National Climate Assessment Objectives, Proposed Topics, and Next Steps

What is the NCA? The National Climate Assessment (NCA) is being conducted under the auspices of the U.S. Global Change Research Program (USGCRP), pursuant to the Global Change Research Act of 1990, Section 106, which requires:

"On a periodic basis (not less frequently than every 4 years), the Council *[the National Science and Technology Council]*, through the Committee *[the Global Change Research Committee]*, shall prepare and submit to the President and the Congress an assessment which –

1. integrates, evaluates, and interprets the findings of the Program *[the USGCRP]* and discusses the scientific uncertainties associated with such findings;
2. 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
3. analyzes current trends in global change, both human- induced and natural, and projects major trends for the subsequent 25 to 100 years."

Assessments serve important functions in providing the scientific underpinnings of informed policy. They also serve as progress reports by identifying advances in the underlying science, providing critical analysis of issues, and highlighting key findings and key unknowns that can improve policy choices, and guide decision making related to climate change. The approach that is envisioned for this NCA is a comprehensive assessment of climate change, impacts, vulnerabilities and response strategies, within a context of how communities and the nation as a whole create sustainable and environmentally sound development paths.

This new NCA will differ in multiple ways from previous U.S. climate assessment efforts (*http://globalchange.gov/what-we-do/assessment/nca-reports*). For example, it is more focused on supporting the Nation's activities in adaptation and mitigation and on evaluating the current state of scientific knowledge relative to climate impacts and trends. It will also build on the recommendations of previous NCA efforts by implementing a long-term, consistent process for evaluation of climate risks and opportunities and providing information to support decision making processes within regions and sectors.

A primary goal is to establish permanent assessment capacity both inside and outside of the federal government. The NCA will be an ongoing process that draws upon the work of stakeholders and scientists across the country. Assessment activities will result in the capacity to do ongoing assessments of vulnerability to climate stressors, observe and project impacts of climate change within regions and sectors, develop consistent indicators of progress in adaptation and mitigation activities, and allow for the production of a set of reports and web-based products that are useful for decision-making at multiple levels.

Strategic planning for the NCA began in early 2010 and the first outline for a strategic plan was circulated in January, 2010. This outline served as a basis for strategic planning input meetings in Chicago in February, 2010. In addition, NCA staff convened a listening session with regional, state, and local participants following the National Adaptation Summit in May, 2010. More information about the process to date, including workshop outcome summaries, is available from *http://globalchange.gov/what-we-do/assessment*.

Objectives

NCA Vision: The vision for the NCA incorporates recommendations from the National Research Council, feedback from previous assessment processes, and the results of the workshops and listening session described above. It has been developed within the Interagency National Climate Assessment (INCA) Task Force, which includes members from all 13 USGCRP agencies and departments and additional agencies and departments whose work is relevant to the NCA (*http://globalchange.gov/what-we-do/assessment/nca-participants*). The NCA will continue to solicit input from a broad range of individual stakeholders, decision makers, and concerned citizens to ensure that its vision and implementation is responsive to their needs.

The overarching goal for the broad climate science program within the U.S. government is to inform and enhance our ability to respond to changing climate in a multi-stress context. The primary vision of the NCA is a continuing, inclusive national process that: 1) synthesizes relevant science and information; 2) increases understanding of what is known and not known; 3) identifies needs for information 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; and 7) builds societal understanding and skilled use of Assessment findings. The NCA will be a sustained and integrated process that is responsive to climate assessment needs and meets the requirements of the Global Change Research Act, is based on the best available science, and is authoritative, transparent, and accessible.

NCA Key Objectives: In order to achieve its vision, the NCA has established seven overarching, cross-cutting objectives:

- *Objective 1: Create a sustainable assessment process that involves networks of participants in regions and sectors across the country in addition to engaging federal scientists in multiple agencies.* The reports that will be generated will be viewed as a "time-slice" through an ongoing evaluation effort. This process will enable national, regional, sectoral or topical reports to be created over time as needed to serve important policy and science objectives.
- *Objective 2: Establish an ongoing, national-scale, consistent and replicable approach to assessing current and projected climate impacts and climate-related risk in the context of other stressors.* This includes examining the integrated effects on ecosystems and ecosystem services, social and economic systems, and American civil society and institutions. The intent of this effort is to identify opportunities and risks associated with changes in climate conditions. An ongoing component will be work towards attribution and explanation of events and trends that are observed in the climate system.
- *Objective 3: Within this broad ongoing assessment, nest more specific investigations of regions and topics that have high priority due to existing or anticipated climate stresses, generally in the context of a variety of other concerns.* The number and scale of these specific nested investigations, as well as the time frame and responsibility for completing products related to them have not yet been determined.
- *Objective 4: The NCA office will perform a central coordination function while depending on a distributed process and inclusive engagement with partners both inside and outside of the federal government to meet NCA goals.* Although it is the role of the federal government to conduct a national climate assessment and to provide the support needed for

regional efforts, it is neither appropriate nor possible for the federal government to actually conduct all of this work by itself. This distributed approach will also maximize the likelihood that national climate assessments will continue over time. However, the federal government must play a leading role in cross-regional and international aspects of the NCA.

- *Objective 5: To the extent possible, depend on regional networks and a variety of public and private partners to do the "ground-truthing" of scientific findings, and depend on federal monitoring programs for larger scale or more comprehensive assessments and evaluations.* The intent is to have the National Climate Assessment become the "connective tissue" that ties these efforts to federal science programs.

- *Objective 6: Recognize the international context of climate trends and efforts and help to support some of the U.S. inputs to the IPCC.* Adaptation and mitigation decisions within the U.S. have impacts on other countries, and vice versa. Climate impacts occur within economic and social systems that affect every country across the globe. The NCA will lay the groundwork for a strategic approach to engaging in climate assessment activities internationally and with a specific focus on North America.

- *Objective 7: Build a strong stakeholder engagement process, based on mobilizing a regionally coordinated network of local stakeholders and a nationally coordinated network of professional associations to connect to a series of important sectors and various levels of government.* The stakeholder engagement process will rely on both in-person and virtual (web-based) interactions that will make the assessment process accessible to the general public. Online tools, such as web pages, webinars, and online data sets will help to maximize opportunities for education and communication and will make the data and information collected for the NCA more useful.

Proposed Topics

The NCA is both an ongoing process of assessing the impacts of climate change in the context of broader, baseline conditions and a periodic report that evaluates, integrates, and interprets these impacts. For the next NCA synthesis report, due by June 2013, the following topics are proposed in the initial outline for the product:

I. Background and Context for the Process: This section of the report will contain information on the (1) Purpose (mission, objectives, and intended audience); (2) Background (legal requirements, explanation of previous rounds of assessment, and ways in which USGCRP is responding to advice from the National Research Council); (3) General scope for the NCA (global change and climate variability and change, limitations of the process, and challenges); and (4) Assessment process (timeline, methods and design, tools for assessing climate change and impacts, dealing with uncertainty, sources of material, and common lexicon / glossary of terms).

II. The Scientific Basis for Climate Change: This section of the report will contain information on (1) What climate change is and what it means for the U.S. (summarizing and interpreting the science, new maps and projections, regional climate drivers and impacts, and climate variability and change and climate extremes); (2) Current observations of global change and projections of future changes (detecting the impacts of climate change through a matrix for long-term assessment, models and scenarios, and vulnerability assessment); (3) Overview of research on human responses to climate change (adaptation and mitigation) (4) Interpreting the science

(assessing the value of information and science and execution of decisions); and (5) Uncertainty (scales of time, space, and decisions and prioritizing which uncertainties are important to reduce).

III. Sectors: This section of the report will contain information on the impacts of and responses to climate change in sectors. In addition to introductory information (what a sector is and how sectors are delineated), individual sectoral chapters under consideration include: (1) Natural environment (ecosystems), (2) Biological diversity, (3) Agriculture and forestry, (4) Land resources, (5) Water resources, (6) Marine resources, (7) Air quality, (8) Energy production and use, (9) Transportation, (10) Human health and welfare, and (11) Human social systems (including impacts on cultures and cultural resources).

IV. Regions: This section of the report will contain information on the impacts of and responses to climate change in geographic regions. In addition to introductory information (what a region is, how regions are chosen), individual regional chapters under consideration include those used in the 2009 Global Climate Change Impacts Report (*http://globalchange.gov/what-we-do/assessment/nca-reports*): (1) Northeast, (2) Southeast, (3) Midwest, (4) Great Plains, (5) Southwest, (6) Northwest, (7) Alaska, (8) Islands, and (9) Coasts; and a new region: (10) Arctic.

V. Integrated, Cross-Sectoral Issues: This section of the report will contain information on climate change impacts in specific, integrated issue areas. In addition to introductory information (criteria for selecting integrated assessment topics and criteria for selecting level of assessment effort), this section will include both short case studies (distributed throughout the report) and

individual chapters. Topics under consideration include: (1) Water supply, energy, and agriculture; (2) Biogeochemical cycles (e.g., carbon, nitrogen) (3) Land use change, land cover, and human settlements (e.g., urban environments, rural environments, and/or traditional use rights); (4) Migratory species; (5) Tipping points, thresholds, and extreme events; (6) Ecosystem services and human and natural systems trade-offs; (7) Disaster, recovery, risk management, and perception; and (8) International context: U.S. / global systems interactions (e.g., trade, migration, economics, food security, disaster preparedness and response, water, and health).

VI. Human Responses to Climate Change: This section of the report will describe human responses to climate change and look broadly at how the nation is meeting the challenges of climate change impacts without evaluating individual actions. It will include case studies that explore (1) Adaptation; (2) Mitigation; and (3) Interactions and integration across adaptation and mitigation (e.g., management of forests to sequester carbon and increase resilience, management of heat island responses, and transportation impacts).

VII. Future Scientific and Societal Needs: This section of the report will contain information on (1) Science gap analysis for this round of assessment; (2) Priorities for climate science investments (including impacts and responses); and (3) Facilitating decisions related to climate impacts and responses.

VIII. Appendices: One or more appendices to the report will provide further information about tools, methodologies, guidelines, and assumptions for the NCA, including (1) long-term data sets; (2) models (3) scales and interactions; (4) scenarios; (5) risk; (6) impact assessment; (7)

vulnerability assessment; (8) economic and alternative valuation techniques; (9) dealing with uncertainty; (10 detecting changes through monitoring and observations; (11) knowledge management strategies; (12) communications and engagement; (13) interactions with other types of assessments; and (14) building capacity within regions and sectors for conducting and using assessments in the future.

Next Steps

The next steps in planning for the NCA include gathering inputs on a number of issue areas to help define the NCA process and expectations for its products. Public comments on the above NCA objectives and proposed topics and on the following issue areas may be used by the Interagency National Climate Assessment (INCA) Task Force and the National Climate Assessment Development Committee, an advisory body being created at the National Oceanic and Atmospheric Administration in compliance with the provisions of the Federal Advisory Committee Act, in their discussion of plans for developing the first draft of the this National Climate Assessment.

Issue Areas: The INCA Task Force has identified the need for discussion on important tools, methodologies, guidelines, and assumptions for assessment. USGCRP and the NCA team are actively soliciting input on the following topics:

- *Knowledge Management, Metadata, and Peer Review:* How to manage data, archiving, quality assurance / quality control, peer review, qualifications for inclusion of data in official Assessment documents; documentation of sources; chain of custody of information.

- *Communications and Engagement:* Ensuring consistent messages about what we are trying to accomplish, encouraging co-production of information between government and external stakeholders, coordination with other federal climate-related programs, design of documents and tailored communications with a variety of partners.
- *Economic and Alternative Valuation Techniques and Metrics for Climate Change Impacts, Adaptation, and Mitigation:* Ways of evaluating the effectiveness of adaptation and mitigation options using tools that acknowledge non-monetary values and inter-generational benefits.
- *Vulnerability Assessments:* Identification of approaches to evaluating the relative vulnerability of ecological and social communities and approaches to prioritization of risk across sectors and regions.
- *Planning for Regional and Sectoral Assessments:* Methods to ensure consistent approaches to building regional and sectoral components of the assessment.
- *Role of International Climate Impacts and Responses, and their Implications for the United States:* The ways in which the NCA will consider the implications of stresses that are generated elsewhere in the globe and to consider the global context for the NCA process.
- *Scenarios for Climate Change Assessment:* Methods for the development and use of consistent projections of possible future conditions for use within NCA activities.
- *Climate Change Modeling and Downscaling:* Issues and methodological perspectives related to selecting model and downscaling outputs and approaches for their use in NCA activities. This includes socioeconomic, land use, and other model types and outputs, in addition to climate model outputs.

- *Monitoring Climate Change and its Impacts:* Selecting from existing monitoring and observing systems and a variety of impact reports to design an integrated, ongoing monitoring system for the NCA. This includes establishing a long-term, consistent approach to documenting climate impacts and trends (including developing indicators of, e.g., impacts to the built environment and energy sectors, impacts on and responses of natural systems, socio-economic and public health trends, and disasters and extreme events).