THE GEOLOGICAL SOCIETY OF AMERICA®
CONNECTS 2021
10–13 October
Portland, Oregon, USA

162-7 - PROVENANCE AND DEPOSITIONAL AGE ANALYSIS OF THE BASAL GREAT VALLEY FOREARC IN NORTHERN CALIFORNIA USING DETRITAL AND IGNEOUS ZIRCON U-PB GEOCHRONOLOGY

Tuesday, October 12, 2021

9:00 AM - 1:00 PM

Oregon Convention Center - Exhibit Hall A

Booth No. 119

Abstract

The Great Valley Forearc in northern California is an example of a composite basin that began to form during Late Jurassic to Early Cretaceous time and continued to accumulate sediment into the Early Cenozoic. Although many geologic studies exist on this region, there are still uncertainties regarding the formation of the Great Valley forearc and the age relationship between the underlying basement and overlying stratigraphy. For this study, 2100 single-grain analyses from seven detrital samples from the forearc and 150 single-grain analyses from three igneous samples from the underlying Coast Range Ophiolite from the Paskenta region were analyzed and compared to existing geochronologic data from neighboring areas to determine crystallization ages and maximum depositional ages (MDA), as well as provenance. Previous provenance studies have interpreted detritus deposited in the Elder Creek region (north of Paskenta) and the Grindstone Creek region (south of Paskenta) to be sourced from the erosion of sediment of the Sierra Nevada magmatic arc and the continental interior by arc-retroarc river systems based on major U-Pb age populations of ~140-250 Ma, ~300-450 Ma, ~550-700 Ma, ~950-1300 Ma, ~1400-1500 Ma, ~1600-1800 Ma and >2500 Ma. Preliminary results from this work support these interpretations and document changes in the proportions of magmatic arc versus retroarc material based on the depositional age. Previous findings report MDAs around Elder Creek to be 140-153 Ma and Grindstone Creek to be 142-151 Ma, indicating that these rocks were not deposited prior to the latest Jurassic and some areas began accumulating sediment in earliest Cretaceous time. Analyses on the crystallization age of zircons derived from the Coast Range Ophiolite and overlying breccia are ongoing and will be compared to MDAs from the forearc stratigraphy near Paskenta.

Geological Society of America Abstracts with Programs. Vol 53, No. 6, 2021
doi: 10.1130/abs/2021AM-367406

Author

D

Samantha Dittrich
Montana State University

O

Devon Orme
Montana State University

View Related

Session

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*

Tuesday, October 12, 2021

9:00 AM - 1:00 PM

Oregon Convention Center - Exhibit Hall A

Topical Sessions

Technical Programs

Similar

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

***MANTA, Robert** and ORME, Devon, Earth Sciences, Montana State University, PO Box 173480, Bozeman, MT 59717-3480*

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

***ROMERO, Mariah** and ORME, Devon, Department of Earth Sciences, Montana State University, Bozeman, MT 59717*

DETRITAL ZIRCON GEOCHRONOLOGY OF THE WESTERN BAJA TERRANE: CONSTRAINTS ON THE TIMING OF MESOZOIC SUBDUCTION AND ACCRETION IN BAJA CALIFORNIA

***UNRUH-FRIESEN, Evan**, Geology Department, Macalester College, 1600 Grande Ave, Saint Paul, MN 55105 and CHAPMAN, Alan, Geology, Macalester College, 1600 Grand Ave., Saint Paul, MN 55105-1801*

COUPLING BETWEEN MAGMATISM, RETRO-ARC CONTRACTION, FORELAND BASIN ARCHITECTURE AND PLATE CONVERGENCE: EVIDENCE FROM DETRITAL ZIRCON GEO-THERMOCHRONOLOGY IN THE CORDILLERAN RETROARC BASIN

PUJOLS, Edgardo, *Earth and Space Sciences, Lamar University, 4400 MLK Blvd., PO Box 10009, Beaumont, TX 77710 and STOCKLI, Daniel F., Department of Geological Sciences, University of Texas at Austin, Jackson School of Geosciences, Austin, TX 78712*

DETRITAL ZIRCON RECORD OF CORDILLERAN MAGMATISM AS PRESERVED BY JURASSIC-PALEOCENE FOREARC AND FORELAND BASINS OF THE NORTH AMERICAN CORDILLERA

SCHWARTZ, Theresa[1], *SURPLESS, Kathleen D.*[2] *and COLGAN, Joseph P.*[1], *(1)U.S. Geological Survey, Geosciences and Environmental Change Science Center, DFC, Box 25046, MS 980, Denver, CO 80225, (2)Geosciences, Trinity University, One Trinity Place, San Antonio, TX 78212*