

Dismembered Bennett-Barrovia Block in the East Siberian Arctic Shelf and its implications for the Amerasian Arctic geology

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The East Siberian Arctic Shelf (ESAS) is a key region for understanding the pre-Late Cretaceous geological history of the Arctic. Interpretation of new seismic and geologic data that became available since late 2000s allows us to develop a new tectonic model of ESAS. The latter is pictured to consist of the Kotel'nyi, De Long, & Wrangel-Chukotka crustal blocks, which are divided by the broad North Chukchi Basin (NCB) underlain by thinned lower continental crust and exhumed mantle. We infer that these blocks together with Chukchi Borderland and perhaps Arctic Alaska, represent fragments of what once was a single continental mass – the Bennett-Barrovia Block (BBB) (after Natal'in et al., 1999). BBB key characteristics include:

- Neoproterozoic basement revealed by dominant Timanian Zr signal
- Similar Paleozoic lithostratigraphy across currently separated blocks
- Evidence of a Devonian compressional event on Kotel'nyi and Wrangel islands
- Similar distribution of detrital zircon ages in Paleozoic strata

The BBB was probably separated from Arctic Alaska/Canada and dismembered by crustal thinning associated with NCB formation. Presently, there is no data to constrain the time of this extension we but speculate its relationship with pre-Canada Basin rifting to be Jurassic—earliest Cretaceous. During closure of the Anyui Paleoocean, the Kotel'nyi and Wrangel-Chukotka blocks collided with the Eurasian margin along the South Anyui Suture and became parts of the Verkhoyansk-Chukotka-Brooks orogen. Compressional deformation also affected the southern part of NCB.