

KELLY LUIS

Jet Propulsion Laboratory, California Institute of Technology
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CURRENT APPOINTMENT

Scientist 2024
Water & Ecosystems Group
Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA

EDUCATION

A.A., Hawaiian Studies 2023 – Present
Hawai‘iloa Program
Windward Community College, Kāne‘ohe, HI
Expected Graduation - 2025

Ph.D., Marine Science and Technology 2021
School for the Environment
University of Massachusetts, Boston, MA

M.S., Marine Science and Technology 2020
School for the Environment
University of Massachusetts, Boston, MA

B.A., Environmental Science 2015
Department of Earth and Environmental Sciences
Columbia University, New York, NY

PAST APPOINTMENTS:

JPL Postdoctoral Researcher 2023.9 – 2024.4
Water & Ecosystems Group
Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA

NASA Postdoctoral Program Fellow 2021.9-2023.9
Water & Ecosystems Group
Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA

Research Assistant 2021.5-2021.8
University of Massachusetts Boston, Boston, MA

Career Building Coordinator 2020.5-2020.8
Woods Hole Partnership Education Program, Woods Hole, MA

Research Assistant II 2015.8-2016.8
Department of Marine Chemistry and Geochemistry
Woods Hole Oceanographic Institution, Woods Hole, MA

AWARDS & HONORS

Department of State, Embassy Science Fellow – Auckland, New Zealand	2024
University of Massachusetts Boston, School for the Environment Discovery and Innovation Award	2022
JPL Postdoc Research Day Best Poster in Earth Science: Water, Land, Biome, Carbon Cycle	2021
NASA Postdoctoral Program Fellowship	2021
Robert & Patricia Switzer Foundation – Switzer Environmental Fellow	2020
ASLO – Limnology and Oceanography Research Exchange Fellow	2019
Ford Foundation – Predoctoral Fellowship	2018
National Science Foundation –IGERT Advanced Fellowship	2016
University of California-Santa Cruz – Climate Engagement Fellow	2017
National Science Foundation –IGERT Fellowship	2016
Woods Hole Oceanographic Institution – Whelan Memorial Fund	2016
Columbia University - King’s Crown Leadership Award: Columbia Spirit	2015
Mellon Mays Undergraduate Research Fellowship	2013

REFEREED PUBLICATIONS IN PREPARATION

*Denotes Undergraduate Student Mentee

Luis, K., Hook, S. Mixed Signals: A Multidecadal Perspective on Extreme Temperatures Events in Lake Tahoe

Luis, K., Cawse-Nicholson, K., Thompson, D.R., Smith, J., Pan. J., Trinh, R. Gierach, M. Estimating Phytoplankton Diversity with Intrinsic Dimensionality.

*Kim D., **Luis K.**, Lee, C., Ade. C., Gustine, R., Shreevastava, A., Hestir, E., Hook, S., Bashekev, S. Heatwaves across the Bay Delta: A Holistic perspective

Pecuhet, L., Alvera-Azcarate, A., Dorr, J., Hayward, A., Kuletz, K., Kuzyk, Z., **Luis, K.**, Manizza, M., Mohamed, B., Payne, M., Staehr, P., Szymkowiak, M., Wernberg, T. Marine heatwaves and their impact on Arctic marine ecosystems

REFEREED PUBLICATIONS IN REVIEW

Miner, KR, Gay, BA, Bartsch, A, Elder, C, Goeckede, M, **Luis, K.**, Tamminen, J, Treat, C, Watts, J, and Charles Miller. State of the science: Critical permafrost science gaps

Madani N., Parazoo N., Manizza M., Chatterjee A., Carroll D., Menemenalis D., Matsuoka, A., **Luis K.**, Gierach, M. Miller C. A machine learning approach to produce a continuous solar-induced chlorophyll fluorescence dataset for understanding Arctic ocean productivity.

Chadwick D., et al. (inc. **Luis, K.**) Unlocking Ecological Insights from Subseasonal Visible-to-Shortwave Infrared Imaging Spectroscopy: The SBG High Frequency Time Series (SHIFT) Campaign

REFERRED PUBLICATIONS

[14] **Luis, K.**, Köhler, P., Frankenberg, C., & Gierach, M. (2023). First light demonstration of red solar induced fluorescence for harmful algal bloom monitoring. *Geophysical Research Letters*, 50(13), e2022GL101715.

[13] Lang, S. E., **Luis, K. M.**, Doney, S. C., Cronin-Golomb, O., & Castorani, M. C. (2023). Modeling Coastal Water Clarity Using Landsat-8 and Sentinel-2. *Earth and Space Science*, 10(7), e2022EA002579.

[12] Johanif, D., Alemayehu, E., Chan, T., Nöel, E., Santamaria, C., Davis, S., Evensen, K.G., Liliquist, J., Lockwood, L., Mabry, L., Pluomi, K., Rosenthanl, I., Roy, M., Santamaria, C., & **Luis, K.** (2023). Online Conversations for Equity, Action, and Networking: A Pilot Project Highlighting Diversity in the Ocean Sciences. *Limnology and Oceanography Bulletin*, 32(2), 41-47.

[11] Miner, K., Canavera, L., Gonet, J., **Luis, K.**, Maddox, M., McCarney, P., Bridge, G., Schimel, D., & Rattlingleaf, J. (2023). The co-production of knowledge for climate science. *Nature Climate Change*, 13(4), 307-308.

[10] Ghosh, A., Bizic, M., Gushlank, C.A.C., Lee, Ping Lee, Y., **Luis, K.**, Meinikmann, K., Grossart, H. (2022) Bridging gaps in Aquatic Sciences: A Conscious Effort Toward Unbiased Scientific Presentations through Amplifying Voices. *Limnology and Oceanography Bulletin*. 31:

[9] Meinikmann, K., Gushulak, C.A.C., Ghosh, A., Bizic, M., Lee, Y.P., **Luis, K.**, and Grossart, H.-P. (2022), ASLO's Early Career Committee Amplifies Voices of Underrepresented Groups in Aquatic Sciences. *Limnology and Oceanography Bulletin*, 31: 18-20.

[8] Lee, Z., Shang, S., Li, Y., **Luis, K.**, Dai, M., & Wang, Y. (2021). Three-Dimensional Variation in Light Quality in the Upper Water Column Revealed With a Single Parameter. *IEEE Transactions on Geoscience and Remote Sensing*, 60, 1-10.

[7] Scott Price, O., **Luis, K.**, Price, A. L., Harden, B., Howard, J., Valentin, L. E., Liles, G., Jearld Jr, A. (2020). Same Program Different Delivery: Adapting the Woods Hole Partnership Education Program for a Virtual Era. *Limnology and Oceanography Bulletin*, 29(4), 117-124.

[6] Lee, Z., Wang, Y., Yu, X., Shang, S., **Luis, K.** Evaluation of forward reflectance and empirical algorithm for chlorophyll concentration of stratified waters. *Applied Optics*, 59(30) 9340-9352.

[5] Wei, J., Wang, M., Lee, Z., Briceño, H. O., Yu, X., Jiang, L., Garcia, R., Wang, J., **Luis, K.** (2020). Shallow water bathymetry with multi-spectral satellite ocean color sensors: Leveraging temporal variation in image data. *Remote Sensing of Environment*, 250, 112035.

[4] **Luis, K. M.**, Rheuban, J. E., Kavanaugh, M. T., Glover, D. M., Wei, J., Lee, Z., & Doney, S. C. (2019). Capturing coastal water clarity variability with Landsat 8. *Marine Pollution Bulletin*, 145, 96-104.

[3] Torres, A. D., Keppel-Aleks, G., Doney, S. C., Fendrock, M., **Luis, K.**, De Mazière, M., & Sussmann, R. (2019). A geostatistical framework for quantifying the imprint of mesoscale atmospheric transport on satellite trace gas retrievals. *Journal of Geophysical Research: Atmospheres*, 124(17-18), 9773-9795.

[2] Kavanaugh, M. T., Rheuban, J. E., **Luis, K. M.**, & Doney, S. C. (2017). Thirty-Three Years of Ocean Benthic Warming Along the US Northeast Continental Shelf and Slope: Patterns, Drivers, and Ecological Consequences. *Journal of Geophysical Research: Oceans*, 122(12), 9399-9414.

[1] Lee, Z., Shang, S., Lin, G., Liu, T., Liu, Y., Du, K., & **Luis, K.** (2017). Secchi disk observation with spectral-selective glasses in blue and green waters. *Optics Express*, 25(17), 19878-19885.

MEDIA & NON-REFERRED PUBLICATIONS

Barron, P., Kirshen, P., **Luis, K.** Shapiro, S., Srikanth, R., Morze, L., Woods, C., Albert, M. CODA: Living with the Urban Ocean. *Climate Justice and Public Health: Realities, Responses, and Re-Imaginations for a Better Future*, UMass Press (in press)

[Breaking the Mold: Changing the Face of Climate Science](#). Scientist profile for Children's Book written by Dana Levy

Luis, K., [Life at Sea: Books of the Bold Horizon](#). NASA Earth Expeditions.

[JPL Employee Spotlight](#). Meet Kelly, Postdoctoral Fellow for Water & Ecosystems

Luis, K. The Simplification of an Indigenous Scientist. *Limnology and Oceanography Bulletin*, 29: 131-131. <https://doi.org/10.1002/lob.10410>

Luis, K. [Online Conversations for Equity, Action, and Networking](#). ASLO Blog

Luis, K. [Ocean Hues](#). Schmidt Institute Cruise Log: Studying the Sea-Surface Microlayer 2

Luis, K. [TOS Student Highlight](#). The Oceanography Society Student Newsletter

SELECTED CONFERENCE ACTIVITY

*Denotes Undergraduate Student Mentee

Luis, K., Cawse-Nicholson, K., Thompson, D.R., Smith, J., Gierach, M. Estimating Phytoplankton Diversity with Intrinsic Dimensionality. American Geophysical Union 2023 (oral presentation).

Luis, K., Ocean Visualization: Extracting insight, interactive analysis, exploration, and outreach. Ocean Science Meeting 2022 (convener)

Luis, K., Hill, P., Inferring Subsurface Estuarine Sediment Processes with Landsat 8 and Sentinel 2. Ocean Sciences Meeting 2022 (oral presentation)

Luis, K., Köhler, P., Frankenberg, C., Gierach, M. Leveraging TROPOMI Solar Induced chlorophyll Fluorescence (SIF) Retrievals in the Detection and Monitoring of *K. brevis* blooms – Jet Propulsion Laboratory Virtual Postdoc Research Poster Conference (virtual poster)

Luis, K., Lee, Z. Fusion of Ocean Color Sensors for Global Water Clarity Monitoring – 2nd International Ocean Color Symposium, (virtual poster)

Meletis, O.*, **Luis, K.**, Lee, Z. Analyzing Coral Reef Ecosystem Health Using Remote Sensing

Reflectance, School for the Environment – Earth Day Symposium 2021 (virtual poster)

Charrak, Y.*, **Luis, K.**, Lee, Z. The Effects of Climate Change on the Stellwagen Bank National Marine Sanctuary, School for the Environment – Earth Day Symposium 2021 (virtual poster)

Meletis, O.*, **Luis, K.**, Testing Coral Classification Methods for Remote Sensing, School for the Environment – Earth Day Symposium 2020 (virtual poster)

Smith, R.*, **Luis, K.**, Zhang, S., Lee, Z. Spectral Absorption of Colored Dissolved Organic Matter (CDOM) at Fox Point Dock, Boston Harbor (virtual poster)

Luis, K., Lee, Z. The fusion of multispectral ocean color sensors for water clarity monitoring. Ocean Sciences 2020, San Diego, CA (poster presentation)

Chen, R., **Luis, K.**, Largier, J. Transdisciplinary Research and Education in Coastal Systems Posters, San Diego, CA (co-chair)

Luis, K., Lee, Z., McNally, S. Remote Sensing of Water Quality Parameters for *Vibrio* spp. monitoring. School for the Environment – Earth Day Symposium 2019, Boston, MA (oral presentation)

Luis, K., Lee, Z., Capturing coastal water clarity variations with Landsat 8 and Citizen Science. Ocean Sciences Meeting 2018, Dubrovnik, Croatia (poster presentation, sponsored by TOS student travel award)

Davis, S, Foint, Y., **Luis, K.**, Sheldon, P. Water Security. Land of a Thousand Ideas: Rwanda and the Sustainability Challenge 2018, Boston, MA (oral presentation)

Luis, K., Lee, Z., Capturing coastal water clarity variations with Landsat 8 and Citizen Science. Ocean Sciences Meeting 2018, Portland, OR (poster presentation)

Luis, K., Doney, S. Measuring Carbon Dioxide from Space. Woods Hole Partnership Education Program Symposium 2015, Woods Hole, MA (oral presentation)

GRANTS

NASA – MUREP INCLUDES Grant, author	2021
Partners Aligned To Heighten broad participation in STEM	
NASA – MUREP OCEAN Grant, author	2021
Using Hyperspectral Imagery to Assess the Effects of Warming on New England Kelp Forests	

Social Sciences Research Council – Predoctoral Research Development, PI Coastal and Inland Ocean Color Remote Sensing for Water Quality Monitoring	2020
NASA – MUREP INCLUDES Planning Grant, author Partners Aligned To Heighten broad participation in STEM	2020
Woods Hole Sea Grant – Advancing Diversity, Equity, and Inclusion, PI Online Conversation for Equity, Action, and Networking	2020
Woods Hole Sea Grant – Advancing Diversity, Equity, and Inclusion Partnership Education Program-II, author	2020
Social Sciences Research Council – Graduate Enhancement Grant, PI Remote Sensing of Water Quality Parameters for Vibrio Monitoring	2019
Social Sciences Research Council – Dissertation Development Grant, PI After the storm: Coastal Underwater Habitat Mapping for Improved Storm Response and Coastal Management	2018

INVITED TALKS & PANELS

SACNAS NASA Tribal Engagement panelist	2023
American Indian in Higher Education Consortium Climate Change Innovation Space speaker	2023
National Tribal & Indigenous Climate Conference Water (<i>Moderator</i>) Fish and Aquatic Ecosystem Recovery (<i>Moderator</i>) Intergenerational Climate Conversation (<i>Moderator</i>)	2022
Jet Propulsion Laboratory Leveraging Solar Induced Fluorescence for the Detection of Harmful Algal Blooms (JPL Postdoc Research Day Award Ceremony)	2022
Ocean Sciences Meeting 2022 Mental Health and Self Care in the Ocean Sciences (<i>Moderator</i>) Paper Writing (<i>Moderator</i>) Meet the Plenary (<i>Moderator</i>)	2022
Cal Poly Pomona Native American Student Center and AISES Native Success in STEM: NASA JPL (<i>Panelist</i>)	2021
Ecological Society of America 2021- Inspire talk Online Conversation for Equity, Action, and Networking	2021
Massachusetts Institute of Technology – EAPS Seminar Series Finding Clarity in the Crowd: Improving Water Quality Monitoring	2021
Harris Center for Conservation Education – Women in Science Series The Urban Ocean – The View from Boston Harbor	2021
Indigenous Peoples Day at UMass Boston (<i>Moderator</i>)	2020

Climate Change and Indigenous Resistance: An Intergeneration and Inter-tribal Conversation	
Sea Education Association – The Ocean Odyssey Lecture Series	2020
Painting the Oceans with Satellites and Planes	
Lamont Doherty Earth Observatory – Biology Department Seminar Talk	2020
Coastal and Inland Ocean Color Water Quality Monitoring	
Documentary Educational Resources	2019
Smokin’ Fish (<i>Panelist</i>)	
Ocean Sciences Meeting 2018 – Fluid Oceans: Pecha Kucha Evening	2018
Satellite Imagery	

CRUISES & FIELDWORK

North Pacific Ocean, *R/V Sally Ride*, S-MODE IOP-2 Campaign, April 2023
North Pacific Ocean, *R/V Bold Horizon*, S-MODE IOP-1 Campaign, October 2022
Massachusetts Bay, MA, *R/V Neritic*, NOAA-VIIRS Validation Day Cruises, 2016-2020
South Pacific Ocean, *R/V Falkor*, Sea Surface Microlayer 2, November – December 2019
Maui, Hawaii, *32’ Dive boat*, NASA HypIRI and CORAL Campaigns, February 2017 & 2018

TEACHING & MENTORING:

Science Advisor, NASA DEVELOP Spring 2024, Utilizing NASA Earth Observations to Assess Thermal Stress Impacts on Coastal Native Hawaiian Fisheries
Co-Mentor, JPL Maximizing Student Potential Program, Summer-Fall 2023
Co-Mentor, JPL Year-Round Internship Program, 2023
Young Leaders Mentor, National Tribal and Indigenous Climate Conference, 2022
Mentor, Ocean Sciences Meeting 2022
Technical Advisor, NASA DEVELOP Spring 2022, for Updating and Expanding the Optical Reef and Coastal Area Assessment (ORCAA) Tool
Associate Lecturer, Spring 2020 & Spring 2021, The Urban Oceans, University of Massachusetts – Boston
Guest Lecturer, Spring 2019, Coral Reefs and Climate Change for Climate Change, Emerson College
Guest Lecturer, Spring 2019, Ocean Acidification and Aquatic Optics for Introduction to Oceans, University of Massachusetts-Boston
Undergraduate Research Mentor, 2020-2021
Course Assistant, 2013-2015, Environmental Sustainability and Corporate Decision Making, Introductory to Ecology, Climate Change Adaptation and Natural Disasters, Climate and Biodiversity, Evolution: Darwin to DNA, and Systems and Sustainability, Earth Institute at Columbia University

COURSES AND CERTIFICATIONS

What's Behind the Curtain of NASA Plankton, Aerosol, Cloud, ocean Ecosystem (PACE) mission? – August 2022, Baltimore, Maryland

OceanHackWeek – Summer 2021, virtual

Commonwealth Seminar: Opening the Doors of Government to Everyone – Fall 2020, Boston, MA

Near Term Ecological Forecasting Course – July 2019, Boston University, Boston, MA

Imaging FlowCytobot Training Course – November 2018, McLane Research Laboratories, Inc., Falmouth, MA

Calibration and Validation of Ocean Color Remote Sensing Course – June 2017, Darling Marine Center, Damariscotta, ME (Travel expenses sponsored by Ocean Carbon & Biogeochemistry)

PADI Open Water Diver, Advanced Diver, and Rescue Diver – Summer 2014, Little Cayman, Cayman Islands

Emergency First Responder – Summer 2014, Little Cayman, Cayman Islands

Field Geology Courses: Death Valley, CA; Barbados; Coldigioco, Italy

COMMUNITY ENGAGEMENT

Maui Fires People Locator – Lead of Family Contact team, August 2023

Surface Biology and Geology – VSWIR Aquatics Coordinator, March 2023 - Present

Ocean Optics 2024 Committee Member, January 2023-Present

Surface Biology and Geology – Collaborations Coordinator, January 2023 - Present

Ambassador, Switzer Fellowship Pilot Ambassador Program, 2022-2023

GEO AquaWatch, Google Earth Engine Working Group, 2021-2022

Letters to a Pre-Scientist, September 2021-Present

Association for Limnology & Oceanography Early Career Researcher Committee, January 2021 – March 2022

Ocean Sciences Meeting 2022 ASLO Student Program Representative, Fall 2020-Present

Girls Who Code Lead Instructor, 2016-2020, Grove Hall Branch of the Boston Public Library, Dorchester, MA

NASA HypIRI Outreach Activities Coordinator, 2017 & 2018, Maui, HI

SUBMERGE Marine Science Festival Volunteer, 2017, Hudson River Park, New York, NY

Neponset RiverFest Volunteer, 2018, Neponset River, Dorchester, MA

Ocean Sciences Meeting K-12 Day Mentor, 2018, Portland, Oregon

Hōkūle'a Coordinator and Guest Crew Member, 2016, Massachusetts

ACADEMIC & INSTITUTIONAL SERVICE

User Working Group Member - NASA LPDAAC

Convener of the School for the Environment Graduate Student Anti-Racism Taskforce
Convener of UMass-Boston's Deep Learning Group
Reviewer: Journal of Estuarine, Coastal, and Shelf Science, Limnology and Oceanography
Letters, Marine Pollution Bulletin, Journal of Advances in Modeling Earth Systems (JAMES),
Remote Sensing of the Environment, Journal of Geoscience Education, Remote Sensing, NASA
FINESST & ROSES

MEMBERSHIPS

Pacific Island GIS and Remote Sensing Group
Ecological Forecasting Initiative
The Oceanography Society
American Geophysical Union
Society for Advancement of Chicanos/Hispanics & Native Americans in Science
American Indian Science and Engineering Society

RESEARCH SKILLS

Computational:

- Proficient in Linux, Mac, Python, MATLAB, R, SeaDAS, ACOLITE, Hydrolight, High-Performance Computing Clusters (SLURM, LSF), Google Earth Engine, Git, SNAP, Tensorflow, ArcGIS, QGIS

Instrumentation:

- Field: Hyperpro II (profiling and tethered buoy modes), Spectral Evolution – Handheld Radiometer, HyperSAS with a pySAS configuration, AC-9, AC-S, BB7, Microtops sunphotometer, CTD, Secchi Disk, Van Dorn Sampling, ASD, ECO-CTD, Water Filtration (Chl, CDOM, filter pad absorption, POC, HPLC, Flow Cytometry, eDNA)
- Laboratory: UV-Probe Spectrophotometer, Imaging Flow Cytobot (benchtop), VINDTA 3-C