

**34th Meeting of the NOAA Science Advisory Board
Silver Spring, MD
9-10 March 2009**

Presentations for this meeting will be posted on the SAB website at
<http://www.sab.noaa.gov/Meetings/meetings.html>

Meetings Attendees

SAB members in attendance: Dr. David Fluharty, Chair, and Wakefield Professor of Ocean and Fishery Sciences, School of Marine Affairs, University of Washington; Dr. William Ballhaus, Past President and CEO, The Aerospace Corporation; Mr. Raymond Ban, Executive Vice President, The Weather Channel; Dr. Eric Barron, Director, National Corporation for Atmospheric Research; Mr. Michael Keebaugh, Vice President, Raytheon Company (retired); Dr. Geraldine Knatz, Executive Director, Port of Los Angeles; Dr. Frank Kudrna, Kudrna & Associates Ltd.; Dr. James Mahoney, Environmental Consultant; Dr. Jerry Schubel, President and CEO, Aquarium of the Pacific; Dr. John Snow, Dean, College of Atmospheric and Geographic Sciences, University of Oklahoma; Dr. Gerald Wheeler, Executive Director Emeritus, National Science Teachers Association; Dr. Thomas Zacharia, Associate Laboratory Director, Oak Ridge National Laboratory.

NOAA senior management and Line Office representatives in attendance: Ms. Mary Glackin, Deputy Undersecretary of Commerce for Oceans and Atmosphere; Dr. James Turner, Deputy Assistant Secretary of Commerce for International Affairs; Ms. Laura K. Furgione, Assistant Administrator, Office of Program Planning and Integration; Dr. Richard Spinrad, Assistant Administrator, Office of Oceanic and Atmospheric Research; Dr. Alexander MacDonald, Deputy Assistant Administrator, Office of Oceanic and Atmospheric Research; Mr. Craig Mclean, Deputy Assistant Administrator, Office of Oceanic and Atmospheric Research; Ms. Mary Kicza, Assistant Administrator, National Environmental Satellite, Data and Information Service; Mr. Charles Baker, Deputy Assistant Administrator, National Environmental Satellite, Data and Information Service; Dr. Stan Wilson, Senior Scientist, National Environmental Satellite, Data and Information Service; Dr. James Balsiger, Acting Assistant Administrator, National Marine Fisheries Service; Dr. Steven Murawski, Director of Scientific Programs and Chief Science Advisor, National Marine Fisheries Service; Dr. John Hayes, Assistant Administrator, National Weather Service; Mr. John Dunnigan, Assistant Administrator, National Ocean Service; Dr. William Corso, Deputy Assistant Administrator, National Ocean Service; RDML Philip Kenul, Deputy Director, NOAA Corps & NOAA Office of Marine and Aircraft Operations.

Staff for the Science Advisory Board in attendance: Dr. Cynthia J. Decker, Executive Director; Mary Anne Whitcomb and Donavan Wilson.

Monday March 9, 2009

Opening Statement of the Chair and Self-Introductions by Science Advisory Board (SAB) - David Fluharty, University of Washington and Chair, NOAA SAB

Dr. Fluharty opened the meeting by welcoming the members and NOAA representatives. He particularly welcomed the three new members on the Board – Eric Barron, Jerry Schubel and Thomas Zacharia. The members and representatives from NOAA introduced themselves. Dr. Fluharty then noted that the SAB had a very full agenda for the meeting and turned the floor over to Ms. Glackin for remarks from NOAA.

Welcoming Remarks - Ms. Mary Glackin, Deputy Under Secretary of Commerce for Oceans and Atmosphere

Ms. Glackin began by thanking Dr. John Snow for his contributions to the SAB over the past seven years and welcomed Eric Barron, Jerry Schubel and Thomas Zacharia to the Board. She noted that the new leadership in the Obama Administration includes Dr. Jane Lubchenco as the nominee for the NOAA Administrator and Dr. John Holdren as the Director for the White House Office of Science and Technology Policy. Mr. Gary Locke is the designee for Secretary of Commerce; Carol Browner and Nancy Sutley are in place as White House advisors. NOAA has several additional political vacancies: three Senate-confirmed positions including the Chief Scientist.

NOAA has highlighted areas of national challenges to the transition team. These include high impact weather and water issues such as hurricane forecast improvements, fire weather, and more progress on overall water issues. NOAA also highlighted challenges at the coast. NOAA discussed the work still ahead in fisheries and endangered species management. Finally in the transportation area two issues were highlighted - working with the Federal Aviation Administration (FAA) on the next generation weather transportation system and transportation in the ice-free Arctic. During the SAB meeting members will hear presentations on the proposed National Climate Service. Ms. Glackin highlighted a recent National Academy report (Restructuring Federal climate research to meet the challenges of climate change, NRC 2009) that proposes changes to the interagency climate efforts. NOAA is working toward this challenge and better aligning internal climate efforts. The agency is also striving to improve employees' understanding of climate change. Tom Karl, the Director of the National Climate Data Center, has been asked to take a the lead on the development of a NOAA National Climate Service with Chet Koblinsky, Director of the Climate Program Office, as his deputy with emphasis on the research aspects.

Some initial steps to improve delivery of climate services are under way including a new climate portal for services. Work has started on identification of climate information needed for impact assessments and management of trust resources. NOAA will be sharing thoughts on needs for developing a national strategy for the next 20 years.

Ms. Glackin highlighted work with the FAA on the next generation transportation systems with respect to weather services in Center Weather Service Units (CWSUs). The FAA has requested these services be consolidated. NOAA believes that public safety is paramount but has agreed to the next steps as long as it can demonstrate the capability to provide remote delivery of information without degradation of service.

NOAA has been working to increase resilience in coastal environments and communities. One effort focuses upon coastal hazards and climate change, led by David Kennedy from the National Ocean Service. NOAA is also working on the issues of competing coastal uses and habitat loss as well as coastal pollution and human health events.

NOAA is moving forward with FRV Bell Shimada, Pisces and SWATH fisheries research vessels.

The GOES-R benefitted from the National Polar-orbiting Operational Environmental Satellite System's (NPOESS) "lessons learned". NPOESS activity includes a recent National Research Council (NRC) report that stressed that the satellite constellation is fragile, needs to right-size and budget the right way to avoid risk of a break in continuity of coverage.

Facilities construction efforts, including Ford Island in Hawaii and the Fisheries Center in La Jolla, CA will make progress with stimulus funding. NOAA will work with the Administration on next steps. The American Recovery and Reinvestment Act (Stimulus Bill) includes \$830M for NOAA: \$230M in Operations Research and Facilities funding; \$600M in Procurement Acquisition and Construction funding. NOAA will follow legislative guidance on spending priorities including \$170M for High Performance Computing in climate. NOAA is required to send a spending plan to Congress in 60 days and will move forward quickly on these efforts.

Regarding the FY09 budget, NOAA is still on a \$3.9M Continuing Resolution while Congress is finishing work on an omnibus appropriations bill. If NOAA does not get higher funding in the omnibus bill, there will be major problems.

A member asked how the economic situation is affecting international partners. The Under Secretary responded that the economic situation in Canada has changed drastically in the last three months; the situation there is similar to the U.S. Mary Kicza said major space agencies have some concerns but support is still strong in the climate area. Right now there is concern but no break in coverage.

A member asked about the \$3.9 billion budget and the role of salary increases... If half of it pays for personnel with no increases for annual raises over the past five years, the NOAA program is either becoming more efficient or shrinking. Mary Glackin said the PAC account where satellites are located has been growing and it is true that the general NOAA program is in slight decline. The member noted that if cuts are made the Board would be interested in helping to identify priorities.

A member asked whether the FAA is considering options other than NOAA. Ms. Glackin answered yes; they have outsourced other NOAA functions. NOAA has been receiving requirements from FAA and has been responding to these. A member asked about the impact if FAA decided not to continue funding NOAA work. Ms. Glackin said that aviation weather is an important mission for NOAA. Rick Spinrad mentioned that

the reimbursable issue is a very real one, as identified in a report from the Research Review Team chaired by Berrien Moore five years ago. NOAA recently transferred 40 full-time employees to the EPA that had been funded in NOAA under a reimbursable agreement.

Ethics Requirements for Special Government Employees - Will Jacobi, Department of Commerce Office of the General Counsel

Summary:

Mr. Jacobi provided an overview of the ethics regulations that apply to the members of the SAB. As special government employees SAB members are subject to conflict of interest rules. These include financial reporting requirements. If there is a conflict the OGC will work with members to resolve them—including a waiver to participate in policy discussions.

One of the restrictions to which special government employees are subject is a lobbying restriction. If a member participates in a specific party matter as part of his/her SAB duties, he/she may not in his or her personal capacity lobby any Federal agency or Federal court concerning that specific matter. This restriction does not apply to lobbying Congress. However, members should get guidance from the General Law division before doing any lobbying in a personal capacity while they are in town for an SAB meeting.

Discussion:

A member asked whether testimony as an expert witness was covered. Mr. Jacobi responded that it is only a concern if members are asked to testify on a specific party matter, however this is unlikely. SAB members are not restricted from speaking to Congress in a personal capacity. A member asked whether speaking to Congress as an SAB member is a prohibited activity. There are no restrictions on SAB members speaking on general policy matters. However, SAB members should not be speaking to Congress in their official capacity unless they have authority from the SAB Office to do so.

A member asked about the case when they are invited by a Congressman to provide information. The response was that if a member responds in his or her personal capacity it is fine, however if he or she is in Washington DC for a Board meeting, he or she should get guidance on this first.

A member asked about listing the holding of mutual funds and stocks and whether there is a conflict. The answer was that SAB members need to report this on their financial disclosure statements and the Ethics Office will advise if there is a conflict. Diversified mutual funds do not need to be listed on the financial disclosure report; sector-specific funds do need to be listed, as well as stocks, bonds, and other assets held for investment.

SAB members cannot work on matters concerning individuals with whom they have a close personal or professional relationship. If there is a specific party matter considered that concerns someone with whom a member has close ties, he or she must recuse him or

herself. A member said that on another Board he had asked the attorney to clarify if a study issue constituted a particular matter. Mr. Jacobi said this could be done, however the SAB advice is typically at such a macro level this does not occur often. DoC will need to determine whether the matter is a specific party matter or a policy matter.

SAB members cannot accept gifts unless \$20 or less. Participation is also allowed in a widely-attended event. "Widely-attended" event means participants from outside the government, typically at least 40 people and pertains only if a member is invited because of the SAB position. Working for a foreign government is not a problem for individuals serving on the SAB. Financial disclosure forms from the members must be completed once a year.

SAB Strategic Planning Discussion:

After the discussion with Mr. Jacobi, Dr. Fluharty moved on to discuss the afternoon agenda for the meeting. He noted that there are three aspects of strategic planning for the afternoon agenda. One is the new NOAA strategic plan. A second item is the opportunity for the SAB to identify issues for the new Administrator; input on this was solicited from SAB working groups prior to the meeting. Dr. Fluharty also reviewed SAB issues identified in 2000 and what has been accomplished to date. The third item is a look at the SAB and its work: is the SAB doing its job well; is it addressing the right issues; what is the Board doing that can be done better? The members are responsive to NOAA's requests to key issues on those topics. The SAB charge allows them to make suggestions for topics falling between cracks or future issues, that is, they can bring issues to NOAA.

Mary Glackin said this discussion would be very helpful to NOAA leadership. The agency needs to proactively find ways to solicit external views. NOAA will be challenged given the financial picture and must be very deliberate.

A member noted that the SAB has been effective due to the strong interest of the previous Administration in building and using the Board. For example, the SAB's Research Review Team report in 2004 provided a template that influenced the research infrastructure and management over a number of years

The Next Generation Strategic Plan - *Paul Doremus - Deputy Assistant Administrator, Program Planning and Integration*

Summary:

The purpose of this presentation was to discuss how the SAB wants to provide input into the NOAA next generation strategic plan. Strategic planning is mandated by the Government Performance Results Act (GPRA). A strategic plan creates opportunities with the new Administration and is fundamental to running the organization. An effective strategic plan is the basis for organizational alignment and productivity and a basis for engagement and cultivation of stakeholder influence. The goal is to have the plan in place by this time next year.

NOAA is looking at long term mission objectives beyond five years to 2035. There are trends that the agency needs to consider in climate predication and impacts and fisheries stocks. NOAA is in the business of long term impacts and observations. The concern is how to plan in a short term environment. Although the agency cannot predict the future, it can identify key forces and imagine how they might combine to form alternative futures and strategies to which the agency must respond.

NOAA has pulled together a multidisciplinary and multi-line office team to identify key external forces in scenarios for 2035 and distilled these to high impact, high uncertainty forces. Types of uncertainty that affect NOAA and three possible futures include these elements: nature and mix of economy, governance and decision-making and environment and societal interactions.

Discussion:

One member commented that NOAA should look at high impact events and how NOAA will react to these. The agency should envision all kinds of events and the reactions. Another member agreed and pointed out that different events will affect the NOAA vision, mission and goals differently; some will be completely external, others can be more influenced by NOAA. Dr. Doremus agreed and pointed out that a study (or studies) by the National Academy of Sciences could put together a lot of information on this.

A member commented on the assumptions. Dr. Doremus answered that in the full document, one of the things to examine are the strategies that would enable one to operate efficiently in various scenarios. The member said it is important to write down assumptions. Dr. Doremus indicated that he has a list of assumptions versus facts. Dr. Doremus indicated that the purpose of the scenarios is to frame the environment. Phase 1 is to develop scenarios. In phase 2 the process engages stakeholders. There are more phases ending in March 2010 with a report eventually released for public review. The timeframe of the strategic plan is 2013-2017, a five-year plan within long-term issues. The process is to provide direct input between February and May 2009. This will include a formal review of the draft strategic plan throughout development.

Laura Furgione asked where NOAA was in its stakeholder conversations and expressions of support for the plan. Dr. Doremus indicated that they were surprised and pleased at the meeting in Alaska to hear so clearly that NOAA needs to maintain an independent scientific voice. There was a sense that the entire community in Alaska was impacted by climate change. There is a need for sound science to determine what must be done. The only place where prioritization appeared was in engagement of community and a request that the community provide priorities.

A member noted that the agency always hopes that budgets will be better but wondered if there is a list of essential items that NOAA can't lose. Is there a sense that the agency might be spending too much on infrastructure versus science? Dr. Doremus stated that the mix of priorities and what is funded is a natural outcome of strategic planning. This strategy maybe too time-intensive and any people- intensive organization with a lot of

overhead is in trouble. Scenarios are interesting but personnel costs will be huge and it may be difficult to cover them. Scenarios are ways to plan out the future, overlay the agency priorities, and see where NOAA can have greatest impact. A member indicated that the document should place more emphasis on priorities.

The Chair said that moving to regionalization in delivering services and integrated ecosystem assessments is part of this. These may fit in when the strategy is done. The Chair said society is not mitigating but adapting to climate change. The choice of whether to have an adaptation strategy or a mitigation strategy is important in this plan. What is the discipline for next step? Dr. Doremus indicated that the strategy will examine decision-making processes to handle the prioritization issues.

A member asked if there was an authorization level for NOAA that gives an idea of out-year funding. Dr. Doremus said no but after the America COMPETES Act, NOAA got engaged in policy discussions with the Administration. There are two additional policy dimensions. There is a study commissioned by the National Research Council on economics and environmental growth and a potential investment in earth system science. A member suggested NOMADS (National Organization of Management Analysis and Decision) support. A real threat to the organization is that budget costs are finite, flat or decreasing. NOAA may have to do more with less. NOAA must organize to its statutory requirements and those must be balanced against opportunities. This may conflict with other agencies or private industry.

Many things in NOAA deal with both the long and short term. Lots of things NOAA does very well and routinely. But is NOAA ready for the next Hurricane Katrina? There is a tension between climate and weather and competition for resources. There is a need for balance between ocean and atmosphere issues. There is also competition between satellites and ground-based observing systems that need to be replaced. NOAA must think of itself as an economic resource agency. NOAA needs more proactive and strategic thinking. The current thinking is dominated by operational issues and not science. A member asked more about adaptation strategy and what would prompt that. It is likely to be a combination of mitigation and adaptation.

A member commented that the U.S. Geological Survey is a model for what could happen; the personnel costs resulted in a cut in science funding. The agency now has two-thirds of the staff it had but more funds for science. One member said the Ocean Research and Resources Advisory Panel (ORRAP) found NOAA (and other agencies) needs to better exert collaborative leadership among agencies because no one agency can do it alone. A member said one can project ideal conditions and determine what things are connected. If the agency is considering adaption strategies, it needs to consider weather, climate, land use and toxins in the environment. The agency will eventually support a biosphere comprehensive, interactive approach.

The National Weather Service is accelerating its strategic planning process within the overall NOAA strategic plan. Jack Hayes wants perspectives from the SAB. The plan is to ensure that the strategy is as tuned as possible to ensure it is collaborative and nimble.

A member asked if many of the SAB recommendations are new initiatives, is there anything in the strategic plan that examines what NOAA should stop doing. Jack Dunnigan said as a public agency NOAA is not in charge of its future; the Administration and Congress determine that. But the agency could use help on developing best practices in this area. For example, Dr. Turner stated that some legal mandates do not make sense anymore and may need to be changed. A member said that the SAB can make recommendations that could help NOAA, even if it means reallocating the NOAA budget. At the moment the SAB working groups are looking at specific issues, so the Board is not taking a broader, strategic view of the agency. The SAB can do this if NOAA would like it to take this on.

SAB Strategic Planning Session – Transition and Beyond - *David Fluharty* - *University of Washington and Chair, NOAA SAB*

At this point the meeting became a general discussion about SAB strategic planning, building on the discussion started after Dr. Doremus' presentation.

One member asked how the SAB can improve upon its results. The SAB should have a different way of operating with NOAA requests. The SAB should think strategically, not just respond to operational needs. There was some concern expressed that the SAB may be doing too much; there are a lot of working groups. The SAB should think about how to make NOAA think more strategically by bringing in new science ideas and speakers. The SAB could invite one outside speaker each meeting on the hottest scientific topic.

The SAB role in the review of the Cooperative Institutes is in the SAB charter and NOAA administrative Order. The SAB will review the Northern Gulf of Mexico Cooperative Institute this fall, the Great Lakes CI in Fall 2010, and then the cycle begins with the rest of the CIs. The Chair asked if the SAB was ready to tackle the CI/JI reviews. It would be useful to provide list of Cooperative Institutes and background on the rationale for the SAB review to the SAB members since there are new members who have not been involved in this process.

A member asked if there could be NOAA informational briefings. Dr. Decker said SAB meetings outside the Washington DC area devote time to NOAA activities in the region where the meeting is. Laura Furgione said NOAA is working on a NOAA 101 presentation to employees in regions that could be provided to the SAB. [What is the status of this report?]

Summary points from discussion on advice to the new Administration

- Better tap into academic community
- Realize the potential of Sea Grant
- Maintain a balanced portfolio
- Become more of an engaged organization
- Resolve tension in how biodiversity is operationalized across NOAA
- Resolve tension between weather and climate

- Establish NOAA's role in leading the collaborative climate agenda
- Improve the means for supplying data and information to meet national needs (e.g., marine transportation needs).
- Maintain a robust program of ocean exploration.
- Continue leadership in the Group on Earth Observations as a a major international opportunity
- Make others aware of the strategic and tactical issues around environmental satellites.

Action 1: NOAA will provide an update on Cooperative/ Joint Institute status and review process, including perspective from the CI directors at the next SAB meeting.

Action 2: Science Advisory Board Office and NOAA will provide background information on Cooperative/ Joint Institute review process and past SAB involvement to SAB members prior to July 2009 SAB meeting

Action 3: Science Advisory Board will consolidate a list of priorities for NOAA, develop background statements, review, and provide to the new NOAA Administrator

Action 4: Science Advisory Board will consolidate a list of priorities for itself and develop a plan to address these.

Public Comments

Three comments from the public were received in conjunction with this meeting, one via email prior to the meeting, one presented at the meeting itself, and one provided in writing subsequent to the meeting.

Comment from B. Sachau, Florham Park, NJ (via email, dated 02/18/09, font in capital letters as provided by the commenter)

THE AGENDA HAS A SECTION ON WORKING WITH "CONSTITUENTS". THE ENTIRE AMERICAN POPULATION IS YOUR "CONSTITUENS". YOU ARE SUPPOSED TO BE WORKING FOR EVERY SINGLE ONE OF US - NOT JUST FOR RICH CORPORATIONS, RICH COMMERCIAL FISH PROFITEERS, ETC. THIS IS MY COMMENT FOR THE PUBLIC RECORD.

Comment from Anne Polansky, Climate Science Watch, Government Accountability (presented verbally at the meeting and provided in writing subsequent to the meeting).

In the five minutes allotted, we emphasized that a National Climate Service, should one be created, must be: (a) solutions-oriented and driven by the needs of regional, state and local decision-makers; (b) inclusive of other federal and nonfederal entities with relevant capabilities; (c) be coordinated and led by a dedicated, full-time staff in the White House; (d) avoid duplicating the functions of other programs such as the Climate Change Science Program; (e) have strong oversight by stakeholders (i.e. the users of climate services);

and (f) incorporate robust mechanisms for preserving the scientific integrity of the program.

Comment from Josh Foster, Manager, Climate Adaptation, Center for Clean Air Policy (CCAP) 202-408-9260; jfoster@ccap.org

Since 1985, CCAP has been a recognized world leader in climate and air quality policy and is the only independent, nonprofit think-tank working exclusively on those issues at the local, national and international levels. Headquartered in Washington, D.C., CCAP helps policymakers around the world to develop, promote and implement innovative, market-based solutions to major climate, air quality and energy problems that balance both environmental and economic interests. For more information about CCAP, please visit www.ccap.org.

CCAP's *Urban Leaders Adaptation Initiative* helps local governments adapt to the impacts of climate change and “**Ask the Climate Question**” about the impacts of local policy and funding decisions. Our partners are: Chicago, King County, Los Angeles, Miami-Dade County, Milwaukee, Nassau County, New York City, Phoenix, San Francisco, and Toronto. CCAP is synthesizing best practices on urban climate adaptation, emphasizing efforts that reduce greenhouse gas (GHG) emissions and improves community resilience to climate variability and change. CCAP believes that climate mitigation and adaptation must go hand in hand, like eating and breathing.

CCAP makes the following recommendations to NOAA and other Federal agencies involved in climate services development:

- **Produce Actionable Science**, meaning, “Data, analysis, and forecasts that are sufficiently predictive, accepted, and understandable to support decision-making, including capital investment decision-making.”¹
- **Establish a comprehensive, coordinated and federally sponsored applied research program** that addresses climate adaptation, including the provision of predictive and decision-support tools, and necessary data resources to help local governments plan for the future impacts of climate change. These tools and resources should include climate models that forecast precipitation changes and address other issues pertinent climate related issues on a national, regional, and sub-regional scale; climate models that address sea level rise and its effect on coasts; and assessments to determine – on a national, regional, and sub-regional scale – the vulnerability of different regions to the anticipated impacts of climate change over different timeframes.²
- **Establish an urban sector focus for Federal climate science and services activities** building on the leadership and insights gained from the American

¹ David Behar, San Francisco Public Utility Commission (SFPUC), and staff lead for the Water Utility Climate Alliance (WUCA)

² Paraphrased from WUCA water sector statement on climate change and water resources

Meteorological Society 2009 Annual Meeting broad theme of “Urban Weather and Climate: Now and in the Future.”

- **Build national climate services and extension networks:** NOAA and the Federal government in collaboration with public universities, companies, states, and technical experts around the country, should work to establish national climate services and extension networks to aid state and local governments in implementing climate change solutions. These networks should provide information and technical assistance on best practices, tools, hardware, systems, model processes, and planning support for early warning and risk management on issues such as severe storms, flooding, sea-level rise, drought, wildfire, heat island mitigation, emergency management, building resiliency, model zoning ordinances, ecosystem services, and water infrastructure. In practice, merging a classic agricultural extension model with a community organizing and education approach will ensure that local decision makers, businesses, and citizens will have the resources and information to understand their climate risks, and the opportunity to learn about and participate in solutions to reducing greenhouse gas emissions, preparing for extreme weather, planning ahead for real and emerging climate change impacts, and increasing overall community resilience.
- **Invest in engagement:** significant funding for personnel and educational resources will be required at the local level for national climate services and extension networks to effectively engage and assist local communities—including allocating a majority of personnel time to outreach and extension related activities. NOAA and Arizona via the University of Arizona support a Climate Extension Specialist that spends approximately 70% of his time interacting with a variety of user communities. (<http://cals.arizona.edu/climate/index.htm>)
- **NOAA should work in collaboration with other Federal agencies to leverage existing NOAA and non-NOAA assets and networks** to meet the wide variety of needs for climate information and technical assistance at the local level. Particularly related to NOAA these assets include: Weather Forecast Offices, River Forecast Centers, National Laboratories, Coastal Services Centers, Sea Grant Extension, Regional Integrated Sciences and Assessments (RISA) University Teams, Regional Climate Centers, and State Climatologists Offices.
- **NOAA should engage collaboratively with other non-traditional climate information user groups on climate services development and delivery.** For example, engage the Association of Metropolitan Water Agencies (AMWA) (www.amwa.net/cs/climatechange) whose members serve 130 million people, and the Water Utility Climate Alliance (WUCA)(wucaonline.org) representing eight of the national largest water utilities serving 36 million people, that through their own efforts have recently become interested in how NOAA and the Federal government provide climate information and services.

Tuesday, March 10, 2009

New Working Group Update-ESMWG, OHWG

David Fluharty, University of Washington and Chair, SAB

Dr. Fluharty provided an update on the status of two new working groups established by the SAB since the last meeting.

The Ecosystem Sciences and Management Working Group (ESMWG) is a blend of ecologists, economists and oceanographers. The ESMWG's portfolio represents a very broad program and an interdisciplinary approach to research. Dr. Fluharty discussed important issues that the ESMWG should examine. ESMWG has chosen ocean color and remote sensing as well as NOAA's coastal program integration as its initial substantive targets for study.

The Oceans and Health Working Group (OHWG) is just getting started. The first meeting for the OHWG will be on March 24-25 in Silver Spring. Dr. Steve Weisberg, Southern California Coastal Water Research Project and member of the WG, has agreed to chair the Group. The OHWG will review NOAA's Oceans and Health programs in the context what other agencies are doing. The goal is for OHWG to have a draft report for the SAB by the fall of 2009 and a final report by the spring of 2010.

NOAA High Performance Computing Strategy for FY 2010-2015

Joseph Klimavicz - NOAA Chief Information Officer

Summary:

The goal of Mr. Klimavicz' presentation was to provide an update to the SAB on NOAA's high-performance computing (HPC) strategy in the FY11-15 timeframe. The HPC program was first presented to the SAB in December 2006; the SAB provided recommendations to NOAA subsequent to that meeting; Mr. Klimavicz provided a response to this in March 2008. The primary HPC issues for NOAA are: (1) developing an HPC architecture to advance science on leadership-class systems, (2) minimizing the research to operations timelines, and (3) sustaining operational workloads. The Office of the Chief Information Office has identified several short- and long-term goals and is making progress on all of them. In the short-term, NOAA has implemented collaborations with the Department of Energy and with the National Science Foundation to leverage the use of HPC resources through those organizations. NOAA has also reviewed and updated the HPC system architecture plan for research and development. The agency is working on an overall HPC strategy and roadmap for the future. In the long term, NOAA has started to develop the plan to implement the next generation HPC architecture for research and development. The goal for operations is to eventually develop a sustainable on-demand system. Priority operational requirements are for: Hurricane Forecast Improvement, Climate Modeling and Services, Aviation Forecasting, Modeling and Observing Infrastructure for Coastal Ocean Prediction and Storm Surges,

and Fire Weather. The stimulus package for NOAA includes additional funding for HPC that will enable the agency to move forward on these plans.

Discussion

One member of the SAB asked whether the role of constraints on high-performance computing (as a result of Moore's Law) on the uncertainty error in models can be predicted and addressed by the plan and roadmap that NOAA is developing. The response was that increasing complexity of the models drives uncertainty out. The finer the resolution, the less uncertainty there will be. This is being addressed for hurricane modeling for now with empirical metrics and so the results can be tied to milestones. For climate, discrete parameters such as aerosols will have to be examined but, again, higher resolution models will drive out uncertainty.

The same member noted that software and hardware issues need to be separated; software needs to be optimized on the hardware available. Mr. Klimavicz agreed that this is an important strategy given the mix of hardware that NOAA is using.

Another member asked whether NOAA has researchers with training and skill sets required to do this modeling. Mr. Klimavicz responded that NOAA has some software engineers but not enough.

A member asked about the bandwidth of the communications pipeline. Do we have the confidence to send datasets over distances? The response is that NOAA currently does not have enough bandwidth. This is a critical issue, but NOAA has identified a plan for network upgrades.

One member noted that the strategy used to advance hurricane intensity modeling was to use other people's systems that have higher computational capability. However, in order to really figure out the physics it will require a lot of additional computing time. Another member pointed out that relying on other agencies' resources is fine for certain tasks but that NOAA will ultimately need its own HPC system for the long term, particularly if it intends to lead the nation in climate services.

Another member noted that it is not just about the computers themselves but the human capital – the scientists and engineers. Mr. Klimavicz responded that there is always a need for more administrative personnel such as contracting officers, in addition to the technical personnel.

One member noted that the stimulus package contains language about NOAA working with the Department of Defense and NSF. NOAA wants to encourage innovation and transform its methods and operations. The member's concern was that NOAA may be focusing on maintaining what it has rather than what is needed in the future.

NOAA Response to “Engaging NOAA’s Constituents: A Report from the NOAA Science Advisory Board” - Louisa Koch, Director, NOAA Office of Education

Summary:

Louisa Koch’s presentation provided background regarding the issue of engagement. The SAB Engagement Report called for dramatic changes in addressing the needs of NOAA’s clients and services. The SAB’s report covered issues across NOAA’s operations and issued 8 recommendations. The report found that 1) NOAA does not have an engagement strategy; 2) NOAA’s culture was not conducive to engagement; and 3) NOAA is an unknown commodity to many.

Engagement is a two-way relationship between a service provider and society (stakeholders and customers). The NOAA Engagement Strategy endorses fostering a dialog with stakeholders and customers to meet their goals and needs. The America Competes Act provides NOAA with the legislative authority needed to increase its level of engagement.

The Executive Committee on Engagement was formed to develop and implement NOAA’s engagement strategy. The ECE consist of the: the Communications Committee, the Education Council, Extension and Training Committee, and regional collaboration. The objective is to expand NOAA’s engagement effort across the country. The ECE has a coordination role. Each member of the ECE has a constituency to which to respond.

ECE tested this concept in the field. The Gulf of Mexico region is developing a pilot program. This pilot program is focused on what role line offices can play in engagement. Workshops and stakeholders were brought together to foster engagement. The objective is to create a network of networks, to create connections across the Line Offices. The next steps include ECE overseeing the implementation of the engagement strategy. There are discussions with Laura Furgione and Steve Austin on how NOAA can garner additional resources. In addition, the ECE plans to focus on the Senior Executive Service plan and the Next Generation Strategic Planning.

Discussion:

One member noted that he had “Googled” NOAA during the development of the SAB Extension, Outreach and Education Plan. The result was a question from Google asking “Did you mean NASA?” Another member pointed out that Ms. Koch is a big supporter of engagement and so he expects that the Office of Education is the right place in NOAA to address this. Engagement is a work in progress and budgetary limits make this very difficult.

Ms. Glackin thanked Ms. Koch for her efforts regarding engagement. In particular she notes that the newly formed Extension and Training Committee has great potential. NOAA can only benefit from enhanced communications across the Line Offices.

The SAB's Fire Weather Research Report: NOAA's Initial Position and Future Strategy - Jack Hayes, Assistant Administrator, NOAA National Weather Service

Summary:

Dr. Hayes provided an overview of how NOAA plans to respond to the SAB recommendations on fire weather research.

He started by noting that the threat of uncontrolled wild fire is increasing. There are research-based improvements that are necessary to support NOAA's operational fire weather services. NOAA's National Weather Service and Office of Oceanic and Atmospheric Research concur with the 46 recommendations provided in the SAB's report. The key players in Fire Weather Research include the National Weather Service, Oceanic Atmospheric Research and the Office of the Federal Coordinator for Meteorology.

The NWS Weather Forecast Offices provide routine fire weather forecasts and also provide Incident Meteorologists for dispatch to fire scenes to support our land management partners. The National Center for Environmental Prediction (NCEP) provides national, medium term outlooks for areas where there is a high risk for fire starts. The National Weather Service also collaborates with the Environmental Protection Agency regarding air quality forecasting, and provides digital forecast guidance for ozone and smoke via its Air Quality Forecast Capability.

Dr. Hayes discussed the need to improve on operations, forecast and warnings, and linked these improvements to needed improvements in fire weather modeling. Specific improvements include availability of a higher density of remotely-sensed data as input to new, finer-scale modeling capabilities with output updated hourly. Also, dry lightning and debris flow problems need to be modeled more accurately. Dr. Hayes wants to engage in more collaboration between academia and the U.S. Forest Service. He believes this collaboration will help improve upon forecasting.

Discussion:

John Snow, who chaired the SAB Fire Weather Research Working Group (FWRWG), described the efforts of everyone involved in the development of the SAB's report. The FWRWG traveled across the country to develop the information in this report. This is a very important issue. The Australians lost over 200 people due to wildfires.

A member asked how NOAA can contribute to assisting the location of communities out of dangerous locations. He noted that social science considerations provide information to individual's perceptions of risk, e.g., of wildfires.

Ms. Glackin asked about NOAA's role in fire weather research. She would like to foster collaboration between NOAA and other federal agencies such as the National Institute of Standards and Technology (NIST). Dr. Spinrad wants to engage the academic

community and social sciences to inform the public regarding smoke dispersion and the effects on public health.

Final Report from the SAB Social Science Working Group - Susan Hanna, Professor of Marine Economics, Oregon State University and Chair, Social Science Working Group

Summary:

Dr. Hanna provided a summary of the work of the Social Science Working Group and the recommendations provided to the Science Advisory Board. She first acknowledged the time and expertise of Ms. Glackin, the NOAA Line Office and Goal Team staff, and the staff of other federal agencies. She also discussed the framework for the role of social sciences in NOAA.

Social science is the process of describing, explaining and predicting human behavior through a wide range of disciplines. Human behavior is reflected throughout the NOAA mission, which is to understand and predict changes in Earth's environment and conserve and manage coastal and marine resources to meet our Nation's economic, social, and environmental needs. The 2003 report of the SAB Social Science Review Panel found that inadequate social science staff and resources limit NOAA's capacity to meet its mission. This finding remains relevant in 2009.

NOAA charged Program Planning and Integration (PPI) with responding to the 2003 report. Responses included the creation of the Social Science Committee of the Research Council, inclusion of social science elements in some Cooperative Institute grants, and integration of social sciences in NOAA's strategic planning. Despite this, social sciences continue to comprise less than one percent of the NOAA budget.

Social science capabilities have declined in NOAA overall, and are underrepresented in NOAA leadership. Strengthening social sciences will require a commitment of NOAA leadership, inclusion of social science expertise in corporate planning and program development, and a strategic plan for the development of social sciences. This strategic plan should be based on a formal needs assessment and should include performance metrics and a system to identify and monitor social science full-time employees (FTEs).

The Social Science Working Group recommends the formation of an Office of Societal Impacts to assist NOAA in meeting its mission. Another recommendation is the creation of the Council of Social Science Advisors to provide guidance to NOAA leadership in strengthening social sciences in the agency. Creating a standing Social Sciences Working Group of the Science Advisory Board will also assist NOAA in social science strategic planning and oversight.

Budgetary targets are necessary to increase NOAA's Social Science capacities. In the short-term, i.e., until a formal needs assessment can be conducted, line offices should allocate 5% of their budgets to the social sciences. In the long term, line offices should

determine the proportion of resources dedicated to the social sciences through the identification of desired outcomes.

Dr Hanna made four concluding points: 1) Social science can contribute to NOAA through meeting NOAA mission through better understanding of users and with strategic planning and evaluation based on valuing NOAA products and services.; 2) NOAA lacks sufficient social science expertise to meet its mission and to do more cost-effective planning; 3) Inertia is a major problem and incentives are lacking; 4) Institutionalizing social science will require the commitment of NOAA leadership and strong incentives.

Discussion:

A member asked whether social sciences can provide guidance to NOAA in complying with OMB requirements. Dr. Hanna responded that social science staff can provide guidance in complying with OMB regulations. Jack Hayes mentioned that social sciences provided assistance in understanding how the public reacts to weather warnings. Another member commented that the report identified a critical need for the application of the social sciences to improving NOAA's communications with constituents.

The members of the SAB agreed to accept the report pending some minor editing for format and will transmit this report to NOAA as a product of the Board.

Action 5: The Social Science Working Group will complete the final editing of its report and transmit the final version to the Science Advisory Board.

Action 6: Science Advisory Board will accept the final report from the Social Science Working Group report pending final editing and transmit to NOAA

Environmental Information Services Working Group Membership - Raymond J. Ban, The Weather Channel and SAB Member

Summary:

Mr. Ban provided an update on the status of the Environmental Information Services Working Group and recommendations for membership in the Group. In late 2002, the National Research Council (NRC) issued a report entitled "Fair Weather: Effective Partnerships in Weather and Climate Services." In this report, the NRC specifically recommended "The NWS (National Weather Service) should establish an independent advisory committee to provide ongoing advice to it on weather and climate matters..." In 2006, in a revision to its "Policy on Partnerships in the Provision of Environmental Information," NOAA highlighted its "willingness to consider creating a standing advisory body to support the NOAA Partnership Policy." NOAA initiated its consideration of this advisory body by seeking the advice of the NOAA SAB and in 2008 the SAB accepted the recommendation of an *ad hoc* working group to 1) establish a standing working group of the SAB to address environmental information services across

NOAA with a focus on interactions with the NWS, and 2) evaluate after 1-2 years whether to a) continue with an ongoing focus on NWS; b) broaden the focus to encompass all of NOAA and the broader environmental information enterprise; or c) work with DOC to establish a separate NOAA Partnerships federal advisory committee with a focus on either the NWS or the broader enterprise.

This new standing working group is the Environmental Information Services Working Group (EISWG). The EISWG consists of 18 members selected by the SAB. The first round of nominees for membership consists of 18 candidates and 6 alternates. Ray Ban will serve as the SAB liaison to the EISWG. The Board was asked to consider the slate of nominees and alternates for the EISWG.

Discussion:

A member asked a question regarding maritime transportation interests on the EISWG, expressing concern that there might not be adequate representation in this sector. Mr. Ban referred to the EISWG's terms of reference, which indicate that the initial focus of the working group should be on interactions with the NWS. The EISWG's focus over time can expand to cover more of NOAA's portfolio of services. Another member suggested that the SAB contact the Chair of the NOAA Hydrographic Services Review Panel and ask him to nominate a member of the HRP to serve as a non-voting, *ex officio* liaison to the EISWG to represent these interests in the meantime. The SAB members agreed that this would be an excellent compromise.

The members discussed two recommendations with respect to the EISWG. The first was one for the SAB to finalize the EISWG list of nominees. The EISWG selection committee had considered 49 candidates that were suggested through the Federal Register process and selected a diverse array of individuals for membership. There was also a recommendation to amend the EISWG Terms of Reference to increase the initial, staggered first terms of the members from 1, 2, and 3 years to 2, 3 and 4 years and to have the timing of the initial evaluation period of the working group extended the first to the third year of its existence. Mike Keebaugh, the chair of the SAB Partnerships Working Group indicated his support for both of these recommendations. The SAB accepted the nominations and the proposed amendments to the EISWG's Terms of Reference.

Action 7: SAB accepts the list of proposed members and alternates for the Environmental Information Services Working Group, including a request for a liaison to the NOAA Hydrographic Services Review Panel to cover the interests of the maritime transportation community, and will establish the Group.

Action 8: Science Advisory Board accepts the amendments to the Environmental Information Services Working Group Terms of Reference and will revise the ToR to reflect these.

Action 9: Science Advisory Board will contact the Chair of the NOAA Hydrographic Services Review Panel regarding the liaison role to the SAB Environmental Information Services Working Group.

Climate Working Group Recommendation on Options for a National Climate Service - Eric Barron, Director, National Center for Atmospheric Research , CWG Coordinating Committee for the National Climate Service Options and SAB member

Summary:

Dr. Barron's presentation reviewed the analysis in *Options for Developing a National Climate Service* report. In 2008, the Climate Working Group convened a workshop in Vail, Colorado. The participants in the "Vail Workshop" were largely not from NOAA and examined NOAA's strategic plan for a climate service. The report from that workshop recommended that the pros and cons of four different options for a national climate service be considered as a method of assessing the best path forward. The Vail workshop also established guiding principles for a national climate service. Those principles include a broad description of societal benefits, a breadth of users who would use the services, the promotion of extension of climate information, and improved decision making and assessment.

The NOAA response was to create, under the SAB Climate Working Group, a Coordinating Committee and four "tiger teams," to assess each option using the guiding principles developed at the Vail meeting as well as the strengths and weakness of each option. The four options are: 1) a non-profit corporation with federal sponsorship, 2) a national climate service federation that would determine how to deliver climate services to the nation, 3) a national climate service with NOAA as the lead agency with specifically defined partners, 4) an expanded and improved National Weather Service into weather and climate services within NOAA.

Findings

Finding 1. Each of the four options has significant strengths and weakness. None of the options analyzed are viewed as ideal for National Climate Service

Finding 2: The federated options has some benefits in its flexibility; especially the non-profit element because there are fewer regulations or bureaucracies for the non-profit. Also, there is greater possibility to reach a broad range of users and connect them to the research community.

Finding 3. The models that are federated have a central weakness, which is the lack of a central voice and the fact that it may be less authoritative.

Finding 4. The strength of the NOAA-led model is the ability to speak with an authoritative voice. Also, the agency led model has the potential to promote synergism

with weather and climate functions and one stop shopping with observing systems and operating systems.

Finding 5. The weaknesses of the NOAA-led model are competing agendas and the fact that other agencies may not feel compelled to respond to NOAA. There is no agency that has the expertise to deal with the broad range of potential user communities.

Finding 6. The current structure of NOAA is not suited for the development of national climate service.

Finding 7. The role of agencies regarding collaboration is not well defined.

Recommendations

Recommendation 1. The internal reorganization of NOAA may allow for greater connectivity of weather and climate functions is a necessary step for success.

Recommendation 2. Each federal agency needs to collaboratively define its role, for climate services to work.

Recommendation 3. The success of the National Climate Service requires recognized, clear, authoritative, responsible leadership with the Federal System at the highest level possible.

Recommendation 4. The National Climate Service requires a defined, independent budget large enough to influence the direction of Service and achieve its mission.

Recommendation 5. The National Climate Service requires an interface best described by a federated structure (i.e., non profit or federation) because it has a stronger connections to users and the research community.

In addition, the Coordinating Committee encourages NOAA and its partners to maintain a community advisory function as the steps are take to develop a National Climate Service that is of real value to the nation. No option has the ideal design. The report is an analysis of each option, and is not an implementation plan.

Discussion:

Ms. Glackin asked about the committee's evaluation of the weather and climate engagement in a National Climate Service. She suggested there is an intersection of the coast and climate. NOAA should be in a position to present itself to decision makers in various ways. Dr. Barron responded that NOAA has strengths in both coast and climate.

Dr Tom Karl asked about the most viable options for a national climate service in the context of an observing system. Dr. Barron indicated that if one has an interface that can

tap into a lot of users; the NOAA building blocks like the observing system are a plus for having NOAA as a lead agency.

Dr. Chet Koblinsky asked about Dr. Barron's engagement in the issue as the Director of the National Center for Atmospheric Research (NCAR). Dr. Barron stated that NCAR efforts involve two areas, research applications (a group that would see this as a good thing) and development of regional climate models (there is very little effort in this area but there is a very strong demand for high resolution among resource managers). The chance for a contribution is strong in this area, according to Dr. Barron. Also, the societal impact is just as important as the research component. The core capacity of the federal government is very important in supporting each of these aspects. In contrast, the federated structure incorporates how to interact with a broad set of users.

One member voiced his concerns regarding the language in the report on the history of the 1978 Climate Service Act and the clarity of the motivations and selection of the approach involved, regardless of the options. The report stated that, from 2000-2008, little happened in the US federal government regarding climate change. The member disagrees with this element of the report. He believes that this is not strictly true, that the Climate Change Science Program during that time did an excellent job of outlining the state of the science and what is required to understand climate change. The report does not address NOAA's accomplishments in this area during that period. Dr. Barron clarified that the report was referring explicitly to climate services and nothing else. He pointed out that there was no call for a national climate service in NOAA until 2008 when VADM Lautenbacher requested it be addressed.

Steve Murawski asked about the regulatory role of the federal government. Dr. Barron suggested this may be a reason to develop an interface with community of users. Non-profit organizations could not handle the running of an observing system, however, they can foster relationships with user communities.

Climate Working Group Report & Membership - Antonio Busalacchi, University of Maryland and Chair, CWG

Summary:

Dr. Busalacchi's presentation covered the *Options for Developing a National Climate Service* and nominees for new members on the Climate Working Group (CWG).

There were nine reviews from CWG members regarding the draft report *Options for Developing a National Climate Service*. These indicated a need for improvement regarding the executive summary and recommendations in this report. In general, the CWG members thought that the reasons why a national climate service is needed are presented very well in this report, however, the "hows" and "whats" for the national climate service are not addressed. Dr. Busalacchi suggested that a statement about the next steps or issues requiring more study be incorporated in the next draft. The CWG generally endorsed the National Climate Service report but there are still some specific

details that must be resolved by Dr. Barron and the Coordinating Committee before it is fully approved.

Dr. Busalacchi also noted a major concern expressed by the CWG. The Fiscal Year (FY) 2011 to 2015 budget contains insufficient justification for high performance computing. The CWG believes that the regional and seasonal climate prediction activities are very important and the priority for these should be increased. The budget should contain a much stronger justification for high performance computing in order to achieve these.

There are four CWG members with first terms that will soon end. The CWG and NOAA agree that a second term should be awarded to these individuals. In addition, there are five members whose second term is ending. The CWG and NOAA have agreed on a slate of nominees to replace them. The SAB approved the renewal of four members as well as the nomination of the five new members.

Discussion:

Ms. Glackin indicated that NOAA clearly has more work to do for a national climate service. A member agreed. He stated that the SAB should get this report to the NOAA leadership as soon as possible. The SAB will accept the report with caveats that it be edited as per CWG member comments. The SAB will provide a final review and approval at a later date.

Action 10: Science Advisory Board accepts the Climate Working Group Report on Options for a National Climate Service pending further consideration and will transmit it to NOAA after final review.

Action 11: Science Advisory Board will consider at a future meeting the next steps on providing advice for a National Climate Service

Action 12: Science Advisory Board accepts the five new members proposed for the Climate Working Group and will invite them to serve. The SAB accepts the four members considered for a second term.

SAB-Census of Marine Life Subcommittee Update - David Fluharty, University of Washington and Chair, SAB

Dr. Fluharty recalled to the SAB the formation of the subcommittee to consider the role of NOAA with the Census of Marine Life Program (CoML) that was formed in April 2008. The subcommittee consists of three SAB members and three members from the US Committee for the CoML. The Alfred P. Sloan Foundation funding for the CoML ends in 2010. The question is whether NOAA can fund all or part of the CoML after that time.

There are several projects from NOAA that may have cross linkages with CoML. NOAA is a partner but not the lead in these projects. There is strong interest in coral reefs and the

Barcode of Life as well as the Tagging of Pacific Pelagics (TOPP) and the Pacific Ocean Shelf Tracking (POST) projects...

NOAA could develop a coordination unit for the CoML and call it The Office of Biodiversity or Office of Marine Life. This potential office could broker relationship with non-governmental organizations (NGOS) and universities. NOAA's investment in the CoML may cost \$30-35 million annually. If NOAA agrees to fund a scaled down CoML, the cost will likely be between \$5-8 million annually. This may be very difficult considering budgets and the current economic climate.

Discussion:

Steve Murawski noted that the CoML is a collection of projects with an international focus. The American investment in the COML is very small. It would be FY 2011 before a substantial investment in the CoML could be made by NOAA.

One member asked about other agency involvement in the CoML. The National Science Foundation has funded specific projects in the COML, but not the program as a whole. The United State Geological Survey (USGS) also has a role in this program with respect to the Ocean Biogeographic Information System (OBIS). There is an interagency group meeting on biodiversity on May 4. This may represent a viable forum to discuss the potential investment in the CoML.

Data Archive & Access Requirements Working Group Recommendation & Membership - Roberta Balstad, Columbia University and DAARWG member

Summary:

The mission of the DAARWG is to provide scientific and management advice to NOAA on its data archives. Because the DAARWG Chair, Ferris Webster, could not attend the SAB meeting, Roberta Balstad, a member of the DAARWG, presented his report. She said that the DAARWG had made two recommendations to the SAB in the past, one on the retention of multiple versions of data and the second on the architecture of NOAA's data archives. Progress is being made in both areas by NOAA in response to the DAARWG recommendations. She also reported that one member of the DAARWG had resigned and suggested that Dr. Ernest Hildner be nominated to replace him on the Group.

Discussion:

There was no substantive discussion of this item. The SAB approved Dr. Hildner's nomination to the DAARWG.

Action 13: Science Advisory Board accepts the proposed new member of the Data Archive and Access Requirements Working Group and will invite him to serve.

Ocean Exploration Advisory Working Group Recommendations & Membership -
Larry Mayer, University of New Hampshire and Co-Chair, Ocean Exploration Advisory Working Group

Summary:

Dr. Mayer provided an update on activities of the Ocean Exploration Advisory Working Group (OEAWG), a standing committee of the SAB. This presentation includes recommendations to the SAB. The OEAWG would like to guide NOAA in developing a new paradigm for ocean exploration. The goal is to have NOAA become the lead agency with respect to ocean exploration.

Larry Mayer mentioned that ocean exploration is not like traditional hypothesis-driven research, rather it promotes discovery that then leads to hypothesis-driven research. The NOAA ship the RV *Okeanos Explorer*, as a vessel of discovery equipped with sophisticated mapping systems and the ability to transmit high-volume data and high-definition video to shore in real-time telepresence is a part of this new paradigm. The *Okeanos Explorer* was commissioned in August 2008 and has already undergone successful field trials of its multi-beam sonar system. This system is designed specifically to allow it to resolve high-resolution targets on both the seafloor and in the water column and, in doing so, offer an underway tool for identifying “anomalies” that would then trigger closer examination and the involvement of teams of “scientists on call” across the country through telepresence systems. The telepresence capability also offers tremendous opportunity for outreach and education activities. Bob Ballard stated that the US Navy is also equipping vessels with the telepresence capabilities.

The National Geographic Society wants to develop a television series that will be based largely on the activities of the *Okeanos Explorer*. The NGS will invest \$65 million in the series over the next five years, including a significant investment in outreach. The OEAWG recommends that NOAA establish a Memorandum of Understanding (MOU) with the National Geographic Society with respect to the new TV series. In addition, Dr. Mayer requested that the SAB assign a liaison to the OEAWG. The OEAWG has nominated three individuals for membership, two as replacements for members that have rotated off and an additional member to add needed expertise on the National Undersea Research Program (NURP). The nominations are Patricia Fryer, Univ. of Hawaii; Ruth Blake, Yale University; and Timothy Shank, Woods Hole Oceanographic Institution.

Discussion:

One member asked if there was a connection between the Ocean Exploration program and the Navy. Dr. Mayer responded that yes, the Navy volunteered the *Pathfinder* for use on exploration missions and has strong interest in the mapping and telepresence technologies. Reg Beach from the OER program pointed out that the program is working with the Naval Undersea Warfare Center on a project to identify shipwrecks in Narragansett Bay.

One member indicated some concern about the recommendation for the MOU with NGS for the Oceanus TV series, that it might be too specific. Ms. Glackin agreed and indicated that the SAB should be cautious about this. The SAB agreed to consider the MOU with the National Geographic Society in the context of education and outreach and requests the OEAWG to look into possible modes of interaction on a higher level.

The SAB members also agreed to find a new liaison for the OEAWG. Eric Barron volunteered to do this for at least the short term. The group discussed the proposed new members and agreed to accept the nominations.

Action 14: Science Advisory Board accepts the proposed new members of the Ocean Exploration Advisory Working Group and will invite them to serve.

Action 15: Science Advisory Board recognizes the Ocean Exploration Advisory Working Group Report, including the recommendation for an agreement between NOAA and the National Geographic Society on the Oceanus TV series. SAB recommends that NOAA consider the latter in the context of the SAB's overall recommendations in extension, outreach and education.

Meeting Adjourn

Meeting Actions

Action 1: NOAA will provide an update on Cooperative/ Joint Institute status and review process, including perspective from the CI directors at the next SAB meeting.

Action 2: Science Advisory Board Office and NOAA provide background information on Cooperative/ Joint Institute review process and past SAB involvement to SAB members prior to July 2009 SAB meeting.

Action 3: Science Advisory Board will consolidate a list of priorities for NOAA, develop background statements, review, and provide to the new NOAA Administrator.

Action 4: Science Advisory Board will consolidate a list of priorities for itself and develop a plan to address these.

Action 5: Social Science Working Group will complete the final editing of its report and transmit the final version to the Science Advisory Board.

Action 6: Science Advisory Board will accept the final report from the Social Science Working Group report pending final editing and transmit to NOAA

Action 7: SAB accepts the list of proposed members and alternates for the Environmental Information Services Working Group, including a request for a liaison to the NOAA Hydrographic Services Review Panel to cover the interests of the maritime transportation community, and will establish the Group.

Action 8: Science Advisory Board accepts the amendments to the Environmental Information Services Working Group Terms of Reference and will revise to reflect these.

Action 9: Science Advisory Board will contact the Chair of the NOAA Hydrographic Services Review Panel regarding the liaison role to the SAB Environmental Information Services Working Group.

Action 10: Science Advisory Board accepts the Climate Working Group Report on Options for a National Climate Service pending further consideration and will transmit it to NOAA after final review.

Action 11: Science Advisory Board will consider at a future meeting the next steps on providing advice for a National Climate Service.

Action 12: Science Advisory Board accepts the five new members proposed for the Climate Working Group and will invite them to serve. The SAB accepts the four members considered for a second term.

Action 13: Science Advisory Board accepts the proposed new member of the Data Archive and Access Requirements Working Group and will invite him to serve.

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Action 15: Science Advisory Board recognizes the Ocean Exploration Advisory Working Group Report, including the recommendation for an agreement between NOAA and the National Geographic Society on the Oceanus TV series. SAB recommends that NOAA consider the latter in the context of the SAB's overall recommendations in extension, outreach and education.