

Pock marks in the nearshore and their relationship to forcing conditions and lunate megaripple genesis

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Previous bedform research has described different ripple types forming in varying hydrodynamic conditions, providing a partial basis for using ripple geometry within sedimentary rocks to infer the paleoenvironmental conditions during the ripple formation. However, real-time observations of ripple characteristics during active transport conditions associated with storm events are lacking. During the 1997 SandyDuck'97 nearshore dynamics experiment at the U. S. Army Engineers Waterways Experiment station's field research facility at Duck, North Carolina, rotary fan beam sonars were used to collect centimetre-resolution images of the sea floor within and near the surf zone. In these images, curious depressions

were observed to form in the seabed during storm growth and decay. These "pock marks" have horizontal scales of 10-30 cm and appear to form in a specific range of wave orbital velocity amplitudes. The purpose of this project is to determine the relationship between pock marks and their hydrodynamic forcing conditions. This was accomplished by studying their physical and time characteristics such as size, shape, and duration of existence, and relating these to flow energy and bottom shear stress. Also studied is the mode of formation of the pock marks (i.e. shell/pebble nucleus) and their connection to lunate megaripple genesis.