



OLD DOMINION UNIVERSITY

Center for Coastal Physical Oceanography

Spring 2023 Virtual Seminar Series

Title "Marine Disease in Foundation and Keystone Species are Heating Up with Climate"
Speaker Drew Harvell, Cornell University
Date Monday, February 13, 2023
Time 3:30 PM EST

Zoom Info [Link](#)
Meeting ID: 952 2367 0210
Passcode: 846754

Abstract Ocean warming endangers coastal ecosystems through increased risk of infectious disease. I will summarize work from my research group of major outbreaks affecting both foundation and keystone species in coastal ecosystems. An ongoing, decade-long epidemic in west coast seastars continues to cause mortality during warming events and endangers kelps forests through release of sea urchins.

Eelgrass (*Zostera marina*) meadows provide essential coastal habitat and are vulnerable to a temperature-sensitive wasting disease caused by waterborne transmission of the protist, *Labyrinthula zosterae*. We assessed wasting disease sensitivity to warming temperatures across a 3,500 km study range by combining long-term satellite remote sensing of ocean temperature with field surveys from 32 meadows along the Pacific coast of North America. Disease prevalence was 3x higher in locations with warm temperature anomalies in summer 2019. This study highlights the value of artificial intelligence (a machine language learning program) in marine biological observing for detecting widespread climate-driven disease outbreaks.

Our surveys show that seagrass meadows in the San Juan Islands, Washington, USA have declined over the last decade. Shoot densities, measured along permanent monitoring transects, fell over 90% from 2013 to 2021, while wasting disease prevalence (percent infected plants) remained persistently above 40% since the 2016 Northeast Pacific heatwave. Since 2019, synchronized UAV surveys with midsummer in situ sampling visualize large losses in intertidal meadows.



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Biography

Drew Harvell is Professor Emerita in Ecology and Evolutionary Biology at Cornell University, Affiliate Faculty at the University of Washington, and Science Envoy for The State Department. Her research on the sustainability of marine ecosystems and disease ecology has taken her from the reefs of Mexico, Indonesia, and Hawaii to the cold waters of the Pacific Northwest. She is a Fellow of the Ecological Society of America and the American Association for the Advancement of Science. Her writing appears in The New York Times, The Hill, and in over 190 academic articles in journals, such as Science, Nature, and Ecology. She won the National Outdoor Book Award, top Science-Art book from The Smithsonian, and a Rachel Carson Environmental Book Honorable Mention for A Sea of Glass. She won The Prose Award and the 2020 ESA Sustainability Science Award for Ocean Outbreak and the 2019 Conservation Researcher from The Seattle Aquarium. Visit her website at <http://drewharvell.com/>.