



The Interagency Environment for Global Change Research: Where does HypsIRI fit?

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Overview of Talk

- Introduction
- Interagency Coordination
 - USGCRP
 - National Oceans Council
- Assessment
- Summary and Conclusion

The background of the slide features a space-themed image. On the left, a portion of the Earth is visible, showing blue oceans and white clouds. In the center and right, the reddish surface of Mars is visible against a dark, star-filled sky. The title text is overlaid on this background.

Introduction: NASA and Interagency Cooperation in Global Change

- The problem of global environmental change is of a sufficiently large scale that no one agency can comprehensively address it by itself
- We have a responsibility to avoid duplication and gaps, and leverage opportunities and create synergies
- We need to help span a continuum from research to utilization, which best draws from those with different specialties
- We need to document what we know and share it with others to better plan future research and facilitate the use of results
- NASA can make unique contributions to advancing science of global environmental change with observations (especially new observations) as a key but not exclusive contribution
- NASA has “global reach” and supports open data policy that facilitates cooperation and data use by many parties
- NASA’s strengths in research, including use of its centers and community of funded investigators, are complemented by those of our partners
- NASA has programmatic flexibility and ability to engage in and sustain coordinated activities with a wide variety of partners

NASA Role in National Initiatives

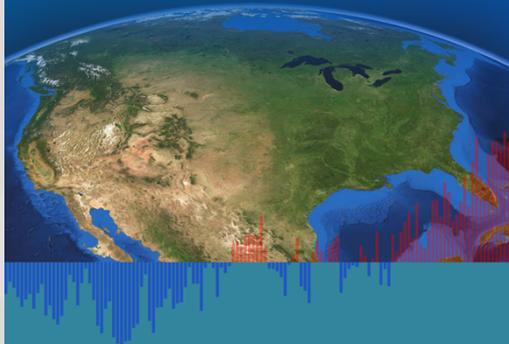
NASA is the largest contributor to the US Global Change Research Program (USGCRP), which coordinates climate-related research of 13 Federal Agencies and publishes documents, including

- Strategic Plan 2012-2021
- Annual *Our Changing Planet*
- Global Climate Change Impacts in the United States

NASA also contributes to National Initiatives in Earth Observation, Oceans, and Arctic

Global Climate Change Impacts in the United States

U.S. Global Change Research Program



OUR CHANGING PLANET

THE U.S. GLOBAL CHANGE RESEARCH PROGRAM
FOR THE YEAR 2012



Volume 1 of the U.S. Global Change Research Program
and the National Global Change Research Program
A Strategic Plan for the U.S. Global Change Research Program
(2012-2021)



THE NATIONAL GLOBAL CHANGE RESEARCH PLAN 2012-2021

A STRATEGIC PLAN FOR THE U.S. GLOBAL CHANGE RESEARCH PROGRAM





OMB/OSTP FY 14 S&T Memo: Guidance to the Agencies

- Agencies should give priority to new activities identified in 2012 Strategic Plan
- Emphasize research that advances understanding of vulnerabilities in human and natural systems and their relationships to climate extremes, thresholds, and tipping points, including:
 - Observations to detect trends in extremes & integration of observations into models
 - Attribution of change to human or natural causes
 - Integrated research on human and natural systems
 - Understanding and prediction at spatial and temporal scales conducive to decision making
 - Adaptation responses to changing frequency and intensity of extreme events

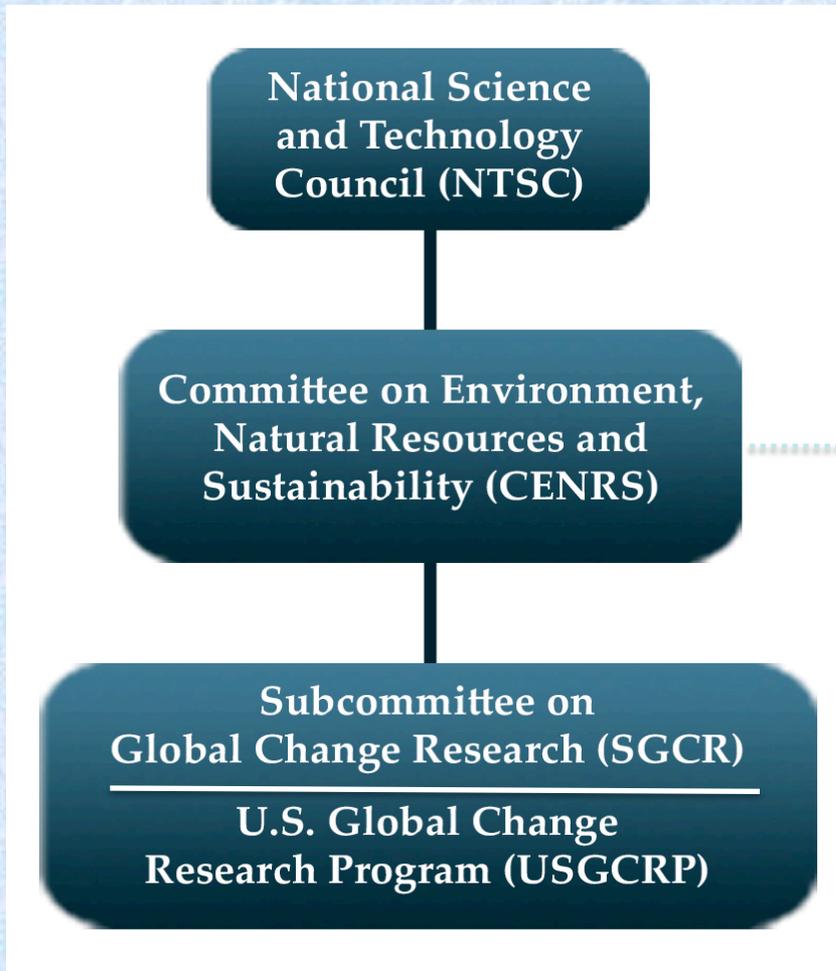
OMB/CEQ FY 14 National Ocean Policy Implementation Guidance to the Agencies

- Agencies should “clearly articulate how their submissions are advancing the goals of the National Ocean Policy as stated in the Executive Order (13547), which are to ensure a ‘comprehensive and collaborative framework for the stewardship of the ocean, our coasts, and the Great Lakes that facilitates cohesive actions across the Federal Government ...’”
- Address the following national priority objectives
 - A description of how programs and activities are promoting and will promote the achievement of NOP priority objectives in these areas
 - Stewardship-based economics
 - Coastal habitats
 - Resilience to climate change and ocean acidification
 - Clean coastal waters
 - Ocean hazards
 - An explanation of how success will be achieved through
 - Ecosystem-based management
 - Science and Data
 - Efficiency and collaboration
 - Regional efforts

National Science and Technology Council (NSTC) Structure

- Committee on the Environment, Natural Resources, and Sustainability (co-chaired by OSTP, NOAA, EPA)
- Committee on Homeland and National Security (co-chaired by DOD, DHS, and OSTP)
- Committee on Science (co chaired by NIH, NSF, and OSTP)
- Committee on STEM Education (co-chaired by OSTP and NSF)
- Committee on Technology (chaired by OSTP)

USGCRP in the Federal Context



CENRS Sub-Committees, WGs, & Task Forces
Air Quality Research (AQRS)
Critical and Strategic Mineral Supply Chains (CSMSC)
Interagency Arctic Research Policy Committee Interagency Working Group (IARPC)
Integration of Science and Technology for Sustainability Task Force
National Earth Observations Task Force (NEO)
Disaster Reduction (SDR)
Ecological Services (SES)
Global Change Research (SGCR)
Ocean Science & Technology (SOST)
Water Availability & Quality (SWAQ)
Toxics & Risks (T&R)
US Group on Earth Observations (USGEO)

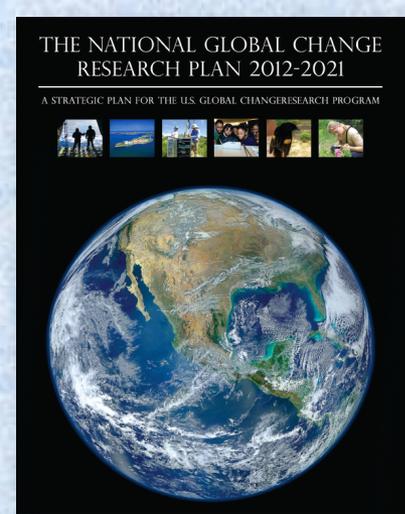
The USGCRP Vision and Mission

Vision - “A nation, globally engaged and guided by science, meeting the challenges of climate and global change.”

Mission - “To build a knowledge base that informs human responses to climate and global change through coordinated and integrated federal programs of research, education, communication, and decision support.”



USGCRP Decadal Strategic Plan



Goal 1 - Advance Science: Advance scientific knowledge of the integrated natural and human components of the Earth system.

- 1.1 Earth System Understanding
- 1.2 Science for Adaptation and Mitigation
- 1.3 Integrated Observations
- 1.4 Integrated Modeling
- 1.5 Information Management and Sharing

Goal 2 - Inform Decisions: Provide the scientific basis to inform and enable timely decisions on adaptation and mitigation.

- 2.1 Inform Adaptation Decisions
- 2.2 Inform Mitigation Decisions
- 2.3 Enhancing Global Change Information

Goal 3 - Conduct Sustained Assessments: Build sustained assessment capacity that improves the Nation's ability to understand, anticipate, and respond to global change impacts and vulnerabilities.

- 3.1 Scientific Integration
- 3.2 Ongoing Capacity
- 3.3 Inform Responses
- 3.4 Evaluate Progress

Goal 4 - Communicate & Educate: Advance communications and education to broaden public understanding of global change and develop the scientific workforce of the future.

- 4.1 Strengthen Communication and Education Research
- 4.2 Reach Diverse Audiences
- 4.3 Increase Engagement
- 4.4 Cultivate Scientific Workforce

The USGCRP FY2014 Priorities

- Theme 1: Extremes, Thresholds, and Tipping Points
 - Research, modeling, and observations for understanding extremes
 - Improve attribution to natural or human causes
 - Enhance understanding of thresholds and tipping points
- Theme 2: Integrated Research on Coupled Earth and Human Systems
 - Expand scenarios development
 - Improve understanding through data and analysis
 - Improve understanding through integrated modeling and assess model capability for research and decision support
- Theme 3: Actionable Science for Informed Policy Making and Management
 - Support agency adaptation planning
 - Support regional coordination efforts of the Interagency Climate Change Adaptation Task Force
 - Develop, adapt, and/or make accessible tools for science translation
 - Advance science to inform decisions
 - Evaluate the effectiveness of adaptation and mitigation actions

USGCRP Research Enterprise

**Create new
knowledge**

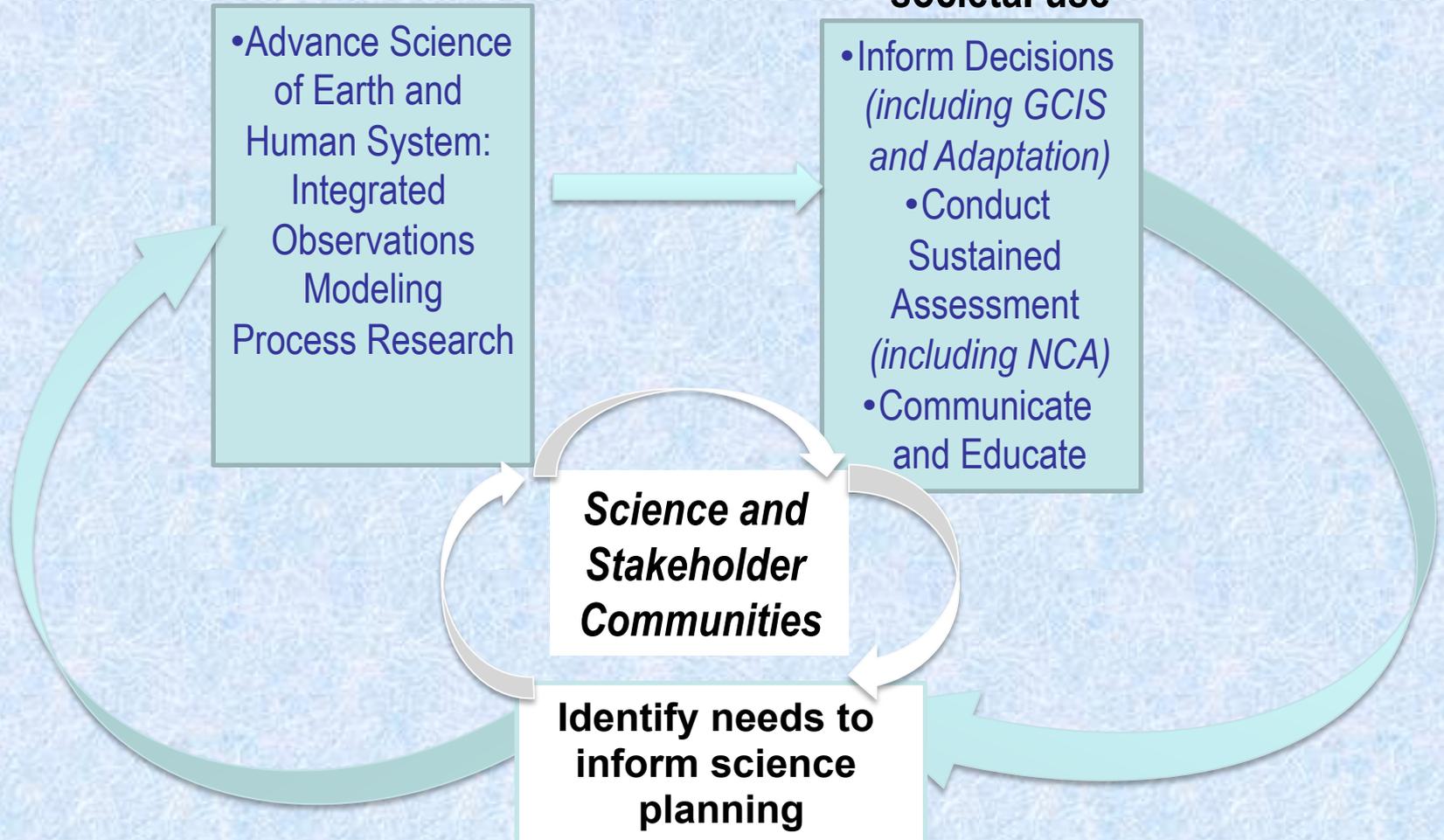
• Advance Science
of Earth and
Human System:
Integrated
Observations
Modeling
Process Research

**Translate, provide
and assess
knowledge for
societal use**

• Inform Decisions
(including *GCIS
and Adaptation*)
• Conduct
Sustained
Assessment
(including *NCA*)
• Communicate
and Educate

**Science and
Stakeholder
Communities**

**Identify needs to
inform science
planning**



A National Vision for the Oceans, Coasts & Great Lakes

Vision : *“An America whose stewardship ensures that the ocean, our coasts, and the Great Lakes are healthy and resilient, safe and productive, and understood and treasured so as to promote the well-being, prosperity, and security of present and future generations.”*



Office of Science & Technology Policy
Executive Office of the President

NATIONAL OCEAN COUNCIL



**26 Federal Departments,
Agencies, and Offices**

**Responsible for Ocean
Activities**

NATIONAL OCEAN COUNCIL

Targeted Implementation Strategy

9 Priority Objectives

Ecosystem-Based
Management

Inform Decisions &
Improve Understanding

Ocean, Coastal, &
Great Lakes Observation,
Mapping & Infrastructure

Coordinate &
Support

Regional Ecosystem
Protection & Restoration

Resiliency & Adaptation
to Climate Change &
Ocean Acidification

Water Quality &
Sustainable Practices
on Land

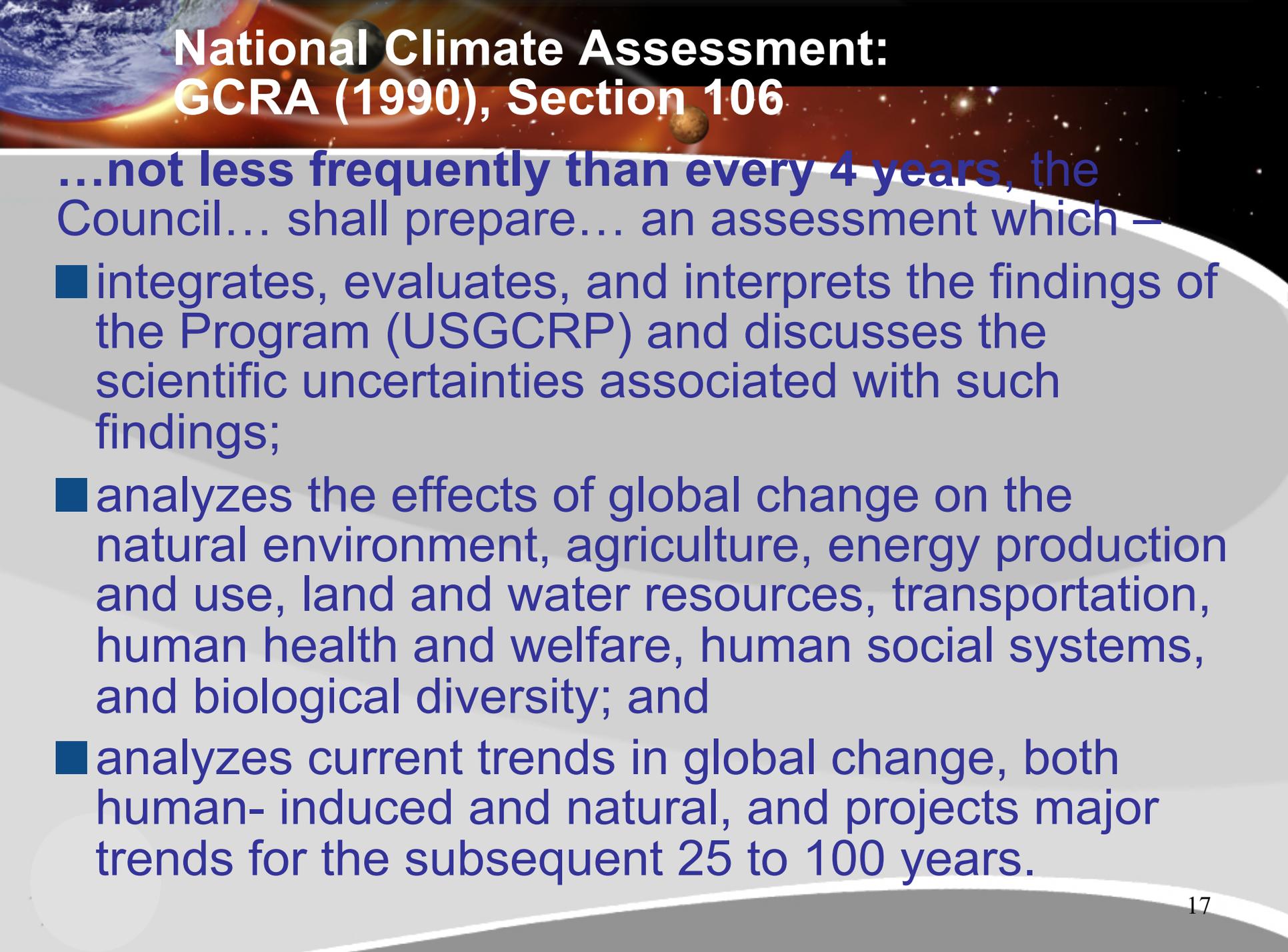
Changing Conditions
in the Arctic

Coastal & Marine
Spatial Planning



Assessment

- *Purpose* – integrate and document state of knowledge with broad participation of community, including detailed consideration of “How well do we really know what we think we know?”
- *Approach* – usually formalized through some structure and includes significant opportunity(ies) for review
- *Examples:*
 - Intergovernmental Panel on Climate Change – (e.g., 5th Assessment Report – WG I/II/III, special reports)
 - WMO/UNEP Quadrennial Ozone Assessment
 - **USGCRP National Climate Assessment**
 - Global Ocean Assessment (new)
 - IPBES (forthcoming?)



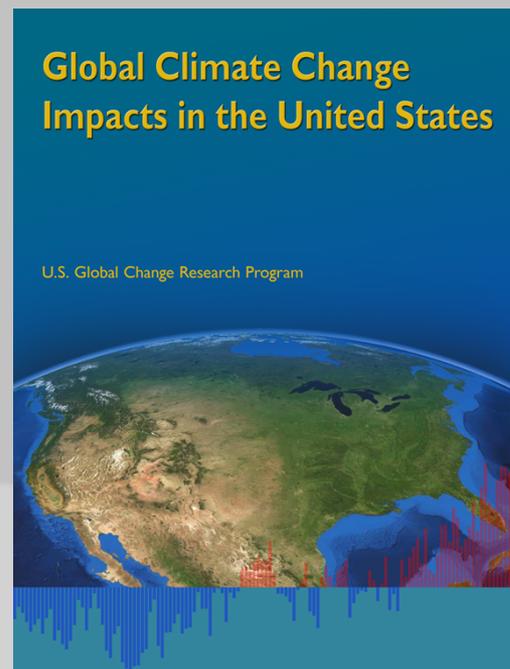
National Climate Assessment: GCRA (1990), Section 106

...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.

Highlights of 2009 USGCRP Report: *Global Climate Change Impacts in the United States*

- Global warming is unequivocal and primarily human-induced
- Climate changes are underway in the United States and are projected to grow
- Widespread climate-related impacts are occurring now and are expected to increase
- Climate change will stress water resources
- Crop and livestock production will be increasingly challenged
- Coastal areas are at increasing risk from sea-level rise, storm surge, and other climate-related stresses
- Threats to human health will increase
- Climate change will interact with many social and environmental stresses
- Thresholds will be crossed, leading to large changes in climate and ecosystems
- Future climate change and its impacts depend on choices made today



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 2013 National Climate Assessment and the Sustained Process

- **Sustainable process** with multiple products over time
- New topics, **cross-sectoral studies**, **risk-based framing**
- Consistent national matrix of **indicators**
- Central coordination, multiple **partners**
- Regional and sectoral **networks** building assessment **capacity**
- Recognizes **international context**
- Engagement and communications focus
- Web-based data and **tools for decision support**
- Process workshops to establish **methodologies**

Outline for 2013 NCA Report



- Executive Summary (overarching themes/findings)
- Introduction (approach to sustained scientific assessment, including scenarios, indicators, engagement, etc.)
- The scientific basis for climate change
- Sectors and sectoral cross-cuts
- Regions and biogeographical cross-cuts
- Decision support, mitigation and adaptation
- Agenda for climate change science
- The NCA long-term process
- Appendices
 - Commonly Asked Questions
 - Expanded Climate Science Info



Concluding Message

- The issue of global environmental change is of sufficient scope and magnitude that it goes well beyond the ability of any single agency to address it
- There are numerous executive and/or legislative requirements on federal agencies to coordinate in their work towards national objectives
- There is an increasing interest in making the connection between scientific knowledge and the use of that information to improve the quality of life at all levels (and integrating social and natural science to help!)
- The need for coordination is not just domestic but international, and includes both observational and research-focused mechanisms.
- NASA has a significant role to play in all of these activities – while we have an emphasis on observations (especially bringing new observational capability) we can contribute in all areas.
- NASA and its scientists and grantees are very much engaged in these coordination activities, from which we all benefit.

USGCRP Budget (\$M) – from FY12

Our Changing Planet

Federal Agency	2010 Enacted	2011 Enacted	2012 Request
Department of Agriculture (USDA)	121.00	116.00	125.00
Department of Commerce (DOC)	363.00	338.00	420.00
Department of Energy (DOE)	170.63	182.87	224.43
Dep't of Health & Human Services (HHS)	4.00	4.00	4.00
Department of State (DOS)	14.20	3.18	3.40
Department of the Interior (DOI)	63.00	64.00	73.00
Department of Transportation (DOT)	3.00	1.00	3.00
Environmental Protection Agency (EPA)	20.80	20.40	20.80
National Aero. & Space Adm. (NASA)	1123.00	1431.00	1338.00
National Science Foundation (NSF)	319.55	321.31	425.11
Smithsonian Institution (SI)	7.00	7.30	8.00
[Agency for Int'l Development (USAID)*]	28.00	25.00	28.00
TOTAL	2237.18	2514.06	2672.74

**USAID spending on international climate assistance does not add to the USGCRP total.*