



The Arctic Connection to the Northeast Atlantic constrained by Crustal Thickness & Lithosphere Thinning Factors from OCTek Gravity Inversion

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Plate reconstructions are vital for our understanding of the formation of rifted continental margins and ocean basins. They provide insight into margin conjugacy as well as constraining the timing of breakup at the continental margins & the geometry of pre-breakup basins. Results from the existing plate reconstructions can be significantly improved by using OCTek gravity-anomaly inversion, which incorporates a lithosphere thermal gravity-anomaly correction, to determine Moho depth, crustal thickness and lithosphere thinning across continental margins. In the Arctic and North Atlantic, these results have been used to map rifted continental-margin structure, location of the continent-ocean boundary (COB) and the distribution of micro-continents within the ocean basins, results which are in turn used to enhance & refine existing plate reconstruction models. Maps of continental lithosphere thinning factor and crustal thickness from gravity inversion provide predictions of structure within the ocean-continent transition and of COB location, independent of magnetic isochrons. Using these maps, with shaded-relief free-air gravity-anomaly superimposed, we have improved the understanding of pre-breakup rifted margin conjugacy and sea-floor spreading trajectory within the Arctic basins. By restoring crustal thickness & continental lithosphere thinning maps of the Eurasia Basin & NE Atlantic to their initial post-breakup configuration we can show the geometry and segmentation of the rifted continental margins at their time of breakup, together with the location of highly-stretched failed breakup basins and rifted micro-continents. In this talk we focus on the Tertiary development of connectivity between the Eurasia Basin & the NE Atlantic. We interpret crustal thicknesses underneath Morris Jessop Rise & Yermak Plateau as continental crust which provided a barrier to the tectonic and palaeo-oceanic linkage between the Arctic & North Atlantic until $\sim 33\text{Ma}$, at which time the two 'micro-continents' become separated. Before this time, we link the seafloor spreading within the Eurasia Basin to that in Baffin Bay, rather than transfer south into the NE Atlantic.