

Department of Earth, Environmental and Planetary Sciences (DEEPS)
Departmental Diversity and Inclusion Action Plan (DIAP)

DEEPS is enthusiastic about increasing the diversity among its undergraduate students, graduate students and faculty while striving to provide a work environment that is conducive to inclusivity of historically under-represented groups (HUGs). However, as typical of many STEM fields, both women and historically underrepresented minorities remain “underrepresented” in our Department relative to general US population statistics. For the purposes of this plan, historically underrepresented minorities (URMs) are defined here as people who self-identify as African American, Hispanic or Latinx, Native American, Alaskan Native, or Native Hawaiian and/or Pacific Islander, and HUGs include these minorities and women. Historically underrepresented minorities make up only 3.4% of all faculty in Earth Science departments in the US (5% in DEEPS), and 5.4% of Assistant Professors (none in DEEPS) (Nelson and Brammer, 2010). Similarly, women comprise only 20% of all faculty in Earth Science departments in the US (25% in DEEPS) and 36% of Assistant Professors (50% in DEEPS and 50% of the last 12 hires in the Department).

Overall, we have a comparatively diverse faculty in DEEPS (25% women, 15% non-white, 20% born outside of North America). We have a very strong record for attracting women to both our undergraduate and graduate programs. On average over the last five years, 61% of our bachelors students have been women (compared to a national average of 39%) and 65% of our PhD recipients have been women (compared to a national average of 43%). We also have a relatively good record for attracting historically underrepresented minorities to our undergraduate program; on average over the last five years 12% of our bachelors degree recipients have been historically underrepresented minorities – on-track with the national average (<http://www.nsf.gov/statistics/2015/nsf15311/tables.cfm>). However, over this time period we have had few PhDs from these groups.

To evaluate if our work climate for faculty and graduate students is as positive as we feel it is, last summer we worked with VP Liza Cariaga-Lo, from the Office of Institutional Diversity and Inclusion, to create and execute a survey on Departmental Work Environment. The survey included assessment of a broad range of issues related to work environment, satisfaction and diversity; the survey results are included here as an appendix. Overall, we were pleased to see that the survey generally reflected the excellent work climate in DEEPS. The first bullet point of the executive summary describing faculty and graduate student responses read, respectively:

When compared to STEM departmental surveys of climate at similar universities, DEEPS faculty responses show greater consensus among women and men faculty regarding their perceptions of all aspects of the departmental work environment, higher levels of faculty satisfaction with departmental HR processes, more positive views of the departmental focus on enhancing diversity, and more positive perceptions regarding respect, openness, and transparency in departmental interactions.

DEEPS graduate students reported very low levels of workplace incivility and sexual harassment, with over 92% reporting respectful treatment by faculty and other graduate students within the department. The students held generally positive views on diversity issues, including support for increasing departmental diversity.

However, there is no doubt that things can improve. The survey illuminated concerns among the graduate student respondents about the need for greater representation of URM doctoral students, instances of gender-based biases, improving inclusivity of international students, and facilitating discussions on

LGBTQ concerns. Our plan outlined in this DIAP strives to address these areas of improvement while further building on our strengths. The survey team also noted that both the quantitative and qualitative (not included in the report) data from both the faculty and graduate student surveys suggest an open, positive, and welcoming environment for increasing diversity. As part of our DIAP, we propose to conduct the survey on intervals of every two years for graduate students and every four years for faculty to assess progress over the timeframe of the DIAP and identify areas where more improvement is needed.

With this departmental DIAP we define goals for the next 5 years to continue to make progress in increasing diversity and broadening awareness of issues that comprise an inclusive environment within the Department and University. Below we outline efforts for attracting a diverse applicant pool for our future faculty positions, graduate students and undergraduate students. Strategies for evaluating our success in achieving this goal are also discussed. We did not appoint a “DIAP” committee in this process. Rather, we took advantage of our current Departmental committee chairs (Curriculum committee (Stephen Parman), DGS (Meredith Hastings), and the Undergraduate Concentration Coordinator (Jan Tullis)) to initiate discussions with students, postdocs and faculty on these topics within the framework of the Department’s structure.

Faculty:

Efforts to increase diversity of faculty in DEEPS will involve proactive recruitment of candidates for open faculty positions, as well as more holistic grassroots efforts to increase the diversity of the pipeline of PhDs in Earth Science. Currently the percentage of students from HUGs receiving PhD’s in Earth Sciences mirrors that of STEM fields in general – though the trend is moving in a positive direction. In 2012, only 7% of PhD’s in Earth Science were historically underrepresented minorities (<http://www.nsf.gov/statistics/2015/nsf15311/tables.cfm>) and 43% were women – both showing significant increases since 2002 (approximately 100% increase in URM’s and 50% in women). Below we outline goals and approaches for attracting diverse applications as well as efforts to increase the diversity of the pipeline.

Faculty recruitment goals

1. Tangibly address ways to further consider diversity in our hiring procedures

We believe that our current faculty hiring procedures are effective for evaluating a broad range of candidates. However, several steps can be employed to explicitly attract a more diverse applicant pool from the limited pipeline in Earth Sciences. We propose the following goals and action items:

a. Make our job advertisements as broad as possible within the desired field to increase the number of applicants, and write the ads using inclusive language (e.g., *Brown is committed to the goal of building a diverse faculty and strongly encourages applications from women, and underrepresented minorities*) (see http://serc.carleton.edu/departments/heads_chairs/diverse.html).

b. Advertise our positions to a broader range of societies, including both our traditional professional societies as well as sites that specifically target certain groups, for example:

Association for Women Geoscientists (<http://www.awg.org/>)

Earth Sciences Women's Network (<http://eswnonline.org/>)

Association for Women in Science (<http://awis.associationcareernetwork.com>)

National Association of Black Geoscientists (<http://www.nabg-us.org/>)

Society for Advancement of Chicanos and Native Americans in Science
(<http://sacnas.org/professionals/opportunities>)

c. Consider expanding search parameters for exceptionally strong minority applicants from sub-fields close to that articulated in searches, and when promising applications are received from minority applicants far outside the search sub-field, consider them in the context of the department as a whole and share them with other academic units (see note below).

d. Have members of the search committee “self-test” for implicit bias before evaluating applications (e.g., see <http://diversity.arizona.edu/advance-grant#bias>).

e. Request an assessment of the demographics of the applicant pool earlier in the evaluation process (e.g., after a first cut of the applications in preparation of a “long list” for requesting letters, but before the letter requests are sent out). This will enable an initial reading of applications without a focus on demographic information, but will also allow us to ensure that promising applications from minority candidates are identified to the greatest extent possible early in the search process.

NOTES: To help us strategize our recruiting efforts, we emphasize that a longer-term hiring plan to fill our anticipated faculty vacancies will improve our capability to act proactively. We anticipate making 4 hires in the next 4 years to maintain our approved roster of 20. There is strong agreement within the Department on which sub-disciplines these positions will focus on. However the year-to-year approval of faculty searches leads to some anxiety on the part of the faculty, which tends to promote a more conservative outlook on how to recruit candidates who would significantly contribute to departmental diversity but who don’t quite fit into the current search.

In our last search, after we had already requested letters, an application was received from a minority candidate with a strong CV in a field outside of the search. We forwarded this application to other departments, and it garnered interest from IBES and Engineering. We highlight this here to emphasize how Departments can work together to attract excellent scientists in “cross-disciplinary” and “trans-disciplinary” fields.

One difficulty that our Department has experienced in recent years is attracting scientists whose research requires facilities with large analytical/equipment requirements. While we’ve had great success in attracting scientists with largely computational expertise (successfully hiring the last five candidates we made offers to: Baylor Fox-Kemper, Colleen Dalton, Jung-Eun Lee, Brandon Johnson, and most recently Christian Huber), we have lost out to competing Universities with better buildings, infrastructure and technical support in our last four offers for positions that included large analytical and/or experimental apparatus (Roger Fu, Rita Parai, Sarah Stewart, Sujoy Mukhopadhyay). We note here that the start-up offers in these instances were all competitive, but the facilities were at issue. As a Department and a University, we need to evaluate why this has occurred and try to make changes so that we don’t miss out on future opportunities and restrict our ability to attract the broadest range of scientists to Brown. Some of these candidates explicitly stated that the comparatively poor state of the building and the limited support for technical staff was a factor in their decision to decline offers from Brown. It is clear that competition for top-level minority candidates is fierce, as all Universities seek to increase diversity from a limited pipeline. As a Department, we need to work with the University to aggressively improve the infrastructure and technical support, as they could be substantial barriers to increasing faculty diversity.

2. Take advantage of existing mechanisms to improve our Department’s networks and visibility to historically underrepresented minorities seeking faculty positions in Geosciences.

- a. We have already been proactive in using the University's nascent *Presidential Diversity Postdoctoral Fellowship* program, being fortunate to make an offer to a promising candidate in the first call.
- b. The Department has also been active in the University's *Young Scholars* program: In its second go-round at Brown, one of our faculty members (Meredith Hastings; joint with IBES) led the workshop, increasing visibility and increasing networks with promising students from HUGs in the Earth Science pipeline. We will continue to support this program, in particular in years where the themes intersect with Earth, Environmental and Planetary Science disciplines.
- c. We have already begun thinking about potential candidates for the Provost's new Visiting Professor program. This process will also help us identify potential recruiting targets for "hires of opportunities" in the fields that we plan to search in.
- d. Have DEEPS faculty give talks in Earth Science departments that graduate relatively large numbers of undergraduates, MS and PhD students from HUGs.
- e. Invite representatives from groups that support HUGs (e.g., *National Association of Black Geoscientists* and *Society for Advancement of Chicanos and Native Americans in Science*) to visit the Department and discuss diversity and inclusion issues with faculty, graduate students and undergraduate students.

Undergraduate and Graduate Students:

DEEPS is proud of our supportive atmosphere in both graduate and undergraduate programs. We will remain committed to activities that promote visibility of our Department to a diverse range of undergraduate and graduate students, as well as grassroots outreach activities to local schools. These outreach efforts foster an inclusive educational and professional environment, and promote outreach to enhance the STEM pipeline. In addition, for undergraduate students currently within our concentration we have initiated discussions on how the culture in the Department attracts students from HUGs and ways in which we can improve. Our graduate student body has also been proactive in self-organizing more inclusive activities within the department as well as developing a Diversity Working Group. We propose the following goals and action items:

1. Use existing programs to increase the visibility of our graduate program to undergraduate students from HUGs.

- a. We plan to remain active in the Leadership Alliance (<http://www.theleadershipalliance.org>). A team of faculty, graduate students, and leadership alliance staff members secured funding in January 2016 for three positions specifically delegated to DEEPS through VP Cariaga-Lo's Diversity and Inclusion Office. Three of our faculty members recruited students from this program for the summer of 2016 and one of these will be coming to Brown. We hope to increase our visibility in the future by a) sending graduate student emissaries to geoscience programs with significant numbers of undergraduate students from HUGs, b) making use of existing listservs (e.g. Woods Hole Science Community Diversity Initiative) targeting HUG students in the summer and fall prior to the February application deadline, and c) continuing advertisement and networking with HUG-serving groups at professional conferences.
- b. Support graduate student initiatives to enhance an inclusive atmosphere and contribute to broadening our applicant pools. Based upon results from the Department Work Survey, the graduate students initiated discussions surrounding how to create more inclusive activities for international students, leading to a new and broader range of organized social activities. DEEPS graduate students staffed booths at three national conferences this past year (with funding from the Department and the Office of Institutional

Diversity and Inclusion), to increase the visibility of our department and encourage a larger and more diverse applicant pool to the PhD program.

c. We encourage all of our undergraduate students concentrating in DEEPS to engage in research over the summer and during the academic year, and we are proactive with students from HUGs. For summer research, we support students at Brown using both external grant funding and UTRAs, and we actively help students find internships at other institutions. These students serve as ambassadors for our program.

2. Strengthen our grassroots efforts in outreach and volunteering at local schools to promote the diversity of the “STEM Pipeline”. We will explore expanding these efforts to include middle and/or high schools.

3. Create a new staff position in Outreach and Science Communication to improve visibility in popular science websites and publications, as well as our Departmental websites.

4. Continue informal group discussions with diverse groups of undergraduate students (see note below) and create similar opportunities for graduate students.

5. Increase visibility of Geosciences careers outside of academia, including a new web database highlighting career choices of both our undergraduate and graduate alums.

6. Increase the diversity of speakers in both our Colloquium series and our Career Day and Degree Day events.

7. Actively include diversity issues as part of our ongoing Professional Development Seminar series, which is organized by DEEPS graduate students. Of the 3-4 events that are held annually, at least one will be related to diversity and climate issues.

8. Continue group discussions on work climate and diversity topics with graduate students, and initiate “town hall” style meetings with graduate students, postdocs and faculty.

The issue of career opportunities in Geoscience was front and center of several discussions with undergraduate students from HUGs in our Department. They emphasized that the Department provides an excellent environment for learning, but that we could be more effective in communicating to students how important Geosciences are for societal issues (see section on Curriculum) and the potential job opportunities within the field.

NOTES: We found group discussions with undergraduates illuminating for assessing the culture of our Department’s undergraduate programs and curriculum (see section on curriculum below), and for promoting new discussion on the topics involved with diversity and inclusion at Brown in general. During these discussions (involving 2 groups of 5 to 6 students talking with the Department Chair and the Undergraduate Program Coordinator) it became clear that these informal discussions are invaluable for openly acknowledging when difficult situations arise on campus and providing suggestions for how the Department can proactively respond. Beyond these discussions, the students also suggested that it would be helpful to organize a mechanism for identifying faculty members who would be willing to discuss difficult personal or social issues (perhaps using stickers on doors?).

Curriculum:

Philosophy: The practice of science does not exist in a vacuum. While the goal of the DEEPS curriculum is to teach the scientific concepts, processes and methods of the field, in doing that, the manner in which the courses are taught should not ignore existing diversity and social issues related to the topic, nor create

a feeling of alienation in any student. For example, in teaching about the geologic and climatologic causes of the flooding of New Orleans by hurricane Katrina, the social issues related to it should not be ignored (e.g., for a student born and raised in the 9th Ward, this is not just a scientific topic!). Ignoring such social consequences can be alienating. However, DEEPS faculty are not professionally trained to discuss such topics properly at an academic level, particularly given the sometimes sensitive nature of the subjects. These are not topics to be cavalier about.

When such topics arise, the goal of the DEEPS faculty is to 1) acknowledge the existence of the diversity-related issue to the students; 2) acknowledge issues that students bring up and 3) point the students interested in such topics towards departments, faculty and staff who are experts in the relevant field. Outside of the classroom, DEEPS faculty should help to organize and participate in discussions and seminars involving diversity in the natural sciences, ideally in collaboration with faculty and staff who are expert in diversity related issues.

Actions: The course materials of all courses should address diversity issues where appropriate. This should include a general statement about diversity issues in science education and specific statements about particular diversity-related topics in the course. These statements should include references to existing diversity related resources and groups at Brown, including the Office of Institutional Diversity, the Office of the Vice President for Academic Development, Diversity and Inclusion, minority mentoring peers and programs and the International Office. Where appropriate, students should be pointed in the direction of courses where they can explore diversity issues in the natural sciences in depth. A list of such courses should be available to the students. The natural science departments at Brown are working on constructing a list of such courses.

In addition, through discussions with students, we have identified several straightforward mechanisms to increase the relevance of our classes to a broader spectrum of students and attract a more diverse demographic to our classes, including:

- a. Where appropriate in classes, highlight the social relevance of geosciences and career opportunities within the field.
- b. We already have a strong and successful undergraduate TA program. We will explore adding a new component to the program to facilitate discussion sections in our introductory classes. Similar to how Meiklejohn fellows facilitate broader communication in advising, we envision that sections organized around these discussion groups could provide an encouraging environment for students coming from diverse backgrounds to discuss both challenging concepts as well as environmental and societal implications of various topics.
- c. Develop sophomore and possibly senior level seminars. In discussing how to integrate diversity into our curriculum, it was clear that most of our opportunities in this area came from First-year Seminars. The undergraduate students encouraged us to consider developing higher-level undergraduate seminars that include the social side of the Earth Sciences.
- d. Explore new ways to include diversity and inclusion issues into the graduate student curriculum. As a first step, we are working on the idea of developing a first-year graduate student seminar aligned with the Department's colloquium series. In addition to bringing first-year students up to speed on a wide range of topics in the Earth Sciences, this seminar would foster stronger cohesiveness among students from different sub-disciplines. This seminar could also address diversity themes where appropriate.

Evaluation

Clearly, a sign of success would be increasing numbers of historically underrepresented minorities among our faculty, graduate students and undergraduate students. We also need to acknowledge that women remain underrepresented as faculty in Earth Sciences, and emphasize that we will not relax our commitment to diversity in this area.

To assess our general progress, we propose to convene annual meetings of a committee composed of: the Department Chair, DGS, Chair of the Curriculum Committee, Undergraduate Concentration Coordinator, Graduate Student Representatives to the Faculty Meeting, and selected undergraduates in the Concentration. The committee will openly discuss progress on each of the action items described above, and provide a report to highlight where progress is being made and where improvement is necessary.

As described above, we will also continue to execute our Department Climate Survey every four years for faculty and every two years for graduate students.