## Petrology and tectonic setting of the Seal Island Pluton, offshore southwestern Nova Scotia

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The Seal Island Pluton outcrops on Seal Island as well as nearby Mud, Round, and Noddy islands, located 30 km west of Cape Sable Island off southwestern Nova Scotia. A limited amount of study of the Seal Island Pluton has been done previously, but its age and relationship to the mainly Devonian granitoid intrusions of mainland Nova Scotia are uncertain. It has been reported to consist of coarse-grained biotite granodiorite and monzogranite, gradational to muscovite-biotite monzogranite and syenogranite, and to be similar in texture and mineralogy to the South Mountain Batholith. Based on the presence of hornfels and metasandstone xenoliths in the monzogranite and syenogranite, the pluton intruded the Meguma Group.

This study aims to examine through petrographic and geochemical analysis the origin, tectonic setting, and emplacement of the Seal Island Pluton and interpret its relationship to other granitoid intrusions of southwestern Nova Scotia. The pluton was mapped and sampled during two days in the summer of 2004 on all the islands on which it outcrops. Preliminary results suggest that it consists mainly of biotite monzogranite. Weak foliation resulting from preferred orientation of biotite ± muscovite was observed in most outcrops, generally trending approximately north-south. Steep shear zones (<50 cm wide) occur throughout the pluton but are more abundant along the western side of Seal Island. These zones trend north to north-northeast and have subhorizontal mineral lineations, locally well developed c-s fabrics, and asymmetric porphyoclasts which exhibit dextral sense of shear. The shearing may be

related to the offshore extension of the major Chebogue Point Shear Zone southeast of Yarmouth.

A distinctive characteristic of the pluton is the presence of tourmaline layers and patches, in places composing up to almost 2% of the rock. Pegmatite dykes and pods occur throughout the pluton, and rare mafic dykes (<1.5 m wide) occur on Seal and Mud islands. The two dykes on Seal Island are highly deformed as they occur in north-trending shear zones. The dykes are likely syn-to late intrusive within the granite based on observed commingling textures. Magnetic susceptibility was measured in the field at all outcrops, and susceptibility values are low in granite and pegmatite, ranging from 0.00 to 0.35, but mainly between 007 to 0.15 $x10^{-3}$ SI units. Mafic dykes have somewhat higher values (0.53-0.75).

Samples from the Seal Island Pluton are being analysed for major and trace elements, and petrographic studies are in progress. Mineral analyses will be done by electron microprobe.

Preliminary work suggests that the pluton differs in appearance from the Wedgeport, Shelburne, and Barrington Passage plutons, and is unlikely to directly link to any of these nearby "peripheral plutons" of the South Mountain Batholith.