that are reflective of climate deterioration. However, during MIS 3, land-sea interrelations appear to be more complex with a kind of asynchrony between HEs and loess deposition. The temporal overlap between the beginning of the main period of loess sedimentation and the onset of MIS 2 is consistent with other loess areas in central and western Europe. But since this period obviously ended prior to the global LGM, this may be seen as an indication of more humid conditions between HE-1 and HE-2 in Iberia. According to a review on findings on human occupation in central Iberia, it follows further that cultural turnover periods that were often tentatively correlated with Heinrich Events in fact appear to be related to extreme environmental conditions.

ID: 01475, 06.- Before and after - climate contrasts across the MPT, (Poster)

Synthetic ice core records of the past 1.5 million years

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The search is on for a site in Antarctica where an ice core older than 800 ka can be retrieved. A key part of that search will be accessing the old ice rapidly with new drilling tools in order to assess the age of the ice and its temporal integrity. These tools would allow profiles of water isotopes, dust and methane to be retrieved. However, if we are to use these profiles to assign ages to the ice column we need to have target records: idealised datasets that closely mimic what the ice should record with time.

To do this, we need to look at existing marine and terrestrial datasets that have shown similarities with the ice core record over the 800 ka that already exists, considering both analogue and modelling approaches. While the primary purpose is to assess what a well-preserved record should look like, we can also consider how diffusion and ice deformation might affect the records we retrieve.

For the water isotopes, a starting point is the marine sediment record. It has been argued that the deep-sea temperature (Mg/Ca) record at a southern Pacific site has the same pattern as Antarctic δD. We will consider the evidence for this in the light of the datasets now available. Similarly, we will consider the extent to which dust proxies in southern hemisphere marine records show similar patterns to dust in Antarctic ice. The case of methane is trickier: aspects of the methane record are shared with Chinese speleothem oxygen isotopes, while it has also been argued that there is a coherence between southern European tree pollen records and methane concentrations. We will use these ideas and others to construct a prediction of methane over 1.5 Ma.

ID: 01685, 06.- Before and after - climate contrasts across the MPT, (Poster)

Investigating sea ice, productivity and nutrient utilisation in the Bering Sea over the Mid-Pleistocene Transition (0–1.2 Ma)

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The Mid-Pleistocene Transition (MPT), a global cooling trend between 1.2–0.8 Ma characterised by a shift from 40 to 100 kyr glacial-interglacial cyclicity, occurred in the absence of a long term change in external orbital forcing. This suggests a change in internal forcing as the cause. There are several proposed mechanisms focusing on sea ice, large land ice sheets, changes to deep ocean circulation and high latitude stratification. Sediment cores from the Bering Sea provide an opportunity to investigate how the subarctic North Pacific responded to MPT oceanographic changes. Here we present proxy data from the IODP Sites U1343 (water depth 1953m, 57°33'N, 175°49'E) and U1344 (water depth 3171m, 59°03'N, 179°12'W), located on the Bering slope in a region of high productivity known as the "Green Belt". Results from $\delta^{15}N_{bulk}$, as a proxy of nutrient utilisation, provide constraint on the processes controlling subarctic primary productivity through the MPT. Fossil diatom assemblage results also allow an investigation into the role of sea ice evolution following MPT increase in glacial severity. Comparisons to records from elsewhere in the Bering Sea at Bowers Ridge and Umnak Plateau provide additional insights into both intermediate water layer conditions and photic zone productivity at shallower sites.

ID: 01687, 03.- Regional and transregional climate variability over the last 2000 years, (Poster)

320 years of sea surface pH and SST variability in the South Pacific inferred from Diploastrea heliopora coral proxy records

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Marine calcifying organisms are under threat from global climate change. Ocean acidification (OA) and warming sea surface temperature (SST) are the results from increasing anthropogenic CO_2 emissions. It is thus important to better understand how marine ecosystems and reef-building corals have responded to climate change pressures relative to historical pH and SST variability. To constrain the natural variability of pH and provide baseline reconstruction and quantification for OA, we measured $\delta^{11}B$ composition in an annually banded modern *Diploastrea heliopora* massive coral colony from New Caledonia in the southwestern Pacific. This coral displays uninterrupted growth between 1690-2010 CE covering historical periods from the termination of the Maunder Minimum (ca. 1690-1715 CE) through the beginning of the Industrial Revolution (ca. 1760-1830 CE) and into the modern era (1900 CE to present). The most striking feature from our pH reconstruction is the evidence of OA (decrease in sea surface pH) based on the depleting $\delta^{11}B$ ratio in the most recent portion of the record. The distinct trend of decreasing $\delta^{13}C$ ratio in this coral documents and confirms the Suess Effect due to increase in anthropogenic atmospheric CO_2 concentration. This modern decrease in reconstructed pH is concurrent to the significant warming trend of at least 1 ºC as revealed by our coral-based SST proxies (i.e., Sr/Ca, Li/Mg, and $\delta^{18}O$). The interannual and longer-term decadal to interdecadal variability of our proxy records indicate a coupled anti-phase relationship between pH and SST reflecting similar climatic drivers related to the El Niño/Southern Oscillation (ENSO) and Pacific Decadal Oscillation. Our results support the potential of this coral genus as an archive to study global climate change where the lower frequency variability of South Pacific pH and SST are strongly modulated by ENSO and are coherent with records across the greater Pacific basin.

ID: 01494, 02.- Quaternary climate and environmental change in the Southern Hemisphere, (Poster)

Variations of the Antarctic Circumpolar Current and environmental conditions in the Kerguelen Islands region, Southern Ocean, during the last 20 kyrs

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As the major hub of oceanic circulation and nutrient redistribution, the Southern Ocean (SO) played an important role in modulating global climate variability throughout the Cenozoic. The SO is a key component of the feedback loop that modulates atmospheric CO_2 concentration variability over glacial–interglacial cycles. However, the mechanisms responsible for the release of the deeply sequestered carbon to the atmosphere during glacial termination remain yet unclear. The feedback loops affecting the air-sea flux of CO_2 include the extent of sea-ice, the position and strength of the westerly wind regime, the dynamics of the Antarctic Circumpolar Current (ACC) and associated physical structure of the water-column, the efficiency/strength of the biological pump and their interactions. Indeed, changes in the westerly wind field modulate ACC intensity and location, which subsequently affects vertical and horizontal oceanic heat transport and, therefore, sea-ice extent and seasonality along with primary productivity. In turn, changes in sea-ice extent impact on the Southern Hemisphere latitudinal thermal gradient which feedbacks on the Westerly winds. Therefore, a robust understanding of these physical and biogeochemical interactions would improve our ability to predict how SO will respond to global warming.

We here present a multi-proxy study on core MD12-3396CQ, located eastward of Kerguelen Islands, to reconstruct changes in sea-surface temperature (diatoms, foraminifera, dinocysts, radiolarians, alkenones), ACC intensity and location (diatoms, mineralogy, magnetic susceptibility, minor elements) and productivity (microfossils, major elements) to gain understanding on physical and biogeochemical interactions over the last 20,000 years and their possible impact on atmospheric CO_2.

ID: 02039, 04.- From the Mediterranean to the Caspian: palaeoclimate variability, environmental responses and human adaptive strategies, (Poster)

Evolution of the Volga river delta during Holocene

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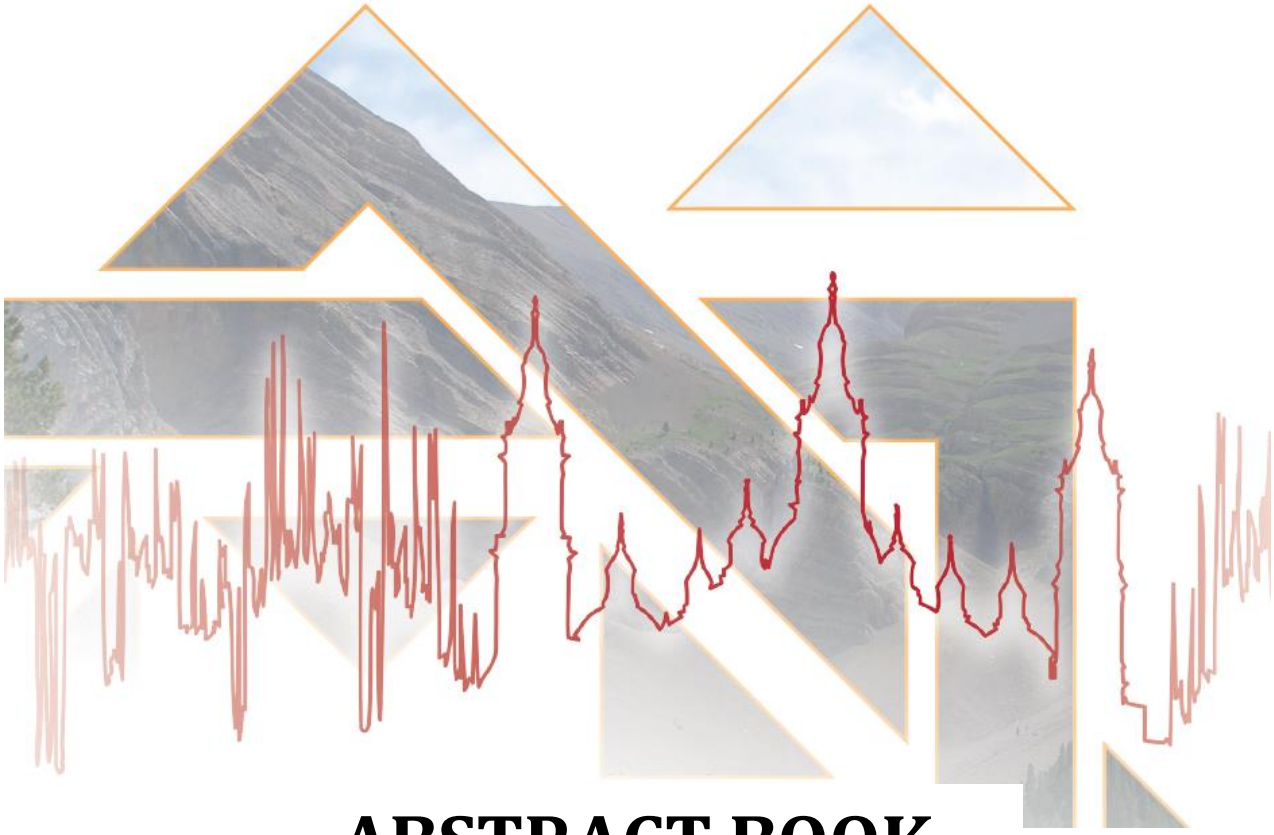

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