

# The Physical Geography of the Illinois River Valley Near Peoria

An Updated Self-Conducted Field Trip  
using EcoCaches and GPS Technology

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# **Abstract**

## **THE PHYSICAL GEOGRAPHY OF THE ILLINOIS RIVER VALLEY NEAR PEORIA:**

### **AN UPDATED SELF CONDUCTED FIELD TRIP USING ECOCACHES AND GPS TECHNOLOGY**

This field trip has been written so that anyone can enjoy the trip without the guidance of a professional. The trip could be taken by student groups, families, or an individual; at least two people, a driver and a reader/navigator, are the recommended minimum number of persons for maximum effectiveness and safety. Subjects of discussion include the Illinois River, the Bloomington, Shelbyville, and LeRoy Moraines, various aspects of the glacial history of the area, stream processes, floodplains, natural vegetation, and human adaptations to the physical environment such as agriculture, industry, transportation, and growth of cities. Activities include riding to the top of a lookout tower, judging distance to several landmark objects, and scenic views of the physical and cultural environment. All along the trip, GPS coordinates are supplied to aid you in your navigation. Information on EcoCaches is available at <http://www.ilega.org/>

#### **Why take a self-guided field trip?**

A self-guided field trip is an excellent way to learn more about the area in which one lives. Newcomers or visitors to an area should find it a most enlightening manner in which to personalize the new territory. Longtime residents will be somewhat amazed at how much there actually is to know about the physical landscape that may have previously been taken for granted. Discovering something new may stimulate students to learn.

## Introduction

Unless the scenery is spectacular, most of us travel through an area with little more than passing notice of the physical landscape. There is an historical basis for every hill and valley that we traverse and the landscape becomes significantly more interesting when we are aware of the causes. A hill is just a hill until we can put a name on it. Most names are just local names and frequently do not give us a true sense of the full history behind them. Usually, there is another name, which only appears on specialized maps that may only be used by specialists in the physical geography of a particular area; it is in these names that one obtains a more striking sense of the reality of the situation.

The central Illinois area was shaped by great masses of flowing ice called glaciers. Thousands of feet thick and hard as rock, the continental glacier spread outward from the Hudson Bay area of Canada. As it did so, it bulged out in lobes that scoured the land over which each lobe passed. The lobes on the leading edge of the glacier were thinner, between 200 and 800 feet thick in northeastern Illinois. Hills, forests, soils, rock outcrops and anything else in the path of these slow moving lobes of ice were sheared off and carried up inside, where the material was pulverized by abrasion as it flowed forward through the ice toward the ice front of the glacier. The glaciers advanced at least 23 times into the central United States.

The temperatures near the ice front of a glacial lobe were frequently warm enough to melt some of the ice. The meltwater flowed from the surface of the glacier and from beneath the ice. The grinding action of the ice and rock mixture changed large rocks into sediment. Streams deposited the sediment over the countryside in the form of gravel, sand, and silt.

If the glacier continued to advance, then the glacier took the gravel, sand, and silt inside once again to be pulverized further. If the glacier did not advance any farther, then the fine silt on the stream valleys gradually dried out. Strong westerly winds along the glacial margins lifted the silt and deposited it on the eastern edges of the stream valleys, forming bluffs of loess.

If the glacier did not advance, then the ice front frequently remained stationary for a period of years, possibly decades or centuries. If people had been here to see it, the glacier would have appeared to be parked on the landscape, parked due to the delicate balance between the warm temperatures in the vicinity of the ice front and the rate of accumulation of new snow at the glacier's head and along its course. This stagnation would have been an illusion, however, for the internal flow of the glacier would have continued like a series of conveyer belts, one above the other, moving at different speeds. Abraded material inside a glacier is always moving toward the ice front with the internal flow of the ice.

In this stationary condition, the meltwater streams distributed sediment well out in front of the glacier. Furthermore, debris moved forward inside the glacier; it was dump-

ed in an unsorted manner in great quantities all along the winding edge of the glacial lobes. The stationary ice front stretched for distances that ranged from tens of miles to hundreds of miles across the landscape. The long, winding ridges that resulted are called moraines. Moraines are primarily responsible for the current landscape of the northeastern one-quarter of the state of Illinois and a good portion of the Peoria area.

With warmer temperatures in the past 12,000 years, grasses and trees developed on the newly weathered debris as it slowly changed chemically into a viable soil. As the ice front melted, the glacial lobes retreated northeastward, frequently remaining stationary for varying lengths of time. In this manner the moraines formed, one behind the other, in a concentric pattern.

Lakes of various sizes formed in low places behind the moraines. Constantly overflowing and occasionally collapsing under the weight of the impounded water, the moraines released great quantities of water. It rushed outward and downward through the valleys below the moraines. The water carried tremendous amounts of sand over long distances and finally deposited it. The wintry winds, over long periods of time, frequently shaped the sand into dunes.

As each moraine formed in sequence, meltwater streams laid down broad expanses of gravel, sand, and silt. Thus, outwash plains were formed between the moraines.

The focus of this project is the physical landscape of the Peoria area. The main features to be seen on this landscape are the moraines, outwash plains, loess deposits, and stream valleys.

Most of the state of Illinois is in the Central Lowland Province of North America. The Peoria area is located on the western margin of the Bloomington Ridged Plain, very close to where it merges with the Galesburg Plain and the Springfield Plain. Moraines form the many ridges within the Bloomington Ridged Plain.

There have been several ice ages in the 4.6 billion year history of the Earth. The last ice age began well over two million years ago and is known as the Pleistocene Epoch. Pleistocene ice mainly affected North America and Europe. Many ice advances and subsequent ice retreats took place. Our present time is probably only an interglacial stage; the glaciers will most likely return, but probably not for thousands of years. The climate here during past interglacial stages was much like the climate of today. In this temperature-moisture environment, an inch of soil can form in approximately 100 years.

Both erosion of the then current landscape and deposition of the resulting sediment occurred during each phase of the ice age. Complex patterns have taken nearly a century to interpret. Many questions still remain. Generally, glacial stages are represented by till deposits (unsorted glacial debris); interglacial stages are marked by the development of soils that supported forests and grasslands, just as they exist today throughout the Midwest.

Table 1: Major Glacial Stages and Interglacial Stages  
with Rough Approximations of the Times of Occurrence

<b>Glacial Stage</b> - Ice Advances - Till Deposits	<b>Interglacial Stage</b> - Ice Retreats - Soil Forms	<b>Approximate Time</b> (Years Before Present)
	Holocene	0-5,000 BP
Wisconsinan (2 substages)		5,000-100,000 BP
	Sangamonian	100,000-135,000 BP
Illinoisan (3 substages)		135,000-275,000 BP
Pre-Illinoisan		275,000-2,500,000 BP

Source: Dr. Robert S. Nelson, Geomorphologist, Illinois State University. February, 1989.

Each glacial and interglacial stage is further subdivided according to the presence of various deposits. Since there is no single location that contains a complete record of the Pleistocene Epoch, information is gathered from several “type locations.” One important type location is located in East Peoria near Farmdale Dam; unfortunately, it is located on U.S. Government property and cannot be accessed by the public. However, there are many exposed deposits that are visible in many places along this trip, which will give the tripper an idea of what the Farm Creek exposure looks like. Watch for tall, steep, barren slopes.

The real beginning of the shaping of the character of the Peoria area took place approximately 22,000 years ago with the beginning of the Woodfordian Substage of the Wisconsinan Glacial Stage. The Woodfordian Substage marked the greatest advance made by the ice during the Wisconsinan; the ice came from the north and the east and covered the entire northeast 1/3 of the state of Illinois. When the ice was finally gone, the present landscape remained.

## CENTRAL ILLINOIS ECOCACHE: FONDULAC DRIVE

EcoCache ID: 17179003

Latitude/Longitude: N 40° 40.229 W 089° 34.200

You are on top of the Bloomington Moraine overlooking the city of Peoria to the west. A moraine is a deposit of unsorted glacial debris. Moraines formed when the glacier stopped advancing and remained stationary for many years. Even though the glacier may have stopped advancing into new territory, the ice that formed the glacier's internal zone of flow continued to move forward toward the outer edge of the glacial lobe. The ice contained massive amounts of debris that had been scooped up by the glacial ice as it spread outward from Canada. The debris that was deposited here ranges in size from large boulders to clay, depending on how much abrasion the rocks experienced inside the glacier.

This is one of the more spectacular views attributable to this moraine. The Illinois River flows from your right to your left. This river drains about 2/3 of the state of Illinois and is a major tributary to the Mississippi River. Peoria Lake is to your right. Upper Peoria Lake is beyond McClugage Bridge in the far distance to your right.

The Bloomington Moraine is really a system of moraines that mark the boundaries of the Peoria Sublobe of the Lake Michigan Lobe of the Woodfordian glacier. This moraine is a thick deposit and near Peoria it formed on top of bedrock cliffs. You are standing on one at this time. The till is about 40 feet thick and is covered by several feet of loess.

This moraine extends from the Livingston-Ford county boundary in eastern Illinois, through the Illinois River Valley between Peoria and Princeton, to DeKalb County in northeastern Illinois.

The Bloomington Moraine overrides the Shelbyville Moraine near Peoria and marks the western edge of Wisconsinan glaciation in Illinois. The moraine is responsible for approximately 200 feet of sharp relief along the Illinois River and an even greater amount along the Green River in Lee County, east of the city of Rock Island. The prominence of this moraine gives character to many places in Illinois.

The internal ice of the glacier that built the Bloomington Moraine flowed forward relatively rapidly. This caused a massive accumulation of unsorted material. The thickness of the ice sheet in central Illinois was probably between 200 and 400 feet thick.

Look at McClugage Bridge to your far right. In the vicinity of the bridge, the Bloomington Moraine once extended across the present river. Water accumulated behind the moraine and formed Glacial Lake Illinois. The Moraine collapsed under the weight of the water in the lake. Water and sediment rushed through the valley that lies in front of you.

The city of Bloomington is also built on top of this moraine. If you sometime travel from Peoria to Bloomington on I-74, you will travel over two prongs of this moraine: the first is just east of the city of Morton at Deer Creek, Illinois; the second is a few miles further east, where I-74 crosses that Mackinaw River.

From this vantage point where you now stand, look for the following features:

1. Farm Creek Delta

Located below and to your left on this side of the river. All of the buildings you see below you are built on this delta. Most of downtown East Peoria is built on the Farm Creek Delta. The mouth of the creek is on the upriver end of the delta below. Farm Creek is the master stream in a system of smaller streams that drain this moraine in East Peoria.

2. Bloomington Moraine

Located on the Peoria side of the river. It slopes steeply upward and away from the river. The I-74 (Murray Baker) Bridge connects Peoria and East Peoria.

3. River Valley Topography

The steep slope below is typical of the topography in and around the area. Streams on steep slopes cut narrow V-shaped valleys with little or no floodplain; when water is plentiful, they flow swiftly and can move baseball sized boulders. They add great quantities of silt to the Illinois River bed.

4. Flagging

The trees near you show signs of a phenomenon called "flagging." Since the prevailing winds in Illinois are predominantly from the west, the branches tend to grow longer in an easterly direction (downwind) than they do in the upwind direction.

5. McClugage Bridge

The bridge is upriver to your right. The left end of the bridge is slightly east of due north.

Prior to the Ice Age, the old course of the Mississippi River flowed through this central Illinois Area. The location of the old channel is a few miles east of here, between Pekin and Morton. South of Pekin, the old Mississippi channel trended west along the present boundary between Tazewell and Mason Counties.

Three Illinoisan glaciers and the Woodfordian glacier forced the Mississippi River to flow around them. At one time, the channel was located between Clinton, Iowa, and Burlington, Iowa, in the present valleys of the Wapsipinicon, Cedar, and Iowa Rivers. The Illinois River now flows in an old lake valley that previously was swept across by the Mississippi River.

The Illinois River is actually a misfit stream in certain parts of its valley. Because the stream bed is nearly flat (less than one inch per mile in places), the water moves along at a relatively low rate of speed. Sand and silt tend to settle to the bottom of the channel and to the bottoms of both Peoria Lake and Upper Peoria Lake.

When the prairie grass and Oak-Hickory forests dominated this area, the forces of erosion were under better control. The natural processes of erosion and deposition (siltation) took place at a slower rate than they do today. When Europeans settled the Midwest, the prairie grass was plowed under and forested areas were cleared. Farmland is now exposed to the element of running water, especially during spring and during intense thunderstorms. Much soil is lost at those times to the creeks that flow toward the river. The modern period of urbanization has brought housing subdivisions, shopping malls, and highways. "Dirt" from a newly excavated basement is washed into the street and is eventually deposited in the Illinois River.

Silting is taking place at a very rapid rate. In terms of survival, the Illinois River, as you now view it, is on the critical list. In the mid-1800s, European royalty frequently crossed the Atlantic Ocean to hunt and fish in this river and its backwater lakes and marshes. Today, boaters come from long distances within Illinois to enjoy the recreational qualities the river has to offer. Barges carry oil and grain. The Illinois River connects central Illinois to the world through the port cities of Chicago and New Orleans. All of these recreational and economic advantages could severely diminish if the present trend continues. Experts and governmental agencies are studying the problem, but the monetary costs of corrective action are staggering and the results would not be permanent. An educated and concerned citizenry is the best hope for improving the situation and for preserving the economic value of the river, not to mention the quality of life for area residents.

### **Geography of Perception Activity**

How are you at gauging distance, orientation and visibility? Haze is a frequent problem due to the evaporation and condensation of moisture near the river, especially with the added factor of smoke particles from a variety of local industries.

Judge your visibility by looking for the following landmarks:

- |                                      |        |          |
|--------------------------------------|--------|----------|
| • McClugage Bridge (far right end)   | 3.6 mi | NNE      |
| • I-74 Bridge (far end)              | 1.6 mi | NW       |
| • Marina (up river from I-74 Bridge) | 2.0 mi | N        |
| • Mouth of Farm Creek                | 1.2 mi | NNW      |
| • Twin Towers in Peoria              | 1.9 mi | NW       |
| • Cedar Street Bridge                | 1.7 mi | W to WNW |
| • Red Tower at Tower Park            | 5.3 mi | N        |
| • First National Bank (White Dome)   | 1.8 mi | NW       |

## CENTRAL ILLINOIS ECOCACHE: GRANDVIEW DRIVE

EcoCache ID: 17143002

Latitude/Longitude: There are four look out points along Grandview Drive. You may use any or all points for this ecocache.

Point 1 - N 40° 44.294 W 089° 33.353

Point 2 - N 40° 44.719 W 089° 33.704

Point 3 - N 40° 44.678 W 089° 33.883

Point 4 - N 40° 44.816 W 089° 34.110

When President Theodore Roosevelt visited Peoria on October 10, 1910, he called Grand View Drive the "World's Most Beautiful Drive." Grand View is revered as one of the most beautiful drives in Peoria because of its breathtaking views of the river and the many historic and remarkable homes lining it. One such home, built by Walter H. Kirk, was known as Valley View. As it was one of the first homes built along the drive, today it has been carefully restored.

The Illinois River flows from your left to your right as you face the river. The river widens upstream (left) and forms the Upper Peoria Lake. Across the river is Ten Mile Creek Delta, which protrudes so far into the river that it becomes significantly narrower. Flat, deltaic deposit can be seen between the Bloomington Moraine and the river for most of the visible distance upriver. Many small streams have deposited alluvial material below the moraine. Upper Peoria Lake is a remnant of old Glacial Lake Illinois. This lake formed behind the Bloomington Moraine, which once extended across the river near this location.

Notice that the flat delta land across the river is very suitable for agricultural purposes. You may notice one or two groins protruding out into the water on the east side of the river. Groins are meant to help protect the beach from erosion. However, groins also cause the sand to be distributed unevenly; one groin inevitably leads to the need for another groin.

The Illinois River was first explored by Louis Joliet and French Jesuit Pere Marquette. LaSalle also plied his way along its course. The Illinois Indians called the river Pimiteoui, meaning "Fat Lake". An historical marker at the one of the pull-off points is dedicated to this topic. On pleasant weekend, Upper Peoria Lake is usually full of sailboats and speedboats. Barges will hopefully stay in the main channel. The main channel has a depth of approximately 9 feet. The channel depth is maintained by the U.S. Army Corps of Engineers.

## CENTRAL ILLINOIS ECOCACHE: TOWER PARK

EcoCache ID: 17143001

Latitude/Longitude: N 40° 44.819 W 089° 34.482

Enjoy a panoramic view of the Illinois River from the comfort of a glass-enclosed elevator that takes you up 175 feet to one of three observation decks. The Observation Tower is open from the first part of April through October (weather permitting).

Tower Park, in Peoria Heights, Illinois, has an Observation Tower, open air pavilion, Veteran's memorial, a refreshing water fountain, children's playground, and a bronze monument of Abraham Lincoln designed by Gutzon Borglum (designer of Mt. Rushmore) that is identical to two other sculptures, one in front of Lincoln's Tomb in Springfield, Illinois, and the other in the U.S. Capitol Rotunda at Washington, D.C.

Glide 170 feet to the top of the tower in the enclosed glass elevator to "View the Wonder" for many miles of the Illinois River Valley. On top of 500,000 gallons of clear, pure well water, there are three separate observation decks designed to provide a spectacular panorama in all directions. There are three telescopes available for even closer viewing. This structure is the only one of its kind in the U.S.A.

Be sure to notice the rather large woodpecker on the side of the tower. You might enjoy seeing the panoramic view of the Illinois Valley from the top of the tower. Don't forget to take your camera and binoculars with you. The ride up is in a glassed elevator. The ride is slow and gentle, even for those not comfortable with heights.

Atop the circular tower you will find a wall that is four-five feet high to see over. Small plaques are mounted on the flat surface of the wall and give the azimuth (direction) to many world cities and Illinois communities. A free guide at the ticket booth lists the locations and distances. From this vantage point, one can easily see the Illinois River Valley including the Bloomington Glacial Moraine.

## CENTRAL ILLINOIS ECOCACHE: LICK CREEK

EcoCache ID: 17179007

Latitude/Longitude: N 40° 34.969 W 089° 36.232

Lick Creek is the master stream in the system of streams that drains the Shelbyville Moraine to the east and north of Pekin. Its course winds through the nearby terrain and through North Pekin where it empties into the Illinois River. The moraine is all around you; your view in any direction is typical of morainic topography.

There is a small floodplain along the stream at this point. The steep V-shaped valley of Lick Creek indicates that it is still a youthful stream. Notice the size of the boulders that the stream can carry when water volume is sufficient. Downstream from the bridge, a steep cutbank is visible along the outer side of the meander. The water in a stream moves fastest and is therefore most erosive on the outside of a meander.

The Shelbyville Moraine is the terminal moraine of the Wisconsinan Glacial Stage. It extends into Illinois through Edgar County from Indiana. It ends a few miles north of Pekin near the Illinois River. The Shelbyville Moraine formed during the Woodfordian Substage, which occurred approximately 22,000 years ago. This moraine is much wider south of Tazewell County. Shortly you will see where it was overridden by the LeRoy Moraine.

The Wisconsinan Glacial Stage was the last of the major ice advances. It began approximately 100,000 years ago and ended roughly 5,000 years ago. The Woodfordian Substage is one of many subdivisions of the Wisconsinan Glacial Stage. The substage is named for Woodford County, which is just north and east of Tazewell County. The Woodfordian ice sheet marked the most aggressive advancement of the ice during Wisconsinan time.

Next to Lick Creek runs the Lick Creek Golf Course. Why do you suppose that morainal topography is excellent for a golf course?

## CENTRAL ILLINOIS ECOCACHE: MANITO TERRACE

EcoCache ID: 17179009

Latitude/Longitude: N 40° 25.353 W 089° 39.106

The basal or lower deposits of the Manito Terrace consist of a combination of outwash sands and gravels from the Bloomington Moraine located to the east, and sands and gravels from the Kankakee torrent, which flowed along the path of the present Illinois River valley. These deposits are overlain by finer grained sediments consisting of windblown sands that form the sand dunes and the finer grained silts and clays that make up the loess deposits. The Manito Terrace may include deposits from the Shelbyville and Leroy moraines below those from the Bloomington Moraine and the Kankakee Torrent. However, the base of the Manito Terrace is not exposed in this area.

The best exposures of these deposits occur along the north-south roadcut of IL 29, and east of the railroad, along the north wall of the terrace adjacent to the east-west trending North Church St., 7000N. From this stop you can see the Shelbyville/Leroy Moraines to the east, the Mackinaw River, the Havana and Bath terraces to the north, and the Illinois River Valley to the west.

All throughout the area are numerous sand dunes. These dunes are reworked glacial outwash and alluvium associated with the Kankakee Torrent. Most of the dunes are rather old, but some have migrated out of the lowland area onto the Shelbyville Moraine. Borings encountered gravel at shallow depths below ground level in the inter-dune areas. Several dunes are on top of the large gravel bars produced during the Kankakee Torrent.

Because the sand and associated soils are very well drained, this area has a flora and fauna that is unusual for Illinois. Prickly Pear cactus is the most distinctive plant in the area. Pine trees also do well in the sandy soil. There are several pine tree plantations in the area. Lizards are common here and with care you may encounter one. Lizards may have burrowed into the dunes and can be excavated by careful digging.

Due to the presence of the well-sorted sands and gravels in this area, sand and gravel pits continue to this day to be an important industry for Tazewell County.

## CENTRAL ILLINOIS ECOCACHE: COLE HOLLOW ROAD

EcoCache ID: 17179017

Latitude/Longitude: N 40° 36.773 W 089° 34.184

You are on the Shelbyville Moraine. Look to the south and southwest toward the Illinois River; you see the prominence of this moraine in and around Pekin. Across the river in a westerly direction you can see the prominence of Illinoisan drift that was deposited on top of bedrock in Bartonville. To the southeast, the hilly terrain is the LeRoy Moraine. As you face the north, the LeRoy Moraine is only a few hundred yards to your right. Near the church ahead on the left, you will be where the LeRoy Moraine merges with and overrides the Shelbyville Moraine.

The more productive soils are on the outwash plains between the moraines; the land there also has less slope. Moraines may be used to grow crops if slopes are moderate. Many of the homes in this area are owned by people who have invested in a few acres. Many of these people own horses and grow their own hay crops to feed them.

This site is a good vantage point for viewing both moraines and gently rolling land. When the first settlers arrived in this region, there were two contrasting types of climax vegetation: trees and prairie grass.

The soils of the flat to gently rolling terrain supported a grassland vegetation. Prairie grass thrived in this climate and grew to heights of 6 to 12 feet. For thousands of years grass above ground level was matted down by winter snows; in the spring, thunderstorms produced lightning that ignited grass fires. Fire is essential to a prairie because it breaks down the old growth and kills invading plants that would otherwise compete with the prairie grass. Unburned old growth and the ashes of the burned-over old growth became part of the soil. The soil became richer in humus each year. New growth thrived because the soil contained a wealth of nutrients and competing plants were kept under control. Today, the soils in this region are among the most productive soils in the entire world.

Due to the frequent prairie fires, trees attained a strong foothold on the moraines and the banks of streams. There were many species of trees and there still are today. Cottonwoods and Sycamores were notable in the valley bottomlands. However, the region came to be dominated overall by oak-hickory forests. An interesting story about the co-evolution of the oaks, the hickorys, and the squirrel must now be told; this story is as true today as it was for the thousands of years it took for the forests to fully develop. This story is ecological and is evidence that everything in this world is part of a system, all the parts of which are interdependent.

These trees produce nuts that are the food for squirrels. Hickory nuts provide more nutrition and are preferred by squirrels, but the nuts are hard to open. Therefore, the squirrels eat hickory nuts in autumn because they have the time required to open them. Acorns from oak trees are less tasty and require less energy to open, but provide more calories per unit of feeding time; therefore, these are eaten during the winter. Both oak

and hickory trees are alternate bearing; that is, they do not bear the same amount of nuts each year. Also, squirrels tend to steal nuts from each other. Therefore, they must bury their collected nuts in the ground in several places for safekeeping; this is called scatter hoarding. Fortunately for us, they do not have very good memories. By burying the nuts of both species of trees, they literally planted the trees that constituted the oak-hickory forests.

## **CENTRAL ILLINOIS ECOCACHE: Bennett's Terraqueous Gardens**

EcoCache ID: 17179001

Latitude/Longitude: N 40° 41.764 E 089° 32.401

Bennett's Terraqueous Gardens sits in 18 acres of parkland owned and operated by the Fon du lac Park District of East Peoria. Within the park grounds, there are hiking trails, a pond, and an observation shelter overlooking the gardens.

Bennett's Terraqueous Gardens is a high-quality seep that lies at the base of deeply dissected bluffs and hills bordering the east side of the Illinois River. The seep community is usually saturated by groundwater that emanates at or near the base of a hill comprised of glacial till. Narrow spring runs flow in rivulets through the seep. Characteristic herbaceous plants found in the seep include swamp thistle, bottlebrush sedge, spotted Joe-Pye weed, fowl manna grass, swamp goldenrod, skunk cabbage, and marsh marigold. A boardwalk provides an opportunity for close views of this interesting wetland. The seep is named in honor of Mr. John Bennett, who donated the property to the Fon du Lac Park District.

## **BACKGROUND INFORMATION FOR TEACHERS, STUDENTS, & THE GENERAL PUBLIC**

Background information is presented here for better teacher understanding and organization. Some information is presented here that is not covered in the main part of the field trip guide. This information is included to help teachers, students, and the general public to better understand this particular field trip. The glossary is not arranged alphabetically, but in outline form to group related terms. Discussion questions/answers follow. For more detailed information, please consult a textbook on any of these subjects: Earth Science, Physical Geography, Geomorphology or Geology.

### GLOSSARY

Advancing Glacier – moving outward (or forward) from a spreading center.

Alpine (Mountain) Glacier – A glacier that moves down a mountain valley, mainly due to gravity.

Climax Vegetation – The end result of the continual succession of plant life in a particular region.

Coevolution – A principle of ecology that states that the mutualistic relationship between several distinctly different species of organisms is essential to the survival of each species involved.

Continental Glacier (Ice Sheet) – A thick, extensive mass of ice that accumulates on land; the only two in the world today are located on Antarctica and on Greenland; in both places, the greatest depth of the ice is approximately 10,000 feet (nearly 2 miles); the ice accumulates in a snowy region, becomes thick and heavy, then spreads out from that place under its own weight.

Delta – A fan shaped accumulation of sediment deposited at the mouth of a stream where it empties into another bodies of water.

Drift – A general non-scientific term used to describe anything left behind by a glacier.

Glacial Lake – A lake that formed due to the release of tremendous amounts of water from a melting glacier.

Glacial Lake Chicago – The predecessor of what today is called Lake Michigan.

Glacial Lake Illinois – The glacial lake that formed north of Peoria. Upper Peoria Lake is all that remains.

Glacial Stage – A period of time during which glaciers advanced into new territory.

Ground Moraine – Unsorted material left lying all over the ground once occupied by a glacier, frequently covered by many feet of outwash.

End Moraine – A morainic ridge that marks the location where a glacier stopped

Ice Front – The leading edge of a continental glacier.

Interglacial Stage – A period of time during which the ice retreated toward the North Pole.

Intermittent Stream – A stream that contains water for only part of the year, as after rainfall or during the rainy season.

Internal Glacial Movement - Ice at different depths moves at different velocities.

Kankakee Torrent – The flood that ensued when a moraine collapsed some 12,500 years ago. The level of Glacial Lake Chicago dropped approximately 25 feet in about one week. This flood passed through the Peoria area leaving behind glacial sediment.

Lake – A body of water enclosed by land. Sometimes applied to a wide place in a stream (ex.. Peoria and Upper Peoria Lakes).

Master (or Trunk) Stream – The main stream in a particular area. Tributary streams flow into it.

Moraine – A ridge of unsorted material dumped by the glacier along the ice margin.

Outwash or Outwash Plain – Glacial material deposited by meltwater streams that flowed on top or from beneath a glacier. The material tends to be sorted according to particle size.

Recessional Moraine – Temporary stopping point of a stationary glacier.

Retreating Glacier – melting back along the ice front.

Stationary Glacier – temporarily at a standstill.

Terminal Moraine – Farthest advance by a glacier.

Till Plains – Gently rolling land formed from the merging of moraines and outwash plains.

Tributary Stream – A stream that empties into another stream.

## DISCUSSION QUESTIONS & ANSWERS

- 1. In what ways was the climate during the Ice Age different than our present climate?**

It was constant winter; temperatures averaged below freezing and most of the precipitation was in the form of snow.

- 2. What is the more important natural resource to develop in our area since the ice age glaciers retreated?**

Soil

- 3. Why is soil important to us here in central Illinois?**

Man settled this region because the soil supported plant life that fed the animals; the Indians had food to eat and animal skins to keep warm; European settlers first made a living trading animal furs; later settlers became farmers; inventions such as the steel plow and the tractor also helped to make this area an industrial region.

- 4. Why was the idea of glaciation not at first believed by many people?**

They thought that glacial erratics were produced by the biblical flood.

- 5. How does the ice inside a glacier move?**

The ice moves at different rates of speed at different depths; in a motion like conveyor belts.

- 6. What is a moraine?**

A ridge of unsorted material dumped by the glacier along the ice margin.

- 7. What is an ice front?**

The leading edge of a continental glacier.

- 8. What glacial substage was responsible for building the moraines in central Illinois? When did it occur?**

The Woodfordian Substage of the Wisconsinan Stage; this period began approximately 22,000 years ago and lasted until 13,000 years ago in Illinois and until 5,000 years ago in Wisconsin.

**9. What are the three moraines that merge near the cities of Peoria, East Peoria, and Pekin?**

Bloomington Moraine, LeRoy Moraine, and Shelbyville Moraine.

**10. Why is siltation a problem in the Illinois River?**

- A. The Illinois River near Peoria flows over a flat valley which provides very little slope; therefore the water in the river moves relatively slowly and does not carry enough silt away.
- B. Too much silt is entering the Illinois River at a relatively high rate from the erosion of topsoil.

**11. Of what importance is riverfront redevelopment in a river community?**

- A. It stimulates the local economy.
- B. It provides a pleasant atmosphere for public participation in community activities.
- C. It instills a sense of pride in member of the community.

**12. Why should you not build a house on a floodplain?**

The floodplain becomes inundated with water when the river floods. Not only would it create a mess in a house, it could destroy the house, because flood waters move faster and has more power to move heavier objects.

**13. What is meant by the term “Prairie”?**

A grassland region dominated by prairie grass.

**14. Coevolution means that several species of organisms required the help of each other to survive. What role did coevolution play in the development of central Illinois forests?**

Squirrels planted the acorns and hickory nuts, thus insuring the survival and spread of the Oak and Hickory trees; the nuts fed the squirrels and insured that they would have food all year long, giving them the energy to reproduce; if one of these three species had not evolved, the other two probably would not have survived long and would have become extinct.

**15. Why should we be concerned with “the environment”?**

Every part of the physical environment plays a role in the health of every other part of both the physical and human environment.

## RESOURCES

Frankiek, W. T., Jacobson R.J, Reinertsen D. L., Nelson, R.S., & Malone D.H. (1995). *Guide to the Geology of the Pekin Area, Tazewell and Peoria Counties, Illinois*. Urbana, IL: Illinois State Geological Survey.

Smith, R. L. (1986) *Elements of Ecology*, 2<sup>nd</sup> ed. New York: Harper & Row.

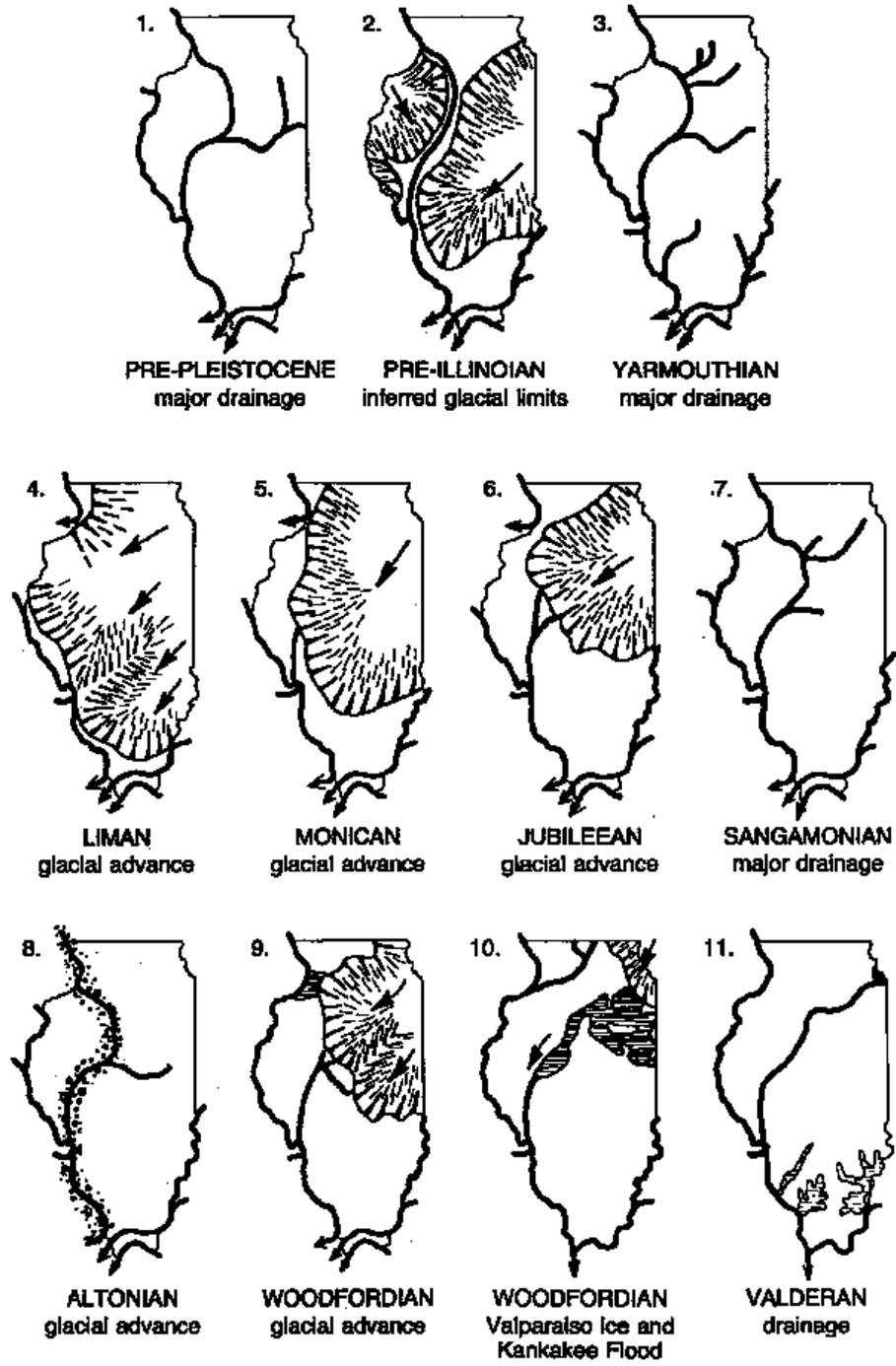
Sublett, M. D., Walters, W. D., Jr., Modry, S. M.(1973). *Commentary On A Corn Belt Countryside: A Self-Guided Rural Experience*. Normal, IL: Department of Geography-Geology, Illinois State University.

Wiggers, R. (1997). *Geology Underfoot In Illinois*. Missoula, MO: Mountain Press.

Willman, H. B. and Frye, J. C. (1970). *Pleistocene Stratigraphy of Illinois*. Urbana, IL: Illinois State Geological Survey

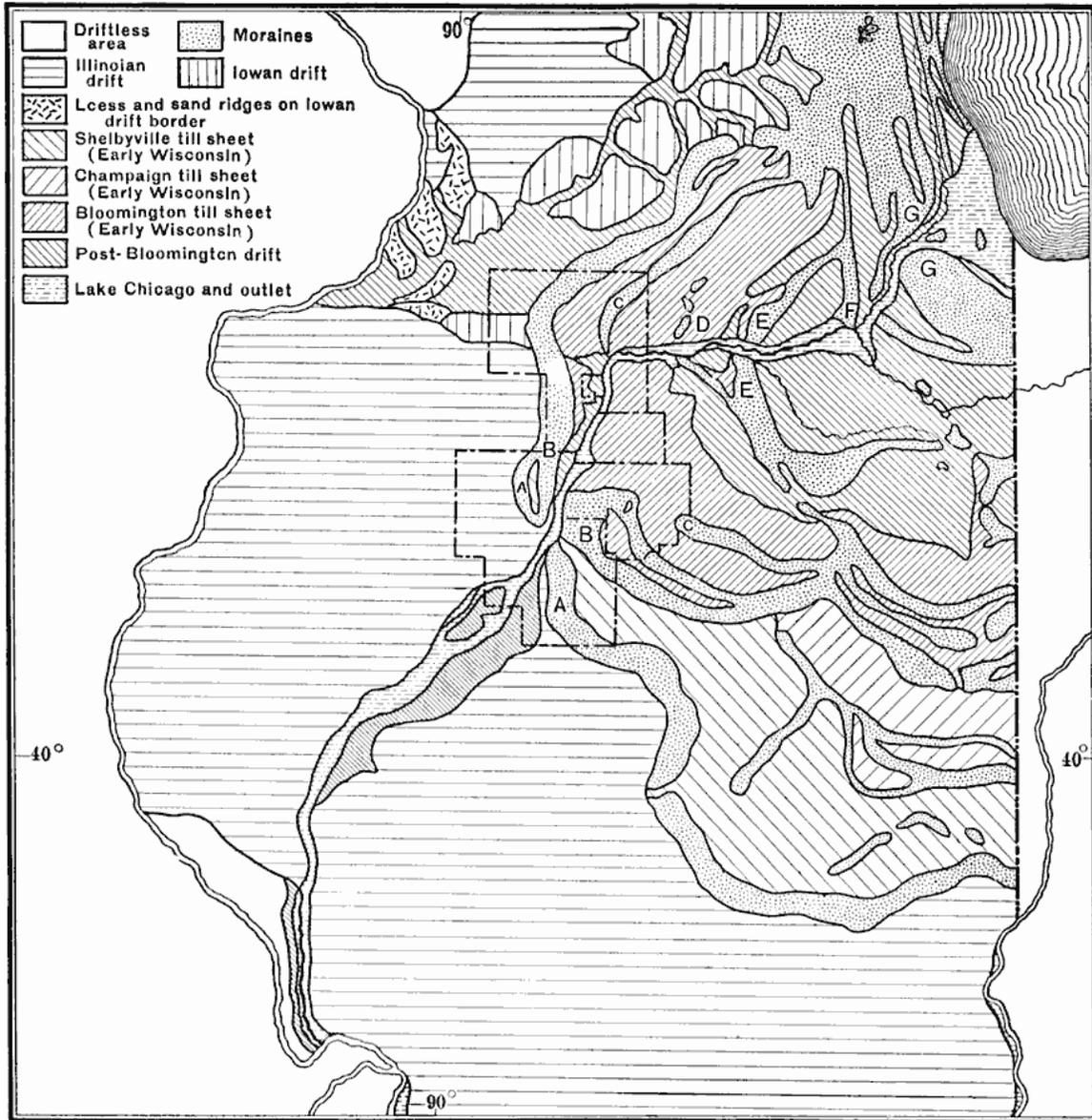
Willman, H.B., et al. (1975). *Handbook of Illinois Stratigraphy*. Urbana, IL: Illinois State Geological Survey.

SEQUENCE OF GLACIATIONS AND INTERGLACIAL DRAINAGE IN ILLINOIS



(Modified from Willman and Frye, "Pleistocene Stratigraphy of Illinois," ISGS Bull. 94, fig. 5, 1970.)

### A Generalized Glacial Map of Northern Illinois



Source: Isaiah Bowman, Ph. D, *Forest Physiography* (New York, NY: John Wiley and Sons, 1911) 472