Research Vessel

BLUE HERON

Cruise Planning Manual

Large Lakes Observatory
University of Minnesota, Duluth

ABOUT THE RESEARCH VESSEL BLUE HERON

The Large Lakes Observatory operates the largest university-owned research vessel in the Great Lakes, the *R/V Blue Heron*. Built in 1985 for fishing on the Grand Banks, the *R/V Blue Heron* was purchased by the University of Minnesota in 1997, sailed from Portland, Maine up the St. Lawrence Seaway to Duluth, and converted into a limnological research vessel during the winter of 1997-98.

She is equipped with standard sampling gear and state-of-the-art acoustic remote sensing systems. The vessel is 86 feet long, has a draft of 12 feet, and a cruising speed of 9 knots. The *R/V Blue Heron* has berthing for 11 crew and scientists, and can operate 24 hours per day for up to 21 days in between port calls. She has a large working deck (800 sq. ft.), a 240 sq. ft. wet lab, and a 575 sq. ft. dry lab.

R/V BLUE HERON CRUISE PLANNING MANUAL

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This manual has been prepared to acquaint you with the capabilities of the Research Vessel Blue Heron and procedures for her use in limnological research. Your suggestions for improvement of the vessel, this manual, or our operating procedures will be most welcome.

The Marine Superintendent is available to assist you in the planning of your scientific operations. The *Blue Heron*'s Master and crew will assist you at sea. Our objective is to make your cruise a success, both professionally and personally.

Steven M. Colman, Director
Large Lakes Observatory
University of Minnesota, Duluth

A. CRUISE PREPARATIONS

1. Scheduling

The University of Minnesota is a member of UNOLS--the University National Oceanographic Laboratory System, and follows the UNOLS scheduling procedures. As such, scheduling is intended to maintain the following objectives: 1) maximum utilization of oceanographic facilities; and 2) accessibility of these facilities by the oceanographic community.

Ship scheduling at the University of Minnesota is done by the Marine Superintendent. Requests for non-NSF funded projects should be submitted to the Marine Superintendent by e-mail. For NSF funded projects the NSF-UNOLS Ship Time Request form is submitted electronically:

http://unolsweb.cms.udel.edu/STRS/Public/diu_login.aspx

The deadline for submitting proposals to NSF that require ship time is **February 15th** for research planned in the following calendar year. Proposals submitted after the target date are deferred to the following year. Once a proposal is funded, cruises are scheduled according to compatibility in terms of dates, area of operation, and equipment requirements.

2. Financing

Investigators should include ship costs (furnished by the Marine Superintendent) within the budget of their particular research project if the project is not funded by NSF. Operating days include all days away from Duluth, Minnesota, including days of departure and arrival. Any part of a day is considered a full operating day unless a '10 hour day cruise' is requested. A '10 hour day cruise' is a 10 hour cruise, leaving the Duluth dock at 7 AM and returning to the Duluth dock no later than 5 PM.

3. Cruises in Canadian Waters

Investigators planning to work in Canadian waters must have prior clearance from the Canadian Government. The Large Lakes Observatory will initiate the request for clearance through the U.S. State Department. The Master will not take the *R/V Blue Heron* into Canadian waters for scientific work unless proper clearance has been obtained. The State Department' website on Foreign Clearance Information can be found at:

http://www.state.gov/g/oes/ocns/rvc/

The Large Lakes Observatory must receive an Application for Consent to Conduct Marine Scientific Research (Appendix 1) at least **3 months** prior to the beginning of work in Canadian waters. Note that the application requests charts denoting cruise track lines, the CV of the

scientist in charge of the project, as well as a passport photo of the scientist in charge of the project.

Within 30 days after completion of a cruise in Canadian waters, the investigator must submit a preliminary Cruise Report to the U.S. State Department for forwarding to Canadian Officials. Failure to submit this report will result in denial of Canadian clearance for future work that the investigator may wish to conduct in Canadian waters. A final report must also be submitted as specified by the State Department.

Non-U.S. citizens who may be in the scientific party will have no problems in Canadian waters as long as they remain on board the ship. Should they, however, contemplate going ashore in Canada they should inform themselves beforehand as to the requirements or restrictions that may apply in their case concerning entry into Canada and their subsequent re-entry into the U.S.A. As long as they remain on board the ship they are not considered to have left the U.S.A. even though the ship is in a Canadian port.

4. Cruise Plan

The cruise plan (Appendix 2; http://www.d.umn.edu/llo/docs/Cruise_Planning_Form.doc) sets forth the requirements of the Principal Investigator for the ship, its people, and equipment, in relation to the scientific work. Some cruises require extensive advance planning.

The following information is needed at least **TWO** weeks prior to the date of departure for your cruise (please use Appendix 2. This form is also available in MS Word format at the R/V Blue Heron web site: http://www.d.umn.edu/llo/docs/Cruise_Planning_Form.doc):

1. Station locations:
    A. a page size track chart showing your station locations,

    B. a list of the coordinates for each station along with a number and/or letter code identification that can be followed and logged by the watch officer, and

    C. all transits should be planned for at a speed of 10 knots. **Realistic estimates of time on planned stations should be provided.**

2. A list of shipboard activities that will be performed at each station.

3. A list of gear and equipment that will be brought aboard, with dimensions and weights given for large items.

4. **A list of chemicals including type, quantity, and material data safety sheets (MSDS) for each chemical and radioisotope that will be brought aboard.** Note: For safety reasons it is advised that only the quantity of chemical needed be brought aboard. Each chemical must be packaged in a break-proof container such as plastic or Teflon. Glass packaging is allowed only if for analytical purposes no other container is suitable. If chemicals are transported in glass containers, they must be secured in

shock-proof metal containers. If you have further questions regarding these requirements, please contact the Marine Superintendent. Chemical spill kits and absorbent materials must be provided in quantities that are sufficient to deal with the chemicals brought aboard. Rules and regulations for use of radioisotopes aboard ship are outlined in Appendix 3.

5. A list of deck equipment that will be needed for each station.

6. A list of shared scientific gear (ship's gear) needed and quantities of each.

7. Requirements for shipboard equipment including refrigerator and freezer space.

8. Number, names, titles, and sex of all individuals in scientific party, indicating whether the numbers will change and the dates that the numbers will vary during the cruise. **If any members of the scientific party have known significant medical problems, this should be indicated (e.g., extreme allergies, required medication, etc.).**

9. Name of Chief Scientist and phone number for contact prior to the cruise. It is expected that the Chief Scientist will have had previous sea-going experience.

10. Written permission must be obtained from the U.S. Coast Guard before any buoys, floats, or other equipment, either surface or sub-surface, will be left in the water. A copy of this written permission **must** be made available to the Master prior to departure.

11. If trawling will be performed, a copy of the DNR permit must be provided with the cruise plan.

12. Any cruse participant who will be on the vessel overnight must fill out a **Medical and Health Survey** (Appendix 4; http://www.d.umn.edu/llo/docs/Health.doc) prior to the cruise. This survey must be given to the Master at the start of the cruise. The information in the survey will be protected according to University of Minnesota HIPAA standards as indicated on the survey.

SEND CRUISE PLAN, CHART, AND WORK SCHEDULE ON STATION TO:

ricketts@d.umn.edu
subject line: R/V Blue Heron Cruise Plan

5. Loading and Port Services

Any advance staging requirements should be coordinated with the Marine Superintendent and Captain well ahead of cruise departure. For your protection, unannounced or unaccompanied shipments will not be accepted.

Unless you tell us otherwise, the ship will normally be loaded on the scheduled day of departure (beginning at 0600) and off loaded on the day of return. Cruise preparation requiring more port time, vessel services, or crew assistance will require careful planning to prevent interference with scientists off-loading equipment or crew performing standard maintenance. Routine vessel maintenance and logistics can interfere with laboratory set-up due to the congestion of conflicting traffic. Consult with the Marine Superintendent well in advance so we can plan for your loading and set-up requirements.

The ship's crane is normally available on scheduled days for loading (1,200 pounds at maximum reach).

6. Meals

In home port (Duluth) and one-day port calls in other ports the scientific party will normally board the vessel at or after 0600 on the day of departure from port. Meals will be served at regularly scheduled times after departure. Meals are not served while the ship is in home port. Where cruise preparation periods in advance of schedule departure have been arranged, the scientific party and support personnel may berth on the vessel within the limit of available scientific berths.

Special circumstances may require modification of these procedures. Cruise planners should consult with the Marine Superintendent in advance.

7. Scientific Berthing

There are accommodations for six scientists on board the vessel. The number of berths is dependent on crewing requirements.

8. Shipboard Clothing and Personal Items

a. ***Shoes*** - Open-toed shoes or sandals are hazardous to the wearer on board ship and should not be worn when working on deck. The recommended minimum requirement on duty is a completely enclosed shoe (toe and heel) of any material. Persons handling heavy gear on deck should consider safety shoes (reinforced toe).

b. ***In the Dining Area at Meals*** - The close proximity of persons eating in the dining area requires a high standard of neatness and cleanliness. Shoes and shirts are required. The minimum requirement for a shirt is a quarter-sleeve T-shirt clearly designed as an outer shirt (not an undershirt). Coveralls or clothes smelling strongly of fish, chemicals, diesel oil, etc.; dirty or ragged clothing; hats or caps; swimwear; or extremely abbreviated shorts are not acceptable.

c. ***Rain Gear*** - Individuals should provide their own cold/foul weather gear. Work gloves and a cap are recommended.

d. ***Personal Items*** - Individuals should provide shaving gear, toothbrush and toothpaste, etc. Bed linen and towels are provided on board. Items for food preparation, such as coffeepots, hot plates, and so on, are not permitted.

9. Status/Release Form

A status/release form must be completed by each member of the scientific party and given to the Master before sailing (Appendix 5). The vessel will not leave port unless this form is on file with the Master.

10. Hazardous Materials

a. Notify the Marine Superintendent well in advance of your plans for use of special chemicals, compressed gases, and radioactive materials. USE OF RADIOISOTOPES ABOARD REQUIRES PRIOR AUTHORIZATION OF THE U of MN DEPARTMENT OF ENVIRONMENTAL HEALTH AND SAFETY. SEE APPENDIX 3 FOR DETAILS.

b. **IMPORTANT** - Federal Occupational Health and Safety (OSHA) rules require chemical manufacturers, importers, and distributors to label containers of hazardous chemicals. State of Minnesota rules require persons bringing hazardous materials into a laboratory (*R/V Blue Heron*) to ensure labels are not removed from containers and that Material Safety Data Sheets (MSDS) are available and accessible in the laboratory. In addition, Chief Scientists must brief all persons on board who work with, or who could come in contact with, such materials on such items as:
   - Applicable laboratory rules;
   - The general physical and health hazards involved;
   - Appropriate personal protective equipment;
   - How to handle spills, accidents, and injuries; and
   - The location of and how to use MSDS.

The MSDS for hazardous material brought on board shall be made available to the Master for copying and inclusion in the ship's emergency files.

11. Refrigerated/Frozen Storage

The ship's refrigerated and frozen food storage areas may not be used for the storage of chemicals, samples, or specimens. The ship has freezer and refrigerator space in the laboratories available exclusively for scientific use.

B. SHIP'S EQUIPMENT AND CAPABILITIES

1. General

Length Overall:	86' 03"
Waterline:	78' 04"
Beam:	23' 04"
Molded Depth:	13' 05"
Draft, DWL:	
Forward	10'03"
Aft	11' 09"
Displacement	
DWL	262 Ltons
Lightship	195 tons
Admeasurement:	<200 GRTons
Speed:	
Cruising:	9 knots
Maximum:	10 knots
Range:	21 days
Endurance:	21 days

Propulsion:	One Caterpillar 3508TA diesel, 775 BHP; reverse red. gear 4.07:1; kort nozzle; 5.5 SS 4-blade prop.
Aux. Power:	One Caterpillar 3304: 65 KW, 480 v, 3ϕ-208 v, 110 v.
	One Caterpillar C4.4: 76 KW, 3ϕ-208 v, 110 v.
Tankage: Fuel:	4,800 gals
Freshwater	3,000 gals
Sewage	5,600 gals
Accommodations:	
	4 crew
	6 scientists + 1 marine tech.
Science Areas: Workdeck:	800 sq. ft.
Wet Lab:	240 sq. ft
Dry Lab:	575 sq. ft.

Owner: The University of Minnesota
Operator: The Large Lakes Observatory
Built: 1985
Home Port: Duluth, Minnesota
Cellular phone: (218) 390-7501
Marine Superintendent: (218) 726-7826
FAX: (218) 726-6979

2. Winches and Wire Rope

a. SeaMac 220 trawl winch with 3000 ft 1/2" wire rope; level wind
b. SeaMac 310 hydrographic winch with 1500 ft 1/4" wire rope; level wind
c. SeaMac 305 electromechanical winch with 3000 ft. .322" conducting cable; level wind
d. SeaMac 210 trawl winch with 3,000 ft ½" wire rope

3. Deck Equipment and Capabilities

a. Morgan Model 070 (HIAB) capable of lifting 1200 lb. at 30 ft.
b. A-Frame (Hydraulic) 5 ton capacity, 13.5' vertical clearance, 7.5' horizontal clearance, 6' off-board reach, 4' in-board reach
c. Power capstan (Electric) 2 ton capacity
d. Anchor windlass (Hydraulic) 500 ft. chain

4. Laboratories

a. Wet Lab- main deck, 10 x 24 ft., counters, clean and utility power lines, sink, hot and cold potable water, continuous flow of sea water can be provided.
b. Dry Lab- lower deck, 23 x 25 ft., counters, electronics racks, clean and utility power lines, communication and computer links with pilot house.
c. Laboratory Van- back deck, 10 x 10ft., counters, clean and utility power lines, hot and cold potable water, air conditioner, heater, liquid scintillation counter, fume hood.

5. Instrumentation

a. Knudsen Model 320/R Echo Sounder with 28 kHz transducer, analog and digital output to computers in dry lab and pilot house
b. RDI Acoustic Doppler Current Profiler, 150 kHz
c. TSS POS-MV 320 Motion Referencing Unit (Inertial with twin differential GPS)
d. SeaBird Model 911 plus CTD (deck unit) with fluorometer, transmissometer, PAR sensor, and altimeter.
e. Seabird 32 Carousel with 12 8-liter bottle capacity
f. Reson Sea Bat Model 8101 Multi-Beam Sonar, 240 kHz, 101 beams, 150 deg swath width, with side scan.
g. Triaxus towed vehicle with 911+ CTD, fluorometer, transmissometer, D.O. sensor, PAR sensor and optical plankton counter (OPC).

6. Navigation

a. Northstar 800 LORAN
b. Two Northstar 941X with differential GPS
c. Furuno Model 1721 radar
d. Furuno Model 7112 radar with ARPA
e. Robertson AP45 Autopilot
f. GPS Gyro Furuno
g. TSS POS-MV Motion Referencing Unit
h. AIS system and Furuno GPS

7. Communications

a. Uniden UM 525
b. Standard Horizon Infinity
c. Cellular Telephone and intercom

8. Other Available Instrumentation

a. Niskin bottles: 12 8-liter and 6 5-liter
b. Ocean Instruments Multi-Corer
c. Piston corer
d. Benthos gravity corer

e. Plankton nets
f. Geopulse High Resolution Seismic Reflection Profiling System (1-3 kHz)
g. Bolt Model 600B airguns with 1, 5, 10 and 40" chambers
h. ORE Model 168 analog side scan sonar system.
i. 60’ Stauffer midwater trawl with a trawl sonar system.

9. Priorities and Procedures

Equipment use priorities

1. NSF funded projects on the Blue Heron
2. Non-NSF funded projects on the Blue Heron
3. NSF funded projects by LLO investigators on other lakes
4. NSF funded projects on other vessels
5. Non-NSF funded projects on other vessels

Plans to use the shared-use equipment must be outlined in the P.I. Cruise Plan Form. Equipment may be unavailable (due to maintenance or use of the equipment by other investigators) therefore the principal investigator must contact the marine superintendent about his/her desire to use shared-use equipment prior to submission of the Cruise Plan Form.

C. ON BOARD

1. Responsibilities of the Chief Scientist at Sea

a. One member of the scientific party performs the duties of Chief Scientist on each cruise. The Chief Scientist is responsible for supervising the scientific party on board in matters of organization, administration, safety, compliance with shipboard regulations, and performance of the scientific work.

b. Assignment of a Chief Scientist is the responsibility of the Principal Investigator of the primary project for which the vessel is scheduled. The individual selected should be of faculty, senior staff, or senior graduate student rank with previous sea experience.

c. The Chief Scientist should exercise common sense in choosing cruise personnel and in supervising multiple party cruises. Due to motion characteristics, a ship is an inherently hostile environment for persons with significant physical disabilities. Any stress-related physical or emotional illness is apt to be exacerbated by conditions at sea. Persons subject to severe motion sickness may be, at best, unable to perform adequately or, at worst, be debilitated to the point they place themselves and others at risk. Such problems are best avoided by planning and forethought. Be advised that it is the duty and responsibility of the Master to discharge at the next available port any persons whose condition or behavior constitutes a safety hazard.

d. Some of the specific duties of the Chief Scientist include the following:

1. Supervise the work and safety of the scientific party. Ensure safe working conditions and avoid hazards. Instruct scientific personnel.
2. Conduct a pre-cruise briefing for the ship's Master and key crew members to cover cruise planning and procedures for each station. This should take place prior to leaving dock.
3. Exchange information daily with the ship's Master and crew concerning the progress of the scientific work, need for changed procedures or additional assistance, changes required in the cruise plan, or other actions necessary to ensure success of the scientific mission and smooth operation of the vessel.
4. Personally ensure that all members of the scientific party are aware of and comply with the shipboard rules and regulations.
5. Prepare a detailed pre-cruise plan and all post-cruise paperwork necessary for the sponsoring agency and the Large Lakes Observatory.

2. Shipboard Procedures for Scientific Party

a. *Introduction* - These regulations are deliberately brief and do repeat some earlier material. If you have questions, please ask the appropriate crew member.

b. *Safety* - The Master is responsible for the overall safety of the vessel, crew, and scientific party. The ship's crew will assist you in carrying out your operations safely. It is the Master's duty to judge when working conditions become unsafe and to correct unsafe working practices. The Master is also responsible for ensuring that the functioning of the ship and the performance of the crew are such that there is maximum potential for accomplishing the scientific objectives.

1. Immediately upon joining the ship, you should inform yourself of the following:
    A. The location and use of each exposure suit.
    B. Location of life rafts and other life saving equipment.
    C. Location of fire fighting equipment and exits.
    D. Your emergency station and respective alarm signals as set forth on the Station Bill. A copy is printed in Appendix 6. Emergency station location is posted on each bunk.

2. Wear a life vest when participating in the periodic fire and boat drills. Everyone is required to participate.

3. Wear a life vest when paying out or taking in towed cables over the stern, when working on deck in rough seas, when working on deck at night, and when working from the ship's utility boat.

4. Wear a life vest when going between the ship and the dock in docking and undocking operations. Don't take unnecessary chances between the ship and dock in these operations; if the distance is too great to step across, wait until the ship is brought closer.

5. Do not climb about on the sides of the ship or superstructure.

6. Do not stand or sit on bulwarks or rails.

7. Do not climb the ladder to the top of the pilot house unless you have permission from the Master or the Watch Officer. Serious injury can result.

8. Report accidents, illnesses, and injuries immediately to the Master. If at any time you notice anything that presents immediate or potential danger to the ship, personnel, or equipment, report this to the Master or the Watch Officer.

9. Wear closed shoes when working on deck. Sandals, clogs, or other floppy footwear can lead to foot injury or falls. Non-slip safety shoes are recommended.

10. Hard hats are available on board. Wear them when working with suspended loads that may swing and cause injury.

11. The Chief Scientist is responsible at all times for safe handling, use, and disposition of radioactive, toxic, and corrosive chemicals and materials. The waste should be disposed of according to the U of MN DEHS Hazardous Chemical Waste Management handbook and U of MN Radioactive Material Services' Radioactive Waste Information handbook. Accidents or problems should be reported to the Master immediately.

12. All electrical equipment that is to be run on the deck will be powered through ground-fault interrupt circuits.

13. Keep all doors and watertight doors secured in the closed position if not in use, as swinging doors can cause serious injury.

14. Non-swimmers must wear a life vest at all times when on the weather decks.

15. Keep hands off all dials, switches, valves, and controls of all equipment and instrumentation that you are not responsible for, or involved in the use of. Keep out of the engine room at all times unless accompanied by a crew member.

16. Keep all laboratories, work areas, and decks clean and organized at all times. Keep equipment and supplies lashed down or otherwise secured at all times to prevent damage if the weather becomes rough.

17. Do not stand on the upper deck in front of the pilothouse while the ship is underway. This blocks the view of the Master and Watch and creates a hazard to navigation.

18. **If you have a potentially serious medical condition (e.g. heart condition, diabetes, pregnancy, etc.) we strongly suggest that you consult with your doctor regarding the advisability of participating on the cruise prior to boarding the ship.**

c. *Fire* - Use common sense. Most fires can be prevented. Do not smoke in bunks. Smoking is not allowed on the vessel as per University of Minnesota policy. Empty trash cans frequently. Learn the location of fire extinguishers in your areas. Notify the Watch Officer immediately if fire starts. Fire and safety drills will be made prior to the start of each cruise. It is the individual's responsibility to know his/her function during an emergency (see Station Bill, Appendix 6).

d. *Emergency Procedures* (See Station Bill - Appendix 6)

1. General - Assemble on the working deck or on the upper deck aft of the bridge as announced and await instructions. Wear a jacket, trousers, cap, shoes, and your life vest.

2. Fire and Emergency - Announced by continuous sounding of ship's alarm bells and whistle for ten seconds.

3. Abandon Ship - Announced by seven short and one long blast on alarm bells and whistle. Break out exposure suits and life vests when you hear this signal. Assemble on aft deck ready to go in the water.

4. Man Overboard - Call out "MAN OVERBOARD" and location (i.e., port or starboard) loudly, throw a life ring near the person overboard, and notify the Deck Watch Officer immediately. KEEP THE PERSON CONSTANTLY IN SIGHT.

5. Life Vests and survival suits are in each stateroom.

e. *Alcohol and Drug Policy* - The possession or use of alcoholic beverages, narcotics, marijuana, or other controlled substances is PROHIBITED (see Appendix 5).

1. It is the policy of the Large Lakes Observatory to prohibit the use, possession, transportation, or distribution of illegal or unauthorized dangerous drugs by any person or persons while on board the vessel or premises.

2. The use, possession, sale, or transport of any illegal drug on the vessel or premises is cause for immediate discharge and referral to law enforcement agencies.

3. All personnel including visitors on board the vessel are required to abide by these regulations. Failure to do so will result in immediate removal from the vessel at the closest suitable port facility.

4. The prohibited drugs shall include all dangerous drugs including but not limited to cocaine, marijuana, prescription drugs not properly prescribed for bona fide medical use, so called "look alike" drugs, and drug paraphernalia.

5. Discovery of any amount of illegal drugs on a vessel may lead to the seizure of the vessel and the arrest, where appropriate, of those on board. Crew members and the Master are alert to the use and possession on board of prohibited articles.

f. It is the policy of the University of Minnesota to maintain an academic and work environment free of sexual harassment for students, faculty, and staff. Sexual harassment is contrary to the standards of the University community. It diminishes individual dignity and impedes equal employment and educational opportunities and equal access to freedom of academic inquiry. Sexual harassment is a barrier to fulfilling the University's scholarly, research, educational, and service missions. It will not be tolerated at the University of Minnesota.

g. Smoking is not allowed on the vessel.

h. Firearms are not permitted on board.

i. Bed linen and a towel are provided.

j. Personal coffeepots, hot plates, etc. for food preparation are not permitted at any time.

k. Limited recreational reading material is available aboard the ship.

l. The crew members will instruct and assist you in the use of the ship's permanent scientific electronic equipment in the labs. Crew members will also assist with matters relating to deck gear.

m. The Chief Scientist is responsible for coordination of all shipboard scientific activities with the Master. All scientific personnel on board, including those involved in ancillary projects, should make their needs and requests known to the Chief Scientist.

n. Ship's crew members are expected to assist with deck operations and operate the crane, winches, and bridge equipment, but any assistance to the scientist's party beyond this should be discussed with the Master well in advance.

o. Do not borrow personal, project, or ship's tools without permission. Return things promptly to the person or place from which they were obtained. Do not remove ship's equipment, furnishings, or supplies from the ship at any time.

p. Do not congregate in the pilothouse. Stay out, except for business. When there, stay clear of the Watch Officer and others who are working. Stay clear of the chart desk, instruments, and controls.

q. Scientific personnel may be asked to assist with lines during docking and undocking. If your assistance is not requested, stay clear of line handling operations.

r. Keep your living quarters clean and organized at all times, and your berth made up. When departing from the ship clean your quarters and strip the berth.

s. Return coffee cups, glasses, etc. to the galley immediately when finished. Wash all dishes used during the night with soap and hot water and place them on the drain rack.

t. Keep voices down when others are trying to sleep.

u. The Steward will make cabin assignments, with consultation of the Chief Scientist.

v. Prior to departing, each member of the scientific party will sign a Status/Release Form (Appendix 5). This form **must be signed and on file** with the Master before the ship will leave port.

w. Never put any equipment over the side without permission of the Master and/or Watch Officer.

x. Use the water sparingly; the shipboard supply is limited. Keep shower time to a minimum. Report any leaking faucets or pipes to the Master and/or Watch Officer at once.

3. Shipboard Procedures in the Dining Area

a. Meals will be served as follows:

BREAKFAST 0700 - 0800
LUNCH 1200 - 1300
DINNER 1700 - 1800

To allow the ship's Steward time to prepare for meals, do not congregate in the dining area for 1 hour before posted meal times. Keep the dining area clean at all times. You are expected to dress properly for meals.

With agreement between the Master, Steward, and Chief Scientist, meal times may change to allow for stations, work, etc. No meals will be provided while the ship is in home port.

b. Other Use. There may be times when it becomes necessary to use the dining area tables for scientific paper work. To prevent any misunderstanding arising from such occasional use, consult with the Steward. Please do not allow such use to interfere with meal preparation and clean-up or to monopolize facilities such that they are not available for normal use by others.

4. Communication with the R/V BLUE HERON

The vessel is in communication with the Large Lakes Observatory daily while away from home port. Messages can be left for personnel aboard the vessel by calling (218)-726-8522. Any communication via the ship’s cellular phone by the scientific party to or from the vessel should be limited.

D. POST CRUISE REQUIREMENTS

1. Shipboard Clean-up Procedures

In order to provide clean laboratories for the next scientific party, it is necessary that each group clean the labs before departing from the ship. They should be cleaned as follows.

a. Sweep and swab the deck (both the lab decks and the aft deck), wipe down bench tops and cabinets, scour sinks, empty trash cans into the dumpster on the dock.

b. Label and pack all waste according to the University of Minnesota's Hazardous Chemical Waste Management handbook.

c. Remove all your data files from data system. This will ensure ample file space for the next user. Any files left on the system will be dumped prior to the next cruise. The Large Lakes Observatory does not take responsibility for any files left on the system once you depart the vessel.

d. Clean up berths by stripping the bunks and putting soiled linens in the pillowcase. Leave the filled pillowcase on the bunk.

e. Material below quoted from Research Vessel Safety Standards, October 1992, pp. 26-27.

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9. SCIENTIFIC AND SHIPBOARD HAZARDOUS MATERIALS

9.1 HAZARDOUS SCIENTIFIC MATERIALS

A hazardous scientific material is any substance that, because of its chemical properties, can cause the deterioration of other materials or injury to living organisms. Hazardous scientific materials may be grouped into five major classes: Flammable or explosive, corrosive, reactive, toxic or poisonous, and cryogenic.

Rules for the stowage, labeling, and protection of flammables and other hazardous scientific stores on inspected vessels are given in Subchapter U, Title 46 CFR, Part 194. These rules should be followed by all research vessels insofar as practicable. Particular standards are singled out below:

(a) Storage containers should be marked, labeled, and stored in a ventilated and protected area under the supervision of the Chief Scientist with the knowledge and approval of the Master. Consideration should be given to transporting and storing hazardous materials, normally shipped in glass containers, in special, non-breakable containers.

(b) Working quantities only should be stored in the laboratory. A reasonable working quantity would be a one-day supply, considering the hazard posed by the material. Containers should be marked with the material's chemical and common names, type and classification.

9.2 CRUISE PLANNING

The Principal Investigator (PI) will be responsible for providing, in a timely manner, in advance of the departure date for any cruise in which hazardous materials will be used:

(a) A list of such materials by chemical name, common name, type and classification.

(b) A listing of the neutralizing agents, buffers and/or absorbents required for the materials, in the event of a spill.

9.3 INVENTORY LIST

Hazardous materials brought aboard by the scientific party must be accompanied by an inventory list showing the actual amounts and a Material Safety Data Sheet (MSDS) for each hazardous material.

Upon departure from the ship, the scientific party must provide the Master an inventory of hazardous materials showing that all of them have been depleted, removed ashore, or properly stored aboard until such time as it is practicable to remove them from the ship.

9.4 TRANSPORTATION AND DISPOSAL

The Chief Scientist and scientific party will be responsible for the proper transportation, shipping and disposal of hazardous materials and waste, including empty containers, associated with their project. Transportation and disposal must be carried out in accordance with Federal, State and Local regulations. In no case will this responsibility be passed to the ship's crew or operating institution unless specifically arranged in advance.

9.5 CHEMICAL SPILL RESPONSE

The scientific party will be responsible for supplying neutralizing agents, buffers and/or absorbents in the amounts adequate to address spills of a size equal to the amount of any chemicals brought aboard. This spill response material must accompany the chemicals when they come aboard.

9.6 MATERIAL SAFETY DATA SHEETS

Hazardous materials will be found among both ship and scientific stores and include such items as organic solvents, corrosives, compressed gases, flammable liquids, and toxic or reactive chemicals. Material Safety Data Sheets (MSDS) contain a list of product ingredients, indicating which are hazardous and why; recommended personnel protection and precautions; spill or leak procedures; and fire, explosion, health (including first aid), and reactivity data; and most importantly, an emergency telephone number for assistance in the event of an accident. Employers are required to inform employees of what hazardous materials are present in the work place and train them in proper use and handling with the aid of MSDSs. It is important for vessel operators to ensure a listing of hazardous materials and copies of MSDSs are provided by participating scientific parties.

Laboratories have no specific status or exemption with regard to these rules. (29 CFR 1910)

9.7 SHIPBOARD HAZARDOUS MATERIALS AND POLLUTION

Many of the materials associated with the normal operation and maintenance of research vessels are classified as hazardous materials. In addition, some materials, waste products and sewage are the subject of pollution control regulations issued by the Coast Guard and other agencies. Research Vessel operators have an obligation to ensure that their crews and scientific parties are informed of the hazards associated with these materials and that they are aware of the pollution control regulations so that wastes are not disposed of in violation of the law.

2. Offloading

a. When the vessel returns to Duluth all scientific and personal gear should be taken off the ship. Offloading requirements should be noted in the Cruise Plan.

b. Before departing the vessel make one final sweep of the vessel to make sure that everything is packed and cleaned.

3. Cruise Assessment

It is required that the Chief Scientist fills out a **UNOLS Research Vessel Cruise Assessment form**. This form is an evaluation of the ship and its operations. This information is used to assist ship users, operating institutions, and funding agencies to improve the quality of research vessel operations. Please use the form on the UNOLS website:

http://gsosun1.gso.uri.edu/cgi-bin/pcget.cgi

Appendix 1 – Application for Consent to Conduct Marine Scientific Research

http://www.state.gov/documents/organization/11121.doc

Application for Consent to Conduct Marine Scientific Research
in Areas Under National Jurisdiction of

(name of coastal state)

Date:

1. General Information

1.1 Cruise name and/or #:	

1.2 Sponsoring institution:	
Name:	
Address:	
Name of Director:	

1.3 Scientist in charge of the project (include CV and passport photo):	
Name:	
Address:	
Telephone:	
Fax:	
Email:	

1.4 Scientist(s) from coastal state involved in the planning of the project:	
Name(s):	
Address:	

1.5 Submitting officer:	
Name and address:	
Nationality:	
Telephone:	
Fax:	
Email:	

2. Description of Project (Attach additional pages as necessary)

2.1 Nature and objectives of the project:

2.2 Relevant previous or future research cruises:

2.3 Previously published research data relating to the project:

3. Methods and Means to be Used

3.1 Particulars of vessel:	
Name:	
Nationality (Flag state):	
Owner:	
Operator:	
Overall length (meters):	
Maximum draught (meters):	
Displacement/Gross tonnage:	
Propulsion:	
Cruising & Maximum speed:	
Call sign:	
Method and capability of communication (including emergency frequencies):	
Name of master:	
Number of crew:	
Number of scientists on board:	

3.2 Aircraft or other craft to be used in the project:

3.3 Particulars of methods and scientific instruments		
Types of samples and data	Methods to be used	Instruments to be used

3.4 Indicate whether harmful substances will be used:

3.5 Indicate whether drilling will be carried out:

3.6 Indicate whether explosives will be used:

4. Installations and Equipment

Details of installations and equipment (dates of laying, servicing, recovery; exact locations and depth):

5. Geographical Areas

5.1 Indicate geographical areas in which the project is to be conducted (with reference in latitude and longitude):

5.2 Attach chart(s) at an appropriate scale (1 page, high-resolution) showing the geographical areas of the intended work and, as far as practicable, the positions of intended stations, the tracks of survey lines, and the locations of installations and equipment.

6. Dates

6.1 Expected dates of first entry into and final departure from the research area of the research vessel:

6.2 Indicated if multiple entry is expected:

7. Port Calls

7.1 Dates and names of intended ports of call:

7.2 Any special logistical requirements at ports of call:

7.3 Name/Address/Telephone of shipping agent (if available):

8. Participation:

8.1 Extent to which coastal state will be enabled to participate or to be represented in the research project:

8.2 Proposed dates and ports for embarkation/disembarkation:

9. Access to data, samples and research results

9.1 Expected dates of submission to coastal state of preliminary reports, which should include the expected dates of submission of the final results:
No more than 30 days from the end date of the cruise.

9.2 Proposed means for access by coastal state to data and samples:

9.3 Proposed means to provide coastal state with assessment of data, samples and research results or provide assistance in their assessment or interpretation:

9.4 Proposed means of making results internationally available:

(Revised June 5, 2002)

Appendix 2 - R/V Blue Heron Cruise Plan

1. Date: 1/22/2009

2. Principle Investigator:

3. Chief Scientist:

4. Phone/Fax:

5. Cruise Title:

6. Requested date and time of loading:

7. Requested date and time of departure from port: **7:00 A.M. on**
SAFETY LECTURE AND FIRE DRILL WILL START AT 6:45 A.M. – SHIP WILL NOT LEAVE THE DOCK PRIOR TO COMPLETION OF THE LECTURE AND DRILL

8. Requested date and time of return to port: 5:00 P.M. on

9. Requested date and time of off-loading:
YOU MUST OFF-LOAD WITHIN 24 HOURS OF RETURNING TO PORT

10. Are you planning on working in Canadian waters? No

11. If you are planning on working in Canadian waters, do you have the necessary clearances? No

12. **Attach** track chart showing station locations and coordinates, as per instructions on page 3 of the cruise manual.

13. Please provide detailed information on each station's activities. Attach separate sheets if necessary. Please estimate time on each station:

14. List the equipment and gear that will be brought aboard. For large items give the size and weight. Attach separate sheets if necessary:

15. List **ALL** chemicals brought aboard. Include type, quantity, and **attach** Material Safety Data Sheets for each:

***NOTE**: BRING ONLY THE QUANTITY OF CHEMICALS THAT YOU NEED. EXCESSIVE AMOUNTS SHOULD BE AVOIDED. PACKAGE EACH IN BREAK-PROOF CONTAINERS IF POSSIBLE.*

***NOTE:** UPON RETURN TO PORT, WASTE CHEMICALS SHOULD BE PROPERLY PACKAGED, LABELED, AND DISPOSED OF ACCORDING TO THE UNIVERSITY OF MINNESOTA'S HAZARDOUS CHEMICAL WASTE MANAGEMENT HANDBOOK.*

16. List all radioactive materials. Include volume, total activity, and chemical form of the isotope. Use of radioisotopes must be discussed with the ship's manager prior to the cruise:

17. List shipboard scientific equipment (Niskin bottles, CTD profiler, etc.) and quantity of each that will be needed for each station:

18. List deck equipment that will be needed at each station:

19. List refrigerator and freezer space needed for the cruise:

20. Water and Power needs:

21. Will fish trawling be preformed? No
If yes, **attach** a copy of a Minnesota DNR permit.

22. **List of scientific personnel.** Use separate sheets if necessary. Please indicate if any individual has any significant medical problems.

Name and Title (e.g. Professor, graduate student, etc.)	Sex	Dates Aboard
Marine Technician	M/F	all

23. List special dietary needs and/or preferences (i.e., diabetic, vegetarian, etc.):

NOTE - FOR OVERNIGHT CRUISES: Please give a copy of the **Healthy and Safety** form (found on the Blue Heron website) to each cruise participant prior to the cruise. Each member of your party should fill out the form and bring it to the vessel on the first day of the cruise. The form will be kept on the vessel in a lock-box and the information on the form will only be used in case of emergency. **If one of your science party has a potentially serious medical condition (e.g. heart condition, diabetes, pregnancy, etc.) we strongly suggest that they consult with their doctor regarding the advisability of participating on the cruise prior to boarding the ship.**

Return the completed CRUISE PLANNING form to:

e-mail: ricketts@d.umn.edu

Fax: (218)-726-6979

Appendix 3 – Use of Radioisotope Materials

Radioactive materials on board ship pose problems not found in shore laboratories. Instead of a dedicated laboratory often used for no other purpose, radioactive materials at sea occupy laboratory spaces that will be used by other researchers. Because of this, research ship operators and scientists have a particular obligation to assure the most careful procedures, including monitoring, clean-up, and record keeping. These precautions are necessary not only for the protection of personnel but also to ensure the integrity of measurements made by different investigators of environmental levels of natural or artificial radionuclides. In most cases it is necessary for these programs to measure as close to zero values of radionuclides as is possible. The work is therefore sensitive to contamination by very small amounts of radioactivity lost by others, amounts far below those having any public health significance.

All users of radioactive materials shall comply with the rules and regulations as set forth by the Nuclear Regulatory Commission (NRC) and the University of Minnesota's Department of Environmental Health and Safety. For current information consult the University of Minnesota Department of Environmental Health and Safety website entitled "Radioactive Material Services" (http://www.dehs.umn.edu/resources.html#Radiation).

Additional regulations for use of radioactive materials on the vessel are as follows:

1. Transport to and from the vessel will be according to the NRC "small quantities" regulations.
2. Users of the radioactive material must be licensed through the University of Minnesota Department of Environmental Health and Safety. People from outside the University must either apply and be granted a license or be working with a University person who is currently licensed.
3. Only currently licensed personnel will be allowed to work with the radioactive material on the vessel and they will be responsible for safe use and disposition of the material.
4. A copy of the license should be sent with the cruise plan and another brought aboard the vessel with the Principal Investigator.
5. The radioactive material will be limited to a small area of the vessel and that area shall be posted with the proper signs.
6. Samples will be brought to the radioactive use area for study. In no case will the radioactive material be allowed to be used throughout the vessel.
7. When radioactive material is on board, all members on board the vessel must be over the age of eighteen years.
8. Swab surveys will be taken before, after, and once a week during a cruise involving radioactive materials.
9. A separate use log will be maintained by the Master showing type of material, date of arrival, volume and activity upon arrival, date of departure, and volume and activity upon departure. Please convey this information to the Master upon arrival and departure.

Appendix 4 – Medical and Health Survey

UNIVERSITY OF MINNESOTA – DULUTH
LARGE LAKES OBSERVATORY - R/V BLUE HERON
MEDICAL AND HEALTH SURVEY PACKET

Chief Scientist: Please print out this survey and have all members of the science party who intend to sail over night on the Blue Heron fill out a survey.

Introduction

The following survey is intended to assist the crew and science party in providing medical assistance to you in case of an emergency. Please take the time to provide accurate and complete information when completing the form. It may be critical for your health care during an emergency.

The Standard Operating Procedure for the use of this form on the Blue Heron is as follows.

1. If you are going to be on board over night, you are required to complete the following form. This form must be completed, signed, and sealed in a brown envelope by you. You must sign the outside of the sealed envelope after it is sealed (sign across the envelope seal).

2. Give the sealed envelope to the Captain and he will place your private health information in a locked box in the Captains' quarters.

3. Post- Cruise: you may request your information packet be returned at the end of your cruise, or **#4**, see below.

4. Those packets **not** returned at the end of the cruise will be shredded at a convenient time after the seasonal lay up period.

5. Packets **will not** be opened by anyone except in the case of a medical emergency. If we find it necessary to open your packet, it will be for your health and safety, so please be as thorough as possible.

Please include a copy of the Front and Back of your personal insurance information

Please add additional sheets if you know of other relevant information.

UNIVERSITY OF MINNESOTA – DULUTH Page 1 of 3
R/V BLUE HERON
MEDICAL AND HEALTH SURVEY SHEET

Current Date: (dd/month/yy) Spell out month (/ /)

Name_____Phone_____

Home Address_____

Mailing Address_____

Date of Birth (dd/month/yy) (___/_____/___) Present age_____years

Height_____' _____" Weight_____lbs

General State of Health: Excellent Good Fair Poor

Presently under the care of a physician? No Yes

Month/Year of most recent Physical Exam? ___/___

List current medications (prescription and non-prescription, include herbal supplements):

None
1. _____ 4. _____
2. _____ 5. _____
3. _____ 6. _____

List Allergies : Allergy Reaction

None
1. _____ _____
2. _____ _____
3. _____ _____
4. _____ _____

List ALL active health problems:

None
1. _____
2. _____
3. _____
4. _____

Major Surgeries / Hospitalizations / Emergency Room visits

Year Reason

None
1. _____ _____
2. _____ _____
3. _____ _____
4. _____ _____

As an adult, have had or experienced **Hepatitis** or **HIV (circle)? YES** or **NO**

R/V BLUE HERON MEDICAL AND HEALTH SURVEY SHEET Page 2 of 3

List Any Dietary Restrictions:

	Restriction	Reason
None	1. _____	_____
	2. _____	_____
	3._____	_____

As an adult, have you had or experienced?

	No	Yes		No	Yes
Cancer			Severe Depression		
Tuberculosis			Paralysis		
Asthma			Epilepsy		
Hepatitis			Impaired Mobility		
Chronic Cough			Severe Hearing Loss		
Coughed up Blood			Severe Visual Impairment		
Recent unexplained gain or loss of 20 or more lbs.			Periods of Unconsciousness		
			Severe Motion Sickness		

Please explain all YES answers:

_____

_____

_____

_____

CARDIAC SCREENING

As an adult, have you had or experienced? (recent values)

	No	Yes	
Abnormal ECG			
Hypertension			recent reading _____
Sedentary Life Style			
Diabetes			HgA_{1C} _____
Family History of Heart attack before age 45			
High Cholesterol			recent reading _____
Tobacco Use			packs/day _____
Heart Attack			
Prolonged Chest Pain			

Shortness of Breath

Fainting spells/Syncope

Please explain all YES answers:

_____

_____

_____

R/V BLUE HERON MEDICAL AND HEALTH SURVEY SHEET Page 3 of 3

IMMUNIZATION SCREENING

Please list the date(s) you obtained immunizations/prophylaxis against the following diseases:

	Date	Type	Date Unknown	None
Cholera	_____			
Diphtheria[1]	_____			
Hepatitis A Series: Dose 1	_____			
Dose 2	_____			
Hepatitis B Series: Dose 1	_____			
Dose 2	_____			
Dose 3	_____			
Influenza (most recent only)	_____			
Immunoglobulin (IG)	_____			
Malaria	_____	_____		
Measles, Mumps, Rubella (MMR)	_____			
Pneumoccic pneumonia	_____			
Polio	_____	_____		
Rabies	_____			
Tetanus[1]	_____			
Typhoid Fever	_____			
Yellow Fever	_____			

Other: Please provide complete information on Continuation Sheet

[1]May be given as part of TD vaccination

If you have a potentially serious medical condition (e.g. heart condition, diabetes, pregnancy, etc.) we strongly suggest that you consult with your doctor regarding the advisability of participating on the cruise prior to boarding the ship.

*******Please include a copy of the **Front** and **Back** of your personal insurance information*******

There is a photocopier on board for use as needed

BLUE HERON STANDARD OPERATING PROCEDURE for MEDICAL AND HEALTH SURVEY

The information provided on the **MEDICAL AND HEALTH SURVEY (MHS)** will be destroyed by shredding, envelope and all, at the end of the sailing season. If you want this information returned to you, you must request it from the Captain at the termination of the cruise. If you will be sailing with us again, you may leave your MHS on board and make your request at the end of your final cruise of the year.

The information provided is complete to the best of my knowledge.

_____ _____

Signature **(Date (dd/Month/yy)**
(Spell out month)

_____

Print name

Appendix 5 – Status Release Form

This form is to be signed by every person who sails on any ship operated by the University of Minnesota, except the regularly assigned members of the crew. Each person must sign on one of the four parts. The Captain must not allow any person who has not done so to sail with the ship, without exception. Use additional sheets if necessary.

R/V Blue Heron CRUISE PERIOD _____ DATE SIGNED_____

I understand that (1) The University of Minnesota supports the Federal "ZERO TOLERANCE POLICY" which strictly enforces the prohibition aboard vessels of illegal drugs (narcotics, marijuana, stimulants, or other similar controlled substances) - my violation of this policy could lead to termination of the voyage and my arrest by Federal authorities; (2) alcoholic beverages, including beer and wine, are prohibited on board at all times; (3) there is no expert medical service on board; (4) Federal Regulations require The University of Minnesota to request I submit to a drug/alcohol test should I be involved in a "Serious Marine Incident*"; and (5) my failure to submit to this test, if requested, will require The University of Minnesota to report my name and address to the U.S. Coast Guard and to my parent institution (*for more information see The University of Minnesota cruise planning manual Appendix 5).

(1) Paid U of MN employee
I certify that I am an employee of the University of Minnesota and that my presence aboard this ship for this cruise is in the course of my assigned duties.

NAME PRINTED	SIGNATURE	TITLE	FUNCTION ON CRUISE (Technician, Observer, Scientist, etc.)
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

(2)Employee of organization other than University of Minnesota

I certify that I am a paid employee of _____ (employer), that my presence aboard this ship for this cruise is in the course of my assigned duties to that employer, and that my employer is responsible for all pay that may be due me for work done aboard ship. I release The Regents of the University of Minnesota, its officers, agents, and employees from any and all claims or liabilities for injuries to my person, including death, or property, in any way arising out of my presence on this ship, except for such injuries or damage caused solely by the gross negligence or willful misconduct of The Regents of the University of Minnesota, its officers, agents, or employees. I agree that I may be asked to perform duties aboard ship that are a part of the scientific program, and that I will not be compensated by the University of Minnesota for such work.

NAME PRINTED	SIGNATURE	EMPLOYER	FUNCTION ON CRUISE (Technician, Observer, Scientist, etc.)

(3)Volunteer

I certify that I have requested to participate on this cruise as a volunteer, that this participation may expose me to certain risks of injury or death, or damage to my property, and I freely and voluntarily assume any and all risks of injury, including death, and damage to my property which might result from my presence aboard this ship. I release The Regents of the University of Minnesota, its officers, agents, and employees from any and all claims or liabilities for injuries to my person, including death, or property, in any way arising out of my presence on this ship, except such injuries or damage caused solely by the gross negligence or willful misconduct of The Regents of the University of Minnesota, its officers, agents or employees.

NAME PRINTED	SIGNATURE	FUNCTION ON CRUISE (Technician, Observer, Scientist, etc.)

(4)Student

I certify that I am a student of _____ and have requested to participate on this cruise as a student/volunteer, that this participation may expose me to certain risks of injury or death, or damage to my property, and I freely and voluntarily assume any and all risks of injury, including death, and damage to my property which might result from my presence aboard this ship. I release The Regents of the University of Minnesota, its officers, agents and employees from any and all claims or liabilities for injuries to my person, including death, or property, in any way arising out of my presence on this ship, except for such injuries or damage caused solely by the gross negligence or willful misconduct of The Regents of the University of Minnesota, its officers, agents or employees.

NAME PRINTED	SIGNATURE	UNDERGRAD/GRADUATE
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

EMERGENCY / NEXT OF KIN INFORMATION

Name	Emergency/Next of Kin Contact	Phone Number

Appendix 6 – Station Bill

GENERAL INSTRUCTIONS

1 .EACH person shall familiarize themselves with their assigned location in the event of an emergency immediately upon boarding the vessel.
2 .All crew members shall be thoroughly familiar with the duties they are assigned to perform in the event of an emergency.
3 .Each person shall participate in emergency drills and shall be properly dressed during drills, including a properly donned personal flotation device (PFD) or exposure suit.
4. The STEWARD shall be responsible for warning personnel, seeing that personnel are properly dressed and have correctly donned their PFDs or exposure suits, assembling and directing personnel to their appointed stations, keeping order in passageways and stairways, controlling personnel movement and ensuring a supply of blankets is taken to the life raft.
5. The ENGINEER shall be responsible for the maintenance and readiness of all lifesaving and firefighting appliances and equipment.

FIRE AND EMERGENCY INSTRUCTIONS

1 .ANY person discovering a fire shall notify the bridge and then take all initial actions as appropriate.
2. All scientific party are to report to their assigned station, the after deck, taking with them a PFD and exposure suit. Ship's crew are to report to their assigned stations.
3. Upon hearing the fire and emergency signal, all air ports, watertight doors, and fire doors shall be closed and all fans and blowers are to be stopped. All safety equipment will be prepared for immediate service and the fire pumps are to be started.
4. Upon seeing a person overboard, immediately throw a life ring and notify the bridge by reporting "MAN OVERBOARD." In all cases keep the person in sight.

EMERGENCY CREW STATIONS

CAPTAIN: On bridge in command.
ENGINEER: At scene of the emergency in charge; start fire pumps.
ABLE SEAMAN: Assisting at scene of the emergency; manning fire hoses.

STEWARD: Close all watertight doors and port lights, and shut down fans and blowers. Assist scientific personnel with exiting to emergency station and donning life saving gear.

EMERGENCY SIGNALS

Fire and Emergency Signal (_____)

The fire and emergency signal shall be a continuous blast of the whistle for a period of not less than 10 seconds followed by a continuous ringing of the general alarm for not less than 10 seconds.

Man Overboard Signal (— — —)

The man overboard signal shall be the letter "0" sounded several (at least 4) times on the ship's whistle followed by the same signal on the general alarm.

Abandon Ship Signal (__ __ __ __ __ __ __ _____)
The abandon ship signal shall be at least 7 short blasts followed by one long blast on the ship's whistle followed by the same signal sounded on the general alarm.

Dismissal (– – –)

Dismissal from fire and emergency stations shall be three short blasts on the ship's whistle followed by the same signal sounded on the general alarm.

NUMBER AND LOCATION OF FIRE FIGHTING AND EMERGENCY EQUIPMENT

Fire Extinguishers: Pilot house (2), port cabin (1),starboard cabin (1), galley (1), fidley (1), wet lab (1), boson's locker (1), engine room (2), dry lab (1), lazerette (1).

Fire Stations:

Hose #1—Starboard side of companion way to mess/galley in wet lab.
Hose #2—Aft of Pilot House on 01 Deck
Hose #3—Forward end of main deck under stairs.

Fire Axe Stations:

Axe #1 — Wet lab.
Axe #2—Aft of Pilot House on 01 Deck

Man Overboard Stations:

#1—Ring buoy main deck starboard side.
#2—Ring buoy main deck port side.
#3—Ring buoy main deck forward bulkhead.
#4—Ring buoy pilot house starboard side.
#5—Life Sling main deck port side aft.

Abandon Ship Stations:

#1—2 10-person life rafts located on foredeck, port and starboard sides.
#2—20personal flotation devices; 1 per bunk located in sleeping quarters; 11 in box located on the 01 deck.
#3—17 exposure suits; 1 per bunk located in sleeping quarters, 8 in box located on the 01 deck.