



Coastal morphodynamics affected by beachrocks: observations from selected beaches in Jamaica, W. I.

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Effects of beachrocks on wave and coastal morphodynamics are not at this time known. However, since more beachrocks are becoming exposed with sea level rise and erosion it is important that we try to understand and quantify the processes in order to inform and fine-tune temporal models of beach response to daily coastal processes and storm events.

The observations of wave morphodynamics at some Jamaican beaches represent a new class of beach that probably operates outside the bounds of existing morphodynamical models. Beaches affected by beachrocks in Jamaica depict a heightened backwash resulting in faster scouring and erosion. This scouring and erosion results in loss of sediment seaward.

Beachrock when buried does not directly affect waves but indirectly affects the backwash by changing the porosity of the beach body. This change will negatively affect the drainage regime, by reducing the infiltration potential of the swash and increasing the backwash.

Alternately, when beachrocks are exposed waves are directly affected; in early stages of exposure, beachrock appears to be a buffer and protects the beach from erosion by reflecting and refracting waves. Sediment is often build up behind the beachrock. However, after prolonged exposure, the opposite is seen where the beachrock is isolated, and the profile of the beach is lowered as most of the sediment is loss and physical features of erosion persist such as scarps, and scour lagoons behind the beachrock on the shore-face.

The beach profile may become compartmentalised, where different sections of the beach may act independently inside lateral cells. Backwash along the profile is intensified, due to the low swash absorption of sediments (low infiltration due to reduced porosity of the beach) resulting in an increase of sediment transport offshore, particularly in moderate to high-energy conditions. Over time, shore parallel and shore perpendicular channels develop that increase the carrying capacity of beach drainage and sediment is lost from the beach in high energy conditions through the movement of waters and entrained sediments in these channels.

The observations of these variations in wave morphodynamics and sediment responses are presented here to stimulate a discussion of the importance and methods that can be undertaken to adequately quantify these processes.