

FIELD SAMPLING PROTOCOL PHYTOPLANKTON MONITORING PROGRAM

Prepared By

California Department of Public Health
Environmental Management Branch

The following protocol is for the field collection and shipping of phytoplankton samples. It is important that field collectors follow the sampling guidelines as closely as possible to ensure that comparable samples are collected.

1. Sample Sites.

New program participants should provide the name and a concise description of the site(s) you are sampling (e.g., shoreline location for nearshore or pier sampling sites, longitude and latitude for open ocean sites). Our program will assign a permanent site number and name to be associated with your sampling location(s).

- a. **Permanent Locations.** Routine monitoring should be conducted at the same site(s) whenever possible. This allows us to make relative comparisons in species composition and abundance between sampling periods.
- b. **Special Locations.** The use of fixed locations is valuable for investigating trends in the phytoplankton data. However, your observations in the field are one of our program's most valuable assets. Field samplers that have the ability to sample other than the prearranged sites are encouraged to do so, particularly if you observe signs of a possible bloom (e.g., turbidity, discolored water: typically red to brown in color).

2. Sampling Frequency.

A sampling schedule of once per week per station is ideal, however any effort is valuable.

3. Sample Collection.

Field samplers have been provided with a 20 μm mesh plankton net fitted with a 200 mL collection bottle at the cod end. Each net is supplied with 50 feet of line. Please follow the following guidelines as closely as possible to ensure the comparability of all samples. Obtain as dense a sample as reasonably possible.

- a. **Vertical Tows:** Perform vertical tows whenever possible. Many species of phytoplankton can migrate a surprising distance vertically, thus vertical tows are more likely to adequately sample these organisms. Standard tow depths are 50 feet; in shallower water you should sample from approximately 1 foot above the bottom. In extremely shallow water (< 5 feet) you can conduct horizontal tows (see 3.b.). A good rule of thumb is that three to five vertical hauls of the net should produce an adequate sample. Keep in mind that the objective is to obtain a dense sample: the color of water in the net and the rate at which the plankton net drains will provide you with an indication of the sample density.
- b. **Horizontal Tows:** Whenever it is impractical to collect a phytoplankton sample with a vertical tow (e.g., in extremely shallow water) you may use this method. Slowly pull the net horizontally, just below the water surface, either along a pier or behind a boat. **Never** pull the net behind a boat while under way! The fine mesh net will easily tear under such stress. A drifting boat will provide enough movement to keep the net moving at the surface. When sampling from a boat try to keep track of the distance covered or the elapsed time of the tow so that you can be consistent each time you sample.

4. Sample Preservation.

Excess water in the net and cod end can be drained by grabbing the net above the water level and rotating the cod end up and down. This is a qualitative sample so we do not need to capture the entire volume. Remove the sample collection bottle from the net, gently swirl the contents to resuspend any settled material, and decant into the 100 mL sample bottle provided. Each sample bottle contains 1-2 mL of buffered formalin solution for preserving the sample. There is no need to refrigerate these samples prior to or during shipment. Excess sample can be discarded or kept for your own identification work.

5. Field Notes.

Please keep complete records for all samples. The laboratory submission form inside the sample shipping canister should be filled out completely.

- a. **Bottle #:** This is the number on the cap of each sample bottle.
- b. **Tow Depth:** This is the maximum depth sampled with a vertical tow (see item 3.a.).
- c. **Tow Length:** This is the total distance that the net was pulled to obtain a sample. For vertical tows this is equivalent to the tow depth multiplied by the number of net retrievals. For horizontal tows you can estimate the distance you walk along a pier; horizontal tows from a boat should be approximated to the best of your abilities.
- d. Whenever possible record the temperature and salinity of the surface waters. Temperatures can be obtained by collecting a bucket of water and placing a thermometer in it.
- e. Record your observations of water color, atmospheric conditions, etc. These observations can be very useful in interpreting the data.

6. Maintenance of Net.

Please rinse the plankton net, collection bucket, and all connectors thoroughly with freshwater after each use. It is also advisable to hang-up the net to air-dry after washing out of direct sunlight. Clean with washing soda if needed.

7. Shipping.

- a. Complete the sample submission form provided in each canister. This form contains most of the information that you recorded on the field data form.
- b. Put the sample bottle in the Zip-loc bag and place in the mailing canister provided along with the sample submission form. Please **do not over-tighten the lid**. Include the absorbent material provided in the canister to soak up any leakage. It is preferable to keep the mailing canister in a safe location (ie. vehicle or at home) while sampling as saltwater will rust the metal on the canister.
- c. Send the canister to our laboratory via U.S. Mail (postage prepaid) or next day courier (upon arrangement with us). If you are routinely sampling several locations in a short time span, you can package all sample bottles in one shipping box. We can provide appropriate sample boxes with postage prepaid labels.
- d. Ensure that all canisters and packages contain the following address:

California Department of Public Health
Environmental Management Branch
850 Marina Bay Parkway, #G165
Richmond, CA 94804
- e. All questions regarding this protocol should be directed to the EMB office in Richmond at (510) 412-4635.