



NOAA response to Open Weather and Climate Services and a Vision of Climate Services Collaboration

A Presentation to the
NOAA Science Advisory Board

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Outline



- Purpose
- Drivers of the SAB reports
- Presentation of Briefing
- NOAA Coordination and Views
- Desired Outcome



Purpose

- To present and discuss the NOAA responses to two SAB reports
 - 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 (EISWG) and the Climate Working Group (CWG) Climate Partnership Taskforce; October 2011
 - Towards Open Weather and Climate Services; A white paper prepared by the Environmental Information Services Working Group (EISWG) of the NOAA Science Advisory Board; December 2011



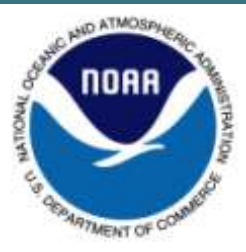
Drivers of the SAB reports



- The SAB EISWG believes that the full potential value of NOAA's weather and climate services is not being realized today. The EISWG see two particular issues:
 - **Limited Published Data:** NOAA collects and creates valuable information more rapidly than can be practically communicated outside of its domain today;
 - **Limited Symbiotic Development:** New NOAA services and technologies are not developed and deployed sufficiently in partnership with the broader Enterprise so as to optimize the net value realized from those new services and technologies.
- The EISWG recommends “An Open Weather and Climate Services (“Open WCS”) ... in which both NOAA and the community share equal and full access to NOAA information and development.”
- The SAB Climate Partnership Taskforce (CWG/EISWG) recommends a vision of private sector collaboration with NOAA where:
 - “NOAA will engage and empower the private sector as a partner in creating climate products and services and delivering them to the nation.”



Overview of NOAA's response



- NOAA concurs, in principle, that the enterprise should have open access to various types of data that NOAA produces and that NOAA should develop new capabilities and systems in an open and transparent fashion.
- NOAA's existing policies support the open data sharing and partnership-driven development concepts, which is broader than weather and climate data. Therefore, NOAA will support working toward Open Environmental Information Services (Open EIS).
- NOAA will designate a Senior Executive Service champion to lead NOAA's implementation of the Open EIS concept.
- 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. The community will also be engaged to evaluate the challenges to implementing the Open EIS paradigm.



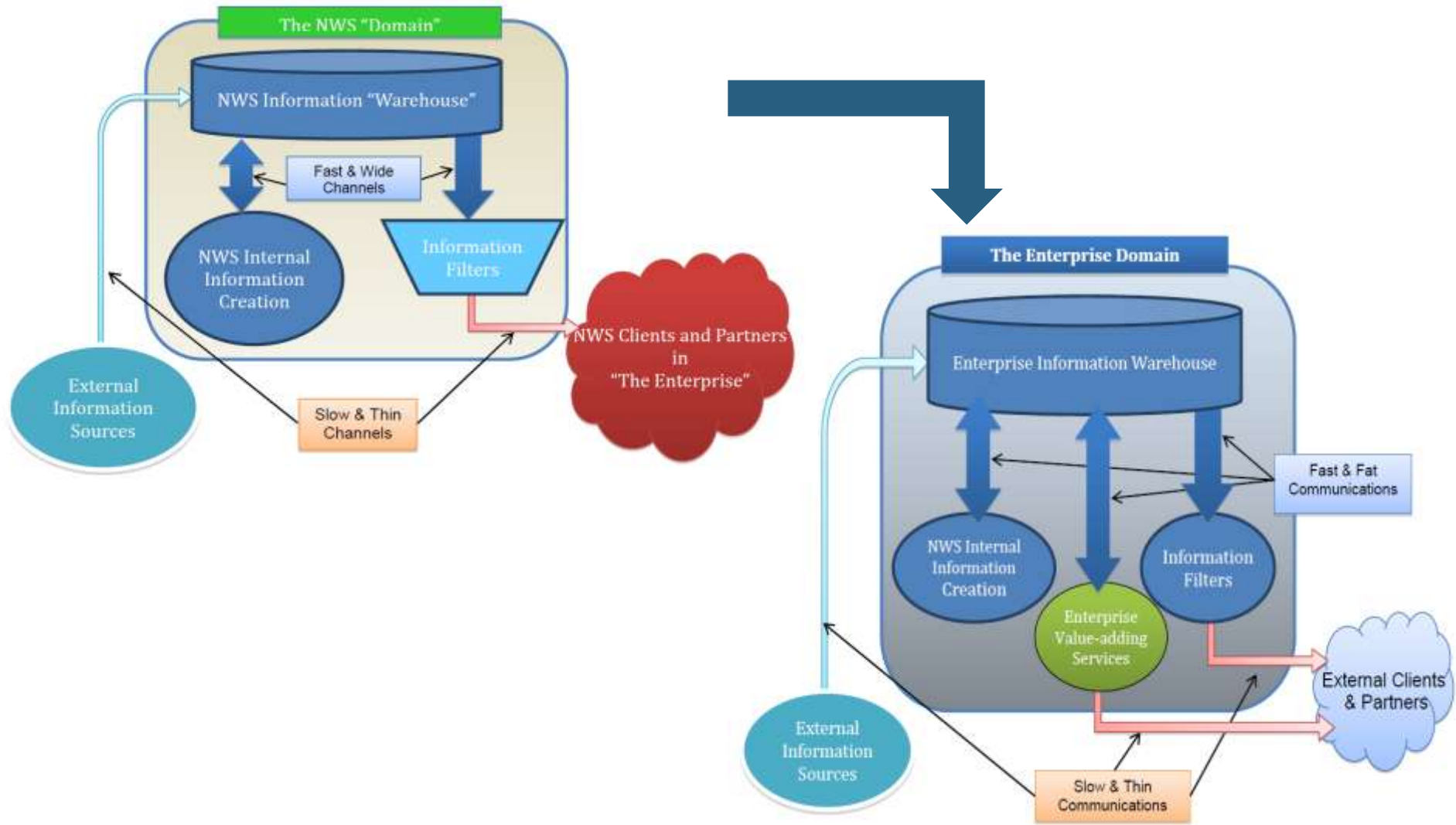
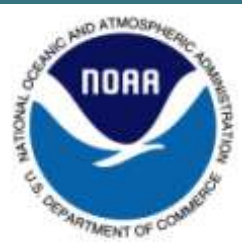
Existing NOAA Policies support Open EIS



- NOAA has numerous policies, developed by various line and staff offices, in support of open data sharing.
- In particular, the NOAA Policy on Partnerships in the Provision of Environmental Information (NOAA Partnership Policy- NOAA Administrative Order [NAO] 216-112) states
 - “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.”



SAB OWCS Evolution Concept





NOAA's Limitations for Open EIS Implementation



- Limitations of the internal architecture of NOAA's data systems.
 - NOAA's data dissemination architecture is disjointed and unable to transport all data to a single portal for ease of data sharing. Internal to NOAA, numerous datasets are not available to NOAA users due to limited distribution channels.
- Limitations of NOAA's capacity to provide data to external parties.
 - NOAA's systems also have limited bandwidth and server infrastructure capacity to deliver high volumes of data to external users. In particular, NOAA doesn't currently have the bandwidth or potential server capacity to deliver the volume of data that might be needed by the private sector and academia.
- Limitations to the use of NOAA data by external parties after they acquire it.
 - Users must understand much about the internal data formats and encodings to exploit data.
 - Observational and model data do not always use the same datum, so translating this to a universal geo-referenced framework is left to the user.
 - The metadata are missing, incomplete, or non-standard.
- Limitations due to available resources within NOAA (dollars and people)



Unique Open EIS Policy Challenges

- Handling of proprietary information.
 - NOAA is working on a policy for External Data Usage in response to a separate SAB action.
- Maintaining information quality.
- Protecting the integrity of NOAA's information systems.
- Compliance with financial controls.
 - Cooperative Research and Development Agreements (CRADAs) should be viewed as a temporary mechanism to pay (as needed) for enhanced access to NOAA data and expertise.



A Process for Moving Toward an Open EIS



NOAA 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.

- NOAA will designate a member of its Senior Executive Service to champion and coordinate its overall effort.
- 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 to prioritize the candidate projects and actions.
- Pending selection of prototype/pilot project(s), the Open EIS Coordinator will be supported by implementation team(s) comprising representatives from the line and staff offices.



Timetable

Initial Actions (FY13)	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

<u>Annual Process (assuming Initial Actions lead to NOAA selection in March 2013)</u>	Date
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)



Next Steps

- NOAA will engage the SAB and its subcommittees such as the EISWG, CWG, and DAARWG, in a discussion about the Open EIS implementation strategy.
- NOAA will continue to use existing mechanisms (e.g. Small Business Innovation Research [SBIR]) to develop partnerships 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.



Notional Pilot/Prototype Projects



- Further discussion is welcomed on identifying other candidates, and prioritizing amongst them.
- **Demonstration of the open data concept:**
 - **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)
 - **Seasonal climate data sharing:** Applications of NOAA information on seasonal climate using the NCEP Climate Forecast System. (NWS)
 - **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)



Notional Pilot/Prototype Projects



- **Demonstration of the collaborative development concept:**
 - **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);
 - **Satellite test-bed:** Invite broader private sector participation in NOAA Satellite test-bed activity (NESDIS);
 - **Participation in Satellite Conference:** NOAA is considering either an expanded Satellite conference or a separate technology-oriented conference (NESDIS);
 - **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);
 - **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);
 - **Joint development of Dual Polar algorithms:** Development of improved algorithms from newly upgraded Dual Polarization Doppler radar (NWS and OAR).



NOAA Coordination & Views



- Coordination with:
 - NOAA's ad-hoc EISWG support team including representatives from NWS, OAR, NOS, NESDIS, OCIO, the Climate Program Office.
 - NOAA's Environmental Data Management Committee.
 - NOAA Executive Panel.



Desired Outcome



- NOAA requests informal guidance from the SAB on:
 - Priorities for pilot/prototype projects; and
 - Strategies for evolving the NOAA Partnership Policy to address roles and responsibilities;



BACKUP SLIDES



Specific SAB recommendations- OWCS

- **OWCS 1.0** NOAA leadership should agree that the Open WCS concept as described herein would be beneficial to the nation and that the agency should immediately begin to develop internal programs to implement the paradigm in targeted parts of the organization that will be most effective in delivering the benefits of Open WCS to society.
- **OWCS 2.0** NOAA should work closely with the SAB, its relevant working groups (e.g. EISWG, CWG and DAARWG) and perhaps other partners to develop an implementation action plan that will create specific recommendations and follow-on activities to implement the Open WCS approach across the agency. This action plan should be developed quickly and target short-term actions that will lead to prototype and targeted Open WCS implementations whose experiences can be used to develop a more comprehensive NOAA Open WCS strategy.
- **OWCS 3.1** Recommend that NOAA implement Open WCS incrementally using targeted programs and prototypes rather than developing broad Open WCS policy and implementation concepts.



Specific SAB recommendations- OWCS



- **OWCS 3.2** Quickly identify short-term actions that can target accelerated implementation of the Open WCS in specific areas that have limited risk or cost and can be achieved without a more comprehensive approach.
- **OWCS 3.3** Consider mechanisms that catalyze better interactions between NOAA's development laboratories and the broader Enterprise such as open access to development datasets and use of open Development Test Centers.
- **OWCS 3.4** Address various challenges of the Open WCS paradigm including security, costs, fair access and effective internal development in the context of the incremental and targeted implementation approach



Specific SAB recommendations- Climate Partnership



- **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.
- **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.



Specific SAB recommendations- Climate Partnership



- **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.
- **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.
- **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.



Specific SAB recommendations- Climate Partnership



- **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).
- **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.
- **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.
- **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 must provide the leadership to initiate this process.



Specific SAB recommendations- Climate Partnership



- **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.
- **CP 5.2** The private sector must assist in the development of NOAA priorities for climate information and products.
- **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.
- **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.