



162-5 - THE RELATIONSHIP BETWEEN THE FORMATION AND EVOLUTION OF THE COAST RANGE OPHIOLITE AND GREAT VALLEY FOREARC, NORTHERN AND CENTRAL CALIFORNIA



Tuesday, October 12, 2021



9:00 AM - 1:00 PM



Oregon Convention Center - Exhibit Hall A

Booth No. 117

Abstract

The Great Valley Forearc (GVF) basin is located in the Central Valley of California nestled between the Sierra Nevada magmatic arc to the east and the Franciscan subduction complex (FSC) to the west; the basal GVF lies atop Coast Range Ophiolite (CRO) along the western outcrop belt. Today, the Central Valley produces much of the United States' produce, and has significant oil and gas reserves in the subsurface. The goal of the GVF-SUR project, is to investigate the relationship between the formation and evolution of the forearc and the CRO. The crystallization age of the CRO, depositional age of the GVF, provenance of the GVF and ophiolitic breccia, as well as the thermal history of all three and their contact relationships will be determined using U-Pb geochronology, apatite and zircon (U-Th)/He and fission track thermochronology methods, sandstone petrography, and biostratigraphy of Radiolaria and Buchia bivalves. Paleomagnetism will be used to determine the relative paleolatitudes of CRO formation, either central North America during the latest Jurassic or 500 km south near modern Mexico, as well as GVF initial deposition.

There are three leading theories for CRO formation and relationship to the GVF that will be tested: (1) Back-arc spreading behind an east-facing island arc that collided with the Sierran continental margin arc; (2) Oceanic lithosphere formed south of the forearc's current location and then drawn northward toward the FSC in front of the Sierran arc; (3) Suprasubduction of the Farallon plate that caused forearc spreading within the region ignited by transtensional deformation from slap rollback. These hypotheses will be tested through the above methods on 49 samples (17 detrital zircon U-Pb, 6 igneous U-Pb, 17 thermochronology, 6 mudstone and chert biostratigraphy, and 3 sandstone and additional igneous paleomagnetism) from localities ranging from Del Puerto Canyon southeast of San Jose to the western outcrop belt between Wilbur Springs and Lowrey.

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162: T7. Initiation and Evolution of Arc-Forearc Systems in Cascadia and Beyond (Posters)

Michael Darin, Nevada Bureau of Mines & Geology, University of Nevada, Reno, Reno, NV, **Kristin McDougall**, U.S. Geological Survey, GMEG Science Center, Flagstaff, AZ, **James Jackson**, Department of Geology, Portland State University, Portland, OR, **Paul Umhoefer**, School of Earth & Sustainability, Northern Arizona University, Flagstaff, AZ, **Megan Mueller**, Department of Earth and Space Sciences, University of Washington, Seattle, WA, **Devon Orme**, Department of Earth Sciences, Montana State University, Bozeman, MT and **Harold Tobin**, Dept. of Earth and Space Sciences, University of Washington, Seattle, WA



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QUANTIFYING RADIATION DAMAGE USING CATHODOLUMINESCENCE, PHOTOLUMINESCENCE, AND RAMAN SPECTROSCOPY ON ZIRCONS FROM THE COAST RANGE OPHIOLITE AND SIERRA NEVADA BASEMENT: IMPLICATIONS FOR THE THERMAL HISTORY OF BASEMENT ROCKS AND THE OVERLYING GREAT VALLEY FOREARC BASIN, NORTHERN CALIFORNIA

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DEPOSITIONAL AGE AND PROVENANCE OF THE GREAT VALLEY FOREARC BASIN EXAMINED THROUGH U-PB GEOCHRONOLOGY, WILBUR HOT SPRINGS AND LYNCH CANYON, NORTHERN CALIFORNIA

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PROVENANCE AND DEPOSITIONAL AGE ANALYSIS OF THE BASAL GREAT VALLEY FOREARC IN NORTHERN CALIFORNIA USING DETRITAL AND IGNEOUS ZIRCON U-PB GEOCHRONOLOGY

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TERRANES, SPREADING RIDGES, AND OCEANIC PLATEAUS – A TALE OF THE SOUTH-CENTRAL ALASKAN FOREARC

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