

# CONSERVING WETLANDS, PROTECTING THE COAST

**H**urricanes and other tropical storms produce damaging winds, storm tides, and rain that flood inland coastal areas, erode beaches, and damage barrier islands. Coastal wetlands help to dissipate the force of storm surge and can lessen the impact of these storms on areas farther inland. In fact, some research indicates that storm surge is reduced by one foot for every square mile (640 acres) of coastal wetlands.

While these wetlands help to protect inland regions, damage to these valuable coastal resources can be quite severe. The effects of high winds and storm surge are most apparent as continuous marsh is broken up into pieces, channels are filled with debris, and areas of marsh are converted into open water.

Subsidence, lack of sediment, local sea level rise, and continuing coastal development are critical factors affecting wetland loss in coastal South Carolina. To remain stable, coastal marshes must grow in height and area as rapidly as they lose elevation or are eroded at their edges. Many portions of coastal South Carolina are isolated from renourishment by sediment and continue to dwindle as coastal populations expand into wetland regions. Winter storms and hurricanes, which suspend and transport sediments in the water column, may partially off-set the effects of subsidence and subsequent wetland loss by supplying those needed sediments.

Not all hurricanes appear to contribute similar amounts of sediment to the coastal environment. The amount depends on their idiosyncratic nature: wind velocity, duration, storm tide height in addition to the normal tide height, angle of approach to the shore, and the availability of a source of sediments. Even if hurricanes do

contribute a beneficial amount of sediment, they may not ultimately help certain coastal marshes maintain their elevation relative to increasing sea level due to the counteractive impacts of erosion.

Proximity to the coast is not necessarily the primary factor that determines damage to wetland vegetation. In many cases, salt marshes closest to the path of the hurricane show the least signs of damage. On the other hand, freshwater plants in interior marshes suffer most from exposure to the moderately saline water that accompanies the storm surge as it moves inland. At sites 20-40 km from the coast, hurricane-induced storm surge can maintain salinity of 10-15 parts per thousand—about half the salt concentration found in seawater. Up to a week following the hurricane, the salinity of some interior marsh sites may remain eight times higher than it was prior to the storm. This saltwater “burns” and, in many cases, kills the aboveground portions of freshwater, marsh plants. Most of the plants, however, begin regrowth within six weeks of a significant storm. However, research studies from Hurricane Hugo in South Carolina indicate that confined regions of some inland marshes measured above-average salinity values for several years. Ultimately, scientists have found that vegetation of these coastal marshes recovers fairly quickly from the impacts of hurricanes and other tropical storms, even in areas where salt burn significantly impacts the landscape.

Hurricanes are valuable sources of sediment for coastal wetlands and may in the short-term be able to counteract subsidence and slow the process of the marsh’s interior fragmentation and degradation. Although these sediments may not completely counteract coastal erosion, rising sea levels, and urban expansion along the South Carolina coast, tropical storms and hurricanes offer the critical addition of sediments in areas cut off from normal supplies. As a delicate balance between the benefits and negative effects, marsh managers must often consider the interaction of weather, climate, and wetlands conservation during restoration and mitigation projects. The best way to protect South Carolina’s wetlands from future hurricane destruction is to promote the inorganic and organic accretionary processes that encourage a “healthy” marsh. By doing so, we are also protecting our shoreline and coastal communities from the imminent destruction attributed to storm surge.

*Jason Caldwell — Meteorologist*

## How Can I Make a Difference?

- Get involved and find out where wetlands exist near your home, try to learn more about them, and support educational efforts.
- Support wetlands and watershed protection initiatives by public agencies and private organizations.
- Purchase federal duck stamps from your local post office to support wetland acquisition.
- Participate in the Clean Water Act Section 404 program and state regulatory programs by reviewing public notices and, in appropriate cases, commenting on permit applications.
- Encourage neighbors, developers, and state and local governments to protect the function and value of wetlands in your watershed.
- Rather than draining or filling wetlands, seek compatible uses involving minimal wetland alteration, such as waterfowl production, hay and forage, wild rice production, hunting and trapping leases, and selective timber harvest.
- Select upland rather than wetlands sites for development projects and avoid wetland alteration or degradation during project construction.
- Maintain wetlands and adjacent buffer strips as open space.
- Learn more about wetland restoration activities in your area; seek and support opportunities to restore degraded wetlands.

**MAY IS AMERICAN WETLANDS MONTH**



*Phillip Jones*



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