

APPLICATION OF HIGH RESOLUTION SATELLITE IMAGERY TO ASSESS STORM TIDE-RELATED FLOODING

N. Chaouch^{*a b} M. Temimi^{a b} S. Hagen^c S. Medeiros^c R. Khanbilvardi^{b a}

^b NOAA-CREST, Civil Engineering, 140@Convent ave, 10031, New York, United States

^a City university of New York/City college, Civil engineering, 140th St
@ Convent Ave, Steinman Hall (T109), 10031, New York, United States

^c University of Central Florida, Civil and Environmental Engineering,
4000 Central Florida Boulevard, 32816, Florida, United States

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ABSTRACT:

The overall goal of this study is to demonstrate the efficacy of employing high resolution satellite imagery to improve coastal inundation models employed by NOAA, USACE, and FEMA. A change detection approach has been adopted to determine the coastal flood wetting front. It consists of comparing two Radarsat 1 images acquired under two extreme conditions. The delineation of flooded areas is not straightforward because of the possible similarity between land and coastal water backscatters particularly under windy conditions. The application of appropriate filters is therefore necessary to allow for a better identification of inundated areas. A multi-temporal image enhancement technique was applied to delineate flooded areas. This technique assigns red, green and blue color to two different black and white SAR images covering the same scene and acquired at two different dates. One image should illustrate normal conditions while the other should correspond to the flood event. The hue of the color in the obtained composite image indicates the date of the change while the intensity of the color represents the degree of change. The methodology was applied to Tampa and Apalachicola zones located in western Florida. The obtained images clearly display flooded areas under high tide and post hurricane conditions. The intensity of the red color corresponding to inundated areas represents the severity of the flood. These preliminary results show that satellite imagery has a great potential in coastal flood monitoring. The product of this work is being ingested into a coastal hydrodynamic model to improve its performance.

TOPIC: Change detection and process modelling

ALTERNATIVE TOPIC: Microwave remote sensing