

Adapting to Climate: A Sampling of NOAA's Actions Relevant to the Water Resource Sector

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Advisory Committee on Water Information
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Overview

Examples of key NOAA accomplishments (2013) and actions planned (2014)

1. NOAA's Climate Strategy
2. Examples of NOAA's Recent Activities and Actions

NOAA's Climate Strategy



Core Societal Challenges & Capabilities

Climate Societal Challenges

Initial climate science and services areas to meet private and public sector challenges

Sustainability of
Marine
Ecosystems

Coasts and
Climate
Resilience

Climate Impacts
on Water
Resources

Weather and
Climate
Extremes

Partners

International
Federal
DOC/NOAA
State/Local
Academic
NGOs
Private Sector

Climate Core Capabilities



Observing Systems, Climate Monitoring, and Data Stewardship



Understanding and Modeling



Predictions and Projections



Assessments



Integrated Service Development and Decision Support



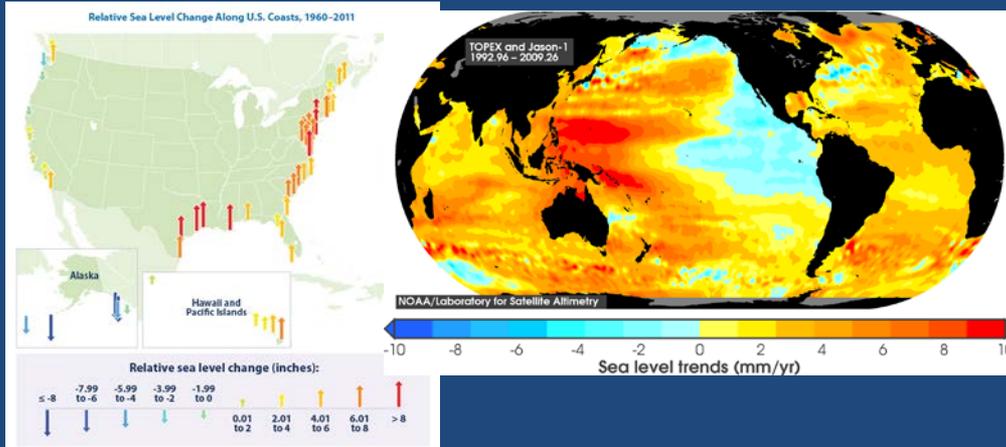
Communication and Education

Research

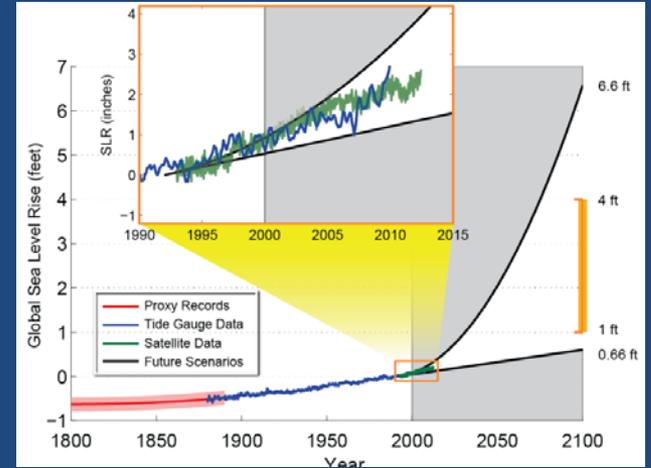
Services

Coastal Inundation

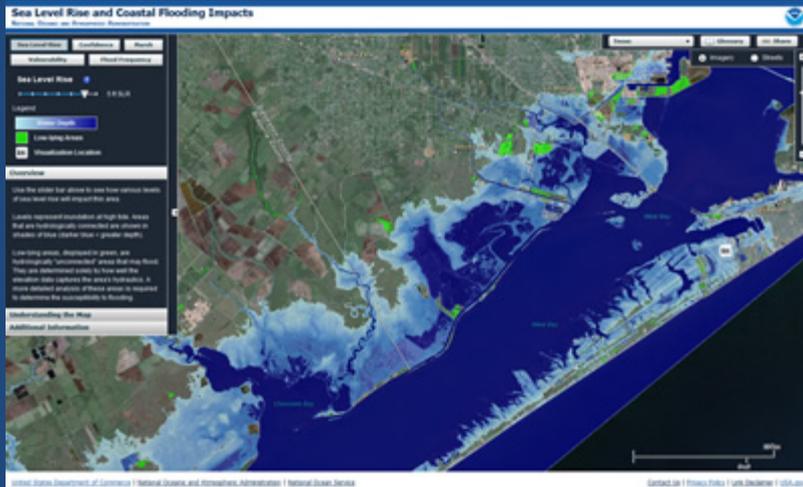
Observations – In situ and satellite



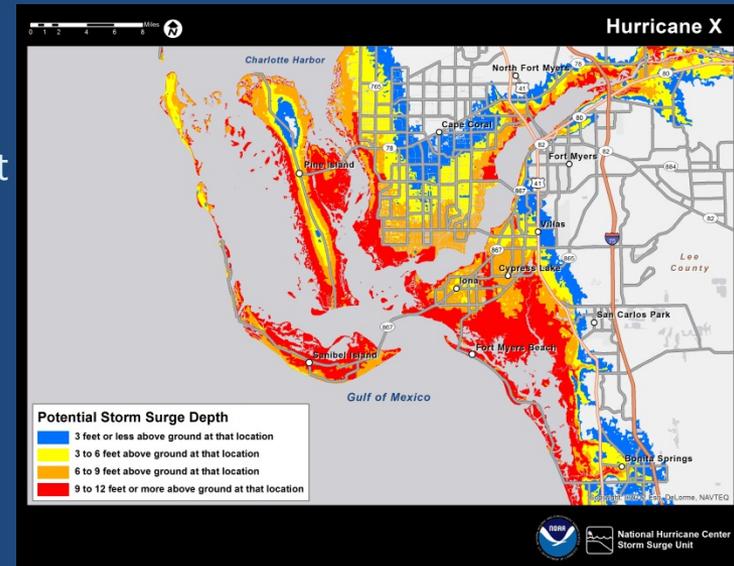
Modeling – Sea Level Projections



Decision-support – Sea Level Rise and Coastal Flooding Impacts



Research – Risk Communication - social science applied to storm surge product development

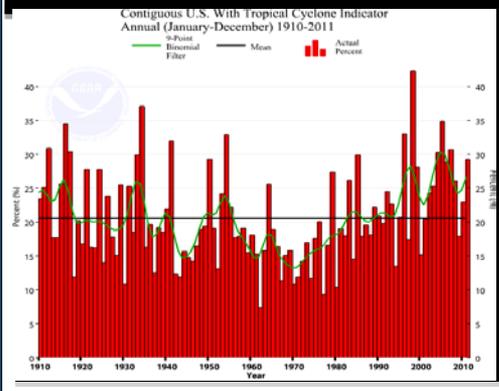


Extreme Events

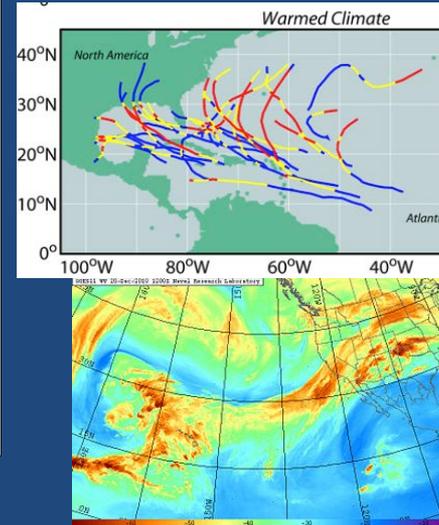
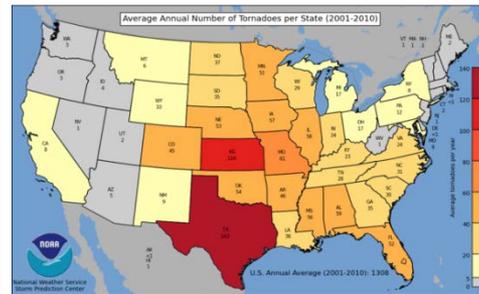
Observations and Data Stewardship

Research and Modeling – Understanding Extremes to Improve Predictability

Climate Extremes Index

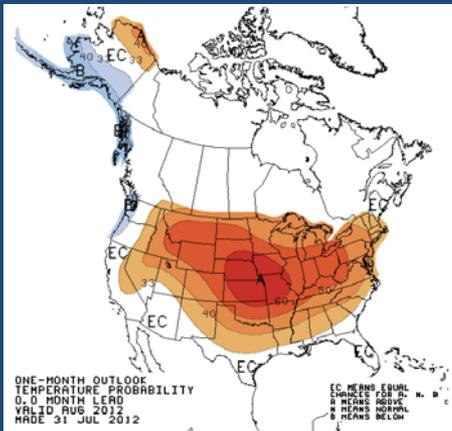


Tracking and Archiving Extreme Events

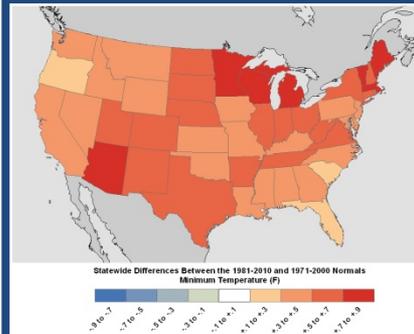


Predictions, Trend Analysis and New 'Normals'

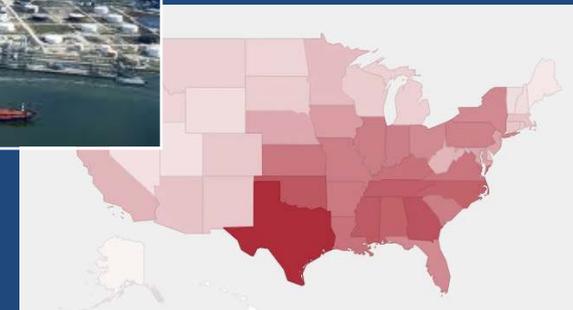
Development of Actionable Information for preparedness and response to extremes



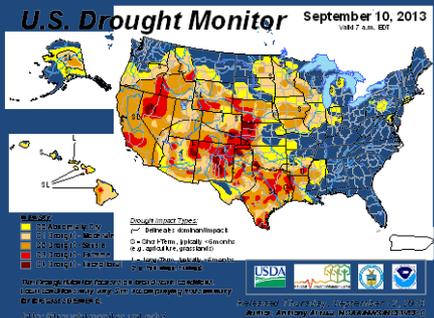
Temperature Trends



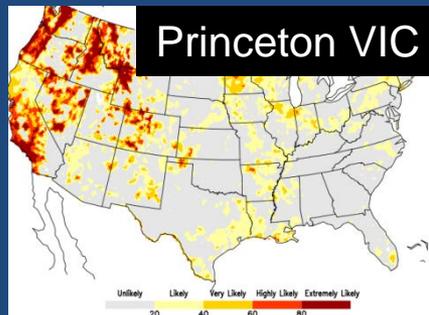
Billion \$ Disasters



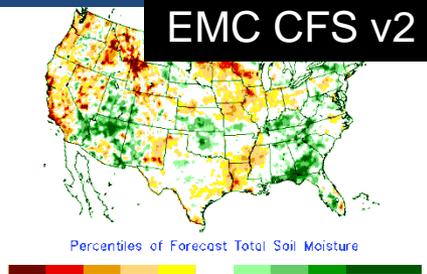
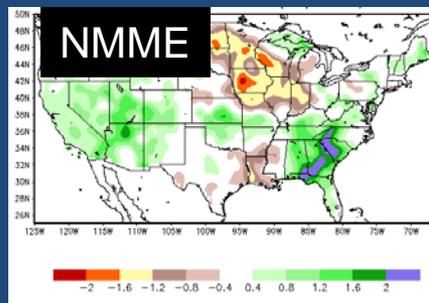
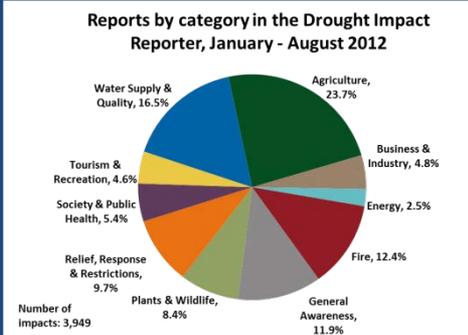
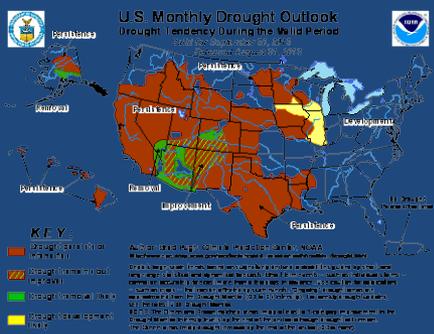
Drought and Water Resources Story



Monitoring Outlooks and Impacts

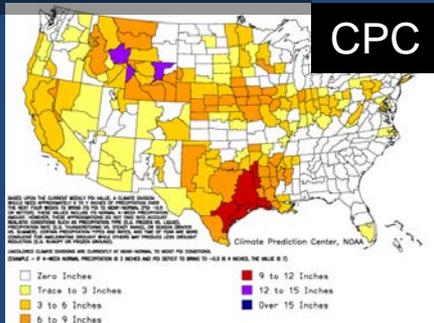
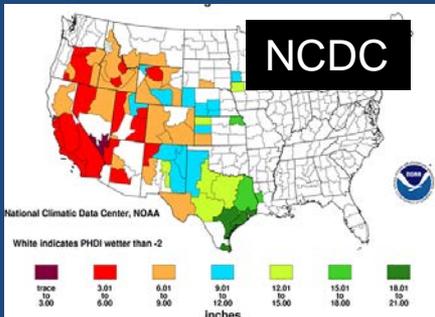


Advancing Modeling, Analysis Predictions & Predictions



Research and Experimental Drought Recovery Products

Understanding Uncertainties in Future Colorado River Streamflow



Decision Support

USGS
United States Geological Survey

Climate Change and Water Resources Management:
A Federal Perspective

An Interpretation of the Origins of the 2012 Central Great Plains Drought

December 12-13, 2012 Washington, DC

National Drought Forum
Summary Report and Priority Actions

2012

Drought and U.S. Preparedness in 2013 and Beyond

National Drought Outlook July 18, 2013

Current Drought Conditions and the Seasonal Drought Outlook

U.S. Drought Monitor July 18, 2013

U.S. Seasonal Drought Outlook July 18, 2013

Temperature, Precipitation and Wildfire Outlooks

NIDIS

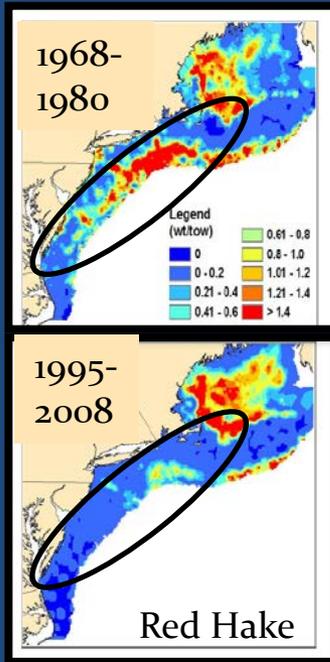
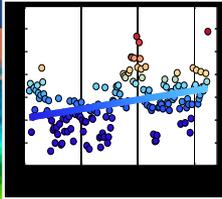
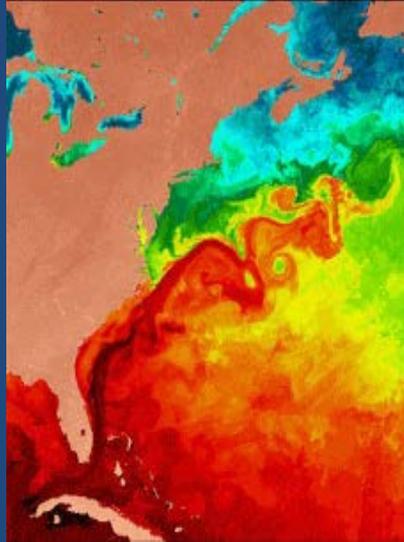
National Integrated Drought Information System (NIDIS)
Regions in the US where NIDIS is currently developing drought early warning information systems

California Pilot DEWS
Upper Colorado River Basin DEWS and Four Corners Pilot DEWS
Missouri Basin Pilot DEWS in development
Southern Plains Pilot DEWS
Rio Grande/Rio Bravo Basin in development
Chesapeake Bay Watershed Pilot DEWS in development
Carolinian Coastal Ecosystems Pilot DEWS
Apalachicola-Chattahoochee-Flint River Basin Pilot DEWS

NIDIS is working toward a fully national drought information system through national, tribal and state partnerships. NIDIS-supported research and monitoring is conducted across the nation. For monitoring, forecasting, data products, research activities and information on NIDIS webinars and meetings, visit the drought portal - www.drought.gov

Marine Ecosystems Story

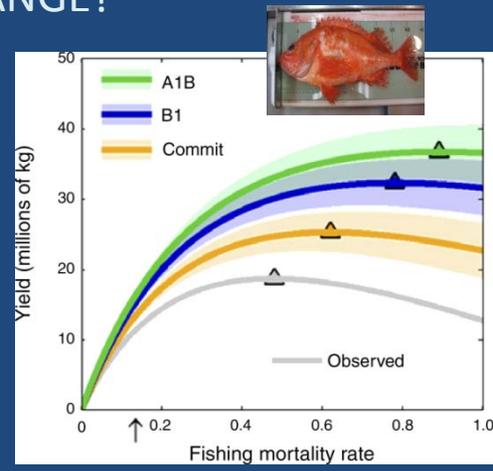
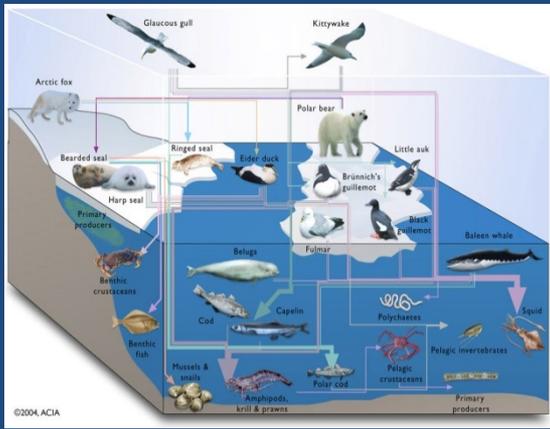
Observations – WHAT IS CHANGING?



Research – WHY CHANGING?

WAtlantic SST

Modeling – HOW WILL IT CHANGE?



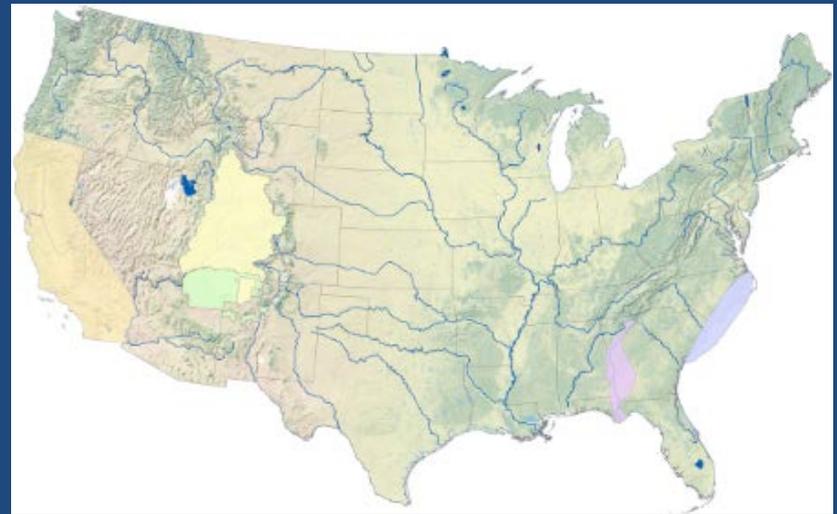
Decision-support – HOW RESPOND?

Examples of NOAA's Activities



The National Integrated Drought Information System (NIDIS)

- Products (e.g., current drought and monitoring, impacts, and forecasting)
- Tools (map and data viewer, soil moisture & temp. data, etc.)
- Regional Programs
 - Drought Early Warning Systems:
 - ACF River Basin
 - Coastal Carolinas
 - Four Corners Tribal Land
 - California
 - Midwest
 - Southern Plain
 - Upper Colorado River Basin



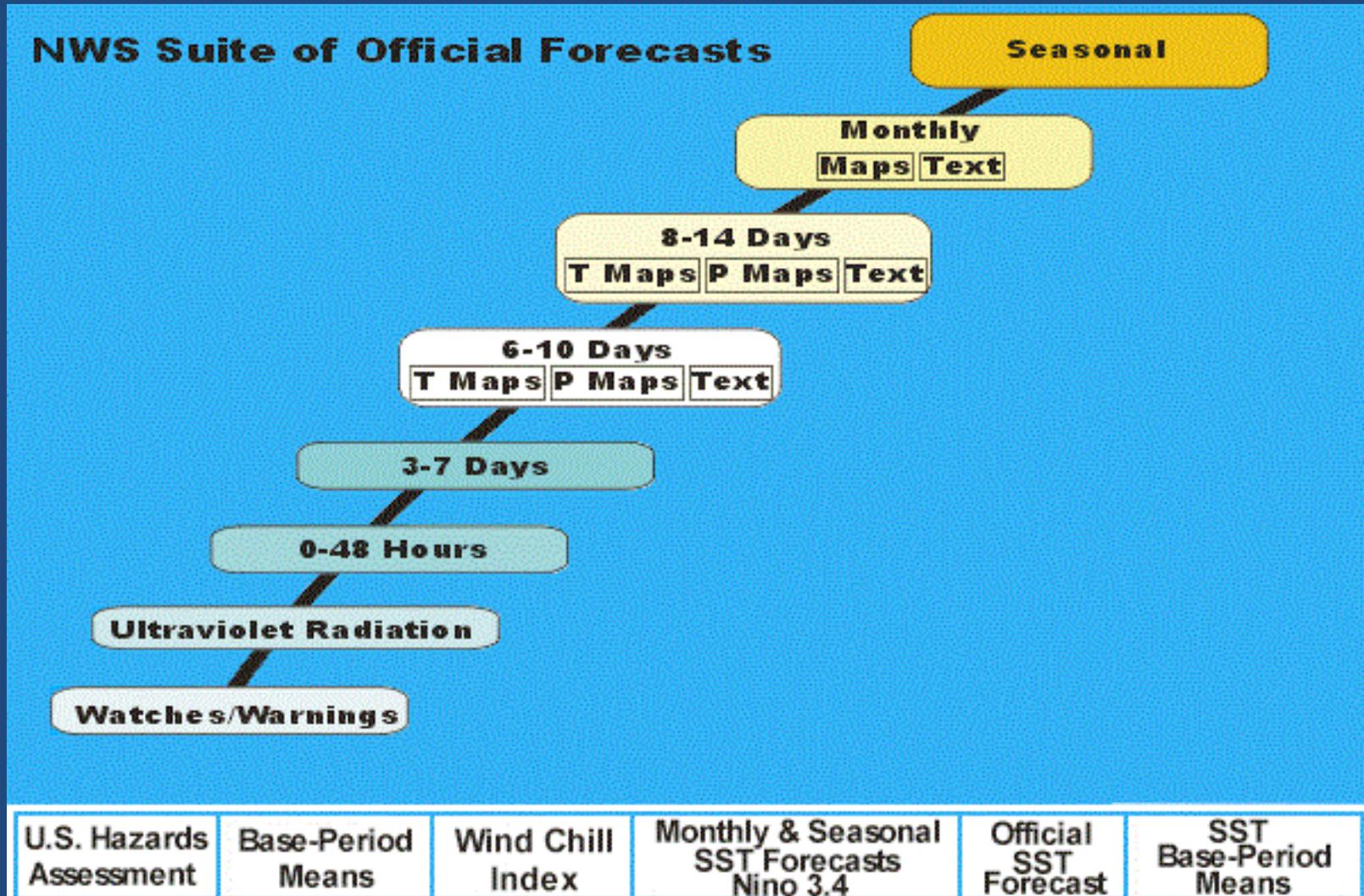
Responding to Extreme Weather/Climate Events: Adaptation Strategies and Information Needs



- Lessons learned (e.g. Emergency Response, Long Term Planning)
- Useful Tools and Resources
- Information Needs

<http://cpo.noaa.gov/ClimatePrograms/ClimateandSocietalInteractions/SARPPProgram/ExtremeEventsCaseStudies.aspx>

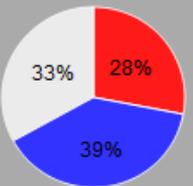
Climate Prediction Center



Web Interface for CPC Outlooks

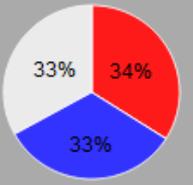
[Eastern Oregon Airport \(Pendleton\) front entrance, Eastern Oregon Regional Airport at Pendleton \(PDT\), Pendleton, OR 97801, USA](#)

Three Category Temperature Outlook
Normal Maximum Temperature: **76**



Category	Percentage
Above Normal	28%
Below Normal	39%
Near Normal	33%

Three Category Precipitation Outlook
Normal Precipitation: **0.33**

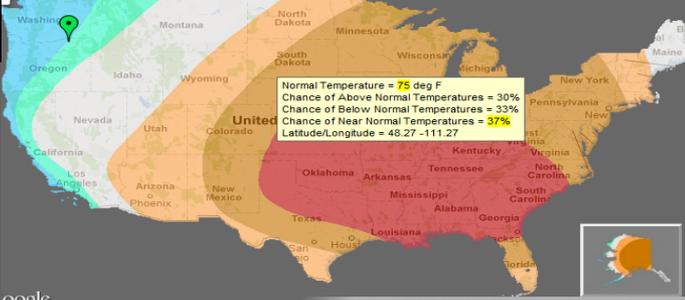


Category	Percentage
Above Normal	34%
Below Normal	33%
Near Normal	33%

8 to 14 Day Outlook
Wednesday June 6 - Tuesday June 12

Temperature: Outlook Normal Road Map Terrain Map
Precipitation: Outlook Normal Custom Link

Below Normal Above Normal

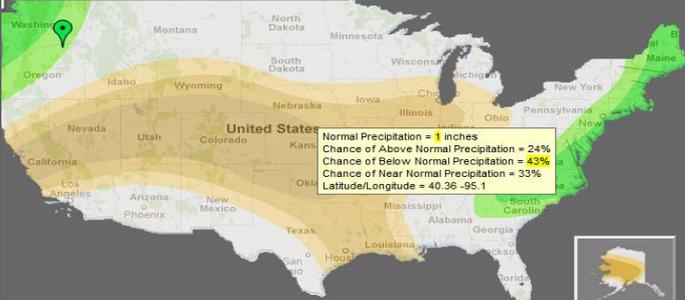


Normal Temperature = 75 deg F
Chance of Above Normal Temperatures = 30%
Chance of Below Normal Temperatures = 33%
Chance of Near Normal Temperatures = 37%
Latitude/Longitude = 48.27 -111.27

8 to 14 Day Outlook
Wednesday June 6 - Tuesday June 12

Temperature: Outlook Normal Road Map Terrain Map
Precipitation: Outlook Normal Custom Link

Below Normal Above Normal



Normal Precipitation = 1 inches
Chance of Above Normal Precipitation = 24%
Chance of Below Normal Precipitation = 43%
Chance of Near Normal Precipitation = 33%
Latitude/Longitude = 40.36 -95.1

- Allows users to display CPC extended range forecasts in additional ways for specific locations
- Includes mouse over capability, pie charts and climate normals

Examples of Other NOAA activities:

- Digital Coasts
- River Forecast Centers
- Weather Ready Nation
- Regional Programs (e.g., RISA)
- Etc.

Questions?



Some Additional Resources

Societal Challenge One Pagers: <http://www.climate.gov>
(<http://www.climate.gov/decision-support/department/fact-sheets>)

Climate Smart Nation: <http://www.climate.gov>



CPO Products & Information - Examples



Observations and Monitoring:

Prototype new technology, such as deep Argo floats, for the global ocean observing system

Climate.gov
science & information for a climate-smart nation

Featured on Climate.gov 1 2 3 4 5

The President's Climate Action Plan »
July 9, 2013
Filed in: Supporting Decisions

In a speech at Georgetown University on June 25, President Obama announced a series of executive actions to reduce carbon pollution, prepare the United States for the impacts of climate change, and lead international efforts to address global climate change.

[view the plan »](#)

Recent Topics

- State of the Climate: Extreme Events
July 12, 2013
Filed in: News & Features
- Teaching Essential Principle 7: Climate change will have consequences for the Earth system and human lives.
July 9, 2013
- Introducing the Local Climate Analysis Tool (LCAT)
July 15, 2013
Filed in: Supporting Decisions

Communication and Education:

Released Climate.gov version 2.0, an integrated, online presentation of NOAA's climate science, data & information services.

- News & Features
- Maps & Data
- Supporting Decisions
- Teaching Climate
- The Dashboard



	Season 1	Season 2	Season 3	Season 4	Season 5
Global SST	●	●	●	●	●
Global prate	●	●	●	●	●
Global tmp2m	●	●	●	●	●
US prate	●	●	●	●	●
US tmp2m	●	●	●	●	●

Climate Modeling & Prediction

Sustained the first National Multi-Model Ensemble seasonal prediction system involving all leading U.S. climate models; running real-time since 2011.

Skill maps for 3-month means

	Season 1	Season 2	Season 3	Season 4	Season 5
Global SST	●	●	●	●	●
Global prate	●	●	●	●	●
Global tmp2m	●	●	●	●	●
US prate	●	●	●	●	●
US tmp2m	●	●	●	●	●



Informing Decisions-Example

Climate and Societal Interactions Program (CSI)

Building capacity to use science

Improving the accessibility and utility of information to meet user needs

Identifying and assessing risks, impacts and opportunities

MANAGING DROUGHT IN THE SOUTHERN PLAINS

You are invited to join us in a webinar (web-based seminar) series to discuss drought conditions, impacts and resources available to help manage drought in the Southern Plains. Webinars will be held on the 2nd Thursday of each month at 10:00 A.M. Central Time. A shortened briefing will also be offered on the 6th Thursday. The content is geared toward a general audience – anyone who has responsibility to manage or assist others in managing drought and its related impacts.

If you would like to join in these webinars, you need to register via the SCIPP website: <http://www.southernclimate.org> or via the SCIPP website: scipp@southernclimate.org. For each webinar, you will receive an e-mail with the link to access the webinar. Each webinar will last 45-60 minutes.

Each webinar will include an overview of the current drought assessment and outlook, summary of impacts across the region, and a topic or resource, such as a NOAA wildlife conditions. You will have an opportunity to suggest topics for following webinars. The primary focus is in the states most heavily impacted from the current drought – Texas, Oklahoma and New Mexico – but participation from surrounding states is encouraged.

The webinar series is sponsored by a partnership of the National Integrated Drought Information System (NIDIS), National Oceanic and Atmospheric Administration (NOAA), National Drought Mitigation Center, Southern Climate Impacts Planning Program, Climate Assessment for the Southwest, and the region's State Climatologists.

Information from the webinars will be posted on a website linked through <http://www.southernclimate.org>. A one-page summary will be produced and posted for each webinar. Please pass on this announcement to relative organizations or groups that are involved in managing or monitoring drought and its related impacts.

To register or for more information, contact:
Southern Climate Impacts Planning Program
<http://www.southernclimate.org>
405-325-2541 or scipp@southernclimate.org

Webinar Topics:

- La Niña
- Cattle & Livestock
- U.S. Drought Monitor
- Ecological Forecasting
- Seasonal Forecasting
- Flash Drought
- Water Supply
- Wildfire
- Drought Ready Communities
- Agricultural Impacts

U.S. Drought Monitor | U.S. Drought Portal - Mozilla Firefox

www.drought.gov

U.S. Drought Portal

Current Drought and Monitoring | Impacts | Forecasting

U.S. Drought Monitor

The U.S. Drought Monitor is unique, blending numeric measures of drought and experts' best judgment into a single map every week. It started in 1999 as a federal, state, and academic partnership, growing out of a Western Governors' Association initiative to provide timely and understandable scientific information on water supply and drought for policymakers.

The Monitor is produced by a rotating group of authors from the U.S. Department of Agriculture, the National Oceanic and Atmospheric Administration, and the National Drought Mitigation Center. It incorporates review from a group of 250 climatologists, extension agents, and others across the nation. Each week the author reviews the previous map based on rain, snow and other events, observers' reports of how drought is affecting crops, wildlife and other indicators. Authors balance conflicting data and reports to come up with a new map every Wednesday afternoon. It is released the following Thursday morning.

Visit the [U.S. Drought Monitor](#) for the current drought conditions...

October 15, 2013
(Released Thursday, Oct. 17, 2013)
Mid 7 a.m. EDT

U.S. Drought Monitor

Drought Impact Tiers

- D1: Extreme Drought
- D2: Severe Drought
- D3: Moderate Drought
- D4: Exceptional Drought
- L: Long Term, typically greater than 6 months (e.g. hydrology, ecology)
- S: Short Term, typically less than 6 months (e.g. agriculture, government)
- X: Extreme Drought
- U: Unreliable
- N: No Data

Additional Products

Drought Indicators

- North American Drought Monitor
- U.S. Drought Monitor
- Crop Moisture Index
- HPI/CCI ACIS Maps
- Palmer Drought Severity Index
- Soil Moisture
- Standardized Precipitation Index
- Surface Water Supply Index
- Hydrological Monitoring
- Local, State and Regional
- Paleoclimatic Data
- Remote Sensing
- Water Quality
- Wildlife

Responding to Extreme Weather and Climate Events
Adaptation Strategies and Information Needs

In recent years, communities have faced a variety of extreme weather and climate events, which have become more severe, more frequent, and more costly. From drought to storm to wild surge, these events have increasingly impacted our lives and livelihoods, leading to property and economic losses. Because the impact of these events is often unpredictable, it is important to have a plan in place to respond to them.

This report provides information on how to respond to extreme weather and climate events, and includes a checklist of actions to take before, during, and after an event.

Extreme Weather Event Workshop Locations:

- Fort Collins, Colorado
- Grand Rapids, Michigan
- Houston, Texas
- Las Vegas, Nevada
- Little Rock, Arkansas
- Madison, Wisconsin
- Miami, Florida
- Phoenix, Arizona
- Portland, Oregon
- Raleigh, North Carolina
- Salt Lake City, Utah
- San Antonio, Texas
- San Diego, California
- Seattle, Washington
- St. Louis, Missouri
- Tampa, Florida
- Wichita, Kansas

Key Findings:

- For Utility Managers: Lessons learned on building resilience, including staff and data issues.
- For Policy Makers and the Research Community: Information on how to address the needs of communities.
- For Communities: Opportunities for dialogue.

A final report will be available late 2013.

WERF | NOAA | NIDIS | NCEP | NWS | NCEP | NWS | NCEP | NWS

STATE OF THE CLIMATE IN 2012

Special Supplement to the Bulletin of the American Meteorological Society
Vol. 94, No. 8, August 2013