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.

Almost 70% of students are students of color.

More female students.

### BY ETHNICITY

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>African American</td>
<td>19,645</td>
<td>4.0%</td>
</tr>
<tr>
<td>American Indian</td>
<td>987</td>
<td>0.2%</td>
</tr>
<tr>
<td>Asian/Pacific Islander</td>
<td>76,509</td>
<td>15.8%</td>
</tr>
<tr>
<td>Hispanic/Latinx</td>
<td>217,232</td>
<td>44.7%</td>
</tr>
<tr>
<td>White</td>
<td>106,603</td>
<td>22.0%</td>
</tr>
<tr>
<td>Other/Unknown</td>
<td>17,464</td>
<td>3.6%</td>
</tr>
<tr>
<td>Two or More Races</td>
<td>20,798</td>
<td>4.3%</td>
</tr>
<tr>
<td>Non-Resident Alien</td>
<td>26,312</td>
<td>5.4%</td>
</tr>
</tbody>
</table>

### BY GENDER

<table>
<thead>
<tr>
<th>Gender</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>206,198</td>
<td>42.5%</td>
</tr>
<tr>
<td>Women</td>
<td>279,352</td>
<td>57.5%</td>
</tr>
</tbody>
</table>
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

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

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

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

Sylvaine Giakoumi¹,²,ª, Cristina Pita⁵,⁶, Marta Coll⁵, Simonetta Fraschetti⁷,⁸, Elena Gissi⁰, Isidora Katara⁹, Elena Lloret-Lloret⁵, Francesca Rossi¹, Michelle Portman¹, Vanessa Stelzenmüller¹°, Fiorenza Micheli¹°
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 that 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)
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, Isaac Sabat, Rachel Trump-Steele and Eden King

Structure Matters: Twenty-One Teaching Strategies to Promote Student Engagement and Cultivate Classroom Equity
Kimberly D. Tanner
Department of Biology, San Francisco State University, San Francisco, CA 94132

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

How Field Courses Propel Inclusion and Collective Excellence
Erika S. Zavaleta, Roxanne S. Beltran, Abraham L. Borker

Improving Underrepresented Minority Student Persistence in STEM

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

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
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?