

October 24, 2019 | 2325 Rayburn House Office Building

45 Independence Ave SE, Washington, DC

Noon to 1:30PM

## National Association of Marine Laboratories

# Briefing: Coastal Intelligence - Using Science to Strengthen Coastal & Inland Community Resilience

Communities in the **Pacific Northwest** coast face ocean acidification and hypoxia challenges; in the **Gulf of Mexico** off shore energy drives the coastal economic development; the **Great Lakes** have seen some lake levels rise 6 feet in as many years, and in the **Mid-Atlantic Coast** population density and strong seasonal variation are heavily impacted by a changing environment. These and other environmental changes are impacting economic and environmental livelihoods of coastal communities.

Coastal intelligence refers to actionable research, monitoring and modeling information used by citizens, small businesses, industry and governments to make informed decisions that support and enhance resilient communities, economies, and healthy, sustainable marine ecosystems along our coastlines.

This briefing will feature short talks by experts from each of these regions discussing how marine and freshwater laboratories, via research, technology development and education and training, are assisting state, local and regional decision makers address these and other challenges.

Participating in this briefing will be:

**Dr. Robert Cowen, Director, Hatfield Marine Science Center, Oregon State University**

**Dr. Kristy Kroeker, Associate Professor, Institute of Marine Sciences, University of California, Santa Cruz**

**Dr. Robert Dickey, Director, University of Texas Marine Science Institute, Port Aransas, Texas**

**Dr. Guy Meadows, Founding Director, Great Lakes Research Center, Michigan Technological University**

**Mr. Mike DeLuca, Director, New Jersey Aquaculture Innovation Center, Rutgers University and Manager, Jacques Cousteau National Estuarine Research Reserve, New Jersey**

## Dr. Robert K. Cowen

Director, Hatfield Marine Science Center

Professor, College of Earth, Ocean, and Atmospheric Sciences

<http://hmsc.oregonstate.edu>

[Plankton Ecology Lab](#)

Bob Cowen is Director of the Hatfield Marine Science Center, Oregon State University and Professor in the College of Earth, Oceans and Atmosphere Science. The Oregon State University's Hatfield Marine Science Center (HMSC) is a leading marine laboratory located in Newport, Oregon. As OSU's coastal campus and a base for oceanographic research, HMSC excels in student research opportunities and experiential instruction. HMSC currently hosts collaborative research and education programs from seven OSU colleges and



five state and federal agencies on its 49-acre campus, with a population of ~450 personnel. With a combined budget of over \$45M, HMSC is an important economic driver on the Oregon Coast. Prior to coming to OSU, Bob was the Robert C. Maytag Professor of Ichthyology at the University of Miami's Rosenstiel School of Marine and Atmospheric Science where he also served as Chair of the Division of Marine Biology and Fisheries, and as Associate Dean for Research. He has authored or co-authored over 140 publications on topics ranging from coastal fish ecology and early life history, to fishery oceanography, larval transport, population connectivity, and ocean acidification. He has also worked on development of new technologies for plankton sampling and image processing. This research has included the mentoring of 28 graduate and 37 undergraduate students. His external activities include serving on the U.S. Ocean Research and Resource Advisory Panel (ORRAP), External Advisory Committee for the Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO), NOAA/NSF CAMEO Steering Committee, JOI Ocean Observatory Interim Steering Committee, and as CLIOTOP/GLOBEC/IMBER Steering Committee and Early Life History Working Group chair. He is currently the President of the National Association of Marine Laboratories (NAML).



**KRISTY J. KROEKER**

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**PROFESSIONAL PREPARATION**

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University of California Santa Cruz	Marine Biology	B.S.	2000
Stanford University	Biology	Ph.D.	2012
University of California Davis	Global Change Biology	Postdoc	2012-2014

**APPOINTMENTS**

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University of California Santa Cruz	Associate Professor	EEB	2018-
University of California Santa Cruz	Assistant Professor	EEB	2014-2018

**FELLOWSHIPS AND AWARDS**

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2017	Kavli Frontiers in Science Fellowship, National Academy of the Sciences
2016	Sloan Research Fellowship in Ocean Sciences, Alfred P. Sloan Foundation
2016	Climate Action Champion Award, UC Office of the President
2015	Packard Fellowship for Science and Engineering, Packard Foundation
2012	Frances Lou Kallman Award, Stanford University (awarded to one female graduate student in Biology/Biomedicine at Stanford for excellence in research)

**SELECTED PRODUCTS**

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1. **Kroeker KJ**, Kordas RA and CDG Harley (2017). Embracing interactions in ocean acidification research: confronting multiple stressor scenarios and context dependence. *Biology Letters* DOI: 10.1098/rsbl.2016.0802.
2. Hughes BB, Lummis SC, Anderson SC and **KJ Kroeker** (2017). Unexpected resilience of a seagrass system to global stressors. *Global Change Biology* DOI: 10.1111/gcb.13854.
3. **Kroeker KJ**, Sanford E, Rose JM, Blanchette CA, Chan F, Chavez FP, Gaylord B, Helmuth B, Hill TM, Hofmann GE, McManus MA, Menge BA, Nielsen KJ, Raimondi PT, Russell AD, and L Washburn (2016). Interacting environmental mosaics drive geographic variation in mussel performance and predation vulnerability. *Ecology Letters*, 19: 771-779.
4. Strong A, **Kroeker KJ**, Teneva L, Mease LA & R Kelly (2014). Ocean Acidification 2.0: Managing our changing coastal ocean chemistry. *BioScience*, 64: 581-592.

5. **Kroeker KJ**, Kordas RL, Crim RN, Hendriks IE, Ramajo L, Singh GG, Duarte C and JP Gattuso. (2013). Impacts of ocean acidification on marine biota: Quantifying variation in sensitivity among organisms and life stages and at elevated temperature. *Global Change Biology*, 19: 1884-1896.
6. **Kroeker KJ**, Micheli F & MC Gambi (2013). Community dynamics and ecosystem simplification in a high-CO<sub>2</sub> ocean. *Proc. Natl. Acad. Sci. USA* 110: 12721-12726.
7. Billé R, Kelly R, Biastoch A, Harrould-Kolieb E, Herr D, Joos F, **Kroeker KJ**, Laffoley D, Oschlies A and JP Gattuso (2013). Taking action against ocean acidification: A review of management and policy options. *Environmental Management*, 52: 761-779.
8. **Kroeker KJ**, Micheli F & MC Gambi (2012). Ocean acidification causes ecosystem shifts via altered competitive interactions. *Nature Climate Change* 3: 156-159.
9. **Kroeker KJ**, Micheli F, Gambi MC & TR Martz. (2011). Divergent ecosystem responses to ocean acidification. *Proc. Natl. Acad. Sci. USA*. 108: 14515–14520.
10. **Kroeker KJ**, Kordas RL, Crim RN & GG Singh (2010). Meta-analysis reveals negative yet variable effects of ocean acidification on marine organisms. *Ecol Letts* 13: 1419–1434.
11. Crain CM, **Kroeker K** & BS Halpern (2008). Interactions and cumulative impacts of multiple stressors in marine ecosystems. *Ecology Letters* 11: 1304-1315.

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## POLICY AND MANAGEMENT ENGAGEMENT

- 2017 California National Resources Agency and Governor’s Office of Planning and Research (Invited Speaker): **Climate Change Symposium – Science to Safeguard CA.**
- 2016 US State Department Our Ocean Conference (Invited Speaker): **The ocean in a changing climate.** Organized by the US State Department for 400+ heads of state, business, and non-profit leaders.
- 2016 United States Congressional Briefing (Invited Speaker): **Experience the reality of ocean acidification.** Organized by Ocean Conservancy and Stanford Virtual Human Interaction Lab.
- 2016 Uncommon dialogue (Invited Participant): **Ocean acidification – setting water quality goals.** Organized by Center for Ocean Solutions, California OPC, Southern California Water Resources Project, and Stanford Woods Institute for the Environment.
- 2015 California State Legislature Briefing (Invited Speaker/Panelist): **California’s Changing Oceans.** Organized by COMPASS and the California OPC.
- 2014 North-Central Coast National Marine Sanctuaries **Climate Adaptation Planning** (Participant): Organized by Eco-Adapt and NMS to assess vulnerability of focal species to climate change.
- 2013 United States Congressional Briefing (Invited Speaker): **The consequences and options for managing ocean acidification.** Organized by AGU, COMPASS, and the US congressional subcommittee on Oceans for over 100 staff from the House of Representatives and the Senate.
- 2013 Peter Wall International Roundtable (Invited Speaker): **Ocean acidification - Global implications for the marine environment.** Vancouver, Canada.
- 2013 California Water Environment Association meeting (Invited Speaker): **The intersection of water quality management and ocean acidification in California.**

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## ENGAGEMENT - RELEVANT PROFESSIONAL SERVICE

- 2016- Ocean Acidification International Coordination Center: Advisory Committee
- 2016- SOLAS-IMBER International Working Group Ocean Acidification
- 2015- Doris Duke Conservation Scholars Program at UCSC: Steering Committee Chair



**Robert W. Dickey**

Professor and Director, Marine Science Institute  
Chair, Department of Marine Science  
University of Texas at Austin  
College of Natural Sciences

Robert Dickey holds the *Nancy Lee and Perry R. Bass Regents Chair in Marine Science* at the University of Texas at Austin Marine Science Institute, where he serves as the Director and Chairman of the Department of Marine Science. Professor Dickey joined The University of Texas at Austin in 2013 after serving for 28 years with the U.S. Food and Drug Administration (FDA). As a

Division Director at FDA, Robert led research programs to elucidate the origins, chemistry and toxicology of human health hazards in seafood (e.g. marine natural toxins, microbial and viral pathogens, biogenic amines, petrochemicals). He also directed science-based responses to food-borne illness outbreaks; advised on international trade disputes and regulatory issues, and led FDA responses to national emergencies such as Hurricane Katrina in 2005 and the 2010 Deep Water Horizon oil spill. He served for six years on the National Science and Technology Council's *Joint Subcommittee on Ocean Science and Technology*, and as science advisor to the FDA Commissioner, the Director of the FDA Center for Food Safety and Applied Nutrition, and U.S. Assistant Surgeon General. During his tenure with FDA, Dr. Dickey was recognized with twenty-eight Special Act, Service and Leadership Awards. As Director of The University of Texas Marine Science Institute Robert provides administrative and programmatic leadership for the pursuit of excellence in research, teaching and public service. Since August of 2017, Robert has guided the Institute through perhaps the most difficult period in its history by leading the restoration of people, programs and infrastructure from the devastation of Hurricane Harvey. Professor Dickey is currently President-Elect of the National Association of Marine Laboratories; serves on the Marine Biotoxins Research Advisory Board for the European Union Food Safety Authority, and on several NASEM and NOAA advisory panels concerned with natural hazards and anthropogenic contaminants in the marine environment.



**Guy Meadows Ph.D.**

Robbins Professor of Sustainable Marine Engineering  
Founding Director, Great Lakes Research Center  
Michigan Technological University

President, Northeastern Association of Marine & Great Lakes Laboratories (NEAMGLL)

Meadows has over 42 years' experience in physical oceanography and applying marine engineering innovation towards scientific advancement in the Great Lakes and coastal oceans. He has served as chief scientist on over 25 Great Lakes and ocean research vessel cruises and has also held a USCG 100-ton captains license. His work in the Great Lakes and Arctic has focused on the implementation of advanced technology to enhance scientific understanding in extreme and harsh environments.

Upon graduation from Purdue University in 1977, Guy Meadows joined the faculty of the University of Michigan, College of Engineering, where he served as Professor of Physical Oceanography for 35 years within the departments of Atmospheric, Oceanic and Space Sciences and Naval Architecture and Marine Engineering. During his tenure, he served the College and University as Director of the Ocean Engineering Laboratory, Director of the Cooperative Institute for Limnology and Ecosystems Research (NOAA, Joint Institute), Director of the Marine Hydrodynamics Laboratories and founding Academic Director of the M-STEM Academy. He joined Michigan Technological University in June of 2012, to help establish and direct the new Great Lakes Research Center where he facilitates collaborative research partnerships across disciplinary boundaries. He currently leads efforts in the formation of the Smart Ships Coalition (SSC), a multi-sector partnership to advance the understanding and adoption of autonomous marine surface vehicle integration across the Great Lakes-St. Lawrence region. In August, 2018, the Marine Autonomy Research Site (MARS) was officially recognized in the waters of central Lake Superior surrounding Michigan Tech by resolution of the Great Lakes Governors and Premiers. His primary goal, to blend scientific understanding and technological advancements into environmentally sound engineering solutions for the marine environment, has led to a distinguished career of teaching, research and service.



### **Mr. Mike De Luca -- Brief Biography**

Mike De Luca provides executive management and leadership for integrated programs of research, education and outreach, especially the Jacques Cousteau National Estuarine Research Reserve, Rutgers Aquaculture Innovation Center and the Coastal Exploration Center. He also serves on the Executive Committee and Board of the National Estuarine Research Reserve Association where he has managed a variety of system-wide reserve initiatives. Other key duties include management of major external research, science education and service programs, government relations, marine and coastal science policy, program development and partnerships. He also oversees operation of major field facilities and serves as Chair of the Rutgers Dive Control Board. He has led efforts to capitalize on environmental sampling and sensing networks to inform coastal management and enrich K-12 science education. Most recently, he initiated Rutgers efforts to support the development, growth and prosperity of aquaculture in New Jersey and the Mid-Atlantic region. In this new key responsibility, he has led efforts to establish new research directions (such as development of nutraceuticals) and new candidate species for culture. He currently leads efforts to restore the ecological integrity of coastal systems and communities in the aftermath of hurricanes and severe storms, develop science-based strategies to enhance resilience of coastal communities and ecosystems, design innovative approaches to science-based management of coastal systems, and activities to advance management of marine protected areas. His experience includes service as the President of the National Estuarine Research Reserve Association, Chair of the Science and Technical Advisory Committee for the Barnegat Bay National Estuary Program, and member of the Heinz Center Panel on Innovations in Coastal Zone Management. He has also served as Chair of the Public Policy Committee and President of the National Association of Marine Laboratories.