Impact of Hurricane María on the Sandy Coast of Rincón, Puerto Rico

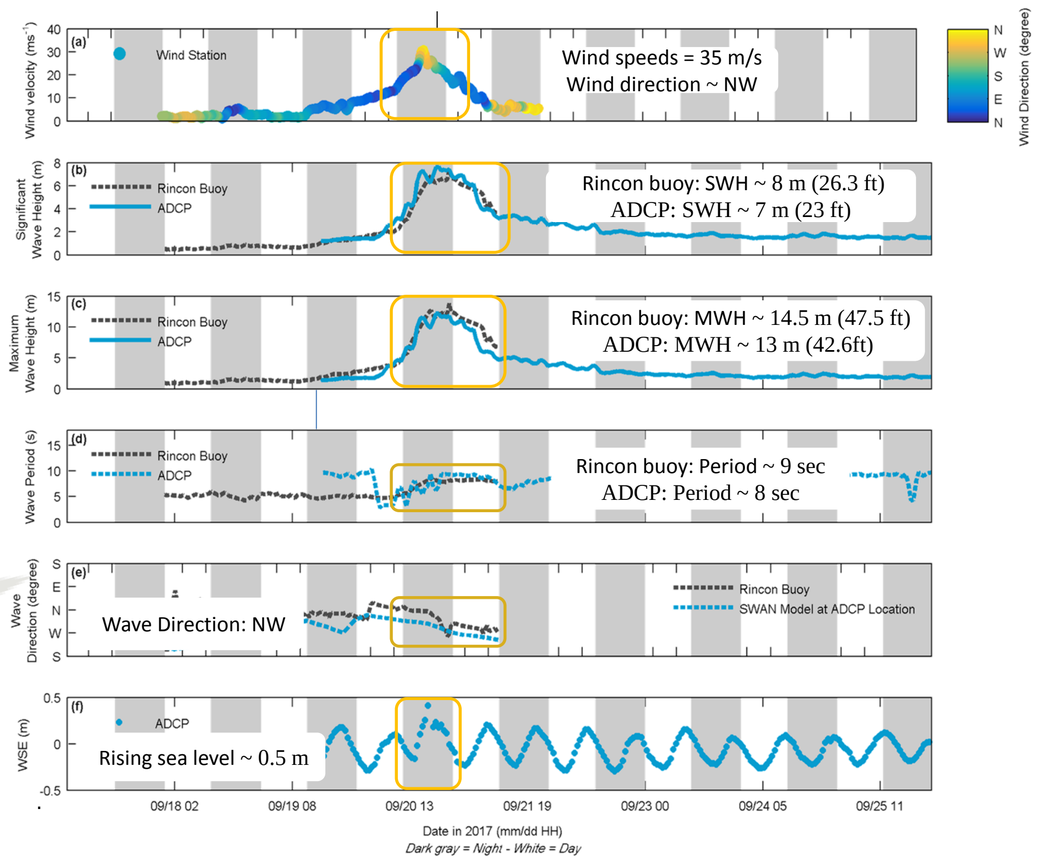
Edward Cruz García[1,3](edward.cruz1@upr.edu), Patricia Chardón-Maldonado[2,3], Peter Rivera[1,3], Miguel Canals[2,3], Sylvia Rodríguez[2,3]

[1]Department of Civil Engineering, University of Puerto Rico at Mayagüez
[2]Caribbean Coastal Ocean Observing System, University of Puerto Rico at Mayagüez
[3]UPRM Center for Applied Ocean Science Engineering, Department of Engineering Science and Materials

On September 20, 2017, Hurricane María made landfall in Puerto Rico, causing severe damage across the island and the mete-ocean conditions caused coastal erosion along the 700 miles of coastline. This coastal problem was more severe in the western region of Puerto Rico, particularly along the coast of Rincón.

On September 19, 2017, an Acoustic Doppler Current Profiler (ADCP) was deployed near Villa Cofresí to record the hydrodynamic conditions during the storm. The data collected by the ADCP was then compared with the data from CARICOOS Rincón buoy, to identify the wave conditions along the coast of Rincón. Beach profiles were collected to quantify the morphological changes caused by the storm.

The peak wave and wind conditions recorded by CARICOOS wind station, buoy, and ADCP are marked by the yellow rectangles.



WIND AND WAVE CONDITIONS

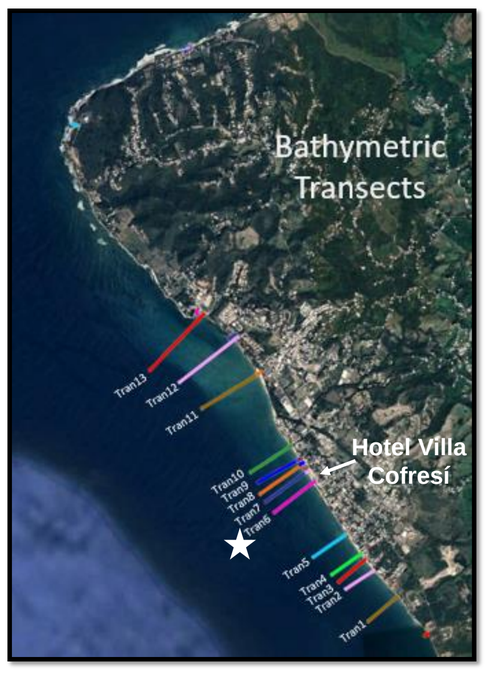
BEACH PROFILES

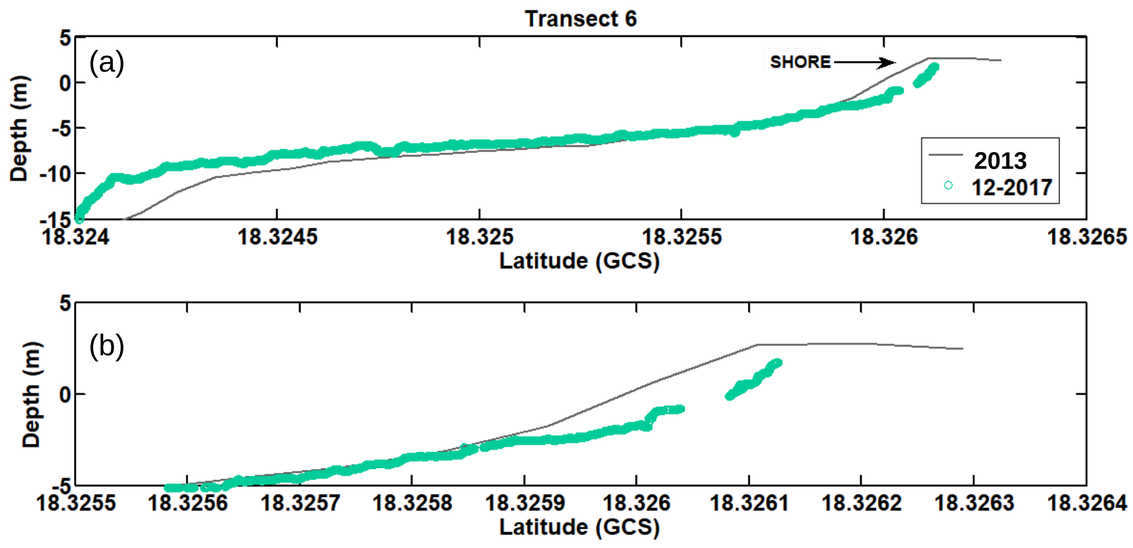
DAMAGE TO INFRASTRUCTURE

ABOUT

Severe structural damage was observed along the south coast of Rincón. Scour of foundations and retaining walls were due to the direct impact of the waves causing the partial and/or complete failure of structures.

Thirteen beach profiles along the coast of Rincón have been collected since Hurricane María to quantify the nearshore morphological changes and to link the nearshore processes responsible for the quantified variability. Transect 6 is shown as an example to explain the morphological changes induced by the storm.





Comparison between the 2013 baseline beach profile (grey line) and post-storm beach profile (green circles) from (a) deep water to shore and (b) shallow water to shore.

- Storm waves coming in from a westerly/southwesterly direction generated offshore sediment transport (erosion) along the coast of Rincón.
- Significant sand deposition was observed between 200 to 350 meters away from the coast.