

THE CLIMATE SERVICE

Overview, Background and Introduction to the Climate Service,
Including Responses to the Five Reviews and Reports from the
SAB Climate Working Group

Chester J. Koblinsky

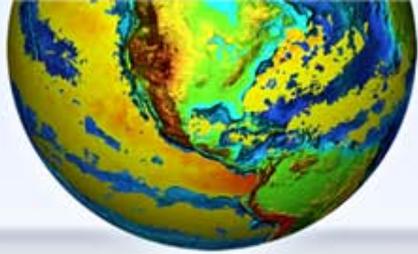
Transition Deputy Director, NOAA's Climate Services

Climate Mission Goal Lead

Director, Climate Program Office

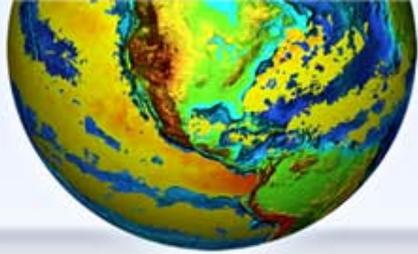
November 30, 2010





Overview

- Background about the Reviews
- Climate Observations and Analysis Program
- Climate Research and Modeling Program
- Climate Information Products and Applications
- NOAA Strategic Plan for a National Climate Service Review



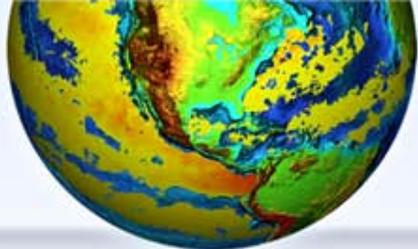
Climate Working Group Reviews

**Climate Observations and Analysis Program Review
Asheville, NC April 11-13, 2007**

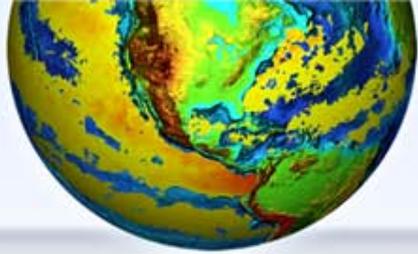
**Climate Research and Modeling Program Review
Princeton, NJ March 24-26, 2008**

**Climate Information Products and Applications Review
Broomfield, CO July 13-15, 2009**

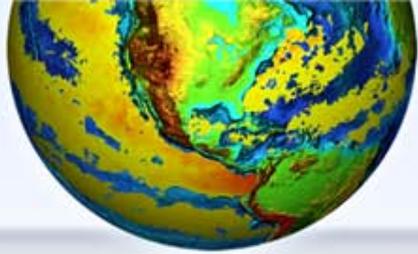
**Review the draft NOAA strategic plan for a National Climate Service
Vail, CO June 23-26, 2008**



Evolution of Climate Services in NOAA



Evolution of Climate Services in NOAA



Evolution of Climate Services in NOAA

January 2009

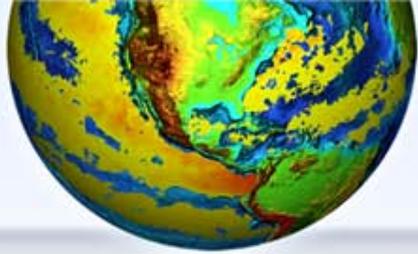
- The Obama Administration begins

Summer 2009

- A Vision for Climate Services in NOAA report released
- Options for Developing a National Climate Service (Barron Report) released
- Review of the Climate Information Products and Applications

January 2010

- NOAA's Climate Service Portal Phase I Prototype publicly available



Evolution of Climate Services in NOAA

February, 2010

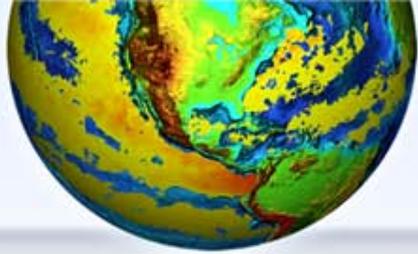
- Secretary Locke announces the intent to create a NOAA Climate Service
- Dr. Lubchenco announces transitional NOAA Climate Service Leadership

Summer 2010

- America's Climate Choices reports released
- NOAA's Next Generation Strategic Plan (NGSP) released for public comment
- Secretary Locke announces the NOAA Regional Climate Services Directors (RCSD)

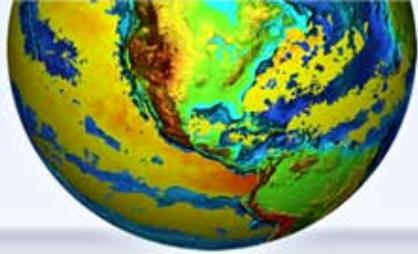
September 2010

- NOAA Strategic Vision and Framework for a Climate Service released for public comment
- Dr. Lubchenco announces the Strategy Execution and Evaluation (SEE) process
- National Academy of Public Administration report on Climate Services Options released



Climate Observations and Analysis Program Review

April 11-13, 2007
Asheville, NC



Climate Observations and Analysis Program Review

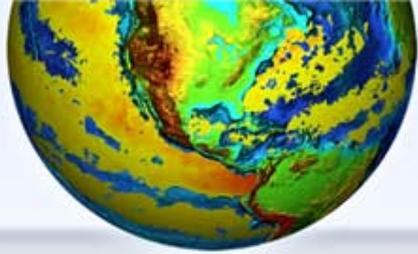
General Findings

There is considerable **excellent work** going on in NOAA which is contributing to the Climate Observations and Analysis program.

The activities in the COA program **are providing many valuable climate observational products and services to the nation** that should be continued.

The essential work of collecting observations and creating climate records, assuring their quality and documenting and making them accessible to the climate research, applications research, and decision-making communities is of **great importance and should receive a high priority** in the Climate Goal.

However, the program was not developed with a particular objective, so that it **lacks an overall coherent theme and a strategic plan.**



Climate Observations and Analysis Program Review

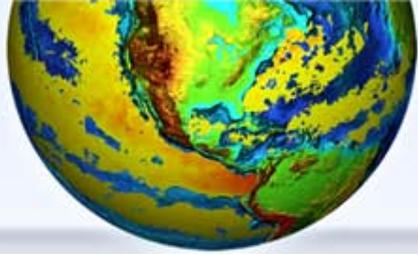
Major Challenges

The review panel identified several overarching strategic issues that affect the management of the COA Program and the NOAA Climate Goal in general.

These include **the need for a shared vision** that

- (i) provides a coherent, integrated structure for COA activities and services, in essence a strategic plan;
- (ii) improves the functioning of the NOAA internal process that integrates program planning, budget formulation and execution, and processes used to determine priorities when requested and appropriated budgets differ;
- (iii) advances the approach to engaging partners from the external communities in COA and Climate efforts; and
- (iv) furthers the integration of the many efforts under COA with one another and other activities under the Climate Goal.

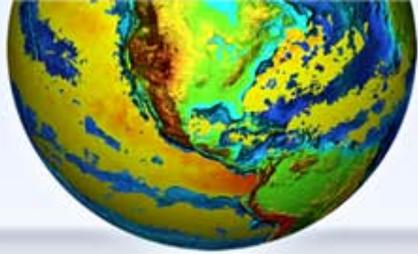
The Panel suggested that if a Climate Service were a distinct line of NOAA then it would ease many of the perceived management difficulties.



Climate Observations and Analysis Program Review

What we have done:

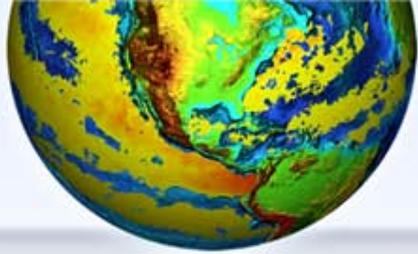
- Proposed a separate Climate Service line office within NOAA
- Established an office for climate observations in proposed Climate Service
- Co-located global climate observing program (ocean, atmosphere, and Arctic in Climate Observation Division) with Integrated Ocean Observing System to improve coordination
- Addressed problems imposed by PPBES process by working with new integrated SEE logic model process
- Proposed expansion of the greenhouse gas observation network
- Overlapped old/new observing systems, decommissioned non-performers
- Enhanced reanalysis activities
- Expanded Annual State of the Climate Report, included external peer review
- Developed an approach to climate attribution issues in a way that maintains agency credibility and reliability with a team of NOAA and non-NOAA experts
- Engaged partners/external organizations



Climate Observations and Analysis Program Review

What we are working on:

- A strategic framework for a NOAA climate observing system
- Adopting “climate information system” approach
- Establishing synergies/interrelationships among observing components to aid prioritization
- Addressing satellite data assimilation, relationships and dependencies on other parts of NOAA, and long-term relationship between NASA and NOAA
- Leading data management activities to provide more appropriate levels of direction, prioritization, and integration of activities, systematically identify opportunities and risks, and to raise the needed funds in the budget process.
- Implementing GEO-IDE and linking it to CLASS
- Sustaining user engagement/feedback



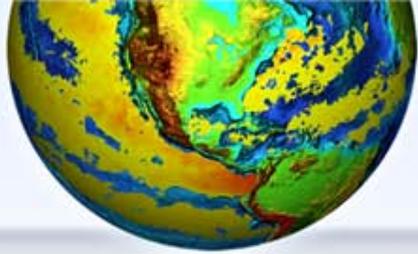
Climate Observations and Analysis Program Review

What we have not done:

- Enhance ocean observing system (deep-diving Argo, additional Ocean Reference Stations, biogeochemical sensors)
- Conduct a Strengths, Weakness, Opportunity and Threat analysis
- Commit a fixed fraction of program funds to peer-reviewed extramural funding, and maintain this funding commitment.



Climate Research and Modeling Program Review
March 24-26, 2008
Hyatt Regency, Princeton, NJ



Climate Research and Modeling Program Review

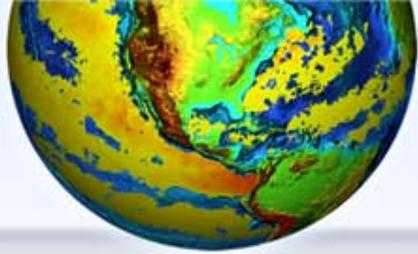
General Findings

This Report concludes that NOAA's CRM Program is **producing important, useful, and interesting research** that represents a major contribution to the extremely important and now highly visible world-wide enterprise of climate research.

NOAA scientists have made many world-class contributions to the scientific investigation of the Earth's climate and global change.

NOAA's superb contributions to recent international assessments are particularly noteworthy.

NOAA's provision of information on climate variability and the impacts of climate variability on society are also commended



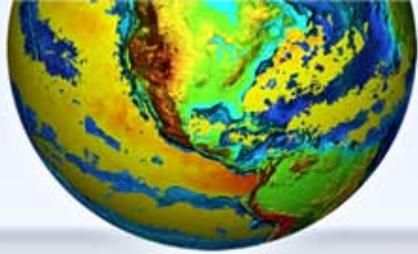
Climate Research and Modeling Program Review

Major Challenges

A key challenge for the future is to improve the overall design and cooperative interactions of the many institutional components involved in the CRM Program.

Strategic Planning is obviously required to meet this challenge.

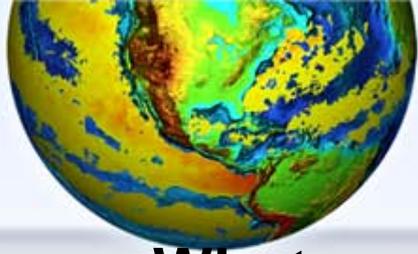
CRM must develop a comprehensive and in-depth Strategic Plan that defines its vision, mission, goals, and objectives, and lays out clearly the the roles and required interactions of the numerous laboratories, centers, institutes and grant programs engaged in CRM-related activities.



Climate Research and Modeling Program Review

What we have done:

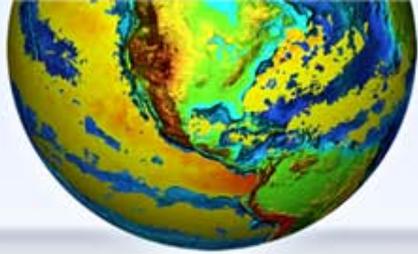
- Strategic planning and management:
 - NOAA has developed a Next Generation Strategic Plan with a goal to support climate adaptation and mitigation.
 - A more detailed scientific and service strategy is provided in the Climate Services Vision and Strategic Framework.
- Financial management: New budgeting, reporting and incentive mechanisms have been developed through the Strategy, Execution and Evaluation process.



Climate Research and Modeling Program Review

What we have done:

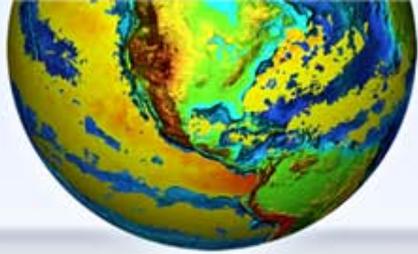
- Balanced research portfolio:
 - Maintained a balance of program funding between internal NOAA research groups, Cooperative Institutes, and the external community
 - Continue to build collaborative program supported research teams, such as Climate Process Teams, through competitive solicitations.
 - Expanded the Regional Integrated Sciences and Assessment projects to 11 through competitive solicitations. Increased regional collaboration with appointment of NOAA Regional Climate Directors.
 - CRM components are increasing their interactions with Decision Support Delivery groups (e.g. providing climate projections and advancing the understanding of high impact issues such as climate and air quality)
 - Evaluated the Applied Research Centers, kept focus on seasonal to inter-annual climate prediction system and observations and data stewardship.
 - Cooperative Institutes are competed on a regular basis to keep their activities aligned with strategic objectives.



Climate Research and Modeling Program Review

What we have done:

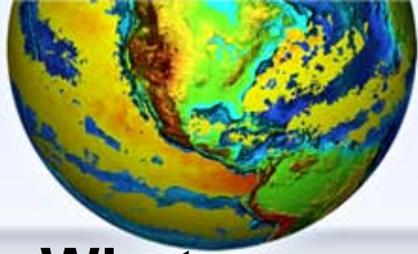
- Understanding:
 - Roles of greenhouse gases (including ozone, water vapor, nitrous oxide) and aerosols (e.g., soot, dust) in climate forcing and change.
- Modeling:
 - Proposed new resources for Earth System Modeling and decadal predictability to draw upon expertise of the larger community
 - Expanded range of resolution of decadal-scale climate models.
 - Developed an integrated approach to high performance computing, and substantially expanded climate computing resources.
 - Improved and documented land model.
- Assessments:
 - Continued NOAA's leadership and support of policy-relevant national and major international scientific assessments and proposed increase in financial support.



Climate Research and Modeling Program Review

What we are working on:

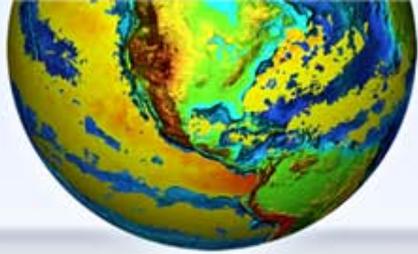
- Multi-agency services: The interagency taskforce on climate services.
- Partnership development growing:
 - Dept of Interior, Dept of Energy, Indian MoES, Australia CSIRO MOUs,
 - Sectors: NIDIS, sea level rise.
- Approaches to customer identification: “Needs Assessments”
- Science to Models:
 - Improved coordination between measurements and modeling and between small-scale process modeling and large-scale prediction, as well as transfer of research breakthroughs to operational capabilities.
 - Improved coordination of chemical and physical sciences in NOAA. Examples: carbon research and carbon tracker development, long-lived greenhouse gases, aerosol and ozone research, ocean models.



Climate Research and Modeling Program Review

What we are working on:

- Radiative and climatic effects of water vapor and trace gases
- Role of aerosols and aerosol-cloud interactions in climate
- Intercontinental transport and chemical transformation of species
- Attribution of observed climate
- Evaluating decadal predictability and high resolution climate models
- Land-ice modeling under development with further increases requested
- New initiative on terrestrial carbon cycle, including a focus on nitrogen/phosphorous soil-vegetation cycles, bio-mass burning, wetland and freshwater biogeochemistry, land-use management, and data assimilation
- Arctic climate change issues: budget requests include funding for improved sea-ice modeling, soot/dust effect on sea-ice, and analysis of causes of past/ongoing climate changes
- Real-time data ingest and data assimilation system under development.



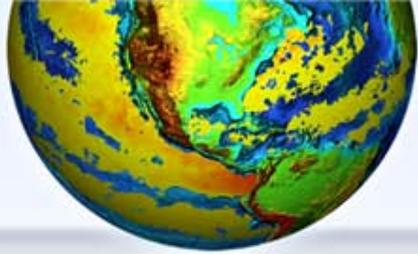
Climate Research and Modeling Program Review

What we have not done:

- A strategic planning exercise towards (possible) operational decadal prediction
- Develop a management strategy that is consistent with modern concepts of open innovation or open communities.
- Improve understanding the interactions among coastal upwelling, advection, nutrient cycling, river inputs, and estuarine biogeochemistry and sedimentation.
- Determine if, when, and how the Coupled ensemble filter Data Assimilation (CDA) should transition to the Climate Forecast System (CFS)



**Climate Information Products and Applications
Review
July 13-15, 2009
Broomfield, CO**



Climate Information Products and Applications Review

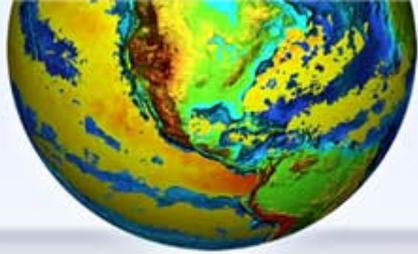
General Findings

The team was impressed by the NOAA work in many respects.

However, **the landscape for climate information products and applications is undergoing rapid change** as the Nation begins to recognize the importance of climate services in addressing the issues of climate adaptation and mitigation.

It is expected that **these societal needs will lead to the establishment of a National Climate Service.**

Within this emerging context, the team believes **a new course should be charted for CIPA.**



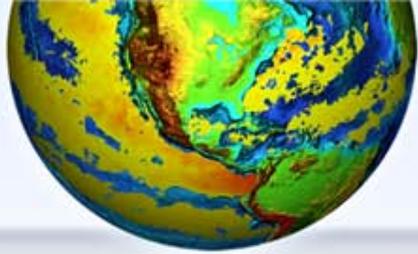
Climate Information Products and Applications Review

Major Challenges

The team found that both the *level and the nature of the existing NOAA effort fall far short of the national need for climate services.*

The team therefore recommends that NOAA:

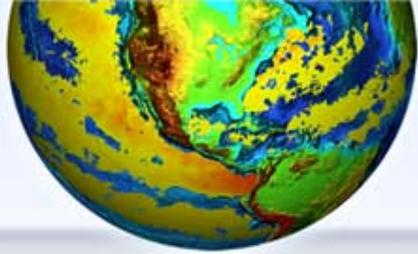
- **develop a strategic plan and framework** for its climate information products, applications, and related services.
- **give highest agency priority to scaling up the level of its effort** devoted to climate information products, applications, and services to match the growing scope and accelerating pace of societal needs.
- **become, in the process, far less insular, more outward-looking, and do far more to partner and collaborate.**



Climate Information Products and Applications Review

What we have done

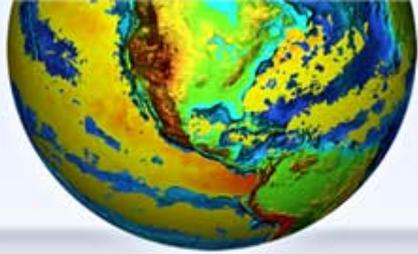
- Developed a vision and strategic framework, including an Integrated Service Development and Decision Support (ISDDS) core capability for climate services. and ensure the scientific underpinning of the CS information, data, products and services thus making them credible, timely and relevant.
- The plan focuses on four societal challenges and how current activities may scale up in these areas.
- Enhanced regional coordination and development with appointment of 6 new federal Regional Climate Service Directors at the NWS Regional Forecast Centers.
- Completed a review by the National Academy of Public Administration on organizational options, emphasizing effectiveness and efficiency.
- Signed a Memorandum of Understanding between the Department of Commerce and the Department of Interior focused on regional climate activities.



Climate Information Products and Applications Review

What we are working on:

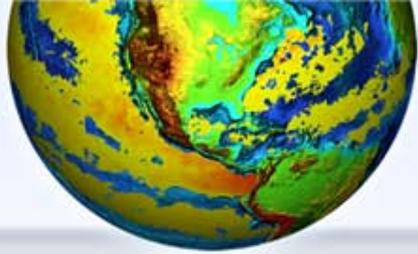
- The development of products and services for four societal challenge foci:
 - climate impacts in water resources,
 - changes in extremes of weather and climate,
 - sustainability of marine ecosystems, and
 - coasts and climate resilience.
- Regional inventories of capabilities will be conducted to develop an integrated regional climate services partnership between internal and external activities.
- Development of outcome based performance measures with clearly identified annual deliverables.
- Continue development of the Climate.Gov portal, make it operational and expand its scope to include other federal agencies.



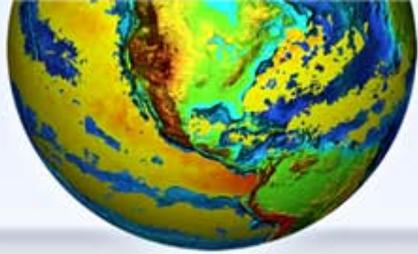
Climate Information Products and Applications Review

What we have not done:

- Conduct with CWG, perhaps within a year, a true NOAA climate services review (Organizational aspects covered in NAPA Review).
- A better inventory and understanding of its activities and assets, including external partnerships.

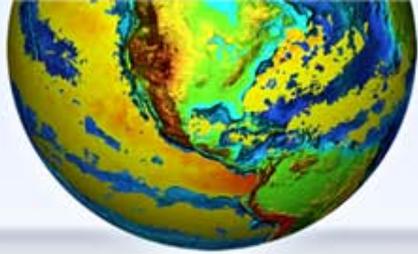


**Review of
NOAA's strategic plan for a
National Climate Service
June 23-26, 2008
Vail, CO**



Review of NOAA's strategic plan for a National Climate Service

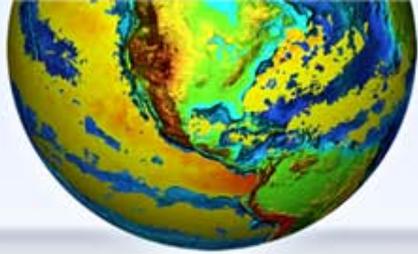
The primary recommendation from the *Climate Services External Review Report* (July 15, 2008) was **“that NOAA lead an effort, with its partners, to compare and contrast specific national options for the development of climate services.”** The report called for the creation of a Coordinating Committee and four Tiger Teams to explore the pros and cons of four National Climate Service organizational options.



Review of NOAA's strategic plan for a National Climate Service

The Coordinating Committee developed a final report, ***Options for Developing a National Climate Service (Barron Report)***, which provides NOAA with recommendations related to the Vision, Mission, and Key Attributes of a successful National Climate Service.

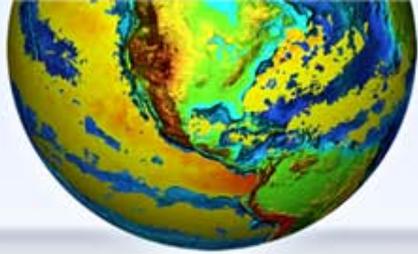
The Coordinating Committee was not charged with making specific recommendations about implementation.



Review of NOAA's strategic plan for a National Climate Service

Five Key Implementation Conclusions:

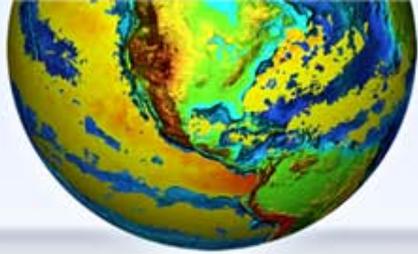
1. Internal reorganization of NOAA that enables greater connectivity of weather and climate functions is a necessary step for success
2. Each federal agency needs to collaboratively define its role and level of commitment in an National Climate Service and there needs to be a lead federal entity
3. Success of a National Climate Service requires recognized, clear, authoritative, responsible leadership within the Federal System at the highest level possible
4. A national climate service enterprise requires a defined, independent budget large enough to influence the direction of the service and achieve its mission
5. A national climate service enterprise requires an interface best described by a federated structure (i.e., non-profit or federation) because it has a stronger connection to users and the research community



Review of NOAA's strategic plan for a National Climate Service

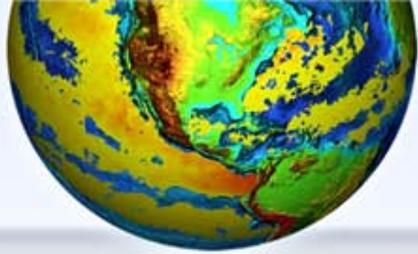
Tiger Teams analyzed four organizational options:

1. Create a **national climate service federation** that would determine how to deliver climate services to the nation;
2. Create a **non-profit corporation** with federal sponsorship;
3. Create a **national climate service with NOAA as the lead** agency with specifically defined partners; and
4. A **weather and climate service within NOAA** developed from an expanded and improved weather services.



Review of NOAA's strategic plan for a National Climate Service

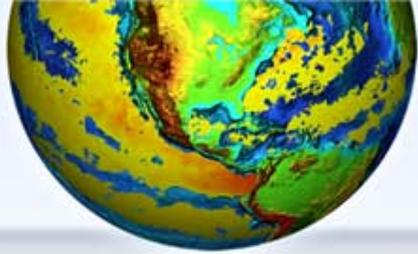
1. Options 1 & 2: **Create a climate service federation or non-profit organization**
 - NOAA believes these options could support the needed climate service activities and is prepared to work with OSTP on its interagency review of climate services
2. Options 3 & 4: **A national climate service with NOAA as the lead or an expanded weather and climate service within NOAA**
 - NOAA believes that elements of each of these arrangements would enable NOAA to assemble a climate service that fulfills the attributes described in the CWG's reports



Review of NOAA's strategic plan for a National Climate Service

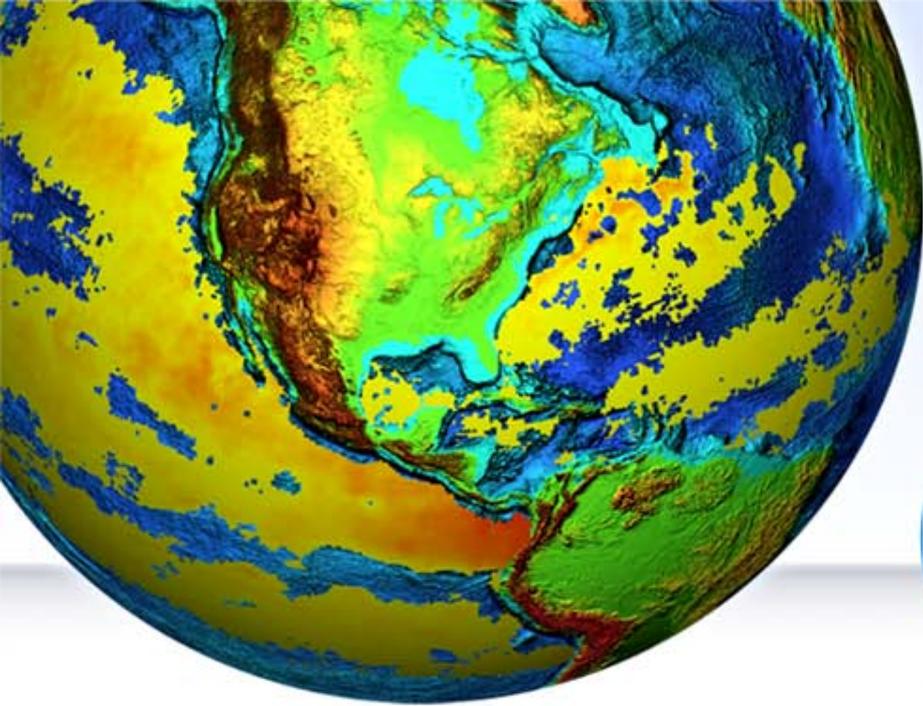
General Update of Progress:

- Sponsored the America's Climate Choices Study performed by the National Academies of Sciences;
- Announced February 8, 2010 by the Department of Commerce (DOC) and NOAA the intent to create a NOAA Climate Service line office; and
- Sponsored review by the National Academy of Public Administration (NAPA) of NOAA's proposed organizational changes for structuring a climate service (completed on September 13, 2010).
- Prepared an Agency reorganization plan for a Climate Service.



Summary Recommendations

1. Improve internal budget and planning processes
2. Develop a comprehensive strategic framework for climate services
 - a) Establish and promote internal and external partnerships
 - b) Provide meaningful methods to evaluate progress and measure performance
 - c) Promote better integration among climate activities
 - d) Engage stakeholders and incorporate user feedback
 - e) Improve understanding of NOAA capabilities and assets
3. Create a separate Climate Service line office within NOAA to ease many of the perceived management difficulties



THE CLIMATE SERVICE

Thank You...

Questions?