

# Flemish Cap: a unique part of the Canadian continental shelf

DAVID J.W. PIPER

*Natural Resources Canada, Geological Survey of Canada (Atlantic), Bedford Institute of Oceanography,  
Dartmouth, Nova Scotia B2Y 4A2, Canada <[david.piper@canada.ca](mailto:david.piper@canada.ca)>*

Flemish Cap is a triumph of Canadian diplomacy, being implicitly identified in Article 76 of the UN Convention on the Law of the Sea along with “plateaux, rises, banks and spurs”. It is also quite unusual in its Quaternary geology. Flemish Cap is a horst of Avalonian basement rocks with a thin Mesozoic and Cenozoic cover, separated from the Grand Banks by the 1000 m deep Flemish Pass. The flanks of the Cap are one of the few areas on the eastern Canadian margin to show neotectonic features. Flemish Cap appears to have supported a glacial ice cap during the penultimate glaciation (MIS 6) despite being no shallower than 127 m today. Seismic profiles show features interpreted as grounding line wedges (“till tongues”) and multibeam bathymetry shows upper slope iceberg pits – evidence of indurated substrate. Ice-margin gullies dating from MIS 6 are widespread around Flemish Cap; a few have been reactivated by turbidity current flows off the Cap. Since MIS 6, sediment supply to the Cap has been almost entirely by iceberg rafting. Sands and gravels have been segregated by currents, with sands swept up into large sand ridges, probably at times of lowered sea level. Large muddy sediment drifts have accumulated in deeper waters around Flemish Cap and cores from these drifts preserve a record of sediment supply from the Labrador Current over the last glacial cycle and into the Holocene. Occasional slope failures in these drifts are likely preconditioned by escaping hydrocarbon fluids, resulting in excess pore pressure, and were triggered by rare passive margin earthquakes. The differences between Flemish Cap and other outer shelf areas on the eastern Canadian margin help to unravel the relative importance of different sedimentation processes on a regional scale.

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