**Sophia LaFond-Hudson**

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**EDUCATION**

Ph.D., Water Resource Science, University of Minnesota Duluth (UMD), May 2020

Dissertation: “Biogeochemical interactions and ecological consequences of sulfur in stands of wild rice (*Zizania palustris*)”

M.S., Water Resource Science, University of Minnesota Duluth, June 2016

Thesis: *“*Iron and sulfur cycling in the rhizosphere of wild rice *(Zizania palustris)”*

B.A., Chemistry, St Olaf College, Northfield, MN, May 2013

B.A., Environmental Studies, St Olaf College, Northfield, MN, May 2013

**EMPLOYMENT**

**Postdoctoral Researcher** **Jan. 2021-current**

*Oak Ridge National Laboratory*

* Modeling coastal wetland vegetation responses to salinity
* Modeling greenhouse gas fluxes from coastal wetlands
* Organized workshop on Gulf coast terrestrial-aquatic interface research needs

**Adjunct Assistant Professor** **August 2020-Nov. 2020**

*St Olaf College*

* Taught Introduction to Environmental Studies

**Researcher** **June 2020-Sept. 2020**

*University of Minnesota Duluth*

* Designed and conducted experiments researching recovery of wild rice populations from sulfur toxicity. Using the populations exposed to long term sulfate loading in my dissertation research, I am exploring how populations will recover when sulfate addition to surface water is ceased.
* Collaborated on experiments researching restoration of wild rice microbiome. These experiments explore if microbiomes from healthy wild rice stands can be extracted and injected into sediment of declining wild rice stands.

**Graduate Research/Teaching Assistant**  **June 2014-May 2020**

*University of Minnesota Duluth*

* Designed and conducted experiments researching sulfur toxicity to wild rice populations. Wild rice was grown individually in buckets or in small populations in stock tanks; water and sediment sulfur and iron chemistry was manipulated to explore geochemical-plant interactions. Populations in stock tanks had sulfate added to the surface water for 5+ years.
* Led collection and data analysis from wild rice projects (see Laboratory/Field Skills).
* Wrote and published peer-reviewed journal articles with collaborators (see Publications).
* Prepared and presented research findings via oral and poster presentations at scientific conferences and community meetings (see Invited Presentations and Presentations/Professional Meeting Proceedings)
* Taught undergraduate labs, discussions, and summer research experiences (see Teaching/Mentoring).

**PUBLICATIONS**

* LaFond-Hudson, S., Johnson, N., Pastor, J., Dewey, B. Sulfur geochemistry impacts population oscillations of wild rice (*Zizania palustris*) In revision.
* LaFond-Hudson, S., Johnson, N., Pastor, J., Dewey, B. 2020. Interactions between sulfide and reproductive phenology of an annual aquatic plant, wild rice (*Zizania palustris*). *Aquatic Botany.*
* LaFond-Hudson, S., Johnson, N., Pastor, J., Dewey, B. 2018. “Iron sulfide formation on root surfaces controlled by the life cycle of wild rice (*Zizania palustris*)” *Biogeochemistry*. 141(1) 95-106.

**AWARDS AND FELLOWSHIPS**

2021 Climate Change Science Institute Call for Ideas funded proposal $25,000

 “Gulf Coast Terrestrial Aquatic Interface: Climate Change and Disturbances

2020 Outstanding Graduate Teaching Assistant, UMD Department of Biology

2019 Graduate School Travel Award $400

2019 Water Resource Science Travel Award $400

2018 UMD Civil Engineering Fellowship $4,625

2018 Water Resource Science Scholarship $3,500

2017 Water Resource Science Travel Award $157

2017 Swenson College of Science and Engineering Travel Grant $400

2015 Water Resource Science Travel Award $500

**LABORATORY/FIELD SKILLS**

*Geochemical sampling* Sonde, Passive diffusion samplers (peepers), sediment coring, rhizons, clean mercury collection, pH, voltammetry

*Geochemical analysis* Atomic absorbance spectroscopy, UV-Vis spectrophotometry, SUVA, ion chromatography, ion selective electrodes, sequential extractions (acid volatile sulfide, chromium reducible sulfide), titrations, total and dissolved solids, loss-on-ignition, DOC preservation and prep, 15NH4 isotope collection and prep for IRMS, saturation index, mixing models, reactive transport modeling, quality assurance/quality control techniques

*Biological sampling* Rhizotrons, mesocosms, phenology observations, chlorophyll fluorescence, anoxic root sampling, WinRhizo software (root morphology), ponar grabs

*Biological analysis* Biomass, moisture content, vegetative and seed tissue 15NH4 prep for IRMS, scanning electron microscopy, macroinvertebrate identification

*Other* Driving and trailering a boat, canoeing, boat safety, map-reading, GPS

**INVITED PRESENTATIONS**

* “Getting to the root of wild rice biogeochemistry” UMD Water Resources Seminar, Duluth, MN. September 16, 2019.
* “How does sulfur affect wild rice?” Science on Tap meeting, Ashland, WI, May 21, 2019.
* “Iron, sulfur, and plant life cycle controls on wild rice root surface chemistry.” St Olaf Chemistry Department Seminar, Northfield, MN. November 3, 2017.

**PRESENTATIONS / PROFESSIONAL MEETING PROCEEDINGS**

* LaFond-Hudson, S., Johnson, N., Pastor, J., Dewey, B “Biogeochemical and microbiological influences on sulfide toxicity in freshwater sediments.” Poster, Association of Environmental Engineering and Science Professors, Phoenix, AZ. May 16, 2019.
* LaFond-Hudson, S., Johnson, N., Pastor, J., Dewey, B “Influence of sulfate, iron, and organic carbon on wild rice populations.” Poster, State of Lake Superior Conference, Houghton, MI. October 11, 2018.
* LaFond-Hudson, S., Johnson, N., Pastor, J., Dewey, B. “Exploring the roles of iron and carbon controlling sulfide toxicity in multi-year wild rice mesocosms.” Presentation, National Meeting, Society of Environmental Toxicology and Chemistry, Minneapolis, MN. November 16, 2017.
* LaFond-Hudson, S. “Iron, sulfur, and plant life cycle controls on wild rice root surface chemistry.” St Olaf Chemistry Department Seminar, Northfield, MN. November 3, 2017.
* LaFond-Hudson, S., Johnson, N., Pastor, J., Dewey, B. “Iron sulfide precipitates on the roots of wild rice (*Zizania palustris*)” Oral Presentation, Midwest Chapter meeting, Society of Environmental Toxicology and Chemistry, Minneapolis, MN. March 21, 2017
* LaFond-Hudson, S., Johnson, N., Pastor, J., Dewey, B. “Iron sulfide accumulation on the roots of wild rice” Oral Presentation, Twin Ports Freshwater Folk Meeting, Duluth, MN. Aug 3 2016.
* LaFond-Hudson, S., Johnson, N., Pastor, J., Dewey, B. “Investigating iron and sulfur accumulation on wild rice roots.”Platform Presentation, National Meeting, Society of Environmental Toxicology and Chemistry, Salt Lake City, UT. November 1-5, 2015.
* LaFond-Hudson, S., Johnson, N., Pastor, J., Dewey, B. “Sulfur, iron, and carbon geochemistry in the rooting zone of wild rice.” Poster, Minnesota Water Resources Conference, St. Paul, MN. October 13-14, 2015.

**TEACHING & MENTORING**

*Instructor of record:*

Introduction to Environmental Studies, St Olaf College, Fall 2020 (remote teaching)

*Graduate teaching assistantships*:

General Biology II, UMD, Spring 2019, 2018, & 2015, Fall 2014, TA coordinator, Spring 2020

Hydraulics and Hydrology, UMD, Fall 2019

Environmental Engineering, UMD, Fall 2018

General Biology I, UMD, Fall 2017

*Mentoring:*

Northstar STEM Alliance, June-August 2015 (1 student)

NSF-REU Sustainable Land and Water Resources program, June-August 2016, 2017, 2019, 2020 (14 students).

*Guest Lectures*:

“How does sulfur affect wild rice?” Chemistry of Sustainability, College of St Scholastica, Jan 29, 2020

“Limnology” Environmental Engineering, UMD, Nov 15, 2019

“Stoichiometry and mass flow” Environmental Engineering, UMD, Sept 27, 2019

“Bioessential elements” General Biology II, UMD, April 29, 2019

“Sulfur and wild rice” Chemistry of Sustainability, College of St Scholastica, March 7, 2019

“Biological oxygen demand” Environmental Engineering, UMD, March 19-21, 2018

*Volunteer:*

Advising Panel, McNair Scholars, June 10, 2019, University of Wisconsin Superior.

Fond du Lac Ojibwe High School engineering visit day, November 8, 2018.

Science fair judge, NE MN Regional & American Indian Science & Engineering Fair 2017, 2018.

Partners in Education, Lake Superior Geology lessons (2-5th grade), Spring 2017.

**CERTIFICATIONS**

Watershed Specialist Training, University of MN Water Resources Center, September-December 2015