Interventions to Increase the Resilience of Coral Reefs

Committee

Stephen R. Palumbi

Chair

Stephen R. Palumbi (NAS) serves as the Jane and Marshall Steel Professor in Marine Sciences and Senior Fellow with the Woods Institute for the Environment at Stanford University. He is the former director for Hopkins Marine Station at Stanford. His research interests include the use of molecular genetics techniques to study evolution and change within the marine populations. His lab is currently studying the adaptive potential of corals in response to climate change. Dr. Palumbi has contributed to enhancing understanding of speciation patterns in open ocean systems, providing insights for marine reserve design and refuges for thermally sensitive corals. Dr. Palumbi has been awarded the Peter Benchley Award for Excellence in Science and elected a member of the National Academy of Sciences, Fellow of the California Academy of Sciences, and Pew Fellow in Marine Conservation. He has published three books focusing on science for the general public, co-founded the microdocumentary series Short Attention Span Science Theater, and appeared in numerous ocean documentaries. After receiving his BA in biology from John’s Hopkins University, he attained his PhD in zoology from the University of Washington with a concentration in marine ecology.

Kenneth Anthony

Member

Kenneth Anthony is a principal research scientist at the Australian Institute of Marine Science. He is also an adjunct professor for both the University of Queensland and Queensland University of Technology. His main research focus is currently in the development of tools to support coral reef conservation management strategies and effective decision-making through the use of decision science, risk modeling, and adaptive management. He works with diverse stakeholders and management agencies to design conservation strategies to build resilience in coral reefs. He received a BSc in Biology and an MSc in Marine Biology from the University of Copenhagen, and a PhD in Coral Reef Ecology from James Cook University.

Andrew Baker

Member

Andrew Baker is an associate professor at the University of Miami's Rosenstiel School of Marine and Atmospheric Science. Dr. Baker's research focus is on the impacts of climate change on marine ecosystems, particularly the relationship between reef-building corals and their diverse algal symbionts to understand how corals adapt to warming ocean temperatures and increased acidification. His work involves the study of physiological and molecular ecology, conservation biology, and population genetics. Dr. Baker's lab currently studies coral bleaching and thermotolerance, the genetic connectivity of corals in the Florida reef tract, and the links between deep and shallow reefs. He has also performed experimental work investigating how inoculating corals with heat tolerant algae may improve temperature resilience. In 2008, he was named a Pew Fellow in Marine Conservation for his work with coral reefs and their response to climate change. Dr. Baker received his undergraduate degree from Cambridge University in zoology and his PhD from the University of Miami in marine biology.

Marissa Baskett

Member

Marissa Baskett is an associate professor in the Department of Environmental Science and Policy at the University of California, Davis. Her research focuses on modeling ecological and evolutionary responses to global environmental change, including understanding potential drivers of resilience in coral reefs. She is particularly interested in evaluating the impact of management options on populations, looking at gene flow and local adaptation, and has initiated a project focusing on the potential for managed relocation of species at risk to climate change. She was selected as an Ecological Society of America Early Career Fellow in 2013. She received her BS in biology from Stanford University and her MA and PhD in ecology and evolutionary biology from Princeton University.

Debashish Bhattacharya

Member

Debashish Bhattacharya is a distinguished professor in the Department of Biochemistry and Microbiology at Rutgers University, New Brunswick. His research interests lie in the genomics and bioinformatics of algal evolution, symbiosis, and biodiversity. He has been working with collaborators to understand coral genome evolution, biomineralization, and interactions with symbionts. His honors include election as a fellow to the American Association for the Advancement of Science in 2007 and receipt of the Darbarker Prize from the Botanical Society of America in 2008. He received his BS in biology and master's in environmental studies from Dalhousie University and his PhD in biology from Simon Fraser University.

David Bourne

Member

David Bourne holds a joint appointment as a principal research scientist at the Australian Institute of Marine Science and a senior lecturer in marine biology at James Cook University. His research interests are in microbial diversity and their structure and function in complex ecosystems, and in the past 15 years has focused on symbiotic microbial interactions with coral. He is engaged in research on the microbial communities associated with corals and their contributions toward coral fitness, and in studying pathogens and mechanisms of diseases in coral and the effects these stresses can have on the reef ecosystem resilience to climate change. Dr. Bourne received his bachelor's and doctorate degrees in Biotechnology from the University of Queensland in Brisbane.

Nancy Knowlton

Member

Nancy Knowlton (NAS) is a coral reef biologist and the Sant Chair for Marine Science at the Smithsonian Institution and senior scientist emeritus at the Smithsonian Tropical Research Institute. Previously, she was a professor at the Scripps Institution of Oceanography at the University of California, San Diego and founder of the Scripps Center for Marine Biodiversity and Conservation. Her areas of expertise include marine biodiversity and conservation, and evolution, behavior, and systematics of coral reef organisms. Her revolutionary studies of reef bleaching and speciation provide fundamental insights into differentiation and mutualism. Her work has revealed new, unexpected levels of diversity in the marine microbial environment. She is a member of the National Academy of Sciences. In 2009 she was awarded the Peter Benchley Award for Science in Service of Conservation. She received a BA in biology from Harvard University and her PhD from the University of California, Berkeley in zoology.

Cheryl Logan

Member

Cheryl Logan is an associate professor in the School of Natural Sciences at California State University, Monterey Bay. She studies the physiological mechanisms marine animals use to survive in their changing environment and how this leads to differential success across species. She is involved in ongoing work modelling corals' potential adaptive ability to respond to rising temperatures and ocean acidification based on IPCC future climate scenarios. She received her B.A. from the University of California, Berkeley in Molecular & Cell Biology and Integrative Biology, and she received her Ph.D. in Biology from Stanford University.

Kerry Naish

Member

Kerry Naish is a professor and curriculum director for the School of Aquatic and Fishery Sciences at the University of Washington. Her research focus is on the genetic diversity and fitness of aquatic populations, and how these respond to natural and anthropogenic influences. She has particularly been involved in efforts to understand the consequences of population enhancement on the fitness of salmon and trout, the spread of disease, and risk to natural populations. She serves on the Science Advisory Panel for the SeaDoc Society and the Seattle Aquarium, and is an Associate Editor of the journal Evolutionary Applications. Dr. Naish received her BS from the University of Cape Town, her MS from Rhodes University and her PhD from the University of Wales, Swansea.

Robert Richmond

Member

Robert Richmond is the Director and a research professor at the Kewalo Marine Laboratory at the University of Hawaii at Manoa. He received his doctorate in 1983 from the State University of New York at Stony Brook with a concentration in biological sciences. His research interests are focused on coral reef ecosystems, with studies including coral reproductive biology, ecotoxicology, coral reef ecology and the impacts of climate change. In 2006, he was awarded a Pew Fellowship in Marine Conservation during which he developed molecular biomarkers of stress in corals as a tool for coral reef conservation. In 2014, he received an award from the U.S. Coral Reef Task Force in recognition of advancing scientific research, mentoring and service. He has been awarded a grant from the Hawaii State Department of Health to develop biomarkers of toxicant exposure in corals in Hawaii. Dr. Richmond is currently a member of the Palau International Coral Reef Center’s Board of Directors, as well as a member of the Climate Change and Coral Reefs working group at the Center for Ocean Solutions. He is the past President of the International Society for Reef Studies and served as the convener for the 13th International Coral Reef Symposium held in Hawaii in 2016.

Tyler Smith

Member

Tyler Smith is an research associate professor of marine biology at the Center for Marine and Environmental Studies at the University of the Virgin Islands. His research interests include coral reef refuges and refugia from chronic and acute disturbance, mechanisms of resistance and recovery of coral reef ecosystems to natural and anthropogenic disturbance, coral-algal-herbivore interactions across seascapes, and biophysical processes controlling coral reef ecology. Since 2005, he has been the Coordinator for Research for the U.S. Virgin Islands Coral Reef Monitoring Program. He received his BS in marine biology from Western Washington University and his PhD in coral reef ecology from the University of Miami.

Katherine von Stackelberg

Member

Katherine von Stackelberg is a research scientist at Harvard University and the principal scientist at NEK Associates. At Harvard, she is affiliated with the Harvard Center for Risk Analysis, the Center for Health and Global Environment, and the Department of Environmental Health. She is an expert in the development of risk-based approaches to support environmental decision-making, with an emphasis on consideration of uncertainties and ecosystem services. She has served as chair of the U.S. EPA Board of Scientific Counselors, and was a member of the Scientific Advisors on Risk Assessment for the European Commission in Brussels. After receiving her bachelor’s degree from Harvard University, she went on to receive a master’s degree in environmental health and health policy and management, as well as a doctoral degree in environmental science and risk management from the Harvard School of Public Health.