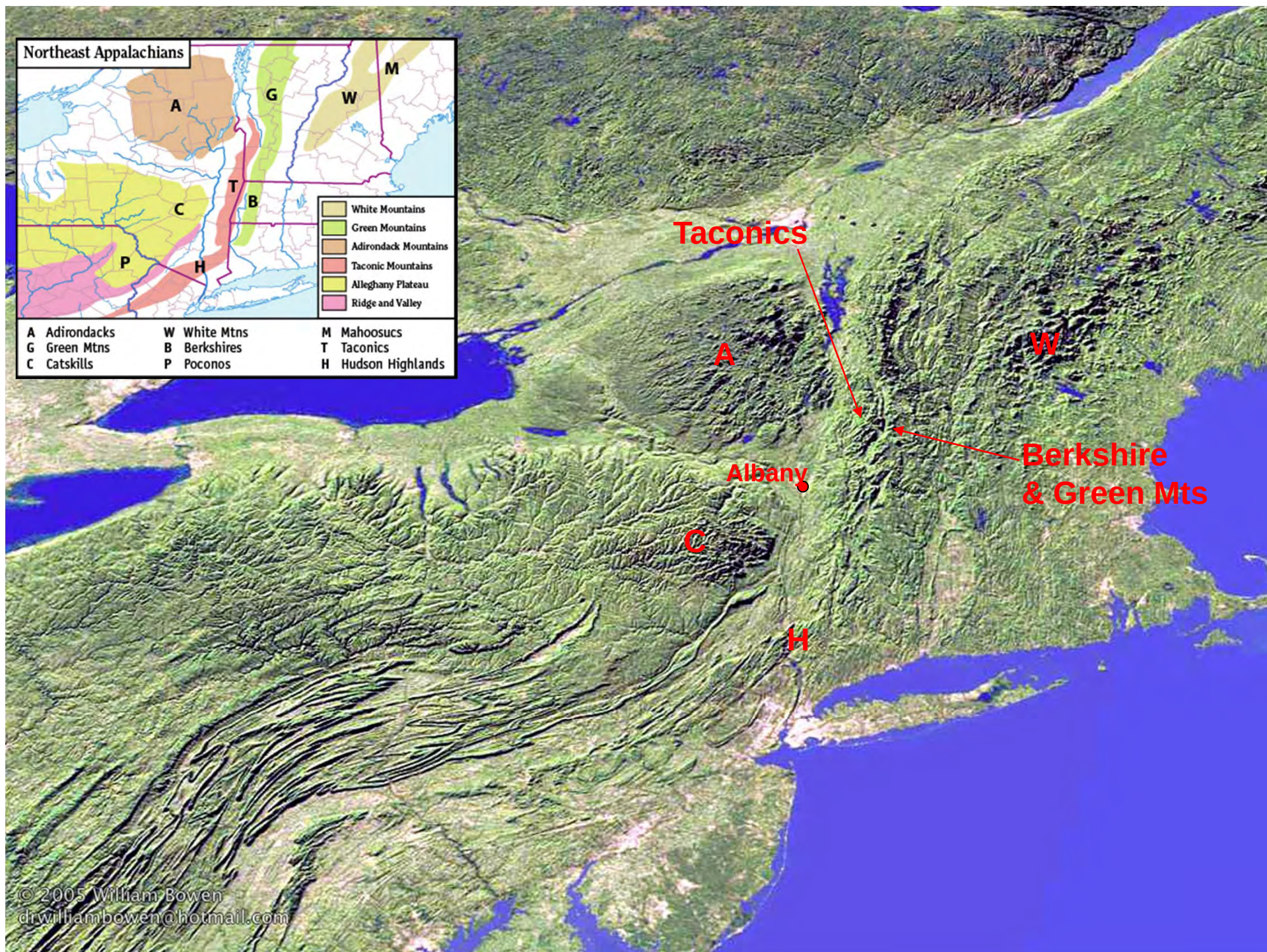


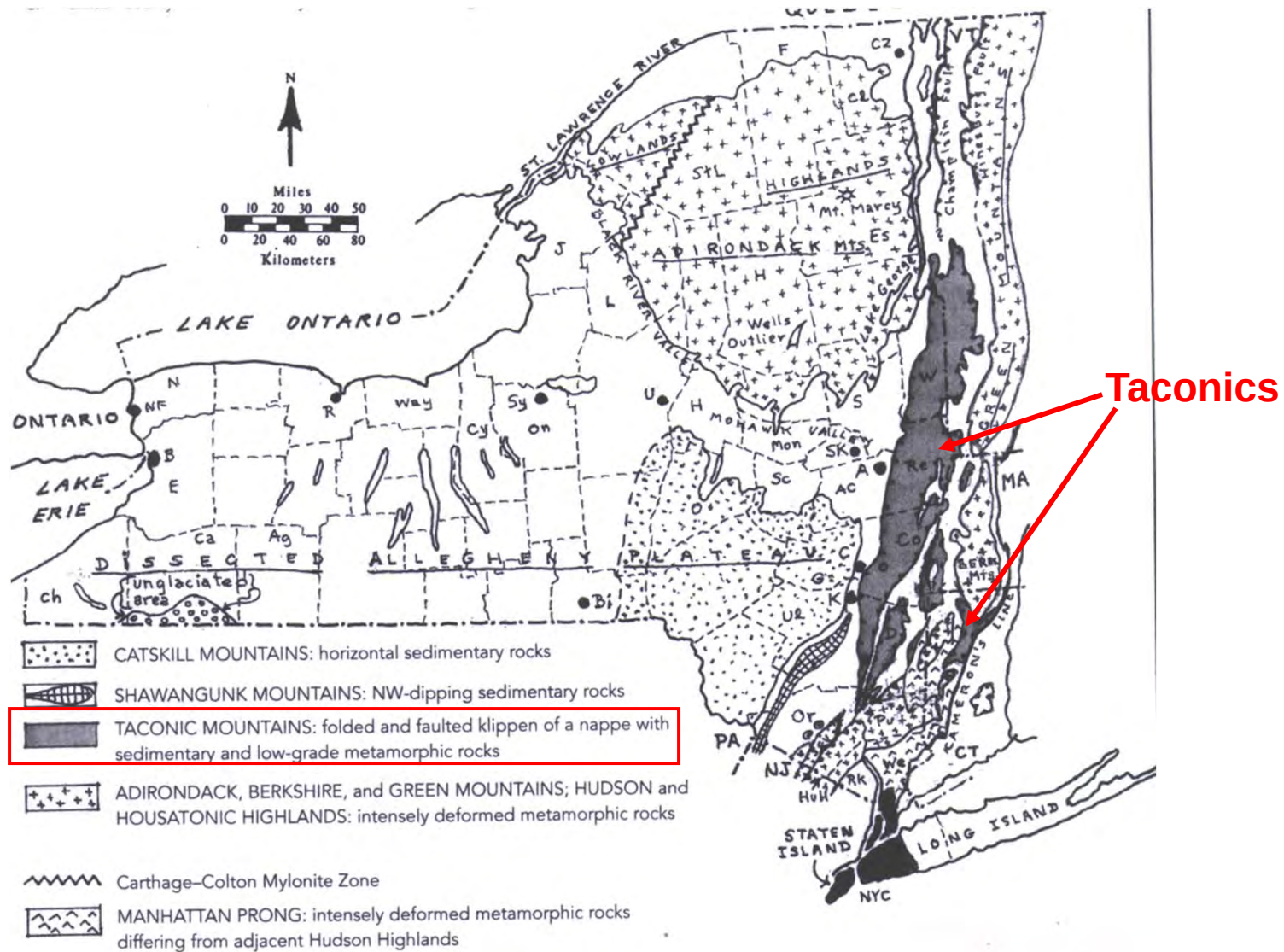
Taconic Tectonics

rootless mountains, lost oceans, crushed coasts

William Kelly, State Geologist
New York State Geological Survey
New York State Museum







Taconic mountains – folded and faulted klippe of a nappe comprised of sedimentary and low-grade metamorphic rocks

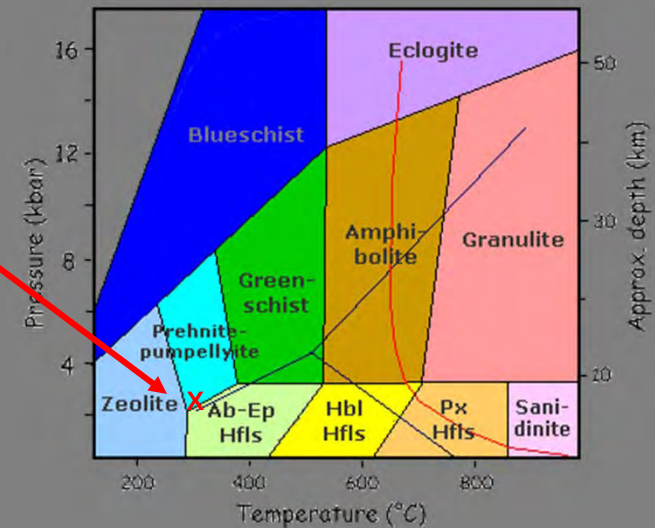
folded & faulted – bent and broken

klippe - isolated rock unit that is the erosional remnant of a nappe

nappe - sheet-like, out-of-place rock unit that has moved on a predominantly horizontal surface by faulting or folding

sedimentary – shale, sandstone, limestone

low-grade metamorphic -
slate
phyllite



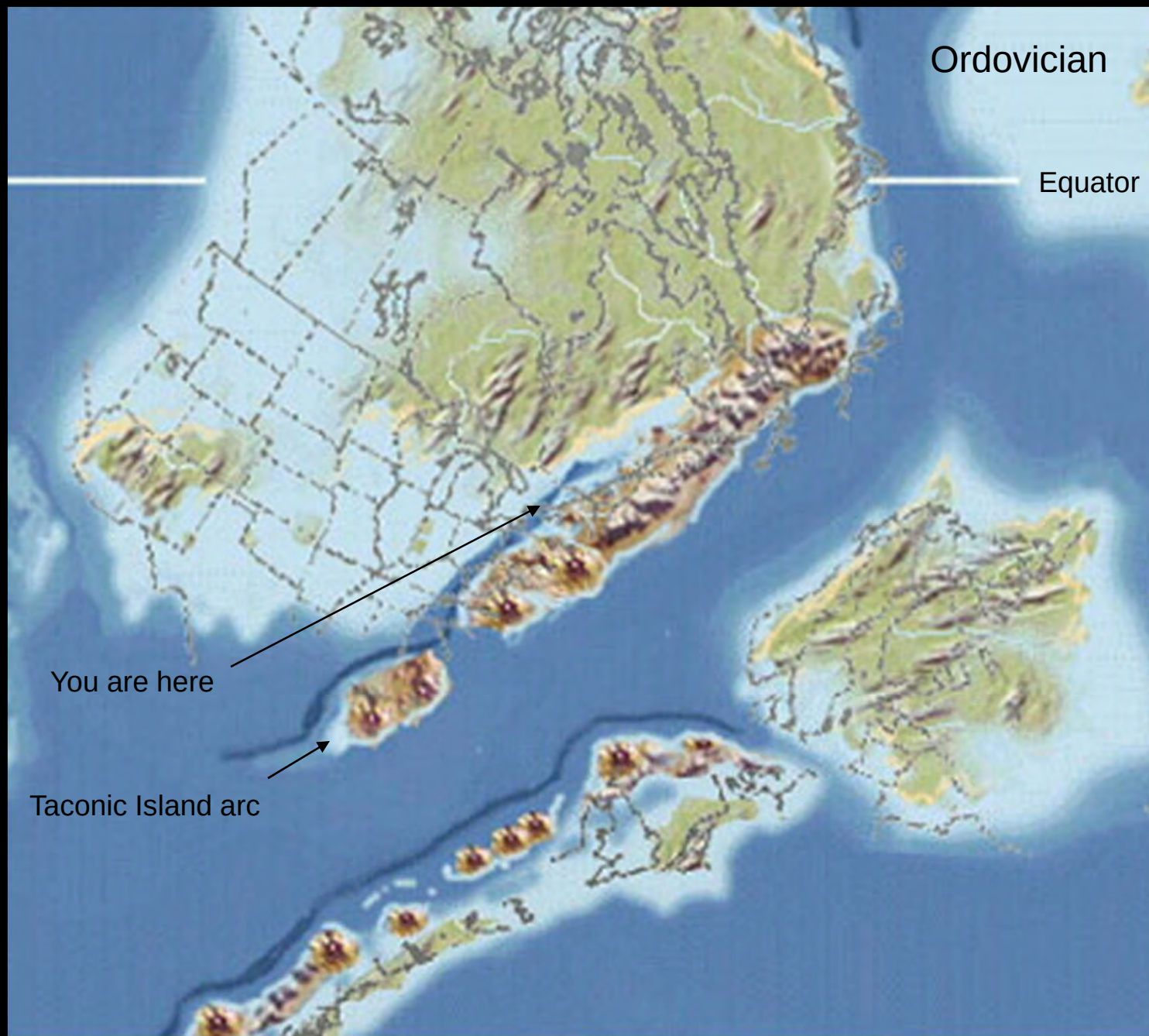
Cambrian

Equator

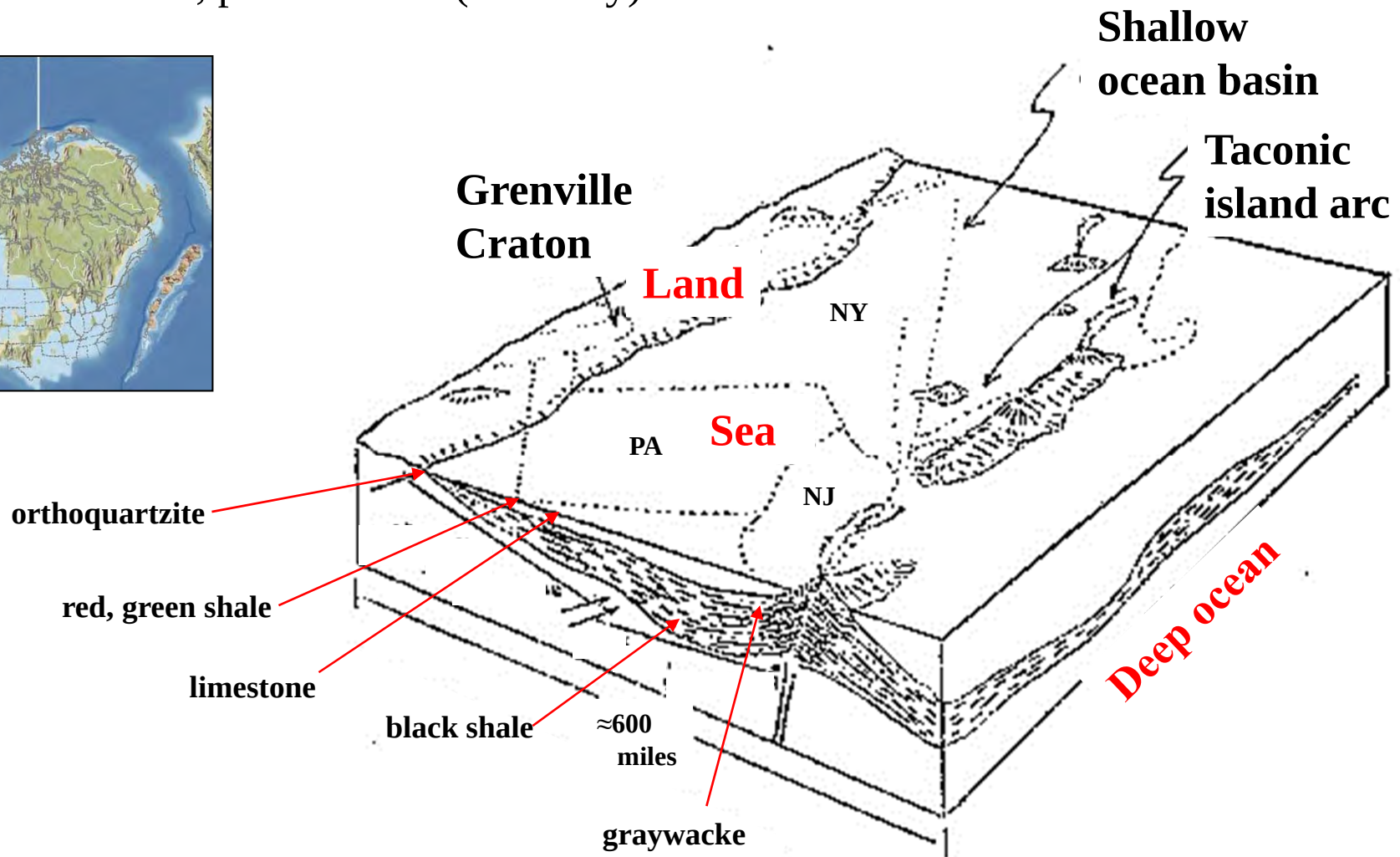
You are here

Taconic Island arc

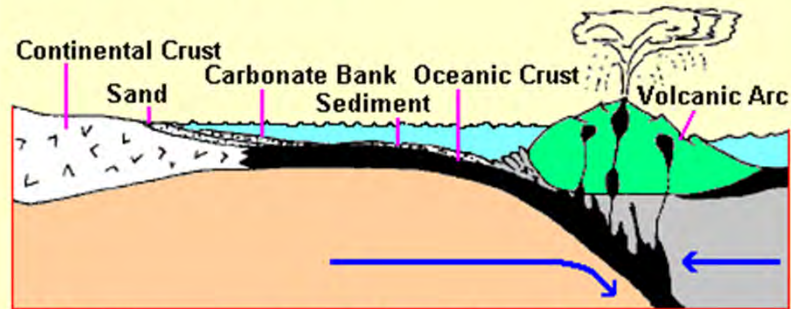




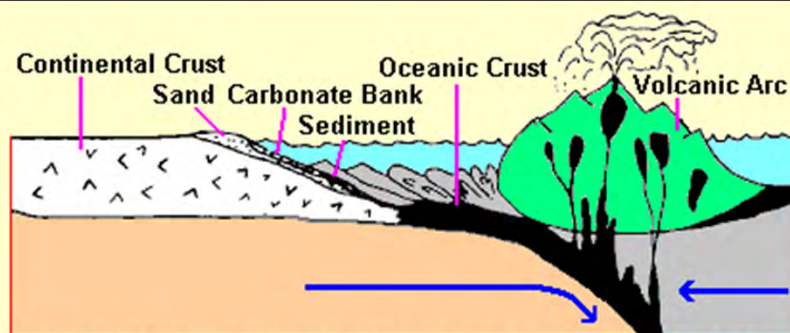
Taconics, pre-collision (~500 my)



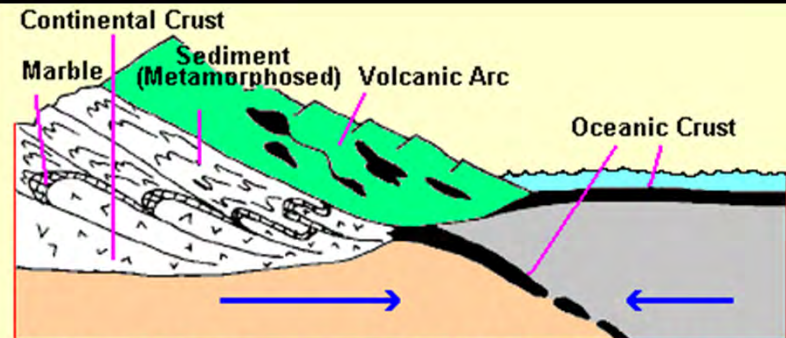
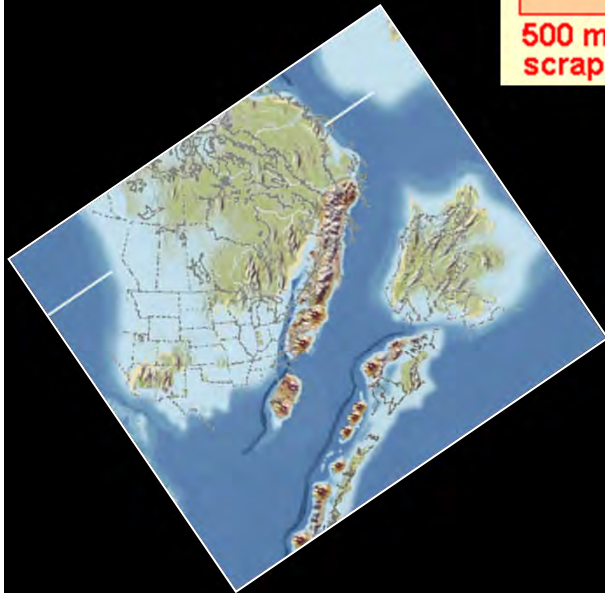
Cross Sections of Eastern North America (as it may have looked)



543 million years ago, active volcano is offshore



500 million years ago, volcano and pile of sediments scraped off the subducting slab are larger



440 million years ago, collision between the volcanic islands and the ancient continent (Taconic Orogeny) formed a tall mountain range. This range has since eroded leaving its roots exposed in the rolling hills of the Eastern Piedmont

W

E

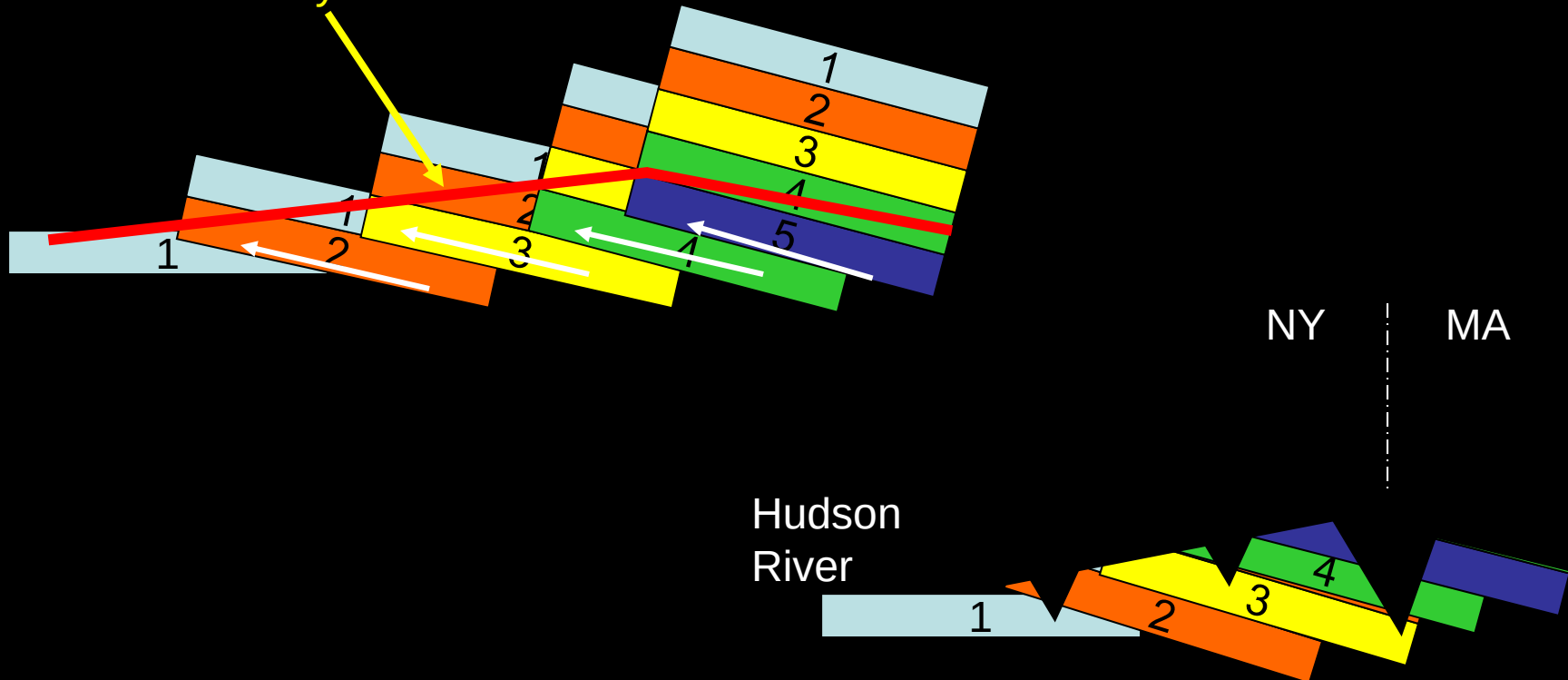
Younger rocks



Motion of crust

Older rocks

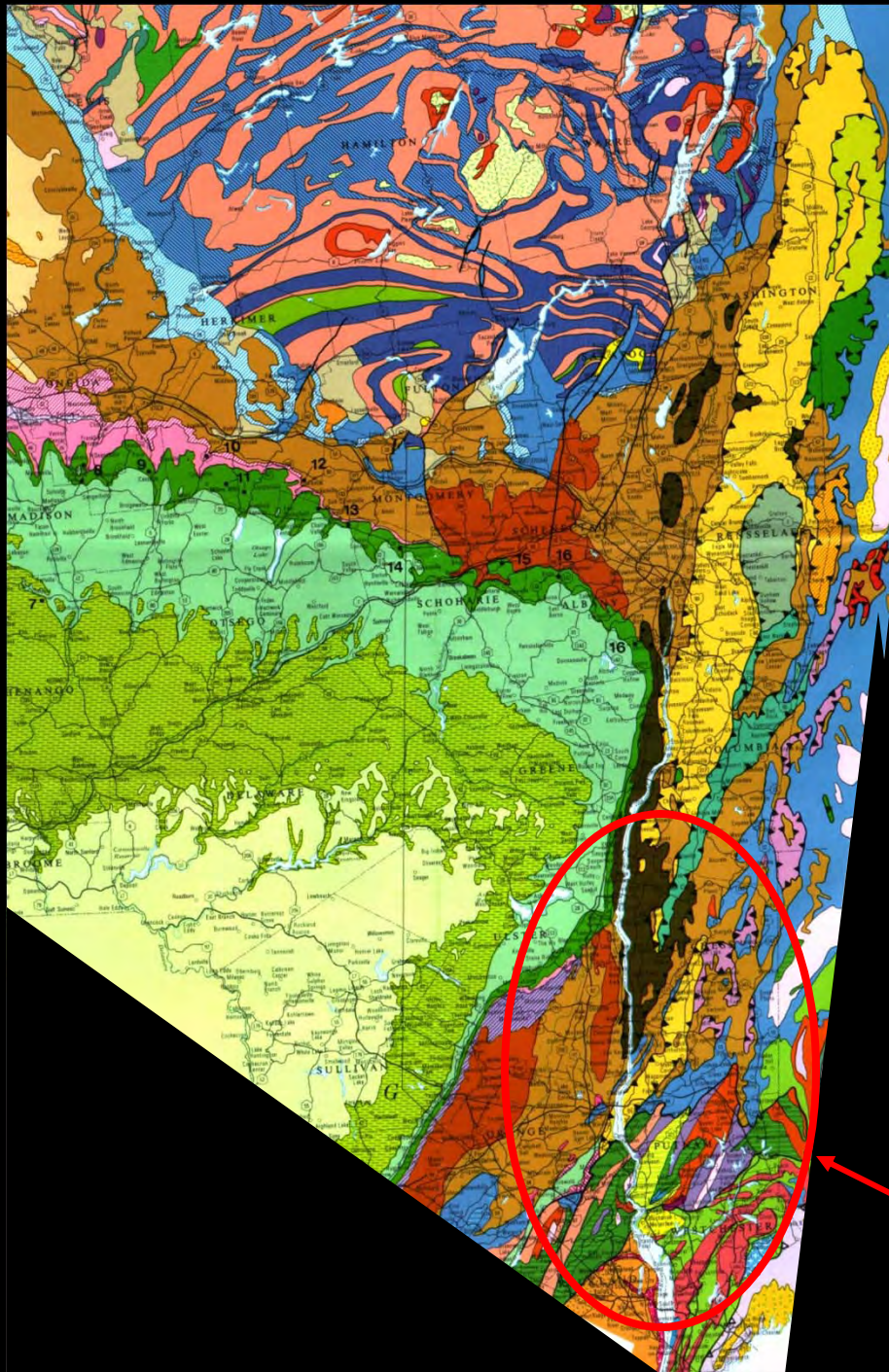
400 million years erosion



Hudson
River

NY

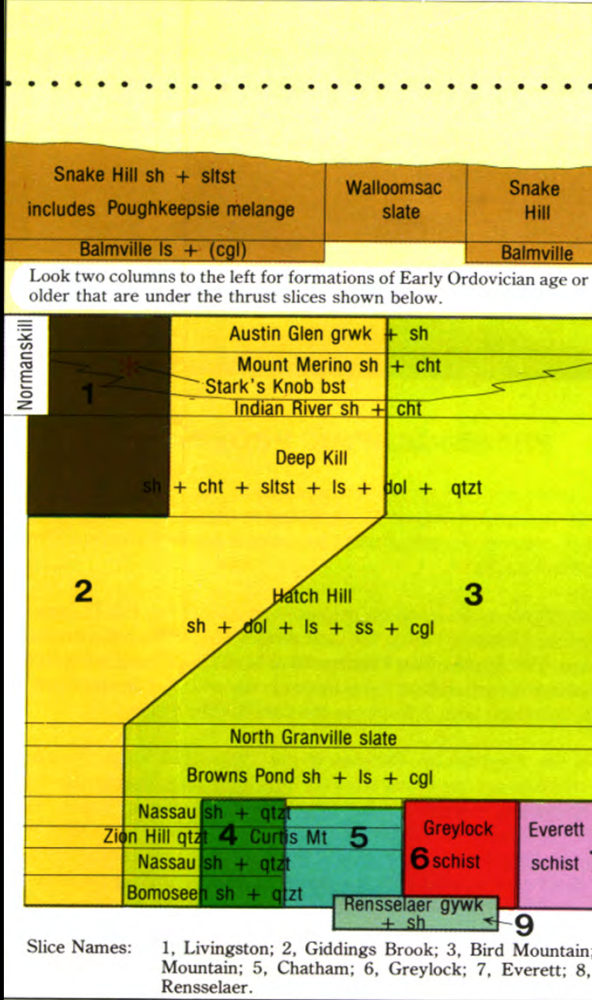
MA



6 Taconic Region

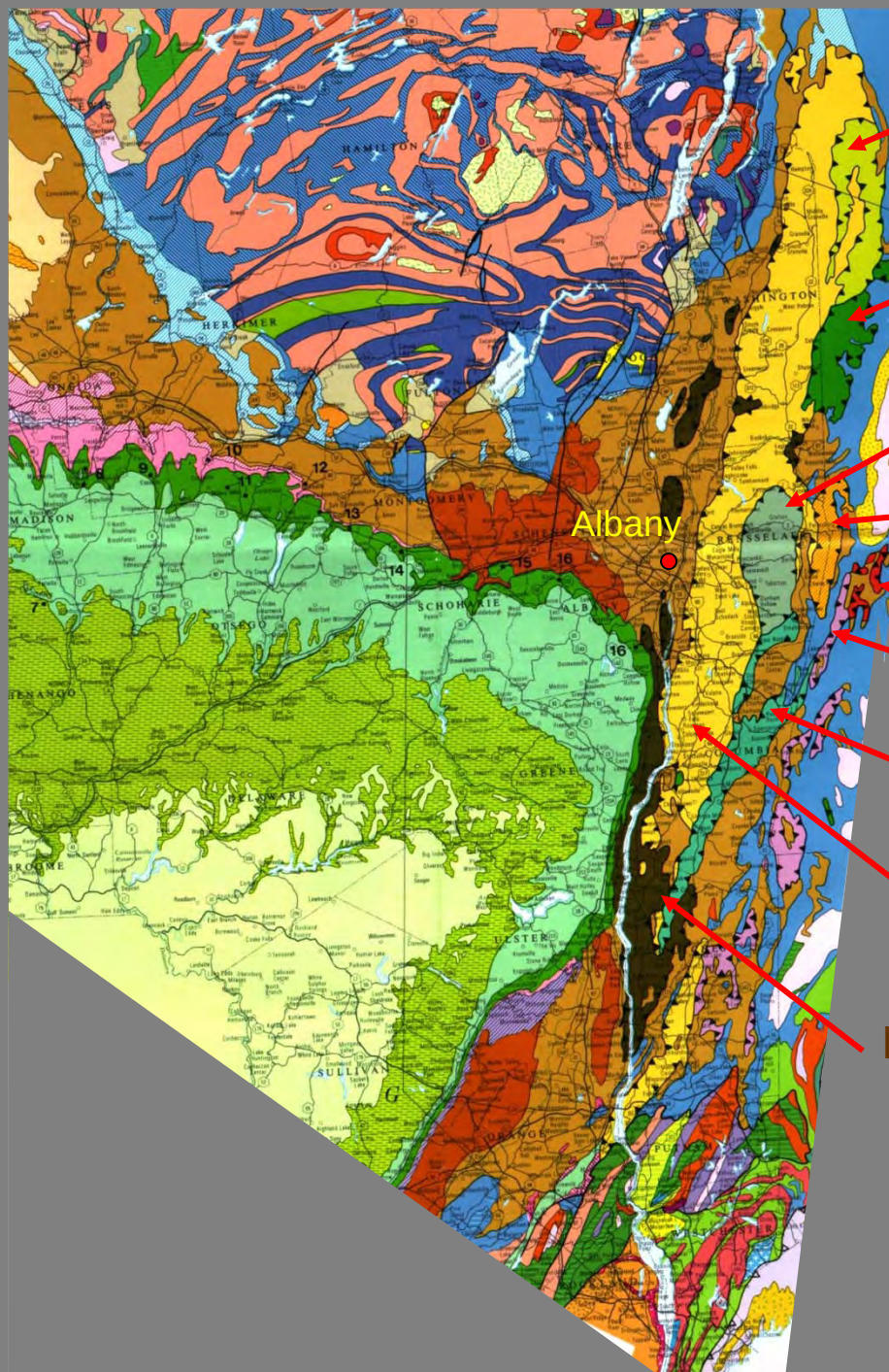
WEST

EAST



Slice Names: 1, Livingston; 2, Giddings Brook; 3, Bird Mountain; 4, Dorset Mountain; 5, Chatham; 6, Greylock; 7, Everett; 8, Berlin; 9, Rensselaer.

Region involved in later mountain building



Bird Mt.

Dorset Mt.

Rensselaer

Berlin

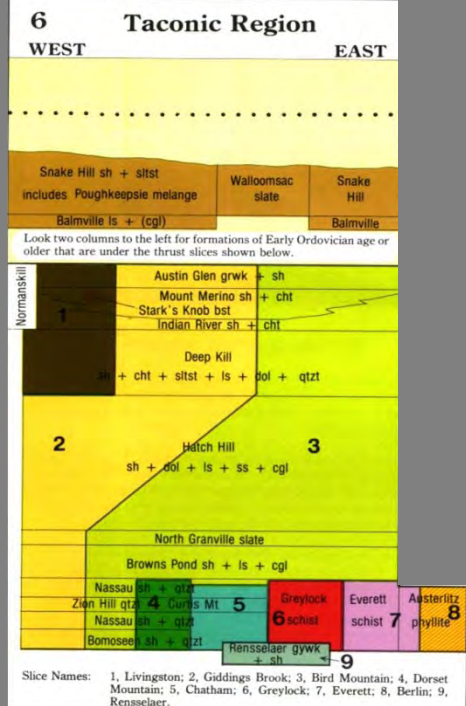
Greylock

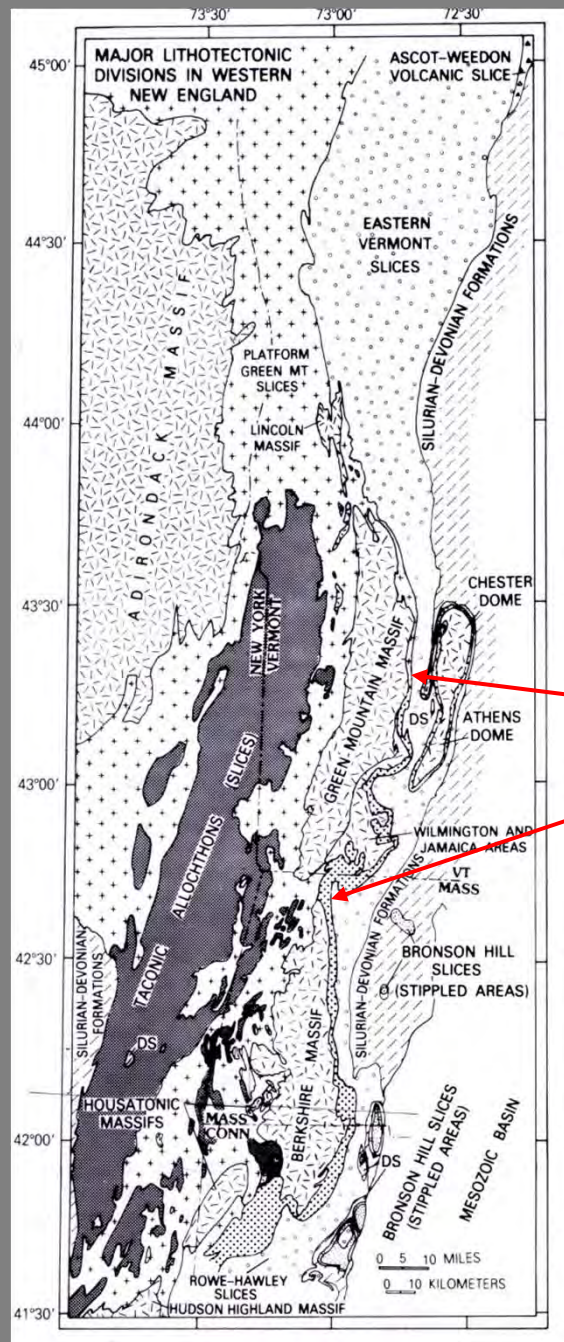
Everett

Chatham

Giddings Brook

Livingston





Taconics are shifty, rootless mountains

Taconic slice root zone

Lake Bomoseen syncline





Fold in Indian River slate





Giddings Brook thrust fault surface

Bald Mt. near Saratoga Park

Folded rock just above the Giddings Brook thrust fault surface



Taconic Melange – chaotic mixture of pebble to block-sized angular to rounded rock fragments in sandy to muddy matrix



Limestone block in melange



Pillow basalt, Starks Knob, Schuylerville



Indian River slate





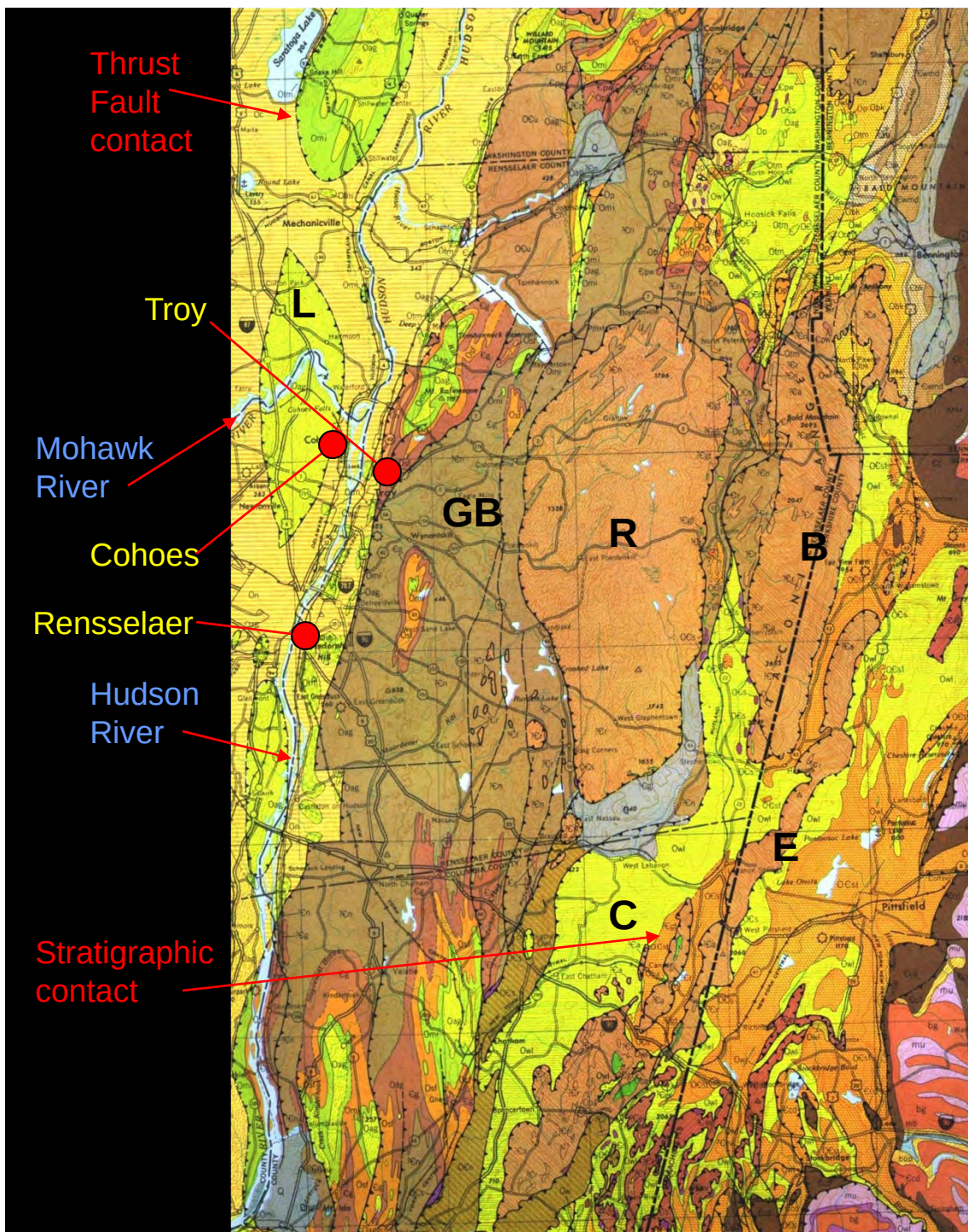
Sheldon Slate Co. quarry, Granville



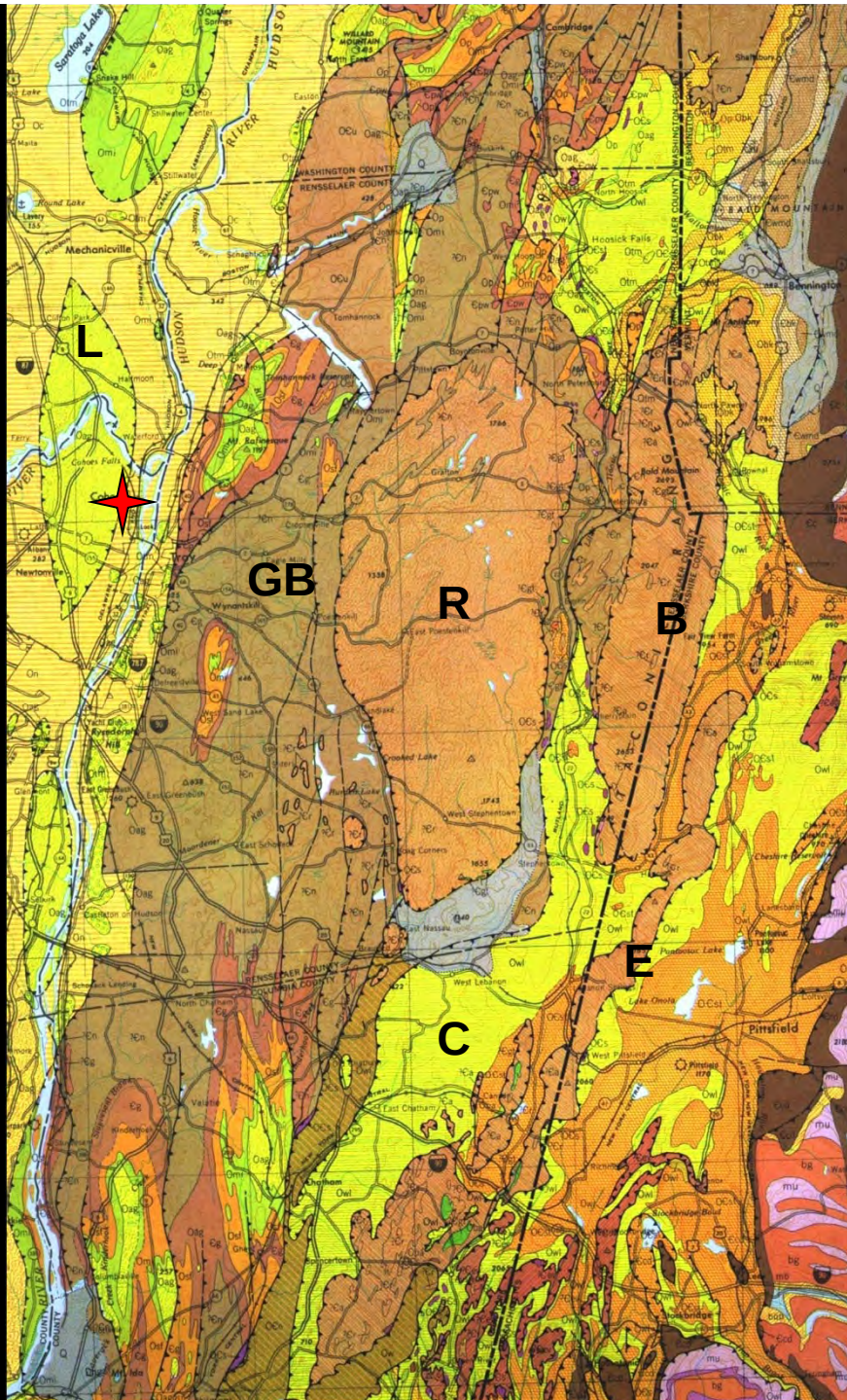




Geologic Map of the area east of Albany



Geologic Map of the area
east of Albany



Austen Glen Fm, Livingston slice

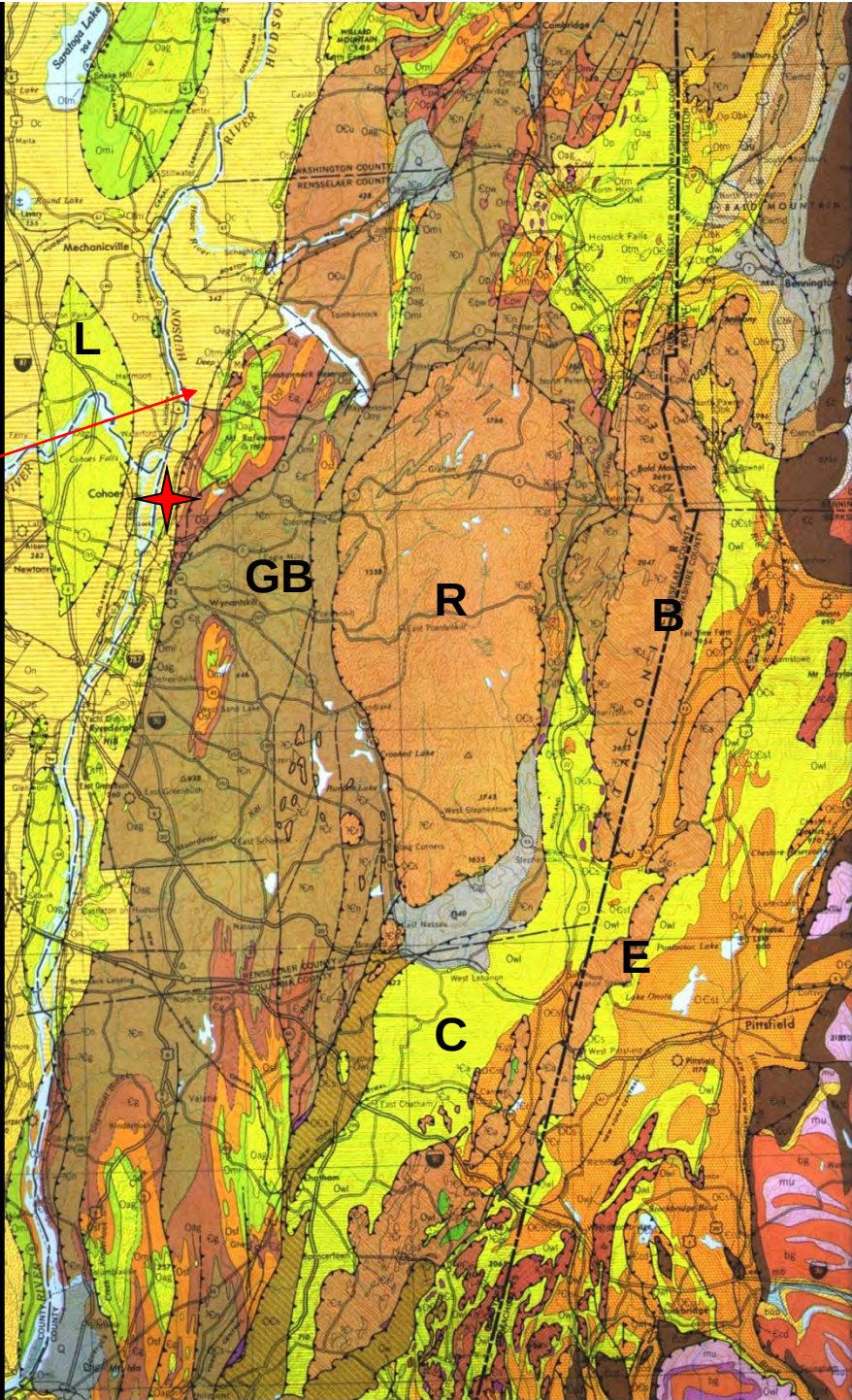


Austen Glen Fm



Geologic Map of the area
east of Albany

Rocks
in
place



Canajoharie
shale



Canajoharie
shale

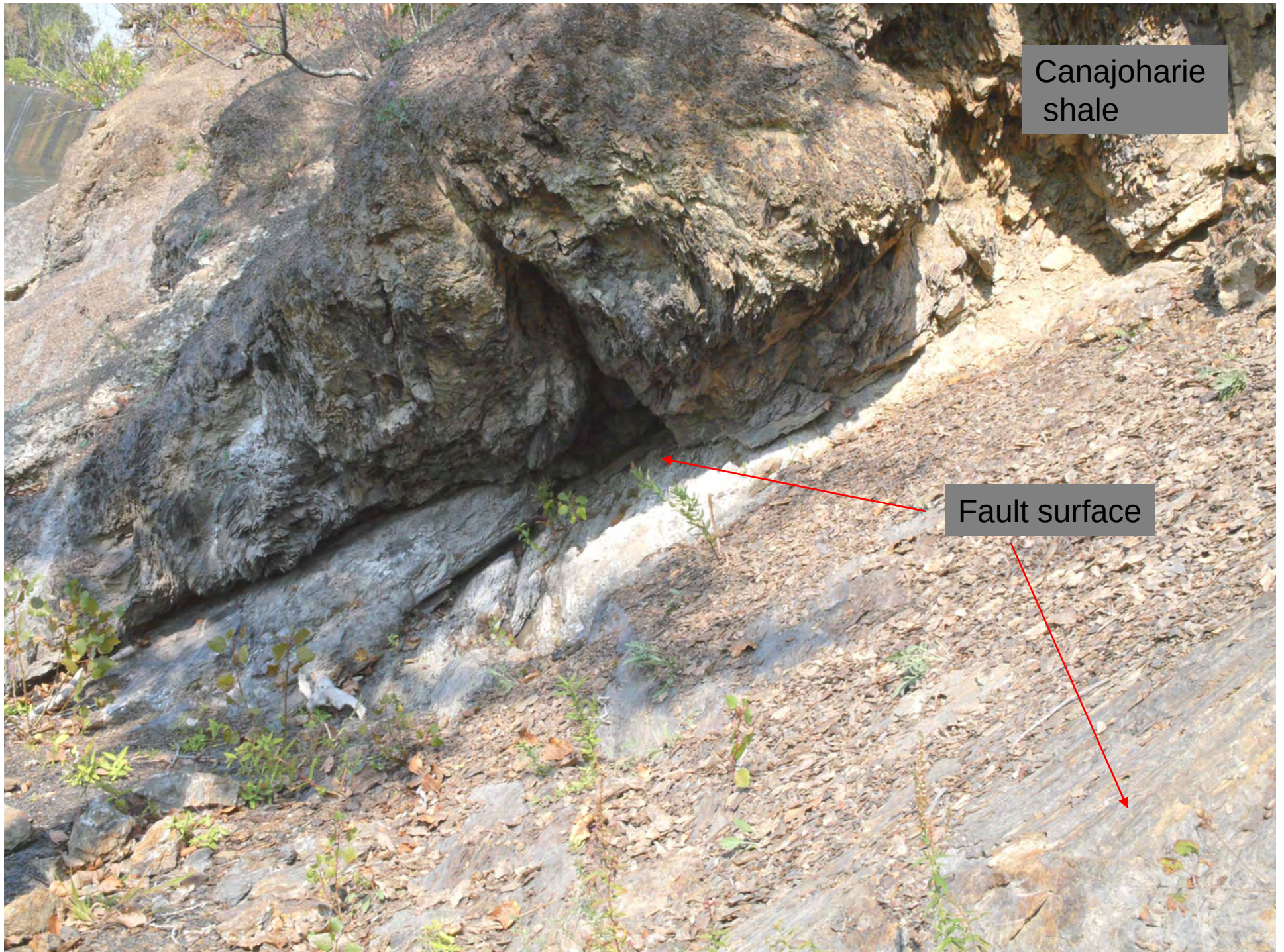


Canajoharie
shale





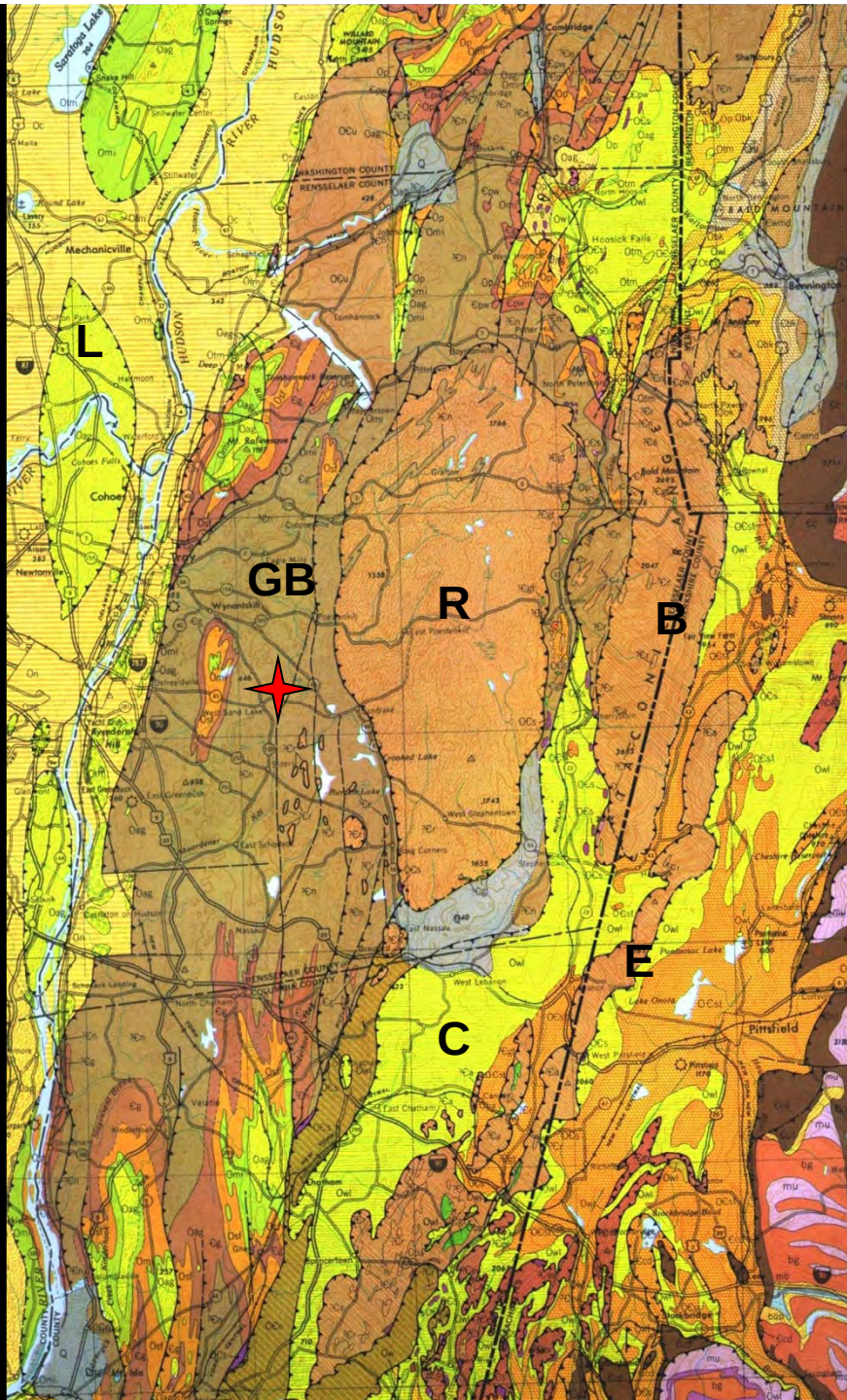
Canajoharie
shale



Canajoharie
shale

Fault surface

Geologic Map of the area
east of Albany



Nassau Fm – Giddings Brook slice



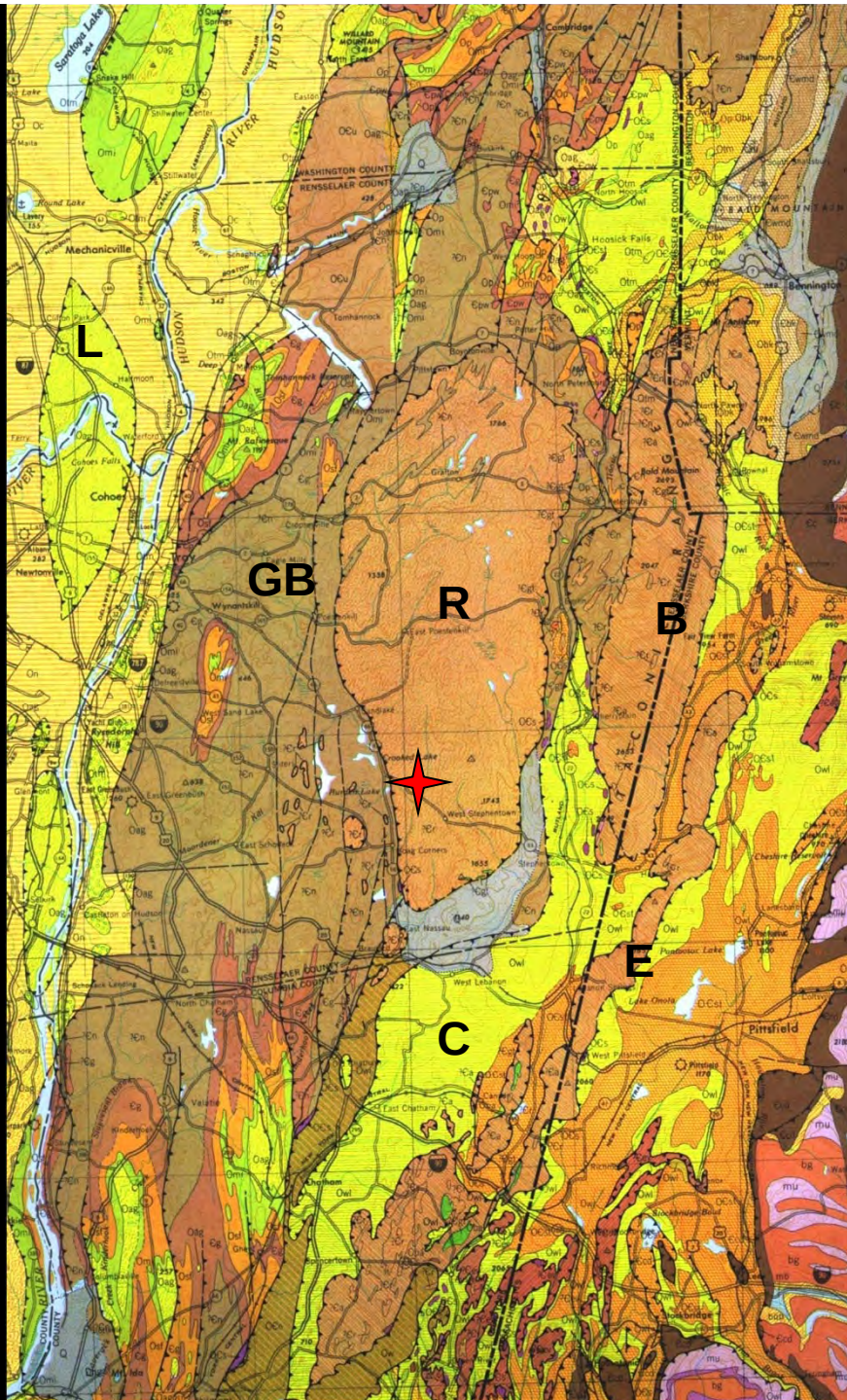
Nassau Fm



Nassau Fm



Geologic Map of the area
east of Albany



Rensselaer Fm, coarse phase

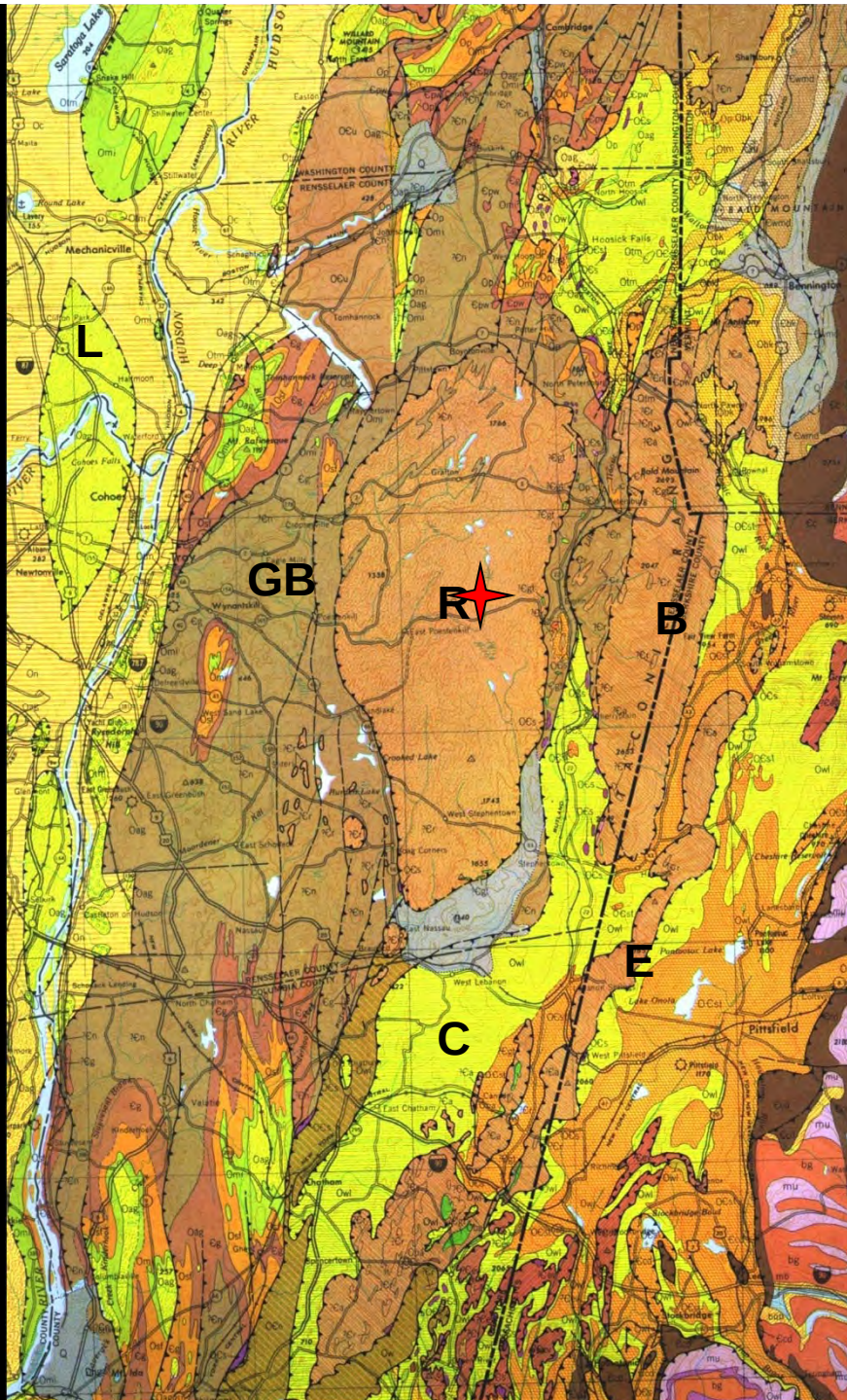




Rensselaer Fm, coarse and fine



Geologic Map of the area
east of Albany



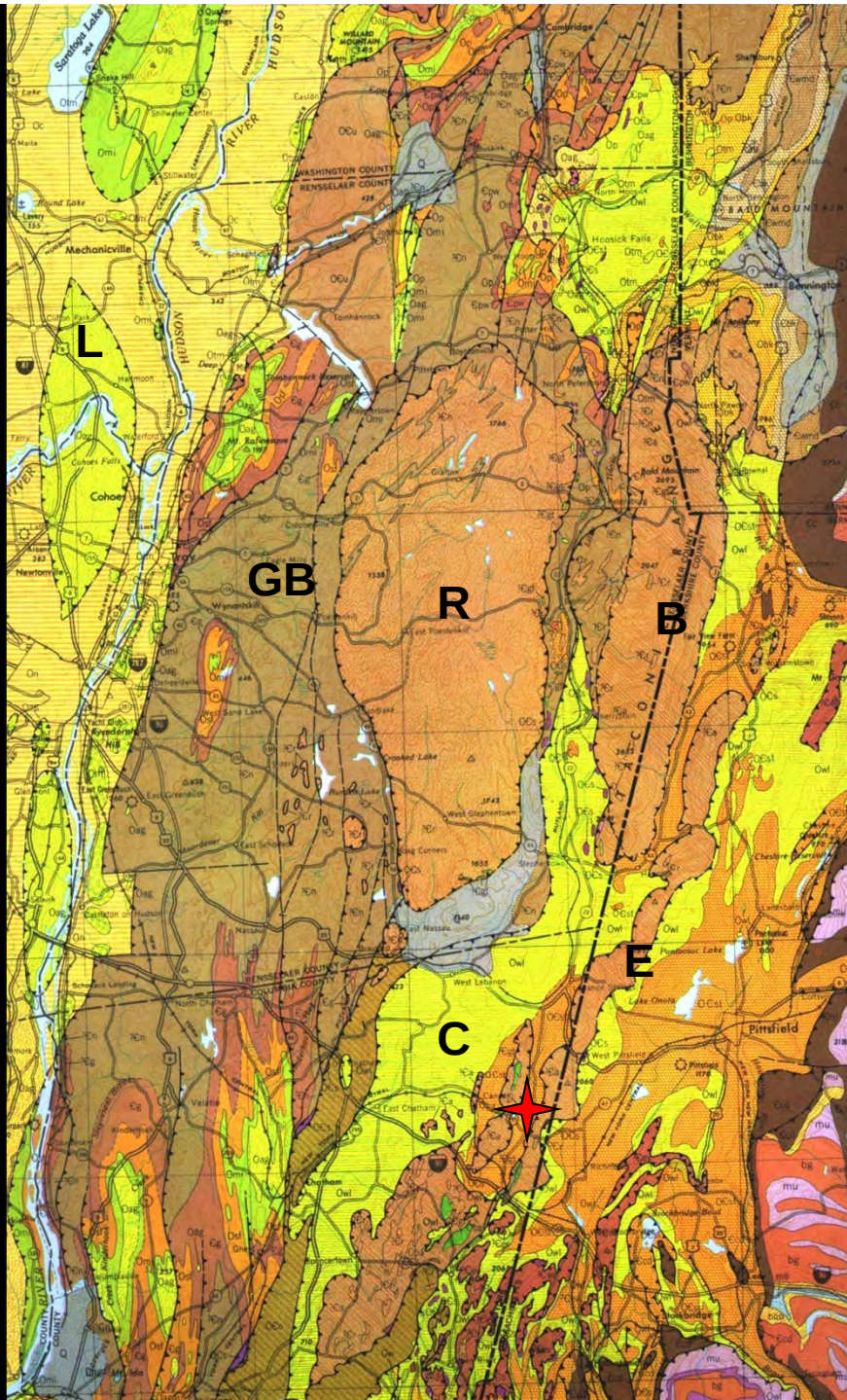
Rensselaer Fm – Rensselaer slice



Rensselaer Fm



Geologic Map of the area
east of Albany



Stockbridge Fm – in place



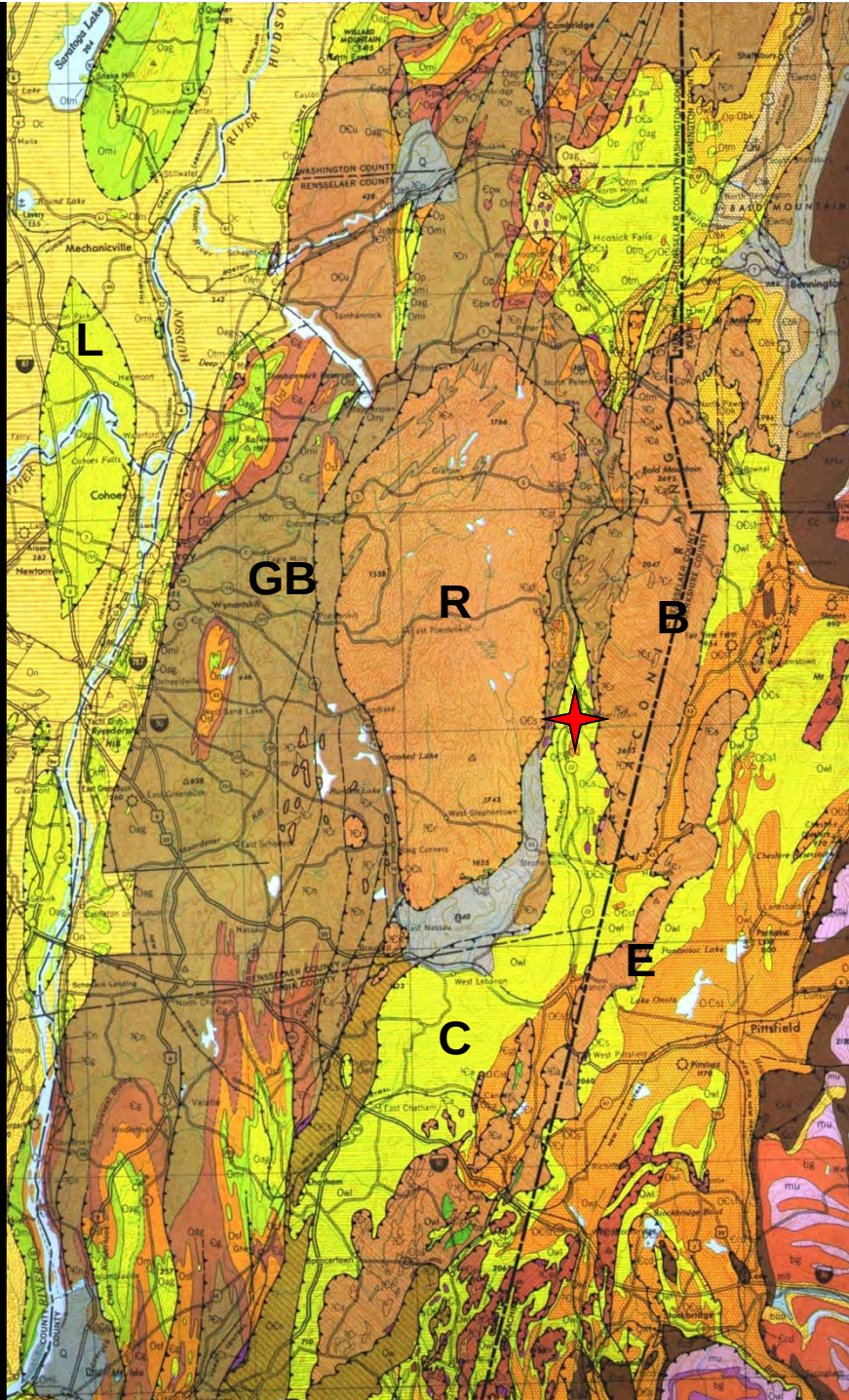
Stockbridge Fm



Stockbridge Fm



Geologic Map of the area
east of Albany



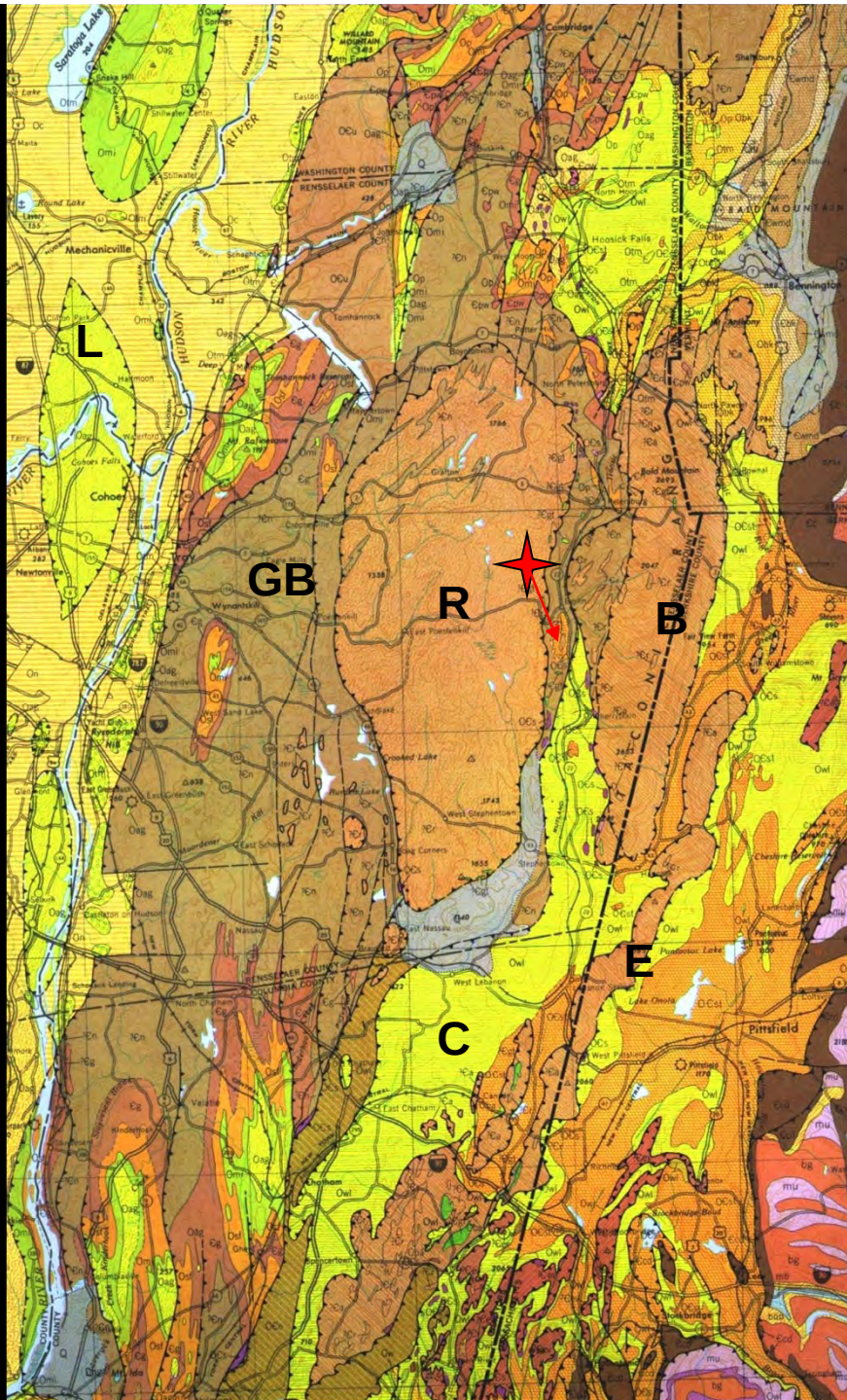
Walloomsack Fm – Chatham slice



Walloomsack Fm



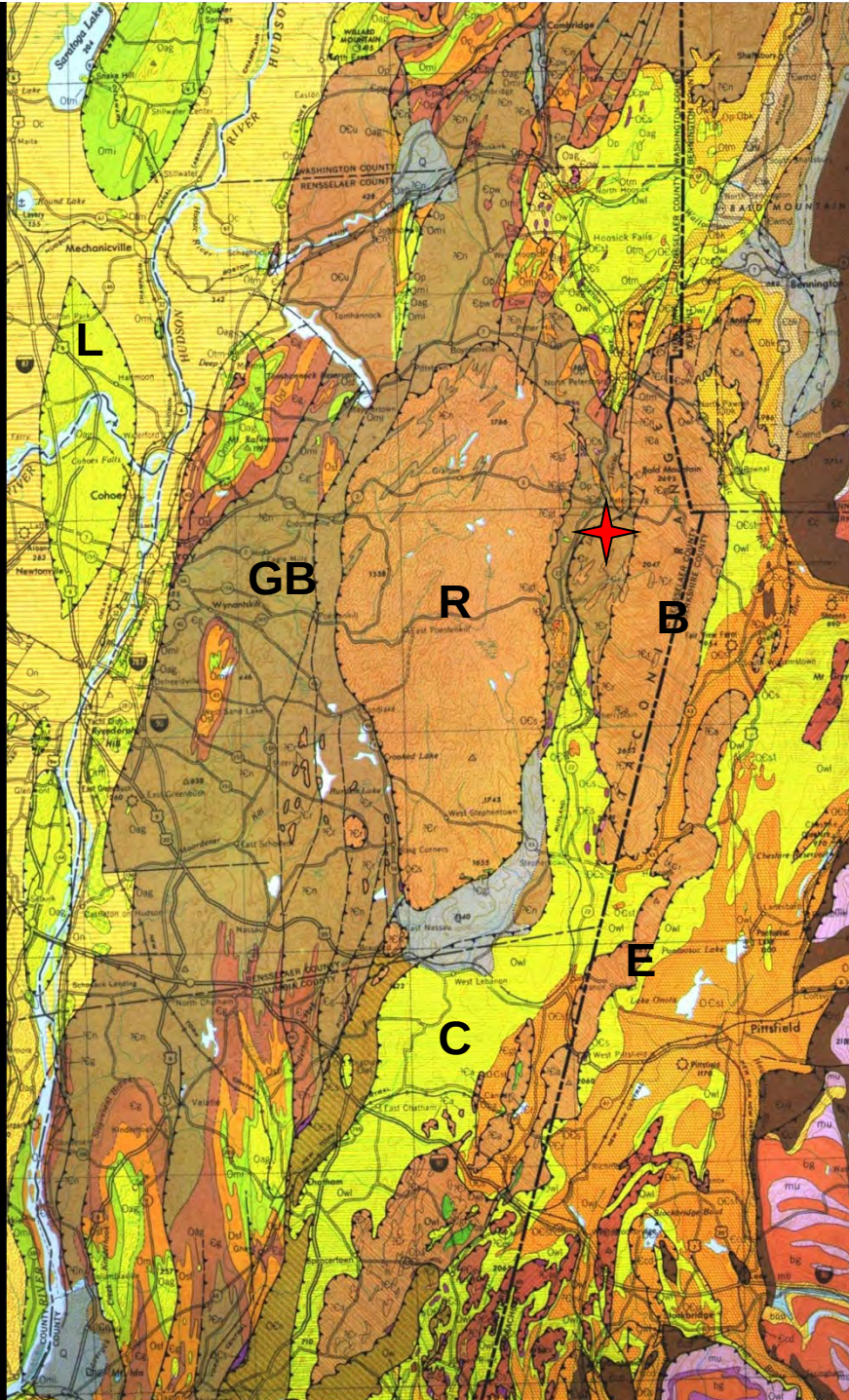
Geologic Map of the area
east of Albany



Sliver of carbonate rock (Stockbridge) in Nassau Fm



Geologic Map of the area
east of Albany



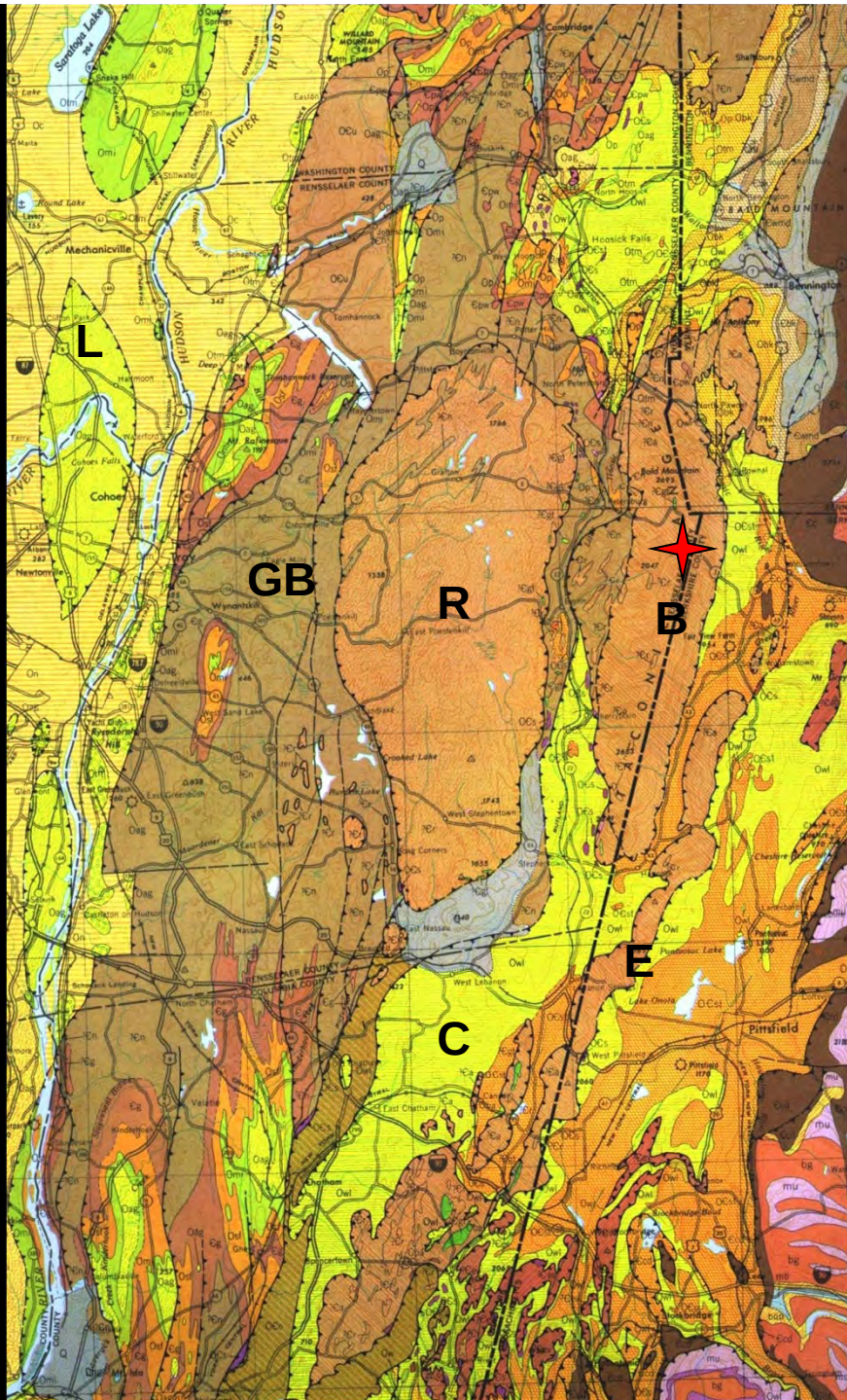
Nassau Fm – Giddings Brook slice



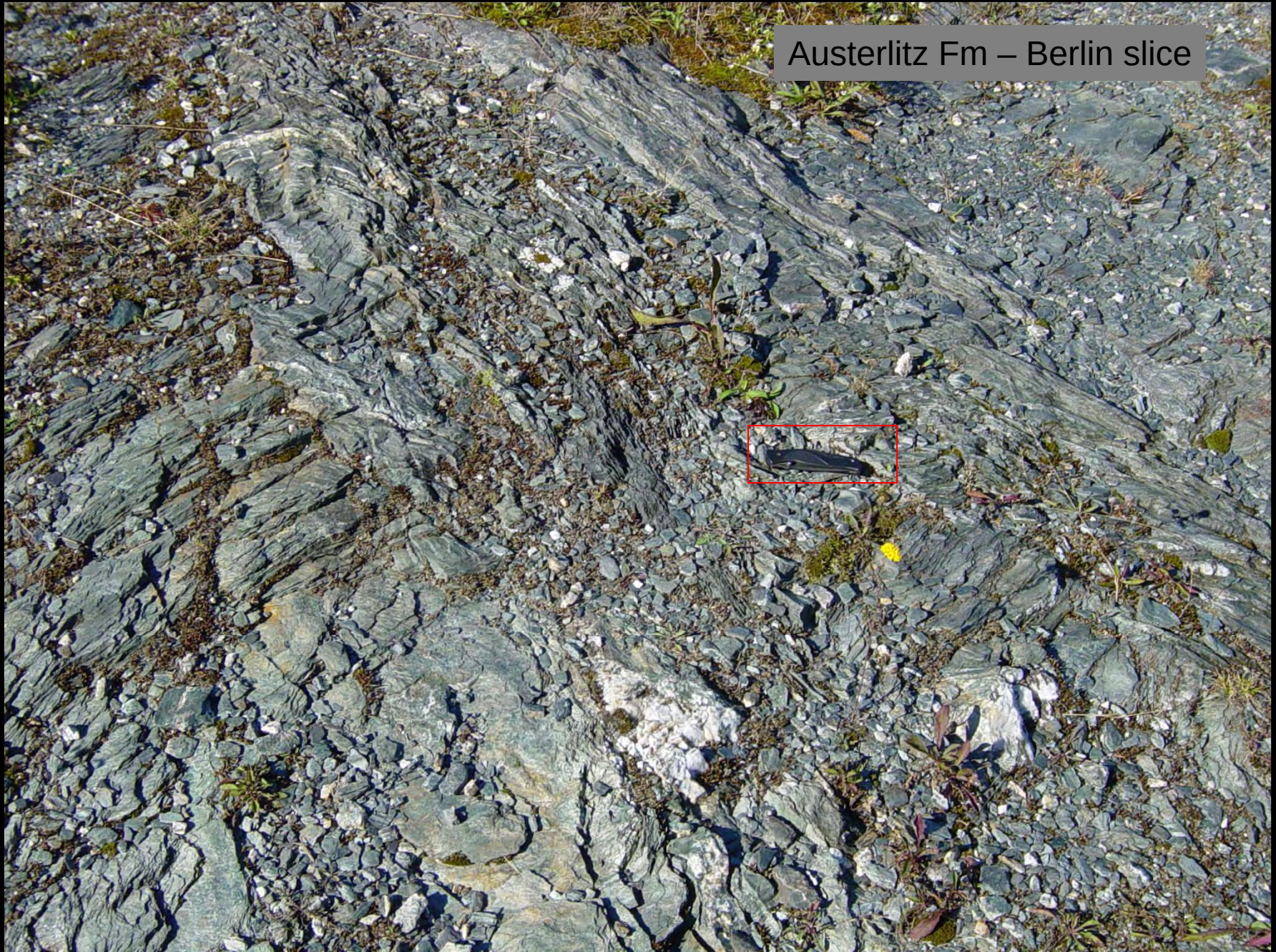
Nassau Fm



Geologic Map of the area
east of Albany



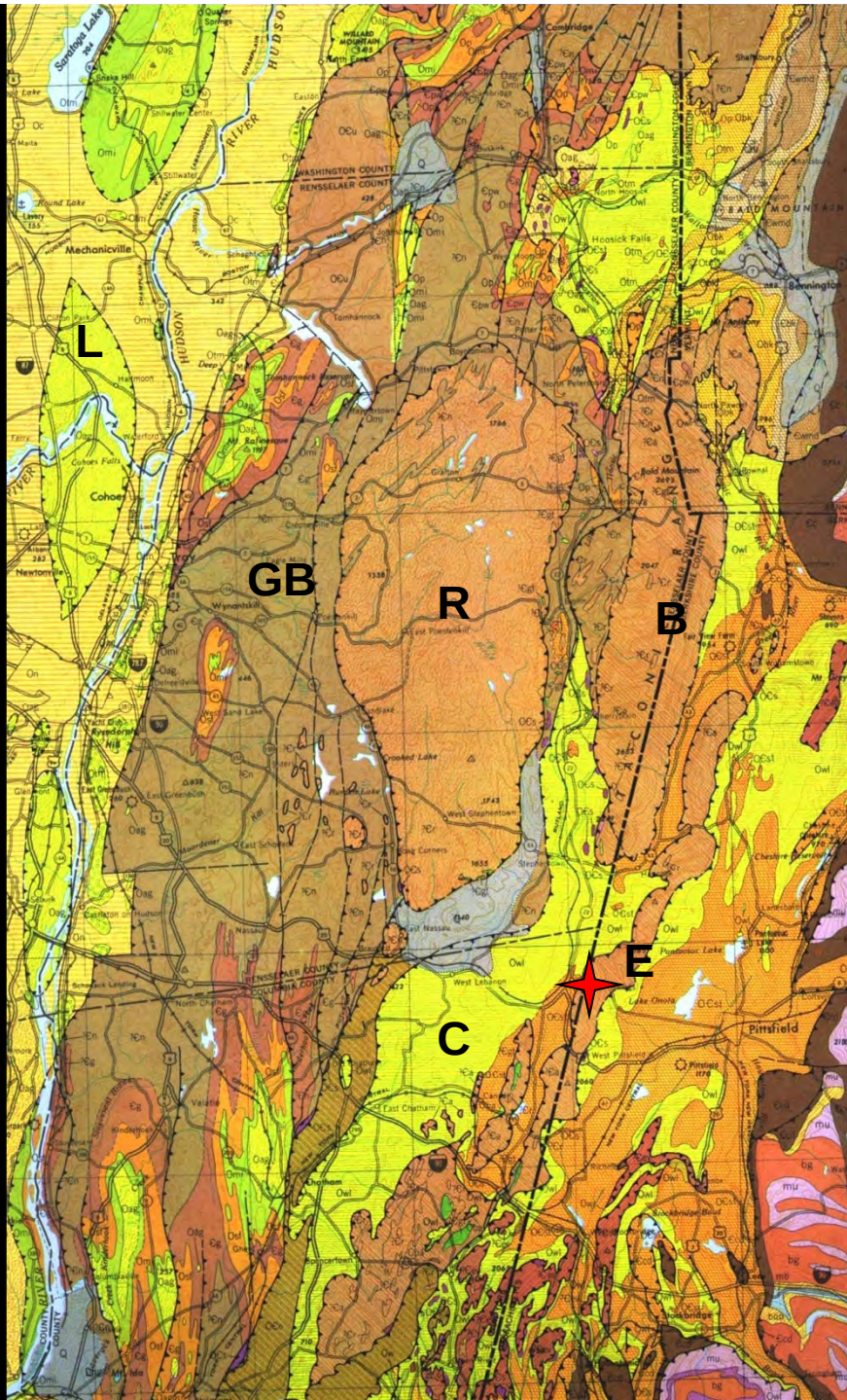
Austerlitz Fm – Berlin slice



Austerlitz phyllite



Geologic Map of the area
east of Albany



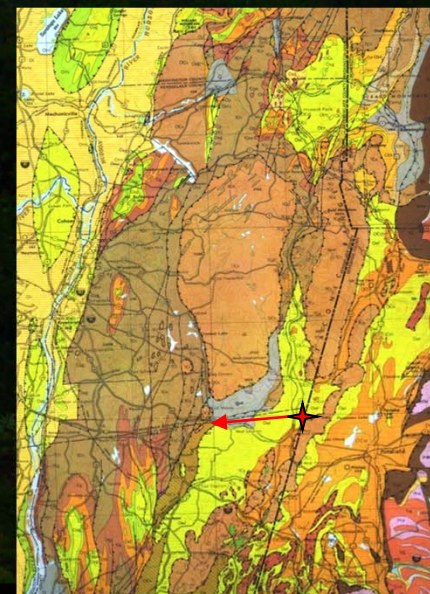
Austerlitz Fm – Everett slice



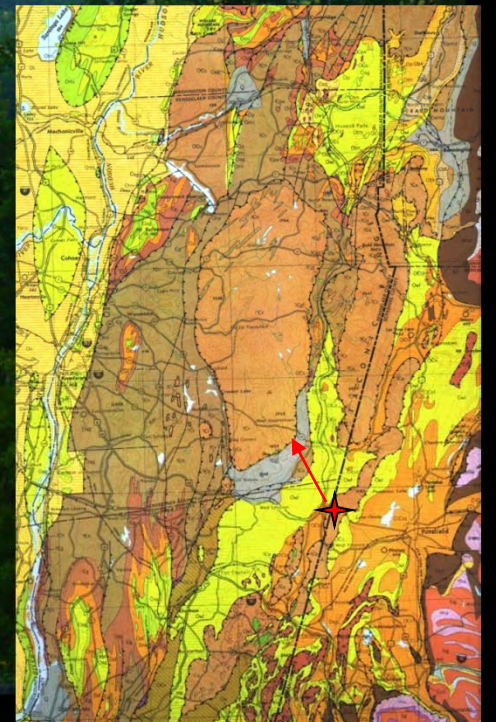
Austerlitz Fm – Everett slice



Chatham slice



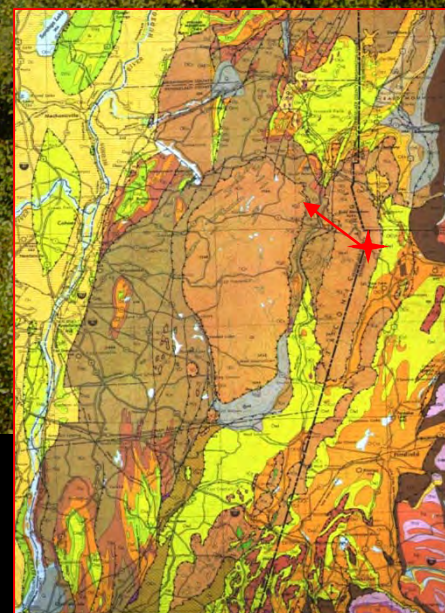
Rensselaer slice

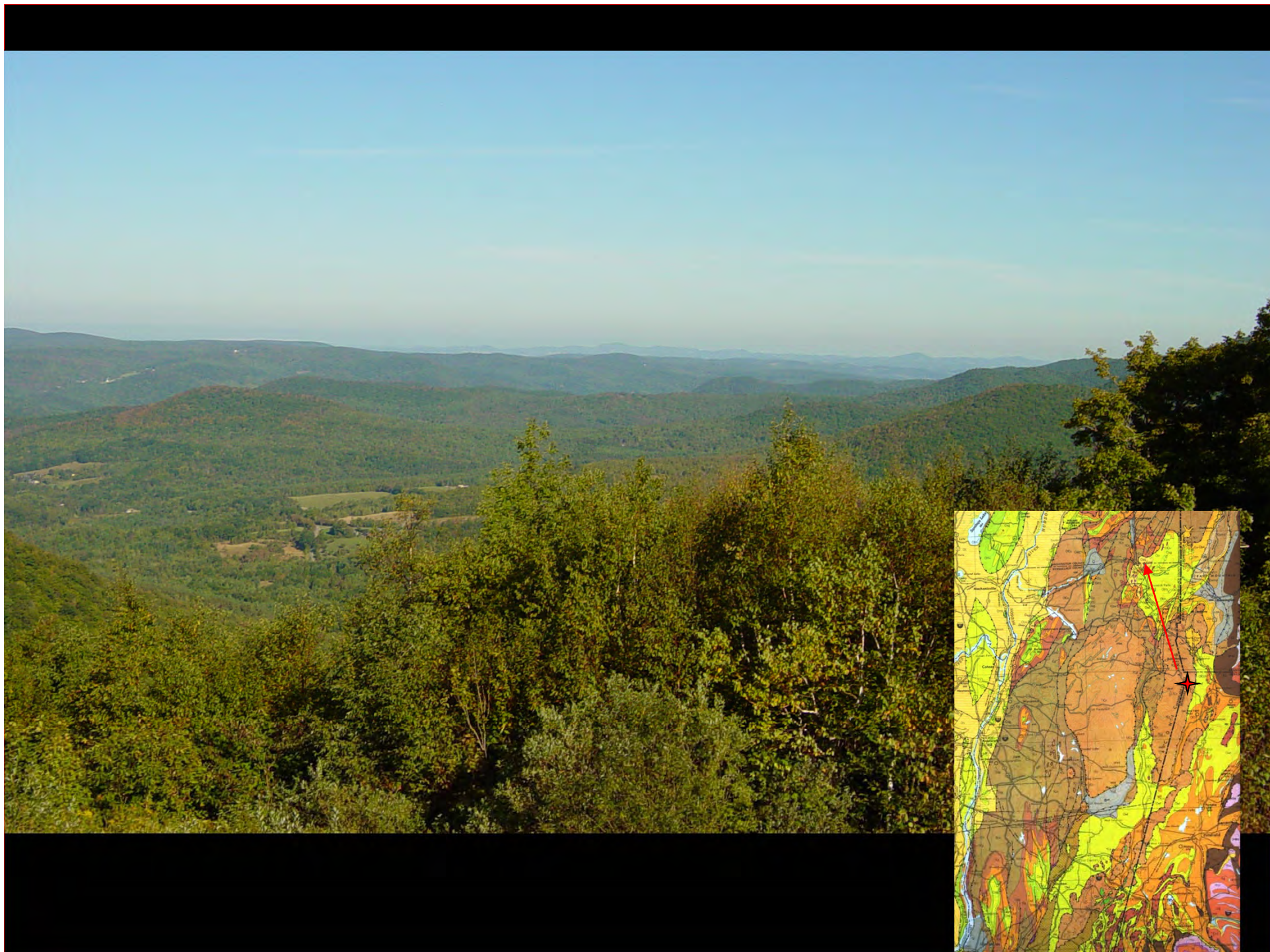


Rensselaer slice

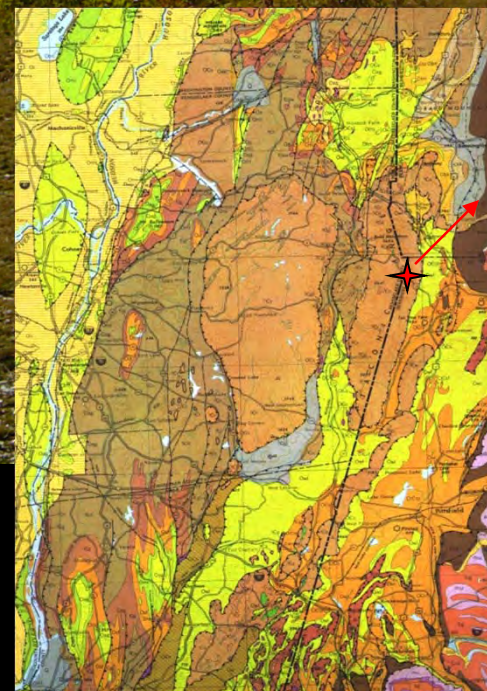
Giddings Brook slice

Rt 2





Berkshires





*Serving the people of New York
for 174 years*

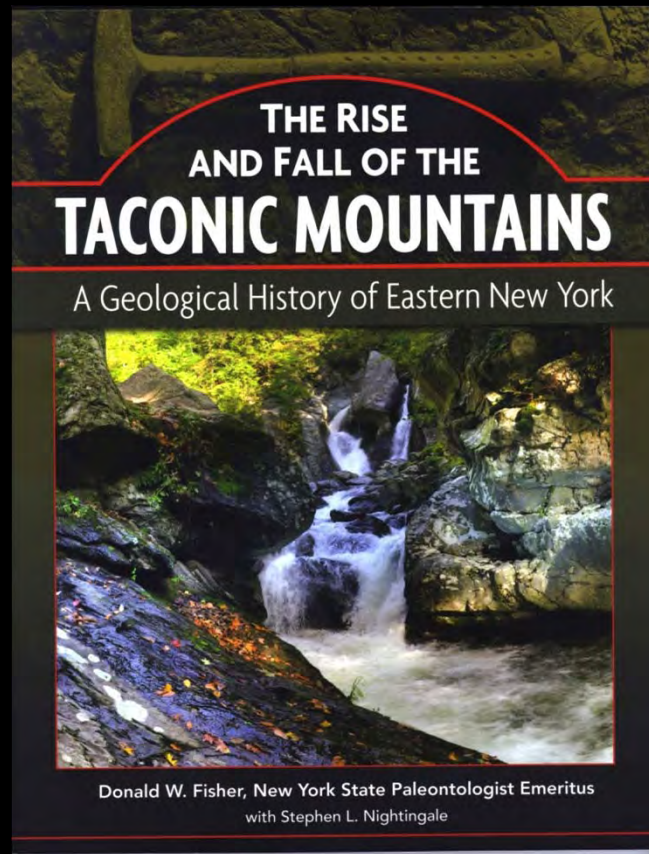
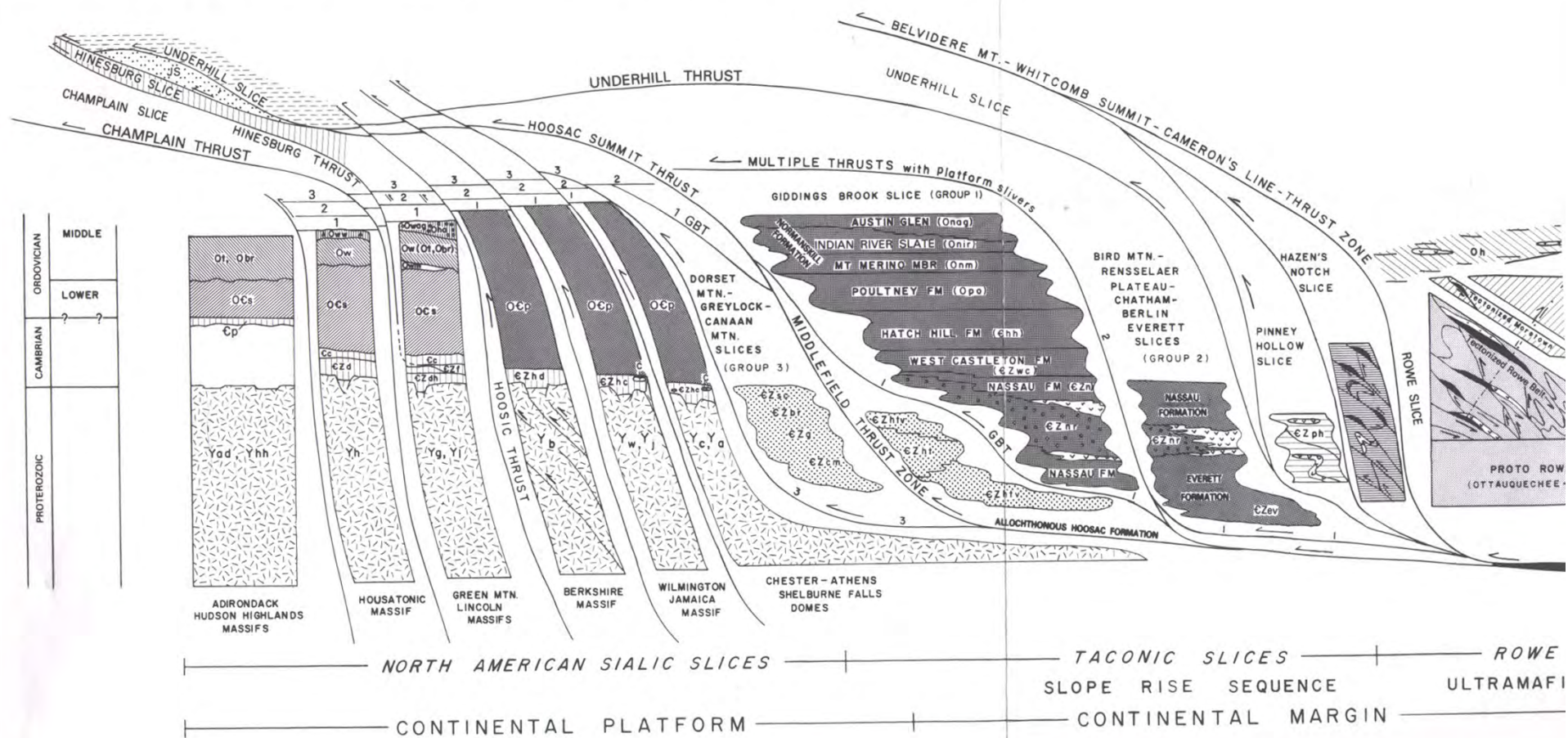
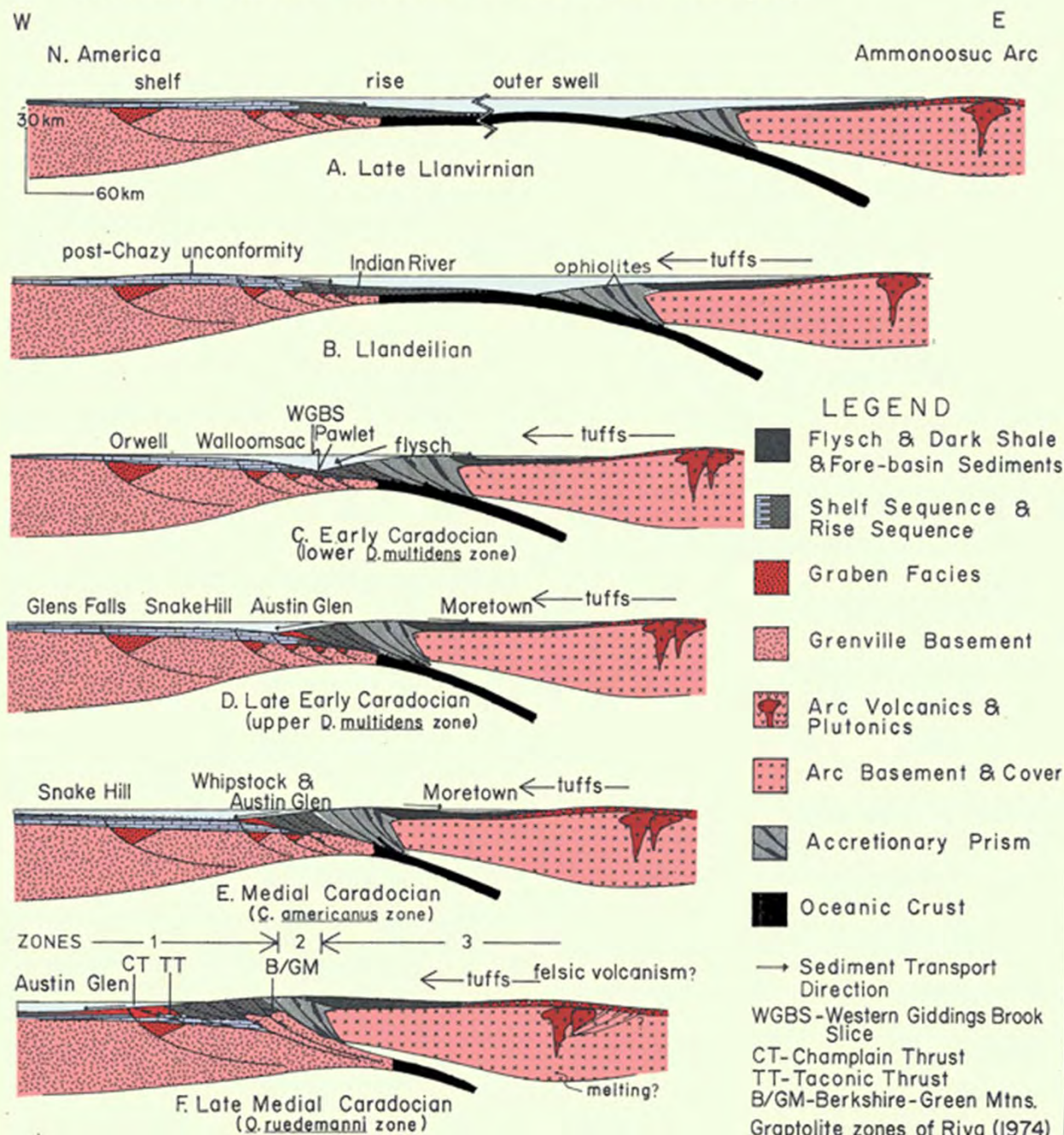
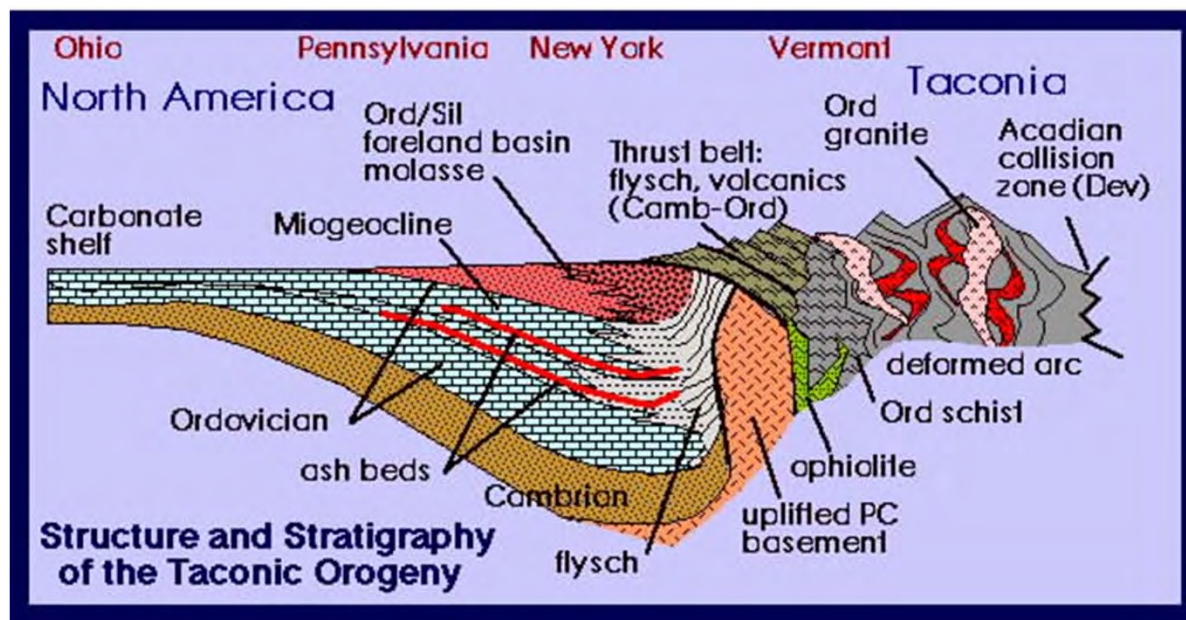


Figure 6— INTERPRETATIVE PALINSPASTIC DIAGRAM OF WESTERN NEW ENGLAND

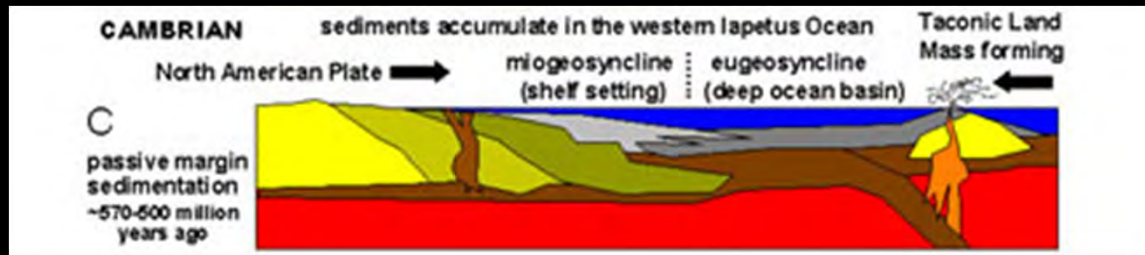


Schematic Tectonic Evolution of the Taconic Orogeny





Taconic Orogeny



Crustal shortening
= 600 km at least



