



Office of Science and Technology Policy
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CLIMATE CHANGE AND GLOBAL OBSERVATIONS

Research and Development Funding in the President's 2005 Budget

Climate Change

The U.S. Global Change Research Program (USGCRP), authorized by the Global Change Research Act of 1990, and the Climate Change Research Initiative (CCRI) were combined in 2002 into the comprehensive U.S. Climate Change Science Program (CCSP). CCSP published the *U.S. Climate Change Science Program Strategic Plan* in July 2003, describing a strategy for developing knowledge of variability and change in climate and for application of this knowledge.

CCRI supports near-term research objectives, such as:

- Reducing scientific uncertainty produced by interactions between atmospheric radiation and organic or black soot aerosols, inorganic or mineral dust aerosols, and water as liquid, solid and vapor
- Developing decision support resources with synthesis and assessment scientific documents
- Improving accuracy of climate model simulations with enhanced computer and cyber infrastructure resources for increased horizontal and vertical model resolutions and for increased effectiveness of data analyses and interpretation

USGCRP supports long-term objectives, such as:

- Building a climate observing system
- Improving climate models through better understanding of the dynamical processes and interconnections between atmosphere, land, and ocean
- Conducting fundamental research on climate processes over time and space, e.g., El Niño, aerosols, agricultural practices in North America, and oceanic uptake of atmospheric heat and carbon.

The Budget for CCSP, which is distributed over 13 agencies, is \$2.0 billion, approximately the same as the amount enacted in 2004. DoE, NASA, NOAA and NSF receive 90% of the CCSP total. The Budget for CCRI is \$240 million, which is 42% larger than the amount enacted in 2004. DoE, NASA, NOAA, and NSF account for 90% of the CCRI request.

For climate change technology--technology to reduce greenhouse gas emissions via renewable energy, fossil energy and nuclear energy efficiency improvements, and carbon sequestration--the Budget provides the U.S. Climate Change Technology Program (CCTP) with approximately \$2.0 billion also, which is the same amount enacted in 2004. About 90% is expended in DoE, 7% in EPA, and the remainder in seven other agencies. CCTP published *Research and Current Activities* in November 2003, describing Administration's initiatives to help reduce, avoid or sequester greenhouse gas emissions. The Hydrogen Fuel Initiative at \$228 million is an innovative and promising new program to produce clean energy for the automobile transportation sector.

Earth Observations

The Administration has accelerated by \$56.5 million the observations on aerosols, water cycle, oceans and carbon cycle to contribute to filling knowledge gaps identified in the CCSP Strategic Plan and to support the development of comprehensive Earth Observation System. These observations will help reduce scientific uncertainty associated with climate impact of aerosols and with the sources and sinks of the carbon cycle. Observations of the global and vertical distributions of size, composition, physical and optical properties of aerosols are needed to determine whether the overall effect of aerosols enhances heating or cooling of the atmosphere. With new observations from satellite, ships and land stations, the uncertainty about the role of aerosols in climate science will be halved in ten years. Measurements of the vertical profile of carbon dioxide in North America will be enhanced from land-based towers and aircraft. Water cycle measurements will be augmented. The world ocean is under sampled and the Administration will accelerate deployment of moored and free-drifting buoys to measure ocean temperature and other variables to detect natural oscillations within the global ocean.