

**Minutes**  
**11th Meeting of the Ocean Exploration Advisory Board**  
**Woods Hole Oceanographic Institution, Falmouth, MA**  
**25-26 September 2018**

**Notification and Availability of Meeting Materials**

The tenth meeting of the Ocean Exploration Advisory Board (OEAB) was announced to the public by Federal Register Notification, and on the OEAB website at [www.oeab.noaa.gov](http://www.oeab.noaa.gov). Background material and presentations prepared for this meeting are posted on the OEAB website.

**Ocean Exploration Advisory Board Members in Attendance**

Mr. John Kreider, Consultant (Chair)  
Dr. James Austin, University of Texas/Austin (Vice Chair)  
Ambassador Cameron Hume, Consultant (Vice Chair)

Dr. Amanda Demopoulos, U.S. Geological Survey  
Dr. Jacqueline Dixon, University of South Florida  
Dr. Christopher German, Woods Hole Oceanographic Institution  
Dr. Darlene Lim, NASA<sup>1</sup>  
Ms. Nicolette Nye, National Ocean Industries Association  
Dr. Richard Rikoski, Hadal, Inc.  
Dr. Dominique Rissolo, University of California at San Diego  
Mr. Lance Towers, The Boeing Company

**NOAA Management and Staff in Attendance**

RDML Timothy Gallaudet, NOAA Administrator (Acting)  
Mr. Stuart Levenbach, NOAA Chief of Staff  
Ms. Brittany Croll, Program Coordination Office  
LT Scott Broo, Flag LT

Dr. Alan Leonardi, Director, OER  
CDR William Mowitz, Deputy Director, OER  
Mr. David McKinnie, Designated Federal Officer for the OEAB  
Dr. Adrienne Copeland, OER  
Dr. Amanda Netburn, OER  
Ms. Susan Haynes, OER<sup>2</sup>  
Ms. Yvette Jefferson, OER

**Invited Briefers**

Mr. Rob Munier, Vice President of Facilities and Operations  
Dr. Jerry Schubel, President and CEO, Aquarium of the Pacific (via teleconference)  
Ms. Katy Croff Bell, MIT Media Lab (via teleconference)

**Observers**

There were an unusually large number of observers at the meeting, given WHOI's prominent role in ocean exploration. A list of observers is attached.

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<sup>1</sup> Dr. Lim participated in the SUBSEA briefing by telephone

<sup>2</sup> Ms. Haynes observed the presentation and discussion of the report of the OEAB subcommittee to review the Office of Ocean Exploration and Research education program.

## Meeting Summary

- 1. Meeting Opening.** The Designated Federal Officer (DFO) opened the meeting on September 25, 2018 at the Laboratory for Ocean Science and Observing Systems at the Woods Hole Ocean Oceanographic Institution. He noted that four OEAB members had agreed to renew their terms: Mr. John Kreider, Dr. Amanda Demopoulos, Dr. Darlene Lim, and Dr. Dominique Rissolo. He also noted that RDML Gallaudet had approved the Education Review subcommittee formally and that any new subcommittees would be established at the request of the NOAA Administrator.
- 2. Host Welcome and Briefing.** Woods Hole Oceanographic Institution (WHOI). Mr. Rob Munier, Vice President for Marine Facilities and Operations, welcomed the OEAB and provided a brief overview of WHOI's deep ocean programs, including Pathways to Ocean Worlds, partnerships, such as that with Ray Dalio's OceanX, and deep submergence vehicles.
- 3. Approval of Minutes.** Dr. Dixon made a motion to approve the minutes from the 10<sup>th</sup> OEAB meeting, held in Washington, D.C. Ambassador Hume seconded, and the Board approved the minutes (see the [OEAB website](#) for Meeting 10 minutes).
- 4. Chairman's Remarks.** The Chair reviewed the OEAB discussion at the end of the Seattle meeting about how the OEAB should define success. The group identified four areas to present to RDML Tim Gallaudet where the OEAB thought it might be able to provide useful advice: adaptive technologies, leveraging partnerships, public engagement, and ocean exploration in the Blue Economy. In Seattle, the OEAB agreed to focus on public engagement and technologies at its next two meetings, in May and September 2018 respectively.

The Chair described phone calls with RDML Gallaudet, Acting NOAA Administrator, and RADM Mike Silah, Director of the Office of Marine and Aviation Operations and Director, NOAA Commissioned Officer Corps. RDML Gallaudet is very supportive of ocean exploration and eager to receive advice from the OEAB. He agreed that the OEAB should focus on public awareness and technology. He also stated his interest in increasing the ocean exploration budget over the next few years and to showing the importance of the ocean to the nation.

RADM Silah also stated his support for the ocean exploration mission and noted that he is looking for a strong signal from the ocean exploration community as to their requirements for ships and other platforms. He also told the Chair that OMAO is actively investigating alternatives to the *Okeanos Explorer*, which will be in service only until 2024, and that he recognized the need to improve uptime and availability across the fleet. Mr. Kreider's presentation is posted on the OEAB website, as are all other presentations given to the OEAB.

- 5. OEAB Discussion.** The chair led a discussion focused on preparing to engage with RDML Gallaudet later in the day. He noted developments in ocean policy, including discussions of reinvigorating the National Ocean Partnership Program (NOPP) and the importance of NOAA's blue economy priorities. He also described in more detail his discussion with RDML Gallaudet, including his positive response to the OEAB's May letter suggesting a blue economy subcommittee, engagement with NASA's Ocean Worlds initiative. The OEAB discussed NOAA's engagement with the commercial sector, comparing it to what it described as Navy's more positive relationships with industry, general ocean exploration priorities, including the importance of meeting requirements within the US EEZ.

6. **OER Education Review Subcommittee Report.** Dr. Jerry Schubel, who chaired the OEAB subcommittee tasked with reviewing the OER education program, joined the meeting via teleconference to brief the OEAB on the subcommittee findings. The complete subcommittee report is posted to the OEAB website. He highlighted OER's successes over the years with limited resources before reviewing seven groups of recommendations that ranged from leveraging partnerships to increasing diversity in OER's education activities. He noted that subcommittee members endorsed all recommendations unanimously. After discussion, the OEAB agreed to endorse the report and forward it to RDML Gallaudet with the recommendation that he take appropriate action.
7. **2018 National Ocean Exploration Forum Update.** The OEAB received an update on planning for *All Hands on Deck: National Ocean Exploration Forum 2018* from Katy Croff-Bell of the MIT Media Lab. Dr. Croff-Bell described both the agenda and the organizers' efforts to increase diversity of all kinds at the event (for example, a better distribution of early-career scientists and established scientists, a mix of disciplines, including international participants, and gender). The OEAB discussed the benefits and costs of Forums and different aspects of planning for the next Forum, on the Blue Economy.
8. **Office of Ocean Exploration and Research Report.** OER Deputy Director CAPT Bill Mowitt presented an overview of OER activities since the last OEAB meeting. The OEAB was particularly interested in the information about the competition for the new cooperative institute (CI) on ocean exploration and expressed concern that it was unaware of the announcement or how such a CI might change OER operations. It requested more transparency from OER on activities such as this. After discussion, CAPT Mowitt noted that the OEAB would be invited to advise on the potential funding amounts for a new CI as well as the nature of the work OER and the CI would do together. The OEAB also discussed the information provided on the upcoming ASPIRE workshop and requested to be invited. Drs. Demopoulos and Austin committed to participate.
9. **DEEP SEARCH Report.** Dr. Demopoulos, a DEEP Sea Expedition to Advance Research on Coral/Canyon/Cold seep Habitats (DEEP SEARCH) principal investigator, briefed the OEAB on the overall effort, as well as the most recent DEEP SEARCH expedition aboard the R/V *Atlantis* using the human-occupied vehicle *Alvin*. Of particular note was the confirmation of a much more extensive range of the deep sea coral *Lophelia*, a discovery that made national news.
10. **Loihi Expedition (SUBSEA) Report.** Dr. Darlene Lim, principal investigator, and Dr. Chris German, deputy principal investigator for the Systematic Underwater Biogeochemical Science and Exploration Analog (SUBSEA) presented on results from the August 2018 Lo`ihi expedition. SUBSEA expeditions are intended to inform both strategies for conducting science via teleoperations in deep space destinations as well as an improved understanding of deep-sea analogs for Ocean Worlds. The Lo`ihi expedition tested algorithms to predict life against relatively well known deep-sea habitats on Lo`ihi. A second expedition planned for 2019 will investigate telepresence applications for missions to Mars.
11. **OEAB Discussion with RDML Gallaudet.** Acting NOAA Administrator RDML Tim Gallaudet and his chief of staff Stu Levenbach joined the OEAB for the second day of the meeting to share his perspective on ocean exploration issues, his priorities as acting Administrator, and areas where he sought OEAB advice. RDML Gallaudet noted that he appreciated and valued OEAB advice, then described two major NOAA priorities: in

Weather and Water, improving weather forecasting and in Oceans, building the Blue Economy. He described four major areas of activity to promote the sustainable economic use of oceans under the Blue Economy:

- Sustainable fisheries (both commercial and recreational)
- Marine transportation (port throughput, precision navigation)
- Tourism and recreation
- Ocean exploration (critical minerals, marine pharmaceuticals, renewable energy)

He stated the importance of reinvigorating NOPP as a means to promote ocean exploration and the Blue Economy and the need to raise awareness about ocean exploration through education and outreach. He noted the education review subcommittee report and indicated he would task OER to respond at the next OEAB meeting.

The chair presented four topics for discussion with the OEAB, noting the need to expand resources available for ocean exploration:

- Blue Economy
- Interagency partnerships
- Enhancing partnership with industry
- A national ocean exploration program

An active dialogue followed in each of these areas, including the need for OER to take a leadership role in NOPP and the importance of NOPP to help build a national program; the value of CRADAs as a way to engaging the private sector, as well as the use of NOAA ships (including the Okeanos Explorer) as technology test beds; and ocean exploration reauthorization.

**12. Tour of the WHOI Deep Submergence Facility.** WHOI provided the OEAB with a tour of its Deep Submergence Facility and a number of the vehicles in development intended for deep ocean exploration.

**13. Discussion, Next Meeting, and Meeting Close.** The OEAB agreed to meet in February 2019, in California. Topics for that meeting should include updates on:

- The Blue Economy Subcommittee
- The ASPIRE workshop
- All Hands on Deck: National Ocean Exploration Forum 2018

Other topics could include planning for a Blue Economy National Forum and NOPP/Ocean Policy Council activities.

The DFO closed the meeting at 17:05.