

A New Era for U.S. Global Change Research: USGCRP Strategic Planning

Sherburne Abbott
Associate Director for Environment
Office of Science and Technology Policy
Executive Office of the President



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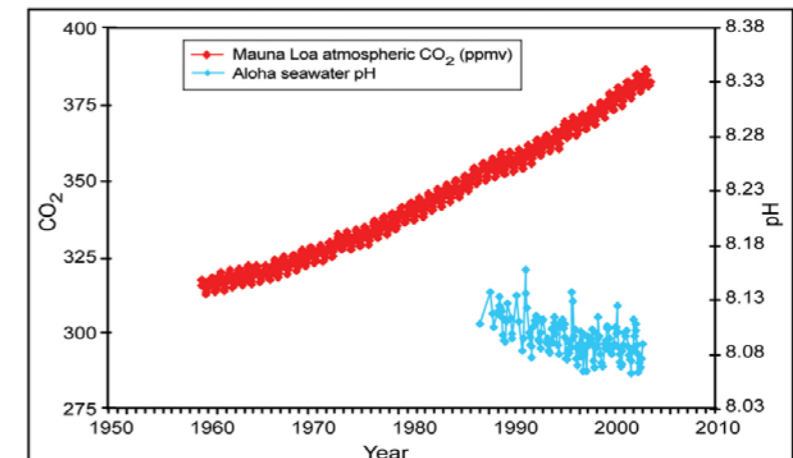
Key messages

- *Vision and mission for integrated global change research focused on the challenges of sustainability*
- *USGCRP mandate is adequate to the task*
- *What we have: CCSP has many of the core elements*
- *What we need: Lots of guidance on the needs*
- *Where we need to end up:*
 - ✓ *climate science and response S&T (adaptation and mitigation)*
 - ✓ *sustained climate assessment capability*
 - ✓ *national climate services*
 - ✓ *national strategy for Earth observations*
- *How we get there*



Promote sustainable well-being

- economic conditions and processes
(e.g., employment, income, wealth, markets, trade, **productive technologies...**)
- sociopolitical conditions and processes
(e.g., law & order, national & homeland security, governance, justice, education, healthcare, **science**, culture & the arts, liberty, privacy...)
- environmental conditions and processes
(e.g., **air, water, soils, mineral resources, the biota, nutrient cycles, climatic processes...**)



The USGCRP Mandate

- *“understand, assess, predict . . .”*
 - *Traditional USGCRP strengths: physical science basis for climate change*
 - *National Climate Assessment process*
- *“ . . . and respond . . . to global change”*
 - *Adaptation research and analysis*
 - *Mitigation – technology and analysis*
 - *Science for decision support (climate services)*
 - *Outreach, education, and engagement*

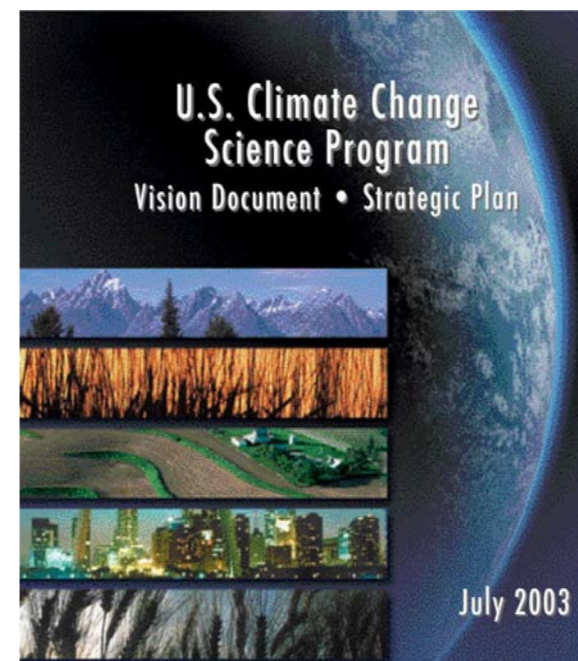


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What we've got: CCSP guiding vision

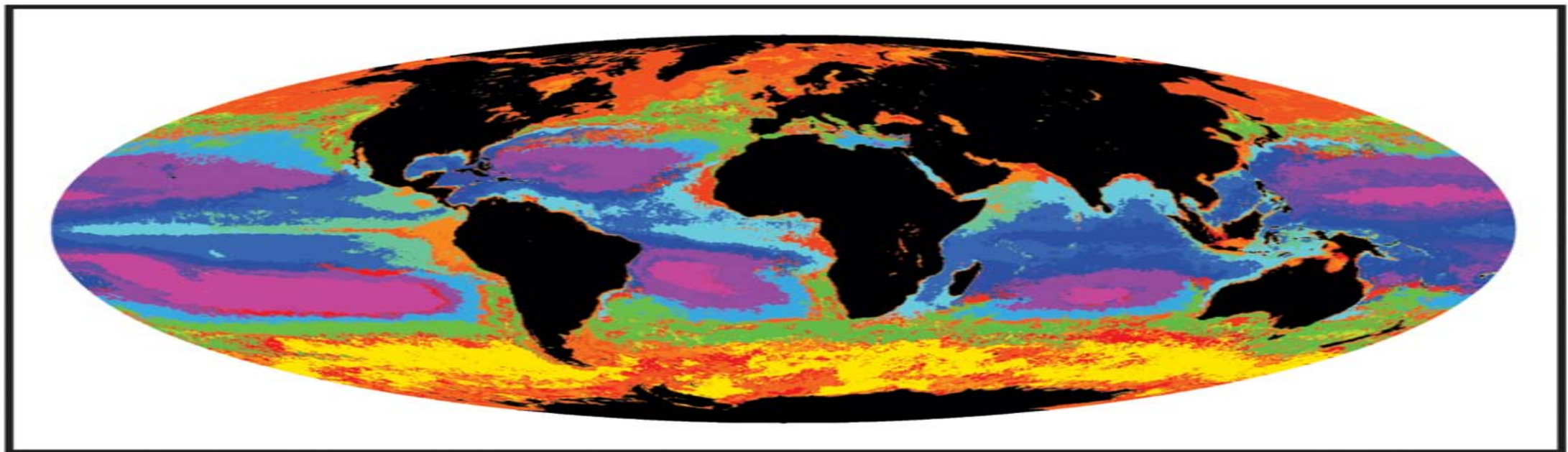
“A nation and the global community empowered with the science-based knowledge to manage the risks and opportunities of change in the climate and related environmental systems.”



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CCSP mission

“...facilitate the creation and application of knowledge of the Earth’s global environment through research, observations, decision support, and communication.”



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CCSP Goals

- 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
- Goal 2** Improve quantification of the forces bringing about changes in the Earth's climate and related systems
- Goal 3** Reduce uncertainty in projections of how the Earth's climate and related systems may change in the future
- Goal 4** Understand the sensitivity and adaptability of different natural and managed ecosystems and human systems to climate and related global changes
- Goal 5** explore the uses and identify the limits of evolving knowledge to manage risks and opportunities related to climate variability and change



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CCSP research elements

Atmospheric composition

Climate variability and change

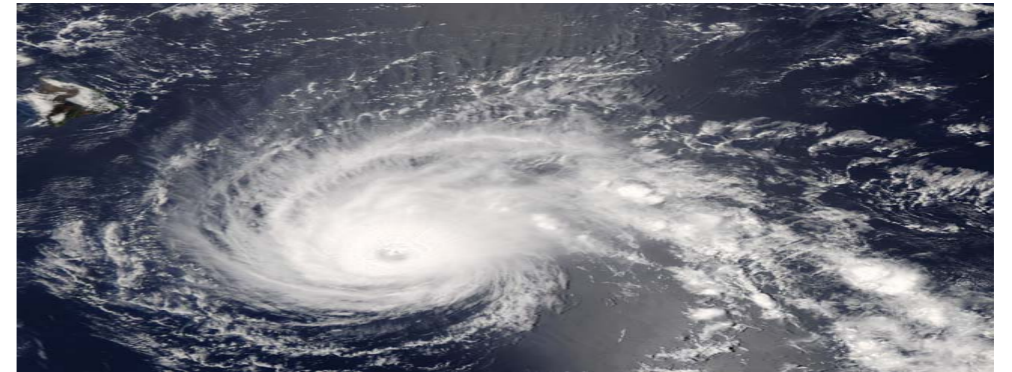
Water cycle

Land use/land cover change

Carbon cycle

Ecosystems

Human contributions and responses



Cross-cutting issues

Modeling

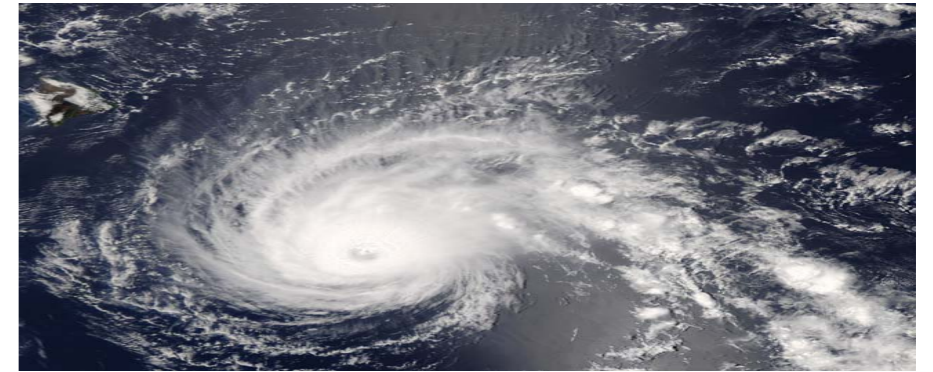
Decision support resources

Observing and monitoring

Data management and information

Communications

International research and cooperation



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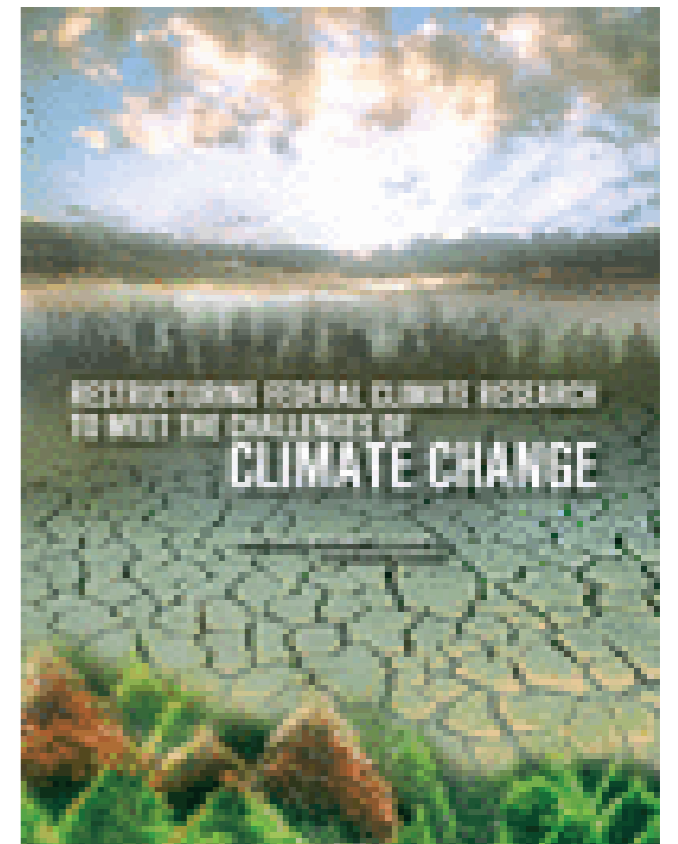
Guidance on improvements



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Scientific basis for understanding climate change and developing informed responses

- Reorganize around scientific-societal issues
- Establish a climate observing system
- Develop next generation coupled Earth system models
- Strengthen research on adaptation, mitigation, and vulnerability
- Initiate national assessment process with broad stakeholder participation
- Coordinate climate services to decision makers



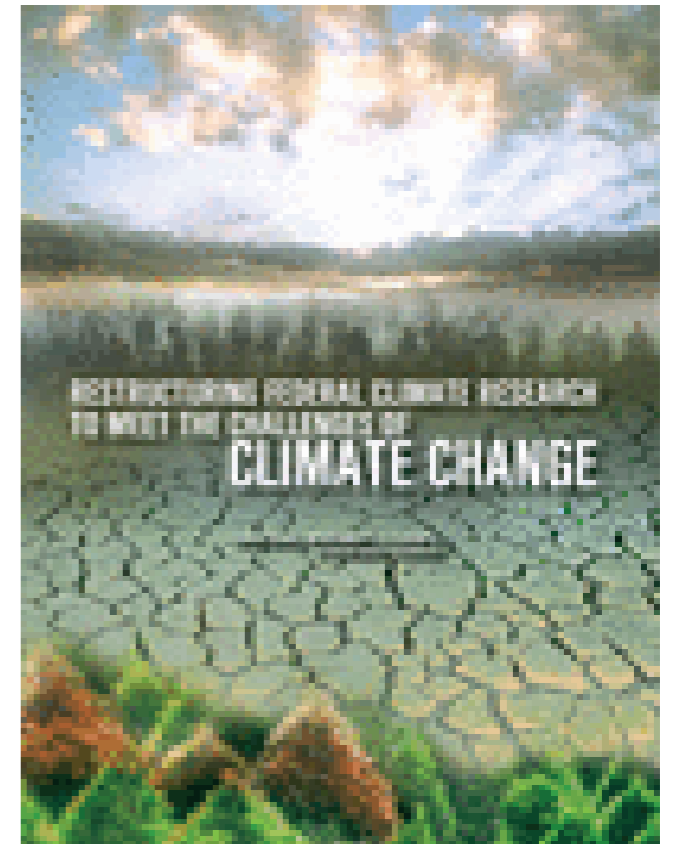
* *Restructuring Federal Climate Research to Meet the Challenge of Climate Change (NRC, 2009)*



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Adaptation research needs bolstering*

- Understanding and predicting physical climate change is progressing well
- Inadequate human dimensions funding
- Need enhanced focus on:
 - assessing impacts on human well being & vulnerabilities
 - providing knowledge to support decision making & risk analyses
 - communicating results and engaging stakeholders in a 2-way dialogue
- Provide climate services routinely to decision makers



* *Restructuring Federal Climate Research to Meet the Challenge of Climate Change (NRC, 2009)*

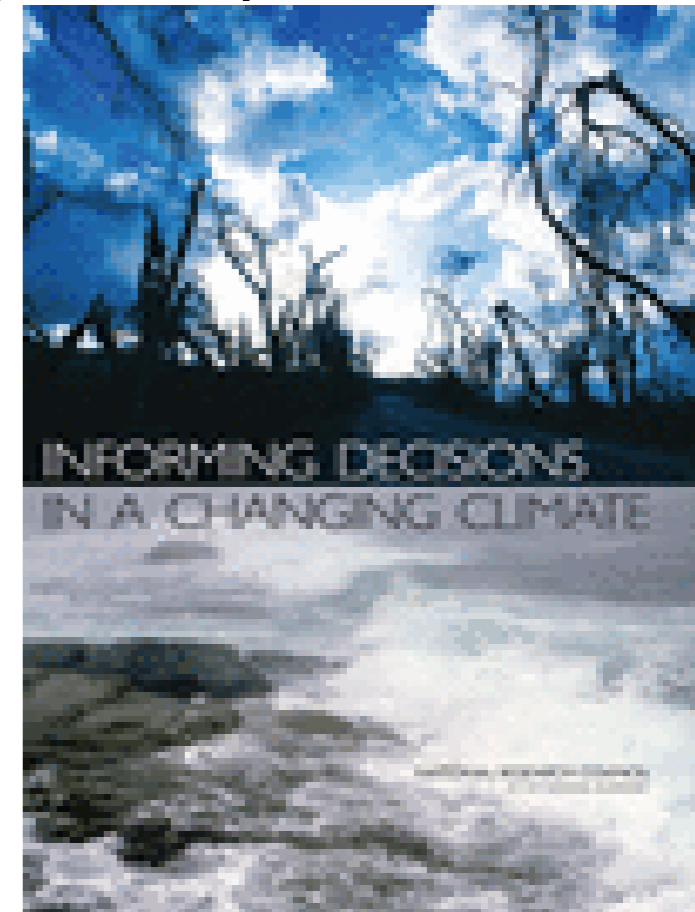


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Five key foci for decision support research: *

Understanding...

- climate change vulnerabilities..for regions, populations, and sectors
- the potential for mitigation...and consequences of mitigation options
- adaptation contexts & capacities, including consequences of adaptive responses
- how mitigation & adaptation interact
- Taking advantage of emerging opportunities associated with climate variability & change.



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* *Informing Decisions in a Changing Climate*
(NRC, 2009)

Outcome metrics that can be applied

The research has engendered significant **new avenues of discovery**.

The program has ...reduced uncertainties that **support decision making or facilitate the advance of other areas of science**.

The program has yielded **improved understanding such as** ...broadly accepted conclusions about key issues or relationships.

Research results have been **transitioned to operational** use.

Institutions and human capacity have been created that can better address a range of related problems and issues.

The measurements, analysis, and **results are being used** ...to support beneficial applications and decision making, such as forecasting, cost-benefit analysis, or improved assessment and management of risk.



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*Thinking Strategically: The Appropriate Use of
Metrics for the Climate Change Research
Program*

Impact metrics that can be applied

1. The results of the program have **informed policy and improved decision making.**
2. The program has **benefited society** in terms of enhancing economic vitality, promoting environmental stewardship, protecting life and property, and reducing vulnerability to the impacts of climate change.
3. **Public understanding** of climate issues has increased.



Challenges of the current system

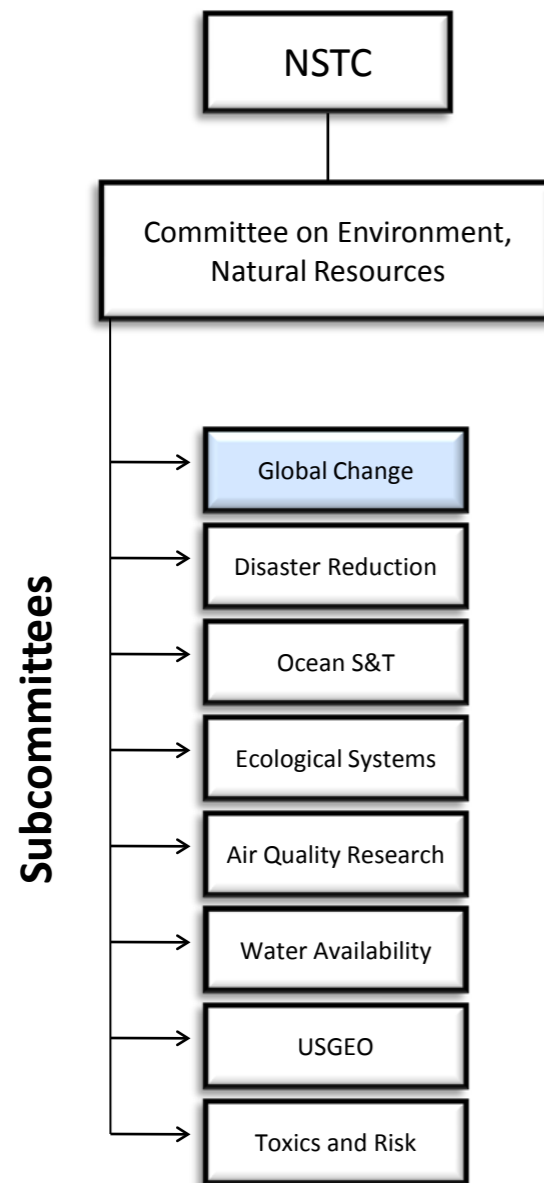
- *Lack of coordination . . .*

among climate change science, adaptation, and mitigation efforts

- *between assessment and services*
- *between the USGCRP and other NSTC subcommittees*
- *. . . makes it difficult to develop coherent national climate change policies*



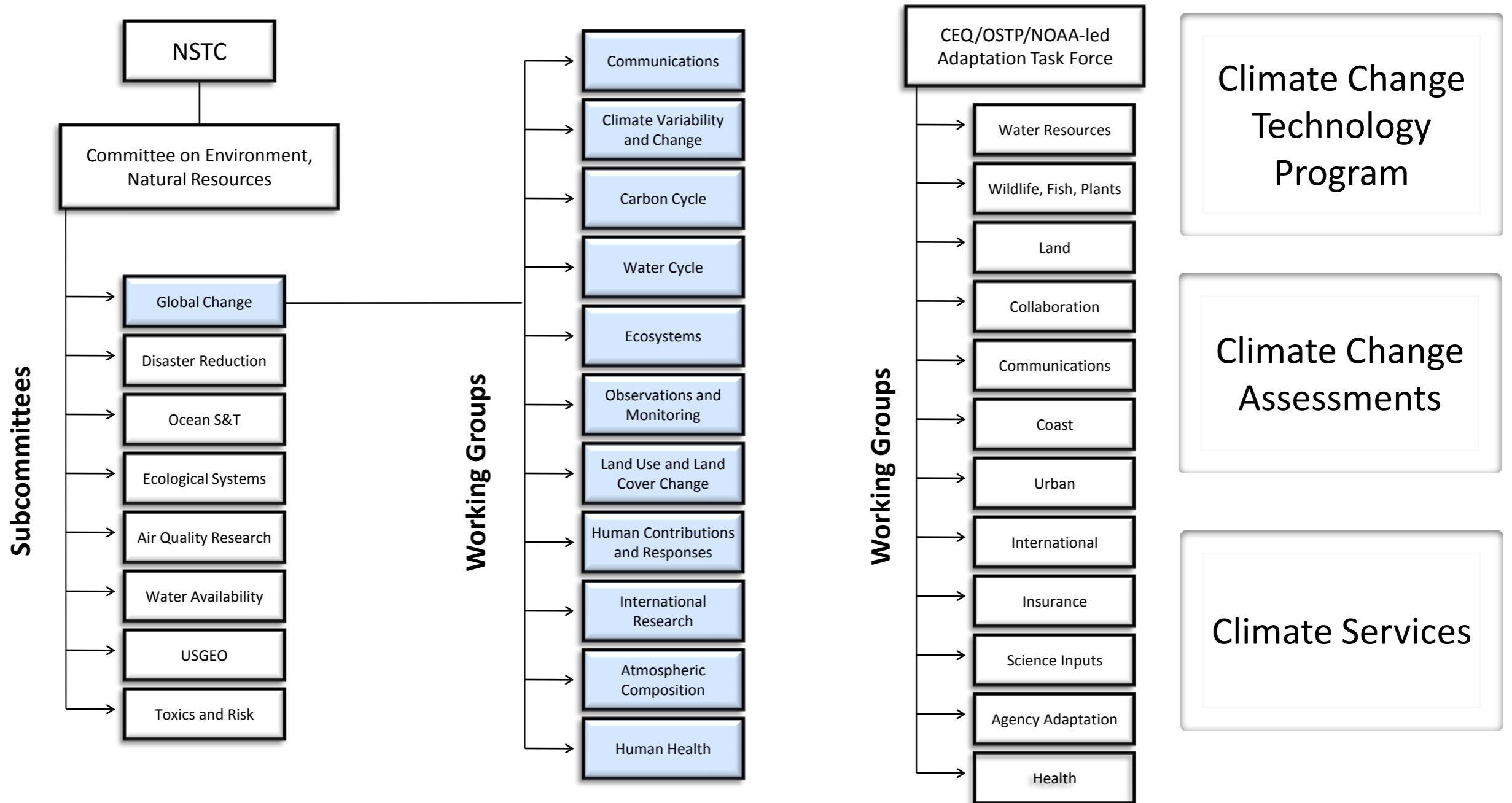
The NSTC/CENR today



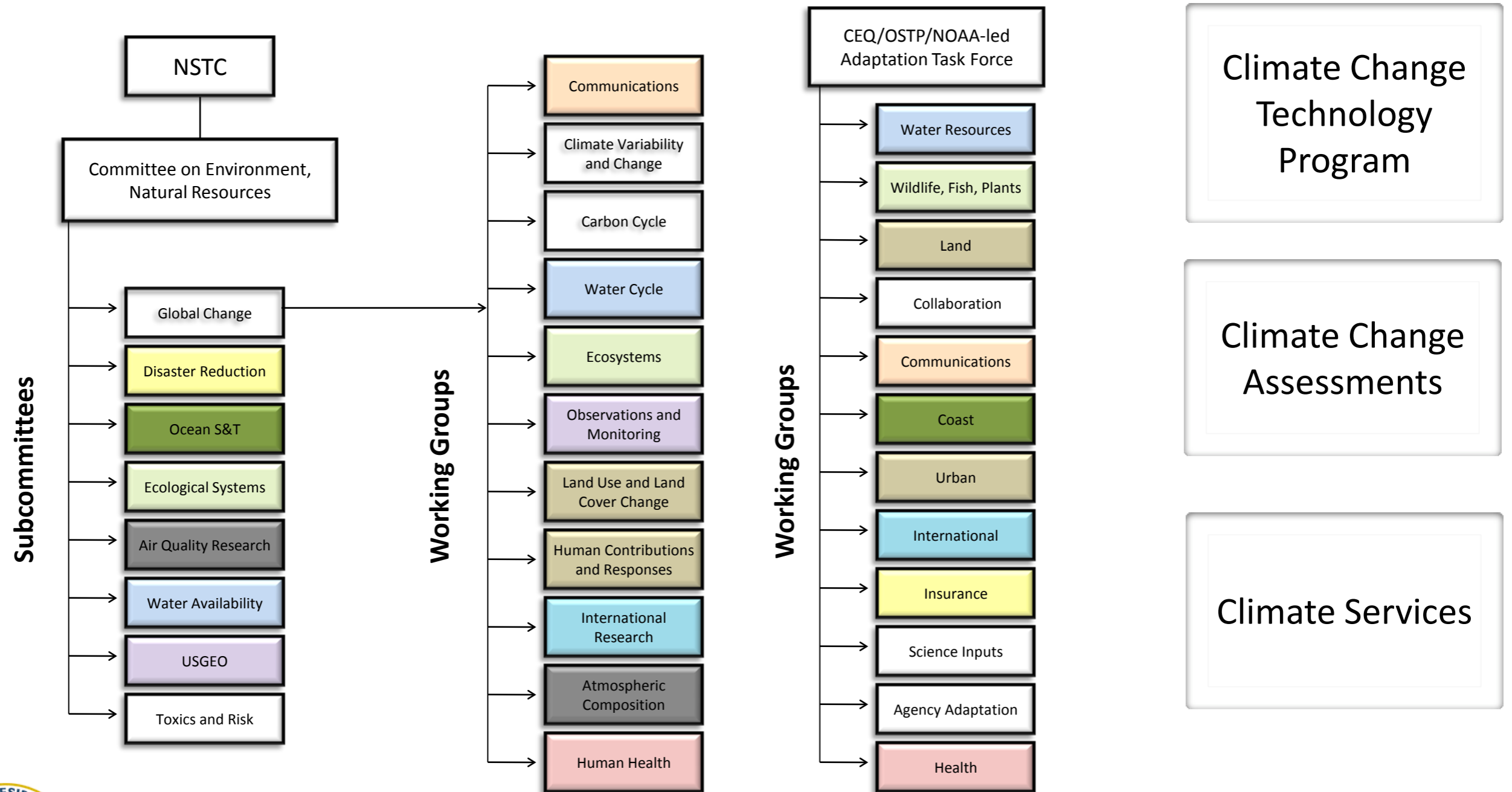
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The NSTC/CENR & other structures



Synergies among the groups



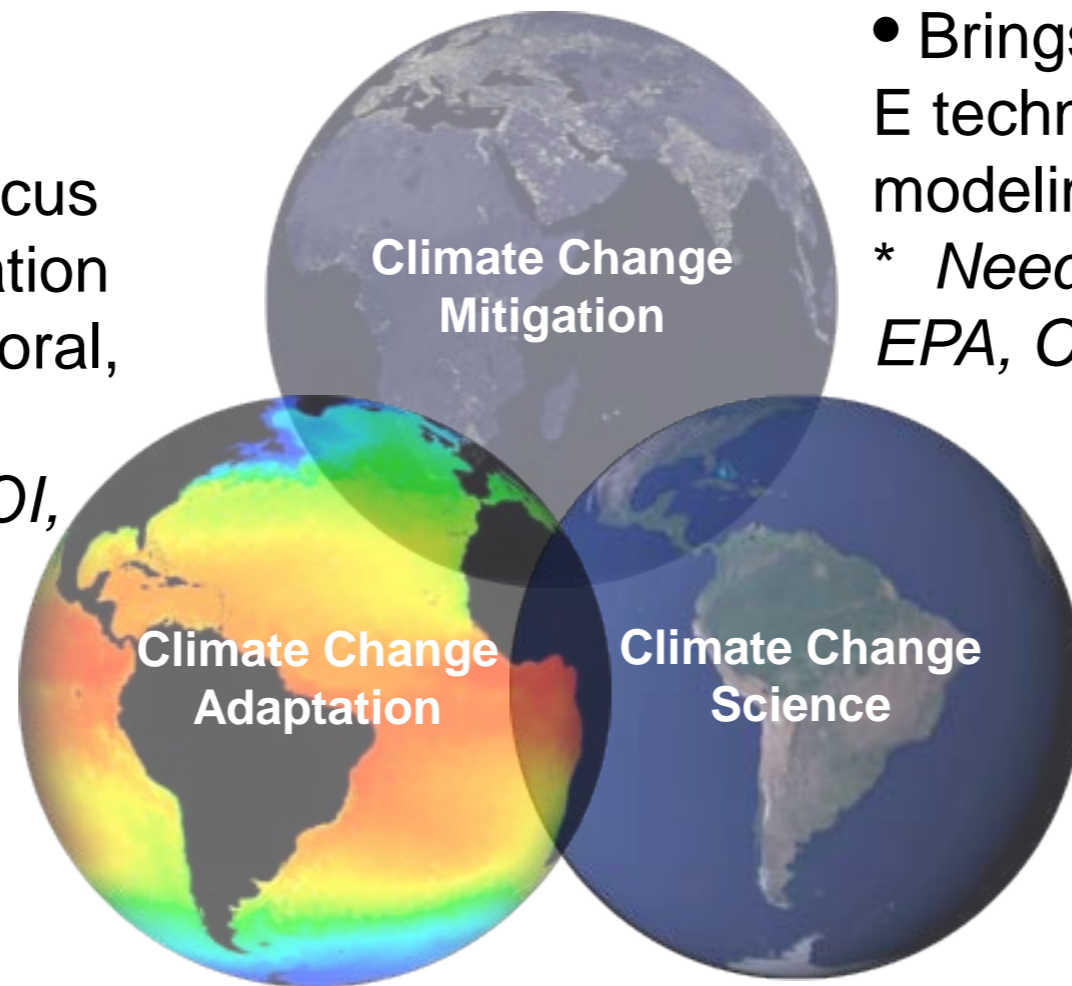
How the NSTC supports the future USGCRP

It will be important to align working groups, reduce duplication, and develop new working groups for this new era in global change research



A vision of the future: Three coordinated elements

- Draw from the Climate Adaptation Task Force focus on vulnerability, & adaptation
- Integrate social, behavioral, & economic science
- *Early interest NOAA, DOI, USDA, others?*

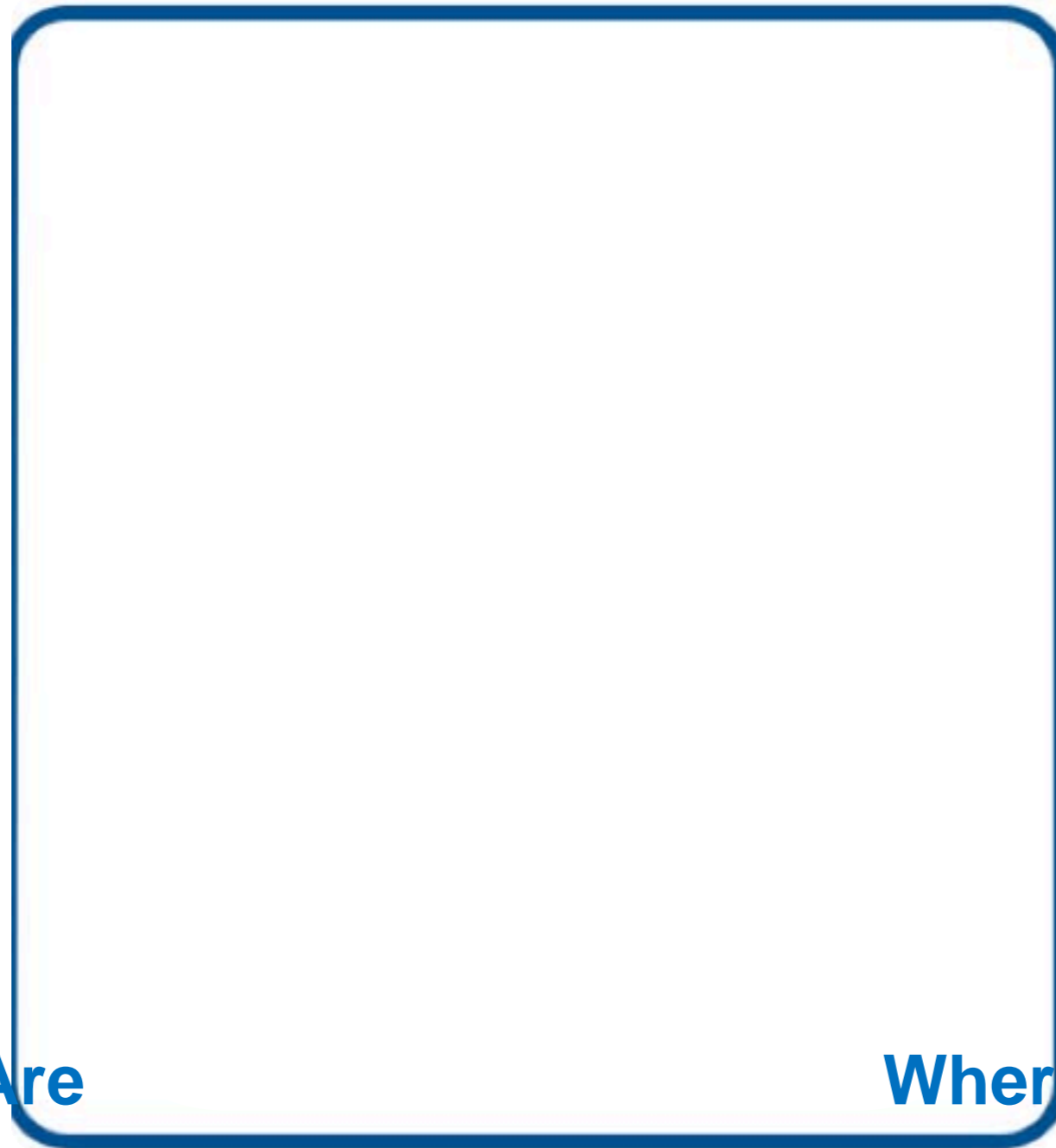


- Brings in the CCTP focus on clean E technology and integrated modeling & analysis
- * *Needs further development (DOE, EPA, CEQ, OECC, OSTP)*

- Existing USGCRP core
- Plus integration of science for decision making
- * *13 USGCRP agencies*



Integrated research issues tied to services & assessments



Where We Are

Where We're Going



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Responding to climate change and decision-support



National assessment

- Requires sustained support for ongoing sectoral & regional capabilities
- USGCRP should provide this support through its IWG's, building on existing capabilities within the USGCRP & elsewhere.
- Observations, basic research, monitoring, modeling, predictions, impacts & vulnerability assessment, decision support, & understanding of adaptive capacity will all be critical.
- Communication and education should be infused throughout



CCSP strategic plan elements

Integrating climate and global change research

Atmospheric composition

Climate variability and change

Water cycle

Land use/Land cover change

Carbon cycle

Ecosystems

Human contributions and responses



CCSP-1

U.S. CLIMATE CHANGE SCIENCE PROGRAM

Overview of the CCSP Strategic Plan

The Strategic Plan for the Climate Change Science Program was released in July 2003. The document is the first comprehensive update of a national plan for climate and global change research since the original U.S. Global Change Research Program strategy was issued at the inception of the program in 1989.

DEVELOPMENT OF THE STRATEGIC PLAN

In July 2002, the CCSP undertook a year-long process to prepare a new 10-year strategic plan for the program. The planning process was designed to ensure a comprehensive examination of research and observation needs, transparent review by the national and international scientific and stakeholder communities, and establishment of defined goals for research on climate and global change.

Scientists and research program managers from the 13 participating agencies and the Climate Change Science Program Office drafted the Strategic Plan. The Administration released a CCSP Discussion Draft Strategic Plan for public review in November 2002. A Climate Change Science Program Workshop, held in December 2002 in Washington, DC, was designed to facilitate extensive discussion and comments on the draft plan. The workshop was attended by 1,300 scientists and other participants, including individuals from 47 states and 36 nations.

Written comments on the Discussion Draft Strategic Plan were submitted during a public review period ending in January 2003. The comments amounted to nearly 900 pages of input from hundreds of scientists, representatives of interest groups, and interested members of the lay public.

In addition, a special committee of the National Academy of Sciences' National Research Council (NRC) reviewed the discussion draft plan at the request of the CCSP and reported its recommendations in February 2003.

The Strategic Plan for the U.S. Climate Change Science Program was released in July 2003 after consideration of all of the workshop discussions, the full range of written public review comments, and the NRC review of the discussion draft plan, as well as an extensive internal U.S. Government review process.

The CCSP Strategic Plan will guide research activities sponsored or conducted by the U.S. Government. It will be modified as warranted by the emergence of key findings and important new scientific questions of public interest.

GOALS OF THE CLIMATE CHANGE SCIENCE PROGRAM

The CCSP adds significant integrative value to the individual Earth and climate science missions of its 13 participating agencies and departments, and their national and international partners. A critical role of the interagency program is to coordinate research and

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Elements ...(cont'd)

Modeling strategy

Decision-support resources development

Observations and monitoring

Data management and information

Communications

International research and cooperation

Program management and review



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2013-2023 USGCRP strategic plan elements (draft)

Extreme weather and climate events and disasters

Sea level rise and melting ice

Freshwater availability

Agriculture and food security

Managing ecosystems

Human health

Impacts on the economy of the US



2013-2020 USGCRP strategic plan elements ...(cont'd)

Climate observations and data

Analysis of earth system data

Earth system modeling

Human dimensions of climate and global change research

Decision support

National assessment of climate impacts and adaptation options

International partnerships



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2013-2020 USGCRP strategic plan cross-cutting elements...(cont'd)

- Integrated observation and monitoring systems (natural and social)
- Improved understanding of Earth system processes (e.g. ice-sheet dynamic, abrupt change, carbon/nitrogen cycling...etc)
- Enhanced predictability and scenarios (Integrated Earth System Models, seasonal-to-decadal forecasting, regional/local scales...etc)
- Comprehensive impacts and vulnerability assessments (threshold of change, natural-social, cross-sectoral, unintended consequences...)
- Expand capacity to provide decision makers and the public with relevant information on climate change (including communication and education)



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USGCRP retreat—August 2000
*“The next 10 year plan will not be
your mother’s Oldsmobile...”*

Have we
achieved that
goal?



Our common goal



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