

Evaluation of the Use of Chemical Dispersants in Oil Spill Response

Committee

Mary E. Landry

Chair

Mary E. Landry retired from the United States Coast Guard's Senior Executive Service in 2015 after over thirty years of active duty with the Coast Guard and the rank of Rear Admiral. Until 2015, RADM Landry served as the Senior Executive Director of Incident Management Preparedness Policy, where she was responsible for establishing, developing, and implementing all hazards incident management goals, strategies, policies, and doctrines to meet Coast Guard responsibilities in incident preparedness and response. From May 2013 to May 2014, RADM Landry also served at the White House as Special Assistant to the President and Senior Director for Resilience Policy. During her flag service, RADM Landry served as the Commander of the Eighth Coast Guard District and Commander of Task Force 189.8, based in New Orleans. In this role, she was responsible for USCG operations covering 26 states, more than 1,200 miles of coastline, and 10,300 miles of inland waterways. Moreover, RADM Landry served as the Federal on Scene Coordinator in the Deepwater Horizon oil spill in 2010. She also held the position of Executive Officer of Marine Safety Office (MSO) Boston during the 9/11 attacks and oversaw the federal response to the Buzzard's Bay oil spill during her tour as Commanding Officer of MSO Providence, Rhode Island. Her military decorations include the Legion of Merit (three awards), Meritorious Service Medal, Coast Guard Commendation Medal (three awards), 9-11 Medal, and Achievement Medal. Ms. Landry completed Officer Candidate School in 1980 after graduating from the State University of New York at Buffalo in 1978. She holds a Masters of Arts in Management from Webster University and a Master of Marine Affairs from the University of Rhode Island. She is also a National Security Fellow, earning this distinction at Harvard University's John F. Kennedy School of Government in 2000. Since retiring from the USCG, Ms. Landry currently serves as an Independent Corporate Director and as part of the Member Audit Committee for the United Services Automobile Association (USAA).

E. E. Adams

Member

E. Eric Adams serves as a Senior Lecturer and Senior Research Engineer in the Department of Civil and Environmental Engineering at the Massachusetts Institute of Technology. His areas of expertise include water quality modeling and the design and environmental evaluation of effluent disposal systems. Recent research projects include modeling multi-phase plumes with application to deep-sea oil spills; applying chemical dispersants to subsurface oil spills; and creating a flexible curtain to contain oil from a deep ocean blowout. Dr. Adams is a member of the American Society of Civil Engineering, and the International Association of Hydro-Environment and Research. After receiving a B.S in Engineering from Harvey Mudd College, Dr. Adams went on to MIT to earn an S.M in Civil Engineering and a Ph.D hydrodynamics.

Adriana Bejarano

Member

Adriana Bejarano is the Senior Aquatic Eco-Toxicology at Research Planning, Inc. in Columbia, South Carolina. Her past research includes the ecological and toxicological effects of organic pollutants on marine and estuarine invertebrates, and she has developed skills in applied ecology, modeling, and ecological risk assessments of contaminated sediments and complex contaminant mixtures, and statistical data analysis. During her time at RPI, Dr. Bejarano has provided technical and scientific support to various inland and marine oil spills. She also led data analyses on the potential toxicological impacts of surface dispersant use to aquatic organisms during the Deepwater Horizon oil spill and co-author a report to the USCG. She was also the lead toxicologist of the Biological Assessment for the RRT4 and RRT9 Preauthorization Plan for Dispersant Use. Furthermore, Dr. Bejarano is an Adjunct Professor at the Department of Environmental Health and Sciences at the University of South Carolina and an active member of the Society of Environmental Toxicology and Chemistry. She received her Ph.D. in Aquatic Toxicology from the Arnold School of Public Health at the University of South Carolina in 2004.

Michel C. Boufadel

Member

Michel Boufadel is a Professor of Environmental Engineering and Director of the Center for Natural Resources Development and Protection at the New Jersey Institute of Technology. He also holds a title of Professor in the Department of Biological, Chemical, and Pharmaceutical Engineering. He is a professional engineer in Pennsylvania and New Jersey, and Fellow of the American Society of Civil Engineers. His expertise lies in environmental fluid mechanics and modeling of processes, and has applied the expertise in researching the behavior of oil since 1995. Dr. Boufadel was involved in addressing the persistence of the Exxon Valdez oil spill, and the fate and behavior of the Deepwater Horizon spill and the Enbridge Pipe 6 spill in Michigan, both in 2010. He has served on several National Academies committees dealing with oil spill. He also served on the Royal Society of Canada Committee on the "Behaviour of oil in aqueous environments, in 2016", and the EPA Science Advisory Board on Shale Gas. He has more than 150 refereed publications in environmental fluid mechanics and modeling. He received a B.S. in Civil Engineering from the Jesuit University at Beirut in Lebanon, and M.S. and Ph.D. in Environmental Engineering at the University of Cincinnati.

Gina Coelho

Member

Gina Coelho has over 25 years of experience in environmental research, consulting, program management, and regulatory compliance in the offshore oil and gas sector. She began working in the field of dispersant and dispersed oil research as a staff scientist for the Marine Spill Response Corporation (1993-1995). In 1996, she began working as an environmental consultant with a small firm supporting onshore and offshore oil and gas and related energy sector projects. Since that time, she has worked on projects for oil companies and associated regulatory agencies (including USCG, EPA, BOEM, and NOAA) on the use of science in supporting dispersant use, policy, and decision making. Dr. Coelho focuses on integrating dispersant and dispersed oil research into spill contingency planning, and serves as an expert on regulatory outreach and community engagement strategies on dispersant issues, both in the US and abroad. She previously served as the President of Ecosystem Management & Associate, Inc. (1996-2012), a Principal Professional Associate and Offshore Oil and Gas Sector Director for HDR Inc. (2012-2015) and is now working as a Principal Senior Scientist for Sponson Group, Inc. (2016-2017). Dr. Coelho was Chief Scientist on the Deepwater Horizon monitoring of subsurface dispersant injection, and served as a scientific liaison for BP on dispersant issues during and after the spill response. In addition, she has worked on other spills in US waters. She received a B.A. in Biology from St. Mary's College of Maryland, completed her graduate coursework through the University of Maryland, Chesapeake Biological Laboratory, and received her Ph.D. in Ecology/Environmental Science from Bircham International University in Madrid, Spain.

Thomas S. Coolbaugh

Member

Dr. Thomas Coolbaugh is an Oil Spill Response Advisor for Exxon Mobil Corporation's Safety, Security, Health and Environment Support organization where he provides technical guidance and training on the full suite of oil spill response strategies in support of global operations. Dr. Coolbaugh has extensive experience in a variety of research settings as a scientist and leader. He is a Vice Chair of IPIECA's Oil Spill Working Group (immediate past Chair), a member of the American Petroleum Industry (API) Spills Advisory Group, the Marine Preservation Association Dispersant Advisory Committee, and the Science Advisory Panel of the University of New Hampshire/NOAA Coastal Response Research Center. He served on the National Academy of Sciences' Committee on Responding to Oil Spills in Arctic Environments and was an invited subject matter expert for a Consensus Environmental Risk Assessment project led by US Coast Guard Sector Delaware Bay relating to potential incidents involving Bakken crude and diluted bitumen. His focus is often on the scientific understanding and regulatory aspects of the use of dispersants during an oil spill response and communicating with a variety of groups on the topics. Dr. Coolbaugh received his B.A. in chemistry from Amherst College, a Ph.D. in chemistry from the California Institute of Technology (Advisor: Professor Robert Grubbs, 2005 Nobel Laureate), and an M.S. in the Management of Technology from New York University. He has been with ExxonMobil since 1988.

Cortis K. Cooper

Member

Cortis Cooper retired after over 27 years of service as a Fellow with Chevron Energy Technology Company, one of 22 Chevron scientists who advise corporate managers about science-related issues. Over his career in the offshore industry, he has focused on quantifying winds, waves, and currents that are used by engineers to operate and design offshore facilities at various locations around the world. His research has included the study of the fate of oil spills, modeling hurricane alleys in the Gulf of Mexico, forecasting the Loop Current and associated eddies in the Gulf of Mexico, supervising the development of ocean current models in the Gulf of Mexico, and investigating the fate of oil and gas from deepwater blowouts. Dr. Cooper was a member of the National Research Council's Committee on Oil in the Sea: Inputs, Fates, and Effects, and he formerly served as a member of the Ocean Studies Board. 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.

Dominic M. Di Toro

Member

Dominic Di Toro (NAE) is the Edward C. Davis Professor of Civil and Environmental Engineering in the Department of Civil and Environmental Engineering at the University of Delaware. He has specialized in the development and application of mathematical and statistical models to stream, lake, estuarine, and coastal water and sediment quality problems. He has participated in the development of water and sediment quality criteria for the U.S. Environmental Agency (EPA), sediment flux models for nutrients and metals, and integrated hydrodynamic, sediment transport, and water quality models. Recently he has participated in developing models for predicting environmental partitioning and toxicity parameters from molecular structure. He is a member of the National Academy of Engineering and served on the NRC Committee on Sediment Dredging at Superfund Megsites, and Committee on the Evaluation of Chesapeake Bay Program Implementation for Nutrient Reduction to Improve Water Quality. He received a B.E.E. from Manhattan College, an M.A. in electrical engineering from Princeton University, and a Ph.D. in civil and geological engineering from Princeton University.

Julia Gohlke

Member

Julia Gohlke is an Assistant Professor in the Department of Population Health Sciences at Virginia-Maryland College of Veterinary Medicine. She is a Faculty Fellow on the Global Forum on Urban and Regional Resilience as well as Affiliated Faculty of the Virginia Tech Global Change Center. Her research interests focus on human health risk assessment and communication after large-scale environmental disasters, including the Deepwater Horizon blowout. Dr. Gohlke is also interested in bioinformatics and alternative model techniques for disseminating environmental effects on human health at the molecular scale. She was selected for the F. Clarke Fraser New Investigator Award by the Teratology Society, and the Future Leader Award by the International Life Sciences Institute. Most recently, she won first prize at the National Institute of Environmental Health Sciences Climate Change and Environmental Exposures Challenge. She received a B.S. in Biology at the University of Michigan and a M.S. and Ph.D. in Environmental Health at the University of Washington.

Terry Hazen

Member

Terry Hazen currently holds a joint appointment with the University of Tennessee -Knoxville's College of Engineering's Civil and Environmental Engineering Department and the College of Arts and Sciences' departments of Microbiology and Earth and Planetary Sciences. He also serves as a Faculty Fellow at the University of Tennessee -Oak Ridge National Laboratory's Joint Institute for Biological Sciences and the Center for Environmental Biotechnology. Specializing in bioremediation and bioenergy, Hazen's research more narrowly focuses on how naturally occurring bacteria can sometimes break down and detoxify hazardous material. He also works with a team of researchers who have developed a method of using bacteria to help test for the presence of a wide array of pollutants. He previously served as the Program Director for the Deepwater Horizons Oil Spill Systems Biology program at the Energy Biosciences Institute at the University of California, Berkeley. Dr. Hazen received his B.S. and M.S. in Interdepartmental Biology, specializing in Parasitology, from Michigan State University in 1973 and 1974, respectively. He then went on to earn his Ph.D in Parasitology-Ecology at Wake Forest University in 1978.

Kenneth Lee

Member

Kenneth Lee is the National Senior Science Advisor for Oil Spill Research, Preparedness and Response for Fisheries and Oceans Canada. Until recently he was the Director of Oceans and Atmosphere in the Commonwealth Scientific and Industrial Research Organisation (CSIRO - Australia's national science agency) with the goal to enhance Australia's prosperity and wellbeing through research to underpin sustainable economic, social, and environmental use of Australia's marine estate and the management of its atmospheric environment. He also served on the Australian Government's National Plan for Maritime Environmental Emergencies Committee. Dr. Lee's research activities include studies on the transport, biotransformation and biodegradation of organic and inorganic contaminants, development of toxicological and modeling approaches to assess the potential impact of the offshore oil and gas industry (including accidental oil spills), and the development and validation of oil spill countermeasure technologies. He has served on the National Research Council's Committee on the Effects of the Deepwater Horizon Mississippi Canyon-252 Oil Spill on Ecosystem Services in the Gulf of Mexico, and the Committee on Arctic Oil Spill Response. In 2016, Dr. Lee chaired the Royal Society of Canada's Expert Panel on The Behaviour and Environmental Impacts of Crude Oil Released Into Aqueous Environments. Dr. Lee received a Ph.D. and M.Sc. in botany/environmental studies from the University of Toronto in 1982 and 1977, respectively, and a B.Sc. in biology from Dalhousie University in 1975.

Steven A. Murawski

Member

Steven Murawski is Professor and Peter Betzer Endowed Chair of Biological Oceanography in the College of Marine Science at the University of South Florida. His research group aims to understand the impacts of human activities on the sustainability of ocean ecosystems. He has developed approaches for understanding the impacts of fishing on marine fish complexes exploited in mixed-species aggregations, with the goal to help inform investments to rebuild the Gulf of Mexico from effects of the Deepwater Horizon Oil Spill, loss of nursery areas, nutrient enrichment, and overfishing. Dr. Murawski serves as Director of the Center for Integrated Analysis and Modeling of Gulf Ecosystems, is a USA Delegate of the International Council for the Exploration of the SEA, and is a member of the National Academy of Sciences' Ocean Studies Board, in addition to being appointed to serve on the committee for Decadal Survey of Ocean Sciences 2015. He received a B.S. and M.S. in Fisheries Biology and a Ph.D. in Fisheries and Wildlife Biology from the University of Massachusetts at Amherst.

W. Scott Pegau

Member

W. Scott Pegau is a Research Scientist and Research Program Manager at the Oil Spill Recovery Institute (OSRI). His research aims to develop novel oil spill detection and tracking approaches to understand the fate and behavior of oil spilled in the Arctic and sub-Arctic. At ASRI, he monitors grant contracts and provides leadership in planning research programs. Prior to joining OSRI, Dr. Pegau was a Senior Scientist and Research Coordinator at the Kachemak Bay Research Reserve in Alaska. He received a B.S. in Physics from the University of Alaska Fairbanks and a Ph.D. in Oceanography from Oregon State University.

Ronald Tjeerdema

Member

Ronald Tjeerdema is the Associate Dean of Environmental Sciences, Professor of Environmental Toxicology and Donald G. Crosby Endowed Chair in Environmental Chemistry at the University of California, Davis. With a focus on marine and freshwater ecosystems, Dr. Tjeerdema's areas of expertise range from chemical fate in the environment, sensitive life stage bioassays and biochemical mechanisms of toxicity. He has also worked extensively with pesticides, petroleum hydrocarbons, dispersants and marine algal toxins. Notably, his research on oil spills and dispersants resulted in the development of the widely-used standardized CROSERF methods for toxicity assessment. During the aftermath of the Deepwater Horizon oil spill, Dr. Tjeerdema served on several NOAA panels advising response plans. He currently serves as co-editor-in-chief on the flagship journal Aquatic Toxicology. He completed his Ph.D. in pharmacology and toxicology, with an emphasis in environmental toxicology, in 1987 from the University of California, Davis.

David L. Valentine

Member

David Valentine is a Professor of Earth Science and Biology at the Marine Science Institute of the University of California, Santa Barbara. His main research interest is the interactions of microbes and the Earth system, and more specifically, the Archaea, biogeochemistry and microbial ecology of hydrocarbons, and the development of novel isotopic approaches to study microbes and geochemical processes. Dr. Valentine's Lab currently works on projects probing the global methane and hydrogen cycles, with field sites from Alaska to the Coal Oil Point seep field in California. He is well known for his contributions to understanding the fate of hydrocarbons and bacteria from the Deepwater Horizon oil spill. He was the recipient of the Nation Science Foundation CAREER award and is a fellow of the Aldo Leopold Leadership Program. After receiving his M.S and B.S degrees in chemistry from the University of California at San Diego, Dr. Valentine went on to earn another M.S and a Ph.D. in earth system sciences from the University of California at Irvine.

Helen White

Member

Helen White is an Associate Professor of Chemistry at Haverford College in Haverford, Pennsylvania. Dr. White's research interests are centered in biogeochemistry, with a focus on examining the sources, sinks, and cycling of organic matter. More specifically, she is interested in the persistence of human-derived compounds in the marine environment and how chemical structure, physical associations, and bioavailability of specific organic compounds determine their cycling and eventual fate. Before joining the Haverford Faculty, she completed the Microbial Science Initiative Postdoctoral Fellowship at Harvard University. In 2015, she received the National Academies of Sciences Gulf Research Program Early-Career fellowship. Dr. White received her Ph.D. in Chemical Oceanography from the Massachusetts Institute of Technology and the Woods Hole Oceanographic Institution.

Bernard D. Goldstein

Member

Bernard Goldstein is Emeritus Dean and Emeritus Professor of Environmental and Occupational Health at the University of Pittsburgh Graduate School of Public Health. He is an elected member of the National Academy of Medicine (NAM), and has chaired over a dozen NAM or National Research Council Committees. He has also chaired committees related to environmental health for the World Health Organization and the United Nations Environmental Program. His past experience includes service as Assistant Administrator for Research and Development of the U.S. Environmental Protection Agency, 1983-1985, and President of the Society for Risk Analysis. His involvement in the Deepwater Horizon oil spill includes serving as an Advisory Board member of the NAS Gulf Research Program and as the original chair of the Coordinating Committee of the Gulf Research Health Outreach Program. He is also active on shale gas issues and on issues related to the science/policy interface.