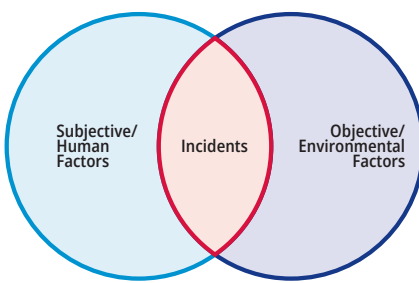
RISK MANAGEMENT

Risk management (RM) is essential to all we do in the field, from the daily hazards inherent to field work, to the bigger risks analyzed weeks or months before a project. Understanding what the hazards are and how to manage them as a team can ensure a successful field season.

Hazards and Risks

Hazard and risk assessments are the foundation of RM, informing the decisions and plans we make in the field. "Hazard" and "risk" are often used interchangeably but are distinct terms in the field. Hazards are sources of danger, while risks constitute the possibility of loss or injury due to exposure to a hazard. Typically, we identify hazards and manage their related risks. We cannot change the hazard but can manage our interactions with it.

RM often concerns "accident potential," the interaction of subjective/human factors and objective/environmental factors. Objective hazards are aspects of the natural environments and forces that present risks (e.g., weather, terrain, ice, snow, rockfall, moving water, wildlife). Subjective factors are the characteristics and behaviors of people (e.g., communication style, fatigue, complacency, personality, risk perception and tolerance, overconfidence, experience level). Incidents occur where the subjective and objective factors intersect.

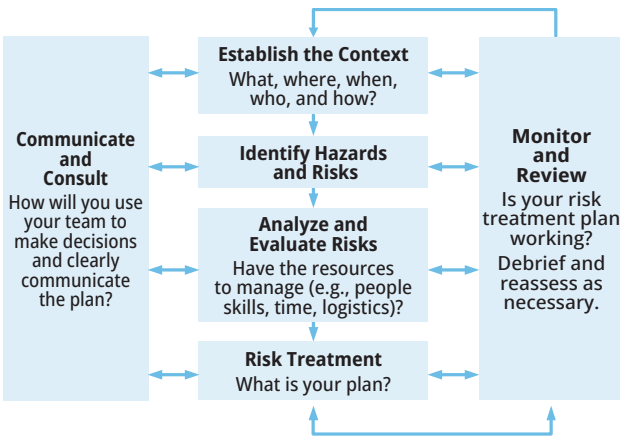


For example, crevasses may be present while traveling on a glacier (objective factor, i.e., out of our control), yet how we

communicate and plan to manage them is key to not falling into a crevasse and getting injured (subjective factor, i.e., within our control).

RM Process

The RM process involves systematically applying management policies, procedures and practices to communicating, consulting and establishing context, as well as to identifying, analyzing, evaluating, treating, monitoring and reviewing risk. From the proposal stage to implementation, RM is accounted for at all levels, from big picture oversight to daily decisions.



Daily RM leads to successful projects. Teams need tools to recognize hazards, mitigate risks and communicate effectively. Questions like the following have proven successful and can serve as the starting point of the risk assessment process:

- What can happen?
- How likely is it to happen?
- If it does happen, what are the consequences?

Asking these questions helps identify one or more scenarios in which someone or something is at risk to a hazard and how. These hypothetical sequences of events go through the initiating conditions to a final state (e.g., reduction of hazard, loss to the entity at risk), leading to this next set of questions that will inform the mitigation measure you choose:

- What is tolerable?
- How safe is safe enough (i.e., what is acceptable)?
- What needs to be done?

The RM process involves continuous iteration as shown in the next figure. Communication, consultation, monitoring and reviewing occur at each step as you cycle through the process.

Practical RM in the Field

Each day, we are making decisions, assessing hazards and communicating with our team. RM does not stop once the field plan is complete and you have arrived in the field. There are many ways to approach practical, everyday RM.

Conduct Daily Briefings and Debriefings

Morning Brief

- Conduct a rundown of activities for the day and associated hazards.
- Cover the mitigation plan for hazards.
- Do a physical and mental check-in for all team members.
- Plan for self-care throughout the day (e.g., food, water, personal needs).
- Go over the equipment and resource checklist.

Afternoon Debrief

- Did we make good decisions, or did we get away with it?
- What happened? So what? What next?
- What do people need to be at their best?

Assess Likelihood Versus Consequence

We often assess this unconsciously. Do a quick check-in: What is the likelihood of injury or incident, and what would that consequence be for myself and my team?

Use Common Language

Come up with common language and terms to identify risks (e.g., red means stop, yellow means caution, green means go). This can be applied to a variety of terrain and hazards.

Practice Situational Awareness

- Observe, orient, decide and act.
- Be observant of changing conditions — with individuals, the team and the environment.
- Effectively make decisions based on your observations.
- Reflect (in real time) on your decisions to refine courses of action.

Positive Work Environment

Successful field work is a result of a high-functioning team. Expeditions with extended time in the field tend to have their own culture characterized by team member's shared values and practices. USAP supports creating an inclusive, respectful and welcoming work environment, on the belief it leads to teams who successfully manage and plan for risks. To help make this happen, make time to discuss and practice the following together:

- Actively invest in a work culture that promotes proactive RM and support for all team members.
- Plan a positive work environment that is pertinent to team makeup, location, work, schedules, etc.
- Have AM/PM meetings that include dialog about subjective and objective hazards.
- Interrupt behaviors that erode the work environment, and actively solicit feedback about impact on others.

- Determine how the group plans to hold one another accountable to this?
- Facilitate foundational conversations around respectful team dynamics.
- Be inclusive by being curious and appreciating other's differences and identities. Exclusion is not tolerated.
- Build in time that is not centered on work. Ensure there is space for fostering relationships, morale and respite.
- Be mindful of humor, jokes and references that could alienate team members.

Sexual misconduct is a serious offense. Online and in-person meetings, both before and during deployment, are good ways to understand and address team dynamics, review the sexual misconduct policies of associated institutions and employers and consider the logistical impact that Antarctic field camp life has on implementing such policies.

Early discussions are chances to build trust and rapport in the group, work through scenarios and formulate agreements on how the team will process conflict and promote accountability in the field. Teams are encouraged to memorialize these discussions in a field safety agreement and ensure all members are aware of and have access to the material.

Self-awareness

Effective RM starts with **you**! Having a good understanding of your skills, attitudes, comfort level and risk tolerance and perceptions allows you to be a solid team member. Working in the cold, harsh environment of Antarctica has its challenges. Learning to thrive and not just survive is the goal.

Strengthen your situational awareness with accurate self-awareness by being aware of both your mood and your thoughts about that mood. Self-awareness can be cognitive (e.g., thoughts, beliefs, biases, assumptions), emotional (e.g., feelings, moods) or behavioral (e.g., language, actions), all of which helps us understand how we will respond in various situations. Self-awareness also benefits from feedback from

others. Strong teams make a habit of giving and receiving objective performance feedback in a way that minimizes defensive responses.

Stress Management

PRO TIPS

- Before deploying to the field, consider talking with your team about what you need to be successful (e.g., I like to have my hot drink in the morning before talking to anyone; it is important to me to laugh and have fun; I like to find time to connect with loved ones at home).
- As part of field planning, discuss some scenarios and ask team members to be realistic about how they would react.
- As a team, determine how you will make space for each other to get needs met.
- What does leadership, communication and feedback look like?
- Think about intent versus impact when communicating.
- Prioritize curiosity over assumptions. We all come with a belief system that influences our behaviors. Ask questions before assuming ill intent.

Stress and fatigue are normal components of field work. Working in the outdoors demands a strong work ethic. Team members work hard, both physically and emotionally, regularly putting in long days throughout the field season.

Teams can be under enormous stress from the physical exertion of living outdoors in the cold, time pressures, aspects out of our control, living with strangers, or adapting to a new diet and routine. The effects of stress and fatigue on performance are well documented. Our strength, stamina, mental and emotional health and immune responsiveness decline if we are chronically tired, undernourished or stressed. We are also more susceptible to injury when tired and hungry.

PRO TIPS

- Make it normal to ask for help. Role-model this regularly.
- It is not a character flaw to be tired or need time to recharge. Before deployment, ask team members what they need to be successful in the field. Know how you will support one another beforehand.
- Have a plan for your team to get good, consistent sleep.
- Ensure mealtimes are consistent and meals are nutritious.
- Have regular team check-ins as a team or one-on-ones as needed.
- Carve out personal time so people can recharge the way that is best for them.
- Mix up camp responsibilities throughout the season.
- Use the following stress continuum so team members have common language to describe how they are feeling.

Using the Responder Alliance's stress continuum (https://www.responderalliance.com/stress-continuum), we can become attuned to our stress levels and communicate when they are green, yellow, orange or red. This helps teams approach situations that require heightened focus and risk mitigation.

Individual Stress Continuum

Green/Ready	Yellow/Reacting	Orange/Injured	Red/Critical
Healthy sleep	Sleep loss	Sleep issues/ nightmares	Insomnia
Healthy relationships	Distance from others	Disengaged relationships	Broken relationships
Spiritual/ emotional health	Change in attitude	Feeling trapped	Intrusive thoughts
Physical health	Fatigue	Exhausted	Anxiety and panic
Emotionally available	Avoidance	Physical symptoms	Depression
Gratitude	Short fuse	Emotional numbness	Feeling lost or out of control
Vitality	Criticism	Suffering	Thoughts of suicide
Room for complexity	Lack of motivation	Isolation	Blame
Sense of mission	Cutting corners	Burnout	Hopelessness
	Loss of creativity/interest		

Fatigue Management

Antarctic field research opportunities are precious. It is tempting to burn the candle at both ends to accomplish project objectives. However, when people become extremely tired, their awareness level can drop and their stress level can rise. Exhaustion causes the following problems:

- Compromised work quality
- Worsening personal relations
- Judgment lapses
- Decreased situation or self-awareness of safety
- Behavioral changes that put self or others at risk

Create a work schedule that encompasses research duties, camp responsibilities and rest time. Divide camp responsibilities as equally or sensibly as possible. Prioritize work objectives and complete them accordingly. Encourage people to be responsible for their own well-being and take advantage of rest periods as necessary.

Rest and Duty Cycles

Setting up a field camp can be one of the busiest days of the field season. Getting basic needs met is the priority: shelter, warmth and water. It is important to determine roles and responsibilities before arriving at camp. It is also important to plan what to accomplish in the first 24, 48 and 72 hours on site. Making your task list is important. So is knowing when you will rest, which keeps motivation up. Consider keeping a rest and duty cycle throughout the field season.

Lifting and Carrying

Manual material-handling tasks performed repeatedly, or over long periods, can lead to fatigue and injury. Below are some of the main risk factors when lifting and carrying.

Risk Factors for Injury

Risk	Example
Awkward posture	Bending, twisting
Repetitive motion	Frequent reaching, lifting, carrying
Forceful exertion	Carrying/lifting heavy loads
Pressure point	Grasping loads, contact with parts/surfaces that are hard or have sharp edges
Static postures	Maintaining one position for an extended time

Before Lifting

- Always test the load for stability and weight.
- Assess whether more than one person may be needed to accomplish the lifting activity.
- Wear appropriate footwear to avoid slips, trips and falls.
- If you wear gloves, choose a size that fits properly. Depending on the glove material and number of pairs worn, more force may be needed to grasp and hold objects. Wearing a single pair of gloves can reduce grip strength up to 40%. Wearing two or more pairs can reduce grip strength up to 60%.
- Lift only as much as you can safely handle by yourself, and be realistic about how much you can lift.
- Keep the lifts in your power zone (i.e., above the knees, below the shoulders and close to the body) if possible.
- Use extra caution when lifting unstable loads.

While Lifting

- Get a secure grip.
- Use both hands whenever possible.
- Use smooth, even motions.
- Keep the load as close to your body as possible.

- To the extent possible, use your legs rather than your back to push up and lift the load.
- Do not twist your body. Step to the side to turn.
- Alternate heavy lifting or forceful exertion tasks with less physically demanding tasks.

Staying Warm

Our health and comfort in the field depends on staying warm and dry — we make better decisions, sleep better and are happier. It is far easier to stay warm than warm up once cold.

Ways We Lose and Generate Heat

Lose	Gain	Mode	Description
x	x	Conduction	Direct transfer of heat from one object to another (e.g., while sitting on ice/ snow with no insulation, picking up cold objects with bare hands)
x	x	Convection	Movement of air between the body and air outside (e.g., via open collars, untucked shirts, unzipped jackets, no hat)
x	x	Radiation	Transfer of electromagnetic energy from a hot object to a cold object, primarily through exposed skin
x	x	Evaporation	Heat exchange when moisture evaporates from wet clothing or skin
x	x	Respiration	Heat exchange via breathing, which can occur rapidly when breathing is heavy in cold weather
	x	Activity	Bodily movement or exertion (e.g., shoveling snow)
	x	Food	Consuming food, especially simple sugars, which the body can break down quickly to produce' heat
	x	Clothing	Wearing light/medium/heavy layers to trap “dead” air space around the body

PRO TIPS

- Take short, frequent breaks while doing strenuous work to avoid sweating, which can cause chills via evaporation and perspiration.
- Change out of wet clothes, or if clothes are only damp, layer up and do light activity. Synthetics and wool dry as your body creates heat.
- Eat throughout the day! Lunch starts as soon as breakfast is over and ends when dinner begins. This helps regulate body temperature during the day.
- Stay hydrated! Not only will the dry environment take its toll on your body, but also drinking fluids will keep you warm.
- Wear a warm hat and gloves most of the time.
- Always have layers available so you can fine-tune for the activity and location.

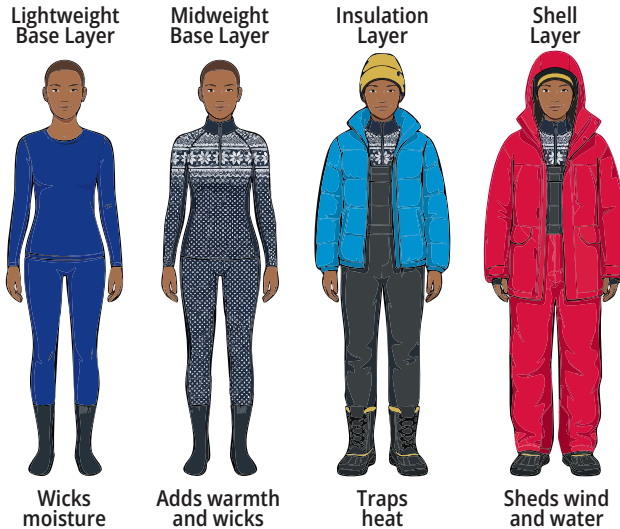
Clothing

In addition to the extreme cold weather (ECW) gear that USAP issues, you will need several layers to be comfortable and thrive in the field. Before leaving home, you should have received a gear list from your team to help you acquire the proper gear.

A good rule for living in cold environments is to get lots of insulation between you and the environment and then remove that insulation, layer by layer, as you warm up. You need a clothing system that allows you to shed layers quickly and easily before you get damp from perspiration. Several thinner garments are better than one bulky layer.

Layering

Layers ensure you can be comfortable in a variety of temperatures and work conditions.



Base Layers

Your first base layer should fit snugly against your skin and be lighter weight. This layer works by wicking away water and keeping your skin dry. Merino wool or synthetic fabrics (e.g., polypropylene aka polypro) work great. Cotton is a poor choice and should be reserved for hanging out around camp and sleeping in warmer temperatures. Depending on location, you may wear two to three base layers of varying weights. This will help trap air and prevent heat loss.

Insulation Layers

An insulation layer can be thick long underwear (e.g., light fleece, wool), whose role is to absorb and maintain heat.

Thickness is warmth! Insulation layers are often worn while working, but avoid wearing your thickest layers for high output. Have an outer garment with several inches of loft during sedentary activities or extreme cold. Down is best for dryer conditions. Synthetic insulation is best for wetter climes.

Shell Layers

Shell layers are often the most important layer in your system and the most used after your base layers. Wind shells over any garment can add up to nearly 4°C (25°F) of warmth and 10°C (50°F) in very windy conditions. In places like Antarctica, we need constant protection from wind. Ensure your wind shell can fit over all layers before going into the field.

PRO TIPS

- Bring comfortable, synthetic fabric underwear, which is easy to wash and fast drying. (If allergic, try merino wool.) Also, bring cotton underwear for sleeping.
- Sports bras are popular and comfortable but often thick and slow to dry. (You will sweat in the cold.) Test before deploying.
- It is tempting to go to sleep with all your layers on but best to remove wind-resistant clothing and sleep in breathable layers to avoid sweating.
- Bring lots of good-quality socks. Our feet can be some of the hardest working parts of our body. Change into sleep socks at night (affectionately called "sacred sleeping socks," which live in your sleeping bag only).
- Wear materials that wick moisture from the skin (e.g., synthetic materials, wool).
- Wear clothing that retains its warming properties even when wet (e.g., wool, fleece, synthetic insulation like Primaloft).
- Try on all layers together and test a variety of layering strategies before going into the field, to ensure your clothing is not constricting and lets circulation take place.
- Avoid excess clothes while active, so they do not saturate with sweat and cause you to lose heat through evaporation.

Damp or Wet Clothes

More often than not in Antarctica, clothes will not dry on their own or when hung outside while you work. Keeping clothes dry takes effort.

PRO TIPS

- Your body is often the best "dryer" for damp clothes. Sandwich them between your layers as you work around camp to dry them.
- Putting clothes in your sleeping bag is usually not enough to dry them. Hot water bottles in the bag will help with drying.
- Socks are the most likely clothing to become damp, as you wear them all day while working. To dry them overnight, you can put socks between your clothing layers so your body heat dries them while you sleep.
- Beware of hanging clothing too close to heaters. Synthetic fibers can melt!

Sleeping in the Field

Part of thriving in the field is getting a good night's rest. Insufficient sleep can affect your physical and psychological well-being. Everyone has different sleeping needs and metabolic rates, so you may need to experiment with sleep during the first few days in the field.

PRO TIPS

- Always use multiple pads for comfort and insulation from the ground. Foam and inflated air mattresses are standard issue.
- Eat well before going to bed, ensuring you have both fats and carbohydrates. Fats take longer to digest, keeping your furnace stoked throughout the night.
- Do not wear all your clothes to bed. Start with base layers and add if needed. The goal is not to sweat.

- Urinate before getting into your sleeping bag, and do not ignore the call to urinate in the middle of the night. Use your pee bottle.
- Do some light calisthenics as you get into your bag to heat up your body.
- Consider wearing a warm hat as significant heat is lost from the head.
- Take a hot water bottle (or two) or hand warmers to bed with you. Place them under your arm pits, in between your legs or at your feet. You will not regret it.
- Have a pair (or two) of sacred sleeping socks that are solely for the bag.
- If your sleeping bag is somewhat big for you, consider filling the voids with other dry clothing to warm up the dead space.
- Keep sugary snacks nearby for midnight refueling.

Staying Found

While most fieldwork happens during the austral summer months, with 24-hour daylight, getting disoriented or lost can happen. As you set up camp, discuss a plan for this. It can be easy to become disoriented in the wind, fog and snow when moving between tents or huts at larger camps. In bad conditions, visibility can plummet in minutes. It is essential to have a plan if you are moving around camp in bad weather:

- Tell someone where you are going.
- Carry a radio.
- Have a check-in time.
- Set up rope lines in advance of bad weather.
- Determine how a person would signal distress if lost around camp (e.g., use of whistle, radio).
- Determine the minimum time-distance from camp in which a person must carry extra supplies (e.g., survival bag, food, layers). Starting this requirement at ~15

minutes from camp is suggested, but it may need to change by location.

If you become disoriented or lost, do the following:

- Stay calm, positive and alert.
- Stop once you know you are disoriented. Make a plan and take a deep breath.
- Do not wander around aimlessly. You are better off staying where you are.
- Make contact or noise.
- Minimize heat loss by putting on additional layers if you have them.
- Stop and think. Try to remember your movements and figure out a way back.

Hygiene

Preventing illness within camp is crucial to ensuring the team's success and eliminating the risk of a serious illness that requires a medevac. Practice proper hygiene to minimize pathogen transmission and keep drinking water clean.

Camp

- Designate a handwashing area in camp.
- Wash hands after using the bathroom, before cooking and eating, before cleaning up after meals and at other times during the day. Have hand sanitizer easily accessible in the toilet tent and at other locations around camp.
- Protect drinking water from motor exhaust and microbial contamination.
- Use filters, chlorine, iodine or boiling to disinfect water as needed.
- Designate certain equipment for water collection (e.g., containers, shovels, ice axes) and do not use it for

anything else. Alternatively, sterilize equipment before using it to collect snow or ice for water.

- Clean and disinfect drinking water storage containers regularly.
- Use bleach to sterilize dishwater and dishes.

Personal

A big part of self-care is personal hygiene. You will be better focused and able to make good decisions if you are comfortable. If you have any anxiety about hygiene during your prolonged time in the wilderness, then this information can help.

Bathroom

You will learn how to "pee and poo" in the field in a way that is environmentally responsible and sanitary. Depending on the field location, there will be different parameters on human waste containment. Many camps require all gray water (pee) and human waste (poop) to be contained in buckets and barrels. Toilet paper is provided for all camps.

You will be issued at least one pee bottle along with your sleep kit. If you have a vagina, you can ask for a urinary adjunct (e.g., Lady J, "shenis") from Peninsula field gear. It is best to practice before leaving for camp, in the comfort and warmth of an indoor bathroom stall.

Handwashing is an important aspect of maintaining backcountry hygiene and health. Alcohol-based hand sanitizer is readily available, but traditional handwashing is best when possible. All camps should plan on having a handwashing system with soap and water.

If you have a vagina, you are encouraged to wash your pubic area with mild soap and water daily and bring an extra bandanna to clean yourself after urinating. Baby wipes are also a good alternative to soap and water. Bandannas can be hung outside of your tent in the sunlight to dry. Consider sleeping in cotton underwear instead of synthetic fibers.

Menstrual

If you menstruate, your cycle may change while living in the outdoors, so plan to bring extra menstrual supplies. You can use a reusable menstrual cup in lieu of tampons or pads. If you are using a new method, be sure to practice using it before deploying.

All camp outhouses should have both a human-waste bucket and a sani-waste bin. Dispose of menstrual products in sani waste. When away from camp, it is also helpful to carry a stuff sack containing menstrual products and a zip-top bag for their disposal and carryout. Placing one or two aspirin tablets (not acetaminophen aka Tylenol) in the disposal bag will help keep odors down.

If you experience menstrual cycle changes or genitourinary symptoms (e.g., itchiness, soreness, excess or smelly discharge, painful or more frequent urination), do not hesitate to contact the field medical lead or whomever you feel most comfortable talking to. USAP field medical kits have medication to treat common infections (e.g., urinary tract infections, yeast infections).