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The sun's rays nourish seagrass, which plays host to a variety of marine animals, including tiny prey fish species such as pinfish.

Healthy Seagrass Forms Underwater Meadows That Harbor Diverse Marine Life

Protection of these important habitats is vital for coastal economies

Overview

Seagrass meadows are home to an astounding array of ocean life. Manatees and turtles nourish themselves on the swaying blades. Young fish begin life there, and shrimp and crabs find shelter.

These marine grasslands are among the most important and valuable ecosystems on Earth. They capture the sun's energy to generate food and oxygen for animals; provide habitat for fish and shellfish that feed people and form the backbone of coastal businesses; stabilize sediments; and absorb the power of waves, helping to stave off erosion and protect coastlines from storms. They also soak up climate-changing carbon and polluting runoff.

But these essential underwater grasslands are disappearing around the globe at the rate of two football fields an hour, pushed beyond their limits by a range of chronic and acute threats.¹ Some are battered by storms, floods, droughts, disease, invasive species, and warming waters while others are ripped from the sand by trawls, dredges, propeller blades, and anchors. Still others are stressed by shifting water levels from runoff and other discharges from land, or they wither under the shade of suspended sediment and smothering algae fueled by pollutants flowing from cities and farms, particularly nitrogen-rich fertilizers.

Protecting seagrass is vital to the health of the oceans as well as businesses and coastal economies.

What is seagrass?

Seagrasses, which resemble prairies on land, are mostly found in the clear shallow waters of bays, lagoons, and estuaries, where they can receive the sunlight they depend on. Worldwide, there are more than 70 species of seagrass, with at least one found on every continent except Antarctica.

Seagrasses are flowering plants with blades, roots, and rhizome networks that spread and anchor to the seafloor or sediment, forming dense beds that can extend for miles. They are not seaweed or algae, and although they are similar in many ways to plants found in marshes and wetlands, they differ significantly from those terrestrial plants because they live fully submerged in salty water.

Like corals, seagrasses form structures where animals find homes, food, and nursery areas.² These undersea communities are filled with a variety of species, such as bay scallops, crabs, seahorses, corals and sponges, snappers and groupers, salmon, sharks, dolphins, and birds ranging from pelicans to herons. Some animals eat the grass, and others feast on small organisms that grow on the blades and roots. Still others, such as small schooling fish like pinfish, anchovies, and smelts, hide from predators among the blades.

Healthy seagrasses also sustain activities that boost coastal economies, such as duck hunting, wildlife watching, and fishing for tarpon, stripers, salmon, and crabs.



A snorkeler plucks a scallop, one of many marine species that need seagrass to survive.

Seagrass Statistics

Seagrass is a valuable ecosystem that provides varied services in the water and on land.

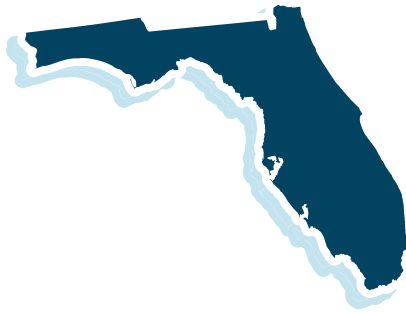
- Humans have used seagrasses for more than 10,000 years to fertilize fields, insulate houses, weave furniture, thatch roofs, make bandages, and fill mattresses and car seats.³
- More than a billion people live within 31 miles of a seagrass meadow.⁴
- Seagrass meadows are believed to be the third-most valuable ecosystem in the world after estuaries and wetlands.⁵ About 2½ acres of seagrass (roughly the size of two football fields) provides habitat, erosion control, and other benefits with an estimated value of nearly \$29,000 a year.⁶
- A single acre of seagrass can support nearly 40,000 fish and 50 million small invertebrates, such as lobsters and shrimp.⁷
- More than 100 times as many animals gain shelter and nourishment in seagrass beds as on adjacent bare sand.⁸
- Seagrasses stabilize sediments and reduce wave action by 20 percent, slowing beach erosion and lessening storm damage to coastlines.⁹
- Seagrass mitigates the effects of climate change by absorbing about 10 percent of the total estimated organic carbon sequestered in the world's oceans each year.¹⁰
- In some places, 1 acre of dense seagrass can sequester more than 1,200 pounds of carbon per year—equivalent to the amount emitted by a car traveling about 6,259 miles, more than twice the distance across the U.S.¹¹
- Global seagrass coverage is diminishing at a rate of 1.5 percent a year, or about two football fields each hour. Estimates suggest that 29 percent of seagrass meadows have died in the past century.¹²



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A school of mullet—an important prey species and valuable catch for commercial fishermen—passes over seagrass.

Seagrass shores up Florida's economy



Along the Florida coastline, seagrass meadows bolster economic activity by nurturing commercially important fish, stone crabs, and shrimp and by drawing tourists from around the world for manatee watching, scalloping, fishing, snorkeling, and paddle sports. The state's seven species of seagrass span more than 2.5 million acres¹³ and give Florida the nation's most diverse seagrasses and two of its largest contiguous seagrass beds: Florida Bay at the southern tip of the state and the Big Bend, between the mouths of the Suwannee and Apalachicola rivers along the Gulf Coast. Florida is also home to the first and only marine plant listed under the Endangered Species Act: Johnson's seagrass.¹⁴

The approximately 400,000-acre habitat along the Nature Coast—which encompasses the shorelines of Citrus, Hernando, and Pasco counties bordering the Gulf of Mexico north of Tampa—is one of the healthiest seagrass habitats in the state.¹⁵ Here, seagrass mingles with mangrove islands, salt marsh, naturally occurring algae, sponges, and corals to provide habitat for recreationally and commercially important marine species that are the lifeblood of the region's economy. The area is home to the "Manatee Capital of the World" and hosts world-class fishing and recreational opportunities that draw hundreds of thousands of tourists, support thousands of jobs, and generate millions of dollars annually.

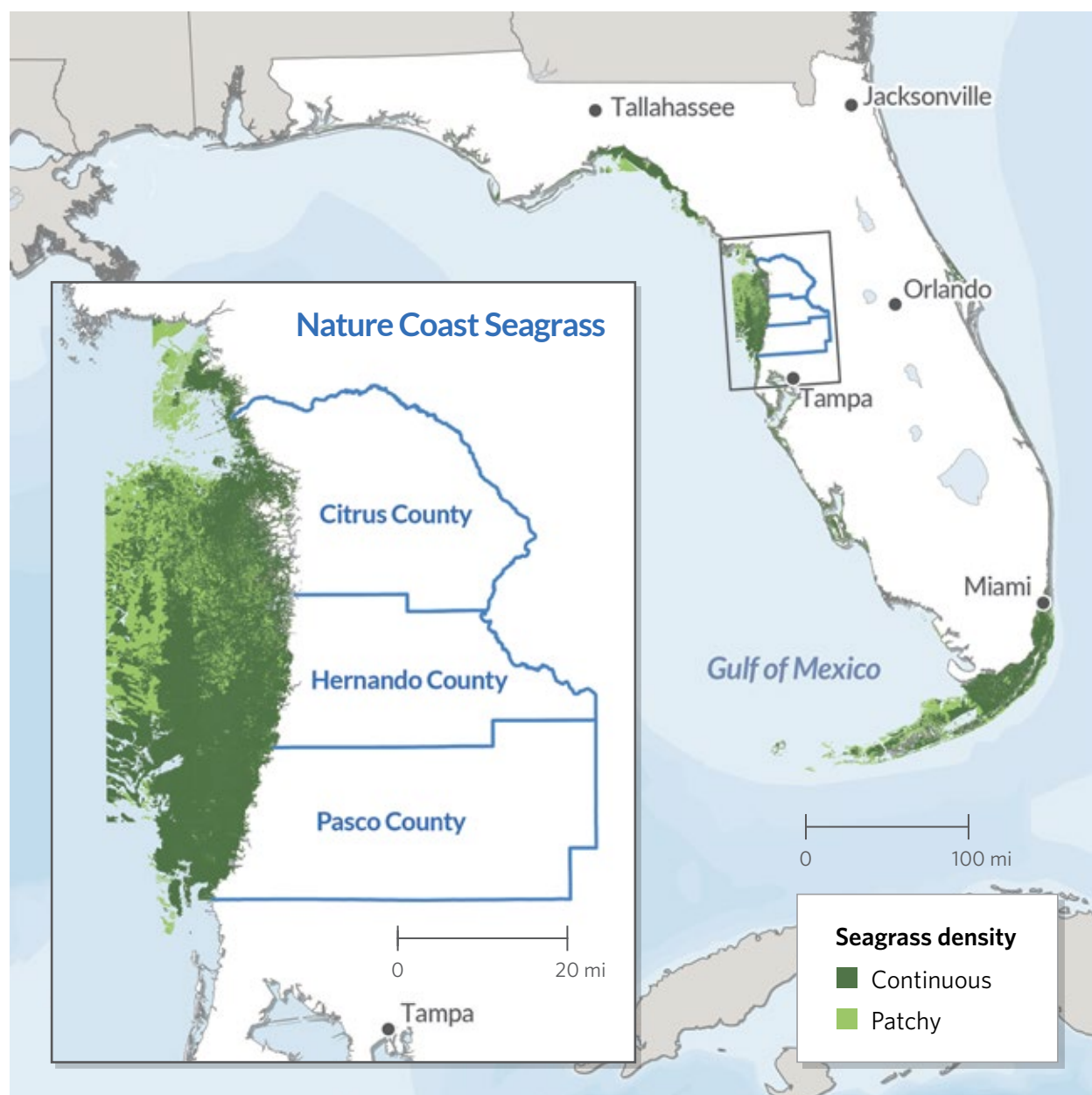


Romona Robbins / Getty Images

Tens of thousands of people, including this young snorkeler, flock to Florida's west coast each year to gather scallops among the seagrass.

Florida Plays Host to Abundant Seagrass

Nature Coast provides ideal habitat for bountiful underwater meadows



Florida boasts more than 2.5 million acres of seagrass, including the largest continuous beds in the country. This map depicts known areas of seagrass, which extend at least 14 miles offshore. Scientists have not yet mapped potential areas farther out. Seagrass is light-loving and generally exists close to land in shallow water, but along Florida's Nature Coast, it is able to grow abundantly in deeper waters farther offshore because the ocean floor slopes gently and the water is clear.

Source: Florida Fish and Wildlife Conservation Commission—Fish and Wildlife Research Institute (2016-2018), <http://geodata.myfwc.com/datasets/seagrass-habitat-in-florida>

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Florida Seagrass Delivers Economic Bounty

- Florida seagrass beds contribute more than \$20 billion a year to the state's economic health by providing habitat for commercially and recreationally important finfish and shellfish, stabilizing the seafloor, and filtering pollution, which keeps the water clear and healthy for marine species and human enjoyment.¹⁶
- Coastal tourism and recreational activities in the Nature Coast counties generate more than \$250 million for the region's economy, provide about 8,000 jobs, and support nearly 500 businesses.¹⁷
- Approximately 70 percent of the species that fishermen target in Florida, including redfish, grouper, and tarpon, spend at least part of their life cycle within seagrass communities.¹⁸
- Commercially fished seagrass-dependent species generate more than \$12 million in average annual revenue in the Nature Coast counties.¹⁹
- Since 2003, Citrus and Hernando counties each reaped nearly \$2 million a year in economic impact from recreational scallop harvesting in seagrass areas, and in Pasco County, seagrass provided essential habitat that helped the diminished scallop population recover sufficiently to support 10-day mini-seasons in 2018 and 2019.²⁰



Capt. William Toney and Delores Belanger, founder of the Nature Coast Lady Anglers fishing club, catch redfish on the Homosassa River in Citrus County.



Carol Grant

Swimming with manatees is one of the most popular recreational activities along the Nature Coast. This and other seagrass-dependent recreational activities drew more than half a million visitors to Citrus County in 2018.



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From seagrass to table: Underwater meadows throughout Florida provide habitat to commercially valuable gag grouper, blue crab, and pink shrimp—popular seafood items for restaurants, including those along the Nature Coast.

Seagrass damage threatens Florida's economy

Florida's seagrasses are threatened by stormwater runoff, failing septic tanks, agricultural nitrogen pollution, coastal development, disease, warming waters, and a host of other problems.

During the 20th century, Florida's seagrass experienced large acreage declines as well as changes in species, density, and size of beds. Recent efforts to improve water quality and clarity have increased seagrasses in a few Florida estuaries, but total seagrass coverage in coastal waters continues to decline along most of the state's shoreline.

Although excellent water quality along the Nature Coast has generally kept the region's seagrass habitats healthy and stable, the lush beds are showing increasing signs of thinning.²¹ Many of the threats to Nature Coast seagrass are shared by meadows in other locations around the state and country, but two issues stand out along the Nature Coast:

- **Physical damage from boats.** Hulls and propellers slice through grasses or rip their roots from the bottom, leaving barren channels known as prop scars. Historical surveys indicate that as much as 40,000 acres of Nature Coast seagrass has experienced some level of prop scarring from careless boaters,²² and heavy localized scarring continues around several nearshore keys and spring-fed river mouths.²³ Once this scarring occurs, tides, storms, and algal growth can quickly deepen and widen the cuts, leading to further loss of seagrass that can last for decades.²⁴
- **Increasing tourist and retirement activity.** As more people visit and move to the area, and as roads, housing, and other developments are built, additional polluted runoff may reach seagrass and block the sunlight these plants need. The total population of all Florida coastal counties is expected to double from 2010 to 2060, magnifying these stressors.²⁵



Seagrass scars along the Nature Coast were probably caused by careless boaters.



FWC Fish and Wildlife Research Institute/Flickr Creative Commons

Drought and storms have killed thousands of acres of Florida Bay seagrass, including this bed in the north-central part of the bay.

Some of the worst damage to the state's seagrass has occurred in the Indian River Lagoon on the east coast and in Florida Bay to the south. Polluted sediments and nitrogen-laden runoff have fueled repeated toxic algae blooms that have received national attention, and water quality has become so poor that sometimes just being close to the water has made people feel sick.²⁶ Under these harsh conditions, seagrass coverage in the lagoon has decreased more than 80 percent during the past decade, a loss of more than 42,000 acres.²⁷

As the lagoon's health has deteriorated, so have the economic benefits of tourism, fishing, and recreational activities, which support local businesses supplying everything from bait to gas. Commercial fisheries in the area have declined precipitously, including a 72 percent reduction in shellfish landings and a 54 percent drop for finfish since 1996.²⁸ Despite a 12 percent increase in the local population during that time, boater registrations, primarily for small inshore and coastal vessels, fell 11 percent, indicating a decrease in overall fishing and recreational boating, which could jeopardize the \$1.2 billion in annual consumer spending generated by these and other water-related activities.²⁹

Florida Bay, the marine gem of the world-famous Everglades National Park, also has experienced significant seagrass die-offs. A prolonged drought and high temperatures in the summer of 2015 damaged more than 40,000 acres of seagrass, followed two years later by Hurricane Irma, which swept through the region, further damaging the seagrasses and delaying recovery of beleaguered meadows.³⁰

Understanding the causes and consequences of seagrass loss is vital, because the most successful conservation efforts have been those that prevent, lessen, or remove threats and allow seagrasses—and the vital coastal economies they support—to recover and thrive.



Biologists from the Florida Department of Environmental Protection conduct water quality testing in coastal seagrass habitat in St. Martins Marsh Aquatic Preserve in Citrus County.

Efforts to protect seagrass in Florida

Using funds from the Deepwater Horizon oil spill legal settlements, Gulf Coast leaders, including state and federal officials, university faculty members, and local citizens, are focusing on seagrass restoration, especially in Panhandle estuaries. In other parts of Florida, networks of federal, state, and county officials, nongovernmental organizations, and local communities are working together to find long-term solutions that can stem further declines of seagrass and set the stage for recovery.

Conclusion

Seagrasses play a vital role in coastal ecosystems and support activities and businesses that power economies. But as chronic and acute threats increase in duration and frequency, these productive and diverse habitats are at growing risk. Given the right environmental conditions, seagrasses can recover from damage resulting from pollution, boat propellers, storms, warming ocean waters, and other stressors. Urgent action on the part of state marine resource managers, elected officials, and others can help protect, conserve, and restore these special habitats.

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