Reed College Field Research Safety Guide

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1.0 Purpose and Scope

The field research safety guidelines provided in the attached document are intended to provide assistance to faculty, research supervisors, postdoctoral associates, technicians, other employees, and undergraduate students with the primary motivation of promoting safety and minimizing risks associated with the execution of research activities in a field setting, where there is an elevated risk of harm compared to routine activities. These guidelines apply to all College-sponsored research, regardless of funding source.

A field/remote setting for the purpose of this guide is defined as a site with hazardous terrain, climate, wildlife, zoonotic risks, poor sanitation, other environmental hazards, or remote sites with limited services (e.g. more than 30 minutes from emergency medical services).

College-sponsored research is performed by and/or under the supervision of a faculty or research supervisor, who is responsible not only for the intellectual/academic execution of the research, but also for promoting the safety of all individuals involved in the research effort. When research conducted by students/employees occurs in the field (off-campus), special care and precautions may be warranted.

Questions of applicability for a specific research activity should be directed to the office of Environmental Health and Safety for guidance.

2.0 Responsibilities of Positions

2.1 Environmental Health and Safety Department (EHS)

EHS is responsible for program development and review to ensure compliance with all applicable federal and state regulations and with best industry practice. EHS will provide technical guidance and assistance in training and methods of compliance. EHS staff are authorized to halt any unsafe work practices that are not in accordance with health and safety policies.

2.2 Faculty/Research Supervisors

Faculty/Supervisors carry the overall responsibility for safety in the field. For the program to be effective, these individuals will expand the plan to cover the hazards and safe work practices unique to each field research program. These modifications must be in writing and maintained within this manual. Other responsibilities include:

- Acquiring the necessary information to recognize and control hazards.
- Knowing the signs and symptoms of overexposure.
- Using appropriate safe practices and controls, such as properly functioning personal protective equipment (PPE), to reduce the potential for exposure to hazards.
- Supervising the performance of staff and all other persons in the field so that everyone understands and follows safe field practices and procedures.

- Providing and documenting training for employees and others to recognize hazards and follow standard procedures for dealing with accidents/incidents.

3.0 Field Research Safety Plan

Faculty/research supervisors should draft a generalized field safety policy for their individual labs that can encompass a number of smaller, more project-specific field safety plans (an example of a field safety plan is provided in Appendix A). Faculty are the best authorities on risks potentially encountered while conducting research at their field sites and should draw upon their judgment and personal experiences in drafting these plans. Generalized field safety policies should address the following categories, where applicable:

1. Personnel Safety Training - Provide guidelines on the availability and necessity of first aid and/or CPR training, first aid kits, and other field safety gear necessary for specific field situations.
2. Communications - Provide phone numbers or contact information for faculty or other important lab and field personnel. Other emergency contact information should also be provided, depending upon the field circumstances.
3. Safe and Inclusive Work Environment Plan – An example of Safe and Inclusive Work Environment Plan can be found in Appendix B.
4. Hazards - Discuss specific chemical, physical, and/or environmental hazards that are important for your research group to know about. Discuss forms of transportation to be used, decide if special training is required, and address safety concerns (e.g. ATVs, boats).

4.0 Safety Training and Personnel Considerations

4.1 Safety Training

Faculty should use discretion when deciding which individual(s) should receive safety training, and what level of awareness/training is appropriate. Direct questions to the Environmental Health and Safety office.

4.2 Personnel Staffing

Normal procedure is for at least two persons to work together in the field. In certain circumstances, the situation may arise that only one person can go into the field. Reed College discourages lone workers in field situations.

If a student/employee encounters dangerous working conditions (flooding river, inclement weather, unsafe boats, unsafe sampling location, etc.), the student/employee may question the dangers with faculty/research supervisor, and if not satisfied that the work can be performed safely, may cease work without repercussions, until the student/employee considers the conditions to be safe. Ultimately, it is the responsibility of the faculty/research supervisor to foster the safety and wellbeing of students/employees. At the same time, students/employees need to be forthcoming about their preparedness. Additionally a field research safety plan should be implemented and all parties aware of the procedures/protocols.

5.0 Communications

5.1 Communications Protocol

Any group that includes students/employees conducting field research needs to adopt a communications protocol ensuring that adequate communications equipment accompany students/employees in field settings.

The written field research safety plan should include a 'Communications' section that outlines a communication protocol that faculty/research supervisor implements and that the field researchers follow. At a minimum, this protocol should include emergency contact numbers, an emergency communication protocol, and communications equipment requirements (e.g., cell phones, satellite phones).

Cellular phones should be carried by each field team while conducting field work for use in case of emergency. Faculty/research supervisor should make clear the communications equipment expectations for all students/employees conducting field work. In most cases, a student's/employee's cell phone will suffice for communications equipment. The field safety plan communication protocol should detail circumstances when personal cell phones are inadequate, such as when research is conducted outside of cell phone coverage, or if research is conducted abroad and U.S. cell phones may not work with basic U.S. cell phone plans. In these circumstances, faculty/research supervisors should either provide alternate communications equipment (cell phone with international access or satellite phone, for instance) or develop a field safety plan (see below) that includes planned communications between the field researcher and Faculty or other designated party.

5.2 Communications Plan Component of Field Research Plan

At the Faculty's/research supervisor's discretion, field communications plans may be included in the field safety plan to facilitate communication between field researchers and the Faculty or other parties such that persons not accompanying the student(s)/employee(s) know when and where the students/employees are conducting field research. If the students/employees have not safely returned by some predetermined time, emergency services will be contacted on their behalf. The purpose of a field safety plan is to avoid a circumstance where a student/employee field crew is conducting field work without the knowledge of some person not on the field research crew. The field safety plan is also designed to keep in contact with a field team if they are conducting field work for an extended period of

time. If the field team were to encounter an emergency and be unable to contact emergency services for whatever reason, the emergency contact would attempt to contact the field crew at a set time. If contact is not established, emergency services would then be contacted.

When appropriate, field communications plans should be filed with the emergency contact before the field crew departs. Field communications plans should contain sufficient detail about the location of the field research such that the emergency contact can, if required, direct emergency services to the research site. The field communications plan should also detail a date and time at which, if communication between the field crew and the emergency contact cannot be established, the emergency contact will implement emergency measures.

Faculty/designee must verify that each member of the research team is in possession of and understands the field communications plan.

6.0 Potential Fieldwork Hazards and Special Circumstances

This list is by no means exhaustive. Each field site has its own set of unique conditions and potential hazards that should be discussed with the research advisor and team. Each faculty member should develop field safety guidelines for the students/employees involved in fieldwork and discuss specific strategies for avoiding or mitigating field hazards.

All-Terrain Vehicles/Snowmobiles/etc.: All users should be properly trained (and where required, licensed) in the safe use and operation of vehicles that may be used in the field.

Animals/Wildlife: Particularly when working in remote areas, animals/wildlife may be of particular concern. Each field location will have its own unique fauna and the potential threat posed by these animals should be considered. Particular attention should be paid if working in an area during mating season or when offspring are present, as these situations may make certain animals more likely to be aggressive. If the field work involves intentional animal handling, hazards such as bites, infection, etc. should be addressed.

Biological Hazards: Contamination of air, water and food sources by local bacteria and viruses should be considered. Immunization may be considered for things like tetanus or other diseases if engaged in activities that put researchers at greater risk. Routine preventive measures should be taken, such as dressing to avoid tick exposure, mosquitos, etc. Consider the potential for water-borne diseases, and have access to clean water, or take appropriate steps to use personal water purification devices while working/camping. Be aware of insect borne disease such as Zika, etc. and review protective strategies.

Boating Safety: All users should be properly trained in the safe use and operation of boats. Personal floatation devices must be available for all passengers and must be worn at all times when in a boat. Safety should be considered not only while on the open water, but also during docking procedures, as this is often when accidents and injuries can occur. Please See Boat Safety Plan for more information.

Cellular Access: When working in a rural area, be aware that cell phone coverage may be limited, and not available for emergency assistance. Also, consider that not all rural areas have 911 emergency

phone numbers in place. If this is the case, know the direct phone number for local emergency services such as ambulance, fire and police and update the field communications plan accordingly.

Chemical Safety: If working with hazardous chemicals while in the field, all precautions should be taken that would normally be taken within Reed College research labs. Proper personal protection should be worn (gloves, goggles, face shield, etc.) and proper ventilation should be available. Additional safety precautions may need to be considered if transporting chemicals to a field site. Also consider what waste disposal procedures may need to be in place.

Electrical Hazards: Consider any electrical hazards that may be present at a field site, including high voltage power lines, etc. Research equipment/instrumentation should be checked for signs of wear prior to deployment in the field (frayed lines, stripped wires, etc.). Care should be taken when operating electrical equipment near water sources.

Environmental Hazards: Natural environment and weather conditions may pose a hazard to personal safety. Each field site will have its own unique set of conditions that may need to be considered. Faculty should discuss potential hazards with personnel prior to field deployment. Issues of concern may include the potential for hyperthermia, hypothermia, sunburn, dehydration, high altitude (altitude sickness), frostbite, etc. Proper personal gear should be available appropriate to the field site and its weather/environmental conditions.

First Aid: First aid kits should be available at all field sites and should be routinely checked for adequate supplies and expired materials. Each faculty member should decide on whether all field team members need to be certified in first aid procedures (e.g. Red Cross certification).

Navigation/Remote Sites: Adequate navigational equipment should be available if traveling to remote sites. All users should be familiar with the use of the equipment (e.g., GPS units).

Social/Cultural Consideration: If the field work has the potential for interaction with people of other cultures, the faculty member is responsible for the training of field personnel with respect to relevant social or cultural considerations.

Appendix A: Field Research Safety Plan Template

Field Research Safety Plan Template			
FieldSite Location			
Activity Description			
Plan Created For		Date of Revision	
Date(s) of Travel			
Site Information			
Location	Latitude:		Longitude:
Site Information	*Elevation, terrain, environment*		
Travel to Site	*How will participants get to the field site? Note dangerous road conditions*		
Site Access	*Are there any particular restrictions or challenges to accessing site? Note any alternate routes or suggested parking areas; gate access codes, etc. Make special note if isolated or remote.*		
Environmental Hazards	*Describe any dangerous wildlife, insects, endemic diseases, poisonous plants, etc. that participants may encounter. Note intended mitigation measures; discuss prior to trip.*		
Security	*High risk for harassment or violence? Note intended mitigation measures; discuss prior to trip. For international travel, check the U.S. State Department travel site for current travel alerts*		
No Go Criteria	*What are the conditions under which approach to - or activities at - the site should be stopped or canceled? e.g. heavy rains, electrical storms, snow, temperatures > 100 degrees, within 2 hours of high tide, wave heights over 1 meter, etc.*		
Expected Weather	*Note extreme conditions that could impact the trip or require additional planning, (e.g. high heat, wind, rain, snow, approaching storm).*		

Drinking Water Availability	☐ Plumbed water available ☐ Water cooler with ice provided ☐ Bottled water provided ☐ Natural source and treatment methods (e.g. filtration, boiling, chemical disinfection):
Acclimatization	If the forecast exceeds the heat index of 80°, heat acclimation practices must be implemented. *Describe acclimatization plan.*
Access to Shade/Shelter	If the forecast exceeds the heat index of 80°, shade must be provided by natural or artificial means for rest breaks. ☐ Building structures ☐ Trees ☐ Temporary Canopy/Tarp ☐ Vehicle with A/C ☐ Other:
High Heat Procedures	Required when heat index is expected to exceed 90° F: If possible, limit strenuous tasks to morning or late afternoon hours. Rest breaks in shade must be provided at least 10 minutes every 2 hours (or more as temperatures increase). Effective means of communication, observation and monitoring for signs of heat illness are required at all times. Pre-work safety discussion required. *Describe rest break plan* ☐ Direct supervision ☐ Buddy system ☐ Reliable cell or radio contact ☐ Other:
Wildfire Smoke Procedures	Should AQI(PM2.5) reach or exceed 101, filtering facepieces must be provided for voluntary use. At AQI(PM2.5) of 251 or greater, filtering facepieces must be provided and use required. Effective means of communication and pre-work safety discussion required. *Describe filtering facepiece distribution plan and/or thresholds to pause/modify work.* ☐ Direct supervision ☐ Buddy system ☐ Reliable cell or radio contact ☐ Other:
Communications	

Local Contact	*Name, address & phone #, may be a local colleague/institution, reserve manager, etc.* **Lodging location***: name, address, phone #*	**College Contact** Not on trip. Provide a copy of this plan.	*Name, number, email; may be a Professor/PI, department contact, supervisor back on campus, etc.* Frequency of check ins: *daily, at end of work day, etc.*
Emergency Medical Services	*Procedures for contacting emergency medical services.*		
Nearest Emergency Department	*Evacuation plan and transportation options to the nearest Emergency Department; include estimated transport time, contact information and driving directions from the site to the nearest provider of emergency medical care. Attach a map with specific directions.*		
Cell Phone Coverage	Primary Number: Coverage: *good, spotty, none* Nearest location with coverage:	Satellite phone/ device	Device carried? ☐yes ☐no Type/number:
Nearby Facilities	*What facilities are available at or near the site: restrooms, water, gas, public phone, store? If not, where are the nearest services along the route?*		
Side Trips	*Are side trips planned or allowed during free time? Before or after the planned activities? Are there restrictions, specific rules, or expected code of conduct?*		
Participant Information			
Field Team/ Participants	Is anyone working alone? ☐ Yes ☐ No I*f yes, develop a communications plan with strict check-in procedures; if cell coverage is unreliable, carry a satellite communication device or personal locator beacon.* Primary Field Team Leader: *Name, phone number* Secondary Field Team Leader: *Name, phone number* ☐ Field Team/Participant list is attached as training documentation ☐ Other attachment: e.g. course roster		
Physical Demands	*List any physical demands required for this trip and training/certification provided. e.g. diving, swimming, hiking, climbing, high altitudes, respirators, heights, confined or restricted spaces, etc. (consult with EH&S regarding appropriate training & documentation).*		

Mental Demands	*List any unique mental demands required for this trip, e.g. long travel days, high stress environments, different cultural norms, etc*
First Aid Training & Supplies	*Requires at least one trained person (with current certification) for work at remote sites. CPR is also recommended.* *List team members trained in first aid and the type of training received.* *Location and description of group medical/first aid kit: Who is carrying it, where is it stored. Brief description of contents.*
Immunizations or Medical Evaluation	*List required immunizations/prophylaxis or required medical evaluation, if applicable*
Equipment and Activities – Consult with EH&S for specific training and requirements.	
Research Activities	*Briefly describe the goal of your field operations, e.g. collection of samples, observation of animals/environment, interviews with human subjects, etc.…*
Field Transportation	*What vehicles will be used during field operations? e.g. chartered boat, paddle craft, car, ATV, truck with trailer, snowmobile, chartered plane or helicopter, etc.*
Research Tools	*Briefly describe tools or equipment that will be used to access the research site or during research activities. Indicate specific training required before use, e.g. sharps (knives, razors, needles), hand tools, chainsaws, power tools, heavy machinery, tractors, specialty equipment; lasers, portable welding/soldering devices; other hazardous equipment or tools.*
Chemicals and Hazardous Materials	*Identify and describe use of chemicals and hazardous materials that will be used during research activities. Indicate specific training required before use and hazards, e.g. flammables, corrosives, procedures, etc.* *Ensure proper containers and labeling are used, and spill kit(s) are available.* *Attach any required documentation for transport, all associated SOPs and SDSs.* *Describe disposal and/or transportation of hazardous materials.*
Other Research Hazards	*Describe other potential research-associated hazards e.g. handling or shipping hazardous materials (chemical, biological, radiation, and explosives), handling animals, climbing or working at heights, rigging; shoring/trenching, digging/entering excavations, caves, other confined spaces; drone use.*
Personal Protective Equipment	Required—*e.g. boots, safety glasses, PFDs, hardhats, etc.* Recommended – *e.g. walking sticks, gloves, long pants, hats, insect*

	repellant, sunscreen	
Additional Considerations		
Insurance		
International Activities	*Visas, permits, finances, import/export controls, transportation of specialized equipment, and data security must be considered. Contact International Programs for guidance.*	
Personal Safety & Security	*Personal safety risks during free time should be considered and discussed in advance, e.g., alcohol or drug use, leaving the group, situational awareness, sexual harassment, or local crime/security concerns. Review expectations and set the tone for a safe, successful trip.* High Risk Travel: Check the U.S. State Department travel site for current travel alerts. Reed prohibits travel to level 4 countries.	
Campus Contacts		
Reed Community Safety		
Campus Health and Counseling Services		
EHS	503-777-7788; ehs@reed.edu	
Report Injuries	ehs@reed.edu/risk@reed.edu	
First Aid Reference – Signs & Symptoms of Illness (examples for heat illnesses included)		
Signs and Symptoms	Treatment	Response Actions
HEAT EXHAUSTION • Dizziness, headache • Rapid heart rate • Pale, cool, clammy or flushed skin • Nausea and/or vomiting • Fatigue, thirst, muscle cramps	• Stop all exertion. • Move to a cool shaded place. • Hydrate with cool water.	*Heat exhaustion is the most common type of heat illness. Initiate treatment. If no improvement, call 911 and seek medical help. Do not return to work in the sun. Heat exhaustion can progress to heat stroke*
HEAT STROKE • Disoriented, irritable, combative, unconscious • Hallucinations,	• Move (gently) to a cooler spot in shade. • Loosen clothing and spray clothes and exposed skin	*Call 911 or seek medical help immediately.* *Heat stroke is a life threatening medical emergency. A victim can die within minutes if not properly treated. Efforts to*

seizures, poor balance • Rapid heart rate • Hot, dry and red skin • Fever, body temperature above 104 °F	with water and fan. • Cool by placing ice or cold packs along neck, chest, armpits and groin (Do not place ice directly on skin)	*reduce body temperature must begin immediately!*

Include any additional resources: route/location maps, photos of general terrain and areas requiring extra caution, etc.

Signature of Faculty/Supervisor:

I acknowledge this safety plan has been prepared for field work under my supervision.

Name	Signature	Date	Phone Number

Field Team/Participant Roster - Training Documentation

I verify that I have read this Field Safety Plan, understand its contents, and agree to comply with its requirements.

Name/Phone Number	Signature	Date	Emergency Contact/Phone Number

Appendix B: Safe & Inclusive Working Environment for Off-site Research

In congruence with NSF guidance, Reed College is committed to creating safe and harassment-free work environments regardless of where research is conducted. College policies, procedures, and project specific plan details are provided below. All individuals must have access to this plan and related documents prior to starting off-site work, and are subject to the policies described independent of work location. Research is defined as data, information, and/or samples being collected off-campus or off-site such as fieldwork and research activities on vessels and aircraft.

Project Title:
Principal Investigator:
Date of Submission:

Off-site location and settings for the project. Off-site locations are areas not on Reed College property.

Describe steps the PI or other leadership will take to foster an inclusive off-site working environment for this project. Steps may include training, development of role definitions, mentee/mentor support mechanisms, check-ins, codes of conduct, or other measures.

Describe third-parties or other organizations that may be present in the off-site working environment. If not applicable, list N/A.

Describe the communication plan while traveling to and working from the off-site location. The plan should address singular points within the communication pathway concerns and communication with present third-parties (if applicable).

Describe how the following behaviors would be addressed, should they occur: Abuse of any person, including, but not limited to, harassment, stalking, bullying, or hazing of any kind, whether the behavior is carried out verbally, physically, electronically, or in written form; or conduct that is unwelcome, offensive, indecent, obscene, or disorderly.

Describe the steps for creating an incident report and how they will be handled.

This plan and all Reed College community members are expected to comply with the following College policies and guidelines:

College Funded Travel Policies
Hazing Policy
Discriminatory Harassment and Sexual Misconduct Policy
Alcohol and Other Drug Policy
Mandatory Child Abuse Reporting Law
Sexual Health, Advocacy, and Relationship Education (SHARE)
Reed College Whistleblower Policy
Responsible and Ethical Conduct of Research (RECR) for NSF Grants

Appendix C: Additional Resources

Training

- Wilderness First Aid Training (third party provider)

Reed Programs

- Heat Illness and Prevention Program
- Wildfire Smoke Exposure Management Program
- Boat Safety Program
- Accident and Incident Reporting Program

Discipline Specific Safety Resources

- Geology and Earth Sciences
  - Field Safety in Uncontrolled Environments (AAPG)
  - Safety & Health for Field Operations (USGS)
- Polar Environments
  - NSF Polar Environment, Safety and Health
- Wildlife Biology
  - Guidelines for use of wild animals in research and teaching (American Society of Mammalogists)
  - Guidelines to the use of wild birds in research, 3rd Edition (2010)
  - Use of fishes in research/fisheries safety (American Fisheries Society)
  - Precautions for Zoonotic Disease Prevention in Veterinary Personnel (National Association of State Public Health Veterinarians)
  - Disease Precautions for Hunters (AVMA)

Additional Resources

- World Health Organization
  - International Travel and Health
  - Travel Advice
- U.S. State Department
  - Embassies, Consulates, and Diplomatic Missions

    - Overseas Security Advisory Council
    - Travel.State.Gov
- Centers for Disease Control (CDC)
    - Infectious Diseases and Travelers' Health (CDC) - Search by Destination
    - Drinking Water Treatment Methods for Backcountry and Travel Use
- Oregon Health Authority
    - Lyme Disease
    - Giardiasis
    - Rocky Mountain Spotted Fever
    - Hantavirus Pulmonary Syndrome
    - Rabies
    - West Nile Virus
    - Zika Virus
    - Malaria
- Extreme Weather
    - Cold Stress – Preventing Hypothermia and Frostbite (NIOSH)
    - Extreme Cold Weather Clothing (US Antarctic Program)
    - Backcountry Avalanche Safety (National Ski Patrol)
    - Storm, Flood and Hurricane Response
    - Lighting Safety Tips
    - Preparing for a Flood
- Flora/Fauna
    - Poisonous Plants
    - Mosquito Bite Prevention
    - Avoiding Ticks
    - Insects and Scorpions
    - Types of Venomous Spiders
    - Western Rattlesnake
    - Large cats
    - Bear safety