Chapter 5
Sarasota Bay

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Description of the region

The Sarasota Bay region extends from Anna Maria Sound in the north to Venice Inlet in the south (Figure 5.1). It includes Sarasota Bay proper, Palma Sola Bay in Manatee County, and a series of smaller, contiguous bays to the south (Roberts, Little Sarasota, and Blackburn Bays; Figure 5.2). The bay connects with Tampa Bay to the north through Anna Maria Sound and the Gulf of Mexico through three passes: Longboat, New, and Big Sarasota passes. Sarasota Bay is not a classic estuary under the influence of a major river, but rather a coastal lagoon bounded by barrier islands. Phillippi Creek, which drains into Roberts Bay, is the largest of 16 tidal tributaries that drain into the bay. Sarasota Bay has 52 mi² (135 km²) of open water and a watershed comprising 150 mi² (390 km²) (SBEP 2007).

Sarasota Bay first acquired its present shape 5,000 years ago, when offshore sand bars became barrier islands (SBEP 1992). Wetlands appeared on these barrier islands and the mainland shoreline 3,500 years ago. While salt marshes are present in the greater Sarasota Bay area, mangrove swamps make up more than 90% of coastal wetlands and often overtake herbaceous coastal habitats. Rhizophora mangle (red mangrove) and Avicennia germinans (black mangrove) are the most abundant mangrove species and dominate 50% of the tidal wetland vegetation (SBEP 1992).

In 1950, the Sarasota Bay watershed comprised about 4,104 acres (1,660 ha) of tidal wetlands; the average area of each wetland was about 22 acres. Wetland acreage decreased 38% (1,609 acres/651 ha) from 1950 to 1990 (SBEP 1992). Much of this loss was due to dredge-and-fill operations in the 1950s and 1960s. The rate of loss was greatest from 1950 through 1975 at an average of 40 acres (16 ha) per year; rates of wetland loss decreased to 20 acres (8 ha) per year from 1975 through 1990. Losses were greatest in the Anna Maria Island, Sister Keys, and Blackburn Bay regions. The average size of wetlands also drastically decreased to 5.6 acres (2.3 ha) during this time (SBEP 1992).

Urban development in the cities of Sarasota and Bradenton and on the barrier island communities has resulted in significant losses of coastal wetlands and an overwhelming hardening of shorelines in this region. Tourism drives the economy of Sarasota County and is the second-largest economic sector in Manatee County (SBEP 2007). Approximately 25% of the area’s population is seasonal; this seasonal proportion reaches 70% on the barrier islands (SBEP 2007). Rapid population growth and coastal development have taken their toll on Sarasota Bay ecosystems. Coastal development replaced mangrove swamps and natural shorelines with buildings and seawalls; more than 100 mi (160 km) of seawalls are present today around Sarasota Bay (SBEP 2010). Increased coastal runoff and poor wastewater management resulted in poor water quality in the bay due to additional loading of sediment, nutrients, and pollutants. In the late 1980s, Sarasota Bay had reduced bivalve and fish harvests and diminished extent of seagrass beds (SBEP 2010).

The turning point for Sarasota Bay came in 1989, when the Sarasota Bay Estuary Program (SBEP) was formed and the community came together to improve water and habitat quality in the bay. Extensive studies were compiled in the 1992 Framework for Action, which also outlined goals and recommendations for improving the bay (SBEP 1992). Key focus areas in-
Figure 5.1. Mangrove and salt marsh coverage in the Sarasota Bay region. Data source: SWFWMD 2011 land use/land cover data, based on FLUCCS classifications (FDOT 1999, SWFWMD 2011).
cluded improving water clarity, seagrass extent, shoreline habitats, fisheries, stormwater quality, and overall management and access to the bay. As a result of large-scale community efforts and regulations, nitrogen pollution entering the bay has decreased 64% since 1989 and nitrogen loading from wastewater has decreased 95% (SBEP 2010).

The status of Sarasota Bay wetlands was assessed as part of the 1992 Framework for Action (SBEP 1992). Although habitat was lost to development, the wetlands that remained were found to be in fairly good condition. Larger wetlands (those greater than 0.5 acre/0.2 ha) were found to be in better condition than smaller ones (less than 0.5 acre/0.2 ha), and wetlands were found to be in similar condition on the mainland and the barrier islands.

Mangrove acreage increased after the establishment of the SBEP and the Framework for Action (SBEP 1995, SBEP 2010). Since 1995, 1,550 acres (627 ha) of intertidal wetlands in Sarasota Bay has been restored (SBEP 2014). The Five Year Habitat Restoration Plans (Scheda 2010, Scheda 2016) were also developed as a planning guide to be used by the SBEP and its partners to identify, prioritize, and implement restoration projects throughout the watershed.

Table 5.1 and Figure 5.3 show a slight increase in total acreage of mangroves mapped after 1990. This increase was due to natural causes, such as conversion of marsh to mangrove, and to mangrove restoration efforts. The increase in coastal wetland habitat from 1999 to 2004 (Figure 5.4) was due primarily to the inclusion of a salt flat category in Southwest Florida Water Management District (SWFWMD) mapping efforts. Salt flats were present before 2004 but had never been mapped. The breakdown of salt marsh, salt flat, and mangrove habitats across the regions of the greater Sarasota Bay area (Figure 5.2) is shown in Table 5.2.

Figure 5.2. Sarasota Bay proper and surrounding bays with current (2011) extent of emergent saltwater vegetation and salt flats. Data source: SWFWMD 2011.
Threats to coastal wetlands

- **Climate change and sea-level rise:** Sea-level rise and coastal development are, perhaps, the most significant stresses to remaining coastal wetlands, although their impacts will be felt on differing time scales. The high degree of coastal development along Sarasota Bay restricts landward migration of coastal wetland habitats in response to sea-level rise, emphasizing the need to conserve remaining coastal upland habitat. The high proportion of seawalls and other hardened shorelines will prevent this landward migration, which will likely lead to the loss of mangrove fringes on seawalls.

- **Hydrologic alterations:** Historical practices that have affected the hydrology of the Sarasota Bay region include extensive coastal construction, dredge-and-fill operations, mosquito-ditching, creation of spoil piles, and the closure of Midnight Pass between Siesta Key and Casey Key. A 1990 assessment found that 15 tidal wetlands in the Sarasota area had extensive ditching, spoil piles, or both (SBEP 1992). Many of the hydrologic alterations occurred during dredge-and-fill operations in the 1950s and 1960s and during the construction of the Intracoastal Waterway. While many of these practices are no longer permitted, their influence on hydrologic patterns in the bay continues. Additionally, the increase in impervious surfaces that accompanies urban development results in the diversion and concentration of stormwater runoff (SBEP 2010).

- **Invasive vegetation:** Invasive plant species, such as *Schinus terebinthifolius* (Brazilian pepper) and *Casuarina* spp. (Australian pines), thrive on the additional elevation provided by spoil piles, enabling them to encroach into coastal wetland habitat (SBEP 1992). The altered hydrology and elevation from mosquito-ditching and spoil piles have facilitated the encroachment of invasive nonnative species into disturbed areas.

- **Mangrove trimming:** Landowners along Sarasota Bay frequently trim or prune mangroves to maintain a waterfront view. In 1992, top-down pruning, or hedging, was found to be the prevalent practice; the less detrimental practice of selective limb removal was used less than 5 percent of the time (SBEP 1992). Forty percent of property owners trimmed most or all of the mangroves on their property. In 1996, the Mangrove Trimming and Preservation Act provided statewide regulations on mangrove trimming, affording protection against extreme mangrove trimming or removal. Assurance of proper mangrove trimming, however, still requires homeowner education and enforcement in order to protect trees from excessive damage.

- **Additional threats:** In the 1990 assessment, approximately a quarter of Sarasota Bay wetlands were found to display some form of natural damage, including lightning strikes, freeze damage, herbivory, and erosion (SBEP 1992). While some erosion is natural, wave energy from boating wake contributes to erosion in several areas, particularly along the Intracoastal Waterway (SBEP 1992).
Coastal Habitat Integrated Mapping and Monitoring Program Report: Florida

Mapping and monitoring efforts

Water management district mapping

To assist in resource management decision-making, the SWFWMD conducts regional land use and land cover (LULC) mapping at regular intervals within its jurisdiction (SWFWMD 2011; Figure 5.3, Table 5.1). Features in 1-ft color infrared imagery are photointerpreted at a scale of 1:8,000. After the review of new imagery, updates and changes to map line work are digitized at a scale of 1:6,000. The features delineated in LULC maps are categorized according to FLUCCS categories (FDOT 1999). The coastal wetland features of interest here are mangrove swamp (FLUCCS 6120), saltwater marsh (FLUCCS 6420), and salt flat (FLUCCS 6600). SWFWMD’s LULC mapping standards require that wetland features be at least 0.5 acre (0.2 ha) in area to be classified in a map.

Table 5.2. 2011 acreages for emergent wetlands and tidal flats in Sarasota Bay and selected bay segments. Data source: SWFWMD 2011.

<table>
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<tr>
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<th>Mangroves</th>
<th>Salt Flats</th>
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</tbody>
</table>

Figure 5.4. Historical acreages of emergent saltwater vegetation and salt flats in selected bay segments surrounding Sarasota Bay (Figure 5.2). SWFWMD did not map salt flats before 2004. Data Source: SWFWMD 2011.

Tidal Stream Assessment Project

The Tidal Stream Assessment Project is part of a multicounty effort from Pinellas to Lee County designed to collect data on vegetation, bathymetry, and habitat in 16 tidal creeks on the central west coast of Florida. In the summer of 2013, the University of South Florida’s Florida Center for Community Design and Research undertook the assessment in collaboration with Mote Marine Laboratory, Janicki Environmental Inc., and the Estuary Programs of Tampa Bay, Sarasota, and Charlotte Harbor. The data from this project is available at www.sarasota.wateratlas.usf.edu/tidal-stream-assessments and is summarized in Eilers 2013, Eilers 2014, and SBEP 2016.

Shoreline vegetation mapping

In 2014, SBEP initiated a shoreline vegetation assessment of all of its tidal tributaries (Eilers 2014). Sixteen creeks were surveyed for all vegetation types, including mangroves and marshes, from the mouth of the creek to the nontidal freshwater reaches. This information increased the resolution of shoreline vegetation maps in the watershed. All tidal creek assessments (both SW Florida and Sarasota Bay) can be accessed at www.sarasota.wateratlas.usf.edu/tidal-stream-assessments.
Recommendations for protection, management, and monitoring

- The Sarasota Bay Estuary Program has developed wetland policies that recommend restoration and enhancement, rather than just protection, for critical estuarine wetlands. A key goal outlined in the Comprehensive Conservation and Management Plan (CCMP) for Sarasota Bay (SBEP 1995, updated SBEP 2014) is to restore and protect coastal wetlands. The Five Year Habitat Restoration Plan (Scheda 2010) serves as the strategic document to support the SBEP’s wetland policies and identify target restoration areas. The Restoration Plan includes a schedule of actions and priorities with the goal of restoring at least 18 acres (7.3 ha) of intertidal wetlands and 11 acres (4.5 ha) of freshwater wetlands annually. CCMP recommendations for the protection and restoration of coastal wetlands include the following:

  - Conservation and improvement projects need to be identified, coordinated, and monitored. Many restoration activities can be integrated with road or recreational improvements by state and local governments.

  - The importance of upland areas adjacent to wetlands should be recognized and incorporated into land purchases, conservation efforts, and restoration projects.

  - Citizen involvement through community education, clean-up efforts, and outreach to homeowners will facilitate endeavors to protect coastal wetlands in highly populated areas. Homeowners with waterfront properties should be encouraged to maintain natural shorelines, landscape with native plants, and practice responsible mangrove trimming.

  - Consistent policies regarding alteration of shorelines are needed. Fines for violation of environmental policies can discourage harmful activities and also fund environmental projects within the watershed.

- Replace seawalls and other hardened shorelines with living shorelines. Living shorelines reduce pollution from runoff, and the gradual topography facilitates inland migration of mangroves in response to sea-level rise.

- Other recommendations include the removal of old spoil piles, mosquito ditches, and other barriers to tidal flow. Help existing wetlands by reducing boat wakes that cause erosion and removing invasive vegetation (SBEP 1992).

Works cited


General references and additional regional information

Sarasota Bay Estuary Program: sarasotabay.org/

Tidal Stream Assessment Project: www.sarasota.wateratlas.usf.edu/tidal-stream-assessments

Regional contacts

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