


# Freshwater@UW

## Summer Research Opportunities Program

### 2027 Project Catalog

The Freshwater@UW Summer Research Opportunities Program (SROP) provides high-impact educational opportunities by facilitating immersive, hands-on mentored research experiences in freshwater science across the 13 Universities of Wisconsin. This catalog contains the 40 undergraduate projects submitted by faculty and staff mentors for the 2027 summer program.

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# Index by Institution & Research Site

Projects are grouped below by primary host institution and research site location. The 2027–2028 catalog features research projects hosted across 10 academic, state, and federal research facilities in Wisconsin.

| Code | Project Title | Institution & Location |
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| **GB01** | Develop OpenReef: Autonomous, Low-Cost Water-Quality Monitoring | University of Wisconsin - Green Bay (Green Bay, WI) |
| **GB02** | Test Reactive Media for Cleaner Water | University of Wisconsin - Green Bay (Green Bay, WI) |
| **GB03** | Fishing for Microplastics: Tracking Plastic Pollution Through Great Lakes Fish | University of Wisconsin - Green Bay (Green Bay, WI) |
| **GB04** | Evaluating Phosphorus Storage and Mobilization in Streambank Sediments | University of Wisconsin - Green Bay (Green Bay, WI / Upham Woods (Central WI)) |
| **LAX01** | Assessing the Toxicity of PFAS in Fish | University of Wisconsin - La Crosse (La Crosse, WI) |
| **LAX02** | Building a Historical Database of Great Lakes Research Vessels | University of Wisconsin - La Crosse (La Crosse, WI) |
| **LAX03** | Voices Across Wisconsin Watersheds: Oral Histories of the Kickapoo, Coon Creek, and Mississippi | University of Wisconsin - La Crosse (La Crosse, WI) |
| **LAX04** | Aquatic Invertebrate Productivity and Biodiversity in Threatened River Floodplain Habitats | University of Wisconsin - La Crosse (La Crosse, WI) |
| **MSN01** | PFAS at the Interface: Assessing Transport and Retention Dynamics Where Groundwater Emerges to Surface Water | University of Wisconsin - Madison (UW-Madison & La Crosse (French Island), WI) |
| **MSN02** | Elucidating the Impacts of PFAS Exposure on Nestling Birds in the Yahara Chain | University of Wisconsin - Madison (UW-Madison & Yahara Chain of Lakes, WI) |
| **MSN03** | Tracking Forever Chemicals: PFAS in Water, Soil and Food | University of Wisconsin - Madison (Water Science and Engineering Laboratory, UW-Madison) |
| **MSN04** | Soil Chemistry and PFAS Movement in Water | University of Wisconsin - Madison (UW-Madison) |
| **MSN05** | PFAS on the Wing: Linking Environmental Contamination and Parasitism in Birds from the Great Lakes Region | University of Wisconsin - Madison (Russell Laboratories, UW-Madison) |
| **MSN06** | AI-Powered Sensors for Rapid Detection of Pesticides in Groundwater | University of Wisconsin - Madison (UW-Madison) |
| **MSN07** | Investigating the Role of Weather Whiplash on Soil Hydraulic Properties | University of Wisconsin - Madison (UW-Madison & Hancock Agricultural Research Station, WI) |
| **MSN08** | Ready for the Heat: How Early Temperatures Shape Later Pollutant or Disease Tolerance | University of Wisconsin - Madison (UW-Madison) |

| | | |
|---|---|---|
| **MSN09** | Translating Climate Impacts for Tourism and Health | WI Department of Health Services / UW-Madison (Madison, WI) |
| **MSN10** | Groundwater Depth Dynamics in Agricultural Fields with Artificial Subsurface Drainage | University of Wisconsin - Madison (UW-Madison & Northeastern WI Commercial Farms) |
| **MSN11** | Soil Health and Nutrient Loss Impacts of Cover Crops and Biochar in Crop-Livestock Integrated Systems | University of Wisconsin - Madison (UW-Madison, Platteville (Pioneer Farms), & Marshfield) |
| **MSN12** | Reconnecting a Watershed: Hydrologic Responses to Peatland Restoration | University of Wisconsin - Madison (UW-Madison & Necedah National Wildlife Refuge, WI) |
| **MSN13** | Molybdenum and Arsenic in Wisconsin Drinking Water | University of Wisconsin - Madison (UW-Madison) |
| **MSN14** | Improving Nitrate Sensors for Soil and Groundwater Monitoring | University of Wisconsin - Madison (UW-Madison) |
| **MSN15** | Investigating Mechanisms of Radium Mobilization to Wisconsin Groundwater | University of Wisconsin - Madison (Water Science and Engineering Laboratory, UW-Madison) |
| **MSN16** | Voices of the East River: Stories of Flooding and Resilience | Wisconsin Sea Grant / UW-Madison (Green Bay & East River Watershed, WI) |
| **MSN17** | Investigating Rainfall Partitioning to Surface Runoff and Infiltration | University of Wisconsin - Madison (UW-Madison) |
| **MSN18** | Community Engagement Improvements to Stormwater Infrastructure in a School Setting | University of Wisconsin - Madison (UW-Madison & Lodi, WI) |
| **MSN19** | Understanding Ammonia Transport Across Reverse Osmosis Membrane | University of Wisconsin - Madison (UW-Madison) |
| **MSN20** | Restoration and Management on the Lake Michigan coast | University of Wisconsin - Madison (but located in Manitowoc, WI) |
| **MKE01** | Biogeochemical Profiles and Dynamics Across the Air-Water Interface | University of Wisconsin - Milwaukee (UW-Milwaukee & UW-Madison) |
| **MKE02** | Ecology of Lake Sturgeon in the Milwaukee River Estuary | University of Wisconsin - Milwaukee (UW-Milwaukee School of Freshwater Sciences) |
| **MKE03** | Microplastics in the Nearshore Lake Michigan Lower Foodweb | University of Wisconsin - Milwaukee (UW-Milwaukee School of Freshwater Sciences) |
| **MKE04** | PCBs in the Lower Food Web of the Milwaukee Harbor Area of Concern | University of Wisconsin - Milwaukee (UW-Milwaukee School of Freshwater Sciences) |
| **MKE05** | Virtual Water Trade | University of Wisconsin - Milwaukee (UW-Milwaukee / Remote) |

| | | |
|---|---|---|
| **MKE06** | Feed Management for Lake Sturgeon Larvae and Juveniles | University of Wisconsin - Milwaukee (UW-Milwaukee School of Freshwater Sciences) |
| **OSH01** | Vertical Profiles of Cyanobacteria in Lake Winnebago and Implications for Field and Satellite-Derived Estimates of CyanoHABs | University of Wisconsin - Oshkosh (UW Oshkosh & Lake Winnebago, WI) |
| **OSH02** | Investigation of Microplastics in Well Water | University of Wisconsin - Oshkosh (UW Oshkosh ERIC Lab, Door & Vilas Counties) |
| **PRK01** | Assessing Populations of the Federally Endangered Hine's Emerald Dragonfly (Somatochlora hineana) in Wisconsin | University of Wisconsin - Parkside (UW-Parkside & Field Sites across WI/IL) |
| **PLT01** | Biochar and Agricultural Water Quality | University of Wisconsin - Platteville (UW-Platteville & Pioneer Farms) |
| **RVF01** | Investigating the Transport of Nutrients and Pesticides in Wisconsin Agricultural Soils | University of Wisconsin - River Falls (UW-River Falls) |
| **RVF02** | Contaminant profiles in western Wisconsin groundwater | University of Wisconsin - River Falls (UW-River Falls & Western WI Rural Wells) |
| **USGS01** | Raman-Based Nanoplastics Enumeration and Characterization in Environmental Waters | USGS M3 Research Laboratory - Madison (Forest Products Laboratory Complex, Madison, WI) |

# Index by Research Theme

To assist student applicants in identifying projects aligned with their scientific interests, projects are categorized below into six core thematic areas in freshwater science.

## Freshwater Sensing, AI & Water Engineering Technology


[GB01] Develop OpenReef: Autonomous, Low-Cost Water-Quality Monitoring — University of Wisconsin - Green Bay (Michael Holly (hollym@uwgb.edu))

[MSN06] AI-Powered Sensors for Rapid Detection of Pesticides in Groundwater — University of Wisconsin - Madison (Haoran Wei (haoran.wei3@wisc.edu))

[MSN14] Improving Nitrate Sensors for Soil and Groundwater Monitoring — University of Wisconsin - Madison (Jingyi Huang (jhuang426@wisc.edu))

[MSN19] Understanding Ammonia Transport Across Reverse Osmosis Membrane — University of Wisconsin - Madison (Mohan Qin (mohan.qin@wisc.edu))


## Agricultural Water Management, Nutrients & Soil Health


[GB02] Test Reactive Media for Cleaner Water — University of Wisconsin - Green Bay (Michael Holly (hollym@uwgb.edu))

[GB04] Evaluating Phosphorus Storage and Mobilization in Streambank Sediments — University of Wisconsin - Green Bay (Erin Berns-Herrboldt (bernse@uwgb.edu))

[MSN07] Investigating the Role of Weather Whiplash on Soil Hydraulic Properties — University of Wisconsin - Madison (Margaret Zimmer (margaret.zimmer@wisc.edu))

[MSN10] Groundwater Depth Dynamics in Agricultural Fields with Artificial Subsurface Drainage — University of Wisconsin - Madison (Steven Hall (steven.hall@wisc.edu))

[MSN11] Soil Health and Nutrient Loss Impacts of Cover Crops and Biochar in Crop-Livestock Integrated Systems — University of Wisconsin - Madison (Mallika Nocco (nocco@wisc.edu))

[MSN17] Investigating Rainfall Partitioning to Surface Runoff and Infiltration — University of Wisconsin - Madison (Margaret Zimmer (margaret.zimmer@wisc.edu))

[PLT01] Biochar and agricultural water quality — University of Wisconsin - Platteville (Joseph Sanford (sanfordj@uwplatt.edu))

[RVF01] Investigating the Transport of Nutrients and Pesticides in Wisconsin Agricultural Soils — University of Wisconsin - River Falls (Bahareh Hassanpour (bahareh.hassanpour@uwrf.edu))


## Microplastics & Nanoplastics


[GB03] Fishing for Microplastics: Tracking Plastic Pollution Through Great Lakes Fish — University of Wisconsin - Green Bay (Patrick Forsythe (forsythp@uwgb.edu))

[MKE03] Microplastics in the Nearshore Lake Michigan Lower Foodweb — University of Wisconsin - Milwaukee (John A. Berges (berges@uwm.edu))

[OSH02] Investigation of Microplastics in Well Water — University of Wisconsin - Oshkosh (Jackie Behrens (behrensj@uwosh.edu))

[USGS01] Raman-Based Nanoplastics Enumeration and Characterization in Environmental Waters — USGS M3 Research Laboratory - Madison (Bryce Cook (bcook@usgs.gov))

## PFAS & Emerging Contaminants

[LAX01] Assessing the Toxicity of PFAS in Fish — University of Wisconsin - La Crosse (Tisha King Heiden (tking-heiden@uwlax.edu))

[MSN01] PFAS at the Interface: Assessing Transport and Retention Dynamics Where Groundwater Emerges to Surface Water — University of Wisconsin - Madison (Michael Cardiff (cardiff@wisc.edu))

[MSN02] Elucidating the Impacts of PFAS Exposure on Nestling Birds in the Yahara Chain — University of Wisconsin - Madison (Gavin Dehnert (dehnert2@wisc.edu))

[MSN03] Tracking Forever Chemicals: PFAS in Water, Soil and Food — University of Wisconsin - Madison (Christy Remucal (remucal@wisc.edu))

[MSN04] Soil Chemistry and PFAS Movement in Water — University of Wisconsin - Madison (Inna Popova (ipopova@wisc.edu))

[MSN05] PFAS on the Wing: Linking Environmental Contamination and Parasitism in Birds from the Great Lakes Region — University of Wisconsin - Madison (Jasmine Childress (jnchildress@wisc.edu))

[MSN13] Molybdenum and Arsenic in Wisconsin Drinking Water — University of Wisconsin - Madison (Athena Nghiem (anghiem@wisc.edu))

[MSN15] Investigating Mechanisms of Radium Mobilization to Wisconsin Groundwater — University of Wisconsin - Madison (Matt Ginder-Vogel (gindervogel@wisc.edu))

[RVF02] Contaminant profiles in western Wisconsin groundwater — University of Wisconsin - River Falls (Jill Coleman Wasik (jill.colemanwasik@uwrf.edu))

## Water History, Social Science, Health & Community Policy

[LAX02] Building a Historical Database of Great Lakes Research Vessels — University of Wisconsin - La Crosse (Penelope K. Hardy (phardy@uwlax.edu))

[LAX03] Voices Across Wisconsin Watersheds: Oral Histories of the Kickapoo, Coon Creek, and Mississippi — University of Wisconsin - La Crosse (Tiffany Trimmer (ttrimmer@uwlax.edu))

[MSN09] Translating Climate Impacts for Tourism and Health — WI Department of Health Services / UW-Madison (Natalie Chin (nchin5@aqua.wisc.edu))

[MSN16] Voices of the East River: Stories of Flooding and Resilience — Wisconsin Sea Grant / UW-Madison (Julia Noordyk (jnoordyk@aqua.wisc.edu))

[MSN18] Community Engagement Improvements to Stormwater Infrastructure in a School Setting — University of Wisconsin - Madison (Carolyn Voter (cvoter@wisc.edu))

[MKE05] Virtual Water Trade — University of Wisconsin - Milwaukee (AVIK CHAKRABARTI (chakra@uwm.edu))

## Great Lakes, Coastal & Aquatic Ecosystem Restoration

[LAX04] Aquatic Invertebrate Productivity and Biodiversity in Threatened River Floodplain Habitats — University of Wisconsin - La Crosse (Ross Vander Vorste (rvandervorste@uwlax.edu))

[MSN08] Ready for the Heat: How Early Temperatures Shape Later Pollutant or Disease Tolerance — University of Wisconsin - Madison (Jessica Hua (jhua23@wisc.edu))

[MSN12] Reconnecting a Watershed: Hydrologic Responses to Peatland Restoration — University of Wisconsin - Madison (Steve Loheide (loheide@wisc.edu))

[MSN20] Restoration and Management on the Lake Michigan coast — University of Wisconsin – Madison (but in Manitowoc, WI) (Titus Seilheimer (tseilheimer@aqua.wisc.edu)

[MKE01] Biogeochemical Profiles and Dynamics Across the Air-Water Interface — University of Wisconsin - Milwaukee (Dr. Charles J. Paradis (paradisc@uwm.edu))

[MKE02] Ecology of Lake Sturgeon in the Milwaukee River Estuary — University of Wisconsin - Milwaukee (Brandon Gerig (gerig@uwm.edu))

[MKE04] PCBs in the Lower Food Web of the Milwaukee Harbor Area of Concern — University of Wisconsin - Milwaukee (Benjamin Peterson (petersob@uwm.edu))

[MKE06] Feed Management for Lake Sturgeon Larvae and Juveniles — University of Wisconsin - Milwaukee (Dong-Fang Deng (dengd@uwm.edu))

[OSH01] Vertical profiles of cyanobacteria in Lake Winnebago and implications for field and satellite-derived estimates of cyanoHABs — University of Wisconsin - Oshkosh (Robert Stelzer (stelzer@uwosh.edu))

[PRK01] Assessing populations of the federally endangered Hine’s Emerald Dragonfly (Somatochlora hineana) in Wisconsin — University of Wisconsin - Parkside (Jessica Orlofske (orlofske@uwp.edu))

# Project Descriptions

## [GB01] Develop OpenReef: Autonomous, Low-Cost Water-Quality Monitoring

| | |
|---|---|
| Institution & Location: | University of Wisconsin - Green Bay (Green Bay, WI) |
| Project PI / Mentor(s): | Michael Holly (hollym@uwgb.edu) \| Mentor: Beth Kondro (kondrob@uwgb.edu) |
| Keywords: | water quality; environmental monitoring; autonomous sensing; environmental sensors; real-time monitoring |
| Expected Work Hours: | 32 hours/week |

### Project Description

Environmental research increasingly depends on continuous, real-time measurements, but commercial monitoring systems can be expensive and difficult to customize. OpenReef is being developed as an affordable and adaptable platform for monitoring water quality and treatment-system performance.

Students will help build, program, calibrate, and test components of the OpenReef platform. Depending on their interests, students may work with sensors that measure flow, turbidity, temperature, conductivity, nutrient concentrations, water depth, pressure, or treatment-system headloss. Other opportunities include microcontroller programming, local data storage, wireless data transmission, dashboard development, and automated quality-control checks.

Students will test OpenReef under laboratory and field conditions, identify sources of measurement error, improve system reliability, and prepare clear assembly and operating instructions. No previous experience with microcontrollers or environmental sensors is required. Training and guidance will be provided.

### Tasks to be Undertaken by Mentee

- Integrate environmental sensors with the OpenReef platform.
- Connect sensors to microcontrollers and data-logging equipment.
- Modify and test code for automated measurements.
- Calibrate sensors and evaluate measurement accuracy.
- Develop local backup storage and wireless data transmission.
- Create dashboards and data-quality checks.
- Test equipment under laboratory and field conditions.
- Troubleshoot hardware, software, power, and communication problems.
- Prepare wiring diagrams and student-friendly operating instructions.

### Required & Preferred Skills

Required Skills: This project is appropriate for students interested in environmental science, environmental engineering, water resources, computer science, electronics, data science, or technology development. Curiosity, reliability, and a willingness to learn are more important than previous coding or electronics experience.

Preferred Skills: Interest in sensor integration, microcontrollers, or data visualization.

## [GB02] Test Reactive Media for Cleaner Water

| | |
|---|---|
| Institution & Location: | University of Wisconsin - Green Bay (Green Bay, WI) |
| Project PI / Mentor(s): | Michael Holly (hollym@uwgb.edu) \| Mentor: Beth Kondro (kondrob@uwgb.edu) |
| Keywords: | phosphorus removal; reactive media; agricultural drainage; water treatment; environmental chemistry |
| Expected Work Hours: | 32 hours/week |

### Project Description

Phosphorus transported by agricultural drainage can contribute to excessive algae growth and declining water quality. Reactive media may provide an affordable treatment option by capturing phosphorus as water passes through a replaceable treatment bed. Before these materials can be used in the field, researchers must determine how effectively they remove phosphorus, how long they remain effective, and whether they restrict water flow over time.

Students will help develop and test prototype reactive-media columns. Activities may include constructing columns, preparing and packing media, establishing controlled flow, collecting water samples, conducting water-quality analyses, and evaluating treatment performance. Students will receive training in laboratory safety, column operation, sampling, analytical methods, sensors, and data management.

### Tasks to be Undertaken by Mentee

- Help design and construct laboratory treatment columns.
- Prepare, characterize, and pack reactive media.
- Establish and verify controlled water-flow conditions.
- Collect influent and effluent water samples.
- Conduct phosphorus and supporting water-quality analyses.
- Monitor flow, pressure, cumulative volume, and headloss.
- Evaluate treatment efficiency, media capacity, and breakthrough.
- Investigate clogging, channeling, and changes in water quality.
- Analyze data and prepare figures showing treatment performance.

### Required & Preferred Skills

Required Skills: Prior laboratory experience is helpful but not required.

Preferred Skills: Analytical chemistry

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## [GB03] Fishing for Microplastics: Tracking Plastic Pollution Through Great Lakes Fish

| | |
|---|---|
| Institution & Location: | University of Wisconsin - Green Bay (Green Bay, WI) |

| | |
|---|---|
| Project PI / Mentor(s): | Patrick Forsythe (forsythp@uwgb.edu) \| Mentor: Patrick Forsythe (forsythp@uwgb.edu) |
| Keywords: | microplastics; great lakes; fish ecology; freshwater pollution; environmental toxicology; aquatic field research; ecosystem health |
| Expected Work Hours: | 32-40 hours/week |

## Project Description

Microplastics—tiny plastic particles less than 5 mm in size—are an emerging pollutant of concern in freshwater ecosystems. The Great Lakes, which hold one-fifth of the world's surface freshwater, are particularly vulnerable because of their proximity to major population centers. Yet, we still know little about how these particles enter aquatic food webs or affect fish health.

This project will investigate the presence, types, and potential sources of microplastics in fish from Lake Michigan and Green Bay. Undergraduate researchers will collect and dissect fish, isolate microplastic particles from gastrointestinal tracts, and use microscopy and spectroscopy to identify their size, shape, and chemical composition. Students will learn about field sampling, laboratory analysis, data interpretation, and environmental toxicology while contributing to one of the first studies of its kind in the region.

Findings will help identify pollution "hotspots" and assess how different species interact with microplastics, providing valuable insights into ecosystem and human health risks. Students will gain hands-on research experience working alongside graduate students and faculty in the Aquatic Ecology and Fisheries Laboratory at UW–Green Bay, developing skills applicable to careers in environmental science, fisheries, and pollution management.

## Tasks to be Undertaken by Mentee

- Assist with fish collection and sample labeling during field surveys
- Dissect fish and extract gastrointestinal contents for analysis
- Filter, categorize, and measure microplastic particles using microscopy
- Record and organize data in spreadsheets and databases
- Participate in lab meetings, data interpretation, and presentations
- Contribute to outreach or poster sessions summarizing research findings

## Required & Preferred Skills

Required Skills: Basic coursework in biology, ecology, or environmental science
Strong attention to detail and ability to follow lab safety protocols
Willingness to work outdoors and handle live or preserved fish specimens
Team-oriented attitude and reliable communication

Preferred Skills: Experience with microscopy or laboratory sample processing
Familiarity with fish identification or aquatic field sampling techniques
Interest in pollution ecology, fisheries biology, or environmental toxicology
Basic data management or statistical analysis (Excel, R, or similar)

## [GB04] Evaluating Phosphorus Storage and Mobilization in Streambank Sediments

| | |
|---|---|
| Institution & Location: | University of Wisconsin - Green Bay (Green Bay, WI / Upham Woods (Central WI)) |
| Project PI / Mentor(s): | Erin Berns-Herrboldt (bernse@uwgb.edu) \| Mentor: Erin Berns-Herrboldt (bernse@uwgb.edu) |
| Keywords: | Phosphorus; Biogeochemical Cycling; Field Experiment; Batch/Column Experiments; Sediment Geochemical Characterization |
| Expected Work Hours: | 32-40 hours/week |

### Project Description

Streambank sediments can be an important source of phosphorus to Wisconsin waterways, driving eutrophication and negatively impacting aquatic health, human health, and local economies. There is limited understanding of how groundwater–surface water exchange impacts river sediment phosphorus storage, and this study aims to quantify these processes. This project will support characterization of phosphorus and subsurface hydrology in stream sediments in central Wisconsin using sediment samples in batch and column experiments to evaluate which biogeochemical conditions promote storage and release of phosphorus. The project will also complete phase two of an in-situ field experiment conducted at Upham Woods Outdoor Learning Center. Research duties on this project include: (1) leading field campaigns with support of your mentor and other researchers to seasonally sample sediments and streambank porewater, (2) running analytical equipment to collect water quality data, and (3) conducting lab and field experiments. Project findings are anticipated to inform land, nutrient, and water management decisions.

### Tasks to be Undertaken by Mentee

- Analyze water samples using an AQ300 discrete analyzer, an ion chromatograph, UV-Vis, TOC anlyzer, and an ICP-OES (detailed training and support provided)
- Install equipment for a field in-situ experiment and collect and analyze water and sediment samples
- Evaluate phosphorus, iron, and carbon in field sediment samples collected from the field experiment
- Support a quarterly monitoring campaign focused on sampling streambank groundwater at an established field site.

### Required & Preferred Skills

Required Skills: Introductory chemistry coursework; Interest in working in an environmental chemistry laboratory; Willing to caonoe to field sites (no experience necessary); Ability to lift field equipment (up to 40 lbs)

Preferred Skills: Experience working in a "wet chemistry" lab setting; Desire to improve water qualitly in surface and groundwater systems; Coursework that has introduced basic hydrology or hydrogeology

## [LAX01] Assessing the Toxicity of PFAS in Fish

| | |
|---|---|
| Institution & Location: | University of Wisconsin - La Crosse (La Crosse, WI) |
| Project PI / Mentor(s): | Tisha King Heiden (tking-heiden@uwlax.edu) \| Mentor: Tisha King Heiden (tking-heiden@uwlax.edu) |
| Keywords: | PFAS, fish, toxicology |
| Expected Work Hours: | 32-40 hours/week |

### Project Description

Various communities across WI struggle with PFAS-contaminated water and the impacts of these "forever chemicals" on ecosystem and human health. This project addresses knowledge gaps with respect to sensitivities of fish larvae to environmentally relevant concentrations of PFAS. Our fish toxicity assays evaluate effects on key developmental milestones (primarily impacts on development, nervous system, behavior and the immune system) that can impact the ability of fish populations to sustain themselves, and translate to human health. Beyond technical experience, students gain familiarity with goal-oriented project management and effective time management, while strengthening their written and oral communication skills. These experiences develop competencies that speak to career-readiness and prepares students for success in graduate programs.

### Tasks to be Undertaken by Mentee

- Handling live fish, including fish husbandry, exposure protocols, and developmental staging of fish
- Learning to synthesize primary literature
- Design controlled, reproducible experiments with appropriate controls
- Running physiological, behavior, immunotoxicological, or neurodevelopmental assays
- Data analysis/statistics
- Data visualization and management

### Required & Preferred Skills

Required Skills: course work in introductory biology and/or chemistry, some experience with basic pipetting and volumetric accuracy, curiosity

Preferred Skills: experience in laboratory settings, chemical safety (general lab safety), strong organizational skills, goal-oriented, active communication

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## [LAX02] Building a Historical Database of Great Lakes Research Vessels

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|---|---|
| Institution & Location: | University of Wisconsin - La Crosse (La Crosse, WI) |
| Project PI / Mentor(s): | Penelope K. Hardy (phardy@uwlax.edu) \| Mentor: Penelope K. Hardy (phardy@uwlax.edu) |
| Keywords: | history, humanities, secondary sources, primary sources, archives, databases, inland waterways, great lakes, maritime history, environmental |

| | |
|---|---|
| | history, history of science, history of technology, research vessels, ships, fisheries history, history of limnology |
| Expected Work Hours: | 32-35 hours/week |

## Project Description

For centuries the Great Lakes have held strategic, economic, and ecological value, inspiring intensive efforts to exploit, understand, control, and remediate them. Research vessels have played a critical yet deeply underappreciated role in this knowledge creation process since at least the nineteenth century. How have academic and governmental scientists mobilized vessels to help them understand the natural phenomena of these uniquely large freshwater systems? How have the scientific questions they asked changed? What constraints and opportunities have vessel operators faced? How has the experience of investigating the lakes from the vantage point of a ship changed over the last century and a half, and what lessons do they hold for future studies?

Partnering with historians Dr. Penelope K. Hardy (UW-La Crosse) and Dr. Christine Keiner (Rochester Institute of Technology), you will do the initial detective work to build a comprehensive database uncovering the history of research vessels and associated technologies and practices used to explore the five Great Lakes and the St. Lawrence River. If you want more experience building bibliographies, discovering and interpreting primary sources, thinking creatively about archives, and digging through finding aids, this project seeks your help.

## Tasks to be Undertaken by Mentee

- Search online articles and databases.
- Review existing literature to identify relevant secondary sources.
- Assist in identifying potential archival collections across a variety of archives.
- Use archival finding aids.
- Communicate professionally via email, phone, and in person with archivists, librarians, and other researchers.
- Learn and use applications such as Tropy, Zotero, Google Maps, and Google Sheets.
- Organize and contribute to shared online files.
- Identify, read, and use secondary sources to contextualize primary sources.
- Write citations. Write and annotate a bibliography.

## Required & Preferred Skills

Required Skills: Strong research, organizational, and writing skills

Preferred Skills: History (or related humanities field) major or minor who has completed a research methods course in their field. Experience working with online library catalogs and archival and database collections. Familiarity with citations using the Chicago Manual of Style.

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# [LAX03] Voices Across Wisconsin Watersheds: Oral Histories of the Kickapoo, Coon Creek, and Mississippi

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|---|---|
| Institution & Location: | University of Wisconsin - La Crosse (La Crosse, WI) |
| Project PI / Mentor(s): | Tiffany Trimmer (ttrimmer@uwlax.edu) \| Mentor: Tiffany Trimmer (ttrimmer@uwlax.edu) |
| Keywords: | Oral History, Digital Storytelling, Digital Humanities, Kickapoo River Watershed, Coon Creek Watershed, Inland Waterways, Flooding, Flood Responses, La Farge Dam Project, Wisconsin History, Mississippi River Watershed |
| Expected Work Hours: | 32-35 hours/week |

## Project Description

Help us increase community awareness, and use, of freshwater-related oral histories describing flooding responses, conservation practices, and daily life in the Kickapoo, Coon Creek, and Mississippi River Watersheds over the past 90 years. UW-La Crosse's Oral History Program (OHP, est. 1968) has seven interview collections containing this kind of primary source evidence but right now, they aren't being listened to because most people don't know they exist or how to access them. An online, interactive, web guide about this set of oral histories is currently being developed. A summer intern is needed to help conduct additional archival research about the oral histories, analyze oral history recordings and transcripts, help identify descendants of interviewees and other affected community members, plan public messaging campaigns, and coordinate with local community groups and stakeholders.

## Tasks to be Undertaken by Mentee

- Communicate professionally with community groups, interviewees and their descendants, local historians, archivists, and librarians.
- Analyze and interpret oral history interview recordings and interview transcripts.
- Conduct additional research to contextualize evidence in oral history collections (examples: visiting campus archives, searching in online databases, reading scholarly articles and books).

## Required & Preferred Skills

Required Skills: Previous coursework in History or other Humanities-related subject(s) that focused on analyzing evidence and building a narrative. Strong research skills, and an ability to find relevant information in different formats including archives, online databases, and scholarly publications. Effective written and verbal communication skills adaptable to diverse audiences. Strong listening comprehension skills.

Preferred Skills: Interest in digital humanities, oral history, community engagement, and environmental history.

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## [LAX04] Aquatic Invertebrate Productivity and Biodiversity in Threatened River Floodplain Habitats

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|---|---|
| Institution & Location: | University of Wisconsin - La Crosse (La Crosse, WI) |
| Project PI / Mentor(s): | Ross Vander Vorste (rvandervorste@uwlax.edu) \| Mentor: Ross Vander Vorste (rvandervorste@uwlax.edu) |
| Keywords: | ecology, biodiversity, aquatic invertebrates, insects |
| Expected Work Hours: | 35-40 hours/week |

### Project Description

Aquatic invertebrates are an important component to floodplain ecosystems, providing food for aquatic and terrestrial organisms and are sentinels of global change. My research lab is exploring how aquatic invertebrate productivity and biodiversity is changing in the Upper Mississippi River. In the proposed project, I will work with a student researcher to continue the collection of a long-term aquatic invertebrate dataset aimed at detecting trends in invertebrate productivity and biodiversity. We will collect aquatic invertebrates from sites on the Upper Mississippi River near La Crosse by boat during a 4-week period. Then in the lab, invertebrates will be counted and identified to provide measures of productivity and biodiversity. Results will be analyzed using R software to provide unique insights into how invertebrates are responding to floodplain conditions and what environmental factors are responsible for these changes.

### Tasks to be Undertaken by Mentee

Collect aquatic invertebrates from the Upper Mississippi River, Count and Identify invertebrates in the laboratory using a dissecting microscope, prepare and maintain sampling equipment. Data analysis related to aquatic invertebrates.

### Required & Preferred Skills

Required Skills: Interest in collection and identification of aquatic invertebrates.

Preferred Skills: Experience in collection and identification of aquatic invertebrates. Experience using R programming language

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## [MSN01] PFAS at the Interface: Assessing Transport and Retention Dynamics Where Groundwater Emerges to Surface Water

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| Institution & Location: | University of Wisconsin - Madison (UW-Madison & La Crosse (French Island), WI) |
| Project PI / Mentor(s): | Michael Cardiff (cardiff@wisc.edu) \| Mentor: Michael Cardiff (cardiff@wisc.edu) |
| Keywords: | PFAS, surface water / groundwater interaction, riverbed sampling, groundwater sampling. |
| Expected Work Hours: | 40 hours/week |

### Project Description

PFAS transporting from groundwater to surface waters enters via the hyporheic zone, the region of major biogeochemical cycling where low-oxygen, low carbon groundwaters discharge into highly oxygenated surface waters and organic carbon-rich sediments. The study of PFAS movement in groundwater, in general, is made difficulty by the complex history present at many source zones (e.g., multiple firefighting training exercises), by vadose zone dynamics that impact PFAS movement, and by aquifer heterogeneity that complicates plume tracing. In this proposal, we propose a timely and opportunistic evaluation of a known PFAS plume as it approaches the hyporheic zone of the Black / Mississippi river. In 2001, a plane crash at the southwest end of the La Crosse Airport on French Island, WI created an instantaneous source with known location due to firefighting activities; no further PFAS use has occurred on the area of this crash. Students working on this project can expect experience with field installation of groundwater and lakebed monitoring equipment, use in field probes for monitoring water quality and geochemistry, and best practices for careful sampling for PFAS species.

### Tasks to be Undertaken by Mentee

- Field work building installations (monitoring wells, piezometers, in-stream samplers)
- Taking detailed field notes
- Fata entry for ongoing monitoring database

### Required & Preferred Skills

Required Skills: ability to work in the field for 2-3 intensive site visits (2-3 days each). Ability to carry approximately 50 lbs of equipment

Preferred Skills: Experience using GIS; experience working with geochemical measurements and different unit conversions.

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## [MSN02] Elucidating the Impacts of PFAS Exposure on Nestling Birds in the Yahara Chain

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|---|---|
| Institution & Location: | University of Wisconsin - Madison (UW-Madison & Yahara Chain of Lakes, WI) |
| Project PI / Mentor(s): | Gavin Dehnert (dehnert2@wisc.edu) \| Mentor: Gavin Dehnert (dehnert2@wisc.edu) |
| Keywords: | Birds, PFAS, Contaminants, Ecotoxicology |
| Expected Work Hours: | 32-35 hours/week |

### Project Description

Per- and polyfluoroalkyl substances (PFAS) are persistent contaminants that can accumulate in aquatic and terrestrial food webs, yet important questions remain about how these chemicals move from environmental sources into wildlife and affect developing birds. This project will investigate PFAS exposure and potential immune impacts in nestling birds across the Yahara chain of lakes in Madison, Wisconsin. We will focus on three commonly occurring species—tree swallows, wrens, and sparrows—that occupy

different ecological niches and rely on distinct dietary resources. By comparing PFAS profiles in nestlings with those of their prey and surrounding environmental media, we will evaluate how dietary preferences influence PFAS exposure and identify potential pathways of trophic transfer.

Sampling across multiple lakes and locations will allow us to examine spatial patterns in PFAS contamination and determine whether exposure varies with proximity to potential sources or differences in local food webs. We will then assess relationships between PFAS concentrations and indicators of immune function in nestlings. By integrating contaminant chemistry, ecological information, dietary pathways, and immunological responses, this study will provide a more comprehensive understanding of how PFAS move through urban freshwater food webs and whether early-life exposure is associated with altered immune function in developing birds. The results will improve our understanding of PFAS ecological risk and identify species and dietary pathways that may be particularly vulnerable to contamination.

### Tasks to be Undertaken by Mentee

Field sampling, animal dissection, immune assays

### Required & Preferred Skills

Required Skills: Hardworking; Willingness to work in the Field

Preferred Skills: Avian ecology and field biology: Identification, capture, handling, and sampling of nestling tree swallows, wrens, and sparrows, including knowledge of nesting behavior and breeding ecology.
Environmental contaminant sampling: Collection and processing of bird tissues, prey items, sediment, water, and other environmental samples while maintaining appropriate contamination-control procedures for PFAS analysis.
Food-web and dietary ecology: Characterization of species-specific diets and prey communities and evaluation of trophic transfer and dietary exposure pathways.
Immunotoxicology: Knowledge of avian immune-system development and measurement of biomarkers or endpoints that can be used to evaluate potential effects of PFAS exposure on immune function.

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## [MSN03] Tracking Forever Chemicals: PFAS in Water, Soil and Food

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| Institution & Location: | University of Wisconsin - Madison (Water Science and Engineering Laboratory, UW-Madison) |
| Project PI / Mentor(s): | Christy Remucal (remucal@wisc.edu) \| Mentor: Zhao Yang & Ben Fry (zyang768@wisc.edu, bfry5@wisc.edu) |
| Keywords: | PFAS, water, soil, chemistry, health |
| Expected Work Hours: | 40 hours/week |

### Project Description

Per- and polyfluoroalkyl substances (PFAS), often referred to as “forever chemicals,” are a large group of synthetic chemicals that have been widely used for decades. Due to their exceptional persistence, PFAS can accumulate in the environment and have been associated with adverse health effects, including kidney and liver cancers, thyroid disease, and elevated cholesterol.

The REU student will contribute to cutting-edge PFAS research by helping measure PFAS in environmental and food samples, including soil, groundwater, surface water, and locally produced foods. Through this work, the student will gain hands-on experience in environmental sampling, laboratory analysis, and data interpretation. The research aims to improve our understanding of PFAS persistence and environmental burden and to identify important pathways of human exposure.

Key responsibilities include:

### Tasks to be Undertaken by Mentee

Learn to use a variety of analytical instruments to characterize PFAS composition in in water, soil and food, including:

- Conducting sample preparation using auto solid phase extraction (auto-SPE).
- PFAS analysis (targeted and non-targeted) using liquid chromatography-tandem mass spectrometry (LC-MS/MS).
- Supporting additional ongoing aquatic contaminant research in the lab.
- Developing critical thinking skills through engagement with scientific literature review and contributing to research presentations.Learn to extract and analyze PFAS in environmental samples (mainly water),

### Required & Preferred Skills

Required Skills: interest in environmental chemistry, having taken analytical chemistry or a similar course, willingness to work in the lab, and interest in learning instruments and data processing.

Preferred Skills: Candidates who have taken R or statistics courses with previous lab experience will be preferred but not required.

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## [MSN04] Soil Chemistry and PFAS Movement in Water

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|---|---|
| Institution & Location: | University of Wisconsin - Madison (UW-Madison) |
| Project PI / Mentor(s): | Inna Popova (ipopova@wisc.edu) \| Mentor: Inna Popova (ipopova@wisc.edu) |
| Keywords: | PFAS; water quality; biochar; soil chemistry; dissolved organic matter; environmental remediation; contaminant transport |
| Expected Work Hours: | 32-40 hours/week |

### Project Description

Per- and polyfluoroalkyl substances (PFAS) are persistent contaminants that can move from soil into groundwater and surface water. Biochar has been proposed as a soil amendment that reduces PFAS mobility. Research conducted at UW-Madison indicates that biochar performance depends on the soil where it is applied. This project will investigate how soil chemistry influences retention of perfluorooctanoic acid (PFOA) by biochar. The project will examine interactions among soils and dissolved organic matter. The project will also examine interactions among biochar and water. The student will conduct laboratory experiments using agricultural and natural soils with contrasting properties. Activities

will include preparation of soil samples and biochar samples. Activities will also include adsorption experiments and UV-visible spectroscopy measurements. Research findings will help improve understanding of factors that influence PFAS movement into water resources.

### Tasks to be Undertaken by Mentee

- Prepare soil and biochar samples for laboratory analysis.
- Measure dissolved organic matter using UV-visible spectroscopy.
- Assist with PFAS retention experiments.
- Organize experimental data in spreadsheets.
- Analyze data and prepare figures.
- Participate in laboratory meetings.

### Required & Preferred Skills

Required Skills: Completion of at least one course in environmental science, chemistry, soil science, biology, or a related field.
Strong attention to detail.
Ability to work independently after training.

Preferred Skills: Interest in water quality or environmental contamination.
Coursework in chemistry, environmental science, soil science, or related fields.
Previous laboratory experience.
Experience with data analysis and graphing.
Interest in environmental research careers or graduate study.

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## [MSN05] PFAS on the Wing: Linking Environmental Contamination and Parasitism in Birds from the Great Lakes Region

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| Institution & Location: | University of Wisconsin - Madison (Russell Laboratories, UW-Madison) |
| Project PI / Mentor(s): | Jasmine Childress (jnchildress@wisc.edu) \| Mentor: Jasmine Groves (jagroves@wisc.edu) |
| Keywords: | PFAS, parasites, environmental contaminants, disease, avian necropsy |
| Expected Work Hours: | 40 hours/week |

### Project Description

PFAS, known as “forever chemicals,” are a large group of man-made organic compounds that have been used in industrial and consumer applications (e.g., non-stick cookware, fabric weatherproofing, and fire-fighting foams) since the 1950’s. These chemicals are of growing concern due to their ubiquity, long half-lives, and resistance to degradation. PFAS can biomagnify in plants and animals, especially organisms associated with aquatic environments. Exposure can occur through consumption of both food and aquatic resources, and understanding how environmentally relevant concentrations of PFAS impact animal health is necessary to protect, preserve, and manage species that depend on aquatic environments and can guide future human health studies. As the cumulative effects of multiple stressors (e.g. environmental

contaminants and disease) is a growing concern for ecologists, ecotoxicologists, conservation biologists, and natural resources managers alike, we will also examine the impacts of parasitism on avian host health. For this project, we will evaluate PFAS concentrations in birds donated by hunters and wildlife rehabilitation partners, and we will ask: (1) What are the levels of PFAS bioaccumulation within avian tissues; (2) how do PFAS contamination affect avian host susceptibility to disease, and (3) how are parasites accumulating PFAS?

Tasks to be Undertaken by Mentee

- Avian necropsy, dissection, and tissue collection: Students will learn how to necropsy avian carcasses to remove various organs (heart, brain, liver, gastrointestinal tract) to analyze concentrations of PFAS.
- Parasite dissection: Students will learn how to dissect the gastrointestinal of collected birds to quantify and identify parasites (e.g. nematodes, cestodes, trematodes, and acanthocephalans). Students will learn how to morphologically identify parasites and prepare them for later molecular confirmation.

### Required & Preferred Skills

Required Skills: Demonstrated ability to work independently; strong time management and organizational skills; hardworking and detail-oriented; critical thinking and communication skills.

Preferred Skills: 1) Research and Communication Skills: Scientific writing and data interpretation abilities. 2) Avian ecology and anatomy (e.g. have taken ornithology, anatomy and physiology, or equivalent classes)

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## [MSN06] AI-Powered Sensors for Rapid Detection of Pesticides in Groundwater

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| Institution & Location: | University of Wisconsin - Madison (UW-Madison) |
| Project PI / Mentor(s): | Haoran Wei (haoran.wei3@wisc.edu) \| Mentor: Haoran Wei (haoran.wei3@wisc.edu) |
| Keywords: | Groundwater Monitoring; Pesticide Detection; Machine Learning; Environmental Sensors. |
| Expected Work Hours: | 36 hours/week |

### Project Description

Groundwater is a vital source of drinking water for millions of people, yet agricultural pesticides can threaten its quality. In Wisconsin, neonicotinoids, a widely used class of insecticides, have been detected in groundwater, highlighting the need for rapid, affordable, and reliable monitoring technologies. This summer research project will explore how advanced sensing technologies and artificial intelligence (AI) can work together to detect trace levels of pesticides in water. The undergraduate researcher will help develop an innovative sensing platform that combines surface-enhanced Raman spectroscopy (SERS) with machine learning. By using gold nanoparticles to amplify the unique molecular fingerprints of pesticides, SERS enables highly sensitive chemical detection, while machine learning helps distinguish different pesticides and estimate their concentrations. The student will gain hands-on experience in preparing samples, conducting spectroscopic measurements, processing experimental data, and

exploring machine learning approaches for chemical analysis. Opportunities to work with real groundwater samples from Wisconsin will connect laboratory research to pressing environmental challenges. This interdisciplinary project offers valuable training at the intersection of environmental engineering, analytical chemistry, advanced sensing technologies, and AI, contributing to the development of next-generation tools for protecting water resources.

### Tasks to be Undertaken by Mentee

- Conducting experiments and analyzing data

### Required & Preferred Skills

Required Skills: General Chemistry

Preferred Skills: Python, Wet lab experience

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## [MSN07] Investigating the Role of Weather Whiplash on Soil Hydraulic Properties

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|---|---|
| Institution & Location: | University of Wisconsin - Madison (UW-Madison & Hancock Agricultural Research Station, WI) |
| Project PI / Mentor(s): | Margaret Zimmer (margaret.zimmer@wisc.edu) \| Mentor: Margaret Zimmer (margaret.zimmer@wisc.edu) |
| Keywords: | hydrology, soil, weather impacts, precipitation, experimental |
| Expected Work Hours: | 40 hours/week |

### Project Description

Increasing weather variability, including more frequent and intense droughts and flooding, has the potential to alter how water infiltrates and moves through soils. However, we know relatively little about how repeated cycles of drying and wetting affect soil hydraulic properties and infiltration capacity, particularly in sandy soils that can develop water repellency as they dry. This is particularly important in the Central Sands, Wisconsin where fertilizer applications on sandy agricultural soils can be a source for excess nutrients in our downstream water bodies and drinking water aquifers.

This project will investigate whether repeated drying–wetting cycles produce persistent changes in soil water repellency. The research project will involve collecting soil samples with varying organic carbon content from the Hancock Agricultural Research Station and conducting laboratory experiments to test how different intensity and frequency of drying-wetting cycles may influence water repellency and infiltration capacity.

By identifying the moisture thresholds at which repellency develops and disappears, and determining how these thresholds change with repeated cycling and soil organic matter, this research will improve our understanding of how soil moisture history influences hydrologic responses to subsequent rainfall. Ultimately, the project will help clarify how increasing variability in drought and precipitation regimes may affect the capacity of sandy soils to absorb and transmit water, with implications for infiltration, runoff, and soil water availability.

### Tasks to be Undertaken by Mentee

- Sample soils at field sites
- Run laboratory experiments of wetting-drying cycles
- Measure water repellency using water drop penetration time method
- Run analytical instruments (MIR) to quantify soil organic carbon
- Analyze and interpret resulting data

### Required & Preferred Skills

Required Skills: Interest in hydrology or soil science, high attention to detail, independent

Preferred Skills: Basic laboratory experience, data management in Excel or R.

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## [MSN08] Ready for the Heat: How Early Temperatures Shape Later Pollutant or Disease Tolerance

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| Institution & Location: | University of Wisconsin - Madison (UW-Madison) |
| Project PI / Mentor(s): | Jessica Hua (jhua23@wisc.edu) \| Mentor: Dr. Zach Gajewski (zgajewski@wisc.edu) |
| Keywords: | Amphibians; animal behavior; developmental temperature; disease ecology; ecotoxicology; global change biology; freshwater ecosystems; fieldwork. |
| Expected Work Hours: | 40 hours/week |

### Project Description

Freshwater ecosystems face increasing pressure from pollutants and emerging infectious diseases. Why do these stressors devastate some wildlife populations while other similar populations are less affected? Explaining this variation is a central challenge in protecting aquatic ecosystems.

This project combines global change biology, ecotoxicology, and disease ecology to explore whether temperatures experienced during a critical developmental stage help explain these different outcomes. Animals breeding at different times of year encounter different embryonic temperatures. These early conditions may lead to costs or benefits that shape how they later respond to pollutants and infection.

Potential questions include: Do animals raised as embryos in warmer conditions later seek out and remain in warmer water when infected? Does this behavior reduce infection, and can pollutants interfere with it? These questions offer opportunities to investigate behavioral fever, a response in which animals seek warmer habitats when infected.

The student will develop a focused question through fieldwork in local ponds and tadpole experiments, with opportunities to use video tracking software. The student will gain experience in experimental design, data collection, data analysis and interpretation, data presentation, and scientific writing.

### Tasks to be Undertaken by Mentee

- Participate in pond field surveys and measure water temperature variation.
- Assist with amphibian husbandry and maintenance of experimental pools.

- Develop a focused research question with the mentoring team.
- Conduct behavioral experiments and use video tracking software to quantify movement and temperature preferences.
- Assist with disease or pollutant exposure experiments, depending on the selected question, and collect observations and samples to assess animal health.
- Read and discuss relevant scientific literature.
- Organize, analyze, and interpret data and prepare a research poster.

### Required & Preferred Skills

Required Skills: Consistency, curiosity, openness to learning and feedback, and willingness to work closely with an integrated research team. Interest in animal behavior, freshwater ecology, wildlife disease, or ecotoxicology, and willingness to participate in fieldwork and amphibian care. No previous research experience is required, we will provide the training.

Preferred Skills: Fieldwork, amphibian husbandry, disease ecology, ecotoxicology, or data analysis. Experience with behavioral observations or video tracking software is helpful but not necessary.

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## [MSN09] Translating Climate Impacts for Tourism and Health

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|---|---|
| Institution & Location: | WI Department of Health Services / UW-Madison (Madison, WI) |
| Project PI / Mentor(s): | Natalie Chin (nchin5@aqua.wisc.edu) \| Mentor: Kate Beardmore (katharine.beardmore@dhs.wisconsin.gov) |
| Keywords: | climate change, communication, evaluation |
| Expected Work Hours: | 40 hours/week |

### Project Description

Wisconsin is getting warmer and wetter. The Wisconsin Initiative on Climate Change Impacts 2026 Report shows the lower two-thirds of Wisconsin counties have seen about a 20% increase in annual precipitation from 1950 to 2024. Extreme rain events flood homes, septic and sewage systems, and contaminate drinking water, affecting health, financial well-being, and the economy. Flooded homes raise respiratory risks such as asthma, and heavy rains can fuel toxic algal blooms. Stress and mental health disorders are also potential impacts when homes and communities are flooded more than once.

This project will help communities understand and reduce those risks. The student will develop factsheets on climate topics (flooding, heat, air quality, etc.) that highlight the impacts of climate change on both tourism and human health while supporting local decision making. The audience for these factsheets includes local health departments, tribal partners, event planners and community leaders. The student will evaluate and test these factsheets through best practices such as A/B testing, focus groups, and survey development.

### Tasks to be Undertaken by Mentee

- Research the impacts of climate change on health and tourism in Wisconsin
- Write and design health and tourism impact fact sheets

- Evaluate factsheets usefulness for decision makers

### Required & Preferred Skills

Required Skills: Ability to communicate ideas well in writing. A basic understanding of climate change. Reliable, organized, and able to work independently on tasks.

Preferred Skills: Knowledge of climate change and health impacts. Designing for the general public. Some experience or interest in learning basic research skills (e.g., interviews, surveys, message testing).

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## [MSN10] Groundwater Depth Dynamics in Agricultural Fields with Artificial Subsurface Drainage

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| Institution & Location: | University of Wisconsin - Madison (UW-Madison & Northeastern WI Commercial Farms) |
| Project PI / Mentor(s): | Steven Hall (steven.hall@wisc.edu) \| Mentor: Steven Hall (steven.hall@wisc.edu) |
| Keywords: | Groundwater; water quality; agriculture; nutrients |
| Expected Work Hours: | 32-40 hours/week |

### Project Description

Understanding groundwater dynamics is critical for effective agricultural and environmental management of poorly drained soils. In Wisconsin, farmers are prohibited from applying manure to fields where the groundwater depth is < 2 ft from the surface, yet few data are available to underpin this regulation. The summer researcher will assist with field measurements of groundwater depth and chemical composition on several commercial farms in northeastern Wisconsin. They will also have the opportunity to engage with project collaborators who are using computer models to predict groundwater dynamics in these fields. Overall, this work will contribute to better understanding of groundwater in agricultural systems to inform effective nutrient management and protect water quality.

### Tasks to be Undertaken by Mentee

Install monitoring wells and collect and process groundwater depth data; contribute to chemical analyses in the lab; contribute to modeling tasks as experience and interest allow

### Required & Preferred Skills

Required Skills: Interest in conducting fieldwork in conventional agricultural systems and ability to carry light loads (< 30 lb) over uneven terrain. Tolerance of occasional adverse weather (heat, rain, muddy conditions, etc).

Preferred Skills: Basic familiarity with concepts of agricultural and/or environmental science.

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# [MSN11] Soil Health and Nutrient Loss Impacts of Cover Crops and Biochar in Crop-Livestock Integrated Systems

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|---|---|
| Institution & Location: | University of Wisconsin - Madison (UW-Madison, Platteville (Pioneer Farms), & Marshfield) |
| Project PI / Mentor(s): | Mallika Nocco (nocco@wisc.edu) \| Mentor: Daniel Maraldo (maraldo@wisc.edu) |
| Keywords: | Agroecosystems, water quality, soil health, N cycle, UAS |
| Expected Work Hours: | 40 hours/week |

## Project Description

Nutrient loss in crop-livestock integrated systems remains an ongoing challenge for Wisconsin dairy producers, as the need grows for sustainable intensification of production while preserving ground and surface water quality. Water and nutrient management strategies such as cover cropping, biochar, and tile drainage are growing in Wisconsin with potential tradeoffs; cover cropping may reduce losses but can also have subsequent impacts on corn yields, which remain a challenge for wider adoption, and biochar has shown to curb nutrient loss in soil column studies but remains largely unvalidated in the field. Tile drainage is rapidly growing in Wisconsin, so we seek to characterize its environmental and agronomic impacts. We set up a field plot study at Pioneer Farms in Platteville, WI and a collaboration with two Discovery Farms in Marshfield, WI to test the nutrient cycling and water quality impacts of a cover crop, biochar amendment, tile drainage installation. Sites will be monitored for leached nitrate, soil physical and chemical characteristics, and crop health data collected via uncrewed aerial systems (UAS). This study, using innovative in situ and remote sensing methods, will provide new insights into the combined impacts of popular and novel sustainable management practices in Wisconsin.

## Tasks to be Undertaken by Mentee

Collect and analyze soil and crop health data, aid in UAS flights and image processing, modeling of water and nutrient balance

## Required & Preferred Skills

Required Skills: Ability to work outdoors in varying weather; ability to drive a car 1-2 hours to field sites; proficiency in excel or similar for data analysis; basic knowledge of statistics and experimental design; ability to work independently and adapt/troubleshoot when needed; strong organizational/time management skills

Preferred Skills: GIS, remote sensing, or UAS; coding (R, python, or similar); basic understanding of soil science, physical geography and/or agroecology

# [MSN12] Reconnecting a Watershed: Hydrologic Responses to Peatland Restoration

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|---|---|
| Institution & Location: | University of Wisconsin - Madison (UW-Madison & Necedah National Wildlife Refuge, WI) |
| Project PI / Mentor(s): | Steve Loheide (loheide@wisc.edu) \| Mentor: Jillian Lukez (lukez@wisc.edu) |
| Keywords: | Hydroecology, hydrology, geology, geophysics, groundwater, rivers, wetlands, fieldwork, GIS, ecosystem restoration |
| Expected Work Hours: | 32-40 hours/week |

## Project Description

Join the UW-Madison Hydroecology Lab to learn about the impacts of wetland restoration on peat hydrology! The wetlands in Necedah National Wildlife Refuge formed thousands of years ago as glaciers receded, providing wildlife habitat, flood control, and carbon storage. The area was ditched in the early 1900s to control the water and develop the rich, organic soil into farmland. This "drainage dream" era did not last long without wetlands to protect from fires and floods, but the disturbance fundamentally severed connections between aquifers and floodplains. Recently, the U.S. Fish and Wildlife Service (USFWS) began plugging ditches to redirect flow throughout the watershed. To support long-term management of restored peatlands, our group began research to document hydrologic properties of peatlands and monitor resulting surface and groundwater exchanges. The Freshwater@UW Student will complete an individualized research project focusing on peat stratigraphy analysis and/or remote sensing applications to monitor changes in vegetation composition and flooding patterns. This project will consist of data analysis (ArcGIS or similar) with regular fieldwork opportunities. We welcome students interested in soil science, groundwater, GIS, geophysics, ecosystem restoration, and stakeholder engagement through collaboration with the USFWS. Please reach out to Jillian Lukez, the graduate student mentor, with any questions.

## Tasks to be Undertaken by Mentee

- Development (with mentor guidance) and execution of an independent research project
- Collection of groundwater and surface water data
- Collection of soil cores (if needed)
- Acquisition of remote sensing data
- Management and analysis of data

## Required & Preferred Skills

Required Skills: Interest in GIS-based data analysis
Interest in surface, groundwater, and peatland interactions
Ability to maintain a positive attitude during wetland focused summer fieldwork (potential hot and cold weather, rain, high humidity, biting insects; mostly day trips with potential for several overnight trips)

Preferred Skills: Basic hydrology coursework (Will be covered during the program regardless of background)
Basic data processing skills (R, Python, MATLAB, or Excel; ArcGIS or similar)

## [MSN13] Molybdenum and Arsenic in Wisconsin Drinking Water

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|---|---|
| Institution & Location: | University of Wisconsin - Madison (UW-Madison) |
| Project PI / Mentor(s): | Athena Nghiem (anghiem@wisc.edu) \| Mentor: Clara Kieschnick (ckieschnick@wisc.edu) |
| Keywords: | Groundwater, field work, molybdenum, arsenic, laboratory analysis, soil, sediment, chemistry |
| Expected Work Hours: | 35-40 hours/week |

### Project Description

This project aims to understand the processes causing high molybdenum and arsenic concentrations in Wisconsin groundwater. Molybdenum, a poorly understood trace metal, is important to human health at low concentrations, but damaging at high ones. Molybdenum is rarely found at high concentrations in groundwater, but studies have found that Wisconsin has certain hotspots of molybdenum in groundwater. Arsenic, on the other hand, has been researched extensively, and its release mechanisms are more well-understood. Recent literature suggests that these two contaminants may be correlated in groundwater, undergoing similar mechanisms of release from soils and sediments into groundwater. This project aims at characterizing the geochemistry of these two elements at a chosen field site, in order to better understand their correlation and presence in the environment.

This project will involve field work, including collecting a sediment core and groundwater samples, and subsequent lab analyses to understand how molybdenum and arsenic are released from soils to groundwater in a selected area of Wisconsin. Field-employed instrumentation will be utilized to characterize groundwater samples in-situ and in-vitro analyses will further be employed on the collected groundwater and solid phase samples. Analytical instrumentation
including but not limited to ICP-OES, ICP-MS, IC, XRD, and SEM will be utilized in this project.

### Tasks to be Undertaken by Mentee

- Participate in a field campaign collecting groundwater and sediment samples.
- Aid in processing these samples in a lab setting, including solid-phase digestion and the use of ICP-MS
- Analyze the results
- Opportunities for more thorough statistical analysis will be available to students interested in statistics.

### Required & Preferred Skills

Required Skills: Familiarity or willingness to learn laboratory and field safety protocols; ability to work in uncomfortable field settings, regardless of weather; strong organizational skills; ability to work independently and as part of a team; enthusiasm for the topic!

Preferred Skills: We strongly prefer for the student to have completed general/introductory chemistry courses at their university, although all applicants are encouraged to apply regardless;

# [MSN14] Improving Nitrate Sensors for Soil and Groundwater Monitoring

| | |
|---|---|
| Institution & Location: | University of Wisconsin - Madison (UW-Madison) |
| Project PI / Mentor(s): | Jingyi Huang (jhuang426@wisc.edu) \| Mentor: Jingyi Huang (jhuang426@wisc.edu) |
| Keywords: | Freshwater; water quality; nitrate; groundwater; soil; agriculture; environmental sensors; environmental monitoring; nutrient pollution; hydrology; field research; laboratory research; data analysis; precision agriculture; sensor calibration |
| Expected Work Hours: | 35–40 hours per week |

## Project Description

Nitrate contamination is a major water-quality challenge in agricultural regions, where fertilizer losses can move through soils and eventually affect groundwater, streams, and lakes. Emerging nitrate sensors could provide continuous, high-frequency measurements that are difficult to obtain using traditional water and soil sampling. However, these sensors must be carefully calibrated and evaluated under realistic environmental conditions before they can be used reliably.

The student will work jointly with Dr. Jingyi Huang's lab and Dr. Joseph Andrews' lab at UW–Madison to improve the calibration and evaluation of soil and groundwater nitrate sensors (https://engineering.wisc.edu/news/printed-sensors-in-soil-could-help-farmers-improve-crop-yields-and-save-money/). The project will combine laboratory experiments, field measurements, environmental sampling, and data analysis. The student will learn how sensor readings compare with reference measurements and investigate how factors such as nitrate concentration, soil and water conditions, and temperature influence sensor performance.

This project will contribute to the development of more reliable and affordable tools for monitoring nitrate movement through agricultural soils and groundwater, ultimately supporting improved nutrient management and freshwater protection. The student will gain interdisciplinary research experience spanning soil science, hydrology, environmental sensing, water quality, and data science.

## Tasks to be Undertaken by Mentee

- Assist with laboratory calibration and testing of nitrate sensors.
- Prepare nitrate solutions and soil/water samples for experiments.
- Collect sensor measurements and reference laboratory measurements.
- Participate in field installation, monitoring, and retrieval of soil and groundwater sensors.
- Collect soil and water samples during field campaigns.
- Measure environmental variables such as soil moisture and temperature.
- Organize, quality-check, and document experimental and field datasets.
- Analyze and visualize relationships between sensor readings and reference measurements.
- Evaluate factors affecting sensor accuracy and calibration.
- Participate in research group meetings and discussions with mentors.
- Summarize results and prepare a final presentation or research poster for the Freshwater@UW program.

### Required & Preferred Skills

Required Skills: No previous experience with nitrate sensors or soil and groundwater research is required.
Applicants should have:
Interest in freshwater, environmental, agricultural, or related sciences.
Willingness to learn laboratory, field, and data-analysis methods.
Ability to work carefully and reliably with research equipment and samples.
Ability to work both independently and collaboratively as part of a research team.
Willingness to participate in outdoor fieldwork under typical summer conditions.

Preferred Skills: Experience in one or more of the following areas would be helpful but is not required:
Environmental science, soil science, hydrology, geology, agricultural science, chemistry, environmental engineering, or related fields.
Laboratory or field research.
Water or soil sampling and basic chemical analysis.
Environmental sensors or data loggers.
Data analysis or visualization using Excel, R, Python, or similar software.
Basic statistics.

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## [MSN15] Investigating Mechanisms of Radium Mobilization to Wisconsin Groundwater

| | |
|---|---|
| Institution & Location: | University of Wisconsin - Madison (Water Science and Engineering Laboratory, UW-Madison) |
| Project PI / Mentor(s): | Matt Ginder-Vogel (gindervogel@wisc.edu) \| Mentor: Peter Christ (pechrist2@wisc.edu) |
| Keywords: | Chemistry, groundwater, contaminants, water quality, laboratory analysis |
| Expected Work Hours: | 32-40 hours/week |

### Project Description

Nearly two thirds of Wisconsin residents rely on groundwater as a primary source of drinking water, but there are emerging concerns about the sustainability of deep groundwater wells and the presence of contaminants from geologic sources. This project will investigate how interactions between water and sedimentary bedrock aquifers can contribute to the release of radium to groundwater. Radium is a naturally occurring radioactive element that, when ingested at high concentrations, can lead to adverse human health effects like bone cancer. Currently, the chemistry and mineralogy that control the occurrence and mobility of radium in groundwater is not well understood. This work will inform the development of safer deep groundwater well construction methods for communities that are at risk of radium contamination to drinking water supplies. An undergraduate summer student will work with a UW graduate student and collaborate on ongoing groundwater quality research projects.

### Tasks to be Undertaken by Mentee

- Conducting batch and column flow-through studies to quantify sorption behavior

- Characterization of associated solid phases
- Field sampling of groundwater
- Handling and preparation of acidified samples for quantitative analysis
- Analytical instrumentation for this work will include using ICP-MS, ICP-OES, Ion chromatography, XRD, and SEM.

### Required & Preferred Skills

Required Skills: Basic coursework in chemistry. Strong attention to detail and ability to follow laboratory protocols. Willingness to work in laboratory settings.

Preferred Skills: Analytical chemistry, experience with basic data management and statistical analysis (Excel, etc.)

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## [MSN16] Voices of the East River: Stories of Flooding and Resilience

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|---|---|
| Institution & Location: | Wisconsin Sea Grant / UW-Madison (Green Bay & East River Watershed, WI) |
| Project PI / Mentor(s): | Julia Noordyk (jnoordyk@aqua.wisc.edu) \| Mentor: Julia Noordyk (jnoordyk@aqua.wisc.edu) |
| Keywords: | social science, environmental communication, community engagement, flood resilience |
| Expected Work Hours: | 32-40 hours/week |

### Project Description

This internship provides an opportunity to apply social science research methods to better understand the experiences and perspectives of residents affected by flooding in the East River watershed in northeast Wisconsin. The intern will focus on collecting and sharing residents' stories to highlight the personal impacts of flooding, community concerns, and opportunities to strengthen flood resilience. The intern will conduct interviews with flood-affected residents and analyze qualitative data to identify common themes and insights. The intern will also help communicate residents' experiences through stories and research summaries that inform local flood resilience planning and community engagement efforts. This experience offers a practical, applied social science project for students interested in qualitative research, environmental communication, and community engagement.

### Tasks to be Undertaken by Mentee

- Conducting interviews
- Analyzing qualitative data
- Developing short stories.

### Required & Preferred Skills

Required Skills: Effective oral and written communication skills, be team-oriented, and have an interest in environmental science communication and people's lived experiences. Reliable, organized, and able to work independently on tasks are essential. A valid driver's license is required.

Preferred Skills: Experience or interest in learning basic social science research skills. A valid driver's license for a minimum of three years.

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## [MSN17] Investigating Rainfall Partitioning to Surface Runoff and Infiltration

| | |
|---|---|
| Institution & Location: | University of Wisconsin - Madison (UW-Madison) |
| Project PI / Mentor(s): | Margaret Zimmer (margaret.zimmer@wisc.edu) \| Mentor: Adelaide Kemp (makemp2@wisc.edu) |
| Keywords: | Hydrology, rainfall extremification, field research |
| Expected Work Hours: | 32 hours/week |

### Project Description

Increasing intensity of the water cycle has led to more frequent and intense storm events, impacting how rainfall is partitioned between surface runoff and infiltration in agricultural systems. Concurrently, land management techniques in agricultural systems have been shown to influence precipitation movement by altering soil properties. Agricultural systems are major contributors to nutrient pollution in both surface and ground water bodies, and understanding how partitioning between runoff and infiltration may be shifting is essential to predicting future water quality risks.

This project will investigate the role of land management strategies in precipitation partitioning in high-intensity storm events through rainfall simulation experiments in an agricultural field setting. The work will involve field site preparation and maintenance of experimental plots where a corn silage system with varying fertilizer and tillage treatments is in place. The student researcher will work closely with a UW-Madison graduate student to prepare the field site, develop hypotheses and experimental plan, perform rainfall simulations, and, if relevant to student researcher goals, perform laboratory analysis of runoff sample nutrient concentration.

### Tasks to be Undertaken by Mentee

- Field site preparation
- Rainfall simulation experiment deployment
- Potential for laboratory analysis

### Required & Preferred Skills

Required Skills: Interest in hydrology, water quality, and field research. Participant must be comfortable spending time outdoors in an open, agricultural system in the summer (potential for hot, cold, sunny, or rainy weather, and biting insects).

Preferred Skills: None

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# [MSN18] Community Engagement Improvements to Stormwater Infrastructure in a School Setting

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|---|---|
| Institution & Location: | University of Wisconsin - Madison (UW-Madison & Lodi, WI) |
| Project PI / Mentor(s): | Carolyn Voter (cvoter@wisc.edu) \| Mentor: Mira Potter (mrpotter3@wisc.edu) |
| Keywords: | green infrastructure, stormwater management, education, community engagement |
| Expected Work Hours: | 15-20 (up to 30-40) hours/week |

## Project Description

Green stormwater infrastructure (GSI) such as rain gardens, bioswales, and green roofs are an attractive solution for enhancing the performance of traditional stormwater infrastructure, in large part because they can provide many ecosystem services beyond stormwater management. Despite this, social and institutional barriers such as low stakeholder awareness and engagement remain a barrier to widespread GSI adoption and the long-term performance of these systems. It is currently unclear to what extent engaging surrounding communities in the design and maintenance of GSI can lead to improved outcomes. To explore this, we will be performing a case-study at a local high school in Lodi, WI. Beginning in Fall 2027, high school students will learn about GSI and design their own system for implementation. For this Freshwater@UW project in Summer 2027, undergraduate student researchers will complete an initial analysis of the design area and measure initial hydrologic and ecological conditions to be provided to the high school students during their design process. Freshwater@UW student researchers will also create a database of other K-12 public schools with existing GSI practices for future analysis. Additionally, if of interest, they will have the chance to help design high school curricula, student surveys, and/or community interview protocols.

## Tasks to be Undertaken by Mentee

- Gather and interpret hydrologic data from field observations and publicly available data
- Gather ecological data through field observations
- Gather and process soil samples
- Package data in an understandable way for high school students
- Assist in designing high school level STEM curricula
- Create surveys and/or semi-structured interview questions

## Required & Preferred Skills

Required Skills: understanding of basic hydrology, willingness to learn and work with others, ability to complete project field work (light hiking, carrying equipment)

Preferred Skills: experience with hydrologic modeling or calculations, majoring in an engineering or science discipline

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## [MSN19] Understanding Ammonia Transport Across Reverse Osmosis Membrane

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|---|---|
| Institution & Location: | University of Wisconsin - Madison (UW-Madison) |
| Project PI / Mentor(s): | Mohan Qin (mohan.qin@wisc.edu) \| Mentor: Zhijie Wang (zwang3338@wisc.edu) |
| Keywords: | Ammonia recovery |
| Expected Work Hours: | 35 hours/week |

### Project Description

Reverse osmosis (RO) offers a promising approach for reclaiming ammonia-rich wastewater while enabling water reuse and nutrient recovery. However, limited mechanistic understanding of ammonia transport across RO membranes hinders process optimization and performance prediction. This project aims to elucidate the fundamental mechanisms governing ammonia partitioning and transport through an integrated framework combining theoretical modeling, laboratory experiments, and molecular dynamics simulations. We will develop an ammonia partitioning and transport model that accounts for pH-dependent $NH_3/NH_4^+$ speciation, membrane charge, and coupled diffusion, advection, and electromigration. Systematic experiments will investigate the effects of operating pressure, feed composition, and solution pH on ammonia permeability and retention. Molecular simulations will further reveal species-specific transport pathways and energy barriers, providing molecular-level insights into membrane selectivity. The resulting framework will be validated using synthetic and real wastewater streams to establish predictive relationships between membrane properties, operating conditions, and ammonia separation performance.

### Tasks to be Undertaken by Mentee

- Experimental data collection

### Required & Preferred Skills

Required Skills: Basic chemistry

Preferred Skills: None specified.

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## [MSN20] Restoration and Management on the Lake Michigan coast

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|---|---|
| Institution & Location: | University of Wisconsin – Madison; (but located in Manitowoc, Wisconsin) |
| Project PI / Mentor(s): | Titus Seilheimer (tseilheimer@aqua.wisc.edu) \| Mentor: Titus Seilheimer (tseilheimer@aqua.wisc.edu) |
| Keywords: | stream ecology, fish ecology, restoration, fieldwork, coastal wetlands |
| Expected Work Hours: | 40 hours/week |

### Project Description

Dip your toes in the field of aquatic habitat restoration in Northeastern Wisconsin with this opportunity to contribute to several restoration and monitoring projects. We are conducting pre-restoration and post-restoration data in several streams that will be used to track improvements through time. There will also be opportunities to survey fish species and monitor wild rice in Green Bay's coastal wetlands. Work locations include bay of Green Bay, Two Rivers, Manitowoc, and Port Washington.

### Tasks to be Undertaken by Mentee

- Assist PI with planning and conducting monitoring in streams and coastal wetlands.
- Map stream habitat and physical conditions, measure stream flow, collect water for phosphate measurements, collect and identify invertebrates.
- Assist with wetland and stream fish monitoring.
- GIS and mapping opportunities also a possibility.

### Required & Preferred Skills

Required Skills: Ability to work in all conditions and weather, Ability to lift 40 pounds and walk on uneven ground, Interest in aquatic ecology and restoration, Basic science experience.
Preferred Skills: Coursework in ecology and aquatic science, GIS experience, Comfortable in boats and water

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## [MKE01] Biogeochemical Profiles and Dynamics Across the Air-Water Interface

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|---|---|
| Institution & Location: | University of Wisconsin - Milwaukee (UW-Milwaukee & UW-Madison) |
| Project PI / Mentor(s): | Dr. Charles J. Paradis (paradisc@uwm.edu) \| Mentor: Dr. Charles J. Paradis (paradisc@uwm.edu) |
| Keywords: | Biogeochemistry, Geology, Microbiology |
| Expected Work Hours: | 32 hours/week |

### Project Description

Chemicals can have an affinity for the air-water interface and form highly-concentrated and ultra-thin films relative to the bulk solution beneath it. This setting is well known to exist geologically, e.g., below the ground surface but above the water table. What is not known, is how chemicals and microbes distribute in profile and change in time across the air-water interface. This project aims to measure, in the laboratory, chemical and microbial profiles across the air-water interface in space and time. Batch microcosms will be constructed in triplicate using natural groundwater with various air to water ratios and sampled periodically for up to two weeks. A suite of chemical (UW-Milwaukee) and microbiological (UW-Madison) analyses will be conducted and interpreted for implications to the biogeochemistry at the air-water interface in geologic settings.

### Tasks to be Undertaken by Mentee

- Design, construct, and operate batch microcosms in the lab (UW-Milwaukee)
- Analyze for microbiological parameters (UW-Madison).

### Required & Preferred Skills

Required Skills: Basic chemistry and algebra.

Preferred Skills: Wet chemistry (weighing, pipetting, serial dilution, titration) and computer programming (Python, R, MATLAB).

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## [MKE02] Ecology of Lake Sturgeon in the Milwaukee River Estuary

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|---|---|
| Institution & Location: | University of Wisconsin - Milwaukee (UW-Milwaukee School of Freshwater Sciences) |
| Project PI / Mentor(s): | Brandon Gerig (gerig@uwm.edu) \| Mentor: Brandon Gerig (gerig@uwm.edu) |
| Keywords: | fish, lake sturgeon, threatened and endangered species, natural resources management |
| Expected Work Hours: | 40 hours/week |

### Project Description

Across the Great Lakes, hatchery and stream-side rearing supplementation have been a key component to lake sturgeon (Acipenser fulvescens) rehabilitation efforts. Since 2009, ~1,000 age-0 sturgeon have been stocked annually into the Milwaukee River Estuary (MRE). While the life history of adult lake sturgeon is generally well known, there are significant uncertainties related to the movement, habitat use, trophic ecology, and survival of juvenile lake sturgeon, particularly in harbor habitats. The scholar will join a research project leveraging acoustic telemetry and stable isotopes to better understand the ecology of juvenile Lake Sturgeon in the MRE. The scholar will directly contribute hand-on field work including fish sampling, gear maintenance and deployment (e.g. telemetry receivers), and preparation of biological samples for stable isotope analysis, while working with the PI and graduate students to develop an independent research project within the scope of this project. Overall, the scholar will contribute to efforts that directly inform lake sturgeon rehabilitation efforts, guide Lake Michigan fish community objectives, and inform estuary remediation efforts in the Milwaukee Area of Concern (AOC).

### Tasks to be Undertaken by Mentee

- Conduct fisheries surveys using gill nets and set lines for juvenile lake sturgeon.
- Assist in the collection of biological data to inform sturgeon growth, habitat use, survival, and diet.
- Deployment and upkeep of river and harbor monitoring equipment including acoustic telemetry receivers.
- Assist in lab processing of stable isotope samples from Milwaukee harbor fish and invertebrates.

### Required & Preferred Skills

Required Skills: Ability to work in the field settings for long hours. Ability to closely collaborate with UWM graduate students, technicians, and the project PI. Ability to work safely from boats. Ability to follow

protocols carefully and work independently following training. Willing to work on weekends and at night if necessary. Enthusiasm and desire to learn about Great Lakes fish ecology.

Preferred Skills: None specified.

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## [MKE03] Microplastics in the Nearshore Lake Michigan Lower Foodweb

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|---|---|
| Institution & Location: | University of Wisconsin - Milwaukee (UW-Milwaukee School of Freshwater Sciences) |
| Project PI / Mentor(s): | John A Berges (berges@uwm.edu) \| Mentor: John A Berges (berges@uwm.edu) |
| Keywords: | zooplankton, invasive species, microplastics, Lake Michigan |
| Expected Work Hours: | Average of 40 h a week |

### Project Description

The invasive mysid, Hemimysis anomala, is abundant in Wisconsin harbors, eaten by most harbor fishes, and present in all seasons. Hemimysis could serve as a model (and possible biomonitoring) organism to investigate microplastics in nearshore Lake Michigan ecosystems. The project aims to: 1) survey microplastics (staining with Nile Red and quantifying with microscopy and image-analysis) in Hemimysis from Milwaukee and other harbors; 2) relating microplastics in the harbor to water abundance and river flow; 3) use laboratory feeding experiments to estimate ingestion of plastics by Hemimysis to aid in modeling; and 5) work with community partners (Friends of Lakeshore State Park and Discovery World) to improve public understanding of invasive species and microplastic.

### Tasks to be Undertaken by Mentee

- Working with graduate students to sample Lake Michigan harbor environments
- Collecting water and setting traps for Hemimysis.
- Maintaining Hemimysis in the lab and conducting grazing experiments with algae and microplastics.
- Analyzing water samples and Hemimysis samples for microplastics.
- Assembling and analyzing datasets, including environmental data.

### Required & Preferred Skills

Required Skills: Basic knowledge of chemistry, some experience with microscopy. Interest in fieldwork in coastal shoreline environments.

Preferred Skills: Experience keeping animals in aquaria. Experience with image analysis.

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# [MKE04] PCBs in the Lower Food Web of the Milwaukee Harbor Area of Concern

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|---|---|
| Institution & Location: | University of Wisconsin - Milwaukee (UW-Milwaukee School of Freshwater Sciences) |
| Project PI / Mentor(s): | Benjamin Peterson (petersob@uwm.edu) \| Mentor: Benjamin Peterson (petersob@uwm.edu) |
| Keywords: | Polychlorinated biphenyls, contaminants, aquatic food webs, invertebrates, fish, water chemistry, Milwaukee Harbor, Area of Concern |
| Expected Work Hours: | 36 (up to two positions) hours/week |

## Project Description

Due to a long history of industrial inputs, sediments in the Milwaukee Estuary are highly contaminated with organic and metal contaminants, leading to its designation as an Area of Concern (AOC). One of the primary contaminants of concern are polychlorinated biphenyls (PCBs). To address this contamination, a multi-agency team has planned sediment dredging in the AOC to remove these contaminants. This effort, the largest sediment dredging effort in the Great Lakes, is scheduled to start in 2027. Monitoring has been conducted on several important compartmentsl; however, significant knowledge gaps remain. This project will establish a critical pre-dredging baseline of PCB uptake into the lower food web of the estuary. PCBs will be quantified in a diverse range of compartments, including benthic invertebrates, zooplankton, invasive mussels, prey fish such as goby, and benthic algae, among others. The student will join research teams to assist with fieldwork and sample processing, storage, and analysis. Finally, with supervision from the PI, the student will conduct an independent research project within the project scope. Overall, the student will contribute directly to a critical project that will monitor the success of a large-scale remediation effort and inform future remediation efforts in the Great Lakes and beyond.

## Tasks to be Undertaken by Mentee

- Collect and process biological and water samples from small boats and on foot (either from bridges or using waders).
- Support laboratory activities, including logging samples, acid washing glassware, filtering water, and preparing sediment and biological samples for PCB analysis.
- Assist with data entry and quality control.
- Visualize and interpret data to answer questions.

## Required & Preferred Skills

Required Skills: Ability and enthusiasm to work in the field for long hours, including on a boat or wading in streams. Comfortable around water (requisite safety gear will be provided). Ability to follow safety and laboratory protocols, work well in a team, and stay organized within a big project. Good communication skills. Willing and able to work flexible hours, as field work sometimes includes early mornings or late evenings. Enthusiasm about contaminant remediation and monitoring.

Preferred Skills: Experience with field work, laboratory work, or boat operations is preferred but not required.

Note to Applicants: These skills are helpful, but are not requirements. Most can be taught or trained, so if you have a strong interest in this project but lack these skills, you should still apply.

## [MKE05] Virtual Water Trade

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|---|---|
| Institution & Location: | University of Wisconsin - Milwaukee (UW-Milwaukee / Remote) |
| Project PI / Mentor(s): | Avik Chakrabarti (chakra@uwm.edu) \| Mentor: AVIK CHAKRABARTI (chakra@uwm.edu) |
| Keywords: | water, trade, technology, comparative advantage, endowment |
| Expected Work Hours: | 32-40 hours/week |

### Project Description

Virtual water trade (VWT) is typically defined as international trade in water-intensive commodities. With the expansion of international trade in agricultural crops, VWT has gained significant mileage. How can we distinguish the contribution of technology from that of relative endowments to VWT? This challenging question has stimulated much debate among scientists, academics, and government policymakers ever since Merrett (1997) noted that the water content of imported grain is much less than the totality of water that
was used to grow the grain. Early contributors, to this debate, had pinned the driving force behind VWT to technology (Ricardian Theory) while an alternative explanation is founded on factor proportions (HeckscherOhlin-Samuelson Theory). In this project, the student mentee is expected to gain hands-on experience in data modeling and analysis in the process of measuring the factor content of VWT to distinguish the contribution of technology from that of relative endowments.

### Tasks to be Undertaken by Mentee

- Data management, modeling, and analysis
- Deliverables include the completion of a short communications assignment and a poster presentation.

### Required & Preferred Skills

Required Skills: Reproducible data management, modeling, and analysis.

Preferred Skills: Familiarity with integrated statistical computing environment, data wrangling, R programming language, data graphics and visualization, and report generation using R Markdown. Experience using R to manipulate data; perform exploratory data analysis; write conditional expressions, loops, and functions; manipulating data matrices and arrays; extracting data from text; and making high level visualizations of data. Note to
applicants: These skills are helpful, but are not requirements. Most can be taught or trained, so if you have a strong interest in this project but lack these skills, you should still apply.

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## [MKE06] Feed Management for Lake Sturgeon Larvae and Juveniles

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|---|---|
| Institution & Location: | University of Wisconsin - Milwaukee (UW-Milwaukee School of Freshwater Sciences) |

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|---|---|
| Project PI / Mentor(s): | Dong-Fang Deng (dengd@uwm.edu) \| Mentor: Dong-Fang Deng (dengd@uwm.edu) |
| Keywords: | Feed, Growth, Nutrition, Lake sturgeon |
| Expected Work Hours: | 35 hours/week |

### Project Description

This project focuses on developing innovative feed formulations and feeding strategies to improve the survival and growth of lake sturgeon larvae and juveniles. The primary goal is to optimize feeding practices while reducing feed costs and labor requirements in hatchery operations.

Under the guidance of the principal investigator (PI) and graduate students, the student will gain hands-on experience in lake sturgeon rearing, feed preparation, and feeding management. The project will involve conducting feeding trials in the PI's laboratory to evaluate the efficiency of different feed formulations and feeding strategies. Feed performance will be assessed by measuring fish growth, survival, feed efficiency, and overall health.

### Tasks to be Undertaken by Mentee

- Conduct a 4–6-week feeding trial to monitor fish growth and survival.
- Provide daily fish care, including feeding and monitoring fish health and behavior.
- Monitor and record water quality parameters to maintain appropriate rearing conditions.
- Assist with feed preparation and implementation of feeding protocols.
- Collect, record, and organize experimental data using Microsoft Excel.

### Required & Preferred Skills

Required Skills: Basic knowledge of biology. The student should be willing to work in a wet laboratory environment and use Microsoft Excel to organize and manage experimental data. Strong time management skills, reliability, and the ability to complete assigned tasks.

Preferred Skills: previous experience working with fish are preferred but not required.

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## [OSH01] Vertical profiles of cyanobacteria in Lake Winnebago and implications for field and satellite-derived estimates of cyanoHABs

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|---|---|
| Institution & Location: | University of Wisconsin - Oshkosh (UW Oshkosh & Lake Winnebago, WI) |
| Project PI / Mentor(s): | Robert Stelzer (stelzer@uwosh.edu) \| Mentor: Robert Stelzer (stelzer@uwosh.edu) |
| Keywords: | cyanobacteria, harmful algal blooms, field work, lake, microscopy, satellite data |
| Expected Work Hours: | 35 hours / week |

### Project Description

Would you like to spend days on a pontoon boat and in lab to address central questions about cyanobacteria harmful algal blooms (cyanoHABS) next summer? You would be part of a collaborative

research team that includes freshwater senior scientists at UW Oshkosh, undergraduate and MS students, and Dr. Timothy Wynne (Research Oceanographer, NOAA).

We are addressing the ability of satellites and conventional field sampling approaches to capture cyanobacteria abundance throughout the water column in Lake Winnebago, the largest inland lake in Wisconsin. Although satellite sensors are powerful ways to detect cyanoHABs in large lakes, they only measure cyanobacteria near the lake surface in most systems. In addition, the most common field sampling methods for cyanobacteria target the lake surface or slightly deeper. Our preliminary data suggests that surface-centric approaches, including remote sensing (e.g., satellites), may underestimate cyanobacteria abundance in lakes. To address our central questions, we will generate a more extensive data set next summer on surface and water column cyanobacteria abundance, and environmental correlates and forcing factors, including turbidity and wind speed.

### Tasks to be Undertaken by Mentee

- Full and partial days of field work on Lake Winnebago while on a pontoon boat (10 – 15 days total).
- Data collection from boat with field sensors and water sampling equipment.
- Lab work consisting mostly of identifying and taking digital photos of cyanobacteria, Image analysis using ImageJ software
- Participation and interaction during team meetings
- Data analysis and comparisons involving field and satellite data from NOAA
- Other tasks to be determined as part of independent research project

### Required & Preferred Skills

Required Skills: Willingness to learn, curiosity

Preferred Skills: Field sampling, microscope experience, attention to details (we will provide full training in all procedures and research methods),

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## [OSH02] Investigation of Microplastics in Well Water

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|---|---|
| Institution & Location: | University of Wisconsin - Oshkosh (UW Oshkosh ERIC Lab, Door & Vilas Counties) |
| Project PI / Mentor(s): | Jackie Behrens (behrensj@uwosh.edu) \| Mentor: Jackie Behrens (behrensj@uwosh.edu) |
| Keywords: | Microplastics, Well Water, FTIR, Laboratory |
| Expected Work Hours: | 40 hours/week |

### Project Description

This project will investigate microplastics in well water collected from wells in Vilas and Door County. The project will allow the researcher to learn sample processing techniques as well as analytical instrumentation for the detection and identification of microplastics such as FTIR. The researcher will be part of a larger team that explore a number of drinking water quality parameters and will be the lead in microplastics analysis. The researcher will have the opportunity to visit field research sites in Door County and Vilas County while engaged in their work. The researcher will get an exposure to field collection

techniques as well as laboratory methodologies for a variety of analyses. Further, the Environmental Research and Innovation Center (ERIC) is a full-service, certified laboratory for a number of environmental analyses with a diverse student researcher population of 12-16 student researchers in the summer. In addition to being the FTIR lead, the researcher will also rotate through the laboratory so they can learn added instrumentation and methods such as discrete analyzers, AA, ICP, TOC, COD, and various microbiological analysis. The exact experience will be attached to the interest of the selected researcher to best optimize their experience.

### Tasks to be Undertaken by Mentee

- The project will allow the researcher to learn sample processing techniques as well as analytical instrumentation for the detection and identification of microplastics such as FTIR. -The researcher will get an exposure to field collection techniques as well as laboratory methodologies for a variety of analyses.
- The researcher will also rotate through the laboratory so they can learn added instrumentation and laboratory methods such as discrete analyzers, AA, ICP, TOC, COD, and various microbiological analysis.
- The exact experience will be attached to the interest of the selected researcher to best optimize their experience.

### Required & Preferred Skills

Required Skills: Basic lab experience. Ability to work with a team.

Preferred Skills: Good communication skills.

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## [PRK01] Assessing populations of the federally endangered Hine's Emerald Dragonfly (Somatochlora hineana) in Wisconsin

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|---|---|
| Institution & Location: | University of Wisconsin - Parkside (UW-Parkside & Field Sites across WI/IL) |
| Project PI / Mentor(s): | Jessica Orlofske (orlofske@uwp.edu) \| Mentor: Jessica Orlofske (orlofske@uwp.edu) |
| Keywords: | insects, dragonflies, freshwater invertebrates, crayfish, wetland ecology, invertebrate ecology, conservation biology, endangered species |
| Expected Work Hours: | Full time (32-40 hours per week, split between field and lab) |

### Project Description

The Hine's Emerald Dragonfly (HED, Somatochlora hineana) is a federally endangered species in the both the United States and Canada. The current range of HED in Wisconsin is restricted to areas of the Door County peninsula with additional records from Iowa, Ozaukee, Richland, and Rock Counties. The unique habitat requirements and life history of the HED make it particularly vulnerable to extirpation and extinction. Specifically, the HED favors shallow groundwater-supported wetland (i.e., fen) habitats where nymphs require multiple years (4-5) to fully develop prior to emergence. To survive with this combination of a long development period and a shallow, sometimes temporary, habitat, dragonfly nymphs require refugia. Thus, the HED cohabitates with burrowing crayfish, specifically the Great Plains Mudbug

(Lacunicambarus nebrascensis) to avoid inhospitable conditions. Therefore, suitable habitat for this endangered species includes appropriate hydrology, water chemistry, wetland vegetation, and the presence of other invertebrates not only for food but also for shelter.

This study will evaluate the distribution of HED populations across verified or potential HED sites across Wisconsin by performing surveys for both adult and larval stages.

### Tasks to be Undertaken by Mentee

- In collaboration with project leads and partners, the mentee will verify HED presence at known or potential HED sites using traditional burrow sampling for larvae and aerial net surveys for adults which may be coupled to mark-recapture and/or radio tracking techniques, specifically:
- Geolocating crayfish burrows in the field
- Pumping crayfish burrows and identifying freshwater invertebrates from pumping samples (in field and/or in the laboratory)
- Catching and identifying crayfish
- Catching and potentially radio tagging or marking adult HED in the field
- Collecting site-scale habitat data, including measurements of water quality parameters and vegetation assessments
- Maintaining detailed field and laboratory data suitable for statistical analysis
- Calculating preliminary descriptive statistics for physical, chemical and biological parameters
- Developing a professional presentation based on preliminary results

Additional responsibilities of the mentee include:

- Attending field trips and meetings with partners, including US Fish and Wildlife Service, Lake County Forest Preserves, Forest Preserve District of DuPage County, Genoa National Fish Hatchery, University of South Dakota, and other stakeholders.
- Contributing to captive rearing efforts for Great Plains Mudbug at UW-Parkside
- Participating in other freshwater surveys (wetlands, rivers, and lakes) to learn additional sampling techniques and become familiar with other aquatic invertebrates and vertebrates
- Collaborating with other students (graduate and undergraduate) in the lab

### Required & Preferred Skills

Required Skills:

Ability to follow directions and respect safety rules
Ability to follow protocols carefully and work independently following training
Willingness to work in prairie and wetland habitat in a variety of weather conditions
Ability to carry up to 20 pounds of equipment into the field (across uneven surfaces)
Comfortable handling live invertebrates, including crayfish

Preferred Skills: An interest in wetland ecology, invertebrate ecology, and/or conservation biology

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## [PLT01] Biochar and agricultural water quality

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| Institution & Location: | University of Wisconsin - Platteville (UW-Platteville & Pioneer Farms) |

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| Project PI / Mentor(s): | Joseph Sanford (sanfordj@uwplatt.edu) \| Mentor: Joseph Sanford (sanfordj@uwplatt.edu) |
| Keywords: | agriculture, nutrient leaching, biochar |
| Expected Work Hours: | 38 hours/week |

### Project Description

This project evaluates how field-applied biochar influences nutrient leaching in agricultural cropping systems. The undergraduate researcher will actively participate in field and laboratory research focused on monitoring soil water quality using suction lysimeters. Key responsibilities include assisting with regular field visits to collect soil water samples from biochar-amended agricultural plots, performing routine water quality laboratory analyses, and maintaining accurate field and analytical logs. Through this project, the student will gain hands-on experience with environmental field instrumentation, water quality analytical analysis, data management, and the practical application of soil amendments.

### Tasks to be Undertaken by Mentee

- Assist with regular field visits to collect soil and water samples
- Perform routine laboratory water quality analysis
- Enter and manage data.

### Required & Preferred Skills

Required Skills: Ability to work outdoors; General chemistry knowledge; Strong attention to detail

Preferred Skills: Laboratory water quality analysis; general understanding of nutrient cycling;

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## [RVF01] Investigating the Transport of Nutrients and Pesticides in Wisconsin Agricultural Soils

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| Institution & Location: | University of Wisconsin - River Falls (UW-River Falls) |
| Project PI / Mentor(s): | Bahareh Hassanpour (bahareh.hassanpour@uwrf.edu) \| Mentor: Bahareh Hassanpour (bahareh.hassanpour@uwrf.edu) |
| Keywords: | Agricultural soils, nutrient transport, pesticide leaching, soil column experiments, water quality, soil analysis, environmental chemistry, agricultural water quality, leachate sampling. |
| Expected Work Hours: | 40 hours/week |

### Project Description

This undergraduate research project will investigate the transport of nutrients and pesticides in Wisconsin agricultural soils through laboratory soil column experiments and field-based leachate studies at a farm. The project aims to improve understanding of how soil properties and hydrological conditions influence the movement of agricultural chemicals and their potential impacts on water quality.

The student will assist with preparing agricultural soil samples, packing soil columns, conducting column experiments, and collecting leachate samples to evaluate the transport of nutrients and pesticides

through soil. The student will also participate in field experiments at an agricultural farm, assisting with leachate collection, sample processing, and water quality measurements. Laboratory analyses will be used to quantify nutrient and pesticide concentrations in collected samples.

Additional responsibilities will include organizing experimental data, developing breakthrough curves, comparing laboratory and field observations, and evaluating factors influencing chemical transport and leaching.

Through this project, the student will gain hands-on experience in environmental research, soil and water analysis, field sampling, laboratory techniques, and data interpretation. The findings will contribute to understanding nutrient and pesticide transport in agricultural landscapes and informing strategies to protect water quality.

### Tasks to be Undertaken by Mentee

- Prepare soil samples and set up laboratory soil column experiments.
- Conduct column and farm-based leachate experiments.
- Collect and analyze soil leachate samples for nutrients and pesticides.
- Organize and analyze experimental data.
- Summarize findings and contribute to research presentations.

### Required & Preferred Skills

Required Skills: Interest in environmental science, soil science, or water quality.
Basic laboratory skills and attention to detail.
Ability to follow experimental protocols and maintain accurate records.
Willingness to learn field sampling and laboratory analytical techniques.
Ability to work independently and collaboratively.

Preferred Skills: Experience with soil sampling or laboratory experiments.
Familiarity with water quality analysis and nutrient chemistry.
Basic data analysis skills using Excel or similar software.
Interest in environmental research and agricultural water quality

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## [RVF02] Contaminant profiles in western Wisconsin groundwater

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| Institution & Location: | University of Wisconsin - River Falls (UW-River Falls & Western WI Rural Wells) |
| Project PI / Mentor(s): | Jill Coleman Wasik (jill.colemanwasik@uwrf.edu) \| Mentor: Jill Coleman Wasik (jill.colemanwasik@uwrf.edu) |
| Keywords: | groundwater, contaminant fate and transport, hydrogeology, heavy metals |
| Expected Work Hours: | 40 hours/week |

### Project Description

Groundwater contamination is common across the state of Wisconsin and poses threats to public health and ecosystems. Contaminants can come from a variety of sources such as industry, agriculture,

residential septic, ambient rocks and soils. And contaminants can range from inorganic forms of nutrients (e.g. nitrate), to salt ions (e.g. chloride), to viruses and bacteria, to organics (e.g. pesticides, pfas), to heavy metals. In western Wisconsin, the University of Wisconsin River Falls collaborates with a regional farmer-led watershed council to monitor a large network of rural residential and farm wells. This program, entering its 10th year in 2027, has focused primarily on monitoring nitrate in groundwater. Over 40% of the wells in the network have average concentrations of nitrate in excess of the 10 part-per-million health standard. Recently council members have expressed interest in understanding other contaminants that may be in their well water. This project will analyze well water samples collected in 2027 for nitrate and additional contaminants to create a profile of groundwater contamination that will allow well owners to better understand health risks associated with their drinking water.

### Tasks to be Undertaken by Mentee

- Residential and farm well water sample collection
- Sample tracking and processing
- Laboratory analyses that may include nitrate/nitrite, phosphate, carbon, heavy metals, etc depending on interest and instrument availability
- Communicating well sample results to well owners

### Required & Preferred Skills

Required Skills: Ability to work in field and laboratory settings
Willingness to learn technical laboratory analyses
Attentive to detail
Ability to work independently and with a partner
Basic familiarity with spreadsheets and data entry
Basic understanding of general chemistry concepts
Basic understanding of hydrology and/or hydrogeology concepts
Ability to become an authorized campus vehicle driver

Preferred Skills: Previous experience using field equipment, running lab instrumentation, and/or analyzing water samples
Taken a hydrology or hydrogeology course

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## [USGS01] Raman-Based Nanoplastics Enumeration and Characterization in Environmental Waters

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| Institution & Location: | USGS M3 Research Laboratory - Madison (Forest Products Laboratory Complex, Madison, WI) |
| Project PI / Mentor(s): | Bryce Cook (bcook@usgs.gov) \| Mentor: Bryce Cook (bcook@usgs.gov) |
| Keywords: | Nanoplastics, Raman, Spectroscopy, Analytical Chemistry |
| Expected Work Hours: | 40 hours/week |

## Project Description

This project will be overseen by a Physical Scientist at the USGS M3 (Mercury, Metals, and Microplastics) Laboratory. The M3 research lab has been working to develop Raman-based methods for nanoplastics enumeration and characterization in environmental matrices. The student will build on previous students' work with the Raman instrument to further methods for detection of ambient nanoplastics in water samples of varying matrix difficulty (drinking water, rinver water, pond water, etc.). The student will work to (1) fine tune instrument parameters to maximize signal from nanoplastics, (2) algorithmically process Raman spectra for polymer identification, (3) use and generate new nanoplastics standards to create calibration curves and perform matrix spike recovery assessment on a variety of waters, (4) and determine optimal procedure for determining concentrations in water samples based on information from the Raman instrument.

## Tasks to be Undertaken by Mentee

- Fine tune instrument parameters to maximize signal from nanoplastics
- Algorithmically process Raman spectra for polymer identification
- Use and generate new nanoplastics standards to create calibration curves and perform matrix spike recovery assessment on a variety of waters
- Determine optimal procedure for determining concentrations in water samples based on information from the Raman instrument.

## Required & Preferred Skills

Required Skills: - Completed coursework in the sciences with a lab component (minimum 3 courses with lab component)

Preferred Skills: Knowledge of analytical and instrumental chemistry principles
Microscopy experience
Interest in micro- and nano-plastics

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