



## Toward a Climate Smart Nation Preparing for the Impacts of Climate Variability and Change

*Americans' health, security, and economic well-being are tied to weather and climate. Every day citizens grapple with impacts resulting from extreme weather events and changing climate conditions.*

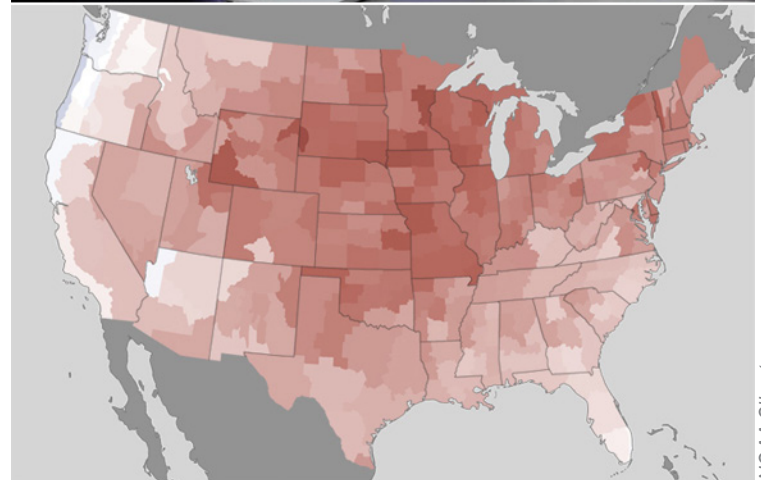
Since 1980, the U.S. has sustained 144 individual weather and climate disasters where the overall damages reached or exceeded \$1 billion. Cumulative losses exceed \$1 trillion. In 2012, there were 11 weather and climate disasters events with losses exceeding \$1 billion, resulting in over \$110 billion in damages and 377 deaths<sup>1</sup>. In addition to these shorter-term extremes, communities and businesses are also contending with issues that unfold over longer timeframes, such as warmer temperatures, changes in the timing and amount of precipitation, sea level rise, ocean acidification, and changes to our natural ecosystems that provide food, water, storm protection, jobs, health, and recreation benefits.

Individuals, businesses, and communities are increasingly turning to NOAA as a trusted source for science and information to help them understand how and why climate conditions are changing and how they can prepare. NOAA has a long history of observing the planet, groundbreaking research, and modeling and prediction capabilities that are already helping a wide variety of individuals and communities. NOAA is building on this success by working with its partners and the public to develop a **climate-smart nation** that is resilient to extreme weather and climate events. Drawing upon NOAA's foundation in science, NOAA is preparing the nation for impacts of anticipated climate variability and change by focusing on four societal challenge areas:

- reduce vulnerability to extreme weather and climate,
- prepare for drought and water resources challenges,



Kurt Mann, American Green



NOAA Climate.gov

*Water treatment managers in Tampa Bay are using climate models to help them make smarter decisions (top). 2012 was a record-setting year in terms of warmer-than-average temperature (bottom).*

- protect and preserve coasts and coastal infrastructure from sea level rise and inundation, and
- identify and manage risks to marine ecosystems and the services they provide.

### Information Products for Decision Makers

NOAA's research, observation, and modeling are a vital part of a global effort to monitor and predict Earth's climate. NOAA provides data and actionable products and services that decision makers in every sector use every day. Our products and services enhance society's ability to plan and respond, increase innovation and development of products used by the private sector, and strengthen the nation's economy. NOAA products and services help answer three basic questions...

## “How and why are climate and weather changing?”

Climate change and natural climate patterns, like El Niño, can have major impacts on weather. NOAA works with partners across sectors to provide useful and timely climate information. Without NOAA's long-term climate monitoring, research, and modeling capabilities we couldn't quantify where and how climate conditions have changed, nor predict where and how they're likely to change. We provide critical early warning systems and forecasts from days to decades and on local to global scales. For example:

- The U.S. Drought Monitor provides up-to-date assessments of drought conditions by experts across federal agencies and other institutions.
- The Climate Prediction Center's Monthly and Seasonal Climate Outlooks alert Americans to where temperatures, precipitation, and drought are likely to be well above or well below normal.
- The annual State of the Climate Report presents a detailed, peer-reviewed update on global climate indicators and notable weather and climate events in the U.S. and around the world.
- The annual Arctic Report Card presents a detailed, peer-reviewed update on the rapidly changing Arctic.
- NOAA-supported research is contributing to the development of the latest National Climate Assessment, which summarizes current impacts and long-term climate outlooks for the United States.

## “How are climate-related changes impacting my community?”

Across the country, the places we live, visit, and value are threatened by the impacts of a changing climate. NOAA delivers regionally relevant climate information to decision makers and works with them to develop and implement action plans for reducing risks and minimizing climate impacts. For example:

- Eleven Regional Integrated Sciences and Assessments (RISA) teams and Regional Climate Centers coordinate with local, tribal, state, regional, and federal partners to produce region-specific data products, tools, training, and resources.
- The Coastal Services Center's Digital Coast website includes tools, training, case studies, and information that help users incorporate climate data into coastal management decisions.

- NOAA's Local Climate Analysis Tool provides regional and local information on the local impacts of climate variability and change to help guide long-term preparedness for severe weather events and extreme conditions.
- NOAA and its partners meet with communities across the country to help them plan for and respond to extreme events.
- NOAA leads the National Integrated Drought Information System (NIDIS), involving many partners, to help assess the impacts of drought and improve preparedness.

## “What changes can we expect in the future?”

NOAA quantifies and assesses how and where climate conditions have changed, and predicts how they are likely to change in the future. We are working with our partners to improve climate models for regional and local decision-making. For example:

- NOAA collaborates with national and international scientists to collect critical atmosphere and ocean data to improve long-range weather and climate forecasts used worldwide.
- NOAA's Climate Program Office recently released a Global Sea Level Rise report which estimates sea level changes over the next century based on the most up-to-date science. This report allows decision makers to consider multiple future scenarios and develop appropriate response options.
- NOAA's fisheries managers are working with scientists and regional fishery management councils to determine how changing ocean conditions impact various species and fisheries, and how to prepare.
- A NOAA-funded project at the Florida Water Institute has linked researchers and water utilities from across the Southeast to co-develop actionable climate and sea level rise predictions at relevant space, time, and event scales.

## Toward a Climate-Smart Nation

NOAA is a trusted source of climate data and information products that are crucial to helping the public and decision makers understand and respond to climate-related challenges. By providing data and information, accurate forecasts, and working with partners across the country, NOAA is helping create a climate-smart nation that makes more informed decisions. Visit us online at [Climate.gov](http://Climate.gov) for easy access to data, information, and resources.

<sup>1</sup> <http://www.ncdc.noaa.gov/billions>