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Northeastern Section - 50th Annual Meeting (23–25 March 2015)

Paper No. 1

Presentation Time: 1:30 PM

RELATIONSHIP OF SHEAR ZONES IN THE MARCELLUS SUBGROUP AND JOINT ORIENTATIONS IN THE CATSKILL MOUNTAINS TO THE HUDSON VALLEY FOLD THRUST BELT, EASTERN NEW YORK

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Determining the relative significance of Acadian versus Alleghanian orogenic events in the Hudson Valley fold thrust belt (HVFTB) has long been an unresolved problem, as overprinting structures have not been definitively documented. Our group at SUNY New Paltz has focused our studies in the Catskill Mountains, to the west of the HVFTB, where structures are less complex and joints should record stress trajectories associated with the HVFTB. Additionally, we are examining structures within the Marcellus Subgroup, at the base of the Catskill sequence, in the Hudson Valley, to determine if décollement structures described by previous workers in the Mohawk Valley, are present in the Hudson Valley as well. Over 1800 total joint measurements, including data from Isachsen et al. (1977), give two clearly defined maxima at $278^\circ - 90^\circ$ (J1) and $014^\circ - 89^\circ$ (J2). A primary focus was to determine crosscutting age relationships, these show J1 are older than J2, although reactivation of older joints can locally give mutually crosscutting relationships. Joint surface features, such as plumose structures, and the absence of slickensides, indicate the joints are extensional and therefore record maximum stress trajectories. At 9 localities within the Marcellus Subgroup we examined bedding and cleavage duplexes, slickensides, and localized zones of spaced cleavage to determine displacement directions. These give a displacement direction of 295° , suggesting a regional décollement beneath the Catskill Mountains, consistent with J1 stress trajectories, as well as previous results from the Mohawk Valley. Our favored hypothesis is that the older J1 joints represent stress trajectories associated with the HVFTB, and J2 joints represent stress trajectories associated with late Alleghanian compression. These conclusions support the hypothesis that stress trajectories from both the Acadian Orogeny and the Alleghanian Orogeny are recorded in the Catskill Mountains, and further that the HVFTB is Acadian in age.

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[S1. Contributions to New England Stratigraphy & Structure II: In Honor of Robert Moench and Douglas Rankin](#)

Monday, 23 March 2015: 1:30 PM-3:00 PM

Grand Ballroom South (Omni Mount Washington Resort)

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