

CCSP Synthesis and Assessment Products



According to the National Research Council, “an essential component of any research program is the periodic synthesis of cumulative knowledge and the evaluation of the implications of that knowledge for scientific research and policy formulation.” The U.S. Climate Change Science Program (CCSP) is helping to meet that fundamental need through a series of 21 “synthesis and assessment” (S&A) products. As a key component of the *CCSP Strategic Plan* (released July 2003), they integrate research results focused on important science issues and questions frequently raised by decisionmakers.

The S&A products support informed discussion and decisions by policymakers, resource managers, stakeholders, the media, and the general public. They also help define and set the future direction and priorities of the program. The S&A products are intended to meet the requirements of the Global Change Research Act of 1990. The law directs agencies to “produce information readily usable by policymakers attempting to formulate effective strategies for preventing, mitigating, and adapting to the effects of global change” and to undertake periodic scientific assessments.

Designated CCSP agencies or departments are taking the lead in generating each S&A product. The CCSP is also continuing to participate in the principal international science assessments, including the Intergovernmental Panel on Climate Change (IPCC) assessment reports, and the World Meteorological Organization (WMO) / United Nations Environment Programme (UNEP)

assessments of stratospheric ozone depletion and associated environmental impacts.

The *CCSP Strategic Plan* sets forth general principles for the S&A products:

- Analyses structured around specific questions
- Early and continuing involvement of stakeholders
- Explicit treatment of uncertainties
- Transparent public review of analysis questions, methods, and draft results
- Flexible approach, building on lessons learned.

As the CCSP progresses with the S&A products, it learns from experience and adjusts its approach accordingly.

To help ensure adherence to those principles, the program has published guidelines for producing the S&A products. These guidelines establish a broadly standardized methodology that facilitates involvement of the research community and the public; ensures focused and useful products; and meets the highest standards of scientific excellence. The guidelines also encourage transparency by providing public access to information about the status of the products through the *Federal Register*, the CCSP web site, and other means. The guidelines address three steps required to produce S&A products:

- 1) Developing a prospectus
- 2) Drafting and revising the document
- 3) Final approval and publication of each product.

The guidelines set forth the roles of participants and the steps in the process (see page 2).

The first S&A product—*Temperature Trends in the Lower Atmosphere: Steps for Understanding and Reconciling Differences*—was issued by CCSP in May 2006. The rest of the reports are scheduled to be published in 2007 and 2008. For more information on the products, process, and schedule, visit the S&A products portion of the CCSP web site at www.climatechange.gov/Library/sap/.



INFORMATION QUALITY ACT (IQA) AND FEDERAL ADVISORY COMMITTEE ACT (FACA)

The S&A products are subject to the IQA and most also fall under FACA. Each product must meet the IQA guidelines of the lead agency responsible for the product. In particular, the lead agency must ensure compliance with peer review requirements established under IQA for “highly influential scientific assessments.” This requires producing and implementing a peer review plan for each product. The determination of whether a FACA committee is required rests with the lead agency. Where a product falls under FACA, the lead agency forms an advisory committee to which authors are appointed. The lead agency produces a draft charter outlining the committee’s mission and specific duties. The charter is made available for public review, and subsequently a final charter is produced by the lead agency and approved by the CCSP Interagency Committee. Each FACA committee must adhere to its charter and must:

- Arrange meetings for reasonably accessible and convenient locations and times
- Publish adequate advance notice of meetings in the Federal Register
- Open advisory committee meetings to the public (with some exceptions)
- Make available for public inspection, subject to the Freedom of Information Act, papers and records, including detailed minutes of each meeting
- Maintain records of expenditures.

STEPS OF THE PROCESS¹

Planning the Process and Preparing a Prospectus

- 1) The lead and supporting agencies solicit input from users and other stakeholders, plan preparation of the product, and summarize the proposed process in a draft prospectus.
- 2) The CCSP Interagency Committee reviews and approves the draft prospectus for public comment.
- 3) Expert reviewers and stakeholders review the draft prospectus over a period of at least 30 days.
- 4) Lead and supporting agencies revise the draft prospectus and finalize recommendations for individuals to serve as authors.
- 5) The CCSP Interagency Committee approves the revised prospectus.
- 6) The CCSP Office posts the draft prospectus comments and the final prospectus on the CCSP web site.

Additional Stakeholder Interactions, if Needed

- 7) Lead authors may solicit additional input from users and other stakeholders to assist in the development of the product. The process for soliciting additional input is open and is described in the prospectus. The results from additional stakeholder interactions are publicly available in summary or more extensive forms through publication on the CCSP web site.

Drafting/Reviewing the Products

- 8) Lead authors prepare the first draft, including a technical section and a summary for interested non-specialists.
- 9) The lead and supporting agencies organize and facilitate an expert peer review of the first draft. All comments submitted during the expert peer review are publicly available.
- 10) Lead authors prepare the second draft of the product.
- 11) The CCSP Office posts the second draft for public comment for not less than 45 days. All comments, and authors responses to comments, are publicly available on the CCSP web site.
- 12) The lead authors prepare a third draft of the product.

Approving, Producing, and Releasing the Products

- 13) Lead agencies certify that the product complies with the Information Quality Act, and submit the third draft and comments received to the CCSP Interagency Committee and the National Science and Technology Council (NSTC).
- 14) The CCSP and NSTC reviews are conducted concurrently.² The NSTC review is conducted by the Committee on Environment and Natural Resources (CENR). Comments generated in these reviews are sent to the lead and supporting agencies for consideration and resolution by the lead authors.
- 15) If needed, the National Research Council (NRC) can be asked to provide additional scientific analysis.
- 16) Approval requires the concurrence of all CENR members.
- 17) Once NSTC approval has been obtained and the product is finalized, the lead agency releases the completed product.
- 18) The CCSP Office widely disseminates the product through its web site and other mechanisms.

Documenting the Process

To promote transparency, a minimum of eleven different documents are posted to each product’s web site throughout the process, including:

- Invitation for public comment on draft prospectus
- Draft prospectus
- Public comments on draft prospectus
- Final prospectus
- Peer review plan (if not part of the prospectus)
- Expert review comments on first draft report and authors’ responses
- Invitation for public comment on second draft report
- Second draft report
- Public comments on second draft report and authors’ responses
- Third draft report
- Final report.

¹ See <<http://www.climate-science.gov/Library/sap/sap-guidelines.htm>>.

² See <<http://www.climate-science.gov/Library/sap/sap-guidelines-clarification-aug2007.htm>>.

PARTICIPANTS AND THEIR ROLES

CCSP Interagency Committee

CCSP's Interagency Committee is chaired by the CCSP Director (DOC appointee) and includes representatives of 13 participating departments/agencies that have mission or funding responsibilities in climate and global change research:

- Department of Agriculture (USDA)
- Department of Commerce / National Oceanic and Atmospheric Administration (DOC/NOAA)
- Department of Defense (DOD)
- Department of Energy (DOE)
- Department of Health and Human Services (HHS)
- Department of the Interior / U.S. Geological Survey (DOI/USGS)
- Department of State (DOS)
- Department of Transportation (DOT)
- Agency for International Development (USAID)
- Environmental Protection Agency (EPA)
- National Aeronautics and Space Administration (NASA)
- National Science Foundation (NSF)
- Smithsonian Institution (SI).

The committee also includes liaisons from the Executive Office of the President (EOP). Membership on the CCSP Interagency Committee is joint with the Subcommittee on Global Change Research (SGCR) of the Committee on Environment and Natural Resources (CENR) of the President's National Science and Technology Council (NSTC).

Lead Agencies/Departments

A single CCSP agency or department will take the lead in producing each product. Among the lead agency's responsibilities is ensuring compliance with the Information Quality Act (PL 106-554, §515 (a)). Each S&A Product must meet the lead agency's Information Quality Guidelines. In so doing, lead agency must ensure compliance with peer review requirements. The lead agency also is responsible for ensuring that the report is produced in accordance with the Federal Advisory Committee Act.

Lead and Contributing Authors

Lead and contributing authors are individuals with appropriate technical expertise. They may be citizens of any country and be drawn from within or outside the Federal government. Lead authors are responsible for producing the S&A reports.

Federal Advisory Committee Act (FACA) Committees

If FACA is applicable to a particular product, a FACA committee is formed. In general, if non-Federal scientists serve as lead authors, the authors are constituted as an advisory committee under the Federal Advisory Committee Act. After substantive deliberations on the product, the committee submits the finished report to the lead agency.

Interagency Working Groups

The CCSP's research-oriented interagency working groups (IWGs) consist of agency program managers who have budget authority within their agencies to implement CCSP research programs. IWGs may help the lead agencies with any product-related task. Current IWGs focus on Atmospheric Composition, Climate Variability and Change, Global Water Cycle, Land-Use/Land-Cover Change, Global Carbon Cycle, Ecosystems, Human Contributions and Responses to Global Change, Decision Support, Modeling, Observations and Monitoring, International, and Data Management.

Expert Reviewers

Expert reviewers are scientists or individuals selected by the lead agencies/departments based on expertise, balance, and independence criteria. In accrediting the experts, the lead agencies/departments ensure that there is no perceived conflict of interest. Reviewers may be citizens of any country and be drawn from within or outside the Federal government (e.g., universities or other public or private sector organizations).

Stakeholders

Stakeholders are individuals or groups whose interests (financial, cultural, value-based, or other) are affected by climate variability, climate change, or options for adapting to or mitigating these phenomena. Stakeholders participate during the "scoping" process by providing information that helps define the audience and potential uses of a product. In addition, stakeholders provide comments on the prospectus, and on the product during the public comment period.

National Research Council

The National Academy of Sciences/National Research Council will provide advice on an as-needed basis to the lead agencies. The NRC may be asked to provide additional scientific analyses to help bound the uncertainty associated with these issues.

National Science and Technology Council

The NSTC is responsible for final review and approval. Approval will require written concurrence from all members of the NSTC's Committee on Environment and Natural Resources, which consists of 15 agency and department representatives on the Assistant Secretary or Deputy Assistant Secretary level. The committee also includes liaisons from the Executive Office of the President, and other Executive organizations, departments, and agencies as the co-chairs may, from time to time, designate.



Summary of Synthesis and Assessment Products*

CCSP GOAL 1	Extend knowledge of the Earth's past and present climate and environment, including its natural variability, and improve understanding of the causes of observed changes	
Product 1.1	Temperature trends in the lower atmosphere: steps for understanding and reconciling differences	NOAA
Product 1.2	Past climate variability and change in the Arctic and at high latitudes	USGS
Product 1.3	Re-analyses of historical climate data for key atmospheric features: implications for attribution of causes of observed change	NOAA
CCSP GOAL 2	Improve quantification of the forces bringing about changes in the Earth's climate and related systems	
Product 2.1	Scenarios of greenhouse gas emissions and atmospheric concentrations and review of integrated scenario development and application	DOE
Product 2.2	North American carbon budget and implications for the global carbon cycle	NOAA
Product 2.3	Aerosol properties and their impacts on climate	NASA
Product 2.4	Trends in emissions of ozone-depleting substances, ozone layer recovery, and implications for ultraviolet radiation exposure	NOAA
CCSP GOAL 3	Reduce uncertainty in projections of how the Earth's climate and related systems may change in the future	
Product 3.1	Climate models: an assessment of strengths and limitations	DOE
Product 3.2	Climate projections for research and assessment based on emissions scenarios developed through the Climate Change Technology Program	NOAA
Product 3.3	Weather and climate extremes in a changing climate: North America, Hawaii, Caribbean, and U.S. Pacific islands	NOAA
Product 3.4	Abrupt climate change	USGS
CCSP GOAL 4	Understand the sensitivity and adaptability of different natural and managed ecosystems and human systems to climate and related global changes	
Product 4.1	Coastal elevation and sensitivity to sea-level rise	EPA
Product 4.2	Thresholds of change in ecosystems	USGS
Product 4.3	The effects of climate change on agriculture, biodiversity, land, and water resources	USDA
Product 4.4	Preliminary review of adaptation options for climate-sensitive ecosystems and resources	EPA
Product 4.5	Effects of global change on energy production and use in the United States	DOE
Product 4.6	Analyses of the effects of global change on human health and welfare and human systems	EPA
Product 4.7	Impacts of climate variability and change on transportation systems and infrastructure: Gulf Coast study	DOT
CCSP GOAL 5	Explore the uses and identify the limits of evolving knowledge to manage risks and opportunities related to climate variability and change	
Product 5.1	Uses and limitations of observations, data, forecasts, and other projections in decision support for selected sectors and regions	NASA
Product 5.2	Best-practice approaches for characterizing, communicating, and incorporating scientific uncertainty in decision making	NOAA
Product 5.3	Decision support experiments and evaluations using seasonal-to-interannual forecasts and observational data	NOAA

* The righthand column provides the S&A product lead agency for IQA and FACA purposes.

This fact sheet was generated by the Climate Change Science Program Office in collaboration with an interagency working group composed of representatives of the 13 Federal agencies participating in the U.S. Climate Change Science Program.

For further information, see <www.climate-science.gov>.