Filling in the gap: Correlation of onshore and offshore geology, southwestern Nova Scotia using geophysical data

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The geology of southwestern Nova Scotia is characterized by plutons of varying compositions intruding a Meguma host rock. Onshore, the Shelburne, Wedgeport and Barrington Passage plutons intrude the alternating Halifax and Goldenville formations of the Meguma Group. The striped magnetic signature of the Meguma contrasts with a smooth, relatively uniform signature, in some cases positive, associated with the plutons. Previous studies of southwestern Nova Scotia have used gravity and aeromagnetic data to extend interpretations of this onshore lithology into the offshore. More recently, swath bathymetric studies have led to a surficial geology map of the continental shelf that shows granite bedrock exposed at the surface. This study will correlate between the coast and the outer portion of the continental shelf based on forward modeling of magnetic data. A series of profiles constrained by magnetic susceptibility values will be used to create 2D cross-sections of lithology. An onshore profile will investigate the Shelburne, Wedgeport and Barrington Passage plutons. A database of magnetic susceptibility values measured for each lithologic unit provides information on composition and the possible genetic relationships between plutons. These onshore results will be extrapolated into the offshore to develop a profile through Mud and Seal Islands to determine the relationship, if any, to the onshore plutons. The extent of plutons in the offshore will be mapped and correlated to regional geology based on their magnetic anomaly and other geophysical characteristics.

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