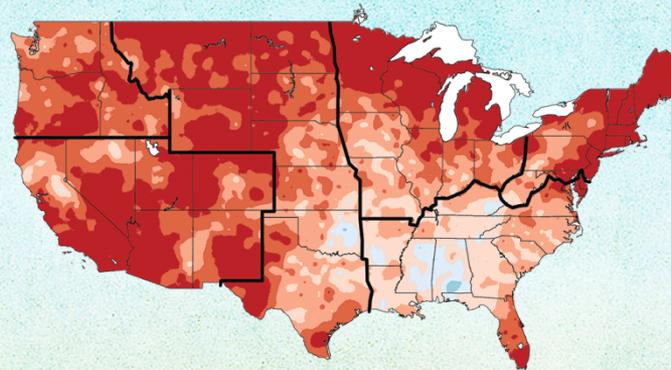


Third National Climate Assessment

Climate Change Impacts in the United States



Anthony Janetos
Director, Pardee Center, BU
16 June 2014



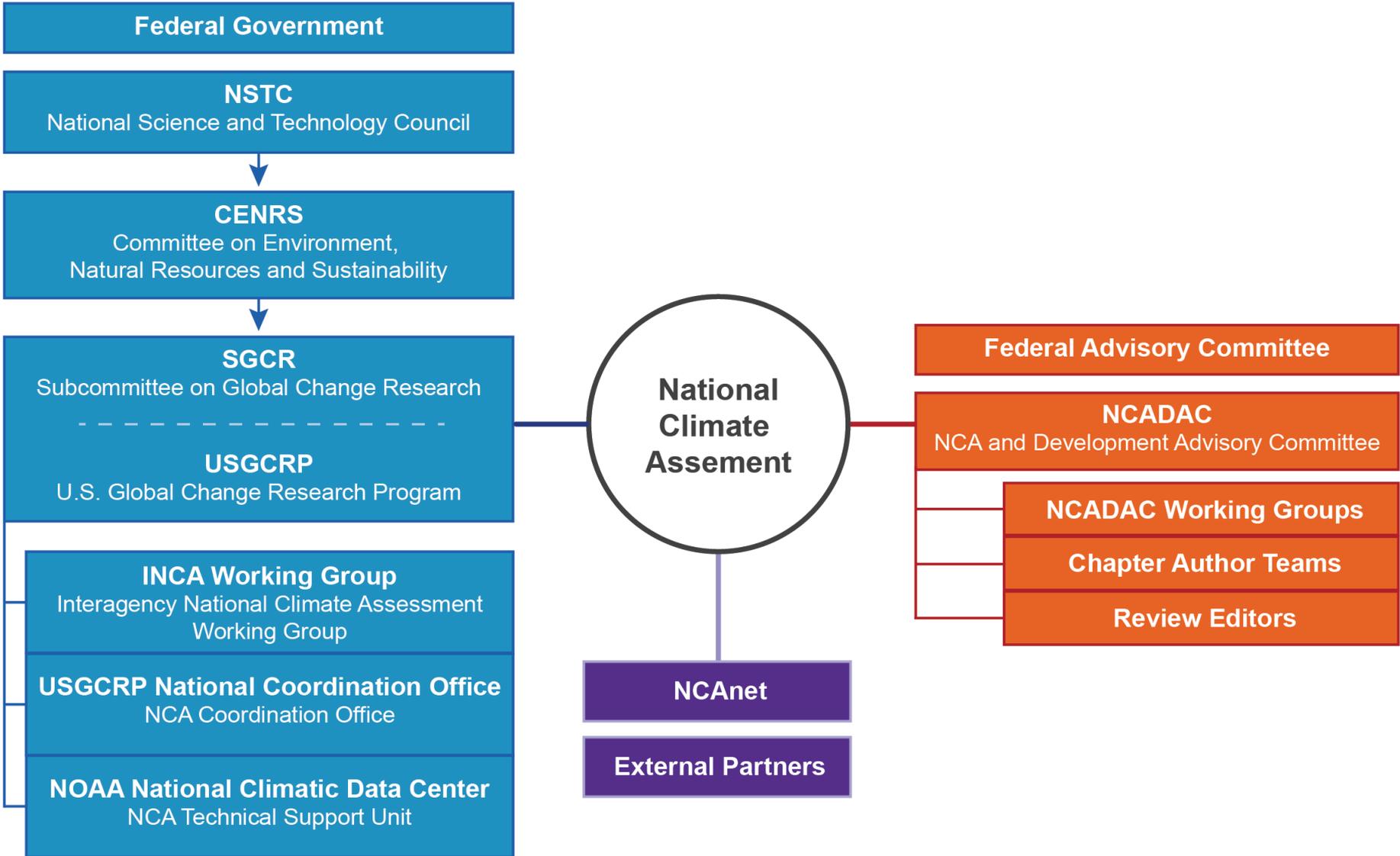
National Climate Assessment: GCRA (1990), Section 106

...not less frequently than every 4 years, the Council... shall prepare... an assessment which –

- **integrates, evaluates, and interprets** the findings of the Program (USGCRP) and discusses the scientific uncertainties associated with such findings;
- **analyzes the effects of global change** on the natural environment, agriculture, energy production and use, land and water resources, transportation, human health and welfare, human social systems, and biological diversity; and
- analyzes current trends in global change, both human-induced and natural, and **projects major trends for the subsequent 25 to 100 years.**



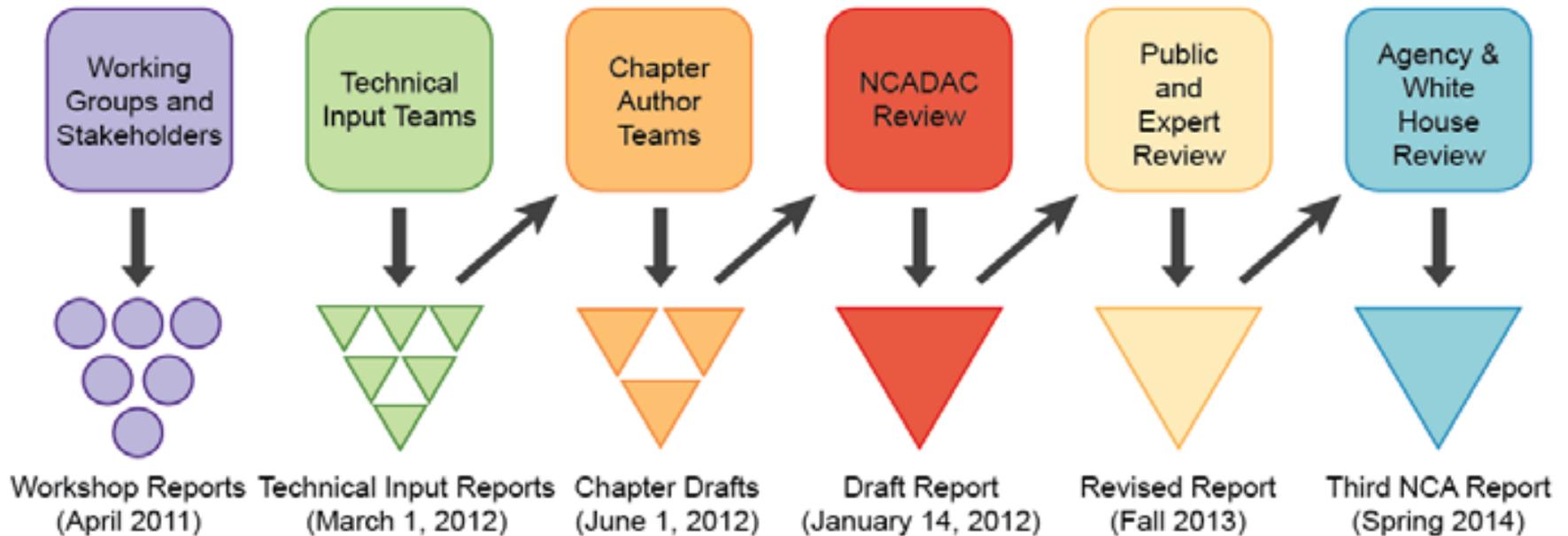
NCA Structure





Third NCA Report Process

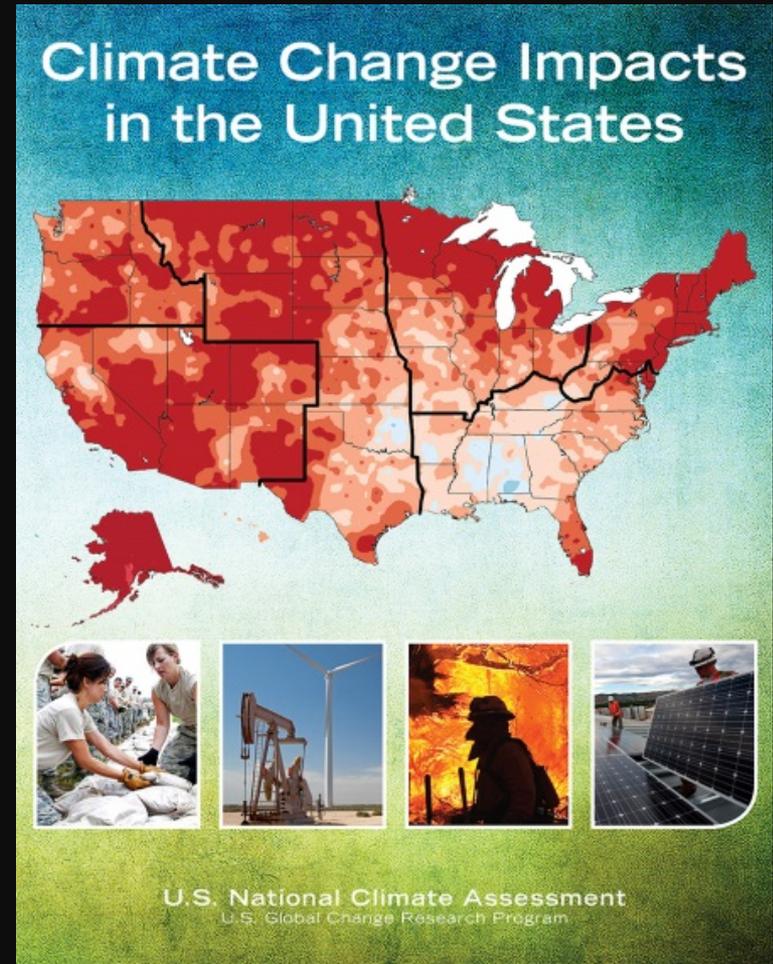
Third National Climate Assessment Report Process





Outline for Third NCA Report

- Climate Change and the American People
- Overview and Report Findings
- Our Changing Climate
- Sectors & Sectoral Cross-cuts
- Regions & Biogeographical Cross-cuts
- Responses
- Appendices



Read online or download at:

<http://nca2014.globalchange.gov>



Sectors

- Water Resources
- Energy Supply and Use
- Transportation
- Agriculture
- Forests
- Ecosystems and Biodiversity
- Human Health



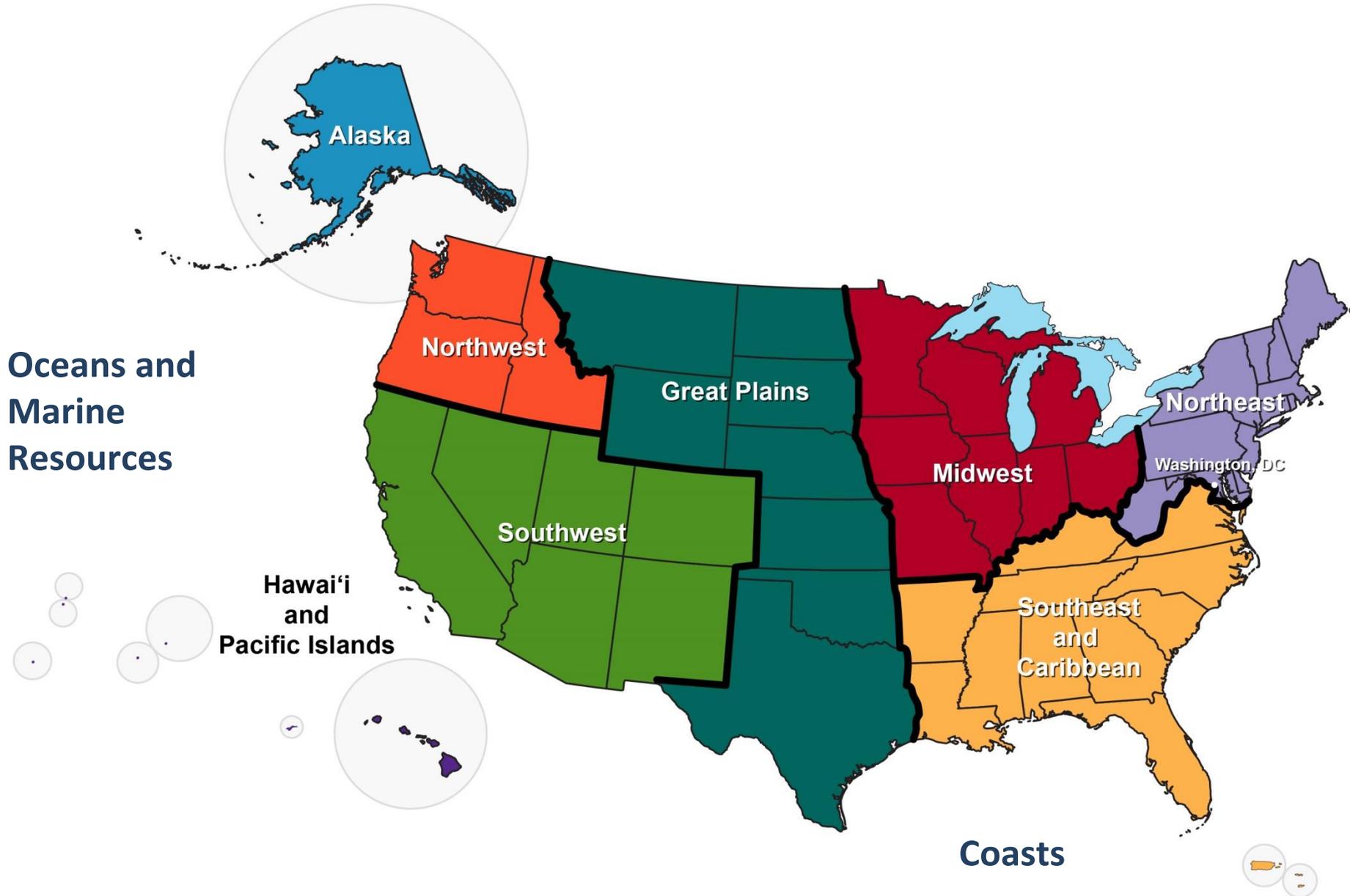


Sectoral Cross-Cuts



- Energy, Water, and Land Use
- Urban Systems and Infrastructure
- Indigenous Peoples, Lands, and Resources
- Land Use and Land Cover Change
- Rural Communities
- Biogeochemical Cycles

Regions & Biogeographical Cross-Cuts





Responses

- Decision Support
- Mitigation
- Adaptation
- Research Needs
- Sustained Assessment



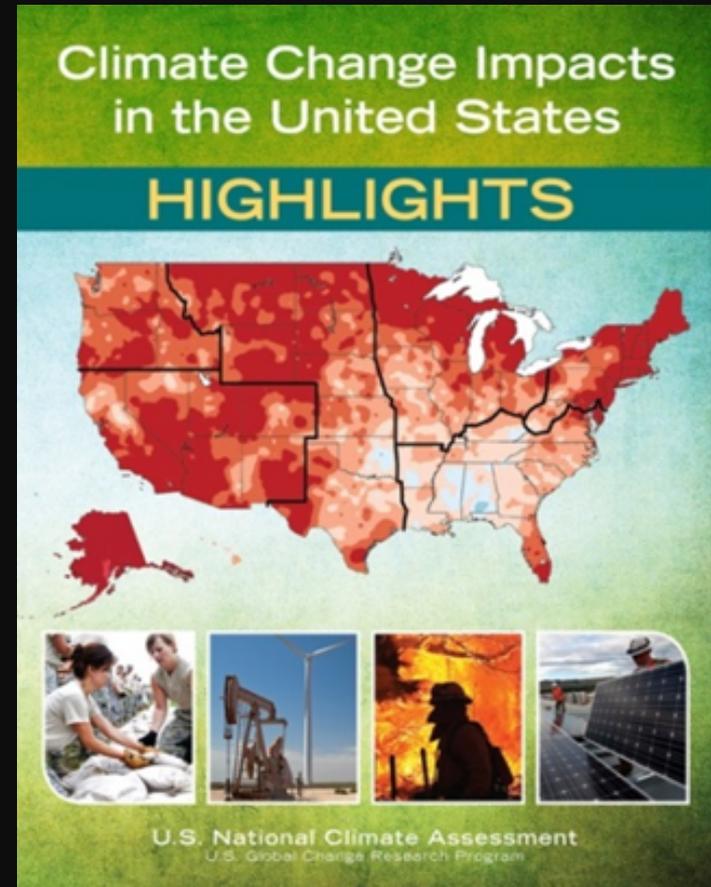


Appendices

- Process
- Information Quality
- Climate Science Supplement
- Frequently Asked Questions
- Scenarios and Models
- Future Assessment Topics



REPORT FINDINGS



GlobalChange.gov

U.S. Global Change Research Program

Human-induced climate change has moved firmly into the present.



© Dave Martin/AP/Corbis

Impacts are apparent in every region and in important sectors including health, water, agriculture, energy, and more.



© Scott Olson/Getty Images

Americans are already feeling the effects of increases in some types of extreme weather and sea level rise.



© Stan Honda/AFP/Getty Images

There are many actions we can take to reduce future climate change and its impacts and to prepare for the impacts we can't avoid.



©Dennis Schroeder, NREL



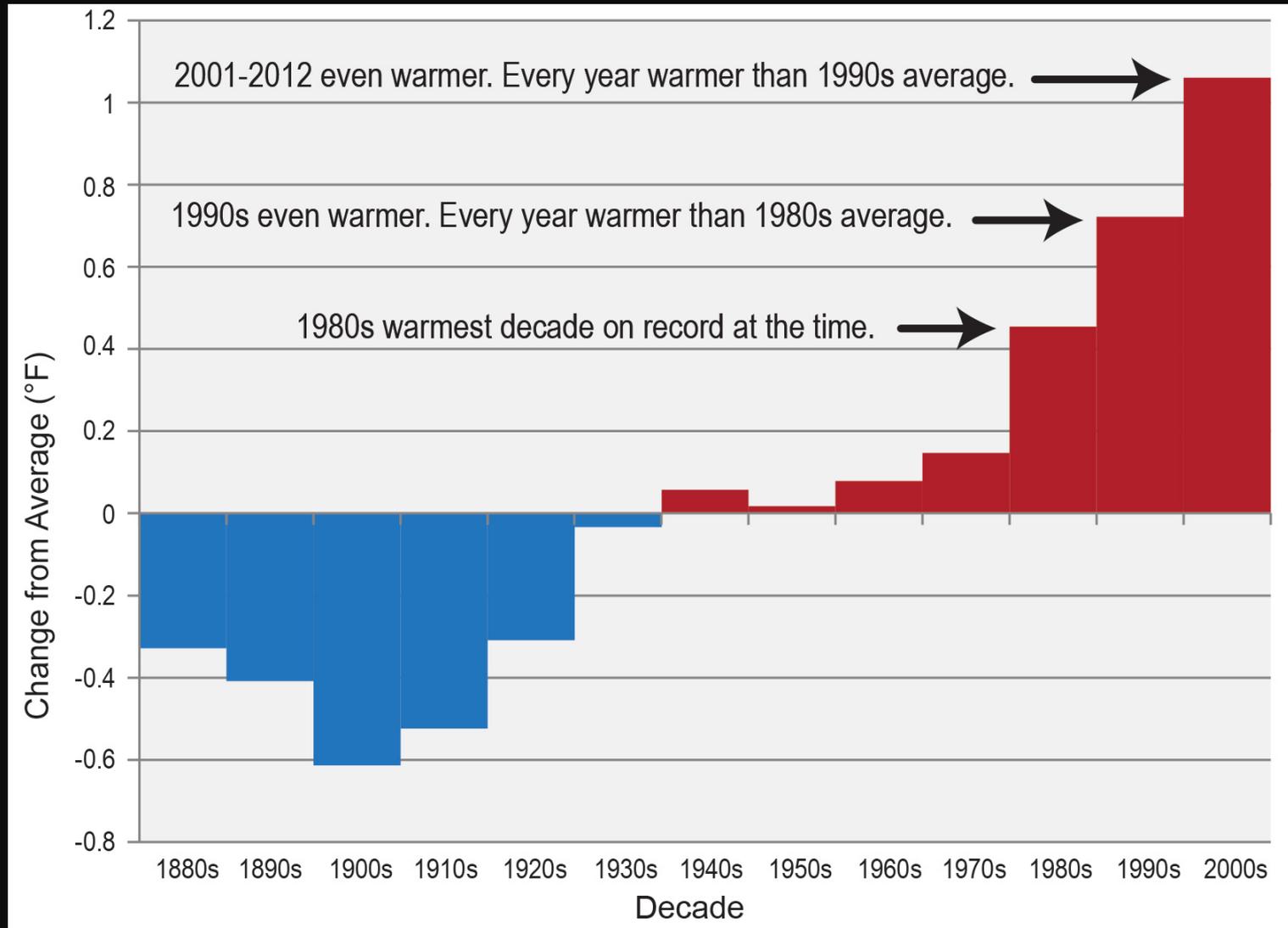
©Esperanza Stancioff, UMaine Extension and Maine Sea Grant

The World is Warming

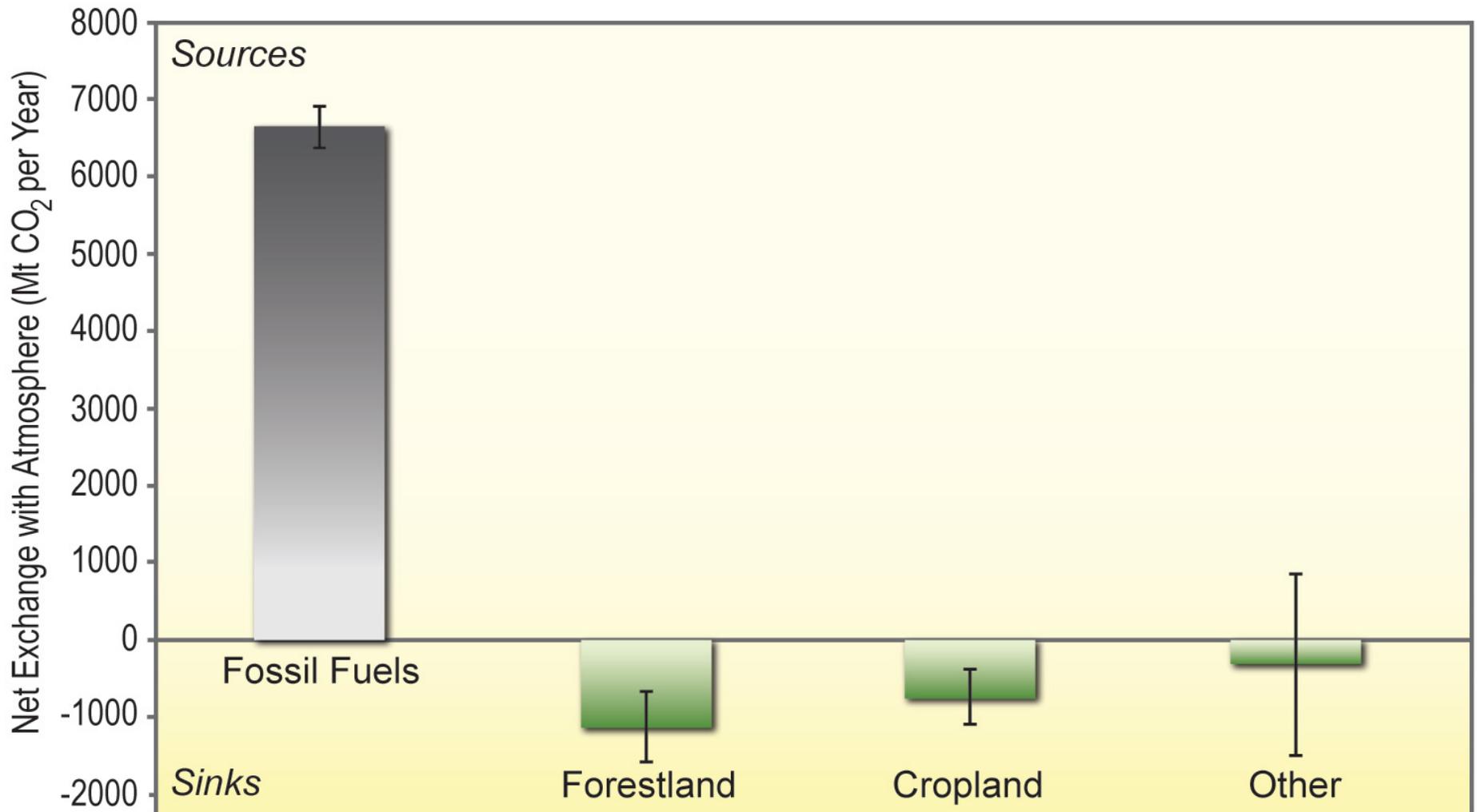
Numerous independent lines of evidence demonstrate that warming has continued.

Because human-induced warming is superimposed on a naturally varying climate, rising temperatures are not evenly distributed across the globe or over time.

Temperature Change by Decade



Major North American CO₂ Sources and Sinks



Future Climate Change Depends Primarily on Emissions Levels



© Jim West/Imagebroker/Corbis

Impacts are Projected to Increase

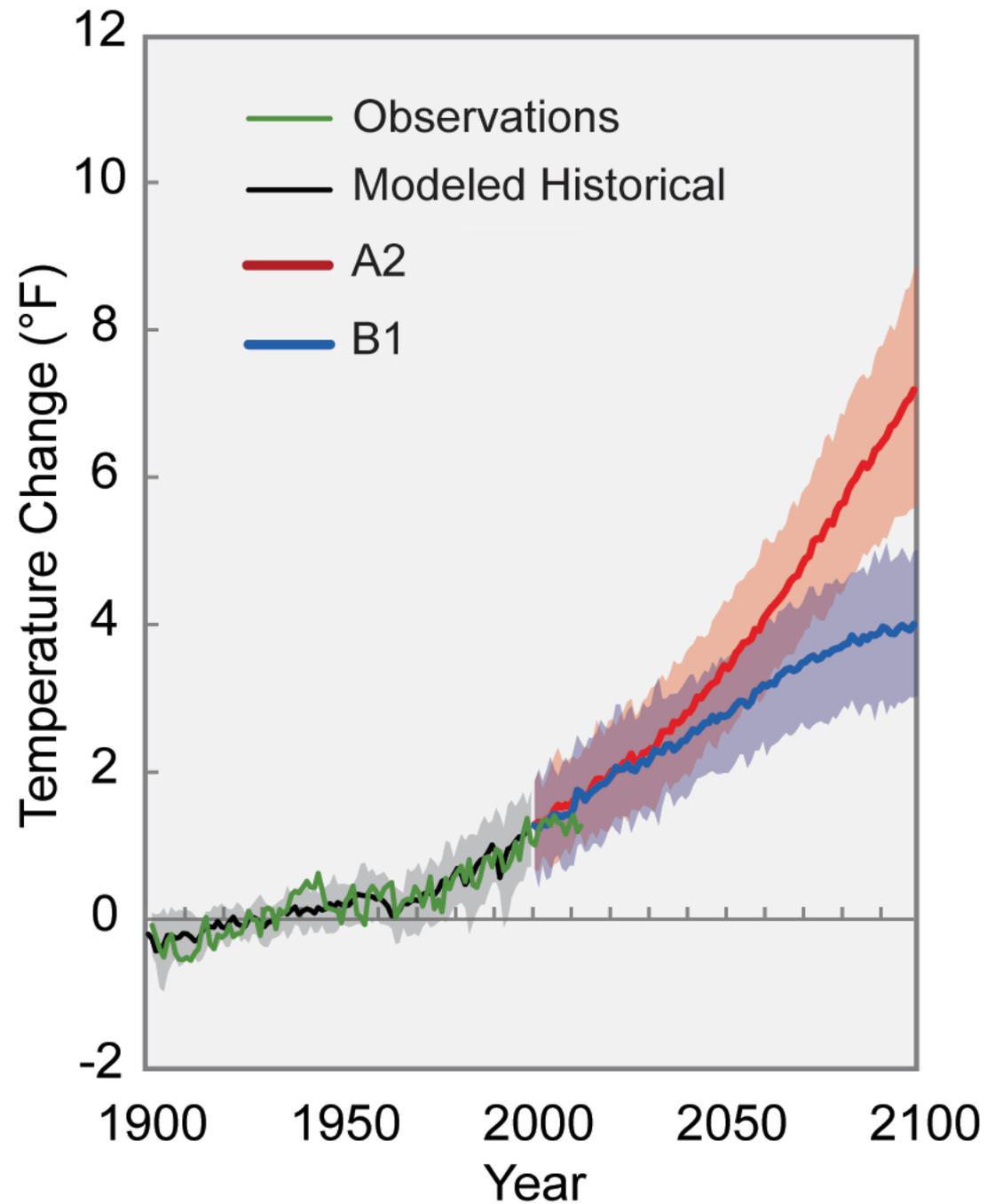


© AP Photo/The Press-Enterprise, Terry Pierson



NOAA

Projected Global Temperature Change

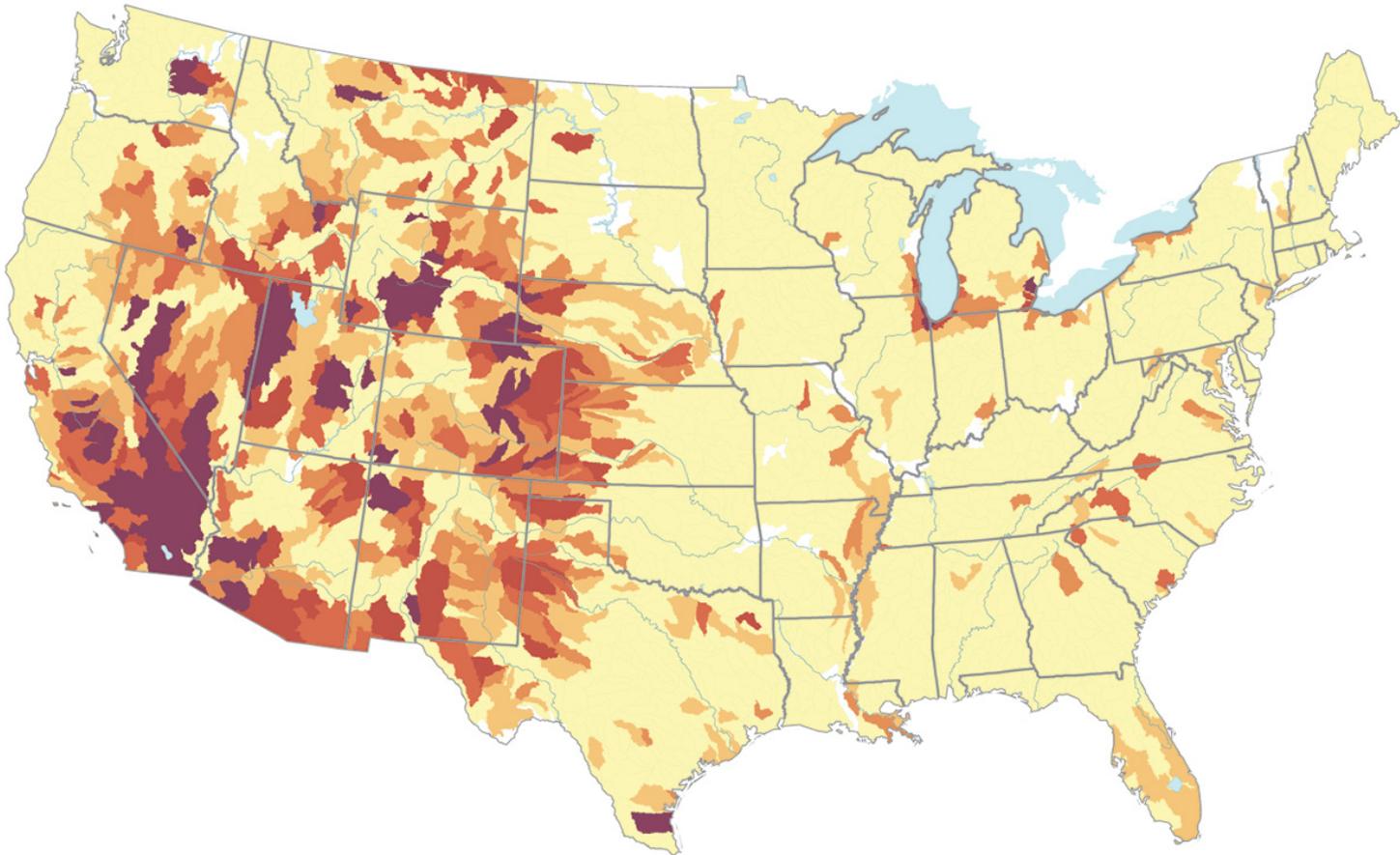


Impacts Are Already Widespread

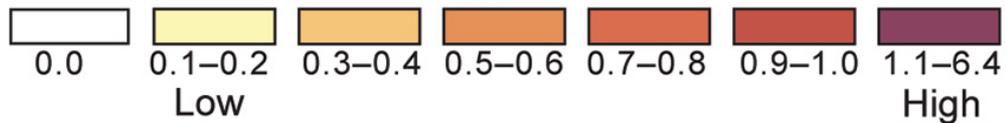


©AP Photo/The Virginian-Pilot, Steve Earley

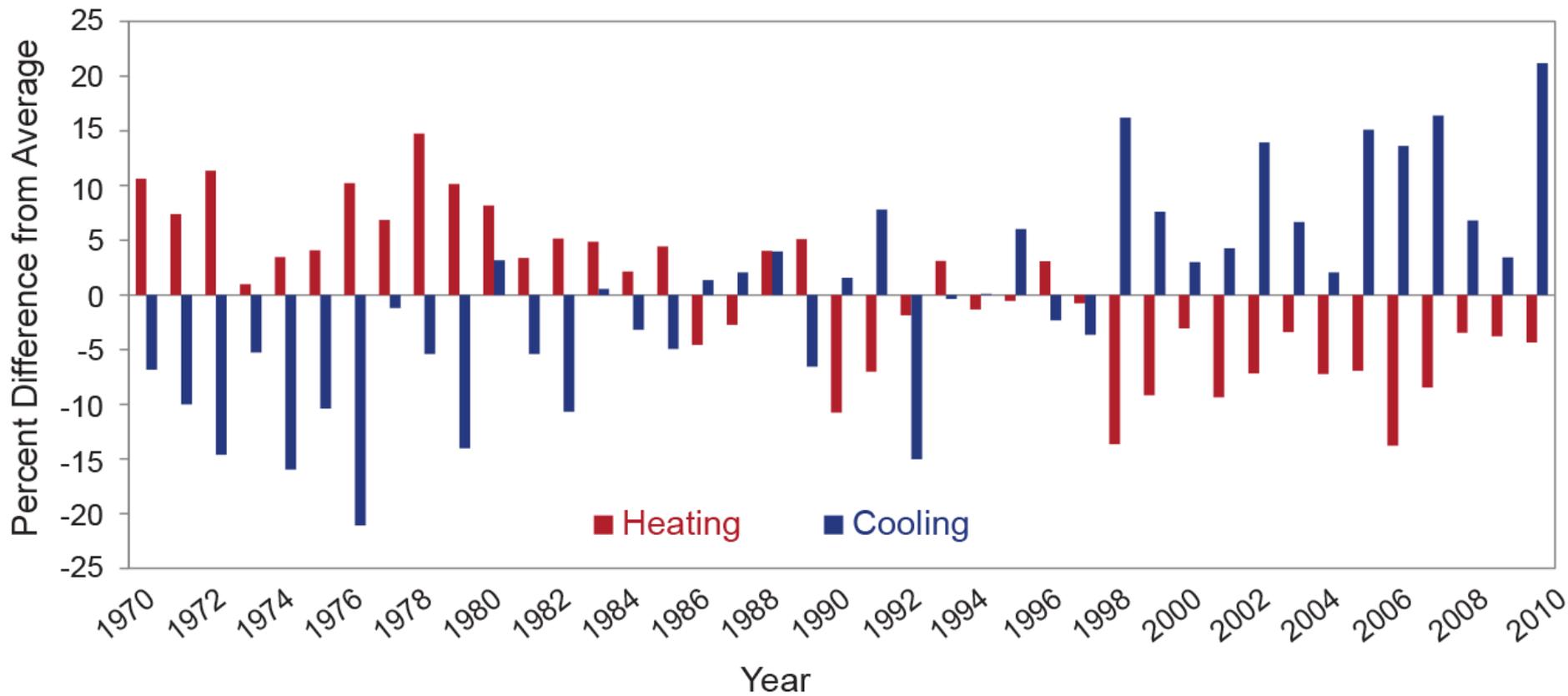
Water Stress in the U. S.



Water Supply Stress Index



Increase in Cooling Demand and Decrease in Heating Demand

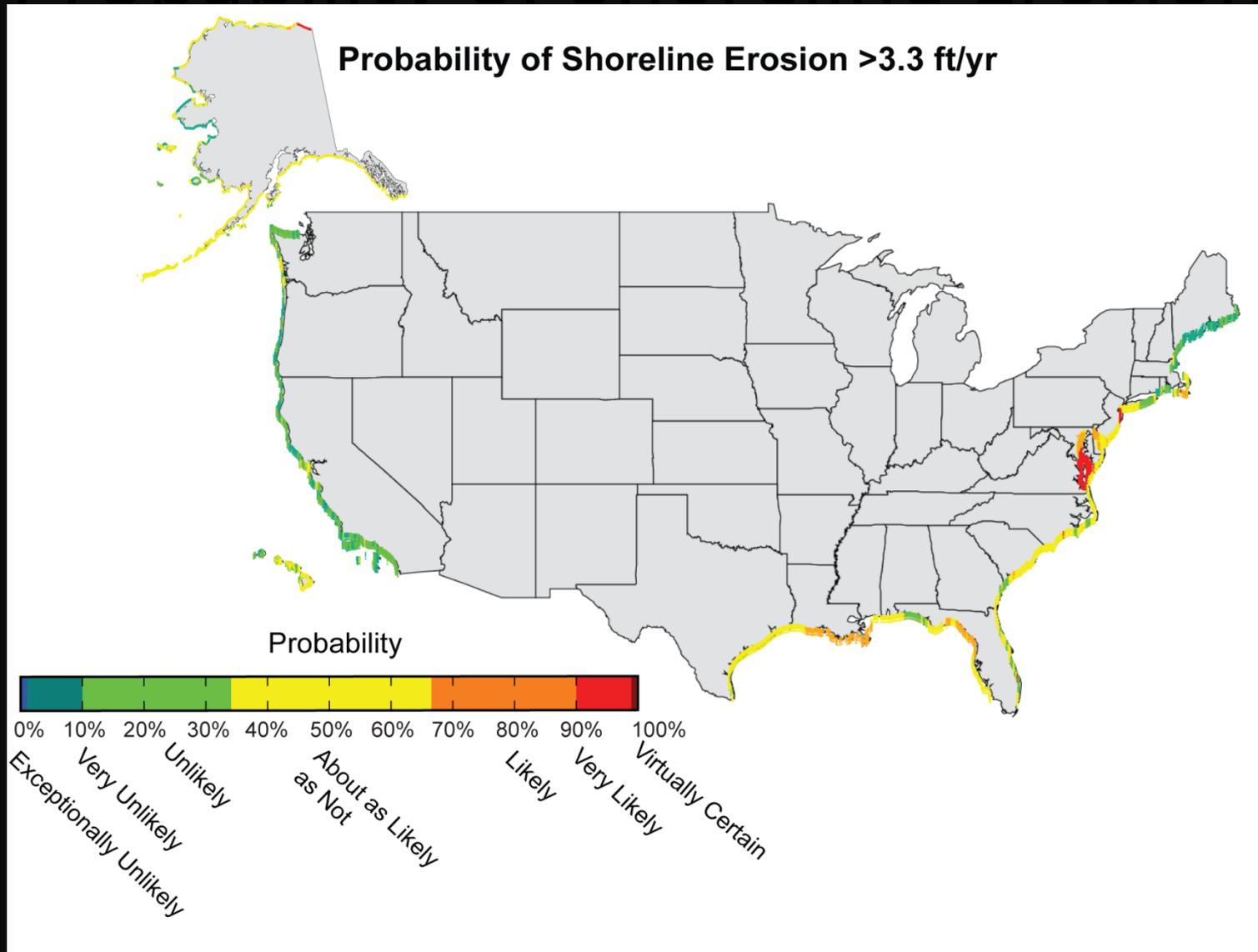


Flooding During High Tides

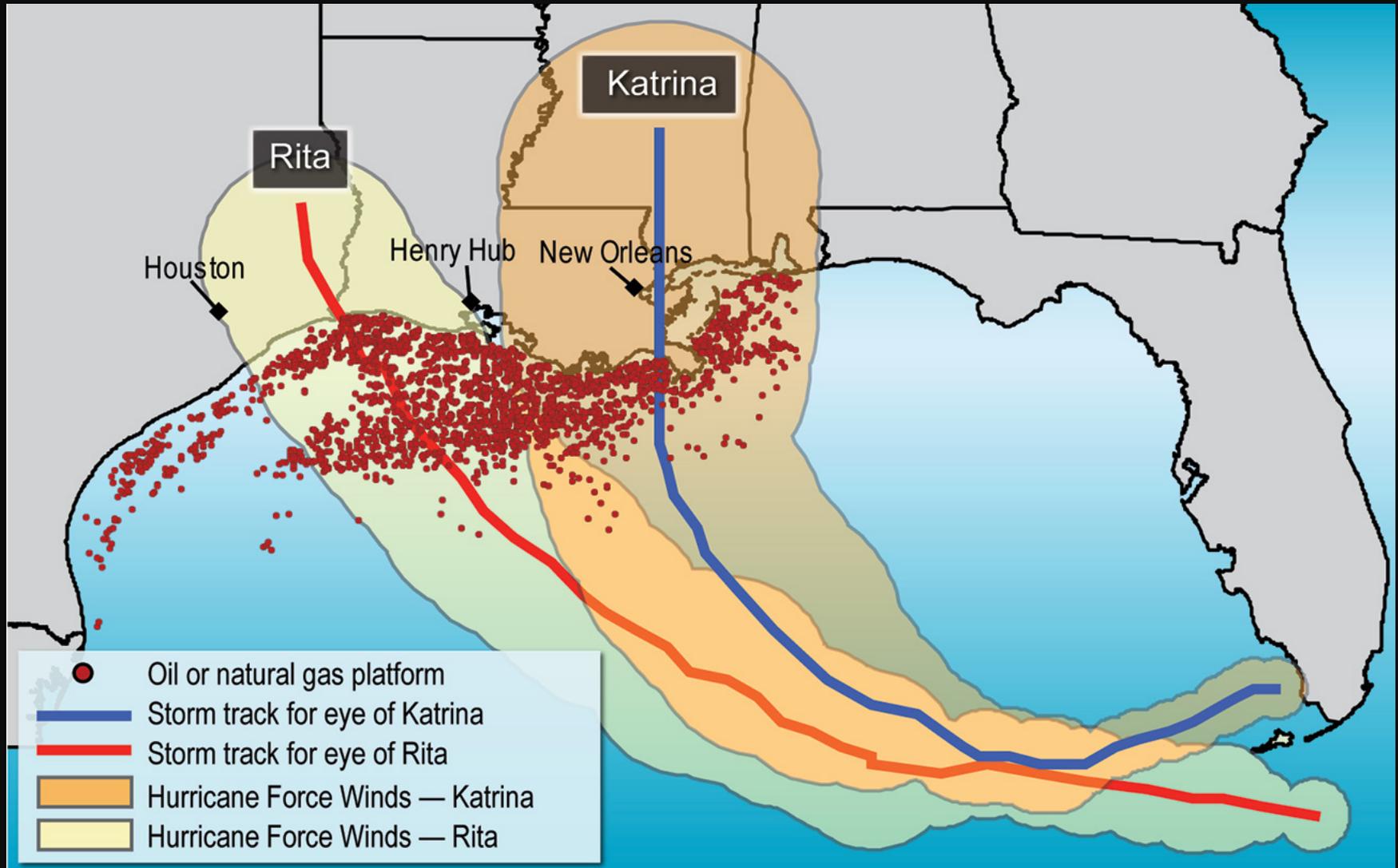


Photo credits: (left) NOAA Coastal Services Center; (right) Ray Garrido, January 6, 2010, reprinted with permission by the Washington Department of Ecology

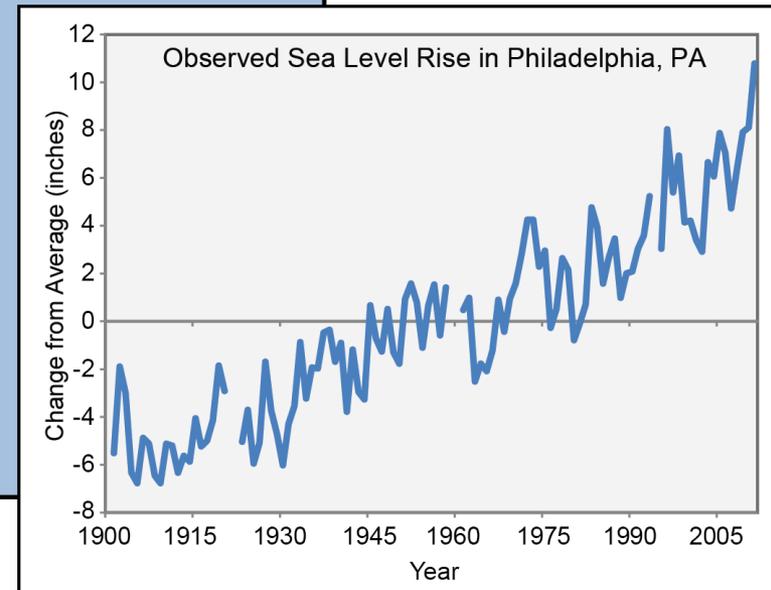
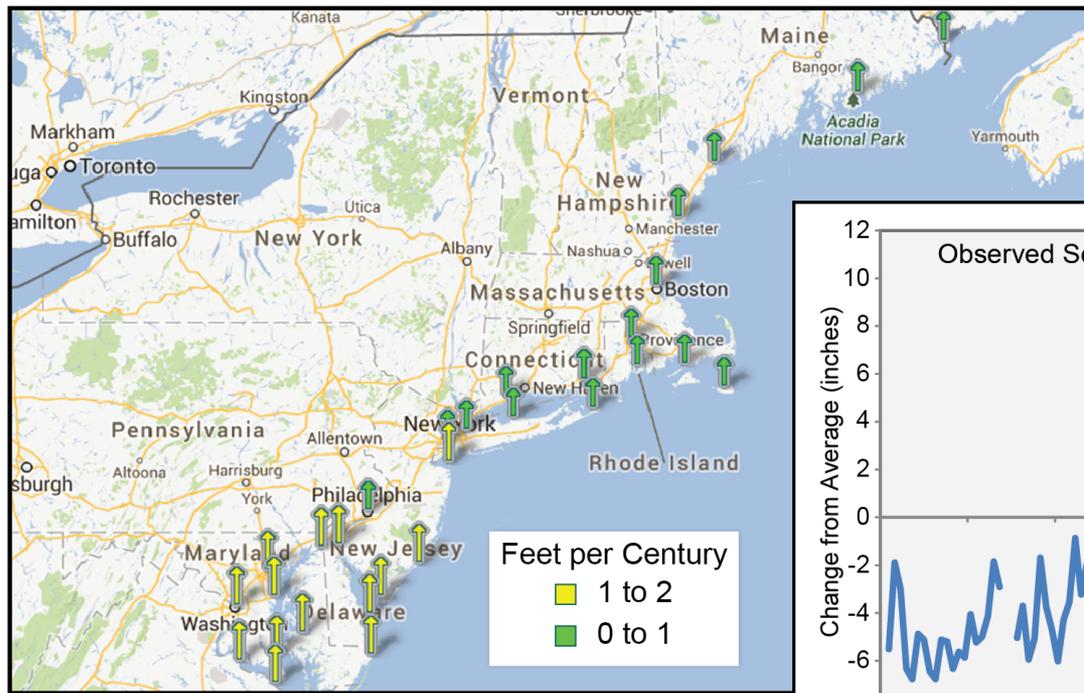
Probability of Shoreline Erosion



Paths of Hurricanes Katrina and Rita Relative to Oil and Gas Production Facilities

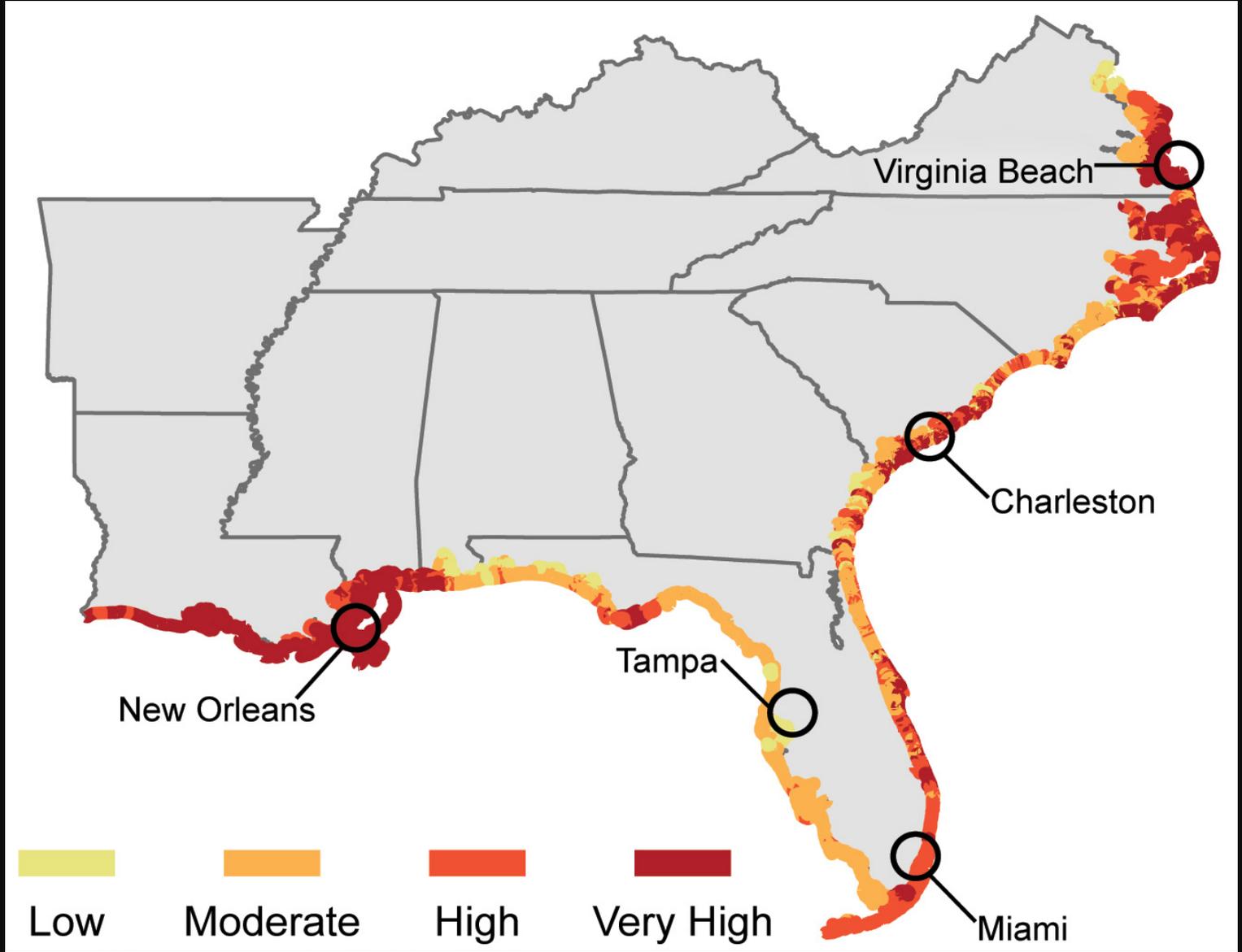


Sea Level is Rising

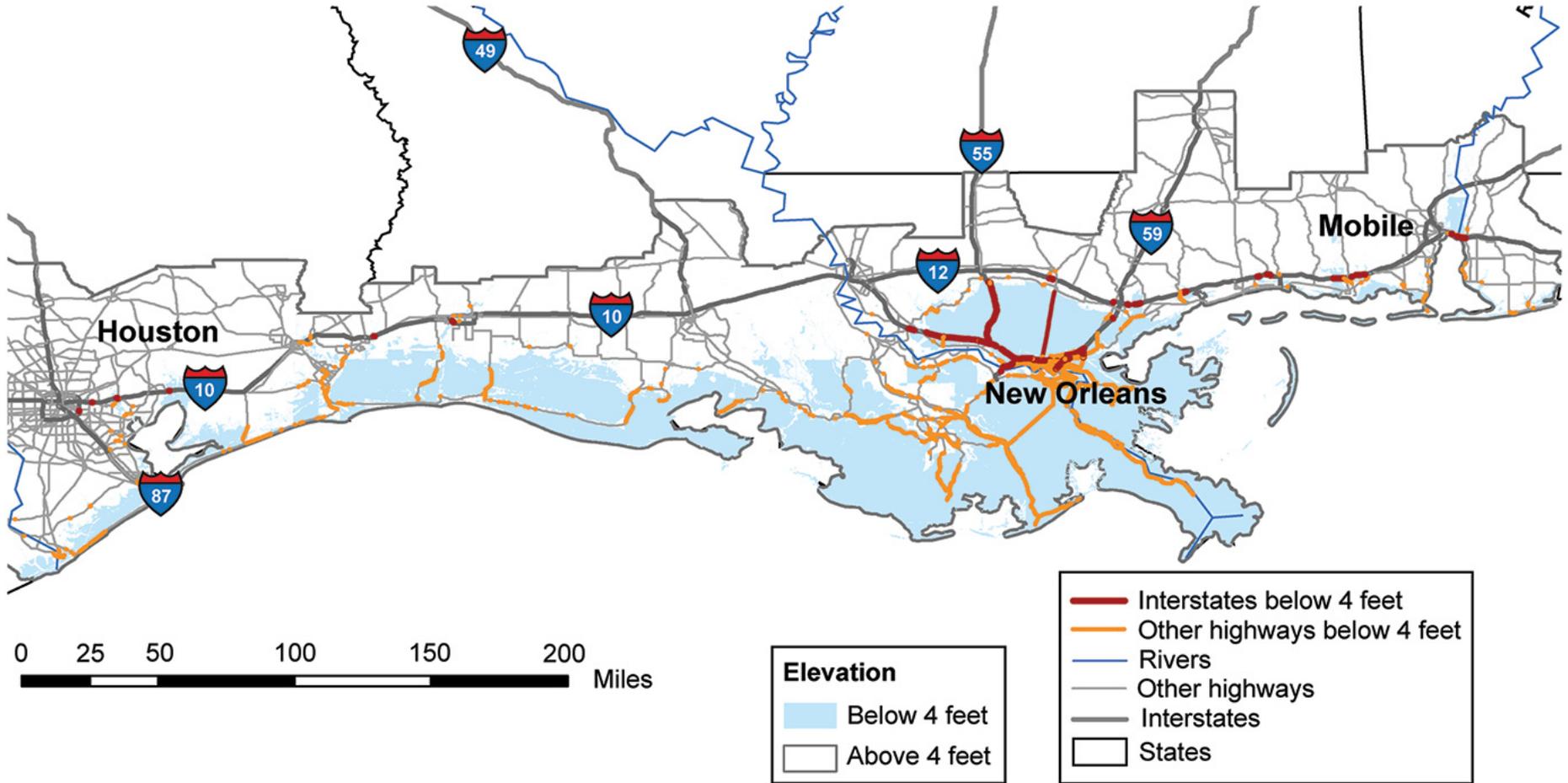


Data from Permanent Service for Mean Sea Level

Vulnerability to Sea Level Rise



Gulf Coast Transportation Hubs at Risk



Urbanization and Infrastructure Systems

Climate change and its impacts threaten the well-being of urban residents in all U.S. regions. Essential infrastructure systems such as water, energy supply, and transportation will increasingly be compromised by interrelated climate change impacts. The nation's economy, security, and culture all depend on the resilience of urban infrastructure systems.

Essential Services are Interdependent

In urban settings, climate-related disruptions of services in one infrastructure system will almost always result in disruptions in one or more other infrastructure systems.

Urban Support Systems are Interconnected

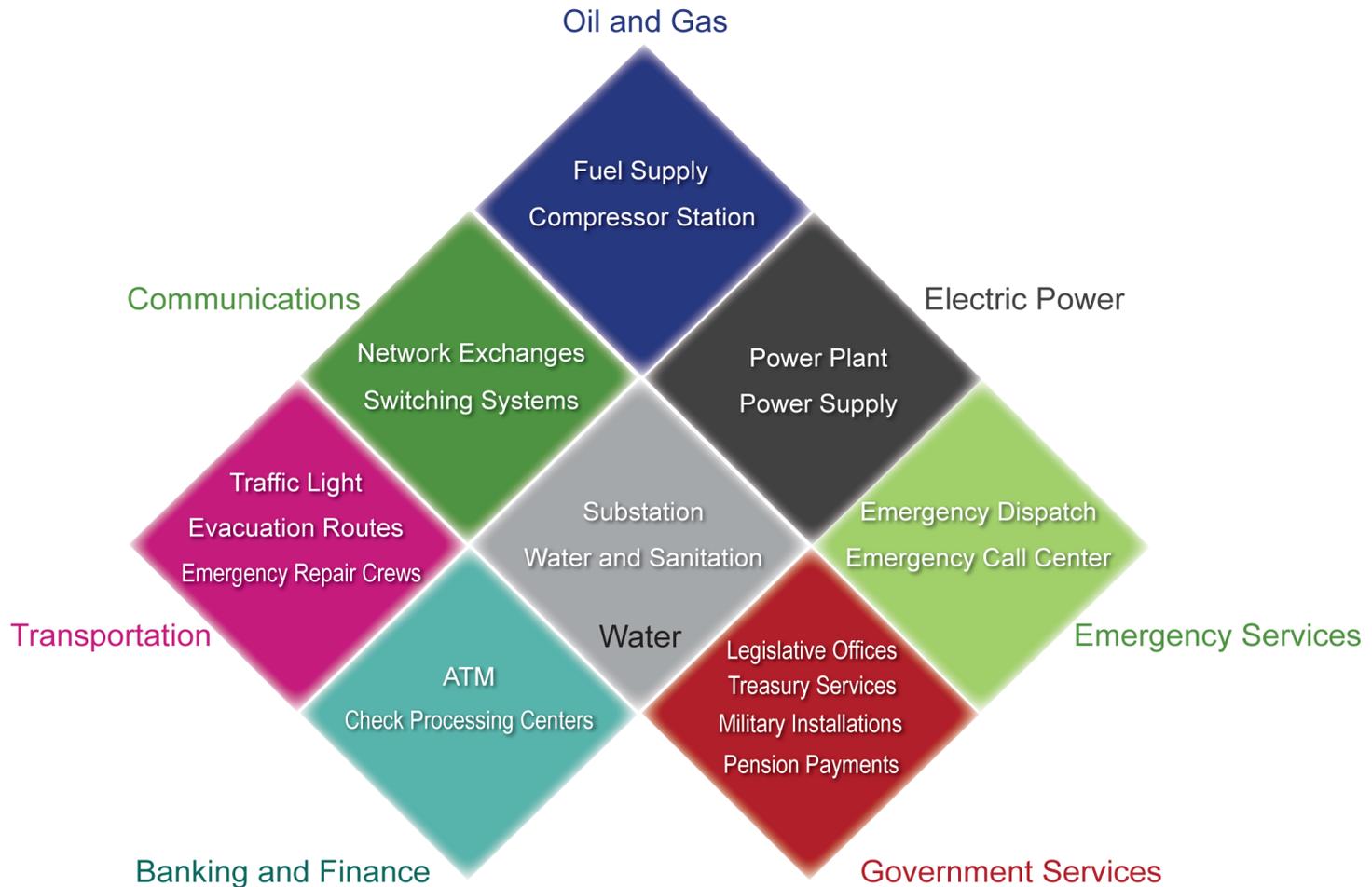
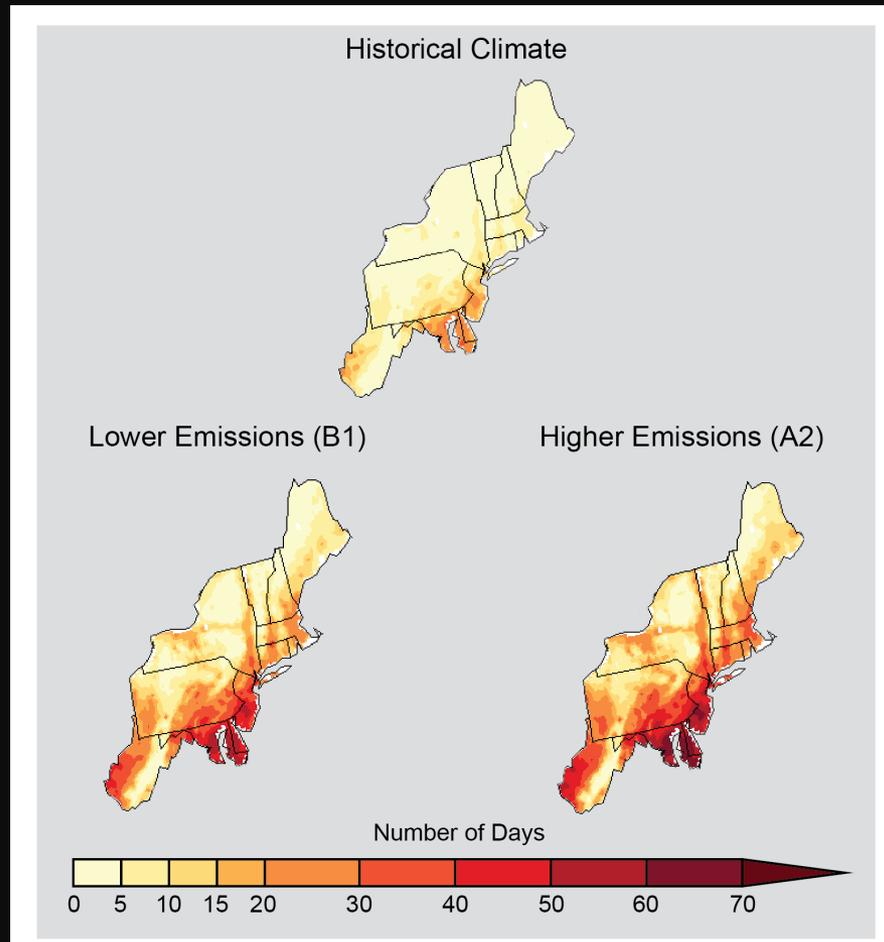


Figure source: adapted from Wilbanks et al. 2012

Projected Increase in the Number of Days Over 90° F



Responses

There are important opportunities to reduce future warming by reducing greenhouse gas emissions and increasing carbon dioxide uptake.

There are also actions we can take to prepare for impacts that are already unavoidable.

Some actions are already underway.

Mitigation



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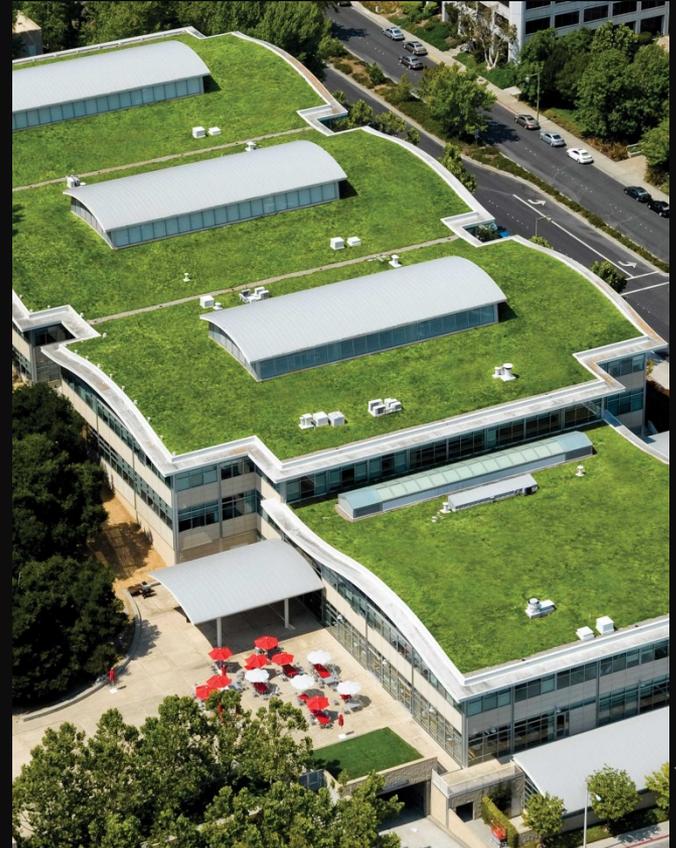


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Adaptation



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FEMA photo by Wendell A. Davis Jr.

Date

Name of Meeting

SUSTAINED ASSESSMENT

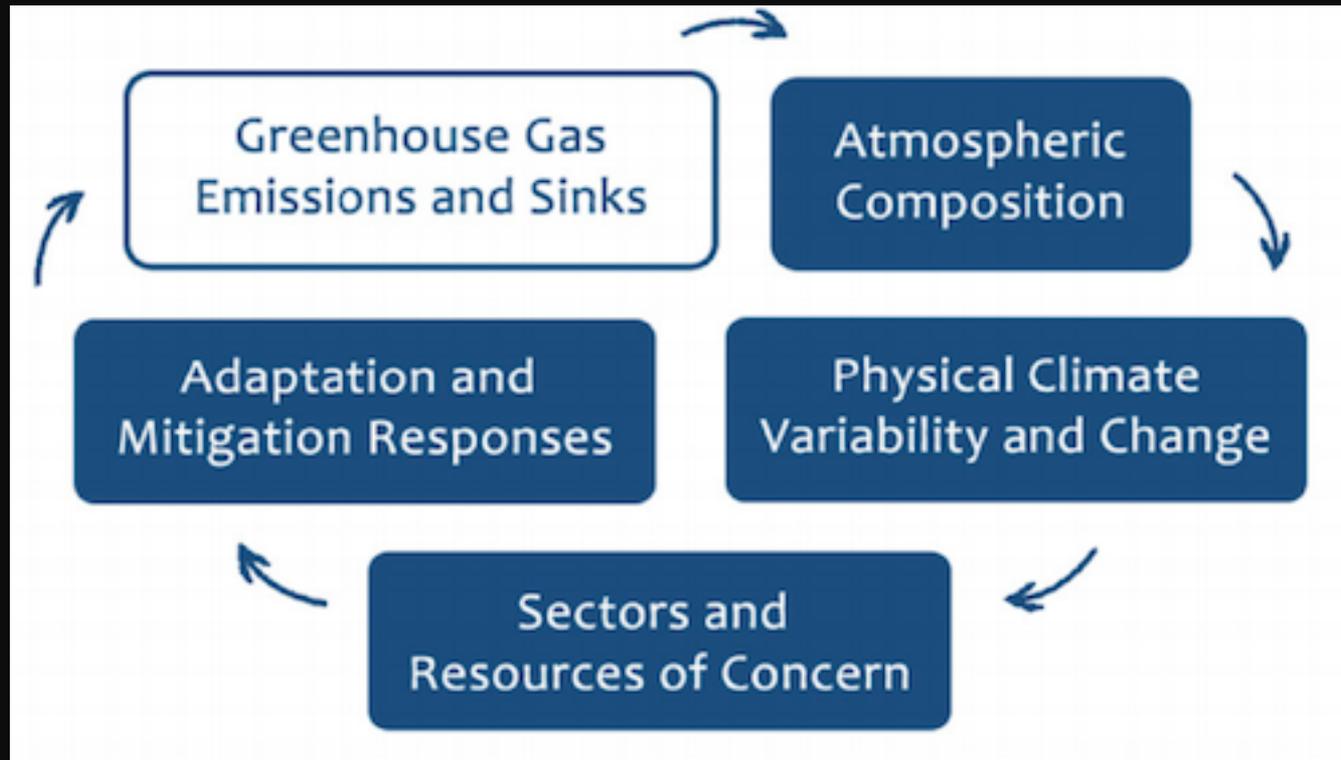


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Indicators System





Special and Foundational Reports

- Inform mitigation and adaptation activities
- Investigate emerging issues of concern
- Consider tradeoffs among different courses of action
- Test various types of data analyses and develop scenarios
- Respond to pressing stakeholder and government needs



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- Private sector
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- Translate & share NCA with members and stakeholders
- Toolkit of materials related to USGCRP and the NCA

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