



WRP Featured Webinar: Highlighting the Tools and Resources available by NOAA

DECEMBER 4, 2023

**Reliable Outcomes for America's Defense, Energy,
Environment and Infrastructure in the West**

wrpinfo.org

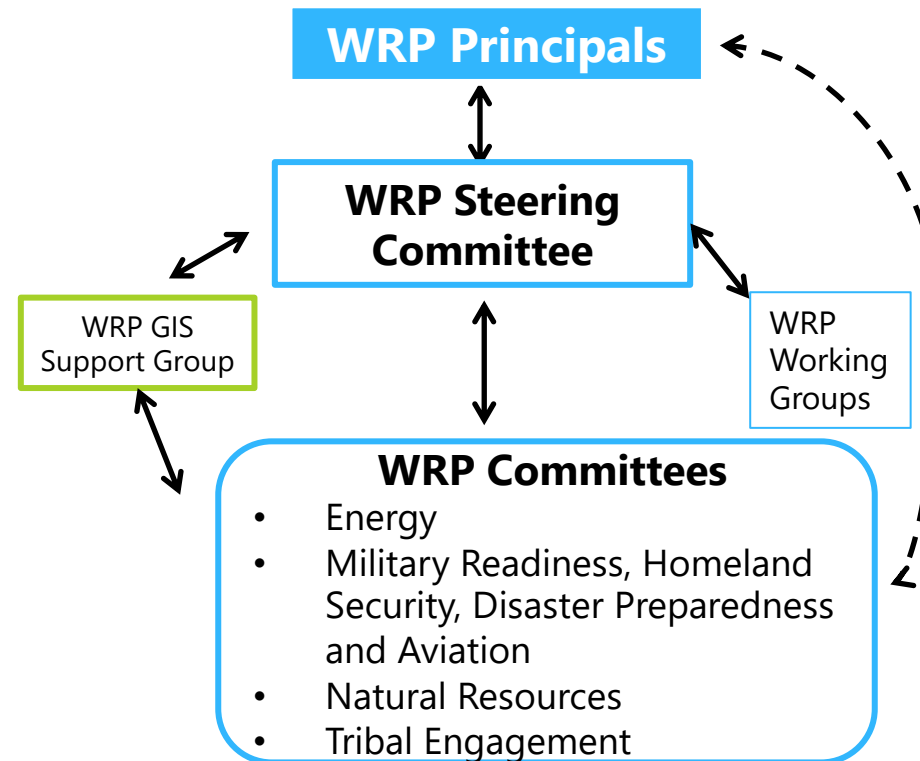
WRP Mission

WRP provides a proactive and collaborative framework for **senior-policy level Federal, State and Tribal leadership** to identify common goals and emerging issues in the states of **Arizona, California, Colorado, Nevada, New Mexico and Utah** and to develop solutions that support WRP Partners and protect natural and cultural resources, while promoting sustainability, homeland security and military readiness.

WRP Co-Chairs:

- **Honorable Spencer Cox**
Governor of Utah
- **Dr. Annalise Blum**, Deputy
Assistant Secretary for Water
and Science, DOI
- **Mr. Ron Tickle** for the Assistant
Secretary of Defense for
Energy, Installations, and
Environment

WRP Structure





2023/2024 Deep-Dives in support of WRP Priority
Enhancing Resilience to Avoid Cascading Disaster

- Water Security/resilience
- Wildland Fire (response/prevention)
- Aviation/Airspace Needs



NOAA Climate Tools Available to Western Regional Partnership

Russ Vose, Ned Gardiner, & Andrea Bair

December 4, 2023



NOAA Speakers Today



- **Russ Vose** - Russ is the Chief of the Monitoring and Assessment Branch at NOAA's National Centers for Environmental Information (NCEI) in Asheville, NC. Over the past three decades, Dr. Vose's research has primarily focused on understanding climate change and integrating climate observations, particularly for use in climate assessments, operational monitoring, and product development. Dr. Vose has been a lead author on the IPCC 6th Assessment Report, the 3rd and 4th U.S. National Climate Assessments, Climate Change Synthesis Product (CCSP) 1.1, and a contributing author on the Arctic Climate Impact Assessment. Most recently he is an author on Chapter 2 (Climate Trends) of the newly released 5th U.S. National Climate Assessment.
- **Ned Gardiner** - Ned is the program manager for the Climate Smart Communities Initiative and coordinates resilience activities in NOAA's Climate Program Office. He's an architect of the Climate Resilience Toolkit and was on the ground floor launching Climate.gov. Before entering federal service, he was a contractor for NOAA for 15 years. Prior to that, he was an ecologist and geographer with the American Museum of Natural History and the University of Georgia. He lives in Asheville, North Carolina.
- **Andrea Bair** - Andrea Bair is the Climate Services Program Manager for the National Weather Service (NWS) Western Region. Andrea has been with the NWS for over 27 years, with a focus on climate and drought for 21 of those years. She earned a B.S. degree in Atmospheric Sciences, and M.S. degree in Geography, both from the University of Utah. Andrea currently resides in Salt Lake City, UT.



NCEI Overview

Dr. Russ Vose

December 4, 2023



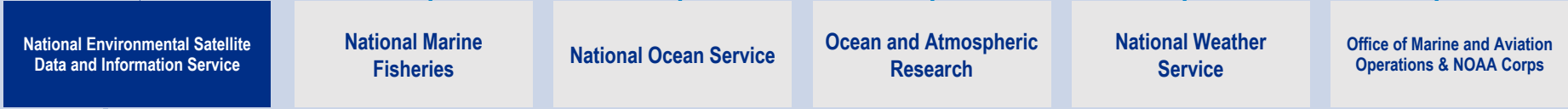
Department of Commerce



NOAA

National Oceanic & Atmospheric Administration

NOAA Line Offices



National Environmental Satellite Data and Information Service (NESDIS) Line Offices



National Centers for Environmental Information (NCEI)



Asheville, NC
Headquarters



Boulder, CO



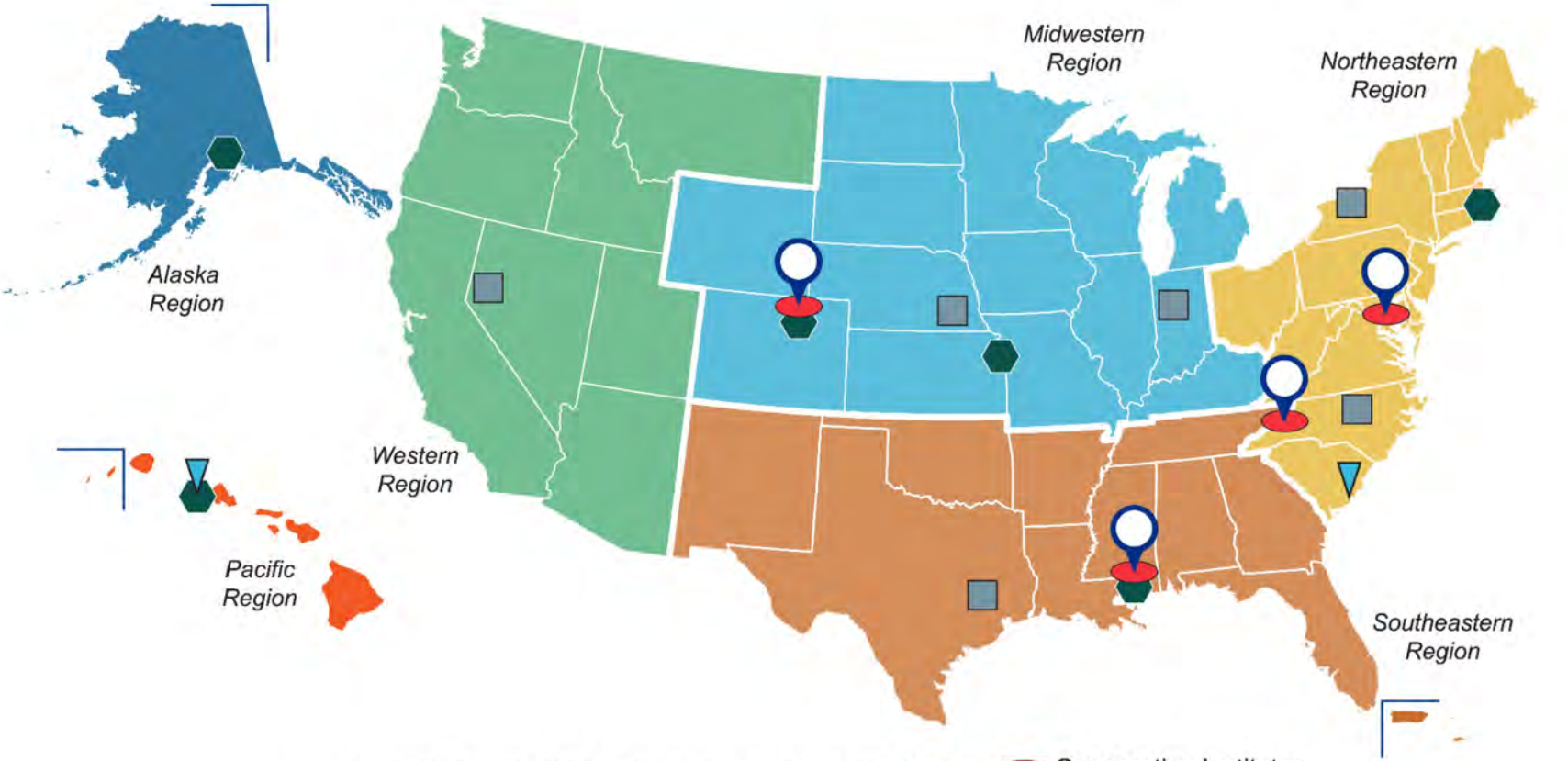
Silver Spring, MD



Stennis, MS

NCEI's Nationwide Presence

National Centers for Environmental Information (NCEI)



National Centers for Environmental Information (NCEI)

- Asheville, North Carolina, Headquarters
- Boulder, Colorado
- Silver Spring, Maryland
- Stennis Space Center, Mississippi

- Cooperative Institutes
- Regional Climate Services Directors (RCSD)
- Regional Climate Centers (RCC)
- ▼ NCEI Field Locations

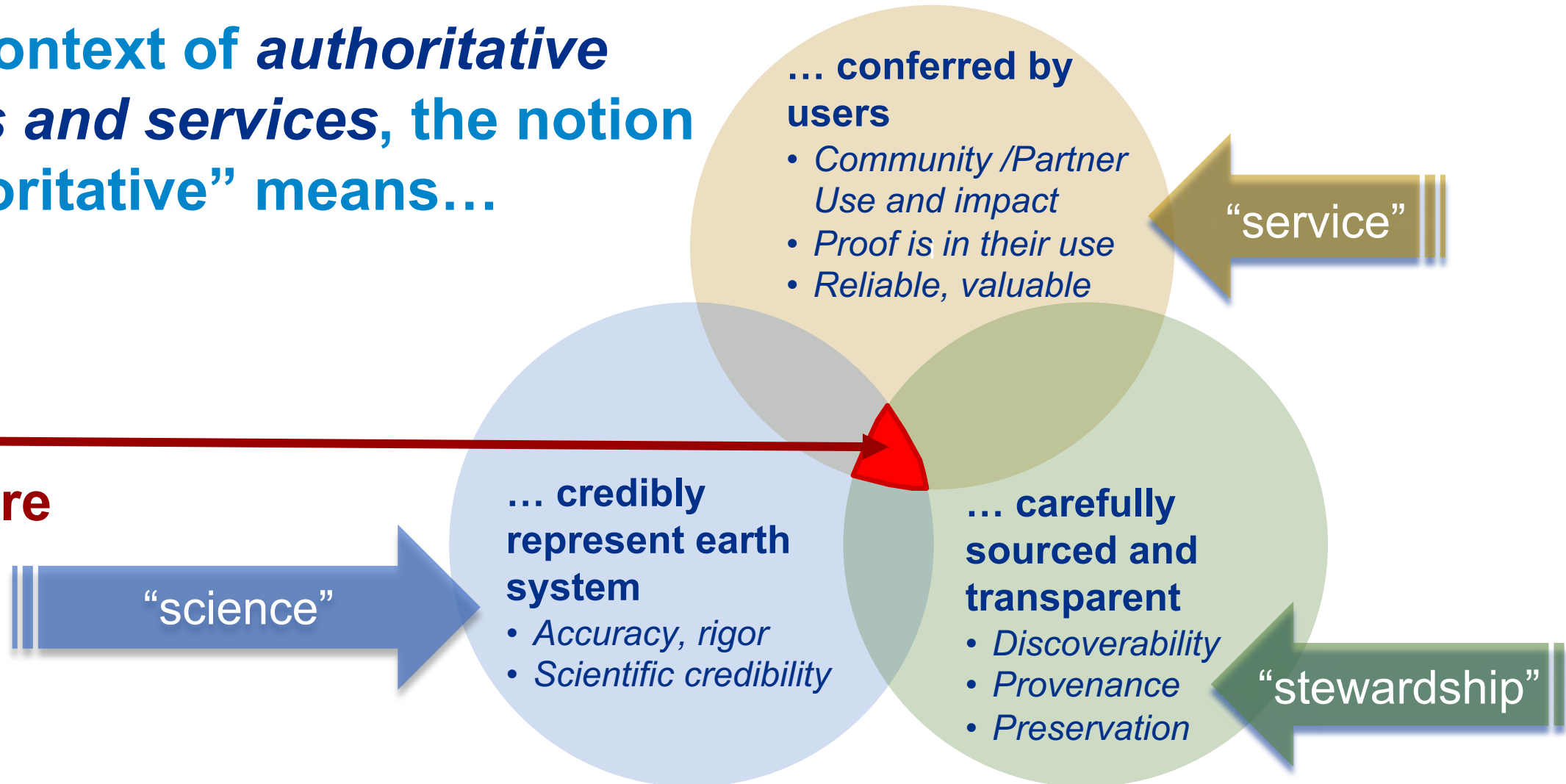


October 2022

Authoritative Information and Services

“In the context of *authoritative products and services*, the notion of “authoritative” means...

NCEI:
Aim here



Products

Browse by Category, Parameter, or Instrument/Method

Category



Apply

[Arctic, Antarctic, and Polar Data](#)

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Select NCEI Monitoring Products and Services

December 4, 2023



Globe

Nation

Region

State

Division

County

City

Mapping

National Mapping

Launch

Time Series

National Time Series

Launch

Rankings

National Rankings

Launch

Haywoods

National Haywoods

Launch

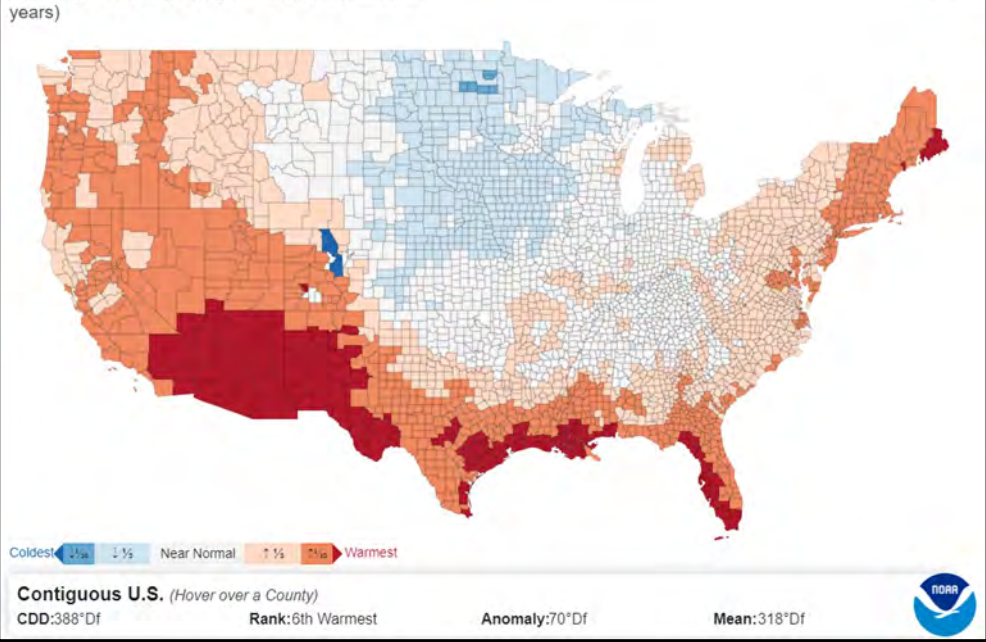
Data Info

National Data Info

Launch

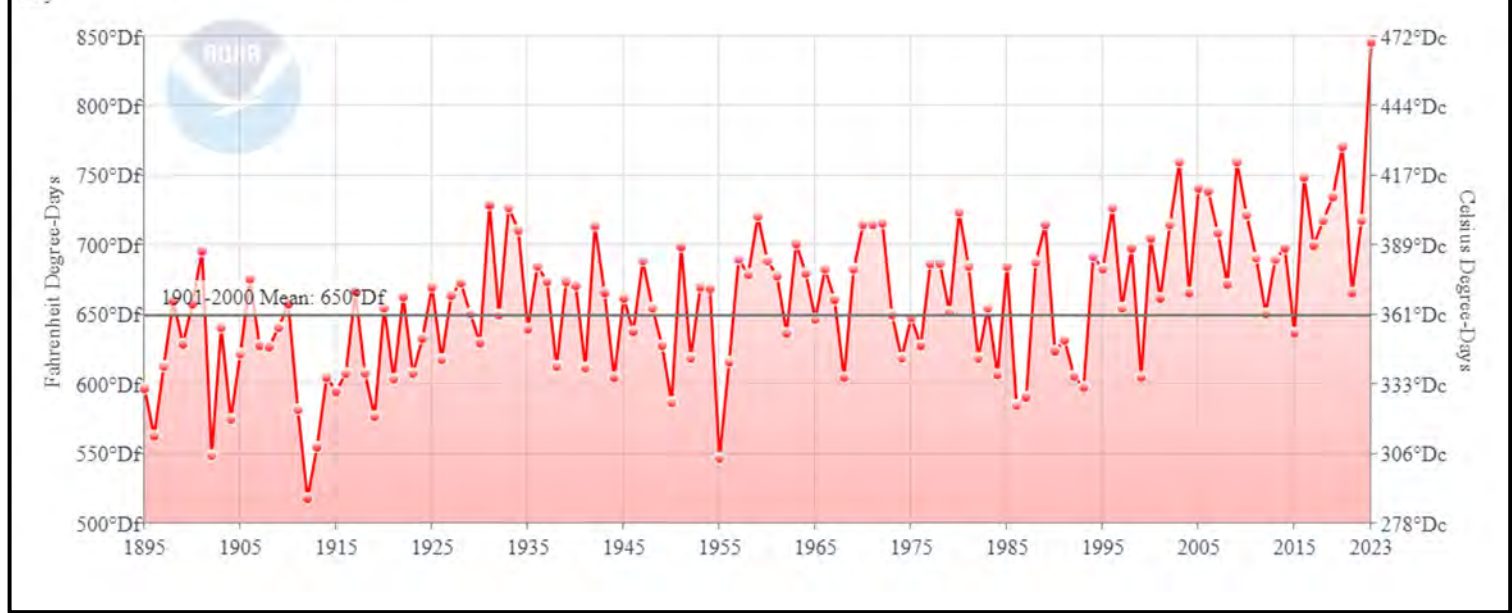
County Cooling Degree Days Rank (129 years)

July 2023



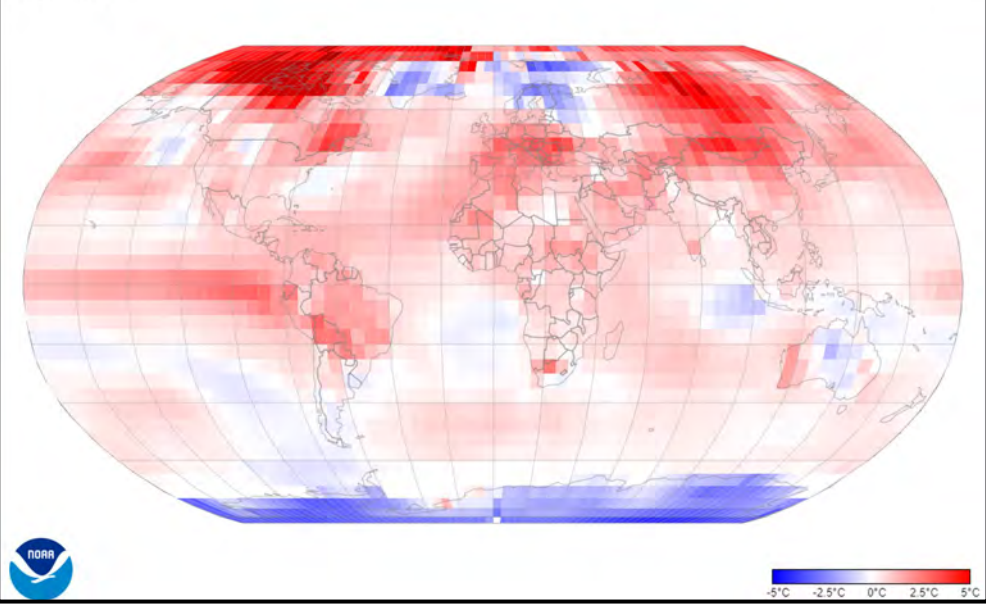
Arizona Cooling Degree Days

July



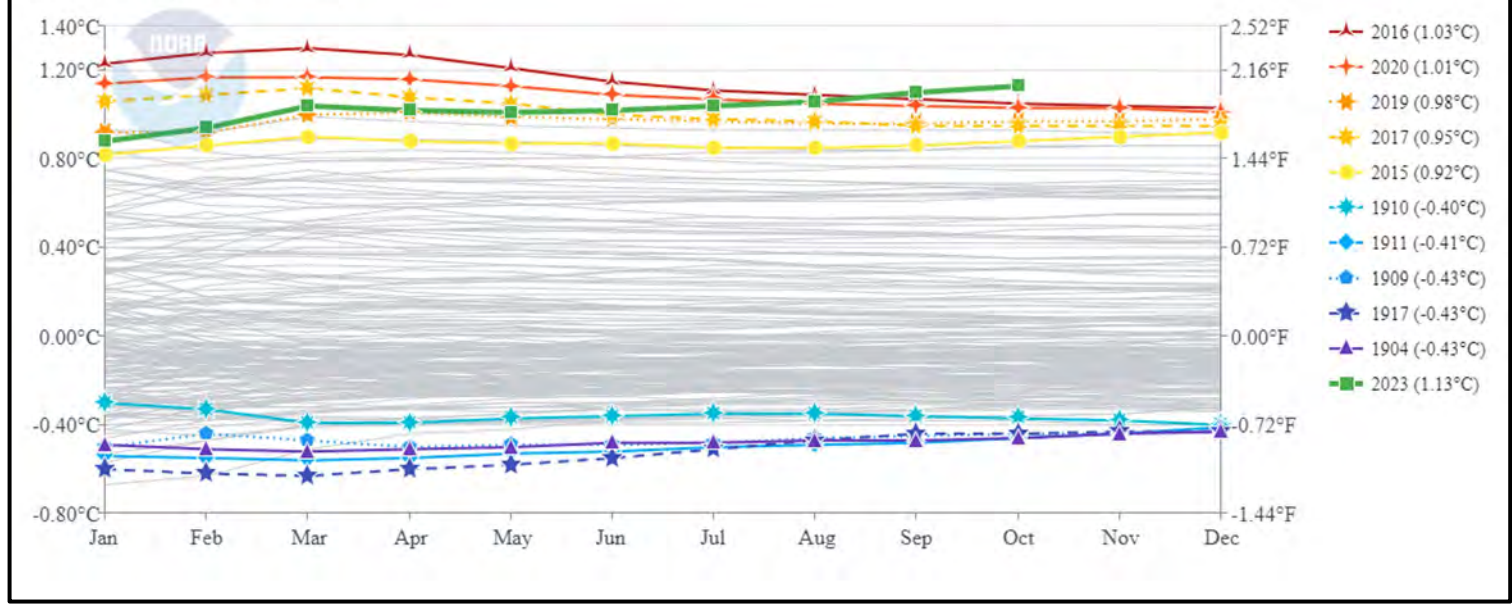
Temperature Anomalies

October 2023



Global Land and Ocean

Year-to-Date Temperature Anomalies





Maps

Animation

Data Info

Maps

Products:

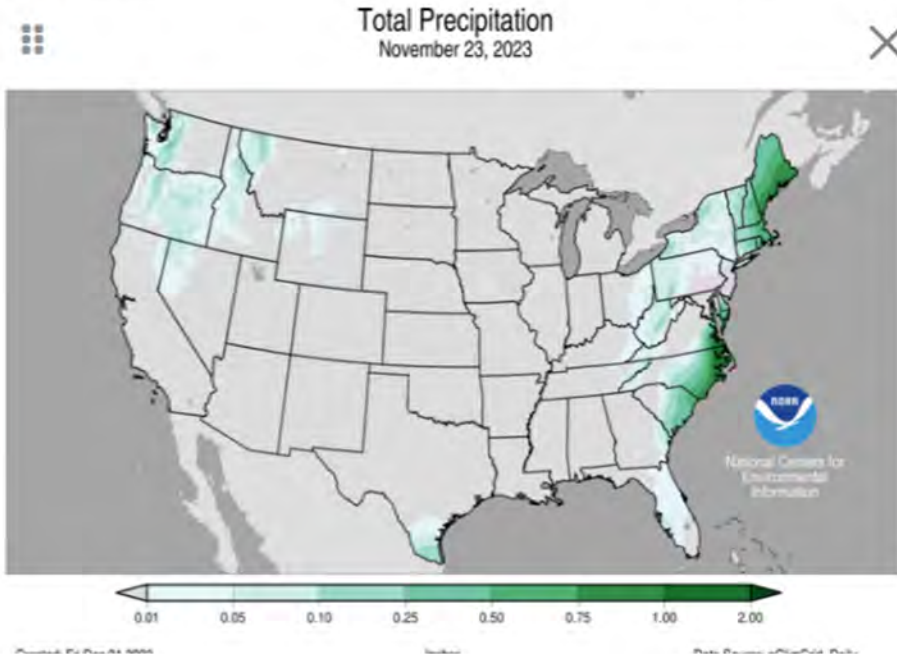
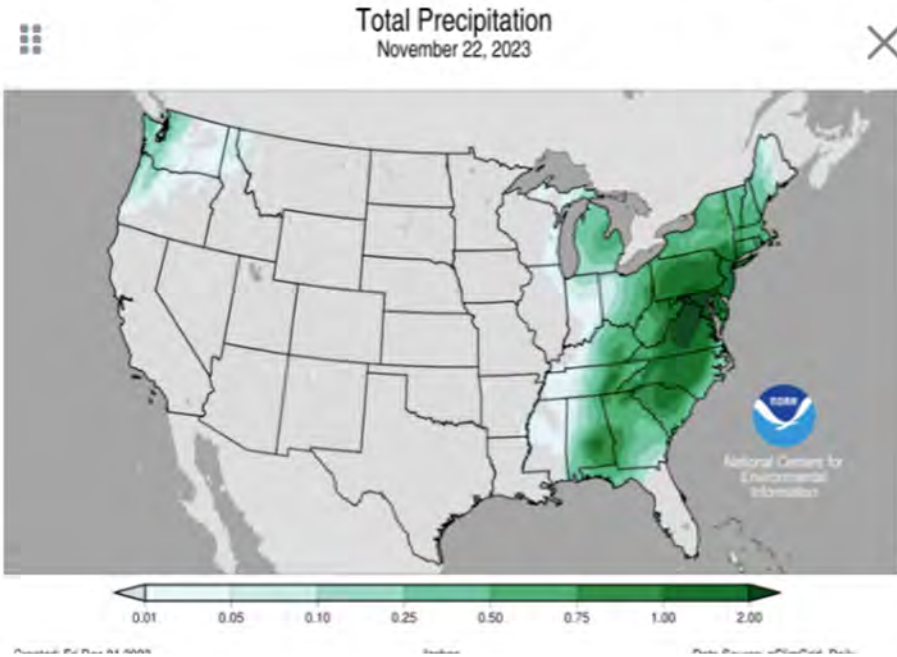
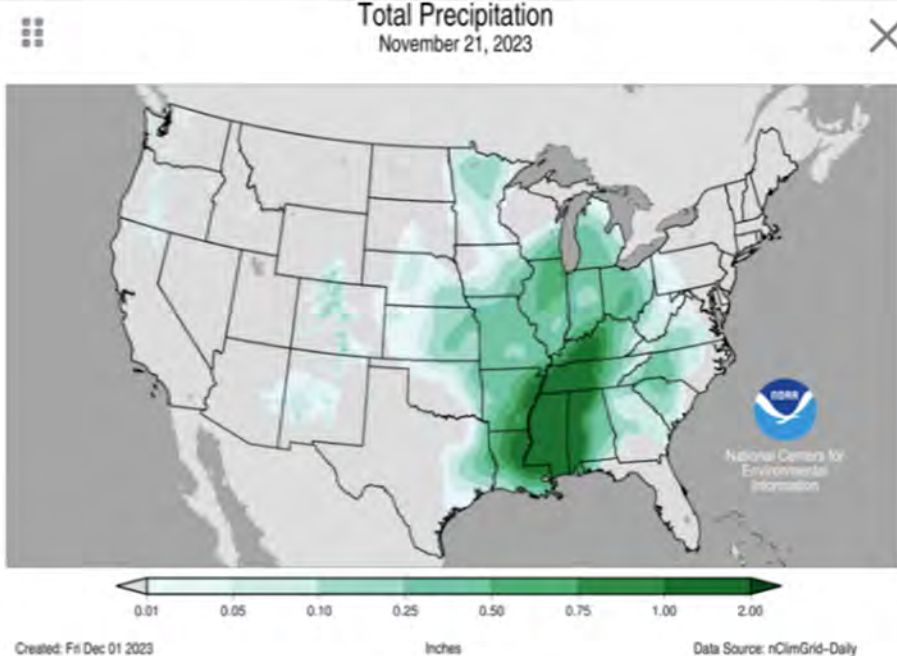
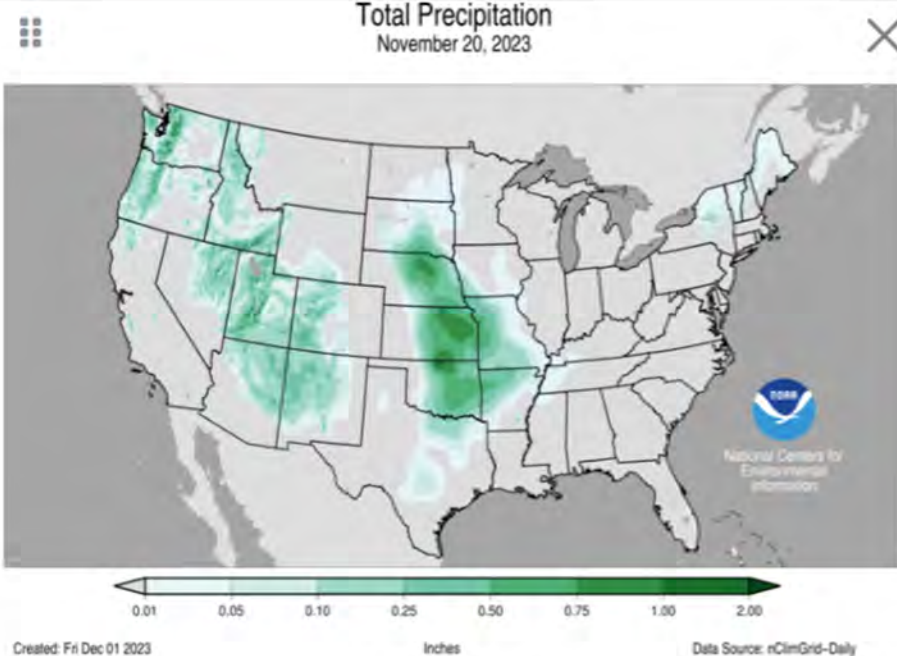
Select All

- County Maximum Temperature
- County Maximum Temperature Anomaly
- County Minimum Temperature
- County Minimum Temperature Anomaly
- County Mean Temperature
- County Mean Temperature Anomaly
- County Total Precipitation

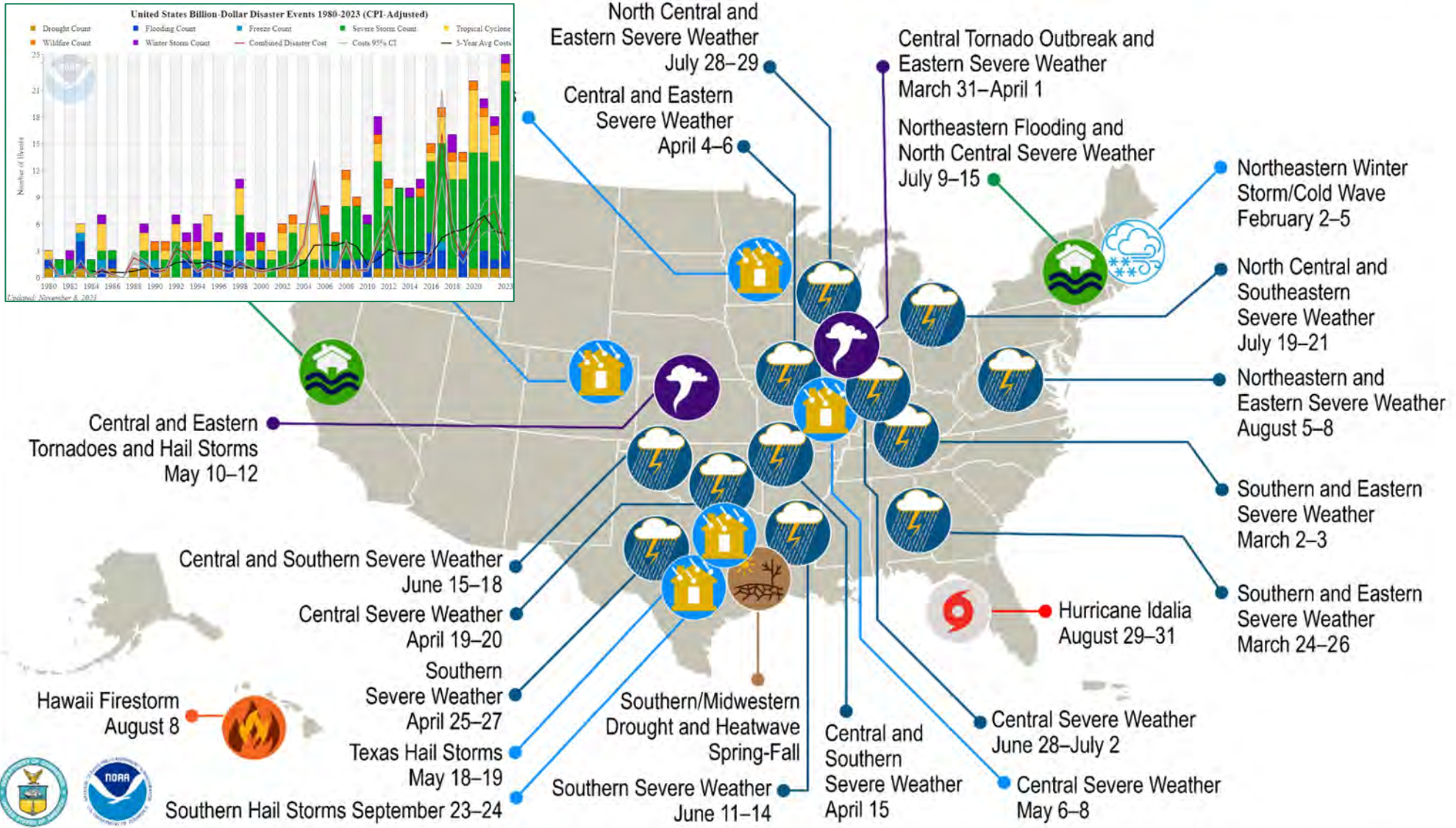
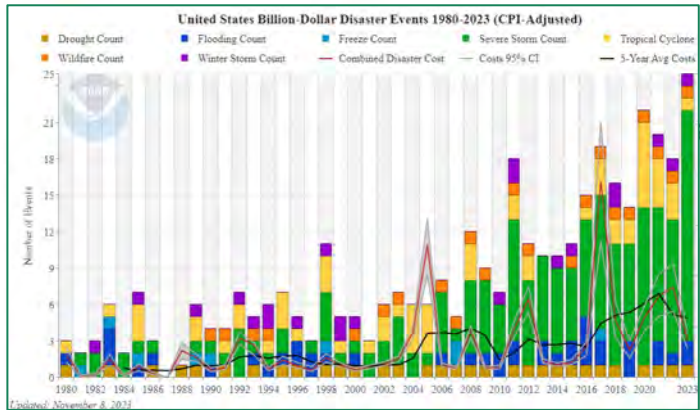
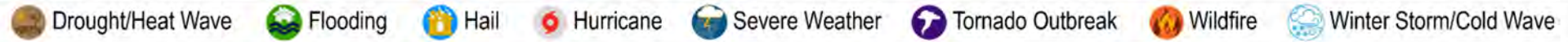
Product Filter

Scope	Region	Parameter	Type
<input type="checkbox"/> National	<input type="checkbox"/> CONUS	<input type="checkbox"/> Temperature	<input type="checkbox"/> Rank
<input type="checkbox"/> Regional	<input type="checkbox"/> Alaska	<input type="checkbox"/> Precipitation	<input type="checkbox"/> Absolute Value
<input type="checkbox"/> Statewide		<input type="checkbox"/> Degree Days	<input type="checkbox"/> Anomalies
<input type="checkbox"/> Divisional			<input type="checkbox"/> % of Normal
<input type="checkbox"/> County			
<input type="checkbox"/> Gridded			

Timescale: Date:



U.S. 2023 Billion-Dollar Weather and Climate Disasters



This map denotes the approximate location for each of the 25 separate billion-dollar weather and climate disasters that impacted the United States through October 2023.



DATA & MAPS

National Current Conditions

November 22, 2023 - November 28, 2023

Almost every region in the U.S. saw improvements to drought or dryness this past week, especially particularly Illinois and Indiana, worsened. And the South/Southeast still needs a lot more precip. U.S. and Puerto Rico and 36.05% of the lower 48 states are in drought, according to the U.S. Drou

30.28%

of the U.S. and 36.05% of the lower 48 states are in drought this week.

↓ 3.7% since last week
↓ 1.3% since last month

250.5 Million

acres of major crops in U.S. are experiencing drought conditions this week.

— 0.0% since last week
↑ 1.7% since last month

92.9 Mill

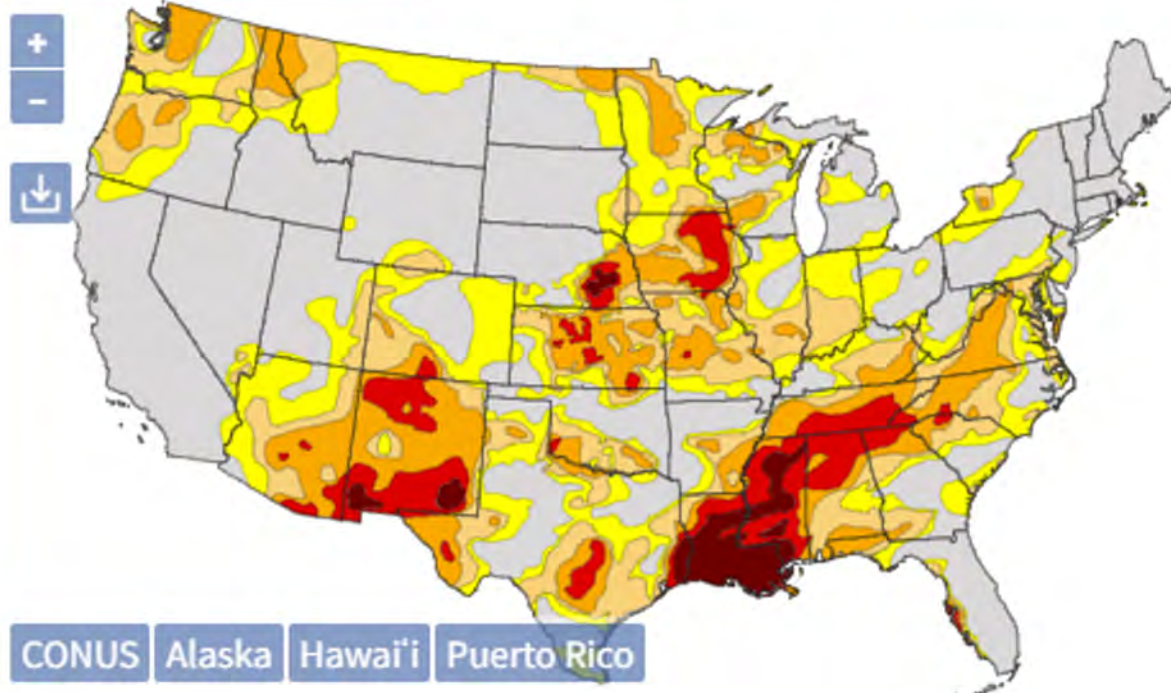
people in the U.S. & Million in the low states are affect drought this w

↓ 4.4% since la
↑ 0.7% since las

Current Conditions and Outlooks

U.S. Drought Monitor

Seasonal (3-Month) Drought Outlook





Fifth National Climate Assessment Update

December 4, 2023

The Fifth National Climate Assessment

The Fifth National Climate Assessment is the US Government's preeminent report on climate change impacts, risks, and responses. It is a congressionally mandated interagency effort that provides the scientific foundation to support informed decision-making across the United States.





Explore Climate Maps from the Assessment

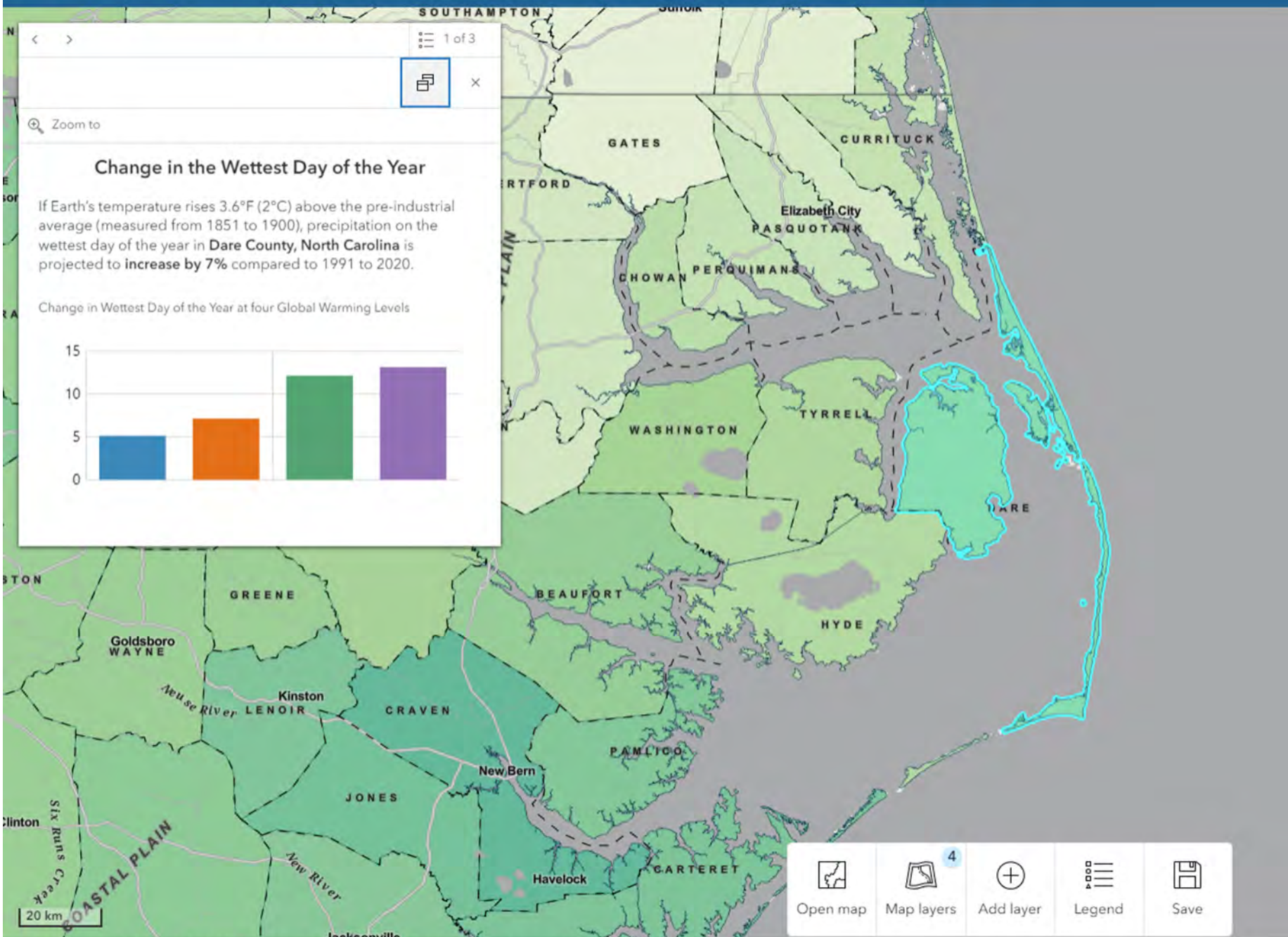
Check climate conditions projected for your region later this century using the NCA Interactive Atlas Explorer.

[Open the Explorer](#)[Learn how to use the Explorer](#)

Learn more about the Global Warming Levels shown in each map.

[About the data](#)

Click the "Open map" button to access the map gallery.



Climate Trends



Climate is changing, and scientists understand why. Long-term changes are evident in many aspects of the climate system. Warming over the United States is higher than the global average.

Extreme events are becoming more frequent and severe. Temperature extremes are changing. Heavy rainfall has increased since the 1950s, mainly in the East. Hurricanes are changing in dangerous ways.

How much the climate changes will depend upon the choices made now. Extreme heat and heavy rainfall will increase. The greater the warming, the greater the impacts.



Portals for Climate Information

Climate.gov

Climate Resilience Toolkit

Climate Explorer

Climate Mapping for Resilience and Adaptation (CMRA)



Office of Oceanic and Atmospheric
Research

December 4, 2023

Ned Gardiner

One NOAA



Launched in 2009 with leadership and contributions from throughout NOAA

FEATURED

Highlights from State of the Climate 2022

NEWS AND FEATURES | SEPTEMBER 5, 2023

U.S. climate outlook for September 2023

SEPTEMBER 1, 2023

How much the United States will reduce its carbon dioxide emissions if China does?

AUGUST 30, 2023

How has El Niño influenced summer precipitation around the world?

AUGUST 24, 2023

September 2023 ENSO Outlook: An El Niño convo

NEWS AND FEATURES | SEPTEMBER 14, 2023

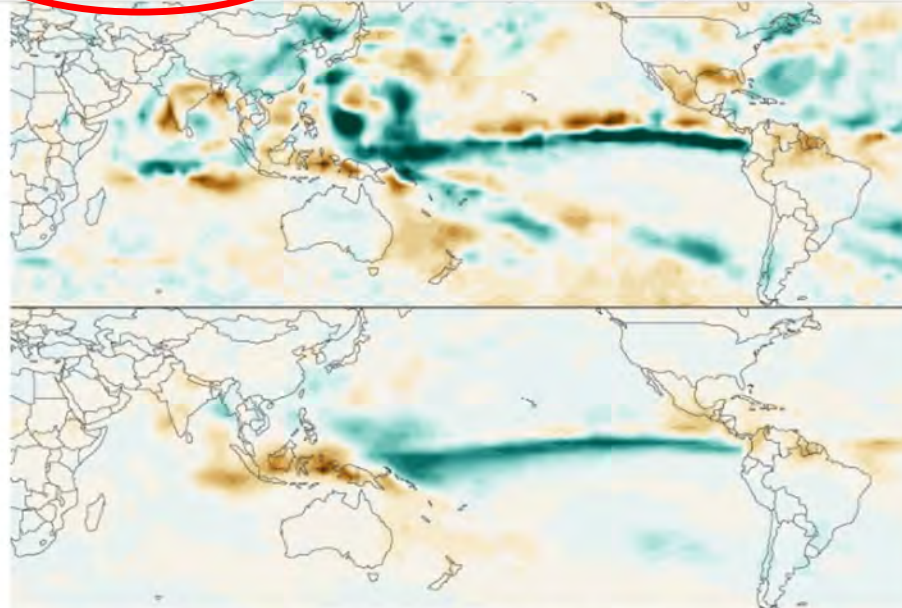
The September 2023 ENSO Outlook predicts El Niño will stick around at least through January-March 2024. But don't just take it from us, hear directly from the Pacific Ocean and tropical atmosphere, who join the blog to answer some questions.

El Niño means an even floodier future is on the coastal horizon

NEWS AND FEATURES | AUGUST 22, 2023

Former Hurricane Hilary brought Southern California its first-ever tropical storm watch

NEWS AND FEATURES | AUGUST 21, 2023



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Does it matter how much the United States reduces its carbon dioxide emissions if China doesn't do the same?

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Historically, how has El Niño influenced summer temperature and precipitation around the world?

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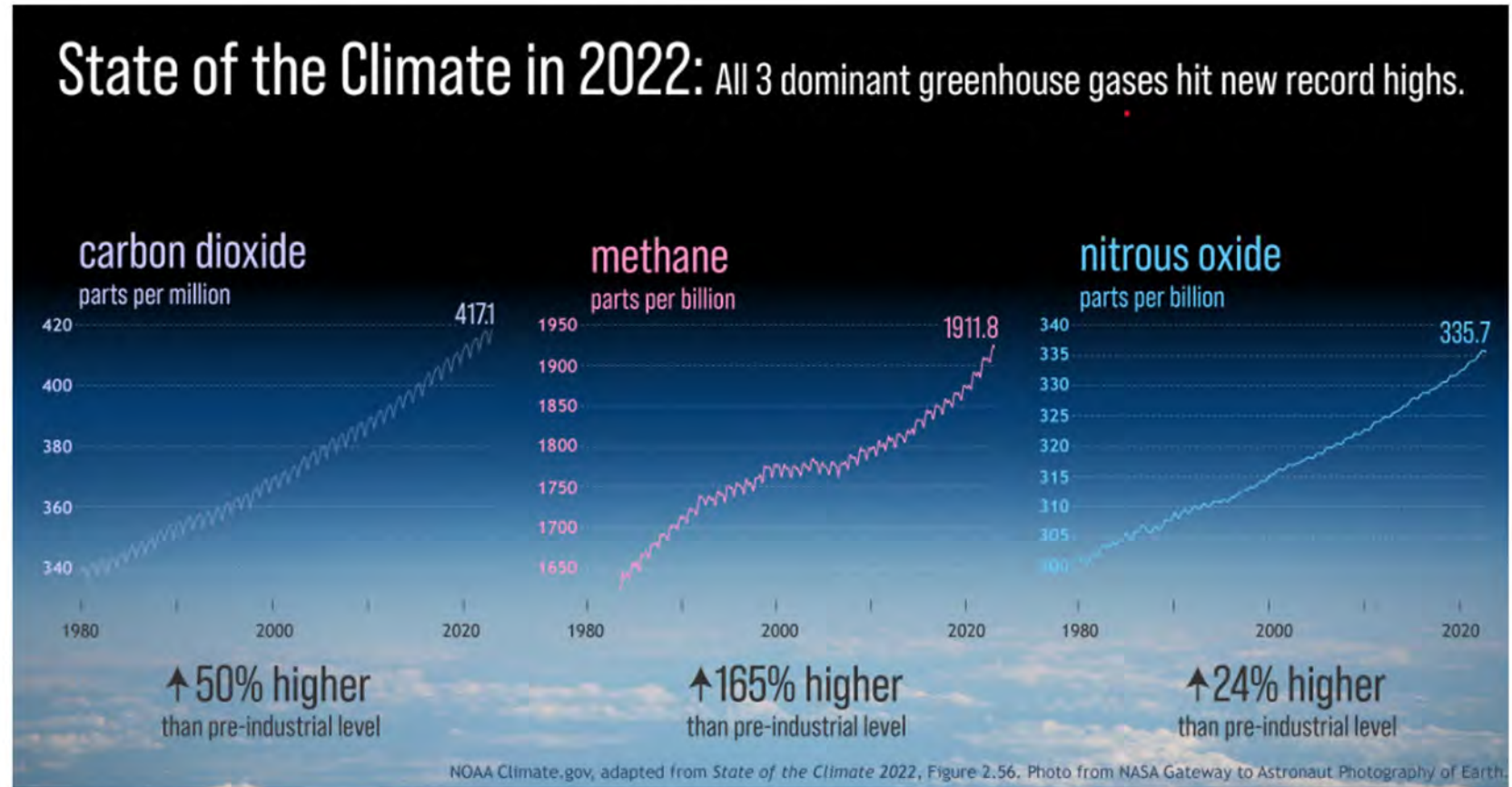
Notable findings from State of the Climate in 2022

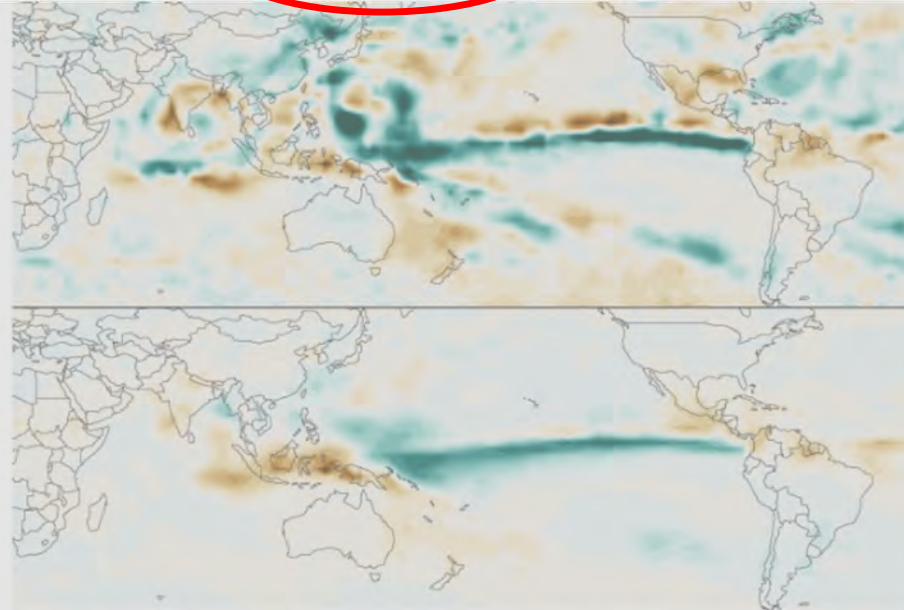
Earth's greenhouse gas concentrations
were the highest on record

Plain language
journalism

Broadens reach of
major climate science
findings

Large audience,
national media





September 2023 ENSO Outlook: An El Niño convo

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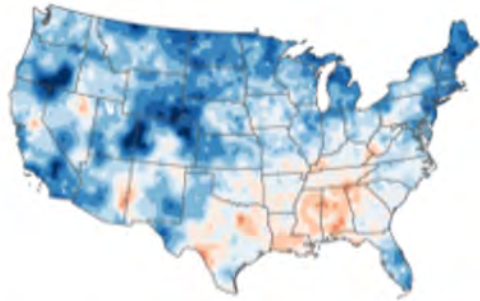
Former Hurricane Hilary brought Southern California its first-ever tropical storm watch

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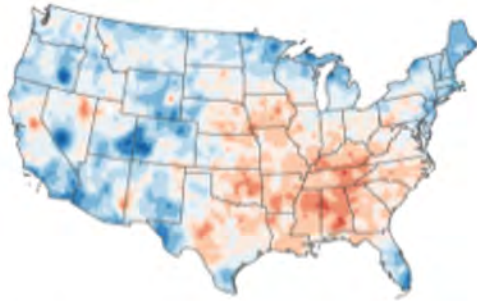
One NOAA
Magazine
Data visualization

Data Visualization

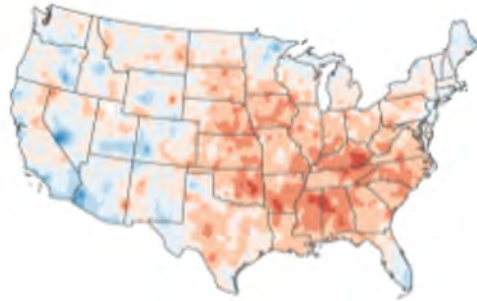
1901-1930



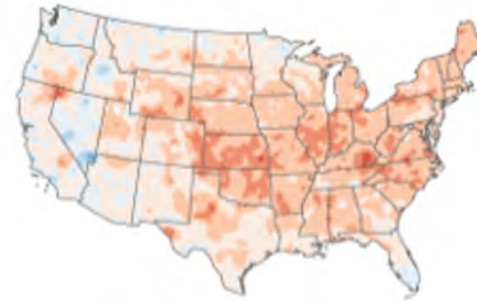
1911-1940



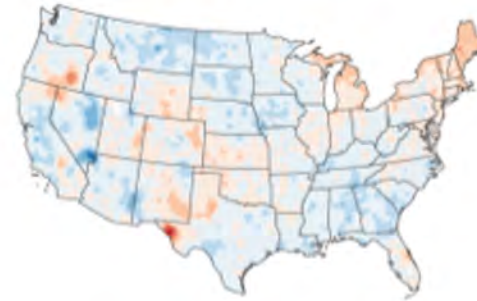
1921-1950



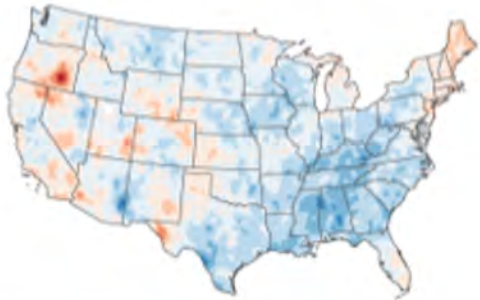
1931-1960



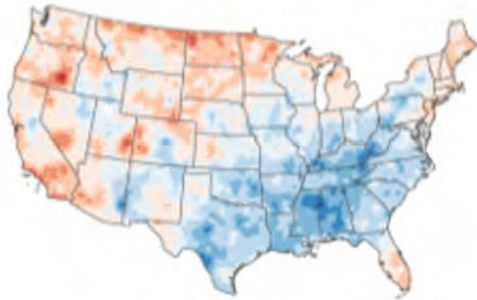
1941-1970



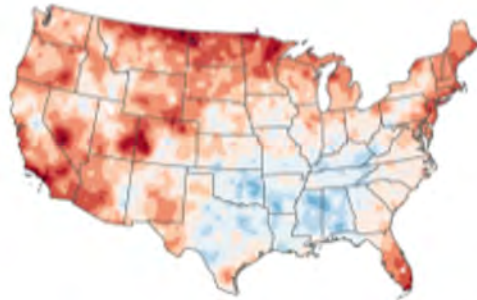
1951-1980



1961-1990



1971-2000



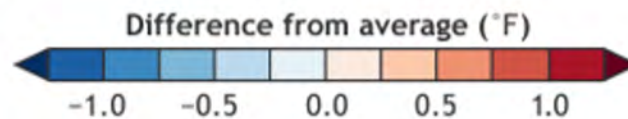
1981-2010



1991-2020



30-year Normal
compared to 1901-2000



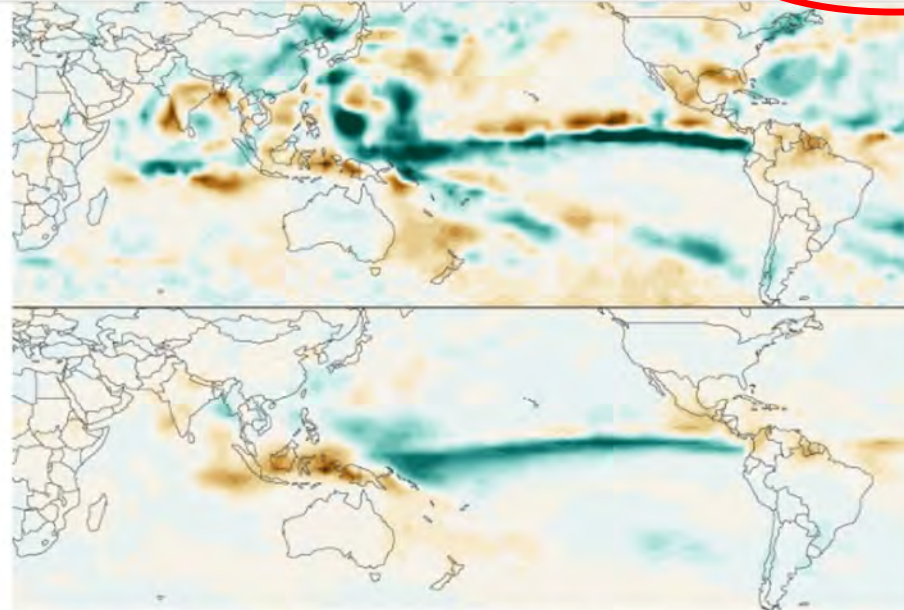
NOAA Climate.gov
Data: NCEI



The Essential Principles of Climate Literacy

One NOAA Magazine
Data visualization
Teachers' resources





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NEWS AND FEATURES | AUGUST 21, 2023

Originally, a section devoted to decision makers.

Subsequently spun off to become the Climate Resilience Toolkit.



Meet the Challenges of a Changing Climate

Learn about potential climate hazards and how you can protect your vulnerable assets.

Manage climate risk with our
[Steps to Resilience >](#)

Read case studies of building
resilience [>](#)

Check conditions projected for
the future [>](#)

[Implementing the Steps to Resilience: A Practitioner's Guide >](#)

[Learn GIS for Climate Resilience >](#)

[Ready-to-Fund Resilience Toolkit >](#)





MORE



Last modified: 3 August 2017 - 10:08am

State Climatologists

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» [National Estuarine Research \(NERR\)](#)

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USDA

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Ellen Mecray, Eastern Region RCSD
 Taunton, MA | [View Website](#)

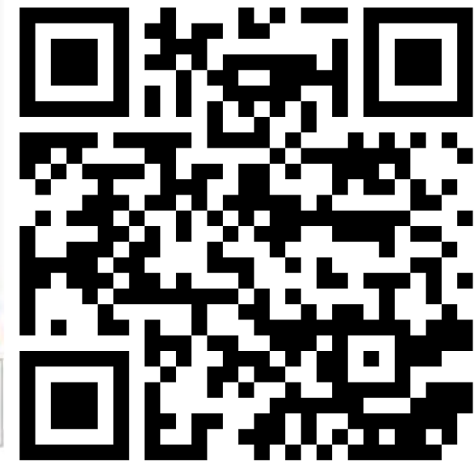
The RCSD mission is to connect people to actionable & trusted climate information by integrating & transforming data into regional products & services, and promoting access to climate information through robust partnership networks.

Area(s) Served: Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, South Carolina, Vermont, Virginia, & West Virginia

+

-

[Lower 48 States](#) | [Alaska](#) | [Pacific Region](#) | [Puerto Rico](#)



Steps to Resilience

- 1 Understand Exposure
- 2 Assess Vulnerability & Risks
- 3 Investigate Options
- 4 Prioritize & Plan
- 5 Take Action



Built upon research about other frameworks and from the practical experiences of our research partners

Case studies

exemplify actions to build resilience



Find Out How People Are Building Resilience



Forests to Faucets
[Watch video >](#)



Building a Bridge to Reduce Risk
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Dune Migration and Shoreline Protection
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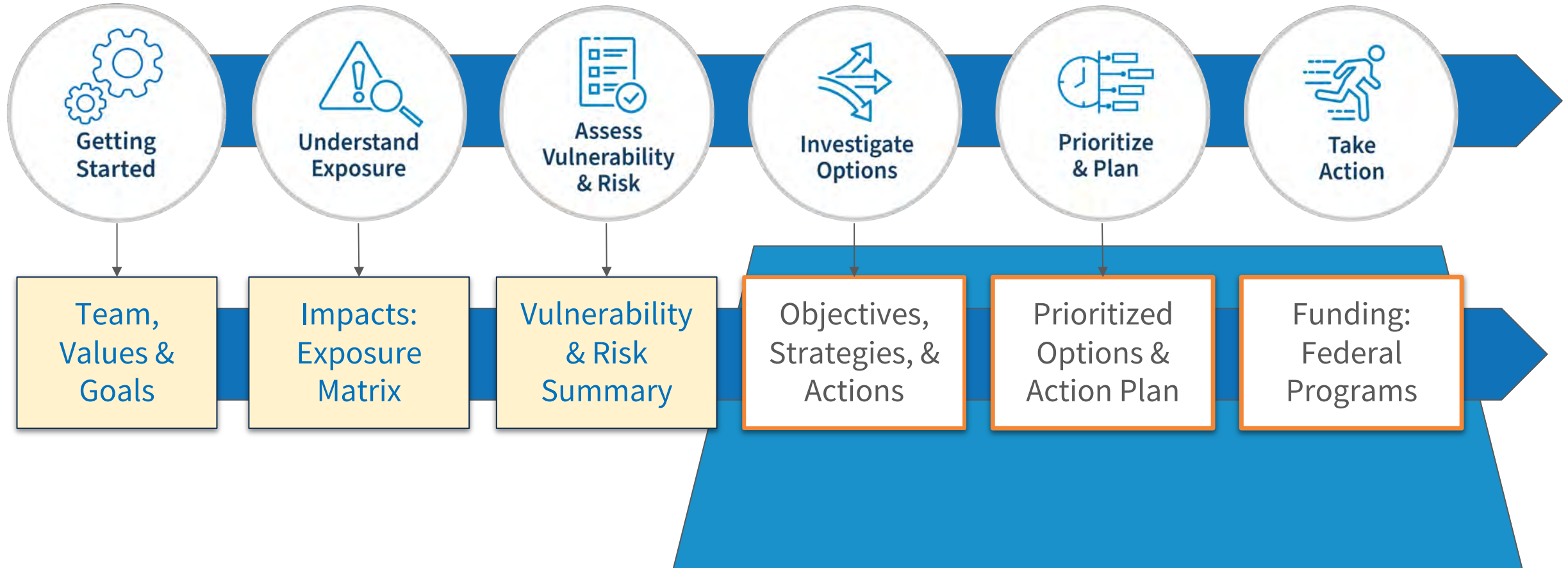
Louisiana's Front Line Defense from Storm and Surge
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Steps to Resilience in Practice



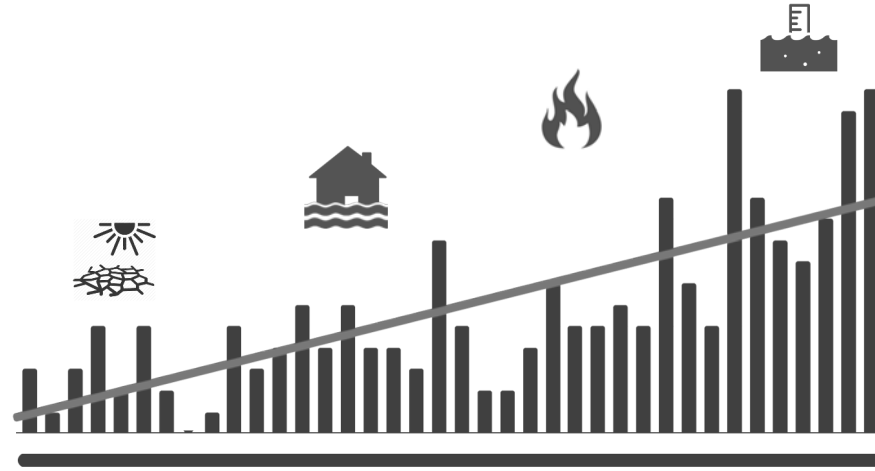
Steps to Resilience

Practical guidance and assistance





GROWING
COMMUNITIES

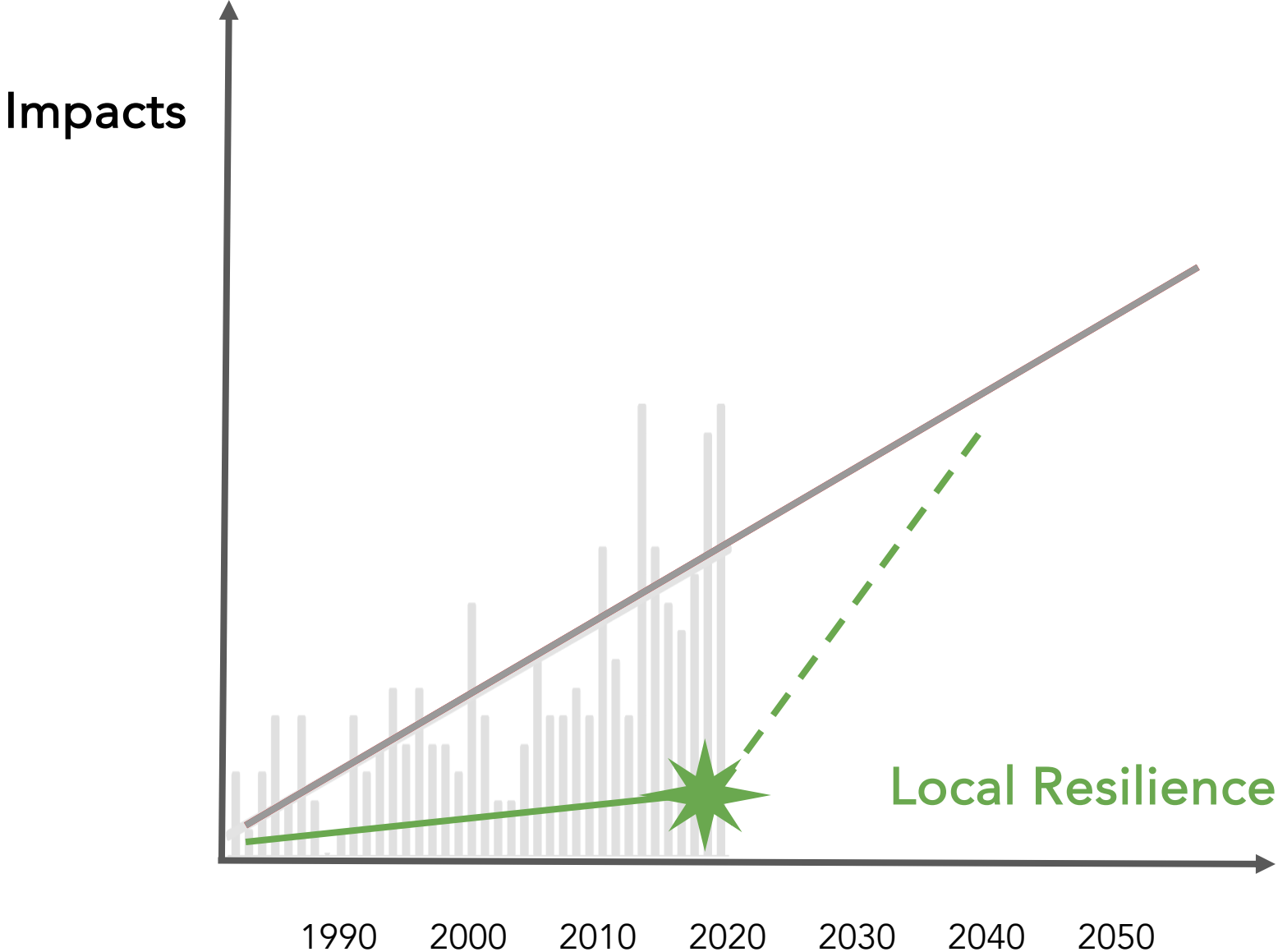


BILLION DOLLAR DISASTERS



INCREASING RISK

When will Resilience Building Catch Up with Climate Change?



From "In Harm's Way..." by John Cleveland and Peter Plastrik, 2021

Climate Practitioners





Ready to start building resilience?

Protect what you care about from climate hazards



[Explore Case Studies and Plans](#) →



[Learn the Steps to Resilience](#) →



[Lead a Resilience Journey](#) →

Announcements

[Where Do We Need Shade?
Mapping Urban Heat Islands in
Richmond, Virginia](#)

 April 20, 2023

[Inflation Reduction Act Resources](#)

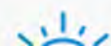
 June 6, 2023

[Where Do We Need Shade?
Mapping Urban Heat Islands in
Richmond, Virginia](#)

 April 20, 2023

[More Announcements](#) →

Important considerations





Filters: Filter 1 Filter 2 [Clear all filters](#)

Sort by

1-10 of 36 results for Data & Tools

Filter By:

Type

[Clear all](#)

- Interactive map
- Data finder
- Planning Guide

[More Types](#)

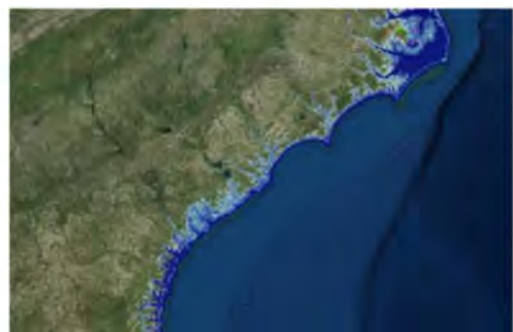
Assets

- Agriculture / Food supply
- Critical Facilities
- Economy

[More Assets](#)

Hazards

- Air pollution
- Blizzard
- Change in growing season



Sea Level Rise Viewer

[More](#) →



AirNow: Air Quality Index (AQI) Monitoring and Forecasts

[More](#) →



Heat Safety Tips

[More](#) →



Sustainable and Climate -



Indigenous Health Indicators Tool



Neighborhoods at Risk

CLIMATE EXPLORER

Explore climate conditions projected for the coming decades for any county in the United States.

Madison, WI in Dane County - Avg Daily Max Temp (°F)

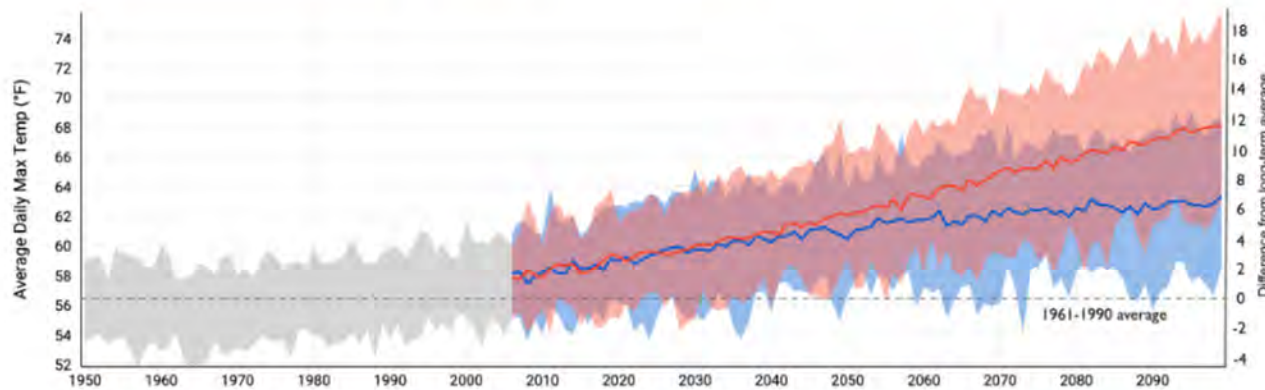
Avg Daily Max Temp (°F)

Chart

Map

Annual

Monthly



1950 2099

Historical Observed

Historical Modeled

Lower Emissions

Higher Emissions

LAUNCH THE CLIMATE EXPLORER >

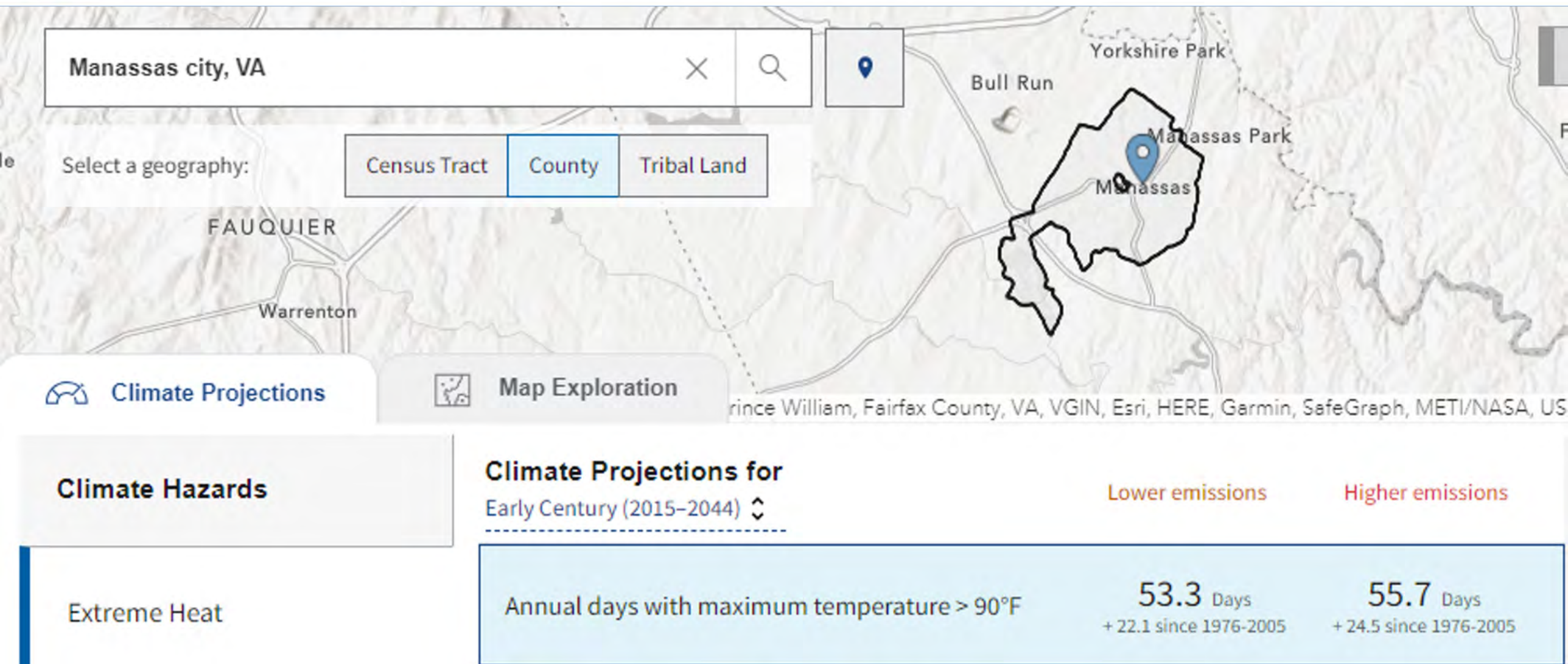
ACCESS AN INTRODUCTORY
VERSION OF THE CLIMATE
EXPLORER >

<https://toolkit.climate.gov/#climate-explorer>



Climate Mapping for Resilience and Adaptation

<https://resilience.climate.gov/>



<https://resilience.climate.gov>



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Understanding Climate Risk - Resources for NTIA Applicants



<https://toolkit.climate.gov/content/understanding-climate-risk-resources-ntia-applicants>

Get in touch

noaa.toolkit@noaa.gov

Ned Gardiner
NOAA Climate Program Office

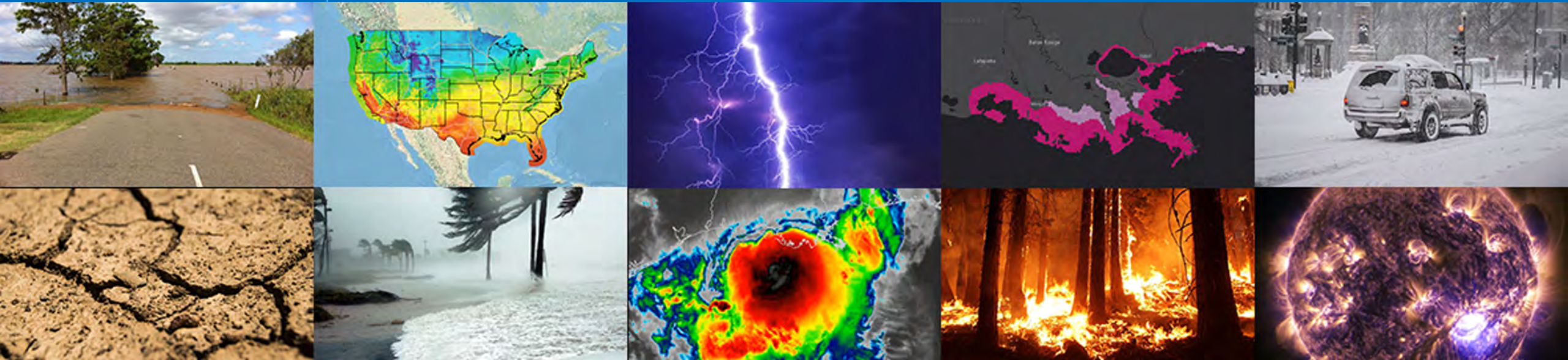


**NATIONAL
WEATHER
SERVICE**

NWS Climate Services

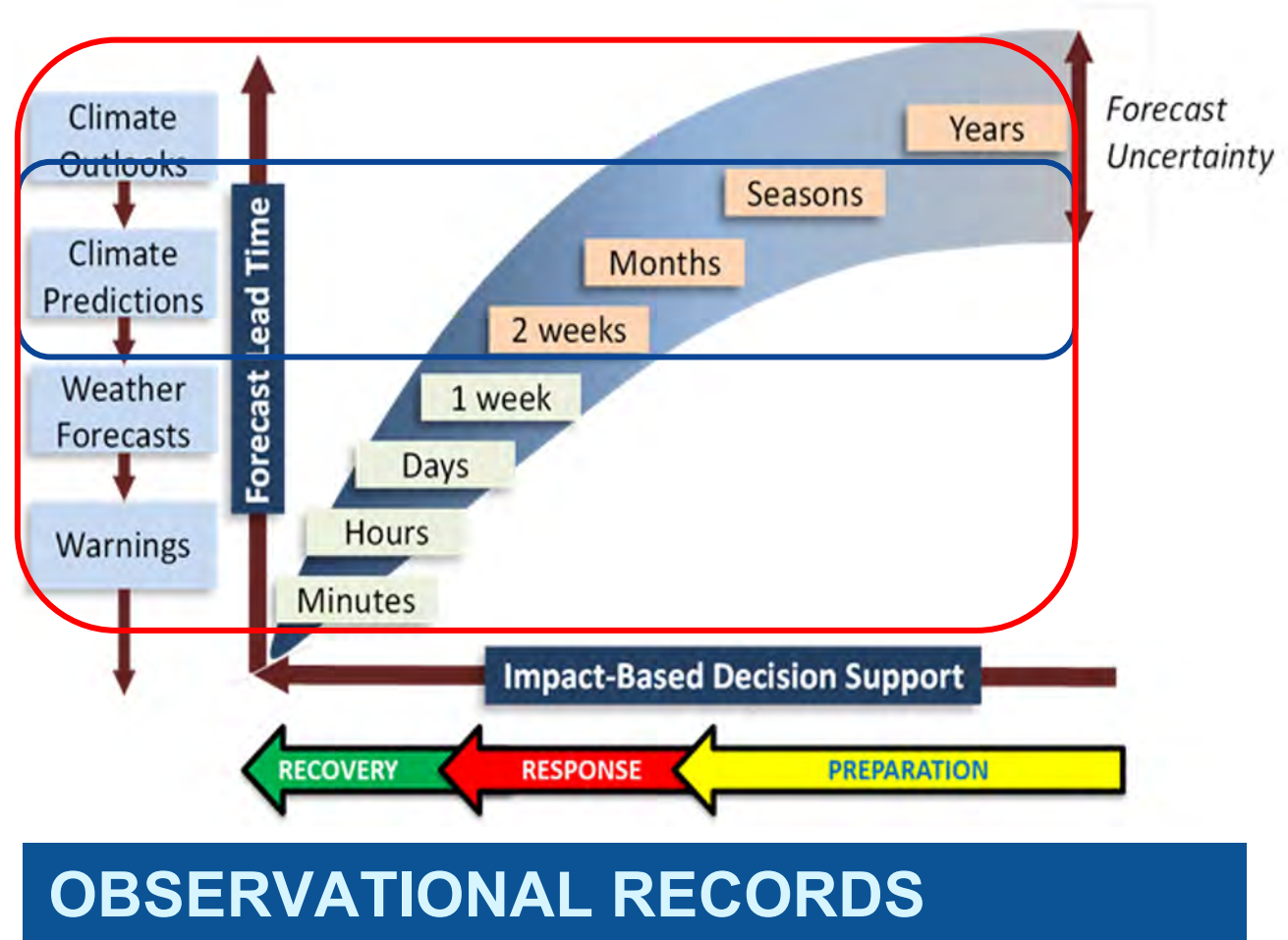
December 4, 2023

Andrea Bair - NOAA/NWS Western Region



NWS Climate Services Program Vision

“A timely, accurate, and reliable NWS suite of subseasonal to seasonal monitoring and prediction products using trusted data, state-of-the-art models, and advances in physical and social sciences, to provide impact-based decision support services in easy-to-understand formats from highly-trained, professional staff for preparedness, response, and climate-related risk reduction.”



Climate Data Services

With our partners at NCEI and Regional Climate Centers



Data reporting tools
Data management tools
Data access tools

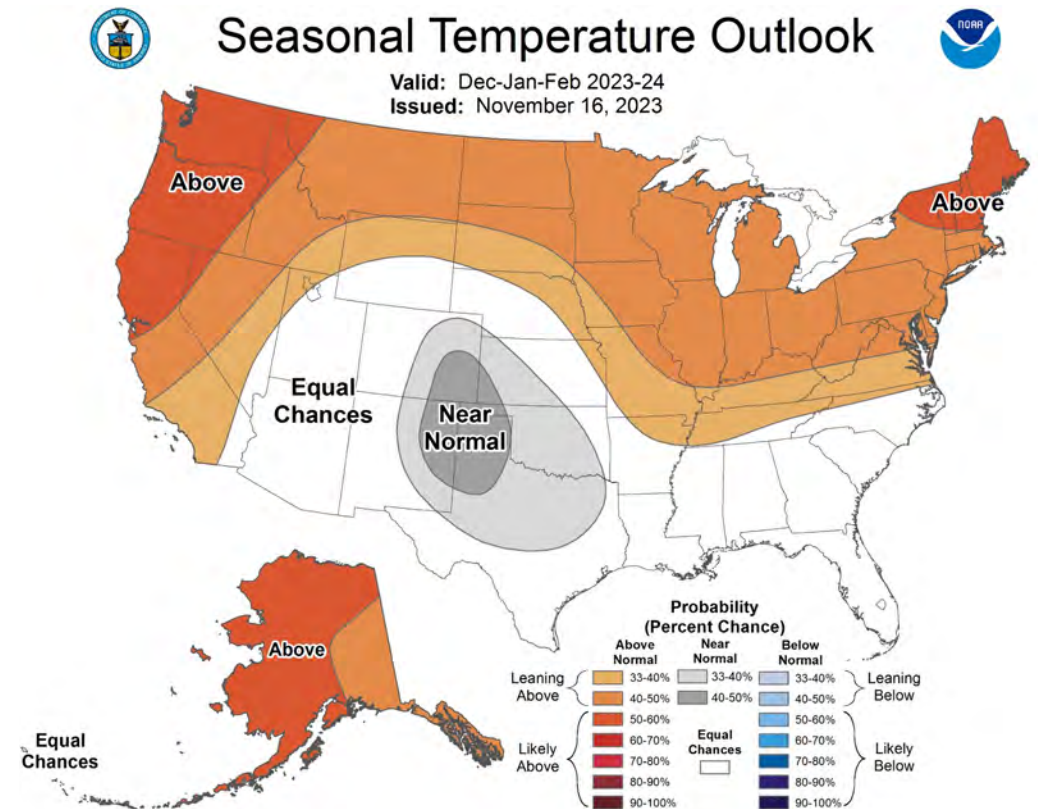
- <https://www.weather.gov/wrh/climate>
- Click on the map
- “NOWData” comes up automatically
- Many available sites and parameters



Climate Prediction Center

Deliver real-time products and information that predict and describe climate variations on timescales from weeks to year(s) thereby promoting effective management of climate risk and a climate-resilient society.

- Focus: weeks, months, seasons, years (i.e. **short term climate**)
- Integral to NWS Seamless Suite of Products
- Valuable resource for NOAA's efforts to deliver climate services
- Provides strong name recognition in international efforts

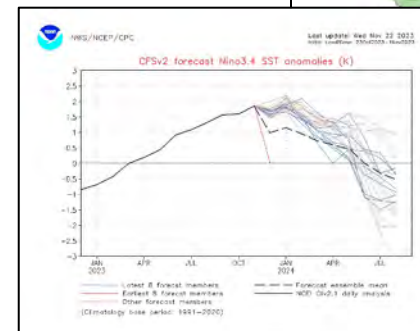
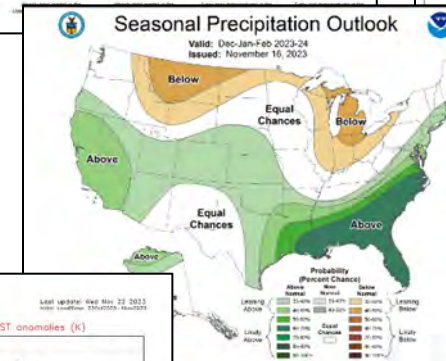
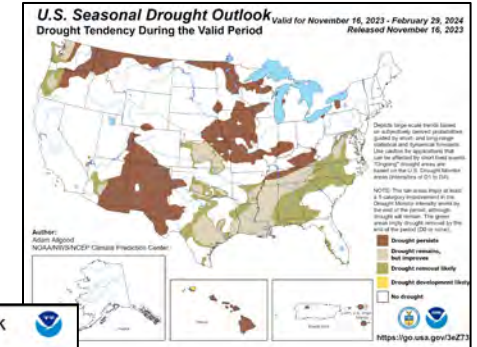
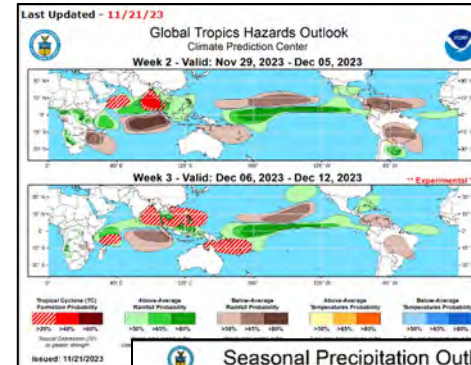




Climate Prediction Products



- 6-10 Day & 8-14 Day Precipitation & Temperature Outlooks
- 8-14 Day Hazards Outlooks
- Global Tropics Hazards Outlooks
- Monthly/Seasonal Precipitation & Temperature Outlooks
- Monthly/Seasonal Drought Outlooks
- Seasonal Hurricane Outlooks
 - Atlantic & Pacific
- Monthly ENSO Prediction
- Week 2 Heat Outlooks
- Week 3-4 Temperature & Precipitation Outlooks
- Arctic Sea Ice Forecasts



- * **Dynamical Models**
- Climate Forecast System
- Global Forecast System
- ECMWF
- NMME

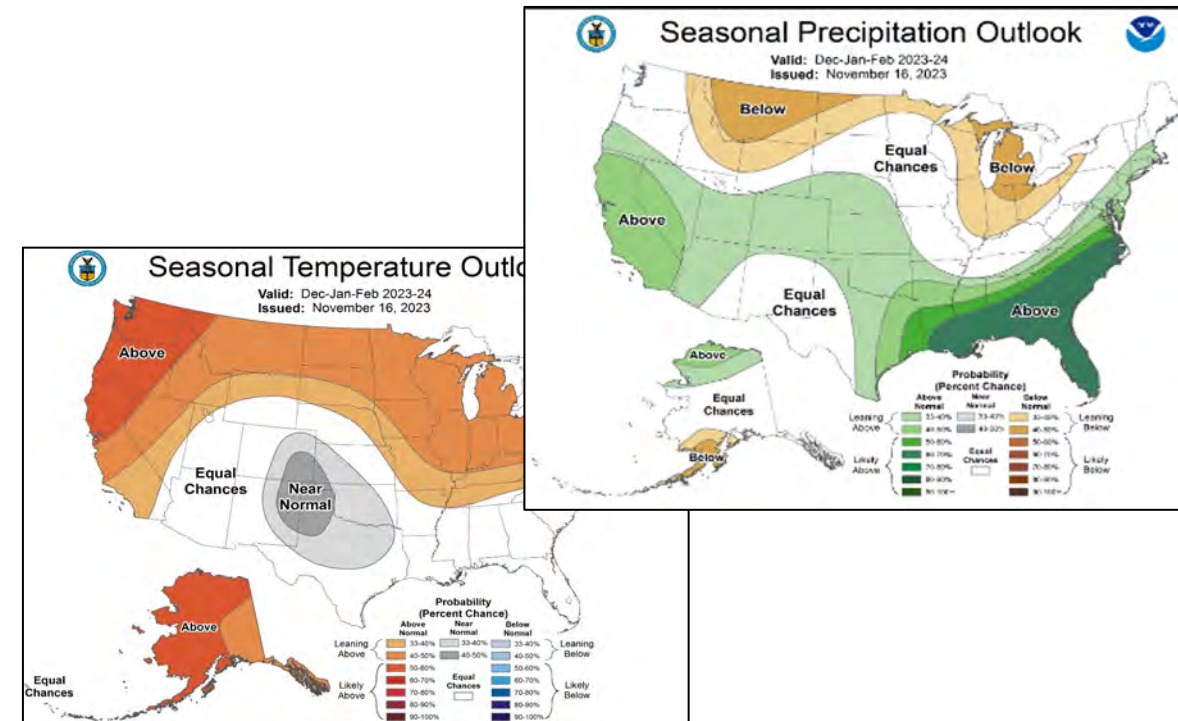
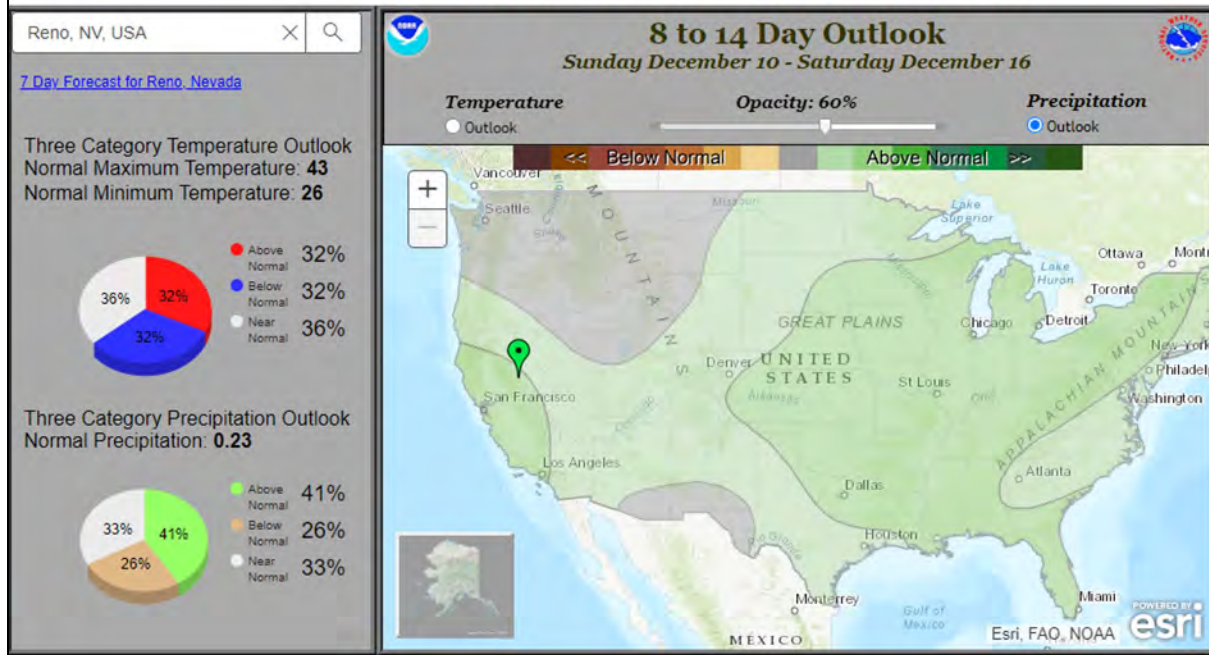


Temperature and Precipitation Outlooks



6-10 Day Outlook (Interactive) Temperature Precipitation	One Month Outlook (Interactive) Temperature Precipitation
8-14 Day Outlook (Interactive) Temperature Precipitation	Three Month Outlook (Interactive) Temperature Precipitation
Week 3-4 Outlooks Temperature Exp. Precipitation	8-14 Day U.S. Hazards Outlook Composite Probabilistic: Temp Precip Snow Wind
U.S. Drought Information Monitor Monthly Outlook Seasonal Outlook	Global Tropics Hazards Outlook Weeks 2 and 3

INTERACTIVE DISPLAY - UPDATED: 02 DEC 2023

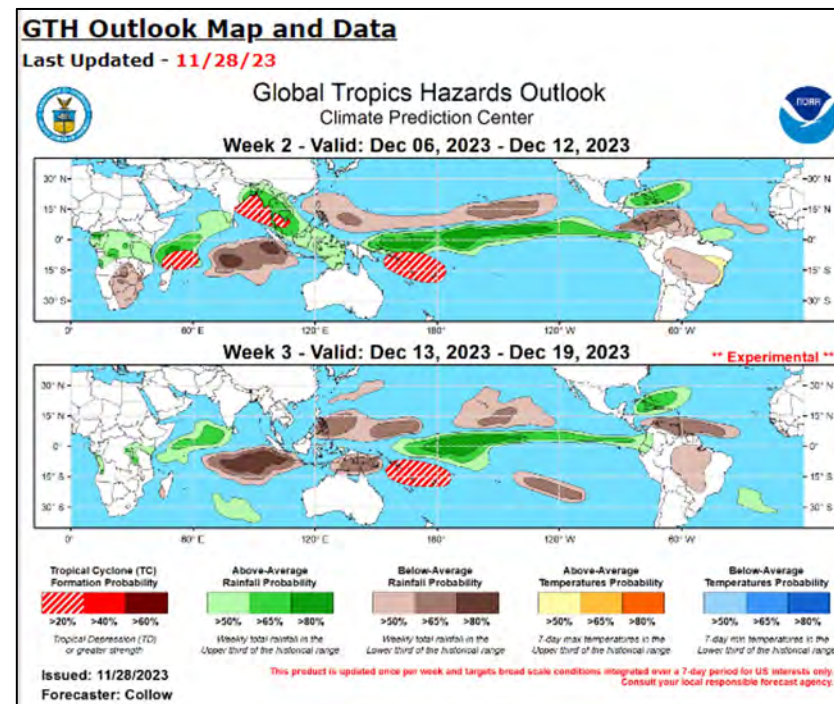
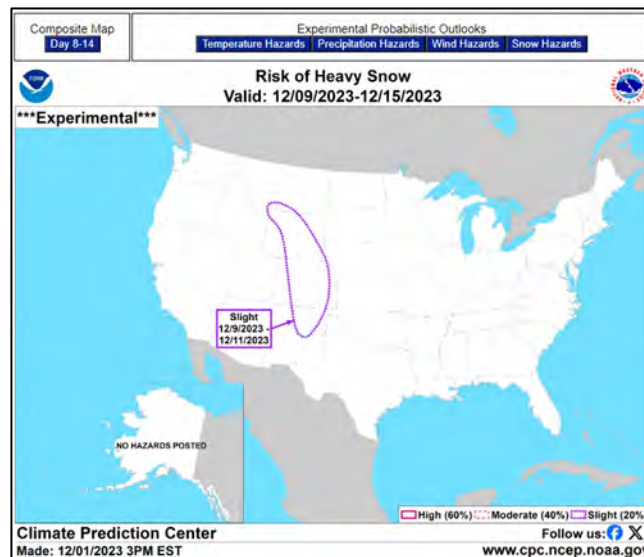
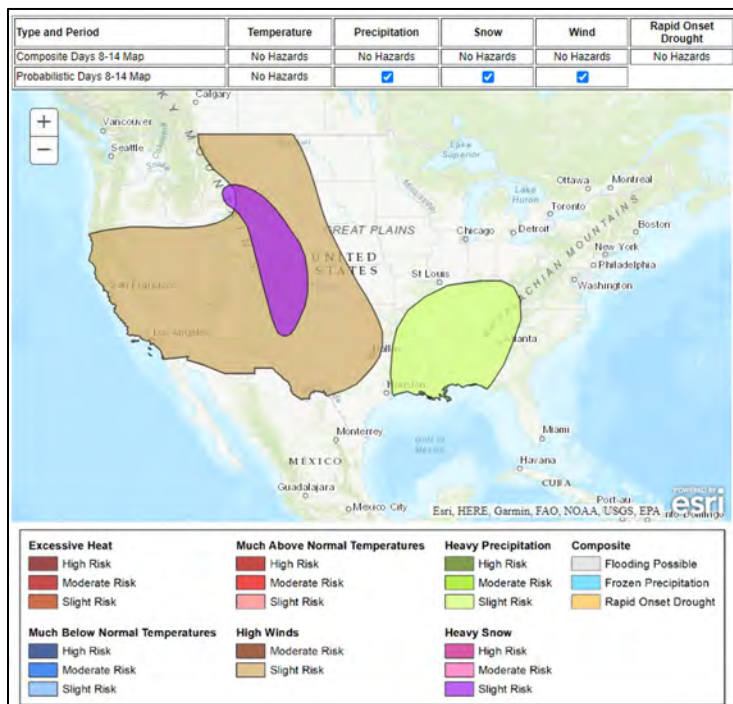




8-14 Day Hazards Outlooks



6-10 Day Outlook (Interactive) Temperature Precipitation	One Month Outlook (Interactive) Temperature Precipitation
8-14 Day Outlook (Interactive) Temperature Precipitation	Three Month Outlook (Interactive) Temperature Precipitation
Week 3-4 Outlooks Temperature Exp. Precipitation	8-14 Day U.S. Hazards Outlook Composite Probabilistic: Temp Precip Snow Wind
U.S. Drought Information Monitor Monthly Outlook Seasonal Outlook	Global Tropics Hazards Outlook Weeks 2 and 3

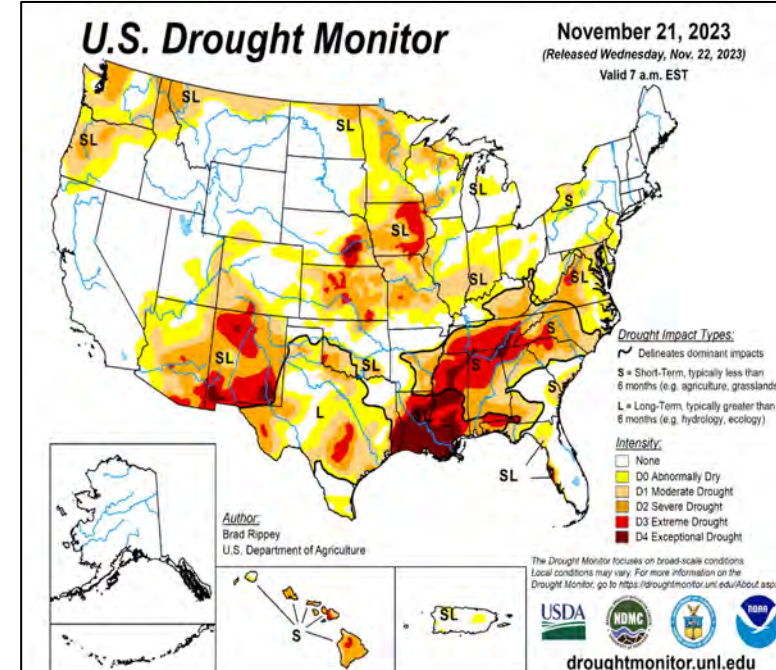
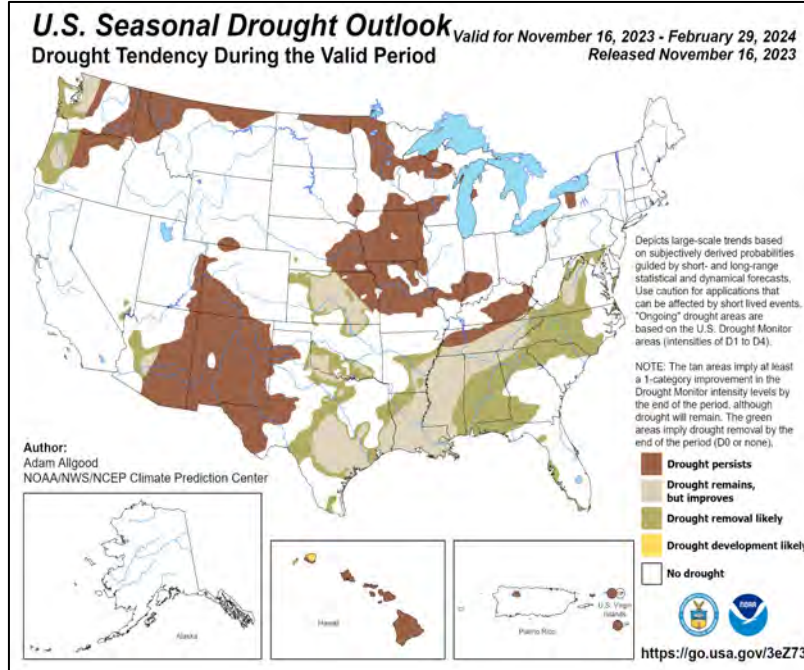
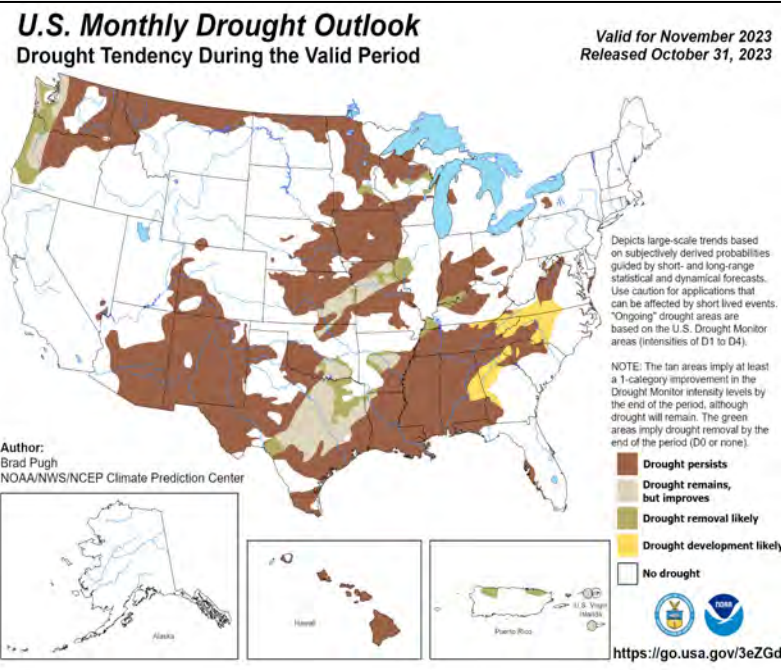




Drought



6-10 Day Outlook (Interactive) Temperature Precipitation	One Month Outlook (Interactive) Temperature Precipitation
8-14 Day Outlook (Interactive) Temperature Precipitation	Three Month Outlook (Interactive) Temperature Precipitation
Week 3-4 Outlooks Temperature Exp. Precipitation	8-14 Day U.S. Hazards Outlook Composite Probabilistic: Temp Precip Snow Wind
U.S. Drought Information Monitor Monthly Outlook Seasonal Outlook	Global Tropics Hazards Outlook Weeks 2 and 3





El Niño/La Niña Information

National Weather Service
Climate Prediction Center

<https://www.cpc.ncep.noaa.gov/>

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Climate News

- NOAA Issues Winter Outlook (19 Oct 2023)
- El Niño is anticipated to continue through the Northern Hemisphere spring (with a 62% chance during April-June 2024) (09 Nov 2023)
- 48th Climate Diagnostics and Prediction Workshop Announcement (6 Apr 2023)

<https://www.ncei.noaa.gov/access/monitoring/enso/>

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<https://www.climate.gov/news-features/blogs/enso>

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ENSO BLOG

A blog mostly about monitoring and forecasting El Niño, La Niña, and their regional and global impacts...but sometimes about other climate phenomena that influence seasonal climate.

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ENSO BLOG | NOVEMBER 30, 2023 | COMMENTS: 4

How does El Niño influence winter precipitation over the United States?

BY NAT JOHNSON

National Centers for Environmental Information
 NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

El Niño/Southern Oscillation (ENSO)

Search Monitoring Products

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November U.S. Release: Fri, 8 Dec 2023, 11:00 AM EST

Introduction | Discussion | Definitions | SOI | SST | OLR | Resources

Introduction

El Niño and the Southern Oscillation, also known as ENSO is a periodic fluctuation (i.e., every 2–7 years) in sea surface temperature (El Niño) and the air pressure of the overlying atmosphere (Southern Oscillation) across the equatorial Pacific Ocean. The presence of an El Niño, or its opposite – La Niña – sufficiently modifies the general flow of the atmosphere to affect normal weather conditions in many parts of the world. [Learn More...](#)

CPC Synopsis

El Niño is anticipated to continue through the Northern Hemisphere spring (with a 62% chance during April-June 2024). [More information...](#)

NOAA Coral Reef Watch Daily 5km SST Anomalies (v3.1) 2 Dec 2023



Helpful NOAA Websites



- Weather.gov
- Climate.gov
- Drought.gov
- Heat.gov

Drought.gov
National Integrated Drought Information System

Expanded Drought.gov Tool Visualizes Historical Drought Conditions by County, State

The U.S. Drought Portal's Historical Data and Conditions Tool allows users to visualize historical drought data for their state or county through an interactive map and time series graph. Recently, NIDIS and NCEI expanded this tool, making it easier to visualize and share historical data.

FEATURED NEWS AND ARTICLES

- Webinar Recap: 2023 Southern U.S. Drought & Heat
- Recap: Special ACF/ACT River Basin Drought Webinar
- NIDIS, CSKT Host Workshop on Building Drought Resilience

NATIONAL WEATHER SERVICE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE

Winter Storm and Heavy Rain Impact Portions of the West. Rain across the Southeast shifts into the Mid-Atlantic on Sunday.

Heavy rain, high elevation snow, and high winds will continue in the Pacific Northwest. Rockies and parts of the Great Basin through the weekend. Siver flooding, basin flooding, and debris flows will also be possible near recent burn scars. Strong storms with heavy downpours will impact the Gulf Coast into the Southeast through Sunday morning. Rain then enters the Mid-Atlantic by the afternoon. [View Details](#)

WRN

Customize Your Weather.gov

City:

Get Weather

ACTIVE ALERTS FORECAST MAPS RADAR RIVERS, LAKES, RAINFALL AIR QUALITY SATELLITE PAST WEATHER

Created: 12/10/23 at 15:41 UTC

Click on the map above for detailed alerts or [Warnings By State](#) [Public Alerts in 15-Min Grids](#) [1-2 week forecast](#)

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- Meet five NOAA lead authors for the new National Climate Assessment
NEWS AND FEATURES | NOVEMBER 14, 2023
- S(no)w pain, S(no)w gain: How does El Niño affect snowfall over North America?
NEWS AND FEATURES | OCTOBER 26, 2023
- U.S. climate outlook for November 2023
NEWS AND FEATURES | NOVEMBER 2, 2023
- November 2023 El Niño update: transport options
NEWS AND FEATURES | NOVEMBER 9, 2023
- Drought parches the central Amazon in October 2023
NEWS AND FEATURES | OCTOBER 30, 2023
- Antarctic ozone hole yearly maximum extent 12th-largest on record
NEWS AND FEATURES | NOVEMBER 1, 2023

Fifth National Climate Assessment: Climate change impacts are increasing for Americans
NEWS AND FEATURES | NOVEMBER 22, 2023

HEAT.gov
National Integrated Heat Health Information System

Home News & Events Learn Urban Heat Islands Tools & Information At Risk Groups Planning & Preparing Funding Opportunities About

Welcome to HEAT.gov

Heat related illnesses and death are largely preventable with proper planning, education, and action. Heat.gov serves as the premier source of heat and health information for the nation to reduce the health, economic, and infrastructural impacts of extreme heat.

Heat.gov is the web portal for the National Integrated Heat Health Information System (NIHHIS)

News

- White House releases Extreme Heat Fact Sheet
- HHS Office of Climate Change & Health Equity Launches Climate and Health Outlook Portal
- HHS and NHTSA launch national dashboard to track heat-related illness

Tools & Information

Who is at Risk to Extreme Heat

Climate and Health Outlook



Thank You!!

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Ned Gardiner: ned.gardiner@noaa.gov
Andrea Bair: andrea.bair@noaa.gov

December 4, 2023



Western Regional Partnership

WRPINFO.ORG