

National Climate Assessment

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United States Global Change Research Program
National Climate Assessment

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Office of Science & Technology Policy
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NATIONAL CLIMATE ASSESSMENT – LONG-TERM MONITORING AND INDICATORS

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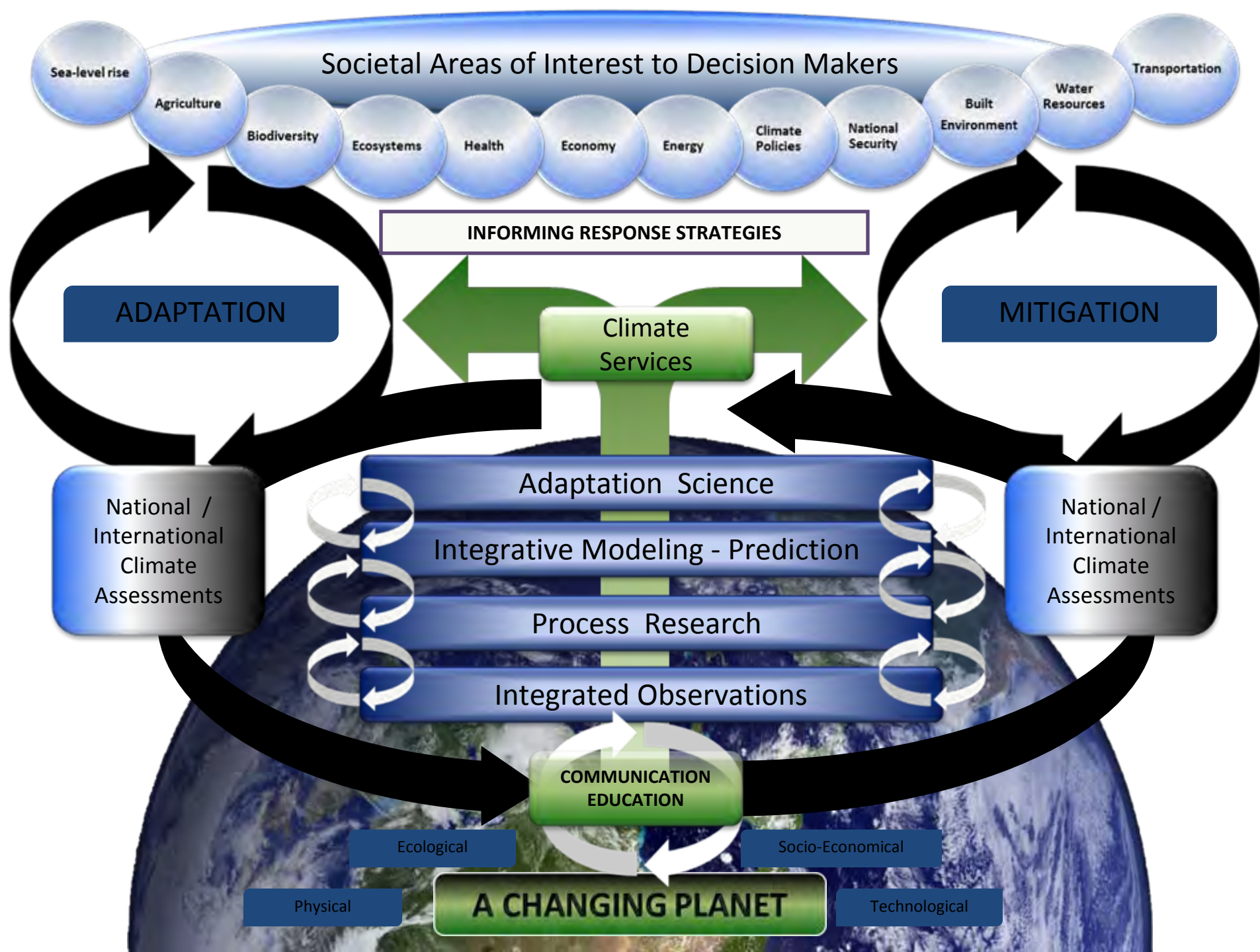
The National Climate Assessment is required to be conducted at least every four years under the Global Change Research Act of 1990. Assessments are used to evaluate the state of the science, identify key gaps in understanding, evaluate climate impacts on regions and sectors, and to provide a scientific basis for adaptation and mitigation decisions. The approach being implemented for the next Assessment involves the use of consistent methodologies for measuring changes in environmental indicators (including climate drivers, impacts and vulnerability) over time. Engagement of regional and sectoral networks of stakeholders is anticipated, as well as significant involvement of professional societies and citizen scientists. Continuously updated web-based information will be produced that should be of interest to natural resources and facilities managers.



USGCRP: A new 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"





The National Climate Assessment

Section 106: Scientific Assessment

On a periodic basis (**not less frequently than every 4 years**), the Council, through the Committee, shall prepare and submit to the President and the Congress an assessment which –

- **integrates, evaluates, and interprets the findings of the Program 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.

The New National Climate Assessment

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

Mission

...to establish a continuing, inclusive National process that:

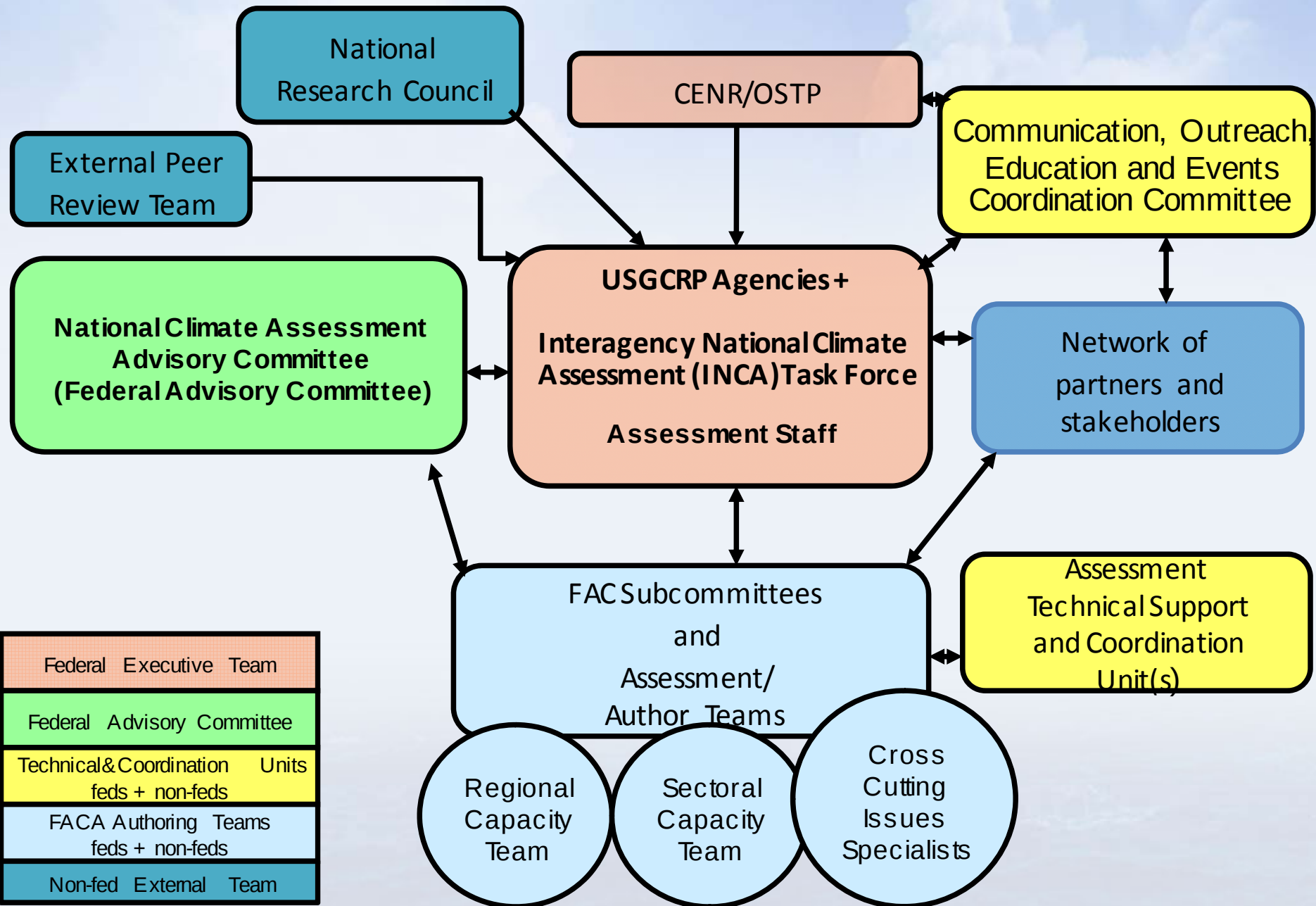
- 1) synthesizes relevant science and information
- 2) increases understanding of what is known and not known
- 3) identifies information needs related to preparing for climate variability and change, and reducing climate impacts and vulnerability
- 4) evaluates progress of adaptation and mitigation activities
- 5) informs science priorities
- 6) builds assessment capacity in regions and sectors.

**First major Assessment report
by June, 2013**



United States Global Change Research Program
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Suggested Assessment Structure



Assessment Activities to date

- Established Interagency National Climate Assessment (INCA) team – 18 agencies
- Developed strategic plan draft and discussed with four Academy panels: Climate Research Committee, Human Dimensions of Global Change, America's Climate Choices and BASC
- NOAA sponsored external FACA Committee in process
- Developed the outline and workplan for the 2013 document
- Established an agreement to fund the coordination office on a continuing basis
- Planning and implementation of 10 “process” workshops and 2 scoping sessions

Process Workshops

- *Data management, documentation and peer review, September;
- Approach to regional and sectoral assessments, November;
- **Ecological indicators for the long-term assessment matrix, November;**
- Scenario methodologies, development and selection, December;
- Modeling and scaling strategy for the Assessment, December;
- Social and economic valuation techniques, January;
- Vulnerability and risk assessment techniques, January;
- Impact and climate drivers indicators, January – March;

**First major Assessment report
by June, 2013; draft June, 2012**



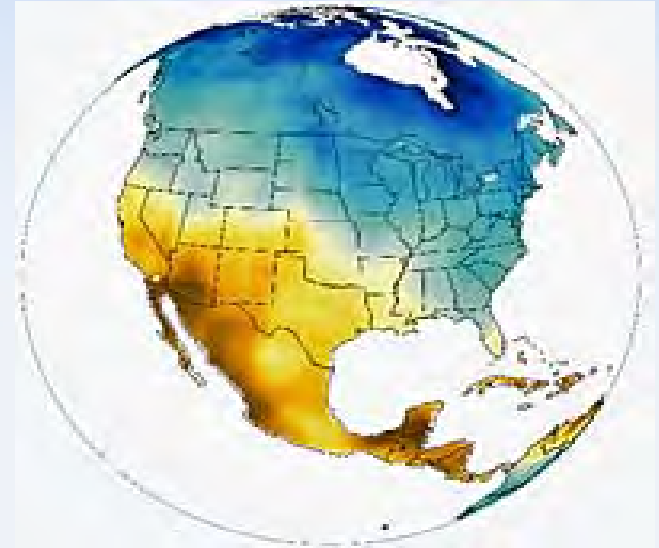
United States Global Change Research Program
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Assessment Products

- **A report or reports to Congress that meet the requirements of the GCRA in a timely fashion**
- **Web-based data and products** that have been vetted through Assessment procedures
- **Regional, sectoral and institutional assessment and science translation capacity at multiple scales**
- **Ongoing national evaluations of changes in climate trends, impacts, risks and vulnerability based on selected indicators and standard assessment methods**
- **Process documentation**, including guidelines, metadata, quality assurance and review procedures
- **Communications and education products** that facilitate broader understanding of climate issues and impacts

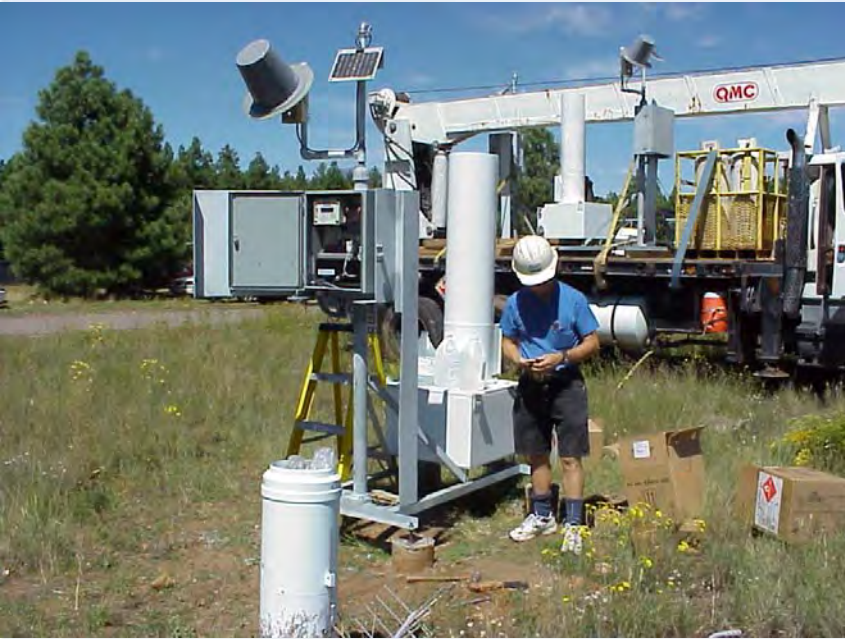
Ecological Indicators for the National Assessment

- In combination with other indicators (climate, impacts, vulnerabilities) design a consistent, long-term national system of observations of change in a climate context
- that supports a “nested matrix” approach, eg, a national framework that has the capacity to support smaller-scale, more intense investigations within regions and sectors as well as having relevance in the global context



- Provide a progress report on adaptation and mitigation activities relative to the rate of change....

Ecological Indicators for the National Assessment



Salt River Project

- Take advantage of existing and developing observations, monitoring and indicator systems within and outside of the federal government
- Promote engagement with regional “consortia” and sectoral partners, universities, and resource managers in state, federal and local agencies

Ecological Indicators for the National Assessment: Possible criteria

- Changes can be documented through direct observations or proxies
- Impacts are of national significance in the context of regional, sectoral or national scale issues
- Data and methods can meet peer-review standards and meet highest level of quality assessment/quality control



Ecological Indicators for the National Assessment: Possible criteria

- Focus on ecosystems from a wide variety of perspectives and scales, eg. biodiversity, ecosystem services, geographical location of species, species of concern, landscape scale changes
- Data sources are either available (preferred) or can be in the near term (1-3 years), or (in limited cases) recommendations can be made for new monitoring, observing or synthesis systems if necessary



Assessment Indicators Workshop Highlights

Purpose: Understanding the role of changes in climate in a decision and research context: status, trends, mechanisms and implications

- Need to answer decision makers questions
- Buy-in from data collectors, applicability to management, clarity to policy makers are all integral to adoption and usefulness.
- Need to establish standards for quality, accessibility, and transparency of data; defined protocols.
- What institutional infrastructure is appropriate to foster long-term monitoring that is tied to decision making
- Identifying climate change in a multiple stress environment requires having enough information about both climate and the other stressors to attribute causes of observed change

Assessment Indicators Workshop Highlights

- When selecting indicators, important to select a suite of indicators that focus on answering important management and research questions, including whether the system is approaching a threshold.
- Need to consider both direct and indirect impacts, including impacts of people's responses to climate change
- Need leading, trailing, trend and state indicators
- Ecosystems respond on multiple time scales, need to have indicators at many of these, seasonally, annually, interannually decadal
- The whole needs to be greater than the sum of the parts; need group of coordinated indicators

Assessment Indicators Workshop Highlights

- Indicators as communications tools
- Species extinction risk is an important indicators
- Defining and prioritizing **time and space scales for appropriate audiences;**
 - trading time for space
 - linear change vs. disturbances
 - “early warning” vs. longer-term changes in structure/function;
 - ways to address national vs. regional change
 - ways to connect with sectors and regions
- Need a balanced suite of indicators that help detect a broad range of changes

Indicator Lists from Breakouts

Terrestrial	Freshwater	Marine
Phenology	Phenology	Phenology
Species composition	Vegetation composition	Distribution
Range Shifts	Loss of sensitive species with short life spans	Abundance
Nutrients (ratios, stoichiometry)	Invasive species	Species diversity
Crop yield (ag and forestry)	Groundwater quality	Primary productivity
Disturbance	Chemical process rates	Invasive species
Vegetation condition and structure (leaf area index)	Lake levels	
Others: Nutrient stocks and fluxes, hydrologic cycle, changes at ecotones, primary productivity, etc.		

Next Steps

Short term: Need to build a conceptual framework for the indicator design and then re-evaluate existing indicator approaches and lists in a working group context

Longer term: Working toward interoperability among existing and potentially new observational networks

A more comprehensive set of indicators with multiple purposes and applicable across multiple time and space scales (possibly based on early lessons learned from use of “priority indicators”)