



Using sediment chemistry in palinspastic reconstructions

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Palinspastic reconstructions are based on both tectonic and sedimentological constraints. The former generally define how the orogen should be restored whilst the latter are used to interpret the basin history. To do this, the typically fragmentary stratigraphic records from different areas must be linked and correlated, essentially to turn a 2-D map view into a 3-D time history. Where high strain/metamorphism has occurred and/or the fossil record is limited, such correlations are difficult and create major uncertainties in the reconstruction. Using sediment geochemistry can assist in correlations, since deposits of the same age in the same basin are likely to have the same composition, whilst units of different age, whether or not within the same basin are likely to be chemically different. Two suites of shales from the Caledonides of N. Norway and Sweden have been analysed. Sediments within the Gaissa Basin post-dating the Gaskiers-equivalent glaciation retain a consistent chemical stratigraphy for up to 500 km distance along and across basin strike, despite orders of magnitude thickness changes. This proves the potential for the correlation method. Sediments from the Finnmark Ridge, Laksefjord Nappe and North Varanger Terrane show marked differences in chemistry compared to the Gaissa Basin and allow a more precise correlation between these units to be made. In both areas, the same systematic changes in source area composition with age are seen.