

United States Contributions to Global Ocean Plastic Waste

Committee

Margaret Spring

Chair

Margaret Spring is Chief Conservation and Science Officer at Monterey Bay Aquarium with decades of experience in environmental law and policy. She oversees the Monterey Bay Aquarium's conservation policy, research, and markets programs, including Seafood Watch, and coordinates the Aquarium's environmental sustainability initiatives. Before joining the aquarium in 2013, Spring served as Chief of Staff, and later Principal Deputy Under Secretary, at the U.S. National Oceanic and Atmospheric Administration (NOAA) from 2009 to 2013. Prior to her tenure at NOAA, Margaret led The Nature Conservancy's California coastal and marine program from 2007-2009. Spring served for eight years (1999-2007) as Senior and General Counsel to the U.S. Senate Committee on Commerce, Science, and Transportation where she advised members of Congress and developed key ocean and climate legislation, including the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006 and the Oceans Act of 2000, which created the U.S. Commission on Ocean Policy. From 1992 to 1999, Margaret was an environmental attorney in private practice at Sidley & Austin in Washington, D.C. specializing in clean water and hazardous waste matters. She currently serves on the Boards of the Environmental Law Institute, the California Ocean Science Trust, and the Monterey Bay Fisheries Trust. She previously served as a member of the Ocean Studies Board (2014-2020) and chaired the American Geophysical Union's Position Statement Committee from 2015-2019. She is a graduate of Duke University Law School and Dartmouth College and was a 1991 John A. Knauss Sea Grant Fellow in the U.S. Senate.

Mary J. Donohue

Member

Dr. Mary Donohue serves as Specialist faculty at the University of Hawai'i Sea Grant College Program where she conducts research, extension, communications, and program and project management. She also serves as affiliate faculty at the University of Hawai'i Water Resources Research Center, and affiliate graduate faculty at Oregon State University. Her research interests include marine mammal physiological ecology and conservation, including the effects of derelict fishing gear and microplastics on marine mammals and the environment. Dr. Donohue has also focused on activities toward achieving sustainable communities through understanding and mitigating pollution in water resources. Her graduate research was conducted on the Pribilof Islands, AK where she investigated the physiological and behavioral ontogeny of northern fur seals. On the Pribilof Islands she observed the problem of plastic pollution on remote oceanic islands, including the entanglement of seals, foxes, and birds in plastic waste and derelict fishing gear. This experience informed her later position with the United States National Oceanic and Atmospheric Administration where from 1999-2002 she developed, administered, coordinated, and served as Chief Scientist on the first systematic at-sea expeditions to document, study, and remove marine debris from the coral reefs of the Northwestern Hawaiian Islands, habitat of the critically endangered Hawaiian monk seal, threatened and endangered marine turtles, and other wildlife. She had the privilege of experiencing an at-sea arrested landing and catapult assisted takeoff by air on the USS Abraham Lincoln (CVN 72) aircraft carrier as an environmental expert to observe the ship's plastic waste management system. Dr. Donohue has published broadly on marine mammals, marine debris, water quality, and more recently workforce development, with an emphasis on science, technology, engineering, and mathematics (STEM) participation, including that relating to diversity, equity, and inclusion. She has spoken at international conferences, symposia, and as an invited university and public seminar speaker in the United States, Japan, Canada, Spain, Monaco, Malta, and Scotland. Dr. Donohue previously served as a Committee member for the National Academies Committee on the Effectiveness of International and National Measures to Reduce and Prevent Marine Debris and Its Impacts in 2007-2008. She earned a BA degree in aquatic biology from the University of California, Santa Barbara in 1989 and MA and PhD degrees from the University of California, Santa Cruz in organismal and population biology in 1997 and 1998, respectively.

Michelle Gierach

Member

Dr. Michelle Gierach is a senior scientist in the Carbon Cycle and Ecosystems Group at the NASA Jet Propulsion Laboratory (JPL). At JPL, she has lead or had central roles in several NASA satellite and airborne remote sensing missions, including but not limited to, center lead for the NASA Surface Biology and Geology (SBG) mission Pathfinder study, project scientist for the NASA Earth Venture Suborbital 2 (EVS-2) Coral Reef Airborne Laboratory (CORAL) mission, and science team members for the NASA EVS-3 Sub-Mesoscale Ocean Dynamics Experiment (S-MODE) and Orbiting Carbon Observatory-2 (OCO-2) missions. Her research interests include analysis and application of multispectral and hyperspectral (otherwise referred to as imaging spectroscopy) satellite and airborne observations to study synoptic to decadal changes in the marine environment. Her current research ranges in scale from the open ocean, investigating the influence of submesoscale ocean dynamics on upper ocean biology (NASA EVS-3 S-MODE mission), to coastal and inland waters, assessing variability in water quality and the current condition of coral reefs (NASA EVS-2 CORAL mission). Further, she is leading several development efforts at JPL to explore existing satellite and airborne remote sensing assets, and strategize future technology development, for the detection of marine plastic debris across the land-sea continuum (including rivers, shores/beaches, and open ocean). Remote sensing is the unifying thread for Dr. Gierach's academic and professional career. She would like to bring this expert knowledge to this study, and strategize an observation system for the detection of marine plastic debris. Dr. Gierach is currently a member of the US CLIVAR Phenomena, Observations, and Synthesis (POS) Panel, member of the Technical Advisory Committee Alliance for Coastal Technologies for Hyperspectral Imaging, and has served as a NASA representative for various domestic and international activities, such as the UN Climate Change Conference (COP-20 and -21). She has received several distinguished NASA and JPL awards (NASA Exceptional Public Achievement Medal, NASA Early Career Achievement Medal, JPL Lew Allen Award for Excellence), as well as distinguished awards from the Florida State University (Reubin O'D. Askew Young Alumni Award, Notable Noles) and the University of South Carolina (Dean's Award). Dr. Gierach began her academic career in Meteorology at the Florida State University, receiving a Bachelor of Science and Master of Science in 2004 and 2006, respectively. Her focus was on utilization of remote sensing to understand and improve prediction of tropical cyclogenesis. Dr. Gierach transitioned to Oceanography at the University of South Carolina (USC) where she received a PhD in Marine Science in 2009. At USC she investigated the ocean response to hurricanes using remote sensing, physical and biological models.

Jenna Jambeck

Member

Dr. Jenna Jambeck is a Georgia Athletic Association Distinguished Professor in Environmental Engineering in the College of Engineering at the University of Georgia (UGA), Director of the Center for Circular Materials Management in the New Materials Institute at the University of Georgia and a National Geographic Fellow. She has been conducting research on solid waste issues for over 24 years with related projects on marine debris since 2001. She also specializes in global waste management issues and plastic contamination. Her work on plastic waste inputs into the ocean has been recognized by the global community and translated into policy discussions by the Global Ocean Commission, in testimony to U.S. Congress, in G7 and G20 Declarations, and the United Nations Environment program. She conducts public environmental diplomacy as an International Informational Speaker for the US Department of State. This has included multiple global programs of speaking events, meetings, presentations to governmental bodies, and media outreach in 13 countries. She has won awards for her teaching and research in the College of Engineering and the UGA Creative Research Medal, as well as a Public Service and Outreach Fellowship. She received her masters and doctorate degrees in Environmental Engineering from the University of Florida in 1998 and 2004, respectively. She graduated with Bachelors degree in Environmental Engineering with honors from Florida in 1996.

Hauke Kite-Powell

Member

Dr. Hauke L. Kite-Powell is a Research Specialist at the Marine Policy Center of the Woods Hole Oceanographic Institution. Dr. Kite-Powell also holds appointments as a lecturer at the Massachusetts Maritime Academy, and as a senior analyst with Marsoft Inc. Dr. Kite-Powell's research focuses on public and private sector management issues for marine resources and the economic activities that depend on them. Current and recent research projects include work on: costs and benefits from improved ocean observing activities; approaches to economic valuation of marine resources; policy issues surrounding use of ocean "space" for non-traditional activities, such as aquaculture and wind power; economics and management of marine aquaculture operations; economics of ocean plastics and removal of plastics from the oceans; and economic dimensions of climate change effects on marine ecosystems, shoreline change, and the carbon cycle. Dr. Kite-Powell has contributed to several National Academies studies including: Charting a Course into the Digital Era: Guidance for NOAA's Nautical Charting Mission (1994); Critical Infrastructure for Ocean Research and Societal Needs in 2030 (2011); Best Practices for Shellfish Mariculture and the Effects of Commerical Mariculture on Drakes Estero, Pt. Reyes National Seashore, California (2010); and Ecosystem Concepts for Sustainable Bivalve Mariculture (2010). He holds degrees in naval architecture (B.S), technology and policy (M.S.), and ocean systems management (M.S. and Ph.D.) from the Massachusetts Institute of Technology.

Kara Lavender Law

Member

Dr. Kara Lavender Law is Research Professor of Oceanography at Sea Education Association (SEA; Woods Hole, MA). Her current research interests are focused on plastic debris in the ocean, including sources of plastic to the marine environment; understanding how ocean physics affects the distribution of plastic debris; and the degradation and ultimate fate of different plastic materials in the ocean. Dr. Law continued her PhD research into large-scale and mesoscale ocean circulation and intermediate and deep water formation in the subpolar North Atlantic as a Postdoctoral Scholar at the Woods Hole Oceanographic Institution. In 2003, Dr. Law joined the oceanography faculty at Sea Education Association, an educational non-profit organization offering academic SEA Semester programs for undergraduate students from colleges and universities across the U.S. and abroad. Dr. Law taught students on shore and directed independent student field research on SEA's sailing research vessels in the Atlantic and Pacific Oceans and Caribbean Sea, earning more than 12 months of sea time. Since 2007, Dr. Law's research has focused on plastic debris in the ocean, beginning with an analysis of SEA's then-25-year data set of floating microplastics in the North Atlantic collected by more than 7,000 SEA students and scientists, then expanding into research in the Pacific Ocean as well as on upstream sources of debris and the ultimate fate of plastics in the environment. Dr. Law served as co-principal investigator of the Marine Debris Working Group at the National Center for Ecological Analysis and Synthesis (NCEAS) and is co-chair of the SCOR Working Group FLOTSAM (Floating Litter and its Oceanic Transport Analysis and Modelling), and has participated in many other working groups, workshops and panels, including at the National Academies, on the topic of marine debris. Dr. Law holds several scientific advisory roles and strives to effectively communicate the scientific understanding of ocean plastics, including major knowledge gaps, to wide ranging audiences including policymakers, industry groups and the general public. Dr. Law served as a witness in the U.S. Senate Committee on Environment and Public Works Hearing on "Cleaning Up the Oceans: How to Reduce the Impact of Man-Made Trash on the Environment, Wildlife, and Human Health?" in September, 2018. Dr. Law received her Ph.D. from the Scripps Institution of Oceanography/University of California, San Diego in physical oceanography in 2001, and graduated magna cum laude with a degree in mathematics from Duke University in 1994.

Jay R. Lund

Member

Dr. Jay R. Lund (NAE) is the director of the Center for Watershed Sciences and Distinguished Professor of Civil and Environmental Engineering, Department of Civil and Environmental Engineering at the University of California, Davis. Dr. Lund joined the UC Davis faculty in 1987 after completing his Ph.D. He teaches and conducts research on applications of systems analysis, economic, and management methods to infrastructure and public works problems. His recent work is primarily on water and environmental problems, but he has done substantial work in solid and hazardous waste management; dredging and coastal zone management; and urban, regional, and transportation planning. While most of this work involves the application of economics, optimization, and simulation modeling, his interests also include more qualitative policy, planning, and management studies. He was elected to the National Academy of Engineering for analysis of water and environmental policy issues leading to integrated water resources planning and management. He served on the Committee on Further Studies of Endangered and Threatened Fishes in the Klamath River and the Committee to Review the New York City Watershed Protection Program. Dr. Lund has a B.A. in regional planning and international relations from the University of Delaware (1979). He also has a B.S. in civil engineering, an M.A. in geography (1983), and a Ph.D. in civil engineering, all from the University of Washington (1986). A small percentage of Dr. Lund's personal investment portfolio includes stock in the chemical industry.

Ramani Narayan

Member

Dr. Ramani Narayan is University Distinguished Professor at Michigan State University in the Department of Chemical Engineering & Materials Science. He has 200+ refereed publications in leading journals, 32 issued patents, and edited three books in the area of environmentally responsible biobased materials [h-index 50; i10-index 143, 12,248 citations -- Google Scholar]. He has graduated 22 Ph.D. and 23 Master's students at MSU and currently has 4 Ph.D. students working in his group along with several post-doctoral fellows, industrial visiting fellows, and six undergraduate CHE students. He has won many awards and honors including fellow of U.S. National Academy of Inventors, the MSU University Distinguished Professor in 2007, and the William N. Findley Award for "significant contributions to the application of new technologies within the scope of ASTM Committee D20 on Plastic". Dr. Narayan received his masters in Organic Chemistry and PhD in Organic Chemistry (Polymer Science and Engineering) from Bombay University.

Eben Schwartz

Member

Eben Schwartz, a staff member of the California Coastal Commission since 2000, runs Marine Debris and Public Outreach programs for the Public Education Program. Eben has a lengthy history of work on plastic pollution and marine debris, topics on which he has become one of the state's leading authorities. As the leader of California Coastal Cleanup Day, California's largest volunteer event, as well as the year-round Adopt-A-Beach Program, Eben has helped motivate hundreds of thousands of citizens to become active in the fight against plastic pollution. Eben works with hundreds of non-profit organizations, local government agencies, and corporate partners to coordinate beach and inland shoreline cleanups as well as develop long-term policies that will stop pollution at its source. Eben serves as the Chair of the West Coast Marine Debris Alliance, an organization that he helped found in 2008, initially as part of the West Coast Governors' Alliance on Ocean Health. From 2007-2010, Eben served as the Chair of the California Ocean Protection Council's Marine Debris Steering Committee while it was drafting and adopting the first statewide Ocean Litter Strategy, and currently serves on the planning committee for that strategy's update, which was adopted and published in April 2018. Eben has traveled extensively to give talks and presentations about the challenges and potential solutions to marine debris and plastic pollution. A brief sampling include an address to The Economist's Sustainability Summit in London in March, 2019, a keynote address to the United Nations Environment Programme's NOWPAP Marine Litter Workshop in Okinawa, Japan in October, 2013, and multiple presentations to both the 5th and 6th Marine Debris Conferences in 2011 and 2018. In 2018, the U.S. State Department's Bureau of Educational and Cultural Affairs invited Eben to join their Guest Speaker Program, for which he has traveled to Poland in 2019 and will be participating in virtual programs in Taiwan in the Fall of 2020. Prior to his work with the Coastal Commission, Eben worked in conservation programs at the Sierra Club at both the local and national levels. In 2007, Eben was awarded an Aspen Institute Fellowship and served as one of the inaugural Catto Fellows, a program designed for emerging leaders in the environment and energy sector. Eben holds a B.A. from Johns Hopkins University.

Rashid Sumaila

Member

Dr. Rashid Sumaila is a Professor and Canada Research Chair (Tier 1) in Interdisciplinary Ocean and Fisheries Economics. He is Director of both the Fisheries Economics Research Unit and the OceanCanada Partnership at the Institute for the Oceans and Fisheries, University of British Columbia. Sumaila is also appointed in the UBC School of Public Policy and Global Affairs. His research focuses on bioeconomics, marine ecosystem valuation and the analysis of global issues such as fisheries subsidies, illegal fishing, climate change, marine plastic pollution, and oil spills. Dr. Sumaila is widely published and cited. He is on the Editorial Boards of several journals, including Science Advances, Scientific Reports and Environmental & Resource Economics. As well as winning the 2017 Volvo Environment Prize and other prestigious awards, Dr. Sumaila was inducted into the Fellowship of the Royal Society of Canada in 2019. He was named a Hokkaido University Ambassador in 2016 and a Distinguished Professor (visiting) at the National University of Malaysia in 2020. Dr. Sumaila has given talks at the UN Rio+20, the WTO, the White House, the Canadian Parliament, the African Union, the St James Palace, and the British House of Lords. Dr. Sumaila has served on many Scientific Advisory Boards and High-Level Panels. He is currently on the Board of Directors of Oceana and he is a member of the Science Advisory Committee for the High-Level Panel for a Sustainable Ocean Economy convened by the Prime Minister of Norway, which consist of 14 Sitting Heads of States and Governments. The mission of the Panel is to build momentum toward a sustainable ocean economy, where “effective protection, sustainable production and equitable prosperity go hand-in-hand”. Dr. Sumaila received his Ph.D. and M.Sc. from the University of Bergen, Norway in Economics in 1996 and 1993, respectively, and graduated with B.Sc. (Hon.) degree in Quantity Surveying from the Ahmadu Bello University, Nigeria in 1986.