

Review of Science Advisory Board (SAB) Working Groups 2012-2017

Introduction and Background

The Science Advisory Board (SAB) is called upon to provide information and advice to NOAA on a wide variety of topics important to the Agency. Because of the breadth of subject matter that the SAB addresses, SAB members frequently consult with outside experts on specific topics. In some cases, the technical nature of a topic requires SAB members to convene a group of experts to study a subject of long-term interest to NOAA, and the SAB establishes such subcommittees on a regular basis. These subcommittees are called “standing working groups,” and operate under procedures outlined in the SAB Subcommittee Concept of Operations (ConOps).

The SAB Subcommittee ConOps was revised in early 2017 to include a review of standing working groups every two years in conjunction with renewal of the SAB charter. Specifically, the ConOps language states that “[t]he terms of reference for a standing working group should be reviewed and revised on a biennial basis by the SAB and NOAA, in conjunction with renewal of the SAB charter.” The ConOps further notes that subcommittee reviews will result in a report with a recommendation for whether NOAA should maintain the group, suggested revisions to the subcommittee Terms of Reference, and other recommendations about subcommittee operations, as appropriate.

Notably, the Environmental Information Services Working Group (EISWG) is legislatively mandated under the Weather Research and Forecasting Innovation Act of 2017. Although EISWG will be reviewed along with the other standing working groups, NOAA will only consider changes to its Terms of Reference and operations, not whether to maintain it as a working group.

The SAB approved the review process and the timeline for the process, with the SAB reviewing a draft report then approving a final report with recommendations for next steps by NOAA and the standing working groups. The process included collection of relevant data, including frequency of meetings, reports submitted during the review period and questions posed to NOAA program liaisons, Working Group Chairs and SAB liaisons on proposed changes to the Terms of Reference and other recommendations about subcommittee operations, as appropriate. NOAA program liaisons, Chairs and SAB liaisons new in their positions were encouraged to consult their predecessors to assist in completion of the questions in the survey.

After review by the SAB, comments are sent to NOAA for final action. NOAA completes review of the report and sends the final report back to the SAB for action; SAB sends the final report to standing working groups for action, with reports from the working group on completed actions due in six months.

Note the background data on meetings held and reports submitted to the SAB is shown as Appendix A and questions sent to NOAA program liaisons, Working Group Chairs and SAB liaisons in Appendix B. Working Group Reports and Terms of Reference can be found on the Standing Working Group page on the SAB website:

Draft August 18, 2017

<http://sab.noaa.gov/WorkingGroups/StandingWorkingGroups.aspx>

The following pages provide input on changes to the Terms of Reference, input on whether the subcommittee should continue or be disestablished and working group best practices as provided by the Chair(s) and other proposed changes to working group operations.

Part 1. Proposed Changes to Terms of Reference (TOR) and Continuance as Working Group by Group

Summary:

CWG:

- **TOR - revised once and still relevant but it may be a good time to revisit to determine and/or narrow the TOR.**
- **Continuance – group should be continued**

DAARWG:

- **TOR-NOAA liaison and Chair recommend a number of changes; TOR has not been revised since the group began.**
- **Continuance - group should be continued**

EISWG-TOR:

- **TOR - must be revised to reflect new mandates under the Weather Research and Forecasting Act; the same legislation mandates the EISWG as a SAB working group**
- **Continuance – N/A since legislatively mandated**

ESMWG:

- **TOR - General agreement that the TOR is still relevant with no major changes needed.**
- **Continuance - group should be continued.**

Note: Response details are included below; responses are identified as NOAA Liaison (NL), Chair or Co-Chairs (CH) or SAB Liaison (SL) Questions on TOR relevance/changes asked to all groups; Continuance question asked only to NOAA and SAB liaisons of CWG, DAARWG and ESMWG.

Climate Working Group (CWG)

Input was received from the NOAA program office liaison, the Co-Chairs of the working group and one of the two SAB liaisons.

Climate Working Group - Proposed Changes to Terms of Reference

-The TOR reflects the status of the CWG when NOAA was in the process of developing a climate service. As this service did not happen, I think it would be a good time to revisit the TOR to determine and/or narrow the focus of the TOR (NL)

-They are still relevant, but some clarification on the procedure of adding new members may be needed. (CH)

Climate Working Group Continuance

The NOAA liaison recommended that the CWG continue as a standing working group. There are currently two very engaged co-chairs and two SAB liaisons. The CWG is working on four subtopics/subgroups that are especially relevant to NOAA's Climate Activities. This Climate Working Group is helpful in providing insight and recommendations to NOAA's climate activities. (NL)

A SAB liaison commented that the Climate Working Group seems to be the most important SAB Working Group: given the current uncertainties, it is important to support NOAA climate. (SL)

Data Archive and Access Requirements Working Group (DAARWG)

Input was received from the NOAA program office liaison and the Chair. There is currently no SAB liaison (the previous SAB liaison was asked to provide input but declined due to time constraints).

DAARWG - Proposed Changes to Terms of Reference

Changes should be made to the DAARWG TOR. Data archiving and access methods and policies are much better understood and implemented now than when DAARWG was established. In the meantime, however, technology has evolved (notably with the advent of Cloud Computing) and data volumes have grown enormously. Recommend a scope change and ToR revision to focus on data access and usability, and how NOAA can leverage these new technologies. Also new in the last 4 years is the establishment of NOAA Chief Data Officer (CDO) and Geographic Information Officer (GIO) positions, in addition to Data Management (NL)

It is the opinion of the chair that the DAARWG Terms of Reference may benefit from an update. The current Terms of Reference document is focused on archiving and access. However, the recognition of the central role of data science has increased within NOAA and the DAARWG charge should be revised to reflect this changing role. In this context, to be clear, we apply a notion of data science that is not simply limited to analytics. The notion espoused by DAARWG includes ideas of the 'science of data', integration of science and cyberinfrastructure, reproducibility, expanding notions of what constitutes scientific 'data' to be managed (e.g., physical samples), linkages to high performance computing, science as a service platform, as well as new analytical and modeling techniques. These complementary facets of data science influence choices about archiving and access. The current terms of reference do not preclude examining the types of data science topics listed above. However, the language might be updated to communicate more readily the actual scope in more contemporary language. DAARWG has had several conversations regarding its Terms of Reference and raised a number of themes, e.g., emphasizing access over archiving, or potentially changing the name to reflect other changes; the working group members have not reached a consensus as to what specific changes to recommend. (CH)

DAARWG - Continuance

The WG has been of value to NOAA and should absolutely continue. Perhaps a name change to Data Accessibility WG, or Open Data WG, or other, would be warranted based on scope change proposed in the TOR comment above. (NL)

Environmental Information Services Working Group (EISWG)

(Input received from NOAA program liaison, Co-Chair and SAB Liaison)

EISWG - Proposed Changes to Terms of Reference

The EISWG ToR charges the EISWG to work closely with all five NOAA Line Offices (National Marine Fisheries Service – NMFS, National Ocean Service – NOS, Oceanic and Atmospheric Research – OAR, National Environmental Satellite, Data, and Information Service – NESDIS, and National Weather Service - NWS).

There is a need to define what is meant by ‘will work closely’ in specific actions or personnel with whom the EISWG should interact. Currently, there is only a NWS liaison. There are no other liaisons from the other NOAA Line Offices.

“Environmental Information Services” suggests a wide variety of products and services that this group could examine, assess, and provide scientific input on. Based on broad representation on EISWG, this group could be particularly helpful in how NOAA can/should integrate information and deliver more comprehensive tools – e.g., from a boater’s perspective: “I want wind, tides, waves, weather, etc. I have to go to multiple NOAA websites to get that info.”

The EISWG ToR should align and sharpen its charge, composition, and reporting requirements as stated in the [Weather Research and Forecasting Innovation Act of 2017](#) since the EISWG is now legislatively mandated. The most effective advice includes very specific recommendations and a way forward as opposed to a list of priorities. (NL)

The TOR should be updated to include the actions required by the recently passed Weather Research and Innovation Act. The TOR was updated in 2013 and remains generally relevant for a way forward for the EISWG, but, in addition to the actions required by the Weather Research Act, the TOR should reflect the themes and priorities identified by the SAB and NOAA leadership. Since the TOR was last reviewed in 2013, it would also be appropriate to update the background section to include more recent actions and shorten the history dating back to 2003/2004.

While not directly related to the TOR per se the SAB liaison believes the NWS must take a more active role working with the EISWG to update the work plan. The current work plan is mostly self-generated by the EISWG and I believe there should be more top down input in developing the work plan to assure its relevance to NWS and NOAA-wide issues. Also, there needs to be more active involvement by other NOAA line offices. The Weather Research Act will be a catalyst to update the work plan. (SL)

There is a sense among the older members of the WG that what needs to change is not so much the mandate, but the operations of EISWG. Overall, the Terms of Reference remain relevant.

More emphasis should be made on environmental information and the role of “weather, water, climate” in it. The TOR does need to be updated to reflect Congress’ charge to the EISWG as included in this year’s weather legislation.[the Weather Research and Forecasting Innovation Act of 2017] (CH)

Ecosystem Sciences and Management Working Group (ESMWG)

(Input received from working group co-chairs and 3 NOAA program liaisons; input was not received from the SAB liaison.)

ESMWG - Proposed Changes to Terms of Reference

The Terms of Reference are still relevant and there are no suggested changes. (NL)

The ESMWG Terms of Reference are still relevant and the working group requests that they not be changed. There has been some discussion about how the SAB would like to further refine its consideration of ecosystem restoration in NOAA. Clearly, the ESMWG could be a vehicle, as demonstrated by the EMSWG 2014 Restore report. It is our impression that when Gulf of Mexico restoration became a significant NOAA science issue, the ESMWG was fully engaged in nationwide studies and did not have the capability to tackle that rapidly developing issue. Further, the regional nature of the Gulf restoration meant that regional expertise was necessary to provide timely and region-specific advice. Thus, an ad hoc or new working group would better serve NOAA than the ESMWG on Gulf of Mexico restoration. (CH)

No changes were suggested to the TORs, other than perhaps some explicit consideration of the most effective way to communicate findings. (NL)

The current Terms of Reference look fine to the NOS liaison. (NL)

ESMWG Continuance

The ESMWG should continue as a standing working group and it should incorporate the activities of the working group created to advise NOAA’s RESTORE Act science program. (NL)

The group supports the ESMWG’s continued standing as a WG. The WG has provided valuable information and advice on a host of important topics, some of which are now part of NOAA’s science efforts. Given the anticipated further integration of natural and social sciences, survey methods, advanced data collection, as our community takes a more holistic and quantitative view of ecosystems, the WG’s role is likely to be heightened in the coming years. (NL)

The ESMWG should be continued per the NOS liaison. (NL)

Part 2. Impact of Working Group Reports on NOAA Science Portfolio and Consideration of Reports by NOAA/SAB by Working Group

Summary:

CWG - Has not had a report since 2009 so the questions on both impacts reports on science portfolio and reports fully considered by SAB/NOAA are not relevant.

DAARWG -The NOAA liaison gave examples of the impact of the reports on the science portfolio; there was general agreement that reports were fully considered by the SAB and NOAA.

EISWG -There was a mixed reaction to the impact of reports on the science portfolio as NOAA liaison responded that the 2016 report on the review of NOAA partnership policy has been put on hold due to the change in Administration; similarly the Co-Chair reported that some EISWG members were less positive of the impact of their reports on NOAA science portfolio. On the full consideration of reports by the SAB and NOAA, the Chair said for the most part the SAB has fully considered the reports but the NOAA Administration has been slow to take action.

ESMWG - All of the reports have been timely, if not ahead of practices in NOAA's portfolio. Details of how the reports had an impact are seen in the NOAA responses to the findings. There was general agreement that the reports had been fully considered by the SAB and NOAA, however one NOAA liaison stated that while the working group reports are at a high level in NOAA, they are not necessarily known at mid- and lower levels. Additional efforts could be made to better disseminate the WG's reports; this is probably something the program liaisons should consider.

Note: Response details are included below; responses are identified as NOAA Liaison (NL), Chair or Co-Chairs (CH) or SAB Liaison (SL) Question on impact on NOAA science portfolio asked to NOAA liaisons and Chairs; question on full consideration of reports by the SAB asked to Chairs and question on full consideration of reports by NOAA asked to NOAA liaisons only.

Climate Working Group

(Input was received from the NOAA program office liaison, the Co-Chairs of the working group and one of the two SAB liaisons.)

Do you think the reports have had an impact on the NOAA science portfolio? Please give examples.

In the pre- "climate service" development days, the NOAA liaison thinks that recommendations by the CWG had an impact on the science portfolio. These recommendations were specific to the Climate Program Office programs and the science being done by those programs. (NL)

Do you think the reports were fully considered by NOAA?

In the “climate service” development days, the NOAA liaison thinks that recommendations by the CWG were fully considered by NOAA. (NL)

Do you think the reports were fully considered by the SAB?

The CWG has not issued a formal report to the SAB since 2009 (several groups ago). Since the current CWG has not submitted a report to the SAB, no feedback was requested. (CH)

Data Archive and Access Requirements Working Group

(Input was received from the NOAA program office liaison and the Chair. There is currently no SAB liaison; the previous SAB liaison was asked to provide input but declined due to time constraints).

Do you think the reports have had an impact on the NOAA science portfolio? Please give examples.

EDM [Environmental Data Management] Framework did provide guidance in developing EDMC [Environmental Data Management Committee of NOAA] Directives. GOES-R Level 0 Data report led to the decision by NESDIS to archive Level 0 data. The Non-NOAA Data report led to EDMC Recommended Practice on Use of External Data; this document is relevant now, especially for the NESDIS Secure Ingest Gateway Pilot Project. (NL)

Increasingly, the scientific process and data science are interconnected. The application of data science supports better, more efficient science, new science, and enhanced decision support. NOAA’s mission relies on data at its core. Without maintaining state of the art practices regarding data science and cyberinfrastructure, this key asset is at risk. Clearly, NOAA leadership recognizes the centrality of robust data as evidenced by the elevation of data science as a theme in the NOAA science plan, by the recent creation of the Chief Data Officer position, and by NOAA’s ongoing support for operationalizing and improving its enterprise-wide data management efforts. (CH)

Do you think the reports were fully considered by the SAB?

Formal reports were fully considered. Consideration by SAB of other updates, e.g., Quad Charts, was less clear. Granted these routine updates were part of the Consent Calendar, but it would be useful for the WG to know if there are any questions or other feedback from SAB. DAARWG wants to ensure that it supports the work of the SAB and, by extension, provides useful guidance for NOAA. (CH)

Do you think the reports were fully considered by NOAA?

NOAA has been clearly responsive to DAARWG recommendations. The development of the suite of enterprise-wide data management directives and procedures can, to a large extent, be connected to DAARWG recommendations, e.g., the data management framework report and the report on accessing non-NOAA data. NOAA responded directly and affirmatively to GOES-R

level 0 recommendations from DAARWG. The actions taken by NOAA in this area will facilitate scientific reproducibility and new science. (CH)

Reports were fully considered by NOAA. (NL)

Environmental Information Services Working Group

(Input received from NOAA program liaison, Co-Chair and SAB Liaison)

Do you think the report(s) have had an impact on the NOAA science portfolio? Please give examples.

The 2016 report, *A Review of the NOAA Policy on partnerships in the Provision of Environmental Information*, was not a direct impact to the science portfolio of NOAA. It was a review of the NOAA Policy on Partnerships with specific recommendations for NOAA to consider in a future update of the policy itself. It could potentially have an impact if all recommendations had been adopted by NOAA, but the change of Administration put any adoption on hold. (NL)

There are three examples of impacts: a) strategic plan review and responses; b) open data report; and c) partnership policy.

The members of EISWG were less positive about the overall impact EISWG has had on NOAA's science portfolio. One example: EISWG influenced NOAA's strategic plan by including a focus on urban meteorology in the strategic plan, but the WG never saw a change in the science portfolio resulting from that inclusion. (CH)

Do you think your reports were fully considered by the SAB?

For the most part, yes. For a few reports, NOAA Administration has been slow to respond or to take action. For example, this is what the WG saw with the Partnership Policy review. There has been no response to the Partnership Policy Review, which was approved by the SAB and forwarded to the NOAA Administrator. Another example is the climate partnership task force report, on which NOAA was very, very slow to respond, which is now posted to the SAB web site. (CH)

Do you think the report(s) were fully considered by NOAA?

The report was debriefed to NOAA leadership as well as submitted formally through the NOAA Science Advisory Board. It was fully considered by NOAA, but no formal action has been taken by NOAA to date due to the change of Administration. (NL)

Ecosystem Sciences and Management Working Group

(Input received from working group co-chairs and 3 NOAA program liaisons; input was not received from the SAB liaison.)

Do you think the reports have had an impact on the NOAA science portfolio? Please give

examples.

ESMWG reports have undoubtedly informed NOAA science, but it is unclear the extent to which they have impacted NOAA's science portfolio. I am unaware of any clearly identifiable link between a report and significant changes in NOAA's portfolio. However, the OAR liaison suspects the report addressing ecosystem-based fishery management in the U.S. might be influencing a more holistic approach to fishery management by the Councils. (NL)

All of the ESMWG's reports have been timely, if not even ahead of practices within NOAA's portfolio. Examples include the IEA [Integrated Ecosystem Analysis] Report and the EBFM [Ecosystem-Based Fishery Management] Report that have been used in the establishment of activities nationally (in the case of IEAs), the completion of the EBFM Roadmap (now in the process of being implemented through the creation of Regional Implementation Plans). Reports such as Ecosystem Valuation and the Local Ecological Knowledge (LEK) are immediately relevant to present activities of NOAA's Socioeconomic Working Group, and as the WG develops approaches to engage Citizen Science and Crowdsourcing. (NL)

It is hard for the NOS liaison to judge if the reports have had an impact on the NOAA science portfolio. The six topics the ESMWG has addressed since 2014 are all very important topics to NOAA and no doubt they have been influential on NOAA's fulfillment of its science and stewardship missions. Having said that, the NOS liaison does not have any specific examples where I have used those reports in the execution of my duties as the Director of NOAA's Office of Marine Sanctuaries; that may be because he was not aware of them until joining the group. (NL)

Details of how ESMWG reports had an impact on NOAA's science portfolio are seen in the NOAA responses to the findings. Summaries are provided below for 2012-2017 reports: 2014 restoration of coastal habitats produced a lot of "shovel ready" projects. The ESMWG report reviewed how these efforts incorporated/contributed to ecosystem science and provided lessons to be learned about how to improve the programs.

The 2014 exploration of ecosystem science and management in regional fisheries was used to inform the development of the NMFS Ecosystem-Based Fishery Management (EBFM) Policy and (EBFM Roadmap) now being implemented. The 2016 ecosystem services valuation (ESV) study aided NOAA's efforts in developing a consistent approach to ESV, achieving cutting edge approaches, and assisted in prioritizing when ESV should be performed.

The 2016 report on the high Arctic helped to set NOAA's priorities for research post-2017 with emphasis on partnerships with other federal agencies and international partners. It is too early to tell how this advice will hold given changes in oil and gas leasing, the transition in government, sanctions with Russia, and international Arctic trade routes increasing.

The 2016 report on emerging technologies highlighted some technologies NOAA may be able to implement in an ecosystem context in the next five years - especially with respect to eDNA. The ESMWG was impressed with NOAA's efforts to stay abreast of and to be on the cutting edge of many of the emerging technologies, e.g., drones, underwater autonomous vehicles, cube sats, etc.

2017 report on indigenous and local ecological knowledge provides a process for NOAA to use to develop a stronger use of indigenous and local science. As with the Arctic report, it

considered international components. Again, it is early to document impact on NOAA. (CH)

Do you think your reports were fully considered by the SAB?

From a process perspective, we believe that the SAB reviewed the reports but that the contents and recommendations were not as thoroughly absorbed by the SAB members. It seems that the Visioning Process the SAB undertook was not fully informed by recent reports, e.g., EBFM, and Ecosystem Services Valuation. While the whole SAB does not need to second guess the Working Group findings, it is possible that the lack of a SAB institutional memory may have hampered the interchange. Recent attention of the SAB to the role of the WG liaisons has improved the process, as they are able to provide immediate and very helpful feedback and perspectives. Also, inviting the co-chairs of WG to participate in SAB meetings strengthens the process. The effort to revise and systematize the interaction between the SAB and the WG is also important. Finally, the new two-year review process may increase the reporting workload, but it will tighten the exchange between the SAB and the WG.

The Quad Charts are a great way to summarize the progress being made by SAB Working Groups. However, including these reports under the Consent Calendar instead of having Working Group activities be reported by the SAB liaisons [or co-chairs attending the meeting] seems not to convey the same impact. If a way could be found to combine the time saving value of reading the Quad Charts with some way to see and hear the information, that would improve engagement between NOAA SAB and its Working Groups. (CH)

Do you think the reports were fully considered by NOAA?

The NOAA responses to each report reflect the consideration each was given. (NL)

In the case of the examples listed above, the reports and their recommendations were, or are in the process of being, considered by NOAA. While the WG's reports are considered at a high level, they are not necessarily known at mid- and lower levels. Additional efforts could be made to better disseminate the WG's reports. This is probably something the program liaisons should consider. (NL)

Given the importance of the topics, NOAA leadership thoroughly considered them. (NL)

Part 3. Summary of Best Practices and Proposed Changes in Working Group Operations

Summary: The questions on best practices and working group operations are in the context of operating procedures in the Working Group Concept of Operations and do not need to be approved by NOAA.

Some highlights: There are a number of suggestions involving communications, including clarifying and strengthening the role of the SAB and NOAA liaisons; providing SAB top-down guidance on working group activities; adding a verbal report on the working group quad charts at SAB meetings to allow for questions and feedback on proposed activities; and support for planning across working groups to discuss synergies and priorities. Suggestions were also made to clarify/simplify the approval process for new members.

Note: Response details are included below; responses are identified as NOAA Liaison (NL), Chair or Co-Chairs (CH) or SAB Liaison (SL) Question on impact on NOAA science portfolio asked to NOAA liaisons and Chairs; question on best practices was asked to Chairs; and question on proposed changes in working group operations was asked to all respondents.

Climate Working Group

(Input was received from the NOAA program office liaison, the Co-Chairs of the working group and one of the two SAB liaisons.)

Best Practices

The Climate Work Group has employed the following practices to facilitate its engagement: Teleconference calls with planned agenda; Google Docs to share draft reports; voting with doodle poll for meeting dates; volunteering based on expertise for subcommittees. (CH)

What other changes should be made in the SAB working group processes?

- SAB Support/plan meetings for working group chairs and co-chairs to meet together and discuss synergies and priorities
- SAB Support/plan for joint meetings between the working groups when possible to support these topics (and others) across working groups
- Allow working group members more of an opportunity to speak/report out at SAB meetings rather than a quad chart that really has no bearing (nor does it warrant any lengthy discussion) on anything the SAB discusses during their meetings
- Have the SAB provide some direction to the working groups on what they should focus on
- Provide more stringent requirements on the SAB liaisons to the working groups. When active, engaged and regular participants in the process, they are effective in providing input to the NOAA programs and to the SAB (NL)

Frequent interactions with the SAB-CWG liaisons are very important. For the first year and a half of our co-chairing, the CWG had no SAB liaison. (CH)

It is good to have one or two liaisons. (SL)

Data Archive and Access Requirements Working Group

(Input was received from the NOAA program office liaison and the Chair. There is currently no SAB liaison; the previous SAB liaison was asked to provide input but declined due to time constraints).

Best Practices

Coordination with NOAA: DAARWG has a close working relationship with the primary liaison to the working group and with NOAA staff who support DAARWG. This relationship allows an open dialog regarding topics identified by DAARWG, under the DAARWG portfolio, to consider for the DAARWG agenda and discussion. The liaison facilitates DAARWG access to relevant topical experts across NOAA. These experts provide critical information about NOAA activities under consideration by DAARWG. NOAA staff also support the engagement of NOAA management.

On a more practical note, the use of google docs to provide access to developing agendas, materials, and for shared note taking makes information sharing easier and more transparent.(CH)

What other changes should be made in the SAB working group processes?

Invitational travel for WG members should be kept entirely outside the travel ceiling for federal employees of the Line Office supporting the WG. Otherwise, there is an inherent conflict between need for routine business travel and this invitational support.

Meeting logistics and travel coordination should be entirely handled by NOAA SAB office, which should be funded and staffed accordingly. These costs may need to be funded by contribution from each LO.

A stronger linkage between SAB activities and WG tasks is desirable; the new SAB ConOps appears to provide for that.

The process for finding new members is cumbersome and should be streamlined. Issues include desire for 2 candidates per slot (meaning that at least half of candidates will be rejected, which can be professionally disappointing or embarrassing), and lack of clear guidance regarding asking potential candidates if they would be interested in serving prior to actually compiling biographical dossier.

The individual selected as SAB liaison to a WG should be someone who is actually available to attend most WG meetings. (NL)

It would be useful to continue to develop ways to support closer connections/coordination between SAB and the WG's and to support interactions and information sharing across the working groups. The Chair realizes that the role of the liaison now, in theory, is more well-defined in the context of the updated concepts of operation. It is less clear how this will play out in practice. It is still not clear to me whether the expectations regarding line office support for working groups is completely clear. A practical effect is uncertainty regarding procedures, e.g., how to arrange travel or get reimbursed for travel expenses; travel budgets or allowable expenses, e.g., for offsite meetings. The Chair is not sure about the bureaucratic implications of

centralizing these kinds of things for all working groups, but it might make some aspects of working group operations more efficient. (CH)

Environmental Information Services Working Group

(Input received from NOAA program liaison, Co-Chair and SAB Liaison)

Best Practices

The best practice for EISWG has been to always be forward thinking—identifying those trends in industry that NOAA may or may not be considering and bringing those trends to the attention of the NOAA leadership. Open data is an excellent example of that. EISWG believes it really made a difference in that respect. The vision brainstorming session in April 2014 (?) was very insightful and might be repeated in the future). (CH)

EISWG must continue to examine coordination and collaboration with the private sector through the Partnership Policy. This is unique to EISWG and does positively influence the application of NOAA science.

It should be noted that EISWG never received a response to its partnership policy review. A new policy is probably required at this point. **Frequent communication with the EISWG members** helps keep the WG membership informed and open to collaboration. (CH)

What other changes should be made in the SAB working group processes?

- Suggest clear instructions of the role of NOAA liaisons across all working group ToRs and SAB CONOPS.
- Suggest a clear focus on a limited set of issues or projects so as to raise visibility and provide clear recommendations with the greatest potential to lead to lasting and meaningful change.(NL)

The SAB, staff and NOAA leadership have spent considerable time during the past year to review and update processes with respect to the working groups and have developed a process for membership and for reviewing its working groups. So, I do not believe that there is an additional need for further review of working group processes. However, the SAB should take a more active role in developing top down guidance for working group work plans. For example, the recent discussion of priority topics, if adopted, for the SAB, can form the basis for guidance for the relevant working groups. With respect to the EISWG in particular, the SAB has been rather silent on providing top down oversight, other than reviewing and accepting the EISWG proposed work plan and updates at each SAB meeting. The SAB will have an oversight role of the EISWG as a result of the Weather Research Act [Weather Research and Forecasting Innovation Act of 2017], so it will need to be in concert with the requirements of the Act, as well as understanding priorities of the NWS for the EISWG. (SL)

The EISWG is always more successful when interacting with NOAA leadership. This helps the WG be more responsive AND it does not imply coordination or collusion on specific policies or

programs. The WG collectively and the co-chairs, in particular, were always respectful of their engagement with NOAA and the process for SAB review, approval, and submission of recommendations to NOAA leadership. NWS leadership's participation in EISWG meetings declined over the years and during the last year had almost no meaningful involvement. (CH)

Ecosystem Sciences and Management Working Group

(Input received from working group co-chairs and 3 NOAA program liaisons; input was not received from the SAB liaison.)

Best Practices

- Work closely with NOAA liaisons
- Use liaisons to obtain detailed materials needed from NOAA to establish a baseline of activity in the study area
- Meet in locations where expertise can be obtained to assist in developing recommendations
- Ensure that ESMWG members have expert knowledge of a study area and rely on other members for support and critical thinking
- Invite *ad hoc* members to assist ESMWG when expertise is thin. (CH)

What other changes should be made in the SAB working group processes?

As noted, recent changes are likely to have a positive impact on SAB working group processes. It is important that the SAB look at the timeline and process for selecting new studies and appointing new WG members. We recognize that it is difficult to streamline the process, but because the phasing of meetings and teleconferences takes an inordinate amount of time from start to finish. Some of this may be resolved as new processes become more routine. (CH)

In speaking with some of the WG members, it was mentioned that there have been recent discussions on the length of the reports, namely that the WG reports tended to be long and, hence, perhaps not considered as fully as intended. As a result, the most recent report on LEK was approximately 14 pages long, while previous reports were on the order of 50 to 100pp documents. Focusing on page numbers is artificial, as the length of the document should be dictated by the need of what needs to be communicated. Perhaps there could be a component on the WG's reports that addresses the reports' structure. This would be of help to the WG as well as the audience reading the reports. (NL)

While the NOS liaison certainly believes NOAA fully considers the work of the SAB and its working groups, he thinks the SAB and NOAA leadership could probably improve their processes for distributing and communicating the work products (within NOAA and potentially partner agencies and institutions) and explaining to practitioners how exactly they can/should be applied in the day-to-day business. (NL)

Appendix A
Background Data on Meetings and Reports to the SAB 2012-2017 by Working Group

| Meetings 2012-2017 by Working Group; I=in-person, T=teleconference | | | | | | |
|---|-------------------|----------|----------|----------|----------|------------------------|
| | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 to date |
| CWG | None ¹ | I-1, T-1 | I-1,T-1 | I-1, T-1 | T-2 | I-1, T-1 |
| DAARWG | I-2 | T-2 | I-2 | I-2 | I-2 | I-1 |
| EISWG | I-2, T-1 | I-1, T-1 | I-2 | I-2 | I-2 | I-pending August 28-29 |
| ESMWG | I-2 | I-1, T-2 | I-2, T-1 | I-2, T-1 | I-2, T-1 | I-1, T-2 |

Reports to the SAB 2012-2017 by Working Group

Climate Working Group
None during this period²

Data Archive and Access Requirements Working Group
Report to NOAA on Accessing Data from non-NOAA Sources 2012
White Paper on the Need for a NOAA Environmental Data Management Framework 2012
Report on Archiving GOES-R Level 0 Data 2015

Environmental Information Services Working Group
A Review of the NOAA Policy on Partnerships in the Provision of Environmental Information, 2016

Ecosystem Sciences and Management Working Group
Restoration of Coastal Habitats May 2014
Exploration of Ecosystem-Based Fishery Management in the United States, July 2014
An Assessment of the Use and Potential Use of Ecosystem Service Valuation May 2016
Review of the High Arctic Program in NOAA, October 2016
Emerging Technologies for NOAA Ocean Research, Operations and Management in an Ecosystem Context, December 2016
Indigenous and Local Ecological Knowledge and NOAA May 2017

¹ No meetings in 2012 due to retirement of Climate Program Office Director and vacancy of Chair

² While no reports 2012-2017, CWG had 5 reports in the period 2008-2009

Appendix B
Working Group review questions asked to NOAA program liaisons, Chairs and SAB Liaisons

Program Office Liaison Review (all liaisons should complete if there is more than one)

Do you think the reports have had an impact on the NOAA science portfolio? Please give examples.

Do you think the reports were fully considered by NOAA?

What other changes should be made in the SAB working group processes?

Based on your understanding of the group's work and upcoming work plans, are the Terms of Reference still relevant or do changes need to be made? Please explain any suggested changes. Based on the overall work of the working group, do you recommend it continues as a standing working group?³

Working Group Chair(s) Review

Please identify practices that have worked well for the Working Group

Do you think your reports had an impact on the NOAA science portfolio? Please give examples

Do you think your reports were fully considered by the SAB?

What other changes should be made in the SAB working group processes?

Based on subcommittee work and upcoming work plans, are the Terms of Reference still relevant or do changes need to be made? Please explain any suggested changes.

SAB Liaison Review

What changes are needed to the current Terms of Reference for the group?

What other changes do you think should be made to SAB working group processes?

Based on the overall work of the working group, do you recommend it continues as a standing working group?

³ Note questions on continuance were not asked for EISWG as it is a legislatively-mandated SAB working group