

Volunteer Training Manual

R/V KATY



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R/V KATY Volunteer Job Description

Objective

To convey the mission and interpretive goals of the Mission Aransas National Estuarine Research Reserve (NERR) education department at the University of Texas Marine Science Institute by helping to educate school and public groups about the importance and biodiversity of different ecological habitats within marine systems that flow into the Gulf of Mexico.

Characteristics and Experiences

Deckhands must be enthusiastic, cheerful and willing to learn. They should have an interest in working with students and other groups of all ages. It is essential that Deckhands are physically capable of working on a boat for up to four hours at a time. Experience in natural history, environmental or marine science and/or education are helpful but not required.

Supervision and Training

Deckhands will complete an introductory training with volunteer supervisor, compliance training, and read and familiarize themselves with the Volunteer Training Manual. Deckhands will shadow the naturalist and assist on R/V KATY trips as in the field training.

Requirements

- Minimum age of 15 years
- Communicate via e-mail
- Receive and follow directions from volunteer supervisor
- Work up to a four hour shift
- Walk and talk comfortably on a moving boat
- Withstand extreme weather conditions, heat, rain, cold etc.

Activities and Responsibilities

Deckhands are responsible for helping to engage students in a better understanding of the biological, physical and chemical processes at work in the marine environment and the interrelationships among them. The Deckhands are also responsible for assisting with supply set up, take down, and cleaning.



Introduction

The University of Texas Marine Science Institute is located at the north end of Mustang Island. Across the ship channel to the north is San Jose Island. These are two of a string of barrier islands that form a protective ribbon of sand that stretches from south of Brownsville to north of Galveston, a distance of some 270 miles of open beach. Between the mainland and the barrier islands lie shallow bays and lagoons that form a rich nursery ground teeming with marine life.

The soft bottoms of the bays are rich in nutrients, supporting a diverse community of mollusks, marine annelids, crustaceans, and benthic algae.

The margins of the bays and lagoons are covered with dense seagrass meadows that provide both food and shelter for larval and juvenile forms of marine life.

The central Texas coast has two major bay systems. The Aransas Bay System, north of Port Aransas, covers an area of 157 square miles and includes Aransas, Copano, and Mission Bays. Aransas Bay is located behind San Jose Island. Its maximum depth is 5 to 6 feet deep in the north end of the bay increasing to 10 to 13 feet at the southern end near the Lydia Ann Channel.

One of the areas frequently visited on R/V KATY trips is located at the junction of the Lydia Ann Channel and Aransas Bay. It represents a hard

substrate environment. Otter trawl samples are collected here in a long trough, averaging 24 to 28 feet deep, formed by the large volumes of water funneling from Aransas Bay through the narrow Lydia Ann Channel. This massive water movement occurs during hurricane storm surges and, more frequently during passage of very windy cold fronts in the winter. The moving water scours the bottom and carries finer sediments up the channel, leaving the heavier shell and shell fragments behind. Some of the shell fragments found there are slowly being destroyed by the boring sponge, *Clione* sp.

The shells in the Lydia Ann Channel also provide attachment points for a host of other marine invertebrates, such as encrusting bryozoan, star coral, serpulid worms, barnacles, oyster spat, ribbed mussels, and hydroids. The shell rubble is also home for several species of mud crabs, amphipods, brittle stars, snapping shrimp, and tunicates, as well as a variety of gobies, blennies, and skillet fish.

The Lydia Ann Channel extends to the south between San Jose Island and Harbor Island. The remainder of the channel averages 12 to 15 feet deep over a sandy-mud bottom. The Harbor Island area on the west side of the channel is the largest black mangrove marsh in Texas. The shallow sloughs and lakes within the marsh provide shelter and food for the area. The marsh is also home to many of the larger wading birds, such as the Reddish Egret, Great Blue Heron, Snowy Egret, Great Egret, and the Roseatte Spoonbill.

The Aransas Pass Lighthouse (or Lydia Ann Lighthouse), built in 1855, also is located on Harbor Island. Its beacon guided sailors across San Jose Island through the many natural passes that once existed there. The present pass is a natural pass that has been jettied with granite boulders and deepened to 45 feet to allow ships to pass through the barrier island to the inshore ports.



To the south of Port Aransas is the Corpus Christi Bay system, made up of Corpus Christi Bay, Nueces Bay, and Redfish Bay, an area of approximately 200 square miles. Corpus Christi Bay is the largest of the three with an area of 152 square miles. It has an average natural depth of 12 to 15 feet, grading up to a depth of 3 to 5 feet along the margins of the bay. The sediment is dark, clay-like mud with scattered oyster reefs located in the shallows along the shore.

Nueces Bay, one of the two true riverine- influenced estuaries along the central Texas coast, is located on the northwest edge of Corpus Christi Bay. Nueces Bay is a small, shallow bay covering an area of 29 square miles. Runoff from the Nueces River and its upstream drainage basin plays an important role in nutrient cycling and regeneration throughout the Corpus Christi Bay system. Dams placed upstream, however, will reduce the flow of the river and affect both the salinity gradient of the bay and the nutrient flushing and cycling that occurs after periodic floods.

Redfish Bay is on the northeast side of Corpus Christi Bay. This small, shallow bay has an average depth of only 3 to 8 feet and covers an area of 19 square miles. The sediment varies from coarse shell along the margin of the ship channel to soupy, claylike mud in the upper parts of the bay.

Redfish Bay's margins are heavily vegetated with several species of seagrasses as well as dense growths of macroalgae. Stands of submerged

vegetation form dense meadows that provide both food and shelter for a host of larval and juvenile marine life.

The Corpus Christi Bay and Aransas Bay systems are connected by a ship channel which runs from the west end of Corpus Christi Bay to the junction of the Lydia Ann Channel. This channel is connected to the Gulf of Mexico by a natural pass through the barrier islands. The channel is maintained at an authorized depth of 45 feet. It has been dredged through a hard clay substrate and is shaped like an open “U”.

All the sampling that takes place on the R/V KATY trips occurs behind the barrier islands. As the name implies, barrier islands provide an effective barrier against wind and waves, storm surges during hurricanes, and can even help prevent oil from entering the productive bay systems.

Barrier islands are cut by natural passes that allow Gulf waters to exchange and mix with bay and lagoon waters. Collectively these channels provide a highway to move goods and materials by ships and barges. They also serve as a highway for nutrients and marine life to move between the bay nursery grounds and the shallow, productive continental shelf off the Texas coast. During virtually every month of the year, some form of adult marine life - fish, shrimp or crab - is migrating from the shallow bays and lagoons through channels and barrier islands into the shallow Gulf shelf to spawn either offshore or in the mouth of the channel. The native Gulf white shrimp, *Penaeus setiferus*, is a typical example.



After hatching from an egg, shrimp begin life offshore as larvae. Being poor swimmers, they are carried by tides and currents through passes into shallow bays and lagoons. As postlarvae, they take up residence in the rich nursery grounds. Shrimp are omnivorous bottom feeders, and their food consists of algae, mollusks, marine worms, and small

crustaceans. *P. setiferus* reach adult size after nearly a year in the sheltered bays, and begin their annual spring migration back to the open Gulf, using channels and passes through the barrier islands. Adult shrimp feed on organic materials that they find in the surface layer of the offshore sediments. This organic material, called detritus, is made up of rotting vegetation swept out of bays by tides. It also includes remains of other marine plants and animals that have a role in the marine food chain.

This is a typical estuarine life cycle. It is exhibited by the majority of important commercial and sport species of fish, crabs, and shrimp found off the Texas coast.

Safety

- All persons 12 years of age or younger must wear a U.S.C.G. approved life jacket at all times.
 - Life jackets are available on the R/V Katy under the benches in the main cabin. Please take note of this location.
- Closed-toed shoes are required. No sandals.
 - Please be aware that boat decks can be slippery. Wearing shoes with good traction will protect you.
- Board/disembark only when instructed.
- No running or horseplay.
- Do not go below deck or on the upper deck without permission.
- Keep body extremities inside the boat while underway.



- Beware of equipment. Watch your step. Hoses, cables, and other equipment will be on the deck.
 - Do not sit on, climb on, or attempt to operate any equipment or rigging. If you see a potential issue with equipment, tell the naturalist. Do not try to fix the issue yourself.
- Do not handle specimens until shown how to do so properly. Some animals can sting, bite, pinch, cut, or stab very effectively.
 - Follow all instructions of UTMSI personnel.
 - Persons with known allergies should inform UTMSI personnel in advance.

Trip Procedures

Trip agenda may vary on the basis of trip length and student group.

Pre- cruise

1. Meet at the UTMSI Boat Basin 30 minutes prior to when the R/V Katy is scheduled to leave. (Morning trips- 7:30, Afternoon trips- 12:30)
2. Assist naturalist in preparing gear. This includes the microscope and TV, purple microscopes, and mud grab gear (if needed).
3. Ensure that all those going on the boat have signed the ship's log. This includes the naturalist and volunteers. Signed log goes to the captain.
4. Naturalist will give the educational and safety briefing. Please listen to this briefing each time.
5. If needed, assist students in properly donning their lifejackets. See naturalist with any questions.
6. Board before students and assist them in stowing their gear and finding the bow (front most part of the deck).

Cruise

1. Monitor safe behavior of students and other participants.
2. Encourage students to look outside the vessel for wildlife. Dolphins, birds, and the occasional shark can be viewed while we are travelling to our sampling locations.
3. **Plankton Tow**
 - a. Be prepared to turn on the hose, or retrieve bottles or pipets.
 - b. Ensure that students are following directions. Be prepared to repeat the naturalist, in case a student did not hear the instruction or does not understand.
 - c. After the sample is on board: Please stow the plankton net and then assist students in using the purple microscopes.
 - i. Students will also cycle to the wet lab to observe plankton on the larger microscope. Please assist in cycling students from the purple scopes to the wet lab. Wet lab observations can be facilitated by the naturalist or the volunteer. If interested, please let the naturalist know. Training is available for microscope use and plankton identification.
 - d. After plankton discovery is finished, please rinse the slides with fresh water from the sink and return the purple scopes to their bin. Please leave



a few scopes and the plankton sample out on the counter for students to return to during the cruise. These can be cleaned once we are back at the dock.

4. Peterson Mud Grab

- a. Please assist the naturalist, or an adult participant, in moving the mud grab and small bucket into deployment location. The naturalist will show you this location.
- b. During deployment, please fill the small glass dishes approximately half way with salt water from the live well, add 3-5 tweezers per dish (dependent on size of student group), and place on stair cover on back deck. Naturalist will show you this location.
- c. Encourage students to look closely at their samples. Help them bring organisms to the large microscope.
- d. After discovery, please rinse mud grab and stand and replace to original location.



5. Otter Trawl

- a. Please assist the naturalist in keeping everyone, except the naturalist, out of the orange area on the deck. This is for the safety of everyone.
- b. Setting the net
 - i. The naturalist will work the hydraulic wench system.
 - ii. You can assist, if you feel comfortable, by deploying the green net part of the trawl. If interested, please talk with the naturalist for training.
- c. Active trawling
 - i. Please assist the naturalist in preparing the deck to bring fish onboard. This includes filling water buckets, fish viewers, and the live well. This could also include spraying mud off of the back deck and stowing any mud grab gear.

- ii. Keep students engaged. They can assist in preparing the deck, they can continue analyzing mud or plankton samples, or they can look outside of the vessel for other animals etc. Students can be in the wet lab at this time.
 - d. Retrieving the trawl net
 - i. The naturalist will work the hydraulic wench system.
 - ii. You can assist, if you feel comfortable, by lowering and raising the pulley used for the lazy line, and/or by pulling the green net onto the deck and into the black water bin. If interested, please talk with the naturalist for training.
 - e. Specimen observations
 - i. Please allow students to get close to the black bin.
 - ii. Assist students in carrying buckets of “safe” fish for them to analyze.
 - iii. Keep students engaged by asking them leading questions.
 - 1. What did you notice? Why do you think that fish/crab/etc. has that/ does that?
 - 2. How are these fish the same/ similar? How are they different?
 - 3. Questions should get them to think more about the animals and where they live. Try to not ask anything that can be answered with a yes or no. Try to get the students to think.
 - 4. You do not need to be a biologist, or a fish expert to keep students engaged. If they are observing new things and thinking about those things, then they are learning.
 - iv. If interested, you can prepare the net for its next deployment. Please talk with the naturalist for training.
- 6. Return Trip
 - a. Please assist students and naturalist in cleaning and stowing all gear.
 - b. Specimens are returned to the water at this time- please check with naturalist before releasing any specimens.
 - i. If there are multiple trips in one day, some specimens will be kept onboard for the next group. Please add fresh saltwater to the live well to oxygenate the water for these fish.

At the Boat Basin

1. Monitor student safety. Body parts remain inside the boat and life jackets stay fashioned.
2. Once students have disembarked, please assist in life jacket removal (at the pavilion).
3. Please assist in cleaning and stowing all gear. Microscopes, TV, life jackets, plankton net, mud grab, etc.

Emergency Procedures

In the event of any emergency, notify the naturalist and captain and wait for further instructions.

In the case of:

- **Fire**
There are fire extinguishers located in the wheelhouse and dry cabin of the boat.
- **Man Overboard**
Immediately notify the captain. Do not take your eyes off of the person(s) in the water. Throw anything that floats, preferably a life ring with a tether.
- **First Aid**
There is a large first aid kit located in the dry cabin on the wall over the stairs. Any injury needs to be recorded on an incident report. Incident reports are located in the first aid kit. For injuries more severe than a small cut, please get the attention of the naturalist immediately.



Resources

Naturalist/ Environmental Educator

Amanda Taylor
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