



162-6 - AGE RELATIONSHIPS BETWEEN THE COAST RANGE OPHIOLITE, OPHIOLITIC BRECCIA, AND OVERLYING STRATA OF THE GREAT VALLEY FOREARC, SACRAMENTO SUBBASIN, NORTHERN CALIFORNIA



Tuesday, October 12, 2021



9:00 AM - 1:00 PM



Oregon Convention Center - Exhibit Hall A

Booth No. 118

Abstract

The Great Valley Forearc (GVF) basin in California reflects deposition along the western margin of North America during active oceanic subduction between Mesozoic-early Cenozoic time. Along the western GVF, its underlying basement, the Coast Range Ophiolite (CRO), is exposed as a narrow outcrop belt. CRO segments are overlain by basal GVF strata, and locally, an ophiolitic breccia separates the CRO from basal GVF strata. This study reports new stratigraphic, petrographic and geochronologic data from the upper CRO, ophiolitic breccia, and basal GVF strata in the northwestern Sacramento subbasin of the GVF to address the temporal relationship between the three units, along with their provenance signatures. Gabbros from the upper CRO yield zircon U-Pb ages of 164.84 ± 0.89 Ma and 164.85 ± 0.61 Ma. Detrital zircon data from the lower and upper ophiolitic breccia yield MDAs of ~ 165 Ma and ~ 151 Ma, respectively. Along strike variation in Jurassic and Cretaceous MDAs from basal GVF strata range from ~ 147 -141 Ma, which may reflect diachronous deposition in segmented depocenters during early development of the forearc. Prominent detrital zircon age populations of the ophiolitic breccia and basal GVF strata comprise Jurassic and Early Cretaceous ages, likely derived from Mesozoic igneous and volcanic rocks of the Sierra Nevada-Klamath magmatic arc. Sandstone modal point count results support this interpretation, with the majority of detrital samples comprising litharenites and plotting in the magmatic arc tectonic provenance field. Pre-Mesozoic detrital zircon age populations of the ophiolitic breccia and basal GVF strata contain peak populations of 2200-2000 Ma, 1900-1600 Ma, 1500-1400 Ma, 1300-950 Ma, 700-550 Ma, and 450-250 Ma, consistent with North America affinity sources. We present a tectonic model for the early development of the GVF wherein the ophiolitic breccia was deposited in a forearc position atop the CRO and relatively proximal to the Sierra Nevada-Klamath magmatic arc, subsequently followed by deposition of GVF sediment.

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OVERLYING GREAT VALLEY FOREARC BASIN, NORTHERN CALIFORNIA

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