

MAINE



*Maine Healthy Beaches Program
Field Methods*

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FIELD TIP SHEET

When taking a sample, be sure to:

Mark the bag with black permanent marker **before** filling it with water.

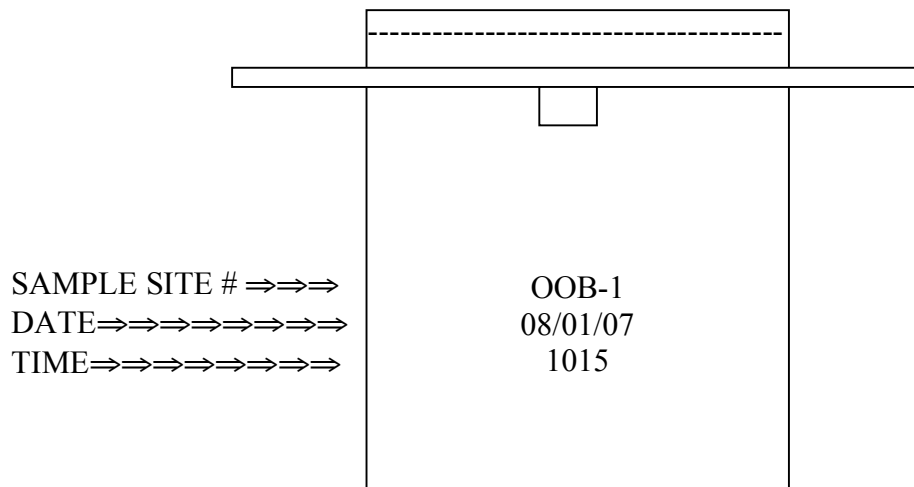
Mark the bag with the sample site number (OOB-1), DATE and TIME (military) only. See example below.

Look around at each station and record observations that could affect water quality. (For example: 25 gulls, 3 seals, seasonal cottage occupied, heavy runoff in stream in cove to north.)

Be very careful not to contaminate the bag by opening it too early. Do not touch the bag near the perforated opening. Wade into water to 3 feet of depth, or at the level you see people in the water.

Sample water 6-8 inches below the surface. Fill the bag two-thirds full.

Keep samples upright in the cooler. (Cooler temperature between 4° and 10° C). **Be sure samples are not touching the ice directly!**



- Remember to calibrate refractometer with distilled water and dry with kimwipe before reading salinity
- Remember to record air and water temperatures
- Remember to bring cooler down to water's edge!

FIELD PROCEDURES

1 List of Equipment

- ~ Whirlpak bags (sterile bags)
- ~ Sample tongs
- ~ Digital Thermometer
- ~ Permanent markers
- ~ Plastic pipette
- ~ Distilled water in 125 ml squirt bottle
- ~ Kimwipes in zip lock bag (refractometer)
- ~ Clipboard with datasheets, sample sites map, and field “tip sheet” (should have a plastic cover for these to protect them in inclement weather or laminate “tip sheet” and tape to back of clipboard.
- ~ Pencil (soft pencils will write on damp surfaces) and indelible pen.
- ~ Cooler and ice packs (3-4 blue ice packs—more may be needed in hot weather)
- ~ Hand-held Refractometer
- ~ Tray or cut-off gallon jug to separate samples when appropriate
- ~ MHB field equipment bag

2. Sample Collection and Transport

Monitoring of coastal sites should be conducted weekly. Tuesdays, Wednesdays or Thursdays work well since the results would be back to the beach manager just before the weekend when usage is highest.

The following procedures are for taking a water sample that will be analyzed for bacteria content. In the case of beach monitoring the indicator being monitored is *Enterococci*.

All sampling personnel should be aware of the concept of “**aseptic technique**” and the integrity of sterile systems. It is imperative, especially under primitive field conditions, that precautions are taken against bacterial contamination or cross-contamination of containers or samples.

Safety is of utmost concern! Use good safety practices, and when in doubt, do not ever risk personal safety for sample collection. Consider wearing a personal floatation device (pfd). This is especially important while wearing waders, as they may fill up and pose a risk. Do not touch eyes and mouth during and after sample collection and be sure to wash your hands. Consider wearing gloves while monitoring areas with high bacteria levels. Working in pairs is recommended for safety, efficiency and quality control.

STEP 1

At the beginning of sample collection, record the sample site number, time, and date on the environmental datasheet.

STEP 2

Record air temperature in degrees Celsius while the thermometer is still dry. Be sure the probe isn't touching anything, and is in the shade or out of direct sunlight for one to two minute before reading. Tidal stage should be recorded (indicate falling or rising tidal stage if possible), as well as present weather conditions and previous weather conditions. (See field *Tip Sheet*).

STEP 2

Collect water samples for bacterial examination in sterile plastic container, such as whirlpak bags. Protection against contamination of the sample and container before, during, and after collection is extremely important. Sterile bags or bottles must first be labeled on the bottom third of the bag starting with the area letter for your beach sample site number, date, and (military) time.

STEP 3

Wade into the water, being careful not to disturb the bottom, to a 3 ft depth to take measurements and to collect the sample. Take the water temperature at each site

at a depth of 6 to 8 inches by holding the thermometer in the water 1-2 minutes before reading the value.

STEP 4

Samples should be collected with the aid of sampling tongs. Keep the sample container closed until immediately before filling. During sampling, protect the container closure from contamination.

To collect the sample, hold the bag with one hand and place the alligator clips of the sample tongs on the **white** tabs (*Hint: located on side of bag, not yellow, paper-covered wires used to close bag*) with the other hand. Try to position alligator clips on tabs at the smallest end (strongest end) of the clips. Also take care to keep the spring-loaded tongs together while placing the clips on the tabs. Tear off top of bag at the perforation, taking care not to touch the opening. Squeeze tongs together and plunge bag *below the surface* 6 to 8 inches. Then tilt it with bag open and pointed toward current.

Before bringing the bag to the surface, close the opening by squeezing the tongs together. To facilitate shaking the sample in the laboratory, fill only two thirds full. Carefully pour or flip out any excess water so that an air space will remain in the two-thirds full bag of water.

STEP 5

Twirl the bag away from you, holding the ends, and then twist the yellow paper-covered wire closures together over the top of the bag. Samples are then placed upright in the cooler, containing ice or ice pack(s), which should be kept between 4-10° C. During the hot summer months place several ice paks in the cooler prior to sampling, assuring that the temperature in the cooler is 4-10 degrees C. (Plastic quart or gallon milk jugs cut in half make good containers for keeping the samples in place and upright.) Only sample bags and ice packs should be transported in the cooler. All other equipment should be stored in the MHB bag or another container.

STEP 7

Record the water temperature on data sheet. Be sure to complete the data sheet as each sample is taken: sample number, temperature, time, salinity, time of tide, weather conditions and any observations that might relate to water quality (e.g. flooding, 10 seals on rocks, oil on surface of water, rotten egg odor, etc.) (*See codes on back of field datasheet*)

3. Salinity Using a Hand-Held Refractometer

These instruments are fairly easy to use.

STEP 1

To calibrate using distilled water, adjust the boundary line to read at the 0/00 of the scale by turning the scale-adjusting knob.

STEP 2

Open the daylight plate and apply one or two drops of a sample solution on the prism surface.

STEP 3

Close the daylight plate gently. The sample solution spreads like a thin film between the daylight plate and the prism. Make sure there are no bubbles in the sample solution.

STEP 4

Hold the refractometer with the daylight plate upward, direct it toward the light, and observe the field of view through the eyepiece. When the field of view is not clear, adjust it by turning the grooved plastic portion of the eyepiece either clockwise or counter clockwise.

STEP 5

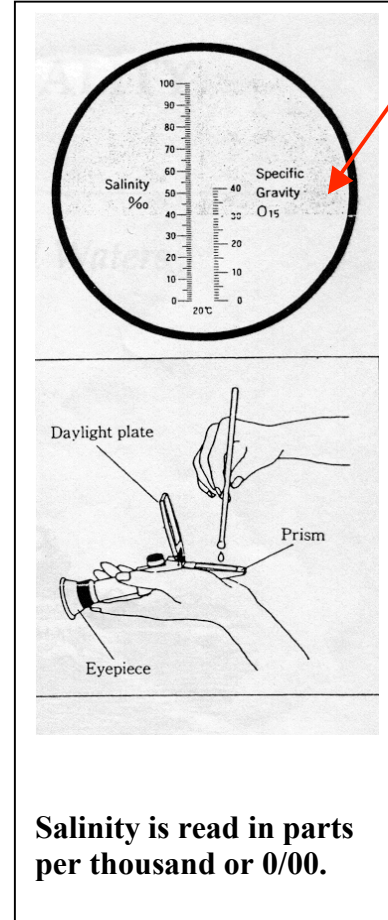
The upper field of view appears in blue and the lower field of view appears in white. Read the scale where the boundary line of the blue and white fields cross the scale. The value read on the right hand scale (in parts per thousand) is the salinity of the sample.

STEP 6

Clean the refractometer after use with a soft cloth soaked in fresh water and wipe off the moisture with a dry cloth.

If the prism surface is smeared with oil or similar liquids, it will repel the sample and obstruct the measurement. Wipe off the contaminant with alcohol, then with fresh water. **NOTE:** You can adjust for your eyesight by twisting the black ring near the eyepiece.

4. **Chain of Custody**-These measures are to ensure the safe transport and integrity of the collected samples. Record cooler temperature, and wait one to two minutes



This diagram is reversed. The instrument has Salinity on the right-hand side.

Salinity is read in parts per thousand or 0/00.

before reading. **DO NOT** crush the thermometer cable between the lid and cooler lip. Record date, time and signature at the bottom of the datasheet.

- 5. Environmental Data-**Transfer all the data recorded on the field datasheet into the MHB Program Database by the end of the scheduled sampling day. Have this verified by another colleague for accuracy when possible.

Methods adapted from: Stancioff, Esperanza. *Clean Water: A Manual for Coastal Water Quality Monitoring*, published by the University of Maine Sea Grant, 1992, revised 1996