

# Alina C. Spera

Woods Hole Oceanographic Institution

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## ACADEMIC APPOINTMENTS

### **Postdoctoral Investigator – Guimond Group,**

Woods Hole Oceanographic Institution, 2024-Present

Project: *Collaborative Research: Drivers and Biogeochemical Implications of Saltwater Intrusion Along Arctic Coastlines (NSF Arctic Natural Sciences)*

## EDUCATION

### **Ph.D. Ecology and Evolutionary Biology, 2024**

University of Texas at El Paso.

Advisor: Vanessa L. Lougheed. Defended July, 2024

Dissertation: [Ecological, Climatic, and Geomorphic Controls of the Flux and Fate of CO<sub>2</sub> From Coastal Arctic Ecosystems](#)

### **M.S. Oceanography and Coastal Sciences, 2019**

Louisiana State University

Advisor: John R. White. Defended May 2019

Thesis: [Decadal changes of soil physiochemical properties in a freshwater wetland after hydrologic reconnection,](#)

### **B.S. Marine Science and Biology, Minor: Geological Sciences, 2016**

University of Miami, Rosenstiel School of Marine and Atmospheric Science

Departmental Honors

### **Guest Student, Spring 2015**

James Cook University, Townsville, QLD, Australia

## PUBLICATIONS (peer-reviewed)

6. Marvy, A., Andresen, C., **Spera, A.C.**, Lougheed, V.L., 2026. Contrasting CO<sub>2</sub> fluxes among Arctic pond types are driven by differences in carbon lability, terrestrial inputs, and benthic respiration. *JGR Biogeosciences*. <https://doi.org/10.1029/2025JG009318>
5. **Spera, A.C.**, Peterson, S., Tweedie, C., Lougheed, V., 2026. Wind-driven Circulation Impacts Water Quality and pCO<sub>2</sub> Over an Estuarine Gradient in an Arctic Lagoon. *Estuaries and Coasts* 49, 49. <https://doi.org/10.1007/s12237-025-01662-6>
4. **Spera, A.C.**, McClelland, J.W., Demir, C., Cardenas, M.B., Guimond, J.A., 2025. Saltwater inundation's concurrent effects on below-ground thermal hydrology and above-ground properties of Arctic coastal tundra. *Science of The Total Environment* 1008, 180906. <https://doi.org/10.1016/j.scitotenv.2025.180906>
3. **Spera, A.C.**, Lougheed, V.L., 2025. Carbon dioxide fluxes of Arctic coastal ecosystems controlled by seasonal patterns of land-to-ocean connectivity. *Limnology and Oceanography*, June 2025. <https://doi.org/10.1002/lno.70101>
2. **Spera, A.C.**, Lougheed, V.L., 2025. CO<sub>2</sub> Emissions From Low Order Tundra Streams Stimulated by Surface-Subsurface Connectivity Following Extreme Rainfall Events. *JGR Biogeosciences* 130, e2024JG008459. <https://doi.org/10.1029/2024JG008459>

1. **Spera, A.C.**, White, J.R., Corstanje, R., 2020. Spatial and temporal changes to a hydrologically-reconnected coastal wetland: Implications for restoration. *Estuarine, Coastal and Shelf Science* 238, 106728. <https://doi.org/10.1016/j.ecss.2020.106728>

## MANUSCRIPTS IN REVIEW OR PREPARATION

1. Peterson, S.V., **Spera, A.C.**, Lougheed, V.L., Tweedie, C., *in prep*, Nearshore Turbidity in a Rapidly Changing Arctic: Implications for Sediment and Carbon Cycling in a Coastal Lagoon

## GRANTS + FELLOWSHIPS

- **Co-PI, NSF Arctic Natural Sciences Grant (in review), 2026-2029**
- **National Academies NRC Research Associateship Fellowship (Awarded), 2026-2028**

## TEACHING + SCIENCE COMMUNICATION

### ***Teaching experience:***

Guest Lecturer University of Texas at El Paso, 2023-2024

- Prepared two lectures for a graduate and undergraduate level Limnology course on aquatic biogeochemistry.

Guest Lecturer Virginia Institute of Marine Science, 2023

- Delivered lecture for a graduate level Arctic Sciences course on Arctic terrestrial and aquatic greenhouse gas fluxes.

Field Station Educator at Chincoteague Bay Field Station, Wallops Island VA – 2016-2017

- Lead placed based marine ecology and oceanographic education programs for children, adults, and college level field course programming.

Assistant Naturalist with NJ Fish and Wildlife, IBSP NJ - Summer 2013, 2014

- Operate hands-on, place-based environmental education programs located in Barnegat Bay Marine Conservation Zone for students and educational groups.

### ***Pedagogical Training:***

Co-Organizer for Programming in Earth science Classrooms Educational workShop (PECES)

- Organized workshop aiming to equip early career scientists to effectively incorporate programming into Earth Science course instruction.

ACUE Course in Promoting Active Learning - Fall 2023

- Completion of an Association of College and University Educators course requiring the implementation of evidence-based instructional approaches.

### ***Science Communication:***

- LTER Network Student Science Writing Fellow- April 2021-August 2022
- Publication Editor and Author for *Envirobites.org* - May 2018-August 2020
- Contributor to LSU College of the Coast and Environment Newsletter - June 2018 – May 2019

## MENTORING

### ***University of Texas at El Paso***

- Primary research mentor for eight undergraduate students and one post-baccalaureate researcher
- Supervised student fieldwork in remote Arctic environments, laboratory analyses, and data interpretation.
- Mentoring outcomes:
  - o Two undergraduate poster presentation awards
  - o One article published with post-baccalaureate researcher as first author

### ***Louisiana State University***

- Research mentor for three undergraduate students in laboratory research, data analysis, and conference presentation preparation.

## PUBLISHED DATASETS

1. Beaufort Lagoon Ecosystems LTER. 2026. Daily average pCO<sub>2</sub>, dissolved oxygen, and water quality in Elson Lagoon: 2019, 2021, 2022 ver 1. Environmental Data Initiative. <https://doi.org/10.6073/pasta/bd140df496a851ced06f8f03445f73ab>.
2. Beaufort Lagoon Ecosystems LTER, Core Program. 2026. Spot and continuous seasonal pCO<sub>2</sub> sensor measurements from lagoon and river sites along the Alaska Beaufort Sea coast, 2019-ongoing ver 4. Environmental Data Initiative. <https://doi.org/10.6073/pasta/fe576c1fedeb7a369c6d58c1fa3431e6>.
3. Beaufort Lagoon Ecosystems LTER, Core Program. 2025. Free water metabolism (FWM) derived net ecosystem production (NEP) from lagoon sites along the Beaufort Sea Coast, Alaska, 2019-ongoing ver 1. Environmental Data Initiative. <https://doi.org/10.6073/pasta/74f675276213727571c2b3f6c197fa17>.
4. Beaufort Lagoon Ecosystems LTER, A. Spera, and V. Lougheed. 2025. Daily summer riverine and groundwater pCO<sub>2</sub>, dissolved oxygen, and ecosystem metabolism from sites along the Alaska Beaufort Sea coast, 2019-2022 ver 1. Environmental Data Initiative. <https://doi.org/10.6073/pasta/eb56765417b7156cb178c73d963c7283>.

## RESEARCH EXPERIENCE

### **Research Assistant at the University of Texas at El Paso – August 2019-August 2024**

- Led small field teams in coastal Arctic aquatic sampling, deployment of shallow marine moorings and long term aquatic instrumentation. Managed and conducted laboratory biogeochemical operations and analysis.

### **Participant in BREATHE 2023 Sea Ice Field School - May 2023**

- Student participant for sea ice field school aboard Kronprins Haakon ice breaking research vessel with University of Tromsø (UiT). Sea ice and oceanographic sampling and data collection.

### **Research Assistant at Louisiana State University – August 2017-August 2019**

- Led field team in coastal wetland soil sampling and conducted laboratory biogeochemical analysis for master's thesis to determine effectiveness of local hydrological restoration.
- Contributed to daily lab operations, organized and processed soil and water samples.

### **Undergraduate Thesis Project, University of Miami, Miami, FL - Spring 2016**

- Project for departmental honors at the University of Miami.
- *Thesis title:* "Distribution of cephalopod paralarvae in the Eastern Caribbean (U.S. and British Virgin Islands)."

### **Lab Assistant in National Marine Fisheries Service, Miami FL - January 2014-May 2016**

- Assisted with data collection, data entry, and support for fish and invertebrate larval research projects. Completed independent research project.

## INVITED TALKS

1. *"Thawing Boundaries: Coupled Physical and Biogeochemical Processes Shaping Terrestrial-Aquatic Connectivity in Permafrost Landscapes"*. Permafrost Young Researchers Network Webinar Series, May 8, 2026.
2. *"Saltwater Intrusion as an Emerging Driver of Coastal Hydrologic Change in the Arctic Coastal Plain"*. University of Texas at El Paso, Ecology and Evolutionary Biology Program Seminar, April 8, 2026.

3. *“Arctic Aquatic Connectivity Under Change: Linking Physical and Biogeochemical Processes Across the River–Ocean Interface”*. Northeastern University Marine Science Department Seminar, March 10, 2026.

## PRESENTATIONS

1. **Coastal and Estuarine Research Federation, Richmond, VA - November 2025**  
*Talk title: “Tundra salinization alters subsurface hydrothermal characteristics and threatens Arctic coastal resilience”*
2. **Saltwater Intrusion Meeting (SWIM), Barcelona, Spain – June 2025**  
*Talk title: “Feedbacks between saltwater intrusion, permafrost thaw, and soil thermal properties in an arctic coastal system”*
3. **Ocean Sciences Meeting, New Orleans, LA - February 2024**  
*Talk title: “What is the relative contribution of nearshore CO<sub>2</sub> flux to estuarine carbon balance in an Arctic lagoon?”*
4. **Coastal and Estuarine Research Federation, Portland, OR - November 2023**  
*Talk title: “Seasonal trends of CO<sub>2</sub> flux and metabolic status of Arctic lagoons”*
5. **Joint Aquatic Sciences Meeting, Grand Rapids, MI - May 2022**  
*Talk title: “Relating form to physical and ecological contributions to CO<sub>2</sub> evasion in small streams on the Alaskan Arctic coastal plain”*
6. **American Geophysical Union, New Orleans, LA - December 2021**  
*Poster title: “Seasonal Shifts in Carbon Flux and Cycling in an Arctic Lagoon”*
7. **Alaska Marine Science Symposium, Anchorage, AK - January 2020**  
*Poster title: “Land-Ocean Connectivity of Inorganic Carbon Dynamics in Small Coastal Watersheds and Lagoon Systems on the North Slope of Alaska”*
8. **LSU CC&E Graduate Student Symposium, Baton Rouge, LA - April 2019**  
*Talk title: “Decadal changes of soil physiochemical properties in a freshwater wetland after hydrologic reconnection”*
9. **Soil Science Society of America Annual Meeting, San Diego, CA - January 2019**  
*Talk title: “Effect of Mississippi River Surface Water Diversion on Wetland Soils after 10+ Years of Operation”*
10. **State of the Coast Conference, New Orleans, LA - June 2018**  
*Poster title: “Effect of hydrologic restoration on coastal Louisiana freshwater wetland soil properties and resilience”*
11. **International Symposium on Biogeochemistry of Wetlands, Ft Lauderdale, FL April 2018**  
*Talk title: “Effect of hydrologic restoration on coastal Louisiana freshwater wetland soil properties and resilience”*
12. **University of Miami Rosenstiel School of Marine and Atmospheric - May 2016**  
**Science Undergraduate Poster Symposium, Miami FL**  
*Poster title: “Distribution of cephalopod paralarvae in the Eastern Caribbean (U.S. and British Virgin Islands).”*

## HONORS AND AWARDS

- **LSU CC&E Graduate Student Symposium Award: First Place, 2019**
- **Society of Wetland Scientists Student Research Grant, 2018**

## SERVICE TO THE PROFESSION

- Subcommittee Co-Chair, Attendee Experience Committee, Coastal and Estuarine Research Federation Annual Meeting, 2024–2025

- Executive Committee Student Representative, Beaufort Lagoon Ecosystems (BLE) LTER, 2020–2023
- President, Biology, Environmental and Engineering Graduate Student Group, University of Texas at El Paso, 2020–2022

### PUBLICATIONS (popular media)

- **Spera, Alina C** “Stream Dissolved Nitrogen Cycling Responds to Human Activity across the Landscape”, LTER Network Science Stories. March 2022. [URL](#).
- **Spera, Alina C.** “Thawing Out Coastal Arctic Food Webs with Long-Term Biochemical Data”, LTER Network Science Stories. September 2021. [URL](#).
- **Spera, Alina C.** “What Microfossils Can Tell Us About Sea Level Rise”, ECO Magazine Special Issue: State of the Coast, December 2018. [URL](#).

### OUTREACH & BROADER IMPACTS

- Science Field Trip Facilitator, Insights El Paso Science Center, 2022–2024
- Invited Speaker, El Paso High School Science Career Showcase, 2022–2023
- Community Outreach Volunteer, Utqiagvik Boys and Girls Club, 2022
- Outreach Coordinator, Ukpeagvik Iñupiat Corporation Science & Culture Fair, 2019, 2023
- Louisiana Sea Grant Ocean Commotion Outreach Event Organizer, 2017–2018

### PROFESSIONAL MEMBERSHIP

- Society of Wetland Scientists (SWS), American Geophysical Union (AGU), Ecological Society of America (ESA), Coastal and Estuarine Research Federation (CERF)
- Alpha Pi Chapter of Alpha Phi Omega, International Co-ed Service Fraternity

### REFERENCES AVAILABLE UPON REQUEST