

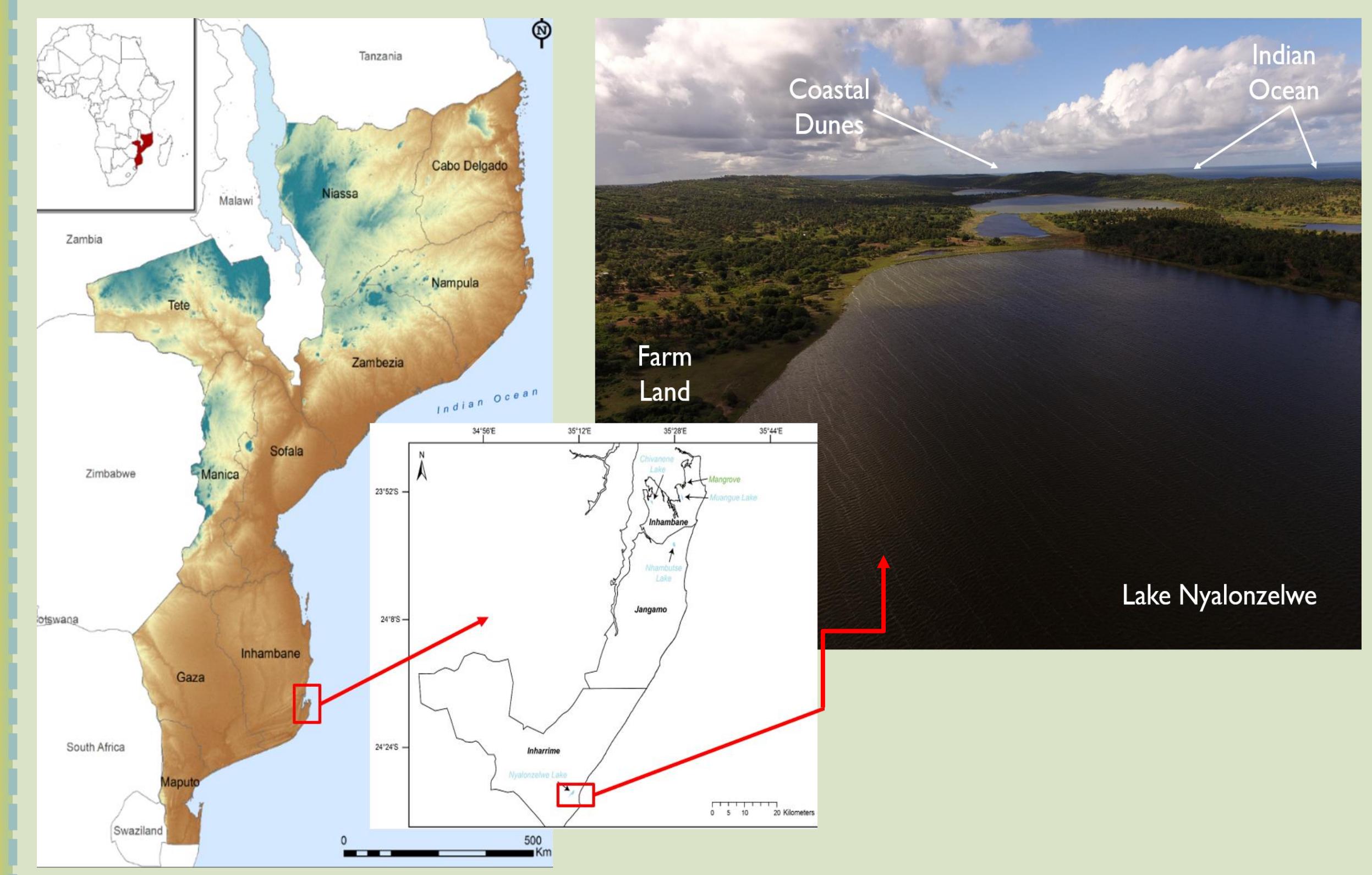
Biogeochemical analysis of newly dated lacustrine cores: a first look at Quaternary paleoenvironment in coastal Mozambique



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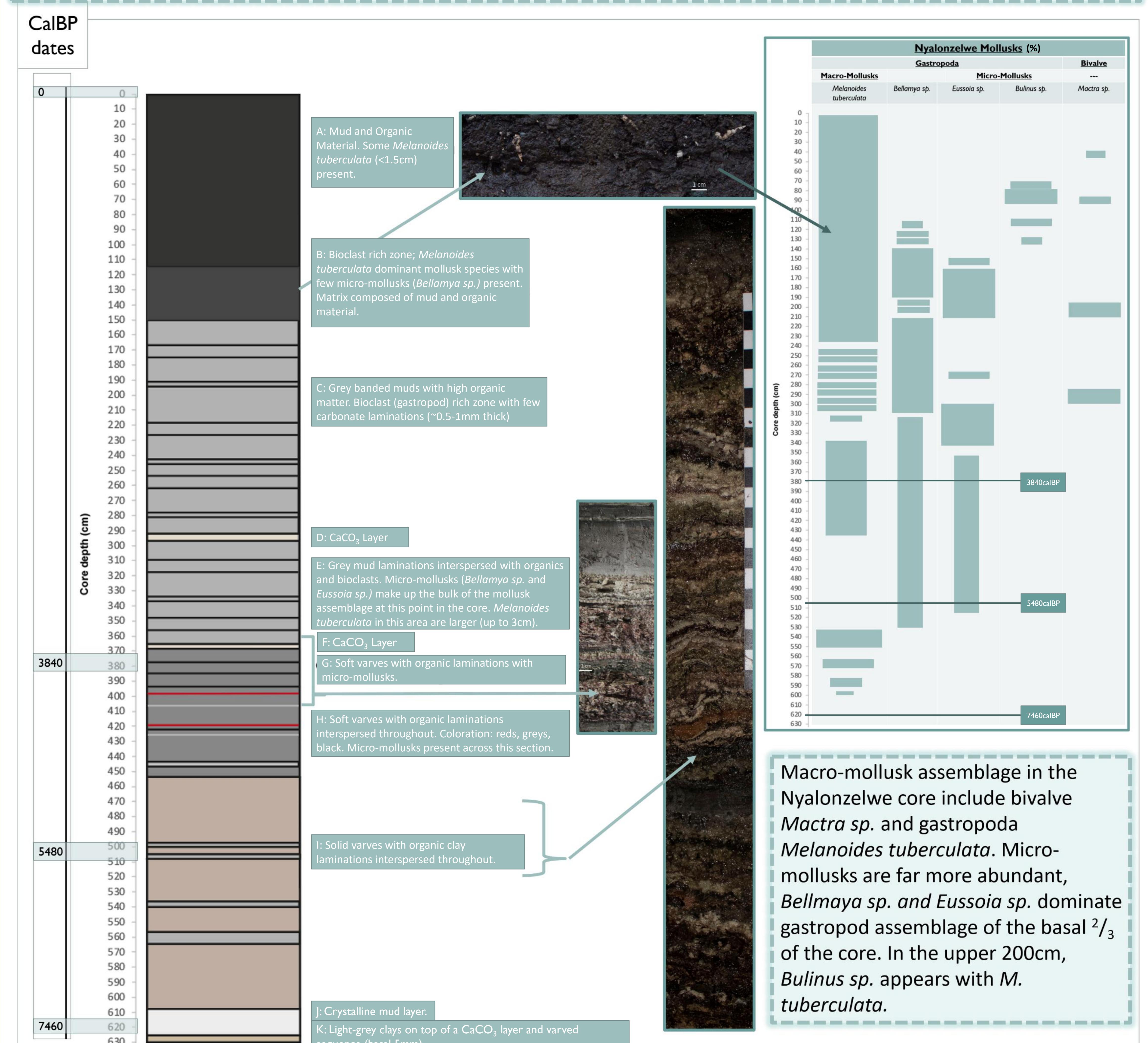
Study Objectives: In order to better quantify the role of climate variability in southeastern Africa, and its impact on the spread of anatomically modern humans, our international and interdisciplinary team cored a series of coastal lakes during the summer of 2019. This work seeks to present the results of Carbon, Hydrogen, Nitrogen (CHN) elemental analysis, and mollusk species distribution from lake Nyalonzewa, one of many interdunal lakes present along the coast in the Inhambane region of southeastern Mozambique. Together these data represent a first look at late Quaternary paleoenvironmental evolution in southeastern coastal Mozambique, the importance of climate (in)stability in the region, and its impact on modern human populations.

Study Area: Lake Nyalonzewa sits 5m above MSL and is bounded by a coastal dune system, reaching between 29-121m in elevation, protecting the lake from the Indian Ocean. In the Inhambane province, a series of Pleistocene sand-dunes are cut by fluvial and elongated lagoon depressions, preserving the orientation of the original dune system formed along a migrating shoreline.

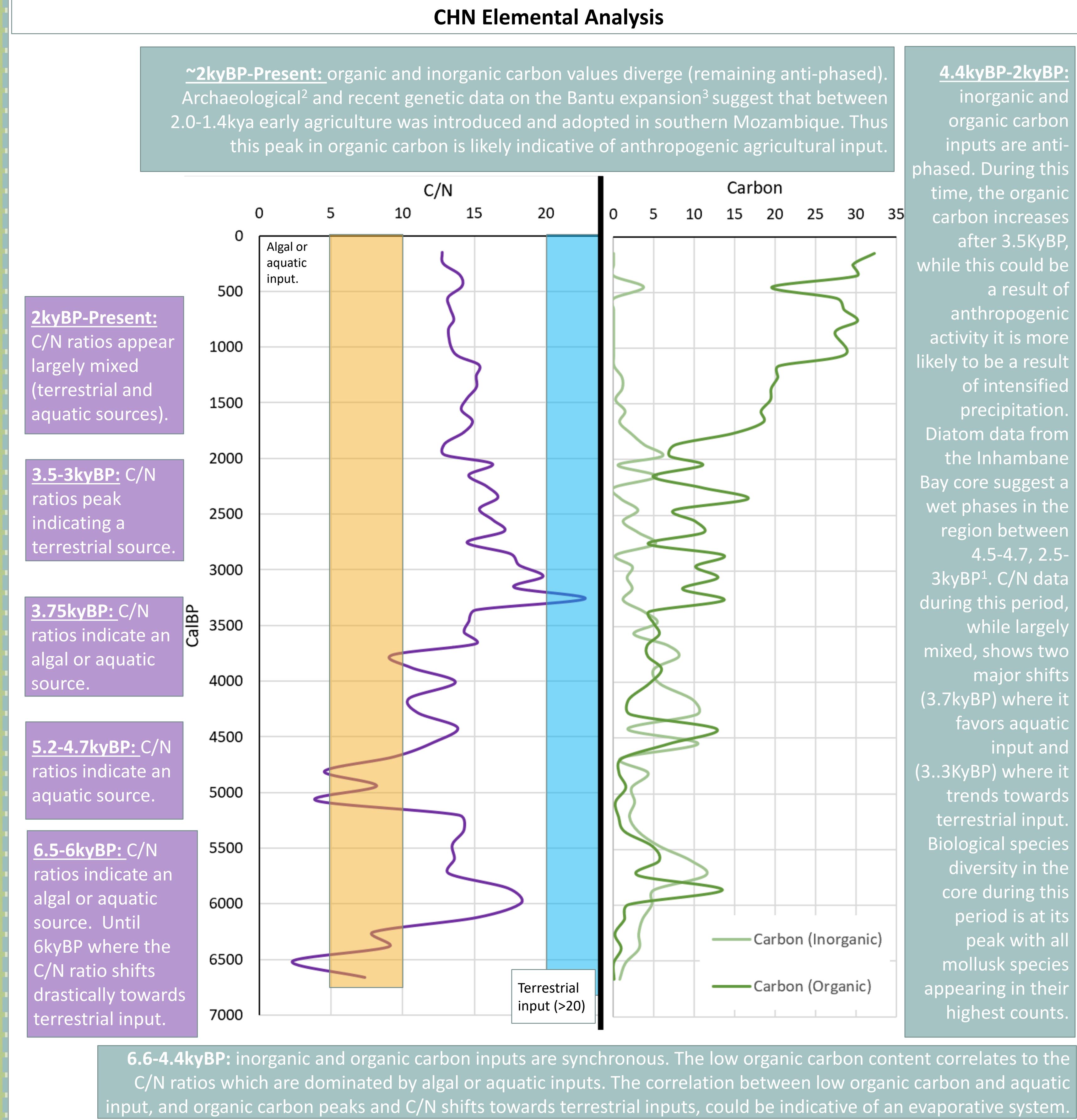


Methods: Two cores, C1 and C4, with depths of 6.12m and 6.23m respectively, were collected for multiproxy biogeochemical analyses and C¹⁴ dating using a Livingstone corer. CHN analysis was conducted using an Elementar model Vario EL III at the University of Algarve CCMAR for both organic and inorganic carbon present in sediment samples from C1. Nyalonzewa cores C1 and C4 are stratigraphically correlated.

Nyalonzewa Core Stratigraphy: The sedimentological record of Nyalonzewa presents over 6m of stratigraphic variability, including a varve sequence spanning the basal 2m. The oldest date on the core is 7460calBP.



Findings:



Future Research: Due to laboratory closures as a result of COVID-19, we were unable to complete the FT-IR analysis of Nyalonzewa mollusks. Future research for this project will include: (1) completion of Aragonite Calcite ratios of Nyalonzewa Mollusks, (2) stable Isotope analysis of Gastropods and bulk sediment to complete paleo-precipitation reconstruction, and (3) TEX86 analysis of bulk sediment samples for paleotemperature reconstruction.

¹Gomes et al. (2019). Quaternary Paleoenvironmental Changes in the Inhambane Bay (Southeastern Mozambique). 84th Annual Meeting of the Society for American Archaeology, Albuquerque, USA. tDAR-ID: 452014.
²McWethy et al. (2016). Late Quaternary vegetation development and disturbance dynamics from a peatland on Mount Gorongosa, central Mozambique. Quat.Sci.Rev.37: 221-233.
³Semo et al. (2019). Along the Indian Ocean Coast: Genomic Variation in Mozambique Provides New Insights into the Bantu Expansion. Mol.Biol.Evol.37(2):406-416.