Document Delivery

Thorson, Robert

Username: **rmt02003**
Email: **robert.thorson@uconn.edu**
UCW

TN#: 413786

RAPID request held locally (Main Library)

Call #: **NA**

Location: : **hbl per**

Book/Journal Title:
Quaternary Research

Book Author:

Volume: **7**

Pages: **149-156**

Article Author: **Thorson, Robert M., and Hamilton, T.D.,**

Article Title: **Geology of the Dry Creek Site; a Stratified Early Man Site in Interior Alaska**

If you experience any problems with this document, please contact us at udoc@uconn.edu and cite the transaction number 413786.

___**Journal title found; requested volume or issue not on shelf.**

___**Book title not on shelf**

___**Journal title not found at all.**

___**Journal or Book title found; Article not found as cited.**

Student Information: ILLiad Username _____ Date: _____

QUATERNARY RESEARCH 7, 149–176 (1977)

Geology of the Dry Creek Site; a Stratified Early Man Site in Interior Alaska

ROBERT M. THORSON[1]

Geology Department, University of Alaska, Fairbanks, Alaska

AND

THOMAS D. HAMILTON

U.S. Geological Survey, 345 Middlefield Road, Menlo Park, California 94025

Received March 30, 1976

The Dry Creek archeologic site contains a stratified record of late Pleistocene human occupation in central Alaska. Four archeologic components occur within a sequence of multiple loess and sand layers which together form a 2-m cap above weathered glacial outwash. The two oldest components appear to be of late Pleistocene age and occur with the bones of extinct game animals. Geologic mapping, stratigraphic correlations, radiocarbon dating, and sediment analyses indicate that the basal loess units formed part of a widespread blanket that was associated with an arctic steppe environment and with stream aggradation during waning phases of the last major glaciation of the Alaska Range. These basal loess beds contain artifacts for which radiocarbon dates and typologic correlations suggest a time range of perhaps 12,000–9000 yr ago. A long subsequent episode of cultural sterility was associated with waning loess deposition and development of a cryoturbated tundra soil above shallow permafrost. Sand deposition from local source areas predominated during the middle and late Holocene, and buried Subarctic Brown Soils indicate that a forest fringe developed on bluff-edge sand sheets along Dry Creek. The youngest archeologic component, which is associated with the deepest forest soil, indicates intermittent human occupation of the site between about 4700 and 3400 ^{14}C yr BP.

INTRODUCTION

The Dry Creek archeologic site occupies a prominent loess-covered bluff within the Nenana Valley about 10 km north of the Alaska Range (Figs. 1 and 2). Excavations in 1973 and 1974 revealed that the site contains a well-stratified record of environmental fluctuations and repeated human occupations which span more than 11,000 yr. Five buried paleosol complexes within eolian sediments record arctic steppe conditions of the late Pleistocene (Matthews, 1976) succeeded by a milder forested environment during Holocene time. The Dry Creek site is the first well-documented occurrence in Alaska of deeply buried artifacts and charcoal in primary stratigraphic association with the bones of late Pleistocene mammals. Cultural horizons between 1- and 2-m depth also show strong similarities to the Siberian Paleolithic (Powers and Hamilton, in press), suggesting that the site may have been first occupied during an early phase of late Pleistocene human influx into the New World.

Because of its potential paleoecologic significance and Early Man record, detailed geologic studies of the Dry Creek site were carried out in conjunction with the archeologic excavations. Primary objectives of the geologic program were to (1) document the site's stratigraphy and its lateral variations, (2) determine the genesis of local soils and sediments, (3) date the principal geologic and cultural events represented at the site, and (4) determine the environmental history

[1] Present address: Department of Geological Sciences, University of Washington, Seattle, Washington 98195.

ISSN 0033-5894

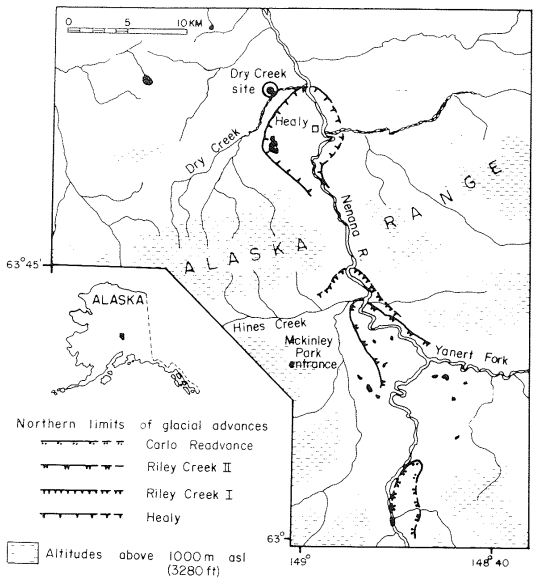

FIG. 1. Location map, Dry Creek archeologic site.

of the area and its probable relations to the successive human occupations.

REGIONAL SETTING

The area around Dry Creek, which occupies a transition zone at about 500-m altitude between the rugged Alaska Range and its more subdued northern foothills (Fig. 3), exhibits a varied and complex Quaternary history. Glacial, glaciofluvial, and lacustrine sediments within the Nenana Valley, alluvial deposits of Dry Creek, and eolian sediments of diverse provenance record the complex succession of environmental changes that occurred here during middle and late Quaternary time.

The Pleistocene glacial sequence of the Nenana Valley was defined by Wahrhaftig (1953, 1958). Wahrhaftig recognized two old and extensive glaciations, Browne and Dry Creek, each of which was followed by major episodes of erosion, weathering, and tectonic uplift of the Alaska Range. The Browne Glaciation is now believed to be of late Pliocene to early Pleistocene age (Wahrhaftig, personal communication, 1974); the Dry Creek Glaciation probably dates broadly from the middle Pleistocene. During the subsequent Healy Glaciation, ice advanced down the Nenana Valley and expanded into a piedmont lobe that terminated about 1 km upvalley from the Dry Creek site (Fig. 1). Outwash from the Healy moraine forms the substrate upon which the site's eolian deposits and paleosols later formed. The Riley Creek Glaciation, which includes the last major ice advances in the Nenana Valley, terminated sometime prior to about 9000 yr BP. The Healy Glaciation is generally considered to be Illinoian in age (Péwé *et al.*, 1965), but it could be as young as early Wisconsinan (Péwé, 1975; Wahrhaftig, personal communication, 1975). A late Wisconsinan age is generally accepted for the Riley Creek Glaciation.

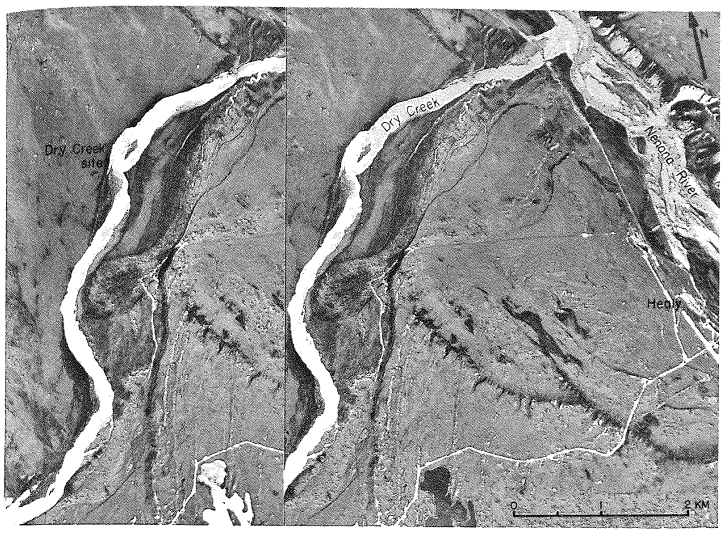

FIG. 2. Stereopair showing Dry Creek site and surrounding area.

Near its confluence with Dry Creek, the Nenana River presently occupies a relatively narrow (0.3 km), slightly braided flood plain incised within a series of broader outwash terraces of Healy and Riley Creek age. The bedload of the river consists primarily of very well-rounded to subrounded sand- to small-boulder-sized clasts of quartz–mica schist, lithic sandstone and conglomerate, and various volcanic and plutonic rocks. Its suspended load consists largely of rock fragments that impart a gray color in both water and sediments.

From its origin near the north flank of the Alaska Range, Dry Creek flows northeastward for 20 km along a wide, braided flood plain and crosses a small alluvial fan that presently is displacing the Nenana River towards its east bank. Near the head of its valley Dry Creek drains a 10-km-wide belt of the quartz–mica schist which forms the northernmost ridge of the Alaska Range in this region (Wahrhaftig, 1970a, b). Farther north, the creek crosses a narrow belt of Tertiary coal-bearing rocks, continues through poorly consolidated Pliocene gravel deposits, and finally crosses Quaternary deposits of Healy and Riley Creek age. Along the lower 8 km of its course, Dry Creek occupies a complexly braided network of shallow channels that averages 150 m in width and has an average gradient of about 20.7 m km^{-1}. Irregularly shaped cobbles and small boulders of quartz–mica schist account for 80% of its bedload. Most of the remaining clasts are well-rounded igneous and metasedimentary cobbles derived from the Pliocene gravel. Platy sand- to granule-sized coal fragments are also present in the flood plain of the creek downstream from the coal-bearing rocks. Dry Creek's suspended load, which consists almost entirely of platy fragments of weathered schist, quartz, and muscovite, imparts a pale brown color to its sediments.

Dry Creek presently lies within the dis-