

## New geochronologic evidence exposes kinematic transitions detailed by stratigraphic complexities for the previously broadly classified Weepah Hills supradetachment basin, western Nevada

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The Weepah Hills extensional complex is part of the greater Silver Peak-Lone Mountain extensional complex that transfers dextral strike-slip motion, derived from the Eastern California shear zone, through the Death Valley-Fish Lake Valley fault system to the central Walker Lane structural belt. Previous research conducted in the Weepah Hills metamorphic core complex and the overlying extensional allochthon of the Alum Prospect area suggested that the dissected upper-plate sediments were deposited as a single, temporally continuous stratigraphic package, formerly known as the Esmeralda Formation, in a supradetachment basin that formed as a result of northwest directed transtension. Former research also contends that the detachment fault and high angle normal faults that cut these sediments were kinematically linked. New geochronologic data paired with detailed stratigraphic sections and geologic mapping elucidates a more complex structural and depositional evolution; three temporally distinct stratigraphic packages comprised primarily of laterally discontinuous alluvial and lacustrine sedimentary deposits interbedded with tuffaceous units are separated by two distinct unconformities. This stratigraphic and structural evidence, framed by the geochronologic dating of tuffaceous units, records the kinematic transition from Basin and Range related east-west extension to northwest oriented transtension and detachment faulting. (U-Th)/He thermochronology, for both zircon and apatite, and U-Pb geochronologic analysis of zircons has been conducted on samples from the footwall of the detachment fault to constrain the timing of footwall exhumation and to determine if the magmatism responsible for the Weepah Hills pluton temporally coincides with other, compositionally similar plutons in the region (e.g. Lone Mountain and Mineral Ridge plutons).

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