MarineGEO

Sediment Organic Matter

v 0.1.1

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Introduction

This protocol provides standardized data on sediment organic matter content, which 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 MarineGEO protocol website: https://marinegeo.github.io/.

Measured Parameters

This protocol quantifies the organic matter content in marine sediments, measured as:

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

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: Six (6) 5 cm-x-5cm sediment cores are taken along three (3) transects (total *N* = 18)

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

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

Preparation:

1. Identify sampling scheme. If following the MarineGEO survey design, review the materials here (6 replicates *x* 3 transects = 18 replicates total). Alternately, samples can be taken haphazardly within the bed (if done, record GPS coordinates of each sample)
2. Place 18 internal labels written on waterproof paper with the sampling location, transect, and replicate number inside 18 plastic bags
3. Fill a cooler with ice immediately before departing for the field

Fieldwork:

1. At each sampling location, identify a patch at the corresponding point along the transect (if following the MarineGEO survey design) and select the corresponding labeled mesh bag
2. 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
3. Place the plunger into the syringe to create suction, and then gently extract the syringe from the sediment
4. Use the plunger to push the sediment into the plastic bag and seal it. Rinse the syringe
5. Repeat steps 2-5 at the next location along the first transect until all 6 replicates are taken
6. Repeat steps 2-6 for the remaining two transects for a total of 18 samples
7. Place all bags on ice in the cooler. Transport cooler with samples back to the lab for processing

Sample Processing:

Samples are best processed within 24 hours of returning from the field. Samples can be stored for longer in the refrigerator, but risks evaporation

1. Weigh foil tins and record the weight of the tin directly on the foil using a pen. Tins can be either pre-made, or constructed by folding an aluminum foil square over on itself and sealing the sides
2. Invert each plastic bag and deposit the sediment plug into a pre-weighed tin
3. Remove all visible fauna, large shells, rhizomes/roots/woody debris from the sample. Work quickly to minimize loss of water
4. Weigh the tin and wet sediment plug, and record the weight on the lab data sheet
5. 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)

6. Weigh the tin and now dry sediment plug, and record the weight on the lab data sheet
7. Combust the samples at 520°C for 5 hours.
8. 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

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Data Submission

1. Enter data into provided data entry template
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