

SYENITIC COMPOSITE DIKES AT CAT COVE, SALEM, MASSACHUSETTS

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According to the Bedrock Geologic Map of Massachusetts (Zen et al., 1984), Proterozoic Z mafic plutonic rocks form the bedrock throughout Salem Neck in Salem, MA. A particularly good outcropping of these rocks, formerly grouped as the Salem Gabbro-Diorite, occurs along the shore of Cat Cove at a spot reported to be the type locality of "essexite" (Sears, 1891). The gabbro-diorite here is variable, but Washington (1899) described an augite-hornblende-biotite monzonite containing nepheline and micropertthite. Nepheline syenite dikes intrude the mafic rocks at Cat Cove and are believed to be part of the late Ordovician Cape Ann Plutonic Series (CAPS) (Hon et al., 1993). A small bay separates this locality from the main body of the Beverly syenite facies of the CAPS. The syenite dikes vary in grain size and are pegmatitic in places. Interestingly, these dikes are themselves intruded by basalt, apparently while they were still liquid, forming pillows and mixing with the syenite. Radiometric ages obtained recently for other mafic rocks shown as Proterozoic Z on the Massachusetts map range from Ordovician to Devonian (Hepburn et al., 1998) suggesting the possibility that the Salem rocks may also be younger and part of the CAPS event. The syenitic character of the "essexite" is consistent with this possibility. Whole-rock geochemical data are being collected to explore the possible origins of these rocks as well as to document the character of the magma mixing in the syenite dikes.

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