

Regular talk

BOREAL MESOZOIC SEEP COMMUNITIES

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Four areas of Upper Jurassic to Upper Cretaceous aged methane seepage are known from present-day high latitude sites in the Arctic region. These are: (1) East Greenland at Kuhnpasset, Wollaston Foreland (Barremian) and Leitch Bjerg, Geographical Society Island (Campanian), (2) Spitsbergen (Tithonian–Berriasian), (3) Novaya Zemlya (three ages: Oxfordian–Kimmeridgian and Tithonian, and latest Berriasian–Valanginian), and (4) Canadian Arctic on Prince Patrick and Ellef Ringnes Islands (both Albian). In the Mesozoic the latter three areas were part of the Boreal Ocean, which, like the present-day Arctic Ocean, was a relatively isolated marine basin with limited marine connections with the Tethys and ancient Pacific (Panthalassic) Oceans at various times. The East Greenland seeps occurred in a more southerly position in the narrow Norwegian–Greenland Seaway that linked the Boreal Ocean to the Tethys, through NW Europe. Only the Spitsbergen and Early Cretaceous Greenland seep communities have been studied taxonomically and these show an intriguing mixture of species, including a large percentage of background taxa and few seep obligates (Spitsbergen), and a large percentage of seep obligates and few background species (Greenland). Some fossils common in the Panthalassic and Tethyan Mesozoic seep sites are completely absent from the Spitsbergen and Greenland seeps, for example dimerelloid brachiopods and the gastropod genus *Paskentana*. Based on preliminary data this is also true for the Novaya Zemlya and Canadian Arctic seeps (on-going work with colleagues from Poland, Norway, Sweden and Canada). This suggests that in the Mesozoic there was a seep fauna in the Arctic area distinct from that of contemporary lower latitude seeps. Potential explanations for this may be related to the palaeobiogeographic isolation of the Arctic area seeps in the Mesozoic (as seen periodically in non-seep molluscan faunas, particularly ammonites), and/or contemporary palaeoenvironmental differences, such as palaeolatitudinal seawater temperatures, or water depth (palaeobathymetry).

