

CRETACEOUS TECTONIC AND MAGMATIC EVOLUTION OF THE BENDELEBEN AND WINDY CREEK PLUTONS, SEWARD PENINSULA, ALASKA

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The Bendeleben and Windy Creek granitoid plutons, located in the Bendeleben and Darby Mountains, were emplaced at the end of a multiple-phase injection event lasting about 20 my within an extensional setting during the late Cretaceous. ^{207}Pb corrected $^{206}\text{Pb}/^{238}\text{U}$ SHRIMP-RG ages of zircons from these plutons are 82 to 86 $\pm$ 2 Ma and 96 $\pm$ 2 Ma respectively, and 95 $\pm$ 2 Ma from a nearby dike to the south. Comparison of these data to an age of 104 $\pm$ 1 Ma from the western margin of the Bendeleben pluton (Gottlieb and Amato, 2008) implies a more complex history of magmatism than previously suggested. Petrographic analysis of 85 samples collected from the plutons and surrounding country rock supports an extensional setting of the Seward Peninsula during the Cretaceous through observation of sense of shear indicators and well preserved high temperature sheared microfabrics in the metasediments. In-place biotite-rich granites found within the Bendeleben pluton range from strongly foliated to unfoliated, and show local hornblende rich zones. Country rocks to the south are southward-dipping well-foliated units of garnet and sillimanite-bearing schist and boudinaged marble. Strain shadows from boudins and oriented thin sections show top to south shear. The Bendeleben pluton is separated to the southeast from the Windy Creek pluton by a wedge-shaped mylonitic shear zone. The Windy Creek pluton is composed of unfoliated granite exposed in frost-heaved boulder fields. Country rocks to the southwest are low-grade white-mica schist, garnet-bearing schist and graphitic marble correlative with the Nome Group. While geochronology and structural analysis of the southern Seward Peninsula help to explain the tectonic history of the area, the cause for the abrupt change in structural trends from the east-west oriented Bendeleben Mountains to the north-south oriented Darby Mountains is unclear.

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