

Anegada Island, British Virgin Islands: a case study of beach ridges

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Miss Anna Lisa Cescon was awarded a Postgraduate travel grant to attend the 8th International Conference on Geomorphology in Paris (August 2013). There she presented a talk and a poster on her ongoing PhD research in coastal geomorphology. The attendance at the conference was really valuable for the grant holder as it was her first international conference.

The research aims to provide a better understanding of beach ridge landforms. Beach ridges occur worldwide in a variety of environmental settings. However their definition and formative processes are still under debate (e.g. Scheffers *et al*, 2012; Tamura, 2012). Of particular interest is their poorly studied sedimentological structure (Tamura, 2012).

Anegada Island (British Virgin Islands) contains a 6 km² beach ridge plain with north and south-facing components. The northern (Atlantic-facing) plain has around 25 ridges while the southern plain (Caribbean-facing) has about 15 ridges. Since 1953, eight storm events were recorded crossing over or close-by Anegada but no tsunami events have occurred since 1755. The only source of the beach sediments is the fringing coral reef that surrounds the island. The isolated site position is an opportunity to study beach ridge formation without influence from other sediment sources.



Figure 1: Anegada beach ridge plains highlighted over a 2002 aerial photo set.

Based on six sets of historical aerial photos and a satellite image between 1953 and 2009 the beach ridge plain geometry and the temporal evolution of the shoreline have been studied. Accretion up to 50 m has occurred at some locations along the north coast within this study period. Strong longshore drift has been identified along this northern shore. The southern beach ridge plain is more complex than the northern one and historical analysis shows that the south shore has been reworked many times between 1953 and 2009. Of particular interest is the impact of Hurricane Donna crossing over the island in 1960. The relationship between storms and beach ridge genesis was discussed at the conference.

The sedimentology of the beach ridges was also presented from the data collected during field work in November 2012. Anegada's beach ridges are composed of fine-medium sand with extremely rare pebbles. The lack of macro-size shells in the stratigraphy renders radiometric dating problematic. The shoreline change study allows recent deposition processes and rates to be quantified.

A poster was presented at the conference focusing on a mapping exercise that used Google Earth© to identify beach ridge sites on all islands of the Greater Caribbean. More than 200 sites with a minimum of two beach ridges were observed in the Greater Caribbean.

Work cited

Scheffers, A.; Engel, M.; Scheffers, S.; Squire, P. & Kelletat, D. 2012. Beach ridge systems – archives for Holocene coastal events? *Progress in Physical Geography*, 36, pp. 5-37

Tamura, T. 2012. Beach ridges and prograded beach deposits as palaeoenvironment records. *Earth-Science Reviews*, 114, pp. 279-297