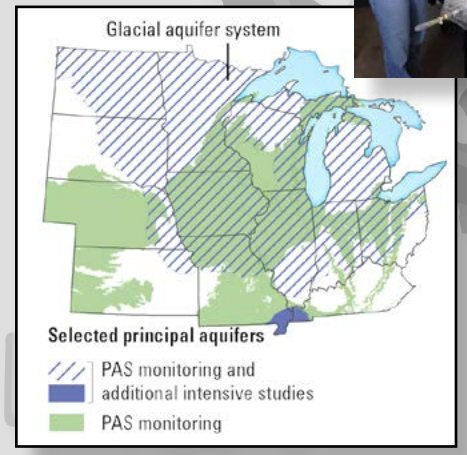
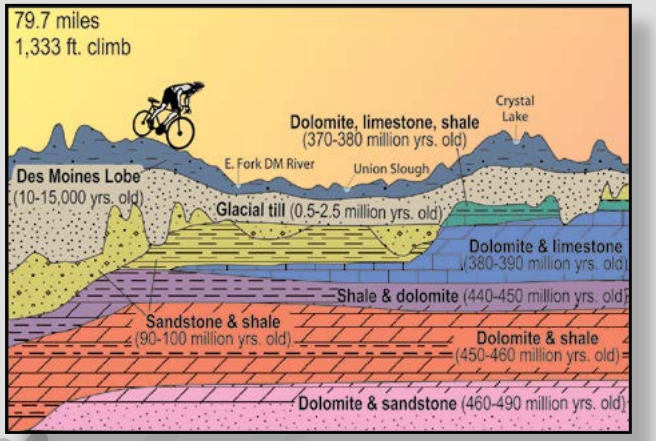
Groundwater/Water-Quality Studies

On today's Century Loop, you will pass through the town of Burt, one of 60 towns in the upper Midwest that is a part of the USGS National Water-Quality Assessment's (NAWQA) Principal Aquifer Study (**PAS**). The USGS has identified 68 principal aquifers across the Nation. Groundwater pumped from these aquifers provides 45 percent of the Nation's drinking water supply. This study will provide information on the quality of water (both natural and/or human-impacted) in shallow monitoring wells, domestic-supply wells, and public-supply wells. In addition, samples will be evaluated for the age of groundwater from the supply wells. This information has proven valuable for gaining a better understanding of our Nation's groundwater system.

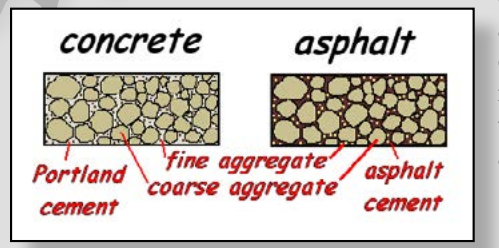
USGS Publication

http://pubs.usgs.gov/fs/2014/3024/





As you bike across the state of Iowa you will primarily be riding on paved roads, but what are they paved with? Some are paved with concrete and some with asphalt. What is the difference? Well both are composed mostly of aggregate, fragments of crushed limestone or dolomite and sand. It is the material that glues these fragments together that is the primary difference. Concrete (the white or light gray road surface) uses Portland cement to glue the aggregate together. Portland cement is made by firing a finely crushed mixture of limestone, sand clay, and other materials to 2,600° F in a kiln to produce a clinker that is mixed with gypsum and crushed to a fine powder to make the cement. The cement is mixed with water and the aggregate and applied to the road base to create a concrete roadway. Asphalt is a viscous petroleum product that is heated, mixed with aggregate and applied to the road base to create an asphalt roadway. 94% of asphalt and 80% of concrete is made up from aggregate.



RAGBRAI

Day 3 2014

Tuesday, July 22

Learn About the Land

Floods

IOWA GEOLOGICAL SURVEY

IIHR Hydroscience & Engineering

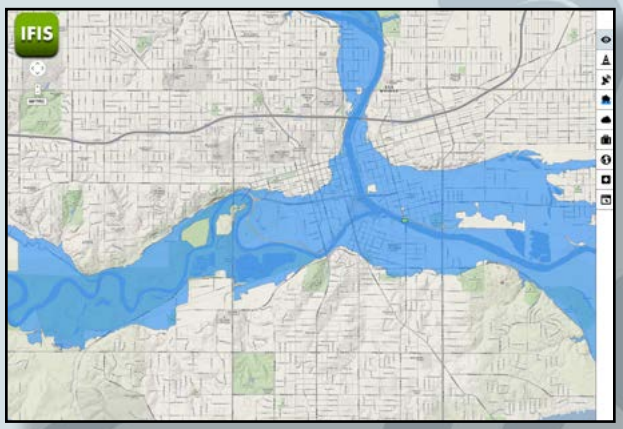
USGS science for a changing world

IOWA LIMESTONE PRODUCERS ASSOCIATION
Your limestone resource since 1945!

DNR

Glacial Moraines

Day 3 finds RAGBRAI riding the heart of the Des Moines Lobe. Many of you may have taken a dip in Five Island Lake yesterday. Five Island Lake owes its origin to the drainage of a younger re-advance of the Des Moines Lobe, the Algona Moraine. The lake most likely formed out in front of the glacier along a failed meltwater drainage channel that travels through present day Emmetsburg and drains to the West Fork of the Des Moines River. That channel functioned very similarly to the Okoboji Outlet Channel you biked across early yesterday near Milford, with the exception that it became inactive after a time. Below the lake sediments is a thick peat bed sequence that chronicles the change in flow conditions. Several miles north of Emmetsburg you will notice a ridge, the Algona Moraine, which you will ascend, and then proceed across the Algona Till Plain until Crystal Lake. Upon leaving Crystal Lake you will bike across the slightly older Altamont Moraine and traverse a host of glacial landforms such as kames and eskers which are the by-products of extensive ice wastage associated with the Des Moines Lobe.



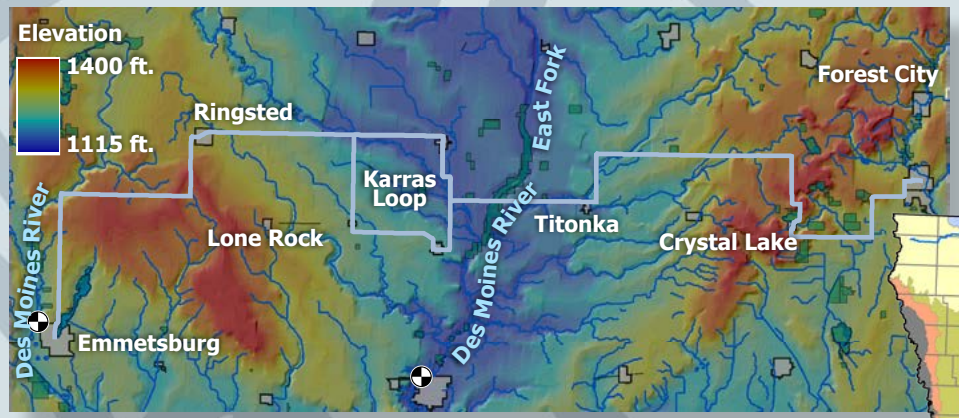
Iowa Flood Information System (IFIS)

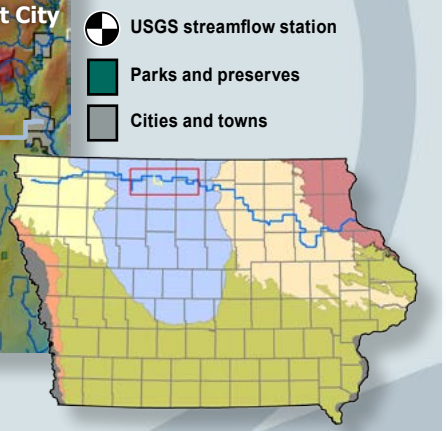
IFC developed IFIS after the 2008 floods to help Iowans be better prepared for flooding. IFIS is an easy-to-use online application that allows users to find their watersheds, view stream levels in real-time, check local rainfall, and see predicted flood levels.

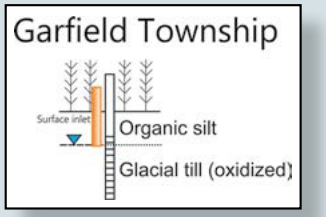
IFIS

http://ifis.iowaflood-center.org/ifis/en/

In 2013, thousands of Iowans took advantage of IFIS to better understand their flood risks and check local conditions. During the week of May 26, when some areas received record rainfall, IFIS got more than 27,000 visits; the highest one-day total 7,391 visits occurred on May 30.





Farmed Wetlands Project

Since European settlement, approximately 3.5 million acres, or 90% of historical wetlands have been lost in Iowa due to artificial drainage and expansion of row crop agriculture. Although the wetlands have been drained, the land surface depressions they formerly resided in still remain, and these areas occasionally hold water during wet periods. The shallow and temporary wetlands in agricultural fields are referred to as "farmed wetlands" and they are the subject of a collaborative study by the Iowa DNR, Iowa State University, and the IGS. The IGS is taking the lead on evaluating the hydrology of these drained wetland areas. In 2011, eight shallow monitoring wells were installed in various farmed wetland sites in north-central Iowa and instrumented with pressure transducers to record water table fluctuations. This 4-year study is documenting the transient nature of water table behavior in unstudied farmed wetlands. Observations indicate the water table typically rises in the spring in response to precipitation inputs and then falls in the mid-summer when conditions dry and evapotranspiration dominates the hydrologic budget. The results of this study are shedding new light on the functioning of drained wetland ecosystems in the prairie pothole region of Iowa.