

30. Sustained Assessment

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A New Vision for Future U.S. Assessments

A primary goal of the U.S. National Climate Assessment (NCA) is to help the nation anticipate, mitigate, and adapt to impacts from national and global climate change, including changes in climate variability. Since 1990, when Congress authorized the U.S. Global Change Research Program (USGCRP) through the Global Change Research Act (GCRA 1990) and required periodic updates on climate science and its implications, researchers from many fields have observed significant climate change impacts in every region of the U.S. The accelerating pace of these changes, as well as scenario-based projections for future climate changes and effects, is articulated in this third national climate assessment.

As the third NCA synthesis report was being prepared, a vision for a new approach to future assessments took shape: a “sustained assessment” process. The vision includes an ongoing process of working to understand and evaluate the nation’s vulnerabilities to climate variability and change and its capacity to respond. A sustained assessment, in addition to producing periodic synthesis reports as required by law, recognizes that the ability to understand, predict, assess, and respond to rapid changes in the global environment requires ongoing efforts to integrate new knowledge and experience. It accomplishes this by: 1) building foundational knowledge and collecting relevant data; 2) developing targeted scientific reports and other products that respond directly to the needs of agencies, decision-makers, and end users; and 3) creating a framework for continued interactions between the assessment partners and stakeholders and the scientific community.

To provide decision-makers with more timely, concise, and useful information, a sustained assessment process would include both ongoing, extensive engagement with public and private partners and targeted, scientifically rigorous reports that address concerns in a timely fashion. A growing body of assessment literature has guided and informed the development of this approach to a sustained assessment (Cash and Moser 2000; Clark et al. 2006; Farrell and Jager 2005; Mitchell 2006; NRC 2007).

The envisioned sustained assessment process includes continuing and expanding engagement with scientists from government, academia, business, and non-governmental organizations. These partnerships broaden the scientific base from which conclusions can be drawn. In addition, sustained engagement with decision-makers and end users helps scientists understand what

1 information society wants and needs, and it provides mechanisms for researchers to receive
2 ongoing feedback on the utility of the tools and data they provide.

3 An ongoing process that supports these forms of outreach and engagement allows for more
4 comprehensive and insightful evaluation of climate changes across the nation, including how
5 decision-makers and end users are responding to these changes. The most thoughtful and robust
6 responses to climate change can be made only when these complex issues, including the
7 underlying science and its many implications for the nation, are documented and communicated
8 in a way that both scientists and non-scientists can understand.

9 This sustained assessment process will lead to better outcomes for the people of the United
10 States by providing more relevant, comprehensible, and usable knowledge to guide decisions
11 related to climate change at local, regional, and national scales. Additional details about the
12 components of the sustained assessment process will be provided in the first special report of the
13 National Climate Assessment and Development Advisory Committee (*ref when complete*).

14 **Contributions of a Sustained Assessment Process**

15 A sustained assessment process will not only include producing the periodic scientific
16 assessment reports required by the 1990 GCRA, but it also will enable many other important
17 outcomes. A well designed and executed sustained assessment process will:

- 18 1. Increase the nation's capacity to measure and evaluate the impacts of and responses to further
19 climate change in the United States, locally, regionally, and nationally.
- 20 2. Improve the collection of critical data, access to that data, and the capacity of users to work
21 with datasets relevant to their specific issues and interests.
- 22 3. Support the creation of the first integrated suite of national indicators of climate-related
23 trends across a variety of important climate drivers and responses.
- 24 4. Catalyze the production of targeted, in-depth special assessment reports on sectoral topics
25 (for example, agriculture), cross-sectoral topics (for example, the connection between water
26 and energy production), regional topics, and other topics that will help inform Americans'
27 climate choices about mitigation and adaptation. These reports will generate new insights
28 about climate change, its impacts, and the effectiveness of societal responses. Special reports
29 also can focus on improvements to specific aspects of the process (for example, scenarios,
30 indicators, and data systems) to reinforce the foundation for the overarching but necessarily
31 more constrained periodic synthesis reports.
- 32 5. Create a network of scientific, decision-maker, and user communities for extended dialogue
33 and engagement regarding climate change.
- 34 6. Provide a systematic way to identify gaps in knowledge and uncertainties faced by the
35 scientific community and by U.S. domestic and international partners and to set priorities for
36 their resolution.
- 37 7. Develop and apply tools to evaluate progress and guide improvements in processes and
38 products over time. This will support an iterative approach to managing risks and
39 opportunities associated with changing global and national conditions.

1 Assessments facilitate the collection of different kinds of information that can be integrated to
2 yield new and useful scientific insights. The vision for the sustained assessment process is to
3 continue to build knowledge about the intersection of human and natural systems to better
4 understand the risks and opportunities of global change at multiple spatial and temporal scales.
5 The sustained assessment process also can help define the range of information needs of
6 decision-makers and end users relative to adaptation and mitigation, as well as the associated
7 costs of impacts and benefits of response actions. Moreover, it is by its very nature a continuous
8 process, uniquely positioned to support an iterative, risk-based approach to adaptation.

9 Finally, although a sustained assessment process allows for ongoing improvements in products
10 and processes, it also requires underlying support systems. These can include access to
11 observational data sources, information management systems, and support networks such as the
12 Global Change Information System (GCIS; see below). Other fundamental infrastructure for
13 assessments includes integrated assessment models, climate model inter-comparison projects,
14 data streams (for example, emissions data or socioeconomic data), processes for building
15 scenarios and deploying them at critical junctures in the assessment process, and evaluation
16 systems.

17 **Assessment Capacity**

18 Scientific assessments require substantial scientific expertise and judgment, involving skills
19 atypical of those required for typical research (Farrell and Jager 2005; Mitchell 2006; NRC
20 2007). Assessment capacity includes engaging knowledgeable and experienced people,
21 developing networks to promote interactions, identifying and mentoring new scientific talent,
22 and building in-depth understanding of a variety of economic, technical, and scientific topics.
23 Building and maintaining capacity through all of these approaches is therefore critical to the
24 smooth and efficient functioning of the assessment process.

25 Sustained interactions among scientists and stakeholders have consistently been shown to
26 improve the utility and effectiveness of assessment processes and outcomes (NRC 2007) and to
27 facilitate the development of decision support tools (CCSP 2008). A sustained assessment
28 provides the necessary coordination and infrastructure needed to maintain an ongoing dialog
29 among producers and users of information so that decision-makers can manage risks and take
30 advantage of opportunities more efficiently. This provides the capacity and flexibility to react to,
31 and take advantage of, rapidly advancing developments in climate science and changing
32 conditions in order to improve the utility and timeliness of future synthesis reports.

33 **Data Collection, Access, and Analysis**

34 Credible scientific information is needed on an ongoing basis to support fundamental
35 understanding of the climate system and its interactions with ecological, economic, and social
36 systems, and for the development of adaptation and mitigation strategies. Improved systems for
37 data access can more effectively meet the requests of stakeholders for accessible, relevant, and
38 timely information. An ongoing process can build a more complete information base related to
39 climate change related impacts and vulnerabilities, and it can result in more sophisticated
40 scientific analyses that support the mandated quadrennial synthesis reports in a more efficient
41 and effective manner. Selecting which data to collect and analyze is a critical component of
42 assessments of change.

1 The sustained assessment process will facilitate the development and maintenance of a web-
2 based assessment information discovery, access, and retrieval system that facilitates easy access
3 to a range of information for those who need it, in a timely and authoritative manner (the GCIS
4 of the USGCRP). A major short-term goal is to provide transparent and highly linked access to
5 the data used to support conclusions in the third NCA report, but this is only the first step in a
6 much larger effort.

7 **Indicators**

8 Indicators are measurements or calculations that represent important features of the status,
9 trends, or performance of a system (such as the economy, agriculture, natural ecosystems, or
10 changes in Arctic sea ice cover). Indicators are used to identify and communicate changing
11 conditions to inform both research and management decisions (NRC 2000). The NCA indicator
12 system is intended to focus on key aspects of change – as well as vulnerabilities, impacts, and
13 states of preparedness – to inform decision-makers and the public. In the context of ongoing
14 assessment activities, these indicators can be tracked to provide timely, authoritative, and
15 climate-relevant measurements regarding the status, rates of change, and trends of key physical,
16 ecological, and societal variables.

17 **Special Reports**

18 As currently envisioned, the sustained assessment process also paves the way for special reports
19 that help inform local, regional, and sectoral mitigation and adaptation activities and provide a
20 foundation for more useful and more comprehensive periodic synthesis reports. Completing in-
21 depth assessments of national or regional importance and providing a constantly improving
22 foundation for the periodic synthesis reports provides for significant flexibility and enhanced
23 policy relevance. In addition, these special reports also can investigate emerging issues of
24 concern or help decision-makers understand the trade-offs among different courses of action.
25 Even more focused reports and activities that emerge from ongoing assessment activities can
26 blend the objectives of incorporating the latest science with responding relatively quickly to the
27 most pressing stakeholder and government needs. Finally, special reports also can be produced
28 on scenarios of climate change, sea level rise, demography, land-use change, and other issues
29 critical to the assessment process.

30 **A Network to Foster Partnerships, Encourage Engagement, and Develop Solutions**

31 The USGCRP has long recognized the importance of partnerships, two-way communication, and
32 ongoing and meaningful engagement (USGCRP 2012). The five National Research Council
33 (NRC) *America's Climate Choices* reports published in 2010 and 2011 also underscore the
34 essential nature of this engagement (for example, see NRC 2010). Partnerships and engagement
35 strategies among federal and non-federal participants are needed to: 1) communicate effectively
36 about the assessment, including its products and processes and their relevance as actionable
37 information (Moser and Dilling 2011); 2) encourage participation and knowledge sharing; 3)
38 create opportunities for meaningful engagement of end users and public and private decision-
39 makers to inform the substance of the assessment; and 4) offer opportunities for input, direction,
40 review, and feedback.

41 An important component of the new sustained assessment vision is NCAnet: a “network of
42 networks” that helps to communicate the NCA process and products to a broader audience. This

1 network of partner organizations, including private sector, government, non-governmental
2 organizations, and professional societies, leverages resources and facilitates communication and
3 partnerships. NCAnet can assist in developing and supporting diverse science capabilities and
4 assessment competencies within and outside of the federal government.

5 **Evaluation of the Process**

6 Ongoing evaluation of assessment processes and products, as well as incorporating the lessons
7 learned over time, is a specific objective of the USGCRP Strategic Plan (USGCRP 2012).
8 Evaluation efforts are considered integral for enabling learning and adaptive management of the
9 assessment process, measuring the ability to meet both legally required objectives and strategic
10 goals, maintaining institutional memory, and improving the assessment process and its
11 contributions to scientific understanding as well as to society. Ongoing improvements in the
12 assessment process also will support an iterative approach to decision making in the context of
13 rapid change.

14 **Recommendations on Research Priorities**

15 The GCRA requires regular evaluations of gaps in knowledge and assessments of uncertainties
16 that require additional scientific input. A sustained assessment process provides for regular
17 updates on science needs to the USGCRP's annual research prioritization process, as well as to
18 the triennial and decadal revisions to its research plan.

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Traceable Account

Chapter 30: Sustained Assessment

Key Message Process:

Planning for the sustained assessment process and including a description of the process in a chapter of the third NCA synthesis report began as soon as the report process was launched, with mechanisms for creating and implementing a sustained process included as key discussion points in early NCA process workshops (USGCRP 2010a, 2010b, 2010c). Prior to the formation of the chapter author teams, the need for a sustained assessment was described in the NCA Strategy Summary (USGCRP 2011). The amended charter for the National Climate Assessment and Development Advisory Committee (NCADAC) specifies that the NCADAC is to provide advice and recommendations toward the development of an ongoing, sustainable national assessment of global change impacts and adaptation and mitigation strategies for the Nation. To that end, NCADAC formed a working group on sustained assessment, and the USGCRP Interagency National Climate Assessment Working Group (INCA) made this topic a priority in their regular meetings. The USGCRP also established “conduct sustained assessments” as one of four programmatic pillars in its recent Strategic Plan (USGCRP 2012).

The sustained assessment author team drew on a wide variety of source materials in framing the need for a sustained assessment process, including calls in both previous National Climate Assessment reports (Karl et al. 2009; NAST 2000) and in several publications from the National Research Council (NRC 2007, 2009, 2010) that focused specifically on the National Climate Assessment. The author team also considered a rich literature on assessments in general (for example, (Farrell and Jager 2005; Mitchell 2006). In developing the chapter describing the sustained assessment process, the author team first worked with the NCADAC, especially the NCADAC working group on sustained assessment, and the INCA to develop a vision for sustained assessment and a list of activities required to implement this vision. They then collected feedback from each of the chapters’ coordinating lead authors, agencies, chairs of other NCADAC working groups, and targeted stakeholders. Drawing on these comments and the knowledge bases cited above, the author team came to consensus on the objectives and categories of activities provided in the chapter using teleconference and email discussions. The NCADAC is currently forming a new author team to produce a longer special report on the sustained assessment process.

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