



*University of Utah*

UNDERGRADUATE RESEARCH JOURNAL

**RECONSTRUCTING PALEOCLIMATE IN THE GREAT BASIN  
USING SIZE CLINES IN THE FAUNAL REMAINS FROM HOMESTEAD CAVE**

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Size clines in contemporary mammalian species are well known to track environmental gradients (e.g., in temperature, precipitation, productivity). Such relationships can be used to determine the nature of paleoclimatic change using the fossil record. The faunal remains collected from Homestead Cave serve as the best documented faunal record for the Great Basin, and include an abundance of small mammal remains spanning the last 12 thousand years. These remains can be measured and compared to their modern counterparts in order to track and understand paleoclimate in the region. Previous paleoenvironmental research in the Great Basin indicates a transition from a cool and humid terminal Pleistocene to a warmer and more arid Holocene, with peak aridity occurring during the middle Holocene. For this study two species of squirrel were used: the white-tailed antelope squirrel (*Ammospermophilus leucurus*) and Townsend's ground squirrel (*Spermophilus townsendii*). Specifically, mandibles from all available contexts were measured for comparison against each other and their modern counterparts. The primary data collected from the Homestead Cave fauna have shown that there is variation occurring between stratigraphic contexts, indicating that climate may have been driving some morphological variation within species. These variations include increased width and thickness of mandible body, and an increased length in the mandibles. Using the predefined relationships between small mammal morphology and climate, the variations in robusticity allow for paleoclimatic inference.