2025 - 2030 MONITORING PLAN

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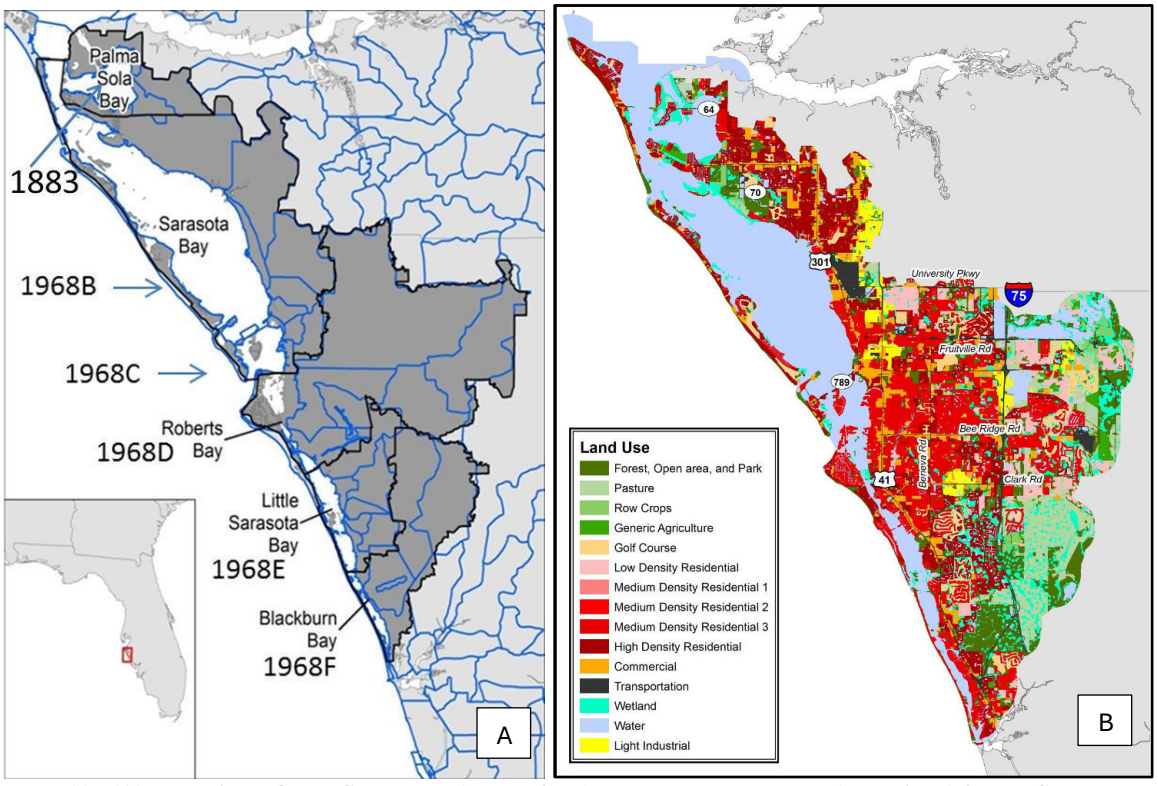
Executive Summary

The Sarasota Bay Estuary is a series of five coastal lagoons (Figure 1 A) located on the southwest coast of Florida bounded to the north by the Tampa Bay Estuary Program and to the south by the Coastal and Heartland National Estuary Partnership. This 150 square mile watershed is over 85% developed into an urban landscape (Figure 1 B) with shorelines that are over 80% hardened with seawalls. Over the past 150 years the watershed was drained through channelization that converted the land use from pine flatwoods and wetland to agricultural then in the last 75 years developed into a dense urban landscape. The result of which is a watershed that has little residence time for processing nutrient inputs. Infrastructure is racing to catch up with a population that has been expanding since 2000. A focus on nutrients has led this region to have long-standing water quality sampling programs, with more recent increased habitat, fisheries, and harmful algal bloom monitoring intensity, referenced in this Monitoring plan. Those programs are utilized to monitor, assess, and manage the state of the estuary within this region.

Figure 1 – Sarasota Bay Watershed and Land Use Classification.



Source(s): (A) Location of Bay Segments (black lines) and Waterbody IDs (blue lines) in the Sarasota Bay Estuary Program from the 2025 SBEP Water Quality Protection Plan. (B) Land Use in the Sarasota Bay Estuary Program's watershed from the 2025 Surface Water Improvement and Management (SWIM) Plan; Jones Edmunds, ESA and SWFWMD.

The Sarasota Bay Estuary Program (SBEP) has benefited from the long-term investments in monitoring, carried out by local and state agencies. These efforts have provided

sufficiently detailed information to allow for the development of Numeric Nutrient Concentration (NNC) criteria that were reviewed and approved by both the Florida Department of Environmental Protection (FDEP) and the US Environmental Protection Agency (EPA) in 2013. The data sets were also sufficient to allow FDEP to determine that the southern portions of Sarasota Bay had degraded sufficiently during past years that they were out of compliance with those NNC criteria. However, recent investments in wastewater and stormwater infrastructure have reduced dissolved inorganic loads to such a degree that the bay's water quality has improved enough to once again be in compliance with NNC criteria, a determination made by FDEP in 2023.

In addition to the substantial and long-term investments in the bay's water quality monitoring network, SBEP has developed a holistic "Ecosystem Health Report Card" which includes not only water chemistry, but also seagrass acreage and the abundance of drift macroalgae. The SBEP's Ecosystem Health Report Card was used to identify a "reference period" (2006 to 2012) during which the bay displayed multiple lines of evidence that it was a healthy system. Nutrient loads during this reference period data set were then compared against nutrient loads during the "degraded period" (2013 to 2019) to develop a pollutant load reduction goal, which was then used to identify the projects needed to bring about a healthier bay.

Thus, SBEP's monitoring plan is mainly focused on maintaining the data collection efforts that have been successful at helping to facilitate nutrient management strategies that have resulted in the de-listing of Sarasota Bay for nutrient impairments (in 2023) as well as allowing for the recent 1,913 acre (19 %) increase in seagrass coverage between 2022 and 2024. While additional monitoring efforts may be needed and appropriate, those potential future and additional efforts should not come at the expense of replacing the long-term and effective monitoring efforts that have been implemented by SBEP's stakeholders over the past few decades. More recent data sets of fisheries, habitat, and harmful algal blooms collected by state agencies will be advantageous in the expansion of the Report Card to provide a more comprehensive understanding of and investigating into how changes in water quality and land use impact on those resources.

Monitoring Plan Goals and Objectives

The objective of this monitoring plan is for the SBEP and its partners to work together to monitor the health of the bay, identify ongoing or emerging issues, and develop actions that facilitate the achievement of the Action Plans identified in the 2022 CCMP Update.

- **Water Quality & Quantity Action Plan** – (WQQ 1-8) Improve water quality and the timing, quantity, and distribution of freshwater flow to the estuary.
- **Watershed Action Plan** – (WH1-5) Restore shoreline, wetland, and bay habitats and eliminate future losses.
- **Wildlife Action Plan** – (FW 1-3) Protect, restore, and enhance fish and wildlife populations in SBEP bays and watersheds.
- **Community Engagement Action Plan** – (CE 1-4) Engage, educate, and encourage environmental stewardship of Sarasota Bay and increase community connections to the estuary through low impact recreational use and enjoyment.

This Monitoring Plan is a technical supplement to the 2022 CCMP Update and focuses on aspects of monitoring, data collection, analyses, and their uses in informing us about the state of the estuary. Please refer to those Action Plans in the 2022 CCMP Update for full descriptions of program objectives and performance criteria that guide each objective, as well as the strategies and actions for management of these resources. The 2022 CCMP Update includes the background on each action and the approaches to their assessment, restoration, or protection that are supported by this Monitoring Plan. The details on the specific monitoring actions that SBEP uses in the current assessment of bay health, and those not currently used but are available for improving the Report Card for a more comprehensive evaluation of the Sarasota Bay estuary are outlined in Table 1.

Table 1. Monitoring in the Sarasota Bay Region

Data Type	Water Body Identification (WBIDs)	Bay Segments	Collecting Agencies	Sampling and Assessment Frequency	Number of Stations Sampled per Year	Number of Samples per Year	Years of Effort	Cost $ (< 25 K) $$ (25-99 K) $$$ (100-500 K) $$$$ (500 K - 1 M) $$$$$ (> 1 M)	Data Gap	CCMP Action Item Codes
Water Quality	1883, 1968B, 1968C, 1968D, 1968E, 1968F	All Sarasota Bay segments	Sarasota County; Manatee County; FDEP	Monthly (ambient bays); Biennial assessments (FDEP)	40 bay subsegments	~480 (40 subsegments sampled monthly)	~30+ years	$$$	N	WQQ 1.1, WQQ 1.2, WQQ 2.1, WQQ 2.2 WH, FW, CE
Rainfall	1883, 1968B, 1968C, 1968D, 1968E, 1968F	Watershed-wide	Sarasota County ARMS; Manatee County gauges; Water Atlas	Near real-time (hourly)	46 (Manatee: 38 Campbell + 8 Ambient); Sarasota ARMS: additional stations	~403,000 (46 gauges × 8,760 hr/yr)	Ongoing	$$$	N	WQQ 3.1, WQQ 3.2
Hydrology (Flow/Stage)	1883, 1968B, 1968C, 1968D, 1968E, 1968F	All Sarasota Bay segments	USGS NWIS; Sarasota & Manatee County sensors; SWFWMD	Continuous (15–60 min intervals)	~25 (approx., regional continuous stations)	~875,000 (25 stations × 35,040/yr at 15 min, approx.)	Ongoing	$$$	N	WQQ 3.1, WQQ 3.2
Seagrass Coverage	1883, 1968B, 1968C, 1968D, 1968E, 1968F	All Sarasota Bay segments	Sarasota County; SWFWMD (aerial mapping)	Annual field surveys (County); Biennial (SWFWMD aerial mapping assessment)	160 field sites (Sarasota County)	~160 site surveys/year (County); Aerial mapping is polygonal (no per-station samples)	~30+ years (mapping since 1988)	$$$	N	WH-5.3, WH-5.4
Macroalgae	1883, 1968B, 1968C, 1968D, 1968E, 1968F	All Sarasota Bay segments	SBEP (Eyes on Seagrass); Sarasota County (defered to EOS data in 2021)	Biannual (spring & summer windows)	~40–45 transects	~800 quadrat transect samples	~15+ years (expanded to EOS in 2021–present)	$$	N	WQQ 8.1, WQQ 8.2
Fisheries (FIM)	1883, 1968B, 1968C, 1968E, 1968F	All Sarasota Bay segments	FWC-FWRI (FIM); SBEP	Bi-Monthly, stratified-random sampling	~30–40 (approx., varies by gear and habitat)	~180–240 net sets/year (approx.)	~15+ years; SBEP-funded locally since 2009	$$	N	FW-1.1, FW-1.2
Red Tide / HAB	1883, 1968B, 1968C, 1968D, 1968E, 1968F	All Sarasota Bay segments (inshore & nearshore offshore context)	FWC-FWRI; USF; NOAA	Daily sample map updates; Weekly status reports	Variable (dozens active in region during blooms)	~1,500–2,000 in active years (approx.)	~70+ years (HAB database since 1953)	$$$$	N	WQQ 8.1, WQQ 8.2
Bacteria	1883, 1968B, 1968C, 1968D, 1968E, 1968F	All Sarasota Bay segments (Class 3 marine; Class 2 shellfish areas in upper bay & Palma Sola)	Sarasota County; Manatee County; FDEP; DOH	Monthly ambient; Beaches biweekly	~480 ambient (Sarasota bays program); Beaches: separate fixed sites	~480 ambient; Beaches vary (biweekly)	~25+ years	$$	N	WQQ 4.1, WQQ 5.1, WQQ 5.2
Mangroves (CHIMMP)	1883, 1968B, 1968C, 1968D, 1968E, 1968F	Sarasota Bay (Upper & Lower), Roberts Bay (North & South), Little Sarasota Bay, Blackburn Bay, Palma Sola Bay	FWC-FWRI CHIMMP; SBEP; SWFWMD; Sarasota & Manatee Counties	Mapping updates every 2–3 years; field verification as needed	Not station-based (GIS polygons); verification points vary by cycle	Not discrete samples; polygon updates + site-level field checks	CHIMMP since 2013	$$	N	WH-4.1, WH-4.3
	1968D, 1968E, 1968F	Roberts; Little Sarasota; Blackburn; Palma Sola	Suncoast Waterkeeper	Annual (pilot & ongoing monitoring)	8 sites (Mangrove Rangers program)	8–16 surveys/year	~15+ years; Mangrove Rangers 2024–present	$	Y	WH-4.1, WH-4.3
Oysters (Habitat & Population, CHIMMP)	1883, 1968B, 1968C, 1968D, 1968E, 1968F	All Sarasota Bay segments and tidal creeks	Sarasota County (Stormwater); SBEP; FWC-CHIMMP/OIMMP	Semiannual (county quadrat surveys); Mapping updates every 2–3 years (CHIMMP/OIMMP)	~27+ stations (expanded county-wide); CHIMMP uses habitat polygons	~60 quadrat samples/year (county); CHIMMP polygons not discrete samples	~20+ years (2003–present; CHIMMP since 2016)	$$	N	WH-5.1, FW-2.1, FW-2.2
Dolphins (Bottlenose)	1883, 1968B, 1968C, 1968D, 1968E, 1968F	All Sarasota Bay segments	Sarasota Dolphin Research Program (CZS) at Mote; Partners: New College, Loggerhead Instruments	Photo-ID ~10 days/month; Passive Acoustic Listening Stations (PALS) continuous	10 PALS hydrophone stations + boat survey transects	~120 boat-survey days; acoustic data continuous (millions of detections)	~50+ years (1970–present)	$$$	N	FW-3.1, FW-3.2
Manatees (Florida Manatee)	1883, 1968B, 1968C, 1968D, 1968E, 1968F	All Sarasota Bay segments	FWC-FWRI (Synoptic surveys); Mote; SBEP	Synoptic aerial surveys 1–3×/yr (winter); Local acoustic presence via PALS continuous	Synoptic: statewide observation points (hundreds); Local: 10 PALS hydrophones	Synoptic: hundreds of observations per survey; Acoustic continuous	~30+ years (synoptic since 1991)	$$$	N	FW-3.1, FW-3.2

Background

The National Estuary Program (NEP) was established in 1987 under Section 320 of the Clean Water Act. The purpose of the NEP is to protect and/or restore the health of "nationally significant estuaries." Under Section 320, the Administrator of the U.S. Environmental Protection Agency (EPA) is authorized to convene Management Conferences to identify priority problems within these estuaries and develop a Comprehensive Conservation and Management Plan (CCMP) to address priority problems related to ecosystem health.

Each of the 28 NEPs is required to track CCMP implementation and to monitor key indicators of ecosystem health. While many NEPs share common concerns over issues such as cultural eutrophication, toxins, habitat loss, etc., most NEPs have unique conditions, which require NEP-specific indicators of ecosystem health.

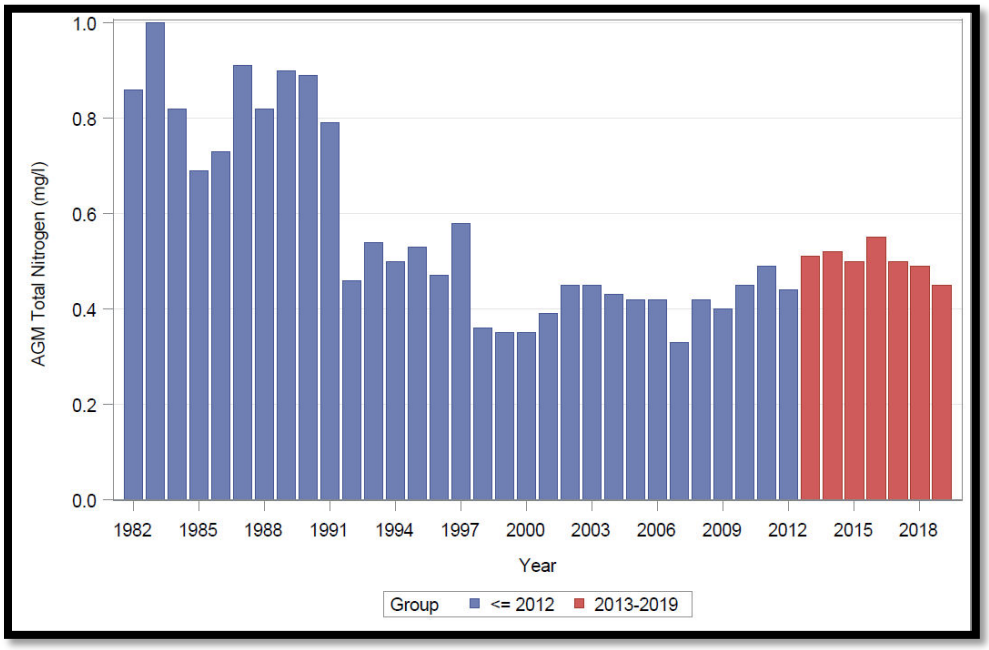
In 1992, the Sarasota Bay National Estuary Program, now referred to as the Sarasota Bay Estuary Program (SBEP), released its first summary of the bay's health, the Framework for Action (SBNEP_Framework_for_Action.pdf). That document was produced under the guidance of the EPA, and it synthesized results from over two years of diagnostic studies, including the following:

- Developing a segmentation scheme to be used for bay management
- Assessing the status and trends of freshwater and saltwater wetlands
- Assessing the status and trends of the bay's water quality
- Characterizing contaminant levels in the bay's sediments
- Characterizing contaminant levels in bivalve populations in the bay
- Characterizing the seagrass coverage, and clam and oyster habitats of the bay
- Characterizing the status of dolphin and manatee populations in the bay
- Characterizing the fish populations of the bay
- Developing a bay-wide pollutant loading model
- Developing a bay-wide calibrated circulation model
- Determining the susceptibility (if any) of the bay to sea level rise

The 1992 report concluded that between the late 1960s and the early 1990s, Sarasota Bay had become less saline over time, and its pH had declined. These findings were consistent

with expectations of increased freshwater influence, associated with increased urbanization of the watershed. However, that same report concluded that nutrient concentrations had been declining over time, as were levels of chlorophyll-a, a surrogate for phytoplankton populations. In parts of the bay, such as Roberts Bay, the reduction in nutrient concentrations from the early 1980s to the late 1990s was substantial, approximating a 50% decrease (Figure 2).

Figure 2 – Trend over time for Total Nitrogen (TN; mg/L) in Roberts Bay. Years 2013 to 2019 refer to the "degraded" period, compared to the "reference period" of 2006 to 2012. Note that even the most recent "degraded period" is substantially better water quality than the pre-SBEP years of 1982 to 1990.



Related to the reduction in chlorophyll-a, it was found that water clarity had been increasing over time in most of the bay's segments.

Thus, as far back as 30 years ago, it was known that increased urbanization of the bay's watershed did not have to be accompanied by degrading water quality, at least in terms of nutrient pollution. The major reasons for the trend of improving water quality were believed to be recent (at the time) upgrades to the City of Sarasota's wastewater treatment plant, consolidation of some of the smaller and less effective private wastewater treatment plants in Sarasota County, and efforts by Manatee County to reduce offsite movement of wastewater from a large-scale effluent disposal site through the construction of a deep well injection site for the County's Southwest Water Reclamation Facility.

At the same time, toxic contaminants such as chlorinated pesticides, polycyclic aromatic hydrocarbons (PAHs), and metals were found in high abundance in various locations, particularly Hudson Bayou.

Clear evidence of a gradient in pollutant loads was found around downtown Sarasota, likely reflecting the influence of sediment loads from stormwater discharges into the bay from older neighborhoods that were developed prior to the establishment of stormwater treatment rules in the 1980s.

2025 – 2030 SBEP Monitoring Plan Crosswalk to Existing Management Plans

As related to SBEP's 2022 CCCMP update, the following CCMP objectives are addressed in this Monitoring Plan.

Water Quality and Quantity (WQQ) Objective 3: Improve and manage hydrology for a more natural pattern of timing, quantity and distribution of surface waters.

SBEP and its partners work together to monitor the health of the bay to determine nutrient impairments via their monitoring efforts and combine those results with pollutant loading models to determine the cause(s) of water quality impairments, and the activities most likely to be successful addressing identified concerns. The successful use of results from the various monitoring programs allowed SBEP to develop a Pollutant Load Reduction Goal (PLRG) of 12 tons of Dissolved Inorganic Nitrogen (DIN) per year, based on the selection of 2006 to 2012 as a "reference period." In 2021, SBEP hosted a Water Quality Restoration Workshop, which was used to identify projects that could meet that PLRG - 2021 Sarasota Bay Water Quality Restoration Workshop.

Water Quality and Quantity (WQQ) Objective 4: Reduce pollutant loading from stormwater.

SBEP and its partners work together to monitor the health of the bay to determine nutrient impairments via their monitoring efforts and combine those results with pollutant loading models to determine "hot spots" for stormwater loading. These combined efforts have helped with the design, permitting and expected performance of two large-scale stormwater retrofit projects, an instream retrofit for Hudson Bayou adjacent to Sarasota High School (Hudson Bayou Restoration Awarded APWA Project of the Year) and the large stormwater treatment park and nature park at the Bobby Jones Golf Course – (Director's Note: Progress being made on large regional stormwater retrofit project – Sarasota Bay Estuary Program). Combined, those two projects retrofitted over 6,000 acres of urbanized watershed that had no prior stormwater BMPs and have reduced nitrogen loads to the bay by approximately 1,000 pounds.

Community Engagement (CE) Objective 2: Improve public understanding of bay-related issues.

Results from the monitoring efforts conducted by SBEP and its partners are compiled into an Ecosystem Health Report Card, which is used in presentations to the public and to elected officials to summarize the health of the bay - Report Card | Sarasota Bay Estuary Program. The equations and algorithms behind the Ecosystem Health Report Card have been vetted by SBEP's Technical Advisory Committee and are available for review and/or comment - 2021-SBEP-Water-Quality-Report-Card-Supplemental-Information.pdf . The report card, while based on detailed assessments on water quality, seagrass maps and drift macroalgae monitoring, combines results in a format that is understandable to the general public, helping to highlight the precarious nature of the bay back in the years 2013 to 2019, as well as the improvements that have occurred in recent years. For those who wish to dive into the report card in more detail, the raw data used to create the reported values are available via SBEP's website - SBEP Office - Documents.

In addition, the output from these monitoring efforts, including the annual updates to the Ecosystem Health Report Card, will be coordinated with the SBEP's Water Quality Protection Plan (WQPP) - Our Plans | Sarasota Bay Estuary Program to ensure that the projects outlined in the WQPP are enacted, so that the bay's health does not deteriorate, which would be reflected in outcomes reported in the Ecosystem Health Report Card. In 2023, FDEP determined that Sarasota Bay's open waters were no longer out of compliance with nutrient-related water quality standards, eliminating the need for a Reasonable Assurance Plan (RAP) for nutrient impairments. However, the SBEP Policy Board chose to remain proactive and develop a Water Quality Protection Plan (WQPP), which includes similar elements to the RAP but does not have regulatory enforcement. Local governments will still need to adhere to regulations in their Watershed Management Plans and/or NPDES permits.

Ecosystem Health Indicators

While many factors are involved with ecological health of estuaries, the primary focus of the SBEP and many of the other 28 NEPs has been towards identifying and acting upon those impacts that can lead to cultural eutrophication.

For example, early on, the Tampa Bay Estuary Program (TBEP) developed a pollutant load reduction goal for nitrogen, to reduce phytoplankton levels, improve water clarity, and allow for seagrass recovery - State of the Bay - Tampa Bay Estuary Program. The TBEP's "key indicators" of system health are nutrient-based assessments of water quality, annual assessments of nitrogen loads to the bay, nutrient-based assessments of the health of the

bay's various tidal creeks, and an assessment of the health of the benthic and sediment conditions of the bay.

In the New York-New Jersey Harbor Estuary Program (NY-NJ HEP), ecological health is tracked via quantifying the status and trends of nutrients, but also toxins, trash levels and wildlife populations across their system - hudsonriver.org. The status and trends in the health of the NJ-NJ HEP is summarized in a single page, including sub-headings for Water Quality, Habitat and Ecology, Contaminants, Community Engagement, and Public Access.

Similarly, SBEP has previously conducted substantial research on indicators of ecosystem health outside of those associated with cultural eutrophication, although nutrient-related issues have dominated most of SBEP's efforts over the last few years.

In part, the focus on nutrients has been based on the findings that portions of Sarasota Bay had become "impaired" for nutrients, using criteria developed by SBEP in 2011 - Numeric Nutrient Criteria Recommendations. After review and approval of those Numeric Nutrient Concentration (NNC) criteria by both FDEP and the EPA, they were formally adopted by the State of Florida and incorporated via Florida Administrative Code (FAC) 62-302.532 - 62-302.532 : Estuary-Specific Numeric Interpretations of the Narrative Nutrient Criterion.

While factors other than nutrients alone are clearly important to fully characterize the health of coastal systems, nutrient loads are particularly called out as a factor that needs to be addressed in the State of Florida. As outlined in the 1998 Watershed Protection Plan, there is a required process for all stakeholders to follow, as it relates to nutrient issues. These steps include the following:

- Water quality data must be collected at a frequency deemed acceptable by FDEP
    - In Sarasota Bay, Manatee County collects and analyzes water quality in their portions of the Bay, while Sarasota County funds Mote Marine Laboratory to do the same in their portion of the bay
    - Both counties collect data monthly
        - Data are available for review and analysis for Sarasota County - Sarasota.WaterAtlas.org
        - Data are available for review and analysis for Manatee County – Manatee.WaterAtlas.org
- Results are to be compared against surface water quality standards listed in FAC 62-302.532 (linked above)

- Based on a comparison of results and NNC criteria, the waterbodies will be reviewed to determine compliance with the Impaired Waters Rule (FAC 62-303)
- Should a water body be determined to be out of compliance with existing NNC criteria, the State of Florida's default approach would be to complete a Total Maximum Daily Load (TMDL) as outlined in FAC 62-304
- Based on results from the TMDL, and identified excessive nutrient loads would be allocated to stakeholders through the development of a Basin Management Action Plan (BMAP)
- BMAP load allocations are intended to be self-implemented via the renewal of Non-Point Discharge Elimination System (NPDES) permits

The first step in this process, the collection of water quality data, has been undertaken for over 20 years by Manatee and Sarasota Counties. The WBIDs where data are sampled for Palma Sola, Sarasota, Roberts, Little Sarasota and Blackburn Bays are shown in Figure 1A, respectively.

It should be noted that the frequency with which sample locations are randomized differs between Manatee and Sarasota County. Manatee County visits multiple sites per month per bay segment, but the sites are randomly assigned to be visited over the course of a year, while sampling sites are randomly assigned to new locations on a more frequent basis by Sarasota County. This gives the impression of more sampling sites in those waters sampled by Sarasota County. The number of sampling sites differs between bay segments, with locations such as Palma Sola Bay not having as many sites visited as larger systems such as Upper Sarasota Bay, for example.

Water Quality Monitoring

The local governments in SBEP's watershed have carried out water quality monitoring programs for more than 20 years. While the station locations, techniques and frequency of sampling efforts may have changed over time, the overall design and responsibility for these county-led efforts has not. Consequently, SBEP has prioritized the need to maintain existing efforts for water quality monitoring, rather than trying to change their approaches.

Table 2. Data collected by each county, monthly, include the following:

Parameter	Manatee County	Sarasota County
Red tide (*Karenia brevis*; #/L)	Y	Y
Total Nitrogen (mg/L)	Y	Y
Phosphorus as P (mg/L)	Y	Y
Chlorophyll-a (uncorrected for phaeophytin; µg/L)	Y	Y
Chlorophyll-a (corrected for phaeophytin; µg/L)	Y	Y
Nitrogen, ammonia as N (mg/L)	Y	Y
Nitrogen, Kjeldahl (mg/L)	Y	Y
Nitrogen, nitrate + nitrite as N (mg/L)	Y	Y
Secchi disk depth (ft)	Y	Y
Turbidity (NTU)	Y	Y
Apparent color (PCU)	Y	Y
Salinity (ppt)	Y	Y
Specific conductance (µmho)	Y	Y
Fecal coliform bacteria (cfu/100 ml)	Y	Y
Enterococcus bacteria (cfu/100 ml)	Y	Y
Dissolved oxygen (mg/L)	Y	Y
Biochemical oxygen demand (mg/L)	Y	Y
Dissolved oxygen (% saturation)	Y	Y
pH (SU)	Y	Y
Water Temperature (°F)	Y	Y

The water quality data collection efforts that have been carried out have been sufficient to allow for the following assessments:

- Documentation of the long-term trends in water quality over the past 40 years
    - However, prior data collection efforts organized by the SBEP in the 1990s involved quarterly sampling of more locations
    - For the past 20 or so years, monitoring efforts have involved monthly sampling at fewer locations
- Development of NNC criteria that were developed for the SBEP in 2011, and then reviewed and approved by the TAC, FDEP and the US EPA in 2013
- Determination that chlorophyll-a concentrations in lower Sarasota Bay, Roberts Bay, Little Sarasota Bay, and Blackburn Bay were elevated enough to be out of compliance with NNC criteria during the SBEP's "degraded period"
    - The determination of impairment was made by FDEP in 2021
- Determination that improvements in chlorophyll-a in those same four waterbodies had improved enough that those waterbodies were considered to no longer out of compliance with NNC criteria
    - The determination of sufficient improvement for all bay segments to be "de-listed" for nutrient impairments was made by FDEP in 2023

While factors other than nutrients are important indicators of ecosystem health, the focus on nutrients is based on the requirement of SBEP to meet the expectations of state guidance, as summarized above.

SBEP has responded to this guidance in its 2022 Comprehensive Conservation and Management Plan (CCMP) update, where established NNC criteria are listed in comparison to proposed "reference period" based NNC criteria, as listed in Table 3.

Table 3 – Comparison of nutrient criteria based upon SBEP's reference period approach (set in 2021) vs. NNC criteria established by SBEP in 2013. The Table is from SBEP's CCMP (2022).

Table WQQ-2.
Existing and potential updated numeric nutrient criteria (NNC) thresholds for SBEP estuary segments. Potential updates to NNC criteria are based on comparison to reference period (2006-2012) water quality conditions. The State of the Bay report card for Sarasota Bay does not include values for TP, as changes in laboratory techniques over time make comparisons problematic. The report card takes into account values for reference period averages, average values plus a standard deviation, and the highest value recorded for each bay segment during the reference period. Different management responses are required depending upon whether averages, average values plus a standard deviation, or highest values are exceeded.

ESTUARY SEGMENT	Existing Estuarine NNC			Reference Period Average	
	Total Phosphorous Threshold[1]	Total Nitrogen Threshold[1]	Chlorophyll a Threshold[2]	Total N [1]	Chlorophyll a
Palma Sola Bay	0.26 mg/L	0.93 mg/L	11.8 µg/L	0.46 mg/L	6.9 µg/L
Big Sarasota Bay	0.19 mg/L	NA[3]	6.1 µg/L	0.32 mg/L	3.8 µg/L
Roberts Bay	0.23 mg/L	0.54 mg/L	11.0 µg/L	0.42 mg/L	5.6 µg/L
Little Sarasota Bay	0.21 mg/L	0.60 mg/L	10.4 µg/L	0.48 mg/L	5.8 µg/L
Blackburn Bay	0.21 mg/L	0.43 mg/L	8.2 µg/L	0.31 mg/L	3.8 µg/L

[1] annual geometric mean not to be exceed more than once in a three-year period
[2] annual arithmetic mean not to be exceeded more than once in a three-year period
[3] annual geometric mean is calculated from monthly arithmetic mean of color by region and season

Combining Indicators with Pollutant Loading Models to Develop Management Targets

As can be seen, the reference period based NNC criteria proposed by SBEP in 2022's CCMP are stricter (i.e., lower) than the NNC criteria listed in FAC 62-302.532. In general, the reference period based NNC criteria for both Total Nitrogen (TN) and chlorophyll-a are at least 20% lower than levels included in FAC 62.302.532. Those stricter NNC criteria were used as the water quality components of SBEP's Ecosystem Health Report Card, developed in 2021 - Report Card | Sarasota Bay Estuary Program.

The Ecosystem Health Report Card is not based on water quality alone, but also includes estimates of bay-segment specific values for the amount of seagrass meadows, as well as volunteer-collected data on the abundance of drift macroalgae in the bay - 2021-SBEP-Water-Quality-Report-Card-Supplemental-Information. Earlier drift macroalgae data collection efforts by Sarasota County were included in the data set used to develop the report card, but such data are absent from both Palma Sola Bay and the Manatee County portion of Upper Sarasota Bay.

Output from the Ecosystem Health Report Card was combined with output from the SBEP's pollutant loading model to develop the Pollutant Load Reduction Goad (PLRG) in 2021 - 2021 Sarasota Bay Water Quality Restoration Workshop. At that workshop, a PLRG goal or reducing loads of dissolved inorganic nitrogen by 20% - equal to 12 tons per year – was presented - Workshop Summary.

As discussed in various communications from the SBEP, not only has the PLRG been met by actions undertaken by our local stakeholders - Director's Note: Honing in on the basis for recent trends…, but the bay's water quality has improved sufficient for FDEP to have determined (in 2023) that the bay was no longer considered impaired for nutrients - Director's Note: FDEP determinations of water quality trends. In response to these recent improvements, Sarasota Bay has recently seen a nearly 2,000 acre increase in seagrass coverage since 2022, a 19% increase that is the second largest increase in over 30 years - Seagrass & Algae | Sarasota Bay Estuary Program.

With this background, SBEP and its partners have successfully developed a holistic ecosystem health report card (for nutrients) and coupled that effort with a pollutant loading model to develop a 20% DIN load reduction target for its PLRG. Implementation of the target PLRG has allowed the bay to recover from its prior diminished condition.

As such, the monitoring plan for the SBEP – as far as nutrients – is based on maintaining what has been a satisfactory approach to develop and implement a resource-based ecosystem monitoring program.

The main components and responsibilities for these efforts are spelled out below:

- **Monthly** water quality sampling
    - Manatee County and Sarasota County as responsible entities
    - Continued focus on combined field and laboratory parameters
        - Water temperature, salinity, oxygen (mg/L and percent saturation), Total Nitrogen (TN), Total Phosphorus (TP), chlorophyll-a (corrected for phaeophytin
    - Seagrass mapping
        - Southwest Florida Water Management District (SWFWMD) to continue its 30-year monitoring program
        - Results on a segment and bay-wide basis **every two years**
    - Drift macroalgae
        - SBEP to continue to coordinate volunteer efforts
        - Sampling conducted **twice a year**, in spring and summer

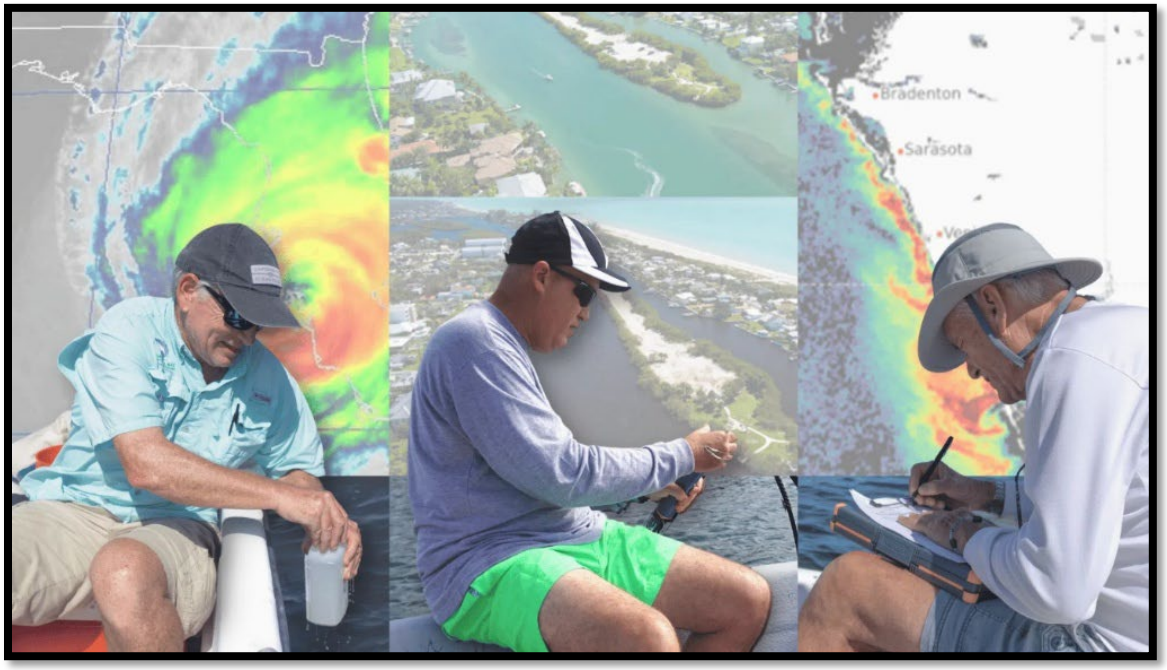
- Techniques to continue to use protocols consistent with the UF/IFAS "Eyes on Seagrass" program
- QAPP was approved in June of 2021 and no changes or amendments have been made to the monitoring strategy requiring amendment of the document, QAPP will meet its 5 years expiration in June of 2026.
- Data are collected from approximately 45 transects visited in both spring and summer, and results compiled on a bay-segment basis
- These data help support/implement the WQPP and help meet the goal of increased seagrass coverage.

Data from these nutrient-focused efforts will be used by SBEP to update the Ecosystem Health Report Card and will also be used by FDEP to determine compliance with the SBEP's NNC criteria.

Water quality monitoring efforts conducted by Manatee and Sarasota counties have been ongoing for over 30 years and are paid for and/or carried out by the two counties. These data have been reviewed and determined to be sufficient to not only characterize the water quality of Sarasota Bay, but the output from these programs was sufficient to develop NNC criteria, and to determine impairment status as well. For these reasons, SBEP does not view that there is a need to refine or revise the water quality monitoring efforts that have been used for over 20 years to track the status and trends of water quality in Sarasota Bay.

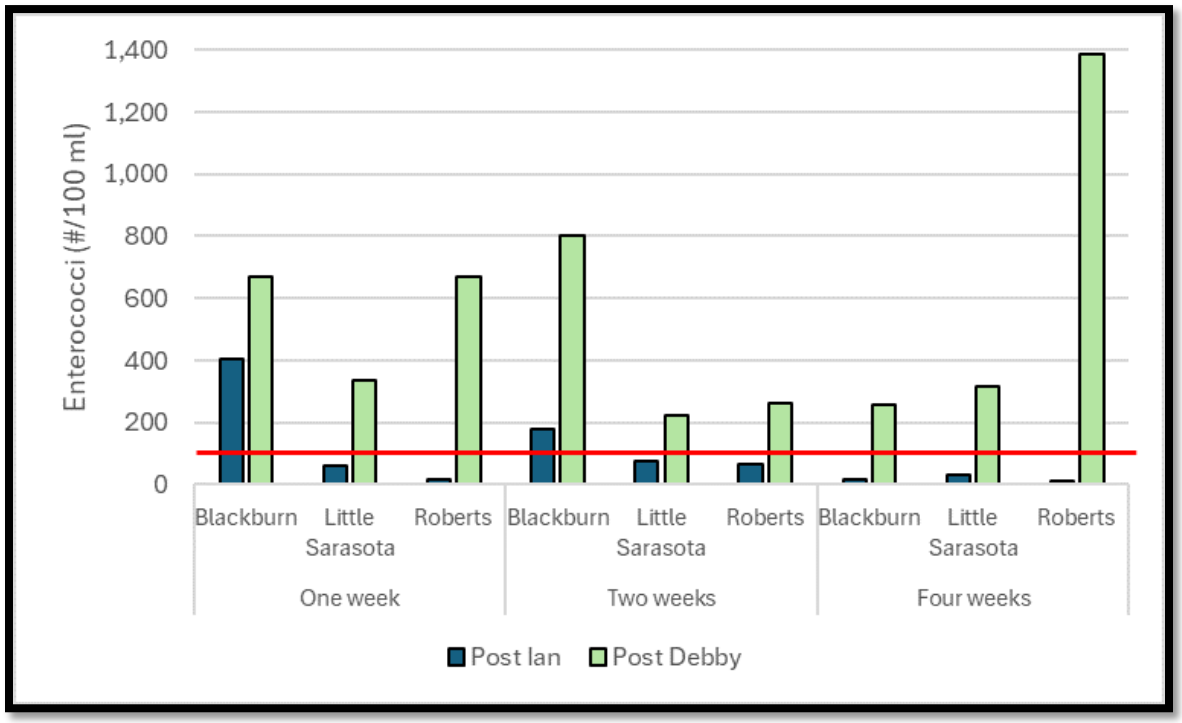
However, after tropical events come through, it is worth continuing the approach first undertaken by SBEP after Hurricane Ian (2022) and Debby (2024) wherein SBEP staff worked with staff from local governments and the SWFWMD to characterize water quality after these events. This has allowed County staff to focus their efforts on responding to flooding and physical impacts, while SBEP takes the lead on characterizing impacts and recovery from such events (see Figure 3).

Figure 3 – SBEP staff, along with staff from SWFWMD and Sarasota County, sampled the bay's water quality after Hurricane Ian (2022).



Results from these targeted efforts have focused on phytoplankton and nutrient levels, as well as dissolved oxygen and bacteria. Of particular concern, SBEP has noted that even when data are collected in the middle of the bay, elevated levels of bacteria were recorded for as long as a month after the storm's landfall, although this differed between storms (Figure 4).

Figure 4 – Results of sampling for enterococci bacteria (#/100 ml) in Roberts, Little Sarasota and Blackburn Bays after Hurricanes Ian (2022) and Debby (2024). The red line represents the Class III – Marine waters standard (130/100 ml).



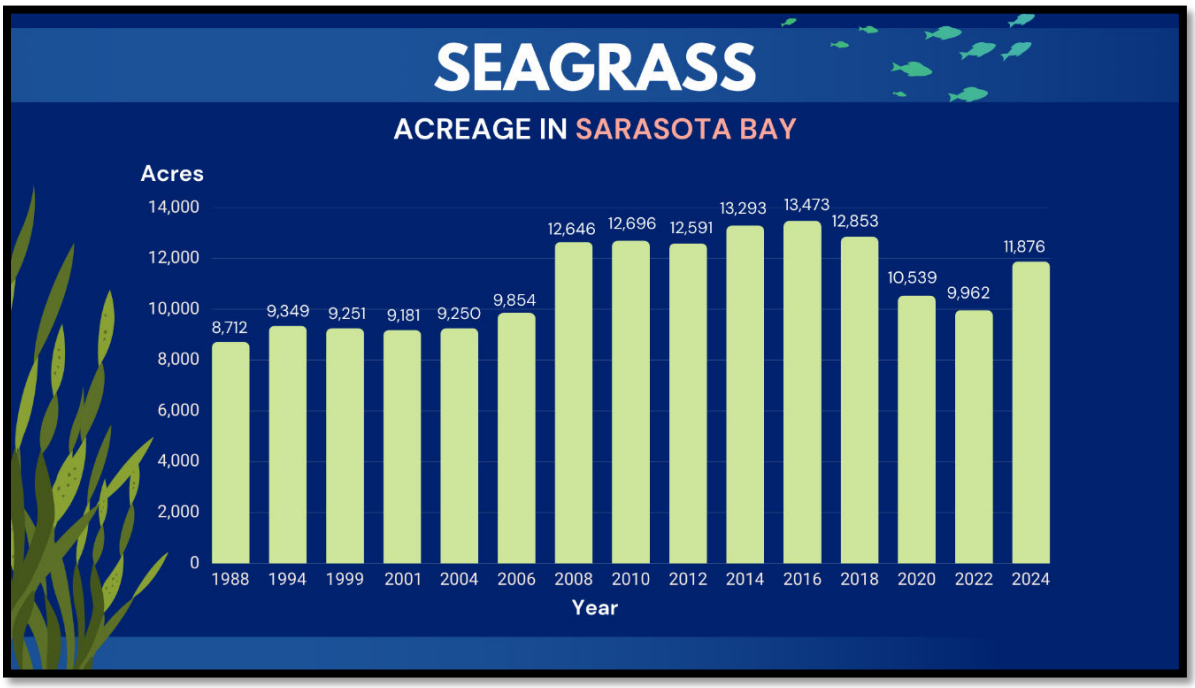
Discussions are ongoing related to how to more formally organize monitoring efforts that have been initiated after various storm events. However, experience has shown that formal arrangements can be made useless based upon issues such as damage to buildings, boat ramps, etc. that can preclude data collection efforts, regardless of good intentions. Most likely, future monitoring efforts will be on an ad hoc basis, as they are now, but coordinated amongst those agencies that have the ability to either collect data, analyze data, or pay for collection and analysis of data.

Seagrass and Drift macroalgae Monitoring

In addition to traditional and event-based water quality monitoring efforts, the SWFWMD has implemented a biennial (every other year) program to map seagrass resources throughout the region from Tarpon Springs down to Boca Grande Pass. While techniques have been modified over time, the SWFWMD has been conducting these complicated monitoring efforts for over 30 years, at no cost to SBEP, although the cost for the entire Suncoast region, which includes Tampa Bay, Sarasota Bay, Lemon Bay and Charlotte Harbor exceeds $1 million every two years - Seagrass Mapping | WaterMatters.org.

Data are summarized by the SBEP (Figure 5) and are available for review and/or analysis through the SWFWMD as well - https://data-swfwmd.opendata.arcgis.com/.

Figure 5 – Trends in seagrass coverage in Sarasota Bay between 1988 and 2024.

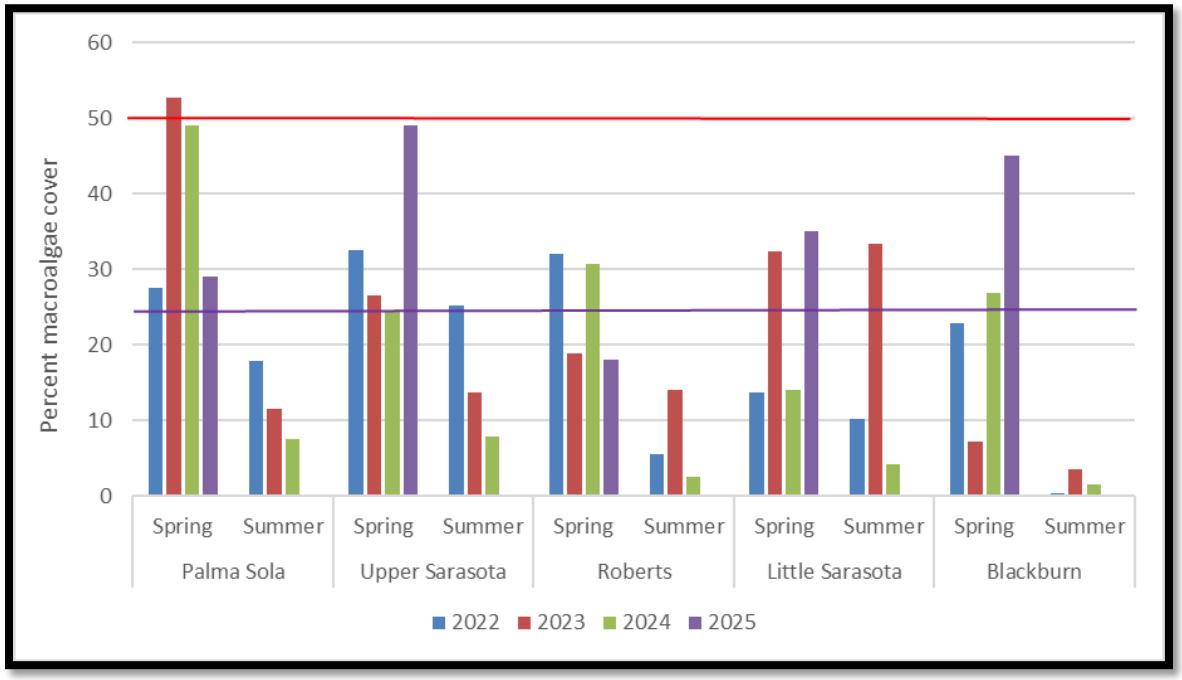


The last metric in SBEP's Ecosystem Health Report Card is a quantification of the amount of drift macroalgae at numerous locations around the bay. Twice a year, in spring and summer, trained volunteers (Figure 6) go out to 40 or so locations chosen via a grid system, from Palma Sola Bay down to Venice Inlet. At each location, the amount of drift macroalgae is quantified using techniques first developed by UF/IFAS Extension Sea Grant researchers, and as documented in the SBEP's EPA-approved QA/QC Plan - Quality Assurance Plan for Eyes on Seagrass.

Figure 6 – Trained volunteers prepare to quantify drift macroalgae coverage in Sarasota Bay.

Results from the drift macroalgae sampling effort are used to communicate with the public about the status and trends in drift macroalgae coverage over recent years (Figure 7) and results and a portal for workshops to train volunteers is available online - Eyes on Seagrass | Sarasota Bay Estuary Program.

Figure 7 – Plot of drift macroalgae abundance in each of SBEP's five bay segments. Data are bay-segment average percent of a 50 cm by 50 cm quadrat for Spring and Summer sampling events for 2021 to Spring of 2025. Purple and red lines represent two threshold values (25 and 50%, respectively) for characterizing drift macroalgae coverage.



Fish, Wildlife, and Habitat Monitoring Strategy

The SBEP Monitoring Strategy is to assess changes to the areal extent and quality of critical estuarine habitats and the populations of marine organisms that depend on them. Guiding questions were developed to evaluate the status of these and provide guidance for meeting the objective. Questions 1 and 2 are currently being in use in the SBEP Ecosystem Health Report Card while questions 3 through 7 are future needs that we seek to address the potential for their use in the SBEP Ecosystem Health Report Card during this five-year period.

Guiding Questions for the Fish, Wildlife, and Habitat Monitoring Strategy:

1. Seagrass: Are seagrass acreage and coverage trending toward CCMP restoration targets or at least maintaining reference period levels in each bay segment?
2. Macroalgae: Is macroalgae percent cover, at monitoring sites, at or below the reference period mean indicating reduced eutrophication?

3. Fisheries: Are abundance, species composition, and recruitment of key estuarine species improving with habitat gains? Are population trends consistent with water quality improvements and habitat restoration outcomes?
4. Mangroves: What is the trend in mangrove extent (acres)? Is there room-for-migration to accommodate landward shifts in tidal height?
5. Oysters: Is reef extent (acres) expanding in priority segments and tidal creeks consistent with CCMP habitat goals?
6. Dolphins: Are population metrics (abundance, survival, calf recruitment) stable or improving in Sarasota Bay?
7. Manatees: Are synoptic counts and local occurrences indicating sustained seasonal habitat use in the bay? Is forage availability (seagrass) adequate in preferred use areas, with minimal disturbance?

Each of these guiding questions is addressed by one or more environmental data collection parameters and tied to indicators of success identified in the CCMP Fish, Wildlife, and Habitat Protection Actions. The following table outlines these data collection parameters (either in use or needed for future determination).

Table 3. Monitoring Indicators for Fish, Wildlife, and Habitat

Data Type	CCMP Action Item Codes	Guiding Questions	Indicators of Success	Sample and Assessment Frequency	SBEP Use	Gaps/Needs	Cost $ (< 25 K) $$ (25-99 K) $$$ (100-500 K) $$$$ (500 K - 1 M) $$$$$ (> 1 M)
Seagrass Coverage	WH-5.3, WH-5.4	• Are seagrass acreage and coverage trending toward CCMP restoration targets or at least maintaining reference period levels in each bay segment?	• Net change in seagrass acreage vs. reference period/targets; percent cover.	Annual field surveys (County); Biennial (SWFWMD aerial mapping assessment)	Component of the SBEP Report Card.	No Data Gap/ Current funding adequate.	$$$
Macroalgae	WQQ 8.1, WQQ 8.2	• Is macroalgae percent cover, at monitoring sites, at or below the reference period mean indicating reduced eutrophication?	• Long term trend in sites macroalgae cover •Maintanance at or below reference period mean.	Biannual (spring & summer windows) (SBEP Eyes on Seagrass)	Component of the SBEP Report Card.	No Data Gap/ Current funding adequate.	$$$
Fisheries (FIM)	FW-1.1, FW-1.2	• Are abundance, species composition, and recruitment of key estuarine species improving with habitat gains? • Are population trends consistent with water quality improvements and habitat restoration outcomes?	• CPUE and diversity indices improve for sentinel species; positive recruitment signals • Spatial concordance between water quality trends or habitat restoration sites and improved fish metrics	Bi-Monthly, stratified-random sampling (FFWC-FWRI-FIM)	Potential future component of the SBEP Report Card.	Needs technical evaluation as a potential additional component of the Report Card.	$$
Mangroves (CHIMMP)	WH-4.1, WH-4.3	• What is the trend in mangrove extent (acres)? • Is room-for-migration to accommodate landward shifts in tidal height?	• Change in net acres of mangrove habitat increase • Percent of existing acreage that have corridors extenting for landward migration	Mapping updates every 2–3 years; field verification as needed (CHIMPP)	Potential future component of the SBEP Report Card.	Needs technical evaluation as a potential additional component of the Report Card.	$$
Oysters (Habitat & Population, CHIMMP)	WH-5.1, FW-2.1, FW-2.2	• Is reef extent (acres) expanding in priority segments and tidal creeks consistent with CCMP habitat goals?	• Reef acreage restored/created per year; structural integrity maintained	Semiannual (county quadrat surveys); Mapping updates every 2–3 years (CHIMMP/OIMMP)	Potential future component of the SBEP Report Card.	Needs technical evaluation as a potential additional component of the Report Card.	$$
Dolphins (Bottlenose)	FW-3.1, FW-3.2	• Are population metrics (abundance, survival, calf recruitment) stable or improving in Sarasota Bay?	• Photo-ID catalog size and survival maintained or increased; calf production stable	Photo-ID ~10 days/month; Passive Acoustic Listening Stations (PALS) continuous (Mote)	Potential future component of the SBEP Report Card.	Needs technical evaluation as a potential additional component of the Report Card.	$-$$
Manatees (Florida Manatee)	FW-3.1, FW-3.2	• Are synoptic counts and local occurrence indicating sustained seasonal habitat use in the bay? • Is forage availability (seagrass) adequate in preferred use areas, with minimal disturbance?	• Synoptic survey counts stable or increasing; local PALS detections sustained • Seagrass acreage in grazing areas stable/increasing; minimal disturbance reports	Synoptic aerial surveys 1–3×/yr (winter); Local acoustic presence via PALS continuous (Mote)	Potential future component of the SBEP Report Card.	Needs technical evaluation as a potential additional component of the Report Card.	$-$$

Fish, Wildlife, and Habitat Monitoring Programs

Seagrass Coverage

SBEP' partners conduct two complementary efforts to understand and manage seagrass in Sarasota Bay. First, Sarasota County leads annual in-water field surveys at ~160 sites (40 fixed and 120 random) across all bay segments. These surveys characterize percent cover, species composition (primarily turtle grass, shoal grass, and manatee grass), blade length, epiphyte abundance, sediment type, and other biological observations. Second, the Southwest Florida Water Management District (SWFWMD) performs biennial aerial mapping that delineates continuous and patchy seagrass polygons and quantifies acreage changes baywide. Together, these programs provide status and trends for seagrass extent and condition, link biological observations to water-quality drivers (light attenuation, chlorophyll-a, nitrogen), and inform CCMP habitat targets and restoration priorities. Results are used in SBEP's Ecosystem Health Report Card and in planning seagrass protection, boater education (prop-scar reduction), and nutrient load reduction projects.

Macroalgae

Macroalgae are monitored biannually through SBEP's Eyes on Seagrass (EOS) program, co-run with local governments and volunteer networks. Teams collect transect-based quadrat data on macroalgal percent cover and species presence at sites co-located with seagrass meadows. These observations act as a rapid indicator of eutrophication: elevated drift algae can shade seagrass, increase epiphyte loads, and depress dissolved oxygen during decomposition. EOS results are compared against ambient water-quality indicators (nitrogen, chlorophyll-a) and used to identify hot spots for stormwater retrofits, fertilizer ordinance outreach, and other CCMP water-quality actions. Macroalgae trends also help interpret seagrass gains or setbacks between aerial mapping cycles.

Fisheries (FIM)

The Florida Fish and Wildlife Conservation Commission's Fish and Wildlife Research Institute (FWRI) conducts the Fisheries Independent Monitoring (FIM) program in Sarasota Bay on a bi-monthly schedule using stratified-random sampling. Multiple gears (seines, trawls, etc.) are deployed across habitat strata, capturing abundance (CPUE), diversity, size/age structures, and habitat associations of estuarine fish communities. These data provide long-term, statistically robust trends for sentinel species and assemblages, link fish responses to habitat restoration (e.g., seagrass expansion, oyster reefs), and support CCMP wildlife actions. SBEP has helped fund and coordinate regional FIM work so that fisheries performance can be explicitly tied to restoration outcomes and water-quality recovery efforts.

Mangroves (CHIMMP and local monitoring)

Mangrove status and trends are tracked through two complementary approaches. The Coastal Habitat Integrated Mapping and Monitoring Program (CHIMMP) compiles multi-year, GIS-based polygon mapping of mangrove extent for Sarasota Bay with periodic field verification. This product supports shoreline resilience planning, room-for-migration assessments to accommodate rising tides, and CCMP habitat accounting. Locally, targeted monitoring by the Suncoast Waterkeeper (e.g., Mangrove Rangers pilot sites) assesses survival and canopy condition at restoration and stewardship locations, sometimes using drones or standardized photo points. Together, these efforts quantify net changes in mangrove acreage and condition, identify erosion or die-back areas, guide living shoreline projects, invasive control, and permitting/management decisions consistent with the CCMP Watershed actions.

Oysters (Habitat & Population, CHIMMP/OIMMP & County surveys)
Oyster work combines semiannual county-led quadrat surveys with integrated mapping and restoration tracking. Sarasota County's program measures live density, percent live, spat recruitment, and shell height at reefs in tidal creek mouths and bay segments; results are published via the Water Atlas. CHIMMP/OIMMP update polygon mapping of reef presence/extent every 2–3 years and track restoration footprints and condition. These data upon further investigation may inform CCMP habitat targets, identify locations suitable for reef creation or enhancement, and support water-quality benefits (filtration, clarity) and fisheries nursery functions. Where applicable, bacteriological conditions in shellfish harvesting areas are cross-checked with ambient monitoring to evaluate beneficial use attainment.

Dolphins (Bottlenose)
The Sarasota Dolphin Research Program (SDRP) leads long-term monitoring of bottlenose dolphins in Sarasota Bay. The program conducts photo-identification surveys approximately ten days per month to document group composition, reproductive status, survival, and movement patterns across known resident communities. A network of passive acoustic listening stations (PALS) continuously records vocalizations, providing spatial–temporal occurrence data and insights into behavior and disturbance. These complementary datasets (photo-ID and acoustics) produce one of the world's most complete records of wild dolphin population health and habitat use, these data upon further investigation may allow SBEP to connect CCMP wildlife objectives with real population metrics while informing vessel-interaction management, outreach, and habitat protection.

Manatees (Florida Manatee)

Manatee monitoring integrates statewide synoptic aerial surveys led by FWC with local occurrence information and passive acoustics where available. Synoptic counts (typically 1–3 times per winter season) provide consistent indices of manatee presence across coastal systems, including Sarasota Bay. Locally, sightings and acoustic detections complement synoptic results to identify preferred use areas and seasonal patterns. These data, considered alongside seagrass status in grazing zones and boater-speed compliance information, these data upon further investigation may inform CCMP wildlife actions focused on reducing anthropogenic stressors (e.g., boat strikes) and maintaining adequate forage. The combined approach helps prioritize education, enforcement, and habitat protection to sustain manatee use of Sarasota Bay.

The data from the monitoring of Fish, Mangroves, Oysters, and Marine Mammals have not yet been fully implemented into a bay-wide ecosystem assessment (Report Card), we anticipate that during this five-year period the SBEP and its associated TAC will investigate the utility of this information in strengthening our assessment of bay health as Sarasota Bay, now that it appears to be recovering from its recent eutrophic conditions.

In addition, bacteria levels in Sarasota Bay have not been included in an ecosystem health report card. A number of locations within the bay are regularly sampled by staff of the Florida Department of Health - Florida Healthy Beaches Program | Florida Department of Health. While most FDOH sites are Gulf beaches, the south side of Palma Sola Causeway and Bird Key Park along the Ringling Causeway are both sampled weekly for compliance with Class 3 Marine standards for enterococci bacteria. During this five-year period we intend to investigate this further as an additional ecosystem indicator and determine if it is useful or what additional information is needed to guide the future collection and use of this information in the assessment of bay health.

While the 1992 Framework for Action summarized information related to the spatial and temporal variation in the abundance of clams, oysters, dolphins and manatees in the bay, it does not appear that a formal monitoring program has ever been initiated by the SBEP, although the Sarasota Dolphin Research Program and Chicago's Brookfield Zoo have been running a decades-long research program focused on Sarasota Bay - Home - Sarasota Dolphin Research Program.

Similarly, while FFWCC tracks manatee populations over time, the latest state-wide estimate is from surveys conducted in the late fall to winter of 2021 on Florida's Gulf coast and late fall to winter of 2022 on Florida's Atlantic coast. There does not appear to be a bay-specific tracking of manatee populations, because manatees are not restricted to simply one coastal system, but move between estuaries, and from estuaries into

freshwater systems. This is an area for possible focus with initial inquiries into the utility of focusing on these populations in assessing bay health.

The SBEP will be working with the TAC to investigate the potential for indicators for Fisheries, Oysters, Mangroves, Dolphins and Manatees (Table 3) to further inform us on the health of the region. This review will seek to determine those that may be good candidates for future monitoring efforts including assessing spatial distribution and abundance. Like what was done for clams and oysters in the 1992 Framework for Action. Similarly, the development of an index-based system, such as was developed by the TBEP, might be a useful technique to adapt and/or implement these as additional into indicators of Bay health in the Report Card, as per guidance from the SBEP's Technical Advisory Committee (TAC).

Data Gaps and Funding Needs

As environmental conditions continue to shift under the influence of environmental stressors, gaps in water quality sampling are becoming increasingly evident. These gaps pose challenges for meeting the Florida Department of Environmental Protection (FDEP) quality assurance and quality control (QA/QC) standards, which are essential for impairment determinations, as well as for the development and compliance of Total Maximum Daily Loads (TMDLs) and Basin Management Action Plans (BMAPs). Currently, monitoring efforts do not fully capture critical information needed to address emerging water quality concerns. Specifically, there is insufficient data on:

- **Sources and loads of nutrient pollution**, including contributions from reuse irrigation, atmospheric deposition, agricultural runoff, and urban stormwater.
- **Effectiveness of water quality Best Management Practices (BMPs)** in removing nutrients.
- **Nutrient loading from wastewater reuse irrigation** and its long-term impacts.
- **Occurrence and drivers of harmful algal blooms (HABs)**.
- **Interactions between environment, land-based pollution, and HAB formation**, requires improving our understanding.
- **Emerging contaminants**, such as pharmaceuticals and microplastics, that pose new risks to aquatic ecosystems.

To address these gaps, SBEP will continue to collaborate with partners to identify emerging needs and secure resources. This includes pursuing funding, equipment, volunteer support, and other assets necessary to expand sampling and research in these priority areas. By strengthening data collection and analysis, SBEP aims to ensure that management strategies remain adaptive and effective in safeguarding water quality under changing environmental conditions.

Conclusions

Prior guidance from EPA, related to the design and implementation of monitoring programs, has stressed the following points:

- Indicators should have a connection with potential management actions
- Indicators should be vetted through both technical and non-technical audiences to ensure that they are scientifically sound, but also understandable to the public
- Indicators should be based on the likelihood that they can be sustained over time for long-term monitoring
- Results from indicator monitoring efforts should be able to be understood by the public and policy makers so that the implications of findings can be clearly understood

Based on the experiences over the past 30 years, the nutrient-focused indicators used by SBEP (water quality, seagrass coverage and drift macroalgae abundance) provide a holistic overview of the bay's health that meets the intent of the main concerns expressed by the US Congress in Section 320 of the Federal Clean Water Act. However, the Bay Health Report Card needs to continue to develop into a more comprehensive tool for assessing the Sarasota Bay Estuary by incorporating additional ongoing monitoring efforts such as fisheries, bacteria levels, marine mammals, benthic communities, mangroves, oysters, and toxins among others that are not currently included. The process to expand the Report Card will begin with a review by SBEP's Technical Advisory Committee (TAC) during summer and fall 2025. This review will identify potential areas of focus and provide guidance. The goal is to broaden the Report Card over the next five years into a more comprehensive evaluation of the estuary and its watershed.

Acronyms

AWT	Advanced Wastewater Treatment
BMAP	Basin Management Action Plan
BMP	Best Management Practice
CCMP	Comprehensive Conservation and Management Plan
CE	CCMP Community Engagement Action Plan
EPA	United States Environmental Protection Agency
FDACS	Florida Department of Agriculture and Consumer Services
FDEP	Florida Department of Environmental Protection
FDOH	Florida Department of Health
FDOT	Florida Department of Transportation
FIM	Fisheries Independent Monitoring Program
FWC	Florida Fish and Wildlife Conservation Commission
FWRI	Fish and Wildlife Research Institute
FW	CCMP Wildlife Action Plan
GCOOS	Gulf of Mexico Coast Ocean Observing System
GIS	Geographic Information System
HAB	Harmful Algal Bloom
NEPORT	National Estuary Program Online Reporting Tool
NGO	Non-governmental organization
NNC	Numeric Nutrient Criteria
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
QA/QC	Quality Assurance/Quality Control
SFWMD	South Florida Water Management District
STORET	Storage and Retrieval (now called Watershed Information Network, WIN)
SWFWMD	Southwest Florida Water Management District
TMDL	Total Maximum Daily Load
USACE	U.S. Army Corps of Engineers
USDA	Unites States Department of Agriculture
USDI	United States Department of the Interior
USF-CMS	University of South Florida College of Marine Science
USGS	United States Geologic Survey
WH	CCMP Watershed Action Plan
WIN	Watershed Information Network
WMIS	Water Management Information System
WQQ	CCMP Water Quality & Quantity Action Plan

SARASOTA BAY ESTUARY PROGRAM

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