Equity Through Access:
Mitigating Barriers to STEM for Marginalized & Minoritized Scholars

COBRA
Master Class
Respectful Concept Development Session
March 19, 2024

Catalina Martinez (she/her)
Equity Advisor
NOAA Ocean Exploration
“The language that we use to describe these groups and the results of racism matters.

In this vein, I do not use the terms underrepresented groups or underrepresented minorities and, in its place, I use the terms racialized, marginalized, minoritized, and/or excluded groups.

Marginalized or minoritized groups can generally apply to any of the identities that suffer from discrimination due to the multiple identities of race, ethnicity, sexual orientation, gender, religion, or ability, among others.

This choice of terminology offers a more accurate description. It removes the yoke of the problem from those individuals for whom damage is being done. Simply put, deficit language problematizes the victim.”

V. Morris
Community Guidelines

• Confidentiality: Share experiences, but no identifiers
• Acknowledge, support, & affirm one another
• Practice acceptance & commit to learning
• Convert resistance into “wonder”
• Be present & listen actively

• Speak from your own experiences
• What is learned leaves; what is shared stays
• Give space & grace to others
The Chance of Birth

... dictates access to opportunities and resources on all levels

- Family
- Community
- Identity
- Health/wealth

- Economic, social, political and cultural capital

Source: federalreserve.gov/econres/notes/feds-notes/disparities-in-wealth
Face of America is Changing

Face of STEM in America is not

Scientists and engineers working in science and engineering occupations: 2015

Racial/ethnic composition US 1980-2040

NOTES: Hispanic may be any race. Other includes American Indian or Alaska Native, Native Hawaiian or Other Pacific Islander, and multiple race. Women, Minorities, and Persons with Disabilities in Science and Engineering: 2017

Source: nsf.gov/statistics

Source: Pewresearch.org/fact-tank
NOAA TOTAL WORKFORCE BY DEMOGRAPHIC

(Data collected from HR Connect Data Insight Reporting System - Table A1 (All) – Data as of 09/14/2021)

Source: MD-715 FY21 NOAA State of the Agency Report-Out by R. Grant, Acting Director, NOAA OICR
Progress?

Earth Science Has a Whiteness Problem

 Barely 10 percent of doctoral degrees in the geosciences go to recipients of color. The lack of diversity limits the quality of research, many scientists say.

Race and racism in the geosciences

Kuheli Dutt

Nature Geoscience 13, 2–3 (2020) | Cite this article

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.
Diversity
• Is increasing
• Is a moral & ethical imperative
• Is essential
• Is a choice
How did I get here??

NOAA TOTAL WORKFORCE BY DEMOGRAPHIC

Source: nsf.gov/sta7s7cs

Photo credit: Dave Wright
Class of 2002

John A. Knauss
Marine Policy Fellowship
Seagrant.noaa.gov

noaa.gov/education
What can we do?

Effective Practices
Benefits of Experiential Opportunities

- Financial $$$
- Mentors & Champions
- Uncover Super Powers
- Build Science Identity
- Technical Skills
- Professional Networks
- Strengthen Resume
- Sense of Social Belonging
- Assess Interest
- Build Relationships
- Future Job Opportunities
Strategic Recruitment Practices

- Honest marketing
- Be active & intentional
- Be relational & meet people where they are
- Include MSI’s, CC’s, & National Societies
- Allocate resources
- Work doesn’t end here!

Welcome to the NSF SOARS® website!
Equitable Financial Considerations

- Equitable & full funding for all
- Travel/transportation
- Housing and room & board
- Conference participation

- Stipends & timing
- Dress code
- Field gear
- Unanticipated costs

Bridge the Preparation Gap

- Guidance & assistance
- Webinars & videos
- Mentoring & encouragement

If yes, what were the barriers to completion?

- Timing/deadline: 8 (50%)
- Lack of guidance/assistance: 8 (50%)
- The need for letters of recommendation: 5 (31.3%)
- Writing the personal statement: 1 (6.3%)
- GPA too low: 6 (37.5%)
- Lack of confidence in my application packets: 11 (68.8%)
- Other: 1 (6.3%)

Have you ever started, but not completed an application for an internship, scholarship, and/or fellowship?

- Yes: 23.8%
- No: 76.2%

21 responses

ODI & UCLA CDLS 2019
Example of Traditional Application Requirements

<table>
<thead>
<tr>
<th>Weight Percentage</th>
<th>Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>30%</td>
<td>Education</td>
</tr>
<tr>
<td>20%</td>
<td>Activities</td>
</tr>
<tr>
<td>20%</td>
<td>References</td>
</tr>
<tr>
<td>30%</td>
<td>Essay</td>
</tr>
</tbody>
</table>

- General: GPA, citizenship, school reputation, major
- Education: Relevant coursework
- Activities: Experiences, activities, awards, volunteering
- References: Letters from Academic Advisor or Professor
- Essay: Education/career plans

Avoiding gender bias in reference writing

Got a great student? Planning to write a super letter of reference? Don’t fall into these common traps based on unconscious gender bias.

**Mention research & publications**

Letters of reference for men are 4x more likely to mention publications and twice as likely to have multiple references to research. Make sure you put three critical accomplishments in every letter!

**Keep it professional**

Letters of reference for women are 7x more likely to mention personal life - something that is almost always irrelevant for the application. Also make sure you use formal titles and surnames for both men and women.

**Step away from stereotypes**

- Positive traits: passionate, intelligent
- Avoid using double standards; men are often expected to have leadership roles, women are expected to be nurturing.
- Avoid stereotypes directly (not emotional).

**Sing doubt**

No letters, but continents, such as 'I have one better than him' in letters for 100% of men.

**Ives to include**

- Successful, excellent
- Accomplished, outstanding
- Skilled, insightful
- Resourceful, confident
- Intellectual, independent

**Unconscious Racial Bias Can Creep Into Recommendation Letters—Here’s How to Avoid It**

(by Asmeret Asefaw Berhe and Sina Kim)

[Link to Facebook page on www.facebook.com/uacsw]
Holistic Review Process

Human Potential, thought not always apparent, is there waiting to be discovered and invited forth. William W. Purkey
Diversify Reviewer Pools & Selection Committees

“We want the best and the brightest!”
“He’ll fit into the group more easily.”
“I went to grad school with his advisor: I trust them.”
“Can’t go wrong with a Stanford student.”

SHIFT THE MINDSET: Select for culture ADD not culture FIT
Critical Mass Matters
Cohort Models | Diverse Faculty/staff/mentors

Othering

The ‘lonely only’

Biases = slow violence
Safety, Culture, & Environment

- Environment & culture
- Physical & emotional safety
- SASH prevention & response
- Comprehensive trainings & orientation
- Codes of conduct
- Support structures & POCs
- Reporting procedures
- Emergency response protocols

"Stop asking how we can get more women interested in science] and protect the women, and people of color, people with disabilities, and LGBTQ persons who are in science already," Geologist Jane Willenbring
Race and gender differences in how sense of belonging influences decisions to major in STEM

Katherine Rainey, Melissa Dancy, Roslyn Mickelson, Elizabeth Stearns & Stephanie Moller

Am I a Science Person? A Strong Science Identity Bolsters Minority Students’ Sense of Belonging and Performance in College

Susie Chen, Kevin R. Binning, & Nancy Kaufmann

The Importance of Science Identity for Inclusion

December 04, 2020 By Marie A. Bernard
"This idea that we all have the same life is false. Race, class, gender come together to shape the life chances of people in very different ways.” Kimberlé Crenshaw
Systemic Racism & STEM

Oceanography's Diversity Deficit: Identifying and Addressing Challenges for Marginalized Groups
By Salma T. Abdel-Raheem, Allison R. Payne, Milagros G. Rivera, S. Kersey Sturdivant, Nia S. Walker, Melissa C. Márquez, Armando Ornelas, Mo Turner, Kelsey Byers, and Roxanne S. Beltran

Colonialism still influences the earth sciences today — and that's a big problem for research
Western biases still pervade research
By Justine Calma | @justinecalma | Jan 4, 2020, 9:19am EST

Interrogating Structural Racism in STEM Higher Education
Ebony Omotola McGee
First Published November 13, 2020 | Research Article | Check for updates
https://doi.org/10.3102/0013189X20972718

Decolonising Science Reading List
It's The End of Science As You Know It

From V. Sloan
• Flawed analogy
• Passive approach
• Fails to acknowledge exclusionary experiences

Source: Articles & Commentary, Workforce Development/STEM, Mar 11, 2015
'Reframing the challenges of BIPOC scholars, especially women of color, as a hostile obstacle course provides a more accurate visual representation of the inequitable experiences within academia and the systemic barriers that exist.'
Be Intentional & Relational

Opportunity

Experience

INSANITY: DOING THE SAME THING OVER AND OVER AGAIN, AND EXPECTING DIFFERENT RESULTS.

Source: B. Jones
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Ben Cuker, Hampton University
Corey Garza, University of Washington
Deidre Gibson, Hampton University
Catalina Martinez, NOAA Ocean Exploration
Wendy F. Todd, University of Minnesota Duluth
Cassie Xu, formerly with Columbia University
GEO REU Handbook

Creating an Inclusive REU Application
Christopher Atchison
Vahina Sloan
Rebecca Haacker
Gabriela Bernardo Mariki
Saan Thaircher

Selecting a Diverse and Balanced Cohort
Vahina Sloan
Barbara C. Brune
Rebecca Haacker

Developing an Anti-Racist REU Program
Monica Messer
Vahina Sloan
Valerie Sloan
Lisa Vihma

Sexual Harassment Prevention
Barbara C. Brune
Rebecca Haacker
Michael Hubenthal
Enika Marie-Spaeta

Source: V. Sloan