

## Orphan Knoll: A dynamic part of a passive margin

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Almost 44 years ago, a young Alan Ruffman sailed on the Glomar Challenger to drill to basement on Orphan Knoll. This was one of the early steps in a process that led to Orphan Knoll being defined as Canadian territory under UNCLOS in December 2013. In the intervening years, Orphan Knoll has proved to be more mysterious than the early workers could have imagined. This presentation will summarize recently reported or published work and present previously unpublished studies.

East of Orphan Knoll, an irregular chain of seamounts runs parallel to the continental margin, the largest of which has a flattish top and mineralogical evidence of emergence. The eastern scarp of Orphan Knoll has shed thick blocky landslides in the early Quaternary, whereas gentler slopes provide a record of passive margin earthquakes away from the influence of glacial eustasy. Orphan Knoll is famous for its enigmatic seabed mounds, which are probably of two types. Previous unpublished studies by S. Meredyk have reported Neogene faulting and uplift, forming small mounds at the crest of the Knoll. On the periphery of the Knoll, larger mounds appear to be rooted in shallow water Cretaceous strata. Seismic data suggests that they may be reef-like structures, but their upper part consists of a winnowed drape of Quaternary sediments with no evidence for active growth of deep-water corals. Quaternary sediment was supplied to the Knoll by the outer part of the Labrador Current and records both fluctuations in current velocity and variations in glacial sources of sediment through time.