A paleoclimatic record from the "Nevadaplano" during the Middle Cretaceous using stable isotopes and clumped isotope paleothermometry

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During the Cretaceous, a time marked by global temperatures ~14°C warmer and sea levels >100m higher than today, there were at least eight major ocean anoxic events (OAEs) [1]. OAEs caused rapid organic carbon burial and are often attributed to abrupt increases in ocean temperatures induced by influxes of pCO_2. These events have been well documented in large positive $\delta^{13}C$ excursions in the Cretaceous marine sediment record, but it is still unknown if signals from the OAE carbon cycle are truly 'global' perturbations as they have not yet been documented in terrestrial environments.

By Late Cretaceous time, central Nevada, USA, was likely a high elevation, low relief plateau ("Nevadaplano"). However, the timing and extent of surface uplift of the Nevadaplano is the subject of continued debate and is critical for evaluating regional-scale tectonic responses to Cordilleran orogenesis and coevel paleoclimatic responses to regional and global changes. The Newark Canyon Formation (NCF) is a sedimentary unit in central Nevada that consists of interbedded conglomerates, sandstones, mudstones, and limestones that record fluvial and lacustrine deposition. The NCF is proposed to have been deposited in a series of syn-contractional 'piggy-back' basins associated with early thrust faulting and folding in the hinterland of the Cordilleran mountain belt [2]. Thus, it presents a unique opportunity to examine how a mid-latitude, terrestrial system responds climatically and environmentally to considerable global climate variation and potential regional elevation change. We are using stable and clumped isotope geochemistry to examine temperature variation, hydrologic change, and signals of aridity throughout Middle Cretaceous time in central Nevada in order to deconvolve paleoclimatic variation from changes in surface elevation.

We will present clumped isotope values (Δ_{47}), $\delta^{13}C$, and $\delta^{18}O$ stable isotope data from terrestrial lacustrine and palustrine carbonates alongside detailed stratigraphic sections and petrography from the type section of the NCF. These data will enable us to evaluate the paleoenvironmental setting represented by the Newark Canyon Formation, how it responded to orogenic processes, and to what extent rapid climate variation during Cretaceous OAEs has been preserved in the terrestrial record.

[1] Takashima (2006) *Oceanography* 19, 64-74. [2] Long (2014) *Geosphere* 10, 564-584.