

Global to continental-scale glaciations and their sedimentary record during the Archean-Proterozoic transition

K. STRAND^{1,2*}

¹*Oulu Mining School, (*correspondence: kari.strand@oulu.fi), P.O. Box 3000, University of Oulu, 90014, Oulu, FINLAND*

²*Thule Institute, P.O. Box 7300, University of Oulu, 90014, Oulu, FINLAND*

Earth's climate during the Archean-Proterozoic transition was marked by the first major glacial events with evidence for large continental ice sheets on many cratons, and with sedimentological data indicating that glaciers had extended to sea-level. This study emphasizes the sedimentological and sequence stratigraphic responses to glaciations to evaluate the major driving forces of glaciations during the Archean-Proterozoic transition. First- and second-order sequences are recognized related to continental-scale fragmentation and formation of marine rift basins wherein sedimentary rocks indicate glacial influences and pronounced tectonic-climatic linkages. These glacial deposits seem always to be associated with extensional tectonic setting, although not necessarily always having very intimate relationships to the Earth's supercontinent cycles. It is suggested, however that some long-lived marine terminated glaciers were also situated at low paleolatitudes.

There is a need to continue detailed sedimentological studies of pre-glacial and post-glacial deposits as well as to interpret syn-glacial lithofacies for their inferred transportation and depositional processes. Pre-glacial deposits, especially, should provide a new target to help us understand the processes that initiated the Paleoproterozoic glaciations.

References:

Strand K., 2012. Global and continental-scale glaciations on the Precambrian earth. *Marine and Petroleum Geology* 33, 69-79.

Young, G.M., 2004. Earth's two great Precambrian glaciations: aftermath of the "Snowball Earth" hypothesis. In: Eriksson, P.G., Altermann, W., Nelson, D.R., Mueller, W.U., Catuneanu, O. (Eds.), *The Precambrian Earth: Tempos and Events*. Elsevier, Amsterdam, pp. 440-448.