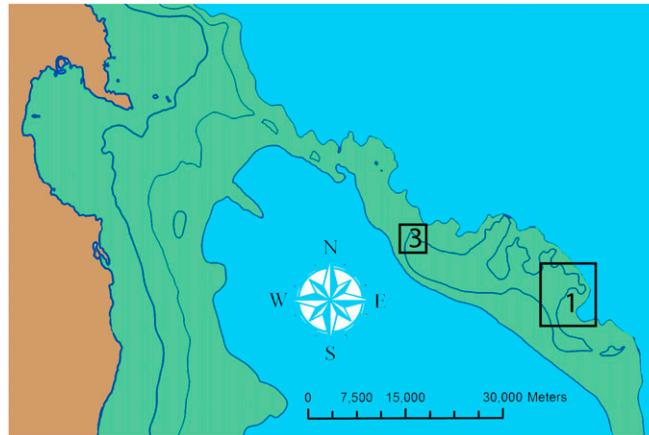


# Supporting Information

O'Shea et al. 10.1073/pnas.1404404111



**Fig. S1.** The location of research areas on the Alpena-Amberley Ridge (AAR). The figure illustrates the American portion of the AAR during the later Lake Stanley low water phase (after ref. 1). Modern land is shown in brown, whereas areas of exposed dry land during Lake Stanley are green. Areas of water are presented in blue. The contour interval is 20 m, with the modern lake shore represented as 176 m amsl. Rectangular boxes indicate the two areas in which active archaeological and paleoenvironmental work has been conducted.

1. O'Shea J, Lemke AK, Reynolds RG (2013) "Nobody knows the way of the caribou": Rangifer hunting at 45° North Latitude. *Quat Int* 29:36–44.

**Table S1. Summary of Paleoenvironmental results from the AAR**

Analysis	Summary of results	Paleoenvironmental implications
Testate amoebae	6 distinct assemblages based on cluster analysis; Oligotrophic Pond ( <i>Diffflugia oblonga</i> )	Variety of microenvironments, including fens, sphagnum moss bogs, and inland lakes
Dominant or indicator species	Kettle Hole Mire ( <i>Centropyxids</i> ) Sphagnum Fen ( <i>Cyphoderia ampulla</i> ) Sphagnum Bog ( <i>Hyalosphenia papilio</i> ) Spruce/Tamarack Swamp ( <i>Diffflugia globulus</i> ) Eutrophic Pond ( <i>Curcurbitella tricuspis</i> )	
Particle size	Sand—66.16%	Deep lake sediments are normally silts and clays; abundance of sand indicates little deposition after inundation
Percentage of total samples	Silt—23.09%	
	Mud—10.77%	
Particle sorting	Well sorted—1.54%	Variety of sorting indicates different sedimentary regimes; less well sorted samples indicate lack of transport and variety indicates preservation
Percentage of total samples	Moderately well-sorted—21.54%	
	Moderately sorted—26.15%	
	Poorly sorted—35.38%	
	Very poorly sorted—15.38%	
Particle shape	Very angular to subangular—70%	Lack of rounded sediments indicate sediments have not traveled
Percentage of total samples	Subrounded to well-rounded—30%	
Particle material	Area 1—Quartz, 65%; Chert, 12%; other, 23%	In Area 3 where lithics are found, higher amounts of chert available; glacial sediment with possible chert cobbles used for tool production
Percentage of total samples	Area 3—Quartz, 50%; Chert, 25%; other, 25%	

**Table S2. Carbon dates for late Lake Stanley stage on the AAR**

Laboratory no.	Sample unit	Years B.P.	SD	Calibrated years B.P.	Delta <sup>13</sup> C	Material
X20851*	AA95226/Wood 1	8,038	46	8,900	-25.50	Spruce pole
OS-99473	Wood 4	7,960	55	8,829	-25.12	Rooted spruce
OS-100524	Wood 5	7,840	40	8,640	-26.12	Tamarack pole
OS-100526	92912F	8,080	35	9,020	-26.54	Charcoal in rock ring

\*Sample was run at the University of Arizona Accelerator Mass Spectrometry (AMS) laboratory. Remaining three dates were run at the National Ocean Sciences AMS facility at Woods Hole.