GeoFORCE Texas
Annual Report 2021

GeoFORCE TEXAS
JACKSON SCHOOL OF GEOSCIENCES

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GeoFORCE Texas Family,

I am excited to share news from this transformative year for GeoFORCE Texas. With your support and dedication, we overcame obstacle after obstacle, turning challenges into opportunities for students and their families. Honoring our commitment to the education, engagement and empowerment of the next generation of diverse leadership, the GeoFORCE program developed and executed 4 supplemental programs, 2 new cohorts, and revamped our social media efforts.

We strengthened our GeoFORCE Texas virtual academies in summer 2021. Unfortunately, the COVID pandemic kept us from in-person experiences with all cohorts completing remote academies due to the heightened travel restrictions from The University of Texas at Austin and the subsequent Youth Protection Program precautions. Even so, educational staff and professional mentors ran 13 virtual academies and helped 375 students learn about the geosciences. We also expanded and welcomed the Austin Metropolitan Area into the GeoFORCE family. Broadening participation throughout Central Texas will help maximize impact and prove beneficial in the long-term recruitment efforts for the University of Texas, the Jackson School of Geosciences, corporate sponsors and other great entities seeking

exceptional scholars. I'm thrilled to report that 6 students from the 2021 graduating class chose to major in the geosciences. Five of those 6 are currently enrolled at the Jackson School.

Supporting the next generation of diverse leadership in energy and earth sciences requires holistic programming, created and implemented by dedicated professionals with varying expertise. It gives me great pleasure to introduce two new coordinators and the projects they will lead with GeoFORCE Texas. Linda Quintero graduated from Texas A&M University with a bachelor's degree in environmental studies and a minor in geography. She has a passion for communication and policy. Formerly, Linda served as a government affairs and sustainability intern at a private farmer co-op in Washington, D.C. She also worked at the Jackson School's Bureau of Economic Geology as a research engineering assistant, developing a sediment catalog for the Texas Commission on Environmental Quality (TCEQ). Her interdisciplinary expertise, with a focus in environmental geoscience, creates a unique perspective for addressing modern societal challenges. Linda is an alumna of GeoFORCE Texas and will lead the new GeoFORCE Family program, the Transition to Career efforts, social media and serve as a co-lead for teacher professional development. Carlton Mueller is joining the GeoFORCE team from the University of Colorado Boulder, where he finished a master's degree in geoscience education research. More specifically his research was focused on the impact of STEM bridge programs on student recruitment and retention. With his focus on improving learning environments through research based instructional strategies, evidence based instructional practices, and creative intuition, he will have lasting impact leading educational team trainings, AGU Bright STaRS experiences and the GeoFORCE Research Summit, as well as co-leading teacher professional development. He also served honorably as an intelligence analyst and sergeant in the United States Marine Corps, where

he focused on strategic operations, geopolitics, foreign military acquisitions and threat analyses.

Despite the economic downturn, massive reorganizations, and the pressure to decrease budgets, the GeoFORCE Texas program perseveres and remains in good financial standing. We are working to diversify the portfolio of corporate sponsors, breaking into the areas of renewable energy, sports and outdoors, technology, and other companies who believe in diverse, equitable, inclusive and just workplaces. GeoFORCE Texas would not be so successful without our dedicated corporate sponsors. So, thank you to Shell, KLE Foundation, Chevron, ConocoPhillips, ExxonMobil, Marathon, Repsol, Halliburton, and the SEG Foundation.

If you are looking to give back in 2022, please consider a gift to GeoFORCE to help change a life. We encounter so many alumni who credit GeoFORCE for its lasting impact. Many credit GeoFORCE for the introduction to their passion for geosciences. With a $750,000 programmatic match opportunity, you can double your impact! Contact us to learn more about this incredible opportunity.

On behalf of the GeoFORCE Texas team and the Jackson School of Geosciences, I thank you all for your strength, courage and support throughout this two-year global pandemic. We plan to travel on amazing field experiences in summer 2022. However, if we are once again limited by traveling restrictions, we will forge forward knowing that we have already developed innovative remote learning opportunities for our students.

Be sure to stay in contact with us via social media and check out the GeoFORCE Monthly newsletter for updates.

Sincerely,

Leah M. Turner, Ph.D.

GeoFORCE Texas is an outreach program of The University of Texas at Austin's Jackson School of Geosciences that introduces high school students from underserved school districts to careers in geosciences and STEM by taking them on summer field experiences across the country. In 2021, all educational and mentoring experiences were conducted virtually because of the COVID-19 pandemic. The program also helps students apply for college and explore potential career paths through guidance and mentoring.

GeoFORCE Texas is recognized as one of the most successful programs of its kind in the country. Over 16 years, the program has seen 100% of its alumni finish high school and 90% persist through their second year of college. Of the GeoFORCE Texas alumni who are incoming freshmen in college this year, half are majoring in STEM and about 17% are majoring in geosciences — roughly 120 times the national rate of undergraduate students majoring in the geosciences, according to 2019 data from the American Geosciences Institute.

These are the kind of results that in 2015 earned GeoFORCE Texas the Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring — the highest such honor from the United States government.

GeoFORCE Texas began in 2005. It started in counties surrounding Southwest Texas Junior College. In 2008, the program expanded to schools in the Houston Independent School District. Since then, GeoFORCE Texas has recruited at least one student cohort from each region annually.

Each cohort takes part in the GeoFORCE program for four years. Students start the program the summer before 9th grade, and complete it the summer before 12th grade. During this time, they take trips to some of the most spectacular geologic sites in Texas and throughout the United States, and learn first-hand from geoscientists in the field, the lab and the classroom.

GEAR UP, a federal grant program administered by the Texas Education Agency, has helped expand GeoFORCE's reach, funding a cohort with students from San Antonio, San Marcos, and Livingston. The Jackson School's STEMFORCE program has also helped boost geosciences and STEM outreach in Texas, but it did not run a cohort this year because of COVID-19.

In 2021, GeoFORCE Texas opened a permanent Austin cohort, accepting new rising 9th grade students from school districts in and surrounding Austin, Texas. 11th grade students from Austin were also accepted to participate in the STEMFORCE Academy due to the generous donation of the Harman-Mayes-Sooch Family Fund. STEMFORCE is identical to the GeoFORCE 12th Grade Academy. In coming years, STEMFORCE students will be folded in with the new Austin cohort.

After finishing the final summer academy, all GeoFORCE and STEMFORCE students are admitted into the college transition experience and offered resources and guidance through their undergraduate years and beyond.

For more information, visit: *www.jsg.utexas.edu/geoforce.*

STATISTICS
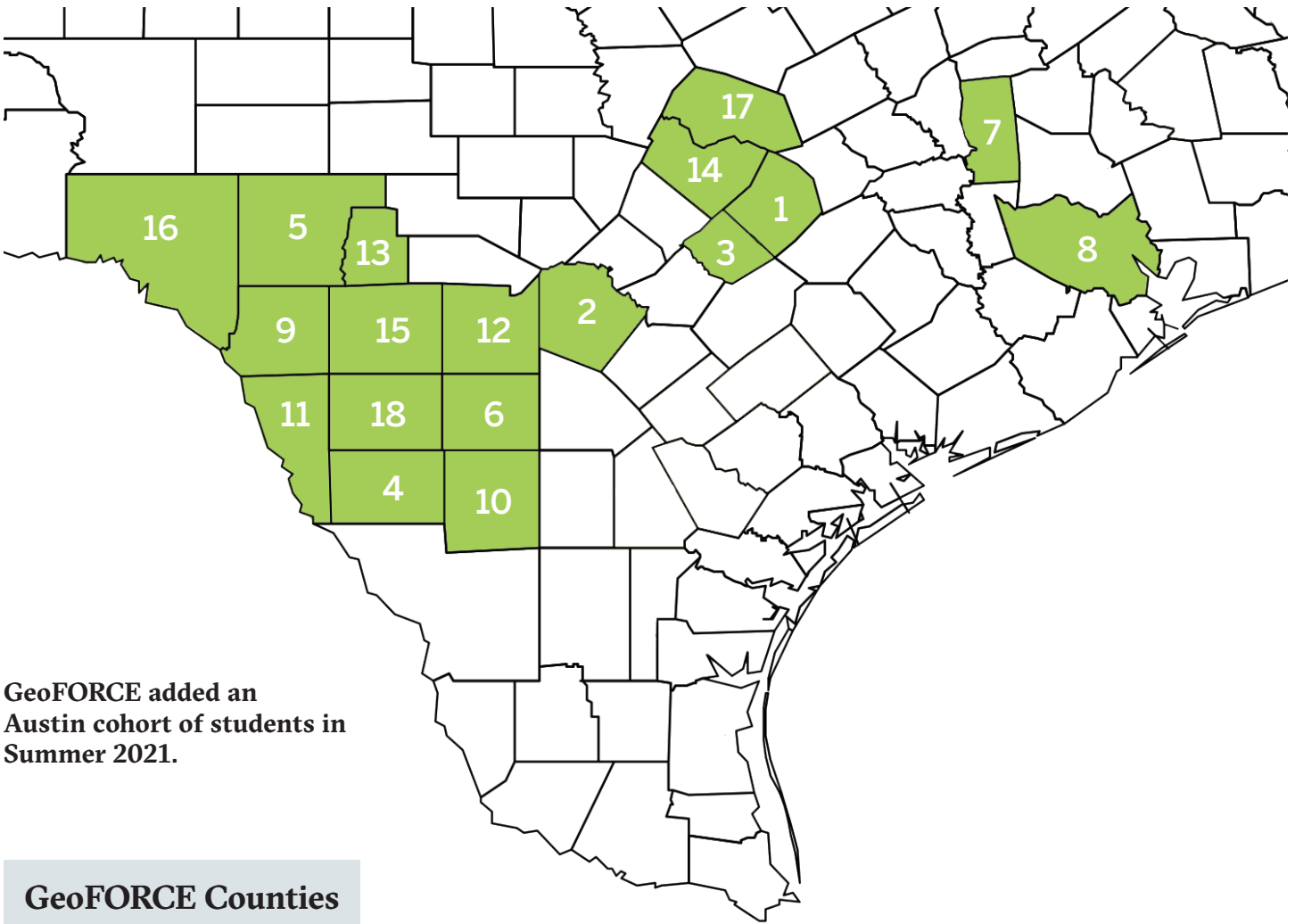
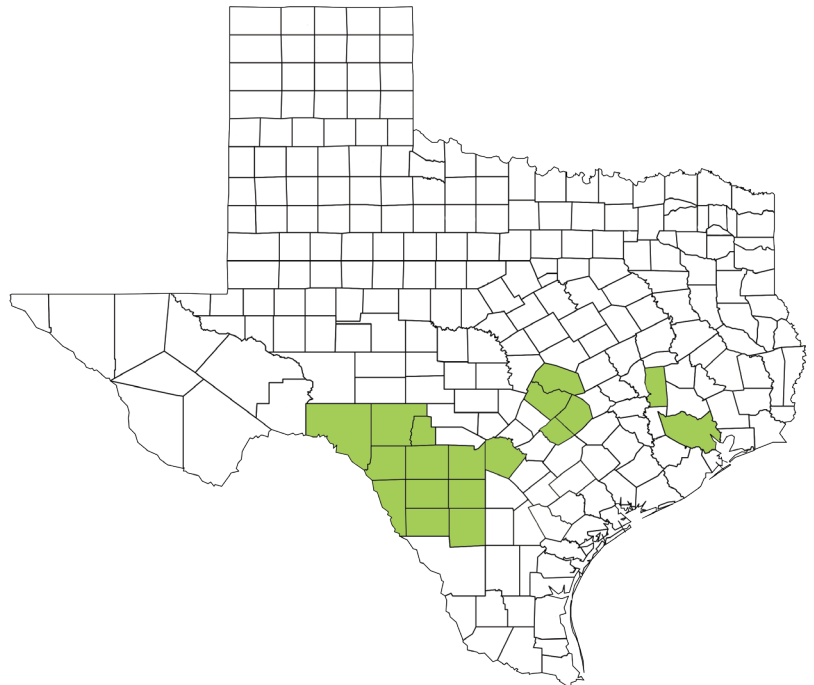**GeoFORCE added an Austin cohort of students in Summer 2021.**

GeoFORCE Counties

1. Bastrop County
2. Bexar County
3. Caldwell County
4. Dimmit County
5. Edwards County
6. Frio County
7. Grimes County
8. Harris County
9. Kinney County
10. LaSalle County
11. Maverick County
12. Medina County
13. Real County
14. Travis County
15. Uvalde County
16. Val Verde County
17. Williamson County
18. Zavala County

In summer 2021, 389 Texas high school students attended GeoFORCE Texas. This year, 64 completed the program, which was held virtually due to the coronavirus pandemic. The students are divided into four groups. Most of the students are from underserved school districts in Houston, rural Southwest Texas and the new cohort made up of students from the Austin area. The GEAR UP group is relatively small, constituting about 7% of GeoFORCE students, and is supported by a federal grant distributed by the Texas Education Agency. Students in this group come from counties throughout the state.

Numbers may not equal 100% because of rounding.

Summer 2021 Attendance

GEAR UP	**28**
Houston	**137**
Southwest	**168**
Austin (includes StemFORCE)	**56**

GeoFORCE Gender

Male	**35%**
Female	**64%**
Other/Nonbinary	**1%**

Overall GeoFORCE Ethnicity

58% Hispanic/Latine
18% White
1% Other
4% Multiracial (not including white)
9% Asian
9% Black
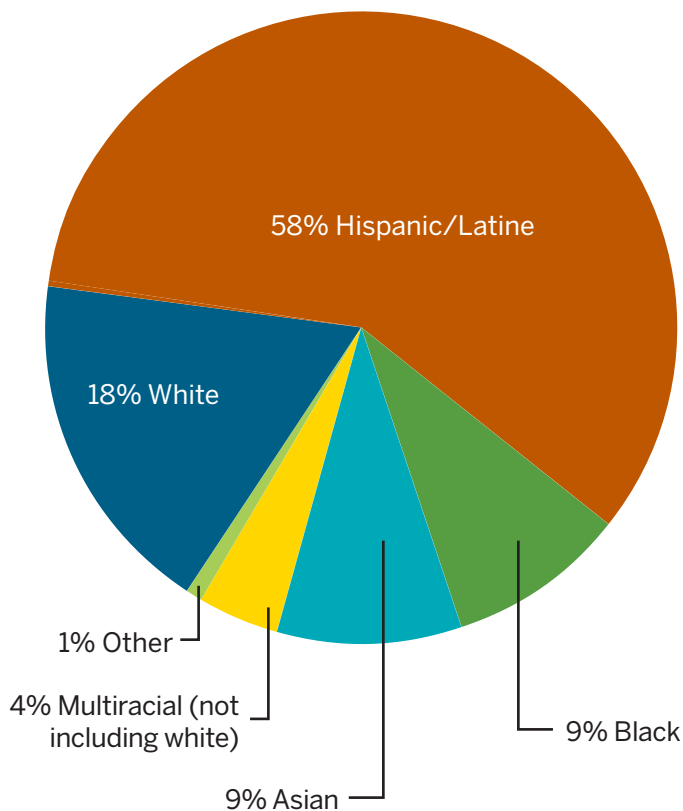
Houston Cohort Ethnicity

45% Hispanic/Latine
12% Asian
26% Black
1% Native American/Indigenous
7% White
2% Other
7% Multiracial (not including white)
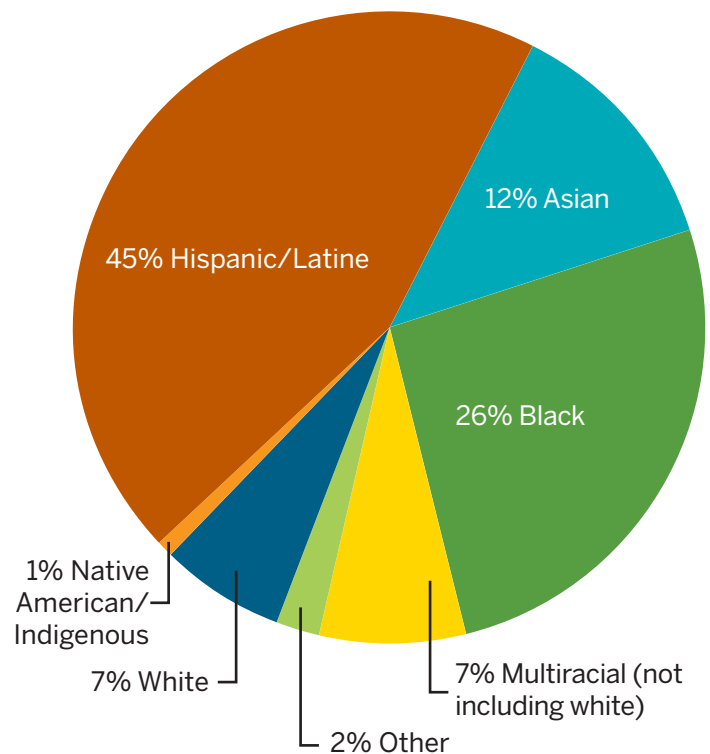
STUDENT DEMOGRAPHICS 2021

Southwest Cohort Ethnicity

76% Hispanic/Latine

17% White

4% Asian

2% Multiracial (not including white)

1% Black

Austin Cohort Ethnicity

34% Hispanic/Latine

29% White

27% Asian

4% Black

5% Multiracial (not including white)

2% Other
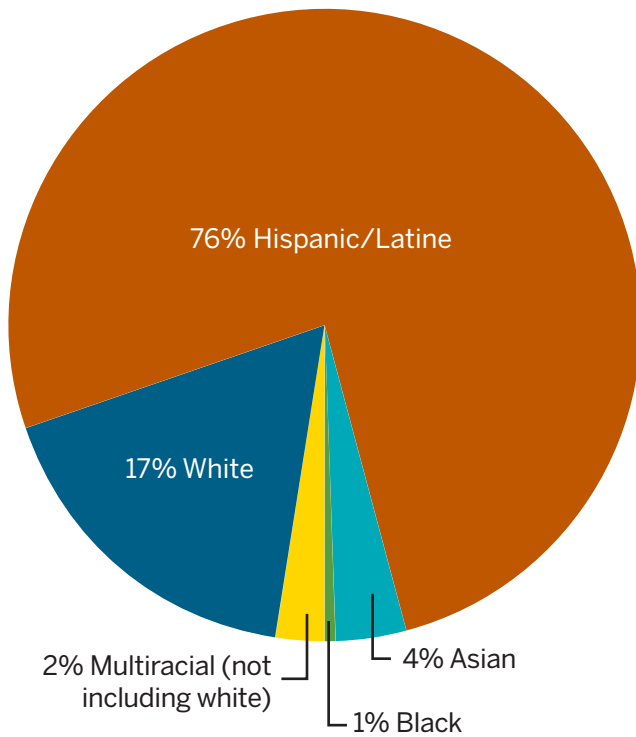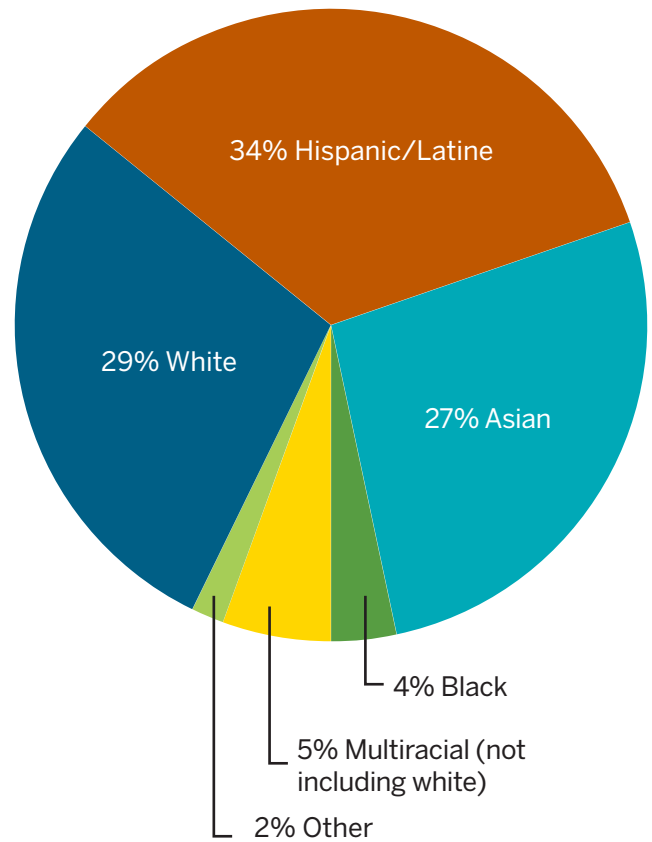
GEAR UP Cohort Ethnicity

54% Hispanic/Latine

7% Black

39% White
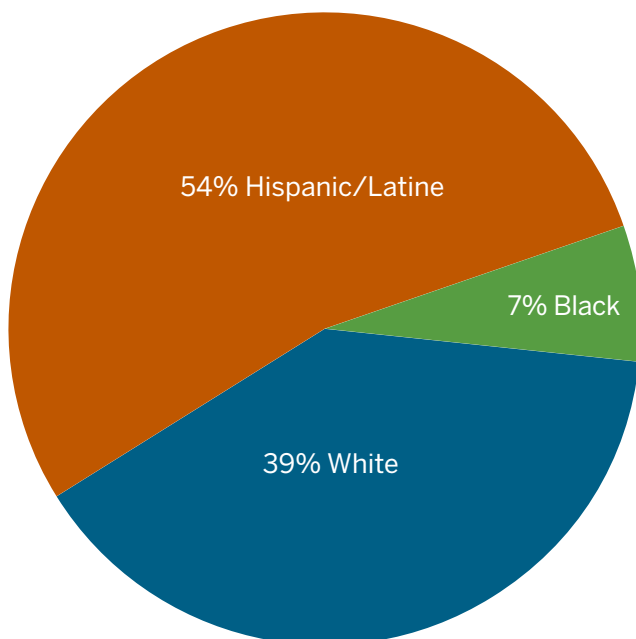
UNDERGRADUATE STUDENTS

A total of 241 GeoFORCE alumni are undergraduate students enrolled at four-year universities. Slightly more than half of first-time freshmen that enrolled in 2021 are majoring in a STEM field, with about 17% of these students majoring in geosciences. Out of all undergraduates currently enrolled at a four-year university, 8% are geosciences majors. These percentages are far greater than the 0.14% of undergraduate students nationally who graduate with geosciences degrees, according to data collected in 2019 by the American Geosciences Institute.

Numbers may not add up exactly because of rounding. STEM data does not include health sciences.

Institutions Attended by Undergraduate Geoscience Majors

· The University of Texas at Austin
· Texas A&M University
· Oklahoma State University-Tulsa
· Sam Houston State University
· Texas A&M University, Kingsville

First-Time Freshmen Majoring in STEM: 51%

Freshmen Majoring in Geoscience	17%
Freshmen Majoring in Engineering	14%
Freshmen Majoring in Biological Sciences	6%
Freshmen Majoring in other STEM	14%

STEM Undergraduates Enrolled at 4-Year Universities: 39%*

Geoscience Majors	20	8%
Engineering Majors	32	13%
Other STEM Majors	41	17%

Non-STEM Majors 61%

Other STEM Majors 17%

Engineering Majors 13%

Geoscience Majors 8%
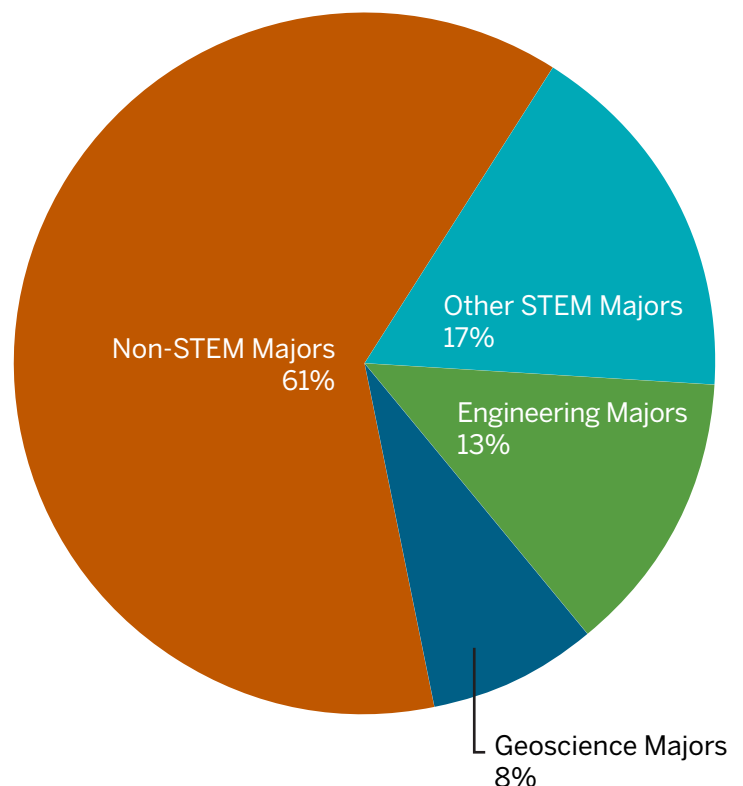
Out of the 64 GeoFORCE alumni who are currently enrolled in graduate school, 66% are studying a STEM field. About 14% of these students are studying geosciences, which is second only to health professions. This percentage is far greater than national trends, in which 0.3% of master's students and 1.3% of doctoral students earned a degree in geosciences, according to data collected in 2016 by the National Center for Education Statistics.

Numbers may not equal 100% because of rounding.

Number of Students: 64

Geoscience	9	14%
Engineering	0	0%
Health Professions	28	44%
Other STEM	5	8%
Non-STEM	20	31%
No Data	2	3%

Pursuing Geoscience Graduate Degrees: 9

Doctoral	4
Master's	5

Since 2005, a total of 1,554 students have completed the GeoFORCE program. About 15% of these students are currently enrolled in an undergraduate program. Students who have graduated college have earned a total of 173 associate's degrees and 695 bachelor's degrees. About 12% of the bachelor's degrees are in geosciences. That is more than 30 times higher than the 0.4% of bachelor's degrees earned in geosciences by U.S. citizens and permanent residents in 2016, according to the National Center for Education Statistics.

Numbers may not equal 100% because of rounding. STEM data does not include health sciences.

Bachelor's Degrees by Majors
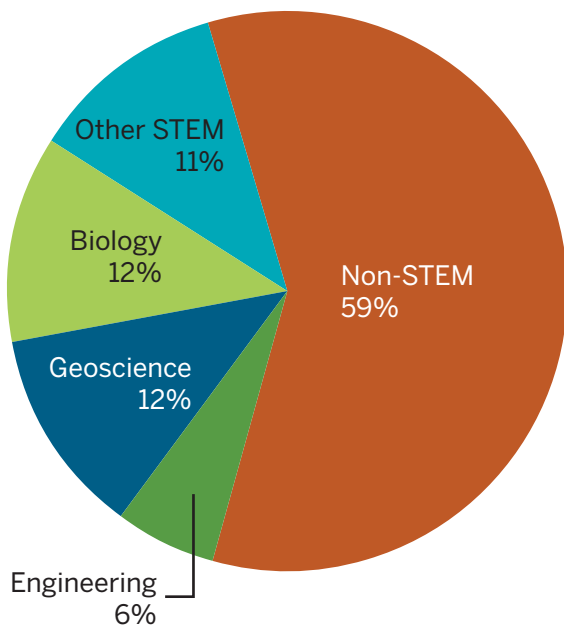
GeoFORCE students earn bachelor's degrees in geosciences at a rate 30 times higher than the national average.

Degrees Earned by GeoFORCE Alumni Through August 2021

Associate's Degrees: 173

Bachelor's Degrees: 695

Bachelor's Degrees Earned in Engineering	**42**
Bachelor's Degrees Earned in Geoscience	**83**
Bachelor's Degrees Earned in Biology	**83**
Bachelor's Degrees Earned in Other STEM	**79**
Bachelor's Degrees in Non-STEM	**408**

Bachelor's Degrees in Geoscience: 83

Geoscience Bachelor's Degrees Earned by Females	**52%**
Geoscience Bachelor's Degrees Earned by URM*	**67%**

Bachelor's Degrees in STEM Fields: 287

STEM Bachelor's Degrees Earned by Females	**53%**
STEM Bachelor's Degrees Earned by URM*	**67%**

Master's Degrees: 101

Master's Degrees in Geoscience	**18**

Doctoral and Law Degrees: 14

Doctor of Medicine	**3**
Doctor of Pharmacy	**3**
Doctor of Physical Therapy	**4**
Law Degree	**4**

*URM: Underrepresented minorities in STEM as defined by the National Science Foundation. This includes Blacks; Hispanics; American Indians or Alaska Natives; Native Hawaiians or Other Pacific Islanders; and individuals who report more than one race and are not Hispanic.

DEVELOPMENT

SPONSORS AND CHARITABLE FUNDS

	Corporate Sponsors	Foundation Sponsors	Charitable Funds
$150K and up	Shell Oil Company		
$100K and up		KLE Foundation	
$50K and up	Chevron Corporation		
$25K and up	ConocoPhillips ExxonMobil Marathon Oil Corporation Repsol		
Less than $25K		Halliburton Foundation SEG Foundation	UT HornRaiser

INDIVIDUAL AND ENDOWMENT DONORS

We are grateful for the enduring support of the endowments that have been established to support the program in perpetuity.

Jesse and Ina Brundrett GeoFORCE Texas Fund, *Established in 2016 by the estates of Jesse and Ina Brundrett*

Charles A. Caughey Endowed Graduate Fellowship, *Established in 2019 by Mr. Charles A. Caughey*

Darwin Family GeoFORCE Texas Fund, *Established in 2009 by Mr. C. Barnes and Mrs. Pamela T. Darwin*

GeoFORCE Texas Fund, *Established in 2009 by an anonymous donor*

Gerson Garcia Endowed GeoFORCE Scholarship Fund, *Established in 2014 by friends in memory of Gerson Garcia*

Friends of GeoFORCE Endowment in Honor of Doug Ratcliff, *Established in 2014 by friends of Doug Ratcliff in his honor*

Deborah Susan Pfeiffer Endowed GeoFORCE Scholarship, *Established in 2017 by Mrs. Deborah S. Pfeiffer*

Janet E. and David I. Rainey GeoFORCE Texas Scholarship, *Established in 2010 by Drs. Janet E. and David I. Rainey*

Students Raising Students GeoFORCE Endowment, *Established in 2017 by the Graduate Student Executive Committee*

Stephen P. and Katherine Hubby Weiner GeoFORCE Scholarship, *Established in 2017 by Mr. Stephen P. and Mrs. Katherine H. Weiner*

We would like to recognize the following individuals who contributed to GeoFORCE Texas during the 2020-2021 fiscal year.

Anonymous
Sara Avant
Felix Benavides
Laura Bowman
Robert Boyce
Kevin Chu
April Duerson
Paul Hardwick
John Jeffers
Faqi Liu
John Preston
Christine Skirius
Nicola Tisato
Kristen Tucek

ALUMNI VOICES

FIRST-YEAR GEOLOGY MAJORS

Ethan Cavasos

Sabinal, Texas
Sabinal High School, *Valedictorian*
Texas A&M University
Geology & Geophysics Department

Nikki Dargahi

Houston, Texas
Westside High School
The University of Texas at Austin
Jackson School of Geosciences

Brandon Garcia

Hondo, Texas
Hondo High School
The University of Texas at Austin
Jackson School of Geosciences

Kaylin Hong

Frisco, Texas
Lebanon Trail High School
The University of Texas at Austin
Jackson School of Geosciences

Cecilia Jeffers

Houston, Texas
Westside High School
The University of Texas at Austin
Jackson School of Geosciences

Enrique Morales

Uvalde, Texas
Uvalde High School
The University of Texas at Austin
Jackson School of Geosciences

Nicole Gonzalez

In July of 2015, during her third summer with the GeoFORCE program, Nicole Gonzalez stood overlooking Crater Lake in Oregon and realized she wanted to be a geologist. Now, she's a graduate student at The University of Texas Jackson School of Geosciences researching the continuity and compartmentalization of shallow marine sandstones along the Southwest Oregon coast. In her own words, "It's come full circle!"

Gonzalez graduated with a bachelor's degree in geology with honors from the University of Colorado at Boulder in December 2019. She presented on her undergraduate research at the Geological Society of America

> "I'm eager to use my geologic knowledge and problem-solving skills to innovatively yet consciously meet the world's energy needs."
>
> *-Nicole Gonzalez*

(GSA)'s annual conferences in 2018 and 2019. She also experienced work in the environmental sector at the Texas Commission on Environmental Quality in Austin, Texas, as a Mickey Leland Environmental intern where she reviewed petroleum storage tank/ dry cleaner remediation program (PST/ DCRP) site files.

In summer 2019, Gonzalez was selected for GSA and ExxonMobil's Bighorn Basin Field Camp, "which gave me the opportunity to hone my field skills and gain better insight into what a career at ExxonMobil has to offer," Gonzalez said.

Additionally, Gonzalez has fond memories of visiting BP's headquarters in Houston as a GeoFORCE student and was honored when BP selected her as

their BP LEADERS Fellow to fund her graduate studies.

"Upon graduating, I would like to work for an oil and gas company as a geologist," Gonzalez said. "I'm eager to use my geologic knowledge and problem-solving skills to innovatively yet consciously meet the world's energy needs. In addition, I am extremely passionate about youth development programs and hope to serve on a board of directors for a non-profit organization in the future."

Gonzalez has already sought out opportunities to help with youth development. Besides being a GeoFORCE counselor, she implemented STEM programming for 2nd through 5th graders as a Youth Development Specialist for the Boys and Girls Club in Houston. Her enthusiasm will undoubtedly inspire other youth to pursue geology in school and beyond.

ABOVE: NICOLE GONZALEZ AT HER UNDERGRADUATE FIELD CAMP IN 2018.

Hector Garza

In 2015, Hector Garza stood in front of a group of GeoFORCE 9th graders as a surprise guest speaker enthusing about the geologic processes at work at McKinney Falls State Park. Six years later, he's preparing to enthuse about those same processes as an Educational Coach for the virtual GeoFORCE Houston 9th grade academy.

Garza was part of GeoFORCE's Young Geoscientists program from 2008 to 2011. It was his senior trip to New Mexico that made him decide to study geology.

"I've never wanted to sit in an office all day," said Garza. "That trip, seeing all the locations, the sand dunes and the lava fields, and talking to the staff that year,

> ## "There were larger questions I wanted to answer than what I was doing."
>
> ### -Hector Garza

hearing about their jobs, was what made me decide this is what I want to do."

Garza received his Bachelor of Science in Geology from The University of Texas at Austin Jackson School of Geosciences in 2016. While in college, he worked as a GeoFORCE counselor for three summers. He then got a job at Premier Oilfield Group managing a mineralogy laboratory where he was in charge of analyzing mineral samples for oil and gas companies.

After three years of running this mineralogy lab, Garza returned to the Jackson School to earn a Ph.D. in geosciences focusing on geochemistry and geochronology. He's working under Dr. Elizabeth Catlos, using these techniques to research the transition of life from water to land by looking at plant and arthropod fossils from sites in Scotland.

"There were larger questions I wanted to answer than what I was doing,"

Garza said, explaining why he chose the Jackson School. "I got the opportunity to come back to school with a project that was fit specifically for me. Most people, when they come to graduate school, try to be as specific as possible, but I wanted to stay broad and work on a project encompassing geochronology, geochemistry, and paleontology. From my experience in industry, you're more marketable the more experience you have. I looked at grad school in different places, but the Jackson School was the best fit."

ABOVE: HECTOR GARZA TALKING WITH GEOFORCE 9TH GRADERS AT MCKINNEY FALLS STATE PARK IN 2015.

Caleb McBride

"There is a booming field that leverages geological subject-matter-expertise and the tech-skills of data analytics."

-Caleb McBride

You may not expect a geoscientist to care much about computer skills, but GeoFORCE alumni Caleb McBride disagrees. McBride was in the second GeoFORCE cohort, back in 2006-2009. He earned his degree in Earth Sciences from Rice University in 2014 and his master's degree from The University of Texas at San Antonio in 2019.

"I decided to pursue this dream [of geoscience] seriously during our junior trip to the Pacific Northwest," McBride said. "Our trip instructor invited everyone to speculate on a grey band running along the length of the dunes and none of us had any clue. The instructor walked us through their thought process and revealed to us that

we were looking at an ash trace from the explosion of Mt. St. Helens in 1980. Nature is filled with secrets and that trip made me want to decipher them myself."

McBride now works for Shell, but he's not officially a geoscientist. Instead, he's a Technical Data Management Analyst.

"There is a booming field that leverages geological subject-matter-expertise and the tech-skills of data analytics," McBride explained. "When I learned that the oil and gas industry needed people who had a geology background and skills in data analytics, I realized that I could stick with my dream of doing geology work, albeit without the title of geologist."

For the first year of his master's, McBride studied geochemical paleoclimate records in Spain. In his second year, he took courses in statistics

and Python-based mathematics. Alongside his university work, he also paid for affordable online classes to learn SQL, machine learning, and Python. Because of this experience, McBride highly recommends programs like Texas A&M's Master's in Petroleum Data Management or Rice University's professional certificate in Energy & Data Management. Geoscience undergraduate students can also take classes in Python at schools like The University of Texas at Austin.

As McBride said, "If you're interested in seeing how you can distinguish yourself amongst your top-notch geological cohort, data management and analytics might be something you should investigate."

ABOVE: CALEB MCBRIDE (MIDDLE) WITH HOUSTON MAYOR SYLVESTER TURNER (LEFT) AND HOUSTON FIRE CHIEF SAMUEL PEÑA (RIGHT) AT A SHELL OUTREACH EVENT.

Jennifer Nguyen

"My advice to new GeoFORCE students would be to embrace the journey," GeoFORCE alumna Jennifer Nguyen said. "Don't knock yourself down if you are not at the place you want to be at a certain time. Everybody has a journey to get to the place in life that best suits them."

Nguyen graduated from The University of Texas at San Antonio with a Bachelor's in Geology just before the COVID-19 pandemic put everything, including the job market, in lockdown. Nguyen initially struggled to find a relevant entry-level job.

"I did various jobs from waitressing to being a date coach," Nguyen said. "What I did not expect was that those jobs were what really helped me gain confidence

"Everybody has a journey to get to the place in life that best suits them."

-Jennifer Nguyen

in myself and perfect my interpersonal communication skills which is crucial for the position I am in now."

Now, Nguyen is a project development engineer for ABEI Energy, an independent power company that's leading the renewable energy industry. Nguyen herself leads utility-scale solar energy projects. She does everything from figure out if the power lines have the capacity to support a solar generation site to buying the land to working with the United States Department of Energy for permitting and taxes. Those interpersonal skills she learned at her previous jobs became unexpectedly crucial for tasks like securing contracts and building company relations.

Nguyen's interest in geology, and in energy resources, was sparked during her third summer as a GeoFORCE student. There she learned about the beautiful geology of Oregon under the guidance of Dr. Jeffery Paine, a senior research

scientist at The University of Texas at Austin's Bureau of Economic Geology.

In college, Nguyen explored this passion as a member of the American Association of Petroleum Geologists, South Texas Geological Society and the Geological Society of America. She also completed a project for the McNair Postbaccalaureate Achievement Program that won 3rd place at the 2019 McNair Research Symposium.

Nguyen's advice for GeoFORCE students and recent alumni is to keep an open mind and perspective. "Only then will you be able to understand how other decisions you have made positively impact your journey to your end goal," she said. "GeoFORCE is an amazing program that not only helps build your geological knowledge at a young age, but also gives you the opportunity to build life-long friends and connections. Take advantage of that."

ABOVE: JENNIFER NGUYEN AS A 10TH GRADE GEOFORCE STUDENT AT THE GRAND CANYON.

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