Title: The Fieldwork Wellness Framework: A new approach to field research in Ecology

Authors: Anna E Nordseth[1†], Jacqueline R Gerson[2†], Lucrecia K Aguilar[3], Amy E Dunham[4], Anecia Gentles[5], Zoey Neale[4], Erynn Rebol[6]

[1]Duke University, [2]University of California, Berkeley, [3]Harvard University, [4]Rice University, [5]University of Georgia, [6]Wake Forest University

[†]co-first authors

No data were collected for this study.

Abstract

Fieldwork is often an important aspect of research in Ecology, Evolution, and Conservation Biology (EECB), but individuals with marginalized identities are likely to experience compromised wellness. The responsibility for structurally changing fieldwork to improve experiences and outcomes falls on the entire EECB community. We propose a Fieldwork Wellness Framework to replace traditional fieldwork approaches, which are dangerous and ill-suited to today's increasingly diverse EECB community and its goals. This Framework aims to prevent and manage risk while also promoting holistic wellbeing and belonging for all field research participants. We outline nine facets of the Framework: acknowledge and address identity, create a code of conduct, promote and practice self-care, form local connections, use support structures in decision-making, host and attend trainings, address financial concerns, enact emergency plans, and debrief. By centering wellness in planning and performing

fieldwork, EECB can make space for a more diverse, equitable, inclusive, healthy, and productive community.

In a Nutshell

- Fieldwork, a key part of research, is often carried out in ways that can cause harm, especially for individuals with marginalized identities.
- We propose a novel Fieldwork Wellness Framework to replace current underlying beliefs and practices of fieldwork that are dangerous and ill-suited to today's research community.
- We delineate nine actionable steps that labs, departments, and institutions should take to make fieldwork safer and more equitable: acknowledge and address identity, create a code of conduct, promote and practice self-care, form local connections, use support structures in decision-making, host and attend trainings, address financial concerns, enact emergency plans, and debrief.

Introduction

Fieldwork is often an essential part of Ecology, Evolution, and Conservation Biology (EECB) research. However, individuals - especially those from vulnerable groups - often face undue stress and danger that make work, self-care, and reporting issues difficult (Sharp and Kremer, 2006; Clancy et al., 2017; Cheyne, 2019; Nash et al., 2019; Chiarella and Vurro, 2020; Demery and Pipkin, 2021; Berhe et al., 2022). Without acknowledgement of and preparation for these risks, fieldwork can present serious physical and emotional challenges (Pollard, 2009; Cheyne, 2019). In the long-term, unsafe field experiences can reduce feelings of belonging, cause lasting

47 mental health problems, and counteract efforts to foster diversity in EECB (Emery et al., 2021).
48 We argue that EECB needs to create and implement a Fieldwork Wellness Framework that
49 actively promotes the holistic wellbeing of all research participants in the field.
50
51 In EECB, most field data collection is done by junior participants, which includes research
52 assistants, local research guides, graduate students, and/or postdoctoral researchers. These groups
53 are often disproportionately exposed to expectations and practices for field research that are
54 dangerous and ill-suited to an increasingly diverse EECB community (Anadu et al., 2020;
55 Douglas-Jones et al., 2020). In many cases, researchers doing fieldwork are expected to
56 independently manage all risks without the tools to identify, mitigate, or confront the hazards
57 they face in the field (Nash et al., 2019; King et al., 2020). People who identify as female,
58 BIPOC (black, indigenous, and people of color), disabled, and LGBTQIA+ (lesbian, gay,
59 bisexual, transgender, queer, intersex, asexual/agender, and others) often face the additional
60 burden of managing risks of ill-treatment or even violence stemming from identity prejudice
61 (McGuire et al., 2012; Cheyne, 2019; Anadu et al., 2020; Demery and Pipkin, 2021; Lawrence
62 and Dowey, 2021). Suffering in the field is *not* a requisite for graduate or early career training,
63 but rather a signal that intervention is needed (Douglas-Jones et al., 2020; King et al., 2020).
64
65 Rather than simply modifying the current system of fieldwork that values struggle and work over
66 wellbeing, we must create new basic tenets for fieldwork that prevent and manage risk while also
67 promoting belonging and productivity (Figure 1). The Fieldwork Wellness Framework proposed
68 herein requires more than the bare minimum of keeping research participants (anyone executing
69 or supporting research activities, hereafter “researchers”) safe (free of physical and psychological

harm). It identifies and considers the needs of the most vulnerable to ensure the wellness of all in the field. Wellness (1) includes both preventative and restorative measures, (2) emphasizes each individual's potential, (3) stresses holistic and continuous wellbeing, and (4) contains eight dimensions that extend wellbeing beyond physical safety (Dunn, 1977) (Figure 2). Adopting the Fieldwork Wellness Framework will reconstruct the way we plan and perform fieldwork, making space for a more diverse, equitable, inclusive, and healthy EECB community.

By recognizing issues with current procedures and enacting solutions for structural change, we can create a supportive space for all researchers to thrive in the field and in EECB. The responsibility for improving fieldwork experiences falls not on individuals hoping to "make it" in the field, but rather on the EECB community and especially those in leadership positions who make decisions on institutional policy and procedures that affect other researchers (hereafter, "leadership"). Here, we propose nine facets of the Fieldwork Wellness Framework that individuals and leadership can implement to promote wellness for field researchers of all identities before, during, and after fieldwork. While our Framework may not cover every aspect of wellness for every individual, we hope the EECB community will use it as a starting point for centering wellness in fieldwork.

Acknowledge and Address Identity

The risks a researcher faces are intrinsically shaped by elements of identity and prejudices others may hold against these identities (Sharp and Kremer, 2006; Clancy et al., 2017; Cheyne, 2019; Nash et al., 2019; Chiarella and Vurro, 2020; Demery and Pipkin, 2021). Yet many field researchers feel unprepared to deal with the discrimination or harassment they experience (Clark

and Grant, 2015). When leadership fails to address the impact of identity on fieldwork experiences or to provide equitable field support for all researchers, the EECB community perpetuates the exclusion of marginalized groups. All community members should openly learn and discuss how different identities experience fieldwork and be prepared to listen without judgment as concerns arise. People who have not experienced identity-related threats may feel apprehensive about these discussions due to feelings of guilt or anxiety. However, making space for these conversations with a "hold harmless" approach – one that assumes the best intentions of all participants – can foster mutual understanding and lead to more productive conversations about the use of power and privilege to support those historically harmed and currently vulnerable in EECB (Demery and Pipkin, 2021). Mitigation of identity-related risks should not be the sole responsibility of an individual, but rather a task shared by an informed EECB research community.

Create a Code of Conduct

Unclear expectations for behavior and lack of explicit repercussions for violating group norms can lead to abuses of power between researchers, teammates, and subordinates (Nelson et al., 2017; Marin-Spiotta et al., 2020). This ambiguity creates an environment that fosters distrust and contention within the team and local community (Nelson et al., 2017; Schneider, 2020). Designing, discussing, and implementing a clear code of conduct can reduce questions regarding what is and is not acceptable behavior in the field, build in accountability for misconduct, and reduce risks (Mansur et al., 2017). All team members should read and sign the code of conduct prior to fieldwork, regardless of whether they work within their own communities, other cultural contexts, and/or international research spaces. A code of conduct ensures that all researchers

116 understand behavioral expectations and that actionable steps for reporting misconduct for both
117 victims and bystanders, regardless of their role or responsibility level, are clearly delineated.
118
119 **Promote and Practice Self-Care**
120 Long days in harsh conditions, continually changing plans, and separation from familiar social
121 environments can take a toll on mental and physical health (Eifling, 2021). This can be
122 particularly challenging when a researcher also faces identity-related challenges, has underlying
123 health concerns, or struggles with imposter syndrome (Tucker and Horton, 2019). Promoting the
124 wellbeing of every individual is rooted in a team culture of self-care, which begins in the
125 planning stages of fieldwork through the establishment of reasonable goals and expectations
126 (Hummel and El Kurd, 2021). Pre-fieldwork conversations should plan for sufficient sleep and
127 downtime, bathroom accommodations, space for spiritual practices, mitigating responses to
128 emotional triggers and second-hand trauma, and mechanisms for practicing self-care within the
129 anticipated field environment (van der Merwe and Hunt, 2019; Hummel and El Kurd, 2021).
130 Non-judgmental discussions around self-care should continue once in the field, addressing issues
131 that arise in both personal and professional spheres of life, particularly when cultural,
132 hierarchical, or financial status promotes work over wellbeing. Adversity may be inevitable but
133 maintaining self-care routines can build resilience and positivity.
134
135 **Form Local Connections**
136 Field research can be lonely, especially in remote or unfamiliar locations. When done outside of
137 a research participant's home and/or culture, it can also perpetuate colonialist science, leading to
138 unintended harm to local people and communities (Asase et al., 2021). Local connections are

essential for reducing isolation, collaborating with local communities, helping with emergencies, and promoting successful, ethical fieldwork. Research leaders should establish connections with people who will be present at or near the field site to ensure adequate on-the-ground support. As much as possible, local contacts should be identified before fieldwork begins, as not having them on arrival could leave research participants particularly vulnerable and slow research progress. Trusted, on-the-ground individuals can aid in resolving concerns and facilitate the proper actions outlined in an emergency plan.

Use Support Structures in Decision-Making

All researchers involved in fieldwork face a near-constant stream of decisions in the field regarding both research and wellbeing. Under the traditional do-it-yourself approach to fieldwork, the ability and willingness to make such decisions alone signals an individual's innate capacity to succeed in fieldwork (Douglas-Jones et al., 2020; King et al., 2020). However, it is rarely necessary, nor advisable, for significant decisions to be made in isolation (Pollard, 2009). Having a variety of support structures in place can prevent decision fatigue, minimize unnecessary mistakes, and serve as a mechanism for researchers to engage with those outside of their direct field team. Internal support can come from within research teams through discussions around decisions and plans, thereby promoting belonging and agency for all team members. Researchers should also prepare a list before going into the field of readily available sounding boards who can listen non-judgmentally and provide reliable advice. This support network may include local contacts, colleagues from a researcher's institution, research mentors, and friends and family - each of whom can help address different needs or issues that arise.

Host and Attend Trainings

Leadership has a responsibility to help researchers anticipate, avoid, and mitigate unsafe field situations and to foster inclusive environments (Demery and Pipkin, 2021; Peixotto et al., 2021). At nearly every research institution, lab safety trainings are a prerequisite for engaging in labwork and sexual harassment prevention trainings are usually required for onboarding employees. However, these institutions often do not mandate any training or discussion of risk prior to fieldwork. Training researchers in field-relevant subjects such as wilderness first aid, self-defense, anti-colonialism/anti-racism, mental health care, and bystander intervention training is vital to fostering wellness-centered research, as well as to producing high-quality work.

Address Financial Concerns

Sufficient funding in the field is critical to researcher safety and wellbeing (Rinkus et al., 2018). Funding for EECB research is often limited and highly competitive, leaving researchers with scarcity mindsets and shoestring budgets (Bakker et al., 2010). Researchers may therefore place themselves in risky scenarios such as staying at hotels in dangerous locations, walking instead of hiring a cab, or working alone rather than employing field assistants. Financial stress is exacerbated by commonly used reimbursement systems, where researchers must pay for field expenses out-of-pocket and receive reimbursement weeks or months after fieldwork completion. This practice puts unfair burdens on graduate students and other early career researchers, particularly those from low-income backgrounds, without the financial means to upfront the costs (Ruud et al., 2016; Cronin et al., 2021). Leadership must ensure that researchers going into the field have sufficient funds to cover day-to-day and research expenses, without assuming that

any researcher can front money. Field researchers also need access to emergency funds, so money is not a limiting factor when making decisions involving safety and wellbeing.

Enact Emergency Plans

Detailed emergency plans enable researchers to quickly respond to dangerous situations. However, nearly half of American archeologists and biologists conducting international fieldwork do not believe their teams have an adequate emergency plan in place (Eifling and Klehm, 2018). Prior to any fieldwork, comprehensive protocols should be established that delineate risk mitigation and prevention strategies; describe local customs and historical context of the field site; address physical and mental health emergencies, theft, civil unrest, sexual harassment, and sexual assault; include contact information for reporting and confidentiality guidelines; describe evacuation plans or safe havens if evacuation is not possible; explain processes for seeking medical attention and insurance coverage; and address how to immediately access emergency funds. Once written, the document should be reviewed by each team member prior to fieldwork with sufficient time to propose changes and opportunities to request additional information. Everyone should have access to a hard copy of this plan while in the field.

Debrief

A critical, but often neglected, part of fieldwork is making time for a formal debriefing process amongst research team members and between researchers and leadership. Debriefings should emphasize the comfort and safety of the researcher, acknowledge power structures and differences in identity, and clearly identify alternative people to talk to outside of the research team, lab, department, or institution depending on researcher needs. Debriefing provides an

important opportunity for participants to reflect on their experiences and receive necessary support (Roguski and Tauri, 2013). These sessions also allow researchers to air and unpack concerns about wellness that arose during fieldwork and provide suggestions for mitigating risks in the future, if they wish to discuss them (Rinkus et al., 2018). Debriefing is most effective if systems are in place for addressing concerns, including follow-up care and the option of formally documenting issues to create institutional memory. Concerns uncovered during debriefing that involve a particular site, individual, or situation require further investigation by leadership and transparency regarding actions taken.

Conclusion

Through implementing the Fieldwork Wellness Framework, we can all take meaningful steps towards transforming fieldwork practices for the present and future EECB community. Leadership should carefully assess and account for the substantial financial and energy investments necessary for promoting the wellness of current and new researchers in the field (Rinkus et al., 2018). The rewards for these investments - improved work satisfaction and performance, along with more diverse, equitable, inclusive, and healthy research spaces - are incalculable.

Successful promotion of all dimensions of wellness for researchers conducting fieldwork must be embedded in a culture of open, respectful communication. This will normalize discussions of wellness and empower all researchers, especially those with marginalized identities. To monitor changes in fieldwork experiences over time and act upon expressed needs, leadership should consider collecting anonymous survey data regarding the field experiences of researchers under

their supervision (Pollard, 2009; Bohannon, 2013; Clancy et al., 2014). Such surveys must be designed to protect researchers, so questions regarding identity should be optional and include the response "minority" to allow participants to withhold specific identifying information. As we gather more information about fieldwork experiences and encourage further conversations, the EECB community should revisit and revise the Framework proposed here to ensure that wellness is continuously centered in all fieldwork for all individuals.

Addressing major flaws in EECB's current approach to fieldwork can help remove barriers faced by historically excluded groups and strengthen the community as a whole. Overhauls in fieldwork practices are underway within the anthropology, archeology, and geosciences communities (King et al., 2020; Marin-Spiotta et al., 2020; Peixotto et al., 2021); EECB must do the same. We expect that adopting the Fieldwork Wellness Framework for EECB will allow for the recruitment and retention of more diverse researchers who are motivated, well, and better equipped to succeed professionally and advance their fields.

Competing Interests

The authors declare no competing interests.

References

Anadu, J., Ali, H., and Jackson, C. (2020). Ten steps to protect BIPOC scholars in the field. *Eos (Washington. DC).* 101. doi:10.1029/2020EO150525.

Asase, A., Tiwonge, |, Mzumara-Gawa, I., Owino, J. O., Andrew, |, Peterson, T., et al. (2021). Replacing "parachute science" with "global science" in ecology and conservation biology.

253 *Conserv. Sci. Pract.*, e517. doi:10.1111/csp2.517.
254 Bakker, V. J., Baum, J. K., Brodie, J. F., Salomon, A. K., Dickson, B. G., Gibbs, H. K., et al.
255 (2010). The changing landscape of conservation science funding in the United States.
256 *Conserv. Lett.* 3, 435–444. doi:10.1111/j.1755-263X.2010.00125.x.
257 Berhe, A. A., Barnes, R. T., Hastings, M. G., Mattheis, A., Schneider, B., Williams, B. M., et al.
258 (2022). Scientists from historically excluded groups face a hostile obstacle course. *Nat.*
259 *Geosci.* 15, 2–4. doi:10.1038/s41561-021-00868-0.
260 Bohannon, J. (2013). Survey finds sexual harassment in anthropology. *Sci. AAAS*.
261 Cheyne, S. M. (2019). Being "Out" in the Field: Who Is Responsible for Health and Safety? *Int.*
262 *J. Primatol.* 40, 468–469. doi:10.1007/s10764-019-00107-9.
263 Chiarella, D., and Vurro, G. (2020). Fieldwork and disability: an overview for an inclusive
264 experience. *Geol. Mag.* 157, 1933–1938. doi:10.1017/S0016756820000928.
265 Clancy, K. B. H. H., Nelson, R. G., Rutherford, J. N., and Hinde, K. (2014). Survey of Academic
266 Field Experiences (SAFE): Trainees report harassment and assault. *PLoS One* 9, 1–9.
267 doi:10.1371/journal.pone.0102172.
268 Clancy, K. B. H., Lee, K. M. N., Rodgers, E. M., and Richey, C. (2017). Double jeopardy in
269 astronomy and planetary science: Women of color face greater risks of gendered and racial
270 harassment. *J. Geophys. Res. Planets*. doi:10.1038/175238c0.
271 Clark, I., and Grant, A. (2015). Sexuality and danger in the field: Starting an uncomfortable
272 conversation. *J. Anthropol. Soc. Oxford* 7, 1–14.
273 Cronin, M. R., Alonzo, S. H., Adamczak, S. K., Baker, D. N., Beltran, R. S., Borker, A. L., et al.
274 (2021). Anti-racist interventions to transform ecology, evolution and conservation biology
275 departments. *Nat. Ecol. Evol. 2021 59* 5, 1213–1223.

Davidson, K. (2021). Why we use BIPOC. *YWCA*.

Demery, A.-J. J. C., and Pipkin, M. A. (2021). Safe fieldwork strategies for at-risk individuals, their supervisors and institutions. *Nat. Ecol. Evol.* 5, 5–9. doi:10.1038/s41559-020-01328-5.

Douglas-Jones, R., Mathur, N., Trundle, C., and Vaeau, T. (2020). Trial by Fire: Trauma, Vulnerability and the Heroics of Fieldwork. *Commoning Ethnogr.* 3, 91.

Dunn, H. L. (1977). "What high-level wellness means," in *Health Values: Achieving High-Level Wellness*, 9–16.

Eifling, K. P. (2021). Mental Health and the Field Research Team. *Adv. Archaeol. Pract.* 9, 10–22. doi:10.1017/aap.2020.51.

Eifling, K. P., and Klehm, C. E. (2018). CAMPS: Combined Anthropology Medical Preparation Survey. *Curr. Anthropol.* 61, 798–807. doi:DOI: 10.1086/712004.

Emery, N. C., Bledsoe, E. K., Hasley, A. O., and Eaton, C. D. (2021). Cultivating inclusive instructional and research environments in ecology and evolutionary science. *Ecol. Evol.* 11, 1480–1491. doi:10.1002/ece3.7062.

Hummel, C., and El Kurd, D. (2021). Mental Health and Fieldwork. *PS Polit. Sci. Polit.* 54, 121–125. doi:10.1017/S1049096520001055.

King, T. J., Giles, D. B., Meher, M., and Gould, H. (2020). Anthropology and #MeToo: Reimagining fieldwork. doi:10.1111/taja.12371.

Lawrence, A., and Dowey, N. (2021). Six simple steps towards making GEES fieldwork more accessible and inclusive. *Area*, 1–8. doi:10.1111/area.12747.

Mansur, K. L., Ponciano, L. C. M. O., and De Castro, A. R. S. F. (2017). Contributions to a Brazilian Code of Conduct for Fieldwork in Geology: an approach based on Geoconservation and Geoethics. *An. Acad. Bras. Cienc.* 89, 431–444.

299 Marin-Spiotta, E., T. Barnes, R., Asefaw Berhe, A., G. Hastings, M., Mattheis, A., Schneider, B.,
300 et al. (2020). Hostile climates are barriers to diversifying the geosciences. *Adv. Geosci.* 53,
301 117–127. doi:10.5194/ADGEO-53-117-2020.
302 McGuire, K. L., Primack, R. B., and Losos, E. C. (2012). Dramatic improvements and persistent
303 challenges for women ecologists. *Bioscience* 62, 189–196.
304 Nash, M., Nielsen, H. E. F., Shaw, J., King, M., Lea, M.-A., Bax, N., et al. (2019). "Antarctica
305 just has this hero factor…": gendered barriers to Australian Antarctic research and remote
306 fieldwork. *PLoS One* 14, e0209983. doi:10.1371/journal.pone.0209983.
307 Nelson, R. G., Rutherford, J. N., Hinde, K., and Clancy, K. B. H. (2017). Signaling Safety:
308 Characterizing Fieldwork Experiences and Their Implications for Career Trajectories. *Am.*
309 *Anthropol.* 119, 710–722. doi:10.1111/aman.12929.
310 Peixotto, B., Klehm, C., and Eifling, K. P. (2021). Rethinking Research Sites as Wilderness
311 Activity Sites: Reframing Health, Safety, and Wellness in Archaeology. *Adv. Archaeol.*
312 *Pract.* 9, 1–9. doi:10.1017/AAP.2020.50.
313 Pollard, A. (2009). Field of screams: difficulty and ethnographic fieldwork. *Anthropol. Matters*
314 11, 1–24. doi:10.22582/am.v11i2.10.
315 Rinkus, M. A., Kelly, J. R., Wright, W., Medina, L., and Dobson, T. (2018). Gendered
316 Considerations for Safety in Conservation Fieldwork. *Soc. Nat. Resour.* 31, 1419–1426.
317 doi:10.1080/08941920.2018.1471177.
318 Roguski, M., and Tauri, J. M. (2013). Key issues effecting field researcher safety: A reflexive
319 commentary. *New Zeal. Sociol.* 28, 18–35.
320 Ruud, C. M., Saclarides, E. S., George-Jackson, C. E., and Lubienski, S. T. (2016). Tipping
321 Points: Doctoral Students and Consideration of Departure. *J. Coll. Student Retent. Res.*

Theory Pract. 20, 286–307. doi:10.1177/1521025116666082.

Schneider, L. T. (2020). Sexual violence during research: How the unpredictability of fieldwork and the right to risk collide with academic bureaucracy and expectations. *Crit. Anthropol.* 40, 173–193. doi:10.1177/0308275X20917272.

Sharp, G., and Kremer, E. (2006). The Safety Dance: Confronting Harassment, Intimidation, and Violence in the Field. *Sociol. Methodol.* 36, 317–327. doi:10.1111/j.1467-9531.2006.00183.x.

Tucker, F., and Horton, J. (2019). "The show must go on!" Fieldwork, mental health and wellbeing in Geography, Earth and Environmental Sciences. *Area* 51, 84–93. doi:10.1111/AREA.12437.

van der Merwe, A., and Hunt, X. (2019). Secondary trauma among trauma researchers: Lessons from the field. *Psychol. Trauma Theory, Res. Pract. Policy* 11, 10–18. doi:10.1037/tra0000414.

Figure Legends

Figure 1: Rebuilding our approach to field research with the Fieldwork Wellness Framework will make fieldwork better for everyone, especially individuals with marginalized identities.

Figure 2: The Fieldwork Wellness Framework promotes holistic wellbeing by incorporating the eight dimensions of wellness (Dunn, 1977) (outer shading) compared to an example of an individual's wellness under the traditional fieldwork paradigm (inner shading).

Panel 1: Key Terms

BIPOC - Black, Indigenous, and People of Color. “This is a term specific to the United States, intended to center the experiences of Black and Indigenous groups and demonstrate solidarity between communities of color (Davidson, 2021).”

Fieldwork code of conduct - Written rules and expectations that outline appropriate and/or inappropriate behavior for interacting with other members of the research team, engaging with local communities and/or other cultures, and mitigating risks in the research environment. This document also clearly describes consequences for violating these rules and reporting protocols.

EECB - Ecology, Evolution, and Conservation Biology

Fieldwork Wellness Framework - A conceptual, solution-oriented, and evolving approach toward fieldwork that broadens goals to include all aspects of wellness. The Framework takes an identity-centered approach that both removes barriers for marginalized individuals and raises the bar for everyone. Currently, the Framework consists of nine facets: acknowledge and address identity, create a code of conduct, promote and practice self-care, form local connections, use support structures in decision-making, host and attend trainings, address financial concerns, enact emergency plans, and debrief.

Identity - Experiences, relationships, traits, and values that collectively form an individual’s sense of self. These may include, but are not limited to, (dis)ability, ethnicity, sexuality, gender identity and expression, race, religion, and socioeconomic status.

Leadership - Individuals and/or groups that make decisions on organization policy and procedures that affect other individuals and/or groups. These include advisors, chairs, deans, departments, field station managers, labs, provosts, and society presidents.

LGBTQIA+ - An evolving initialism that encompasses the identities of Lesbian, Gay, Bisexual, Transgender, Queer, Intersex, Asexual/Agender, and all other non-heterosexual or non-cisgender identities.

Researcher - An individual or member of a team executing or supporting research activities. This includes senior faculty, early career faculty, postdoctoral researchers, graduate students, undergraduate students, research technicians, local guides, and anyone else who contributes to the conducting of research. Some researchers also play leadership roles, depending on where they fall in the institutional and team power hierarchy.

Safety - A foundation for wellness that focuses on minimizing the risk of physical and psychological danger and harm.

Wellness - The active pursuit of good health and quality of life across eight interconnected dimensions: physical, emotional, social, intellectual, environmental, spiritual, occupational, and financial. Wellness includes both preventative and restorative measures, emphasizes each individual's potential, and stresses holistic and continuous wellbeing (Dunn, 1977).

Panel 2: Positionality Statement

Our identities shape our perspectives and experiences in research and fieldwork, as well as our ideas presented in this paper. We are women in EECB and are PhD students, a postdoctoral researcher, a research scientist, and an associate professor from public and private universities. We are Jamaican-American, mixed Latinx American, and white American citizens, both first generation and not. We identify as cis- and transgender, straight, and bisexual. We are Agnostic, Atheist, Buddhist, Christian, Jewish, and spiritual. We are neurodiverse, with ADHD, anxiety, depression, dyslexia, and PTSD. We are introverts and extroverts. We recognize that we do not speak for everyone with these identities and note that our identities represent only a fraction of those in our field; our proposed solutions may thus be limited by our own experiences.

To identify changes needed in EECB fieldwork, we drew on published literature and personal experiences. We conduct fieldwork domestically in the U.S. and internationally in multiple countries. All of us have been unsafe and unwell in the field and know of countless others with similar experiences. We have witnessed and experienced financial hardships, hazing, homophobia, neocolonialism, racism, religious intolerance, and sexism. We have had the emotionally taxing need to hide our identities in the field to avoid danger and discrimination. We have sustained physical injuries and endured verbal abuse. We have survived failings of our institutions and EECB community while watching others be permanently harmed, held back in their careers, or compelled to leave EECB altogether. For these reasons and more, we feel the need to work towards large-scale change.

Figures

Figure 1

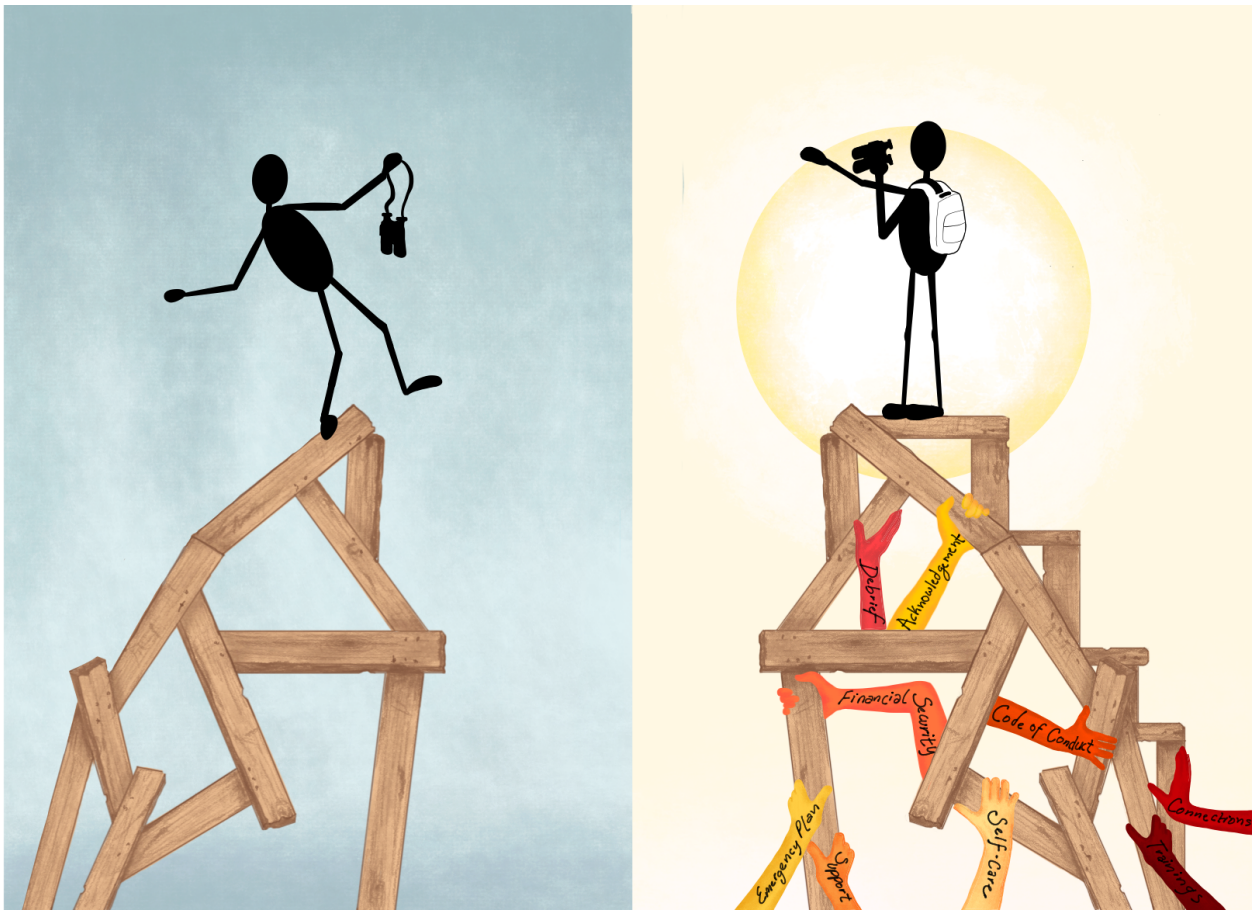
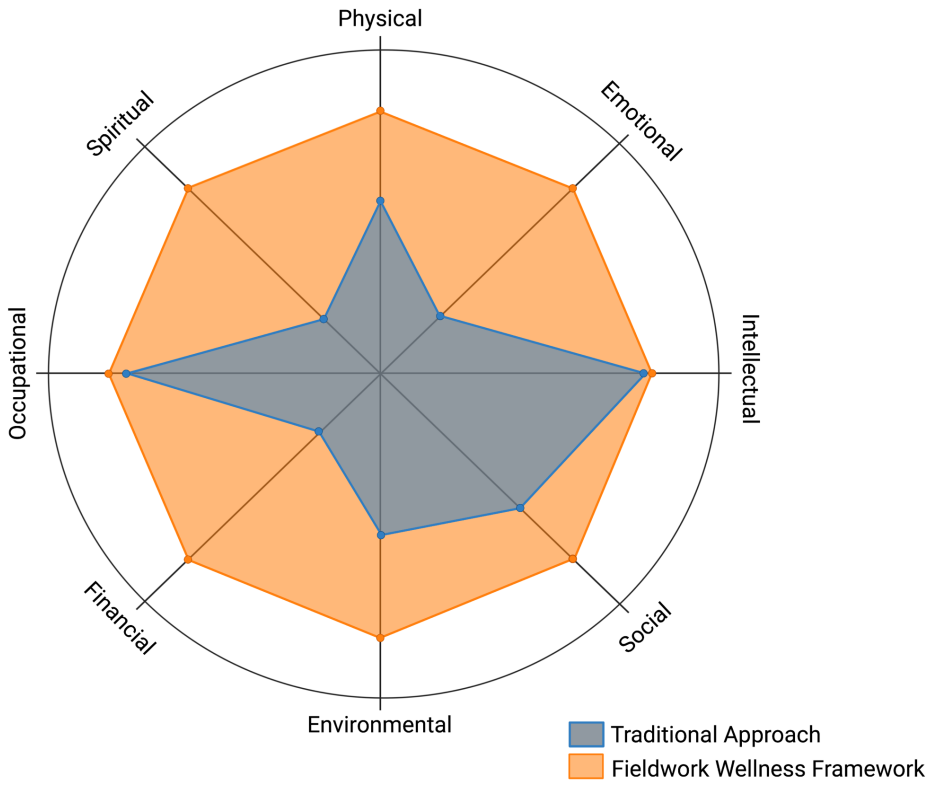


Figure 2



419

420

421

422

423

Title: The Fieldwork Wellness Framework: A new approach to field research in Ecology

Authors: Anna E Nordseth[1†], Jacqueline R Gerson[2†], Lucrecia K Aguilar[3], Amy Dunham[4], Anecia Gentles[5], Zoey Neale[4], Erynn Rebol[6]

[1]Duke University, [2]University of California, Berkeley, [3]Harvard University, [4]Rice University, [5]University of Georgia, [6]Wake Forest University

[†]co-first authors

Fieldwork Wellness Resources

Anadu, J., Ali, H., and Jackson, C. (2020). Ten steps to protect BIPOC scholars in the field. *Eos (Washington. DC).* 101. doi:10.1029/2020EO150525.

Asase, A., Tiwonge, |, Mzumara-Gawa, I., Owino, J. O., Andrew, |, Peterson, T., et al. (2021). Replacing "parachute science" with "global science" in ecology and conservation biology. *Conserv. Sci. Pract.*, e517. doi:10.1111/csp2.517.

Bailey, K., Morales, N., and Newberry, M. (2020). Inclusive conservation requires amplifying experiences of diverse scientists. *Nat. Ecol. Evol.* 4, 1294–1295. doi:10.1038/s41559-020-01313-y.

Bakker, V. J., Baum, J. K., Brodie, J. F., Salomon, A. K., Dickson, B. G., Gibbs, H. K., et al. (2010). The changing landscape of conservation science funding in the United States. *Conserv. Lett.* 3, 435–444. doi:10.1111/j.1755-263X.2010.00125.x.

Beltran, R. S., Marnocha, E., Race, A., Croll, D. A., Dayton, G. H., and Zavaleta, E. S. (2020). Field courses narrow demographic achievement gaps in ecology and evolutionary biology. *Ecol. Evol.* 10, 5184–5196.

Berry, M. J., Argüelles, C. C., Cordis, S., Ihmoud, S., and Estrada, E. V. (2017). Toward a fugitive anthropology: Gender, race, and violence in the field. *Cult. Anthropol.* 32, 537–565.

Bohannon, J. (2013). Survey finds sexual harassment in anthropology. *Sci. AAAS*.

Burek, C. V., and Kölbl-Ebert, M. (2007). Historical problems of travel for women geologists. *Geol. Today* 23, 30–32. doi:10.1111/j.1365-2451.2007.00598.x.

Carter, T. L., Jennings, L. L., Pressler, Y., Gallo, A. C., Berhe, A. A., Marín-Spiotta, E., et al. (2021). Towards diverse representation and inclusion in soil science in the United States. *Soil Sci. Soc. Am. J.* 85, 963–974. doi:10.1002/saj2.20210.

Casad, B. J., Oyler, D. L., Sullivan, E. T., McClellan, E. M., Tierney, D. N., Anderson, D. A., et al. (2018). Wise psychological interventions to improve gender and racial equality in STEM. *Gr. Process. Intergr. Relations* 21, 767–787. doi:10.1177/1368430218767034.

Chen, S., Binning, K. R., Manke, K. J., Brady, S. T., McGreevy, E. M., Betancur, L., et al. (2021). Am I a Science Person? A Strong Science Identity Bolsters Minority Students' Sense of Belonging and Performance in College. *Personal. Soc. Psychol. Bull.* 47, 593–606.

Cheyne, S. M. (2019). Being "Out" in the Field: Who Is Responsible for Health and Safety? *Int. J. Primatol.* 40, 468–469. doi:10.1007/s10764-019-00107-9.

Chiarella, D., and Vurro, G. (2020). Fieldwork and disability: an overview for an inclusive experience. *Geol. Mag.* 157, 1933–1938. doi:10.1017/S0016756820000928.

Chiener, C. (2002). Experience and fieldwork: A native researcher's view. *Ethnomusicology* 46, 456–486.

Clancy, K. B. H. H., Nelson, R. G., Rutherford, J. N., and Hinde, K. (2014). Survey of Academic Field Experiences (SAFE): Trainees report harassment and assault. *PLoS One* 9, 1–9. doi:10.1371/journal.pone.0102172.

Clancy, K. B. H., Lee, K. M. N., Rodgers, E. M., and Richey, C. (2017). Double jeopardy in astronomy and planetary science: Women of color face greater risks of gendered and racial harassment. *J. Geophys. Res. Planets*. doi:10.1038/175238c0.

Clark, I., and Grant, A. (2015). Sexuality and danger in the field: Starting an uncomfortable conversation. *J. Anthropol. Soc. Oxford* 7, 1–14.

Coffey, A. (1999). *The ethnographic self: Fieldwork and the representation of identity*. Sage.

Consortium for Ocean Leadership, and California State UniversityDesert Studies (2021). Report of the Workshop to Promote Safety in Field Sciences. doi:10.5281/zenodo.5604956.

Cronin, M. R., Alonzo, S. H., Adamczak, S. K., Baker, D. N., Beltran, R. S., Borker, A. L., et al. (2021). Anti-racist interventions to transform ecology, evolution and conservation biology departments. *Nat. Ecol. Evol. 2021 59* 5, 1213–1223.

Davidson, K. (2021). Why we use BIPOC. *YWCA*.

Davis, K. E., Meehan, P., Klehm, C., Kurnick, S., and Cameron, C. (2021). Recommendations for Safety Education and Training for Graduate Students Directing Field Projects. *Adv. Archaeol. Pract.* 9, 74–80. doi:10.1017/aap.2020.46.

Demery, A.-J. J. C., and Pipkin, M. A. (2021). Safe fieldwork strategies for at-risk individuals, their supervisors and institutions. *Nat. Ecol. Evol.* 5, 5–9. doi:10.1038/s41559-020-01328-5.

Douglas-Jones, R., Mathur, N., Trundle, C., and Vaeau, T. (2020). Trial by Fire: Trauma, Vulnerability and the Heroics of Fieldwork. *Commoning Ethnogr.* 3, 91.

Duc Bo Massey, M., Arif, S., Albury, C., and Cluney, V. A. (2021). Ecology and evolutionary biology must elevate BIPOC scholars. *Ecol. Lett.* 24, 913–919. doi:10.1111/ele.13716.

Dunn, H. L. (1977). "What high-level wellness means," in *Health Values: Achieving High-Level Wellness*, 9–16.

Eifling, K. P. (2021). Mental Health and the Field Research Team. *Adv. Archaeol. Pract.* 9, 10–22. doi:10.1017/aap.2020.51.

Eifling, K. P., and Klehm, C. E. (2018). CAMPS: Combined Anthropology Medical Preparation Survey. *Curr. Anthropol.* 61, 798–807. doi:DOI: 10.1086/712004.

Emery, N. C., Bledsoe, E. K., Hasley, A. O., and Eaton, C. D. (2021). Cultivating inclusive instructional and research environments in ecology and evolutionary science. *Ecol. Evol.* 11, 1480–1491. doi:10.1002/ece3.7062.

Gewin, V. (2020). The time tax put on scientists of colour. *Nature* 583, 479–481. doi:10.1038/d41586-020-01920-6.

Gifford, L., and Hall-Clifford, R. (2008). From Catcalls to Kidnapping: Towards an Open Dialogue on the Fieldwork Experience of Graduate Women. *Anthropol. News*, 26–27.

Giles, S., Jackson, C., and Stephen, N. (2020). Barriers to fieldwork in undergraduate geoscience degrees. *Nat. Rev. Earth Environ.* 1, 77–78.

Greene, S. E., Antell, G. S., Atterby, J., Bhatia, R., Singh, S., Stevenson, C. T., et al. (2021). Safety and Belonging in the Field: A Checklist for Educators.

Grogan, K. E. (2019). How the entire scientific community can confront gender bias in the workplace. *Nat. Ecol. Evol.* 3, 3–6. doi:10.1038/s41559-018-0747-4.

Hall, T., Healey, M., and Harrison, M. (2004). Fieldwork and disabled students: Discourses of exclusion and inclusion. *J. Geogr. High. Educ.* 28, 255–280. doi:10.1080/0309826042000242495.

Halsey, S. J., Strickland, L. R., Scott-Richardson, M., Perrin-Stowe, T., and Massenburg, L. (2020). Elevate, don't assimilate, to revolutionize the experience of scientists who are Black, Indigenous and people of colour. *Nat. Ecol. Evol.* 4, 1291–1293. doi:10.1038/s41559-020-01297-9.

Henderson, F. B. (2009). “We thought you would be white”: Race and gender in fieldwork. *PS Polit. Sci. Polit.* 42, 291–294.

Hilhorst, D., and Jansen, B. J. (2005). Fieldwork in hazardous areas. Wageningen University, Disaster Studies.

Horton, J. (2020). Failure failure failure failure failure failure: Six types of failure within the neoliberal academy. *Emot. Sp. Soc.* 35. doi:10.1016/j.emospa.2020.100672.

Hummel, C., and El Kurd, D. (2021). Mental Health and Fieldwork. *PS Polit. Sci. Polit.* 54, 121–125. doi:10.1017/S1049096520001055.

Jimenez, M. F., Laverty, T. M., Bombaci, S. P., Wilkins, K., Bennett, D. E., and Pejchar, L. (2019). Underrepresented faculty play a disproportionate role in advancing diversity and inclusion. *Nat. Ecol. Evol.* 3, 1030–1033. doi:10.1038/s41559-019-0911-5.

King, T. J., Giles, D. B., Meher, M., and Gould, H. (2020). Anthropology and #MeToo: Reimagining fieldwork. doi:10.1111/taja.12371.

Kloß, S. T. (2017). Sexual(ized) harassment and ethnographic fieldwork: A silenced aspect of social research. *Ethnography* 18, 396–414. doi:10.1177/1466138116641958.

Kuebbing, S., Clark, D., Gharaibeh, B., Janecka, M., Kohl, K., Kramp, R., et al. (2021). Field Safety Manual.

Lau, J. D. (2020). Three lessons for gender equity in biodiversity conservation. *Conserv. Biol.* 34, 1589–1591. doi:10.1111/COBI.13487.

Lawrence, A., and Dowey, N. (2021). Six simple steps towards making GEES fieldwork more accessible and inclusive. *Area*, 1–8. doi:10.1111/area.12747.

Lunn, J. (2014). *Fieldwork in the Global South: Ethical Challenges and Dilemmas*. Routledge.

Maestre, F. T. (2019). Ten simple rules towards healthier research labs. *PLoS Comput. Biol.* 15, 14–16. doi:10.1371/journal.pcbi.1006914.

Mansur, K. L., Ponciano, L. C. M. O., and De Castro, A. R. S. F. (2017). Contributions to a Brazilian Code of Conduct for Fieldwork in Geology: an approach based on Geoconservation and Geoethics. *An. Acad. Bras. Cienc.* 89, 431–444.

Marin-Spiotta, E., T. Barnes, R., Asefaw Berhe, A., G. Hastings, M., Mattheis, A., Schneider, B., et al. (2020). Hostile climates are barriers to diversifying the geosciences. *Adv. Geosci.* 53, 117–127. doi:10.5194/ADGEO-53-117-2020.

McGuire, K. L., Primack, R. B., and Losos, E. C. (2012). Dramatic improvements and persistent challenges for women ecologists. *Bioscience* 62, 189–196.

Mol, L., and Atchison, C. (2019). Image is everything: educator awareness of perceived barriers for students with physical disabilities in geoscience degree programs. *J. Geogr. High. Educ.* 43, 544–567. doi:10.1080/03098265.2019.1660862.

Nair Ambujam, M. (2021). Navigating the Field. *TSANTSA – J. Swiss Anthropol. Assoc.* 26, 186–194. doi:10.36950/tsantsa.2021.26.7014.

Nash, M. National Antarctic Program responses to fieldwork sexual harassment. *Antarct. Sci.*, 1–12.

Nash, M., Nielsen, H. E. F., Shaw, J., King, M., Lea, M.-A., Bax, N., et al. (2019). "Antarctica just has this hero factor…": gendered barriers to Australian Antarctic research and remote fieldwork. *PLoS One* 14, e0209983. doi:10.1371/journal.pone.0209983.

Nelson, R. G., Rutherford, J. N., Hinde, K., and Clancy, K. B. H. (2017). Signaling Safety: Characterizing Fieldwork Experiences and Their Implications for Career Trajectories. *Am. Anthropol.* 119, 710–722. doi:10.1111/aman.12929.

Nielsen, M. W., Alegria, S., Börjeson, L., Etzkowitz, H., Falk-Krzesinski, H. J., Joshi, A., et al. (2017). Gender diversity leads to better science. *Proc Natl Acad Sci* 8, 1740–1742. doi:10.1073/pnas.1700616114.

O'Brien, L. T., Bart, H. L., and Garcia, D. M. (2020). Why are there so few ethnic minorities in ecology and evolutionary biology? Challenges to inclusion and the role of sense of belonging. *Soc. Psychol. Educ.* 23, 449–477. doi:10.1007/s11218-019-09538-x.

Ortbals, C. D., and Rincker, M. E. (2009). Embodied Researchers: Gendered Bodies, Research Activity, and Pregnancy in the Field. *PS Polit. Sci. Polit.* 42, 315–319. doi:10.1017/S1049096509090635.

Parsons, E. C. M., and Scarlett, A. (2020). The problem of toxic internships in the environmental field: Guidelines for more equitable professional experiences. *J. Environ. Stud. Sci. 2020 103* 10, 352–354. doi:10.1007/S13412-020-00629-2.

Pearson, M. N. (2020). Exploring Potential Relationships of Mindset and Scarcity in the Inequitable Experience and Outcomes of First Generation and Low Income Students in Higher Education.

Peixotto, B., Klehm, C., and Eifling, K. P. (2021). Rethinking Research Sites as Wilderness Activity Sites: Reframing Health, Safety, and Wellness in Archaeology. *Adv. Archaeol. Pract.* 9, 1–9. doi:10.1017/AAP.2020.50.

Pico, T. (2021). Linking Past to Present in a Postcolonial Field Science: How Scientific Training and Practice in US Geology Perpetuates Marginalization.

Pollard, A. (2009). Field of screams: difficulty and ethnographic fieldwork. *Anthropol. Matters* 11, 1–24. doi:10.22582/am.v11i2.10.

Poor, E. E., Imron, M. A., Novalina, R., Shaffer, L. J., and Mullinax, J. M. (2021). Increasing diversity to save biodiversity: Rising to the challenge and supporting Indonesian women in conservation. *Conserv. Sci. Pract.* 3, 1–12. doi:10.1111/csp2.395.

Rinkus, M. A., Kelly, J. R., Wright, W., Medina, L., and Dobson, T. (2018). Gendered Considerations for Safety in Conservation Fieldwork. *Soc. Nat. Resour.* 31, 1419–1426. doi:10.1080/08941920.2018.1471177.

Roguski, M., and Tauri, J. M. (2013). Key issues effecting field researcher safety: A reflexive commentary. *New Zeal. Sociol.* 28, 18–35.

Ross, K. (2015). "No sir, she was not a fool in the field": Gendered risks and sexual violence in immersed cross-cultural fieldwork. *Prof. Geogr.* 67, 180–186.

Rudd, L. F., Allred, S., Bright Ross, J. G., Hare, D., Nkomo, M. N., Shanker, K., et al. (2021). Overcoming racism in the twin spheres of conservation science and practice. *Proc. R. Soc. B Biol. Sci.* 288, 20211871. doi:10.1098/rspb.2021.1871.

Ruud, C. M., Saclarides, E. S., George-Jackson, C. E., and Lubienski, S. T. (2016). Tipping Points: Doctoral Students and Consideration of Departure. *J. Coll. Student Retent. Res. Theory Pract.* 20, 286–307. doi:10.1177/1521025116666082.

Sanne, J. M. (2008). Incident reporting or storytelling? Competing schemes in a safety-critical and hazardous work setting. *Saf. Sci.* 46, 1205–1222. doi:10.1016/j.ssci.2007.06.024.

Schell, C. J., Guy, C., Shelton, D. S., Campbell-Staton, S. C., Sealey, B. A., Lee, D. N., et al. (2020). Recreating Wakanda by promoting Black excellence in ecology and evolution. *Nat. Ecol. Evol.* 4, 1285–1287. doi:10.1038/s41559-020-1266-7.

Schneider, L. T. (2020). Sexual violence during research: How the unpredictability of fieldwork and the right to risk collide with academic bureaucracy and expectations. *Crit. Anthropol.* 40, 173–193. doi:10.1177/0308275X20917272.

Sharp, G., and Kremer, E. (2006). The Safety Dance: Confronting Harassment, Intimidation, and Violence in the Field. *Sociol. Methodol.* 36, 317–327. doi:10.1111/j.1467-9531.2006.00183.x.

Thornton, S. A., Cook, S., Astiani, D., Hapsari, K. A., Varkkey, H., Cole, L. E. S., et al. (2019). 'Pushing the limits': experiences of women in tropical peatland research. *Mar. Freshw. Res.* 71, 170–178.

Townsend-Bell, E. (2009). Being True and Being You: Race, Gender, Class, and the Fieldwork Experience. *PS Polit. Sci. Polit.* 42, 311–314. doi:10.1017/S1049096509090623.

Tseng, M., El-Sabaawi, R. W., Kantar, M. B., Pantel, J. H., Srivastava, D. S., and Ware, J. L. (2020). Strategies and support for Black, Indigenous, and people of colour in ecology and evolutionary biology. *Nat. Ecol. Evol.* 4, 1288–1290.

Tucker, F., and Horton, J. (2019). "The show must go on!" Fieldwork, mental health and wellbeing in Geography, Earth and Environmental Sciences. *Area* 51, 84–93. doi:10.1111/AREA.12437.

Turner, T. R., Bernstein, R. M., Taylor, A. B., Asangba, A., Bekelman, T., Cramer, J. D., et al. (2018). Participation, representation, and shared experiences of women scholars in biological anthropology. *Am. J. Phys. Anthropol.* 165, 126–157. doi:10.1002/ajpa.23386.

van der Merwe, A., and Hunt, X. (2019). Secondary trauma among trauma researchers: Lessons from the field. *Psychol. Trauma Theory, Res. Pract. Policy* 11, 10–18. doi:10.1037/tra0000414.

Velasco, A. A., Aderhold, K., Alfaro-Diaz, R., Brown, W., Brudzinski, M. R., Fraiser, M., et al. (2021). SSA Task Force on Diversity, Equity, and Inclusion: Toward a Changing, Inclusive Future in Earthquake Science. *Seismol. Res. Lett.* 92, 3267–3275. doi:10.1785/0220210170.

Wanelik, K. M., Griffin, J. S., Head, M. L., Ingleby, F. C., and Lewis, Z. (2020). Breaking barriers? Ethnicity and socioeconomic background impact on early career progression in the fields of ecology and evolution. *Ecol. Evol.* 10, 6870–6880. doi:10.1002/ece3.6423.

Witze, A. (2018). Sexual harassment is rife in the sciences, finds landmark US study news. *Nature* 558, 352–353. doi:10.1038/d41586-018-05404-6.

Zavaleta, E. S., Beltran, R. S., and Borker, A. L. (2020). How Field Courses Propel Inclusion and Collective Excellence. *Trends Ecol. Evol.* 35, 953–956. doi:10.1016/j.tree.2020.08.005.