



2023

Program Evaluation

Sarasota Bay Estuary Program

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Introduction

The Sarasota Bay Estuary Program (SBEP) functions as a non-regulatory facilitator to promote the protection and /or restoration of Sarasota Bay, Florida. The SBEP works with its stakeholders to help bring together resources and funding from multiple sources to address the priority actions listed in the 2022 update to the SBEP's (CCMP). The CCMP update is available via an ArcGIS Storymap - [A Thriving Estuary \(arcgis.com\)](#). Within the Storymap, there is a link to a PDF of the CCMP itself, for those who wish to access a more detailed understanding of the state of the bay, the actions needed to preserve and/or protect its health, and the responsibilities of local stakeholders related to implementing the CCMP's Action Plans.

The SBEP seeks to leverage the combined efforts of local, regional, state and federal governments with an engaged and dedicated group of volunteers and local residents to help guide the restoration of Sarasota Bay.

Since its inception more than 30 years ago, the SBEP has functioned as a non-regulatory and non-partisan voice to provide locally developed and scientifically sound management guidance for the bay and its resources. The SBEP is actively involved in efforts to reach out to the public and elected officials to serve as a respected source of information on topics as diverse as the role that humans play in local red tide events to the impacts of recent industrial wastewater spills at Piney Point in 2021 and 2022's combination of Hurricane Ian and Tropical Storm Nicole.

Over the past five years, SBEP staff have worked with our partners to reinvigorate efforts aimed at restoring the ecological health of Sarasota Bay. This has been accomplished by building scientific and community consensus by working through our Citizens Action Committee (CAC), the Technical Advisory Committee (TAC), our



Management Board, and our Policy Board. Our CAC members act as a local check on the problems and proposed solutions being considered, vet our public outreach approach, and review proposals for our grant-funding program, the Bay Partners Grants. Our TAC acts to ensure that bay guidance is based on scientifically sound principles, so that when the SBEP speaks to stakeholders about issues as diverse as future scenarios related to sea level rise and the role that humans play in exacerbating red tide blooms, we can speak with confidence on these topics. Our Management Board includes senior-level management staff with our local governments to ensure that CCMP guidance does not conflict with their proposed approaches to bay problems. The SBEP's Policy Board includes elected officials from Manatee and Sarasota counties, Bradenton and Sarasota and the Town of Longboat Key. These elected officials are also joined by a representative of the Southwest Florida Water Management District (SWFWMD), as well as the Florida Department of Environmental Protection (FDEP), and a non-voting member of the US Environmental Protection Agency (EPA). The Policy Board acts as a sounding board of sorts to provide the link between recommendations contained within the CCMP and actual plans and or policies to implement CCMP priorities. The Management and Policy Boards also oversee the operation of the SBEP and approve our budget and workplan.

The overarching goals outlined in the SBEP's 2022 CCMP Update are:

- Improve water quality and the timing, quantity, and distribution of freshwater flow to the bay
- Restore shoreline, wetland and bay habitat and eliminate future losses
- Protect, restore and enhance fish and wildlife populations in bays and watersheds
- Engage, educate and encourage stewardship of Sarasota Bay and increase community connections to the estuary



While these goals differ somewhat from the reporting categories used by EPA in their guidance to SBEP for producing this Program Evaluation (PE) Report, they fit nicely into the broad categories of reporting that EPA has proposed: 1) Healthy ecosystems, 2) Clean waters, and 3) Strong communities. This PE Report will address EPA's guidance in a way that ties together the broader topics related to how to judge the progress being made by National Estuary Programs (NEPs) across the country with the more detailed and site-specific guidance contained within our recently updated CCMP.



Key Accomplishments

Climate Resilience

Since its inception, the SBEP has discussed the impacts of climate change on the bay's resources. The original technical diagnostic study on the bay's health, the SBEP's now 30-year-old 1992 Framework for Action included a chapter on Sea-Level Rise (SLR). That chapter and 16 others are available for the public to view [1992-SBNEP Framework for Action-sm.pdf \(sarasotabay.org\)](#). Expected rates of SLR first reported in the 1992 Framework For Action were of an increase of perhaps 2.1 feet between 1992 and 2115. More recently, the SBEP developed an updated SLR estimate, with a shorter timeline (30 years) than the 123-year timeline originally examined. When normalized for time, the SBEP's more recent estimate is for higher rates of SLR than was predicted in 1992. From 2020 to 2050, the SBEP estimates that SLR will increase by about 8 to 9 inches, on top of the 6 inches that occurred between 2000 and 2020. This expected rate of future SLR is almost exactly the average of the National Oceanic and Atmospheric Administration (NOAA) Intermediate Low and NOAA Intermediate scenarios outlined in the Tampa Bay Climate Science Advisory Panel's 2019 report ([Recommended Projections of Sea Level Rise in the Tampa Bay Region \(tbrpc.org\)](#)).

At the September 16, 2022, Policy Board meeting, SBEP staff summarized the expectations of climate change that had been vetted through the SBEP's TAC, CAC and Management Board. These include:

- 8 to 9 inches of additional SLR between 2020 and 2050
- Increased air temperatures, regularly exceeding monthly averages from the 20th century
- Likely increases in water temperatures

The ecological impacts of SLR and increased temperatures were presented to the Policy Board:

- Increases in blue-sky flooding and also after rainfall during high tides
- The potential loss of mangroves that could be “trapped” on the outside of seawalls due to future Sea Level Rise
- The potential to increase harmful algal blooms by increasing the amount of time that water temperatures stay above sub-optimal values
- Changes in the behavior and distribution of various species of fish
- Adverse impacts to sea turtles, as the sex of sea turtles is determined by nest temperatures

Nutrients

The SBEP’s 2022 CCMP update includes sections related to our recent move to fast-track nutrient management actions in the watershed. Over the past few years, the SBEP had completed the following tasks:

- Developed draft Numeric Nutrient Concentration (NNC) criteria for all bay segments, which were reviewed and adopted by both FDEP and the [EPA 2019-Revised-NNC-for-Sarasota-Bay-Estuarine-Nutrient-Region-Final-Report.pdf \(sarasotabay.org\)](#)
- Development of guidance for water quality within tidal creeks in the bay’s watershed - [2019-Southwest-Florida-Tidal-Creeks-Nutrient-Management-Framework-and-Indicator-Development.pdf \(sarasotabay.org\)](#)
- Development of a watershed-wide pollutant loading model for the bay for the period of 1995 to 2019 [2021-SBEP-RA-Phase-1-Final-Report-072021.pdf \(sarasotabay.org\)](#)
- Development of a draft ecosystem health report card for Sarasota Bay [State of the Bay | Sarasota Bay Estuary Program](#)
- Development of a draft pollutant load reduction goal for the bay, based on a TAC-reviewed reference period approach.

The SBEP also initiated a locally led Reasonable Assurance Plan (RAP) for the bay. The proposed RAP approach was reviewed by the SBEP’s TAC, CAC, Management and Policy Boards (including FDEP and EPA staff) and our recently constituted Water Quality Consortium (WQC). The WQC is meant to serve as a bridge of sorts between the TAC and agencies that would have to implement the projects outlined in the RAP. Members of the SBEP’s Management Board comprised a selection committee reviewing proposed approaches for consultants looking to assist the SBEP on RAP

development. A consultant was chosen and put under contract, and initial meetings between the consultant, SBEP and FDEP have been held, and the results presented to the WQC.

There is much work to be done, but much work has already been done, such as the recent groundbreaking ceremony for upgrades to the Bee Ridge Wastewater Treatment Plant (WWTP) – [Director's Note: Bee Ridge Wastewater Treatment Plant groundbreaking ceremony \(sarasotabay.org\)](#). Upgrades to the Bee Ridge WWTP are the biggest single item in the CCMP's "to-do" list, and the >\$200 million price tag for upgrades to Advanced Wastewater Treatment (AWT) levels with effluent going to reclaimed water users represents the largest single capital improvement project ever pursued by Sarasota County.

Habitat Protection and Restoration

SBEP's staff have worked with our stakeholders to develop a Habitat Restoration Master Plan, which includes a site description and overall design features for 18 potential habitat restoration projects across the bay's shoreline and watershed – [1 \(sarasotabay.org\)](#). The projects listed in the Habitat Restoration Master Plan have been vetted through the SBEP's TAC, CAC, Management and Policy Boards, and they serve as a suite of projects that meet the intent of the CCMP's goals for habitat restoration and/or the restoration of the bay's wildlife populations. The SBEP has a consultant under contract to take projects from the conceptual phase and advance them through the final design and permitting process, at which point they become "shovel ready" for construction.

Throughout its history, the SBEP has successfully completed a number of habitat restoration projects – along with its partners – including the following:



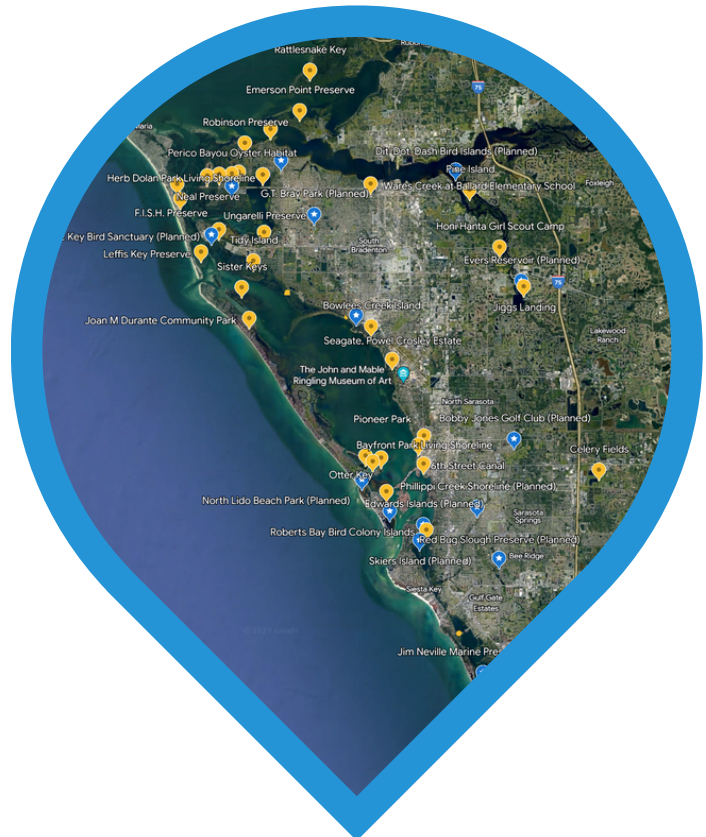


SBEP volunteers planting native grasses at Robinson Preserve

- Watershed restoration efforts at:
 - Neal Preserve
 - Perico Preserve
 - Robinson Preserve
 - Bowlees Creek Island
 - Hudson Bayou
 - North Lido Park
- Oyster reef restoration projects at:
 - 36th Street
 - Gladiola Fields
 - Turtle Beach
 - White Beach
- Artificial Reef projects at:
 - Hart Reef
 - Sportfisherman Reef
 - Coker Reef
 - Evans Reef

In 2021, the SBEP created an interactive Google Earth Map, which provides detailed information about all the SBEP's restoration projects, and is available via our website - [Google Earth](#).

Some of these prior habitat and fish and wildlife restoration projects have been completed over the past 5 years, while some were completed earlier in the SBEP's history, but were "refreshed" or maintained within the past five years. The SBEP has learned that habitat restoration projects must be maintained over time, due to problems related to exotic invasive species, vandalism, and impacts of the various tropical storms and hurricanes that have impacted our bay over time.



SBEP's interactive Habitat Restoration Map



Response to Challenges Identified in 2017 Program Evaluation

The sole item identified as a “Challenge” in the 2018 PE Report ([2018-SBEP-EPA-Performance-Evaluation-Package-and-Letter.pdf \(sarasotabay.org\)](#)) involved public outreach efforts related to transmitting evidence of the successful restoration of Sarasota Bay to a broader audience, as follows:

Program Implementation and Reporting – Outreach and Communication

EPA’s 2018 PE report suggested that the SBEP should increase its efforts to communicate the successes (and challenges) of SBEP to more diverse audiences. Specifically, it was recommended that SBEP enhance its communication across various types of media, with a focus on the different audiences that different approaches might involve.

Over the past two years, SBEP has revised its public outreach approach, including the following steps:

- The SBEP’s website has been revised and updated – [Sarasota Bay Estuary Program](#)
 - The website has been visited over 51,000 times over the past five years
 - The new website includes links that describe our management structure, our staff, volunteer opportunities, access to our technical library, a link to our report card on ecosystem health, and more
 - The website includes a link to an ArcGIS Storymap that summarizes our CCMP – [A Thriving Estuary \(arcgis.com\)](#) which has been viewed over 1,500 times
- SBEP has over 3,400 subscriptions to our quarterly newsletter, “Bay Reflections” – [Newsletter Archive | Sarasota Bay Estuary Program](#)

- Over the past five years, SBEP staff have given over 70 public presentations, to approximately 2,000 total audience members
- SBEP has social media accounts with Facebook, Instagram, LinkedIn and YouTube, with a combined number of followers in excess of 5,000
- The SBEP has increased its public visibility considerably over the past few years – [SBEP In the News | Sarasota Bay Estuary Program](#)
 - In 2019, SBEP staff and/or the health of Sarasota Bay were topics covered by local, regional and/or national media outlets 18 times
 - In 2020, that number dropped to 8 times
 - In 2021, that number increased to 50 times
 - In 2022, that number again increased to 80 times
- Over the past two years, the SBEP has produced over 60 “Director’s Notes” to update our Management Conference on items of interest to managing the health of Sarasota Bay – [News – Sarasota Bay Estuary Program](#)

In conclusion, the SBEP has effectively responded to the only identified challenge listed in EPA’s review of SBEP’s 2018 PE report.



SBEP social media posts



Program Evaluation Narrative, Implementation Years 2018–2022

Received guidance related to the formatting of this PE Report pointed out the need to cover the following topics: Healthy Ecosystems, Clean Waters, and Strong Communities. These three topics are already the focus of the 2022 CCMP update, but there is much overlap between these different topics. For example, some ecosystem features can be developed without too much attention to water quality, but others can only be brought about through improvements in water quality.

To cover the required information, in a manner consistent with the SBEP’s CCMP, this report is based on the format of the CCMP, so that progress towards each of the CCMP Action Plans could be reviewed. Within each of the four Action Plan categories, the topics discussed above are included in the following manner, to allow for the CCMP Actions to be summarized in a format consistent with the PER topics:

| Program Evaluation Report Topics | CCCMP Action Plans | | | |
|----------------------------------|--|--|------------------------------------|---------------------------------------|
| | Water Quality and Quantity Action Plan (WQQ) | Watershed Habitat Restoration Action Plan (WH) | Fish and Wildlife Action Plan (FW) | Community Engagement Action Plan (CE) |
| Healthy Ecosystems | X | X | X | X |
| Clean Waters | X | X | X | X |
| Strong Communities | | X | | X |

Topic 1: NEP Environmental / Programmatic Workplan Accomplishments



Water Quality and Quantity – CCMP Action Plans WQQ 1 – WQQ 8

Alteration of natural landscapes by residential, commercial, agricultural, and industrial land uses has interrupted the natural infiltration and historical volume, location, and timing of surface and groundwater flow into Sarasota Bay and increased loads of pollutants delivered to the bay from these same sources of freshwater inflow. These changes have adversely impacted both water quality and those ecosystem features dependent upon adequate water quality. SBEP and its partners have achieved many successes in protecting and restoring water quality. As last quantified in 2014, nitrogen loading to Sarasota Bay has been reduced 64% since 1989 due to considerable capital investments in wastewater and stormwater treatment infrastructure (SBEP 2014). These gains were achieved over a period of decades by the consolidation of small private WWTPs, improvements in the nutrient removal processes used by WWTPs, the elimination of direct wastewater discharge to the bays, and the construction of numerous large and small stormwater treatment systems throughout the watershed. As population growth and development continue and climate change provides additional challenges, regional partnerships are even more critical for monitoring, evaluating, and responding to water quality threats.

Water Quality Action Plan WQ1 – Support comprehensive and coordinated surface water and groundwater quality monitoring, assessment, and reporting.

The ongoing long-term standardized water quality monitoring of the bay's tidal creeks and estuaries is largely driven by the regulatory requirements of municipal stormwater permits required under the federal Clean Water Act, as administered by FDEP. National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System (MS4) stormwater permits held by county and municipal governments require ongoing water quality monitoring to demonstrate that stormwater discharges do not contribute to the deterioration of the area's receiving water bodies. Coordination among a variety of agencies conducting environmental water quality sampling in Southwest Florida estuaries occurs through the Regional Ambient Monitoring Program with standardized field sampling and laboratory analysis protocols that results in consistent data collection methods used by all parties. This ensures that water quality data meet stringent state quality assurance standards before being submitted to a statewide and online database maintained by FDEP.

| Activities | Benefits |
|---|---|
| Support the continuation of long term, coordinated, and timely collection, archiving, analysis, reporting, and quality assurance/quality control of water quality data. Support and enhance timely public communication of water quality monitoring data. | Long-term, standardized water quality data that is regularly analyzed and publicly accessible supports identification of waterbody improvements or impairments and management actions to improve water quality. |
| Review and evaluate monitoring programs, increase efficiencies, fill water and air quality monitoring gaps, reevaluate estuary circulation models, identify sources of pollution, and update pollutant sources in pollutant load models. | |

The continuation of the bay’s long-term and standardized water quality collection programs allows for the production of a water quality data set for providing information related to the status and trends in water quality, and also to allow for the development of regulatory and management criteria for managing the bay’s water quality.

Water Quality Action Plan WQ2 – Develop improvement plans to maintain, attain or surpass state water quality standards.

SBEP and partners support the CCMP goal to improve and maintain environmental water quality necessary to support and sustain natural communities and the designated uses of the bay. Efforts to improve water quality are carried out under the regulatory guidance of the federal Clean Water Act cooperatively administered by the US EPA and FDEP. Under the Clean Water Act, FDEP classifies waters by degree of highest designated beneficial use – including Class 1 for drinking water, Class 2 for shellfish harvesting, and Class 3 for fishing, recreation, and support of healthy fish and wildlife – and develops water quality standards supportive of each designated use. Most Florida and SBEP waters are designated Class 3 – Marine, often referred to as “swimmable and fishable” waters. A large part of Big Sarasota Bay is designated Class 2 but has been closed to shellfish harvest since 2004 due to bacteria impairment.



| Activities | Benefits |
|---|---|
| Revise and implement watershed management plans and prioritized projects. Include hydrologic improvement in watershed management plans. | Watershed management plans and projects developed from accurate nutrient pollutant loading models and science-based criteria for water quality indicators, targets, and thresholds result in measurable water quality improvements. |
| Convene a Sarasota Bay Water Quality Consortium and produce a report detailing water quality indicators and a pathway to remediation. | |

The SBEP developed NNC Criteria back in 2013. These criteria were reviewed and approved by both FDEP and EPA, after first being presented to the SBEP’s TAC. However, it was noted (Janicki Environmental, Inc. [2019 - 2019-Revised-NNC-for-Sarasota-Bay-Estuarine-Nutrient-Region-Final-Report.pdf \(sarasotabay.org\)](#)) that the development of NNC were not by themselves able to prevent the deterioration of water quality. Follow-up work (Tomasko and Kennan 2019 - [2019-Preliminary-Assessment-of-Sarasota-Bay-Water-Quality-Trends-Memo.pdf \(sarasotabay.org\)](#)) concluded that changes in rainfall were not enough – by itself – to explain the increases in nutrient contents in Sarasota Bay, and that recent trends were suggestive of an increased influence of high nutrient loading sources, such as would occur through wastewater.

In response, the SBEP completed two important technical products that are essential to bay management. The first of these was the completion of a Water Quality Report Card for the bay that evaluates water quality in each bay segment using four indicators: total nitrogen, chlorophyll-a, seagrass cover, and macroalgae cover. The scores include management recommendations to improve or sustain water quality. Following a peer review process, the Water Quality Report Card, the State of the Bay, was presented to the SBEP’s Policy Board for their consideration on May 14, 2021. The Water Quality Report Card, which displays results from each bay segment for the years 2006 to 2021, is now available on the SBEP’s website - [State of the Bay | Sarasota Bay Estuary Program](#).

In addition to the Water Quality Report Card, SBEP completed the peer review process for a comprehensive pollutant loading model for Sarasota Bay. This latest pollutant loading model includes load estimates for both and Dissolved Inorganic Nitrogen (DIN), which is the most problematic form of nitrogen loads - [2021-SBEP-RA-Phase-1-Final-Report-072021.pdf \(sarasotabay.org\)](#).

The Report Card and the reference period within the report card of 2006 to 2012

were used in combination with the updated pollutant loading model to develop a draft pollutant load reduction goal of 20%, equivalent to seeking a 12 tons/year DIN load reduction. The projects that could meet this load reduction goal are being identified through the SBEP-led RAP effort, which is coordinated with local, regional, state and federal agencies through the SBEP-led WQC. The WQC includes staff from local governments that act as a bridge between the SBEP's TAC and elected officials, to ensure that agreed-upon load reduction strategies are implemented promptly.

Water Quality Action Plan WQ3 – Improve and manage hydrology for a more natural pattern of timing, quantity and distribution of surface water flows.

Historically, the flat and slow-draining Southwest Florida landscape was dotted with chains of wetlands, linked by shallow, meandering creeks. Beginning in the 1920s, agricultural and residential development required the systematic reengineering of surface water conveyance. The increased runoff from increased impervious surfaces was addressed by modifying wetlands and natural creeks to accelerate conveyance of runoff via canals and pipes clustered together in large drainage networks. Freshwater flows, volumes, and timing were redirected and accelerated, vastly increasing the rate and volume of freshwater reaching the estuary and increasing the loads of pollutants brought into the bay by stormwater runoff.

| Activities | Benefits |
|--|--|
| Understand historic, current, and projected hydrologic regimes, accounting for projected climate change and the role of beneficial reuse. Identify and prioritize hydrologic improvement projects. | Improving hydrology to a more natural state provides multiple benefits for water quality, recreation, habitat, and flood protection. |
| Support floodplain management that benefits resiliency to flooding and climate change, stormwater quality and quantity improvement, nutrient reduction, and flowway and floodplain restoration to mimic natural system function. | |

Sarasota County is developing a Phillippi Creek restoration strategy that involves retrofitting man-made canals to mimic the natural function of the original creek. Canals can be reengineered to incorporate shallow, broad, vegetated, and serpentine stream-like components that create variable patterns of flows and eddies. This nature-based design would improve water quality and create fish habitat and can be

done without compromising flood protection. Prioritized areas within the Phillippi Creek drainage system were identified, based on erosion and repetitive maintenance. In addition, the degraded water control structure on Phillippi Creek near the Southgate Community Center no longer serves a functional purpose and has been evaluated for removal.

However, it is not feasible to fully restore flowways and floodplains in many developed areas due to concerns over increased flooding. Nevertheless, there are many opportunities for hydrologic improvements that provide multiple benefits of flood protection, wetland restoration, increased recreational opportunities, and improved water quality. Over 80 such projects are detailed in watershed management plans for produced for both Sarasota and Manatee Counties. SBEP continues to prioritize hydrologic protection and restoration by reestablishing landscape scale floodplains, protecting wetlands, and protecting tidal tributary isohaline zones to support critical habitat migration and improve resilience of natural system, in coordination with the CCMP's Watershed Habitat Restoration Plans.



FISH Preserve habitat restoration

Water Quality Action Plan WQ4 – Reduce pollutant loading from stormwater runoff.

The Sarasota Bay region typically receives about 45 inches or more of rainfall annually. Prior to development, this rainfall would be intercepted by tree canopies, some of it would be used for evapotranspiration by Southwest Florida’s abundant vegetation, some of it would filter into the surficial aquifer, and some portion would flow overland into isolated wetlands, creeks and/or the open waters of the bay itself. Development increases the amount of impervious surfaces, such as rooftops, roads, and parking lots. This increases the amount of stormwater runoff, which not only is supplied to the bay in greater quantities than would have occurred prior to development, but the runoff now contains higher concentrations of pollutants such as nutrients, sediments, heavy metals and various pathogens. For Sarasota Bay, urban stormwater runoff is the primary source of nutrient loads.

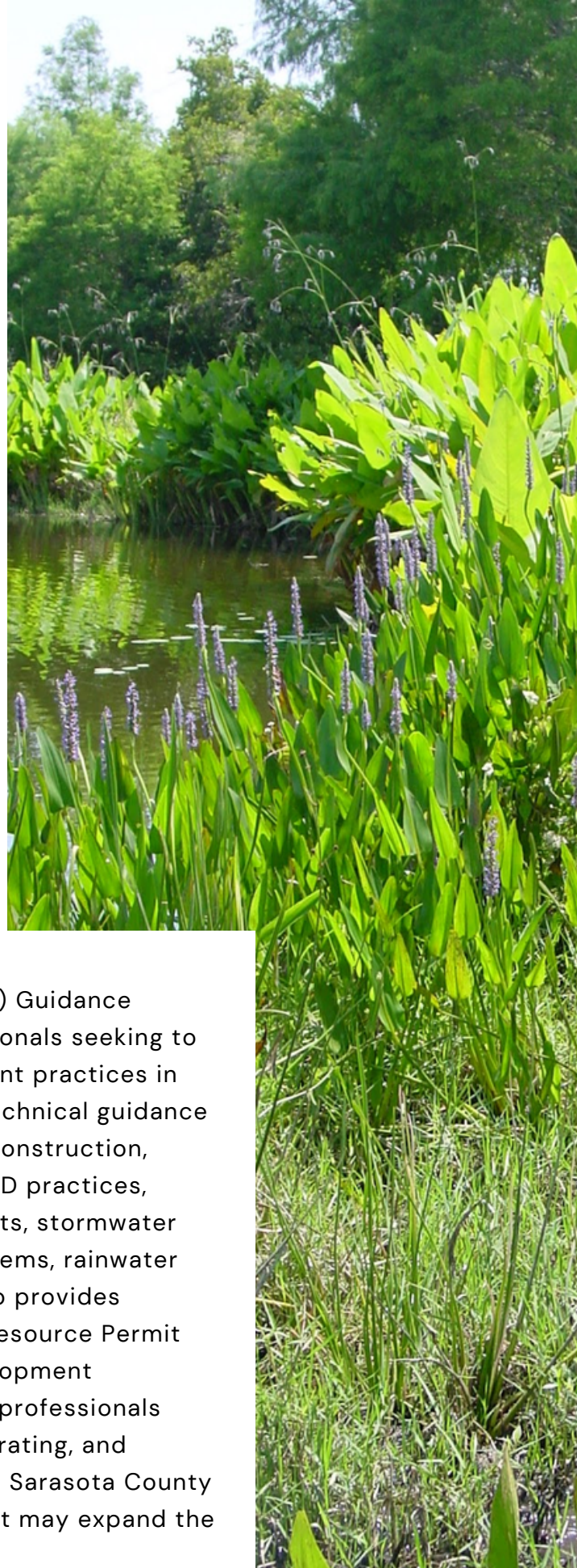
| Activities | Benefits |
|---|--|
| Support development and adoption of green infrastructure and smart growth standards in comprehensive land-use plans and land development regulations, including stormwater rules and design manuals, to reduce stormwater quantity and pollutant loading. | Reduced pollutant loading from stormwater improves water quality necessary for human uses and healthy aquatic systems. |
| Install green infrastructure projects to improve stormwater management for efficient pollution reduction and flood control. | |
| Establish the fee schedule for the Manatee County stormwater utility and consider utilizing stormwater utility funding for water quality improvement projects, especially green infrastructure. | |
| Evaluate nutrient removal performance and cost-benefits of nutrient removal BMPs. Support development of a homeowner/HOA BMP manual and a model vendor contract supportive of water quality. | |

The most effective way to reduce the impacts of urban stormwater runoff is to reduce the quantity of water delivered. This is the basis for the increased pollutant load reduction credit given for dry retention basins (aka “rain gardens”) vs. the more widely used wet detention ponds.

However, dry retention systems require at least a two-foot separation between the bottom of the pond and the seasonal high-water table, which is not possible in much of the watershed. The second most efficient way to reduce pollutant loads via stormwater runoff is to reduce the concentration of pollutants in runoff. Fertilizer ordinances prohibiting nitrogen and phosphorus-based application in the summer wet season exist throughout the bay's watershed. In addition, SBEP and its partners continue to support fertilizer and pet waste education and outreach efforts, including the Florida Friendly Landscaping™ program.

Street sweeping is also used to reduce pollutant loads in stormwater. In 2018 the City of Sarasota swept 8,208 miles of streets, removing 1,547 tons of sediment, 66.7 tons of litter, 1,742 pounds of nitrogen, and 1,117 pounds of phosphorous.

Sarasota County's Low-Impact Development (LID) Guidance Document provides technical support to professionals seeking to implement LID-integrated stormwater management practices in their project. That document provides specific technical guidance and design specifications related to the design, construction, operations, and maintenance specifications for LID practices, including shallow bioretention, pervious pavements, stormwater harvesting, green roof stormwater treatment systems, rainwater harvesting, and detention with biofiltration. It also provides permitting guidance for meeting Environmental Resource Permit Basis for Review and Sarasota County Land Development Regulation. Increased outreach and education to professionals engaged in planning, designing, constructing, operating, and maintaining building and development projects in Sarasota County about LID and how to use the Guidance Document may expand the use of LID in SBEP watersheds.



Water Quality Action Plan WQ5 – Reduce pollutant loading from septic and other onsite sewage treatment and disposal systems.

Untreated or partially treated sewage contains nutrients, bacteria, chemicals, microplastics, and pharmaceuticals harmful to the environment and public health. Commercial and residential properties not serviced by modern wastewater treatment facilities commonly use Onsite Sewage Treatment and Disposal Systems (OSTDS) like septic systems to treat sewage on their property. Conventional septic systems are primarily designed to treat bacteria and other pathogens, though they do provide some nutrient treatment. In some areas, septic systems can be a significant source of pollution in Florida surface and groundwaters, while in areas with sufficient lot sizes, adequate separation between the bottom of the drainfield and the seasonal high-water table, and sufficient distance from surface waters, OSTDSs can be a safe and effective way to treat household sewage.

| Activities | Benefits |
|---|--|
| Continued conversion of septic systems to centralized sewer systems and consolidation of small wastewater treatment plants, prioritized in coastal areas. | Improving understanding and management of pollutant loading from septic systems and converting parcels from septic to sewer service will reduce pollutant loading from septic systems. |
| Encourage regular service conversions, inspection and maintenance of septic systems and installation of supplemental and advanced septic system technologies, prioritized in coastal areas and basins with impaired waters. | |
| Improve inventory and mapping of septic and other OSTDS and increase understanding about septic system capacity to treat nutrient pollution and pathogens under different site conditions, including climate change. | |

Outreach and education are important tools to promote these opportunities to property owners in areas where septic systems are underperforming or failing and where future central sewer service is unplanned.

Converting underperforming or failing septic systems to central sewer is an effective strategy to reduce nutrient pollution from septic systems. In 2001, Sarasota County began the phased conversion of septic to sewer service for about 14,000 parcels in the Phillippi Creek Watershed. Phillippi Creek is the largest tidal creek entering Sarasota Bay, with a watershed approximately 50 square miles in size. As of October 2021, connections to central wastewater service have been made available to 10,232 parcels out of the planned 14,000, or about 73% of the houses with septic tanks in this high priority watershed.

Water Quality Action Plan WQ6 – Reduce pollutant loading from centralized wastewater collection, treatment and disposal systems, including reuse.

In the Sarasota Bay region, WWTPs can treat their effluent to different levels. All WWTPs in the bay’s watershed are required to remove bacteria from their effluent streams, but the nutrient content of their effluent can vary. Secondary Treatment reduces the amount of biological oxygen demand and brings about a reduction in nutrient concentrations compared to raw sewage, but concentrations of Total Nitrogen (TN) can vary from 6 to 20 mg TN per liter. In contrast, AWT further reduces nutrient contents through a combined nitrification–denitrification system, such that nitrogen concentrations average less than 3 mg TN per liter.

In Central and much of Southwest Florida, legislation exists that requires treated effluent to meet or exceed (lower than) AWT standards for nutrients before effluent can be directly discharged into Sarasota Bay, Little Sarasota Bay, Roberts Bay, or “...into any river, stream, channel, canal, bay, bayou, sound, or other water tributary thereto...” (Grizzle- Figg Act 1987, F.S. 403.086 - [Chapter 403 Section 086 - 2021 Florida Statutes - The Florida Senate \(flsenate.gov\)](#)).

| Activities | Benefits |
|--|---|
| Support AWT (or better) WWTP effluent standards throughout the bay’s watershed. Improve public understanding of the value of AWT. | Reducing spills and overflows from failing or underperforming centralized wastewater infrastructure and converting WWTPs to AWT will reduce pollutant loading from centralized wastewater collection, treatment, and disposal systems, including reuse. |
| Evaluate and manage impact of reuse storage and distribution on nutrient loading and hydrology, including reuse irrigation. Develop management plans and BMPS to avoid overflows, releases, and excess nutrient loading. | |
| Encourage proactive inspection, maintenance and replacement of failing or underperforming sanitary sewer infrastructure to prevent inflow and infiltration, overflows, and spills. Support improved quantitative public reporting requirements for accidental and emergency sewage discharges. | |

To reduce the challenges that arise for disposal during the wet season, Sarasota County, with matching funding from SWFWMD, built supporting infrastructure for an Aquifer Storage and Recovery well at the Central County Water Reclamation Facility, which allows for underground storage of reuse water during periods of wet weather when irrigation demand is low.

In addition, Sarasota County eliminated its last regular surface water discharge of treated wastewater in 2018 when it decommissioned the Siesta Key advanced WWTP. Collection infrastructure, including eight miles of force main, a master pump station, and a booster pump station, was built to transfer wastewater from the island to the larger Bee Ridge advanced-secondary WWTP. Sarasota County is currently converting its Bee Ridge WWTP to AWT, with expected completion in 2025. In 2021, the Sarasota County Commission announced plans to spend a total of \$500 million to upgrade its Bee Ridge, Venice Gardens, and Central County facilities to provide AWT levels of treatment – [Director's Note: Bee Ridge Wastewater Treatment Plant groundbreaking ceremony \(sarasotabay.org\)](#). The accelerated pace of converting the Bee Ridge WWTP to AWT was made possible in part by participation of EPA in the funding the improvements – [EPA Announces \\$105 Million WIFIA Loan to Improve Water Infrastructure in Sarasota County, Florida | US EPA](#).

In 2017 Manatee County upgraded its advanced-secondary treatment Southwest Regional Water Reclamation Facility to include a modified process that reduces TN levels below an average 8.5 mg/l – about a 40% reduction. Additionally, Manatee County recently completed construction of a 15-million-gallon recharge well at Southwest Regional Water Reclamation Facility that provides additional wet weather disposal capacity for their reuse system. Manatee County added an additional 10-million-gallon reuse water storage tank and a high service pump station in support of the Manatee County Agricultural Reuse System. The system connects the County's three regional WWTPs and is designed to supply up to 30 million gallons per day of reuse water for agricultural, residential, and residential users – [Investments in wastewater treatment help protect water quality in Manatee County \(sarasotabay.org\)](#).

The City of Sarasota further improved the nitrogen and phosphorus removal performance at their AWT WWTP to achieve average effluent concentration values of 1.65 mg TN per liter and 1.68 mg of total phosphorus per liter in their reuse water, exceeding requirements for AWT. The City of Sarasota's WWTP effluent is low enough in TN content that it meets Florida's numeric nutrient concentration criteria for flowing streams in Central Florida. Even with these improvements in nutrient

concentrations, the City of Sarasota’s WWTP was still a controllable nutrient load (albeit at a much-reduced rate) to the bay. Over the past few years, the City of Sarasota has worked with various funding sources to effectively eliminate ongoing surface water discharges of treated wastewater into Whitaker Bayou, resulting in about a 20% reduction to the upper bay - [Status and Trends in Pollutant Loads and Natural Resource Responses in Sarasota Bay \(usf.edu\)](#).

Water Quality Action Plan WQ7 – Improve understanding of pollutant loading from atmospheric nitrogen deposition.

Airborne nitrogen compounds in the form of nitrogen oxides and ammonia contribute to the nitrogen loads to Sarasota Bay. Atmospheric nitrogen can be deposited directly onto waterbodies or indirectly by deposition on the watershed and conveyed to waterbodies by stormwater or groundwater. It can be deposited as gas molecules and dust (dry deposition) or rain (wet deposition).

Natural sources of reactive atmospheric nitrogen include emissions from wild animal waste, lightning, forest fires, and soils; anthropogenic sources include emissions from fertilizer application, human and livestock waste, and fossil fuel combustion by power plants, vehicles, and outdoor power equipment. Mobile sources of nitrogen oxides like cars and landscape machinery create emissions close to the ground, which can contribute four times more nitrogen deposition to the local watershed than regional power plants.

| Activities | Benefits |
|--|---|
| Evaluate air quality monitoring network and programs to quantify sources, pathways, and contribution of direct and indirect atmospheric deposition to area waters. | Improved understanding of pollutant loading from atmospheric deposition will improve management of water quality in SBEP watersheds and bays. |
| Support initiatives to reduce emissions from vehicles, landscape maintenance equipment and other mobile sources. | |

Two monitoring networks have air quality monitoring stations in Sarasota and Manatee Counties. The National Atmospheric Deposition Program is a cooperative among federal, tribal, state, and local government agencies, educational institutions, private sector, and non-governmental agencies that monitors rainfall chemistry. The Program includes one station located at the Verna Wellfields in northeastern Sarasota County, where records of nitrate concentration, equivalents, wet nitrogen deposition peaked during the early to mid-90s, declined until 2012, then began rising again, perhaps due to the finding that precipitation at the station has increased

around 2006. Because Verna Wellfields is in a remote area of the County away from traffic and outside the bay’s watershed, it is not an ideal location to quantify atmospheric deposition.

Florida’s Ambient Air Quality Monitoring Program is coordinated by FDEP. The Program includes 100 monitoring sites across the state to assess progress in maintaining and improving air quality, understand temporal variations in air pollutants, and evaluate pollution exposure by individuals and the environment. The Program includes four air quality stations in Sarasota County and four in Manatee County. Unfortunately, none currently monitor nitrogen oxide concentrations or deposition.

Water Quality Action Plan WQ8 – Support measures to better understand, monitor, report, respond to, recover from, mitigate, and reduce harmful algal blooms.

Harmful Algal Blooms (HABs) have increased in frequency, extent, and duration throughout the world’s waters, often in response to increased temperatures due to climate change and anthropogenic (human-caused) nutrient pollution (Gilbert 2020). Climate change is expected to further increase their impacts due to reduced oxygen solubility, increased water column stratification, variable salinity, increased acidity, and more intense precipitation events washing nutrients into waterways (O’Brien 2016, SBEP and Shafer 2017). SBEP waterbodies are impacted by red tide and blooms of cyanobacteria and macroalgae.

| Activities | Benefits |
|--|--|
| Support development of coordinated, standardized tools for monitoring and reporting HABs, evaluating their impact on the environment, economy, and human health, and improving capacity to mitigate, prepare for, respond to, and recover from them. | Improved knowledge about HABs and their impacts on environment, economy, and human health and improved capacity to prepare for, respond to, and recover from them will build public support for water quality improvement and habitat restoration and will increase human and ecosystem resilience to impacts from HABs. |
| Support research and monitoring to better understand the taxonomic composition, toxicity, severity, extent, and duration of HABs, and the role nutrient sources and climate change play in bloom initiation, growth, maintenance, and termination. | |

SBEP and its partners collaborate on a number of projects aimed at better understanding and responding to HABs in our local waterways. These include the following:

Collaboration for Prediction of Red Tides: FWC provides red tide data to the USF College of Marine Sciences, which forecasts red tide movement using the West Florida Shelf Regional Ocean Modeling System.

USF Optical Oceanography Laboratory: USF processes NASA and NOAA data to provide bloom maps to FWC to assist them in directing sampling efforts and bloom assessments.

Harmful Algal Blooms Observing System (HABSOS): FWC provides data to NOAA's HABSOS, a system used to visualize blooms and changes in environmental conditions.

Beach Conditions Reporting System: Mote Marine Laboratory reports information about red tide-related respiratory irritation and dead fish at local beaches.

Harmful Algal Bloom Operational Forecast System: Florida Fish and Wildlife Conservation Commission (FWC) provides data to NOAA's Harmful Algal Blooms Operational Forecast System (HAB-OFS), which publishes information bulletins.

In addition, SBEP and its partners from the University of Florida have directly contributed to the scientific literature that relates the role of anthropogenic nutrient enrichment and the enhancement of red tides that get advected to nearshore waters in Southwest Florida - [Nitrogen-enriched discharges from a highly managed watershed intensify red tide \(*Karenia brevis*\) blooms in southwest Florida \(sarasotabay.org\)](#). A follow-up study did not find a similar enhancement of red tide intensity near Venice Inlet, however - [2022-UF-Venice-Inlet-study-Phase-1-report.pdf \(sarasotabay.org\)](#).

Researchers at New College provided technical documentation of the impacts of red tide on the fish populations in Sarasota Bay - [NCF-BPG2021-Final-Report.pdf \(sarasotabay.org\)](#).

Watershed Habitats Action Plans – CCMP Action Plans WH1 – WH6

The majority of Sarasota Bay’s watershed has been altered by urban and (to a much lesser degree) agricultural development, leaving isolated natural and conservation areas with limited ecosystem function. The SBEP’s goals included that of abundant seagrass meadows, well-developed oyster reefs filtering water and providing essential habitat for fish and birds, vegetated coastal wetlands and shorelines filtering runoff and protecting our shorelines, a mosaic of uplands, freshwater wetlands, and tidal creeks supporting natural waterflow and habitat for fish and wildlife, and vegetated dunes and sandy shorelines along our Gulf beaches.

For the past few decades, SBEP and its partners have made significant progress towards this vision of protecting and restoring the Sarasota Bay area’s ecosystems. Associated with reductions in nutrient loads from both stormwater and wastewater, seagrass coverage had increased by about 50% between 1988 and 2016. However, coverage in 2020 was down by more than 20%, compared to 2016, although 2020 levels were still 20% higher than in the late 1980s. In addition, live oysters appear to be increasing in the tidal creeks, at least in the southern portion of the watershed (Meaux et al. 2016).

Through protection and restoration, total coastal wetland acreage appears to have been stable between 2014 and 2018 (Florida Land Cover Classification System data). From 2014–2018, SBEP leveraged \$12.6 million in public and private funds for 66 habitat restoration projects, creating 1,100 acres and 900 linear feet of shoreline (Table WH-1 in SBEP’s 2022 CCMP Update). Habitat restoration projects have included beach and dune restoration, bird island habitat enhancement, oyster reef and artificial reef construction, coastal wetland restoration, exotic vegetation removal and native planting, prescribed burns, and land conservation.



SBEP volunteers deploying oysters at Robinson Preserve

Watershed Habitats Action Plan WH1 – Update the five-year Habitat Restoration Plan with consideration of local watershed management plan priority projects and resiliency strategies.

SBEP developed the first Five-Year Habitat Restoration Plan (HRP) in 2004 to guide efforts of SBEP and its partners to identify, prioritize, and implement restoration projects throughout the bay and its watersheds. In general, the site selection approach of the HRP recognizes that a watershed level habitat mosaic, in appropriate proportions, is necessary to maintain ecological health. Revisions to the original 2004 ranking criteria were made in successive five-year plans (2010 and 2016) to encompass new regulatory and ecosystem management priorities, while providing flexibility to prioritize selected projects when funding opportunities arise. Fourteen site-scoring criteria cover logistical considerations and habitat balance considerations and support the following restoration objectives: 1) essential habitat restoration and/or creation, 2) water retention and water quality improvements, and 3) historic habitat restoration and/or preservation.

| Activities | Benefits |
|--|--|
| Update the five-year HRP, with consideration of local watershed management plan priority projects and resiliency strategies. Coordinate, track, and report progress metrics for habitat Restoration. | A science-based approach to identifying and prioritizing restoration projects effectively and efficiently guides program resources to maximize habitat protection and restoration. |



As outlined in the SBEP’s 2022 CCMP update, eight (8) habitat restoration projects from the FY2016–2022 HRP have been initiated and/or completed. These include the following: 1) North Lido (partial completion 2016); 2) South Lido (partial construction as of 2017); 3) Tidy Island (plans and permits 2018, exotic pest plant removal 2021); 4) Dit-Dot-Dash Bird Islands (plans and permits 2018); 5) Jim Neville Preserve (plans 2018); 6) 34th Street Oyster Restoration (completed 2017, monitoring and shell replenishment ongoing); 7) FISH Preserve (partial construction 2019, additional exotic pest plant removal 2021); and 8) Perico Bayou Oyster restoration (plans and permits 2019, completed 2020).

Completed and/or planned habitat restoration projects can be viewed in an interactive ArcGIS format created and updated by the SBEP – [Google Earth](#).

Watershed Habitats Action Plan WH2 – Protect, enhance and restore uplands and freshwater wetlands.

Healthy bay water quality and wildlife require a diversity of interconnected habitats in the watershed – including upland forests and freshwater wetlands – that support the full suite of natural processes necessary to sustain life. Even though these inland habitats may not be confluent with the bay, they influence the health of the bay through hydrologic connectivity that affects bay water quality and habitat connectivity that supports fish and bay wildlife.

| Activities | Benefits |
|---|---|
| Encourage and support the permanent conservation of natural lands throughout acquisition and conservation easements, including freshwater wetlands and flowways, corridors, and uplands adjacent to coastal habitat necessary for habitat resilience and migration. | Healthy and interconnected, upland and freshwater wetland habitats support the natural processes necessary for a healthy bay. |
| Restore and manage natural lands through prescribed fire, eradication of invasive exotic plants and animals, hydrologic improvement, and reestablishment of threatened and endangered plants. | |

Due to regulatory protection and restoration of wetlands, wetland areas have remained relatively stable over the last 30 years, but upland forests have declined (Water Atlas, SWFWMD 2014). Regionally, 20% of the total land area of Manatee and Sarasota Counties is conservation lands in public and private ownership (Table WH-2 in SBEP’s 2022 CCMP update). Sarasota County has a conservation land acquisition program approved by voter referendum and financed through dedicated ad valorem property tax revenue and other sources. Manatee County successfully identifies and acquires conservation lands through general funds, grants, and innovative public-private partnerships. In addition to public acquisitions, the Conservation Foundation of the Gulf Coast provides leadership and initiates conservation land acquisitions on private lands and through public-private partnerships.

In addition, SBEP and its partners promote existing federal, state, water management district, and local conservation land acquisition programs, including the following: 1) Florida Department of Environmental Protection Florida Forever; 2) Florida Forest Service Rural and Family Land Protection Program and Forest Legacy Program; 3) U.S. Department of Agriculture National Resources Conservation Service; and 4) Southwest Florida Water Management District’s land purchase and restoration activities.

Watershed Habitats Action Plan WH3 – Improve tributary habitats, with a special emphasis on fisheries.

Tidal creeks provide food and habitat for crustaceans, wading birds, alligators, and small bodied and larger piscivorous fishes and provide nursery areas for crustaceans and fishes of high ecological and economic value. They also provide many beneficial hydrologic services including water retention, groundwater recharge, and flood prevention.

| Activities | Benefits |
|---|---|
| Create and implement a strategy for restoring habitat in tributaries to characterize, delineate, and quantify tributary shoreline and habitat features supportive of fisheries and to prioritize habitat restoration projects that increase critical juvenile habitats. | Improvements to the habitat quality and connectivity of tributaries support water quality and fish populations, while providing flood control and increasing property values. |

SBEP and its partners determined that creek segments with low dissolved oxygen and high chlorophyll levels could still support high densities of juvenile fishes and baitfish suggesting that current narrative-based criteria for water quality in tidal creeks based on DO and chlorophyll may be ineffective and misleading as indicators of the biological integrity of tidal creeks - [Developing a Water Quality Assessment Framework for Southwest Florida Tidal Creeks \(sarasotabay.org\)](http://sarasotabay.org).

Large differences among creeks suggested that no single optimum water quality criterion may be appropriate for setting nutrient targets and thresholds to maintain ecological health for all creeks. Instead, the status of juvenile fishes using the creeks might be a more reliable indicator of ecological health, rather than water quality alone.

To better understand how tidal creek habitat quality affects creeks’ effectiveness as a nursery habitat for fish, researchers from the Bonefish and Tarpon Trust and FWC analyzed statewide maps of juvenile snook and tarpon locations and assembled a list of habitat characteristics common to successful nursery habitats (Wilson 2017). Locally, Mote Marine Laboratory scientists conducted a study to determine the status of juvenile fishes in canal systems. Results suggest that creek segments with secondary stage habitat – such as curved channels, wetland plants, or slower moving waters – tend to have increased fish diversity and support proportionally more recreationally important species (Locascio 2017). Data gathered to date suggest that fish associated with stretches of creek with hardened shorelines spend less time along seawalls. However, if the hardened shorelines have vegetation associated with them, then fish use them as much as nearby natural shorelines (R. Schloesser, Mote Marine Laboratory, personal communication).

Watershed Habitats Action Plan WH4 – Protect, enhance and restore coastal wetlands and improve shoreline resiliency.

Coastal wetlands are vegetated intertidal areas around the bay's perimeter and its tidal tributaries, including mangrove forests, salt marshes, and salt flats. They provide food and habitat for hundreds of species of bay fish and wildlife and are considered critical habitat for many important recreational and commercial fish species, including striped mullet (*Mugil cephalus*) and pink shrimp (*Farfantepenaeus duorarum*). Tidal tributary shorelines serve as prime nursery habitat for estuary-dependent fauna. Coastal wetlands are critical to the world's carbon balance; they take up carbon dioxide and store "blue carbon" in plant biomass and associated wet soils at roughly 25 times the rate of temperate and tropical forests (Moyer 2016, McLeod 2011). They also help stabilize shorelines from erosion, provide buffering from storm surge, and help filter pollutants from land-based runoff into the estuary.

| Activities | Benefits |
|---|---|
| Continue coastal wetland restoration and protection projects prioritized by the HRP. | Expanded use of softened shorelines in bay and tidal tributary locations improves wildlife habitat, water quality, and resilience to storms and sea level rise. Expanded ecosystem services and non-habitat related benefits. |
| Continue spoil island restoration and protection. Support establishment of protected managed areas for bay islands. | |
| Implement shoreline resiliency strategies to: conserve adjacent uplands, encourage installation of living shorelines through education, incentives, technical and permitting assistance, workshops, and training. Support consistent policies across jurisdictions regarding rolling easements, coastal construction setbacks, and shoreline alterations that encourage or do not prohibit living shorelines, especially for resiliency and post-disaster planning. | |

Between 2014–2018, 21 projects on about 500 acres were completed to protect, enhance or restore coastal wetlands and shorelines across Sarasota Bay (see Watershed Habitat Action Plan, 2022 CCMP update). Activities included removing exotic vegetation, planting native vegetation, creating new habitats, and acquiring coastal properties. Most of these efforts focused on coastal preserves in Manatee County, including Robinson Preserve and Robinson Preserve Expansion, Perico Preserve, and FISH Preserve. Many of these projects were supported by local volunteers organized through the Bay Guardians Program (see Community Action Plan, 2022 CCMP update) and Bay Partners Grants.

Watershed Habitats Action Plan WH5 – Protect, enhance and restore hard bottom and seagrass habitats.

Sarasota Bay includes approximately 52 square miles of open water in Manatee and Sarasota Counties. As a shallow lagoonal estuary, the bay bottom is primarily composed of soft sediments ranging from mud to sand to shell that provide habitat to hundreds of species of small benthic invertebrates. In impacted dredged areas, soft sediments are a sink for nutrients and toxic substances. Hard-bottom habitat is relatively rare and consists of oyster reefs along shoreline fringes, sporadic rock outcrops, and strategically located artificial reefs. About a third of the bay bottom is covered in seagrass meadows. The hard-bottom habitats and seagrass meadows are priority habitats for protection, enhancement, and restoration.

| Activities | Benefits |
|---|---|
| Monitor artificial and oyster reef habitat quality, explore optimal placement of new reefs, and establish/ enhance oyster and artificial reefs in Sarasota Bay. | Mapping, monitoring, and enhancing hard bottom and seagrass habitats support fish and shellfish populations and improves water quality. |
| Participate in inventories of benthic and living hard-bottom habitats in Sarasota Bay and nearshore Gulf water and passes. | |
| Reevaluate seagrass indicators and targets in bay segments. Implement water quality improvement strategies to increase seagrass habitat. | |
| Continue seagrass mapping and monitoring and expand seagrass monitoring transects to Manatee County. | |



Artificial Reef in Sarasota Bay

Within Sarasota Bay, artificial reefs have been deployed for decades, with follow-up research documenting the value of these habitat restoration projects. A study to monitor the colonization of artificial reef habitats in Sarasota Bay and Tampa Bay showed that artificial reefs were important seasonal habitats in these systems for both finfish and invertebrates (Blackburn 2008). Reefs appeared to benefit both recruitment and retention of organisms and abundance on reefs was positively correlated to reef size. Specific to Sarasota Bay, researchers found that certain types of artificial reef structures were more effective at creating habitat for commercially and recreationally important species of fish than more generic “reef” structures – [FINAL_Sarasota-Bay-Artificial-Reef-Monitoring-Report.pdf \(sarasotabay.org\)](https://www.sarasotabay.org/files/2018/07/FINAL_Sarasota-Bay-Artificial-Reef-Monitoring-Report.pdf).

In 2017, four 20-foot-diameter reefs were installed in northern Sarasota Bay at the 34th Street Canal in Bayshore Gardens, creating one acre of new oyster habitat. From 2017–2019, hundreds of feet of shoreline were enhanced with recycled oyster shell at Robinson Preserve and Perico Preserve through the unique local partnership of the Gulf Coast Oyster Recycling and Renewal program. With the help of community volunteers who bag and deploy the oyster shells, Gulf Coast Oyster Recycling and Renewal coordinates the use of live oyster shell discards, collected and cleaned by eleven participating restaurants, for oyster habitat restoration. This operation reduces impacts from shell mining and eliminates an estimated 80 tons of restaurant waste going to landfill. Monitoring shows that oyster reefs created with live shell produce 23% more new oyster growth than those built with fossil shell (see Watershed Habitat Action Plan WH5, 2022 CCMP update).

Over a five-year period between 2013 and 2018, there were ongoing effluent overflows from non-AWT plants to creeks that reach Roberts, Little Sarasota, and Blackburn Bays. During the same period, monitoring data showed increased nitrogen concentrations, increased phytoplankton, decreased water clarity, and an approximate 30% decline in seagrass coverage in those bay segments. These seagrass losses effectively reset the restoration clock in our lower bays. The upper portions of Sarasota Bay fared better until a 2,000-acre reduction of seagrass meadows around Long Bar Pointe between 2018–2020, a decrease of approximately 20%. A strong and persistent red tide event in 2018 particularly impacted north Sarasota Bay and darkened the water column for months. These conditions likely caused seagrass meadows to contract. Wildlife populations, already devastated by the red tide, lost critical habitat. The seagrass meadows that were lost between 2018–2020 likely supported more than 30 million fish. Since 2021, the SWFWMD seagrass maps have been supplemented by data collection on seagrass and macroalgae coverage at 45 transects throughout the bay. Each transect includes 6 stations, and transects are visited twice a year, in spring and early summer.



Watershed Habitats Action Plan WH6 – Protect, enhance and restore beaches and dunes for wildlife and resiliency.

Sarasota Bay barrier island beaches provide critical habitat for fish and wildlife and significant ecosystem services to Sarasota Bay. Many fish and wildlife species commonly associated with Sarasota Bay utilize beaches, dunes, and surf zone environments during various life stages. For instance, during May–October, loggerhead (*Caretta caretta*) and green sea turtles (*Chelonia mydas*) use area beaches for nesting.

Resident and migratory shorebirds depend on beaches and dunes for resting, foraging, and nesting. A community of small invertebrates live among the beach wrack that washes up on beaches. Beach wrack is the primary source of nutrients for beach communities, particularly for shorebirds (Dugan et al. 2003). Small animals living in wrack and nutrients from decomposing wrack regularly wash into the surf zone, making it an important nursery area for ecologically and economically important bay-associated fishes like snook, redfish, spotted seatrout, and sheepshead. Barrier island beaches and dunes also provide protection to relatively fragile bay habitats like seagrass meadows, salt marshes, and mangrove forests by reducing the impact of high energy waves and storms.

| Activities | Benefits |
|---|---|
| Restore coastal dunes and encourage the protection of beach wrack communities. | Better understanding of impacts of dredge and fill activities on beach and dune habitat improves comprehensive planning and protection of sensitive fish birds, turtles, and invertebrates. |
| Curate scientific knowledge of habitat impacts of sand replenishment and movement. | |
| Explore the role of SBEP in regional sediment management planning and monitoring, including coordination with the U.S. Army Corps of Engineers. | |

Over the past five years, SBEP has led or participated in a variety of beach and dune restoration projects. In 2014, SBEP participated in replacing invasive exotic Australian pine trees on Siesta Beach with more than 400 native plants. A 2018 Bay Partners Grant funded the purchase of signs to encourage beachgoers use established paths rather than trampling dunes on Anna Maria Island. SBEP also removed exotic vegetation on Leffis Key in 2017 and removed Australian pines from coastal upland habitat on North Lido Key. Over the next five years, SBEP will continue to prioritize projects to remove exotic species and restore beach and dune communities.

Fish and Wildlife – CCMP Action Plans FW1 – FW3

Sarasota Bay and its tributaries support a diversity of marine, estuarine, and freshwater fishes. They are critical components of bay ecosystem integrity, function, and services and are important to the cultural identity and economy of Sarasota and Manatee Counties.

The village of Cortez, founded in the 1880s, contains the last stretch of shoreline with a significant commercial fishing presence. The native striped mullet is still harvested by small local fishing boats. The mullet roe is collected, processed, and exported to Europe as exclusive Gulf Coast caviar, also known as bottarga. Commercial fishing occurs throughout SBEP bays and coastal waters. Between 2014 and 2018, over 31.6 million pounds of finfish worth over \$25.6 million were commercially landed in Manatee County and 616,000 pounds of finfish worth \$943,000 were commercially landed in Sarasota County (see Fish and Wildlife Action Plan, 2022 CCMP update). Commercial finfish landings are dominated by striped mullet (*Mugil cephalus*), thread herring (*Opisthonema oglinum*), small miscellaneous bait fish, ladyfish (*Elops saurus*), and red grouper (*Epinephelus morio*).



Historic Cortez Fishing Village, photo credit: FISH



Cortez Fishing Village, photo credit: Bradenton Magazine

SBEP and partners will continue to protect and restore water quality (see Water Quality and Quantity Action Plan, 2022 CCMP update) and the full mosaic of interconnected aquatic habitats necessary to support fish populations, including seagrasses, mangrove shorelines, tidal creeks, and oyster reefs, and other hardbottom habitats (see Watershed Habitat Action Plan, 2022 CCMP update).

The goal of the SBEP's Fish and Wildlife Action Plan is to protect, restore, and enhance fish and wildlife populations in Sarasota Bay. For this to happen, there needs to be continued coordination with the goals of the three other CCMP Action Plans (Water Quality and Quantity, Watershed Habitat, and Community Engagement Action Plans). Healthy populations of fish and wildlife depend on clean water (see Water Quality and Quantity Action Plan, 2022 CCMP update) and a mosaic of resilient, interconnected habitats ranging from freshwater wetlands, ponds, and creeks to brackish tidal creeks and estuaries, to marine waters of the Gulf of Mexico (see Watershed Habitat Action Plan, 2022 CCMP update). They also benefit from an informed public that supports protection and restoration and reduces harmful interactions, unsustainable harvest, littering, and other negative impacts (see Community Engagement Action Plan, 2022 CCMP update).

Fish and Wildlife Action Plan FW1 – Protect, restore, and enhance the diversity and abundance of native fish.

SBEP and its partners continue to advance our knowledge about fish life history and population dynamics in tidal tributaries, bays, and Gulf of Mexico. Priorities include understanding habitat usage by all life stages and connectivity among those habitats, response and recovery efforts related to HABs, impacts of invasive species, and projected climate change impacts. Fish monitoring programs will continue to advance these understandings, support adaptive fishery management, and provide important feedback on the effectiveness of water and habitat quality improvement strategies. If monitoring leads to the recognition of a problem, for example, the rapid population growth of an invasive species, SBEP will collaborate with partners to develop adaptive management strategies.

| Activities | Benefits |
|--|---|
| Continue fish population monitoring programs to support fisheries management, monitor invasive species, and understand habitat usage through all life stages. Explore opportunities to expand monitoring programs to include a greater diversity of species, tidal creeks and canals, and use of innovative monitoring technologies. | Native fish are critical components of the ecological integrity of SBEP bays and tributaries. |
| Support research to fisheries data gaps, including habitat connectivity between tidal tributaries, bays, and the Gulf of Mexico; migration barriers; HAB response and recovery; and projected climate change impacts. | |
| Explore capacity and potential effectiveness of protected managed areas, enhanced fishery management actions, and stock enhancement to protect and restore fish diversity, abundance, and resilience. | |
| Promote ethical angling practices that increase conservation and prevent marine debris. | |

Protecting, restoring, and enhancing the diversity and abundance of native fish populations is a long-standing management priority for SBEP (SBEP 1995). A variety of management activities are ongoing or proposed to accomplish this objective, including research and monitoring, protected areas, stock enhancement, habitat protection and restoration, and outreach and education.

SBEP and partners support, coordinate, and conduct efforts to protect, restore, and promote recovery of critical fish habitats, especially wetlands, oyster reefs, and seagrass meadows (see Watershed Habitat Action Plan, 2022 CCMP update). A review of publications documenting habitat restoration projects in the northern Gulf of Mexico found that nekton colonization can be relatively rapid following seagrass and oyster reef restoration, with densities and assemblages matching reference sites within five years for seagrass and 1–2 years for oyster reefs (Hollweg 2019). For restored marshes, fishes can recover to reference densities and assemblages about three years after restoration, but crustaceans can take longer than a decade to achieve reference densities and assemblages. SBEP’s strategy for water quality improvement through nutrient management also improves fish habitat by promoting seagrass recovery (see Water Quality and Quantity Action Plan, 2022 CCMP update).

Status and trends of fish abundance are documented annually, with reports prepared by FWC staff. See, for example, the 2021 report – Sarasota Bay Year 2 report. Additionally, staff with New College have presented their findings on the impact to fish populations of 2018’s severe red tide event, which documented recovery within a two-year period – [NCF-BPG2021-Final-Report.pdf \(sarasotabay.org\)](#).



Staff and students at New College of Florida examine the effects of the 2017-2019 red tide on Sarasota Bay fish communities. Project funded by a 2021 SBEP Bay Partners Grant.

Fish and Wildlife Action Plan FW2 – Protect, restore, and enhance the diversity and abundance of native shellfish.

The term “shellfish” is casually applied to aquatic invertebrates with shells and exoskeletons that are commonly consumed as seafood. SBEP waters support diverse assemblages of shellfish, including oysters, clams, scallops, crabs, shrimp, and lobsters. These species are important components of the integrity and function of SBEP bays and tidal tributaries and provide a wide range of beneficial ecosystem services. They are also valuable to the culture and economy of Sarasota Bay communities.

| Activities | Benefits |
|--|---|
| Monitor native bivalve populations and protect, restore and enhance their habitats. | Native shellfish are critical components of the ecological integrity of Sarasota Bay. |
| Support research to understand native shellfish recruitment, habitat needs, and vulnerabilities to climate change impacts. | |
| Support research to understand the benefits of native bivalve stock enhancement for improvements to water quality, habitat and native populations. | |

For nearly two decades, SBEP has led oyster restoration efforts in SBEP bays. Oysters can be restored in areas if appropriate environmental conditions are restored, including availability of suitable hard substrate and salinity regimes. SBEP reviews historical oyster reefs, current water conditions, and potential oyster recruitment to identify optimum oyster restoration sites.

In 2005, new reefs were created at White Beach and Turtle Beach in Sarasota County and in 2010 new reefs were created offshore of the Gladiola Fields in Manatee County. Starting in 2017, 1.2 acres of new oyster reef was created at the 34th Street Canal in Bayshore Gardens and hundreds of feet of oyster habitat was enhanced at Robinson and Perico Preserves.

Sarasota Bay Watch (SBW) formed a community-based partnership in 2011 with citizens, businesses, and local organizations to restore scallops in Sarasota Bay with guidance from SBEP, FWC-FWRI, Mote Marine Laboratory, and the Bay Shellfish Company. From 2011–2018, SBW released 105 million larval and 110,000 juvenile scallops at strategically selected locations in Sarasota Bay, utilizing a variety of approaches including free releases and boom-contained releases to reduce predation. From 2015–2017, SBW, Sarasota County, and Mote Marine Laboratory deployed 1,640 maturing adult scallops in protective cages to create natural spawning pulses to repopulate the bay. Despite these efforts, scallop populations in Sarasota Bay remain small.

To restore once abundant populations of the southern hard clam in Sarasota Bay, SBW launched a stock enhancement program in 2016. To date, they have released 380,221 southern hard clams into Sarasota Bay. Mote Marine Laboratory is conducting monitoring at release sites. Compared to bay scallops, southern hard clams are relatively tolerant of red tide.



SBEP Volunteers deploy oyster bags at Perico Preserve

Fish and Wildlife Action Plan FW3 – Monitor and protect threatened, endangered, and vulnerable wildlife.

Sarasota Bay is well known for its charismatic wildlife species, many of which are afforded special federal, state, and local protections due to being threatened, endangered, or vulnerable to human impacts. The federal Endangered Species Act of 1973, as amended, protects and recovers species from extinction and protects and restores their associated ecosystems. The Act is administered by National Marine Fisheries Service for marine species and by USFWS for freshwater and all other species.

In addition to federal programs, the Florida Endangered and Threatened Species Act of 1977, administered by FWC, requires conservation and special management of imperiled species considered endangered or threatened by either federal or state designations. Florida’s Imperiled Species Management Plan of 2016, as amended, focuses on conserving 57 imperiled fish and wildlife species by reducing extinction risks, maintaining essential habitat, and improving public and partner support of such efforts.

| Activities | Benefits |
|--|---|
| Support monitoring of threatened, endangered and vulnerable wildlife. | Healthy native wildlife population are critical components of the ecological integrity of Sarasota Bay, its tributaries and watersheds. |
| Support protection of threatened, endangered, and vulnerable wildlife, including outreach and education. | |

Sarasota Bay has a resident population of approximately 160 common bottlenose dolphins (*Tursiops truncatus*). Major stressors and threats include predation by sharks on juveniles, water and habitat quality degradation, disease, red tide, and adverse human interactions, especially boat collisions, illegal feeding, harassment, and entanglement or ingestion of fishing gear.

The Florida manatee (*Trichechus manatus latirostris*) is a cherished occupant of Sarasota Bay. It feeds on submerged, emergent, and floating freshwater and marine vegetation and is commonly found grazing in seagrass. Manatees require access to freshwater for drinking. During winter, they concentrate in peninsular Florida, relying on warm water from natural springs and power plant outfalls as a refuge from colder temperatures. Many return to the same winter sites year after year. Manatee habitat degradation, fragmentation, and loss caused populations to decline to a few hundred individuals around 1967. Significant efforts by federal, state, private, and nonprofit organizations to protect and restore the West Indian manatee (*T. manatus*), of which the Florida manatee is a subspecies, have improved critical manatee habitats and increased the Florida population substantially, compared to 1960-era estimates. In 2017, USFWS downlisted the Florida subspecies from endangered to threatened



(USFWS 2017). However, 1,100 manatees died in Florida in 2021, the worst year on record. The epicenter of this die-off was the Indian River Lagoon, where seagrass resources have collapsed due to inadequate water quality. As of June of 2022, an additional 600 manatees had died in 2022, with most deaths occurring – again – on Florida’s east coast. Combined, those 18 months (2021 and half of 2022) represent a loss of perhaps a third of the population of manatees on Florida’s east coast.

Sea turtles are protected under the federal Endangered Species Act of 1973, as amended, Florida’s marine turtle Protection Act (379.2431 F.S.), and Florida’s Endangered and Threatened Species Rule (68A-27 F.A.C.). Green and leatherback sea turtles are federally listed as Endangered, and the loggerhead sea turtle is federally listed as Threatened. Florida law restricts possession, disturbance, mutilation, destruction, selling, transference, molestation, and harassment of marine turtles, nests, or eggs. FDEP and FWC review coastal construction permits that affect sea turtles. Florida created the Model Lighting Ordinance for Marine Turtle Protection Rule (62B-55 F.A.C.) to provide guidance to county and municipal governments to develop ordinances for preventing light from reaching the beach. As of March 2020, Anna Maria Island, Bradenton Beach, Holmes Beach, Sarasota County, City of Sarasota, Town of Longboat Key, and City of Venice have lighting ordinances to protect sea turtle hatchlings (FWC 2020).

Community Engagement – CCMP Action Plans CE1 – CE4

Connecting the health of Sarasota Bay to economic and community values like quality of life, public health, recreation, and sense of pride and place can motivate a wider audience.

Encouraging citizens to develop a personal relationship with the bay through low-impact recreational experiences like boating, fishing, walking, or simply taking in the view can bolster a long-lasting appreciation for and desire to protect Sarasota Bay.

SBEP plays a critical role in convening, coordinating, and supporting a wide network of community partners and formal partners with shared missions and responsibilities to protect and restore Sarasota Bay. Program sustainability and the foundation of the NEP model relies on an informed and engaged citizenry to carry out its mission. The Goals of the CCMP's other three Action Plans can only be achieved with an informed public that supports protection and restoration and makes sustainable choices to reduce harmful interactions, overharvest, pollution, and other negative impacts.

Community Engagement Action Plan CE1 – Reduce recreational use impacts on Sarasota Bay and improve access for communities disconnected from waterways.

Efforts to enhance access and promote recreational opportunities in the bay must be accompanied by education to prevent overuse and damage. Educating users about best practices to avoid impacts to bay waters, habitats, and wildlife is an ongoing need as part of responsive and adaptive management of recreational carrying capacity. Ultimately, improving and managing Sarasota Bay recreational opportunities is key to sustaining support for the large public investments needed to protect and restore Sarasota Bay.

| Activities | Benefits |
|--|---|
| Promote and support community-driven public land acquisitions and improvements, including new and expanded hiking and paddle trails, launch points, and bay views that enhance recreational access for communities disconnected from waterways, including environmental justice and other underserved communities. | Reducing recreational use impacts helps ensure the sustainability of bay resources. Enhancing managed recreational access for communities disconnected from waterways increases watershed awareness and community-wide support for a healthy bay. |
| Educate recreational users about best practices to avoid impacts to bay waters, wildlife, and habitats, including pollution prevention, safe boating, ethical angling, and sustainable tourism. | |
| Support responsive and adaptive management of bay access points and recreational trails to avert impacts from overuse. | |



Seagrass Safe Boating signage and maps are located at popular marinas throughout Sarasota Bay

In 2019, SBEP partnered with Sarasota and Manatee Counties, Florida Sea Grant, Sarasota Bay Watch, New College of Florida, West Coast Inland Navigation District, and waterfront businesses to study seagrass scarring trends and boating behavior in Sarasota Bay and develop a boater outreach program featuring a Seagrass Safe Boating video, educational signage, and Sarasota Bay waterway guide that delineates areas of seagrass and safe boating practices to avoid propeller scarring. In April 2021, seagrass-safe boating signs and maps were posted at public boat ramps, marinas, and rental/tackle shops in Sarasota and Manatee counties.

Florida Sea Grant launched a Florida Friendly Fishing Guide Certification in 2020. SBEP helps fund the Science and Environment Council’s Watershed Audio Tour, which features audio messages at locations around the estuary with advice on best practices for plastic pollution prevention, sustainable fishing, seagrass-safe boating, and safe wildlife watching.

In response to recreational user impacts and conflicts at popular kayak launch sites, Sarasota County implemented a capacity management scheme in 2013 wherein commercial kayak tour operators must register and pay an annual permit fee per kayak to launch from Ted Sperling Park at South Lido Beach. The program was expanded to Turtle Beach Park on Siesta Key in 2017. In 2021, the County will further limit the total number of commercial operators to twelve and the number of kayaks to 260 at these locations through a formal competitive bid process. In 2021, Manatee County will begin limiting the total number of commercial kayaks permitted to launch from Robinson Preserve, Emerson Point Preserve, and possibly North Coquina Boat Ramp. Manatee County’s overall strategy regulates user behavior rather than numbers by restricting recreational access and activities in certain areas.

Community Engagement Action Plan CE2 – Improve public understanding and action on bay-related issues and expand reach to priority audiences.

Outreach that delivers consistent and compelling science-based environmental education can help inspire and motivate bay users, homeowners, visitors, and other target audiences to care about and participate in conserving, protecting, and restoring Sarasota Bay.

SBEP education efforts focus specifically on bay-related priority issues such as reducing stormwater and wastewater pollution (see Water Quality and Quantity Action Plan, 2022 CCMP update), mitigating and adapting to climate change, protecting and restoring seagrass and coastal wetlands (see Wetland Habitat Action Plan, 2022 CCMP update), protecting native fish, shellfish, and wildlife (see Fish and Wildlife Action Plan, 2022 CCMP update), and minimizing recreational use impacts (see Community Engagement Action Plan, 2022 CCMP update).

| Activities | Benefits |
|--|---|
| Support volunteer restoration and citizen science activities that contribute to assessment, monitoring, and restoration of bay and gulf waters, shorelines, wetlands, and other habitats. | CCMP implementation can be improved by increasing the capacity of non-profit, community, and business partners to educate and engage the public about bay issues and solutions. |
| Assist and empower citizens to adopt sustainable bay-friendly lifestyles and to lead community initiatives that reduce pollution, conserve water and energy, and promote community health. | |

SBEP funds dozens of field trips throughout the Sarasota Bay watershed that serve nearly 2,000 students each year. Professional teacher training workshops are funded by SBEP three times per year, where K-12 science teachers improve teaching skills and science literacy. SBEP intends to focus environmental education funds to hands-on bay-related experiences for Title I schools and youth-focused human service organizations that reach underserved populations. The inaugural Sarasota Bay Educators’ Workshop, held in 2022, convened formal and informal educators to identify gaps in bay-related K-12 education and brainstorm potential new or expanded programs to fill those gaps.

In 2019, SBEP began a new partnership with Mote Marine Laboratory and local human service organizations to provide kayak instruction, bay exploration, and aquarium trips for youth in communities that are traditionally underrepresented in bay user groups. So far, this partnership has engaged approximately 50 individuals through organizations that support minority or at-risk youth, including Visible Men Academy, the Sarasota Housing Authority, Unidos Now!, and the Bradenton Dream Center.

Throughout the year, SBEP staff interact with the public by tabling at community events and through invited speaking engagements at colleges and universities, adult classes, homeowner associations, and other community groups. Almost 5,000 followers and subscribers are engaged on a variety of timely bay-related issues, activities, and program accomplishments through semi-weekly social media posts and SBEP's quarterly e-newsletter Bay Reflections. In 2017, SBEP redesigned and launched a new website that is easier to navigate, more visually engaging, mobile friendly, and more complete with new, improved, and better organized content - [Newsletter Archive | Sarasota Bay Estuary Program](#)



SBEP sponsored field trip at MOTE Marine Laboratory



Hands on learning with summer camp children and families



2021 Educator's Workshop

Community Engagement Action Plan CE3 – Coordinate and support community initiatives that advance CCMP implementation.

SBEP supports the capacity of non-profit, community, and business partners to educate and engage the public in outreach and stewardship that furthers CCMP implementation through supporting professional development, workshops and meetings, and grants. By developing, enhancing, and leveraging capacities of collaborating organizations, SBEP can accelerate the implementation of CCMP goals and objectives for protecting and restoring Sarasota Bay.

| Activities | Benefits |
|--|---|
| Support capacity of non-profit, community, and business partners to educate and engage the public in outreach and stewardship that furthers CCMP implementation through professional development opportunities, workshops, and grants. | CCMP implementation can be improved by increasing the capacity of non-profit, community, and business partners to educate and engage the public about bay issues and solutions. |
| Connect the value of natural resource protection with preservation of cultural heritage and traditional use of Sarasota Bay through partnerships with cultural heritage organizations. | |

in October 2021, SBEP convened high-level stakeholders in a Water Quality Restoration Workshop to address water quality status and plans for infrastructure investments (see Water Quality and Quantity Action Plan, WQQ-2). In 2018, SBEP sponsored and participated in the Environmental Summit, hosted by the Science and Environment Council. The Summit highlighted connections between environmental heritage and a resilient future, natural habitats and fish and wildlife, and a healthy environment and quality of life.

SBEP’s Bay Partners Grants Program promotes environmental education, community involvement, and stewardship to improve Sarasota Bay and its tributaries. Grants are provided to local businesses, non-profit organizations, schools, academic institutions, civic associations, religious organizations, homeowner associations, and neighborhood associations for a wide variety of projects that focus on water and habitat quality improvement and bay-related environmental outreach, education, and engagement. Until 2020, ten to twelve community projects were funded each year with a maximum of \$4,000 per project. Since 2020, the overall budget for Bay Partner’s Grants was increased to \$100,000, with a maximum allowed amount of \$10,000 per project – [Apply for a Grant | Sarasota Bay Estuary Program](#).

Community Engagement Action Plan CE4 – Ensure coordination of interlocal partners for CCMP implementation.

SBEP is organized as a management conference of SBEP staff and four committees that bring together a diverse assemblage of interests, perspectives, and expertise to coordinate information sharing and problem solving in SBEP bays and by convening policymakers (Policy Board), managers (Management Board), scientists (Technical Advisory Committee), and community members (Citizens Advisory Committee). SBEP has a unique, centralized role for informing policy and management decisions and guiding the development of technical studies, monitoring, restoration and management plans, projects, and outreach and education throughout SBEP watersheds.

SBEP’s CCMP was first adopted in 1995 and updated in 2000, 2006, 2010, and 2014. It is a multi-partner, science-based, and consensus-driven strategic plan that prioritizes goals, objectives, and actions to protect and restore the water quality and ecological integrity of Sarasota Bay. Local, state, and federal governmental and regulatory partners have formally committed to implementing CCMP goals through adoption of an Interlocal Agreement, enacted in 2004.

| Activities | Benefits |
|--|--|
| Implement the Finance and Implementation Plan, including continuation of the Interlocal Agreement and participation in the Florida Estuaries Alliance. | Coordination of partners, projects, and funding for CCMP implementation will leverage resources and create efficiencies to protect and restore SBEP bays, tributaries, and watersheds. |
| Coordinate multi-partner projects supportive of CCMP objectives and partner reporting of CCMP performance metrics. | |
| Provide regular updates to policymakers and decision makers about priority issues, best available science, and examples of success. | |
| Support and encourage interlocal partners to develop and implement climate vulnerability assessments and adaptation plans. Provide tools and assistance to mitigate and adapt to climate change impacts. | |
| Incorporate CCMP objectives and activities in local government comprehensive plans, land development regulations, or ordinances. | |

In 2016, Florida's four NEPs – Coastal and Heartland National Estuary Partnership, Sarasota Bay Estuary Program, Tampa Bay Estuary Program, and the Indian River Lagoon Council, host of the Indian River Lagoon National Estuary Program—created the Florida Estuaries Alliance. The Alliance aims to help advance Florida as a national leader in coastal and estuarine restoration, research, stewardship, and education.

Local coordination of multi-partner projects can leverage partner investments and create efficiencies in accomplishing CCMP goals. SBEP has participated in more than 200 water quality or habitat improvement projects since the program's inception in 1989, which can be viewed on an interactive ArcGIS map – [Google Earth](#). Through its role as a project manager, SBEP brings together partners, funding, and contractors. SBEP's Five-Year Habitat Restoration Plan guides efforts of SBEP and partners to identify, prioritize, and implement restoration projects throughout the bay and its watersheds. Funding for projects requires coordination with funding opportunities and partner priorities. Tracking and reporting habitat restoration accomplishments is important for monitoring progress toward water quality and habitat goals. SBEP reports completed habitat restoration projects annually to USEPA through the National Estuary Program Online Reporting Tool (NEPORT). Improved coordination of partner reporting, such as standardizing categories and metrics for restoration, monitoring, and management activities and CCMP performance metrics will increase the clarity and value of these reports for tracking improvements in water and habitat quality in SBEP bays and tributaries. Information on the health of the bay is regularly communicated to the Policy Board through the use of the SBEP's ecosystem health report card – [State of the Bay | Sarasota Bay Estuary Program](#). Results are also shared on a more frequent basis through a series of "Director's Notes" – [Sarasota Bay Health Updates | Sarasota Bay Estuary Program](#).

Over the past five years, SBEP partners have made progress in assessing climate vulnerabilities and planning for climate change – [2017-SBEP-CVA-Final.pdf \(sarasotabay.org\)](#). The City of Sarasota conducted a climate vulnerability assessment and adaptation plan of over 200 city-owned assets in 2017 (City of Sarasota 2017). The assessment considered how sea level rise, storm surge, extreme heat, and extreme precipitation might impact city water supply, stormwater and wastewater management, transportation, public lands, and critical buildings. Eighty assets, including nine public parcels and two public shorelines, were identified as vulnerable to future climate conditions and high-level strategies were presented to protect them.

The Town of Longboat Key has completed the first phase of a four-phase Comprehensive Adaptation Plan for sea level rise. Manatee County conducted a sea level rise vulnerability analysis for its public infrastructure, natural environment, and social environment (Manatee County 2019). Sarasota County conducted a sea level rise vulnerability assessment that

provides recommendations for sea level rise planning (Sarasota County 2021).

Sarasota and Manatee Counties are members of the Tampa Bay Regional Resilience Coalition, where they convene with members from Citrus, Hernando, Hillsborough, Pasco, and Pinellas Counties and 21 Tampa Bay municipalities to discuss complex regional issues associated with climate change, develop strategic regional responses, and build consensus for accomplishing regional goals. SBEP is a founding partner of the Sarasota- Manatee Climate Council, a network of experts and practitioners working on climate change issues, facilitated by the Science and Environment Council. The Climate Council works collaboratively to advance regional understandings of climate change through science and education and to translate those understandings into planning and projects. SBEP provides leadership and guidance through its work with the Climate Council Education Outreach Working Group and participates in a variety of collaborative education projects.



Staff from SBEP, FDOT, the City of Sarasota, and the Bay Park Conservancy guided Florida's Chief Resilience Officer, Dr. Wesely Brooks on a tour through downtown Sarasota. The tour highlighted established and potential coastal climate resilience projects.

Topic 2: NEP Program Implementation

NEP Administration and Governance Structure

How does the SBEP provide a clear and transparent decision-making process based on stakeholder input and science, allowing the SBEP to be seen as a leader in watershed management?

The SBEP is structured as a Special Independent District within the State of Florida, as outlined in the SBEP's Interlocal Agreement (2004) - [Interlocal-Agreement.pdf \(sarasotabay.org\)](#). The Interlocal Agreement set up two committees to provide oversight, the Policy Board and the Management Board.

The SBEP's Policy Board members include elected officials who represent Manatee County, Sarasota County, the City of Sarasota, the City of Bradenton and the Town of Longboat Key, as well as an appointed official representing the Southwest Florida Water Management District. The Florida Department of Environmental Protection and EPA represent the final two members of the Policy Board. EPA's representative is a non-voting member of the Policy Board. The Policy Board has policymaking oversight responsibilities, in addition to explicit powers listed in the Interlocal Agreement.

The Management Board consists of representatives from the entities represented on the Policy Board, as well as the Chairs of the Citizens Advisory Committee (CAC) and the Technical Advisory Committee (TAC). Representatives from the FWC and the US Fish and Wildlife Service and the US Army Corps of Engineers can be appointed to serve as non-voting members of the Management Board. The Management Board has managerial powers related to oversight of the SBEP, in addition to explicit powers listed in the Interlocal Agreement.

Annual workplans and budgets are developed by staff based mainly on CAC and TAC input and review by the Management Board. The outline of draft workplan elements is presented to the Management and Policy Boards at the first Board meetings of each calendar year (typically in January and February, respectively). The workplans are then developed and presented to the Management and Policy Boards in their second meeting of the year (typically in May). After review and adoption – by formal vote – by the Policy Board, the final workplan is then submitted to EPA.

How does the SBEP ensure that its Management Conference includes input from diverse populations and interests?

By reaching out to the SBEP's CAC and TAC, the workplan seeks input from diverse local stakeholders. For example, the SBEP's CAC members include a high school student, employees of local governments, real estate agents, small business owners, charter boat captains, as well as retirees. The SBEP's TAC includes over twenty scientists and engineers, with about a third holding Ph.D.'s in their field. In addition, SBEP recommendations are based on peer-reviewed reports and/or relevant literature published in scientific journals, available for review by stakeholders via the SBEP's online technical library - [Technical Reports | Sarasota Bay Estuary Program](#).

How does the SBEP's staffing and planning promote stability and continuity of succession?

The SBEP has a full-time staff of only five individuals, so formal planning for succession is limited. Staff are expected to make efforts to be available each Monday, so that the plans and activities of each staff member are known to the rest of the staff. In addition, each staff member informs the others of their expected work activities each week, and calendars are kept up to date so that each member of the SBEP knows what other members are working on, and where they are working. Staff are cross trained, but with so few employees, there are skills required for the program that can only be done by one or at most two staff. This problem is inherent in any small office setting, but it has not been a problem over the past two years under the current Director.

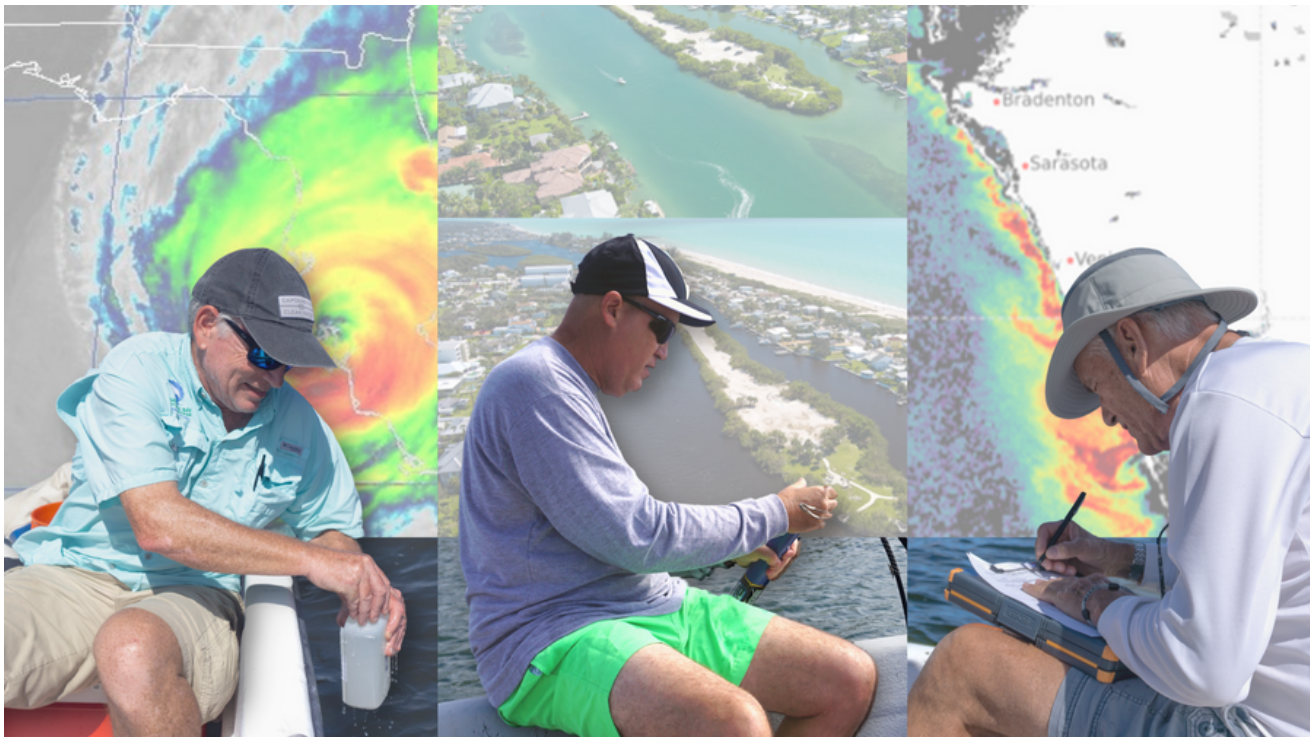
How does the NEP plan to continue operations during emergencies?

Since the new Director was hired in November of 2020, the SBEP has dealt with impacts of a global pandemic, an historic release of industrial wastewater in the contiguous waters of lower Tampa Bay, a strong hurricane (Ian) and a tropical storm (Nicole). A common thread related to each of these has been a focus on making sure that SBEP staff are kept safe as a first priority. For example, in-person meetings were curtailed as much as possible, although Florida law required in-person meetings for Management and Policy Boards and the CAC (all decision-making bodies) in 2021 and 2022.

During tropical storm events, staff helped secure our office and then were given contact information for each other. During both Hurricane Ian and Tropical Storm Nicole, staff stayed in contact via both email and text messages, to ensure that each employee had people to assist them with storm damage or a need for a place to stay, since most SBEP staff lost power for several days after Hurricane Ian.

Community Response

In response to Hurricane Ian, SBEP staff worked with agency staff from local, regional and state agencies to develop a coordinated water quality monitoring effort to answer the related questions of: 1) is it safe to go in the bay, 2) if not, when will it be safe, and 3) what were the impacts of Hurricane Ian on Sarasota Bay? The results from this effort were shared with the CAC, TAC and Management and Policy Boards through a series of Director's Notes, which were summarized on both social media and in our website - [Hurricane Ian's Impact on Sarasota Bay](#).



Graphic used to promote SBEP's Hurricane Ian blog post

Grant Obligations and Finance

Has the NEP consistently met all their EPA §320 grant obligations?

The SBEP has made on-time filings of the following NEP-required documents:

- Climate Change Vulnerability Report - [2017-SBEP-CVA-Final.pdf](#) ([sarasotabay.org](#)).
- Annual Workplans - [Financial and Public Records | Sarasota Bay Estuary Program](#)
- Annual NEPORT reporting, and
- State of the Bay reports - [State of the Bay | Sarasota Bay Estuary Program](#)

EPA Region 4 staff serve on the SBEP's Management and Policy Boards, and SBEP staff attend annual Washington, D.C. and Association of NEPs conferences, although COVID reduced these to virtual meetings for most of 2020 and 2021. The SBEP complies with EPA planning requirements, including Quality Assurance Project Plans for data gathering (although water quality monitoring and seagrass mapping are carried out by our partners), as well as providing public access to all our Financial and Public Records documents - [Financial and Public Records | Sarasota Bay Estuary Program](#).

The SBEP's habitat restoration plans are contained within a Five-Year Master Plan - [1](#) ([sarasotabay.org](#)). Additional and more detailed information is available via the SBEP's interactive ArcGIS map of proposed and/or completed habitat restoration projects - [Google Earth](#).

The SBEP's Community Engagement efforts are summarized on our website - [Community Engagement | Sarasota Bay Estuary Program](#), with sections devoted to the topics of community engagement goals, a link to membership application for the CAC, a summary and timeline of the process for the Bay Guardians Program, a link to the Bay Partners Grant program, a link to book a speaker for bay topics, a library of educational brochures, and links to advice on how to live a "bay-friendly" lifestyle.

By far, the most relevant evidence of the SBEP meeting its EPA §320 grant obligations is the recently completed 2022 CCMP update. Hard copies of the CCMP have been given out to all CAC members, as well as all members of the Management and Policy Boards. In addition, the CCMP was summarized via a link to an ArcGIS Storymap - [A Thriving Estuary \(arcgis.com\)](#). A link to the Storymap is also available

viewing on cell phones, which can be downloaded via scanning a QR code on “leave behind” cards distributed at meetings and given to local businesses. A PDF version of the CCMP ([SBEP CCMP 2022 Update.pdf - Google Drive](#)) is available for viewing in both the laptop and cell phone versions of the ArcGIS Storymap. After downloading (which is not necessary for viewing) this PDF is a searchable document, so that readers can find all references to topics such as septic tanks, red tide, etc. After downloading, the CCMP can also be listened to as an audio file, should that be desired. Combined, the online versions of the CCMP have been viewed more than 1,500 times (as of February 2023).



Graphic used to promote SBEP's CCMP StoryMap

Have there been any challenges or problems encountered with cost sharing or implementing its federal NEP award?

There have been no problems meeting cost-share obligations. Currently, local governments fund the SBEP to the amount of \$296,000. These funds come from Manatee County (\$50,000/yr), Sarasota County (\$50,000/yr), the City of Sarasota (\$33,000/yr), the (\$133,000/yr), the City of Bradenton (\$15,000/yr) and the Town of Longboat Key (\$15,000/yr). While this is not enough to meet a 50-50 cash match, our local partners are spending multiple hundreds of millions of dollars on projects to meet CCMP obligations - ([Sarasota Bay Water Quality Restoration Workshop - YouTube](#)) - finding projects that meet the cost-share obligations is not a problem.

Have grant dollars been drawn down promptly in accordance with the terms and conditions of the grant for implementation of the EPA-approved workplan?

In general, yes. On a few occasions a subcontractor has not been able to complete their project by the end of the EPA Implementation Year budget from which it is being paid. In that case, we have applied for and been granted a one-year, no-cost extension of the affected grant. This has occurred largely associated with the COVID pandemic, which reduced the SBEP's ability to spend funds on projects requiring in-person meetings, such as public outreach.

Budget Summary

The SBEP's Budgets, Workplans, annual independent programmatic audits and financial statements are all available for review on our website - Financial and Public Records | Sarasota Bay Estuary Program. As indicated in the audit summaries, the SBEP continues to use public funds as intended, with no operational irregularities reported. In addition, the findings from EPA's 2018 Performance Evaluation Report are also available for review - [2018-SBEP-EPA-Performance-Evaluation-Package-and-Letter.pdf \(sarasotabay.org\)](#). The 2018 EPA review did not find any issues with operational irregularities or problems with tracking the SBEP's budgets over the previously reviewed period.

What kind of obstacles, if any, has the SBEP faced with CCMP implementation (political, institutional, etc.) and what has the NEP done to overcome those obstacles? How can EPA (Regions/HQ), support the NEP's efforts to address these obstacles?

The SBEP is currently in the process of developing a RAP for the bay. A RAP is a locally led alternative to a Total Maximum Daily Load, or TMDL. While the RAP is led by local stakeholders (who are involved with the RAP process through the SBEP's WQC) the output guidance from a RAP is equivalent to TMDL guidance in that it will result in specific load reduction targets for both stormwater and wastewater, which would be legally binding based upon the National Pollutant Discharge Elimination System permit process.

The preliminary load reduction target for Sarasota Bay is to reduce watershed-level nitrogen loads by 20%, based on a comparison of loads during the "reference period" of 2006 to 2012, compared to later years when water quality had deteriorated,

macroalgae had become more abundant, and seagrass coverage had declined by more than 20 percent.

To meet these load reduction targets, the SBEP's local government stakeholders have publicly committed to spending nearly a billion dollars over the next five to ten years on a variety of wastewater upgrade and stormwater retrofit projects – ([Sarasota Bay Water Quality Restoration Workshop - YouTube](#)). This is an enormous obligation, and will require financial support from state and federal agencies, similar to the \$132 million loan made to Sarasota County by the EPA's Water Infrastructure Finance and Innovation Act (WIFIA) – [WIFIA 2020 Selected Project Factsheet \(epa.gov\)](#).

How can EPA (Regions/HQ), states, and/or other Federal agencies support the NEP's efforts to more effectively address climate and equity priorities?

SBEP has been working with our local stakeholders on developing strategies for responding to climate change, with a summary available for review on our website – [2017-SBEP-CVA-Final.pdf \(sarasotabay.org\)](#). Stressors anticipated fall into the following categories: 1) impacts to wastewater treatment and application of reclaimed water, 2) impacts on stormwater conveyance and treatment, 3) impacts to wetlands from potential changes in rainfall and temperature, 4) impacts to fish and wildlife populations of increased temperatures and sea level rise. These potential impacts were then incorporated into Action Plans meant to be implemented by our local governments. At this point, the most immediate impact expected over the next few decades relates to sea level rise, and its impacts on shoreline features and stormwater conveyance.

A citizen-science effort coordinated by the SBEP found that expectations of sea level rise over the next 30 years are not expected to result in sea level overtopping most seawalls along the bay's shoreline (although such is expected to occur more easily during tropical weather events). However, a number of storm drains are currently submerged during high tides associated with full and new moons, aka "spring tides," which is expected to increase street flooding, especially during rain events which coincide with high tides.

For the SBEP to be most effective on this topic, the program must work productively with state agencies that are currently fully involved with increasing the state's resiliency, although such efforts do not typically involve the discussion of global warming and/or reducing carbon footprints.

What difficulties or priorities does the SBEP anticipate during the next five years?

Public perception of the effectiveness of the SBEP is tied, in large part, to the health of the bay – as it should be. And the SBEP’s CCMP is a holistic guide to how to get to the healthier bay that our stakeholders desire. There have also been commitments from our local stakeholders to spend nearly a billion dollars on infrastructure projects to meet the SBEP’s preliminary 20 percent nitrogen load reduction target.

However, there have been many impacts to the bay over the past few years that make bay recovery more difficult. Between 2013 and 2018 or so, there were over 750 million gallons of treated, yet high-nutrient content wastewater effluent that overflowed into the lower bay – [637096244262470000 \(scgov.net\)](https://www.scgov.net). These years coincided with concurrent increased nutrient contents, elevated levels of both phytoplankton and macroalgae, and a 30 percent loss of seagrass in the lower bay.

In the spring of 2021, over 200 million gallons of industrial wastewater was discharged into lower Tampa Bay over a 10-day period. These discharges brought about a combination of phytoplankton blooms and massive blooms of macroalgae in both Tampa Bay and upper Sarasota Bay, and preceded the worst red tide in middle Tampa Bay in over 50 years – [Initial estuarine response to inorganic nutrient inputs from a legacy mining facility adjacent to Tampa Bay, Florida \(sarasotabay.org\)](https://www.sarasotabay.org).

And in 2022, the lower bay experienced at least two weeks of degraded water quality, in response to rainfall and wind damage from Hurricane Ian, although the bay’s water quality appears to have mostly recovered within four weeks – [Hurricane Ian's Impact on Sarasota Bay](https://www.sarasotabay.org).

The combination of natural phenomena such as storms and environmental impacts from inadequate wastewater and stormwater infrastructure will have a continuing impact on Sarasota Bay, particularly when they work in unison to dramatically increase pollutant loads to our local waters.

Topic 3: Ecosystem and Community Status

Community and Stakeholder Engagement

How does the SBEP ensure that the public has access to the decision-making process and engagement opportunities?

The SBEP's CAC has over two dozen citizen representatives, with a variety of backgrounds – [Citizens Advisory Committee | Sarasota Bay Estuary Program](#). The chair of the CAC is also a member of the Management Board, and their input on SBEP priorities is represented on multiple topics included in the SBEP's CCMP. Additional outreach occurs via the SBEP's Bay Guardians Program, which engages the public through school-led projects and various community science efforts – [Volunteer | Sarasota Bay Estuary Program](#). Since 2021, the SBEP's Bay Partners Grants, which provide financial assistance to local stakeholders for education and restoration activities, has distributed \$100,000 per year for projects that not only engage local stakeholders, but help to implement the CCMP as well.



The SBEP's social media presence has increased dramatically over the past few years. The SBEP not only has an up-to-date website (with a new and modern updated brand – [Sarasota Bay Estuary Program](#)) but the SBEP also has thousands of combined followers who learn about or keep current on SBEP activities using Facebook – [Sarasota Bay Estuary Program - Home | Facebook](#), Instagram – [Sarasota Bay Estuary Program \(@sarasotabayestuaryprogram\)](#) • [Instagram photos and videos](#) and LinkedIn – [\(2\) Sarasota Bay Estuary Program: Overview | LinkedIn](#).

SBEP recently solicited bay-related questions from social media followers. The Q&A video was shared on all social media platforms and can be viewed on Youtube: <https://www.youtube.com/watch?v=zXMzQoVdQXg&t=248s>

Education and Outreach

Is the NEP effectively promoting and creating widespread recognition of the Program?

In the recent past, SBEP has increased efforts at promoting the SBEP to ensure that the SBEP plays a central role in managing the bay's resources. These efforts include the following:

The SBEP's website has been revised and updated - [Sarasota Bay Estuary Program](#). The revised website has been visited over 51,000 times over the past five years, and includes a link to an ArcGIS Storymap that summarizes our CCMP - [A Thriving Estuary \(arcgis.com\)](#) which has been viewed over 1,500 times (as of February 2023). In addition, the SBEP has over 3,400 subscriptions to our quarterly newsletter, "Bay Reflections" - [Newsletter Archive | Sarasota Bay Estuary Program](#).

Over the past five years, SBEP staff have given over 70 public presentations to approximately 2,000 total audience members. As noted above, the SBEP has social media accounts with Facebook, Instagram, LinkedIn and YouTube, with a combined number of followers in excess of 5,000.

In addition, the SBEP has increased its visibility in terms of increased mentions in local and national media, with links available to the public via our website - [SBEP In the News | Sarasota Bay Estuary Program](#). These efforts have increased our presence in the community, a concern raised in the 2018 EPA Programmatic Evaluation Report. For example, SBEP staff and/or the health of Sarasota Bay were topics covered by local, regional and/or national media outlets 18 times in 2019. By 2020, that number dropped to 8 times. However, in 2021, the number of stories related to the SBEP and/or the health of the bay had increased to 50 times and increased again in 2022 to 80 times.

Over the past two years, the SBEP has produced over 60 "Director's Notes" to update our Management Conference on items of interest to managing the health of Sarasota Bay - [News - Sarasota Bay Estuary Program](#). These Director's Notes are often distributed among most of the senior staff and elected officials who represent our local stakeholders.

Monitoring and Assessment

How do the NEP's monitoring plan and indicators produce data to support a comprehensive and integrated analysis of environmental conditions (e.g., environmental progress report that communicates ecosystem status and trends, aka State of the Bay/Estuary Reports)?

The SBEP's 2022 CCMP update includes sections related to our recent move to fast-track nutrient management actions in the watershed. The steps followed to produce these indicators and management guidance include the following:

- In 2019, draft NNC criteria were developed for all bay segments, which were reviewed and adopted by both FDEP and the EPA [2019-Revised-NNC-for-Sarasota-Bay-Estuarine-Nutrient-Region-Final-Report.pdf \(sarasotabay.org\)](#).
- Also in 2019, guidance for water quality for tidal creeks were developed by the SBEP - [2019-Southwest-Florida-Tidal-Creeks-Nutrient-Management-Framework-and-Indicator-Development.pdf \(sarasotabay.org\)](#).
- Ending in 2021, SBEP finalized a watershed-wide pollutant loading model for the bay [2021-SBEP-RA-Phase-1-Final-Report-072021.pdf \(sarasotabay.org\)](#).
- In 2022, the SBEP developed a four-metric ecosystem health report card for Sarasota Bay [State of the Bay | Sarasota Bay Estuary Program](#)
- In 2021 and 2022, the SBEP developed a draft pollutant load reduction goal for the bay, based on a TAC-reviewed reference period approach. This draft 20 percent reduction target is being reviewed for inclusion in the SBEP-led effort to develop a RAP for the bay.

The proposed RAP approach was reviewed by the SBEP's TAC, CAC, Management and Policy Boards (including FDEP and EPA staff) and our recently constituted WQC. The WQC is meant to serve as a bridge of sorts between the TAC and agencies that would have to implement the projects outlined in the RAP. Members of the SBEP's Management Board comprised a selection committee reviewing proposed approaches for consultants looking to assist the SBEP on RAP development. A consultant was chosen and put under contract, and initial meetings between the consultant, SBEP and FDEP have been held, and the results presented to the WQC.

What is the NEP's relation to the Federal Clean Water Act?

As previously mentioned in Water Quality Action Plans 1 (WQ1) and 2 (WQ2) the SBEP closely coordinates its actions with the Federal Clean Water Act.

EPA Priorities

How does the SBEP incorporate relevant aspects of EPA priorities into their workplans consistent with locally generated concerns?

Examples of such efforts are described in detail in earlier portions of this report.

Reduction in nutrient pollution and HABs

As discussed above, the SBEP has led efforts to develop water quality standards meant to protect the water quality and natural resources of the bay and reduce the spatial extent, duration, and intensity of HABs such as red tide

Green Infrastructure

SBEP has been involved with “green infrastructure” and “nature-based solutions” such as those shown in our ArcGIS map of completed and/or ongoing habitat restoration sites – Google Earth. The SBEP’s dozens of habitat restoration projects have typically been completed through a coordinated effort wherein the SBEP’s consultants get projects through the design and permitting phase, with construction carried out by a combination of local, regional, state and federal agencies.

Environmental justice and climate change

In the fall of 2021, President Biden signed into law the \$1.2 trillion Infrastructure and Investment Jobs Act, aka the Bipartisan Infrastructure Law (BIL). Of interest to SBEP is that the infrastructure deal includes \$132 million for EPA’s NEP to be disbursed over five years, starting in 2022. BIL-funded projects are intended not only to implement CCMP Action Plans, but they are expected to include elements that respond to climate change and resiliency and include outreach and educational efforts for underserved communities and environmental justice concerns, to the greatest extent possible.

On a census tract level, EPA's EJScreen tool was used to derive Environmental Justice benefits of potential projects, using a five-factor Supplemental Demographic Index that combines the following metrics: 1) percent low-income households, 2) percent linguistically isolated, 3) percent of the population with less than a high school education, 4) unemployment rate, and 5) life expectancy.

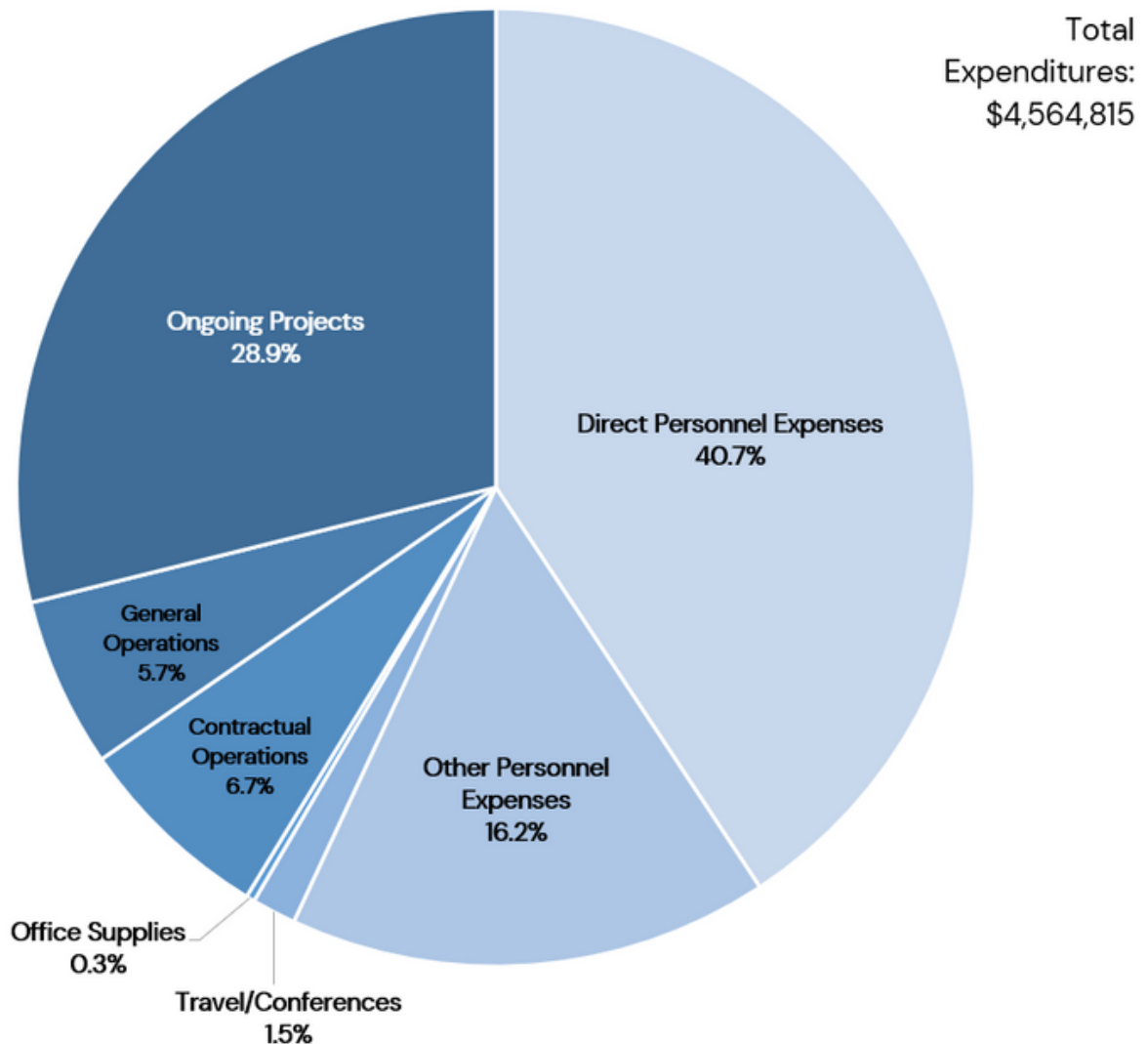
These demographic indicators were used to highlight areas where vulnerable populations may be disproportionately impacted. Maps generated in EJScreen highlight census block groups above the 80th, 90th, and 95th percentiles when compared to the nation, calculated as the average of these demographic indicators. SBEP's methodology to identify demographic indicators to determine the disadvantaged communities or those populations that may be disproportionately impacted in the SBEP watershed is as follows - communities were considered disadvantaged if at least one of the above demographic indicators results in an index percentile between 80 and 100. This information was supplemented with information from additional EJ screening tools, and incorporated applicable factors from outside census block data, such as the proximity of Title 1 schools. Designation as a Title 1 school reflects a prior determination by the State of Florida and the US Government that such a school has a "...high percentage of socioeconomically disadvantaged children."

An additional screening tool developed by the White House Council on Environmental Quality includes susceptibility of census tracts to impacts from Climate Change, and is titled "Climate and Economic Justice Screening Tool" - Explore the map - Climate & Economic Justice Screening Tool ([geoplatform.gov](https://www.epa.gov/cejst)). The third is from the State of Florida list of schools designated as Title I schools, local to the Sarasota Bay watershed area.

Based on the three Environmental Justice and Climate Resilience screening tools, SBEP identified three projects to be competed using FY22 and FY23 funds: 1) a shoreline habitat restoration and stormwater treatment project located east of Cortez, 2) a stream restoration and stormwater pond restoration project located within GT Bray Park, in the City of Bradenton, and 3) expansion of existing artificial reef deployments located in both Manatee and Sarasota County portions of upper Sarasota Bay. Combined, these three projects meet EPA's goal to have 40% of BIL funds spent on projects that address the linked topics of Environmental Justice and Climate Resiliency.

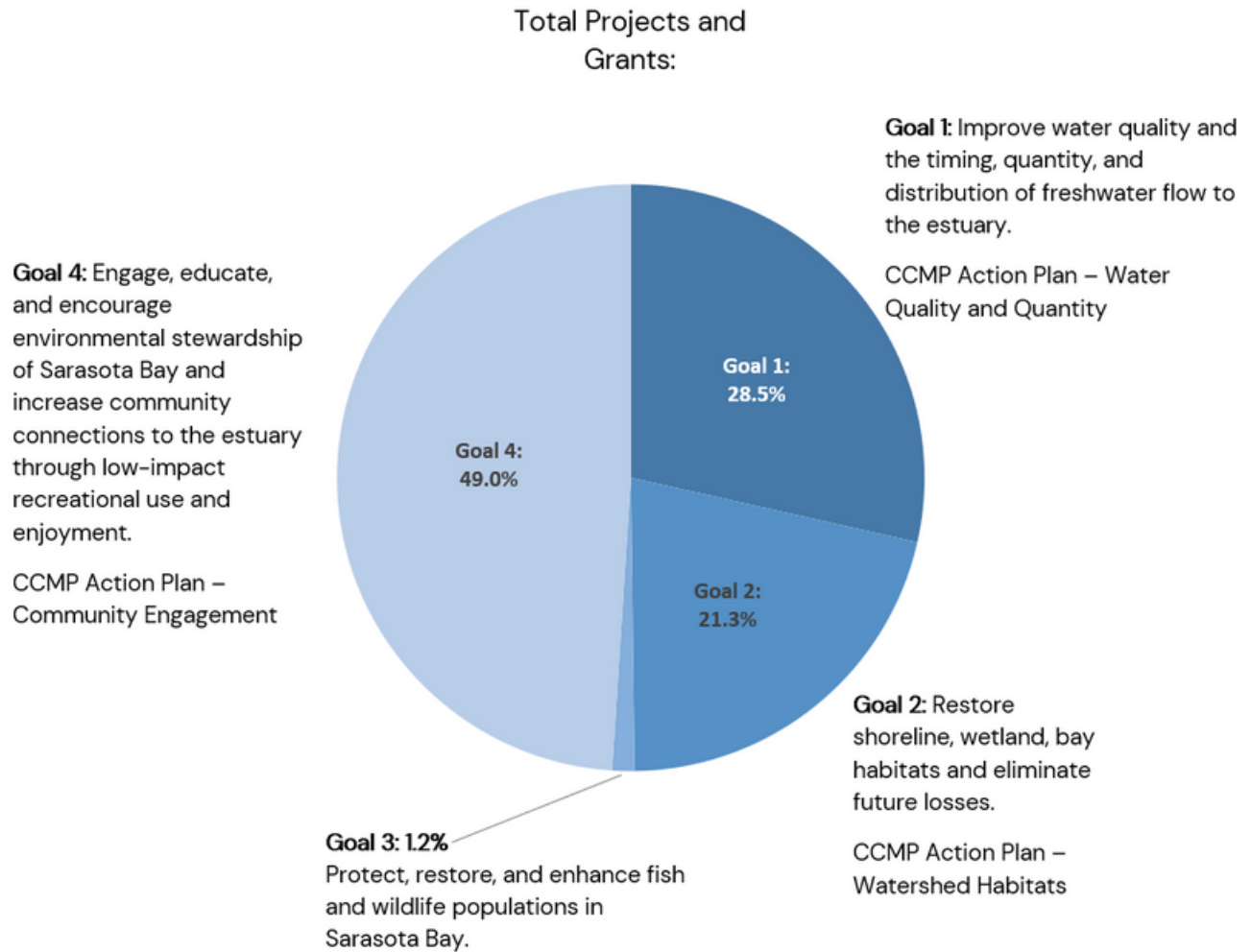
Expenditures Summary

TOTAL SBEP EXPENDITURES BY EPA BUDGET CATEGORY OCTOBER 1, 2017 TO SEPTEMBER 30, 2022



Expenditures include funds from Section 320 award and annual State and Local Government contributions. Direct Personnel Expenses refers to salary for five full-time staff. Other Personnel Expenses refers to staff benefits (retirement, insurance, etc.). Contractual Operations refers to contract agreements including IT support, liability insurance, and legal services. General Operations refers to all other routine operating costs such as telecommunications, office space rental, and capital expenditures.

**SBEP ONGOING PROJECTS AND BAY PARTNERS GRANTS
EXPENDITURES BY CCMP GOAL
OCTOBER 1, 2017 TO SEPTEMBER 30, 2022**



Expenditures include funds from Section 320 award and annual State and Local Government contributions. Various projects have multiple benefits across the SBEP’s four goals. For example, a project to build a stormwater treatment system in a neighborhood would be classified as Community Engagement if it came through the Bay Partners Grant proposal from a homeowner’s association, although it has benefits to Goals 1, 2, and 3. While Goal 3 is the smallest category, in terms of direct funding, most projects that address Goals 1 and 2 have benefits to fish and wildlife populations as well.

ONGOING PROJECT EXPENSES BY FISCAL YEAR

| PROJECT | FY18 | FY19 | FY20 | FY21 | FY22 |
|--|------------------|------------------|------------------|------------------|------------------|
| Reasonable Assurance Plan and Water Quality Management | \$85,275 | \$7,684 | \$46,400 | \$33,600 | \$0* |
| Macroalgae Study | \$0 | \$0 | \$0 | \$4,696 | \$6,148 |
| Artificial Reefs | \$7,200 | \$0 | \$8,846 | \$0 | \$0 |
| Biological Monitoring | \$41,667 | \$58,333 | \$41,667 | \$0 | \$50,503 |
| Wetlands Coordination | \$29,175 | \$25,460 | \$7,899 | \$58,091 | \$72,852 |
| Habitat Restoration and Maintenance | \$0 | \$0 | \$0 | \$18,191 | \$68,592 |
| Community Action Plan | \$123,478 | \$109,231 | \$94,461 | \$79,757 | \$136,552 |
| Public Outreach and Education | \$4,413 | \$7,316 | \$9,119 | \$8,511 | \$0** |
| CCMP Update | \$0 | \$10,000 | \$20,000 | \$20,000 | \$9,223 |
| State of the Bay | \$0 | \$0 | \$0 | \$7,852 | \$0 |
| Program Development | \$2,900 | \$2,020 | \$0 | \$619 | \$0 |
| TOTAL | \$294,108 | \$220,044 | \$228,392 | \$231,317 | \$343,870 |

* \$50,000 from the FY22 RAP budget was rolled into FY23 for a total project budget of \$100,000

** In FY22, the Public Outreach and Education line item was combined with CAP

Expenditures include funds from Section 320 award and annual State and Local Government contributions.

Acronym Key

| | |
|--------|---|
| SBEP | Sarasota Bay Estuary Program |
| PE | Program Evaluation |
| CCMP | Comprehensive Conservation and Management Plan |
| CAC | Citizens Advisory Committee |
| TAC | Technical Advisory Committee |
| SWFWMD | Southwest Florida Water Management District |
| EPA | Environmental Protection Agency |
| FDEP | Florida Department of Environmental Protection |
| NEP | National Estuary Program |
| SLR | Sea Level Rise |
| NOAA | National Oceanic and Atmospheric Administration |
| NNC | Numeric Nutrient Concentration |
| WQC | Water Quality Consortium |
| RAP | Reasonable Assurance Plan |
| WWTP | Wastewater Treatment Plant |
| AWT | Advanced Wastewater Treatment |
| WQQ | Water Quality & Quantity |
| WH | Watershed Habitat |
| FW | Fish & Wildlife |
| CE | Community Engagement |
| DIN | Dissolved Inorganic Nitrogen |
| LID | Low-Impact Development |
| OSTDS | Onsite Sewage Treatment and Disposal Systems |
| TN | Total Nitrogen |
| HABs | Harmful Algal Blooms |
| FWC | Florida Fish & Wildlife Conservation Commission |
| HRP | Five-Year Habitat Restoration Plan |

