

Sediment provenance at the edge of Baltica during the late Neoproterozoic and Cambrian: Insights from a multi-method approach on the Digermulen Peninsula (Finnmark, Arctic Norway)

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The Digermulen Peninsula contains an almost complete sedimentary record across the Ediacaran–Cambrian transition as well as microfossils, macrofossils and trace fossils for studying the Ediacaran biota and the Cambrian radiation. The site was located at the edge of Baltica during the Ediacaran–Cambrian transition, where potentially the dramatic climatic turnover from icehouse to greenhouse conditions can be deduced and tied to large-scale plate tectonics. The succession consists mainly of quartz-rich sandstones and mudrocks. Deposition took place in various environments including fluvial, shallow marine and deeper marine settings. As shown by previous studies using palaeocurrent data, sediment supply was from the Baltic Shield toward the passive margin of Baltica in pre-Ediacaran time. At one point within the Ediacaran succession, it shifted by 180 degrees due to the newly formed Timanian orogen. This orogen formed in north-eastern Baltica during the late Neoproterozoic. It caused a change in source area due to the formation of the Timanian foreland basin to the east of Digermulen Peninsula. Extensive field and laboratory work by the Digermulen Early Life Research Group allows for the first time a detailed analysis of sediment supply and to test current palaeotectonic models based on a multi-method provenance approach on Neoproterozoic and Cambrian sedimentary rocks of the Digermulen Peninsula. We present and discuss the first results to decipher the sediment sources and to track changes of sediment supply through this critical time interval of Earth history.