

# Western New York Nuclear Service Center

## Geology Overview

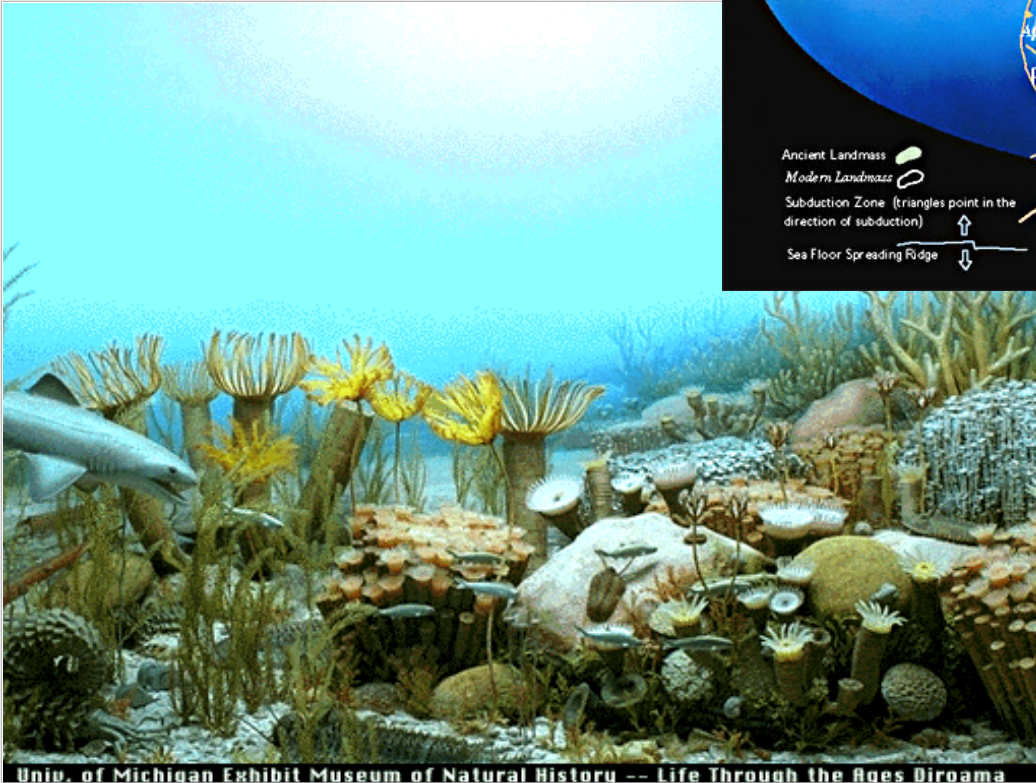
Presented by: Paul J. Bembia

May 16, 2013

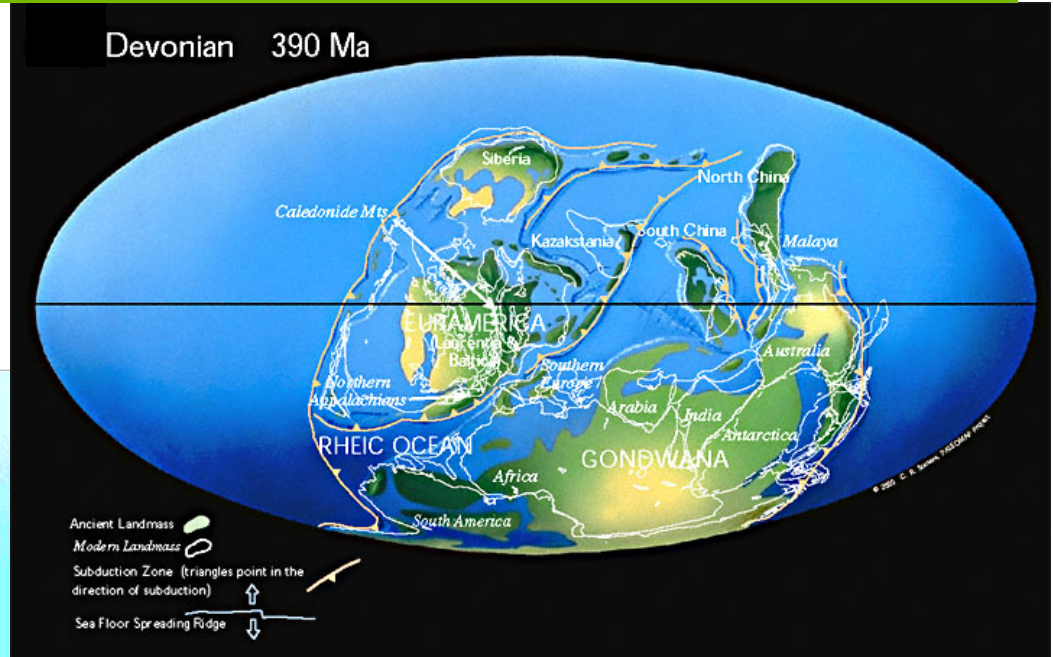
# Western New York Bedrock Geology

## Western New York in the Middle Devonian Period

390 Million Years Ago



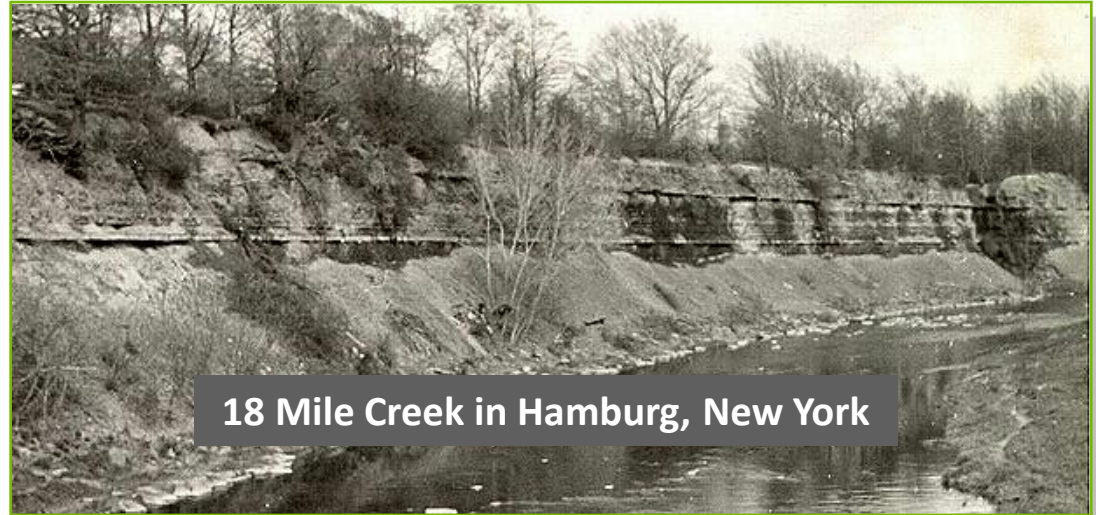
Univ. of Michigan Exhibit Museum of Natural History -- Life Through the Ages Diorama



Modified from Scotese, C.R., 2002,  
<http://www.scotese.com>, (PALEOMAP website).

# Bedrock Geology

The sediment from the shallow ocean that covered Western New York 350-400 million years ago is now sedimentary rock.



18 Mile Creek in Hamburg, New York

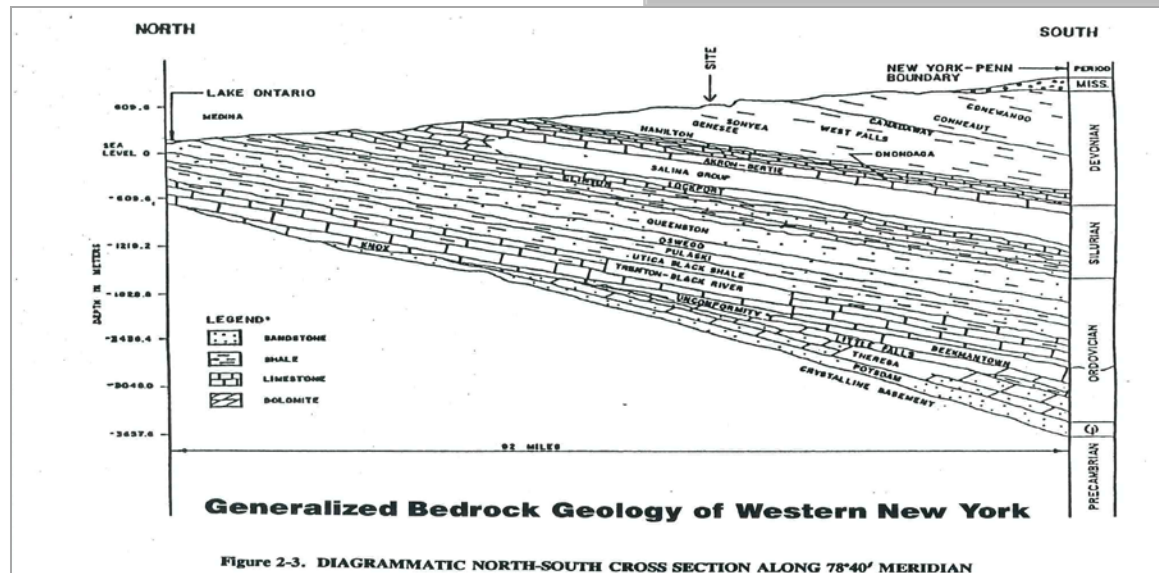


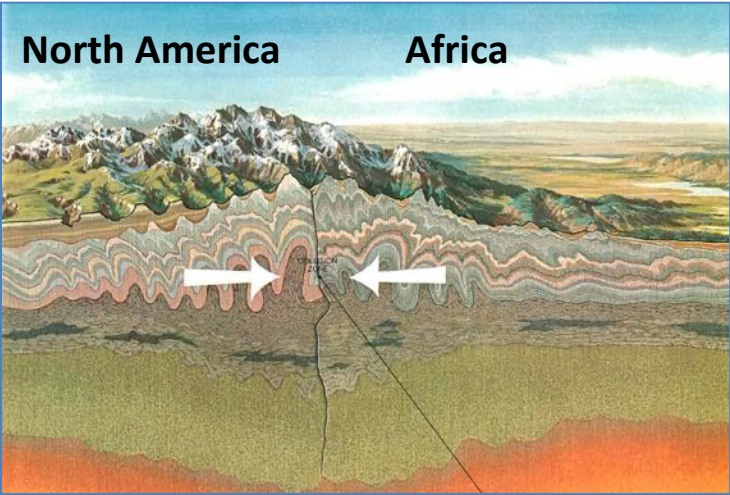
Figure 2-3. DIAGRAMMATIC NORTH-SOUTH CROSS SECTION ALONG 78°40' MERIDIAN

10,000 feet of sedimentary rock underlie the Western New York Nuclear Service Center

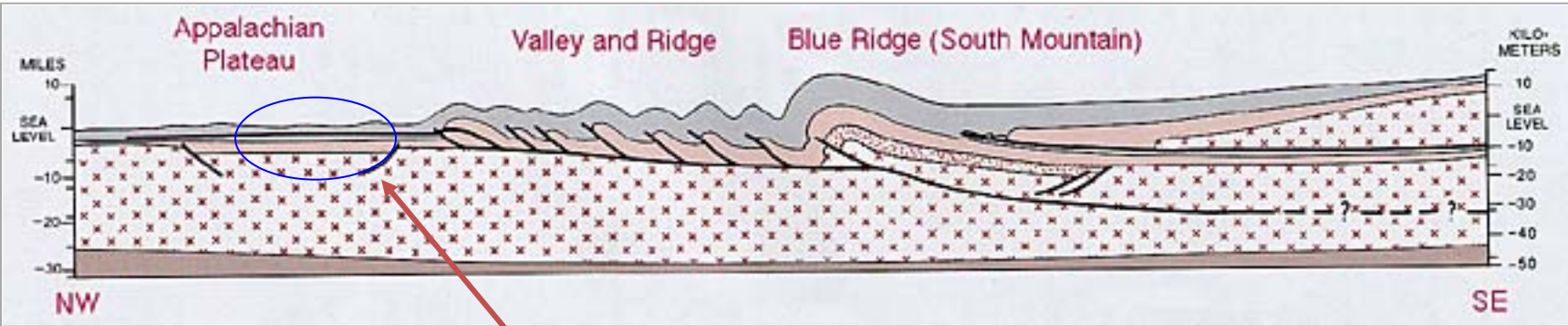


# Bedrock Geology

300 million years ago, continents that are now North America/Europe and Africa collide, and the flat-lying rocks are deformed.



*Cross Section – SE Pennsylvania to Western New York*



Bedrock in WNY is tilted slightly to the south from the continental collision with Africa.

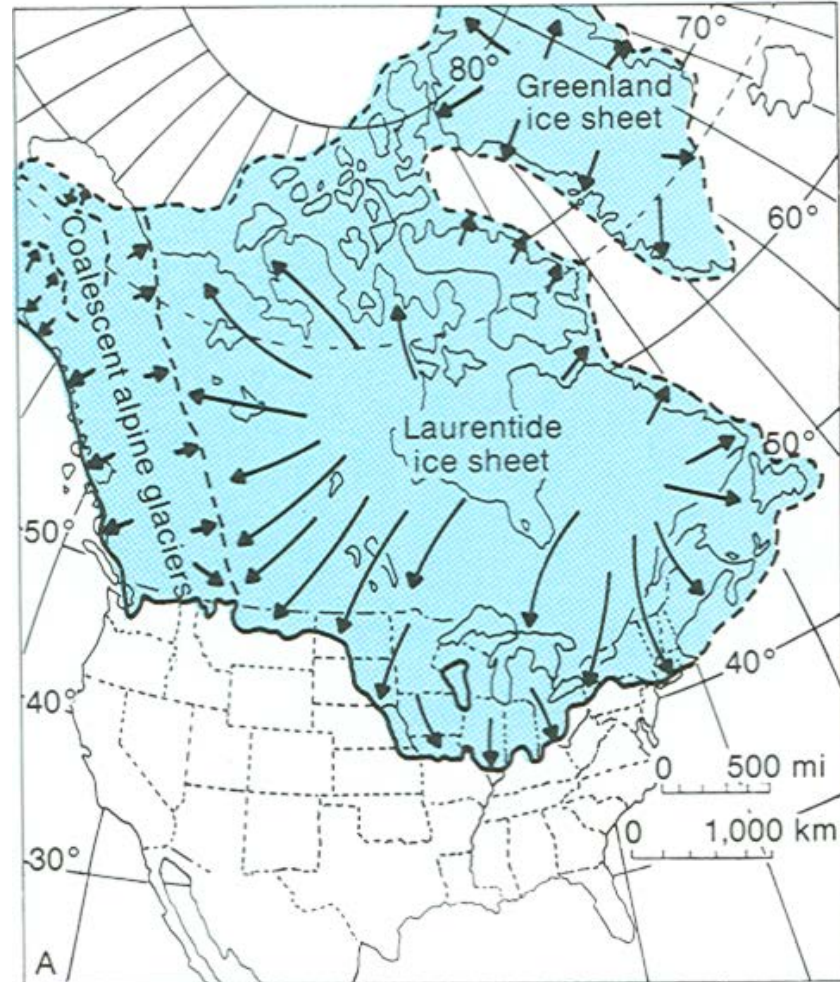
# Glaciers Modify the Landscape



**Arctic Ice Sheet**

[www.krug.com.by/work-archives-arctic.html](http://www.krug.com.by/work-archives-arctic.html)

**Continental ice sheets advanced into Western New York during the last ice age – from 1.6 million years ago to 12,000 years ago.**



**Limit of Pleistocene Ice Sheets of North America**



# Glacial Deposits Cover the Bedrock

**Glaciers grind up bedrock as they advance into an area and can leave thick deposits of sediment. Glaciers release vast quantities of water and sort and transport sediment as they melt and withdraw from an area.**

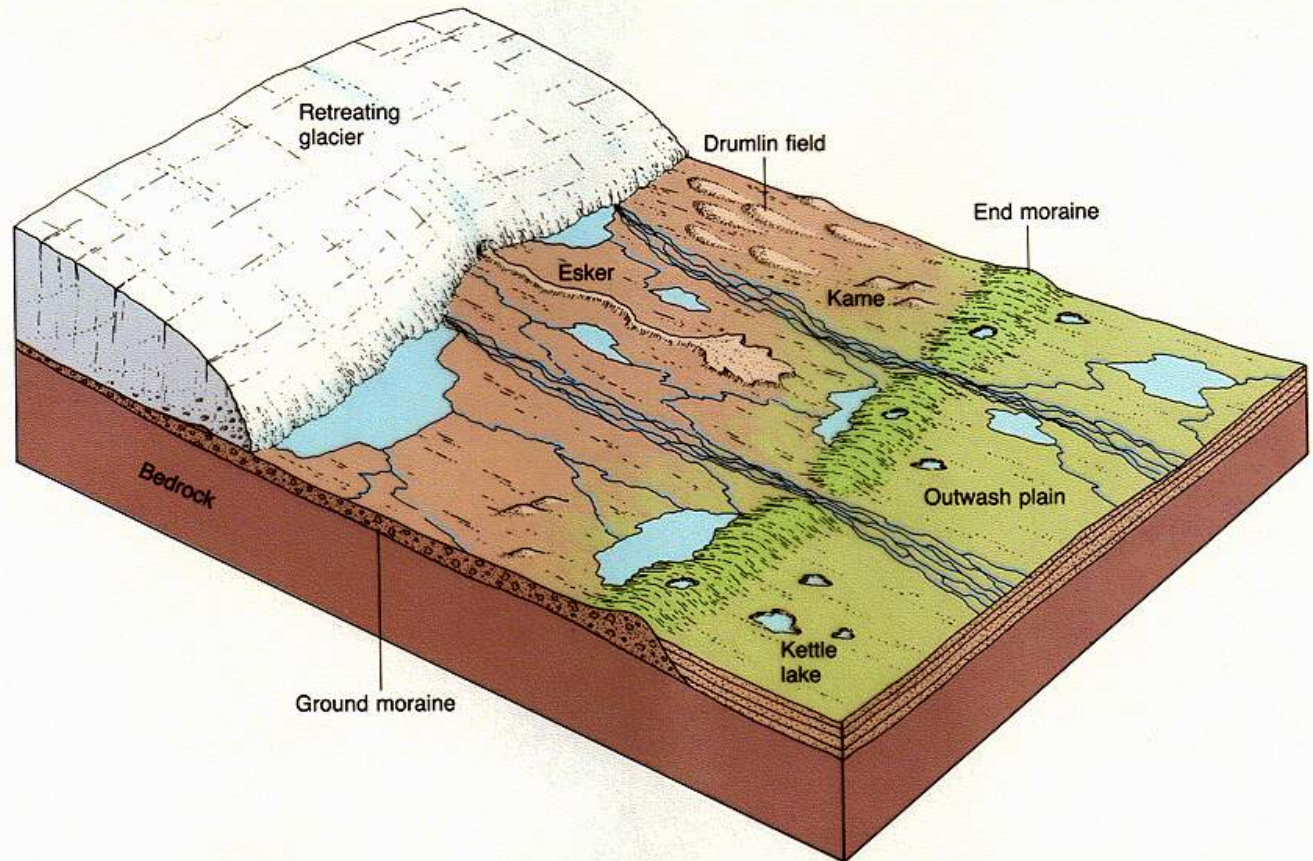


Figure - School of Geology & Geophysics  
University of Oklahoma



# Glacial Deposits Cover the Bedrock

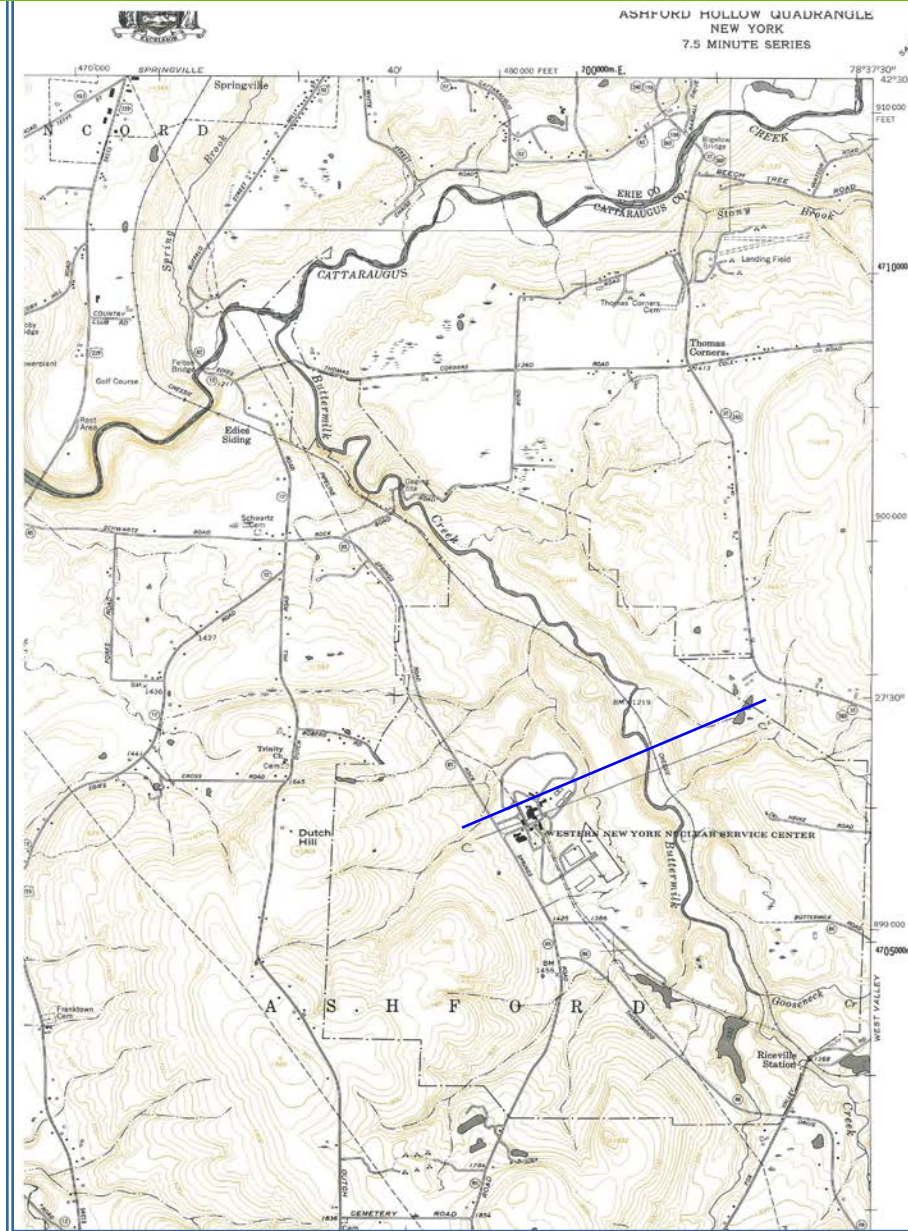


**Site Glacial  
Deposits**



# Cross Section Line

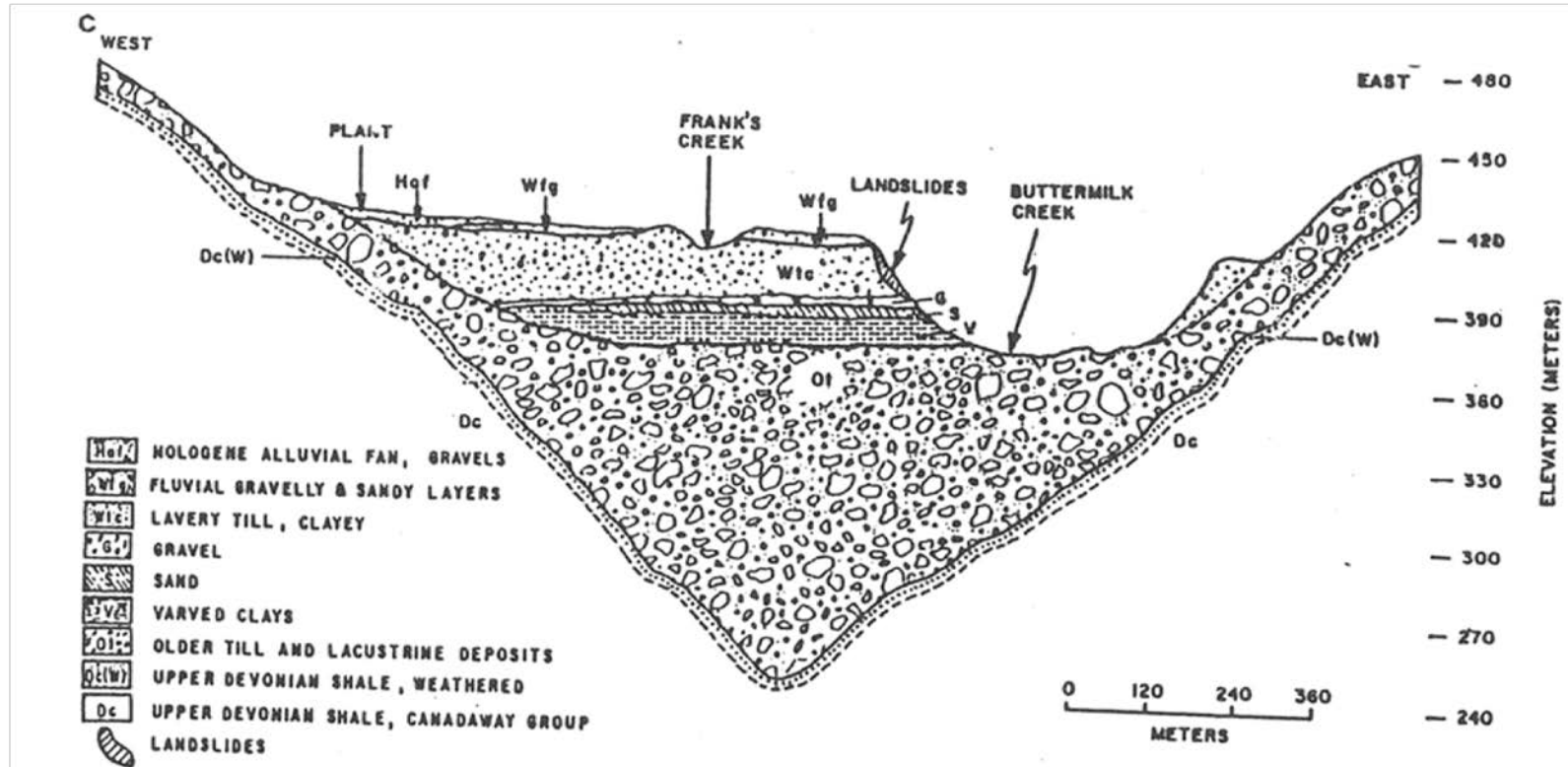
Northeast portion  
of Ashford Hollow,  
NY, 7.5 Minute  
Quadrangle



NYS DOT, 1988

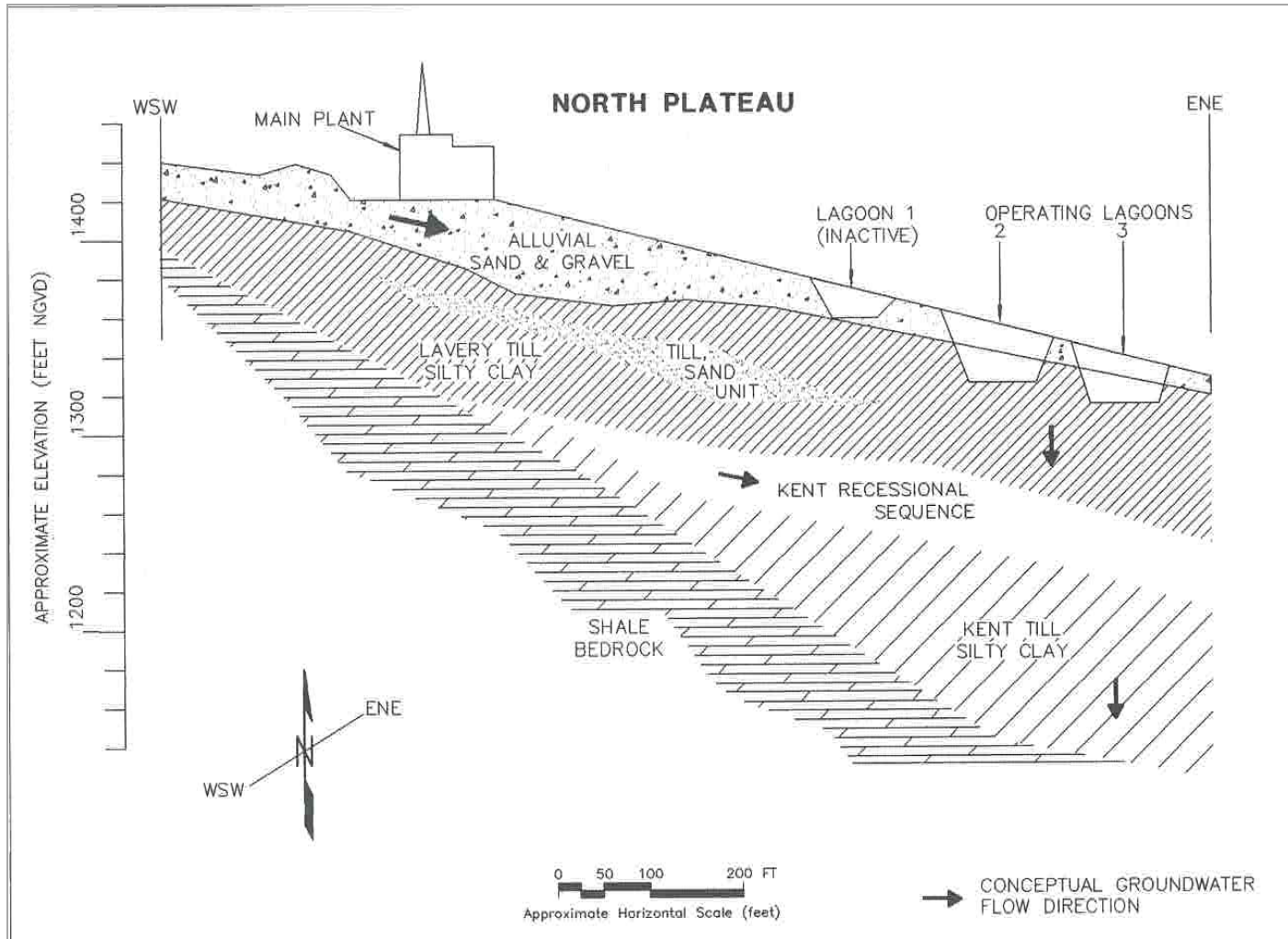


# Geologic Cross Section of the Buried Central Valley at the WNYNSC



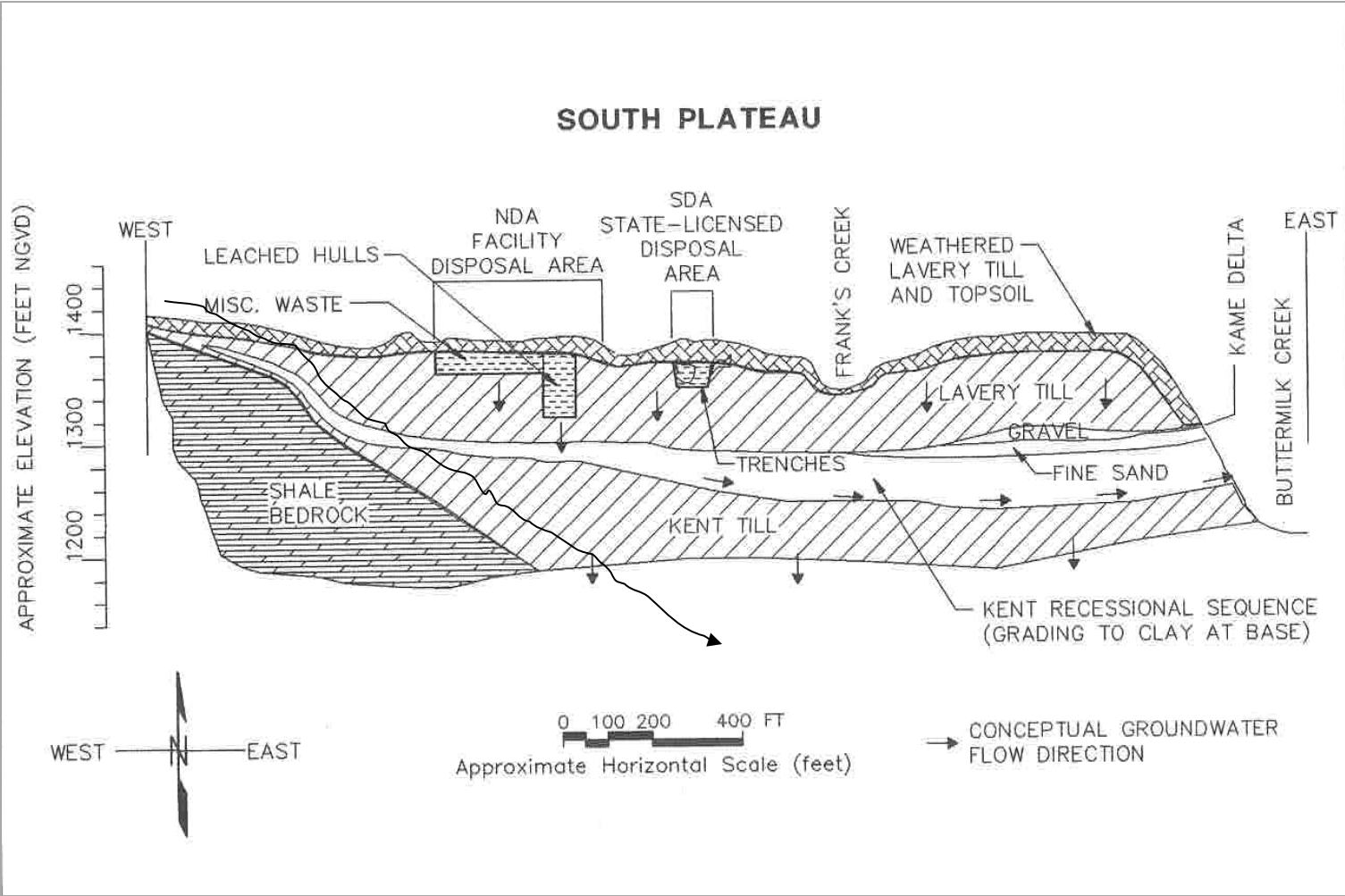
NOTE: Vertical Scale = ¼ horizontal scale.  
Adapted from Dana et al. (1979a)

# North Plateau Geology

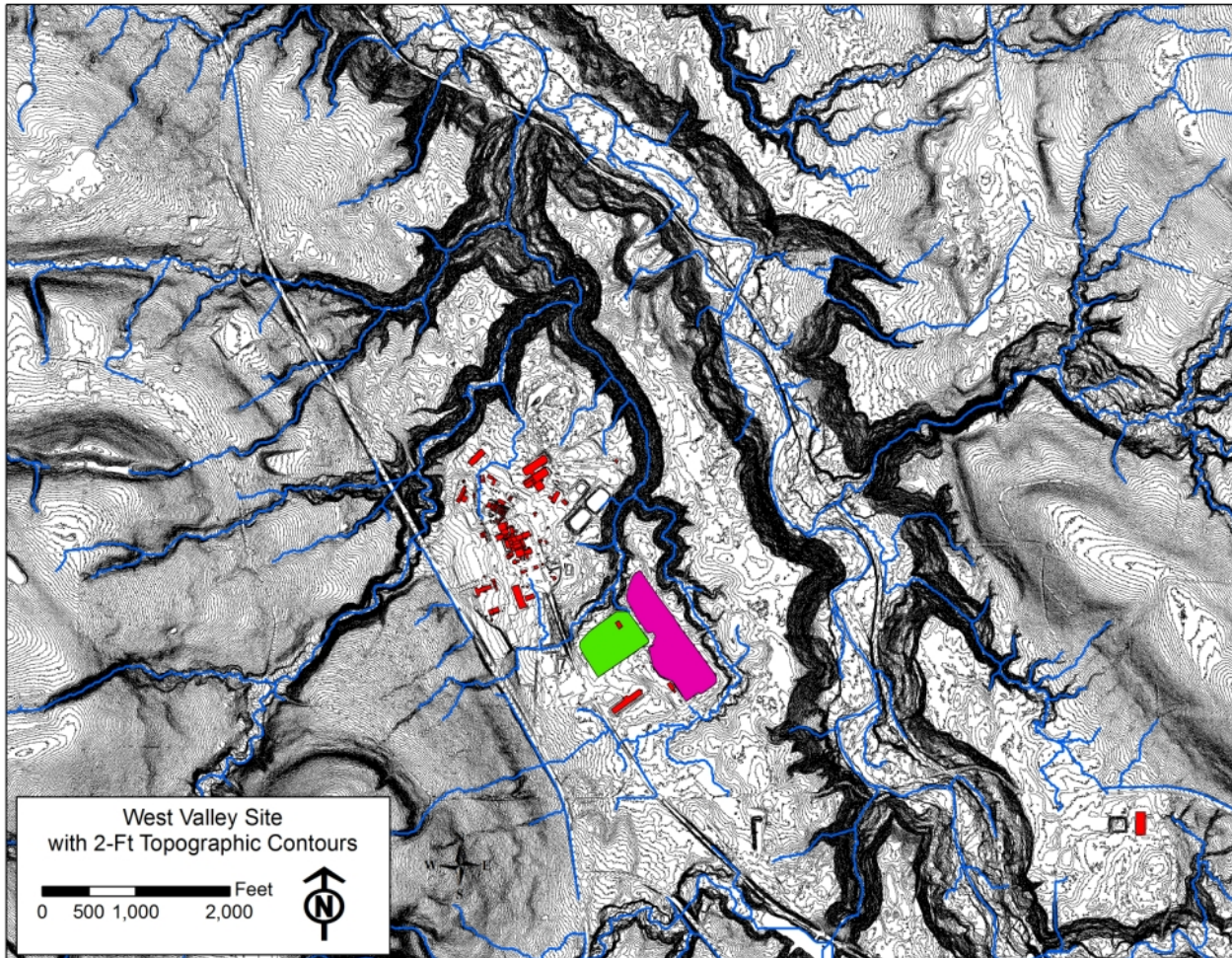




# South Plateau Geology



# Erosion is a Significant Long-Term Issue



- Erosion is bisecting the landscape
- Gullies are growing and lengthening
- Streams are advancing by headward erosion