



Continental Flood Basalts of Bennett Island, East Siberian Sea: High Arctic Geodynamics

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Volcanism provides a means of tracing mantle melting events and crustal evolution. The High Arctic includes a rich portfolio of volcanic rocks outcropping in the Circum-Arctic borderlands and imaged geophysically beneath the Alpha-Mendeleev Ridge that have been lumped together as a High-Arctic Large Igneous Province (HALIP). However, the ages (c. 440–60 Ma) and compositions (tholeiitic–alkaline–calc-alkaline) reported varies considerably and geological correlations remain elusive. One of the possible correlative events is the formation of continental flood basalts and sills in the Canadian Arctic Islands, Svalbard, Franz Josef Land and Bennett Island. These flood basalts have previously been linked to mantle plume melting and may represent a short-lived LIP event at c. 124–122 Ma.

We present new data for a 350 m thick continental flood basalt succession at Bennett Island examined during fieldwork in September 2013 on a joint Russian (VSEGEI) – Swedish (SWEDARCTIC) expedition to the De Long Archipelago. This volcanic succession is composed of 20 near-horizonta, undeformed flow units overlying a thin sedimentary succession of Cretaceous age (?) including coal seams and possibly volcanoclastic material that, in turn, unconformably overlies a more steeply dipping succession of Cambrian and Ordovician sediments. The flows are thinnest (c. 2–10 m) and aphyric to very-sparsely olivine-phyric in the lower portion. In contrast, the flows in the upper portion are thicker (>20 m) and aphyric to sparsely plagioclase-phyric.

We will discuss new petrographic and compositional data for the Bennett Island flood basalts, possibly including new U–Pb age data. The aim is to evaluate their petrogenesis, to discuss their possible correlation to the flood basalt and sill successions of the Canadian Arctic Islands, Svalbard and Franz Josef Land and evaluate the geodynamic evolution of the High Arctic.