First steps in the production of a Geographic Information System for Îles-de-la-Madeleine, Québec

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Current geological knowledge of the Madeleine Basin is almost entirely based on seismic surveys and drilling carried out since the 1960s. For this reason, the Îles-de-la-Madeleine archipelago occupies, at the centre of the basin, a strategic position that enables the groundtruthing of geophysical and borehole data acquired from offshore and aerial surveys. There is agreement in the scientific community that this is an important aspect of the Madeleine Basin's geological framework.

A GIS project is currently underway through a collaborative effort between the Geological Survey of Canada, the Department of Earth Sciences at Dalhousie University, and Mines Seleine. The first step is a formal revision of the current geological map published by D. Brisebois in 1981 to resolve some outstanding questions concerning the volcanic history of the islands. Previous studies have shown that the stratigraphy of the islands is complex, and in places unresolved, particularly along coastal sections where igneous rocks and evaporites have been intensely deformed. Field work in Îles-de-la-Madeleine in August 2005 was conducted along the east-facing coastline of l'île du Havre Aubert, l'île du Cap aux Meules, and l'île Havre aux Maisons, and included a traverse at l'île d'Entrée. In addition, some remarkably well-preserved volcanic rocks were

sampled at quarries and along road cuts. The field programme had two objectives: (1) to define, for the first time, a spatial frame of reference for volcanic rocks associated with the salt structures; and (2) identify key samples of igneous rock for absolute age dating. The results are being applied to a study of the thermal effects of igneous activity and salt diapirism on source rocks, reservoirs, and traps in the Madeleine Basin. Both geophysical and geological databases will be integrated in the GIS to correlate the complex pattern of faults mapped onshore with offshore structures and lineaments identified from marine and aeromagnetic surveys.