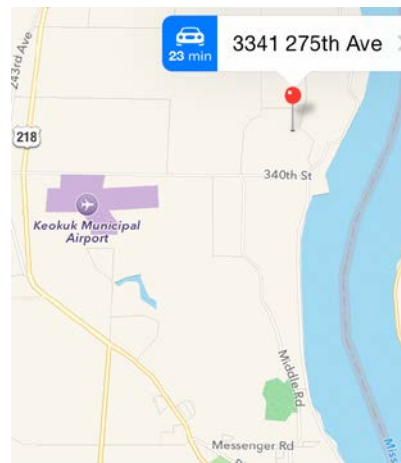


Geological Resources of Iowa
Final Project
July 15, 15
Jamey Sue Smith



Longitude and Latitude
 $40^{\circ}28'29"N$ $91^{\circ}23'19"W$

The location that I chose for my project is the Lamalees Creek that drains into the Mississippi River about one mile downstream. It has a small outcrop of limestone along the bank that includes several crinoids. In the creek bed itself are several geodes, dolomite, and chert. It is also described as, “the site of two wonderful springs from which the Indians would quench their thirst on the canoe trips down the river or when they were on the trail through the vicinity.” (Vertical Files: Keokuk Public Library, July 17, 2015)

The location was settled by the Indians, in speculation, due to the chert deposits that can still be found in the creek. When one of the first white settlers, Valencourt Vanausdol, arrived to the banks of the location now known as Sandusky in 1827 he described it as covered in heavy timber and went on to say that, “the woods were full of wild turkeys, deer

squirrels and other wild game.”(The Keokuk, IA Gate City and Constitution Democrat, September 6, 1947)

A French trader, Lemoliese, established a town, Sandusky, as a trading post in 1820 on the banks of the Mississippi River at the mouth of the Lamalees Creek . “The Indians brought immense quantities of buffalo, elk, deer wolf coon, mink, otter, beaver, and muskrats skins to trade to the whites for such things as suited then in exchange, especially blankets, knives, trinkets and whisky.” (The Keokuk, IA Gate City and Constitution Democrat, September 6, 1947)

The Mississippi River had many dangerous rapids and shallow water in this part of the river so in the years of 1870-1978 a canal and locks were built. During this time the town thrived with multiple boarding homes, groceries and hardware store, blacksmith shop, saloon, and two churches. (When Sandusky was quite a Town, Vertical files: Keokuk, Iowa) The settlement of Sandusky continued to thrive until a dam was completed in Keokuk in 1913. At this time the upper lock house in Sandusky for a canal built in the 1870's was not longer needed and a large part of the town was submerged into the river. (Lee County Iowa, Sloat)

The town that once thrived is now just a small settlement of homes on a blacktop road. There is still an active church, but all other establishments have either been washed down the Mississippi or tore down. The once heavily wooded area has since been cleared and replaced with large fields for corn and beans. The area directly along the creek is still partially wooded but many areas have large areas where erosion has exposed the bedrock. The creek itself does not go over three feet deep in most areas and in many parts it is just a small trickle of water. According to locals there use to be a bridge over the creek and the

exposed bedrock was a cliff that was one story high. The creek in that location twenty-five years ago was deep enough that they would go there and jump in and swim. There is a legend that the area is haunted because Indians used to also swim there and one jumped in head first and broke his neck due to a large stump under the water. I could not verify this story with resources in print, but several locals that are over the age of 40 verified this story when I asked them about the history of the location. Those locals told me that ten years ago the creek was modified and a large concrete culvert was put in place of the bridge. Signs are posted that this is a flood zone and during rain to stay away from the area. Even with the substantial rain that the area has had the creek itself is deep enough to wade in, but it is not deep enough to swim.

The area surrounding the creek of interest is predominantly nutrient rich sandy soil that is known for high crop yields. Land is sold at a premium as farm ground and very little timber can be found. A couple of miles from the area a coalmine has been established and barge traffic carrying coal is common practice using the Mississippi as a method of transportation. Lastly, upstream from the place of interest a gravel pit can be found with natural deposits of gravel.

Bedrock Geology of Southeast Iowa

Digital Geologic Map of Iowa Phase 7: Southeast Iowa

Index Showing Area of Geologic Map

Prepared under the STATEMAP program, in cooperation with the
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Prepared by the Iowa Department of Natural Resources
Iowa Geological Survey, September 2004
Open File Map 04-1

prepared by

Brian J. Witzke, Raymond R. Anderson,
Bill J. Bunker

Iowa Geological Survey
2004

Msp

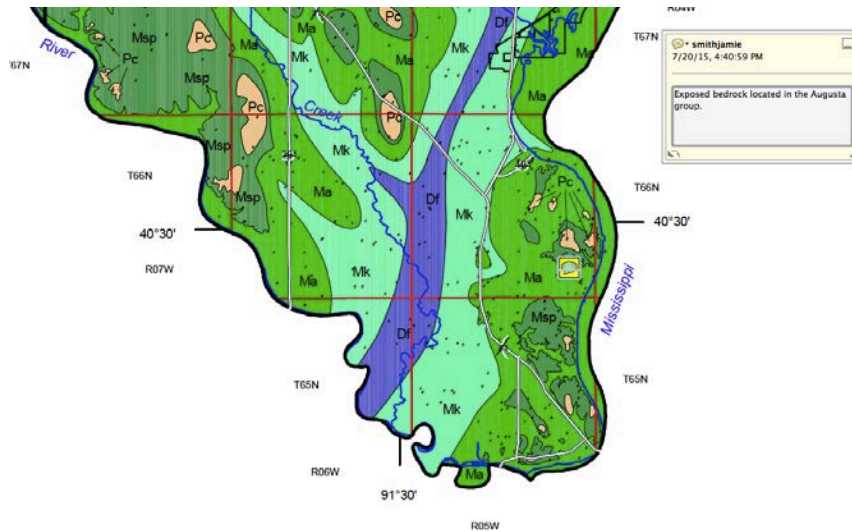
"St Louis" and Pella formations. Middle Mississippian (Meramecian). Locally includes Sonora Fm in Lee, Van Buren, Henry, Des Moines, and Jefferson counties. Maximum thicknesses vary 45-130 ft (14-40 m); beveled to truncated beneath sub-Pennsylvanian unconformity. Primary lithologies: dolomite, part sandy to fossiliferous; limestone, part sandy to fossiliferous; dolomite/limestone breccia; sandstone; shale, green-gray to pink. Secondary lithologies: oolitic limestone; gray shale. Minor: chert, chalcedony, anhydrite.

Pc

Cherokee Group and Caseyville Fm. Lower and Middle Pennsylvanian (Morrowan, Atokan-Desmoinesian). Includes Kilbourn, Kalo, Floris, Swede Hollow, Spoon fms.; Caseyville Fm primarily in Muscatine Co. Maximum thickness to 412 ft (126 m) Wapello Co., 230 ft (70 m) Muscatine Co. Primary lithologies: shale, gray, part silty to sandy; sandstone, vf-m. Secondary lithologies: shale, black; mudstone, gray to red; coal. Minor: limestone; coarse sandstone; siderite, pyrite.

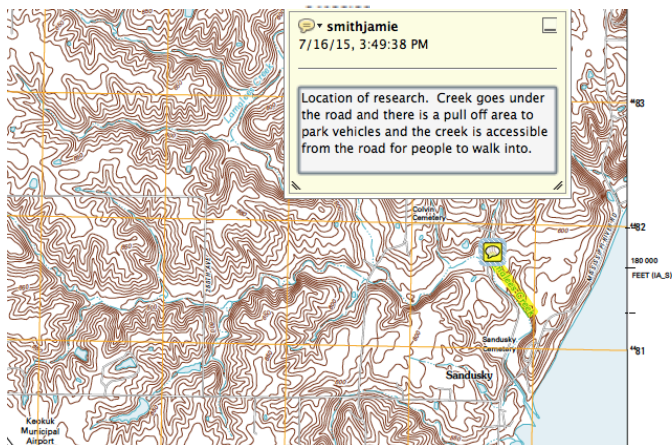
Ma

Augusta Group. Middle Mississippian (Osagean); upper Warsaw in Lee and Van Buren counties likely ranges into basal Meramecian. Includes Burlington, Keokuk, Warsaw fms. Maximum thickness 200 ft (60 m); locally beveled beneath sub-St. Louis and sub-Pennsylvanian unconformities. Primary lithologies: dolomite, part argillaceous; fossiliferous limestone (especially crinoidal packstone). Secondary lithologies: glauconitic limestone and dolomite; chert, nodular to bedded; shale, gray to green-gray, part silty. Minor: quartz geodes, chalcedony, silicification, siltstone, phosphatic limestone.





KEOKUK QUADRANGLE
IOWA-MISSOURI-ILLINOIS
7.5-MINUTE SERIES



The location is a part of the Mississippian formations in the series of Osagean(Middle Mississippian) and is known as the Keokuk formation where, "Various fossiliferous limestones, chert, dolomite, and shale" can be found.(Anderson, p.188) It is divided into a lower cherty interval known as the Montrose interval and a upper Keokuk unit. The location of interest is between the two in what is called the transitional stage. When I visited the location I found some evidence of brown limestone with crinoidal packstones, quartz crystals geodes, and chert, which are common for this area. "The bulk of the Keokuk Formation apparently formed in a middle-shelf setting Fossiliferous wackestones and lime mudstones of the formation probably formed in quiet-water subtidal environment, below fair-weather wave base." (Anderson, p.198) The formation can range in thickness from 45 to 90 feet and over and is overlain by the Warsaw formation, which is why a sparse number of geodes can be found on the surface.

The geological age of the place of interest is of the Illinoian Glacial age. The stratigraphic evidence is the presence of the Kellerville Till Member of the Glasford Formation with glacial drift and Loveland Loess. (Anderson, p.312) The landform region of the area of interest is the Mississippi Alluvial Plain with sandy lowlands that can be filled with floodwater during rainy seasons of the year. It is common to see deposits of gravel, silt, and clay. The sediment identified is due to glacial melt from 9,500 to 30,000 years ago. The original river valley for the Mississippi was not original located where it is today, but was instead rerouted to this location between 21,000 and 25,000 years ago during the Wisconsinan Glacial time.

Student activity

NGSS alignment:

Iowa Core Literacy Standards:

Student engagement

Day 1

1. Read aloud to give the students some background about the area and when white man settled it and how the area topography appeared upon arrival. Follow each read aloud with a group discussion on the main point of the article and how it helps us paint a picture of the area of interest.

- Chapter 1 Lee County, Iowa A Pictorial History
 - Share the image on page 13 of the Lemoliese creek and of Sandusky under water when Keokuk Dam was built on page 178
- Sandusky, Lee county, Iowa; By Essie Britton
- Marquette and Redskins knew about Sandusky from the Vertical Files at Keokuk Public Library
- Excerpt “Indians Numerous” from a newspaper article: Lemoliese and Blondeau Among Earliest Settlers in Lee County out of Keokuk, IA Gate City and Constitution Democrat

2. Split the class in half and each half will write a short story. Assign one half will be from the perspective of a white man and the other from the perspective of an Indian.

- The perspective of a white man setting foot in this area for the first time. The story should include the landscape that they encountered and how they first survived by using the land.

- The perspective of an Indian living in the area. The story should include some of the following things: how they make their tools, what resources they used from the land, or what kind of things they wanted to trade the white man.

Day 2

1. Share out stories and make a bulleted list that describe how the land helped man.

Examples: Rocks used to build houses. Wood to build houses. Land cleared to show gardens. Rock to make weapons and tools. Springs to have fresh water. River to transport merchandise. Etc.

2. Break bulleted list into three main categories.

- Water
- Rock
- Soil

3. Use a map to give a short presentation on the water ways in the area, where they came from, and how they have changed over the years. Include glacial movement and how the Mississippi River has changed over the years.

4. Discuss the types of trees and crops that can be seen in the area and discuss the deposition that occurred that caused the soil to be sandy and the river bed to include sand, rocks and gravel as its bed. Talk about the gravel pit that can be found upstream and why there is a large deposit of gravel there.

5. Discuss the soil horizons and soil quality in the area and how it has affected the life of humans past and present.

Day 3

1. Pass around the rocks collected from the area that we will be visiting. Classify the rocks by the chemical and physical properties. Discuss why they are rocks and not minerals and investigate the chemical composition of the minerals present in each rock.
2. Identify the fossils found in each rock by doing small group research online and create a hypothesis as to how those rocks got to this area.
3. Relate the chemical composition and the fossils identified by talking about the area once being a shallow ocean and the types of ocean life that were in this area. Ticket out the door: How close was your hypothesis and one thing you learned today.
4. Discuss the goal of the field trip: To collect a large variety of rocks and pictures of the outcroppings found along the streambed.

Day 4

Field trip

Day 5

1. Classify rocks by using their chemical and physical properties and identify them by using information from Day 3.
2. Put images of outcroppings on projector and talk about the characteristics that we can use to identify it as sedimentary rock.
3. Homework: Story revision. Add information learned in this unit to the story written on day one.