

## Paleoenvironments: Geosciences

### Geoarchaeological Investigations at the Cummins Paleoindian Site, Thunder Bay, Ontario

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In 1983 a 'three-year' excavation program was started at Cummins, a large Plano period quarry/workshop and habitation site situated on raised beaches of proglacial Lake Minong. Minong levels were present in the Superior Basin during two periods, from ca. 10,500 to 10,100 yr B.P., and ca. 9,500 to 9,300 yr B.P., separated by a higher Lake Duluth stand (Clayton 1983). Cummins, Brohm, Simmonds, and other Lakehead Complex Plano sites located on Minong beaches at elevations of 230 to 240 m had previously been assigned maximum geological dates of ca. 9,000 to 9,500 yr B.P. (Fox 1975; Dawson 1983). The earliest C-14 date for Cummins is an accelerator date of  $8,480 \pm 390$  yr B.P. (NMC-1216), on the fragmentary remains of a cremation burial recovered in 1963 by J.V. Wright (Dawson 1983). Excavations in 1983 revealed water-tumbled artifacts in poorly sorted (lag?) cobbles and gravels beneath Minong beach sands, underlying dune deposits, and in bog sediments of adjacent Cummins Pond indicating diverse geomorphic site environments and a substantial period of occupation (Julig 1984). The water-worn taconite artifacts in the lower gravels indicate occupation prior to the last Minong level at ca. 9,500 yr B.P. Various sediment analyses are used to refine site geochronology, and to assist in interpretation of site formation processes, artifact context, and paleoenvironment.

In the western portions of Cummins, at the WTT section, a podzolic soil has formed in 2 m of medium fine sand, overlying 0.5 m of lag gravel with cobbles, a thin deposit of sandy silt, and taconite bedrock. The upper sands are very well sorted with a mean  $\phi$  of 2.0, and are positively skewed. Observations with SEM (scanning electron microscope) indicate quartz grains are generally well-rounded and frosted, supporting an aeolian origin. Taconite artifacts present in the upper soil horizons are lightly polished. The underlying coarse gravel with cobbles is interpreted as a lag gravel, as pebble orientations indicate no fabric.

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Taconite artifacts, only slightly worn, were recovered in the upper parts of this very coarse and poorly sorted archaeological-geological facies.

At the DT section, adjacent to Cummins Pond, heavily worn artifacts occurred in coarse sand and gravel (mean  $\phi$  of -2.2), at depths of 1.5 m below the surface. Three cultural strata are present in the overlying sandy soil; a thin Archaic horizon below the humus, and two Plano occupations with Agate Basin and Plainview type lanceolate points (Julig 1984). There is some aeolian sand in the upper soil horizons of most locations sampled on these main Minong beaches.

A small tributary of the Neebing River cuts the Minong beach on site, associated with a bog (Cummins Pond), interpreted by B. Phillips (pers. comm.) as being a former lagoon of Lake Minong. The oldest fossil pollen assemblage for Cummins Pond and Oliver Pond (2 km to the northeast) are similar, with spruce (*Picea*) (30%) and pine (*Pinus*) (40%) dominating lower (zone 2) sediments; however, poplar (*Populus*) pollen is abundant in the clay-rich sediments at the base of Oliver Pond core. A birch (*Betula*) and alder (*Alnus*) rise signals the beginning of zone 3, C-14 dated to  $7,730 \pm 95$  (DIC-2504) at Cummins Pond. Spruce wood from the 454-457 cm level of the Cummins Pond core is dated at  $8,110 \pm 110$  (Beta-4486), with a 15 cm sandy strata present immediately above. This 15 cm fine sand horizon is partly aeolian in origin, indicating a dune-forming episode at ca. 8,000 yr B.P.

Excavations at the edge of Cummins Pond yielded artifacts and a cultural feature (post molds) below 30 cm of peat. Associated pollen was zone 3B (abundant alder and birch), indicating a relative date of ca. 7,500 yr B.P. for this cultural component. Smectite (montmorillonite) is present in the Cummins Pond core below 8,100 yr B.P., and in lower grey clays of the DT section, which suggests a source in a dry environment. Lake Agassiz discharges into the Minong basin at ca. 9,500 to 8,500 yr B.P. (Clayton 1983), are likely responsible.

Analysis of sediments indicate a variety of geomorphic processes affected the Cummins site. Glacial activity in the basin during initial occupations may be responsible for the coarse, poorly sorted, lower facies. Contrary to previous research, Cummins is deeply stratified, with continued human use through much of the preceramic period, despite changing environmental conditions.

#### References Cited

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