

US EPA ARCHIVE DOCUMENT

The National Climate Assessment: Overview

Glynis C. Lough, Ph.D.

National Climate Assessment

US Global Change Research Program National Coordination Office

EPA Climate-Related Extremes Forum

February 26, 2013



US Global Change Research Program

Global Change Research Act
(1990) Mandate:

“To provide for development and coordination of a comprehensive and integrated United States research program which will assist the Nation and the world to **understand, assess, predict, and respond** to human-induced and natural processes of global change.”



United States
Global Change
Research Program



13 Federal Departments & Agencies +
Executive Office of the President



U.S. Global Change Research Program
**National Climate
Assessment**

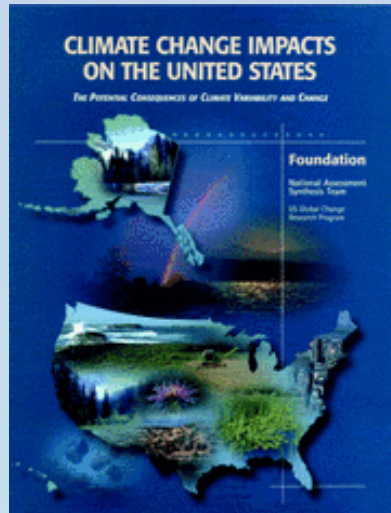
National Climate Assessment: GCRA (1990), Section 106

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

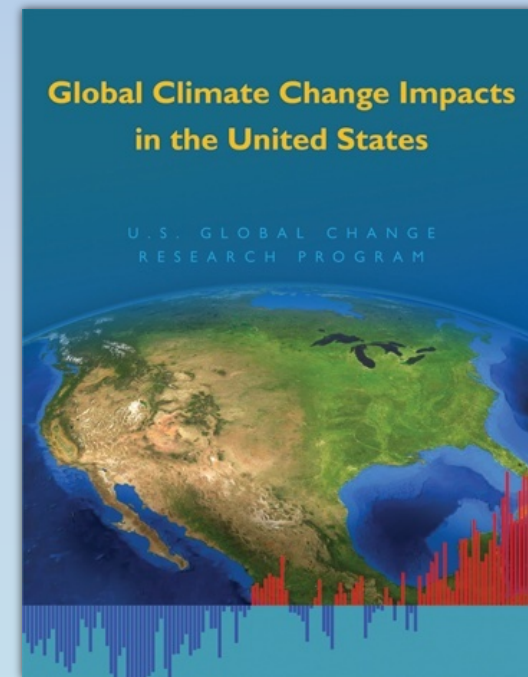
- **integrates, evaluates, and interprets** the findings of the Program (USGCRP) and discusses the scientific uncertainties associated with such findings;
- **analyzes the effects of global change** on the natural environment, agriculture, energy production and use, land and water resources, transportation, 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.**

Previous National Climate Assessments

Climate Change Impacts on the United States (2000)



Climate Change Impacts in the United States (2009)



<http://nca2009.globalchange.gov/>

The “New” National Climate Assessment

Goal

- Enhance the ability of the United States to **anticipate, mitigate, and adapt** to changes in the global environment.

Vision

- Advance an **inclusive, broad-based, and sustained process** for assessing and communicating scientific knowledge of the impacts, risks, and vulnerabilities associated with a changing global climate in support of decision-making across the United States.



Goals for the NCA

- A **sustained process** for informing an **integrated research program**
- New approaches to development and use of **scenarios at multiple scales**
- **Evaluation** of the implications of alternative **adaptation and mitigation options**
- **Community building** within regions and sectors that can lead to enhanced resilience

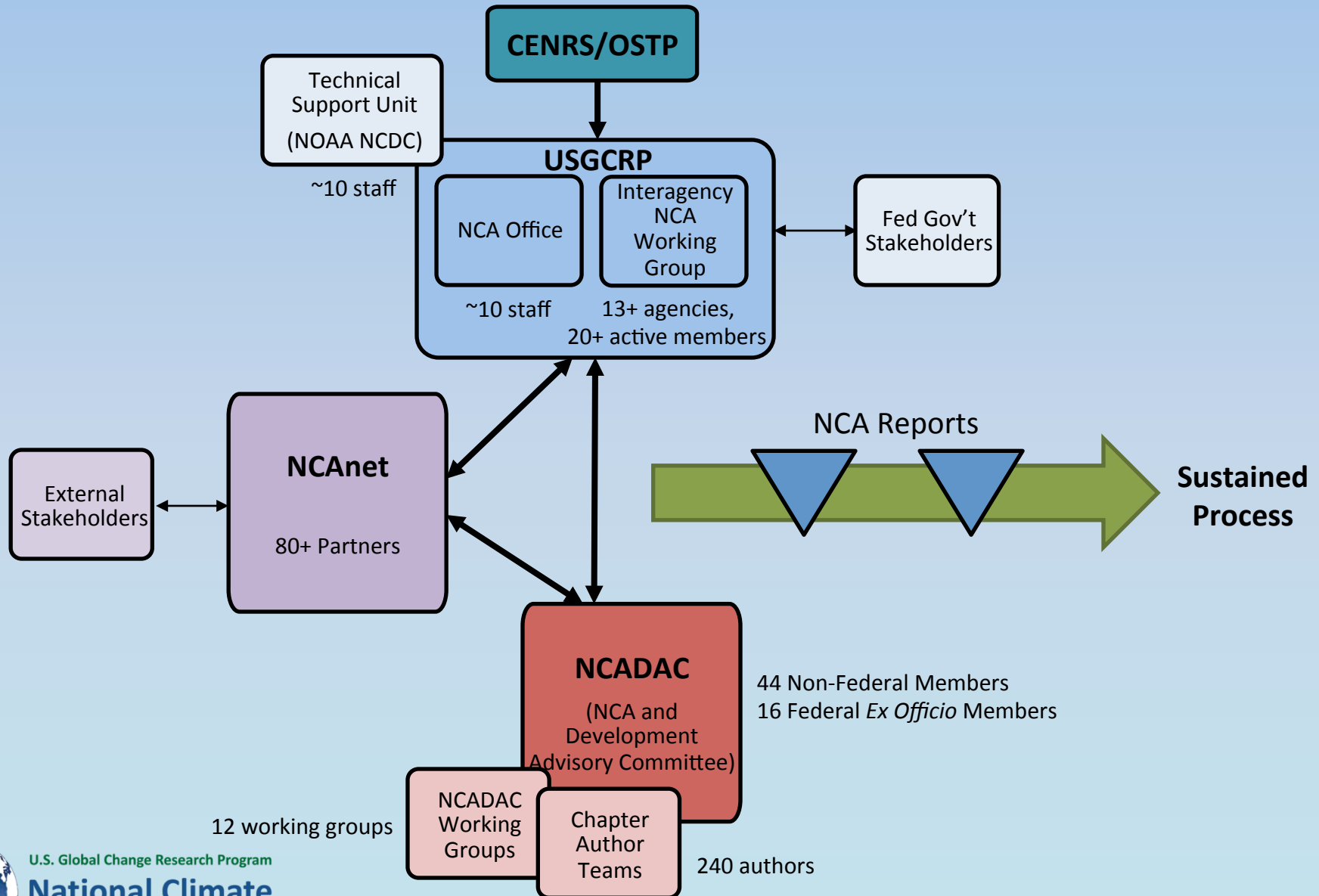


Outcomes of the NCA

- **Ongoing, relevant, highly credible analysis** of scientific understanding of climate change impacts, risk, and vulnerability
- Enhanced timely **access to Assessment-related data** from multiple sources useful for decision making
- **Systematic evaluation** of progress towards reducing risk, vulnerability, and impacts
- **National indicators** of change and the capacity to respond



NCA Structure

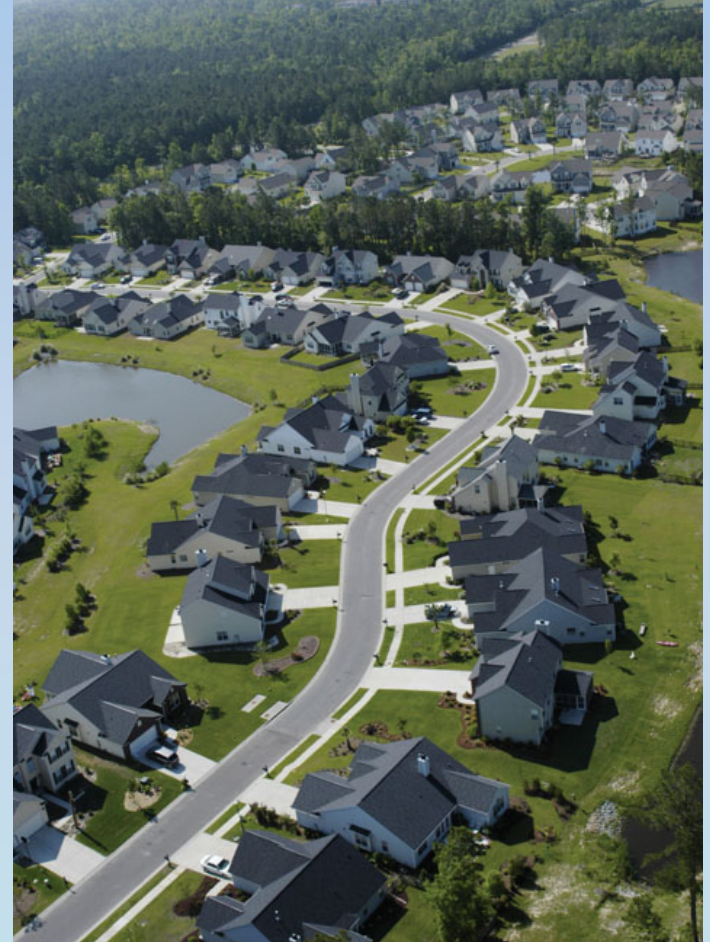


NCA Progress

- Hosted many workshops focused on assessing impacts and vulnerabilities in 8 regions and 13 sectors, evaluating the state of climate science, and identifying research needs
- Established consistent methodologies, models, scenarios and approaches to be used in Assessment processes
- Developed new regional climatologies and projections for all 8 regions and the Nation, as well as sea level rise scenarios (all available at: scenarios.globalchange.gov)
- Initiated development of the first national indicator system to evaluate global change and the ability to adapt/respond

Outline for Third NCA Report

- Letter to the American People
- Executive Summary: Report Findings
- Introduction
- Our Changing Climate
- Sectors & Sectoral Cross-cuts
- Regions & Biogeographical Cross-cuts
- Responses
 - Decision Support
 - Mitigation
 - Adaptation
- Agenda for Climate Change Science
- The NCA Long-term Process
- Appendices
 - Commonly Asked Questions
 - Expanded Climate Science Info



Draft Report Findings: Extremes

- Every chapter has 3+ Key Messages
- Almost every chapter includes a KM on extremes
- The Executive Summary includes 11 Draft Report Findings that represent key messages across chapters
- Of the 11 Draft Report Findings, 5 describe extremes

Draft Report Findings: Extremes

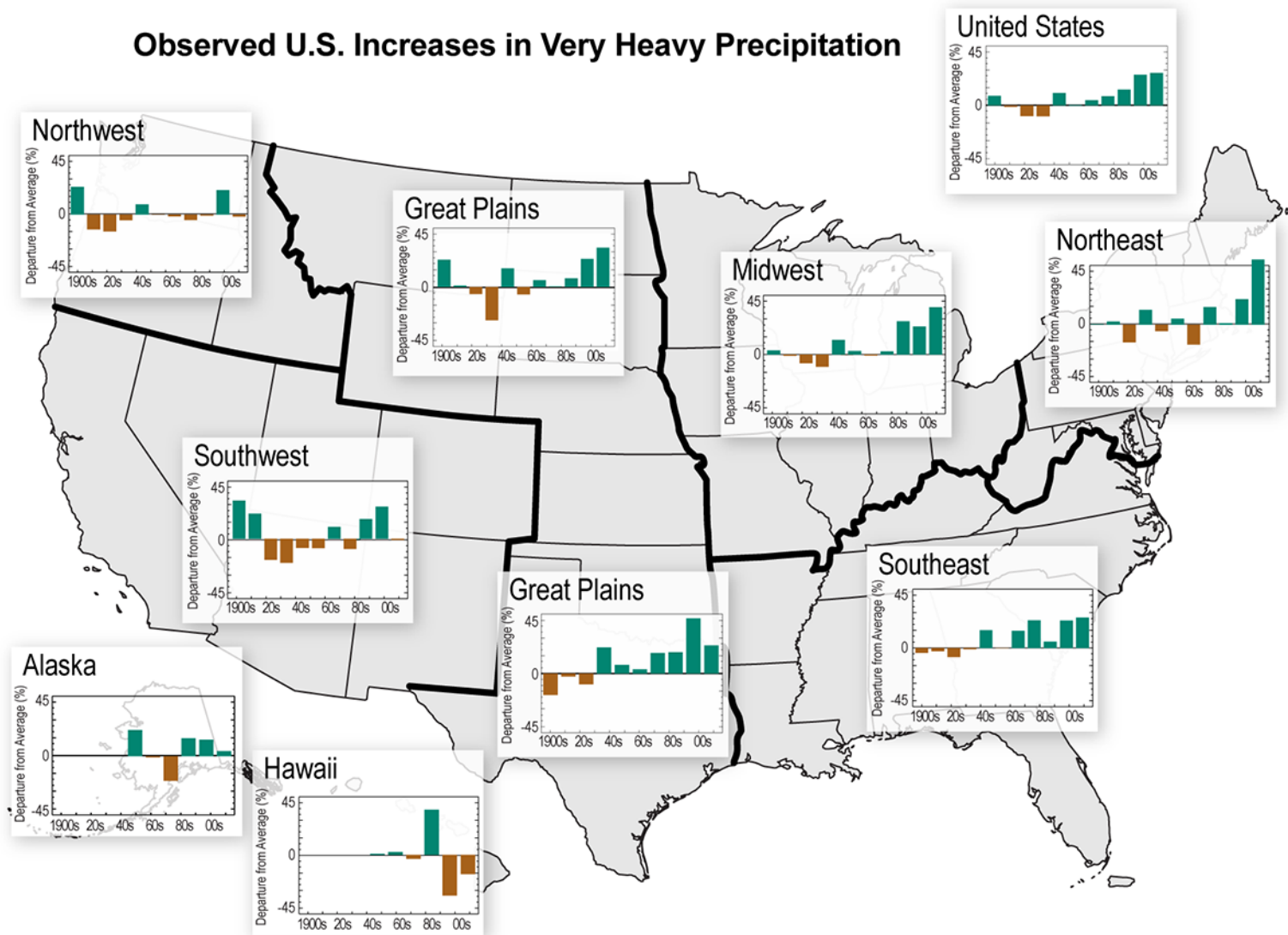
- Some extreme weather and climate events have increased in recent decades, and there is **new and stronger evidence** that many of these increases are related to human activities.
- **Climate change threatens human health and well-being** in many ways, including impacts from increased extreme weather events, wildfire, decreased air quality, diseases transmitted by insects, food, and water, and threats to mental health.
- **Infrastructure across the U.S. is being adversely affected** by phenomena associated with climate change, including sea level rise, storm surge, heavy downpours, and extreme heat.
- **Reliability of water supplies is being reduced** by climate change in a variety of ways that affect ecosystems and livelihoods in many regions
- **Natural ecosystems are being directly affected** by climate change, including changes in biodiversity and location of species. As a result, the capacity of ecosystems to moderate the consequences of disturbances such as droughts, floods, and severe storms is being diminished.

Draft Report Findings: Extremes

- Climate Science chapter presents trends and projections for extreme weather events, including:
 - Extreme Precipitation
 - Total Precipitation above daily 99th percentile precip threshold
 - Number of 2-day totals exceeding a 1-in-5yr threshold
 - Heat and Cold Waves
 - Number of 4-day periods exceeding a 1-in-5yr threshold
 - Extreme Storms
- Sectoral and Regional chapters describe projected impacts from extremes

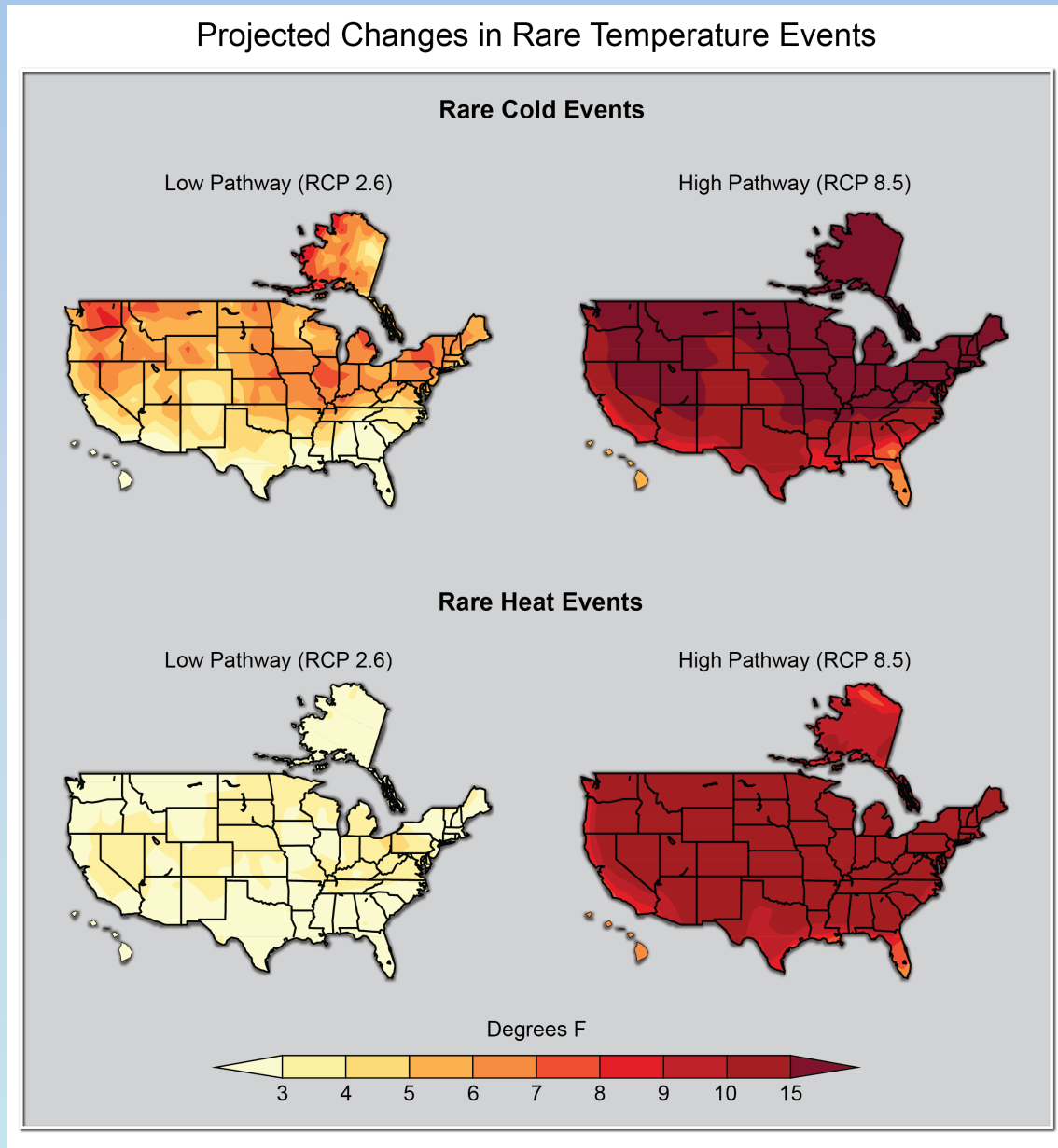
Trends & Projections: Very Heavy Precip

Observed U.S. Increases in Very Heavy Precipitation



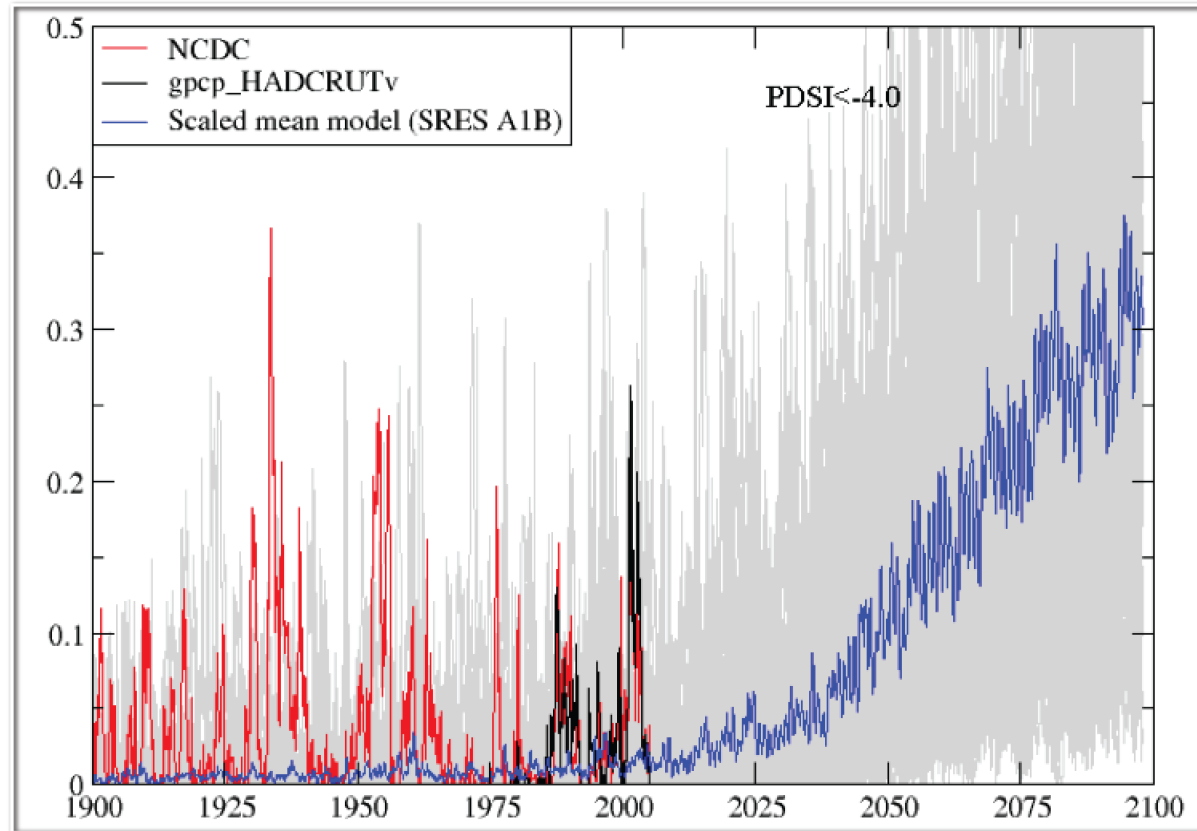
Projected Changes in Rare Temperatures

- Both the hottest and coldest days are projected to be warmer.
- Projected changes in surface air temperature at the end of this century (2081-2100) relative to the end of the last century (1981-2000) on very rare cold and hot days for
 - RCP 2.6 (Left)
 - RCP 8.5 (Right)



Extreme Drought Projections

Extreme Drought in the U.S. and Mexico, Past and Future

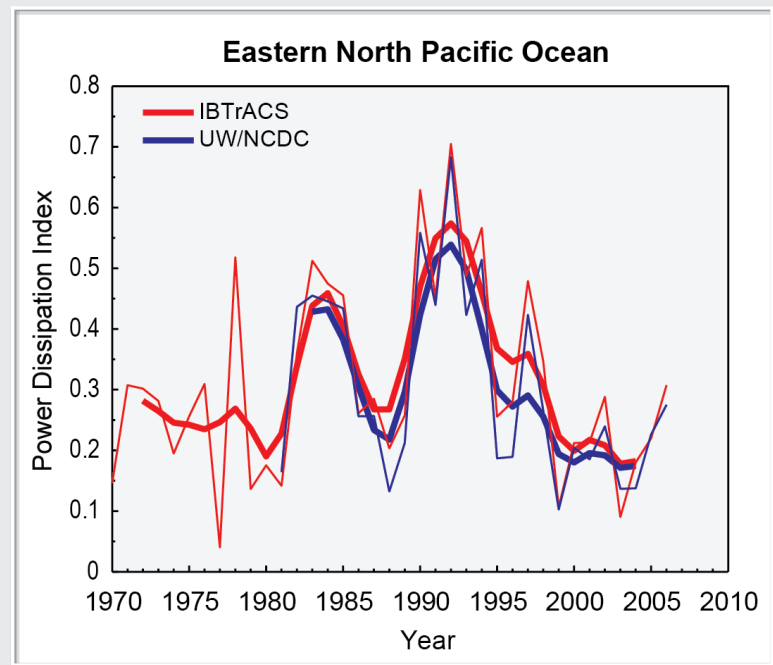
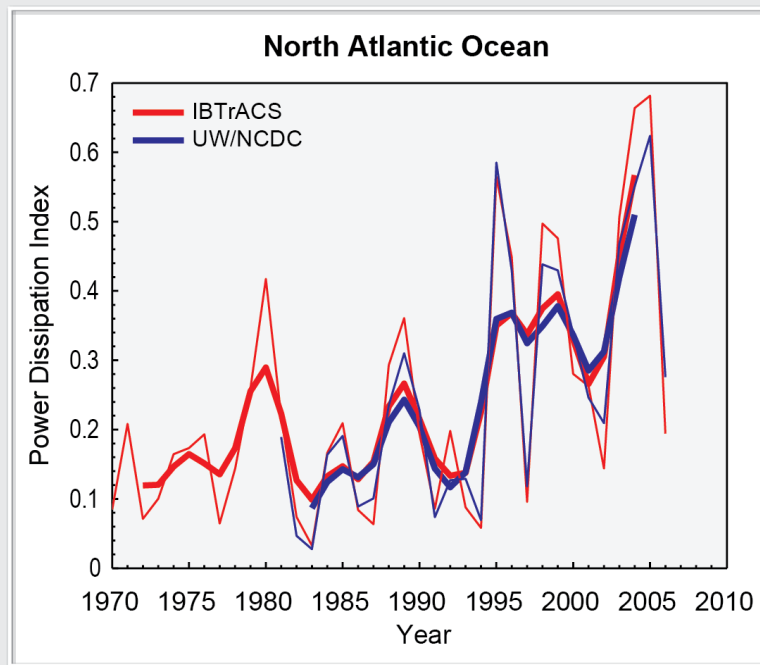


U.S. Global Change Research Program

**National Climate
Assessment**

Storm Intensity and Frequency

Observed Trends in Hurricane Intensity



Review of Draft Third NCA Report

Draft report:

<http://ncadac.globalchange.gov>

Comments MUST be submitted via the online comment tool

Main NCA page:

<http://assessment.globalchange.gov>

- Public comment period: January 14 – April 12, 2013
- Concurrent review by National Research Council panel
- Review comments are an important part of the process of producing a credible and relevant report
- Authors and NCADAC will respond to all comments
- Commenters will be anonymous during review; names will be public with the final version.

Ensuring a Sustained Assessment

- Creating and sustaining the capacity to conduct and use assessments is an essential part of the NCA process
- The National Climate Assessment and Development Advisory Committee (NCADAC) is charged with both producing a synthesis assessment report and providing advice on the sustained process
- The sustained assessment process is already underway



Sustained Assessment

Why Consider Special Reports and Activities?

- Deepen understanding of climate change effects on a particular sector or region that are of national importance
- Investigate new scientific issues of concern
- Build capacity to conduct more sophisticated, useful, and credible assessments over time
- Better support decisions that reduce risk and increase opportunities
- Enable a full review for issues of national importance in an efficient and credible way

Sustained Assessment

Foundational and Special Topics

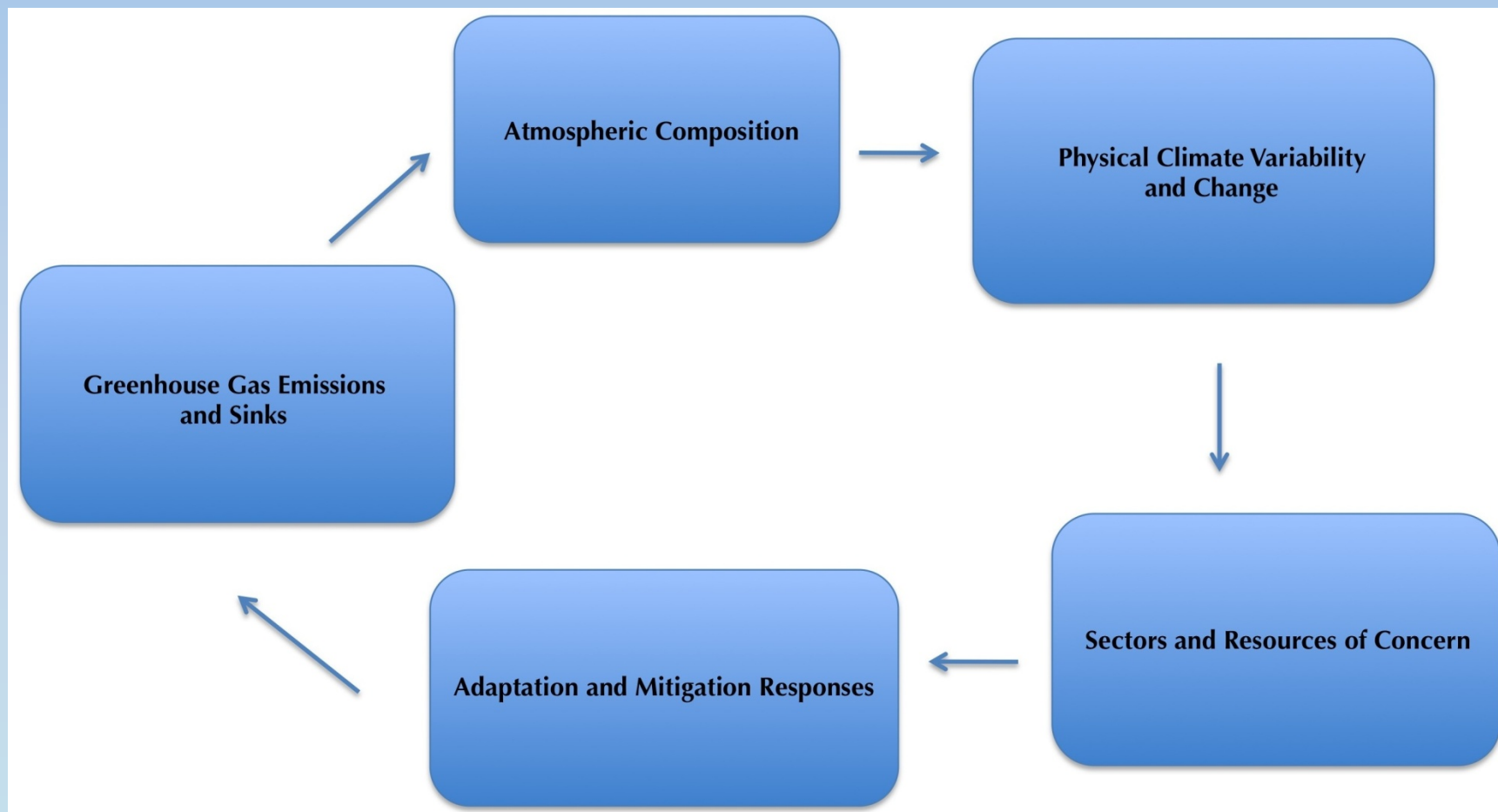
- Foundational Topics (supportive of 2017 synthesis report and beyond)
 - **Sustained assessment**
 - Scenario development
 - Integration with CMIP5 outputs
 - Land cover/use cover updates
 - Guidance on use of model data
 - **Indicators**
 - Valuation
- Special topics “experiments” (require more depth than is afforded by coverage within a synthesis report)
 - Food security
 - International context
 - Water and drought
 - Large biophysical regions (e.g., Arctic or Mississippi Watershed)

National Climate Assessment Indicators

The goals for the NCA indicators are to:

- Provide meaningful, authoritative climate-relevant measures about the status, rates, and trends of key physical, ecological, and societal variables and values
- Inform decisions on management, research, and education at regional to national scales
- Identify climate-related conditions and impacts to help develop effective mitigation and adaptation measures
- Provide analytical tools by which user communities can derive their own indicators for particular purposes

Indicators Framework



U.S. Global Change Research Program

**National Climate
Assessment**

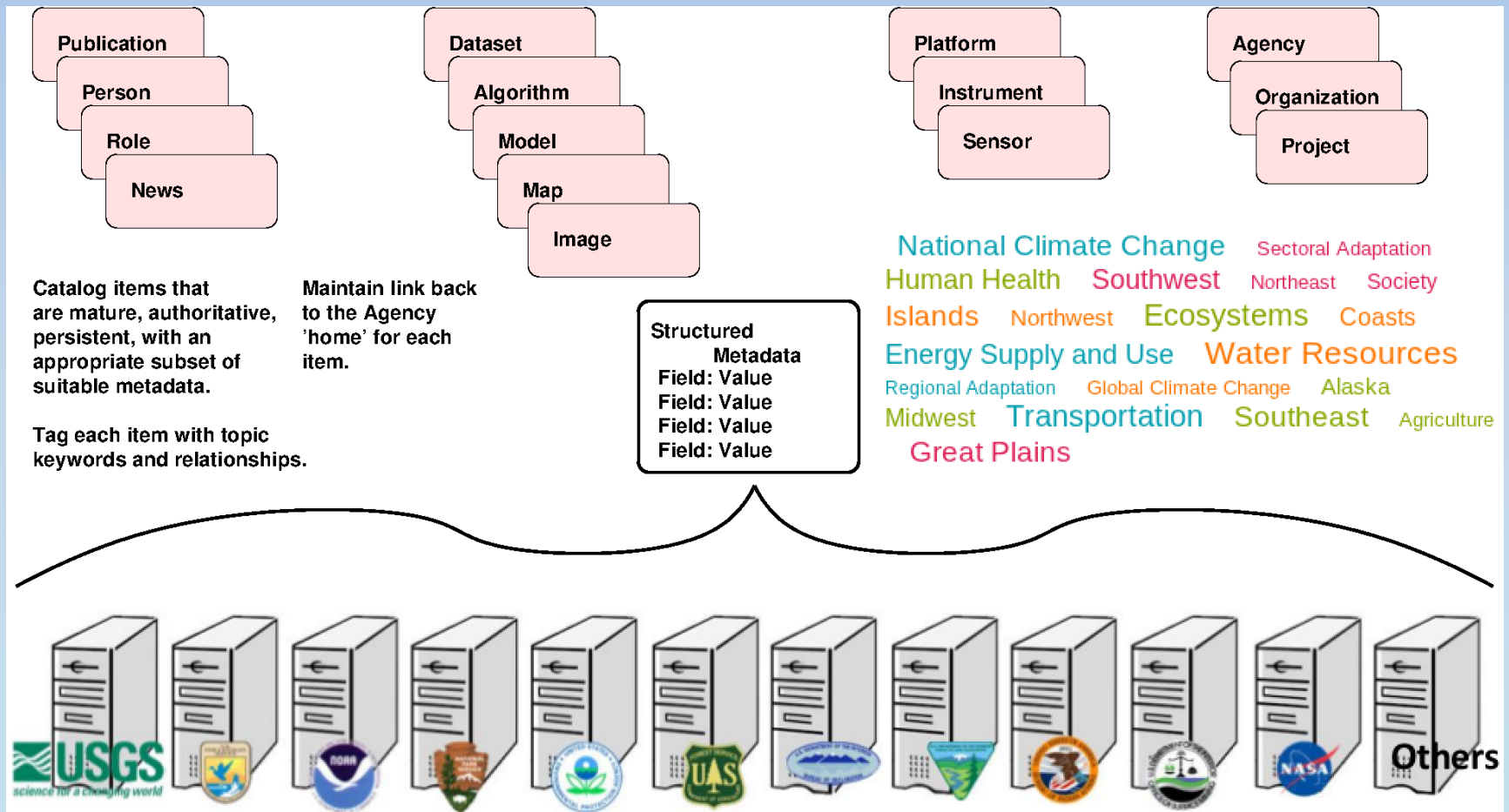
Global Change Information System

- A “one-stop-shop” web based source of *authoritative, accessible, usable, and timely* information about climate and global change for use by scientists, decision makers, and the public
 - A friendly, accessible entry into global change information for non-scientists
 - Global, persistent, reusable identifiers for each item
 - Integrated data catalog provides interagency metrics, data mining, searching, etc.
 - Interagency relationships allow discovery of interdependencies and increase collaboration opportunities
 - Agency information mapped into a common, consistent model with a standard vocabulary
 - Concept tagging and linking improves search results for agency products

Current Sustained Assessment Activities:

GLOBAL CHANGE INFORMATION SYSTEM

Providing Access to Useful & Usable Climate Science and information



U.S. Global Change Research Program

**National Climate
Assessment**

Building Engagement and Communications Capacity

Human Capital

- NCADAC Engagement and Communication Working Group
- NCA Staff
- NCAnet Partners

NCA Vision

Advance an **inclusive, broad-based**, and sustained process for assessing and **communicating scientific knowledge** of the impacts, risks, and vulnerabilities associated with a changing global climate in support of decision-making across the United States.

Engagement Activities

- NCA Website and E-newsletters
- Federal Register Notices soliciting comments on NCA approach and topics
- First-ever Request for Information from the public – 250+ “technical inputs”
- Workshops on assessment methodologies, regional and sectoral issues
- Listening sessions and presentations at professional society meetings, conferences, agencies, NGOs, Town Halls

NCAnet: Partners in Assessment

- 80+ organizations extend the NCA process and products beyond the federal government and are active partners in the sustained assessment process
- Professional societies, Academic institutions and consortia, Non-governmental organizations, Local and state government departments, Private sector

Online at

<http://ncanet.usgcrp.gov>

- List of partners' NCA-related activities
- Monthly conversations among existing partners
- “Affinity groups” model for collaboration on activities

Contributions: Technical Inputs



- **Literature reviews, discussion papers, and other review papers**
 - Synthesize recent work in relevant field(s)
 - Consider assessment methods
 - Highlight important questions for future study
- **Case studies of a particular community**
 - Climate change vulnerabilities or impacts
 - Planning for and responses to climate change
- **Data, modeling results, interpretation, and topical reports**
 - Analysis, synthesis, and interpretation
 - Metadata and quality assurance information

Examples:

[Climate Adaptation Knowledge Exchange,](#)

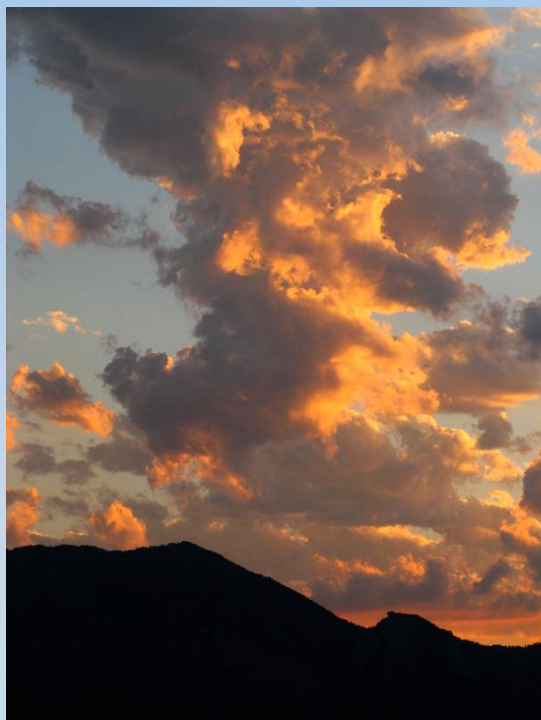
[The Future of Research on Climate Change Impacts on Water](#)



U.S. Global Change Research Program

**National Climate
Assessment**

Contributions: Assessment Capacities



Examples: Climate Conversations ([Charleston](#), [Omaha](#), [Milwaukee](#), and [Las Vegas](#)), [Listening Session on Communication Strategies](#), Health Sector Workshops ([Southeast](#) and [Northwest](#)), Publication of Technical Input Reports

- **Meetings, workshops, and other dialogues**
 - Discussions among producers and users of assessments
 - Throughout assessment process
- **Supporting indicator systems and GCIS**
 - Identifying / maintaining key observation & monitoring systems
 - Integrating across data sets to create indicators
- **Stakeholder analyses**
 - Knowledge and attitudes
 - Communication pathways
 - Network analyses
- **Communicating with stakeholders**
 - Outreach and educational materials
 - Evaluating effectiveness and use



U.S. Global Change Research Program
**National Climate
Assessment**

Thank you!

For more information:

<http://assessment.globalchange.gov>

Draft Third National Climate Assessment:

<http://ncadac.globalchange.gov>

Glynis C. Lough, Ph.D.

NCA Chief of Staff, glough@usgcrp.gov

