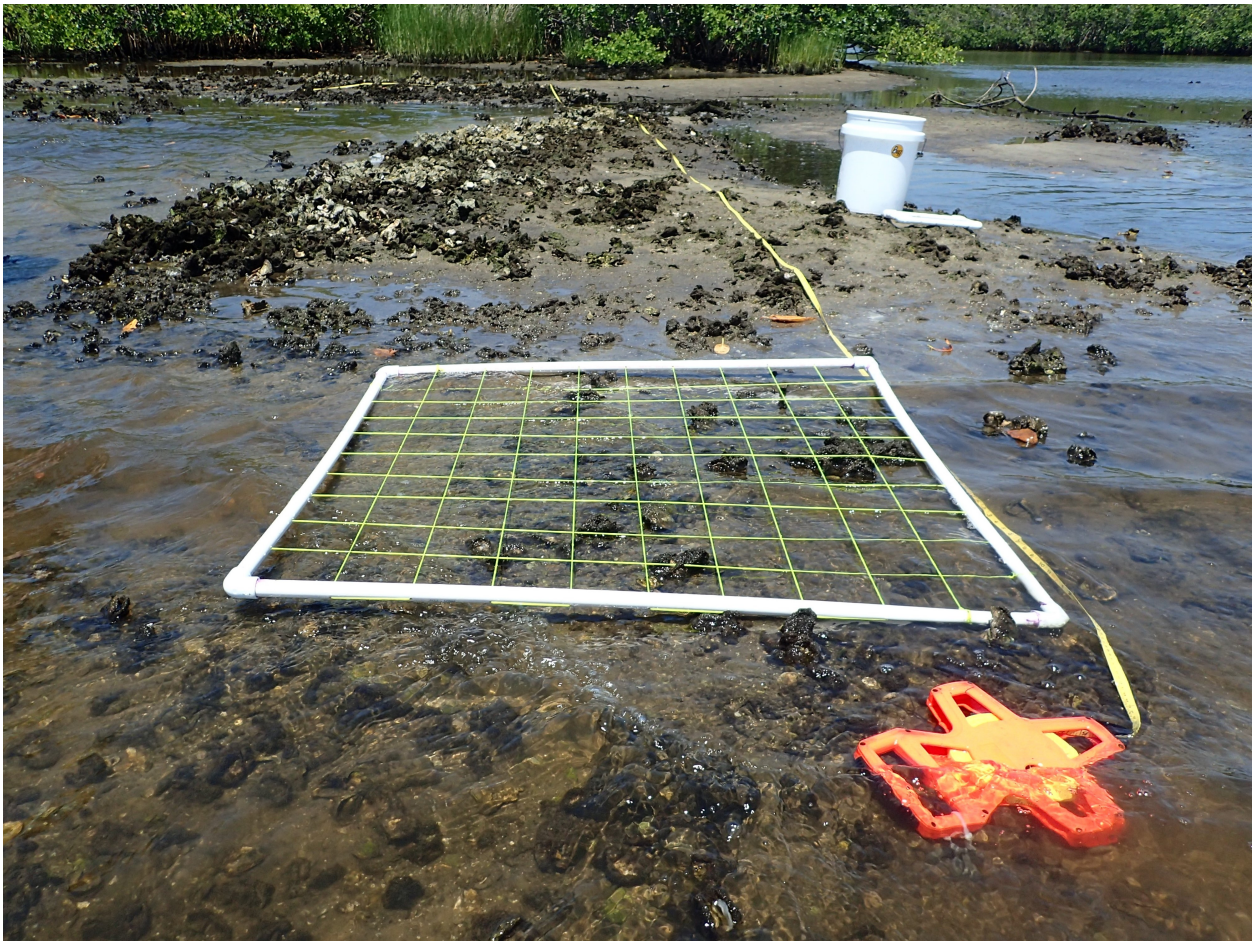
Protocol: Oyster Reef Rugosity



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Smithsonian Institution

Introduction

This protocol provides methods on standardized data collection to measure rugosity on an oyster reef. Rugosity is defined as the three-dimensional arrangement of structural features and can be used as a proxy for habitat complexity which can be directly related to other measured parameters such as oyster percent cover, oyster size frequency, and the abundance of associated species. Rugosity (**Rq**) is measured by a chain method in which a chain of known length is hung over the substrate in a straight line. A Rugosity index is calculated as **Rq = 1-d/l** where **d** = distance covered by chain on substrate and **l** = length of chain fully extended. A value approaching 1 indicates a nearly flat surface and decreases as the substrate becomes more structurally complex.

Measured Parameters

- Ratio: fixed distance / length of chain to reach that fixed distance

Requirements

Personnel: 2 – 4 people

Estimated Total Time Per Location ($n = 15$)

Preparation: 1 person x 1 day
Fieldwork: 2 - 4 people x 1 day per location
Post processing: None
Data processing: 1 person x 1 day

Replication: At least 15 measurements per oyster reef

Materials:

Fieldwork:

- ☐ Brass chain (1 m)
- ☐ Oyster reef rugosity data sheets

Methods

Preparation:

1. Review the MarineGEO Oyster Reef Habitat Survey Design for selection of permanent sites.
2. Sampling is typically done at a low tide when the oyster reef is exposed.

Fieldwork:

1. Along each of the transect lines that have been placed to sample oyster percent cover (Reef Composition Protocol), randomly select 5 spots to measure rugosity (5 measurements per transect x 3 transects = 15 total measurements per site) parallel to the waterline. At each spot, place the chain and lay it out along the substrate to conform with the oysters.
2. Measure the horizontal distance of the laid-out chain and record this.
3. Rugosity: **Rq = 1 − d / l** where **d** = length of measured distance and **l** = total length of chain

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Data Submission

1. Scan the completed field data sheets and save both paper and electronic versions locally. We do not require you to submit the scanned forms.
2. Enter data into the provided data entry template. Each template is an Excel spreadsheet. Please provide as much protocol and sample metadata as possible, such as the protocol version and contact information. Use the "notes" columns to provide additional information or context if a relevant column doesn't already exist, rather than renaming or creating columns.
3. Use our online submission portal to upload the Excel Spreadsheet: https://marinegeo.github.io/data-submission
4. Contact us if you have any questions: marinegeo@si.edu