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Observation and Modeling of the Evolution of an Ephemeral Storm-Induced Inlet: Pea Island Breach, North Carolina, USA

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Abstract

The Outer Banks of North Carolina is a wave-dominated barrier island system that has experienced the opening and closure of numerous inlets in the last four centuries. The most recent of those inlets formed after the breaching of Pea Island during Hurricane Irene in 2011. The Pea Island Breach experienced a rapid evolution including episodic curvature of the main channel, rotation of the ebb channel, shoaling, widening by Hurricane Sandy in 2012, and finally closing before the summer of 2013. Studying the life cycle of Pea Island Breach contributes to understanding the behavior of ephemeral inlets in breaching-prone regions. This topic has gained relevance due to rising sea levels, a phenomenon that increases the chances of ephemeral inlet formation during extreme events.