

102nd Annual Meeting of the Cordilleran Section, GSA, 81st Annual Meeting of the Pacific Section, AAPG, and the Western Regional Meeting of the Alaska Section, SPE (8–10 May 2006)

Paper No. 24-8

Presentation Time: 4:10 PM-4:30 PM

MESOZOIC ARC-ARC AND ARC-CONTINENT COLLISION IN THE BLUE MOUNTAINS PROVINCE, NORTHEASTERN OREGON: A NEW HYPOTHESIS TO BE TESTED

[DORSEY, Rebecca J.](#), Dept. of Geological Sciences, 1272 University of Oregon, Eugene, OR 97403-1272, rdorsey@uoregon.edu and LAMASKIN, Todd A., Department of Geological Sciences, Univ of Oregon, 1272 University of Oregon, Eugene, OR 97403

Ongoing study of accreted terranes in the Blue Mountains Province (BMP) of NE Oregon provides new insight into growth of the western Cordillera. Paleozoic and Mesozoic rocks represent two dismembered magmatic arcs (Wallowa and Olds Ferry terranes), an intervening oceanic subduction complex (Baker terrane), and a thick sedimentary overlap assemblage known as the "Izee terrane". Review of the literature indicates that Triassic magmatism in the Wallowa and Olds Ferry arcs ended in late Carnian time, and that Carnian-Norian chert-bearing olistostromes and conglomerates were shed in opposite directions off a large tectonic highland in the Baker terrane. The transition from Martin Bridge Limestone to marine flysch of the Hurwal Fm records foundering of a carbonate platform, possibly in response to Late Triassic growth of a large foredeep basin. Stratigraphic relations in the Izee-Suplee area show that the Baker terrane thrust belt became inactive, subsided deeply, and was submerged up to ~10 km beneath the Early to Middle Jurassic marine Izee basin (Dickinson and Thayer, 1978). These observations can be explained by a multi-stage history of protracted arc-arc and arc-continent collision consisting of: (1) Middle to Late Triassic (~235-220 Ma) doubly-vergent subduction of oceanic crust beneath the pre-collisional Wallowa and Olds Ferry arcs; (2) early-collisional shortening and growth of a large thrust belt in the Baker terrane during Carnian-Norian time (~225-210 Ma); (3) Latest Triassic to Middle Jurassic (~210-160 Ma) flexural subsidence in the Izee basin, possibly in response to telescoping of the back-arc basin and thrust loading in the Luning Fencemaker thrust belt of western Nevada (Wyld and Wright, 2001); and (4) Late Jurassic tectonic closure of the Izee basin during regional metamorphism, plutonism, and deformation. This hypothesis differs from existing models for the BMP, which infer that Izee-basin strata accumulated in a long-lived Triassic-Jurassic forearc basin between a noncollisional subduction zone in the west and the Olds Ferry magmatic arc in the east. We plan to test the arc-collision hypothesis with a new study of basin evolution and sedimentary provenance using detrital zircon geochronology, Nd-Sm isotopes, and trace element geochemistry, in collaboration with Jeff Vervoort at WSU.

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[General Information for this Meeting](#)

Session No. 24

[GSA: Accreted Terranes of Western North America: An Update on Current Research on the Construction of the Cordillera I](#)

Anchorage Hilton Hotel: Aleutian

1:20 PM-5:00 PM, Tuesday, 9 May 2006

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