



# Assessing the Impacts of Hurricanes Ian and Nicole on the Beaches and Dunes of Florida

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Office of Resilience and Coastal Protection  
Florida Department of Environmental Protection

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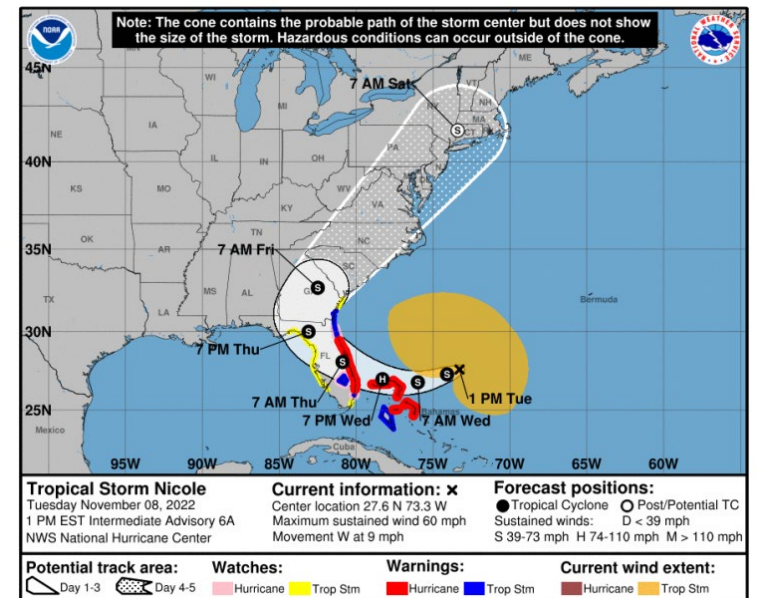
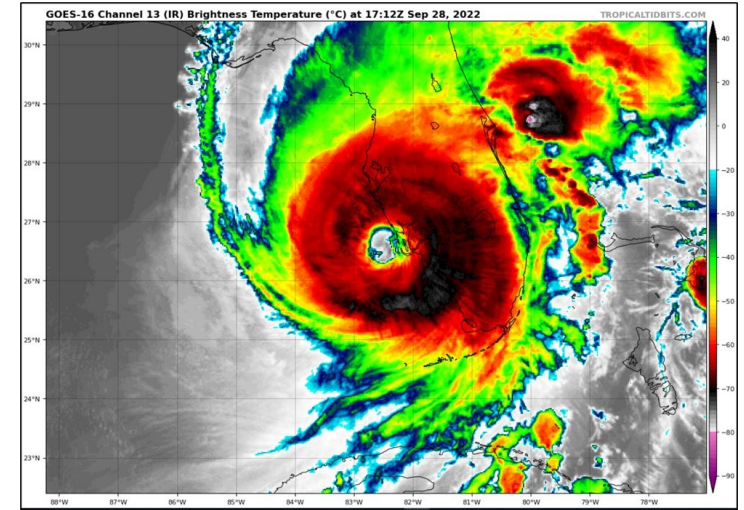


# Overview: Hurricanes Ian and Nicole

**H. Ian made landfall as a strong Category 4 on Sept. 28, 2022 at Cayo Costa, FL, in northern Lee County**

**H. Ian also impacted the East Coast as a Category 1, even though it exited Florida as a Tropical Storm**

**H. Nicole approached Florida as a Category 1 hurricane on Nov. 10, but weakened to a tropical storm before making landfall at Avalon Beach in St. Lucie County**





# Coastal Impact Evaluations by Land

**FDEP damage assessment teams deployed immediately following the storms**

**Detailed damage assessments were conducted in Sarasota, Charlotte, Lee, Collier, St. Johns, Flagler and Volusia Counties on the ground by CEG/BIPP staff and CCCL staff**

**A total of 113 miles of beaches and dunes were assessed on the ground by the damage assessment teams on the SW coast and 108 miles on the East Coast**





# Coastal Impact Evaluations by Land

**FDEP damage assessment teams were deployed using 4-wheel drive vehicles, ATV/UTV's, and Tablets to assess the erosion conditions and major damages to structures**

**GPS/RTK survey data was not collected in the early stages of the storm response by FDEP**

**GPS/RTK survey data/ LiDAR data will be reviewed and placed in DEP's final post-storm impact report**





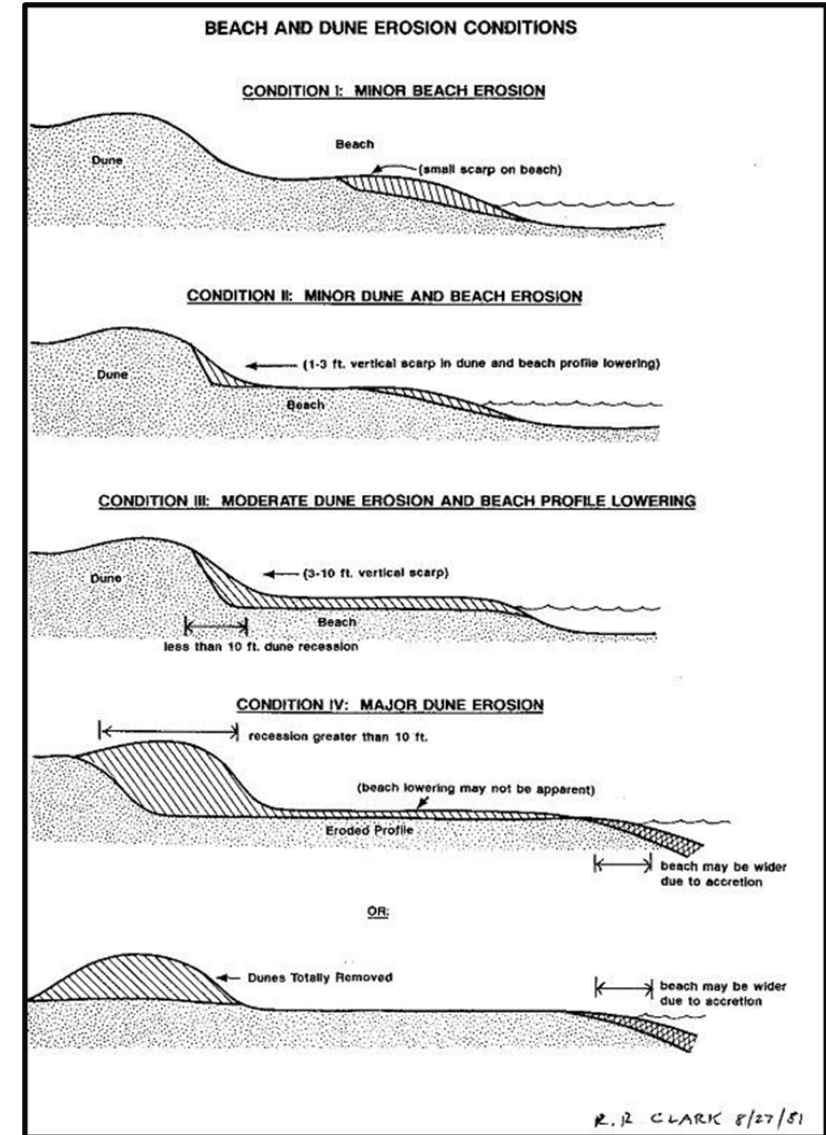
# Erosion Conditions

**Condition I : Minor Beach Erosion**

**Condition II: Minor Beach and Dune Erosion**

**Condition III: Moderate Dune Erosion and Beach Profile Lowering**

**Condition IV: Major Dune Erosion**





# Erosion: Sarasota County – Venice Beach

**Minor beach and dune erosion at Venice Beach except for the stormwater gullies**

**Erosion condition I mostly along with the condition IVs at four stormwater runoff gullies north of the pier, photo is near R-130**





# Coastal Impact Evaluations in SW Florida



**Estero Island near Flamingo Street with erosion condition IV, near R-199**



# Coastal Impact Evaluations in SW Florida



**Naples beach with erosion condition IV, near R-85**





# Coastal Impact Evaluations by Land

**FDEP receives additional support from local governments/ local coastal engineering consultants and the USACE to assess local beach erosion conditions and project erosion conditions.**

**Hurricanes Ian and Nicole created damages like the hurricane seasons of 2004 and 2017.**

**It is hard to be everywhere...!**

**THANK YOU...!!**





# Coastal Impact Evaluations by Air

**After Hurricane Ian, FDEP deployed an additional damage assessment team to fly from Anclote Key (Pasco County) to Cape Romano (Collier County) by helicopter and videography - Camera Copters and Active Camera Systems**

**Paul Barth – helicopter pilot**

**Pat Longman – videographer**

**A total of 187 miles were assessed by Camera Copters in SW Florida**





# Coastal Impact Evaluations by Air

**The helicopter videography was very useful assessing damages on barrier islands with no access by road that included:**

**Don Pedro Island/Knight Island**

**Cayo Costa**

**North Captiva Island**

**Captiva Island**

**Sanibel Island**

**Keewaydin Island**





# Coastal Impact Evaluations by Air



Hurricane Ian's beach and dune damages (Condition IV) on North Captiva Island (R-79) near Charley's Cut, video photo by Camera Copters and Active Camera Systems



# Coastal Impact Evaluations by Air



Hurricane Ian's beach and dune damages (Condition IV) on Sanibel Island (R-148), video photo by Camera Copters and Active Camera Systems



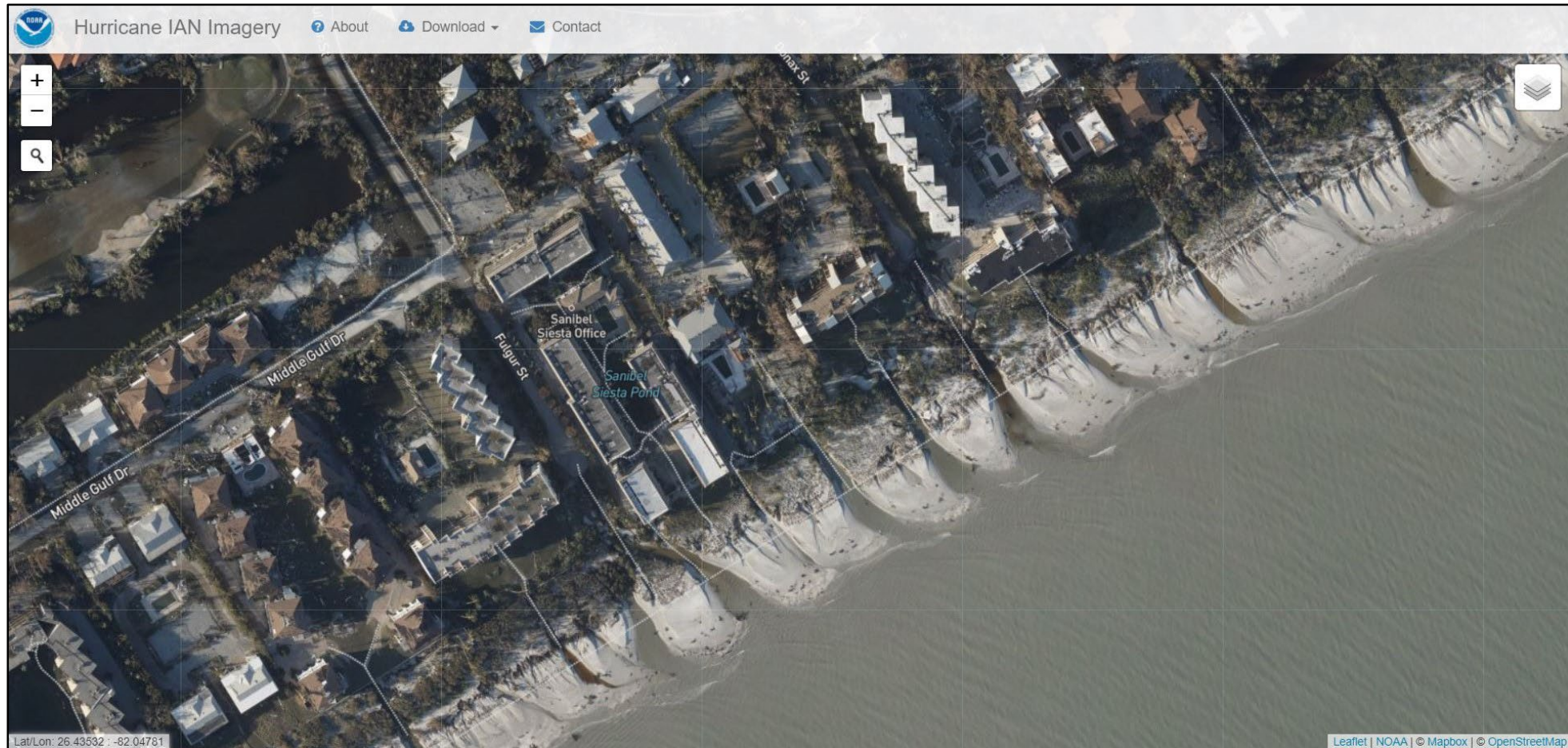
# Coastal Impact Evaluations by Air



Hurricane Ian's beach and dune damages (Condition IV), Big Hickory Island (R-222) video photo by Camera Copters and Active Camera Systems



# Coastal Impact Evaluations by Aerial Imagery



Sanibel Island with erosion condition IV. This is NOAA aerial imagery, R-161 to R-162



# Coastal Impact Evaluations by Air



LAT: 26.068860  
LNG: -81.791754  
UTC: 2022-10-02 21:01:54

FROM: Begin (2792.1 m)  
TO: R-099 (84.1 m)

Hurricane Ian causes a breach (Condition IV) on Keewaydin Island (R-99), video photo by Camera Copters and Active Camera Systems





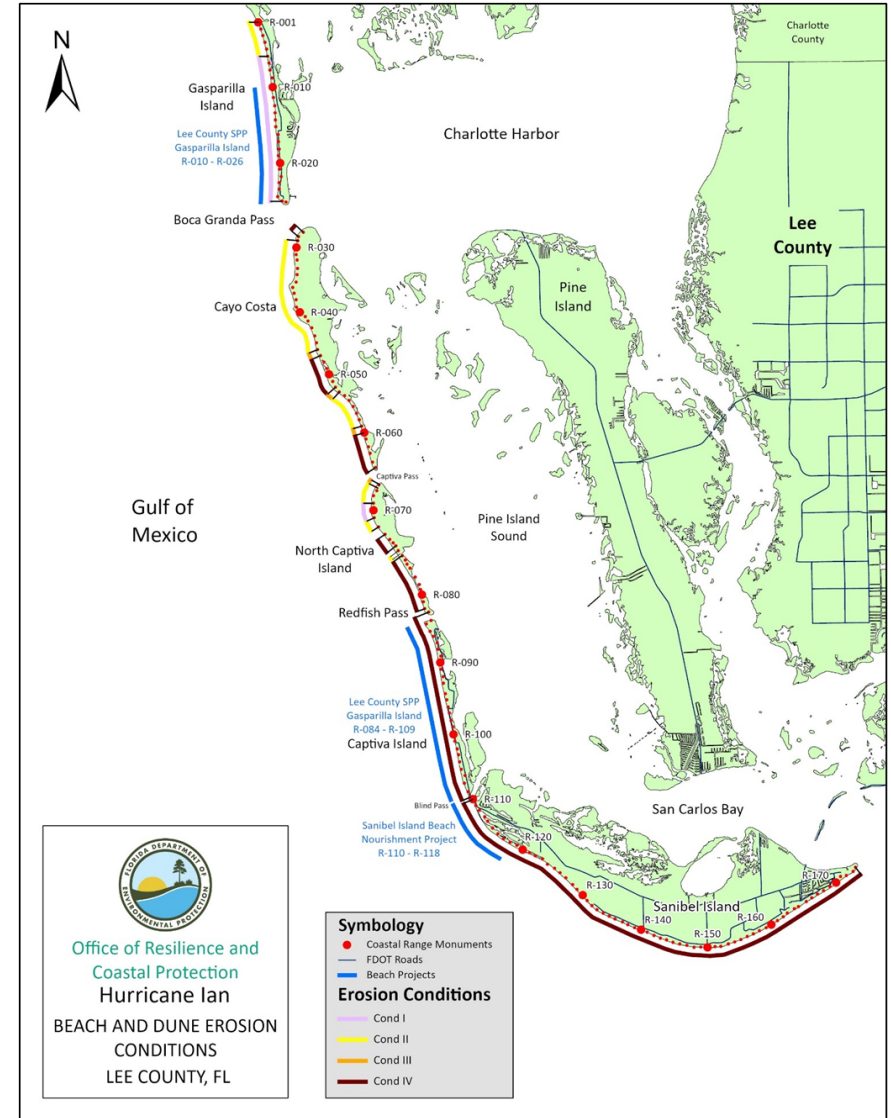
# Erosion Conditions – Lee County

**Condition I: Minor Beach Erosion**

**Condition II: Minor Beach and Dune Erosion**

**Condition III: Moderate Dune Erosion and Beach Profile Lowering**

**Condition IV: Major Dune Erosion**





# Erosion Conditions – Lee County

**Condition I: Minor Beach Erosion**

**Condition II: Minor Beach and Dune Erosion**

**Condition III: Moderate Dune Erosion and Beach Profile Lowering**

**Condition IV: Major Dune Erosion**

Locations	Range Monuments	Erosion Condition
Gasparilla Island	R1 – R6	II
Gasparilla Island	R6 - R26	I
Cayo Costa Island	R27 – R28	IV
Cayo Costa Island	R28 – R46	II
Cayo Costa Island	R46 – R47	III
Cayo Costa Island	R47 – R52	IV
Cayo Costa Island	R52 – R53	III
Cayo Costa Island	R53 – R59	II
Cayo Costa Island	R59 – R60	III
Cayo Costa Island	R60 – R65	IV
North Captiva Island	R66	III
North Captiva Island	R66.5 – R69	II
North Captiva Island	R69 – R71	I
North Captiva Island	R71 – R72	III
North Captiva Island	R73 – R75	IV
North Captiva Island	R75A	II
North Captiva Island	R76 – R82	IV
Captiva Island	R83 – R109	IV
Sanibel Island	R110- R174	IV
Estero Island (Ft. Myers Beach)	R175- R210	IV
Lovers Key	R211 - R222	IV
Big Hickory Island	R222 - R225	IV
Bonita Beach	R225 - R239	IV



# Coastal Impact Evaluations in NE Florida



Major beach and dune erosion in Ponte Vedra Beach, erosion condition IV, near R-15



# Coastal Impact Evaluations in NE Florida



Major beach and dune erosion in South Ponte Vedra Beach, erosion condition IV, near R-86



# Coastal Impact Evaluations in NE Florida



Major beach and dune erosion at St. Augustine Beach, erosion condition IV, near R-144



# Coastal Impact Evaluations in NE Florida



Major beach and dune erosion at Crescent Beach, erosion condition IV, near R-172



# Coastal Impact Evaluations by Air in NE Florida

After Hurricane Nicole, FDEP requested through the Florida Department of Emergency Management (FDEM ) to have the Civil Air Patrol fly the East Coast of Florida. Nassau thru Dade counties were flown (363 miles) by the Civil Air Patrol with a Nikon D 7200





# Coastal Impact Evaluations by Air in NE Florida



**Breaches at Summer Haven, erosion condition IV, near R-200 (R) and R-204.9 (L)**





# Coastal Impact Evaluations by Air in NE Florida



Hurricane Nicole's beach and dune damages (condition IV) to A1A in Flagler Beach (R-88, 17<sup>th</sup> St. South), photo by Civil Air Patrol



# Erosion: Ocean Hammock in Flagler County



Major beach and dune erosion (condition IV) at Ocean Hammock, near R-37



# Erosion: Ormond Beach in Volusia County



Major beach and dune erosion at Ormond Beach, erosion condition IV, near R-55



# Erosion: Town of Ponce Inlet – Volusia County



Major beach and dune erosion (condition IV) at Town of Ponce Inlet, near R-138



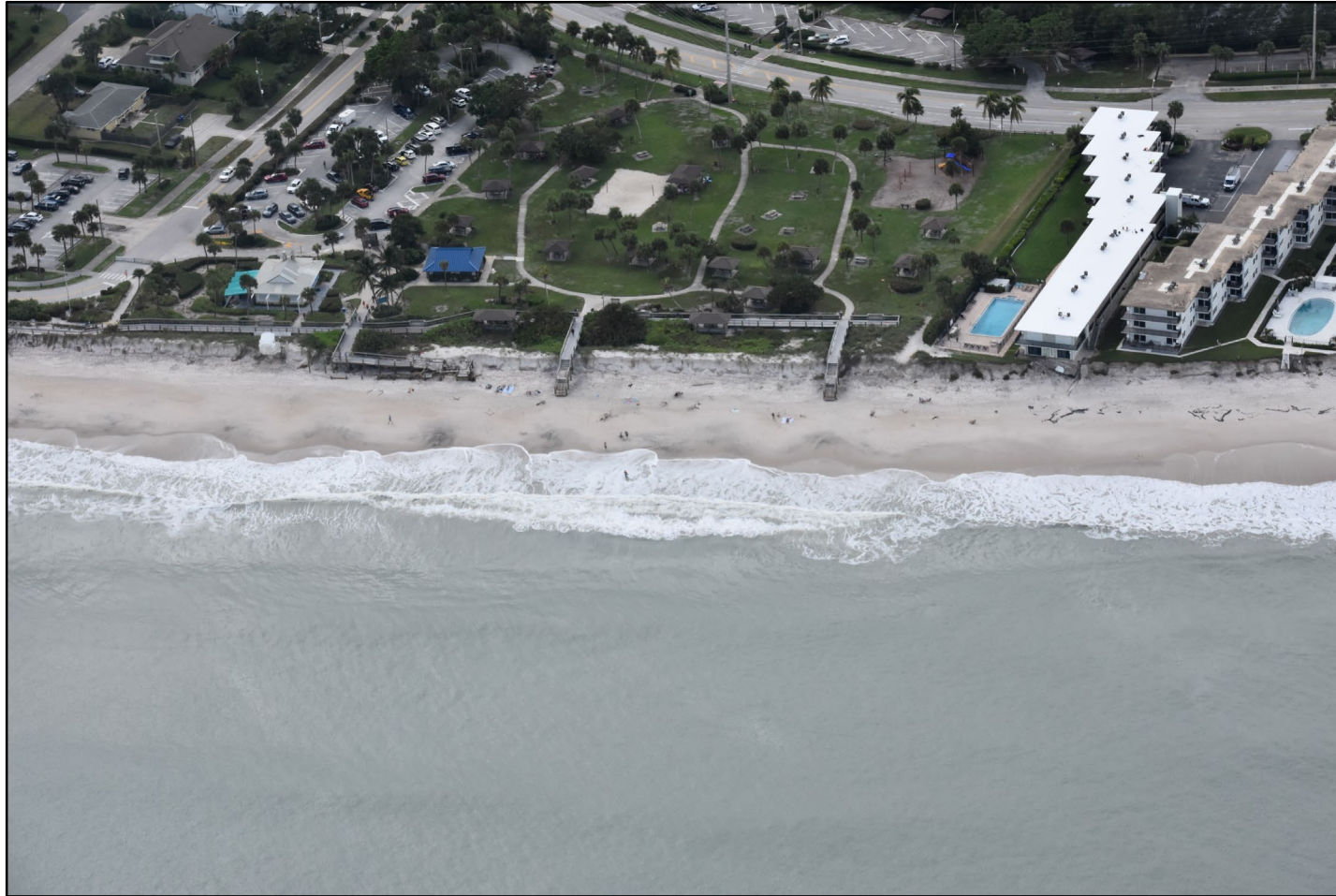
# Erosion – Brevard County, Florida



Major beach and dune erosion (condition IV) at South Beaches (Floridana) in Brevard County, near R-188



# Coastal Impact Evaluations by Air in NE Florida



Major beach and dune erosion (condition IV) at Vero Beach, near R-77



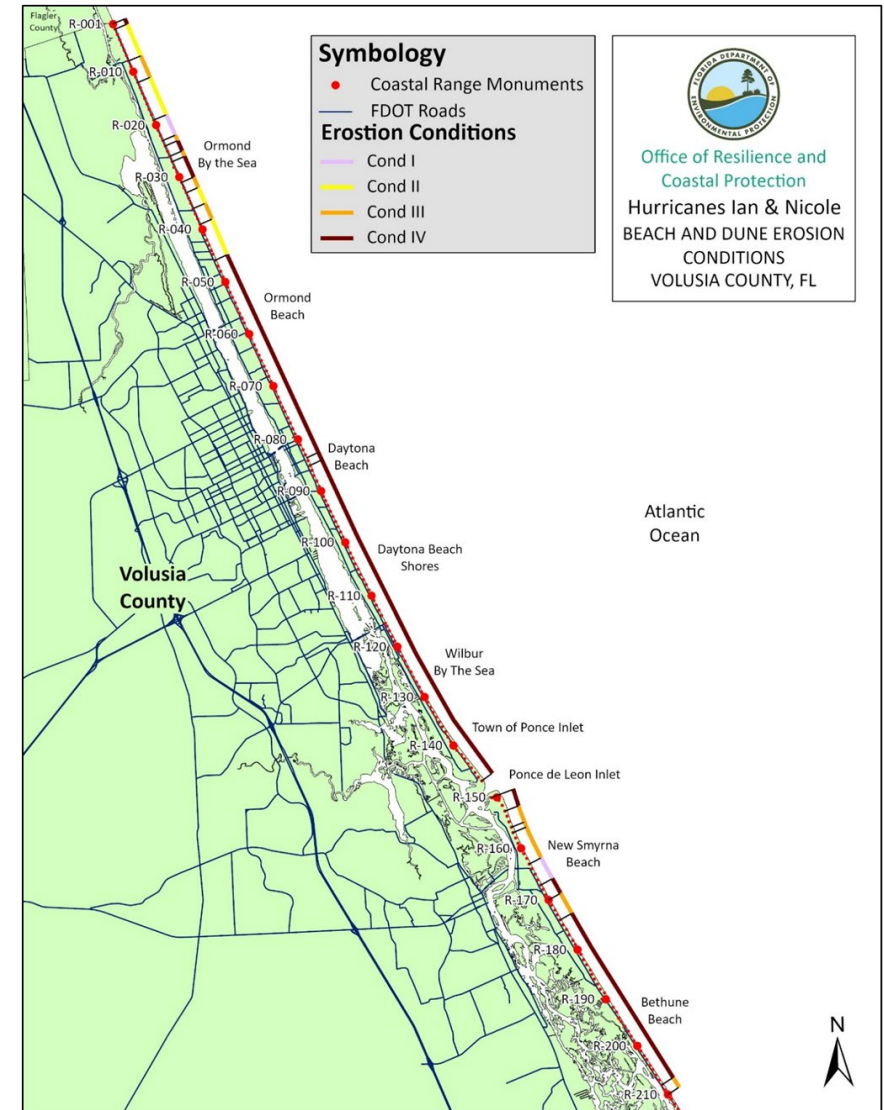
# Erosion Conditions – Volusia County

**Condition I: Minor Beach Erosion**

**Condition II: Minor Beach and Dune Erosion**

**Condition III: Moderate Dune Erosion and Beach Profile Lowering**

**Condition IV: Major Dune Erosion**





# Erosion Conditions – Volusia County

**Condition I: Minor Beach Erosion**

**Condition II: Minor Beach and Dune Erosion**

**Condition III: Moderate Dune Erosion and Beach Profile Lowering**

**Condition IV: Major Dune Erosion**

Locations	Range Monuments	Erosion Condition
North Peninsula State Park	CL - R2	IV
North Peninsula State Park	R2 – R8	II
North Peninsula State Park	R8 – R12	III
North Peninsula State Park/ Ormond Beach	R12 – R19	II
Ormond Beach	R19 – R23	I
Ormond Beach	R23 – R24	III
Ormond Beach	R24 – R26	IV
Ormond Beach	R26 – R27	III
Ormond Beach	R27 – R31	IV
Ormond Beach	R31 – R33	III
Ormond Beach	R33 – R36	II
Ormond Beach	R36 – R39	III
Ormond Beach/ Daytona Beach/ Daytona Beach Shores/Wilbur by the Sea/ Ponce Inlet	R46 – R148	IV
New Smyrna Beach	R149 – R153	IV
New Smyrna Beach	R153 – R163	III
New Smyrna Beach	R163 – R167	I
New Smyrna Beach	R167 – R170	IV
New Smyrna Beach	R170 – R174	III
New Smyrna Beach/ Bethune Beach	R174 – R208	IV
Canaveral National Seashore	R208 – R210	III
Canaveral National Seashore	R210 - V337	Not Available





# Hurricanes Ian and Nicole Impact Report

**\*Hurricanes Ian and Nicole Post-Storm Impact Report is available on the department's web page at the following link below:**

**\*The Final Report with the survey data will be posted in February or March.**

**\*Links to the aerial videography and aerial photos are in the report**

**<https://floridadep.gov/rcp/coastal-engineering-geology/documents/hurricane-ian-hurricane-nicole-preliminary-post-storm>**

*Hurricane Ian & Hurricane Nicole  
Preliminary Post-Storm Beach Conditions  
and Coastal Impact Report*

Office of Resilience and Coastal Protection  
Florida Department of Environmental Protection  
December 2022





# Contact Information



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