Mesoproterozoic Basins Project

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This study focuses on the environments in which 1.2 billion year-old sedimentary rocks were deposited. These sedimentary rocks were deposited on the Earth's surface at a time when movements in the Earth's crust formed high areas that shed sediment and low areas where the sediment accumulated. We are interested in how these activities influenced the sediment that accumulated in ancient rivers and shallow-marine environments. Variations in these types of sedimentary rocks record how the environments differed according to geographic location on the Earth's surface, and through time, as the Earth's crustal movements changed. There are two motivations for this study. (1) The area concerned is known to contain metal deposits. Finding more such deposits will be easier if the geologic history of the area is better understood. (2) The nature of the Earth's surface environments 1.2 billion years ago is not well known, and this project will contribute scientific information toward filling that gap in understanding Earth's history. The areas of interest are northern Baffin Island and the adjacent mainland, Somerset Island, southern Devon Island, and southeastern Ellesmere Island.

The main activity in the field part of the study consists of examining and describing outcrops of sedimentary rock, and collecting fist-sized samples of rocks exposed at the surface of the land for later analysis. The project is based on slow and simple data-gathering in the field, all done on foot from very small base camps that are moved weekly by helicopter. Multiple years of data-gathering are required before a regional synthesis can be put together. 2009 was the first of several proposed years for this project. In 2009, 9 field locations were documented during a field season of approximately 4 weeks, with a field party of two camps of two people each.

The new Mesoproterozoic Basins Project is based on the success of its predecessor, the Borden Basin Project (2003-2007), but focuses on a larger area and more rock types. I am pleased to report that the Borden Basin Project's final publication has been published and is available through NRI (see reference below). The same type of time-line is envisaged for the Mesoproterozoic Basins project. Even though this project has just started, several items have already been produced. Two talks were given at the Yellowknife Geoscience Forum in November, 2009, and a paper is being prepared for publication this year.

Journal paper:

Turner, E.C., 2009. Mesoproterozoic carbonate systems in the Borden Basin, Nunavut. Canadian Journal of Earth Sciences, v. 46, p. 915-938.

Talks:

Turner, E.C. and Long, D.G.F., 2009. Rift-related shale lithostratigraphy, chemostratigraphy and metal prospectivity, Mesoproterozoic Borden Basin, NU. 37th Yellowknife Geoscience Forum, Program and Abstracts, November 17-19, 2009.

Long, D.G.F. and Turner, E.C., 2009. Tectonic, sedimentary and metallogenic re-evaluation of basal strata in the Mesoproterozoic Bylot Basins (NU): Are unconformity-type uranium concentrations a realistic expectation? 37th Yellowknife Geoscience Forum, Program and Abstracts, November 17-19, 2009.