights of the National Climate Assessment including an Overview, the report's 12 overarching findings, and a summary of impacts by region." Below this text is a button that says "EXPLORE HIGHLIGHTS". The right column is titled "Full Report" and contains the text: "Explore the entire report covering our changing climate, regions, cross sector topics, and response strategies." Below this text is a button that says "EXPLORE FULL REPORT". In the center, there is a circular graphic with the text "CLIMATE CHANGE IMPACTS IN THE UNITED STATES". A downward-pointing arrow is located at the bottom center of the page.

<http://nca2014.globalchange.gov/>

<http://toolkit.climate.gov/>

## US Climate Resilience Toolkit



The screenshot shows the homepage of the U.S. Climate Resilience Toolkit website. The header includes the U.S. Climate Resilience Toolkit logo, a search bar, and navigation links for "Steps to Resilience", "Case Studies", "Tools", "Expertise", "Regions", and "Topics". The main content area features a large background image of a sunset over water. Below the image is the text: "Meet the Challenges of a Changing Climate" and "Find information and tools to help you understand and address your climate risks." There are three buttons: "LEARN ABOUT OUR RESILIENCE FRAMEWORK >", "SEE WHAT OTHERS ARE DOING >", and "USE THE CLIMATE EXPLORER >". At the bottom, there is a button that says "TOUR THE TOOLKIT v".

# US Climate Resilience Toolkit

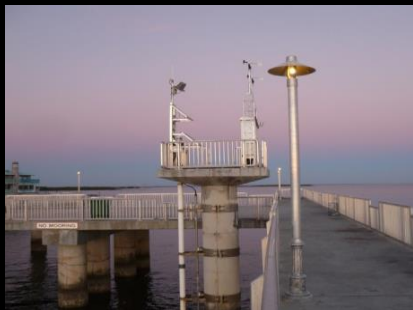
## Case Studies and Sector-specifics

The screenshot shows the 'CASE STUDIES' section of the U.S. Climate Resilience Toolkit. At the top left is the toolkit logo. A navigation bar includes 'Steps to Resilience', 'Case Studies', 'Tools', 'Expertise', 'Regions', 'Topics', and a 'Search' field. Below the navigation is a heading 'CASE STUDIES' and a descriptive paragraph: 'Explore case studies to see how people are building resilience for their businesses and in their communities. Click dots on the map below to preview case studies, or browse all case studies by clicking the button below the map.' A map of the United States is displayed with numerous blue location pins. A zoom control with '+' and '-' buttons is visible in the top left corner of the map.

## Climate Explorer

The screenshot displays the 'THE CLIMATE EXPLORER' interface. The header includes the U.S. Climate Resilience Toolkit logo and a 'Menu' button. On the right side, there are links for 'Tour This Page', 'About', 'Definitions', and 'Credits', along with a 'SHARE' button. The main content area features the title 'THE CLIMATE EXPLORER' in large blue letters. Below the title is a text box: 'Explore maps and graphs of historical and projected climate trends for any county in the contiguous United States. View data by topics to see how climate change will impact things you care about.' To the right of this text is a search and filter panel with options: 'Search by location', 'View by variable', 'View by topic', and 'New here? Take 1'. A red circular badge with a hammer icon and the text 'WE'RE IMPROVING THE CLIMATE EXPLORER' is overlaid on the bottom right. At the bottom, there are logos for 'GlobalChange.gov', 'U.S. Global Change Research Program', 'NEMAL', 'USDA', and 'USDA Forest Service'. A footer note says 'Designed by Habitat Seven' and a specific example is listed: 'Explore: Pinal County, Arizona'.

# NCEI Stewards the Nation's Largest Archive of Environmental Data



Coastal Water  
Temperature Guide



Satellite Data Services



Ocean Drilling Data



Space Weather  
Data



Weather Balloon Data



Hourly Precipitation Data



Argo Profiling Float  
Data



Paleoclimatology Data

# Data Access: <https://www.ncei.noaa.gov/access>



## Climate Monitoring & Extremes

These data and products describe the state of the U.S. and global climates and provide details on extremes such as droughts, tornadoes, and hurricanes.

[Climate at a Glance](#)

[Climate Information](#)

[Extreme Climate Events](#)

[Global Ocean Heat and Salt Content](#)

[Monthly, Seasonal, and Annual Climate Reports](#)



## Coastal & Regional

These data and products provide an array of ocean-related environmental, marine, and economic information for specific coastal and regional areas across the world.

[Coastal Relief Models](#)

[Gulf of Mexico Data Atlas](#)

tornadoes, and hurricanes.

[Earthquakes](#)

[Extreme Climate Events](#)

[Geophysical Data, Images, and Education](#)

[Tsunamis](#)



## Ocean Climatologies

These data and products provide long-term information, analyses, and averages of ocean observations such as temperature and salinity.

[Marine and Ocean Surface Data](#)

[Pathfinder Sea Surface Temperature Climate Data Record](#)

[Regional Climatology Atlases](#)

[World Ocean Atlas 2013](#)



## Ocean Data

What's on the menu?

- Terrestrial station data
- Satellite data
- Weather balloon data
- Moored buoy data
- Model runs for weather and climate timescales
- Paleoclimate data from ice, tree rings, corals, pollen, dust
- Ocean surface data incl SST and wind
- Bathymetry, incl multibeam
- Earthquakes and tsunamis
- Solar and space weather

# Examples- Data and graphing products

## Climate at a Glance

Climate Monitoring  
State of the Climate  
Temp, Precip, and Drought  
Climate at a Glance  
Extremes  
Societal Impacts  
Snow and Ice  
Teleconnections  
GHCN Monthly  
Monitoring References

Time Series | Mapping | Data Information | Background

NCEI added Alaska climate divisions to its nClimDiv dataset on Friday, March 6, 2015, coincident with the release of the February 2015 monthly monitoring report. For more information on this data, please visit the Alaska Climate Divisions FAQ.

Time Series

U.S. | Globe

Choose from the options below and click "Plot" to create a time series graph.  
Please note: Degree Days are not available for Agricultural Belts, NWS Regions, Alaska and Cities; Palmer Indices are not available for NWS Regions, Alaska and Cities.

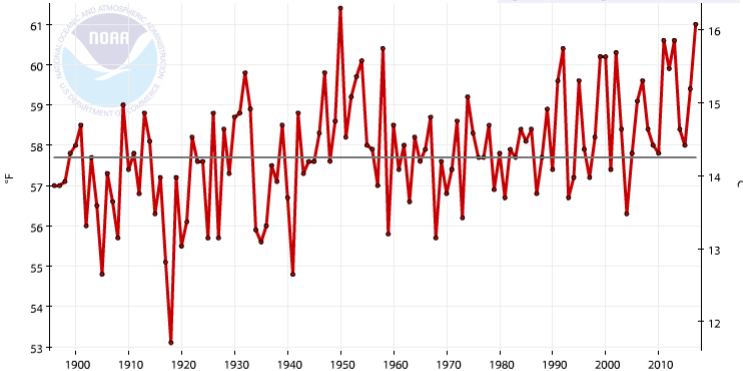
Parameter: Maximum Temperature  
Time Scale: 12-Month  
Month: January  
Start Year: 1895  
End Year: 2017  
State/Region: Massachusetts  
Climate Division/City: Blue Hill

Options

Display Base Period  
Start: 1901 End: 2000

Display Trend  
per Decade per Century  
Start: 1895 End: 2017

Smoothed Time Series  
Binomial Filter LOESS



Download: XML

DATES	VALUE	RANK	DEPARTURE FROM MEAN (57.7°F) 1901-2000 BASE PERIOD
-------	-------	------	---

## U.S. Climate Extremes Index (CEI): Graph

Climate Monitoring  
State of the Climate  
Temp, Precip, and Drought  
Climate at a Glance  
Extremes  
Societal Impacts  
Snow and Ice  
Teleconnections  
GHCN Monthly  
Monitoring References

NCEI added Alaska climate divisions to its nClimDiv dataset on Friday, March 6, 2015, coincident with the release of the February 2015 monthly monitoring report. For more information on this data, please visit the Alaska Climate Divisions FAQ.

NCEI replaced input data for the CEI mean monthly maximum and minimum temperature extremes on Thursday, October 6, 2016, coincident with the release of the September 2016 monthly monitoring report. For more information on transition from USHCN to nClimGrid data, please visit the CEI - Data Used page.

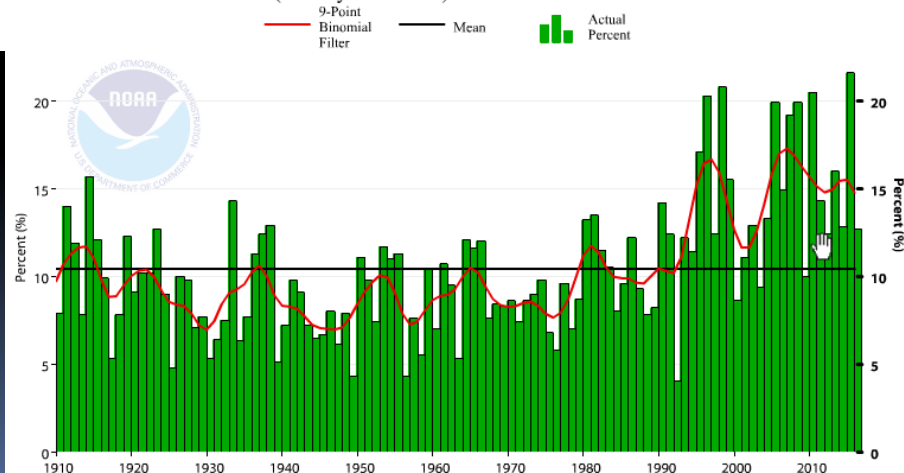
[Introduction](#) | [Data Used](#) | [Definition](#) | [Graph](#) | [Regional Overview](#) | [References](#)

### Graph

Choose a period/season and an indicator from the options below and click "Plot" to create a time series graph. Note that the sixth indicator (Step 6) is not calculated for the spring (March-May), winter (December-February) and cold (October-March) seasons since most months during these periods are outside of the traditional hurricane season.

Region: Contiguous U.S.

### Contiguous U.S. Extremes in 1-Day Precipitation (Step 4\*) Annual (January-December) 1910-2016



Download: XML



# NOAA's Regional Climate Services

*Developing and Delivering Products and Services*

State Climatologists: <http://stateclimate.org/>

Regional Climate Centers:

<http://www.ncdc.noaa.gov/customer-support/partnerships/regional-climate-centers>

Regional Climate Services Directors:

<http://www.ncdc.noaa.gov/rcsd>

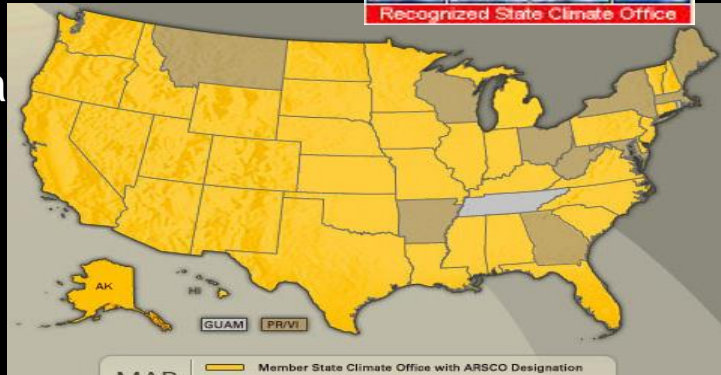
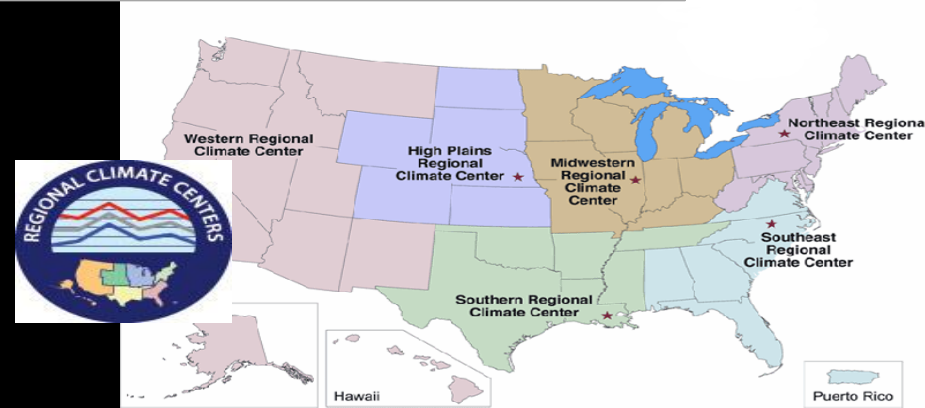
Federal

State

Academia

NGOs

Tribes



## NOAA's Regional Climate Services Directors



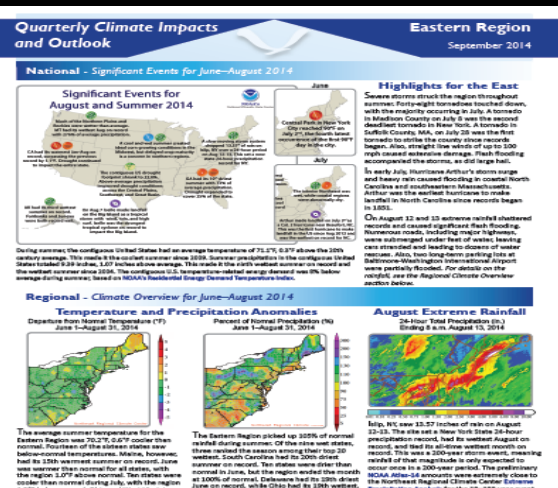
# Key Services

*Generate, transmit, transform, translate*

- **Monitoring** – value add, trends, anomalies
- **Data** – instrumentation, collection, database
- **Prediction** – interpretation, place/sector based
- **Outreach** – informing decisions, accessibility
- **Education** – capacity building for understanding
- **Research** – applied, useable
- **Networks** – awareness, linkages, sharing

# Key Regional Products

- Quarterly Climate Summaries/Outlooks (2 page Summaries): <http://www.drought.gov/drought/content/resources/reports>
- Monthly Webinars: <http://www.nrcc.cornell.edu/services/webinars/2017/08/index.html>
- Sectoral Information Dashboards: [Gulf of Maine, Water, Energy, Health, Fisheries, Coasts](#)



**Northeast Regional Climate Center**

Home  
Weather Station Data  
State & Regional Analyses  
Analyses for Industry  
Climate Resources  
Publications & Services  
Blog  
Monthly Webinars  
2017  
Hurricane Season & Outlook  
Climate Models & Downscaling  
Severe Weather Climatology  
Heat & Health

**Hurricane Season & Outlook**

**Northeast Monthly Climate Update Hurricane Season & Outlook**

Individual presentations (p August Conditions (Samantha Boris)

**U.S. Climate Resilience Toolkit**

Steps to Resilience Case Studies Tools Expertise Regions Topics

**Water Resources Dashboard**

Water resource managers and urban planners can use this dashboard to access maps and data that help them monitor the potential for extreme precipitation and drought in their regions. The Acknowledgments page lists the individuals who helped select our initial offerings.

Note that this is a dynamic page: the scope and content of dashboard entries are driven by input from users. We welcome your suggestions and additions to improve its usefulness. Please email us with your suggestions.

Forecasts & Outlooks

# Examples- Regional Info Source



## Northeast Regional Climate Center

Recent and historical weather data  
customized to meet your needs

### Home

[Weather Station Data](#)

[State & Regional Analyses](#)

[Analyses for Industry](#)

[Climate Resources](#)

[Publications & Services](#)

[Quick Links](#)

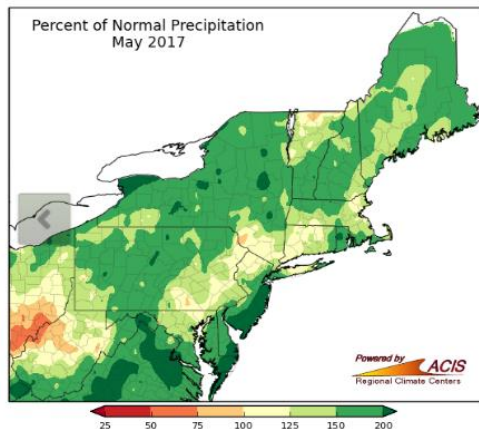
[Webinar](#)

[Blog](#)

[Like 1.2K](#)

We appreciate any feedback:  
[nrcc@cornell.edu](mailto:nrcc@cornell.edu)

<http://www.nrcc.cornell.edu/>



### Hartford Area, CT (ThreadEx) - January 26, 2017

	Observed	Normal	Record Highest	Record Lowest
<b>Daily Data</b>				
Maximum temperature	52	35	65 in 1950	12 in 1905
Minimum temperature	34	18	44 in 1916	-8 in 1948
Average temperature	43.0	26.3	53.0 in 1916	6.5 in 1920
Precipitation	0.03	0.10	2.00 in 1986	0.00 in 2009
Snowfall	0.0	0.4	6.2 in 1949	0.0 in 2017
Snow depth	2	-	34 in 1923	0 in 2010
<b>Month-to-Date</b>				
Average temperature	33.1	26	38 in 1932	14.6 in 1970
Total precipitation	3.35	2.71	9.61 in 1978	0.34 in 1970
Total snowfall	6.1	10.3	45.1 in 2011	T in 1913
<b>Year-to-Date</b>				
Average temperature	33.1	26	38 in 1932	14.6 in 1970
Total precipitation	3.35	2.71	9.61 in 1978	0.34 in 1970
Snowfall since July 1	17.8	19.8	67.2 in 1996	0.1 in 1928

[Home](#)

[Weather Station Data](#)

[State & Regional Analyses](#)

[Analyses for Industry](#)

[Turf Grass](#)

[Apple Frost Risk](#)

[Grape Bud Hardiness](#)

[Roadway Freezing/Thawing](#)

[Mosquito Control](#)

[Extreme Precipitation](#)

[East Coast Winter Storms](#)

[Pest & Crop Management \(NEWA\)](#)

[Emerald Ash Borer](#)

[Gypsy Moth](#)

[Lawn Watering](#)

[Stewart's Disease Risk](#)

# Water Resources- too much and too little

National Observations

Warnings & Forecasts | Graphical Forecasts | National Maps | Radar | Water | Air Quality | Satellite | Climate

River Observations | River Forecasts | Experimental Long-Range River Flood Risk | Precipitation | River Download | Other Information

Auto Refresh: OFF

All Locations

Click on the map or select one of the data views below:

- United States
- NWS Weather Forecast Offices
- NWS River Forecast Centers
- Water Resources Regions

Probability and forecasts available  
 Observations only available  
 Forecasts available

8572 total gauges  
Show all locations in flood (44)

- 5 Gauges: Major Flooding
- 8 Gauges: Moderate Flooding
- 31 Gauges: Minor Flooding
- 27 Gauges: Near Flood Stage
- 5529 Gauges: No Flooding
- 2585 Flood Category Not Defined
- 25 At or Below Low
- 294 Gauges: Observed
- 68 Gauges: Out of

The U.S. Drought Monitor is a weekly map based on measurements of climatic, hydrologic and soil conditions as well as reported impacts and observations from more than 350 contributors around the U.S.

## U.S. Drought Monitor

September 19, 2017  
(Released Thursday, Sep. 21, 2017)  
Valid 8 a.m. EDT

**Drought Impact Types:**

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

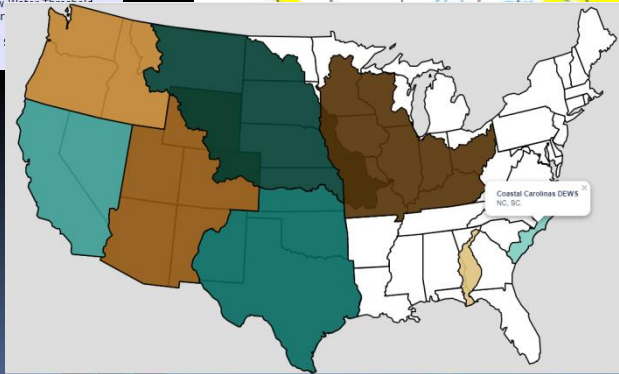
**Intensity:**

- 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.

USDA | NRCS | NWS | NOAA

<http://droughtmonitor.unl.edu>



<https://water.weather.gov/ahps/>

River observation and forecast information:

<https://water.weather.gov/ahps>

Snow Information: <https://www.nohrsc.noaa.gov>

Precipitation Frequency

Estimates: <http://www.nws.noaa.gov/oh/hdsc>

<https://www.drought.gov/drought/>

Questions?

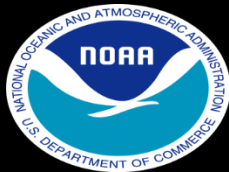
**Ellen L. Mecray**

NOAA National Centers for Environmental Information  
Regional Climate Services Director- Eastern Region  
Ellen.L.Mecray@noaa.gov

<http://www.ncdc.noaa.gov/rcsd/eastern>

March 14 2018

USDA Climate Hub Meeting  
Rutgers Univ., New Brunswick, NJ





# BACKUP SLIDES



# Climate Information Providers

Variables:

Geographic scale (international, national, regional, state, local)

Temporal coverage (historical or projected)

Research or operational information delivery

Regional Group	Temporal coverage	Research or operational delivery
NOAA RCS (RCSD, RCC, and SC)	Historical context, present observations	Operational
NOAA RISAs	Historical and projected	Research, multi-sectoral
NOAA Cooperative Institutes	historical	Research, multi-sectoral
DOI/Climate Science Centers	Historical and projected	Research, primarily for natural resources
Others?		