

Meeting of the NOAA Science Advisory Board
April 30, 2021

Location: Webinar

Advisory Board Members Present:

Mr. John Kreider, President, Kreider Consulting LLC (Chair); **Dr. Robert L. Grossman**, Frederick H. Rawson Distinguished Service Professor in Medicine and Computer Science and Jim and Karen Frank Director, Center for Translational Data Science, University of Chicago; **Dr. Everett Joseph**, Director, National Center for Atmospheric Research (NCAR); **Dr. Eugenia Kalnay**, Distinguished University Professor, Department of Atmospheric and Oceanic Science, University of Maryland; **Mr. M. Christopher Lenhardt**, Domain Scientist, Renaissance Computing Institution; **Dr. Ruth Perry**, Marine Scientist and Regulatory Policy Specialist, Shell Exploration and Production Company; **Dr. Denise Reed**, Professor Gratis, Pontchartrain Institute for Environmental Sciences, University of New Orleans; and **Dr. Elizabeth Weatherhead**, Senior Scientist, U.S. Geological Survey.

NOAA Representatives Present:

Mr. Benjamin Friedman, Deputy Under Secretary for Operations, Performing the Duties of Under Secretary of Commerce for Oceans and Atmosphere, NOAA Administrator; **Mr. Craig McLean**, Assistant Administrator for Oceanic and Atmospheric Research, Performing the Duties of NOAA Chief Scientist; **Ms. Nicole LeBoeuf**, Acting Assistant Administrator, National Ocean Service, NOAA; **Dr. Louis Uccellini**, Assistant Administrator for Weather Service and Director, National Weather Service (NWS); **Rear Admiral (RDML) Nancy Hann**, Deputy Director for Operations, NOAA Office of Marine and Aviation Operations (OMAO), and Deputy Director of the NOAA Commissioned Officer Corps; **Ms. Mary Erickson**, Deputy Director, National Weather Service; **Dr. Mitch Goldberg**, Chief Program Scientist, Joint Polar-Orbiting Satellite System, NOAA; and **Dr. Gary Matlock**, Deputy Assistant Administrator for Science, Oceanic, and Atmospheric Research, NOAA.

Working Group Co-Chairs:

Dr. Bradley R. Colman, Director of Science, Weather Science, The Climate Corporation and Co-Chair, Environmental Information Services Working Group (EISWG); **Dr. Scott Glenn**, Professor, Department of Marine and Coastal Science, Rutgers University and Co-Chair, EISWG; **Dr. Jeff de la Beaujardiere**, Director, NCAR/CISL Information Systems Division and Co-Chair, Data Archive and Access Requirements Working Group (DAARWG); and **Dr. Joellen Russell**, Professor, Biogeochemical Dynamics, University of Arizona, Co-Chair of the Climate Working Group.

Staff for the Science Advisory Board Present:

Dr. Cynthia J. Decker, Executive Director and Designated Federal Officer; **Ms. Tiffany Atkinson**, Program Analyst; and **Ms. Courtney Edwards**, Program Analyst.

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Opening Statement of the Chair

John Kreider, Kreider Consulting and Chair, NOAA SAB

Mr. Kreider thanked the SAB for convening on short notice in order to review a statement from the EISWG about NWS's data dissemination challenges and to receive an update on the Priorities for Weather Research work.

EISWG National Weather Service Data Dissemination Statement

Bradley R. Colman, Director of Science, Weather Science, The Climate Corporation and Co-Chair, Environmental Information Services Working Group

Scott Glenn, Professor, Department of Marine and Coastal Science, Rutgers University and Co-Chair, Environmental Information Services Working Group

Presentation

Dr. Colman explained that the challenge concerned NOAA's ability to keep up with the pace of and demand for their data and information. Due to the Weather Service's success, more and more users have used this resource, but the products have higher resolution and longer projection times, which all added load to the data distribution system. He added that the Weather Service had anticipated this problem and recently presented a plan to Congressional staff on how they plan to tackle the problem.

Given the critical and pressing nature of this issue, the EISWG felt it was important to raise the issue and offer support to NOAA. The impacts of this problem are already being seen. Data centers previously used as backups are being hit with data demands during high-impact weather events, causing loss of that backup capability and creating outages that prevent data access.

Dr. Glenn spoke next and went through the Weather Service's Integrated Dissemination Program (IDP), which has four phases for improving NWS data delivery infrastructure. NWS has completed phase one and is now close to completion of phase two, which focuses on a conversion of activities to IPD. While phase three will complete that transition, the ultimate goal in phase four is to move the data to the cloud. Lack of funding is the main element that has prevented the progression of this effort.

Dr. Glenn noted that the Weather Service had released a Public Information Notice that access would be limited to 60 connections per minute on many websites within the IDP, including the Operational Model Archive and Distribution System (NOMADS), which is critical for the larger weather enterprise. After public input, another service change announcement indicated there would be only limited access to five websites and increased the restrictions to 120 connections per minute. Overall, the weather enterprise has concerns about the rate limits, especially as fire

and hurricane season approaches. Dr. Glenn added that NWS audits the rates across the five websites for 120 connections per minute and that access would be shut off if that was exceeded. However, those responsible for reinstatement of the websites only work weekdays, 9 to 5, which could become an issue if site access is interrupted on the weekends.

Dr. Glenn moved on to the EISWG recommendations for the NWS. First was to prioritize the emergency response of the \$1.5 million which was given to increase the bandwidth and other infrastructure modifications in order to limit the impact of these high-demand times. The second recommendation was to continue to engage the broader weather enterprise for ways to improve the situation and better utilize their experiences and broad knowledge. The third recommendation was to leverage a content delivery network which would cache certain data files and prevent the need for users to access NWS origin servers, reducing the number of requests going directly to NWS.

The fourth recommendation was to implement user management activities. This would allow the NWS to send data and notices out to people more regularly and reduce demand in the infrastructure. In addition, the system could notify users that they had exceeded the traffic limits and propose ways to help them.

The fifth and last recommendation was to encourage the acceleration towards migrating to a commercial cloud network, which is already part of phase 4 of the IDP.

Discussion

Mr. Friedman asserted that they could agree with the EISWG statement but not necessarily with the news articles that were attached to it. He indicated the statement would be useful for the FY22 budget cycle because it reinforces some of the issues NOAA has already brought up to Congress. As long as the report aligned with the already developed IDP plan, it was something NOAA could embrace, but in areas that the report had recommendations that differed from the plan, there may be some work to do to resolve those. Overall, NOAA is generally supportive of the statement.

Dr. Uccellini emphasized that the National Weather Service is aware of the dissemination needs and has been working to consolidate the dissemination program and systems and establish the infrastructure since he started. He gave a brief background on where they began and what they had accomplished through the years but acknowledged the importance of timely access to mission-critical watches, warnings, forecasts, observational data sets, and model outputs when there are increased demands. Dr. Uccellini added that they had briefed Senate and House Appropriations Committees on the IDP Plan, and he felt optimistic about the FY22 budget. He added the reasons why they didn't like the news articles that were attached were because of inaccuracies within the articles and the negative impact on the workforce.

Dr. Colman responded to Mr. Friedman and Dr. Uccellini that the EISWG's reason to include the articles was not to endorse their content, but rather to show that conversation on this issue had

gone beyond the core enterprise stakeholders and gained more public exposure. He added that the EISWG would find a way to communicate that point in their report without inclusion of the articles.

Dr. Grossman suggested clarifying whether the data delivery mechanisms, like content delivery networks, are part of an architecture, and if that architecture is part of the IDP and needs to be implemented, or if the correct architecture has yet to be identified. Dr. Glenn responded that Recommendation 2 suggested NWS bring together the stakeholders to have this discussion. Dr. Grossman suggested a recommendation of identifying a consistent, agreed-upon architecture if that does not exist in the IDP.

Dr. Reed had concerns about a couple of the recommendations that simply told the agency to find money. She also expressed confusion as to whether the items referred to in the report had already been included in the IDP or not and why the endnotes with the links to the news articles are needed at all. She also asked what it meant for SAB to accept the statement and whether acceptance meant it would get forwarded to NOAA. She reiterated her concern about the “find-the money” type of recommendations. She suggested a strong statement of support for the IDP, with one or two additions to improve the Plan as is.

Dr. Colman responded that they could rephrase to finding “solutions” instead of “resources”. He noted that having a separate statement, as opposed to just an endorsement of the IDP, was a way to prioritize the urgency of the situation. It also allowed them to emphasize the lifesaving and money-producing aspects of the National Weather Service’s work and highlight the real impact to private industry these multi-day outages have had. The hope was that these recommendations, in addition to the IDP, would help the Weather Service arrive at a solution more quickly and perhaps be helpful in the interim while the IDP was instituted.

Dr. Reed was unsure that the report will actually be helpful in solving this problem or that it may not read as EISWG intended in helping to find solutions to address this problem. She was particularly concerned about the recommendation stating that NOAA needed to obtain funding, noting the tradeoffs that might occur if funds are reprogramed as suggested. Mr. Lenhardt asked if there was discussion about assessing user demand so that in designing these systems, they could address those burdens as efficiently and effectively as possible. Dr. Glenn and Dr. Colman both referenced Recommendation 4, which suggested learning more about the user side to gain a better idea of who accessed the data, especially at key times, to see if there was a different option to provide stakeholders what they needed without undue burden to the system.

They invited Mr. Jon Porter, an EISWG member and a stakeholder from AccuWeather, to speak. Mr. Porter commended the work the Weather Service had already done on collecting user input with a focus on dissemination. He stated that EISWG members felt that if the Weather Service could not disseminate its data reliably in real time, then it has a challenge in fulfilling its mission. He added that the number of different industries who rely on the Weather Service data continued to grow and no longer included just the private weather industry. He again emphasized they

were impressed with what NOAA had accomplished thus far, particularly with the IDP Plan, but EISWG still saw room for collaboration and quicker more creative solutions to address the overall site load issue.

Mr. Kreider summarized the concerns expressed so far: endnote articles; wording of Recommendation 1 urging NOAA leadership to obtain funds; and addressing broader architecture in Recommendation 3. Responding to Dr. Reed's earlier comments, Dr. Colman added that they've been told in the past that statements from the SAB and working groups can be helpful to NOAA in demonstrating community priorities and resources, which was the intent here. He agreed they could remove the footnotes and rephrase to recommend solutions rather than "finding the funds". Dr. Joseph agreed with Dr. Reed's concerns about removing the endnotes, adding that the bringing the perspective of the weather enterprise forward was more impactful. Mr. Kreider added to his summary that support of the IDP was not in question, but proceeding with the plan as is will not solve the demand issues in the short-term.

Dr. Uccellini added to that what they really needed was more an endorsement of the IDP plan, which would help gain support from the current Administration and Congress. He added the plan does have flexibilities built in to engage with the outside community. But he added that NWS appreciated the recommendation that it continue to connect with the larger weather enterprise. Mr. Friedman added that he wanted the SAB to decide on how to proceed without too much influence from NOAA and reminded them that all reports would be taken under advisement.

Dr. Colman stated that they shouldn't assume accelerating the IDP will solve the problem and reiterated the urgency of the current situation, noting that solutions not quite in alignment with the IDP may be needed to course-correct in the short-term. Mr. Kreider agreed, but pointed out it is more appropriate for the SAB to bring attention to the problem, but not recommend solutions. Dr. Weatherhead suggested a statement supporting the continued collaboration between NOAA and the private sector to find a solution, which was supported by Dr. Joseph.

There was discussion about the SAB consensus process and how to proceed given the significant edits the SAB requested EISWG make. It was proposed that the SAB would send the statement back to the EISWG for revisions and hold another public meeting in June to make a final decision. Despite this being an urgent issue, the SAB agreed that waiting another month to approve the statement would be a good idea, especially with the timing of the FY22 budget. It was debated if the SAB could approve the statement with revisions, or if they had to reject it and send it back. The final decision was that the SAB needed more information, so the statement was returned to EISWG for revisions and a meeting would be scheduled for early June.

Dr. Colman voiced concern about waiting another month to approve the statement, given the problems being seen now. He hoped that since all the decision-makers were present today, they heard all of EISWG's concerns and internal conversations could continue in the meantime. Specific support of Recommendation 2 in working with stakeholders was voiced by Dr. Weatherhead, Dr. Reed, and Dr. Uccellini. Mr. McLean noted that EISWG was authorized

under federal law, but was not itself a federal advisory committee. He voiced frustration that EISWG needed “ceremonial” approval from the SAB in order for its work to be sent to NOAA. There was additional discussion of a general letter of support by the SAB, but that was rejected as it would still need to be approved at a public meeting and it would not speed up the process.

Public Comment Period

Dr. Decker opened the meeting for public comment. There were no public comments.

Adjourn

At 5:45 p.m., this meeting of the Science Advisory Board was adjourned.