Preliminary Paleohydrological Investigations at Kaplan-Hoover Archaeological Site

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Abstract. The Kaplan-Hoover bison kill site is a Late-Archaic arroyo trap located near Windsor Colorado. Ontonogenic research suggests the kill occurred during the fall, with Paleo-Indians herding the bison into the arroyo. Minimal bone weathering and the tightly packed nature of the remains strongly suggests that the carcasses were transported during flooding 1-2 years after the kill. Paleo-hydrologic investigations at the site sought to characterize the fluvial events that occurred subsequent to Paleo-Indian occupation of the site. As archaeological excavation has not yet recovered the channel bed, rock fragments typically utilized as proxy indicators of discharge were not available. It was hypothesized that by correlating archeological data with modeled discharge through the ancient arroyo, flood magnitude could be estimated. Using Archimedes Principle, a buoyancy model was developed to determine the volume of water needed to transport the carcasses from the butchering location to their current position in the stratigraphic record. Discharge was simulated using the HEC-RAS flow routing program and modeled flow was matched with volumes estimated from the buoyancy model. By comparing these results with actual runoff data from similar small watersheds, the Kaplan-Hoover flood event appears to be much greater than expected for an annual event. These preliminary findings were used to formulate possible scenarios regarding the sequence of fluvial events at the site. The theorized scenarios acknowledge that damming caused by transported carcasses could lead to overestimation of discharge. These preliminary results may be refined as site excavation continues and new data allow for comparison against estimates calculated from the sheer stress needed to transport rock fragments discovered at the site.