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. Some of these research opportunities are paid positions. Read each posting carefully to see what compensation is available.

**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. **Students must provide the following information with their inquiry:**

   *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/ availability required for the project based on the advertisement listed here. Indicate “SUMMER RESEARCH INTERN” in the subject line of your email.*

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/wp-content/uploads/2011/11/ENVSCI_IndepStudyForm_fields.pdf](http://eco.umass.edu/wp-content/uploads/2011/11/ENVSCI_IndepStudyForm_fields.pdf)

   Instructions for completing the form are provided on-line within the same document link. 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.

3) **To enroll for SUMMER Credits, the completed Independent Study Contract must be delivered to the ENVSCI Program Office at 310 Holdsworth Hall before the end of the Spring semester.** Additional paperwork is required to enroll through Continuing & Professional Education for Summer credits. You will be guided through this process. Please note that there is an additional tuition cost for enrolling in summer credits. (Note: It may be possible to roll-over some academic credit into the Fall term, depending on what follow-up written report might be required and when this work is conducted.)

SEE LIST OF FACULTY RESEARCH INTERESTS ON NEXT PAGE.
Anne Averill, Professor
Environmental Conservation
301 Holdsworth Hall

Pollinator Ecology
averill@eco.umass.edu

BEE CONSERVATION RESEARCH in AGRICULTURAL AND NATURAL SYSTEMS. Summer off-campus (Southeastern Massachusetts) paid research assistant positions. Several positions open for assistance in study of bee pollinators of a native crop. We are looking at bumble bee decline, native bee conservation, cranberry pollination, nutrition of bees and factors impacting health of bees (pathogens, parasites, landuse change, pesticides). Research activity is centered at the Cranberry Station Labs in East Wareham, MA (this is a UMass satellite unit with ca. 8 scientists and a staff of 25) 5 miles from the Cape Cod Canal.

The job begins as early as May and ends late August. 40 hours/week—full time people sought. Starting at $12/hour. We will carry out bee collections and conduct work in cranberry systems and natural settings. For our experimental studies, students equally comfortable conducting field observations under hot, exposed conditions, as well as long hours of lab dissections, microscope time, insect curation, and data entry sought. Must be comfortable around bumble bees (stings are exceedingly rare), pesticides, and a pesticide-treated crop. No housing is available—this is fully the responsibility of the successful applicants to figure out, but I may consider adding additional stipend to defray housing cost. Please contact Anne Averill averill@eco.umass.edu

Dwayne Breger, Extension Professor
Clean Energy
dbreger@umass.edu
www.ag.umass.edu/energy

The Clean Energy Extension is in possession of a large public database from the MA Department of Environmental Protection of all permitted boiler and engines in the Commonwealth (about 7000 records). For each facility, the database includes geographical information, technical and performance specifications, and emission thresholds. The Clean Energy Extension is interested in using GIS software to map these facilities and evaluate target opportunities for combined heat and power, district energy, and renewable thermal technologies. The student will be required to perform this GIS mapping and develop a set of queries, and perform and document an initial evaluation.

Project will be performed at UMass. The Clean Energy Extension will provide desk space in Morrill I, or a student can work remotely with periodic meetings with the Supervisor. Student must have strong GIS capabilities (minimum NRC 585) and an interest in energy and climate issues.

Project Duration: 20 hours/week for 4 weeks
Compensation: Student can opt for hourly compensation, or credit subject to Department approvals
Application Deadline: Students should apply by the priority deadline of March 25th.
Contact: Dwayne Breger, Extension Professor, dbreger@umass.edu, (413) 545-8859
My lab can accept up to seven undergrad students to gain hands on training in both lab and research field during summer. A few tips related to all projects follow:

- None of these projects require a specific skill. Students who like outdoor activities and have passion about agriculture and its impact on environment are welcome.
- There is no funding available in any of the projects. These research experience can be structured either as independent study or practicum.
- My grad students and myself prefer students who are willing to continue working on the project during fall semester 2016.

The following projects are available and only one student will be accepted for each project:

1) **Growing Local Brewing Barley (Caroline Wise, supervisor)**
This research opportunity is focused on optimizing techniques for local malt barley production in order to support local farmers, brewers and maltsters. Students could work on projects focused on soil nitrogen, cover crop analysis, malt quality characterization, or another related project of their interest. There will be opportunities for gaining both field and laboratory experience. Qualified students should have an interest in gaining hands-on research experience, enjoy the outdoors, and have an interest in sustainable agriculture. While scheduling can be determined with the candidates, preference will be given to students who can commit to either the full summer or be present during the very exciting barley harvest!

2) **Cover Crop Cocktails & No-till for Sustainable Sweet Corn Production (Juli Fine, supervisor)**
This experiment evaluates nutrient cycling, feasibility of early planting and sweet corn yield in a no-till system following cover crop mixtures that include forage radish. Data from this research will able to be used to develop an innovative production system for early sweet corn to take full advantage of the benefits of a forage radish multi-species cover crop. Qualified students should have an interest in gaining hands-on research experience, enjoy the outdoors, and have an interest in sustainable agriculture.

3) **Cover Crops - Corn silage Production Systems for Increased Sustainability and Resiliency (Sam Corcoran, supervisor)**
In this project we are working with farmers and conducting research at the University farm to develop management systems that encourage cover crop use and to identify cover crops that can also serve as an additional, alternative source of feed on dairy farms. A student will assist with lab work (sample analysis) and field work (crop planting, maintenance, and sampling). The student will receive hands-on training in the lab and field. The independent study project includes monitoring cover crop decomposition in the field and the resulting nutrient contributions to growing corn crops. The student will model this interaction and investigate the potential of various cover crops to reduce fertilizer inputs.

Hashemi Projects continued on next page.
4) Midterm influence of biochar on physical, chemical and biological characteristics of edamame (Omid Zand vakili, supervisor) In this project the effect of various percentage of biochar as soil amendment on soil physical, chemical, and biological characteristics as well as edamame yield and quality will be investigated. Students will be involved in soil sampling, soil analysis, and harvesting edamame at different stages of growth.

5) Sustainability and Resiliency of Apple Orchards in New England Through Cover Cropping (Hoveizeh Karimi, supervisor) This project includes two experiments to evaluate influence of different cover crops as a pre/post replant management tool in establishing new orchards and to improve soil health indicators in established orchards. Also, we will compare nematode and soil microbe communities in different apple rootstock genotypes as well as in cover crops. Expected responsibilities for the undergraduate student are field and lab work, e.g., taking soil and tissue samples, sample preparation for analysis, etc.

6) Reducing agricultural impacts on environment though growing efficient cover crop species and time of planting (Parisa Akbari, supervisor) An increasing concern for the sustainability of farming including soil quality and plant productivity has led to the development of a set of cover crop management practices to reduce the potentially negative impact of agricultural activities on environment. This project evaluates various cover crops including winter rye, oat, hairy vetch and forage radish planted at a wide range of planting times in nutrient removal from the soil which otherwise will pollute water bodies. The synchrony between the nutrient release from cover crops and nutrient demand of the next crop will also be investigated. In-season soil and tissue plant samples will be taken during the fall and spring and analyzed in the laboratory to determine soil and plant fertility. Students will be involved in both field and lab works including cover crops tissue sampling, taking soil samples, harvesting the main crop and measuring yield, grounding tissues and measuring crop and soil nutrients in the lab.

7) Evaluating faba bean varieties as a new multi-purpose crop for New England (Fatemeh Etemadi, supervisor) In this project we continue evaluating eight faba bean varieties for their yield performance, disease resistance, and profitability in New England condition. In this project student will be involved in every step of the project including growing faba bean in greenhouse, transplanting to the main field, faba bean tissue samples at different stages of growth, harvesting pods, measuring yield and yield components, preparation of tissue samples for determination of L-Dopa content in harvested plants.

John Fable, Adjunct Instructor
Environmental Conservation

Brief project description: Fabricating and testing high-performance wood based structural bio-composites for use in bicycles and other applications. Other projects available may include assessment of the musical instrument wood market as a market opportunity for 2nd tier regional hardwoods. Project location: My fabrication shop and design studio in North Amherst 110 Pulpit Hill Rd, and Holdsworth 103/104. Duration of project and number of hours required can be flexible, but I anticipate 8+ hours per week. Practicum (Pass/Fail) and Independent study (graded projects) available.

Applicants should contact me, John Fabel johnfabel@eco.umass.edu to set up an interview.
Project 1. Measuring the growth and sway motion of trees with and without support cables installed. Most of the work will be in Cadwell forest (Pelham, MA) and Holdsworth Hall. The most important qualifications are someone who is responsible and willing to work hard; having a flexible schedule is also helpful. The total time commitment is probably ten (10) 8-hour days, but it is more likely that work will occur intermittently throughout the summer, depending on my travel schedule and the weather. Hourly compensation is possible, credit towards an independent study is more likely. Interested students can contact me at their convenience.

Project 2. Measuring the growth of trees on campus. This project would require a student to work mostly unsupervised collecting increment cores from trees on campus, and measuring site conditions and taking GPS coordinates. The student(s) would also have to measure growth rings on a microscope. This project would probably last the entire summer (there are lots of trees on campus) and I would try to find some funding to pay someone an hourly rate. Credits for an independent study or even an honor's thesis would also be possible.

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

Student interns needed for research studying the ecology of birds in urban/suburban environments in Springfield, MA. Two projects are available.

Project 1. Assist with a graduate research project on Chimney Swift nesting ecology in Springfield, MA. Although an abundant urban bird, Chimney Swifts have experienced severe declines and understanding the factors that limit populations is necessary for conservation initiatives. The interns will gain experience in a wide variety of field skills including point-counts, nest searching, habitat assessment, and outreach. Commitment of at least 2 mornings, beginning in early May through to the end of July / Early August. Please contact Anthony Ortiz with your interest: laortiz@umass.edu.

Project 2. Neighborhood Nestwatch is a Smithsonian Migratory Bird Center citizen science program that takes place in backyards and schoolyards within a growing number of regional centers along the Eastern seaboard. This community-based research project provides an opportunity to conduct basic conservation biology and environmental education in urban and suburban environments. This work requires an ability to communicate ecology to a wide range of ages and capture birds in urban/suburban settings. Most work is conducted in backyards but occasional team visits to underserved youth groups, camps and schools are involved where banding demonstrations and complementary outreach activities are conducted. The interns will gain experience in a wide variety of field skills including point-counts, nest searching, resighting color banded birds, mist-netting and outreach. Commitment of at least 2 field days, beginning in early May through to the end of July / Early August. Please contact Susannah Lerman with your interest: slerman@cns.umass.edu.

Qualifications for both projects: 1) Be highly motivated, interested and enthusiastic about bird conservation; 2) Previous experience conducting field work is a plus but not required; 3) Ideal for undergraduate students wanting field experience in urban ecology and avian biology; 4) Environmental education / outreach experience desirable, willingness a must; 5) Ability to project infectious enthusiasm for urban birds; 6) Academic credit available.

Faculty Summer Research Projects. Updated March 2016.
Elsa Petit, Lecturer
Stockbridge School of Agriculture
206 Bowditch Hall, 413-545-5217

**Project 1:**
The cold climate wine industry has recently boomed in the Northeastern America after the successful breeding of cold-tolerant grape varieties. Vineyards harbor a wide variety of microorganisms that play a pivotal role in grape quality and will contribute significantly to the final aromatic properties of wine. If essential beneficial microorganisms have been identified in traditional wine cultivars, in contrast little is known about cold-climate cultivars.

This project investigates how microbial communities vary according to different farming practices from organic to conventional in vineyards of Northeastern America. This will help in the discovery of yeast and bacterial species essential to wine quality and guide future sustainable farming practices.

**Project 2:**
Pruning and removing shoots, leaves and fruits early in the season is a common practice in viticulture and is thought to have beneficial effect on fruit juice quality (sugar, acidity) and disease control. Yet, these practices are laborious and costly and their beneficial effect is not proven for newly bred grape varieties adapted to cold climate. This project quantifies, for these different thinning methods, the labor costs, impact on juice quality (sugar content, acidity) and disease control on the cold tolerant variety Frontenac. Results will provide winegrowers with a real measurement of the cost and benefit of such practices.

Student must have be motivated, either like to work in outdoor or in the lab or both
Independent Study (graded project) or Practicum (pass/fail credit) available. Project timing is flexible but should be 45 hours of effort for each 1 credit awarded. Application deadline is April 15th.

Allison Roy, Assistant Unit Leader
Massachusetts Cooperative Fish and Wildlife Research Unit
Environmental Conservation, 317 Holdsworth Hall
aroy@eco.umass.edu

Adrian Jordaan, Assistant Professor
Environmental Conservation, 309 Holdsworth Hall
ajordaan@eco.umass.edu

We are looking for multiple student technicians for three aquatic and fisheries ecology research projects (described below). Preference will be given to rising sophomores and rising juniors from UMass Amherst. To apply, email cover letter (with name, email address, and phone number for two references, including at least one academic reference), resume (with your local contact information, pertinent experiences, relevant coursework, etc.), and unofficial transcript to Allison Roy aroy@eco.umass.edu. If you are interested in more than one project, please indicate your preferred order of consideration in your cover letter. Review of applications will begin on 28 March 2015.

**Lake Food Webs (2 positions)**
The technician will assist a PhD student in a project examining effects of winter lake drawdowns on lake littoral communities and food webs. We will be sampling fishes, mussels, macroinvertebrates, and water quality in the field and taking samples back to the laboratory for processing of gut contents and stable isotopes.

(Continued next page.)
Both positions are approximately half field work and half lab work. The position is based at UMass Amherst, but will require driving to field sites throughout Massachusetts with USGS vehicles. Applicants must have a driver's license and insurance to drive USGS vehicles. Applicants with a strong background and interest in field work, particularly related to aquatic systems (fish, mussel, and macroinvertebrate sampling) are preferred. Must be able to swim and be comfortable in canoes and snorkeling. Dependability, attention to detail, initiative, and independence will also be considered.

**Supervisors:** Jason Carmignani (PhD student) and Allison Roy (PI)

**Employment Period:** May through August 2015 for 32-40 hours/week

**Salary:** $10/hour (~$5000 for summer)

### Alewife Productivity (2 positions)

The technicians will assist on a project investigating alewife productivity in freshwater lakes and ponds in coastal lakes. The positions are split between field work and lab work. For field work (10-20 days), juvenile fishes will be sampled using purse seines from boats at night. Additional sampling will take place for water quality, habitat quality, zooplankton, etc. When not in the field, technicians will be ageing fish otoliths, identifying zooplankton, and/or analyzing sonar footage. There may also be opportunity to develop short-term laboratory experiments at the Richard Cronin Aquatic Resource Center in Sunderland, MA. The position is based at UMass Amherst, but will require occasional overnight travel to field sites throughout Massachusetts. Applicants with a strong background and interest in fishes and aquatic systems, and have experience in field and laboratory settings are preferred. Must be able to swim and be comfortable on boats; MOCC boat safety training will be provided.

**Supervisors:** Matt Devine (MS student), Adrian Jordaan (PI), and Allison Roy (PI)

**Employment Period:** May through August 2015 for 32-40 hours/week

**Salary:** $10/hour (~$5000 for summer)

### Mussel Propagation (1 position)

The technician will work with a team of technicians on various research projects at the US Fish & Wildlife Service’s Richard Cronin Aquatic Resource Center in Sunderland, MA (5 min from UMass-Amherst and on the bus line). Projects include culturing freshwater mussels indoors and measuring growth of mussels in outdoor raceways. There may be additional experimental projects set up over the course of the summer. The position includes some field work, such as mussel and habitat surveys. Applicants who are independent, creative, good technical trouble-shooters, and interested in developing and testing laboratory tank set-ups are preferred. Dependability, attention to detail, initiative, and ability to do teamwork will also be considered.

**Supervisors:** Dave Perkins (US Fish & Wildlife Service), Pete Hazelton (MDFW), and Allison Roy (UMass)

**Employment Period:** May through August 2015 for 32-40 hours/week

**Salary:** $10/hour (~$5000 for summer)

(More internships on next page)
Project description: When food is scarce, how do birds feed both themselves and their chicks? We study Wood Thrush and Gray Catbirds nesting in forest patches around Amherst, and compare their food supply and behaviors to individuals nesting in the Quabbin Reservoir. We are looking for motivated team players with interests in birds, bugs, and/or animal behavior. We will have two crews operating in tandem over the summer. Bird crew members will learn how to find bird nests, monitor nests, place nest cameras, mistnet to catch birds, and even learn how to handle birds and take body measurements. Bug crew members will learn a variety of invertebrate sampling techniques like sweep netting or the use of Berlese funnels in order to quantify food availability. Both teams will gain valuable hands on experience and learn how to identify northeastern trees and shrubs.

Location: We will be working out of our lab at UMass Amherst; field sites are in Amherst or the Quabbin Reservoir in New Salem.

Qualifications: Crew members need to be able to start work early (approximately 5 AM), move through forest habitat carrying equipment, and handle summer field conditions (heat and insects). Ideal candidates are interested in birds, bugs, or forests, have some experience identifying northeastern plants, and can drive a personal vehicle for the project.

Project duration: We begin training in mid-May. The project typically runs through mid-August as we complete final vegetation surveys. Students do not have to commit to the whole summer, but students with greater availability are preferred. Part time (2-3 days/week) or full time (5 days/week). Typical days run from ~5 AM-2 PM.

Compensation: The positions are volunteer and we do not provide monetary compensation. Students can register for Practicum (Pass/Fail) credits. There is a potential Independent Study project for interested individuals on nest ectoparasites.

Please contact Kit Straley (MS graduate student) at kstraley@cns.umass.edu with: a cover letter indicating if you are interested in bird or bug crew, a resume, unofficial transcripts, and contact information for 3 references. Applications accepted through March 25, 2016.
Mass Audubon is seeking to fill an unpaid seasonal horseshoe crab research assistant position based at the 800 acre Wellfleet Bay Wildlife Sanctuary on the coast of Cape Cod, Massachusetts. The position involves working on horseshoe crab spawning surveys, U.S. Fish and Wildlife Service button tagging, acoustic telemetry, juvenile surveys, and public outreach and education. University of Massachusetts students can earn independent study credits and/or count hours toward the Coastal and Marine Sciences Certificate Program.

Responsibilities:
- Assist with visual spawning surveys on Cape Cod beaches
- Assist with USFWS Service tagging for mark-recapture studies
- Help coordinate volunteers for spawning surveys and USFWS tagging
- Assist with an acoustic telemetry project in Wellfleet Bay in cooperation with the University of Massachusetts, Amherst
- Conduct visual juvenile abundance and distribution surveys
- Enter, analyze, and summarize data collected through the aforementioned research projects
- Educate and guide public and youth camp groups through both presentations and field work

Qualifications:
- Working toward or have received a Bachelor's Degree in marine biology or related field
- Previous field experience and interest in marine ecology
- Strong interpersonal skills and motivated work ethic
- Willingness to work outdoors in the sun or adverse weather conditions often for long hours on beaches, tidal flats, salt marshes, or boats
- Willingness to conduct surveys at night and work flexible hours including some weekends
- Applicants should be in good physical condition, able to swim, and have a valid driver's license with a reliable vehicle
- Desirable but not required qualifications include boating experience, diving or snorkeling experience, and previous experience with horseshoe crabs

Details:
- Position is based in South Wellfleet, Massachusetts
- Position is full time at 40 hours/week from April 2016 through August 2016
- Dorm housing is available at $30-35/week from April through June with the possibility of extension through August, but local Cape Cod housing is a major plus
- Applicant must pass a background records check (CORI, SORI, and driver's)

To Apply:
Send a cover letter (stating dates of availability and local housing availability), resume or CV, and contact info for three references in one PDF document to Michael Long at mlong@massaudubon.org with "Horseshoe Crab Research Assistant" in the subject line by March 25.

Successful candidates may register for practicum credits through Professor Adrian Jordaan, ECO Assistant Professor ajordaan@eco.umass.edu