Marine Carbon Dioxide Removal Standing Committee

Committee

Scott C. Doney

Chair

Scott Doney is the inaugural Joe D. and Helen J. Kington Professor in Environmental Change in the Department of Environmental Sciences at the University of Virginia (UVA). Before joining UVA, he was a scientist at the National Center for Atmospheric Research and the Woods Hole Oceanographic Institution and also served in the White House Office of Science and Technology Policy. His research spans oceanography, climate, carbon cycle, and biogeochemistry using a combination of field data, satellite remote sensing, and numerical models. He is a member of the National Academy of Sciences. His other honors include the James B. Macelwane Medal from the American Geophysical Union, an Aldo Leopold Leadership Fellow, and the Huntsman Award for Excellence in Marine Science from the Royal Society of Canada. He is a fellow of the American Geophysical Union, the American Association for the Advancement of Science, and the Association for Sciences of Limnology and Oceanography. Doney received a B.A. in chemistry from the University of California, San Diego and a Ph.D. in chemical oceanography from the Massachusetts Institute of Technology/Woods Hole Oceanographic Institution Joint Program in Oceanography. He previously served on the National Academies Committee on a Research Strategy for Ocean Carbon Dioxide Removal and Sequestration.

Miranda Boettcher

Member

Miranda Böttcher is a Research Associate at the German Institute for International and Security Affairs (SWP), Germany, and an Adjunct Assistant Professor at the Copernicus Institute of Sustainable Development, Utrecht University, Netherlands. She is currently the project leader on a German government-funded project assessing the potential of marine carbon removal, with a focus on future policy and governance pathways. She is a member of the United Nations Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection Working Group 41: Ocean Interventions for Climate Mitigation, a Lead Author on

Lead Author of the IPCC AR7 WG III Report on Mitigation of Climate Change, a review editor for the United Nations Environment Programme GEO-7 report, a reviewer of the 2025 World Ocean Assessment, a member of the German CDRmare research mission, a member of the European Marine Board Working Group on Marine Carbon Dioxide Removal. Böttcher received an M.A. from Heidelberg University, Germany and a Ph.D. from Utrecht University. She served as a reviewer of the 2022 National Academies report A Research Strategy for Ocean-Based Carbon Dioxide Removal and Sequestration.

Jessica Cross

Member

Jessica N. Cross is an Earth Scientist in the Coastal Sciences Division at the Pacific Northwest National Laboratory (PNNL). She joined PNNL in 2024 after a decade working with the National Oceanographic and Atmospheric Administration's (NOAA's) Pacific Marine Environmental Laboratory, where she developed new Arctic sensing tools, oversaw the Alaska regional carbon monitoring program, founded NOAA's Carbon Dioxide Removal (CDR) Task Team, and led development of NOAA's CDR Research Strategy. Her current research focuses on CDR, especially in marine and ocean settings. She has been awarded multiple honors and awards, including three Bronze Medals for federal service. Cross received a B.S. in chemistry from Rhodes College and a Ph.D. in chemical oceanography from the University of Alaska, Fairbanks.

Jay Cullen

Member

Jay Cullen is a Professor in the School of Earth and Ocean Sciences at the University of Victoria, Canada. He previously held a postdoctoral fellowship in marine chemistry and geochemistry at Woods Hole Oceanographic Institution and has also held visiting positions at the University of Oxford and the University of Pennsylvania. His research aims to understand the distribution, chemical speciation, and fate of metals in the ocean and the influence of human activities on the health of marine ecosystems. He has helped to develop sensitive analytical techniques to measure metals and contaminants in natural waters. His multidisciplinary research combines analytical chemistry, radioisotope tracer studies, and collaboration with microbial physiologists. Cullen received a B.S. in biology from McGill University, Canada and a Ph.D. in chemical oceanography from Rutgers University.

Mahmud Farooque

Member

Mahmud Farooque is the Associate Director, Consortium for Science, Policy and Outcomes, and a Clinical Professor in the School for the Future of Innovation in Society at Arizona State University. He also leads the Expert and Citizen Assessment of Science and Technology and has held previous research leadership positions at the New York Academy of Sciences, City University of New York, Northwestern University, and Purdue University. He is a leading expert in participatory technology assessment, specializing in methods that promote public engagement in the governance of science and technology across diverse issues including biodiversity, planetary defense, solar geoengineering, autonomous vehicles, human gene editing, nuclear waste management, and carbon dioxide removal. His expertise spans science and technology studies, science of science, public administration, public engagement, and deliberative democracy. He serves on the editorial board of the journal Technology Assessment in Theory and Practice. Farooque received an M.P.A. from Syracuse University and a Ph.D. in public policy from George Mason University. He currently serves on the National Academies Board on Environmental Studies and Toxicology.

Elizabeth Jewett

Member

Elizabeth “Libby” Jewett recently retired from the National Oceanic and Atmospheric Administration’s (NOAA’s) Northeast Fisheries Science Center where she managed the center’s research portfolio assessing the impacts of offshore wind and marine carbon dioxide removal (CDR) on marine ecosystems. Previously, she served as the founding Director of the NOAA Ocean Acidification Program in the Oceanic and Atmospheric Research division for 11 years. Her expertise includes ocean acidification, ocean-climate interactions, hypoxia, harmful algal blooms, ocean observing, federal policy development, and most recently, marine (CDR). She received numerous NOAA and Department of Commerce awards during her tenure at NOAA and served as a lead author on the last three U.S. National Climate Assessments and the 5th Intergovernmental Panel on Climate Change Working Group 2 Report. She serves as an advisor to the ARPA-e SEA CO2 project. Jewett received a B.A. from Yale University, an M.P.P. from the Kennedy School of Government at Harvard University, and a Ph.D. in marine science from the University of Maryland.

David M. Karl

Member

David M. Karl serves as the inaugural Pavel Chair of Microbial Oceanography and is Professor of Oceanography at the University of Hawai’i. His research interests include marine microbial ecology and biogeochemistry, and he has spent more than 1,000 days at sea including 23 expeditions to Antarctica. He co-founded the Hawaii Ocean Time-series project in 1988 and the Center for Microbial Oceanography: Research and Education in 2006. Both are recognized as transdisciplinary research collaborations focused on the ocean’s carbon cycle. He is a member of the National Academy of Sciences, an elected fellow of the American Geophysical Union and the American Academy of Microbiology, and an elected member of the American Society for Arts and Sciences. His other honors include the G. E. Hutchinson Medal from the Association for the Sciences of Limnology and Oceanography, the A. G. Huntsman Medal from the Royal Society of Canada, the Alexander Agassiz Medal from the National Academy of Sciences, and the 2015 International Balzan Prize. He is a member of the Exploring Ocean Iron Solutions non-profit consortium. Karl received a Ph.D. from the Scripps Institution of Oceanography, University of California, San Diego and was awarded an honorary D.Sc. degree from the University of Chicago.

Gabriella Kitch

Member

Gabriella Kitch was most recently the Marine Carbon Dioxide Removal Lead at the National Oceanic and Atmospheric Administration (NOAA). Previously, she served as an International Policy Fellow at NOAA through the John A. Knauss Fellowship, coordinating global ocean observation initiatives and contributing to international climate policy efforts. Her expertise spans marine carbon dioxide removal, geochemistry, and carbon cycle science, with a strong background in interdisciplinary research and science communication and she has led technical reviews and strategic initiatives at the intersection of science, technology, and policy. She is a nominee for the 2025 Samuel J. Heyman Service to America Medals and a recipient of the prestigious National Science Foundation Graduate Research Fellowship. Kitch received a B.S. in geology, magna cum laude, from Washington and Lee University and an M.S. and Ph.D. in Earth and planetary sciences from Northwestern University.

Kitch is currently exploring a new initiative supported by The Navigation Fund and conducted under the Carbon Removal Standards Initiative on integrating CDR in coastal resilience projects. She is also serving in a part-time role as mCDR lead for the Yale Center for Natural Carbon Capture.

Kristin Kleisner

Member

Kristin Kleisner is Lead Senior Scientist and the Associate Vice President for Oceans Science at the Environmental Defense Fund. Previously, she was a research scientist at the National Oceanic and Atmospheric Administration exploring the effects of climate change on fish stock distributions in New England. Currently her research is focused on global fisheries, blue carbon, marine carbon dioxide removal, and the integration of aquatic foods in global food policy frameworks. She was a co-PI on the Science for Nature and People Partnership Working Group on Climate Resilient Fisheries and is a co-lead on the UN Ocean Decade FishSCORE 2030 programme. Kleisner received a Ph.D. in marine biology and fisheries from the University of Miami’s Rosenstiel School of Marine and Atmospheric Science.

Lisa A. Levin

Member

Lisa A. Levin is a Distinguished Professor Emerita at the Scripps Institution of Oceanography, University of California, San Diego and former Director of the Center for Marine Biodiversity and Conservation. Her current research addresses the ecology of deep-sea ecosystems, their ecosystem services, and their vulnerability to resource extraction, contaminants, climate change, and marine carbon dioxide removal. She is recognized for her dedication to bringing deep-sea science to decision making through contributions to International Panel on Climate Change reports and World Ocean Assessments, and via leadership of the Deep Ocean Stewardship Initiative's Climate Working group, and the Deep Ocean Observing Strategy. She is a member of the National Academy of Sciences and a fellow of the American Geophysical Union and the American Association for the Advancement of Science. Other honors include lifetime achievement awards from the American Society of Limnology and Oceanography and Western Society of Naturalists and the Prince Albert I Grand Medal in Ocean Science. Levin received a B.A. from Radcliffe College and a Ph.D. from Scripps Institution of Oceanography, UC San Diego. She currently serves on the National Academies Ocean Studies Board.

Galen McKinley

Member

Galen McKinley is a Professor of Earth and Environmental Sciences at Columbia University and the Lamont-Doherty Earth Observatory. Previously, she was a Professor of Atmospheric and Oceanic Sciences at the University of Wisconsin—Madison. Her research investigates the physical, chemical, and ecological drivers of the ocean's anthropogenic carbon sink, using models of the ocean and climate, in situ and satellite datasets, and machine learning. She received the Ocean Sciences Voyager Award from the American Geophysical Union in 2020 for her leadership in the scientific community. She is a member of the Climate and Global Dynamics Advisory Panel at the National Center for Atmospheric Research. McKinley received a B.S. in civil engineering from Rice University and a Ph.D. in climate physics and chemistry from the Massachusetts Institute of Technology. She currently serves on the National Academies Ocean Studies Board.

Helene Muri

Member

Helene Muri is a Senior Scientist at the Climate and Environmental Research Institute NILU and adjunct professor at the Norwegian University of Science and Technology. Previously, she has held research positions at the University of Oslo, Norway and Université Catholique de Louvain, Belgium. Her research focuses on Earth system modeling, with a focus on carbon dioxide removal (CDR) methods. Muri is chair of the European Marine Board working group on marine CDR. She is an author on the Intergovernmental Panel on Climate Change reports and currently serves on the advisory board of the American Geophysical Union Ethical Framework for Climate Intervention, helping to shape guidelines for responsible research practices. She also serves as an advisor to the Norwegian parliament on responsible science. She has been recognized for her scientific contributions with honors such as The Royal Norwegian Society for Development Award and is an active member of organizations like the European Geosciences Union and the American Geophysical Union. Muri received a Ph.D. in climate physics from the University of Oxford, United Kingdom.

Phil Renforth

Member

Phil Renforth is a Professor in the School of Engineering and Physical Sciences, Heriot-Watt University, United Kingdom. His research considers technology development and assessment for ocean alkalinity enhancement including the first techno-economic and life-cycle assessments of these approaches. He co-founded the journal Frontiers in Climate – Carbon Dioxide Removal, and was a judge for the landmark Carbon Removal XPrize. Renforth received an M.Eng. and Ph.D. in civil engineering from Newcastle University, United Kingdom and holds professional chartered status as an engineer and a geologist. He previously served on the National Academies Committee on a Research Strategy for Ocean Carbon Dioxide Removal and Sequestration.

Renforth has submitted a patent application relating to production of minerals in support of ocean alkalinity enhancement; if the patent is accepted, Planeteers has a license agreement with Heriot-Watt University to enable commercialization of the technology.

Terre Satterfield

Member

Terre Satterfield is a Professor of Culture, Risk, and the Environment in the Institute for Resources, Environment and Sustainability and the University of British Columbia, Canada. Her interdisciplinary research focuses on questions of sustainable development in the context of environmental values, risk, and environmental health, addressing fundamental questions such as what people value environmentally and culturally, how they perceive risks from technological interventions, and implications of conservation programs for local and Indigenous communities. She serves as an advisor to OceanVisions. Satterfield received an M.A and a Ph.D. in anthropology from the University of New Mexico.

David A. Siegel

Member

David Siegel is a Distinguished Professor of Marine Science at the University of California, Santa Barbara. He previously held a postdoctoral fellowship at the Woods Hole Oceanographic Institution. His research spans a wide range of issues from ocean carbon cycling and ocean color remote sensing to coastal oceanography and kelp forest ecology. He is the science lead for NASA's EXport Processes in the Ocean from RemoTe Sensing (EXPORTS) program, focused on quantifying the ocean's biological carbon pump. He is a fellow of the American Geophysical Union and the American Association for the Advancement of Science. Siegel received a B.A. in chemistry and a B.S. in engineering sciences from the University of California, San Diego and an M.S. and Ph.D. in geological sciences from the University of Southern California. He previously served on the National Academies Committee on a Research Strategy for Ocean Carbon Dioxide Removal and Sequestration.

Udayan Singh

Member

Udayan Singh is an Energy Systems Analyst at the Argonne National Laboratory and holds a joint appointment as a Scientist-at-Large at the University of Chicago's Consortium for Advanced Science and Engineering. His research includes life-cycle analysis and techno-economic analysis of carbon management systems and other infrastructure. In this role, he has contributed to key policy-relevant documents such as the 2023 Billion Ton Report. Previously, he also served as a Contributing Author to and the Intergovernmental Panel on Climate Change Sixth National Assessment Report. Singh received a Ph.D. in civil and environmental engineering from the University of Virginia.

Adam Subhas

Member

Adam V. Subhas is an Associate Scientist in the Marine Chemistry and Geochemistry Department at the Woods Hole Oceanographic Institution. He studies the marine carbon and alkalinity cycles, focusing on quantifying the biogeochemical processes that partition carbon between the ocean and the atmosphere. Subhas received a B.S. in chemistry from Haverford College and a Ph.D. in geochemistry from the California Institute of Technology. In addition to ongoing work on the natural marine carbon cycle, Subhas leads the Locking Ocean Carbon in the Northeast Shelf and Slope (LOC-NESS) Project, a multi-disciplinary effort to evaluate the effectiveness and environmental impacts of ocean alkalinity enhancement (OAE). The project is centered on a field experiment of ship-based alkalinity dispersal and subsequent monitoring to assess carbon dioxide uptake from the atmosphere and constrain effects on marine life. Additional efforts include high-resolution ocean modeling; laboratory experiments on biogeochemical impacts of OAE; community engagement with the goal of education and feedback on project design; and engineering design of safe and effective ship-based alkalinity dispersal.

Romany Webb

Member

Romany Webb is Deputy Director of the Sabin Center for Climate Change Law, a Research Scholar at Columbia Law School, and Adjunct Associate Professor of Climate at the Columbia Climate School. Prior to joining the Sabin Center, Romany worked at the University of California, Berkeley's Energy and Climate Institute, researching executive authority to combat climate change. Romany also completed a fellowship with the Kay Bailey Hutchison Center for Energy, Law, and Business at the University of Texas at Austin, where she researched energy policy. Her research explores legal issues associated with the development and deployment of negative emissions technologies on land and in the ocean. She was recently appointed to the Pool of Experts of the United Nations Regular Process for Global Reporting and Assessment of the State of the Marine Environment and invited to be a contributing author of the Third UN World Ocean Assessment. She is also a member of the Exploring Ocean Iron Solutions non-profit consortium. Webb received an LL.B., awarded with first class honors, from the University of New South Wales, Australia and an LL.M., with a certificate of specialization in environmental law, from the University of California, Berkeley. She previously served on the National Academies Committee on a Research Strategy for Ocean Carbon Dioxide Removal and Sequestration.

Webb serves as a consultant for Windward Fund and Frontier Australia Climate and receives compensation for these services.

Heather Willauer

Member

Heather D. Willauer is Head of the Materials Physics and Chemistry Section at the U.S. Naval Research Laboratory (NRL) and a Program Officer at the Office of Naval Research. In these roles, she leads a multidisciplinary team of scientists and engineers developing programs and technologies that support the capture and utilization of environmental carbon for materials, fuels, and energy. Her research was highlighted and received the Popular Science 2014 Best of What's New Award and her group has been honored with the distinguished NRL Edison Award. Most recently her group's emerging innovation area, Operational Fuels from Seawater, was recognized as one of 25 NRL Technologies for the Next 25 years. Willauer received a B.S. in chemistry from Berry College and a Ph.D. in chemistry from the University of Alabama.

Willauer has submitted several patent applications related to electrochemical approaches to marine carbon dioxide removal; if any of the patents are accepted, Willauer will receive compensation of a predetermined amount from NRL as part of a Department of Defense technology transfer incentive program.

Kelly Oskvig

Staff Officer