Coastal Chemical Monitoring Field Directions

Temperature

Reminders

- Record air temperature before water temperature
- Take one measurement for air temperature and one for water temperature using the same recording device

Procedure

Air Temperature

- Place the dry thermometer in a shady area and record temperature after reading stabilizes.
- Record temperature in degrees Celsius to the nearest 0.5 degree.

Water Temperature

- Take the temperature reading in a well-mixed part of the stream, in the shade if possible.
- If you cannot take the temperature directly from the waterway, fill a bucket with water from a well-flowing area of the waterway and place the thermometer directly into its water.
- Take a reading after the temperature has stabilized (about 2 minutes).
- Record temperature in degrees Celsius to the nearest 0.5 degree.

Salinity

Reminders

- Take two measurements within a duplicate precision of +/- 0.1 ppt
- Calibrate the refractometer no more than 24 hours before a sampling event and record on data sheet
- Before storing the device in its case, rinse the glass with tap water and blot dry with a paper towel

Procedure

- Lift lid on refractometer that protects the glass prism
- Place one or 2 large drops of water from the site onto the glass and close the lid.
- Look through the eye piece and focus your view of the scale inside. Read the line where the blue color meets the white color in the field of view.
- Read the scale on the right hand side that shows parts per thousand or ppt %
- Repeat these steps for both samples and ensure they are within duplicate precision of +/- 1 ppt

Calibrating the Meter

- Life the refractometer lid that protects the glass prism
- Place one or two large drops of distilled water onto the glass and close the lid
- Look through the eye piece and focus your view of the scale inside. Read the line where the blue color meets the white color in the field of view
- Read the scale on the right hand side that shows parts per thousand or ppt %, it should read ‘0’
- If it does not read zero, take a small flat head screw driver (should be included in the case, if not, use a small one made for fixing glasses), and turn the small screen at the top of the refractometer until it reads zero

Water Clarity (Secchi Disk)

Reminders

- Rake two measurements for this parameter within a duplicate precision of +/- 10 cm
- Before taking readings, ensure conditions are right for sampling. Ideal conditions include sunny or partly sunny/cloudy skies; wind-calm to breezy (there should be no whitecaps)
- Collect Secchi measurements between 10 am and 5 pm
- Remove your sun glasses. Wearing sun glasses will give you an unnatural reading

Procedure

- Attached to a calibrated line (in meters (m) or centimeters (cm)), lower the disk into the water on the shady side of the dock/boat until it just disappears. Mark the rope at the surface of the water with a clothespin.
- After marking the spot with a clothespin, lower the disk a few more feet into the water. Slowly raise the disc. When the Secchi disk reappears, mark the rope at the surface of the water with the second clothespin. The clothespin marks may be at the same spot, several inches or feet apart
- Bring the Secchi disk up to the dock/boat
- Average both readings by forming a loop between the two clothespins. Use a 3rd clothespin to mark the center of this loop and remove the other clothespin.
- The remaining clothespin mark is the Secchi reading. Measure from the top of the Secchi disk to the

remaining clothespin for the Secchi Depth measurement 1 (cm)
- Repeat these steps for a second Secchi Depth reading.
- If the Secchi disk reaches the bottom before disappearing, move to deeper water to measure Secchi Depth. If this is not possible then the Secchi Depth is greater than the water depth and cannot be accurately measured. If this occurs, make note of it in the comments section of the data form.

pH

Reminders
- Take two measurements within duplicate precision of 0.25 standard units
- Hold the reagent bottle vertically to ensure uniform drops
- Use a white background when viewing the color comparator with the light shining into it

Procedure

- Rinse two small glass tubes with water from the stream
- Fill each tube to the 10mL line with stream water. Ensure that the meniscus is at the fill line
- Add 10 drops of the pH wide range indicator to each tube
- Cap and gently invert the tubes several times to ensure mixing
- Use the color comparator to determine the pH level
- Record pH to the nearest 0.25 standard units
- Rinse glass vials and caps with distilled water before storing

Dissolved Oxygen

Reminders
- Take two measurements within a duplicate precision of +/- 0.6 mg/L
- Hold reagent bottle vertically to ensure uniform drops
- Many of the reagents used are sensitive to sunlight and high temperatures. Ensure they are not exposed to these conditions for long periods of time.

Procedure

Collecting a Sample

- Rinse both dissolved oxygen sample bottoms twice with stream water
- Submerge the bottles in a well-mixed area of the waterway and cap them while under water to avoid air bubbles from being trapped in the sample
- Avoid collecting samples in areas where the substrate has been disturbed

Fixing the Sample

- In quick succession, add 8 drops of *Manganous Sulfate* to both bottles then add 8 drops of *Alkaline Potassium Iodide Azide* immediately after. Cap both bottles and invert them several times. Wait for the precipitate to settle before proceeding to the next step.
- Add 8 drops of *Sulfuric Acid 1:1*. Cap and shake the bottles until the brown flakes dissolve. This may take some time, so be patient.
- The solution is now "fixed" and may range in color from yellow to orange brown

Fixing the Sample

- Rinse the titration tube twice with a small amount of the fixed sample. Dispose of rinse water in the waste jug. Next, place 20 mL of the fixed sample into the glass titration vial for analysis.
- Using the pink tip, fill the titrator (small syringe) to the 10 mL line with *Sodium Thiosulfate*. Ensure no air bubbles are trapped in the titrator. Place the titrator into the hole in the cap of the glass titration vial, or, depending on the kit being used, hold the eyedropper above the fixed sample.
- Slowly add *Sodium Thiosulfate* from the titrator into the sample. After each drop, swirl thoroughly to mix the reagent throughout the solution. Continue one drop at a time until the solution turns a **pale, straw yellow color.**
- Remove the titration vial cap and titrator CAREFULLY so as not to lose any of the *Sodium Thiosulfate* which will be used again shortly. Add 8 drops of the *Starch Solution* to the titration vial that is holding the sample. The sample will turn dark blue.
- Place the syringe filled with leftover *Sodium Thiosulfate* into the sample **ONE DROP AT A TIME**, swirling thoroughly after each drop until the solution turns from blue to clear.
- Read the amount of oxygen dissolved in your sample directly from the syringe. Tick marks measure 0.2 ppm. Read the final dissolved oxygen value at the liquid side of the green plunger disk inside the titrator.
- Repeat the procedure of Step C for the second sample bottle.