

This document outlines what each group will be responsible for on the ship. It gives their science duties and their ship duties.

One group cannot switch ship duties with another group.

Please give your students this information and help them choose the group they'd like to be in. We are hoping you can create groups of students who are interested in their task and can work together.

Once you are here we will verify the plan as a group before we set sail. The captain will also inform us of any important weather considerations.

## **WATER QUALITY**

### **Science duties:**

- Measure water clarity in Suttons Bay and compare your reading to historical data. You will also collect and average water clarity readings from your colleagues in other groups.
- Measure surface water temperature, and collect and average surface water temperatures from your colleagues in other groups.
- Collect other data on weather and sea state.
- Examine the condition of the water in Suttons Bay through several water quality parameters:
  - Use a long-cabled scientific probe to quickly gather readings of dissolved oxygen and temperature throughout the water column and/or perform chemical tests to determine dissolved oxygen at various depths in the water column.
  - Collect water samples with a traditional limnology tool, a VanDorn bottle, which captures a sample of water from any depth that can be hauled to the surface and analyzed on deck. Sample this water with a pH meter, the DO probe, and a thermometer.
  - Use your data to create a visual profile of the bay, and compare your readings to historical data.

### **Ship duties:**

- Toward the end of the program, when your science duties are nearly complete, your group takes over responsibilities for ship operations. If conditions permit, you will help the crew handle sails and can take turns at the helm with the captain.
- These responsibilities require good listening and quick learning so you can handle your responsibilities once you have been trained.
- Like all groups, you will help raise the sails! We need all hands.

## **PLANKTON GROUP**

### **Science duties:**

- Measure water clarity in Suttons Bay and compare your reading to historical data.
- Measure surface water temperature, and collect other data on weather and sea state.
- Answer a question about plankton density or plankton composition in Suttons Bay.
  - Your group will collect 3 or more plankton samples using a plankton net and/or a plankton trap.
  - You will use microscopes below deck to identify (and possibly count) zooplankton species, and compare samples to answer your question. You will have about 50 minutes to look at plankton, which will get you out of the weather, but also into a slightly more vertiginous part of the boat. If you are prone to motion sickness this is not the group for you, however most people will have no trouble.
  - It is possible to preserve samples and bring them back to school for further analysis if you bring your own sample containers.

### **Ship duties:**

- You are responsible for helping the ship leave the dock. When we depart the dock, lines need to be hauled in, coiled and stowed. You may also help the captain steer the ship, and help the crew tidy the ship after docking.
- These responsibilities require good listening for the captain's commands, and following directions exactly so you are safe and successful.
- There will be 1 student at each dock line (there are four), and 1-2 students at the helm with the captain.
- Like all groups, you will help raise the sails! We need all hands.

## **FISH GROUP**

### **Science duties:**

- Measure water clarity in Suttons Bay and compare your reading to historical data.
- Measure surface water temperature, and collect other data on weather and sea state.
- Collect sea state and weather conditions and report to NOAA.
- Help researchers find the best way to attract round gobies to minnow traps.
  - Bait 15 minnow traps, drop traps in the water, recover the minnow traps, and process any fish caught by the traps.
  - Your group will be on deck the entire time, so be sure to dress warmly and be prepared to weather inclement conditions.
  - This group will have periods of intense activity, which means you will need learn quickly and follow directions accurately. You will be communicating with the crew during trap launch and recovery so will need to listen well.

### **Ship duties:**

- You will help the crew prepare to raise the sails. This might involve a little walking on the cabin tops, which normally is not allowed! There may be additional responsibilities depending on your maturity and enthusiasm – and the weather conditions, of course.
- Students will pair off with crew members to take care of tasks. You will need to follow directions quickly and learn by watching.
- Like all groups, you will help raise the sails! We need all hands.

## **MICROPLASTICS GROUP**

### **Science duties:**

- Measure water clarity in Suttons Bay and compare your reading to historical data.
- Measure surface water temperature, and collect other data on weather and sea state.
- Carry out data collection to examine microplastic density and composition in Suttons Bay
  - Launch, monitor, and recover the Manta trawl. The trawl will be in the water for 30 minutes.
  - When the trawl is complete, you will wash the sample from the net.
  - You will use microscopes down below to examine your sample for microplastic content. You will have about 35 minutes to look for plastic particles, which will get you out of the weather, but also into a slightly more vertiginous part of the boat. If you are prone to motion sickness this is not the group for you, however most people will have no trouble.
  - These responsibilities require careful data collection, since these samples are part of a research project managed by State University of New York Fredonia. This group has the opportunity to look at data from multiple research projects, data that has not been published yet.

### **Ship duties:**

- Your collection of microplastics occurs while the ship is at sail and takes 30 minutes. You are responsible for the ship throughout your trawl. The first part of your time involves launching the trawl.
- While the trawl is in the water students take their turn at the helm with the captain. There may be additional responsibilities depending on your maturity and enthusiasm – and the weather conditions, of course.
- Like all groups, you will help raise the sails! We need all hands.

## **BENTHOS**

### **Science duties:**

- Measure water clarity in Suttons Bay and compare your reading to historical data.
- Measure surface water temperature, and collect other data on weather and sea state.
- Replicate an important study of benthic organisms: density of zebra and quagga mussels in Lake Michigan.
  - Use the PONAR dredge to take samples of the Bay bottom, then wash the sediment through sieves to extract organisms.
  - Measure the mussel shell sizes, sort by species, and separate living from dead shells
  - Identify and count other benthic organisms and compare your observations to historical data.
  - It is possible to preserve samples and bring them back to school for further analysis if you bring your own sample containers.

### **Ship duties:**

- You are the last group to sail the boat. If conditions permit, you will help the crew handle sails and can take turns at the helm with the captain.
- Your group may also help the crew prepare to lower the sails.
- These responsibilities require a willingness to learn new things and good listening.
- Like all groups, you will help raise the sails! We need all hands.