Module 13 Safety and Access Issues

Introduction

Of paramount importance to any monitoring program is to ensure the safety of its volunteers. Assuring reasonable and legal access to sampling stations is another important concern. Please read this section carefully and make sure you understand all the safeguards and practices for protecting yourself and others during monitoring activities.

In this module participants will review: *Personal preparation, personal and equipment safety, and safety in running water quality monitoring tests.*

Prepare for the Elements

There are hundreds of volunteer monitoring programs across the country. Here are a few rules which all volunteers must follow:

- **Always leave word** with a reliable source as to where and when you will be sampling.

- **Ensure sufficient supplies** (e.g. food, water, clothes, fuel, flashlight/batteries, cellular phone) to sustain you and other team members in the event of an emergency.

- **Dress appropriately for all possible weather conditions**. Volunteers should be prepared with the necessary footwear (e.g. waterproof boots), raingear, gloves, hats, coats, long underwear, sunblock, etc. Remember that you will be outside, remaining fairly still, for 40 to 60 minutes. You may slosh water on yourself. Layered clothing, gloves, and boots are important in colder weather. Wool and polypropylene are the best fabrics to wear to retain body heat when wet.

- **Always sample with a qualified partner**. Volunteers are assigned to monitoring teams and should strive to sample in groups of two or more.

Protect Yourself and Your Equipment: Safety in Sampling

The water quality monitoring kits include a number of chemical reagents which can be harmful if improperly handled or disposed. Please follow these important rules when sampling and testing:

- Read all instructions to re-familiarize yourself with the test procedures before you begin, and note all precautions.

- Read the label on each reagent before use. Some containers include precautionary notices or material safety data sheets (MSDS) which provide important safety information.

- Avoid contact between chemicals and skin, eyes, nose, and mouth.

- Wear safety goggles or glasses and rubber gloves when handling chemicals.

- Use test tube caps or stoppers, not your fingers, when shaking or mixing reagents.

- When dispensing a chemical from a squeeze bottle, hold the bottle vertically upside-down (not at an angle) and squeeze gently.

- Rinse test tubes and other containers after use, cap all reagents tightly and wash and dry your hands after each test session.

- Wipe up any chemical spills immediately and dispose of chemical wastes in appropriate waste containers.

- Keep all equipment and chemicals out of the reach of young children.

- Avoid prolonged exposure of equipment and reagents to direct sunlight, and protect them from extreme high and low temperatures. Check your reagent solutions for cloudiness or the formation of precipitates. If any of your reagents appear abnormal, contact the monitoring coordinator. Postpone your sampling session until you get new reagents.

- Check your thermometers to make sure that the fluid inside has not separated, as separation will cause inaccurate readings. If your thermometer fluid has separated, contact the monitoring coordinator for a new one.

- In the event of a chemical accident or suspected poisoning, immediately contact the Poison Information Center (1-800-478-3193) and be prepared to provide the name and identification number of the relevant chemical. This information is located on the reagent container.

- When monitoring close to a wastewater treatment plant, and particularly when a strong wind is blowing from the direction of the plant, surgical masks should be considered to protect against aerosols. (Aerosols are windborne contaminants that can be breathed deeply into the lungs if present.)

- Contact your nearest Health Department or Department of Natural Resources, or the U.S. Environmental Protection Agency (EPA) for specific warnings about local rivers. Some stretches of river and land bordering rivers may contain dangerous levels of toxic contaminants in the sediment. If in doubt, please consult the local authorities.

- Avoid sampling from heavily used bridges, and only do so after consulting the local public works department. Sampling sites with steep banks should also be avoided if possible.

Safety in Running the Tests

- There should be some Material Safety Data Sheets (MSDS) packed in with each water quality test kit. These sheets provide very specific first aid and chemical information if someone ingests one of the chemicals, or if it comes in contact with someone's eyes or skin. Such sheets should be reproduced and displayed for others to see.

- Ensure that monitors understand from the beginning the danger of treating these chemicals casually or endangering others through "horseplay."

- Safety goggles should be worn, particularly when running water quality tests that require shaking or swirling a chemical mixture (dissolved oxygen, biochemical oxygen demand, pH, nitrates, and total phosphate).

- Wash your hands after running every water quality test. Avoid placing hands in contact with eyes or mouth during monitoring.

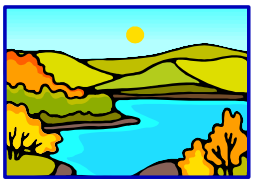
- Follow the general safety guidelines for your particular organization, agency, school, etc.

- Dispose of spent chemicals in an environmentally sound manner. See specific instructions for individual tests.

- In general, the following items will help to ensure a safe monitoring experience:

    - Safety goggles for each participant;
    - Clean pail or bucket for washing hands;
    - Jug of clean water for washing hands;
    - Soap (biodegradable if possible)
    - Towels
    - Waste container for liquid chemical waste (except nitrate waste; see last item below);
    - Plastic gloves;
    - Eye wash bottle;
    - First aid kit;
    - Hazardous waste container clearly marked (from nitrate test liquid waste) and then deposited in accordance with hazardous waste guidelines.

Water Monitoring Safety & Access Issues



Protect the Environment and your Water Body: Safety for your Site

The water monitoring experience provides a number of opportunities to impact the site surrounding the water bodies that you will be visiting. The physical contact you will have by walking, disturbing, and studying at the site will impact soils, plants, wildlife, microorganisms, macroinvertebrates, and other organisms. Monitors are entering nature's house, make sure you are great guests that will be welcome on your return. Be sure you do the following.

- Remember to "leave no trace" of your presence at the monitoring site. That means picking up your own waste, flagging tape, and marking flags and double checking that all materials brought to the site go back home.
- Select equipment and tests that are the least toxic so that if they are broken or lost they will have limited impact. For example select mercury-free thermometers or test kits that do not contain cadmium.
- Collect samples with respect and care. Be responsible to return all collected samples to the stream, lake, pond, or estuary where they were found, preferably living and capable of completing their natural life cycles.
- Remove garbage or other waste that your group finds during your water body assessment experience, even if other humans left it. We all can make a difference by returning the site to a more natural state.

Discussion Points

- Why is safety a major concern in water quality and monitoring efforts?
- Once you are at the field site determine where the safe exits are for monitors. Is this a good site? Why or why not?
- What is the best sequence to conduct water chemistry tests?
- What concerns do you think the plants and animals that live in the site would have about your entry if they could talk?

Major Points to Remember

- Prepare for the elements.
- Protect yourself and your equipment, use safety in sampling and monitoring efforts.
- Read sampling kit instructions and follow safety guidelines for each test.
- Consider the safety of the environment and remember to "Leave no trace!"

Journal and Evaluation

In your journal write down the safety concerns you might need to address if you were running the short-course. What are the plusses and what do you wish had been explained?

Additional Activities

- Have local search and rescue volunteers overview water safety, access issues, and natural hazards (ticks, rattlesnakes, scorpions, spiders, etc.) one might encounter during a monitoring event.
- Have local health department officials brief participants on known surface water health concerns for the water resource studied.

Links and References

Cook Inlet Keeper Volunteer Training Manual (1998) Citizens Environmental Monitoring Program, 1st edition, Master Watershed Steward Program, Anchorage Waterways Council, Anchorage, AK.

Forestry BMPs for Idaho (1993) EXT 745, Ag Publications, P.O. Box 442240, University of Idaho, Moscow, ID 83844-2240.

Short-course Presenters

Site Safety Plans:

- Sampling sites are selected, in part, because they are safely accessible. Short-course organizers need to make an effort to visit each selected site before sampling begins to locate safe access routes and identify any potential hazards. If sites, or access routes to sites, are located on private property, written permission from landowners is obtained prior to the field event. Monitors are instructed to use safe access routes and warned of site-specific hazards.

- Whenever possible, monitors are to conduct samplings as a team. In winter months, monitors are instructed to exercise caution in sampling sites with no direct road or winter trail access and not to sample when weather conditions are extreme. Monitors may, at times, be required to chop and maintain holes in ice covered fresh water sites but they are instructed not to monitor if ice conditions are such that monitors cannot conduct testing safely or if cold temperature is extreme.

- Volunteers are provided with rubber gloves and told to wear them, as well as goggles or eyeglasses at all times during sampling and analysis. Monitors who must sample their sites by wading in from shore are instructed to wear rubber boots, and all monitors are advised to dress appropriately and be prepared for variable weather conditions which may include wearing extra layers of warm clothing and waterproof outer gear during all seasons.

- Have a first aid kit available during the field portion of the short-course.

- It may be important to have a sheltered area to conduct tests at each monitoring site. For this reason parks or recreation sites with picnic shelters work good. Some programs have portable shelters and tables set up so that participants can conduct various tests.

- Take some time to put together written maps with directions to field sites; provide phone numbers to call in case of cancellation or need for further directions. Distribute these the day before you conduct the field experiment.

- With large groups appointing a safety person or officer is a good idea: nurse, search and rescue person, EMT, etc.