

# The Salt Marsh

## The Tides

The gravitational pull of the sun and the moon cause the earth's water to bulge toward them; this response results in Earth's tides. Depending on your location the height of these tides varies considerably. Beaufort County sits at the most western position on the Georgia Bight. This combined with its mid-latitude locations gives it one of the largest tidal ranges on the Atlantic coast. Beaufort County has an average tidal range of around 7 feet. During spring tides this can exceed 9 feet. Twice a day low lying areas are flooded and drained of salt water. South Carolina has more salt marsh than any other state, around 500,000 acres.

## The Keystone Plant of the Salt Marsh

The dominate plant of the salt marsh is *Spartina alterniflora*, or **Smooth Cordgrass**. Cordgrass is a remarkable plant that can tolerate salinity of up to 35 parts per thousand, which is the usual salinity of seawater. While salinity varies depending on input from fresh water rivers and streams the salinity around Pinckney Island is fairly high and most of the dilution of the seawater comes from runoff from the high lands, groundwater and rainfall. While the types of plants and animals that can tolerate this daily influx is limited, the abundant sunshine and rich soil makes the salt marsh one of the most productive places on earth. *Spartina* has thick tough stalks and an extensive root system that keeps it well anchored. The plant itself slows down the water that travels by and thus encourages the dropping of the sediment that the water is carrying. This helps build up the substrate, which is referred to as pluff mud. *Spartina* grows well in the low marsh and is usually most lush near the many small creeks that crisscross the marshes. In the high marsh *Spartina* rarely reaches more than 18 inches.

While Cordgrass is the producer of a far reaching food chain, few animals can eat it directly. Insects may feed on it flowers, no herbivores are seen grazing in the pluff mud. It is not until *Spartina* dies off in late autumn and begins to decay does it enter in the food chain. Tides float the pieces of the dead Cordgrass out to sea. Often these are clumped together in large wracks and deposited on top of the marsh. Spring tides float and transport them seaward. Wherever they land and even before decomposers begin their work, by this time Cordgrass is mainly cellulose, a material not digestible by most animals. Bacteria, fungi, and other microorganisms decompose the plants and the nutrients from the Cordgrass enter the food chain. These decomposers are themselves consumed by other organisms.

## Other Plants Along the Salt Marsh

As you leave the low marsh, you come to a transitional zone between the marsh and surrounding high land. These areas have much less time underwater and many be flood only an hour or two per day to only an hour or two per month, depending on their elevation. A greater variety of plants can grow under these conditions. Some of the plants seen in the high marsh at Pinckney Island include;

- Glasswort, *Salicornia sp*; [www.inaturalist.org/taxa/78930-Salicornis-depressa](http://www.inaturalist.org/taxa/78930-Salicornis-depressa)
- Sea Lavender, *Linonium spp*; [www.wildflower.org/plants/result.php?id\\_plant=LICA17](http://www.wildflower.org/plants/result.php?id_plant=LICA17)
- Sea Oxeye, *Borrchia frutescens*; <https://plants.usda.gov/core/profile?symbol=Bofr>

- Marsh Elder, *Iva frutescens* [http://plants.usda.gov/factsheet/pdf/fs\\_ivfr.pdf](http://plants.usda.gov/factsheet/pdf/fs_ivfr.pdf)
- Salt Grass, *Distichlis spicata*, [http://plants.usda.gov/factsheet/pdf/fs\\_disp.pdf](http://plants.usda.gov/factsheet/pdf/fs_disp.pdf)
- Yaupon Holly, *Ilex vomitoria* [http://plant.usda.gov/factsheet/pdf/fs\\_ilvo.pdf](http://plant.usda.gov/factsheet/pdf/fs_ilvo.pdf)
- Groundsel Tree, *Baccharis halimifolia* [http://plants.usda.gov/factsheet/pdf/fs\\_ivfr.pdf](http://plants.usda.gov/factsheet/pdf/fs_ivfr.pdf)
- Black Needle Rush, *Juncus roemenanus* [https://plants.usda.gov/plantguide/pdf/pg\\_juro.pdf](https://plants.usda.gov/plantguide/pdf/pg_juro.pdf)

to name a few!

A wonderful discussion of plants along the salt marsh and its upper regions was written for Clemson Extension and can be found at

[http://www.clemson.edu/extension/hgic/water/resources\\_stormwater/life\\_along\\_the\\_salt\\_marsh\\_protecting\\_tidal\\_creeks\\_with\\_vegetative\\_buffers.html](http://www.clemson.edu/extension/hgic/water/resources_stormwater/life_along_the_salt_marsh_protecting_tidal_creeks_with_vegetative_buffers.html)

### **Animals Found Within the Salt Marsh**

Life in the salt marsh takes advantage of the rhythm of the tides. While the marsh is often visited for food and shelter, not many animals call it a full time home. Notable exceptions are a variety of invertebrates; small crabs, including species of fiddler crabs, *Uca* spp, have burrows in the marsh and come out to feed and find mates when the tide is out. Several species of Mollusca remain throughout the tidal changes;

#### **Gastropods**

Marsh periwinkle, *Littorina littorea*; <http://www.dnr.sc.gov/cwcs/pdf/MarshPeriwinkle.pdf>

- Mud snails, *Nassarius vibex* .
- Coffee Bean Snail *Melampus bidentatus*

#### **Bivalves**

- Ribbed Mussel, *Geukensia demissa*, which lives much higher in the marsh than other species,
- Oysters, *Crassostrea virginica*, which are found lower in marsh and
- Clams species such as *Mercenaria mercenaria*, who prefer a sandy bottom.

Worms of a number of varieties live in mud and oyster reefs within the salt marsh. Several species of birds live full time in the salt marsh. The loud calls of the clapper rail, *Rallus crepitans* and the sweet songs of the marsh wren, *Cistothorus palustris* are often heard. Those spending time in our many creeks can often view these birds.

### **Visitors to the Salt Marsh**

During low tide birds and mammals visit salt marsh to forage for food. At higher tides others come hoping to catch a meal in the creeks.

- Raccoons, (*Procyon lotor*) <http://www.dnr.sc.gov/wildlife/species/raccoon.html>
- Mink, *Mustela vison* (<http://www.dnr.sc.gov/wildlife/species/mink.html>)
- and Otters (*Lutra Canadensis*) <http://www.dnr.sc.gov/wildlife/species/riverotter.html>

are frequently seen. Many bird species visit the exposed banks and flat to look for food. The low water gives wading birds the chance to catch a dinner. As the creeks and marsh fill with water, many animals move in to take advantage of food and shelter the marsh provides. Important commercial invertebrate species such as the

- Atlantic Blue Crab, *Callinectes sapidus*, <https://www.bluecrab.info/lifecycle.html> and <http://www.dnr.sc.gov/marine/pub/seascience/bluecrab.htm>, our two main shrimp species
- Our two main shrimp species, Atlantic White Shrimp, *Litopenaeus setiferus* <https://www.nwf.org/Wildlife/Wildlife-Library/Invertebrates/Atlantic-White-Shrimp.aspx>
- and Brown Shrimp, *Farfantepenaeus aztecus* , <http://www.dnr.sc.gov/marine/pub/seascience/shrimp.html>

spend large portions of their life cycles in the salt marsh and surround estuaries.

### **Benefits of the Salt Marsh**

Quoting directly from the Marine Resources Division of SCDNR's publication;  
<http://www.dnr.sc.gov/marine/pub/seascience/dynamic.html>

“Before the complex salt marsh food web and its value to marine life became known, over half the original salt marshes in the United States vanished due to filling to create land for homes, industry and agriculture. Ditching for mosquito control and diking to create waterfowl impoundments also destroyed marshes. Eventually, people realized the importance of these habitats, and now federal and state laws protect salt marshes from any type of alteration.”

- Salt marshes serve as a buffer that protect the mainland from wind and wave action.
- Salt marshes help to filter pollutants and silt from coastal waters.
- Three quarters of the animals harvested as seafood in South Carolina, even off shore species spend part of their lives in the salt marsh.
- Harvesting of commercial species contributes millions of dollars to South Carolina's economy.
- Eco-tourism centers around the health of the salt marsh ecosystem.

Threats to the salt marsh and estuaries still exist, especially as the population along the coast skyrockets. Every development, no matter how benign, increases the pressures on the estuary systems.