UNIVERSITY PROGRAMS SAFETY MANUAL

GUIDELINES FOR SAFETY PROCEDURES IN UNIVERSITY PROGRAMS AT BAMFIELD MARINE SCIENCES CENTRE

INTRODUCTION

The safety of all personnel, as well as visitors to the campus, is of paramount concern. It is therefore Bamfield Marine Sciences Centre's (BMSC) policy to provide and maintain a safe and healthy work environment. To achieve this goal, every reasonable effort shall be made to utilize the principles of accident and loss prevention in the management of all activities and programs.

Specifically, it is management's responsibility to identify, control and/or eliminate known hazards which can result in personal injury or illness, property damage, fire, breach of security, negative environmental impact or any other form of controllable loss.

All personnel are ultimately responsible for their own safety by complying with legislative, BMSC and industry standards, as well as by promptly reporting all unsafe acts or conditions to supervisors. Supervisors are responsible for taking immediate action to solve such problems.

Visitors shall comply with BMSC safety policies and procedures and all other pertinent regulations. The success of our safety and loss prevention program requires the dedication, commitment, involvement and participation of all personnel working together to achieve this common goal.

BMSC SAFETY ORIENTATION
FOR INSTRUCTORS AND TEACHING ASSISTANTS

As an instructor or TA hired by the Bamfield Marine Sciences Centre, you, along with the University Programs Coordinator, are responsible for the safety of your students. During the first week of classes, you and your students will be given orientation tours and talks by various BMSC personnel.

- General BMSC Welcome – Director, University Programs Coordinator, Research Coordinator
- General Station Tour – Research Coordinator
- Radio Operating Procedures – Safety Officer
- Boat Safety & Operation – Boat Staff and/or University Programs Coordinator

It is your responsibility to give your students a laboratory safety orientation before any lab-based activities are undertaken, usually on the first day of classes. A laboratory orientation shall include:

- Emergency procedures.
- Location and usage of laboratory safety equipment: fire extinguisher, first aid kit, emergency shower, eye-wash station, spill kit, etc.
- General lab safety regulations.
- Introduction to personal protective equipment: lab coats, safety goggles, gloves, and if/when it needs to be worn during the course.
- Material Safety Data Sheets: location and how to access them online.
- Glass disposal.
- Hazardous waste disposal.
- Health Concerns
- General Field Safety

EMERGENCY PROCEDURES

Emergency Numbers

Emergency	911
Bamfield Health Clinic	250 728-3312
Canadian Coast Guard	VHF Channel 16 (emergency) or 250 728-3322
Bamfield Volunteer Fire Department	911
BC Poison Control Centre	1-800-567-8911

BMSC Staff Contacts

Diving and Safety Officer	Siobhan Gray	office: 250 728-3301 (222)
Work place emergencies between 0830-1630		Cell: 250 720 1433
University Programs Coordinator	Nicole Gerbrant	office: 250 728-3301 (216)
Research Coordinator	Dr. Eric Clelland	offce: 250 728-3301 (255)

Emergency numbers are also listed on the "emergency procedures" poster posted at every phone and first aid kit on site and on the front page of the Bamfield phone directory.

Background

In Bamfield, we are on the **911 emergency response system**. However, depending on the situation, it may be better to first contact the **Bamfield Health Clinic** and/or the **Canadian Coast Guard** as they can provide a quicker response time. The Canadian Coast Guard station is located directly across Bamfield Inlet from the Marine Sciences Centre,

The **Bamfield Health Clinic** is located at 353 Bamfield Road (**728-3312**). The Bamfield Health Clinic nurses are able to stabilize patients requiring serious medical attention. You may need to accompany a student to the Health Clinic. Phone first to let them know you are coming; This especially applies after hours as here is no phone located outside the clinic and cell reseption is poor. If the situation is serious, the nurse may decide to come to the Centre upon hearing the situation.

The Bamfield Search and Rescue crew of **the Canadian Coast Guard (CCG)** includes several highly trained medics. Use this resource as needed, especially in marine emergency situations or in the case of transporting neck-injuries. The Bamfield CCG can be reached on **Channel 16 on the VHF radio** or at 250 **728-3322**. If you are in a poor radio transmission site, the Tofino CCG (Tofino traffic) will assist to relay a message to Bamfield Search and Rescue. They monitor the radio continuously and are both professional and very helpful. They are able to dispatch the Bamfield Coast Guard through the Rescue Coordination Centre in the quickest possible manner.

Emergency Procedures

Fire

- Pull the nearest fire alarm.
- Call Bamfield Volunteer Fire Department (911).
- Provide your name, phone number, location and nature of fire.
- If possible, turn off/remove all sources of heat, gas or open flames.
- If a small fire, use a fire extinguisher.
- Evacuate the lab, and ensure that doors are closed behind you.
- Leave the building.

Major Medical Emergencies

- Do not move a seriously injured person.
- Call (or have someone call and report back to you) 911, the Bamfield Health Clinic and the Coast Guard (Channel 16), providing name, phone number, location, nature of injury).
- Contact Siobhan Gray, BMSC Safety Officer 250 720 1433 (or Nicole Gerbrandt Alternate Level 3 First aid Attendant.)
- Perform First Aid ABC's, and monitor vital signs until someone more qualified comes to replace you.

Minor Medical Emergency

- Make the injured person comfortable.
- Contact Siobhan Gray, BMSC Safety Officer. 250 720 1433 (or Nicole Gerbrandt Alternate Level 3 First aid Attendant.)
- Phone the Bamfield Health Clinic
- If the nurse is already busy with an emergency, contact the Bamfield Search and Rescue of the Canadian Coast Guard.
- Continue to stay with the injured person, keeping them comfortable and monitoring their vitals.

Tsunami information

If the ground shakes -drop cover and hold on. Locate a safe path and get to high ground quickly.

- BMSC has a tidal gauge centre that is part of a Pacific wide Tsunami Warning System
- It monitors tidal fluctuations and if a rapid change in tide height is detected, a tsunami warning is extended to the entire Pacific Basin.
- BMSC and the town of Bamfield have an Emergency Response program.
- The signal for a tsunami is a continuous siren. This siren will be set off in the case of a warning and signifies to get to high ground as soon as possible.
- (high ground is considered to be >/= 20 m above sea level.)
- A local earthquake could mean an immanent Tsunami.
- For tsunami watch, warning and information bulletins, go to the National Weather Service website (http://tsunami.gov/).

LOCATION AND USE OR LABORATORY SAFETY EQUIPMENT

Learn where the following pieces of equipment are in your lab. Consult with the University Programs Coordinator or Safety Officer ahead of time to help in locating them.

- Fire extinguisher
- First aid kits, EpiPen stations
- Emergency shower
- Eye-wash station
- Spill kit

GENERAL LAB SAFETY REGULATIONS

The Professor or TA supervising student use of Chemicals must be WHMIS certified. BMSC can supply you with this certification through the UVIC on line link. Please see The University Program Coordinator for access.

1. Eating, drinking and smoking is prohibited in all laboratories.

   The separation of food and drink from locations containing hazardous materials and potentially contaminated items minimizes the risk of accidental ingestion. The risk of exposure is also reduced by not using laboratory microwave ovens for the heating of food.

2. Laboratory coats and appropriate eye protection must be worn in laboratories when working with chemicals. Appropriate personal clothing must be worn, and shoes must be worn that provide full coverage of the feet.

   Splashing hazardous materials onto exposed skin or into the eyes is a commonly encountered occurrence. Skin exposed by inappropriate clothing; for example, shorts and short skirts, has to be protected with appropriate laboratory attire; for example, an apron or gown that covers your exposed skin. Appropriate eye protection, such as splash goggles, face-shields, or UV blocking glasses, must be available and worn if a risk of injury to eyes exists.

3. Procedures, which involve the liberation of volatile, flammable, or toxic materials, must be performed in a fume hood.

4. Long hair must be tied back when working with hazardous chemicals and open flames.

5. While enthusiasm is encouraged, pranks and horseplay will not be tolerated in the lab.

6. Laboratory coats and gloves shall be removed before leaving the laboratory.

7. Hands must be washed before leaving the laboratory.

INTRODUCTION TO PERSONAL PROTECTIVE EQUIPMENT

- Lab coats: Depending on the course, students may be required to bring their own lab coats to BMSC. There are some extra lab coats on hooks nears the Research Coordinator's office.
- Safety goggles: BMSC will provide safety goggles for any procedures that require them. There is a least one set of goggles located in each fume hood. Goggles must be worn during every use of chemicals at fume hoods. Gloves: Some labs require the use of gloves. Ask students ahead of time if there are any latex allergies. BMSC can supply Nitrel (latex free gloves) If only latex is available, their labmate should then carry out the procedure.
- Proper clothing and footwear: Closed Toed Shoes must be worn at all times in labs. During the summer, students often wear shirts/skirts/sandals. If there is a lab that requires lab coats and personal protective clothing such as pants and closed-toed shoes, students must dress appropriately for the lab. If student shows up to lab wearing improper attire, you must ask them to return to their dorm room to change. The benefit of BMSC is that it won't take students very long to change and return to lab!

MATERIAL DATA SAFETY SHEETS (MSDS)

A binder of Material Data Safety Sheets for all chemicals on site at BMSC is kept in the Research Coordinator's office on the Research Level of the main building. They can also be accessed through the internet:

http://hazard.com/msds/

Before working with chemicals in the lab, it is your responsibility to be familiar with the risks posed by each chemical and the proper way to safely use it in the lab

GLASS AND SHARPS DISPOSAL

In each lab, there are large buckets labeled "GLASS DISPOSAL". Please ensure that students put glassware in these buckets at that the buckets lid is replaced. If glass ends up in the regular trash, housecleaning staff members are at risk of injury. If the glass is contaminated with biohazardous material, instruct students to dispose of glass in the special biohazard/sharps containers. Contact Research coordinator for further information.

Sharps should ALWAYS be disposed of in proper biohazard marked sharps disposal containers. If your labs sharps container is missing please notify the Safety Officer and they will supply you with one.

HAZARDOUS AND NON-HAZARDOUS WASTE DISPOSAL

Spills

MINOR SPILLS OF SOLUTION/CHEMICAL:

PUT ON GLOVES, lay down paper towels and locate the research coordinator.

Major Spills of ACID/BASE/TOXIN: Put on gloves and lay down appropriate absorbent material from spill kit cabinets (both Hazmats and barriers are available) and locate the research coordinator immediately.

Radioactive Material:

Small volume/little activity: While wearing lab coats/gloves, clean up the fluid and deposit all materials in the solid waste container.

Large volume/unsure of total activity: Contact the Radiation Safety officer (Research coordinator) and Safety Officer (Diving and Safety officer).

All spills of radioactive material on individuals or on lab coats must be reported to the Radiation Safety officer (Research coordinator)and the Safety Officer(Diving and Safety officer).

Blood/Bacterial/Fungal/Virus Spills: If a student spills a container of biohazardous material, evacuate the immediate area. Get the student to remove any contaminated protective and personal clothing. Get the student to wash their hands and face. Contact the Safety Officer immediately.

Chemical and Hazardous Waste Disposal

At BMSC, chemical and hazardous waste disposal are very different. We are far away from proper waste disposal facilities, so this means that these wastes are often stored for periods of time before being transported to a proper waste disposal facility. Therefore, it is very important that we dispose of wastes into the proper containers and that these containers are clearly and properly labeled. In each fume hood, there are carefully labeled containers for different types of waste. Once waste materials have been put into waste containers inform the research coordinator If you are unsure of where to dispose of a certain chemical, please contact the Research Coordinator (x 255).

Health Concerns

1. Allergies: Ask your students to inform you of any allergies relevant to lab/field exercises, and ensure them of full confidentiality. If it is possible to arrange alternatives (ie. non-latex gloves, library exercise during a specific lab) then do so at yours and the instructor's discretion. Please pass all allergies on to the University Programs Coordinator and Safety Officer.

2. Pregnancy: Some chemicals in certain labs may cause fetal deformities. Pregnant students or teaching staff should take necessary precautions in consultation with the Safety Officer.

3. Other Health Concerns: Animal bites, etc. Contact Safety officer.

GENERAL FIELD SAFETY

Field Trips

In Heavy wave-exposed environments, it is necessary to wear a PFD at all times. Examples of locations include the intertidal at Cape Beale and on the exposed side of Seppings Island. In less exposed environments, the decision to wear at PFD is at the discretion of the instructor, TA and University Programs Coordinator. If you are on a night field trip, a PFD should be worn and fully zipped up at all times, without exception. Routinely check the number of students (head count sound off), and encourage classmates to use the buddy system. If you are going to be back from the field trip until after 4:30pm, it is your responsibility to ensure that you have a check-in person (as written on your sail plan).

Rogue waves

Rogue waves are a possibility and can result in injuries or even death. Rogue waves are unexpectedly larger than the rest of the waves in the area and are capable of reaching higher on the shore thus possibly hitting people and either dragging them out to sea, throwing them onto rocks, knocking them with driftwood on the beach or simply getting them wet. Rogue waves are formed out on the open ocean and are caused by the addition of waves from different storm systems. Never turn your back on the water in an exposed site. You can see waves coming so organize a watch. If someone sees a rogue wave coming, they should yell to warn others, and everyone should run up the beach. If there is no time to run, hold on to whatever (try to lay flat with a tight grip like a chiton to reduce your drag exposed to the passing wave) but try to get the out of the area. If someone is hit, the severity of the situation will dictate the response. Discuss safety immediately before entering these areas.

Potentially hazardous locations on field trips

If you are entering a potentially hazardous location, stop to assess the risks realistically. Do not proceed if the risk is unacceptable or if you feel uncomfortable; do not be pushed into a risky situation by the need to make that field trip happen. Make everyone aware of the risks, how to minimize risk and remind them of what to do in an emergency. Students are trained in VHF radio operation, so if something happens to

you (instructor and TA), then they will have to take over and call the Coast Guard or BMSC (depending on the emergency) and ask for assistance.

Hikes

Sometimes students want to hike out to Pachena Lighthouse, Maben's Beach, or during a trip to Pachena, hike a little ways down the West Coast Trail. If on a class trip, sign out a radio (with fully-charged batteries) and first aid kit. It can be a strenuous hike for many students who are not physically fit. Furthermore, some students may have knee/ankle problems that will make certain hikes for them impossible. Tactfully discuss this with your class beforehand. It is your responsibility to find these students an alternative activity if the hike is a class field trip. Remind students to fill up their water bottles and make sure you have sufficient blister supplies, tensor bandages and medical tape. Remind students about how slippery it can be!! Even in the summer, some of the planks, logs and boardwalks are slick! If you are hiking down the West Coast Trail, please sign in at the trailhead. Students should also sign in when on pleasure hikes down the West Coast Trail. Have a leader at the start and end of the hike.

In case of an emergency

Perform any First Aid you can. If you need assistance, use the VHF radio to radio for assistance. Your radio contact might be limited because they work on line of sight. Because you are on land, you might not have reception. BMSC has satellite phones available for field trips. (If you have a cell phone, it would be a good idea to bring it on hikes. There is a tower near Ucluelet and reception is pretty good.) Call/radio BMSC and the Coast Guard. The Coast Guard will have the most ability to access you. If you can't get the Coast Guard on the radio, try Tofino Traffic, who you might have a better chance of contacting and they will relay messages to the Coast Guard and BMSC for you. It may be possible to contact either the light house keepers at Pachena Point on VHF Channel 16 or someone at Anacla on VHF Channel 68. They could relay messages for you.

Boat Safety

When on the water, Bamfield Marine Sciences Centre Boat and Diving Policy must be followed and these additional guidelines will help ensure that everyone comes back safely. You and all students will have your Pleasure Craft Operator's License.

Skiffs and Copes:

Skiffs are the boats that you as an instructor or TA provided you have your SVOP drive on field trips after you have had a check-out with Foreshore staff. Copes can be operated by you or by students provided you have your PCOC. Make sure that all safety equipment is aboard the vessel and operational before leaving the dock. A foreshore staff member will have given you a skiff check-out. After this, it is a good idea to spend some time practicing driving and docking in the inlet. If you are new to operating the skiffs, GO SLOWLY and don't push your limits of comfort. If you are not yet comfortable driving the skiffs or do not know the area to which you are going, arrange ahead of time to have the University Programs Coordinator accompany you on your field trip. Make sure you have the following equipment on the skiff (* for Copes):

- Fuel*
- Bailer, pumps (manual and electric)*
- Throw rope
- Anchor*
- Life-ring and rope
- Wire for unplugging cooling system of engines*
- Running Lights at night
- Paddles*
- Lanyard for kill switch*
- VHF radio*
- Safety kit (the skiffs already have one in them)*
- Marine Chart if not familiar with destination*

Always make sure you have enough gas. As the operator of the vessel you are fully responsible for both the people and the vessel. The maximum number of people in the skiffs is 12 plus driver. BMSC boat policy must be followed. There are minor exceptions where the 14th person can be a deckhand but we try to stick to the magic number 12 + 1. Know your area before you drive through it, carry a chart. When traveling ensure that useful guidelines to follow include:

- Load and unload the boat one person at a time
- ·Filling up the far side first so that you don't get a jam on the entry side
- Ensure even weight distribution
- Don't let people sit up on the bow
- No standing while the boat is moving.
- Always tie and untie the boats from within the boat
- When docking, make sure fenders are out, and warn students to be very careful about keeping their hands out from between the skiff and the dock.
- When rafting boats together always use rafting bouys located out side the Dive shed.

Research vessel ALTA:

The skippers John Richards or Janice Pierce will go over all vessel safety issues with your class before you leave the dock. They will usually provide a deckhand, but if TA's have experience and training/certification, a minimum of Med A3, they may be chosen as a deckhand. At least two training trips must be completed before going as the sole deckhand.

Barkley Star/R.O.V: Skipper: John Richards, Janice Pierce. If TA's have experience and training/certification, a minimum of Med A3 They will handle all deck handing when the purpose of the trip is to use the R.O.V. If the purpose of the trip is different, then TA's may be deck-handing. As deck hand you are responsible to the skipper for crowd control, on-deck safety, assisting with operations as needed, and clean up. At least two training trips must be completed before going as the sole deckhand.
Example of lab postings that should be located in all teaching labs.

LABORATORY POSTING

1. Food, drink and related utensils shall not be brought into, stored in or consumed in a laboratory.

2. Smoking is prohibited in laboratories.

3. Laboratory coats and appropriate eye protection must be worn in laboratories. Appropriate personal clothing must be worn, and shoes must be worn that provide full coverage of the feet.

4. Laboratory coats and gloves shall be removed before leaving the laboratory. *

5. Hands must be washed before leaving the laboratory.

6. Procedures, which involve the liberation of volatile, flammable, or toxic materials, must be performed in a fume hood.

7. Unauthorized individuals must not be allowed in the laboratory.

8. Laboratory must remain locked when unoccupied.

**This requirement excludes movement and transport of materials between laboratories or accessing equipment and storage in interlabs. Another concern is the wearing of gloves when pushing elevator buttons and touching door handles.*

SPILL CLEAN UP SUPPLIES

INTRODUCTION

A spill clean up kit is required in all laboratories and areas that utilize chemical, biological or radioactive materials. The spill kit is laboratory specific, based upon the materials present in the laboratory or area, and must be maintained. Laboratory personnel must follow the proper emergency response plan for spills, including proper notification to Safety Officer @ ext. 222. Caretaking personnel are not properly trained to clean up laboratory spills and will not be requested to do so. Safety Officer will arrange for help with the spill clean up for spills that may be too large or too dangerous. Safety Officer can also provide advice on the proper clean-up techniques and personal protective equipment, which may be required.

A successful spill clean up is one in which no one gets exposed or injured during the clean up. DON'T RUSH, DON'T WORK ALONE, AND DON'T CLEAN UP A SPILL UNTIL YOU ARE FAMILIAR WITH THE PROPERTIES OF THE CHEMICAL *Remember to check the MSDS (Material Safety Data Sheet).

SPILL KIT SUPPLIES

- Signs/Tape to secure spill area (i.e. yellow caution tape, "Caution: Spill – Please keep out")
- Brush and scoop for mixing and cleanup
- Plastic bags for clean up (heavy-duty)
- Paper towels or absorbent pads
- Tongs to pick up glass/sharps
- Leak & puncture-proof containers for removal of contaminated glass/sharps
- Know the location of nearest eyewash station and emergency shower
- Absorbent materials: such as X-sorb*or GREEN STUFF* absorbents, or a 1:1 mixture of clumping cat litter and dry sand. DO NOT USE ON HF SPILLS see information on HF (hydrofluoric acid will deteriorate absorbents)
- For **acid** spills: neutralizers such as sodium bicarbonate, or a 1:1 mixture of sand and soda ash (Sodium Carbonate), or Neutrasorb*
- For **caustic** spills: Citric Acid powder (Sodium citrate)
- For **biohazardous materials**: suitable disinfectant, detergent, autoclave bags & tags
- For **radioactive spills**: appropriate detergent/soap
- Appropriate Emergency Response Plan(s) for Chemical, Biohazardous or Radioactive Spills

SPILL KIT PPE (Personal Protective Equipment)

- Eye protection - Face shield and / or goggles
- Lab coat
- Nitrile or other gloves resistant to the material spilled
- Protective covers for your shoes - rubber foot covers or boots
- Rubber or neoprene apron (optional)

*Special circumstances may require an appropriate respirator with organic vapour/acid gas cartridge (NIOSH approved). Individual respirator fitting is required. Contact Safety Officer for assistance.

SPILL KIT LOCATION: The spill kit should be located in an area of the laboratory where it can be easily accessed and where a spill is least likely to occur. Large Yellow Spill kit cabinets are located in proximity of all chemical labs.
Please read the BMSC general Safety Manual and print the final signature page. Sign and hand into administration office.

Thank You. If you have any questions regarding safety, policy or your responsibilities please contact the Diving and Safety Officer x 222.