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Environmental and hydrological changes in coastal tropical wetlands over the Holocene: a case study from Crooked Tree, Belize

Virtual Paper Abstract

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Keywords: geoarchaeology, paleoenvironmental change, geomorphology, paleoecology, remote sensing
Abstract Type: Virtual Paper Abstract

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Abstract

In the Maya Lowlands of Belize, Guatemala, and Mexico, wetlands have played a crucial role as vital resources throughout human history. Today, these wetlands continue to function as significant ecosystems and cultural heritage zones, though they are threatened by sea level rise and anthropogenic climate change. Our ongoing research focuses on the reconstruction of both natural processes and human interventions that have occurred in riparian and coastal wetlands in Belize. Decades of fieldwork and remote sensing efforts have transformed our understanding of wetland paleoecology, system response to regional climate perturbations, and human resource use. In some places, multiple proxies suggest widespread landscape and hydrological changes began occurring within wetlands during the latter half of the middle Holocene. Since then, continued management for multiple purposes has occurred throughout drought cycles as well as societal changes within the region. This paper focuses on two main goals: First we review and build on past multiproxy efforts to reconstruct the geomorphology and human history across varied wetlands in the Maya Lowlands. Through this, we synthesize previous datasets and records with new information and proxies, with the goal of providing new insights into regional wetland use and change over the Holocene. Second, we introduce new and ongoing records collected in the most recent field seasons in the Crooked Tree wetlands of coastal Belize, building on a more spatially diverse dataset across Belize. Methods discussed in this paper include results from lidar survey, as well as multiproxy wetland reconstruction using sediment geochemistry and paleoecology.