

# North Carolina National Estuarine Research Reserve

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## What Are Ecosystem Services?

Maybe you have heard the term ‘ecosystem services’ recently, but are unsure exactly what that means. Simply stated, ecosystem services are the benefits people get from the ecosystems where they live and around the world. Usually these are not benefits that people pay for directly and often we are unaware that we are getting anything at all. One example of an ecosystem service is the production of oxygen by trees. While people do not directly pay for this service, it is one we rely upon daily. When ecosystems are negatively impacted by human activities, the value of the lost ecosystem services is generally not included when considering the costs of development or habitat loss.

The estuarine salt marshes of North Carolina provide many of the ecosystem services listed in the graphic to the right. For example, marsh vegetation provides a buffer between high energy waves and adjacent shoreline. This marsh fringe can keep shoreline property from eroding. Such marshes also absorb floodwaters and break up wave energy during ocean storm events.

Marsh habitat is critical for a variety of animals. Many fish, especially juveniles, rely upon the food and shelter they find in the marsh. These fish are important components of the aquatic ecosystem. Blue crab, shrimp, flounder

and red drum – these valuable fish resources are just a few of the aquatic animals that need marsh to survive and grow. Many of our favorite coastal birds such as pelicans, egrets, herons and osprey forage and live in the marsh.

Another ecosystem service provided by estuarine marshes is water filtration. Plants and animals in the marsh filter out nutrients and chemicals, providing people and animals with clean and safe water. Excess nutrients can cause harmful algal and bacterial blooms which can result in fish kills.



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.



| Ecosystem Services Provided by Estuarine Marshes in North Carolina |   |  |
|--|---|--|
| Ecosystem Service  | Description   | Example of Marsh Habitat                         |
| <b>Erosion Control</b>   | The presence of marsh between shoreline property and open water decreases the erosive effects of wave energy. Healthy marshes trap sediment and can keep property from eroding.   | <b><i>Spartina</i> marshes</b>                   |
| <b>Habitat</b>   | Many aquatic animals rely on marsh habitats for food and shelter. This includes important commercial and recreational species such as blue crab and red drum. Many bird species rely on marshes as feeding grounds.                       | <b>Oyster reefs</b>                              |
| <b>Water Quality</b>   | Plants and animals in the marsh filter water and remove excess nutrients. This process keeps our waters clean. Excess nutrients can lead to harmful algal blooms. Clean water provides a beautiful and safe place for people and animals. | <b>Intertidal mud flats</b>                      |
| <b>Storm Protection</b>  | Marshes provide a barrier from ocean storms that can damage homes, buildings and other infrastructure. Marshes absorb floodwaters and decrease damaging wave energy.  | <b><i>Juncus</i> and <i>Spartina</i> marshes</b> |
| <b>Eco-tourism</b>   | The aesthetic value of coastal marshes draws visitors to the area. Vacationers, artists, sportsmen and photographers travel to the coast and support the local economy throughout the year.   | <b>Coastal marshes</b>                           |
| <b>Recreation</b>  | Fishing, hunting, kayaking, bird-watching and hiking are among the many activities enjoyed by the people that live on the coast.  | <b>Sound-side marshes</b>                        |

When marshes are intact and healthy, people derive many benefits and services. Because we get many of these benefits for no direct cost, it is often easy to forget that there is economic value associated with ecosystem services. The cost to society in terms of lost services when marshes are adversely impacted or destroyed is difficult to calculate. However, efforts are being made to begin putting dollar figures on what salt marsh is worth. For example, studies are underway to evaluate how much it would cost to remove nitrogen from water in a treatment facility and then compare that to the rate at which a marsh removes it naturally. This provides an estimate of the monetary value of just one service. Continued refinement of similar estimations for other ecosystem services will provide a more realistic picture of the true value of services provided by salt marshes and other ecosystems.

You can learn more about protecting the ecosystem services provided by estuaries when you visit [www.stateofthecoast.noaa.gov](http://www.stateofthecoast.noaa.gov)