ZACHARY A. BENGTSSON

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EDUCATION

University of Washington: 2021-Present
Graduate Student, Masters of Science
School of Aquatic & Fishery Science

Boston University: 2013-2015
B.A., Biology – Specialization in Ecology and Conservation Biology
Minor: Marine Science
Cumulative GPA: 3.58, *Cum Laude*

The George Washington University: 2011-2013
Full-Time Undergraduate Student (Transferred)

EMPLOYMENT HISTORY

University of Washington • School of Aquatic & Fishery Science
Graduate Research Assistant (September 2021 - Present)
• Research coral epigenetic-environmental linkages in the Mo'orea coral reef under the framework of the NSF E5 Coral project (https://e5coral.org/).
• Create annotation and analysis pipelines for the processing of coral genomic data.
• Explore the application of field-based and remotely-sensed environmental data to energetic models.

NASA Applied Remote Sensing Training Program (ARSET) • NASA Ames Research Center
Research Associate (October 2020 – August 2021)
• Assisted in all portions of content creation and delivery of online environmental remote sensing trainings for ARSET's land and coastal management application area.
• Led the creation and delivery of five trainings related to vegetation-based wildfire risk assessment and Google Earth Engine for land management applications.
• Coordinated across NASA Earth Applied Sciences to complete capacity building activities and improve public access to satellite remote sensing data products for environmental management.

NASA DEVELOP • NASA Ames Research Center
Project Coordination Fellow (September 2019 – September 2020)
• Supported Earth science projects across 11 locations and developed partnerships to highlight the scientific applications of NASA satellite sensors for environmental and public policy issues.
• Edited proposals, technical deliverables, and science communication materials.
• Assisted DEVELOP locations with scoping and generation of novel research projects in areas such as water resources, ecological forecasting, food security & agriculture, and health & air quality.

NASA DEVELOP • Boston University
Center Lead (April 2018 – August 2019) + Project Lead (January 2018 – March 2018)
• Proposed remote sensing and GIS projects that utilize NASA Earth observations.
• Carried out remote sensing data processing and analysis using geospatial and statistical analysis platforms (i.e. Google Earth Engine, SeaDAS, ACOLITE, R).
• Managed project team members as well as participant selections and developed partnerships with environmental and public policy organizations.

The Nature Conservancy • Pulaski, NY
Environmental DNA Project Coordinator (June 2017 – October 2017)
• Sampled aquatic ecosystems for environmental DNA analysis and operated underwater video surveillance equipment.
• Coordinated Cornell University laboratory staff, volunteers, TNC staff members, and U.S. Fish and Wildlife officials.
• Managed, analyzed, and stored eDNA data and video files.
• Contributed to a final technical report and eDNA citizen science reference guide made available to the public.

Exosome Diagnostics, Inc. • Cambridge, MA
Clinical Laboratory Technologist (November 2016 – April 2017)
• Completed RNA extractions and qPCR analysis as a part of a clinical prostate cancer testing procedure.
• Managed testing work flow and results using laboratory information management systems.
• Assisted with sample accessioning and laboratory safety.

Microarray and Sequencing Resource Laboratory • Boston University School of Medicine
Research Technician (August 2015 – October 2016)
• Completed genetics and genomics experiments using Affymetrix microarray processing, Illumina sequencing, and Ion Proton sequencing.
• Contributed to various projects related to osteology, rheumatology, and cancer biology as well as projects outside of the medical school related to general biology and marine ecology.
• Assisted with project management and client communications.

PUBLICATIONS

Bengtsson, Z., Kuhn, K., Battaglino, A., Li, A., Talbot, M., Wafapoor, M., Atta, C., Kowalski, M., Margolis, S., Rar, E., Burmester, E., Lesneski, K., Scavo Lord, K., Kaufman, L., Stewart, N., and Finnerty, J. (2019). *Corals of the genus Porites are a locally abundant component of the epibiont community on mangrove prop roots at Calabash Caye, Turneffe Atoll, Belize*. Caribbean Naturalist, Volume 67.

Lord, K.S., Lesneski, K., **Bengtsson, Z.**, Kuhn, K., Madden, J., Cheung, B., Ewa, R., Taylor, J., Burmester, E., Morey, J., Kaufman, L., Finnerty, J. (2020). *Multi-year viability of a reef coral population living on mangrove roots suggests an important role for mangroves in the broader habitat mosaic of corals*. Frontiers in Marine Science, Volume 7.

Zhang, X., Fichot, C. G., Baracco, C., Guo, R., Neugebauer, S., **Bengtsson, Z.**, Ganju, N., Fagherazzi, S. (2020). *Determining the drivers of suspended sediment dynamics in tidal marsh-influenced estuaries using high-resolution ocean color remote sensing*. Remote Sensing of Environment, Volume 240.

SELECTED PROJECTS

Citizen Science, Environmental DNA, and Underwater Video Surveillance in Eastern Lake Ontario
The Nature Conservancy • June 2017 – October 2017
• Utilized environmental DNA and underwater video surveillance to detect invasive aquatic species in Lake Ontario and surrounding rivers.
• Identified DNA from an invasive fish species thought not to be present in the Lake Ontario region.
• Examined the feasibility of this technology for use by citizen scientists at a community level for waterbody management.

Corals of the Genus *Porites* are a Locally Abundant Component of the Epibiont Community on Mangrove Prop Roots at Calabash Caye, Turneffe Atoll, Belize

Boston University Undergraduate Research • October 2015 – August 2015

• Collected data in the field to examine the abundance and distribution of *Porites* corals in the mangrove ecosystems of Calabash Cay, Turneffe Atoll, Belize.
• Analyzed colony photography and spatial data to determine relative age and clustering distribution trends.
• Handed off research to be continued by a Boston University graduate student.

Examining Tick-Borne Illness Risk by Evaluating Land Cover and Tick Habitat Suitability in Southern Maine

NASA DEVELOP, Boston University • June 2019 – August 2019

• Analyzed Landsat 8 OLI imagery to assess land cover classes relevant to tick-human encounter.
• Utilized simple Bayesian statistical models to assess the relationship between environmental parameters and Lyme disease incidence.
• Communicated tick-borne illness risk to community partners in Cumberland County, Maine.

Employing Remote Sensing Techniques to Evaluate Flood Extent and Environmental Parameters that Contribute to High Water Levels in Lake Ontario's Coastal New York Communities

NASA DEVELOP, Boston University • January 2019 – April 2019

• Created a user-friendly tool to compile and visually display precipitation, soil moisture, and snow/ice cover remote sensing data.
• Examined the feasibility of using current urban flood mapping methods to target frequently flooded areas in the Niagara Falls, NY area.
• Coordinated with municipal offices and universities to establish use of this data in future flood modeling efforts.

Employing Remote Sensing Techniques to Quantify Sediment Supply and Evaluate Marsh Vulnerability in the Plum Island Estuary

NASA DEVELOP, Boston University • January 2018 – August 2018

• Led the team at DEVELOP Massachusetts in the use of Landsat 8 OLI and Sentinel-2 MSI imagery to calculate suspended sediment concentration (SSC) in the Plum Island Estuary.
• Developed a local algorithm for the conversion of remote sensing reflectance to SSC.
• Coordinated with partners at the USGS and Boston University to incorporate results into sediment flux modeling and marsh vulnerability assessment.

PRESENTATIONS

Narrowing the Gap in Environmental Problem Solving: Connecting with Communities Using Emerging Geospatial and Communications Technologies. American Geophysical Union Fall Meeting, December 2020. eLightning & Poster Session Convener.

Wildlife CSI: Using Environmental DNA and Remote Sensing to Solve Ecological Crimes. Ignite@AGU (https://youtu.be/VP-W-xVp4OY), December 2019. Oral presentation.

Using NASA Earth Observations within the DEVELOP National Program to Address Environmental Issues in Bhutan. NASA Ames Research Center Earth Science Presentations for His Majesty Jigme Khesar Namgyel Wangchuck, King of Bhutan, Novermber 2019. Oral presentation.

Employing Remote Sensing Techniques to Quantify Sediment Supply and Evaluate Marsh Vulnerability in the Plum Island Estuary. William T. Pecora Memorial Remote Sensing Symposium (Pecora 21) and the International Symposium on Remote Sensing of Environment (ISRSE 38), October 2019. Oral presentation.

Examining Tick-Borne Illness Risk by Evaluating Land Cover and Tick Habitat Suitability in Southern Maine. NASA Applied Sciences Health & Air Quality Program Review, September 2019. Oral presentation.

Applying the Lens of NASA Earth Observations to Flood Conditions Monitoring Along the Coast of Lake Ontario. Great Lakes and St. Lawrence Cities Initiative Annual Meeting, June 2019. Oral presentation.

Employing Remote Sensing Techniques to Evaluate Flood Extent and Environmental Parameters that Contribute to High Water Levels in Lake Ontario's Coastal New York Communities. Goddard Space Flight Center Mid-Atlantic DEVELOP Closeout Symposium, April 2019. Oral and poster presentation.

Employing Remote Sensing Techniques to Quantify Sediment Supply and Evaluate Marsh Vulnerability in the Plum Island Estuary. NASA Annual Earth Science Applications Showcase, August 2018. Poster presentation.

HONORS AND AWARDS

Latin Honors: *Cum Laude*, Boston University (2015)
BU Marine Program Convocation Speaker, Boston University (2015)
Dean's List, Boston University (2014-2015)
Trustee Scholar, The George Washington University (2011-2013)