

# North Carolina National Estuarine Research Reserve

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## Marsh on the Fringe

Along the edge of the North Carolina coast, where the tidal marine waters meet the land, you can find vast and lush estuarine marshes of smooth cordgrass. This tall, grass-like plant is called *Spartina alterniflora* by scientists and it is the dominant plant in many of our coastal marshes.

To some, these fringing salt marshes may seem like mucky, smelly, mosquito-infested swamps with little use or value. In fact, *Spartina* marshes are one of the most important coastal habitats, providing many benefits to people. These benefits, or ecosystem services, include storm protection, erosion control and nutrient cycling. Salt marshes also support a complex and fascinating diversity of plant and animal life.

### Erosion Control

Fringing salt marshes provide a physical barrier between the water and adjacent land. Every day, water moves along the shore as currents or waves. Along bare shorelines, this movement can result in erosion of the land. For homeowners,

this may lead to significant loss of property or even threaten homes. Marsh grasses, including *Spartina*, offer an effective and natural solution. These grasses absorb and break up the energy of the water along the shore, which decreases erosion. Additionally, the roots and stems of marsh grasses can trap sediment providing a more stable, and even growing, shoreline. So, fringing marshes provide two benefits. They help prevent erosion and promote the buildup of new shoreline.

### Storm Protection

The day-to-day benefits of shoreline stabilization provided by marshes is enhanced during storm events. Marsh sediments and vegetation serve as shock absorbers when strong waves and wind lash against the shoreline, providing a buffer for homes and property. Even land that is relatively stable during normal weather conditions is at greater risk of being washed away during storm surges. Marsh vegetation plays a vital role in anchoring shoreline sediments during tropical storms, hurricanes and nor'easters.



The North Carolina National Estuarine Research Reserve is a cooperative program between the North Carolina Department of Environment and Natural Resources, Division of Coastal Management and the National Oceanic and Atmospheric Administration.

## Nutrient Cycling & Water Quality

In addition to trapping sediment, fringing marshes trap nutrients. Nutrients are carried into the estuary in water flowing from upland rivers and from water that flows across adjacent land. Marsh grasses and other plants in the estuarine community rely on this nutrient input to fuel their growth. By absorbing nutrients in estuarine waters, fringing marshes reduce nutrient loads naturally and contribute to a balanced ecosystem. When marsh grasses are sparse or absent, nutrients build up and a common result are harmful “blooms” of algae. Like *Spartina*, algae are a natural part of the ecosystem and provide food for aquatic organisms. However, if too much algae grows it can cause serious problems. Algal blooms can choke out other plants and animals, and may lead to oxygen depletion in coastal waters, often resulting in fish kills. Similarly, harmful bacterial blooms, potentially causing illness in aquatic animals and humans, may result when nutrients are overabundant.

## Biodiversity

As marsh grass grows, dies back and decomposes throughout the year, it provides the basis for a complex and dynamic food web. In some cases, this includes our own dinner tables. The small, sometimes microscopic, creatures that feed on the marsh plants are, in turn, food for larger animals that also rely on marsh habitats. These larger animals include the blue crabs and shrimp. Many juvenile fishes use the marsh as a nursery area, feeding ground and refuge from predators. The abundance of smaller fishes draws in larger predators such as striped bass, red drum, flounder, bluefish and speckled seatrout.

Many other animals depend on fringing marsh for habitat and food. After juvenile fish grow in the estuary, many move into offshore waters. There they become part of an even larger ocean ecosystem. Countless bird species – great egrets, black skimmers, American oystercatchers, and snowy egrets to name but a few – can be found fishing for dinner, raising their young or posing for photographers amongst the marsh grasses.



There are nearly 200,000 acres of salt marsh along the North Carolina coast. While it may be difficult to imagine that those muddy expanses of marsh grass are serving much of a purpose, there are many services and benefits that these fringing marshes provide every day.

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