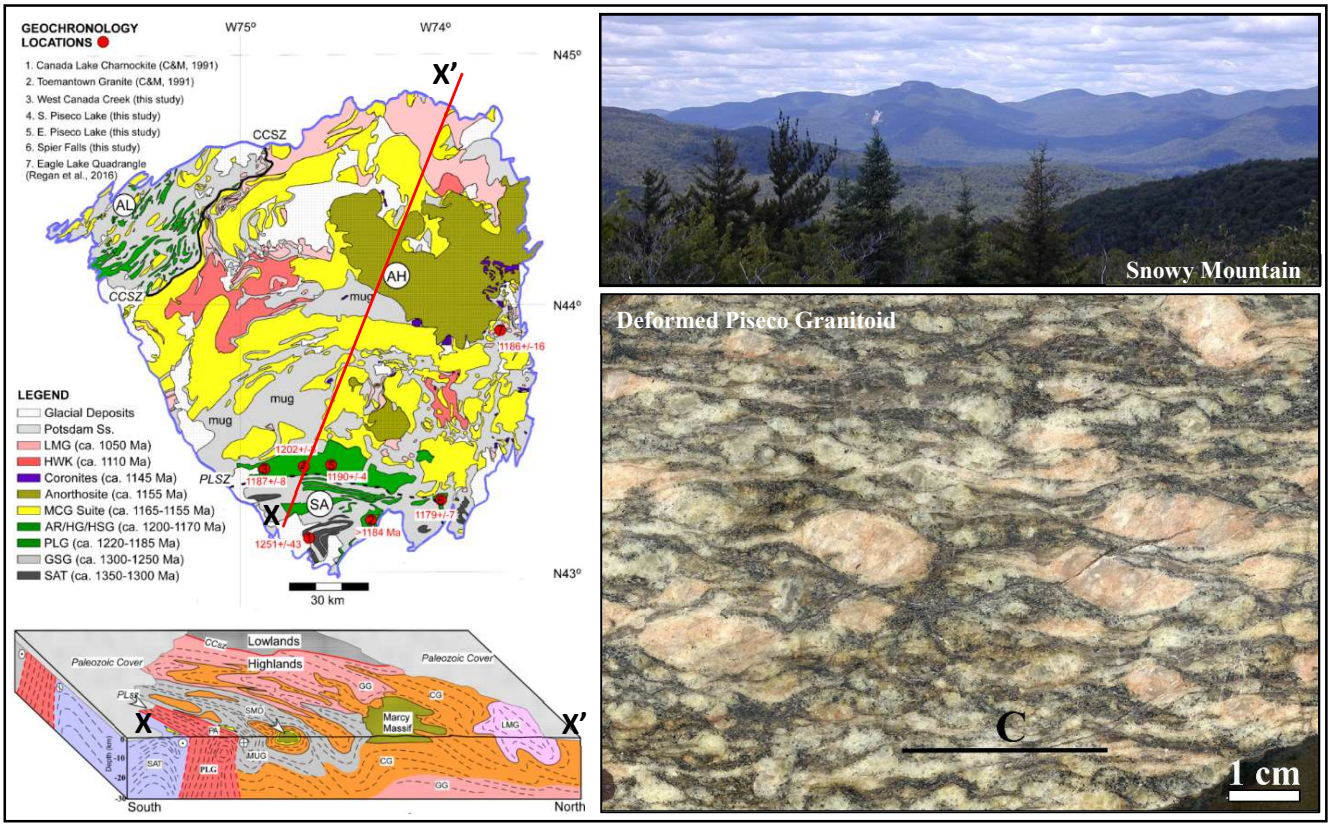
New York State Geological Association

95th Annual Meeting
Field Trip Guidebook



Compiled by David W. Valentino

Hosted by the State University of New York at Oswego at the Lewey Lake Campground, Southern Adirondacks

September 13-15, 2024

Field Trip Guidebook, 95th Annual Meeting New York State Geological Association

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Structure, Petrology, Geochemistry and Geochronology of the South-Central Adirondacks

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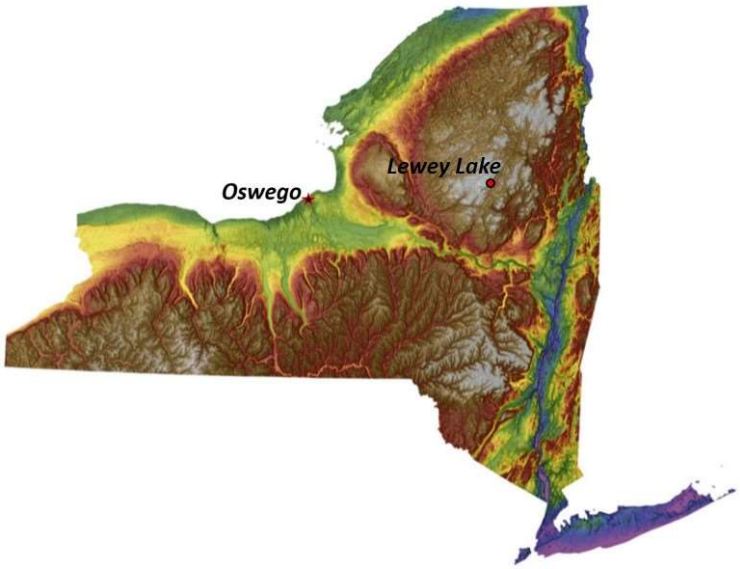

This guidebook was published by the New York State Geological Association.
Additional copies may be obtained from the Executive Secretary of NYSGA, or downloaded at the NYSGA website, www.nysga-online.org.

Field Trip Leaders

David Valentino, State University of New York at Oswego
Matthew Gorring, Montclair State University
Jeff Chiarenzelli, St. Lawrence University

ACTIVITIES

FRIDAY, SEPTEMBER 13, 2024

Field trip attendees arrive at Lewey Lake Campground.

Group meal (bring cash) and evening social will be hosted by the Oswego Geology Club.

SATURDAY, SEPTEMBER 14, 2024

Group will meet at 8AM at the entrance to the Lewey Lake Campground.

First half of the day will include an excursion through the Snowy Mountain AMCG suite and structural dome.

Lunch at Falls Brook.

Second half of the day will include a traverse south across mixed metasedimentary gneisses and into the Piseco shear zone.

Group meail (bring cash) and evening social will be hosted by the Oswego Geology Club at the Lewey Lake Campground - Site location to be determined.

SUNDAY, SEPTEMBER 15, 2024

Group will meet at the Charlie John's parking lot in Speculator at 8:30AM.

The traverse through the Piseco shear zone will continue on Powley Road, south of Piseco Lake.

The last stop of the trip will be a short hike to the L-tectonite zone located on the flank of Fort Noble Mountain.

Trip will end at about noon.

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Due to the timing of organization of the 2024 NYSGA field trip, this field guide is a compilation of select field trips run in the southern Adirondacks, by a long list of researchers over the past 20 years. The authors of those trips are included in the field guide, and the current field trip will lean heavily on that earlier work.

ABSTRACT

This field trip was first run in 2004 for NYSGA and was reorganized for the 2005 meeting, and again 2018 NYSGA-NEIGC joint field conference to show progress in our understanding of the complex geology of the southern Adirondacks. However, in 2018 the trip canceled just prior to the conference due to the sudden tragic loss of Dr. Brian Hough that occurred a few days before the conference. Brian was a colleague of the lead author. The trip was offered in 2022, but canceled due to poor attendance. Two years later the trip is offere again, and it is dedicated to the memory of Brian. Although his tenure at SUNY Oswego was not long, and was tragically cut-short, the impact that he had on many student and colleagues will last a lifetime.

Highly deformed Piseco granitic gneisses occur in an arching east-west transpressional ductile shear zone (Piseco Lake shear zone) that spans the width of the exposed southern Adirondacks. The highly deformed granitic gneisses have restricted silica content, are metaluminous, alkali-calcic to calc-alkalic, continental arc trace element signatures. These granitic rocks intruded supracrustal gneisses resulting in extensive Shawinigan partial melting. The Piseco Lake shear zone (20-30 km wide) formed in this belt of granitic rocks and correlate with a pronounced arcuate-shaped high magnetic anomaly. The magnetic anomaly extends well beyond the exposed Adirondack basement window.

The shear zone is 20-30 km wide and is believed to be the location of a cryptic suture because it occurs between the Adirondack Highlands (underlain primarily by anorthosite and related granitic rocks, AMCG suite) and the Southern Adirondack Terrane (underlain by calc-alkaline tonalitic arc rocks) (Valentino et al., 2019). Within the shear zone, the original megacrystic granite contains lineated quartz and rodded feldspar aggregates up to a meter long in places. Along the axis of the shear zone there are thick (1-2 km), subvertical zones of granitic L-S and L-tectonites. The northern domain of the zone is defined by large foliation domes that are cored by L-tectonite. The southern limbs of the domes steepen toward the south and merge with a wide zone (up to 15 km) of steeply dipping granitic mylonite. Overall, the shear system (domes and steep mylonite zone) forms the core of a region of intense ductile deformation with left-lateral kinematic indicators and subhorizontal E-W ribbon lineations.

The Piseco granitic suite are highly deformed suture-stitching arc plutons that intruded within a sinistral, oblique-convergent, shear system in the deep crust during the Shawinigan orogeny. This is ductile shear zone is the most continuous and largest in the entire Adirondack massif. The shear zone, associated granitic rocks, and the magnetic anomaly abruptly trends toward the south in the eastern Adirondacks. Just beyond this location, the magnetic anomaly appears to be truncated by a branch of the NY-AL magnetic lineament. Following the trace of the magnetic anomaly toward the west, suggests that the shear zone continues for a considerable distance beyond the Adirondack window. It's magnitude, in addition to the magnitude and extend of the associated magnetic anomaly, suggests that the Piseco shear zone penetrates the Moho.

The current field trip is an update on our very long research project, and it's geared toward an undergraduate student audience. All field locations were picked to accommodate large student groups. Sampling in the Adirondack Park is generally prohibited by NYS law, and we encourage future instructors to help preserve the field locations presented herein by showing and discussing, and not removing the spectacular bedrock features. Note that the field guide is a compilation of previously run trips for Friends of the Grenville and New York State Geological Association.