

# THE “CRYSTAL EYE OF NUNAVIK” (PINGUALUIT CRATER LAKE): DIATOM INFERRED PALEOENVIRONMENTAL RECORD FOR THREE PREVIOUS INTERGLACIAL PERIODS

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The sediments of the 1.4. Ma old Pingualuit Crater Lake known as the “*Crystal Eye of Nunavik*” offer the unique opportunity to study terrestrial climate dynamics not only during the postglacial period, but over several hundreds of thousands of years as its deep sediment infill yields an uninterrupted arctic paleoclimate record. The Pingualuit meteoritic crater (Nunavik, Canada; 61°17' N, 73°41' W) is located in the northernmost part of the Ungava Peninsula in northern Quebec - close to the area where the Laurentide Ice Sheet reached maximum thickness during the last (Wisconsinan) glaciation. In May, 2007 ~10 m of sediments was recovered from the crater lake at a water depth of 270 m using a UWITEC piston percussion corer system.

Here we present results of limnological measurements (PAR, UV light transparency), sedimentological (grain size, MS), micropaleontological (diatom), and stratigraphic interpretations of Pingualuit Crater Lake sediments. There are two decimetre-thick intervals in addition to the uppermost Holocene sediments composed of laminated, dark grey clayey-silts characterized by a relatively low density and magnetic susceptibility, that contrast sharply with the thicker over- and underlying sections with light grey, denser, sandy sediments. Moreover, these two intervals contain fossil diatoms and chrysophytes, suggesting that these two intervals represent ice-free conditions and thus interglacials, whereas the more extensive light grey and sandy sediments reflect glacial

intervals. Initial TL dates indicate the first interglacial after the Holocene corresponds to MIS 5d and the second interglacial corresponds to MIS 7. The Holocene, MIS 5, and MIS 7 interglacials are characterized by three statistically different diatom assemblages, likely reflecting different forcing mechanisms controlling the lake environment during those warm times. In addition, the oldest interglacial period recovered MIS 7 was dominated by species of *Cyclotella* not yet described, and which went extinct directly after the end of MIS 7. The timing and magnitude of the interglacial periods have been reconstructed from Pingualuit Crater Lake and will be compared with other records from around the Arctic.