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**38th Meeting of the NOAA Science Advisory Board
Sarasota, FL
20-21 July 2010**

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

SAB members in attendance: Mr. Raymond Ban, Chair, Consultant, Weather Industry and Government Partnerships, The Weather Channel; Dr. William Ballhaus, President and CEO, (retired) The Aerospace Corporation; Dr Eric Barron, President, Florida State University; Dr. Heidi Cullen, CEO, Climate Central; Dr. Eve Gruntfest, Director, Social Science Woven into Meteorology; Dr. Jeremy Jackson, Director, Center for Marine Biodiversity and Conservation, Mr. Michael Keebaugh, Raytheon (retired); Dr. Frank Kudrna, Kudrna & Associates Ltd; Dr. James Sanchirico, Associate Professor, University of California at Davis; Dr. Jerry Schubel, President and CEO, Aquarium of the Pacific; 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: Dr. Jane Lubchenco, Under Secretary of Commerce for Oceans and Atmosphere and NOAA Administrator; MS Margaret Spring Chief of Staff of Commerce for Oceans and Atmosphere; Dr Larry Robinson, Assistant Secretary of Commerce for Oceans and Atmosphere, Dr. Paul Sandifer, Science Advisor to the Under Secretary; Ms. Laura Furgione, Deputy Assistant Administrator, National Weather Service; Mr. Paul Doremus, Deputy Assistant Administrator, Program Policy Integration; Mr. Craig McLean, Acting Assistant Administrator, Office of Oceanic and Atmospheric Research; Dr. Alexander MacDonald, Deputy Assistant Administrator, Office of Oceanic and Atmospheric Research; Dr. Stanley Wilson, Senior Scientist for NOAA Satellite Service, National Environmental Satellite, Data and Information Service; Mr. Eric Schwaab, Assistant Administrator, National Marine Fisheries Service; Dr, Holly Anne Bamford, Acting Assistant Administrator, National Ocean Service; Rear Admiral Philip Kenul, Commissioned Officer NOAA Corps and Office of Marine and Aviation and Operation.

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

Tuesday, July 20, 2010

Opening Statement by the Chair and Self-Introductions by Science Advisory Board Members - Mr. Raymond Ban, The Weather Channel and Chair, NOAA SAB

Mr. Raymond Ban called the thirty-eighth meeting of the NOAA Science Advisory Board into session. SAB members, NOAA leadership and staff introduced themselves to the public.

FINAL

Welcoming Remarks and Opening Statement – Dr. Jane Lubchenco, Under Secretary of Commerce for Oceans and Atmosphere and NOAA Administrator

Summary:

Dr. Lubchenco welcomed everyone to the meeting on behalf of NOAA and thanked them for attending. She thanked departing members Michael Keebaugh, Gerald Wheeler, Carolyn Thoroughgood and William Ballhaus for their service on the Science Advisory Board and welcomed Eve Gruntfest to the Board.

Dr. Lubchenco said that there has been an inordinate amount of activity since last meeting. The major activity was the Deepwater Horizon (DWH) oil spill, which she described as a human tragedy and environmental disaster, unfolding in the Gulf of Mexico (GOM) and which will be a problem for decades. There is a wide impact of this spill on the Gulf region and nation in terms of human health, commerce and ecology of the food chain, which has rippling effects throughout the overall ecosystem and country.

The oil spill brings home the message that healthy oceans matter and the health of the Gulf is connected to the health of the region. Those connections have been made obvious throughout her discussions with people in the Gulf region. Healthy oceans are important for several reasons such as people's income and happiness, the creatures in the Gulf, and the vibrancy of coastal communities and the Nation. She is personally concerned about short and long term effects on the Gulf of Mexico. Dr. Lubchenco pointed out that this trip to the GOM is her sixth since the spill began and she heard deep concern and frustration from people about their livelihoods and the health of Gulf. She is proud that NOAA is making significant contributions to deal with this tragedy.

NOAA's roles in the DWH have been multiple and unprecedented and very dynamic. Dr. Lubchenco pointed out the NOAA is the lead science agency to the US Coast Guard, providing advice on a variety of issues. At the same time NOAA is also the steward of oceans and coasts. Dr. Lubchenco said NOAA was 100 percent committed to fulfilling its responsibilities from both strategic and science perspectives. She added that there had been an "all hands on deck" response from NOAA within hours of call to the Office of Response and Restoration in Seattle, starting with projected oil spill trajectories. Since that time there has been a huge number of people across NOAA Line Offices, including satellites, planes, buoys, gliders, and scientists on the ground that have contributed.

Dr. Lubchenco said there were a lot of questions asked such as where was the oil going, what is the impact on marine mammals, how would the clean-up proceed, what is the potential impact of hurricanes, and what are the seafood safety concerns? These are just a few examples of issues that have come up. She added that there was a strong connection between this and topics for which the SAB provides advice such as partnerships, ecosystem services, outreach and regional engagement and data management. The regional and national Sea Grant programs are important partners as was demonstrated by their organizing of four town hall meetings early in the incident that were invaluable in providing input on what the concerns were. NOAA will continue working with other federal agencies and the academic community to develop the science for this very challenging event. On June 3, 2010, NOAA organized a science symposium in Baton

FINAL

Rouge, LA to pull together academic researchers to identify priorities on what research should be done. She pointed out that NOAA needed more activities like this to discuss, share ideas and information. A recent workshop in Miami organized by the Atlantic Oceanographic and Meteorological Laboratory (AOML) and the Southeast Fisheries Science Center also brought scientists together to discuss science issues such as the dynamics and physical aspects of the spill. Several other workshops are being planned, including oil spill impacts on human health and deep sea ecosystems.

Dr. Lubchenco said that the DWH tragedy began to unfold the week of the 40th anniversary of Earth Day, an event that came about because of the Santa Barbara, CA oil spill. The Clean Air Act, Coastal Zone Management Act, creation of NOAA, EPA, Clean Water Act, and Marine Mammal Protection Act all were created as a result of the Santa Barbara oil spill. She said it was important to think about what the legacy of the DWH oil spill should be.

Dr Lubchenco remarked on how impressed she was with amazing work on the spill by NOAA staff and how the staff rose to the challenge in a unified manner. She emphasized how appreciative she was of the work and how it was a seamless and integrated effort with partners. Dr. Lubchenco expressed that it was timely and appropriate that on July 19, 2010 President Obama signed Executive Order 13547 creating new National Ocean Council (NOC). NOAA is at the table on the NOC in addition to the Secretary of Commerce. The NOC is co-chaired by the Office of Science and Technology Policy (OSTP) and the Council on Environmental Quality (CEQ). The Executive Order lays out the framework for Coastal and Marine Spatial Planning (CMSP), calling for the creation of nine regional councils to do the planning and integrating of federal, state, local and tribal plans for the regions. The intent of the Executive Order is to ensure sustainability of oceans, coasts, Great Lakes, and their ecosystems for future generations. . Now the hard work starts for the actions come to pass.

Dr. Lubchenco shifted the discussion to NOAA's ship, the R/V *Okeanos Explorer*, which is the only federal ship dedicated to ocean exploration. She said that the *Okeanos* was currently halfway around world in Indonesia on its maiden expedition voyage. Dr. Lubchenco revealed that it was the first time a research vessel was operating in Indonesian waters, working jointly with the Indonesians to explore in an area highly unknown. The *Okeanos* has special capabilities, which include a multibeam mapping system and a dual remotely-operated vehicle (ROV), and is outfitted with high-definition video cameras and a suite of standard oceanographic sensors. In the first week of expedition, the *Okeanos* mapped a huge undersea volcano that towers 10,000 feet above the ocean floor and is taller than all but three or four mountains in Indonesia. Dr. Lubchenco showed videos from the expedition with pictures of seamount in Indonesia, much of which is likely new and yet-to-be-described organisms, including creatures from the vents/ smokers down there. The *Okeanos* has real-time broadband satellite transmission of data to command centers or to scientists anywhere around the world in their laboratories. This system can even send images to school kids so that they can be more appreciative of biodiversity.

On the weather side, Dr. Lubchenco said that there has been extreme weather in the US this year with an above-normal hurricane season anticipated. Factors contributing to this extreme weather are the development of La Nina in the Pacific, which is more favorable for storms to strengthen,

FINAL

and warmer water in Atlantic. This is in addition to tropical multi-decadal signal that leads to stronger storms.

In June there was Hurricane Alex which was a first June hurricane since the mid-1990s. Dr. Lubchenco said that the National Hurricane Center (NHC) is actively monitoring storms, including the potential for any operational decisions for the DWH spill. She added that the numbers of tornadoes for June was very large; June may turn out to be the second most active on record.

Dr. Lubchenco said there has been a lot of activity with respect to the NOAA Climate Service and more details would be provided in subsequent meetings. She also stated that NOAA's State of the Climate Report was recently issued. The warmest month ever recorded in the US and globally was June 2010. The National Climatic Data Center's Climate Extremes index (CEI) examines how climate extremes vary in space and time. In the first half of 2010 the extremes were three times above average and the CEI was six percent higher than the historical average. Dr Lubchenco said the NOAA budget has trended upward from 2005-2010. She disclosed that the FY2011 budget supports strong research and development investments in fisheries, satellite observations, and climate.

Dr Lubchenco concluded saying that it has been a very busy time on multiple fronts but NOAA has stepped up to the response to the DWH oil spill without compromising other activities.

Discussion

Gerry Wheeler asked if there is a way US students can view *Okeanos Explorer* images live. Craig McLean responded that there is a distribution network existing for education with live broadcasts. However, there are some IT security issues to consider and handle before streaming. Some distilled images are already available; information about this is on the Ocean Explorer website. Gerry Wheeler added that it is very important to show that NOAA acknowledges that the information and data are owned by the public

Updates on the SAB Working Group Reviews of the NOAA Next Generation Strategic Plan - Ray Ban, The Weather Channel and Chair, NOAA SAB

The original purpose of this item was to discuss the comments by the working groups of the SAB on the NOAA Next Generation Strategic Plan (NGSP). However, Ray Ban said the deadline for comments on the NOAA NGSP had been extended to July 26 to allow more time for the working groups to review. The SAB will discuss its working group comments in a teleconference during August.

Discussion

Paul Doremus thanked the chair and SAB members for allowing the working groups the opportunity to provide comments. He said NOAA staff has worked to be responsive to comments from the SAB on previous version of the NGSP and look forward to seeing the comments from the working groups. A SAB comment on the theme of resilience - what it means

FINAL

and how effective it can be - was a core message for NOAA. NOAA took away that this concept was sound and works well but the Plan is not the only way to communicate this message. Paul Doremus added that NOAA developed the enterprise objectives to incorporate the outreach and engagement aspects that the SAB has worked for. In closing, he said the SAB will be hearing more about the core content on research and science enterprise. He added that since the last SAB meeting, NOAA held a Science Workshop and content from that workshop formed core content for the NGSP. The Science Workshop will be discussed later in the meeting by Paul Sandifer. He also welcomed the opportunity to talk offline with members.

Frank Kudrna said he was pleased to see the discussion of engagement in the NGSP. He agrees that passing request for comments to the SAB working groups is a great idea and useful tool. Similar opportunities for working groups should be included in the groups' charters or terms of reference so that this can be done more in the future.

Ray asked all liaisons from the working groups to encourage input on the NGSP.

Update from the SAB Ecosystem Sciences and Management Working Group

Jim Sanchirico, University of California at Davis and SAB member

Summary

Jim Sanchirico stated that the purpose of his presentation was to request the SAB to approve a new co-chair and a new member and also to provide an update on ESMWG activities. David Conover, co-chair of the ESMWG resigned in June and moved to the National Science Foundation. Thus two different actions were being proposed to recommend David Fluharty, who is a current member, to assume co-chair responsibilities and to recommend a new member to fill the seat vacated by David Conover. Jim said that the ESMWG members were an active, dedicated and a vocal group with a wide range of expertise. They tried to identify candidates with expertise that would complement the current membership. Three candidates considered for membership slot were in order of preference based on needed expertise: Tim Essington, Ruth Carmichael and Efi Foufoula. Tim Essington is from the University of Washington and his expertise is in ecosystem dynamics, ocean and fishery sciences. Ruth Carmichael is an expert in nutrient cycling, marine benthic communities and currently works with the Dauphin Island Sea Lab in Alabama. Efi Foufoula is from the University of Minnesota and is an Environmental engineer and has expertise in surface water hydrology.

Dr. Sanchirico continued with an update on various ESMWG activities. The ESMWG has set up a subcommittee on Coastal and Marine Spatial Planning (CMSP) and the group is working on a draft white paper to provide guidance to the NOAA SAB on general issues and priorities contained in the interim Framework for Effective Coastal and Marine Spatial Planning. Inputs into the white paper include investigating current domestic and international efforts, examination of task force recommendations in the Presidential Executive Order on Ocean Policy, and NOAA's role with respect to implementation of the policy and framework documents. Dr. Sanchirico pointed out that the goal was to send this draft to the full ESMWG before the October meeting where it will be discussed and, depending on progress, the report may be presented to the SAB at the fall meeting.

FINAL

Jim Sanchirico also noted that the ESMWG is addressing the topic of transformative research. He said the ESMWG strongly supported efforts of NOAA scientists or collaborative teams who propose transformative approaches to major contemporary challenges in science. The ESMWG is continuing discussions, particularly related to ecosystem sciences, and is also considering drafting recommendations for a process to emphasize transformative research as part of NOAA's research funding strategy. In its last two meetings the ESMWG discussed transformative research in NOAA's research portfolio. As a result of these discussions, the ESMWG solicited ideas from members and are currently focusing on defining transformative research and mandates to use as a filter for the group's ideas.

In conclusion, Jim Sanchirico said that the ESMWG would be submitting its formal comments to the SAB on the NGSP but he gave some general comments which included concern over use of jargon, the need for specificity in providing to clarify points, role of the climate service, developing management options for government and society, and integration among objectives.

Discussion

Frank Kudrna supported the nomination of Tim Essington. The motion to approve Essington was moved, seconded and passed unanimously. The motion to approve the candidate for co-chair, David Fluharty, was also moved, seconded, and passed unanimously.

Dr. Lubchenco said transformative research was a topic to be discussed with Craig McLean and Oceanic and Atmospheric Research (OAR). She pointed out that the National Science Foundation has written on this and should be considered through the National Science Board (NSB).

Action 1: The Science Advisory Board approves David Fluharty, University of Washington, as new co-chair of the Ecosystem Sciences and Management Working Group

Action 2: Science Advisory Board approves Tim Essington, University of Washington, as new member of the Ecosystem Science and Management Working Group

Action 3: The Science Advisory Board Office will provide the National Science Foundation National Science Board report on transformative research to the Science Advisory Board members.

Data Archive and Access Requirements Working Group Update - Ferris Webster, University of Delaware and Chair, DAARWG

Summary

The purpose of this briefing was to provide an update on the SAB Data Archiving and Access Requirements Working Group (DAARWG) and to request action from the Science Advisory Board on its membership. Dr Ferris Webster provided a brief update on the Terms of Reference and recent DAARWG activity. He pointed out that the group first met in December 2006 and has had four meetings since then with the most recent meeting being in January 2009. The next

meeting is scheduled for fall of 2010. Ferris Webster highlighted the issues that have arisen which are: advice on NOAA data-retention: concern for developing a NOAA-wide archive; clarification of the roles and responsibilities of the Comprehensive Large Array-Data Stewardship System (CLASS); Data Centers; Centers for Data and legacy data systems. He mentioned that NOAA has created a new Environmental Data Management Committee (EDMC) whose focus is to consider the end-to-end data management life cycle instead of just data access and preservation. Thus, DAARWG plans to broaden the scope of the issues that it will address beyond the emphasis on NESDIS and its National Data Centers. Dr. Webster also pointed out some possible future issues that the group could focus on. The main three issues to consider were:

- How can NOAA best coordinate its multitude of data systems for interoperability?
- Should all NOAA data, whatever their quality be retained?
- Should a NOAA-wide data and information archive be created?

To conclude, Ferris Webster said that the existing DAARWG members had a diversity of expertise but the terms of nearly all DAARWG members have expired. He proposed that the appointment terms be clearly established with staggered lengths and also proposed the appointment of two new members, John Boreman and Krish Narasimham, each of whom will bring a new expertise to the group. He ended by asking for SAB approval of his proposal.

Discussion

Tom Karl asked if the Climate Portal developed by NOAA was something that would fit in the group's redefined Terms of Reference TOR. Ferris Webster responded in the affirmative but added that the DAARWG would need the right people to address climate data issues. Tom Karl said this issue extended beyond NOAA and Ferris agreed saying NOAA's climate data policies should be consistent with international efforts.

Thomas Zacharia said this is an important working group that needs support and that the autumn meeting should be set as soon as possible. Gerry Wheeler asked if this was a standing committee and was told that it was.

Mike Keebaugh asked if there were federal guidelines on data retention and if NOAA was consistent with these guidelines. Tom Karl responded that National Climatic Data Center (NCDC) guidelines are consistent with the federal requirements. Mike Keebaugh again asked if the working group was taking federal guidelines into account. Ferris answered that such considerations have not come up and federal guidelines have not been limiting or constraining. Tom Karl added that there are multiple versions of data-derived products and there are issues about what to retain, including maintenance of relevant metadata. Ferris said his opinion was that NOAA conforms to federal guidelines.

Ray asked if the SAB members were in consensus that the DAARWG should be revitalized, as per its request. Eric Barron agreed the discussion was leading to an agreement on revitalizing the group.

FINAL

Frank Kudrna asked if Integrated Ocean Observing System (IOOS) and eleven regional associations are considered NOAA data and if the DAARWG will discuss peripheral regional organizations and their data archiving and access issues. Ferris said IOOS is something the DAARWG would like to consider but has not done so to date. Tom Karl said that IOOS should be considered because it generates valuable data and will challenge the way NOAA integrates data. The National Ocean Data Center (NODC) is being engaged on this topic and will provide a new model for data not directly generated and controlled by NOAA.

Dr. Lubchenco said that NOAA climate data would be integrated in the new Climate Portal and Tom Karl is already working on this. This portal is not just for NOAA but would be one-stop shop on climate data for federal agencies. Dr Lubchenco added that another effort under way is the Deepwater Horizon data effort and the emergency management tool that NOAA and University of New Hampshire developed to show the status of assets. This has now been transformed into a publicly-accessible site under geoplatform.gov. The Climate Portal and Geoplatform are two new efforts in the last six months, both of which are new visions for accessing and archiving data that go beyond NOAA. These new efforts are much broader than NOAA. Dr. Lubchenco said she did not know if the expertise of current DAARWG is what is needed to handle that larger charge. She added that may be worth taking a look at the broader charge to DAARWG as well as the membership to handle this expanded effort. Ferris agreed that this was very exciting and noted that there will be vacancies opening up in DAARWG in another year and thus the gaps in expertise could be addressed.

Ray Ban said based on Dr Lubchenco's remarks and other comments, this may be the time to look at the working group again based on its broader mission and current membership and discuss whether DAARWG can do it all or whether more working groups are needed. Ferris said he could not comment on this until Working Group had met and discussed this broader issue. Thomas Zacharia agreed with Ferris that the working group should meet again and become familiar with NOAA's new activities.

Ray Ban suggested that there was going to be a broader discussion on working groups later in the meeting and this would be a chance to revisit the DAARWG request. Mr. Ban offered two options: approval of new members and new terms for existing members now or wait and revisit the DAARWG issues after the Working Group general discussion.

Tom Karl noted that if the desire was to reach out beyond NOAA's data then it may be necessary to engage other partners by establishing a group that includes other agencies or representation from international advisory groups.

Jim Sanchirico said it may be worthwhile to rethink the mission of the DAARWG in the context of Coastal and Marine Spatial Planning (CMSP) because the draft CMSP Framework has a lot of questions on data, including standardization of data across nine regions. He added that he did not know if the current DAARWG members have expertise and so was concerned about how these issues would be handled by the working group.

Thomas Zacharia asked if the working group really still existed. Dr. Webster answered that the DAARWG has been inactive for a year. Jerry Schubel suggested that the DAARWG should

FINAL

submit a plan for consideration at the next meeting. Tom Karl said there was need for NOAA leadership to support this group. He added that there should be a commitment from NOAA and identification of leadership on the NOAA side. Ferris Webster said there was support for DAARWG in NOAA through Environmental Data Management Committee (EDMC) although there was some concern about this support now that Helen Wood had retired.

Thomas Zacharia asked if there was a framework to have a meeting if the working group did not have members. Jerry Schubel said the meeting could be used to develop new terms of reference that better reflected the expanded mission.

Ray Ban suggested that if the SAB sets up a working group subcommittee, that group should provide feedback to the full SAB with ideas to consider; this subcommittee should include the DAARWG members. Ray asked if the SAB wanted to look at the DAARWG proposal in light of the broader working groups discussion to follow. The SAB agreed that it was not ready to approve the DAARWG membership proposals at this time but wanted further discussion first. The SAB agreed to further consider this in the near future.

Action 4: The Science Advisory Board will consider the future of the Data Archive and Access Requirements Working Group in the context of the overall strategy developed for SAB working groups.

Report on the Work Plan for the SAB Environmental Information Services Working Group

Nancy Colleton, Institute for Global Environmental Strategies & Alliance for Earth Observations, and Co-Chair, EISWG, Walter Dabberdt, Vaisala, Inc. and Co-Chair, EISWG

Summary

Nancy Colleton presented the EISWG work plan, highlighting key areas of work with external partnerships and determining the best way to handle those relationships. She and fellow co-chair, Walt Dabberdt, see the role of the group as crosscutting and have reached out to the Data Archive and Access Requirements (DAARWG) and Climate Working Groups (CWG) to make sure they serve that role and are complimenting ongoing activities.

Nancy Colleton discussed group membership and noted that one member, Bruce Baughman, has resigned. The group is looking for a replacement and its recommendations will be provided at a future SAB meeting. She also provided the history of the Working Group, leading into discussion of the Work Plan.

At its spring 2010 meeting, the EISWG identified seven action items as part of its Work Plan. These actions included comments on the NOAA Next Generation Strategic Plan (NGSP). It is the group's belief that the NGSP would benefit from a discussion on strengthening partnerships and stakeholder engagement. The EISWG also plans to review and comment on the draft National Weather Service's (NWS) Strategic Plan and subsequent Roadmaps as well as begin the five-year review of the NOAA Partnership Policy. In addition, the EISWG has had interactions with the CWG and will provide advice on NOAA's role regarding information services to

FINAL

support a NOAA climate service, including formation of a subgroup to do this. Walter Dabberdt said the EISWG will work on clarifying roles with respect to rapidly changing needs and have developed a subgroup to look at particular sectors of interest to EISWG and provide advice on NOAA's role in meeting these needs. The EISWG also wants to look at how environmental information is provided to stakeholders and the impact of the information.

Dr. Dabberdt concluded by saying that there are a number of considerations that could fall under the purview of the EISWG and it is within their plan to work with standing and *ad hoc* working groups to accomplish these goals.

Discussion

Laura Furgione mentioned that nominations were open for the National Academy of Sciences' (NAS) study on the modernization of the NWS and she asked if the EISWG wanted to submit nominations. The response was that the EISWG would relay that information to its members so they could submit nominations.

Frank Kudrna suggested that there should be a final NOAA Next Generation Strategic Plan before there is a final NWS strategic plan. Laura Furgione responded that the NWS was working in parallel with the NGSP and that the plans will be coordinated; the NGSP will come out first and then the NWS.

Jerry Schubel commented that he was impressed with the work of the EISWG and wanted to know when and how they would work on ocean and coastal issues. Walter Dabberdt answered that they were asked to focus initially on weather and climate side but they would like to expand the group's work, especially in the built environment as many US cities are located in the coastal zone.

Mike Keebaugh noted that the working group's membership included only one person from academia and asked if this was a problem. Walter Dabberdt agreed that this is a concern but added that the current members did not have a role in the original selection. He stated that they will consider that in identifying individuals to fill future vacancies.

Ray Ban said support to renewable energy industries in terms of data support have arisen in recent years. NOAA will increasingly be asked to support these critical initiatives and thus it is important to think about how that is provided by NOAA, academia and industry. Nancy Colleton said Melinda Marquis from Boulder may be willing to update the EISWG on NOAA activities in this area. Laura Furgione pointed out that Emily Lindow was scheduled to present later in the meeting on the NOAA Strategic Energy Review.

Ray Ban thanked Nancy Colleton and Walter Dabberdt for attending the SAB meeting and presenting the update. The SAB is looking forward to further reports from the EISWG in the future.

Discussion on SAB Working Groups – The Way Forward: *Led by Ray Ban, Chair, SAB*

The purpose of this discussion was to review the relationship between the SAB and its working groups over the past few years and consider whether and how any changes should be made to the groups supported and the processes followed. Ray Ban provided some background on the Charter of the SAB and also reviewed the current, past and ad hoc working groups. He pointed out that the working group rationale is established when either NOAA or the SAB determines that advice is needed by the agency on a particular topic. He also explained the difference between ad hoc groups versus a standing working group.

Ray indicated that terms of reference used by working groups were established jointly by NOAA and the SAB. He added that liaisons for the working groups are identified from both NOAA and SAB and that working group reports were submitted to the SAB for approval and then transmitted to NOAA with or without revisions. Ray emphasized that there have been a number of high profile areas where the SAB working groups provided critical advice and input to NOAA.

Ray Ban posed some questions for discussion:

- Are the current standing working groups the correct ones?
- Is there a need to add, subtract or combine groups?
- Is synergy among standing working groups being optimized?
- Is there a need to for any new Ad hoc working groups?

Discussion

Bill Ballhaus asked if there is a mechanism for disestablishing a working group. Cynthia Decker responded saying that the SAB has never had to disestablish a working group. The closest example was the plan to disestablish the Ocean Exploration Advisory Working Group (OEAWG) when legislation created a new Ocean Exploration Advisory Board (OEAB). The SAB agreed to dissolve the OEAWG after NOAA formally creates the OEAB. Such an action to dissolve a working group would require specific action from the SAB.

Carolyn Thoroughgood stated that the SAB needs to be agile. She said the SAB must determine how they can be responsive in a timely manner. She also suggested the need to work across agencies by perhaps having talks with other advisory boards in other agencies. In this way, working groups could be optimized by having them do double duty with other science advisory boards.

Eric Barron suggested that if a group becomes inactive then the charge to that group is inappropriate. A group can also be inactive because the people are not right for the group or because NOAA does not need it. Should this happen, the SAB should reconsider the working group.

Eric Barron further noted issues in the Ocean Policy Task Force Report and asked if the SAB should provide advice on these. He said there were areas in NOAA's portfolio that will need advice in the future. He gave the Deepwater Horizon oil spill as an example and added that

FINAL

advice given early impacted responsiveness but that other science in regards to the oil spill was not considered after that. He asked if science was being regionalized and if that was being captured in any of the working group structures. He emphasized that science advice should be given to NOAA from the beginning of these processes and not later.

Ray Ban responded to Carolyn Thoroughgood's comment on nimbleness by asking if the SAB needed to think about "SWAT" (rapid response) working groups for high profile situations and if SAB meetings could be done virtually to allow faster response time to these.

Frank Kurdna said the NOAA SAB narrative needs to emphasize independence of the SAB and its advice. On standing committees, he said that there should be a regular agenda item on the status of the committees and consideration of whether or not provisions need to be made to end a working group after a certain period of time. He noted that interactions between working groups is a good idea and also expressed that there should be a new standing working group on engagement. He indicated that he had communicated this idea to Andy Winer, the Director of NOAA External Affairs, who, in turn, indicated his support for this concept.

Bill Ballhaus asked about the role of NOAA management in the process of proposing and in disbanding working groups. He said that the SAB provides objectivity and independence in its advice on possible conclusions. He added that NOAA management has to play a key role in helping to define areas of interest when developing and defining working groups. He asked if Cynthia Decker has observed and consolidated NOAA management opinion. Dr. Decker responded that all working groups were established in consultation between NOAA and the SAB.

Bill Ballhaus wanted to know if and when NOAA has ever determined that there was no value in advice received from the SAB. The response was yes and that this had happened with the Ocean Exploration Advisory Working Group. However, this group is going to be replaced with another advisory body so not quite the same as disestablishment because no longer relevant.

Thomas Zacharia said he is a member of various other federal advisory committees and from his experience, almost always these respond directly to requirements from the agency. He said it was not usually a good idea for an advisory board to create its own working groups independently because these groups must be relevant and wanted by the agency. On the issue of extemporaneous meetings, he said teleconferences can be set up but there is still need for public access. He gave an example of the data working group conference call, where there was not access for stakeholders seeking answers. Bill Ballhaus shared that he was past chair of the Air Force Science Advisory Board (AFSAB). The AFSAB would jointly identify the top problems with the head of agency. As a result, the Board worked on problems of direct interest to the agency leadership. Thomas Zacharia added that interaction between working groups comes about generally through interactions by members of the Board working on the groups and not through actions of the working groups themselves.

Gerry Wheeler emphasized the importance of the independence of the SAB. He noted that for the Extension, Outreach, and Education Working Group, the SAB decided that this was an important issue to NOAA and decided to address the issue even though this was not very popular

FINAL

with all of the NOAA leadership. Tom Zacharia added that the SAB is only an advisory board, thus, it must ultimately work with NOAA for constructive engagement. Gerry Wheeler concurred but also pointed out that sometimes the Board has to push issues if it thinks the issue is important.

Jerry Schubel said NOAA is a science and service agency and thus must deliver science and products that people will use. Therefore there is need for transformative strategies and the SAB should encourage NOAA in this arena. He suggested a new *ad hoc* working group that focuses specifically on this

Holly Bamford said the NOS interest is on coastal areas. She said there is need to look at communities and economies and multiple uses of coasts. From the perspective of NOS, it would be useful if the SAB could provide advice on core capabilities and responsibilities such as the Integrated Ocean Observing System with a coastal and regional focus. Larry Robinson said Deepwater Horizon was consuming a lot time and effort both in the short and long term. He added that there will be a lot of ecological impacts of this oil spill. He asked if the SAB would consider providing some advice on how to marshal response.

Paul Sandifer noted that this was all good advice but that there needs to be a better connection between working groups and the SAB. There are a number of connections to be made, including the physical sciences, the breadth and maturity of ecosystems, the terrestrial environment, and recognition of the built environment—where the people are. He would like the SAB and NOAA to think about working group arrangements that better connect these pieces. Maybe a coastal working group would be one that could connect these without reinventing things.

Mike Keebaugh asked if the Board should ever initially set up a standing working group as opposed to first setting up an *ad hoc* working which can progress to standing group. The response was that there were two examples of when this happened. The DAARWG and OEAWG were created as standing groups without first being *ad hoc*.

Eric Barron asked if the NOAA Next Generation Strategic Plan will have any impact on how NOAA will be structured and if the answer is yes, the perhaps there should be a correspondence from the advisory structure to the components of the strategic plan. Larry Robinson agreed that alignment would be good and that NOAA would be diplomatic and recognize the independence of the committee. He said there may be some additional standing or *ad hoc* working groups needed.

Jeremy Jackson said when considering Deepwater Horizon, the ecosystem and oil spill, none of the impacts are a surprise. There is a body of knowledge that exists; however, those lessons have never been incorporated in management policies for natural resources. If there is commitment to healthy oceans and a regional approach, then there should be diligence and NOAA must be encouraged to focus on this issue.

Bill Bauhaus said risk management is a huge issue and risk should be properly mitigated. Often mitigation does not occur because of low probability of the occurrence of an event and also

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because of time or money. He asked what the high consequence risks are and how have they been mitigated and also who defines the unmitigated risks and who defines the consequences. He said that with regards to the oil spill there is no one better than NOAA in defining risk. He added that NOAA should have a role in the risk mitigation for things like deep water drilling. Dr. Jane Lubchenco responded that the previous arrangement was that the Minerals Management Service (MMS) had the authority to make decisions and consulted with NOAA although not required to consult on every step. NOAA could comment but MMS decides what to do with NOAA input. There was evidence that sometimes plans based on NOAA's comments were considered but other times the NOAA comments were not taken into account. She pointed out that NOAA did not recommend measures for mitigation of risk but just raised the concern about a high risk event. NOAA accepted MMS account of blowout risks. She added that previously NOAA has not independently calculated risks from MMS; that needed to be reexamined. Bill Ballhaus suggested that even if there is a low probability of high consequence events, they should be mitigated. Dr. Lubchenco responded that the Commission the President is setting up will address this. She asked if the SAB was able to help.

Ray Ban said he believes strategic plans are critical and are not just an exercise as they are used to guide operational decisions, what to do and what not to do. Thus it is critical for the SAB to provide input to the Next Generation Strategic Plan. Accordingly the working groups and objectives should be aligned to this plan. Dr. Lubchenco concurred saying NGSP was very real but is also a function of the budget, authorization and line items. She added that mapping these onto the working groups makes sense. Ray Ban pointed out that the main objectives have remained the same and if we were to "zero-base" working groups today the best way to move forward would be via the strategic plan. If there are elements in strategic plan that cut across the four objectives then perhaps the working groups may address these. Ray Ban also said there is need to consider rapid response working groups to address issues in the short term.

Jeremy Jackson pointed out that one of the things that stand out is the breakdown of communication between bureaucracy and community. For this reason, there is need for a fifth goal that deals with the issue of informed society and communication and should be an issue for an SAB working group to look into. Paul Doremus added that the intent of the engagement enterprise in the NGSP is supposed to be wide and cut across all of the goals but perhaps this section is not strong enough. Jeremy Jackson said that this is very important and should be singled out for more focus.

Heidi Cullen supported these concepts. She pointed out that this is the 41st anniversary of the moon landing and the group saw images of the deep ocean from the Okeanos Explorer today. She noted that not enough is known about this planet yet so there is a need to communicate resiliency better.

Ray Ban highlighted the actions for the discussion saying that the working groups would be organized around the four NGSP objectives and those working groups would be cross-cutting. The logical way would be to convene group of SAB members augmented with appropriate folks from NOAA to look at the current working group structure and report back with specific proposals at the next meeting. The members of the SAB that will be part of this team are Eric Baron, Heidi Cullen, Frank Kurdna, Jim Sanchirico and Jerry Schubel; they will work with Larry

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Robinson from NOAA. Jerry Schubel said that there is need to add chairs of existing standing working groups but the group agreed that this would make the Subcommittee too large. The SAB agreed the Subcommittee should consult with the chairs of the existing working groups in development of its recommendations.

Dr. Lubchenco stated that this was an exciting discussion to revisit and rethink the working groups. She also said the current working groups were good and there is need to avoid derailing or losing their work. There is also a need to ensure that working groups have customers within NOAA so as to avoid a disconnect and lack of usefulness.

Mike Keebaugh asked about the fate of the DAARWG. There was no decision made on the DAARWG. The SAB deferred this until a later date.

Action 5: The Science Advisory Board will form a subcommittee to develop a plan for working groups (standing and *ad hoc*). This group will engage chairs of existing WGs and relevant NOAA staff as appropriate and will consider how to align WGs with objectives of the NOAA Next Generation Strategic Plan.

NOAA's Role in Oil Spill Response - *David Kennedy, Acting Assistant Administrator, NOAA National Ocean Service*

Summary

The purpose of this presentation was to provide the SAB with an overview of NOAA's involvement in oil spills in general and the high-level response to the Deepwater Horizon (DWH) oil spill in the Gulf of Mexico in particular. David Kennedy, who was designated as the lead for NOAA's response to the DWH oil spill, began by saying that NOAA has had long-term responsibilities for the response to oil spills. The Deepwater Horizon event, however, had so many new issues that the response to meet requirements was as much of the story as the spill itself. David Kennedy said there were a variety of reasons why NOAA was responding in the Gulf. NOAA conducts science for a spill and is a trustee along with other federal and state agencies. He also listed a number of NOAA statutory authorities that related to NOAA's involvement in the Deepwater Horizon spill.

David Kennedy provided a brief history of the event. On April 20, an explosion and subsequent fire damaged a deepwater drilling platform approximately 50 miles southeast of Venice, Louisiana. The rig capsized and sank on April 22, after burning for hours. It is unclear how much the estimated 700,000 gallons of #2 fuel onboard burned before it sank. The rig is owned by Transocean and under contract to BP. He continued that as the leading scientific resource for spills, NOAA has been on the scene of the BP spill from the start, and arrived on the scene in a matter of minutes, providing coordinated scientific weather and biological response services to federal, state and local government organizations. He said NOAA mobilized experts from across the agency to help contain the spreading oil spill and protect the Gulf of Mexico's many marine mammals, sea turtles, fish, shellfish and other endangered marine life. He also provided a list of NOAA's scientific support activities that ranged from incident specific weather forecasts to satellite imagery for spill trajectory forecasts. Dr. Kennedy explained that NOAA tried to survey

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shorelines before the oil came onshore, and then assessed the oil when it came ashore and the process to clean it up. He said satellite imagery for the oil spill trajectory forecasts were a significant contribution of NOAA. He said weather played a significant role daily in terms of safety and techniques used for the cleanup. He also said that as the response got more complex, more NOAA line offices were involved and a new structure within NOAA was developed to manage the NOAA response to the spill. Personnel within the new structure were engaged both on the site and remotely. NOAA ships that were on cruises were repurposed to respond to the spill.

David Kennedy said issues that evolved with the spill were unique and thus the response needed to be organized in a different way from other spills. Issues from the spill included operations on the ground with the US Coast Guard; science on scene that was not adequate to answer all questions; and new budget, policy, legal, and international questions. Consequently dozens of new pieces of legislation were introduced to address these issues. He noted that NOAA was mentioned in about half of these and is trying to provide its best information to the Congress. Dr. Kennedy pointed out that there were current and upcoming challenges. There have been problems with getting data accessible while ensuring the quality of those data. NOAA is working with partners on QA/QC clearances to provide quality data as soon as possible. There are several portals for these data now.

He also pointed out that NOAA has predicted that this is going to be a very active hurricane season. This will impact operations because some activities will need to be shut down during a hurricane. The environment and thus the behavior of the oil will also be affected by a hurricane. He also mentioned NOAA's responsibility to protect marine mammals and sea turtles, including necropsies for those that have died and treatment for those that have been rescued. Once the well is capped, there will be a transition to other activities such as restoration. However, the Gulf of Mexico is an ecosystem already impacted by other threats. Given these other impacts, it has to be determined how bad this has been and how long it will take for the system to recover. Not enough is known about the ecosystem to make predictions on recovery. There have been White House discussions that focus on long-term restoration. For that reason, a group has been formed by the White House to integrate restoration activities in long term.

Discussion

Mike Keebaugh asked what was not getting done at NOAA due to the DWH. Dr Kennedy responded that NOAA tried very hard to keep things going and staff stepped up and back-filled positions for individuals assigned to the spill; thus far no other critical activity has been compromised. Dr. Lubchenco said were people brought out of retirement to fill some positions, especially the Office of Response and Restoration. She said NOAA was not in triage mode but some activities have been delayed because there really is not enough staff to do everything. NOAA is identifying people to rotate in and out of various DWH activities in order to avoid staff fatigue but this has been a challenge. Larry Robinson added that some of these efforts are reimbursable and NOAA is tracking this so that investment will be recovered from the responsible party, particularly assets in the field. Ray Ban said trying to quantify efforts may be a good story to tell.

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Dr. Lubchenco said in interagency efforts and the Unified Area Command NOAA's contributions have really been recognized and this has not happened before. NOAA has been a key player on a par for this effort with cabinet-level agencies and OAA has been giving briefings to the President on average once a week. Some NOAA people are leading and many others are participating on the National Incident Command. NOAA has not gotten this visibility before. This is due to the expertise that NOAA is bringing to this effort.

Jeremy Jackson asked about NOAA-specific role in restoration since it is the natural resources trustee. Dr. Kennedy responded that NOAA is responsible for the Natural Resources Damage Assessment (NRDA) and will assess before and after the spill how to restore the system. There are also other NOAA programs with significant expertise in restoration. Therefore the agency is expected to play a significant role in the restoration effort.

Stan Wilson asked that, given the uncertainty in spill rate, how does this spill compare to the Exxon Valdez spill rate of 35k-60K barrels/ \$2M gallons a day; the media has said that DWH is releasing an Exxon Valdez equivalent every 5-6 days. Dave Kennedy answered that this was hard to calculate because the flow rate is still not clear and mass balance budget difficult to do.

Frank Kudrna asked if NOAA thought its efforts were recognized given the frustration from the shoreline. Dr. Lubchenco said the story is not being told as well as it could be because even NOAA has not always made clear who is doing the work and this an area that can be improved. On the other hand, Dr. Lubchenco said she had visited the region six times and many people in region expressed appreciation so the public is not all of one mind.

Panel Discussion: Regional response to an ecological disaster - integrating science capabilities within a regional framework - *Michael Carron, Director, Northern Gulf Institute; Bonnie Ponwith, Science Director, Southeast Fisheries Science Center; Russ Beard, Director, NOAA National Coastal Data Development Center*

Summary

The panel used the Deepwater Horizon oil spill as a context to talk about regional collaboration teams in terms of how they perform during an event of unprecedented magnitude. They detailed the issues faced, which included identifying the ecosystem response, establishing partnerships for enhanced response capabilities, coordinating the data collection efforts, and facing the challenges of direct and indirect pressure for quick results and directives from multiple directions that may result in reduced coordination and duplication of efforts.

NOAA Cooperative Institutes and their associated universities were formed to confront the stated issues and challenges. New structures were also created within NOAA to cope with these problems. In 2006, NOAA regional collaborations were created with the primary purpose of looking across the NOAA line offices to leverage capabilities in the region.

Panel members stated that NOAA Cooperative Institutes and their associated universities are prepared to mobilize and assist NOAA line offices. The Cooperative Institutes in the Gulf of Mexico region include the Northern Gulf Institute, the Cooperative Institute for Marine and

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Atmospheric Studies (CIMAS) at the University of Miami and the Cooperative Institute for Ocean Exploration, Research, and Technology (CIOERT) at the Florida Atlantic University. The Regional Cooperative Institutes can play significant roles such as mobilizing assets quickly and can assist NOAA in planning. The Regional CIs have strong regional expertise as well as extensive collaborations with NOAA line offices, non- CI universities, state agencies, NGOs and Sea Grant organizations. During the oil spill, regional efforts provided a nimbleness and flexibility that allowed a strong response to the spill. The panel said it was important to remove bureaucratic hurdles in emergent situations for an effective response.

The panel members said that proliferation of data is making it increasingly difficult to find the specific information desired. Citizens and non-governmental organizations are pressing for access to public data at the national, state and municipal level. They added that providing access to data creates culture of accountability. One lesson learned from data management was how to get data out as quickly as possible

The panel concluded its presentation by stating that the desired outcome was to have SAB guidance on developing inter-governmental collaboration with both federal and state agencies. An additional desired outcome was a need for insights on how to more effectively utilize NOAA's Regional Collaboration Teams as a mechanism for integrating resources, including reaching across line offices and fostering good working relationships with regional academic institutions.

Discussion

Larry Robinson asked if there was coordination with other agencies for data. Russ Beard responded that, for the Deepwater Horizon data, the Coastal Services Center is working with Environmental Protection Agency (EPA), U.S. Geological Survey (USGS), Navy, CIs and others to gather data and put it into an Environmental Response Management Application (ERMA) and GeoPlatform (the visualization website). Jerry Schubel said the decisions on data were not always made by NOAA but by organizations in the Gulf. He wanted to know what was being done to minimize the mistakes. The panel members responded that daily discussions among the Joint Analysis Group (JAG), EPA, USGS and BP were carried out to interpret data and agree on results.

Thomas Zacharia asked what best practices the panel would like to see institutionalized and also what significant challenges were yet to be overcome. He said a "data warrior" was need to speak at an interagency level at the National Incident Command (NIC) and Joint Incident Command (JIC) to make sure protocols and standards were established and surveys were being done in a consistent manner. He added that a continuity of operations plan was also needed for risk mitigation on oil rigs in order for federal agencies to respond. He said the focus should be to have assets in each region to respond to these incidents.

Stan Wilson asked about capabilities and limitations of current observations and forecast models for oil projections. Michael Carron responded that forecasts of subsurface oil trajectories were very problematic. For surface oil trajectories there has been more research. Initial predictions

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were not good because the physics in the models were not well characterized. In addition, a lot more *in situ* monitoring is needed to improve the models.

Frank Kudrna asked if the SAB reviews of the Cooperative Institute should include a recommendation for one that addresses disasters. Mike Carron answered yes although six months ago the answer would have been no. He added that that NOAA's regional collaboration team in the Gulf has been very active and there is a lot of integration on that team between the NOAA offices in the GoM and the members of the Gulf of Mexico Alliance.

Eric Barron said he thought there were regional enterprises with data sets and models readily accessible. The reality was that there were a series of projects because there are a series of talents. He asked if they could look at what exists now and say what it should have to respond to such an event. Bonnie Ponwith answered that the oil spill has forced them to work at many levels, across disciplines and across agencies, to do things quickly and worry about funding later. This has reinforced the importance of ecosystem approaches including human dimensions. Russ Beard added that granularities of information vary among areas with some having more data than others and some with hardly any data.

Eric Barron asked what was needed to set up a regional center. Mike Carron said money was needed to collect baseline data throughout the Gulf and a workshop would be needed to determine data standards, what to measure, how to get all data into a central location to develop products.

Larry Robinson said a discussion was held in June 2010 to consider where and what research should be done to understand the ecosystem. He said he was glad that universities are discussing how to integrate and collaborate on research with BP funds including the Florida Institute of Oceanography, Northern Gulf Institute, and Louisiana State University. The federal government has framed some of these research areas and the hope is that this will continue. Mike Carron said universities in DWH-affected states were developing a cooperative effort to identify and carry out a research agenda. Larry Robinson added that he met with the Chancellor of the University of Florida on this issue and also with non-university research entities who could also contribute. Jerry Schubel said an advantage of the CIs is their expertise in regional operations and areas but should expand disaster prevention.

Ray Ban asked the panel if the members were satisfied with the interactions with the SAB. The response was yes but that this was just the start of a dialogue which can be continued with the SAB.

Summary

The purpose of the presentation was to provide an informational overview of the NOAA Strategic Energy Review. Emily Lindow stated that the Strategic Energy Review (SER) was directed by the NOAA Executive Council in June 2009 to provide an inventory of existing programs and legislative mandates and to examine gaps and develop recommendations. Ms Lindow said that as the U.S. attempted to transform many aspects of its energy economy, NOAA had the capabilities to make important contributions such as improving domestic energy security; expanding clean energy technology, which also creates jobs; decreasing greenhouse gases; and decreasing the environmental impacts of ocean and coastal energy exploration and development. She said potential contributions were based on NOAA's scientific expertise.

Ms. Lindow said that all of the NOAA line offices were either directly or indirectly involved in energy-related issues. NOAA roles were defined by many legislative mandates. Agency roles include regulation, environmental review, science, and services and cover multiple energy sectors such as land and water. She talked about the federal agency workshops organized by energy sector. The goals of the workshops were to gain understanding of roles and responsibilities, evaluate and improve relationships and to determine how NOAA could help with future energy challenges. Findings from the workshops were that NOAA's unique roles in energy complement and enhance the work of other federal agencies.

Several recommendations were made by the Strategic Energy Review. The first recommendation was that the importance of energy-related activities should be clearly articulated and integrated into NOAA's objectives, strategies, and plans. The budgeting process should recognize the importance of NOAA's energy activities. This means that there is a need to communicate clear leadership support regarding the importance of NOAA's energy role. NOAA should establish a more formal internal structure to coordinate and manage energy issues, recognize importance of energy roles in strategic plans and budgetary documents, and align NOAA efforts with Department of Commerce priorities.

Secondly, NOAA should expand or augment its existing observing, modeling, and forecasting capabilities to provide additional science and services that will benefit renewable energy production and use. This can be achieved through many ways that include the use and possible expansion of observing systems and aggregation of data to improve models. Another recommendation was that NOAA should take actions to improve regulatory consistency and predictability for coastal and ocean energy sectors, while also seeking to decrease their environmental impacts.

Lastly, NOAA should seek legislative clarity related to its role in science and services for energy. NOAA should seek reauthorization of additional legislation related to energy. This could include authorization to support science for weather- and water-driven energy sectors, reauthorization of the Coastal Zone Management Act, and revisions to the Ocean Thermal Energy Conversion Act. The SER will be reviewed next by NOAA line and staff offices and NOAA councils. After final edits by the SER team, the report will be reviewed by the NOAA Executive Council.

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Ms. Lindow ended by saying that she was interested in comments from the SAB particularly on the draft recommendations.

Dr Thomas Zacharia asked about NOAA's involvement with nuclear power issues. Ms Lindow said National Marine Fisheries Service (NMFS) does environmental reviews because of the location of many nuclear power plants on coasts or rivers. Ms. Lindow added that hydrologists reviewed the use of cooling waters. Dr. Zacharia agreed but said that no reactors are being built. He asked if there was a proactive stance from NOAA. Ms. Lindow answered that NOAA was not particularly taking a proactive stance but National Weather Service (NWS) and Climate Service (NCS) were meeting with National Research Council (NRC) on issues of interest.

Dr. Zacharia asked if NOAA was complying with the requirement to reduce the generation of greenhouse gases by 28% by 2018 and, if yes, what NOAA was doing to comply. Ms Lindow replied that NOAA has a team on the greening of NOAA. Mr. Craig McLean added that NOAA has a biodiesel program for the Great Lakes (GL) ships in Ocean and Atmospheric Research (OAR). He said it was a small-scale program that could be expanded.

Dr. Frank Kudrna said three pieces of legislation were recorded. He stated that NOAA should have an organic act and seek combined authority. Ms Lindow said this was a great suggestion and these authorities could be consolidated in an organic act.

Dr. Laura Furgione thanked Emily for her presentation. Dr. Furgione mentioned that observing data are a recurring theme for energy. There are issues of proprietary rights on data related to oil and gas activities, for example. In the Gulf of Mexico, there is a Memorandum of Understanding about this but similar agreements are needed elsewhere.

Wednesday, 21 July 2010

The meeting was called to order by Dr Cynthia Decker, the Executive Director of the NOAA Science Advisory Board. Mr. Raymond Ban welcomed everyone and thanked Dr. Eric Barron, Florida State University and the Ringling Museum for hosting the meeting.

Climate Working Group Spring 2010 Meeting Report - Antonio Busalacchi, University of Maryland and Chair, CWG

Summary

The purpose of this talk was to present the report from the most recent meeting of the Climate Working Group and findings contained in it. Antonio Busalacchi began by explaining the main focus of the Climate Working Group (CWG) Spring meeting. He said the focus was NOAA's plans for a proposed Climate Service inclusive of NOAA's responsibilities vis-a-vis other agencies, integration of science and services, communication/outreach, high performance computing needs, and Climate Service Priorities for 2010-2020 across regional services, observations and monitoring, and science (i.e., research and modeling). He also stated areas of concern noted by the CWG. The issues of concern mentioned were the lack of specificity and priorities needed to implement NOAA's Climate Service, lack of formal response from NOAA

to CWG reviews of the past three years, low priority for seasonal to inter-annual climate prediction in the NCS initiative, lack of apparent strategy within the NCS initiative for the provision of climate predictions on regional scales, and the expressed need for a realistic and inclusive computing requirements planning process. Dr. Busalacchi also gave an overview and update on the CWG opinions on NOAA's Planning for a Proposed Climate Service. He said most of the statements made in the NCS presentations were quite general and focused on challenges, principles of various kinds, and issues that merit consideration. Thus they were informative, but did not provide much substance about how NOAA intends to create and then operate a NOAA Climate Service. The CWG recommended the NCS leadership team start filling in the details such as what is already being done, what will be done, how it will done and assessed.

He also commented on the NOAA Engagement and Communications Strategy. He said the CWG was extremely supportive of the Climate Portal effort and felt that it has great potential for NOAA's engagement strategy and as the agency's public face to the public, stakeholders, and decision makers. However, the CWG believes a considerable amount of effort is needed to determine what can be done in a timely manner to engage the public on such topics as response and attribution. He added that NOAA's Climate Engagement group faces challenges in shifting from a media focus to a key role in bidirectional dialogue and discovery with users that informs climate services. With limited resources and rapidly evolving demands, the need to prioritize engagement will be required.

Dr. Busalacchi talked about the Climate Service's 2010 - 2020 Priorities for Regional Services, Climate Observations and Monitoring, and Science (Research and Modeling – CRM). He said the presentation on regional services provided a philosophy for designing regional services, with six objectives and five design requirements. These will include a graphical depiction of the relationships between users, NOAA units comprising the core of "climate services", other NOAA units, federal partners, and the larger climate services enterprise. Although this is a good evolution the CWG notes there is little sense of how the philosophy translates to implementation and practice, relationships with partner agencies, or priorities, or any criteria for establishing priorities of regional climate services, even in the schedule of FY2010-2015 activities. He added that the CWG recommends that either the NCS as envisioned or an Interim/Transition Plan develop a very specific case to "build out" climate services, with a realistic time schedule, to demonstrate that NOAA understands what it means to integrate science and regional services in practice.

With regard to the Climate Observations and Monitoring, Dr. Busalacchi said the program review presentation was structured by several components: ocean observations, climate forcing, atmosphere, and Arctic. He said because NOAA has had no responsibility for land climate monitoring, there are no plans of what types of land observations may be required, nor any strategy for land monitoring as part of a NOAA Climate Service agenda. Addressing these goals will require significant investment and interagency and international coordination. He also stated that the CWG is concerned there was no evidence of an integrative structure or strategy. In other words there was no apparent attempt to prioritize or establish the synergies and interrelationships among observing components that might aid prioritization. He noted that the ocean observing effort has been quite responsive to past CWG input and that this system benefits

international and interagency engagement. This is a healthy input that helps guide prioritization and ensure a broader than NOAA perspective. He also said it was not clear from the presentation that the other components of the observing effort had similar guidance. Such guidance over the whole observing portfolio would lead to greater synthesis and holistic management.

Antonio Busalacchi said the overall goal of the Science (Research and Modeling CRM was expressed by three sub-goals: understanding climate processes; Earth System Modeling for prediction and projections; and analysis and attribution. He said the CWG noted the lack of seasonal-to-inter-annual climate forecasting and regional modeling in support of regional climate change assessments in the current activities. Fifteen items were provided as the current thinking for topics/ areas of mid-term consideration. They were not prioritized and it was more a stream of ideas than the output from pre-determined CRM planning. He said the CWG has concerns that it is unclear how priorities are being set, particularly to meet NCS needs; He said that significant gaps exist in areas like seasonal-to-inter-annual forecast improvements and regional modeling and downscaling of climate projections needed for climate assessment studies among others.

Dr. Busalacchi reported that at the Fall 2009 meeting, the CWG indicated that the Climate Program needed a realistic computing requirements planning process and requested a briefing on this topic at this meeting. The NOAA Chief Information Officer and Director of High Performance Computing (HPC) and Communications briefed the CWG on NOAA's HPC Strategic Plan for 2010-2015, application of American Recovery and Reinvestment funds, the target HPC architecture, and the integrated management of this architecture. However, the CWG did not receive the briefing that was expected on the computing requirements planning process. It was quite apparent that NOAA's external user community was not well represented in this planning process. Neither access to the research computers by the NOAA-funded external research community nor the computing needs for NOAA-sponsored research have been taken into account. It was unclear, for example, if the computational requirements of the RISAs were solicited and factored into the planning process, or how regional climate modeling in an operational sense is to be accommodated.

Discussion

Eric Barron asked if the CWG was defining land climate services. The answer was that what was meant by the CWG was land observations such as soil temperature and moisture that align with land surface processes. The US Geological Survey states that it is the lead in land surface processes but there is a long history in NOAA as well and a need for integration and consolidation.

Larry Robinson said he served on National Science Foundation NEON advisory board and thought that this program would provide the land-based observations for climate change. He said there was an interagency working group for NEON and asked if NOAA was part of this group. Dr. Busalacchi pointed out that the CWG asked how NOAA was prioritizing observation three years ago when they reviewed climate observation. The response then was that there was no prioritization that the agency did not know how. Three years later there is still no prioritization of observation systems.

Frank Kudrna stated that congressional approval was required for the reorganization of NOAA's National Climate Services (NCS) and wanted to know what the status was. Mary Glackin asked Tom Karl to give an overall update of activities happening with Climate Services.

Tom Karl replied that NOAA was funding a study by the National Academy of Public Administration on climate services. NOAA has prepared a draft implementation strategy which is yet to be seen by NAPA until it has been reviewed within NOAA. The climate offices would then do a broader review after which they will include the CWG. The Climate Service Implementation Strategy addresses several priority NOAA issues such as strengthening science and delivering improved service. It also identifies why the Climate Service is needed and how it is going to partner within and outside of NOAA. NOAA must preserve good science but also provide assessment services to move information to decision making, including problem-focused climate assessment—regional activities, stakeholder requirement. An example is the Devil's Lake where the shoreline expanded due to increased precipitation. They have been asked to determine the cause and what is likely to happen in the next 20 years. They have answers to some of the questions but for others there is need for more research. He said there will be a number of areas where the climate service can make a difference based on a number of factors. Frank Kudrna said that his question regarding the status of creation of the Climate Service was not answered. Tom Karl responded that authorization approval is needed to spend money on a new line office. He said he believed that they did not need a new bill or legislation to create the climate service and that they are looking for this in the 2011 budget. Craig McLean added that for authorization from Congress NOAA must submit a reprogramming request. Congress has requested the results of NAPA study before it will consider this reprogramming.

Jerry Schubel asked about the status of the NOAA responses to three program reviews from the CWG through the SAB. Cynthia Decker said NOAA would provide a response to all three of the reports by the fall 2010 SAB meeting. Tom Karl added that the original plan had been to respond collectively when the climate service was formed but it took longer than anticipated. Ray Ban asked if there were any questions about the report before transmitting to NOAA. Antonio Busalacchi said the CWG meeting reports were not usually sent to NOAA upper management. Ray Ban responded that this report included recommendations that the SAB believed would be useful to NOAA. Therefore, the SAB decided it would formally transmit the report to the Under Secretary.

The SAB members agreed to accept the report of the CWG and transmit it to NOAA. Eric suggested that the letter accompanying the report include key issues of interest from the report. Ray Ban agreed to draft a letter and circulate to members. The SAB will discuss and make a final decision on the transmittal letter at a conference call in August.

Action 6: The Science Advisory Board accepts the Spring 2010 Meeting Report from the Climate Working Group and will transmit it to the NOAA Administrator with a letter that highlights key points of advice to NOAA contained in the report

Panel Discussion: Strategies for Regional Coastal and Marine Spatial Planning - engaging other federal and state partners with the Gulf of Mexico as an example - Paul Sandifer,

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Acting Senior Science Advisor, NOAA; Bill Walker, Director, Mississippi Department of Marine Resources, Gulf of Mexico Alliance; John Stein, Deputy Director, NMFS Northwest Fisheries Science Center; Cristina Carollo, Research Associate, Gulf of Mexico Geospatial Assessment of Marine Ecosystems (GAME), Florida Institute of Oceanography

Summary

Paul Sandifer presented the National Ocean Policy Plan and its relationship to Coastal and Marine Spatial Planning (CMSP). He announced that on Monday, 19 July, 2010 the President announced the recommendations in Executive Order 13547. He also gave an overview of the National Ocean Policy and Framework for Coastal and Marine Spatial Planning. In June of 2009 President Obama signed a memo that established an Interagency Ocean Policy Task Force (OPTF) which was chaired by the White House Council on Environmental Quality (CEQ) and the Office of Science and Technology (OSTPP). Members of the OPTF are Senior Policy level Officials from across 24 federal Agencies and Departments; Dr. Lubchenco was the Department of Commerce representative. Both the Pew Ocean Commission and US Commission on Ocean Policy in their recommendations (in 2003 and 2004 respectively) called for the establishment of a comprehensive national ocean policy to remedy the current situation where there were over 140 different laws that govern the management of oceans. President Obama's charge to the OPTF was to: 1) develop recommendations for a national policy and develop a US Framework for Policy Coordination (within 90 days) and implementation Strategy; and 2), develop a Framework for Effective Coastal and Marine Spatial Planning (CMSP) (within 180 days).

The vision Statement for the OPTF is:

“An America whose stewardship ensures that the ocean, our coasts, and the Great Lakes are healthy and resilient, safe and productive, and understood and treasured so as to promote the well-being, prosperity, and security of present and future generations.”

Paul Sandifer explained that the vision sets the tone of the National Ocean Policy with regards to what they would like to see in the future. He said the policies for US government action follow the Vision statement and are made in terms of categories of Healthy and Resilient, Safe and Productive, Understood and Treasured. He said there are nine Principles for US government management decisions and actions affecting the oceans, coasts, and Great Lakes. The Policy also has nine Priority Objectives for implementation and many of them explicitly focus on the need for regional implementation, particularly CMSP and Regional Ecosystem Protection and Restoration. They are divided into two categories. The first category is overarching ways in which the US government must operate differently to better improve stewardship. NOAA has been practicing elements of ecosystem-based management and CMSP, two of the priority objectives, for quite some time now, but this calls upon other agencies to take this approach. The second category contains substantive areas of particular importance to achieving the National Policy.

Dr. Sandifer identified the key elements of the CMSP Framework as: promoting compatibility among users and reducing user conflicts, streamlining and improving the rigor and consistency of decision-making and regulatory processes, and increasing certainty and predictability in planning. The planning would be undertaken by nine regional planning boards. Strong public

and stakeholder engagement is embedded in every step of the process. Paul Sandifer stated that NOAA should work with its partners in government, industry, academia, and NGOs and utilize groups such as the SAB and its working groups to help in this effort. He also said that within the President's FY11 budget there were several requests for increases that will allow NOAA to take action on CMSP. Bill Ballhaus asked if any of these new policies will conflict with other policies like reducing dependence on foreign oil. Paul responded that the ocean policy is not regulatory but builds on existing legislation and requires considerable coordination in the federal government. The policy will put those mechanisms in place.

NOAA is in the process of reconfiguring the NOAA Ocean Council to serve as a central coordinating body for development of agency policy and implementation of the National Ocean Policy within NOAA and it will guide NOAA's engagement in the new interagency structure. He said the NOAA Ocean Council will change its name to the NOAA Ocean and Coastal Council (NOC-C)—and its agenda will be driven by the nine National Priority Objectives. Under the NOC-C, nine senior career staff will be appointed to serve as NOAA-wide liaisons for each of the nine objectives. They will be responsible for NOAA-wide coordination and interagency engagement under the new National Ocean Council. In NOAA, they will report to and be held accountable by the NOC-C. Paul Sandifer said NOAA will need to rely upon the breadth of expertise and knowledge that the SAB and its working groups have to offer as NOAA begins implementation. He added the draft work plan for CMSP and the information generated by Ecosystem Sciences and Management Working Group would be extremely valuable as NOAA grapples with the science and data integration questions related to CMSP.

John Stein said there have been a number of lessons learned from participation in regional governance in Washington State through the Puget Sound Partnership (PSP). The first lesson learned was the development of Integrated Ecosystem Assessments (IEA). This requires providing a scientific foundation for ecosystem approach, making objectives more specific, developing indicators that have 'buy in' from the stakeholders, and making it a PSPs tool. Another lesson was the need to expand traditional ecological modeling in terms of benefits and costs. IEA modeling provides synthesis of information to better inform decision-making. John Stein said the lesson that may be obvious was that partnerships and inter/intra- governmental partnerships are challenging. Lastly, with regards to Tribal Nations, it is important to understand the law and recognize important regional variations.

Bill Walker talked about the Gulf of Mexico Alliance. He said this is a state-led, federally-supported organization. The federal government provides staff and financial support. Five states are involved: Alabama, Florida, Louisiana, Mississippi (Chair), Texas. The Federal working group includes three co chairs: Environmental Protection Agency (EPA), Department of the Interior (DOI), and NOAA. He said teams were assembled that work on specific priority issues including water quality, habitat conservation and restoration, education, ecosystem integration and assessment, community resilience, and nutrients. There are about 30-40 people on each of these teams leading to improved federal-state cooperation on these issues.

The current Governors' Action Plan II was released in 2009 and includes specific outcomes that will enhance the health of the Gulf of Mexico. The five-year implementation timeframe is 2009-2014. The new plan involves working up the Mississippi River watershed to address the reasons

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for problems with the Gulf of Mexico as a result of activities upstream. Specific problems result from fertilizer use on farms in Iowa all the way through Mississippi. The specific desired outcomes from this plan are those that will enhance the health of the Gulf of Mexico. The goal is to decrease the overall costs and increase effectiveness of coastal management on a regional scale. The Coastal improvements program is supported by a comprehensive plan that supports Gulf Coast recovery and contributes to more resilient coastal communities as well as ecosystem and habitat restoration.

Cristina Carollo spoke about the Ecosystem Integration and Assessment Priority Issue Team. Focus areas for this team are: Gulf of Mexico's Master Mapping Plan; data access and acquisition; living marine resources; emergent wetlands status and trends report; and ecosystem services valuation. She presented the Gulf Geospatial Assessment of Marine Ecosystems (GAME) project. The goal of this project is to identify, inventory, and catalog existing data sets and information related to the coastal and marine environment in the Gulf of Mexico. She also provided an overview of an ecosystem services workshop that was held in Bay St Louis, MS, June 16-18, 2010. During this workshop agreement was reached on definitions for ecosystem services for the Gulf of Mexico and ecosystem services quantification. She also mentioned the other outcomes of the workshop: list of ecosystem services of the Gulf of Mexico and ecosystem services associated to identify Gulf of Mexico geo-environments.

Cristina Carollo stated that NOAA's views on the subject were that regional approach to CMSP was fundamental to success and that integration with existing regional governances or structures may streamline the process. She said there was need for basic research to understand and document linkages among services and consequences of losing services, especially as a consequence of the Deepwater Horizon oil spill. She emphasized that some of these activities were already underway but the spill disaster had elevated the need for action.

The panel stated that this presentation was to inform the SAB of the level of engagement and support that NOAA is providing in the Gulf of Mexico related to ecosystem assessments, data discovery and access, and valuation of ecosystem services. They said no action was required of the SAB at this time except that the SAB recognize the importance of this work and endorse NOAA's continued involvement in such activities.

Discussion

Jim Sanchirico noted that the SAB Ecosystem Sciences and Management Working Group (ESMWG) is tackling related issues on CMSP, IEAs and also looking at ecosystem services valuation. He said the ESMWG would be happy to talk to GOM staff at their next meeting in New Orleans on October 14-16.

Frank Kudrna commented that GOMA was a model for what should be done in other areas of the country. Some of the science is relevant to what is going on in other areas of country. He said sea level rise will be a big issue in the Gulf of Mexico and wanted to know if this was being discussed. He was told that this would be discussed on the engagement panel. Paul Sandifer said the information on sea level rise is getting more spatially mobile and readily available. All of the regional groups are working with this information. Buck Sutter commented that sea level

FINAL

rise is a huge issue for Louisiana because of the additional questions about coastal subsidence. Land-loss issues are crucial there. Bill Walker commented that at a sea level rise workshop when talking to land managers he does not use terms like sea level rise or global warming but instead talks about better land use strategies and building codes.

Paul Sandifer noted that the maturity of partnerships is crucial. He said voluntary bodies that agree on what to do are needed. He said the CMSP framework will be a spring board for developing regional planning bodies and will build on success of partnerships already there. John Stein said NOAA is working at a national level on IEAs and they are taking the SAB advice on transferring lessons learned.

Paul Sandifer asked Bill Walker about how the states have come together for the long term in planning for the region. In addition, given the long time frame for the restoration requirements for the oil spill, what is the likely scenario 40 years from now. Bill Walker said the Deepwater Horizon oil spill was not a big disaster like Hurricane Katrina. The states are working together, the federal government is coordinating efforts, and this has worked well contrary to what the media is portraying. He said there was hardly any oil on the beaches and thought that animal deaths would not be that significant. He said he knew there would be restoration funding to clean up and recover and that a year from now there likely would not be any significant long-term impacts seen. He said that now was the opportunity to envision the Gulf coast in ten years.

Bill Ballhaus asked what an acceptable risk would be in the future, balancing financial cost to the oil companies with the cost of restoring the environment. The answer was that no risk from an oil leak is acceptable. The question will be what must be done to prevent a leak completely, not what must be done to have minimal impact. The short-term impacts may not be great but the long-term impacts are unknown. The President's Oil Spill Commission should be looking at what is needed to prevent occurrences in the future.

Panel Discussion: Regional Engagement (applying regional education, outreach And extension capabilities around a unified science message) - *Buck Sutter, NMFS Deputy Regional Administrator, NOAA Gulf of Mexico Regional Collaboration Team Leader; LaDon Swann, Director, MS/AL Sea Grant, Auburn University; Heidi Recksiek, NOS Coastal Services Center*

Summary

The purpose of the presentation was to brief the SAB on NOAA's Gulf of Mexico Regional Collaboration Team's engagement efforts; to share an approach for fostering and leveraging outreach and engagement; to request reactions and recommendations from the SAB on this approach; and to update the SAB on the mid-year progress of the first year of the Gulf of Mexico Engagement Pilot.

The Gulf of Mexico Alliance is a partnership of the states of Alabama, Florida, Louisiana, Mississippi, and Texas, with the goal of significantly increasing regional collaboration to enhance the ecological and economic health of the Gulf of Mexico. NOAA and other federal

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agencies participate in the Alliance, and the Regional Team is actively engaged with the Alliance's six priority issue teams. State Sea Grant programs, the Northern Gulf Institute and other academic institutions, place-based entities for multiple federal and state agencies, the Gulf Coast Ocean Observing System and the EPA GoM Program also participate in the Alliance, making it a critical vehicle for engagement across the region.

Bucker Sutter started by pointing out that regional engagement and outreach is an integral part of regional team activities. He said the GoM Team worked with many NOAA regional locations, including the NOS Gulf Coast Services Center and the Gulf of Mexico Sea Grant programs. They applied best practices in doing a need assessment and developing a regional communication nexus. This proved to be really helpful during the Deepwater Horizon oil spill when communication among many organizations was essential

In building regional engagement capabilities the team implemented new tools and approaches such as a Climate Outreach Community of Practice, the Gulf of Mexico Engagement Pilot, Bay and Watershed Education Training (B-WET) and Storm Smart Connect. They also did an evaluation of engagement programs and strategies of regional partners and enhanced coordination between NOAA and the Gulf of Mexico Alliance.

Engagement challenges faced included the length of time it takes and resources for effective engagement. Staff are already burdened with significant workloads, and this is an investment requiring long-term maintenance that could have significant budget implications

Heidi Recksiek talked about the Gulf of Mexico Climate Outreach Community of Practice. She said many organizations were doing or planning climate outreach and had the same common need for information, tools, and case studies. Initiated by the Regional Team and the Gulf Sea Grant Programs, the Community of Practice project got underway with a kickoff workshop that brought together organizations from around the Gulf that are or will be conducting outreach, extension, and/or education (EOE) on sea level rise. The Community of Practice (CoP) approach involves participants learning from each other, providing a support network and avoiding duplication of effort. The CoP provides opportunities for NOAA leadership, partnership, and learning. NOAA is helping to bring both natural and social science to this CoP. She explained that climate outreach required natural science (e.g. rates of sea level rise around the Gulf, impacts on different habitats), and NOAA could contribute a lot in this arena. She also said a CoP needs "care and feeding" to keep up the exchange of ideas, models, and lessons learned, and thus more resources are needed. Jerry Schubel asked if the Coastal America Learning Centers were invited and she responded that the Florida Aquarium had been invited and that it was a good idea to invite all of the CELCs to future workshops.

LaDon Swann talked about the SAB recommendation from its Extension, Outreach, and Education Working Group (EOEWG) report to develop the three-year Engagement Pilot in the GoM through Sea Grant to test how NOAA engages its constituents. Gulf Quest, National Maritime Museum of the GoM, is serving as a fiscal host, with Sea Grant coordinating activities. He said the focus areas for these activities were nutrients and hypoxia, climate and resiliency, communications, and K-12 and informal education at GulfQuest. Dr. Swann said they created a Climate and Resiliency Engagement Panel to expand constituent engagement to better address

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regional climate and resiliency in coastal communities. Additionally, a NOAA Engagement survey is being developed to administer and repeat over time.

The panel concluded by stating their requests to the SAB. They were seeking SAB recommendations to NOAA Leadership for a more engaged NOAA and also SAB guidance on the application of the CoP approach to engage stakeholders on other NGSP priorities and environmental disasters such as the Deepwater Horizon spill.

Discussion

Gerry Wheeler said CoPs needed a champion, funding, and support from a high level in the agency. LaDon Swann responded that if there is focused funding from NOAA to the CoP this may encourage people to stay involved. Heidi Recksiek said there were potential champions for the CoP approach at the first workshop.

Frank Kudrna said that Dr. Lubchenco complimented Sea Grant on their efforts in the Gulf. On behalf of the SAB EOEWG, the team is to be complimented for finding a way to implement the regional pilot. He said Sea Grant was a match program and asked Dr. Swann to describe partners in the match for grants. Dr. Swann responded that match was from university salaries, state appropriations and other fees.

Craig McLean asked the panel how they would assess constitutional engagement. He said, for example, NOAA has 2.6 million YouTube downloads of which 2M are of the Ocean Exploration program and he has defined that as best practice. He asked how the region identifies best practices and metrics and provides feedback to NOAA. The answer was that there is a use of social media and some things do well in that medium like the Coastal Storms Program and others do not. The questions about what can be shared and social networking sites still need guidelines.

Summary of NOAA Science Workshop, April 20-22, 2010 - Paul Sandifer, Senior Science Advisor, NOAA, Randall Dole, Deputy Director for Research, Physical Sciences Division, OAR Earth Systems Research Laboratory

Summary

Paul Sandifer presented a summary of the NOAA Science Workshop which was held on April 20-22, 2010, sponsored by the NOAA Research Council and co-chaired by him and Randy Dole. He said the workshop was a sort of experiment, the first of its kind and should not be the last. The workshop involved a diverse group of approximately 70 scientists from across the agency. The target audience for the workshop output was Dr Lubchenco and NOAA leadership, NOAA Research Council, the sponsor, NOAA office of Policy Planning and Evaluation (PPI) for Next Gen Strategic Plan, NOAA Budget Office for FY12 and other future science budgets, 2010 Senior Executive Summit (SES), NOAA Science Advisory Board and science colleagues throughout NOAA and in the external community

The workshop was centered on two questions: What are the most critical science challenges for NOAA over the next 5-20 years and what are opportunities and practical steps for improving

NOAA science and how science is conducted at NOAA? Workshop participants identified one overarching challenge, two crosscutting challenges, and seven topical science challenges but these were not prioritized. The overarching challenge involves developing and applying a holistic, integrated Earth system approach to understand the processes that connect changes in the atmosphere, ocean, space, land surface, and cryosphere with ecosystems, organisms, and humans over different scales. Paul Sandifer said connecting geophysical and biological components will be central to addressing the Grand Societal Challenges Dr. Lubchenco enunciated in her opening presentation for the Workshop. These are: “to improve human well-being while restoring the planet’s life support system,” as well as to achieving NOAA’s long-term vision of “healthy ecosystems, communities, and economies that are resilient in the face of change.” In addition to the overarching and topical challenges, the Workshop identified two cross-cutting challenges: characterizing the uncertainties associated with scientific information and communicating scientific information and associated uncertainties to policy makers, the media, and the public at large accurately and effectively. Paul Sandifer described the seven topical science challenges identified by participants. These include:

1. Incorporating knowledge of human behavior into earth system science
2. Understanding and quantifying the interactions between atmospheric composition and climate variations and change;
3. Understanding and characterizing ocean-climate interactions and their effects;
4. Assessing and understanding the roles of ecosystem processes and biodiversity in sustaining ecosystem services
5. Improving understanding of the water cycle,
6. Reducing environmental degradation;
7. Sustaining and enhancing observing systems.

Paul Sandifer stated that all groups emphasized the importance of a strong social science component as part of NOAA’s future science priorities. He said participants also identified a number of areas where they thought NOAA could improve the way it conducts and supports science. Areas of improvement included workforce, business/management practices, scientific integrity and outcomes, infrastructure, and external partnering. Suggestions were provided on how each of these areas could be improved; For example, to improve the workforce, NOAA could provide a clear pathway for career advancement for scientists from early career to successive levels of responsibility and seniority that would not require the scientists to undertake successively more management responsibility.

Workshop outputs have been integrated into the NOAA Next Generation Strategic Plan and a workshop white paper has been prepared. The NOAA Research Council has also been briefed on the outcomes. NOAA will conduct additional briefings and cross-NOAA science meetings focused on solutions, as needed. NOAA also intends to hold a larger science conference with external participants. It is also the desire of NOAA’s leaders to provide a clear response that includes a commitment to continued engagement with scientists.

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Paul Sandifer concluded by stating that NOAA was seeking a review, discussion, and comment by the SAB on the Workshop White Paper. Specifically, NOAA is soliciting review and recommendations for the science challenges and areas where NOAA could improve how it conducts science. NOAA is also soliciting ideas from the SAB on other theme/issue-focused workshops and ways to continue internal discussions, and planning for and participation in a larger NOAA science conference.

Discussion

Bill Bauhaus asked about including things with increasing uncertainty like social science and how NOAA would identify error bars. Randy Dole responded that science is a challenge but communicating it is also a challenge. Expression of uncertainty is a double challenge for those reasons.

Bill Ballhaus asked about the origin of foreign national regulations (“deemed export”) and why this was a problem. Craig McLean answered that the origin was in both the Departments of State and Commerce. He said NOAA is working on this issue. Bill Ballhaus asked what the penalty was for violations of the regulations. Craig McLean said that it could be criminal liability if anything happened. There has been a grace period but it is ending soon, and NOAA is continuing to work with Department of Commerce (DoC) to address concerns related to foreign visiting scientists and students working in NOAA laboratories and science centers. Currently, foreign scientists cannot leave their offices or laboratories unescorted nor can they be in the facility after normal business hours.

Paul Sandifer said this workshop was for NOAA only but the agency would like to include external partners in these discussions in the future. The request to the SAB is on how NOAA could best engage the scientific community. NOAA would like to move from defining problems to defining solutions.

Frank Kudrna asked about the idea of having input from users in this process. The answer was that it would be helpful but the workshop was brand new thus they had not engaged other external groups.

Jerry Schubel said NOAA should not let users decide on the science but should know what their questions are to help define the science. He added that informal science centers are underutilized for communicating science. NOAA agreed but said it needed to know how best to provide the message to the informal science centers. Randy Dole added that funding was a national issue. Jerry Schubel commented that it was clear society was generally science-illiterate and does not know how the science enterprise works.

Craig McLean reminded the group that NOAA’s current efforts are focused on the creation of a climate service and strengthening NOAA science. He thought that OAR may be the right place to put some of crosscutting activities and new programs, resulting in OAR being a real home for research.

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Ray asked Board members with how they wanted to proceed on the request from Paul Sandifer. Jerry Schubel said the workshop was a good start for NOAA. Jeremy Jackson commented that he was surprised that there was no strong scientific career path in NOAA. He said NOAA needed to make it an attractive place for a scientific career as does the Smithsonian Institution. Margaret Spring and Paul Sandifer noted that the number of Scientific and Professional (ST) and Senior Level (SL) positions has been increased to address the issue of the scientific career path in the agency. A report was prepared on these for Dr Lubchenco. Sandy McDonald noted the results of the workshop and the creation of the new positions are positive things and are helping science in NOAA.

Frank Kudrna suggested that this discussion could be added to the upcoming SAB conference call in August. It was agreed to review the science white paper and have further discuss on the August 4 teleconference. Ray Ban suggested the SAB consider how to involve SAB working groups in discussion of strengthening science in NOAA.

Action 7: The Science Advisory Board will further discuss input to NOAA on the Science Workshop/ Strengthening Science in NOAA at August conference call and provide remarks to NOAA if appropriate.

Action 8: The Science Advisory Board will convene a teleconference on Wednesday, August 4, 1010 from 3:00-5:00 PM EDT to discuss the comments on the NOAA Next Generation Strategic Plan by its working groups. Other topics will include the draft transmittal letter for the Climate Working Group Spring 2010 Meeting Report and the next steps for engagement with NOAA on the Science Workshop/ Strengthening Science NOAA (see Action 7).

Public Comments

One comment was received in conjunction with this meeting, presented verbally at the meeting.
Comment from Mike Crosby, Vice President MOTE Marine Laboratory

Mike Crosby is a former NOAA employee and was the first director of the NOAA SAB. He stated that he was disappointed that Mote Marine Laboratory could not host the SAB meeting but an invitation was open to tour the Mote anytime. He provided an overview of MOTE Marine Laboratory saying MOTE has seven areas of research with 200 permanent staff, half are researchers. Over 50 percent of budget comes from research grants, with the balance from other operations and revenue from aquaria. MOTE has highly migratory species and harmful algal blooms (HAB) proposals, for example, waiting to hear on funding from NOAA.

Mike Crosby said MOTE was supportive of mission in many ways. He said because MOTE is a non-governmental organization it is very flexible and adaptable. He said, unlike the government and universities, they do not have any direct appropriations.

MOTE is pursuing a concern that BP should pay for the aftermath of Deep Water Horizon (DWH), particularly for impacts such as trophic cascading. Mote is expanding its research on the oil spill and working on the beach condition report. It is also actively pursuing a workshop on trophic cascading from DWH.

FINAL

Mike Crosby said he was gratified by the SAB discussions. He added that budget discussions are something that the SAB can help with. He mentioned that MOTE was ready to partner with SAB on challenges facing NOAA.

Meeting Adjourn

The meeting was adjourned at 3:15 PM.

List of Actions

Action 1: The Science Advisory Board approves David Fluharty, University of Washington, as new co-chair of the Ecosystem Sciences and Management Working Group

Action 2: Science Advisory Board approves Tim Essington, University of Washington, as new member of the Ecosystem Science and Management Working Group

Action 3: The Science Advisory Board Office will provide the National Science Foundation National Science Board report on transformative research to the Science Advisory Board members.

Action 4: The Science Advisory Board will consider the future of the Data Archive and Access Requirements Working Group in the context of the overall strategy developed for SAB working groups.

Action 5: The Science Advisory Board will form a subcommittee to develop a plan for working groups (standing and *ad hoc*). This group will engage chairs of existing WGs and relevant NOAA staff as appropriate and will consider how to align WGs with objectives of the NOAA Next Generation Strategic Plan.

Action 6: The Science Advisory Board accepts the Spring 2010 Meeting Report from the Climate Working Group and will transmit it to the NOAA Administrator with a letter that highlights key points of advice to NOAA contained in the report.

Action 7: The Science Advisory Board will further discuss input to NOAA on the Science Workshop/ Strengthening Science in NOAA at August conference call and provide remarks to NOAA if appropriate.

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