Stratigraphy and Chronology at the Little John Site, Yukon Territory, Canada

Michael Grooms, University of New Mexico
N.A. Easton, Yukon College

Abstract

This research presents preliminary investigations examining the stratigraphy and chronology at the Little John site, Yukon Territory. The core of this dissertation research focuses on hunter-gather adaptations during climate changes in harsh high-latitude environments. Specifically, the research addresses how technological changes from 15,000 cal BP and 8,000 cal BP, between the Nenana/Chindadn (non-microblade) and Denali (microblade) complexes in the Yukon-Alaskan borderlands correlate with specific environmental conditions and climate events, such as the Younger Dryas. The Little John site is ideal for addressing these issues because of its unique, stratified geologic setting, lithic artifacts, and abundant, well-preserved faunal materials.

Setting

The Little John site is located on a knoll overlooking Mirror Creek, which lies within the easternmost extension of the Tanana River drainage. Unglaciated during the last glacial, archaeological materials at the site span the past 14,000 years. Due to the undulating topography of the site, the stratigraphy consists of variable thickness of loess (from 10 cm in the west lobe to 450 cm in the east lobe). Soil development and depositional hiatus are evident in the loess/paleosol sequences in the east lobe dating to 14,000 ky. Shallow deposits of loess and diagnostic artifacts of both complexes characterize the deflated west lobe. B horizons that represent Holocene soil formation characterize the east and west lobes. White River Tephra (1900 kya) provides a chronological marker between the B1 and B2 horizons.

Hypotheses

Clarifying hunter-gather adaptations to harsh high-latitude environments and changing climates will require hypotheses centered on how technological change correlates with environmental change. Previous research conducted at the site since 2005 indicates the two complexes maybe temporally distinct given the distinct stratigraphic relationship between the complexes at the site (Easton and MacKay 2008). However, the degrees to which the complexes are temporally and environmentally distinct remain unclear. Additionally, both complexes may correlate with different environmental conditions evidenced by the unique climate-driven depositional context of each complex. Nenana/Chindadn artifacts are found primarily in loess deposits (and in the west lobe), while the Denali artifacts are associated with paleosol formation, indicating a change in climate conditions (Easton and Mackay 2008). In far eastern Beringia it remains in doubt if the complexes relate temporally to one another and to what degree the correlate with specific environments.

The hypotheses to be tested are: 1) if the two complexes are temporally and environmentally distinct, the lithic variation represents different adaptive strategies, and 2) if the complexes are contemporaneous, lithic variability represents seasonal and/or functional adaptive strategies

The project will attempt to create a high-resolution chronology that can be correlated with archaeological deposits and small and large-scale environmental changes. Two independent dating methods (OSL and AMS ^{14}C), and sediment and soil analysis will be employed to assess late Pleistocene adaptive strategies and whether the complexes are temporally and environmentally distinct, and/or how each complex correlates with seasonal/functional proxies.

Conclusions and Future Work

The 2011 test pit transect between excavations lobes (red-dashed line) has not yet revealed a direct stratigraphic correlation between lobes. Continued research at Little John will include OSL and AMS^{14}C dating techniques, soil analysis, and correlation to paleoclimate records in an attempt to correlate the two excavation lobes. The proposed 2012 transect (purple) will be conducted to trace soil horizons (specifically paleosols) and sedimentary deposits across the site.

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