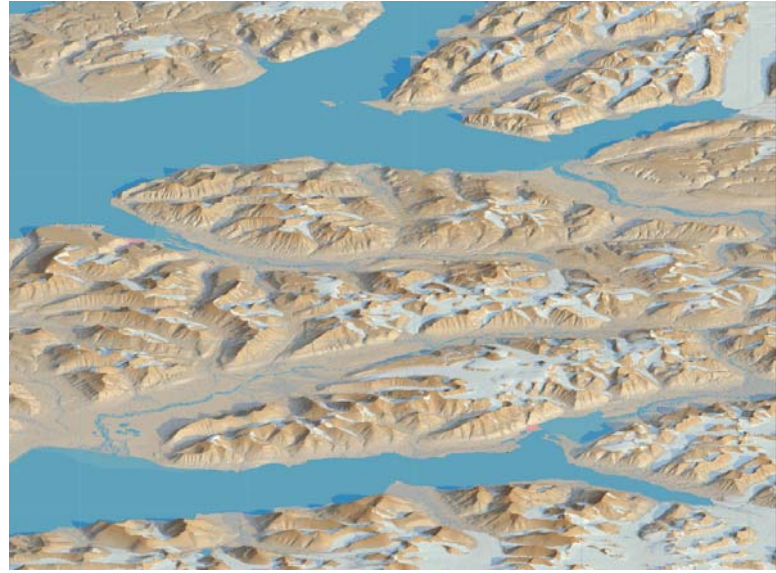
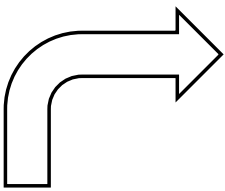
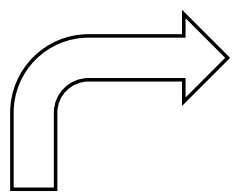


Performing Fieldwork Safely in Mountainous Terrain: A guide for station managers



Why is this relevant?

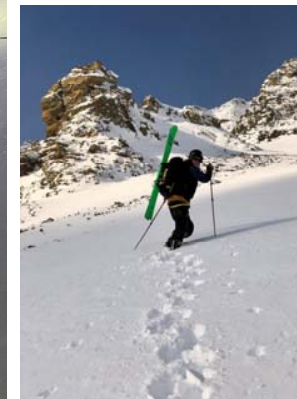
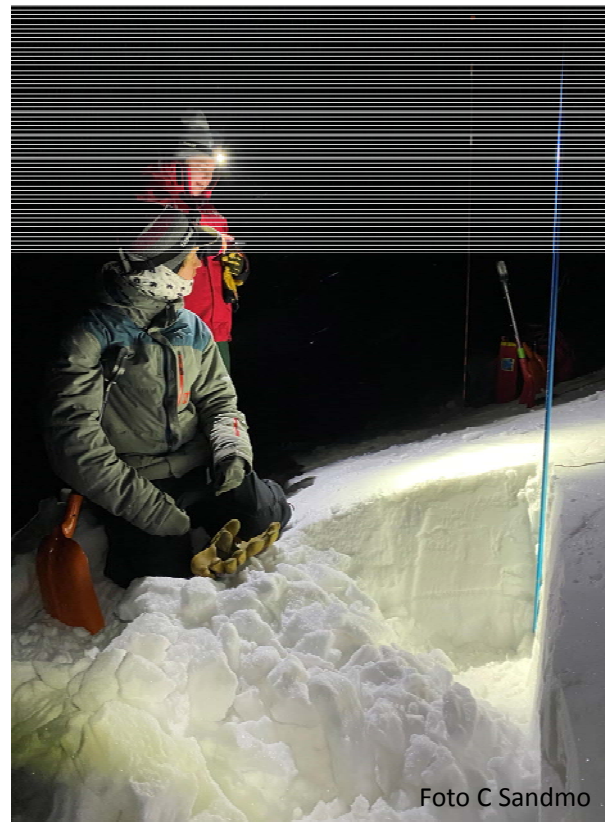


Content

- Identifying the field activities & common hazards
- Summer hazards in mountainous terrain
- Winter hazards in mountainous terrain
- Relevant equipment, safety training and practical training before going in the field



Common field activities in mountainous terrain



How do we prepare our field groups?

Step 1 – hazard awareness

- Pre-information from the group on their fieldplan <https://www.unis.no/resources/logistical-services/>
- Identify relevant hazards and necessary training

Step 2 – hazard education

- Choose relevant safety course
- Groups all need some general information, focus on relevant hazards to go into further detail
- Do not overwhelm the group with information on hazards not relevant to them
- The safety course should focus on: How to identify hazards, how to operate safely in the field and what to do in case of an accident or emergency

Step 3 – equipment for fieldwork, equipment for rescue, training

- Provide group with equipment needed for fieldwork
- If group should provide their own equipment, ensure they have adequate time to prepare
- Hands-on training and practice with the equipment if practical, especially to test that everything works as it should

Step 4 – final planning and briefing before fieldwork

- At UNIS this is called the 'HSE Brief'. A final meeting before the fieldwork to address the fieldplan, hazards, weather, etc. <https://www.unis.no/resources/hse/>

Step 5 – follow up of routines and activities while in the field

- Established communication/tracking while in the field and debrief afterwards

Summer Season Working in Steep Mountain Terrain

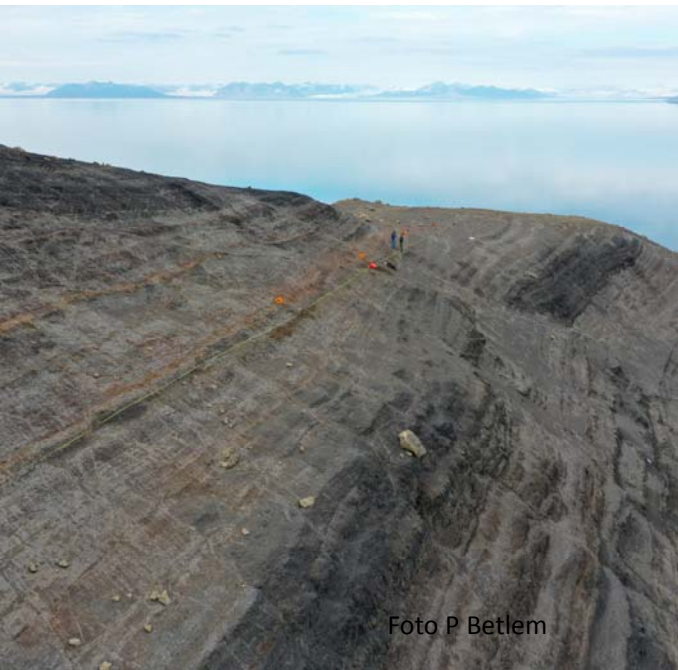


Foto P Betlem



Foto G Lord



Foto P Eidessen

Summary of Hazards

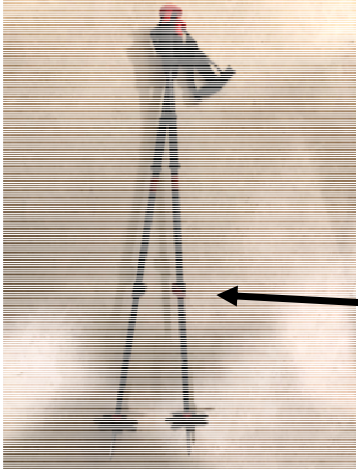
- a complete supplemental safety course will be available

- Rock fall/Land slides
 - When? Increase in precipitation, freeze/thaw cycles, earthquake, human/animal instigation, 'random'
 - What can we do? Wear a helmet! Do not travel in exposed slopes during/after heavy precipitation or sudden jump in temperature/sunlight. Do not walk under people, spread out horizontally and always wait in a safe place as people pass through bottleneck areas.
 - If you hear rockfall/set off rockfall make the rest of the group aware!
 - If you see a lot of fresh rockfall/land slides/ fresh debris, consider if it is safe to move in the area or if it's better to wait for stable conditions
- Human error
 - When? Walking vertically, walking in loose rock, panic in steep terrain
 - What can we do? Pick safest path, study terrain beforehand, make sure experience is adequate
- Weather
 - When? Heavy precipitation can lead to unstable conditions, low clouds/snow can lead to decrease in visibility, temperatures going below and above freezing can lead to instability. Freezing can lead to icy/slick ground
 - What can we do? Work during stable periods, avoid working during heavy rain, fog or snow
- Exposed Terrain
 - When? Working around cliffs, waterfalls, other 'no-go' zones
 - What can we do? Minimize or cut out our time near these dangerous zones completely. Use a drone if possible if it is too dangerous to walk, set limits!

Equipment

- Helmet
 - Lightweight climbing helmet, remember that it is only useful against small rockfall
- Thin Gloves
 - To protect your hands if you fall/trip
- Adequate Hiking Boots
 - When hiking on steep slopes/loose rocks you need proper ankle support!
- Eye Protection
 - If sampling rocks
- Walking Sticks
 - Helps balance in steep slopes
- Light Crampons
 - Helps walking in icy/snow conditions
- Static Rope
 - For emergency use





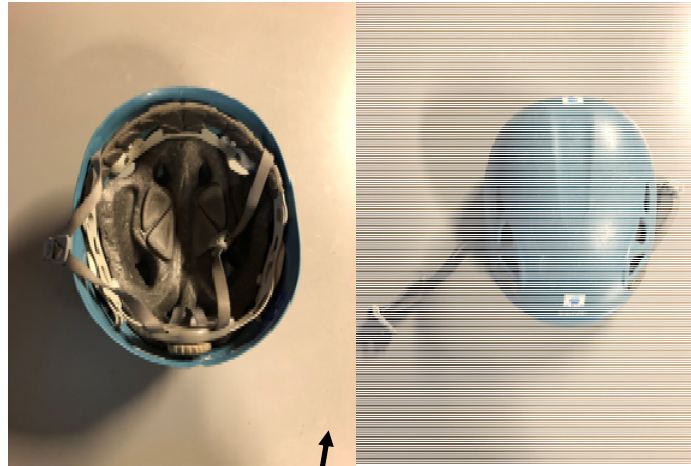
Hiking Poles
Adjustable for steepness



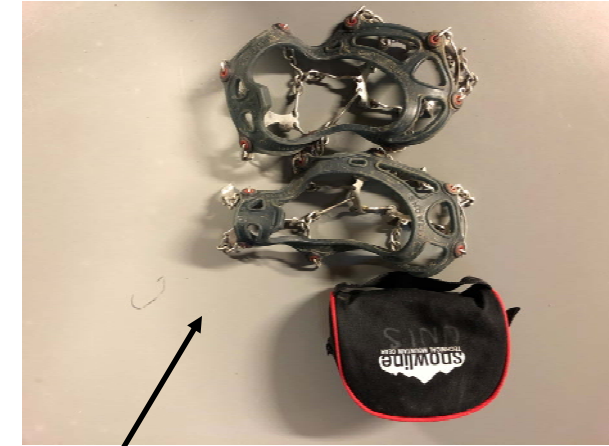
Hiking Boots
Tall & stiff for ankle support



Gloves
Thin material for dexterity



Lightweight helmet
Vented for breathability
and adjustable to fit over
hats and various head
sizes



Light Crampons or Bootchains
Lightweight, easy to wear over any boots

Education & Practical Training

- Familiarize the group with local conditions & terrain
 - When groups are coming from all over the world, information on where to find the best local maps and weather forecasts are essential!

Weather forecasts in Norway: www.yr.no or www.windy.com

Maps for Svalbard and terrain information: www.toposvalbard.no

Supplemental safety course for summer fieldwork at UNIS is available

- If working in very steep slopes or slopes with a lot of loose rock, a course in using ropes or traversing might be useful



Foto G Lord

Winter Season Working in Steep Mountain Terrain



Summary of Hazards- a complete supplemental safety course will be available

- Avalanches- All you need is a slope + snow, identify different types of avalanches and which you could encounter and what causes them. When? Check out the five obvious signs of avalanche danger and avoid avalanche terrain when any of the signs are observed
- Weather/Exposure
 - Weather can change and move in and out of the mountains quickly during winter
 - Be aware of fresh precipitation, wind, clouds
 - Important for avalanches, windchill, frost bite, visibility
- Terrain Traps
 - Travelling not only through 'avalanche terrain' but terrain traps where avalanches can deposit. Movement must be only essential and done quickly through these areas
- Steepness
 - Avalanches occur typically in slopes from 30-45°, but runout can reach flatter areas



Five Obvious Signs of Avalanche Danger

- Recent avalanches
- Collapsing of a snow layer & shooting cracks
- Wind drifted snow
- New snow
- Rapid warming



Equipment

- Beacon, shovel, probe, backpack
 - Essentials for traveling in mountain terrain during the winter
- Helmet
 - Important when traveling by snow mobile, ski or foot in steep terrain
- Warm boots
 - Sturdy for walking, warm enough
- Warm clothes
 - Windproof layer outside, down and wool inside
- Hat, neck warmer, mittens, goggles
 - Extras of each, smart to have thin gloves for working
 - Goggles often fog up in the cold, important to see!
- Food, hot water, cold water
- GPS, map, compass
- First aid kit
- Emergency communication equipment
 - Satellite phone, emergency beacon or personal locator beacon, Inreach, cell phone



Equipment



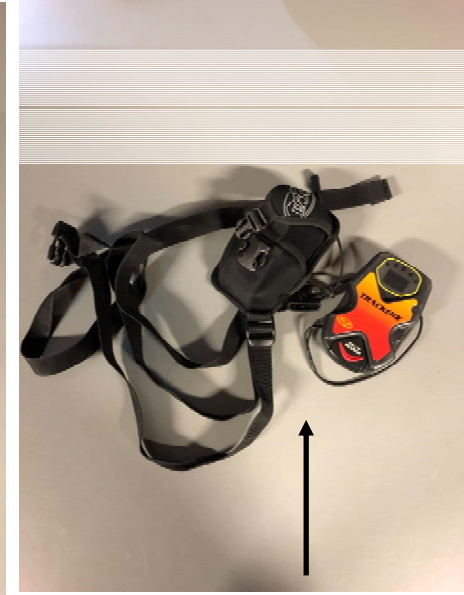
↑
The essential kit for working/traveling in avalanche terrain consists of an avalanche beacon, shovel and probe



↑
Avalanche probe, important to practice putting together quickly (not always intuitive), make sure you don't lose the sleeve!



↑
The shovel comes in two parts, so easy to store in a backpack.



↑
There are many different types of avalanche beacons, important to practice! Also be aware of battery life and firmware updates

Education/Practical Training

- If possible, hold a thorough safety course on working in avalanche terrain, practical training on how to use a beacon, and buddy rescue/group rescue
- At UNIS the bare minimum is running through what an avalanche is, where/when they occur & danger signs as well as a practical training on how to use the essential kit (beacon, shovel, probe)
- Show the group where to find the most up-to-date weather forecasts, avalanche forecasts and terrain maps for your area
 - Avalanche forecasts for Norway: www.varsom.no
 - Weather forecasts for Norway: www.yr.no or www.windy.com
 - Terrain Maps for Norway: www.toposvalbard.no



Foto M Indrieten

Additional Emergency Equipment for Fieldwork in Mountainous Terrain

Fieldwork by snow mobile



Heavy box, only suitable for carrying by sledge, enough equipment to have an emergency overnight camp for up to eight people, or help someone who is injured

Fieldwork by foot



Essentials you can fit in your backpack, for a daytrip in steep, mountainous terrain

Base Information Center

