

## **New applications of petrographic and geochemical techniques to Lucayan archives**

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Testing hypotheses that draw causal links between human adaptation, climatic change, and landscape evolution requires robust, well-dated records of past human behavior and environmental change. The Turks & Caicos Islands (TCI) are an ideal natural laboratory at the intersection of these areas thanks to their geomorphology and history of human inhabitation. The TCI are low-lying carbonate islands at the southeastern terminus of the Bahama archipelago in the north Atlantic Ocean. Indigenous Lucayan Taino settlement of the TCI spans seven centuries and includes multiple waves of migration, ceramic styles, and a high degree of cultural diffusion. Initial migration into the TCI from the Greater Antilles occurred in the 7th century AD and is hypothesized to relate to broader climatic change during the Medieval Warm Period.

This presentation will discuss the current state of Holocene chronologies from the TCI—both archaeological and geological—which are currently critically limited by the inherent difficulty of translating radiocarbon (<sup>14</sup>C) measurements into precise, robust ages. We will give an update on our efforts to more precisely date Lucayan sites and constrain a marine <sup>14</sup>C reservoir correction for the TCI by using <sup>14</sup>C and U-Th dating in tandem. Since 2016, we have been investigating a small TCI island, Little Ambergris Cay, which has yielded rich <sup>14</sup>C and sedimentological datasets showing how and when the island formed and grew. Our results indicate that the island grew throughout the period of Lucayan inhabitation, and we present here evidence for Lucayan use of the island. Lucayan artifacts are found lithified as part of beach aeolianites on the island, an under-considered mode of preservation. This presentation will leverage recent results from *in situ* beachrock formation experiments to explicate the mode of formation and probable extent of this unusual archive across the TCI.