



Figure 13: Volusia County Location Map

Volusia County

The southernmost of the five northeast Florida coastal counties, Volusia County extends for 48.8 miles between Flagler and Brevard Counties. Volusia County includes the following barrier beach communities and major parks: North Peninsula State Park, Ormond-by-the-Sea, Ormond Beach, Daytona Beach, Daytona Beach Shores, Wilbur-by-the-Sea, Town of Ponce Inlet, Ponce de Leon Inlet State Park, New Smyrna Beach, Bethune Beach, and Cape Canaveral National Seashore (Figure 13). Prior to landfall of the two storms Volusia County had two designated critically eroded areas (16.7 miles), one noncritically eroded area (1.1 miles), and one critically eroded inlet shoreline area (0.6 mile). The Volusia County beaches extended approximately 130 to 170 miles from the center of both hurricanes' eyes at landfall.

Ponce de Leon Inlet

Ponce de Leon Inlet near the middle of Volusia County has a federal navigation project, which appeared to sustain significant shoaling with the passage of Hurricanes Frances and Jeanne. The north shoreline of Ponce de Leon Inlet is designated as critically eroded; however, a recent landward extension of the north jetty appears to have stabilized this shoreline. Following the impact of both Hurricanes Frances and Jeanne, the south shoreline (R149) of the inlet was observed to have sustained major erosion (Condition IV); however, there does not appear to be a threat to structures or recreation areas by this erosion.

North Peninsula Beach and Dune Erosion

An 8.3-mile segment of beach (R57-R103) along Ormond Beach, Daytona Beach, and Daytona Beach Shores was designated as critically eroded prior to the two storms. After the passage of Hurricane Frances, northern Volusia County to Ponce de Leon Inlet was observed to have post-storm erosion conditions generally increasing from minor beach erosion (Condition I) to minor beach and dune erosion (Condition II). The erosion impact of Hurricane Jeanne was even more severe to the northern Volusia County beaches. Generally, major beach and dune erosion (Condition IV) was sustained throughout the north peninsula.

South Peninsula Beach and Dune Erosion

The 8.4 miles of beaches (R161-R208) south of Ponce de Leon Inlet within New Smyrna Beach and Bethune Beach were designated as critically eroded prior to the two storms. The 1.1-mile segment of shoreline (R208-R214) south of Bethune Beach within the Cape Canaveral National Seashore was also designated a noncritically eroded area. Throughout southern Volusia County south of Ponce de Leon Inlet into the National Seashore, erosion conditions varied from moderate (Condition III) to major beach and dune erosion (Condition IV) after Hurricane Frances. More specifically, from Ponce de Leon Inlet southward through R177, Condition IV prevailed. South of R177, moderate beach and dune erosion (Condition III) prevailed. Bethune Beach (R194-R208) has been particularly susceptible to erosion and storm damage in the past 20 years. Most recently,

prior to this hurricane season, Hurricanes Floyd and Irene (1999) inflicted severe erosion including the destruction of over 1200 feet of the ocean front road (R201-R202). In contrast to the 1999 storm damage, Frances only caused moderate beach and dune erosion (Condition III) and no road damage, even though storm tides of 4 to 5 feet were experienced.



Photo 3: Major Beach and Dune Erosion, New Smyrna Beach

The Condition IV erosion impact of Hurricane Jeanne was particularly severe along New Smyrna Beach, where currently there is a complete loss of beach during high tide conditions (Photo 3). This loss of beach has led to the failure of a number of seawalls and created a pending storm threat to numerous upland dwelling structures. South of R193 throughout Bethune Beach and into the Cape Canaveral National Seashore, the Condition IV erosion that prevailed along New Smyrna Beach changed abruptly to accretion. Throughout Bethune Beach the beach berm grew to the point of covering the lower half of the coquina boulder revetments. This very unexpected result of two hurricanes' impact on an area that has historically been erosional is not readily explainable.

Seawalls and Other Coastal Protection Structures

There are no beach restoration projects in Volusia County although the north peninsula extending northward from Ponce de Leon Inlet to Daytona Beach Shores received beach fill from inlet channel maintenance dredging in the past. Many vertical seawalls and bulkheads, some with rock toe scour protection exist along Ormond Beach, Daytona Beach, Daytona Beach Shores, Wilber-by-the-Sea, Town of Ponce Inlet, New Smyrna Beach, and Bethune Beach. During Frances no damage was sustained by these structures. Bethune Beach has a coquina boulder revetment along two segments which was designed and certified for a 100-year storm event. Frances likewise inflicted no damage to these revetments. In contrast, Jeanne damaged and destroyed some 19 vertical seawalls countywide having a total length of 5,430 feet (Photo 4).

Four of these damaged walls totaling 285 feet were located on the northern peninsula while 15 of these damaged walls totaling 5,145 feet were located in New Smyrna Beach. Once again there was no damage to the coquina boulder revetments in Bethune Beach. Unlike the scour caused by many vertical walls along the coast, the gradually sloping rock revetments appeared to have had no negative impact on the adjacent beach. In fact, sand even accreted on the revetments. Most of the concrete seawalls failed due to the same reasons including, lack of beach seaward of the walls, age of the structures, corrosion to the reinforcing steel, and lack of filter cloth behind the wall. A complete listing of the damaged and destroyed seawalls located by the Department's reference monuments is shown in Table 3.

Table 3: Summary of Destroyed Seawalls in Volusia County

Summary of Seawall Damages in Volusia County (All walls were reinforced concrete walls except as noted)	
Location (DEP R-monument)	Length (feet)
R93.85-R94	130
R115	30
R123.8	50 ¹
R124.9	75 ²
R163-R163.25	350
R163.25-R163.35	125
R163.5-R163.7	200
R164.5-R164.6	100
R165-R165.4	420
R165.9	50
R169.15-R169.25	100
R171.3	50
R175.9-R176.3	400
R176.3-R176.8	550
R178-R179	875
R180.1-R180.85	750
R183.3	75
R183.55-R183.65	100
R191.25-R192	1000
Total	5,430

1 – Concrete culvert wall

2 – Wood bulkhead



Photo 4: Seawall Damage, New Smyrna Beach

North Peninsula Damage

Throughout Volusia County, there was widespread wind damage to roofing, siding, signs, awnings, carports, gas station covers, power lines, trees and shrubs. Many wooden beach access walkways were destroyed or damaged by the storm tides and waves. The north peninsula had experienced wind damage from Hurricane Charley's exit into the Atlantic Ocean following an August 13, 2004, landfall on the Gulf coast at Lee County. North of Ponce de Leon Inlet, Hurricane Charley was observed to cause major roof damage on at least 27 single-family dwellings, 16 condominiums/hotels, and three commercial buildings on the coast (about 46 ocean front major structures). Hurricane Frances additionally caused major damage to at least nine single-family dwellings and three hotels. Among these, a single-family dwelling was destroyed 250 feet north of R124. A portion of the roof of the Peabody Auditorium was also damaged. The Main Street Pier in Daytona Beach (R84) sustained no apparent significant structural damage; however, the Sunglow Fishing Pier (350 ft. north of R118) in Daytona Beach Shores had its seaward end destroyed. Hurricane Jeanne caused additional structural damage to the end of the Sunglow Fishing Pier. Jeanne also caused major damage to three single-family dwellings, 20 multifamily dwellings (mostly hotels and motels), a lifeguard tower, and five vehicle access ramps.

South Peninsula Damage

South of Ponce de Leon Inlet along New Smyrna Beach and Bethune Beach, Hurricane Charley was observed to cause major roof damage to 11 single-family dwellings and two multifamily dwellings. Perhaps due to its closer proximity to the eye of Hurricane Frances, the south peninsula area sustained greater wind damage in the second storm including major roof damage to 18 single-family dwellings and nine multifamily dwelling structures. In addition, three single-family dwellings were destroyed and two other single-family dwellings and a multifamily dwelling had major side damage. Hurricane Jeanne also caused wind, wave, and undermining damage to major structures in New Smyrna Beach (Photo 5). Major damage was sustained by five single-family



Photo 5: Building Undermined after Seawall Collapsed, New Smyrna Beach

dwellings, five multifamily dwellings, and a commercial building. Among the condemned buildings were a six-story, 62-unit condominium, two 33-unit condominiums, and a beach bar. In addition, a pool, a concrete pedestrian access ramp, and two vehicle access ramps were destroyed(Photo 6).



Photo 6: Pool Destroyed, New Smyrna Beach

Summary of Damage

In all, Hurricane Frances destroyed or caused major structural damage to 46 major structures along the coast of Volusia County. This followed Hurricane Charley, which caused major damage to 59 major habitable structures. Hurricane Jeanne destroyed or caused major damage to 45 major structures as well as 19 seawalls having a length of 5,430 feet (1.03 mile). Approximately 150 dune walkovers throughout the county were also destroyed or damaged.