1 POINT OF CONTACT

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2 OBJECTIVE

Determine the clarity of the water as represented by Secchi depth. Frequency of sampling and daily order of events are specified in the “UWS Sampling Plan SOP.”

3 DEFINITIONS AND ABBREVIATIONS

Embayment: A recess in a coastline or an indentation off a shoreline which forms a bay. In Long Island Sound, the names of embayments often include the words Harbor (27%), River (23%), Cove (19%), Bay (10%), Creek (10%), and Pond (7%); with a few including the names Brook, Gut, Inlet, or Lake.

Field Team: Person or group of people working together to sample a station.
Monitoring Group: The group conducting the field work.

Section: The reporting regions for the embayment report card. Each section must include a minimum of three stations. Sections will be assigned a unique name by the UWS; examples are included below.

<table>
<thead>
<tr>
<th>Number of Sections</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of Sections</td>
<td>whole</td>
<td>inner</td>
<td>outer</td>
</tr>
<tr>
<td>Abbreviations for Sections</td>
<td>W</td>
<td>I O</td>
<td>I M O</td>
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</tbody>
</table>

Site: The whole embayment, as defined by the UWS list. Each site has a unique three letter code assigned by the UWS; for example, Little neck Bay, NY is “LNE”.

SOP: Standard operating procedure; this document is a SOP.

Station: The location where samples are collected, identified by a GPS location.

UWS: Unified Water Study

UWS Coordinator: The person designated as the point of contact for the UWS.

UWS Scientific Advisor: Estuarine or water quality scientists designated as advisors to the UWS.

4 OVERVIEW

Secchi disks are used by many monitoring programs as they provide an inexpensive and quick method for evaluating the clarity of the water.

Secchi disks range in size and material. The disc is typically divided into four alternating black and white quadrants, though discs can alternatively be all white; either is fine for the UWS. Secchi discs used in freshwater systems are typically 20 cm in diameter, while Secchi discs used in open water (deep) marine systems are typically 40 cm to 50 cm in diameter, though they can range in sizes from 5 cm to 1 m. The size is determined by the expected Secchi depth for the system. Larger sizes are used in clearer waters, where the disappearance from view may be due to the size of the disc versus the clarity of the water.

5 SOURCES

These procedures are based on the EPA Volunteer Estuary Monitoring Manual (EPA, 2007) and follows methods used in the EPA National Coastal Assessment (EPA, 2001). The EPA Volunteer Estuary Monitoring Manual (EPA, 2007) provides a wealth of specific data for monitoring groups. All groups should refer to the EPA manual for specific guidance.

6 MATERIALS AND EQUIPMENT

- Weighted Secchi disc
o Rope with depth designations measured from the surface of the Secchi disc, when connected.
  ➢ You may use a metered line.
  ➢ Alternatively, you may use a rope and connect a meter tape to the rope for determining depth.

7 METHODS

7.1 Preparation

o Examine the Secchi disc for damage; check that the weight is securely attached to the Secchi disc. Check that the attachment for the rope is secure.
  o Chipped sections on the disc are acceptable if they do not affect your ability to see the disc when underwater.
  o Chips can be repaired by painting with the appropriate color or using electrical tape of the appropriate color to cover the chips.

o Examine the line for wear or damage.

o At least once a month, measure the increments on the line to ensure line has not stretched or shrank.

o Check out the Secchi disc simulator. This website provides a chance to test your Secchi depth reading skills: http://www.mainelakedata.org/recertify/disk.php. This site is hosted by the Maine Volunteer Lake Monitoring Program.

7.2 Field Collection and Processing

1. Check to make sure that the Secchi disk is securely attached to the measured line.

2. Lean over the side of the boat and lower the Secchi disk into the water.
   a. Sampling should occur on the shady side of the boat. If there is no shade, or you are sampling from shore, keep your back to the sun to block glare.
   b. Do not wear sunglasses.

3. Lower the disk until it disappears from view. Lower it an additional one third of a meter and then slowly raise the disk until it just reappears. Move the disk up and down until the exact vanishing point is found.

4. Record the depth of the vanishing point to the nearest 5 centimeters on the data sheet. It can be helpful to pinch the line exactly at the waterline before retrieving for measurement.

5. Repeat for a total of at least three readings and record each.

6. If the range of measurements for the three readings is greater than 0.5 m, repeat the entire measurement process, raising and lowering the disk several times around the vanishing point.
   ➢ If the Secchi disk is still visible on the bottom, record the Secchi depth as “BV” for bottom viewable. Be sure to record the depth on the data sheet.
   ➢ If more than one person is available, each person should make a measurement and the results should be averaged.
7.3 Sample Storage

Not applicable.

7.4 Laboratory Analysis

Not applicable.

8 TROUBLESHOOTING / HINTS

➢ Secure the free end of the line to a cleat or piling to avoid losing the Secchi disc overboard.
➢ Use the shady side of the boat.
➢ Do not wear sunglasses.
➢ Add more weight in strong currents if needed.
➢ Always carry a copy of this SOP and the relevant parameter-specific SOPs.
➢ Print out the “quick sheets” for relevant SOPs to use as a reminder in the field. Do not laminate these as you will want to add notes. A plastic page-protector taped close can be used to keep these sheets dry.

9 DATA PROCESSING AND STORAGE

The UWS coordinator will be the custodian of the finalized data files. The UWS coordinator will maintain a database which includes the unique site codes, section codes, and station codes for the embayment. Each unique station code will be affiliated with the corresponding GPS for the station.

The monitoring group is responsible for obtaining data, entering data into the UWS data template, and delivering the data to the UWS coordinator.

The monitoring group is responsible for assuring that the correct unique station ID assigned by the UWS is properly matched with the local organizations station ID codes. Both codes (monitoring group’s station code and UWS unique station ID) will be entered into the data template, along with the GPS coordinates.

10 REFERENCES


11 Quick Sheet – Secchi Depth

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