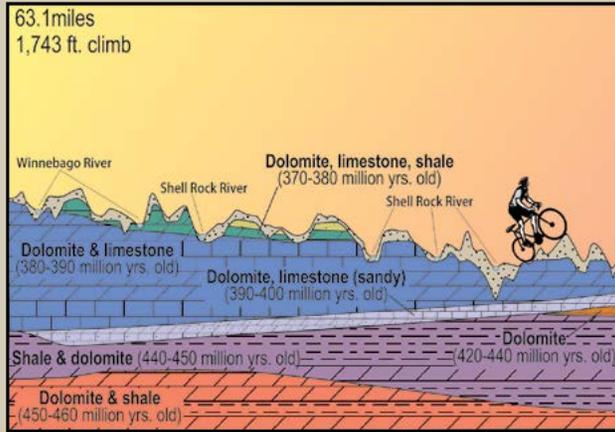


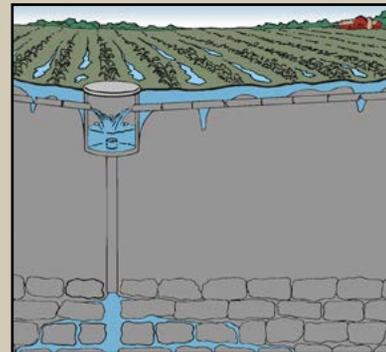
Rockford Fossil Park

Nestled just to the west of Rockford lies one of the most accessible areas in Iowa for fossil collecting. The Rockford Fossil & Prairie Park Reserve contains a wealth of marine specimens from the Devonian-age (375 million years ago), when Iowa was under a shallow sea. These fossils are found in the Lime Creek Formation that is composed of three members: the Juniper Hill, Cerro Gordo and Owen. Visitors to the preserve are encouraged to collect some of the ample fossils including brachiopods (shellfish), solitary and colonial corals, stromatoperoids (presumed sponges), bryozoans ('moss animals'), crinoids ('sea lilies'), cephalopods (squid-like), and pelecypods (clams). Molds of gastropods (snails) and pelecypods can be found, as well. In addition to the fossils, there are 60 acres of lush native prairie, an abandoned shale pit, and a visitor's center. Claybanks Forest and Bird Hill State preserves, located nearby, also contain the fossil-rich units, but collecting is only permitted at the Rockford Preserve.



Agricultural drainage wells

In the past, some farmers used agricultural drainage wells (ADW) to remove excess water from fields and funneled it into underlying bedrock units. ADWs pose a threat to groundwater quality in Iowa, because contaminants such as nitrate, pesticides, and sediment can be delivered directly into the underlying bedrock aquifers. The IGS monitored the improvement in aquifer water quality in central Floyd County after three ADWs were closed. The State of Iowa has established a fund to close ADWs. As a result, the number of ADWs in Floyd County has dropped from 53 in 1998 to eight in 2009, along with the nitrate levels in the groundwater.



RAGBRAI

Day 5

2014

Thursday, July 24

Learn About the Land

Fossils



Iowan Surface and Erratics

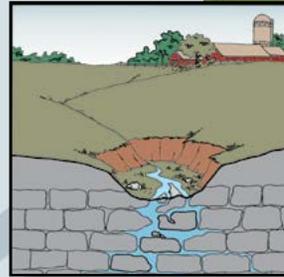
On Days 5 and 6 as well as part of 7, riders will traverse the Iowan Surface landform region. At Clear Lake, riders will exit the Des Moines Lobe landform region and will travel on the Iowan Surface landform region until two miles east of Edgewood.

Iowa was glaciated numerous times during the Pre-Illinoian Episode (2.6 to 0.5 million years ago). The Iowan Surface, which makes up northeast Iowa, was subjected to a period of intense cold between approximately 21,000 and 16,500 years ago during the Wisconsin Glacial Episode. This period was characterized by periglacial processes including freeze-thaw activity, persistent strong winds, and solifluction, creating gently rolling topography and a low relief landscape with highly meandering low-gradient streams.

Characteristic features of the Iowan Surface include stone lines, glacial erratics (large boulders carried from the north by glaciers), and pahas. Both stone lines and glacial erratics are lag deposits left behind as erosion carried away finer materials. Stone lines are often covered by a thin layer of loess (wind-blown silt) and are only visible in cross-sectional views. Numerous glacial erratics are found throughout the area and may be observed in fields along the route. The town square of Nora Springs is designed around a very large erratic.

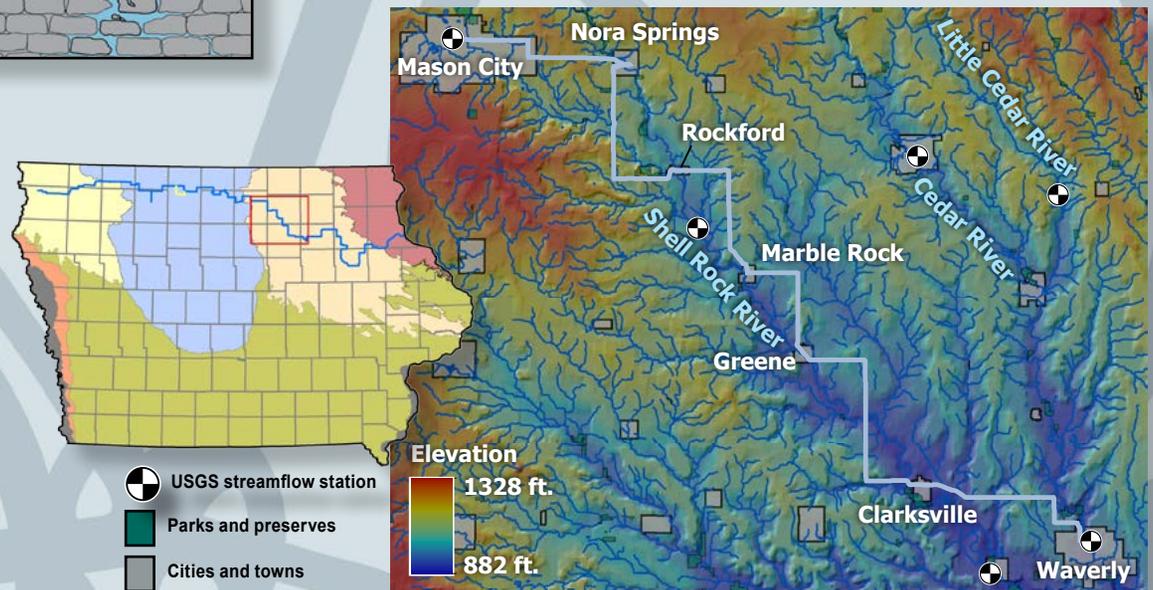
Living in Karst

<ftp://ftp.igsb.uiowa.edu/igspubs/pdf/GB-25.pdf>



Karst

Karst terrains form by the dissolving of limestone or dolomite by groundwater. Typical features of karst terrains are caves, sinkholes, and springs. Many sinkholes have developed in the Cedar Valley Group, a geologic unit consisting of Devonian-age limestone and dolomite, in Floyd County and are visible from the highways. Highway 218 north of Floyd, for example, is a great area to view these sinkholes. Trees growing from a depression are indicative of a sinkhole.



Limestone is one of the most common rocks in Iowa. It is a sedimentary rock composed largely of the mineral calcite (calcium carbonate or CaCO_3). Limestones often contain variable amounts of chert or flint as tiny void fills, nodules, or layers. Sand, silt, and clay are also commonly found in limestone to varying degrees; geologists refer to a clayey or silty limestone as argillaceous limestone.

The primary source of the calcite in limestone is typically microscopic remains of ancient marine organisms. Iowa's vast resources of limestone are obvious when you see buildings, retaining walls, sculptures, signs, walkways, gravel roads, and interstate highways all utilizing this vastly versatile material.