Brown County
Wisconsin
Shaded Relief Map

Brown County's Landscape
does not have mountains or deep canyons.

However, there are plenty of interesting landforms.

A shaded relief map like this one will highlight features of the landscape that you may not have known existed. Study this map and you will find plenty of interesting landforms that have both natural and human origins.

Several notable landforms are listed below, along with an index to the map. Use the letters and numbers found along the edge of this map (much like the "battleship grid") to find the following features on the map.

Bedrock features

"The Ledge"

The Niagara Escarpment is one of the well-known landforms in Brown County. It is most prominent on this map near N-18 in the aptly-named Town of Ledgeview. The escarpment consists of bedrock called Niagara Dolomite that is more resistant to erosion than the surrounding rock types. This formation is essentially the same one that forms much of the Door Peninsula, and it arcs all the way around Georgian Bay on Lake Huron and back to the south-southeast between lakes Erie and Ontario–where Niagara Falls plummets from the escarpment (hence the name).

Ice Age features

Drumlins

Thousands of years ago, the great glaciers of the Ice Age left their marks all over Brown County with many different types of landforms. Ice flowed from the north, advancing and retreating many times. At least four major "episodes" of glacial advance and retreat are recorded in the land formations and deposits of the county.

One telltale sign of past glacial activity is a landform known as a "drumlin". These streamlined, elongated hills tell a lot about a glacier, including the direction of ice flow. There are many drumlins in Brown County but there are some particularly interesting "drumlin field" on this map at N-29 in the Town of Morrison. There are dozens of drumlins in this area, but they are part of the Wayside Member of the Horicon Formation, the oldest episode of glacial activity seen in Brown County from the last Ice Age. Note that the direction of these drumlins is very different than other drumlins from younger deposits to the north such as in Pittsfield at coordinate E-6 on this map.

Moraines

Ice sheets receded and again advanced. This next "episode" did not advance as far to the south as the previous; in fact, the prominent east-west trending "terminal moraine" along Park Road in the Town of Morrison (refer to coordinate N-37 on this map) marks the limit of this ice advance. When the ice stops moving, it leaves linear areas of hummocky terrain at the front edge of the glacier. These features are known as "terminal" or "recessional" moraines.

Other moraines that can be seen in Holland and Wrightstown (look in the vicinity of J-28 on this map).

Wind-blown sand dunes

Large areas of thick windblown sand dunes up to 145 feet thick were deposited near the end of Reforestation Road (I-1) and are related to the second to last ice episode in Brown County.

11,000 year old trees

Prior to the final advance of ice across Brown County and eastern Wisconsin (about 11,000 years ago), a coniferous forest grew and flourished as well defined saw of forest materials.

The last advance of ice buried this forest under many feet of thick clay then prevented air from facilitating wood rot and decay. Through erosion and excavation, many intact pieces of this wood have been unearthed in Brown County. The wood that remained much younger than 11,000 years of age. This layer can be seen along quarry walls and other deep excavations in many parts of eastern and northeastern Brown County. This buried forest is very unique in it's formation, age, preservation,... and what it tells us about the conditions of this area during past. This ice is known as the "Two Creeks buried forest" and it has been the subject of many studies and glacial geology textbooks worldwide.

Features left by the final advance of glacial ice

The last episode of ice advance deposited the Denmark Moraine– an east-west line of hummocky terrain near T-23 that begins to the trend somewhat north-south through eastern Washington and Holland Townships, and west of the older terminal moraines.

Other features left by this youngest episode include the Duck Creek Ridge (near H-9) and Pelton & Burton Hills in the same vicinity.

High water

Liquid water also played a major role in shaping Brown County. In addition to the modern rivers, lakes and streams that erode or deposit landforms today, there are several interesting events in natural history that are evident on this map.

Glacial lakes and abandoned outflow channels

Whenever the natural drainage of water to the north was blocked by thick glaciers in the bay, water ponded against the ice in the Fox River Lowland forming "proglacial lakes". "Glacial Lake Oshkosh" reached a depth of about 220 feet above the present level of the Fox Valley, covering much of Brown County under water. At its maximum depth, this lake probably drained west and into the Wisconsin River near Portage, and down the Wisconsin River. As the glacier retreated to the north, a lower part of the Niagara Escarpment at S-17 (near Hwy I-41, 29 and K) was exposed and catastrophically drained through a new outlet to the southeast and on to Lake Michigan. Presently, the Neshota River flows through this valley but it is nowhere near this valley. The sheer size of the valley shows that it was responsible for cutting this channel. Other large glacial lake outflow channels can be seen on this map in the vicinity of K-6, Even lower elevations along the Escarpment existed to the north (such as the Ahnapee River valley) and these too became outlets to Glacial Lake Oshkosh as the glacier receded. By the time the ice retreated north of Sturgeon Bay, Glacial Lake Oshkosh ceased to exist.

Abandoned Shorelines

Long after the glaciers retreated back into Canada, there were other natural processes that caused the water levels of Lake Michigan and the bay to fluctuate. One particularly long period of high water occurred between 5500 and 6000 years ago. This "stage" of the Great Lakes is known as the "Lake Nipissing" level and was about 27 feet higher than the present level of Lake Michigan and the bay. This elevated shoreline is evident on this map in the form of wave-cut shoreline terraces at N-12 (near Crooks St in downtown Green Bay) as well as the ridge near Packer's Gone St. that leads to Shawano and Oneida streets (K-11). Other shoreline features from this elevated lake level can be found along Nicolet Drive (S-5) and many, other areas.

"Nipissing" level of Lake Michigan and Green Bay. This elevated lake stage existed about 5500 to 6000 years ago, long after the glaciers receded.

It covered much of modern-day areas of Suamico, Howard Green Bay, Allouez Bellevue & Ledgeview

Human impacts to the landscape

Humans have also impacted the landscape features of the County.

Quarries

Quarries are visible at O-5, P-19 and several other places where people have mined the bedrock of the Niagara Escarpment or the sand & gravel left behind by the glaciers and actions of water.

Waterborne Commerce

Coal piles at M-13, M-10 and N-13 made it onto this map. These large coal piles help to fuel the paper industry and are left by ships between 400-800 feet in length. These huge freighters require water depths of more than 20 feet to traverse the Bay and Fox River. Dredging of the shipping channel to this depth can be clearly seen on the deep blue "bathtub" color showing on this map. Commercial shipping no longer occurs south of Georgia-Pacific (M-11) but the remnants of the system of locks, dams and canals that once connected the Green Bay and the Great Lakes to the Fox-Wisconsin-Mississippi waterways are still seen at 3-16, H-21 and D-25.

Airport

The runways of Austin Straubel International Airport can be seen as built-up, flat, linear features near G-13.

Portions of the above text were paraphrased from these sources:

Need, Edward, 1985, "Pleistocene Geology of Brown County, Wisconsin" UW-Extension: Wisconsin Geological and Natural History Survey.

Farrand, William, 1988 Bulletin 4 "The Glacial Lakes around Michigan" University of Michigan.

This map and corresponding text are a compilation and interpretation of the data available at the time of preparation. Every reasonable effort has been made to ensure that this interpretation conforms to accepted scientific and geologic principles; however, the map should not be used to guide site-specific decisions without verification. The proper use of the map is the sole responsibility of the user.

Map last updated January 2011

*Transverse Mercator Projection
Brown County Coordinate System
NAD83 1991 adjustment*

Legend

LANDMARKS
- Airport
- Campground
- Cemetery
- Church
- School / College
- Golf
- Government
- Hospital
- Mall
- Park
- Prison
- Radio / TV Tower
- Navigational Aid
- Major Highway
- Other Highway
- Local Road or Street
- Multi-Use Trail
- Private Road or Street
- Railroad
- Unofficial Road or Street
- Rivers & Streams
- Municipal Boundaries
- Wetland

Surface Elevation

This map highlights just a few of the facets of
Brown County's Geographic Information System (GIS)

What is GIS?

"A GIS is a tool for mapping and analyzing things that exist and events that happen on earth. GIS technology integrates common database operations such as query and statistical analysis with the unique visualization and geographic analysis benefits offered by maps." Well, that's one book definition anyway. Read on.

Why use GIS?

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Wisconsin Land Information Program

...

Brown County Land Information Office (LIO)

...

LIO Committee

...

GIS/LIO Coordinator

...

Benefits & Successes of the program

...