

2011 GSA Annual Meeting in Minneapolis (9–12 October 2011)

Paper No. 32-7

Presentation Time: 9:00 AM-6:00 PM

**UNRAVELING THE DEFORMATION HISTORY OF THE NOXON ROAD
OUTCROP IN DUTCHESS COUNTY, NEW YORK AND IMPLICATIONS
FOR THE RELATIVE ROLES OF COMPRESSIONAL AND GRAVITY
TECTONICS IN THE EMPLACEMENT OF THE GIDDINGS BROOK
SLICE, TACONIC OROGEN**

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The relative roles of compressional and gravity tectonics has a long history of debate in the Taconic Orogen of New York and New England. Early emplacement models (Zen 1967) focused on gravity sliding, with lower slices emplaced first. Later studies (Rowley and Kidd 1981, Stanley and Ratcliffe, 1985) of structural and stratigraphic relationships, as well as mechanical arguments (Davis et al., 1983), largely replaced this with a compressional thrust-tectonics model, however questions remain about the role of gravity tectonics, and emplacement order of the lowest slice in particular, Giddings Brook. An outcrop of particular significance and complexity is on Dutchess County Rt. 21, Noxon Road. This outcrop has been featured in numerous field guides (e.g., Bence and McLelland, 1976; Fisher and Warthin, 1976; Whitney and Peck 2004; Vollmer and Walker, 2009), but has not undergone detailed structural analysis. The outcrop of low grade, highly crenulated phyllite is bisected by the road with much detail preserved on both the north and south sides of the road.

Four lithologic units are present, interpreted here as, from west to east, Austin Glen greywacke, green and red slates of the Mount Merino and Indian River, and a unit of thinly layered micrite. The Austin Glen is in fault contact with the Mount Merino/Indian River, but there are similar, if not identical, fold relationships preserved within them. Three of the four lithologies have compatible fold structures, however these may have formed late in the emplacement history, after the juxtaposition of the units. The contacts between the green Mount Merino, and red Indian River units are complex, and the micrite unit shows complex refolding and probable sedimentary brecciation, suggesting gravitational-slide emplacement. There are at least three foliations preserved within the Mount Merino/Indian River, indicating multiple episodes of deformation. The package of micrite to the east end of the outcrop has been incorporated into the Indian River in no apparent pattern. The folds in the micrite have little continuity and the emplacement of the micrite is likely a slide block of older material uplifted along a fault scarp that slid into the younger relatively unconsolidated sediments of the Mount Merino/Indian River, subsequently deformed by multiple tectonic events.

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[General Information for this Meeting](#)

Session No. 32--Booth# 151

[Tectonics \(Posters\) I: New Discoveries in Global Tectonics](#)

Minneapolis Convention Center: Hall C

9:00 AM-6:00 PM, Sunday, 9 October 2011

Geological Society of America *Abstracts with Programs*, Vol. 43, No. 5, p. 100

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