National Park Service
U.S. Department of the Interior

Natural Resource Stewardship and Science

Northeast Coastal and Barrier Network Tidal Wetland Elevation Monitoring Program Safety Plan

ON THE COVER

Top: Measuring a rod Surface Elevation Table at Acadia National Park, Maine. Lower left: Collecting a cryogenic soil core from a marker horizon plot at Gateway National Recreation Area, NY. Lower right: Soil core extracted with a knife showing a marker horizon (white layer) sampled at Tijuana Slough NERR, CA.

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Revision History Log

Version #	Revision Date	Author	Changes Made	Reason for Change
1.00				

Executive Summary

This safety plan documents the safety procedures used by the Northeast Coastal and Barrier Network (NCBN) for activities related to the implementation of monitoring as described in the NCBN's Tidal Wetland Elevation Monitoring Protocol (Surface Elevation Table [SET] and Marker Horizon Technique).

Definitions (alphabetical)

Designated office staff (DOS): Refers to the individual who is designated to remain in the office, is aware of trip plans, daily fieldwork plans, and can help coordinate emergency response services for field teams.

Monitoring staff: Refers to all personnel engaged in activities related to this protocol. This includes National Park Service (NPS) employees (park or NCBN staff, seasonal biological science technicians, and interns), other partnership agency employees, cooperators, and contractors either actively participating in or observing monitoring activities.

NCBN program manager: Refers to the National Park Service individual responsible for overseeing the protocol lead and monitoring staff, and works closely with the protocol lead to review all aspects of this monitoring protocol.

Park staff: Refers to any employee of one of the eight parks included in the NCBN, and any other parks where monitoring may take place. Park staff may occasionally participate in fieldwork. When present, they will assist the protocol lead and monitoring staff by identifying any safety concerns and providing support during incident response.

Point of contact (POC): Refers to a person serving as the coordinator or focal point of information concerning an activity or program. A designated park staff member will be the POC for relaying pre-monitoring plans to, as well as a safety check-in for the monitoring staff, while they perform fieldwork in the park.

Protocol lead: Refers to the individual responsible for all design, implementation, and safety aspects of this monitoring protocol. The protocol lead is responsible for ensuring monitoring volunteers are properly trained.

Keywords

Northeast Coastal and Barrier Network, NCBN, safety, training, fieldwork, emergency, incident reporting, hazards, GAR, JSA, risk assessment, safety analysis, tidal wetlands, elevation monitoring, SET

Overview

This safety plan provides monitoring staff with an overview of safety procedures and issues that should be considered when conducting elevation monitoring in tidal wetland environments, and should serve as a first reference in case of an incident.

Personnel safety is always the number one priority. While it is the goal of the National Park Service and the Northeast Coastal and Barrier Network to ensure a safe working environment for all monitoring staff, each individual is responsible for ensuring their own safety in the field. Safety concerns should be brought to the attention of either the NCBN program manager or the protocol lead as soon as possible. Staff will conduct monitoring in more than one park during the field season, so it is critical that individual park policies regarding safety are respected and followed.

Topics covered in this plan include emergency procedures and contacts, incident reporting, trip and fieldwork preparation, safe fieldwork procedures, vehicle safety, and workers compensation procedures. A Job Safety Analysis (JSA) documenting hazards associated with this protocol and recommended approaches to mitigate these hazards is included (Appendix A). The JSA must be read and signed by all monitoring staff who conduct fieldwork using this protocol. Additionally, a Green-Amber Red Risk Assessment (GAR) has been conducted for this protocol based on optimal fieldwork conditions but should be re-evaluated pre-fieldwork on a daily basis to ensure conditions are still safe and risk is low (Appendix B). This safety plan document does not cover first aid procedures.

Tidal wetland elevation monitoring performed by the protocol lead takes part in the following NPS Inventory & Monitoring (I&M) networks and parks:

Northeast Temperate Network (NETN):

- Acadia National Park (ACAD),
- Boston Harbor Islands National Recreation Area (BOHA)

Northeast Coastal & Barrier Network (NCBN):

- Assateague Island National Seashore (ASIS),
- Cape Cod National Seashore (CACO),

- Colonial National Historical Park (COLO)
- Fire Island National Seashore (FIIS),
- Gateway National Recreation Area (GATE),

National Capitol Region Network (NCRN):

- George Washington Memorial Parkway (GWMP),
- National Capital Parks – East (NACE)

The protocol lead will utilize the NCBN Tidal Wetland Elevation Monitoring Safety Plan regardless of working in parks outside the NCBN.

Pre-Season Preparation

Annual Review of Safety Procedures

Each year prior to the start of the field season, the NCBN program manager, staff assigned to managing safety procedures for the Network, and the protocol lead will work together to review current safety procedures and update the safety plan as needed.

All monitoring staff are equally responsible for maintaining a safe work environment for themselves and their coworkers and ensuring that safety remains at the forefront of daily activities throughout the field season. Everyone should clearly understand routine and emergency communication procedures and how to respond to medical emergencies as well as non-medical emergency incidents. Everyone should also carry the required supplies with them into the field in order to promote their own safety as well as allow them to respond effectively to an incident. More information on items recommended for personal safety is listed in the Field Safety section.

All monitoring staff involved in fieldwork for this protocol (including individuals who are observing or only participating for a short time) must read this safety plan (including documents linked in this plan) and **sign the *Acknowledgement of Safety Training* form** (Appendix C) prior to deploying to the field. By signing the form, monitoring staff acknowledge that they have read and understand the information contained in the safety plan and agree to practice these safety procedures to the best of their ability. It is the responsibility of the protocol lead to ensure that any monitoring staff who miss the in-person training undergo either a virtual or separate individual in-person training by the lead or other qualified staff, and are provided with this safety plan. They must also submit a signed acknowledgement form before being allowed to participate in fieldwork.

Operational Risk Management

Preventing accidents is a matter of recognizing and managing risks. The key to successfully recognizing and analyzing risk is the careful definition of the hazards. In order to define those hazards, a Job Safety Analysis (JSA; sometimes called a Job Hazard Analysis or JHA) has been conducted for tidal wetland elevation monitoring (Appendix A). The JSA process is to (1) identify hazards associated with the field settings, as appropriate, and (2) develop approaches to mitigate those hazards in order to safely proceed with the work.

To be effective, risk management must be able to be conducted in different situations depending on available time. The Green-Amber-Red Risk Assessment Model (GAR) is a good example of a strategic (adequate planning time) risk assessment and has been conducted for coastal geomorphological monitoring (Appendix B). The model is most effective when assessing the eight mission risk factors that contribute the greatest risk to a job, task, or project. The most common mission risk factors are:

1. Supervision
2. Planning
3. Team Selection
4. Team Fitness
5. Communication
6. Contingency Resources
7. Environment
8. Event or Incident Complexity

The protocol lead must acknowledge that specific hazards may present themselves while in the field with minimum planning time. The SPE Risk Assessment Tool works best for these specific hazards. It considers:

1. Severity: the potential loss or consequences of an accident
2. Probability: the likelihood that given exposure to the hazard, the projected consequence will occur, and
3. Exposure: the amount of time you are exposed to a hazard, the number of people at risk, the amount of equipment involved, and/or the number of times a task is done.

Because the JSA and GAR outline the potential risks and appropriate measures to minimize them, both will be read and reviewed annually during pre-season training by all monitoring staff engaged in field activities related to this protocol. This approach is consistent with the Reference Manual 50B for Occupational Health and Safety, and the 2015 NPS Operational Leadership Student Manual. To fully understand the methods important for Operational Risk Management, including specific information about JSA/JHAs, GARs, and SPEs, all monitoring staff must read Module 4: Mission Analysis in the Occupational Health and Safety Manual. All these documents are also available on the NCBN Safety SharePoint site.

To assist the management of risk on the day of fieldwork, the protocol lead and monitoring staff should download and become familiar with a cellular phone application called "**Risk: SPE and ORMA Calculator**". The monitoring staff can use this app to calculate the SPE assessment if necessary, along with the daily pre-fieldwork GAR assessment. The monitoring staff can opt out of using the app for the GAR assessment and instead download, copy, and carry hard copies of the fillable GAR form from the NCBN Safety SharePoint site.

First Aid Kits and Training

First aid kits are provided by the Network and should always be with monitoring staff while in the field. There should also always be a vehicle emergency safety kit that includes a first aid kit in the government vehicle being used during fieldwork. An inventory of the contents of all first aid kits should be performed prior to each field season to ensure that all medical supplies are in sufficient quantity and haven't expired. Any medical supplies that are used should be promptly replaced. In addition to medical supplies, each first aid kit will have an inventory list of the supplies contained within it and the most recent version of instructions on how to respond to an incident (Appendix D) and safety information for each park (Appendix E).

It is strongly encouraged that at least one monitoring staff team member have current first aid and CPR certification.

To complete a pre-field season inventory of the items needed in the first aid and vehicle emergency safety kits, complete the checklists found on the NCBN Safety SharePoint site.

Emergency Response

Prior to entering the field, all monitoring staff should feel prepared to initiate an emergency response or request help from the park staff POC depending on the severity of the incident (Appendix D). Steps for responding to an incident will be taught during pre-season training, are required reading for all monitoring staff engaged in fieldwork related to this protocol. Steps for responding to an incident must also always be carried in the first aid kit accompanying each survey.

Park-specific safety information and steps, current park contacts, and nearby institutions to seek medical help are available in Appendix E. It is the responsibility of the protocol lead to provide monitoring staff with the current park emergency contact information prior to conducting monitoring. The protocol lead will verify this information with park staff on an annual basis, prior to the field season. Copies of the park-specific safety information sheet should be printed/laminated prior to the field season, and are to be carried with the monitoring staff at all times.

Communication

While in the field, the monitoring staff is expected to carry a functioning primary and secondary method by which emergency services can be contacted. A cellular phone (either personal or NPS-issued) is the primary device for communication and a GPS satellite communicator is the secondary device. If a particular park requires the use of a two-way radio, it will be provided by the park, although a cellular phone and GPS satellite communication device are required regardless of whether or not a two-way radio is used. All monitoring staff are required to read the **GPS satellite communication device owner's manual** and know how to operate it prior to any fieldwork. The manual is available on the NCBN Safety SharePoint site.

Be aware of the local conditions for cell phone and radio use and make alternative plans if there is a chance you will not have cell or radio coverage. Unless they are waterproof, communication items should be stored in a water resistant or water proof container (e.g. Ziploc bag, dry bag, dry box). A fully charged battery power pack for re-charging cell phones is required to be carried in the field.

The protocol lead will establish an agreement between the NCBN and the park, designating someone at the park to serve as an official point of contact (POC) for the monitoring staff (usually a resource manager or chief ranger depending on the park). It is the responsibility of the protocol lead to obtain and provide the name and contact information for the park POC to monitoring staff before the field season begins. The protocol lead will verify this information on an annual basis. It is also the protocol lead's responsibility to provide the park staff POC with the phone contacts for the monitoring staff, along with the contact method and tracking link for the GPS satellite communication device. The protocol lead is responsible for making sure the device is in working condition, and that the park staff POC contact's information is added to the Garmin Explore website and synced to the device.

Planning

Prior to the field season, a list designated office staff (DOS) will be agreed upon by the protocol lead and the NCBN staff. The DOS will be the point of contact between the monitoring staff in the field and the NCBN offices. Note: The DOS may change based on availability. Be aware of who the DOS is on a daily basis. If the first contact is not successfully reached, contact the next DOS on the list.

Table 1. Designated office staff (DOS) for the Northeast Coastal and Barrier Network, in order of contact priority.

Contact	Cell	E-Mail
1. Sara Stevens	(401) 486-2374	sara_stevens@nps.gov
2. Robin Baranowski	(401) 824-9909	robin_baranowski@nps.gov
3. Dennis Skidds	(401) 573-7925	dennis_skidds@nps.gov
4. Holly Plaisted	(508) 246-4534	holly_plaisted@nps.gov
5. Scott Rasmussen	(401) 207-5335	scott_rasmussen@nps.gov

As updates become available, the protocol lead will provide the appropriate park staff POC, the DOS, and NCBN program manager with a copy of their proposed field schedule, including monitoring locations. Make sure that NPS park personnel are aware of your field schedule and agree with your plans. Only after the proposed schedule is accepted, may the protocol lead and monitoring staff make trip plans.

Tide Planning Considerations

Be aware of the tides for each of the sites you are visiting. Try to sample when the soil surface is not flooded. If traveling to the site via boat or canoe you need to schedule your trips to ensure the water is deep enough for the boat to get to and from the site. The protocol lead or monitoring staff must share a daily **float plan** with the park POC if they are accessing monitoring sites by boat or canoe during the field season.

Weather Planning Considerations

Be aware of the seasonal requirements for visiting and sampling your monitoring sites. Weather along the coast can change rapidly, so be aware of the current forecast and the potential for severe weather while you are in the field. Monitoring staff are responsible for planning their day according to the daily local weather forecast and for being aware of their surroundings and changing conditions. If there are signs of dangerous weather in the forecast or approaching while in the field, the monitoring staff should perform a SPE risk assessment. It is the decision of the protocol lead whether to cancel a trip or cut it short based on weather. The protocol lead bears the responsibility of contacting the park staff POC and the DOS to communicate any weather-related change in plans or cancellations.

Pandemic Considerations

Due to the Coronavirus (COVID-19) pandemic that began in 2020, the protocol lead and the NCBN program manager must evaluate the safety of performing fieldwork during the pandemic. The protocol lead must complete a request to travel including Risk Decision Making Forms (GAR), a Job Safety Analysis (JSA), and a Go/No Go Checklist. The lead will also have to conform to national, regional, and state public health standards at the time of the monitoring trip. Permission from both the NCBN program manager and the park being visited is required before any travel plans can take place.

For in depth and up to date information and guidelines related to the pandemic, visit the CDC's Coronavirus site. Forms and other documents needed to evaluate the safety of working during a COVID-19 pandemic can be found on the NCBN Safety SharePoint site.

Field Safety

Communication

Trip Plans (pre-travel)

Due to the travel distances the monitoring staff must travel to and from their duty stations or homes to parks, trip plans must be documented and shared with the program manager and DOS prior to leaving and returning from a trip. This required information must be entered in the **trip plan spreadsheet t**hat can be found and filled in at the NCBN Safety SharePoint site.

Daily Field Plans (pre-fieldwork)

On the day of monitoring and prior to entering the field, the details of the **daily field plan** for the current day are reviewed with participating monitoring staff. The protocol lead must notify the appropriate park staff POC of the daily field plan (either through text or email, whatever is recommended by the park contact). Input is solicited from team members on any personal concerns or limitation they might have regarding the day's itinerary. It is in best practice to also notify the program manager or the DOS of the daily field plan if possible.

The information requirements of the **daily field plan** can be found on the NCBN Safety SharePoint site.

In the event that the monitoring staff need to access monitoring sites by kayak or canoe, a **float plan form** must be filled out and submitted along with the daily field plan. The float plan form can be found and downloaded from the NCBN Safety SharePoint site.

The park POC must be instructed that they are the main contact for the NCBN field staff each day that they are conducting fieldwork in their park. If the NCBN monitoring staff fail to check-in returning from the field the park POC is responsible for calling additional park support or emergency services. The park POC will use the following procedure if the monitoring staff fail to check-in on or before 1) the planned, hourly check-in times, or 2) the completion of field work, the park staff POC will immediately try to reach the team by cellphones. If the monitoring staff crew have not been reached within 30 minutes, the park staff POC must attempt to make contact or view monitoring staff location through the GPS satellite communication device. Failure to make contact through the satellite communication device will result in the Park staff POC notifying emergency services and initiating a search.

If the trip is cancelled or if the plan changes while in the field (e.g. weather), staff must notify the park staff POC immediately.

Please note: ALL monitoring staff are responsible for being aware of the time and ensuring that hourly and end of day check-ins occur on schedule; the park staff POC will call emergency services if the monitoring staff fail to meet their check in schedule and cannot be located within 1 hour of the check-in time.

Safety Briefings (pre-fieldwork)

Each fieldwork trip will begin with a safety briefing by the protocol lead. The protocol lead will review the trip plan with monitoring staff and highlight any potential hazards likely to be encountered that day (weather, poison ivy, etc.). Participating park staff should also voice any trip specific safety concerns at this time and make sure all participants have exchanged phone numbers. The daily pre-fieldwork safety briefing is also a chance for the protocol lead and monitoring staff to complete a GAR (ORMA) risk assessment for the day. This assessment can be completed utilizing the cellular phone application called "**Risk: SPE and ORMA Calculator**", or completed using a hard copy of the GAR form if one is available. If using the cell app, the monitoring staff must take a screen shot of the GAR assessment calculation as a record.

The protocol lead will review the equipment each monitoring staff crew member is always expected to have in the field with them. In addition to equipment used for tidal wetland elevation monitoring, monitoring staff are responsible for packing any personal items needed for working in a wetland.

A complete checklist of safety items that need to be brought in the field can be found on the NCBN Safety SharePoint site.

Teamwork

To ensure a safe and successful field trip, it is important that monitoring staff recognize their roles as part of the team, and that all individuals take steps to be informed about potential hazards and park policies.

Nobody may work alone when conducting tidal wetland elevation monitoring, no matter how experienced they are. All monitoring staff must be in visual contact with at least one other person. If the monitoring staff separate into multiple teams, the teams must periodically check in with each other regarding the status of sampling and where on the site they will be located.

Personal Gear and Safety Equipment

Each person is responsible for ensuring they are wearing fieldwork-appropriate clothing and footwear, such as long pants, a hat, and boots. Dress in layers to accommodate temperature change while in wetlands. Proper footwear will provide adequate ankle support and traction on both the sampling platform as well as the variable natural surfaces encountered in and on the way to the wetland (mud, slippery rocks, sand, uneven terrain). Depending on the weather, rain gear or warm clothing should be taken into the field and it is recommended that any extra clothing be kept in a waterproof bag. Staff should take care to avoid overexposure to the sun by wearing sunscreen and/or protective clothing. In addition to providing protection from the elements long-sleeved shirts and pants are also effective at reducing the threats of biting insects and exposure to chemical or plant irritants (e.g. poison ivy, thorns).

A complete checklist of items that of safety items that are needed when conducting tidal wetland elevation monitoring in the field can be found on the NCBN Safety SharePoint site.

Food and Water

Everyone should always carry ample water (2-3 liters) and food when working in the field. Staff members are responsible for providing and packing their own food and drinking water needed for each field day. Dehydration can lead to more serious conditions if untreated and should be avoided. It is important to drink liquid frequently to maintain hydration and important electrolytes.

Carrying Gear and Equipment

Field staff will be carrying gear, some of which may be heavy. Most of the gear for conducting tidal wetland elevation monitoring will be hand-carried (SET equipment, planks, camera, iPads, GPS unit, liquid nitrogen). All equipment must be stored in proper cases or bags when traveling between monitoring sites to avoid injury occurring during a possible trip, slip, or fall.

Remember to slow down and rest frequently to avoid hand and arm fatigue. Some items like the liquid nitrogen tank should be carried by two people. Any person hand-carrying a heavy item should always try to have one hand free for balance and so the item can be shifted between hands.

Monitoring staff may find it useful to carry a small backpack to keep their hands free when monitoring instruments are not in use. Backpacks are also useful for keeping safety items, sunscreen, water, snacks, and clothing layers nearby at all times. It is important for everyone to understand appropriate ways to pack and carry a backpack. Follow these guidelines:

- Use a sturdy field pack sized appropriately for the task with which you are going to use it.
- Pack heavy items in the center of the pack and close to your back.
- Make sure weight is evenly distributed from side to side.

- Once equipment is packed, tighten the compression straps to minimize movement inside the pack during travel.
- Always carry a pack with both shoulder straps and with the hip belt and chest straps secured.
- Keep your pack organized, and only carry the necessary equipment, food, and water to reduce weight.

Slip, Trip, Fall Prevention

Tidal wetland elevation monitoring will undoubtedly involve walking on various types of wetlands and shallow streams or tidal creeks. Staff should be prepared to work in uneven and muddy terrain. The addition of slippery surfaces, dense grass, and fatigue are all hazards that could result in a slip, trip, or fall. These general guidelines must be followed by monitoring staff to avoid injury from slips, trips, or falls:

- Always wear appropriate footwear.
- Pay attention to where you are going and remain alert of potential hazards.
- Walk at an appropriate pace and adjust pace for changes in terrain (e.g., slow down and take smaller steps on slippery surfaces).
- When hiking long distances, take breaks to avoid fatigue.
- When navigating to an off-trail location, choose the safest route (this may not be the shortest route).
- Avoid any steep terrain and sudden drop-offs
- Maintain good communication with co-workers, warn others behind you of a hazard in their path.

More specifically for wetland and marsh travel:

- Look for and test secure footing.
- Be aware of ditches. Ditches may cause sudden drop-offs and can be much deeper than they look, or may be partially covered by vegetation.
- Be aware of tidal creeks. At low tide they may present steep and slippery terrain.
- Take slow and cautious steps when crossing tidal creeks and large pools—the sediment is often unconsolidated.
- Steer clear of muddy, unvegetated areas where sediment is often unconsolidated to avoid sinking and getting stuck.
- When using sampling platforms at the monitoring site, be careful stepping up and down from them to avoid a slip or fall.
- When boarding or disembarking from a boat (if applicable), always keep at least one hand free, and always test your footing before putting your full weight down.

Weather

Weather conditions in the eastern U.S., especially the coast, can be hazardous and can change quickly. It is important to constantly monitor weather conditions before going out in the field and while working.

- Be acquainted with local park policies regarding safety during adverse weather (i.e., high wind, rough seas, and thunderstorms). You may be required to return from the field early.
- Use a smartphone to get weather updates during the day or stay in contact with the DOS to get weather updates.
- Re-schedule or shorten field days accordingly if thunderstorms are likely.

Thunderstorms

Storms that produce strong winds and lightning are dangerous and should be avoided in the field. It is the protocol lead's responsibility to monitor the weather and get the monitoring staff to a safe area in the case of an impending thunderstorm. If caught in a lightning storm on land:

- Monitoring staff should seek shelter in a building or car as soon as possible.
- If no shelter is available, spread out and move to an open space.
- Avoid high elevations, conductive materials (metallic and electrical gear), and tall structures such as trees or telephone poles.
- If you are in the open and feel your hair stand on end (indicating lightning is about to strike), immediately make yourself the smallest target possible and minimize contact with the ground.
- Squat low to the ground on the balls of your feet with your hands on your knees (do NOT lie flat on the ground).
- Get into a dry marsh ditch if possible.

Note: A person struck by lightning can often be revived by prompt administration of CPR and oxygen (e.g. "rescue breathing").

Excessive Heat/Sun or Cold

When working in hot weather, be sure to drink plenty of water and eat foods that can replace electrolytes. Wear loose and light-colored clothing, including a hat to block the sun's rays. Many wetlands, such as salt marshes, are generally in the open, without significant sources of shade. Therefore, steps must be taken to prevent over exposure to heat and sun. This can cause dehydration, heat exhaustion, or heat stroke. All are serious conditions that can be life threatening and should be avoided. Review the CDC heat-related illness website for what to look for and what to do. Constantly monitor yourself and others. If you do notice signs of heat illness, take immediate steps to remediate the problem or seek medical assistance.

Hypothermia can occur in mild temperatures especially if it is windy or if clothing is wet. Dress in layers and do not wear cotton if possible. If such conditions exist, constantly monitor yourself and

others for signs of hypothermia. You should be aware of the risks of hypothermia. Review the CDC hypothermia prevention website for what to look for and what to do. If you do notice signs of hypothermia, take immediate steps to remediate the problem or seek medical assistance.

More temperature-related safety information can be found on the NCBN Safety SharePoint site.

Poor Air Quality

Summer ozone and particulate matter levels occasionally exceed federal health standards. Young children, seniors, and those suffering from asthma, chronic bronchitis, chronic obstructive pulmonary disease or heart problems are especially sensitive to poor air quality and should minimize outdoor activity when poor air quality warnings are posted. The risks of occasional exposure to ozone and fine particulate matter are minimal for healthy individuals.

When poor air quality warnings occur, it is advisable for monitoring staff to avoid overly strenuous activity during the hottest part of the day (pollution levels tend to be lowest early in the morning), and to stick to lower elevations under a forest canopy.

To check local air quality forecasts, or learn more about health risks of air pollution, visit the AIRNow intergovernmental agency website: http://www.airnow.gov/.

Individual monitoring staff should engage in self-monitoring and share health concerns with the protocol lead or park staff as soon as they are discovered. If you do not feel quite right, you do NOT want to be in a remote area in case it gets worse.

More weather-related safety information can be found on the NCBN Safety SharePoint site.

Tides

Tidal wetland elevation monitoring sites occur in areas with tidal influence. All monitoring staff must consider tidal regime factors when in the field:

- Be aware of the tidal regime for the site you are sampling and whether the tide is falling or rising.
- Be alert for rising tides that may rapidly flood tidal creeks, ditches, and the wetland surface, isolating individuals from the upland or boat.
- High tides may cover the wetland in water, making it more difficult to walk and see potential hazards (like holes).

Harmful Wildlife

Monitoring staff should be acquainted with potential wildlife/plant and marine organism hazards encountered during fieldwork, including ticks, mosquitoes, stinging insects, chiggers, jellyfish, and poison ivy. Staff should be able to identify and be alert to the presence of noxious plants (e.g., poison ivy, poison oak) so contact may be avoided whenever possible. Individuals should be aware of their individual sensitivity to noxious plants, pre-treat with a skin barrier product, and wash thoroughly at the end of the day (washing with liquid dish detergent helps to remove noxious plant oils from the skin). Warning labels on insect repellants should be read thoroughly and only the minimum amount

of repellant needed for protection should be applied. Insect repellant is only applied to clothing and not under clothing. Monitoring staff should also keep a safe distance from wildlife.

More harmful wildlife information can be found on the NCBN Safety SharePoint site.

Ticks and Tick-borne Disease

Several species of ticks are commonly encountered in eastern U.S. parks while working in the field and are vectors of harmful diseases. Become familiar with identifying the species and the disease they transmit by reading the CDC Reference Manual For Tickborne Diseases. Although ticks do not typically inhabit the areas monitored in the protocol, monitoring staff may have to walk through areas with high tick activity. Monitoring staff should consider taking the following precautions to minimize the chances of having an embedded tick that could lead to illness:

- Clothes treated with tick and insect repellents have been found to be effective deterrents. Monitoring staff are strongly encouraged to treat their clothing with permethrin prior to conducting monitoring and should read the considerations for using repellents containing permethrin.
- Wear light color clothing so ticks are more visible and can be removed quickly.
- Tuck pants in socks and tuck in shirts. Long sleeves and gaiters have been found to help. Monitoring staff may consider other barrier devices, such as RynoSkin™, Under Armor®, elastic bands, and duct tape, when they are an option.
- Check field clothes for ticks before entering living space or vehicles.
- Check skin for ticks at the end of every field day. If a tick is found embedded in your skin, it should be carefully removed using specialized tick remover spoon or fine-tipped tweezers. For information about checking for and removing ticks, read Tick Bite: What To Do and RM50B – Ch. 55: Tickborne Disease Prevention.
- If bitten, you should document the tick bite; include the date and time of discovery as well as the location of fieldwork. Keep an eye out for any early symptoms of tick-borne diseases for up to 30 days. Learn more about symptoms by reading the CDC Reference Manual For Tickborne Diseases.
- If you think you have symptoms, seek medical care and report to your supervisor for further instruction on filing Worker's Compensation if necessary. See RM50B – Ch. 55: Tickborne Disease Prevention for more information.

More information and fact sheets about tick prevention, removal, identification, and the diseases they transmit can be found on the NCBN Safety SharePoint site.

Mosquitoes and Mosquito-borne Disease

In the eastern U.S., a few species of mosquitos can spread germs (viruses and parasites) to people while working in the field in coastal areas. The main route of human infection is through the bite of an infected mosquito. For the most up-to-date information on mosquito identification, symptoms, testing, and treatment of mosquito-borne disease please visit the CDC mosquito website prior to fieldwork.

Engaging in the following personal protective measures can greatly reduce your exposure to mosquito-borne diseases:

- Stay informed about the presence of mosquito-borne disease at or near monitoring sites. Visit CDC's ArboNET to view recent disease activity.
- When possible avoid outdoor activity during dawn and dusk when most mosquitoes are most active.
- To reduce mosquito bite, consider wearing long pants, long sleeves, head-nets, and/or mosquito jackets whenever outdoors. Tuck pants into socks and tuck shirts into pants. Reinforce thin areas of clothing (such as pockets) with duct tape.
- Use mosquito repellant. Monitoring staff are strongly encouraged to treat their clothing with repellents containing 10% to 35% DEET. Repellants can also be applied directly to skin and will provide adequate protection under most conditions. Monitoring staff should read the considerations for using repellents containing DEET.

More information about mosquito prevention and the diseases they carry can be found on the NCBN Safety SharePoint site.

Bees and Wasps

If any monitoring staff are allergic to bee stings, they must alert the protocol lead prior to fieldwork and make sure to carry appropriate medications. If they carry an epinephrine injector and are working in a team, they should make sure all members of their field team know where it is carried. Only monitoring staff certified to use the EpiPen may administer it.

Prior to fieldwork, visit the CDC bees & wasps website for information about risk, exposure, prevention, and first aid of bee and wasp stings.

Plants

Monitoring staff will often have to traverse areas of thick vegetation to reach a tidal wetland. Be on full alert to avoid injury to skin from thorned plants, or injury to eyes and ears from branches. Once in a tidal wetland, tall grass can also pose a threat. The sharp blades of grass can cut skin or poke eyes and ears. For working in both types of vegetation, it is best to wear long sleeves and pants, wear glasses or a hat, and shield your eyes and face with your hands while walking. Keep your head and eyes pointed somewhat downward so your head hits obstacles before your eyes. Do not follow closely behind other monitoring staff to avoid having vegetation snap back and hit you. Always look before you grab vegetation to avoid grasping thorny stems or poisonous plants.

Poison ivy and poison sumac may be present at NCBN parks and can be very abundant in localized areas. Prior to fieldwork, visit the CDC poisonous plant website for information about plant identification, types of exposure, prevention, and first aid for dermal contact with poisonous plants. Monitoring staff should know how to identify a poisonous plant and avoid it while in the field.

Both for safety and protection of park resources, it is never advisable for monitoring staff to eat wild plants while working in a National Park, regardless of their confidence in plant identification.

Other Health Safety Concerns

Allergies / Medical Conditions

All allergies or special conditions must be brought to the attention of the protocol lead and other monitoring staff prior to the beginning of a field trip. Individuals are required to carry any necessary medications (i.e., EpiPens, inhalers) and medical alert tags on their person at all times.

Coronavirus (COVID-19)

If permission to perform fieldwork is granted during the COVID-19 pandemic after going through rigorous safety assessment, all current safety procedures must be met during monitoring. At the very least, some guidelines are:

- Restrict close encounters and maintain social distancing (at least 6 feet apart).
- Minimize sharing of equipment that could lead to cross-contamination.
- Disinfect all equipment after use.
- Wear face coverings at all times, which research has shown protect the wearer and those you encounter.
- Avoid touching eyes, nose, or mouth.
- Wash hands frequently with soap and water or use hand sanitizer.
- Frequently assess your own health and stay home if you are ill, even mildly ill.

More information can be found in the *Essential Employees Working During COVID-19 Pandemic* JSA in Appendix G and on the NCBN Safety SharePoint site. The protocol lead and any monitoring staff should fully research and examine all rules and regulations regarding the pandemic at the time of the fieldwork as information evolves about the virus. Visit the CDC's Coronavirus site for up to date information and guidelines.

Vehicle Safety

Monitoring staff are responsible for inspecting vehicles before every use to ensure the vehicles are in safe working condition. This includes visually checking tire pressure, adjusting mirrors, and making sure equipment is secure. Monitoring staff must perform preventative maintenance in a timely manner (e.g., having oil changed by a qualified mechanic), and report any potential hazards or needed repairs to their supervisor. The vehicle must also contain a vehicle emergency safety kit that includes a first aid kit. Before using the vehicle to take a trip to a park, the monitoring staff must complete and sign **vehicle safety checklist**. This checklist should be available in the **vehicle safety binder**, or available for download and print on the NCBN Safety SharePoint site. Retain the completed and signed checklist in the rear of the binder as a record of inspection.

Rules that must be followed when operating a vehicle:

- Everyone in a government vehicle is required to **wear a seat belt**, and when using other vehicles seat belts are mandatory where required by law, and strongly recommended in all situations.
- **Texting or any other cell phone use is strictly prohibited** while driving a government vehicle and it is strongly recommended that staff avoid use of cell phones while driving any vehicle.
- Only federal employees or authorized volunteers, cooperators and contractors are allowed to operate a government vehicle.
- Passengers who are not federal employees, volunteers, or authorized cooperators and contractors are forbidden from riding in a government vehicle.
- Drivers must adhere to all federal and state vehicle regulations, including all posted speed limits. Drivers are responsible for any tickets.

At certain parks, off-road driving is required to reach tidal wetland elevation monitoring sites. The monitoring staff must be trained on the off-road procedures (letting air out of tires, avoiding striking debris or getting stuck, filling tires, etc.) at the beginning of the field season. Check and read any off-roading safety documents in the applicable the park folder on the NCBN Safety SharePoint site.

Monitoring staff must be aware of the following hazards when driving in off-road terrain:

- Be aware of steep beach-faces and scarps or other vehicle in order to avoid rollovers.
- Be aware of the presence of driftwood, fishing gear, and other debris, particularly following storm events.
- Familiarize yourself with all jetties, groin fields, and other structures on the beach, particularly those which may become partially obscured by sand.

Because government vehicles are self-insured, damage resulting from government vehicle accidents are generally paid by the driver's NPS program (e.g., NCBN). However, in cases of severe negligence, the driver found at fault for the accident may be personally liable.

Procedures for Reporting a Motor Vehicle Accident

If you or other NCBN personnel are involved in a vehicle accident, contact state, or local law enforcement authorities, as required by law. Contact emergency services immediately if a medical emergency is involved.

Operators of any government motor vehicle involved in an accident shall secure the site from further accident and immediately notify the direct supervisor to alert them of the motor vehicle incident and any relevant danger. If the supervisor is unavailable contact the park (if on park land) or regional safety officer. It is important to make sure you have verbally contacted one of these individuals.

More detailed instructions for responding to an NPS-owned vehicle can be found in Appendix F of this document, along with the NPS Personal Property Management Handbook. Relevant sections are

included in the vehicle safety binder under the motor vehicle accident reporting section. Information that should always be in the **vehicle safety binder** can be found on the NCBN Safety SharePoint site.

If a Department of Interior-owned vehicle is involved in an accident:

- Complete the Standard Form (SF)-91 Motor Vehicle Accident Report form and SF-94 Statement of Witness (if possible) located in the vehicle safety binder. These forms are also available as fill-in Portable Document Format (PDF) forms in can be found on the NCBN Safety SharePoint site.

More general driving safety information such as driving policies and distracted driving can be found on the NCBN Safety SharePoint site.

Boat Safety (if applicable)

Boats may be used to reach certain tidal wetland elevation monitoring sites. Any boat used for this protocol must meet or exceed all requirements of the U.S. Coast Guard. The boat may be operated by NCBN staff or by park staff depending on the circumstance and availability. However, any monitoring staff who will be operating a motorboat during the field season is required to complete a week-long Department of the Interior Motorboat Operator Certification Course (DOI MOCC). Completion of the course does not necessarily mean that monitoring staff will be allowed to independently (without additional NPS supervision) operate an NPS vessel—this is at the discretion of individual parks. Personal flotation devices (PFDs) must always be worn while in a boat. Monitoring staff with MOCC training are responsible for making sure the boat has the appropriate type and number of PFDs, as well as any other US Coast Guard required safety equipment (e.g., flares, fire extinguishers, radio). Each park may implement specific boating requirements, and staff are responsible for following individual park protocols.

Monitoring staff must follow all instructions from the boat captain to ensure their own safety. Immediately upon boarding the boat and before it has left the dock, the boat captain will brief the monitoring staff on boat safety. The briefing should include location of personal flotation devices (PFDs), man overboard (MOB) procedures, and location of fire extinguishers. All passengers in any open landing craft conducting work as part of this protocol must wear a personal flotation device, often an inflatable life vest. The boat captain will instruct passengers on its use.

While on the boat, staff should remain vigilant to their surroundings and to potential hazards above, on, and below the water. Communicate your concerns to the boat captain immediately. Wet conditions, sudden changes in boat direction, strong winds, and rolling waves can all contribute to unstable footing in the boat. Know your limitations and do not exceed them (e.g. motion sickness can be greatly enhanced using binoculars).

Waves are a significant marine threat, even on relatively calm days. Large waves tend to arrive in sets, or groups, but rogue waves or wakes from large boats can make footing suddenly unstable in a boat. Be particularly vigilant of the surf conditions and tide level when boarding or disembarking the boat.

Information regarding each park's individual boating JHAs, GARs, and SOPs can be found on the NCBN Safety SharePoint site.

Installation of SET Marks and Establishing/Sampling Marker Horizons

Installation of a permanent SET mark and sampling the marker horizon require special attention and safety procedures. It is not a regular part of monitoring fieldwork, although this work does take place from time to time by the protocol lead and monitoring staff. Information regarding these safety procedures can be found on the NCBN Safety SharePoint site.

Appendix A. Tidal Wetland Elevation Monitoring: Job Safety Analysis (JSA)

JOB SAFETY ANALYSIS: NCBN Tidal Wetland Elevation Monitoring fieldwork, travel to and from sites and within parks	**JOB TITLE:** Tidal Wetland Elevation Monitoring Staff **DEPARTMENT:** Northeast Coastal & Barrier Network **ANALYSIS BY:** James Lynch, protocol lead and NCBN biologist and Sara Stevens, NCBN program manager	☐ **NEW** ☒ **REVISED** Robin Baranowski, NCBN biotech 2/18/21 ☒ **REVIEWED** Sara Stevens, NCBN program manager 2/18/21

Required and/or Recommended Personal Protective Equipment:

Required: Radio (if the park requires or recommends it), cell phone, fully charged power pack, GPS satellite communication device, first aid kit; driver's license, personal flotation device (PFD) if working from watercraft.

Recommended as appropriate: Rain gear, condition-appropriate footwear and clothing, hat, sunscreen, mosquito repellant, mosquito jackets/hats, dry change of clothes, sufficient food and water.

Tasks	Potential Hazards	Recommended Action or Procedure
Planning and communication	• Not being prepared and following plan/itinerary • Not following park check-in/check-out procedures • Communication breakdowns	• Prior to traveling to park, contact the designated network (if outside of NCBN) and park point of contact (POC) and confirm dates and areas that monitoring will be taking place. Finish making trip plans only after the network/park accepts your plans. • Before traveling to a park from home or duty station, let the designated office staff (DOS) or supervisor know your trip plan information. This information must be entered in the **trip plan excel spreadsheet**. • Check in with park or network POC and DOS prior to daily fieldwork. Let them know your **daily field plan**. Complete and share a float plan if applicable. Confirm specifically where you are going and when you expect to return. • Plan ahead. Know where you and other monitoring staff (if applicable) will be going, particular hazards associated with travel routes, and sites to be visited that day. Check

Tasks	Potential Hazards	Recommended Action or Procedure
		expected weather and tide for day and sites to be visited. • While at the park, understand itinerary of planned trip and follow carefully. Coordinate drop-off and pick-up times (or return times) and locations precisely with other monitoring or park staff that you are working with in the field. • Contact park or network POC at end of fieldwork to confirm monitoring staff safety. If return will be delayed, contact park or network POC before agreed-upon check-in time to establish a new check-in time. • Always carry two methods of communication with full charges and additional power packs. Use cell phones, and in the case of an emergency when there is no cellphone service, use the GPS satellite communication device.
Emergency preparedness	• Not knowing emergency procedures • Not having emergency supplies	• Prior to arriving at a park, review and print out the **safety information sheet**. Bring this sheet with you in the field - this tells you who to contact and how to reach them in the event of a life-threatening or non-life-threatening emergency. • Prior to fieldwork use the **safety item checklist** to make sure you have all the items required and suggested before heading out. • Have current CPR and first aid certification (not required but highly recommended). • Keep a well-maintained first aid kit with the monitoring staff at all times. • Keep an emergency safety kit (including a first aid kit) in each vehicle. • Know the location of safety equipment
Teamwork	• Lack of awareness of other team members leading to delayed incident response	• Fieldwork is never conducted alone. • Make sure that monitoring staff are never out of sight of other monitoring staff; i.e., work in pairs at a minimum. • If monitoring staff split up into multiple pairs, the pairs should periodically check in with each other.

Tasks	Potential Hazards	Recommended Action or Procedure
General foot travel in a wetland	• Falling or tripping due to holes and/or wet areas • Poor footing • Uneven terrain • Deep mud • Tidal ditches • Carrying gear, carts, etc	• Use caution at all times. Walk carefully, watching footing. • Wear knee boots, hip boots or chest waders as necessary for the particular work and time of year. • Wear appropriate socks and stay aware of the condition of your feet. Address blisters and hot spots promptly. • Avoid carrying excessive weight loads or unbalanced loads. • Use extreme caution if you have to cross non-vegetated areas of the wetland (shallow pools/pannes) as the mud could be very deep. • Use extreme caution when traversing the wetland, and be aware of holes or unconsolidated areas in which you would sink. Avoid them if possible. Use a plank if available to assist your travels. • Try to avoid stepping in mosquito ditches. Some can be very **deep**. Use a plank to cross wide ditches if possible.
Wading across marsh pools and creeks.	• Falling • Deep mud • Deep water	• Make sure you are with someone with local knowledge of the creeks and waterways. Do not cross waterways by foot without some knowledge of the depth and conditions in the creek/waterway. • Wear appropriate footwear (usually waders); pools and creeks can be ankle- to chest-deep. • Use a plank to cross narrow pools or creeks if possible.
Working outdoors during storms	• Being struck by falling trees or branches • Being struck by lightning	• Listen to the weather forecast each morning (park radio and/or internet) and throughout the day if you suspect severe weather could occur or see threatening clouds. • Perform a SPE risk assessment if dangerous weather is in the near forecast. • Contact the DOS during the day to get weather updates. • Plan or adjust fieldwork to avoid being out in thunderstorms.

Tasks	Potential Hazards	Recommended Action or Procedure
		• Postpone work if safety will be compromised by storm conditions. If you see or hear a thunderstorm coming, retreat from high ground and exposed areas. Go inside a sturdy building or vehicle, if possible. • If you can't get inside and if you feel your hair stand on end, lightning is about to strike. • Make yourself the smallest target possible and minimize contact with the ground. • Crouch down on your pack on the balls of your feet and keep your feet close together. Place your hands on your knees and lower your head. • During a thunderstorm, monitoring staff should stay separated by at least ten feet.
Poisonous plants, especially poison ivy	• Contamination/toxicity from contact with poisonous plants	• Learn to identify poison ivy in its many growth forms. • Wear long sleeves and pants. • Be aware of poison ivy and avoid coming in direct contact with it. • Thoroughly wash hands, equipment, and clothes with Tecnu or similar specialized soap if you come into contact with poison ivy.
Bee or wasp, stings	• Multiple stings from disturbing or stepping into nest areas	• Bees and wasps may be encountered while hiking to monitoring sites. • Be alert to hives in brush, ground holes, or hollow logs. Watch for insects traveling in and out of one location. • If you or anyone you are working with is known to have allergic reactions to be stings, tell the rest of the monitoring staff and your supervisor. Make sure you carry emergency medication with you at all times and that your co-workers know where you keep it. • Wear long sleeve shirts and trousers, tuck in shirt. Bright colors and metal objects may attract bees or wasps. • Avoid perfumes, bright colors and metal objects that may attract bees or wasps. • If you are stung, a cold compress may bring relief.

Tasks	Potential Hazards	Recommended Action or Procedure
		• If stinger is left behind, scrape it off of skin. Do not use tweezer as this squeezes the venom sack, worsening the injury. • If the victim develops hives, asthmatic breathing, tissue swelling or a drop in blood pressure, seek medical help immediately.
Bites from mosquitoes, flies, and other insects	• Itchy reactions to multiple bites	• Wear long sleeves and pants, mosquito jackets. • Avoid sitting on the ground or on logs, especially in dry, sunny, grassy areas. • Use insect repellants. Do not apply Permethrin, Permanone, or greater than 30% DEET directly to skin, only to clothing. • Carry after-bite medication to reduce skin irritation.
Ticks	• Contracting diseases transmitted from ticks	• Use tick avoidance precautions, including pre-treating clothing with permethrin, tucking pants into socks and shirt into pants when hiking to and from sites. • Wear clothes (including pants and long-sleeved shirts) that are light colored and check for ticks on clothing after traveling through vegetation. • Conduct a thorough tick check every evening after completing fieldwork. • Know how to identify tick life forms, and the signs & symptoms of tick-borne diseases.
Working in wetland vegetation	• Tall plants, plants with sharp points and standing dead plants can be an eye or laceration hazard	• Identify and recognize the species of vegetation in the marsh that could potentially cause injury. • Be careful and wear eye protection when working in or walking through grass in tidal marshes to avoid eye injuries. • Wear pants and long-sleeved shirts to protect bare skin.
Walking through thick vegetation	• Cut, scratched, or bruised by vegetation • Eye or ear injuries	• Shield your eyes and face with your hands, glasses, or hat when moving through tall thick brush. Keep your head and eyes pointed somewhat downward so your head hits obstacles before your eyes.

Tasks	Potential Hazards	Recommended Action or Procedure
		• Wear pants and long-sleeved shirts to protect bare skin. • Look before you grab vegetation to avoid grasping thorny stems or poisonous plants. • Do not follow closely behind other people to avoid having branches snap back and hit you.
Working in heat, humidity, or cold	• Heat exhaustion • Sunburn • Dehydration • Hypothermia	• Evaluate the weather forecast each morning and plan fieldwork accordingly. • Carry and drink plenty of water. Always bring more water than you think will need. • Take extra breaks during extreme weather events. Adjust the work routine to minimize exposure to extreme heat and humidity. • Take adequate garments for all possible weather conditions. Choose clothing that will keep you warm even if it gets wet. • If possible, have a cooler of ice in hot weather.
Hazard trees	• Being struck by falling trees or branches	• Look up. Be alert for widow-makers, storm damaged trees with large broken limbs, and unstable standing dead trees. • Do not spend extended time in an area with hazard trees.
Carrying a pack and other equipment	• Injuries from improper packing, adjustment, and lifting of backpacks • Injuries from improper carrying of gear	• Learn how to properly pack, adjust, lift, and carry a pack. • When hand-carrying gear, keep one hand free. • If carrying long equipment, be aware of other people and never swing around quickly. Avoid allowing a long piece of equipment to project up and behind you, where you cannot see it.
Use of power tools and/or generator when installing SET marks	• Loud noise and vibrations from equipment used to install SET marks • Shock from electrical power tools (if applicable) • Possible injury to hand/fingers or feet/toes from power tools	• Wear gloves, eye protection and ear plugs to protect your hands, eyes and ears. • If using an electric generator, make sure it stays dry. Always have a person watching the generator.

Tasks	Potential Hazards	Recommended Action or Procedure
Establishing feldspar plots	• Inhalation of feldspar dust. (Feldspar is a finely powdered silica used in pottery and is commonly used as a marker horizon at sampling stations)	• Exposure to feldspar powder should be minimized. Use a HEPA filter mask when establishing new feldspar plots. Thoroughly wash your hands and face when finished working with it.
Working on planks when taking SET measurements	• Slipping or falling off of a plank • Plank breaking	• Try to sit on the plank. Try to avoid squatting on the plank since that can be bad for your knees and raises your center of gravity. • Try to use aluminum planks which are lighter and not prone to sudden breakage like wooden planks.
Taking accretion soil cores with liquid nitrogen.	• Liquid nitrogen is very cold (-196º C,-321º F) and can cause burns if exposed to bare skin	• Always wear gloves and eye protection. • Keep exposure to the liquid at a minimum. Do not freeze cores for too long. Stop coring at the first signs of liquid escaping the coring apparatus (white cloud of gas). • Let any liquid burn off before trying to handle the frozen core (cloud will dissipate quickly). • Keep your gloves dry so they don't freeze to the cores. Have extra pairs available.
Taking soil cores or scraping frozen accretion cores with a knife.	• Working with a sharp edge can cut you	• Wear gloves when working with frozen cores. • Always push away from you with the blade.
Travelling with liquid nitrogen tanks	• Nitrogen gas in a confined space can be a suffocation hazard • Nitrogen gas is VERY cold and can burn your skin if you come in contact with it	• Never travel in the same cab as the liquid nitrogen tanks. For example, do not put full tanks in the cabin of your vehicle. • Keep LN_2 tanks secured to the floor of the vehicle to keep them from coming free in case of an accident. • The tanks used for sampling accretion plots only hold 15 liters of LN_2. If there is a leak in the tank which you can't control, try to move the tank to an open area and allow the tank to empty. You can open the "liquid" valve to speed up emptying a tank. • When finished with the LN_2 on a field trip, empty the tanks prior to putting them into the vehicle.

Tasks	Potential Hazards	Recommended Action or Procedure
		• If transporting tanks in a boat, secure them with a strap or rope to keep them from falling over.
Riding in landing craft or other small boat	• Injuries from tripping while getting on and off boat • Injuries from crossing waves/wakes • Exposure to wind, sun, and rain	• Obey all instructions from the boat captain. • Personal flotation devices (PFDs) are required. • If unsure of footing, have someone help you on or off of boat. • Pass gear between people on boat and land rather than carrying the gear onto the boat. • When the boat is in motion, stay flexible and try to move with the boat motion; avoid bracing yourself rigidly. • Bring a jacket, even on warm days, since it is cooler on the water. • Check the weather and be prepared with hat, sunscreen, and rain gear.
Using a canoe or kayak to transport gear and personnel	• Injuries and loss of equipment from capsizing • Injuries from tripping while getting on and off boat • Injuries from improper rowing technique • Exposure to wind, sun, and rain	• Personal flotation devices (PFDs) are required. • Get in and out of the canoe/kayak carefully, keeping center of gravity low. • When someone is entering or exiting the canoe/kayak, at least one other person should be helping to stabilize it. • The person with experience canoeing should be in the back and responsible for steering. • Do not overload canoes/kayaks and never stand up while canoe/kayak is in motion. • Consider wearing gloves while rowing to protect from blisters. • If you are inexperienced with rowing, take turns with other monitoring staff or let a more experienced staff member row. • Bring a jacket, even on warm days, since it is cooler on the water. • Check the weather and be prepared with hat, sunscreen, and rain gear.

Tasks	Potential Hazards	Recommended Action or Procedure
General operation of a vehicle	• Injuries from vehicle accident • Damage to vehicle	• Perform pre-operational check of vehicle (oil, tire pressure, tire condition, fluids, wipers, brakes, lights, gas, etc.). Report all needed repairs to the protocol lead or supervisor promptly. • Do not use the vehicle if it is unsafe. • Wear seat belts with shoulder harnesses whenever vehicle is in motion. • Ensure full visibility from all windows and mirrors. Clean windshield regularly. • Do not use cell phones or text while driving. • Only NPS employees, volunteers or authorized cooperators and contractors are allowed to operate or ride in a government vehicle. • Always ride inside the vehicle. • Properly store and secure all tools, equipment, and cargo so that they will not shift during sudden starts or stops. • Plan your travel before you start. Know your route. • Practice defensive driving; be alert to potential hazards. • Obey all traffic laws and speed limits. • Adjust speed to changing weather or traffic conditions. • Allow adequate time and anticipate heavy traffic delays. • Allow adequate following/stopping distance. • Avoid distractions such as eating while driving. • Be alert for pedestrians or bicyclists using roadways. • Be watchful for wildlife crossing roads, especially at early morning, dusk, and after dark. • Do NOT drive if fatigued. Stay alert! • Review and obey the NPS Motor Vehicle Driving Policy regarding exceeding time limits of driving time.

Appendix B. Tidal Wetland Elevation Monitoring: Green-Amber-Red Risk Assessment (GAR)

(December 22, 2020)

This document describes the application of the GREEN-AMBER-RED (GAR) Risk Assessment Model (as outlined in the NPS Operational Leadership Student Manual (Version 2; October 2015)) to the NCBN Tidal Wetland Elevation Monitoring Protocol (The Surface Elevation Table and Marker Horizon Technique: A Protocol for Monitoring Wetland Elevation Dynamics).

The GAR model allows for a general assessment of a task or operation and generates communication concerning the risks of an activity. In this case, the activity is the field monitoring tidal wetland elevation with the use of SET sampling stations (accretion and elevation measurements). The most important part of the process is the team discussions leading to an understanding of the risks and how they will be managed.

The GAR model is a seven-step process. Each step is defined and explained in the context of the NCBN's Tidal Wetland Elevation Monitoring Protocol. A completed GAR Risk Assessment Form regarding monitoring under usual conditions is available, as is a blank one should the protocol lead feel the need to reassess the risks based on changes in condition, risks, or threats. Visit the NCBN Safety SharePoint site to view/download these forms.

Step 1: Define the Mission or Task

The NCBN Tidal Wetland Elevation Monitoring Protocol details the theory and procedures used when monitoring elevation change and accretion in tidal wetland ecosystems. This protocol includes instructions for a few field-based monitoring activities:

1. Measurement of the tidal wetland surface using a custom-built Surface Elevation Table (SET)
2. Collecting soil cores using liquid nitrogen and/or a small knife.
3. GPS surveying

All fieldwork is conducted tidal wetland environments (brackish marshes, salt marshes) located in both remote and urban settings. Potential safety hazards (along with mitigation measures) have been identified in a Job Safety Analysis (JSA).

Step 2: Define the Threats

The threats/hazards for this activity along with mitigation measures are described in the associated JSA. A severe slip and fall while traversing uneven terrain or a capsized boat or canoe are possible and are the most significant risks encountered when conducting this activity.

Step 3: Assess Risk and Assign a Numerical Value

The numerical ranks (Table 1) were assigned by the protocol lead (James Lynch) and the NCBN program manager (Sara Stevens) with input from other NCBN staff.

The activity risk can be visualized using the colors of a traffic light. If the total risk value falls in the GREEN ZONE (1-35), risk is rated as low. If the total risk value falls in the AMBER ZONE (36-60), risk is moderate and you should consider adopting procedures to minimize the risk. If the total value falls in the RED ZONE (61-80), you should implement measures to reduce or avoid the risk prior to starting the event or evolution.

The ability to assign numerical values or "color codes" to hazards using the GAR Model is not the most important part of risk assessment. What is critical to this step are team discussions leading to an understanding of the risks and how they will be managed.

Table 1. The NCBN Tidal Wetland Elevation Monitoring assigned risk codes of 0 (for **no risk**) through 10 (for **maximum risk**) to each of the eight Green-Amber-Red Risk Assessment elements.

Element	Rating
Supervision	2
Planning	3
Team Selection	3
Team Fitness	4
Communication	2
Contingency Resources	5
Environment	5
Event/Evolution Complexity	5
Total Risk Score	29

Step 4: Identify Risk Control Options

Supervision

The protocol lead will always be on site overseeing the 1-4 monitoring staff assisting in data collection and recording. The monitoring staff will always work as a group and not alone. A score of (2) was assigned due to the fact that the team will always be working with on-site, highly experienced, supervision.

(Risk Mitigation: A clear supervisory chain-of-command, on-site supervision by protocol lead, field training provided to other monitoring staff)

Planning

The **NCBN Tidal Wetland Elevation Monitoring Protocol** includes numerous SOPs that detail the methodology needed for each of the tasks performed in the field during monitoring. The **NCBN Tidal Wetland Elevation Safety Plan** outlines all safety concerns and procedures, or provides links to important safety information located on the **NCBN Safety SharePoint site**. The protocol lead plans all trips in conjunction with local NPS colleagues and trains all monitoring staff in the operation of all sampling gear. Due to this advance planning, written documentation, and training procedures, a low score (3) was assigned.

(Risk Mitigation: Extensive, advanced planning, up to date written documentation of safety procedures, site locations, and park contacts, field training)

Team Selection

The **NCBN Tidal Wetland Elevation Monitoring Protocol** clearly identifies the essential skills and abilities required to execute this protocol in a competent manner. The protocol lead will be present at all field monitoring trips. Prior experience is not required for additional monitoring staff. All training, if needed, will be provided by the protocol lead. A score of (3) was assigned due to the fact that the protocol lead (highly experienced) will be present during all field trips and that all other monitoring staff will only be selected if they are able to conduct the fieldwork responsibly and safely.

(Risk Mitigation: The protocol lead is highly experienced and selects additional monitoring staff who are physically capable of completed the fieldwork, Protocol lead provides onsite field training to additional monitoring staff at the beginning of every field season to remain proficient, regardless of their experience)

Team Fitness

Team selection should ensure an overall high level of initial team fitness. Fieldwork can last for approximately 7-8 hours per day (not including drive times). Sampling always occurs during daylight hours. A score of (4) was assigned because the field days are long, and can be strenuous (especially when installing new sites). Monitoring staff must be physically fit, able to carry heavy equipment over uneven terrain, and be diligent about adequate rest and nourishment to ensure that fatigue does not become a factor.

(Risk Mitigation: Field work is conducted by protocol lead and monitoring staff who are physically fit and prepared to work under difficult field conditions; travel is scheduled with flexibility to ensure adequate rest, communicate often with other monitoring staff in the field to identify if they feel fatigued, stressed, or ill, extend length of visit if needed to ensure monitoring staff have breaks and don't overexert themselves.)

Communication

Routine and emergency communication equipment and procedures are explained in the **NCBN Tidal Wetland Elevation Monitoring Safety Plan**. This includes coordination with park staff POC (resource managers, rangers, and dispatchers). It also includes check-out/check-in procedure for the monitoring staff to ensure that a responsible party knows if someone has not returned from the field activity in a timely manner. Two modes of communication are always carried while in the field to ensure communication with the park staff POC is always possible. A safety briefing before each fieldwork trip allows monitoring staff to discuss what each member is responsible for and to voice any concerns. Due to this advance planning, written documentation, and training procedures, a low score (2) was assigned.

(Risk Mitigation: Established check-in /check-out procedures with more than one person, while in the field carry more than 2 modes of communication when possible, open communication with park staff POC, frequent communication among protocol lead and monitoring staff regarding planned field activities throughout the day - not just pre-fieldwork)

Contingency Resources

Contingency resources include communication equipment and procedures that explicitly involve park rangers, park dispatch, and 9-1-1. Monitoring staff always have at least one mode of **primary** communication (park radios or cell phones), and one mode of **secondary** communication (GPS satellite communication device). The protocol lead is responsible for submitting their daily field plan to the park staff POC, including contacts to all monitoring staff present in the field each day. The monitoring staff carry a list of emergency contacts and the nearest medical facilities at all time. Notification of emergency services should happen within minutes of an incident, but emergency services may not be able to reach the monitoring staff quickly due to the remoteness of some sites (especially at ASIS and FIIS). A score of 5 was assigned instead of a lower score because of the potential delay before emergency services could reach the monitoring staff.

(Risk Mitigation: Advance planning, communication plan, check-in / check-out procedures are in place and re-evaluated regularly, Frequent review of the Safety Plan and JSA to ensure monitoring staff are aware of potential hazards and reduce the risk of an incident and, identify alternative emergency contacts and emergency medical facilities, if unable to reach 911 or park staff POC through a cell phone during an emergency, activate the SOS button on the GPS satellite communication device)

Environment

Environment was assigned a score of (5) because fieldwork occurs during a variety of weather conditions (cold, heat, wind, rain), and can also be accompanied by biting insects and harmful plants. Some sites may be remote and accessible only by boat or canoe. In addition, some sites require extensive walking over uneven, wetland terrain.

(Risk Mitigation: Monitoring staff are physically prepared for working under difficult field conditions, and are aware of how to reduce the risk of cold/heat related illness, monitoring staff are trained in the use of canoes/kayaks, canoe/kayak safety SOPs are available, personal flotation devices (PFDs) will be worn whenever the use of canoe/kayak (or other boat) is required to access a site.)

Incident Complexity

Incident complexity was also assigned a higher score (5) mostly because daily field conditions can be highly variable due to weather and ocean conditions that could change unpredictably, and because some sites are remote and only accessible by watercraft. The monitoring staff must use judgment and experience to respond appropriately.

(Risk Mitigation: Monitoring staff evaluate weather/water conditions prior to fieldwork and remains aware of changing conditions, are provided with emergency contact information multiple methods of communication, first aid kits, and checklists of what they should bring in the field at all time to mitigate any potential risks to safety, JSA in place to help reduce the risk of incident)

Step 5: Evaluate Risk vs. Gain

The NCBN program manager has determined that the activity, if carried out in accordance with Tidal Wetland Elevation Monitoring Protocol, all SOPs, and the NCBN Tidal Wetland Elevation Monitoring Safety Plan, has an acceptable level of risk.

Step 6: Execute Decision

The decision made by the NCBN program manager is to conduct the activity in accordance with the Tidal Wetland Elevation Monitoring Protocol, all SOPs, and the NCBN Tidal Wetland Elevation Monitoring Safety Plan.

Step 7: Supervise – Watch for Change

The NCBN program manager and tidal wetland elevation monitoring protocol lead will continually solicit feedback from monitoring staff on safe execution of the protocol including risk control options not considered thus far.

Appendix C. Acknowledgement of Safety Training

I hereby attest that I have read in its entirety and understand the following information provided to me:

- The Northeast Coastal and Barrier Network's Tidal Wetland Elevation Monitoring Safety Plan, which including the following appendices:
  - Appendix A. Tidal Wetland Elevation Monitoring Job Safety Analysis (JSA)
  - Appendix B. Tidal Wetland Elevation Monitoring: Green-Amber-Red Risk Assessment (GAR)
  - Appendix D. Responding to an Incident
  - Appendix E. Safety Information – Tidal Wetland Elevation Monitoring Sites at NPS Parks in Region 1
  - Appendix F. NCBN Working During COVID-19 Pandemic Job Safety Analysis (JSA)
- All links within the plan to external websites
- All links within the plan to documents on the NCBN Safety SharePoint site

The information provided identifies hazards of conducting fieldwork as a member of the NCBN tidal wetland elevation monitoring staff, and documents practices and behaviors to mitigate those hazards. I understand that part of my responsibilities as a member of the monitoring team is to practice these safety practices to the best of my ability.

Print Name:_____ Signature:_____ Date:_____

Print Name:_____ Signature:_____ Date:_____

Print Name:_____ Signature:_____ Date:_____

Print Name:_____ Signature:_____ Date:_____

Print Name:_____ Signature:_____ Date:_____

Print Name:_____ Signature:_____ Date:_____

Print Name:_____ Signature:_____ Date:_____

Appendix D. Responding to an Incident

Incident Requiring an Emergency Response

Immediate Response

1. **If you have cell phone service, call 9-1-1, and tell the operator:**
   a. "We need an emergency response in (name of park)" and the specific area or nearest landmark to your location.
   b. Description of the vehicle if close to it.
   c. Ask 9-1-1 who is responding (so you know who to look out for). If 9-1-1 operator doesn't know ask for a call-back.
2. **If you do not have cell phone service, activate the SOS button on your GPS satellite communication device.**
   a. Also attempt to text the park staff POC from the GPS satellite communication device to let them know you have activated the SOS button.
3. **Administer first aid** to the best of your knowledge, ability, and training. If appropriate, arrange for transporting the victim to the emergency room.
4. **Inform all team members** that an emergency is in progress and determine if emergency contacts of victim should be contacted.
5. **Call designated park staff POC**. If you have not already, let them know the nature of the incident and who is responding.

Secondary Response

1. As soon as it is practical to do so, inform your supervisor (NCBN program manager). The program manager will contact any emergency contacts for the victim.
2. For NPS employees and volunteers involved in an injury producing incident, work with the protocol lead and program manager to complete and turn in worker's compensation paperwork (CA-1) within 48 hours of the accident. The form can be obtained from the NCBN Safety SharePoint site or downloaded from the Department of Labor (https://www.dol.gov/owcp/dfec/regs/compliance/forms.htm). For contractors and cooperators, follow your organization's procedures for documenting accidents, and notify the NCBN program manager with details of the incident.

Incident Not Requiring an Emergency Response

1. Administer first aid and seek medical attention if needed.
2. Contact your supervisor (NCBN program manager) as soon as practical after any incident.
3. Follow instructions in Step 6 of Incident Requiring and Emergency Response section above.

NOTE: Never discard original paperwork related to workers compensation claims (including information from doctor's visits, and CA-1, CA-2, CA-16 or CA-17 forms).

Appendix E. Safety Information – Tidal Wetland Elevation Monitoring Sites at NPS Parks in Region 1

Each park has unique information regarding park staff POC's, check-in and check-out procedures, park safety documents (SOPs, JSAs, GARs), emergency contact and response, and listings for local hospitals and urgent care.

Prior to visiting one of the following parks, the protocol lead or monitoring staff must always review the park's safety information sheet and print out a copy to be kept on them. Ensure that there is a copy in the glove box of the vehicle being used and a copy in the first aid kit to be carried in the field.

The most up-to-date **safety information sheets** of the following parks can be found on the NCBN Safety SharePoint site.

Northeast Temperate Network (NETN):

- Acadia National Park (ACAD),
- Boston Harbor Islands National Recreation Area (BOHA)

Northeast Coastal & Barrier Network (NCBN):

- Assateague Island National Seashore (ASIS)
- Cape Cod National Seashore (CACO)
- Colonial National Historical Park (COLO)
- Fire Island National Seashore (FIIS),
- Gateway National Recreation Area (GATE),

National Capitol Region Network (NCRN):

- George Washington Memorial Parkway (GWMP),
- National Capital Parks – East (NACE)

Appendix F. Instructions for responding to an automobile accident in an NPS-owned vehicle

Operators of any government motor vehicle involved in an accident shall immediately take the following actions:

1. Stop immediately and turn on emergency flashers.

2. Take steps to prevent another accident at the scene.

3. Notify the following persons immediately, either in person, or by telephone, of any accident in which the vehicle may be involved:

    - 911, State, or local law enforcement authorities, NPS law enforcement (if on park land) as required by law;

    - Immediate Supervisor; and

    - Accountable Property Officer

    - In the event of death, actual or potential serious injury, or significant property damage (damage greater than $2,500), the employee involved must immediately notify the NER Regional Tort Claims Officer (TCO), Cyrille Young (215-597-7701), in addition to their supervisor.

4. In reporting an accident, employee should state the facts to the best of her/her knowledge. **Conclusions as to fault or responsibility should not be stated.** The employee should report the accident only to authorized representatives of the Government, the employee's insurance company, and police officers investigating the accident. The employee shall also file any report required by law.

5. Obtain the information necessary to complete the accident reporting forms, **Standard Form 91 (SF-91), Operator's Report of Motor Vehicle Accidents**.

    - Information on other driver(s) (name, address, telephone number, operator's permit number, vehicle license number)

    - Name and address of each person involved and extent of injury, in any

    - Insurance company name, policy number, and claims address of company insuring other vehicle(s)

    - General information such as location, time, measurements, weather, damage, etc.

    - Note: If conditions prevent this, make notes of the following: registration information for other vehicle(s) (owner's name, owner's address, tag number, VIN, and vehicle description)

6. Obtain the names, addresses, and telephone numbers of any witnesses (preferably two witnesses), and whenever possible have witnesses complete the **Standard Form 94 (SF-94), Statement of Witness** (41CFR 101-39.401).

7. Provide your name, address, place of employment, telephone number, permit number, vehicle license number and agency identification to the police when requested to do so.

8. Ask the police officer to collect the required information if personal injury prevents collecting it, and contact the supervisor, who will complete and process the forms.

9. Obtain a police investigation report, photographs, doctor's certification of bodily injuries, and any other pertinent documentation concerning the accident if possible. Submit all reports and data to your supervisor within one working day. This information should be processed with all required accident reporting forms no later than 5 working days after the accident.

10. Have the operator's immediate supervisor complete the forms if the operator is unable.

11. If vehicle is unsafe to operate, arrange for a towing service and pay for these services on vehicle charge/gas card.

12. If federal employee is injured, workers compensation process needs to be initiated within 48 hours of incident. Supervisor will assist with this process. It is important for injured employee to receive prompt medical treatment. Make sure the employee sees a doctor, not a nurse, nurse practitioner, or physician's assistant.

13. Supervisor will submit copies of all reports and data to the employee's regional TORT Claims Officer (TCO) [Cyrille Young 215-597-7701] as soon as possible but no later than 10 calendar days after the accident.

Accident/collision reports should be filed for:

1. All motor vehicle accidents involving federally owned or leased vehicles and employee-owned or rented vehicles while being used on official business, regardless of the amount of damage.

2. All public/visitor accidents will be reported on a SF-91 when a government-owned vehicle is involved, government property is damaged, fatality occurs, medical treatment is required and/or a reasonable possibility of a tort claim is expected.

3. Thefts and Vandalism should be reported to Park Law Enforcement Officials rather than reported on SF-91.

4. Reporting Multiple Vehicle Accidents – when a privately owned vehicle damages Government property, two reports (SF-91) are required: one report for the Government property and one for the private operator.

Appendix G. NCBN Working During COVID-19 Pandemic Job Safety Analysis (JSA)

Northeast Coastal and Barrier Network
Job Safety Analysis Sheet

Job Category: **Essential Employees Working During COVID-19 Pandemic**
Required Safety Training: **Review of this JSA**
Personal Protective Equipment: **Varies**
Tools Needed: **Varies**

Tasks	Hazards	Safety Procedures
Working during COVID-19 pandemic	Contracting COVID-19	1. Practice social distancing in the workplace. Avoid any contact with sick people. 2. Ensure proper PPE is worn at all times when in the company of other people. 3. Avoid touching your eyes, nose, or mouth. 4. Wash with soap and water to destroy the virus. Wash your hands for 20 seconds. Alcohol-based hand sanitizer that contains 60% -95% alcohol can be used where soap and water are not readily available. 5. Clean and disinfect frequently touched objects and surfaces. EPA registered disinfectants will destroy the virus. https://www.americanchemistry.com/Novel-Coronavirus-Fighting-Products-List.pdf 6. **Practice Operational Leadership principles and assess your personal risk before conducting activities.** Conduct risk assessments as needed using SPEs and GARs to determine whether each specific work activity should take place. (See attached SPE/GAR Card) Remember the 4 key principles of Operational Risk Management: • Accept no unnecessary risk. • Make decisions at appropriate level. ○ Supervisors must ensure employees know how much risk is acceptable and when to elevate decisions on risk to a higher level. Employees are to make the final risk decisions ***at or below*** what management says is acceptable. • Accept risks only when benefits outweigh costs.

Tasks	Hazards	Safety Procedures
		• Integrate risk management into planning as early as possible, and at every level.
	Encounters with the public	1. Maintain situational awareness. If a visitor begins to approach, let them know you are maintaining social distancing (standing at least 6 feet away from visitors). Assist visitors from a distance if possible. 2. If unable to assist visitors from a distance (LE, medical response), ensure proper PPE is worn, including N-95 masks, nitrile gloves, and eye protection.
	Sick/unwell employees	1. Supervisors – Monitor staff. Remain aware of employee's physical and mental health. 2. Employees who have symptoms (i.e., fever, cough, or shortness of breath) should **notify their supervisor and stay home**. Employee should contact their primary care physician to determine need for testing. Employees must keep supervisors aware of their condition. 3. Sick employees should follow CDC-recommended steps. Employees should not return to work until the criteria to discontinue home isolation are met, in consultation with WASO public health, healthcare providers and state and local health departments. 4. Employees who are well but who have a sick family member at home with COVID-19 should notify their supervisor and follow CDC recommended precautions. 5. If employee tests positive for COVID-19, contact Park Safety Officer and WASO Public Health. Follow CDC guidance for facility cleaning. https://www.cdc.gov/coronavirus/2019-ncov/prepare/disinfecting-building-facility.html • Close off areas used by the sick person. • Open outside doors and windows to increase air circulation in the area. Wait 24 hours (or as long as possible) before you clean or disinfect. • Clean and disinfect all areas used by the sick person.
Using shared tools and monitoring equipment	Contracting COVID-19	1. Clean and disinfect tools and equipment before you use them. 2. Clean tools and equipment once you finish with them. 3. Clean and disinfect frequently touched objects and surfaces. EPA registered disinfectants will destroy the virus.

Tasks	Hazards	Safety Procedures
Accident documentation and procedures	Injury/illness	1. In cases of emergency, depending on severity, contact supervisor or 911. 2. Report all incidents, even minor, to your supervisor and Safety Officer. 3. Enter information into SMIS and ECOMP 4. DOI Occupational Safety and Health has created a detailed explanation for the reporting and determination of work-relatedness for all cases of COVID-19. https://www.smis.doi.gov/SMIS_Help/CoronaVirus.html

GAR Operational Risk Management Assessment	
Rate 1-10 → Any category rated > 5 should receive specific mitigation	
1. Supervision	*Qualified, effective, accessible? Clear chain of command? Appropriate span of control ratio?*
2. Planning	*Information available & clear; adequate time to plan? SOPs & JHAs? Team briefed & input solicited?*
3. Team Selection	*Level of training and experience? Cohesiveness & attitude? Prone to skill error, complacency error?*
4. Team Fitness	*Physical & mental state of the team? Consider rest, fatigue, morale, outside distractions.*
5. Communication	*Communications equipment, infrastructure & dispatch? Interpersonal communications of team?*
6. Contingency Resources	*MOU's and pre-plans in place? Shared communications plan? Response time?*
7. Environment	*Time of day, weather, topography, approach & access, fuel load, urban challenges, chemicals?*
8. Incident Complexity	*Exposure time, environment stable? Potential for taxing staff? Multiple tasks? Sense of urgency?*
Green (8-35)	**Amber (36-60)** / **Red (61-80)**

SEVERITY × PROBABILITY × EXPOSURE SPE		
SEVERITY	***PROBABILITY***	***EXPOSURE***
1. Insignificant 2. Minor 3. Moderate 4. Major 5. Catastrophic	1. Rare 2. Unlikely 3. Possible 4. Likely to occur 5. Frequent, very likely to happen	1. Below average 2. Average 3. Above average 4. Great

VALUES	***RISK LEVEL***	***ACTION***
80-100	Very High	Discontinue / Stop
60-79	High	Immediate Correction
40-59	Substantial	Correction Required
20-39	Possible	Attention Needed / Proceed w Caution
1-19	Slight	Proceed / Possibly Acceptable

*This Document was adapted from CACO's COVID-19 JSA

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