FRONT COVER
Turkey River Mounds State Preserve
Clayton County

Photo by Gary Hightshoe,
Iowa State University

Iowa Department of Natural Resources
Geological Survey Bureau
109 Trowbridge Hall
Iowa City, Iowa 52242-1319
www.igsb.uiowa.edu

Educational Materials: EM-28 (2001)

Landscape Features

# of Iowa

The topographic features seen in this brochure illustrate the range of picturesque diversity that is present across our state. In addition to their beauty, each of these landscape views reflects some aspect of Iowa's geologic history. Understanding the geologic setting of various types of terrain is essential for citizens concerned with farming, urban expansion, recreation, excavation of mineral resources, pumping of groundwater supplies, landfilling of waste materials, and other environmental and natural resource issues. Also, it is useful to think about these landscapes in terms of their influence on the distribution of native plant and animal habitats, on various soil types, on the potential for archaeological remains, and on patterns of historic settlement. Learning more about the features of Iowa's landscape increases our understanding and appreciation of the views around us and the earth beneath our feet.

Gary Hightshoe, Iowa State University

*This **island-braided channel** of the Mississippi River occupies a gorge eroded through steep rock-lined bluffs in Clayton County. The deeply entrenched river valley was shaped by glacial meltwater floods between 18,000 and 9,500 years ago.*

Gary Hightshoe, Iowa State University

*Continuous rock bluffs called **palisades** line the Upper Iowa River. These cliffs result from the river eroding against dolomite, a resistant rock unit formed 450 million years ago. Such scenic landscapes in northeastern Iowa reflect sedimentary bedrock close to the land surface.*

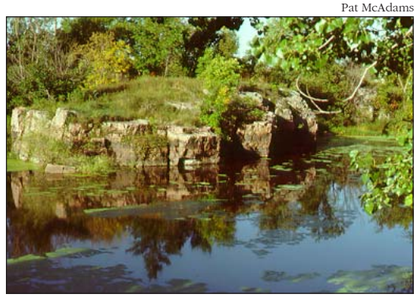
Gary Hightshoe, Iowa State University

*The Iowa River forms sweeping **meander loops** as it flows across its floodplain in Iowa County. Earlier migration channels are visible in the fields and woodlands. Floodplains are underlain by porous alluvial deposits that yield valuable groundwater supplies. These shallow resources are vulnerable to contamination from the land surface.*

Jean Prior

*Shifting **sand dunes** occupy part of an abandoned channel of the Upper Iowa River in Allamakee County. The sand accumulated when water flowed here earlier in the valley's history. Wind also deposited sand during later dry periods.*

Pat McAdams



*The oldest bedrock formation visible in Iowa outcrops at Gitchie Manitou State Preserve in Lyon County. The distinctive reddish **Sioux Quartzite** is seen here at "Jasper Pool," an 1800's-era quarry on the preserve. These durable, quartz-rich rocks are 2.6 billion years old. Glacial erratics of this formation are easily recognizable and may be found many miles to the southeast.*

Don Poggensee

*Some of Iowa's most fascinating scenery is found in the **Loess Hills**. Alternating peaks and saddles diverge along ridge crests sculpted from thick deposits of loess carried by wind from the broad Missouri River valley. The loess originated as silt, left in the valley following glacial meltwater floods between 12,000 and 50,000 years ago.*

*This inside view of a **cave** entrance at Maquoketa Caves State Park illustrates an example of **karst topography**. Such features also include springs and sinkholes, landforms that result from groundwater movement slowly dissolving shallow limestone or dolomite bedrock.*

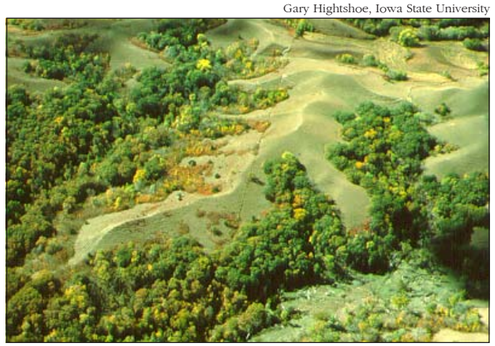
Greg Ludvigson

Doug Harr

*Ocheyedan Mound is an isolated conical hill composed of sand and gravel. It is an excellent example of a **glacial kame**, formed as meltwater carried sediments off the glacier surface and into a cavity in the slowly melting ice.*

Gary Hightshoe, Iowa State University

*Crooked ridges with steep sideslopes characterize the **Loess Hills** of western Iowa. They are composed of thick deposits of silt carried by wind from the adjoining Missouri River valley during seasons when glacial meltwater flood sediments were exposed. A sharp contrast exists between prairie and encroaching woodlands in this topographic setting.*



*Circular depressions, some filled with water or clumps of trees, mark the location of sinkholes in this Clayton County aerial view. **Sinkholes** form by collapse of thin soil and unstable rock into underground crevice or cave openings. Shallow aquifers are vulnerable to contamination in this geologic setting. Though most common in northeastern Iowa, sinkholes also are seen in Floyd and Mitchell counties and in the Burlington area of southeastern Iowa.*

Gary Hightshoe, Iowa State University

Jean Prior

*An outcrop of **sedimentary rock** displays horizontal layering, which reflects the rock's origins in a marine environment. Vertical fractures, caused by later earth stresses on the brittle dolomite, contribute a blocky appearance to the outcrop. These various planes of weakness are flowpaths for ground-water movement.*

Gary Hightshoe, Iowa State University

*These wetlands are a series of **glacial kettles** at Doolittle Prairie State Preserve in Story County. A subtle drainage system connects them, as noted by the soil moisture and darker vegetation patterns. The linked "prairie potholes" trace a route taken by glacial melt-water through disintegrating glacial ice 13,000 years ago.*

Pat Lohmann

***Glacial erratics** are boulders of igneous and metamorphic rock, native to regions north of Iowa. The erratics in this Black Hawk County pasture were carried into Iowa by glaciers over 500,000 years ago. They were concentrated at the land surface by later erosion, which removed the fine-grained deposits once surrounding them.*

***Dendritic drainage** patterns crease these cropped fields with branching routes along which precipitation runoff is channeled into rills, creeks, and rivers. This effective drainage network has reshaped the glacial plains left after southern Iowa's last contact with glaciers, over 500,000 years ago.*

Gary Hightshoe, Iowa State University

Tim Kemmis

*Hump-backed ridges rise from the landscape in southeastern Linn County. These ridges, known as **paha**, are always oriented NW to SE. They are all that remain of a once higher glacial plain and are often capped with wind-blown loess and sand.*

***Gullies** are deep, narrow erosional cuts through the landscape. Their development and growth is an active geologic process within the silt-dominated Loess Hills topography of western Iowa. Gullies widen and lengthen headward (upslope), eroding quickly, especially after heavy rains.*

Stan Mitchem

Pat Lohmann

*A **glacial moraine** in Dickinson County appears as a series of irregular broken ridges crossing the landscape. These are hummocky accumulations of pebbly debris that settled out of stagnant, slowly melting glacial ice about 13,000 years ago.*