

UNDERC LABORATORY INTEGRATED SAFETY PROTOCOL DOCUMENT

UNDERC SAFETY MISSION

UNDERC endeavors to create a safe and healthy environment that fosters education and research activities for undergraduates, graduate students, faculty, staff, technicians and senior researchers. UNDERC policies and guidelines are designed to achieve this goal and will be enforced by staff at its physical facilities. However, activities in a field setting always entail an element of risk, and UNDERC policies and guidelines can only achieve the sought after safety and health outcomes if UNDERC users follow them when in the field away from physical facilities. UNDERC staff along with UNDERC users need to work together to achieve a safe and healthy education and research environment at physical facilities and in the field, our foremost goal.

UNDERC LOCAL SAFETY COMMITTEE

The UNDERC Safety Committee will meet *twice a year*. A **spring** meeting will occur prior to or at the start of the UNDERC-main use period to reinforce previous and establish new safety/health goals for the upcoming season. The spring meeting is suggested to occur at Land O Lakes when Risk Management and Safety inspects the facilities, which usually occurs in late May or early June. A **late-fall** meeting will occur to review UNDERC safety/health performance during the preceding main-use season and to highlight possible improvements.

The committee's composition will be:

1. UNDERC Director, as chair (administrator/faculty);
2. UNDERC Assistant Director-East (professional specialist supervising East daily operations);
3. UNDERC Assistant Director-West (professional specialist supervising West daily operations);
4. UNDERC Technician (staff, responsible for lab equipment and facilities);
5. Faculty research user (ND or non-ND faculty conducting UNDERC research);
6. Graduate student research user (ND student conducting UNDERC research);
7. NEON Domain 5 Site Manager (30+ year contracted user of UNDERC-East);
8. RMS representative (responsible for inspecting UNDERC).
9. LOL Property Manager, *ex officio*.

Committee members, not physically present for meetings, will participate via conference call.

The UNDERC Director, UNDERC Assistant Director-East, UNDERC Assistant Director-West, and UNDERC Technician, as members of the LSC, are present at UNDERC sites to oversee implementation of the UNDERC safety/health-policies/guidelines. Nonetheless, compliance with safety/health-policies/guidelines is ultimately the responsibility of all individuals involved in education/research activities at UNDERC sites, especially while in the field.

UNDERC SAFETY PROGRAM

Independent from specific safety policies at UNDERC, the following actions are required:

- UNDERC staff must undergo first aid training and maintain their safety (laboratory/fire/chemical/animal/radiation/driving/health) training. They are responsible for enforcing UNDERC policies/guidelines.
- UNDERC vehicles must be safety inspected annually and must contain a first aid kit and fire extinguisher.
- The UNDERC office must contain a first aid kit, cardiac defibrillator, and epi-pen.
- UNDERC users must sign a safety waiver (Appendix A).
- All UNDERC class participants are provided with necessary laboratory/chemical/radiation/animal/fire/driving safety/health training by UNDERC staff.
- All UNDERC users immediately upon arrival at a site must register (e.g., provide vehicle description, copy of driver's license or official photo id, etc.) and provide documentation that all necessary Notre Dame (or home institution equivalent) safety (laboratory/chemical/radiation/animal/ fire/driving safety/health) training, IACUC approval, and state/tribal/federal permits for the activities have been obtained with the Director or Assistant Director. These documents are kept on file by UNDERC for a year.
- Anyone using UNDERC vehicles must undergo Notre Dame driver safety training.
- Research projects that are not part of UNDERC classes must appoint a representative, who is responsible for ensuring that policies/guidelines are met by project personnel and are the contact for UNDERC staff.

POLICIES/GUIDELINES

The following policies/guidelines regarding safety/health are provided in writing, online and in a meeting to all undergraduates/graduate students/researchers using UNDERC.

I. Chemical and Laboratory Safety

a. **Introduction:** To ensure the protection of individuals from health hazards associated with laboratories, a chemical hygiene plan has been formulated that governs all persons working in or entering UNDERC laboratories. Review of the UNDERC chemical hygiene plan is the responsibility of the Notre Dame Institutional Biosafety Committee (IBC) appointed by the President of the University and a Chemical Hygiene Officer (CHO) appointed by the IBC. The UNDERC Director and Assistant Directors act on behalf of the CHO in monitoring the effectiveness of and compliance with IBC procedures and rules at UNDERC. Principal Investigators are responsible for compliance with chemical hygiene and safety procedures. These include: (1) procurement, use, storage, and disposal of chemicals used at UNDERC; (2) ensuring that employees under their direction know and follow all UNDERC rules and procedures; and (3) providing the Director with an annual inventory of the hazardous materials used at UNDERC. All individuals working in or entering UNDERC are responsible for conducting themselves and their actions in accordance with UNDERC policies/guidelines.

b. **Behavior in the Laboratory:** Individuals working in or entering UNDERC laboratories (including visitors) must conduct themselves in a professional manner at all times. Horseplay and practical jokes are expressly forbidden. Individuals should never work alone when conducting a potentially hazardous activity and must be aware of the location and proper operation of laboratory safety equipment. Unattended laboratory experiments must be set up in a manner that ensures that hazardous substances will be safely contained in the event of a power or equipment failure. Visitors to UNDERC laboratories must observe all safety regulations. Unattended children are not permitted in UNDERC laboratories. In addition, children are not permitted in areas where radioactive isotopes or hazardous chemicals are stored or used.

c. **Disabling or Removal of Safety Equipment:** The disablement, removal, and/or frivolous use of safety and first aid equipment and supplies are prohibited. These include fire extinguishers, fire blankets, eye washes, chemical spill clean-up kits, and first-aid kits. Missing or malfunctioning safety equipment and/or missing or consumed safety or first-aid supplies must be reported promptly to the Director or Assistant Director during the spring-summer field season and to the Property Managers at other times of the year.

d. **Avoidance of Routine Exposure:** Skin contact with potentially hazardous chemicals must be avoided at all times. Individuals should never smell or taste chemicals, and pipetting by mouth is prohibited. Apparatus that might discharge chemical vapors or dusts must be vented into a hood or to the outside of the building. Only chemicals that can be used safely in UNDERC laboratories may be used by researchers. Individuals should never underestimate risks and should remain aware that chemical reactions involving two or more substances can form reaction products that are significantly more toxic than the initial reagents. In addition, individuals should always assume that substances of unknown toxicity are toxic.

e. **Professional Habits in the Laboratory:** Eating, drinking, chewing gum, and cosmetic application are not permitted in laboratories. Smoking is not permitted in the laboratories. Food must not be stored in a refrigerator with chemicals nor be prepared or served in glassware or utensils that are used in the laboratory. Hands should be washed before using the restroom; eating; drinking; applying any cosmetics, lotions, or insect repellents; and before leaving the laboratory area. Long hair and loose clothing must be confined.

f. **Proper Laboratory Attire:** Individuals entering or working in laboratories must wear shirts, long pants, and closed-toed shoes. Persons wearing skimpy clothing such as bathing suits, halter tops, or shorts are not permitted in laboratory areas unless they are wearing a protective lab coat. Wearing of open-toed shoes is not permitted in laboratory areas. Wearing of canvas shoes is not permitted when caustic, corrosive, flammable, toxic, or radioactive substances are used. Individuals should remain alert to unsafe conditions and report and/or correct such conditions when detected.

g. **Housekeeping:** Lab areas (bench tops, hoods, etc.) are to be kept clean and uncluttered to minimize the risk of spillage, breakage, personal injury, and unnecessary contact with chemicals. Any spills or accumulations of chemicals on work surfaces or floors must be removed as soon as possible with techniques that minimize residual surface contamination. Floors and walkways must remain dry at all times. Doorways, walkways, exits, access to emergency equipment, and access to utility controls must not be blocked.

h. **Personal Protection:** Individuals in the laboratories (including visitors) must be informed of the location and proper use of available protective equipment. Individuals must wear appropriate protection including gloves, lab coats, and safety glasses when chemicals are handled. Contact lenses should not be worn in the laboratory unless absolutely necessary. Vapors and chemicals can get trapped under lenses making it difficult or impossible to remove lenses to properly rinse the eye. This can result in severe eye damage. If wearing contact lenses is absolutely necessary, the Assistant Director and other persons working in the laboratory at the time must be informed so that precautions can be taken in the event of an accident.

i. **Lifting Heavy Objects:** Individuals are cautioned to always get help when handling objects that are too heavy or too bulky for one person. Heavy objects should be lifted by bending at the knees using leg muscles not back muscles. Heavy objects should be held close to the body.

j. **Glassware:** All glassware must be inspected for defects and cracks. Weak glass can cause severe accidents by leaking hazardous chemicals, cutting individuals, or imploding under vacuum. A lubricant must always be used when inserting glass tubing or thermometers into rubber stoppers. All cut glass tubing and rods must be fire polished. Vacuum filtrations and distillations must use implosion resistant glassware designed for this purpose. Individuals are cautioned to exercise special care when removing frozen glass stoppers. The glass should be soaked in hot water in order to allow it to expand. Broken glass should be promptly swept up and disposed of in sharps containers or containers marked "GLASS". Sharps containers can be obtained from the Assistant Director.

k. **Instrument and Equipment Care and Operation:** Individuals should never attempt to operate a machine or instrument without proper instruction in its use. The area around instruments must be kept clear of obstructing materials. All belt-driven equipment (vacuums, air pumps, etc.) must have a guard to prevent hands and/or clothing from being pulled between the belt and pulley. Equipment with damaged or frayed electrical cords should not be used. Such damage must be reported by completing an UNDERC Work Request form, which is located in the UNDERC office. Oil and boiling water baths should never be unattended. Precaution should be taken to contain any hot oil or water spills. Equipment in the UNDERC-East Storage area (drill press and table saws) must be locked when not in use, to prevent unauthorized use. Permission to use any UNDERC equipment must be obtained from the Director or Assistant Director.

l. **Chemical Procurement and Distribution:** All OSHA Standard Specific Chemicals must have the approval of the University of Notre Dame Chemical Hygiene Office and UNDERC Director before being transported or delivered to UNDERC. A material safety data sheet (MSDS) is required for all chemicals if a MSDS is not already on file. All containers must be adequately labeled with the following information as a minimum: substance name, appropriate hazard warnings, precautionary measures to be observed when storing and using the substance, owner's name, date the substance was received, and date the container was opened. Chemical containers may not be brought to or stored at UNDERC without an adequate identifying label. Bulk quantity chemicals that are subdivided must be placed in containers that are labeled with the same information as a minimum. Unneeded items must be removed from UNDERC or disposed of properly. When potentially hazardous chemicals are hand carried, the container should be placed in a second container to protect from breakage and spillage. In addition, each Principal Investigator must provide the Director or Assistant Director with a yearly inventory of all chemicals used at UNDERC in order to make this information available to the Notre Dame Risk Management and Safety Department.

m. **Lab Chemical Storage:** Stored and working amounts of hazardous chemicals must be as small as practically possible. Storage of bulk chemicals beyond what would be reasonably consumed during a single field season requires approval from the Director or Assistant Director. Chemical reagents must remain in closed containers when not in use. Flammable chemicals must be stored in a flammable materials cabinet or in the flammables storage building located next to the gas pumps at UNDERC-East. Incompatible chemicals should be segregated. Gas cylinders must be secured at all times, and safety caps should be in place when the cylinder is not in use.

n. **Bulk Chemical Storage:** Only working amounts of chemicals may be stored in laboratories unless advanced approval is given by the Director or Assistant Director. Chemicals in containers 5 gallons or larger which are unlikely to be used within a two week period are considered "bulk" and must be stored in the flammables location. This location is divided into the following areas: acids, bases, solvents, gas, and alcohol. Containers must be stored in the appropriate area. Each container must be adequately labeled with the following information: substance name, appropriate hazard warnings, precautionary measures to be observed when storing and using the substance, owner's name, date the substance was received, and, if opened, the date the container was opened. Chemical containers may not be brought to or stored at UNDERC without an adequate label. Chemicals not consumed within a single spring-summer field season may be stored between field seasons with the approval of the Director or Assistant Director.

o. **Waste Storage and Disposal:** Individuals working in the laboratories are responsible for properly disposing of all wastes. Broken glass and radioactive or chemical waste must be properly labeled and disposed of by procedures that avoid injury or contamination of the work area and property habitats. Procedures must conform to OSHA, EPA, state, and NRC regulations. All radioactive and potentially hazardous chemical waste must be stored in areas that are inaccessible to unsupervised non-laboratory personnel.

p. **Accidents, Hazards, and Injuries:** All accidents resulting in injury, damage, or potential chemical or radioactive contamination must be reported immediately to other individuals in the laboratory area who might benefit from this information. Accidents must then promptly be reported to the Director or Assistant Director during the spring-summer field season and to the Property Managers at other times during the year. Unsafe laboratory conditions and/or practices by laboratory personnel or visitors must be similarly reported whether or not they result in injury or contamination. Emergency telephone numbers are posted by the telephones in the research laboratories.

q. **Spills:** Protocols for different types of spills follow –

i. **Chemical spills** must be cleaned up by spreading the contents of an appropriate spill control kit on the spill. Once the chemical is absorbed, the material must be scooped up and deposited in a plastic disposal bag. The contaminated surface must then be wiped up with soap, water, and a sponge. This must be added to the disposal bag contents as well. The disposal bag must then be tied and labeled. Notify the Assistant Director (or in his or her absence the Director or Property Managers) for appropriate disposal procedure or pickup. If there is any doubt regarding proper spill cleanup procedure, contact the Assistant Director or call the Notre Dame Risk Management and Safety Department at (574) 631-5037.

ii. **Radioactive material spills**, consult the "RADIATION EMERGENCY PROCEDURES" section of the Notre Dame Radiation Safety Manual (section IV, page 51) located in the laboratories. Immediate notification of an on-site Radiation Safety Officer (normally the Director or Assistant Director) is required. If the Radiation Safety Officer is unavailable, the Notre Dame Risk Management and Safety Department should be notified at (574) 631-5037. If no one answers, Notre Dame Security/Police should be notified at the 24-hour number (574) 631-5555. Notre Dame Security/Police then contact a Notre Dame Risk Management and Safety Department representative and notify him or her of the situation.

r. **Radiation Safety Considerations**

- i. Permission to use radioactive materials at UNDERC must be approved by the Director and the Radiation Control Committee at the University of Notre Dame.
- ii. All personnel using radioactive materials must complete Radiation Safety Training through the Office of Risk Management and Safety at the University of Notre Dame annually.
- iii. During the summer, the Assistant Director operates as the Radiation Safety Officer, and is responsible for all deliveries of radioactive materials, as well as monthly surveys of all labs using radioactive materials.
- iv. Labs where radioactive materials are stored must be locked when not in use.
- v. Radioactive waste disposal must be arranged through the Office of Risk Management and Safety at the University of Notre Dame.
- vi. All researchers using radioactive materials must adhere to the Radiation Safety Manual provided by the Office of Risk Management and Safety at the University of Notre Dame.

II. **Field Safety**

a. **Introduction.** All individuals working in or entering UNDERC are responsible for conducting themselves and their operations in accordance with the proper procedures. Use of chemicals/radiation/animals in the field must follow appropriate safety/health procedures (see above). UNDERC driving protocols must be followed while at UNDERC sites and when using UNDERC vehicles away from UNDERC sites. All protocols established by UNDERC's partners, who permit use of their lands for education/research must be followed by UNDERC students and researchers. Personal responsibility and common sense are critical to the safety of you and others when working in field conditions.

b. **Behavior in the field.** Individuals working in or entering UNDERC field sites (including visitors and lands managed by UNDERC partners) must conduct themselves in a professional manner at all times. Horseplay and practical jokes are expressly forbidden. Visitors to UNDERC field sites must observe all safety regulations. Unattended children are not permitted in UNDERC field sites.

c. **Proper field attire.** Students and researchers working at UNDERC field sites are advised to wear appropriate attire for field conditions. This includes closed-toe shoes, long pants, and sun protection (including sunscreen). Weather conditions can change rapidly in the field, so UNDERC users are advised to bring warm clothes and rain gear with them when working in the field.

d. **Wildlife.** Students and researchers are only allowed to handle wildlife as part of class activities or research. Research may only be conducted on vertebrates with appropriate IACUC permits and other federal/state permits. Researchers and students are expected to comply with all permit and UNDERC guidelines with respect to animal research. Wildlife may not be kept as pets.

i. **Proper handling of animal subjects** is set by IACUC and other federal/state permits, as well as various scientific organizations. Proper animal care is a part of responsible research.

ii. **Wildlife can be dangerous.** Do not approach wildlife.

1. UNDERC-East. Black bear can be dangerous, especially females with cubs. Snapping turtles can be dangerous - do not try to handle. Any wildlife can be dangerous (e.g., deer), especially when driving the narrow roads too fast and you try to avoid them.

2. UNDERC-West. The National Bison Range is not a petting zoo. Bison are wild animals that can be dangerous and unpredictable. Other large ungulates (elk, deer, pronghorn) can also be dangerous, particularly during mating season. Black bears, grizzly bears and mountain lions live on the Bison Range, as do rattlesnakes and black widows. All of these wild animals can pose a risk to the safety of UNDERC users. Students and researchers should keep a distance of at least 100m between themselves and large mammals at all times. Vigilance and being aware of surroundings will help students and researchers avoid putting themselves into dangerous situations. If you find yourself close to a dangerous animal, slowly and calmly back away until you are a safe distance.

e. **Precautions.** Safety precautions should be taken when working in field conditions:

i. First aid kits should be kept in any (personal, project or UNDERC) vehicle used for field research at UNDERC facilities. For research that is to be conducted far from a vehicle, a basic first aid kit should be taken with researchers to field sites. Sufficient food and water should be taken into the field at all times.

ii. Undergraduates working at UNDERC facilities or its partner's lands are not allowed to conduct field research alone, but must have another person with them in the field at all times. Researchers should fill out appropriate logbooks when going into the field so that UNDERC staff know the general vicinity they will be in and approximate return time.

iii. Insect bites/ticks can be abundant at UNDERC field sites, personal hygiene is critical to avoid infections and to be aware of the potential for possible illness.

iv. Rattlesnake bites should be treated by staying calm and going immediately to the hospital emergency room, never by first aid.

f. **Accidents, Hazards, and Injuries:** All accidents resulting in injury or damage must be reported immediately to other individuals in the area who might benefit from this information. Accidents must then promptly be reported to the Director or Assistant Director during the spring-summer field season and to the Property Manager (UNDERC-East) at other times during the year. Unsafe field conditions and/or practices by personnel or visitors must be similarly reported whether or not they result in injury or damage. Emergency telephone numbers are posted by the telephones in the research laboratories. These numbers should be carried into the field for cell phone use.

g. **Vehicles:** Researchers and students at UNDERC facilities may use UNDERC vehicles if they have completed the driver's training. Vehicles must be signed out prior to use. People using UNDERC vehicles must obey all speed limits and traffic laws. Driving under the influence of drugs or alcohol is strictly prohibited. Any incidents involving UNDERC vehicles must be reported to the Assistant Director or the Director.

i. UNDERC-East. The speed limit on all roads is 15 mph.

ii. UNDERC-West. The speed limit on the National Bison Range is 25 mph.

g. **Boat Safety:** Undergraduates are required to practice proper boat safety when using the lakes/streams at UNDERC. This includes taking personal floatation devices for each person in a boat. In addition, there is a boating log in the Hank Lab, where the students write who is taking the boat, which lakes/bogs/streams that they will be using, and what approximate time they plan on returning. UNDERC staff use this log to monitor student use of the property. In cases where there are severe weather or boating warnings issued by the National Weather Service, the nature of the warning is written on the log and boating is prohibited. If students fail to return at the specified time, UNDERC staff will attempt to locate the students. Any use of the lakes/bogs/streams by the undergraduates without using the log will result in loss of boating privileges, determined by the Assistant Director.

III. Safety/Health Training

a. **Chemical:** All personnel using labs at UNDERC must annually complete Notre Dame General Lab Safety training through the Office of Risk Management and Safety at the University of Notre Dame or the equivalent from their home institution. Evidence of this training must be provided to UNDERC staff.

b. **Radiation:** Personnel using radioactive materials must annually complete Notre Dame Radiation Safety training through the Office of Risk Management and Safety at the University of Notre Dame or the equivalent from their home institution annually. Evidence of this training must be provided to UNDERC staff.

c. **Driving:** Any person using UNDERC (university)-owned vehicles must view the driver training video supplied by Notre Dame Transportation Services and must complete a Motor Vehicle Record Check Request form obtained from UNDERC staff prior to using UNDERC vehicles.

d. **Fire safety:** All Notre Dame and Saint Mary's undergraduate students participating in UNDERC classes are trained in fire safety by the Notre Dame Fire Department prior to leaving for UNDERC. This training includes a video on how to safely respond to a fire emergency and how to properly use a fire extinguisher. In addition, training includes hands-on training on putting out fires using a fire extinguisher. This training is reviewed for non-ND/SMC undergraduates participating in UNDERC classes and research project personnel.

e. **Animal care:** All undergraduate students participating in UNDERC classes are trained in animal care protocols as established by the Notre Dame IACUC committee. All research projects involving vertebrate animals must be approved by the Notre Dame IACUC committee and research personnel are responsible for obtaining Notre Dame IACUC training.

IV. Emergency Procedures

a. **UNDERC emergency procedures** are documented in the UNDERC CLERY document.

b. **Safety meetings** are held at the arrival of the UNDERC classes and research project personnel to review emergency procedures, which include building fire evacuation, wildfire evacuation and severe weather procedures. An established meeting place is designated for all to meet in case of evacuation. All policies/guidelines are provided in writing and reviewed during these meetings.

c. **Local law enforcement** has jurisdiction at all UNDERC sites and these are listed below--

i. East:

Gogebic County, MI	-----	1-906-667-0203
Vilas County, WI	-----	1-800-472-7290

ii. West:

Lake County, MT	-----	1-406-883-7301
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d. **Fire services** are provided by:

i. East:

Boulder Junction Fire Department	-----	1-715-385-2002
Land O' Lakes Fire Department	-----	1-715-547-6170

ii. West:

Charlo Fire Department	-----	1-406-644-2501
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e. **Medical emergency**: It is especially important for students who have been injured to seek immediate and appropriate medical treatment. The UNDERC Director or Assistant Directors can assist students in obtaining care at UNDERC sites.

i. East:

Howard Young Medical Center, Woodruff, WI – Open for emergencies 24/7 (phone 1-715-356-8000)
Aspirus Clinic, Land O' Lakes, WI – Limited hours (phone 1-715-547-6118)

ii. West:

St. Luke's Community Health Care, Ronan, MT – Open for emergencies 24/7 (phone 1-406-676-4441)

f. **Sexual assault counseling**:

i. East:

Howard Young Medical Center, Woodruff, WI – Open for emergencies 24/7 (phone 1-715-356-8000)
Tri-County Council on Domestic Violence – Limited hours (phone 1-715-547-6118)

ii. West:

St. Luke's Community Health Care, Ronan, MT – Open for emergencies 24/7 (phone 1-406-676-4441)
Domestic Violence Education and Services, Polson, MT – Limited hours (phone 1-406-883-3316)

iii. National:

RAINN National Sexual Assault Hotline – 24/7 (phone 1-800-656-HOPE)