A Tour of the U.S. Climate Resilience Toolkit: Steps to Resilience, Case Studies, Tools and Other Expertise

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USAID
Adaptation Community Meeting

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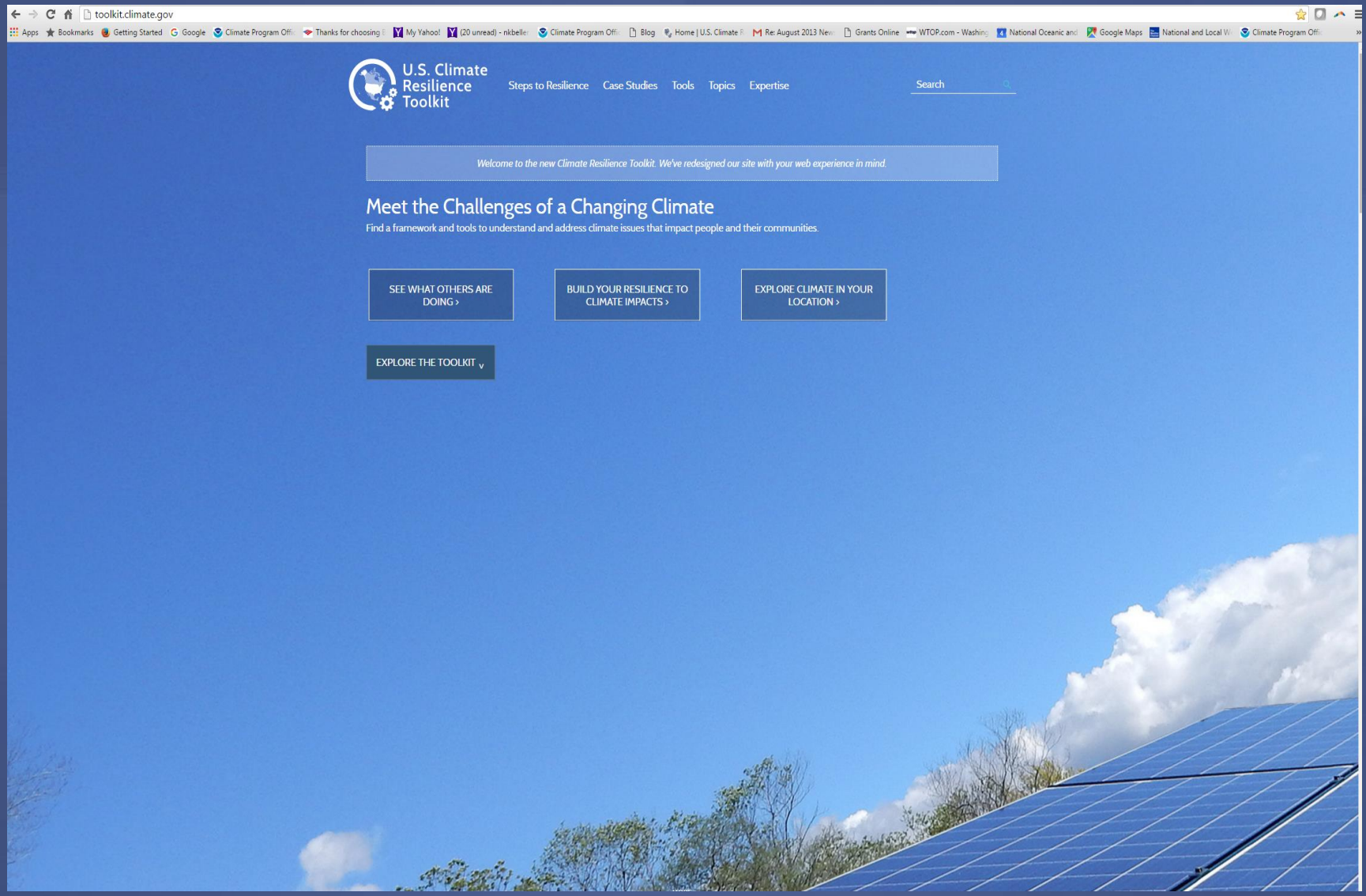
Today's Presentation:

- Steps to Resilience
- Topics
- Case Studies
- Tools
  - Climate Explorer
  - Water Resources Dashboard / Learning Series
- Expertise



http://toolkit.climate.gov/

STEPS TO RESILIENCE

Individuals, businesses, and communities can respond to the challenges of our changing climate. This framework can guide you through the process of planning and implementing resilience-building projects.

OVERVIEW ›

STEP 1: EXPLORE CLIMATE THREATS ›

STEP 2: ASSESS VULNERABILITY & RISKS ›

STEP 3: INVESTIGATE OPTIONS ›

STEP 4: PRIORITIZE ACTIONS ›

STEP 5: TAKE ACTION ›

MORE

TOPICS

ARCTIC ›

BUILT ENVIRONMENT ›

COASTS ›

ECOSYSTEMS ›

ENERGY ›

FOOD ›

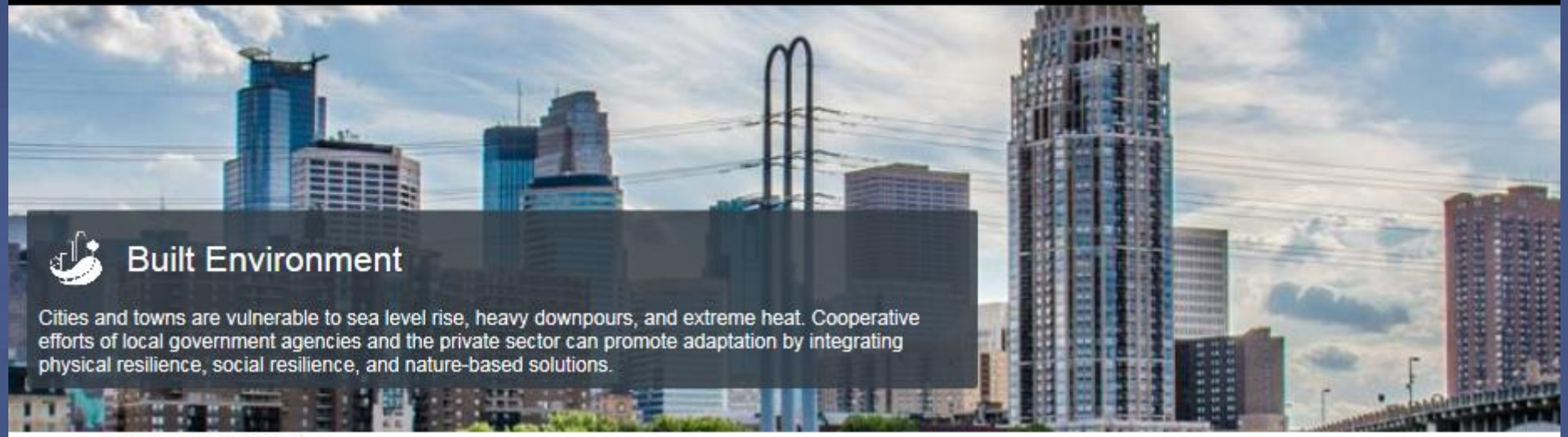
HEALTH ›

MARINE ›

TRANSPORTATION ›

TRIBAL NATIONS ›

WATER ›



Built Environment

Cities and towns are vulnerable to sea level rise, heavy downpours, and extreme heat. Cooperative efforts of local government agencies and the private sector can promote adaptation by integrating physical resilience, social resilience, and nature-based solutions.

Key points:

- *The impacts of extreme weather, climate, and other hazardous events are felt particularly acutely in cities and towns.*
- *Ensuring the resilience of built environment systems takes collaboration among all interested stakeholders before, during, and after extreme events and disasters.*
- *Stressors such as economic inequality and environmental degradation, coupled with deteriorating public infrastructure, can make some communities more vulnerable to extreme weather and climate change than others.*
- *Building resilience by investing in physical adaptation efforts and/or utilizing nature-based solutions can provide co-benefits for a range of challenges, including climate mitigation.*

When extreme weather, climate, and other hazardous events occur, the most obvious and costly impacts are to the built environment. Protecting the structures, infrastructure systems, and natural spaces within our cities, towns, and communities is a key focus of resilience efforts across the public

Browse Topics

› Arctic

⌄ Built Environment

– Buildings and Structures
– Communications
– Community Resilience
– Disaster Planning
– Economics
– Energy
– Environment and Natural Resources
– Social Equity
– Transportation
– Water and Wastewater

Taking Action:

After Record-Breaking Rains, a Major Medical Center's Hazard Mitigation Plan Improves Resilience ›

Improving Communication of Flood Forecasts ›

Seasonal Climate Forecast Serves as a Call to Action ›

Training Sessions Build Capacity for Recovery and Planning ›

Using Demonstration Storms to Prepare for Extreme Rainfall ›

Related Tools:

Advanced Hydrologic Prediction Service ›

Arctic ERMA® (Environmental Response Management Application) ›

Climate Outlooks ›

Coastal Change Hazards Portal ›

Coastal Flood Exposure Mapper ›

CASE STUDIES

Communities and businesses across the nation are taking action to confront their climate threats, reduce their vulnerability to climate-related impacts, and build resilience to extreme events. Filter or browse the Case Studies to see how other people are building resilience for their businesses and in their communities.

Bracing for Heat ›

Heat waves bring some level of discomfort to nearly everyone. When excessive heat catches vulnerable populations off guard, though, discomfort can advance to illness and even death. Learn about strategies that help protect people in both rural and urban settings.

SEE MORE EXAMPLES OF PEOPLE TAKING ACTION:

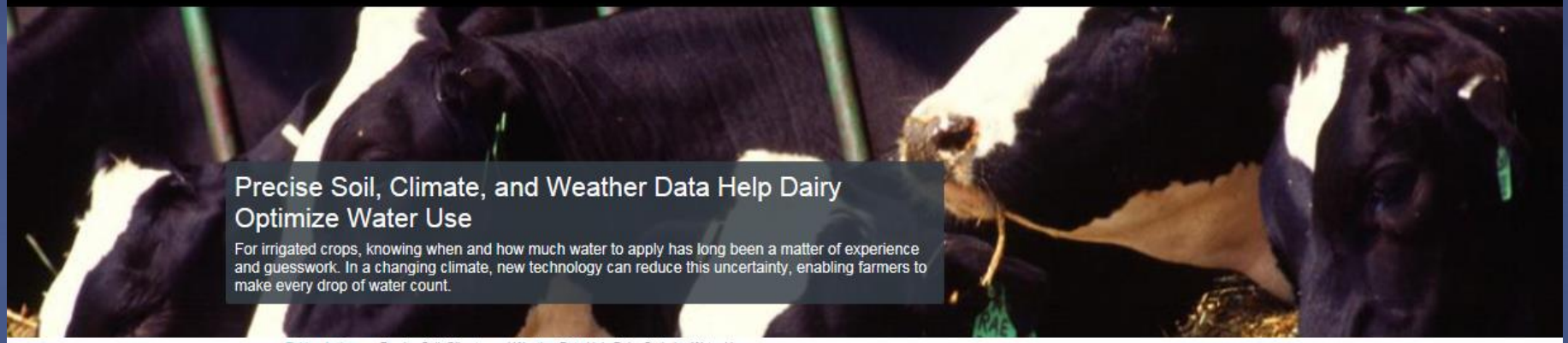
VIEW DROUGHT-RELATED CASE STUDIES ›

VIEW NORTHEASTERN CASE STUDIES ›

VIEW ALL CASE STUDIES ›

U.S. Climate Resilience Toolkit

Steps to Resilience | Case Studies | Tools | Topics | Expertise | Search



Precise Soil, Climate, and Weather Data Help Dairy Optimize Water Use

For irrigated crops, knowing when and how much water to apply has long been a matter of experience and guesswork. In a changing climate, new technology can reduce this uncertainty, enabling farmers to make every drop of water count.

Stressors and impacts

Utah dairyman Dee Waldron watches the weather like a hawk. He wants up-to-date weather and climate information now, in the field, and in a clear way that helps him make critical farming decisions, such as when to irrigate, plant, and harvest. Waldron operates a dairy and feed grain farm in Morgan County, Utah, just east of Salt Lake City, which is considered a high mountain desert and not very productive without mountain streamflows stored in irrigation reservoirs.

"Before, I used to take a shovel in the field, dig down, and guess by feeling how much moisture was available for my crops," said Waldron. "Now, I use my computer and smart phone to access the local weather forecast, the amount of soil moisture, the snow levels in the mountains, the amount of water in the river, and even the soil temperature. This really helps us as agricultural producers."

As climate warms and a higher proportion of precipitation falls as rain rather than snow, the amount of

Steps to Resilience:

- Step 1: Explore Climate Threats
- Step 2: Assess Vulnerability & Risks
- Step 3: Investigate Options
- Step 4: Prioritize Actions
- Step 5: Take Action

Tools:

Soil Climate Analysis Network (SCAN) Data Viewer ›

Topic:

Food › Food Production ›

TOOLS

Many U.S. federal science agencies offer tools to help you explore climate threats and vulnerabilities, and to help guide you in building climate resilience.

Heat Safety Tool ›

When you're working in the heat, safety comes first. With this OSHA Heat Safety Tool, you have vital safety information available whenever and wherever you need it –right on your mobile phone.

SEE MORE EXAMPLES OF TOOLS IN ACTION:

VIEW CLIMATE PROJECTION TOOLS ›

VIEW HEALTH TOOLS ›

VIEW ALL TOOLS ›

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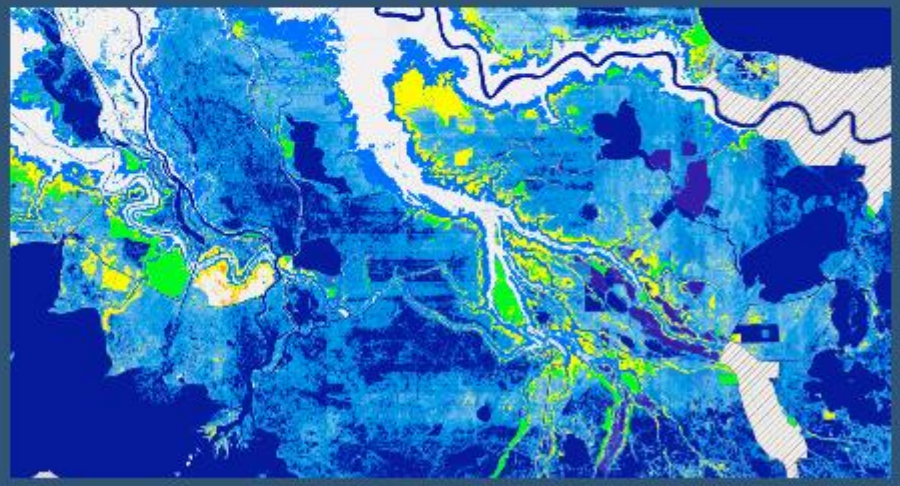
Steps to Resilience | Case Studies | Tools | Topics | Expertise | MORE | Search

CLIMATE EXPLORER

This visualization tool provides interactive graphs and maps of climate projections and observations. It can display historical temperature and precipitation observations for hundreds of climate stations, and offers map layers of valued assets and climate threats.



LAUNCH THE CLIMATE EXPLORER ›

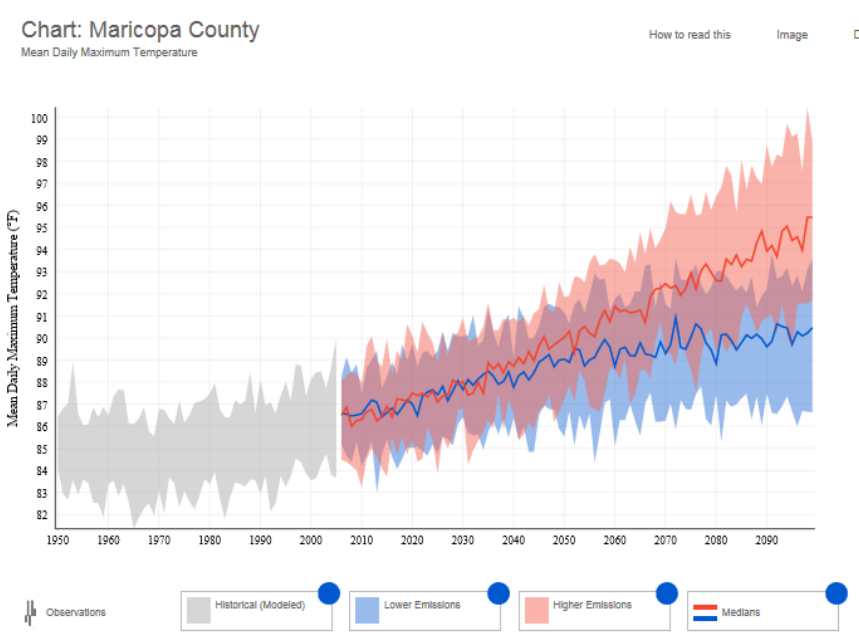
LEARN MORE ABOUT THE CLIMATE EXPLORER ›

LAUNCH THE LEGACY VERSION OF CLIMATE EXPLORER ›

Temperature

- Mean Daily Maximum Temperature
  - Annual
  - Monthly
  - Seasonal
- Mean Daily Minimum Temperature
- Days with Maximum Above 95°F
- Days with Minimum Below 32°F

Display: Actual



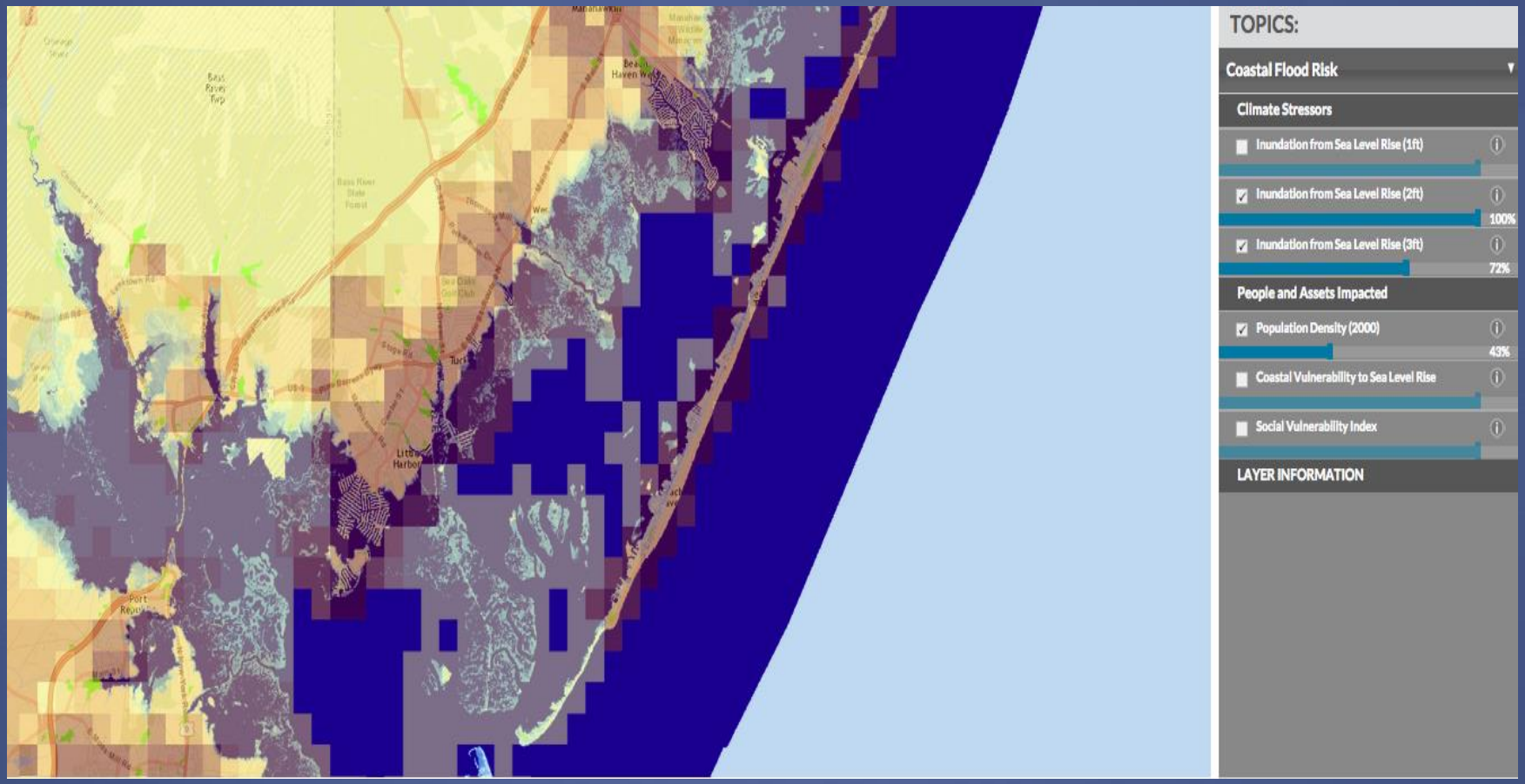
U.S. Climate Resilience Toolkit

PHOENIX, AZ

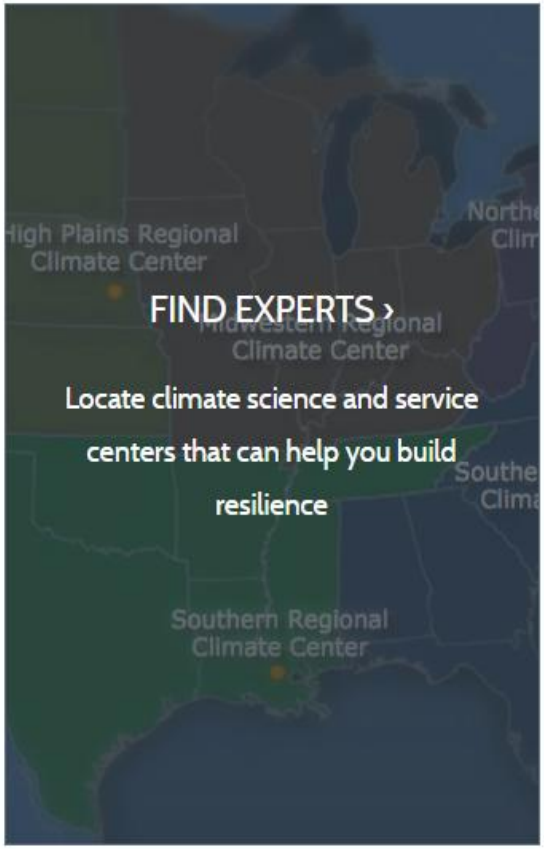
Maricopa County

Graphs and maps below show observed and modeled data for the county of your selected location. Adjust the displays to focus on times or regions of interest.

JUMP TO: Temperature Precipitation Other Weather Stations


TOPICS:
Coastal Flood Risk
Climate Stressors
Inundation from Sea Level Rise (1ft)
Inundation from Sea Level Rise (2ft)
100%
Inundation from Sea Level Rise (3ft)
72%
People and Assets Impacted
Population Density (2000)
43%
Coastal Vulnerability to Sea Level Rise
Social Vulnerability Index
LAYER INFORMATION

EXPERTISE



FIND EXPERTS ›

Locate climate science and service centers that can help you build resilience

TRAINING COURSES ›

Acquire tools, skills, and knowledge to manage climate-related risks and opportunities

REPORTS ›

Access climate-related reports issued by government agencies and scientific organizations

Training Courses

Filter by category: ▼ | Filter by type of training: ▼ | Filter by difficulty scale: ▼

The training courses here can help you acquire the tools, skills, and knowledge you need to manage your climate-related risks and opportunities. All courses are free of charge, and are offered in at least one of three formats: online audio-visual presentations ("Online, Self-Guided" and "Tool Tutorial"), training webinars ("Online, Scheduled Lecture Series"), and residence training courses ("Onsite, Instructor-Led"). Each training module is accompanied with a test to help you evaluate your knowledge. These courses feature scientific information adapted from authoritative sources, prepared by recognized subject matter experts. The courses have been pilot tested with users and other subject matter experts and may be updated periodically, as needed.

Adapting to Climate Change: A Short Course for Land Managers ›

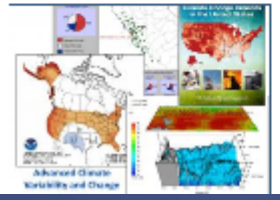
Information in this short course summarizes the state-of-the-art science for natural resource managers and decision makers regarding climate variability, change, projections, and ecological and management responses. The course includes video lectures, interactive quizzes, literature citations, and links to further information. The lectures were videotaped at a 2008 workshop that included U.S. Forest Service and U.S. Geological Survey scientists, as well as U.S. Forest Service resource managers.

Category:
Climate Change, Climate Adaptation & Mitigation, Strategic Planning
Type of Training: Online, Self-Guided
Difficulty scale: Intermediate
Module time (hr:min): 6:00

Source:
USDA Forest Service Climate Change Resource Center

Advanced Climate Variability and Change Course ›

This three-day residence training course provides advanced knowledge in climate modeling, downscaling, attribution of extreme weather and water events to climate, and approaches and tools for developing local climate studies.



Category:
Climate Variability, Climate Change, Climate Products, Climate Attribution & Extreme Events
Type of Training: Onsite, Instructor-Led
Difficulty scale: Advanced

Source:
National Weather Service

Funding Opportunities

Many of the strategies for increasing climate resilience come with a price tag. In the United States, a range of government entities and private foundations offer financial and technical resources to advance local adaptation and mitigation efforts. For your convenience, we've listed some of them here. Please follow the external link for any program to learn more.

- **Gulf Research Program - Research-Practice Grants – Award Year 2017**

  The Gulf Research Program of the National Academies of Sciences, Engineering, and Medicine and the Robert Wood Johnson Foundation are committing $10 million to enhancing coastal community resilience. This funding opportunity is a broad call for scientifically-sound research and practice projects that will develop information, test strategies, and provide evidence that can be used by communities to enhance their resilience to the adverse impacts of climate change, severe weather, and major environmental disasters in ways that also improve well-being.

  - Required letters of intent are due October 5, 2016. If you have submitted a letter of intent, then full proposals can be submitted starting October 6, 2016 - full proposals are due December 14, 2016.

- **EPA Smart Growth Grants and Other Funding**

  The U.S. Environmental Protection Agency's Office of Sustainable Communities occasionally offers grants to support activities that improve the quality of development and protect human health and the environment.

- **Partnership for Sustainable Communities**

  The U.S. Department of Housing and Urban Development (HUD), U.S. Department of Transportation (DOT), and the U.S. Environmental Protection Agency (EPA) work together to help communities nationwide improve access to affordable housing, increase transportation options, and lower transportation costs while protecting the environment. The site's map of grants shows information on awards already made through Partnership programs.

- **FEMA (Federal Emergency Management Agency) Preparedness (Non-Disaster) Grants**

  FEMA provides state and local governments with preparedness program funding to enhance the capacity of their emergency responders to prevent,

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Topics › Water › Water Resources Dashboard ›

Water Resources Dashboard

This dashboard provides access to maps and data that can help water resource managers and urban planners monitor the potential for extreme precipitation and drought in their regions. The scope and content of dashboard entries are driven by input from users. Individuals who contributed to this resource are listed under About the Climate Resilience Toolkit.

Current External Partners for the Dashboard

- American Planning Association (APA)
- American Water Works Association (AWWA)
- Association of Metropolitan Water Agencies (AMWA)
- Water Environment Federation (WEF)
- Water Environment Research Foundation (WERF)
- Water Research Foundation (WRF)

Developing the Extreme Events Dashboard

General Approach:

- Meet regularly
- Agree upon goals
- Re-evaluate goals

Specific Approach:

- Better understand population
- Develop survey
- Identify most relevant constituents (avoided member fatigue) for inclusion in survey

The Survey

Climate Data and Information Survey

Thank you for participating in our survey on Climate Data and Information Needs. Your feedback is important to the water, climate, and planning communities.

The survey asks about specific climatological/meteorological data sets used for climate and resilience preparedness. It is intended for those within your institution's climate change, resiliency planning, or emergency management/preparedness departments, among others.

The information you provide will primarily be used to help us identify areas for improvement in the collection, dissemination, and training on data relevant to planning for climate change and extreme weather events and creating a "one-stop-shop" for data needs.

Collective survey results may also be used in outreach efforts to members at participating organizations, to inform a sector working model for larger collaborative goals among water/planning groups, and/or as a source of information for efforts taken under the development of the White House's national Climate Resiliency Toolkit.

The survey should take ~20 minutes to complete. Participation is anonymous and voluntary. You do not need to provide contact information, and you may withdraw at any time. If do you not know the answer to a specific question (or part of a question), or do not want to answer it, please leave it blank.

If you have any questions, please contact the institution that sent you this survey:

American Planning Association (APA): James Schwab; JSchwab@planning.org
American Water Works Association (AWWA): Adam Carpenter; acarpenter@awwa.org
Association of Metropolitan Water Agencies (AMWA): Erica Brown; brown@amwa.net
Water Environment Federation (WEF): Claudio Ternieden; cternieden@wef.org
Water Environment Research Foundation (WERF): Katy Lackey; klackey@werf.org
Water Research Foundation (WRF): Kenan Ozekin; kozekin@waterrf.org

***1) Do you currently use climate information for planning purposes at your institution?**

- ◯ Yes
- ◯ No

1a) Why not?

***Do you plan to use climate information for planning purposes in the future?**

- ◯ Yes
- ◯ No
- ◯ Maybe

Use of Climate Information

Frequent (50%+)

1. Understanding risk for water supply
2. Infrastructure/capital investments
3. Operational purposes

Frequent/Occasional (50%+)

4. Prepare hazard mitigation/climate adaptation
5. Develop impact reports & risk assessments
6. Plan extreme events
7. Plan explicit forecast
8. Plan emergency/long-term response
9. Other purposes

Don't Use/May in Future (50%+)

10. Rebuilding following an extreme event

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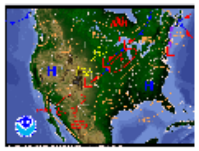
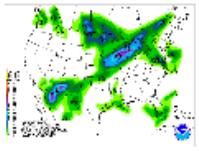
Forecasts & Outlooks



NWS Forecasts

View current conditions and short- to medium-range (1-7 days) forecasts for precipitation, temperature, wind, and clouds. These forecasts often identify potential hazards such as heavy precipitation three or more days in advance.

Visit data source ›

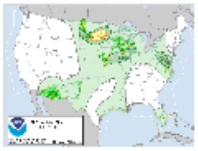


Quantitative Precipitation Forecasts

View forecasts of cumulative precipitation for periods from 6 hours to 7 days into the future. Monitoring this site can alert decision makers of the potential for wet weather and/or flooding.

View Tool Demo

Visit data source ›



Storm Prediction Center

This site shows the chances for Severe Weather and Fire Weather over the next 8 days. Browse a range of information on severe weather events including tornadoes, thunderstorms, winds, and hail.

Visit data source ›

Drought Outlook

Maps show how conditions related to drought are likely to change. Monthly and seasonal outlooks indicate areas where drought is likely to develop, persist, or worsen. Monitoring this map can help decision makers anticipate future drought tendency.

Visit data source ›

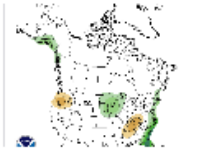
Hazards Outlook

View hazard outlooks for the next 3-7 days and the next 8-14 days into the future. Get advance notice of the potential for hazards such as flooding, severe storms, extreme temperatures, drought, and risk of wildfires.

Alternate link for Internet Explorer users

View Tool Demo

Visit data source ›



Precipitation Outlooks

View monthly maps showing the probability for precipitation ranking in the top, middle, or bottom third of historical observations. Outlooks that favor drier or wetter periods can raise awareness of the potential for changing conditions.

View Tool Demo

Visit data source ›

Current Observations

Daily Streamflow Conditions

Dots on this map indicate current streamflow: a quick look can show if water levels in your region are high, normal, or low. Click any region on the site, and then select stations to access graphs or raw data on streamflow and precipitation. Monitoring this site can help water managers judge short-term future supply.

Visit data source ›

Case Study ›

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.

Visit data source ›

River Forecast Center

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

Visit data source ›

Current Drought

This weekly map—updated every Thursday—shows experts' assessments of regional conditions related to dryness and drought. The maps focus on broad-scale conditions, so local conditions may vary.

Visit data source ›

View this layer in the Climate Explorer ›

Soil Moisture

Access maps that show estimates of surface soil moisture. View Total, Anomaly, Percentile, or Change in soil moisture over the last month or season. Monitoring this site can help decision makers judge field conditions and the potential for drought development.

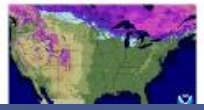
Visit data source ›

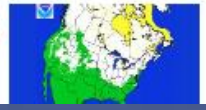
Case Study ›

Water Quality Information

WATERS (Watershed Assessment, Tracking, & Environmental Results System) provides comprehensive information about the quality of surface water across the nation.

Visit data source ›





Map Layers from Data.gov

Rivers, Streams, etc.

This tile cache base map combines the National Hydrography Dataset (NHD) and the Watershed Boundary Dataset (WBD). Use the data as an overlay in your own analysis software, or access it through the Climate Explorer.

Visit data source ›

Case Study ›

View this layer in the Climate Explorer ›

Flood Hazard Zones

Local areas that carry an official designation of risk with respect to flooding show up on this map. The map highlights land that FEMA has judged to have a chance of flooding or lie within a regulatory floodway. Checking which areas of a community carry these designations is an important part of assessing vulnerability. View the layer in your own analysis software or the Climate Explorer.

Visit data source ›

Case Study ›

View this layer in the Climate Explorer ›

Impervious Surfaces (2011)

Parking lots, rooftops, and roads block water from soaking into the ground. These impervious surfaces can increase stormwater runoff, promote flooding, and contaminate surface waters. Explore this tile cache base map of impervious surfaces in your own analysis software, or view it in the Climate Explorer.

Visit data source ›

Case Study ›

View this layer in the Climate Explorer ›

Land cover (2011)

This satellite-derived map can help viewers figure out what is on the ground across a region. Colors show 21 different categories of natural vegetation, crops, and development. Explore the layer in your own analysis software, or view it in the Climate Explorer.

Visit data source ›

Case Study ›

View this layer in the Climate Explorer ›

Population Density (2000)

View estimates of the number of humans living within each square kilometer of the planet during the year 2000. Users can compare the locations of urban and rural populations and identify clusters of residents in rural areas. Download the layer and view it in your own analysis software, or view it in the Climate Explorer.

Visit data source ›

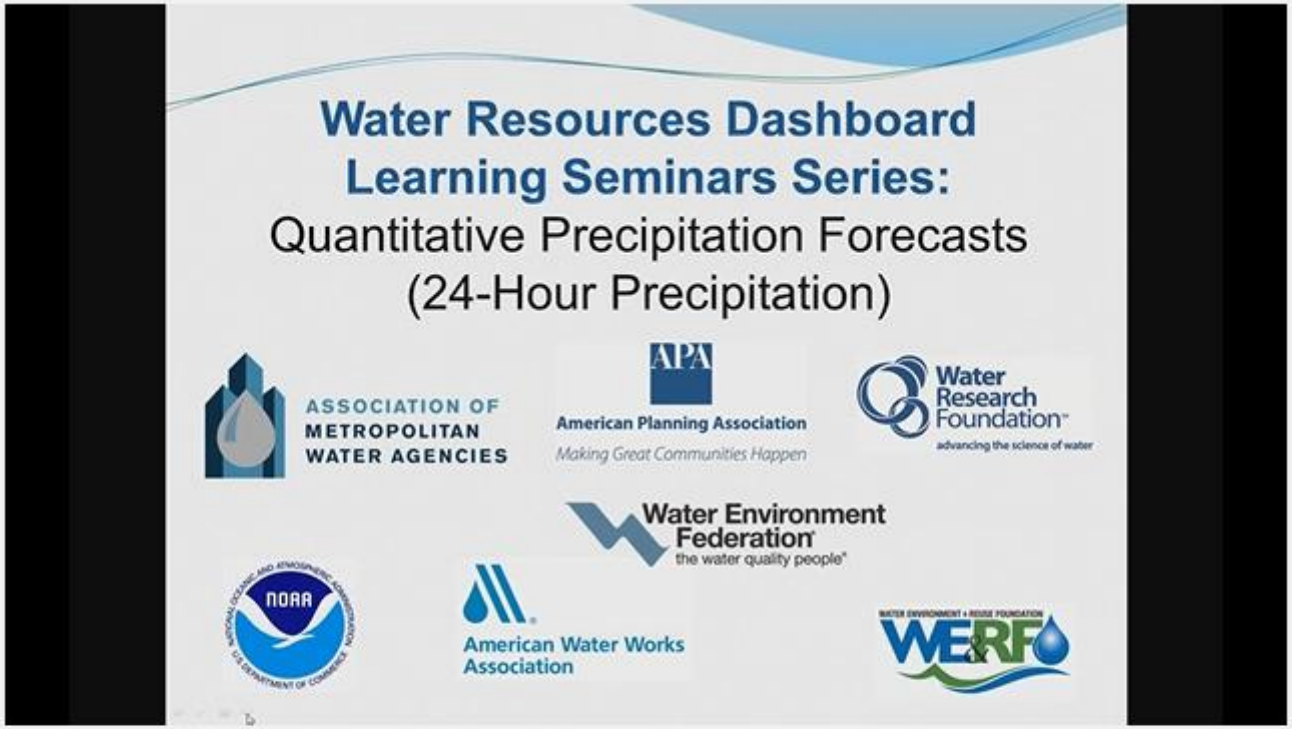
View this layer in the Climate Explorer ›

Social Vulnerability Index

This map shows communities' vulnerability to environmental hazards based on demographic measures drawn mostly from the 2010 Census. Local officials can use the information to identify communities that may need support in preparing for hazards or recovering from disasters.

Visit data source ›

View this layer in the Climate Explorer ›



Water Resources Dashboard Learning Session: Quantitative Precipitation Forecasts

amithsagar18

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61 views

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Water resource managers, city planners, and the general public are witnessing changes in the climate, as well as associated impacts to our environment. To better plan for the future, the American Planning Association, American Water Works Association, Association of Metropolitan Water Agencies, National Oceanic and Atmospheric Administration, Water Environment Federation, Water Environment Research Foundation, and the Water Resource Foundation collaborated to create a water resources dashboard – a one-stop location for water-relevant data sets.

SHOW MORE

Thank you!

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