

Logan Rhodes

Geology of Iowa

Geological Information of Plymouth County Iowa

And the how the People affect the Earth

And how the Earth affects the People

Location of Plymouth county on Iowa

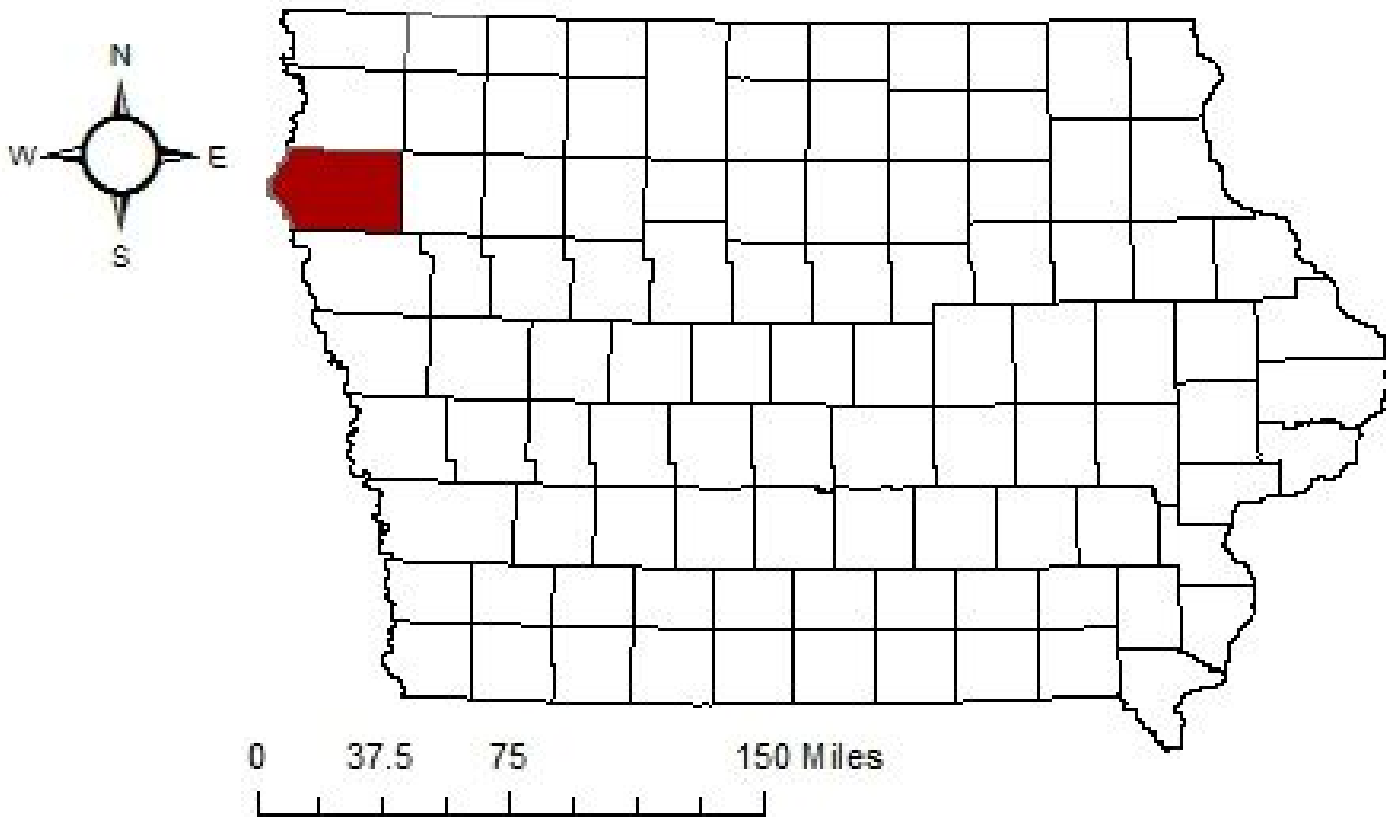


Figure 1(Plymouth county location in Iowa)

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Abstract: The purpose of this paper is to cover a long range of topics specific to Plymouth county Iowa, Iowa, and how the people of the county affect the land and vice versa. Plymouth county is in Northwest Iowa and has the same parent material minus one and climate as the rest of Iowa. The county was first inhabited by the white man in 1856 and has a population of 24,874. 94% of the land is used for farming. The main crops are corn and soybean and the main livestock are cattle and hogs/pigs. Plymouth county only has Cretaceous bedrock and consists of Loess Hills, Northwest Iowa Plains, and Southern Iowa Drift Plain regions for the landform regions. Not all past time periods have evidence in the county and fossils found are all from the Cretaceous time period. The biggest city is Le Mars. The main source of water for the county is wells. People can pollute the rivers from farming. Weather affects the yield to our crops and how the crops are planted affects the nutrients in the soil. Product waste is sent to landfill or recycled, both located near Le Mars. Future plans to reduce the need for polluting energy sources is the creation of a wind farm of 100 mills.

Introduction: Over time, things come and go. Some of the things leave evidence that they were there. However, some of the evidence disappears. So when looking back some of the times are missing depending on the location. We do know more recent information that have occurred. However, time and natural causes are not the only causes that impacts the earth and the evidence of its past. More precisely, we humans cause some of these impacts by accident, product of living, for advancements to our society, etc. This is not just a one direction relationship, the land also impacts the lives of the people that live on it. Some of the ways the land impacts us is that we have forgotten or not usually thought of, since they are either out of sight or not used directly.

Geography: Plymouth county is located in Northwest Iowa, shown in figure 1 on title page. The county's land takes up 9,604 square miles, while its water takes up 863 square miles. (unknown, last updated July 17, 2015) The population of the county is estimated to be 24,874 in 2014 which is 29 people per square mile. People under the age of 18 make up 25.1% of the population and people over the age of 65 make up 17.6%. So people of the age 18 to 65 make up 57.3% of the population. The majority of population is white (97.2 as of 2014) and African Americans, Native Americans, Asians, and others make up the rest. Plymouth county has an estimate of 10,668 housing units as of 2014. The average person per household is 2.48 for the 9,899 household. 92.3% of the county's population that is over the age of 25 is a high school graduate and 20% have at least a bachelor's degree. (unknown, 2016) Females take over the majority with 50.48% of the population, while males take 49.52%. (unknown, copyright 2011-2012)

Plymouth county is next to three counties in Iowa; Sioux to the North, Cherokee to the West, and Woodbury to the South. The top three major cities are Le Mars (pop. 12,296), Remsen (pop. 2,622), and Akron (pop. 2,432) shown in figure 2. Le Mars being the county seat and being

known for its Blue Bunny ice cream. (unknown, last updated July 17, 2015) Which is the only touristy area in Plymouth but not much to do besides eat ice cream.

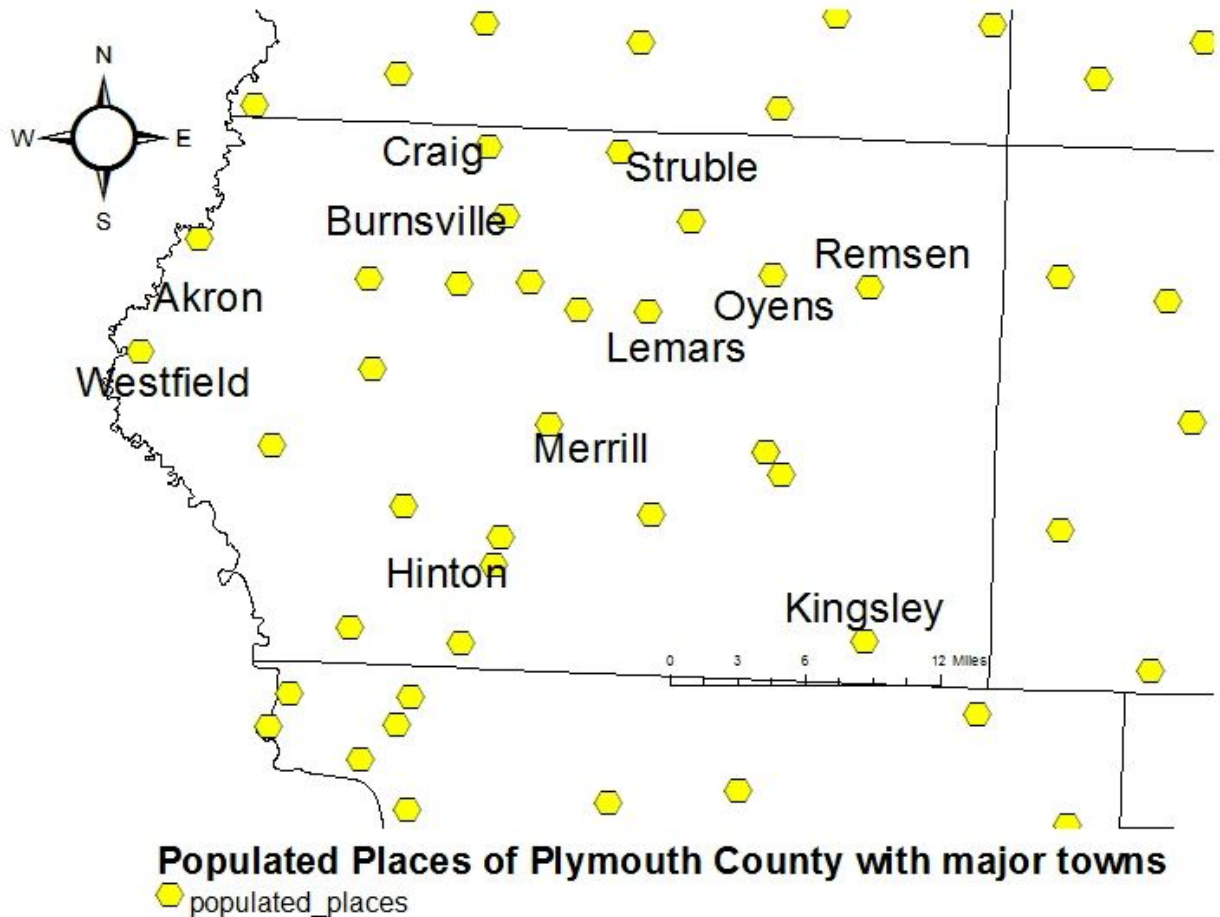


Figure 2(Major towns of Plymouth county)

History: Plymouth county was formed in 1851, however settlement began in 1856. The last Native Americans to leave the county were the Santee Sioux tribe. When settlers were starting to live in Plymouth county, most of the settlers were from Germany, Luxemburg, and Ireland. The first reported families and people were two Swiss families Veragath and Ulrich. Also Barney Rooney and James Dormandy, Irish, were also reported to have settled in the county first. (S.J.Clark Pub, 1927) Melbourne was the first county seat until 1872 when it was moved to Le Mars, due to the construction of the railroad. (unknown, unknown) The county was named after Plymouth, Massachusetts. An interesting fact on the history of Plymouth County is that the county was placed under Martial Law in 1929. This was due to farmers threatening to hang a judge during the depression. Most likely to demand price of crops that the farmers wanted to be met. (<http://www.co.plymouth.ia.us/about/about.aspx>)

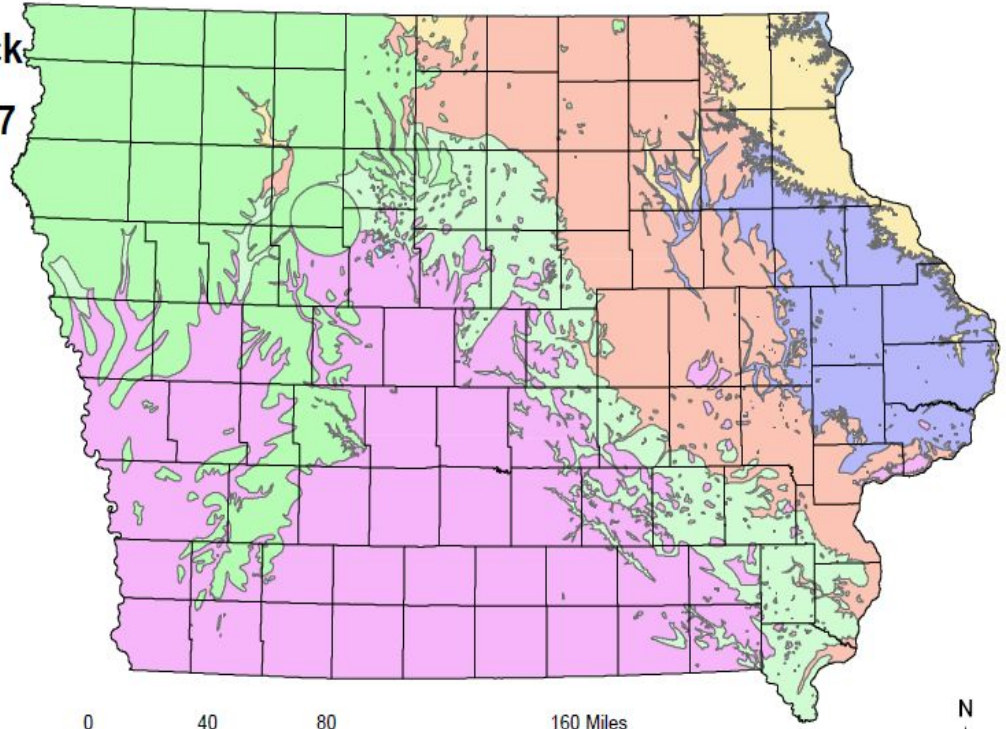
Iowa Bedrock:

Legend of Bedrock

geologic_map_1997

SYSTEM

-  Cambrian
-  Cretaceous
-  Devonian
-  Jurassic
-  Mississippian
-  Ordovician
-  Pennsylvanian
-  Pre-Cambrian
-  Silurian



0 40 80 160 Miles

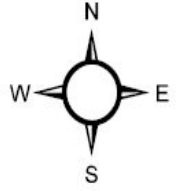


Figure 3(Iowa bedrock)

Legend of Landforms Regions of Iowa

landform_regions

LANDFORM_R

- Des Moines Lobe
- East-Central Iowa Drift Plain
- Iowa-Cedar Lowland
- Iowan Surface
- Loess Hills
- Mississippi River Alluvial Plain
- Missouri River Alluvial Plain
- Northwest Iowa Plains
- Paleozoic Plateau
- Southern Iowa Drift Plain

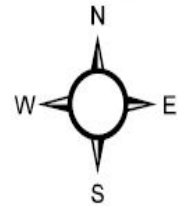
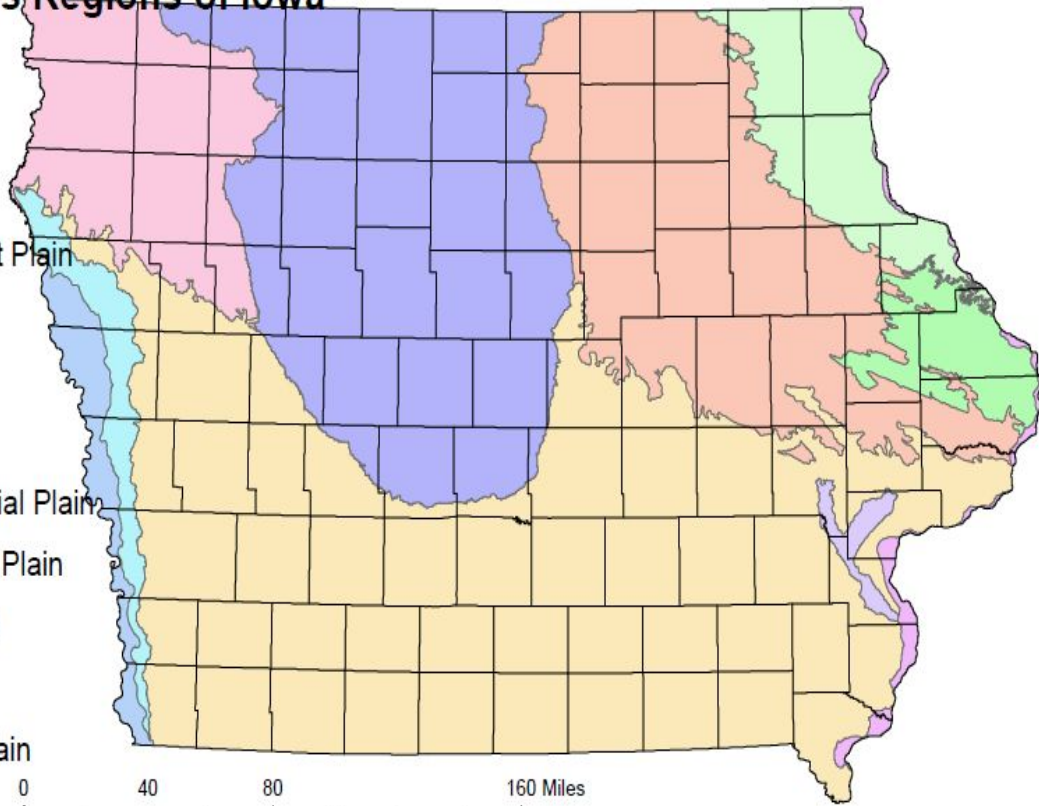


Figure 4 (Landform Regions of Iowa)

Iowa contains the bedrocks (shown Figure 3) Cretaceous, Jurassic, Pennsylvanian(298Ma-232Ma), Mississippian(358Ma-323Ma), Devonian(419Ma-358Ma), Silurian(443Ma-419Ma), Ordovician (485Ma-443Ma), Cambrian(541Ma-485Ma), and PreCambrian (4.6Ga-541Ma)bedrock. The Pennsylvanian is the most common bedrock in Iowa. As shown in figure 4, Iowa has ten landform regions. With southern Iowa Drift Plain covering the most area. The parent material of the Iowan soil are glacial drift, loess, and alluvium. The Missouri (West) and the Mississippi River(East) border Iowa. Iowa has an impact structure called the Manson Impact Structure. Fossils of Iowa are mostly of aquatic creatures and plants of both sea and land. Some examples of fossils are gastropods, crinoids, ferns, and shells. The climate of Iowa is hot in summer, max of 118 degrees Fahrenheit (highest), and coldest in the winter, min of -47degrees Fahrenheit(Lowest).

Plymouth County Geology:

Legend of Landforms Regions of Iowa

landform_regions

LANDFORM_R

- Des Moines Lobe
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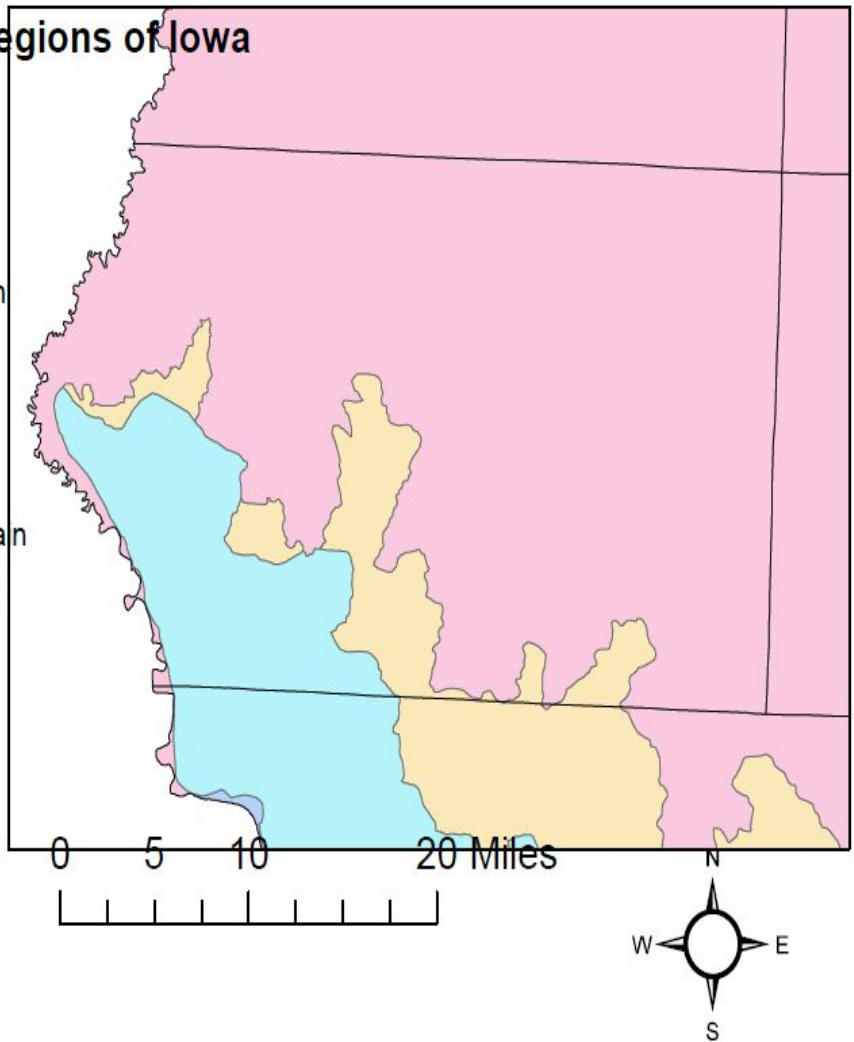


Figure 5(Plymouth County LandForm Regions)

Legend of Bedrock

geologic_map_1997

SYSTEM

	Cambrian
	Cretaceous
	Devonian
	Jurassic
	Mississippian
	Ordovician
	Pennsylvanian
	Pre-Cambrian
	Silurian

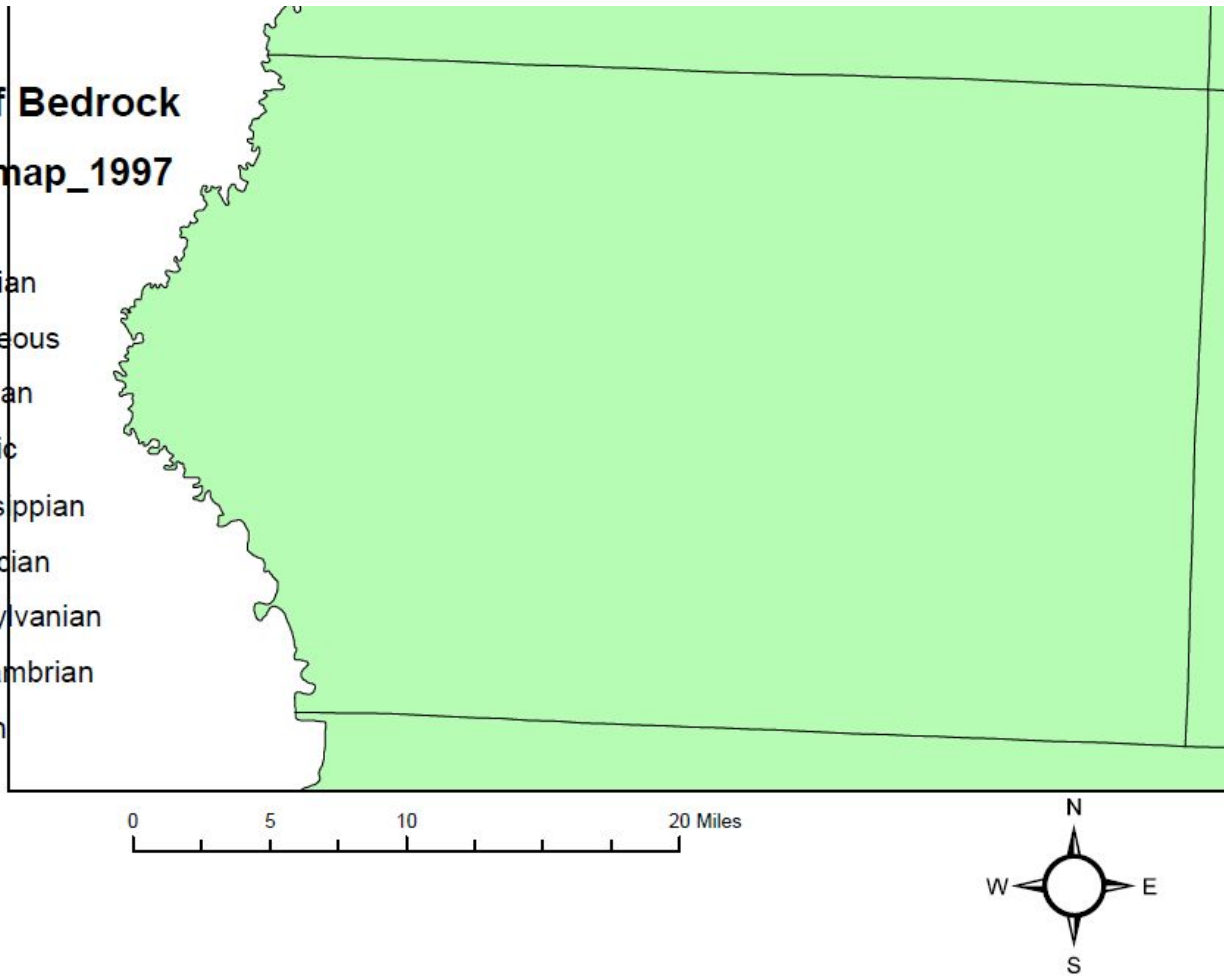


Figure 6(Plymouth County Bedrock)

Plymouth county's bedrock only contains Cretaceous bedrock as shown in figure 6. From the aquifers around the county, we have found some rock evidence of the early time periods. From the Akron and Struble aquifers, sandstone from the Cretaceous was found. From the Oyens aquifer, Cambrian-Ordovician dolostone was found. (Nalley, 2001) A Cretaceous bedrock exposure is exposed near Le Mars. (witzke, 1997) Fossils found within the county are gastropods, cephalopods, clams, fish scales, shark teeth, hadrosaur, and a vertebrae of a plesiosaur, which are all from the Cretaceous period. (Iowa Association of Naturalists, 1999, Witzke, 2014) There seems to be no evidence of Devonian, Silurian, Mississippian, Pennsylvanian, or Jurassic in Plymouth county. Based on the bedrock map of Iowa (figure 3) the closest locations for these are; Kossuth county for Devonian, Bremer for Silurian, Woodbury for Mississippian and Pennsylvanian, and Webster for Jurassic. Three of landform regions are in Plymouth county. These would be the Loess Hills, Northwest Iowa Plains making up the majority of the county, and the Southern Iowa Drift Plain shown in figure 5. The parent material of the soil is loess and glacial till. Most of the soil is a silt loam. However, there is also sandy and clay loam. (D.S. Gray, 1928) Flooding in the county is not usually a problem unless there is major rainfall in a short amount of time. Plymouth county watersheds are the Lower Big Sioux, Blackbird-Soldier, Floyd, Little Sioux, and Monona-Harrison Ditch. (unknown, last updated

3/10/2016) Plymouth county has three aquifers one near Akron, Oyens and Struble. (Nalley, 2001) For rivers,creeks, and streams Plymouth county has the Big Sioux River on its left border and many smaller water systems throughout the county shown in figure (7). The climate of Plymouth county is similar to the rest of Iowa.

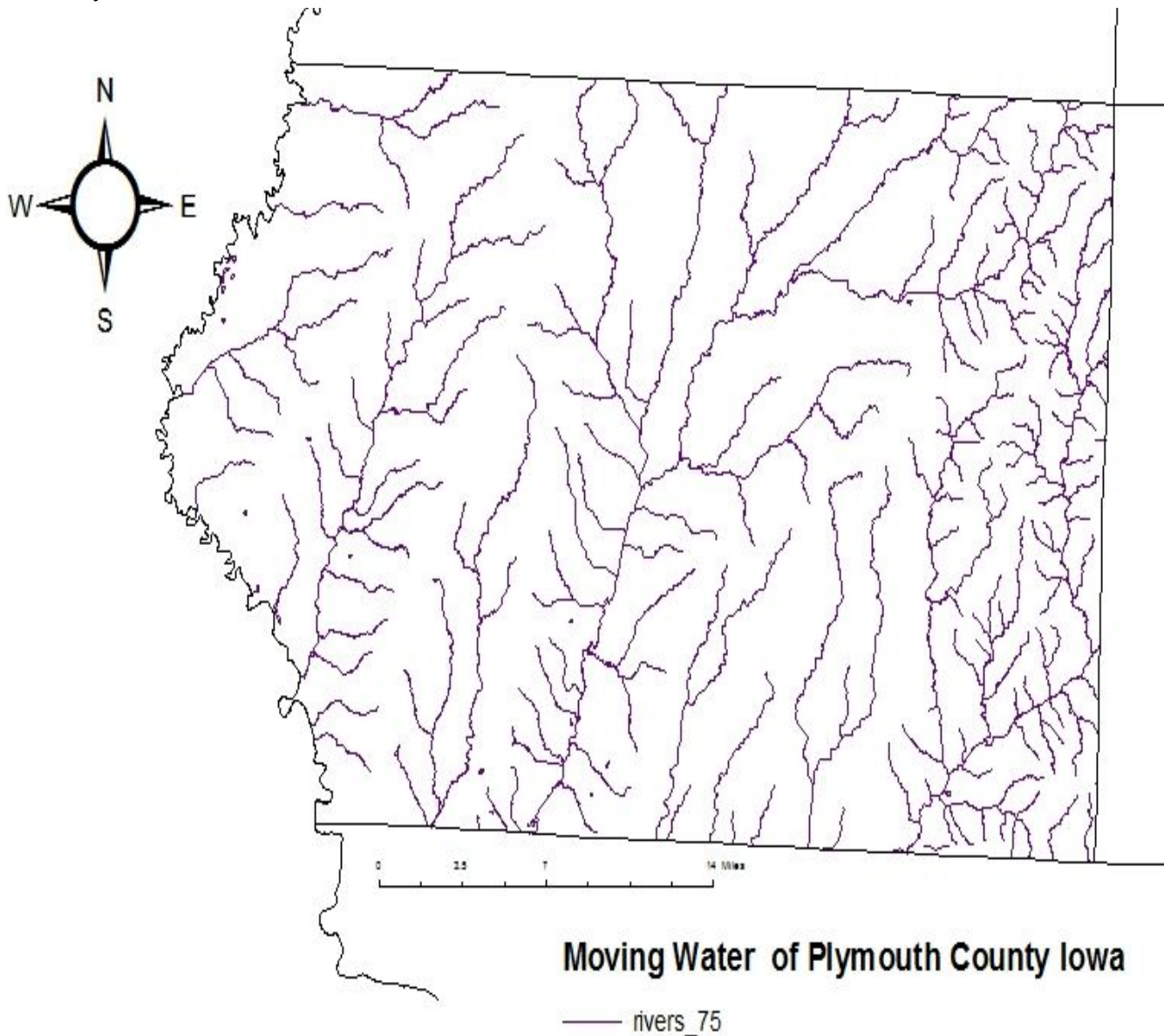


Figure 7(Water systems of Plymouth County)

Natural Resources:

In regards to natural resources of Plymouth County, crops are at the top of the short list in the county. To which Plymouth's main crops are corn and soybeans. Even though it is not really a natural resource, livestock is another big part. Hogs, pigs, and cattle are the major livestock. The county has 1442 farms covering 517,248 acres which is 94% of the county's land.(Otto,Daniel 2007) Water sources would be the water systems that were mentioned before

and drinking water is obtained from the aquifers. There are also sources of limestone, that the county leaves alone.(The Diggings, 2016) Other natural resources would be clay for bricks, limestone, and coal. (Bain H.F., unknown) Plymouth also has some natural parks that cover 2,200 acres for 15 sites. Activities to be done there are hunting, viewing, fishing, and such. (Plymouth County Conservation, unknown)

The Relationship Between the People of Plymouth County and the Land :

The relationship of the people and the land goes both ways. People's actions either hurt the land or try to lessen our impact on it/not impact it at all . Then the earth helps us or makes it difficult to live normally on it.Farming makes up 36.8% of the county's jobs. With the people's farming nutrients are taken out of the soil. The people put more nutrients in by crop rotation or adding the nutrients by man made products. Then the land gives us crops, to which the amount is determined by the weather. Too much and too little rain could mean a decrease in the amount of crops that are harvested. With the too much rain, this could cause flooding which could impact the living of the people. Too little rain could mean that drinking water may be scarcer to which a limit in uses for the water may be placed. If the weather gets too hot the crops lose their water and pig/hogs may die. If too cold loss of crops could also occur. Late/early frost could decrease the yield of the crops. Waste from the people's products are placed in the county's landfill that is located near Le Mars. To reduce the waste Le Mars also as a recycling plant for the county. Some other problems that may occur to Plymouth's drinking water is the level of nitrate.(Ohrtman, Becky) Product of farming further impact the water by the possibility of contamination from the spray of the crops or the waste of the livestock. A more recent way the people affect the land was that a windmill farm was proposed for Plymouth. This would reduce the need of energy sources that use pollutants. The plan is for 200 millions dollars for 100 windmills. The mills are planned to be put between Le Mars, Kingsley and Remsen. The earliest completion date would be 2018-2019 and cover 10000 acres. (Kaufman, Kirby 2016) Since 94% of Plymouth's land is farmland, that would mean that most of the land would be farmland. So if corn has a profit of \$373 and soybeans \$252 per acre. That would be a loss of \$3,730,000 on corn sales or a loss of \$2,520,000 on soybeans per year. Depending on yield being constant, prices staying the same , and the acres are only of the respected crop. The mills also pose a threat to birds and bats. So trying to reduce our need on pollutant energy can affect the people themselves. Thus the relationship of the people and the land is a circle, meaning that the people could hurt themselves or that the land could hurt itself.

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