Ocean Exploration Advisory Board
A Federal Advisory Committee Act Committee

April 27, 2016

Honorable Kathryn D. Sullivan, PhD
Under Secretary of Commerce for Oceans and Atmosphere and
Administrator, National Oceanic and Atmospheric Administration
1401 Constitution Avenue, NW
Washington, DC 20330

Dear Dr. Sullivan:

At the January meeting of the Ocean Exploration Advisory Board (OEAB), we heard from the NOAA Chief Scientist about the importance of NOAA's Strategic Guidance Memoranda (SGM) process. We have since seen and reviewed the three FY18 SGMs:

- NOAA Observing Systems Council Input into FY18 Planning Process
- FY18 Strategic Guidance on Oceans, Coasts, and Great Lakes
- NOAA Strategic Research Guidance Memorandum for FY18

We also know that NOAA fiscal guidance has been promulgated as a result. Using the SGMs as a guide, the following OEAB recommendations support NOAA's Office of Ocean Exploration and Research (OER) funding and are provided for consideration in preparing the FY18 agency budget proposal:

I. SGM Observing Systems:

a. Filling Critical Gaps in Arctic Observations:

i. Complete unexplored Arctic segments of the OER ECS program as quickly as possible.

1. Finishing the at-sea ECS campaigns ensures America retains a lead in characterizing potentially contested resource claims. The Arctic has become a most-interesting area to our global competitors for many reasons. Further, as the federal ocean exploration leader, NOAA can help validate/refine current planned efforts in sister agencies, such as the U.S. Navy's Arctic Roadmap.

2. See Section III.f. (SRGM), where again Arctic observations in this largely unexplored area are listed as a top priority.

II. SGM Conservation and Management:

a. High Quality Observations:

i. Before NOAA can establish a sustained observing program in un-characterized areas, but areas of interest inside or outside the U.S. EEZ/ECS, it should first explore and make preliminary characterizations of those areas. OER is effective in achieving this objective because it is nimble in taking advantage of "state of the art ... sensors and research vessels" though a Cooperative Institute, Cooperative Agreements, and competitive grant programs. This largely extramural program meets this focus area objective and should be funded appropriately to provide the basis for downstream commitments to sustained observing program sites/efforts.

ii. OER is actively involved and has been nationally recognized for its ongoing partnerships/collaborations record, see III.c.i below. NOAA's federal ocean exploration leadership responsibility and demonstrated success are foundations upon which to build.

iii. Complete underway segments of the OER ECS program as quickly as possible. This links nicely with this SGM's discussion on "high-resolution bathymetry."

1. Completing this requirement will maximize the return on investment by eliminating inefficiency that naturally results from continued starts and stops.

iv. The SGM encourages NOAA to "think about generating observations" using "less expensive and more efficient technologies" and "unmanned aerial, surface, and subsurface systems." Facilitating new approaches to ocean data collection has been a key OER objective. OER has successfully demonstrated at-sea testing of new technologies (e.g., sampling during telepresence operations, Cooperative Institute for Ocean Exploration, Research, and Technology (CIOERT) sensor development, PMEL acoustic sensors in ultra-deep waters, etc.). The practical at-sea application of new techniques during ocean exploration campaigns is essential to put-to-the-test, adapt, and accelerate development and transition of innovative approaches to ocean observing.

v. The SGM (and the SRGM) encourages "new approaches ... for creating and leveraging creative, mutually beneficial partnerships/collaborations." Partnerships have underpinned OER, which has been recognized both inside and outside of NOAA for its success. OER has sustained public-private partnerships. It has been a catalyst for coordinated expeditions with other government agencies to effect significant scientific achievements that would not otherwise have occurred.

b. Seafood Security:

i. Central and Western Pacific U.S. EEZ regions are rich in seamounts, but largely uncharacterized. They are potentially fruitful fisheries that OER should be funded to characterize in accordance with NMFS priorities. Specific new funding and/or allocation of ship time for OER-coordinated campaigns will enhance NMFS evaluation and management skill in these "new" fisheries.

c. Socioeconomic Data and Information:

i. A corollary: NOAA has a responsibility and an opportunity to legitimately inform the public (voters, students, industry, etc.) about the ocean's value, its condition, and its management challenges. Funding support for ocean exploration campaigns enables effectively reaching and influencing the public. OER-funded telepresence successes have clearly fulfilled NOAA's goal of "quantifying and promoting the value and impact of NOAA's products and services." The high demand from the public for this type of information is a clear indicator of its hunger to learn more about the ocean. In sum: OER furthers NOAA Leadership's primary goal of improving environmental intelligence.

III. SGM Research:

a. Introduction:

i. NOAA is likely the only agency that has "ocean exploration" in its founding rationale as stated in the SRGM preface. Further, OER's greatest asset and greatest responsibility is its statutory authority as the federal ocean exploration leader. America's future depends on an understanding of the global ocean. We explore the ocean because its health and resilience are vital to our economy and our lives. Core funding for a respected NOAA ocean exploration program is both logical and supportive of broad NOAA goals for improved environmental intelligence, sustained models, and integrated ecosystem models.

b. Mission Alignment:

i. Ocean exploration campaigns are important national opportunities to measure certain climate-related parameters in areas/at depths where the data gap is significant (ocean acidification measurements are a prime example). NOAA Ocean Acidification funding should support ocean exploration campaigns in unmeasured areas/depths.

ii. OER "shares . . . information with others." To many in the public, OER's video/telepresence output is NOAA's most popular ocean information. Core OER funding should continue to support this

important connection with America's students and citizens, academe and industry partners.

c. Partnerships:

i. OER has a model Cooperative Institute (CIOERT). NOAA should build on that success and consider, as well, outsourcing its exploration and telepresence campaign planning and execution tasks and its public outreach to a new, competitively awarded Cooperative Institute. This could reduce the federal headcount, cost less, create better collaboration with and within academe, and comply with the Decadal Review recommendation.

ii. OER's telepresence capability is "citizen science," and therefore meets stated Agency requirements and addresses science priorities articulated annually in national science planning forums.

d. Facilities Infrastructure:

i. OKEANOS EXPLORER purportedly was upgraded before her FY16 Marianas Campaign. Study and then consider funding upgrades to E/V NAUTILUS's exploration and communications capabilities and hull/mechanical/engineering systems.

ii. Begin investment in technologies to allow other ships in the federal oceanographic fleet (and, eventually, select vessels in the commercial and fishing fleets) to conduct exploration operations (viz., "fly-away" telepresence systems, other water column and bottom bio-geo-chemical-acoustic measurement, and sampling systems and AUVs). Such investment will allow NOAA to access the best national capability and eventually minimize in-house ocean exploration infrastructure.

iii. Explore opportunities to develop a network that uses affordable sensors on commercial and private vessels for collection and application of ocean data. For example, the vast number of commercial fishing vessels far outweighs the total of all government platforms. If OER could establish a partnership with commercial fisheries, it may be able to collect a significant amount of useful ocean chemistry data.

e. Observing System Optimization:

i. See II.a.i above.

ii. "... observations of climate relevant variables"; see III.b.i above.

iii. "... develop sensors [and capabilities] to accelerate baseline sensors." The sensor development success at the CIOERT suggests increased funding to further advance on its proven record.

f. Arctic:

i. The SRGM is replete with statements about the need to increase our environmental understanding in the Arctic – the least explored ocean. Section I.a. above presents the OEAB's recommendation on ECS campaigns in the Arctic. But, ocean exploration generally (and OER specifically) is expanding beyond bathymetry and telepresence to include more measurements and sampling. It is logical that OER should be assigned the direct role in exploring those unexplored parts of the Arctic as a foundation for those NOAA partners who will follow with observations, models, and predictions and for those federal partners who will manage use, protect lives, and defend in the Arctic.

In summary, NOAA's Ocean Exploration program is fully aligned with NOAA's FY18 SGMs. Its track record demonstrates the ability to advance our understanding of the world's ocean and help our nation make better decisions. OER creates new knowledge; advances innovative technology; engages other federal, private, and international partners; and shares the results with key stakeholders to be more effective in sustainably using, reasonably conserving, and effectively managing our marine resources.

In separate correspondence, we will present additional recommendations for the FY19 SGMs, per your Chief Scientist's suggestion.

Sincerely,

Paul G. Gaffney II
Vice Admiral, U.S. Navy (Ret.)
Chair

Copy to: Assistant Secretary, Conservation and Management
Assistant Secretary, Observation and Prediction
Chief Scientist
Director, Ocean Exploration and Research
OEAB File