NOAA Response to:

A Vision and Model for NOAA and Private Sector Collaboration in a National Climate Services Enterprise

A report prepared by the
NOAA Science Advisory Board Environmental Information Services Working Group's
(EISWG) and the Climate Working Group's (CWG)
Climate Partnership Taskforce
October 2011

October 24, 2012

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Introduction

NOAA welcomes the SAB EISWG/CWG report "A Vision and Model for NOAA and Private Sector Collaboration in a National Climate Services Enterprise" and its vision of engaging and empowering the private sector as a partner in the creation and distribution of climate products and services. The recommendations are similar to those in the SAB EISWG's whitepaper "Towards an Open Weather and Climate Services," thus NOAA has developed an execution strategy that will apply to both sets of recommendations. The symbiotic relationship between NOAA and non-government partners has proven to be highly effective. NOAA has relationships with other Federal agencies, states and local agencies, NGOs, academia, and the private industry, which collectively will be referred to as the "Enterprise." NOAA shares the SAB's concern for maximizing NOAA's overall benefit to the public, especially in the provision of climate information and services, and welcomes the opportunity to further enhance this symbiotic relationship with an eye towards increasing value to the Nation in an economic environment where funding for new NOAA initiatives is challenging.

The NOAA Policy on Partnership in the Provision of Environmental Information ("NOAA Partnership Policy"- NOAA Administrative Order (NAO) 216-112 - see http://www.corporateservices.noaa.gov/ames/administrative_orders/chapter_216/216-112.html) states that "the nation benefits from government information disseminated both by Federal agencies and by diverse nonfederal parties, including commercial and not-for-profit entities. NOAA recognizes cooperation, not competition, with private sector and academic and research entities best serves the public interest…. NOAA will take advantage of existing capabilities and services of commercial and academic sectors to support efficient performance of NOAA's mission and avoid duplication and competition in areas not related to the NOAA mission. NOAA will give due consideration to these abilities and consider the effects of its decisions on the activities of these entities … to serve the public interest and advance the nation's environmental information enterprise as a whole."

The Enterprise can be enhanced by the evolution of these partnership policies to address the challenges facing our country and the global environmental community. NOAA views this as an effort to move towards Open Environmental Information Services (Open EIS), as the opportunities for collaboration extends beyond the weather and climate parameters, and with partners spanning the entire Enterprise. The SAB recommendations will then be implemented as part of this wide scope.

NOAA would like to respond to each of the specific recommendations in the SAB CWG/EISWG paper and then provide an assessment of policy challenges that may affect NOAA's capability to fully implement the Open EIS as it relates to the public-private partnership in the provision of climate information and services. NOAA also wants to outline its plans for managing collaboration with the SAB and its subcommittees as we move toward the Open EIS, including the identification of points of contact within the relevant Line and Staff Offices. Lastly, NOAA would like to propose some possible areas where we can begin incremental implementation.

Summary of recommendations

Specific Recommendations (Climate Partnership- CP)	NOAA Response Summary
CP 1.1 NOAA and the private sector must develop a process to define roles and priorities for the management of climate information, of services and products, and of clients to be served. Together, they must establish an evolving process for discussing and resolving these issues as they arise with advances in climate science, with increased understanding of the impacts of climate variability, and with the resultant needs of both the public and private sectors for climate information.	NOAA will work with the community to develop a process to manage the partnership within the Enterprise. As part of NOAA's support of the concept, NOAA will continue to engage actively with private sector groups with interests in climate data and forecasts. As interest is developed from other private sector groups and as funds are available, NOAA will plan and conduct additional targeted industry conferences. These conferences enable mutual dialog regarding respective roles and climate-related priorities for the Enterprise.
CP 1.2 NOAA and the private sector each have largely unique responsibilities to advance a dynamic and innovative climate services enterprise. Whenever possible, the private sector should take the lead in creating and delivering new climate products and services, thereby expanding opportunity, creating jobs, and shifting risk from the public to the private sector.	NOAA has recognized that partnership with the rest of the Enterprise is critical to the success of achieving the NOAA climate mission goal and objectives. The private sector is a key part of the development and delivery of weather and climate services to the public. NOAA will work with the community to develop a process to manage the Enterprise collaboration, in particular the roles for the lead development of new climate products and services.
CP 2.1 NOAA and private sector executives must embrace the reality that a strong and enabling partnership is mandatory to meet the accelerating demand for climate information.	NOAA encourages the emergence of a strong private sector supporting the provision of climate information and climate services. NOAA is committed to working collaboratively with our private sector partners to advance timely and effective climate information.
CP 2.2 NOAA must recognize that its efforts and investments to strengthen the climate partnership will be amplified many times in the growth of private sector climate partners and in the increasing value of their services throughout the private and public markets for climate services.	NOAA encourages and supports the continued development of private markets for climate services while recognizing the special responsibility of government to sustain reference quality data and information. NOAA's climate communication efforts will play a critical role in getting information to

	the Enterprise.
CP 2.3 The climate partnership must create effective and economically efficient strategies to integrate the increasingly diverse surface observations and networks. A business model, in which participants share data, as well as the costs of creating, processing and disseminating it, should be developed in ways that will prove advantageous to both the public and private sectors.	The wider use of observational data and networks will increase the value and influence of the information. The plans to be developed for the Open EIS concepts, in collaboration with the community, will address building effective business relationships for data sharing and service development.
CP 3.1 NOAA and the private sector must collaborate in developing a strategy and a plan for identifying and describing climate datasets and forecasts, for archiving and ensuring the integrity of the data, and for making it readily available on reliable operational servers. The plan should take account of climate data sets at other agencies (such as NASA, DoE, USGS, NSF, USDA, and EPA).	NOAA has recognized that partnership with the private sector is critical to the success of achieving the NOAA mission goals related to climate. The private sector is a key part of the development and delivery of weather and climate services to the public. NOAA will work with the community to develop plans for the management of Open EIS concepts, identification of prototype projects, and testing of the concepts.
CP 3.2 NOAA should create funding mechanisms that will engage the private sector as collaborators in managing and analyzing climate data sets, in development of computer models for predicting climate variability and long-term trends, and in designing and implementing new observational capabilities.	NOAA has recognized that partnership with the private sector is critical to the success of achieving the NOAA mission goals related to climate. The private sector is a key part of the development and delivery of weather and climate services to the public. NOAA will work with the community to develop plans for the management of Open EIS concepts, identification of prototype projects, and testing of the concepts. NOAA believes that the entire Enterprise shares the responsibility for the execution of these concepts.
CP 3.3 The climate partnership must consider how climate data obtained with private sector financing can be made available for broader purposes without compromising its value to its owners.	NOAA will work with the community to evaluate the challenges to implementing the Open EIS paradigm. NOAA views identification of these challenges as an important focus of short-term actions.
CP 3.4 NOAA and the private sector must agree on a strategy and a mechanism for structuring the climate enterprise. The planning process must be open, transparent, and designed to advance the enterprise for NOAA and the private sector.	NOAA will consider mechanisms to further interactions between its labs and offices and the broader Enterprise, including an open planning process. As an example, NOAA could broaden existing technology sharing

NOAA must provide the leadership to initiate this process.	conferences to provide information more targeted to commercial use. NOAA will develop a process to evaluate the challenges to strengthening the Enterprise collaboration.
CP 5.1 NOAA and the private sector should develop a mission statement for climate services that distinguishes between services delivered by NOAA for the public good and those that are the responsibility of the private sector and the other components of the national climate partnership.	NOAA will work with the community to develop a process to manage Enterprise collaboration, including defining roles and responsibilities and NOAA policies regarding handling of information from the private industry.
CP 5.2 The private sector must assist in the development of NOAA priorities for climate information and products.	NOAA has recognized that partnership with the private sector is critical to the success of achieving the NOAA climate mission goal and objectives. The private sector is a key part of the development and delivery of weather and climate services to the public. NOAA will work with the community to develop a process to manage the Enterprise collaboration, including defining roles and responsibilities.
CP 5.3 NOAA and the private sector must collaborate to develop a process for directing users to appropriate sources for existing climate products and services and for guiding them to new products and services as they become available.	NOAA will work with the community to develop a process to manage the Enterprise collaboration. NOAA recognizes the special responsibility of government to sustain reference quality data and information and to make it easily accessible and useable. NOAA's Climate communication efforts will play a critical role in getting information to the private sector, helping understand the information, and encouraging the appropriate use of the information by decision makers. NOAA has the opportunity to grow their efforts in this area in particular.
CP 5.4 The climate services partnership must develop a strategy to assist users and providers to understand the utility of various data sets, products, and forecasts, with an emphasis on the use of statistical and probabilistic information in decision-making.	NOAA will work with the community to develop a process to manage the partnership within the Enterprise. As part of NOAA's support of the concept, NOAA will continue to engage actively with private sector groups with interests in climate data and forecasts. As interest is developed from other private sector groups and as funds are available, NOAA will plan and conduct additional

	targeted industry conferences. These conferences enable mutual dialog regarding respective roles and climate-related priorities for the Enterprise.

NOAA anticipates that it will continue to face challenges and difficult choices not only about what and how to measure in the environment, but in what and how to disseminate. NOAA acknowledges that in spite of its policy goals, the dissemination of all data to all people is not feasible due to the barriers of cost and internal NOAA limitations. Increased partnership with academia and the private sector is one of the most important ways NOAA can overcome these barriers.

Policy Framework and Challenges

The NOAA Partnership Policy creates the basic policy framework for an Open EIS and Enterprise collaboration in climate information and services. As noted above, the NOAA Partnership Policy recognizes the importance of the various roles of participants in the Nation's environmental information enterprise. In particular, section 3.07 of this policy states that "NOAA's participation in the environmental information Enterprise will be founded on the following principles:

1. Mission connection: NOAA's information services will support the NOAA mission. As a government agency, NOAA recognizes its core responsibility to protect life and property.

2. Consultation: Unless public safety or national security concerns dictate otherwise, NOAA will provide interested persons and entities adequate notice and opportunity for input into decisions regarding the development, dissemination, and discontinuance of significant products and services.

3. Open information dissemination: NOAA recognizes that open and unrestricted dissemination of high quality publicly funded information, as appropriate and within resource constraints, is good policy and is the law.

4. Equity: NOAA will be equitable in dealings with various classes of entities and will not show favoritism toward any particular entity within a class. NOAA recognizes it has special responsibilities to some users (e.g., public safety officials) and different legal requirements for its interactions with entities of different types (e.g., other federal agencies). NOAA will not provide an information service to one entity unless it can also be provided to other similar entities. There may be some creative arrangements that the Enterprise can develop that may help the government overcome this challenge. (Example: Ford/GM/Toyota battery development (R&D) model).

5. Recognition of Roles of Others: When faced with requests for information services, NOAA will explain existing NOAA services, including their uses and

limitations, and inform the requester that others in the environmental information enterprise may be able to meet the requester's needs."

In effect, the NOAA Partnership Policy and its information management policies already endorse, in principle, the SAB CWG/EISWG recommendations and provide the framework for an Open EIS. However, an endorsement in principle does not remove the challenges associated with actual implementation of some of the SAB CWG/EISWG recommendations. NOAA has the overarching challenge of meeting its broader mission and fulfilling responsibilities to federal/state/local government partners as well as international agreements while participating in an Open EIS. Policy challenges include:

1. Proprietary Information: NOAA acquires a wide variety of information from external sources, and some of this information is acquired under terms that restrict NOAA's ability to redistribute this third-party information to others. When NOAA accepts data under restrictive terms, these terms must be honored, which may restrict NOAA's ability to make all of its information available to others. NOAA is working on a policy for External Data Usage in response to a separate SAB action.

2. Information Quality: Few NOAA datasets are released that have not been verified through stringent quality control processes. NOAA is subject to the Data Quality Act[1], which is focused on maximizing the quality, objectivity, utility, and integrity of information disseminated by federal agencies. Prior to releasing any intermediate satellite data, NOAA must complete a determination under this Act in support of dissemination. This would likely involve drawing clear distinctions between NOAA's uncalibrated data and NOAA's finished products. Quality control for uncalibrated data would likely focus on timely delivery of an accurate copy of the "unfinished" data.

3. Information Security: There are numerous policies that apply to information security intended to protect the integrity of NOAA's information systems and the information they contain. An Open EIS would need to be consistent with these.

4. Financial Controls: As discussed above, federal agencies, including NOAA, are under enormous pressure to reduce federal spending and the federal budget deficit. In addition to this basic limitation in NOAA's ability to expend funds to implement the SAB CWG/EISWG recommendations, NOAA must comply with numerous financial controls regarding the manner in which it acquires funds and the purposes for which these funds are used. To the extent that the expenditure of funds is required, these financial controls may limit NOAA's ability to implement some of the SAB CWG/EISWG recommendations. For example, NOAA cannot simply accept funds outside of the appropriations process – it must have specific authority to do so and must operate within the authorities granted.[2]

[1] Section 515 of the Treasury and General Government Appropriations Act for FY2001 (Public Law 106-554)

[2] Cooperative Research and Development Agreements (CRADA) are examples of a mechanism for external parties to obtain proprietary access and, if needed, to pay for the cost of such access. Such agreements, however, will

Taking an incremental and targeted implementation approach, as recommended in the white paper, "Towards an Open Weather and Climate Services," will afford NOAA an opportunity to develop implementation methods that comply with the various policy challenges above and develop examples that can be followed to expand implementation in ways that address these policy challenges. NOAA does not believe additional legislation is required to provide necessary authorities to begin to implement an Open EIS, but initial projects undertaken in response to SAB recommendations may help clarify areas where legislation could be helpful. These issues are expected to be reviewed periodically by the NOAA Executive Council (NEC).

NOAA expects many of the challenges to implementation will be resolved incrementally through the Open EIS demonstration projects. Through periodic consultation with the SAB and its subcommittees and other existing partnership processes, NOAA hopes to overcome the limitations and challenges described above and along the way to recognize some guiding principles and establish criteria for selecting projects and actions to be implemented toward the Open EIS.

A Process for Moving Toward an Open EIS

Recognizing the goal of incremental progress toward an Open EIS and effective public-private climate partnership, NOAA proposes to establish a process to define the roles and responsibilities, mission and vision, and leadership and governance in collaboration with the community as policies are updated. NOAA has numerous existing groups and individuals whose work intersect with the Open EIS concepts; Environmental Data Management Committee (EDMC), Geographic Information System (GIS) Committee, Enterprise Architecture Committee, Data Management Integration Team (DMIT), Program Oversight Board (POB) review of new IT investments and their data management plans, and the NOAA Enterprise Architect and Data management Architect. These groups will be engaged and leveraged to orient NOAA towards Open EIS implementation. NOAA also proposes to establish a process to facilitate the identification and implementation of specific projects or actions to demonstrate an Open EIS as well as steps to remove impediments and to facilitate projects and actions.

By December 1, 2012, NOAA will designate a member of its senior executive service to champion and coordinate its overall effort as the Open EIS Coordinator. The Open EIS coordinator will work with the community to set up meetings and strategy sessions to develop the plan for enhancements to Enterprise collaboration on climate information and services. NOAA envisions an annual cycle in which projects are selected for implementation and progress is reported to the NOAA Executive Council (NEC) by the Open EIS Coordinator. NOAA will look to community input, facilitated by the SAB and other groups, to prioritize the candidate projects and actions in advance of the annual NOAA selection. Initially, in order to expedite the process, NOAA will conduct an internal process to identify a number of candidate projects and actions for community review. Beginning in 2013, NOAA will conduct an open call for proposals that NOAA will evaluate in relation to the NOAA mission, available resources, and

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always be evaluated by NOAA from a broad public interest perspective. CRADAs should be viewed as a temporary mechanism to gain enhanced access to NOAA data and expertise.

feasibility then seek community input on priorities, and finally select for implementation.. NOAA will appoint individuals from the Line and Staff Offices to support the Open EIS Coordinator as implementation teams for the selected prototype/pilot projects. The following is an outline of the initial and annual processes and suggested timetable:

Initial Actions	Date
NOAA Open EIS Coordinator Named	December 2012
NOAA and the community strategize on the plan for evolving implementation of the NOAA Partnership Policy	February 2012
NOAA review of going-forward plan	March 2012
NOAA seeks community input to prioritize candidate projects	December 2012 - February 2013
NOAA selects projects/actions for implementation	March 2013
NOAA Open EIS implementation team members identified	March 2013

Annual Process (assuming Initial Actions lead to NOAA selection in March 2013)

NOAA Open EIS Report to NEC on status	September 2013 (Six months after project selection)
NOAA Open EIS Report to SAB on status	SAB Fall meeting 2013
NOAA call for proposals	September 2013 (Six months prior to NOAA decision)
NOAA identifies most feasible projects	December 2013 (Three months prior to NOAA decision)
NOAA seeks community input to prioritize candidate projects	February 2014 (One month prior to NOAA decision)
NOAA decides which (new) projects to implement and selects the Open EIS implementation team(s) for the projects.	March 2014 (Six months after annual report)

During the annual cycle, the NOAA Open EIS Coordinator and supporting implementation team(s) will consult with the SAB and its subcommittees, as needed and at the request of the SAB, to discuss the process and progress toward an Open EIS, including the identification of obstacles to implementation and opportunities to remove them. These meetings and the issues raised will be summarized in the annual report to the NEC and SAB. To the extent that progress toward an Open EIS requires a strategy or action plan as well as the identification of guiding principles, NOAA anticipates that these will be articulated in the annual report and NOAA's internal implementation plans will be updated to include the activities to link to the annual SEE process and the updates to the NOAA Strategic Plan.

Next Steps

NOAA will engage the SAB and subcommittees such as the EISWG, CWG, and DAARWG, in a discussion about the Open EIS implementation strategy and on the plan to enhance Enterprise Collaboration on climate information and services. NOAA will continue to use existing mechanisms (e.g. Small Business Innovation Research [SBIR]) to develop partnership with private-sector companies so they can develop and market enhanced products and services using weather and climate data. The Enterprise will need to determine the measures of success for Open EIS to evaluate the pilots and begin to develop a library of best practices. The Enterprise will need to leverage the baseline set by the "State of the Enterprise" project[3] to understand how the enterprise has changed as a result of Open EIS. A notional list of candidate prototypes is included below, and further discussion is welcomed on identifying other candidates, and prioritizing amongst them.

Demonstration of the open data concept:

1. **High resolution Temperature and Precipitation climate data pilot:** Make available high-resolution (1 to 50 km TBD) 5/60 minute US precipitation and temperature data that is not immediately made available to the community, but is available after a period of time as a climate record dataset (NESDIS);

2. **Seasonal climate data sharing:** Applications of NOAA information on seasonal climate using the NCEP Climate Forecast System (NWS and NESDIS); and

3. **Convective initiation data sharing:** Deriving information on severe weather and convective initiation from hourly real-time weather analyses and high resolution (<4 km) numerical guidance; available experimentally from NWS/NCEP and OAR/ESRL. (NWS and OAR).

Demonstration of the collaborative development concept:

1. **Collaborative development or upgrades to the Global Forecast System (GFS) model:** Invite the Enterprise to participate in the evolution of the GFS model and develop a management process for the collaboration, including visiting scientist programs (NWS);

2. **Satellite test-bed:** Invite broader private sector participation in NOAA Satellite test-bed activity (NESDIS);

3. **Participation in Satellite Conference:** In response to OWCS recommendations, NOAA's Center for Satellite Applications and Research (STAR) is considering either an expanded Satellite conference or a separate technology-oriented conference. The existing Satellite conferences have been quite successful at bringing in a large segment of NOAA satellite data users for technology updates and feedback. While these conferences do

[3] This project, currently underway under the aegis of the American Meteorological Society's Commission on the Weather and Climate Enterprise, aims to prepare a report periodically (every few years) that summarizes the status of the entire weather and climate enterprise, including private sector, academic, and government participants.

discuss technology, they may fall short of the level of details needed for NOAA collaborators to plan synergistic developments (NESDIS);

4. **Joint development of ensemble-based products:** Inclusion of interested partners in development of ensemble-based products using NCEP's global and regional operational ensemble products (NWS and OAR);

5. **Joint development of rapid refresh situational awareness products:** Development of a rapidly updating analysis of the atmosphere, land and hydrology to support forecaster situational awareness in NWS and commercial applications (NWS and OAR); and

6. **Joint development of Dual Polar algorithms:** Development of improved algorithms from newly upgraded Dual Polarization Doppler radar (NWS and OAR).