

Iowa's 'Sublime-stone' Beauty



Imagine life in Iowa without structure – impassable roads and new homes without a foundation of concrete. These are only two of many countless uses of crushed limestone, perhaps Iowa's most forgotten natural resource. Each year, Iowans use over 32 million tons of crushed limestone! It impacts the lives of every Iowan every single day. It is a key ingredient in the construction of our infrastructure: roads, commercial buildings, and bike paths. It even purifies our drinking water, increases crop production by neutralizing acid soil in our farm fields, and is the key ingredient in antacids.

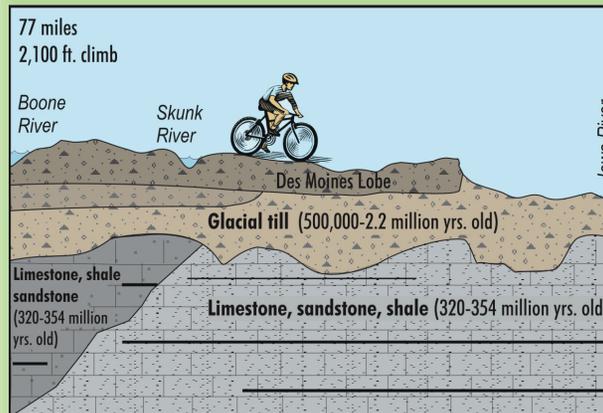
Employing over 1,800 people, the limestone industry in Iowa is very conscious of its impact on the land and has a long history of working to protect the environment and ensure proper reclamation of mined lands.



"Everything we have and everything we use comes from our Natural Resources."

COVER PHOTO: Project AWARE volunteers cleaning up the Turkey River in 2011.

Day 4 Milestones



- Start:** Webster City
- Goose Lake:** 22.5 miles
- South Skunk River:** 35 miles
- Altamont Moraine:** 40 miles
- Off Des Moines Lobe/**
- Onto Southern Iowa Drift Plain:** 60 miles
- Iowa River Valley:** 71 miles
- Finish:** Marshalltown – 77 miles



For More Information...

Project AWARE
www.iowaprojectaware.com

IDNR - Recreational Canoeing & Kayaking
<http://www.iowadnr.gov/Recreation/CanoeingKayaking.aspx>

USGS Earthquake Hazards Program
<http://earthquake.usgs.gov/>

Exploring the Midcontinent Rift
<ftp://ftp.igsb.uiowa.edu/igs pubs/pdf/RIFS-2006-2.pdf>

Iowa's State Preserves
<http://www.iowadnr.gov/Destinations/StatePreserves.aspx>

40th **2012**
RAGBRAI
Learn about the Land
Wednesday, July 25
Day 4



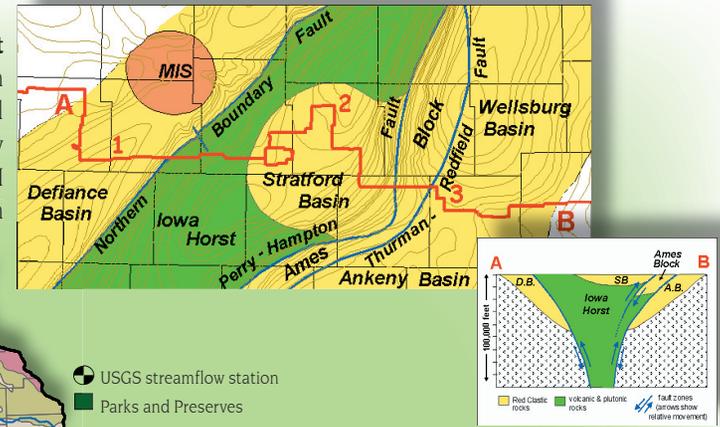
Iowa DNR – Geological and Water Survey
109 Trowbridge Hall
Iowa City, IA 52242
www.igsb.uiowa.edu

US Geological Survey - IA Water Science Center
400 S. Clinton St.
Iowa City, IA 52240
<http://ia.water.usgs.gov>

Iowa Limestone Producers Association
5907 Meredith Dr., Suite A
Des Moines, IA 50322
www.limestone.org

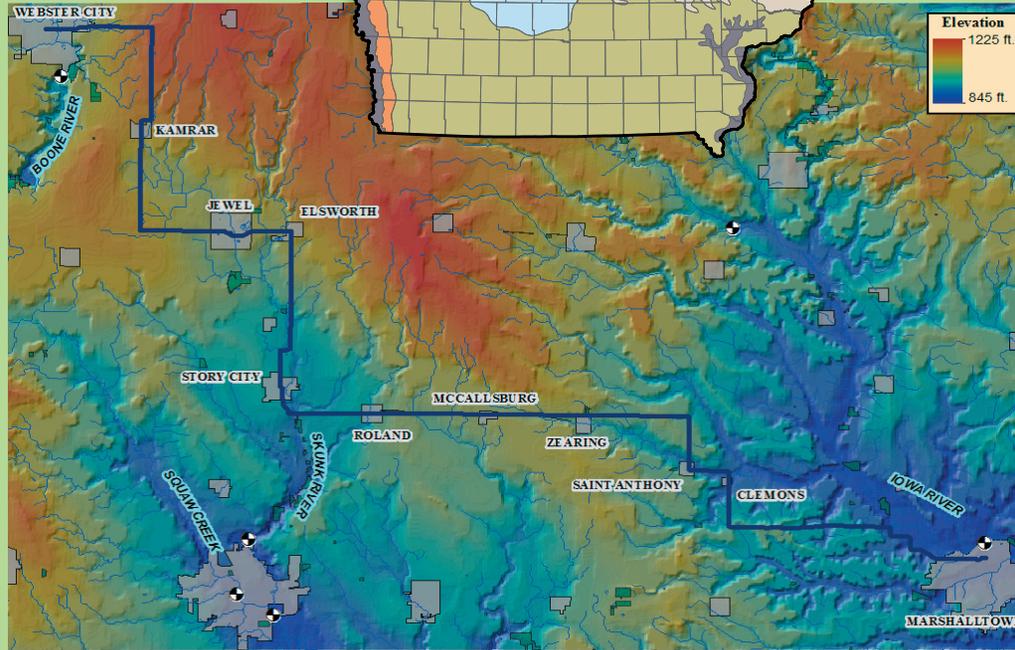
Gravitational Anomale...or Next Weight Loss Craze?

Most of RAGBRAI days 3 and 4 will be spent crossing one of the largest geological features in Iowa, the **Midcontinent Rift System**. This rift, a giant crack in the Earth that nearly split North America in half about 1 billion years ago, is buried beneath about 2,000 feet of younger geologic materials in this area of Iowa. The rift stretches from eastern Lake Superior to central Kansas, and is characterized in Iowa by a 20-30 mile wide block of dense igneous rocks called the Iowa Horst, bounded by high displacement fault zones, and flanked by deep basins of lighter clastic rocks (sandstones and shales). The RAGBRAI route also passes over a shallow clastic basin, the Stratford Basin, on top of the Iowa Horst. The thick, low density rocks in the flanking basins reduce the Earth's gravitational attraction by 90 miligals (mgals) at point 1 on the map and by 70 mgals at point 3. The dense rocks of the Iowa Horst increase the Earth's gravitational attraction by as much as 60 mgals at 2 on the map. So this gravitational change between 1 and 2 on the map (150 mgals) would increase the weight of a 180 pound person by about a half an ounce. This is one of the largest gravity anomalies in North America.



Did You Feel That?

Today you will be traveling near the only **USGS seismic station** in the State of Iowa. Iowa has experienced only minor earthquake activity since the United States obtained control of the state. The great **New Madrid**, Missouri earthquakes of 1811 - 1812 were the first reported felt in Iowa. The absence of historical seismic records from the territory prevents an accurate assessment of the actual effects from these earthquakes. Over the years there have been reports of earthquakes within the state with only slight damage. The USGS studies earthquakes around the world and estimates that several million occur each year, but many go undetected because they occur in remote areas or have very small magnitudes. The USGS now locates about 50 earthquakes each day; 20,000 a year. Earthquakes pose significant risk to 75 million Americans in 39 States.



'Canoe' Think of a Better Way to Enjoy Iowa's Rivers?

Iowa is blessed in having abundant water resources. Iowa's 72,000 miles of rivers and 125,000 acres of lakes and reservoirs provide numerous recreational opportunities, including fishing, boating, and swimming. Water trails are marked routes along a river or other water body specifically designed for people using non-motorized boats such as canoes or kayaks. Water trails include signs, maps showing river mileages and launch and landing sites, as well as information on amenities along the route. As part of the Iowa Water Trails program, Iowa has 893 miles of designated water trails with another 592 miles under development. As you leave Webster City, you will cross the Boone River which has a completed water trail. Later in the day you will traverse the South Skunk River which has a water trail in the development stage.



'AWARE-ness' is Bliss

Each year, hundreds of Iowans spend anywhere from a day to a week of their summer vacation participating on Project AWARE as aquatic garbage collectors. Project AWARE, which stands for **A Watershed Awareness River Expedition**, is the Iowa DNR annual volunteer weeklong river clean up. In addition to cleaning up the river, Project AWARE volunteers have opportunities to participate in a variety of educational opportunities, collect and analyze water quality monitoring data, and develop healthy behaviors that help benefit the environment. Since 2003, more than 2,150 participants have cleaned up 700 river miles, removed 182 tons of trash of which 65% has been recycled. Earlier this month, Project AWARE celebrated its 10th year, with volunteers removing garbage from a 94-mile stretch of the Iowa River in central

Iowa from Dows to Marshalltown. To help tell the story of Iowans and their efforts to improve water quality, some of the trash is transformed into metal sculptures, including 10-foot tall security gates that now adorn the DNR's State Fair building in Des Moines.