

## The pre-Caledonian margin of Baltica

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It is well-documented that the pre-Caledonian margin of Baltica constituted a several hundred-km wide and more than 2000 km long passive margin. Its vestiges occur at low- to intermediate structural levels in the mountain belt, and are variably overprinted by the early- to end-Caledonian orogenic deformation and extension. Attempts to reconstruct the Caledonian margin of Baltica must be based on detailed maps integrated with studies of the rock-complexes that originally constituted the passive margin. The proximal parts of pre-Caledonian margin of Baltica are dominated by continental rift basins with coarse to fine-grained sediments deposited in the late Proterozoic through the Ediacaran and into the Lower Palaeozoic. The youngest dated clastic zircons probably record magmatism associated with initial contraction near or in the distal margin. The 'margin nappes' also comprise Baltican basement slivers and coarse to fine-grained sedimentary units as well as deep-marine basin deposits. A major change in the architecture of the passive margin units takes place across a transvers zone, which is sub-parallel to the present-day Gudbrandsdalen of South Norway. The transition is roughly parallel to the major basement lineament of the Sveconorwegian orogenic front in south Norway. The most important change across this transverse lineament is that the NE segment is magma-rich, characterized by abundant basaltic magmatism. The SW segment is magma-poor, and characterised by numerous (>100) solitary meta-peridotites, mostly meta-dunites and meta-harzburgites as well as a number of detrital serpentinites and soapstones. These are interpreted as fragments of exhumed mantle and their erosion products, respectively. The meta-peridotites emplaced structurally, and covered by dominantly deep-basin sediments, but also by coarser sedimentary breccias and conglomerates, as part of the rifted margin development. This mixed unit (mélange) was locally intruded by Late Cambrian to Early Ordovician gabbros and granitoids, and was affected by early metasomatism before the main Caledonian metamorphism and deformation. Another important feature of the mélange is the common presence of elongate (<40 km), thin (maks 1.5 km) basement slivers of Baltican affinity. The magma-poor SW segment is structurally overlain by huge crystalline basement nappes of Baltican basement, which after rifting, but prior to the Scandian Caledonian shortening were positioned outboard of the hyperextended segment. These nappes probably constituted a microcontinental sliver comparable in size to the Jan Mayen microcontinent in the present Greenland-Norwegian Sea, and were variably affected by early Caledonian contraction before the Scandian collision. The SW segment represented interpreted to have constituted a more than 400 km long, hyperextended- and magma-poor basin, which received sediments into the Early Ordovician and perhaps until the onset of the Scandian orogeny? The SW segment is devoid of magmatic rocks of Ediacaran age, except for cutting in-situ Baltican basement at ~615Ma. The NE segment also has numerous mantle peridotites including detrital serpentinites, but are better characterised by the abundant mafic intrusions constituting a LIP. This segment is interpreted to represent transitional crust between the distal margin of Baltica and the oceanic crust. The magma-poor segment to the SW is suggested to have constituted a transitional-crust to oceanic basin opening NE-ward to a seaway, which most likely had oceanic lithosphere, much similar to present North Atlantic between Ireland and the Hatton-Rockall ribbons.