



Putting Science, History and Innovative Economic Strategies to Work

4TH ANNUAL CAPE COASTAL CONFERENCE

OUR COASTAL FUTURE: TAKING ACTION FOR A PROSPEROUS & HEALTHY CAPE COD

DECEMBER 6 & 7, 2016

SPEAKER BIOGRAPHIES

CHRISTOPHER ADAMS joined the Cape Cod Chamber of Commerce in 2014 as the Chief of Staff. In his role at the Chamber, he leads government relations & public policy development; leads the Blue Economy vision plan development; guides organization alignment and health, has general oversight of all departments, and supports the work of all Chamber pillars.

Adams has been very active in the Cape community for decades and has a thorough understanding of complex issues such as energy, transportation, maritime, water resources, and the environment. He has been a small business owner, worked for two members of the U.S. Congress, been very involved in local marine industry, and serves as a fire department (C-O-MM) officer, EMT and public safety dive team leader. A Cape native, Adams graduated from Barnstable High School and holds a BA from Ohio Wesleyan University.

JAMES G. BELLINGHAM is the founding Director of the Center of Marine Robotics at the Woods Hole Oceanographic Institution (WHOI). Dr. Bellingham joined WHOI from the Monterey Bay Aquarium Research Institute (MBARI), where he was first Director of Engineering and then Chief Technologist. Prior to MBARI, Jim founded the Autonomous Underwater Vehicles Laboratory at MIT Sea Grant (1988) and co-founded Bluefin Robotics (1997). Bluefin is a Massachusetts-based company that develops, builds and operates autonomous underwater vehicles (AUVs) and was acquired by Battelle in 2005. Jim's research activities revolve around creation of autonomous marine robots and their use at sea. He pioneered the development of small, high performance Autonomous Underwater Vehicles (AUVs), resulting in a class of systems which are now widely used within the military, industry and scientific communities. He was instrumental in developing and demonstrating distributed system approaches to ocean observing, leading the Autonomous Ocean Sampling Network program which coupled fleets of AUVs to ocean models to observe and predict ocean conditions. Jim has spent considerable time at sea, leading over 20 AUV expeditions in locations such as the Antarctic, North Atlantic, Mediterranean, South Pacific, and the Arctic. He has served on numerous advisory committees and boards, including Chairing the Naval Research Advisory Committee and serving on several National Academies studies. His awards include the Lockheed Martin Award for Ocean Science and Engineering and the MIT Fourteenth Robert Bruce Wallace lecturer. Jim received an S.B., S.M., and Ph.D. in physics from the Massachusetts Institute of Technology.

MARK BORRELLI is the Chair of the Marine Geology Department and the Director of the Seafloor Mapping Program at the Center for Coastal Studies. He is also Research Faculty at the University of Massachusetts-Boston. His research interests include coastal sedimentary processes in general and understanding how storms, sea level rise and anthropogenic impacts affect the coast in particular.
BRUCE CARLISLE is the Director of the Massachusetts Office of Coastal Zone Management (CZM)

(*Mark Borelli continued*) and has worked for the agency in several capacities since 1993 when he began as an intern. Following his graduate program at Tufts University, his internship ended and he moved on to work on water quality, wetlands policy and technical issues for CZM in 1994. From 2003 to 2005, he managed the wetlands restoration program, moving to Assistant Director of the agency in 2005. In 2008, he was awarded the Susan Snow-Cotter Leadership Award by the Gulf of Maine Council on the Marine Environment.

As agency head Carlisle directs policy efforts and technical approaches for CZM program areas, including ocean planning, shoreline and floodplain management, habitat protection and restoration, port and harbor planning, water quality, seafloor and tidal habitat mapping, and GIS/data management. In addition to being a member of the Gulf of Maine Council on the Marine Environment, Carlisle serves on the Northeast Regional Ocean Council - the U.S. National Ocean Policy's arm for the region.

MARC CARULLO is a GIS/Environmental Analyst with the Massachusetts Office of Coastal Zone Management, directing or supporting a variety of projects involving wetland monitoring and assessment, land cover/land use analysis, and coastal and ocean planning. He is the project lead on CZM's effort to model the potential effects of sea-level rise on coastal wetlands and support enhanced planning, management, and policy development. Marc sits on the Northeast Ocean Council's Marsh Migration Steering Committee and participates in regional and national biological assessment of wetlands work groups. Marc has previously worked for the USFWS and NPS in GIS development and biological monitoring capacities.

JANE CROWLEY, R.S., M.S., is Health Agent for the Town of Eastham. Jane has a B.S. in Microbiology from UNH and M.S. in Environmental Science from George Washington University. She has worked for the Town of Eastham for 16 years in the areas of Environmental and Public Health. In addition to work in Public Health she has been involved in programs regarding private well drinking water quality, landfill studies, waste water planning and successful pond remediation projects. Eastham is last town of Cape Cod to rely completely on private wells for drinking water. The development of municipal water supply is currently underway after many years of effort to gain voter support. The Town has established a mandatory hook up area to municipal water supply down gradient of the landfill to eliminate public health exposure to potential contaminants. The current environmental focus is now centered on wastewater planning.

JOHN CUMBLER is an emeritus professor from the University of Louisville. He has also been a Visiting Professor at the University of Warwick, England, a visiting scholar at MIT and the John Adams Distinguished Fulbright Professor in the Netherlands. He has been an American Council of Learned Societies Senior Fellow and a National Endowment for the Humanities Fellow. Dr. Cumbler has been the recipient of multiple distinguished teaching awards as well as an award for research and creative activity. He has published 7 books, mostly with academic presses. His most recent book, *Cape Cod: An Environmental History of a Fragile Eco-system*, came out in 2014. Dr. Cumbler has strong ties with the Cape Cod region where he currently serves on several town boards and committees. He is also involved in rescuing large marine mammals and sea turtles and is a National Park volunteer.

SCOTT DONEY is a Senior Scientist in the Department of Marine Chemistry and Geochemistry and presently the Director of the Ocean and Climate Change Institute at the Woods Hole Oceanographic Institution (WHOI). He graduated with a BA in chemistry from the University of California, San Diego in 1986 and a PhD in chemical oceanography from the Massachusetts Institute of Technology/Woods Hole Oceanographic Institution Joint Program in Oceanography in 1991. He was a postdoctoral fellow and later a scientist at the National Center for Atmospheric Research, before returning to Woods Hole in 2002. Much of his research focuses on how the global carbon cycle and ocean ecology respond to natural and human-driven climate change and ocean acidification. He was a convening lead author for the Oceans and Marine Resources chapter of the 2014 U.S. National Climate Assessment. He was awarded the James B. Macelwane Medal from the American Geophysical Union in 2000, an Aldo Leopold Leadership Fellow in 2004, a AAAS Fellow in 2010, and the Huntsman Award for Excellence in Marine Science in 2013.

MARK ELLS currently serves as Town Manager for the Town of Barnstable. Prior to becoming Town Manager he also held positions as DPW Director and Assistant Town Manager. The Barnstable Town Managers Office is responsible for the administration of policies and programs approved by the Town Council. With the assistance of the Finance Division, the office also drafts the annual budget and ensures the budget policies and spending plans of the Council are followed through. The office also implements sections of the Town Charter concerning management of the town.

PETE FURZE spent thirty years in the U.S. Navy as a meteorologist, oceanographer and leader. He has a wealth of experience in marine science developed during shipboard tours as lead forecaster, and was commander of Oceanographic Unit ONE conducting deep ocean survey operations in the Pacific, the Joint Typhoon Warning Center and Navy's Undersea Surveillance operations. Pete received masters' degrees in Meteorology and Physical Oceanography from the Naval Postgraduate School and National Security and Strategic Studies from the Naval War College. Since retiring from the Navy, he has held several leadership and management positions with companies supporting the Navy, NASA and NOAA.

Pete is currently the Product Line Manager for Teledyne's Autonomous Profiling Explorer (APEX), a sensor bearing vehicle that samples the ocean and reports observations in real time via satellite. APEX drifts at 1000 meters depth, collecting temperature, salinity and other ocean variables while ascending to the surface to periodically transmit data. APEX is the profiler of choice for scientists worldwide monitoring the physical and biogeochemical properties of the oceans. Since 1997, over 7,000 APEX profilers have been deployed by scientists in 30 nations in the global Argo Program.

GEORGE HEUFELDER is the Director of the Barnstable County Department of Health and Environment and The Massachusetts Alternative Septic System Test Center. He has been instrumental in both beginning the Test Center and initiating the first-of-its-kind electronic performance tracking service for alternative onsite septic systems. George conducts research on various aspects of onsite wastewater disposal including nitrogen, phosphorus and contaminant of emerging concern removal. He has a Bachelor's Degree in Biology from Kansas State University, a Master's Degree in Biology from Eastern Michigan University. He is a Class 4 Treatment Plant Operator, a Certified Title 5 Soil Evaluator and Septic System Inspector and he is a Registered Sanitarian in the Commonwealth.

RAYMOND A. JACK is a resident of Falmouth and serves as Director of Public Works. He is a Certified Public Works Manager with over 28 years experience in public works administration and is a past-president of the Massachusetts Water Works Association. Mr. Jack currently serves as a Commissioner on the Commonwealth's Water Resources Commission and has served on the state's Water Conservation Standards Committee, the Sustainable Water Management Committee and the Climate Change Committee whose goal was to formulate mitigation and adaptation strategies in response to a changing environment. He also teaches classes in Global Water and Water Resources at Cape Cod Community College as part of their environmental science degree program.

SHANNON JARBEAU is the Community Rating System and Floodplain Coordinator for Barnstable County through the Cape Cod Cooperative Extension. In this capacity, Shannon helps Barnstable County towns apply to and maintain participation in the National Flood Insurance Program's Community Rating System to earn residents discounts on flood insurance and help make Cape Cod safer from flooding. Shannon is a Certified Floodplain Manager (CFM®) with a master's degree in coastal policy and floodplain management. Prior to coming to Cape Cod, Shannon worked for a small non-profit called Wetlands Watch in Norfolk, Virginia, on issues related to sea level rise, floodplain management, and the Community Rating System.

TED KEON is the Director of Coastal Resources with the Town of Chatham, MA, a position he has held since 1998. Mr. Keon is the primary liaison for Chatham's marine and shoreline related activities. He oversees the planning and implementation of projects affecting Chatham's waterways, coastal shorelines and water dependent infrastructure and also provides oversight of Chatham's Town Landings and water related access. Mr. Keon is directly responsible for the Town's comprehensive dredging, shoreline change and sediment management program.

Prior to his position with Chatham, Mr. Keon was the Chief of the Coastal Planning Section of the Philadelphia District of the U.S. Army Corps of Engineers. During his tenure with the Corps, Mr. Keon was actively involved in the planning and development of numerous shore protection, navigation and other coastal related projects and activities along the coasts of New Jersey, Delaware and Delaware Bay. He holds Bachelor's and Master's degrees in Physical Geography from the University of Delaware and Arizona State University.

CATHERINE LAURENT has over 22 years of experience in municipal government. She is currently the Director of Public Works for the Town of Mashpee, a position she has held for over eight years. She previously worked for the Town as the Assistant Director and for the Towns of Danvers and Chatham as a Planner. Ms. Laurent is responsible for all public infrastructure within the Town of Mashpee including roads, buildings, grounds, solid waste, and recreational facilities, managing a staff of 42 and an annual operating budget of approximately \$5.5 million. She has a BS degree in Chemical Engineering from Lafayette College."

SANDY MACFARLANE retired as shellfish biologist and conservation administrator for Orleans after nearly 25 years. Currently, she is involved in marine resource policy issues, especially related to shellfish restoration, volunteer action programs, aquaculture and water quality necessary to maintain habitat. She authored two books with a third, *Swirling Currents*, due out this spring.

CARL MANCUSO is the VP of Sales and Marketing for Falmouth Scientific, Inc., a Cape Cod based company which designs and manufactures electronic and acoustic systems for underwater commercial and military applications. He has many years of experience in sales, marketing, applications engineering, and electronics design and development. Carl started his professional career working on sonar systems for naval submarine applications, and from there progressed through technical and sales positions in the semiconductor, consumer electronics, simulation software, advanced learning technologies, and media industries. Joining the team at FSI in 2010 has brought him full circle back into the ocean. Mr. Mancuso holds a BS degree in Electrical Engineering from Rensselaer Polytechnic Institute, and a Master's in Business Administration from Clark University. Carl also presently sits on the Board of Directors for the Marine & Oceanographic Technology Network (MOTN).

DANIEL C. MCCORKLE is a Senior Scientist and Department Chair in the department of Geology and Geophysics at the Woods Hole Oceanographic Institution. He received his B.A. in Geology from Columbia University, and his Ph.D. in Chemical Oceanography from the University of Washington. His research interests center on the carbon cycle in the oceans and seafloor sediments, in both the modern ocean and during natural climate cycles in the past. Currently, much of his work is focused on understanding the controls on the carbonate chemistry of coastal waters, including coral reef ecosystems, and understanding the impact of ocean acidification on corals, shellfish, and other marine organisms.

HEATHER MCELROY has served as the Cape Cod Commission's Natural Resources Specialist for the last 15 years, developing natural resource and land use policy for Cape Cod, and applying those policies to the Commission's planning and regulatory work. Her work includes natural resources management policy, green infrastructure planning, and coastal resiliency and ocean planning. Heather has supported the development of the Section 208 Water Quality Plan for Cape Cod, including facilitating the science advisory panel convened to examine alternative nitrogen management technologies, and overseeing the maintenance of the Technologies Matrix. She is part of the team of hydrogeologists, planners, and GIS analysts assisting towns with incorporating green infrastructure approaches into the plans for managing water quality in nutrient-impacted watersheds for the 208 plan. Heather participated in the Massachusetts Ocean Management planning process since that project started in 2008, and serves as the Cape Cod Commission's representative to the Massachusetts Ocean Advisory Commission. She managed Barnstable County's

(Heather McElroy continued) regional ocean planning project, the Cape Cod Ocean Management Planning District of Critical Planning Concern (DCPC), coordinating staff, and technical and policy advisory committees.

Education: Bachelor of Fine Arts, 1989, Cornell University, College of Architecture, Art, and Planning, Master of Arts, 1996, Tufts University, Department of Urban and Environmental Planning & Policy

LESLIE ANN MCGEE: Through her consulting practice, Full Sail Consulting, Leslie-Ann McGee is the program manager for the Cape Cod Chamber of Commerce's Blue Economy Project. Leslie-Ann is also is the Program Manager for the Center for Marine Robotics at Woods Hole Oceanographic Institution (www.whoi.edu/marinerobotics or @WHOI_CMR). Ms. McGee, among other projects, manages the Robots to the Sea project – a partnership to drive innovation in marine robotics between WHOI and the Commonwealth of Massachusetts. She is an expert in ocean and coastal issues in both the domestic and international arena and has a diverse background working with and for state, regional, national, business and environmental entities globally. She has direct experience working as regulatory staff within the U.S. Government and state government and has contributed to protecting marine ecosystems through innovative applications of law and policy. She has successfully partnered with interest groups, industry members, private non-profits and other stakeholders to form cohesive management strategies by communicating regularly with a wide variety of people with often conflicting perspectives.

Ms. McGee served as the Director of Coastal Zone Management for the Commonwealth of Massachusetts. In addition, McGee was the Director of Programs for the World Ocean Council, Director of Ocean and Coastal Solutions at Battelle Memorial Institute and held state and federal positions with NOAA, the New England Fishery Management Council and the MA Department of Fish and Game. She is a graduate of the University of Colorado at Boulder and Duke University's Nicholas School of the Environment. She conducted her graduate research on Bluefin Tuna at the New England Aquarium.

STEPHEN MCKENNA is a Cape Cod native who grew up in Harwich. He studied Environmental Science and Marine Transportation at Massachusetts Maritime Academy, and became a licensed officer in the US Merchant Marine. After working as a professional mariner for a number of years, Steve sought to combine his maritime experience and interest in environmental protection. In 1996 he began working for the Massachusetts Coastal Zone Management Program. He has held a variety of positions over the past twenty years, including Assistant Regional Coordinator, Coastal Pollution Remediation Grant Coordinator, and Cape & Islands Regional Coordinator. In addition to his work with CZM, he has served on the Brewster Conservation Commission for many years; has served on the Mass Association of Conservation Commissions Board of Directors; co-chairs the Barnstable County Coastal Resource Committee, and the Barnstable County Dredge Advisory Board.

DANIEL MCKIERNAN is the Deputy Director at the Division of Marine Fisheries. He is a Sandwich resident and has worked at DMF for 32 years, with the past 28 years serving at the Boston Headquarters. He has extensive experience developing fisheries policy and regulations working with stakeholder groups to create fishery management plans that satisfy conservation mandates while preserving the legacy industries of commercial and recreational fishing in Massachusetts.

REX MCKINSEY was chasing a childhood dream when he let go the lines from New Orleans intent on sailing around the world. When he set anchor in Provincetown in 1995, he didn't realize he had truly washed ashore to his new home. He has worked on Provincetown Harbor ever since. First as dock master, mechanic and excursion captain at Flyer's Boatyard. In 2003, he took over the helm of MacMillan Pier as the Pier Corp Manager and Harbormaster. During his tenure, the department has pursued economic development, environmental studies, educational programs, and coastal resilience grants.

ANDREW (DREW) MC MANUS started working for the Town of Mashpee in 2006 as the Assistant Conservation Agent. In 2008, he was hired as the Conservation Administrator. Drew graduated UMass Amherst in 1999 with a Bachelor of Science in Wildlife and Fisheries Management. The Mashpee Conservation Dept is responsible for permitting of residential and/or commercial development within wetland jurisdiction. Additionally, the Department manages over 1400 acres of conservation land and open space for native flora and fauna as well as recreational enjoyment. It is a delicate balancing act to protect environmental values while accommodating development, but Drew thoroughly enjoys this job.

WENDY NORTHCROSS is Chief Executive Officer of the Cape Cod (MA) Chamber of Commerce. She has been with the organization since 1997 and a chamber executive since 1988. She is a Certified Chamber Executive (CCE) and completed a Ford Foundation Fellowship for Regional Sustainable Development through the Association of Chamber of Commerce Executives (ACCE). She joined the board of directors of ACCE in 2013 and its executive committee in August 2015. In 2015, Northcross was elected to the national Destinations Council of the U.S. Travel Association, and serves the local boards of The Cooperative Bank of Cape Cod, the Cape & Islands Workforce Investment Board, and the Job Training & Employment Corp. She is a member of the Town of Barnstable's Affordable Housing Growth & Development Trust Fund Board. In 2012, Northcross threw the opening pitch at the Boston Red Sox game on Cape Cod Day. In 2014 she was listed as one of the Cape's 12 most powerful women by Cape Cod Magazine. In 2015, she was awarded the inaugural Founders Community Leadership Award by the JFK Hyannis Museum. Northcross was born in Michigan and was raised in the greater Boston area and on Cape Cod where she lives with her husband, Van, who is retired from Cape Cod Healthcare. She and her husband enjoy the Cape's rich cultural offerings as well as traveling to see the world and spending time with family.

THOMAS O'SHEA is the Director of Field Operations for the Trustees of Reservations. Tom leads a number of new stewardship initiatives to drive and support achievement of sustainability, resource integrity, and stewardship excellence across The Trustees in collaboration with specialists, property managers, and partners. These include the development of innovative, stewardship systems, best practices, standards and assessments, property and capital planning approaches, and data-driven performance metrics. Tom has over 20 years of experience and accomplishments in natural resource conservation in Massachusetts and holds a Masters of Public Administration from Harvard's Kennedy School of Government, a Masters of Forestry from the Yale School of Forestry and Environmental Studies, and a B.S. in Forestry from the University of Maine.

JOHN PAPPALARDO has spent his entire career working to protect the traditions of Cape Cod's oldest industry and to create new opportunities for the next generation of fishermen. He has been the CEO of the Cape Cod Commercial Fishermen's Alliance since 2010. Before that, he served for a decade as the organization's Policy Director. At the heart of Pappalardo's work is the pursuit of new solutions to managing our marine environment. He is a strong advocate of including broader perspectives on current challenges and on approaches to protecting the ocean ecology. One top goal is to bring local fishermen's knowledge and experience to bear on policymaking. Whether he is engaged in fisheries management policy work or scientific projects, community education or local economic development, Pappalardo is particularly interested in the power of public-private partnerships.

JOSH REITSMA received a bachelor's degree in environmental science from Unity College in Maine and later a master's degree in aquaculture and fisheries from the University of RI. He has worked with restoration and aquaculture of finfish and shellfish from Maine to Alaska, including the management of a small farm in Virginia. Since 2009, he has worked with the Cape Cod Cooperative Extension and Woods Hole Sea Grant in support of fisheries and aquaculture here in Massachusetts.

LAUREL SCHAIKER is a Research Scientist at Silent Spring Institute with expertise in environmental chemistry, environmental engineering, and exposure assessment. She leads the Institute's Cape Cod water quality research on highly fluorinated chemicals and other contaminants of emerging concern. Before joining Silent Spring, she was a research associate at the Harvard School of Public Health where she studied heavy metal transport at an abandoned mining site in rural Oklahoma and mercury exposure among local anglers and their families including local Native American tribes. Dr. Schaider earned her master's and Ph.D. in Environmental Engineering at the University of California, Berkeley, and a bachelor's degree in Environmental Engineering Science from MIT. She has taught ecology and environmental engineering courses at MIT and Northeastern University.

CHRIS SCHILLACI is the Aquaculture Specialist and Vibrio Coordinator for the Massachusetts Division of Marine Fisheries (DMF). Chris will discuss the recent increase in the occurrence of *Vibrio parahaemolyticus* (Vp) illness in Massachusetts and research conducted by DMF to evaluate trends in Vp abundance in local shellfish harvest areas and the efficacy of control measures in place to reduce Vp illness. Chris will also discuss DMF's role in permitting private aquaculture and municipal propagation efforts in the Commonwealth.

KRISTY SENATORI is Deputy Director of the Cape Cod Commission where she leads land use policy and economic development initiatives, the Strategic Information Office, and regionalization and smarter government efforts for the Commission. After graduating from law school Ms. Senatori worked in the private sector for several years before joining the Commission in 2008 and serving as the Commission's Chief Regulatory Officer for four years. Kristy graduated from Hamilton College, received a J.D. from Vermont Law School where she was editor of the Vermont Journal of Environmental Law, and is a member of the Massachusetts Bar.

TOBY STAPLETON is the Assistant Vice Chancellor and Director of the UMass Dartmouth Center for Innovation and Entrepreneurship (CIE). The CIE is UMass Dartmouth's technology incubator, located in a 60,000 square foot facility, in Fall River, MA, that provides physical space to start-ups and access to a prototype laboratory, machine shop, environmental chemistry laboratory, and a life sciences laboratory. The CIE is currently supporting 21 companies and has graduated more than 45 companies which have a combined sales revenue of more than \$200 Million and have created more than 230 jobs. In addition to having over 20 years of professional experience, serving in roles such as the President/CEO of the International Trade Assistance Center, Inc. and as the Marketing Director for the US Cranberry Industry, Toby has been a founder or co-founder of 4 start-ups and he is currently the Chair of the Southern New England Entrepreneurs Forum (SNEEF) and serves as a mentor, and on the board of, Entrepreneurship for All (EforAll) Southcoast. He holds a BA from Bryant University, an MBA from Suffolk University, and is currently pursuing a PhD at the University of Massachusetts Dartmouth.

DONALD WALTER is a hydrologist with the US Geological Survey's New England Water Science Center. He has worked in the field of hydrology since joining the USGS in 1989, after receiving an MS Degree from the University of Missouri. His research focus has been in coastal aquifer systems; research topics have included aquifer geochemistry, contaminant transport, and the response of coastal aquifers to natural and human-induced stresses.

BRADFORD WASHBURN is the Assistant Director of the Massachusetts Office of Coastal Zone Management, providing oversight and administration and directing policy development, planning, and technical approaches for program areas including shoreline/floodplain management, ports and harbors planning, regional coordination and project review.

TED WICKWIRE is the Applied Ecology and Sustainability Team Leader and Senior Environmental Scientist for the Woods Hole Group. Mr. Wickwire focuses on solving complex environmental problems using risk assessment, causal analysis, vulnerability assessment and weight-of-evidence approaches. He has applied his expertise to evaluating spills, legacy contamination, ecological vulnerabilities, environmental stressors and developing new methods to advance the evaluations. Mr. Wickwire has prepared numerous aquatic and terrestrial ecological and human health risk assessments in New England and around the United States. He has managed the development of models that incorporate wildlife behaviors and habitat suitability to increase the realism of exposure modeling. Using multiple types of evidence, he applies the causal analysis framework to provide a defensible path to identifying and managing a probable cause. Mr. Wickwire also uses relative risk model approaches to understand the potential vulnerabilities of different alternative approaches to environmental management such as introduction of species or climate change adaptation. He helps clients to evaluate the consequence of different probabilities of climate and storm driven inundation and other stressors on diverse assets.