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BEDROCK GEOLOGY IN CASS COUNTY

This map is a depiction of the bedrock geology found beneath the unconsolidated glacial cover across Cass County. Lithologic logs from test holes, water wells (i.e., driller's logs), and mineral exploration drilling were reviewed for bedrock geologic information consisting of bedrock depth and lithology. A total of 482 locations were selected based on the quality of the lithology recorded on the log and whether bedrock was encountered in the drill hole.

There are two different types of bedrock found in Cass County. Sedimentary shale bedrock of Cretaceous age is found nonconformably overlying Igneous granitic basement bedrock of Precambrian age. Shale bedrock extends across three-quarters of the county from west to east and is the first bedrock that occurs beneath the shallow cover of glacial deposits. It generally thins from the west to the east and is found in isolated areas in the shallow subsurface in the central portion of the Red River Valley closer to Fargo. Precambrian age granite rocks are found directly beneath the glacial cover in the easternmost portion of the county.

EXPLANATION

- Kc

CARLILE FORMATION: SHALE - Dark gray, Upper Cretaceous marine offshore sediment.
- Kg

GREENHORN FORMATION: SHALE - Dark gray, calcareous, Upper Cretaceous marine offshore sediment.
- Kbs

SKULL CREEK-BELLE FOURCHE FORMATIONS (UNDIFFERENTIATED): SHALE - Black and brown to light gray, silty to sandy, micaceous, soft, massive, commonly bentonitic, with occasional pyrite, carbonaceous, some white to gray, fine grained, noncalcareous sandstone and silt. Mesozoic (Cretaceous age) marine sediments.
- pE

BASEMENT ROCK OF THE SUPERIOR PROVINCE: GRANITE (WEATHERED) - Dark to light green and gray to white, commonly weathered, soft greenish-pink-white kaolinitic clay, occasional quartz grains. Precambrian (Archean age) basement rocks.
- Geologic contact (Known)

REFERENCES

Anderson, F.J., 2011, Depth to Bedrock in the Fargo Area, North Dakota, North Dakota Geological Survey, Geologic Investigation No. 142, 1:48,000.

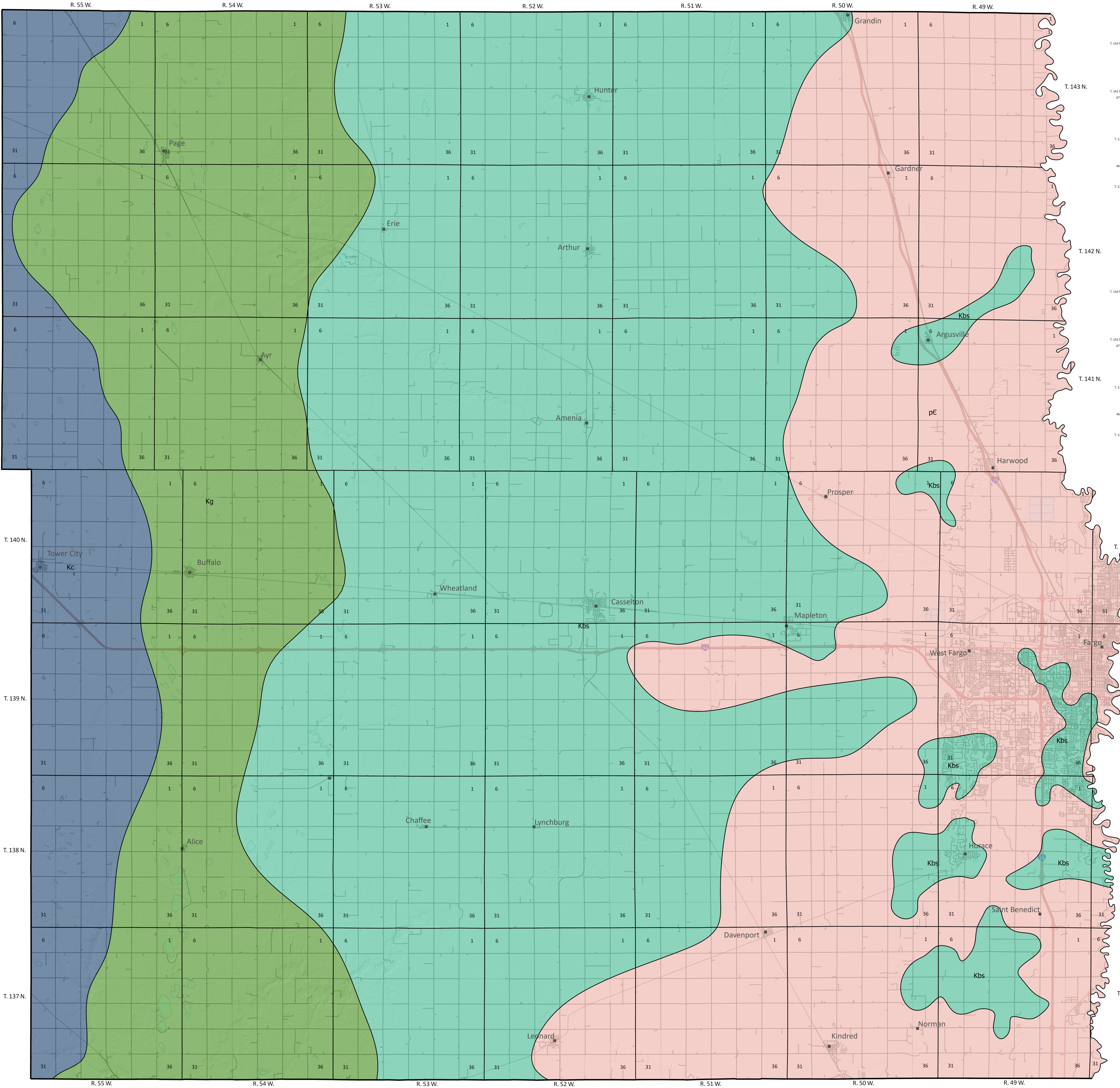
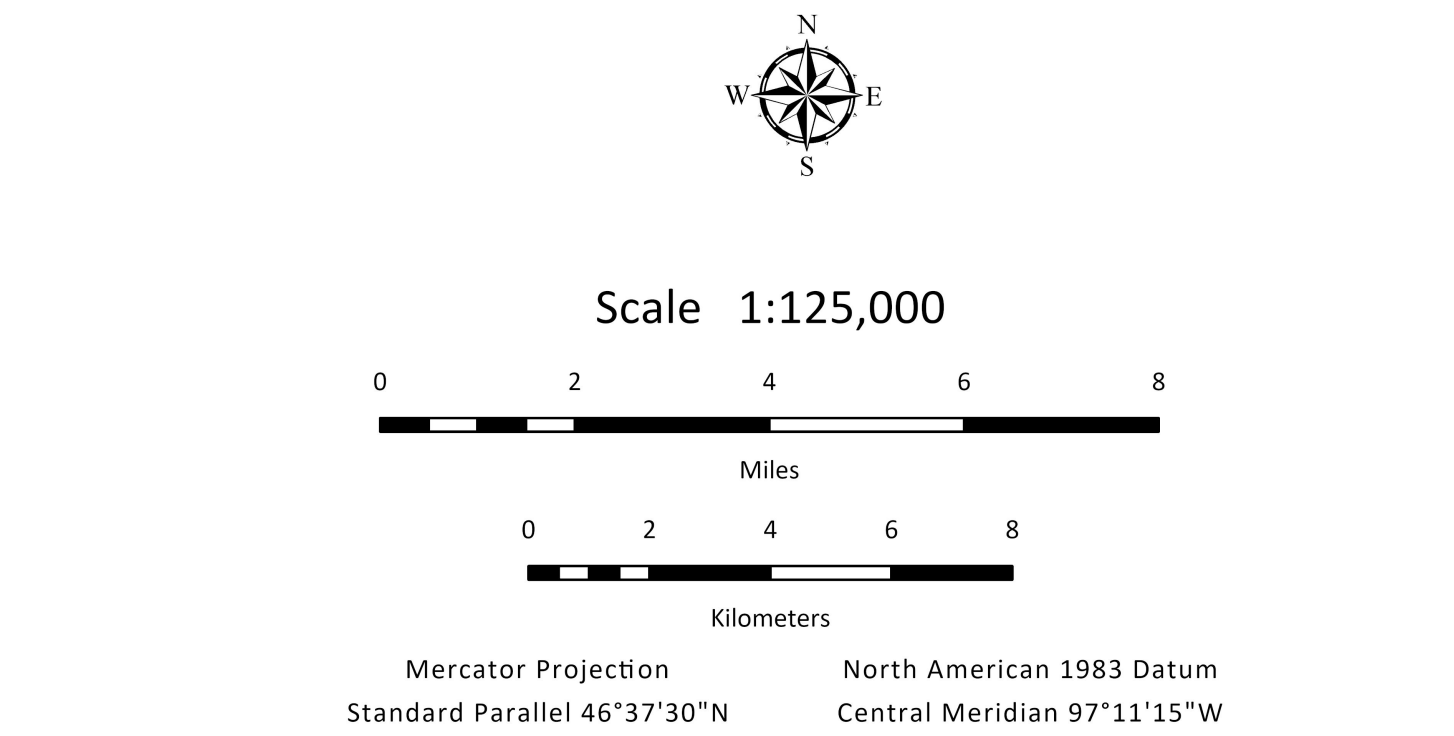
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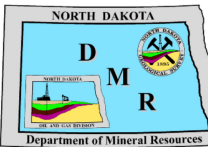
Klausing, R.L., 1968, Geology and Ground Water Resources of Cass County, North Dakota, Part I – Geology, North Dakota Geological Survey, Bulletin 47, 39 p., 3 plates.

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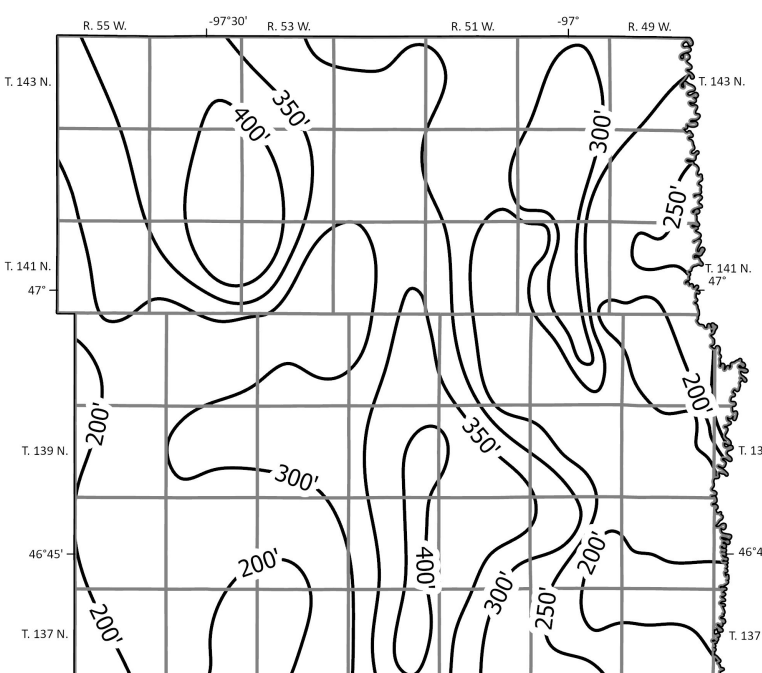
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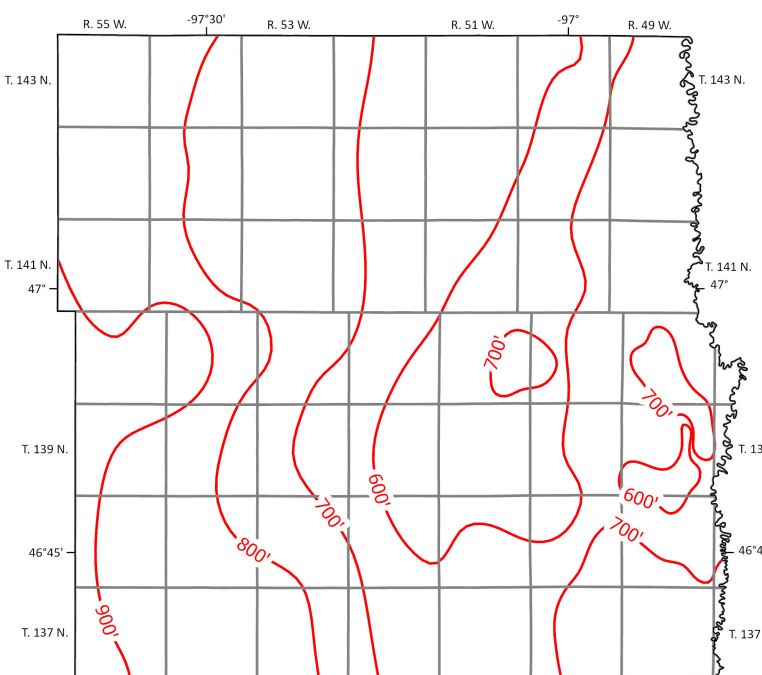


DEPTH TO BEDROCK



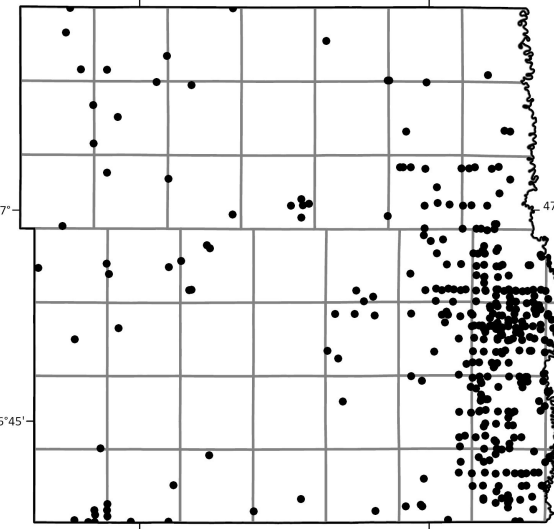
Depth to bedrock across Cass County. Bedrock depth generally thins from around 300-ft below land surface (b/s) in the western part of the county to 200-ft or less in the east. Shale bedrock is found at 300-400 feet in the south central and northwestern parts of the county.

BEDROCK ELEVATION



Elevation of the bedrock surface across Cass County decreases 200 to 300-ft in elevation from west to east with approximately the eastern two-thirds of the county's bedrock surface occurring between 600 to 700-ft above sea level.

DRILLHOLE LOCATIONS



Locations of selected drillholes in Cass County.

CORRELATION OF MAP UNITS

Marine	Superior Province	Epoch	Period	Era
	Offshore	Mississippian	Carboniferous	Paleozoic
		Devonian		
		Permian		Mesozoic
		Triassic		
		Jurassic		Cenozoic
		Cretaceous		
		Quaternary		

Kc

Kg

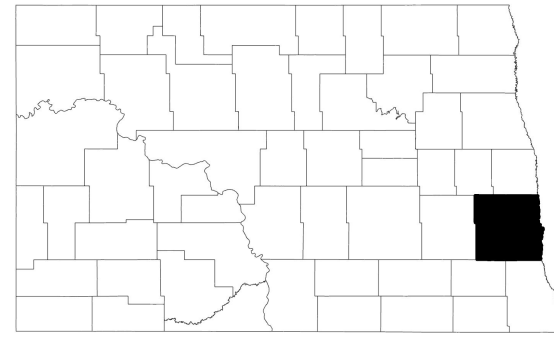
Kbs

pE

pEw

pE

CASS COUNTY, NORTH DAKOTA



Cartographic Compilation: Navin Thapa