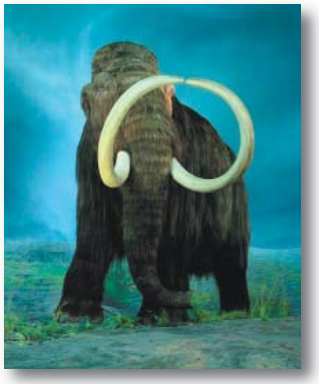
RAGBRAI Geo-pedia

Mammoths in Iowa



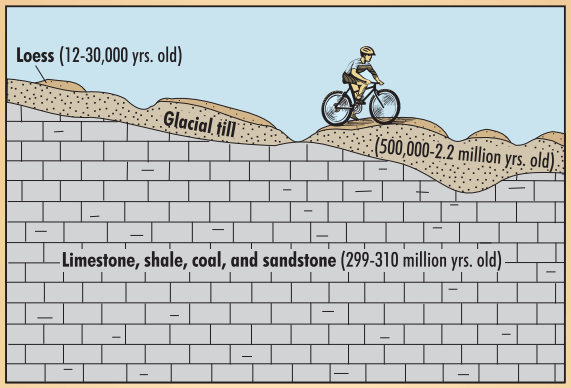
Woolly Mammoth.
Photo courtesy of the Royal British Columbia Museum, Victoria, BC, Canada.

The close of the great Ice Age brought many changes to the upper Midwest. This change is well documented by the sediments exposed along Clanton Creek near St. Charles. The creek sediments provide geological evidence of ancient fluvial and biotic environments, along with well-preserved mammoth (Mammuthus) bones that have been radiocarbon dated to 34,000 years ago! Evidence shows that this area was once a weedy flood plain filled with a wide variety of vegetative species. The younger alluvial fill contains well-preserved pollen, plant macrofossils, and insects. The Iowa landscape changed drastically as the climate warmed in this 'Great Plains' area. With these changes came human habitation. Great beasts, such as the mammoths that lived during the Pleistocene, watched as their world and their dominance disappeared.

Mammoths are close relatives of modern elephants; they had long curved tusks and long brown hair that covered their entire body. Mammoths, unlike Mastodons, had molar teeth that were flat and used for grinding grasses and other long thin plant material, while Mastodons had teeth used for crushing and eating hard plant materials such as tree and thick bushes. Mammoths are believed to have lived in the Pliocene epoch about 4.8 million to 4,500 years ago. Prehistoric human hunting was likely a strong contributing factor in the extinction of the mammoth, along with many other large mammal species.

COVER PHOTO: *Imes covered bridge in Madison County, Iowa*

Day 3 Milestones



Start: Greenfield
Glacial Erratic: Orient
Thompson River: 5 miles after Zion
Clanton Creek: 0.7 miles after East Peru
Pennsyvanian Outcrop: 1 mile after East Peru
Imes Bridge: 0.5 miles after St. Charles
Middle River: 4.2 miles after St. Marys
Finish: Indianola – 75 miles

For more information...

about the health of Iowa's rivers, including the South, North, and Middle Rivers, visit:
http://programs.iowadnr.gov/adbnet/search.aspx

Iowa has created a water quality index (or IWQI) to better compare and contrast streams and rivers in the state. This monthly-updated index is available at:
http://wqm.igsb.uiowa.edu/wqi/IA/WQI_IA.asp

Information on mammoths, mastodons, cephalopods, along with many other Iowa fossils can be found at:
www.igsb.uiowa.edu/Browse/fossils/fossils.htm

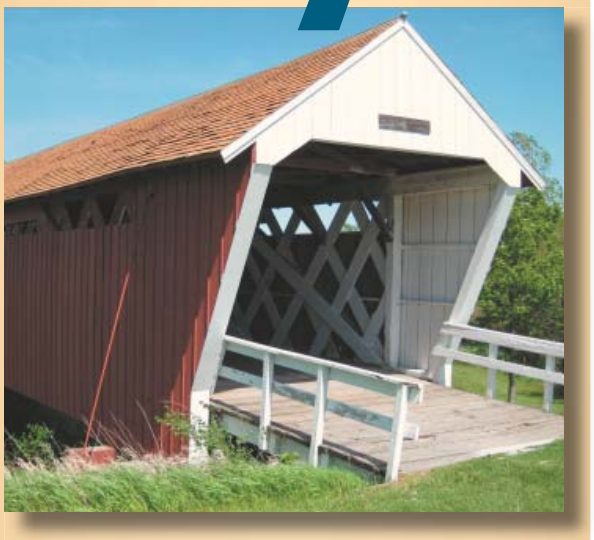
For information about the Pennsylvanian bedrock of Southern Iowa, visit: **www.igsb.uiowa.edu/gsbpubs/gsbpubs4.asp?findit=PENNSYLVANIAN**

RAGBRAI 2009

Learn about the Land

Day 3

Tuesday, July 21



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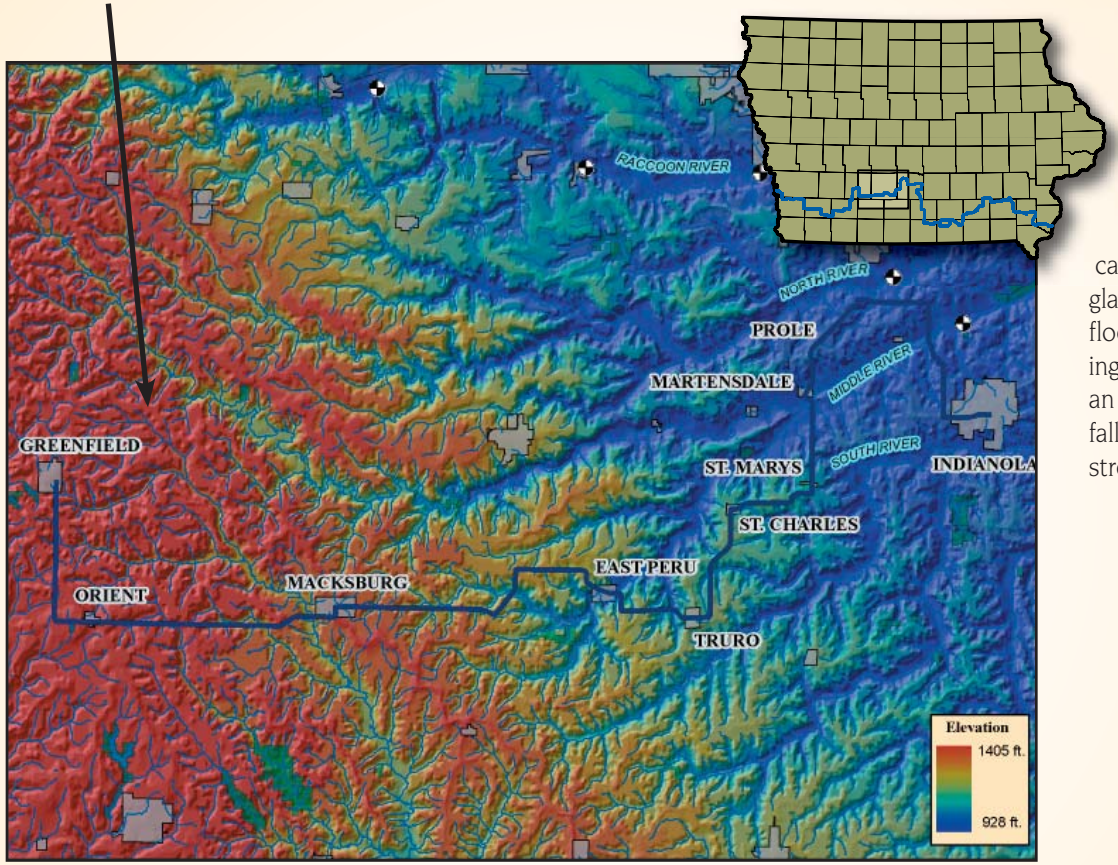
Iowa City, IA 52242-1319
(319)-335-1575
www.igsb.uiowa.edu

US Geological Survey
Iowa Water Science Center
400 S. Clinton St.
Iowa City, IA 52240
(319) 337-4191
http://ia.water.usgs.gov

Throughout southern Iowa numerous **windmills** are still visible on farmsteads. Although most are no longer functional, their presence tells us something about the local geology. Generally speaking, the surface geology of the area consists of a loess mantled till plain. In many areas in Southern Iowa, a shallow "perched" water table is present at the boundary between a relatively thin (10-15 feet) section of loess and the older, deeper till. The perched water develops because the clay-rich paleosols (ancient soil) in the till slow the water infiltration, keeping water in the loess near the land surface. Many farmers constructed simple wells and windmills to pump this shallow, accessible water for their livestock and homesteads.

On the third day, as RAGBRAI travels from the town of Orient to Macksburg, you will cross the **drainage divide** between the Missouri River to the west and the Mississippi River to the east. Several rivers have their headwaters along this drainage divide, including the South, Middle, and North rivers. You will travel through all three of these river's watersheds today.

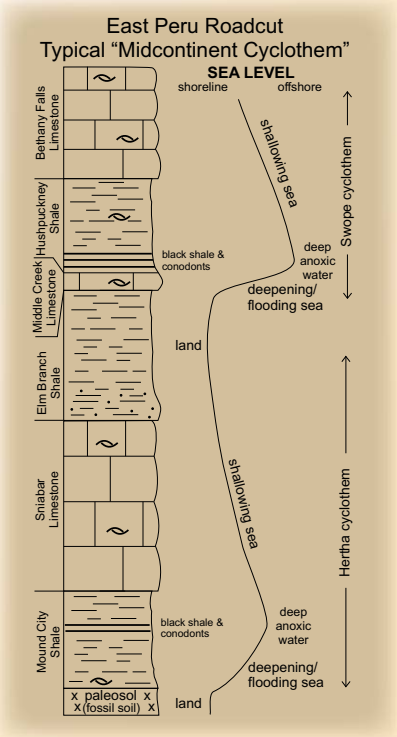


USGS streamflow station

Parks and Preserves

As you have probably noticed, this year's RAGBRAI route is far more hilly than usual. This is because RAGBRAI 2009 is almost exclusively on the mature landscape of the **Southern Iowa Drift Plain**, the largest landform region in Iowa. The Southern Iowa Drift Plain comprises most of the southern half of the state. Iowa was glaciated numerous times from 2.2-0.5 million years ago. These glacial advances left behind a thick package of glacial till that has subsequently eroded. The long period of erosion and landscape development created the well-defined river valleys and topography that we see today. More recently, this area was thinly mantled by several loess deposits. The loess deposits are thickest near river sources that carried material from the Des Moines Lobe.

Pennsylvanian-age, 306 million year-old rocks at East Peru (photo above) preserve the cyclic record (cyclothems) shown below of rising and falling sea levels caused by the waxing and waning of ancient glaciers. As glaciers melted, rising sea levels flooded coastal & interior lowlands depositing limestones and black shales that contain an abundance of fossils. As glaciers grew, falling sea levels led to river delta migration, stream erosion, and soil formation.



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