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 to learn more about project expectations and qualifications (if any) that are needed. **Mark your subject line of your email as “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) 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.
Faculty Research Interests. Updated September 2016.
Michelle DaCosta, Assoc. Professor
Stockbridge School of Agriculture
Paige Hall, 413-545-2547

Project description: We are looking for a motivated student to assist in ongoing research projects involving laboratory and greenhouse experiments in plant stress physiology. Our lab conducts studies to better understand physiological strategies that plants use to survive environmental stresses (mainly drought and temperature extremes), as well as best management practices for reducing water and pesticide inputs. Of particular interest to Environmental Science students are projects related to nutrient and pesticide movement in relation to water quality in urban landscapes.

Supervision will be provided by Prof. DaCosta and graduate student Rachael Bernstein.

Qualifications: Students with prior experience working in a greenhouse or laboratory is desirable, but not required. However, we need someone that is highly organized, responsible, and pays attention to detail. Also, since this position may include greenhouse and field work, we need someone that literally doesn't mind getting their hands dirty.

Anticipated duration: Fall semester, with option to continue through Spring 2017 semester.

Hours required: We can accommodate projects requiring anywhere from 5 to 15 hours per week.

Compensation: We can offer independent study credits (graded project) or practicum credits (Pass/Fail).

Contact: Please send inquiries to Professor Michelle DaCosta (mdacosta@umass.edu).

Brian Kane, Professor
Environmental Conservation
214 Holdsworth Hall, 413-545-6637

Measuring tree sways
Project description: We are installing cables in red oaks at Cadwell forest and measuring how they sway. The student’s work will involve recording measurements on a laptop, tying off ropes and sending tools up into the tree, and measuring the diameter, length, and mass of cut pieces of wood when we remove the tree after testing.

Pre-req’s or qualifications: a good attitude and willingness to learn; a flexible schedule is helpful, but not mandatory (see next point) Hours per week: 4-6 (on average); the position may require several longer days, including a weekend day if the student has a flexible schedule. Academic credit is available. Weather constraints will probably limit this work to the fall semester, but it may be possible to continue some of the work in the spring semester if student is interested.
Om Parkash, Associate Professor  
Stockbridge School of Agriculture  
318 Paige Lab, 413-545-0062  

Biofuels & Plant Biotechnology  
parkash@umass.edu

Long-term projects available for students interested in developing dedicated biofuel crops through biotechnology. Project involves analysis of transgenic plants for biofuel suitability, by improving the oil yield in oil seed crops. Another project is engineering rice to block the uptake of arsenic, to result in healthy rice crop (without arsenic) even when grown on high arsenic soils.

Fall semester work would be mostly reading related scientific literature to gain a working knowledge of the science involved, with actual lab work beginning in Spring 2017. Freshmen and Sophomore Commonwealth Honors students encouraged to apply (possible thesis option). Academic credit available. Students must have strong interest in biotechnology and looking for long-term research opportunity.

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

Water Resources  
randhir@eco.umass.edu

Project description: To monitor water quality in constructed wetlands treating runoff from composting facility at UMass. Student should have some background in environmental chemistry; experience with water quality analysis would be helpful, but not absolutely required. Ability to work independently. Anticipate about 6-10 hours of effort per week, for 2-3 academic credits of graded independent study. Project supervisors: Tim Randhir & Deborah Henson. Project can likely be extended into Spring 2017 if desired.

Allison Roy, Research Assistant Professor  
Environmental Conservation/US Geological Survey  
317 Holdsworth Hall, 413-545-4895  

Aquatic Ecology  
aroys@eco.umass.edu

Several positions are available in aquatic ecology:

1) Laboratory assistance for graduate project investigating effects of winter lake drawdowns on food webs and macroinvertebrates (with Jason Carmignani, PhD student). Work involves sorting macroinvertebrates from debris using a dissecting microscope, dissecting fish stomachs, and preparing specimens for stable isotope analysis. No experience necessary, but students comfortable using microscopes are preferred.

2) Laboratory assistance for graduate project examining age and growth of juvenile river herring (with Matt Devine, MS student). Work involves extracting and mounting otoliths (fish ear bones) from small fish (< 100 mm), counting growth lines from otoliths under a dissecting microscope, and processing video footage of river herring. Students comfortable using microscopes and willing to work alongside others are encouraged to apply. We are also looking for a student with database experience to help create and MS Access database for the river herring project.

(continued next page)
3) Independent study examining the combined physical and biological effects of river restoration. Involves field sampling for macroinvertebrates in channelized/restored and non-channelized/restored sites (with John Gartner, postdoc in Geosciences), sorting macroinvertebrates from debris in the laboratory, and identifying macroinvertebrates. Students interested in multiple semesters and/or working this into an Honor's project are highly encouraged to apply.

All positions are available for academic credit (1-3 credits, 3-9 hours/week), with possible extension into Spring 2017. Students will work directly with graduate student mentors, and have the opportunity to participate in weekly lab meetings with the entire Roy lab group. Honor's students interested in conducting aquatic research in 2017 or 2018 are encouraged to apply. Compensation for work study students is possible. More information about Dr. Roy's research can be found at: http://www.coopunits.org/Massachusetts/People/Allison_Roy/index.html

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**Kristina Stinson, Assistant Professor**  
**Plant Ecology & Global Change**  
Environmental Conservation  
kstinson@eco.umass.edu  
217 Holdsworth Hall, 413-577-3304

The Stinson lab is looking for a student interested in a holistic ecological research experience; the research will involve field and laboratory work. Overall, we are looking for a student interested in earning 1 or 2 credits for helping with ecological research within the Environmental Conservation Department. Before November, time will be spent out at the Harvard Forest (in Petersham, MA) looking at microhabitat effects on a metapopulation of garlic mustard - an invasive, biennial plant.

Duties will include literature reviews, collecting environmental data (soil temperature & moisture, canopy cover photos, light availability, worm densities), and laboratory work (weighing biomass and possible phytochemical analysis). Applicants should feel comfortable in a laboratory and field setting, and be able to spend 5 or 6 each week (possibly on weekend days) out at the Harvard Forest before October 15th. Specific dates will be decided later based upon mutual availability. The student will be working closely with a third year graduate student.

Project supervisor: Laura Hancock (MS student)  
No perquisite knowledge needed, but the student should feel comfortable working outside as well as in a lab and have strong attention to detail. The hours will be highly variable, but will not average more than 3 hours per week. Academic credit available.  
Contact Laura Hancock with your interest in this project. (lhancock@cns.umass.edu)

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**Chris Sutherland, Assistant Professor**  
**Wildlife Population Ecology**  
Environmental Conservation  
csutherland@umass.edu  
118 Holdsworth Hall, 413-545-1770

I am currently looking for three undergraduate student who are looking to gain some research experience. We are working on three basic research questions - see below.

**1. Can we reconcile recaptures using genetic information when tags are lost?**

When marking individuals in wildlife capture-recapture studies, it is important that tags/marks are not lost. I study a meta-population of water voles, one of the UK's most threatened native mammals, by marking them once a year using ear tags but also collecting ear biopsies to be used

Faculty Research Interests. Updated September 2016.
Faculty Research Interests. Updated September 2016.

1. Does the establishment of ant colonies influence salamander detectability under artificial cover boards?

Capture using artificial cover boards is a widely accepted method for sampling red-backed salamanders. In addition to red-backed salamanders, artificial cover objects attract a number of non-target species. Among these non-target organisms, ants are some of the more commonly encountered. We are seeking an undergraduate student to collect spatially explicit presence/absence data on ant colonies and red-backed salamanders from a set of established artificial cover board arrays. The goal of the project will be to test whether salamander presence is affected by the presence of ants.

Supervising Individual: Jill Fleming (jefleming@eco.umass.edu)
Prerequisites: An interest in field research and spatial ecology
Hours Required: 10 hours/week
Compensation: Three graded Independent Study Credits
Extension to Spring 2017: Possible

2. Turkeys eat salamanders, but which morph do they prefer?

Wild turkeys are omnivorous ground feeders that are known eat terrestrial salamanders. However, little is known about how important a food source salamanders are to turkeys, and less is known about any salamander predator avoidance strategy. In red-backed salamanders, the frequency of a striped morph (redback) and a dark morph that has no red stripe (leadback) fluctuate over time. One working hypothesis is that turkeys may preferentially predate one morph over the other and as a result, turkey density and distribution may influence the observed redback-leadback ratio.

We seek a student to study morph preference using painted plaster molds of salamanders. The student will arrange clay molds of salamanders painted as the two morphs in ‘natural’ configuration across a woodland where turkeys are known to forage. Molds will be checked regularly and the number of beak and teeth marks will be recorded. The aim will be to test for differences in ‘attack rates’ between the two color morphs.

Supervising Individual: Chris Sutherland (csutherland@umass.edu)
Prerequisites: Interests in field research, natural history or predator-prey interactions, must be able to drive to sites
Hours Required: 10 hours/week
Compensation: Three graded Independent Study Credits
Extension to Spring 2017: Possible

Faculty Research Interests. Updated September 2016.
Research in the Warren lab focuses on the impacts of urbanization on wildlife. Suburban development changes habitat structure, influences resource availability, and affects wildlife behavior. Multiple projects available (see list below).

1. **Bird TV? Behavioral Analysis of Nesting Songbirds from NestCam Footage**

As food availability in a habitat changes, animals must make foraging decisions to optimize the use of their time and energy while still avoiding predator detection. We are looking for research assistants to contribute to a project on parental behavior of songbirds at the nest, utilizing previously recorded video footage of nesting wood thrushes and gray catbirds. Duties for the potential assistant would include watching nest videos and collecting data from them using a computer program developed for this purpose. Opportunities may arise to assist with other lab projects as well as to assist with data analysis and writing for interested students. This position requires a person who is: interested in birds and animal behavior, highly reliable, able to work independently, detail oriented, strong on critical thinking skills. There is a possibility to stay on in the lab during the next semester.

Sophomore, Junior, or Senior preferred. 6-10 hours per week, for practicum academic credits (2-3)

2. **Spiders, Worms, and Pillbugs - Oh My! Sorting Leaf Litter Invertebrates from Suburban Forests**

We are looking for research assistants to contribute to a project on food availability for nesting songbirds in suburban and rural forest habitats. Duties for the potential assistant would include sorting and counting invertebrate samples collected over the previous summer. Interested students may also contribute as writers to an ongoing outreach blog on insects in the lab: [https://bittybugs.wordpress.com/](https://bittybugs.wordpress.com/). Opportunities may arise to assist with other lab projects, such as the preparation of fruit and invertebrate samples for stable isotope analysis. This position requires a person who is: interested in invertebrates and insect taxonomy, highly reliable, able to work independently, detail oriented, strong on critical thinking skills. There is a possibility to stay on in the lab during the next semester.

Any level student may apply; 6-10 hours per week for academic credit (2-3)

3. **Data Management and Analysis, Archiving and Interpreting the Information You've Worked so Hard For**

We are looking for research assistants to contribute to a project on food availability for nesting songbirds in suburban and rural forest habitats. Duties for the potential assistant would include reviewing data collected over the summer for accuracy, working with a Microsoft Access database and Excel to input new data, and working with a graduate student on exploratory visualization of data. This position requires a person who is: interested in data management and computer programs, highly reliable, able to work independently, detail oriented, strong on critical thinking skills. There is a possibility to stay on in the lab during the next semester. Preference to Sophomore, Junior, or Senior student. 6-10 hours/week, for academic credit (2-3)

To apply for any of these three positions (Projects 1, 2, and 3) – Contact Kit Straley, Graduate Student  kstraley@cns.umass.edu
And please submit 1) a brief letter expressing your interest, 2) a copy of your resume with relevant work and coursework, and 3) unofficial transcripts.

4. **House Wren Nest Box Project**

I’m seeking fall laboratory technicians for an avian urban ecology study. The study is focused on the effect of perceived predation risk and urbanization on House Wren nesting biology along an urban-rural gradient. We monitored House Wren nests in constructed nest boxes on private homeowner lands in collaboration with Smithsonian and U.S. Forest Service Neighborhood Nestwatch Springfield Project. We conducted avian, small mammal and vegetation surveys, and banded and measured House Wren eggs, nestlings, and adults. We are now seeking volunteer undergraduate technicians to help us with data management and collection see details below.

4A. **Data Management and Mammal Camera Laboratory Technician** (2-3 positions)

Description: Data Management Laboratory technicians will be responsible for sorting and managing data on a Microsoft Access Database and with physical datasheets, and analyze/entering new data from (1) mammal camera traps and (2) iButton temperature logger graphs. In addition, technicians will do various data-related tasks, such as scanning, datasheet management, validation, sorting, and notetaking. Undergraduates applying for this position must be responsible, careful, detail-oriented and hard-working. Preference will be given to undergraduates who have an advanced understanding of database management, including Microsoft Access, and/or small mammal identification skills. Technicians will have the opportunity to learn Microsoft Access database management, small mammal identification, and basic scientific data organization skills. This is a 3+ hours per week (i.e., 1+ credit) position.

4B. **Videography Technician** (2 positions)

Description: Videography technician will aid a Ph.D. student to analyze and score provisioning (feeding), brooding, incubating, and other avian behaviors from recordings of House Wren nests within nest boxes. They will use the program JayWatcher to “score” videos of Wren behaviors. Undergraduate must be detail oriented, hard-working, observant, and responsible. No previous experience is required, and training will be provided. In addition to watching videos, technicians will be assigned miscellaneous tasks such as data sorting and management. This is a 3+ hours per week (i.e., 1+ credit) position.

There may be opportunities to extend this work in the Spring semester. There are going to be summer fieldwork positions open to undergraduate volunteers this coming summer to continue the nest box monitoring. Please contact Aaron Grade, PhD student at agrade@umass.edu with a resume, and cover letter outlining your experiences and interests.

5. **Environmental Education project**

In cities, individuals often have fewer opportunities to interact with biodiversity. Environmental education often provides structured nature experiences for children, such as catching frogs and observing ants, sometimes promoting further interest in environmental activities down the road. We are seeking up to four research assistants to help understand the legacy of environmental education and the nature opportunities it provides in Springfield, MA.
5A. Memories of Environmental Education (2 positions)

Seeking two research assistants to help conduct, transcribe, and analyze interviews with adults who participated in an environmental education program in their youth, specifically the Environmental Center for Our Schools (ECOS) in Springfield, MA. What role, if any, does this program have on the formation of environmental memories and identities among past participants? Assistant(s) will also have the opportunity to develop and pursue independent research questions within the scope of the project.

RAs will be supervised by Evan Kuras (graduate student) and past experience conducting interviews or working with qualitative data is helpful but not necessary. Position requires 3-6 hours per week, ideal for independent study credits, practicum credits, or honors/senior thesis. Students who are willing to extend the project through Spring 2017 are preferred. Interested students should contact Evan at ekuras@umass.edu.

5B. Historical Perspectives of Urban Environmental Education (2 positions)

Seeking two research assistants to archive and interpret historical records concerning the formation and evolution of the Environmental Center for Our Schools (ECOS) Program in Springfield, MA. UMass Special Collections and University Archives (SCUA) holds 50 years of ECOS documents, including information about its beginnings under Title III through the Office for Civil Rights. RAs will process this collection and have the opportunity to develop and pursue independent research questions involving these documents.

RAs will be supervised by Evan Kuras (graduate student) and staff at SCUA. No past experience is necessary although an interest in environmental and urban history is encouraged. Position requires 3-6 hours per week, ideal for independent study credits, practicum credits, or honors/senior thesis. Students who are willing to extend the project through Spring 2017 are preferred. Interested students should contact Evan at ekuras@umass.edu.

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

- Three project areas:
  - Environmental fate, behavior and ecotoxicity of engineered nanoparticles;
  - Fate of engineered nanomaterials in consumer products during use;
  - Sorption of phosphate by engineered biochars

Students must have basic knowledge of chemistry and willing to work diligently. Six to ten (6 to 10) hours/week anticipated. Graded Independent Study credits only. It is preferred that students can extend their research to Spring 2017 for completion of the project and producing meaningful/publishable data.

Other campus research opportunities can be found on the Biology Research Site: BURA (https://www.bio.umass.edu/bura/content/welcome)

Faculty Research Interests. Updated September 2016.
Off-Campus Internship Opportunity
Town of Palmer, Conservation & Planning Department
Angela Panaccione, Conservation Agent
Town of Palmer, 4417 Main Street, Palmer, MA.  413-283-2687 (cell: 413-222-4934)

I will be looking for two interns for this year. The focus would be split between administration and enforcement of the Wetlands Protection Act and Conservation Land Maintenance. This would consist of attending Conservation Commission meetings, recording and typing minutes, attending site visits, reviewing site plans and helping draft permits under the Wetlands Protection Act and the Town Wetlands Ordinance. The Conservation Land Management would include boundary marking and GPS locating survey points in the field from deed descriptions as well a deed research into parcels targeted for acquisition by the Town.

I'm normally looking for Juniors or Seniors, with a focus in either Environmental Policy/Land Use or Environmental Planning/Natural Resources Conservation. Academic credit can be awarded (with campus faculty sponsor). It could either be a graded independent study course, or a pass/fail practicum, or a project could be tailored to meet senior thesis requirements.

Contact Angela Panaccione about internship position. Successful candidates can coordinate academic credit through Deb Henson (dhenson@eco.umass.edu)