THE NATIONAL ASSOCIATION OF GEOSCIENCE TEACHERS

NAGT Position Statement

Adopted February 2026

Supporting Justice, Equity, Diversity, and Inclusion in the Geosciences

Position Statement

To advance Earth science education for all, it is critical that geoscience teaching, learning, and research be inclusive, conducted in ways that recognize and value diverse backgrounds, and are anti-racist, anti-ableist, and culturally responsive. NAGT recognizes that all scientists and educators benefit as a community from broadening the perspectives we engage with and from reflection about our own lived experiences and identities. As a community, geoscientists and educators should work together to support the success of *all* identities in our work, especially in recognizing and responding to the different ways people may be marginalized both in the classroom and our communities. We advocate for and seek to enact systemic change where education and the advancement of the geosciences is centered in justice, equity, diversity, and inclusion.

Rationale

We belong to a global society of diverse identities where inequities exist in access to resources, education, and how we are impacted by Earth processes. NAGT seeks to create a teaching and learning environment that is welcoming and just for all of its participants. In this context, we begin by clarifying our terminology as used herein. **Diversity** refers to the presence of differences in our community make-up based on socially understood concepts or societally dominant norms. These include, but are not limited to, race and ethnicity, gender and gender identity, sexual orientation, religion, socioeconomic status, disability, neurodiversity, marital status, pregnancy, status as a parent, guardian, or caregiver, citizenship, first-generation status, and language. The interconnected nature of different aspects of diversity experienced by individuals is **intersectionality** [1–4]. Within these intersectional components of human identity, there is a wide range of lived experiences. Geoscience is one of the least diverse of all STEM disciplines [5–13], and we have a responsibility to actively improve our discipline's representation and environment when engaging in geoscience education and research.

Because people vary in their access and needs in learning, it is critical to approach education and research in the geosciences through the lens of equity. **Equity** acknowledges that people do not all start at the "same place," and therefore require different resources or approaches to permit full participation. **Inclusion** emphasizes creating environments where all individuals feel supported, valued, and welcomed. Inclusive educational practices promote belonging for students with marginalized identities and include universal design for learning, culturally-informed pedagogy, and other student-centered approaches. **Justice** promotes fairness for all. It acknowledges past and present harms that have impacted certain individuals and communities and seeks restoration for those harms. Many of the environmental issues faced by members of society are a matter of justice, and Earth processes can disproportionately negatively affect marginalized groups due to structural racism, ableism, and other biases.

While representation of women in geoscience has improved in recent decades, racial and ethnic diversity has not shown the same trend [6,10]. Geoscientists have often historically been perceived and represented as white, able-bodied, cis-gender heterosexual men engaged in field work, which marginalizes people of other identities through lack of representation [2,14–21]. Geosciences as a discipline also has deep roots in colonialism [8,22,23], and has a long history of extractive exploitation of individuals and communities [22,24]. Teaching and study of geosciences in the Western Hemisphere relies extensively on approaches and ways of knowing from practitioners in North America and Europe and has largely ignored or failed to recognize historical contributions from other parts of the world, members of historically minoritized and excluded groups, and other ways of knowing such as traditional indigenous knowledge [25,26].

Students from historically excluded groups face additional obstacles, such as reduced sense of belonging, limited role models relevant to their identities, or limited support for their learning and professional growth. These students may also have had fewer opportunities to engage with geosciences within or beyond the classroom. Unsafe or inaccessible lab or field settings due to racism, sexism, ableism, and other forms of systemic oppression can additionally contribute to a culture of exclusion, especially where instructors do not consider how choices for field and lab work can differentially impact students. These concerns are the direct result of inequity, exclusion, and injustice, whether intended or unintended, resulting in a lack of diverse identities and perspectives within geoscience spaces.

We must address justice, equity, diversity, and inclusion (JEDI) in all aspects of our work to expand access to quality Earth science education and to the discipline as a whole, and to maintain the legitimacy of our collective work as

scientists and educators in global communities. Resolving inequities and biases in the geosciences and education broadly must be a priority in our work, our communities, our organizations, and our institutions. Because inequities are perpetuated by individuals as well as systems, we need to take collective action at both the individual and the systemic level to advance NAGT's vision of Earth education for all.

Recommendations

The following action is needed by all members and leaders of the association in our various roles:

Everyone Engaged in Geoscience Research and Education

- Examine how our individual backgrounds and biases influence the research we conduct and how we engage with the communities in which we conduct research and teaching
    - Recognize intersectional identities, multiple cultural contexts and histories
- Acknowledge inequities that result from the impacts of natural hazards and climate change
- Cultivate safe and inclusive communities in the classroom, field, at conferences, and beyond. Model inclusive practices and recognize the safety concerns of minoritized groups, gender expansive people, and women in field settings

Educators and Researchers

- Study, learn, and implement equitable and inclusive teaching, research, and leadership practices
    - Recognize exclusionary instructional and assessment practices and implement anti-racist, culturally responsive, trauma-informed, and other inclusive practices [5,27–34]
    - Apply universal design principles to increase accessible and equitable learning [35–40]
    - Engage in anti-ableist geosciences practices, such as acknowledging disabled community and perspectives in geoscience [29,41–43]
- Teach and engage in research with support for intersectional identities and in recognition of cultural contexts (e.g. colonialism, traditional and indigenous ways of knowing, disabled culture)
- Respect our community partners and develop skills in community-based and culturally relevant research and learning [27,29,30,44–49]
- Examine biases and implications of research approaches on marginalized communities and intersectional identities to implement changes which support all who may be impacted

Developers of Published Materials

- Textbook editors, educators, and marketing professionals should provide geoscience promotional materials that highlight diverse geoscience activities beyond rugged fieldwork [50,51]

Departmental and Institutional Leadership

- Advocate for programming and resources to better support opportunities for underserved and marginalized populations
- Foster a culture where JEDI work is recognized, valued, and expected of all community members
    - Recognize JEDI work when considering individuals for hiring, tenure, promotion, or awards
- Promote and support leadership by persons from historically excluded groups
- Encourage contributions, reporting, and measurable goal-setting through action plans for JEDI activities by all individuals/committees/schools

Professional Societies including NAGT

- Disseminate high-quality JEDI-related research, curriculum and instruction, reviews, and position articles through the *Journal of Geoscience Education, In the Trenches*, and other journals
- Empower educators and scientists to safely and effectively navigate ethical issues and create safer geoscience spaces

Supporting References: https://nagt.org/nagt/policy/ps-jedi.html#supporting

NAGT JEDI Resources: https://nagt.org/nagt/dei/resources.html

About NAGT: The National Association of Geoscience Teachers (www.nagt.org) champions its strong vision that *everyone* experiences welcoming, inspiring, and effective Earth education. NAGT promotes high-quality Earth education; fosters and disseminates research in geoscience education; drives change toward an equitable and inclusive system of geoscience education; and supports all geoscience educators throughout their careers.

Once adopted, NAGT position statements remain in effect for five years, as per the Procedure for Approval of NAGT Position Statements.

References

1. Carrera, A., Luckie, T. & Cooperdock, E. H. Extreme underrepresentation of first-generation college students in the geosciences: An intersectional issue. *Journal of Geoscience Education* **72**, 3–14 (2024).
2. Mattheis, A., Murphy, M. & Marin-Spiotta, E. Examining intersectionality and inclusivity in geosciences education research: A synthesis of the literature 2008–2018. *Journal of Geoscience Education* **67**, 505–517 (2019).
3. Núñez, A.-M., Rivera, J. & Hallmark, T. Applying an intersectionality lens to expand equity in the geosciences. *Journal of Geoscience Education* **68**, 97–114 (2020).
4. Crenshaw, K. Demarginalizing the intersection of race and sex: A black feminist critique of antidiscrimination doctrine, feminist theory and antiracist politics. in *Feminist legal theories* 23–51 (Routledge, 2013).
5. Ali, H. N. *et al.* An actionable anti-racism plan for geoscience organizations. *Nature Communications* **12**, 3794 (2021).
6. Bernard, R. E. & Cooperdock, E. H. No progress on diversity in 40 years. *Nature Geoscience* **11**, 292–295 (2018).
7. Dowey, N. *et al.* A UK perspective on tackling the geoscience racial diversity crisis in the Global North. *Nature Geoscience* **14**, 256–259 (2021).
8. Dutt, K. Addressing racism through ownership. *Nature Geoscience* **14**, 58–58 (2021).
9. Harris, L. *et al.* Equitable exchange: A framework for diversity and inclusion in the geosciences. *AGU Advances* **2**, e2020AV000359 (2021).
10. Huntoon, J. E., Tanenbaum, C. & Hodges, J. Increasing diversity in the geosciences. *Eos* **96**, 13–15 (2015).
11. King, L. *et al.* Diversity in geoscience: Participation, behaviour, and the division of scientific labour at a Canadian geoscience conference. *Facets* **3**, 415–440 (2018).
12. Ormand, C. J. *et al.* Making departments diverse, equitable, and inclusive: Engaging colleagues in departmental transformation through discussion groups committed to action. *Journal of Geoscience Education* **70**, 280–291 (2022).
13. Vila-Concejo, A. *et al.* Steps to improve gender diversity in coastal geoscience and engineering. *Palgrave Communications* **4**, 1–9 (2018).
14. Atchison, C. L. & Libarkin, J. C. Professionally held perceptions about the accessibility of the geosciences. *Geosphere* **12**, 1154–1165 (2016).
15. Bush, P. & Mattox, S. Decadal review: How gender and race of geoscientists are portrayed in physical geology textbooks. *Journal of Geoscience Education* **68**, 2–7 (2020).
16. Heimann, S. Perceiving gendered organizations: positions, power, and gender in geoscience. *Journal of Geoethics and Social Geosciences* **1**, 1–34 (2025).
17. Marín-Spiotta, E. *et al.* Hostile climates are barriers to diversifying the geosciences. *Advances in Geosciences* **53**, 117–127 (2020).
18. Mattox, S. *et al.* How gender and race of geologists are portrayed in physical geology textbooks. *Journal of Geoscience Education* **56**, 156–159 (2008).
19. Mervis, J. Better Intro Courses Seen as Key to Reducing Attrition of STEM Majors. *Science* **330**, 306–306 (2010).
20. Mol, L. & Atchison, C. Image is everything: Educator awareness of perceived barriers for students with physical disabilities in geoscience degree programs. *Journal of Geography in Higher Education* **43**, 544–567 (2019).
21. Sexton, J., O'Connell, S., Banning, J. H. & Most, D. E. Characteristics and culture of geoscience departments as interpreted from their website photographs. *Journal of Women and Minorities in Science and Engineering* **20**, (2014).

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22. Diaz-Vallejo, E. J., Keefover-Ring, K., Hennessy, E. & Marín-Spiotta, E. Critical Engaged Pedagogy to Confront Racism and Colonialism in (Geo) Science Education Through a Historical Lens. *Earth Science, Systems and Society* **4**, 10114 (2024).
23. Monarrez, P. M. *et al.* Our past creates our present: a brief overview of racism and colonialism in Western paleontology. *Paleobiology* **48**, 173–185 (2022).
24. Hearth, S. & Robbins, C. Mineral displays as embodiments of geological thought and colonial invisibility. *Journal of Natural Science Collections* **10**, 3–17 (2022).
25. Todd, W. F., Towne, C. E. & Clarke, J. B. Importance of centering traditional knowledge and Indigenous culture in geoscience education. *Journal of Geoscience Education* **71**, 403–414 (2023).
26. Visaggi, C. C. *Equity, Culture, and Place in Teaching Paleontology: Student-Centered Pedagogy for Broadening Participation*. (Cambridge University Press, 2020).
27. Andrews, E. E. *Disability as Diversity: Developing Cultural Competence*. (Oxford University Press, 2020).
28. Branch, H. A., Klingler, A. N., Byers, K. J., Panofsky, A. & Peers, D. Discussions of the "not so fit": how ableism limits diverse thought and investigative potential in evolutionary biology. *The American Naturalist* **200**, 101–113 (2022).
29. Carabajal, I. G., Marshall, A. M. & Atchison, C. L. A synthesis of instructional strategies in geoscience education literature that address barriers to inclusion for students with disabilities. *Journal of Geoscience Education* **65**, 531–541 (2017).
30. Johnson, A. & Elliott, S. Culturally Relevant Pedagogy: A Model To Guide Cultural Transformation in STEM Departments. *Journal of microbiology & biology education* **21**, 21.1.35 (2020).
31. Reano, D., Gedz, C., Garcia, Á. A. & Johnson, E. A. Confluent identities in the geosciences. *Journal of Geoscience Education* **71**, 288–300 (2023).
32. Rice, M. M. *et al.* Terminology in ecology and evolutionary biology disproportionately harms marginalized groups. *PLoS biology* **23**, e3002933 (2025).
33. Aghi, K. *et al.* Rigorous science demands support of transgender scientists. *Cell* **187**, 1327–1334 (2024).
34. Beane, R., McNeal, K. S. & Macdonald, R. H. Probing the National Geoscience Faculty Survey for reported use of practices that support inclusive learning environments in undergraduate courses. *Journal of Geoscience Education* **67**, 427–445 (2019).
35. CAST. Universal Design for Learning Guidelines version 3.0. https://udlguidelines.cast.org (2024).
36. Dell, C., Dell, T., Online, T. B.-J. of E. & 2015, undefined. Applying universal design for learning in online courses: Pedagogical and practical considerations. *ERIC* **13**, (2015).
37. Hall, T., Meyer, A. & Rose, D. *Universal Design for Learning in the Classroom: Practical Applications.* (Guilford Press., 2012).
38. Kumar, K. L. & Wideman, M. Accessible by design: Applying UDL principles in a first year undergraduate course. *Canadian Journal of Higher Education* **44**, 125–147 (2014).
39. Orndorf, H. C. *et al.* Opening the Pathway: An Example of Universal Design for Learning as a Guide to Inclusive Teaching Practices. *CBE life sciences education* **21**, ar28–ar28 (2022).
40. Scanlon, E., Schreffler, J., James, W., Vasquez, E. & Chini, J. J. Postsecondary physics curricula and Universal Design for Learning: Planning for diverse learners. *Physical Review Physics Education Research* **14**, (2018).
41. Castro, I. O. & Atchison, C. L. Acknowledging the Intersectionality of Geoscientists With Disabilities to Enhance Diversity, Equity, Inclusion, and Accessibility. *ES3* **4**, 10081 (2024).
42. Kingsbury, C. G., Sibert, E. C., Killingback, Z. & Atchison, C. L. "Nothing about us without us:" The perspectives of autistic geoscientists on inclusive instructional practices in geoscience education. *Journal of Geoscience Education* **68**, 302–310 (2020).
43. Stokes, P. J., Levine, R. & Flessa, K. W. Choosing the geoscience major: Important factors, race/ethnicity, and gender. *Journal of Geoscience Education* **63**, 250–263 (2015).
44. Anderson, B. L. & Deil-Amen, R. Exploring How Culture Matters in Building Responsive and Humanizing

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Contexts for Community College Students Pursuing STEM. *Education Sciences* **14**, 956 (2024).
45. Boda, P. A. Dreaming of disability-as-possibility as a humanistic STEM education futurity. *Science Education* **108**, 1590–1607 (2024).
46. Bunnell, S. *et al.* From protest to progress through partnership with students: Being human in STEM (HSTEM). *International Journal for Students as Partners* **5**, 26–56 (2021).
47. de Bie, A., Luqueño, L., Giron, A., Cook-Sather, A. & Marquis, E. *Promoting Equity and Justice Through Pedagogical Partnership*. (Routledge, 2023). doi:10.4324/9781003446521.
48. Ladson-Billings, G. But that's just good teaching! the case for culturally relevant pedagogy. *Theory Into Practice* **34**, 159–165 (1995).
49. Valencia, R. R. & Guadarrama, I. High-Stakes testing and its impact on racial and ethnic minority students. in *In Multicultural assessment: Clinical, psychological, and educational applications 561–610.* (eds Suzuku, L. A., Meller, P. J. & Ponterotto, J. G.) (Jossey-Bass, San Francisco, CA, 1996).
50. Carabajal, I. G. & Atchison, C. L. An investigation of accessible and inclusive instructional field practices in US geoscience departments. *Advances in Geosciences* **53**, 53–63 (2020).
51. Morales, N. *et al.* Promoting inclusion in ecological field experiences: Examining and overcoming barriers to a professional rite of passage. *The Bulletin of the Ecological Society of America* **101**, e01742 (2020).