

9-8 - U-PB DETRITAL ZIRCON DATING OF THE SITKA GREYWACKE, BARANOF ISLAND, SE ALASKA



Thursday, 7 April 2022



8:00 AM - 12:00 PM



Duke Energy Convention Center - Junior Ballroom B

Booth No. 8

Abstract

The Sitka Greywacke on Baranof Island in Southeast Alaska is part of the Chugach-Prince William terrane, a ~2100 km accretionary complex along the southern margin of Alaska from Sanak Island in the west to Baranof Island in the east. The Cretaceous-Paleogene Sitka Greywacke is composed of deformed turbidites intruded by 47-53 Ma plutons of the Sanak-Baranof belt. Metamorphism in the Sitka Greywacke is generally low grade (prehnite-pumpellyite) but locally reaches amphibolite facies containing garnet + andalusite adjacent to plutons. In this contribution, we use LA-ICPMS U-Pb dating of detrital zircon from 29 sandstone samples (22 from this study) to determine the maximum depositional age (MDA) and provenance of the Sitka Greywacke. MDAs calculated from the weighted mean of the youngest three grains and using the youngest statistical population are typically indistinguishable (within 2σ) and range from 102 to 58 Ma.

All samples have primary age populations in the Paleogene or Late Cretaceous (Cenomanian-Maastrichtian). Several samples have minor populations in the Lower Jurassic, Upper Triassic, and Devonian. A range of Precambrian grains exists, with ages spanning the Neoproterozoic through the Mesoarchean. The MDAs young systematically toward the ocean (inboard to outboard) and support the presence of an inboard Albian belt (81-102 Ma), an intermediate Maastrichtian belt (66-70 Ma), and an outboard Paleocene belt (58-64 Ma) as first proposed by Rick (2014). All three belts are exposed in Sitka Sound with the oldest ages near Sitka (102 Ma) and the youngest ages in Whale Bay (58 Ma). The ~11 m.y. gap in the MDAs between the Albian and Maastrichtian belts could be due to non-deposition, subduction erosion, was cut-out during thrusting in the accretionary wedge, or removed during strike-slip motion associated with the Fairweather fault system. MDAs from the Maastrichtian and Paleocene belts on Baranof Island correlate with those from the Valdez and Orca Formations in Prince William Sound near Anchorage, Alaska.

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