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Questioning the visibility of the landscape learning process during the Paleoindian colonization of northeastern North America

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ABSTRACT

In this study Energy Dispersive X-Ray Fluorescence (EDXRF) is used to confirm previous visual identifications of red Munsungun chert, in 23 fluted point sites, or loci, in New England and southern Quebec. These source designations are combined with previous visual raw material identifications to provide a proxy measure of landscape knowledge possessed by early inhabitants of the region. The results herein show these groups possessed significant landscape knowledge and patterned lithic raw material procurement strategies. These results fail to support the idea that some behavioral adaptations during the early fluted point period such as robust toolkit design, long distance lithic transport or other such behaviors are the result of landscape unfamiliarity. These patterns likely hold for other are colonized by mobile hunting and gathering groups.

1. Introduction

Clovis and other early fluted point technologies are the first widespread lithic technology in the Americas. If these technologies represent the very first populations in the New World remains a matter of debate in American archaeology (Adovasio et al., 1990; Dillehay, 1989, 1999, 2000; Gilbert et al., 2009, 2008; Meltzer, 2002: 30; Waters and Stafford, 2007; Waters et al., 2011a; Waters et al., 2011b). Debate also surrounds the duration of the Clovis period, proposed to last as little as 250 years (Waters and Stafford, 2007), or possibly over 1000 (Prasciunas and Surovell, 2015). In the event Clovis does not represent the first populations in the Americas, or the Clovis period lasted significantly longer than the 250 years proposed by Waters and Stafford (2007) it is unlikely that *all* Clovis sites are representative of the colonization, or the landscape learning process (e.g. Ellis and Lothrop, 1989: 149; Snow, 1980). Despite such uncertainty, archaeologists continue to attribute ostensibly unique behaviors in the Clovis record, such as long distance lithic transport and robust toolkit designs as adaptations to landscape unfamiliarity (e.g. Andrews et al., 2015; Boulanger et al., 2015; Meltzer, 2009: 252; Tankersley, 1991: 297). The research herein uses lithic raw material procurement patterns amongst early fluted point groups in northeastern North America as a proxy measure of landscape knowledge. Visual identifications of lithic raw materials were augmented by XRF geochemistry. No evidence was found to indicate that these early populations had limited knowledge of their landscape.

The Northeast (Massachusetts, Maine, New Hampshire, southern Quebec, and Vermont for the purposes of this study) is an ideal location to test colonization models because of a well understood deglaciation chronology (Ridge et al., 2012), a small number of lithic raw material sources with both large and small source areas (see Burke et al., 2014; Table 1), and a number of excavated fluted point sites located across a large geographic area (Spiess et al., 1998).

Glacial ice rendered far northern New England unavailable to human occupation just prior to the appearance of early fluted point technology in other areas of North America (Sanchez et al., 2014, see also Ferring, 2001: 50). This ice precludes the possibility of an earlier "pre-Clovis" occupation in the region rendering a lengthy, but archaeologically undetected exploration period impossible in this region. Though "Clovis" technology sensu stricto is not found in the Northeast, three point types collectively placed into the "early fluted point period" of the region (Bradley et al., 2008) are often argued to be colonizing populations (Dincauze, 1996: 10).

Ice also covered five separate lithic raw material sources in northern New Hampshire and Maine. These sources are Jefferson rhyolite, Ledge Ridge chert, Mount Jasper rhyolite, and most importantly Munsungun chert (Table 1). Ice blanketed a number of small chert sources in southeastern Québec (Burke, 2007; Pollock et al., 2008; Pollock et al., 1999: 281), though these have not been identified in any fluted point site lithic assemblages to date. In the Lake Champlain Valley of Vermont, the bedrock source for Hathaway and similar cherts (Burke, 1997: 44–46) remained buried by ice upon the first appearance of early fluted point technology in North America and were then likely inundated by the Champlain Sea following glacial retreat (Robinson, 2012). Larger

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Table 1
Lithic source descriptions.

Name	Stone type	Source size	Location	Secondary transport	Description	Citations
Cheshire quartzite	Metaquartzite	>100 km^2	Northwest Vermont to Connecticut	Unknown	White vitreous quartzite	Condon (1993) and Ratcliffe et al. (1975)
Mt. Jasper rhyolite	Flow Banded Rhyolite	<100 m^2	Berlin, NH	None	Olive green to brownish weathering to nearly white	Boisvert (1992) and Pollock et al. (2008)
Jefferson rhyolite	Flow banded rhyolite	Unknown	Jefferson, NH	Limited to low densities in gravel deposits near Jefferson, NH	Pink, olive yellow, blackish green. Coarse to microcrystalline in texture	Pollock et al. (2008)
Kineo/Traveler rhylite	Rhyolite	≈80 km^3 16,000 km^2 (includes secondary deposits)	Mooshead Lake, ME	Found in deposits from the source southeast to the seacoast	Olive green weathering to white. Frequent phenocrysts. Very homogenous.	Rankin and Caldwell (2010) and Bourque (1995: 102)
Ledge ridge chert	Chert	100 m^2	Northwest, ME	Unknown. Likely very limited	Green to black. Some pyrite rhombs	Gramly (1982) and (Gramly (2009: 124)
Red Munsungun chert	Chert	10 km^2	Munsungun Lake, ME	Limited	Black to light gray, green and red.	Hall (1970), Pollock (1987) and Pollock et al. (1999)

bedrock exposures and earlier deglaciation led to the availability of other raw materials, such as Cheshire quartzite and Kineo/Traveler rhyolite (Table 1) prior to the availability of smaller more northerly sources. Glacial transport of material from these larger sources is much more significant than from smaller sources further extending the spatial area over which these sources are available (Fig. 1).

Of the five lithic sources used for this study, three lie to the north of the ice margin circa 13,500 cal B.P. (Fig. 1), meaning that even if the region was settled at this time these sources were not available. These raw material sources, Jefferson Rhyolite, Mt. Jasper Rhyolite, and Munsungun Chert, are also found over limited spatial areas (Table 1). Due to the relatively small size of their bedrock outcrops these materials have limited natural transport of the material from their primary source area. Like the materials discussed by Tankersley (1989: 261), these materials are not available in meaningful quantities or sizes in secondary deposits distant from their bedrock source. Thus, the possibility of

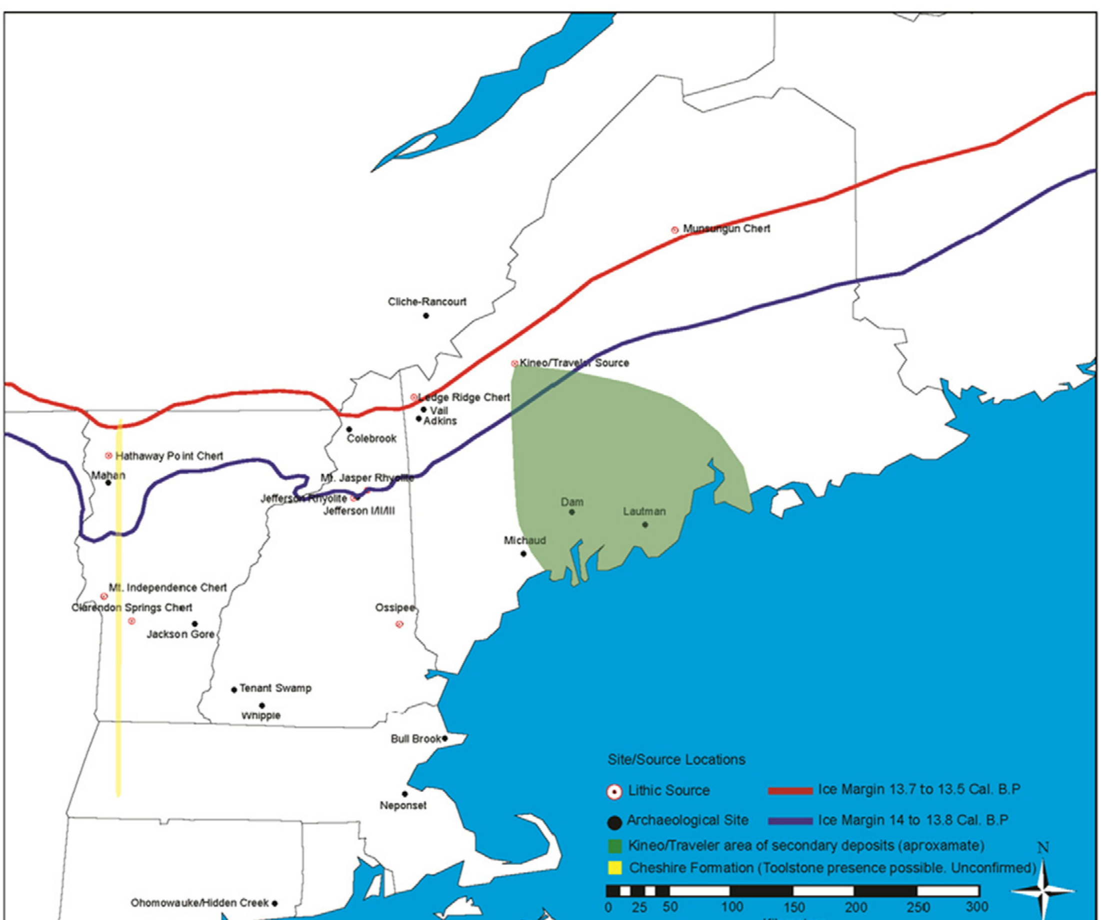

Fig. 1. Map shows locations of archaeological sites and lithic sources in the Northeast. Approximate ice margin locations at 14,000 to 13,800 and 13,700 to 13,500 Cal. B.P. are also indicated. Ice margins approximated from Ridge et al. (2012).