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The Campus Safety, Health, and Environmental Management Association (CSHEMA) is a professional organization composed of safety professionals from 425-member institutions of higher education. Our professional organization includes highly educated, experienced, and credentialed experts in research safety, risk management, and advancing safety cultures. Members are thought-leaders at their respective institutions focused on ensuring the safety and security of researchers, the public, and the environment.

Within CSHEMA, a Field Research Safety Community of Practice was established in July 2018 to provide a forum for health and safety professionals in Environmental Health & Safety (EHS) departments at academic institutions to share resources and best practices in hazard assessment, emergency planning, and research-specific training for both urban and remote field settings. These comments were developed by members of this Community of Practice.

The NSF Proposed Changes to include a “Plan for Safe and Inclusive Field/Vessel/Aircraft Research (PSI-FVAR)” are broadly supported by the CSHEMA and its associated Field Research Safety Community of Practice; however, we feel that more could be done to enhance researcher safety in these environments. The following sections define our specific recommendations for improvements, including specific language enhancements to the text.

Expansion of the Safety Definition

As EHS professionals, we feel that it is imperative that this safety plan include safety considerations beyond potential for harassment. Physical, environmental, health, and activity hazards in field environments have all led to the deaths of researchers (see Table 1) in recent years. As consistent reporting of field incidents is not tracked, we feel that true incident rates are higher, even accounting for the higher degree of risks involved. As safety and security are closely linked within the field environment, inclusion of these elements would not greatly impact the overall administrative burden of creation of these plans and would greatly enhance the safety of field research personnel. Elements should include a description of the safety hazard, possible risk, and mitigation strategy. Emergency/Incident response plans can be inclusive of security/harassment as well as other possible emergency protocols.

Tied into this expansion would be the inclusion of researcher mental health. The same challenging circumstances that can exacerbate the risk of harassment can also be problematic for researcher mental health (e.g., John and Kahn, 2018).

Nelson et al. (2017) indicated that rules and enforcement of those rules are essential for safe and successful field work. Thus, a description of consequences for non-compliance must be added to ensure that researcher teams meet this goal.

In order to accommodate this expansion in scope, it is recommended that the page limit be increased by one page to a total of three pages.

Training and Resource Availability

Researchers in field environments often do not benefit from the defined safety structures and administrative oversight that is present for laboratory, biosafety, and animal research, as field research safety programs with dedicated staffing are nascent or non-existent at most institutions. Adding the requirement that an institutional responsible entity be established, in-line with other safety areas such as biosafety, would push institutions to improve overall management of risks in these areas.

Most available institutional training (e.g., harassment, discrimination, etc.) is not tailored to field environments. Confounding factors such as a lack of reporting mechanisms, no access to emergency services, or altered legal landscapes can render the training inadequate for field research applications. We think that it would be prudent for the NSF to develop standardized training content for field researchers in these areas. Alternatively, additional funding opportunities to tailor training content and improve access could be made available through the NSF.

Inclusion and Anti-Discrimination for All

While we agree that field environments have a higher degree of risk and complication that requires a specific plan be put in place, we also believe that all researchers should be apprised of the NSF expectations for safe and respectful conduct. As such, we believe the expectations should be placed in a location where they would apply for all research groups. This document should also identify basic conduct expectations for NSF researchers interacting with the communities where they are conducting research activities. Conduct expectations should also include non-consensual acts as unacceptable.

The language included in this change avoids specific mentions of harassment related to minority status. Demery and Pipkin (2021) identify individuals from minority identities related to race/ethnicity, sexual orientation, disability, gender identity, and/or religion as being significantly at-risk of harassment or prejudice. Each of these categories should be included in language. Sexual harassment and assault should be cited specifically due to the high prevalence of these experiences in certain populations of field researchers (e.g., Clancy et al., 2014).

Harassment and discrimination concerns can be internal to the field team or from the external community. More emphasis should be made to distinguish between these scenarios, as the risk mitigation strategies and response tools will be different in each case. Additional in-group risk factors may include the type of accommodations expected and power dynamics/imbances.

Suggested Language

Field research is a necessary component of many STEM fields. Fieldwork presents unique challenges to managing the safety and security of field researchers. The likelihood of harassment can also be increased in these areas, including but not limited to, challenging physical conditions, social isolation, and limited communication methods. All research should be done in a safe environment that is free from harassment.

It is NSF's expectation that:

1. All personnel will treat others with dignity and respect, will exercise the highest level of professional and ethical behavior, within the team and with respect to the surrounding community and environment; and,
2. It is everyone's responsibility to provide a safe and inclusive workplace. While not exhaustive, the following acts are examples of conduct that do not meet NSF's expectations:
 - a. Abuse of any person, including, but not limited to, assault, harassment, stalking, bullying, or hazing of any kind, whether the behavior is carried out verbally, physically, electronically, or in written form; or,
 - b. Conduct that is unwelcome, non-consensual, offensive, indecent, obscene, disorderly, or unsafe; or,
 - c. Conduct that is derogative to individuals based on their race/ethnicity, sexual orientation, disability, gender identity, and/or religion whether the behavior is carried out verbally, physically, electronically, or in written form.

The PSI-FVAR will document background information, pre-deployment activities, and plans for conduct while in the field and must include the following three sections:

1. Background Information
 - a. Description of Field Locations – (Note: only one PSI-FVAR is required per proposal if the research involves multiple locations).
 - b. Description of the physical, health, field activity, and personal security hazards and safety risk factors present at the field locations.
 - c. Description of the harassment risk factors external to the group. For example, diversity differences between local community and group, legal system differences or barriers, cultural customs, and access to emergency and/or health care services.
 - d. Description of harassment risk factors internal to the group. For example, accommodations, power dynamics/imbances, off-duty time, relationships, and privacy expectations.
2. Preparation for Fieldwork
 - a. Training- Include description of required training courses related to safety, first aid, anti-harassment, misconduct, etc. that will be assigned to researchers.
 - b. Planned processes to establish shared team definitions of roles, responsibilities, and culture (these identified executive summaries do not replace the need for specific detailed plans should be developed for distribution and training for field researchers).
 - i. Executive summary of how safety expectations and conduct rules are defined and how a culture of safety and inclusivity will be maintained.
 - ii. Executive summary of risk assessment which describes how probability and severity of possible negative events were calculated.
 - iii. Executive summary of field safety plan which identifies mitigation strategies to reduce risks.
 - iv. Executive summary of communication plans. For example, description of means of communication, check-in plans, escalation communication procedures; specifics if multiple organizations involved; consideration of involvement outside the funded organization(s).

- c. Field Support Plan- Include information related to active monitoring of conditions and support of field researchers. Also include details related to the enforcement of safety expectations and conduct rules, such as disciplinary procedures.
- 3. Emergency Response and Recovery
 - a. Incident Response Plan- Should cover response activities surrounding situational scenarios related to potential risks identified in previous sections including but not limited to:
 - i. Medical or health related incident, mental health related incident, missing person, search and rescue event, natural disaster, security threat/event, terrorism, global health event, civil unrest event, weather emergency; or,
 - ii. Significant conduct/rule non-compliance or violation with any of the established expectations.
 - b. Reporting Plan-Should cover mandatory reporting requirements and support assistance resources (e.g., points of contact, hotlines).
 - c. Recovery Plan- Should include procedures for resuming field activities post-incident, if possible. Include survivor support resources available. Identify conditions that trigger an immediate cessation of research activities. If cessation of activities is necessary, identify procedures for returning to home institution(s).



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Table 1 Selected Field Fatalities in Research 2000-Present

Year	Victim Names (Age)	Incident Type
2020	Konrad Steffen (68)	Crevasse Fall
2019	Umihiko Hoshijima (28)	Diving Accident
2019	Josh Copus (39)	Diving Accident
2018	Denis Lynn (71)	Rogue Wave
2016	Sharon Gray (30)	Civil Unrest
2016	Danny Powers (57)	ATV Accident
2016	Gordon Hamilton (50)	Snowmobile Accident
2015	Margarita Metallinou (29)	Elephant Attack
2014	Luigi Michaud (40)	Diving Accident
2014	Bhupathy Subramaniam (51)	Fall
2014	Adam Stewart (31)	Bear Attack
2014	Keren Embar (36)	Hantavirus
2012	Chad DiGregorio (26)	Fall
2011	Suzanne Abele (27)	ATV Accident
2010	Ben Samphire (31)	Shot
2010	John Thorbjarnarson (52)	Malaria
2007	Alyssa Heberton-Morimoto (24)	Murder
2007	Eric York (37)	Plague
2005	Jarrod Stehbins (23)	Shark Attack
2005	Kenton Carnegie (22)	Wolf Attack
2004	Jeff Kaminski (32)	Hantavirus
2003	Kristy Brown (28)	Leopard Seal Attack
2001	Diego Viracucha (37)	Fall
2001	Joseph Slowinski (38)	Snake Bite
2001	Chris Wysiekierski (30)	Drowning
2000	Asep Wildan, Mukti	Volcanic Eruption
2000	Gary Polis (53), Michael Rose (28), Takuya Abe (55), Masahiko Higashi (45), Shigeru Nakano (37)	Boating Accident

References

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John, C.M., Khan, S.B. Mental health in the field. *Nature Geosci* **11**, 618–620 (2018). <https://doi.org/10.1038/s41561-018-0219-0>

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