

Niwot Ridge LTER Orientation Guide

Niwot Ridge Long-term Ecological Research Program, one of the original sites of the LTER network, has been funded by the National Science Foundation for almost 40 years. We are an interdisciplinary research program with the long-term goals of building a predictive understanding of ecological processes in high-elevation mountain ecosystems and contributing to broad conceptual advances in ecology. NWT also provides education, outreach, and knowledge to inform high mountain resource management and conservation.

The Niwot Ridge Long-Term Ecological Research Program is committed to providing a safe, productive and non-discriminatory environment that fosters excellence in research, training, and outreach. If you are planning on doing research at Niwot Ridge or the Green Lakes Valley as part of the LTER program, this document provides some basic information that every participant is expected to follow. If you have any questions, need more information, or have suggestions, please contact Nancy Emery (PI, Nancy.Emery@colorado.edu), Jennifer Morse or Jane Smith (lead field techs, jennifer.f.morse@colorado.edu and jane.g.smith@colorado.edu).

I. Code of Conduct

The Niwot Ridge Long-Term Ecological Research Program (NWT LTER) is committed to providing a safe, productive, and non-discriminatory environment that fosters excellence in research, training, and outreach. To best fulfill this commitment, all community members of the NWT LTER program must adhere to the following guidelines. If you need more information, have suggestions, or want to raise a concern, please contact Nancy Emery (PI, Nancy.Emery@colorado.edu), Katharine Suding (co-PI, suding@colorado.edu), Marko Spasojevic (Chair Diversity and Equity committee, markos@ucr.edu) or Alexa Esler (program coordinator, aternwt@colorado.edu).

All participants, including students, faculty, and staff, are expected to abide by a common Code of Conduct. The Code of Conduct applies in all physical and virtual places related to NWT activities (e.g., field, laboratories, offices, in person and online meetings, shuttle).

Expected Behavior

- Treat all participants with kindness, respect, and consideration.
- No demeaning, discriminatory, or harassing behavior and/or speech directed toward others, whether in person, in print, or online.
- Be mindful of your actions and how your actions may impact your fellow participants.
- Abide by principles of academic integrity and ethical professional conduct (see below).

Harassment, intimidation, discrimination, and sexual misconduct are unacceptable. Harassment includes unfair treatment, abusive words, imagery, or expressions, or intimidating behavior aimed at any member of the NWT community based on an aspect of identity. Examples of unacceptable behavior include—but are not limited to—unwelcome or offensive verbal comments related to age, appearance or body size, employment or military status, ethnicity, gender identity and expression, individual lifestyle, marital status, national origin, physical or cognitive ability, political affiliation, sexual orientation, race, or religion. Sexual misconduct includes unwanted sexual behavior, abuse in a relationship, and stalking.

Don't ignore it! If you are the subject of unacceptable behavior or have witnessed any such behavior, please report your concerns (see **How do I report a concern?**). If you notice a dangerous situation, someone in distress, or any violations of the code of conduct, please report your concerns. Please notify one of the parties listed below even if you don't know the identity of the person who caused the harm, if you are unsure whether it is something that NWT or the University could address, or if you think it's not serious enough.

How do I report a concern? Notify any of the following: Nancy Emery (PI, Nancy.Emery@colorado.edu), Katharine Suding (co-PI, suding@colorado.edu), Marko Spasojevic (Chair Diversity and Equity committee, markos@ucr.edu), Alexa Esler (program coordinator, lternwt@colorado.edu) or any NWT staff member with concerns. Confidential options are also available for reporting harassment, discriminatory actions, and sexual misconduct, and for dispute resolution through the Office of Institutional Equity and Compliance (303-492-2127, <https://www.colorado.edu/oiec/>). The Office of Institutional Equity and Compliance (OIEC) at CU addresses concerns about protected class discrimination or harassment and sexual misconduct through formal investigation, informal resolutions, and remedial and protective measures. Anonymous NWT LTER specific concerns or suggestions can be reported using the following form: <https://forms.gle/r5fniw7sq2iphRFU8>

How do I get support? University of Colorado Office of Victim Assistance (OVA) offers support services for undergrads, grad students, staff, and faculty following a traumatic, disturbing, or disruptive event. You can reach the OVA by calling 303-492-8855 or sending an email assist@colorado.edu. More information about this office is provided at <https://www.colorado.edu/ova/>.

What do I do if I am notified about a concern? If someone's actions infringe on our ability to provide a safe, welcoming, and productive research environment, we encourage you to take appropriate action. All CU employees who have the authority to hire, promote, discipline, evaluate, grade, formally advise, or direct faculty, staff, or students are considered "responsible employees" and are required to report concerns related to sexual misconduct and protected class discrimination and harassment to OIEC. If you are not a CU employee please follow your employer's guidelines.

Consequences. The NWT LTER executive committee, in consultation with appropriate CU offices, reserves the right to enforce this Code of Conduct in any manner deemed appropriate. In cases not covered by the Office of Institutional Equity and Compliance, anyone violating the Code of Conduct will first be asked to cease these behaviors. Failure to comply with this request will lead to expulsion from further participation in the NWT LTER program.

Community Engagement Guidelines¹

As our code of conduct lays out, we have absolutely no tolerance of harassment of any kind. Over and above this commitment, we strive to actively counter unconscious biases and disparities that occur along gender, race, sexual orientation, class, and other lines in our communities. We are committed to increasing equity in research, training, and outreach.

¹ We base this section on the excellent resource of Massive Science (massivesci.com)

Follow the principles of scientific academic integrity. As scientists and communicators, we have special obligations to society. We follow the seven principles from Professor Sir David King, then chief scientific advisor, outlined to the British government in 2008:

- Act with skill and care, keep skills up to date
- Prevent corrupt practice and declare conflicts of interest
- Respect and acknowledge the work of other scientists
- Ensure that research is justified and lawful
- Minimize impacts on people, animals, and the environment
- Discuss issues science raises for society
- Do not mislead, present evidence honestly

Be an amplifier for others. In science and society, women, LGBTQ+ people, people of color, and other marginalized groups have a harder time having their ideas recognized and, when they are recognized, receiving proper credit for them. Amplify good ideas and credit the originators.

Step back and step up. Society tends to give more space to privileged individuals – in particular, in positions of power in the academic hierarchy or in the programmatic framework of NWT. Be aware of the level of your contributions, and make sure all voices can be heard. If you find yourself contributing a lot, consider stepping back on occasion and letting others respond or, better yet, inviting others to join the conversation. On the flip side, if your tendency is to sit back, your voice is important to us; please join the conversation or find other ways to communicate your ideas.

Give and take. Our project runs on being community minded and giving to the larger good. Unfortunately, women, people of color, and other underrepresented groups often are asked and take on more of these community-minded roles, often to the detriment of their individual success. We ask that everyone be mindful of reaching an appropriate balance contributing both to their individual gain and to the larger gain of the project as a whole.

Learn from mistakes. If someone isn't following these guidelines, ask them to remember these guidelines. If someone suggests that you might change how you engage with others, don't become defensive: listen, seek a constructive way to proceed, and learn, rather than assuming the other person meant to criticize or attack you.

Look for opportunities and be open to dialog. Like every community, our identities – including gender, race, class, sexual orientation, and others – infuse our science. We expect and welcome open discussions and engagement with these issues and expect everyone part of NWT to follow the above guidelines. If you see ways where we can better support efforts of equity and inclusion at the project level, please share your suggestions to further our commitment to taking action.

II. Data & Communication

A. Data Submission. We strive to make our data open and accessible to the general public without undue restrictions or barriers. All datasets collected with NWT support should be archived with appropriate metadata in consultation with our information manager, Sarah Elmendorf (sarah.elmendorf@colorado.edu). Please fill out the metadata form on the Niwot web site. Niwot data can be searched through our website as well as through the Environmental Data Initiative

(<https://environmentaldatainitiative.org/>). Currently, there are >300 NWT datasets available through EDI, including aerial imagery.

Per NSF requirements, data need to be submitted to Sarah within a year of collection, who will publish the data on EDI as part of Niwot’s catalog. For those who are not yet ready to make their data public within a year of collection, data can be submitted to the NWT IM with restricted access (embargo); we request an explanation of the data embargo, including when the data will be made available to the general public as part of the metadata form. Please note that in general data should be made public within two years of collection. The full LTER data access policy can be read here: <https://lternet.edu/data-access-policy/>. As part of our funding, the NSF tracks data submission and public availability of our datasets; we cannot continue to provide support to those researchers who do not abide by these requirements.

B. Publications & Outreach. Please see the [NWT Authorship Guidelines](#) for NWT’s policy for collaborative manuscript development that uses NWT data and/or other resources. All efforts that rely on NWT support (funding, staff, logistics such as transportation/shuttle, use of datasets) must acknowledge in publications the NWT LTER program using the NSF LTER Grant numbers: [#DEB-1637686](#) for NWT VII and NSF [#DEB-2224439](#) for NWT VIII. Acknowledging NSF support is essential for our continued funding. Please upload all NWT-related publications to <https://nwt.lternet.edu/gfr-submit-a-publication>.

Please submit any outreach-related news including public talks, news coverage, awards received, etc., to <https://nwt.lternet.edu/guidelines-for-researchers>.

III. LTER Shuttles

During the summer field season, LTER shuttle vehicles are used to provide transportation for researchers from Boulder to the MRS and the Cable Gate parking area below the trail to Niwot Ridge. *In order to take the shuttle, you must have completed NWT orientation and submitted to NWT your contact and emergency contact information.* Although you are welcome to drive your personal vehicle to the MRS, please keep in mind that there is limited parking space at the MRS. Due to rough road conditions and frequent air sampling, we discourage the use of personal vehicles beyond the gate at the Marr Lab. If you believe that you need to drive a personal vehicle beyond the gate, please speak in advance to the MRS station manager, Kris Hess.

Shuttle schedule:

| | |
|---------|--|
| 6:15 am | Shuttle leaves from SEEC southwest parking lot for MRS Marr Lab |
| 7:30 am | Shuttle leaves Marr Lab for C1 and cable gate |
| 3:15 pm | Shuttle departure deadline from cable gate to return to Marr Lab |
| 4:00 pm | Shuttle leaves from Marr Lab for SEEC |

Although we strive to always leave the Marr Lab promptly at 4:00 pm, on Tues/Thurs departure may occasionally be delayed depending on the timing of researchers returning from GLV.

A. Boulder – MRS. The LTER shuttle between Boulder and the MRS runs daily from SEEC on CU East Campus to the Marr lab.

i. Pick-up locations. After leaving from the SEEC southwest parking lot, additional shuttle pick-up stops will be made at the following locations:

- a) The People's Crossing (formerly Settler's Park) parking lot on Canyon Blvd.
- b) Magnolia bus stop on Boulder Canyon Dr.

ii. Shuttle Calendar. A calendar of SEEC—MRS shuttle drivers and passengers is accessible via the shuttle calendar link on the LTER shuttle page on the NWT website. If you would like to take the shuttle, please add your full name to the calendar. ***If your plans change, please remove your name from the calendar!

iii. Shuttle Drivers. The shuttle will run only when there is an authorized driver available. If you are interested in becoming an authorized driver, please coordinate with Jane Smith ***by no later than June 1***. Shuttle drivers are responsible for adding themselves to the calendar on days they can commit to driving and coordinating key access with other drivers.

B. MRS – Cable Gate. The LTER shuttle between the MRS and Cable Gate runs daily from the MRS Marr Lab up to C1 and Cable Gate once the road is clear of snow. An additional shuttle to the Green Lakes Valley watershed runs on Tues/Thurs for permitted researchers only. Shuttles depart from the Marr Lab promptly at 7:30 am, and should leave cable gate no later than 3:15 pm, and the watershed 3:00 pm, in order to be back at the Marr Lab by 4:00 pm.

If you are in need of transporting something up to the ridge that is too heavy to hike up with, please plan ahead and contact Jen Morse about other transport options.

i. Staying Late. If you need to stay in the field later than 3:15 pm, you must let the shuttle driver and either Jane Smith or Jen Morse know in advance. You should also indicate on the shuttle list (see below) that you will not be returning for a ride down and bring a beacon with you to the field in case there is an emergency.

ii. Shuttle Calendar. If you want a ride on the shuttle from the MRS to Cable Gate or GLV, you must sign up ahead of time on the shuttle calendar available via the LTER Shuttle page of the NWT website. If there are more people than will fit in the shuttle(s), priority will be given to NWT staff and those who are signed up for a spot on the shuttle calendar.

iii. Shuttle List. A shuttle list is used to ensure that everyone who takes the shuttle to Cable Gate or GLV returns safely to the MRS at the end of the day. Failure to comply with the shuttle list protocol may result in the loss of shuttle privileges. Shuttle lists are kept in all shuttle vehicles. Please add to the shuttle list your name, affiliation and where you'll be most of the day. If more than one vehicle goes up to cable gate, upon arrival all shuttle lists should be placed on the console of the designated shuttle vehicle #1.

iv. Leaving Early. If you return to the shuttle early and wish to take an alternate mode of transportation back to the MRS (e.g. walking, catching a ride with someone else), please put a check mark in the "gone back to the MRS?" box next to your name. If your name is not checked-off, it will be assumed that you are still in the field and the shuttle will be left for you

to drive back to the MRS *if you are an authorized driver*. Otherwise, an authorized driver will wait at the shuttle until you return. If it is after 3:15 pm and you have not checked your name off on the shuttle list, a search party will be sent out to find you in case you've been injured. When everyone listed on the shuttle list is either present or has their name checked off, the shuttle may leave for the MRS.

C. Shuttle Keys. A gate key should be kept in every shuttle vehicle. When shuttles are not in use at the Cable Gate/GLV, please leave the doors unlocked and the keys inside the gas tank door. Please do not leave vehicles unlocked or keys inside the vehicles anywhere else.

IV. Driving CU Vehicles

CU-Owned & Rented Vehicles. You must be on the LTER authorized driver list in order to drive any CU-owned or rented vehicles, even if it is only around the MRS. For instructions on how to become an authorized driver, please see driver authorization Addendum III of this document.

Please refill the gas tank if it is below half full. Each CU-owned vehicle has its own fuel card, kept in the vehicle console; please return the fuel card with the receipt when finished fueling. *DO NOT use a personal credit card, CU procurement card or travel card to buy gas.* When using the fuel card, you will be asked to enter vehicle mileage and a PIN; the PIN is your six-digit employee (not student) ID number. If the wrong number is entered 3 times, the card will be frozen, and **you** will need to call the 1-800 number on the back of the card ASAP in order to re-activate. If you have any other issues using the fuel card, always call the 1-800 number on the back of the card.

Fuel for rental vehicles must be paid for using a CU Travel Card (preferably that of the person who rented the vehicle). Please keep the receipt and submit it to Kathleen Hale (kathleen.hale@colorado.edu) with rental number (1 or 2) ASAP.

V. Marr Lab

A. Lab room 9. If you anticipate spending a significant amount of time at Niwot Ridge during the summer and need lab space for working or temporarily storing frequently used research materials, please let Jane know so that some space in the lab can be designated for you. Otherwise, please do not leave your stuff in the lab.

Any time you are in the lab, please be respectful of other people's stuff and clean up after yourself. Always wipe down tables, countertops, and balances after use so that no chemicals, soil particles, plant biomass, or other debris remain. If you get anything on the floor, sweep or mop it up. If you use any materials in the lab (e.g. weigh boats, beakers, scoopulas, tape, rulers), clean and dry as needed, and return them to their proper place when you are done. Close any drawers or cabinets that you opened.

B. Lab Equipment Sign-Out. If you need to borrow equipment or supplies, please use the sign-out list on the lab bench to sign out and back in anything you use. If you know you will need something at a future date, you may sign up in advance to reserve it. Before using any equipment/supplies, please

make sure no one else has already signed up to use it that day. If anything you use is damaged, lost or used-up, please let Jane know ASAP so that it can be replaced.

There is also field equipment at the tundra lab. Please get permission from Jane or Jen prior to using any of this equipment, return it ASAP, and let them know if anything is damaged. If you are in need of storing field equipment at the tundra lab, please also ask Jane or Jen.

C. Lab Storage. Marr lab space is not for long-term storage of samples, equipment, or supplies (including in refrigerators and freezers). If you need to store samples temporarily, all samples must be clearly labeled with your name, email address, sample contents and date. Any samples left in the Marr lab for more than 12 months will be thrown out. When you have finished working at Niwot Ridge for the summer, please remove all personal equipment and materials from the lab and clean the area you were using. If you have something you believe needs to be stored in the lab during the off-season, talk to Jane. Please do not leave items you no longer want or need in the lab with the expectation that someone else will take care of them for you.

VI. Basic Safety for Field Work at Niwot Ridge

We break down safety guidelines according to where you will be working in the field and what time of year you will be conducting the work. Core areas include the cable gate, saddle and t-van area, where much of our activity occurs in the summer field seasons. When going to more satellite areas (watershed, D1, subalpine forest sites), you should take additional backcountry precautions and prepare to be more isolated. Research during the fall, winter, spring require an extra level of planning and precaution. While we outline briefly some of the additional backcountry precautions, if you are planning to work in more isolated satellite areas (any time of year) or during non-summer months (anywhere) we advise direct coordination with Jen Morse for more essential safety information.

A. Emergency Contacts. CU's Mountain Research Station (MRS) generally serves as a base camp for anyone doing research at Niwot Ridge. There is a 24-hour access phone in the breezeway at the Marr lab.

When in the field, you should always bring a way to communicate. This can include a cell phone or other appropriate communication device such as Spot Beacon with battery fully charged; consider turning off cell phone to preserve battery life until you need it. Do not rely upon PLBs, SPOTs, radios or cellphones to always work. If you do not have service in a life or limb emergency, you should still try 911; if any carrier can pick up a 911 call it should get through. Important contact numbers:

- Emergencies: 911
- Kris Hess, MRS Station Manager: 303-492-8842
- LTER Office: 303-492-8841
- Boulder County Sheriff Dispatch: 303-441-4444

B. Niwot Ridge Emergency Communication.

- VOIP: phones are located at Tundra Lab and C1.
- Radios: Emergency radios to travel with- and remain in- each University vehicle/shuttle headed up the Ridge. Radios are for life or limb situations only. Directions will be on each radio.
- Personal Locator Beacon/ Satellite phones: If you are conducting work in areas that are not in the core NWT research area or not in the summer field season, it is highly recommended that

you carry some form of PLB (Personal Locator Beacon) or satellite phone with you on Niwot Ridge in the event your cell phone fails. Spot or Delorme are popular brands. T

- The LTER has 2 ACR ResQlink PLB's that you may borrow. Please email Jen Morse to reserve.
- There is one PLB w/ instructions located in the Emergency Cabinet in Tundra Lab.

C. Niwot Ridge Emergency Equipment and Shelter Locations. We have a series of structures throughout the research site for emergencies. Know where these are (see map in appendix)! Please use these supplies for emergencies only. You are still responsible for carrying your own 1st aid supplies and appropriate gear. If you do take anything out of any of our 1st aid kits (even if it is just a band-aid or Ibuprofen) please let Jen Morse or Kris Hess know so the item can be replaced for the next person in need.

- Tundra Lab: AED, supplemental oxygen, EpiPen (summer only), back country 1st aid kit, sleeping bags x 2, plastic tarps x 2, VOIP phone, Personal Locator Beacon (PLB)
 - The tundra lab is locked. The combination to enter the tundra lab is 0214.
- C1: back country 1st aid kit, VOIP phone (inside metal shed on north side of road)
- KiwiVan: back country 1st aid kit, sleeping bags x 2, plastic tarps x 2
- Tvan: back country 1st aid kit, sleeping bags x 2, plastic tarps x 2
- D1: back country 1st aid kit, sleeping bags x 2, plastic tarps x 2
- GL4: back country 1st aid kit (inside Stevenson Screen at Met station)

D. Field Planning.

- Don't travel alone, or if you do travel alone tell someone you trust where you're going and when you'll be back. When you go up on the shuttle to cable gate, make sure you tell others your plans for the day (locations, approximate timing). When you do field work outside the core areas or seasons, you should notify a trusted personal emergency contact of plans in case there are problems.
- Check the weather report and plan appropriately, but don't count on it to be 100% accurate. Rapid weather changes are commonplace at NWT throughout all seasons. Expect summer conditions of rapidly dropping temperatures, high winds, and unexpected thunderstorms producing heavy rainfall.

E. What to bring. Think in terms of "The Essentials" list below. Modify this list based on what is appropriate for the time of year and distance/location you plan on travelling. For example; a rain jacket and rain pants with extra layers for summer work is appropriate, but an emergency bivy with down jacket and down pants is needed in spring, late fall and winter. If you are conducting winter research, please contact Jen Morse for a list of expected gear and more information on winter hazards. Consider:

1. Navigation (map and compass, GPS)
2. Sun protection (sunglasses/goggles and sunscreen)
3. Insulation (extra clothing, no cotton). Regardless of the season, make sure you bring plenty of layers. A waterproof rain jacket/rain pants, extra fleece jacket, hat, and extra socks are bare bones essentials to bring along. Avoid cotton and layer with wool or synthetics. Bring enough clothing/shelter to wait a number of hours for help to arise should you be immobilized.
4. First-aid supplies** We suggest every group have at least one person with basic first aid supplies.

5. Nutrition (extra food)
6. Hydration (extra water)
7. Communication (phone, other devices; see above)
8. If you are working in satellite locations without easy access to emergency shelters or outside of the summer field season, we also recommend:
 - a. Fire (waterproof matches/lighter/candles)
 - b. Emergency shelter (emergency blanket for summer, emergency bivy and extra down clothing in winter)
 - c. Repair kit and tools (knife, Leatherman or other multi-tool)
 - d. Illumination (headlamp/flashlight with spare batteries)

****List of Minimum Items for a First Aid Kit**

- Ace bandage to support sprains or construct splints
- Duct tape/athletic tape, strong string, or rope to secure splints
- Iodine ointment for cleaning wounds
- Band-Aids
- Sterile gauze dressing for large wounds
- Adhesive tape to attach dressing
- Antibiotic cream, like Neosporin
- Pain killer/anti-inflammatory (i.e. Ibuprofen)
- Antihistamine (i.e. Benadryl)
- Signal mirror or whistle in case you get hurt or lost
- Candy or Sugar packets for quick energy

VII. Hazards

Consider the hazards you expect to encounter during your field research work, and make a plan for how you will handle them should they arise. Have a planned meeting place in the event your group gets separated.

A. Lightning. Storms move at varying speeds and directions, limiting your ability to predict precise storm behavior. The best option is to be conservative. Check the forecast, monitor the weather, plan to be finished with your field work before storms build. Remember you are not just putting yourself at risk by staying too long in dangerous weather; if you are hurt you may be putting others at risk when they come to your aid. A conservative approach is your best risk management option when it comes to lightning!

Avoid:

- places higher than surrounding terrain: peaks, ridges, hills.
- isolated tall objects like lone trees
- open terrain
- large bodies of water, especially the shoreline
- shallow overhangs and caves
- places obviously struck before
- large conductors: pipes, wires

Seek:

- uniform cover: trees of the same height or rolling hills
- tundra lab or other Niwot shelter
- your vehicle

If you cannot find cover:

- stay low to the ground in a crouching position (not lying or sitting on the ground so any current will hopefully just pass through your feet and not your vital organs)
- spread out your group to limit casualties (as far as you can without losing good visual contact). This will minimize the chance everyone in the group will be struck. It is important to ensure at least one person will be able to respond to an emergency situation.
- Remain calm if someone is struck and provide the proper first aid. If the victim is not breathing, provide mouth-to-mouth resuscitation or if the person no longer has a pulse, provide CPR. Someone from the group should stay with the victim until help arrives.

If you are taking shelter in the Tundra Lab from lightning:

- Stand in the middle of the tundra lab.
- Do not use the computer or any other electronics.
- Do not stand against the metal frame of the tundra lab until the storm has passed.
- The same applies for seeking shelter from lightning in your vehicle--do not touch the metal frame of your vehicle until the storm has passed.

B. High Altitude. Symptoms of altitude sickness include dizziness, nausea, headache, shortness of breath, and just a general feeling of being ill. To combat these symptoms, drink plenty of water and avoid caffeine, alcohol, or tobacco, pace yourself when hiking and working and eat plenty of calories so your body has energy. If symptoms persist, the best remedy is to descend to a lower altitude.

Extreme altitude sickness can lead to life threatening illness. HAPE, or high altitude pulmonary edema, is a buildup of fluid in the lungs, inhibiting oxygen exchange and possibly leading to death. HAPE symptoms include shortness of breath, decreased performance, persistent cough, a “tight” feeling in the chest, and crackling or wheezing sounds heard in the lungs (you may need a stethoscope for this). HAPE is life threatening and if you experience some or all of these symptoms you need to descend to a lower altitude immediately and seek medical attention.

C. Hypothermia. Prevailing winter conditions can be expected from September through late May. Cold temperatures and consistently high wind speeds are commonly encountered above tree line on Niwot Ridge. These conditions greatly increase your exposure to hypothermia and frostbite. Hypothermia is the lowering of your core body temperature. This can happen at temperatures as high as 45 degrees Fahrenheit! Three causes of hypothermia include: inadequate protection from exposure, lack of proper hydration and nutrition, and lack of proper planning for your level of activity and expected conditions.

Symptoms of mild hypothermia include shivering, mumbling, stumbling, changes in personality, such as someone becoming overly quiet or cranky, and pale cool skin. As hypothermia continues from mild to severe symptoms of shivering will cease, and other symptoms will progress to incoherence and severe lack of coordination. Severe hypothermia is a life threatening situation. If you or someone you are with begin to exhibit the symptoms of mild hypothermia, stop and treat the situation before it gets worse!

Treatment of mild hypothermia includes:

- Removing yourself from areas of high exposure from wind, rain or snow
- Replace wet base layers with dry layers, and adding insulating layers

- Short term exercise to generate heat (jumping jacks, jog in place)
- Drink water and ingest quick energy (bars, gels)
- Drink hot water or tea if possible
- Wrap patient in extra layers or a sleeping bag if possible

In the case of severe hypothermia treat the afflicted person with care as rapid movements could lead to ventricular fibrillation (heart attack). If you are moving the person to shelter, proceed slowly and smoothly. Evacuation by professional medical providers maybe needed, call 911 or send someone to get help. Shelter the person from the elements and remove wet clothing, wrap in as many layers and sleeping bags as possible

D. Frostbite. Frostbite occurs during prolonged exposure to cold temperatures, especially during high winds, or brief exposure in very cold temperatures of low wind-chill factors, when temperatures are cold enough to freeze body tissue. Extremities such as fingers and toes, or exposed skin, like cheeks or nose are most susceptible to frostbite. Signs of frostbite:

- Numbness
- Skin that is waxy and white
- In more severe cases, the skin may become gray and even black

To prevent frostbite, cover all exposed skin in the winter during high winds. Furthermore, ensure gloves and boots are not too tight, causing restricted blood flow and increasing the chances for frostbite. Carrying an extra pair of gloves or mittens is always a good practice.

E. Wildlife. We do not have grizzly bears, and it is unlikely that an encounter with a *black bear* will be a threat. Certain precautions should still be taken. Make noise, especially if you are hiking alone to avoid surprising a bear. In the unlikely event that you run into a bear never run. Keep your distance and back slowly away facing the bear, avoiding direct eye contact. Slowly and calmly leave the area. Use extreme caution around a female bear with cubs. Fight back if attacked. Black bears have been driven away when people fight with sticks, cameras, or even their bare hands.

Mountain lions are primarily nocturnal creatures. You are most likely to come in contact with a mountain lion in the early mornings, late evenings or if you are out at night. If you do choose to travel during these hours (or if your research necessitates it), travel in groups and make plenty of noise to reduce the chances of surprising a mountain lion.

Never approach a mountain lion if you do have an encounter. Always give it a way to escape as most mtn. lions will try to avoid confrontation with humans. Stay calm, and back away slowly while facing the mountain lion and making yourself appear as large as possible. Opening your jacket or lifting up objects may make you appear larger than you are. If the lion is aggressive throw sticks or rocks. Do not turn your back on a lion and do not bend down. If a mountain lion does attack, fight back with everything you have. A mountain lion may be driven away by prey that fights back.

Moose have very few natural enemies and generally are not afraid of humans. While not typically aggressive, moose have very poor eyesight and are known to become aggravated by dogs. If you come across a moose, give it the command and respect that it deserves. A moose can be extremely dangerous especially when a female is with her young. In the case that you are threatened by a moose stay calm, do not run away, slowly back away in the direction you came. Give it space, and keep pets away.

Bees, wasps, and ticks are some of the more common insects that can unexpectedly become a hazard in the Colorado alpine. Ensure steps are taken to prevent, prepare for, and care for a bite in the field if one were to occur. Bee and wasp stings are generally not a problem unless an allergic reaction occurs. A severe allergic reaction, or anaphylaxis can cause difficulty breathing, shock, and fatality. Signs of anaphylaxis are:

- Hives/swelling in the face, eyelids, lips, tongue, throat, hands and feet
- Difficulty breathing
- A drop in blood pressure leading to dizziness or loss of consciousness

Carrying an antihistamine such as Benadryl in your first aid kit can help decrease the symptoms of anaphylaxis if the victim can safely swallow. Most people susceptible to serious anaphylactic reaction carry an epinephrine kit and can administer it themselves. In either case, this will only slow down the effects of the allergic reaction. You should call 911 immediately for emergency transport to the nearest hospital.

Ticks are insects that feed on a hosts' blood and can transmit diseases. To date, no cases of Lyme disease have originated in Colorado. Ticks are most active in spring and summer and will wait in highly active areas--atop vegetation often found at the woodland edges of grassy fields. It is recommended that you check yourself for ticks regularly to prevent getting bitten. Ticks often take 12-24 hours after landing on you to dig in. Other ways to avoid getting bitten by a tick involve tucking your pants into your socks, and using a repellent such as DEET.

If you are bitten by a tick, you must be careful to remove the entire tick, as barbed mouth pieces may remain embedded in your skin and cause infection. Use tweezers and grasp the tick as close to the skin as possible to pull all of it out. In rare cases if ticks are left attached to the body for a long time, tick paralysis can occur. Symptoms include difficulty walking, breathing, and possible limb numbness.

F. Heat & Sun. Adequate sun protection is a necessity for successful fieldwork during all seasons on Niwot Ridge. Sunglasses, sunscreen, and hydration are key to preventing heat exhaustion or heat stroke. In addition to painful sunburn, UVA and UVB rays can cause skin cancer--the most common of all cancer types. The American Cancer Society recommends covering as much skin as possible by wearing long pants and a long-sleeved shirt, a good brimmed hat, and thickly applying a sunscreen that protects against both UVB and UVA to exposed skin every two hours. Exposure to UV rays can cause eye disease over time. Wear a good pair of sunglasses with UVB and UVA protection.

VIII. Boulder Watershed Research Permit Regulations

The following section applies to Watershed Research Permit Holders only. If you do not have a Watershed research permit you are not allowed in the City of Boulder Watershed. The deadline to request a permit is in May each year, late applications won't be considered.

The City of Boulder Watershed encompasses the Silver Lakes Watershed and Green Lakes Valley to the south and west of Niwot Ridge. The Watershed boundary is marked with a fence in some areas and in other areas is marked with signs. It is your responsibility to know if you have crossed over the boundary somewhere. Please pay attention to your surroundings when on the Ridge.

Watershed trespassers will be issued a summons under City Code 11-1-11; the maximum fine is \$1000.00.

In addition to incurring a fine, trespassing damages our relationship with the City of Boulder Watershed and this violation may restrict future access.

If you have been granted a watershed research permit, you should have received a Watershed Research Permit Regulations form (see Addendum II of this document). Please be sure you have completely read through all of the regulations.

We will communicate with the watershed manager on a weekly basis to let him know who will be in the watershed and where they will be working. This will facilitate patrolling by watershed personnel, and also be a point of communication if there are any questions, issues, or watershed communications such as road closures or other work that would affect research plans.

Please email Jen Morse at Jennifer.f.morse@colorado.edu by 9am on the Monday of the week you are planning to work in the watershed with the following information:

- day(s) of week
- who will be going
- where and what research will be conducted (you may only travel to the sites that were listed on your watershed permit request)
- what travel route you will use in and out of the watershed.

Your timely email will allow Jen to communicate with the Watershed Manager on Monday mornings with LTER research plans for each week.

A couple of things the Watershed Manager has asked us to remind all users of:

- You must carry a photo ID with you at all times in the Watershed.
- You may not bring anyone into the Watershed who is not on your permit (i.e. no family members, friends, or students, researchers, staff etc. not on your permit even if they are part of any bona fide research project on Niwot Ridge).
- You may not conduct research in the Watershed on Weekends or Holidays. No exceptions.
- You may only travel to the area of your permitted research (i.e. no lunch break hikes to summits or lakes not on your travel route).

Please follow these and all Watershed rules and regulations, and help us continue this relationship which allows us to conduct our research in such a special and beautiful place!

VIII. Additional Resources

Depending on where and when you plan to conduct NWT research, may want to consider a wilderness first aid class. There are a number of organizations which offer these classes, a few of which are listed below.

- The Wilderness Medical Institute of NOLS, or WMI offers classes through REI and a number of locations in the Boulder area. Course info can be found at: <http://www.nols.edu/wmi/courses/wildfirstaid.shtml>
- The MRS plans to host a Wilderness First Aid course each spring at the start of field season. Please enquire with Jennifer Morse about dates and registration. NWT provides first aid training to all permanent staff in the program.

There are a number of books and websites on Wilderness First Aid and preparedness, so this is not meant to be a comprehensive list but just a few ideas to get you started.

More on lightning:

<http://thecohiker.com/hiking-tips/lightning-safety-tips/>

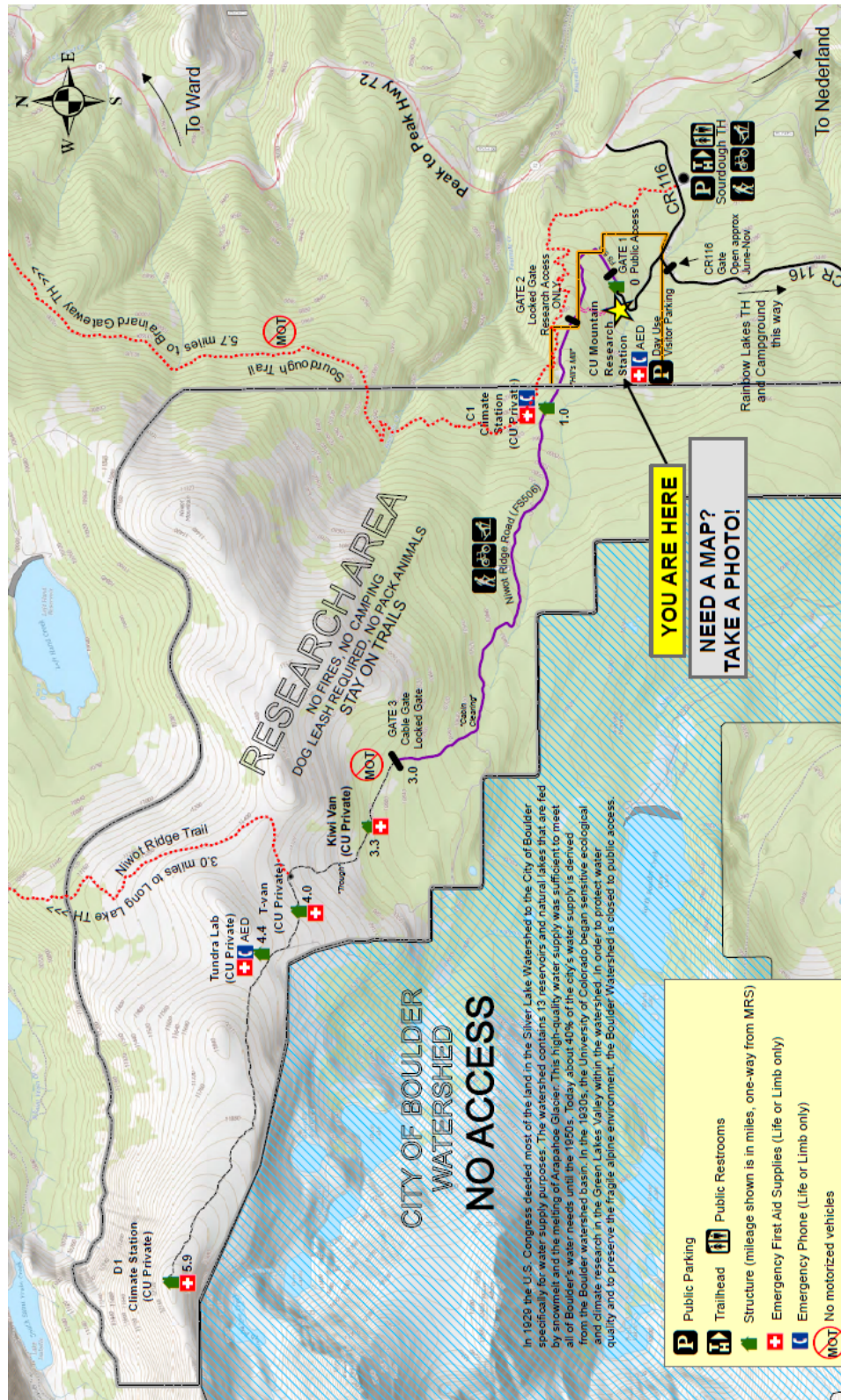
More on altitude sickness including HAPE and HACE:

<http://www.high-altitude-medicine.com/>

Comprehensive outdoor safety tips:

http://www.rmg.net/outdoor_safety.php

Addendum I: Map of MRS & Niwot Ridge



Addendum II: City of Boulder Watershed Research Permit Regulations



CITY
OF
BOULDER

Utilities Division
P.O. Box 791
1739 Broadway
Boulder CO 80306-0791
303-441-3266

CITY OF BOULDER WATERSHED RESEARCH PERMIT REGULATIONS

- I. Research Permit Applications
 - a. All researchers must apply through the University of Colorado Mountain Research Station.
 - b. Application deadline will be May 15, of each year. Late applications will not be considered.
 - c. Permits are valid for one (1) year. Multi-year projects must reapply every year.
 - d. The City of Boulder reserves the right to revoke a permit at any time, for any reason whatsoever.
- II. Travel
 - a. Only state-owned 4WD vehicles are allowed on the Watershed property.
 - b. Vehicles may not travel beyond Green Lake #1.
 - c. Permits are site specific and those permitted must use the most efficient, shortest routes to that research site. No sightseeing or hiking beyond the specific site is allowed. Violators will be issued a trespass summons under City Code 11-1-11; maximum fine is \$1,000.00.
 - d. Researchers must use established trails when possible.
- III. Personnel
 - a. Only persons listed on the Permit Application may access the Watershed. No non-essential personnel are allowed (i.e. friends, family, associates, or curious onlookers)
 - b. Picture ID must be carried and presented to any watershed employee when asked.
 - c. No tours will be allowed without special permission from City personnel.
 - d. No pets.
 - e. No camping.
- IV. Site Specifics
 - a. GPS coordinates may be required for each site.
 - b. All apparatus (i.e. towers or structures) must be approved by City staff before installation.

- c. Signs or markers must be pre-approved by City staff before installation, including wording on signs.
- d. Care must be taken to cause as little danger and damage as possible to the local flora and fauna.
- e. All materials must be removed at project completion. A deposit may be required to assure cleanup.

V. Research Hours

- a. No access is allowed on weekends or holidays.
- b. Hours are 7:00 a.m. to 5:00 p.m., Monday through Friday.

VI. Miscellaneous

- a. No relic or souvenir collecting is allowed.
- b. Minimize press exposure; a low profile is critical. If the project needs public exposure, consider a different site. No reporters are allowed without City staff permission.
- c. The City of Boulder assumes no liability for any injuries or property loss related to any research occurring on the Watershed property.

NOTE: A copy of this document will be distributed to all permit holders. Enjoy your time in this unique and beautiful area and remember, leave nothing but your footprints, take nothing but your data.

These regulations are subject to revision.

Addendum III: Driver Authorization

All NWT vehicle drivers must be authorized. To become an authorized driver, follow the below instructions *at least two weeks in advance* of when you will be driving. If you are not a CU student or employee, you must first be entered into the HCM system as a person of interest (POI). If you need to do this, please contact [Kathleen Hale](#).

If you're not sure whether you're authorized, contact [Jane Smith](#).

To become an authorized driver:

1. Take CU's online defensive driving course and save a copy of the certificate of completion.

Step 1- Go to MyCU

Step 2- Go to "QUICK LINKS"

Step 3- Go to "START SKILLSOFT"

Step 4- Click on the **CU BOULDER** Tab

Step 5- Go to and click on "TRANSPORTATION" – *on left side of page bottom*

Step 6- Click on: "CU: DEFENSIVE DRIVING" course

Step 7- Launch and take the course

Step 8- On successful completion:

- i. Go to your profile pictures' down arrow [*top right*]
- ii. Go to "LEARNING TRANSCRIPT"
- iii. Click on the "ACTIONS" button for CU: Defensive Driving
- iv. **View** then "PRINT" the certificate

2. Access the departmental authorization form (DAF) on the [Authorized Drivers](#) page of the CU Website. Fill in your personal information and Jane Smith (jane.g.smith@colorado.edu) as the "responsible person who will be signing this form." Use the speedtype # **11100514** and attach your DD certificate when prompted.