

LTER Undergraduate Education: Innovations and Cross-Site Opportunities

Thursday, September 13, 2012 - 10:00am-12:00pm

Organizers: Clarisse Hart & Art Schwarzschild

The 2012 LTER ASM saw the first meeting of the newly established Undergraduate Education Working Group which is co-chaired by Clarisse Hart (HFR) and Art Schwarzschild (VCR) with input from Alan Berkowitz (BES). The main goals of this working group meeting were to: 1) identify contacts for key individuals at each LTER site actively coordinating undergraduate education/training programs, and 2) develop a list of actionable items to significantly improve the effectiveness and assessment of LTER related undergraduate education/training programs.

The meeting was attended by 24 individuals and included representatives from 12 LTER sites. The session began with an overview of current activities based on the results of a 2012 Network-wide Higher Ed survey and challenges identified by LTER Site Ed Reps., followed by an introduction to the new web page underdevelopment and discussions of LTER and related programs that may offer resources to support Undergraduate Education/Training programs, diversity recruitment and new reporting requirements.

Break-out group brainstorming sessions were then conducted centered on the themes of: 1) Socio-Environmental Synthesis in Curriculum and the possibility of generating a Cross-Site Diversity Initiative, 2) Broadening participation in and tracking the impacts of REU programs, and 3) Opportunities for Cross-Site Undergraduate education/training programs. The results of these discussion groups are reported below and form the basis for action items to be addressed by the Undergraduate Working Group and the LTER Education Executive Committee over the coming year.

SUMMARY OF FINAL RECOMMENDATIONS

COMMUNICATIONS:

- Ed Reps and interested parties will work to identify the best/most appropriate individual at each LTER site to serve as the Undergraduate Education contact/point person for each site (will most likely be different from the K-12 contact, and may also differ from the Graduate Education Contact).
- Undergraduate Education Working Group will meet twice per year via conference call, other Ed Reps and interested members from the LTER community will be welcome to participate
- Group goal will be to develop and conduct survey of LTER sites to better identify/assess use of LTER data/products in undergraduate training programs and classes along with the number of classes/programs participating in field trips to LTER sites.
- Questions related to key undergraduate programs/statistics may be added to annual reports and LNO surveys in order to maintain updated information.

Diversity:

Develop template of recommendations for mechanisms to increase diversity recruitment to LTER linked undergraduate training programs and opportunities (REU, internships, etc.).

Monitoring Student Outcomes:

Continue conversations initiated during ASM Working Group and consider development of a Working Group Proposal to develop mechanisms for tracking student outcomes with emphasis on developing a protocol for following REU participants as required by America Competes Act. This will most likely require input from the LNO and site PIs.

Cross-Site Opportunities:

Maintain communications between LTER site REU program administrators interested in establishing cross-site REU opportunities in order to identify suitable candidates and develop/implement pilot programs.

Resulting Working Group Proposals

Training workshop for data collection at REU sites – proposed by Clarisse Hart (HFR)

Detailed Description of Meeting Activities and Discussion Notes:

MEETING AGENDA

- Describe strengthened higher ed role in Education Executive Committee
- Summarize results of 2012 Network-wide higher ed survey
- Solicit feedback on draft content for LTER website
- Presentations and full-group feedback:
 - **IDEA #1: Curricular innovation in socio-environmental synthesis** (Alan Berkowitz, BES)
 - **IDEA #2: A possible cross-site diversity initiative** (Alan Berkowitz, BES)
 - **IDEA #3: Broadening participation, tracking REU impacts** (Manisha Patel, HFR)
 - **IDEA #4: Summer cross-site opportunities** (Art Schwarzschild, VCR)
- Break-out “idea groups” to brainstorm next steps

Agenda Item: Higher Ed in the Education Executive Committee

- Undergraduate working group will meet by phone twice a year; all LTER community welcome to join (admins, students, PIs, ed reps, etc.).
- WG Goal 1: Ascertain site activities to share best practices, forge cross-site collaborations, and explore external programs that can broaden participation and create new opportunities for undergraduate students.
- WG Goal 2: Populate and continuously update higher ed website, news, and print materials for the Network.

Agenda Item: Website Feedback

- We should ask LTER undergraduates what they would like to see here.
- Are faculty going to this site to find resources?
- We should add resources for administrators (program evaluation tools, etc.)

IDEA #1 – SOCIO-ENVIRONMENTAL SYNTHESIS IN THE CURRICULUM

Alan Berkowitz (BES Education Dir.) presented what he knew about the new synthesis center, [SESYNC](#), and how Network higher ed efforts might benefit from their support.

1. SESYNC funds short courses and workshops; working groups; sabbaticals; and post-docs.
2. With support, BES is developing some teaching modules to put on their website, and are doing assessment of synthesis success and student attitudes.
3. [David Hawthorne](#) is their director of education and maybe able to comment on the applicability of proposals.

Attendee input:

- Need to assess how LTER data is already being used in the classroom.
 - Can we ask LTER faculty? Department faculty? Or students?
 - TIEE analytics
 - Could quantify number of courses doing field trips at LTER sites
 - Could add a question on the LNO survey (?)

IDEA #2 – A POSSIBLE CROSS-SITE DIVERSITY INITIATIVE

Alan Berkowitz (BES Education Dir.) discussed burgeoning interest from a foundation in developing a program that, over the course of two years, immerses students in conservation science.

1. The first summer, students would work with a research scientist, and the second summer they'd be placed with an NGO.
2. Could this dovetail with RETs?
3. Interested parties should contact Alan.

Attendee input:

Harvard Forest is interested!

IDEA #3 – BROADENING PARTICIPATION, TRACKING REU IMPACTS

Manisha Patel (HFR Summer Program Coordinator) summarized Harvard Forest's successes in broadening REU/summer research applicant and participant pools, as well as their efforts to track program alumni outcomes.

1. Applications and hires from traditionally underrepresented groups have risen with effort on behalf of the site PI.
2. A 2009 survey tracked the education and career outcomes for the 2001-2008 REU cohort.
3. All REU sites must comply with the new America Competes Act, passed by Congress in 2010, annually tracking the educational and career outcomes of their REU students from 2011 onward, for up to 3 years following graduation.

Attendee input:

- SURVEYS:
 - Alan Berkowitz is a member of the NSF BIO REU Leadership Council. They hold a PI meeting every 2 years. They developed the SALG survey that is now used by many sites and are now looking to develop an REU site survey strategy that will satisfy the America Competes Act. The timeline for this effort is unknown. They are also working on a common application for REU programs.
 - Might be interesting to ask students at various stages in the process what their career/school goals and aspirations are.
- TRACKING STUDENT OUTCOMES:
 - Can student outcomes be passively tracked? Can we get relevant information from the National Student Clearing House (a national database following students from high school to college) – and does it cover grad studies?
 - Other ideas: data from NSF BioLink, Evalu-ate.org, career centers and alumni associations
 - Social scientists & educational researchers might be interested in taking this on.
 - WISE.BERKELEY.EDU – initial assessment tools
- FINDING PROGRAM ALUMNI IN THE FIRST PLACE
 - Calling REU parents is an effective (if painful) way to get info on student whereabouts.
 - How are student loan trackers finding student contact info?

IDEA #4 – SUMMER CROSS-SITE OPPORTUNITIES

Art Schwarzschild (VCR ed rep, site coordinator) facilitated a discussion about cross-site REU experiences and student travel/field trips.

Attendee input:

- Deepening the REU experience through cross-site research
 - PIs could be encouraged to identify particular summer students who might benefit from a second summer at a different LTER site (e.g. working on a similar project in a different ecosystem). Benefits to this approach would include increased communication among PIs; PIs inheriting a student who's already been trained on particular methods/equipment; the student having a deeper research experience. One drawback of this approach is that NSF discourages re-hiring of past REUs. But there are other funding mechanisms to support summer students, including the SEEDS fellowship program and HHMI. Students could also move between REU "supplements" and REU "sites."
 - An undergraduate attendee, Chris Sanchez, offered his support in a written comment after the meeting:

"I would say that my cross-site REU experience has been one of the most useful experiences so far in my academic life. From a structural standpoint, I gained wonderful perspective on the management styles, outreach techniques, etc. that differed between the two sites. However, what proved most useful as a student was being exposed to the different research questions and contexts for each site. For example, in both of my REU projects at FCE and at CAP, I used very similar techniques to measure various components that cycle through wetland ecosystems (carbon and water flux, respectively). However, the way that we explained, understood, and interpreted these data was very different. At FCE, my questions and conclusions were framed in terms of Everglades conservation and traditional physical science interests (biogeochemical cycling). However, at CAP, my questions and conclusions revolved more around water-use policy, adaptive management, and how our research site ties into the larger City of Phoenix water infrastructure. The wonderful physical science that I've picked up at FCE was very well complemented by my intense exposure to sustainability and social sciences at CAP. And if it had not been for my chance to go visit CAP, I would not have discovered that socioecological crossroads that I now am so interested in and wish to work towards in the coming years."

- What about student *and* PI travel to another site?
 - Question: do students *want* to do multiple REUs?
 - Could we send out a call to LTER PIs to ask how many would be interested in sharing REUs, and whether they see/value those kinds of linkages?
- Cross-site courses/experiences could be developed for intersession periods (e.g. January Term, spring break) or be offered online during the year.
 - Sites in close proximity (e.g. California, New England) could send students to another site for a few-day field trip during the course of the summer.
 - SEEDS field trips are a great way to get students to multiple sites.
 - If summer projects were made visible on the web – like in a searchable clearinghouse – students working on similar projects could get in touch.
 - Could one cohort of LTER students travel to multiple sites? Ideally we'd want to link populations – RET, undergrads, grad students, faculty, site researchers (using the OTS model)
 - Would there be value in developing an undergrad group at the Network level that is comparable to the grad student group? There could at least be an LTER undergrad Facebook group (Ross, the grad student rep on the Education Committee, is willing to make this).
 - Low-hanging fruit: REUs could be encouraged to do a field day with another REU at their site
 - ADVERTISING OPPORTUNITIES
 - More outreach needs to happen at PI levels; students aren't finding opportunities unless they are told

- REU opportunities should be advertised on the LTER website
- Can applicant pools be shared among sites?

APPENDIX 1. CONTACT INFORMATION

Sign-ups for ongoing higher-ed working group, part of the Education Committee

Jeff Hepinstall-Lymerman – CWT – jhepinst@uga.edu

Jose R. Perez-Jimenez – LUQ – ut_jperezjm@suagor.edu

Gina Hupton – CAP – ghupton@asu.edu

Chad Johnson – CAP – icjohn14@asu.edu

Justin Kunkle – KBS – kunkleju@msu.edu

Saleit Ron – Israel iLTER site – saleit@ramathanadiv.org.il

Heather Bateman – ASU/CAP faculty – heather.l.bateman@asu.edu

MEETING ATTENDEES

Name	Role	Site	Email
Patel, Manisha	Administrator: summer program coordinator	HFR	manishapatel@fas.harvard.edu
Boucek, Ross	Grad student	FCE	rbouc003@fiu.edu
Bateman, Heather	Faculty	CAP	heatherbateman@asu.edu
Berkowitz, Alan	Administrator: edu director	BES	berkowitza@caryinstitute.org
Johnson, Chad	Faculty	CAP	ichadwick@asu.edu
Hupton, Gina	Administrator: edu staff	CAP	ghupton@asu.edu
Ray, Chris	Administrator: edu coordinator; Researcher	NWT	cray@colorado.edu
Ellin, Edythe	Administrator	HFR	ellin@fas.harvard.edu
Chiasson, Laurie	Administrator	HFR	chiasson@fas.harvard.edu
Sparrow, Elena	Administrator: edu coordinator Faculty	BNZ	esparrow@alaska.edu
Kunkle, Justin	Administrator: science coordinator	KBS	kunkleju@msu.edu
Sandercock, Brett	Faculty; Administrator: REU coordinator	KNZ	bsanderc@ksu.edu
Hepinstall- Lymeconan, Jeff	Faculty; PI	CWT	jhepinst@uga.edu
Haussler, Josh	Undergraduate	JRN	jhaussle@asu.edu
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Baez Rodriguez, Noelia	Administrator: ed rep	LUQ	nbaez@ites.upr.edu

McGee, Steven	Administrator: ed rep	LUQ	mcgee@lponline.net
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Reidenbach, Matt	Faculty; co-PI	VCR	marsjj@virginia.edu
Perez-Jimenez, Jose	Faculty	LUQ	ut_iperezjm@suagru.edu

APPENDIX 2. HIGHER ED PORTIONS OF THE LTER STRATEGIC IMPLEMENTATION PLAN

3B. Increase the training opportunities for undergraduate and graduate students to engage in interdisciplinary science (REU's IGERTs URM's)	A. Identify sites that host programs (e.g. REU, GK-12, IGERT, etc.)	Higher Education Working Group	Craft survey and compile results for ASM.	Underway
	B. Identify involvement (e.g. annual REU supplement) and feasibility/impediments to increased activity (e.g. resources/staffing needed, program	Higher Education Working Group	Craft survey and compile results for ASM.	Underway
	A. Promote interdisciplinary training by sharing successful model of REU, IGERT, GK-12 and other programs	Higher Education Working Group		Needs Planning
	C. Fund Grad students to attend annual meetings at related sites. Write up connections to their research	Higher Education Working Group	\$12,000 request to support roughly 12 grad students. (Grad student committee review proposals)	Needs Planning
	D. Expand research opportunities for students from traditionally underrepresented groups.	Higher Education Working Group		Needs Planning
3C. Develop opportunities for grad students to engage in near-peer mentoring (1-2 years older than protégé), in education, and in outreach. Promote collaboration in undergraduate research and integrate curricula across biophysical and social science disciplines (e.g., arts	A. Assemble group and seek funding support to develop undergraduate teaching modules and mentoring opportunities	Higher Education Working Group		Planning started
	B. Encourage submission of new lesson plans to TIEE using LTER datasets.	Higher Education Working Group		Presentation ASM

and humanities, policy and sustainability)	C. Include in the higher ed survey a question about providing opportunities for mentoring.	Higher Education Working Group		Underway
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