

Hurricanes Irma and Maria: Damage to Observing Infrastructure Impacts Safety

Hurricanes Irma and Maria wreaked havoc on the Southeast U.S. and Caribbean regions. Storm surge flooded towns and high sustained winds removed roofs. Citizens in the hurricanes' paths were dependent on real time reporting of each storms' catastrophic conditions.

Data from observing infrastructure is used by the US Coast Guard, weather forecasters and other emergency response managers to save lives.

Buoys, coastal stations, high frequency radar and other observing technologies transmit data – such as wind speed and wave height – in near real time.

The Southeast Coastal Ocean Observing System (SECOORA) supports observing infrastructure including real-time systems that report storm conditions.

“The timeliness of credible data is critical to the National Weather Service (NWS) and its mission to protect life and property... Data sources used by the NWS are diverse... However, it is the ground truth data from observational platforms such as the [SECOORA funded] USF COMPS buoys and coastal stations that provide us with necessary data to warn the public.”



Brian LaMarre
Meteorologist-in-Charge
NOAA Gulf of Mexico Regional Collaboration Team Lead

Damages to Ocean Observing Assets

Observing assets are critical to mariners, ports, and other stakeholders that live and work at or near the coast. SECOORA has conducted damage assessments of this critical infrastructure that informs us as to whether our ocean 'highways' are safe for work and recreation.

Unfortunately, like other infrastructure in the storms' paths, ocean observing assets have been damaged and must be repaired to keep people safe along coast and at sea.

Total Damages from Irma and Maria	
High Frequency Radar	\$830,056
Buoys	\$156,637
Coastal Stations	\$23,563
Total Damage to SECOORA Assets	\$1.01 million

Supplemental funding should be directed to the IOOS Regional Observation budget line under the Navigation, Observations and Positioning program in NOAA's National Ocean Service.

High Frequency Radar



Land-based high frequency radar (HFR) provides real-time information on the speed and direction of surface currents over a large coverage area. This information is used for US Coast Guard search and rescue operations and by emergency managers to track oil or other hazardous materials and harmful algal blooms.



The storm caused damage to 60% of the SECOORA HFR system. Nine out of 15 HFRs are non-operational or operational but in need of repairs. Beach erosion and flooding impacted HFR cable integrity and computer system enclosures. For example, SECOORA's Dania Beach site near Miami needs new cables to provide power to the HFR array.

Buoys and Coastal Stations




Buoys moored in our coastal and offshore waters hold a variety of sensors. They measure conditions such as wind speed, gust, and direction, air temperature, water temperature, and wave height. Weather models, such as those that forecast hurricane track and intensity, assimilate data from these sensors. Similarly, coastal stations are installed along the coastline to measure water level and storm surge.

Data from buoys and coastal stations validate and improve model predictions, including storm surge models, wave height models, and storm tracks. Only 9 of 18 SECOORA buoys and coastal stations are operating at full capacity, which increases the potential for loss of life during emergencies.

Prior to being damaged, SECOORA coastal stations and buoys captured high wind gusts* along Hurricane Irma's path.


Capers Nearshore (CAP2) (NBDC 41029)

55 mph 
 Offshore 15 miles, NE of the Charleston Harbor Entrance
 September 11, 2017 1:00 PM EDT
 UNCW CORMP / SECOORA / US IOOS


Fripp Nearshore, SC (FRP2) (NBDC 41033)

54 mph 
 Offshore 8.5 miles, SE of Fripp Inlet, South Carolina
 September 11, 2017 8:00 AM EDT
 UNCW CORMP / SECOORA / US IOOS

Greys Reef NMS (NBDC 42013)

60 mph 
 Offshore 46 miles, SE of Savannah, Georgia
 September 11, 2017 4:50 AM EDT
 UGA / NBDC / SECOORA / NOAA OAP

Shell Point Coastal Station

56 mph 
 Shell Point, FL
 September 11, 2017 8:00 AM EDT
 USF CMS COMPS / SECOORA / US IOOS

Aripeka Coastal Station

45 mph 
 Aripeka, FL
 September 11, 2017 5:54 AM EDT
 USF CMS COMPS / SECOORA / US IOOS


Fred Howard Park Coastal Station

84 mph 
 Fred Howard Park - Tarpon Springs, FL
 September 11, 2017 1:18 PM EDT
 USF CMS COMPS / SECOORA / US IOOS

C12 Buoy (NBDC 42022)

71 mph 
 Offshore 70 miles, SW of St. Petersburg, Florida
 September 11, 2017 1:00 AM EDT
 USF CMS COMPS / SECOORA / US IOOS


Clam Bayou Coastal Station

52 mph 
 Clam Bayou - Gulfport, FL
 September 11, 2017 1:00 AM EDT
 USF CMS COMPS / SECOORA / US IOOS


C10 Buoy (NBDC 42013)

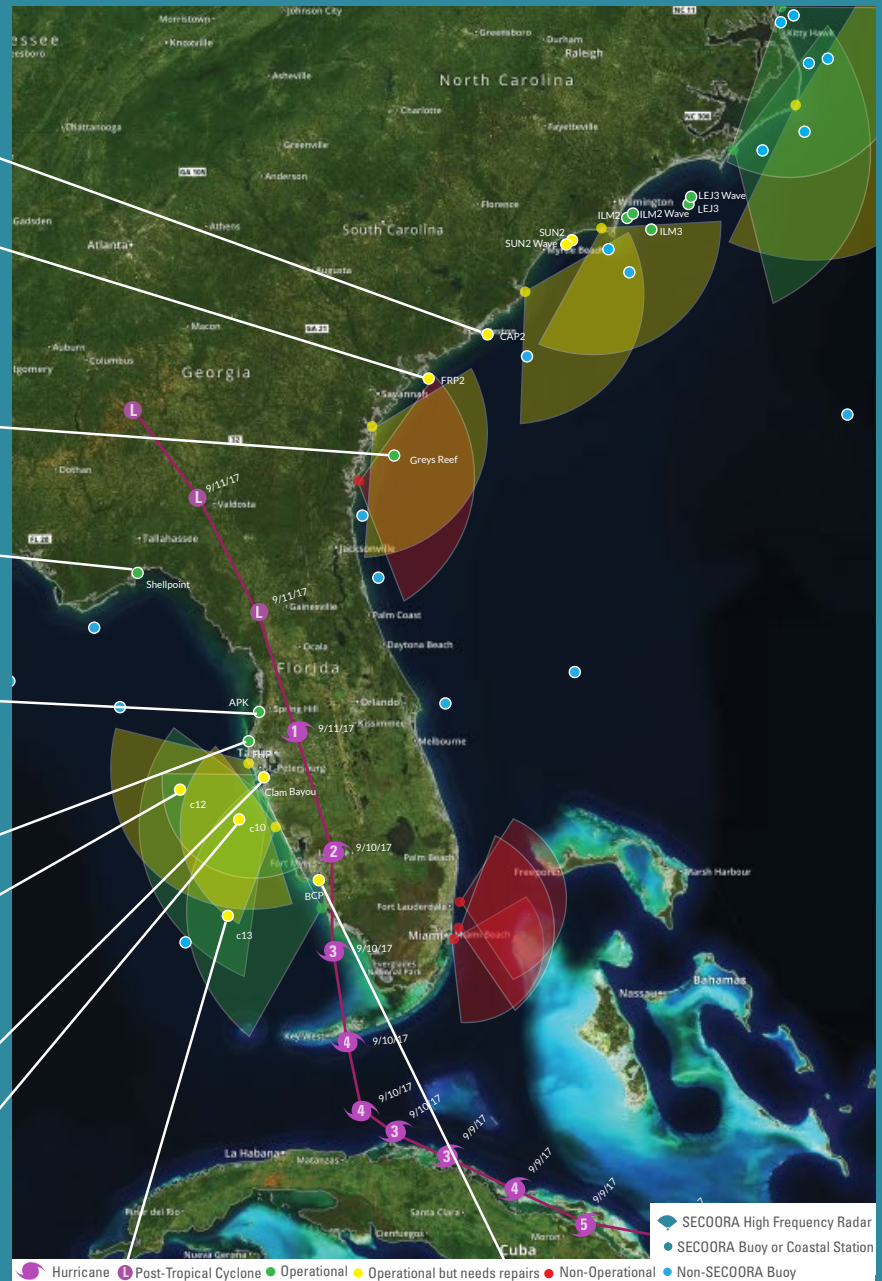
81 mph 
 Offshore 27 miles, SW of Sarasota, FL
 September 11, 2017 2:00 AM EDT
 USF CMS COMPS / SECOORA / US IOOS

C13 Buoy (NBDC 42023)

67 mph 
 Offshore 86 miles, SW of Fort Myers, Florida
 September 10, 2017 4:30 PM EDT
 USF CMS COMPS / SECOORA / US IOOS

Big Carlos Pass

115 mph 
 Big Carlos Pass, FL
 September 10, 2017 6:00 PM EDT
 USF CMS COMPS / SECOORA / US IOOS



*Only listing SECOORA stations that captured wind gusts 45 mph or over.

SECOORA, a 501(c) (3) nonprofit, coordinates coastal and ocean monitoring activities in the southeast United States in partnership with NOAA, U.S. Integrated Ocean Observing System (IOOS) and a number of other public and private interests. U.S. IOOS is essentially the weather service for the coastal oceans and Great Lakes, providing the ability to “see” what is happening both above and below the ocean surface and making that information readily available.

More Information



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