

the thickness and the extent of the sill in the subsurface by performing geophysical surveys in the area. These surveys are (1) an elevation survey using a TopCon Hiperlite + DGPS, (2) a gravity survey using a Scintrex CG-5 Autograv Gravity Meter, and (3) a magnetic survey using Scintrex Envi Proton Precession Magnetometer. The DGPS survey determined the UTM coordinates for the stations and their elevations. These elevations were then used for Free-Air and Bouguer Correction for the gravity data. The Bouguer-corrected gravity data show that the sill has higher gravity readings than the surrounding sedimentary rocks, dipping and extending to the NW. Most of the magnetic data obtained were from an earlier survey in 2003. Another survey was conducted in 2013 to correlate these two groups of data due to magnetic drift. The magnetic survey shows total magnetic intensity (TMI) along the sill that are higher than in the surrounding sedimentary rocks, which is the same intensity as the Earth's magnetic field. But the concentrated high magnetic intensity at different spots along the sill may suggest that rather than the sill being highly magnetic, it may be younger dykes intruded throughout the sill that may be highly magnetic, most likely belonging to the Beaver Hat Intrusive Suite.

The gravity data still need to be terrain corrected using the Hammer terrain correction. The corrected data will then be modelled using Potent to determine the depth and the extent of the sill into the subsurface.

Gravity and magnetic surveys of a mafic Proterozoic sill at Cape St. Francis, Newfoundland

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The geology of the Cape St. Francis region near Pouch Cove consists of Late Neoproterozoic rocks. They include flow-banded rhyolite overlain by hematite-rich basalt, and then siliceous sandstone and siltstone. One distinctive feature in the region is a 600 m-long, ENE-trending topographic feature southeast of Jacobs Cove. The southeastern part of this feature is a steep cliff face with underlying scree. The cliff is noticeable from the nearby dirt road, and shows a mafic sill in the cliff. The sill has been determined from previous surveys to be highly magnetic, and dipping toward the northwest.

The objective of this BSc honours thesis is to model