

Definition and Measurement of Reef Area and Vertical Relief of Restored Oyster Reefs

Lesley P. Baggett¹; Sean P. Powers¹; Robert Brumbaugh²; Loren Coen³;
Bryan DeAngelis⁴; Boze Hancock²; **Summer Morlock⁴**

¹The University of South Alabama/Dauphin Island Sea Lab; ²The Nature Conservancy; ³Florida Atlantic University; ⁴**NOAA Restoration Center**



Universal Metrics

- Reef Areal Dimension
- Reef Height (*Crassostrea virginica*)
- Emergent Reef Structure (*Ostrea lurida* only)
- Oyster Density
- Oyster Size-Frequency Distribution

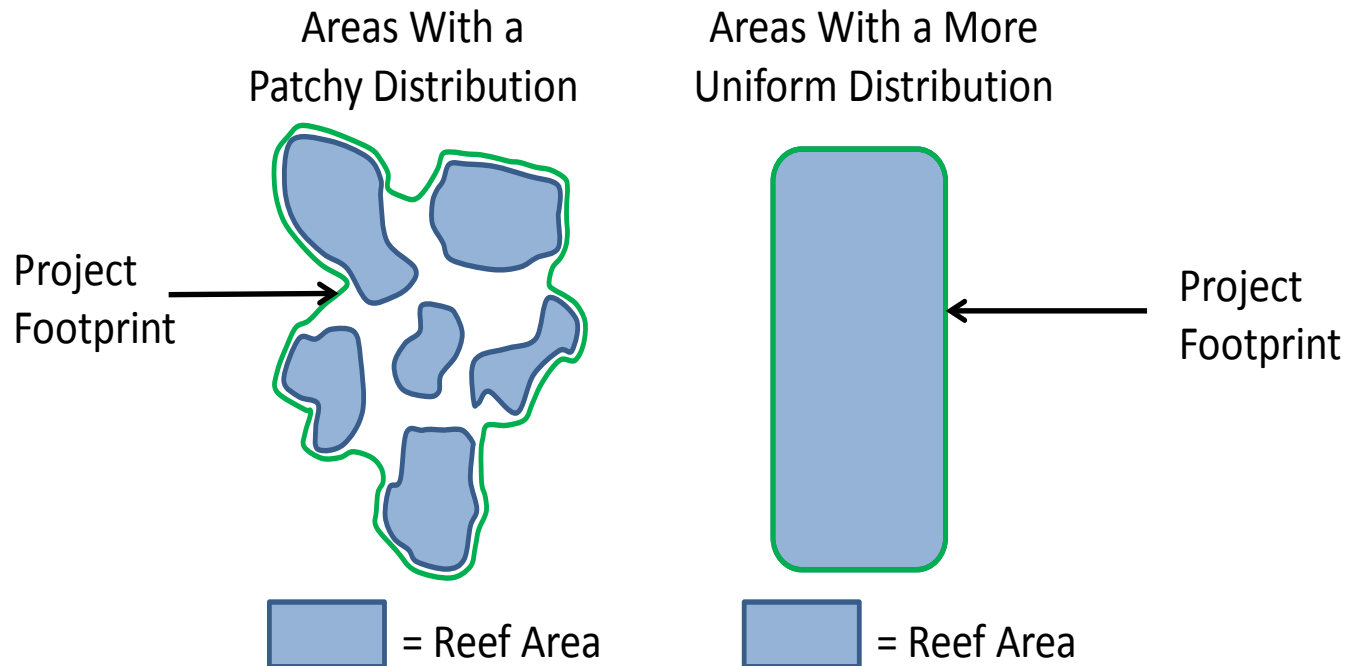


Mosaic of images obtained using side-scan sonar showing oyster reefs in Mobile Bay, AL

Universal Metric: Reef Areal Dimension

- Consists of two component metrics:
 - Project footprint – maximum areal extent of the footprint of the reef system
 - Reef area – summed area of patches of living and non-living oyster shell (or reef substrate) within the project footprint

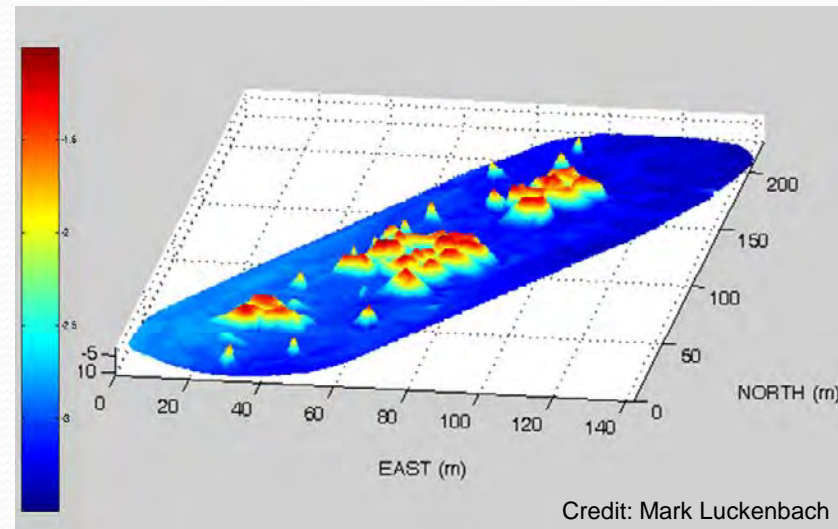
Universal Metric: Reef Areal Dimension



The footprint perimeter is defined as a continuous line where the percent coverage of living or non-living shell substrate is equal to or greater than 25%

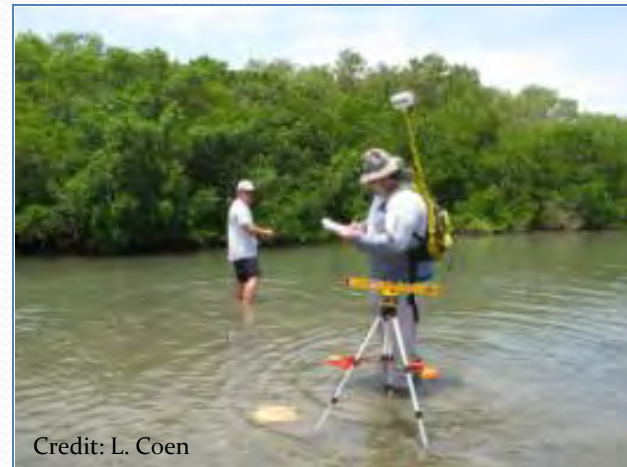
Universal Metric: Reef Areal Dimension

- Units: m^2
- Preferred Methodology: Differential GPS/GIS (side-scan sonar/depth-finder for sub-tidal)
- Performance Criteria = None
 - Gains in reef areal dimension may be due to spreading of original cultch and not accretion of the reef
 - Still important to document potential changes in area over time to performance

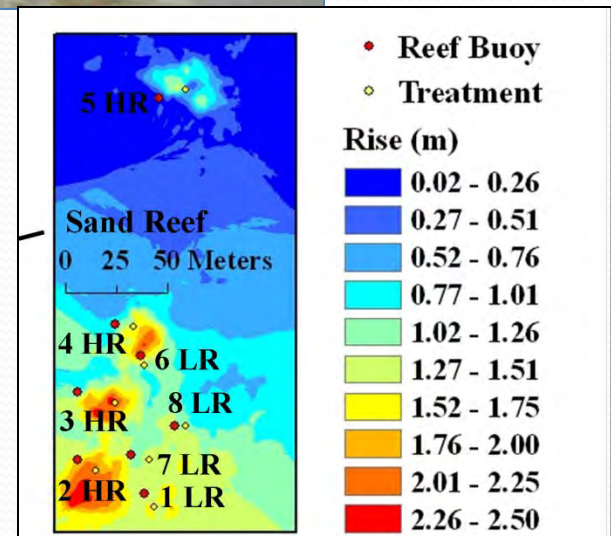


Universal Metric: Reef Height

- For *C. virginica*
- Average height of a reef off the bottom substrate
- Units: m
- Preferred Methodology: rod and transit/laser-level (subtidal: side-scan sonar/depth finder)
- Performance criteria = positive or neutral change in reef height from original structure



Credit: L. Coen



Credit: DISL

Universal Metric: Emergent Reef Structure

- For *O. lurida* only
- Consists of three component measurements:
 - Shell thickness - Average height of bed off the bottom substrate
 - Percent cover - Visual estimation of percentage of substrate covered by shell
 - Emergent shell volume - Volume of emergent shell present on bed
- Units: cm (shell thickness); % (percent cover); ml/m² (emergent shell volume)
- Preferred Methodology: 1/16th m² quadrats (ruler; visual estimation; weight displacement of all collected shell)
- Performance Criteria = Positive or neutral change in component metrics from initial structure