

Geology

The rock formations of the Manitoba Escarpment constitute a very small window (80-90 m.y.) on Manitoba's geological past. In order to understand how those sediments were deposited, we have to broaden our view to include the history of the world and North America during the Late Cretaceous Period (136-65 m.y.).

At that time the continents were being pulled apart by tectonic forces continuing their migration that started during the Triassic Period. New oceans were formed in rift zones similar to today's Rift Valley of East Africa and globally the weather was very warm and humid. The ice caps had totally melted, even on Antarctica, causing a worldwide rise in sea levels. The middle of the continent, North America was at relatively low elevation relative to the world's oceans and was thus covered by a body of water separating the continent in two separate land masses.

The Western Interior Seaway, stretched from the Arctic Ocean to the Gulf of Mexico. During the Cretaceous the Seaway was very dynamic, its levels and boundaries shifting constantly, depositing cyclical sequences of sediments that geologists call cyclothem.

The Appalachian Mountains to the East rose during the Triassic Period and were by this time, already old and worn down by erosion. They contributed little to the influx of sediments to the Seaway.

The situation on the western side of the continent was very different. The Rocky Mountains were newly formed. They towered high above the land and were accompanied by very violent volcanic activity. Large volumes of sediments were carried by streams, rivers and wind to the Seaway.

The rock sequences that we observe on the Manitoba escarpment were deposited in that warm shallow sea during the Late Cretaceous (80-90 m.y.) and consist mainly of marine shales with some units containing thin bands of bentonite. Bentonite is a type of clay formed by the alteration of volcanic ash by seawater and is used industrially to absorb impurities in liquids. In the Morden-Miami area these deposits started to be mined commercially in the 1930's. Most of the creamy white to yellow bentonite that we see today is exposed at old quarries and pits or in gullies where streams have cut through the overlying blanket of glacial sediments deposited during the last ice age.