

## CCSP FY 2006 PRIORITY AREAS AND NEW INITIATIVES

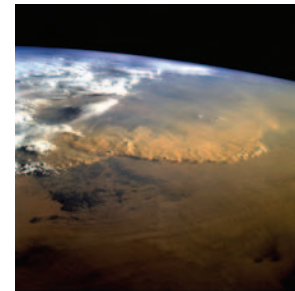
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An important step in coordinating the CCSP budget for FY 2006 has been to align the agency climate programs with the goals and key research focus areas in the *CCSP Strategic Plan*, thus helping to ensure consistency. The emphasis is on ensuring alignment of current funding with a recommended list of priorities and identifying gaps that may occur, as well as identifying measurable milestones and deliverables that reflect accountability toward meeting program goals.

The current CCSP program is a high-priority selection of activities that merit continued support. However, new initiatives are required to move in directions identified in the *CCSP Strategic Plan*. CCSP must maintain key research activities, while encouraging innovation in a constrained budget environment. There is a need for continuing evolution of program priorities and activities through new initiatives, the competitive grant process within the agencies, and other evolutionary redirection reflecting new focus areas for high-priority research in climate science. The program aspires to refresh programs during each budget cycle such that over a 5-year period, approximately one-third of CCSP research activities will support new research directions. Recognizing that research and monitoring often involve long-term programs, the objective of refreshing one-third of program activities over a 5-year period represents a desired balance between program continuity and new program priorities.

CCSP focuses on nine priority themes to accelerate the delivery of critical science-based information in support of decisionmaking:

- 1) Reduce scientific uncertainties associated with aerosol distribution, properties, and radiative impacts
- 2) Analyze climate variability, sensitivity, and feedbacks
- 3) Enhance climate modeling systems



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- 4) Reduce scientific uncertainties regarding the water cycle
- 5) Reduce scientific uncertainties regarding carbon sources and sinks
- 6) Conduct climate-ecosystems research
- 7) Improve decision-support capabilities
- 8) Enhance global climate observations
- 9) Improve communications between scientists and information users.

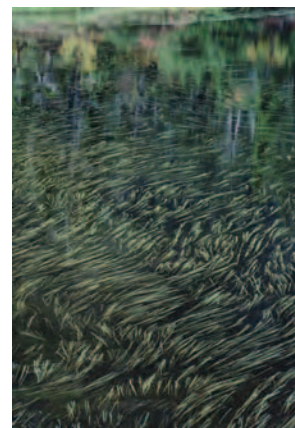


There is close alignment between these priority areas and the CCSP research elements described in the *CCSP Strategic Plan* and in this document. A number of ongoing CCSP-supported research projects do not fall within the priority themes identified above, but are essential for meeting the agreed objectives of the *CCSP Strategic Plan* (e.g., long-term monitoring efforts). The following examples highlight some of the topics included under each of these priority areas:

- *Reduce scientific uncertainties associated with aerosol distribution, properties, and radiative impacts* – CCSP will continue to explore the representation of climate forcing resulting from atmospheric aerosols. Examples of proposed activities include research on:
  - The radiative effects of aerosols and their impacts on climate
  - Aerosol-cloud-climate interactions and the relationship between aerosols and precipitation.
- *Analyze climate variability, sensitivity, and feedbacks* – CCSP will continue to extend understanding of climate variability, sensitivity, and feedbacks, including feedbacks from clouds, water vapor, atmospheric convection, ocean circulation, ice albedo, and vegetation. Some key activities are research projects that will:
  - Extend and improve predictions of the effects of ocean circulation and periodic natural fluctuations such as El Niño and solar activity on climate variability
  - Document and understand the observed trends and variability of climate extremes
  - Improve representation of cloud feedback processes in global climate models using results from satellite and *in situ* observations and results from process studies.
- *Enhance climate modeling systems* – The capabilities of climate and atmospheric composition models will be enhanced with some key efforts, such as:
  - Improving model representations of key physical processes including clouds, aerosols, and precipitation, as well as coupling of atmosphere, ocean, land, and vegetation processes
  - Increasing resolution of climate model simulations
  - Improving methods to assimilate observed climate data
  - Testing models against observations and defining requirements for observing systems to support forecasts and improve models.

Many of these modeling efforts will require continuing increases in computer capacity as well as human capital.

- *Reduce scientific uncertainties regarding the water cycle* – CCSP seeks to improve the understanding of global and regional water cycles through specific activities, including:
  - Research utilizing improved observations and modeling of water cycle processes leading to closing the water budget on regional and global scales
  - Research on the interactions between the atmospheric, continental land surface/vegetation, oceanic, biogeochemical, and cryospheric processes involving the water cycle
  - Studies of the predictability of extreme events such as extended droughts or wet spells, and consequences of natural or anthropogenically influenced changes to the climatic regimes of the water cycle.
- *Reduce scientific uncertainties regarding carbon sources and sinks* – CCSP seeks to improve understanding of the global carbon cycle through targeted activities such as:
  - Research relating to the North American Carbon Program, which will reduce the uncertainty in estimates of the North American carbon budget
  - Research on terrestrial processes regulating carbon storage, which will improve estimates of carbon sequestration in terrestrial ecosystems
  - Conducting studies using model projections to help improve understanding of the range of future carbon dioxide emissions and scenarios.
- *Conduct climate-ecosystems research* – Key activities in climate-ecosystem research include studies of:
  - The relationship between observed ecosystem changes and climate change
  - Coastal response to sea-level change
  - The effects of warming, changes in precipitation, increasing atmospheric carbon dioxide concentration, and ultraviolet radiation on the structure and functioning of terrestrial and marine ecosystems.
- *Improve decision-support capabilities* – CCSP will develop and test resources to support planning, adaptive management, policymaking, and public discussion of changes in climate and related systems. A major focus area will be drafting the first set of CCSP synthesis and assessment products and the initial phases of work on the remaining products. Specific plans for enhanced decision-support resources include:
  - Developing decision-support tools to improve society’s ability to plan and respond to climate variability and change
  - Conducting decision-support experiments and evaluations using seasonal-to-interannual forecasts and observational data.
- *Enhance global climate observations* – CCSP will continue to focus on the development of a comprehensive climate observing system in close collaboration with the U.S. Group on Earth Observations, which is coordinating the overall contributions of the United States to the Global Earth Observing System of Systems (GEOSS). Priority activities will address the development of an integrated



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end-to-end observing system designed to minimize data gaps and maximize the utility of observing networks. Highlighted activities include:

- Providing new paleoclimate products, such as annual- to decadal-scale maps of Arctic climate variability over the past 2,000 years
- Developing and demonstrating new space-based observing capabilities to meet climate research requirements
- Enhancing data and information management and distribution systems by developing and implementing new technologies.
- *Improve communications between scientists and information users* – CCSP will improve dialog with stakeholders through workshops, publications, and web sites. All of the CCSP agencies implement efforts in this area, which include:
  - Reporting relevant aspects of scientific findings
  - Disseminating results of CCSP activities
  - Making scientific information and products easily available in formats suitable to a diverse set of audiences, policymakers, and technical experts involved in adaptive management decisions.

