

OCGC Seminar

Frozen in Time: Climate, landscape, forests and mammals of the Pliocene High Arctic

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Canadian Museum of Nature

Thursday, April 4, 2019 11:30 AM

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Carleton University

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This talk reports on the ongoing work of a recently formed research working group PoLAR-FIT (Pliocene Landscapes and Arctic Remains – Frozen In Time). The Pliocene ([5.3-2.6](#) MA) of the Canadian High Arctic preserves evidence of a warm phase, prior to the onset of the Pleistocene glaciations, and include a fossil record of plant, vertebrates and invertebrates, exquisitely preserved in permafrost. Geochronological results indicate the deposits are [3.8-2.6](#) million years old, a global warm phase when CO₂ levels were 350 to 400 ppm and global temperatures were ~ 2.5°C above modern.

Using a multi proxy approach our research has found mean annual terrestrial temperatures in the high Arctic were 11 to 22°C greater than today. Pliocene warming may have contributed to the release of sediments, > 2.5 km thick in places, forming the western Arctic coastal plain. The vertebrate fossil record includes 15 mammal species, as well as fish, and bird. We are investigating paleomolecular approaches to expand this list. These taxa formed part of a forest community that extended to 80° north and showed strong Eurasian affinities, evidence of a trans-continental Arctic Biome. Our group aims to investigate feedbacks that contributed to this remarkable Arctic warming as well as biotic and landscape responses.

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