

Project Title: Testing the Orosirian carbon cycle: Long Island Sound, Nunavut

Researcher's Name and Affiliation: Malcolm Hodgskiss (Stanford University), Margaret Whelan (McGill University)

Project Location: Long Island Sound, Nunavut

The proposed scientific research project will study the geology of the Long Island Sound area, in the Cree/Inuit Joint Zone of Hudson Bay. The rocks occurring in this area are approximately two billion years old, and are part of a succession of ancient rocks deposited on the eastern edge of Hudson Bay. Although these related areas along the coast have been studied in the 1970s – 80s (near Kuujjuarapik and Umiujaq) and the Belcher Islands (by the applicant in 2016 and 2017), the geology of Long Island Sound is unique, because it has not been studied since 1902. This geological fieldwork will be carried out by two people from July 1st to August 31st, 2019. Transportation to the field area from Chisasibi, and within Long Island Sound, will occur by a small motor boat. The camp will consist of three tents (two for sleeping, one for cooking), and all tents, garbage, etc., will be removed upon completion of the work.

The purpose of this scientific research project is to understand the history of the Earth recorded in the geology of Long Island Sound, during the interval approximately 2.0 – 1.8 billion years ago. To achieve this, a geological map for Long Island Sound will be made, by visiting the islands in the area and defining geological units. Small rock samples (~50 – 500 grams) will be collected in the field, and returned to Stanford University for chemical analyses. This project will establish a geological framework for the area, and in the long term, will contribute to a better understanding of the ancient Earth and the environmental conditions that prevailed approximately 2.0 to 1.8 billion years ago.

The area for the proposed research is approximately 120 km north of Chisasibi, and 110 km west-southwest of Kuujjuarapik. There are no known protected areas nearby. Upon completion of the fieldwork everything will be removed, leaving no impact.

This fieldwork will take place over a fixed period, from July 1st to August 31st, 2019. We expect this project to have a small contribution to the local economy. During this project, we will use Chisasibi as a logistical center, and will hire local hunters to guide us to the field area. In addition, we will be making use of the local hotels and Co-op for accommodations, fuel purchases, etc. In total, we expect to spend approximately \$7,000 in Chisasibi, with the majority paid directly to local hunters. This project will have no environmental impact.

The results of this study will be integrated into research projects (e.g., Ph.D theses) ongoing at Stanford University and McGill University, and scientific articles will be published in peer-reviewed journals. All results and publications from this project will be available online, and made available upon request to anyone without institutional access.