

Age and tectonic setting of northern circum-Pacific magmatic belts and their potential constraints on the opening of the Amerasia Basin of the Arctic

Elizabeth L. Miller & Viacheslav V. Akinin

elmiller@stanford.edu

The evolution of continental margin subduction-related magmatic belts is key to understanding the nature of plate margin tectonics through time as the histories of these belts are sensitive to plate motion changes and re-organizations. A synthesis of northern circum-Pacific magmatism aims to establish the regional timing of magmatic belts, their nature, tectonic setting and, more specifically, how changes in their age and evolution might be spatially and temporally linked to formation of the Amerasia Basin of the Arctic. Our findings suggest that the likely time span for rifting in the Amerasia Basin is coeval with a widespread episode of ~125-90 Ma potassic to calc-alkaline syn-extensional plutonism across Chukotka and central Alaska (whose inception is syn-HALIP). This magmatic belt post-dates development of a ~160-135 Ma Pacific margin fold-thrust/accretionary belt whose elements are now displaced by rifting/extension. The ~80-90 Ma subduction related Okhostsk-Chukotka volcanic belt mostly post-dates rifting/transtension in the NE Russia sector of the Arctic but is coeval with continued extension in the Bering Strait and Alaska, suggesting that opening of the Canada Basin might be linked to younger events, possibly as young as the subsequent southward migration of 90 to 60 Ma magmatism as well as to differences in tectonic setting from shortening (east Alaska) to extension (Bering Strait) in the Late Cretaceous to Tertiary. This timing is the reverse of what has been suggested for the relative ages of the western (younger) versus eastern (older) Amerasia Basin.