



Freshwater vs. Saltwater wetlands

In North Carolina



THE BASICS

Have you ever visited the ocean and tasted salt while you were swimming?

That's because the ocean has saltwater. Some of that saltwater is in wetlands along the coast. Those are called saltwater wetlands. Lakes or ponds that you might have visited are not salty. We call that freshwater. Most of the wetlands in North Carolina have freshwater. Not many plants are tough enough to live in saltwater. Saltwater wetlands often have tall grasses and not much else.



Saltmarsh, *Fort Macon State Park*

WANT TO KNOW MORE?

North Carolina is one of 23 states that has both saltwater and freshwater wetlands.

Saltwater wetlands are found along the coast, and freshwater wetlands are found further inland where saltwater, from tides and coastal flooding, can't reach them. Can you guess the biggest difference between the two? If you said "salt" then you're right! Saltwater wetlands, or saltmarshes, have a high salt content, which makes them a great habitat for many kinds of tall grasses that you find near the coast. Few trees or large shrubs can handle the high salinity, or salt content. The salt prevents those plants from absorbing the water they need. However, you can find trees and shrubs in brackish wetlands. Brackish wetlands are places where there is a mix of freshwater and saltwater. Only certain kinds of plants live in brackish wetlands.



Freshwater pond, *Roanoke Island Marsh Game Land*



LET'S GET TECHNICAL

Wetlands along the coast are saltwater wetlands called “saltmarshes.”

Daily tidewaters flood into our coastal wetlands, bringing nutrients and keeping the *salinity* stable. The large amount of vegetation in saltmarshes (mostly aquatic salt-tolerant plants like cordgrass and black needle rush) helps prevent shoreline erosion and filters toxins from storm water when floods occur. For a wetland to be considered a saltmarsh, it must be tidally influenced by seawater, which average salinity levels of 35 parts per thousand (ppt). Scientists take this measurement using a *conductivity meter*. A little salt makes a big difference! Saltwater wetlands have high conductivity, and the plants and animals who live there have special adaptations that allow them to get rid of extra salt so they can live in saltwater.

Freshwater wetlands have very low salinity.

High concentrations of salt can be toxic to freshwater plants. It reduces the osmotic ability of plant roots so they cannot absorb water. The plants may also absorb salt, and if they absorb too much, the salt causes a chemical imbalance in the plants. In either of these cases, salt can stunt growth or cause the plants to die. Freshwater animals, like fish, are unable to live in waters with high salt concentrations for similar reasons. The salinity of the water causes them to dehydrate and die. Freshwater wetlands typically have a salinity measure of less than 0.5 ppt, but sometimes nearby land uses increase the salinity, which is destructive to plants. Remember, a little salt makes a big difference.

Brackish wetlands are places where saltwater and freshwater mix.

Brackish marshes typically have an inflow of freshwater from higher in the watershed that mixes with some saltwater being pushed in by tides or storms. The salinity measure in brackish marshes can range all the way from 0.5 ppt to 35 ppt (salinity of ocean water). Brackish marsh vegetation is more diverse than saltwater vegetation, since both freshwater and saltwater species can grow there. Common brackish marsh plants include arrow arum, soft rush, cattail, and sawgrass.

Salinity and habitat changes

In several places along the North Carolina coast, large areas of dead pine trees are visible in wetlands. This large scale die-off has occurred because those wetlands have become saltier with the encroachment of seawater, increasing the amount and residency of saltwater in these coastal wetlands. These wetlands were fresh to brackish pine and shrub wetlands, but are now converting to salt-tolerant marshes because of saltwater intrusion.



Effects of saltwater intrusion, *Alligator River National Wildlife Refuge*

SUPPLEMENTAL LINKS

Glossary: <http://www.ncwetlands.org/wp-content/uploads/NCWetlands-Glossary-of-wetland-terms.pdf>

Curriculum: 1.E.2, 1.L.1, 3.L.2, 3.E.2, 4.L.1, 5.L.2, 6.L.2, EEn2.2, EEn2.4

CITATION

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