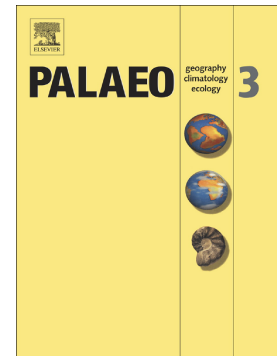


## Accepted Manuscript

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## Organic matter sources and lateral sedimentation in a Bahamian karst basin (sinkhole) over the late Holocene: influence of local vegetation and climate

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### Abstract

Karst basins (e.g., blueholes, sinkholes) accumulate well-preserved sedimentary successions that provide transformative paleoclimatic and paleoenvironmental information. However, the sedimentary processes within these basins are not yet fully understood. Here we present stable carbon isotopic values ( $\delta^{13}\text{C}_{\text{org}}$ ) and C:N ratios of bulk organic matter in well-dated sediment cores from Blackwood Sinkhole (Abaco, The Bahamas) to investigate the changing flux of organic matter into the sinkhole during the late Holocene. The provenance of preserved organic matter changed through the late Holocene between three primary sources, as determined by three-endmember mixing modeling: wetland organic matter from the adjacent epikarst surface, authigenic primary productivity in the oligohaline meteoric lens, and terrestrial organic matter from the surrounding landscape. Expansion of wetlands on the adjacent epikarst surface played a critical role by increasing the flux of wetland organic matter to the sinkhole, especially during the last 1000 years. Hurricanes and regional rainfall may have mediated organic matter delivery to the benthos, either through hampering wetland development (prior to 1000 cal yr BP) or by changing dissolved nutrient concentrations available in the basin for primary producers. These results demonstrate that organic matter provenance in karst basins is not constant through time, and is significantly dependent upon both landscape vegetation on the epikarst surface and changing hydrographic conditions that impacts nutrient availability to primary producers.

**Keywords:** Stable isotopes, mixing model, karst, subtropical landscape, Caribbean

### 1. Introduction

The sediment in karst basins (e.g., sinkholes, blueholes) provides useful paleoclimate and paleoecological information from carbonate landscapes. In general, the Holocene parasequence on North

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