From Sea to Little Karoo: Tracking the paleo-landscape inhabited by the first modern humans

Exploring the coastal landscape evolution of the Agulhas Plain during the Middle Stone Age (120-50 ka).

UNIVERSITAS BERGENSIS

SapienCE — CENTRE FOR EARLY SAPIENS BEHAVIOUR — UNIVERSITY OF BERGEN

SNWR — SANBONA NATURE AND WILDERNESS RESERVE NPC

Kurt Heinrich Wogau Chong
kurt.chong@uib.no
Department of Earth Science
SapienCE
SEAS

Background and motivation

My name is Kurt Wogau. I´m a Mexican geologist. My investigation line refers to the study of paleolandscape evolution and geoarchaeology during the Pleistocene and the Holocene. I use sedimentary records, such as lake sediments, fluvio-lacustrine sequences, and sea sediments for these proposes. My main research motivation involves the analysis of the complex relationship between human-landscape, especially for hunter-gatherer groups and stratified societies, such as Mesoamerican cultures.

Project description

The South African coastline hosts archaeological sites related to the hominid evolution and the first modern humans. This region has been strongly shaped by a series of sea level fluctuations resulting in multiple exposures of South Africa's continental shelf. However, there is limited knowledge regarding the main paleoclimatic drivers behind sea level variability and the presence and distribution of Early to Late Stone Age open-air sites in the continental interior. Our research aims to uncover the trigger mechanism linked to sea transgressive and regressive phases during the Middle Stone Age period (120-50 ka) and its impact on the coastal landscape. Moreover, our research aims to study the distribution and evolution of paleowetlands systems and their possible implications with the dynamics of the Early to Late Stone Age hunter-gatherers groups in the continental interior.

Main questions

What were the main drivers behind sea level variability in the South African coastline during the Middle Stone Age?
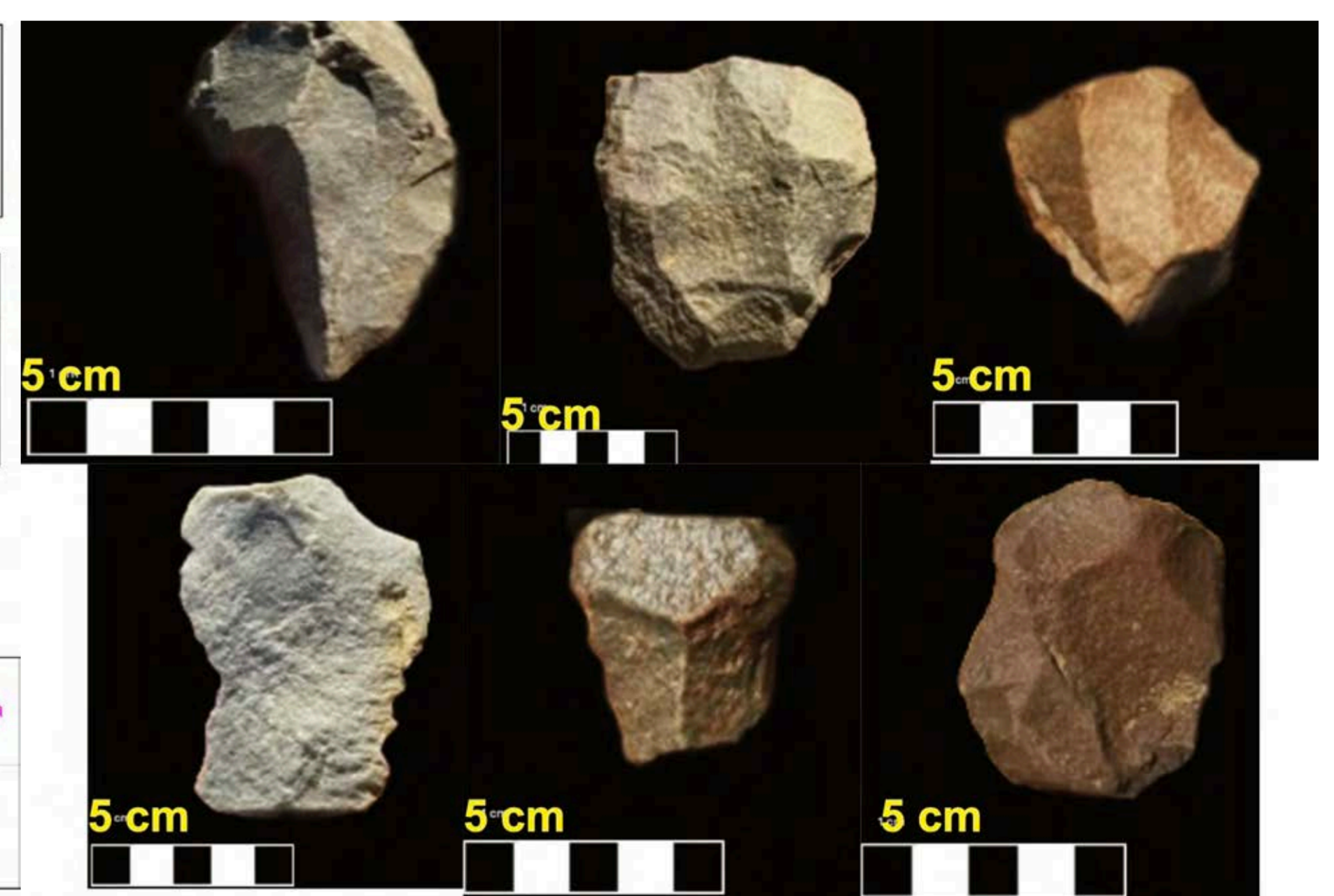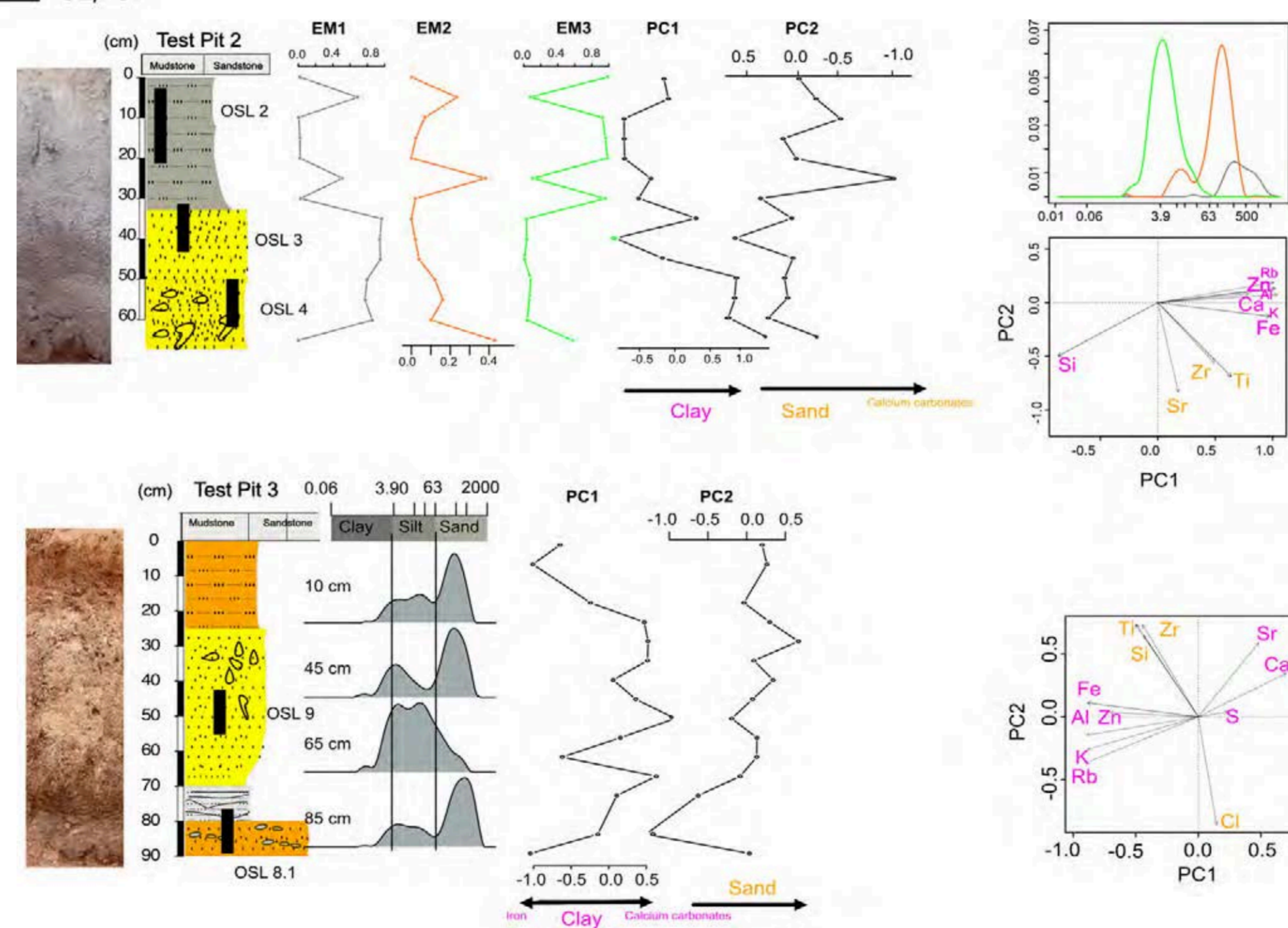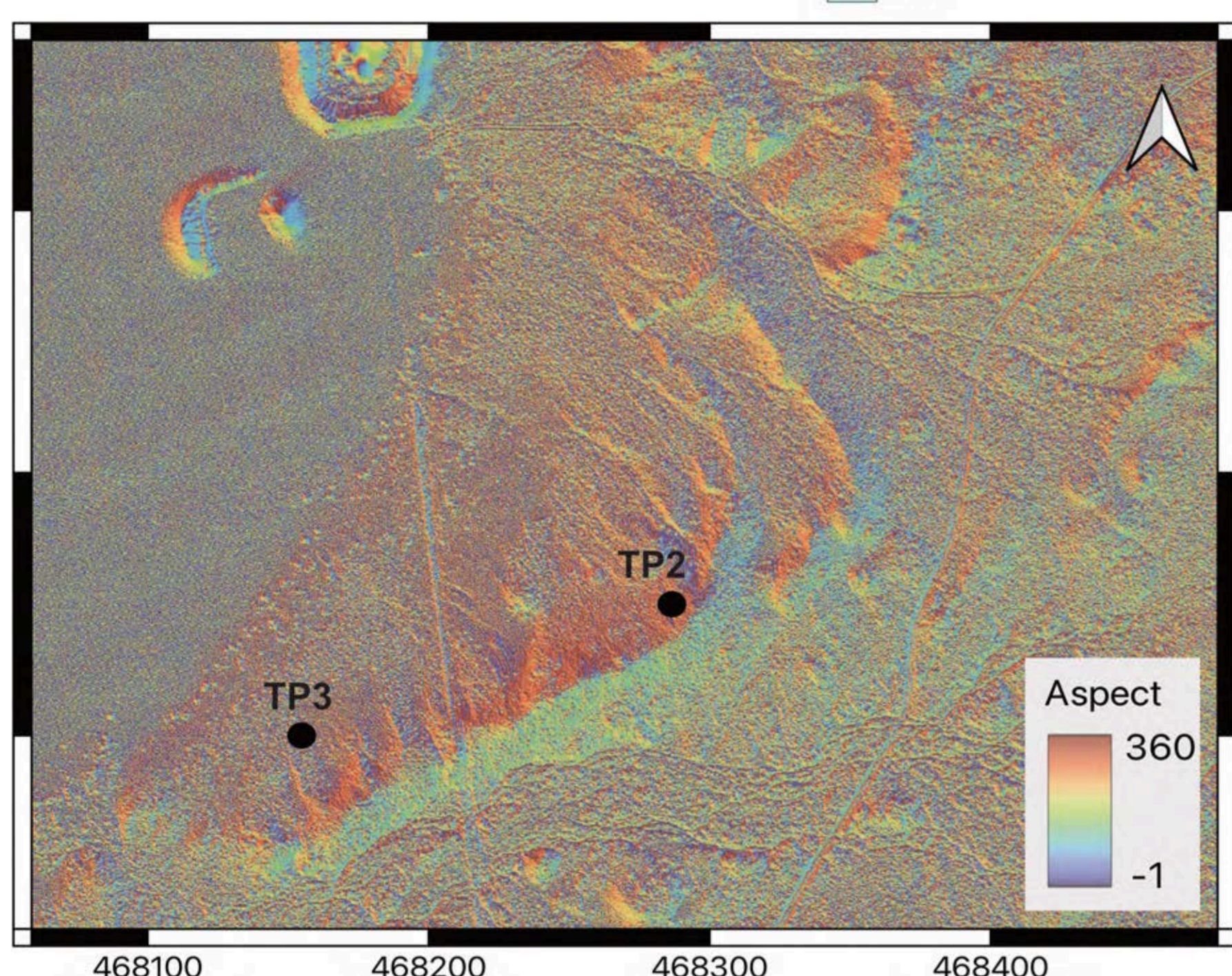What wetland types shaped the Brak River paleolandscape between the Early and Late Stone Age?
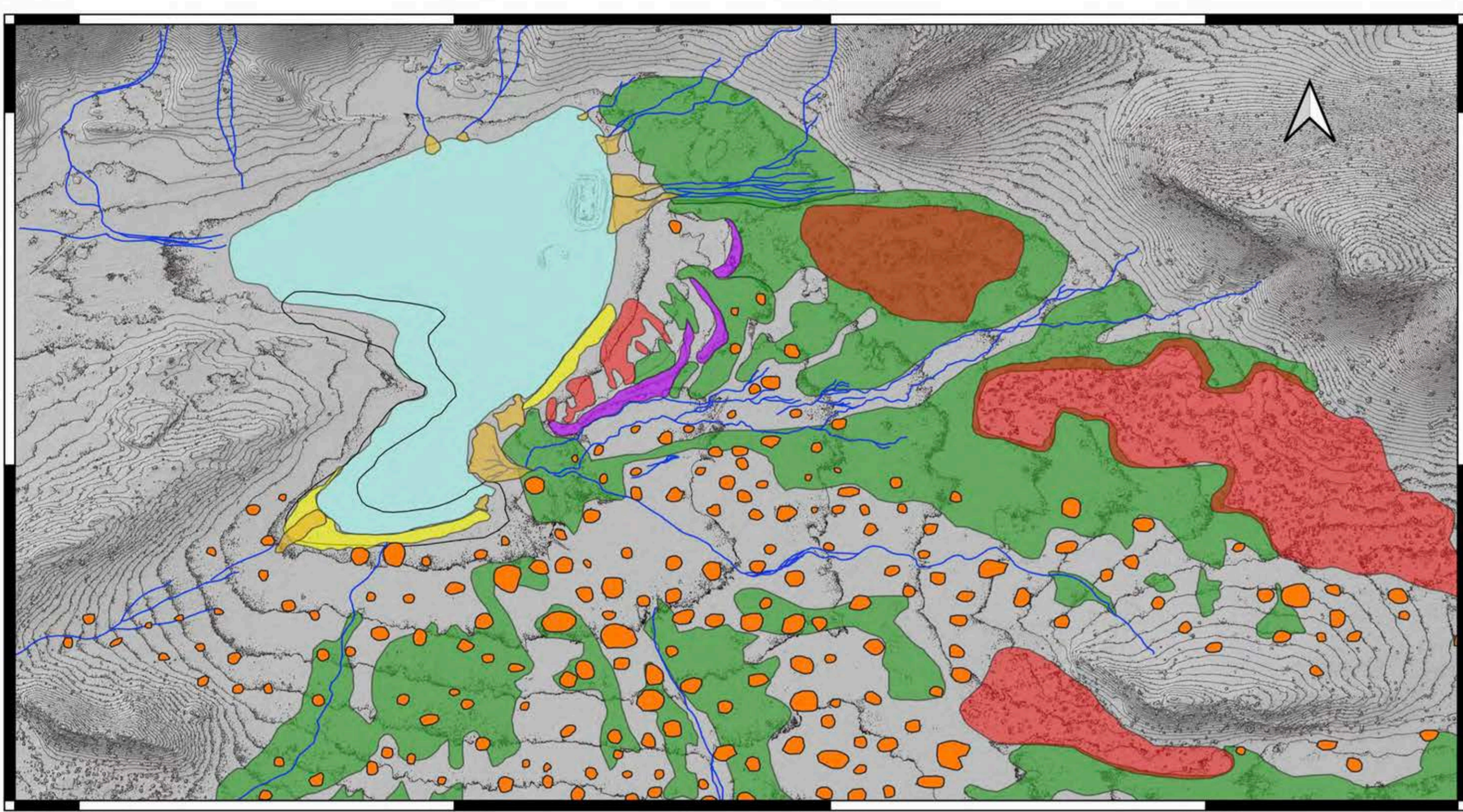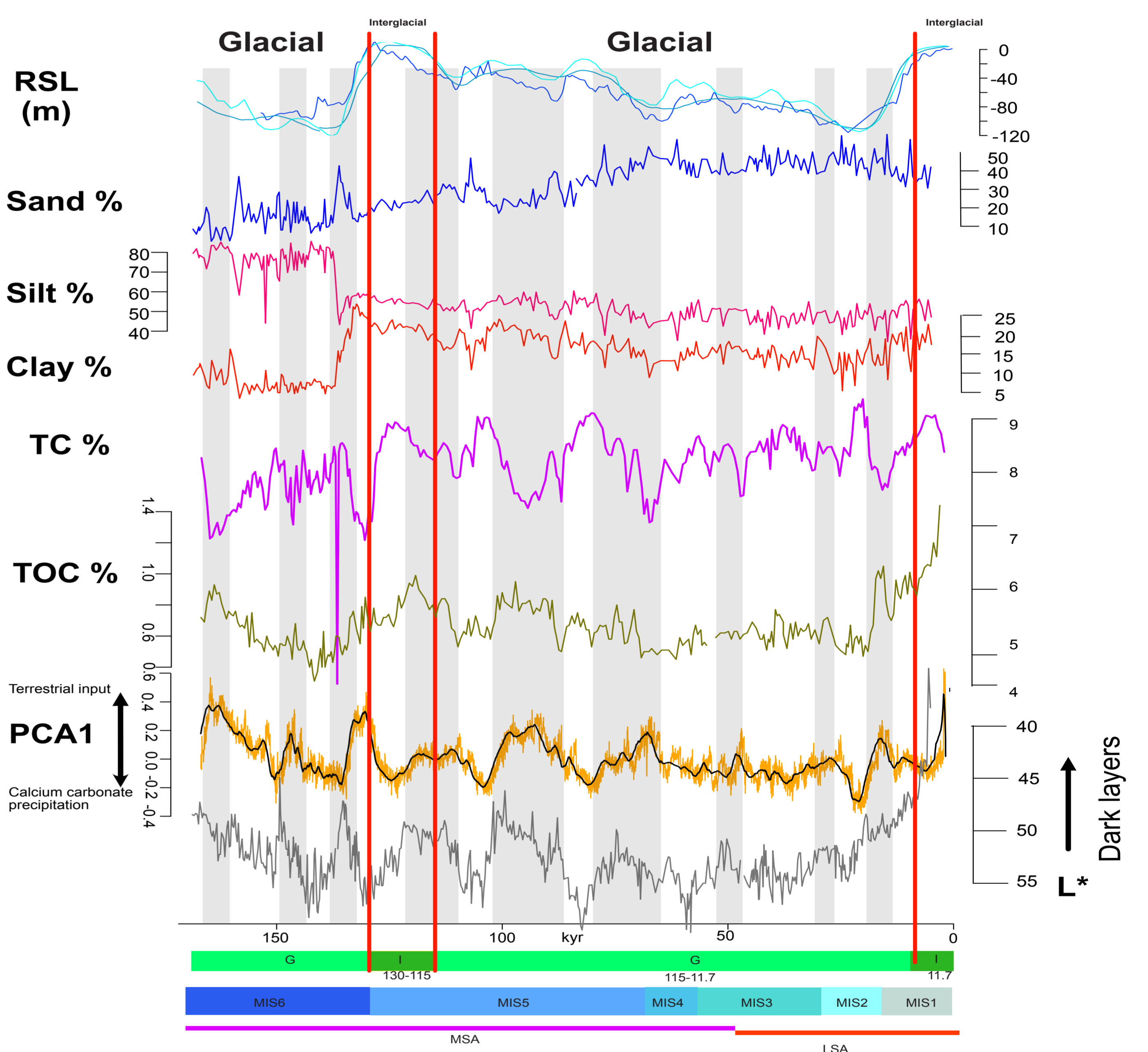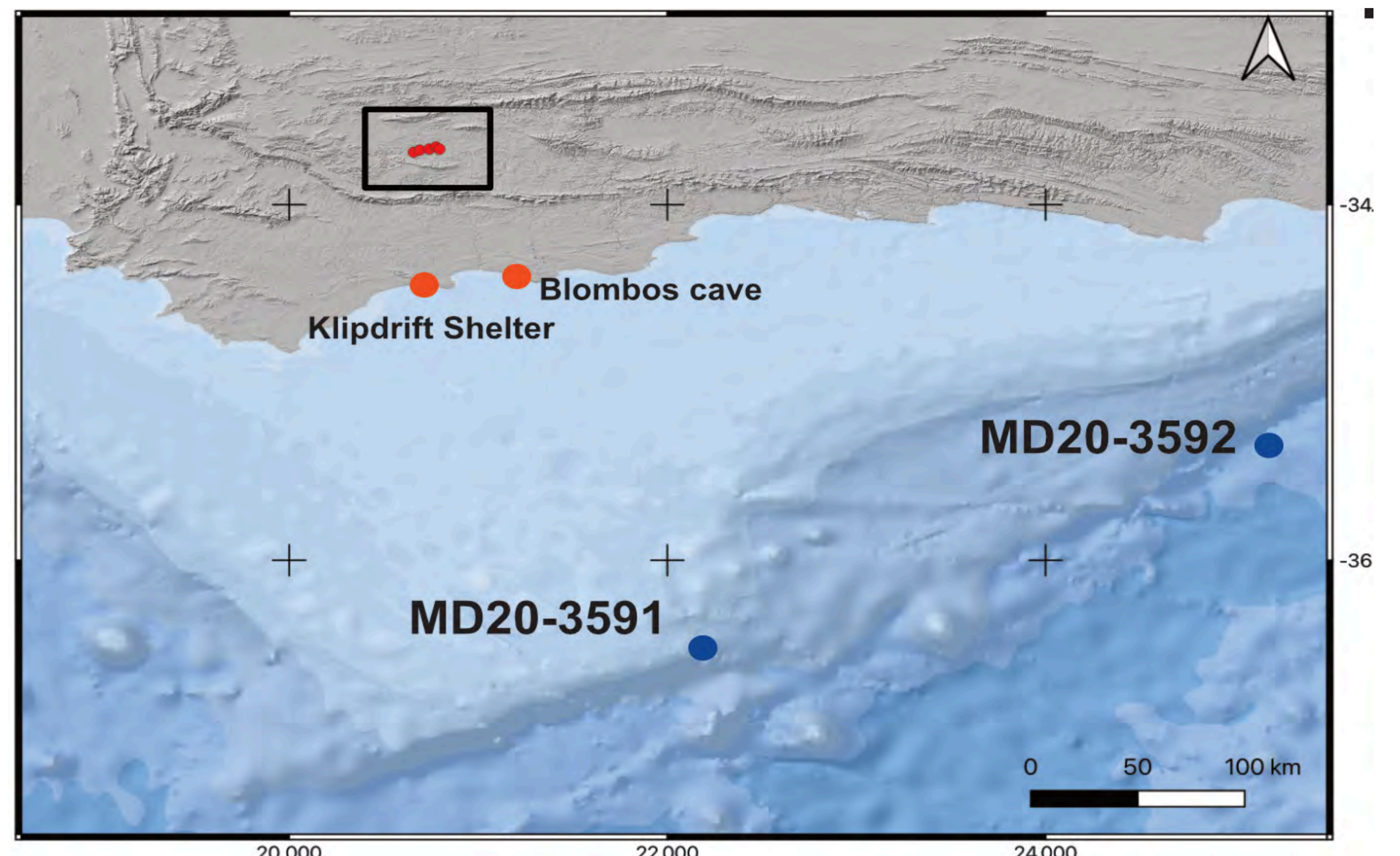
Aims

Coastal landscape

Our research investigates the factors that led to transgressive and regressive sea phases during the Middle Stone Age period (120-50 ka).

Continental interior

Study the landscape evolution of the western Little Karoo, potentially employed as an inland dispersal corridor by hunter-gatherer groups.

Legend: Coppice dunes, Colluvial, Delta, Lunette dunes, Beach, Streams, Desert pavements, Pan, Soil, Hillshade 32,767 / -32,767, 1m

MD20-3591 core preliminary results

-Our ongoing sedimentary analyses on the MD20-3591 marine core highlighted the presence of dark layers with high amounts of charcoal.

-These layers are characterized by a high content of clay minerals, namely smectite.

-Their geochemical signature displays an increase in the PCA1, interpreted as the dominance of continental terrigenous input. Low PCA1 values suggest a dissolution or reduction in marine calcium carbonate precipitation.

-Dark layer formation correlates with a decrease in relative sea level

Little Karoo preliminary results

-Although the Little Karoo region is strongly affected by erosion, diverse landscape attributes preserve sedimentary sequences that are valuable for understanding the paleolandscape evolution.

-Lunette dunes sedimentary and edaphic attributes display variability suggest that wet/dry cycles shaped the Big Pan paleolanscape

-Archaeological findings suggest past human presence in the Big Pan region, likely due to the availability of natural resources

Marine sustainability

Our study will provide valuable clues regarding the involved mechanisms that trigger sea transgressive-regressive phases. The produced data will be valuable to diverse global models that try to explain and predict sea level fluctuation and its possible human and economic impacts in highly populated coastal urban areas.

Supervisory team

Professor Eystein Jansen
Professor, in Earth Sciences /Paleoclimatology/Research and SapienCE

Margit Hildegard Simon
Researcher II at NORCE and SpienCE

Karen Loise van Niekerk
Research and SapienCE

Professor Christopher S. Henshilwood
Director, SFF Centre for Early Sapiens Behaviour (SapienCE)

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