

Diversity Report for CEOE (2017-8 Academic year)

The College of Earth, Ocean and Environment (CEOE) is comprised of two departments (Geological Sciences and Geography) and one school (the School of Marine Science and Policy or SMSPP), and is the administrative base of the Delaware Sea Grant College Program and the Delaware Geological Survey. We offer undergraduate degrees in all three units, including B.S. degrees (in Earth Science Education, Environmental Science, Meteorology and Climatology, Geological Sciences, and Marine Science) and B.A. degrees (in Environmental Studies, Geography, Geography Education, and Geological Sciences). CEOE offers MA, MS and PhD degrees in all three academic units. In 2017, Dean Estella Atekwana started her tenure in CEOE, and she has set a positive tone for CEOE to be a leader in diversity issues. The CEOE Committee on Diversity web page (<http://www.ceoe.udel.edu/about/committee-on-diversity>) has been updated with links to CEOE courses with diversity components and our Diversity goals (includes quality assessment report and annual reports to Vice Provost Carol Henderson). Data for plots in this report are from the web site of UD’s Department of Institutional Research and Effectiveness (<https://ire.udel.edu/>). However, some data are incomplete on the website as noted in this report.

1.0 Student Data

As with most units at UD, diversity across CEOE needs improvement. However, there is an overall lack of diversity across the geosciences in the US and internationally. Of all STEM fields, the Geosciences have the lowest diversity at all levels of higher education (National Center for Science and Engineering Statistics, 2017). From 2000 to 2008, 16-17% of undergraduate degrees in STEM fields were earned by underrepresented minorities, but only 5-7% of these were in the Geosciences (O’Connell & Holmes 2011). For the last four decades, there has been no progress on diversity for people earning doctorates in earth, atmospheric and ocean sciences (Bernhard and Cooperdock, 2018). Figure 1 shows that 19% of undergraduate students and 35% of graduate students are from underrepresented groups; however, we need to improve in recruiting African American and Hispanic students. The total undergraduate and graduate populations in 2017 were 413 and 130, respectively. Diversity across CEOE has been improving due to recent positive steps and exceeds the national average (see Appendix Figure 1).

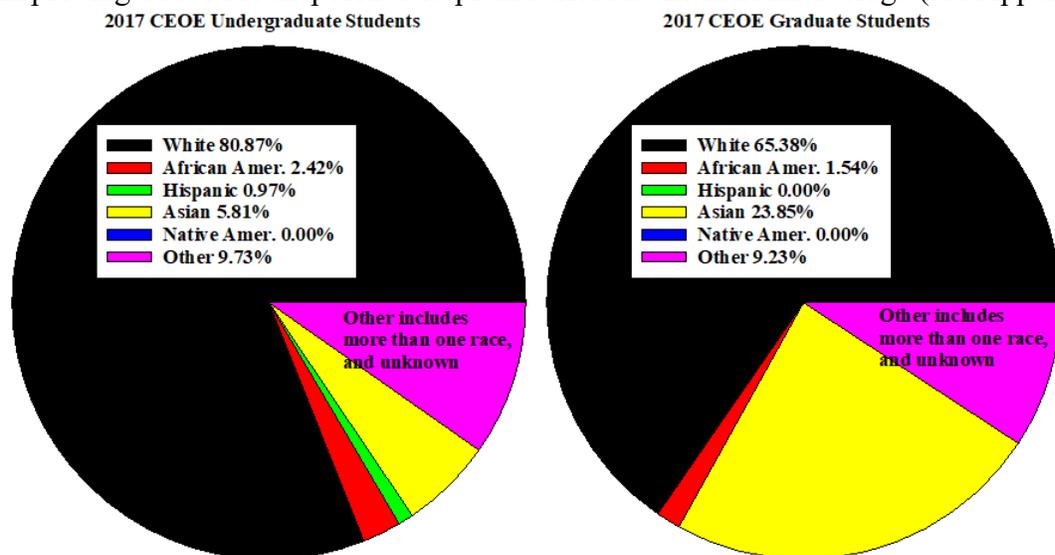


Figure 1. CEOE undergraduate and graduate student diversity in 2017 by race and primary ethnicity including underrepresented groupings.

Figures 2, 3 and 4 show overall CEOE student diversity by department and gender from 2014-2017. Figure 2 shows that Geography has a near equal number of male and female undergraduate students and that the percentage of diverse students has stabilized at 20%. Graduate student patterns show no clear pattern as the total number of students is small so a change in 1 or 2 students in any category can result in significant variation.

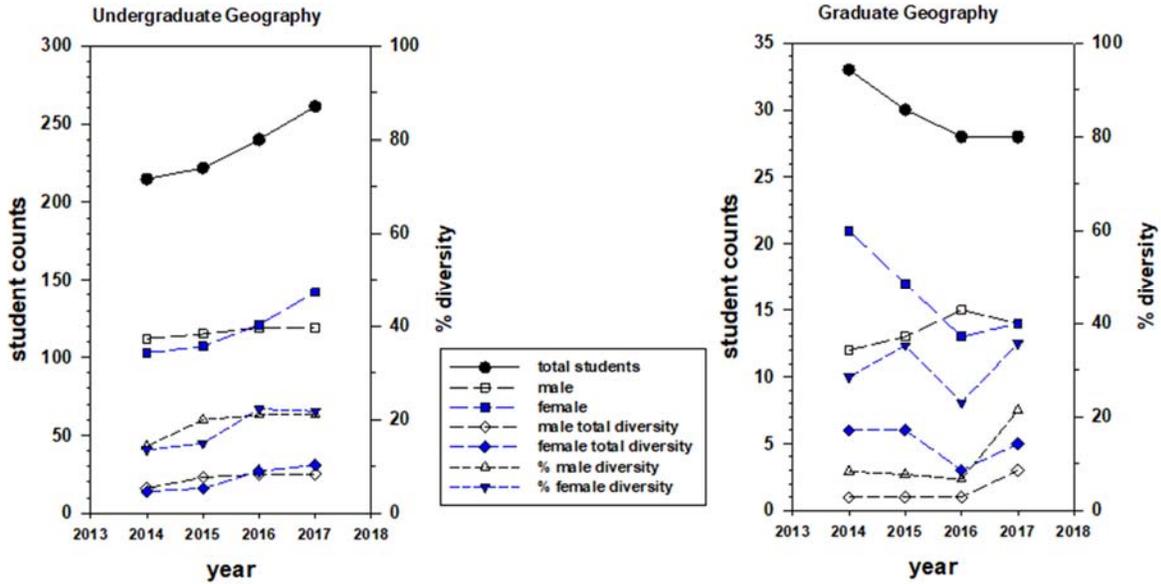


Figure 2. Undergraduate and graduate student diversity by gender in Geography.

Figure 3 shows that Geological Sciences also has a near equal number of undergraduate male and female students. However, the percentage of diverse students varies significantly due to the smaller number of total students. The graduate student population is similar for male and female students with no clear trend for diverse students due to the smaller number of total students.

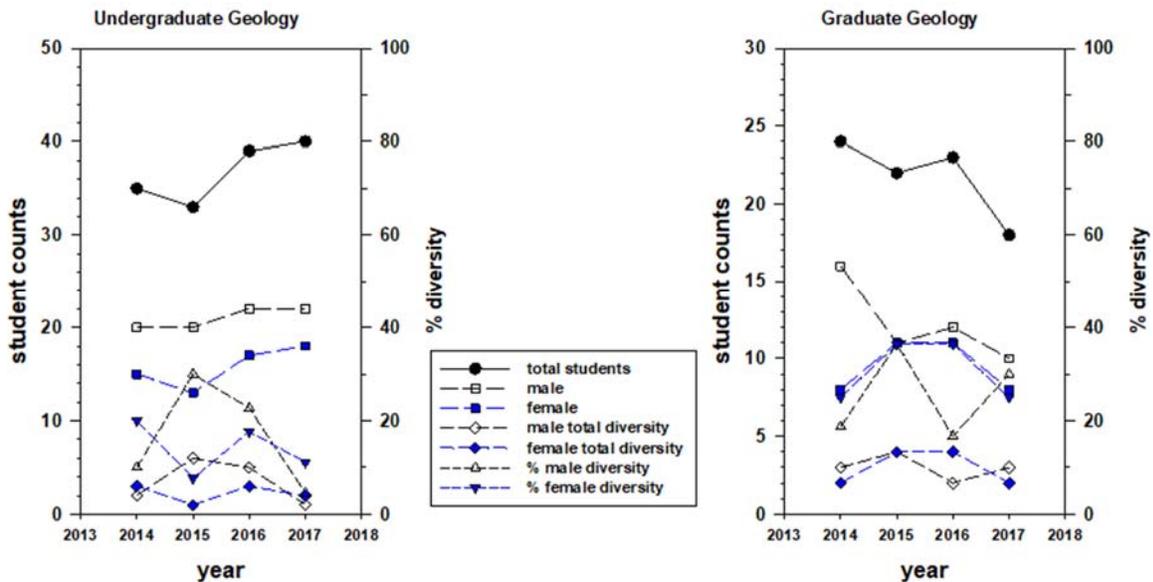


Figure 3. Undergraduate and graduate student diversity by gender in Geological Sciences.

Figure 4 shows that SMSP has twice the number of undergraduate female students to male students, and the percentage of diverse students is similar for each and not changing with time.

The graduate student population has a constant gender diversity of 30% female and 40% male, which is mainly Asian. However, data appear incomplete on the UD Institutional Research and Effectiveness website for SMSP graduate students prior to 2015. Furthermore, Graduate students in SMSP can obtain degrees in Marine Policy, Marine Studies, Ocean Engineering and Oceanography. The Marine Policy and Marine Studies degrees are listed as SMSP. The Ocean Engineering and Oceanography degrees are tabulated separately from SMSP by the Office of Institutional Research and Effectiveness as Office of the Dean- MS, and Earth and Ocean and Environment, respectively. All are summed in Figure 4 as these degrees are given by the School of Marine Science and Policy.

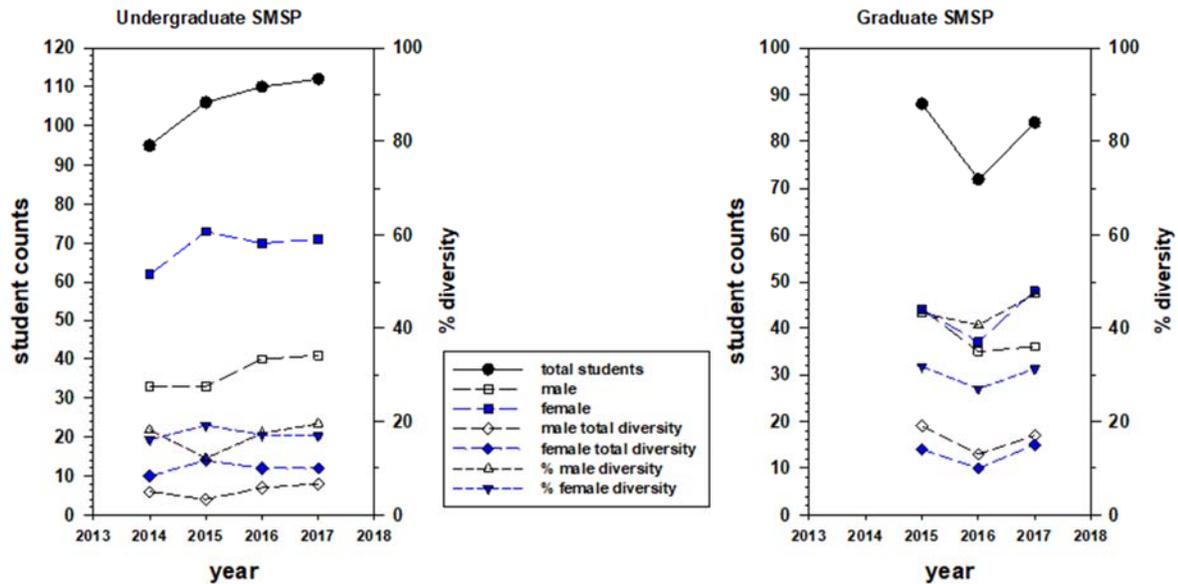


Figure 4. Undergraduate and graduate student diversity by gender in SMSP. No 2014 graduate student data plotted due to incomplete data on the UD Institutional Research and Effectiveness website.

1.1 Graduate Student recruitment efforts

CEOE has a recruitment committee with representation from the two departments and the SMSP. The committee is working on a diversity survey. They sent letters to encourage student applications based on McNair requirements (e.g., low income, first generation college students and students from underrepresented groups).

CEOE had a recruitment booth at the February 2018 Ocean Sciences meeting, which had staff, faculty, postdocs and graduate students interacting with prospective students.

CEOE has been at other recruitment fairs including SACNAS (Advancing Chicanos, Hispanics, and Native Americans in Science). We plan to have a booth at NABG (National Association of Black Geologists) next year.

Historically Underrepresented Graduate Students (HUGS) Fellowships have been awarded in CEOE. Dean Atekwana granted 2 stipend lines (one in GEOL and one in GEOG) to assist with

diversity recruitment efforts in those two units. This is in direct support of what we agreed to focus on during our 2017 Diversity Survey of Graduate Programs. Both have been accepted.

UD provided Graduate Scholars awards, which target underrepresented students as well as first generation students. We were given 2 renewal awards and 2 new awards.

The NSF Research Experiences for Undergraduate Students (REU) program is working well in SMSP, and has been an effective way to recruit talented underrepresented minority graduate students as NSF requires a percentage of them to be selected as REU students. There were a total of 10 REU interns in summer 2018 and offers were made to three for Fall 2019 admission. Five previous REU students are starting in our graduate program in Fall 2018. Our committee discussed having a summer program at the CEOE level for recruitment, particularly for diverse candidates.

Overall, CEOE is seeing more diversity in International Student graduate applications, and there is diversification in what countries are represented in the application pool.

1.2 Graduate Student retention efforts

In the past, retention of Lewes graduate students has been dependent on access to some services including counseling that is only available on the main campus. We have been trying to expand the messaging and offerings to the Lewes campus.

1.3 Undergraduate Student recruitment efforts

CEOE has a recruitment committee with representation from the two departments and the SMSP.

The university has increased overall undergraduate diversity; however, we are hampered by the inability to directly recruit/accept undergraduate students as we do graduate students. Our Assistant Dean for Undergraduate Services makes outreach efforts to already accepted undergraduates, who have not yet declared a major. She also asked the committee to develop a fact sheet (or sheets for all separate majors) to send to UD admissions staff, which would be different from the outward-facing pieces that already exist. In this internal fact sheet, we highlight what differentiates UD from similar programs at other institutions, our classroom and research facilities, special opportunities (e.g., geology field trip, Semester in Residence, etc.). These fact sheets go beyond the typical course listings and brief program descriptions on our existing literature and target students aged 14-17. If possible, we'd like to have prospective students do a direct tour of CEOE (Newark and Lewes), and we made a request to UD admissions to do so.

The Director of SMSP, Dr. Mark Moline, initiated a program in 2015 of accepting Cape Henlopen High School senior students as interns to learn about conducting research with Lewes faculty members.

1.4 Undergraduate Student retention efforts

Our Assistant Dean for Undergraduate Services does targeted retention messaging through the Blue Hen Success Collaborative (BHSC). As far as current student retention, BHSC has data and messaging capabilities to send targeted messages (as much as weekly) to students in different

risk groups (on probation, near probation, pending dismissal, poor midterm grades, not making adequate progress, not registered for the upcoming term, etc.). BHSC allows us to identify students who may be in trouble and to provide proactive interventions to prevent undesirable outcomes (academic dismissal, dropping out, etc.). BHSC also targets students for special opportunities, including programs for first-generation students, underrepresented students, or veterans.

CEOE also provides co-curricular programming for our current students. Our first-year students are part of a living learning community that provides academic and social support. We are also starting a series of professional development workshops for undergraduates focused on skills like resume writing, interviewing, and applying to graduate school.

2.0 Faculty data and recruitment

Increasing faculty diversity is important to the Dean and our committee. The committee voted to require a diversity statement from each potential hire in addition to teaching and research statements. The Chair of the Diversity Committee or a designate is expected to interview each candidate from each department and the SMSP to help guide appointments of faculty from underrepresented groups. Also, Dr. David Kirchman, our CEOE Advance Fellow, offered workshops on recruiting.

Figure 5 shows gender and ethnicity data for tenure track faculty members in Geography, Geological Sciences and SMSP from 2014-7. These data do not reflect 3 SMSP females (1 Asian) and 2 GEOG Asian females, who will start September 2018. Geography has a near equal balance of male and female faculty with one faculty member from an underrepresented group. Geological Sciences has almost two times more male to female faculty (7:4) with 20% of the total faculty from underrepresented groups. In 2017, SMSP had four times more male to female faculty (25:6) with 16% of the total faculty from underrepresented groups (primarily Asian).

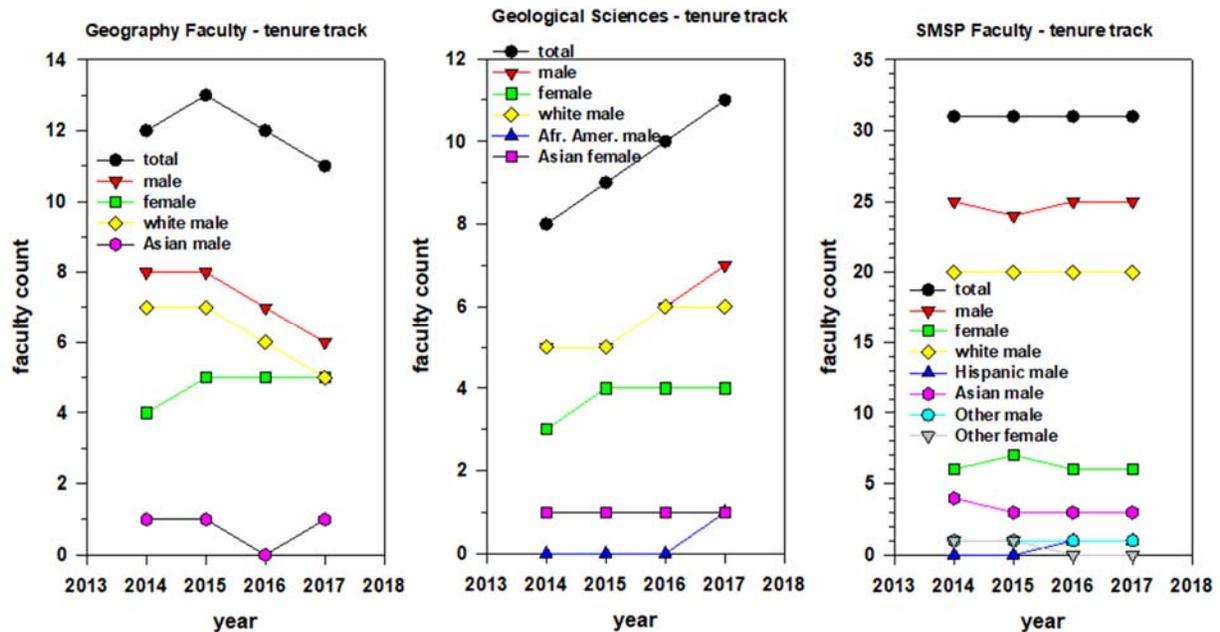


Figure 5. CEOE tenure track faculty diversity by department/school 2014-7.

2.1 Faculty retention

While increasing recruitment from underrepresented faculty groups, we have also included efforts at retention. Dr. David Kirchman, our CEOE Advance Fellow, offered mentoring workshops. Our SMSP Director indicated that we need to be sensitive to mid-career retention as some faculty move to other Institutions that will provide new start up packages with new/improved instrumentation.

3.0 Courses with Diversity Competence

CEOE has many courses that meet the diversity competency (especially in Geography and SMSP). Over twenty courses have specific diversity modules, and these courses are on our committee's web site.

Overall, the committee agreed to integrate diversity issues into classwork, not just by research topics. This could be accomplished by being sure to identify work done by members of underrepresented groups in lecture material, or how environmental issues usually impact low income communities; e.g. sea level rise, Arsenic in ground water and energy production in poor areas among other items fit this area. In all courses, the question is "do we teach in an engaged manner?" should be kept in mind.

As some of our study abroad courses discuss diversity issues, we are looking at how study abroad courses, the Research Experiences for Undergraduate Students (REU) program and the undergraduate semester in residence (SiR) program could be useful for introducing diversity topics.

4.0 Professional development

CEOE provided several opportunities for professional development throughout the year and some of these are listed below. These are in addition to circulation of the minutes of our CEOE Diversity Committee's meetings to all in CEOE to keep them up to date on various activities including implementation of CEOE procedures as well as professional programs that are available.

The recently formed UD chapter of the Society of Women in Marine Science (SWMS) had a brunch in Lewes, Feb. 26, 2018. Dr. Jame McCray did a question and answer discussion with Dean Atekwana to a packed house in Cannon 104. Members also attended a regional conference for SWMS at the University of Rhode Island.

CEOE paid for five students to attend the American Association of University Women (AAUW) biennial convention on March 10. The UD Diversity office paid for a 6th student. The topic was "Join the risk takers: Delaware women in STEM changing the climate for women and girls".

Karen Carlson is a member of our CEOE Dean's Advisory Council (DAC), and on April 20 gave a Professional Development Seminar for the graduate students as part of our series. The talk was entitled, "Diversity Perspectives of the Earth Sciences Workplace....Gender, Culture, Education, Thinking". It was open to all CEOE graduate students as well as the Diversity Committee. The presentation was via ITV so there were about 50 seats on each campus.

Dr. Delphis Levia and his PhD student, Asia Downtin, wrote an article “The power of persistence” in *Science* (Downtin and Levia, 2018) concerning the difficulties of an African American female doing field work in an affluent white neighborhood, and how perseverance with mentoring successfully helped overcome career obstacles.

Dr. Biddle brought “The Bearded Lady Project” (<http://thebeardedladyproject.com/>) to our campus on May 22. The film examines the obstacles women face in field science. It was open to all CEOE students. The presentation was via ITV so there were about 50 seats on each campus.

CEOE participated at the Women of Promise Dinner (March 14); however, no students from Lewes were recognized due to communication issues.

There are 2 items of information on people of Diversity that can be found on the CEOE Diversity Committee web site.

See the website regarding Dr. Randolph Bromery, an African American Earth Scientist (Johns Hopkins University PhD) and Tuskegee Airman (<http://www.visionaryproject.org/bromeryrandolph/>).

The Oceanography Society published a Special Issue on Women in Oceanography: a decade later 2014. The web has features and briefs of personal history from female oceanographers https://tos.org/oceanography/assets/images/content/27-4_supplement.pdf

The committee plans to bring in speakers for college wide initiatives focused on Diversity, possibly one per semester.

UD held a **Graduate Student Appreciation Day** on April 6. CEOE supplemented that with bagels, fruit and beverages at both campuses.

Lastly, we have established a CEOE award committee, and it plans to give a CEOE Diversity Award to a student, staff or faculty member every year. This award is to help promote a climate of diversity and inclusion within CEOE.

2017-8 CEOE Diversity Committee Roster:

Saleem Ali, *Professor Geography Department*

Eliot Atekwana, *Professor Geological Sciences Department*

Estella Atekwana, *Dean, College of Earth, Ocean and Environment*

Jennifer Biddle, *Associate Professor School of Marine Science & Policy*

Sharmayne Burns, *Assistant Dean for Finance*

L. Pamela Cook, *UD ADVANCE, Associate Dean, College of Engineering (ex-officio)*

Heather Doty, *UD ADVANCE, Assistant Professor, College of Engineering (ex-officio)*

David Kirchman, *Professor School of Marine Science & Policy and CEOE ADVANCE fellow*

Delphis Levia, *Department Chair, Geography Department*

Janis Lopez, *Assistant Dean for Graduate Services*

George Luther, *Professor School of Marine Science & Policy and Chief Diversity Advocate*

Jame McCray, *Delaware Sea Grant, Marine Advisory Service*

Mark Moline, *Director, School of Marine Science & Policy*

Keeley Powell, *Assistant Dean for Undergraduate Services*
 Neil Sturchio, *Department Chair, Geological Sciences Department*
 Sharon Wiegner, *Business Administrator, School of Marine Science & Policy*
 Joanna York*, *Assistant Professor, School of Marine Science & Policy*

* *previous Chief Diversity Advocate*

References

Bernhard, R. E. and E. H. G. Cooperdock, 2018. No progress on diversity in 40 years. *Nature Geoscience* 11, 292-295. <https://doi.org/10.1038/s41561-018-0116-6>

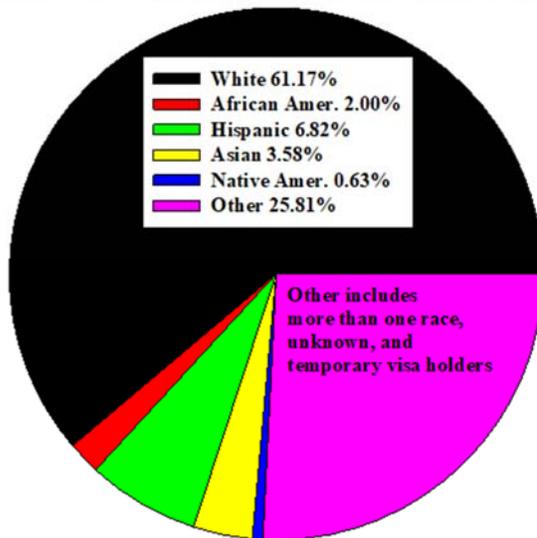
Dowtin, A. L. and D. F. Levia. 2018. The power of being persistent. *Science* 360 (6393), 1142. <https://doi.org/10.1126/science.360.6393.1142>

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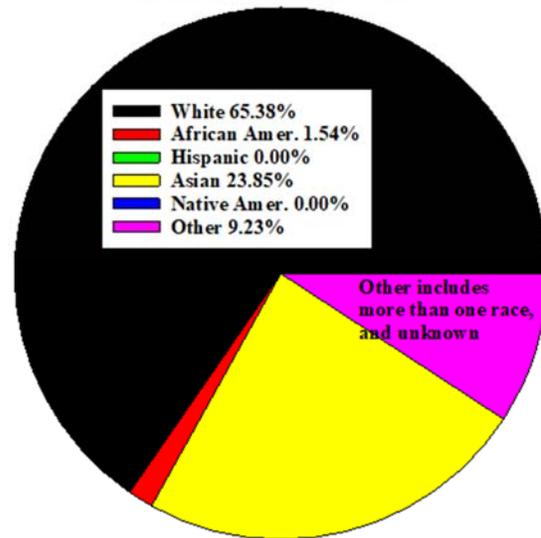
O’Connell, S., and A. Holmes. 2011. Obstacles to the recruitment of minorities into the geosciences: A call to action. *GSA Today* 21 (no. 6), 52-54. <https://doi.org/10.1130/G105GW.1>

Appendix

2014 NSF Graduate Students in Earth, Atmospheric and Ocean Sciences



2017 CEOE Graduate Students



Appendix Figure 1. Comparison of NSF 2014 graduate student diversity data in Earth, Atmospheric and Ocean Sciences with 2017 CEOE diversity data showing that CEOE has a high percentage of Asian students.