

**NOAA Response to the NOAA Science Advisory Board's
Portfolio Review Task Force Report**

***In the Nation's Best Interest: Making the Most of
NOAA's Science Enterprise***

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Introduction

The National Oceanic and Atmospheric Administration (NOAA) received the final report of the Science Advisory Board (SAB) Portfolio Review Task Force (PRTF) in April 2013. Their report, entitled *In the Nation's Best Interest: Making the Most of NOAA's Science Enterprise*, makes ten specific recommendations for improving NOAA's research and development enterprise. NOAA thanks the members of the SAB and PRTF for their work on this important task and for providing their collective insight on the agency's scientific endeavors.

This document provides NOAA's response to these recommendations. For each recommendation, we detail actions we have taken since the report was delivered to NOAA, and the actions we intend to take. (Note that the response to recommendation 1 has been split into parts a and b, for social and ecosystem science, respectively, per the discussion on these topics in the report.)

Background

The SAB's [Review of the Organization and Management of Research in NOAA](#) (Moore et al., 2004) found "The major challenge for NOAA is connecting the pieces of its research program and ensuring research is linked to the broader science needs of the agency." That review yielded a number of more specific findings and recommendations concerning the strategic management of R&D at NOAA.

Several issues raised by the 2004 review have been addressed. NOAA connected research to corporate strategy through the Next Generation Strategic Plan (NGSP) and the new Five-Year Research and Development (R&D) Plan. NOAA has also implemented a practice of Strategy Execution and Evaluation (SEE) for corporate performance management. It also established a corporate Research Council to advise the Chief Scientist and NOAA line office leadership and to be a venue for agency-wide R&D planning and evaluation.

Other issues, however, have remained: the challenge of integrating R&D across NOAA's line offices, the growing demands for interdisciplinary research, and cost effective technology development and deployment, especially in a climate of flat or declining budgets. Furthermore, NOAA's research investments are broad and conducted through a variety of mechanisms, and the agency faces increasing challenges in managing its research portfolio, as a whole, to optimize the development, acquisition, and use of new science and technology.¹

While Moore et al. (2004) focused on organizational aspects of NOAA R&D, they did not address programmatic composition of the research portfolio relative to NOAA's strategic goals. Given the

¹ Presentation to the NOAA Executive Council on 15 November 2011. "Engaging the SAB: Review of Planning Issues for the Fall Meeting," by Paul Doremus, NOAA Office of Program Planning and Integration

creation of the NGSP in 2010, and the issues noted above, NOAA required an assessment of both R&D portfolio composition and management relative to its new strategy.²

NOAA requested the SAB's recommendations once again, this time through the Portfolio Review Task Force (PRTF). The PRTF was established in February 2011 to conduct a strategic assessment of the portfolio of R&D that NOAA conducts or funds, and offer answers to two overarching questions:³

1. What portfolio of R&D activities does NOAA need to achieve its vision and strategic goals? (What R&D portfolio does it currently have, what are the differences, what changes should be made, and what changes take priority?)
2. How should NOAA's R&D portfolio be organized and managed to achieve its vision and strategic goals? Is NOAA's expertise appropriate? (How is it organized and managed now, what expertise does it have now, what are the differences, what changes should be made, what changes take priority?)

The ten recommendations that the PRTF (and the SAB as a whole) offered in response to these questions are detailed below, along with NOAA's responses to each.

Recommendation 1a:

The PRTF recommends that, in addition to its core strengths, NOAA needs greater capacity in the socioeconomic ... sciences.

NOAA Response

NOAA **agrees** with this recommendation.

What we have done:

Completed a report, *NOAA, Society, and the Economy: An Assessment of NOAA'S Social Science Capability and Needs*, in June 2013. This report was presented to the SAB at its July 2013 meeting and has led to the following:

- Established a Social Science "Tiger Team" to generate recommendations for filling critical gaps identified in the needs assessment (report to NOAA Deputy Undersecretary for Operations recommendations submitted on Nov. 20, 2013).
- Increased social science capacity in the Chief Economist's office, establishing two senior-level deputy positions, and transitioning the Chief Economist to a full-time, permanent SL position. In the meantime, NOAA is seeking a full-time Intergovernmental Personnel Act (IPA) assignment to serve as Acting Chief Economist.
- Hired an ST-level⁴ economist in the National Marine Fisheries Service (NMFS) to guide economics and social science activities in NMFS and participate as a senior leader in NOAA's social science community.

² This was a conclusion of the 2010 Corporate Portfolio Analysis and subsequent budget scenario development.

³ Per the assumptions and approach detailed in the PRTF Terms of Reference and its Addendum.

⁴ This unique category of Federal jobs covers non-executive positions classified above the GS-15 level, and involves performance of high-level research and development in the physical, biological, medical, or engineering sciences, or a closely-related field. Many of the Federal Government's most renowned scientists and engineers serve in ST positions.

- Built a partnership with the Department of Commerce’s (DOC) Bureau of Economic Analysis to establish and maintain an ocean and coastal “satellite account”⁵ that meets the needs of NOAA leadership and stakeholders.
- Established a working partnership with the National Science Foundation (NSF) Social Behavior Economics (SBE) Division, resulting in the opportunity to leverage NSF Hazard Science, Engineering, and Education for Sustainability (SEES) Fellowship funds to bring NSF researchers into NOAA to work on translating weather and climate hazard research to NOAA operations and policy.

What we intend to do:

- Establish a NOAA Social Science Committee to advance, coordinate, and guide NOAA’s social science research, operations, and decision-making. This committee will subsume the functions of the existing NOAA Research Council Social Science Committee and will be expanded to include staff knowledgeable about how social science capabilities are incorporated into operations and decision-making, and who can identify and leverage opportunities to integrate social science into NOAA’s day-to-day functions.
- Task this Committee with developing and vetting across the agency a Social Science Vision and Strategy by Q4 of FY2014. This strategy should include recommendations for filling critical mission and capacity gaps not previously identified in the Social Science Tiger Team report, as well as identifying opportunities to leverage internal and external capacity and funds.
- Implement, where feasible, the recommendations of the Social Science Tiger Team report aimed at filling the most critical social science capacity gaps identified in the June 2013 needs assessment.

Recommendation 1b:

The PRTF recommends that, in addition to its core strengths, NOAA needs greater capacity in ... integrated ecosystem sciences.

NOAA Response

NOAA **agrees** with this recommendation. We have taken the following steps to incorporate natural and social scientists into NOAA’s integrated ecosystems science.

What we have done:

- Worked closely with regional Fishery Management Councils to develop Ecosystem-Based Fishery Management Plans.
- NOAA’s Integrated Ecosystem Assessment (IEA) Program has developed tools and models to conduct holistic assessments of U.S. large marine ecosystems and to transfer scientific knowledge to management. The program is being implemented in five regions and, in 2012, NOAA significantly advanced the first IEA of a large marine ecosystem for the California Current.
- Building on the recommendations of the 2011 NOAA Ecosystem Research Science Challenge Workshop, the NOAA Research Council established an Ecosystem Research Agenda Committee that developed a holistic framework for integrating natural and social sciences to enable multi-

⁵ Satellite Industry Accounts are statistical frameworks designed to expand the analytical capacity of the national income and product accounts and the input-output accounts and to supplement these accounts by focusing on a particular aspect of economic activity. <http://www.bea.gov/industry/satdef.htm>

scale ecosystem understanding. The NOS ST Coastal Ecologist/Chief Science Advisor serves as senior champion for the Ecosystem Research Agenda.

- NOAA Fisheries has selected a ST-level ecologist to guide integrated ecosystem science activities within NOAA Fisheries and has worked closely with the SAB's Ecosystem Science and Management Working Group to evaluate NOAA's implementation of ecosystem approaches to management.
- In collaboration with EPA and other partners, NOAA has implemented elements of the Great Lakes Restoration Initiative (GLRI). The GLRI has been supported by a total budget of over \$85 million since 2010 and includes research, modeling, and observing system upgrade projects.

What we intend to do:

- Convene cross-NOAA interdisciplinary teams of natural (physical and biological) and social scientists to focus on synthesizing research, observations, monitoring, modeling, and products from projects and programs that address shared scientific or management interests.
- Continue to lead development of Ecosystem-Based Management (EBM) principles and an EBM science framework, train managers in applying EBM principles and information, and conduct pilot projects, as required by the National Ocean Policy Implementation Plan.
- Expand IEA activities in the Gulf of Mexico to include other federal and/or academic partners by the end of 2014 and fully implement an IEA in one additional region by 2019.
- Lead development and implementation of a sound science program to implement the RESTORE Act in a manner that mitigates damages and restores functioning habitats in the Gulf of Mexico.
- Conduct ecosystem research to support the NOAA Habitat Blueprint (NOAA's strategy to integrate habitat conservation throughout the agency) to implement the Resources and Ecosystems Sustainability, Tourism Opportunities, and Revived Economies of the Gulf Coast States (RESTORE) Act Science Program, habitat conservation, and other ecosystem-based science activities.
- Hold a regional ecosystem science workshop in 2014, and based on recommendations from that workshop, conduct a regional-scale ecological research agenda demonstration project in the Gulf of Mexico.
- Continue developing the NOAA Ecological Forecasting Roadmap to increase ability to predict occurrences and effects of ecological events such as harmful algal blooms (HABs) and hypoxia and improve ecological modeling.
- Add ecosystem science expertise as opportunities arise through hires, contracts, grants, CIs, IPAs, and fellowships.

Recommendation 2:

The PRTF recommends that NOAA should emphasize, highlight, and provide incentives to support the seamless integration of research and services in both its Research to Operations (R2O) and Operations to Research (O2R) enterprises

NOAA Response

NOAA **agrees** with this recommendation.

What we have done:

- Drafted updates to NOAA Administrative Order (NAO) 216-105 "Policy on Transition of Research and Development to Application" to apply to transitions beyond NOAA, incorporate the concept

of Technical Readiness Levels, and formalize the role of NOAA testbeds and proving grounds (approved by the NOAA Executive Council, October 2013).

- Established the Line Office Transition Managers Committee (LOTMC) that reports directly to the NOAA Research Council. The committee's objective is to plan, monitor, evaluate and improve the effectiveness of NOAA R&D transition activities. The LOTMC has active membership and participation from every NOAA line office.
- Published a highly visible paper in the *Bulletin of the American Meteorological Society* journal to reach a wide audience and inform researchers about the NOAA testbeds and proving grounds: *M. Ralph et al., 2013: The Emergence of Weather-Related Test Beds Linking Research and Forecasting Operations. Bull. Amer. Meteor. Soc., 94, 1187–1211.*
- Established, in collaboration with the external research community (academia, federal agencies), a "Research Ready" environment which allows non-NOAA scientists to run NOAA operational models in a research mode on NOAA's high performance computers. With strict traceability mechanisms in place, if R&D projects are successful they can be quickly transitioned to operations.
- Successfully completed several R2O projects including operationalizing the Suomi National Polar-orbiting Partnership (NPP) Advanced Technology Microwave Sounder (ATMS) data seven months after launch, transitioning the Rapid Refresh enhancement to the NWS operational weather prediction model, and advancing the experimental HABs forecasting in western Lake Erie toward operational status.
- Established with the NSF Division of Atmospheric and Geospace Sciences a visiting scientist program at the National Centers for Environmental Prediction.

What we intend to do:

- Complete transition plans for high-visibility projects containing R2O and/or O2R components, approved at the Assistant Administrator (AA) level and monitored by the LOTMC. These transition plans will define requirements, milestones, schedule, and transition success/acceptance criteria through the identification of technology readiness levels; they should define the amount and source of funds needed to cover the costs associated with the transition and future operations, as necessary.
- Include a core evaluation criteria "science and technologies transferred" in the regular external reviews of NOAA's laboratories, centers and programs required by NOAA's "strengthening science" NAO (216-115). In FY14, the line offices will conduct the science reviews for at least five major R&D units.
- Implement corporate, "GPRA-ready" performance measures of NOAA R2O and O2R activities that will include and report contributed transitions from every NOAA line office.

Recommendation 3:

The PRTF recommends that the SAB, in partnership with NOAA, form a special scientific task force to review existing observing capabilities, examine options for more cost-effective observation and data sharing strategies, and discuss evolving needs and sustainable approaches for new observations and technologies.

NOAA Response

NOAA **does not agree** with this recommendation. The question of whether and how to conduct such a review is a NOAA management decision.

What we have done:

- Defined and prioritized observing system requirements and set data management guidelines.
- Advanced application of the Portfolio Analysis Machine, or PALMA⁶, model to conduct analysis of alternatives, trade studies, and prioritization of observing requirements and systems. Developed the NOAA Observing System Integrated Analysis (NOSIA II) in FY13 to assess the impacts of changes in NOAA's observing portfolio on its capabilities and to aid decisions on priorities.
- Formed the Quantitative Observing System Assessment Program to study the utility of NOAA's current and future observing systems. This program coordinates NOAA line offices' execution of adjoint studies, Observing System Experiments (OSE), Observing System Simulation Experiments (OSSE), and trade studies to inform NOAA management of the value of current and future observing systems.
- Continued to advance the Integrated Ocean Observing System (IOOS), including its regional associations. For example, NOAA supported regional observing system design activities for the Great Lakes Observing System, to identify and recommend specific actions and investments to achieve an integrated, comprehensive, and sustainable observing system.
- Collaborated with SAB working groups and external partners on these issues, including the Environmental Information and Services Working Group (EISWG), Data Archive and Access Requirements Working Group (DAARWG), Climate Working Group (CWG), Ocean Ecosystems Working Group (OEWG), and the Ocean Exploration Advisory Working Group (currently changing status).

What we intend to do

- Continue to be involved in broad observing system network coordination through efforts such as the Global Earth Observations System of Systems (GEOSS), which is being built to link together existing and planned observing systems around the world and support the development of new systems where gaps currently exist.
- Convene an international workshop on Tropical Pacific Observing Systems in FY14 including both government and academic researchers to chart the future of tropical ocean observing systems.

Recommendation 4:

The PRTF recommends that the responsibilities and authority of the current Chief Scientist position be significantly enhanced to provide the necessary tools to ensure that the total R&D effort of NOAA is efficiently implemented and aligned with NOAA's strategic priorities. This will require budget authority so that resources can be matched to priorities.

NOAA response:

NOAA agrees with the recommendation that the Chief Scientist should have broad oversight and influence over NOAA's R&D portfolio; however, NOAA **does not agree** that the Chief Scientist should have budget authority over that portfolio. Budget formulation and execution are responsibilities of the line offices. While central control of the R&D portfolio might be desirable, NOAA cannot effectively implement a recommendation to change budget authority without Presidential and congressional approval.

⁶ PALMA is a decision analysis and support tool developed by The MITRE Corporation. It integrates observing system performance metrics and investment costs to identify a range of optimal observing portfolios.

Within the Federal bureaucracy, financial management cannot be separated from chain of command, or other hierarchically-defined organizational boundaries. Direct budget authority over all NOAA R&D would require reorganization of the agency and thus Presidential and Congressional approval. The NOAA SEE process (as with the process before it) is the means for NOAA AAs to coordinate interrelated efforts that span multiple centers of financial management. The NOAA Administrator, of course, has ultimate and direct budget authority for every activity across the agency, and the Chief Scientist serves as counsel to the Administrator in matters of agency science. While this is not direct *authority*, it is direct *influence* – at the highest level of agency administration. It is not clear that explicit authority would result in a better matching of resources to priorities (the intent of this recommendation), nor if it would be worth the added complications of reorganization and the opportunity costs of engaging the President and Congress in other important matters.

What we intend to do:

- Encourage the nomination of a full-time Chief Scientist by the President. In the meantime, the OAR Assistant Administrator will serve as Acting Chief Scientist.
- The Chief Scientist (permanent or acting) will continue to influence NOAA R&D budgets through participating on the NOAA Executive Council and the NOAA Administrator’s leadership team.
- Charge the Chief Scientist (permanent or acting) with balancing and strengthening NOAA’s R&D portfolio, including research applications, innovation, transition, and education, both internally and in coordination with external partners.
- Develop and maintain a comprehensive R&D portfolio management system containing current information on how NOAA’s budget is being applied to R&D projects across all line offices, to provide the Chief Scientist with budget awareness critical for managing the R&D portfolio.

Recommendation 5:

The PRTF recommends that NOAA maintain a strong and productive internal scientific staff in its laboratories and centers.

NOAA Response

NOAA **agrees** with this recommendation.

What we have done:

- Obtained approval at the both the Department and NOAA level for a new NOAA Science Career Track process (NAO 202-511A) that allows non-competitive promotion of high-performing scientists.
- Supported development of new research scientist capacity, especially in the socio-economic and ecosystem sciences.
- Developed Operating Agreements among existing line office laboratories and science centers to leverage expertise, coordinate common research themes and facilitate transition of research to operations. For example, there are current discussions on developing a shared science mission between OAR laboratories (Pacific Marine Environmental Lab, Geophysical Fluid Dynamics Lab and Atlantic Oceanographic and Meteorological Lab) and NMFS Science Centers on climate advice to fishery managers. The Storm Surge and Ecological Forecasting Roadmaps have pulled together scientific and operational teams and leverage resources from across NOAA.

- Attracted and supported the development of new research scientist capacity through AAAS and Knauss Fellows programs, complementary research programs, Cooperative Institutes (CIs), and especially programs such as the Education Partnership Program Cooperative Science Centers (CSCs) which encourage the training and hiring of minorities and underrepresented groups.
- Continued to support co-location of research centers with other agencies and universities as a way of attracting scientists and enhancing collaboration. Mechanisms include CIs, Sea Grant Institutions, CSCs, and consortia such as Integrated Water Resources Science and Services.

What we intend to do:

- Implement the newly established NOAA Science Career Track process (NAO 202-511A) that allows non-competitive promotion of high-performing scientists.
- Encourage Labs and Centers to develop staffing plans that align with the NGSP and NOAA's R&D priorities and needs, by implementing NAO 202-511A which provides the position classification of scientific research positions, and by identifying and removing NOAA internal obstacles that impede hiring, promotions, and staff rotations.
- Expand our in-house capacity in both socioeconomic and ecosystem sciences (responsive to Recommendation 1).
- Explore opportunities to increase the use of Interagency Personnel Assignments (IPAs) to both bring talented personnel into NOAA for specific periods.
- Consider establishing at NOAA a broad, science-focused post-doctoral program similar to the U.S. Geological Survey's Mendenhall Research Fellowship Program.
- Attract and support the development of new staff through use of the new Presidential Management Fellows (PMF) Science, Technology, Engineering, and Mathematics (STEM) track. PMFs are non-competitive hires with a long history of success in NOAA, and the addition of a STEM track creates a source of hires for NOAA not previously available.

Recommendation 6:

The PRTF recommends that NOAA assess the Cooperative Institutes in terms of their scientific focus, funding and staffing levels to ensure that the Cooperative Institutes have sufficient support to adequately leverage NOAA's investment and that they are aligned with strategic priorities.

NOAA Response

NOAA **agrees** with this recommendation, but believes this issue has been addressed. NOAA supports 18 CIs, consisting of 42 universities and research institutions across 23 states and the District of Columbia. Total funding to CIs in FY13 was \$168.4M. NOAA is implementing a Policy on Cooperative Institutes (NAO 216-107) that requires rigorous evaluation of all CIs every five years to confirm programmatic need as well as technical and administrative excellence.

What we have done:

- Consulted with the CI Directors Executive Committee on the underlying concerns and potential approaches to address them. The Executive Committee indicated the report omitted a key fact: the concern about current investment level relates to Task 1 funding, which supports CI administrative activities and is separate from the programmatic funding provided to CIs.
- Agreed with CIs on a new, uniform model for supporting Task 1 funding at each CI, which will provide some CIs with more funding than they currently receive. The CI Directors Executive Committee believes that the new funding model, which will be initiated in FY14, goes a long way towards addressing this issue.

- Terminated two CIs in 2013: Cooperative Institute for Climate Applications and Research and the Cooperative Institute for Oceanographic Satellite Studies.

What we intend to do:

- In light of the decision to increase aggregate Task 1 funding beginning in FY14 and the existing robust review process for evaluating the need for and quality of CIs, NOAA feels that no further action is required to address this recommendation. This assessment is supported by the CI Directors' Executive Committee.
- Continue to have the SAB play a leading role in the periodic reviews of the CIs.

Recommendation 7:

The PRTF recommends that NOAA should critically examine its distribution of R&D funds and allocation of scientific staff within the agency to better align with the Next Generation Strategic Plan.

NOAA Response

NOAA **agrees** with this recommendation.

An analysis such as this is a regular part of strategic planning and budget formulation, albeit at a coarse level of resolution. NOAA must comply with OMB Circular A-11, the Government Performance and Results (GPRA) Act, and the GPRA Modernization Act to align resources with agency goals. NOAA's SEE process incorporates portfolio analysis as one of its primary functions through the regular update of implementation plans, the development of a Corporate Portfolio Analysis, and a post-appropriation Corporate Portfolio Review. Implementation plans are required to link activities and outcomes to the specific budget lines of NOAA's R&D execution units. The need to critically examine the strategic distribution of resources for R&D (i.e., a portfolio analysis) was the basis for requesting that the SAB conduct an independent review of NOAA's R&D portfolio. Detailed financial and personnel data were provided to the PRTF to assist NOAA in this regard.

What we have done:

- In September 2013, completed a new NOAA 5-Year R&D Plan, which describes anticipated balancing of R&D dimensions, such as near-term versus long-term efforts, internal versus external, research push versus user pull, knowledge outputs versus technology outputs, creation versus diffusion. This Plan is aligned to the NGSP, assumes a flat-line budget in the out years, and describes major R&D priorities to meet the goals of the NGSP.
- In Spring 2013 performed a formal assessment of NOAA's progress on NGSP objectives through an agency-wide evaluation of executed programs called "Progress to Plan." Completed human resources needs assessments for ecosystems research and for social sciences (see responses to recommendation 1).

What we intend to do:

- Annually review NOAA's R&D enterprise execution and future R&D budget formulations in light of PRTF recommendations and the NGSP. The NOAA Research Council directly oversees the SEE submissions for the Holistic Understanding Enterprise and Environmental Modeling Enterprise Objectives; the NOAA Executive Committee reviews and approves the NOAA-wide SEE submission.

- Establish and maintain a R&D portfolio management system for all NOAA R&D research and development projects (per NAO 216-115). This database will contain numbers of full-time equivalents (FTE) and costs, including external funding and leveraged costs, on a project-by-project basis.
- Produce an annual State of NOAA Research report (per NAO 216-115).

Recommendation 8:

The PRTF recommends that NOAA capitalize on the support and skills of the extramural research community by developing carefully targeted initiatives that meet the needs of the Next Generation Strategic Plan, that are stable and consistent over time to enable year to year planning, and that ensure the results are integrated into NOAA’s R&D operations.

NOAA Response

NOAA **agrees** with this recommendation. In addition to the steps taken to address recommendations from the last review of NOAA’s research enterprise (Moore et al., 2004), such as enhancing the Agency’s grants management and establishing more formalized processes and procedures for its cooperative partners (e.g., Cooperative Institute Policy and Handbook), NOAA has regularly engaged with partners in Sea Grant Principal Investigator meetings, CI Directors’ meetings, constituent roundtables, scientific conferences, etc.

NOAA concurs with the PRTF that stable and consistent direction and funding from year-to-year is important to the success of these extramural partnerships. Declining research budgets over the past several years, the uncertainty in these budgets while under Continuing Resolutions through much of each fiscal year, the impacts of sequestration, and the lapse in FY14 appropriations have made achieving a goal of stable external science funding very challenging.

What we have done:

- Involved the external community in NOAA Science Challenge workshops.
- Solicited input from the broader community in the development of NOAA’s new 5-Year Research and Development Plan.
- Engaged CI staff in developing plans for some activities supported under the Sandy Supplemental Appropriation.

What we intend to do:

- Continue to engage extramural partners in longer-range science planning and, as appropriate, in developing execution plans to achieve NOAA’s research objectives, including integrating results into applications. A good example of an ongoing effort of this type is the development of a science plan for the NOAA RESTORE Act Science Program for the Gulf of Mexico.
- A full-time Chief Scientist (discussed under recommendation 4) will further guide and promote science initiatives aligned with the NGSP. He or she will work with the external community to build understanding of NOAA’s R&D needs, funding opportunities, and limitations.
- Leverage external community’s unique research expertise in, for example, the social/behavioral/economic sciences. NOAA lacks sufficient capacity in this area, but evaluations conducted by NOAA’s Social Science Committee (recommendation 1A) may yield focused initiatives where the external community could be further entrained.

Recommendation 9:

The PRTF recommends that in the current Federal budget situation, it is imperative that NOAA make the most of its existing talent and find ways to accelerate and enhance learning and professional development of that talent.

NOAA Response

NOAA **agrees** with this recommendation. NOAA remains fully committed to developing and retaining a diverse and highly qualified workforce with the skills necessary for achieving our mission goals and objectives. NOAA's NGSP and line office strategic plans call for measures and incentives to recruit and retain top-tier researchers, interdisciplinary professionals, and science program managers. Professional advancement is recorded in yearly performance plans for employees in science and technology positions.

NOAA Workforce Planning Policy has been designed to implement competency-based approaches to recruit, develop, and maintain the agency's workforce with the knowledge and skills required to advance NOAA's mission goals and objectives; this includes a systematic identification of human capital needs in science and technology (NAO 202-1103: October 2007). NOAA supports recognition of our federal and CI employees through the Presidential Early Career Awards for Scientists and Engineers (PECASE).

Following years of federal staff attrition (e.g., the number of federal FTE in OAR declined over 10% between 2010 and 2013), NOAA recently was further challenged by the automatic spending cuts under the budget sequestration events in 2013 and the lapse in FY 2014 appropriations. Within NOAA, training and recruitment were frozen, limiting NOAA's ability to develop staff. These temporary restrictions on training and recruitment have now been removed, bolstering NOAA's ability to further develop and apply existing talent.

What we have done:

- NOAA and other federal agencies authored a letter to the White House Office of Science and Technology Policy, outlining the barriers that restrictions on travel and conference attendance present to fostering collaboration and scientific discovery, as well as to scientist training and professional development.
- Completed NAO 202-511A and its associated handbook to define criteria for merit-based promotion in positions within the NOAA Science Career Track.
- Continued to provide tuition remission and other support for scientists to complete masters or doctoral degrees.
- Established the Council of NOAA Fellows, a standing body of all NOAA Senior Scientists (STs) and Senior Leaders (SLs) which reports to the Chief Scientist and Deputy Under Secretary for Operations. The CNF is developing as an internal "think tank" for NOAA, with plans to address high-level science topics and promote scientific excellence across the agency.
- Broadened the PECASE applicant pool by opening the process to CI scientists and further encouraging consideration of all qualified staff, and also increased the stipend to provide additional support for these most promising and talented scientists and engineers.

What we intend to do:

- Fully implement the recently drafted handbook that defines criteria for promotion in positions within the NOAA Science Career Track (NAO 202-511A).

- A direct result of the 2010 NOAA Science Workshop that called for “better-defined science career paths to attract and retain the best quality staff and to ensure a motivating research environment.”
- The NAO and handbook underscore recognized achievements in research and development as the basis for attracting, retaining and promoting individuals, including merit-based non-competitive career advancement.
- Continue to work with DOC and OMB to seek relief from travel restrictions and, where appropriate, give young and mid-career scientists special consideration with regard to conference participation and training.
- Increase scientific interactions and exchanges with academic and research institutions, non-governmental organizations, and private firms in ways that are mutually beneficial and will result in state-of-the-art training and professional enrichment for NOAA scientific staff. Examples include Cooperative Research and Development Agreements (CRADAs) and science challenge workshops.
- Establish a Diversity and Professional Development Working Group under the NOAA Education Council. The group will be comprised of early- to mid-career alumni of the Educational Partnership Program and will focus on barriers and opportunities for career advancement for underrepresented minorities at NOAA.

Recommendation 10:

The PRTF recommends that NOAA work closely with the Department of Commerce, the Office of Management and Budget, and with the Congress to create ways to manage its R&D funds more flexibly and efficiently and to implement its new research priorities over a period of several years.

NOAA Response

NOAA **agrees** with this recommendation. NOAA will continue to highlight our research priorities to the Administration and to Congress.

What we have done:

- Proposed restructuring of budgets of several line offices to reduce the number of Program, Project, or Activity (PPA) lines and increase budget execution flexibility.
- Developed budgets that include competitively awarded R&D funding in areas of increased priority. One example of NOAA’s budget agility is the National Sea Grant College Program which has established a series of National Strategic Investments (NSIs) that complement the strategic objectives of the state Sea Grant programs. NSIs have a national focus and are intended to enhance Sea Grant's network-wide capabilities (R&D, education, extension, and outreach) to respond to high priority issues and opportunities. Projects are generally selected through annual national competitions. This agility was used to increase funding for social science by a factor of three.
- Advanced R&D through opportunities created by event-linked or time-limited funding (e.g., Hurricane Sandy Supplemental Appropriations).

What we intend to do:

- Continue budget structure discussions begun in FY13 concerning possible changes to NOAA’s appropriations. The goal of budget restructuring would be to reduce the total number of PPAs to enable more flexibility in budget execution.
- Provide information on NOAA R&D accomplishments in light of NGSP goals and objectives.

- Develop reorganized line office budget structures to more effectively, efficiently, and transparently support NOAA's Strategic Goals and Enterprise Objectives. This effort should simplify NOAA's execution budgets, provide the agency flexibility to address emerging science and operational issues, and help clarify what funds are distributed to the external community. Per direction by the NOAA Chief Financial Officer, and consistent with the inputs provided to the PRTF, NOAA is working to standardize and improve consistency of line office reporting of investments into categories of research, development, and associated infrastructure.
- Develop a strategy to optimize use of unexpected funding opportunities (e.g., RESTORE Act, American Recovery and Reinvestment Act of 2009 (ARRA)).