

E-2: Charlotte Council Education Award

Submitted by: Harbor Island Garden Club

Brief summary and objectives:

Harbor Island Garden Club, in conjunction with the Wrightsville Beach Elementary School 5th Grade Rooty Rascals Junior Gardeners Club, worked with the marine and environmental science teacher Cissie Brooks to create four environmental learning / story boards. The story boards teach all ages including school children, teachers and the Wrightsville Beach community about their estuarine environment from plant life, marine animals, birds and tidal zones. The school is lucky enough to be located on Keenan's Creek, a beautiful estuary, where students have access to the creek via dock or by kayak. These signs represent everything they study so they can visually see everything in the estuarine community and can learn to identify the plants, birds and marine life. Once the information was compiled, a graphic design firm printed the information on the stainless story boards. The material should last for many years to come to aid in teaching kids about their coastal environment and how to protect it.



Involvement of club members and other organizations:

Due to Covid-19, many programs that were planned for the school year were canceled. The HIGC Rooty Rascal leaders, along with the Wrightsville Beach marine and environmental science teacher, decided to use the remaining funds to create these story boards that could be enjoyed and utilized as learning tools for years to come.

Project expenses and means of funding:

The funding for these boards came from the Harbor Island Garden Club budget of money designated for the Rooty Rascals Junior Gardeners Club.

Continuing involvement, follow-up, maintenance:

It is hoped that the story boards will not need maintenance for many years and will be utilized daily by school kids as an environmental education tool. We hope to do a few additional story boards on the school grounds in the future!

Attach or insert photos, digital photos:

See the following pages for additional photos of the story boards.

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Salt Marsh Plants

Many different types of plants grow in salt marshes. They require varying water levels, oxygen content, and salinity. These requirements determine where plants grow - the lower, middle, or upper marsh. Salt marsh plants are adapted to tolerate salt water. Some of these adaptations are:

- Salt water exclusion, which reduces salt intake through the roots
- Salt-secreting glands that remove salt from the leaves
- Fleshy leaves that collect the salt, which are then shed by the plant
- Succulent leaves that store fresh water and dilute the saltwater concentration
- Waxy coverings that protect the leaves against sea salt and salt spray
- Small leaves to reduce leaf surface, thereby minimizing exposure to salt

Each plant species requires varying water levels, oxygen content, and salinity. These requirements determine where plants grow - the Supratidal, Upper Intertidal, and Lower Intertidal.

Upper Intertidal Zone Plants

This area is inundated with salt water during short periods of each high tide. Plants are submerged less than 50 percent of the time.

- Sea-bite (*Suaeda linearis*)
- Glasswort (*Salicornia virginica*)
- Sea Lavender (*Limnium carolinianum*)
- Marsh Five (*Sabatia stellaris*)
- Marsh Aster (*Aster tenuifolius*)
- Black Needlerush (*Juncus roemerianus*)
- Sea Oat (*Barringtonia floridana*)

Supratidal Zone Plants

This area is above the average high tide mark. Only unusually high tides and storms reach this area, although plants are exposed to salt spray.

- Wax Myrtle (*Myrica asarifera*)
- Groundnut bush (*Baccharis halimifolia*)
- Yaupon (*Ilex vomitoria*)
- Bamboo vine, Greenbriar (*Smitelia laurifolia*)
- Seaback Orchid (*Ampelisca patula*)
- Marsh Elder (*Iva rubescens*)
- Smooth Goldenrod (*Solidago sempervirens*)
- Seashore mallard, Marsh Mallow (*Kosteletzkya virginica*)
- Cattail, greenbriar (*Smitelia bonariensis*)
- Salt Meadow Hay (*Spartina patens*)

Lower Intertidal Plants

This is a lower elevation zone where plants are submerged more than 50 percent of the time.

- Salt Marsh Cordgrass (*Spartina alterniflora*)

Donated by the Harbor Island Garden Club
With special thanks and gratitude to marine ecologist, Charles Boyer.

The Salt Marsh

The salt marsh is a dynamic, constantly changing ecosystem. This salt marsh has two high tides and two low tides each day, each lasting about six hours, and with an average tidal range of about three feet. At high tide, the surface of the salt marsh is under water, and at low tide, there are vast areas that are dry.

Salt marshes act as a buffer zone.
Salt marshes stabilize shorelines and protect coastal areas from floods, storm surges, and hurricanes. When flooding does occur, the salt marsh acts like a huge sponge, soaking up the excess water.

Salt Marshes act like an enormous filter.
Marsh grasses and peat (a spongy matrix of live roots, decomposing organic material, and soil) filter pollutants such as herbicides, pesticides, and heavy metals out of the water.

Salt marshes combat climate change.
Deep in the waterlogged peat of salt marshes, carbon is stored at much greater rates than in land ecosystems, serving as an offset to climate change due to carbon dioxide (CO₂) build up in the atmosphere.

Salt Marshes provide food.
Salt marshes provide great volumes of food that attract many animal species. Dead plant leaves and stems break down in the water to form small particles of organic material called "detritus." This enriched material is at the base of many food chains, as it feeds plankton, aquatic insects, shellfish and small fish that are food for larger predatory fish, reptiles, amphibians, birds and mammals.


Salt marshes serve as nursery habitats and shelter.
Salt marshes provide essential refuge and nursery habitat for more than 75 percent of fisheries species, including shrimp, blue crab, and many finfish. Many resident birds feed, and some nest, in the marsh. Migrating birds rest and feed here between their nesting and wintering habitat.

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Birds in the Salt Marsh

The number of birds that frequent the salt marsh is extensive, including birds of prey, songbirds, seabirds and shorebirds, Wading Birds, and Waterfowl.

Scaup Sparrow (<i>Ammodramus maritimus</i>)  <p>The Scaup Sparrow is a small bird with a brown back and a white breast. It is found in the salt marsh and is a common sight.</p>	Willet (<i>Catoptrophorus semipalmatus</i>)  <p>The Willet is a large wading bird with a long neck and a long bill. It is found in the salt marsh and is a common sight.</p>	Black Skimmer (<i>Ptychocheilus nigres</i>)  <p>The Black Skimmer is a large wading bird with a long, dark bill and a white breast. It is found in the salt marsh and is a common sight.</p>	Herring Gull (<i>Larus argentatus</i>)  <p>The Herring Gull is a large gull with a white head and neck and a dark body. It is found in the salt marsh and is a common sight.</p>
Marsh Wren (<i>Catoptrophus palustris</i>)  <p>The Marsh Wren is a small bird with a brown back and a white breast. It is found in the salt marsh and is a common sight.</p>	Whimbrel (<i>Numenius phaeopus</i>)  <p>The Whimbrel is a large wading bird with a long neck and a long bill. It is found in the salt marsh and is a common sight.</p>	Great Blue Heron (<i>Ardea herodias</i>)  <p>The Great Blue Heron is a large wading bird with a long neck and a long bill. It is found in the salt marsh and is a common sight.</p>	Laughing Gull (<i>Larus atrifrons</i>)  <p>The Laughing Gull is a large gull with a white head and neck and a dark body. It is found in the salt marsh and is a common sight.</p>
Red-winged Blackbird (<i>Icthyophaga phoeniceus</i>)  <p>The Red-winged Blackbird is a small bird with a black body and a red patch on its wing. It is found in the salt marsh and is a common sight.</p>	Dowitcher (<i>Catidix alpeus</i>)  <p>The Dowitcher is a large wading bird with a long neck and a long bill. It is found in the salt marsh and is a common sight.</p>	Traill's Heron (<i>Egretta tricolor</i>)  <p>The Traill's Heron is a large wading bird with a long neck and a long bill. It is found in the salt marsh and is a common sight.</p>	Ogreon (<i>Pendula haliaeetus</i>)  <p>The Ogreon is a large wading bird with a long neck and a long bill. It is found in the salt marsh and is a common sight.</p>
Boat-tailed Grackle (<i>Quiscalus major</i>)  <p>The Boat-tailed Grackle is a small bird with a black body and a white patch on its tail. It is found in the salt marsh and is a common sight.</p>	Short-billed Dowitcher (<i>Limnodromus griseus</i>)  <p>The Short-billed Dowitcher is a large wading bird with a long neck and a long bill. It is found in the salt marsh and is a common sight.</p>	Great Egret (<i>Ardea alba</i>)  <p>The Great Egret is a large wading bird with a long neck and a long bill. It is found in the salt marsh and is a common sight.</p>	Hooded Merganser (<i>Lophodytes cucullatus</i>)  <p>The Hooded Merganser is a large wading bird with a long neck and a long bill. It is found in the salt marsh and is a common sight.</p>
Salt Marsh Kingbird (<i>Megascops alpeus</i>)  <p>The Salt Marsh Kingbird is a small bird with a brown back and a white breast. It is found in the salt marsh and is a common sight.</p>	Greater Yellowlegs (<i>Tringa melanoleuca</i>)  <p>The Greater Yellowlegs is a large wading bird with a long neck and a long bill. It is found in the salt marsh and is a common sight.</p>	White Ibis (<i>Eudicercus albus</i>)  <p>The White Ibis is a large wading bird with a long neck and a long bill. It is found in the salt marsh and is a common sight.</p>	Bullhead (<i>Ictalurus nebulosus</i>)  <p>The Bullhead is a large wading bird with a long neck and a long bill. It is found in the salt marsh and is a common sight.</p>
Ring-billed Gull (<i>Larus delawarensis</i>)  <p>The Ring-billed Gull is a large gull with a white head and neck and a dark body. It is found in the salt marsh and is a common sight.</p>	<p>Donated by the Harbor Island Garden Club With special thanks and gratitude to Harbor Island's neighbor, The City of Norfolk.</p>		

Salt Marsh Animals

The salt marsh is a rich and diverse ecosystem, home to a wide variety of animals. From small invertebrates to large vertebrates, the salt marsh is a vital habitat for many species.

Blue Crab (<i>Callinectes sapidus</i>)  <p>The Blue Crab is a large crab with a blue and white mottled pattern. It is found in the salt marsh and is a common sight.</p>	Oyster (<i>Crassostrea virginica</i>)  <p>The Oyster is a large shellfish with a dark, rough shell. It is found in the salt marsh and is a common sight.</p>	Tulip Snail (<i>Fasciolaria limus hankaria</i>)  <p>The Tulip Snail is a small snail with a white and yellow shell. It is found in the salt marsh and is a common sight.</p>
Fiddler Crab (<i>Uca pugnax</i>)  <p>The Fiddler Crab is a small crab with a white and black mottled pattern. It is found in the salt marsh and is a common sight.</p>	Quahog Clam (<i>Mercenaria mercenaria</i>)  <p>The Quahog Clam is a large clam with a white and black mottled pattern. It is found in the salt marsh and is a common sight.</p>	Mummichog (<i>Fundulus heteroclitus</i>)  <p>The Mummichog is a small fish with a white and black mottled pattern. It is found in the salt marsh and is a common sight.</p>
Hermit Crab (several species)  <p>The Hermit Crab is a small crab that lives in the shells of other animals. It is found in the salt marsh and is a common sight.</p>	Mussels (<i>Modiolus demissus</i>)  <p>The Mussel is a small shellfish with a dark, rough shell. It is found in the salt marsh and is a common sight.</p>	Grass Shrimp (<i>Palaemonetes pugio</i>)  <p>The Grass Shrimp is a small shrimp with a white and black mottled pattern. It is found in the salt marsh and is a common sight.</p>
Marsh Crab (<i>Sesarma reticulatum</i>)  <p>The Marsh Crab is a small crab with a white and black mottled pattern. It is found in the salt marsh and is a common sight.</p>	Marsh Periwinkle (<i>Littorina irrorata</i>)  <p>The Marsh Periwinkle is a small snail with a white and black mottled pattern. It is found in the salt marsh and is a common sight.</p>	Shrimp  <p>The Shrimp is a small crustacean with a white and black mottled pattern. It is found in the salt marsh and is a common sight.</p>
Mud Snail (<i>Ilyanassa obsoleta</i>)  <p>The Mud Snail is a small snail with a white and black mottled pattern. It is found in the salt marsh and is a common sight.</p>	Diamondback Terrapin (<i>Malaclemys terrapin</i>)  <p>The Diamondback Terrapin is a large turtle with a diamond-shaped pattern on its shell. It is found in the salt marsh and is a common sight.</p>	