

NOAA Science Advisory Board

Comments from the Working Groups on the Draft NOAA Next Generation Strategic Plan

1. Climate Working Group Comments

Overall, NOAA's Climate Working Group (CWG) concurs with the high-level goals, priority themes, and five-year objectives in the Administration's Next Generation Strategic Plan. At the next level of scrutiny, as with many strategic plans, the document emphasizes the "what" at the expense of the "how" and the "why". In this regard, the plan falls short on the rationale for the "what" at the expense of the "how; i.e., the specifics with respect to implementation. Therefore, we look forward to the opportunity to provide input to the Implementation Plan, when it is being developed. Even at the strategic level, however, the CWG has noted a number of key gaps or incomplete explanations that it believes need to be addressed if NOAA is to deliver on its stated mission statement, goals, and objectives. In this regard, the CWG has noted the following:

The time scale for climate change is never defined. Similarly, the terms climate change vs. climate variability and change are not used consistently throughout the plan. This is an important point: namely, "climate variability" and "climate change" are generally viewed as referring to different forcings and manifestation of climate; the former natural and the latter anthropogenic. Moreover, this "climate change" centric focus conveys a sense that certain groups within NOAA are being marginalized, whereas we consider their current responsibilities will continue to be important to NOAA: NCEP (except perhaps CPC), Office of Hydrology, River Forecast Offices; WFO, maybe others. This could be a serious issue, as "climate" must be communicated in a consistent manner if the stakeholders are to have confidence in the services coming from multiple NOAA sources. There is no real mapping on how the various NOAA activities (NCEP, RFC, etc) map onto the strategic plan, given that it is a NOAA wide plan. Will the 5 year goals change how groups do their business?

Consistent with the above, there are a few phrases related to seasonal prediction, so one cannot say it is ignored, but the plan reads as giving much greater priority to climate change than to climate variability. We welcome the growing attention to climate change, but it should not come at the expense of work on climate variability. Prediction and services that should address each of these (which are often different) should be supported. Even the weather goals are crafted as being related to climate change.

The scientific and technical challenges that NOAA needs to confront to meet its vision, as mentioned on page 26, come way too late in the document. This statement accurately reflects the imperative to the agency and should be incorporated as early as possible in the document. It is difficult, given the present context, to read and accept the Strategic Plan as being credible. Specifically, we bring attention to the infrastructure and support issues for climate research and climate observations. Early in the report one reads about the foundations that NOAA builds on that includes people and observing infrastructure. Later, one reads about a commitment to develop and maintain the next generations of ships and observing platforms. However, one must

read these words in the face of the present context. That context is one in which NOAA Office of Marine and Aviation Operations (OMAO) is underfunded and struggling to maintain its platforms and meet the demands for Days at Sea. There is only one Class 1 vessel, the RH Brown. It will be out of service for a mid-life refit in 2014. Even when in service, the combination of low levels of funding and a demanding pace of operations have created issues with maintenance and availability. The RH Brown was brought on line to replace four large vessels. At that time funds were dedicated to chartering additional ship time as needed. Those charter funds have been eroded to support OMAO. Further, NOAA's relations with UNOLS vessel operators are problematic; and it appears that neither the funds nor the dialog and plans have been put in place to meet NOAA Class 1 ships needs in the near future. NOAA Class 1 ship time is an essential component of the climate observation and research program, necessary to support long term moorings, repeat hydrography/carbon lines, and process studies such as VOCALS. Knowing of no apparent plans to meet this essential need, and taking this as perhaps but one example of such a situation, one cannot read the Strategic Plan and believe there is a sound underpinning of planning and assessment of the challenges that need to be met to achieve. As a result, the Strategic Plan lacks credibility.

A critical gap exists in the objective for a modern IT infrastructure. That objective should recognize that IT components essential for achieving other NOAA objectives will necessarily be developed outside NOAA, e.g., by NOAA-funded academic and private sector research efforts. NOAA must develop capacity for rapid and scalable entrainment of IT tools from research to operations, at a scale that is consistent with the level of external funding and accomplishment, and the growing needs and expectations of decision makers and stakeholders.

A significant change to NOAA's mission and vision is noted when compared to the current ones that reside on NOAA web site. The new (?) mission statement ignores land surface processes, yet throughout the document mention is made of providing land-based predictions and services that include sectors such as water management, agriculture, energy, transportation, etc as well as flood and drought prediction. Hence there is an inconsistency. This is best illustrated in the integrated environmental modeling system section on page 28 that states such a system will "evolve to a comprehensive Earth-system modeling enterprise that links atmospheric and oceanic models". It is as if the land does not matter or does not exist. As written this is a very old fashioned perspective, circa late 1980's. Also, on page 15 there is reference to coupled models for rivers, lakes, and estuaries but it is not clear at all what exactly is being coupled and if it is, how the coupling will work; one-way, two-way, three-way, interactive?

The mission and vision appropriately aim for a 'better future' for ecosystems, communities, and economies. That future, however, does not yet exist and is realistically unlikely to be achieved within the five year horizon of the strategic plan. How does NOAA plan to support ecosystems, communities, and economies that are not yet, or will not become, resilient or healthy, or that may irretrievably fail? Does NOAA have a plan to provide early warning of such events, provide rapid response and long-term assessment and support services, or integrate with other organizations and agencies to support transitions to alternative situations?

In the text for several of the objectives, there is an appropriate focus on reducing “uncertainty”. However, in different contexts, the uncertainties often exist because knowledge of key processes and relationships is so incomplete that we do not even know the correct functional form. While we may be confident that we understand the key processes, it could well be that spatial and or temporal sampling is inadequate or else the instrumentation is not up to the measurement tasks required. It could also be that processes are inherently non-deterministic. It would help for the plan to be clearer, whenever it can be, as regards which type(s) of uncertainty is (are) the dominant one(s) being considered in the various objectives - for example the Objective for "Improved understanding of Climate System”.

Related to this concern, an overall theme crosscutting the objectives is the provision of information to society. However there is a failure to acknowledge that not all types of information will have equal value to any sector of society, nor that different sectors of society will give greatest value to different types of information. The Strategic Plan should include recognition of the need to deal with how that “value” of information will be defined and measured. One key perspective is that from a government perspective the highest value is usually under conditions of uncertainty and when decision-makers have the capacity to take action in response to the information. Perhaps the plan could include text to the extent that “Throughout these objectives, NOAA will strive to identify and deliver information of the highest value as defined by decision-makers, and will continuously seek to refine our information products to enhance this value.” It might also wish to acknowledge that “Other sectors of society may consider additional types of information to be of high value, and NOAA will strive to interact with key sectors of society to ensure it can address their information needs to the greatest extent appropriate.

The Objective "Improved transportation ..." is quite good. However, as read it is quite apparent that many other industry / commerce sectors would be affected by the same environmental / climate / weather drivers that are posing threats of impacts on transportation. It is actually very helpful and appropriate for NOAA to say in its Strategic Plan that Transportation will be a priority. However there would be benefits by just adding a couple of sentences acknowledging the opportunities for synergies - using insights arising from the work being done to achieve this objective to other sectors as well.

The texts for the different objectives vary greatly in how well they acknowledge (and sometimes bring out actively) the overlaps and interactions among the objectives. This is done well in the Arctic objective, where the potential relevance of work done on several other specific objectives is acknowledged. On the other hand the text for the objective "Improved coastal water quality ..." (pg 18), in addition to being quite vague, almost sounds like this work will be done separately from much of the potentially relevant work in several other objectives. Another example would be the impact of climate variability and change on marine ecosystems. Understanding of this involves literally every NOAA LO across NWS, NESDIS, OAR, NOS, and NMFS. Yet, what is the strategy within the spirit of this plan for dealing with this? While NOAA recognizes the importance of breaking down the stovepipes to make progress in such areas, the Strategic Plan falls short in emphasizing how this will be done. This has been historically and continues to be a challenge for NOAA, yet the present plan does little to confront this head on. The Plan is the

rightful place to start acknowledging the linkages among the objectives and new ways of doing business to ensure those linkages are addressed.

The objectives vary considerably in the evidence of progress that will be used to track NOAA activities over the five years of the plan. Some depend on the weather and climate during the five years (e.g., “fewer aviation delays” may not be achievable if problematic weather conditions are frequent and widespread, regardless of improvements in forecasting); others are not comparative, but unlikely to be achieved in full or a case could be made that the evidence already exists. The entire plan would benefit from an integrated review of the sections on evidence of progress, with an emphasis on measurability, actionability (i.e., they are within the ability of NOAA to affect the outcome), and linkages across objectives.

The "Integrated modeling framework ... (pg 22) should be an integrated modeling AND ASSESSMENT framework. Be it integrated assessment for climate or ecosystems, the development of frameworks and tools for modeling and for assessment need to progress hand-in-hand, each benefitting from advances made by the other and each drawing from a common (and ever-improving) corpus of data and information. Keeping the modeling initiatives linked to the assessment initiatives keeps the modeling from becoming too lost in the frontiers of speculative theory; keeping the integrated assessment initiatives linked to the modeling makes the assessment process actually integrate and add value to the component pieces, rather than do possibly authoritative but independent assessments of either climate or ecosystem components and pressures, put a staple through the pile and call it integrated.

Given the myriad of challenges that NOAA needs to confront as embodied by this plan it is surprising, dismaying, disappointing, and perhaps telling that there is absolutely no mention of the role NOAA intends and expects of its Cooperative Institutes.

The objective on integrated assessments and climate services (page 11-12) has no mention of NOAA’s role or intention with respect to the WMO-lead Global Framework for Climate Services (GFCS). Although Administrator Lubchenco was a key participant at the World Climate Conference-3 and the kickoff of the GFCS, it is rather curious why the GFCS is neglected here.

The long-term goal for climate adaptation and mitigation (pages 9-10) and related objective (page 11-2) have no mention of the need or role of socio-economic/human dimensions research, in stark contrast to that for transportation efficiency (page 15) or resource management (page 18). Numerous NRC documents over the past several years have repeatedly pointed to the importance of such research for climate adaptation, mitigation and provision of climate services.

The five-year plan for the Arctic (page 25) does not highlight the national need for enhanced hydrographic surveys in the Arctic as called for in the 2010 NRC document on the National Security Implications of Climate Change for US Naval Forces.

The most expensive component of the Earth observing systems discussed on page 27-28 is the space-based component. As illustrated in the NPOESS debacle, a key issue in this regard is getting the interagency working relationships right. Yet, this section has absolutely no mention

of the importance and need of partnerships with sister agencies such as NASA and USGS. This conveys the mistaken impression that NOAA can do it alone.

Page 31, regional services: Is there a need/role for decision support tools? The fact that there is no mention of the role of the RISAs in this strategy is glaring by its absence.

The international partnerships discussion on page 31 has no mention whatsoever of NOAA's intention regarding research partnerships in the international domain. This is an area where NOAA has played historically a leading role, was able to leverage off international contributions, and benefited as a result.

Respectfully submitted on behalf of the NOAA Climate Working Group

Antonio J. Busalacchi
Chair, NOAA CWG

2. Data Access and Archiving Requirements Working Group (DAARWG) Comments

Prepared by Ferris Webster

I have consolidated the views of members of the DAARWG in this response. The views of the members were varied. Instead of attempting to present a single view, I have retained some of the diversity of opinion.

In the view of most of those responding, the *Plan* is well written and comprehensive, though it is light on data-related topics. Responders applaud NOAA's openness and commitment to scientific integrity.

- A minority view is that the *Plan* needs editing and would be clearer if the many superlatives relating to NOAA throughout the document were omitted. The frequent use of terms like “world-class” had a cloying effect on some readers.

Bullets are used with effect throughout the *Plan*. However, they are frequently inconsistently phrased or contain awkward phraseology. As examples, consider two bullets [Page 24]:

"...evidence of progress toward this objective will include stakeholder needs for NOAA science are continually assessed". And

"...evidence of progress toward this objective will include NOAA employees are better prepared to..."

Even the four bullets describing NOAA's long-term goals [on the overview page] are not set out in parallel fashion. If they were, the first bullet, to be consistent with the three that follow would read: “An informed society anticipates and responds to climate and its impacts”.

- As far as substance of the *Plan* is concerned, NOAA's Mission, Vision of the Future, and Long-Term Goals all require data collection, analysis, and dissemination. In the DAARWG view, there could be more explicit emphasis on these aspects so that their importance is not overlooked by NOAA and other entities. There could be more emphasis on the interoperability of systems and data, as well as the overall topic of data usability.
- One DAARWG member believes that the *Plan* should note that data and information products become more valuable the more they are accessed. Thus ease of access increases data demand and data use for both current and archived data.
- The benefits of international collaboration should be emphasized. NOAA is in a position to exercise international leadership in environmental data systems. Through judicious establishment of standards and techniques, users of the systems can be assured of more effective access to data and information worldwide.
- The section beginning on Page 21 and continued on Page 22, “Objective: Accurate and reliable data from sustained and integrated earth observing systems” received the most attention from DAARWG. A series of bullets give objectives for the next five years.

The first bullet: "Enhanced horizontal, vertical, and temporal coverage of the Earth from deep ocean to space" may be overly ambitious. Five years is a short time. A four-

dimensional weather database makes sense, but is it being created from scratch? If it is, it would likely take at least 5 years to yield some results. Viewed another way we are continually enhancing our observations of Earth, if only by simply extending time series, so what does this bullet really mean?

The following bullets are vague as to what is to be done. Is it planning and designing or is it creating? What does “improving” mean, specifically? Rather than a preamble that aims at "evidence of progress toward this objective", we would have preferred a more forceful and specific statement, something like:

"Over the next five years, NOAA, will work with its partner agencies to:

Design and begin building an observation system that will extend spatial and temporal coverage of the Earth from deep ocean to space beyond the coverage to be achieved by the current observational network."

- On Page 27, the section “Objective: Sound, life-cycle management of capital investments”, we note that life-cycle data management must preserve data over many years. Preserving digital information decades and even centuries requires media stewardship, error correction beyond that of the normal devices, and preservation of an environment that can physically read data from the physical device on which it is stored. That is, long-term data stewardship requires physical bit preservation and preservation of the logical environment to preserve the bits. It might be important to add long-term data stewardship to this objective.

DAARWG members were pleased to have this opportunity to respond to the *Plan*, We would be pleased to discuss these issues further if needed.

21 July, 2010

3. Ecosystem Sciences and Management Working Group Comments

The Ecosystem Sciences and Management Working Group (ESMWG) received several briefings on the Next Generation Strategic Plan (NGSP) from Paul Doremus in the last 12 months. Thus, it has had the opportunity to comment specifically on previous drafts, and is pleased to see the evolution of the document to its current form. The current version of the document represents a balanced view of NOAA's mission and identifies important priority themes for the future of the organization. The ESMWG comments are offered to provide clarity and ensure consistency with the goal of strengthening the document for future use.

General Comments

1. Audience.

The NGSP does not make it clear what NOAA constituents are being addressed by this document. The ESMWG is concerned that, if the intent is to provide a document for use by the public and NOAA's many stakeholders, the language is bureaucratic in places. The writers have done a good job of translating complex technical issues into terminology which is more widely accessible, but terms such as 'enterprise science' and 'enterprise engagement' are not widely understood outside of government. A short, perhaps a 5-page summary of the document for the public would be an excellent addition to the final version of the NGSP.

2. Integration.

The narratives for the different objectives vary greatly in how well they acknowledge (and sometimes bring out actively) the overlaps and interactions among the objectives. This is done well in the Arctic objective, where the potential relevance of work done on several other specific objectives is acknowledged. On the other hand, the text for the Objective "Improved coastal water quality ..." (p. 18) seems to imply that this work will be done separately from a lot of potentially very relevant work in several other objectives. It is important that a Strategic Plan explicitly speak to integration, especially in an agency as complex and traditionally 'stove-piped' as NOAA, and acknowledging the linkages among the objectives is a simple step towards integration. This would not require extensive narrative and may not be required in all cases. A sentence or two of the type found in the Arctic text is all that is needed, and it will help point to the integrated approach that the ESMWG thinks NOAA is seeking to achieve.

3. Level of Specificity.

Under the Objectives there is a notable heterogeneity in the scope of the specific examples used to clarify or illustrate points throughout the document. For example, under the objective: "Improved understanding of the climate system and the impacts of a changing climate system" benefits to stakeholders over the next 5 years include high-level benefits such as 'More accurate, precise, and comprehensive knowledge of greenhouse gases and other climate forcing agents', which cover many possible products, and a more detailed programmatic operational benefit of 'Quantitative, weekly to decadal Arctic sea ice projections', which is a very specific deliverable. It is unclear why there is this inconsistency in scope of the illustrations, but the disparity suggests a priority for some very specific activities that would be on par with the priority of some broad scales of NOAA work. The ESMWG thinks that the credibility and usefulness of the Strategic

Plan would be higher if there was consistency in the scope of the statements made within a particular objective; either all high-level and trying to cover the range of intended activities, or all very specific and clearly identified as illustrative of a much larger class of products or activities consistent with the objective.

4. Developing Options

In many places throughout the Draft Strategic Plan there are references to NOAA informing governments and society regarding tradeoffs and consequences of options among which they must choose. This is an important role for NOAA. However, NOAA has a crucial role in identifying options that may not already be under consideration. This creative and forward-looking use of NOAA knowledge and expertise interacting with and adding value to diverse partnerships should feature prominently in NOAA's Strategic Plan. It is not a separate goal or objective. Rather it should be written explicitly in many of the objectives already in the Strategic Plan. In many of the objectives where the text refers to NOAA's role in exploring the consequences of management or policy options and/or informing societal choices among them, the ESMWG suggests text should be added to highlight the commitment of NOAA to find new options to deal with the new and complex challenges facing society.

5. Role of Climate Service

The NGSP gives appropriate prominence to a Climate Service under several objectives in the goal of climate adaptation and mitigation. However, once the NOAA (and partner) Climate Service is formed, the entire operational environment for all the other parts of NOAA will be affected. Many parts of NOAA will have information available to them that does not exist at present, has and this has implications for what those other parts of NOAA could do and should do. Public expectations of information and services from diverse NOAA agencies will also be changed by the existence of the services provided by a NOAA Climate Service. The ESMWG suggests that the NGSP should acknowledge these future changes.

Terminology

1. Resilience.

The concept of resilience is a significant underpinning of the Strategic Plan, as stated on p. 3 "Unified by an overarching vision of resilience, these goals are mutually supportive and complementary." The ESMWG observes that the concept of resilience is used in different ways throughout the document. Individually the uses generally are reasonable; collectively the shifting meaning of the concept invites confusion. This is exemplified early in the document on p. 3, namely:

- "Resilient ecosystems, communities, and economies can maintain or improve their health and vitality over time by anticipating, absorbing, and diffusing change." and
- "A resilient ecosystem – including humans and their institutions – is ecologically sound, economically feasible, and socially just for generations to come."

As read, it appears as though NOAA is choosing to define ecosystems as inclusive of humans and their activities. This definition, while not new to holistic thinking of human ecology and conservation biology, requires careful use in this significant motivational document.

Furthermore, it means that the term "resilience" is likely to mean different and sometimes conflicting things in different uses through the document. For example, folding biological and

human communities into the structure of the first sentence results in an internal scientific inconsistency – ecosystems do not anticipate change, whereas communities and economies may. The second sentence relies on the reader agreeing to the inclusive definition of ecosystems, which then means that the phrase “resilient ecosystem” must be interpreted along with human constructs of “economically feasible and socially just.”

One possible solution would be to replace these sentences with more rigorously-structured sentences as follows:

“Resilient ecosystems can absorb impacts without significant change in condition or bounce back quickly after impacts. A resilient ecosystem continues to provide expected goods and services to human communities.” and

“Resilient human communities and economies can maintain or improve their health and vitality over time by anticipating, absorbing, diffusing, and adapting to change. Human communities and institutions derive goods and services from ecosystems in a resilient fashion when use does not compromise ecosystem goods and services, is economically feasible, and socially just for generations to come.”

A larger concern is that the inconsistent use of the word *resilience* throughout the document could lead to similar or greater inconsistencies in translation from strategic direction to roll-out and implementation, potentially resulting in tangential or unfocused activities. For example, folding human communities into the definition of ecosystem resilience has substantially different implications to a fisheries program tasked with stock recovery, a satellite program tasked with maintaining data availability, and a social science program tasked with improving community reaction to predictions of hazardous weather. Moreover, imprecise definition has the potential for entities external to NOAA to misconstrue or misattribute what NOAA should be doing vis-à-vis its various responsibilities (e.g., regulatory, managerial, and scientific) to the Department of Commerce and biological and/or human communities served by NOAA.

To address this concern, the ESMWG suggests that NOAA reconsider what it means when using the term resilience. The term is entrenched in the discussion of both ecological and socio-economic contexts, and it would be artificial to avoid its usage in the Strategic Plan. However, it is essential that early in the document clear definitions are given of the intended meaning of resilience in each of the contexts where the term will be used. Following the definitions, the document then must always be clear what context is intended for the term, and within each context the term is used consistently with the appropriate definition. The language of the document must be as precise as possible so as to reduce the likelihood of misinterpretation or confusion.

2. Uncertainty.

Clarity in the use of the term ‘uncertainty’ would also provide better expectations of NOAA’s goals and objectives. In the text on several of the objectives, there is an appropriate focus on reducing or understanding uncertainty (e.g., pp. 5 and 6). However, uncertainties can arise for a number of reasons. Sometimes, because knowledge of key processes and relationships is incomplete, we don’t even know the correct functional form of basic relationships; or, in other instances process knowledge may be adequate but data are limited to either insufficient sampling or the limits of instrumentation. Both of these types of uncertainty can be reduced. In other

instances, where processes are inherently not deterministic, it is not reasonable to expect reduced uncertainty.

The ESMWG recommends that the NGSP recognize more explicitly which types of uncertainty are being considered in the various objectives to ensure reasonable expectations and appropriate understanding by stakeholders of NOAA's objectives.

3. Weather and Climate.

The ESMWG appreciates the separation of goals for "Climate Adaptation and Management" and "Weather-ready Nation." However, we note that there is broad confusion among the public and others on the distinction between weather and climate. The ESMWG recommends defining these terms in the document to help solidify the distinction between these two goals. Because the climate-related goal appears first in the document, the definitions could be placed on p. 4 directly under "Long-term goal: Climate Adaptation and Mitigation". The definitions could be stated something as: "***Weather*** is the present condition of the atmosphere and its short-term (e.g., days up to 2 weeks) variation at a particular location, whereas ***climate*** is the weather of a locality averaged over a long-term period (often 30 years) including its variability. The change in the mean state of the weather over periods of time from decades to centuries to millions of years is called ***climate change***."

Specific Comments

- The Objective "Improved transportation ..." reads well but it is clear that many other industry/commerce sectors would be affected by the same environmental/climate/weather drivers that are posing threats or impacts to transportation. It is appropriate for NOAA to say in its Strategic Plan that Transportation will be a priority. However the ESMWG suggests there would be benefits by simply acknowledging the opportunities to provide similarly focused information to other sectors in the future.
- The ESMWG is concerned that the Objective "An Integrated environmental modeling framework" (p. 22) does not rise to the level of the other Objectives in either clarity or purpose. The purpose, importance and key activities need to be strengthened in this objective. This could include the addition of the concept of 'assessment' which is central to some of NOAA's current integrated approach to understanding ecosystems. Alternatively, this objective could be folded in to one of the earlier Objectives, (e.g., "A holistic understanding of oceanic and atmospheric systems").
- For the Objective "A holistic understanding of oceanic and atmospheric systems" the ESMWG suggests adding an additional research challenge: *7. To develop a systematic approach to measuring resilience ecologically and socio-economically in coastal communities to measure progress towards NOAA's Long Term Goals.* Following on from the concept of resiliency discussed above, which is prevalent throughout the NGSP, it will be essential for the Science Enterprise to identify ways to assess NOAA's performance on these challenging issues.
- At present Strategic Partnerships seems to be an afterthought at the end of the document (p. 28). NOAA is already a leader among the agencies in its partnership activities and it has

used its partnerships quite effectively. Clearly indicating that these partnerships have been and will be an important Objective (under NOAAs Enterprise Engagement) for NOAA would highlight that work and advance it. Otherwise the message is that partnerships are not an Objective for NOAA. The ESMWG recommends that the NGSP include a specific objective for Strategic Partnerships.

Respectfully Submitted on behalf of the Ecosystem Sciences and Management Working Group

Jo-Ann Leong and David Fluharty, Co-Chairs

4. Comments from the Environmental Information Services Working Group

July 26, 2010
NOAA Science Advisory Board
1315 East-West Highway
Room 11230
Silver Spring, Maryland 20190

Dear NOAA Science Advisory Board Members:

On behalf of the Environmental Information Services Working Group (EISWG) of the NOAA Science Advisory Board (SAB), we are pleased to provide you with the following comments on the NOAA Next-Generation Strategic Plan (NGSP).

Overall, the EISWG had a very positive response to the plan and applauds NOAA's efforts. We are extremely appreciative of the time Dr. Paul Doremus, NOAA Acting Assistant Administrator of Program Planning and Integration and Director of Strategic Planning, has taken to brief and engage the EISWG members in the development of the plan.

The following material describes the priority issues that the EISWG recommends NOAA address. These issues and accompanying recommendations were developed based on more than 50 detailed comments prepared by EISWG members. The EISWG members also took part in a teleconference to focus our input into the seven issues discussed below, which represent our consensus comment on the NGSP.

Issue 1: Partnerships

The importance of partnerships is cited throughout the plan, which recognizes NOAA's need for cooperation with other agencies, industry, and academia as key to implementation of the goals. NOAA's ability to maintain and enjoy the synergies of close working partnerships with other agencies in the federal community is critical to both NOAA's success and to the effectiveness of the entire federal community in meeting the nation's needs. NOAA's partnerships also extend to international organizations and other governments, and are also critical to every goal in the NGSP. Whether discussing climate services, the 4D weather information database, global Earth observations, mammal protection, fish populations, coastal management, or improved forecasting for aviation, these partnerships are key to understanding and implementing improved products, services, systems, decision support, and outcomes.

However, as presented, the plan does not provide a clear description of NOAA partnerships or how NOAA partnerships may work more effectively within the context of the NGSP. Partnerships are different than stakeholder relationships in the respect that partners—through various agreements and mechanisms—work in cooperation with NOAA to define, develop, or leverage products and services. Often, these partnerships have clearly defined roles and responsibilities or even time periods based on a particular situation.

In addition, the history and significance of NOAA's Partnership Policy, which is key to facilitating NOAA weather or climate products and services for private sector opportunity, is also not acknowledged. As a result, the reader may misconstrue that NOAA is competing with the U.S. weather and climate industry, does not collaborate with other Federal, state, or local agencies, international organizations and governments, or does not engage with the academic sector in the development of products and services.

The EISWG recommends that the NGSP emphasize the importance of partnerships and clearly define how NOAA currently engages partners and may more effectively engage partners in the future. The plan should also explicitly recognize the importance of establishing, nurturing, and sustaining partnerships with academia and the private sector.

Issue 2: Stakeholders

The EISWG recommends that the role of stakeholders and their engagement be more clearly delineated in the NOAA Strategic Plan. One objective identified in the Strategic Plan is "integrated assessments of current and future states of the climate system that identify potential impacts and inform science, services and decisions" (page 6). A crucial component of integrated assessments is the incorporation of stakeholder needs, knowledge and perspectives. While the Strategic Plan acknowledges NOAA's commitment to the many communities it serves, it does not sufficiently address how stakeholder input will be obtained and incorporated into NOAA activities, particularly the proposed integrated assessment activities. The "extended facts" that stakeholders contribute to an assessment enhance the quality of the assessment and the overall utility of the assessment outcomes, lead to more effective means for dealing with uncertainty, legitimize the assessment particularly in the eyes of other stakeholders, provide a sounder basis for decision making, and ensure that important components or concerns are not overlooked. In addition, insights from stakeholders are essential for identifying adaptation and mitigation options and their feasibility and for evaluating the effectiveness of an assessment. The limited stakeholder involvement that has been observed in integrated assessments to date partly reflects the substantial resources (including time) needed to effectively engage stakeholders. NOAA must carefully consider efficient, effective mechanisms for involving stakeholders in integrated assessments including active versus passive stakeholder engagement. This distinction is important as generally more resources are required for active stakeholder involvement, whereas passive involvement may result in the misinterpretation and/or incorrect use of stakeholder knowledge and perspectives.

NOAA should consider how it can use current mechanisms such as advisory boards and working groups to effectively engage with a broader range of stakeholders, and how it can identify and work with "trusted experts" for different stakeholder groups. Greater stakeholder engagement will enhance other NOAA activities as well. For example, the greater use of "test-beds" in NOAA's research to operations transition can facilitate stakeholder engagement as test-beds can (1) support the understanding of user/industry priorities, needs and requirements for NOAA environmental information services, and (2) assist with developing and implementing social and economic metrics that are holistic and justify the operational implementation of the new technology.

Issue 3: Ecosystems

The Plan indicates that “NOAA’s vision of the future is one where societies and natural ecosystems reinforce each other and are mutually resilient in the face of sudden or prolonged change” (page 3: Overview of NOAA’s NGSP). It is unclear why the coastal environment and their natural ecosystems are singled out as a special goal area (the fourth goal area) when other terrestrial ecosystems are not. There appears to be unevenness in the Plan in that the first three goal areas focus on the earth-atmosphere system at large, but not their attendant ecosystems per se. It may help to identify the coastal ecosystems as an area where NOAA has lead responsibility—unlike some interior ecosystems.

Further, the draft Plan consistently fails to recognize and consider what may be the most important of all ecosystems – the so-called manmade or artificial ecosystem that is the built environment of the cities. The cities are especially important as they are home to about 81 percent of the US’ total population of about 310 million people (NRC, 2010¹). Cities impact – directly and indirectly—weather and climate, and are impacted by weather and climate (and their sudden and prolonged changes). Cities increase heat stress, exacerbate poor air quality, increase flood hazards and vulnerabilities, alter precipitation patterns, modify dispersion, are responsible for ~80% of greenhouse gas emissions, and more. Yet cities are not specifically cited anywhere in the Plan as regions or artificial ecosystems in need of special focus. There are other natural ecosystems as well, with associated ecosystem services, which need to be given greater attention in the NGSP and greater focus in NOAA’s programs in the future. These include the mountains, deserts, croplands, and wetlands.

The EISWG recommends that NOAA establish a new initiative or thrust that focuses on the special weather- and climate-related problems, challenges and needs of the cities. NOAA is also encouraged to further expand the fourth goal area to explicitly include (or otherwise place greater emphasis on) other terrestrial ecosystems, such as mountain areas, forests, croplands, and wetlands.

1 NRC, 2010. *When Weather Matters: Science and Service to Meet Critical Societal Needs*, National Academy Press, 159 pp., July 2010. (http://www.nap.edu/catalog.php?record_id=12888).

Issue 4: Identifying Gaps

Though not essential to this document, a gap analysis between today’s “as is” state and NOAA’s vision could help to underpin the importance for the Plan’s objectives. Addressing gaps in NOAA’s current efforts, especially infrastructure, is essential to progress of the four goals.

To perform this across the entire mission would be a significant effort, and could dilute this document. That said, there may be places where specific examples of important gaps that NOAA plans to close could be identified. In other words, for each of the four goal areas, there exists both an “as is” (today’s) state and a “to be” future state (the vision). Between each of these exists a gap. Closure of the gap in each goal area is one intent of the NGSP. Identification and

description of each of the principal gaps to be closed forms a (missing) foundation for the NGSP. In addition, there are critical components of infrastructure that form major gaps (e.g., level of HPC capability versus requirement) that are fundamental as well. NOAA should consider identifying these gaps to complete their systems engineering process.

Issue 5: Social Science Research and Applications

Socioeconomic issues, needs and plans are underemphasized throughout all goal areas of the NGSP. And while many of the objectives and indicators of progress in the Engagement Enterprise section of the Plan involve socioeconomic considerations, the NGSP does not adequately address the need for increased emphasis, resources and capabilities in this area.

Socioeconomic considerations are fundamental in determining how, when, and why the weather-climate-ocean-coastal-ecosystem (or, for convenience, “environmental”) information is or is not beneficial. They are an extremely important component of scientific research and research-to-operations (and also transfers from operations to research) at NOAA. Yet the environmental information and prediction enterprise still largely lacks the interdisciplinary capacity to understand and address socioeconomic issues. Socioeconomic expertise is underutilized throughout the environmental community. In the same way that there are major gaps in environmental research and research-to-operations so are there key gaps in the socioeconomics of the environment that, when filled, will substantially benefit NOAA, its stakeholders and partners and, more importantly, society at large. The EISWG supports three priority topics in the socioeconomics of environmental information that require attention: estimating socioeconomic value, understanding information interpretation and use, and improving communication of information to enhance decision-making and value. These three priority socioeconomic needs are adapted from the set of weather needs identified in NRC (2010).

The EISWG encourages NOAA to address the need for increased socioeconomic research and capacity and its integration into NOAA plans and programs, as they pertain to all four goal areas. NOAA is encouraged to develop a critical-level of internal social science capacity and expertise and develop partnerships with other agencies, academia and the private sector to integrate social science throughout all NOAA goal areas. NOAA is encouraged to develop a social science capability that will initially address three priority areas: estimating the societal and economic value of environmental information; understanding the interpretation and use of environmental information by various stakeholders; and applying this knowledge to improve communication, use, and value.

Issue 6: Evaluating and Measuring Success

For each goal and objective in the NGSP, suggestions for “evidence of progress toward this objective” are offered. Within the EISWG, and likely among authors of the Plan, there exists a variety of perspectives as to the nature of metrics employed to assess progress or success. Some favor specific quantitative measure, whereas others favor measures that are more qualitative. Such metrics are desired for multiple purposes: assessment of progress, efficacy of resource expenditure by the agency, usefulness of agency activities to different audiences, internal

feedback to the work force and their managers, improvements in delivery of services, quality of forecasts, quantification of the impact of agency activities, overall satisfaction as expressed by internal participants and external stakeholders or collaborators, and others.

It is not clear which combination of these (or yet others) are more desirable. And, it does not seem that a consensus answer will emerge any time soon. Quantitative measures may sound precise and objective but can provide false confidence and may be difficult to prove that the results are attributable to actions by NOAA; qualitative measures may be valuable but hard to interpret or utilize. Evaluation is a social science discipline unto itself. Specialists in this field have noted that a) evaluation is seldom taken as seriously as are other phases of complex activities, b) evaluation is not an integral component of the activity and thus frequently performed as an add-on after the fact, and c) evaluation techniques are quite often either not widely known or are applied inappropriately. Evaluation takes time and skill and is ideally independent, to avoid a tendency to “game the system” and automatically produce findings deemed desirable by the manager/evaluators. The EISWG suggests that professional guidance on this important topic be solicited by recognized experts in the field and incorporated along the way and in an iterative fashion, perhaps through workshops or other venues.

Issue 7: References to Corresponding Plans and Efforts

Being a strategic plan, the document does not address specific tactics for implementing the goals and vision outlined in the report. It is presumed that NOAA will conduct a variety of follow-on activities that will result in a number of dependent reports aimed at refining the strategy, developing implementation plans and/or measuring progress towards stated objectives. It would be highly useful if the strategic plan document made specific reference to such activities and reports, and the schedule by which these are expected to be completed. This would provide the reader with a complete roadmap for the execution of the concepts described in the report. Where explicit activities and/or documents are known, they should be reference precisely. Otherwise, a good general outline of activities, schedules and reports should be provided.

We hope that the SAB agrees and puts forward these identified issues and recommendations. Please know that the EISWG members have also been encouraged to submit their individual detailed comments via the NGSP website tool. If we can provide any additional information, please do not hesitate to contact us at

nancy_colleton@strategies.org or walter.dabberdt@vaisala.com.

Sincerely,

Nancy Colleton
EISWG Co-Chair

Walter Dabberdt
EISWG Co-Chair

5. Comments on the NOAA Next Generation Strategic Plan from the SAB Extension, Outreach and Education Working Group

Overall Comments

1. Compliments on Engagement Enterprise section

NOAA is to be complimented for including the section, “NOAA’s Engagement Enterprise” in the strategic plan. While we think having this section in the strategic plan is a significant accomplishment, we offer additional general comments here and some suggestions for that section in the “Specific Comments” section below.

2. NOAA as a Service Agency should be emphasized

The Strategic Plan is a good statement of what a scientific agenda can and should be. But during the last four decades NOAA has evolved in the direction of being a service agency, albeit one whose services are based on good science. Vocal citizens have pushed NOAA in this direction. However the philosophy in the plan still seems to regard NOAA as primarily an agency dedicated to doing good earth system science. That is not all bad, but the American people deserve better; they deserve service that is based on their needs and even their desires. In short they believe they need a SERVICE agency that is based on good science and a comprehensive knowledge of how the earth and its biota, including humans, function. In the wording of the report, the voice of the service function of NOAA is muffled and barely audible when overwhelmed by the roar for science and technology.

3. Focus on Information Service Delivery

The group has also a fundamental concern that the NGSP in its present form does not make a compelling case for the roles NOAA plays and must play in the future, particularly related to the design, development and delivery of information products that are used in decision-making by policy makers and managers. Perhaps an SAB Standing Working Group to focus on advice in this area would be useful. The case for the need for a set of measuring platforms, IOOS, etc. for critical environmental data and information is well done but the descriptions of the applications of the resulting data and information need work. This is NOAA’s opportunity to define its niche and clarify its critically important roles; NOAA has not fully seized this opportunity.

4. Wording on Strategic Partnerships Needs Strengthening/Expansion

The last section in the plan “Strategic Partnerships” has a laundry list of types of partners but no detail on what it means to be a “NOAA partner” and how NOAA interacts with its partners. In this or some other companion document, NOAA should be more explicit in what its partnerships with the proposed groups will look like, e.g., describe the roles of each of the proposed partners and NOAA's role with each of the partners.

5. Scientific Literacy sections need tie in with universities, education standards.

The idea that NOAA will engage stakeholders and has an objective a climate-literate public needs more than putting materials out there for use. There is a need for discourse with universities to prepare scientists/researcher/users and future educators, with the informal science-rich educational facilities that see citizens from cradle to grave, and with PK-12 educators. The climate portal may offer what NOAA sees as a broad array of educational materials but do "educators" mentioned only once in this plan see them as tools that can be actually used?

- Educators and other outreach professionals increase their use of climate science resources. (P.8)

NOAA through various means played major roles in the development of the Ocean Literacy: Essential Principles and Fundamental Concepts and Climate Literacy: The Essential Principles of Climate Science. There is a major effort underway to revise the science standards and where these two documents will fit is not certain. (Social studies will be a focus soon; ELA and Math Common Core Standards have been released.) Using the revised standards may become somewhat important to states in securing federal funds like those of “Race to the Top.” Once created NOAA should have seen the two documents above not as something to require be used in future funded projects but as the ground work for a next project that met the needs (being identified by the administration) of highly effective teachers ... perhaps something that could be used to measure the knowledge of the student and teacher that "Life on Earth depends on, is shaped by, and affects climate." (#3)

6. References to recent work on education, partnerships and outreach-based monitoring and evaluation are missing

The NOAA Next Generation Strategic Plan mentions extension, outreach and education topics in two places, page 7-8 and 23-24. What is there is fine, but the text lacks any details or any sense of conviction, innovation, or awareness of what is happening in NOAA and elsewhere. For example, there is no mention that in the report of the following activities/plans:

- Any reference to the NOAA 2009-2014 Implementation Plan and 2009-2029 Strategic Plan produced by the NOAA education group, with extensive input from all divisions of NOAA. Does the Strategic Plan reject all that work? If not, it should specifically endorse some or all of the education group's plans and cite highlights from it. Otherwise the hard work done by NOAA's devoted education group members and their colleagues will have been wasted.
- Any reference to the NRC Report on NOAA Education. Again, unless the Strategic Plan is rejecting that hard and expensive study, it should cite it and be specific about what findings the Strategic Plan includes.
- Any reference to the ongoing and highly promising partnerships NOAA already is pursuing, such as the NSF-funded Communicating Climate Change project in which NOAA plays a leading advisory role, partnering with a dozen science-technology centers and a dozen research universities.
- Any reference to the upcoming NRC work for NOAA on Outreach-Based Monitoring and Evaluation Framework, which directly addresses the Report's plan on page 8 for gathering evidence of progress towards its public understanding objects.

With these omissions, it looks as if the Strategic Plan is unaware of all this work, or has rejected it all.

Specific Comments

A definition of “engagement” at the beginning of the Engagement Enterprise section might be useful. From the document it seems that engagement is synonymous with outreach and it is not. We were unable to determine from reading the NGSP who the primary and secondary audiences are for this document. Can this be clarified in the document itself?

NOAA has the huge challenge of convincing the American people that Climate Change, Global Warming, and Sea Level Rise are real, and something that they should be concerned about. With questions of scientific muzzling this is a real issue. It is probably the most important engagement issue NOAA has, and they need to do something about it. This is mentioned in bullet 1 on page 24, but the statement is not strong enough.

Submitted by Frank Kudrna and Gerry Wheeler on behalf of the Extension, Outreach and Education Working Group

6. Comments from the Oceans and Health Working Group

Ray Ban, Chair,
NOAA Science Advisory Board
OAR/SAB
1315 East West Highway
Room 11219
Silver Spring, MD 20910

July 21, 2010

Dear Ray:

The Oceans and Health Working Group [OHWG] would like to offer the following comments to the Science Advisory Board on the Draft NOAA Strategic Plan. We base these comments on the content our April 2010 Report “One Ocean, One Health: NOAA in the Lead” and review of the June 2010 NOAA Draft Strategic Plan.

First, we would like to compliment NOAA for increasing the visibility of health of oceans and marine life as an element of this draft of the Strategic Plan. As our final report asserts, NOAA has significant responsibilities for human and other organism health where additional emphasis is needed. We observe that NOAA has made progress despite critical resource constraints but remains below fulfilling its mandates. Further, NOAA has key leadership and partnership roles to play that require expansion of NOAA’s current activities.

Second, while it might appear biased for the OHWG to argue this, we believe that NOAA should strengthen the ocean health portions consistent with our report. We recognize and applaud the inclusion of human health in the NOAA Strategic Plan objectives. In the key sections of the Draft Strategic Plan we see that there is recognition of health of humans and “marine life”. This marine life component is particularly important to recognize because the OHWG specifically addressed marine mammals, shellfish, and other organisms that depend on a healthy ocean and which can also serve as indicators of poor ocean health with direct and indirect impacts on humans. This might be made clearer where NOAA’s marine mammal management responsibilities are discussed as one instance.

Third, because oceans and health deals directly with threats and benefits to human beings, the OHWG call for NOAA engagement is especially strong. The approach to engagement still has a tone of “talking to” constituents, rather than “listening” to understand constituent needs and then help them solve their problems. Engagement is not solely public relations although that is an important part of what NOAA needs to do as well.

Fourth and possibly most importantly, the need for NOAA to play both a leadership role and a partnership role that is expressed in general terms throughout the NOAA Strategic Plan. The Strategic Partnership section [p. 28] should definitely identify health of oceans and human and marine life as one of its strategic partnerships. This final element of the strategic plan gives NOAA an opportunity for stronger partnership with other Federal agencies, once again in support of a “One Ocean, One Health” mission for which NOAA seeks to be recognized.

We look forward to NOAA finalizing the next generation of its Strategic Plan and its implementation.

Sincerely,

The OHWG Chair
Steve Weisberg

Submitted on the request of Steve Weisberg on behalf of the OHWG by David Fluharty

7. Comments from the Social Sciences Working Group

July 27, 2010

Ray Ban, Chair,
NOAA Science Advisory Board
OAR/SAB
1315 East West Highway
Room 11219
Silver Spring, MD 20910

Dear Chairman Ban:

The Social Science Working Group [SSWG] would like to offer you and the NOAA Science Advisory Board [SAB] our comments on the Draft NOAA Strategic Plan to assist you in preparing comments from the SAB. Our comments reflect the recommendations of our April 2009 Report approved by the SAB and our examination of the Draft NOAA Strategic Plan.

The Draft NOAA Strategic Plan is very much consistent with our recommendations. The SSWG agrees with a NOAA goal to develop and maintain, “a world-class earth system research capability that spans natural and social science disciplines.” We are also gratified to see that, “NOAA also will support socioeconomic research and policy analyses to evaluate management strategies with respect to both ecological and social outcomes, and will assist partners in the development of ecosystem-based plans that include all aspects of the biological, social and economic environment. “ We fully support the intent to have, “increased use of social scientists for research, service development, and operations.” Finally, we strongly endorse the investment necessary to “build the capacity in the social, behavioral and economic sciences to support the valuation of ecosystem services.”

The SSWG realizes that building social science capacity represents a challenging and long-term culture shift for NOAA. In the Draft NOAA Strategic Plan, there seems to be a strong appreciation for accelerating this culture shift, however, the specific measures that might be prioritized are not presented [which is true for other areas and is appropriate in strategic planning].

The SSWG would like to remind the SAB that within the SSWG report there are a number of actions that can be executed without undue budget stresses and within a relative short-term timeframe. While the SSWG does not expect that these actions would be part of the NOAA Strategic Plan, we hope that the NOAA SAB will continue to monitor and ensure that social science within NOAA’s new management structure is integrated with the natural sciences. Achieving the vision for strengthened social science within NOAA requires advocates within NOAA leadership, support of the Assistant Administrators (AAs), and a commitment to expand the culture of NOAA to include social sciences. Social science capabilities can be strengthened in part by providing the societally relevant incentives to line office and program managers to

incorporate decision making metrics. This in turn necessitates developing social science capacity to guide, inform, and support the application of social science for corporate planning and program development. In particular, NOAA can create a leadership role for social science research coordination, integration, and implementation by establishing an Office of Societal Impacts as recommended in our Report.

As you advise NOAA on revisions to its next generation of the NOAA Strategic Plan please know that the members of the SSWG remain able and willing to assist you as you monitor implementation.

Sincerely,

Susan Hanna, Chair
On behalf of the SSWG