

Biology Research Opportunities at UWSP

Temporal and Spatial Analysis of Lakes Within the Great Lakes Region Using Large Data Sets and Paleo Proxies

Dr. Krista Slemmons
Associate Professor of Biology
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Description: My research on temperate, arctic and alpine lakes examines the response of aquatic ecosystems to long-term climate variation. I use fossil diatom reconstructions, field observations and modern ecological experimentation to understand the drivers of aquatic community change. Particularly, I am interested how the combined effects of climate variability, nutrient loading and hydrologic change influence ecosystem dynamics through time and how this can inform management decisions.

Techniques: Data analysis, field collection/analysis, diatom identification, chemical and geological lab analyses

General Requirements for Students: None

Number of new students: 3-5

Project Timeline: Fall, Spring

The Ecology and Evolutionary Biology of Cannabis Sativa

Dr. Brian Barringer
Associate Professor of Biology
bbarring@uwsp.edu

Description: I have a variety of projects focused on the ecology and evolutionary biology of Cannabis sativa. Some of my work focuses on understanding the ecology of feral populations and whether and to what extent feral lineages can be used to improve modern-day varieties. Other projects focus on the ability of this species to act as a phytoremediator (removing toxins from the soil and sequestering them in plant tissues). I'm also quite interested in the interactions this species has with other organisms (soil biota, insects, etc.).
Techniques: Experimental design, growing and caring for plants in the greenhouse and field, gathering, analyzing, and interpreting data, sharing results with others in written and oral presentations

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General Requirements for Students: : Intellectual curiosity, responsible, motivated and takes initiative, positive disposition and works well on own and as part of a team

Number of new students: Not actively recruiting but always interested in working with motivated students

Project Timeline: Fall, Spring

The Ecology and Evolution of Clarkia spp. in California

Dr. Brian Barringer
Associate Professor of Biology
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Description: I have a number of ongoing projects focused on a few different species in the genus Clarkia (a group of annual plants native to the western US). Most of my work in this study system focuses in one way or another on understanding the ecology and evolutionary biology of plant mating systems. The work includes both greenhouse and lab work at UWSP and field work in CA.

Techniques: I involve students in all aspects of my research, including experimental design and execution, data analysis and interpretation, and sharing results via scientific conferences and publications

General Requirements for Students: Students must be intellectually curious, responsible, and must work well with others

Number of new students: Not actively recruiting but always interested in working with motivated students

Project Timeline: Fall, Spring

Biogeography of Wisconsin Fishes and Fish Communities

Dr. Justin Sipiorski
Professor of Biology
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Description: My students survey waterways for all fish species using a variety of methods. In the face of climate change and environmental degradation, aquatic ecosystems are constantly in flux (including fishes). We submit findings to the Wisconsin DNR. The DNR focuses on gamefish populations and our efforts complement theirs, providing data on non-game fish distributions. Each year we discover new localities for fish species, and are also investigating evidence for recent potential fish extirpations. We curate fish specimens in the UWSP Museum of Natural History's Becker Memorial Ichthyological collection, one of the major collection documenting current and historical Wisconsin fish populations.

Techniques: Fish collection techniques (seines, dip nets, purse seines, electrofishing); aquatic habitat qualification/quantification; fish age, growth and body condition estimation; fish life history description; fish population dynamics modeling; fluid vertebrate collection curation techniques; georeferencing biological collection

General Requirements for Students: reliability, interest in biogeography, interest in biological collections, interest in fish diversity

Number of new students: 1-10

Project Timeline: Year-round



Parasitology Museum Curation and Digitization Projects

Dr. Sarah Orlofske
Assistant Professor of Biology
sorlofsk@uwsp.edu

Description: The UWSP Stephen J. Taft Animal Parasitology Collection contains over 22,000 specimens and represents one of the largest parasite- focused collections in the Midwest. Active curation of physical slide and vial specimens is needed to secure the collection for research and teaching purposes. Active digitization efforts make our specimens available to the public, researchers and students world wide. Current emphasis is on Arthropod parasites, but significant work is needed on Helminths and Protozoa.

Techniques: Museum preservation methods, microscopy (including digital photomicroscopy), molecular methods for species identification, literature reviews and exhibit development and outreach.

General Requirements for Students: General interest in Museum Collections, Natural History, Parasitology, Taxonomy, Evolution or Systematics. Ability to work as a team and follow detailed protocols for handling specimens, working with microscopes, and computer programs. General computer skills including Microsoft Excel and Adobe Creative Suite.

Number of new students: 3-4

Project Timeline: Fall, Spring

Waterfowl Parasitology: Ecosystem and Community Ecology

Dr. Sarah Orlofske
Assistant Professor of Biology
sorlofsk@uwsp.edu

Description: Waterfowl are obtained from hunters and then dissections are performed by standardized protocols to obtain accurate species identifications and quantitative data on infection prevalence and intensity. We address a variety of research questions including detecting the presence of pathogenic species or discovery of new species. Overall the ecological and evolutionary significance stems from understanding how the environment or host characteristics influence parasite infection and the potential impact parasites have on hosts. There are also numerous opportunities for public engagement and outreach through existing collaborations with Wisconsin Waterfowl Association, USGS, WDNR, and individual hunters.

Techniques: Microscopy, Dissection Protocols, Museum Methods, Molecular Techniques

General Requirements for Students: Interest in parasitology, ecology, evolution or wildlife disease. Ability to work as a team and follow detailed safety protocols. Attention to detail and interest in statistics and data analysis.

Number of new students: 2-4

Project Timeline: Fall, Spring

Biological Control and Suppressive Soilless Systems

Dr. Ann Impullitti
Assistant Professor of Biology
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Description: Hydroponics and aquaponics are soilless based cropping systems in which a nutrient solution is fed to plant roots. Our goal will be to identify potential biological antagonists of the pathogen *Pythium oopapillum*. Managing plant diseases in these systems is challenging since the primary goal of many soilless systems is sustainability and pesticide free production. The overall goal of this research is to begin to investigate disease incidence and management in soilless systems.

Techniques: Culturing fungi, DNA extraction, PCR, hydroponics

General Requirements for Students: Prefer second or third year level

Number of new students: 1-2

Project Timeline: Fall

Student Enrichment, Engagement, & Equity in Chemistry, Biology, & Biochemistry through Science History and Research Displays (SEEE CBB SHAReD)

Dr. Lindsay Dresang
Assistant Professor of Biology
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Description: Representation promotes inclusion and instills confidence to succeed in STEM fields. Our goal is to develop a series of themed displays in CBB related to great discoveries in science, explaining the history and importance of these discoveries while simultaneously highlighting the contributions made by women and minorities in science. Additionally, we will connect these great discoveries to the research work of our current faculty and career opportunities. Displays will have interactive QR codes to promote engagement for community events and allow us to analyze the effectiveness of the displays in improving engagement and belongingness for K-12 students, science majors and community members.

Techniques: IRB protocol, questionnaire formatting & analysis, science history

General Requirements for Students: : interests in illustration, composition, diversity in STEM, and/or science education; required to have had a course with PI/co-PI/strong or strong recommendation from either Justin Sipiorski or Sarah Scripps

Number of new students: 1-2

Project Timeline: Summer 2022 to Spring 2023



Department of Biology
College of Letters and Science
University of Wisconsin - Stevens Point

Primate Stress Behavior and Fecal Cortisol Analysis

Dr. Sarah Jane Alger
Associate Professor of Biology
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Description: Primates Incorporated is a primate sanctuary about one hour south of campus. They collect behavioral data and fecal samples from their residents and send them to us for analysis. This project is to statistically explore the available data and write a grant to process the fecal samples.

Techniques: Grant writing and statistical design and analysis

General Requirements for Students: The completion of biology and statistics courses is preferred, but not required.

Number of new students: 1-2

Project Timeline: Fall

Neural Responses of Zebra Finches Exposed to Vocalizations of A Current Partner, Ex-Partner or Stranger

Dr. Sarah Jane Alger
Associate Professor of Biology
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Description: Zebra finches were exposed to vocalizations of a current partner, ex-partner or stranger. Brains were fixed and stained for proteins indicating neuronal activity. We will be counting active cells under the microscope for multiple brain regions of interest to see how brain activity compared in these three conditions.

Techniques: Microscopy and data analysis

General Requirements for Students: Must commit to the project for at least 2 semesters.

Number of new students: Up to 3

Project Timeline: Fall

Behavior and life history of lizards in one of the hottest places on Earth; the bottom of the Grand Canyon

Dr. Pete Zani
Associate Professor of Biology
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Description: Ecosystem collapse due to ongoing climate change is well and truly underway in the tropics and poles, yet temperate regions are slower to see those effects. This study is meant to create baseline data to document the presence and behavior of lizards at the bottom of the Grand Canyon prior to their expected local extinction sometime in the next 50-100 years. As such, we will backpack to the bottom of the Grand Canyon and spend four nights camping while we study lizards in early (March) and again in late (May) spring.

Techniques: focal behavioral observations of animals, lizard capture and measurement, field techniques

General Requirements for Students: Physically able to carry a backpack weighing up to 1/4 of their weight for 10 miles both down into and up out of the Grand Canyon.

Number of new students: 2-3

Project Timeline: Fieldwork over spring break and Memorial Day

