

Studies of European Pleistocene faunal remains tend to focus on individual sites or on evolutionary trends in specific lineages. Our knowledge of these faunas has now advanced to a level where it has become possible to investigate the intricate relationships between abiotic environmental conditions, especially climatic and geographical factors, and community processes. The high amplitude of the Pleistocene glacial-interglacial cycles in Europe and the excellent faunal and floral records provide opportunities to examine the role of specific climatic and community processes in the dynamics of the mammal fauna.

The Last Interglacial (oxygen isotope stage 5e) of north-west and central Europe was characterised by an abrupt transition from cold glacial conditions to a temperate oceanic climate. The climate and largely forested environment are thought to have been similar over large stretches of northern Europe. Though the British Isles are climatically comparable to the European mainland at this time, certain key species, notably hominins, horses and forest rhino, are missing from Last Interglacial faunas of the British Isles.

To examine the causal factors behind these differences in faunal composition, a variety of palaeoproxies (mammal remains, beetles and pollen) are investigated against a background of climatic data using a range of methods including environmental modelling, ecological analyses and morphometric approaches. The detailed environmental and faunal record for the Last Interglacial allows for a comparison of the impact of both rapid climate change and differences in community composition on the dynamics of the large mammal community between regions with similar climatic conditions.

POSITION OF THE STEINHEIM INTERGLACIAL SEQUENCE WITHIN THE MARINE OXYGEN ISOTOPE RECORD BASED ON MAMMAL BIOSTRATIGRAPHY

Eline N. van Asperen. *Liverpool John Moores University, United Kingdom*
E-mail address: envanasperen@palaeo.eu

The site of Steinheim (Germany) has been regarded as an iconic hominin locality for the Middle Pleistocene of Europe since the recovery of a hominin skull from the interglacial 'Antiquus-Schotter' of the River Murr in 1933. The skull, attributed to *Homo heidelbergensis*, is considered to be morphologically similar to the skull from the British Hoxnian site Swanscombe. Based on stratigraphical considerations and the characteristics of the associated faunal assemblage, the site has generally been correlated with the Holsteinian Interglacial and marine oxygen isotope stage (MIS) 11. However, over the last decades it has become apparent that many sites previously attributed to the Holsteinian Interglacial (*sensu stricto*) in actuality represent several temperate stages.

During the late Middle Pleistocene, the caballoid horse lineage was characterised by changes in size and morphology under the influence of climatic oscillations in temperature and humidity, biogeographical and community factors. Significant differences in horse morphology can be observed between European late Middle Pleistocene sites dating from different oxygen isotope stages. An analysis of caballoid horse remains from the Steinheim skull layer reveals clear morphological differences with horse fossils from British and German sites dated to MIS 11 and 9. A connection with MIS 9 material from southern France is suggested, implying a subdivision of the horse lineage into an eastern and a southern population, with an area of overlap in western continental Europe. As well as providing a relative date for the Steinheim site, these results indicate that biogeographic factors should be considered in biostratigraphical correlations.

HOLOCENE SPATIAL AND TEMPORAL PATTERNS OF CARBON SEQUESTRATION IN OMBROTROPHIC PEATLANDS OF QUEBEC, CANADA: IMPLICATIONS FOR GLOBAL RECONSTRUCTIONS

Simon van Bellen. *Université du Québec à Montréal, Canada*
E-mail address: van_bellen.simon@courrier.uqam.ca

Reconstructions of carbon sequestration in peatlands are often obtained from single and long records sampled in central sections of the ecosystem. As peatland margins are often hydrologically and botanically distinct and lateral expansion rates may be related to local rather than external factors, reconstructions from a single core may poorly represent accumulation patterns at the ecosystem scale.

We used multiple cores to reconstruct spatial and temporal carbon sequestration in three pristine, ombrotrophic peatlands (1.7–2.7 km²) in the Eastmain region of boreal Quebec, Canada. Peatland depth was modelled by kriging after extensive manual probing and ground-penetrating radar analyses. Peat carbon density was quantified after bulk density and loss-on-ignition analyses.

At the ecosystem scale, Holocene carbon accumulation rates averaged 16.2 g m⁻² yr⁻¹, with a mean age of peat inception of 5.1 ka BP. Site-specific age-depth modelling shows a long-term decrease in vertical peat accumulation after initial peat inception between 7.5–7.0 ka BP for each peatland, while lateral expansion rates culminated in the earliest stages of bog history between 7.0–6.0 ka BP. Except for a shift at the acrotelm-catotelm boundary, carbon density did not show a consistent increasing trend towards older peat. Combining vertical peat accumulation, lateral expansion and carbon density data, the most important period of carbon sequestration was centered between 5.0–3.0 ka BP.

These results show that reconstructions of both vertical accumulation and lateral expansion patterns are essential to accurately quantify carbon sequestration at the ecosystem scale and that reconstructions based on vertical rates only may provide erroneous interpretations. Moreover, as changes in expansion rates have previously been linked to local variability in basin morphology rather than climate factors, this implies that past sequestration might have been controlled to a greater extent by local, geomorphological conditions than previously thought.

APPLICATION OF TEPHROCHRONOLOGY IN THE KURILE-KAMCHATKA AND ALEUTIAN MARGINAL SEA-ISLAND ARC SYSTEMS (KALMAR-PROJECT)

Christel van den Bogaard. *IFM-GEOMAR, Germany*
E-mail address: cbogaard@ifm-geomar.de

KALMAR aims at investigating the geosystem "Kurile-Kamchatka-Aleutian Arc" and its interaction with the climate system onshore Kamchatka and offshore in the NW Pacific and the Bering Sea. The complex system is controlled by the most active volcanoes on earth and allows the study of the flux rates of material from mantle to atmosphere as well as the interaction of the asthenosphere, hydrosphere and the atmosphere.

Environmental changes during the Pleistocene to Holocene are inferred from both marine and lake sediment cores that give insight into climate-driven changes in palaeoceanography as well as ecological and limnological changes in the terrestrial realm, respectively. Marine sediment cores were taken from the NW-Pacific and the Bering Sea during cruise SO201 of research vessel 'SONNE' in 2009, while lake records were obtained from Two-Yurts Lake and Lake Sokoch on Kamchatka peninsula in summer 2007. Various tephra layers were identified in the sediment cores. To enable a long distance correlation of individual tephra layers a reliable fingerprinting of the volcanic ash was aimed at by EMP and LA-ICP-MS glass analyses. In the poster aspects of this study are shown as well as implications of the correlations that link various geological records. The study will permit the comparison of paleoclimatic, paleoceanological and volcanological records. The study contributes to understand the volcanic and magmatic evolution of the Kamchatka-Aleutian Triple Junction.

TOWARDS ABSOLUTE POLLEN SAMPLING IN SURFACE MOSS

Pim van der Knaap. *Institute of Plant Sciences & Oeschger Centre for, Switzerland*
E-mail address: pim.vanderknaap@ips.unibe.ch

Modern palynological studies require a good understanding of biases in pollen deposition and often use comparisons of modern pollen assemblages with vegetation. Modern pollen is often collected as moss samples. The question on how the moss should be collected and how well it represents the average pollen deposition is relevant to existing datasets and to the design of new studies. Here we evaluate the composition and absolute content of pollen in moss samples against long pollen monitoring series by means of modified Tauber Traps as employed in the Pollen Monitoring Programme. We developed a semi-quantitative way of moss sampling for calibration with pollen trap results: pre-defined surfaces (22 cm²) of moss were sampled close to each of 12 pollen traps in the Swiss mountains. Each sample was split in a sub-sample consisting of the upper