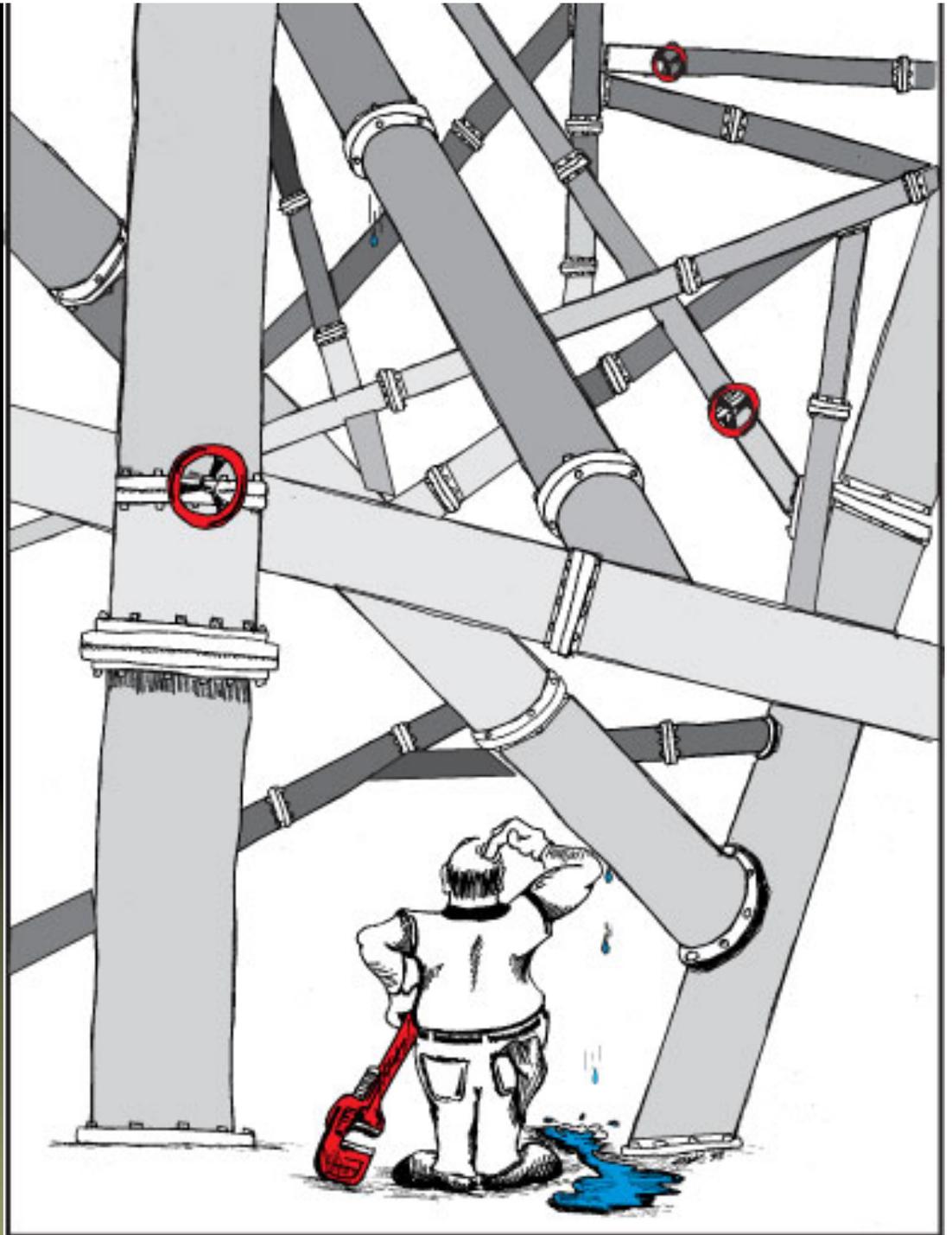


Karst and Carbonate Bedrock

What's the Connection?

Bill Kappel
USGS
Ithaca, NY
wkappel@usgs.gov



Objectives of Genesee County Carbonate Aquifer Study

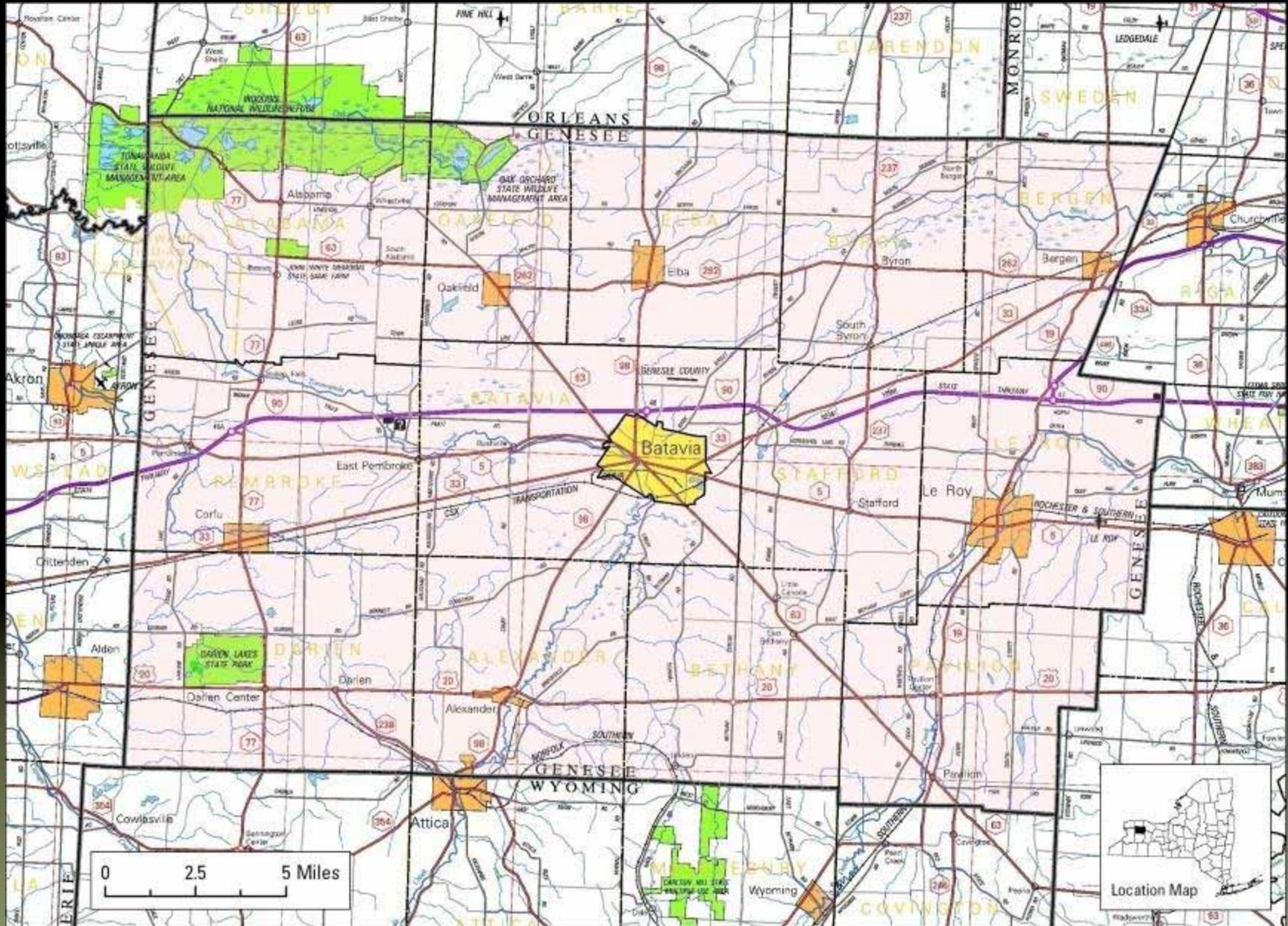
(A pilot study by NYS-DEC Division of Water
and the U.S. Geological Survey)

Understand the hydrogeology of the carbonate aquifer system
in Genesee County

In particular, where are the areas of greatest recharge
over the carbonate aquifer that might perturb the quality
of ground water.

← Buffalo

Rochester ↗



Shaded Relief Map with Bedrock Geology Genesee County

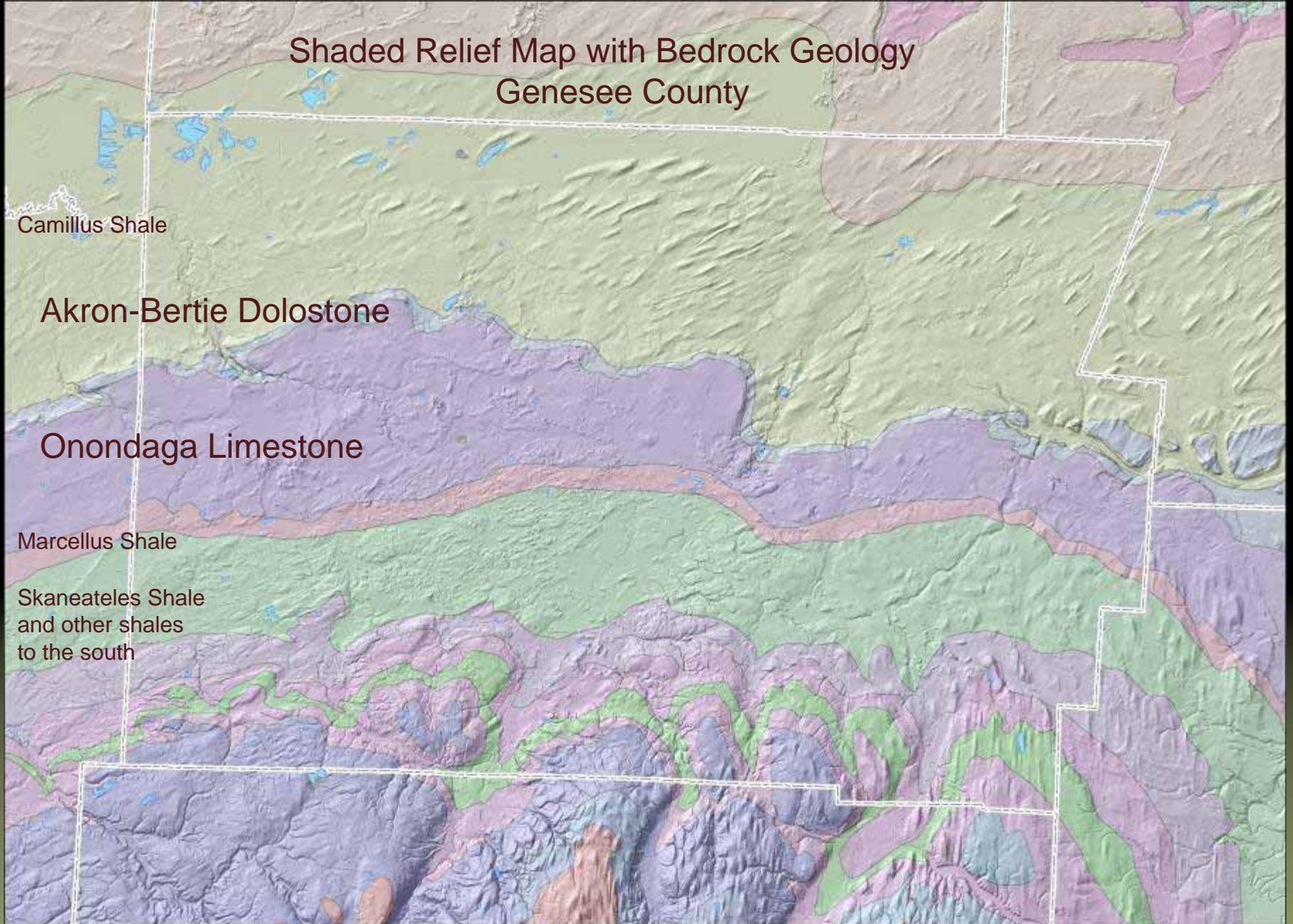
Camillus Shale

Akron-Bertie Dolostone

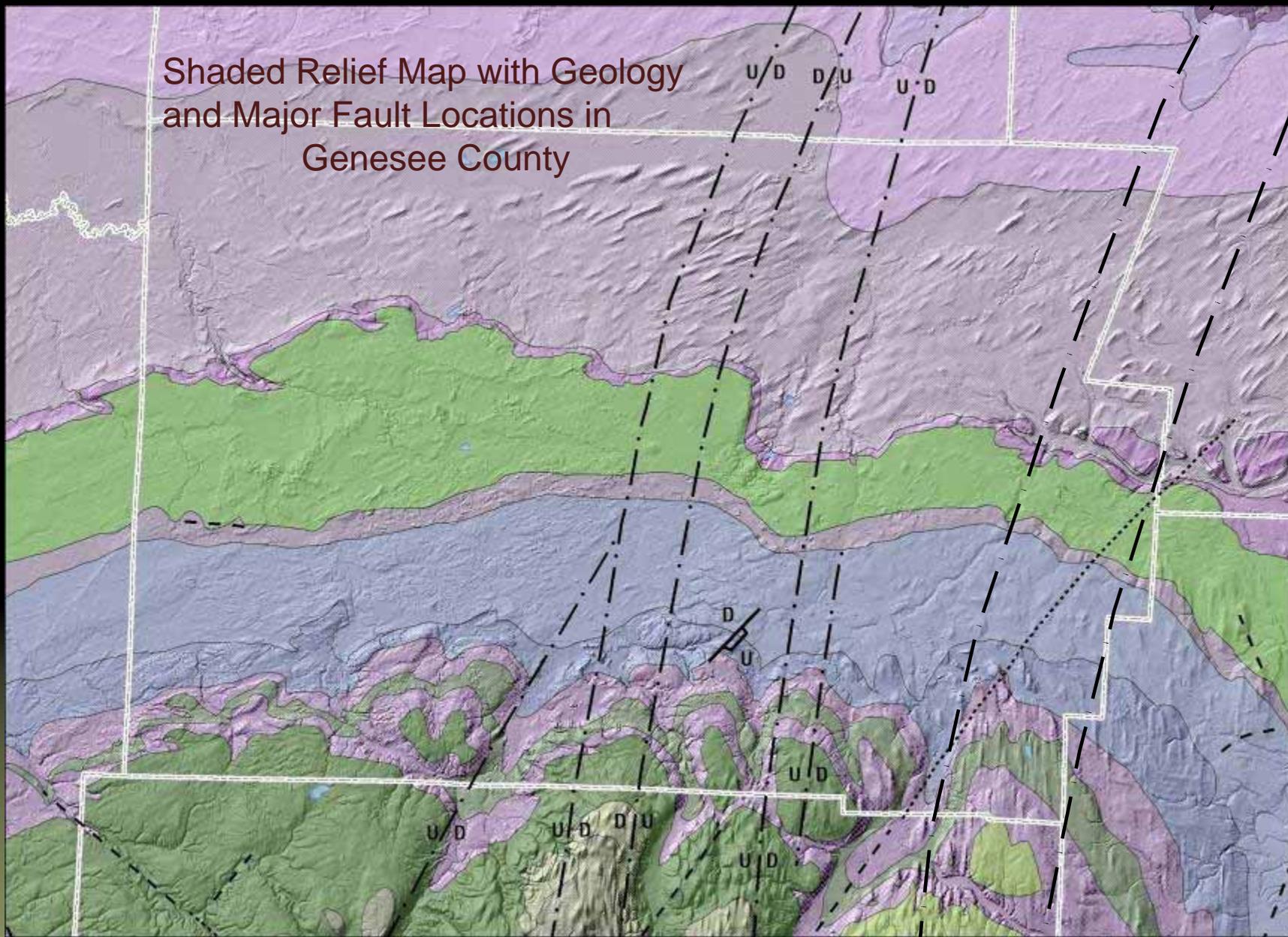
Onondaga Limestone

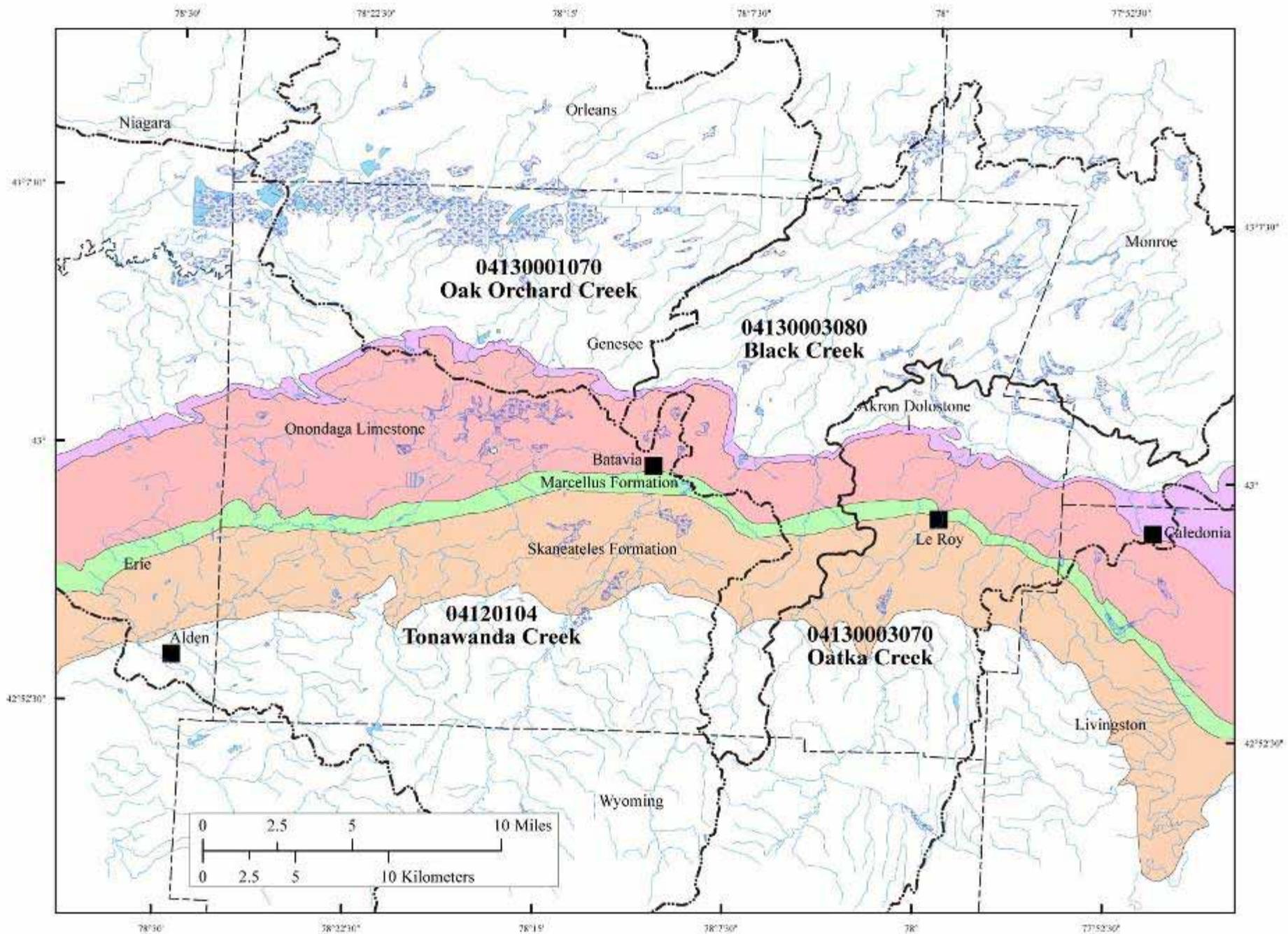
Marcellus Shale

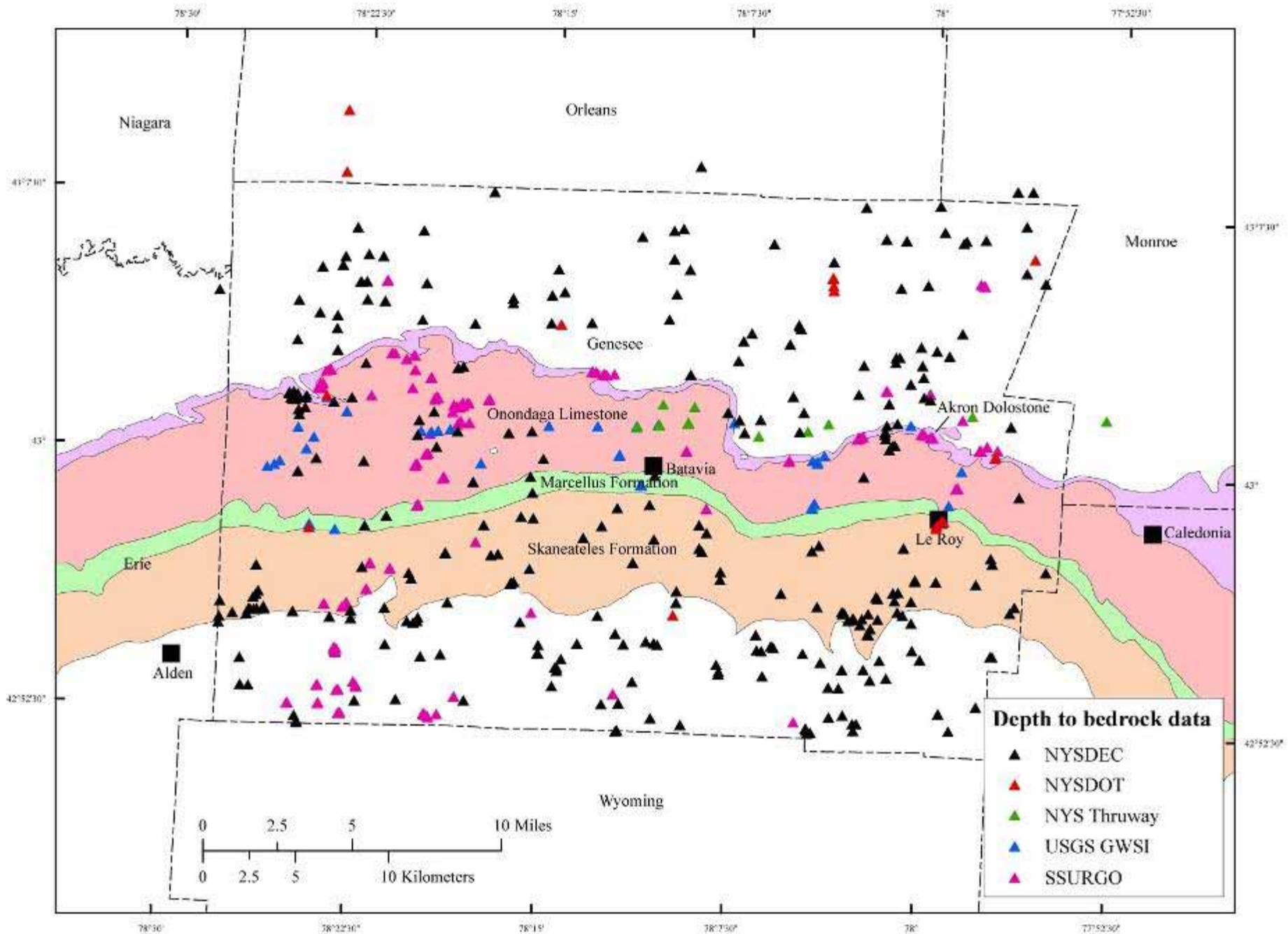
Skaneateles Shale
and other shales
to the south



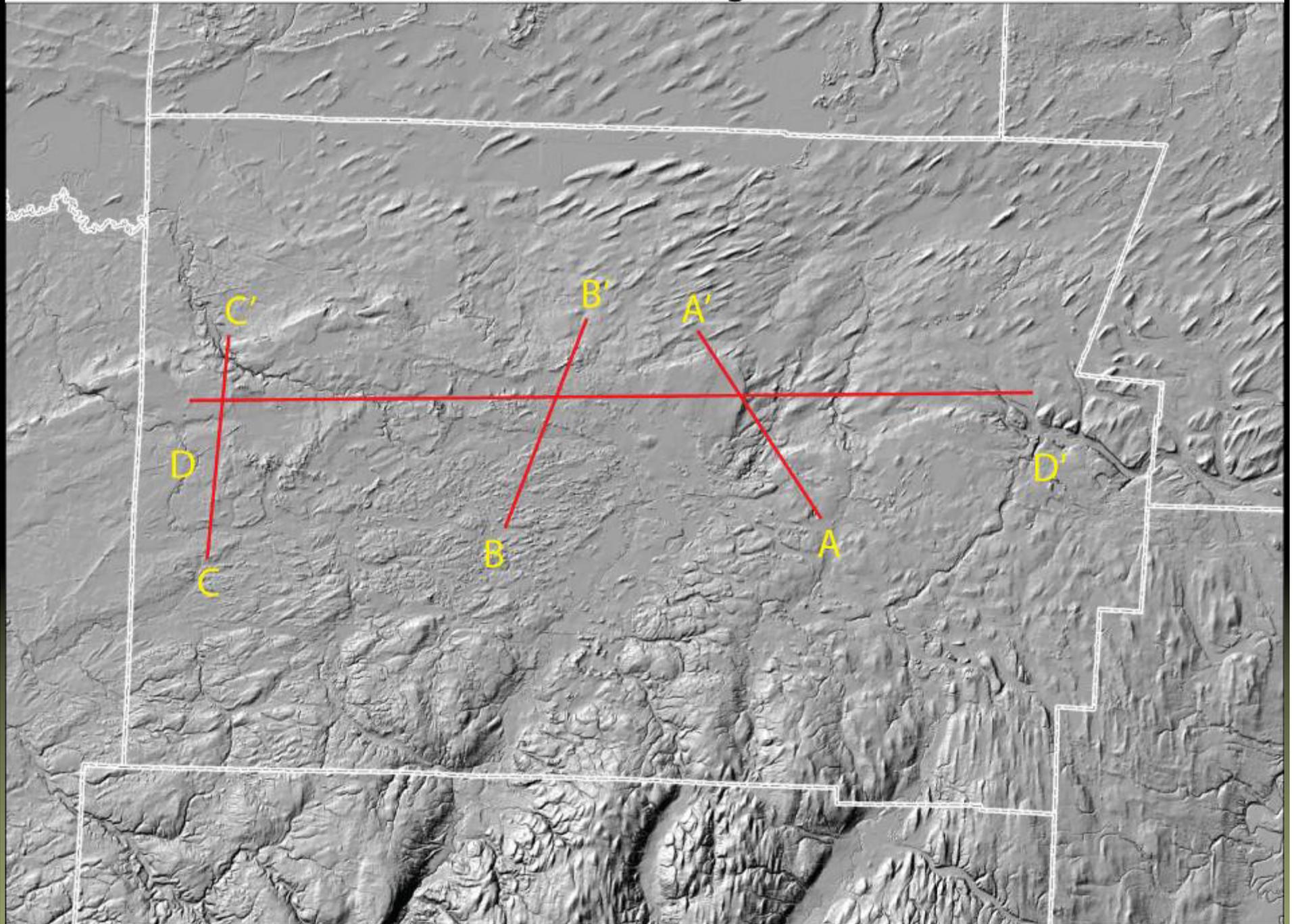
Shaded Relief Map with Geology
and Major Fault Locations in
Genesee County



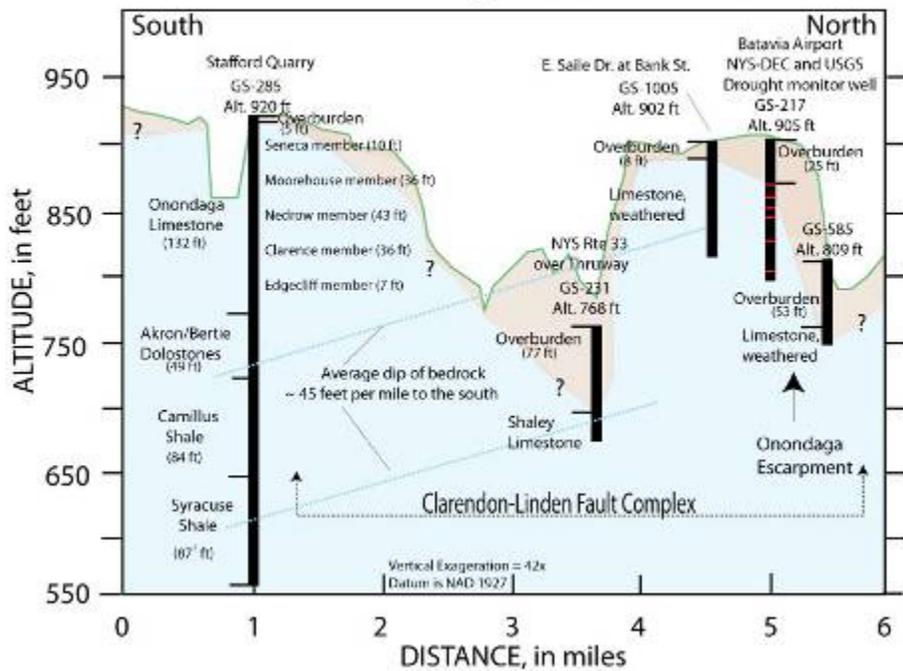




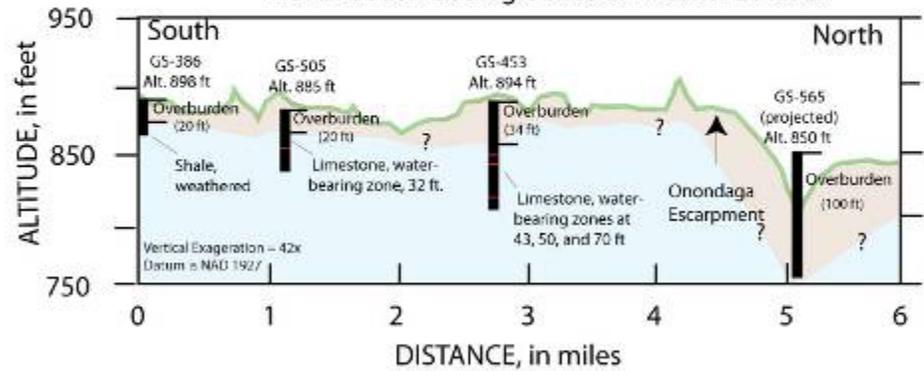
Location of Geologic Sections



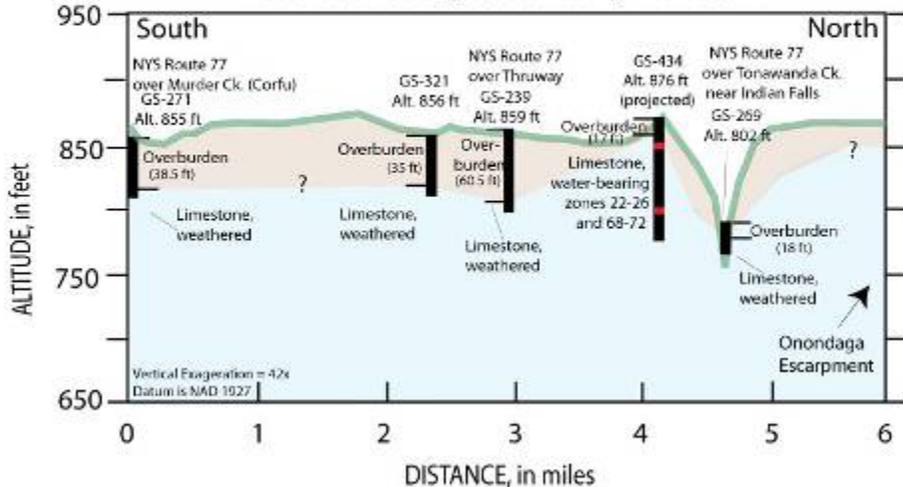
Geologic Section A-A'
North-South Geologic Section east of Batavia, NY



Geologic Section B-B'
North-South Geologic Section West of Batavia



Geologic Section C-C'
North-South Geologic Section along NYS Route 77

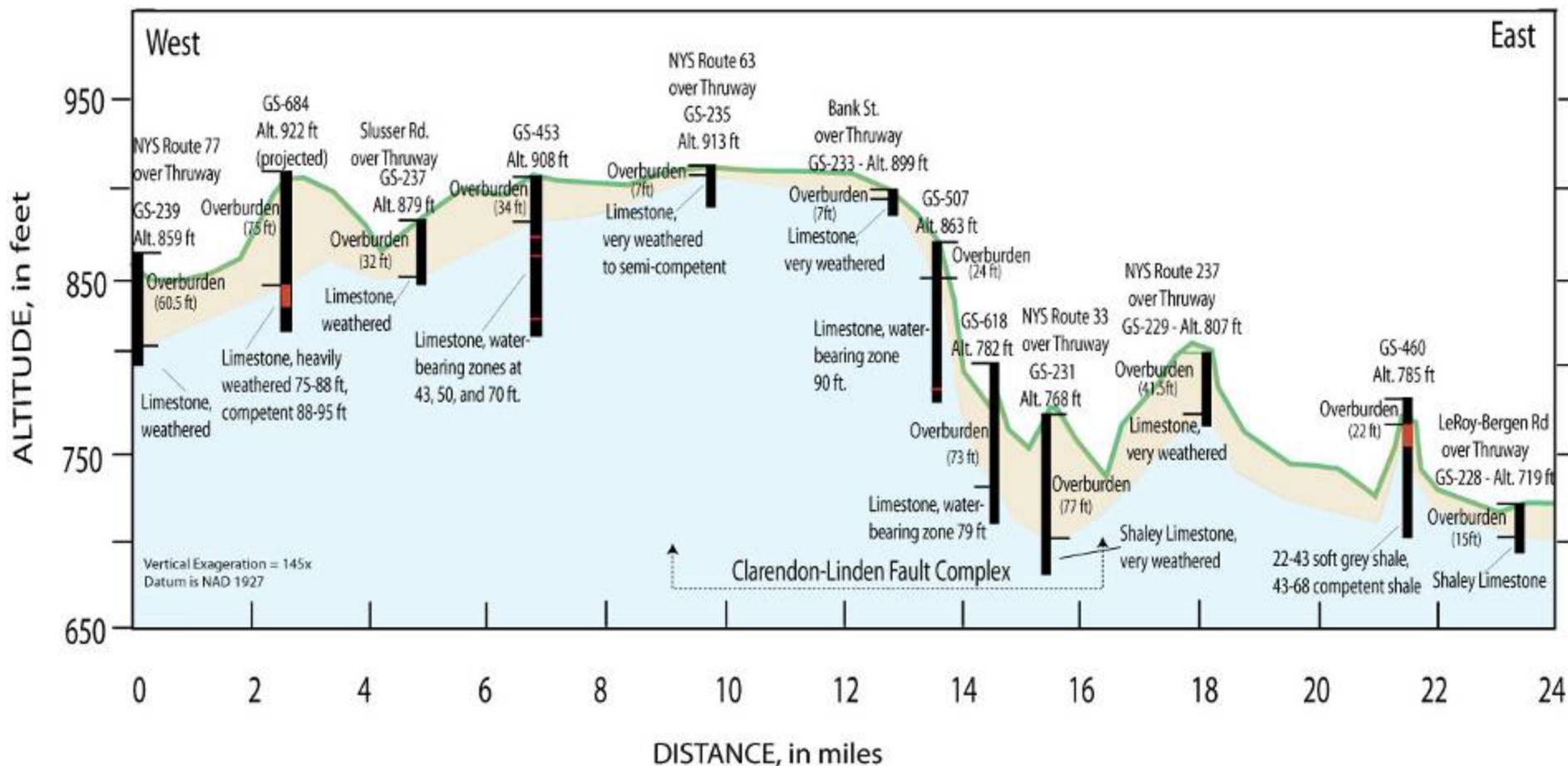


EXPLANATION

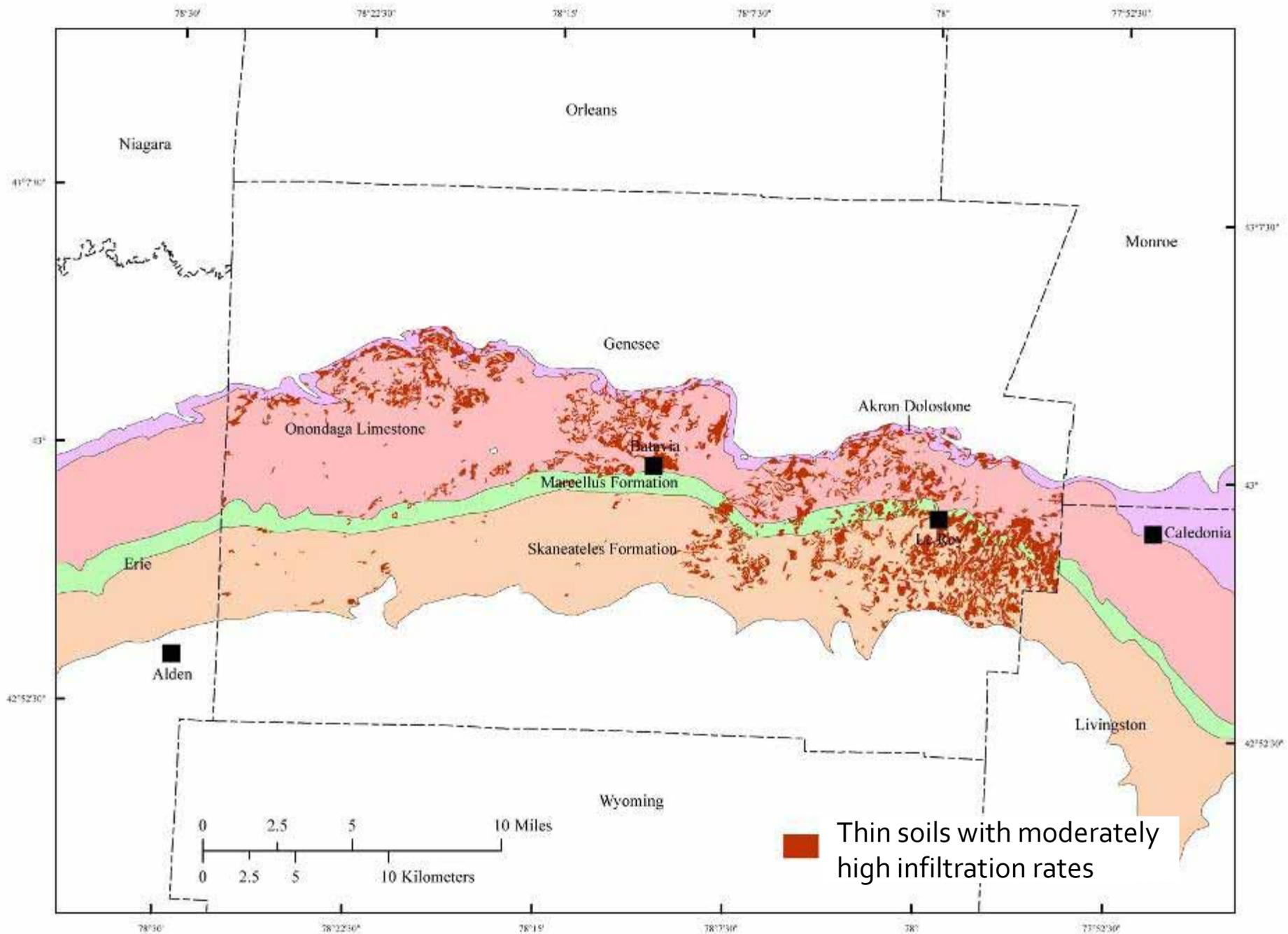
- Overburden - glacial clay, silt, sand, and gravel
- Bedrock (limestone and shale) weathered near bedrock surface, competent at depth
- Water-bearing zone
- Land surface profile along section

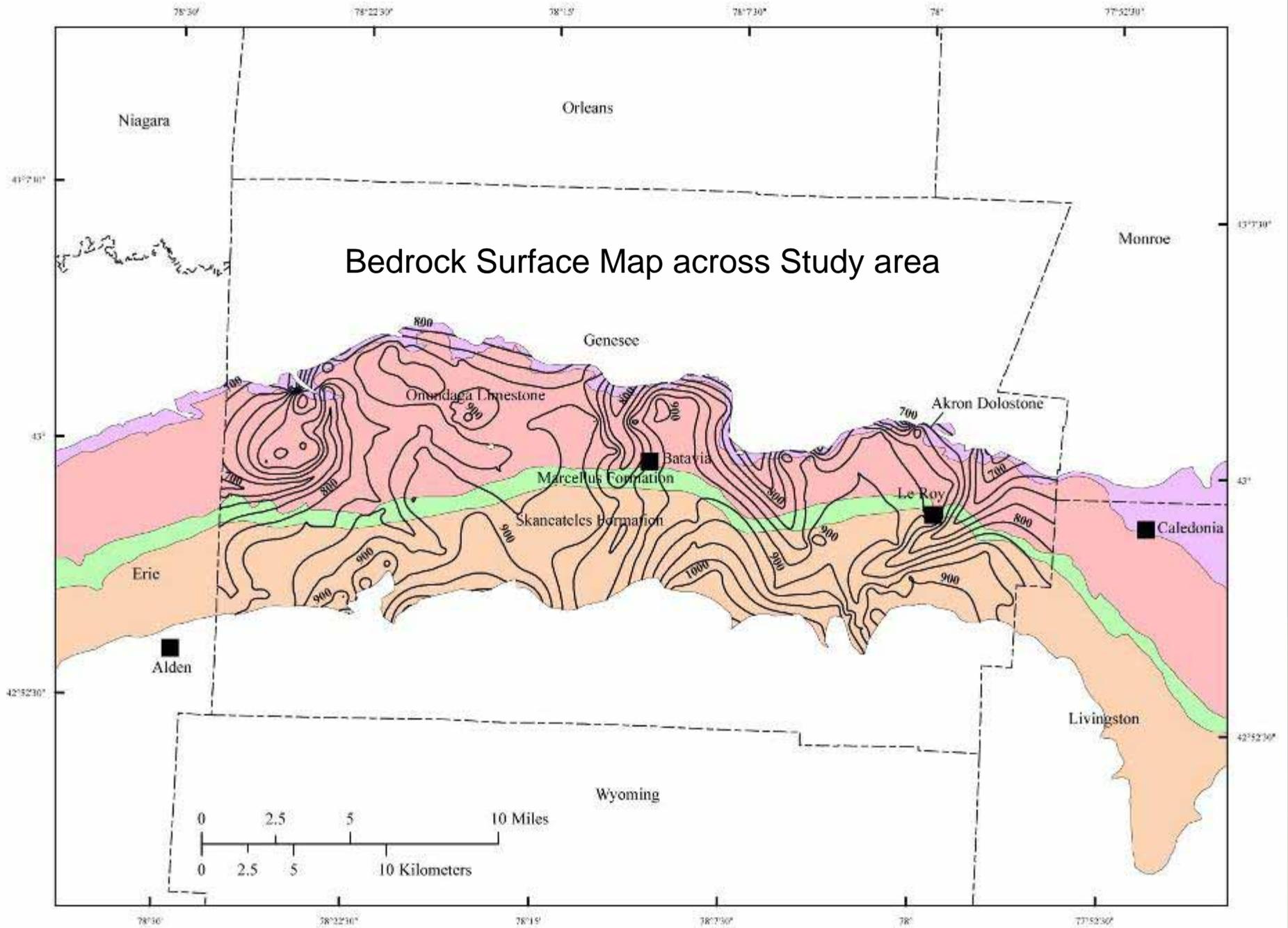
Geologic Section D-D'

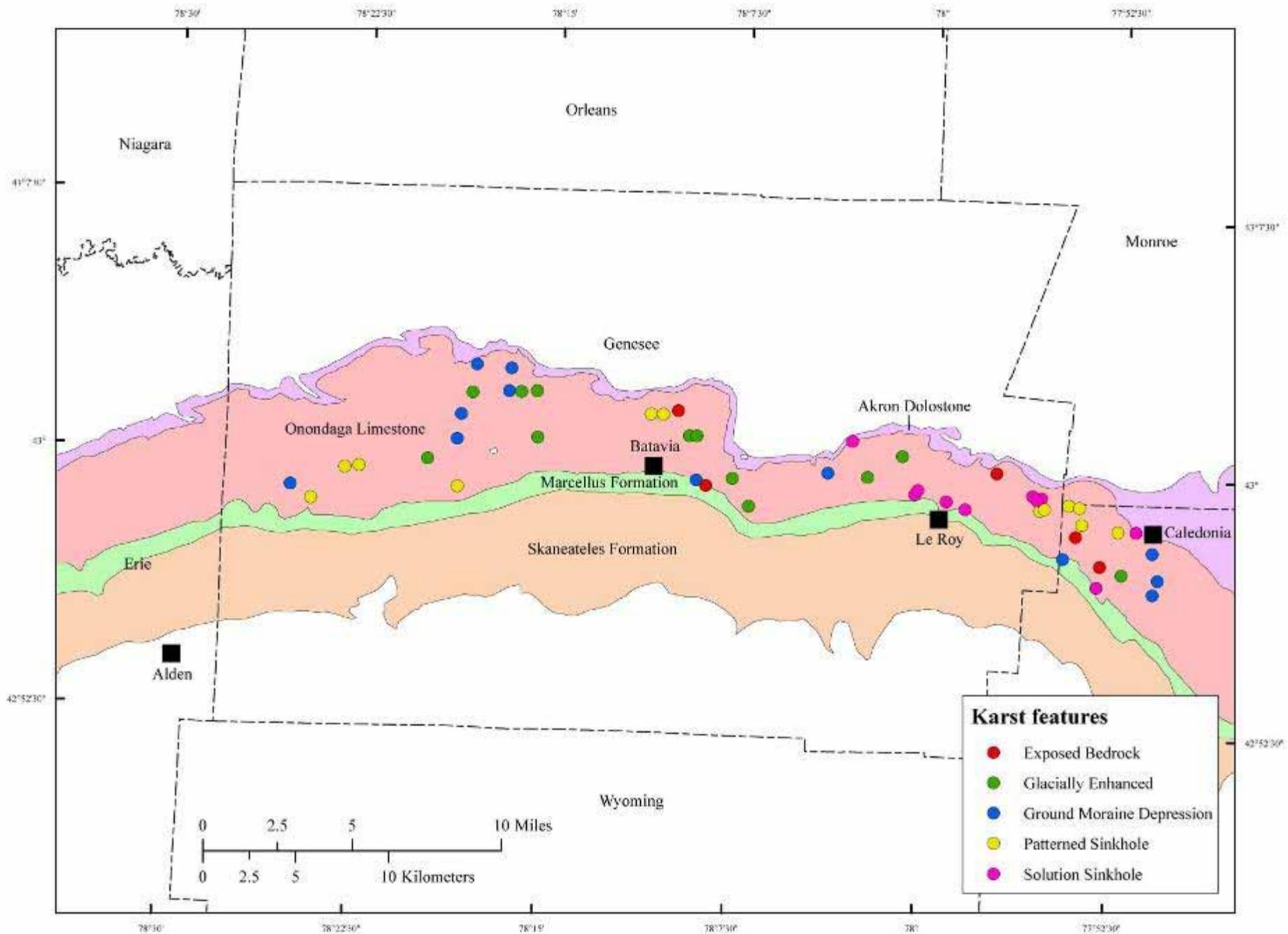
East-West section (roughly parallel to the New York State Thruway)

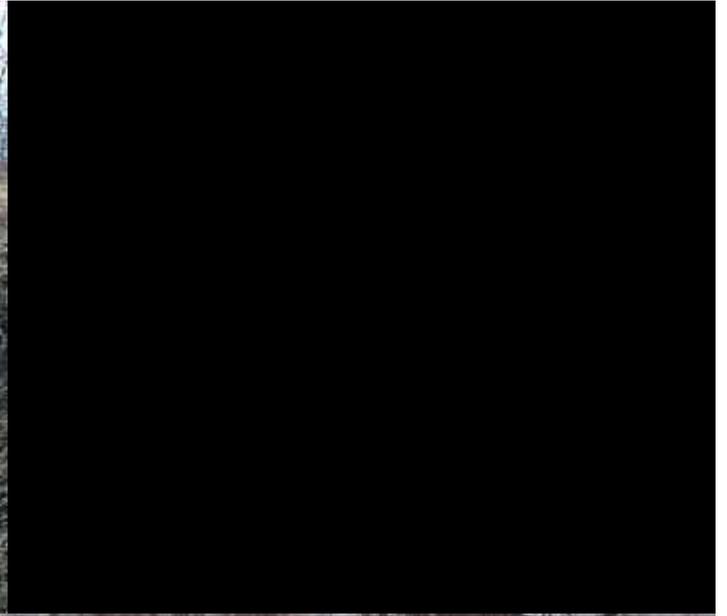


EXPLANATION	
	Overburden - glacial clay, silt, sand, and gravel
	Bedrock (limestone and shale) weathered
	Water-bearing zone
	Land surface profile along section









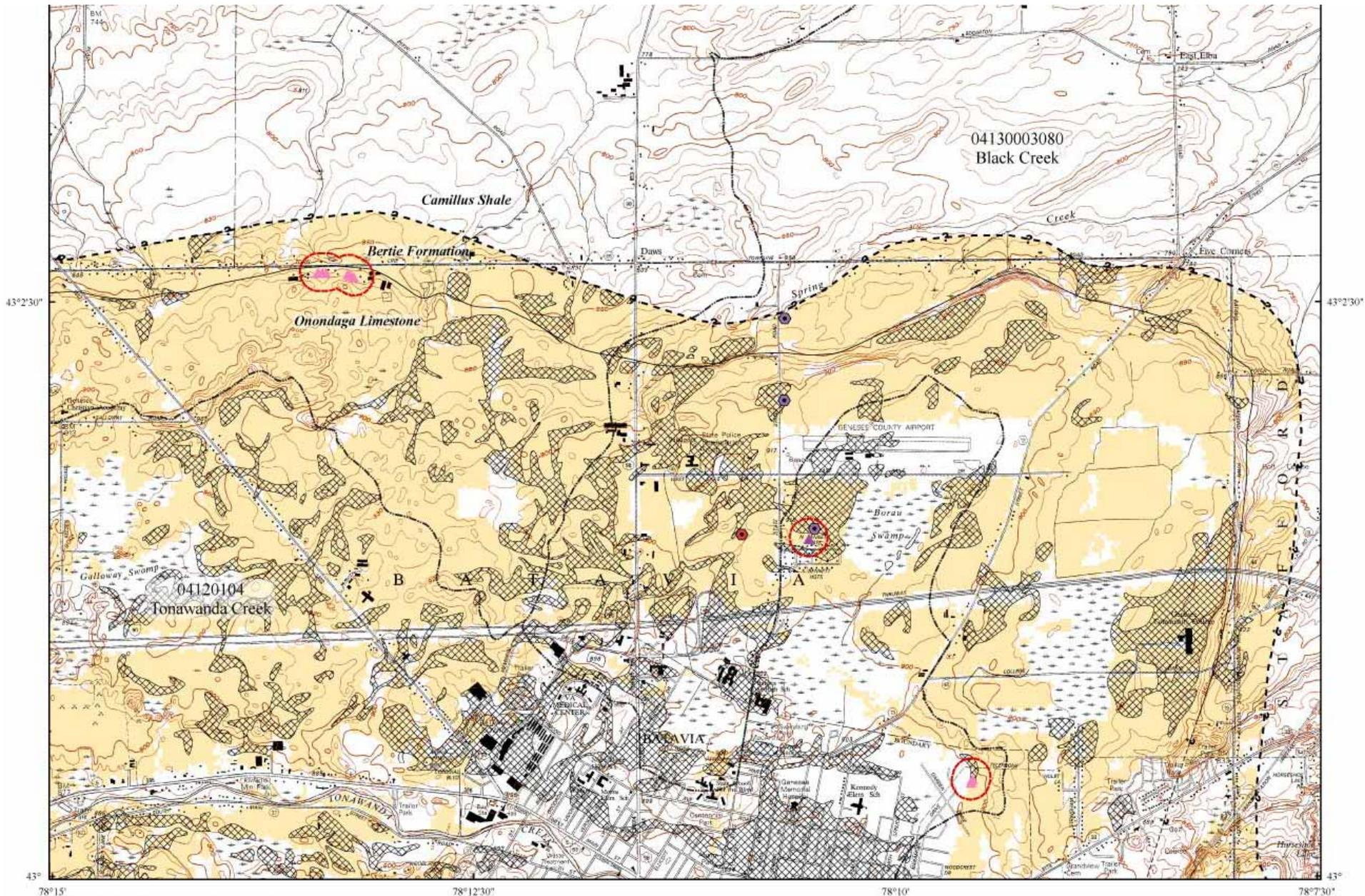




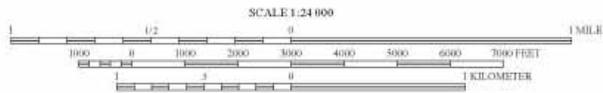
Richards and others, 2010



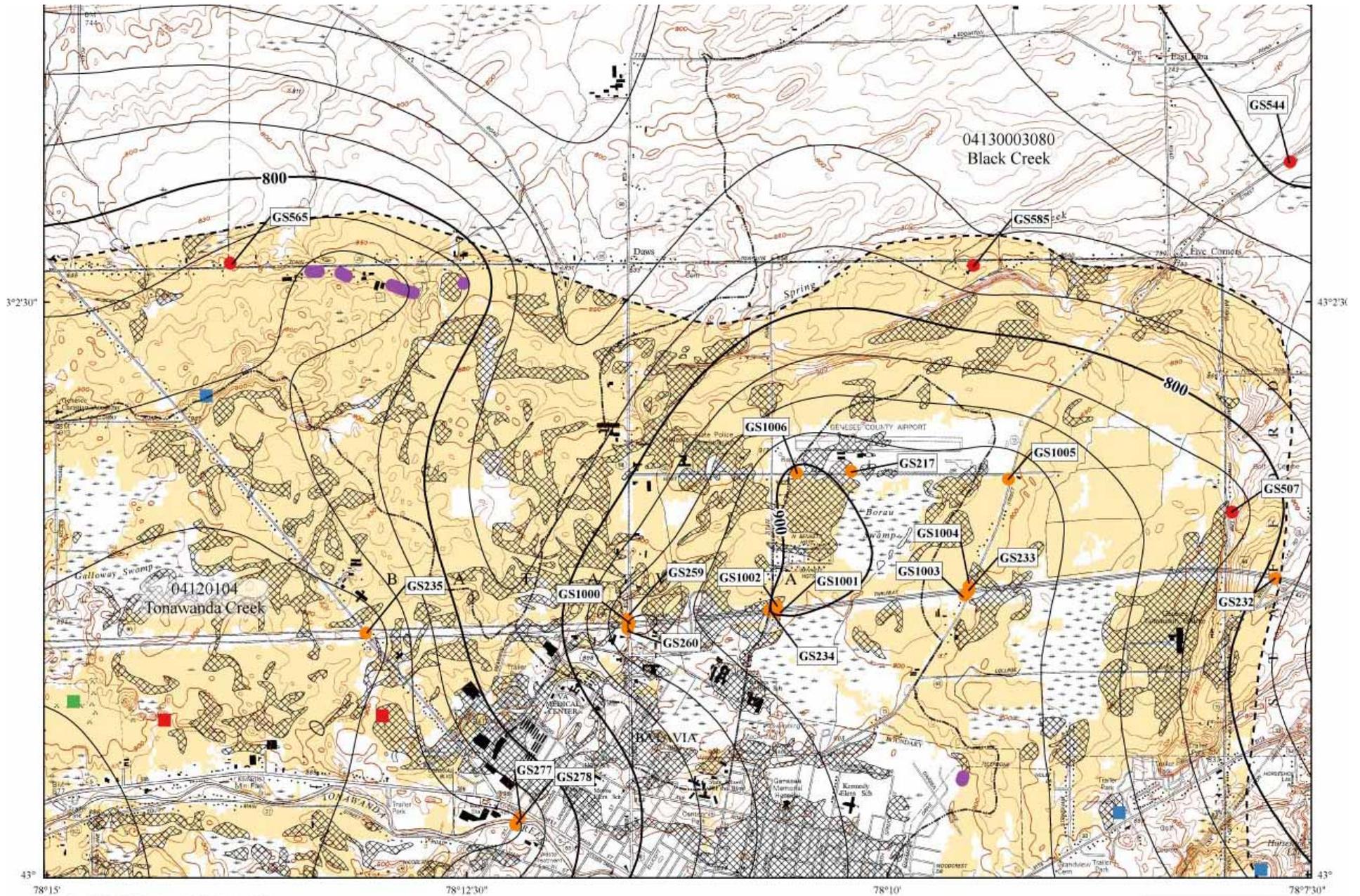
State Street Rd



Base from NYS DOT Mapping and GIS Section, 1998
 accessed in 2009 at <http://www.nysgis.state.ny.us/gisdata/>
 Land use from National Land Cover Data 2001,
 Resolution 1 arc-second (approx. 30m)
 Bedrock Geology from New York State Museum, 1:250,000
 Soils from United States Department of Agriculture,
 Soil Survey Geographic (SSURGO) Database
 accessed in 2009 at <http://soildatamart.nrcs.usda.gov>
 State Plane Coordinate System 1983 projection, SPCS Zone 3103



BATAVIA NORTH, NY



Base from NYS DOT Mapping and GIS Section, 1998
 accessed in 2009 at <http://www.nysgis.state.ny.us/gisdata/>

Land use from National Land Cover Data 2001,
 Resolution 1 arc-second (approx. 30m)

Soils from United States Department of Agriculture,
 Soil Survey Geographic (SSURGO) Database
 accessed in 2009 at <http://soildatamart.nrcs.usda.gov>

State Plane Coordinate System 1983 projection, SPCS Zone 3103



Lessons Learned so far.....

1. Current GIS databases provide 'adequate' information on bedrock type, bedrock surface configuration, water-table elevation, well location, and past chemical spills, and other contamination "issue" locations.
2. Locating karst features cannot be done 'from the office'. While review of aerial photography, maps, and DEM's are good an for initial determination, only field verification will suffice. Working with land-owners and land-use managers produces the best understanding of karst-feature location and function.
3. The pilot GIS analysis has yielded a tool for land/water resource managers to aid them in determining where resource appraisals would require further (field) assessment to evaluate and protect both surface- and ground-water resources.
4. A systematic methodology to collect, verify, store, and make available these data (karst features and previous contamination locations) will provide another useful tool for all water- and land-resource managers.

Questions?

