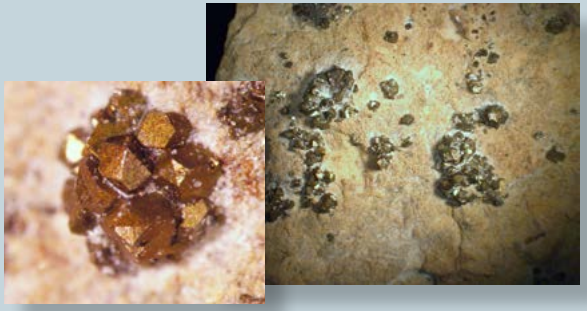
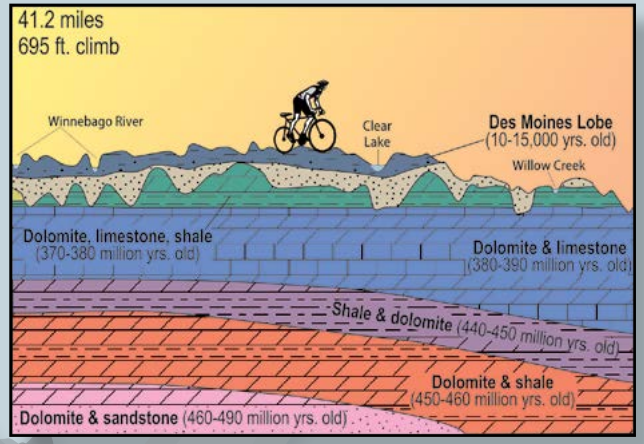
RAGBRAI

Day 4 2014

Wednesday, July 23





Research aiming to reduce arsenic in Iowa groundwater

Recent research is documenting the presence of natural arsenic in groundwater for private wells in north-central Iowa and elsewhere in the state. An ongoing five-year study is raising awareness among Iowa residents and well drillers to better understand what causes the arsenic to mobilize into groundwater. Typically arsenic is found in sulfide minerals like arsenopyrite (photos above) or in smaller concentrations in iron pyrite (fool's gold), both of which naturally occur as secondary minerals in many of Iowa's bedrock units. This mobilization was found to occur through geochemical processes such as oxidation and reduction reactions. Thanks to this research, conducted by IIHR –Hydroscience & Engineering, the Cerro Gordo County Public Health Department, The State Hygienic Lab at the University of Iowa, and the Iowa DNR, well drillers now know how deep to drill and how to construct their wells in order to significantly reduce the potential for elevated arsenic levels in groundwater aquifers. Homeowner testing of private wells has also increased, which has led to better understanding of the possible risk.

Hoffman Prairie

Hoffman Prairie is a 36-acre biological and geological state preserve managed by The Nature Conservancy. Located between Ventura and Clear Lake on Highway 18, Hoffman Prairie is a result of past glaciation. The terrain at Hoffman Prairie is described as "knob and kettle," where small marshes are surrounded by knobby terrain with numerous glacial erratics, and is characteristic of glacial moraines. Over 150 plant species and 12 butterfly species can be found in Hoffman Prairie.

Learn About the Land

Mapping

IOWA GEOLOGICAL SURVEY

IIHR Hydroscience & Engineering

USGS science for a changing world

IOWA LIMESTONE PRODUCERS ASSOCIATION
Your limestone resource since 1945!

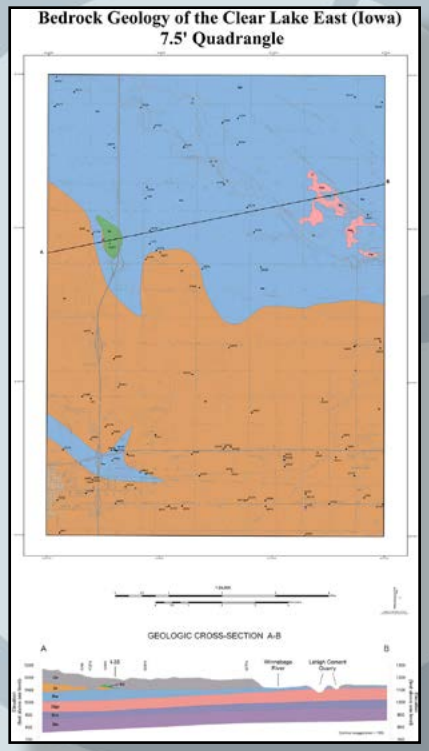
DNR

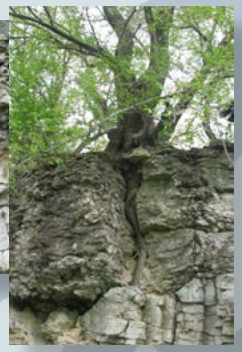
STATEMAP

is a federal competitive grant program, with a 50:50 funding match between the USGS and state geological surveys. The IGS has participated in the STATEMAP program since 1994. The IGS has produced both bedrock and surficial geologic maps at quadrangle (1:24,000) and county (1:100,000) scale, as well as a complete bedrock map update of the State of Iowa in 2010 (1:500,000). On Day 4, riders will cross our current mapping areas in Cerro Gordo County (Mason City and Nora Springs quadrangles). Additional mapping is occurring in Mitchell County (St. Ansgar and Osage quadrangles). These areas compliment previous mapping in Worth County that was completed in conjunction with the Natural Resources Conservation Service (NRCS) update of that county. Mapping products provide valuable land-use planning tools for local communities and watershed groups.

STATEMAP

http://ncgmp.usgs.gov/about/statemap.html



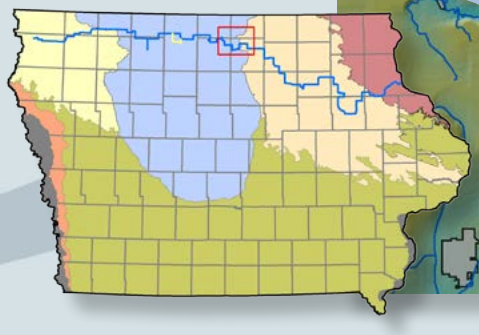
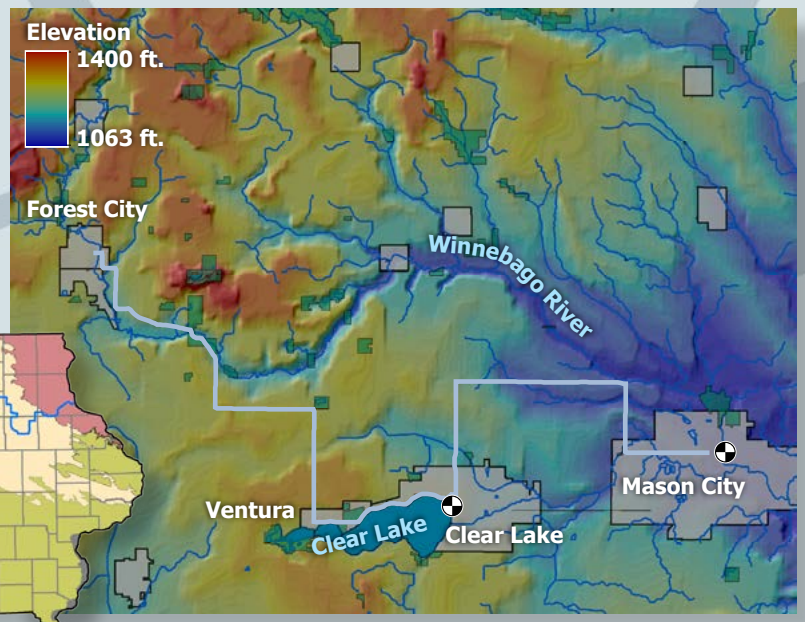


East Park

Riders staying in Mason City's East Park can view the exquisite geologic contact between the Devonian-age Shell Rock and Lithograph City formations (top left photo). These two formations are divided by a biostrome unit (fossil-rich zone) at the base of the Shell Rock Fm. This unit is made of stromatoporoids, which are believed to be fossil sponges. They can be semi-spherical or digitate (finger-like). The aptly named Lithograph City Formation in this area is a very fine grained pure limestone, which is why it was historically useful in printmaking. The contact between these two formations represents a disconformity, or a gap in geologic time, where sea level dropped and possibly some erosion took place. Then sea level rose to the point where deposition of the Shell Rock Fm. continued.

GSI Guidebook No. 90

ftp://ftp.igsb.uiowa.edu/igspubs/pdf/GSI-090.pdf

Mason City Quarries

As you ride into Mason City on 300th Street (B20) and turn south on Mallard Avenue (S34) you will pass just south of one of the largest limestone quarries in the area. The Mason City area hosts several large quarries and cement factories that have been operating in the area for over a century. The physical and chemical properties of the Devonian-age bedrock here make for an excellent source of aggregate and cement products. Carbonate rocks, limestone and dolomite, of the Shell Rock and upper Lithograph City formations are quarried and crushed to be used as roadbed aggregate, gravel for rural roads, and asphalt.