

PROVENANCE AND AGE OF LOESS ON LONG ISLAND, NY USA

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Loess ubiquitously overlies Late Wisconsinan glacial sediments on Long Island and is a major reason Long Island's soils have been so productive. The provenance of the loess was studied using single grain ⁴⁰Ar/³⁹Ar biotite and muscovite ages from three localities along the North Shore of Long Island: Caumsett State Park, Stony Brook University campus (Zhong, 2002) and Wildwood State Park. Muscovite from Caumsett State Park loess has Ar/Ar ages ranging from 200-400 Ma consistent with its source being basement rocks to the north in Connecticut. Biotite in loess from Caumsett State Park did not give reliable ages.

Muscovite Ar/Ar ages from loess on the Stony Brook University campus are similar to those at Caumsett State Park. Biotite Ar/Ar ages of loess on Stony Brook campus also have a mode between 200 and 400 Ma consistent with their source being the basement rocks to the north in Connecticut. However, there are a small number of Ar/Ar ages for biotite that are up to 1800 Ma suggesting that a small proportion of the loess has sources to the west in the mid continent.

Muscovite Ar/Ar ages from Wildwood State Park loess are similar to ages from Caumsett State Park and SUNY campus at Stony Brook ranging from 200-400 Ma with the mode between 300 and 400 Ma. Biotite from Wildwood State Park produced young ages. Those biotite grains were picked from a sample that came from just below the soil line therefore the weathering might have caused young ages.

Optically Stimulated Luminescence (OSL) ages for a 2.7 m thick loess deposit at Wildwood State Park on the North Shore of Long Island are $13,780 \pm 1,100$ years for the bottom of the deposit, $13,400 \pm 1,250$ years for the middle and $7,730 \pm 690$ years for just below the soil line. These data are consistent with the hypothesis that the immediate source of Long Island loess is glacial sediment deposited in glacial Lake Connecticut in Long Island Sound basement. The deposition of loess would have started when the proglacial Lake Connecticut drained and its bottom was exposed at about 15 ka (Lewis and Stone, 1991). The deposition ceased when the sea entered the Long island Sound basin at about 12 ka (Lewis and Stone, 1991) and its bottom was no longer exposed. The *ca* 8 ka age corresponds well to the Holocene cooling episode known as the 8.2 ka event (Dean et al., 2002; Yu and Wright, 2001). At that time a drier and colder climate might have been responsible for loess deposition on Long Island.

This poster can be viewed on Saturday, July 26, 2003 between 1:30-4:30 p.m. and 6:00-8:00 p.m. in the Pavillion room of Reno Hilton Resort and Conference Center in the poster booth number 40.

Name of the session is: Ice sheets as Active Agents of Sediment Redistribution in the Earth System (Posters).

Additional information can be found at:

<http://pbisotopes.ess.sunysb.edu/lig/Conferences/abstracts-03/kundic/kundic.htm>

http://www.geo.sunysb.edu/lig/Conferences/abstracts_02/zhong/Zhong-abst-2.htm

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REFERENCES

- Dean, W.E., Forester, R.M., and Bradbury, J.P., 2002, Early Holocene change in atmospheric circulation in the Northern Great Plains: an upstream view of the 8.2 ka cold event: *Quaternary Science Reviews*, v. 21, p. 1763-1775.
- Lewis, R.S., and Stone, J.R., 1991, Late Quaternary stratigraphy and depositional history of the Long Island Sound basin: Connecticut and New York: *Quaternary geology of Long Island Sound and adjacent coastal areas: Journal of Coastal Research*, p. Walter Newman Memorial volume, Special Issue No. 11; p. 1-23.
- Yu, Z.C., and Wright, H.E., 2001, Response of interior North America to abrupt climate oscillations in the North Atlantic region during the last deglaciation: *Earth-Science Reviews*, v. 52, p. 333-369.