

## **Investigating possible hybridization of the Peggys Cove granite section of the Halifax Pluton, South Mountain Batholith, Nova Scotia, Canada**

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An investigation of magmatic growth history of the K-feldspar megacrysts in the Halifax Pluton, a Late Devonian granite intruded into the Meguma strata bedrock, is ongoing. Specifically, the rocks being investigated in this study outcrop along the coast by Peggys Cove, Prospect, and Sambro Head, Nova Scotia. Several outcrops in the latter two areas contain clusters of large mafic enclaves, which differ texturally from country-rock metasedimentary xenoliths, and appear to be of a magmatic origin. The presence of mafic enclaves suggests that a period, or periods, of magma mixing may have occurred. Magma mixing has been documented at Sambro Head, where a mafic intrusion, specifically a dyke, has been injected into the still partially molten granitic host. Similar partial mixing zones have been described in other granitic intrusions of the same age in southwest Nova Scotia. Large K-feldspar phenocrysts (megacrysts) are present in both the granitic rocks and in some mafic enclaves at Prospect. Of note are enclaves which show megacrysts crosscutting their margins, suggesting that both the host granite and enclave were at least partially liquid during megacryst growth. The study area at Peggys Cove differs in that it shows a significant decrease in the volume and size of these mafic enclaves. It also has a much higher temperature gradient than that of the latter two study areas. The granites around Peggys Cove have been much more resorbed, therefore suggesting that there has been much more thorough mixing in this area. This study used field observations, petrography, whole-rock analysis, and detailed electron microprobe analysis to study samples taken from the mafic enclaves, the surrounding host granitic rocks and in particular, the large megacrysts from three separate locations in the Halifax Pluton. Evidence of chemical zoning evident through the patterns of barium and strontium preserved in the granitic feldspar megacrysts, especially where no obvious mafic enclaves occur, suggest that hybridization of this granitic pluton may have been more widespread than previously documented.