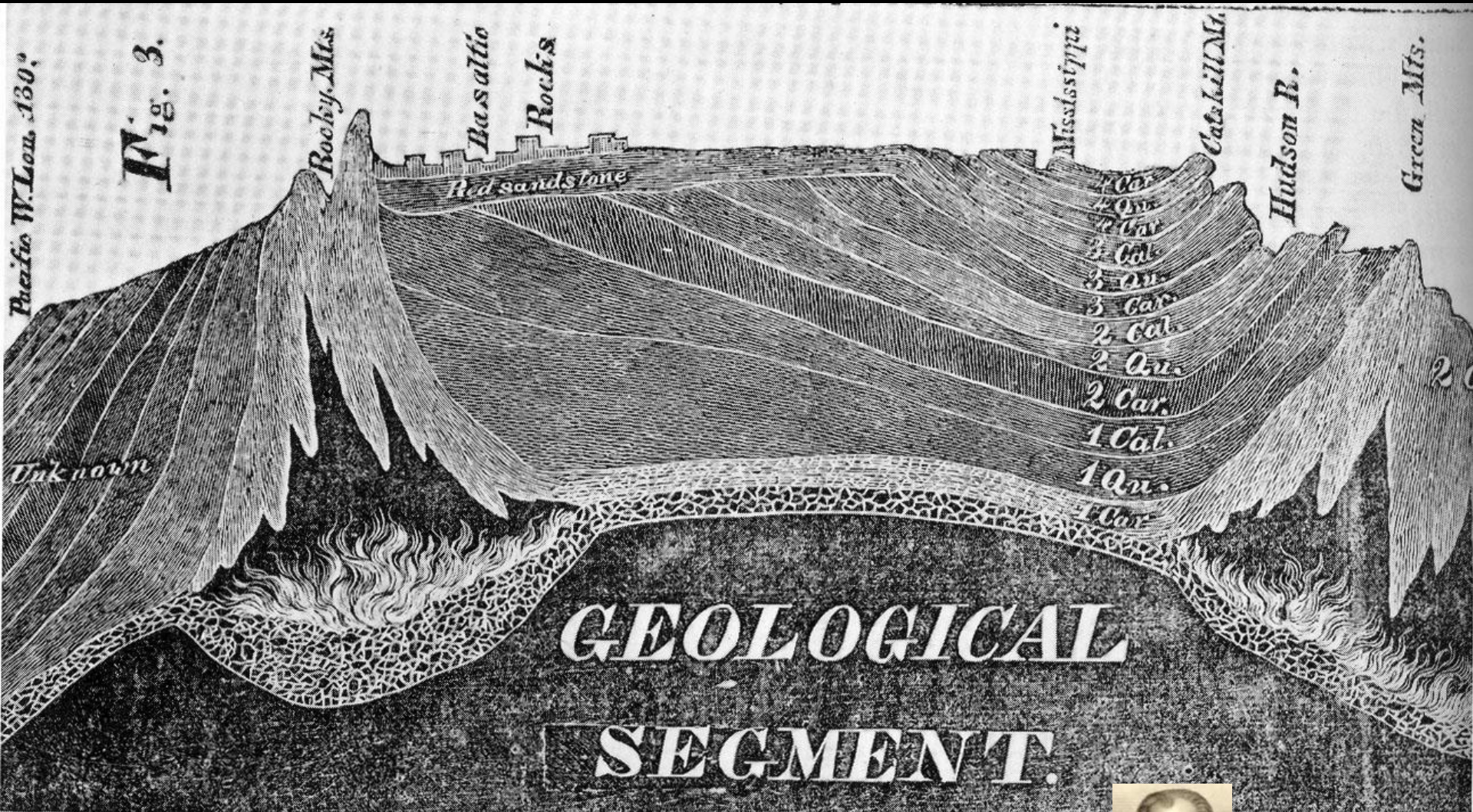


Tectonostratigraphy of NYC Schistose Rocks

Charles and J. Mickey Merguerian

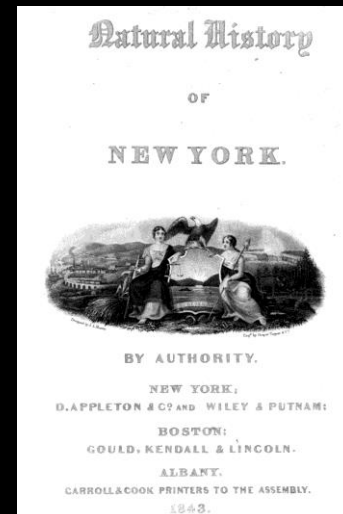
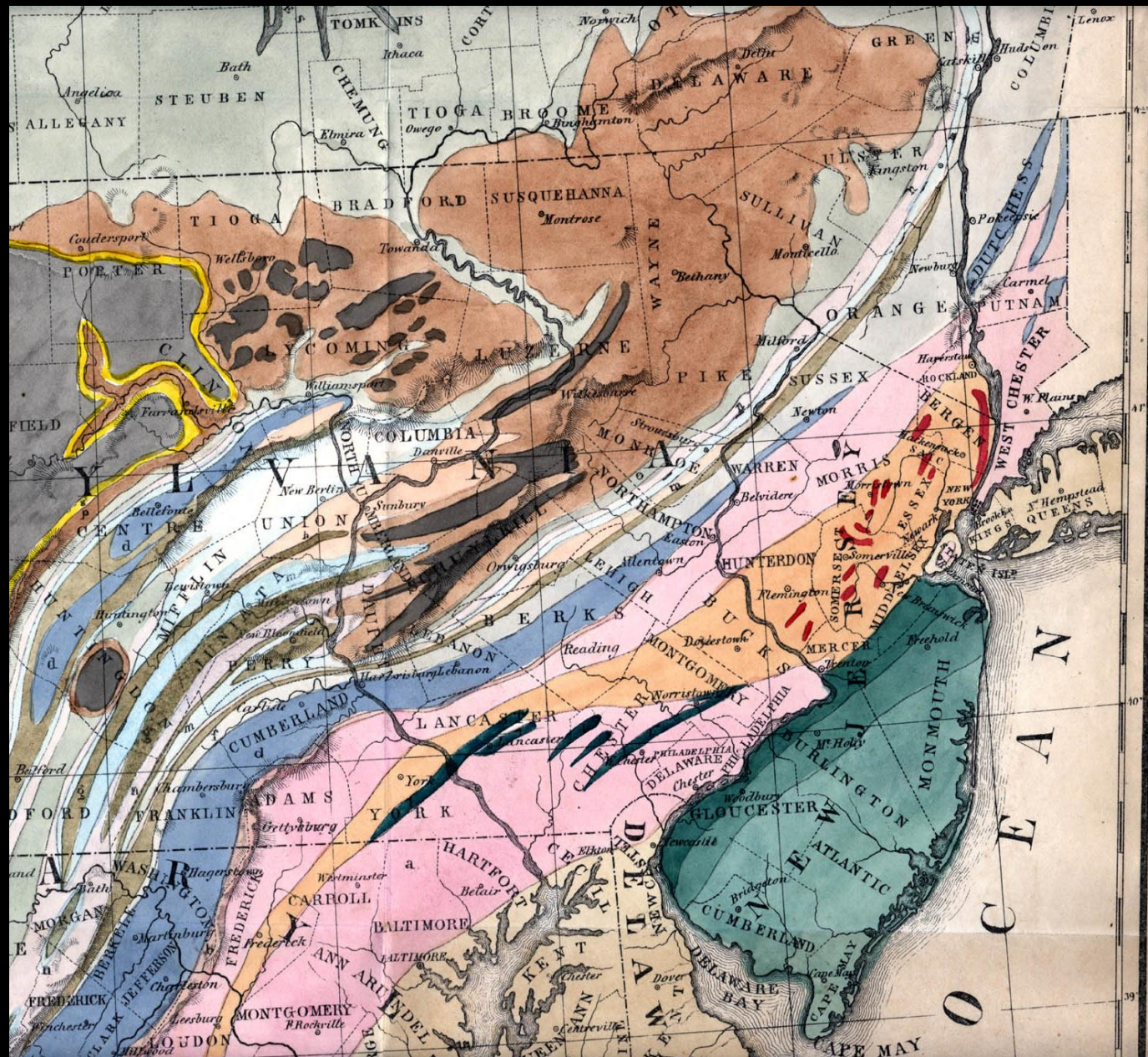
DUKE



Eaton 1820

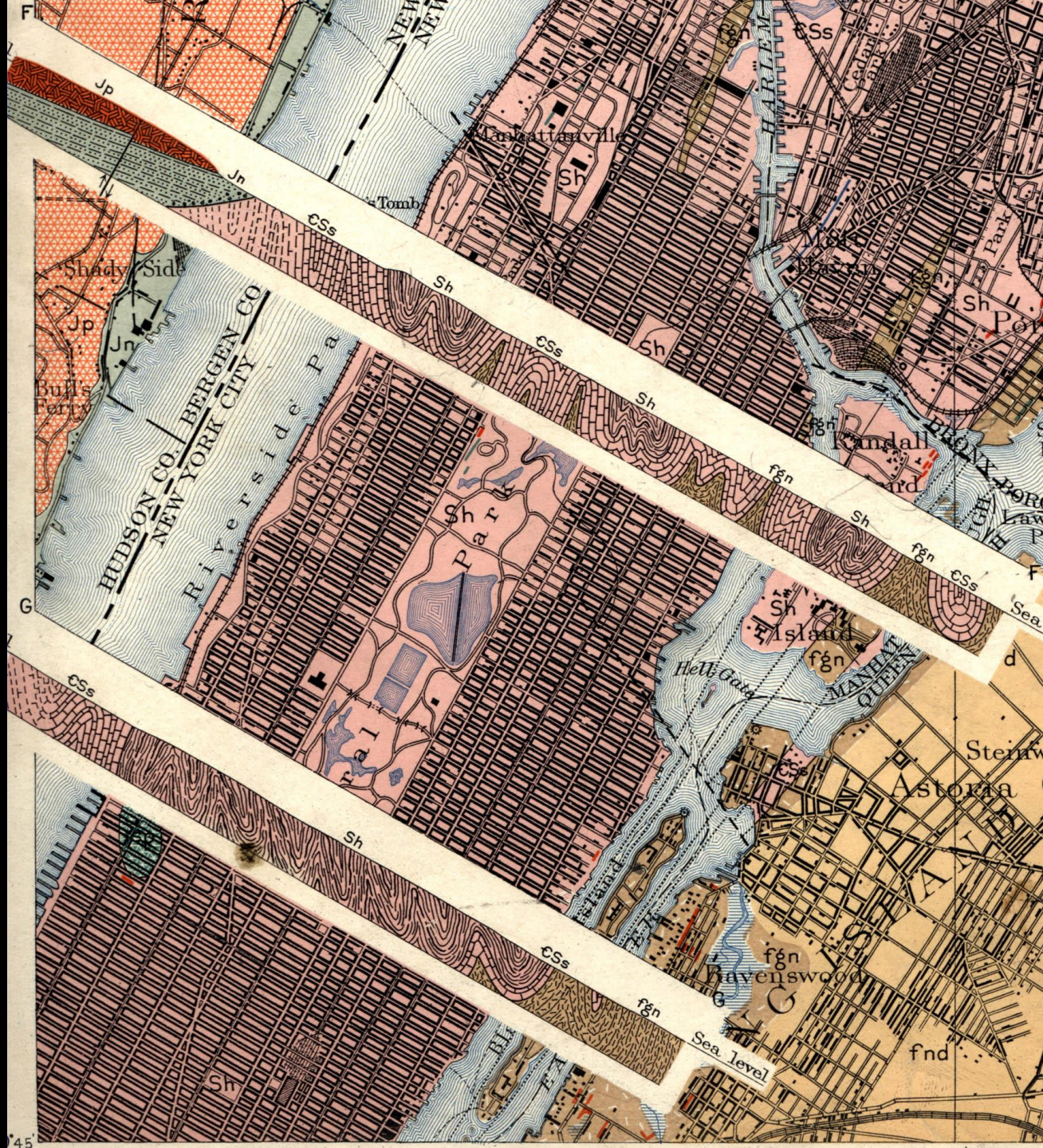
Stonybrook Metro NY Conference (06 April 2025)

Natural History of New York 1843



Hall
Mather
Emmons
Beck
Vanuxem

USGS Folio 83

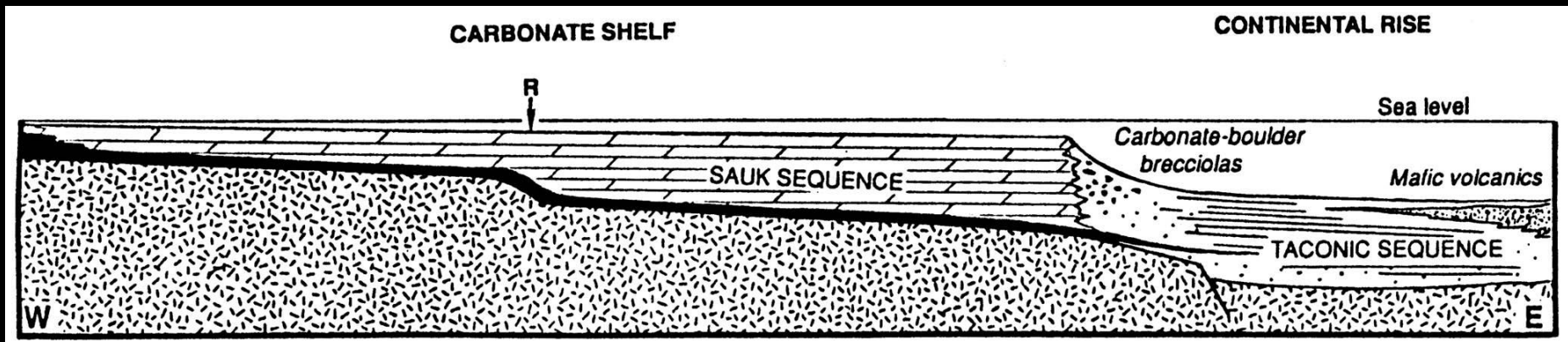


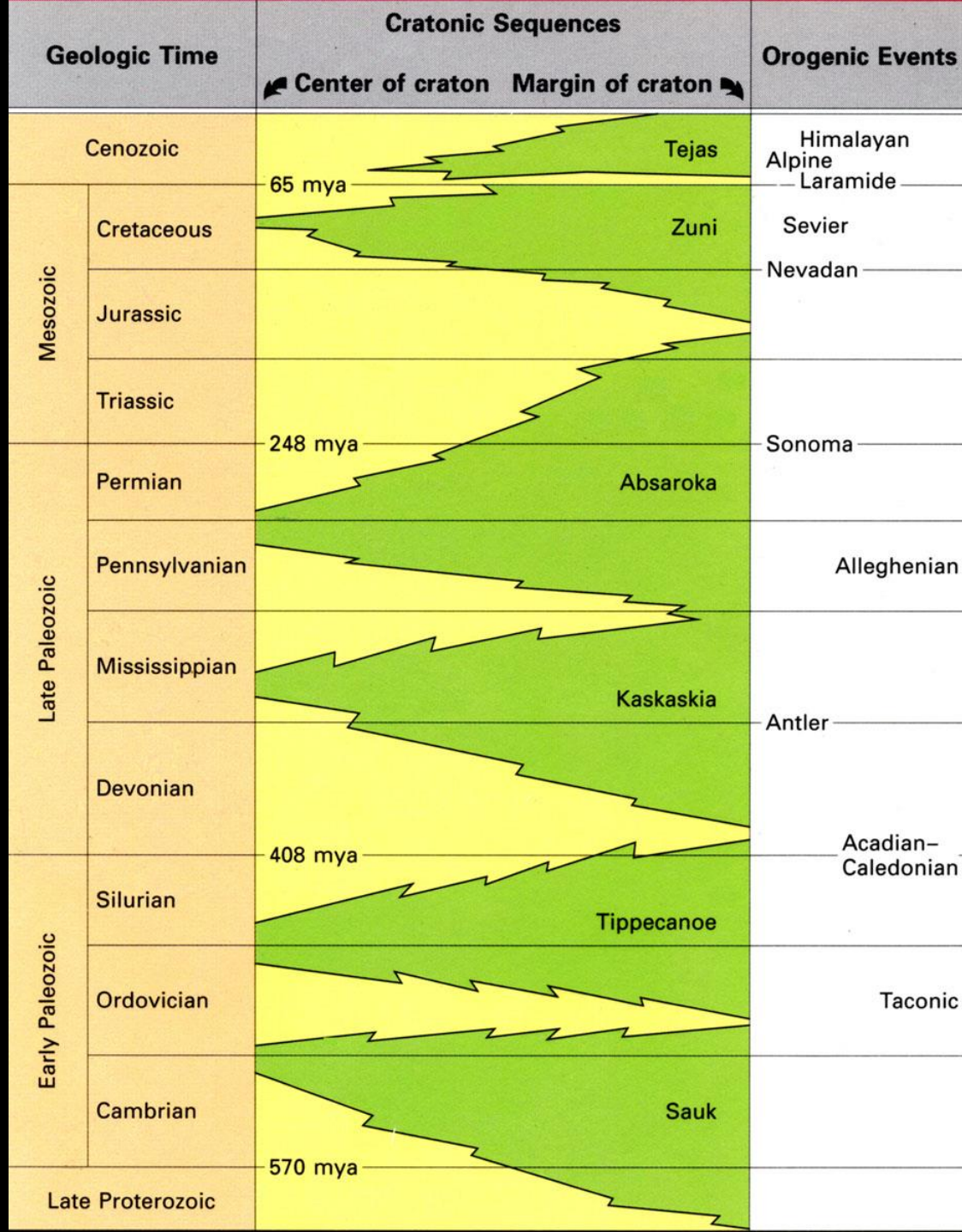
Merrill et al, 1902

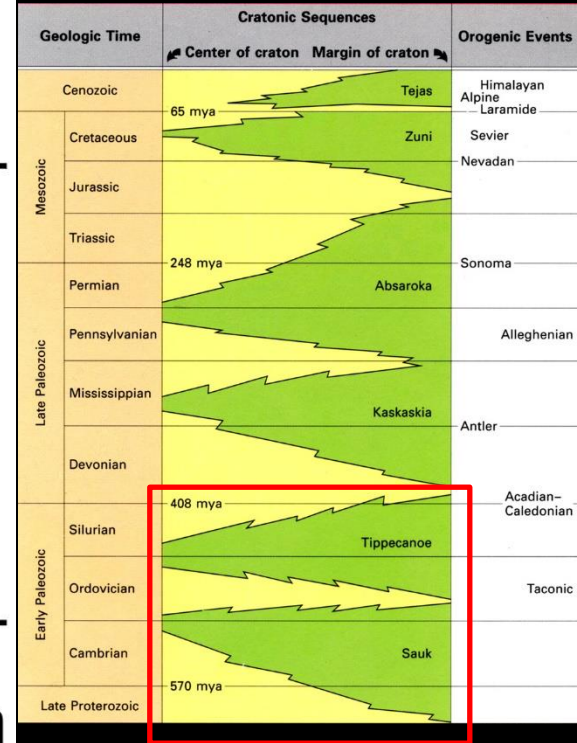
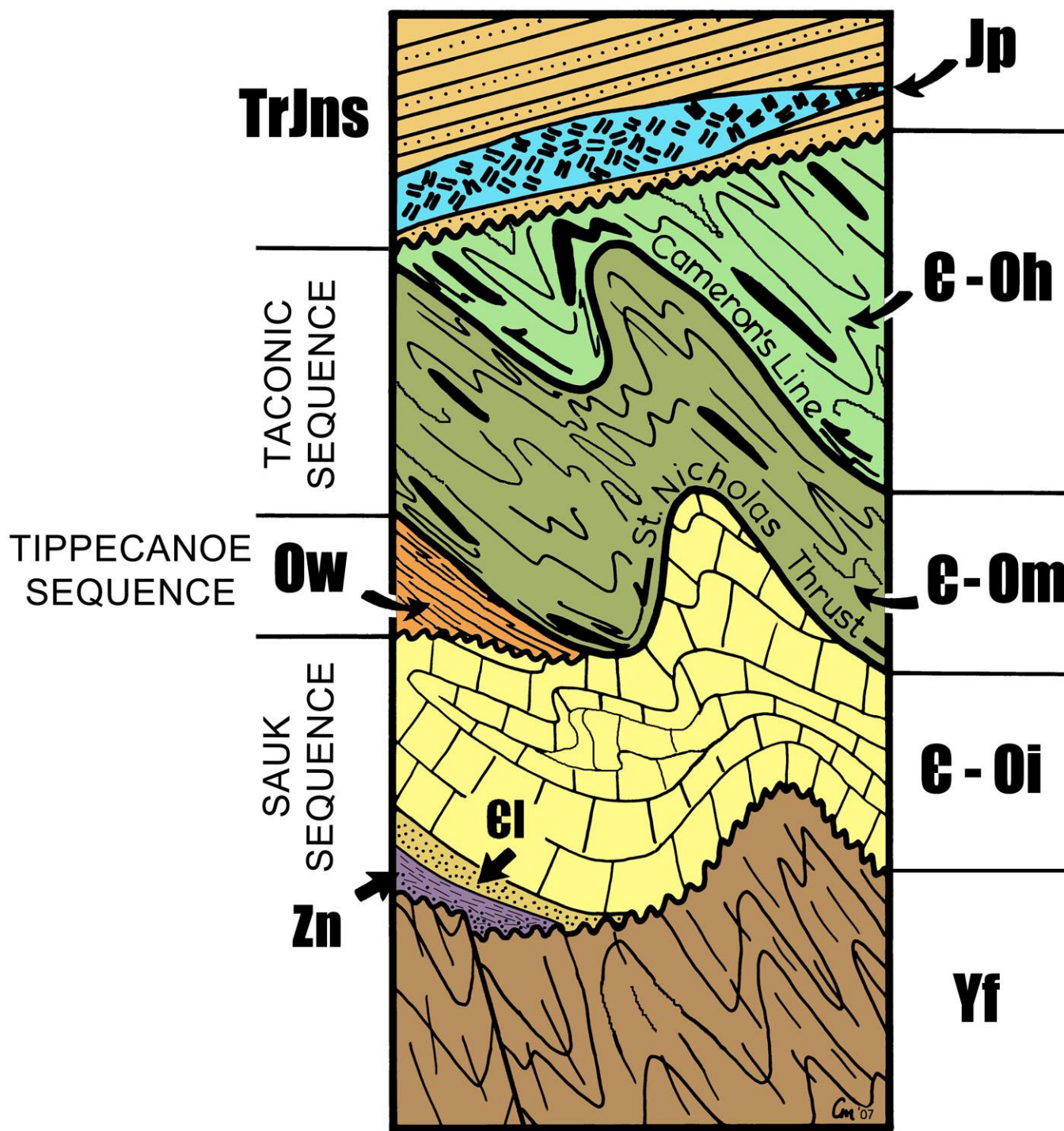
Tippecanoe

Sauk

Taconic







Taconic
Tippecanoe
Sauk

EARLY MEDIAL ORDOVICIAN

(Early Chazyan)

PALEOGEOGRAPHY

by Marshall Kay

Drawn by Erwin Raisz

Palinspastic base - Sinusoidal projection



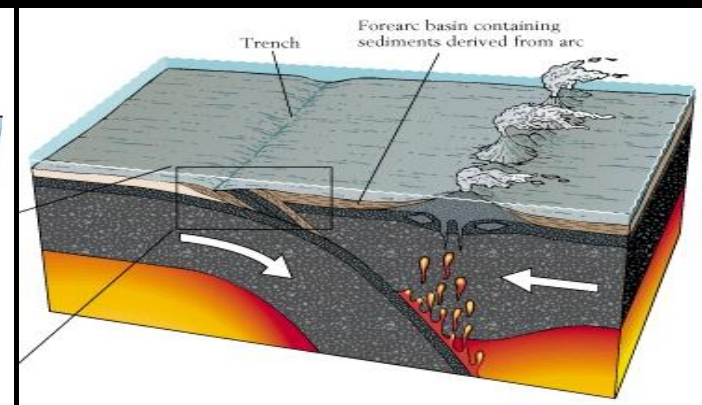
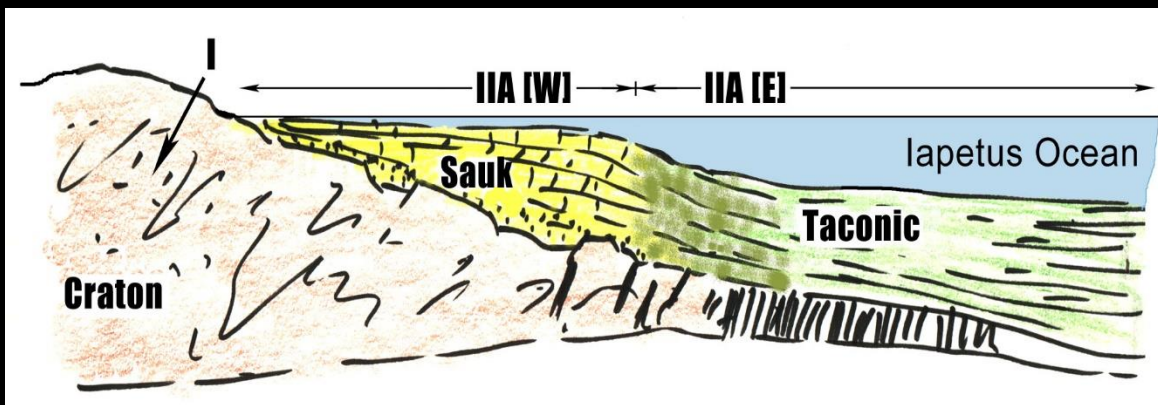
Paleo-shoreline

Seas with limy and sandy bottoms on miogeosynclines

Seas with bottoms of argillaceous muds and volcanic rocks on eugeosynclines

after Kay, 1951

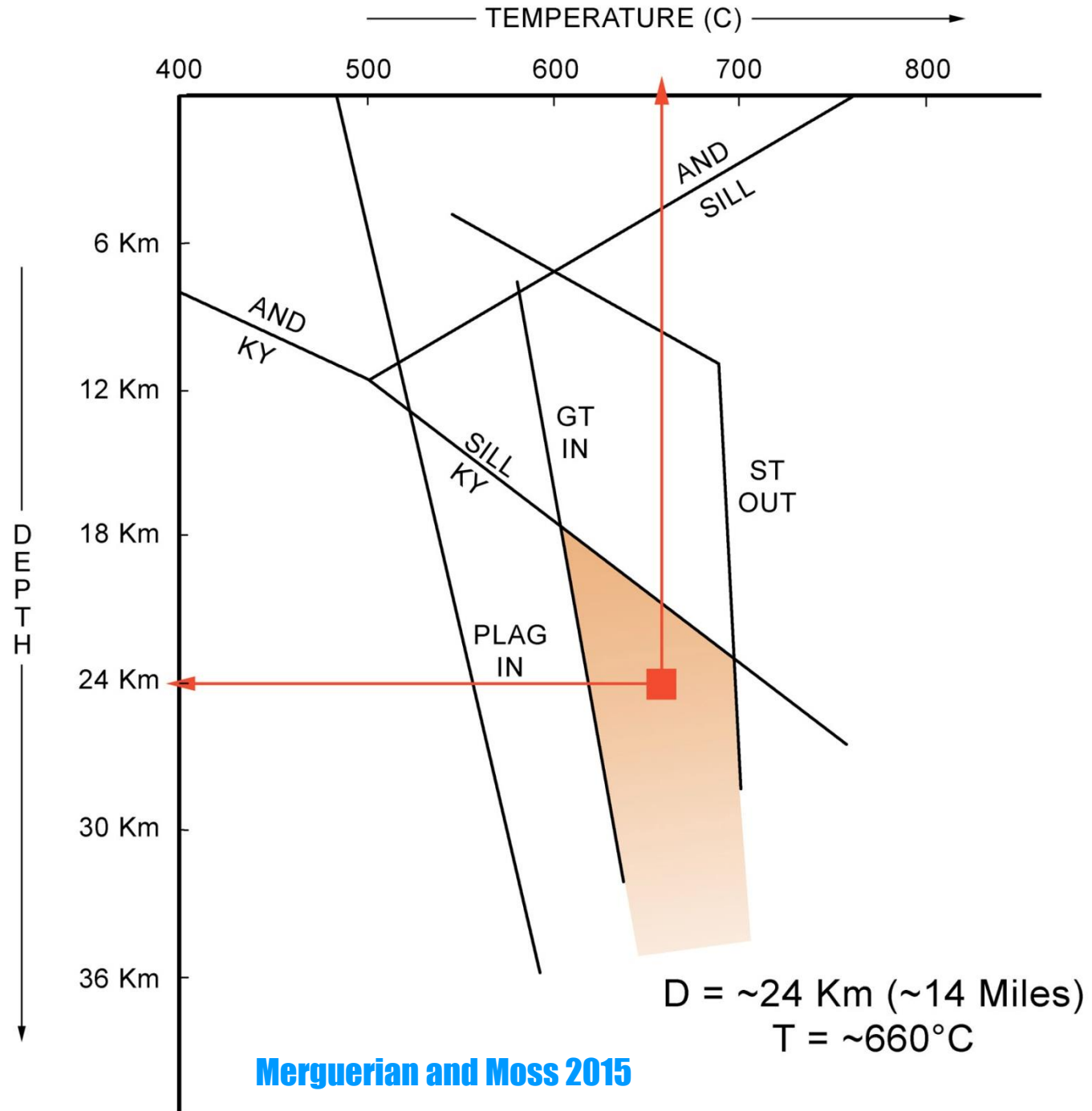
~ 450 Ma Taconian Arc – Passive Margin Collision



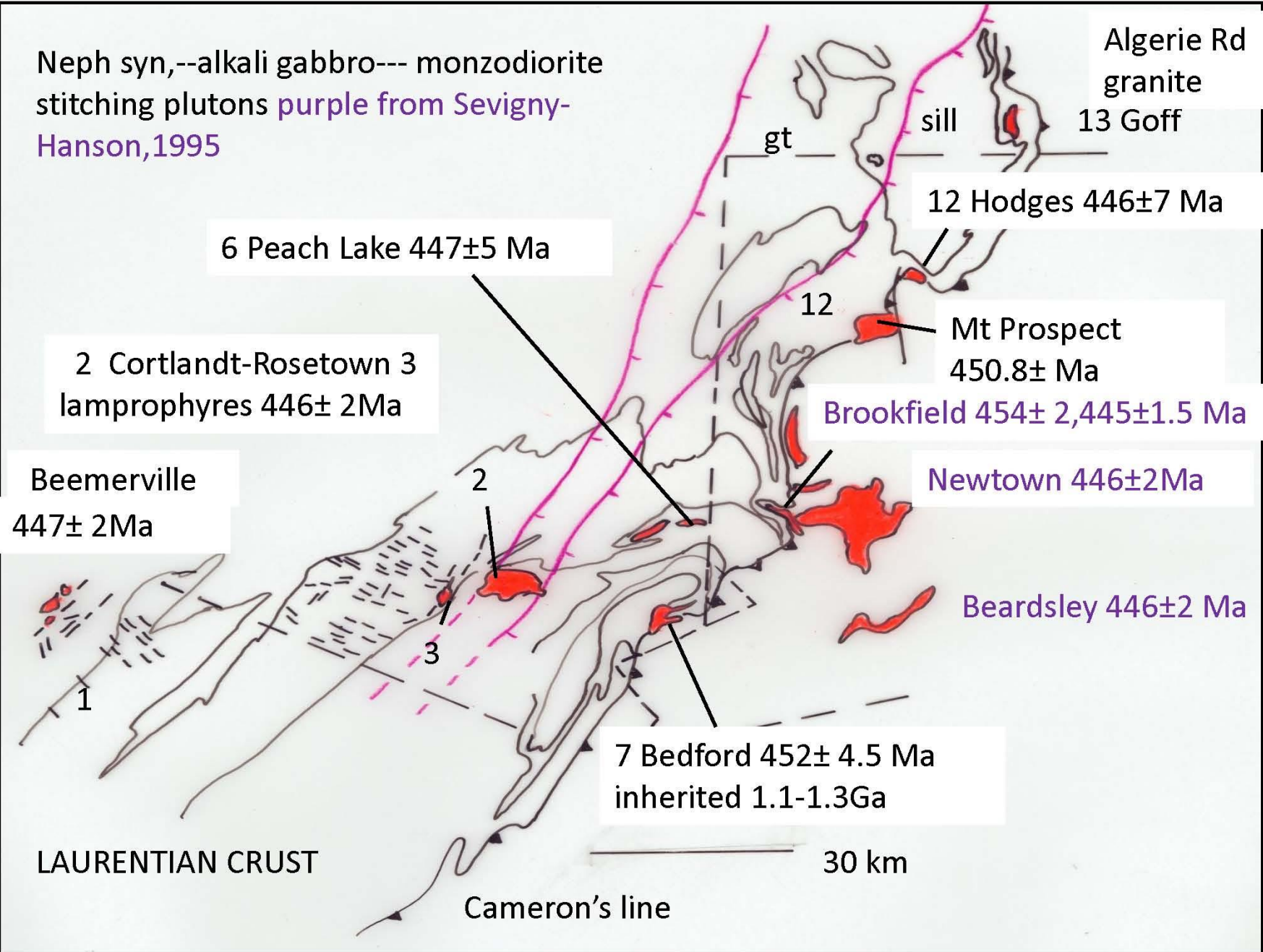
**Minerals Are
Your Pals!**

WTC Minerals

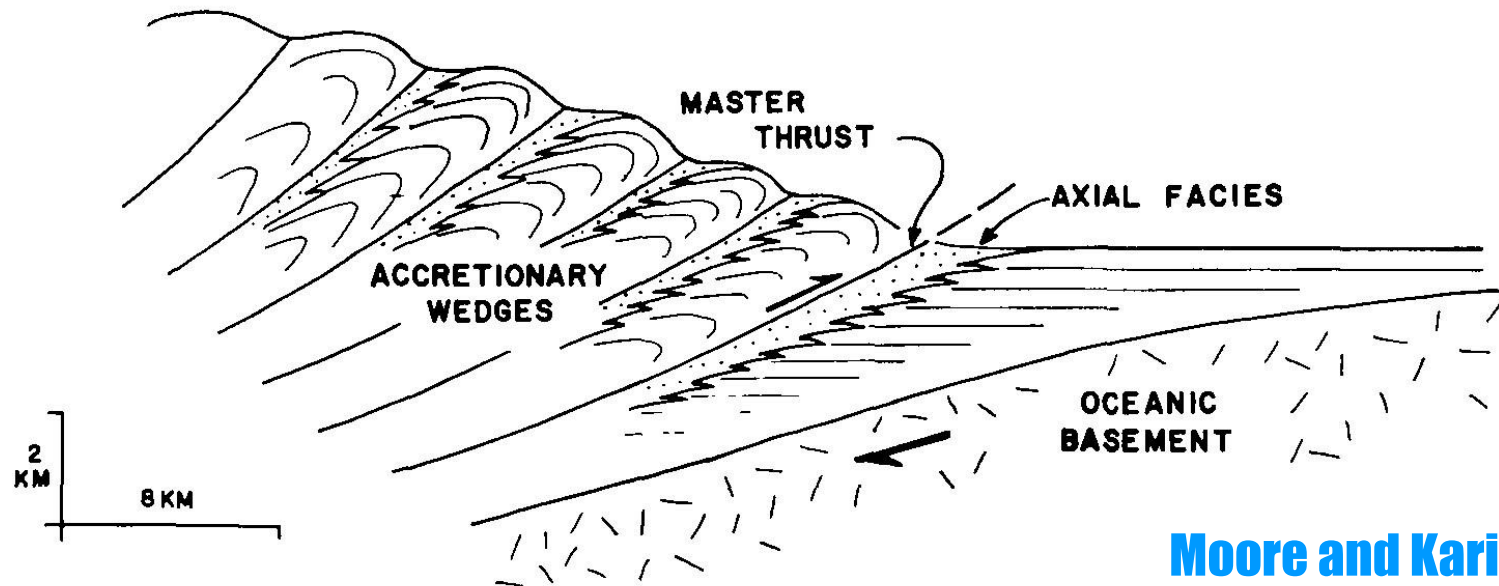
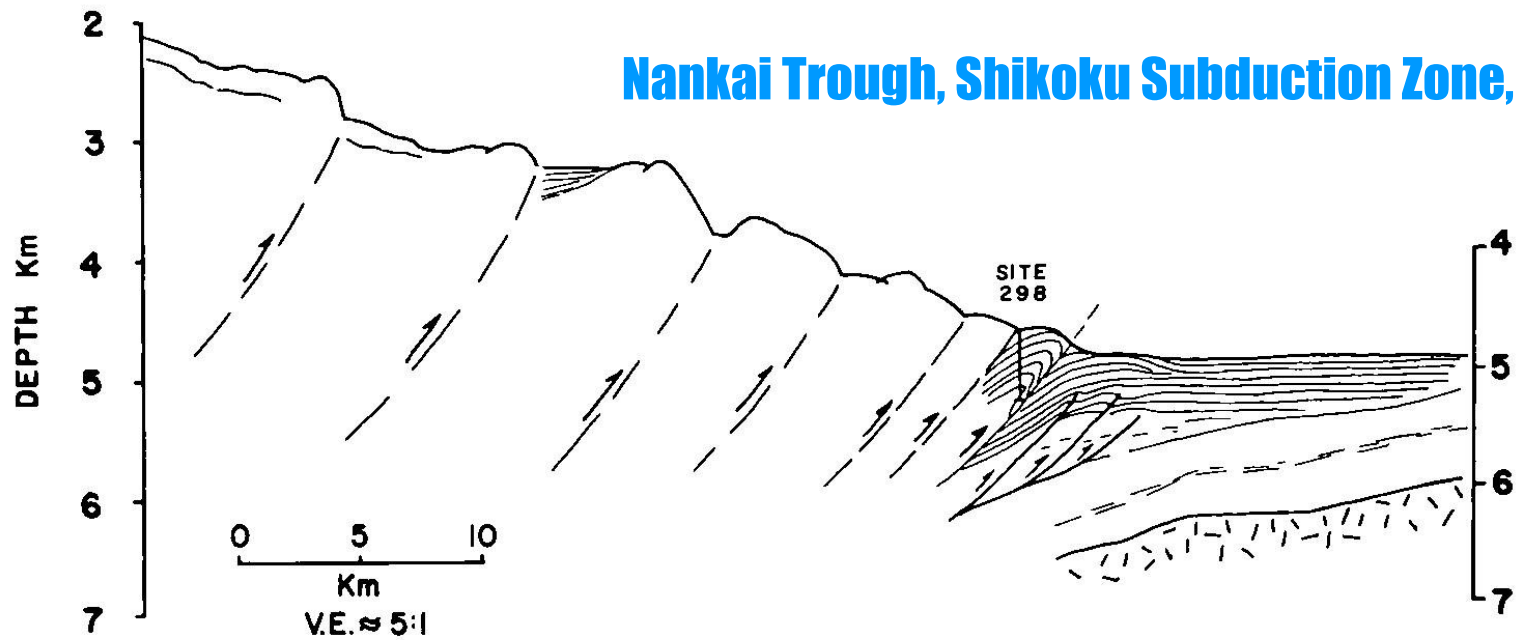
**Plagioclase
Garnet
Staurolite
Kyanite**



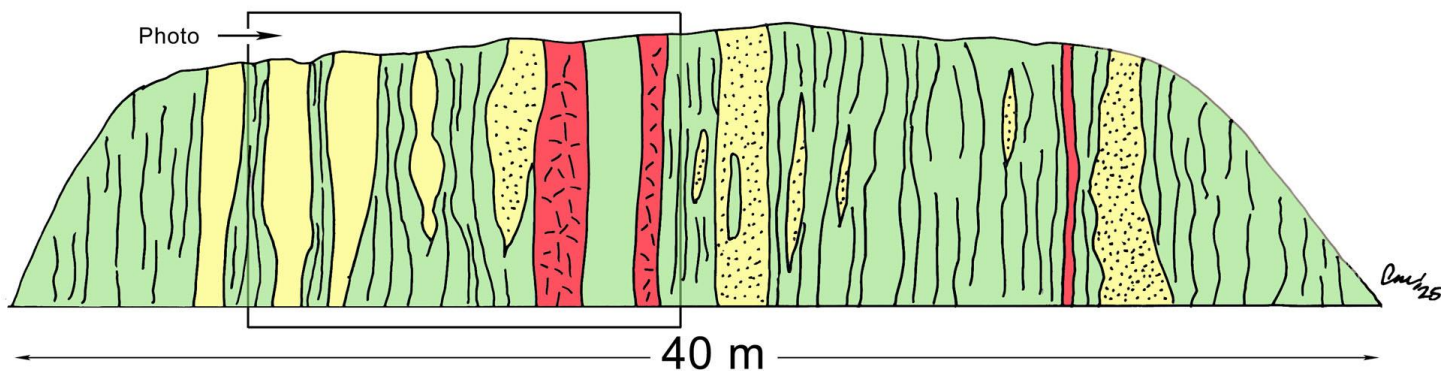
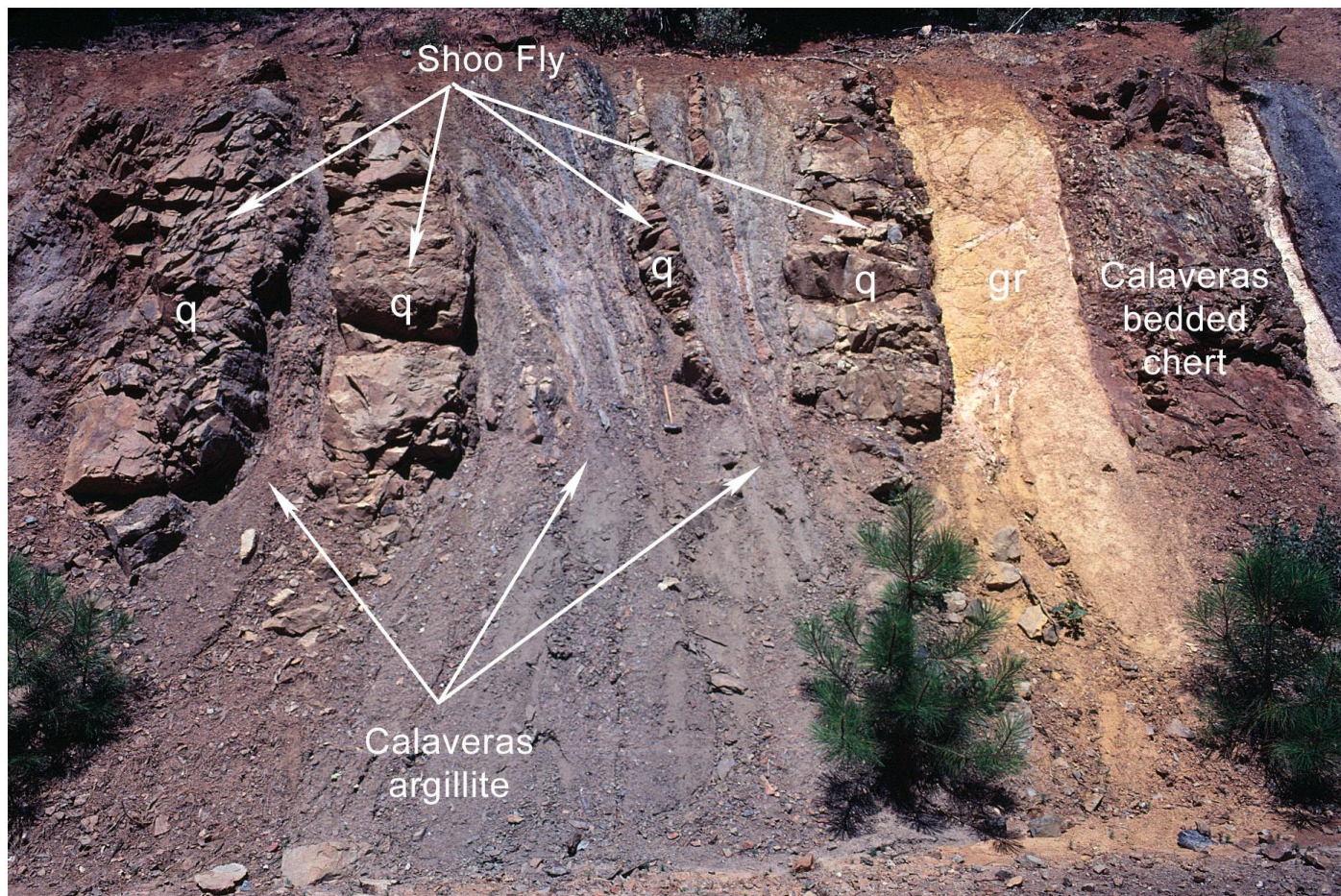
Neph syn,--alkali gabbro--- monzodiorite
stitching plutons **purple from Sevigny-
Hanson,1995**



Nankai Trough, Shikoku Subduction Zone, Japan

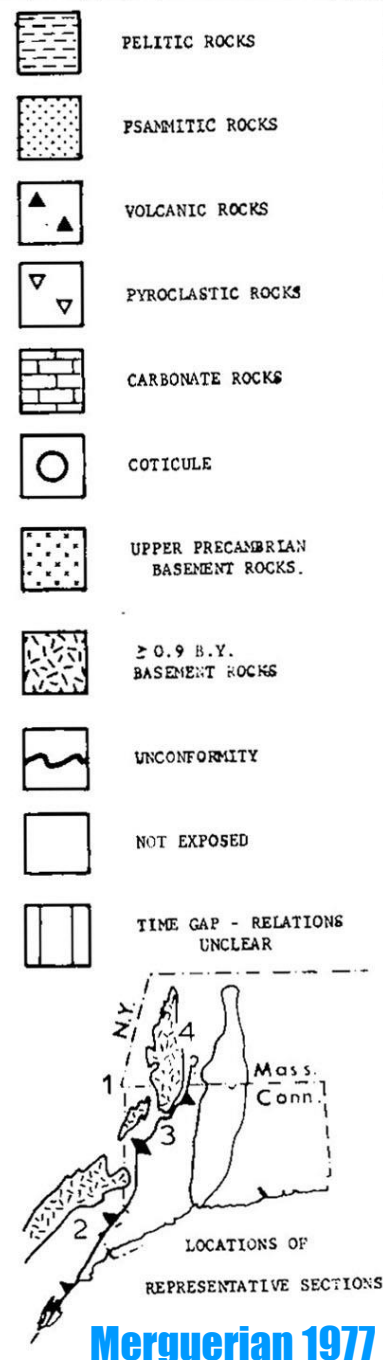
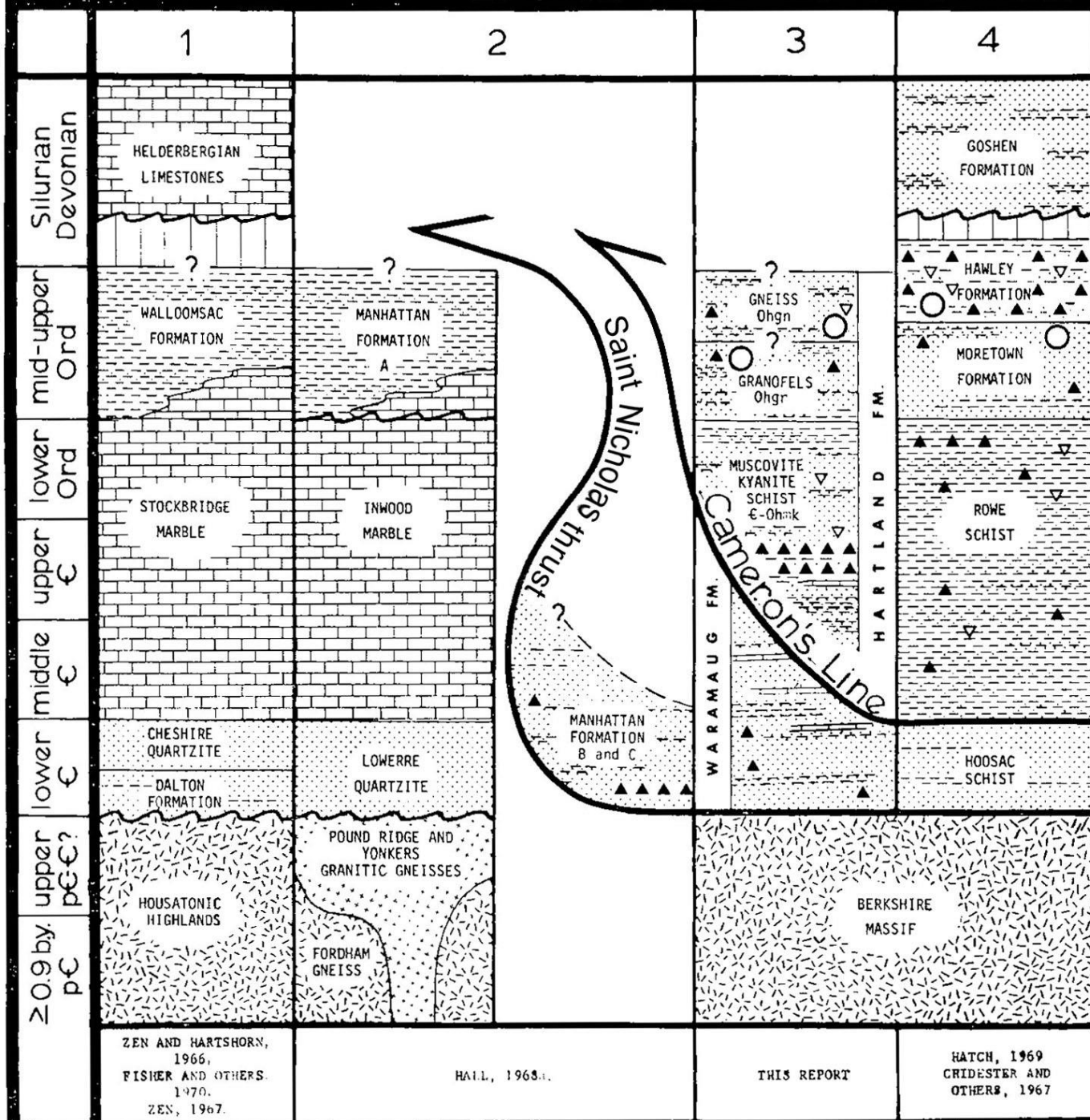


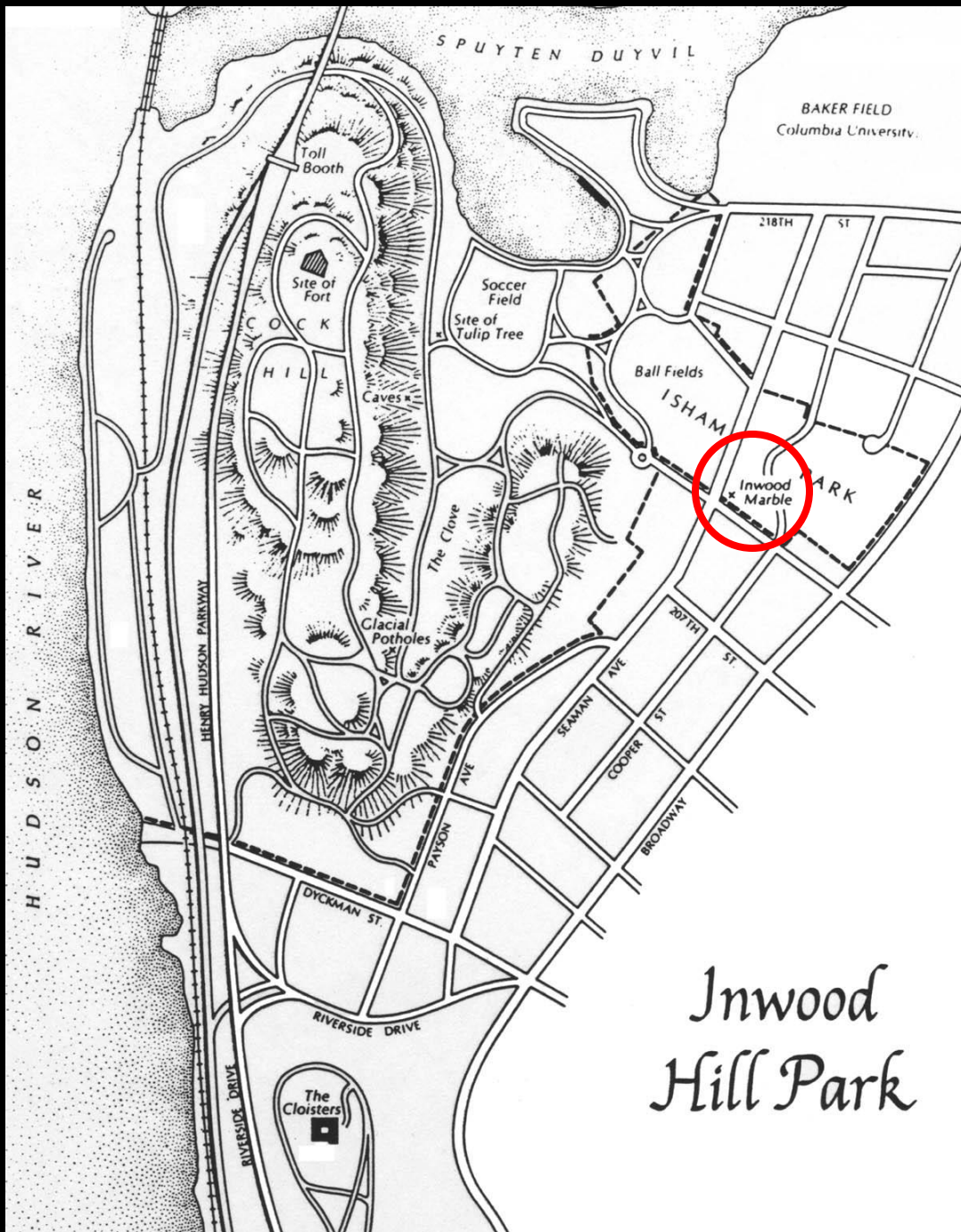
Moore and Karig 1976



Calaveras-Shoo Fly thrust, Sierra Nevada western foothills metamorphic belt

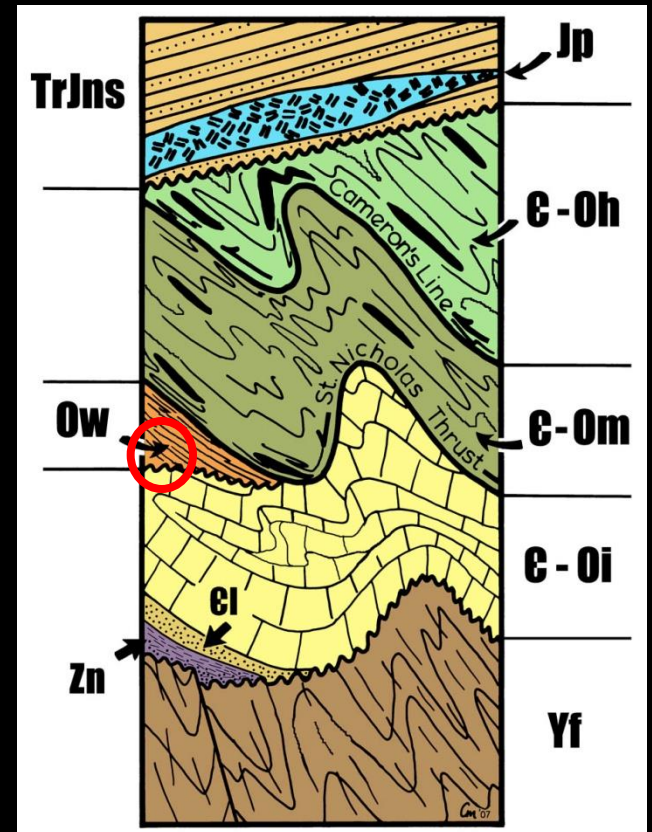
Merguerian 1985a





Interlayered with Walloomsac
at N Tip of Manhattan; I-95
Bronx, Mt. Morris Park,
Con Ed Cable Tunnel **Sauk**

Tippecanoe

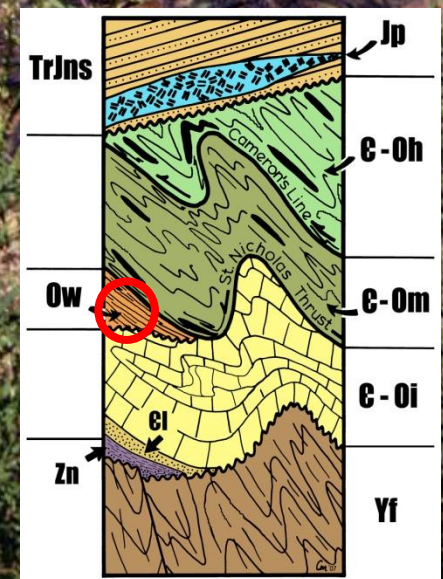


Balmville, FDR VA,
Verplanck, Stony Point +

I-95 - Walloomsac "Balmville" Contact, Grand Concourse, Bronx, NY

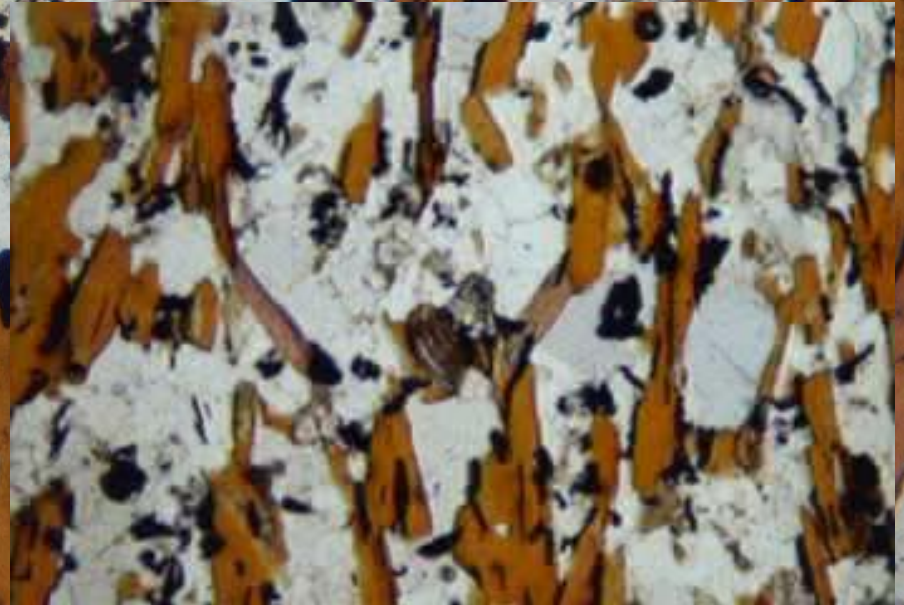
Tippecanoe

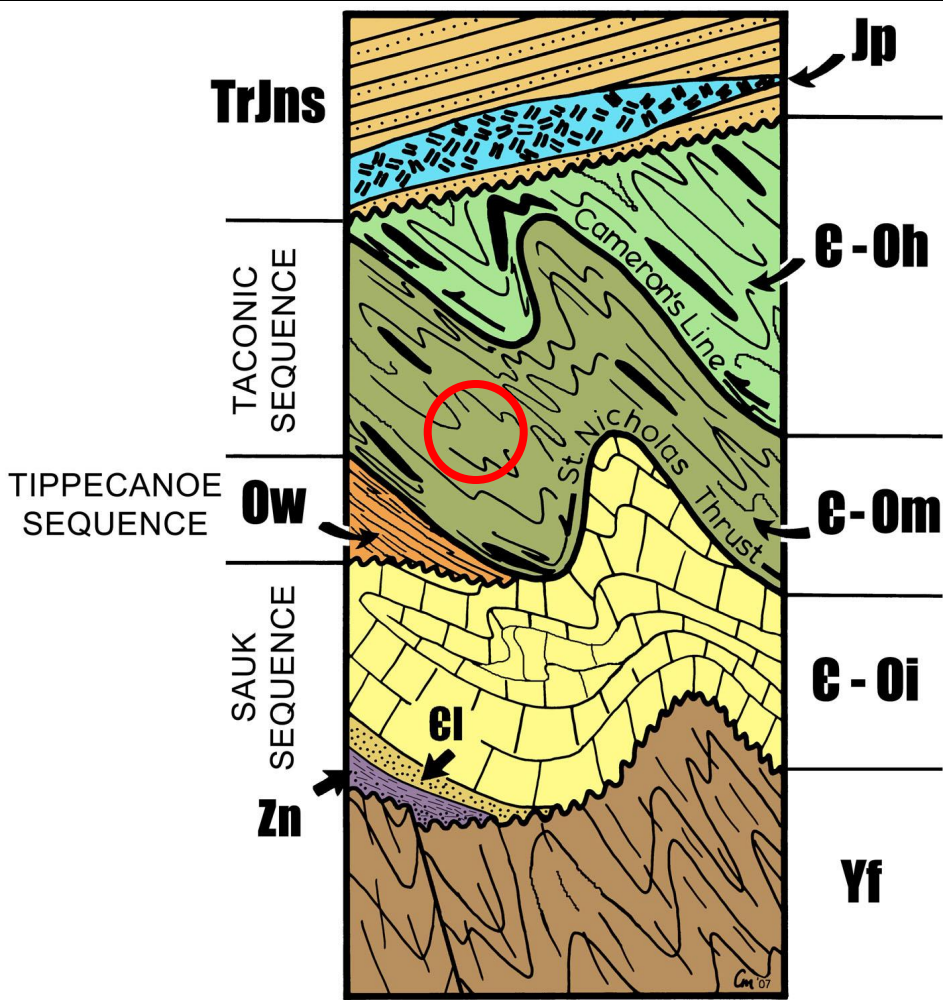
N289 Sulfidic Walloomsac - Mt. Morris Park



Tippecanoe

N622 – Warren Street (0w)





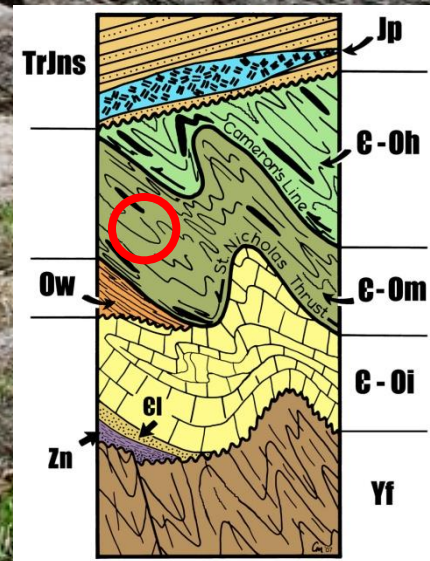
Taconic

Manhattan Schist
F₃ Folds of S₂
Central Park, NYC



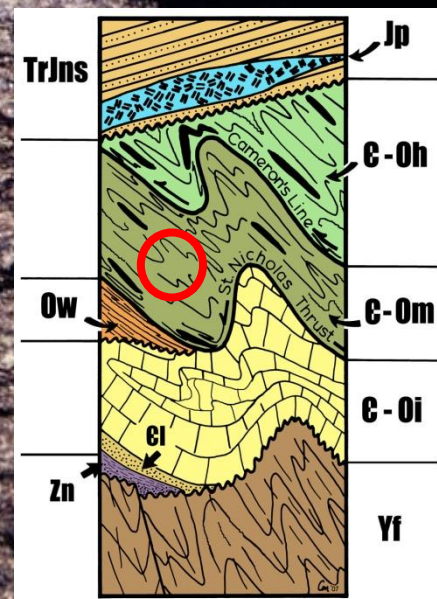
Taconic

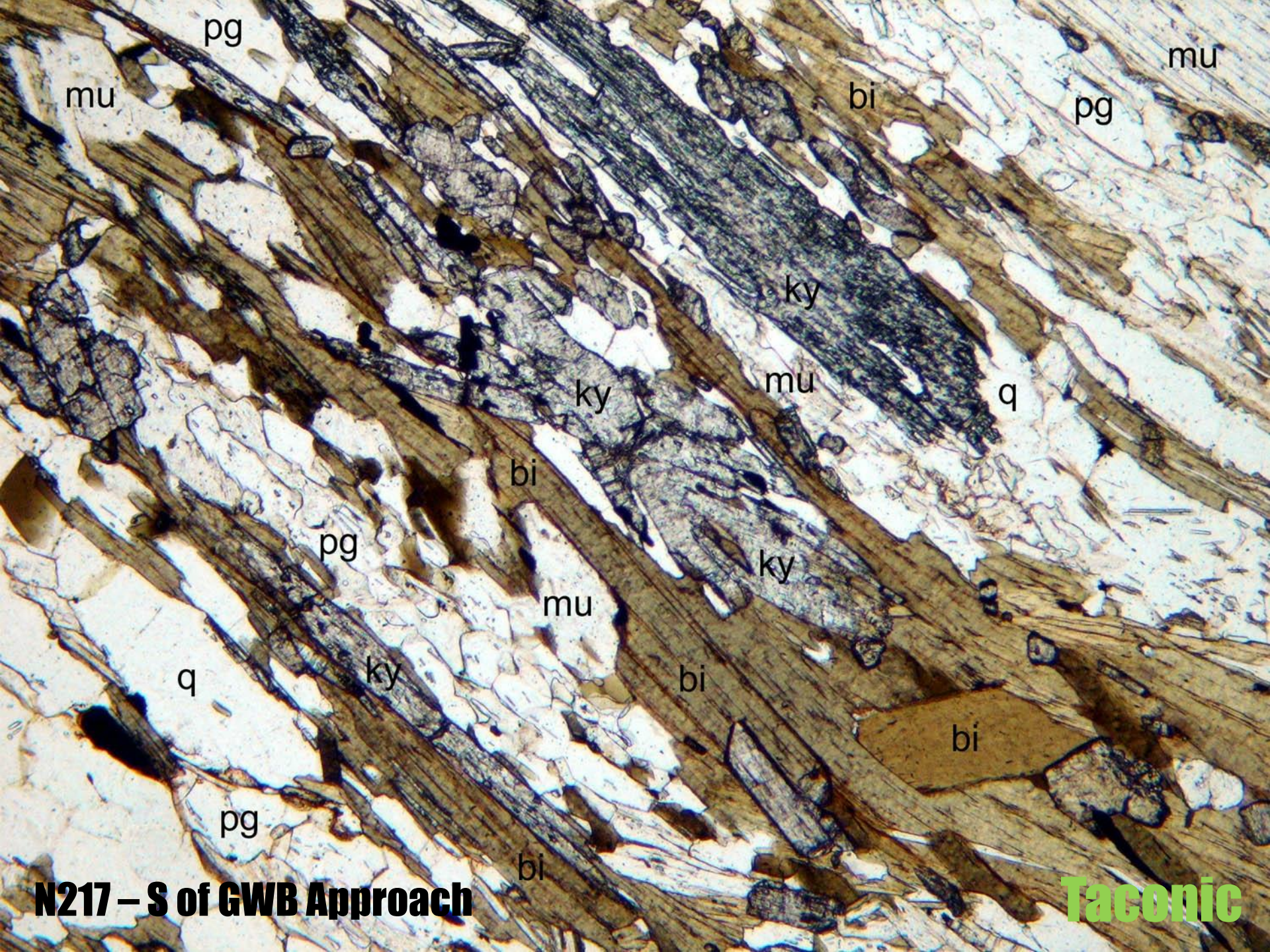
Manhattan Schist, Central Park



Taconic

N283 - Mt Morris Park Kyanite Nodule





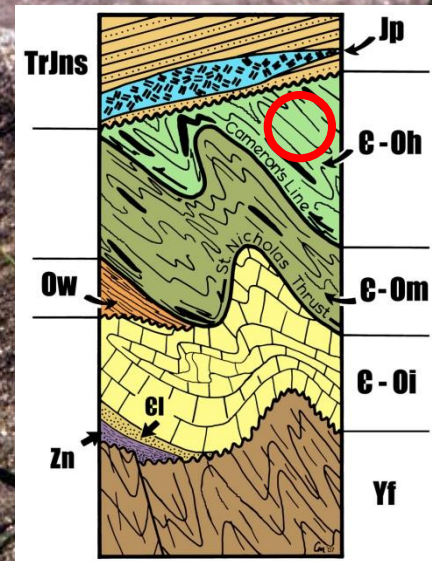
N217 – S of GWB Approach

Taonic

Taconic

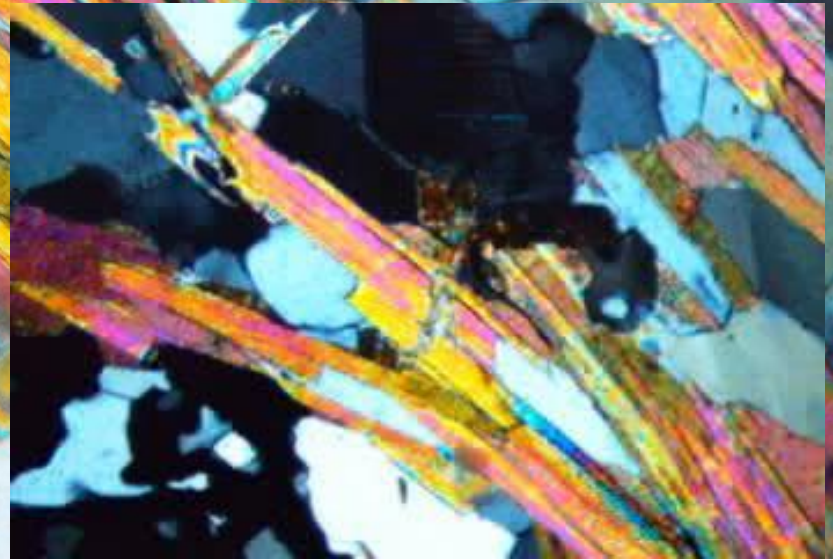


Hartland Schist, Riverside Park

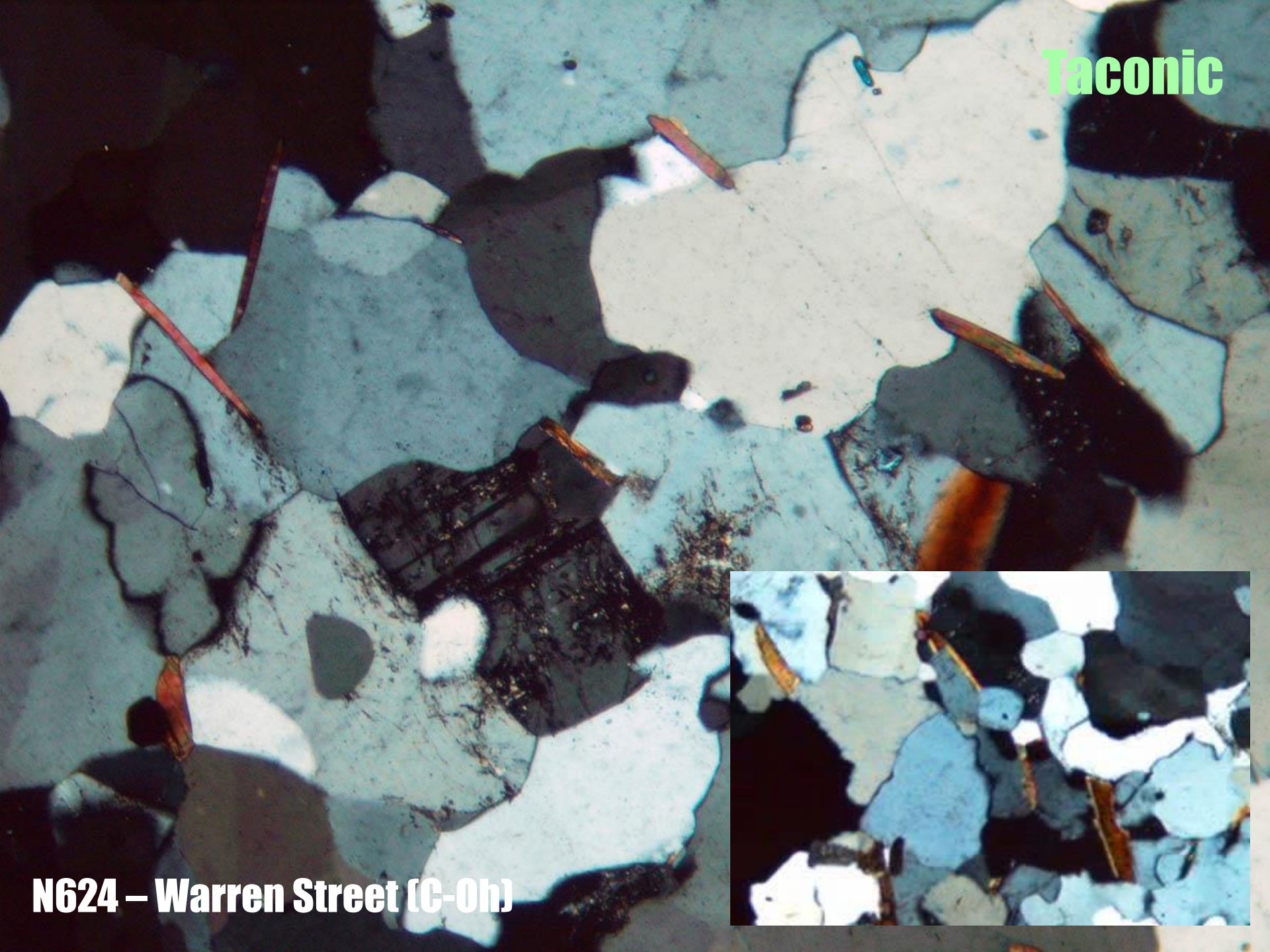


Taconic

N629 – Warren Street (C-0h)



Taconic



N624 – Warren Street (C-0h)

Taconnic

**N567 - Hartland Amphibolite
Central Park**

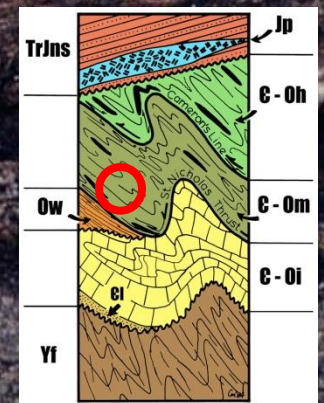


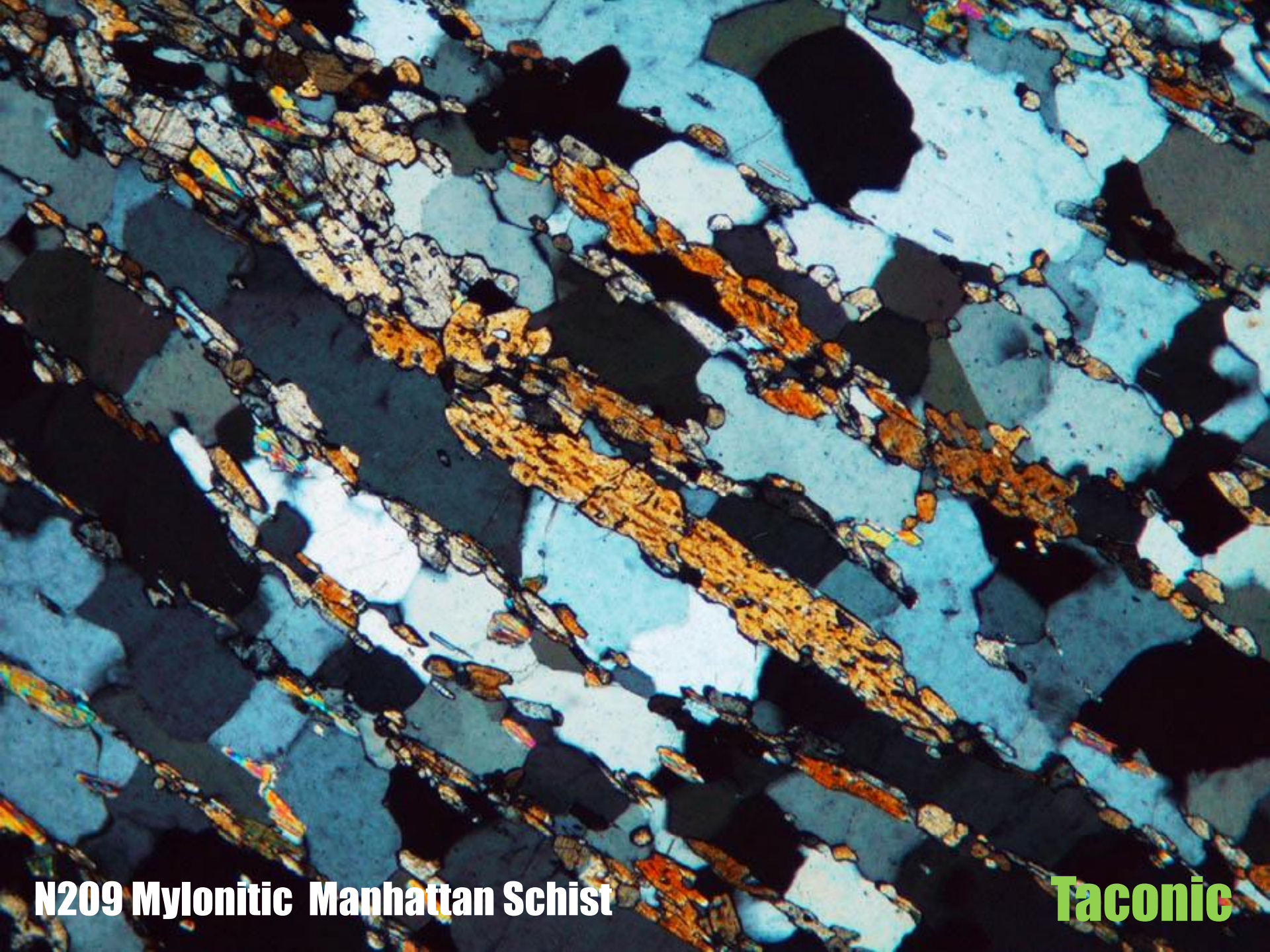
Structural Features

Taonic



Sheared Manhattan Schist, St. Nicholas Park





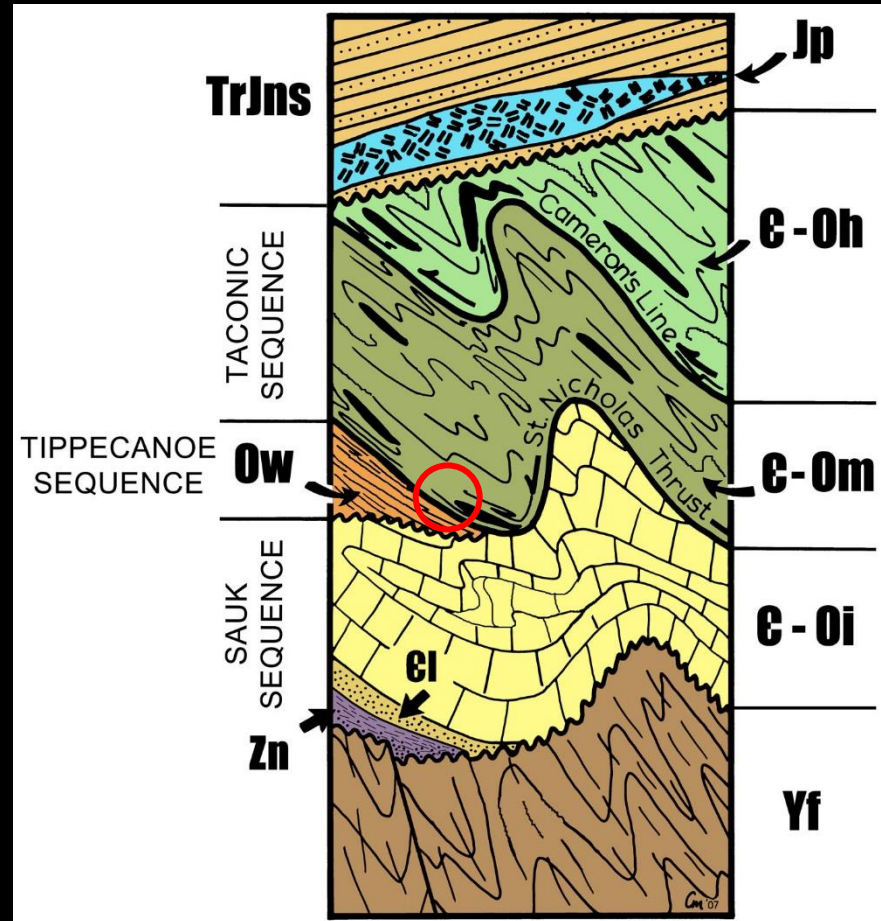
N209 Mylonitic Manhattan Schist

Taconic

Taconic

N172 Sheared Manhattan Schist C-0m

Saint Nicholas Thrust = Taconian Basal thrust



Second Avenue Subway



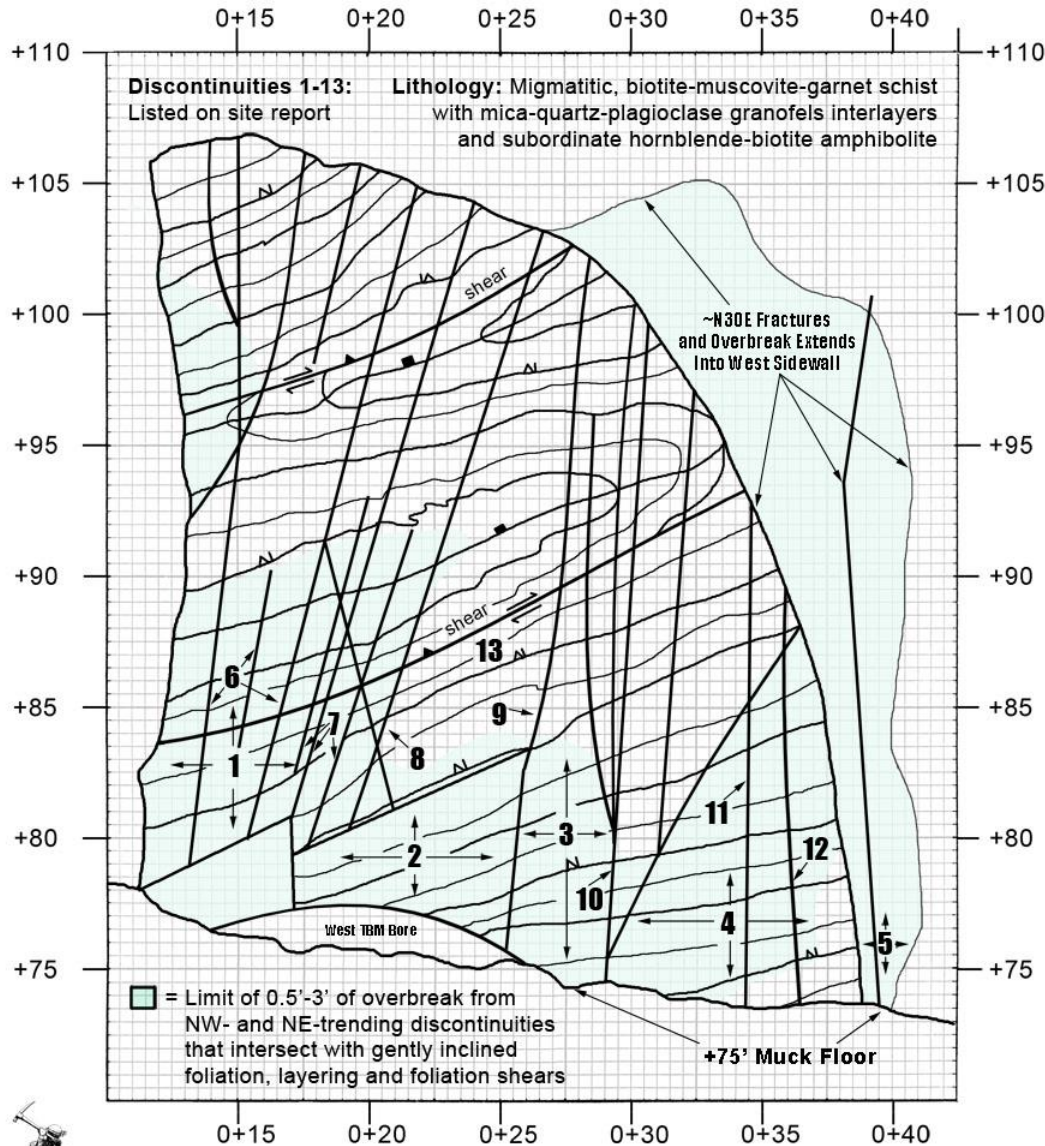
Sta ~1205+00 – North Cavern

Second Avenue Subway



Sta 1205+10 – North Cavern

**Second Avenue Subway - North Cavern West Slash
Working Face at Sta. 1205+10; Elev. +75' to +105'**



Duke Geological Lab
Westbury, NY 11590
(516) 280-7144
www.dukelabs.com

Stationing in Feet West of Second Avenue Centerline →

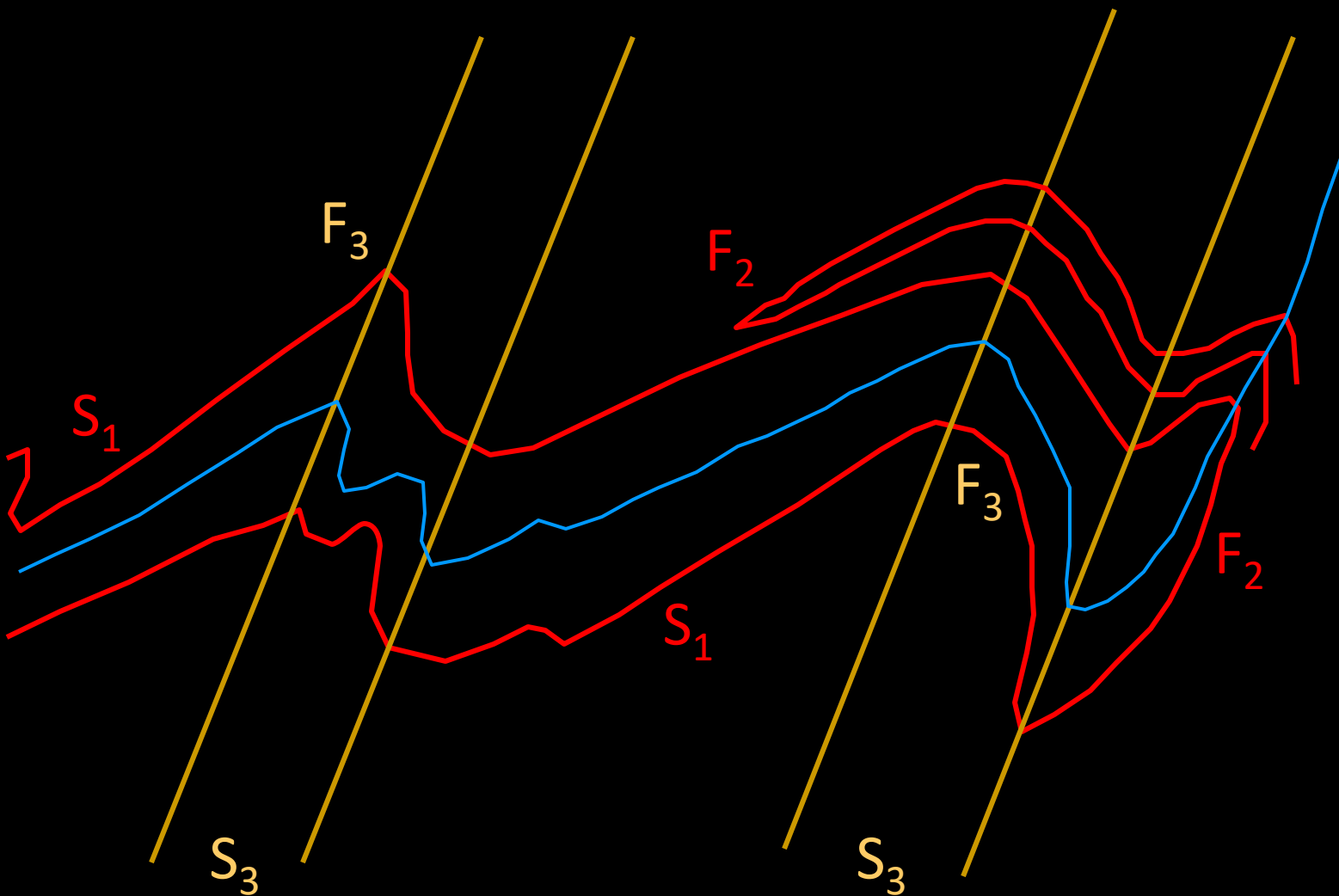
Mapped 19 December 2012

Second Avenue Subway

Sta 1205+10 – North Cavern



Polydeformed Bedrock



Polydeformed Bedrock



D2 x D3 Interference Patterns



Merguerian
and Moss 2005

Serpentinite with Talc-Chlorite-Biotite Shear Envelope



**Cigar-
Shaped
Mass with
Steep
Plunge
Southward**

**Base Not
Exposed**

**>10 m Long
Dimension**

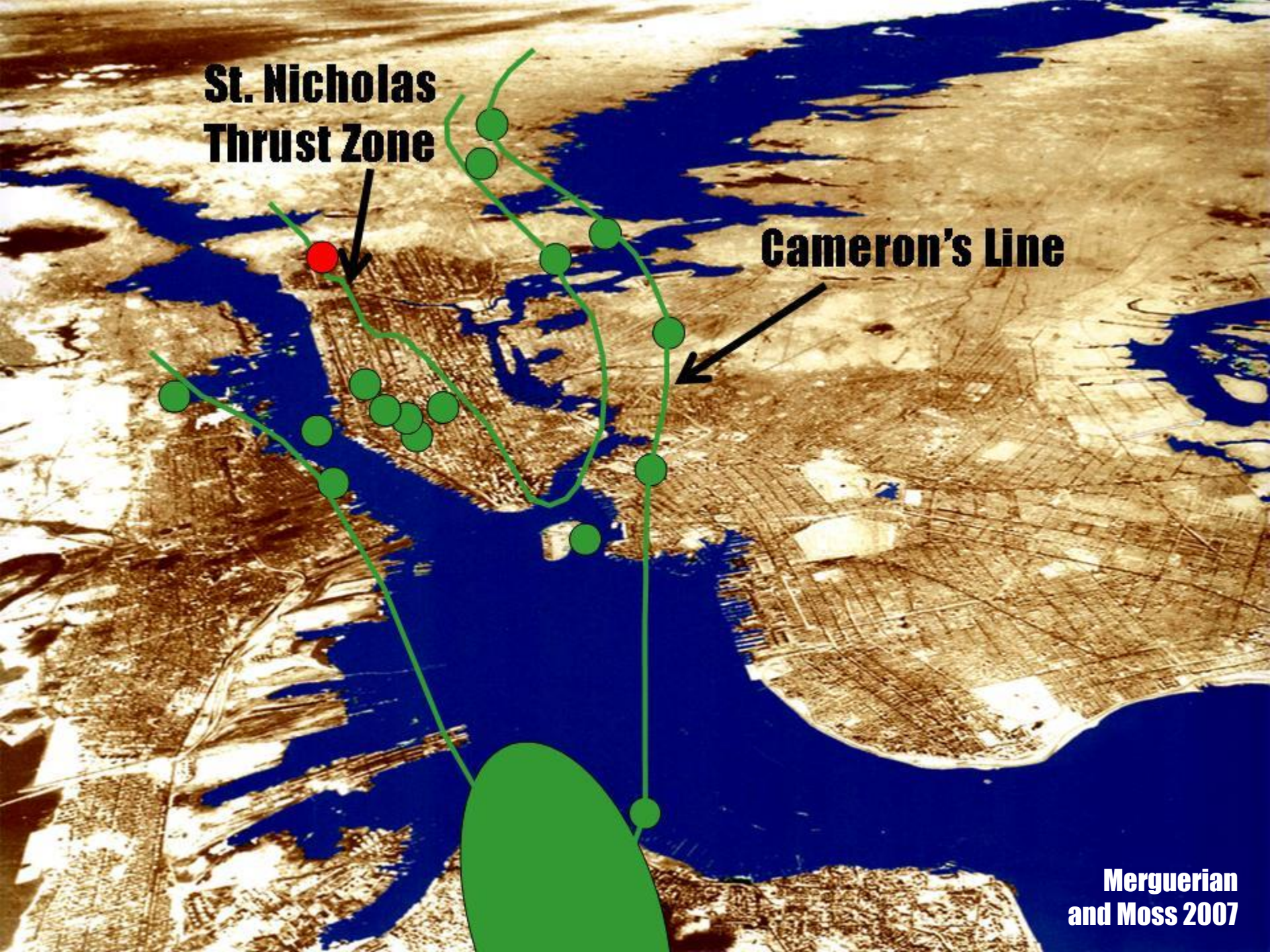
**Merguerian
and Moss 2005**

70°

**St. Nicholas
Thrust Zone**

Cameron's Line

**Merguerian
and Moss 2007**



TrJns

TACONIC
SEQUENCE

TIPPECANOE
SEQUENCE

OW

SAUK
SEQUENCE

Zn

Jp

ε - Oh

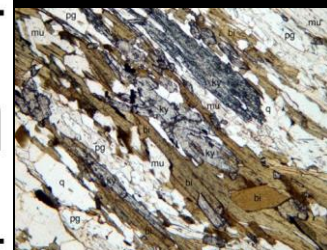
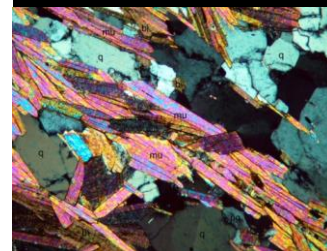
ε - Om

ε - Oi

Yf

Cameron's Line
St. Nicholas Thrust

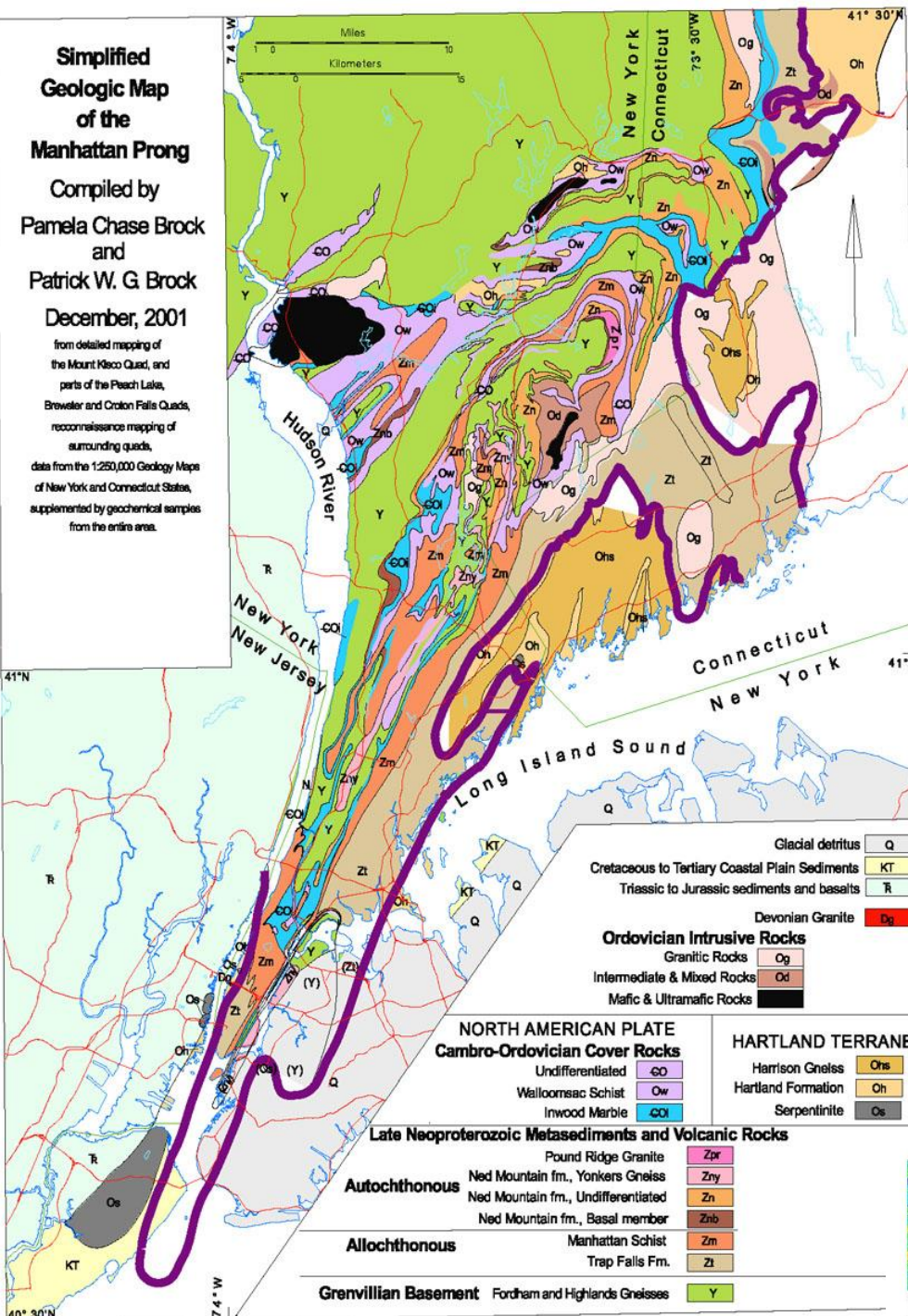
εi



Simplified Geologic Map of the Manhattan Prong

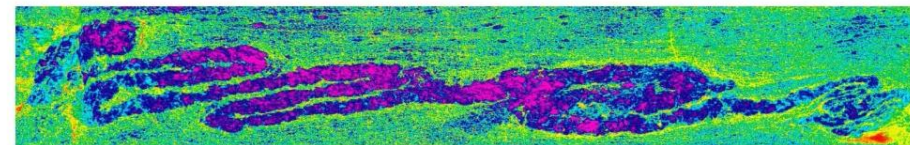
Compiled by
Pamela Chase Brock
and
Patrick W. G. Brock
December, 2001

from detailed mapping of
the Mount Kisco Quad, and
parts of the Peach Lakes,
Brewster and Croton Falls Quads,
reconnaissance mapping of
surrounding quads,
data from the 1:250,000 Geology Maps
of New York and Connecticut States,
supplemented by geochemical samples
from the entire area.

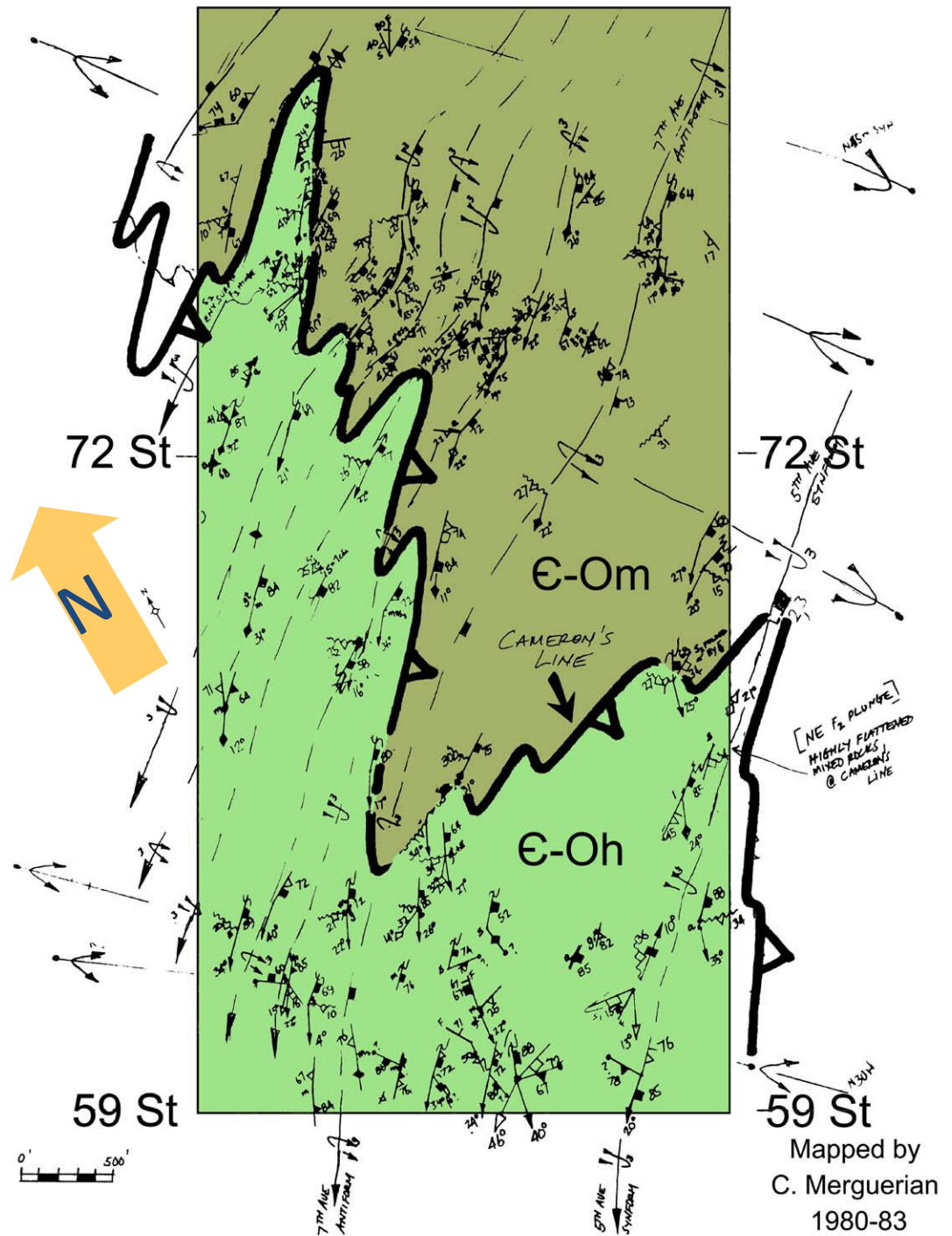


Main Questions:

- 1) Position/Geometry of Cameron's Line & Saint Nicholas Thrust
- 2) Age/Provenance of Schistose Rocks
- 3) Metamorphic History
- 4) Mafic Rocks
- 5) Plutons/Dikes
- 6) Serpentinities
- 7) Age Dating

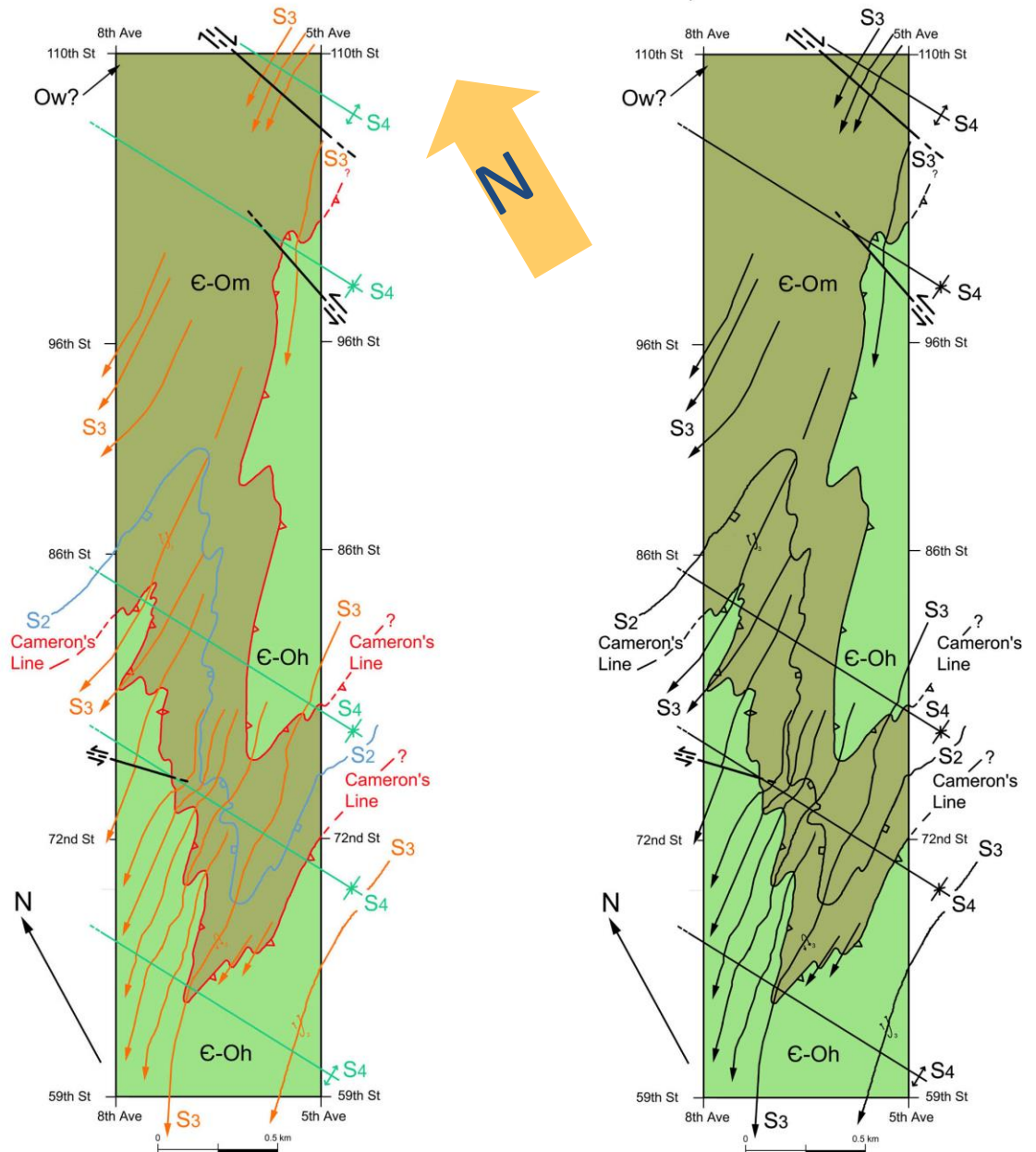


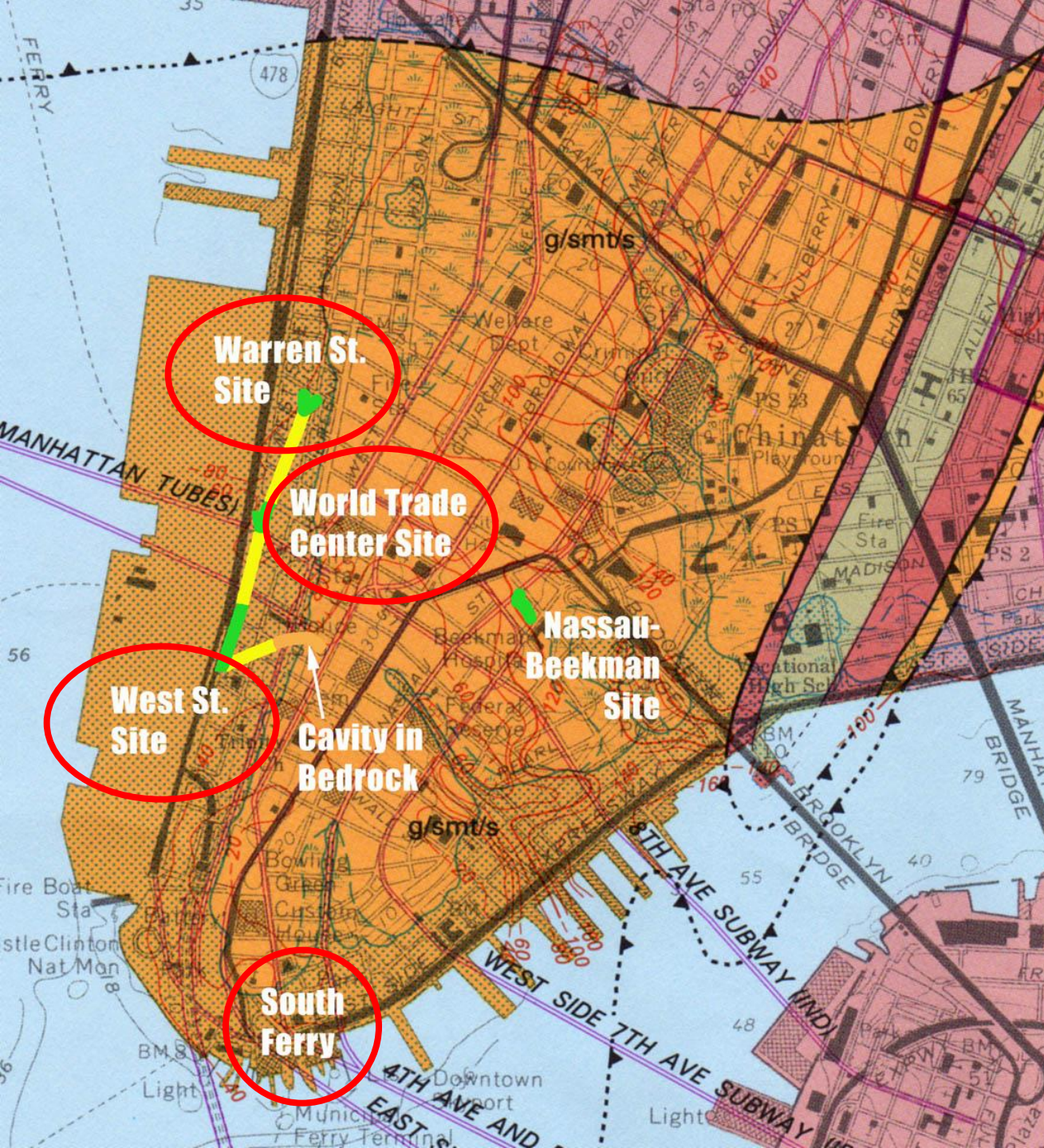
Cameron's Line in Central Park



Cameron's Line in Central Park

PRELIMINARY GEOLOGICAL MAP OF CENTRAL PARK, NYC





Most Display
Sheared
Walloomsac
Rocks!

**Interpretive
Geologic Map and
Section of
SE Manhattan,
Brooklyn,
and Queens
Based on Borings
of Berkey (1910)**

