ADVANCING SYSTEMIC CHANGE THROUGH FACULTY AND EARLY CAREER DEVELOPMENT TO IMPROVE INSTITUTIONAL CLIMATES

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THE DATA IS CLEAR: OCEAN SCIENCES HAS A DEI PROBLEM

- 6 of 10 years: No AI or AN women received a BS in ocean science.
- In 2006, 1 Hispanic/Latino woman received a BS in ocean science.
- 4 of 10 years (2004-2014): No black women received a BS in ocean science.

## INCLUSIVE CLIMATES IN OCEANOGRAPHY

<table>
<thead>
<tr>
<th>ONE SIDE:</th>
<th>THE OTHER SIDE OF THE SPECTRUM:</th>
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</thead>
<tbody>
<tr>
<td>Invisibility</td>
<td>Acknowledgement</td>
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<tr>
<td>Exclusion</td>
<td>Engaged listening</td>
</tr>
<tr>
<td>Interruption</td>
<td>Recognition of privilege</td>
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<tr>
<td>Condescension</td>
<td>Support</td>
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<tr>
<td>Stereotyping</td>
<td>Mentoring and network and resource sharing</td>
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<tr>
<td>Bullying</td>
<td>Respect</td>
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<td>Intentional acts of cruelty</td>
<td>Exceptional acts of kindness</td>
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The balance between inclusivity and exclusivity in oceanography.
THE CULTURE OF OCEANOGRAPHY IS CONSTANTLY BEING CREATED

- All of us are agents that can work **individually** and within **groups**
- Inclusion is socially constructed through **actions** with and **behavior** towards other
- Oppression has to be constantly reproduced in **everyday life encounters and processes** to endure

Transformation cannot exist without centering anti-oppressive processes for achieving anti-oppressive goals.

ASSESSMENT DATA

Pilot:
• Supported by a NSF CAREER award
• One motivated PI with a growth mindset reading the educational literature
• 90% retention rates, while the national average is 20-40% for different groups in STEM
FROM OASIS TO FOREST

• Grass-roots (faculty, students, postdocs, staff from multiple departments, partners)

• Collaboration including Higher Education Research Institute, Center for Education, Innovation and Learning in the Sciences; faculty, students, postdocs, and staff; Geography, AOS, EPSS, IoES, Chemistry

• MSI partners including CCs, CSUs, HBCUs, TCU, and PWI/HWI partners

• Diversity and inclusion are elevated to the equivalent level as STEM research areas and disciplines in this ORU

• Support people connecting across units to learn, share, adapt, and achieve a critical mass for institutional change!
SUPPORTS INCLUSIVE SCIENCE ELEMENTS FROM META-ANALYSIS OF SUCCESSFUL BIOMED PROGRAMS

Faculty Development
- Participation of Diverse Researchers
- Integrated Race/Gender and Science Identities
- Culturally Responsive Practices

Inclusive Science
- Diversity Innovations in Science
- Climate for Diversity
- Connections with Diverse Communities

Research Enrichment or Curriculum Innovation

Partnerships/Networks
- Student Training

Hurtado et al., 2017
**EFFECTIVE INDIVIDUAL AND CONTEXTUAL INTERVENTIONS TO SUPPORT RETENTION OF TRAINEES**

<table>
<thead>
<tr>
<th>Highly talented, motivated, and prepared URM students</th>
<th>Highly talented, motivated, but underprepared URM students</th>
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<tbody>
<tr>
<td>Program examples</td>
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<tr>
<td>Meyerhoff Scholars, DNIMAS Scholars (Norfolk State University Dozoretz National Institute for Mathematics and Applied Sciences)</td>
<td>SACNAS/Synapse (Society for Advancement of Chicanos and Native Americans in Science/Supporting Young Native Americans to Pursue Science Education)</td>
</tr>
<tr>
<td>MARC/U-STAR (NIH–NIGMS Maximizing Access to Research Careers/Undergraduate Student Training in Academic Research)</td>
<td>College Horizons Program, RISE (Research Intensive Senior Experience)</td>
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<tr>
<td>LA-STEM (Louisiana Science, Technology, Engineering &amp; Mathematics) Research Scholars</td>
<td>Biology Scholars Program (UC Berkeley)</td>
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<td>IMSD (and NIH–NIGMS Initiative for Maximizing Student Development)</td>
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<td>NIH Women of Color Legacy Project (Spelman)</td>
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**individual-level interventions**

- Emphasize elite status as scholar

**Contextual-level interventions**

- Provide faculty and institutional climate of inclusion, cultural competence, acceptance, high expectations, and financial support

- Build science efficacy, identity as a scientist, and motivation and internalize values of STEM disciplines

Programs listed were chosen because of their national reputations for increasing retention and/or persistence of URM STEM students across several years. This list is not exhaustive.

Estrada et al., 2016
AN ECOSYSTEM OF FELLOWSHIP PROGRAMS
COMMUNITIES OF LEARNING AND PRACTICE

FACULTY AND HONORARY FELLOWS PROGRAM:

• Emphasis on creating collaborative, inclusive environments in research lab and classroom and departments

• ~50% completed 20-50 hours of training in past 1.5 years

• 27 trainings offered

• 8 trainings that faculty participated in: Confronting Bias, Entering Mentoring, Facilitating Entering Mentoring, Faculty Learning Program, Summer Institute, Bringing Theory to Practice in Education. Multiple Models for Community-Engaged Teaching, Community Partner Perspectives

• Able to nominate early career fellows

• Put into practice: Produce deliverables to receive small amount of funding, and be able to apply for a small grant
MULTI-EDUCATIONAL STAGE FELLOWS PROGRAM FOR TRAINEES

- Higher and technical skills development, service learning, research in collaborative environments

- >50 trainings offered to early career fellows; we helped sponsor: Emerging Leaders for our Emerging Future, ALOHA leadership training, Indigenous Perspectives of Health and Well-being, Reclaiming STEM

- Fellow-led community engagement programs include: Queers in STEM, Environmental Justice and First Nations, K-12 Outreach, Diversi-Tea and Courageous Coffee, Climate Currents, Veterans in STEM, and more!

- Collaborative research projects in range of subjects from environmental justice, coastal resilience, paleoclimate, paleoceanography, geochemistry, biomineralization, green chemistry, conservation biology, science identity, and more

Demographics

- LGBTQIA+
- Womxn of color
- Womxn
- URM

% Early Career Fellows

0 20 40 60 80
HERI ASSESSMENT TOOLS

Trainees:
• STEM identity
• Science skills, practices

Trainees and faculty:
• Higher skills, behaviors, practices
  Leadership
  Sense of belonging
  Climate with respect to diversity
  Habits of mind
  Social awareness
  Influencing social values
  Communication

Stokes et al. – student fellow-led assessment study of science identity in trainees
THURSDAY AT OCEAN SCIENCES: Multiple screenings of different documentaries “Can We Talk?”

Geosciences data: Bernard and Cooperdock, Nature Geoscience, 2018


Inclusive science: Hurtado et al., 2016

Film screenings and facilitated discussions of Can We Talk: kendallmoore@uri.edu

NOAA Scientist-in-Residence program at Ocean Discovery Institute:
https://oceandiscoveryinstitute.org/scientist-in-residence-program/

NOAA Barriers to Scholarship/Program Application: catalina.martinez@noaa.gov

Center for Diverse Leadership in Science: http://ioes.ucla.edu/diversity

NOAA Cooperative Science Center in Atmospheric Sciences and Meteorology: http://ncas-m.org or http://ncas.howard.edu

Advocacy, reporting, and legal expertise: Through AGU – Kristina Larsen