

## **Detailed Geologic Mapping and Structural Analysis of a Portion of the Central Georgia Inner Piedmont, and an Exhumed Fault Identified by Aeromagnetic Data**

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Detailed geologic mapping was performed in several 7.5-minute quadrangles in the central Georgia Inner Piedmont, to investigate the geologic significance of a prominent aeromagnetic lineament ~100 kilometers southeast of Atlanta. The lineament truncates a suite of curved magnetic anomalies, is interpreted as a fault, and is possibly the southwest continuation of the Brindle Creek fault. The Brindle Creek fault separates high-grade metasedimentary rocks of the eastern Tugaloo terrane and Cat Square terrane, and is interpreted as a large-scale southwest-directed type-F thrust sheet and terrane boundary. The Tugaloo terrane consists of the Neoproterozoic to early Paleozoic(?) Tallulah Falls Formation and the Middle Ordovician Poor Mountain Formation, and intruded by Ordovician-Silurian(?) granitoids. Cat Square terrane rocks consist of Silurian-Devonian metasedimentary rocks and Devonian-Mississippian anatectic granitoids. Peri-Gondwanan, Laurentian, and 430 Ma zircons have been identified in the Cat Square terrane, with one detrital zircon sample from the study area containing Laurentian and peri-Gondwanan ages. Three granitic units have been identified in the field area: 1) an early, strongly foliated, coarse megacrystic granitoid; 2) a later, weakly foliated, coarse-grained granitoid; and 3) a weakly foliated, fine-grained granitoid, the youngest. At least five ductile and brittle deformational events have been recognized in the Inner Piedmont producing early recumbent folds overprinted by upright tight folds and then open folds. Mesozoic brittle faults, traced by siliceous cataclasite, threshold quartz ductility mylonite, and diabase dikes, are present throughout the study area. A prominent siliceous cataclasite body traverses the field area trending ~035, and crosscuts northwest-southeast trending diabase dikes.