Field Directions for Core Tests of Coastal Chemical Monitoring

Temperature

Notes:

- Record air temperature before water temperature
- Take one measurement for air temperature and water temperature

1. 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.
2. Water temperature - take the temperature reading of the water in the shade. It is best to take the temperature reading directly in the stream, but if you cannot, place thermometer directly into a bucket of sample water (in the shade) and record temperature. Take reading after temperature has stabilized (about 2 minutes). Record temperature in degrees Celsius to the nearest 0.5 degree.

Salinity

Note:

- Take two measurements for this parameter, the duplicate precision is +/- 1.0ppt

Calibrating the meter:

Notes:

- Use distilled water
- Calibrate your meter prior to each sampling event and record on data form

1. Lift lid on refractometer that protects the glass prism.
2. Place one or 2 large drops of distilled water onto the glass and close the lid.
3. 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.
4. Read the scale on the right hand side that shows parts per thousand or ppt ‰, this should read '0'
5. If it does not read zero, take small flat-head screw driver (should be in case, and if not, use a small one made for fixing glasses), and turn small screw on the top of the refractometer until it does read zero.

Measuring Salinity:

1. Lift lid on refractometer that protects the glass prism.
2. Place one or 2 large drops of water sample onto the glass and close the lid.
3. 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.
4. Read the scale on the right hand side that shows parts per thousand or ppt ‰.
5. Repeat steps 1-4, ensuring that the two samples are within the duplicate precision rule of +/- 1ppt.

Instrument Maintenance:

1. Rinse glass with tap water, blot dry with a paper towel, and store in case.

Water Clarity (Secchi Disk)

Note:

- Take two measurements for this parameter, the duplicate precision is +/- 10 centimeters (cm)
- Before going out to take your Secchi disk readings, be sure the conditions are right for sampling. Ideal weather conditions include sunny or partly sunny/cloudy skies; wind-calm to breezy (there should be no whitecaps)
- Collect Secchi measurements between 10 am and 4 pm
- Remove your sun glasses. Wearing sun glasses will give you an unnatural reading.

1. Attached to a calibrated line (in meters (m) and/or centimeters (cm), lower the disk into the water on the shady side of the dock/boat until it just disappears from sight. Mark the rope at the surface of the water with a clothespin.
2. After you have marked this spot with the 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 even several feet apart.
3. Bring the Secchi disk up to the dock/boat
4. Average your two Secchi disk readings by forming a loop between the two clothespins. Mark with a 3rd clothespin, the center of the loop to mark it. Remove the other clothespin.
5. The remaining clothespin mark will be your Secchi reading. Measure from the top of the Secchi disk to the remaining clothespin for your Secchi Depth measurement #1 (cm).
6. Repeat steps 1-5 for Secchi Depth reading #2. Note: 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. When this occurs, please make a note of this in the comments section of the data form.

Dissolved Oxygen

Notes:

- Take two measurements for dissolved oxygen, the duplicate precision rule for dissolved oxygen is +/- 0.6 mg/L
- Hold reagent bottles vertical to ensure uniform drops

A- Collect two replicate samples to ensure precision

1. Using the two dissolved oxygen sample bottles in your kit, remove caps and rinse bottles twice with stream water. In a well-mixed area of the stream, hold both bottles under water and carefully fill them completely with water, avoiding trapping air bubbles or bubbling air into the sample (which may add dissolved oxygen) and cap under water. Avoid collecting samples in areas that you have disturbed the substrate.

B- "Fixing" the samples

Note: "fix" both sample bottles at the same time

2. In quick succession, add 8 drops of *Manganous Sulfate* Solution to each sample bottle then 8 drops of *Alkaline Potassium Iodide Azide* to each sample bottle. Cap the bottles and invert several times. Wait until the precipitate settles below the shoulder of the bottle before proceeding to step 3.
3. Add 8 drops of *Sulfuric Acid 1:1*. Cap and repeatedly invert bottles until the brown flakes dissolve. This may take some time, so be patient. Once this step is complete, the solution is now "fixed" and may range in color from yellow to orange brown.

C- Titrating the sample

Note: Process one sample bottle at a time

4. 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.

5. Using the pink tip, fill the titrator (small syringe) to the 10mL line with *Sodium Thiosulfate*. Make sure no bubbles are in the titrator. Place the titrator into the hole in the cap of the glass titration vial, or, depending on which kit is used, hold the eyedropper above the fixed sample.

6. Slowly add *Sodium Thiosulfate* from the titrator into the sample. After each drop, swirl to thoroughly to mix the Sodium Thiosulfate throughout the solution. Continue one drop at a time until the solution turns a **pale straw yellow color**. *Note- High light intensity degrades Sodium Thiosulfate - do not allow the sample bottle to be exposed to the sun for long periods of time.
7. Remove the titration vial cap and titrator CAREFULLY so as not to lose any of the Sodium Thiosulfate (you will continue titrating in step 9). Add 8 drops of *Starch Solution* to the titration vial that is holding the sample. The sample will turn dark blue. Continue titrating with *Sodium Thiosulfate* **ONE DROP AT A TIME**, swirling thoroughly after each drop, until the solution turns from blue to clear.
8. Read the amount of dissolved oxygen in your sample directly from the syringe (direct reading titrator). Tick marks measure 0.2 ppm. Read the final dissolved oxygen value at the liquid side of the green plunger disk inside the titrator.
9. Repeat the procedures of Step C for the second sample bottle.

pH

Notes:

- Take two measurements, the duplicate precision rule for pH is 0.25 standard units
- Hold reagent bottle vertical to ensure uniform drops
- Use a white background and view the comparator box with the light shining over your shoulders into the comparator.

1. Rinse two small glass tubes twice with sample water.
2. Fill each tube to the 5 mL line with sample water. If using the octa-slide 2 viewer pH test, fill each tube to the 10 mL line and proceed with next step. Overfill the tube and 'flick' out excess water. Ensure that the meniscus is at the fill line.
3. Add 10 drops of the pH wide range indicator to each tube.
4. Cap and gently invert the tubes several times to ensure mixing.
5. Use the color comparator boxes to determine the pH level.
6. Record pH to the nearest 0.25 standard units.
7. Rinse glass vials and caps with distilled water so they are ready for your next sampling event.