

Undergraduate Research Opportunities For Environmental Majors – Spring 2020

Students are encouraged to seek out research experience while pursuing their undergraduate degree. Students desiring a research experience should review the list of faculty research projects provided below and see what opportunities are available. Students must contact faculty directly to express their interest and get more information. Students may earn academic credit for their research experience.

The following faculty members are eager to work with undergraduate students majoring in environmental disciplines who want practical research experience, integrating basic and applied science working towards solutions to real world problems facing our environment.

Basic Instructions:

- 1) Student should review list of available projects below, and then contact faculty members directly (or other individual listed) to learn more about project expectations and qualifications (if any) that are needed. **Mark your subject line of your email as "Undergrad Research Inquiry" and in your email provide the following information:**

***Student name, class year, GPA, list of any relevant course work completed, number of hours available to work on project each week; specific skills/experience/training required for the project.**

- 2) **Priority deadline for applications is Friday, January 24th.** Faculty will contact qualified students to arrange for interviews as appropriate. Selection of interns (for most projects) will occur by Friday, January 31st.
- 2) To earn academic credit, an ENVSCI Independent Study contract must be completed and signed by both the student and the sponsoring faculty member. This form is available on-line at http://eco.umass.edu/wpcontent/uploads/2011/11/ENVSCI_IndepStudyForm_fields.pdf
- 3) Instructions for completing the form are provided on-line within the same document link. Be sure to indicate the number of credits being earned for the research experience.
- 4) Please note that all Independent Study projects (ENVIRSCI 296, 396, 496) **must be letter graded**. Student can choose to enroll in Internship/Practicum credits (ENVIRSCI 298, 398, 498), but these courses are mandatory Pass/Fail.
- 5) **The completed Independent Study Contract must be delivered to the ENVSCI Program Office at 310 Holdsworth Hall prior to the close of the Add/Drop period.** (If form is received after the end of the Add/Drop period, the ENVSCI Office will initiate the paperwork for a Late Add request, and the student will be required to hand-carry this paperwork across campus for the necessary approval signatures.)

SEE LIST OF FACULTY RESEARCH INTERESTS BEGINS ON NEXT PAGE.

~ Environmental Research Opportunities ~ Spring 2020~

Forrest Bowlick, Lecturer

Geosciences & Environmental Conservation

Morrill Science Center IV Room #260, (413)-577-3816

Geographic Information Science

fbowlick@umass.edu

Project 1: GIS in Western Mass

Description: Students participating in this project will gather information about GIS in municipalities, conservation organizations, state and federal agencies, and in education in Western Massachusetts. Students will gather information and make connections to understand the landscape of GIS in the region.

Qualifications: Completion or enrollment in Intro GIS (NRC 585) is preferred but not required.

Time Commitment: Flexible based on student

Compensation: Independent Study or practicum credits (with the possibility of a funded position, especially for work study students)

Duration: Summer work possible if interested

To Apply: Email Forrest (fbowlick@umass.edu) with CV/Resume and brief statement of interest.

Project 2: Geocomputation

Description: Students participating in this project will review courses in geocomputation through syllabi analysis. This project aims to understand what makes up the geocomputation curriculum, and understand the knowledge, skills, and practices in that realm.

Qualifications: Completion or enrollment in Intro GIS (NRC 585).

Time Commitment: Timing flexible based on student

Compensation: Independent Study or practicum credits (funding pending but likely)

Duration: Summer work possible if interested

To Apply: Email Forrest (fbowlick@umass.edu) with CV/Resume and brief statement of interest

Bethany Bradley, Associate Professor

Environmental Conservation

318 Holdsworth Hall, 413-545-1764

Spatial Ecology & Invasive Species

bbradley@eco.umass.edu

Description: The primary pathway through which invasive plant species enter the United States is through the plant trade/gardening industry. Even so, the gardening industry continues to import and distribute exotic plant species. This project aims to understand how the practices and trends of the gardening industry may contribute to plant invasions in the United States.

Supervisor: Eve Beaury (grad student)

Qualifications: The student must be self-sufficient, attentive to detail, and good at following instructions. It's not necessary, but experience with google sheets and excel is preferred.

Compensation: Academic Credit. Graded Independent Study or P/F Practicum.

Time Commitment / Duration: 3-9 hours/week depending on credits. Three hours per week = 1 credit. We are looking for someone who might continue to work in a paid position over the summer.

To Apply: Please send an email to ebeaury@umass.edu with your interest, your transcript, and a resume if you have one.

Raymond Bradley, Distinguished Professor
Department of Geosciences
Morrill Science Center II, Room 138A ; 413-545-2120

Paleoclimatology
rbradley@geo.umass.edu

Project Title: Paleoenvironmental analysis of lake sediments

Project Description: The aim of this project is to train the interested student in the classical methods used to study lake sedimentology. These methods involve sediment mass calculations (wet mass and dry mass), loss on ignition (organic matter concentration/CaCO₃ %), and grain-size analysis (laser diffraction). Results will be compared to instrument loggers (i.e. Ct-Scan, Itrax, SEM grain-size, etc). The student will first be taught about the study site (Svalbard, Arctic) and its importance in terms of regional climate signals preserved in the lake sediments, a description of the methodology that will be applied and the different instruments. Most of the work will be done in the Quaternary lab of the geosciences department.

Supervisor: Raymond Bradley (Prof at UMASS) and Francois Lapointe (Postdoc in the geosciences department, flapointe@umass.edu)

Compensation: Academic credit. Three hours per week equals one academic credit.

Time Commitment/Duration: Lab work will be ~3h per week = 1 credit. Depending on the evolution of the student, the project can be extended to Summer and/or next Fall.

To Apply: Those interested should send an email to Dr Bradley and Dr Lapointe with a cover letter explaining her/his motivation toward this project together with her/his grades (unofficial transcript).



View of Linnevatnet Lake, Svalbard. August 2018.

Andy Danylchuk, Professor
Environmental Conservation
304 Holdsworth Hall, 413-545-2940

Aquaculture & Fish Conservation
danylchuk@eco.umass.edu

Title: Effects of dams on freshwater fishes

Description: For freshwater fishes, dams are a considerable threat because of the potential isolation of populations and the cascading effects on life history traits. This project uses a meta-analysis approach to examine how freshwater fish populations respond to environmental changes created by the construction of dams. We are interested in understanding the common effects of dams of fish populations globally. The student will be synthesizing and extracting data from published literature, help conclude the results, and potentially help produce figures and tables for a manuscript alongside a PhD student.

Students participating in this project will gain experience in efficiently reviewing scientific literature, in addition to learning how to collect data from these publications and databases. These skills will carry far past their undergraduate academic career and strengthen the skillset of those interested in continuing their career in science. Additionally, students will acquire knowledge in dam effects on freshwater fish species and learn more about the potential impacts of dams.

Supervisor: Nadia Fernandez (ECo PhD graduate student)

Qualifications: Must have great attention to detail and organizational skills; Must be proficient in using excel. Must have some interest in learning how to code in R (although experience is preferred). Duties will include reviewing and extracting data from peer-reviewed literature and compiling data from various databases using specific protocols. No previous experience needed.

Time Commitment/Duration: 6 hours/week = 2 credits. There may be opportunities to continue with this project for academic credit to Summer 2020, but this is not required.

Compensation: Independent study credits (graded project) only

To Apply: Please email Nadia Fernandez at nbfernandez@umass.edu. Be sure to include a resume, transcript, and cover letter.

Christine Hatch, Extens. Assoc. Professor **Water Resources & Climate Change**
Department of Geosciences chatch@geo.umass.edu
233 Morrill Science Center, 413-577-2245

<TWO OPPORTUNITIES>

Project Title: 1. Measures of Success in Wetland Restoration

Project Description: Tidmarsh Farms is a wetland restoration site on a retired cranberry farm in Plymouth, Massachusetts. It is the largest freshwater restoration project in Massachusetts to date. The property is divided into two sections, Tidmarsh East (now Tidmarsh Wildlife Sanctuary) and Tidmarsh West (now Foothills Preserve). Tidmarsh East (retired in 2010) has already undergone extensive restoration, and is now owned and run by Mass Audubon as a wildlife sanctuary. Foothills Preserve (retired in 2015) has been purchased by the town of Plymouth and is slated to begin restoration in March! But how do we measure the success of wetland restorations? We will research metrics for measuring success, go out to the site to measure some of these, and process

data that are of keen interest to MA DER, which has just developed a whole new program for these kinds of restorations.

Part of our pre-restoration site assessment has included selecting about 60 plots at Foothills to survey vegetation and collect soil cores (4 samples from each plot). We have a number of chemical analyses to perform on soil and water samples in the lab, and water level and other data to analyze. We are looking for an organized, detail-oriented student with good data keeping skills that may be interested in gaining some lab and field experience to help us with this project.

Responsibilities/qualifications: The student must have the ability to work independently and be responsible, and the lab instrumentation requires acute attention to detail for successful measurements. Enthusiasm and patience are also a plus!

Time Commitment: Depending on the number of credits desired, this will require an average of 3, 6, or 9 hours per week (corresponding to 1, 2, or 3 credits), but may be irregularly distributed throughout the semester, and are flexible by arrangement.

Duration: This project may have the possibility for extension into the Summer. Look for a paid CAFÉ Summer Scholar opportunity related to this work

Compensation: This will be a 2-credit independent study (or practicum if desired), and the student will be expected to submit organized and complete field/ lab notes, as well as write up the methods used and all of the results with some data interpretation by the end of the semester.

To Apply: Contact Christine Hatch, chatch@geo.umass.edu, (413) 577-2245 and graduate student, Naomi Valentine, nvalentine@umass.edu. Please send a brief statement of interest and resume to be considered for this position.

Project Title: 2. Lot 52 Site Assessment: Feasibility and Design of a Sustainable, Aesthetically-pleasing and Functional Stormwater-catchment Space

Project Description: For this project, we would like to enhance the aesthetics of UMass campus, effectively harnessing the natural beauty and water availability present in a natural rain garden, and sustainably manage stormwater runoff while also generating a meaningful, implementable educational experience for landscape architecture students. There is a ~1.5-acre area of land where Hills Hall once stood between Butterfield Terrace, Clark Hill Road, Thatcher Way and Parking Lot 52 that was very quickly “finished” during the construction of Lot 52 where a natural water ponding expresses on the surface. This water surfaces here both because of the natural change in slope as well as due to seasonal stormwater flows over land that can pool in this natural depression.

This area was intended to be developed for the benefit and recreational desires of students, but there has yet to be any formal student involvement. We envision a student researched-and-designed rain garden park that will naturally capture and filter both surface stormflows and groundwater upwelling, while also providing a beautiful green area for students to enjoy.

See: <https://www.umass.edu/newsoffice/article/turning-soggy-ground-rain-garden>

For this research opportunity, we need several students to continue initial site assessment work begun in the Fall, and conduct feasibility studies. Specifically, we would like students who are interested in (one or more of) the following: (1) site slope and hydrologic assessment (drone-derived and/or LiDAR-based elevation models, in-situ water and piezometer measurements), (2) development of a tool (survey or similar), technique, and/or focus groups to gauge student interest

and desired outcomes for this location, (3) soils, landscape and construction feasibility site assessment, and (4) research on technical best practices for green infrastructure that may be appropriate to lot 52 site conditions.

Supervisors: Christine Hatch, GEO; Mark Harmin, Sr. Lecturer II and Mike Davidsohn. Sr. Lecturer II, Department of Landscape Architecture and Regional Planning (LARP)

Responsibilities/qualifications: The student(s) must have the ability to work independently and be responsible. Enthusiasm for a novel project and ability to work in a diverse team are also a plus! Students will be primarily advised by Christine Hatch and Mark Hamin, with consultation and additional advising provided by Michael Davidsohn.

Time Commitment: Depending on the number of credits desired, this will require an average of 3, 6, or 9 hours per week (corresponding to 1, 2, or 3 credits), but may be irregularly distributed throughout the semester, and are flexible by arrangement. The student(s) will be expected to contribute proportionately to the team site assessment report.

Duration: This project may have the possibility for extension into the Summer.

Compensation: This will be a 1-, 2-, or 3-credit independent study (or practicum if desired), and the students will be expected to submit a collective site assessment report with the group by the end of the semester.

To Apply: Contact Christine Hatch, chatch@geo.umass.edu, (413) 577-2245 or Mark Hamin, mhamin@larp.umass.edu, 413 545-6608. Please send a brief statement of interest and resume to be considered for these positions.

Marco Keiluweit, Assistant Professor
Stockbridge School of Agriculture
411 Paige Lab, 413-545-6798

Soil-Microbe Interactions
keiluweit@umass.edu

Title: Studying climate change impacts on soil carbon in alpine floodplains of the Rocky Mountains, Colorado?

Description: Focused on the alpine East River floodplain in Colorado, this work investigates how snowmelt and flooding impact carbon in floodplain soils, through interactions with both minerals and microbes. As part of a larger project investigating carbon cycling in alpine floodplains, the student will be tasked with determining the type of minerals responsible for storing carbon in floodplain soils. In addition, the student will have the opportunity to run analyses that characterize the forms of organic matter stored in floodplain soils. The student will be trained in advanced soil chemical techniques to perform these tasks.

Supervisors: Dr. Marco Keiluweit and Carolyn Anderson (PhD Student).

Qualifications: Potential candidates should have a keen interest in soil science and laboratory work. The ideal candidate has taken introductory soil science classes and basic chemistry labs.

Time Commitment: We anticipate this project to amount to 9 hours a week (= 3 Credits).

Compensation: Independent study or practicum credits are available.

Duration: If the candidate shows enthusiasm and productivity for this project, we would like to convert this position into a permanent, paid position that could be extended into the summer and following academic year. (Work-study desirable, but not required.)

To Apply: Please send your resume and transcripts to Dr. Marco Keiluweit (keiluweit@umass.edu)

Ashley Keiser, Assistant Professor
Stockbridge School of Agriculture
311 Paige Lab, 413-577-1027

Soil Ecosystem Ecology
akeiser@umass.edu

Title: Measuring soil properties and microbial function across a Northeastern latitudinal transect

Description: This project aims to measure soil properties and microbial function across a latitudinal transect spanning from Virginia to NH/VT. This work supports a larger project examining litter decomposition and microbial dispersal. In support of this project, the student will be tasked with making baseline soil measurements, such as soil moisture and pH. The student will also have the opportunity to run soil respiration measurements to quantify a range of soil microbial characteristics. The student will be thoroughly trained in all techniques.

Qualifications/Skills: The applicant must have great attention to detail and organizational skills. The applicant must have an interest in soils and ecology. The ideal candidate has taken an introductory soil science class along with laboratory classes.

Time Commitment: Expected to be 6 – 9 hours per week (= 2 or 3 credits). If the student shows enthusiasm for the work and is productive, there is a possibility to extend the position across the summer

Compensation: This will be a 2- or 3-credit independent study or practicum credits.

To Apply: Please email Dr. Ashley Keiser (akeiser@umass.edu). Please include your resume, an unofficial copy of your transcript, and a brief statement on why you would like to work on this project.

Dave King, Adjunct Associate Professor
US Forest Service, Northern Research Station
Environmental Conservation
201 Holdsworth Hall, 413-545-6795

Forest Wildlife Management
daveking@umass.edu

Title: Swainson's thrush nest insulation in NH

Project description. This project examines songbird nests along an elevation gradient by assessing the insulation of each individual nest collected from field seasons 2016-2019. High elevation montane ecosystems typically experience colder temperatures and more precipitation than low elevations. Therefore, the objective is to determine if nests are more insulated at high elevations than low elevations by using temperature loggers that will be put inside the nests to record active temperature. This project is part of a PhD student's research examining the effects of abiotic and biotic factors on nesting success along an elevation gradient. After nests were found and monitored throughout the breeding season, field crews went out and collected nests that fledged (i.e. the nestlings left the nest) and failed for further analysis. We are in need of student(s) to help with lab work measuring how well insulated the nests are at different elevations, with plans to conduct nest dissection in the future.

Supervisors: Sarah Deckel, PhD student in ECO; David King, USFS northern research station

Qualifications: There is no prerequisite knowledge required, however, an interest in breeding bird biology or physiology is desired. The student must be patient, detail-oriented, have strong organizational skills, and have the ability to sit for long periods of time while trials/experiments are running. The student will have skills with lab work in a controlled setting, and there is opportunity to learn analysis if desired.

Time commitment/Duration: 6-9 hours/week. We prefer the student to block out 3 hours of time/day since trials need some time to run. It is possible for the student to extend this study through the summer and/or fall (but this is not required).

Compensation: Academic Credit (pass/fail practicum credit).

To Apply: Please send an email to Sarah Deckel (sdeckel@umass.edu) with CV/resume attached, as well as your most recent transcript and a short paragraph on why you're interested in working on this project. Please include all documents as one PDF file called "Lastname_firstname_nestproject" (ex. Sarah_Deckel_nestproject).

Susannah Lerman, Research Ecologist
Environmental Conservation (Adjunct Professor)
USDA Forest Service, Northern Research Station
201 Holdsworth Hall, 413-545-5447

Urban Ecology & Sustainability
slerman@umass.edu

Project 1: Urban Bee and Wasp Project

Description: Student intern needed to primarily assist in preparation of a database of bee traits and some assistance preparing and organizing insect specimens for identification. Research is part of the "Alternative Futures for the American Residential Macrosystem (ARM)"; project, a multi-city integrated assessment of local and regional-scale consequences of residential development. We are investigating how varied land management decisions influence the ecological function and biodiversity of residential yards and other urban green spaces. The interns will gain experience in a variety of techniques including data entry and reading scientific literature as well as pinning wasps, making specimen labels, and basic insect identification skills.

Supervisor: Postdoctoral Researcher, Desiree Narango

Qualifications: No previous experience is needed. Enthusiasm, patience and attention to detail required. Training and lab space will be provided.

Time Commitment: 5-10 hours per week (3 hours per week = 1 credit)

Compensation: Independent study credits (graded project), practicum credits (Pass/Fail), or volunteer experience.

Duration: Initial project duration is Spring 2020, opportunities for field work in late spring/early summer may be available for engaged students.

To Apply: Interested students should email a resume, and a brief statement on why they want to work on this project, their research interests and future career goals to dnarango@umass.edu.

Project 2: Wildlife ecology of residential yards and urban green space

Description: We are seeking a student intern to assist with a systematic literature review of urban wildlife papers to determine spatial and temporal trends, the proportion of research that takes place on different types of green space and whether these patterns have changed over time. Duties will include organizing and compiling relevant literature, reviewing research articles to collect

specific information and entering data in excel. Other data management projects may be possible with availability and interest of the student.

Supervisor: Postdoctoral Researcher, Desiree Narango

Qualifications: No previous experience is needed. Good reading comprehension skills and a willingness to work independently. Training and office space will be provided. This position would be a good fit for a student interested in graduate work in wildlife or urban ecology. Several opportunities for independent projects with existing data are possible.

Time Commitment: 5-10 hours per week

Compensation: Independent study credits (graded project), practicum credits (Pass/Fail), or volunteer experience

Duration: Initial project duration is Spring 2020, opportunities for field work in late spring/early summer may be available for engaged students.

Contact: Interested students should email a resume, and a brief statement on why they want to work on this project, their research interests and future career goals to dnarango@umass.edu.

Toni Lyn Morelli, USGS Research Ecologist
Environmental Conservation (Adjunct Faculty)

Northeast Climate Science Center, 134 Morrill Science Center, 413-545-2515
Lab website: <https://necsc.umass.edu/people/toni-lyn-morelli>

Climate Change Impacts
tmorelli@usgs.gov

Project Title: Dragonfly migration and climate change

Description: The common green darner (*Anax junius*) is a long-distance migratory dragonfly whose nymph development and migratory timing are temperature dependent.

Duties: We are looking for a highly motivated student to help measure digital specimens and assemble environmental data to determine how climate change is affecting dragonfly morphology, the timing of migration and migration distance. The selected student will measure wing morphology from standardized photographs of specimens spanning over 140 years with ImageJ, as well as collate spatial and environmental data from capture locations.

Supervisors: Michael Hallworth (Post-doc researcher) mhallworth@umass.edu

Qualifications: We're looking for an organized, and highly motivated individual who works well as part of a team and independently. Prior experience with ImageJ, GIS and/or program R are preferred but not required.

Compensation: Academic Credit (graded Independent Study or P/F Practicum).

Time Commitment: 6-12 hours per week (2 to 4 credits). Possible honors thesis for qualified candidate interested in long-term project.

To Apply: Please send a brief statement (1-2 paragraphs) that includes of summary of your research interests, and a copy of your C.V. (resumé) to Dr. Hallworth (mhallworth@umass.edu), who will supervise the candidate.

Timothy Randhir, Professor
Environmental Conservation
326 Holdsworth Hall, 413-545-3969

Watershed Management & Conservation
randhir@eco.umass.edu

Projection Description: The student will be involved in specific organization tasks for the Southern New England Chapter of Soil and Water Conservation Society. Specific activities will involve compilation of member data, preparation of outreach material, help with planning for the conference, and editing content on the web and social media sites. This opportunity will provide valuable experience working in environmental nonprofit management which will be a good resume builder for any student wishing to pursue a career in some aspect of non-profit conservation management.

Qualifications: None. Just an interest in working with a non-profit conservation organization.

Compensation: Graded Independent Study Credits.

Time Commitment / Duration: 3 hours per week for 1 academic credit. Project involvement can be extended beyond this semester.

To Apply: Contact Professor Tim Randhir (randhir@eco.umass.edu) with a copy of your resume and a brief explanation of why you are interested in this position.

Allison Roy, Assistant Unit Leader
Massachusetts Cooperative Fish and Wildlife Research Unit
Environmental Conservation, 317 Holdsworth Hall

Freshwater & Fish Ecology
aroy@eco.umass.edu

Multiple positions are available in freshwater and fish ecology.

Students will work directly with Dr. Roy or graduate student mentors and are invited to participate in weekly lab meetings with the entire Roy lab group. Information about Dr. Roy's research can be found at: http://www.coopunits.org/Massachusetts/People/Allison_Roy/index.html

General inquiries about the lab or questions can be directed to Allison Roy at aroy@eco.umass.edu.

Project 1: Juvenile River Herring Emigration

Description: When do baby river herring leave fresh water? These research opportunities are part of a statewide research project of the UMass-River Herring Research Lab to better understand the freshwater portion of the river herring life cycle. River herring are anadromous fishes, meaning they are born in freshwater, migrate to sea as juveniles, mature in the ocean, and return to their natal freshwater ponds to spawn upon maturity. We are evaluating what environmental and biological factors are associated with juvenile productivity, growth rates, and departure from freshwater to the ocean.

There are two opportunities associated with this project:

- **Zooplankton processing:** The assistant will learn how to process and identify different types of zooplankton to assess composition and density in freshwater samples, estuarine samples, and river herring gut contents. This will involve microscope and lab work. Ideally, the undergraduate assistant may continue into the summer and fall 2020 semester and portions can be used for a senior thesis. Multiple positions available: 2-3 credits (6-9 hours/week).

- **Video processing:** This assistant will watch videos and help manage a citizen science monitoring platform to estimate river herring emigration rates. There may be opportunity to continue into additional semesters. Multiple positions available: 1-2 credits (3-6 hours/week).
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Time Commitment: 3–9 hours/week, depending on project and availability (3 hrs/wk = 1 credit).

Qualifications: Familiarity with microscopes preferred for zooplankton processing.

Compensation: Practicum credits (pass/fail), independent study (if applicant has worked in the lab before and has interest in a research project), or work study

Duration: Spring 2020 with potential for continuation into fall 2020.

To Apply: Email Meghna Marjadi (mmarjadi@umass.edu), PhD candidate who will supervise both opportunities, with resume and short cover letter detailing your interest and experience.

Project 2: Effects of Dam Removal on Stream Ecosystems

Description: The technician(s) will assist a graduate student in a project examining the response of stream ecosystems to small dam removals across Massachusetts. Students will have the opportunity to learn methods of processing and sorting macroinvertebrate samples from debris with the use of a dissecting microscope, which will contribute to our understanding of how macroinvertebrate assemblages change after dam removal. Multiple positions are available, and ideally students will continue into the Fall 2020 semester. There is also the potential to assist with in-stream fieldwork in May 2020.

Qualifications: Preferred applicants will be detail-oriented, able to work independently, and have a strong interest in laboratory-based research. Experience and comfort using dissecting microscope is preferred, but not necessary.

Time Commitment: 3–9 hours/week, depending on availability (3 hours/week = 1 credit)

Compensation: Practicum credits (pass/fail) or work study Duration: Fall 2019. Continuation into 2020 is desirable, but not required.

To Apply: Email Kate Abbott (kmabbott@umass.edu), PhD candidate who will supervise both opportunities, with resume (include availability) and copy of transcripts (unofficial).

Project 3: Synthesizing Macroinvertebrate Responses to Urbanization

Description: Over the last 2 decades, many empirical studies from around the world have documented changes in stream macroinvertebrate assemblages in response to urbanization. As a first step of a future synthesis paper, we aim compile peer-reviewed literature on responses to urbanization and restoration actions. The student will conduct literature searches and extract information from papers into a table.

Qualifications: An interest learning more about urban streams! Past experience searching literature and doing annotated bibliographies helpful, but not necessary.

Time Commitment / Duration:: 3–6 hours/week (1-2 credits); Spring 2020 only

Compensation: Practicum credits (pass/fail)

To Apply: Email Allison Roy (aroy@eco.umass.edu) with resume and brief description of why you are interested in this project

Baoshan Xing, Professor
Stockbridge School of Agriculture
410 Paige Lab, 413-545-5212

Environmental & Soil Chemistry
bx@umass.edu

Project areas:

- Agricultural application of engineered nanoparticles;
- Effect of engineered nanomaterials on the bioavailability of nutrients in simulated human gastrointestinal systems;
- Interaction between engineered nanomaterials and plants;
- micro/nanoplastics in the environment (analysis, fate, and impact);
- Biochar characterization and use

Qualifications: Students must have basic knowledge of chemistry and willing to work diligently.

Commitment: Nine to ten (10 to 12) hours/week anticipated.

Compensation available: Graded Independent Study credits only.

Duration: It is preferred that students can extend their research to Fall 2020 (maybe summer 2020 too) for completion of the project and producing meaningful/publishable data. **For the summer of 2020, paid internship is potentially available, depending on the performance of the students during the semester.**

To apply: Contact Professor Xing (bx@umass.edu) with a resume and a statement of interest

UMASS School of Earth and Sustainability

In conjunction with Chancellor's Sustainability Advisory Council (CSAC)

Title: Sustainable UMASS Procurement Analysis

Project Description: Assist with the analysis of sustainable procurement practices at UMass Amherst. This project will assist the School of Earth & Sustainability and the university submit its annual report to the Association for the Advancement of Sustainability in Higher Education (AASHE)'s Sustainability Tracking, Assessment, and Rating System Reporting Tool. • Gather best readily-available data • Identify information gaps • Coordinate with partners • Provide some basic analysis • Develop summary of data and findings

Supervisor: This opportunity will be co-supervised by Ezra Small, the Campus Sustainability Coordinator, and Darci Maresca, the Assistant Director for the School of Earth & Sustainability

Qualifications: Seeking an organized, detailed-oriented student. Experience with excel is required.

Time Commitment: 2-5 hours per week

Compensation: Academic Credit available

To Apply: Contact Darci Maresca at dmaresca@umass.edu