



## **Mid-Year Monitoring Memorandum**

### **HILTON HEAD PUBLIC SERVICE DISTRICT RECYCLED WATER PROJECTS** *Hilton Head Plantation and Palmetto Hall, Hilton Head Island, SC*

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This memorandum summarizes the environmental conditions in the Hilton Head Public Service District (HHPSD) Recycled Water Project (RWP) in the wetlands of Hilton Head Plantation and Palmetto Hall, Hilton Head Island (HHI) SC.

Category 2 Hurricane Matthew made landfall on October 8, 2016 with winds of approximately 105 mph. Rainfall amounts were 11"- 15". The storm's impacts were significantly more intense and widespread on the project wetlands than any other event in the past two decades or more. This document summarizes the storm's effects, but also reveals the natural ability of the wetlands to resist greater damage and to recover quickly.

#### ***RESILIENCE IN THE HURRICANE***

Coastal natives, as well as scientists, know first hand that wetlands are uniquely suited to resist ecological damage from hurricane winds and flooding, and to recover more readily than higher, drier, "upland" terrain. Their adaptation features were apparent in the four project wetlands receiving Recycled Water (RW): Hilton Head Plantation's Cypress Swamp (Cypress) and Whooping Crane Conservancy (WCC); and Palmetto Hall's Wooded and Grassy wetlands. Each are ecologically distinct; yet in the hurricane each survived *resiliently*. The project

wetlands have been strengthened by regular application of RW, enhancing widely diverse aquatic vegetative communities including ponds, marshes, and old growth forests. The wetlands provide crucial protection that buffers human and wildlife communities.

### ***HILTON HEAD PLANTATION***

Dramatic stands of specimen trees-100 years old or more- attest to the wetlands' ability to buffer wind. Swamps also slow floodwater and act as long term storage basins.

The longest-running (over 35 years) RWP on northern HHI, Cypress and WCC programs fared well in the past year, despite Hurricane Matthew's destructive winds and floods. This result demonstrates the effectiveness of the low-tech, *nature-based* technology to store, filter and clarify domestic treated water—and as a benefit enriches natural landscape and overall scenic beauty.

Cypress Conservancy is the last large enclave of rare bald and pond cypress trees on HHI. This habitat receives less recycled water. Hurricane blow-down of trees, primarily in Cypress Swamp, occurred on the windward (facing north-northwest) perimeter of the wetlands. The palisade of fallen trees served as a protective wind barrier shielding not only the interior of the wetlands, but also homes, golf courses, roads, and infrastructure.

Flooding took place in several areas of the wetlands. Although the RW habitats are innately suited to accommodate water, *too much* water became a problem in WCC. The mass of windblown water breached a dike in WCC, and this allowed a large quantity of water to flow into adjoining areas and properties. It is important to note, however, that the mass of water has receded and did not damage the RWP infrastructure—only several walking trails nearby. These areas have since been restored.

## ***PALMETTO HALL***

Matthew's hurricane winds from the northeast struck Palmetto Hall with noteworthy damage to the RW landscapes.

The Grassy Wetland appears to be the least affected by the hurricane. It was generally dry with shallow water collecting in the center and perimeters of the wetland. Compared to the Wooded Wetland, Grassy had few trees down and very little erosion. Strong rain and winds did convey sediment into the wetland, which may have caused dieback of groundcover.

However, the Wooded Wetland, a bottomland hardwood forest, is similar to Hilton Head Plantation's WCC. This past year, the effect of the hurricane was similar, except for a stand of young trees on the northeastern corner of the eastern flank of the property that faced strong winds surging across Port Royal Sound.

### **Conclusion**

Wetlands are an integrated, communal system in which every part works in tandem with another to produce a resilient habitat. This was evident during and after the hurricane. Some damage took place (tree fall, isolated flooding), but on the whole, the RW wetlands withstood the storm's wind and water thrashing.

The HHPSD Recycled Water Program is a technology that continues to benefit the population of its service area and the environment of northern HHI. Hurricane Matthew was a strong test of the program to date. Six months after the hurricane, monitoring this project and its innate natural resources revealed that despite hurricane damage, the program meets the needs of water quality management, public service, and long-term conservation.

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May 2017 Growing Season Monitoring Photographs



**Cypress Conservancy**



**Whooping Crane Pond Conservancy**



**Grassy Wetland**



**Wooded Wetland**