

Science and Math Seminar Series: Fall 2015



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Living on the Edge: coping and adaptation in an extreme environment

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How does an organism cope with changing climatic conditions when it already sits at the extreme edge of its' physiological tolerance? Can animals adapt to drastic shifts in temperature, especially when they occur rapidly over short time intervals? What options does an animal living in an extreme environment have? This research examines the adaptive responses of *Neotoma* (woodrats) to significant climate fluctuations over the last 30,000 years and how animals living at the edge of their thermal and ecological thresholds have persisted in Death Valley, dubiously the hottest place on earth. We combined fieldwork on extant animals living on the Valley floor with historical museum information and paleomiddens to reconstruct evolutionary histories of two species that differ significantly in body size and habitat preferences. Our work suggests Death Valley temperatures have had a profound influence on all aspects of woodrat life history, ecology, distribution, and evolution in one of the most extreme places on earth.

