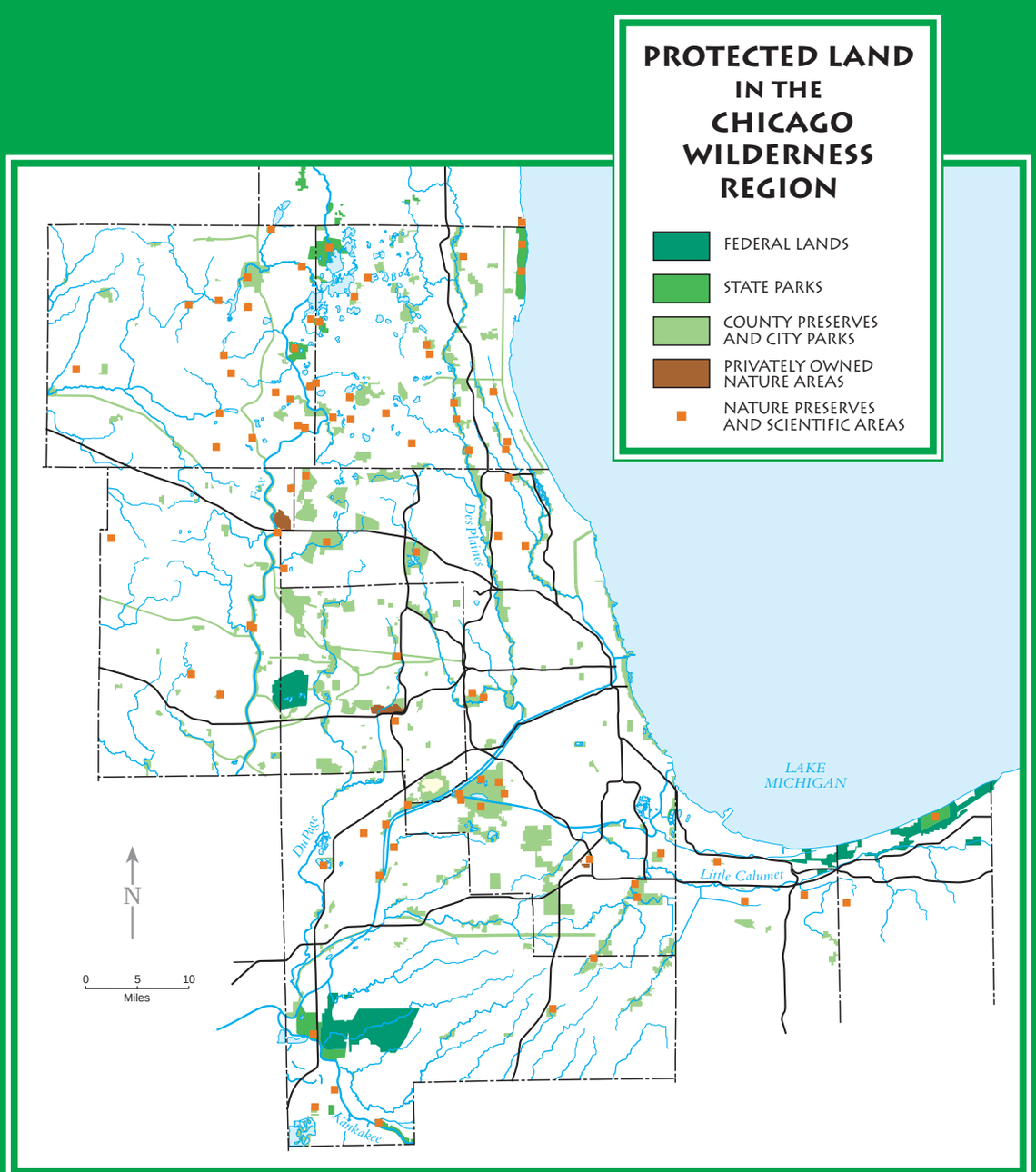
CHICAGO WILDERNESS

A Regional Nature Reserve

An Atlas of Biodiversity



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Chicago Academy of Sciences
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Chicago Park District
City of Chicago, Department of Environment
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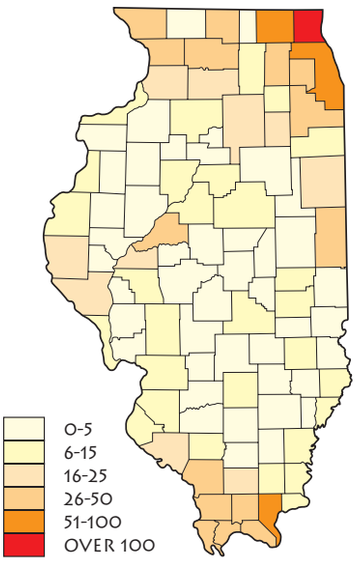
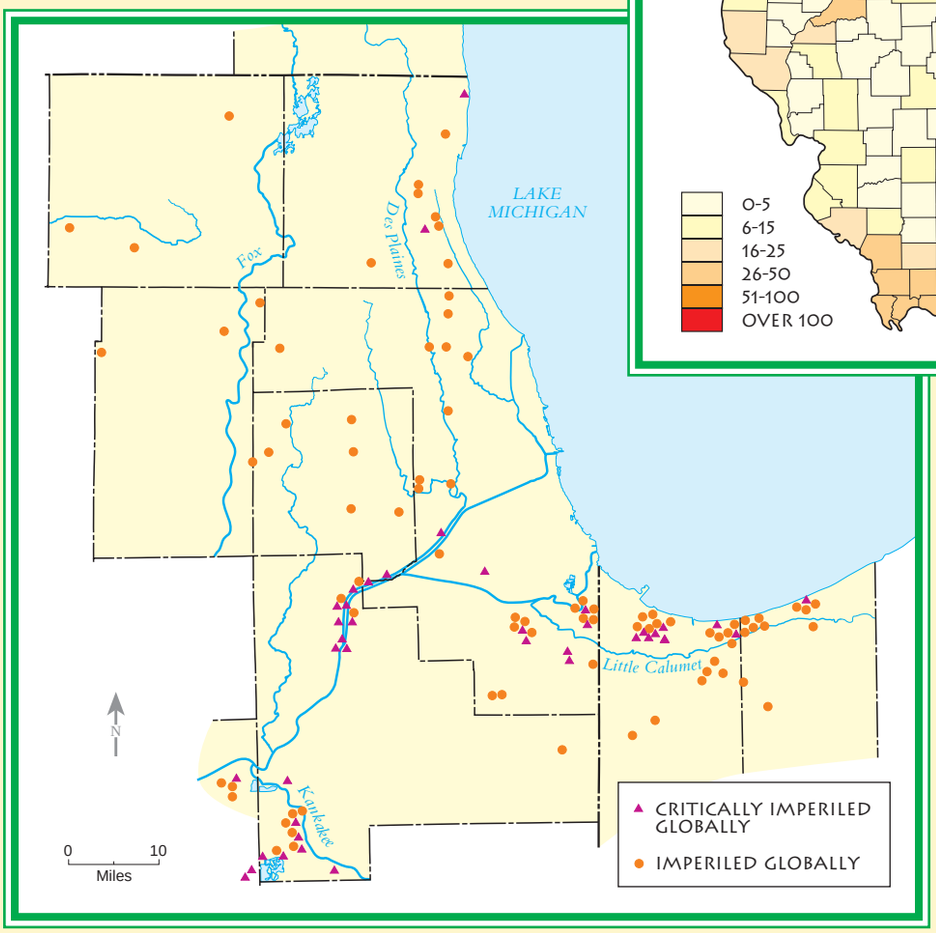
CONTENTS

ENDANGERED AND THREATENED SPECIES IN ILLINOIS



RARE AND ENDANGERED NATURAL COMMUNITIES IN CHICAGO WILDERNESS



NATURE IN THE METROPOLIS

The Story of Chicago Wilderness

The lands stretching south and west from the shores of Lake Michigan hold one of North America's great metropolises. Nearly eight million people live in northwestern Indiana, northeastern Illinois, and southeastern Wisconsin. Living among them, on islands of green, are thousands of native species of plants and animals, species that make up some of the rarest natural communities on earth. We call these communities and the lands and waters that are their homes Chicago Wilderness. Communities like these—prairies, oak savannas, woodlands, marshes, fens, sedge meadows and others—once covered most of the Midwest. They have been destroyed almost everywhere to make way for towns and farms.

Only small fragments survive, and many of the richest of these fragments are in Chicago Wilderness. The largest metropolis in the region is also home to the finest surviving examples of the natural heritage of the Midwest. More than one-third of Illlinois' dedicated nature preserves are in the six counties of Chicago Wilderness.

The maps on the facing page suggest what is at stake. They show the concentration of rare animals and plants and the dense clusters of whole natural communities that may vanish from the face of the earth if they are not protected in Chicago Wilderness.

This Atlas provides an introduction to these endangered communities. It tells how they sustain themselves and how natural forces—and people—have shaped them over thousands of years. It describes efforts to use land preservation and ecological restoration to save them and tells where interested people can see them.

A combination of enlightened action and historical accident has thus far prevented the extinction of the natural wonders of Chicago Wilderness. They will survive into the next century only if we act to ensure that survival.

GEOLOGY OF THE CHICAGO WILDERNESS REGION

Ice built the landscape of the Chicago Wilderness. Major construction began about 26,000 years ago and ended about 13,000 years ago when the glaciers receded from the Chicago region for the last time. Even after the ice had gone, the after effects of glaciation repeatedly remade the shoreline of Lake Michigan. The lake stabilized at its present size just 2,000 years ago.

The Ice Age, geologists call it the Pleistocene, saw four major ice advances in eastern North America. The first occurred about 500,000 years ago. The last—the Wisconsin stage—began about 70,000 years ago. At one time, the Wisconsin ice spread as far as Shelbyville, Illinois, 200 miles south of Chicago. Our landscape reveals the complex series of ice movements that occurred during the later years of the Wisconsin glacial episode.

The glaciers that covered our region were as much as a quarter of a mile thick. Land around the northern Great Lakes is still rising, still rebounding from the weight placed upon it by the ice thousands of years ago.

It would seem that something that big could go wherever it wanted to go, but in fact, the land under the ice exerted a powerful influence on glacial movements. In central North America, the ice followed river valleys, and over the course of the Pleistocene, scoured those valleys into the deep, broad basins that now hold the Great Lakes. The landscape of the Chicago region records five major advances of the ice out of the Lake Michigan basin alternating with periods when the ice retreated to the basin.

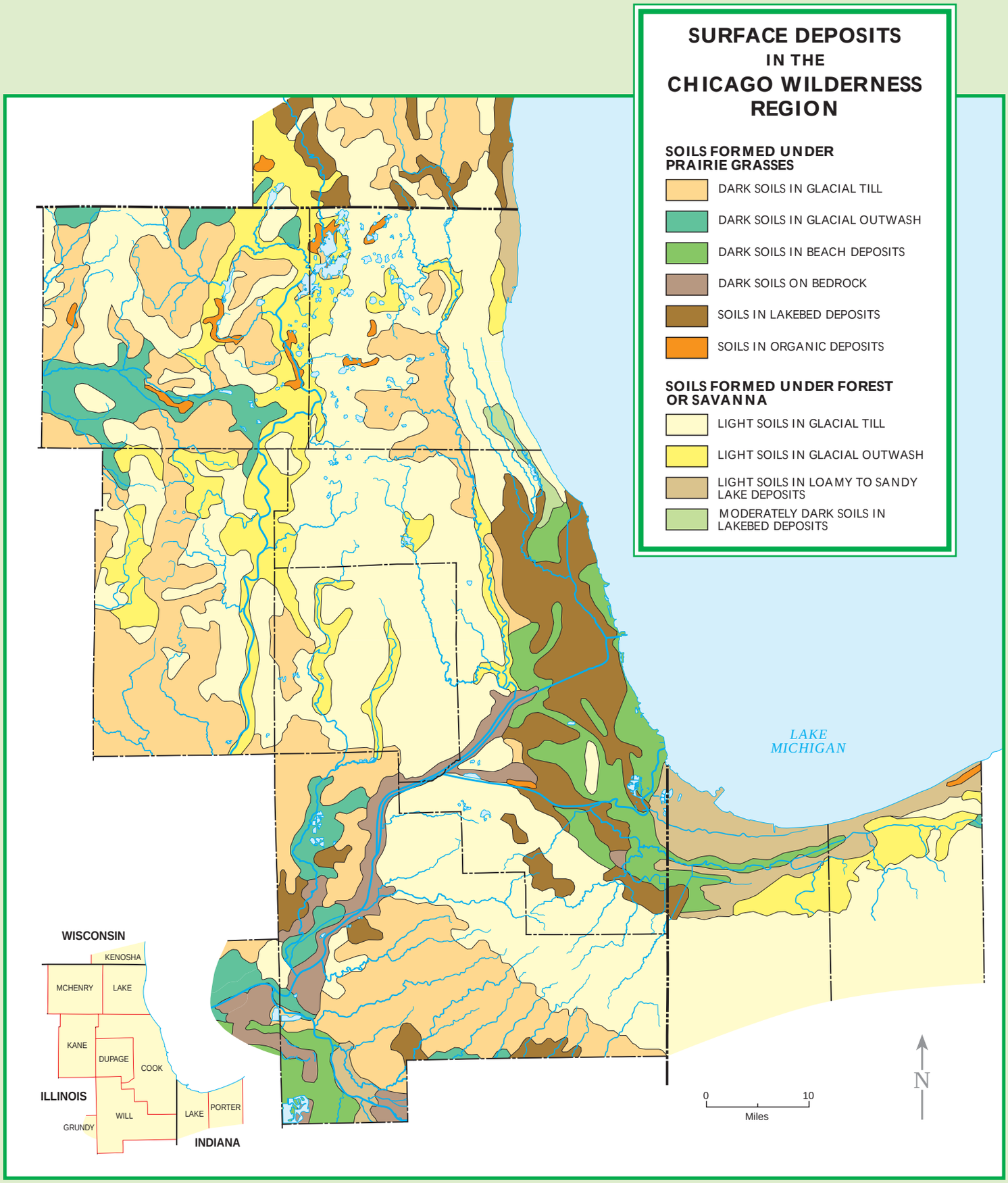
The glacial constructions cover a bedrock foundation made of very old sedimentary rocks. In the Chicago region, the most common type of bedrock is a magnesium-rich limestone called dolomite that was originally deposited on reefs set in shallow seas during the Silurian period about 400 million years ago. The youngest bedrock in our region dates from the Pennsylvanian period about 300 million years ago. This is the rock that contains the coal deposits in Will County.

There are highlands and valleys in our bedrock, but none of them corresponds to the highlands and valleys visible at the surface. The surface features are all made of material deposited by the glaciers or by the lakes that appeared as the glaciers melted. In some places, these deposits are nearly 400 feet thick. Only along the Des Plaines River in southwestern Cook and western Will Counties are bedrock exposures large enough to have an effect on living things. There, unique communities of plants and animals live on soils only a few inches thick that lie above the Silurian dolomite bedrock.

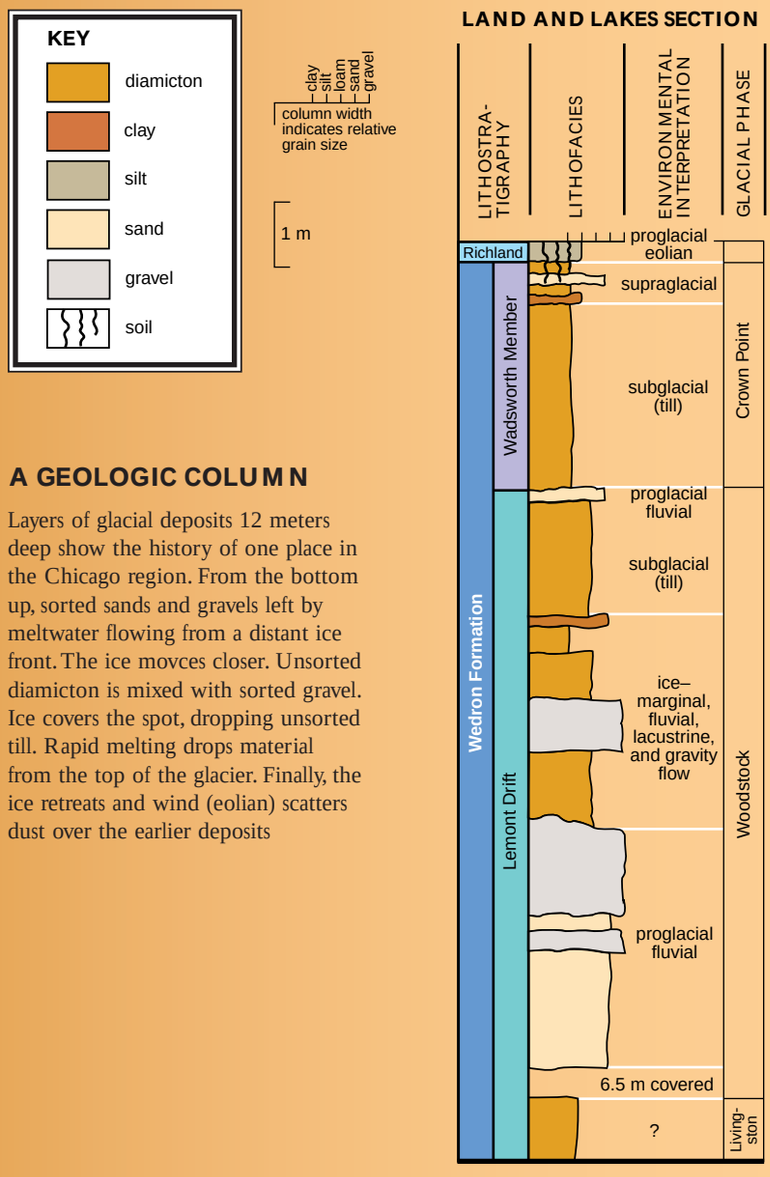
GLACIAL DRIFT

Drift is the traditional term for the material left behind by glaciers. There are two kinds of drift. *Till* is material that was deposited directly from the glacier. *Outwash* is material deposited by meltwater flowing from the glacier.

Glaciers are supreme earth movers. As their enormous weight scrapes across the ground, they easily collect loose surface deposits. Bedrock is harder to dislodge, but they manage to collect it as well. Frozen into the ice as a totally unsorted mixture of giant boulders, cobbles, gravel, sand, silt, and the finest of clay particles, drift can be carried hundreds of miles. When glaciers begin to melt, this material drops out and piles up in front of the ice. Glaciers are always moving, and sometimes their rate of movement is equal to their rate of



Deposits left by the glaciers or by the lakes that formed as the glaciers melted are the raw materials of soils. Topography, drainage, climate, and vegetation shape these raw mateials into soils. The process takes centuries. In a dynamic landscape, vegetation may change more rapidly than soils. We may find prairies growing on forest soils and forests on prairie soils. The scale of the map allows us to show only broad categories. Small patches of soil that do not match the surrounding land will not appear.



A GEOLOGIC COLUMN

Layers of glacial deposits 12 meters deep show the history of one place in the Chicago region. From the bottom up, sorted sands and gravels left by meltwater flowing from a distant ice front. The ice movces closer. Unsorted diamicton is mixed with sorted gravel. Ice covers the spot, dropping unsorted till. Rapid melting drops material from the top of the glacier. Finally, the ice retreats and wind (eolian) scatters dust over the earlier deposits

melting. Geologists call such times "still stands." The ice front appears to be standing still, but it is really acting like a giant conveyor carrying an endless supply of fresh drift to the ice front.

At a stationary ice front, heaps of drift can form hills hundreds of feet high. Since these hills are made of till, they are an unsorted mixture of everything from rocks the size of garages to microscopic clay particles. Immense blocks of ice break off from the melting glacier and are buried in this debris. As they melt, they form ponds and lakes.

The landscapes created by these conditions are called *moraines*. Moraines are places where knobby hills and ridges are mixed with kettle-holes where blocks of ice melted into lakes and marshes. The Chicago region has hundreds of square miles of moraines where the varied landscape supports a rich assortment of natural communities that are home to much of the biodiversity of the Chicago wilderness.

When a glacier a quarter of a mile thick begins to melt, it floods the land with cascades, torrents, whole lakes full of water. In our region, many proglacial lakes were dammed between the ice front and older moraines. They filled, endured for a few decades or a few centuries, and drained away. Rivers a mile wide scoured valleys. In some places the water just poured over the land in sheets.

Water sorts the particles it carries. It takes a heavy, powerful flow to push a boulder along. As the current slows, smaller and smaller particles settle to the bottom: gravel, sand, and silt along rivers; clays in the lake bottoms. Much of the surface deposits on the lowlands lying between the moraines in the Chicago Wilderness are made of outwash.

SHAPING THE LAND

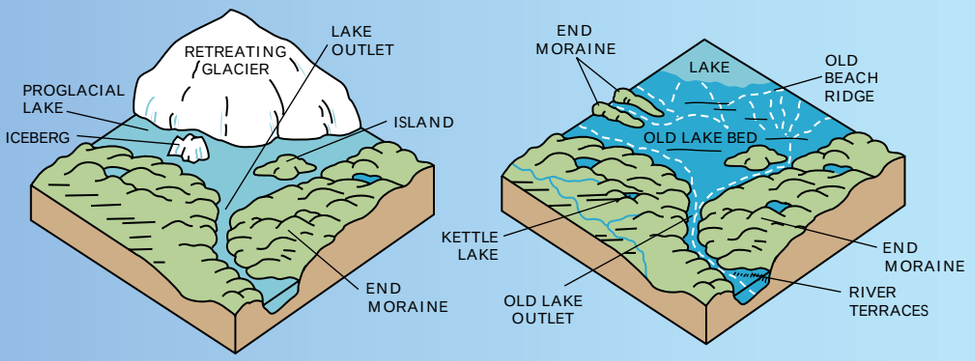
The ice advance of 26,000 years ago that began the process of shaping our landscape brought the ice front to the Marengo Moraine, often called the Marengo Ridge, which runs north and south through western McHenry County to Kane County. This is the westernmost and oldest of the moraines in our region.

The push south to Shelbyville came after the building of the Marengo Ridge, but by about 17,500 years ago, the ice front had once again melted back to the Chicago area. This was the beginning of a very eventful few thousand years. The ice, in a complex dance of advance-retreat-readvance built a zone of overlapping moraines that extends from western Kane County to the shore of Lake Michigan. The ice moved rapidly—by glacial standards—and each episode of moraine building was followed by a retreat when the ice melted back—often as far as the Lake Michigan Basin.

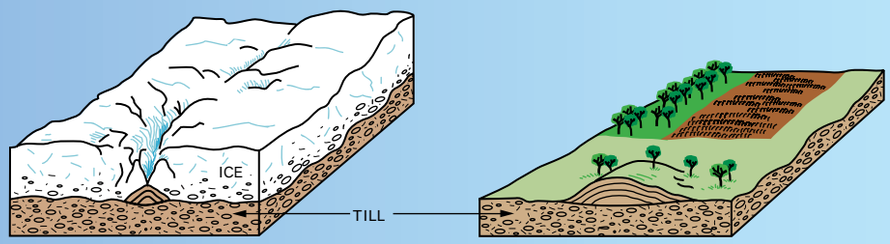
The oldest moraines in our region are to the west and south. The land gets progressively younger toward Lake Michigan. Our largest moraine belt is the Valparaiso Moraine which runs south through Lake, Cook, and DuPage Counties before swinging east through Will County and Lake and Porter Counties in

GLACIAL PROCESSES

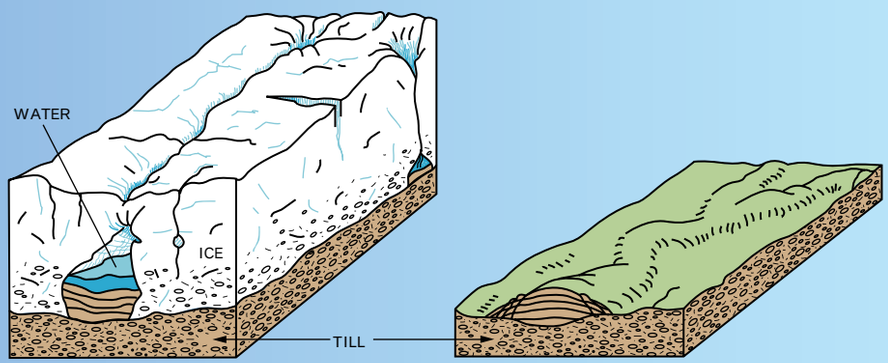
A glacier melts back from an end moraine. The moraine acts as a dam, holding in the waters of a proglacial lake. The water cuts a single outlet channel through the moraine. As the lake drains away, the lake bottom becomes a plain marked with sandy beach ridges located along the old shoreline.



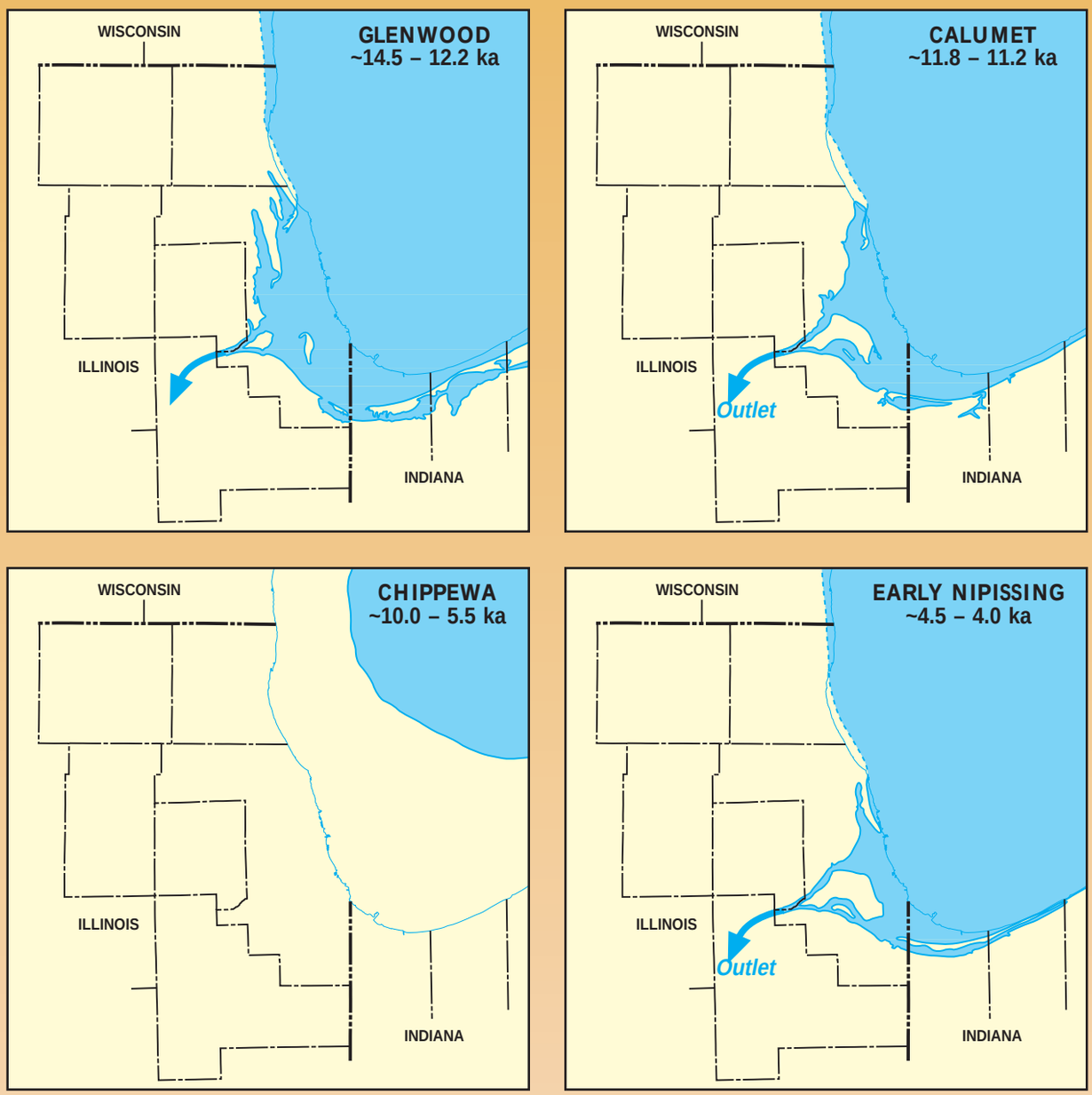
Meltwater swirls down through a hole in the ice. The moving water carries away smaller particles, leaving a mound of gravel called a *kame*.



Meltwater flows under the ice in a winding channel like the meandering course of a river. With the ice gone, deposits left by the water make an *esker*, a ridge that winds like a river.



The narrow ridge of the Visitation Esker in southwestern Cook County meanders through Cap Sauers' Holdings, a Cook County Forest Preserve.



LAKE MICHIGAN'S EVENTFUL HISTORY

The lake began as a pro-glacial lake dammed between the ice front and the moraines that circle the southern end of the Lake Michigan Basin. This Glenwood Stage was 55 feet above the present level of the lake. Sand ridges on the moraines mark that early shore. The lake overtopped the moraine in what is now southwestern Cook County and rapidly eroded an outlet (the Sag Valley) nearly a mile wide.

The Calumet Stage was about 35 feet above the present level. Blue Island, where resistant bedrock had prevented erosion by the ice, stood above the water.

The low-water Chippewa Stage occurred when a temporary outlet opened for Lakes Michigan and Huron through North Bay, Ontario. Water fell to 300 feet below the present level. Forests grew in what is now deep water.

Geologists call these early stages Lake Chicago. The title "Lake Michigan" refers to stages that occurred after ice had completely left the basin.

The Nipissing Phase of Lake Michigan saw water rising again over the lake plain and drainage from the lake flowing south through the Sag and down the Des Plaines to the Illinois. This phase left several prominent landmarks, including the beach ridge that provided the route for Clark Street in Chicago.

Indiana. The Valparaiso Moraine is as much as 25 miles wide with many high ridges and kettlehole lakes and marshes. Our youngest moraines are the Lake Border Moraines in Lake and northern Cook County, Illinois. Five separate Lake Border moraines, all lying parallel to the shore of Lake Michigan, have been named. The low areas between these moraines are the valleys of the Des Plaines and Chicago Rivers. Glaciers never returned to land in the Chicago region after the easternmost of these morainal ridges fell from the ice about 14,000 years ago.

However, the history of Lake Michigan was just beginning. The earliest proglacial lake, the Glenwood Phase of Lake Chicago, was 55 feet above the present mean level of Lake Michigan. As the lake went up and down with the geological changes that followed the retreat of the ice, it left behind beaches, sandspits, and thick layers of clay fallen from quiet waters. These features mark the largest of our lake plains, the Chicago Lake Plain. Most of the modern city is located on this plain.

The early stages of Lake Chicago drained south to the Illinois and Mississippi Rivers through a gap in the moraines called the Chicago Outlet in what is now southwestern Cook County. The rush of water through this gap cut the Sag Valley and eroded the Des Plaines River channel down to bedrock in Cook and Will Counties.

After cutting the channel of the Des Plaines down to bedrock, the lake stabilized for a time, then dropped again after a new outlet opened to the north, shutting down the so-called Chicago outlet. However, the lake returned to the Chicago Outlet in later times, most recently during the Nipissing Phase of Lake Michigan, a period that ended only 4,000 years ago. The youngest land in the region is along the shore of Lake Michigan in northern Lake County (IL). The land in Illinois Beach State Park is sand deposited by lake currents since the end of the Nipissing Phase.

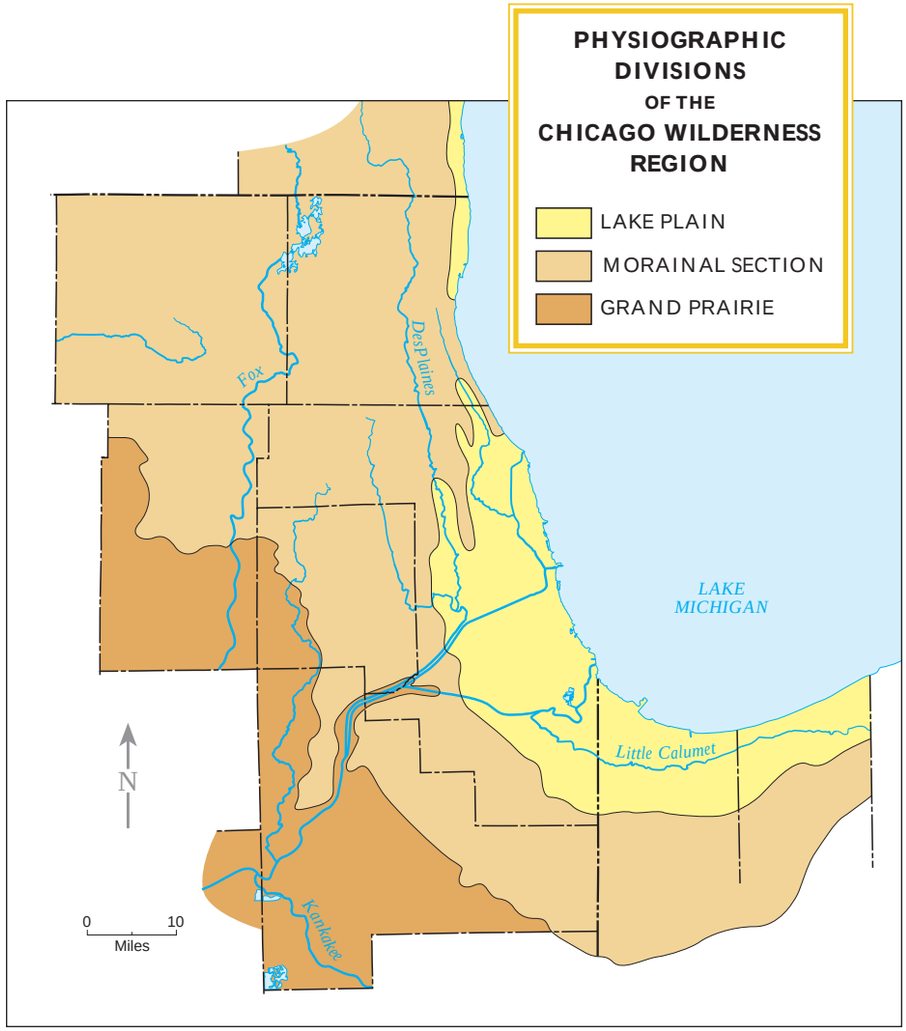
Since the ice departed, the pace and scope of change has drastically slowed. Deposits of wind blown dust called loess (pronounced "luss.") have accumulated on the glacial drift. Our rivers have cut more definite channels in the intermorainal areas, although marshes, bogs and other wetlands show that much of the land is poorly drained or not drained at all. Peat has built up in undrained basins and blowing sands have built the high dunes of the Indiana shore.

SOILS

The deposits left by the glaciers and the lake stages are the raw materials of soils. The soils themselves develop over centuries, products of climate, topography, and the effects of living things.

Soils that develop on hilltops are quite different from those that develop in low valleys—especially if the valleys are subject to regular flooding. Soils on steep slopes may erode as fast as they develop.

Soils developed under forests are quite distinct from those that were created under prairies. Wetland soils are equally distinctive. We will describe these soils in more detail in the coming pages.



Chicago Wilderness is part of three separate physiographic regions. The regions differ in their geological history, their terrain, and their vegetation.