

Geochemistry and Geochronology of the Ravenswood Granodiorite, Long Island City

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The Ravenswood Granodiorite is a known, mappable unit that occurs in New York City primarily in western Queens near the 59th St, Queensborough Bridge. This unit is a coarse grained slightly metamorphosed granitoid, consisting of a plagioclase-quartz-garnet-biotite mineral assemblage, with rare mafic enclaves. Although this rock is mapped on both the USGS 7.5 minute quadrangle maps (Baskerville, 1992, 1994) and the State Geology Map (southern section) very little is known about this unit. The only published study of the Ravenswood is Zeigler, 1912. However, modern maps have attempted to correlate this unit with other broadly Paleozoic granitoids in the region, specifically the Harrison Gneiss in CT or the Yonkers Gneiss in Westchester NY.

Here we present new whole-rock geochemistry and zircon U-Pb ages for the Ravenswood and the Yonkers Gneiss for comparison. The mean zircon age for the Ravenswood is 583.4 +/- 4.3 Ma. The mean zircon age for the Yonkers is 575.4 +/-3 Ma. Zircon morphology and CL patterns are distinct between the two samples. Rare earth element patterns for both the Ravenswood and the Yonkers are similar: both show a negatively sloping REE pattern with slightly depleted heavy REE compared to the light REE. However, the Yonkers is slightly enriched overall in REEs and shows a dramatic Eu anomaly not seen in the Ravenswood. This suggests, that while these units are broadly similar, they may not be derived from the exact same source, suggesting a broader melting event ~580 Ma. Importantly, the age of the Ravenswood and the Yonkers is not consistent with the Harrison Gneiss in CT, which is younger, 453±3 Ma (Sevigny and Hanson) and more similar to arc volcanics of the Bronson Hill Belt.