

FINAL April 09, 2018

NOAA Science Advisory Board (SAB)

Teleconference

20 February 2018

2:00 – 4:00 PM Eastern Standard Time

Webinar: <https://attendee.gotowebinar.com/register/2013943949799846914>

Location: SSMC 3, Room 11836
1315 East-West Highway
Silver Spring, MD 20910

Presentations for this meeting have been posted on the Science Advisory Board (SAB) website:
<http://www.sab.noaa.gov/SABMeetings.aspx>

SAB members in attendance:

Ms. P. Lynn Scarlett, Co-Chief External Affairs Officer, The Nature Conservancy (Chair); Dr. Susan Avery, President Emeritus, Woods Hole Oceanographic Institution; Dr. Michael Donahue, Vice President and Director, Water Resources and Environmental Sciences, AECOM Corporation; Dr. Robert Grossman, Fredrick H. Rawson Professor and Jim and Karen Frank Director of the Center for Data Intensive Science, University of Chicago; Dr. Everette Joseph, Director, Atmospheric Science Research Center, University at Albany, State University of New York (SUNY); Dr. Eugenia Kalnay, Distinguished University Professor, Department of Atmospheric and Oceanic Science, University of Maryland; Mr. W. Christopher Lenhardt, Domain Scientist, Renaissance Computing Institute, University of North Carolina at Chapel Hill; Ms. Jean May- Brett, STEM Partnership Coordinator, Louisiana Department of Education (ret.); Dr. Stephen Polasky, Professor, Department of Applied Economics, University of Minnesota; Dr. Denise Reed, University of New Orleans; Dr. Robert Rheault, Executive Director, East Coast Shellfish Growers Association; Dr. Martin Storksdieck, Director, Center for Research on Lifelong STEM Learning and Professor, College of Education and School of Public Policy, Oregon State University; and Mr. Robert S. Winokur, Consultant (ret. NOAA, Navy)

NOAA senior management and Line Office representatives in attendance:

RDML (ret.USN) Timothy Gallaudet, PhD, Assistant Secretary of Commerce for Oceans and Atmosphere and Acting NOAA Administrator; Mr. Ben Friedman, Deputy Under Secretary for Operations; Dr. Gary Matlock, Deputy Assistant Administrator, NOAA Office of Oceanic and Atmospheric Research (OAR); Dr. Russell Callender, Assistant Administrator; NOAA National Ocean Service (NOS); Mr. Harry Cikanek, Director, Center for Satellite Applications and Research, NESDIS; Dr. Ned Cyr, Director, Office of Science and Technology, NOAA National Marine Fisheries Service (NMFS); Dr. Louis Uccellini, Assistant Administrator, National Weather Service (NWS);

Staff for the Science Advisory Board in attendance:

Dr. Cynthia Decker, Executive Director and Designated Federal Officer; Ms. Elizabeth Akede; and Mr. Doug Bell

Call to Order

Lynn Scarlett, The Nature Conservancy and Chair, NOAA SAB

Lynn Scarlett welcomed everyone to the meeting.

SAB Consent Calendar

Lynn Scarlett, The Nature Conservancy and Chair, NOAA SAB

SAB member Michael Donahue moved to approve the October 2017 SAB meeting minutes and the nomination of Environmental Information Services Working Group (EISWG) Co-Chair and Member Dr. Bradley Colman; Susan Avery second the motion. The SAB members unanimously approved the consent calendar.

NOAA Update

RDML Timothy Gallaudet (USN, ret), Assistant Secretary of Commerce for Oceans and Atmosphere and Acting NOAA Administrator

RDML Gallaudet started by giving an overview of the topics he intended to cover: political appointees, the budget, science and technology (S&T) leadership, partnerships, and the draft SAB work plan.

Political Appointees

Almost all of the new non-Senate confirmed appointees have joined NOAA. Two of the three Senate-confirmed appointees have been confirmed including himself and Dr. Neil Jacobs; however, Dr. Jacobs' appointment is awaiting approval from the White House. Dr. Jacobs will be the Assistant Secretary for overseeing NOAA's Environmental Observation and Prediction portfolio. RDML Gallaudet will continue to serve as the Assistant Secretary of Commerce for Oceans and Atmosphere; he will serve as the Acting NOAA Administrator until an Under Secretary of Commerce for Oceans and Atmosphere has been confirmed.

Non-Senate confirmed appointees include:

- Stuart Levenbach – Chief of Staff, NOAA
- Kevin Wheeler – Deputy Chief of Staff for Policy, NOAA
 - Taylor Jordan – Senior Policy Advisor
 - Brandon Elsner – Senior Policy Advisor
- Julie Roberts – Director of Communications, NOAA
- LCDR Wendy Lewis – Director, NOAA Office of Legislative and Intergovernmental Affairs
- Erik Noble – Senior Policy Analyst
- Chris Oliver – Assistant Administrator, NOAA Fisheries

Budget

The White House released the President's budget for fiscal year (FY) 2019 which allotted the agency over one billion dollars less than what was received for FY 2017. To meet these constraints, NOAA maintained and increased, to some degree, programs and activities core to its functions and services to meet its mission and meet national security requirements. Programs and activities not thought to benefit federal core mission activities such as state and local grant programs were cut from the agency's budget.

Although NOAA values these state and local grants programs, to meet the President's budget and priorities, programs such as the National Sea Grant Program and the National Estuarine Research Reserves, were removed from NOAA's portfolio. Areas where the agency increased funding include:

- core weather forecasting;
- decision support activities;
- satellite programs;
- recapitalizing NOAA ships - important for hydrographic surveying which has direct economic benefits as well as national security benefits;
- disaster preparedness - a new line under the National Ocean Service (NOS); and
- fisheries management and science.

Discussion

Lynn Scarlett asked for the more information on what is included in the new disaster preparedness program. Dr. Russell Callendar, NOS, stated that NOAA allotted \$1.2 million for the program which will focus on providing disaster response and recovery training, exercises, lessons learned and resources within NOAA and to its emergency response partners across the nation.

Susan Avery expressed her concerns over budget cuts to NOAA extramural research and research partnerships; particularly cuts to climate research. How does NOAA expect to see itself grow in the future with a decimated research foundation? RDML shared Dr. Avery's concerns. NOAA has depended heavily on its extramural research partners in the past; however, discussions are on-going regarding the budget and there may be a chance to influence things in the future.

S&T Leadership

The current Administration hasn't mentioned much about science and technology (S&T), however, Michael Kratsios, Deputy Assistant to the President and the Deputy U.S. Chief Technology Officer, has articulated a S&T agenda focusing on quick wins and examples of such wins. S&T investments quickly transition and benefit the American people. RDML Gallaudet would like for NOAA to be the "go-to" agency for consideration to lead and carry out the applied S&T agenda and initiatives.

The Information Reporting Program Advisory Committee (IRPAC) was convened by Michael Kratsios recently and RDML Gallaudet attended and presented the three NOAA priorities. Mr. Kratsios was impressed by the presentation and the approach NOAA presented on its plan for prioritizing science, which aligns with the Administration's plan. After the IRPAC meeting, Mr. Kratsios convened the Nation Science and Technology Council where each member of the council was asked to present the three priorities of their agency, much like what was presented by NOAA at the IRPAC meeting.

To continue to keep NOAA in the forefront of the Administration's S&T agenda, NOAA will utilize hurricane stories gathered during last year's hurricane season in preparation of the upcoming hurricane season. NOAA will collaborate with the Office of Science and Technology Policy (OSTP) to tell the story of how S&T investments, quickly transitioned, benefit the American people. Recently, NOAA gave a presentation on Capitol Hill using stories from the past hurricane season. The presentation highlighted the preparation, forecasting and warning, response following, improvements and lessons learned, and the contributions of all of the NOAA line offices during the 2017 hurricane season.

Lastly, RDML Gallaudet repeated his statement from the fall 2017 American Geophysical Union (AGU) meeting that outside of the U.S. military, no other federal agency has the scale and scope, breadth and depth, and importance and impact of applying S&T to better the lives of the American people than NOAA based on the direct return of investments of NOAA's research.

Discussion

Bob Winokur mentioned that this current administration has not shown interest in S&T. Many of the science and technology positions have remained vacant including the head Office of Science and Technology Policy position and many chief scientist positions at the various agencies. As a result of the vacancies, the S&T agenda is now being determined by the Office of Management and Budget (OMB). Unless Congress presents S&T recommendations it is hard for the NOAA to know where to go to establish itself as the leader of S&T. RDML Gallaudet agreed with Mr. Winokur's statements. He added that Stuart Levenbach, NOAA's new Chief of Staff, worked for OMB prior to coming to NOAA. His experience and network will help NOAA navigate interactions with OMB as it concerns S&T. Also, NOAA will continue to convey its activities so the various agencies with the ability to shape the S&T agenda and initiatives know what NOAA is capable of doing.

Lynn Scarlett expressed interest in viewing the NOAA presentation on the hurricane stories presented to Congress. She also appreciated comments related to NOAA leadership's efforts to communicate the impact of S&T investments having significant returns on investments, which can serve as a building block for others and get traction and interest in S&T.

Susan Avery mentioned that over the past few years, the NOAA Science Advisory Board has talked extensively about the breadth of NOAA's ROI and the strategies for developing research to operations, services, and commercialization. When thinking about ROI, it is important to think broadly and it is important to look at different NOAA line offices for their contribution. RDML Gallaudet agreed.

Partnerships

In the face of steep budget cuts, the role of leadership becomes critical to encourage and motivate the current workforce and to leverage and strengthen partnerships. Some partnerships NOAA plans to leverage are with extramural programs such as the Cooperative Institutes; long standing relationships such as NOAA's relationships with the U.S Navy, U.S. Coastguard, National Oceanographic Partnership Program; and other public and private partnerships as they expand their research portfolio at a rate that is out pacing the rate of the federal government.

Discussion

Bob Winokur agrees with leveraging partnerships and pointed out that leveraging partnerships requires funding. Based on NOAA's budget this may present a challenge with the partnership approach. RDML Gallaudet agreed with Mr. Winokur's point relating to challenges funding and partnerships.

SAB Work Plan

The current version of the work plan is laid out using the three priorities presented at the October 2017 SAB meeting. Due to an upcoming briefing on Capitol Hill, the three priorities were consolidated into two. The SAB work plan needs to reflect this change as its current layout is based on the three priorities. The two NOAA priorities are:

Priority 1: Lead The World in Earth Systems Observation and Weather Prediction and Minimize Impacts From Severe Weather.

Priority 2: Increase the Sustainable Economic Contributions of Our Fishery and Ocean Resources (Blue Economy)

Other remarks related to topic listed in the work plan include:

- Ecosystem Restoration – early on, when this item was originally presented it was of great interest. After visiting a restored marsh in Louisiana and a restored Estuary in Washington State, ecosystem restoration continues to be a great priority of interest that the SAB should focus on.
- Unmanned Systems – this item is currently not included in the work plan but should be considered as a high priority item that the SAB can look at. Just within NOAA, there is an exponential growth in the use and application of unmanned systems. Using this technology to address both NOAA priorities offers great opportunity and cost efficiencies for the agency.
- Social Sciences – the focus should be on increasing the gross domestic product (GDP) to coastal communities and understanding the social science needs in order to increase GDP.

In addition to the comments provided it was suggested that the SAB meet with Dr. Neil Jacobs as soon as possible to go over the work plan and get his comments on the document. Lastly, the hurricane supplemental budget passed. Two hundred million dollars have been set aside for fisheries disasters and another \$200 million, broken up into \$100 million pieces each, for damages and restoration efforts and hurricane forecast improvement. Due to the supplemental budget, NOAA now has \$100 million in place to implement the Weather Research and Forecasting Innovation Act of 2017 (Public Law No: 115-25).

Discussion

Lynn Scarlett agreed to recombine the topics listed in the work plan to fit into the two NOAA priorities. Regarding the focus on GDP, she noted that there is also a link between GDP and ecosystem restoration. On one hand ecosystem restoration benefits ecosystems (biodiversity and nature benefits) and on the other hand these kinds of investments are linked to reduced risks to communities and enhanced performance in the circumstances of high intensity storms. Regarding the cuts to non-core programs, she suggested that, instead of focusing on which programs are core and not-core, perhaps it is better to focus on NOAA's mission and determining how to expand funds to leverage outcomes most effectively. Use NOAA's core mission and identify the activities and tools needed to achieve said mission to determine which programs to keep. RDML Gallaudet agreed with both points made. In terms of partnerships, cuts had to be made and NOAA developed a rationale using the idea of core and not-core to determine which programs to cut and which to keep.

Denise Reed asked for clarification on the time-scale of GDP growth needed by the agency. RDML Gallaudet stated that the administration is focused on the near-term but encouraged the SAB not to exclude information on the long-term as well. Contributions and elements of both are welcomed. For example, with the Blue Economy, NOAA is looking at ways to increase and improve the quality of data provided to port managers, operations officers, and directors to increase efficiencies and throughput to U.S ports.

Action 1: Cynthia Decker will work with NOAA leadership to share the hurricane presentation given on Capitol Hill with the SAB members.

SAB Working Group Activities in the Context of the three NOAA Priorities

Climate Working Group (CWG)

Paul Knight, CWG Co-Chair

Paul Knight provided an update on the membership of the working group. The Climate Working Group (CWG) currently has 13 members. The group plans to focus on the following topics:

- Tropical Pacific Subgroup – The CWG will confer with the Tropical Pacific Observing System (TPOS) 2020 task teams and inform the SAB about developing plans, activities and progress in three project areas modeling and data assimilation components of the updated observation network; intensive pilot and process experiments for advancing understanding and transition into national observing and modeling capabilities; and the improvement of the backbone of observing system to include additions of biogeochemical and ecosystem parameters. This topic relates to NOAA Priority 1: Lead the World in Earth System Observation and Weather Prediction, presented at the October 2017 meeting.
- Arctic Environment Subgroup - The CWG will inform the SAB about the plans for an arctic end-to-end observation and prediction system. This topic relates to NOAA Priority 1.
- Modeling: Seasonal to Sub-seasonal (S2S) and Research to Operations (R2O) Subgroup - The CWG will explore the weakest links in the planned seamless prediction plans for sub-seasonal to seasonal outputs. This topic relates to NOAA Priority 1.
- Climate and Societal Apps Subgroup - The CWG will inform the SAB as it works with NOAA's Climate Portfolio to discern the process by which stakeholders, decision-makers, and social scientists identify user needs and translate these into NOAA deliverables. This topic relates to NOAA Priority 2: Minimize the Impacts from Severe Weather, presented at the October 2017 meeting.

Data Archive and Access Requirements Working Group (DAARWG)

Christopher Lenhardt, DAARWG Chair and SAB Member

Chris Lenhardt provided an update on the topics currently being focused on by the DAARWG including:

- Software and Model Archiving Practices and Requirements – The DAARWG has received briefings on this topic because data, science, and code are increasingly comingled leading to potential issues of reproducibility and reusability if software and models are not curated appropriately. As a science agency, this topic affects activities conducted by all of the different line offices with NOAA and this topic relates to all three NOAA priorities presented at the October 2017 SAB meeting.
- NOAA Big Data Partnership – The DAARWG has received briefings from various key leads of the Big Data Project (BDP). The BDP looks at ways to leverage private sector partnerships to enable better and faster access to NOAA data. This topic relates to all three NOAA priorities presented at the October 2017 SAB meeting.
- Specialized Archiving and Access Requirements for Social Science Data - The DAARWG initiated conversations with NOAA Chief Economist related to specialized archiving and access requirements related to social science data. This topic relates to NOAA priorities 1 and 2.
- Preliminary Discussions Related to Specialized Requirements of Information Products – The DAARWG has had internal discussions on the consistency of information products within NOAA. More work will be done on this topic. This topic relates to NOAA Priority 2 & 3.
- Curation of Physical Samples and Objects – The DAARWG received briefings related to physical samples of objects. A number of topics related to the 'omics of samples and the role of managing collected samples in the context of challenges such as reproducibility. This topic relates to NOAA Priority 3: Increase the sustainable economic contributions of our fisheries and oceans presented at the October 2017 SAB meeting.

Ecosystem Science and Management Working Group (ESMWG)

Michael Castellini, ESMWG Co-Chair

Michael Castellini started by providing an update on ESMWG membership. The working group is below critical mass and is working to identify new members. The ESMWG has recently presented a number of reports to the SAB related to the three NOAA priorities including:

- Indigenous and Local Ecological Knowledge and NOAA
- Emerging Technologies for NOAA Ocean Research, Operations and Management in an Ecosystem Context
- Review of the High Arctic Program in NOAA
- An Assessment of the Use and Potential Use of Ecosystem Service Valuation (ESV) within NOAA

Due to the working groups charge and the expertise on the working group, the ESMWG can most directly assist with NOAA Priority 3: Increase the sustainable economic contributions of our fisheries and oceans presented at the October 2017 SAB meeting; however the results from ESMWG activities and reports can be applicable to NOAA Priorities 1 and 2. To assist with NOAA Priority 3, the ESMWG plans to focus on the following topics in the near term:

- Citizen Science to Improve Ecosystem-Based Management – The ESMWG will focus on the scientific value of citizen science. The group will examine ways of dealing with large data sets, collecting data, working with the public in terms of the science, understanding publication criteria, quality assurance and quality control as well as a number of other topics.
- Holistic Ecosystem Assessment – The ESMWG plans to focus on the design of ecosystem assessments, goal development, and parameter setting for balancing the issues related to a holistic ecosystem assessment.

Environmental Information Services Working Group (EISWG)

John Snow, EISWG Co-Chair

John Snow was unable to join the call at the last minute. His thoughts and those of the EISWG are reflected in the current version of the SAB work plan and in the EISWG power point submitted for this meeting.

Discussion

Martin Storksdieck asked for clarification on the citizen science topic mentioned by the ESMWG. Is the focus on how to make citizen science more valuable? Michael Castellini stated that the focus will be on quality assurance and quality control. Critics of citizen science focus on the methods used for collecting data. The ESMWG plans to develop a report focusing on how citizen science quality assurance and control can be assured, so that once information is passed to management for decision making, doubts of the quality of data are no longer a problem.

Louis Uccellini commented on the specialized archiving and access requirements for social science data mentioned by the DAARWG. There are a number of challenges related to archiving social science data; however, archiving such data sets can be beneficial in a number of areas including legal. Chris Lenhardt agreed with Dr. Uccellini's comments stating that one issue the DAARWG plans to explore is related to ensuring that the right meta-data are used when archiving such data sets.

Review of Proposed SAB Work Plan Topics

Lynn Scarlett, The Nature Conservancy and Chair, NOAA SAB

Lynn Scarlett started by providing background on how the work plan was developed. The current draft being discussed is a very rough draft. This version was framed in the context of the three NOAA priorities presented at the October 2017 SAB meeting. After the October meeting, she and Richard Moss had a follow-up meeting with RDML Gallaudet. Notes from both the October 2017 meeting and the follow-up

meeting were used to develop the topics presented in this work plan. This version is not final and at this time the SAB should decide if there are topics missing from the outline and if there are topics included in the outline that need to be removed.

Discussion

Bob Winokur agreed with RDML Gallaudet's suggestion of including autonomous systems as a topic in the work plan. A number of line offices within NOAA use autonomous systems and this topic can be used to address the NOAA priorities. He also urged SAB engagement and convergence with the EISWG when addressing NOAA Priority 1. Lynn Scarlett stated that this session is for identifying topics that should be added or removed from the work plan. Discussions of who the SAB should work with on the different topics will come in the Next Steps portion of the agenda.

Martin Storksdieck mentioned that the federal government has appointed or is in the process of finalizing appointments for a Science, Technology, Engineering, and Mathematics (STEM) Education Advisory Panel that is to provide advice and recommendations to the Committee on Science, Technology, Engineering, and Mathematics Education (CoSTEM), assess CoSTEM's progress in carrying out responsibilities related to the America Creating Opportunities to Meaningfully Promote Excellence in Technology, Education, and Science (COMPETES) Reauthorization Act, and help identify need or opportunity to update the Federal STEM Education 5-Year Strategic Plan. Perhaps the SAB can use this opportunity look at NOAA's role in the broad STEM education ecosystem and the degree to which NOAA is a curator of its own content which it needs to actively feed into the education "ecosystem" in order to impact public literacy and education

Denise Reed supported the addition of decision support/social science related to GDP mentioned by RDML Gallaudet. Also, the RDML talked a lot about NOAA being a leader in S&T, perhaps the SAB can focus on NOAA's role in training and workforce development to help meet the goal in becoming the S&T lead agency.

Susan Avery questioned the notion that NOAA be responsible for conducting all earth system observations as stated in NOAA Priority 1. To lead the world in earth system observation, NOAA needs to have all of the land, ice, and ocean data which NOAA doesn't have. Also, it was surprising that NOAA hasn't made mention of the most recent decadal study conducted by NASA and its partnering agencies. Lynn Scarlett suggested that in the Next Steps portion of the agenda, the SAB can explore the necessary partnerships needed for NOAA to accomplish its goal stated in priority 1 to lead the world in earth system observations.

Bob Grossman stated that NOAA Priority 2 doesn't mention environmental data science which is the broader term used to describe environmental intelligence, which is mentioned. Perhaps the topic should be broadened to include environmental data science.

Louie Uccellini stated that the National Weather Service, in concert with the NOAA Office of Oceanic and Atmospheric Research and the larger weather community, is attempting to link forecast and warning to decision-making. They are realizing that linking to decision-making is predicated on understanding changing risk preferences, which relates back to enhancing social sciences. This is not just happening along the coast, but across the nation. There is a lot of social science that the agency is getting interested in.

Next Steps in Finalizing the SAB Work Plan

Lynn Scarlett, The Nature Conservancy and Chair, NOAA SAB

Lynn Scarlett started by suggesting she work with Cynthia Decker to revise the current draft SAB work plan based on the discussions had and feedback received on the meeting. Next, two subgroups, one for each of the two NOAA priority areas, will be convened to further develop the work plan. Below are the two subgroups and the names of the SAB members whom volunteered to assist with each subgroup.

Subgroup One: Focus on Priorities 1 & 2 which will be combined together in the revised work plan to become Priority 1.

Eugenia Kalnay
Bob Grossman
Everette Joseph
Bob Winokur (would like to review)

Subgroup Two 2: Focus on Priority 3 which will become Priority 2 in the revised work plan.

Denise Reed
Bob Rheault
Michael Donahue

Each subgroup will review, refine through the expansion, addition, and/or subtraction of topics within each priority area, and identify potential projects and timelines for the SAB to carryout.

Public Comment

There was no public comment.

Review of Actions

Cynthia J. Decker, Executive Director, SAB

The SAB office will post the 2017 Hurricane Season Presentation by RDML Timothy Gallaudet, to the SAB website.

Two SAB subcommittees will elaborate on the topics listed in the draft SAB work plan outline, develop a process for addressing each topic, and identify potential products.

Cynthia Decker will work with SAB Chair to combine NOAA priorities 1&2 into one topic and provide the new draft work plan to the two subcommittees.

Adjourn