

Non-Technical Project Descriptions (The current page is the description in English; the following page is the same text translated to Inuktitut)

Project Title: Geological and Geomorphological Studies of the Devon Island Impact Structure

Researcher's name and affiliation:

The project is led by Dr. Gordon Osinski from the University of Western Ontario, London, Ontario.

Location: Haughton Impact Structure on Devon Island, Nunavut (75° 22' 18.30" N, 89° 32' 6.10" W).

Time Frame: From July 15, 2016, to August 10, 2016.

Project Description:

The Haughton impact structure is one of the best-preserved and best-exposed meteorite craters on Earth. Geological investigations at this crater over the past several years have revolutionized our understanding of various aspects of the impact cratering process. The research of this project focuses on understanding the geological, biological, and environmental effects of the impact event. This project has 3 major objectives. First, we will ground-truth a remote predictive map generated with Radarsat-2 and other satellite data. Second, we will carry out comparative planetary geology studies aimed at understanding the origin of sub-glacial channels and gullies. Third, we will focus on the study of the hydrothermal system generated by the impact event.

Transportation to the site will be by Twin Otter to a landing strip within the Haughton Impact Structure. While on site, access to scientific sites will be accomplished using All Terrain Vehicles (ATV) and by walking. A helicopter will be used on two days to travel to locations not accessible by ATV.

A temporary camp will be erected consisting of a Longhouse tent and several small personal tents. Water for camp use (approx. 0.04 m³ per day) will be collected from the nearby Haughton River. All combustible waste will be incinerated while all non-combustible waste will be returned to Polar Continental Shelf facilities for disposal.

At the conclusion of the field campaign, the camp will be dismantled and the terrain restored to its original state.

Methodology:

Objective 1: Remote Predictive Mapping: We will ground-truth a map of the Haughton structure produced from satellite images. We will measure the physical properties of surface materials in order to interpret radar data.

Objective 2: Comparative Planetary Geology: We will characterize channel morphology, geology and structure of channels. We will collect the profiles of individual gullies and measurements of substrate composition and grain size. These results will be compared to similar landforms on Mars.

Objective 3: Impact-generated hydrothermal alteration: We will conduct detailed outcrop-scale mapping and sampling of hydrothermal deposits. Follow up laboratory work will attempt to constrain the properties of the fluids that formed these hydrothermal deposits.

Data/Reporting:

Data collected during this project will form the basis of several students' undergraduate honours research, Masters, and PhD projects. This will result in publications and presentations to be presented at various scientific and technical conferences around the world.

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