Six simple steps towards making GEES fieldwork more accessible and inclusive

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Fieldwork is a defining aspect of Physical Geography, Earth and Environmental Science programme curricula. At its best, fieldwork offers students valuable opportunities to develop independent research skills in real-world situations, examine analogues for a range of scientific concepts, and socialise with peers. It offers experiences that are challenging to replicate using virtual/remote learning. However, at its worst, traditional fieldwork practice and culture can present barriers to access and hostile environments that epitomise the broader equality, diversity and inclusivity problems faced by GEES disciplines. With the role of fieldwork increasingly being called into question, here we promote simple adaptations that can make fieldwork more accessible and enjoyable for all.

Keywords

GEES, Fieldwork, equality, diversity, inclusivity, accessibility

Introduction

Fieldwork is a key aspect of most Physical Geography, Earth and Environmental Science (GEES) degrees. From sampling Caledonian granites in Ireland, to measuring water turbidity in the Zambezi River, to logging sedimentary sequences in Utah, to using drones to analyse glaciers in Iceland; fieldwork means so many different things to geographers, earth and environmental scientists.

Yet this diversity of field environments is not mirrored by the wider GEES community itself. Numerous publications have now demonstrated that these disciplines have alarmingly poor representation of disabled, ethnic minority and LGBTQ+ scientists (e.g. Stokes et al., 2015; Bernard and Cooperdock, 2018; Dutt, 2020; Dowey et al. 2021). This growing awareness of the need for improved equity, diversity and inclusivity (EDI), together with the unprecedented travel disruption wrought by COVID-19, has led to the role of fieldwork in GEES education increasingly being the subject of debate (e.g. Dzombak, 2020a; Pickrell, 2020; Giles et al., 2020).

Fieldwork has been the subject of significant criticism for its “masculine, eurocentric origins, assumptions and languages” (Bracken and Mawdsley, 2004). In their 2014 survey of field

scientists from some 30 different countries, Clancy et al. found mistreatment of female early career academics to be widespread, with 71% of female respondents having experienced sexual harassment during fieldwork and over a quarter reporting sexual assault. Frequently encountered fieldwork cultures, including heavy drinking, partying and 'banter' (Nairn, 1996), have served to exclude those with markers of difference, especially LGBTQ+ and disabled scientists (Nairn, 2003; Hall et al., 2004; Pickrell, 2020).

GEES fieldwork involves inherent barriers to individuals from minority groups, including expense, physical exertion, alcohol culture, and access to toilets (Greene et al., 2019; Dowey et al., 2021; Abeyta et al., 2021). Even where fieldwork costs are covered, the expense of field equipment and clothing is a problem for researchers from low socioeconomic upbringings, who are disproportionately from minority ethnic backgrounds in Global North countries like the UK (Office for National Statistics, 2020). For some cultures, residential stays in mixed accommodations (Nairn, 2003), or the scheduling of field courses with regards to the religious calendar, may cause concern. Furthermore, fieldwork traditionally takes place in remote, rural, racially homogenous locations, where ethnic minority researchers may be more likely to face racism (Anadu et al., 2020).

In taught fieldwork, these barriers may be heightened by a lack of flexibility to adapt field locations or sites to be more inclusive for all and by employing the standard 'transmission' model of teaching, which is not conducive to active participation of students and student-centered learning (Barr and Tagg, 1995; Michael, 2006).

Many authors maintain that fieldwork is a defining and indispensable aspect of GEES curricula; whilst it may be supplemented through virtual or non-field based activities (particularly during the current conditions of the Covid-19 pandemic), these alternatives cannot replicate the learning experiences from outdoor fieldwork (Stokes et al., 2019; Giles et al., 2020; Sima, 2020). Fieldwork is a compulsory part of GEES curricula; in the UK, the Quality Assurance Agency for Higher Education Benchmark Statements for these disciplines refer to fieldwork as 'core' and 'essential'(QAA, 2019a, 2019b). We cannot, therefore, make GEES disciplines more inclusive by simply removing outdoors working, or by converting it wholesale into something different. We instead must adapt our practice in the field to create more inclusive outdoor working experiences. Embedding EDI considerations into fieldwork is ethical best practice, and a crucial step in removing the barriers that fieldwork poses to access, participation and retention of minority researchers in GEES.

In this contribution we draw on our lived experiences as a mixed ethnicity autistic non-binary early career geoscientist and a white female physical geography lecturer with experience in industry, respectively. We do not seek to focus on any particular minority or marginalised identity but rather to offer straightforward, holistic recommendations for removing some frequently overlooked barriers and stressors that can occur in the field. Our hope is that these proposed adaptations will help make fieldwork a more accessible and rewarding experience for all.

Planning is key

Fieldwork has always been prone to challenges. Poor weather, unexpected lack of access to outcrops, vehicle breakdown, a lack of toilets. Overcoming such setbacks is arguably part of the 'hidden curriculum' (Jackson, 1968), building resilience and transferable skills in students that they can draw upon in future careers. However, for some students, simply participating in a field trip can be challenging, due to pre-existing financial, physical, racial and/or emotional barriers (Stokes et al., 2019). It follows that if participants experience further adversity in the field, it may impact confidence and be a deterrent to undertaking future fieldwork or pursuing careers in field-based disciplines.

GEES educators are trained to undertake broad planning for health and safety scenarios in the field. However, more can be done to ensure preparedness for a broad range of other challenging situations, some of which have serious health and safety implications. For example, Prior-Jones et al. (2020) recommend embedding inclusion into risk assessments so that greater consideration is given to hazards and appropriate mitigations that particularly affect those from minorities with protected characteristics such as disability, gender reassignment, marriage and civil partnership, religion or belief, sex, and sexual orientation. Anadu et al. (2020) provide detailed recommendations to protect fieldwork participants from racism and prejudice, including racial risk assessments and antidiscrimination training for field leaders.

Kingsbury et al. (2020) advocate creating daily schedules that factor in non-academic aspects of working in the field, such as taking breaks from working in groups to preclude overstimulation and related meltdowns/ shutdowns in autistic individuals.

Considered logistical preparation, involving lists of alternative accessible outcrops, digital resources and plans B, C and D, may be crucial in avoiding demoralisation and disengagement, particularly for students with disabilities. Although devising backup plans may require creativity and additional effort on the trip organiser's part, having alternatives such as wet-weather activities can be beneficial for entire student cohorts and can easily be reused for each presentation of the field course (Houghton et al. 2020; Figure 1).

Field leaders can be open about their mitigations and planning, promoting measures made to improve accessibility and also training students on how to problem-solve when planning their own independent field activities.

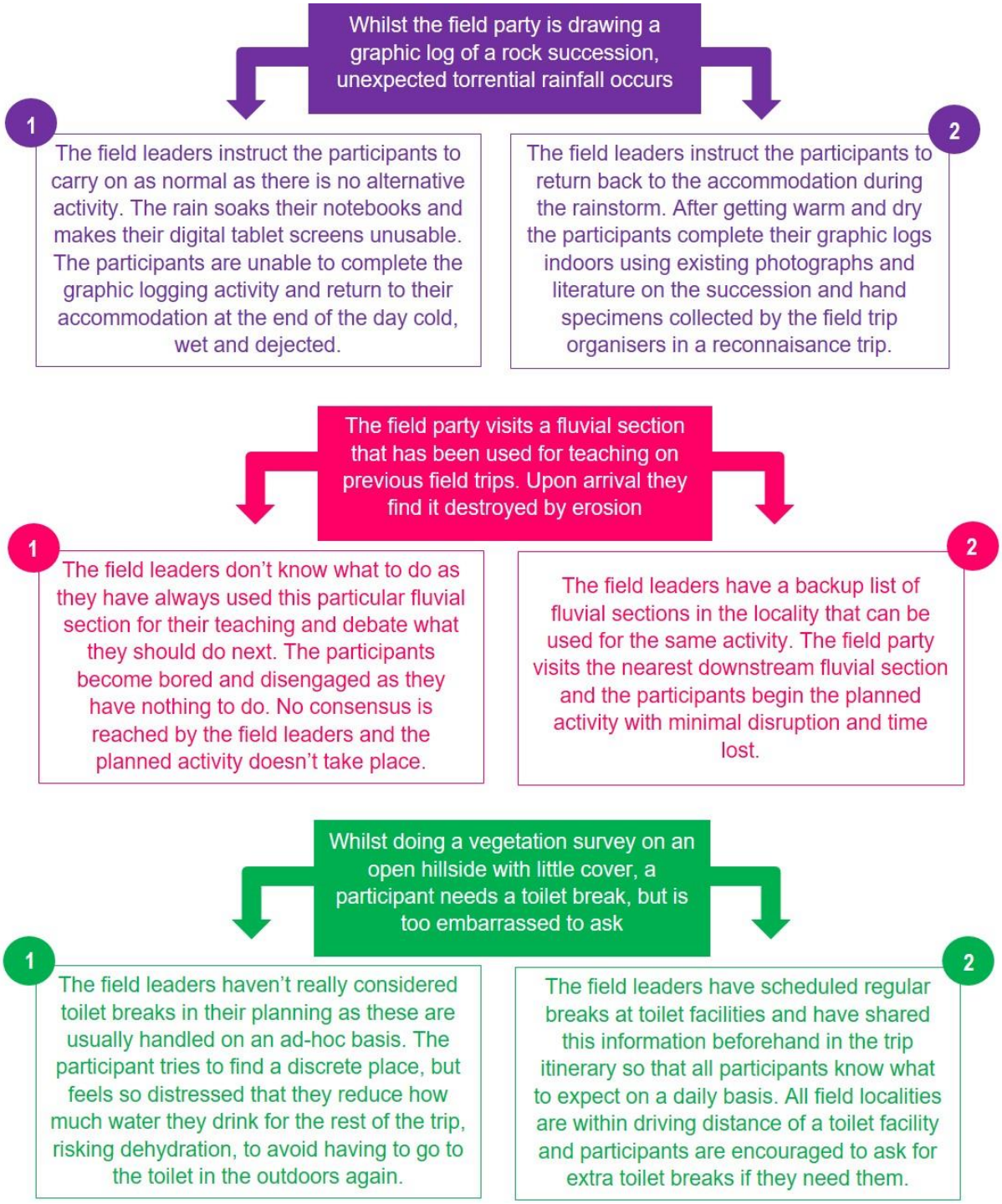

Figure 1 *Example problems in the field and outcomes. Outcome 1 results from rudimentary fieldwork planning while outcome 2 reflects more considered planning*

Fun not fear

Experiences shared on social media in recent years have revealed a glimpse of the discrimination faced by minority geoscientists in the field (e.g. Larson, 2020; Litchfield, 2020; Anadu, 2020). Even where comprehensive fieldwork planning and preparation is undertaken, such experiences could understandably discourage some to forgo fieldwork altogether because of fear. For LGBTQ+ geographers, fear of travelling to countries where their status is criminalized (Olcott and Downen, 2020; Mackay, 2021); for ethnic minority geoscientists, fear of experiencing racism (Anadu et al., 2020); for disabled environmental scientists, fear of being in unfamiliar and poorly accessible areas far from the safety net of home and professional healthcare support (Hall and Healy, 2005; Tucker and Horton, 2019; Stokes et al., 2019).

Although these concerns may be difficult to fully address, a good first step is to remove problematic destinations, such as countries that criminalise homosexuality, from field itineraries altogether (Murphy, 2020; Jackson, 2021). To further ensure that all participants can feel safe and find fun in their field experiences a complete package of support should be offered, that goes beyond the standard field trip leader, health and safety officer, or informal buddy schemes.

Assigning personal assistants or mentors to vulnerable individuals can enhance inclusion and access in field environments, especially if the mentor is someone with shared experiences that allow them to relate well to their mentees (Olcott and Downen, 2020). This mentor/assistant can liaise with their mentees prior to the field course, to gain understanding of their personal and cultural circumstances and abilities. As well as ensuring that all prospective mentors and field staff are offered general training in allyship (Anadu et al. 2020), institutions must adopt a flexible approach to fieldwork mentoring, working on a case-by-case basis. Institutional disability service providers may not have the pedagogic experience or familiarity with GEES disciplines required to provide appropriate mentoring support for academics outside of traditional workplace settings (Feig et al. 2019). For example, the first author of this study is provided assistance by their parents in the field as, being full-time carers, they have the greatest insight into the author's disability, including how it affects them on a day-to-day basis and their specific needs in the context of geoscience fieldwork.

Upon arrival at the field locality, mentors could offer a meet-and-greet service for their mentees to replace any initial feelings of trepidation and anxiety with a sense of welcome and belonging. During the fieldwork itself, mentors should maintain regular communication with their mentees to assess how much support they require to feel comfortable and effectively engage in the learning experience (Hendricks et al., 2017).

Whilst universities and colleges may not consider it their responsibility to provide off-campus support (Anadu et al., 2020), they do have a duty of care to ensure the safety and wellbeing of all staff and students, and it is important that individuals who need it have the safety net of a designated person that can listen and respond to their concerns as they arise.

Skills over hills

A key aim of field training is to allow scientists to gain practical, transferable skills that they can reuse in the future when independently gathering primary data.

However, skills development can be undermined not only by safety concerns but also by fieldwork cultures. It is well-reported that a machismo culture of ‘we must visit that outcrop because it’s there’ pervades fieldwork in many physical science disciplines (e.g. Maguire, 1998; Hall et al., 2004; Fitzpatrick, 2020). This may lead to a focus on who can ‘bag’ the most locations, rather than who is able to accurately conduct the analyses necessary. Where fieldwork grades into adventure tourism rather than a purposeful, educative experience, it reinforces casual ableism and excludes people with disabilities (Tucker and Horton, 2018; Pickrell, 2020).

To create more inclusive instructional environments and equitable access to the field, these traditional attitudes and hostile climates must be dismantled. Part of this effort involves institutions reviewing materials used to promote fieldwork, which routinely depict white, physically fit scientists in rugged outdoor settings (Hall et al., 2004; Atchison and Libarkin, 2016; Dowey et al., 2021).

Careful and considered field work design is also needed (Gilley et al., 2015). For example, where a field locality presents accessibility issues, the trip organisers should endeavour to find an alternative that is easily reachable for those with mobility issues or lower levels of physical fitness. Where this isn’t feasible, portable Wi-fi networks and mobile technology can provide students remote access to the inaccessible field site and thereby create an environment conducive to active participation and social inclusion, as demonstrated through the Enabling Remote Activity (ERA) approach pioneered by the Open University (Collins et al., 2016).

In this way, no students need to miss out on experiencing outdoor field activity and related opportunities to build skills just because they are unable to reach the outcrop at the end of a slippery, rocky beach or atop the highest, most difficult hill.

One size never fits all

Another factor which can deter GEES scientists from participating in outdoor field activities is the course length. The prospect of spending many days or even weeks in the field can raise significant anxieties not just for students but for scientists at various different levels within the academic hierarchy (Tucker and Horton, 2018).

Whereas postgraduates and more senior academics often have independence to determine the duration of fieldwork that they undertake for their own research, undergraduates and teaching staff involved in field courses rarely have the autonomy to decide.

Therefore, institutions should be open to creating more flexible fieldwork timetables that allow for several shorter field courses or daytrips. This may be preferable to the concentrated social environment, typically long working hours and intense nature of a

multiday residential trip, which for some is an “ordeal” rather than a constructive experience (Tucker and Horton, 2018). This has the added advantage of providing thinking and planning time in between field trips; students and staff can reflect on what worked well for them on a trip and whether this can be replicated during their next field visit. Likewise, they can consider what didn’t work so well and how this could be improved next time.

Another consideration here is financial (Abeyta et al., 2021). Field skills training in overseas locations, where not fully subsidised, is an expensive and inaccessible option for many researchers. The feasibility of offering domestic trips, that offer the same degree of pedagogic rigour and generate similar learning outcomes (Figure 2), should be considered for those with caring responsibilities, on a restricted budget and/or not wanting to stray too far from home.

Figure 2 *Different destinations, same aims; The authors of this study photographing field exposures of igneous rocks in overseas (left) and domestic (right) destinations*

Embracing diversity – and being actively anti-prejudice

As well as offering flexibility in terms of field work destinations and course lengths, when working with those from diverse backgrounds it is important to show open-mindedness and acceptance towards different personal needs and requirements.

For example, autistic individuals may need to carry a tactile object like a blanket, engage in stimming or use toys such as fidget spinners, to help maintain focus and cope with the myriad of external sensory stimuli in field environments (Kingsbury et al., 2020).

Researchers who are practising religious fasting may have eating patterns that differ from the traditional meal times that many field courses are structured around. In these cases, leaders should avoid scheduling trips during religious fasting periods such as Ramadan where possible. If this is unavoidable, and students practising fasting are participating in the fieldwork, leaders must ensure that suitable food is available at the appropriate times (including suitable gluten-free, vegetarian, vegan, halal and kosher options), and that the trip

does not involve an unnecessarily high level of strenuous physical exertion. The risk assessment of the trip should be adapted to include the possibility of students experiencing acute dehydration or fainting. Furthermore,to promote the positive wellbeing of those from various religious groups, it is essential that the accommodation in residential field courses contains quiet, suitable spaces for worship and prayer that can be used in between field activities (ECU, 2009; Advance HE, 2018).

Research indicates that 40% of trans and 52% of non-binary people in the UK feel they must adjust the way they dress to avoid discrimination or harassment (Stonewall, 2017). Being given the freedom to dress in outdoor gear and clothing that they feel comfortable and confident wearing is essential for trans and non-binary individuals (Dzombak, 2020b). Furthermore, careful consideration of toilet and changing facilities on fieldtrips is necessary to ensure that everyone can safely use these spaces. Fieldwork leaders should avoid unnecessary gender divisions (e.g. girls queue on the left), ensure that there is universal provision available at the accommodation, and bear in mind that not all trans people feel comfortable using public conveniences (Gendered Intelligence, 2020).

Whatever the difference, tolerance must be extended towards those from underrepresented groups to make the field a more welcoming and diverse place.

Carry on the conversation

It is imperative that the critical thought provoked by the coronavirus pandemic about field work accessibility and inclusion remains at the forefront of our minds long after lockdowns and travel restrictions have ceased. The momentum must continue in order to improve equity, diversity and accessibility within GEES and associated field work (Sima, 2020).

To see positive, lasting change take effect, those who have been previously excluded should be included in the dialogue and lead the conversation going forward (Scarpelli, 2017). Social media, focus groups and workshops (Pickrell, 2020) are powerful forums through which academics, fieldwork leaders and those in management roles can be educated on the challenges faced by minority groups. Conferences, such as those held on accessible virtual platforms during the pandemic (see Batty and Worsfold, 2021; iCRAG, 2021) can enable solution-focussed discussions to take place within the wider GEES community and provide opportunities for disseminating information on best practice to broad, international audiences.

Summary

The six steps outlined here (Figure 3) have the potential to create meaningful change and transform the nature of fieldwork. They can also form part of broader conversations about ethical code of conduct within departments. Increasing accessibility of GEES subjects is very much aligned to the Cape Town Statement of Geoethics, one of the fundamental values of which is to “promote geoduction for all” (Di Capua et al., 2017). Our suggestions are broad, and what is perceived as ‘ethical practice’ may differ amongst different groups and individuals. For that reason, it is important that we listen to diverse groups, and are flexible to actioning their thoughts and ideas where possible. If we do not act on their concerns, we risk losing unique and irreplaceable geographers, earth scientists and environmental scientists not only from the field, but from our disciplines altogether.

Figure 3 *Summary of the Six simple steps towards making fieldwork more accessible and inclusive*

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Dear Sir/ Madam,

I am writing to you, as the editor in chief of ….., to make a presubmission inquiry about an original piece that we believe would be classed as a 'commentary' according to the content types outlined on the …... journal website.

The article is concerned with improving accessibility and inclusivity in geoscience fieldwork. It is informed by recent literature and our perspectives and personal experiences as a mixed-ethnicity, disabled (autistic) early career geoscientist and a geoscience lecturer with experience in industry, respectively.

Our article focuses on the simple adaptations that can make fieldwork more accessible and enjoyable for all. It is written in an accessible and non-technical style that would appeal to a diverse, non-specialist readership, including those from academic disciplines beyond Geoscience.

We have attached the short piece here. Could you please let us know if our article could be of interest to you and if we should submit the manuscript to your online system for your further consideration?

Kind regards,
Miss Anya Lawrence and Dr Natasha Dowey