

NOAA's Climate Services: Connecting Energy Users with Climate Science and Services



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NOAA Satellite and Information Service | National Centers for Environmental Information

Delivering Actionable Climate Information: National Scales

Overview info:

- U.S. National Climate Assessment: <https://nca2018.globalchange.gov/>
- Climate.gov
- Climate Resilience Toolkit: <http://toolkit.climate.gov/>
- Drought.gov
- Climate at a Glance: <https://www.ncdc.noaa.gov/cag/national>

The screenshot shows the NOAA National Centers for Environmental Information website. The header includes the NOAA logo and navigation links: Home, Climate Information, Data Access, Customer Support, Contact, and About. A search bar is located on the right. Below the header, the page is titled 'Climate at a Glance'. On the left, there is a sidebar with links: Climate Monitoring, State of the Climate, Temp, Precip, and Drought, Climate at a Glance (selected), Extremes, Societal Impacts, Snow and Ice, Teleconnections, and Monitoring References. The main content area is titled 'National Mapping' and includes a sub-header 'Choose from the options below and click "Plot" to create a map. Select Temperature and Precipitation Maps are available for download.' Below this, there are dropdown menus for 'Parameter' (set to Average Temperature), 'Year' (set to 2020), 'Month' (set to May), and 'Time Scale' (set to 1-Month). A 'Plot' button is at the bottom left. A note on the right states: 'Palmer Drought Severity Index (PDSI), Palmer Hydrological Drought Index (PHDI), and Palmer Modified Drought Index (PMDI) are not offered for multiple-month time scales. These data are available for bulk download.'

The screenshot shows the U.S. Climate Resilience Toolkit website. The header includes the U.S. Climate Resilience Toolkit logo and navigation links: Steps to Resilience, Case Studies, Tools, Expertise, Regions, and Topics. A search bar is located on the right. The main content area features a large image of a sunset over water. Below the image, the text reads: 'Meet the Challenges of a Changing Climate' and 'Find information and tools to help you understand and address your climate risks.' There are three buttons: 'LEARN ABOUT OUR RESILIENCE FRAMEWORK >', 'SEE WHAT OTHERS ARE DOING >', and 'USE THE CLIMATE EXPLORER >'. A 'TOUR THE TOOLKIT >' button is at the bottom left.

The screenshot shows the Fourth National Climate Assessment website. The header includes the title 'FOURTH NATIONAL CLIMATE ASSESSMENT' and the subtitle 'Volume II: Impacts, Risks, and Adaptation in the United States'. Below this, a paragraph states: 'The National Climate Assessment (NCA) assesses the science of climate change and variability and its impacts across the United States, now and throughout this century.' There are two main buttons: 'SUMMARY FINDINGS' and 'REPORT CHAPTERS'. Below these, there are two more buttons: 'OVERVIEW' and 'DOWNLOADS'. At the bottom, a note states: 'Volume I presents an assessment of the physical science underlying this report. science2017.globalchange.gov'.

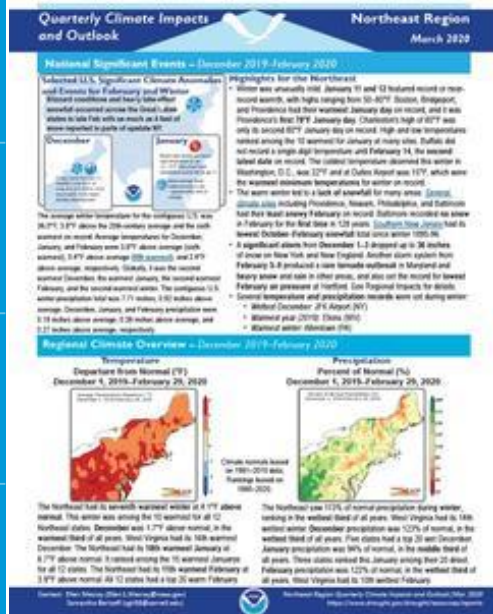
Delivering Actionable Climate Information: Regional Scales

Quarterly Climate Summaries/Outlooks (2 page Summaries):

<http://www.drought.gov/drought/content/resources/reports>

Monthly Webinars: <http://www.nrcc.cornell.edu/services/webinars/2017/08/index.html>

Sectoral Information Dashboards: Gulf of Maine, Water, Energy, Health, Fisheries, Coasts



Northeast Regional Climate Center

Recent and historical weather data customized to meet your needs

Home

Weather Station Data

State & Regional Analyses

Analyses for Industry

Climate Resources

Publications & Services

Blog

Monthly Webinars

2017

Hurricane Season & Outlook

Climate Models & Downscaling

Severe Weather Climatology

Heat & Health

National Climate Assessment - Northeast

Individual presentations (pdf):

- [August Conditions \(Samantha Borisoff - NRCC\)](#)
- [NOAA's Updated 2017 Atlantic Hurricane Season Outlook \(Gerry Bell - Climate Prediction Center\)](#)

Compare to gallery

CLIMATE INFORMATION FOR ELECTRIC UTILITIES

Enhancing the Resilience of the Nation's Electricity System focuses on identifying, developing, and implementing strategies to increase the power system's resilience to events that can cause large-area, long-duration outages. This site contributes to that goal by helping utilities recognize their exposure to climate-related hazards.

Scroll down to explore climate conditions projected for the next season or the next several decades. Data products described on the site can raise awareness of potential hazards to your assets and operations.

RESILIENT CLIMATE

Story Map - <http://arcg.is/1jOLCb>

Delivering Actionable Climate Information: Energy Sector Partnerships

NOAA is working in a government to government relationship to offer weather and climate information to meet the requirements of DOE and its core partners

Mission Interests- Grid Sustainability and Critical Infrastructure Security

Weather and Climate Information Requirements:

- Icing events, temperature extremes, Wet bulb temperatures, Wind speed and duration, Water availability (drought impacts), and Sea level rise

Climate Services co-development with utility partners (localized climatologies based on targeted severe events):

- NCEI's Storm Events Database (<https://www.ncdc.noaa.gov/stormevents/>)
- CLIMOD hourly ASOS observations (<https://www.ncei.noaa.gov/products/land-based-station/automated-surface-weather-observing-systems>)
- Coop data/xmACIS for temp/precip (<https://www.rcc-acis.org/>)

The screenshot shows the NOAA National Centers for Environmental Information website. The header includes the NOAA logo and the text "NATIONAL CENTERS FOR ENVIRONMENTAL INFORMATION" and "NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION". Below the header is a navigation bar with links: Home, Contact Us, About NCEI, and Help. The main content area is titled "Storm Events Database" and includes a "Data Access" section with links for Search, Bulk Data Download (CSV), Storm Data Publication, Documentation, Database Details, Version History, Storm Data FAQ, NOAA's NWS Documentation, Tornado EF Scale, External Resources, NOAA's SPC Reports, NOAA's SPC WCM Page, NOAA's NWS Damage Assessment Toolkit, NOAA's Tsunami Database, ESRI/FEMA Civil Air Patrol Images, SHELDS, and USDA Cause of Loss Data. To the right, there is a "Storm Events Database" section with a description: "The Storm Events Database contains the records used to create the following documenting:" followed by a list of event types: a. The occurrence of storms and other significant weather phenomena that result in loss of life, injuries, significant property damage, and/or disruption of critical services; b. Rare, unusual, weather phenomena that generate media attention, such as Florida or the San Diego coastal area; and c. Other significant meteorological events, such as record maximum precipitation that occur in connection with another event. Below this, it states: "The database currently contains data from January 1950 to May 2014. Weather Service (NWS). Due to changes in the data collection and reporting standards, some unique periods of record available depending on the event type and the specific data collection. The database does not contain any data on damage, narratives and any other event specific information. Please see the following link for more information."

The screenshot shows the Applied Climate Information System (ACIS) website. The header includes the ACIS logo and the text "Applied Climate Information System". Below the header is a navigation bar with links: HOME, ABOUT ACIS, EXAMPLES, and DX. The main content area is titled "ACIS Climate Summary Maps" and includes three maps of the United States showing temperature, precipitation, and wind speed. The maps are labeled: "Departure from Normal Temperature (°F)", "Percent of Normal Precipitation (%)", and "Monthly SP". Below the maps, there is a caption: "ACIS Climate Maps provide precipitation and temperature maps at the national, regional, and state level." Below the maps is a section titled "Applied Climate Information System" with a description: "The Applied Climate Information System (ACIS) was developed and is maintained by the NOAA Regional Climate Centers (RCCs). It was designed to manage the complex flow of information from climate data collectors to the end users of climate data information. The main purpose of ACIS is to alleviate the burden of climate information management for people who use climate information to make management decisions."

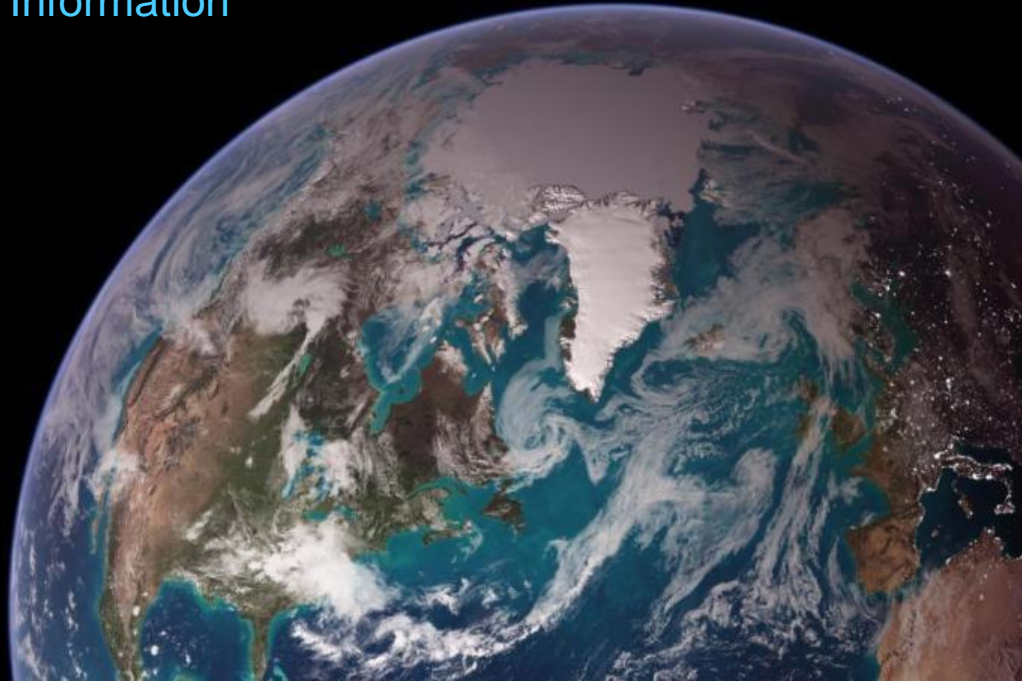
Questions?

Ellen L. Mecray

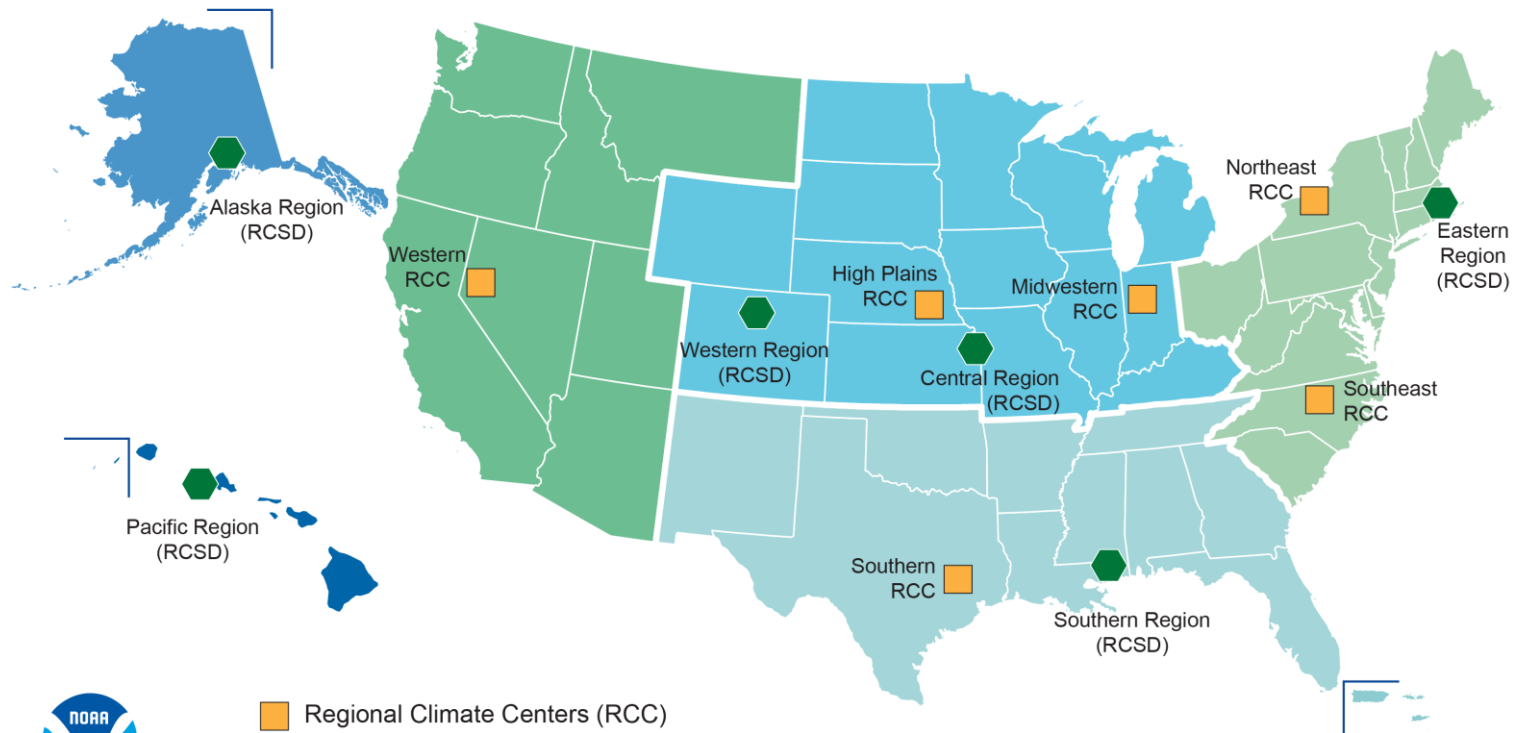
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<http://www.ncdc.noaa.gov/rcsd/eastern>

September 15, 2021
Aspen Global Change Institute
Invited Virtual Lightning Talk



NOAA/NCEI/Regional Climate Services



- Regional Climate Centers (RCC)
- Regional Climate Services Directors (RCSD)

May 2021

NCA4: Key Messages of Energy Chapter

- Key Message 1: Impacts on Energy Sector Extend Across the Nation
- Key Message 2: Transformations in the Energy System Are Changing Vulnerabilities to Climate and Weather Impacts
- Key Message 3: Actions are Underway to Improve Energy System Resilience

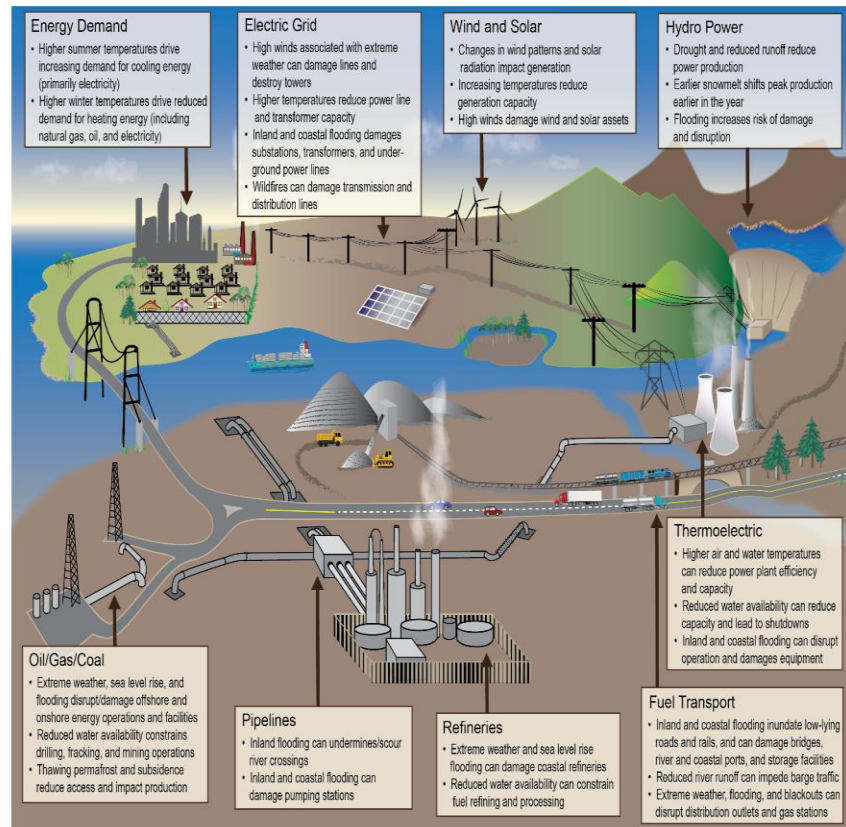


KEY MESSAGE 1: Impacts on Energy Sector Extend Across the Nation

Potential Impacts from Extreme Weather and Climate Change

Extreme weather impacts all components of the Nation's energy system, from fuel production and distribution to electricity generation, transmission, and demand.

Climate change will likely result in more frequent and longer-lasting impacts, damaging infrastructure, and creating fuel availability and demand imbalances.





Key Message 2:

Transformations in the Energy System Are Changing Vulnerabilities to Climate and Weather Impacts



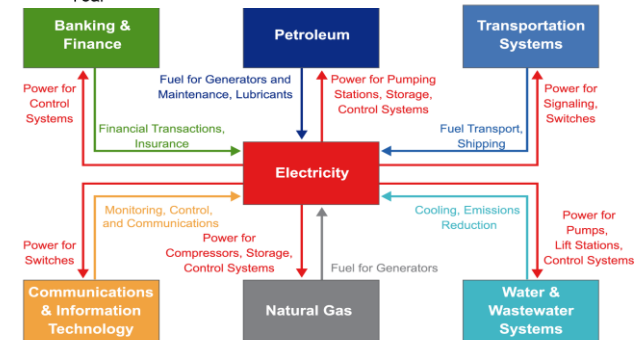
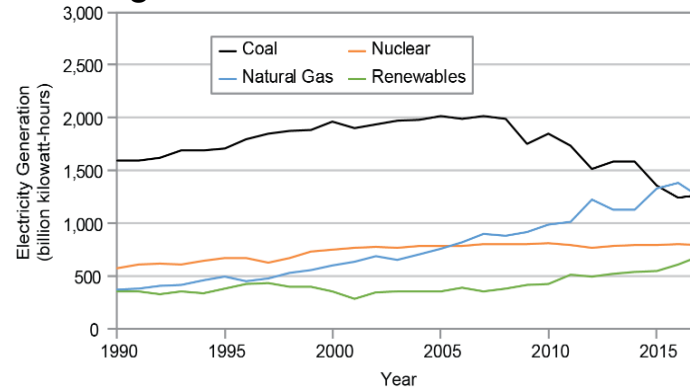
- Changes in energy technologies, markets, and policies are affecting the energy system's vulnerabilities to climate change and extreme weather.



- Some of these changes may increase reliability and resilience, while others create additional vulnerabilities.



- Changes include:
 - ❖ Natural gas is increasingly used for power
 - ❖ Renewables expanding market share
 - ❖ Energy efficiency efforts increase
 - ❖ Electrification of other sectors and more interconnected



Key Message 3: Actions are Underway to Improve Energy System

Resilience

➤ This progress occurs through:

- Improved data collection, modeling, and analysis to support resilience planning;

- Private and public-private partnerships supporting coordinated action;

- Development and deployment of innovative energy technologies adapting energy assets to extreme weather hazards.

➤ Opportunities remain to accelerate the pace, scale and scope of investments in systems resilience.



Flood Protection

- Building/strengthening berms, levees, and floodwalls
- Elevating substations, control rooms, and pump stations
- Expanding wetlands restoration
- Installing flood monitors



Wind Protection

- Inspecting and upgrading poles and structures
- Burying power lines underground
- Improving vegetation management efforts



Drought Protection

- Adopting water efficient thermoelectric cooling
- Utilizing non-freshwater sources
- Expanding low water-use generation



Modernization

- Deploying sensors and control technology
- Installing asset databases/tools, including supervisory control and data acquisition (SCADA) system redundancies
- Deploying energy storage and microgrid infrastructure (distributed energy resources, demand response programs, islanding capabilities)



Advanced Planning and Preparedness

- Conducting extreme weather risk assessment planning, preparedness, and training
- Participating in mutual assistance groups and public-private partnerships
- Purchasing or leasing mobile transformers and substations
- Utilizing geographic information systems (GIS) analysis to help identify vulnerabilities and plan for new builds and relocations



Storm-Specific Readiness

- Coordinating priority restoration and waivers
- Securing emergency fuel contracts
- Improving communication during outages to assist customers



NCA4 Energy: Key Takeaways

- ❖ Extreme weather events are already impacting the energy sector and resulting in annual costs in the billions. The current pace, scale, and scope of efforts to improve energy system resilience are likely to be insufficient given the nature of the challenge
- ❖ The need for adaptation will only increase without substantial mitigation efforts to reduce global greenhouse gas emissions and avoid more severe consequences in the long-term
- ❖ Additional Resilience Opportunities:
 - Improved awareness of energy asset vulnerability
 - Reliable projections of extreme weather and climate change at a local level
 - Standardized cost-benefit methodologies to fully account for benefits of resilience investments
 - Cost-effective resilience-enhancing energy technologies
 - Resilience-based design codes and standards
 - Enabling policy framework to incentivize resilience investments