

DESIGN AND PLANNING OF A RAPID-RESPONSE HURRICANE WAVE AND STORM SURGE MEASUREMENT SYSTEM

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ABSTRACT

Hurricane waves and storm surge pose a threat to the well being of human populations as well as the natural and built environments, yet the quality of their measurements is often incomplete or inadequate. Tide and wave gauges can be hundreds of miles apart and can fail during hurricanes, conditions they are not designed to handle. Field surveys following hurricanes provide much useful data, but high water marks are often minimum estimates and it is difficult to accurately infer the change in water levels with time. In addition, most data collected focuses on inundation distances and surge heights over land, while data is sparse in the nearshore environment. Self-recording pressure gauges sunk about a mile offshore prior to landfall pose a novel solution to this problem. Before hurricane landfall, a rapid response team can be launched to deploy pressure gauges based on the projected hurricane path. Subsequent retrieval and traditional post-disaster reconnaissance surveys will follow. The high memory capacity of these gauges allows measurements to be made at extremely short intervals, making wave analysis possible. The presence of high quality wave and storm surge data taken from the actual disaster areas will allow hydrodynamicists to refine their approaches and aid in predicting the extent of future storms. With this information structures can be engineered to better withstand hurricane forces and better evacuation zone maps can be prepared.

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