Protocol: Seagrass Sediment Organic Matter

V 0.0.1

Last updated: 10 November 2018

1. Introduction

This protocol provides standardized data on seagrass sediment organic matter obtained through loss-on-ignition. Quantification of the sediments may inform characteristics of the seagrass itself obtained through complementary surveys.

> Six (6) 5 cm-*x*-5cm sediment cores are taken along three (3) transects (total $N = 18$). Organic matter content is obtained through loss-on-ignition using a combustion furnace.

Additional copies of this protocol, field datasheets, data entry templates, instructional videos, literature, and more can be found on the Seagrass section of the MarineGEO protocol website: https://marinegeo.github.io/seagrass-habitat.

2. Measured Parameters

- Sediment dry weight (mg)
- Sediment ash-free dry weight (mg)

3. Requirements

Personnel: 2 persons

Time:
Preparation: 2 persons *x* 0.5 hr.
Field work: 2 persons *x* 0.5 days.
Post processing: 1 persons *x* 1 days.
Data processing: 1 persons *x* 1 hr.

Replication: 6 locations *x* 3 transects = 18 samples

Materials Checklist:

- ☐ 18 plastic bags (1 quart or 1 L) with external and internal labels
- ☐ 5-mL syringe with the applicator tip cut off
- ☐ Pencil

- ☐ Waterproof paper
- ☐ Drying oven
- ☐ Combustion furnace

4. Methods

Fully review this and any additional protocols necessary for the sampling excursion. Address any questions or concerns to marinegeo@si.edu before beginning this protocol.

4.1 Preparation

1. Place 18 internal labels written on waterproof paper with the sampling location, transect, and replicate number inside 18 plastic bags.
2. Fill a cooler with ice immediately before departing for the field.

4.2 Fieldwork

1. Sampling locations should align with half of the 36 quadrat locations as determined in the Seagrass Quadrats Protocol (link). The sediment samples will be taken *every other* point along the transect (e.g., replicate 1, 3, 5, etc.). (Alternately, the 16 sampling locations can be determined haphazardly within the full area of the bed.)
2. At each sampling location, select the corresponding labeled plastic bag.
3. Remove the plunger from the syringe. Take the open end of the 5-mL syringe and gently insert it into the sediment to a depth of ~5 cm. Take care to avoid any structures like rhizomes or woody debris.
4. Place the plunger into the syringe to create suction, and then gently extract the syringe from the sediment.
5. Use the plunger to push the sediment into the plastic bag and seal it. Rinse the syringe.
6. Repeat steps 2-5 at the next location along the first transect until all 6 replicates are taken.
7. Repeat steps 2-6 for the remaining two transects for a total of 18 samples.
8. Place all bags on ice in the cooler. Transport cooler with samples back to the lab for processing.

4.3 Sample Processing

1. Samples are best processed within 24 hours of returning from the field. Samples can be stored for longer in the refrigerator, but risks evaporation.
2. Use a scale to pre-weigh foil tins (either manufactured, or made by folding an aluminum foil square over on itself and sealing the sides). Record the weight of the tin directly on the foil using a pen.
3. Invert each plastic bag and deposit the sediment plug into a pre-weighed tin.
4. Remove all visible fauna, large shells, rhizomes/roots/woody debris from the sample. Work quickly to minimize loss of water.
5. Weigh the tin and wet sediment plug, and record the weight on the lab data sheet.

6. Place the labeled foil tins in a drying oven at 60°C and dry to constant weight (usually 1-3 days, depending on the volume of material).
7. Weigh the tin and dry sediment plug, and record the weight on the lab data sheet.
8. Combust the samples at 520°C for 5 hours.
9. Let the sample cool in the drying oven to avoid taking on any moisture, then weigh the tin and combusted sediment plug, and record the weight on the lab data sheet.

4.4 Data Submission

1. Enter data into provided data entry template (https://marinegeo.github.io/modules/seagrass-sediment-om).
2. Scan the completed lab data sheets and save both paper and electronic versions.
3. E-mail data entry file and scanned lab data sheets to: marinegeo-data@si.edu