

THE ROLE OF EAST GREENLAND AS A SOURCE OF SEDIMENT TO THE VØRING BASIN DURING THE LATE CRETACEOUS

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ABSTRACT

Provenance-sensitive heavy mineral criteria, mineral chemistry and detrital zircon age data show that there are strong links between Cretaceous sandstones in the Vøring Basin and East Greenland areas. There are marked differences in the age spectra of detrital zircons from wells along the eastern margin of the Vøring Basin (sandstone type K1) and those in the centre and west of the basin (sandstone type K2). K1 sandstones have a relatively simple zircon age spectra with largely Mid-Late Proterozoic zircons and a number of Caledonian age zircons. By contrast, K2 sandstones have complex zircon age spectra, with Archaean, Early Proterozoic, Permo-Triassic and mid-Cretaceous age zircons that are absent in the K1 sandstones. Some sandstones of Cenomanian and younger age from East Greenland share mineralogical features with the K2 sandstone type, having overlapping ranges of critical provenance sensitive parameters such as RuZi, MZi and CZi, and similar types of detrital tourmalines and garnets. Detrital zircon age spectra from East Greenland samples include critical Archaean, Early Proterozoic and Permo-Triassic populations found in K2 sandstones. The zircon age data therefore provide support for sourcing of K2 sandstones from East Greenland. However, a source for the K2 sandstones to the east of the Caledonian front in Scandinavia cannot be ruled out, neither can recycling of older sediment previously transferred across the rift.