Addressing Structural Barriers to Diversity in Science

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Problem statement

Coastal populations are inherently diverse along racial, ethnic, and socioeconomic dimensions. If the goal of CoPe is to best serve our coastal populations, it is imperative that our research hubs reflect these populations. Yet enduring barriers to diversifying science exist both within and external to the academy. These barriers may be visible, such as requirements to submit GRE scores, or not, such as internalized biases. In the latter case, overturning poor practices becomes a greater challenge.

Thus, this work is long and arduous. It can lead to lasting partnerships and better research. It starts with all of us acknowledging our own lived experiences as equally legitimate to our peers, our students, and all of our partners—and not superior to. So, too, we must acknowledge that these lived experiences have informed and deeply ingrained biases with which we view and experience the world and our science.

Proposed solution

Our specific, differentiated recommendation is to create a framework through which the NSF and CoPe can begin to deconstruct these existing structural barriers that suppress diversity within the academy and our academic partnerships.

We note that scientists are not necessarily academics, and we do not wish to delimit the possible improvements to diversity in science to the academy alone. Rather, we choose to target academic scientists for a workable solution on this timeline.

This framework should be informed using existing, robust literatures from the learning/social sciences and diversity, equity, access, and inclusion (DEAI) work. (This includes leveraging lessons learned from existing NSF-funded programs including ADVANCE and INCLUDES). Further, let us engage those learning and social scientists to help inform these best practices *as partners within the hub.*

The framework should be flexible enough to incorporate new findings and best practices (and to remove those practices that are no longer useful). Such a module lends itself well to transferability and, ideally, can find a much greater reach outside of CoPe hubs alone.

Because of its size and reach, there exists a great advantage to using the CoPe hub model to promote diversity enrichment strategies. Some specific relationships, and possible ameliorative measures, are listed below. All of these mechanisms can be enforced as requirements to be join CoPe hubs and should be made available to future and different funding bodies:

- NSF->Academic scientists
    - **Holistic reviews**
    In order to join CoPe, academic scientists must undergo a holistic review directed by the NSF, or CoPe's governing body, or an external review board (whatever structure fits the chosen hub model). We define a holistic review as one that considers much more than professional success—CoPe participants *must* exhibit a clear track record (or reasonable promise) of engaging in DEAI best practices.
    - **Cohort training,** this may come in two forms:
        - Onboarding—as a new researchers/junior faculty joining or hoping to join CoPe.
        - Enhancing awareness of existing NSF programs and
- Academic scientists<->Academic scientists
    - We recognize that several barriers to success for junior scientists exist. One specific barrier is isolation, which is a side effect of the hiring process. To help aid in their networking, interaction with scientists at similar career stages should be facilitated through **peer-to-peer networks**, either virtual networks (mailing lists, etc) or as face-to-face interactions at workshops.
    - Peer-to-peer barriers stem from our own internalized biases. One possible CoPe mechanism to surmount this is "**internalized bias review**" (e.g. Harvard Implicit Bias Assessment), which helps identify held biases which can be addressed.
- Academic scientists->students
    - Academic scientists, when considering future students or lab staff, should conduct a holistic review of candidates. See above for a definition of **holistic review**, with the clear distinction that this style of holistic review would examine the whole student (and not just their academic success).
    - Barrier to students: disaggregated student networks & access to marine studies programs. A potential solution is to develop **a cohort model**, which connects coastal science students with one another as a peer-support network.
    - Barrier to students: unpaid internships. Solution—CoPe should **prioritize funds dedicated to training future scientists**, including paid internships.
    - Barrier to students: perception of coastal scientists as homogenous, nondiverse group. This turns potential students away from considering a career in the coastal sciences. **In diversifying CoPe participants, we present a unified, diverse front of scientists.**
    - Barrier to students: perception of scientists, more broadly, as unrelatable. Solution within the CoPe framework is to equip CoPe scientists with better science engagement (including communication) abilities that highlight and prioritize the multidimensional lives of scientists (i.e. humanizing scientists).

Reasoning or supporting evidence

Beyond the blanket statement that DEAI work is inherently "the right thing to do," there is a clear business and research case in favor of a diverse workforce. The most innovate solutions cannot be attained without a diversity of thought.