Dinoflagellate gems from the GEM project: aspects of Mesozoic-Cenozoic biostratigraphy from Canada's North

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The latest phase of Geological Survey of Canada's Geoscience for Energy and Minerals (GEM) project involves six regions of interest spread across northern Canada, from Baffin Bay to the Cordillera. Rocks of these regions include marine Mesozoic and Cenozoic rocks, which are important in evaluating the geology and petroleum systems of several GEM regions. Dinoflagellate cysts (dinocysts) are a key tool in establishing the ages of Jurassic through Neogene marine strata, and together with other palynomorphs (notably spores and pollen) they are an important source of paleoenvironmental information. Our work is currently focussed on using dinocysts and other palynomorphs to elucidate the Cretaceous–Paleogene stratigraphy within two GEM regions of interest: the Baffin Bay area and the Mackenzie region of western Northwest Territories and eastern Yukon. In the Baffin region, the sections studied are from three areas on Bylot Island: Maud Bight, Two Snout Creek, and the South Coast. Collectively, the sections encompass Albian–Cenomanian to middle Paleocene (Selandian) rocks, previously dated using only spores and pollen. The dinocyst assemblages are refining the age control and highlighting previously unsuspected fluctuations in the marine paleoenvironments. Mesozoic rocks in the Mackenzie region form a key link between the better-dated strata of the Western Interior Seaway further south and coeval strata of the Western Arctic. The Hume River section northwest of Norman Wells has been examined previously using foraminiferal assemblages, but some stratigraphic problems still remain, such as the position of the Albian–Cenomanian transition and the dating of an important unconformity between the Arctic Red and Slater River formations. Dinocysts are being applied to address these problems. Analyses of assemblages in the Hume River section will also provide a benchmark for expanding to other sections in the region and for establishing biostratigraphic events to correlate to other GEM regions. The Hume River section has yielded a rich variety of areoligeracean dinocysts of the genus *Cyclonephelium* and related forms, and these are providing core material for a taxonomic revision of that complex in anticipation of their improved utility for biostratigraphy.

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