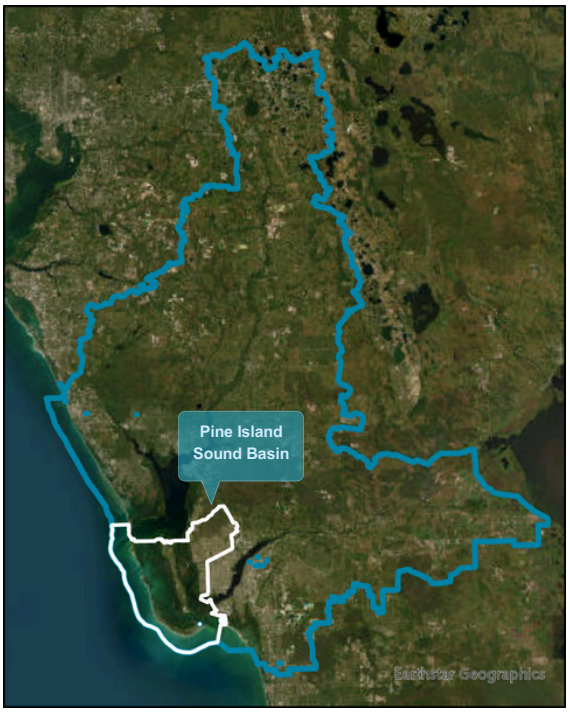
Pine Island Sound Basin Water Quality Status Report

WATER QUALITY IMPROVEMENT

Summary

Pine Island Sound and Matlacha Pass are two large estuaries that lie immediately south of Charlotte Harbor. Pine Island separates the two estuaries and provides them with limited freshwater from numerous small creeks and wetlands. Rainfall and runoff from western Cape Coral provide freshwater, with the Cape interceptor waterways influencing the quantity and quality of inflow. The Pine Island Sound basin spans 374.9 square miles.

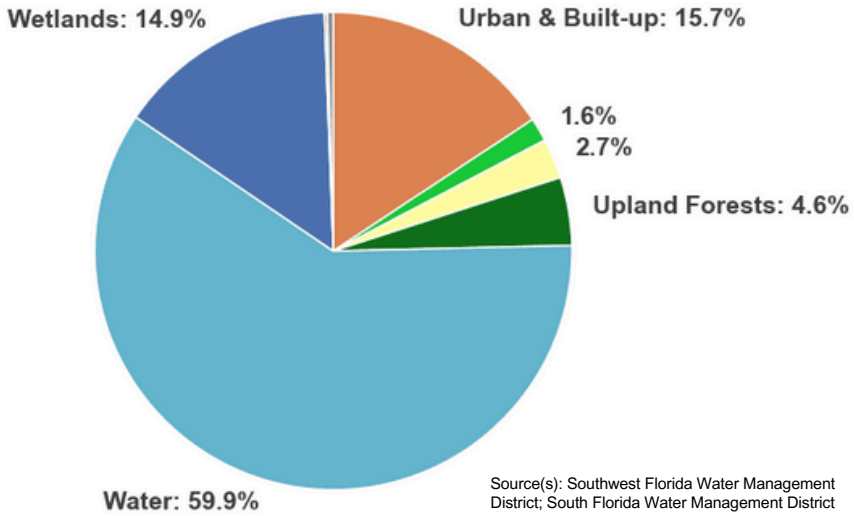
Both estuaries have extensive seagrass beds that provide essential habitat for young fish. Periodically, during large releases from that Caloosahatchee River, outflow can discharge freshwater through San Carlos Bay into southern Pine Island Sound and southern Matlacha Pass. Dredging, altered timing and volumes of freshwater discharges to the Caloosahatchee River system have greatly impacted these downstream estuaries. Seagrasses, oyster beds and other plants and animals are vulnerable to salinity changes, sediments and pollutants that occur during dramatic changes in freshwater flows.



The Coastal & Heartland National Estuary Partnership (CHNEP) and its partners conduct water quality monitoring in this area, which is available on the CHNEP Water Atlas (www.chnep.wateratlas.usf.edu). This report describes waterbodies that are not currently meeting water quality standards pursuant to the Impaired Waters Rule (IWR 62-303 F.A.C.).

Land Use / Land Cover Categories as a Percentage of Basin Area

Pine Island Sound Basin, 2019



Source(s): Southwest Florida Water Management District; South Florida Water Management District

CHNEP WATER ATLAS

PINE ISLAND SOUND BASIN PAGE

PINE ISLAND SOUND BASIN

UPDATED 8/1/25

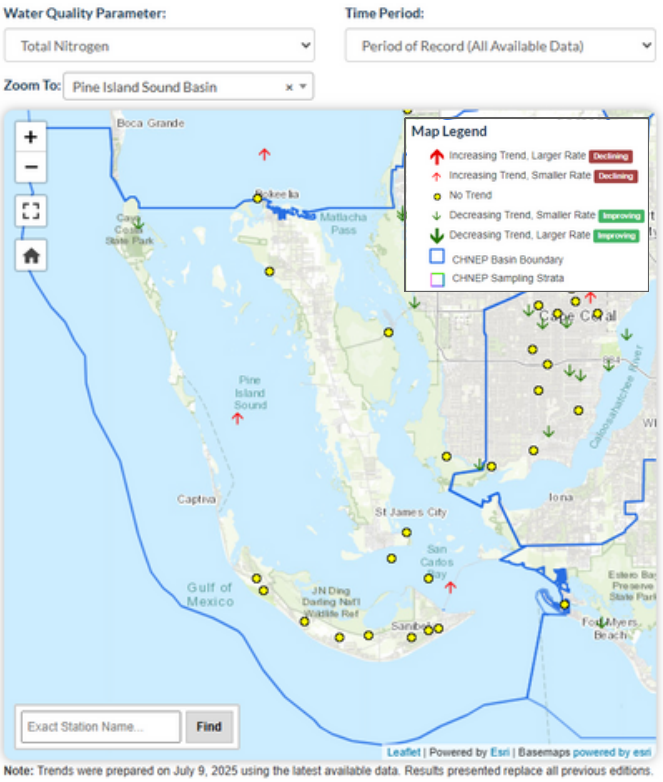
Nutrients

Nutrient pollution in waterbodies is one of the most widespread water quality problems, caused by excess nitrogen and phosphorus. Too much nitrogen and phosphorus in the water can cause algae to grow excessively, degrading aquatic habitat and decreasing the dissolved oxygen that fish and other aquatic life need to survive.

Below are some examples of sources of nutrients:

- Sewage treatment plants/domestic point sources
- Atmospheric deposition from air pollution
- Lake Okeechobee water releases
- Septic systems improperly placed or maintained
- Groundwater pollution
- Fertilizers from residential and agricultural runoff

Top graphic shows the trends for Nitrogen at long-term monitoring stations spread throughout the Basin.



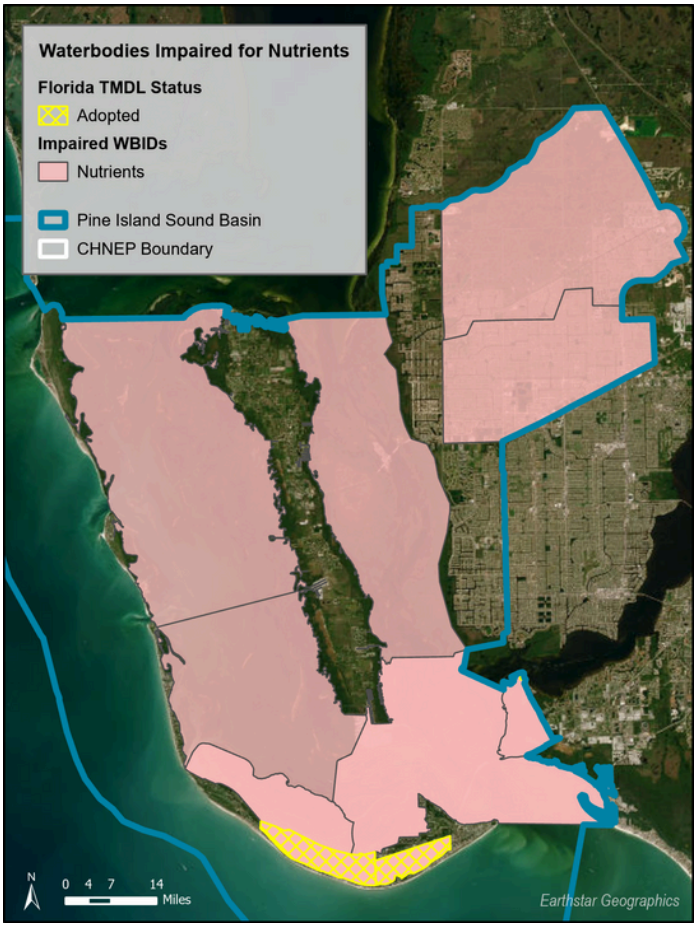
Note: Trends were prepared on July 9, 2025 using the latest available data. Results presented replace all previous editions.

The Florida Department of Environmental Protection (FDEP) uses water quality data that meets its quality control standards to identify waterbodies and water segments "WBIDs" that are not meeting the applicable water quality standards and designated uses based on the IWR 62-303 and 62-302, F.A.C. Once a WBID is verified impaired, it is to be placed on a schedule for TMDL development. TMDLs are waterbody-specific pollutant limits aimed at restoring attainment of water quality standards.

The following WBIDs are currently not meeting water quality standards for nutrients:

- Gator Slough Canal
- Horseshoe Hermosa Canals
- Matlacha Pass
- Pine Island Sound (Upper and Lower Segments)
- Punta Rasa Cove
- San Carlos Bay
- Sanibel Bayous
- Sanibel Slough (East and West)

On the map to the right, pink areas are verified impaired for nutrients and yellow striped areas designate areas under TMDL or TMDL development.



Bacteria

Bacteria in the water affect our ability to use the water for drinking, swimming, and shellfishing. The state water standards establish bacteria limits for different types of uses. The most stringent standards are for shellfishing areas, followed by drinking water and water used for recreation such as swimming and fishing.

Bacteria come from a variety of sources, but those of most concern come from fecal waste of animals and people. Sources of fecal bacteria include:

- Malfunctioning septic systems
- Leaking sanitary sewers
- Confined animal feedlots / overgrazing
- Wastewater plant overflows
- Urban pet waste
- Stormwater

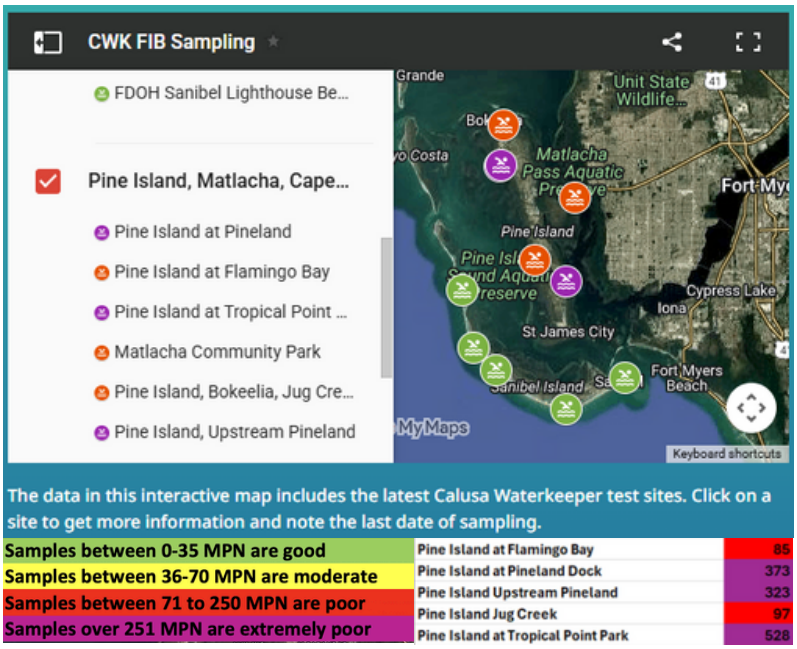
The graphic above shows recent results for Bacteria (Entercocci) at monitoring stations spread throughout the Pine Island Sound Basin.

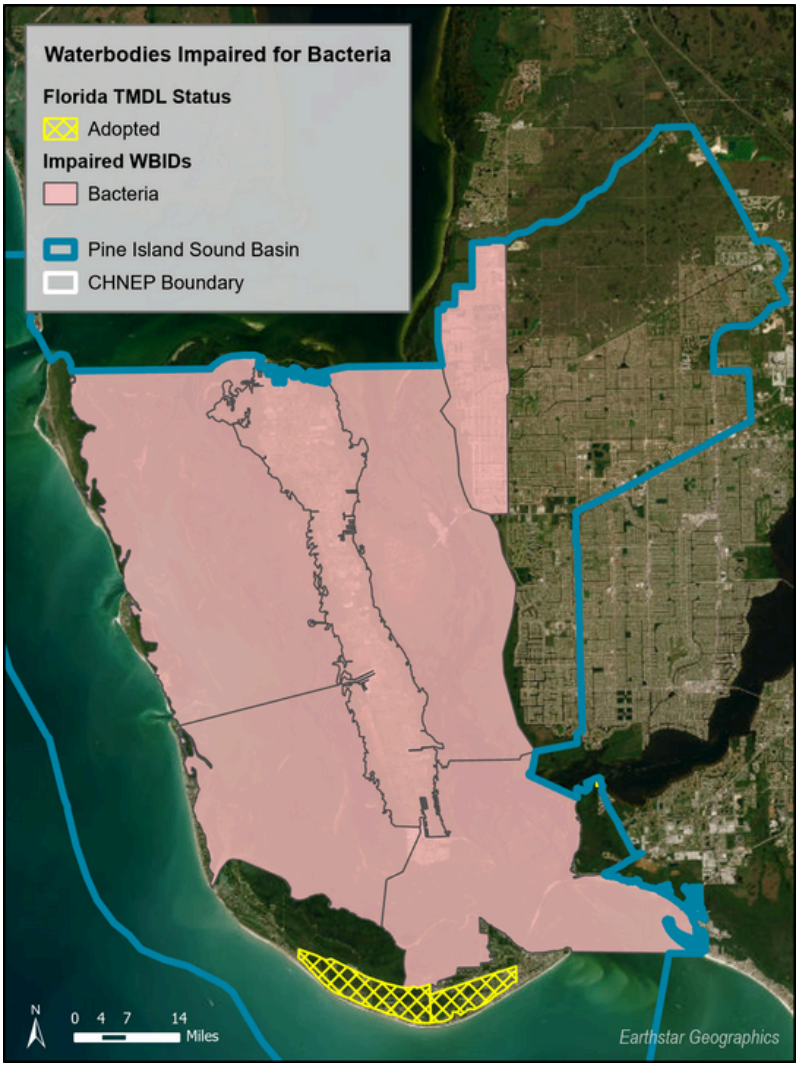
Bacteria impairment is determined by FDEP using the same processes as nutrients. In addition, TMDLs are developed for impaired waters to identify the waterbody-specific pollutant target needed for attaining applicable water quality standards.

The following WBIDs are currently not meeting water quality standards for bacteria:

- Cape Coral (West Urban)
- Matlacha Pass
- San Carlos Bay
- Pine Island
- Pine Island Sound (Lower Segment)
- Pine Island Sound (Upper Segment)

Pink areas are verified impaired for bacteria on the map to the right. No TMDL development has yet occurred at the state level for bacteria within the Pine Island Sound Basin.





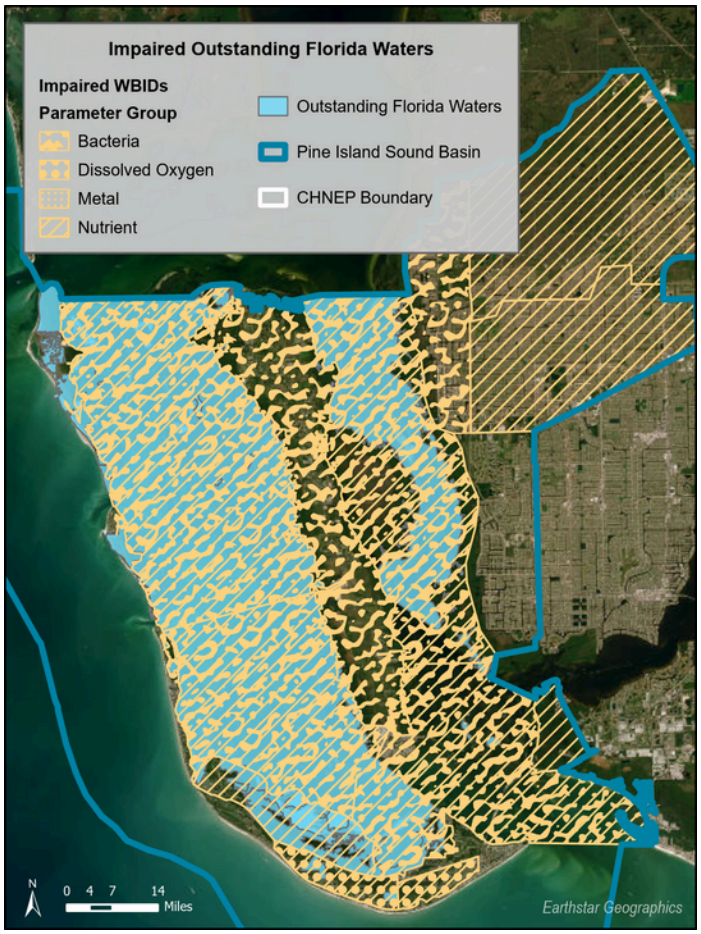
Outstanding Florida Waters

An Outstanding Florida Water (OFW) is a water designated worthy of special protection because of its natural attributes. This special designation is applied to certain waters and is intended to protect existing good water quality.

Most OFWs are areas managed by the state or federal government as parks, refuges, or preserves. However, many of these OFWs are currently impaired (*as indicated by light blue with peach fill pattern on the map to the right*).

The following OFWs are currently not meeting water quality standards:

- Cayo Costa State Park
- Josslyn Island
- J.N. Ding Darling National Wildlife Refuge
- Matlacha Pass Aquatic Preserve
- Matlacha Pass National Wildlife Refuge
- Pine Island Sound Aquatic Preserve
- Pine Island National Wildlife Refuge



WBID	Waterbody Name	Impairment(s)	Status
2065E	Pine Island Sound (Upper Segment)	Nutrients (Total Nitrogen)	Impaired
2065E	Pine Island Sound (Upper Segment)	Fecal Coliform (SEAS Classification)	Impaired
2065E	Pine Island Sound (Upper Segment)	Mercury (in fish tissue)	TMDL Complete
2065F	Matlacha Pass	Fecal Coliform (SEAS Classification)	Impaired
2065F	Matlacha Pass	Mercury (in fish tissue)	TMDL Complete
2065F	Matlacha Pass	Nutrients (Total Nitrogen)	Impaired
2065G	Pine Island Sound (Lower Segment)	Mercury (in fish tissue)	TMDL Complete
2065G	Pine Island Sound (Lower Segment)	Nutrients (Total Nitrogen)	Impaired
2065G	Pine Island Sound (Lower Segment)	Fecal Coliform (SEAS Classification)	Impaired
2065H1	San Carlos Bay	Mercury (in fish tissue)	TMDL Complete
2065H1	San Carlos Bay	Nutrients (Chlorophyll-a)	Impaired
2065H1	San Carlos Bay	Fecal Coliform (SEAS Classification)	Impaired
2065H1	San Carlos Bay	Nutrients (Total Nitrogen)	Impaired
2065H2	Sanibel Canal System West	Mercury (in fish tissue)	TMDL Complete
2065H3	Sanibel Canal System East	Mercury (in fish tissue)	TMDL Complete
2082C	Gator Slough Canal	Nutrients (Macrophytes)	Impaired
2082C1	Cape Coral (West Urban)	Enterococci	Impaired
2082C1	Cape Coral (West Urban)	Mercury (in fish tissue)	TMDL Complete
2092C	North Captiva Island	Mercury (in fish tissue)	TMDL Complete
2092D	Captiva Island	Mercury (in fish tissue)	TMDL Complete
2092E	Pine Island	Mercury (in fish tissue)	TMDL Complete
2092E	Pine Island	Fecal Coliform (SEAS Classification)	Impaired
2092F1	Sanibel Slough West	Nutrients (Chlorophyll-a)	TMDL Complete
2092F1	Sanibel Slough West	Nutrients (Total Nitrogen)	TMDL Complete
2092F1	Sanibel Slough West	Dissolved Oxygen (Percent Saturation)	TMDL Complete
2092F1	Sanibel Slough West	Nutrients (Total Phosphorus)	TMDL Complete
2092F2	Sanibel Slough East	Nutrients (Chlorophyll-a)	TMDL Complete
2092F2	Sanibel Slough East	Nutrients (Total Nitrogen)	TMDL Complete
2092F2	Sanibel Slough East	Nutrients (Total Phosphorus)	TMDL Complete
2092F2	Sanibel Slough East	Dissolved Oxygen (Percent Saturation)	TMDL Complete
2092G	Sanibel Bayous	Nutrients (Total Nitrogen)	Impaired
2092G	Sanibel Bayous	Nutrients (Chlorophyll-a)	Impaired
2092G	Sanibel Bayous	Mercury (in fish tissue)	TMDL Complete
2092G1	Clam Bayou	Mercury (in fish tissue)	TMDL Complete
3240A3	Horseshoe Hermosa Canals	Nutrients (Macrophytes)	Impaired
3240O	Punta Rasa Cove	Nutrients (Total Nitrogen)	Impaired
3240O	Punta Rasa Cove	Nutrients (Total Phosphorus)	Impaired
3240O	Punta Rasa Cove	Mercury (in fish tissue)	TMDL Complete
3240S	Cape Coral (South Urban)	Mercury (in fish tissue)	TMDL Complete
3258A1	Estero Bay Wetlands	Mercury (in fish tissue)	TMDL Complete
8056	Gulf of Mexico (Lee County; Captiva Island)	Mercury (in fish tissue)	TMDL Complete
8057	Gulf of Mexico (Lee County; Captiva Island)	Mercury (in fish tissue)	TMDL Complete
8058	Gulf of Mexico (Lee County; Sanibel Island)	Mercury (in fish tissue)	TMDL Complete
8059	Gulf of Mexico (Lee County; Sanibel Island)	Mercury (in fish tissue)	TMDL Complete

Source(s): Florida Department of Environmental Protection

CONTACT INFORMATION

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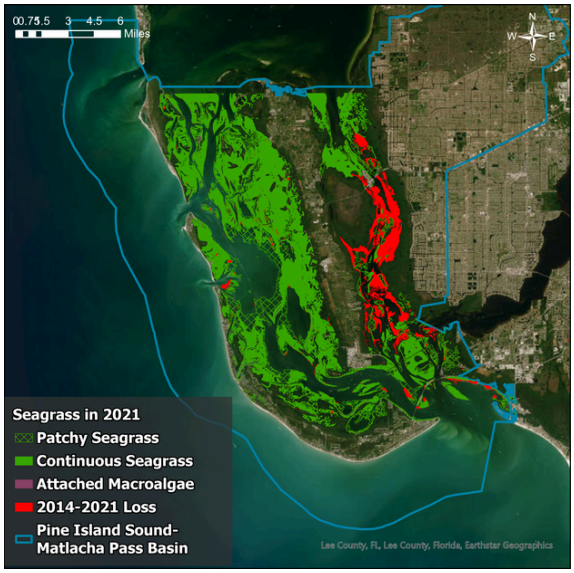
Seagrass in Pine Island Sound Basin

FISH, WILDLIFE & HABITAT PROTECTION

Seagrass Measures Water Quality & Improves Estuary Health

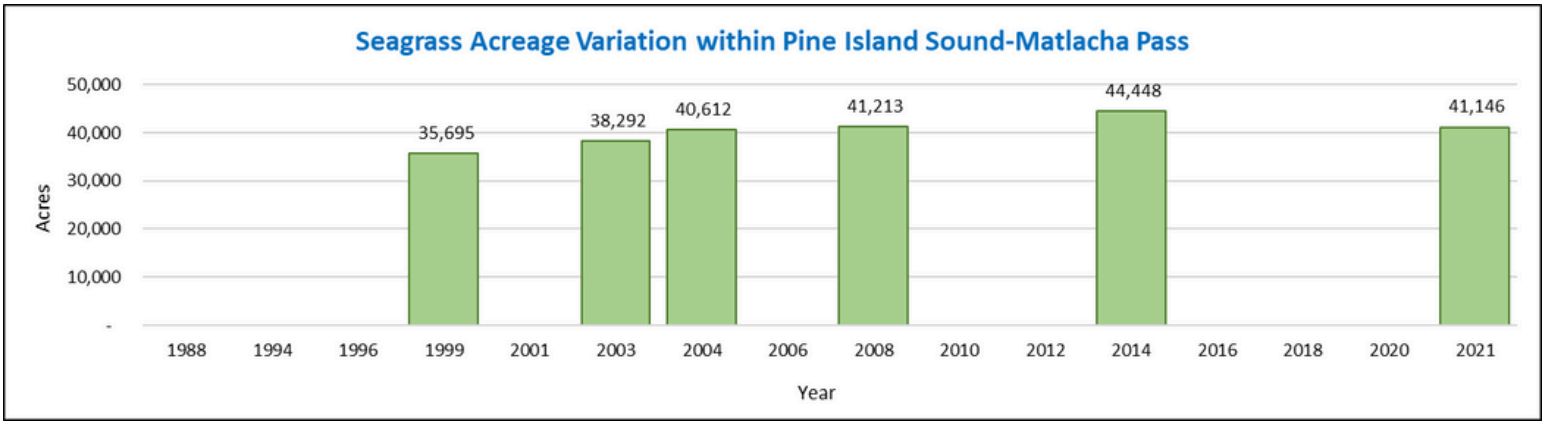
Seagrass beds provide many benefits. It is nursery habitat for fish and shellfish and it contributes to better water quality by trapping sediments, storing carbon, and filtering nutrients from stormwater runoff. Seagrass requires clean water and ample sunlight to grow, and therefore it is used by agencies and local governments as a way to measure water quality. This is documented in two ways:

- Mapping changes in seagrass acreage and location over time with aerial photography. This is valuable for estimating seagrass locations, acres and broad changes over time.
- On-the-ground monitoring of changes in species composition, estimation of bottom cover in a seagrass bed (abundance), and maximum depth in which seagrass can grow due to light availability and water clarity (deep edge). This monitoring works to characterize the density, complexity, and stability of those seagrass meadows.



Seagrass Acreage

The graphs below depict results from seagrass mapping in Pine Island Sound, Matlacha Pass, and San Carlos Bay from 1999–2021. Due to tidal flushing in Pine Island Sound, which hosts the majority of the region's seagrass, acreages in this area have remained relatively stable over time. Note that consistent mapping of acreage and locations with aerial photography is needed at least every 3-4 years in order to evaluate trends in seagrass acreage. Between 2014 and 2021, Pine Island Sound/Matlacha Pass lost 3,302 acres of seagrass, representing a 7% loss overall. The reason for this decline is complex and likely involves several factors. This includes impacts from storm events such as Hurricane Irma, increased temperatures and rainfall, additional nutrient runoff from land, as well as prolonged red tide and algae blooms in the region. CHNEP continues to work with our partners to better understand causes and investigate solutions.

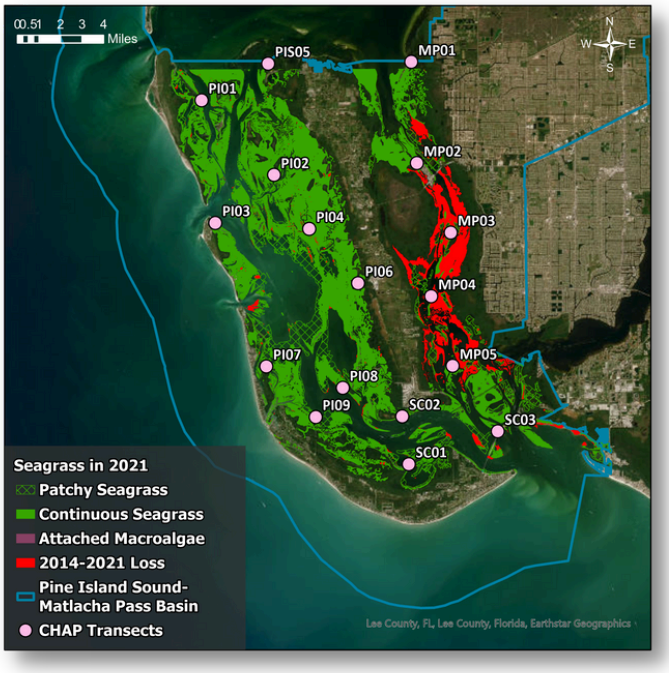


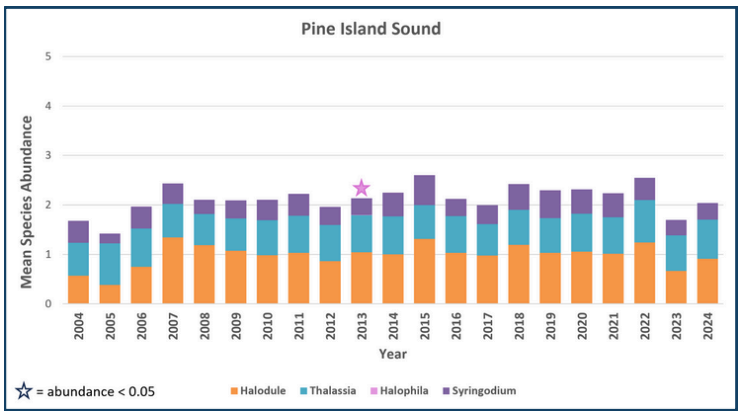
For more information, please visit the CHNEP Water Atlas at chnep.wateratlas.usf.edu.

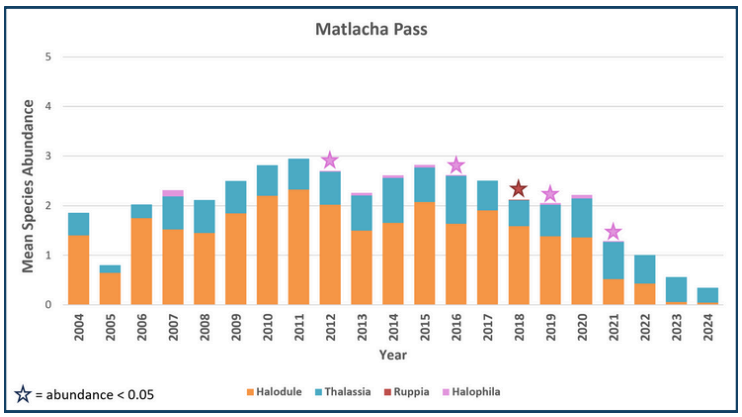
Seagrass Diversity and Health

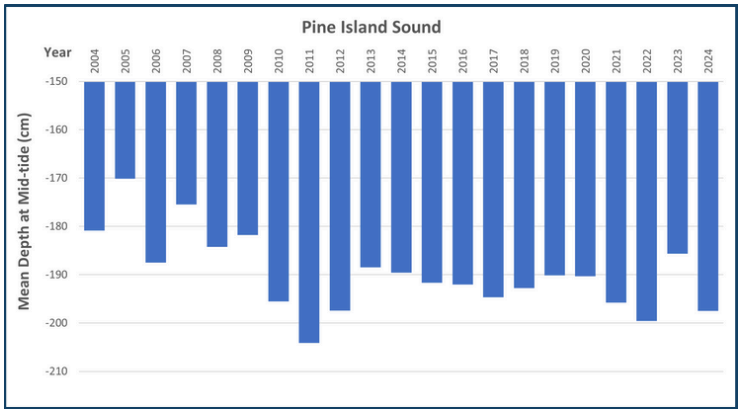
The bar graphs here depict the changes in presence of different species of seagrass found at monitored locations in the region. Since this region is so large, data shared in the graphs below are divided by two seagrass species at different monitoring locations in Pine Island Sound and Matlacha Pass for the years 2004-2024. Other types of seagrass are only found infrequently at these locations; there are not enough data to be graphed here.

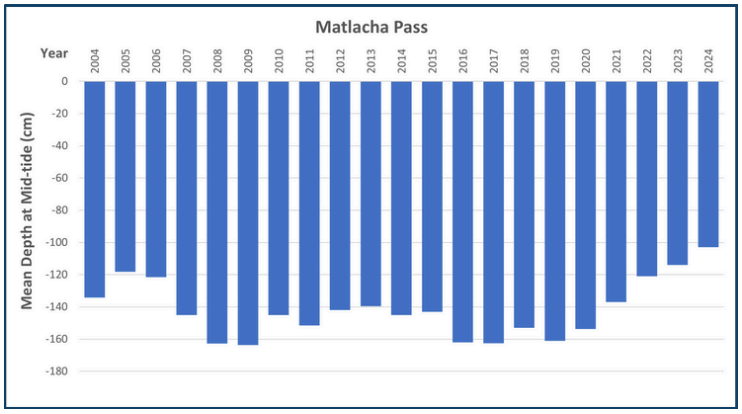
Although both types of seagrass species experienced some declines at multiple monitoring locations starting as far back as 2016, numbers are relatively more stable in Pine Island Sound, which is mostly influenced by seawater from the nearby passes. Matlacha Pass (which receives freshwater flows from the Caloosahatchee River) has experienced more notable declines in seagrass in recent years due to a macroalgae issue (*Caulerpa fastigiata*).











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