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Key Points:

- Limited attention has been given to the challenges faced by transgender and gender diverse (TGD) scientists
- TGD people face harassment, gendered berthing, and other legal and physical barriers while working at sea
- Improvements to increase equity can be made at the individual, chief scientist and officer, and institutional levels

Supporting Information:

Supporting Information may be found in the online version of this article.

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Navigating Gender at Sea

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Abstract Fieldwork, including work done at sea, is a key component of many geoscientists' careers. Recent studies have highlighted the pervasive harassment faced by women and LGBTQ+ people during fieldwork. However, transgender and gender diverse (TGD) scientists face obstacles which have not yet been thoroughly examined. We fill this gap by sharing our experiences as TGD people. We have experienced sexual harassment, misconduct, privacy issues, and legal and medical struggles as we conduct seagoing work. In this work, we provide recommendations for individuals, cruise leaders, and institutions for making seagoing work safer for our communities.

Plain Language Summary Transgender and gender diverse people have unique lived experiences. Work done in the field and at sea are integral components of many geoscientists' careers. Understanding the barriers that transgender and gender diverse (TGD) people face during fieldwork is one facet of making the geoscience community more diverse, equitable, and welcoming. This commentary shares some of the lived experiences of the authors and provides recommendations for making seagoing work more welcoming to TGD people.

1. Introduction

Transgender and gender diverse (TGD) people have always been part of the geosciences community but they continue to face significant obstacles and harassment. Fieldwork is an important part of our disciplines, especially in research conducted at sea, and in our experience harassment during fieldwork remains sadly prolific, impacting people at all career stages but in particular being discouraging to students and early-career scientists.

Gender shapes the prevalence and power dynamics of harassment during fieldwork. Recent work has largely focused on the experiences of women during fieldwork, finding that 64% of scientists have experienced sexual harassment in the field, and women are 30% more likely to experience harassment and 20% more likely to experience assault than men (Clancy et al., 2014). Studies on the experiences of women during fieldwork have made recommendations such as creating avenues for reporting misconduct and operating fieldsites in an egalitarian manner (Nelson et al., 2017). Additionally, many recent studies consider the experiences of lesbian, gay, bisexual, transgender, and queer (LGBTQ+) individuals doing fieldwork, finding that 55% of LGBTQ+ scientists have felt unsafe during fieldwork (Olcott & Downen, 2020). Many of these studies have focused on fieldwork in locations with anti-LGBTQ+ laws (Atchison, 2021) and on the struggle of deciding whether to be “out” in the field (Mackay & Bishop, 2022; Zebracki & Greatrick, 2022). One recent study makes recommendations for principal investigators to ensure safety of TGD individuals in ecological fieldwork (Matsuda, 2023). However, none of these studies specifically consider TGD individuals at sea. While there is overlap in the experiences of TGD people and the broader categories of women and of LGBTQ+ people, there are also many differences.

The omission of TGD people in recent studies about fieldwork is likely due to a lack of data, as many fieldwork related demographics surveys do not ask about gender modality or omit any entries that are not male or female (Ashley, 2019; Burnett et al., 2022; Kozlov, 2023; Langin, 2020, 2023; Legg et al., 2022). The omission of TGD people may also be due to the lack of awareness that TGD people face unique challenges during fieldwork. Here

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we aim to partially address this gap using our collective experiences as TGD people during seagoing fieldwork. We hope these recommendations are useful more broadly.

2. Background

Transgender people have gender identities which do not correspond with their gender assigned at birth (referred to as “assigned gender”). We use the term “transgender and gender diverse” to acknowledge that some people may be perceived as a gender other than their assigned gender without identifying as transgender. Specific identities within the TGD umbrella include transgender, nonbinary, transmasculine, transfeminine, and two spirit (see definitions in Table S2 in Supporting Information S1). By contrast, people who have gender identities that align with their assigned gender are cisgender.

Many, though not all, TGD people experience gender dysphoria. Gender dysphoria is defined as physical and/or psychological distress caused by the incongruence between one's assigned gender and one's gender identity. TGD individuals fall under the broader category of LGBTQ+, but gender identity (one's internal sense of gender) and sexual orientation (whom one is attracted to) are different, and require different considerations during fieldwork.

Many, though not all, TGD people choose to transition. Transition is a broad term that encompasses legal, medical, and social transition (Ashley & Skolnik, 2022). Legal transition includes changing legal documents to match a person's name and gender. The requirements for such legal changes vary by state and country and often require months or years of planning. Requirements sometimes include surgery that a TGD person may not want, essentially making it impossible for that person to update their legal documents. Medical transition often includes gender-affirming hormone treatments and surgeries to alleviate gender dysphoria. Like legal transition, medical transition may require planning for years in advance due to waitlists and securing health insurance coverage. Social transition broadly includes alterations to gender expression that help a person be perceived as their desired gender. This might include altering clothing or the name and pronouns that one uses. While some TGD people change from using he/him to she/her (or vice versa), other TGD people use the singular pronoun “they/them.” These legal, medical, and social aspects of transition can create challenges for TGD people, often limiting or even preventing their participation in fieldwork.

Historically, most TGD people in the geosciences and in seagoing work were not “out” about their TGD identities, choosing instead to live closeted as their assigned gender or to transition and not disclose their assigned gender. For example, Elke Mackenzie was a lichenologist who did not publicly disclose she was a woman until the age of 58 (Imbler, 2020). TGD people such as Eugene Falleni, Jack Bee Garland, John Weed, and George Wilson worked in historically men-only marine industries and the navy by “assimilating” into cisgender society. In recent decades, an increasing number of TGD people are out (i.e., publicly disclose their transgender status), able to transition, and may not aim to assimilate into cisgender society. This is evidenced by the 13 authors of this paper who are sharing our experiences as out TGD scientists. This paper draws directly from the experiences of the authors as seagoing TGD scientists, recognizing that the group of authors cannot represent all transgender people and our experiences are not and cannot be representative of all TGD people (Text S1 in Supporting Information S1).

3. Common Challenges of TGD People at Sea

In this section, we describe common experiences and challenges that the authors have experienced before, during, and after research cruises.

3.1. Cruise Preparation

Preparation for a research cruise typically involves paperwork containing personal information for domestic or foreign governments as well as internal cruise planning officials (e.g., for chief scientists or funding agencies). Many TGD people change their names and gender markers on official documents, which often takes months of processing through state and federal agencies and may interfere with cruise travel. These considerations require TGD people to undertake additional planning around rigid cruise dates and academic programs. Additionally,

certain gender markers (e.g., “X” marker, which is allowed on U.S. passports) are not accepted in all countries, and passports with these markers may make travel more difficult or impossible (Quinan, 2022). Some authors chose to not change their passport markers to “X” to avoid potential travel issues. Some authors with “X” markers had experienced difficulty obtaining visas for cruise related travel. Multiple authors reported cruise travel as a reason to alter the timeline of their official document changes. Chief scientists should be aware that TGD individuals may need additional time to navigate the visa process, and that cruises leaving from certain locations may exclude TGD people entirely.

TGD people may encounter scenarios where their reported name and/or gender marker on official paperwork does not match their lived name and/or gender, which can pose logistical and personal challenges. Gender markers on official documentation are often used for internal berthing plans, separating berths into male or female cabins. For example, a TGD person may be nonbinary, have a passport which says “M,” and be perceived by strangers as a woman. This TGD person would need to contact the cruise planner and involuntarily disclose that they are transgender and that their passport gender marker should not be used to determine berthing. This leads to uncomfortable situations, particularly for those who are not publicly out or who are not perceived as their true gender. Generally speaking, allotted gendered berthing enforces barriers that can restrict or exclude TGD people from going to sea (Krum et al., 2013).

Aside from logistical preparation, there are personal considerations to be mindful of while preparing for sea. TGD people who are undergoing hormone replacement therapy (HRT; e.g., testosterone, estrogen, progesterone) often need special permission from doctors or prescribers to order several months of medication for fieldwork away from land. This is not always an option for TGD people, as some laws place restrictions on health insurance providers such that the considerable cost of HRT may not be covered for extended time periods. Altogether, pre-cruise planning for TGD people can take significant time and energy.

3.2. Life at Sea

At sea, the safety of all passengers is the ultimate concern, and safety includes prevention of both physical and emotional harm. Unfortunately, the authors' experiences as TGD people at sea includes forms of harm from scientists and crew members. Misgendering, both intentional and accidental, is a frequent occurrence and has documented negative effects on mental health and wellbeing (Matsuno et al., 2022; McLemore, 2018). Intentional misgendering is a form of sexual harassment (Sexual Orientation and Gender Identity (SOGI) Discrimination | U.S. Equal Employment Opportunity Commission, 2023).

When boarding a research vessel, TGD people must decide whether to disclose their TGD status to other passengers. One occurrence that is helpful for TGD people is the normalization of sharing pronouns, especially from chief scientists and ship officers (I. R. Johnson et al., 2021). However, we do not recommend mandatory pronoun sharing (e.g., requiring pronouns as a part of cruise planning), as this can force TGD people to either out or misgender themselves (Frary, 2022).

Physical harm can also occur as a result of being TGD at sea. For some TGD people, this may involve chest binding (flattening chest tissue) or tucking (concealing external genitalia) for prolonged periods of time, which can result in nausea, physical pain, and injury (Poteat et al., 2018). Problems from these practices are exacerbated by not allowing TGD people to choose their cabinmates, as TGD people may need to bind or tuck even in their cabins. Additionally, some authors reported feeling uncomfortable or unable to use the toilet that aligns with their gender identity, instead opting to use the toilet less frequently. On vessels without a toilet, TGD people may forgo relieving themselves at all due to privacy concerns, with potential health risks such as dehydration and urinary tract infection. Having a well-communicated plan for toilet usage ahead of departure can alleviate these privacy concerns.

Several authors stated that they had not reported harassment because the person they were meant to report concerns to (e.g., chief scientist) was the perpetrator or was known to be discriminatory toward TGD people. To alleviate this, there should be reporting systems in place, clear reporting policies, a leadership-enforced safe-space policy, and someone to report harassment to who is not in a position of power (i.e., neither the ship's captain nor chief scientist).

3.3. Post-Cruise

After returning to land, there are often celebrations with scientists and crew that involve alcohol. While this can be a time to unwind and celebrate a successful research expedition, it is also a time when multiple authors reported being subject to inappropriate comments, questions, and jokes regarding their gender identities and expressions. In some cases, what was an otherwise positive at sea experience became a negative one, as the TGD person realized their shipmates held harmful prejudices all along. These comments and jokes can constitute sexual harassment.

The stressors and harm of going to sea as a TGD person, as described above, have led some authors to change their career plans to avoid future seagoing work. Others report being passed over and overlooked due to their gender identity, therefore missing important career opportunities. Even if TGD individuals stay in the seagoing oceanographic discipline, the stress and discomfort of the above experiences can negatively affect their work and mental, physical, and emotional health (Cech & Waidzun, 2021).

These common challenges experienced by TGD individuals at sea include forms of sexual harassment as well as logistical challenges due to social, legal, and medical transition. Both kinds of challenges should be taken into account when considering ways to make seagoing work more inclusive for all. We note that additional challenges are likely experienced by TGD people with intersectional identities (e.g., race, folks with disabilities; Chiarella & Vurro, 2020; Núñez et al., 2020), and indeed, authors with these intersectional identities reported more negative experiences.

4. Recommendations and Conclusions

We provide a list of recommendations that individuals, chief scientists, and institutions may use to improve the seagoing fieldwork experience for TGD people. These recommendations should be considered as a specific case within the broader discussion of field safety in science and promoting inclusivity in geosciences (e.g., Ackerman et al., 2023; Behl et al., 2021; Consortium for Ocean Leadership and California State University Desert Studies, 2021; Conway et al., 2023; Coon et al., 2023; Demery & Pipkin, 2021). The list is non-exhaustive and is intended to be used as a starting point. It includes suggestions on what to do (“do”), an example (“example”), and pitfalls to avoid (“avoid”). The left hand column specifies whether the recommendation applies to all individuals, chief scientists and ship officers, or institutions that fund, plan, or administer research cruises. Several of these recommendations can support not only TGD people but many categories of people who have been historically excluded from seagoing research, including women and racial minorities (Ali et al., 2021). We note that these recommendations are general; soliciting and listening to the preferences of the local TGD community is still necessary. For context, we also provide relevant definitions and suggested language surrounding TGD identities and experiences in the Supporting Information S1.

TGD people experience challenges at sea, such as struggles due to legal documentation not matching our true genders, sexual harassment and other misconduct, difficulty accessing medication, privacy concerns due to berthing and bathroom arrangements, and retaliation for reporting misconduct. Some recommendations that everyone can take into consideration are including pronouns when introducing themselves and privately correcting others who misgender TGD people. These recommendations, and the others listed in Figure 1, are a step toward a more inclusive environment for all during fieldwork.

WHO	DO	EXAMPLE	AVOID
Everyone	Refer to everyone the way they ask you to refer to them (e.g. names, pronouns, identities)	Introduce yourself using the name you prefer and your pronouns, to set the precedent for others	Requiring everyone to state their pronouns. This can force people to either misgender themselves or out themselves to others
Everyone	Handle misgendering incidents briefly, directly, and on your own	Where's Jason? She went for lunch. They went for lunch? Right, yes, they did	Telling the misgendered person about the incident or expect them to handle it later
Chief scientists and ship officers	Include respect for transgender people in safety / harassment training. Include indigenous genders (e.g. two-spirit)	Assume questions around berths, bathrooms, and pronouns will arise. Prepare all authority figures aboard	Avoiding the topic. At least 1% of the US is trans / nonbinary. 0.1-2% are intersex (InterACT 2021; Brown 2022; Nonbinary Wiki Contributors 2022)
Chief scientists and ship officers	Ask for berthing preferences from all scientists onboard	'Our berthings have 2 bunks. What individuals or genders would you prefer to share with?'	Assuming you can pair people by gender based on names, appearance, or gender markers on legal identification
Chief scientists and ship officers	Check how ports handle X gender markers on identification. (Equality Maps 2023, Quinan 2022)	Consider this issue in the cruise planning phase and communicate this information to TGD persons	Waiting for the affected persons to ask about the port's requirements
Chief scientists and ship officers	Provide anonymous methods of feedback for cases of harassment, misconduct, and discomfort	Use online portals or intermediary reporting services. Explain usage at safety announcements, training, and berthing	Requiring people to communicate directly with captains, marine technicians, or other authority figures to report incidents
Chief scientists and ship officers	Collect inclusive data on TGD people that go to sea	Collect demographics data on both gender and transgender status (Kronk et al 2022)	Use inadequate sets of identifiers such as 'man or woman or other' and 'male / trans male or female / trans female'
Chief scientists and ship officers	Include gender and / or pronouns as an optional category for ship rosters	Allow people to self-describe in optional, free-text boxes	Requiring gender and pronouns be listed on the ship roster, as this can force people to either misgender themselves or out themselves
Chief scientists and ship officers + Institutions	Adopt inclusive ethics and codes of conduct, disseminate best practices	Share relevant codes of conduct and best practices with scientists and crew	Assuming that everyone already knows appropriate conduct and best practices
Chief scientists and ship officers + Institutions	Publicly display Equity, Diversity, and Inclusion (EDI) statements at institutes and onboard	Explicitly acknowledge TGD people in public EDI statements	Assuming that EDI persons know they are included and accepted
Chief scientists and ship officers + Institutions	Work with EDI experts to audit procedures and educate staff	Seek out TGD-led organizations that can provide guidance and / or pay TGD experts to consult	Asking TGD people to audit procedures and educate as an unpaid service
Chief scientists and ship officers + Institutions	Consider how single bunks berthings are allocated	Ask about accommodations generally, the same way you might ask about dietary needs	Assuming that everyone has equal privacy needs, or allocate single bunk berths based solely on seniority

Figure 1. Recommendations for making seagoing work more inclusive for Transgender and gender diverse people.

Conflict of Interest

The authors declare no conflicts of interest relevant to this study.

Data Availability Statement

Data were not used, nor created for this research.

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