

## **ANNUAL SUMMARY**

Project: Natural Hazards in Baffin Bay (Licence #02-042-13R-M)  
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### **Introduction**

A natural geologic hazard (geohazard) is a geologic condition capable of causing damage to people or the environment. The Baffin Bay Geohazards Activity of the Geological Survey of Canada's (GSC) Public Safety Geoscience Program is aimed at improving the understanding of geological processes and hazards in Baffin Bay that could be a risk to coastal communities, the environment, and infrastructure. Knowledge of geohazards is required in Baffin Bay to support community, Nunavut government, and regulator decisions on the use of offshore areas and provide northern coastal communities with better knowledge for improving public safety.

Analysis of existing data suggest that geological hazards in Baffin Bay include hydrocarbon venting features, uneven seabed caused by glacial seafloor processes, submarine slope failures, ice scour and a high level of earthquake activity. The M 7.3 earthquake of November 20, 1933 in Baffin Bay is the largest passive margin earthquake in North America, possibly the world, and it is also the largest known earthquake north of the Arctic Circle. The frequency of earthquakes combined with its high latitude is what makes Baffin Bay unique compared to other glaciated margins. Despite the presence of these hazards, there are large portions of the seabed in Baffin Bay have never been mapped or sampled creating gaps in the understanding of geohazards in Baffin Bay.

### **2013 Field Activities**

During August-September 2013, the GSC conducted a scientific expedition onboard Canadian Coast Guard Ship Hudson (CCGS Hudson) to the Baffin Bay region. The ship left Halifax on August 15 and arrived in Nunavut waters on August 27. Scientific research was conducted in Baffin Bay until September 9 when the ship started transiting back to Halifax, arriving on September 16. The objectives of the expedition were to improve understanding of the surficial geology, seafloor properties and processes on the continental shelf and slope in the area to better assess geological hazards. Specifically, the expedition:

1. Assessed the regional surficial geology framework in the area. This includes the seabed sediment type and physical properties.
2. Collected data should improve estimates of how often large earthquakes happen in the area.
3. Investigated natural hydrocarbon seeps on the seabed in the area.
4. Investigated underwater landslides in the area.

5. Collected data to figure out the impact rate of icebergs on the seabed.

The expedition involved 23 science staff from Nova Scotia, Quebec, and Nunavut. Several different types of geological and geophysical data were collected during the expedition. The data included core samples from the seabed, seafloor photographs, multibeam bathymetry, and sub-bottom profiles. The samples and data will be processed and interpreted over the next several months. The information from this research will be provided to northern communities, the Government of Nunavut, and regulators in order to better manage these offshore areas.