Geology of the Great Lakes

Name

Institution

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The Great Lakes include Lake Superior, Lake Michigan, Lake Huron, Lake Erie, and Lake Ontario on the US-Canadian perimeter. These lakes are the biggest freshwater basin on the planet. They make up for 20 percent of the freshwater bodies on Earth at six quadrillion gallons. They have an area of 95,160 square miles with more than 3,500 flora and fauna species, incorporating 170 plus fish species. Approximately 14,000 years ago, the Great Lakes region was engulfed with a half-mile plus thick glacier. It eventually liquefied due to warming and gradually moved towards Canada, leaving back a succession of huge depressions that filled up with water, thus making up the basic structure of the present Great Lakes (Hough, 2003).

In the Paleozoic period, around six hundred million years ago, mid-North America was engulfed by a low sea, which had salts, sand, and silts that compacted into sandstone, limestone, gypsum, shale, and halite over time. The sea then receded from the Great Lakes area, and in due course, the earth began cooling. In the Pleistocene period, around 1 million years ago, the ice ages commenced, and glaciers proceeded and receded severally in the Great Lakes region, leveling and carving huge holes in the earth. They experienced resistant bedrock like volcanic residues; only the overlying layers were taken out. The softer shale and sandstone enabled the glaciers to excavate the enormous basins that contain the Great Lakes today (Medaris, 1983).

The foundational geology formulating the present-day Great Lakes was established from approximately 1,000 years ago, during the final glacial era. Two preceding amalgamated tectonic plates split apart, and the Laurentide ice mass ebbed and fashioned the Midcontinent Rift that passed the Great Lakes Tectonic Zone. It formed a valley, which produced a basin that consequently became today's Lake Superior. A second fault line formed

the Saint Lawrence rift, which created the basis for Lakes Ontario, Lake Erie, and Saint Lawrence River.

The glaciers melted, and their edges created rock formations and high ridges, while water accumulated in their interior, originating from the receding ice fronts. The cause of this was warmer earth conditions after the ice age period, which resulted to glaciers dissolving, and the resultant molten water filled the enormous holes left from the glaciers. The lakes were much bigger than the present size and had different river outlets, but as the ice receded, Saint Lawrence River Valley became the outlet to the Atlantic Ocean, and the Great Lakes levels subsequently became the present size. The recoil of the ice accumulation left behind a massive amount of molten water that occupied the basins that the glaciers had carved, therefore creating the present Great Lakes (Holman, 1995).

Due to the jagged mechanisms of glacier erosion, several hills that were more elevated became the Great Lakes islands. The earth beneath the glaciers returned to normal because it was uncovered. Lake Ontario's shores have wetlands, Lake Superior has a rocky shore, and Lake Michigan's shorelines have sand dunes, which all absorb the wind and wave energy from the Great Lakes to shield the inland region.

Several rivers and tributaries connect the Great Lakes. For instance, the Straits of Mackinac connect Lake Huron and Lake Michigan, Niagara River connects Lake Ontario and Lake Erie, and Saint Lawrence River connects Lake Ontario to the Gulf of Saint Lawrence, up into the Atlantic Ocean. The Great Lakes have over 30,000 islands with Lake Huron's Manitoulin Island being the largest island on Earth in an inland water body with an area of 1,068 square miles (Grady, Litteljohn, and Damstra, 2007).

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