Biological Monitoring – Seagrass Monitoring
Reporting and Assessment of Monitoring Results

Seagrass is the response variable that was used to develop nutrient management criteria for bays in Southwest Florida. The SW Florida Water Management District maps seagrass from aerial photography every other winter. Results from 2016 show an overall increase in seagrass throughout Sarasota County but increases in Sarasota, Roberts and Dona/Roberts Bays were offset by losses in Little Sarasota, Blackburn and Lemon Bays. This data is for Sarasota County only and does not include the portions of Sarasota and Lemon Bay that are beyond the County borders.

Year	*Sarasota Bay*	*Roberts Bay*	*Little Sarasota Bay*	*Blackburn Bay*	*Dona Roberts Bay*	*Lemon Bay*
2014	3,479	321	884	461	99	1,354
2016	3,719	356	772	415	101	1,340

Summary of Monitoring Data from 2016 Reporting Year

Sarasota County monitors the quality of seagrass by monitoring species, percent cover of the bay bottom (abundance), blade length, drift algae, epiphyte coverage and other characteristics. The premise is that healthy seagrass beds will grow densely, be climax species, and be tall. When extremely abundant, drift algae and epiphytes are known to be harmful to the health of seagrass. In 2016, 40 fixed and 130 random sites were sampled throughout all of the bays in Sarasota County.

Long Term Assessment

The SWFWMD Sarasota Bay Surface Water Improvement and Management Plan established that there is a negative correlation between nitrogen and seagrass biomass in Sarasota Bay (Tomasko et al., 1992).

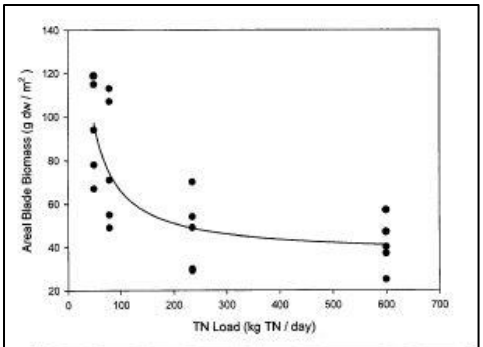


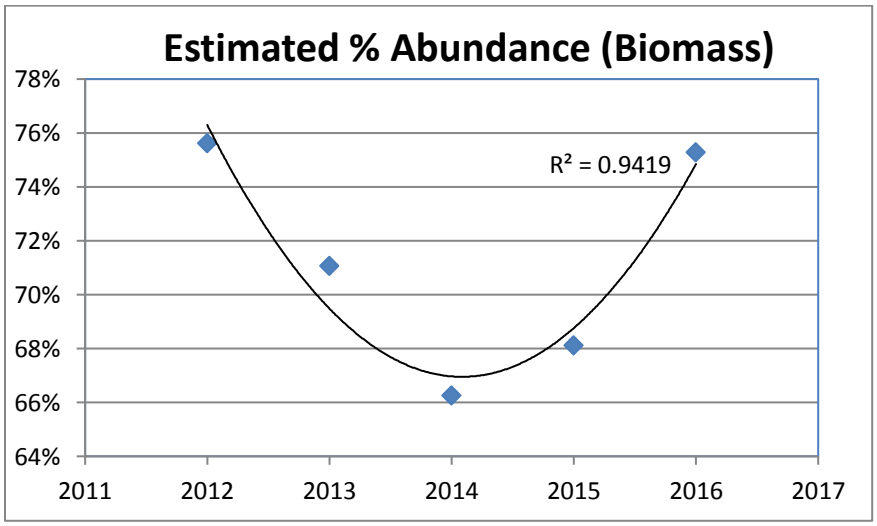
Figure B-5. Nitrogen Loads vs. Seagrass Biomass

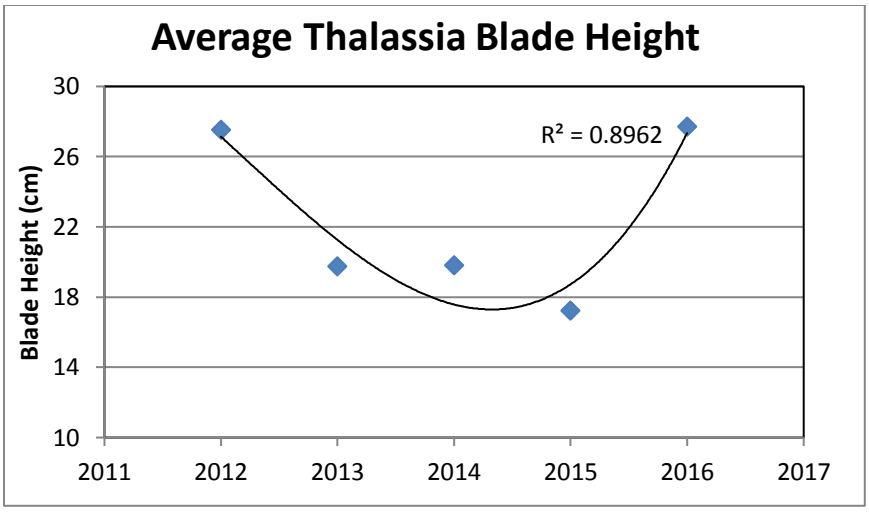
Five-year trends in the majority of the water bodies in Sarasota show evidence of an increase in nitrogen between 2013 and 2014. This correlates with the overall decline in biomass and robustness found by the Sarasota County Seagrass Monitoring Program in

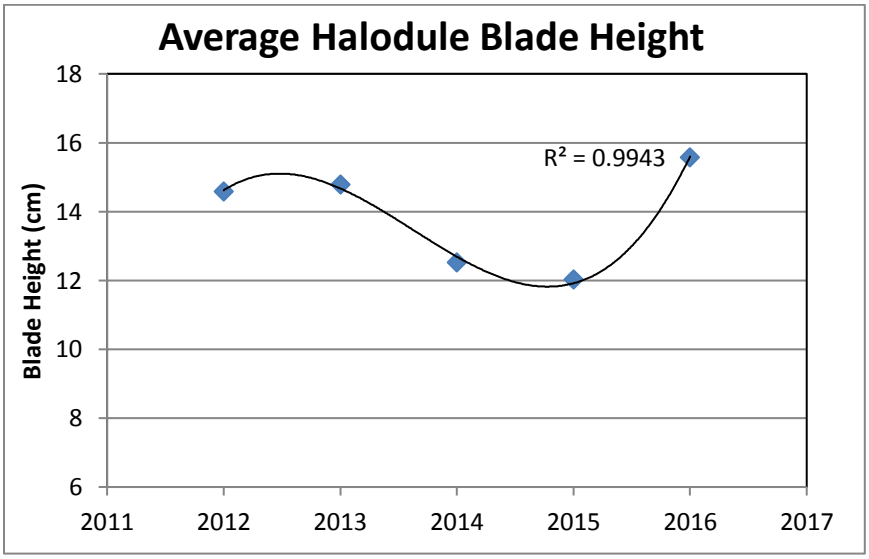
those years and subsequent recovery. 2013 demonstrates evidence of slightly higher than rainfall average which may also contribute to increased nitrogen levels.

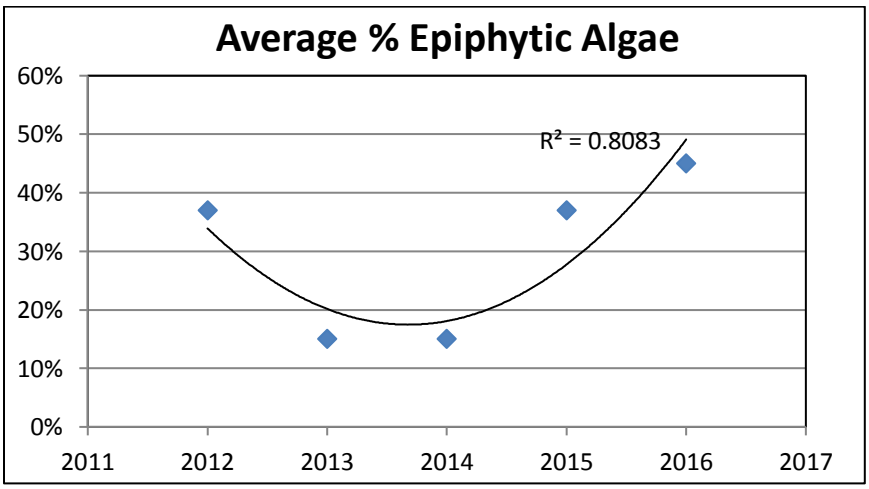
Year	Tot. Abundance	Avg. Thalassia Cover	Avg. Halodule Cover	Avg. Thalassia Blade Height (cm)	Avg. Halodule Blade Height (cm)	Avg. Drift Algae	Avg. Epiphytic Algae
2012	76%	74%	85%	27.52	14.59	6%	37%
2013	71%	70%	89%	19.76	14.78	23%	15%
2014	66%	62%	75%	19.83	12.52	18%	15%
2015	68%	65%	75%	17.23	12.03	18%	37%
2016	75%	58%	99%	27.71	15.57	10%	45%

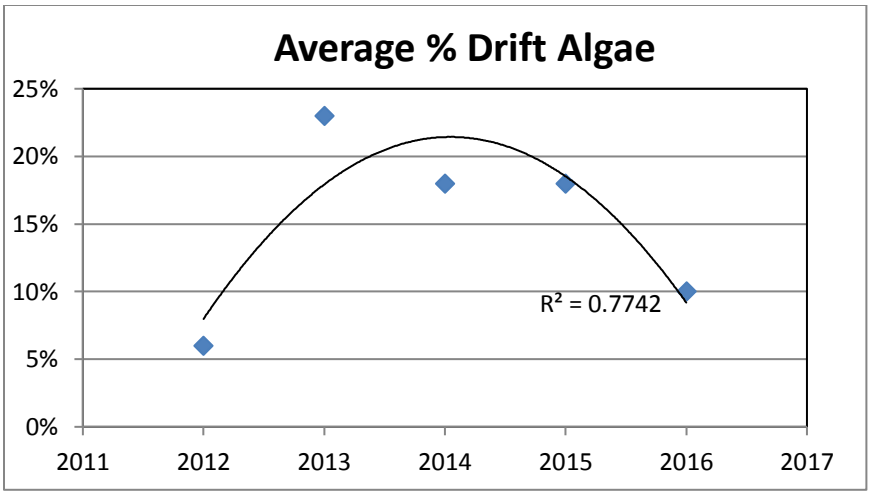
In 2016, increases were seen in abundance, blade length, and epiphytes; drift algae was down, as was the relative abundance of Thalassia. Halodule is a pioneer species and will recover more quickly than Thalassia which is a climax seagrass bed community. The mix of negative and positive characteristics may be analyzed spatially for each bay and bay segment and be correlated to water quality characteristics such as nitrogen and chlorophyll.

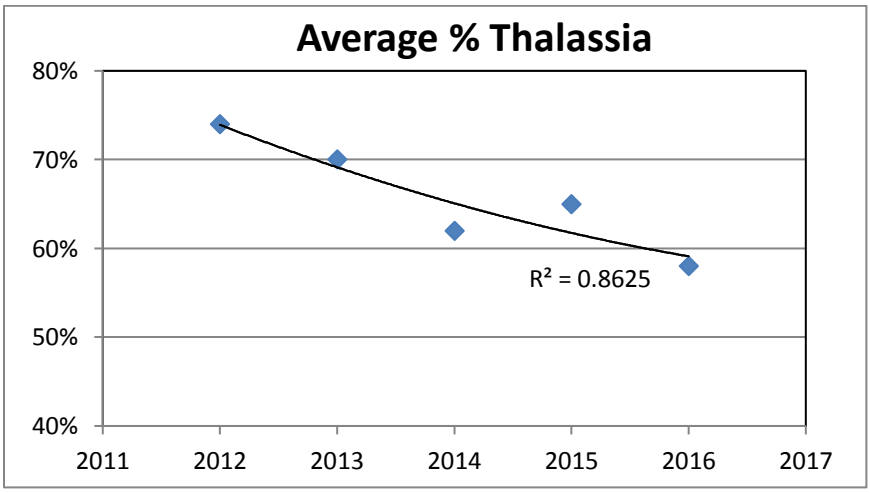


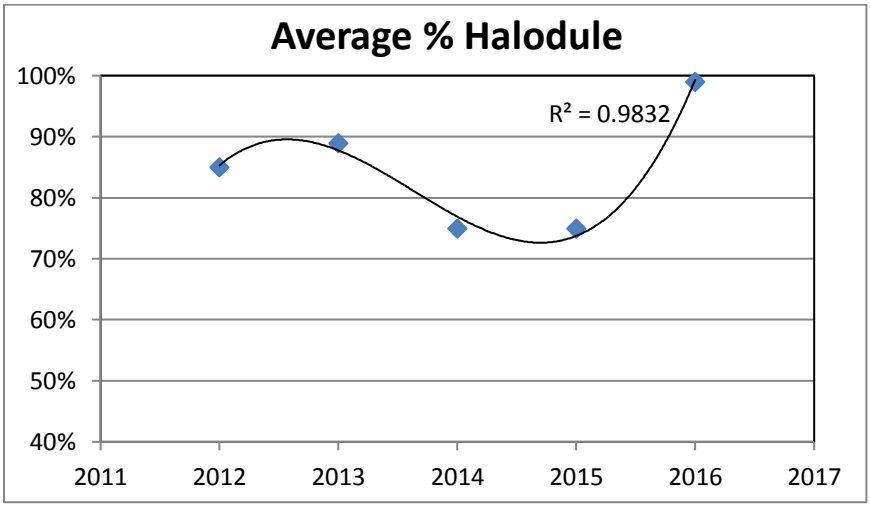

Average Thalassia Blade Height
Blade Height (cm)
30
26
22
18
14
10
2011
2012
2013
2014
2015
2016
2017
R² = 0.8962


Average Halodule Blade Height
Blade Height (cm)
18
16
14
12
10
8
6
2011
2012
2013
2014
2015
2016
2017
R² = 0.9943


Average % Epiphytic Algae
60%
50%
40%
30%
20%
10%
0%
2011
2012
2013
2014
2015
2016
2017
R² = 0.8083


Average % Drift Algae
25%
20%
15%
10%
5%
0%
2011
2012
2013
2014
2015
2016
2017
R² = 0.7742


Average % Thalassia
80%
70%
60%
50%
40%
2011
2012
2013
2014
2015
2016
2017
R² = 0.8625


Average % Halodule
100%
90%
80%
70%
60%
50%
40%
2011
2012
2013
2014
2015
2016
2017
R² = 0.9832

Relationship of Data to Stormwater Management Plan (SWMP)

The County Seagrass Monitoring Program does not just measure the presence of seagrass but also measures the health of seagrass. Note that Halodule is about 60% as tall as Thalassia so having climax species like Thalassia is beneficial as habitat, for sediment control and for grazing by manatees, turtles and other marine life. Seagrass species are sensitive to salinity so have an inherent relationship to stormwater management. It is expected that the Dona Bay Project, which was completed in 2017, will provide measurable benefits to seagrass in the downstream estuary by reducing salinity, color and nutrient levels in the bays.