

New Geologic Discoveries in Southern Manhattan

HCLAS 3rd Annual Division of Natural Sciences Research Day

Charles Merguerian
Geology Department
Hofstra University

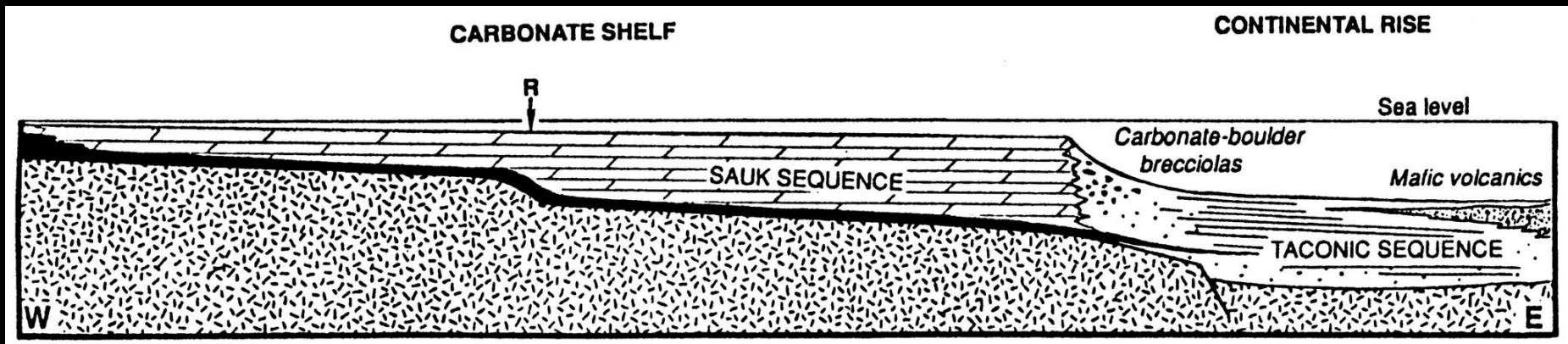
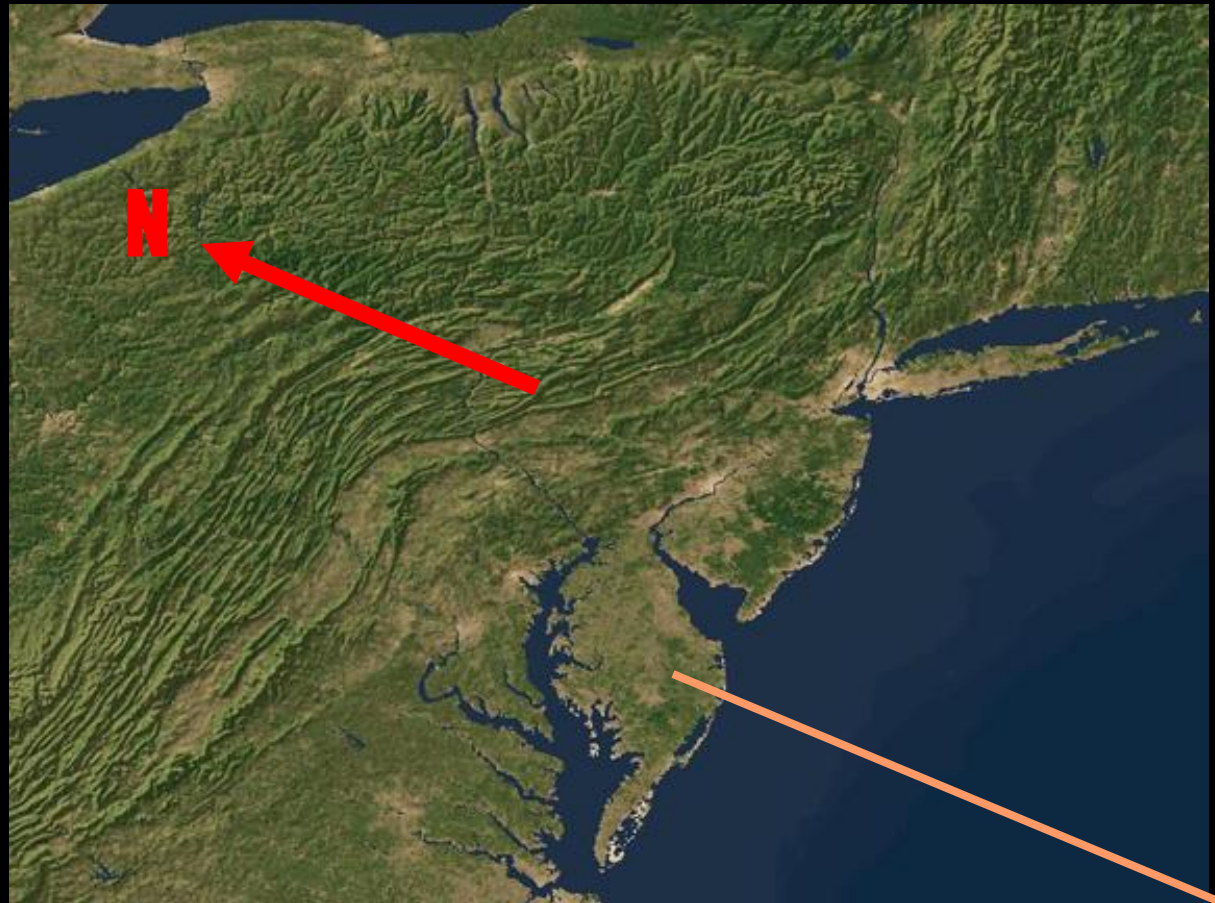


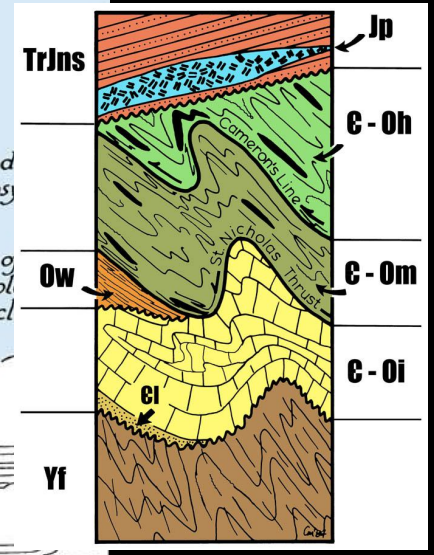
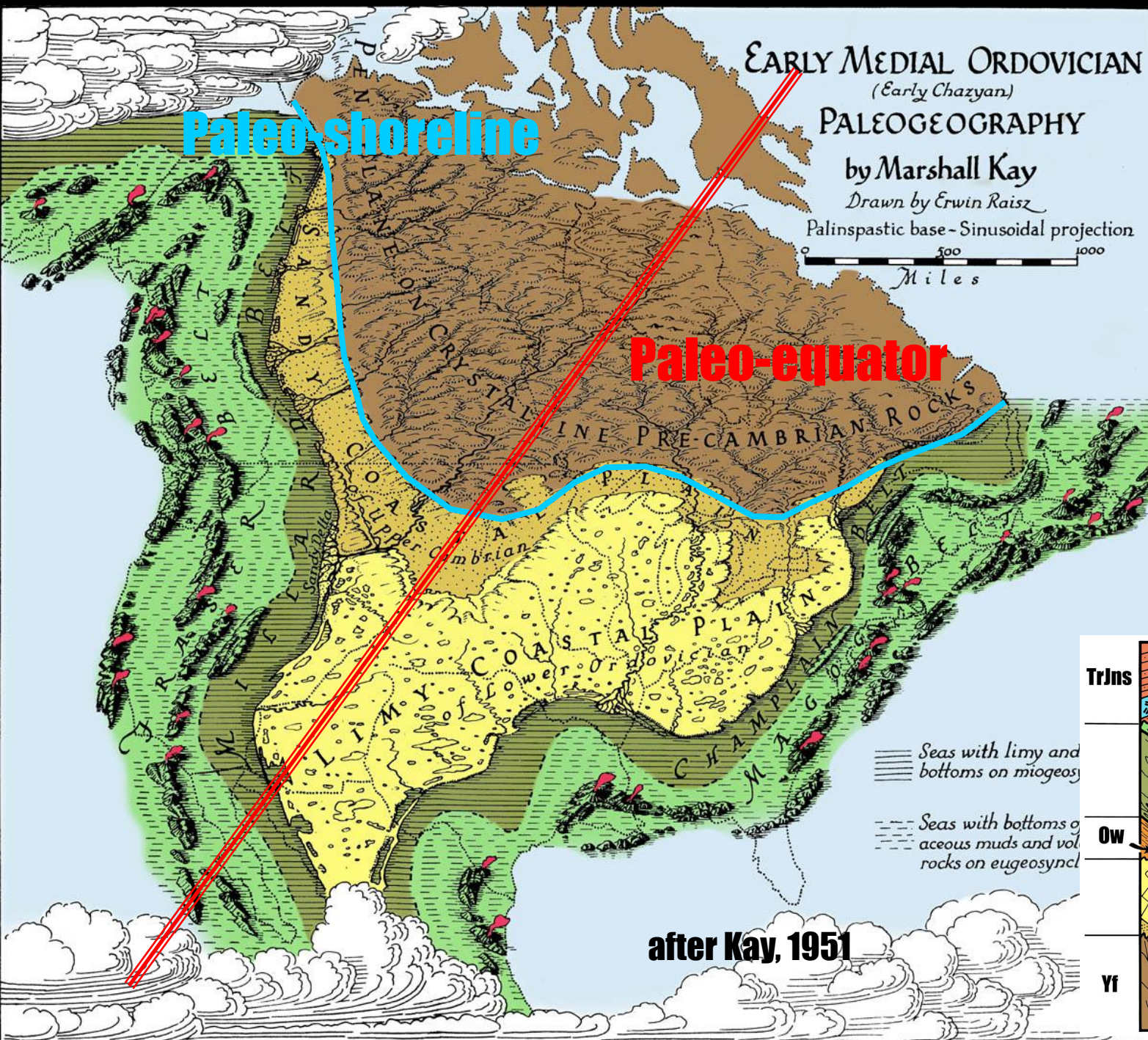
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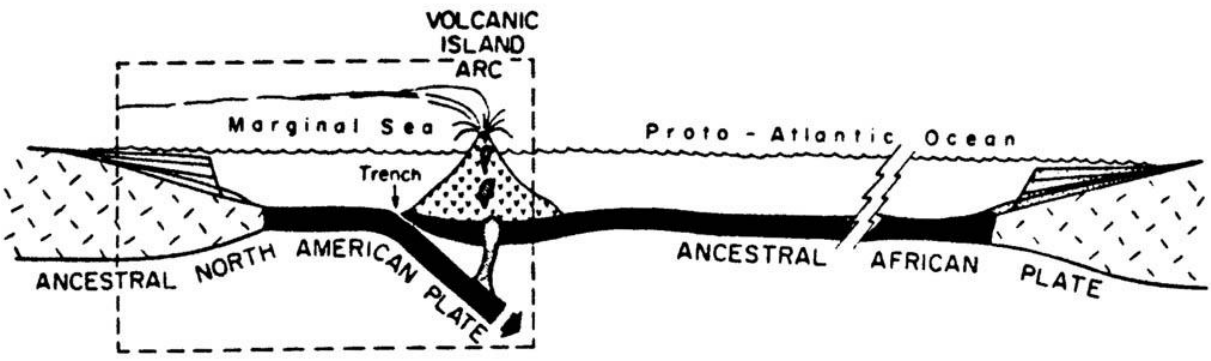
Tippecanoe

Sauk

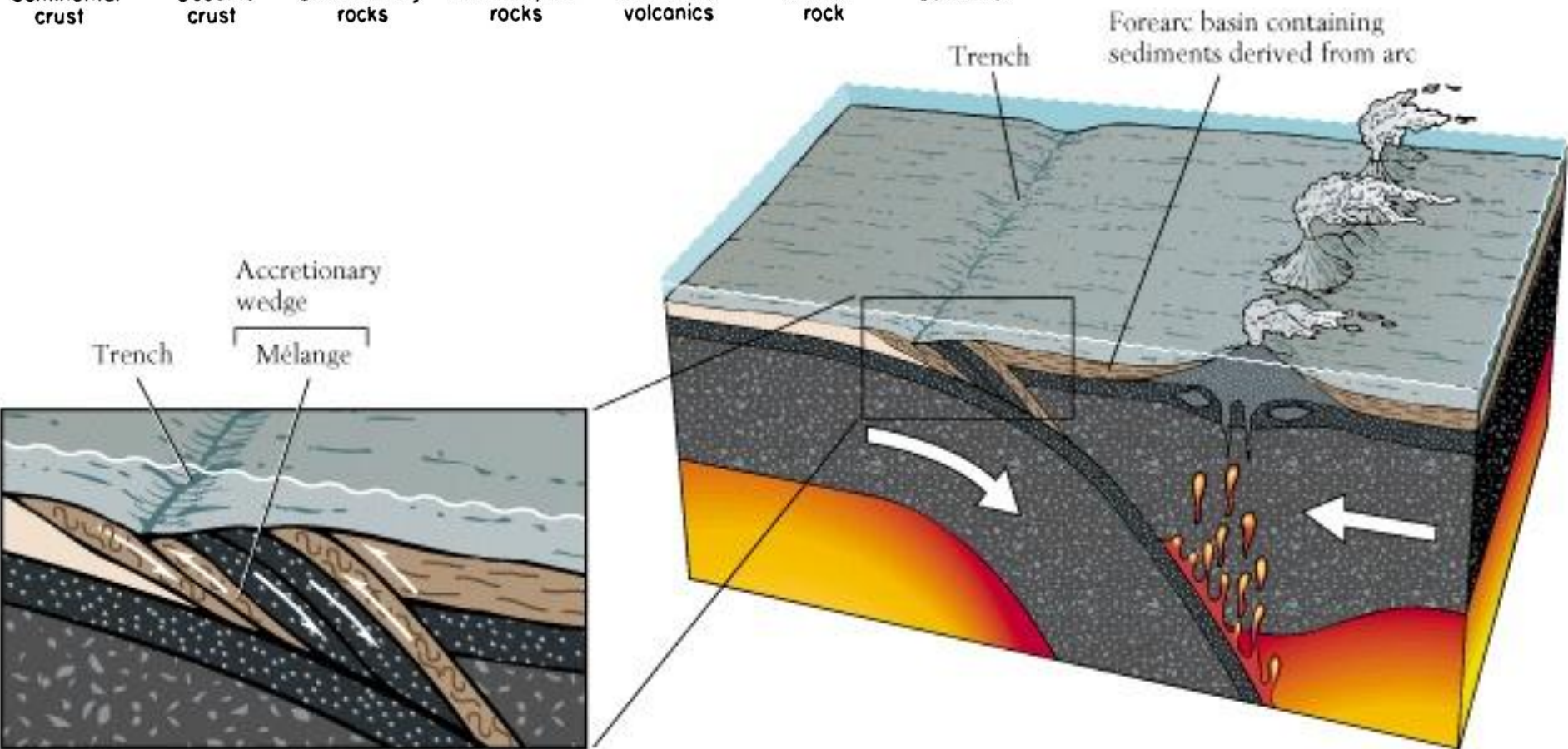
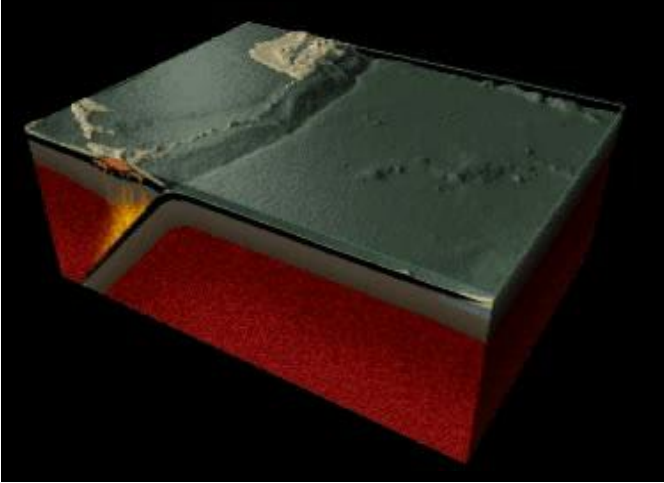
Taconic

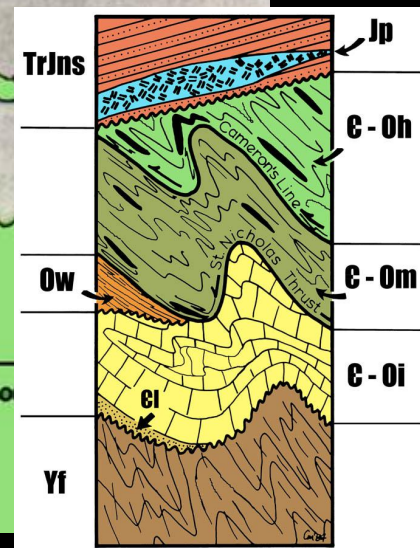
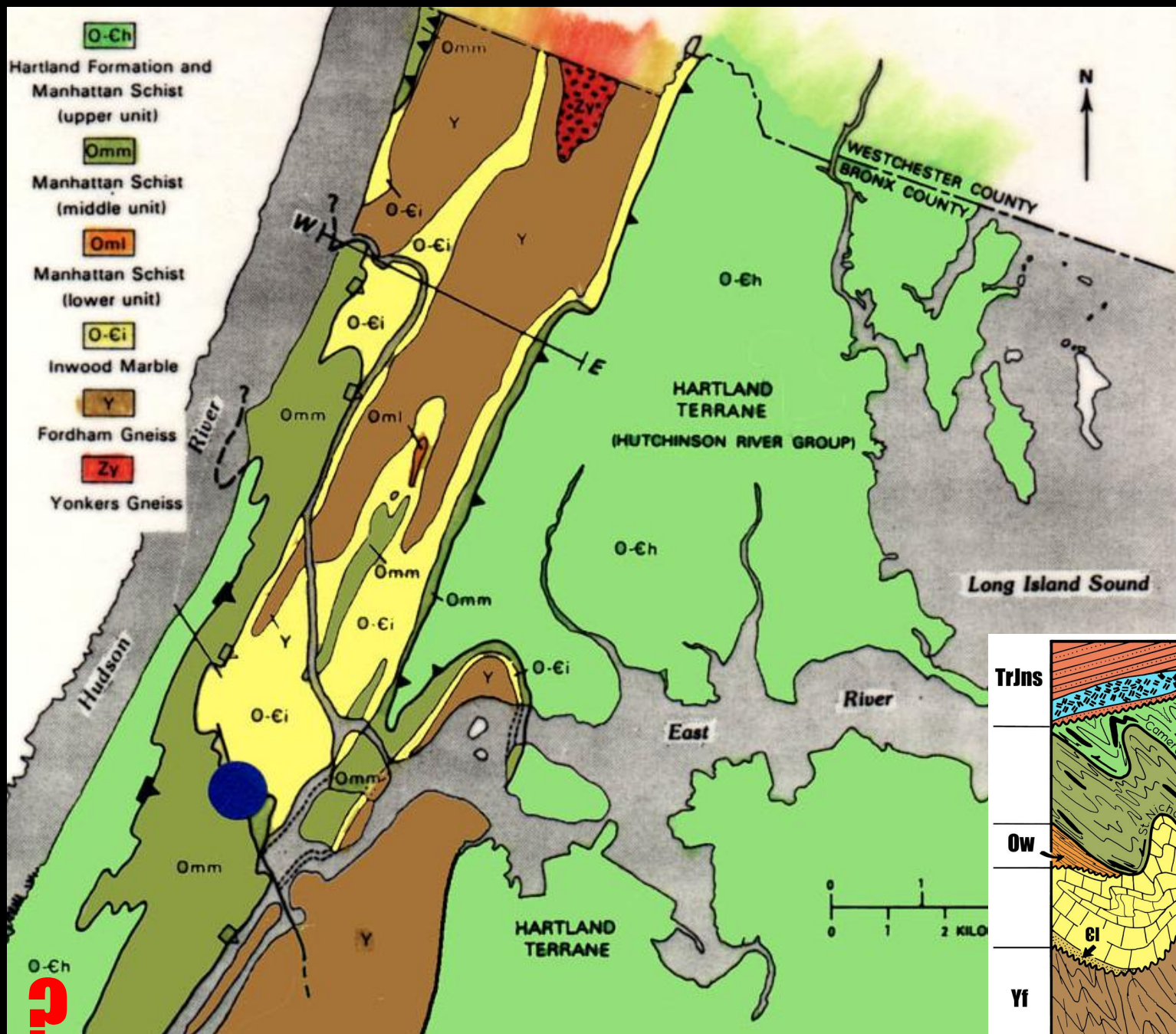






- 
 Continental crust
- 
 Oceanic crust
- 
 Sedimentary rocks
- 
 Metamorphic rocks
- 
 Island arc volcanics
- 
 Molten rock
- 
 Seawater

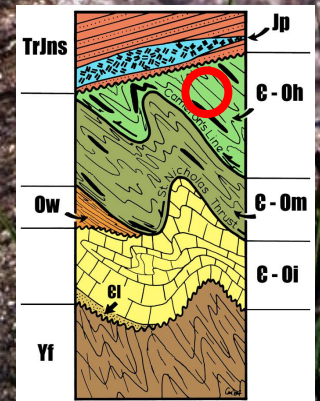


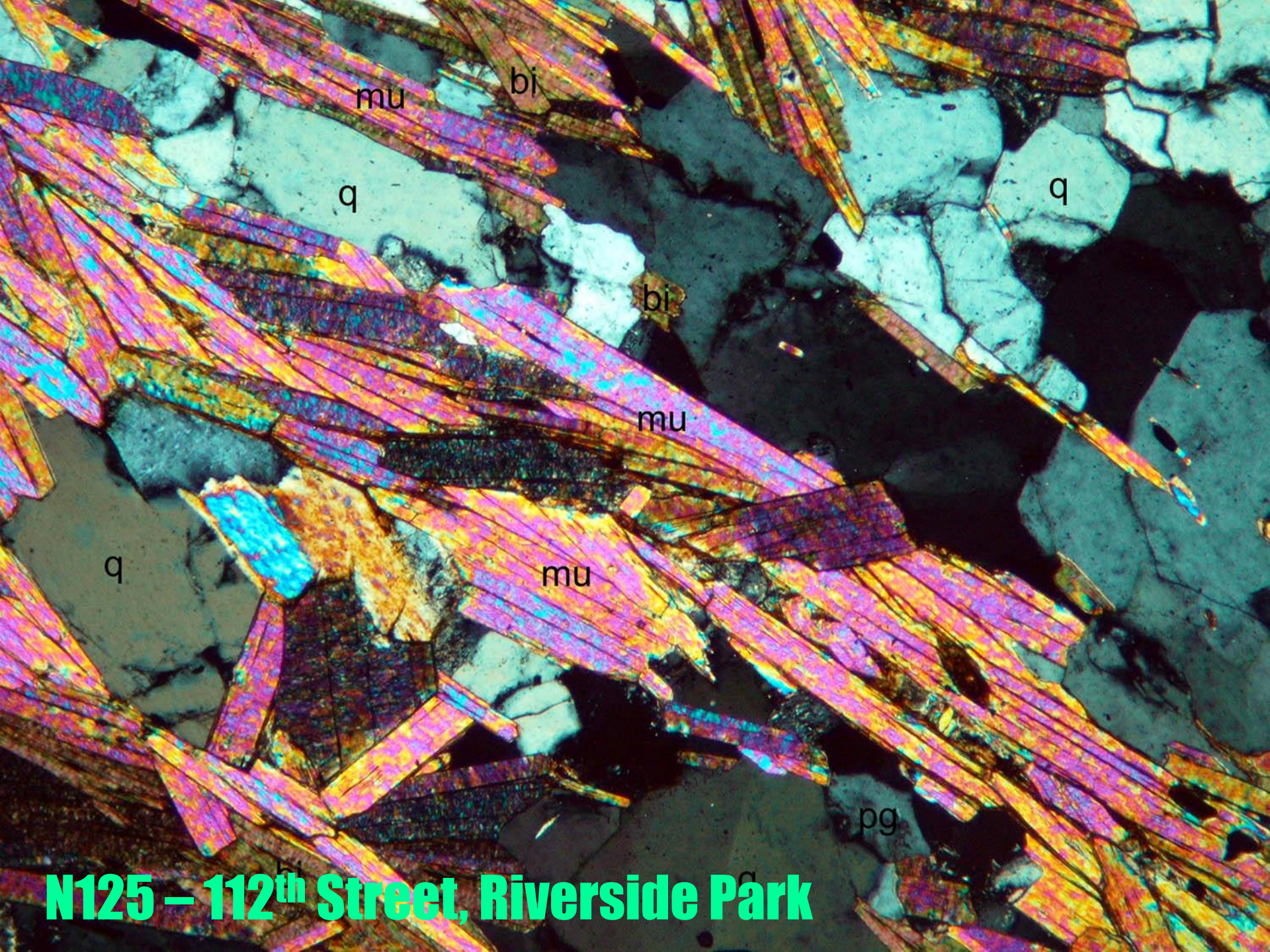


Taconic



Hartland Schist, Riverside Park





N125 – 112th Street, Riverside Park

Taconnic

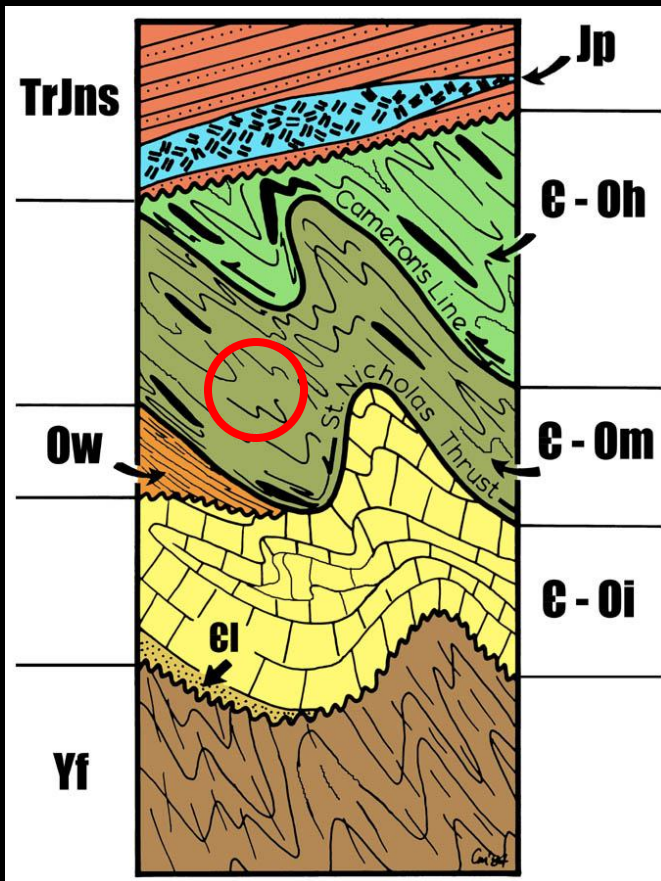
Hartland Amphibolite N567



Manhattan Schist

F₃ Folds of S₂

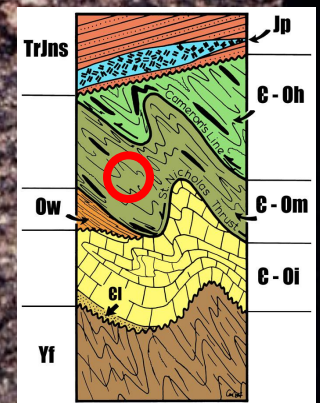
Central Park, NYC

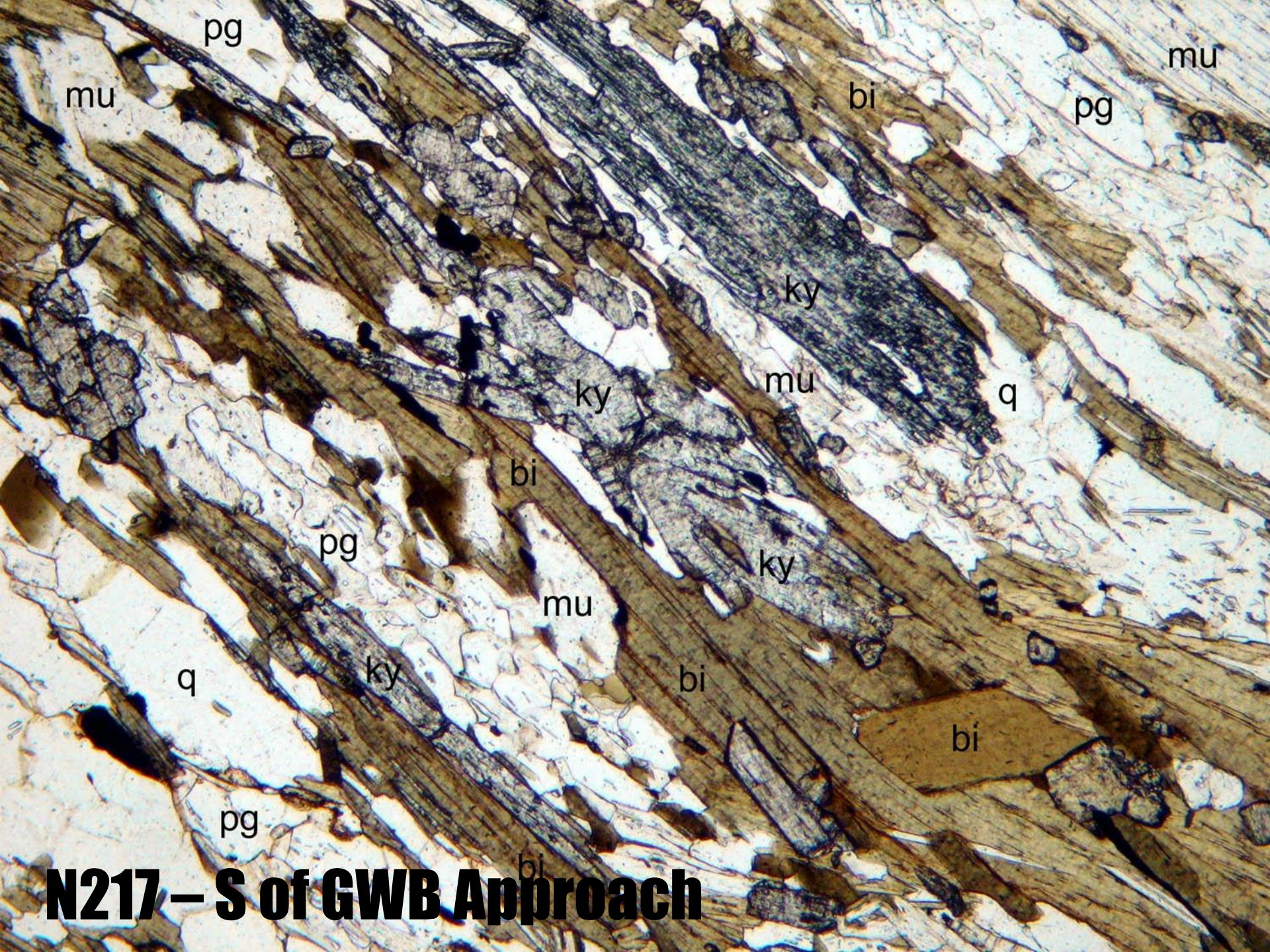


Taconic

Taconic

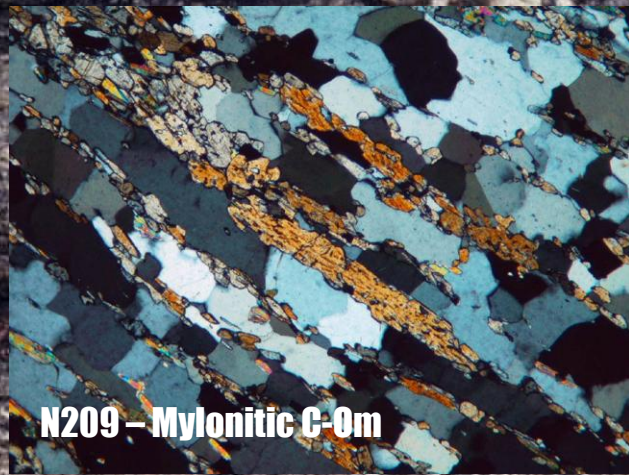
N283 - Mt Morris Park Kyanite Nodule





N217 – S of GWB Approach

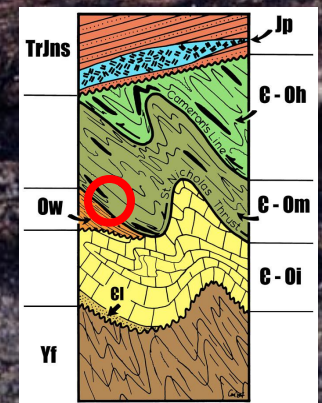
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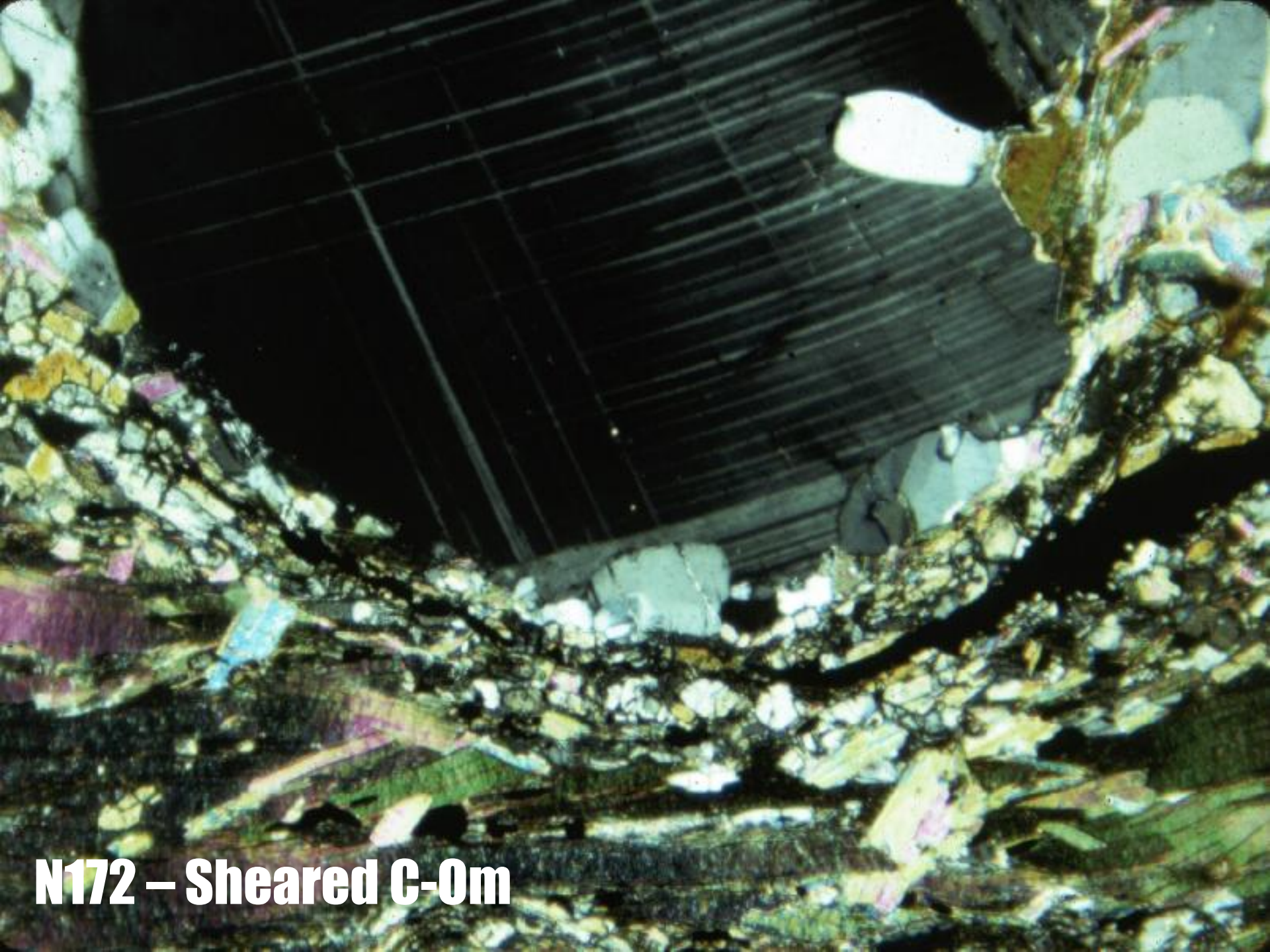


N209 – Mylonitic C-Om



Sheared Manhattan Schist, St. Nicholas Park

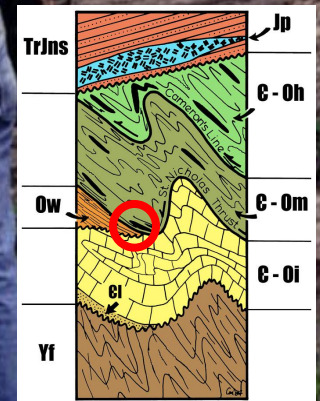




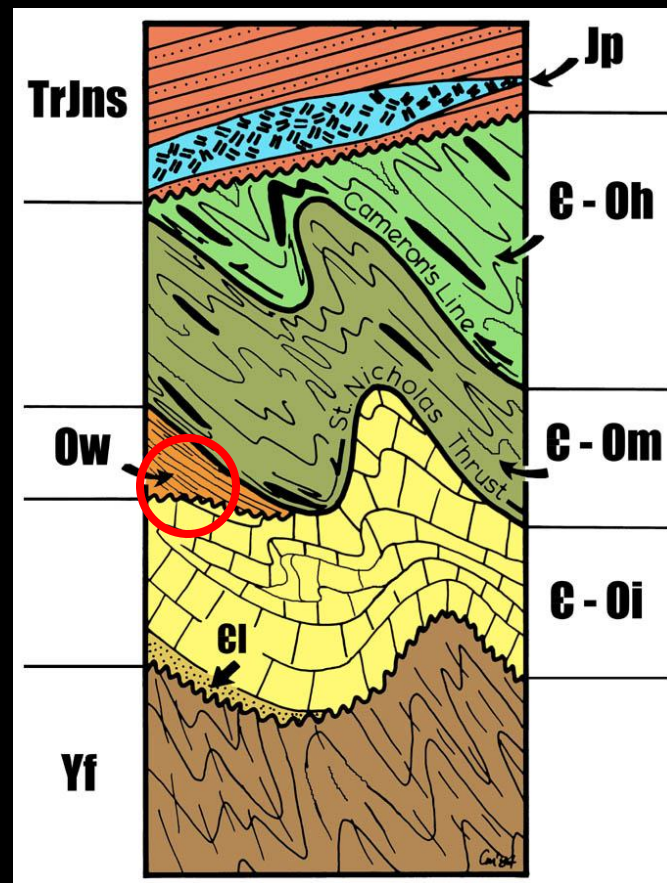
N172 – Sheared C-0m

St. Nicholas Thrust

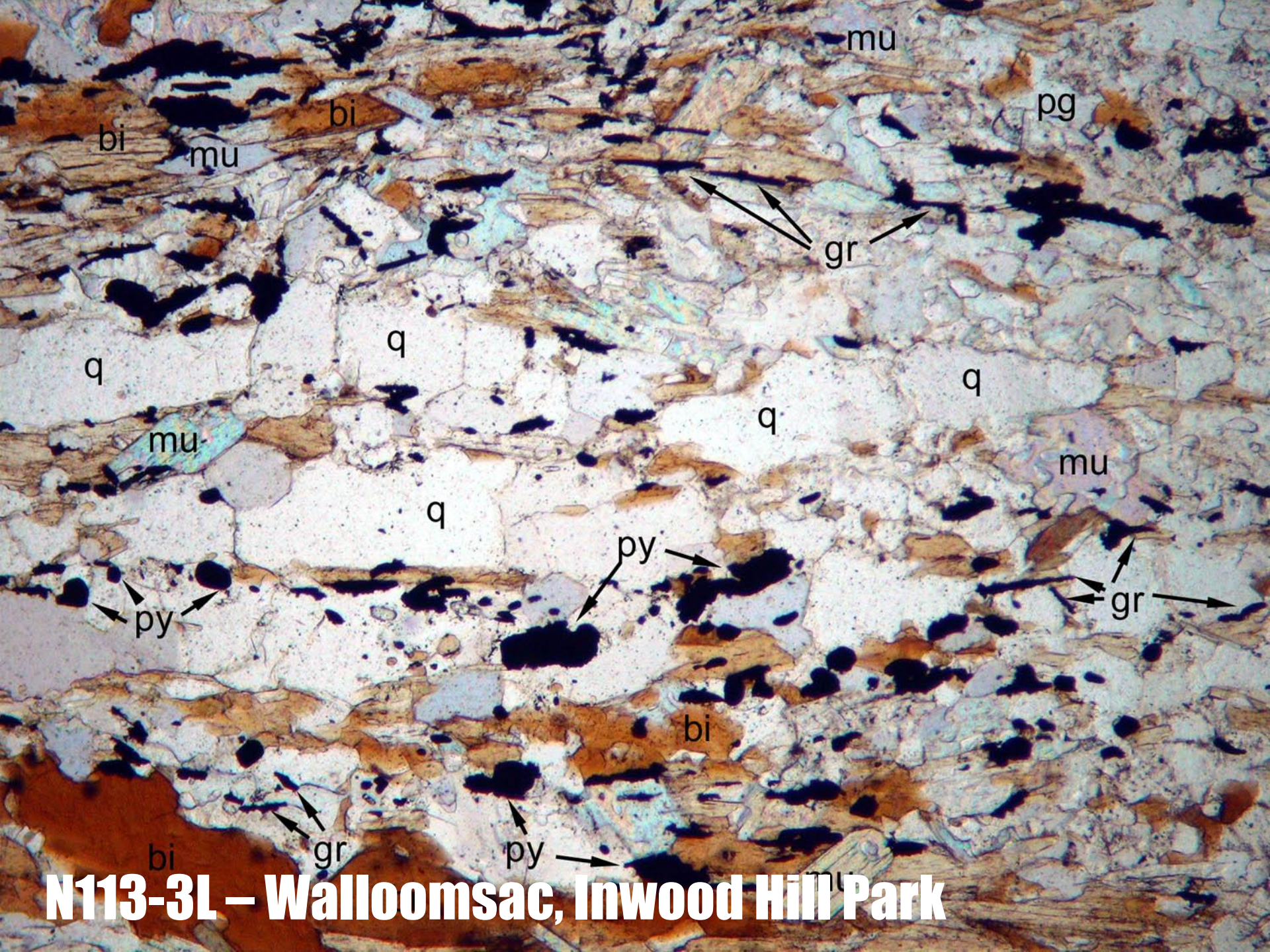
N279 – Morris Garvey Park Klippe



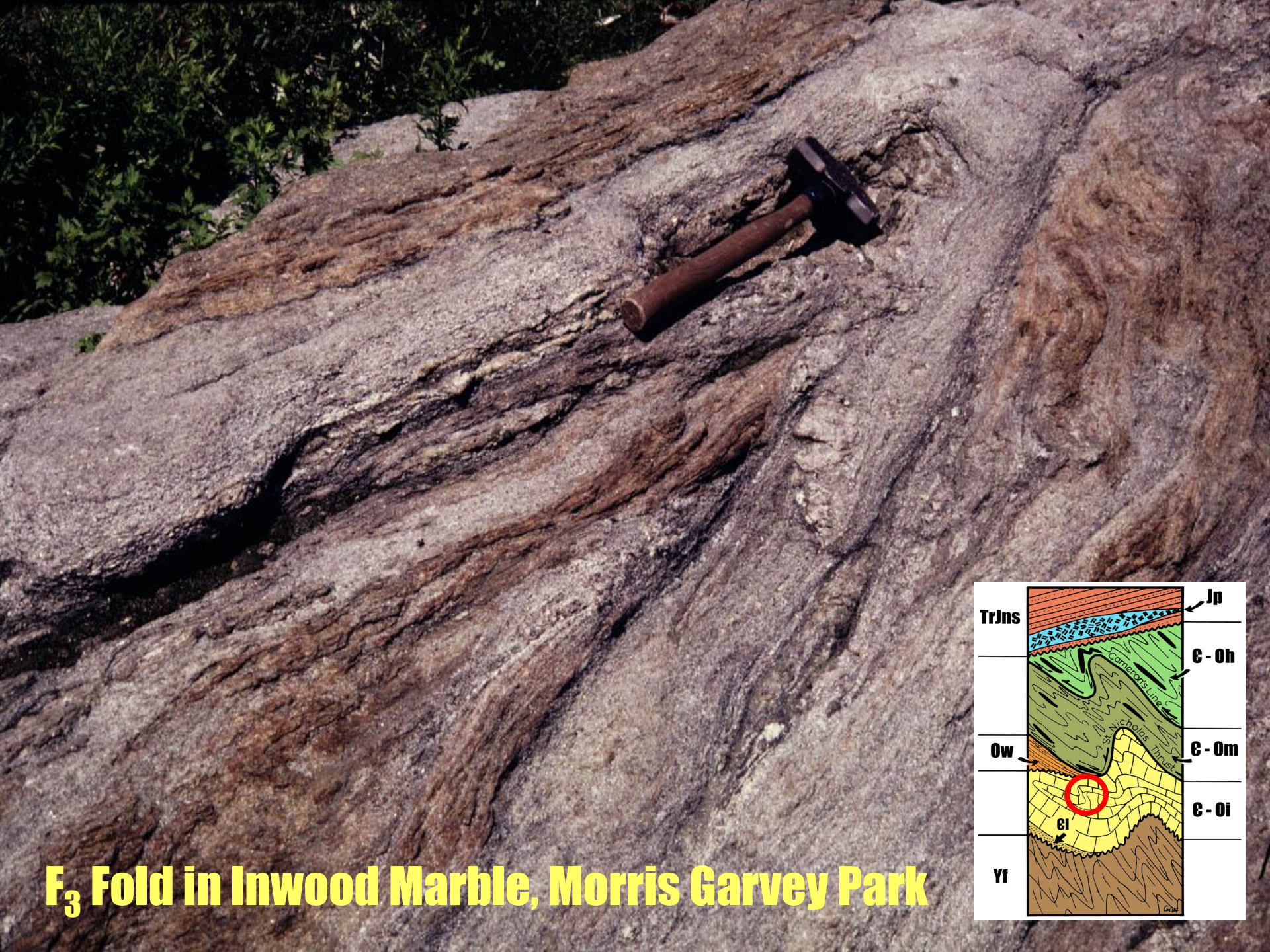
Tippecanoe



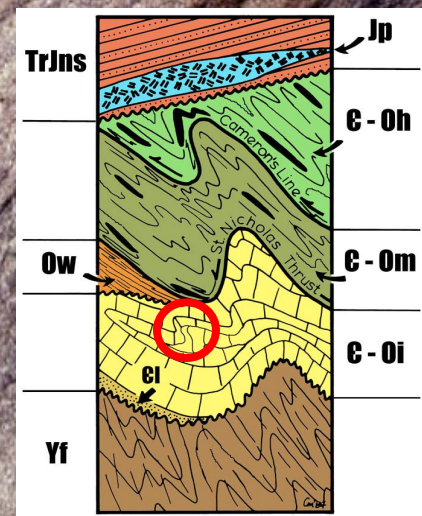
Walloomsac "Balmville" Contact, Grand Concourse, Bronx, NY



N113-3L – Walloomsac, Inwood Hill Park

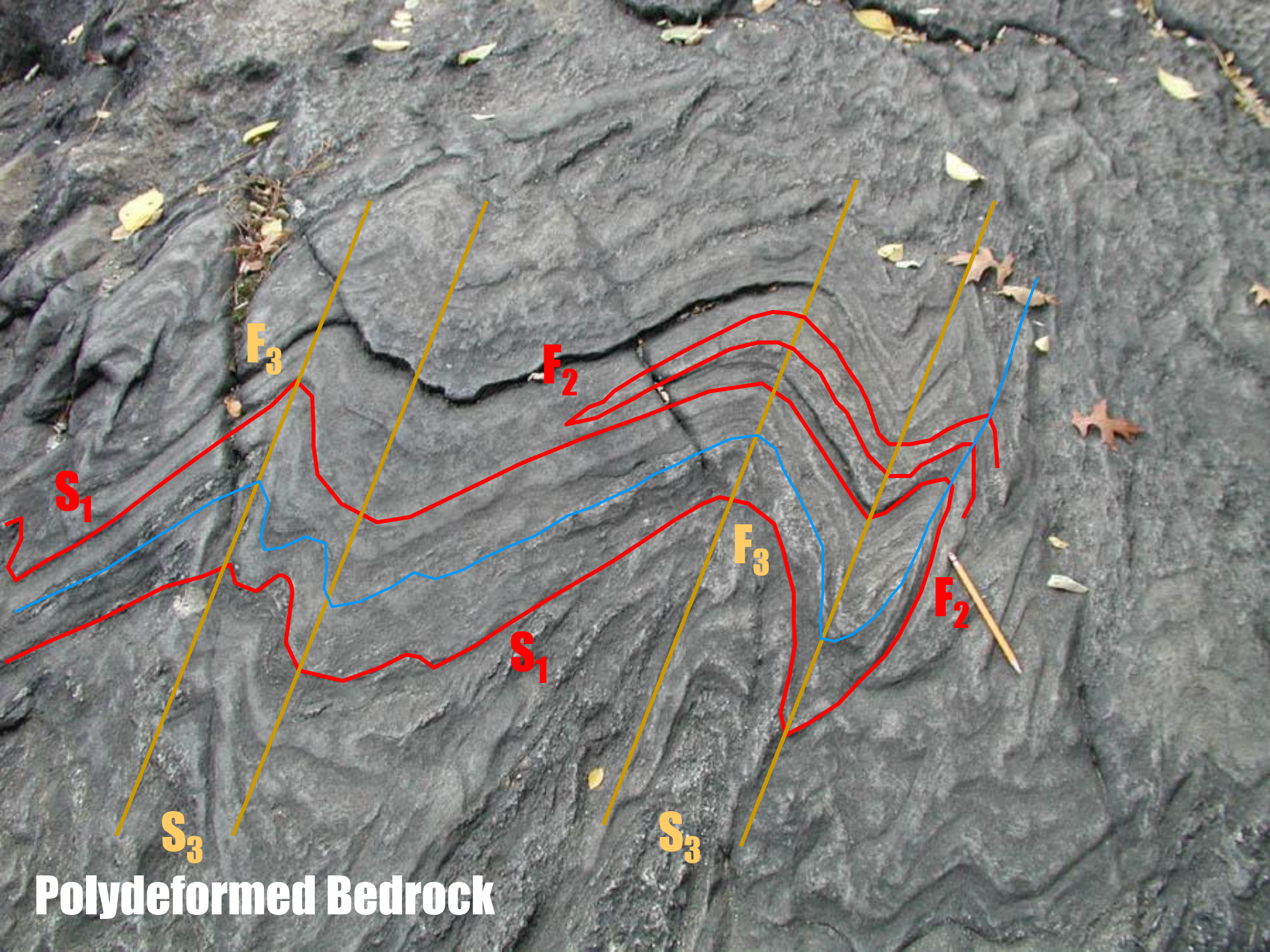


F₃ Fold in Inwood Marble, Morris Garvey Park

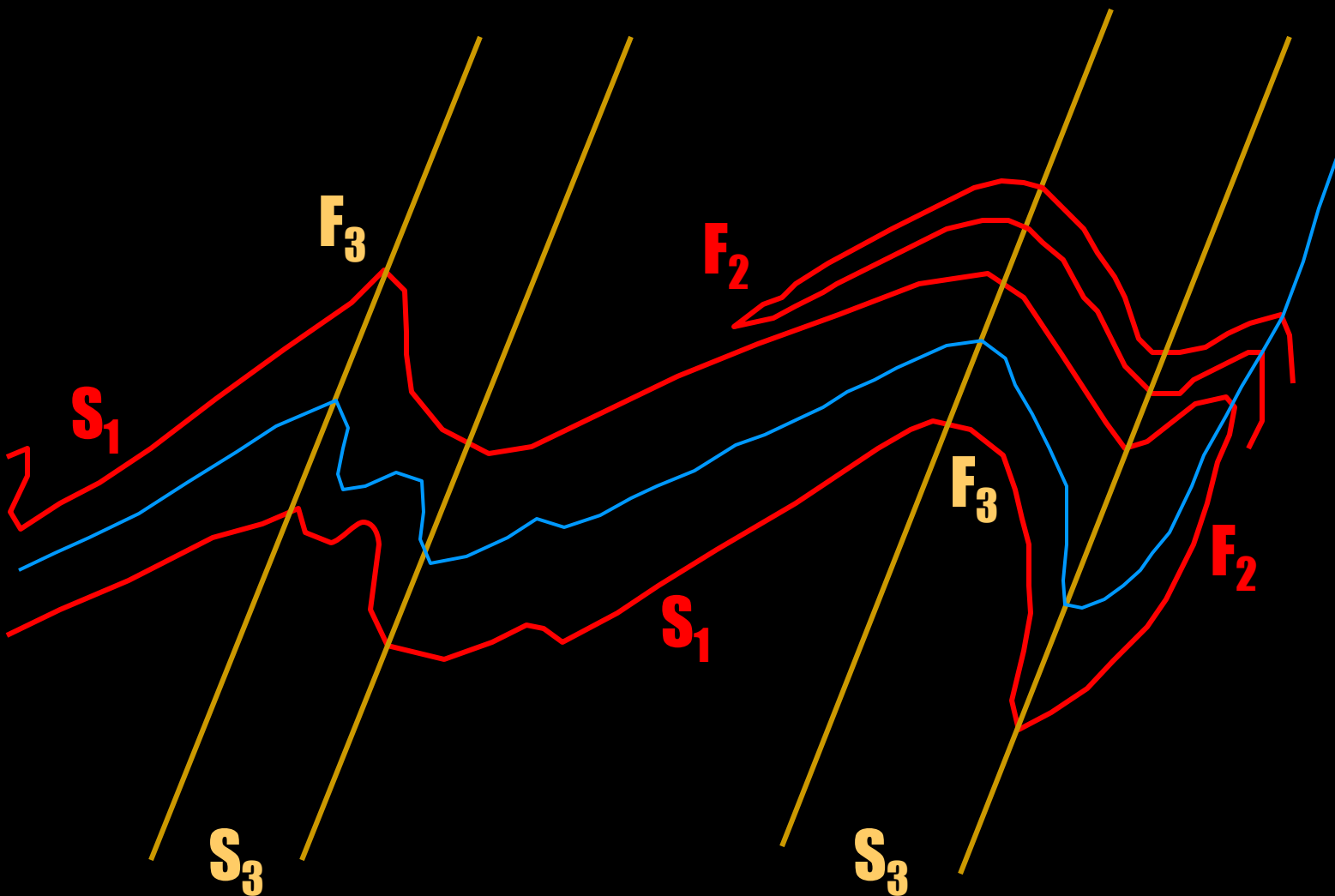




Polydeformed Bedrock



Polydeformed Bedrock

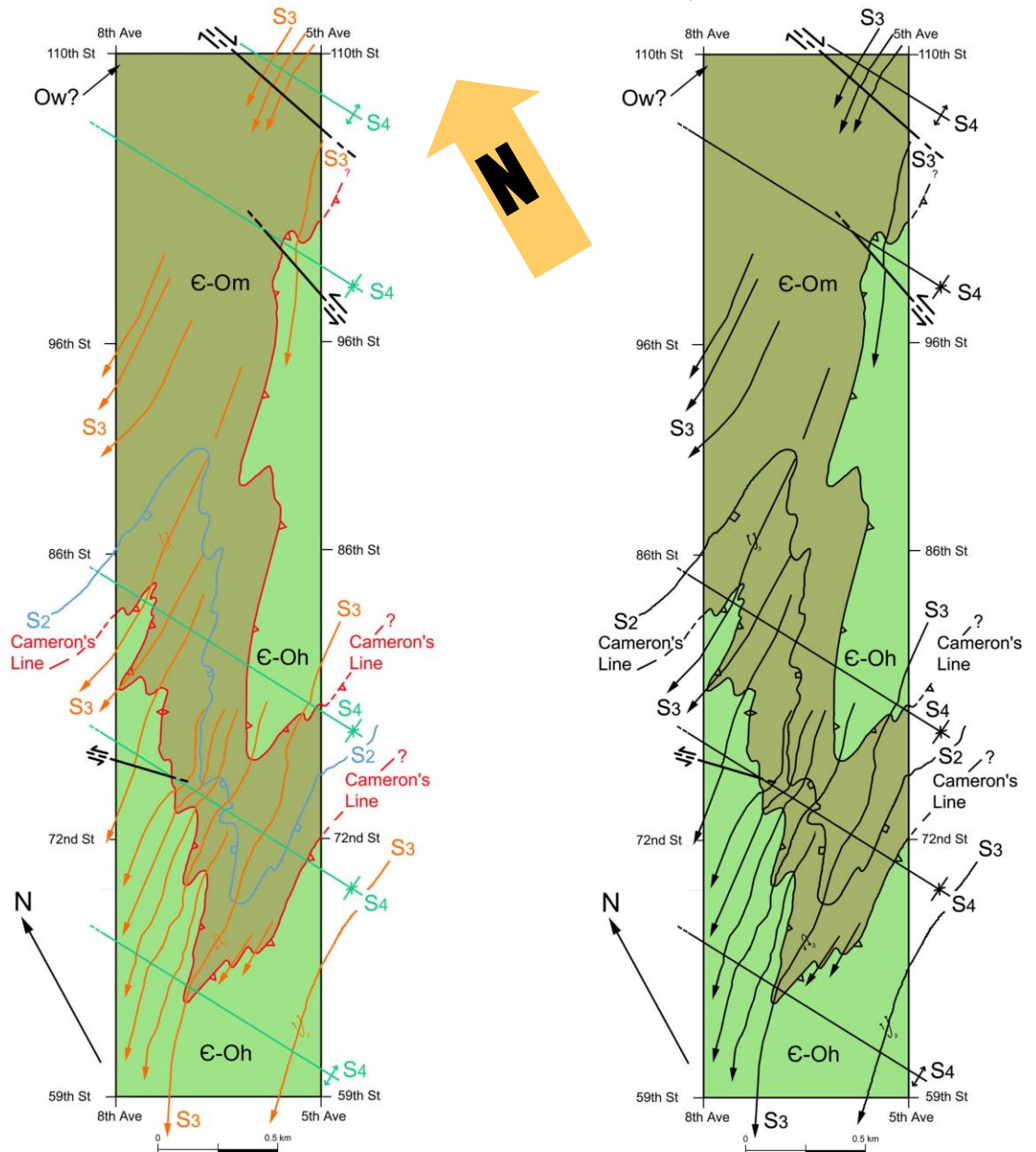


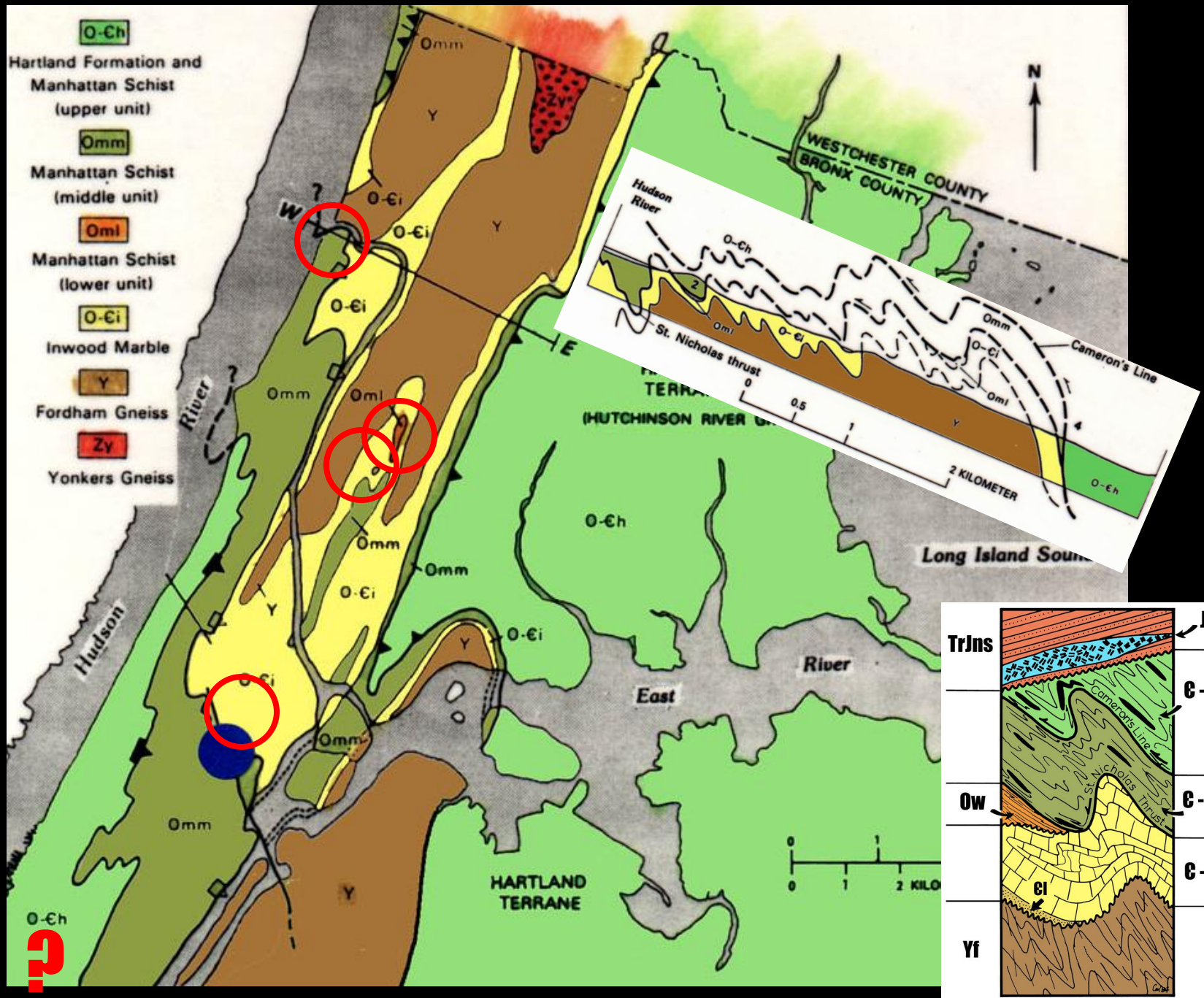
Polydeformed Bedrock

Cameron's Line in Central Park

Merguerian and Merguerian,
2004

PRELIMINARY GEOLOGICAL MAP OF CENTRAL PARK, NYC



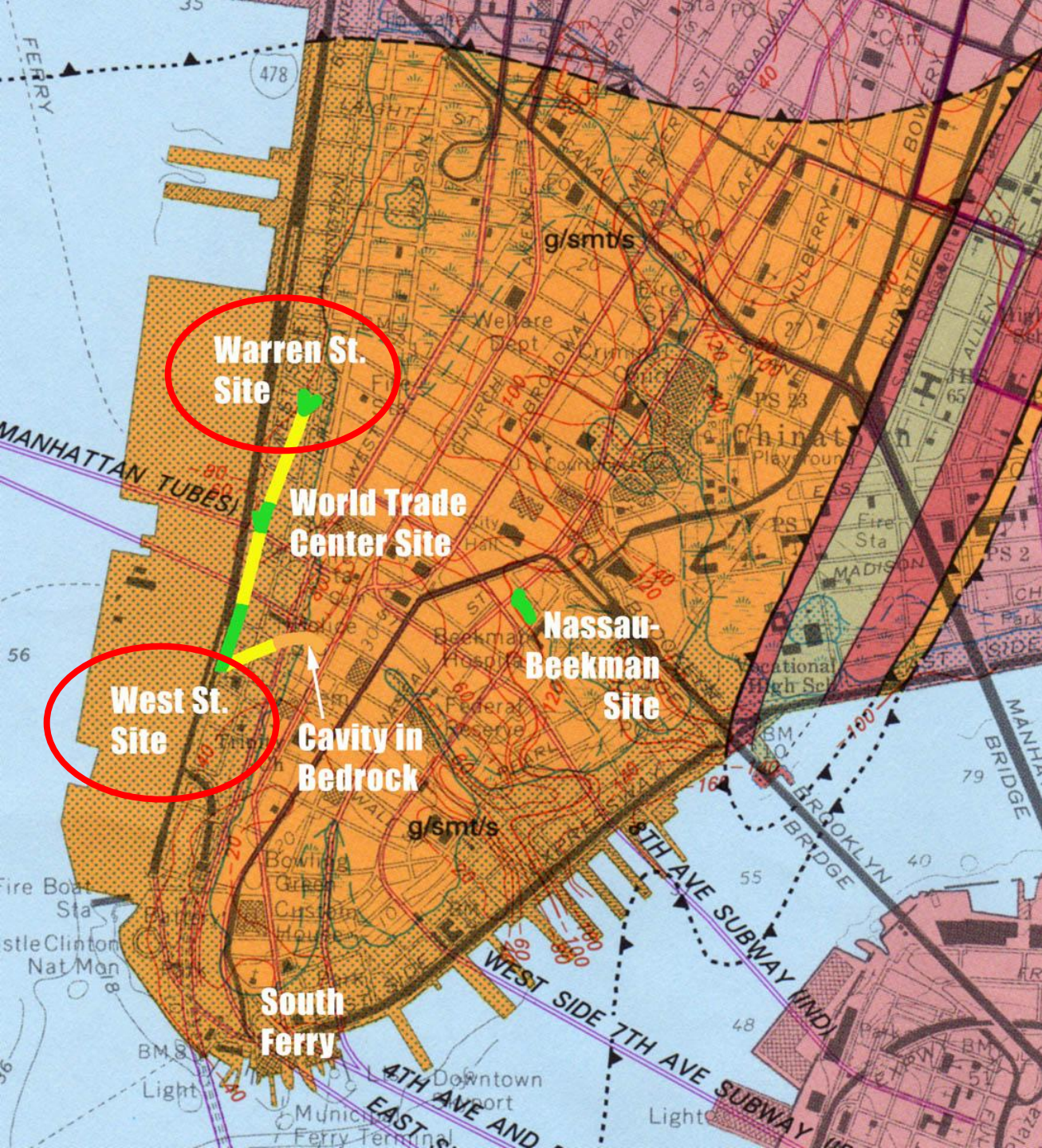


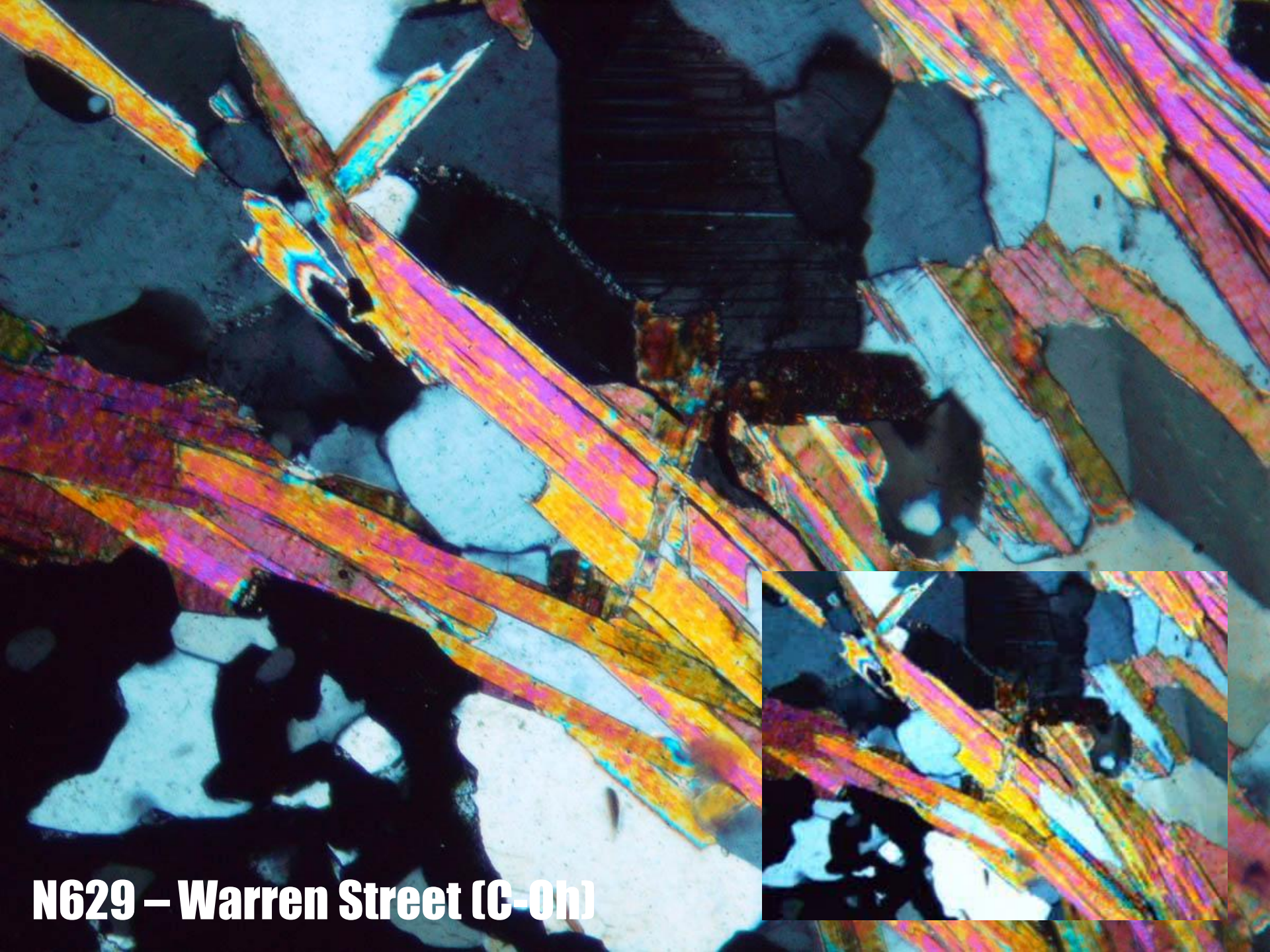
**Four Main
Localities
South of
Canal Street**

**Mapped as
Manhattan!**

**All Display
Sheared
Walloomsac
Rocks!**

after Baskerville 1994

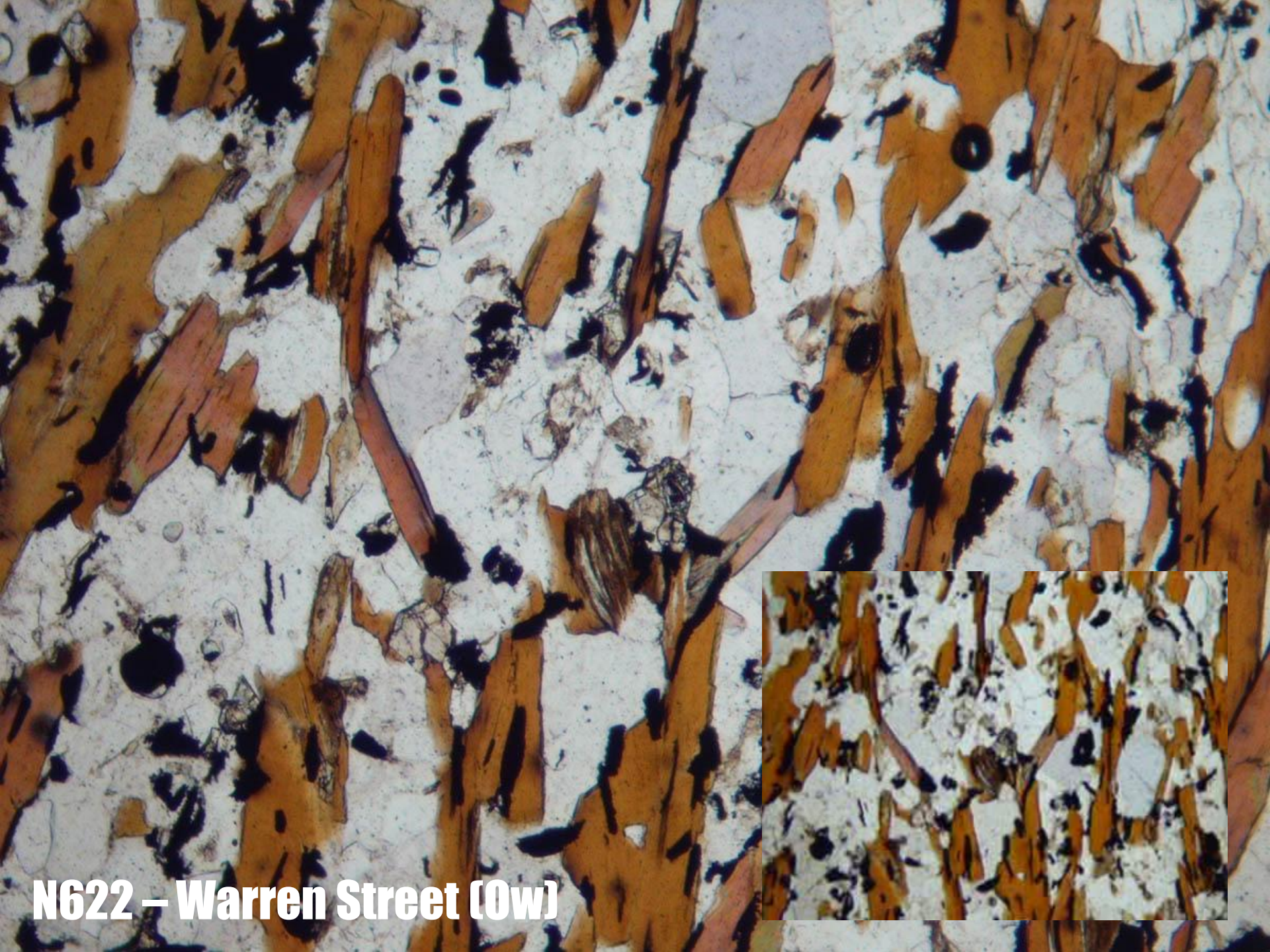




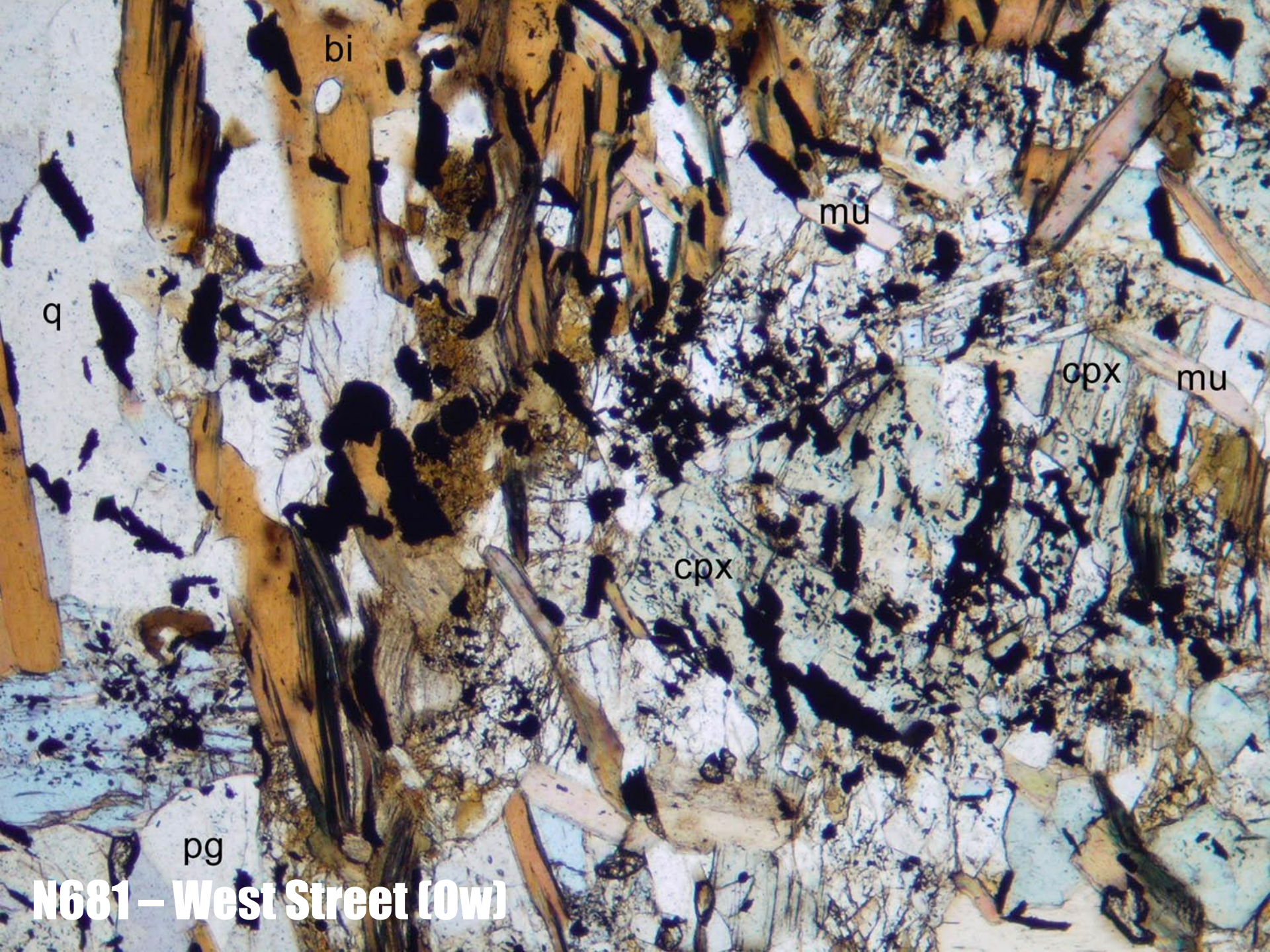
N629 – Warren Street (C-0h)



N631 – Warren Street (0w)



N622 – Warren Street (Ow)



bi

mu

q

cpx

mu

cpx

pg

N681 – West Street (0w)

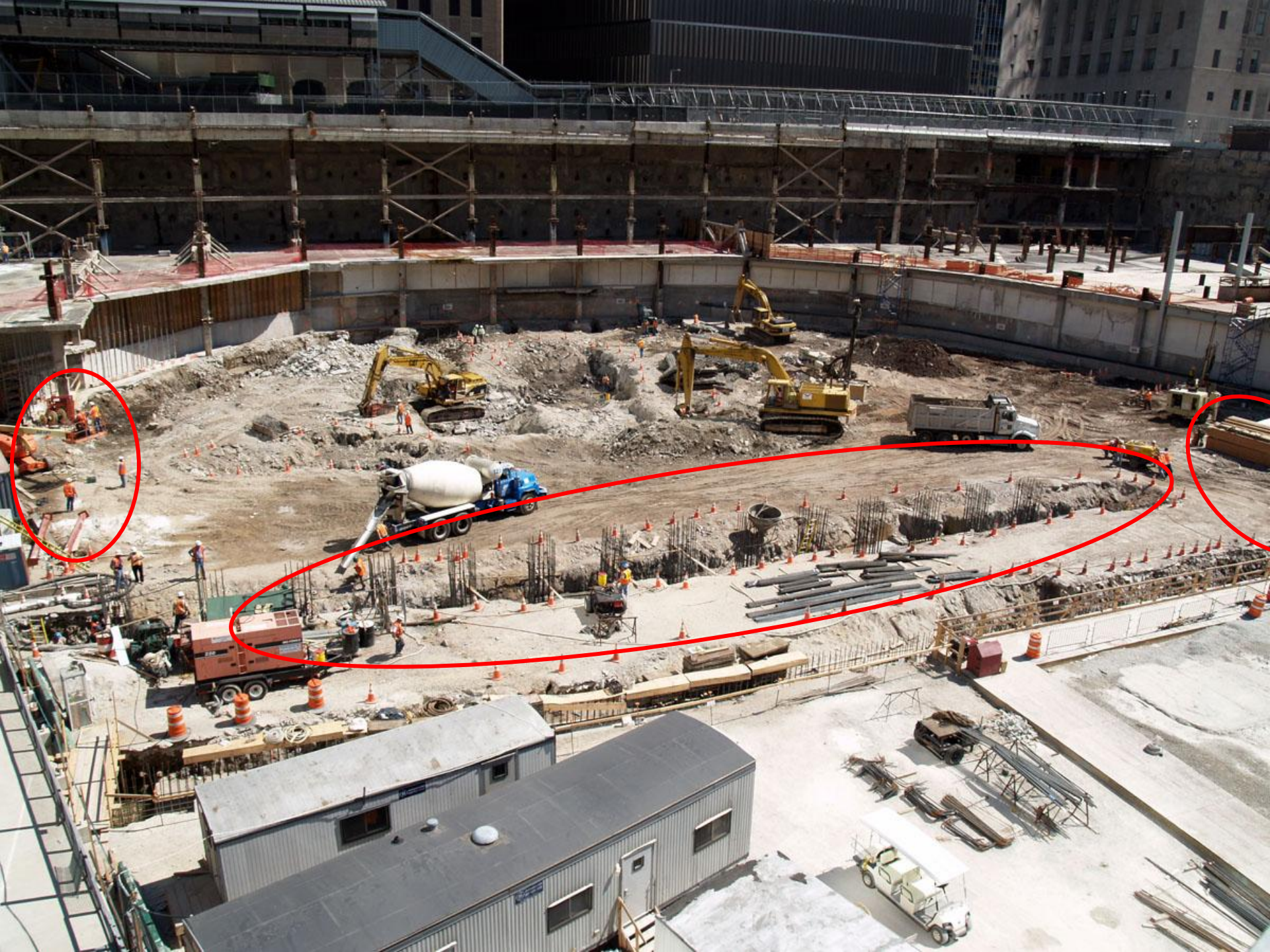
The map shows Lower Manhattan with several proposed sites for the World Trade Center highlighted in red circles: Warren St. Site, World Trade Center Site, Nassau-Beekman Site, and West St. Site. A yellow line connects the West St. Site to the World Trade Center Site, with a green dot indicating a 'Cavity in Bedrock' near the Nassau-Beekman Site. The map includes street names, subway lines, and landmarks like the Statue of Liberty and the Empire State Building.

The map displays Lower Manhattan with various landmarks and transportation routes. Key features include:

- Warren St. Site:** Located near the top left, marked with a red circle and a green dot.
- World Trade Center Site:** Located in the center, marked with a red circle and a green dot.
- Nassau-Beekman Site:** Located to the right of the World Trade Center Site, marked with a red circle and a green dot.
- West St. Site:** Located to the left of the World Trade Center Site, marked with a red circle and a green dot.
- Cavity in Bedrock:** Indicated by a white arrow pointing to a specific location near the World Trade Center Site.
- South Ferry:** Located at the bottom left, near the water.
- Manhattan Tubes:** Shown as a purple line running along the left side of the map.
- 8th Ave Subway:** Shown as a dashed line running diagonally across the map.
- West Side 7th Ave Subway:** Shown as a dashed line running diagonally across the map.
- Other Labels:** Includes "g/smt/s", "Chinatown", "Fire Sta", "MADISON", "PS 23", "PS 24", "PS 25", "PS 26", "PS 27", "PS 28", "PS 29", "PS 30", "PS 31", "PS 32", "PS 33", "PS 34", "PS 35", "PS 36", "PS 37", "PS 38", "PS 39", "PS 40", "PS 41", "PS 42", "PS 43", "PS 44", "PS 45", "PS 46", "PS 47", "PS 48", "PS 49", "PS 50", "PS 51", "PS 52", "PS 53", "PS 54", "PS 55", "PS 56", "PS 57", "PS 58", "PS 59", "PS 60", "PS 61", "PS 62", "PS 63", "PS 64", "PS 65", "PS 66", "PS 67", "PS 68", "PS 69", "PS 70", "PS 71", "PS 72", "PS 73", "PS 74", "PS 75", "PS 76", "PS 77", "PS 78", "PS 79", "PS 80", "PS 81", "PS 82", "PS 83", "PS 84", "PS 85", "PS 86", "PS 87", "PS 88", "PS 89", "PS 90", "PS 91", "PS 92", "PS 93", "PS 94", "PS 95", "PS 96", "PS 97", "PS 98", "PS 99", "PS 100".

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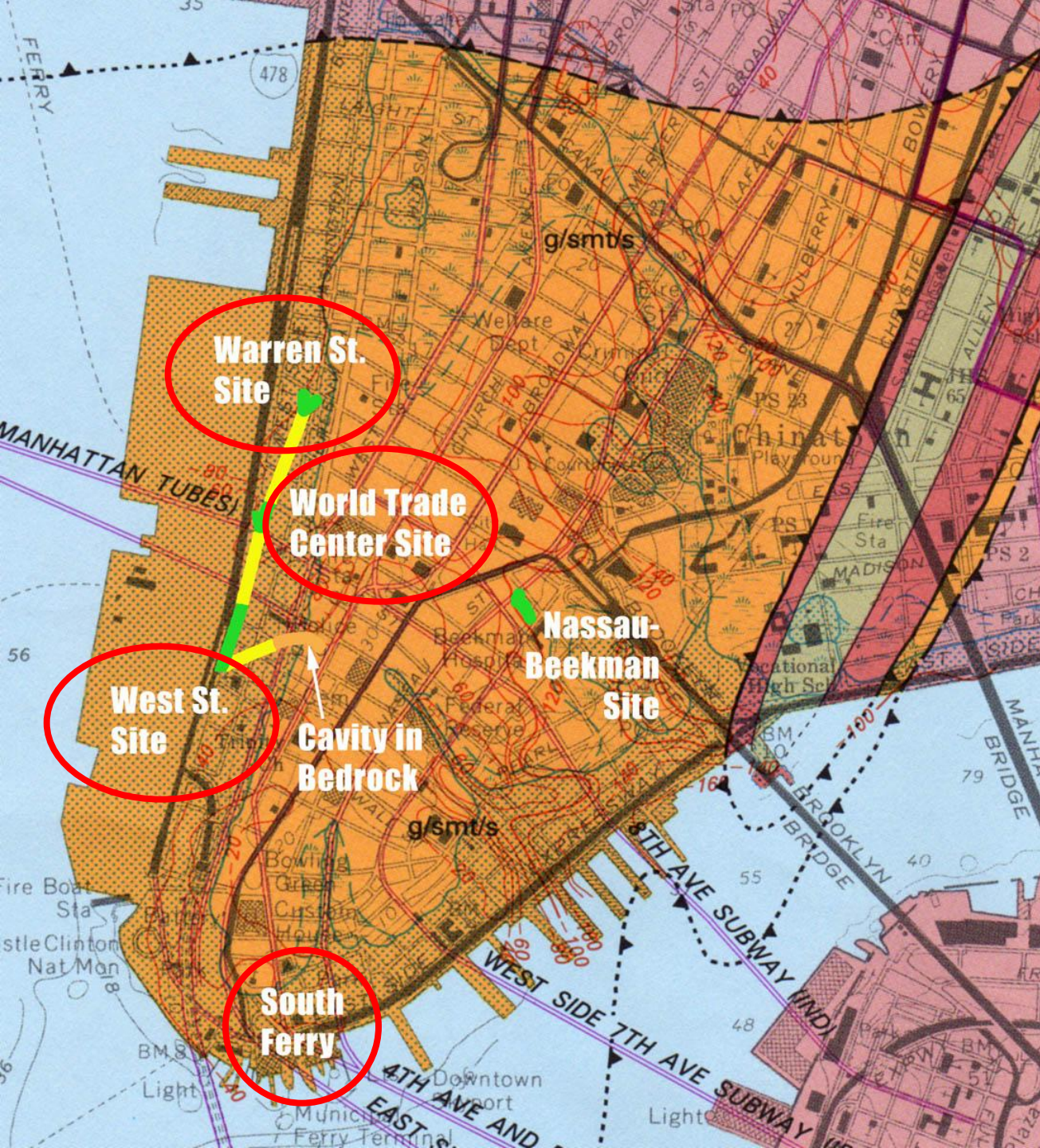
**Mostly Hartland Schist
and Granofels
WITH
Walloomsac Schist
and Calc-silicate**





**WTC East Wall
Sheared Walloomsac
Calc-silicate rock
and Graphitic Schist**





**Four Main
Localities
South of
Canal Street**

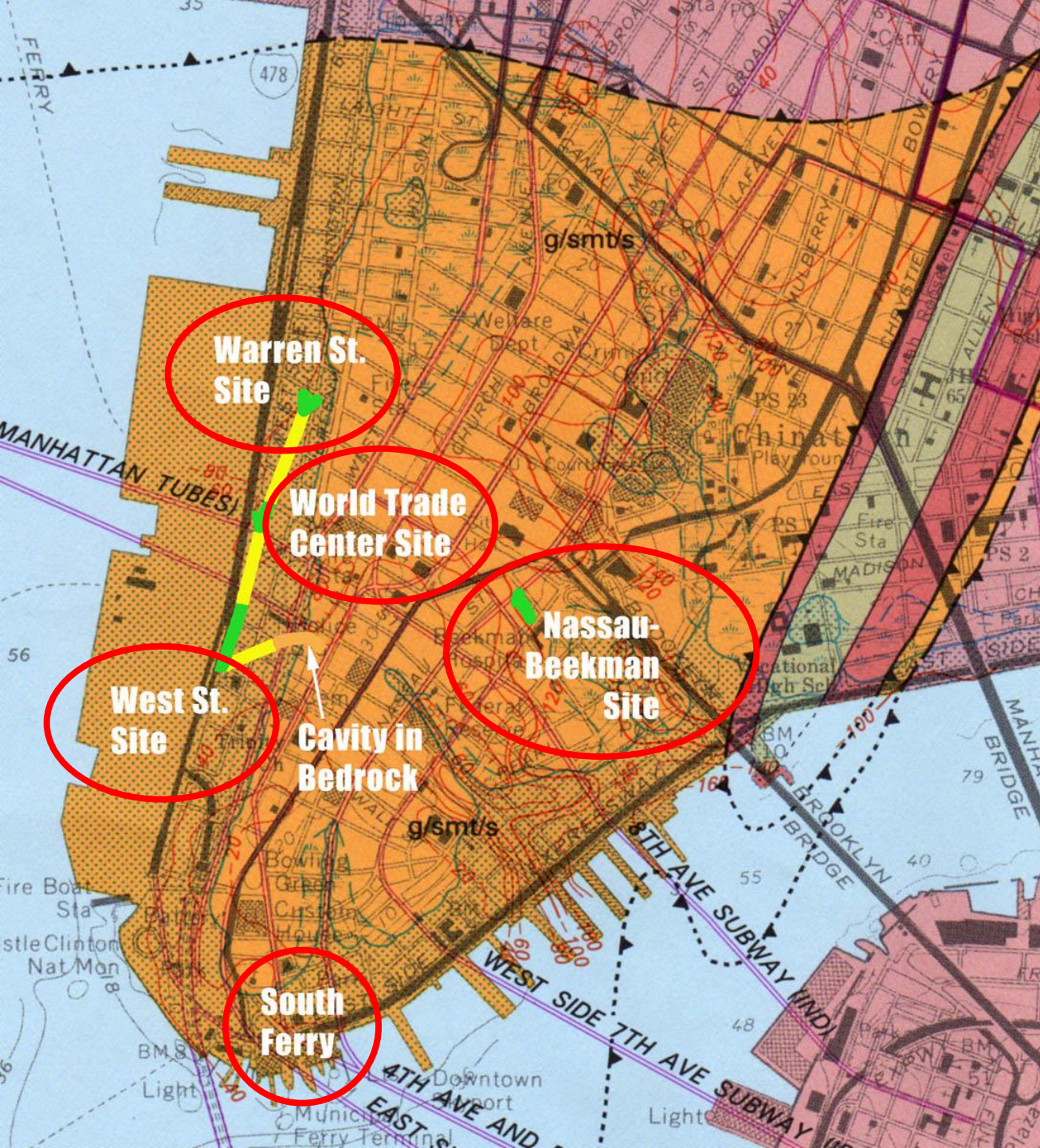
**All Display
Sheared
Walloomsac
Rocks!**

after Baskerville 1994



Sheared Hartland and Manhattan Schist



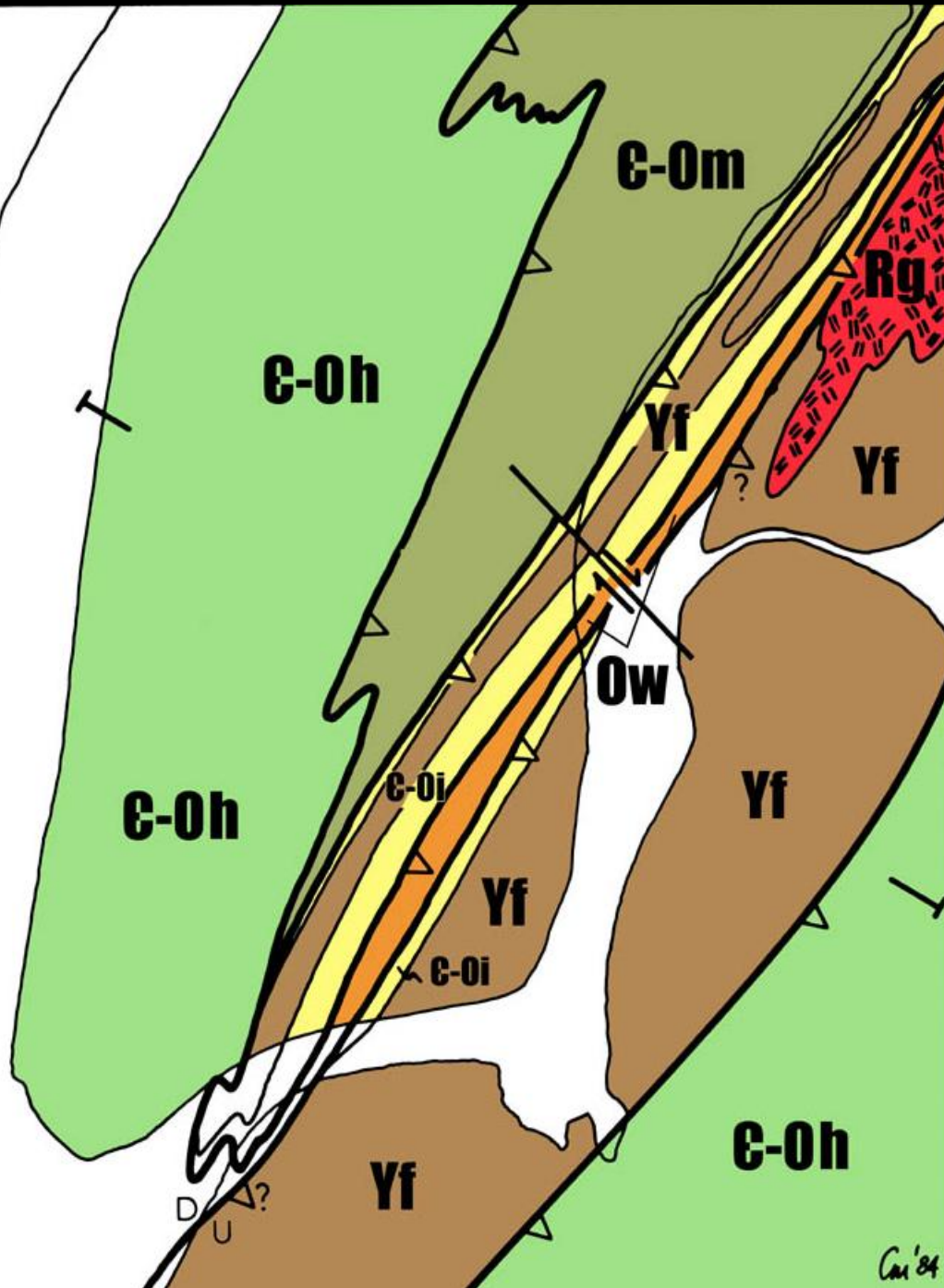


**Four Main
Localities
South of
Canal Street**

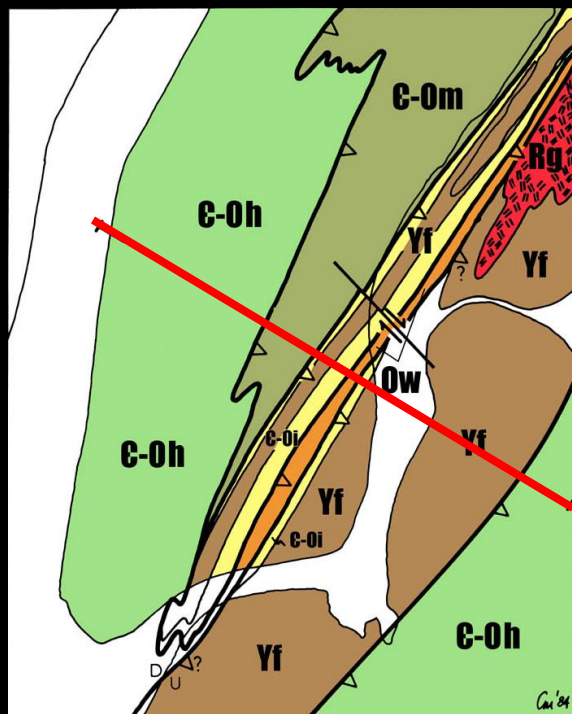
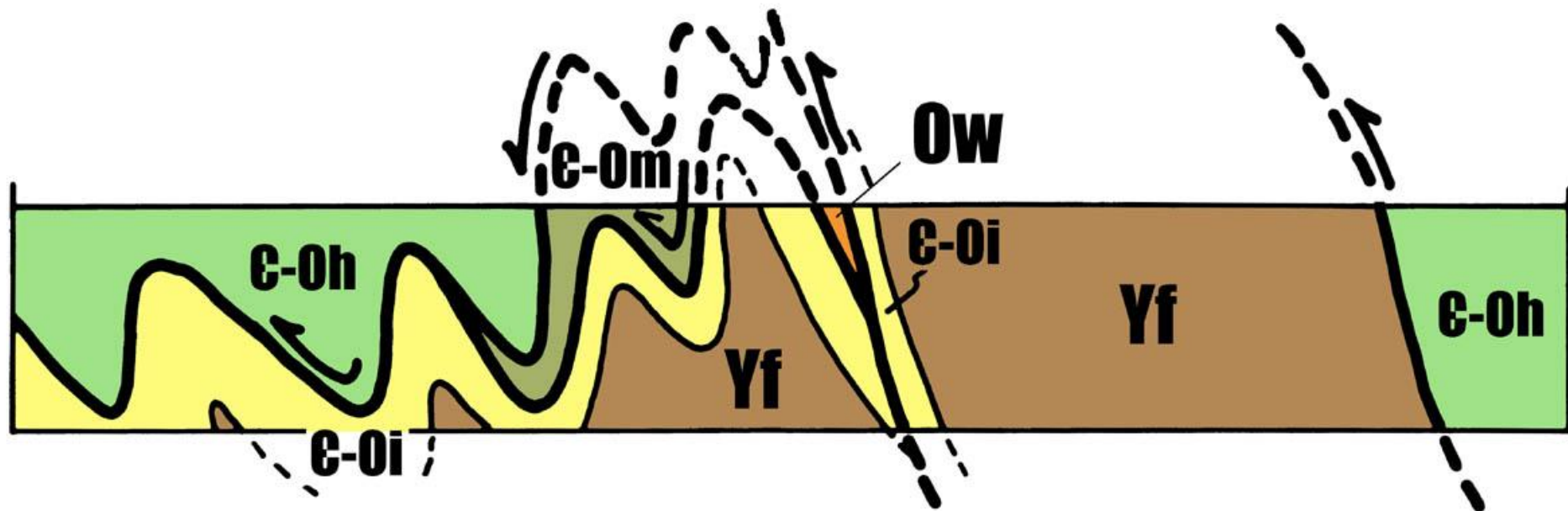
**All Display
Sheared
Walloomsac
Rocks!**

after Baskerville 1994

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



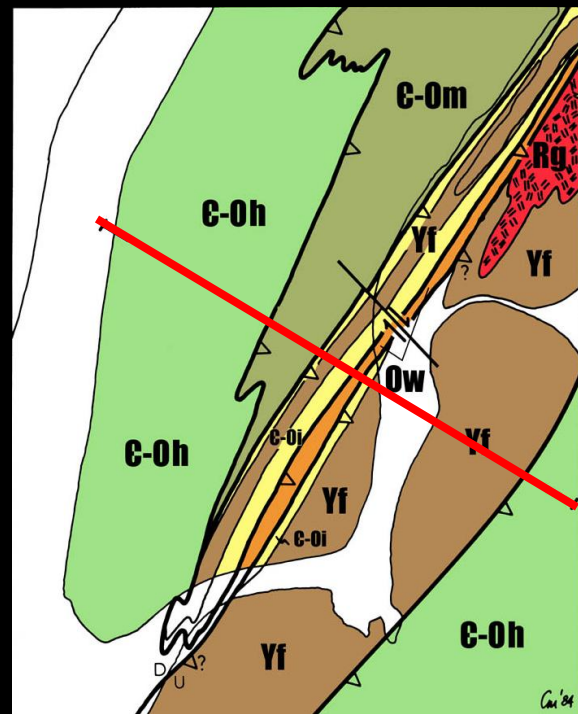
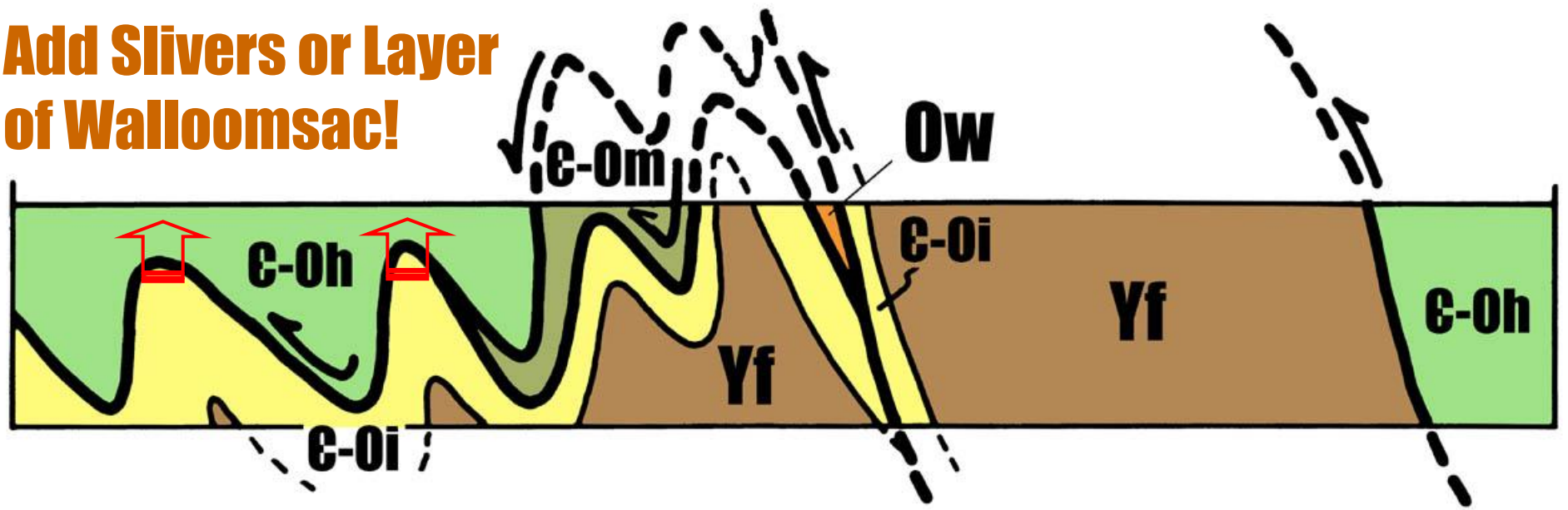
Merguerian, 1984



Interpretive NW-SE Geologic Section Based on Berkey 1910 Boring Data

Merguerian, 1984

Add Slivers or Layer of Walloomsac!



**Interpretive NW-SE
Geologic Section Based
on Berkey 1910 Boring Data**

Merguerian, ~~1934~~ (2006)



Thanks For Coming



