

Jacksonville Beach, Florida - A tale of two Hurricanes

By Gabriel Todaro
Intern, EN-WC
U.S. Army Corps of Engineers
Jacksonville District



**US Army Corps
of Engineers®**



Figure 1: Damage caused by the storm surge in Atlantic Beach during Hurricane Dora

Hurricane Dora and Hurricane Matthew struck Jacksonville Beach, Florida almost 52 years apart but they will be tied together as the strongest hurricanes to directly strike the coastal city.

Hurricane Dora formed in the Atlantic Ocean on August 28, 1964. As it crossed the Atlantic, Dora continued to strengthen until peaking as a Category 4 hurricane on September 6. Hurricane Dora made landfall near St. Augustine, Florida as a Category 3 storm on September 10th. In Florida, nearly 10,000 homes received damage and 156,000 homes lost power. Floodwaters rushed up Atlantic Boulevard and onto A1A as the floodwalls that protected the beach were overwhelmed. Numerous houses fell into the Ocean as steady winds of greater than 65 mph pounded the coast. Figure 1 shows the water breaking through and washing away a house in Atlantic Beach, FL.



Figure 2: Jacksonville Beach during the early 1960s

Prior to the current shore protection project, the beach looked very different than it does today. Figures 2 and 3 show the conditions between 1928 and 1963. The beach was much narrower and there were not any dunes to protect the shoreline. A rock revetment and concrete seawall protected Jacksonville Beach prior to Hurricane Dora (Figures 4 and 5). Unfortunately, these defenses were inadequate to against the storm. During Dora, Jacksonville Beach faced severe coastal flooding from the storm.

Hurricane Dora resulted in the decision that better protection was needed along the Jacksonville shoreline. The

Rivers and Harbors Act of 1965 and House Document 519/89/2 in 1966 authorized the Duval County Shore Protection Project for Jacksonville Beach, Florida. The project was initially constructed in 1978 and has been re-nourished five times (1985-87, 1991, 1995, 2005, and 2011), in addition to the current ongoing renourishment project.

The project has resulted in an increase in the size and width of the beach. By 2012, dunes covered the area over the original rock revetment and they reached almost 20 feet in elevation. Between 1974 and 2012, the beach width was increased by approximately 300 feet and the height was increased by approximately 15 feet. There are sea oats that cover the dunes that aid in stabilizing the sand and help to prevent erosion to the beach, which adds another layer of protection to the shoreline.

This increased protection was tested in October of 2016 during Hurricane Matthew. Matthew originated from a tropical wave off the coast of Africa on September 22, 2016. Matthew became a hurricane on September 29 and quickly strengthened in a Category 5 storm the following day. After passing through the Caribbean as a Category 4 storm, Matthew moved north as a slightly weakened Category 3 storm. The hurricane moved up along the Florida coast and its eye moved within 12 miles of Jacksonville, Florida where it caused major damage to the beach.

The dunes were completely washed away in many places along the Jacksonville coast but ultimately they proved successful at defending the properties behind them. Unlike during Dora, there were only a few instances of coastal flooding during the storm, and these occurred primarily at areas where there were gaps in the dunes.

Next Page



Figure 3: Jacksonville Beach in 1928



Figure 4: Rock revetment at Jacksonville Beach in 1965

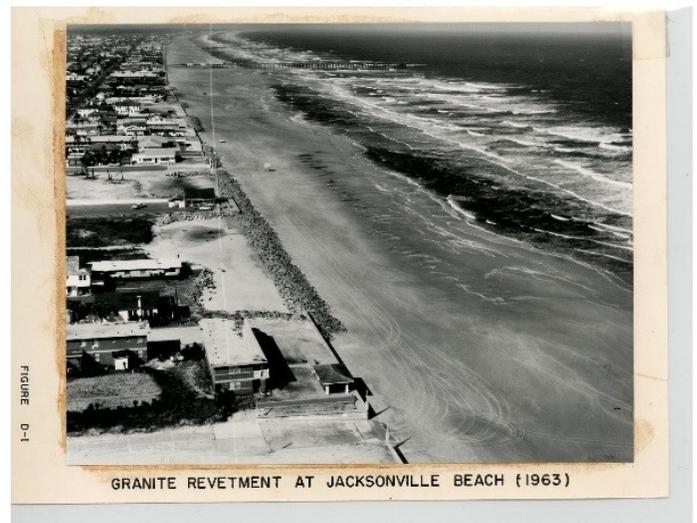


Figure 5: Rock revetment at Jacksonville Beach in 1963

Figures 6 and 7 show Jacksonville Beach post-Matthew. Figures 8 and 9 show devastation that was typical during Hurricane Dora. As seen in the photos, there was severe damage to the dunes but many of them survived Hurricane Matthew and were much more effective in protecting the local infrastructure than the revetment during Hurricane Dora.



Figure 6: Dune erosion caused by Hurricane Matthew in October 2016



Figure 7: Dune erosion at Jacksonville Beach in October 2016



Figure 8: Damage from Hurricane Dora in 1964



Figure 9: House falling in water during Hurricane Dora

Next Page

Hurricane Matthew struck the Duval Shore Protection Project in the middle of its sixth renourishment. The hurricane delayed the renourishment and changed the goal from simply to renourishing the beach to also restoring the protective dune features. The contractor's dredge was fully booked with previous contractual agreements requirements that caused the restoration work to be paused on December 3, 2016. The work will be reinitiated in May of 2017.

The pictures below (Figures 10-11) show how the beach has changed from before the Shore Protection Project to 2011, at the time of the fifth renourishment.



Figure 10: Jacksonville Beach in 1973



Figure 11: Jacksonville Beach in 2011

[Back to Main Page](#)