



ISAES 2019

XIII International Symposium on Antarctic Earth Sciences

22 July (Mon) – 26 July (Fri) , 2019
Songdo Convensia, Incheon, Republic of Korea



Abstract List – Oral



Ocean temperature control on ice shelf and glacier extent around the Antarctic Peninsula throughout the Holocene

Johan Etourneau^{1†}, Veronica Willmott^{2,3}, Jung-Hyun Kim^{2,4}, Xavier Crosta⁵, Carlota Escutia¹, Eugene Domack⁶, Jaap Sinninghe Damste^{2,7}, Stefan Schouten^{2,7}

¹Instituto Andaluz de Ciencias de la Tierra, CSIC-Universidad Granada, Granada, , Spain, ²NIOZ Royal Netherlands Institute for Sea Research, Texel, Netherlands, ³Alfred Wegener Institute, Bremerhaven, Germany, ⁴Korea Polar Research Institute, Incheon, Korea, ⁵UMR 5805 EPOC, EPHE/CNRS, Université de Bordeaux, Pessac, France, ⁶Hamilton College, Clinton, New York, USA, ⁷Faculty of Geosciences, University of Utrecht, Utrecht, Netherlands

The Antarctic Peninsula is one of the most affected regions on Earth by the global warming. Both surface atmosphere and subsurface ocean temperatures have rapidly increased over the last decades and contributed to massive regional ice shelf and glacier regressions. However, we still need to further understand the relationship between changes in temperatures and ice cap, especially around the North of the Peninsula where the glaciers have the potential to raise sea level by nearly 70m. To this aim, we provide a new subsurface ocean temperature (SOT) (50-400m) record in the northern Antarctic Peninsula spanning the last 9,000 years before present (BP). We applied the TEX86L (TetraEther Index of tetraethers with 86 carbons) proxy for low temperatures to the relatively well-dated marine core Jumbo Piston Core (JPC) 33, retrieved in the southern Bransfield Strait. Our new Holocene SOT record reveals a strong +3°C warming episode between 8.3 and 6.5 kyrs BP, before a cooling period preceding a second +2°C warming phase during the last 4.0 kyrs BP. These two warming intervals are synchronous with pronounced regional ice shelf and glaciers retreat. Similar connections between increasing SOT and ice cap recession have also been reported along the Western and Eastern Antarctic Peninsula, thus confirming the predominant role of the SOT, mainly tied to the enhanced supply of relatively warm subsurface deep waters onto the ice shelf, on the ice cap extent over the last millennia.