

Eleventh Meeting of the NOAA Science Advisory Board's Environmental Information Services Working Group (EISWG)

April 28-29, 2014
National Center for Weather and Climate Prediction (NCWCP)
College Park, Maryland
5830 University Research Court, College Park, MD 20740
Conference Room #1606

SUMMARY

The following paragraphs summarize the Eleventh Meeting of the Environmental Information Services Working Group (EISWG) of the NOAA Science Advisory Board (SAB).

Meeting attendees included:

EISWG Members

Ms. Nancy Colleton, IGES (Co-Chair)
Dr. Walter F. Dabberdt, Vaisala (Co-Chair)
Mr. Ron Birk, Northrop Grumman
Dr. Anne Bostrom, University of WA (*by phone*)
Dr. Eric Grimit, 3Tier, Inc.
Mr. Eddie Hicks, Morgan County, Alabama (*by phone*)
Mr. Barry L. Myers, AccuWeather, Inc.
Dr. Peter P. Neilley, The Weather Channel Companies
Mr. Warren Qualley, Harris Corp.
Mr. John Toohey-Morales, ClimaData Corp. (*by phone*)
Dr. Jean Vieux, Vieux Associates
Dr. Julie Ann Winkler, Michigan State University
Mr. Robert Winokur, Retired NOAA and the Navy

Members not in attendance include:

Dr. Phil Ardanuy, Raytheon
Dr. Kelly T. Redmond, Desert Research Institute, Western Regional Climate Center
Dr. John Snow, University of Oklahoma
Dr. Bob Weller, Woods Hole Oceanographic Institute
Mr. Joel M. Widder, The Oldaker Group

SAB Liaison:

Mr. Ray Ban, Ban & Associates, LLC; SAB Chair

Participants

Fred Carr, UCACN Co-Chair
Ashley Chappel, NOAA
Cynthia Decker, SAB Executive Director, NOAA
Mary Glackin, Commissioner, AMS Commission Weather and Climate Enterprise
David Hemreck, NESDIS, NOAA
Ed Johnson, NWS, NOAA
Jim Kinter, UCACN Co-Chair
Bill Lapenta, NOAA, NWS NCEP Director
Derek Parks, OAR
Jennifer Sprague, NWS, NOAA
Betsy Weatherhead, University of Colorado
Louis Uccellini, NWS Director
Bina Venkataraman, Senior Advisor on Climate Change Innovation, Executive Office of the President

Monday, April 28, 2014

National Weather Service Update (Louis Uccellini)

Dr. Louis Uccellini, together with Dr. Ed Johnson, provided a brief update on various issues impacting the NWS. Many of the NWS' strategic goals are being addressed through the Weather Ready Nation program, which is being built around the Integrated Decision Support System concept with a focus on addressing "the last mile." Overall, NWS' strategic goals include:

- Improvement of weather decision services
- Improving water forecasting services
- Enhancing climate services and adaptation to climate-related risks
- Improving sector-relevant information in support of economic productivity

Uccellini gave some examples of recent modeling achievements, saying that:

- The HWRF high-resolution (3km) model is performing well
- Global ensemble predictions will have their resolution increased from 55 to 35km
- Short-range ensemble predictions will become available at 12km resolution

With regard to political items, he indicated that the Senate staff has expressed support for a reinvigorated US Weather Research Program. He also indicated that the NWS budget is his biggest concern although he is optimistic.

Dr. Johnson mentioned that organizational changes at NWS will require stakeholder outreach and involvement, and that there may well be a need for formal advisory committee input. Several options are being considered, ranging from a single broad-based FAC to several smaller advisory group mechanisms. NWS will continue to seek input from several existing bodies, such as the UCACN (see subsequent discussion), the AMS FIG (again, discussed later) and the EISWG.

SAB Update (Ray Ban)

Ray Ban, the NOAA SAB Chair, indicated that his term on the SAB ends on June 23, 2014. Dr. Lynne Scarlet of the Nature Conservancy will succeed Ray as SAB Chair. The SAB has recently added nine new members, including EISWG member Dr. Bob Winokur. Ray indicated that Dr. Sullivan is looking to engage the SAB more substantively and has begun the process by seeking input from the various NOAA line offices. One area being addressed is the number and scope of the various standing working groups of the SAB. Dr. Sullivan has also indicated that she intends to focus her interactions with the SAB in several areas, including observing infrastructure, community resilience, and organizational excellence, among others.

Climate Data (Bina Venkataraman)

Ms. Venkataraman serves as Senior Advisor for Climate Change Innovation in the Obama Administration in the Executive Office of the President, where she leads initiatives to stimulate data-driven and creative actions on the part of communities, companies, and citizens to respond to a warming climate. In June 2013, President Obama launched a Climate Action Plan to cut carbon pollution, prepare communities for the impacts of climate change, and lead international efforts to address this global challenge. Subsequently, the Obama Administration recently (March 19, 2014) launched the Climate Data Initiative (<http://www.whitehouse.gov/the-press-office/2014/03/19/fact-sheet-president-s-climate-data-initiative-empowering-america-s-comm>), which is a broad effort that seeks to leverage the Federal Government's extensive, freely-available climate-relevant data resources to stimulate innovation and private-sector entrepreneurship in support of national climate-change preparedness. Bina provided an overview of the Climate Data Initiative, and discussed the challenges and objectives of defining the respective roles of and collaboration among the public and private sectors.

National Centers for Environmental Prediction (Bill Lapenta)

Dr. Lapenta provided a summary of the many challenges facing NCEP:

- Fifty (50) vacancies need to be filled
- A new leadership team will be formed as 4 of the 9 NCEP Center Directors are new
- Prepare in the coming year an NCEP strategic plan, and an implementation plan
- Provide input to the Weather Ready Nation program
- Strengthen engagement of stakeholders
- Shift to a portfolio-based management plan
- Strengthen relationships among the NCEP Centers and the WFOs
- Harmonize forecasts and practices across the WFOs
- Interact with NWS' new water center
- Develop a modeling strategy
- Increase accessibility to more model data
- Strengthen R2O and O2R
- Create new testbeds, as needed

NCEP Building Tour

Over the Monday lunch hour, EISWG members and guests were given a tour of NCEP's impressive new building facility (the National Center for Weather and Climate Prediction).

Pending OpenEIS Trial at NCEP

EISWG member Peter Neilley gave a status report on the pending Cooperative Research and Development Agreement (CRADA) with NCEP that would enable a 2-3-year trial of increased private sector access to much of NCEP's model data (Neilley's slides are available at the EISWG website). Companies such as Amazon, Unysis, Northrop Grumman, Google, Vaisala, and Unidata have all agreed to work with the Weather Company on this demonstration. [Subsequently, on June 3, 2014, NOAA announced that the CRADA activity was being cancelled due to the perception of 'privileged access' concerns raised by several companies. NOAA indicated it would seek to address the OpenEIS goals through the existing NOMADS program and the pending DOC Big Data initiative].

AMS OpenEIS Committee Activities (Warren Qualley)

Warren Qualley indicated that the AMS OpenEIS Committee is focused more widely than only NOAA. In addition, they are also examining availability of enhanced data from international sources. The committee plans to either organize a Town Hall meeting or a technical session at the 2015 AMS Annual Meeting. The committee is examining options for a survey of providers and users; it was suggested that the survey should include other scientific and professional societies as well.

EarthCube (Anna Katz)

Dr. Anna Katz gave a remote presentation of the EarthCube program, sponsored by NSF. EarthCube is a community-led cyberinfrastructure program that will allow for unprecedented data sharing across the geosciences. Its aim is to develop a framework over the next decade to assist researchers in understanding and predicting the Earth system from the sun to the center of the Earth. EarthCube has the potential to:

- Create effective, community-driven cyberinfrastructure
- Allow global data discovery and knowledge management
- Achieve interoperability and data integration within and across disciplines

Formed in 2011, EarthCube is a collaborative partnership between NSF's Directorate of Geosciences (GEO) and the Division of Advanced Cyberinfrastructure (ACI). It's also a virtual community with over 2,500 participants, including atmosphere, ocean, computer, information, and social scientists, as well as educators, data managers, and other diverse contributors. More information is available at: <http://www.earthcube.org>.

National Climate Data Center (NCDC) Data Initiatives (Tom Karl)

NCDC Director, Dr. Tom Karl, gave an overview of three Requests for Information that will soon be released by NCDC. The three RFIs seek to:

- Have respondents prioritize the criteria used by NCDC to, in turn, prioritize NCDC's data products; respondents will also be asked to identify and prioritize additional criteria.
- Create public-private partnerships that will facilitate resilience in responding to impacts of a changing climate
- Create a directory of experts and their expertise in providing advice, support and assistance with regard to NCDC-generated data products.

Tuesday, April 29, 2014

A Vision for the Weather Enterprise in 2025 (moderated by Bill Hooke)

Dr. Bill Hooke moderated a discussion among the EISWG members and guests on what changes might take place within the weather enterprise over the coming decade. The common view among the group was that the changes would be significant, rapid, and many in number. It was also agreed that 90 minutes was insufficient for this discussion, and that a follow-on discussion needs to be part of a future EISWG meeting. It was also agreed that NOAA should be encouraged to engage in similar discussions as part of its long-range strategic planning. Annex B to this meeting summary identifies the many points articulated during the discussion.

Accelerating Ocean Data Collection and Use (Holly Bamford)

Dr. Holly Bamford, Assistant Administrator, National Oceans Service, provided an overview to EISWG of ongoing and planned NOS programs. Of specific interest, was Bamford's discussion about mainstreaming ocean-related data and information by working more closely with other NOAA line offices such as the National Weather Service. Integrating weather and oceans data is a high priority. Bamford also noted the how the NWS infrastructure for delivering data and information is being used by NOS. She noted that the NWS "Storefront" is extremely beneficial for delivery data for numerous NOS projects.

UCAR Community Advisory Committee for NCEP (UCACN – Fred Carr and Jim Kinter)

UCACN CoChairs Dr. Fred Carr and Dr. Jim Kinter provided a summary of this community effort. UCACN was originally established by then-NCEP Director Uccellini to provide guidance and feedback on the activities of NCEP's nine centers and Office of the Director utilizing UCAR as the organizing body. UCACN membership is comprised of individuals from universities, NCAR, other Federal agencies and the private sector. Fred and Jim's presentation slides are provided on the EISWG website.

AMS Forecast Improvement Group (FIG -- Betsy Weatherhead)

Dr. Betsy Weatherhead created this informal community body, and provided the following detailed summary of her presentation.

- There is a clear desire for the messages from NOAA's Science Advisory Board's Environmental Information Services Working Group (EISWG), UCAR Community Advisory Committee for NCEIP (UCACN) and AMS Forecast Improvement (FIG) to be coordinated when appropriate. Uccellini has requested this coordination, and we all see the value in it. However, this will not restrict or guide the content of any recommendations any one group may come up with.
- The scope of EISWG, UCACN and FIG are each different. EISWG offers "advice" to NOAA as a sub-group of NOAA's Science Advisory Board; NOAA is obliged to respond to that advice (when forwarded to NOAA by the SAB as a formal recommendation). UCACN offers community input to NWS/NCEP; in the past, the recommendations were taken seriously and tracked for NCEP's response. The FIG offers a forum for community discussions and has come up with recommendations for making significant forecast improvement; these recommendations are not solicited and do not require a response. The general goals of the three groups are in good agreement, even if the scope and details are significantly different.
- The FIG has come up with seven recommendations for significant improvements in weather forecasting, including recommendations about computing, modeling, observations and coordination.
- The FIG's future efforts will focus on examining alternative business models, refining the seven FIG recommendations to be more actionable, and clarifying issues that may be obstacles to significant improvements in forecasting.

- The FIG has recently discussed the need for community-wide strategic planning. The value of such planning was discussed at the EISWG meeting, as well as the difficulty in finding an appropriate venue (SAB, FIG, OFCM, etc.) for those discussions. EISWG members were in agreement with the value of community-wide strategic planning, but offered no clear indication that leadership on this issue would be undertaken by the SAB, although participation of the SAB may be possible if another group took leadership. This topic may be discussed at the next SAB meeting.
- Suggestions were made to the FIG to consider writing a BAMS article on work done to date as well as writing an AMS Policy Statement.
- All agreed to the intentions for continued coordination of EISWG, UCACN and FIG

Summary Comment (Dabberdt and Colleton)

NWS Director Uccellini has said on several occasions that he looks to the EISWG, FIG and UCACN as the three external bodies that he looks to for community feedback and input, and has encouraged the three groups to coordinate with each other. While EISWG and UCACN have coordinated in the past, this is the first time that the three groups have formally coordinated and shared ideas and experiences. As mentioned in the FIG summary, the three groups are well aligned with some overlap but little duplication, while their organizational constructs are quite different. The three sets of chairs agreed to continue this constructive dialogue.

Review of Actions

1. Dabberdt—explore next steps regarding OEIS efforts for symbiotic development;
2. EISWG—examine the value to NOAA of a Weather FACA.
3. TBD—consider the value of working groups within the context of the EISWG
4. EISWG—identify actionable opportunities for NOAA climate data
5. NESDIS/Dave Hemrick—respond to the EISWG request to identify methods to provide real-time internet access to satellite data.
6. Dabberdt/Colleton—draft correspondence to the SAB regarding next steps with the OIES.
7. Dabberdt/Colleton—determine whether to recommend that NOAA’s OEIS pilot decision be placed on the SAB’s July agenda.
8. Colleton/Dabberdt—meet with Lynn Scarlett, new SAB Chair

APPENDIX A

**Eleventh Meeting of the NOAA Science Advisory Board's
Environmental Information Services Working Group (EISWG)**

April 28-29, 2014
National Center for Weather and Climate Prediction (NCWCP)
College Park, Maryland
5830 University Research Court, College Park, MD 20740
Conference Room #1606

AGENDA

Monday, April 28, 2014

- | | | |
|-------|---|--|
| 8:30 | Meet & Greet | |
| 8:45 | National Weather Service Update | <i>NWS Director, Louis Uccellini</i> |
| 9:30 | Welcome, Introductions, and Meeting Overview | <i>EISWG Co-Chairs
Nancy Colleton & Walt Dabberdt</i> |
| 9:45 | SAB Update | <i>SAB Chair, Ray Ban</i> |
| 10:15 | Break | |
| 10:45 | Climate Data and Agriculture | <i>Bina Venkataraman
Senior Advisor on Climate Change
Innovation
Executive Office of the President</i> |
| 11:45 | NCEP Welcome | <i>NOAA/NWS/NCEP Director
Bill Lapenta</i> |
| 12:15 | Lunch (and NCWCP tour) | |
| 1:15 | OpenEIS | |
| | <ul style="list-style-type: none">• Reston OpenEIS Trial• AMS OpenEIS Committee Activities• Symbiotic Development | <i>Peter Neilley
Barry Myers
Warren Qualley
Walt Dabberdt</i> |
| 3:15 | Break | |

**Environmental
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- 3:30 NOAA Data
- NSF's EarthCube Program *Anna Katz, EarthCube*
 - National Climate Data Center Data Initiatives *Tom Karl, NCDC Director*
- 4:45 Summary and Review of Action Items *Colleton & Dabberdt*
- 5:15 Adjourn
- 6:30 Dinner – 8407 Kitchen Bar (8407 Ramsey Ave, Silver Spring, MD 20910)

Tuesday, April 29, 2014

- 8:30 Meet & Greet
- 9:00 Welcome, Introductions, and Meeting Overview *EISWG Co-Chairs
Nancy Colleton & Walt Dabberdt*
- 9:15 A Vision for the Weather Enterprise in 2025 *An EISWG Discussion Moderated by
William Hooke, AMS Deputy Executive
Director*
- 10:45 Break
- 11:00 Accelerating Ocean Data Collection & Use *Holly A. Bamford, Assistant
Administrator, National Ocean Service,
NOAA*
- 11:45 Lunch -- EISWG Information Sharing Session *EISWG Members*
- 12:45 UCAR Community Advisory Committee
for NCEP (UCACN) *UCACN Co-Chairs
Fred Carr & Jim Kinter*
- 1:15 AMS Forecast Improvement Group (FIG) *Betsy Weatherhead, University of
Colorado and AMS "FIG Chair"*
- 1:45 EISWG-UCACN-FIG Interactions Discussion *Colleton & Dabberdt, Kinter & Carr, and
Weatherhead*
- 2:15 Review of Actions and Summary *Colleton & Dabberdt*
- 3:00 Adjourn

APPENDIX B

Notes (unedited) on the April 29th EISWG Session on:

“A Vision for the Weather Enterprise in 2025”
moderated by Bill Hooke, AMS Deputy Executive Director

Four broad themes were considered:

- World view in 2025
- Demand for information services
- Disruptive technologies and events
- EISWG’s role? What message to send to NOAA?

Cultural Changes:

- What will have replaced Facebook and Twitter?
- There will be significant personalized integration of information
- Population will be much greater (globally and domestically)
- Cities will be
 - More populous
 - More densely populated
 - Located more along and in coastal regions
- Some natural resources will be scarce
- Geopolitical landscape will be different
- Greater global interdependence
- Possible global economic meltdown
- More remote working
- Bitcoin (or equivalent) will be widely used
- More Arctic activity (e.g. transport, tourism)
- Increased pressure to sustain/maintain our current meteorological observing system
- Commercial companies will provide more satellite observations
- Decline of national powers and a rise of the influence of people and companies
- Aging population distribution
- Decline of STEM education
- Colleges and universities will be prohibitively expensive

Science & Technology Changes:

- Many medical advances
- People demand more personalized information
- Increased need for and recognition of social sciences
- Niche marketing to individuals commonplace
- Concerns regarding personal privacy and security

- Crowdsourcing will be a norm
- Reduced social (i.e. interpersonal) interactions
- More dependency on engineered systems (artificial intelligence?)
- Reduced ability to communicate verbally ('speak proper English')
- Creation of information will exceed ability to digest
- Greater interoperability among (engineered) devices
- Drones to be widely used (e.g. in agriculture)
- Technology development will outpace the ability to 'control' it

Developments Within the Weather & Climate Domain

- Fundamental changes (advances) in observations; new technologies
- Increased use of crowdsourcing
- Reduced cycle time for satellite observations
- Increasingly false sense of security w/r/t information content of graphical displays
- Escalating cost of satellite observations
- More centralized data management and computation
- Advances in NWP
- Increased decision support services for transport and energy communities
- Tornado-genesis will be understood
- Weather computing will be widely distributed (Q: geographically or sectorally?)

Provision and Delivery of Weather & Climate Services

- More emphasis on nowcasting (up to 2 hours)
- Very high spatial resolution
- Complex terrain flows will remain undetermined
- Observations will lag requirements for modeling and visualization
- PBL observations still lacking
- False expectations remain w/r/t hurricane track forecasting (an unintended consequence of the success of Hurricane Andrew track forecast)
- Probabilistic and ensemble forecasting will see big advances and wider use in decision-making
- Door-to-door decision support will be common for transport sectors
- Personalized and customized information delivery will be "me-centric"

Changing Roles of Government and Private Providers

- Real potential for real transition here (C: these notes not very good w/r/t Ed's comments; help)
 - o Increasing value of timely weather information
 - o Trend continues from today
 - o Disruptive changes likely
- There will be continued changing of the respective roles of the sectors; this evolution has already started
- Hybrid skill sets will be needed for all meteorologists

- Universities unprepared for these changing needs
- Universities largely do not understand the weather business
- 2025 will see a serious debate on the continued need for public weather services
 - At the same time, private industry has been built on the availability of free and open data
 - What will be the role of government for the Nation?
 - Will the private sector have the will and capacity to sustain a national observing system?
 - Will commercial giants (such as Google, Amazon, Microsoft, IBM) create end-to-end national weather and climate services in direct competition with NOAA and NWS?
 - What would be the international impacts of a private national weather service(s) and the potential loss of international cooperation agreements?
 - Is the privatization of the US Postal Service a relevant analog?
- Political vs. economic power? Is this a differentiator among government and private weather services? What's the value of lobbying?

Disruptive Events?

- Weather and climate geoengineering (domestic and/or foreign)?
- Vulnerabilities due to a highly interconnected system?
- People's abilities to deal with increasingly complex situations
- Artificial photosynthesis and climate change?
- IT security (e.g. ports and harbors)?
- Possible undermining of US' economic stability
- Cost of protection from "what ifs"
- Vulnerability of the electric power grid
- Isolation of people from nature
- 'impoverished vision of disruptors' (C: need help here)
- Disease outbreaks (e.g. pandemics)
- Megacompany(ies) capitalizing a new, competitive private weather service

What Can EISWG Do?

- Encourage NOAA to also brainstorm the future
- OpenEIS has been a valuable learning exercise
- Summarize and share today's discussion
- Consider the ongoing NWS reorganization w/r/t the future
- Encourage NOAA to initiate and sustain ongoing dialog on changing roles of public and private sectors
- Is there an 'untapped strength' in NOAA being a part of the Department of Commerce? How to use the DOC connection to the advantage of NOAA and the private sector?
- NOAA still struggling with the environmental intelligence theme
- By 2025, electronic 'mechanisms' may supplant the need for Federal Advisory Committees (C: this observation was raised by a non-EISWG participant)

What Are the Elements of a Good Strategic Plan (Bill Hooke)?

**Environmental
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of the NOAA Science Advisory Board

1. Nimble
2. Perceptive
3. Adaptive
4. Useful

At this point, time ran out but the energy level did not!