Summary Report for Sarasota Bay

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In

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General assessment: In 2014, seagrass covered 13,289 acres of bay bottom in the Sarasota Bay region (Table 1). Seagrass acreage has steadily increased since 2001, but between 2006 and 2008, seagrass increased 28%, or by 2,786 acres. From 2008 through 2012, seagrass acreage was stable, and then acreage increased by over 5% (702 acres) between 2012 and 2014. Most of the expansion in acreage (633 acres) between 2012 and 2014 occurred in the Sarasota Bay subregion. Since 2008, acreage has rebounded to well above 1950 levels. Seagrass species composition appears to be stable. Sarasota Bay and Palma Sola Bay are dominated by turtlegrass (*Thalassia testudinum*), but also contain high percentages of shoalgrass (*Halodule wrightii*) and manateegrass (*Syringodium filiforme*). Shoalgrass is the major seagrass species in Roberts and Little Sarasota Bays; Blackburn Bay has a mixture of all three major species (Figure 3). Stressors include light availability, which is reduced occasionally by elevated phytoplankton and turbidity. Seagrass acreage in Sarasota Bay now exceeds the estimated coverage in 1950 by 29%. Seagrass-based water quality targets have been developed for five separate Sarasota Bay segments based on recent or historical acreage.

General Status of Seagrasses in Sarasota Bay

Status and stressors	Status	Trend	Assessment, causes
Seagrass acreage	Green	Increasing	Above 1950 acreage estimates
Water clarity	Yellow	Good	Affected by runoff, storms
Natural events	Green	Sporadic; minimal impacts	Poor water quality due to El Niño, tropical cyclones
Propeller scarring	Yellow	Localized	

Geographic extent: The Sarasota Bay region includes coastal waters in Manatee and Sarasota counties, extends from Anna Maria Sound through Blackburn Bay, and includes Roberts and Little Sarasota bays. Seagrass resources of the Sarasota Bay region are managed by the Sarasota Bay Estuary Program (SBEP).

Mapping and Monitoring Recommendations

- Continue to acquire aerial photography and map seagrass cover every two years to evaluate trends in seagrass acreage.
- Continue to monitor changes in species composition, abundance, and deep edge, conducted by several agencies, including the Southwest Florida Water Management District (SWFWMD), Manatee County, Sarasota County, and the Florida Department of Environmental Protection (FDEP).
- Update the 2003 propeller scarring map by Sargent *et al.* (2005) to assess trends in scarring and recovery. (Updated, in part, in 2013)

Figure 1 Seagrasses in Sarasota Bay, Little Sarasota Bay, and Blackburn Bay, 2012.

Management and Restoration Recommendations

- Continue development of the Sarasota Bay optical model, and use this model to evaluate water quality and light attenuation as part of the SBEP Comprehensive Conservation and Management Plan. For more accurate assessment and management, bay waters are divided into segments having generally homogeneous water quality and seagrass conditions. Sarasota Bay is divided into several subestuaries, including Palma Sola Bay, Sarasota Bay, Roberts Bay, Little Sarasota Bay, and Blackburn Bay (Figure 2).
- Assess development pressures on stormwater runoff and the effects of runoff on bay water quality.
- Conduct statistical analysis of *in situ* seagrass data. A project is underway to analyze monitoring data collected by Sarasota County at numerous fixed and random stations throughout County waters. Findings will be used to assist Manatee County in developing and implementing a similar program in their bay waters.
- Use the recently completed boating and angling guides for waters in the

region to improve boater education and awareness of seagrass beds and to reduce propeller scarring.

- Establish a framework to detect effects of climate change and ocean acidification on coastal marine resources in the region.

Seagrass Status and Potential Stressors in Sarasota Bay			
Status indicator	**Status**	**Trend**	**Assessment, causes**
Seagrass cover	Green	Increasing	All areas
Seagrass meadow texture	Green	Stable	No significant changes
Seagrass species composition	Green	Stable	No significant changes
Overall seagrass trends	Green	Improving	Potential nutrient impacts
Seagrass stressor	**Intensity**	**Impact**	**Explanation**
Water clarity	Yellow	Improving	Affected by runoff and storms
Nutrients	Yellow	Relative low	
Phytoplankton	Yellow	Relative low	
Natural events	Green	Minimal impact	El Niño, tropical cyclones
Propeller scarring	Yellow	Localized	

Summary assessment: Seagrass cover in Sarasota Bay increased 5.6% from 2012 through 2014, and acreage now exceeds estimated cover from 1950. Seagrass species composition and meadow texture appear stable. Stressors include light limitation and propeller scarring. Seagrass cover decreased by 98 acres between 1994 and 1999, following the 1997–98 El Niño (Table 1). However, optical water quality has improved since then, and increases in seagrass acreage were observed between 1999 and 2006 (603 acres). Dramatic improvement in acreage occurred in 2008 when 12,646 acres were mapped (Table 1). Acreage in 2008 exceeded by 29% the target of 9,738 acres, obtained from estimating seagrass cover in 1950. From 2008 through 2012, seagrass acreage has remained stable, and then it increased 702 acres from 2012 through 2014. At the same time as acreage increased, steady increases in the extent of continuous seagrass beds have been observed (State of the Bay 2014, Sarasota Bay Estuary Program).

Seagrass mapping assessment: Between 2012 and 2014, total seagrass cover for the Sarasota Bay region increased by 702 acres or 5.6%, from 12,587 acres to 13,289 acres (Table 1). In 2014, most of the seagrass acreage in the region occurred in the Sarasota bay subregion (Figure 1), which includes Palma Sola Bay (11,614 acres, or 87%). Seagrass expansion in the Sarasota Bay subregion also accounted for 90% of the increase from 2012 through 2014. Seagrass acreage increased by small amounts in Roberts Bay, Little Sarasota Bay and Blackburn from 2012 through 2014.

Monitoring assessment: Seagrass beds throughout this region are stable or increasing in area. Recent seagrass losses observed in Roberts Bay, near Venice, coincided with a dramatic increase in the cover of the green attached alga *Caulerpa prolifera*. Turtlegrass is the most common seagrass species in Sarasota Bay, while shoalgrass is dominant in Roberts Bay, Little Sarasota Bay, and Blackburn Bay (Figure 3).

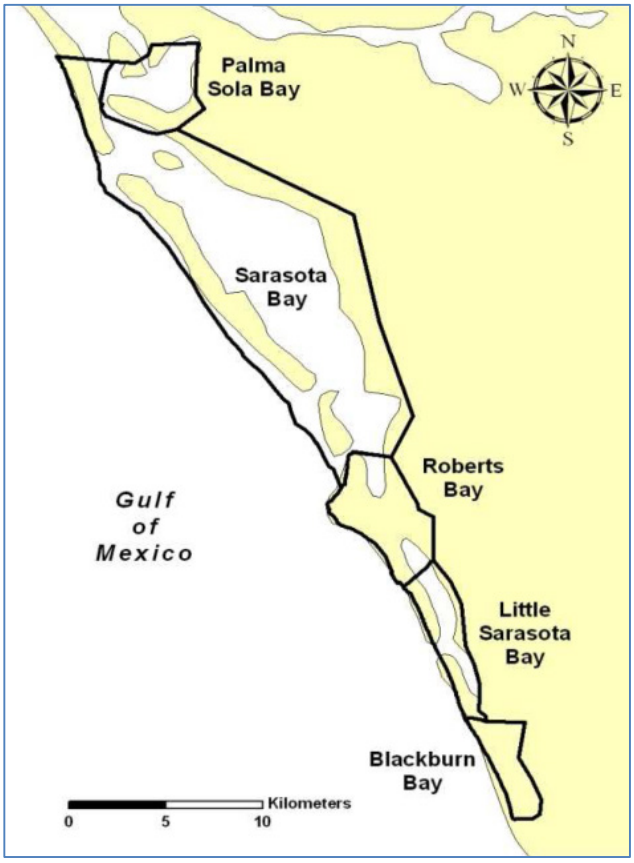

Figure 2 Estuary segments of Sarasota Bay used in seagrass and water quality data analyses.

Table 1 Seagrass acreage in segments of the Sarasota Bay region, 1950–2014. Data from Photo Science Inc. and Kaufman (2015).

Segment	1950	1988	1994	1999	2001	2004	2006	2008	2010	2012	2014	Change 2012–2014 Acres	Change 2012–2014 %	Change 1950–2014 Acres
Palma Sola Bay	1,031	1,111	1,089	1,025	1,046	1,002	1,029	1,164	1,176	1,184	11,614	633	5.8%	3,314
Sarasota Bay	7,269	6,323	6,910	6,750	6,862	6,646	7,438	9,996	9,917	9,797				
Roberts Bay	282	334	347	332	273	371	324	299	326	305	325	20	6.6%	43
Little Sarasota Bay	883	533	592	770	699	763	640	837	891	903	929	26	2.9%	46
Blackburn Bay	273	411	411	374	301	468	424	345	382	398	421	23	5.8%	148
Total	**9,738**	**8,712**	**9,349**	**9,251**	**9,181**	**9,250**	**9,855**	**12,641**	**12,692**	**12,587**	**13,289**	**702**	**5.6%**	**3,551**

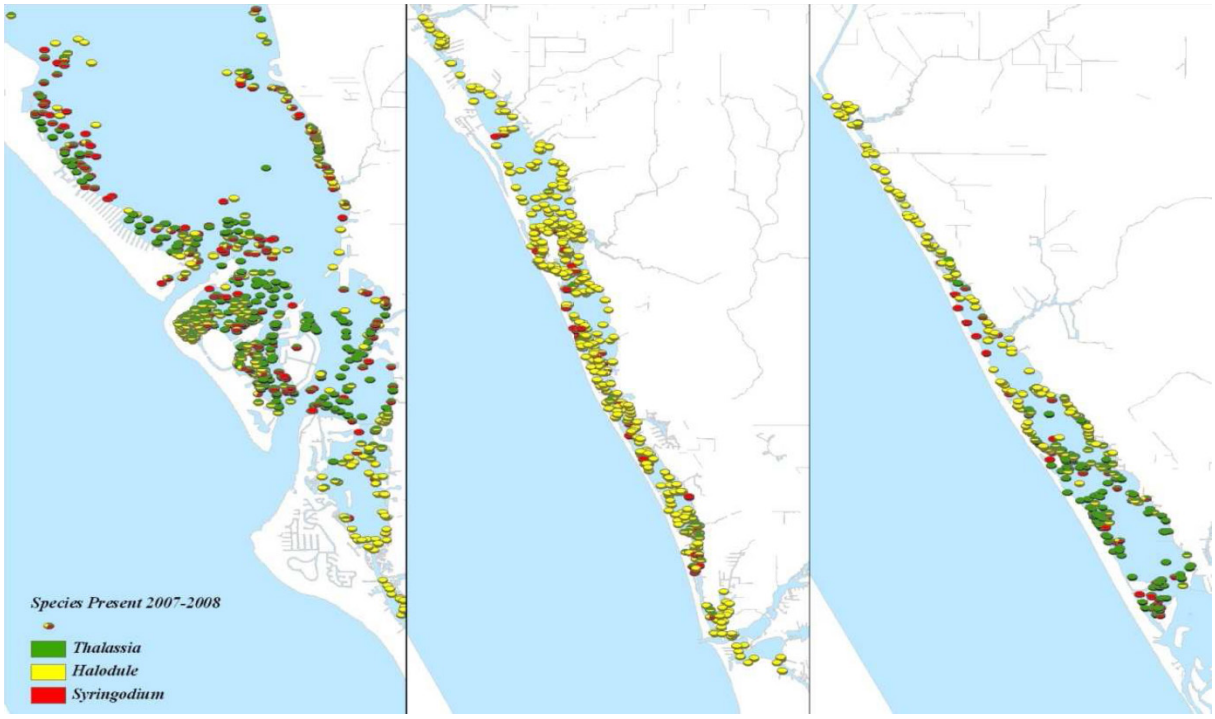

Figure 3 *Occurrence of seagrass in Sarasota Bay and Roberts Bay (left), Little Sarasota Bay and Blackburn Bay (middle), and Lemon Bay (right). Data from the Sarasota County monitoring program.*

Management and restoration assessment: Seagrass acreage targets for each bay segment were established by the Sarasota Bay Estuary Program (SBEP) in cooperation with its county and state partners. Targets were established using either the maximum historical (1950) or recent (2004 – 2006) seagrass extent, whichever was greater. In turn, these seagrass target acreages were used to establish water quality targets for each estuarine segment. Seagrass target acreages for the respective Sarasota Bay segments are: Palm Sola Bay, 1,031 acres; Sarasota Bay, 7,269 acres; Roberts Bay, 348 acres; Little Sarasota Bay, 702 acres; and Blackburn Bay, 447 acres. Since 2008, these targets have been met in Sarasota Bay, Palma Sola Bay and Little Sarasota Bay; seagrass acreages are very close to target levels in Roberts and Blackburn Bays. Progress toward reaching and maintaining seagrass and water quality targets are evaluated annually.

Staff at Sarasota County and the SBEP are embarking on a statistical analysis of Sarasota County seagrass survey data provided by county staff. Data are collected twice a year in winter and summer. Other management goals include the continual improvement of water quality and light transmission to the bay bottom, increasing control of nonpoint-source pollution, assessment of the impacts of diverting freshwater from tributaries into Roberts Bay, and remediation and prevention of propeller scarring.

Prop scar damage to Sarasota seagrass beds from 2010–2012 was assessed by New College student Lauren Ali. Most scarring occurred in turtlegrass beds, and upper Sarasota Bay had the most scars. Each bay segment had “scarring hotspots”.

Mapping and Monitoring Recommendations

- Continue the biennial imagery acquisition, photo-interpretation, and mapping program by the Southwest Florida Water Management District.
- Continue the twice-yearly field monitoring program.
- Produce propeller scarring maps of Sarasota Bay, following the methods of Madley *et al.* (2004).

Management and Restoration Recommendations

- Evaluate water quality and light attenuation annually using available region-specific models and tools.
- Twice a year, compare water quality, seagrass maps, and monitoring data to assess progress in meeting and maintaining seagrass acreage targets.
- Continue efforts to reduce propeller scarring.
- Use the recently completed boating and angling guide for waters in the region to improve boater education and awareness of seagrass beds and to reduce propeller scarring.
- Establish a framework to detect effects of climate change and ocean acidification on coastal marine resources in the region.

Mapping methods, data, and imagery: SWFWMD has acquired aerial imagery for the Sarasota Bay region every two years since 1988. The most recent set of imagery was collected in December 2013 and January 2014, and mapping data were released in spring 2016. Mapping data from 2012 imagery are available from SWFWMD or the Fish and Wildlife Research Institute (FWRI). Seagrass imagery was photo-interpreted from 1:24,000 scale natural color aerial photography and classified using the SWFWMD modified Florida Land Use Cover and Forms Classification System (Florida Department of Transportation, 1999). The minimum mapping unit for classification was 0.5 acre.

Monitoring methods and data: FDEP has been monitoring seagrass in Sarasota Bay each fall since 1999. Field monitoring includes seagrass assessment in quadrats at specific intervals along seven permanent transects, and seagrass and macroalgal cover are estimated by species using the Braun-Blanquet method. In addition, epiphyte loads, seagrass blade length, and sediment quality are evaluated. Sarasota County staff also sample 40 fixed and 120 random points semi-annually within County bay waters. They also coordinate a volunteer monitoring program to supplement these data. At each point, depth and Secchi depth are recorded. Estimates of seagrass metrics include presence/absence of seagrass species, species percent composition, blade length, and percent cover. Other biotic measures include the presence of drift and attached algae and epiphyte cover on seagrass blades. Sediment composition is noted along with any other biological features.

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