Seagrass Quadrats

v 0.1

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Introduction

This protocol provides standardized data on seagrass percent cover, species composition, and shoot density using a common non-destructive method: the quadrat. The information from these variables helps characterize the quality and quantity of habitat that seagrasses provide, and is therefore closely linked with other seagrass sampling methods employed by MarineGEO.

Copies of this protocol, field datasheets, data entry templates, instructional videos, literature, and more can be found on the seagrass quadrat section of the MarineGEO protocol website: https://marinegeo.github.io/modules/seagrass-quadrats.

Measured parameters

- Percent cover of each seagrass and macroalgae species (in 5% bins of 0.25 m^2)
- Macroinvertebrate abundance (number 0.25 m^{-2}) and approximate size (cm)
- Grazing scars (present/absent)
- Shoot density (number 0.0625 m^{-2})

Requirements

Personnel: 2 persons

Time: Preparation: None
Fieldwork: 2 persons x 0.5 days
Data processing: 1 person x 0.5 days

Replication: 3 transects X 12 quadrats each = 36 replicates

Materials:

- ☐ Hand-held GPS unit
- ☐ 1 (large) 50 cm-x-50 cm (0.25 m^2) quadrat (PVC or other material)
- ☐ 1 (small) 25 cm-x-25 cm (0.0625 m^2) quadrat
- ☐ 1 50-m transect tape with 1-m markers
- ☐ 3 sets of twelve randomly generated numbers for each transect survey
- ☐ 2 PVC marker poles (diameter and length as needed)
- ☐ Pencil
- ☐ Waterproof paper
- ☐ Clipboard
- ☐ OPTIONAL: Waterproof camera

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. Assemble field gear (see Materials checklist)
2. Print field data sheets on waterproof paper. You will need at least 3 sheets, potentially more.
3. Make three sets of 12 random numbers ranging from 0-50 (i.e., 12 numbers for each transect; total=36). Record these in the notes section of the field datasheet.

Fieldwork

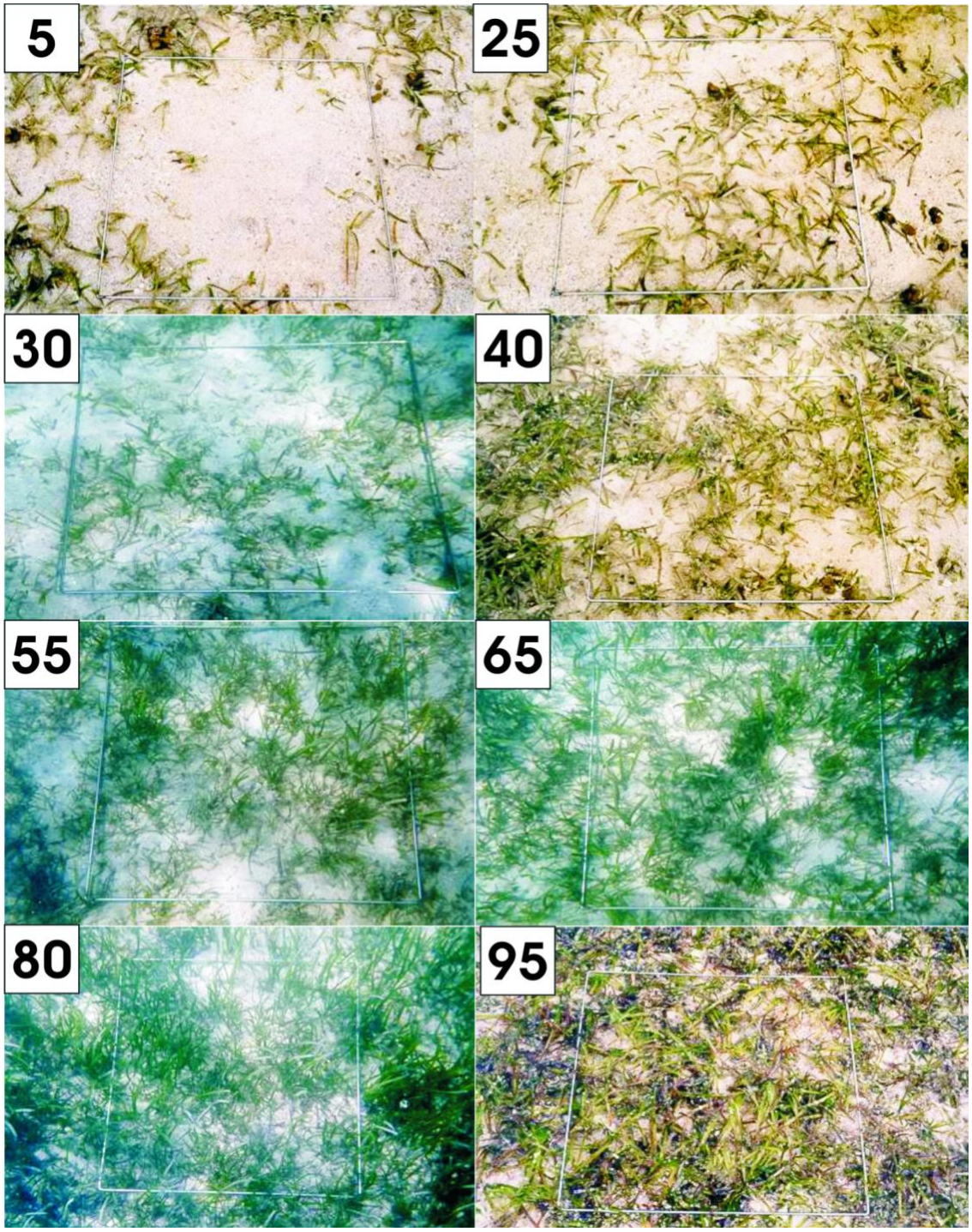
1. Scout the site to determine positions of the three, 50-m transects. Transects should be placed parallel to shore near the shallow, middle, and deep edges of the bed and capture the maximum amount of meadow possible.
2. Record the GPS coordinates (decimal format) of the beginning and end of each of the 3 transects (N = 6 measurements).
3. Lay out the first transect line and anchor it using the PCV marker poles.
4. On the shallow transect, go to the meter point that corresponds to the first random number you generated.
5. Lay down the 50 cm-x-50 cm quadrat grid immediately adjacent to the transect line.
6. Estimate and record percentage (in 5% bins) of:
    a. Each seagrass species (see Appendix A – Seagrass Percentage Cover Photo Guide).
    b. Other sessile organisms (e.g., macroalgae, sponges, etc.). Be as specific as you can in identifying these organisms but do not guess if you are unsure (e.g., record 'red sponge' not '*Acarnus erithacus?*').
    c. Bare substratum. Note the type (e.g., sand, mud, mixed).
    d. If multiple species are present in layers, percent cover may exceed 100%.
7. Presence and approximate size of any larger (>1 cm) mobile benthic macroinvertebrates that fall within the quadrat (e.g., gastropods, urchins, sea cucumbers)
8. Presence of any conspicuous grazing scars (e.g., turtle, manatee, parrotfish) within or immediately adjacent to the quadrat.
9. Place the smaller 25 cm-x-25 cm quadrat in the lower quadrant of the larger quadrat.
    a. Record the number of seagrass shoots within the smaller quadrat
    b. Record the number of flowering/fruiting
10. OPTIONAL—If visibility is sufficient, record a photograph of the larger, 0.25-m^2 transect using an underwater digital camera.
11. Repeat for the remaining points along the first transect.

12. Move PVC markers and repeat steps 2-11 for the second and third transects.

Data Submission

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

Appendix A – Seagrass Percentage Cover Photo Guide



Courtesy: SeagrassNet

Appendix A – Seagrass Flowers and Fruit

Figure 1: Flower of Thalassia testidinum

Figure 2: Fruit of Posidonia australia