Assessment of Professional Development Learning Outcomes in Earth and Environmental Sciences
Submitted by Monica Varsanyi, Executive Officer and Michael Weisberg, Deputy Executive Officer, Earth and Environmental Sciences Program (May 3, 2019)

1. Goals of Professional Development Activities
Currently, there are two learning outcomes that relate to professional development. Both EES and the GC indicate that a grounding in professional ethics is an important learning outcome for doctoral programs. Additionally, the GC indicates the importance of focusing on learning outcomes that enhance oral and written communication skills, and other skills and experience appropriate to the discipline as required for career success.

2. Self-Review of Professional Development Activities
Monica Varsanyi (EO) and Mike Weisberg (DEO) met with current EES students on April 7, 2019. The meeting was very well-attended, with approximately 40 students participating. As both Mike and I are relatively new in our positions, we were unfamiliar with the long-term professional development training offerings in the program. As such, we posed two questions to the students: (1) What professional development activities have taken place in the program; and (2) What professional development activities would the students like to incorporate into the program going forward?

(1) What professional development activities have taken place in the program? The students responded that the program has offered several types of professional development activities. First, announcements about GC-wide professional development workshops are regularly distributed on the EES student listserv, though the students did indicate that they would like to have EES-specific workshops offered as well. Second, first-year students are required to take (and everyone else is urged to attend) our weekly colloquium series. Students take turns introducing speakers and moderating discussions afterwards. Third, a panel of student presentations is regularly incorporated into this weekly colloquium series, usually once per year. These presentations are typically 10-15 minutes in length, and approximate the experience of giving a conference presentation. Finally, some professional development training is offered in two of the EES required courses: Nature of Scientific Research (1st year required course) and Proposal Writing (3rd year required course). Topics include:

- CV development
- Article publishing (selecting journals, referee process, etc)
- Academic interviews (skype and on-campus)
- Guest lecture on funding body panel reviews (e.g. NSF)
- Citation management software (Mendeley, Zotero, Endnote)
- Academic social media and networking (Academia, ResearchGate, LinkedIn)

(2) What PD activities would the students like to incorporate into the program going forward?
In addition to continuing with the above activities, the students were very eager to have additional professional development activities incorporated into regular program offerings. The topics they requested included:

- Understanding the research process and research design
- Proposal writing and funding applications for first year students
- Understanding the publishing process (peer-review)
- An orientation to publishing and how to prioritize publications (books vs. journal articles vs. book chapters, etc...)
- Conferences and networking
- Pedagogy and syllabus development
- Connecting with like-minded students in the department to share experiences, tips, best practices
- Sharing research in non-academic venues and media engagement
- Professional ethics and navigating the IRB

3. Proposed Changes

(1) Expand professional development offerings for both first year students and all students in the program:
   a. Do one professional development workshop during our colloquium series each semester, accessible to the whole department. Given differences in professional norms in the sciences and social sciences, invite a panel of faculty from both sides of the program, as well as related GC staff, to participate. We can rotate through 4-6 major topics, one each semester. Possible topics include:
      i. Publication strategies for your doctoral student career; introduction to the world of journals, peer-review, and publishing.
      ii. Conferences and networking in the discipline
      iii. Media outreach and media training; disseminating research in non-academic venues
      iv. The job market: finding job listings, writing cover letters, developing CV’s, giving job talks.
      v. Pedagogy and syllabus development
      vi. Finding and applying for grants
      vii. Professional ethics and navigating the IRB
   b. Shift the content of the first year course, Nature of Scientific Research, to additionally focus on professional development and presentations from faculty and advanced graduate students on research design, their research process, methodology, and professional development. Ask them to provide readings from similar authors/research for further illustration.

(2) Set up a brown bag series so that students can present work-in-progress, conference papers, and job talks to a friendly audience.

(3) Facilitate networking of students with each other by improving the student webpages and sharing student research keywords/topics with all students. At present, the student webpages are underdeveloped and hard to navigate, and first-year students do not have
an easy way to learn about other students in the program, and to connect with more advanced students in their fields who may have professional development strategies to share.

4. Next Steps

(1) We are planning to incorporate one professional development seminar in our colloquium series each semester, starting Fall 2019. In August, I will send out an online survey that asks students to rank the topics they would like to be presented, and we will proceed accordingly.

(2) Mike, Jean Carmalt (the current instructor for Nature of Scientific Research), Peter Kabachnik (the current instructor for Proposal Writing) and I have had extensive discussions this semester regarding how to restructure the first year course, Nature of Scientific Research. Starting next fall, we are planning to shift the content of course towards presentations from faculty and advanced graduate students on research design, their research process, methodology, and professional development.

(3) We hope to continue offering professional development topics in our required courses, and will seek ways to institutionalize those offerings regardless of who teaches the class each year.

(4) In the fall, we will reach out to the students to set up a weekly or periodic brown bag/student speaker series.

(5) With the assistance of Benj DeMott, our College Assistant, I’ve started an overhaul of the student webpages, in order to facilitate better networking and communication between the cohorts. We hope to have the revised student webpages posted by June 2019.

(6) I have reached out to the students whose research addresses immigration and migration, in order to create a Migration Working Group that meets several times a semester. Creating these communities of interest is an additional way in which like-minded students in different cohorts will be able to better network with one another and exchange professional development ideas. We are planning to start meeting in Fall 2019. If we have a good experience, I will urge other faculty and students to create similar Working Groups.

In all of the above, the EO and DEO have made provisional plans for Fall Semester 2019, and we are planning to follow up with the Curriculum Committee and Executive Committees in Fall 2019 and Spring 2020 to report on successes/failures and to strategize on developing longer-term, enduring professional development activities in our program.