

Margaret (Molly) Keogh

Postdoctoral Scholar, University of Oregon, Eugene, OR
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PRIMARY RESEARCH INTERESTS

Wetland geology, coastal geomorphology, sedimentology, community outreach and education

EDUCATION

Ph.D., Earth and Environmental Sciences, Tulane University **2019**

Dissertation: Accretion, compaction, and restoration: Sediment dynamics and relative sea-level rise in coastal wetlands

Advisors: Dr. Torbjörn Törnqvist, Dr. Alexander Kolker

B.S., Geological Sciences, Biology minor, *magna cum laude*, University of Oregon, **2010**
Clark Honors College

Honors thesis: Stratigraphic analysis of late Miocene to early Pliocene (?) sedimentary rocks, SW Isla Tiburón, Sonora, Mexico

Advisor: Dr. Rebecca Dorsey

School for Field Studies wildlife ecology and management program, Mto Wa Mbu, Tanzania **2008**

Oregon Institute of Marine Biology, Charleston, OR **2007**

PROFESSIONAL EXPERIENCE

Postdoctoral Scholar, University of Oregon, Eugene, OR **2021 - present**

Supervisor: Dr. David Sutherland

- Investigating sediment dynamics in the Coos Estuary, focusing on the implications of sediment accretion, climate change, and human environmental manipulation on native ecosystems.

Technical Proposal Specialist, Quantum Spatial, Corvallis, OR **2020 - 2021**

Supervisor: Dr. Oriane Taft

- Developed technical proposals to win multimillion-dollar Federal geospatial services contracts, focusing on topographic and bathymetric lidar and orthoimagery.

Graduate Research Assistant, Tulane University, New Orleans, LA **2014 - 2019**

Supervisors: Dr. Torbjörn Törnqvist, Dr. Alexander Kolker

- Quantified the effects of hydrology on sediment deposition in deltas and assessed implications for wetland restoration using sediment cores, gamma spectroscopy, and geospatial analysis.
- Investigated the role of organic material in delta accretion and long-term wetland sustainability using sediment core data and analysis of compaction rate and magnitude.
- Critically evaluated methods of measuring present-day relative sea-level rise in low-elevation coastal zones using stratigraphic analysis and archived records for tide gauges and GPS stations.

Visiting Researcher, Deltares, Utrecht, The Netherlands **Fall 2018**
Supervisor: Dr. Gilles Erkens

- Pioneered the use of the sediment compaction modeling software D-Settlement for use in river diversion settings.

Environmental Scientist, Stantec Consulting, Ellensburg, WA **2011 - 2014**
Supervisor: Janice Gardner, M.S.

- Led field operations for post-construction wildlife monitoring at new wind farms. Completed standardized avian and bat fatality surveys, monitored nesting raptors, managed field data, and assisted with report preparation and field crew training.

Hydrogeology Intern, Washington Water Trust, Ellensburg, WA **2010 - 2011**
Supervisor: Jason McCormick

- Correlated water well drilling logs and surface maps to determine local geology, groundwater flow divides, and groundwater/surface water interaction.

Geology Field Assistant, University of Oregon, Eugene, OR **Summer 2010**
Supervisors: Dr. Ray Weldon, Dr. Kate Scharer

- Assisted with surveying and stratigraphic analysis of a multi-trench site along the San Andreas Fault at Frazier Mountain, CA, using a total station, RTK GPS, and stratigraphic correlation.

Geology Field Assistant, University of Oregon, Eugene, OR **Spring 2009**
Supervisors: Dr. Rebecca Dorsey

- Investigated the timing of the opening of the Gulf of California through geologic mapping of Isla Tiburón (Sonora, Mexico), stratigraphic analysis, facies identification, and petrographic analysis.

Fisheries Biology Field Technician, Oregon State University, Corvallis, OR **Summers 2007 - 2009**
Supervisors: Dr. Doug Bateman, David Leer

- Captured native fish in coastal watersheds, inserted PIT tags, and collected population data to study the effects of logging on fish communities.

TEACHING EXPERIENCE

Graduate Teaching Assistant, Tulane University, New Orleans, LA **2015 - 2017**
Supervisors: Dr. Stephen Nelson, Dr. Jeffrey Agnew

- Prepared and taught hands-on and theory-based laboratory activities for:
 - Petrology Laboratory Spring 2016, 2017
 - Mineralogy Laboratory Fall 2015, 2016, 2017
 - Physical Geology Laboratory Spring 2015

Assistant STEM Instructor, GE Girls Camp, New Orleans, LA **Summer 2018**
Supervisors: Allison Luzader, Dr. Michelle Sanchez

- Prepared and taught a wide variety of hands-on STEM activities for 30 girls, ages 11-13, for a weeklong camp. Mentored a sub-group of 7 girls, acting as a role model and encouraging inquiry.

PEER REVIEWED PUBLICATIONS

Submitted: **Keogh, M.E.**, T.E. Törnqvist, A.S. Kolker, G. Erkens, and J. Bridgeman. Organic matter accretion, shallow subsidence, and river delta sustainability. *Journal of Geophysical Research: Earth Surface*.

Keogh, M.E. and T.E. Törnqvist. 2019. Measuring rates of present-day relative sea-level rise in low-elevation coastal zones: A critical evaluation. *Ocean Science*, 15, 61-73.

Keogh, M.E., A.S. Kolker, G.A. Snedden, and A.A. Renfro. 2019. Hydrodynamic controls on sediment retention in an emerging diversion-fed delta. *Geomorphology*, 332, 100-111.

Nienhuis, J.H., T.E. Törnqvist, K.L. Jankowski, A.M. Fernandes, and **M.E. Keogh**. 2017. A new subsidence map for coastal Louisiana. *GSA Today*, 27(9), 58-59.

TECHNICAL SKILLS

Field instruments: Sediment auger and gouge, other hand-coring devices, Vibracorer, real-time kinematic GPS, acoustic Doppler current profiler, Niskin water sampler, conductivity/temperature/depth sensors, certified small boat operator (2017)

Laboratory instruments: Low-energy gamma spectrometer, laser particle-size analyzer, muffle furnace

Software: ArcGIS Pro, D-Settlement, ENVI, Microsoft Excel, Adobe Illustrator, Photoshop, InDesign

MEDIA COVERAGE (selected)

Encompass Films. 2020. Last Call for the Bayou: 5 Stories From Louisiana's Disappearing Delta (Episode 2: Mud, Sweat, and Fears). Trailer available at: <https://www.lastcallforthebayou.com>.

Cook, T. (CEO of Apple). 2019. Keynote speech, Tulane University Commencement, May 18. Available at: <https://www.youtube.com/watch?v=taLzKBS-Yu4> (beginning at time 13:39).

Voosen, P. 2019. Seas are rising faster than believed at many river deltas. *Science*, 363, 441.

Lux, T. 2019. Coastal news roundup: Marshes sinking faster than previously thought. WWNO New Orleans Public Radio, February 1. Available at: <https://www.wwno.org/post/coastal-news-roundup-marshes-sinking-faster-previously-thought>.

Jackman, C. 2019. Tulane Study: Sea levels are rising faster than originally thought. WWLTV, January 30. Available at: <https://www.wwltv.com/article/news/tulane-study-sea-levels-are-rising-faster-than-originally-thought/289-f6ca1d44-9167-4243-a337-41e4525c95f1>.

White, M. 2017. Forecast: Climate conversations with Michael White (climate sciences editor for *Nature*). Available at: <https://forecastpod.org/2018/12/20/episode-58-11th-graduate-climate-conference/> (beginning at time 41:20).

ORAL PRESENTATIONS (selected)

Conference Presentations:

Keogh, M., T. Törnqvist, A. Kolker, and G. Erkens. 2019. Sediment compaction and delta sustainability: What is the role of organic material? American Geophysical Union Fall Meeting, December 9-13, San Francisco, CA.

Keogh, M. and T.E. Törnqvist. 2018. Measuring rates of present-day relative sea-level rise in low-elevation coastal zones: A critical evaluation. International Union for Quaternary Research–Past Global Changes Conference for Early-Career Researchers, August 26-29, Utrecht, The Netherlands.

- Keogh, M., A. Kolker, G. Snedden, and A. Renfro. 2018. Sediment retention in diversion-fed coastal wetlands: A field-based conceptual model. State of the Coast Conference, May 30-June 1, New Orleans, LA.
- Keogh, M. 2017. Building wetlands in an era of rapid sea-level rise and subsidence. 11th Graduate Climate Conference, November 10-12, Woods Hole, MA.
- Keogh, M., A. Kolker, G. Snedden, and A. Renfro. 2017. Hydrologic controls on sediment retention in an emerging delta. Coastal and Estuarine Research Federation's 24th Biennial Conference, November 5-9, Providence, RI.

Guest Lectures:

- Keogh M. 2021. Organic matter accretion, shallow subsidence, and river delta sustainability. Quaternary Research Group, Tulane University, April 12, 2021.
- Keogh, M. 2021. The ups and downs of coastal wetlands: Organic matter accretion, shallow subsidence, and river delta sustainability. Department of Earth Sciences, University of Oregon, March 3, 2021.
- Keogh, M. 2018. Channels and lobes and floods, oh my! A geological tour of the Mississippi Delta. Maritime Studies Program, Williams College and Mystic Seaport, November 7, Cocodrie, LA.
- Keogh, M. 2018. Coastal Louisiana in a world of change. Tulane Interdisciplinary Experience Seminar (TIDES) 1034, New Orleans: The Lay of the Land, October 15, New Orleans, LA.
- Keogh, M. 2018. Delta geology. Mississippi River Delta Institute for K-12 science teachers, June 11, New Orleans, LA.

WORKSHOPS

- Coastal Changes and Evolution. 2019. A multidisciplinary training school for early career coastal researchers. September 15-18, Sardinia, Italy.

HONORS, AWARDS, AND GRANTS (selected)

National Estuarine Research Reserve System (NERRS) Science Collaborative Grant (co-investigator; \$598,307)	2021
Corasaniti Cowen Scholars Fellowship, School of Science and Engineering, Tulane University	2018
Outstanding Research Assistant Award, Dept. of Earth and Env. Sci., Tulane University	2018
Student Oral Presentation Award, 1 st Place, State of the Coast Conference	2018
Outstanding Teaching Assistant Award, Dept. of Earth and Env. Sci., Tulane University	2016, 2017
Research Grant, PADI Foundation (principal investigator; \$5500)	2015
Phi Beta Kappa honor society, Oregon Six honor society, University of Oregon	2010

SERVICE TO THE PROFESSION

Reviewer: 4 manuscripts (Nature Communications; Scientific Reports; Global and Planetary Change; Estuarine, Coastal and Shelf Science); 1 book chapter (Bayous & Barriers, Canals & Katrina)	2019 - 2021
Blog post: Optimizing river diversions in order to maximize sediment retention and land building. Delta Dispatches blog, Restore the Mississippi River Delta, May 23.	2019
Sediment texture workshop, Mississippi River Delta Institute for K-12 science teachers	2018
Group leader and workshop assistant, Girls in STEM at Tulane	2015, 2017