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

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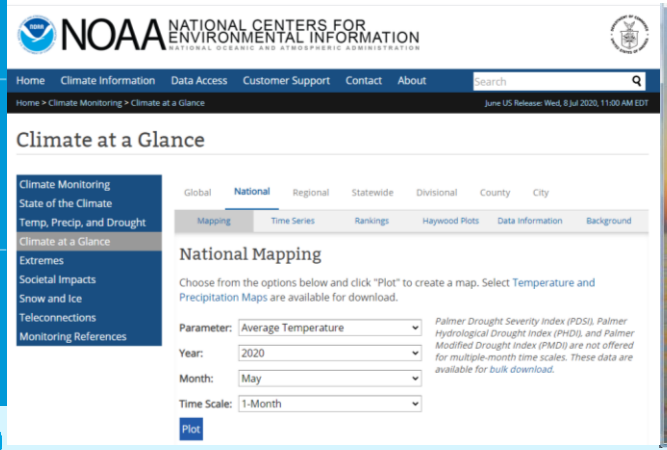
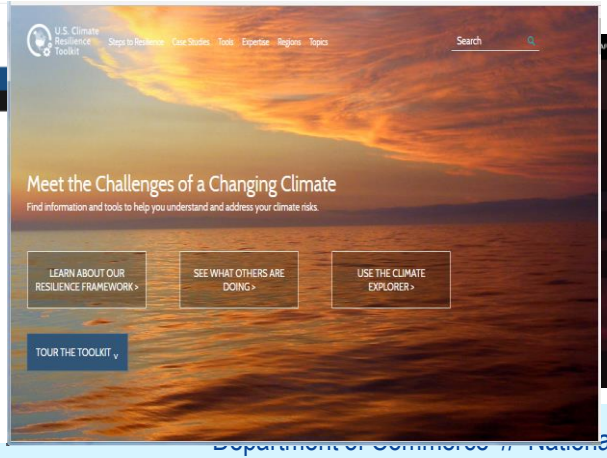
NOAA/NESDIS/NCEI Regional Climate Services

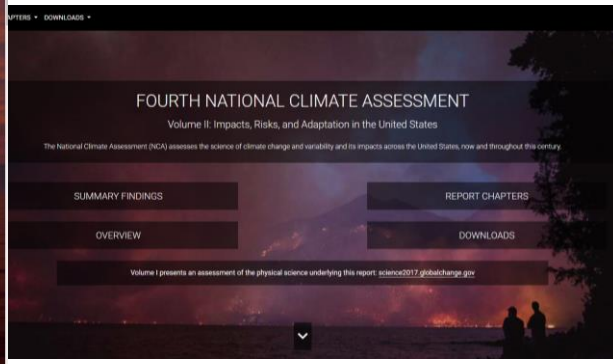
Delivering Actionable Climate Information: National Scales

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





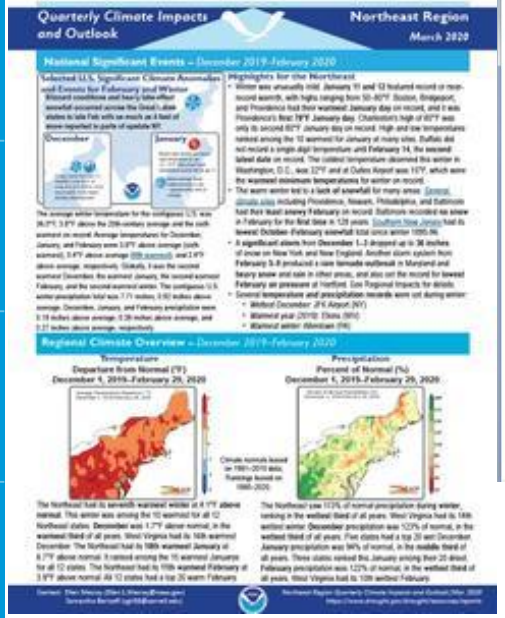


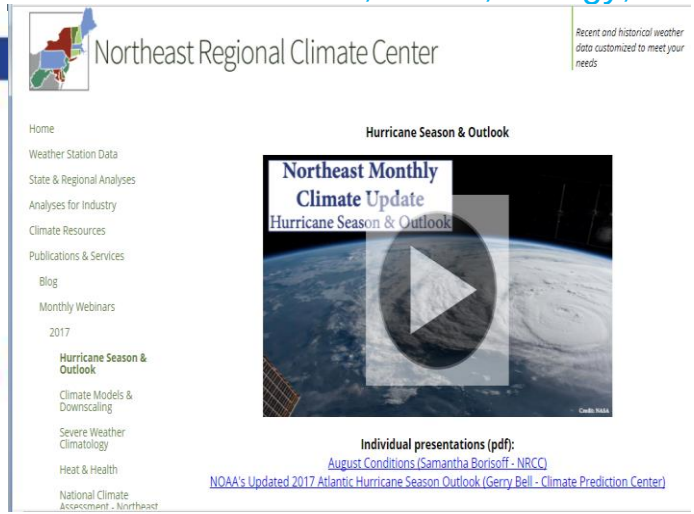
Delivering Actionable Climate Information: Regional Scales

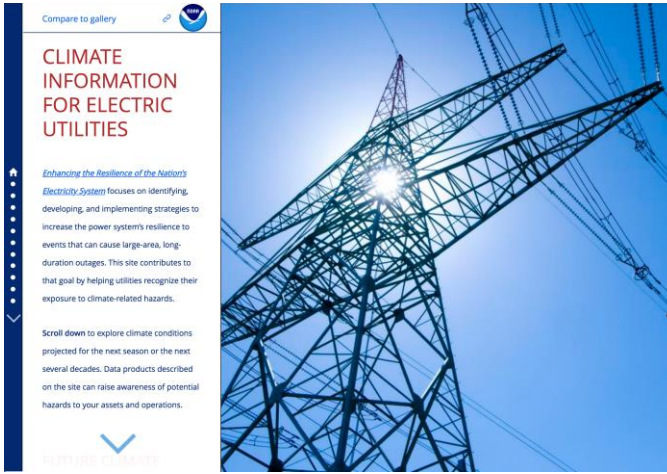
Quarterly Climate Summaries/Outlooks (2 page Summaries): http://www.drought.gov/drought/content/resources/reports

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

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







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

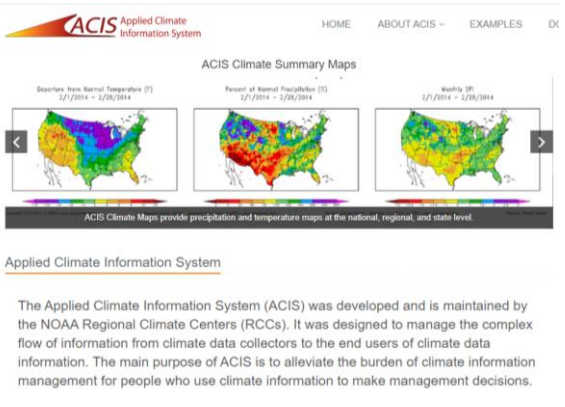
Mission Interests- Grid Sustainability and Critical Infrastructure Security

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/)



Questions?

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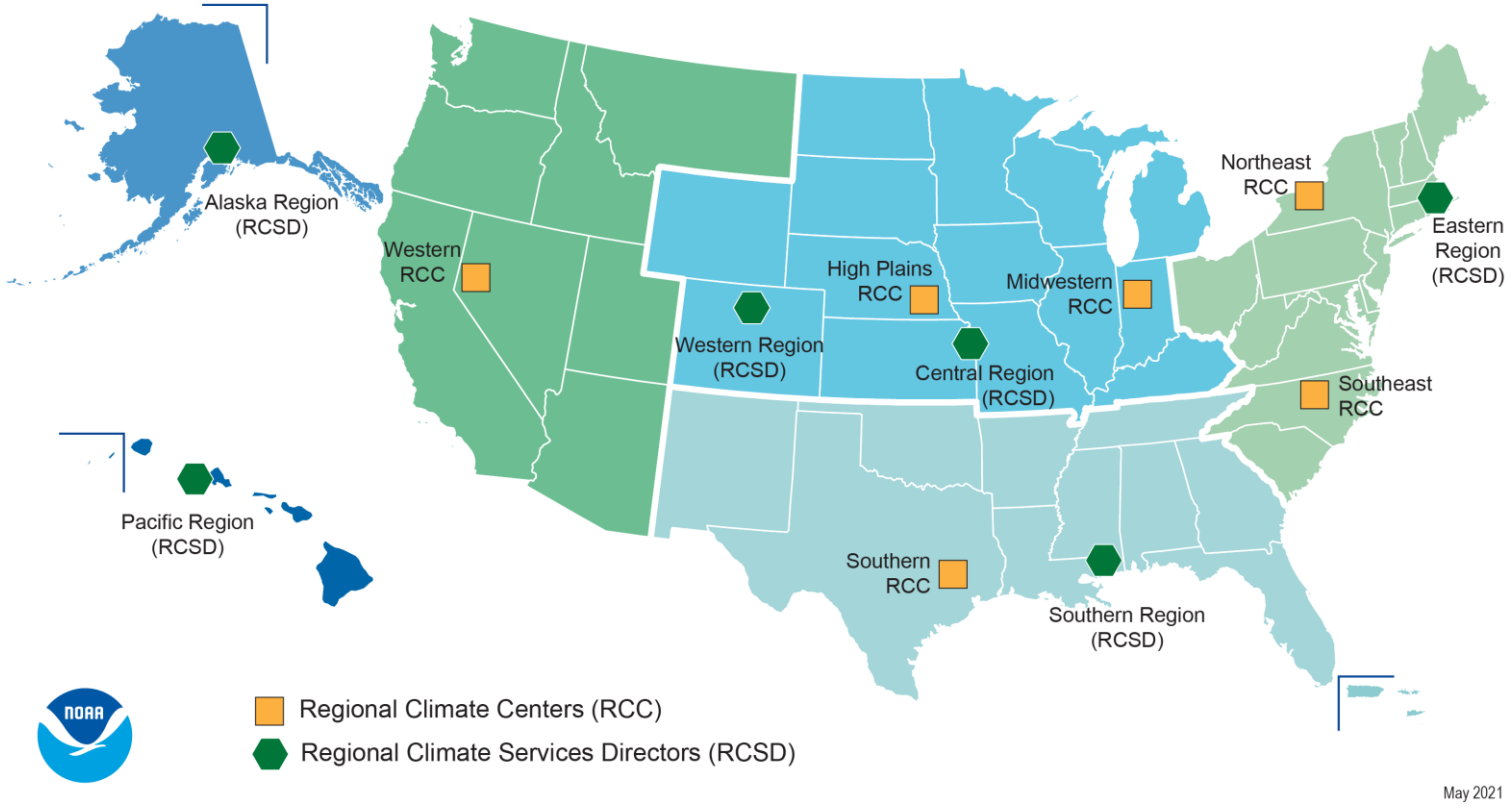
http://www.ncdc.noaa.gov/rcsd/eastern

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

NOAA/NCEI/Regional Climate Services



NCA4: Key Messages of Energy Chapter

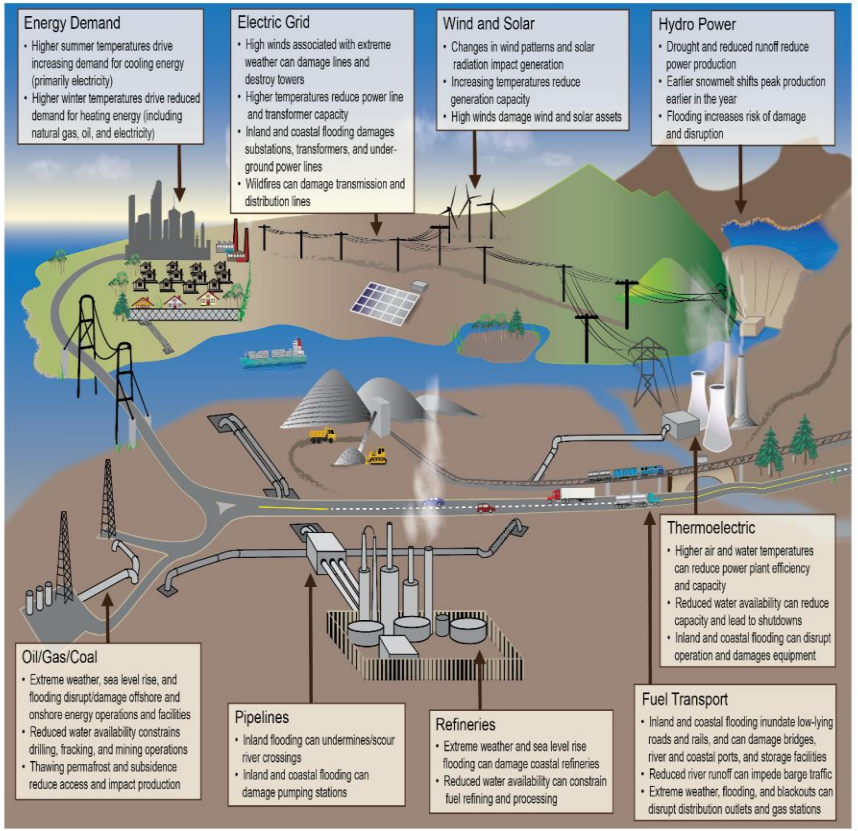
- Key Message 1: Impacts on Energy Sector Extend Across the Nation
- Key Message 2: Transformations in the Energy System Are Changing Vulnerabilities to Climate and Weather Impacts
- Key Message 3: Actions are Underway to Improve Energy System Resilience

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.

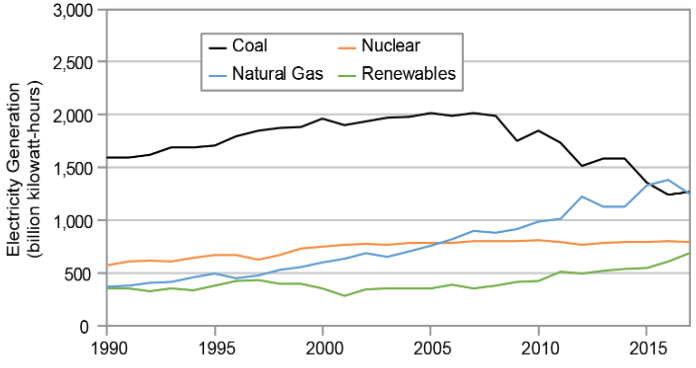
Climate change will likely result in more frequent and longer-lasting impacts, damaging infrastructure, and creating fuel availability and demand imbalances.

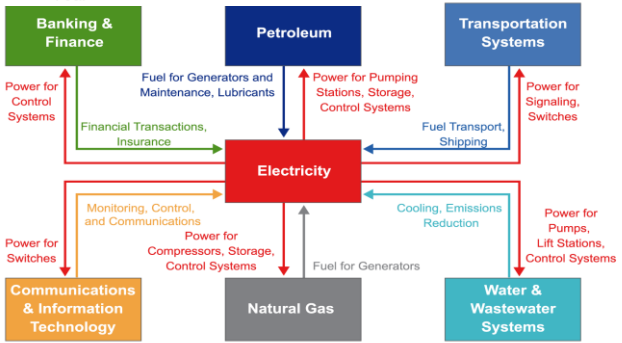


Key Message 2:

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 deployme innovative energy technologie 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