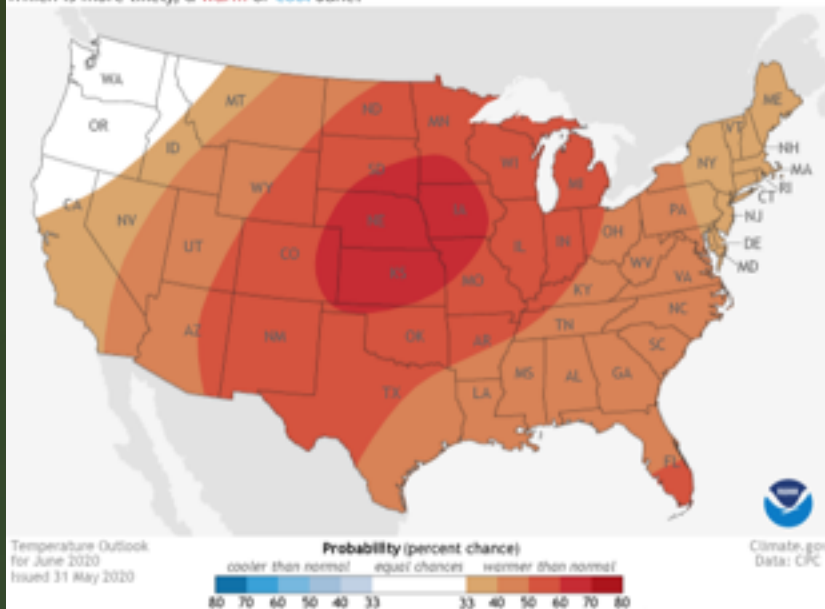


Three NOAA Tools for Water Resource Managers & City Planners



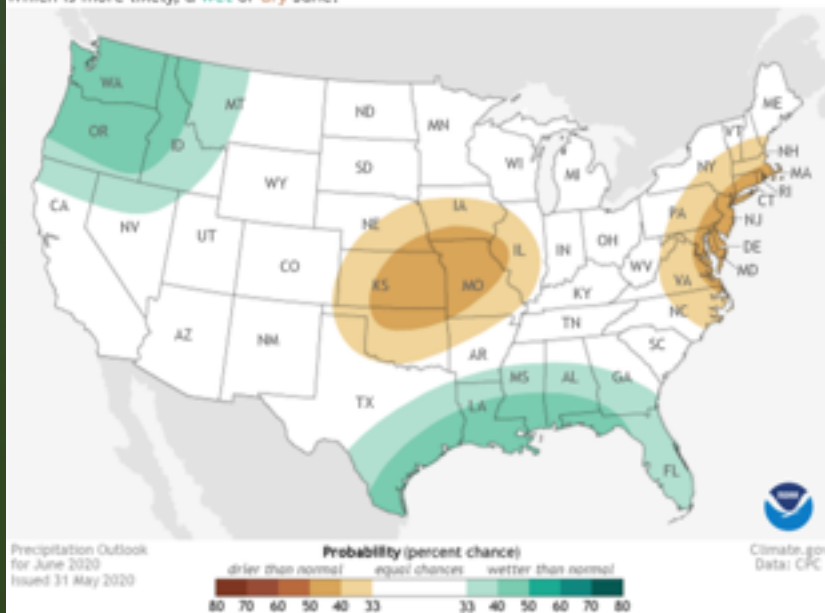
Nancy Beller-Simms, PhD
Water Portfolio Lead, Climate and Societal Interactions
NOAA's Climate Program Office

Which is more likely, a warm or cool June?



Climate Resilience Toolkit

Which is more likely, a wet or dry June?



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



U.S. Climate
Resilience
Toolkit

[Steps to Resilience](#) [Case Studies](#) [Tools](#) [Topics](#) [Expertise](#)

Search

Welcome to the new Climate Resilience Toolkit. We've redesigned our site with your web experience in mind.

Meet the Challenges of a Changing Climate

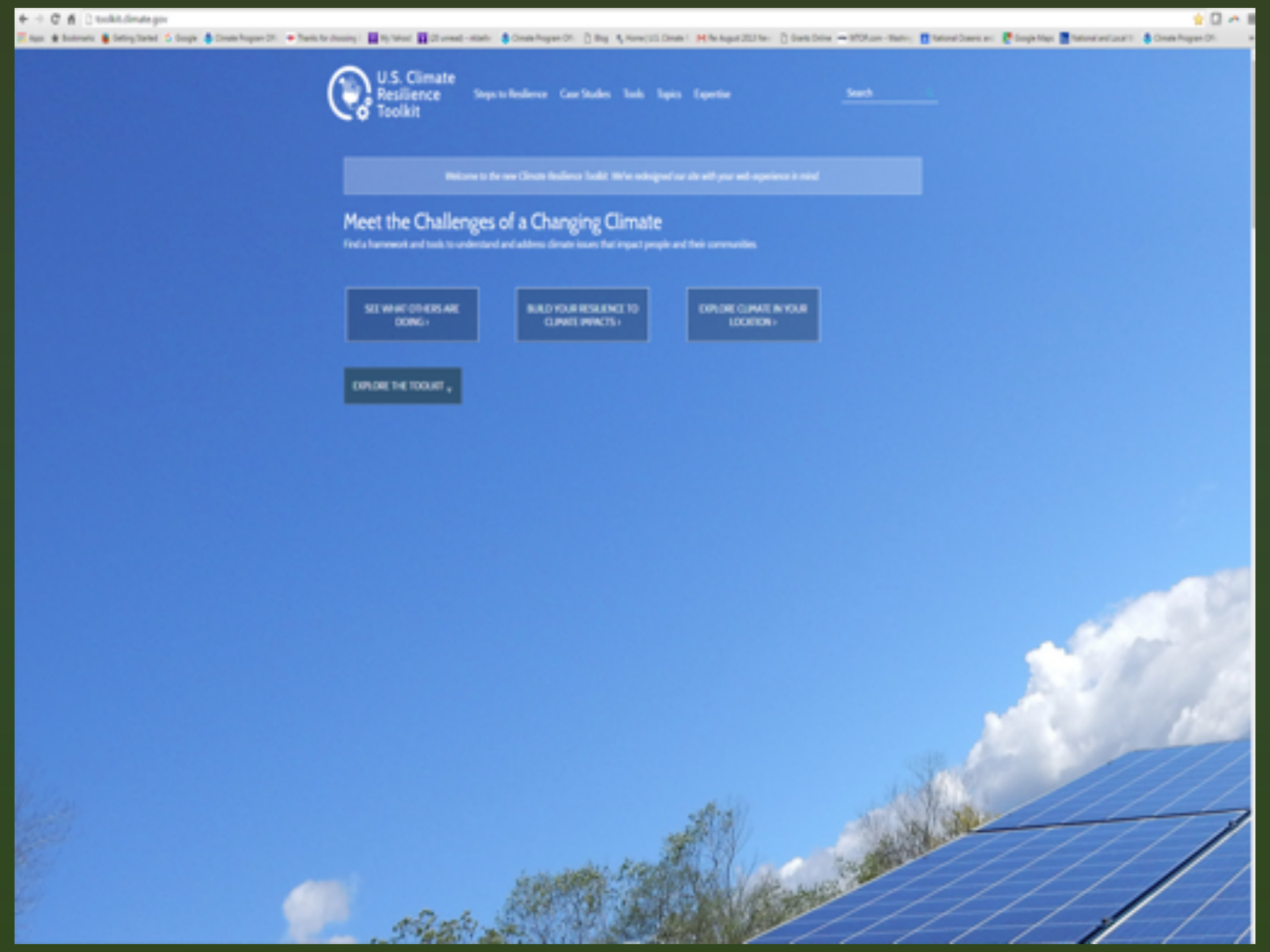
Find a framework and tools to understand and address climate issues that impact people and their communities.

SEE WHAT OTHERS ARE
DOING >

BUILD YOUR RESILIENCE TO
CLIMATE IMPACTS >

EXPLORE CLIMATE IN YOUR
LOCATION >

EXPLORE THE TOOLKIT >





STEPS TO RESILIENCE

Use this framework to discover and document climate hazards, then develop workable solutions to lower climate-related risks. Watch the overview video or click any step to learn more.

1 Explore Hazards

2 Assess Vulnerability & Risks

3 Investigate Options

4 Prioritize & Plan

5 Take Action



TOPICS



ARCTIC >



BUILT ENVIRONMENT >



COASTS >



ECOSYSTEMS >



ENERGY >



FOOD >



HEALTH >



MARINE >



TRANSPORTATION >



TRIBAL NATIONS >



WATER >



Variable precipitation and exposed water infrastructure pose increasing threats to municipal water supplies. Greater evaporation and earlier snowmelt increase the threat of seasonal drought. At the same time, increases in the frequency of heavy precipitation events increase the threat of flooding.

[Topics](#) > [Water](#) >

Key points:

- *In response to Earth's warming oceans and atmosphere, precipitation patterns are changing. Across the nation, the amount of rain falling in the heaviest precipitation events is increasing, and climate models suggest this trend will continue. Models also suggest total precipitation will increase in northern states and decrease in the Southwest.*
- *Based on results from climate models, scientists project an increase in the frequency of flooding along inland waterways in many areas of the United States.*
- *Models also indicate an increase in the length of dry periods across most of the United States. As higher temperatures lead to greater evaporation and earlier snowmelt, the threat of seasonal drought will increase. In some regions, changing conditions and increased demand will challenge the reliability of municipal water supplies.*
- *Water, energy, and land systems interact in many ways. Climate variability and change impact these systems and their interactions. The links between these systems mean they are susceptible to cascading effects from one system to the next, which in turn impacts communities and businesses.*
- *Decreases in the amount of water available to the natural environment pose threats to the viability of land and aquatic ecosystems.*

[Adapted from the Third National Climate Assessment](#)

Changes in the water cycle

Browse Topics

- > [Arctic](#)
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Taking Action > Waterfront Restaurant Rebuilds to Remain Open Through Future Storms >



Waterfront Restaurant Rebuilds to Remain Open Through Future Storms

Property owners in New Jersey can check their vulnerability to sea level rise and storm surge using an interactive mapping tool—the NJ Flood Mapper. Here's how one restaurant owner used results from the tool in his long-term planning.

Subr

The l accompanied Hurricane Sandy in October 2012 flooded hundreds of businesses, forcing them to close. Faced with the loss of his income, restaurant owner Ivar Johnson's first reaction was to rebuild right away. His seaside restaurant, Panini Bay in Tuckerton, New Jersey, had been heavily damaged, and it seemed that reopening as quickly as possible was the best way to move forward. When his rebuilding got under way, however, Johnson learned that flooding due to storms was not the only threat to his seaside business. He learned that rising sea level was also a factor to consider.

Related Video: "After Sandy: Facing the Future" from Climate.gov



Considering the future Johnson's team examined FEMA's floodplain maps to learn about past flood conditions, and then consulted FEMA's Advisory Base Flood Elevation levels to consider the potential for future

flooding. Johnson also worked with a local expert, Lisa Auermiller of the Jacques Cousteau National Estuarine Research Reserve, to understand the vulnerabilities his restaurant faced.

Steps to Resilience:

- Step 1: Identify the Problem
- Step 2: Determine Vulnerability
- Step 3: Investigate
- Step 4: Evaluate Risks
- Step 5: Take Action

Tools:

- [Sea Level Rise and Coastal Flooding Impacts Viewer >](#)
- [NJ Flood Mapper >](#)
- [Getting to Resilience >](#)
- [Sea Level Rise Tool for Sandy Recovery >](#)

Topic:

- [Coastal Flood Risk >](#)
- [Sea Level Rise >](#)
- [Coastal Flood Risk > Storm Surge >](#)

Additional Resources:

- [Climate.gov | After Sandy: Facing the Future >](#)

Partners:

- [Federal Emergency Management Agency \(FEMA\) >](#)

Tools

[Clear Filters](#)

Filter by topic: ▼

Filter by tool function: ▼

Filter by steps to resilience: ▼

Filter by region: ▼

Tools are available to help you manage your climate-related risks and opportunities, and to help guide you in building resilience to extreme events. Browse the list below, or filter by topic and/or tool functionality in the boxes above. To expand your results, click the Clear Filters link.



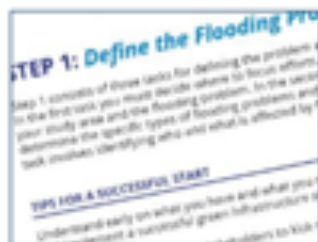
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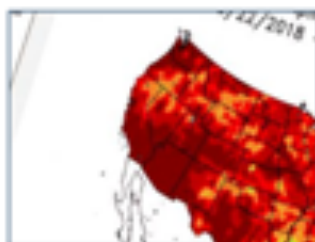
PRINT



A Guide to Assessing Green Infrastructure Costs and Benefits for Flood Reduction

Communities can use this six-step process as a framework—and to spark discussion—when assessing the costs and benefits of green infrastructure projects.

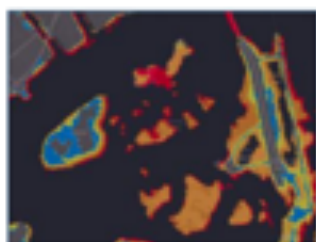
[Read more >](#)



ACIS Climate Maps

Generate maps of temperature and precipitation variables for the United States.

[Read more >](#)



AdaptMap Jamaica Bay

This online mapping tool for New York's Jamaica Bay allows users to compare and contrast historical, present day, and potential future landscapes against an array of sea level and storm tide scenarios.

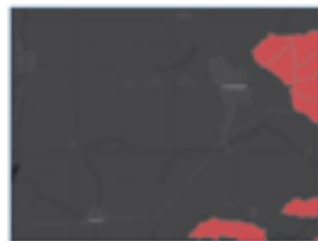
[Read more >](#)



Advanced Hydrologic Prediction Service

This comprehensive suite of graphical forecast products shows a range of information on current and projected river levels for almost 4,000 stations in the contiguous United States.

[Read more >](#)



Agricultural Conservation Planning Framework (ACPF) Toolbox

This GIS toolset can help conservation planners, landowners, and researchers better manage watershed runoff while supporting agricultural production, as well as to identify appropriate locations for implementing conservation options in a watershed.

[Read more >](#)



AgroClimate—Tools for Managing Climate Risk in Agriculture

Interactive tools and climate information provide support to improve crop management decisions and reduce production risks associated with climate variability, climate change, and extreme weather events in the southeastern United States.

[Read more >](#)



Alaska and Northwestern Canada Quarterly Climate Impacts and Outlook

Each issue of this graphics-rich product describes weather and climate highlights from the previous quarter, and indicates the most likely temperature and precipitation conditions for the upcoming quarter.

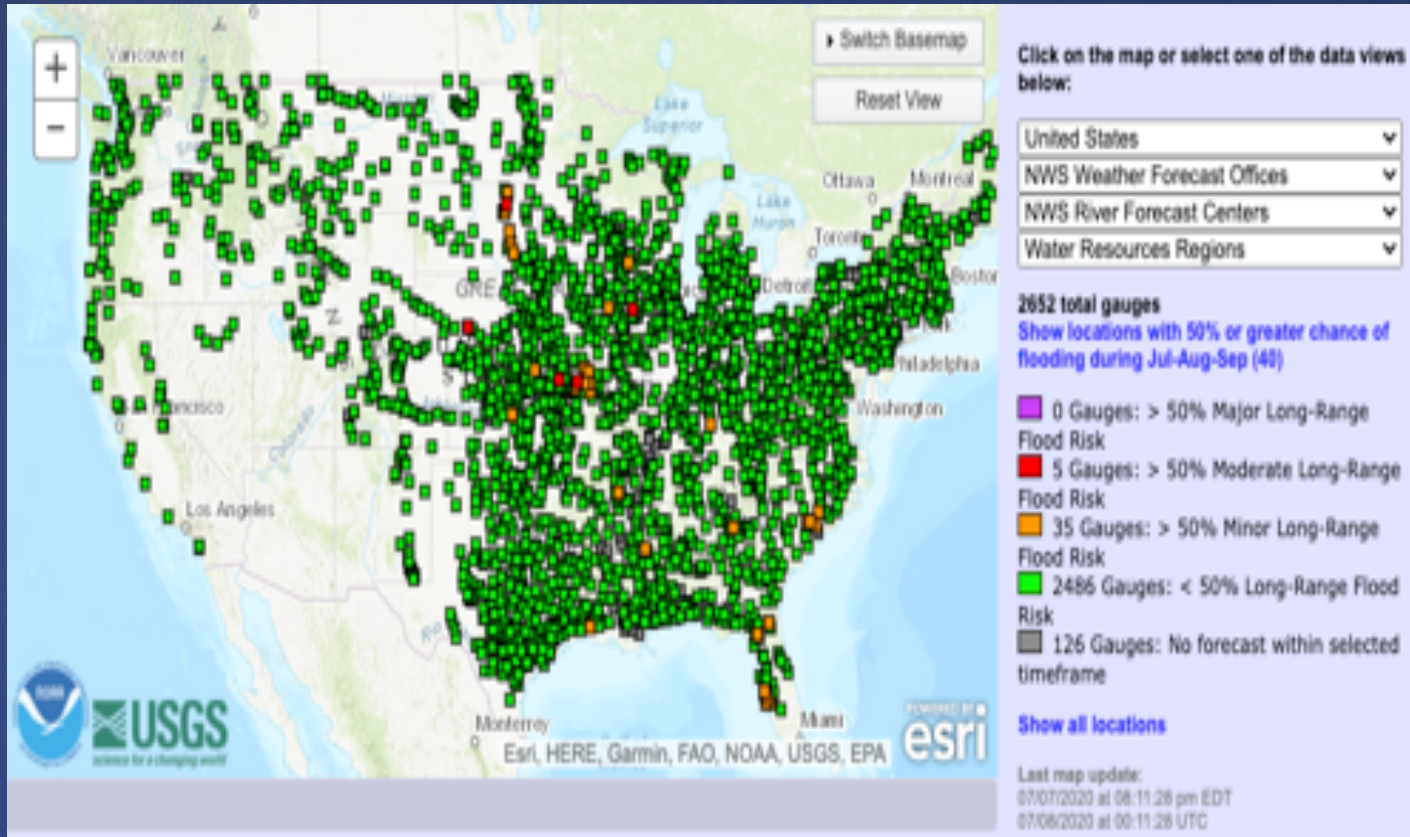
[Read more >](#)



Alaska Online Aquatic Temperature Site (AKOATS)

Researchers can access this Alaska-wide catalog of mapped stream and lake temperature monitoring locations that use a common set of attributes.

[Read more >](#)



Water Resources Dashboard

<https://toolkit.climate.gov/waterdashboard>

The Potential Use of the Water Resources Dashboard became personal to me...



Ben Caudron NBC4 (July 8, 2019)

<https://www.nbcwashington.com/news/local/Flash-Flood--512411651.html>

- American Planning Association (APA)
- American Water Works Association (AWWA)
- Association of Metropolitan Water Agencies (AMWA)
- Environmental Protection Agency (US EPA)
- National Oceanic and Atmospheric Admin. (NOAA)
- Water Environment Federation (WEF)
- Water Environment and Reuse Foundation (WERF)
- Water Research Foundation (WRF)

Partners





Water Resources Dashboard



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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. A similar set of information is available via an Esri Story Map, [Climate Information for Water Utilities](#). The Climate Resilience Toolkit's [Acknowledgments](#) page lists the individuals who contributed to this collection.

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, and Future Projections



Browse Topics

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Story Map

Climate Information for Water Utilities

Home

Forecasts & Outlooks

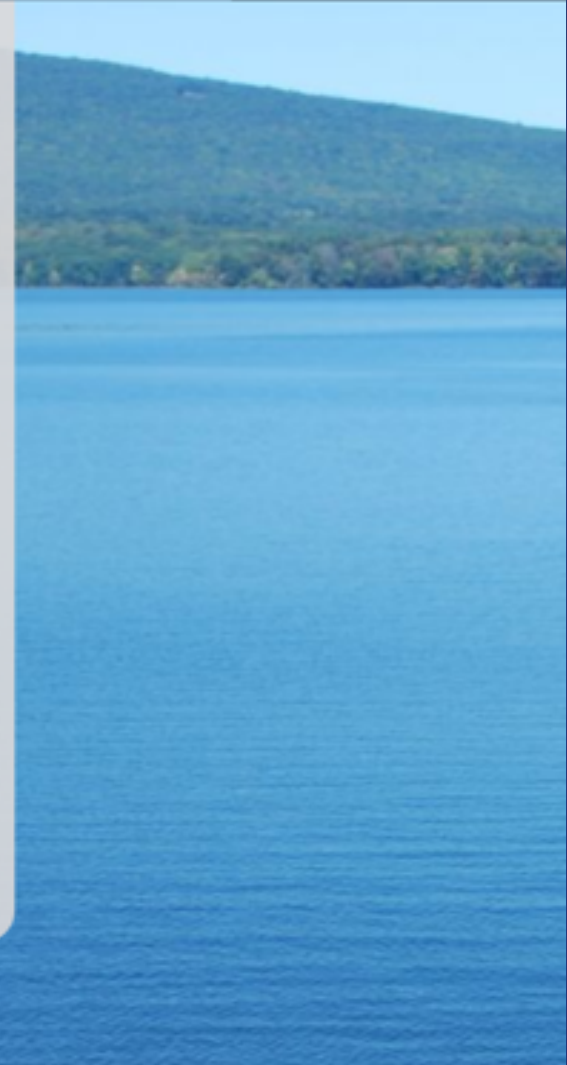
Current Observations

Historical Observations

To ensure a constant water supply as well as the health and safety of residents, water resource managers and urban planners need to monitor the potential for flooding and drought in their regions. Federal weather and climate data and tools can help keep decision-makers informed.

Click the tabs above to view **Forecasts & Outlooks** for the future, check **Current Observations** for what's happening now, or **Historical Observations** to explore conditions that occurred in the past.

Content of these pages is driven by input from the water resources community. We gratefully acknowledge contributors to the original Water Resources Dashboard, and we welcome new suggestions to further improve the usefulness of the site. Email us at noaa.toolkit@noaa.gov.





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. A similar set of information is available via an Esri Story Map, [Climate Information for Water Utilities](#). The Climate Resilience Toolkit's [Acknowledgments](#) page lists the individuals who contributed to this collection.

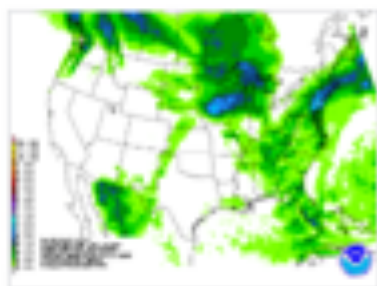
Note that this is a dynamic page: the scope and content of dashboard entries are driven by input from users. We welcome your suggestions and additions to improve its usefulness. Please [email us](#) with your suggestions.

Forecasts, Outlooks, and Future Projections



NWS Forecasts

View current conditions and short- to medium-range (1-7 days) forecasts for precipitation, temperature, wind, and clouds.



Quantitative Precipitation Forecasts

View forecasts of cumulative precipitation for periods from 6



National Water Model (NWM)

The National Water Model (NWM) forecasts streamflow over the

Browse Topics

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Water

– Municipal Water Supply

– Flooding

– Drought

– Ecosystems

– [Water Resources Dashboard](#)

Current Observations



Daily Streamflow Conditions

Colors indicate current streamflow. Click any region on the site, and then click individual stations to access graphs or raw data on streamflow and precipitation. This display can help water managers judge short-term future supply.

[View tool demo >](#)

[Visit data source >](#)



River Observations

View current and predicted flood status at more than 7,500 gauges in the United States. Click to zoom in on a region, and then roll your cursor over gauge locations to view hydrographs of recent and forecast discharge levels.

[View tool demo >](#)

[Visit data source >](#)



River Forecast Centers

View observed flow conditions across 13 regions of the contiguous United States. For each gauge location, access hydrographs showing observed and predicted water levels that account for upcoming weather and snowmelt.

[Visit data source >](#)



Historical Observations



Daily Summary Observations

Access summary observations from more than 90,000 land-based stations around the world. Data may include precipitation, maximum and minimum temperature, temperature at the time of observation, and/or snow depth. A How-to Guide provides assistance with selecting stations of interest in the map interface.

[View tool demo »](#)

[Visit data source >](#)

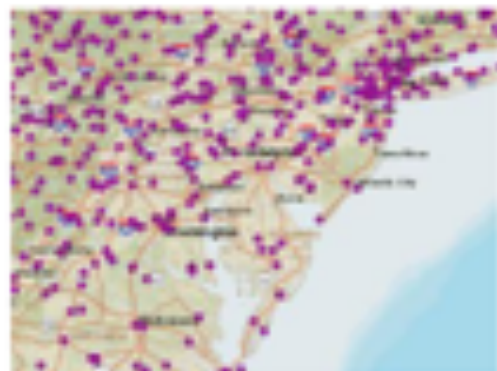


1981-2010 Daily Normals by Weather Station

Use this GIS interface to select stations for which you want to view daily normals. Climate Normals are the latest three-decade averages of climatological variables, including temperature and precipitation. Hourly, monthly, and annual normals are also available.

[View tool demo »](#)

[Visit data source >](#)



Hourly Precipitation

Use this GIS interface to select from more than 5000 stations that indicate maximum observed rates of rainfall. You can consult these records to see historical extremes for locations of interest.

[View tool demo »](#)

[Visit data source >](#)

