Sedimentological evidence of tsunamis and hurricanes on Anegada (British Virgin Islands)

Michaela Spiske
1. Staatliches Museum für Naturkunde Karlsruhe, Germany
2. Universität Basel, Switzerland

Monday, 15 March 2021
Anegada (British Virgin Islands) is a low-lying island, located 120 km south of the Puerto Rico Trench. Sedimentary archives on Anegada document evidence of two tsunamis that affected the island. The younger event corresponds to the trans-Atlantic 1755 Lisbon tsunami. The older event has a regional source and occurred during pre-Columbian times (1200–1480 AD).

The pre-Columbian event inundated almost the entire island from north to south. Dune ridges were breached and large volumes of lagoonal, beach and dune sand were transported inland. Sheets of mainly marine sand with conches and articulated shells cover the limestone platform and are also found in the salt ponds. Large coral boulders were ripped off the coral reef and transported as far as 1.5 km on land. Slabs of the Pleistocene limestone platform were eroded from onshore point sources and scattered as elongate boulder fields. The best-fit earthquake scenario for this tsunami event is a thrust earthquake in the Puerto Rico trench with a magnitude of ~8.45.

The island is also prone to hurricane inundation. The most recent inundation was caused by a category 5 hurricane in 2017. The storm surge caused substantial coastal erosion, but also deposited thick laminated sand sheets. A pre-existing coarse-clast rubble ridge was completely reworked and medium-sized onshore boulders were moved.