



EGUsphere, author comment AC1
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Reply on RC1

Caitlyn A. Hall et al.

Author comment on "GC Insights: Diversifying the geosciences in higher education: a manifesto for change" by Caitlyn A. Hall et al., EGU sphere,
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RC1

Thank you for taking the time to read this manuscript, and for providing helpful and specific feedback for how to improve this work. Below we have responded to all of your comments and have indicated how we will change the manuscript (which, for ease of use, we have written in blue text) as a result of these suggestions.

RC1.1: While the abstract is clear and concise, it leads the reader to expect a more robust discussion about specific recommendations for increasing diversity within geoscience academic programs. However, the article is scattered and attempts to cover too much ground in the limited amount of space allowed, especially with regards to couching the recommendations within the context of bias, racism, ethics, and barriers to inclusion. As a result, the recommendations are not as strong and well-formed as they could be, and the depth of discussion needed for explaining clearly how those recommendations fit within and solve the issues of bias, racism, ethics, and barriers to inclusion is lacking. Furthermore, the strength of the recommendations is significantly diminished by the adversarial tenor of the article and the dearth of robust support for the assertions cited by the authors as the causes for low diversity within geoscience academic programs. While diversity continues to be a long-standing issue for the geosciences, the drivers are more complex than what the authors assert.

Response: We agree with the reviewer that a more holistic perspective of diversity more accurately reflects the complexity of topics within geoscience contexts that our paper addresses. There is certainly a lot more work to do for true and authentic diversity to become commonplace within academia. However, we are not intending to provide a robust analysis of the "causes of low diversity within geoscience academic programs". We are simply providing examples of scholars who are leading discussions on how we, the geoscience community, might begin to develop solutions to the complex issues of bias, racism, etc.

Our primary goal, in this manuscript, is focused on offering opportunities for geoscience educators to improve their curricula by using specific strategies to **diversify** their teaching

behaviors as well as their sources of technical expertise. Similarly, there is simply not enough space to discuss the complex history of how the geosciences came to have low diversity. Rather, we are more interested in sharing a forward-looking perspective that recognizes the history, but focuses on what geoscientists today have the power to change.

The intent of this article is to assert that there is a substantial body of knowledge about both the drivers and solutions that needs to be bridged into practice. However, we recognize that these comments from the reviewer are an important perspective on the communication of the article that we hope many physical scientists will read. In the revised version of the manuscript we will take these comments into consideration by making the main contribution more clear, explaining the work that we believe can be done now, and the limitations of our article given the format.

RC1.2: Overall, the strength of the article is in the recommendations for improving higher education by:

- advocating for institutional change through investing in the recruitment and retention of educators and learners from under-represented communities.
- incorporating diverse perspectives and authors in curricula by prioritizing the use of a wide array of publications and information sources
- including the historical, cultural, and sociopolitical contexts of geoscience information discovery in curricula.
- connecting geoscience principles to more geographically diverse locations, especially more local and regional sites across the world.
- implementing different communication styles that improve student engagement and learning and empower learner transformation and agency.

Response: Thank you for your comments, this will be greatly helpful in addressing RC1.1 to ensure that our intentions are clear and straightforward.

RC1.3: Development of operational approaches to these recommendations would strengthen the article as would inclusion of examples that have shown measurable improvements in increasing diversity, equity and inclusion within geoscience academic programs.

Response: We will work to include more examples throughout the article about the strides made. However, due to the manuscript word limit, we will need to use this to illustrate how we can leverage these advances to continue making change.

RC1.4: In the Introduction, the authors assert that the geosciences is “entangled with prejudiced practices, making it an inequitable and exclusive field” but do not provide any supporting references, and in the next sentence, the reference to the Marin-Spiotta et al, 2020 is not included in the list of references.

Response: We will include additional references to assert this, as well as ensure that the in-text citations match the end list.

The full citation for the Marín-Spiotta et al., 2020 reference is:

Marín-Spiotta, E., Barnes, R. T., Berhe, A. A., Hastings, M. G., Mattheis, A., Schneider, B., & Williams, B. M. (2020). Hostile climates are barriers to diversifying the geosciences. *Advances in Geosciences*, 53, 117-127. DOI: <https://doi.org/10.5194/adgeo-53-117-2020>

RC1.5: In the Champion Meaningful Transformation section, the arguments are scattered over two paragraphs between a brief overview of the need to build community relationships, ethics, and the need to recruit and retain educators and learners from underserved communities. This section would be strengthened by better organization of the content and a deeper discussion about the key agents, such as ethics training, recruitment and retention of educators and learners from underserved communities, and frameworks for building and maintaining community relationships. References to programs and initiatives that have shown measurable change would help strengthen these recommendations as well.

Response: This is a valuable comment that will help us to bring clarity to this section. We will reorganize this section to focus first on external engagement and then focus second on recruitment and retention as a key part of the way that universities can make progress in addressing societal challenges. In this section, many of the concrete programs are buried in the references. We will instead state those explicitly in the text and draw out the key concepts such as reparations for dispossession (Land Grab Universities and Slavery and Justice reports), programs that advance equitable engagement, valuing work that scholars do on outreach, community engagement, and equity, and education.

RC1.6: In the discussion about diversification of information sources, the authors discuss search engine use and the prioritization of high-impact journal articles over other types of articles. The authors fail to discuss the self-customizing algorithms of search engines that show search results tailored to the user's browsing behavior, including the country and language of the country in which the user resides. This algorithmic bias is inherent to search engine algorithms and at its best, attempts to help a user find the information they are seeking quickly. The authors do not discuss this algorithmic bias, nor offer any solutions to overcome this bias. Instead, they briefly mention SCImago, a database that only covers journals in the Scopus® database, and of the 240 countries covered by this database, U.S. publications represent 21% of the database contents. While this is a helpful site, recommendations on how to use browsers to find less visible publications, and discussion of the necessary skills for critically evaluating information sources would strengthen this section of the article.

Response: Thank you for this comment. We included algorithm bias in an earlier internal draft, but cut it during edits. This has been very helpful to see that it is a necessary point to include. We will make sure to include these details to further illuminate issues with search engines. We will include additional resources to highlight additional databases to find more diverse resources, as well as note the limitations of these.

RC1.7: The section on integrating historical content, citation of Stefanoudis et al., 2021 does not bring to light the long list of recommendations put forth in that article for including local researchers, but only highlights that local researchers are excluded by many scientists today, thus excluding the important actionable steps that Stefanoudis et al., 2021 detail.

Response: We will include the actionable steps included in this section as well as others that have been brought forth. We do note that we are focused on educators as our audience and will focus on applicable steps.

RC1.8: The section on connecting across geographies could be better developed by including a discussion about including local and regional context relative to the location of the academic department. By including local sites adjacent to institution's location, educators and learners would build community within the areas where they work and learn and would begin to integrate the other recommendations put forth in this article.

Response: Thank you for this comment. We will elaborate further on the value of place-

based education.