

Next Generation Careers – Innovation in Environmental Biology

Research Coordination Network: Undergraduate Biology Education Incubator



Highlights of Survey Findings

Between May 4- and June 30, 2016, the Undergraduate Career Preparation in Environmental Biology Survey was disseminated to the members of participating societies - including ESA, SCB, American Society of Plant Biologists, Botanical Society of America, Society for Economic Botany and Society for the Study of Evolution. Members of the Quantitative Undergraduate Biology Education and Synthesis (QUBES) network were also invited. We further requested representatives of related societies that attended our focus group session to disseminate the survey to their members. These included National Association of Agricultural Educators, Alliance of Crop, Soil and Environmental Science Societies, American Society of Landscape Architects, American Fisheries Society and Society of American Foresters. The survey drew 142 responses.

This survey is to learn about programs preparing students for career tracks in environmental biology as well as the needs of faculty in this preparation. Faculty, department chairs, academic counselors, career services professionals, and others involved in undergraduate education are invited to participate. Faculty involved with mathematical biology are strongly encouraged to respond.

Demographics

Institutions

- Nearly all the respondents were from 4-year institutions.
- About 58% were institutions with graduate programs and 38% were undergraduate institutions.
- Close to 20% of respondents came from minority-serving institutions, or nearly so.

Respondents

- About 68% have taught for more than 2 years and 39% had some administrative experience
- 23% are currently department chairs/deans
- 10% have experience as career professionals. 3.5% are currently career professionals.
- About 20% have primary responsibility for career services activities in their department.
- 65% of respondents have expertise in ecology, conservation biology and evolution.
- The largest group within the “Other” category are landscape architects.

Primary responsibility for coordinating career services

- In 61% of institutions, career services activities are coordinated by professionals for the entire institution.
- 14% of institutions relied on the faculty

One note: academic advisers are not the same as career advisers

Required Coursework

- Traditional science, mathematics, and social sciences courses are required by more than 80% of the institutions
- Field work-based courses are required by nearly 66% and a research project / senior thesis /capstone projects is required by 52%.
- Technical courses (GIS, remote sensing, modeling, informatics) are required by a sizeable 49%
- Career building an team projects are required by 42-43%
- Internships, volunteer projects and community service is required by only 39%
- Interdisciplinary sequences offer more choices across environmental studies, humanities or social science

Additional Coursework

- Biostats, Biometry and Bioinformatics
- GIS
- Human dimensions, community engagement
- Technical courses – plant identification, soil science, field biology, zoology, site analysis, taxon-specific
- International

Career Preparation

What kind of careers do you prepare students for?

Sector	% Programs (Q12)	% Instructor (Q22)	Sector that class of 2014 entered (Q16)
<i>Respondents selected up to 5 sectors</i>			
Government	90%	88%	62%
NGO	84%	77%	55%
Academia	73%	85%	55%
Business	52%	37%	55%
K12	30%	50%	38%
Policy	27%	26%	18%
Sustainability	64%	58%	31%
Advocacy	25%	20%	9%

Skills Preparation

What are the most important skills you want your students to graduate with?

Skills	% Programs (Q13)	% Instructor (Q23)
<i>Respondents selected up to 5 skills</i>		
Written	85%	84%
Verbal	74%	69%
Research Design	59%	49%
Field techniques	61%	62%
Formal and Informal Presentation	50%	42%

Group/Team-based project	47%	45%
Statistical analysis	26%	39%
Technical Writing	18%	23%

Enrolment

No. of Students	% Enrolled (Q14)	% Graduated (Q15)
Over 100 students	38%	7%
26-50 students	23%	24%
51-100 students	17%	19%

Can students succeed without graduate training (Q20)?

- 53% - Yes
- 30% - Maybe
- 12% - No
- 5% - It depends

In what ways do you feel your field will change in the next decade?

Areas that will change	% Faculty who anticipate an increase in importance (Q25)	% of faculty who feel equipped to address the changes (Q26)
Communicate science to non-technical audiences	87%	48%
Organize Teams/ projects involving other disciplines	85%	55%
Engage in virtual collaborations	79%	18%

Faculty Support

Areas of Faculty Support	% of faculty who receive this support	% of faculty who would like to receive this support
Travel support to conferences or workshops	65%	76%
Appropriate lab, equipment, facilities	60%	86%
Participate in education research	55%	59%
Education Innovation funding	18%	85%

Connecting students with careers

There is consistency between programs and faculty on the most frequently used methods to connect students with careers. Surprisingly, only 16% of programs and 12% of faculty frequently tap alumni networks; and only 17% of programs and 15% of faculty included a mentoring program frequently.

Most frequently used by programs (Q19)	Activities	Most frequently used by faculty (Q24)
65%	Field trips	50%
56%	Guest Speakers	34%
50%	Volunteer opportunities	37%
39%	Summer research	43%
38%	Paid internships	25%

Success Indicators

Programs used all the indicators except level of funding.

“Other” indicators:

- Society certification standards
- GPA
- Independent review
- Emphasis on broad training vs specific career preparation

Open-ended comments

- Increase diversity in profession, thinking, behavior
 - Access to Training in implicit biases
- Tools for remedial needs in chemistry, English, computer programming, Math
- Insufficient resources are available to instructors
 - Facilities e.g. labs
 - Faculty development
 - For undergraduate research
 - For Supplies, equipment
 - For mentoring
 - For educational innovation
 - Time - adjust teaching loads
- Better information on career options – faculty and career professionals especially institution-wide level
 - One-stop hub for careers information
 - Mechanisms to allow faculty to stay current on what skills students need
- Consider applications (e.g. landscape architecture); be aware of flavors of environmental biology / science / studies fields – that can lead to different careers
- Enhance value of teaching
- Help with teaching pedagogies
 - Critical thinking is lacking
- Feeling disconnected
 - Faculty who no longer conduct research and so have not support to travel
 - Isolated institutions e.g. in rural areas

Role of Professional organizations

- Compile careers information for members
- Market analysis of ecological careers
- Promote interdisciplinarity at graduate level, help junior faculty recognize rewarding opportunities outside of traditional disciplinary departments
- Help faculty stay informed of skills student need
- Chapters as venue for student participation and opportunities to engage with professionals
- Funding support to attend national or regional conferences and workshops
- Engage traditional wildlife (applied programs)
- Offer undergrad programs, e.g. quiz bowl, student presentations, “conclave” equivalent
- Promote mentoring by members, provide opportunities for students to meet professionals (agency and industry reps) not just faculty
 - Partnerships for research