

Investigating IDEA Work in Geoscience Departments Across the United States: Who carries out this work? What motivates faculty to become involved? How is faculty IDEA labor recognized and rewarded? M.E. Elwood Madden¹, A. Kotash¹, M. Woodle¹, J. Bhattacharya¹, A. Cerato¹, M. Fahs¹, J. Irungu¹, E. Martin¹, L. Snyder¹, and G. Soreghan¹, ¹University of Oklahoma, Norman, OK (melwood@ou.edu)

Introduction: Racial and ethnic diversity in the geosciences, including planetary science is exceptionally low, even relative to other STEM fields. Alarming, these demographics have not shifted significantly over the past 40 years, even as gender representation improved, and despite sustained attempts to achieve diversity [1](Bernard & Cooperdock, 2018). This result does not reflect a lack of study, but — to some degree— a lack of effectiveness, especially in achieving retention beyond the undergraduate degree [2] (Whittaker and Montgomery, 2014).

Growing and sustaining diversity in academia and research labs requires addressing the climate and culture— including career-advancement structures [3] (Rice and Alfred, 2014)— a macrosystem approach to diversity and inclusion [4] (Wolfe & Riggs, 2017). In other words, mentoring early career planetary scientists with systemically underrepresented and marginalized (URM) identities is not enough; institution-scale and discipline-scale cultural change is critical [5] (Ovink & Veazey, 2011). Planetary science, and geosciences more broadly, will suffer if we fail to hire, support, encourage, and mentor faculty who actively support diversity, equity, and inclusion (DEI) efforts to achieve success in tenure and promotion. Institutional barriers impede progress because traditional evaluation criteria focus on research metrics (and secondarily teaching within academia), with minimal acknowledgment of service, which is where “diversity activities” commonly fall. Activities such as mentoring URM students in research, implementing inclusive teaching and mentoring practices, and collaborating with postdocs and junior faculty are undervalued. In addition, the invisible labor carried out by many URM scientists is often ignored in traditional evaluation systems (e.g. one-on-one listening sessions, educating uninformed colleagues, providing peer mentoring and support for other URM colleagues).

Constraints on faculty time impede implementation of effective teaching and mentoring practices, which *can* improve diversity, inclusion, and equity in the geosciences [6] (Riihimaki & Viskupic, 2020). If these practices occur and go unrewarded in evaluations or tenure and promotion processes, change for the better may also fail; motivations reflect expectancies of effort and outcome, and thus individuals lose motivation when the outcome is unvalued [7] (Walker & Symons, 1997). Recognizing and rewarding equity-building activities as valid and valued work is a big step toward removing educational disparities in STEM;

sustained change requires such changes in systematic/institutional practices [2]. Therefore, we suggest that evaluations of faculty, research scientists, postdocs, and other PI-level roles, must be scrutinized, deconstructed, and revised within our institutional systems to lower the barriers for meaningful DEI work that will support and engage current and future URM students within planetary science and the geosciences more broadly. While numerous studies have documented the bias in academic reward systems that affect women and URM faculty, few studies have investigated and demonstrated how reward system can be revised to IDEA outcomes.

This project focuses on geoscience faculty, as faculty have a significant impact on the climate and culture within undergraduate and graduate programs, thus influencing future scientists at a critical juncture in their career and personal development (Figure 1). However, we hope that our work can be adapted to evaluations of other professional Planetary Science roles, including research scientists, project leads, principle investigators, program managers, and other management, leadership, training, and mentoring positions.

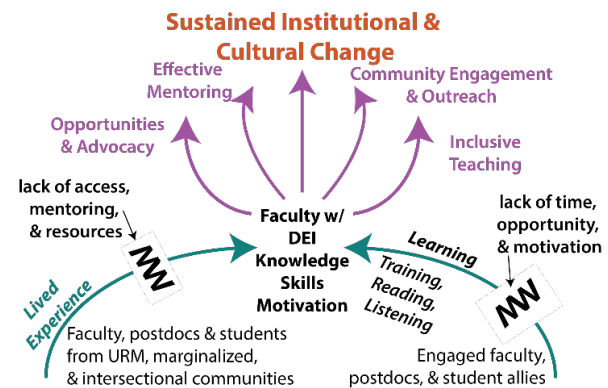


Figure 1. Faculty who engage in evidence-based IDEA work can have a significant impact on our future planetary science community. Faculty efforts should be recognized and supported through evaluations that equitably value and reward IDEA work

Research Methods: We attempted to collect faculty demographic data via a survey of geoscience departments nationwide to gain a baseline understanding of the distribution of faculty identities within academic programs. We also conducted videocall interviews of faculty in focus geoscience to learn how existing evaluation systems impact their perceptions, motivation,

and efforts to engage in DEI learning and work were completed in fall 2021. We randomly invited 3 faculty members representing different career stages (Assistant or Associate/Full) and with different perceived identities (women+URM) from each department to participate, in hopes of gaining different perspectives. We are currently collecting data through a national survey of geoscience faculty, including planetary scientists, to further expand our understanding of ongoing IDEA activities, motivations, and evaluation practices across a broader range of faculty.

Faculty Demographics, Interviews, and Surveys:

Faculty Demographic Data- Our efforts to collect and collate high quality geoscience faculty demographic data from institutional research offices across the United States were largely unsuccessful. Despite wide recruitment efforts, we only received institutional data from <60 departments. Of the responses we did receive, most contained only the most broadly classified data (binary gender data, URM status), without detailed data needed to investigate the intersectional identities (e.g. Black women, Native American men). Based on questions and responses we received from administrators and faculty leaders, we infer that there were significant institutional barriers that prevented department chairs and directors from gaining access to the institutional data or sharing the data beyond the institution. Funding agencies and/or professional organizations may be more effective at collecting, collating, and sharing this type of faculty demographic data. The data may also exist in Department of Education repositories, but is not publicly available at the discipline level, only within the broad Physical Sciences classification.

Faculty Interviews- We interviewed 45 geoscience faculty members in X departments across the U.S. to learn about the types of IDEA work they are aware of within their program, their own IDEA efforts, and what motivates them to engage in IDEA work. We also asked faculty whether IDEA efforts are valued in workload policies, evaluations, tenure/promotion decisions, raises, awards, or bonuses, as well as questions about how IDEA work is distributed amongst faculty within their department. Initial results suggest that >70% of the respondents perceived that IDEA work was not recognized or valued in their department's evaluation systems and almost 90% of respondents reported IDEA work is not equally distributed, with women and early career faculty carrying out most of the labor. We continue to code and analyze the interview responses to glean insight into motivations and equitable evaluation structures that recognize and reward IDEA work.

Geoscience Faculty Survey- as of Feb 15th, 2022 we have collected 398 responses to our national survey which asks similar questions to those covered in the interview. We hope to collect ~100 more survey responses before we delve into data analysis.

Next Steps:

The project team continues to analyze the data collected through our interviews and will begin analyzing survey responses soon. Results will inform development of promising evaluation practices that equitably recognize, value, and reward IDEA work. We plan to share example evaluation language, templates and other resources with the geoscience and planetary science community through journal articles and webinars in 2023.

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References: [1] Bernard & Cooperdock 2018, *Nature Geoscience*, 11, 292-295. [2] Whittaker & Montgomery 2014, *Innov. Higher Ed.*, 39, 263-275. [3] Rice & Alfred 2014, *J. STEM Ed: Innov. and Res.*, 15, 40-49. [4] (Wolfe & Riggs, 2017). [5] Ovink & Veazey 2011, *Res. Higher Ed.* 52, 370-394. [6] Riihimaki & Viskupic 2020, *J. Geosci. Ed.*, 68, 115-132 [7] Walker & Symons 1997, in Bass (ed.) *Teaching Well and Learning It*, 3-18.