

#GeoGRExit: Why Geosciences Programs Are Dropping the GRE

Geoscience graduate programs are increasingly abandoning the controversial test as an admissions requirement, a welcome development for equity and inclusion in the field. How can your school be next?



Many graduate programs in the United States, including a growing number of geoscience programs, are dropping the GRE as an admissions requirement. Credit: [Brodie Vissers](#), [CCO 1.0](#)

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A lot is changing this year in higher education. Amid the ongoing pandemic caused by the infectious coronavirus disease 2019 (COVID-19), universities and graduate schools have had to adapt to entirely online instruction and have canceled fieldwork, closed labs, and faced declining revenues. These immediate changes have been forced upon programs by necessity, and they, along with negative impacts on many students from the current pandemic, will likely continue affecting higher education in the near future by, for example, decreasing application numbers. To bolster fall admissions, some graduate programs are temporarily

(<https://www.usm.edu/news/2020/release/temporary-waiver-graduate-school-test-requirements.php>) dropping

(https://www.sent-trib.com/news/bgsu-temporarily-waives-gre-gmat-requirements/article_613da950-7033-11ea-9851-233ef8943757.html),

the Graduate Record Examinations (GRE) as an admissions requirement. However, dropping the GRE altogether, as a step toward equity and inclusivity in graduate admissions and education, has been a longer-term battle, with many terming it #GRExit

(<https://twitter.com/hashtag/grexit?lang=en>), on social media.

The GRE is a standardized test widely used as a requirement for U.S. and Canadian graduate admissions since the 1950s. The earliest versions of the GRE were first tested on students at Harvard, Yale, Princeton, and Columbia in 1936, 3 decades before those universities became fully coed, with the test standardized by 1949. The test was overhauled in 2011, but research continues to show that it is not an accurate predictor of graduate school success, that scores are commonly misused

(<https://www.americangeosciences.org/webinars/equity-graduate-admissions>)

and misinterpreted by admissions committees, and that the test is biased against women compared to men and against people of color compared to white and Asian people [*Miller and Stassun*

Making Geosciences Antiracist (<https://eos.org/special-topics#antiracism>)

- [Geoscience Commits to Racial Justice. Now We've Got Work to Do](#)

(<https://eos.org/articles/geoscience-commits-to-racial-justice-now-weve-got-work-to-do>)

- [Deep Biases Prevent Diverse Talent from Advancing](#) (<https://eos.org/articles/deep-biases-prevent-diverse-talent-from-advancing>)

- [What's in a Seminar?](#)

(<https://eos.org/opinions/whats-in-a-seminar>)

- [Scientific Meetings for All](#)

(<https://eos.org/opinions/scientific-meetings-for-all>)

- [Promoting Racial Diversity in Geoscience Through Transparency](#)

(<https://eos.org/opinions/promoting-racial-diversity-in-geoscience-through-transparency>)

- [Laying Proper Foundations for Diversity in the Geosciences](#) (<https://eos.org/opinions/laying-proper-foundations-for-diversity-in-the-geosciences>)

- [#GeoGRExit: Why Geosciences Programs Are Dropping the GRE](#)

(<https://eos.org/opinions/geogrexit-why-geosciences-programs-are-dropping-the-gre>)

- [AGU's Bridge Program Creates Opportunities for Underrepresented Students](#)

(<https://eos.org/agu-news/agus-bridge-program-creates-opportunities-for-underrepresented-students>)

(<https://doi.org/10.1038/nj7504-303a>), 2014]. The burden of taking the test, and the impact of low scores, limits graduate school access to underrepresented groups [*Miller et al.* (<https://doi.org/10.1126/sciadv.aat7550>), 2019].

The geosciences are some of the least diverse (<https://eos.org/opinions/promoting-racial-diversity-in-geoscience-through-transparency>) science, technology, engineering, and mathematics (STEM) fields, especially at higher levels. More than 90% of geoscience doctoral degrees in the United States are awarded to white people, and there has been no significant change in 40 years [*Bernard and Cooperdock* (<https://doi.org/10.1038/s41561-018-0116-6>), 2018]. Structural and social barriers result in underrepresented minority students, both undergraduate and graduate students, leaving the field, which compounds the lack of diversity at the faculty level. The lack of diversity and inclusion hurts the geosciences, excluding voices that can help solve Earth's most critical problems. Geoscience faculty must understand, acknowledge, and address individual and institutional biases to improve inclusion (<https://eos.org/opinions/whats-in-a-seminar>) in our field. One simple way to improve diversity in geoscience graduate programs is to drop the GRE requirement for graduate admissions.

Why #GRExit?

“The GRE does not test the skill set and knowledge base to be a strong scientist. Nor does it test the ability to form strong research questions, conduct research, and synthesize results for consumption by other scientists and the public.”

First, “the GRE does not test the skill set and knowledge base to be a strong scientist,” Shirley Malcom (<https://www.amacad.org/person/shirley-mahaley-malcom>), director of education and human resources programs at the American Association for the Advancement of Science, told us recently. “Nor does it test the ability to form strong research questions, conduct research, and synthesize results for consumption by other scientists and the public.” Like other standardized tests, the GRE mostly tests a person's ability to take a standardized test.

Several studies have shown that performance on the GRE is a poor predictor of graduate degree success across fields. For example, researchers tracked more than 1,800 doctoral students in STEM fields and found little correlation between GRE scores and degree completion. In fact, men with the lowest GRE scores finished their doctoral programs more frequently than those with the highest scores [*Petersen et al.* (<https://doi.org/10.1371/journal.pone.0206570>), 2018]. *Moneta-Koehler et al.* (<https://doi.org/10.1371/journal.pone.0166742>) [2017] found that the GRE did not assess skills and fortitude for biomedical graduate programs: GRE scores had no predictive capabilities for who would graduate, pass qualifying exams, publish more papers, and obtain grants or for any other measure of success.

Second, the GRE poses a significant financial burden to economically disadvantaged students. As of 2020, the test costs \$205 to take and \$27 for each official score sent to an institution to which a student applies. GRE books are an additional cost, and preparation courses can cost thousands of dollars. On top of these costs, lost wages from taking time off to travel to a testing center or attend classes, plus paying for childcare during this time, put an overwhelming burden on economically disadvantaged students.

Third, the GRE has been shown to effectively predict sex and race. *Petersen et al.*

(<https://doi.org/10.1371/journal.pone.0206570>) [2018] showed that there was “a significant gender effect” in GRE quantitative (Q) scores: Men averaged far higher scores than women, but no significant gender differences were seen in any other measure of success, including degree completion percentage. Further, *Miller and Stassun* (<https://doi.org/10.1038/nj7504-303a>) [2014] showed that minorities also scored far lower than white and Asian people—for example, 82% of white and Asian applicants scored above 700 on the GRE Q, but only 5.2% of minorities did—meaning that if GRE scores provided an arbitrary cutoff for admissions, many underrepresented minorities, Asian women, and white women would not even be considered for admissions.

The #GRExit Movement Grows

From May to December 2019, the number of geosciences programs that dropped the GRE or made it optional rose from 0 to 30.

In response to the shortcomings listed above, the 2019–2020 academic year has seen a major increase in geosciences programs dropping the GRE from admission requirements: From May to December 2019, the number of geosciences programs that dropped the GRE or made it optional rose from 0 to 30. The movement to remove GRE requirements for graduate school admissions started in the life sciences. The geosciences movement built on the bioscience #GRExit movement and a crowdsourced database (<https://docs.google.com/spreadsheets/d/1MYcxZMhf97H5Uxr2Y7XndHn6eEC5oO8XWQiz2PU5jLxQ/edit#gid=0>) of programs that have abandoned the GRE. In September 2019, lead author Sarah Ledford created a similar #GeoGRExit database

(https://docs.google.com/spreadsheets/d/1ZUZowZJ25DtqCgr3kK_Ief1CoYOnrZeADcm4K81bq08/edit#gid=0) of programs no longer requiring the GRE, which students can reference when applying to graduate school.

Spring 2020 marked the first round of applications following when many geosciences programs dropped the GRE requirement. Long-term monitoring of applicants and acceptances will be necessary to determine whether removing the GRE changes the numbers of minorities and white women in geosciences graduate programs and whether removing the GRE affects student success rates.

Initial anecdotal evidence indicates that graduate programs that removed the GRE requirement had higher overall numbers of applicants, as well as higher percentages of underrepresented minority

applicants and acceptances. In Boise State's Department of Geosciences, the number of applications increased substantially in the first applicant pool after the department dropped the GRE requirement in 2019. Across the multiple doctoral programs administered by the department, the total number of applicants was more than double the previous maximum and more than 4 times the number from the previous year. After the GRE was dropped, initial offers for admission and funding offers were balanced across gender.

In Georgia Tech's School of Earth and Atmospheric Sciences, the percentage of underrepresented minority graduate applicants increased from a low within the past 8 years of 6% to 13% in 2020, the first applicant pool after the program dropped its GRE requirement. Of the accepted applications this spring, 23% were from underrepresented minorities, compared with 5%–18% over the past 8 years.

Advice on How to #GeoGRExit

Here we present some tips on how to approach the [#GeoGRExit](https://twitter.com/hashtag/geogrexit) (<https://twitter.com/hashtag/geogrexit>), process from faculty whose departments successfully dropped the GRE.

Knowing and sharing the ample, peer-reviewed literature about the inequalities inherent in the test with faculty have been an important approach in convincing departments to drop the requirement.

First, arm yourself with data. Knowing and sharing the ample, peer-reviewed literature about the inequalities inherent in the test with faculty have been an important approach in convincing departments to drop the requirement. Prior to the successful faculty vote to drop the GRE by Georgia Tech's School of Earth and Atmospheric Sciences, coauthor Kim Cobb gave a presentation ([available here](https://www.slideshare.net/coralsncaves/drop-the-gre-as-a-requirement-for-graduate-admission) (<https://www.slideshare.net/coralsncaves/drop-the-gre-as-a-requirement-for-graduate-admission>)) to her colleagues about compiled research on established biases in the GRE and how it is not a successful indicator of student success in graduate school.

Second, prepare for pushback. Many faculty have been using the GRE as an admissions metric for years without considering how it is removing strong candidates from their pool. Strike up conversations with these faculty informally to get a sense of their position, so you know where you are starting. Encourage dialogue among faculty to provide opportunities to catalog concerns about changes in admissions processes and evaluate whether those concerns are borne out by data.

Third, do your homework with the university as a whole. Find out if other programs at your university have dropped the GRE; if so, they may already have built a framework that could save your department time and effort. You should be aware of your university's broader requirements for graduate admissions as well: Some schools have dropped the GRE from consideration for department-level admissions while still requiring it for the university application and thus still imposing financial burdens on applicants.

(Temporary changes in admissions processes made by schools during the current pandemic might spur effective pushes for permanent university-wide changes in GRE requirements, although that remains to be seen.) It is also important to check whether the GRE is required for other elements within the application process, such as fellowships.

A Better Measure of Applicants

The graduate admissions process should move away from numerical rankings of students to more holistic evaluations of entire applications. Graduate programs need to clearly articulate what skills are required of applicants and use those as criteria for admissions. It is essential to remember that graduate students are trainees and will gain most of their research and technical skills in graduate school and beyond.

The overarching concept of holistic review, which emphasizes assessment of noncognitive skills, is receiving increased attention from graduate administrators [*Kent and McCarthy*, (https://cgsnet.org/ckfinder/userfiles/files/CGS_HolisticReview_final_web.pdf), 2016]. Graduate programs have the opportunity to base decisions on assessments of skills and character attributes “such as drive, diligence, and the willingness to take scientific risks,” as *Miller and Stassun* (<https://doi.org/10.1038/nj7504-303a>) [2014, p. 303] put it, which research has shown are more predictive of future success in STEM workforces than GRE scores.

Implicit biases will continue to hamper the progress of minorities in STEM. As an outdated, expensive, and biased test, the GRE exacerbates such biases.

There are no guidelines yet for what exactly programs should include in holistic reviews, but interviews with applicants would be very telling, as noted in the 2016 “[Holistic Review in Graduate Admissions](https://cgsnet.org/ckfinder/userfiles/files/CGS_HolisticReview_final_web.pdf)” report. Other application criteria, like GPA and letters of reference, should also be considered, but they can be susceptible to pitfalls. GPAs and institutional prestige are often unconsciously weighted more than is warranted. Overreliance on reference letters is also problematic; many of the gatekeeping techniques that hinder equity and diversity are strongly reflected in reference letters [*Faulkes* (<https://doi.org/10.1126/science.aaw1012>), 2019]. We acknowledge that not every program has time to interview every graduate student candidate, but as with job interviews, time spent interviewing a short list of prospective students will result in selection of stronger candidates.

Implicit biases will continue to hamper the progress of minorities in STEM. As an outdated, expensive, and biased test, the GRE exacerbates such biases. Not only is it irrelevant for American higher education in the 21st century, it arguably threatens scientific progress. Given the interdisciplinary and synthetic nature of Earth science subdisciplines like climate and critical zone science, placing emphasis on

noncognitive skills has the potential to enhance diversity, inclusion, and access in the field while accelerating scientific discovery and innovation.

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