

Protocol: Oyster Reef Area and Height



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Introduction

This protocol provides methods on standardized data collection for the areal dimensions and height of an oyster reef. The area is defined as the reef itself with a continuous edge extending to approximately 25% cover of living or dead shell. The height of an oyster reef is defined as the mean height of the reef above the surrounding adjacent substrate, excluding the terrestrial shoreline. At a particular site, several reefs or patch reefs could be present. Each reef within the vicinity should have both the height and area measured if other forms of data are taken from it.

Measured Parameters

- Oyster reef areal dimensions (m^2)
- Mean reef height (cm, m)

Requirements

Personnel: 2 – 4 people

Estimated Total Time Per Location ($n = 3$)

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 3 oyster reefs per region

Materials:

Fieldwork:

- Hand-held GPS or better
 - String with line level
 - Meter stick
 - Oyster reef area and height data sheets
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Methods

Preparation:

1. Review the MarineGEO Oyster Reef Habitat Survey Design for selection of permanent sites.
2. Become familiar with the GPS equipment that will be used in the field. Test the device and make sure that it is collecting data and that this data can be moved to mapping software.
3. Sampling is typically done at a low tide when the oyster reef is exposed.

Fieldwork: Reef Area

1. For intertidal reefs and at a negative low tide, walk the continuous edge (<25% dead/live shell) or perimeter of the reef(s) using at least a standard hand-held GPS. Collect as many GPS points as possible along the edge. The more points collected will increase the accuracy of the area calculated during post-processing. Coordinates are later entered into mapping software (e.g. ArcGIS) in order to calculate both the individual reef area as well as the summed total reef area.
2. Repeat data collection for each reef.

Alternative Methodology:

1. The area of an oyster reef can be obtained in several ways, all of which will inherently have some error associated with them. An alternative method to collecting areal dimensions includes using a drone to capture aerial imagery that can be used to quantify the extent of a reef. During an extreme low tide, whereby the edge of a reef is exposed or at least visible in shallow water, fly the drone at a constant height that captures the entire reef. Include a meter stick or something similar to be used for post-processing scaling on the reef and place a GPS reference point on the reef to be including in the aerial imagery.

Fieldwork: Reef Height

1. If available, more sophisticated GPS equipment can be utilized to capture the mean height of a reef, however, in most cases practitioners will not have access to this and therefore they can proceed as follows below.
 2. One person should find the average crest of the reef. In general, oyster reefs have little relief and so the position picked should be easy to find, approximate of the center, and representative of the crest. At the selected point, hold a string (with line level attached) against the oysters. The other end of the string is held by another along with a ruler or meter stick. Starting at the oyster reef edge (<25% living/dead shell cover), walk the perimeter of the reef and every 1-2 m take another measurement with respect to the edge and the crest of the reef. Encircling the reef should provide a relatively accurate mean height of the reef.
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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