ENVIRONMENTAL CONSERVATION

ACADEMIC & CAREER ADVISING

Part I. Analysis of the Current Landscape

Our mission is to provide our students with the knowledge, skills and tools to solve the complex, global challenges of environmental sustainability, and to change the world.

We, in the Department of Environmental Conservation (ECo), are passionate about our mission and about making a BIG difference in the world. By virtue of our breadth of expertise and inherent ability to reach across disciplines, ECo is uniquely qualified and dedicated to training the next generation of scholars and practitioners in environmental sustainability.

ECo is deeply committed to undergraduate education. It is a priority for our department, and this is reflected in the type and quality of support we provide our students. In ECo, undergraduates are part of a vibrant learning community where creative teaching methods are celebrated and applied, and hands-on experiences extend well beyond the classroom. Each of our faculty works closely with students, assisting them with their academic advising and career planning. The outcome of this effort is firmly shown in our students’ success post graduation, the university’s metrics used to gauge student experiences, and the assessment findings for our undergraduate programs.

Several needs of our students shape our approach to academic and career advising. First, a large proportion of graduating seniors in ECo plan to enter the job market after graduation (Table 1). Consequently, our advising is designed to meet the dual demands of a) certification requirements of our diverse professional societies, and b) the workforce needs of employers. Additionally, we must also provide our students with the advice and training to continue their education via graduate school if they so choose.

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*Note: For this major, post graduation plans vary by concentration. For example, the Urban Forestry & Arboriculture concentration virtually all graduates enter the job market with 100% full-time employment.
Table 1. Post graduation plans of BCT, NRC and ENVSCI graduating seniors compared to CNS and campus wide undergraduate students.  Source: 2015 UMass senior survey data.

**ECo Culture & Undergraduate Education**

Despite our size of about 700 undergraduate students, ECo provides a small-college atmosphere within a large university. This is because we prioritize the undergraduate experience and foster a sense of community. Within ECo, there are three undergraduate majors programs. These include: Building & Construction Technology (BCT), Natural Resources Conservation (NRC), and Environmental Science (ENVSCI) that is co-administered by three academic units - ECo, Geosciences (GEO), and the Stockbridge School of Agriculture (SSA). Our review focuses on our two ECo programs, BCT and NRC. The ENVSCI program review is in a separate joint report prepared by the three administering units that is appended to this review. We also combine our discussion of academic and career advising because our faculty advisors conduct these activities simultaneously when meeting with their advisees.

**Current Academic & Career Advising Strategies in ECo**

**Faculty-Centered Advising**

Faculty-centered advising is a hallmark of our ECo community. All of our programs champion faculty-centered advising in which every student is assigned to an individual faculty advisor. For academic advising, all of our students have a registration hold on their Spire accounts, and must see their faculty advisor to discuss their courses before the hold is released and they can pre-register for courses. This process ensures that every one of our majors sees their faculty advisor during the pre-registration periods in fall and spring semesters. This is a large commitment of faculty time, but we are committed to providing this personal one-on-one time to all of our majors to promote student success.

During pre-registration advising periods, faculty advisors also discuss with their advisees the importance of gaining hands-on experiences – such as research experience in a faculty lab or an internship with an organization, agency or industry – and how they plan to incorporate these professional experiences into their schedules. We’ve found challenging students to think about these experiences intentionally and proactively engaging them to plan ahead helps students to take the next step to pursue hands-on experiences. ECo recognizes that these experiences are critical to prepare our students for career opportunities and graduate school, and consider it part of our responsibility to help students identify and secure these professional experiences. Depending on the individual student’s interest and career goals, faculty advisors may guide an undergraduate to explore one or more of the following opportunities.

- Internships and summer jobs,
- Hands-on training in the field and laboratories,
- Research experiences,
- Honors program, and
- Domestic and international exchanges.
Beyond the registration periods, ECo faculty advisors remain readily available to meet with their advisees and other students throughout the year for academic and career advising, and students are encouraged to access their advisors whenever they need assistance.

We also have a special commitment to advising our students from under-represented minorities. Recognizing the critical need to expand diversity in our professional fields, URM students are assigned to faculty advisors who have a deep commitment to their academic success and facilitating professional experiences to make them more competitive for career opportunities and graduate school. These faculty advisors also have extensive knowledge of special scholarship and research opportunities for URM students and work hard to match students with these opportunities. ECo faculty advisors also place special emphases on facilitating research opportunities for Honors students and students expressing a desire to go onto graduate school.

In addition to faculty advisors, all ECo programs also have faculty program managers who are available to meet and advise students within the three majors and who serve as the primary contact for new students, transfers and change of majors. Once these new students enter the major, they are assigned individual faculty advisors.

**Student Success Centers and Curriculum & Career Planning Seminars**

In 2015, ECo opened a new Student Success Center that is staffed by the faculty program manager, providing additional support and resources to NRC students beyond their individual faculty advisors. This center has open hours when students can access the NRC faculty program manager. Similarly, the BCT faculty program manager also has open office hours for BCT majors. Additionally, NRC offers a required 1-credit seminar on curricular and career planning for students in the Environmental Conservation concentration, providing regular weekly interactions with the program manager or director. Faculty also participate in student-led workshops organized by student chapters, such as addressing strategies for applying to graduate school. These student chapters of national professional societies include: Society of American Foresters, The Wildlife Society, and the American Fisheries Society.

**How Are We Doing in Academic & Career Advising?**

Based on the 2015 UMass Senior Survey data, we are doing a very effective job of meeting the academic and career advising needs and expectations of our students in ECo majors, exceeding the average for all CNS units as well as the UMass campus.
• BCT, NRC, and ENVSCI provide students with very high faculty accessibility (3.6-3.7/4), illustrating our strong commitment to our majors.

![Accessibility to Faculty](image)

• For career preparation and guidance, all the ECo majors indicated a moderately high level (3.3-3.4/4) of satisfaction in comparison to other CNS units and the campus.

![Career Preparation](image)
All the ECo majors earned higher student satisfaction for academic advising relative to other CNS units and the campus.

### Division of Labor/Usage of Personnel

All faculty, both tenure-track and Lecturers, advise students. Thus, there is little distinction between faculty, except for Extension faculty who do not typically advise undergraduate students with the exception of one Extension faculty who has a 50% teaching appointment. However, three of our faculty lecturers also serve as Program Managers/Chief Undergraduate Advisors who have the primary responsibility of meeting prospective new students, transfer students and students considering a change of major. These three faculty also have higher advising loads than other faculty with upwards of 40-60 students, whereas the typical advising load for other faculty range between 20-25 students. ECo does not have dedicated professional advising staff. Currently, we do not use peer advisors, but we plan to expand their use in ECo.

### Data Analytics/Tracking

With our faculty-centered advising, every student is tracked by their individual advisor for academic progress, with particular focus on GPA and progress toward degree completion. Consequently, individual students in need of assistance are identified and provided assistance by their faculty advisor. Faculty advisors also engage students in discussions of experiential and career opportunities. Virtually, 100% of our students meet with their faculty advisor at a minimum of twice per year during pre-registration periods.
All of our faculty program managers were trained on the EAB Student Success Collaborative (SSC) advising tool. The SSC provides a highly effective method to “red flag” students and provide targeted campaigns. It is used to identify “at risk” students and then communicate with those students and/or faculty advisors when additional intervention is deemed appropriate. SCS is also used to identify students with similar majors/concentrations, providing program managers a means to target professional opportunities announcements to appropriate student groups.

**Experiential Opportunities**

Providing students experiential learning experiences is a priority for ECo, which is reflected in our approach to education and the quality of support we provide our students. We prioritize the undergraduate experience with:

- High faculty accessibility with faculty-centered advising of all students;
- A strong commitment to excellence in teaching and experiential learning with a special emphasis on field and laboratory experiences.
- Engaged, student-centered teaching that incorporates team-based learning and civic engagement; and
- Interdisciplinary coursework that emphasizes global perspectives, environmental justice and civic responsibility.

Considering the vast majority of our majors plan to enter the job market after graduation, we offer real-world experiences, both in the classroom and beyond with hands-on training in field and laboratories, internships, research experiences with faculty, and international exchange. Our curricula are designed to provide our students with professional skills and to meet the certification requirements of professional societies.

Further, we recognize that our curricula cannot provide all of the professional experiences our students need to be most competitive in the job market, so we encourage and facilitate our students obtaining professional experiences during the summer via internships and pre-professional summer employment. We strongly encourage our students to focus their summer breaks on gaining practical, professional skills and experiences. Our faculty advisors work with their students to identify and apply for these summer training opportunities.

We also work hard to provide our students with opportunities to gain research experiences, especially for our Honors students, under-represented minorities, and students expressing a desire to go onto graduate school. There are multiple opportunities for gaining these research experiences, including:

- Working with individual faculty or graduate students on their research projects via independent studies, practica, and Honors projects. Each semester a list of available undergraduate research positions in faculty labs is generated and circulated to our
NRC/ENVSCI students. We also work to match students with the most appropriate faculty advisor, providing the opportunity for each student to be advised by a faculty who most closely matches their interests and professional goals.

- Often students return back to campus excited from their summer internships and field assistant experiences. Faculty often work with these students via independent study or as their honors thesis, helping them analyze data, learn technical writing skills, and preparing manuscripts that sometimes result in published journal papers.

- There are 2-3 ECo research fellowships offered each summer to undergraduate students to conduct research with faculty and associated graduate students. Similarly, the U.S. Forest Service, Center for Research on Ecosystem Change, located in ECo, offers two summer research fellowships for students to work with Forest Service biologists.

- ECo faculty also participate in the new CAFE Summer Scholars program. Beginning in summer 2016, the Center for Agriculture, Food & the Environment will offer upwards of 26 summer scholarships for undergraduate students to work with faculty with active MA Experiment Station Projects and UMass Extension Initiatives.

- Faculty also work with students in developing honors theses in conjunction with iCONS, Commonwealth Honors College, and from their research experiences with NSF Research Experiences for Undergraduates (REU) programs.

Based upon 2015 UMass senior survey data, most of our majors gain valuable out-of-classroom experience through internships and other field-related experiences or research opportunities with a faculty member. Over 75% of NRC and ENVSCI majors participated in some kind of internship opportunity during their time at UMass, which well exceeds the average for all CNS units as well as the campus.

![Internship Experience Chart]

**Internship Experience**

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Many of our faculty members provide opportunities for undergraduates to join their research team. For NRC and ENVSCI majors, access to research experience is a strength of those programs and is well above the campus average. We note the very low satisfaction of our BCT students with research experiences that needs our concerted attention.

**Research Experience**

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**Practicum & Independent Study Opportunities**

We took a closer look at the number of practicum and independent study experiences that our students participated in over the past three years by major (Fig. 6). Relatively large numbers of NRC students registered for practicum and independent study credits within the department. In contrast, smaller numbers of BCT students register for these credits; reflecting the very “tight” BCT curriculum and the extensive, hands-on training embedded into many of their core courses. At least eight of the required core BCT courses have a lab component or are full lab-based courses. These data confirm that our students are gaining valuable experience outside the classroom and many are interacting with faculty in a professional setting.
Communication

We invest greatly in our communication strategies, working with students in academic and career planning, including:

- Faculty-centered advising, in which every student is assigned a major advisor and must meet with every semester to pre-register for classes;
- Required curriculum and career planning seminar (NRC 391A) offered in the spring semester that provides students regular interactions with program manager/director;
- A new Student Success Center that provides additional support to students in course planning and professional development beyond their individual faculty advisors;
- Readily accessible printed and on-line materials on program requirements, major, learning goals, and career opportunities;
- Regular coordinated email communications from CUAs alerting students to key deadlines, advising, courses, and campus events;
- Regular email circulation of available undergraduate research/field, scholarship, and internship opportunities;
- Current Academic Requirement Reports (ARR), so that students have ready access to their academic status and requirements;
- Maintenance of Facebook pages affiliated with the department and its programs, contributions to the Sustainable UMass Facebook page, and close collaboration with the undergraduate fellows program for sustainable marketing and communication.
School of Earth & Sustainability

In partnership with the Department of Geosciences and Stockbridge School of Agriculture, ECo is launching a new School of Earth & Sustainability (SES) that joins together and unifies academic programs, research and outreach at UMass Amherst that share a common focus on earth, sustainability and environmental sciences. Through the new school, the partnering departments are better positioned to promote transdisciplinary innovation, educational training, advising, student leadership, cross-campus collaboration, development, and engagement with diverse partners. One of the first initiatives of SES is development of a SES Workforce Engagement Initiative that will provide shared services focused on career development and workforce engagement, greatly enhancing undergraduate support and advising for undergraduates across all three departments.

Part II. Goals for Academic and Career Advising and the Student Experience

With our deep commitment to undergraduate education, our students emerge from their ECo undergraduate experience well equipped to secure meaningful professional positions or pursue advanced degrees. Yet, we also recognize areas for improvement and opportunity. In this section, we outline our major goals and specific mechanisms for further enhancing the academic and career advising support we can provide our undergraduates.

Overarching Goals

Looking across our majors, there are some general goals we have for all our ECo programs. These include:

- Continue our long-standing commitment to faculty-centered advising in which 100% of our majors are assigned a faculty major advisor who guides their academic and career planning.
- Under the new School of Earth & Sustainability, augment existing advising with shared services focused on career development and workforce engagement.
- Increase the percentage of students who find and enter the ECo majors as freshmen and sophomores to improve our 4-year graduation rates.
- Further improve our students’ overall satisfaction in their major.
- Improve access and availability to core required courses that are experiencing capacity and/or enrollment issues.
- Continue to grow the percentage of our students obtaining out-of-classroom, hands-on experiences via internships and research experiences with faculty. For relevant majors, the goal is for 80-85% of our students to engage in out-of-classroom experiences.
- Increase the percentage of our students participating in enriching experiences, such as the Honors Program, iCONS, Eco-Rep, and Sustainability Fellows.
- Identify meaningful, practical opportunities to nurture a sense of community among our students, faculty, and staff.


**Academic & Career Advising**

There are also specific goals targeted to improve academic and career advising, and our students’ overall preparedness for graduation and beyond.

- Work with faculty to share best practices for advising and aid them in providing skillful career guidance.
- Work with students, individually and as a community of learners, to review degree requirements, monitor their progress, and find courses that align with their interests and career goals. Currently, this is provided by individual advising sessions with faculty advisors. We envision providing other opportunities for students to gain access to academic and career planning support (e.g., refine degree information, advising seminars and workshops, peer advising, career panels, etc.).
- Increase student awareness of various experiential opportunities they can engage in during their time at UMass.
  - For example, the BCT program started an internship blog where students write and post pictures from their current or previous experiences ([http://blogs.umass.edu/bct-interns](http://blogs.umass.edu/bct-interns)). This enhances awareness of the opportunities that exist and it also helps students learn from their peers’ experiences.
- Promote a culture with our students that they are ultimately responsible for their own education and career decisions. With support from their advisors, expect more from students in proactively planning their undergraduate experience to enhance their career development.
- Develop and implement a SES career development and workforce engagement plan that includes strategies for expanding opportunities for engaging our students with the workforce.
- Build stronger relationships with UMass Career Services and specifically the CNS Career Advisors.

**Support & Tools**

To enhance student support, ECo and its partners need to clearly understand goals and priorities, identify roles/responsibilities, compile data and develop metrics for success, and implement priority actions.

- Develop career-focused surveys for: 1) graduating seniors and 2) alumni. The intent of these surveys is to supplement existing data and provide a broader base of understanding regarding our alumni career outcomes. Ongoing survey tracking alumni is an important part of our plan to enhance student support.
  - A pilot project is underway in the MS Sustainability Science (MS3) program that can serve as an example for how to implement graduate and alumni assessment.
  - Find ways to stay connected with graduates (e.g., LinkedIn, UMass affinity groups)
    - For example, within the BCT program there is a LinkedIn page where current students and alumni share career development
Develop a schedule for assessing the best readily available data, summarizing it, and refining our approach. Additional information we would like to have include:
- Current students: assessment of advising sessions, what additional information/support/tools do they need, retention rate of majors, and how career development factors into their curriculum planning.
- Alumni: job placement/satisfaction over the longer term (e.g., 3, 5, 10 years out), continuing education needs, and feedback on how we can improve the undergraduate experience.

Within each program, consider how to streamline advising and maximize the use of faculty time.

Part III. Academic and Career Advising Action Plan

To achieve the goals outlined above, we’ve identified a number of actions. Some of these are achievable now, in the short-term, with existing resources; others are actions to consider over the next couple of years depending on resources and staffing. These actions are aimed at several levels with some goals and associated actions addressed by ECo and some facilitated through the SES.

Short-term actions (with existing resources)

Department/Programs

- Enhance and diversify our academic and career advising opportunities by: 1) expanding our student success centers for academic and career advising, 2) developing supplemental advising opportunities (e.g., evening sessions and peer-to-peer mentoring), 3) providing seminar courses for all our majors that include academic and career planning, and 4) creating new advising tools.

- Implement routine programmatic assessment and student tracking to identify and address potential issues, and use data to guide future planning. ECo intends to regularly review our programs to ensure that our degree programs continue to be achievable within 4 years. Given that courses can change over time, we believe this will help us identify and address any unforeseen changes (e.g., course cancelation or scheduling changes) that may impact a student’s graduation timeline. We will also continue to work within our department and with other units to further reduce scheduling conflicts for key courses.

- Develop departmental-based strategies for increasing contact with students post-graduation to build alumnae support, provide a mechanism to better track career success (e.g., job placement), and an opportunity to learn from graduates how to improve our curricula for career preparation.

Faculty

- Work with faculty to develop “best practices” advising guidelines to provide consistent, effective advising practices across all faculty.

- Promote faculty engagement with advising workshops on best practices.
• Develop “best practices” for program managers to effectively utilize information from the EAB SSC advising tool to engage students and faculty in academic advising.

Students
• Improve mechanisms and expand support for students transferring into our programs to maximize the value of their existing experiences and reduce the timeline to graduation; this includes outreach to community colleges around preparing their students for classes in alignment with our curriculum.
• In preparation for advising sessions, task students with developing a summary of career goals and how they plan to approach professional development while in school.
• ECo student orientation or team-building outing for new majors to foster a sense community among students and faculty.

School of Earth & Sustainability
• Prepare the SES Workforce, Employer, and Alumni Engagement Plan. Solicit faculty and advisor input.
• Convene an SES faculty career development work group
• Share “best practices” for advising
• Pool together online resources related to career development, job search engines, and student engagement events (e.g., conferences)
• Develop a SES alumni and employer database
• Create a plan and budget for alumni engagement and career tracking
• Develop a comprehensive, systematic approach to marketing and communications to maximize our reach to prospective students, especially high school seniors, transfer students (especially from community colleges), and undecided majors within the university. With students finding and entering the ECo majors earlier, we would improve our 4-year graduation rates.
• Develop targeted communications to better promote our majors/concentrations with high job placement rates and/or underutilized resources.
• Create and support an SES workforce and alumni advisory group

Mid- and long-term actions (some require additional resources)

Department/Program
• Expand our efforts in concert with SES to connect students with real-world experiences via an on-line portal for identifying and disseminating information to our students on experiential learning and professional opportunities. Further, ECo will explore opportunities to utilize our alumni network and contacts in the field to develop new internships for our students.
• Build community: Evidence shows that student-learning outcomes are greatly enhanced when students have an emotional connection within a learning community. We propose to develop 1) new outdoors team-building events, and 2) new seminar series to expand our ECo learning community and to enhance academic and career advising.
• Increase the number of summer and semester-long research fellowships to work with faculty and graduate students.

• Explore with faculty and the personnel committee development of an assessment tool for students to evaluate faculty advising and incorporate into our cultural standards and annual faculty review.

**School of Earth & Sustainability**

• Hire an engagement specialist, who will help to establish a peer advising centers and a comprehensive framework for disseminating internship and job opportunities.
  
  Long-term action: Expand the SES “Career Services Office” to two full-time staff members with at least one student assistant.

• Launch workforce advisory group.

• Plan and implement SES-wide career conference and exhibit fair.

• Develop SES-wide online portal for posting jobs and internships.

• Develop and launch career advising training sessions for faculty.

• Host career development workshops for students (e.g., internship search process, resume and cover letter writing, etc.).

• Launch SES-wide survey of alumni career outcomes and maintain ongoing tracking.
ENVIRONMENTAL SCIENCE

ACADEMIC & CAREER ADVISING

This document provides a focused look at the Environmental Science program, which is co-administered by the Department of Environmental Conservation (ECo), the Department of Geosciences (GEO), and the Stockbridge School of Agriculture (SSA). It serves as an addendum to each of the department’s individual plans.

Part I. Analysis of the Current Landscape

The Environmental Science (ENVSCI) major at the University of Massachusetts is an interdepartmental program administered by ECo, GEO, and SSA under the banner of the new School of Earth & Sustainability. The partnering units share the responsibilities to provide faculty-centered advising. In addition, ENVSCI also has the support of a faculty program manager to oversee the administration of the major, coordinate across departments and faculty advisors, and provide overarching support and guidance to ENVSCI students.

Program Background

In 2012, there was a major restructuring of ENVSCI program, which included its redesign as a truly interdepartmental program with a faculty program manager to coordinate academic advising and course offerings. Concurrent with this redesign, specific concentration areas (in policy, biology, and toxicology) were eliminated in favor of an approach that helps guide students towards identifying possible career directions and planning their course work and co-curricular activities accordingly. Critical to the success of this plan are three mandatory seminar classes (each 1 credit) which were put in place to provide a strong centralized advising component for all students in the major across their first two years in the program. Major requirements were also modified to include two “praxes,” or practical experiences for each student prior to graduation. More detail is provided in later sections about these changes.

These changes were first implemented in Fall 2012 and the improvements to our student experience are starting to be reflected in the UMass Senior Survey results. The upcoming class of 2016 will be our first crop of students who entered as incoming freshmen under the new program organization. The 2015 results include a large percentage of students who entered the major as sophomores or juniors (both internal and external transfers), and you can see that the results of that survey were higher than previous years.

Career Avenues and Options

The needs of our students shape our approach to academic and career advising. A large proportion of graduating seniors in ENVSCI plan to enter the job market after graduation (Table 1), while approximately one quarter will head directly to graduate school. However, the number of students planning to pursue graduate work within the next five years is roughly equivalent to those who will do so immediately. So we aim to provide students with a firm foundation for this possible pathway. Consequently, our advising is designed to meet
the dual demands of the workforce needs of employers (in both private and public sectors),
while providing our students with the advice and training to continue their education via
graduate school if they so choose.

Recent Environmental Science graduates have enrolled in graduate programs as varied as
conservation biology, hydrogeology, environmental soil science, wetland science,
environmental chemistry, ecotoxicology, environmental policy, and law.

The career outcomes from ENVSCI are as varied as the major itself, but several possible
employment tracks are emphasized to students: private-sector environmental consulting,
environmental regulation (state and federal levels); and non-governmental environmental
organizations.

<table>
<thead>
<tr>
<th>Unit</th>
<th>Full-time employment</th>
<th>Part-time employment</th>
<th>Graduate or prof school</th>
<th>Volunteer</th>
</tr>
</thead>
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<tr>
<td>ENVSCI</td>
<td>69%</td>
<td>7.1%</td>
<td>21.4%</td>
<td>0%</td>
</tr>
<tr>
<td>CNS</td>
<td>53%</td>
<td>10%</td>
<td>31%</td>
<td>2%</td>
</tr>
<tr>
<td>Campus</td>
<td>65%</td>
<td>9%</td>
<td>21%</td>
<td>1%</td>
</tr>
</tbody>
</table>

Table 1. Post graduation plans of ENVSCI graduating seniors compared to CNS and
campus wide undergraduate students. Source: 2015 UMass senior survey data.

**Environmental Science: Undergraduate Education**

UMass Amherst’s Environmental Science Program is an interdisciplinary academic program,
providing students with training in biological/ecological and geophysical sciences. The
curriculum includes innovative course offerings that extend the traditional classroom
experience to outreach activities including environmental applications and problem solving
in off-campus community settings. As part of the undergraduate training, ENVSCI majors
also enroll in special seminars tailored to assist with curriculum planning and career
development. Students benefit from a program manager and an interdisciplinary team of
faculty committed to their long-term success.

Currently, we have approximately 260 students in the Environmental Science major.

**First-year seminars**

All entering students (regardless of status) must enroll in an ENVSCI seminar with the
Program Manager, who also serves as the Chief Undergraduate Advisor (CUA). (ENVIRSCI
191A in Fall, and 194A in Spring). Students take both seminars regardless of which term
they enter. The first-year seminar series is designed for students in their “first-year” in the
major –regardless of how many credits they may have already earned.

The Fall seminar (ENVIRSCI 191A) is designed as a coordinated group advising session that
meets for one hour weekly with the CUA. Guest speakers are invited from across campus to
introduce students to the many programs and opportunities available to them, including: International Programs, Domestic Exchange and Five-College Interchange, Interdisciplinary Concentration in Science (iCons), Career Services-and Career Connect, Library Services, Center for Counseling and Psychological Health, etc. When it is time for preregistration for the coming semester, the CUA reviews major requirements, how to read the SPIRE Academic Requirements Report (ARR), and how best to sequence required classes. This presentation is timed to occur just before registration actually begins when students will be meeting with their individual faculty advisors.

The fall first-year seminar also includes a “Kick-off Celebration” which brings together students and program faculty for a festive event (held in the Student Union Ballroom), with refreshments, faculty introductions, and a guided dialogue about a pertinent environmental issue. All students in the major are invited, but the event is purposely scheduled to take place during the class period for the first-year seminar class to ensure that these students will be in attendance.

(In a typical fall semester, this class will include nearly 40% of the 260+/- students in the major.)

The Spring seminar (ENVIRSCI 194A) is subtitled, “Flavors of Environmental Science.” Each week a different ENVSCI faculty member presents his/her research to the class. Students learn about cutting-edge science and are encouraged to think about whether they want to take upper-level electives about that topic, and students are encouraged to speak to the individual faculty about possible research positions. Faculty are drawn from the three departments in the new School of Earth and Sustainability, as well as Environmental Health Sciences and Environmental Engineering. The CUA reserves one class period to discuss preregistration planning.

**Curriculum & Career Planning Seminar**

A second spring seminar is targeted for sophomores (although many students take this as juniors –if it is their first year in the major). This class (ENVIRSCI 294A) is entitled, “Career and Curriculum Planning.” This class is designed to help students plan and organize their remaining time at UMASS Amherst – based on their intended career focus.

The seminar introduces students to:

- the availability of various related Minors and Certificates,
- 5th year Masters and other Professional Masters degrees offered by UMASS Amherst.
- Finding REU and other research opportunities,
- Strategies for research oriented graduate programs
- Study exchange opportunities. The CUA organizes a study exchange student panel where upper classmen in ENVSCI each give a short presentation regarding their international or domestic exchange experience.
• Career Services and Career Connect. Nessim Watson is invited to talk about “Resume Writing” and “Using Social Media for Networking.”

• Possible career directions, with guest speakers from the private environmental consulting sector, State and/or Federal Environmental Regulatory agencies, and non-governmental conservation organizations. (UMASS/program alumni are invited whenever possible.)

Students are tasked with developing a curriculum plan for their remaining undergraduate time at UMASS, clearly indicating their remaining requirements and how they are going to fill them, term by term. Just prior to preregistration time, the CUA makes a presentation regarding major requirements, reading the ARR, available IE courses, etc. Students are prepped for meeting with their individual faculty advisors.

If one considers the combined population of majors enrolled in one or both of these spring seminars (ENVIRSCI 194A and/or 294A), the CUA is meeting with roughly 50-55% of the students presently declared in the major on a weekly basis.

**Current Academic & Career Advising Strategies in ENVSCI**

**Faculty-Centered Advising**

The Environmental Science program provides faculty-centered advising in which every student is assigned to an individual faculty advisor, who is based in one of the three partnering departments. Students are matched by the CUA with faculty advisors according to their stated interests as expressed during NSO or at an intake advising meeting. Our goal is to have every incoming student meet with the CUA as they enter the major. The only exception we find is those students who declare the major during summer NSO and are initially advised by another program.

**Addressing the Needs of Different Populations**

**Freshmen Orientation:**
The CUA meets with each group of entering ENVSCI students during summer NSO. The CUA gives a Powerpoint presentation highlighting the major with respect to its requirements, common career outcomes, research and internship opportunities, and includes a discussion of the basic advising structure and an introduction to unique academic opportunities (such as international and domestic exchange, and iCons). Students are asked about any specific goals or interests they may have so that they can be better matched with faculty advisors in the program.

Involuntary majors (whose first choice was Engineering, Computer Science, or ISOM) are advised by the CUA, who helps guide them until they are able to officially enter the major of their choice. In some cases, students decide to stay in the ENVSCI major even though it wasn’t their first choice.
External Transfers:
The CUA meets with each student during transfer NSO (in either January or July). Each student’s Transfer Credit Evaluation report is evaluated with respect to major requirements, and students are immediately advised regarding the length of time needed to graduate from the university under the ENVSCI program requirements. Preliminary course plans are sketched out for each student indicating where required course work must be taken and where room for electives exists.

Internal Transfer Students (Change of Majors):
The CUA meets with each incoming student before that student’s change of major is processed. Initial meetings are approximately 30 minutes in length. Each student’s SPIRE ARR is reviewed for course history and status of GenEd requirements. A preliminary course plan is developed for each student – showing where required course work must be taken and where electives can fit. Students are asked about their interest in study exchange (IP and NSE). Notes are made regarding the likely “best” semester for this exchange to occur. The student is given a copy of the course plan and a copy is made for the student’s future faculty advisor. Students are asked about specific interests within the major/field. This allows CUA to match students with faculty advisors who have expertise in these areas.

Overall Advising Framework

- Each student is assigned an individual faculty advisor.

- In addition to faculty advisors, the ENVSCI program has a dedicated faculty program manager, who coordinates across the three departments, is available to meet and advise current students, and serves as the primary contact for new students, transfers and change of majors.

- Registration holds are placed on all students (primary majors only per university standard), requiring that each student meet with his/her faculty advisor at least once a semester.

- Beyond the registration periods, ENVSCI faculty advisors remain readily available to meet with their advisees and other students throughout the year for academic and career advising, and students are encouraged to access their advisors whenever they need assistance.

- The CUA provides current advising materials to the faculty advisors via a Moodle site, including but not limited to:
  
  o checklist of major requirements, updates on course availability (for all required classes and popular electives), a schedule grid showing times of class meetings for all required classes and popular electives, a list of popular electives offered by a variety of related programs,
- A primer on ‘advising best practices’ and ‘strategies for advising’, and a section on frequently asked questions dealing with academic regulations and policies.

- The CUA also offers faculty advising workshops each Fall, with at least two offerings of the material.

- There are three separate, required, 1-credit seminars in the major – taught by the CUA. All have a significant advising component.

- The CUA communicates with students via email to remind them of important academic deadlines.

**How Are We Doing in Academic & Career Advising?**

Based on the 2015 UMass senior survey data, ENVSCI is doing a very effective job of meeting the academic and career advising needs and expectations of our students, exceeding the average for all CNS units as well as the UMass campus.

- ENVSCI provides our majors with very high faculty accessibility (3.6/4), illustrating our strong commitment to our majors.
For career preparation and guidance, ENVSCI majors indicated a moderately high level (3.3/4) of satisfaction in comparison to other CNS units and the campus. Breaking down these data, 50% of ENVSCI students responded that they were Very Satisfied (4/4), with 26% Somewhat Satisfied, and 24% Somewhat Dissatisfied.
ENVSCI majors reflect higher student satisfaction in academic advising relative to other CNS units and the campus.

It is notable that when these data are broken down, more than 71% of students indicated that they were Very Satisfied (4/4), 14% were Somewhat Satisfied (3/4), and 12% were Somewhat Dissatisfied (2/4).

### Division of Labor/Usage of Personnel

Faculty advisors are drawn from the three partnering departments. There are presently thirty (30) ENVSCI faculty advisors, with varied roles and job descriptions. Most are tenured faculty, others pre-tenure faculty, others extension faculty, and lecturers. The ENVSCI Program Manager and CUA is also a faculty lecturer. The Program Manager has the highest advising load compared to other faculty with upwards of 60 students, whereas the typical advising load for other faculty ranges between 5-20 students (depending on individual departmental culture). ENVSCI does not have dedicated professional advising staff or peer advisors, but we are exploring the possibility of this supplemental support system.

### Data Analytics/Tracking

With our faculty-centered advising, every student is tracked by their individual advisor for academic progress, with particular focus on GPA and progress toward degree completion (using the ARR). Virtually, 100% of our students meet with their faculty advisor at a
minimum of twice per year during pre-registration periods. In addition, the CUA provides over-arching tracking of student progress using the EAB Student Success Collaborative (SSC). Various campaigns are run by the CUA and students are targeted for specific outreach activities throughout the semester.

**EAB SSC Campaigns**
After grades are finalized each semester, the CUA uses SSC to identify students who have performed poorly in sequential required coursework (namely, BIOL 151, CHEM 111, and MATH 127). These students are emailed regarding the need to re-enroll in these courses for the following term, and individual faculty advisors are copied on this correspondence. If a student is identified who has performed poorly in more than one course, the student is invited in for a meeting to discuss the situation so that an assessment can be made about the likelihood of success upon repeating the course(s). Where appropriate, the CUA introduces the possibility of changing majors—and the students are given specific guidance regarding other possible programs and how their requirements and career outcomes compare/relate to the ENVSCI program.

SSC is also used to track whether students have registered for the proper ENVSCI seminar courses in the appropriate semester. Students who are “missing” these classes are contacted via email and told to register for the appropriate course (or to contact the CUA for a further discussion regarding specific circumstances).

At mid-semester times, additional campaigns are run to identify the “murky middle” of students with low (but still “in good standing” GPAs). These students are not always contacted (because they will be seeing their faculty advisor during preregistration), but a closer look is taken by the CUA to evaluate whether there has been any downward trend, and sometimes a recommendation is made simply to repeat a class in order to raise their GPA (or to request a repeat course substitution—when appropriate).

**SPIRE ARR & Query Tool**
The Academic Requirement report (ARR) is treated as a “contract” with each student, and we strive to maintain its accuracy. The ARR is used to “clear” students for graduation. The CUA regularly processes ARR exceptions when needed to accept unique transfer credits or exchange courses towards major requirements. Student are encouraged to review their ARR with their faculty advisor and to alert the CUA of any suspected omissions or errors to the report.

The SPIRE Query Tool is used by the CUA to determine if all ENVSCI seniors have satisfied their Integrative Experience (IE) requirement prior to their last semester of expected enrollment. Students are contacted as needed to assure that graduation requirements are being met “on time.”
Experiential Opportunities

Research and Internship Emphasis

Research and internship opportunities are highly valued and this is stressed to the students starting with their initial NSO meeting and through the three required seminars. Starting in Fall 2012, ENVSCI students are required to complete two “praxes” – and these can be filled with either research or internship credits, or with specific courses that include a significant skills component (such as geographic information systems, environmental site assessment, plant identification, hazardous waste operations -OSHA 40-hour certification, etc.)

We recognize that our curriculum cannot provide all of the professional experiences our students need to be most competitive in the job market, so we strongly encourage and facilitate our students obtain additional experiences during the summer via internships and pre-professional summer employment. We stress the value of related volunteer experience (dove-tailed with other summer employment), when paid internships are not possible. Students are not typically encouraged to take summer classes (unless this is what is needed for timely graduation), but when this is appropriate, we encourage students to choose on-line classes that can be completed concurrent with an internship experience.

We also work hard to provide our students with opportunities to gain research experiences. There are multiple opportunities for gaining these research experiences, including:

- Working with individual faculty or graduate students on their research projects via independent studies, practica, and Honors projects. Each semester the ENVIRSCI CUA queries faculty and post-docs from across the three cooperating departments and compiles a list of available undergraduate research opportunities. This list is circulated via email to our ENVSCI students at the start of each semester and prior to summer as well. The list is then published on the program website. An average of two dozen or more opportunities are typically available in any semester.

- ENVSCI faculty also participate in the new CAFE Summer Scholars program. Beginning in summer 2016, the Center for Agriculture, Food & the Environment will offer upwards of 26 summer scholarships for undergraduate students to work with faculty with active MA Experiment Station Projects and UMass Extension Initiatives.

- Faculty also work with students in developing honors theses in conjunction with iCons, Commonwealth Honors College, and research experiences with NSF Research Experiences for Undergraduates (REU) programs.

- Individual faculty in ECO and GEO also circulate announcements of external internships, REUs or other opportunities as they become aware of them through their own professional networks.

- Due to the highly interdisciplinary nature of the major, many ENVSCI students also find research projects with faculty outside our immediate program (including Micro, Biology, VASCI, and Biochemistry).
Based upon 2015 UMass senior survey data, most of our majors gain valuable out-of-classroom experience through internships and other field-related experiences or research opportunities with a faculty member. Over 75% of ENVSCI majors participated in some kind of internship opportunity during their time at UMass, and more than 57% of ENVSCI majors completed a research experience. Both of these metrics well exceed the average for all CNS units as well as the campus.

**Internship Experience**

<table>
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<tbody>
<tr>
<td>Internship Experience</td>
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<td>60%</td>
<td>75%</td>
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</table>

**Research Experience**

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<th>CNS</th>
<th>Campus</th>
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</thead>
<tbody>
<tr>
<td>Research Experience</td>
<td>65%</td>
<td>55%</td>
<td>50%</td>
</tr>
</tbody>
</table>
Study Exchange Emphasis

The number of ENVSCI students participating in study exchange (domestic and international) is growing. Student exchange is highlighted in both the fall first-year seminar and the spring sophomore career and curriculum planning class. The CUA has worked extensively with UMASS International Programs on a Curriculum Integration project which preapproved over two dozen international sites and their course offerings for ENVSCI majors. Consequently, ENVSCI has its own Study Abroad literature and advertising for our students (and prospective students).

The 2015 Senior Survey reports that 14% of the ENVSCI respondents completed an International Exchange, and it is noteworthy that nearly this many students also completed a domestic exchange through the National Student Exchange (NSE), going to locales such as Hawaii and Montana. NSE experiences are promoted as a cost-effective solution for (in-state) students wishing to study in a different geographic region with a different climate and/or ecosystem to study. While these exchanges do not constitute international experiences, they do place students in very different cultural and academic settings that increase their professional skill sets. Unfortunately, the Senior Survey does not track NSE data.

Communication

We invest greatly in our communication strategies, working with students in curriculum and career planning, including:

- Faculty-centered advising, in which every student is assigned a major advisor and must meet with every semester to pre-register for classes;
- Three, required seminars that provide students with weekly interactions with program manager/CUA – with approximately half the total major population enrolled in one of the three seminars in any given semester;
- Readily accessible printed and on-line materials on program requirements, major, learning goals, and career opportunities;
- Regular email communications from CUA alerting students to key deadlines, advising, courses, and campus events;
- Regular email circulation of available undergraduate research/field and scholarship opportunities;
- Current Academic Requirement Reports (ARR), so that students have ready access to their academic status and requirements;

School of Earth & Sustainability

In partnership with the Department of Geosciences and Stockbridge School of Agriculture, ECo is launching a new School of Earth & Sustainability (SES) that joins together and unifies academic programs, research and outreach at UMass Amherst that share a common focus on earth, sustainability, and environmental sciences. Through the new school, the
partnering departments are better positioned to promote transdisciplinary innovation, educational training, advising, student leadership, cross-campus collaboration, development, and engagement with diverse partners. One of the first initiatives of SES is development of a SES Workforce Engagement Initiative that will provide shared services focused on career development and workforce engagement, greatly enhancing undergraduate support and advising for undergraduates across all three departments.

Part II. Goals for Academic and Career Advising and the Student Experience

On a whole, we are very proud of our commitment to high-quality undergraduate education. Through the curriculum, student support services, our undergraduates emerge from UMass Amherst well equipped to secure a meaningful professional position or go on to pursue an advanced degree. We also recognize areas of improvement and opportunity.

**Overarching Goals**

Similar to goals set by other programs in SES, the general goals we have for the ENVSCI program include:

- Continue our long-standing commitment to faculty-centered advising in which 100% of our majors are assigned a faculty major advisor who guides their curricular and career planning.
- Under the new School of Earth & Sustainability, augment existing advising with shared services focused on career development and workforce engagement.
- Further improve our students’ overall satisfaction in their major.
- Maintain sufficient access and availability to core required courses, and improve access to popular electives that are experiencing capacity and/or enrollment issues.
- Continue to grow the percentage of our students obtaining out-of-classroom, hands-on experiences via internships and research experiences with faculty. The goal is for 80-85% of our students to engage in out-of-classroom experiences.
- Increase the percentage of our students participating in enriching experiences such as the Honors Program, iCons, Eco-Rep, Sustainability Fellows, etc.
- Identify meaningful, practicable opportunities to nurture a sense of community among our students, faculty, and staff.

**Academic & Career Advising**

There are also specific goals targeted to improve academic and career advising, and our students’ overall preparedness for graduation and beyond.

- Understand what are the essential functions of department-level or major program advisors and identify how the new School of Earth & Sustainability can provide some overarching support and services to students and faculty.
- Develop and implement a SES career development and workforce engagement plan that includes strategies for building support internally, developing a framework, and providing a range of opportunities for engaging with the workforce.
• Work with students to understand that they are ultimately responsible for their education and career decisions. Supported by advising sessions, students plan how to tailor their undergraduate experience to combine classroom study, lab and fieldwork, internships, team projects, and service learning projects to enhance their career development.

• Expand work with faculty to share best practices for advising and aid them in providing skillful career guidance.

• Continue to work with students, individually and as a community of learners, to review degree requirements, monitor their progress, and find courses that align with their interests and career goals. Currently, this is provided by individual advising sessions with faculty advisors and through required career seminars. We envision providing other opportunities for students to gain access to academic and career planning support (e.g., advising seminars and workshops, peer advising, career panels, etc.).

• Build stronger relationships with UMass Career Services and specifically the CNS Career Advisors.

• Increase student awareness of various experiential opportunities they can engage in during their time at UMass.

Support & Tools
In order to enhance student support, ENVSCI and its partners need to clearly understand goals and priorities, identify roles/responsibilities, compile data and develop metrics for success, and implement priority actions.

• Within the SES career development and workforce engagement plan, identify roles and responsibilities. The plan should include what we can do now with existing resources and what can be done with additional funding and staff.

• Within each program, consider how to streamline advising and maximize the use of faculty time.

• Develop career-focused surveys for: 1) graduating seniors and 2) alumni. The intent of these surveys is to supplement existing data and provide a broader base of understanding regarding our alumni career outcomes. Ongoing survey tracking alumni is an important part of our plan to enhance student support.

• Find ways to stay connected with graduates (e.g., LinkedIn, UMass affinity groups)

• Develop schedule for assessing the best readily available data, summarizing it, and refining our approach. Additional information we would like to have:
  o Current students: assessment of advising sessions, what additional information/support/tools do they need, retention rate of majors, and how career development factors into their curriculum planning.
  o Alumni: job placement/satisfaction over the longer term (e.g., 3, 5, 10 years out), continuing education needs, and feedback on how we can improve the undergraduate experience.

• Consider developing additional metrics for success under the new School of Earth & Sustainability.
Part III. Academic and Career Advising Action Plan

To achieve the goals outlined above, we’ve identified a number of actions. Some of these are achievable now, in the short-term, with existing resources; others are actions to consider over the next couple of years depending on resources and staffing. These actions are aimed at SES, the ENVSCI program, faculty, students, and alumni/workforce contacts. Note: some of the goals and associated actions will be addressed by the individual program, jointly through SES, or in combination.

**Short-term actions (with existing resources)**

**School of Earth & Sustainability**
- Prepare the SES Workforce, Employer, and Alumni Engagement Plan. Solicit faculty and advisor input.
- Convene an SES faculty career development work group
- Share “best practices” for advising
- Pool together online resources related to career development, job search engines, and student engagement events (e.g., conferences)
- Meet with the UMass Amherst Career Planning and Placement Office
- Develop a SES alumni and employer database
- Create a plan and budget for alumni engagement and career tracking
- Develop a comprehensive, systematic approach to marketing and communications to maximize our reach to prospective students, especially high school seniors, transfer students (especially from community colleges), and undecided majors within the university.
- Create and support an SES workforce and alumni advisory group

**ENVSCI Program / Faculty / Students**
- Develop program-based strategies for increasing contact with students post-graduation to build alumnae support, provide a mechanism to better track career success (e.g., job placement), and an opportunity to learn from graduates how to improve our curricula for career preparation.
- Expand work with faculty to disseminate “best practices” advising guidelines to provide consistent, effective advising practices across all faculty.
- Increase the cultural awareness for ENVSCI students to “prepare” for each of their faculty advising sessions. Students enrolled in the required seminar classes are already tasked with developing a course plan and articulating their career goals and how they plan to approach professional development while in school, and then discussing this with their faculty advisor.
Better articulation to students that “Advising” in ENVSCI consists of all the components discussed in this document— and not simply the half hour each semester that they spend with their assigned faculty advisor.

Construct a page on the program website that explains how advising is organized in the program—so that it is evident to current and prospective students (and parents).

Better utilize electronic calendars and appointment tools in the CUA office, to facilitate and manage the 25-30 half-hour appointments that are scheduled each week during the month of preregistration advising that occurs each Fall and Spring.

Create LinkedIn presence to better communicate and track program alumni.

**Mid- and long-term actions (some require additional resources)**

**School of Earth & Sustainability**

- Hire an engagement specialist, who will help to establish a peer advising centers and a comprehensive framework for disseminating internship and job opportunities.
  - Long-term action: Expand the SES “Career Services Office” to two full-time staff members with at least one student assistant
- Launch workforce advisory group
- Plan and implement SES-wide career conference and exhibit fair
- Develop SES-wide online portal for posting jobs and internships
- Develop and launch career advising training sessions for interested faculty
- Host career development workshops for students (e.g., internship search process, resume and cover letter writing, etc.)
- Launch SES-wide survey of alumni career outcomes and maintain ongoing tracking
- Expand the number of students enrolled in curriculum and career planning courses and the number making a “career development plan”