Meeting of the NOAA Science Advisory Board
September 22, 2020

Location: Webinar

Advisory Board Members Present:
Mr. John Kreider, President, Kreider Consulting LLC (Chair); **Dr. Robert L. Grossman**, Frederick H. Rawson Professor and Jim and Karen Frank Director, Center for Data Intensive Science, University of Chicago; **Mr. M. Christopher Lenhardt**, Domain Scientist, Renaissance Computing Institution; **Dr. Robert B. Rheault**, Executive Director, East Coast Shellfish Growers Association; **Dr. Martin Storksdieck**, Director, STEM Research Center and Professor, College of Education and School of Public Policy, Oregon State University; **Dr. Elizabeth Weatherhead**, Senior Scientist and Fellow, Jupiter Intelligence; **Dr. Denise Reed**, Professor Gratis, Pontchartrain Institute for Environmental Sciences, University of New Orleans; **Dr. Everette Joseph**, Director, National Center for Atmospheric Research (NCAR); **Dr. Ruth Perry**, Marine Scientist and Regulatory Policy Specialist, Shell Exploration and Production Company; and **Ms. P. Lynn Scarlett**, Chief External Affairs Officer, The Nature Conservancy

Attendees:
Dr. Neil Jacobs, Assistant Secretary of Commerce for Environmental Observation and Prediction, performing the duties of Under Secretary of Commerce for Oceans and Atmosphere; **Rear Admiral (RDML) (Retired, United States Navy) Timothy Gallaudet**, Ph.D., Assistant Secretary of Commerce for Oceans and Atmosphere and Deputy NOAA Administrator; **Dr. Gary Matlock**, Deputy Assistant Administrator for Science, Oceanic, and Atmospheric Research; **Dr. Steven Thur**, Director, National Centers for Coastal Ocean Sciences, National Ocean Services; **Dr. Louis Uccellini**, Assistant Administrator for Weather Service and Director, National Weather Service; **Dr. Cisco Werner**, Director of Scientific Programs and Chief Science Advisor, National Marine Fisheries Service; **Dr. Mitch Goldberg**, Chief Program Scientist, Joint Polar-Orbiting Satellite System

Working Group Co-Chairs:
Dr. Robert Johnston, Director, George Perkins Marsh Institute and Professor, Department of Economics, Clark University; **Dr. Joellen Russell,** Distinguished Chair of Integrative Science and Professor in Geosciences, Planetary Science, Hydrology & Atmospheric Science, University of Arizona; **Dr. Bradley Colman**, Director of Science – Weather Science, The Climate Corporation; **Dr. Molly Jahn**, Principal, Jahn Research Group, Professor of Agronomy, University of Wisconsin, Madison; **Dr. Kirstin Dow**, Professor, Department of Geography, University of South Carolina; and **Dr. Michael Castellini**, Principal Investigator, Research Enrichment Core, NIH-BLaST

Staff for the Science Advisory Board Present:
Dr. Cynthia J. Decker, Executive Director and Designated Federal Officer; **Ms. Courtney Edwards**.

September 22, 2020

Opening Statement of the Chair
John Kreider, Kreider Consulting and Chair, NOAA SAB

Mr. Kreider welcomed everyone to the meeting and explained that the purpose of the meeting was to address potential priority topics for SAB study. He then took a roll call of members and NOAA representatives.

SAB Consent Calendar
John Kreider, Kreider Consulting and Chair, NOAA SAB

The consent calendar consisted of the July meeting minutes, which had been previously distributed and posted on the website. Dr. Bob Rheault made a motion to approve, which was seconded by Dr. Denise Reed. The minutes were unanimously approved.

SAB Potential Priority Study Topics
John Kreider, Kreider Consulting and Chair, NOAA SAB

The meeting objectives were to discuss potential priority topics for SAB study and to review the SAB liaison assignments for the six NOAA S&T focus area implementation teams.

Introduction

Mr. John Kreider reminded everyone of the process that led to this point in establishing these 13 topics, their respective scopes, and the scoring results. He went over the voting criteria of value, impact, transformational, and fit to NOAA/SAB, and the method of charting, which balanced all four of these points to give a visual ranking from highest rated topics to lowest rated topics. He added that final selection would also incorporate subjective feedback, consideration, and discussion as they couldn't be reduced by simple numerical scoring.

Mr. Kreider displayed slides depicting the mean scores for each topic and the summary of the scoring results. These slides, along with one-page descriptions of each topic, were posted on the website. He noted that the five highest scoring topics were coastal resilience tools, climate observations, rapidly changing marine environment, social and behavioral science, and Earth systems prediction and predictability.

NOAA Presentation

Dr. Neil Jacobs started the discussion. He said that Admiral Gallaudet and the rest of the NOAA team had the opportunity to dig into the topics and while they felt all of the topics were of value,

they added an additional layer of evaluation for the topics, which was budget. He explained that if they didn't know how to fund an idea, it was irrelevant no matter how great an idea it might be and that the best they could do was use it to advocate for funding in the future.

Dr. Jacobs raised Earth system prediction as a high priority for NOAA. He said they had a few funding paths for it, especially since it is being championed by Kelvin Droegemeier, Director of the White House Office of Science and Technology Policy (OSTP), and is consistent with the new the Interagency Council for Advancement of Meteorological Systems (ICAMS).

Dr. Jacobs concluded by sharing the fact that new NOAA Chief Scientist Ryan Maue will focus on a global numerical weather prediction system and a data simulation system. This will free Dr. Jacobs up to focus on other areas of concern, such as red snapper surveys, western water management, and right whale issues.

RDML Timothy Gallaudet next outlined four priority areas on which NOAA leadership would like SAB focus and provided comments on the five topics receiving high scores by the SAB. The first was Earth system prediction and predictability, which he said was on target, but should have computing architectures and resources included and possibly be combined with the research to operations/application (R2X) priority area.

The second one combined several of SAB's topics: future capabilities, disruptive technologies, Science and Technology (S&T) public-private partnerships, and rapid changes of the marine environment. Specifically, he liked the idea of the SAB taking NOAA's recent S&T focus areas and advising on how they could be scaled to monitor and predict changes in the marine environment and its impact on fisheries.

Third, RDML Gallaudet noted that SAB perfectly captured the importance in all areas of integrating social and behavioral sciences. He suggested these could be joined through fisheries management and the Seafood Executive Order, through looking at the Weather Act and the National Weather Service and how people are living with the uncertainties of weather prediction, and through STEM education and outreach, bringing ocean and environmental literacy to the interior of the country. He added that all five of NOAA's Blue Economy pillars had important social science elements as well.

The final NOAA priority, not previously considered by the SAB, was in line with a current national priority of looking into China's impact on the environment. RDML Gallaudet spoke about the lack of scientific study that would determine China's impact on global fisheries, marine pollution, destruction of coral reefs, and infrastructure investments. He said that NOAA could conduct science studies to help expose and document China's environmental impact in hopes to incentivize them to refrain from their current illegal and negative activities.

Discussion

There was a lot of discussion regarding the overlap between NOAA leadership's top priorities and the topics that the SAB team had voted on; many were surprised by the addition of the China topic. Dr. Martin Storksdieck commented that by focusing so wholly on China, rather than taking a broader scientific look at all of those who contribute to the destruction of marine environments, it changes from a scientific effort into one that sounds politically motivated. He suggested perhaps there was a way to frame it so it was more scientifically solid. Dr. Jacobs and RDML Gallaudet agreed with Dr. Storksdieck and suggested the topic could be best focused on the issues (scientific investigation of sources of environmental harm).

Dr. Betsy Weatherhead asked for clarity on the SAB's role in these four priorities. RDML Gallaudet explained that generally for each topic, they would value SAB's thoughts and inputs on how NOAA was handling the priorities and how they could move forward within them.

Dr. Joellen Russell thought the four priorities corresponded well with one another and that at its core, all the topics could bring their data together to create autonomous platforms that could legally work outside U.S. waters without requiring a permit. RDML Gallaudet agreed to the overlap between the topics and that results in some of the topics could definitely influence and contribute to others in the future.

Dr. Rheault suggested the use of additional satellite data to help manage and monitor U.S fisheries and to look at global fishery activity as part of China's activities. RDML Gallaudet agreed with Dr. Rheault and said that satellite data, as well as any other data that showed how global environmental impacts affected the U.S., should be viewed in terms of NOAA's potential scientific contributions.

Dr. Reed also raised a concern about what the SAB would actually do on these priorities. She explained that the SAB is an advisory board and it now sounded like these projects would require more hands-on science than was appropriate. Mr. Kreider said that, based on the charter, the SAB's role would not be to do the actual science but to assess and determine what science should be done, how it should be approached, and to review NOAA's plans and comment on them. RDML Gallaudet added that he would make even more specific recommendations on SAB's role through a detailed letter but that they would mostly be in line with what Mr. Kreider specified.

Dr. Mitch Goldberg asked whether the Earth system prediction and predictability would include climate observations to improve long-range predictions to mitigate and prepare for major hazards, such as droughts, fire, and floods. RDML Gallaudet agreed climate observations would play a role.

There was further conversation about how the SAB's priorities would fit into those selected by NOAA. It was agreed that most of the top five SAB priority topics would be touched on in one way or another through all four of NOAA's priorities, and though number four was unexpected, it could include certain parts of the SAB's topics, such as observations and modeling.

This spurred further discussion about and whether it had anything to do with science and climate or if it was more about policing countries that were systematically violating protocols. The concern was that adding additional items to number four, such as climate observations and modeling, might make it too broad and prevent it from accomplishing the main goal of determining which countries contributed the most to environmental damage. Dr. Russell and Dr. Storksdieck agreed it is unavoidable to do this monitoring without digging into climate research and using modeling to determine where trace gases were coming from as it all plays together; the SAB's role would be to develop high-level guidance for how NOAA could conduct a scientific study to identify causes of environmental harm.

Conclusion

With the SAB in agreement on its role in these priorities moving forward, Mr. Kreider suggested some next steps, starting with combining the top five SAB priority topics to create a complete scope for the first three studies NOAA wanted to tackle. He then suggested the fourth topic would need to be looked at more deliberately by the board to determine a scope of study that would keep it manageable but still provide the added scientific value that could later help with policy impact.

Mr. Kreider suggested the remaining meeting time be used to get a consensus on the topics and to identify small teams consisting of two co-leads, one from SAB or the working group and one from NOAA, who would write up statements for each topic.

Dr. Louis Uccellini commented that for at least the first three topics suggested by NOAA, it isn't only about what is going on at NOAA, but also the enterprise. The agency should be a sound member of the enterprise and/or a leader. For the fourth topic, Dr. Uccellini emphasized it isn't just about the scientific study, but the interactions with different partners and components of the US government.

Dr. Reed raised some concerns about voting on these topics today since she didn't feel she fully understood each topic, especially number four. She would like to see RDML Gallaudet's additional notes before making any final decisions. RDML Gallaudet again summarized the concept behind number four, which was to gather scientific data regarding ocean debris; illegal, unreported, and unregulated (IUU) fishing; and climate-change-causing atmosphere pollution, in an effort to affect policy and hold countries accountable for doing harmful things to the shores and coasts. Dr. Reed voiced further concern about this topic being too big for the SAB.

Mr. Kreider agreed that voting on the topics without a complete write-up was counter to what they did in previous meetings, so he would like to set up groups to begin those write-ups. He also would like to have a further discussion on coastal resilience, which was an important topic to Dr. Reed and rated highly on SAB's voting. RDML Gallaudet explained that while not all of the SAB topics had been included in the four priority items, they were still of high importance

and coastal resilience, for example, was included in the NOAA Blue Economy initiatives. This included items such as space weather, 5G, and coastal resilience.

Dr. Rob Johnston voiced similar concerns as Dr. Reed, stating the group came to the meeting expecting to vote on the SAB priority topics previously discussed and that they put a lot of work into, only to be presented with four new topics. Mr. Kreider noted the first three NOAA topics will fit in well with the topics already voted on by SAB. Dr. Ruth Perry suggested when looking at these topics, to consider whether what is happening in NOAA that should be happening more broadly across the agency.

Dr. Goldberg asked if space weather could be included in the Earth system prediction topic. Dr. Uccellini stated it would be better for the SAB to wait until an upcoming law on space was signed to see how the outside reviews portion would be handled. Dr. Brad Colman noted the EISWG may be able to take on that topic instead, noting the recent addition of space weather expert Jon Linker to the group.

Mr. Kreider reiterated that he would like to have SAB members take on the new NOAA topics and rework the original one-page summaries to create more detailed, descriptive scopes that expounded on the SAB topics as written and made them a better fit to achieve the stated goals of NOAA leadership. Any changes would be based on additional information forthcoming from RDML Gallaudet and on discussions from this meeting.

Dr. Weatherhead was chosen to head the re-work for topic one, Earth system prediction and predictability.

Dr. Perry was selected to lead the changes on number two, which combined several of the topics she had worked on before, including the rapidly changing marine environment, partnerships, and others. Cisco Werner, Robert Rheault, and Mike Castellini, who also participated in some of the other SAB topic groups, agreed to help create this larger NOAA S&T priority.

Dr. Storksdieck was selected to lead the adjustments for topic three, integrating social and behavioral sciences, along with Ms. Lynn Scarlett, Dr. Weatherhead, and Dr. Kirstin Dow.

Dr. Weatherhead volunteered to lead the write-up team for number four, scientific study of negative global impacts and where they were coming from for the purpose of policymaking. Mr. Lenhardt, Dr. Russell, Mr. Kreider, and RDML Gallaudet also volunteered to work on this topic.

Mr. Kreider explained that the groups would re-work these four topics and, where appropriate, the new write-ups would take the place of the respective SAB original one-pagers. The two remaining topics from the SAB's top five, climate observations and coastal resilience, plus NOAA leadership's four topics, would be up for discussion at the October meeting.

Mr. Kreider also decided that, due to time constraints of the meeting, the SAB would delay the conversation around SAB liaisons and the six S&T focus area implementation teams to the October meeting. RDML Gallaudet gave a quick overview which highlighted that implementation plans for the 'omics, UxS, and AI strategies were almost finished, and they were just getting underway on the other three - citizen science, data, and cloud computing. Once they were done, and a timeline had been determined, they would reach out to the SAB for comment.

RDML Gallaudet closed with remarks that he and Neil tried to incorporate as many of SAB's priorities when building theirs and thanked SAB for all the hard work and contributions they made.

Public Comment Period

There were no public comments.

Adjourn

At 5:04 p.m., this meeting of the Science Advisory Board was adjourned.

Minutes Certification

_____   22 March 2021_____

John Kreider, SAB Chair   Date