

# **Basement Geology of Long Island Sound Based on the Lithology of Erratics on the Stony Brook Campus**

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Three hundred forty boulders on the campus of S.U.N.Y. Stony Brook on Long Island were analyzed to constrain the rock types to be expected among the basement rocks of Long Island Sound. The areas of basement rocks immediately overlain by glacial sediments in Long Island Sound (LIS) are known from seismic – reflection studies reported in Lewis and Stone (1991). Drake (1972), and Krumbein (1941) showed that

1. Less than 0.1% of any rock type remains beyond 22 mi of its source.
2. The roundness and breakage distribution of the rock fragments is a measure of the state of dynamic equilibrium between the process of abrasion and crushing and it is a function of the distance the boulders were transported.

The relative distances that the different rock types traveled from closest to furthest are

- Leucocratic biotite granites and gneisses (granite S and gneiss S) are the most abundant rock types of campus and are generally very angular (mean roundness of 0.3 and 0.4) suggesting that they were transported only a short distance. The closest distance to exposed basement is about 6 miles north of the campus in Long Island Sound (Lewis and Stone, 1991).
- The next most abundant rock types are two mica granites, gneisses and pegmatites (granite A, gneiss A and pegmatite A). These are more rounded than granite S and gneiss S, but less rounded than other rock types.
- Lineated granite gneiss has a bimodal distribution of roundness suggesting that these rocks may have two sources one close to Stony Brook and one further away.
- Basalt boulders are quite rounded (most have a roundness greater than 0.5). These boulders may have been derived from the Hartford Basin.
- Boulders of fine to coarse grained, two-mica granite (granite P) are all very rounded (mean roundness greater than 0.5) suggesting that they traveled the furthest.

This study was undertaken as part of GEO 589 Research for Earth Science Teachers during the summer of 1999. A more complete description of this study is on the web at [http://pbisotopes.ess.sunysb.edu/esp/589\\_99/Pacholik/pacholik\\_bio.htm](http://pbisotopes.ess.sunysb.edu/esp/589_99/Pacholik/pacholik_bio.htm)