

# THE NATIONAL ACADEMIES

*Advisers to the Nation on Science, Engineering, and Medicine*

## **Ocean Studies Board** **Member Biographies 2011**

**Donald F. Boesch, *Chair*** is a Professor of Marine Science and President of the University of Maryland Center for Environmental Science, which includes the Chesapeake Biological Laboratory, the Horn Point Laboratory, and the Appalachian Laboratory. He earned his B.S. in biology at Tulane University and Ph.D. in oceanography at the College of William and Mary. Prior to moving to Maryland in 1990, he was the first Executive Director of the Louisiana Universities Marine Consortium and Professor of Marine Science at Louisiana State University. Originally focusing on community ecology of soft-bottom benthos, Dr. Boesch has also conducted research on the marine sedimentary processes, salt marshes, fishery food chains, and ecosystem responses to eutrophication in coastal and continental shelf environments along the Atlantic Coast, and in the Gulf of Mexico, eastern Australia, and the East China Sea. He focuses his current research on practical mechanisms for incorporating scientific information to guide ecosystem-based management and restoration of coastal and riverine environments. Dr. Boesch has been particularly active in extending knowledge to environmental and resource management at regional, national, and international levels. He is a member of both the Scientific and Technical Advisory Committee of the Chesapeake Bay Program and the Maryland Governor's Bay Cabinet. He has served on the NRC's Marine Board and the Ocean Studies Board and has chaired or served on numerous federal agency and regional advisory committees. He also led the coastal sector team of the U.S. National Assessment of the Potential Consequences of Climate Variability and Change and served as a science advisor to both the Pew Oceans Commission and the U.S. Commission on Ocean Policy. Dr. Boesch currently serves on the NRC committee evaluating the Everglades restoration, the Advisory Board of Bonus for Baltic Sea Science, and the Science Board of the Louisiana Coastal Area Ecosystem Restoration Program. He is also a member of the governing boards of the Chesapeake Research Consortium, the Chesapeake Bay Foundation, and the Consortium for Ocean Research and Education.

**NAS Edward A. Boyle** is a professor of ocean geochemistry at the Massachusetts Institute of Technology. His research interests include a focus on ocean trace metal chemistry in relation to biogeochemical cycling, anthropogenic inputs, and as a tool for understanding the geological history of the ocean. Dr. Boyle obtained some of the first valid data for several trace metals in the ocean (a field that had been plagued for decades by sample contamination and analytical problems). For the past 25 years, he has been tracking the evolution of the anthropogenic Pb transient in the ocean, from its first perceptible rise in the middle of the 19th century (based on sediment and annually-banded coral records) through the decrease due to the phasing out of leaded gasoline. He has also worked on Pb and other anthropogenic trace metals in Greenland ice cores and estuaries. Dr. Boyle discovered that Fe in the deep southwest Pacific derives from distant hydrothermal vents. Additionally, he has shown that Cd in some species of benthic foraminifera tracks the Cd content of the bottom water they grow in, and has applied this finding to sediment cores to trace past changes in ocean deepwater chemistry which are influenced by changing ocean circulation patterns and changes in biogeochemical cycling within the ocean, including mechanisms that influence atmospheric carbon dioxide levels. He was the first to observe a predicted response of deep Atlantic Ocean chemistry to abrupt climate change during

OCEAN STUDIES BOARD  
Division on Earth and Life Studies

the Younger Dryas event 12,900 years ago. Dr. Boyle received a B.A. in chemistry from the University of California, San Diego and a Ph.D. in chemical oceanography from MIT. In 2008, Dr. Boyle was elected as a member of the National Academy of Sciences.

**Cortis K. Cooper** currently serves as Fellow with Chevron Energy Technology Company, a position he has held since 2002. Prior to beginning his service as Fellow, Dr. Cooper was employed as Scientist/Engineer at Chevron Exploration Technology for 12 years. In this position, he was primarily tasked with quantifying winds, waves, and currents for operation and design of offshore facilities worldwide including measuring and modeling oil spill fates; modeling hurricane alleys in the Gulf of Mexico; modeling sea level in the Caspian Sea; forecasting the Loop Current and associated eddies in the Gulf of Mexico; supervising major ocean current models in the Gulf of Mexico, W Africa, NE Atlantic and NW Australia; leading a \$1.6 million, 32-company joint industry project (JIP) to improve ocean towing; and leading a \$2 million, 24-company JIP to investigate the fate of oil and gas from deepwater blowouts. Dr. Cooper was a member of the 2003 National Research Council's *Committee on Oil in the Sea: Inputs, Fates, and Effects* and previously served as a member of the Ocean Studies Board from 1999 to 2001. He earned a Ph.D. in environmental engineering from the University of Maine in 1987, and a M.Sc. and B.S. in civil engineering from the Massachusetts Institute of Technology in 1977 and 1975, respectively.

**Jorge E. Corredor** earned a Ph.D. in Biological Oceanography from the University of Miami, and a MS in Biochemistry from the University of Wisconsin, Madison supported by Fulbright-Hays and IOC-UNESCO fellowships. Dr. Corredor is a past Bruun Memorial Lecturer at IOC-UNESCO Paris and has served as Program Officer at UNEP's Nairobi headquarters, as member of GESAMP, and as Chairman of IOC-UNESCO's CARIPOL program for monitoring petroleum pollution in the Caribbean. Dr. Corredor's research has also targeted the biogeochemistry of nitrogen and carbon flux in the Caribbean as forced by upwelling, large river plumes and mesoscale eddies. He is currently Professor of Chemical Oceanography in the Department of Marine Sciences at the University of Puerto Rico, Mayagüez campus where he is engaged in a cooperative agreement with NOAA for the operation and maintenance of an ocean observing system in the US Caribbean. He serves as Chairman of the Stakeholder Council of the Caribbean Regional Association for Coastal Ocean Observing and as a member of the Board of Directors of the National Federation of Regional Associations for Coastal Ocean Observing. The chemical oceanography laboratory at UPRM, under his direction provides a base for the Atlantic Ocean Test Bed for Ocean Acidification an initiative designed to assess carbon dynamics and acidification trends the coral reef environment. Dr. Corredor has authored or co-authored over 65 publications on regional oceanography, biogeochemistry and marine pollution of the Caribbean region.

**Keith R. Criddle** is the Ted Stevens Distinguished Professor of Marine Policy and Fisheries Division director for the University of Alaska Fairbanks School of Fisheries and Ocean Sciences. He received a Ph.D. in agricultural economics from the University of California, Davis in 1989. His research straddles the intersection between the natural sciences and economics, especially the management of living marine resources. He has explored topics ranging from the economic consequences of alternative management regimes for the governance of commercial, sport, and

subsistence fisheries to the bioeconomic effects of climate change in north Pacific fisheries to the evolution of the structure of the Chilean salmon aquaculture industry in response to requirements for traceability and assurance. He is president of the Resource Modeling Association and an associate editor for Natural Resource Modeling. Dr. Criddle chaired the NRC Committee on the Effectiveness of International and National Measures to Reduce and Prevent Marine Debris and its Impact and was a member of the Committee on the Introduction of Nonnative Oysters in the Chesapeake Bay, the Committee to Review Individual Fishing Quotas, and the Committee on the Evaluation of the Sea Grant Program Review Process.

**NAS Jody W. Deming** is a Professor of Biological Oceanography at the University of Washington. Dr. Deming earned her Ph.D. in microbiology from the University of Maryland in 1981. Her research interests include bacterial foraging and survival strategies, especially the use of extracellular enzymes in polar, sedimentary, and deep-sea environments; assessing degradation of natural materials and organic contaminants in marine environments; and limits of microbial life in sea ice and the subsurface marine biosphere. Her interests include the molecular enzymatic basis for psychrophily in marine bacteria and its relevance to polar ecology, biotechnology, and bioremediation. She has made major contributions to the understanding of life in deep sea and polar environments. Through a combination of modeling and experimental approaches, she has explored the limits of microbial life and revealed fundamentals of survival and proliferation under extreme conditions. She has demonstrated the ecological importance of pressure-adapted bacteria throughout the deep ocean and of cold- and salt-adapted bacteria in the high Arctic. She served on NRC's Committee on Frontiers in Polar Biology (2002 -2003), 2006 Gilbert Morgan Smith Medal Selection Committee (2005-2006), and she served on the Polar Research Board (2005 to 2008).

**Robert Hallberg** is an Oceanographer and the Head of the Oceans and Climate Group at NOAA's Geophysical Fluid Dynamics Laboratory, and a Lecturer on the faculty of Princeton University. He has a 1995 Ph.D. in Oceanography from the University of Washington and a 1990 B.A. in Physics from the University of Chicago. He has spent many years developing isopycnal (density) coordinate ocean models to the point where they now are valuable tools for coupled climate studies, including extensive work on the robustness of the models' numerical techniques, and on the development or incorporation of parameterizations of a wide range of physical processes. The isopycnal coordinate ocean model that Dr. Hallberg developed provides the physical ocean component of GFDL's ESM2G comprehensive Earth System Model, which has been developed for use in the IPCC 5<sup>th</sup> Assessment Report. Through the project Modeling Eddies in the Southern Ocean (MESO), Dr. Hallberg has examined the role of transient eddies in the dynamic and watermass balances in the Southern Hemisphere with a series of increasingly high resolution ocean simulations, demonstrating the importance of rectified eddy effects in regulating the large-scale ocean response to climate changes.

Dr. Hallberg has been actively involved in two ocean Climate Process Teams - one studying Gravity Current Entrainment, and the other examining Eddy-Mixed Layer Interactions. These teams aim to improve the representation of these processes in climate-scale models, based on the best understanding that can be obtained from observations, process studies, and theory.

**Debra Hernandez** received her M.S. in civil engineering from Clemson University in 1987. She is a professional engineer and her background is in coastal management and engineering.

Ms. Hernandez is currently the Executive Director of SECOORA. She was the President of Hernandez and Company and previously worked as Director of Program and Policy Development for the South Carolina Department of Health and Environmental Control. She is an acknowledged leader in coastal management with 18 years of experience and extensive policy, legislative, and technical expertise. Ms. Hernandez's expertise lies in federal and state coastal and environmental management laws, regulations, and policies. She currently serves on the Ocean Research and Resources Advisory Panel. Ms. Hernandez is also a founding board member and current vice-chair for the Coastal States Stewardship Foundation, whose purpose is to support healthy coasts and vibrant coastal communities. Additionally, she chaired the Coastal States Organization (CSO) from 2002 to 2004. CSO represents the interests of 35 governors from coastal states on federal activities relating to coastal management.

**Robert A. Holman** earned his B.S. in honors Mathematics and Physics from the Royal Military College at Kingston Canada in 1972 and his Ph.D. from Dalhousie University in Physical Oceanography in 1979 before joining the faculty of the College of Oceanic Atmospheric Sciences at Oregon State University in 1979 where he is now Professor. Dr. Holman's research interests include beach processes, measurements of near-shore waves and currents, models of sandbar generation and morphology, application of remote sensing to near-shore processes, and large-scale coastal behavior. He is currently studying the interactions of waves with near-shore morphology, measurement and modeling of sandbar morphology climatology, and remote-sensing signatures in the near-shore. He is best known as the founder of the Coastal Imaging Lab at OSU and the developer of the Argus Program for nearshore remote sensing. Dr. Holman has published more than 90 refereed papers encompassing theoretical, observation, and technical areas, including recent papers on pattern formation in the nearshore, the statistics and kinematics of transverse sandbars on an open coast, and the role of morphological feedback in surf zone sand bar response. In 2004, he was selected as the CNO/SECNAV Navy Chair in Oceanographic Science. Dr. Holman has also served as a consultant for Navy Special Projects at MITRE Corporation, on several subcommittees for the National Science Foundation (NSF), on the Ocean Studies Board of the National Research Council, and on many other professional and technical organizations.

**Kiho Kim** is an Associate Professor of biology and Chair of the Department of Environmental Science at American University in Washington, DC. He received his PhD in 1996 at the University of Buffalo, studying the ecology of tropical coral reefs, and did his post-doctoral work at Cornell University. His current research focuses on understanding the role of diseases in coral population ecology and the synergistic effects of environmental factors, such as nutrient pollution and ocean warming, in the decline of coral reefs. Dr. Kim has participated in working groups examining the ecology of diseases at the National Center for Ecological Analysis and Synthesis, has worked with the British Council in promoting international networking for young scientists, and is a councilor of the International Society for Reef Studies.

**Barbara A. Knuth** is vice provost and dean at Cornell University. She is a professor in the Department of Natural Resources. She earned her Ph.D. in fisheries and wildlife science from Virginia Polytechnic Institute and State University. She is also Associate Director of the Human Dimensions Research Unit at Cornell University, focusing on (1) improving the understanding of human attitudes and behaviors related to natural resources and the environment; and (2) fostering the integration of social and ecological information in natural resources and environmental

management decision-making processes. Her research focuses on risk perception, communication, and management focused on fisheries affected by chemical contaminants; community-based natural resource management approaches; and factors influencing human stewardship and use of natural resources, particularly fish and wildlife. Dr. Knuth is a former president of the American Fisheries Society and has served on many NRC committees, the Ocean Studies Board, and most recently the Review of Recreational Fisheries Survey Methods.

**Robert A. Lawson** received his M.S. in physical oceanography from Florida Institute of Technology in 1977 and his M.S. in oceanography and meteorology from the Naval Postgraduate School in 1984. Mr. Lawson is a Vice President and the Ocean Technology Division Manager for Science Applications International Corporation. Since joining SAIC in 2004, he has directed the corporation's efforts for development of Tsunami Warning and Mitigation Systems, Global Ocean Observation Systems and Naval Applications of Oceanography and Meteorology. As Division Manager for the Ocean Technology Division he is responsible for providing leadership and guidance in directing the five business areas that make up the Division: Naval Oceanography, Marine Mammals, Maritime Engineering, Ocean Buoys and Sensors, and Marine Renewable Energy. Prior to joining SAIC, he served in the U.S. Navy for nearly 28 years achieving the rank of Captain. As one of the principle leaders of the U.S. Navy's oceanography community, his experience includes providing oceanography, ocean engineering, and meteorology support for a wide range of fleet operations around the world. In his last assignment, he served as the Deputy Oceanographer of the Navy supporting the Chief of Naval Operations. In this capacity, he directed the U.S. Navy's Oceanography Program, which consisted of seven oceanographic survey ships, over 3000 personnel deployed globally, and the development and execution of an annual budget exceeding \$440 million. Additionally, Mr. Lawson has over 30 years of experience with underwater surveillance, sensors, anti-submarine warfare, diving and salvage, and providing operations and hazard decision support. He is also an Executive Committee member of the Alliance for Earth Observations.

**George I. Matsumoto** is a senior educational and research specialist at Monterey Bay Aquarium Research Institute. He received his Ph.D. from UCLA and his research interest is open ocean and deep sea communities; ecology and biogeography of open ocean and deep sea organisms; functional morphology, and natural history and behavior. He manages several education and outreach programs including collaborations with the Monterey Bay Aquarium Research Institute's sister organization, the Monterey Bay Aquarium. Dr. Matsumoto served on the Digital Library for Earth System Education (DLESE) Steering Committee and the 2000 NSF Committee of Visitors for Geoscience Education and is currently serving as a national advisory board member for the Center for Microbial Oceanography: Research and Education (C-MORE), the Centers for Ocean Sciences Education Excellence (COSEE) as well as several regional nonprofit organizations. He also served as a member of the NRC committee for the Evaluation of the Sea Grant Program Review Process and the NRC committee examining NOAA's Education Program: Review and Critique.

**Jay S. Pearlman** was Chief Engineer of NCOC&EM at Boeing Phantom Works. He has a Ph.D. from the University of Washington and a B.S. from the California Institute of Technology. His background includes basic research, program management and program development in sensors, remote sensing and information systems. Over the last few years, Dr. Pearlman was the focal

point for the IGIS Demo on Coastal Impacts, the Boeing Global Radiosonde Program for improved weather data, Chief Architect for the NOAA GOES-R Study Contract and Chief Scientist for the Landsat Data Continuity Contract. He was also Deputy PM and PI for the NASA Hyperion Program. Dr. Pearlman is a Boeing Technical Fellow.

Dr. Pearlman is a Fellow of the IEEE and was Chair of the IEEE Committee on Earth Observation (2007-9) and Principal IEEE delegate (alternate) to GEO. He is Co-Chair of the GEO Architecture and Data Committee. Jay was a member of the GOOS Science and Technology Steering Committee, a member of IOC JCOMM, on the Board of the Northwest Regional Ocean Observing System (NANOOS) and chair of the NANOOS data management committee. Dr. Pearlman is technical committee chair (GEOSS) of the Ocean Engineering Society of IEEE. He is active in systems of systems architecture and information system development for large scale national and global applications including advancing ocean and coastal information systems. Dr. Pearlman has more than 70 publications and 25 US and international patents. He has given Keynote addresses at international conferences on Ocean Engineering and Systems Engineering.

**Andrew A. Rosenberg** is Senior Vice President at Science + Knowledge Conservation International. He is on leave as the Professor of Natural Resources and Earth, Oceans, and Space at the University of New Hampshire. He received his Ph.D. from Dalhousie University in Halifax, Nova Scotia. Dr. Rosenberg explores marine sciences, marine policy, and fisheries in his research projects. Even before joining the University of New Hampshire, he engaged in a distinguished career involving marine sciences. As former Deputy Director of the National Marine Fisheries Service, Dr. Rosenberg was a key policy maker for that agency and served as a liaison to Congress, senior levels of the administration, resource management partners, and the public. Prior to the deputy director post, he served the National Marine Fisheries Service for ten years, where he was the Northeast Regional Administrator and Chief of Research Coordination in Maryland and Massachusetts. Most recently, Dr. Rosenberg served as a member of the President's U.S. Commission on Ocean Policy. Dr. Rosenberg was a member of the OSB committee for the 2006 report *Dynamic Changes in Marine Ecosystems*.

**Daniel L. Rudnick** earned his Ph.D. in oceanography in 1987 from Scripps Institution of Oceanography, and his B.A. in physics at the University of California, San Diego. Dr. Rudnick is currently a professor and formerly Deputy Director of Education at Scripps Institution of Oceanography. Dr. Rudnick is an observational oceanographer whose research focuses on processes in the upper ocean. Of particular interest are fronts and eddies, air-sea interaction, the stirring and mixing of physical and biological tracers, and the effect of oceanic structure on acoustic propagation. Dr. Rudnick is keenly interested in observational instrumentation, having been involved in the use and/or development of moorings, towed and underway profilers, and autonomous underwater gliders. Dr. Rudnick has sailed on over 25 oceanographic cruises, over half as chief scientist. Dr. Rudnick has authored over 50 peer-reviewed publications. Dr. Rudnick currently a member of the Ocean Studies Board of the National Academy of Sciences, and has served on various panels and committees for NSF, NOAA, and ONR.

**Anne M. Tréhu** earned her BA in 1975 from Princeton University and her Ph.D. in 1982 from the Massachusetts Institute of Technology/Woods Hole Oceanographic Institution Joint Program

in Oceanography. She is a professor of geophysics at Oregon State University's College of Oceanic and Atmospheric Sciences. Dr. Tréhu's research interests include seismic reflection and refraction data acquisition and processing on land and at sea, deep crustal structure and tectonic/geologic processes at plate boundaries and continental margins, and the distribution and dynamics of gas hydrates on continental margins. Dr. Tréhu is currently serving on the R NRC Committee to Review the Scientific Accomplishments and Assessment of the Potential for Future Transformative Discoveries with U.S.-Supported Scientific Ocean Drilling (2010-present). She has also served on the NRC Committee to Review the Activities Authorized under the Methane Hydrate Research and Development Act of 2000 (2003-2004) and the Committee on Seismology (1990-1996) and was an NRC postdoctoral associate at the U.S. Geological Survey (1982-1983). Dr. Tréhu is a Fellow of the American Geophysical Union.

**Peter L. Tyack** is a senior scientist at the Woods Hole Oceanographic Institution. He earned his Ph.D. in animal behavior from Rockefeller University in 1982. His research interests include social behavior and vocalizations of cetaceans, including vocal learning and mimicry in their natural communication systems and their responses to human noise. Dr. Tyack has been a senior scientist at the Woods Hole Oceanographic Institution since 1999. He has served on several National Research Council panels that examined the effects of sound on marine mammals.

**NAE Don Walsh** is President of the Oregon-based consulting company, International Maritime Incorporated (IMI), which he founded in 1976. From 1950 to 1975 he was in the US Navy, retiring as a Captain. Seagoing service was in submarines, including command. After retirement, from 1975-1983, he was a professor of ocean engineering at the University of Southern California and founding director of their Institute for Marine and Coastal Studies.

Over the past three decades IMI has completed consulting projects in 22 nations. Walsh has had over 200 papers and articles published, and edited five books on ocean-related subjects. Over the past 35 years, his lecturing activities have taken him to 0 nations where he has given more than 1,500 lectures, TV and radio appearances. Since 1994 he appeared in more than two dozen television programs on ocean topics. Dr. Walsh was educated at the Naval Academy; he earned a Ph.D. and M.S. in oceanography from Texas A&M University in 1968 and 1967, respectively and a MA in political science from San Diego State University in 1969. In 2001, Walsh was elected a member of the National Academy of Engineering.

**Dawn J. Wright** is a professor of geography in the Department of Geosciences at Oregon State University and holds an adjunct professorship in the College of Oceanic and Atmospheric Sciences. She earned an individual interdisciplinary Ph.D. in physical geography and marine geology from the University of California at Santa Barbara. She has authored or co-authored more than 85 articles and 5 books on marine geographic information systems, hydrothermal activity and tectonics of mid-ocean ridges, and marine data modeling and cyberinfrastructure. Dr. Wright has participated in over 20 oceanographic research expeditions worldwide, including 10 legs of the Ocean Drilling Program and 3 dives in the Alvin submersible. Her research currently focuses on coastal/ocean cyberinfrastructure, geographic information science, benthic terrain and habitat characterization, and the processing and interpretation of high-resolution bathymetry and underwater videography/photography. Dr. Wright was a member of the NRC OSB/Board on Earth Sciences and Resources (BESR) Committee on National Needs in Coastal

Mapping and Charting, and currently serves on the BESR Committee on Strategic Directions for the Geographical Sciences in the Next Decade, as well as the BESR Standing Committee on Geophysical and Environmental Data. Dr. Wright's awards include an NSF CAREER award, a Fulbright to Ireland, the Raymond C. Smith Distinguished Alumni Award from the University of California at Santa Barbara, and the Oregon State University Honors College Professor of the Year award. In 2007 she was named U.S. Professor of the Year for the state of Oregon by the Carnegie Foundation for the Advancement of Teaching and the Council for the Advancement and Support of Education.

**James A. Yoder**, a professor of oceanography and former associate dean at the University of Rhode Island Graduate School of Oceanography, is Vice President for Academic Programs and Dean at the Woods Hole Oceanographic Institution (WHOI). A biological oceanographer, Yoder is well known in the oceanographic research community, having served as a researcher, professor and more recently as Director of the Division of Ocean Sciences at the National Science Foundation in Washington, DC from 2001 to 2004. He has worked at NASA headquarters, been a member of numerous national and international committees and panels on oceanographic research, taught graduate and undergraduate courses in oceanography at URI, and advised graduate students on their master's and Ph.D. theses. James Yoder received a B.A. degree in botany from DePauw University in 1970, and M.S. and Ph.D. degrees in oceanography from the University of Rhode Island in 1974 and 1979, respectively. He joined the staff at the Skidaway Institute of Oceanography in Georgia in 1978, and from 1986 to 1988 was a visiting senior scientist at the Jet Propulsion Laboratory, working as a program manager in the ocean branch at NASA headquarters. He joined the faculty at the Graduate School of Oceanography (GSO) at URI in 1989 and was promoted to professor in 1992. He was named Associate Dean of Oceanography at GSO in 1993 and served in that capacity until 1998, with responsibilities for curriculum planning and delivery, admissions, recruitment, and graduate student affairs.