Climate Change and Early Humans in the North

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The current human-made climate change affects all spheres of our society and its impact on the planet's ecosystems is yet unknown. By exploring past human-environment-climate relationships, we infer socio-behavioral responses to climatic and environmental shifts. Furthermore, palaeoclimate modelling and the reconstruction of palaeo-landscape will provide important insights into natural climate shifts. The aim of the project "Climate Change and Early Humans in the North" (CCEHN) is to investigate the evolutionary roots of human adaptations to climatic and palaeo-environmental shifts at the northern limit of their former distribution area. Here, the glacial/ interglacial

cycles led to enormous climatic and environmental changes. The archaeological record of Lower Saxony, with several outstanding sites, shows that early humans inhabited this area since about 300.000 years, but it is unclear whether this happened mostly during the temperate phases, or also during the colder periods. To better understand human adaptational behavior, we will:

(1) study the palaeoenvironment and palaeoclimatic changes, and landscape evolution on macro-, meso- and micro-scales,

(2) link the resulting data to the archaeological record, and

(3) finally establish a high-resolution chronological framework for the period from c. 300 ka to 40 ka (Marine Isotope Stages 9-3).





Fig 1. Map of investigated sites in Lower Saxony, Germany.

Fig 2. Diagramm of project structure and methods.

Lower Saxony is an excellent study area for this research approach: with its rich Palaeolithic record that is preserved in open-air sites and

caves, its sediment archives that document the advance- and retreat of Pleistocene ice-sheets, as well as periglacial conditions and warmclimate periods of the past, the relationship between climatic shifts, concomitant changes of landscape and ecosystems, and the presence of early humans can be unraveled.

In the CCEHN project design, we plan to bring together archaeology, geology and sedimentology, geophysics, paleoecology, as well as aDNA-analysis in a multifaceted approach. We integrate the research expertise, ranging from archeology and geo-biosciences in Lower Saxony and beyond, with the goal to establish a research cluster in the field of human-environment-climate-adaptations.

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