2015

Short Term Changes in Seagrass Meadows in the Northern Indian River Lagoon (Titusville. FL)

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Abstract:

The purpose of this study was to research the distribution and growth of seagrasses at the Max Brewer Causeway (Titusville, FL) over Summer 2015. The seagrass surveyed was *Halodule wrightii*, because of it is the most abundant species of seagrass in the Indian River Lagoon. Seagrass is important to shallow waters because of the coastal/shoreline protection they offer, the food they deliver for grazers, and the nursery habitat they offer for developing fish. Seagrass surveys were carried out at the end of May and the end of June, and then compared. Both drift algae and *H. wrightii* were studied because of their frequent association. Results showed a decrease of drift algae coverage and canopy height, and an increase of seagrass coverage and canopy height in just 4 weeks.

Introduction:

This study focused on the distribution and abundance of *Halodule wrightii*, also called shoal grass. This type of seagrass is important food and habitat in the estuary, and also helps increase sedimentation protect against erosion. The meadows need ample sunlight, however, and are thus restricted to shallow photic zones.

Many factors are stressing and degrading seagrass in the Indian River Lagoon (IRL). Microalgal blooms cause turbidity and shade seagrasses. Drift algae also restrict light available for seagrasses. Anthropogenic damage to meadows (e.g., boat propeller scarring) and nutrient introduction promotes algae and harms seagrasses. These recent stresses on seagrasses have increased interest in their growth, distribution, and success.

The study site (Max Brewer causeway, Titusville, FL) was chosen because of its abundant seagrass meadows and local recent algal blooms. The goal was to examine stability and growth of the seagrass *H. wrightii* in the wake of the recent harmful algal booms. The study is a comparison of seagrass abundance and distribution at the site on May 27th vs. a month later on June 30th (2014).

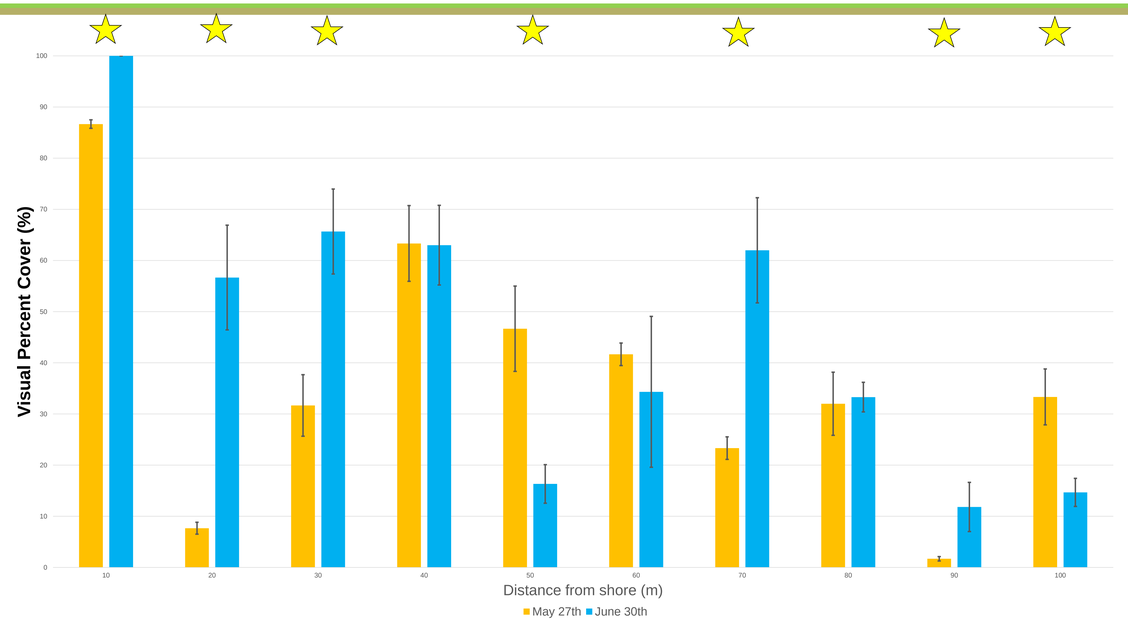

Figure 4: Mean Seagrass Visual Cover, at the max brewer causeway, Titusville, FL. Stars on graph signify significant difference. Error bars are ±1SE.

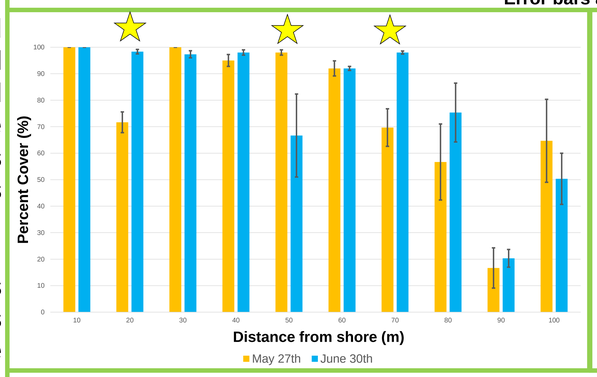

Figure 5: Mean Seagrass total cover at the max brewer causeway, Titusville, FL. Stars on graph signify significant difference. Error bars are ±1SE.

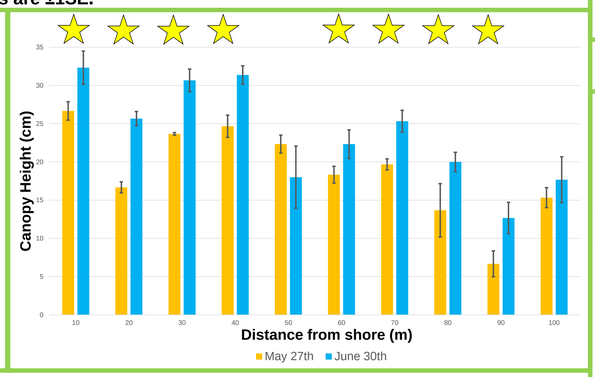

Figure 6: Mean Seagrass canopy height at the max brewer causeway, Titusville, FL. Stars on graph signify significant difference. Error bars are ±1SE.

Methods:

For each sample location in a transect perpendicular to shore, three 1m^2 quadrats were laid down (every ten meters along a 100 meter transect) (n=3). Observations included Visual Cover, Total Cover, and Canopy Height. Visual Cover was measured by grouping the seagrass visually, with at least 40 shoots per square as seen in Figure 1 and 2. Total cover was the number of squares with at least 1 shoot of seagrass as seen on Figure 3. Finally, canopy height was the length of one blade of seagrass that was representative of the whole quadrat.

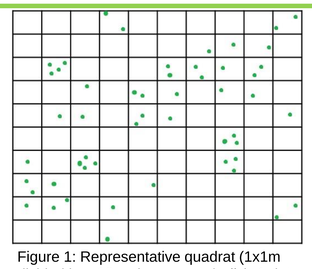

Figure 1: Representative quadrat (1x1m divided into 10cm increments/cells), 1 dot equal 10 shoots of seagrass

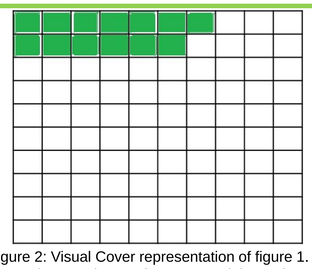

Figure 2: Visual Cover representation of figure 1. One square has 40 shoots of seagrass minimum (1x1m quadrat divided into 10cm increments/cells).

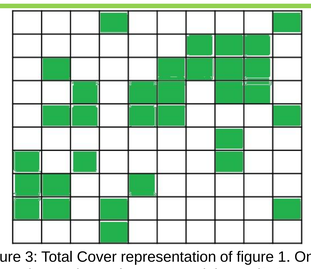

Figure 3: Total Cover representation of figure 1. One square has 1 shoot of seagrass minimum (1x1m quadrat divided into 10cm increments/cells)

Results:

The results for this study are shown in figure 4-6. These figure show the difference between the means for visual cover, total cover and canopy height respectively. For each distance from shore, a t-test was run. A star over the bars indicate a significant difference between the means (5/27 vs. 6/30).

The visual cover (fig. 4) shows increase in the shallower regions of the lagoon and decrease farthest from shore, however, there was a 10% increase in the visual cover of seagrass overall.

Total cover is not expected to vary much in such a short period of time. However, there was a 3% increase in total cover. Finally, canopy height significantly increased in nearly every distance from shore except 50 and 100 meters. On average, blade length of *H. wrightii* increased 5 cm.

Discussion & Conclusion:

These results support observations that the Indian River lagoon is slowly recovering from the seagrass decline that started in 2009. If we look at Titusville as an anecdote, the data are encouraging. The overall lagoon lost 60% of its seagrass, which is equivalent to 250-400 million dollars in economic value. However, these seagrasses have increased in coverage and also the average length of seagrass blades. A seagrass meadow holding steady or growing is a good sign. However, it should also be noted that this is just one location, and during a growing season where even a struggling seagrass population might be expected to demonstrate a gain in coverage.

Acknowledgements:

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References:

St. John's River Water Management District, 2011. *Florida Seagrass Integrated Mapping and Monitoring Program,* Palm Bay: St. John's River Water Management District.