



Building a more inclusive marine science community

November 5, 2021

The CSU is the largest and most ethnically and economically diverse four-year public university system in the US

CSU 2021 Fact Book

Almost 70% of students are students of color

More female students

| BY ETHNICITY | | |
|------------------------|---------|-------|
| African American | 19,645 | 4.0% |
| American Indian | 987 | 0.2% |
| Asian/Pacific Islander | 76,509 | 15.8% |
| Hispanic/Latinx | 217,232 | 44.7% |
| White | 106,603 | 22.0% |
| Other/Unknown | 17,464 | 3.6% |
| Two or More Races | 20,798 | 4.3% |
| Non-Resident Alien | 26,312 | 5.4% |
| BY GENDER | | |
| Men | 206,198 | 42.5% |
| Women | 279,352 | 57.5% |

No progress on diversity in 40 years

Ethnic and racial diversity are extremely low among United States citizens and permanent residents who earned doctorates in earth, atmospheric and ocean sciences. Worse, there has been little to no improvement over the past four decades.

Rachel E. Bernard and Emily H. G. Cooperdock

Persistent gender bias in marine science and conservation calls for action to achieve equity

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Race and racism in the geosciences

Geoscientists in the United States are predominantly White. Progress towards diversification can only come with a concerted shift in mindsets and a deeper understanding of the complexities of race.

Kuheli Dutt

Why are there so few ethnic minorities in ecology and evolutionary biology? Challenges to inclusion and the role of sense of belonging

Laurie T. O'Brien¹  · Henry L. Bart² · Donna M. Garcia³

Hostile climates are barriers to diversifying the geosciences

Erika Marín-Spiotta¹, Rebecca T. Barnes², Asmeret Asefaw Berhe³, Meredith G. Hastings⁴, Allison Mattheis⁵, Blair Schneider⁶, and Billy M. Williams⁷

Historically excluded groups in society, higher education, STEM, marine and coastal sciences

- Race
- Gender
- Ethnicity, culture, country of origin
- Socioeconomic status
- First-in-family
- Sexual/gender orientation and identity
- Rural vs. urban
- Veteran status
- Religion
- Disability (visible or invisible)

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**Why do we need all
these groups?**

**What are the benefits of diversity?
What does it get us?**

Diversity leads to better outcomes.

- Firms with women and POC in leadership and management roles have higher profit margins and more patents.
- Scientific papers written by ethnically diverse teams had higher impact factors than papers written by people from same ethnic group.
- Women and non-White scholars introduce more novelty.
 - Rate of adoption is lower than for White men, indicating novelty is discounted.

Opinion: Gender diversity leads to better science Mathias Wullum Nielsen et al. | PNAS (2017)

The preeminence of ethnic diversity in scientific collaboration Bedoor AlShebli et al. | Nature Communications (2018)

How Diversity Makes Us Smarter Katherine W. Phillips | Scientific American (2014)

Why Diverse Teams Are Smarter David Rock and Heidi Grant | Harvard Business Review (2016)

The Diversity–Innovation Paradox in Science Bas Hofstra et al. | PNAS (2020)

Create a more inclusive and diverse marine and coastal science community in the CSU and California



How do we get people from historically excluded groups to the table, and how do we meaningfully include them?

Evidence-Based Strategies for Improving Diversity and Inclusion in Undergraduate Research Labs

Afra Saeed Ahmad^{1*}, Isaac Sabat^{2*}, Rachel Trump-Steele³ and Eden King³

Structure Matters: Twenty-One Teaching Strategies to Promote Student Engagement and Cultivate Classroom Equity

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Attracting Diverse Students to Field Experiences Requires Adequate Pay, Flexibility, and Inclusion

ALEX J. JENSEN[Ⓞ], SARA P. BOMBACI, LAURA C. GIGLIOTTI, STEPHEN N. HARRIS, COURTNEY J. MARNEWECK, MIKE S. MOTHERSBAUGH, BLAISE A. NEWMAN, SHARI L. RODRIGUEZ, ELIZABETH A. SALDO, KYLE E. SHUTE, KEIFER L. TITUS, AMANDA L. WILLIAMS, SZE WING YU, AND DAVID S. JACHOWSKI

How Field Courses Propel Inclusion and Collective Excellence

Erika S. Zavaleta,^{1,2,*,@}
Roxanne S. Beltran,^{1,@}
Abraham L. Borker^{1,@}

Improving Underrepresented Minority Student Persistence in STEM

Mica Estrada,^{1*} Myra Burnett,² Andrew G. Campbell,³ Patricia B. Campbell,⁴ Wilfred F. Denetclaw,⁵ Carlos G. Gutiérrez,⁶ Sylvia Hurtado,⁷ Gilbert H. John,⁸ John Matsui,⁹ Richard McGee,¹⁰ Camellia Moses Okpodu,¹¹ T. Joan Robinson,¹² Michael F. Summers,^{13,14} Maggie Werner-Washburne,¹⁵ and MariaElena Zavala¹⁶

DIVERSITY IN SCIENCE

Without inclusion, diversity initiatives may not be enough

Focus on minority experiences in STEM, not just numbers

By Chandler Puritty,^{1*} Lynette R. Strickland,^{2*} Eanas Alia,³ Benjamin Blonder,⁴ Emily Klein,⁵ Michel T. Kohl,⁶ Earyn McGee,⁷ Maclovía Quintana,⁸ Robyn E. Ridley,¹ Beth Tellman,⁹ Leah R. Gerber⁹

Why is progress so limited (6, 7)? We see a widespread and underacknowledged disconnect between initiatives aimed at increasing diversity in academic and professional institutions and the experience of URM students

A CRT-Informed Model to Enhance Experiences and Outcomes of Racially Minoritized Students

Candice Powell, Cynthia Demetriou, Terrell R. Morton, James M. Ellis

Anti-racist interventions to transform ecology, evolution and conservation biology departments

Melissa R. Cronin[Ⓞ]✉, Suzanne H. Alonzo, Stephanie K. Adamczak, D. Nevé Baker[Ⓞ], Roxanne S. Beltran, Abraham L. Borker, Arina B. Favilla, Remy Gatins, Laura C. Goetz[Ⓞ], Nicole Hack, Julia G. Harenčár[Ⓞ], Elizabeth A. Howard, Matthew C. Kustra[Ⓞ], Rossana Maguiña, Lourdes Martinez-Estevez, Rita S. Mehta, Ingrid M. Parker, Kyle Reid, May B. Roberts, Sabrina B. Shirazi, Theresa-Anne M. Tatom-Naecker, Kelley M. Voss[Ⓞ], Ellen Willis-Norton, Bee Vadakan, Ana M. Valenzuela-Toro[Ⓞ] and Erika S. Zavaleta

Simply admitting an URM student is not enough if that student feels unwelcome, unheard, and unvalued...Until URM students and researchers can bring their whole selves to their science, no amount of diversity will yield inclusion.

Puritty et al., 2017. *Without inclusion, diversity initiatives may not be enough*. Science 357 (6356): p. 1101-02

Diversity and inclusion cannot exist without a sense of belonging. We need to acknowledge people's identities for them to feel included. Focusing on diversity without inclusion makes marginalized groups feel that they merely serve as a diversity statistic, and that in reality their voices and experiences do not count.

Kuheli Dutt, 2020. *Race and racism in the geosciences*. Nature Geosciences
13: p. 2-3

COAST as a facilitator and curator



COAST Anti-Racism and Inclusive Diversity Resources

https://www.calstate.edu/impact-of-the-csu/research/coast/Pages/Anti-Racism_Inclusive_Diversity_Resources.aspx

- Curated and dynamic list of books, articles, podcasts, websites and other media to help understand systemic racism in the US and what we can do about it.
- Information, including recordings, from previous workshops, panels and speakers we have hosted.
- List of student scholarships, opportunities and resources for Persons Excluded because of their Ethnicity or Race (PEERs)

CSU COAST-ADVANCEGeo Workshops

**Implicit Bias and Microaggression Workshop for Graduate Students
(Sept. 2021)**

Active Bystander Intervention Workshop (Oct. 2021)

Improving work climate: developing effective codes of conduct (Feb. 2022) [REGISTER](#)



<https://serc.carleton.edu/advancegeo/index.html>

Remove financial barriers to field experiences

Field experiences

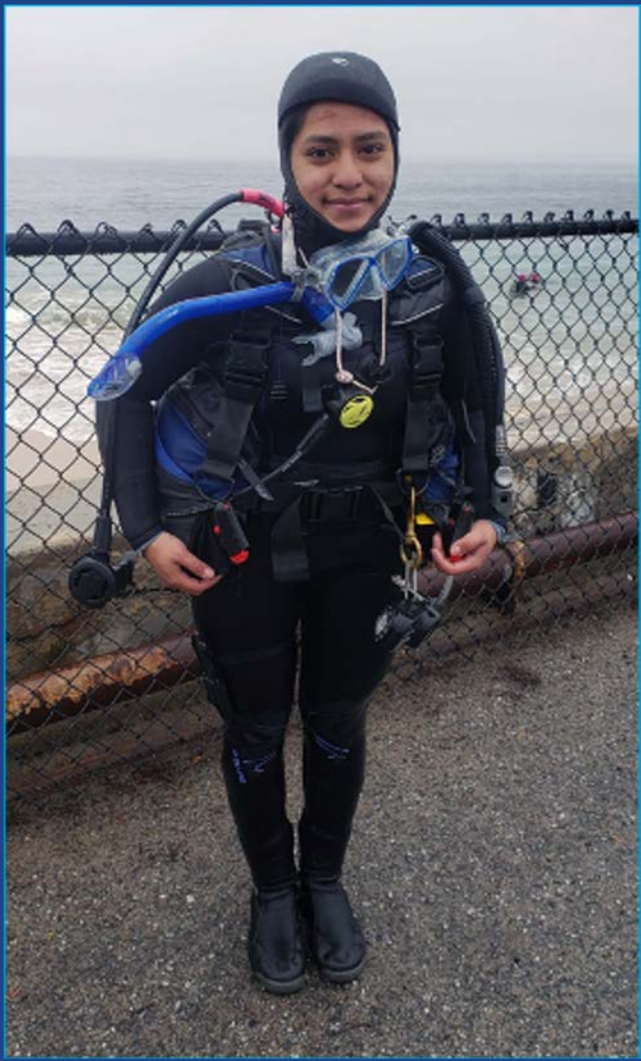
- Are often transformative
- Increase retention of excluded groups
- Can be prohibitively expensive



Is it a good experience or a bad one?

For students new to geoscience, especially those who didn't have access to hiking and camping trips growing up, many items that seasoned field geoscientists take for granted, such as sturdy boots, good waterproofs, and a reliable backpack, must be purchased. This financial burden can be substantial, and typically occurs at a time when students face numerous other new costs. As a result, students often go to the field unprepared and are unlikely to enjoy the experience — having cold and wet feet for a week can understandably erode the desire to learn. Practical aspects of being outdoors can also be daunting for the unfamiliar. Unanswered questions about how to go to the toilet or deal with a period have a range of serious consequences, from dehydration to infections. Universities can do much to

New \$50K student program to defray cost of field experiences



Personal field gear

Field courses fees

Travel and lodging for remote field work

Look for announcement in early 2022!

Questions?

