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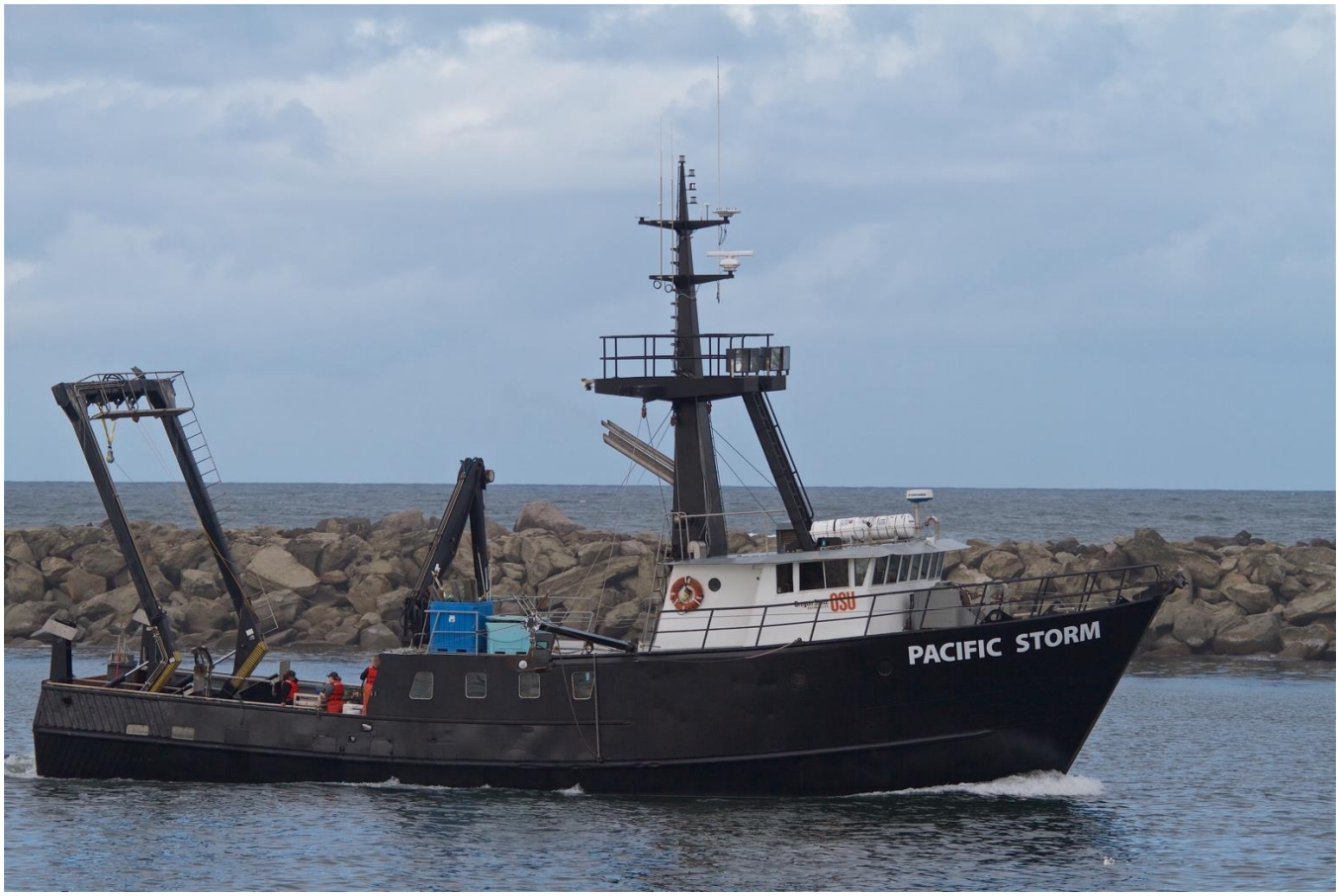
R/V Pacific Storm

Cruise Planning Manual



College of Agricultural Sciences

Marine Mammal Institute

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R/V Pacific Storm

CRUISE PLANNING MANUAL

Version 1.0
01 January 2020

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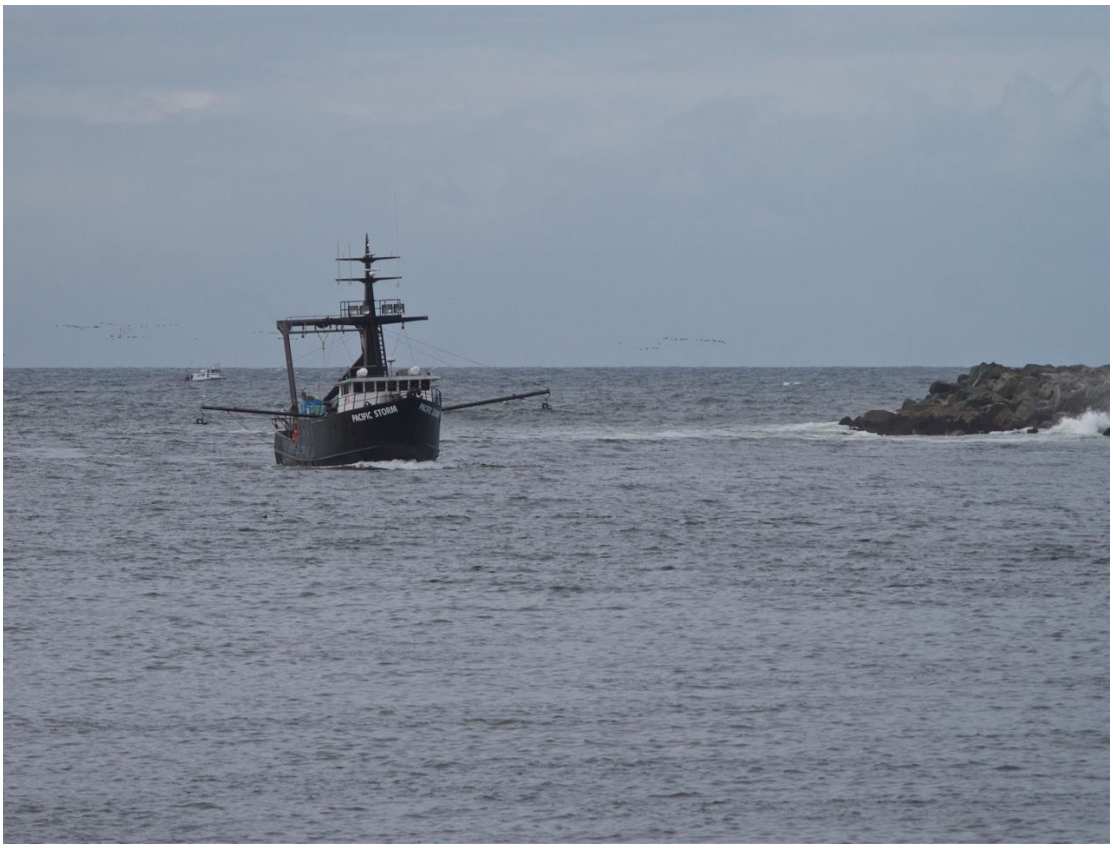

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Welcome Aboard!

The research vessel (R/V) Pacific Storm is owned and operated by the Marine Mammal Institute through the College of Agricultural Science at Oregon State University. The R/V Pacific Storm is operated both coastally and regionally in support of marine research and education. This vessel has been used successfully to support whale tagging projects, sea-floor mapping, sediment coring, ROV operations, mooring recoveries and many other projects and we look forward to successfully supporting your project.

On the R/V Pacific Storm, safety is our highest priority and we are committed to completing your cruise as safely and efficiently as possible. If at anytime during your cruise you have questions about any aspects of the operation of the vessel, speak to the Captain or the Chief Scientist. This will help ensure your cruise goes a smoothly and as safely as possible.

This cruise-planning manual has been developed to provide the ship's user with the arrangement and operational capabilities of the R/V Pacific Storm. The manual delineates the various procedures, policies, regulations, safety, and lifesaving precautions for embarked personnel. All ship users should review this manual with regard to the specific requirements of the proposed project.

If there are any items required for a project that are not delineated in this manual please contact the Marine Mammal Institute. Comments and/or corrections that will help clarify any of this manual, or make it more user friendly, are welcome.

It is the sole purpose of the R/V Pacific Storm's crew and support personnel to provide you with a safe platform with well maintained equipment that will help you accomplish your scientific objectives. We are here to support your project and give you an exceptional cruise experience.

Welcome Aboard!

DocuSigned by:
Lisa Ballance
7AC32216A7AA4CF...

Dr. Lisa Ballance
Director of Marine Mammal Institute

DocuSigned by:
Ron Briggs
ED8838F53F6C438...

Ron Briggs
Captain, R/V Pacific Storm

DocuSigned by:
Mark Wilke
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Mark Wilke
Finance and Program Manager

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SECTION I: SHIP AND SHIP'S EQUIPMENT

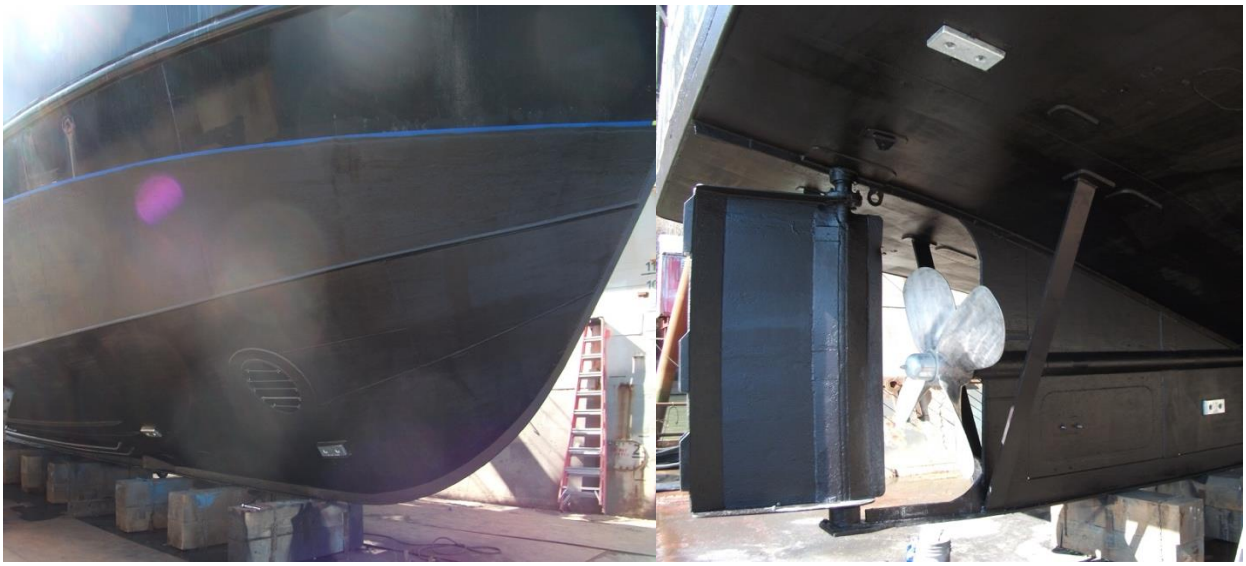
The R/V Pacific Storm is a documented vessel and designated as an oceanographic research vessel by the U.S. Coast Guard. The vessel operates under the Code of Federal Regulations 46 CFR Subchapter U and completes a safety inspection by the U.S. Coast Guard annually. The vessel is of steel construction and is powered by a single main engine and propeller. The home port for the vessel is Newport, OR and it is typically berthed at Port Dock 5 in the North Commercial harbor in Yaquina Bay.

General Vessel Specifications

Ship name: R/V Pacific Storm
Owner: Marine Mammal Institute, Oregon State University
Operator: Marine Mammal Institute
Year built: 1979
Maximum Capacity: 12 (7 for science party)
Builder/location: Spence Bros. Boatyard/ Valparasio, FL
Length overall: 84 feet
Beam: 24 feet
Navigational draft: 10 feet
International Gross Tons: 153 tons
Operated as: Oceanographic Research Vessel
USCG Inspected: NO
USCG Documentation: YES
IMO: 7942685

Propulsion

Single, 4-blade stainless propeller
Main Engine: 520 BHP Caterpillar 3412 E Diesel Engine
Bow Thruster: Westmar 18” hydraulic bow thruster



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Range, Speed, and Endurance

Cruise Speed:	8.5 kts.
Maximum Speed:	10 kts.
Range at Cruise Speed:	5000 n.m. (weather dependent)
Endurance:	25 days continuous duty

Electrical Service

The R/V Pacific Storm is equipped with two power generators – John Deer 70-kw (110/220VAC 3 phase) and an Isuzu 30-kw (110/220VAC 3 phase).

Uninterrupted power supplies (UPS) are available for scientific use although researchers are encouraged to bring their own UPS units to ensure coverage.

If total power requirements will exceed the level available, please contact the Marine Mammal Institute in advance of your cruise so other arrangements can be made to accommodate your needs.

Seawater

A Seawater supply outlet (3/4”) is located on the starboard aft deck area. This water is provided by an 18 gpm pump at 30 psi from an intake located approximately 10 feet below the water line. This water can also be accessible in the main lab.

Fresh Potable Water

The ship holds 2,000 gallons of fresh water and is capable of producing 900 gallons of potable water per day via a reverse osmosis water maker.

Compressed Air

Compressed air is available on the aft deck. Maximum pressure is 180 psi with the ability to regulate the max/min pressure settings as requested.

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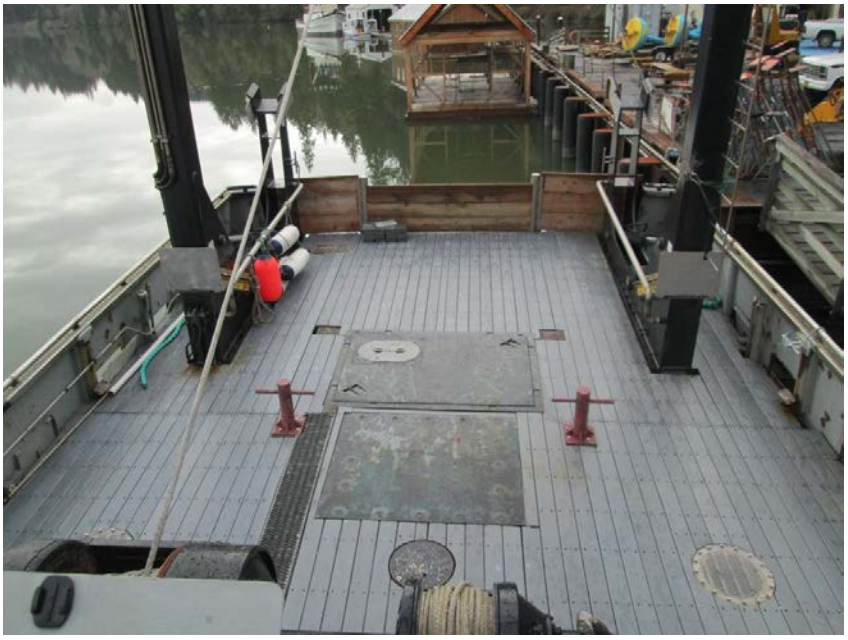
Crane

The vessel is equipped with a 5-ton knuckle marine grade crane used primarily to load/unload the vessel at the dock, re-position deck gear, and launch a 4,500 pound RHIB while at sea. The crane is run by a 300 hp Cummins in-line 6 cylinder engine driving three hydraulic pumps and can safely lift 2,260 lbs. at 30 feet.

Deck Layout

The vessel is of welded steel construction with a raked bow, hard chine and square transom. The main deck is a "whaleback" style with a cabin forward pilot house. The aft deck is covered with "trex" style composite decking suspended above the steel deck, allowing water that sloshes on deck to "drain" quickly and empty over-board via scuppers, thus providing a largely dry deck environment. Designated areas are provided for the bolting of gear to the deck. The 01 deck is of steel construction with space available for securing gear or mounting equipment.



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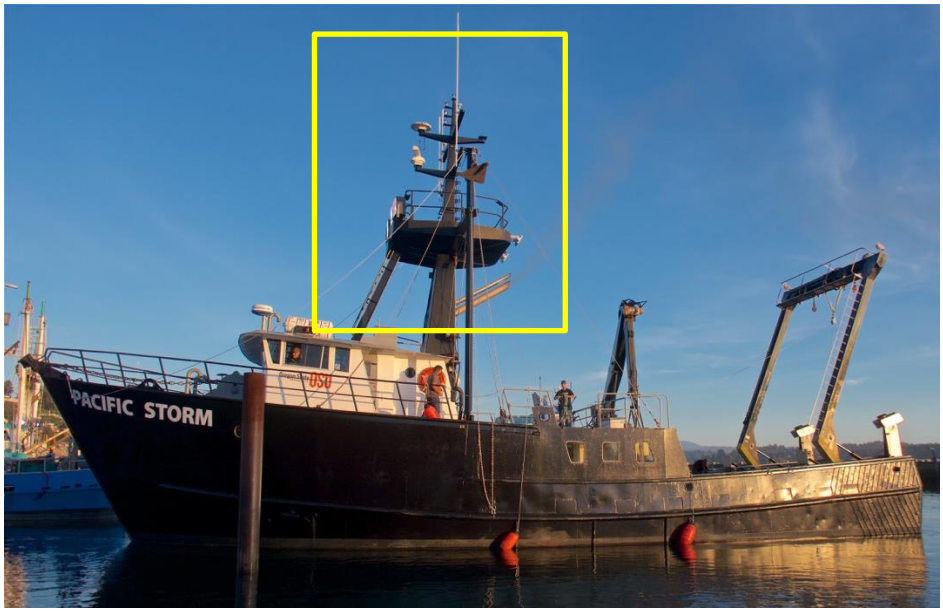
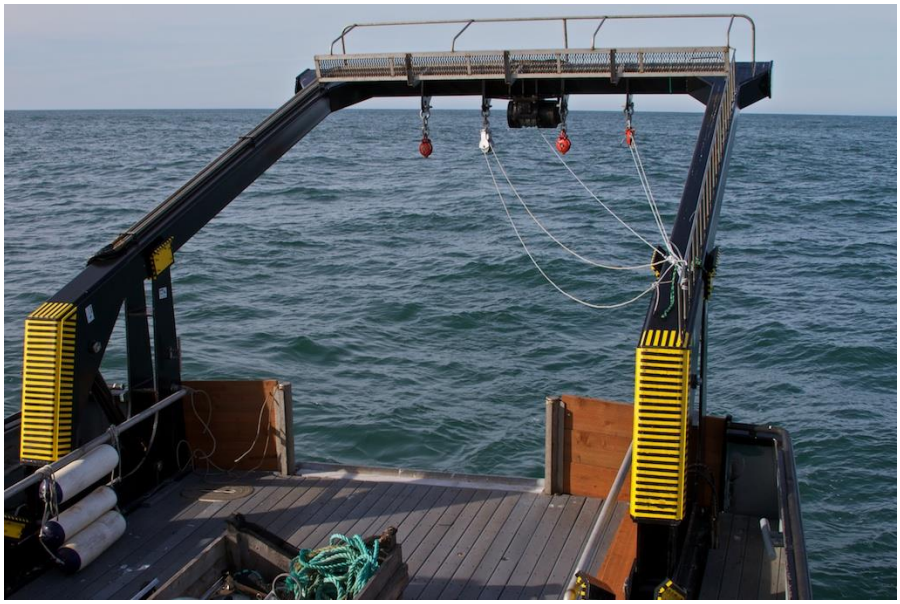
Observation Platform

The vessel has a large observation platform located on the mast of the vessel. The platform can be used for different purposes including marine mammal or bird observations, mounting of user-supplied scientific instrumentation as well as for photo and video coverage of the weather, aft deck work areas or unobstructed views of the sky or horizon. The mast standing area is surrounded by restraining rails and is suitable for up to five observers. It is accessed via an aft ladder to the roof of the wheelhouse and a sloped stairway with hand rails on both sides.



A-Frame

This custom-designed heavy-duty gantry is stern mounted with 21' of reach. A Pullmaster H-18 winch is located on the A-frame's cross member. It handles loads associated with the deployment of RHIB boats and the recovery and deployment of moorings up to 5 tons.



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A-Frame (cont.)

System Safe Working Load: 10,000 lbs.
Vertical Clearance: 26' (from pad eye with a-frame center over deck)
Reach: 21' out – 10' inward

Haulback Winch #1

H-18 Pullmaster
Drum Capacity: 300 m of 0.250" diameter synthetic line (capable of adding various diameters)
SWL of line: various
Line Pull – 18,000 lbs.
Location: 01 Deck facing aft through A-frame

Haulback Winch #2

PL4 Pullmaster
Drum Capacity: 75 m of 0.250" diameter synthetic line (capable of adding various diameters)
SWL of line: various
Line Pull – 4,000 lbs.
Location: 01 Deck facing aft through A-frame

Work Boat

A 6.8 meter Rigid Hull Inflatable boat (RHIB) is available. This boat is powered by an in-board diesel engine and has been deployed extensively from the R/V Pacific Storm for tagging marine mammals and other related activities. Additional expenses will be incurred should a science party request this type of asset.

Navigation

The ship utilizes the following electronic navigation and communication equipment:

- Kongsberg AIS 200
- Furuno 1935 AIS Radar with 48 mile range
- Furuno 1832 Radar with 36 mile range
- Comnav 2000 autopilot with 2 Furuno GP 37 GPS's
- Furuno SC502 satellite compass
- Furuno FCV-292 600 watt dual-frequency (50/200) echo sounder
- Nobletec NavTrack plotting software
- Lowrance chart plotter
- Multiple VHF Icom radios
- Iridium phone
- Panasonic watch alarm
- CCT cameras on back deck, in lab and in engine room fed to wheelhouse
- Multiple handheld VHF radios available for small boat and field operations

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General Capacities

Diesel fuel	15,500 gallons
Freshwater	2,000 gallons
Hydraulic Oil	450 gallons
Lube Oil	110 gallons
Wastewater	300 gallons

Scientific Lab Space

A dry lab is available for computers, scientific experiments, bench space, storage, etc.

Dry Laboratory- 300 sq. ft.

Located amid-ship along the centerline of the vessel.
Serves as ship's dedicated instrumentation room and repair space.
Space is configurable to the specific type of research being conducted.
Laboratory shelving and bench space available.

Air conditioned and heated.
120V UPS receptacles, in addition to uninterrupted power supplies
Freshwater and saltwater available in a stainless-steel sink
General use computer with internet access

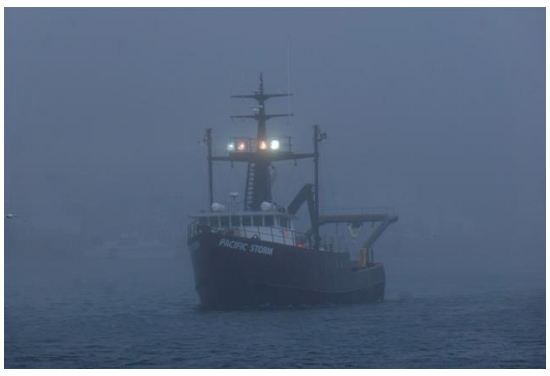
Operating Parameters and Endurance

The standard operating range for the vessel stretches from the California/Oregon border to the international Canadian border and offshore to 200 nm. With prior approval and detailed planning, the vessel has completed complex cruises working as far south as Costa Rica) and north into the central Bering Sea.

The vessel has an endurance of approximately 25 days away from port at full capacity. This can be extended depending on the number of embarked scientists and appropriate pre-cruise planning. Limitations are primarily based on food storage.

The vessel typically sails with a crew of three for day trips of 12 hrs. or less. Additional crew may be required based on the nature of work being conducted. The vessel has berths for up to seven scientists.

With appropriate crew, the vessel is capable of supporting 24-hour operations at sea.



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SECTION II: PRE-CRUISE PLANNING

Contacts

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Director of the Marine Mammal Institute
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541-867-0445

Shipping Address

Marine Mammal Institute
Hatfield Marine Science Center
2030 Marine Science Drive
Newport, OR. 97365
Attn: R/V Pacific Storm

Webpages

R/V Pacific Storm - https://mmi.oregonstate.edu/research-vessels

Marine Mammal Institute - https://mmi.oregonstate.edu/

Scheduling / Daily Rate

To schedule or discuss the charter for the R/V Pacific Storm please contact the Marine Mammal Institute. All ship users must also complete a cruise planning form to help the Captain and vessel crew prepare for your cruise and help ensure your scientific objectives are met.

Daily rates for the ship are provided on the Marine Mammal Institute's website. Rates vary according to the duration of the daily use and any added special requirements. Rates can also fluctuate yearly and consequently, it is prudent to confirm estimated future rates to help ensure budgets are accurately calculated. Daily rates provide for a standard crew of 3, any local shared-use equipment and accommodations for up to 7 science personnel. Science party food and vessel fuel are added to the base daily rate charged for all operational (transit and science) days. Mobilization/de-mobilization (MOB/DMOB) days in a port will be charged to the project at the rate listed on the Marine Mammal Institute's website. Any other costs not part of the daily rate (i.e. dockage, crane rental, portable generator rentals, etc.) will be charged at cost. If a

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day is lost at sea due to ship mechanical failure the day will NOT be charged to the project. All weather days that result in a loss of science operational days will be charged to the project.

Cruise Plan

A pre-cruise planning form must be completed and received a minimum of **15 days in advance** of the cruise. Please contact the Marine Mammal Institute for these forms or visit the R/V Pacific Storm's webpage for a download.
These documents are important to ensure the ship's equipment and adequate personnel are available and ready for your cruise. In addition to the plan, we recommend communicating early via email or verbally with the ship's Captain prior to the cruise. When developing a cruise plan please consider the following:

Personnel

All cruise personnel who are not explicitly members of the ship's crew are considered to be members of the scientific party and, as such, under the direction of the Chief Scientist. The Chief Scientist has the authority to determine the makeup of the science party and the responsibility to assure compliance with institution policies. Clearance forms and medical information will be required of all scientific party members well ahead of the cruise and should include dietary restrictions.

Clearance Forms

A Release and Consent form (**Appendix 1**) is required for each scientist.
The Chief Scientist will circulate the Release and Consent form to all members of the science party to be completed, signed and returned to the Marine Mammal Institute at least a week before the cruise. This procedure saves time and confusion during loading of the ship. The ship will not sail unless a form is completed for each embarked cruise participant.

Medical Information

Each person going to sea is responsible for bringing their own prescription and general medications. The ship only carries a modest supply of over-the-counter medications for pain and seasickness plus specialized medical equipment for emergency use under the direction of our certified crew members, who are trained in CPR, First Aid and the use of an on-board automated external defibrillator (AED). Individuals are responsible for discussing any known medical conditions with the Chief Scientist for the cruise and judging the liability they pose to themselves and the scientific mission. In the case of serious injury or medical emergency, scientific work will be terminated and the ship will proceed to evacuate the patient to the nearest competent medical facility.
Individuals requiring medication must bring an adequate supply of required medications. Those with a medical condition or on prescription drugs should note the condition and medications on the Medical Information Form (**Appendix 2**). This information will be used only in case of emergency and will remain sealed under the control of the chief scientist.

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Scientific Crew Berthing

The R/V Pacific Storm has 7 bunks for scientific personnel. The Chief Scientist is responsible for assigning berthing arrangements for the scientific complement. The Chief Scientist should work with their group to ensure that all are comfortable with their berthing assignments.

There is no steward service. Scientists are responsible for keeping their quarters clean and orderly. Clean sheets, pillowcases, and towels are provided weekly or as needed. Upon completion of the cruise, the departing scientists shall give their quarters a thorough cleaning so they will be habitable for the next occupants.

Loading

In general, one day will be allowed for loading the R/V Pacific Storm prior to a cruise. A crane operator and other members of the department will be available during the normal workday (0800-1630) to assist. The Chief Scientist, with the assistance of Captain, is responsible for arranging any shoreside support (forklifts, etc.) required in ports away from Newport, OR. The scientific party is responsible for the arrangement and securing of scientific equipment on deck and in laboratories. R/V Pacific Storm crew can assist with heavy equipment on deck and has a limited supply of straps, chain and chain binders for securing equipment. One day is normally allowed for unloading. Any charges associated with loading or offloading the vessel will be based on posted rates and will be applied as described.

Equipment Insurance

No insurance coverage is provided for scientific equipment supplied by the charterer used during a particular cruise. Please check with your home institution on their policy regarding insuring equipment and personnel while in use at sea.

Special Operations

The operations identified below should be identified in the cruise plan and should be coordinated with the Captain and the Marine Mammal Institute well in advance of your cruise.

Radioisotope Work

Any cruise requiring the use of radioisotopes must be coordinated with the Marine Mammal Institute and the Captain well in advance of a cruise. This work requires approval and monitoring by the Radiation Safety Officer at Oregon State University. The Chief Scientist is responsible for the safe use and transport and clean-up of all radioactive material including waste generated on and off the ship. In no case may radioactive waste be left on the ship. Radioisotope swab tests must be conducted before and after the cruise, at chartering party's expense, with written reports submitted to the Captain within 5 business days of the completion of the cruise. These tests will be used to demonstrate that no post-cruise contamination exists on the vessel.

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Explosives

The transport, loading and use of explosives is strictly regulated by the U.S. Coast Guard. Any use of explosives must be coordinated well in advance with the Marine Mammal Institute the Captain of the vessel and the chartering party's plan approved by their institutional safety officer.

Hazardous Materials

Programs using hazardous materials shall be coordinated well in advance with the Captain of the vessel. The Chief Scientist is responsible for the safe use, storage and disposal of all hazardous materials brought on the R/V Pacific Storm. The Chief Scientist shall assure that Material Safety Data Sheets (MSDS) for all materials are brought onboard and made available to the ship's Captain. The Chief Scientist will also assure that adequate containment-holding materials, neutralizing agents, etc., are available on the ship to deal with spills or other accidents. In general, hazardous materials (e.g., formalin) are not to be used in the ship's main lab and must be confined to open decks.

Diving Operations

Diving operations from R/V Pacific Storm are subject to the AAUS and OSU Dive guidelines and procedures (**Appendix 3**). UNOLS Research Vessel Safety Standards shall also be consulted and followed as appropriate. Projects with dive operations should contact the Marine Mammal Institute well in advance of the cruise. Once it is determined that diving operations can be safely conducted from the vessel, they will help coordinate communications between OSU's Diving Safety Officer (DSO) and the Chief Scientist. No diving will be conducted without the approval of OSU's DSO.

Lithium Batteries

The science party is required to inform the ship of any lithium batteries brought onboard. For a complete lithium battery policy see **Appendix 4**.

Reporting of Surface and Subsurface Obstacles

Surface and subsurface moorings and bottom mounted instrument packages can present hazards to navigation to surface vessels or submarines and can damage, or be damaged by, fishing vessels. The Principal Investigator/Chief Scientist is responsible for obtaining any necessary permits from appropriate regulatory bodies (e.g., USCG and USA-COE for designated navigation channels, traffic schemes, etc.; NOAA Sanctuary Managers for designated marine sanctuaries, etc.) and for reporting the establishment and disestablishment on any surface or subsurface obstacles. Information on designated areas is available from the latest nautical charts for the operating area, the Coast Pilot or Sailing Directions for the area.

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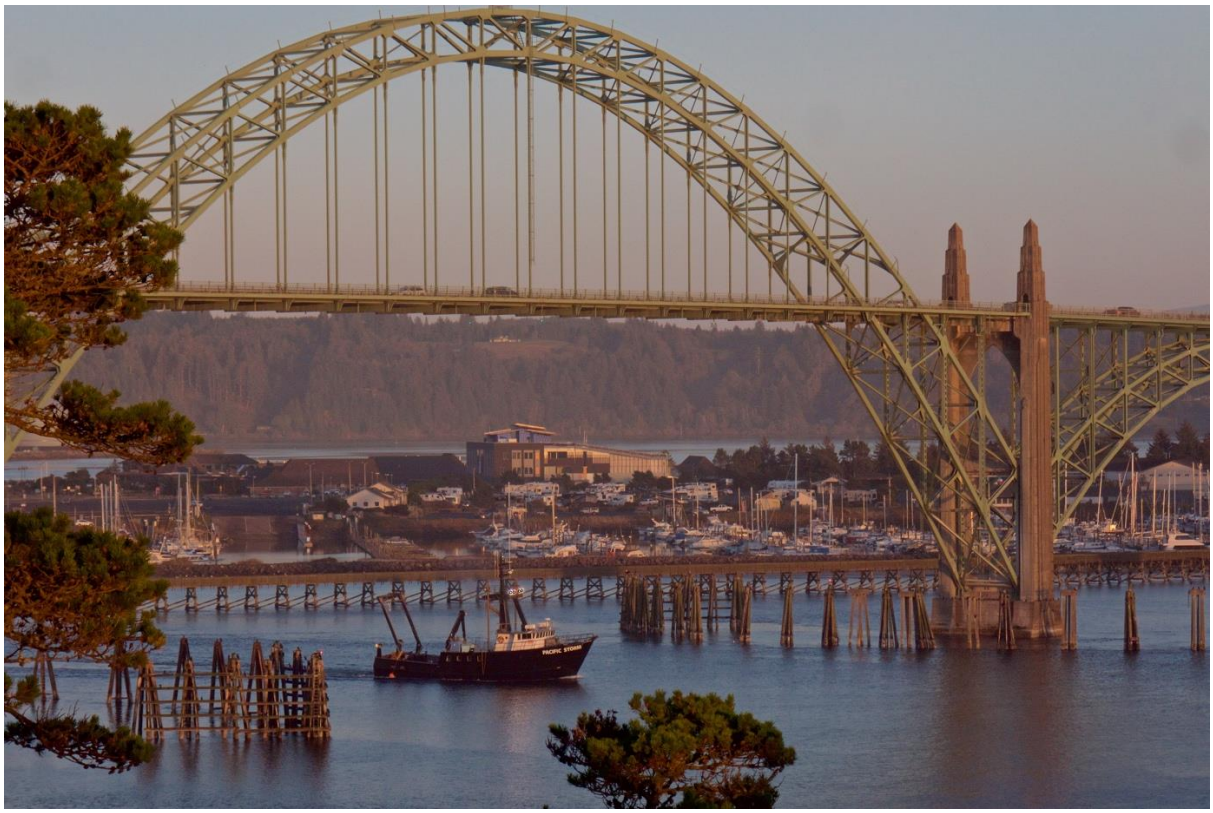
Compressed Gas Cylinders

Compressed gas cylinders must be secured at all times on board R/V Pacific Storm. Portable racks are available for a limited number of bottles. Projects using a large number of bottles should provide racks or pallets. Bottles not in use are to be stowed upright with the caps in place. Flammable gasses must be stowed on the weather decks.



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SECTION III: DURING THE CRUISE

The Marine Mammal Institute operates the R/V Pacific Storm to support scientists conducting oceanographic research and education. A clear understanding of the roles of the Captain and Chief Scientist, and good communication between them, is required to assure both the safety and success of any cruise.

Responsibilities, Authorities and Interactions

Captain

The Captain of a vessel, by law and long-standing tradition, has the full and final responsibility for the ship and all people onboard. In association with this responsibility he/she has full authority over all operations and personnel, both crew and scientific party. If circumstances require alterations of the scientific operations for safety or legal reasons, the Captain shall inform the Chief Scientist and work to resolve the problems at hand.

Disagreements between the Captain and the Chief Scientist which cannot be resolved onboard shall be expeditiously referred to the Director of the Marine Mammal Institute. However, in all decisions regarding safety or legal matters, the Captain's authority is absolute.

A pre-cruise safety orientation briefing will be held prior to departure of each cruise (**Appendix 5 and 6**).

Chief Scientist

One member of the scientific party is designated as the Chief Scientist. This designation is required to provide a clean line of communication between the vessel crew and the scientific party. This individual is responsible for all scientific projects of all scientists conducted on their cruise including the scheduling of the work. In addition, the Chief Scientist is responsible for supervising the scientific party in matters of organization, administration, safety, and compliance with shipboard regulations and legal requirements (e.g., occupational safety and health, environmental compliance, etc.).

The Chief Scientist should consult regularly with the Captain regarding the operational details and progress of the cruise. The Chief Scientist has the authority to modify the scope and order of work, cruise track, etc., within the general scope of the cruise plan. Deviations from the cruise plan are to be discussed with the Captain before implementation. It is critical that this type of information is conveyed to the Captain by the Chief Scientist and not through various different members of the science party. The Marine Mammal Institute shall be notified of any major deviation in program objectives, operating areas or schedule.

Prohibited Items

The following items are not permitted onboard the R/V Pacific Storm:

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- Alcoholic beverages
- Narcotics and other controlled substances
- Pets (including service animals)
- Firearms and personal use non-folding sheath knives

As noted on the Confidential Release and Consent Form, members of the science party may be subject to drug/alcohol testing if involved in a "Serious Marine Incident" as defined by federal regulation.

Smoking Policy

In accordance with Oregon State law and OSU policy, smoking is prohibited in all interior spaces of the R/V Pacific Storm (laboratories, public areas, berthing areas, etc.) with the exception of a designated area on the aft deck.

Reporting of Injuries and Accidents

The R/V Pacific Storm has limited medical capabilities onboard as described in the pre-cruise planning section of this manual. Any accidents, injuries or illnesses are to be immediately brought to the attention of the mate on watch or the Captain. The Captain will see that appropriate treatment is provided to the ability of the ship. In the case of a medical emergency, the Captain has the final responsibility and authority for the appropriate course of action including medical evacuation or termination of the cruise.

Arrivals and Departures

In home port, and on port calls between cruises away from home port, the oncoming scientific party will normally board the ship by 0800 and the ship will depart at 1000. Alternate departure and arrival times may be accommodated pending the approval of the Captain. The oncoming scientific crew may request berthing onboard the vessel the night before departure. These requests will be considered on a case by case basis and are ultimately at the discretion of the Captain.

Arrival back in port will generally be by 1600 the last day of the cruise. The scientific party should have the laboratory and berthing spaces clear and cleaned and be off the ship by the end of the day.

Special circumstances may require modification of these procedures. Cruise planners should consult with the Captain in advance and be sure to include alternate departure and arrival times on the cruise planning form.

Messing Facilities

The mess areas can accommodate approximately 5 people at a sitting. Meals are served cafeteria style during hours discussed during the pre-cruise briefing. The ending time of a meal indicates the time one should finish, not arrive. Given the limited amount of space in the galley and mess deck, consideration should be given to completing your meal in a timely manner so that others

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may be seated.

Those with special dietary requirements should indicate them on the cruise planning form. The galley refrigerator is stocked for snacks after the evening meal. The ship's reefers and dry stores areas are off-limits unless permission is granted by the Captain. Users of the galley and mess deck must properly dispose of all trash and leave the area in an orderly condition.

Suitable clothing will be worn at all meals; shoes and shirts are mandatory. Rain gear, coveralls or clothes dirty from work shall not be worn on the mess deck or in the berthing areas. The ship is the home for scientific personnel and the crew; courtesy dictates that conduct, including wearing apparel, be within acceptable standards.

Refuse Disposal

The R/V Pacific Storm complies with Annex V of MARPOL 73/78 which forbids the overboard discharge of all plastics and restricts all other overboard disposal. No refuse shall be thrown overboard without the permission of the Captain. Separate containers for plastic waste are provided. "Sharps" shall be disposed of in appropriate containers rather than in the general garbage.

Sanitary System

The R/V Pacific Storm is provided with an approved Marine Sanitation Device (MSD). Please note and comply with the posted restrictions regarding what may be put into the system. Some head facilities are not used while in port and these will be posted. The ship “locks” the black water holding tank from being pumped out when the vessel is in port or too close to shore.

Shipboard Clothing and Personal Items

The ship provides hard hats, work vests (for flotation), and some rain gear. All other items are the responsibility of the individual. Open-toed shoes or sandals are hazardous to the wearer onboard ship and are not to be worn outside of the berthing area. A stout, completely enclosed shoe is required as a minimum. Persons working on deck should consider safety shoes with reinforced toes.

A seven-day supply of clothing is recommended for longer cruises since fresh water is limited. There is laundry equipment, but it must be used by many people. The laundry will not operate in heavy weather, when it will be secured.

The ship provides bed linens. Individuals are responsible for soap, shaving gear, toothbrush, and paste, etc. Items such as coffee pots, heaters, hot plates, etc., are not permitted in staterooms because of health and safety concerns.

Potable Water

The potable water is produced by an on-board, reverse osmosis system and thus supplies can be limited. Efforts should be made to conserve fresh water whenever possible. This can be done by using water sparingly when showering.

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Emergency Drills

Fire and abandon ship drills are required by federal regulation and are held monthly. An initial drill will occur shortly before or after departure and will include instruction from the Captain or Mate. This drill is mandatory for all members of the scientific party. It is the responsibility of the scientific party to become familiar with their assignments for each drill and to know the location of the survival suit, life jacket, and emergency breathing apparatus in his/her berthing area as appropriate.

Drills are to be taken seriously as training for survival. All members of the scientific party will attend drills properly attired with hat, jacket, and life jacket as if the ship were to be abandoned.

Safety

Working and living on a ship at sea is inherently dangerous. Each member of the scientific complement, as well as the crew, must be safety conscious at all times. Any situation or condition that might constitute a safety or fire hazard shall be corrected at once, either by the person observing the condition if it's within their purview or by notifying the watch officer on the bridge for further action.

UNOLS RVOC Safety Manual

A copy of the "RVOC Safety Training Manual - Chapter 1 Research Party Supplement" is in each stateroom. Individuals who have not read it are strongly encouraged to do so -- it contains much useful information which can help prevent serious injury or even death.

Work Vests, Safety Harnesses, Hard Hats

Work vests are to be worn by everyone on deck for over-the-side operations such as instrument deployment and mooring work. Hard hats are required for any operations with cranes, A-frames, etc.
Life vests or other appropriate flotation devices are to be worn at all times in boats deployed from the R/V Pacific Storm.

Doors, Hatches, Wire Ropes

Stand clear of all wires, ropes and blocks that are under load or moving. Do not get caught between a moving object and a stationary part of the ship. Do not stand in the bight of a line that is under tension. Never wrap a line around your hand or other part of your body so that you can't let go of it immediately if you need to. Keep fingers, hands and feet away from the knife edges of watertight doors and hatches. Open doors or hatches must be secured and closed. Doors and hatches must be dogged. Doors are never to be allowed to swing freely with the motion of the ship. Brief exceptions may be granted in calm sea conditions (with the approval of the mate on watch) for moving heavy equipment between the deck and laboratory.

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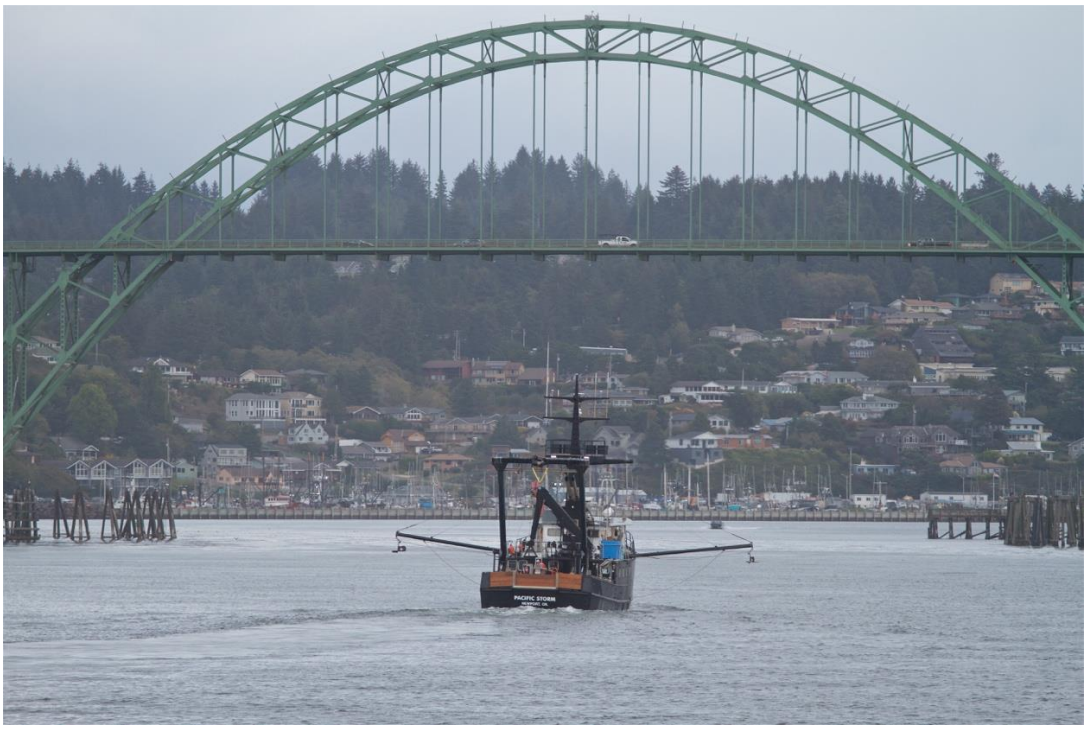
Restricted Areas

Personnel are not to enter the following areas:

- Anyone's stateroom without their explicit approval
- The engine room or other machinery space without approval of the Engineer or Captain (hearing protection will be required)
- The bridge unless approved by a crew member
- The top of the pilot house, mast, stacks or other elevated area without permission of the mate on watch (a safety harness may be required at sea and the ship's radars and communications equipment may have to be secured to eliminate RF and microwave energy hazards)

Communications

Communication equipment and phone numbers are described in the first section of this manual. Those wishing to communicate with the R/V Pacific Storm while at sea need to contact the Marine Mammal Institute.



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SECTION IV: POST CRUISE OBLIGATIONS

Shipboard Clean-up

The Chief Scientist is responsible for assuring that the members of the scientific complement clean all berthing and laboratory areas used during the cruise. This is necessary to make these areas available to the oncoming scientific party.

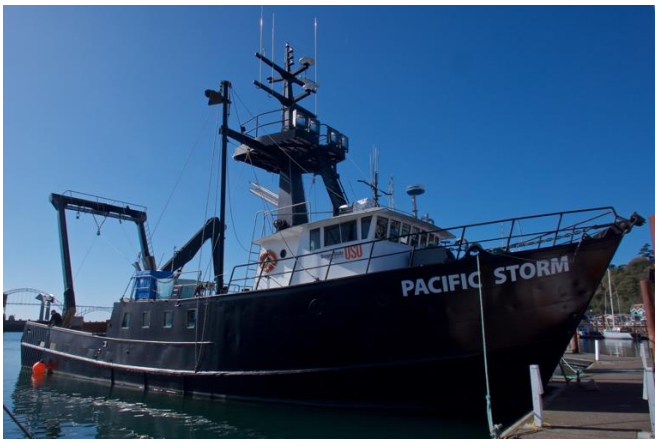
Cleaning guidelines are:

- Laboratories: Sweep and swab (if necessary) the decks; wipe down bench tops and cabinets; clean sink and empty trash containers to "dumpster."
- Staterooms: Clean mirrors and fixtures; wash off any spots on bulkheads or furnishings; vacuum rugs as needed; fold down blankets neatly at foot of bunks; put dirty linen in the laundry bag provided in berthing area.
- Heads and Showers: Clean sink; swab out toilets and wipe down the outside; clean shower bulkheads and deck as appropriate.

Please leave these areas in the condition you would like to find them when you come onboard – this will be greatly appreciated by the next scientific party. The crew can provide cleaning equipment and advice. The Chief Scientist is also responsible for assuring that all hazardous materials are removed and disposed of properly. If the ship incurs any direct costs, such as crew overtime, professional cleaning fees or hazardous waste disposal fees because the scientific party did not fulfill their obligation to clean the designated areas or dispose of materials, they will be billed to the Chief Scientist or Principal Investigator as appropriate.

Off-Loading

The crew will assist the scientific party in unloading all equipment either as part of a charter day or charged as a DEMOB activity. The Chief Scientist is responsible for arranging any shore side services required in other ports. The Captain may assist in securing support if required. All off-loading and the cleaning of spaces should be complete by the evening of arrival so the next science group can begin loading the next morning. Likewise, the off-going science party will not normally be provided with berthing on the ship that night.



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R/V Pacific Storm

CRUISE PLANNING MANUAL APPENDICES

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Appendix 1

Marine Mammal Institute/OSU Release and Consent Form

On the next page please find the MMI/OSU release and consent form. Each participating scientist must fill this out prior to leaving the dock. Please note thee are separate forms of employees of Oregon State University and for non-employees of Oregon State University

Oregon State University

CRUISE NUMBER: _____

R/V PACIFIC STORM – ACKNOWLEDGEMENT OF RISK
OSU EMPLOYEES

INFORMATION: This form must be completed by each member of the science party prior to departure on a cruise on the R/V PACIFIC STORM, a vessel operated by Oregon State University (OSU). Read this form carefully and in its entirety. Sign and return this form to your Principal Investigator or Chief Scientist two weeks prior to your cruise departure date. The completed form is valid for a single cruise.

Cruise Participant Name: _____

Institution/Employer: _____

Street Address: _____

City, State: _____ Zip: _____

Home Phone: _____ Work Phone: _____ Cell Phone: _____

I, the undersigned, am aware that my presence on and participation aboard the R/V PACIFIC STORM, including operation of the vessel's equipment and/or equipment brought aboard necessary for research, may expose me to risks and/or activities that may be dangerous and cause injury, illness, death or damage to my property. I acknowledge that my presence on and participation aboard the R/V PACIFIC STORM has the following non-exhaustive list of activities that bear risk and danger and from which bodily injury and illness, up to and including death, may occur: exposure to extreme weather conditions; deployments of heavy/large science equipment and gear over the side of a moving vessel; overhead hazards from cranes, booms and A-frames; wet and uneven surfaces; vessel movement, rolling and pitching in heavy seas; physical work and/or exertion to include lifting, bending, twisting, climbing and carrying; remote operations with no or little medical support; working around lines or cables under tension; moving parts and equipment which could become pinch points; seasickness; and working on deck during the day, night, and/or during adverse weather conditions.

With full knowledge of the information above and circumstances of my participation on the cruise, I voluntarily participate and acknowledge the risks resulting from my participation, including all risk of property damage and injury or illness to others and to myself. I agree to comply with OSU policies and standards.
I also understand and agree:

- To the Federal "Zero Tolerance Policy" which strictly prohibits illegal drugs, marijuana and controlled substances onboard the R/V PACIFIC STORM. I understand that if I violate this policy it could lead to termination of the cruise and my arrest by federal authorities.
- That alcoholic beverages, including beer and wine, are prohibited onboard at all times, to include consumption and possession.
- That federal regulations require me to submit to a drug/alcohol test should I be involved in a "Serious Marine Incident" and that a failure to submit to this test, if requested, will require termination of the cruise and OSU to report my name and address to the U.S. Coast Guard and my parent institution, and may require reporting to other state and federal agencies.

I understand that there is not a medical care provider on the R/V PACIFIC STORM. I understand I am responsible for bringing along any medication that I may require during the cruise. I understand that the R/V PACIFIC STORM does not stock medications.

I acknowledge that I am solely responsible for any action that I participate in associated with the R/V PACIFIC STORM or around the R/V PACIFIC STORM, regardless if occurring during loading and unloading or aboard the R/V PACIFIC STORM. I will conduct myself in a manner that is considerate of other cruise participants and in accordance with OSU policies and standards (*including Code of Student Conduct, when applicable*) and with any international, federal, state, city and other applicable laws or rules that may apply related to the cruise or to waters and/or locations visited.

I recognize and acknowledge that Oregon State University (OSU) may record my participation and appearance while participating on this cruise on any recorded medium including, but not limited to video, audio, photos (collectively "recordings") for use in any form (including, but not limited to print, websites, blogs, internet, social media). I authorize such recording and release to OSU to use my name, likeness, voice, and biographical material to exhibit or distribute such recordings in whole or in part without restrictions or limitations for any educational or promotional purpose. If you would like to opt out of this section, please request the Photo Opt Out Release.

In signing this Acknowledgement of Risk, I hereby acknowledge and represent that I have read this document in its entirety, understand it, and sign it voluntarily. *If you are under the age of 18, this form must be signed by you as the cruise participant AND by your parent or legal guardian.*

Cruise Participant Signature: _____ Date: _____

Parent or Legal Guardian Signature: _____ Date: _____

This agreement may be executed in two or more counterparts, each of which is an original, and all of which together are deemed one and the same instrument.

Oregon State University

CRUISE NUMBER: _____

R/V PACIFIC STORM – ACKNOWLEDGEMENT OF RISK
NON-EMPLOYEES

INFORMATION: This form must be completed by each member of the science party prior to departure on a cruise on the R/V PACIFIC STORM, a vessel operated by Oregon State University (OSU). Read this form carefully and in its entirety. Sign and return this form to your Principal Investigator or Chief Scientist two weeks prior to your cruise departure date. The completed form is valid for a single cruise.

Cruise Participant Name: _____

Institution/Employer: _____

Street Address: _____

City, State: _____ Zip: _____

Home Phone: _____ Work Phone: _____ Cell Phone: _____

I, the undersigned, am aware that my presence on and participation aboard the R/V PACIFIC STORM, including operation of the vessel's equipment and/or equipment brought aboard necessary for research, may expose me to risks and/or activities that may be dangerous and cause injury, illness, death or damage to my property. I acknowledge that my presence on and participation aboard the R/V PACIFIC STORM has the following non-exhaustive list of activities that bear risk and danger and from which bodily injury and illness, up to and including death, may occur: exposure to extreme weather conditions; deployments of heavy/large science equipment and gear over the side of a moving vessel; overhead hazards from cranes, booms and A-frames; wet and uneven surfaces; vessel movement, rolling and pitching in heavy seas; physical work and/or exertion to include lifting, bending, twisting, climbing and carrying; remote operations with no or little medical support; working around lines or cables under tension; moving parts and equipment which could become pinch points; seasickness; and working on deck during the day, night, and/or during adverse weather conditions.

With full knowledge of the information above and circumstances of my participation on the cruise, I voluntarily participate and acknowledge the risks resulting from my participation, including all risk of property damage and injury or illness to others and to myself. I agree to comply with OSU policies and standards.
I also understand and agree:

- To the Federal "Zero Tolerance Policy" which strictly prohibits illegal drugs, marijuana and controlled substances onboard the R/V PACIFIC STORM. I understand that if I violate this policy it could lead to termination of the cruise and my arrest by federal authorities.
- That alcoholic beverages, including beer and wine, are prohibited onboard at all times, to include consumption and possession.
- That federal regulations require me to submit to a drug/alcohol test should I be involved in a "Serious Marine Incident" and that a failure to submit to this test, if requested, will require termination of the cruise and OSU to report my name and address to the U.S. Coast Guard and my parent institution, and may require reporting to other state and federal agencies.

I understand that there is not a medical care provider on the R/V PACIFIC STORM. I understand I am responsible for bringing along any medication that I may require during the cruise. I understand that the R/V PACIFIC STORM does not stock medications.

I acknowledge that I am solely responsible for any action that I participate in associated with the R/V PACIFIC STORM or around the R/V PACIFIC STORM, regardless if occurring during loading and unloading or aboard the R/V PACIFIC STORM. I will conduct myself in a manner that is considerate of other cruise participants and in accordance with OSU policies and standards (*including Code of Student Conduct, when applicable*) and with any international, federal, state, city and other applicable laws or rules that may apply related to the cruise or to waters and/or locations visited.

I recognize and acknowledge that Oregon State University (OSU) may record my participation and appearance while participating on this cruise on any recorded medium including, but not limited to video, audio, photos (collectively "recordings") for use in any form (including, but not limited to print, websites, blogs, internet, social media). I authorize such recording and release to OSU to use my name, likeness, voice, and biographical material to exhibit or distribute such recordings in whole or in part without restrictions or limitations for any educational or promotional purpose. If you would like to opt out of this section, please request the Photo Opt Out Release.

In signing this Acknowledgement of Risk, I hereby acknowledge and represent that I have read this document in its entirety, understand it, and sign it voluntarily. *If you are under the age of 18, this form must be signed by you as the cruise participant AND by your parent or legal guardian.*

Cruise Participant Signature: _____ Date: _____

This agreement may be executed in two or more counterparts, each of which is an original, and all of which together are deemed one and the same instrument.

Parent or Legal Guardian Signature: _____ Date: _____

Oregon State University

CRUISE NUMBER:

_____

R/V PACIFIC STORM – WAIVER OF LIABILITY
NON-EMPLOYEES

To the extent permitted by law, and in consideration for being allowed to participate, I hereby save, hold harmless, discharge and release Oregon State University(OSU), its officers, trustees, agents, and employees (UNIVERSITY) from any and all liability, claims, causes of actions, damages or demands of any kind and nature whatsoever that may arise from or in connection with my participation in any activities related to the R/V PACIFIC STORM, whether caused by the negligence or carelessness of the UNIVERSITY or otherwise.

It is my express intent that this Acknowledgement of Risk and Waiver of Liability shall bind my spouse, the members of my family and my estate, heirs, administrators, personal representatives and assigns. I further agree to save and hold harmless, indemnify and defend the UNIVERSITY from any claim by the aforementioned parties arising out of my participation in any activities related to the R/V PACIFIC STORM.

I recognize and acknowledge that the UNIVERSITY makes no guarantees, warranties, representations, or other promises relative to the R/V PACIFIC STORM, and assumes no liability or responsibility for injury, illness, or property damage that I may sustain as a result of participation.

I hereby consent to and understand myself to be solely responsible for the cost of first aid, emergency medical care, and, if necessary, hospitalization for executing such care or treatment for injuries that I may sustain while participating. I acknowledge that I have adequate and applicable insurance necessary to provide for and pay any medical costs that may directly or indirectly result from my presence on or participation aboard the R/V PACIFIC STORM, or otherwise understand that I am solely responsible for any medical costs that may directly or indirectly result from my participation. I understand that I am not covered by OSU's insurance for any medical costs. I hereby release, hold harmless, and agree to indemnify the UNIVERSITY with respect to any and all claims, injuries, liabilities, and costs associated with my participation.

I further understand and agree that this is a release of liability and indemnity agreement, and it is intended to be as broad and inclusive as permitted by law. If any portion hereof is held invalid, it is agreed that the balance shall, notwithstanding, continue in full force and legal effect.

In signing this Waiver of Liability I hereby acknowledge and represent: (a) that I have read this document in its entirety, understand it, and sign it voluntarily; and (b) that this Waiver of Liability is the entire agreement between the parties hereto and its terms are contractual and not a mere recital.

Cruise Participant Signature: _____ Date: _____

==========

REQUIRED FOR ALL PARTICIPANTS UNDER 18 YEARS OF AGE:
PARENT OR LEGAL **GUARDIAN'S AUTHORIZATION FOR MEDICAL CARE AND CONSENT TO AGREEMENT**

I certify that I am the parent or legal guardian of the above-named participant. On behalf of myself and my spouse, partner, co-guardian or any other person who claims the participant as a dependent, I have read the above agreement, I understand the contents of this Acknowledgement of Risk and Waiver of Liability, assent to its terms and conditions, and sign this Acknowledgement of Risk and Waiver of Liability of my own free act.
I acknowledge that my dependent and I have agreed to the terms and conditions of my dependent's participation aboard the R/V PACIFIC STORM, and I hereby give my consent to participation by my dependent, and to receive medical treatment determined to be necessary. I further agree to hold harmless, indemnify and defend the UNIVERSITY from and against all claims, demands or suits that my dependent has or may have arising out of my dependent's participation in any activities related to the R/V PACIFIC STORM.

Parent or Legal Guardian Signature: _____ Date: _____

This agreement may be executed in two or more counterparts, each of which is an original, and all of which together are deemed one and the same instrument.

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Appendix 2

Medical Information Form

On the next page you will find the medical information form to be filled out by each participating scientist prior to departure. This form will be used to help the Captain treat a medical emergency.

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Pacific Storm

Medical Information Form

(This form needs to be submitted prior to your departure date.)

Any information you provide is STRICTLY VOLUNTARY and may be used to assist you in case of an emergency.

Current Date _____

Personal Information:

Full Name_____ Date of Birth _____

Street Address/City/State/Zip _____

Home Ph _____ Work Ph _____ Cell Ph _____

Emergency Contact Person_____Relationship _____

Home Ph _____ Work Ph _____ Cell Ph _____

Doctor's Name_____Office Phone_____

Medical History (check all that apply, enter blood type if available)

- □ Blood Pressure problem
  - □ Hi
  - □ Low
- □ Diabetes
  - □ On insulin
  - □ Not on insulin
- □ Heart problems/Chest Pain/MI/CHF
- □ Pacemaker/Defibrillator
- □ Stroke
- □ Breathing Problem; Asthma, Emphysema, COPD
- □ Seizure Disorder
- □ Are you pregnant

Allergies to medications, insect bites, food, latex, or other?

Current Prescription Medication List for Medical Response Team. You are personally responsible for bringing with you any prescription medicines you will require during the cruise. _____

Describe any additional medical information that would be needed in cases of emergency: _____

The information I have provided above is accurate. I understand and acknowledge that this information will be made available to any employee or emergency responder who will assist me in the event of an emergency. I further understand that research conducted from a vessel can be strenuous, involving motions and stresses that require stamina and excellent health for my safety and well-being. I hereby confirm that I have no emotional or health problems incompatible with vessel activities. I understand that I must seek advice from a licensed physician if I am uncertain as to my physical fitness for the rigors of boating activities. I further understand that the Captain of the Pacific Storm may require me to seek approval from a physician if there is a health or safety question relative to my condition. I understand that it is my responsibility to notify the Marine Mammal Institute if there are any changes to my medical condition and to resubmit the medical history form as necessary.

Participant's Signature_____Date _____

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Appendix 3

Scientific Diving Policy

On the next page please find the scientific diving policies as they relate to the R/V Pacific Storm.

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R/V Pacific Strom

Dive Operations

Oregon State University is an organizational member of the American Academy of Underwater Scientists (AAUS).

As a vessel designated as an oceanographic research vessel, the diving standards practiced aboard the R/V Pacific Storm meet or exceed those specified in the UNOLS Scientific Shipboard Diving Safety Addendum Report (April, 1996), the Research Vessel Operators' Committee (RVOC) Safety Training Manual (Section 16. Diving Operations) and the 2006 AAUS operations manual.

The purpose of the Research Vessel Dive Standards is to ensure that safe practice is maintained at all times during dive operations. To that purpose, procedure and protocol are described here.

DIVE PLANNING:

On the cruise planning form, the Chief Scientist must select the box indicating that diving operations are scheduled to take place during the cruise. After a review of the practicality of safely conducting diving operations by the Captain, a Dive Plan form must be submitted by the Chief Scientist or their designee. This form will be sent to the OSU Dive Safety Officer (DSO) for review and approval. In addition, a current diver reciprocity form is required for each AAUS diver or reciprocity credentials for other organizations, such as the NOAA, or the EPA.

A Pre-Dive meeting attended by all divers, the Chief Scientist, participating crew and the Captain will be held prior to commencement of dive operations to clarify working responsibilities and to explain the emergency procedures and safety plan of the vessels involved and the dive operation. The Dive Form will be updated with any new details of the dive if needed. Following the dive meeting, there will be a walkthrough of the equipment to be used including the small boat, diver staging area, and emergency medical equipment.

All dive operations are to be supervised and administered by the on-board Dive Supervisor (as listed in the Dive Form), either from the lead institution or designated by OSU (at additional charge), however ultimate authority and responsibility for ship operations, including any diving operations, rests with the Master of the R/V Pacific Storm.

DIVER RECIPROCITY:

All visiting divers must meet AAUS reciprocity requirements as outlined in Section 1.27, Section 5.00 and Appendix 8 of the AAUS *Standards for Scientific Diving* manual. NOAA and EPA divers meet and exceed these standards, but must show proof of NOAA training, date of last dive, and medical information. All persons cruising on the R/V Pacific are required to complete a medical form and a waiver form provided by the ship before leaving the dock.

The OSU Dive Safety Officer may issue a Temporary Diver Permit in cases where an individual may not meet all of the requirements of the AAUS manual but has demonstrated diving proficiency, is essential to the dive operations and is able to dive safely in the judgment

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of the Dive Officer and the R/V Pacific Storm Captain. This permit is valid for the current Dive Plan only.

Commercial Divers, if self-insured and carrying out dive operations outside the limitations of scientific divers may be exempt from this requirement but must provide essential emergency information and a dive plan to conduct operations from the R/V Pacific Storm.

DIVING FROM THE RESEARCH VESSEL:

The R/V Pacific Strom will provide transport, accommodations, and support for cruise dive operations. The ship will be responsible for launch, recovery, and oversight of the dive tender vessel (vessels). During dive operations the ship will maintain communications and proximity to render assistance to the dive tender (see Small Boat Operations).

There are circumstances where divers may enter the water directly from the R/V Pacific Strom. At those times the ship will be at anchor and the engine shut down. In general, divers will stage at the stern of the vessel and enter and exit the water via a ladder provided by the vessel. The dive tender may be deployed, manned by a crew member and down-current in close proximity to the ship, in order to render assistance to the divers during these operations. In addition, a floating buoy line will be trailed from the ship's stern. These details as well as any other aspects of diving from the R/V Pacific Strom, will be outlined in the Dive Form which will carry the approval of OSU DSO.

PROVIDED EQUIPMENT

Dive operations on cruise aboard the R/V Pacific Storm should be self-contained. All personal dive gear, underwater tools, and dive tanks must be provided by the user. The ship is not equipped for surface-supplied diving. At present, the R/V Pacific Strom is not equipped with a dive tank fill station. If more than 18 dive tanks are to be loaded for dive operations, upright storage tank racks must be provided by the user for safe storage.

The R/V Pacific Strom provides support crew for the dive tender (if requested), a safe launch and recovery platform, radio communication, an emergency plan, medical and oxygen supplies if needed, trained personnel for administration of oxygen and first aid.

SMALL BOAT OPERATIONS

The R/V Pacific Strom can safely deploy small boats, including rigid hull inflatable boats (RHIB) up to 30' in length. If a small boat is requested for use on the vessel, it will be manned by a crew member experienced with the operation of the boat.

The small boats are typically stowed on the main deck in a cradle. Launch is accomplished with the deck crane or the A-frame using a slings or straps provided by the vessel. The deployment and recovery of small boats is a common procedure for the ship's crew.

Loading and offloading of the tender may be done from either the starboard side of the R/V Pacific Storm or from the stern, depending on sea conditions and the size of the small boat. Personal flotation devices must be worn by everyone in the small boat at all times, unless a

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person is wearing a wetsuit. Anyone on the back deck during launch or recovery will wear a work vest and a hard hat.

The minimum equipment carried on the small boat includes: waterproof VHF radio, horn, flares, flotation devices, fire extinguisher, first aid kit and bottled water. A dive flag must be displayed at all times when divers are in the water. As dive support vessel, the R/V Pacific Strom must also display a dive flag if diving is being conducted in the immediate area around the vessel.

If a small boat will be used to support diving operation, communication between the dive tender and the R/V Pacific Storm will be essential. As standard practice the tender carries a water-resistant VHF radio tuned to a predetermined channel. The R/V Pacific Storm will remain in close proximity to the tender when possible and cease any conflicting operations. If required by the Dive Form or requested by the Captain, a designated crew member or, preferably the Dive Supervisor will be posted as Observer on the R/V Pacific Strom and will maintain communications with the tender. The dive log will be kept by the Observer on board ship and the tender operator will radio dive times and depths to the Observer at predetermined intervals.

Divers in the water are to communicate with the dive tender operator with standard diver hand signals upon submerging and resurfacing. All divers should give the OK signal upon surfacing. The tender operator will advise the Dive Supervisor (or Observer) aboard the R/V Pacific Strom of diver status upon submerging and resurfacing and before return to the dive tender.

Upon surfacing and before divers approach the dive tender, the dive tender operator will place the tender down-current from the divers, stop the engine and then signal the divers that it is safe to approach and board the vessel. The operator will assist the divers in boarding as needed.

These procedures outline the basic parameters associated with conducting diving operations from the R/V Pacific Strom. Alternate procedures are acceptable pending the inclusion and approval of the Dive Form by the DSO and the Captain of the vessel.

EQUIPMENT STORAGE:

All NITROX and air tanks are to be stored in upright steel racks located in the dry lab. Dry dive gear may be stowed in the lab while every effort should be made to keep wet dive gear out of the inside of the vessel. After use, dive gear may be washed down with fresh water and hung to dry on the main working deck.

EMERGENCY PROCEDURES:

In the event of a dive-related injury the affected diver must be transported as quickly as possible to the R/V Pacific Storm. All members of the ship's crew, all AAUS divers and the Dive Supervisor are trained in first aid and in the administration of oxygen. A medical locker is maintained by the R/V Pacific Storm and the ship carries medical grade oxygen which can be provided to an injured diver. Further emergency response procedures will be outlined on the Dive Form and followed by on-board personnel.

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Appendix 4

Lithium Battery Use Policy

The policies and procedures for using lithium batteries on the R/V Pacific Storm are included on the next page.

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R/V Pacific Storm

Lithium Battery Policy and Procedures

Purpose

The purpose of this document is to outline the safe handling, usage, storage, disposal and emergency procedures for lithium and lithium ion batteries aboard the R/V Pacific Storm and to define related responsibilities for shore side, vessel crew and science personnel. The Chief Scientist has the primary responsibility for ensuring safety procedures are followed and lithium sources are used safely aboard the vessel. Ultimate responsibility and control of lithium sources on the vessel still resides with the Captain.

Additional information on the safe handling of lithium sources can be found in Chapter 9 of the UNOLS Research Vessel Safety Standards (RVSS) available on the UNOLS website.

Battery Types

Primary or Non-Rechargeable Metallic Lithium Cells

Primary Lithium batteries feature high energy density and long shelf life. They are generally used for smoke alarm, LED lighting and outdoor devices. However, they are not rechargeable and totally different than Li-Ion batteries. These cells are constructed with metallic lithium. The metallic lithium in a non- rechargeable primary lithium battery is a combustible alkali metal that self-ignites at 352°F, and when exposed to water or seawater reacts exothermically and releases hydrogen.

Secondary or Rechargeable Lithium Ion Cells

Rechargeable secondary cells utilize lithium ions that are intercalated into graphite, lithium metal oxides and or lithium salts. There is no metallic lithium in a lithium ion battery. Lithium ion cells prefer partial discharge to deep discharge, so it's best to avoid completely discharging the battery. If the voltage of a lithium ion cell drops below a certain level, it's ruined. Since lithium ion chemistry does not have a "memory", you do not harm the battery pack with a partial discharge. These batteries do age and have a maximum shelf life of three years, even when unused. And finally, avoid using or storing rechargeable Lithium cells at elevated temperatures as heat degrades the batteries.

Because of the differences in the chemistries of the two types of Lithium batteries and the resulting differences in emergency procedures, non-rechargeable primary Lithium batteries should be stored separately from rechargeable Lithium ion batteries.

Responsibilities

Vessel Management

- Development and dissemination of appropriate guidelines and safety procedures for lithium and lithium-ion batteries
- Provide vessel crew with necessary equipment and training for handling

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emergencies involving lithium and lithium-ion batteries.
- Include appropriate information in pre-cruise forms

Vessel Captain (or designee)

- Identify all lithium and lithium-ion batteries stored on the vessel and brought aboard by science parties
- Ensure MSDS's are available for all batteries
- Include lithium and lithium-ion emergency procedures in drills and training (can be completed verbally before a cruise using lithium batteries)
- Provide science parties with lithium battery safe handling procedures that are specific to the vessel
- Confirm with Chief Scientist and vessel crew on the type and size of batteries to be brought aboard through pre-cruise form or on-board meeting
- Ensure MSDS's for batteries are provided by the Chief Scientist
- Confirm with Chief Scientist on the location and procedures for charging the lithium batteries brought on board
- Understand responsibilities during response to lithium battery emergency

Handling and Usage Procedures

The primary hazard associated with both primary and secondary lithium batteries is short circuiting. Short circuiting allows current to follow an unintended path, potentially causing overheating, circuit damage, fire and/or explosion. Hazards can be minimized by following the guidelines below:

- As appropriate, wear safety glasses when handling batteries.
- **When opening underwater housings that contain lithium battery sources, a pressure relief valve must be vented before the housing is opened. The vent must remain open when the housing is stored on the vessel or until re-deployed.**
- Remove jewelry items such as rings, wristwatches, pendants, etc., that could come in contact with battery terminals.
- All dented cells or batteries with dented cells should be disposed of, regardless of electrolyte leakage. Denting of sides or ends of batteries increases the likelihood of developing an internal short circuit at a later time.
- Cover all metal work surfaces with an insulating material such as an anti-static mat. Work areas should be clean, dry and free of sharp objects that could puncture the insulating sleeve on each cell.
- If cells are removed from their original packages for inspection, they should be arranged to preclude shorting. Do not stack or scatter the cells. They should be placed in non-conductive carrying trays with individual compartments for each cell.
- Cells should be transported in non-conductive trays. This will reduce the chances of cells being dropped, causing shorting or other physical damage.
- All inspection tools (including calipers, rulers, etc.) should be made from or covered with a non-conductive material.
- Measure the open circuit voltage (OCV) of the cell. The Nominal OCV for each

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cell's chemistry is printed on the cell label or the manufacturer's data sheet. An open circuit voltage of 0.0 volts may be indicative of a blown fuse. However, if no fuses are present in the circuit, 0.0 volts could be a result of complete discharge.

- After a cell has been inspected it should be returned to its original container, if possible.
- If leads or solder tabs need to be shortened, only cut one lead at a time. Cutting both leads at the same time can short the cell.
- Never touch a cell case directly with a hot soldering iron. When making battery packs, always use cells with factory solder tabs. Heat sinks should be used when soldering to the tabs and contact with the solder tabs should be limited to a few seconds.
- Cells should not be forced into battery holders or other types of housings. This could deform the bottom of the case causing an internal short circuit. Furthermore, the terminal cap could be crushed, putting pressure on the glass to metal seal. This could result in a cell venting. Check for proper fit before inserting the cells into any type of housing.
- Excessive force should not be used to free a cell or battery lodged inside a housing.
- Cells and/or batteries should not be exposed to high voltage AC sources or other DC power supplies that could result in subjecting the cells to unanticipated charging or forced discharging currents. Secondary cells should be charged only according to the cell or battery manufacturer's directions, particularly with respect to maximum applied voltage.

Storage

- Store cells in original containers away from combustible materials
- Store cells in a ventilated, dry area within manufacturer recommended temperatures
- Separate fresh and depleted cells, and limit the number kept in a single area
- Make class D and ABC fire extinguishers available at the storage location as appropriate and recommended by relevant regulatory agencies and subject matter experts
- Avoid crushing or puncturing by not stacking heavy objects on cell containers

Disposal

- Disposal of all lithium and lithium ion batteries must be in accordance with all OSU, local, state and federal regulations
- Waste batteries should be stored inside a weather-proof location
- Individual or a container of batteries must be
  labeled: UGA
  Waste
  Battery
  Start Date
- Large batteries should be stored on a pallet, out of the weather for disposal
- Small batteries should be labeled and inside a container.

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Appendix 5

Key Points of Pre-cruise Safety Orientation

On the following page is a list of key points discussed during the pre-cruise orientation. It is provided to help ensure compliance with policies and procedures critical to a safe and successful cruise.

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R/V Pacific Strom

Key Points from the Pre Cruise Safety Orientation

1. Stowage location of life preservers and immersion suits

2. Location and use of life rings and life rafts

3. Location of fire extinguishers, fire alarms and fire suppression system

4. Work vests are available and are to be used when:
   working on deck in rough seas, working on deck at night, working from deployed small boats, participating in fire and boat drills, and assisting in docking/undocking operations.

5. Hard hats are available and to be used when winches or the deck crane are being used.

6. Never place any equipment over the side without the permission of the Captain and/or Watch Officer.

7. The sink in the lab drains directly over the side. Do not put any chemicals or petroleum-based products down this drain.

8. At no time will any trash be disposed of at sea from the vessel unless it is in compliance with MARPOL 73/78 ANNEX V and with the Captain's approval.

9. No sandals – closed toed shoes only, steel toed safety shoes recommended.

10. Report accidents, illnesses, and injuries immediately to the Captain

11. No smoking on board the vessel unless in designated smoking area.

12. No drugs or alcohol on board the vessel.

13. No firearms on board the vessel.

14. OSU is committed to tolerance, diversity and respect for differences. It is important that a professional atmosphere is maintained at all times through mutual respect for all your shipmates. Any incident of harassment of any kind should be reported to the Chief Scientist, Captain, and Marine Mammal Institute as soon as possible.

15. When shifting from ship power to shore power, there will be a short power outage to non-UPS protected outlets. The crew will make every effort to remind you of this outage, but be aware that this loss of power will occur.

16. You will receive a shipboard safety, fire, and man over board lecture immediately prior to your cruise. You will learn how to don a life vest and an immersion suit. Please pay attention and feel free to ask pertinent questions at that time or anytime thereafter.

17. Talk to the Captain/crew about lithium batteries that are brought on board.

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Appendix 6

Safety Orientation Form

Please find the R/V Pacific Storm Safety Orientation Form on the following page.

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Marine Mammal Institute
Hatfield Marine Science Center, 2030 SE Marine Science Drive, Newport, Oregon 97365-5296
T 541-867-0202 | **F** 541-867-0128 | http://mmi.oregonstate.edu

R/V Pacific Storm Safety Orientation

Please initial each of the following lines to indicate they were reviewed during the safety orientation and you are now familiar with each of the topics:

_____ **Immersion suits/PFD:** location, donning instructions

_____ **Life raft:** location, function, deployment procedures

_____ **Man Overboard Procedures (MOB):** location of gear and use

_____ **Personal Protection Equipment (PPE):** location, policy

_____ **EPIRB:** location, function, deployment procedures

_____ **Flares:** location, function, types, use

_____ **Radios:** location, use

_____ **Fire extinguishers:** location, function, use

_____ **First Aid kit/AED:** locations, function, use

_____ **Sexual Harassment Policy**

_____ **General alarm:** location, what it means, procedures for sounding

_____ **Regular alarms**: difference between general alarm and regular alarms

_____ **Placards:** report all injuries, drug and alcohol policy, waste disposal and discharge of oil prohibited

_____ **Escape Hatches:** lower stateroom escape hatch and forward escape hatch

_____ **Emergency Instructions:** read and understand Station Bill:

____ Understand role in an emergency

____ Willing to accept assigned responsibilities

_____ **Hazards:** hatches, winches, machinery, lines, falling overboard, slipping

_____ **Scientific Operations:** deployment of gear, lithium batteries, sink in lab, etc.

Understand that ALL safety and training manuals are available for your reading

_____ I will ask questions concerning any safety or vessel operations if they need clarification.

_____ I understand that the Captain, Mate and Crew are available any time for discussion to make my work environment on R/V Pacific Storm as safe as possible.

Printed name	Signature	Date