

Geologic Journey: The Great Lakes

The geology of the Great Lakes region of North America contains evidence of a number of episodes in Earth's history. Fill in the missing spaces marked by asterisks (*) in the table below to complete the analysis of the geologic history of the area as revealed in the documentary.

Geologic Feature	Age (years)	Age Determination	Geologic Interpretation
Erosion by Niagara Falls	Today	direct measurement (rate: 1.2 m/yr)	By measuring the length of the gorge and the rate at which is eroded, it became clear by Charles Lyell that Earth must be much older than believed at the time.
Filling of lake by glacial melt water	After 8,522	logical deduction	This perhaps catastrophic event flooded the area and drown the forest the tree lived in as the glaciers melted.
Dead tree at bottom of lake	8,522	*	Allowed geologist to determine that there was a forest in the area that was cover by neither glacial ice nor lake water.
Glacial till	~20,000	time of greatest glacial advance in last Ice Age	*
Limestone	Silurian Period (~400,000,000)	biostratigraphy	The rocks contain reef organisms that would have thrived in the tropics, indicating that the North American plate (including the Michigan basin) was located at the equator.
Salt Deposits	*	*	Evaporite deposits formed from evaporating seawater formed at the edges of the Michigan basin.
Limestone	Silurian Period (~400,000,000)	biostratigraphy	The rocks contain reef organisms that would have thrived in the tropics, indicating that the North American plate (including the Michigan basin) was located at the equator.
Folded metamorphic rocks	~1,100,000,000	*	Eroded roots of the Grenville mountains that were formed by the collision that formed the ancient Supercontinent Rodinia. The fact that the rocks are folded and highly metamorphosed indicates that many kilometers of rocks had been eroded from above the rocks that are now exposed on the surface of the Earth.

Relative Age Techniques: biostratigraphy (faunal succession), superposition, cross-cutting, inclusion;

Absolute Age Technique: radiometric dating (Uranium-Lead dating, radiocarbon dating)