

INSIGHT

OBX

Outer Banks, North Carolina



The estuaries and sounds behind barrier islands are among the most productive ecosystems — providing food, shelter and nurseries for many species.

The Outer Banks is a chain of barrier islands that extends 200 miles along the North Carolina coast. The islands are largely composed of sand and are rarely more than 1 mile wide. Most of the land is low-lying, but the sand dunes of Jockey's Ridge in Nags Head reach a height of 120 feet.

Some of the islands are linked by bridges, while others have ferries that travel between them and to the mainland. The area is home to lighthouses, historic sites and wildlife refuges, among other attractions.

Despite being a risky location for development, the Outer Banks is a popular vacation spot and an important part of North Carolina's tourism industry.

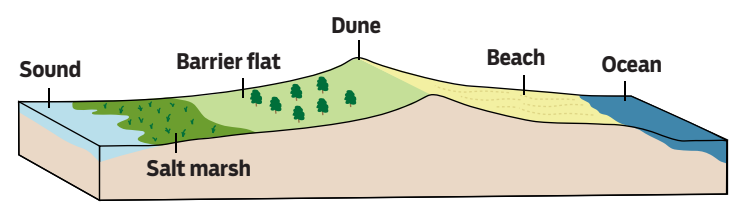


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BARRIER ISLANDS

Barrier islands are long, narrow deposits of sand or sediments that run parallel to the coastline. They are separated from the mainland by a sound, bay or lagoon. Barrier islands will naturally move as sands shift, which creates inlets. This space between the islands provides a pathway for both humans and aquatic life between the sound and the ocean, but they also make the islands more vulnerable. The structure of a typical barrier island consists of the following zones:

- Beach:** consists of sand deposited by waves
 - Dune:** formed from sand carried and deposited by winds
 - Barrier flat:** formed by sediments that get pushed through the dune system by storms. Grasses grow and stabilize these areas.
 - Salt marsh:** a low-lying area on the sound side of a barrier island
- Each zone has a distinct habitat with varying conditions and wildlife.



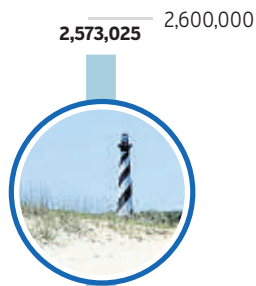
ISLAND DYNAMICS

Barrier islands naturally move in response to their environment. Development on these islands is risky because they are constantly changing.

- Waves, currents, tides, winds:** The ocean continually deposits and removes sediments on barrier islands, while the wind contributes to this movement. The sound side of a barrier island tends to build up as the ocean side erodes.
- Sea level:** Rising seas tend to push barrier islands toward the mainland.
- Storms:** Hurricanes and other storms have the most significant effects on barrier islands by causing overwash and erosion. State Highway 12, which is the only road to Hatteras Island, has repeatedly washed out during storms.



2011, THE ASSOCIATED PRESS
Route 12 on Hatteras Island was cut in five places after Hurricane Irene hit the area.

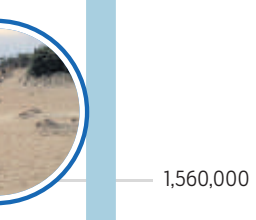


2,573,025 2,600,000

2,340,000

Cape Hatteras National Seashore covers three islands: Bodie, Hatteras and Ocracoke.

2,080,000



1,820,000

1,560,000

Jockey's Ridge in Nags Head is the largest natural living sand dune on the East Coast.

1,491,108

1,300,000

780,000

520,000

260,000

Fort Raleigh and the aquarium are located on Roanoke Island.

WILDLIFE

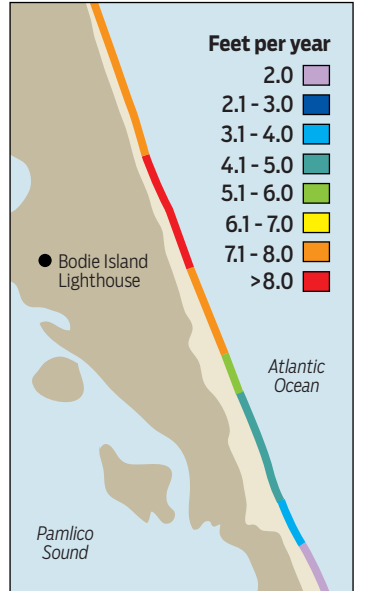
Wild horses are one of the most famous wild animals found at the Outer Banks. They are believed to be descendants of Spanish mustangs that arrived in the 1500s. These horses are most commonly found on the beaches of Corolla and Ocracoke. At least nine species of **dolphins** swim off the North Carolina coast, but the most commonly seen is the bottlenose dolphin. In summer, **jellyfish** are often found

in waters near the islands. The most popular species here is the cannonball jellyfish that has very little venom and no stinging tentacles. Five kinds of **sea turtles** nest on Outer Banks beaches. **Wild boars** are commonly found on barrier islands because they are good swimmers. They have been seen in rural areas of Corolla. Some other wild animals that live on the Outer Banks include minks, beavers, muskrats, brown pelicans, great egrets, wild hares, foxes and deer.



KIRA RIDER/TIMES-DISPATCH
A seawall was built on Hatteras Island to help prevent erosion.

Long-term average annual erosion rate along Bodie Island



Source: North Carolina Department of Environment and Natural Resources, Figures from 2011

EROSION

Beach erosion is a natural process but is accelerated with sea level rise and storms. In an area of Hatteras Island, the beach has receded about 2,500 feet over the past 150 years. In the spring of 2017, a sandbar, known as Shelly Island, appeared off Cape Hatteras National Seashore. That fall, a series of hurricanes increased erosion and redistributed the sand. By February 2018, the island had disappeared. Structures such as seawalls, jetties and groins are built to help protect the shoreline. Beach nourishment — the process of pumping sand onto an eroding beach — is usually considered a desirable alternative. Last month, the town of Nags Head, which suffered sand loss from Hurricane Matthew in 2016, began a \$42 million beach nourishment project of dredging sand from the sea floor. The project is expected to last 90-120 days.

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