# LTER Graduate Student Training: Innovations and Cross-Site Opportunities
Tuesday, September 11, 2012 - 10:00am-12:00pm
Organizers: Clarisse Hart & Art Schwarzschild

The 2012 LTER ASM saw the first meeting of the newly established Graduate 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 graduate education/training programs, and 2) develop a list of actionable items to significantly improve the effectiveness and assessment of LTER related Graduate Education/Training Programs.

The meeting was attended by 34 individuals and included representatives from 16 LTER sites. The session began with an overview of  current activities based on a 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 under development, and discussions of potential cross-site educational and mentoring opportunities for graduate students associated with the LTER program.

The meeting participants were polled to determine topics for break-out group brainstorming sessions.  The resulting brainstorming sessions conducted were centered on the themes of increasing: 1) cross-site research opportunities, 2) cross-site educational activities, 3) mentor training and opportunities, and 4) diversity and sense of community among LTER graduate students. The results of these discussion groups are reported below and form the basis for action items to be addressed by the Graduate Education Working Group and the LTER Education Executive Committee over the coming year.  Additionally, Ross Boucek (FCE) was officially recognized as the Graduate Student representative to the LTER Education Executive Committee.

## SUMMARY OF FINAL RECOMMENDATIONS

**LOGISTICS**
- **Identify a permanent higher-ed contact at each site**.
  - May be different from K-12 contact
  - Serves as consistent point person for grad student site reps
  - Responds to site-wide communications from higher ed working group chair
- **Define Network-wide measurable goals to expand grad students' intra-site sense of community and cross-site/cross-disciplinary research practices.**
  - PIs and grad student reps will be asked to help sites and students meet these Network-wide goals.
- **Identify 2 graduate student site reps, instead of 1, at each site to distribute workload, encourage community, and create continuity across years.**
  - See FCE student council as an example
- **Define responsibilities of grad student site reps.**

- **Define who is an "LTER grad student", and use this definition to help sites and grad student committee develop comprehensive contact lists.**
  - Grad students with LTER field sites
  - Grad students working with LTER PIs
  - Grad students mentoring undergrads and K-12 students at LTER sites

**RESULTING FUNDING REQUESTS/WORKING GROUP PROPOSALS**
- Training workshop: Beyond the numbers: diversity in LTER – organized by Daniel Nidzgorski (CDR)
- Synthesis project: Understanding and improving graduate student collaborations in professional associations – organized by Ross Boucek (FCE)

**Detailed Description of Working Group Meeting and Participant Input:**

## 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: Cross-site research**, Kim LaPierre (KNZ LTER)
    - **IDEA #2: The benefits of mentoring**, Lauren Kinsman (KBS LTER)
    - **IDEA #3: Distributed graduate courses**, Steven Pennings (GCE LTER)
    - **IDEA #4: Supporting diversity** – contributions from group
- Break-out "idea groups" to brainstorm next steps


### Agenda Item: Higher Ed in the Education Executive Committee

- Education Executive Committee now includes a voting graduate student member: Ross Boucek (FCE) – rbouch003@fiu.edu (appointed by grad students at ASM).
- Formal graduate and undergraduate working groups formally expand education committee focus beyond K-12.
- Undergraduate and graduate working groups 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 deepen and create new opportunities for LTER graduate students.
- WG Goal 2: Populate and continuously update higher ed website, news, and print materials for Network.

### Agenda Item: 2012 Higher Ed Survey Results
- 15 sites responding
- A majority of responding sites offer:
    - Grad thesis/dissertation research (14)
    - Grad student opps at site ASMs (13)
    - Grad seminars/discussion groups (10)
- Other widespread opportunities include:
    - REU/K-12 student mentorship (10)
    - Course/field school (9)
    - Social media/online forum (9)
    - Student employment (8)
    - Grad research fellowships/grants (8)
- Very few grad activities/programs are formally evaluated
- Grad students are recruited with diversity in mind
- Grad student cross-site activity much more common than undergrad
- Many logistical barriers to cross-site programs
    - Top three: PI time, admin staff capacity, remote location

- Students need up-to-date info on what PIs and other grad students are doing.
  - Could the LNO database profiles be more specific, and be updated more frequently? Perhaps around ASM each year?
  - If sites keep a blog, they could tag entries by PI/student name and then those would be searchable.


## IDEA #1 - CROSS-SITE RESEARCH

*Kim LaPierre (KNZ) presented her experience conducting cross-site research using three different mechanisms*

1. Participating in networks (e.g. NutNet) allowed her to sample at multiple sites
2. She was part of an LNO grad student working group (formed after the last ASM) that looked at primary production at multiple temperate sites
3. A PI's grant included some time for her work analyzing synthesis project data.

*Attendee input – barriers and solutions to increasing cross-site grad student research*
- **Barrier 1:** **No travel funding to get to other sites** (for research, annual summits within a region, or other sites' annual all-scientists-meetings)
  - *Solution*: Travel money from the Network for these purposes.
  - *Solution*: LNO working group proposals.
- **Barrier 2:** **Students don't know people from other sites**
  - *Solution*: Robust, up-to-date LNO web profiles can assist with finding collaborators.
  - *Solution:* Social networking (Facebook) and a forum on the LNO grad webpage to ask others to collaborate on projects [note: an LTER grad student Facebook page, and a blog, have since been set up]. See the Permafrost Young Researchers Network as a forum example.
  - *Solution*: Grad student gatherings at society meetings like ESA.
- **Barrier 3:** **Students don't know what datasets exits at each site**
  - *Solution:* Have a section of the webpage devoted to what data exists at each site, indexed by experiment type AND variable measured, NOT by site. Each dataset can have keywords associated with it to allow for easy searching. Keep this updated yearly.
- **Barrier 4:** **Students don't know about iLTERs and contacts at those sites**
  - *Solution:* More discrete links to iLTER sites and datasets on grad student section of LNO website
- **Barrier 5:** **Cross-site collaboration can be very time intensive**, so students need to either be exposed to the possibility early in their graduate careers or have cross-site activities that can be done on shorter time scales.
  - *Solution:* Use the forum to get students interested in cross-site research early on. Have workshops or training events for later career students to interact across sites (maybe virtual?), but not have to commit as much time.

## IDEA #2 – BENEFITS OF MENTORING

*Lauren Kinsman (KBS) worked 20 hrs/wk on a GK-12 grant with a high school teacher who'd been pre-identified by KBS sLTER*. Benefits included:

1. She learned the foundations of knowledge for future undergrad students
2. She improved her science communications skills and began to think critically about the actionability of her own science

3. She believes she increased students' interest in pursuing science and teacher understanding of the scientific process.

*Attendee input:*
- Mentors of students at all levels (K-12, undergrad) need training. Could the Network provide this?
- It would be helpful to determine existing formal and informal grad student training practices, define best practices, and possibly develop Network-wide training materials/workshops that are structured but flexible.
- How do we assess the success of mentoring for the mentee & the mentor?

## IDEA #3 – DISTRIBUTED GRADUATE COURSES
*Steve Pennings (GCE) has taught 1 distributed grad course (funded by NCEAS) and is looking to teach another in his field of research.* Lectures administered by local profs provide the underpinnings for an on-site LTER capstone experience.

*Attendee input:*
- Cross-site courses could be advertised on the grad student list-serv and website.
- The higher ed working group could poll grad students to identify content of interest for weekly online seminars to be delivered by LTER PIs at various sites.
- The Network could facilitate 3-day courses/training sessions that take place at an LTER site, on topics of relevance to the LTER student community. These could include mentoring, programming in R, and working with long-term data. These courses could be recorded and archived on the LTER website. Other content could probably be curated and archived there as well.

## IDEA #4 – SUPPORTING DIVERSITY
We have come a long way, but we have further to go. At the Network level, we should be defining: what are the needs and goals? Measurable outcomes will help us get there, and help us bring people together to achieve it. A first step might be compilation of available resources/strengths in this area.

**Sign-ups for ongoing higher-ed working group, part of the Education Committee**
Edie Ellin, admin, HFR (ellin@fas.harvard.edu)
Eve Gasarch, graduate student, U. of Colorado Boulder (eve.gasarch@colorado.edu)
Ally Degrassi, graduate student, U. of Vermont, HFR (adegrass@uvm.edu)
Rose Abramoff, graduate student, Boston University, HFR (r2a@bu.edu)
Talia Dibbell, graduate student, U. of Virginia, VCR (tnd4vd@virginia.edu)
Lauren Kinsman-Costello, graduate student, Michigan State, KBS (kinsman@msu.edu)
Alia Al-Haj, graduate student, U. of Virginia, VCR (ana8f@virginia.edu)
Ahmed Ali, graduate student, U. of Massachusetts, HFR (ahmed_nyala@yahoo.com)
Alan Berkowitz, education director, BES (berkowitza@caryinstitute.org)

**MEETING ATTENDEES**

| Name | Role | Site | Email |
|---|---|---|---|
| Ali, Ahmed | Grad student | HFR | Ahmed_nyala@yahoo.com |
| Kinsman, Lauren | Grad student | KBS | kinsmaniac@gmail.com |
| La Pierre, Kim | Grad student | KNZ | Kimberly.lapierre@yale.edu |
| Nation, Marcia | Administrator: project manager | CAP | Marcia.nation@asu.edu |
| Mourad, Teresa | Administrator: director of edu & diversity | (ESA) | Teresa@esa.org |
| Dibbell, Talia | Grad student | VCR | Tnd4vd@virginia.edu |
| Al-Haj, Alia | Grad student | VCR | Ana8f@virginia.edu |
| van der Pol, Laura | Research: research assistant | ARC | lvanderpol@mbl.edu |
| Barbrow, Sarah | Research: research assistant | (other) | sbarbrow@mbl.edu |
| Wlostowski, Adam | Grad student | MCM | wlostowskiadam@gmail.com |
| Koerner, Sally | Post-doc | SEV | skoerne@unm.edu |
| Gasarch, Eve | Grad student | NWT | Eve.gasarch@colorado.edu |
| Kendig, Amy | Grad student | CDR | Kend0110@umn.edu |
| Nidzgorski, Daniel | Grad student | CDR | dnidz@umn.edu |
| Decina, Steve | Future grad student | | Steve.decina@gmail.com |
| Wei, Xiaojing | Grad student | CDR | Weixx150@umn.edu |
| Ernakovich, Jessica | Grad student | ARC | Jessica.ernakovich@colostate.edu |
| Saurey, Sabrina | Grad student | MCM | sabrinasaurey@gmail.com |
| Ladwig, Laura | Grad student | SEV | lladwig@unm.edu |
| Kunkle, Justin | LTER science coordinator | KBS | kinkleju@msu.edu |
| Doll, Julie | Ed/outreach coordinator | KBS | jedoll@msu.edu |
| Ellin, Edythe | Director of admin | HFR | ellin@fas.harvard.edu |
| Sparrow, Elena | Ed coordinator | BNZ | ebsparrow@alaska.edu |
| Budy, Phaedra | PI | ARC | Phaedra.budy@usu.edu |

| Porras-Alfaro, Andrea | PI | SEV, NWT | A_porras_alfaro@wiu.edu |
|---|---|---|---|
| McGee, Steven | Ed rep | LUQ | mcgee@lponline.net |
| Baez Rodriguez, Noelia | Ed rep | LUQ | nbaez@ites.upr.edu |
| Lopez, Sara | Grad student | LUQ | srlopez@unm.edu |
| Blanchette, Carol | Ed rep | SBC | blanchette@msi.ucsb.edu |
| Emery, Katherine | Grad student | SBC | Katherine.emery@lifesci.ucsb.edu |
| Degrassi, Allyson | Grad student | HFR | adegrass@uvm.edu |
| Agrelius, Trenton | Grad student | GCE | agrelius@email.sc.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 URMs) | 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 and humanities, policy and sustainability) | 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 |
| | C. Include in the higher ed survey a question about providing opportunities for mentoring. | Higher Education Working Group | | Underway |