

Florida Seagrass Integrated Mapping and Monitoring Program



Summary Report for Sarasota Bay and Lemon Bay

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General Assessment: In 2008, seagrass covered 12,641 acres in Sarasota Bay and 2,863 acres in Lemon Bay. Acreage has been steadily increasing since 1999. Between 2006 and 2008, seagrasses increased 28%, or 2,787 acres, in Sarasota Bay and 5.5%, or 149 acres, in Lemon Bay. The greatest gains occurred in Upper Sarasota Bay in Manatee County (1,844 acres), with smaller gains in Sarasota Bay in Sarasota County (850 acres). These gains were offset by a loss of 104 acres of seagrass in Roberts Bay and Blackburn Bay. Seagrass species composition appears to be stable. Stressors include light availability, which is limited in turn by occasionally elevated phytoplankton and turbidity. Seagrass acreage in Sarasota Bay now exceeds the estimated coverage in 1950. Seagrass-based water quality targets have been developed for both bays based on seagrass light requirements, depth at deep edge, and recent or historical acreage.

Seagrass Status and Stresses	Status	Trend	Assessment, Causes
Seagrass cover		Increasing	Large gains, 2006-08
Water clarity		Good	Affected by runoff, storms
Natural events		Minimal impact	2004, 2005 hurricanes
Propeller scarring		Localized	

Geographic Extent: Greater Sarasota Bay extends from Anna Maria Sound in Manatee County south through Blackburn Bay and includes Roberts and Little Sarasota bays. Seagrass resources of Greater Sarasota Bay are managed by the Sarasota Bay Estuary Program. Lemon Bay begins south of Venice and extends south into Charlotte County. Lemon Bay, along with Lyons, Dona and Roberts bays (coastal Venice) are managed by the Charlotte Harbor National Estuary Program (CHNEP). Lemon Bay is also managed as a Florida Aquatic Preserve.



Figure 1. Seagrass cover in Sarasota Bay and Lemon Bay, 2008.

Mapping and Monitoring Recommendations

- Continue to 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, CHNEP, and Florida Department of Environmental Protection (FDEP).
- Update the 2003 propeller scarring map of Lemon Bay prepared for CHNEP by Sargent et al. (2005) to assess trends in scarring and recovery. Assess scarring in Sarasota Bay using similar methods.

Management and Restoration Recommendations

- Evaluate water quality and light attenuation annually using region-specific models and tools available as part of regional Comprehensive Conservation and Management Plans. 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 (Upper Sarasota Bay), Roberts Bay, Little Sarasota Bay, and Blackburn Bay (Figure 2), while the Lemon Bay region is divided into Upper and Lower Lemon bays (Figure 3). Within each segment, water quality results are evaluated together with seagrass mapping and monitoring data every two years.

- Assess development pressures on storm runoff.
- Continue efforts to reduce propeller scarring.

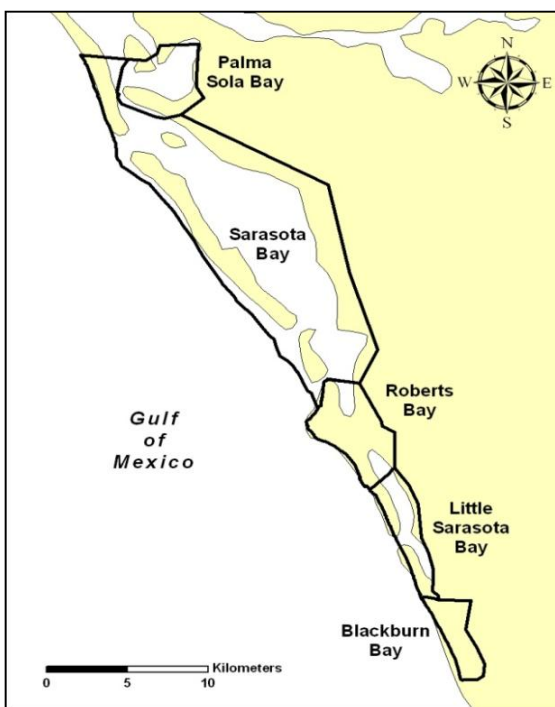


Figure 2. Estuary segments of Sarasota Bay used in seagrass and water quality data analyses.

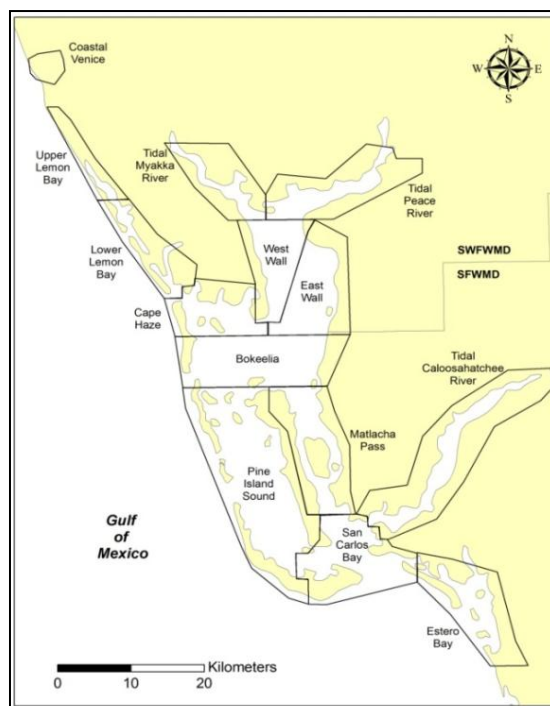


Figure 3. Estuary segments of Lemon Bay and Charlotte Harbor used in seagrass and water quality data analyses.

Summary Assessment: Seagrass cover in Sarasota Bay and Lemon Bay increased during the past four to five years (Table 1). Seagrass species composition and meadow texture appear stable. Stressors include light limitation and propeller scarring. Seagrass cover decreased by 1,085 acres in 1999, following the 1997–98 El Niño. However, optical water quality has improved since then, and increases in seagrass acreage were observed in 2006. Seagrass acreage in Sarasota Bay mapped in 2008 (12,641 acres) exceeded by 29% the target of 9,797 acres. At the same time, steady increases in the extent of continuous seagrass beds have been observed (State of the Bay 2010, Sarasota Bay Estuary Program). Seagrasses in Lemon Bay increased by 149 acres between 2006 and 2008, with 2,863 acres mapped in 2008.

Seagrass Status Indicators	Status	Trend	Assessment, Causes
Seagrass cover		Increasing	Large gains, 2006–08
Seagrass meadow texture		Fairly stable	No significant changes
Seagrass species composition		Fairly stable	No significant changes
Overall seagrass trends		Improving	Potential nutrient impacts
Seagrass Stressors	Intensity	Impact	Explanation
Water clarity		Good	Affected by runoff, storms
Nutrients		Relatively low	Affected by runoff, storms
Phytoplankton		Relatively low	Affected by runoff, storms
Natural events		Minimal impact	2004, 2005 hurricanes
Propeller scarring		Localized	

Seagrass Mapping Assessment: Between 2006 and 2008, total seagrass cover for the Sarasota Bay region increased by 2,787 acres, from 9,854 acres to 12,641 acres, an increase of 28% (Table 1). Most of the increase occurred in Upper Sarasota Bay in Manatee County (1,844 acres). Seagrasses cover small areas in Roberts Bay and Blackburn Bay, and these subregions lost 25 and 79 acres, respectively, from 2006 to 2008. Seagrass acreage in the Sarasota Bay region in 2008 exceeded the target acreage, based on estimates of cover in 1950, by 2,844 acres, or 29%. Seagrass acreage in Lemon Bay increased 5.5%, or 149 acres, between 2006 and 2008, from 2,714 acres to 2,863 acres.

TABLE 1. SEAGRASS ACREAGE IN SARASOTA BAY AND LEMON BAY

Segment	1988	1996	1999	2004	2006	2008	Change 2006–08
Upper Sarasota Bay–Manatee Co.	5,469	6,278	5,714	5,493	5,829	7,673	1,844
Upper Sarasota Bay–Sarasota Co.	1,909	2,578	2,060	2,153	2,637	3,487	850
Roberts Bay	331	358	330	368	324	299	–25
Little Sarasota Bay	532	717	770	762	640	837	197
Blackburn Bay	410	401	373	468	424	345	–79
Total Acres in Sarasota Bay	8,651	10,332	9,247	9,244	9,854	12,641	2,787
Lemon Bay					2,714	2,863	149

Monitoring Assessment: Seagrass beds throughout this region are stable or increasing in area for the most part. Recent seagrass losses observed in Roberts Bay near Venice coincided with a dramatic increase in the cover of the green attached alga *Caulerpa prolifera*. Turtle grass (*Thalassia testudinum*) is most common in Sarasota Bay, and shoal grass (*Halodule wrightii*) is dominant in Roberts Bay, Little Sarasota Bay, and Blackburn Bay to the south (Figure 4). In Lemon Bay, shoal grass is the most common seagrass in the northern reaches, and turtle grass is most common in the southern portion. The average deep edge of seagrass beds in Lemon Bay varied by location and year from 1999 to 2006, ranging from 1.4 m to 1.6 m, based on FDEP transect data.

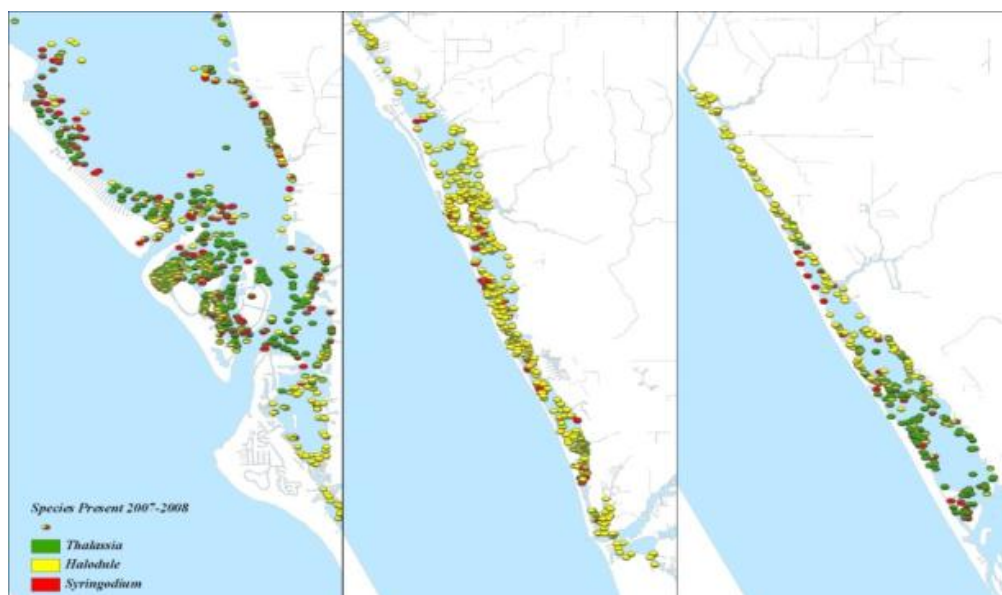


Figure 4. Occurrence of seagrass in Sarasota Bay and Roberts Bay (left), Little Sarasota Bay and Blackburn Bay (middle), and Lemon Bay (right). (Data from the Sarasota County monitoring program.)

Management and Restoration Assessment: Seagrass acreage targets for each segment of Sarasota Bay and Lemon Bay were established by the Sarasota Bay Estuary Program (SBEP) and the CHNEP, respectively, using the maximum historical extent and interannual variability of seagrass cover. In turn, seagrass target acreages were used to establish water quality targets for each estuarine segment. Using aerial photography, persistence of seagrass locations (Figure 5) and historical acreages were determined for Dona, Roberts, and Lemon bays. Seagrass targets for Sarasota Bay are: Palm Sola, 1,031 acres; Sarasota Bay, 7,269 acres; Roberts Bay, 348 acres; Little Sarasota Bay, 702 acres; and Blackburn Bay, 447 acres. For Lemon Bay, seagrass targets are: Dona/Roberts Bay, 110 acres; Upper Lemon Bay, 1,010 acres; and Lower Lemon Bay, 2,880 acres, for a total of 4,000 acres. Progress toward seagrass and water quality targets will be evaluated annually.

Other management goals include 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.

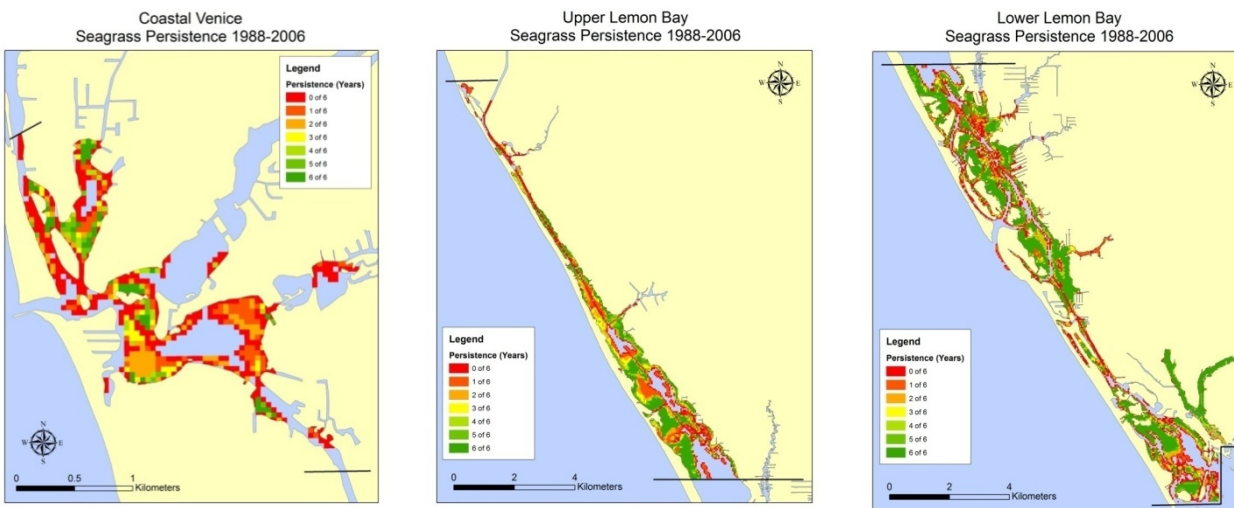


Figure 5. Persistence of seagrass locations in Dona/Roberts and Lemon bays, 1988–2006.

Mapping and Monitoring Recommendations

- Continue biennial mapping and the twice-yearly monitoring program.
- Update the 2003 propeller scarring maps of Lemon Bay produced by Sargent et al. (2005), and produce scarring maps for Sarasota Bay.

Management and Restoration Recommendations

- Evaluate water quality and light attenuation annually using available region-specific models and tools.
- Twice a year, compare water quality and seagrass maps and monitoring data to assess progress in meeting seagrass acreage targets.
- Continue efforts to reduce propeller scarring.

Mapping Data and Imagery: SWFWMD has acquired aerial imagery in Sarasota Bay and Lemon Bay every two years since 1988. The most recent set of photographs was obtained in

2010. In 2008, seagrass imagery was photointerpreted from 1:24,000 scale natural color aerial photography and classified using the SWFWMD modified Florida Land Use Cover Classification System. The minimum mapping unit for classification was 0.5 acre.

Monitoring Data: Seagrass monitoring has been conducted in the Sarasota Bay region annually in the fall since 1999 by FDEP staff. In Lemon Bay, seagrasses have been monitored since 2001 in the fall in a program coordinated by CHNEP. Both monitoring programs evaluate seagrasses along established transects, and seagrass and macroalgal cover are estimated by species. In addition, both programs assess epiphyte loads, seagrass blade length, and sediment quality. Sarasota County staff coordinate a twice-yearly (August and February) monitoring program using volunteers from the fishing community.

Pertinent Reports and Scientific Publications

CORBETT, C. A., and J. A. HALE. 2006. Development of water quality targets for Charlotte Harbor, Florida, using seagrass light requirements. *Florida Scientist* 69: 36–50.

SARGENT, F. J., T. J. LEARY, D. W. CREWZ, and C. R. KRUER. 1995. Scarring of Florida's seagrasses: assessment and management options. Florida Marine Research Institute Technical Report TR-1, Florida Department of Environmental Protection, St. Petersburg, Florida, 37 p. + appendices.

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION CHARLOTTE HARBOR AQUATIC PRESERVES. 2007. Seagrass annual data summary from the Charlotte Harbor & Estero Bay Aquatic Preserves Seagrass Transect Monitoring Program, 1999–2006. Prepared by Celia Stearns. 50 p.
http://www.dep.state.fl.us/coastal/sites/charlotte/research/Seagrass_Data_Summary.pdf, accessed March 2011.

TOMASKO, D. A., D. L. BRISTOL, and J. A. OTT. 2001. Assessment of present and future nitrogen loads, water quality, and seagrass (*Thalassia testudinum*) depth distribution in Lemon Bay, Florida. *Estuaries and Coasts* 24: 1559–2723.

TOMASKO, D. A., C. A. CORBETT, H. S. GREENING, and G. E. RAULERSON. 2005. Spatial and temporal variation in seagrass coverage in southwest Florida: assessing the relative effects of anthropogenic nutrient load reductions and rainfall in four contiguous estuaries. *Marine Pollution Bulletin* 50: 797–805.

CHARLOTTE HARBOR NATIONAL ESTUARY PROGRAM. 2009. Water quality target refinement project, task 1: harbor segmentation scheme, interim report 2, Janicki Environmental, Inc., St. Petersburg, Florida. 62 p., <http://www.chnep.org>; accessed March 2011.

CHARLOTTE HARBOR NATIONAL ESTUARY PROGRAM. 2009. Water quality target refinement project, task 2: seagrass target development, interim report 2. http://www.chnep.org/NEP/agendas-2010/TAC/WQQOS_WQ%20Target%20Refine%20Report%20%20Seagrass%20targets.pdf, accessed March 2011.

General References and Additional Information

TAMPA BAY ESTUARY PROGRAM. 2011. Surveys show record gains for Tampa Bay seagrasses, Jan. 21, 2011, <http://www.tbep.org/news/whatsnew.shtml>, accessed March 2011.

SARASOTA BAY ESTUARY PROGRAM. 2010. State of the bay 2010: Celebrating paradise, staying the course. 43 p. <http://www.sarasotabay.org/documents/SOB2010forwebsite.pdf>, accessed March 2011.

Sarasota Bay Estuary Program: <http://www.sarasotabay.org/habitat-seagrass.html>, accessed March 2011.

Lemon Bay Aquatic Preserve: <http://www.dep.state.fl.us/coastal/sites/lemon/info.htm>, accessed March 2011.

Sarasota County Wateratlas: <http://maps.wateratlas.usf.edu/sarasota/index.asp>; accessed March 2011.

The Charlotte Harbor National Estuary Program: <http://www.chnep.org/>, accessed March 2011.

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