



## Coastal Encounters Field Activities Fall/Spring 2011-12

### Coastal Birding

Our Coastal Birding program utilizes the Mason Inlet Waterbird Management area on Wrightsville Beach. This 300 acre sanctuary is a year-round protected habitat for colonial waterbirds and shorebirds to use for nesting during the breeding season. Through the use of handheld binoculars, students will identify and observe many of the bird species found on the inlet such as American Oystercatcher, Least Tern, Black Skimmers and Wilson's Plover. Common discussion topics for this field activity may include nesting and foraging behavior, challenges facing these species through habitat loss, coastal bird adaptations, predator / prey relationships or ways we can save and protect our coastal bird habitats.

#### Approximate Time: 1 - 1 ½ hours

*Ocean Literacy- 5d, 5h, 5i, 6d, 6e, 6f*

*North Carolina- 4<sup>th</sup> 1.01, 1.02, 1.03, 1.04; 5<sup>th</sup> 1.01, 1.02, 1.05, 1.06; 6<sup>th</sup> 7.01; 8<sup>th</sup> 3.03, 3.04*

*National Science- K-4 A Understandings about Scientific Inquiry, C Characteristics of Organisms, Life Cycles of Organisms, Organisms and Their Environments; 5-8 A Understandings about Scientific Inquiry, C Regulation and Behavior, Populations and Ecosystems; 9-12 A Understandings about Scientific Inquiry, C Interdependence of Organisms, Behavior of Organisms*

### Shoreline Management

The shorelines of a barrier island are continuously being influenced by development, storms, tidal currents and more. Over the century some North Carolina inlets have migrated as much as 460 meters changing in direction and size. During this field activity students will discuss the major threats to our coastal shores and identify ways that environmental engineers are protecting them. Through the use of aerial photographs and hands-on demonstrations, students will make conclusions on what management practices are most effective and cause the least environmental impact. Common discussion topics may include erosion impacts, permanent versus temporary shoreline structures, beach renourishment practices and the impacts of shorelines due to development.

#### Approximate Time: 1 - 1 ½ hours

*Ocean Literacy- 2b, 2c, 2d, 2e, 6a, 6d, 6e, 6f, 6g, 7c, 7d, 7f*

*North Carolina- 5<sup>th</sup> 1.01, 1.04, 1.06, 2.03, 2.05, 2.06, 2.07; 6<sup>th</sup> 1.05, 1.08, 3.06, 7.03, 7.05; 7<sup>th</sup> 1.05, 1.08; 8<sup>th</sup> 1.05, 1.08, 3.07, 5.05*

*National Science- K-4 A Understandings about Scientific Inquiry, F Characteristics and Changes in Populations, Changes in Environments, Science and Technology in Local Challenges; 5-8 A Understandings about Scientific Inquiry, F Populations, Resources and Environments, Natural Hazards; 9-12 A Understandings about Scientific Inquiry, F Population Growth, Environmental Quality*



## Physical Oceanography

Wind and waves are natural working forces that shape and renourish our beaches. However when weather conditions decline, these forces combine to create devastating effects. Understanding the relationship between wind and waves and studying how waves are formed can improve our understanding of coastal engineering and management. Through the use of hand-held devices and boogie boards, students will get up close and personal with ocean waves learning about their characteristics, speed and force. Common discussion topics may include the anatomy of a wave, physical forces and structures that cause wave formation, calculating wave length and height, progressive orbital waves and the differences between winter and summertime waves.

**Approximate time: 1 - 1 ½ hours**

**Optional Activity:** Groups may elect to wade in the water instead of using boogie boards.

*Ocean Literacy- 1c, 3a, 5h, 6c, 7b, 7d, 7e, 7f*

*North Carolina- 5<sup>th</sup> 2.02, 3.02; 8<sup>th</sup> 3.04*

*National Science- K-4 A Understandings about Scientific Inquiry, D Changes in the Earth and Sky; 5-8 A Understandings about Scientific Inquiry, B Motion and Forces; 9-12 A Understandings about Scientific Inquiry, D Energy in the Earth System*

## Marsh Exploration

Salt marshes and coastal wetlands are the nursery grounds for many marine species. However these environments prove to be very dynamic and are often influenced by rain, wind, and pollution. Through the use of seine nets and other field sampling tools, students will get a “hands-on feet-wet” experience in the North Carolina salt marsh while discovering the unique diversity this habitat supports. Common discussion topics may include salt marsh zones, plant and animal adaptations, animal characteristics, and marsh conservation. During this field activity there will be an emphasis on the unique adaptations needed for survivorship for the *Spartina alterniflora* and *Littorina irrorata*.

**Approximate time: 1 - 2 hours**

*Ocean Literacy- 1f, 1g, 5d, 5f, 5h, 6d, 6e, 7b*

*North Carolina- 3<sup>rd</sup> 1.01, 1.02, 2.01; 4<sup>th</sup> 1.01, 1.02, 1.03, 1.04; 5<sup>th</sup> 1.01, 1.02, 1.03, 1.05, 1.06; 6<sup>th</sup> 3.06, 7.01, 7.02, 7.03; 8<sup>th</sup> 3.03, 3.04, 3.07*

*National Science- K-4 A Understandings about Scientific Inquiry, C Characteristics of Organisms, Life Cycles of Organisms, Organisms and their Environments; 5-8 A Understandings about Scientific Inquiry, C Regulation and Behavior, Populations and Ecosystems; 9-12 A Understandings about Scientific Inquiry, C Interdependence of Organisms, Behavior of Organisms, F Environmental Quality, Natural and Human-induced Hazards*



## **Coquina Outcrop**

At the far end of Fort Fisher lies the Coquina Outcrop, an area where natural rock formations sit atop barrier island sand. The outcrop itself is the product of shell fragments, mainly from the coquina clam, being cemented together to form hard limestone rock. This unique formation has become a home for such species as sea urchins, sea stars, horseshoe crabs, whelks, sea anemones and other invertebrates. Common discussion topics may include life in the surf zone, adaptations for survival, prehistoric history of the formation of these rocks, or predator/prey relationships in unstable environments.

### **Approximate time: 1 - 1 ½ hours**

*Ocean Literacy- 2a, 2c, 2d, 5a, 5d, 6d, 6e, 6f*

*North Carolina- 4<sup>th</sup> 1.01, 1.03, 1.04; 5<sup>th</sup> 1.01, 1.02, 1.03, 1.05; 6<sup>th</sup> 3.04, 7.01, 7.03; 8<sup>th</sup> 3.04, 3.07*

*National Science- K-4 A Understandings about Scientific Inquiry, C Organisms and their Environments, D Properties of Earth Materials, E Abilities to Distinguish Between Natural Objects and Objects Made by Humans; 5-8 A Understandings about Scientific Inquiry, C Populations and Ecosystems, D Structure of the Earth System; 9-12 A Understandings about Scientific Inquiry, D Origin and Evolution of the Earth System*

## **Fouling Community**

Fouling organisms are sessile creatures that cannot move about to find their food. Instead, they encrust themselves in vast numbers along the sides of docks, marinas, boats, or harbors, and use tentacles to sweep the water as the currents brush past them. Some common species include mussels, bryozoans, sea anemones, and tube-dwelling worms. Even though the word “fouling” implies these creatures are bad for the environment, what they provide for shallow water ecosystems is high productivity since certain fish and invertebrate species will feed primarily on them. Common discussion topics may include life cycles of common species, adaptations to live within environmental limitations, or antifouling devices and their effects on the environment.

### **Approximate time: 1 - 1 ½ hours**

*Ocean Literacy- 5a, 5d, 5e, 5f, 5h, 6d, 6e*

*North Carolina- 4<sup>th</sup> 1.01, 1.02, 1.03, 1.04; 5<sup>th</sup> 1.01, 1.02, 1.03, 1.05, 1.06; 6<sup>th</sup> 7.01, 7.02, 7.03, 7.05; 8<sup>th</sup> 3.03, 3.04, 3.07*

*National Science- K-4 A Understandings about Scientific Inquiry, C Characteristics of Organisms, Organisms and their Environments; 5-8 A Understandings about Scientific Inquiry, C Regulation and Behavior, Populations and Ecosystems, Diversity and Adaptations of Organisms, F Science and Technology in Society; 9-12 A Understandings about Scientific Inquiry, C Interdependence of Organisms, Behavior of Organisms, F Environmental Quality, Science and Technology in Local, National and Global Challenges*



## **Barrier Island Dynamics**

Barrier islands are naturally occurring formations that move both in a north-south direction, as well as an east-west direction. They are generally characterized as having sandy soils and are regularly bombarded by forces of nature such as wind, waves, tides and currents. Because of their uniqueness in soil composition and plant and animal life, they are becoming more and more important to conservation. Common discussion topics may include how islands migrate, common plant and animal species identification, beach zonation, coastal processes (wind, waves, currents, etc.), or development and conservation.

### **Approximate time: 1 - 1 ½ hours**

*Ocean Literacy- 1b, 2b, 2c, 2e, 5d, 5h, 6d, 6e, 6f*

*North Carolina- 3<sup>rd</sup> 1.01, 1.02, 2.01; 4<sup>th</sup> 1.01, 1.03, 1.04; 5<sup>th</sup> 1.01, 1.03, 1.05, 1.06, 2.06; 6<sup>th</sup> 7.03; 7<sup>th</sup> 3.05; 8<sup>th</sup> 3.04, 3.07*

*National Science- K-4 A Understandings about Scientific Inquiry, C Characteristics of Organisms, Organisms and their Environments, F Characteristics and Changes in Populations, Changes in Environments; 5-8 A Understandings about Scientific Inquiry, C Populations and Ecosystems, D Structure of the Earth System, F Natural Hazards; 9-12 Understandings about Scientific Inquiry, C Biological Evolution, D Origin and Evolution of the Earth System, F Environmental Quality, Natural and Human-induced Hazards, Science and Technology in Local, National and Global Challenges*

## **Maritime Forests**

Maritime forests, or “marine” forests, are named for their close proximity to a large body of water, either an ocean or an estuary. They are often subjected to constant salt spray and salt water intrusion from tides and the plants therein must be more salt-tolerant than many species found in upland habitats. Many animals can be found in these habitats, including foxes, hawks, and rabbits, because there is a delicate balance between plant and animal. Common discussion topics may include forest hike with plant/animal identification, soil sampling, or fire ecology and its importance to this environment.

### **Approximate time: 1 - 1 ½ hours**

*Ocean Literacy- 1f, 1g, 5d, 5f, 5h, 5i, 6d, 6e, 6g*

*North Carolina- 3<sup>rd</sup> 1.01, 1.02, 2.01, 2.03; 4<sup>th</sup> 1.01, 1.02, 1.03, 1.04; 5<sup>th</sup> 1.01, 1.02, 1.03, 1.04, 1.05, 1.06; 6<sup>th</sup> 3.05, 3.06, 7.01, 7.02, 7.03, 7.05; 8<sup>th</sup> 3.04, 3.07*

*National Science- K-4 A Understandings about Scientific Inquiry, C Characteristics of Organisms, Organisms and their Environments, D Properties of Earth Materials, F Characteristics and Changes in Populations, Changes in Environments; 5-8 A Understandings about Scientific Inquiry, C Populations and Ecosystems; 9-12 A Understandings about Scientific Inquiry, C Biological Evolution, Interdependence of Organisms, Behavior of Organisms, F Environmental Quality, Natural and Human-induced Hazards*