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THE FORUM INCLUDED:

- Two members of Congress addressing priorities for ocean science, including new legislation and past achievements
- Three panels exploring lessons to be learned from past ocean policy, the current state of ocean policy and federal funding, and the development of future U.S. ocean policy
- Five featured speakers expanding on their diverse areas of expertise and providing insight on keys to successful ocean policy
SUMMARY

The Consortium for Ocean Leadership’s annual Public Policy Forum explored the topic of U.S. Ocean Policy: Past, Present, and Future. In 2004, the U.S. Commission on Ocean Policy released An Ocean Blueprint for the 21st Century, which included 212 recommendations for a “coordinated and comprehensive national ocean policy.” In the ensuing 15 years, we’ve made scientific and technological advances that help us better understand the ocean, from sustainably managing its resources to forecasting the next major storm. However, despite the monumental advances we’ve made, our ocean and related prosperity continually face new and ongoing threats.

We stand in a unique position now to make great strides in improving ocean health, sustainability, and knowledge to achieve the unmet visions and recommendations from the U.S. Commission on Ocean Policy. Visionary speakers and panelists reflected on the 2004 report, assessed the current state of ocean policy, and discussed the path forward.
OPENING REMARKS
VICE ADMIRAL PAUL GAFFNEY II, USN (RET.)

Former U.S. Commission on Ocean Policy Commissioner Vice Admiral Paul Gaffney II, USN (ret.) set the stage for the day by highlighting a vital component of successful ocean policy: showing the value of sustainable ocean use, which in turn encourages continued investment in ocean science for further informed decision-making. In his opening remarks, he pointed out that when you Google “ocean policy issues” today, the results can be ominous, with lists of what is wrong and what needs to be fixed. Gaffney suggested that rather than focus on the negative to instead look at what has gone right and what we have learned as a way to address the problems. He encouraged the audience to think about how we can build on our successes and think about what opportunities lie ahead.

To this end, in reflecting on the U.S. Commission on Ocean Policy’s Final Report: An Ocean Blueprint for the 21st Century, Gaffney credited its success not only to its comprehensive solutions in areas like ocean monitoring and observation, education, and fisheries, but also to its ability to illustrate the value and importance of a healthy, sustainable ocean to our way of life. Additionally, the process of creating the document was important because it united the ocean science community and created a wave of interest in ocean science that lasted for years.

However, there are ocean issues today that were not prevalent in 2004, when An Ocean Blueprint was published, such as the impacts of the Deepwater Horizon oil spill, microplastics, and the opening of the Arctic. Additionally, federal investment in ocean science has not kept pace with inflation. Due to these new issues, Gaffney declared it is time to “start the wave again” and stressed the need for consolidation and coordination between academia, industry, nongovernmental organizations, and federal agencies to renew interest in ocean science. He highlighted the importance of the National Oceanographic Partnership Program (NOPP) in the execution of current ocean priorities, as NOPP can bring together agencies, industry, and academia to facilitate needed changes.
The first panel began with the history of the U.S. Commission on Ocean Policy and recommendations from their *An Ocean Blueprint for the 21st Century*, including what has been achieved, what has not, and issues the report did not anticipate. The former executive director of the Commission, Dr. Thomas Kitsos (Kitsos Consulting) moderated the discussion with former Commission members Vice Admiral Conrad Lautenbacher, USN (ret.), Ph.D. (GeoOptics); Dr. Andrew Rosenberg (Union of Concerned Scientists); and Dr. Paul Sandifer (College of Charleston).

The report included hundreds of recommendations, and while not all of them received the attention from federal agencies the panelists hoped for, some have been addressed. For example, there has been improved ocean science governance established through executive orders; reformed fisheries management at federal, state, and local levels; expanded support for regional ocean data gathering and planning; an increase in marine protected areas in the Pacific Ocean.

Getting the scientific community, federal agencies, and congressional priorities aligned was and still is one of the major challenges to realizing the goals of the report. Dr. Sandifer spoke about "some of the things we got right... but not as right as we should have," including addressing effects of climate change, protecting biodiversity, and understanding the connection between ocean health and human health. Dr. Rosenberg added that too much time was spent on high-level reorganization efforts, like changing agency structures, when the focus should have been on interagency coordination and cooperation at local, state, and regional levels. Several panelists suggested revisiting the idea of creating a permanent, congressionally mandated national ocean policy — as opposed to one created by executive order at the discretion of the sitting president — and establishing an organic act for the National Oceanic and Atmospheric Administration (NOAA).

Panelists argued for a need to consistently review and reform ocean priorities to keep pace with the times. Several key issues emerged as priorities for the future: microplastics, energy, aquaculture, climate change, and natural disasters. In addition, panelists felt that while some of the report’s recommendations were put into practice, more work needs to be done in the arenas of interagency cooperation and addressing current ocean issues. One of these existing mechanisms, NOPP, was described as a tool to encourage interactions not only among federal agencies but with academia, industry, and the larger ocean science community. Panelists further stated that the next wave of ocean policy must consider global implications, not just the U.S. perspective. Lautenbacher expressed hope for the future of ocean science, stating that “the ocean community is the most dedicated ... diverse groups of scientists I’ve ever had the pleasure to know.”
Ms. Molly McCammon (Alaska Ocean Observing System) moderated the discussion about U.S. ocean policy today, including talk of a national ocean policy, regional coordination, funding, and legislation, with Mr. Deerin Babb-Brott (White House Office of Science and Technology Policy (OSTP)), Mr. Tony MacDonald (Monmouth University), Dr. Alan Mix (Oregon State University), and Ms. Lora Snyder (House Committee on Natural Resources Subcommittee on Water, Oceans, and Wildlife). From her experiences managing the restoration program for the Exxon Valdez oil spill and as director of the Alaska Ocean Observing System, Ms. McCammon spoke about the tremendous changes she has seen in the Arctic region during the last 10 years. While the panel focused on current ocean policy, many of the discussion topics also kept an eye to the future. As Ms. McCammon stated, “when talking about present, we can’t really look at the present without thinking of the future because the future really is now.”

A NATIONAL OCEAN POLICY

Mr. Babb-Brott echoed sentiments from the previous panel that the ocean science community needs to work together and find common priorities to pursue. He spoke about the goals of the new national ocean policy created by President Trump’s 2018 Executive Order Regarding the Ocean Policy to Advance the Economic, Security, and Environmental Interests of the United States, which are to “simplify, focus, and elevate.” Mr. Babb-Brott shared that the executive order focuses on promoting practical and possible solutions to issues facing our ocean that can be accomplished with existing resources, talent, and intellect. For example, there are specific geospatial data sets collected by NOAA that could help manage conflict between New England wind energy development and fisheries management while also advancing administration priorities within both industries. OSTP is working with agencies to identify these priority research and technology needs.

REGIONAL OCEAN POLICIES

Mr. MacDonald provided a regional ocean planning perspective, where connecting issues and people is important. This includes emphasizing the economic connection of the ocean to the rest of the country — not just the coasts — when developing ocean policy. Engaging everyone who benefits from the ocean is a challenge, but ocean policy needs to represent their interests.

In the Mid-Atlantic, Mr. MacDonald said, stakes are high because of the dense coastal population, naval bases, ports connected to the rest of the country, and thriving tourism. He spoke about the long history of regional ocean policy, from providing protein sources to the need for coastal resilience and management of large marine ecosystems. He shared that the groundwork laid by the Mid-Atlantic Regional Ocean Action Plan (certified by President Obama’s National Ocean Council in 2016) is still informing decisions.
and encouraged others to build on established partnerships. There is, Mr. MacDonald added, incredible value in creating venues for collaboration to build the connections needed for successful policy.

Effective regional ocean planning needs to have the best available data to inform and approve decisions; support stakeholders and public in decision making; and provide a venue for states, the federal government, and tribes to work together. An example of regional ocean planning is the Mid-Atlantic Data Portal, a joint federal-state collaboration. The ocean data portal focuses on regional priorities, issues, and information and enhances data collected using artificial intelligence systems and fisheries data. An application of this data portal is “Communities at Sea” — interactive maps that enable communities to identify the ocean places most important for particular ports, specific fisheries, and gear types. Offshore energy is another area that brings together all these issues, so ocean planners must educate stakeholders, inform decision alternatives, and bring consistent science and information to the table to help make decisions. Mr. Babb-Brott shared that, in his experience, engaging stakeholders, industry, and constituents; providing necessary data and information; and bringing federal agencies to the table to help solve problems make for successful communication about ocean policy decisions and are essential to build unity moving forward and to provide basic nonpartisan and nonideological building blocks for ocean policy.

**FEDERAL FUNDING TRENDS**

Dr. Mix described federal ocean science funding trends, focusing mainly on the National Science Foundation (NSF). The data show a large divergence in NSF funding for ocean science in relation to U.S. Gross Domestic Product (GDP), with federal dollars for ocean science decreasing as a percentage of GDP since 1972. While there have been a few spikes in NSF funding over the years, ocean science funding today is for the most part comparable to levels in the 1960s.

Dr. Mix provided examples to show that weaker funding negatively impacts infrastructure; science, technology, engineering, and mathematics (STEM) education; and scientific publications. He asserted that the United States is “aiming low” on our infrastructure, resulting in smaller ships when compared to other countries, such as China and Germany. STEM education in the United States, when measured as the number of bachelor’s and doctoral degrees in the natural sciences and engineering, comes in third place, behind the European Union and China. The number of scientific publications is also lagging in comparison to Europe and Asia. He ended his presentation by calling on the audience to think about what they think the appropriate investment in ocean sciences is and if we, as a community, are okay with this current downward slide.

**116TH CONGRESS LEGISLATIVE PRIORITIES**

Ms. Snyder provided insight into the priorities of the House Committee on Natural Resources and its newly formed Water, Oceans, and Wildlife (WOW) subcommittee and echoed previous statements that, “this present panel needs to start thinking about the future.”

While the committee has jurisdiction over a broad range of issues, Ms. Snyder explained that Chairman Raúl Grijalva (AZ-3) recognizes the wide array of threats to our ocean and that they serve as a large part of the direction of the committee. Climate change is a top issue of concern; in the first month of hearings of the 116th Congress, every House Committee on Natural Resources subcommittee held a climate change-related hearing.

Ms. Snyder was hopeful that, with the new WOW subcommittee, the House would be able to take up important ocean bills in collaboration with the Senate, such as the Digital Coast Act and the reauthorization of the Integrated Coastal and Ocean Observing System Act. Additionally, the subcommittee wants to focus on climate change mitigation and adaptation as well as better data collection to help coastal communities prepare for the future. To do this, they plan to pursue a reauthorization of the Coastal Zone Management Act of 1972 with new climate change guidance while also evaluating the potential of living shorelines, new coastal resiliency grants, and wetlands restoration initiatives. The subcommittee also plans to explore big ideas pertaining to seismic testing; illegal, unreported and unregulated (IUU) fishing; and ocean plastics.
Mr. Jesse Ausubel (The Rockefeller University) moderated the discussion on the future of U.S. ocean policy with Dr. Jon Kaye (Gordon and Betty Moore Foundation), Dr. Kelly Kryc (New England Aquarium), Mr. Matthew Mulrennan (Ocean XPrize), and Ms. Sarah Tsoflias (Chevron USA). All agreed that as a community, we are well aligned, sharing common themes in our visions for the future, including ocean health, sustainable ocean resource use in a blue economy, growth of ocean technology, and community engagement in the ocean. Beyond these, Mr. Ausubel suggested presenting a unified voice and investing in existing organizations and initiatives.

Panelists’ visions all relied on a healthy, resilient ocean that is sustainably managed. Ms. Tsoflias proposed that maintaining a sustainable ocean is a combination of several elements, including leveraging partnerships, digital innovation and use of technology, and science and education. Mr. Mulrennan emphasized the use of big prizes to crowdsource engineers and innovative ocean technology “to solve grand challenges,” which would fill data gaps in ocean exploration, like deep sea mapping, and help people understand ocean health at a larger, more interconnected scale.

Dr. Kaye pointed out environmental policy can make significant strides after a major catastrophe, but unfortunately the ocean is “out of sight and mind” for most people, making it difficult to continually galvanize action. He added that there is a role for increased community engagement through citizen science, which provides educational opportunities and a sense of ownership. If millions of observers are looking for accidental or illegal point source pollution, monitoring what goes into rivers and out to sea, and taking better note of what is being sold in stores and restaurants, there is a possibility to move people at scale to fully achieve and understand a collective vision of a healthy ocean. Dr. Kryc built off this point and described the New England Aquarium as a place to learn about important ocean-related topics and see steps individuals can take to benefit the ocean. She offered the example of marine debris, saying that because ocean plastics are a visible issue in which individuals feel like they can make a difference, there has been traction to make changes in material science and waste management on land to keep plastic out of the ocean.

Mr. Ausubel encouraged investments in existing organizations to offer a more unified voice, rather than creating new entities. Dr. Kaye observed that placing science advisors at federal, state, and local levels to provide objective advice to decisionmakers would bridge a major knowledge gap and help align priorities. Ms. Tsoflias provided an example of successfully leveraging existing partnerships with the Gulf of Mexico Alliance, a partnership led by the five Gulf states where oil and gas companies, federal agencies, and others have agreed on their top environmental and economic priorities for the region. The New England Aquarium is also working in partnership with 22 aquariums around the country, shared Dr. Kryc, and is partnering with academic institutions, the private sector, and other nongovernmental ocean organizations.
Dr. Rick Spinrad (Oregon State University) closed the forum with his perspective on the day’s events, reflecting on the need to establish priorities in ocean science and harness the power of the collaborative, multidisciplinary nature of the ocean community to move forward on new solutions. He described the opportunity we have to build partnerships and apply ocean understanding to a realm of societal needs and benefits. To do so, he added, the ocean science community needs to branch out and talk more with groups in other disciplines — such as medicine, social science, and engineering — to bring those communities and perspectives into our dialogue and inform solutions. Dr. Spinrad stressed the need to expand both federal and private investment, which can be done in part by continuing to show all societal and economic benefits that stem from greater understanding of the ocean.

Within the ocean sciences, Dr. Spinrad emphasized that much has changed in who conducts science. The role of industry has shifted over the years and continues to evolve. The economics of science funding have changed as well, with increases in private sector ocean research funding. Dr. Spinrad also pointed out that demographics of ocean scientists are different in 2019 than they were 15 years ago, and if publicly funded entities do not represent the current diversity of the ocean science community, they will not survive.

While the ocean science community has made much progress over the years and has some concept of where to go in the future, Dr. Spinrad reiterated the need for a unified front to effectively set and address priorities. He emphasized the necessity for clarity in federal leadership of the ocean community; while each agency has a clear sphere of expertise and a specific leadership role that needs to be respected, there does need to be a strong leader to bring all these entities together, and the ocean community must decide what the appropriate structure is. He recommended NOPP as a vehicle for initiatives at the federal level, explaining that the momentum is there for NOPP to catalyze the ocean science community. He concluded the forum with a statement from an article he wrote with Admiral Watkins 10 years ago: “In summary, we have much to appreciate from the evolution of NOPP. It has served as a catalyst for the maturation of our research community and helped us realize that the impact of our research efforts can be compounded through effective collaboration, coordination, and cooperation. It is our responsibility, now, to take these enhanced skills of partnering and apply them to society’s most exigent needs – with haste and vigor.” He emphasized how these words are still relevant and echoed previous panels in reaffirming that there is no shortage of issues in the ocean science community but there is a need for prioritization.

Dr. Spinrad also spoke about the global effort to address ocean issues and how the United States needs to participate more and grow back into a leadership role. Since the United States is not a signatory to the United Nations Convention on the Law of the Sea (UNCLOS), he asserted that we “barely have a seat at the table” when it comes to global ocean planning and decision making.

In conclusion, Dr. Spinrad voiced his support for the Consortium for Ocean Leadership (COL) and its position to implement the vision outlined by speakers at the forum, making it clear that COL is uniquely positioned to implement the vision with support from the community.
FEATUERED SPEAKERS

CONGRESSWOMAN SUZANNE BONAMICI (OR-1)

“The health of the oceans reflect the health of our planet,” stressed Representative Suzanne Bonamici (OR-1) as she spoke about threats to our waters and stated the importance having a productive, healthy ecosystem for our future generations. As co-chair of the House Oceans Caucus, Rep. Bonamici shared the bipartisan group’s most pressing priorities, including researching ocean acidification, harmful algal blooms (HABs), and hypoxia; getting rid of marine debris; strengthening ocean data and monitoring; improving coastal resiliency; and cracking down on IUU fishing.

Rep. Bonamici spoke about ocean-related legislation she is currently working on. The Coastal and Ocean Acidification Stressors and Threats (COAST) Research Act of 2019 (H.R. 1237) is a bipartisan bill that would expand research and monitoring of ocean acidification to identify risks and inform vulnerable communities, industries, and coastal managers how to best plan for and adapt to changing conditions. Another bill would bolster research on HABs and help communities respond quickly to these events. The reauthorization of the Integrated Coastal and Ocean Observing System (ICOOS) Act Amendments of 2019 (H.R. 1314) would strengthen public access to accurate and continuous ocean data. She also shared the bipartisan, bicameral work on the Save Our Seas Act 2.0 Act (S. 1982; H.R. 3969) to further address the issue of marine debris as started in the Save our Seas (SOS) Act of 2018 (P.L. 115-265), by focusing on additional issues such as microplastics and debris from stormwater runoff.

Additionally, the congresswoman highlighted the need for strong advocates to solve specific problems, such as marine debris and ocean acidification, and explained the importance of communicating with colleagues in land-locked states, emphasizing that “changes in ocean conditions don’t just affect people on our coasts.”

CONGRESSMAN JIMMY PANETTA (CA-20)

Representative Jimmy Panetta (CA-20) spoke with pride when describing the central coast of California, calling it “the most beautiful district in the nation.” Growing up along the water, Rep. Panetta shared the deep appreciation he has for what a healthy ocean can bring to a community. “The ocean plays a huge role in our $3 billion tourism industry. It drives our ocean research consortium of over 40 world class institutions that literally line the crescent of Monterey Bay,” he stated. He shared that all these centers are working together to better understand the ocean and the threats facing it, such as climate change, acidification, and rising sea levels.

Rep. Panetta announced his plans to introduce legislation reauthorizing NOPP to strengthen partnership opportunities. NOPP facilitates collaboration among federal agencies, academia, and members of the scientific community, allowing them to work together to promote national goals related to ocean knowledge. This science is crucial, stressed Rep. Panetta, to supporting and guiding Congress when they create ocean policy. He emphasized that it is our collective responsibility to continue to fight for strong research and for the protection of our ocean for our children and the nation’s future.
DR. CHRISTOPHER EKSTROM (U.S. NAVY)

Dr. Christopher Ekstrom emphasized the connection between the naval oceanographic community and the wider oceanographic community and provided several examples of how the U.S. Navy shares research that increases knowledge of the ocean environment with other agencies.

For example, the Global Ocean Forecast System, which provides ocean surface and subsurface observations from naval research, is used by NOAA’s National Weather Service. Additionally, Dr. Ekstrom described the coordinated use of gliders and floats during the 2018 hurricane season. U.S. Navy assets were able to provide near real-time data streams to the operational forecasting centers of NOAA and to academics trying to better comprehend storm intensification. This collaboration and data sharing pushed forward understanding of hurricane intensification and allowed better prediction of future intensity of storms and hurricanes.

The Navy also shares acoustic data they collect for defense purposes with NOAA, which in turn provides agency scientists with insights into fish migratory patterns. Finally, sensitive ocean measuring devices placed by the Navy allow marine geoscientists to see small seismic events and have a deeper grasp of the physical properties of the Earth. There are similar partnerships in other areas as well, such as hydrographic surveys and autonomous untethered vehicles.

DR. NEIL JACOBS (NOAA)

Dr. Neil Jacobs highlighted ocean science priorities at NOAA, including improving forecasting and modeling and sharing data with the public. Drawing on personal experiences, he illustrated how NOAA’s priority areas interact with real-world scenarios. Speaking about a surprise snowstorm in January 2000, he described the inaccuracy of the models predicting the snowfall, which would have been accurate if the models had properly analyzed the Gulf Stream and incorporated the right data. He then described a current NOAA initiative that draws on this experience by creating two-way coupled models for ocean science. For example, by coupling hydrographic and biological models with ocean prediction models, scientists are working to better predict harmful algal blooms.

NOAA is also working with private cloud computing vendors on partnerships for data distribution and processing in the future, for initiatives such as fish gene sequencing. If NOAA code systems can be moved to a community cloud, model development can be crowdsourced by academics or private industry. There are several ongoing pilot projects across NOAA to test moving to cloud computing and figuring out data aggregation across offices.

MS. MARY NEUMAYR (WHITE HOUSE COUNCIL ON ENVIRONMENTAL QUALITY)

Alongside OSTP, the Council on Environmental Quality (CEQ) serves as a co-chair of the Ocean Policy Committee (OPC) established under Executive Order 13840, Ocean Policy to Advance Economic, Security, and Environmental Interests of the United States. Ms. Mary Neumayr expressed enthusiasm toward the work the committee has been tasked with completing and emphasized that a strong ocean economy goes hand in hand with a strong American economy.

She outlined several priorities of the committee, such as coordinating and ensuring federal participation in NOPP to maximize investments in ocean research. Additionally, Ms. Neumayr spoke about making ocean data more publicly available through the Marine Cadastre – a joint initiative between the Bureau of Ocean Energy Management (BOEM) and NOAA for sharing data, mapping information, and providing additional knowledge related to siting of offshore energy and marine planning. She highlighted steps the administration has already taken to address marine debris, including enacting the Save Our Seas (SOS) Act of 2018 (P.L. 115-265), which reauthorized NOAA’s Marine Debris Program for five years and encouraged international cooperation to end marine debris. The OPC also plans to continue support for weather research, forecasting, and monitoring and to make improvements to weather and climate modeling.

Ms. Neumayr reiterated that CEQ is continuing to work closely with OSTP and the OPC to enable timely, public access to federal ocean-related data; promote efficient interagency coordination on ocean-related matters; and continue engagement with marine industry, regional ocean partnerships, the science and technology community, and other stakeholders.
MEMBERS OF THE CONSORTIUM FOR OCEAN LEADERSHIP

The Consortium for Ocean Leadership (COL) is a Washington, D.C.-based nonprofit organization that represents the leading ocean science and technology institutions — public and private, academia, aquaria, and industry. Our mission is to shape the future of ocean science and technology. In addition to our advocacy role as the voice of the ocean research and technology community, COL manages a variety of community-wide research and education programs in areas of ocean observing, ocean exploration, and ocean partnerships.

ALABAMA
Dauphin Island Sea Lab

ALASKA
Alaska Ocean Observing System
Alaska SeaLife Center
ARCUS
North Pacific Research Board
University of Alaska Fairbanks

CALIFORNIA
Aquarium of the Pacific
Eri
Estuary & Ocean Science Center, San Francisco
State University
Hubbs-SeaWorld Research Institute
L-3 MariPro, Inc.
Liquid Robotics, Inc.
MBARI
Moore Foundation
Mos Landing Marine Laboratories
Stanford University
Teledyne RD Instruments
U.S. Naval Postgraduate School
UCSD Scripps Institution of Oceanography
University of California, Davis
University of California, Santa Barbara
University of California, Santa Cruz
University of Southern California

COLORADO
Cooperative Institute for Research in Environmental Sciences

CONNECTICUT
Exocean
Mystic Aquarium

DELAWARE
MARACOOS
University of Delaware

FLORIDA
Earth2Ocean
FAU Harbor Branch Oceanographic Institute
Florida Institute of Oceanography
Mote Marine Laboratory
Nova Southeastern University
University of Florida
University of Miami
University of South Florida

GEORGIA
Savannah State University
Skidaway Institute of Oceanography of UGA

HAWAII
University of Hawaii

LOUISIANA
ASV Global, LLC
Louisiana State University
Louisiana Universities Marine Consortium

MAINE
Bigelow Laboratory for Ocean Sciences
The IOOS Association
University of Maine

MARYLAND
Johns Hopkins University APL
National Aquarium
Severn Marine Technologies, LLC
University of Maryland Center for Environmental Science

MASSACHUSETTS
Massachusetts Institute of Technology
University of Massachusetts, Dartmouth
Woods Hole Oceanographic Institution

MISSISSIPPI
University of Southern Mississippi

NEW HAMPSHIRE
NERACOOS
University of New Hampshire

NEW JERSEY
Monmouth University Urban Coast Institute
Rutgers University

NEW YORK
IEEE Oceanic Engineering Society
Lamont-Doherty Earth Observatory
Stony Brook University

NEW YORK
Duke University
East Carolina University
North Carolina State University
University of North Carolina, Chapel Hill
University of North Carolina, Wilmington

OREGON
Oregon State University

PENNSYLVANIA
Pennsylvania State University

RHODE ISLAND
University of Rhode Island

SOUTH CAROLINA
South Carolina Sea Grant Consortium
University of South Carolina

TENNESSEE
Eastman Chemical Company

TEXAS
Chevron USA
Consumer Energy Alliance
Harte Research Institute
Shell
Sonardyne, Inc.
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Marine Technology Society
NOIA
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Ocean Networks Canada