

IEEE METROPOLITAN LOS ANGELES AND COASTAL SECTION GEOSCIENCE AND REMOTE SENSING SOCIETY (GRSS) CHAPTER



Aquatic ecosystems Monitoring using NASA's EMIT and ECOSTRESS Mission

Dr. Kelly Luis, Aquatic Ecosystem Scientist Jet Propulsion Laboratory, California Institute of Technology

> June 17, 2025 (Tuesday), 5:30 PM Biology and Biological Engineering (BBB), Room B180 California Institute of Technology, Pasadena, CA 91125 And over Zoom at <u>https://tinyurl.com/mla-grss-talk-06-25</u>



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AGENDA

5:30 pm – Refreshments 6:00 pm – Announcements 6:10 pm – Lecture, Dr. Kelly Luis 7:00 pm – Discussion 7:30 pm – Adjournment



The IEEE MLA/Coastal GRSS Joint Chapter Special Lecture Event

Aquatic ecosystems are complex, dynamic interfaces shaped by interactions between land, water, and the atmosphere. Yet, they remain challenging to monitor consistently across spatial and temporal scales. NASA's EMIT (Earth Surface Mineral Dust Source Investigation) and ECOSTRESS (ECOsystem Spaceborne Thermal Radiometer Experiment on Space Station) missions offer new capabilities for observing these environments. EMIT's imaging spectroscopy provides surface reflectance measurements that can support assessments of water quality, and intertidal and benthic habitat composition. ECOSTRESS complements this with thermal observations that help identify thermal gradients, urban runoff patterns, and hydrologic connectivity. This talk highlights how the integration of EMIT and ECOSTRESS data is expanding our toolkit for aquatic ecosystem monitoring, with applications ranging from early detection of water quality changes to improved understanding of ecosystem function and resilience. Case examples will illustrate how these missions are helping connect spacebased observations to local decision-making.

Dr. Kelly Luis is an aquatic ecosystem scientist at NASA's Jet Propulsion Laboratory (JPL), where she advances the use of satellite and airborne remote sensing to monitor water quality and aquatic habitat dynamics. She serves as the aquatic algorithm lead for the Surface Biology and Geology (SBG) mission's Visible to Shortwave Infrared (VSWIR) instrument and as the Aquatic Applications Lead for the Earth Surface Mineral Dust Source Investigation (EMIT) mission. In addition, Kelly serves as an Associate Program Manager for NASA's Water Resources Program, where she leads coordination of agency-wide efforts focused on water quality applications.



Her work emphasizes community-based partnerships to adapt NASA's inland and coastal water quality products to meet local decision-making needs. Her applied research spans satellite-based water clarity monitoring in New England, harmful algal bloom detection along the West Florida Shelf and Southern California, and assessments of thermal stress and urban impacts on coastal water quality in Hawai'i. She holds a Ph.D. and M.S. in Marine Science and Technology from the University of Massachusetts Boston, and a B.A. in Environmental Science from Columbia University.

Directions and Parking: Parking on the Caltech campus is accessible from Michigan Avenue, south of Del Mar Avenue. Parking is free after 5 pm. *Building location*: https://www.caltech.edu/map/campus/the-mabel-and-arnold-beckman-laboratories-of-behavioral-biology

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