SEARCHING FOR THE MOJAVE-SNOW LAKE FAULT: UNDERGRADUATE TEAM RESEARCH AT USC

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The Mojave-Snow Lake fault (MSLF) is a hypothesized structure that accommodated as much as 200 to 400 km of dextral displacement in the Cretaceous, bringing Precambrian through Triassic miogeoclinal rocks north from the western Mojave Desert to their present location in the central Sierra Nevada batholith. Studies using structural, stratigraphic, geochemical and detrital zircon geochronology data have focused on tying metasedimentary pendants of the Snow Lake block in the Sierra Nevada batholith to miogeoclinal rocks found in the western Mojave. Our study focuses on finding evidence for structures that may have accommodated or at least be a result of the proposed ~400 km of displacement. Our detailed mapping near Cinko Lake is in a domain between the easternmost metasedimentary pendants thought to have miogeoclinal affinity and the westernmost extent of Jura-Cretaceous metavolcanic rocks associated with Sierra Nevada arc activity. Our hypothesis is that, between the metasedimentary pendants and metavolcanics, some faulting may have occurred, and therefore this is a key locality to look for MSLF evidence. Mapping in the Harriet Lake granodiorite (HLG), Cinko Lake quartz diorite (CLQD), Fremont Lake granodiorite (FLG) and pendants (metasedimentary and metavolcanic) shows no evidence for large-scale dextral shear. Preliminary U/Pb zircon ages from the HLG and CLQD yield 102 Ma and 95 Ma respectively, and field relationships indicate that the FLG is younger than 95 Ma, confirming that any MSLF motion must have occurred prior to 102 Ma. The Cinko Lake metasedimentary pendant long-axis and structures have dominantly EW orientations implying any MSLF shearing was completely overprinted and possibly rotated post-translation. Likewise, the HLG has high-temperature shear-zones in EW orientations but these have only cm scale displacements and are likely strain features related to late stage emplacement as they cut the NW-SE magmatic foliation in the HLG and probably occur ca. 102 Ma intrusion. All plutons cross-cut bedding and structures that are NW-SE trending and steeply dipping in both pendants. Only minor evidence for pluton related strain is recorded in the pendants as EW overprinting foliations and steeply plunging lineations. We conclude that there is no field evidence for a MSLF north of the Tuolumne batholith that could have been active after 102 Ma.