UNFCCC Special Side Event

“Research Needs
“Relating to the Convention

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U.S. Climate Change Programs

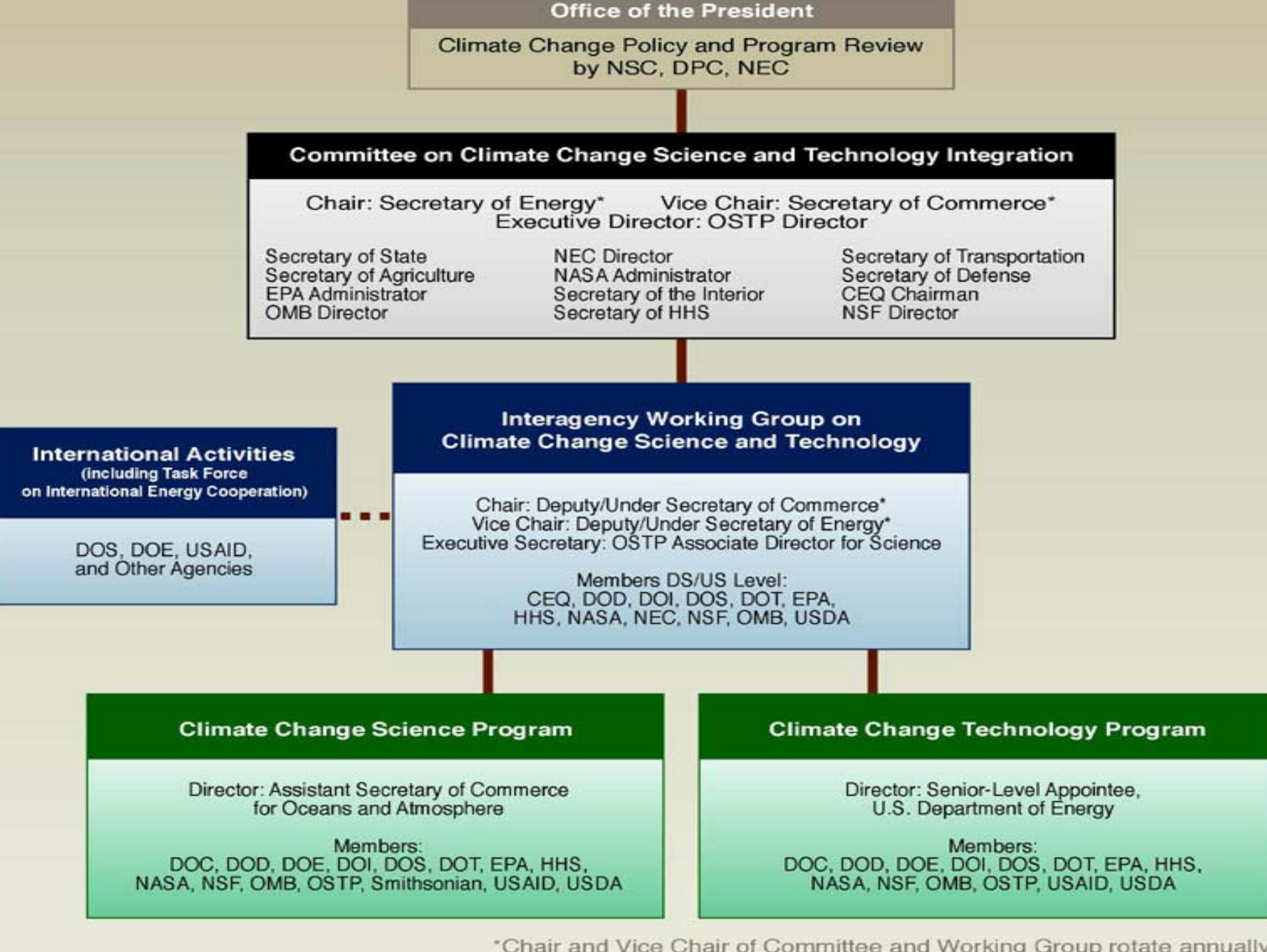
President Bush announced new ministerial-level management responsibilities for climate science and technology programs (Feb 2002)

US Climate Change Science Program
www.climatescience.gov

- USGCRP (1990)
  - CCRI (2001)

US CLIMATE CHANGE TECHNOLOGY PROGRAM
www.climatetechnology.gov

- CCTI (2001)
  - Other technology programs


Office of the President
Climate Change Policy and Program Review by NSC, DPC, NEC
Committee on Climate Change Science and Technology Integration
Chair: Secretary of Energy* Vice Chair: Secretary of Commerce*
Executive Director: OSTP Director
Secretary of State
Secretary of Agriculture
EPA Administrator
OMB Director
NEC Director
NASA Administrator
Secretary of the Interior
Secretary of HHS
Secretary of Transportation
Secretary of Defense
CEQ Chairman
NSF Director
Interagency Working Group on Climate Change Science and Technology
Chair: Deputy/Under Secretary of Commerce*
Vice Chair: Deputy/Under Secretary of Energy*
Executive Secretary: OSTP Associate Director for Science
Members DS/US Level:
CEQ, DOD, DOI, DOS, DOT, EPA, HHS, NASA, NEC, NSF, OMB, USDA
International Activities
(including Task Force on International Energy Cooperation)
DOS, DOE, USAID, and Other Agencies
Climate Change Science Program
Director: Assistant Secretary of Commerce for Oceans and Atmosphere
Members:
DOC, DOD, DOE, DOI, DOS, DOT, EPA, HHS, NASA, NSF, OMB, OSTP, Smithsonian, USAID, USDA
Climate Change Technology Program
Director: Senior-Level Appointee, U.S. Department of Energy
Members:
DOC, DOD, DOE, DOI, DOS, DOT, EPA, HHS, NASA, NSF, OMB, OSTP, USAID, USDA
*Chair and Vice Chair of Committee and Working Group rotate annually

Management Mechanisms: How CCSP Agencies Work Together

- Executive direction by cabinet-based management, including priority setting and oversight
- Implementation by the 13 CCSP agencies
- Coordination through CCSP Interagency Working Groups
- External interactions for guidance, evaluation, and feedback
- Ongoing activities: budget coordination update and use of strategic plan in Agency planning

Climate Change Science Program: FY 2005-2007 Budget by Agency

Agency	FY05			FY06			FY07		
	USGCRP	CCRI	CCSP	USGCRP	CCRI	CCSP	USGCRP	CCRI	CCSP
USDA	54	8	62	54	8	62	49	11	60
DOC/NOAA	74	46	120	117	34	151	127	46	173
DOE	102	25	127	106	25	131	102	24	126
HHS	57	0	57	57	0	57	57	0	57
DOI/USGS	27	0	27	27	0	27	26	0	26
DOT	0	1	1	0	1	1	0	1	1
USAID	0	6	6	0	13	13	0	14	14
EPA	20	0	20	19	0	19	18	0	18
NASA Science	1,147	94	1,241	948	97	1,045	943	86	1,029
NSF	173	25	198	172	25	197	180	25	205
SI	6	0	6	6	0	6	6	0	6
CCSP TOTAL	**1,660**	**205**	**1,865**	**1,506**	**203**	**1,709**	**1,508**	**207**	**1,715**

The FY07 columns are the "proposed" numbers from White House Office of Management and Budget.
NASA includes scientific research and satellite observing systems.

CCSP Guiding Vision

A nation and the global community empowered with the science-based knowledge to manage the risks and opportunities of change in the climate and related environmental systems.

CCSP Mission

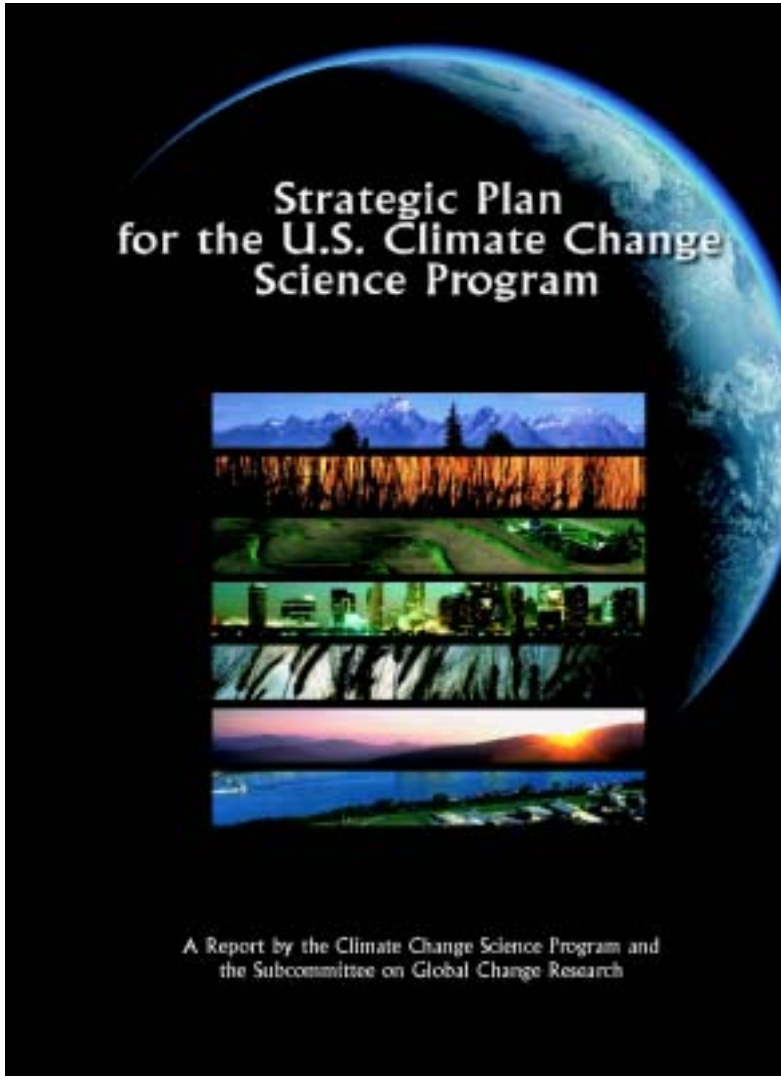
Facilitate the creation and application of knowledge of the Earth's global environment through:

- **research**
- **observations**
- **decision support**
- **communication**

Strategic Plan for the U.S. Climate Change Science Program

Based on:

- Previous planning efforts (e.g., *Pathways* and other NRC reports)
- Comments during workshop (1300 participants)
- 270 sets of comments during an open comment period
- Reviews by the National Academy of Sciences-National Research Council (NAS-NRC)
- Government review
- Released July 2003



www.climatescience.gov

NAS-NRC Review on (final) CCSP Strategic Plan

- "The Strategic Plan for the U.S. Climate Change Science Program articulates a guiding vision, is *appropriately ambitious, and is broad in scope*."

- "In fact, the approaches taken by the CCSP to receive and respond to comments from a large and broad group of scientists and stakeholders, including a two-stage independent review of the plan, *set a high standard for government research programs*."

- "As a result, the revised strategic plan is much improved over its November 2002 draft, and now includes the elements of a strategic management framework that could permit it to *effectively guide research on climate and associated global changes over the next decades*."

- "The plan *addresses much of the critical science* in a strategic framework that places the research it proposes in the context of national needs."

CCSP Strategic Plan

- 10-year plan to guide research activities sponsored or conducted by the U.S. government
- Long term research foci related to science goals
- Near term deliverables (e.g., synthesis and assessment products) stratified by science goals

5 Climate Science Goals

- Improve Knowledge of Climate and Environment
- Improve Quantification of Forces Driving Changes to Climate
- Reduce Uncertainty in Projections of Future Climate Changes
- Understand Sensitivity and Adaptability of Natural and Manmade Ecosystems
- Explore Uses and Limits

CCSP Strategic Plan Elements

USGCRP Research Elements

- Climate Variability and Change
- Water Cycle
- Land Use / Land Cover Change
- Carbon Cycle
- Ecosystems
- Human Contributions and Responses

CCRI Elements

- Modeling Strategy
- Decision Support
- Resources Development
- Observations & Monitoring
- Data Management and Information
- Communication
- International Research and Cooperation
- Program Management

FY06 CCSP Priorities

- Reduce Scientific Uncertainties of Aerosols;
- Reduce Scientific Uncertainties of Carbon Sources and Sinks;
- Reduce Scientific Uncertainties of the Water Cycle;
- Analyze Climate Feedbacks and Sensitivity to Natural and Human-Induced Forcing;
- Improve Understanding of Ecosystem Responses to Climate Change;
- Enhance Global Climate Observations;
- Enhance Climate Modeling Systems;
- Improve Decision Support Capabilities; and
- Improve Communications between Scientists & Information Users

CCSP Assessment Activities

- CCSP research contributes greatly to the international research programs (e.g., WCRP, IGBP, IHDP, IAI)
- CCSP agencies and scientists participate in a wide range of international assessments
  - IPCC
    - ~120 U.S. scientists are IPCC authors; 15 are Review Editors
    - US Co-Chairs and Hosts IPCC WG I
  - WMO/UNEP Ozone assessments
  - Arctic Climate Impacts Assessment
  - Millennium Ecosystem Assessment
- 21 CCSP Synthesis and Assessment Products related to the CCSP goals identified in the CCSP Strategic Plan
- CCSP sponsors research to improve the conduct and utility of assessments

CCSP Synthesis and Assessment Products

- Purpose:
  - Convey the most up-to-date information available, drawing on the evolving body of climate and global change research
  - Address the full range of scientific issues, from past/present conditions to evaluation of options for response
  - Evaluate and report on levels of confidence
- Total of 21 products to be completed between 2006 and 2008
- CCSP information is freely available to the world community
- Product 1.1 – *Temperature Trends in the Lower Atmosphere* – was released on May 9 (www.climatescience.gov)

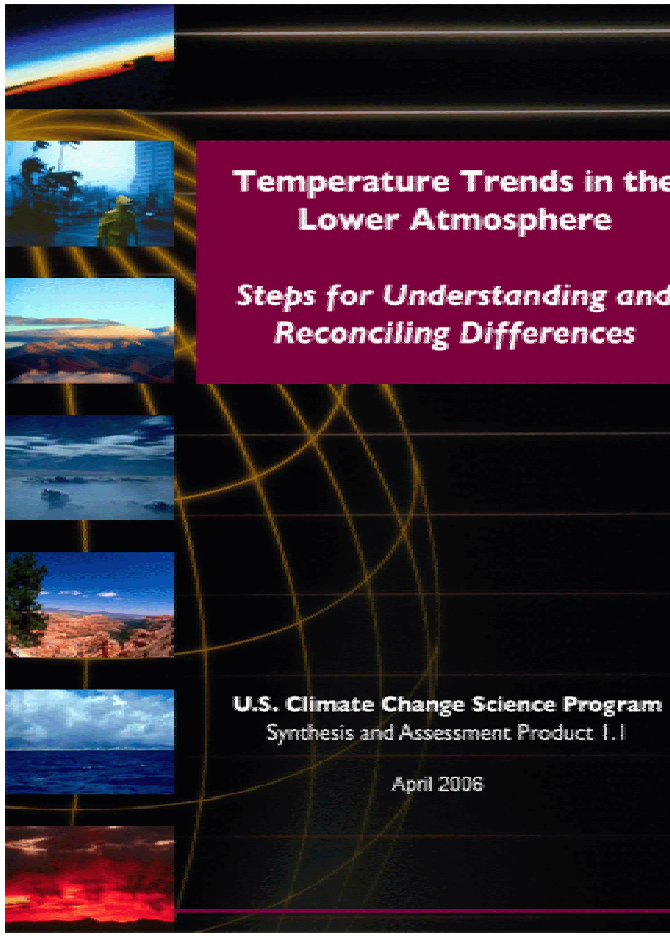
CCSP Synthesis and Assessment Product 1.1

- Tackles long-standing difficulties that have impeded understanding of changes in atmospheric temperatures and the basic causes of these changes

- According to the published report:
  - No longer a discrepancy in rate of global average temperature increase for the surface compared with higher levels in the atmosphere
  - Patterns of observed temperature change show clear evidence of human influences on the climate system due to changes in greenhouse gases, aerosols, and stratospheric ozone
  - Cannot be explained by natural processes alone, nor by the effects of short-lived atmospheric constituents such as aerosols and tropospheric ozone

- Previous reported discrepancies were used to challenge reliability of climate models
  - Specifically, surface data showed substantial global-average warming, while early versions of satellites and weather balloons showed little or no warming above the surface.
  - Errors in the satellite and weather balloon data have been identified and corrected and new data sets developed

- This is an important revision to and update of the conclusions of earlier reports from the U.S. National Research Council and the IPCC




BACK UP SLIDES


Scheduled Completion		Lead (L) / Supporting (S) Agencies
CCSP Goal 1 *Improve knowledge of the Earth's past and present climate and environment, including its natural variability, and improve understanding of the causes of observed variability and change*		
1st Quarter 2006	1.1 Temperature trends in the lower atmosphere—steps for understanding and reconciling differences.	NOAA (L)
2nd Quarter 2008	1.2 Past climate variability and change in the Arctic and at high latitudes.	USGS (L) NSF/NOAA/NASA (S)
2nd Quarter 2008	1.3 Re-analyses of historical climate data for key atmospheric features. Implications for attribution of causes of observed change.	NOAA (L) NASA/DOE (S)
CCSP Goal 2 Improve quantification of the forces bringing about changes in the Earth's climate and related systems		
4th Quarter 2006	2.1 Updating scenarios of greenhouse gas emissions and concentrations, in collaboration with the CCTP. Review of integrated scenario development and application.	DOE (L) NOAA/NASA (S)
1st Quarter 2007	2.2 North American carbon budget and implications for the global carbon cycle.	NOAA (L) DOE/NASA/USDA/USGS (S)
3rd Quarter 2007	2.3 Aerosol properties and their impacts on climate.	NASA (L) NOAA (S)
2nd Quarter 2008	2.4 Trends in emissions of ozone-depleting substances, ozone layer recovery, and implications for ultraviolet radiation exposure and climate change.	NOAA (L) NASA (S)

Scheduled Completion	Topic	Lead (L) / Supporting (S) Agencies
CCSP Goal 3 *Reduce uncertainty in projections of how the Earth's climate and environmental systems may change in the future*		
2nd Quarter 2007	3.1 Climate models and their uses and limitations, including sensitivity, feedbacks, and uncertainty analysis.	DOE (L) NOAA/NASA/NSF (S)
3rd Quarter 2007	3.2 Climate projections for research and assessment based on emissions scenarios developed through the CCTP.	NOAA (L) NSF/DOE (S)
2nd Quarter 2008	3.3 Climate extremes including documentation of current extremes. Prospects for improving projections.	NOAA (L) NASA/USGS (S)
2nd Quarter 2008	3.4 Risks of abrupt changes in global climate.	USGS (L) NOAA/NSF/EPA (S)
CCSP Goal 4 *Understand the sensitivity and adaptability of different natural and managed ecosystems and human systems to climate and related global changes*		
3rd Quarter 2007	4.1 Coastal elevation and sensitivity to sea level rise.	EPA (L) NASA/USGS/NOAA (S)
4th Quarter 2007	4.2 State-of-knowledge of thresholds of change that could lead to discontinuities (sudden changes) in some ecosystems and climate-sensitive resources.	USGS (L) EPA/NOAA/NSF (S)
4th Quarter 2007	4.3** Analyses of the effects of global change on agriculture, biodiversity, land, and water resources.	USDA (L) EPA/NOAA/NASA/NSF/ USGS/ USAID (S)
4th Quarter 2007	4.4 Preliminary review of adaptation options for climate-sensitive ecosystems and resources.	EPA (L) USDA/NOAA/NASA/

Scheduled Completion	Topic	Lead (L) / Supporting (S) Agencies
CCSP Goal 4 *continued*		
2nd Quarter 2007	4.5** Analyses of the effects of global change on energy and production use.	DOE (L) NASA/USGS/EPA (S)
4th Quarter 2007	4.6** Analyses of the effects of global change on human health and welfare and human systems.	EPA (L) NOAA/NASA/USAID (S)
4th Quarter 2007	4.7** Within the transportation sector, a summary of climate change and variability sensitivities, potential impacts, and response options.	DOT (L)
CCSP Goal 5 *Explore the uses and identify the limits of evolving knowledge to manage risks and opportunities related to climate variability and change*		
4th Quarter 2006	5.1 Uses and limitations of observations, data, forecasts, and other projections in decision support for selected sectors and regions.	NASA (L) EPA/NOAA/USGS (S)
3rd Quarter 2006	5.2 Best practice approaches for characterizing, communicating, and incorporating scientific uncertainty in decisionmaking.	NOAA (L)
4th Quarter 2007	5.3 Decision support experiments and evaluations using seasonal to interannual forecasts and observational data.	NOAA (L) NASA/EPA/USAID (S)