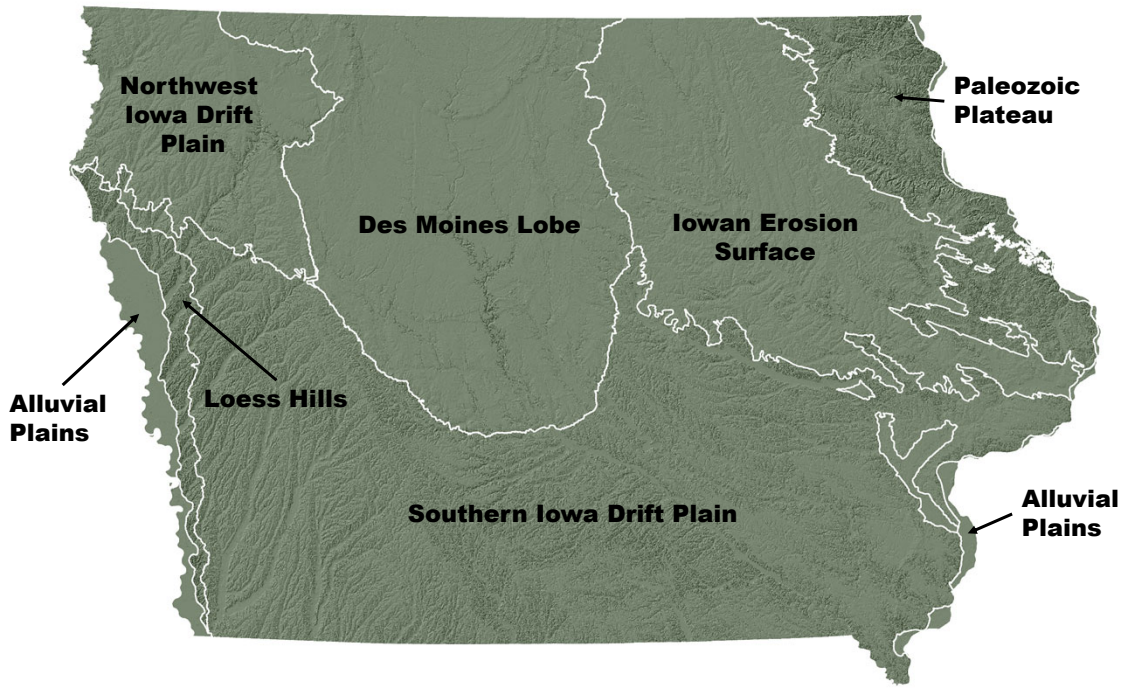
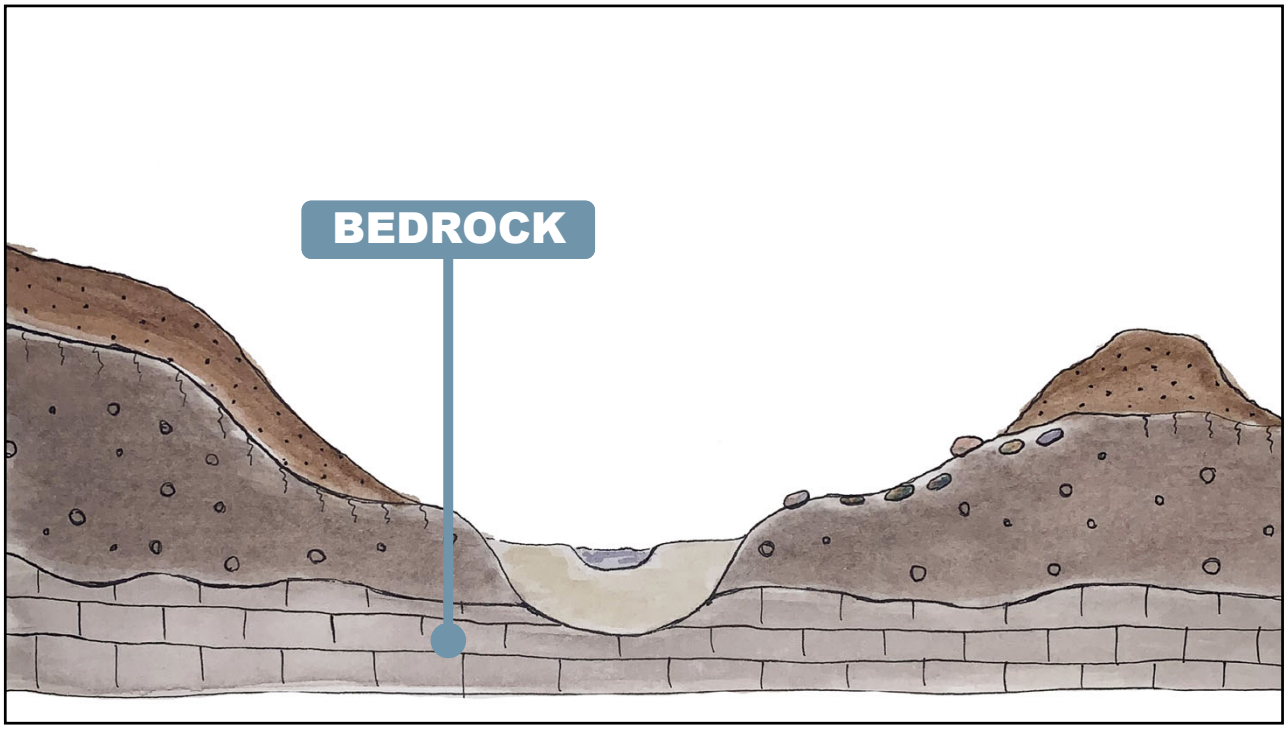
master conservationist

IOWA STATE UNIVERSITY
Extension and Outreach

# Module 1: Part 2

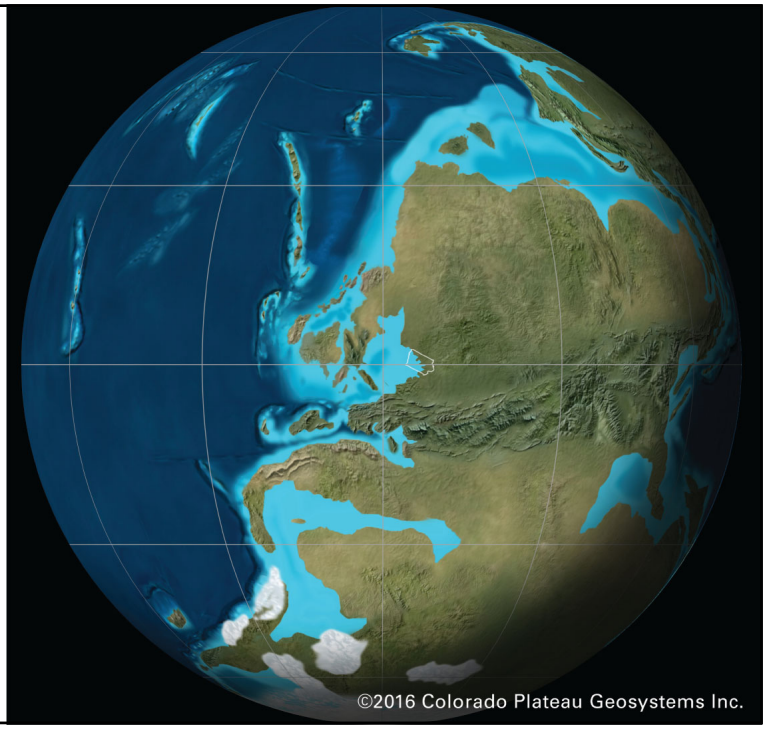
## Iowa's Lands and Waters

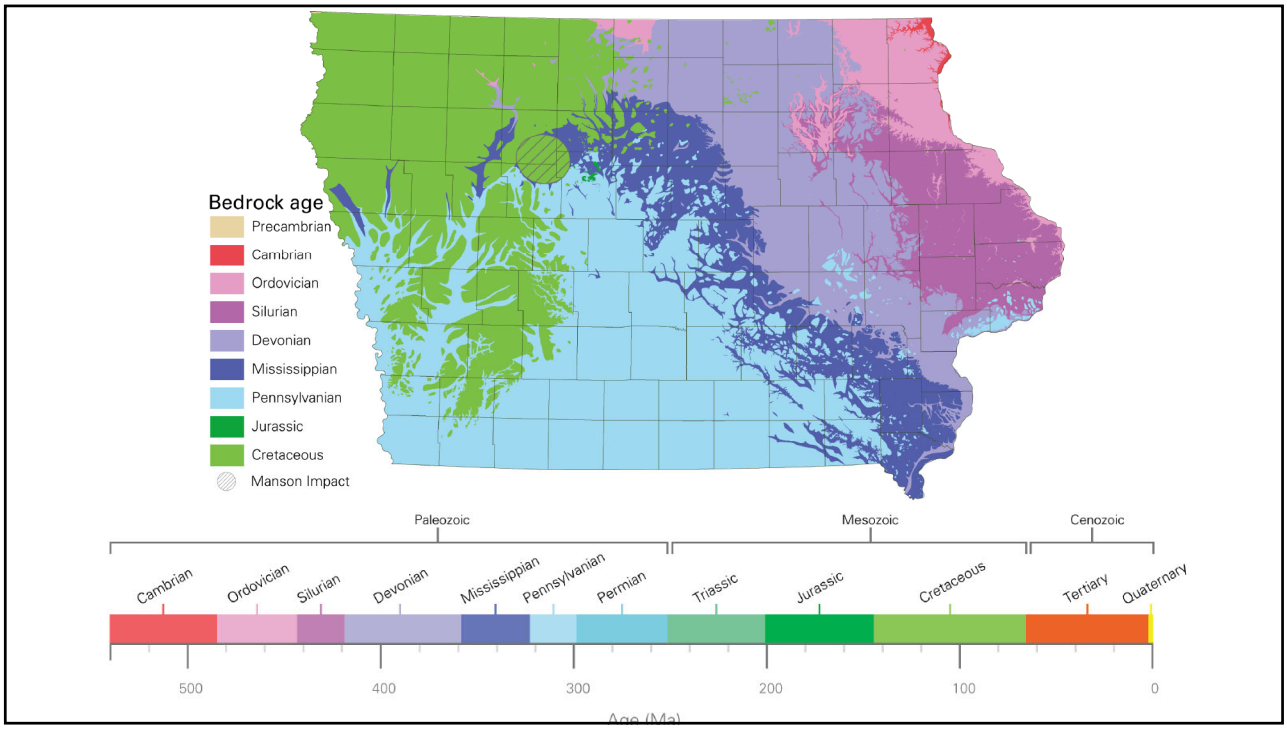




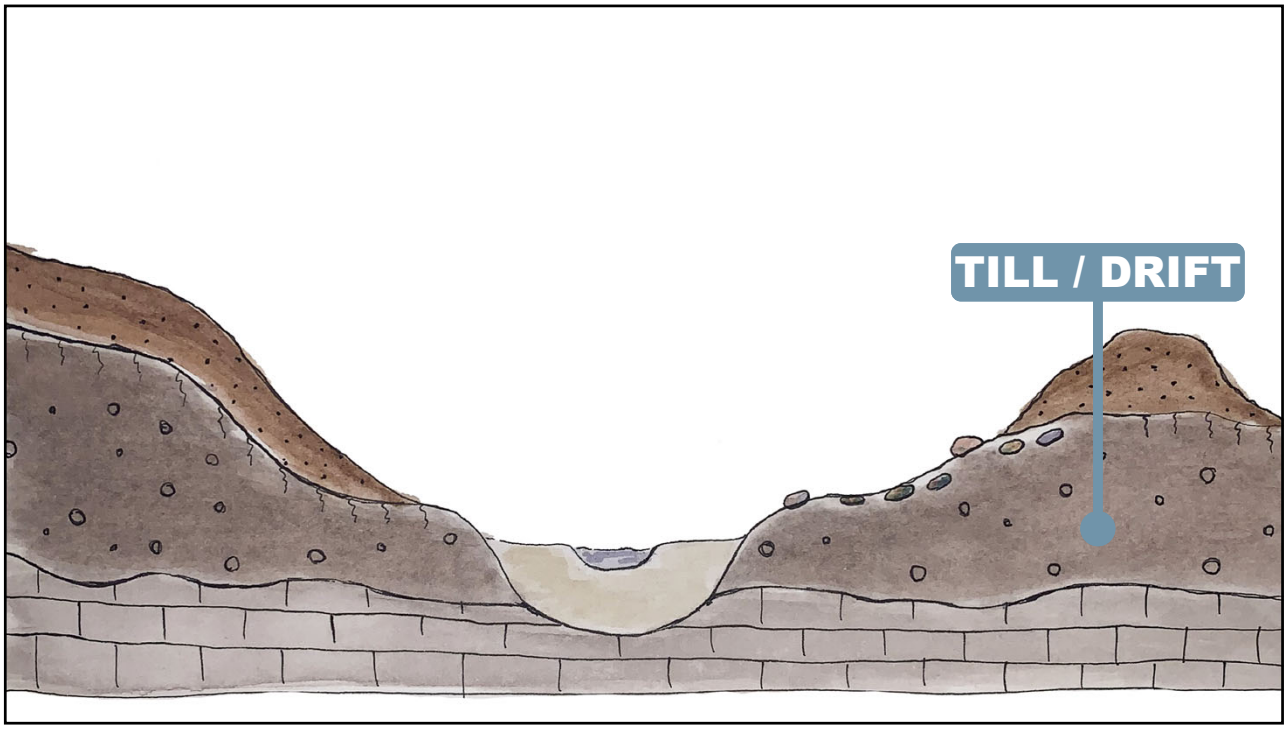

Paleogeographic map showing the position of Iowa and the North American continent straddling the equator during the *Pennsylvanian Period*, around 300 million years ago.

*Source: Iowa's Nature, map produced by Ron Blakey, Global Paleogeography and Tectonics in Deep Time © 2016 Colorado Plateau Geosystems Inc.*






Sioux Quartzite at Gitchie Manitou State Preserve

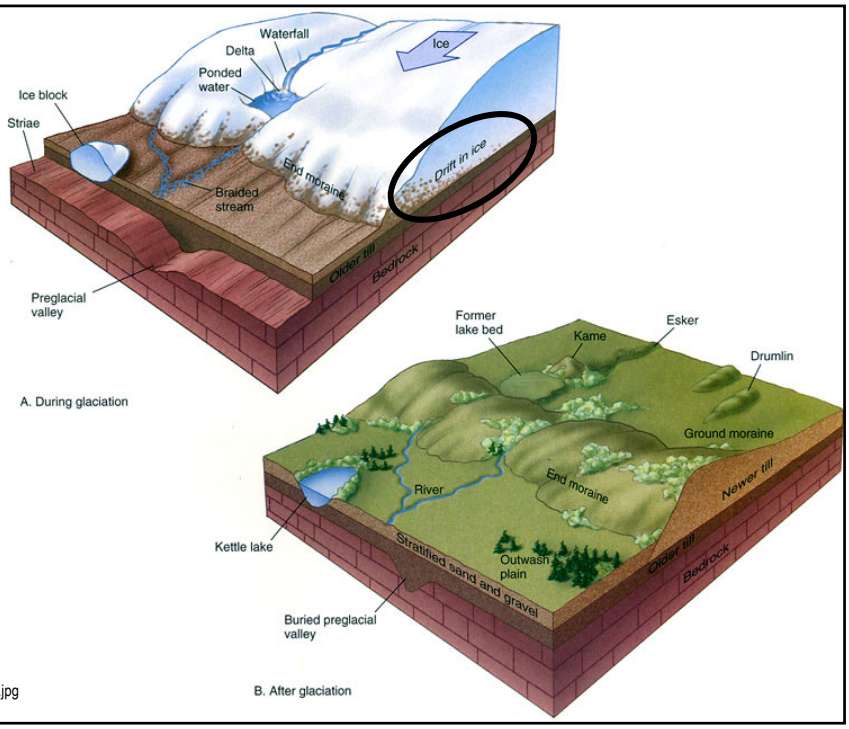



## Glacial till

"Unsorted" sediment with variable sizes (from silt to boulders).

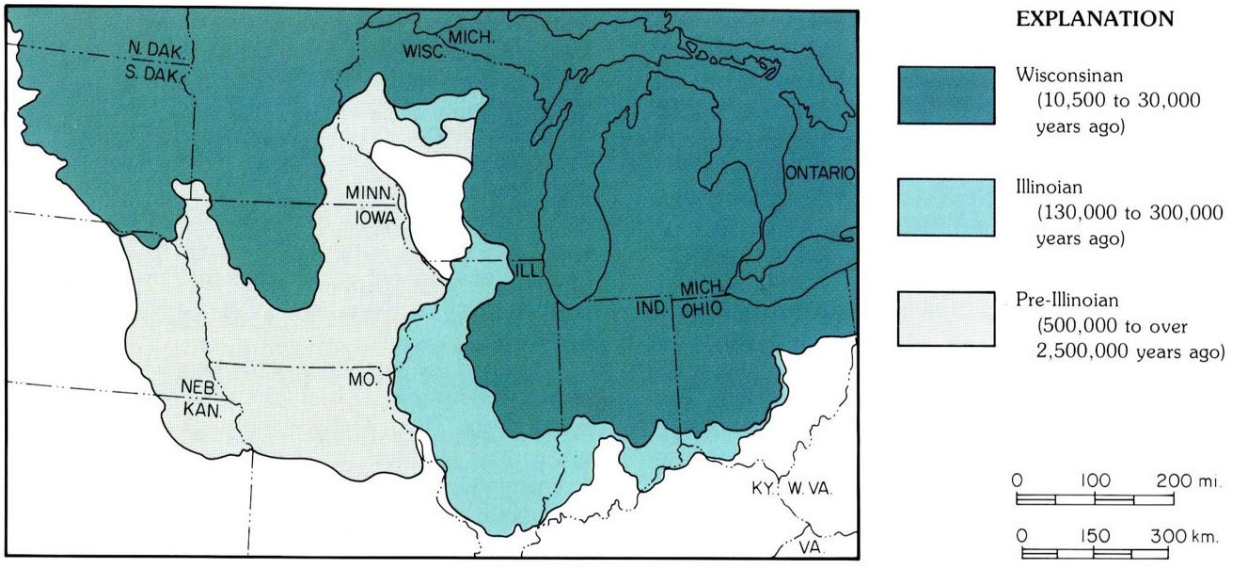
Photo courtesy of Peter Moore

# Glacial forces

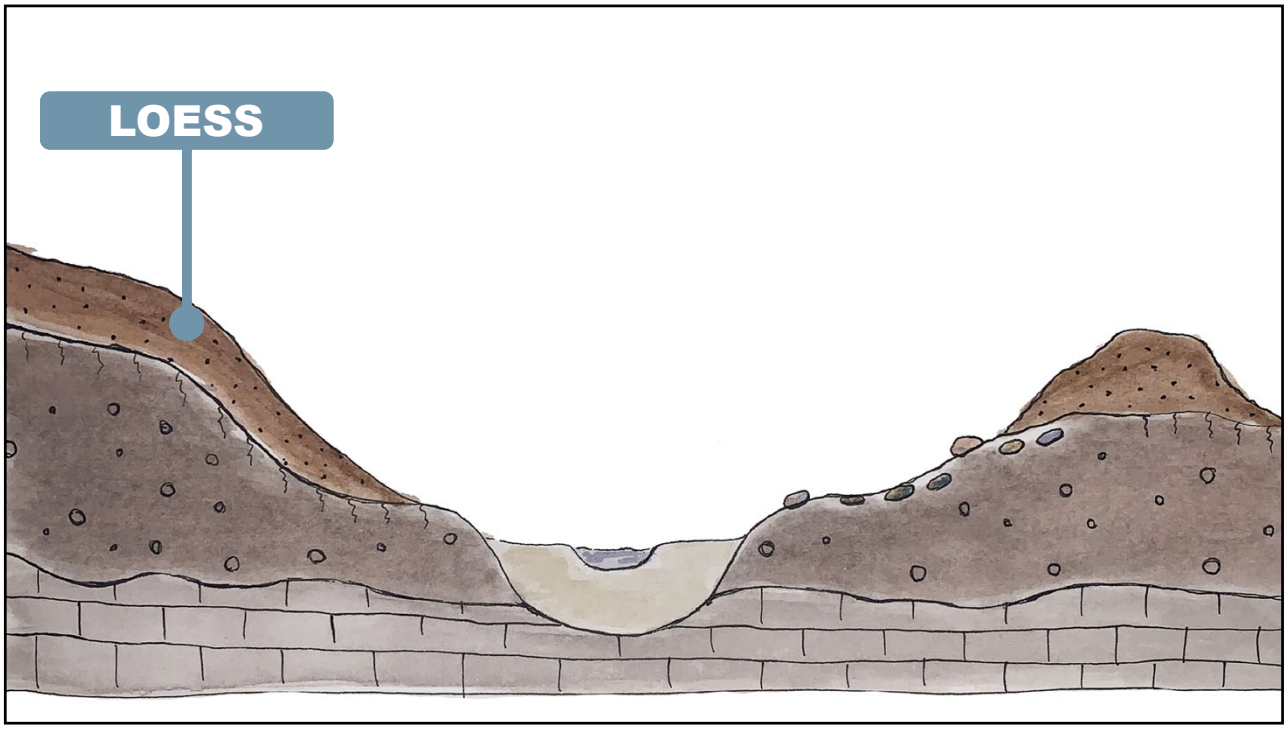



Source: https://www3.nd.edu/~cneal/planetearth/Lab-Glaciation/10.5.jpg

# Glacial episodes




Source: Prior 1991 Landforms of Iowa

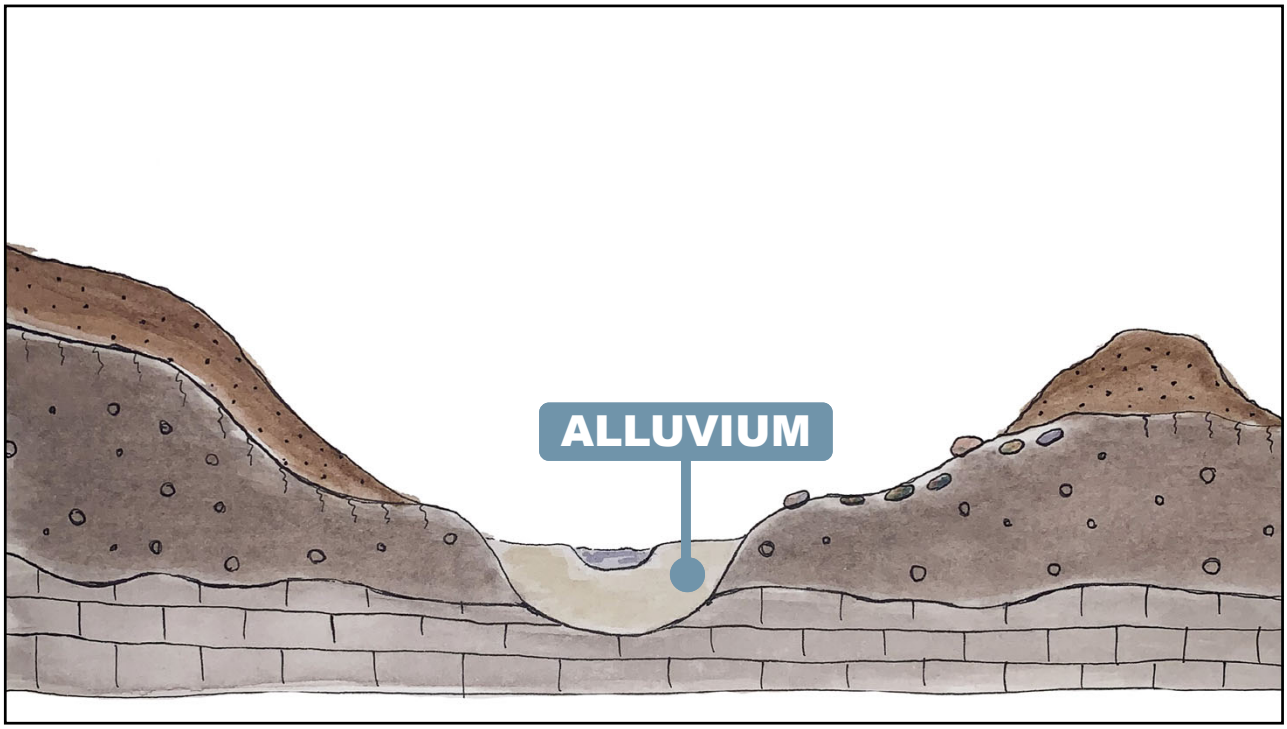



## Loess

Fine, wind-blown sediments

Originate largely from glacial rivers

Photo courtesy of John Thomas

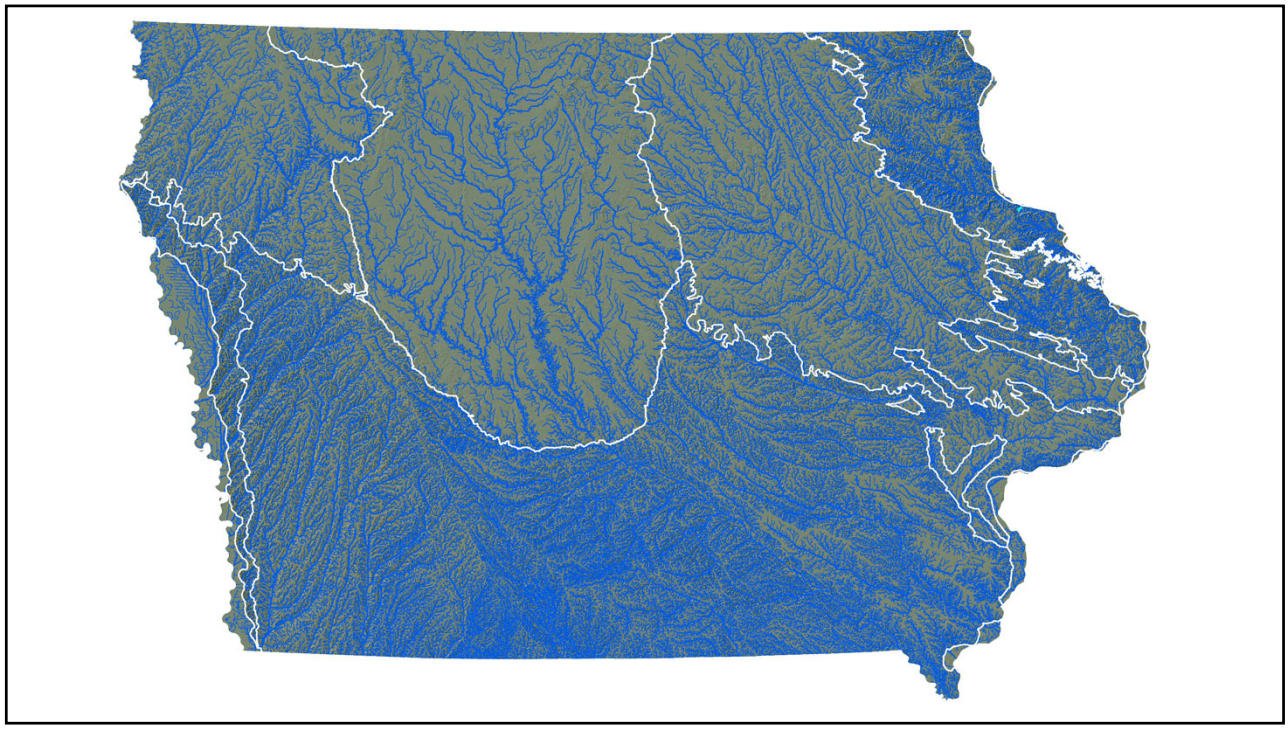



# Alluvium

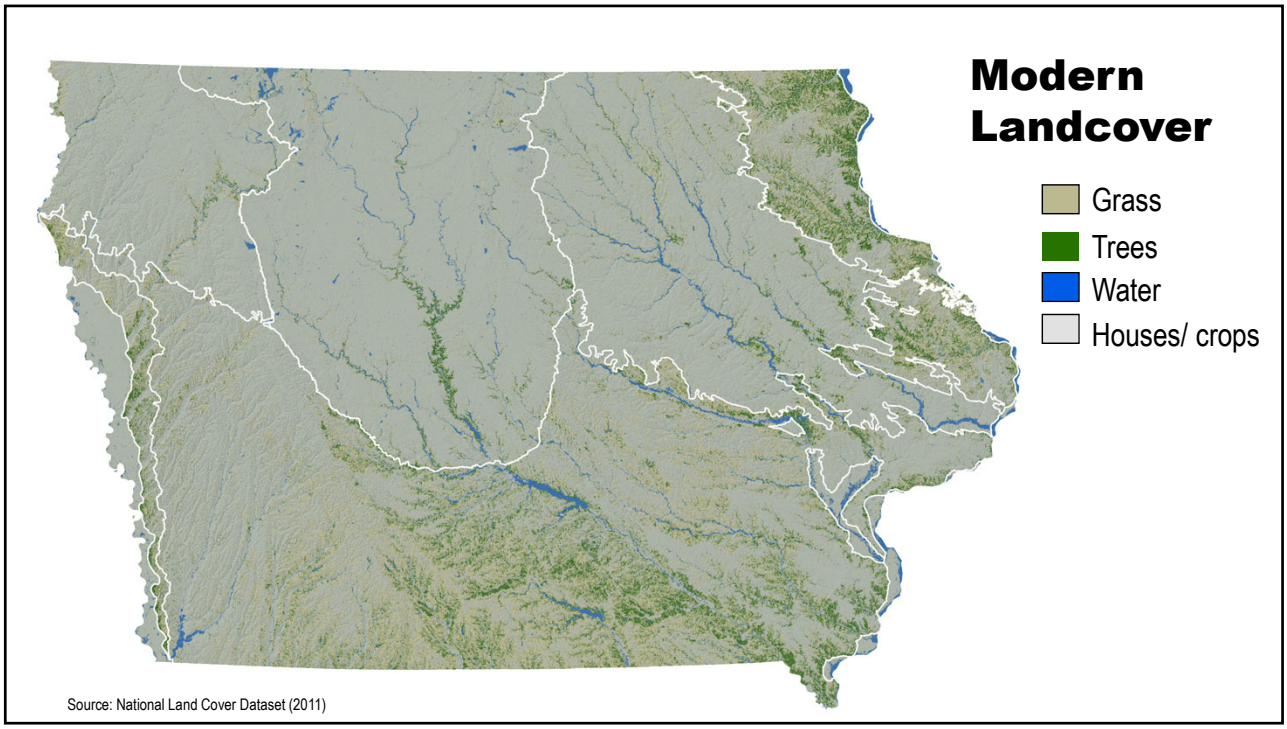
Sorted sediments

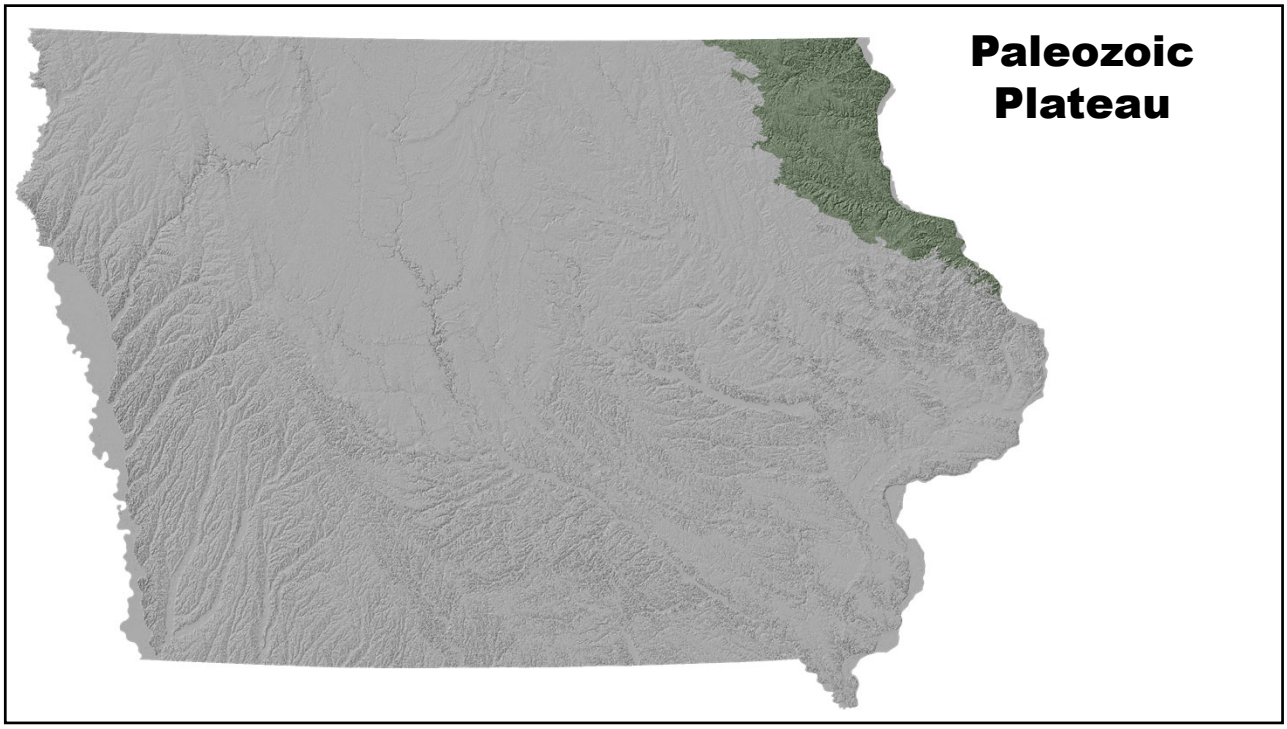
Deposited in layers by moving water

Photo courtesy of Peter Moore




1800s GLO Landcover
Grass
Trees
Water
Houses/ crops
Source: Iowa DNR

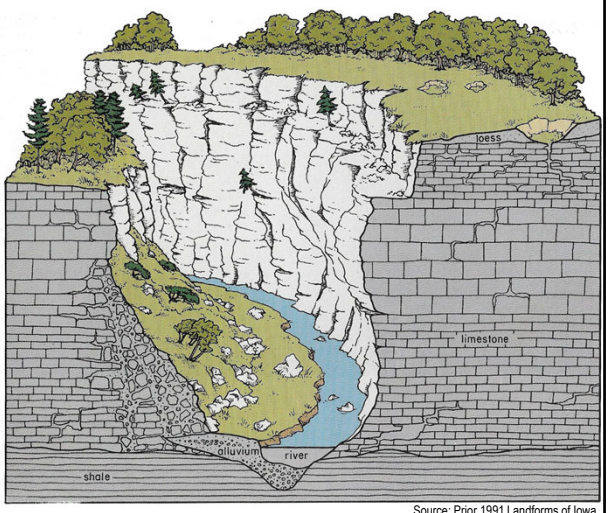

Modern Landcover
Grass
Trees
Water
Houses/ crops
Source: National Land Cover Dataset (2011)


Paleozoic Plateau

# Paleozoic Plateau

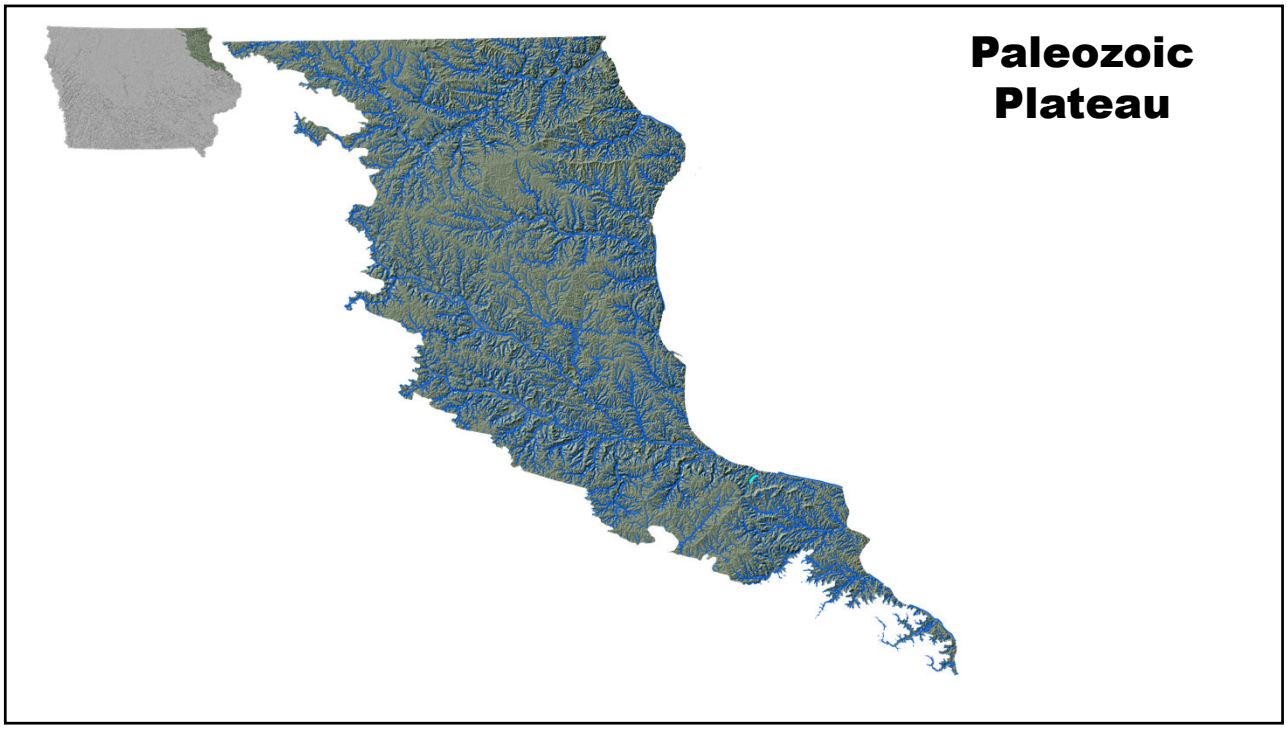
Key Characteristics

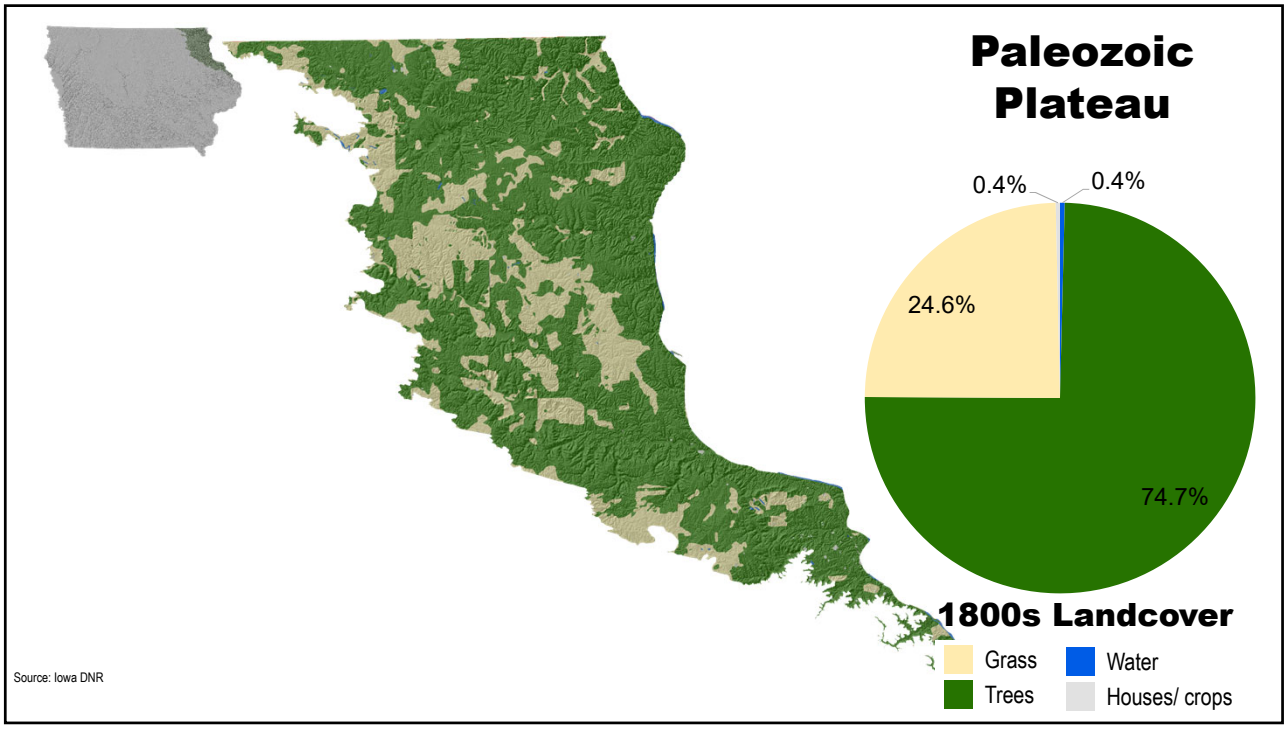
- Patchy evidence of Pre-Illinois glaciation >500K years ago.
- Shallow bedrock shapes land surface.
- Karst topography creates sinkholes, springs, and caves.

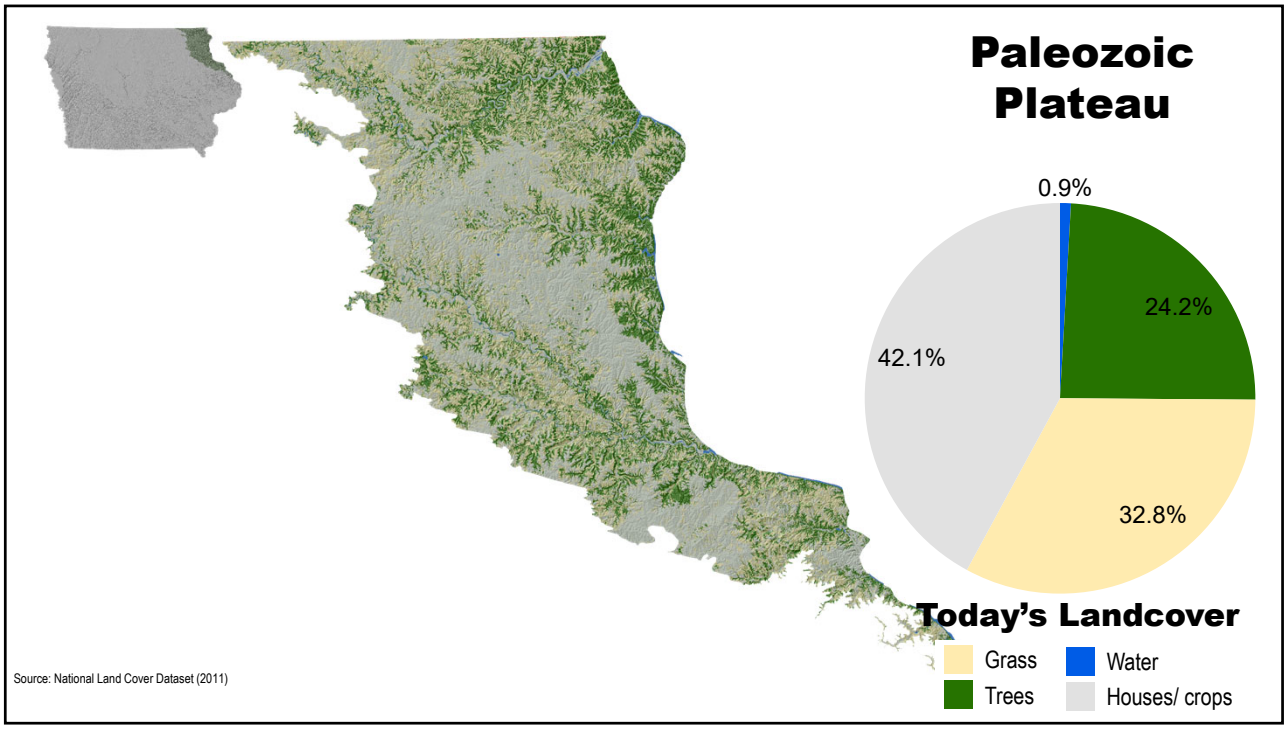


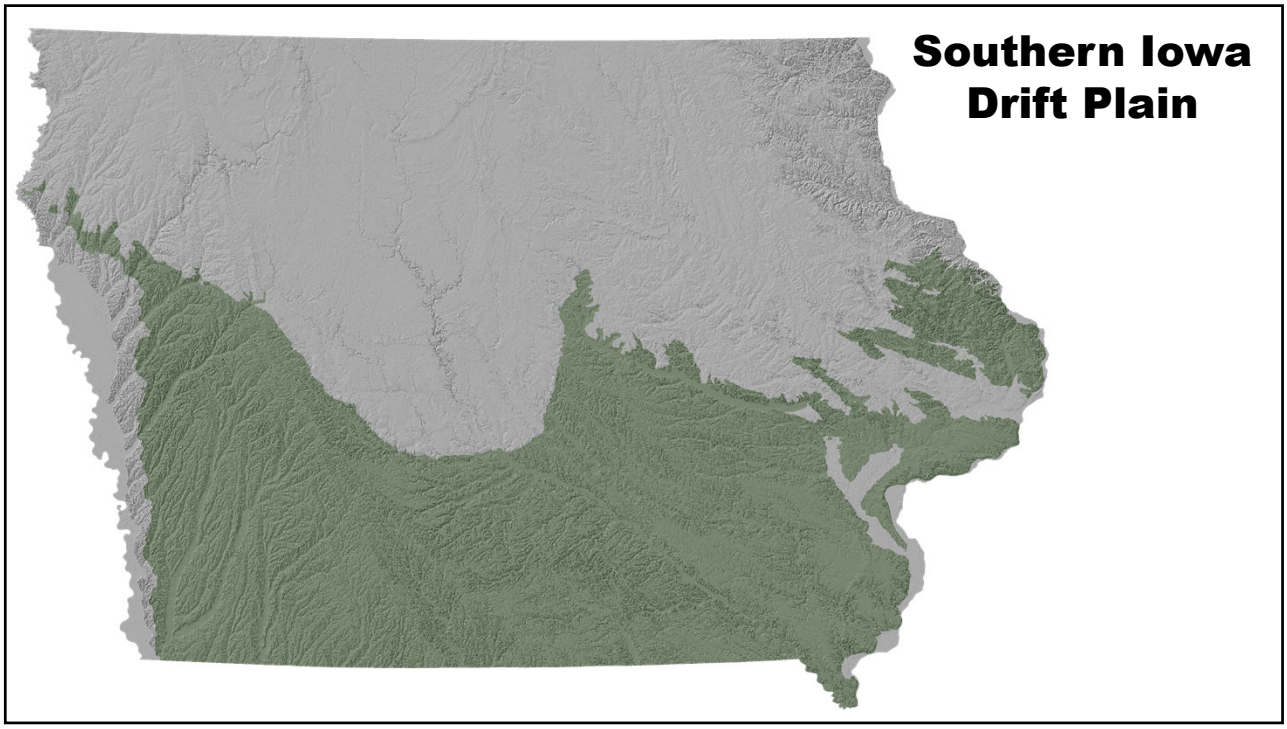

Source: Prior 1991 Landforms of Iowa

Paleozoic Plateau


Paleozoic
Plateau


Paleozoic
Plateau
0.4%
0.4%
24.6%
74.7%
1800s Landcover
Grass
Water
Trees
Houses/ crops
Source: Iowa DNR

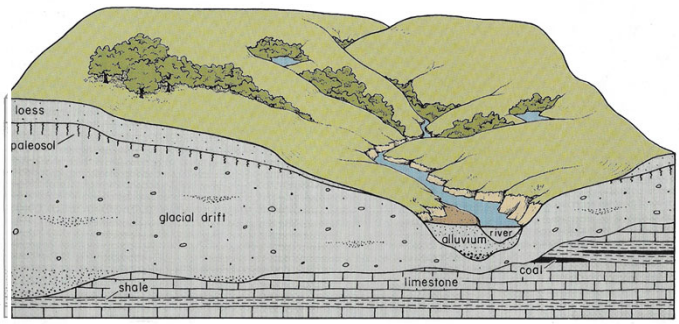

Paleozoic Plateau
0.9%
24.2%
42.1%
32.8%
Today's Landcover
Grass
Water
Trees
Houses/ crops
Source: National Land Cover Dataset (2011)


Southern Iowa Drift Plain

# Southern Iowa Drift Plain

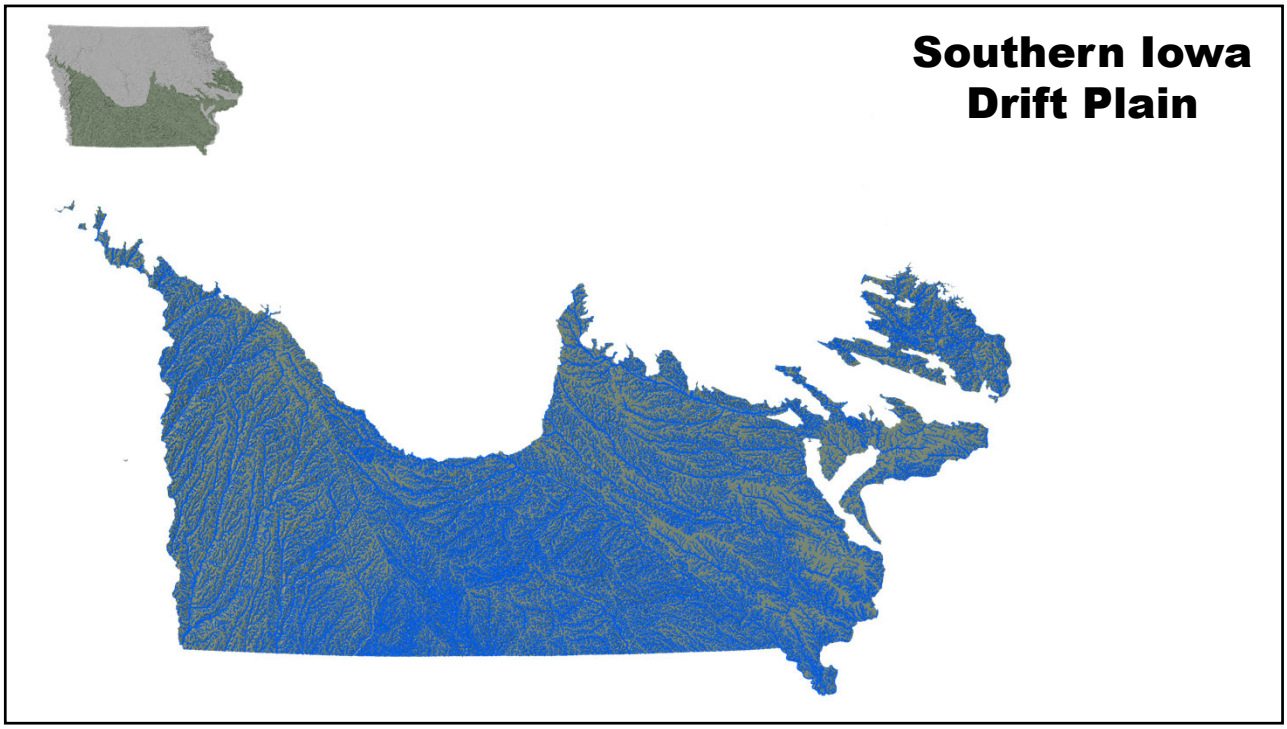
Key Characteristics

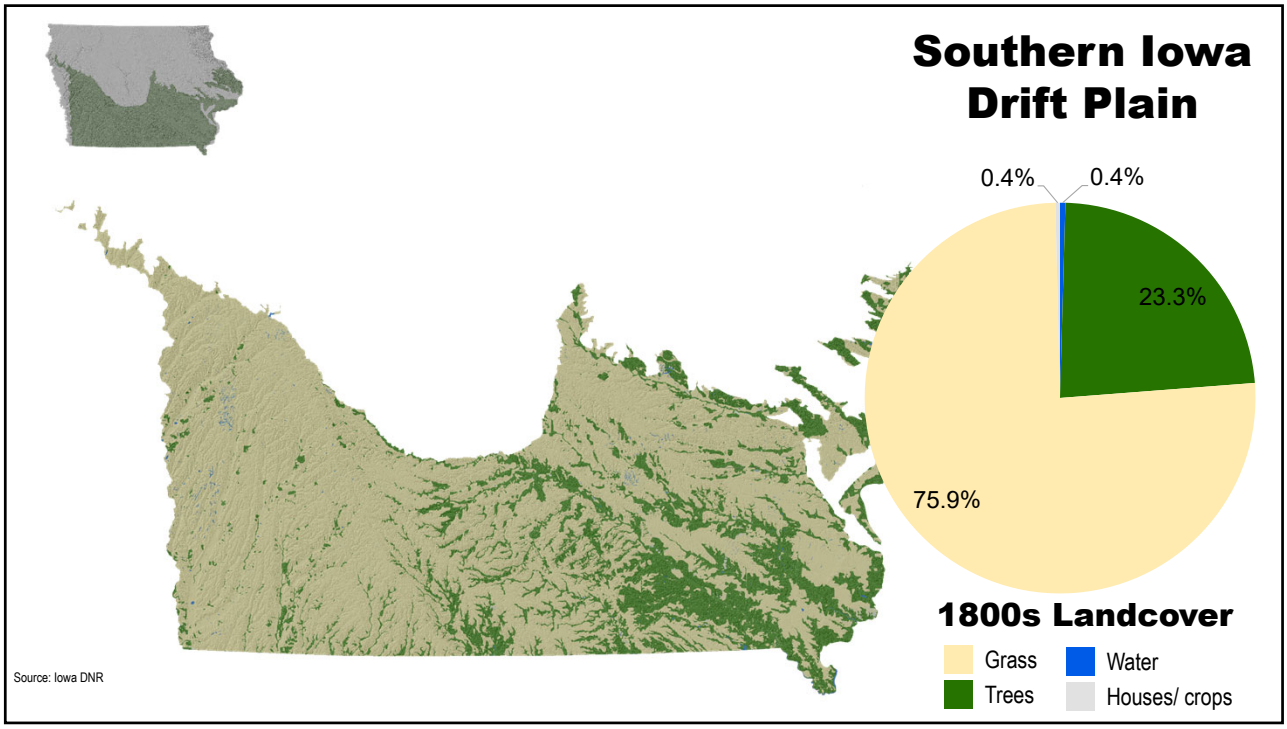
- Pre-Illinoian glaciations (>500K years ago)
- Highly eroded, well developed drainage.
- More gradual slopes from west to east.
- “Loess mantle” over till on ridges.

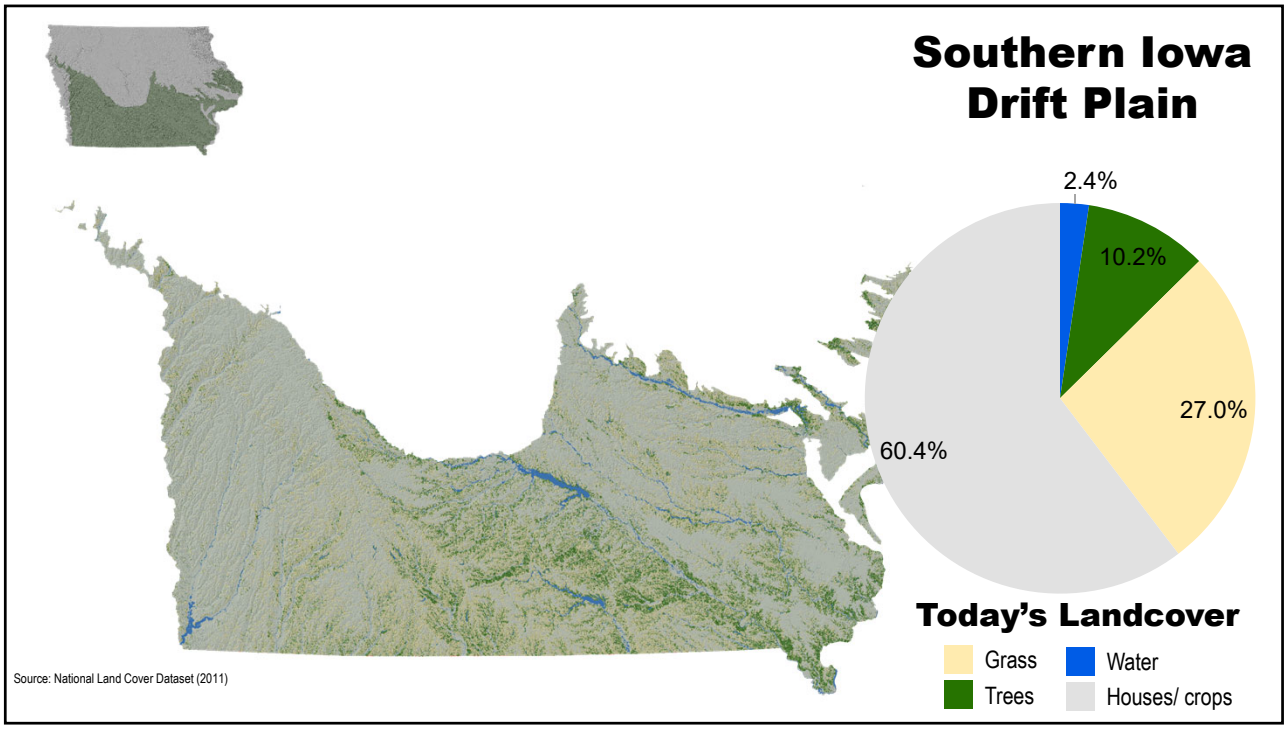


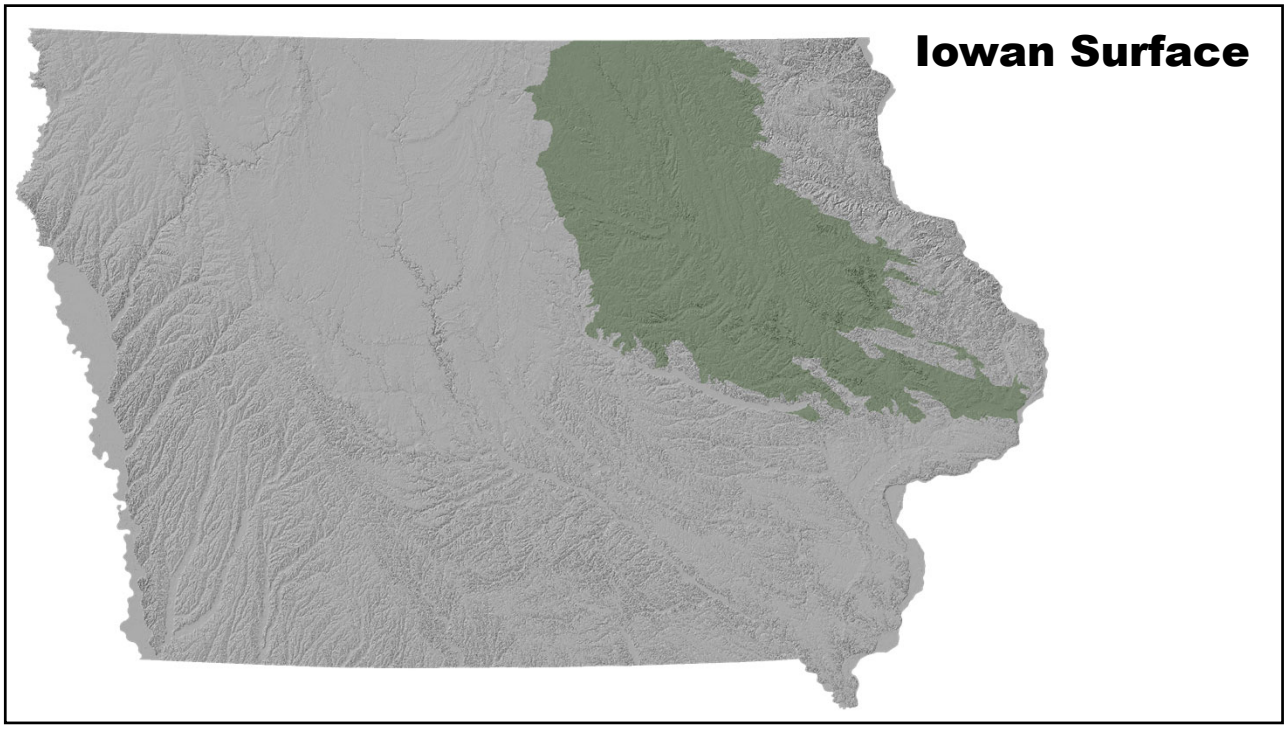

Source: Prior 1991 Landforms of Iowa

Southern Iowa Drift Plain


Southern Iowa
Drift Plain


Southern Iowa
Drift Plain
0.4%
0.4%
23.3%
75.9%
1800s Landcover
Grass
Water
Trees
Houses/ crops
Source: Iowa DNR

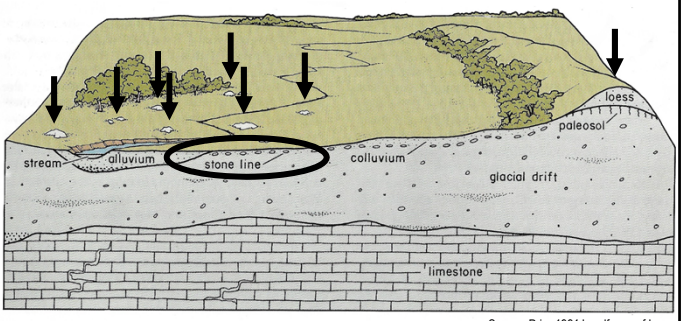

Southern Iowa Drift Plain
2.4%
10.2%
27.0%
60.4%
Today's Landcover
Grass
Water
Trees
Houses/ crops
Source: National Land Cover Dataset (2011)


Iowan Surface

# Iowan Surface

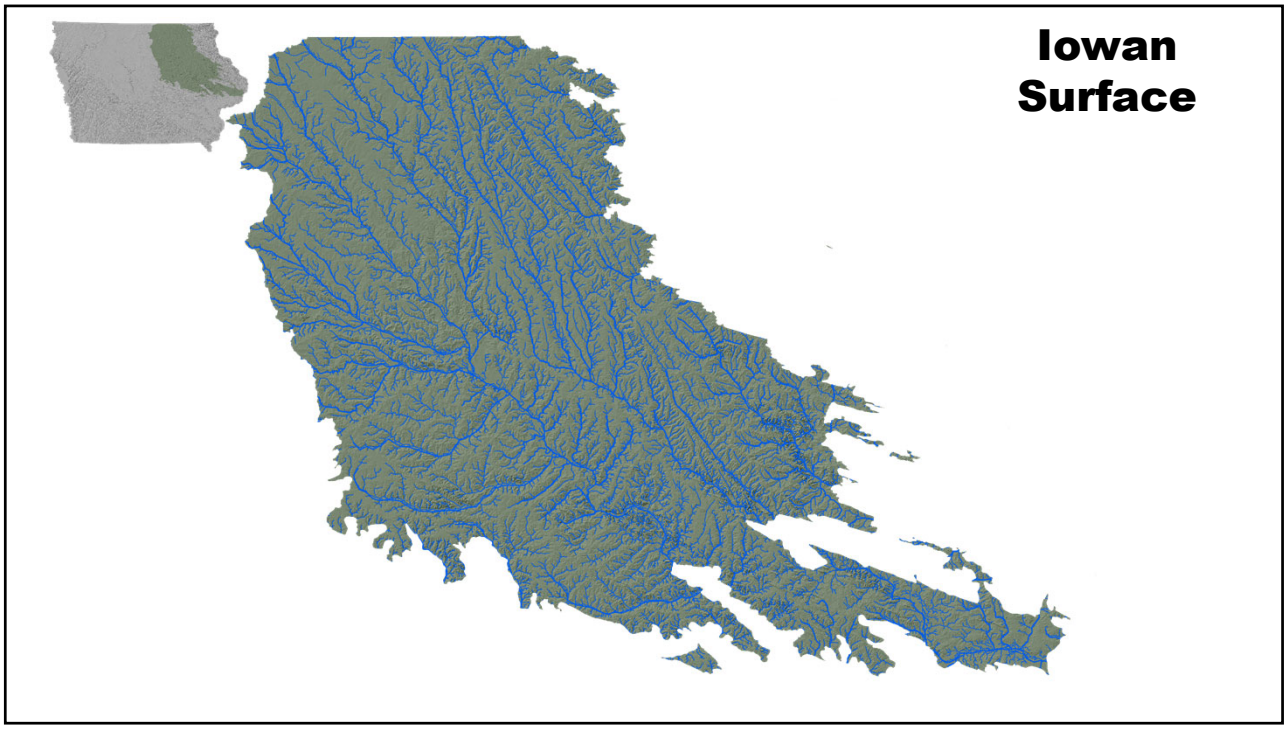
Key Characteristics

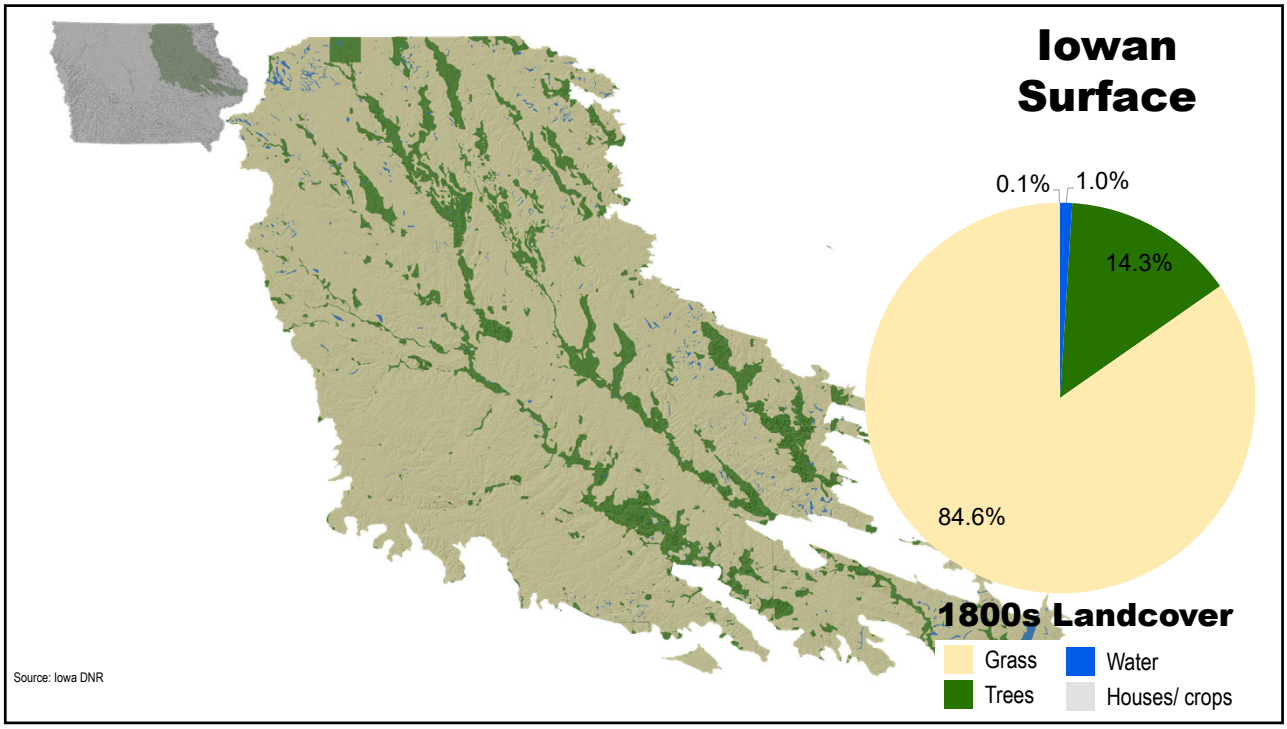
- Pre-Illinoian glaciation, late Wisconsin erosion.
- Loess remaining only in paha ridges.
- Long slopes with low relief.
- Glacial erratics (field stones) common.

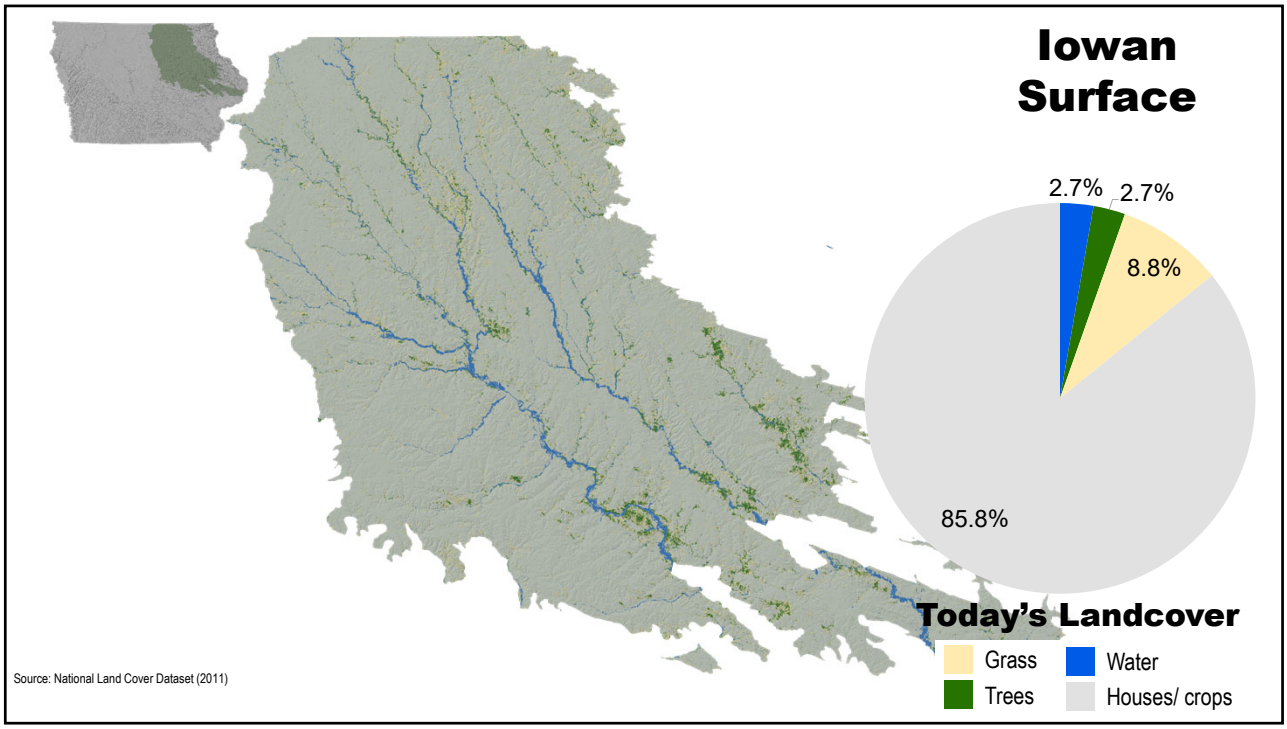


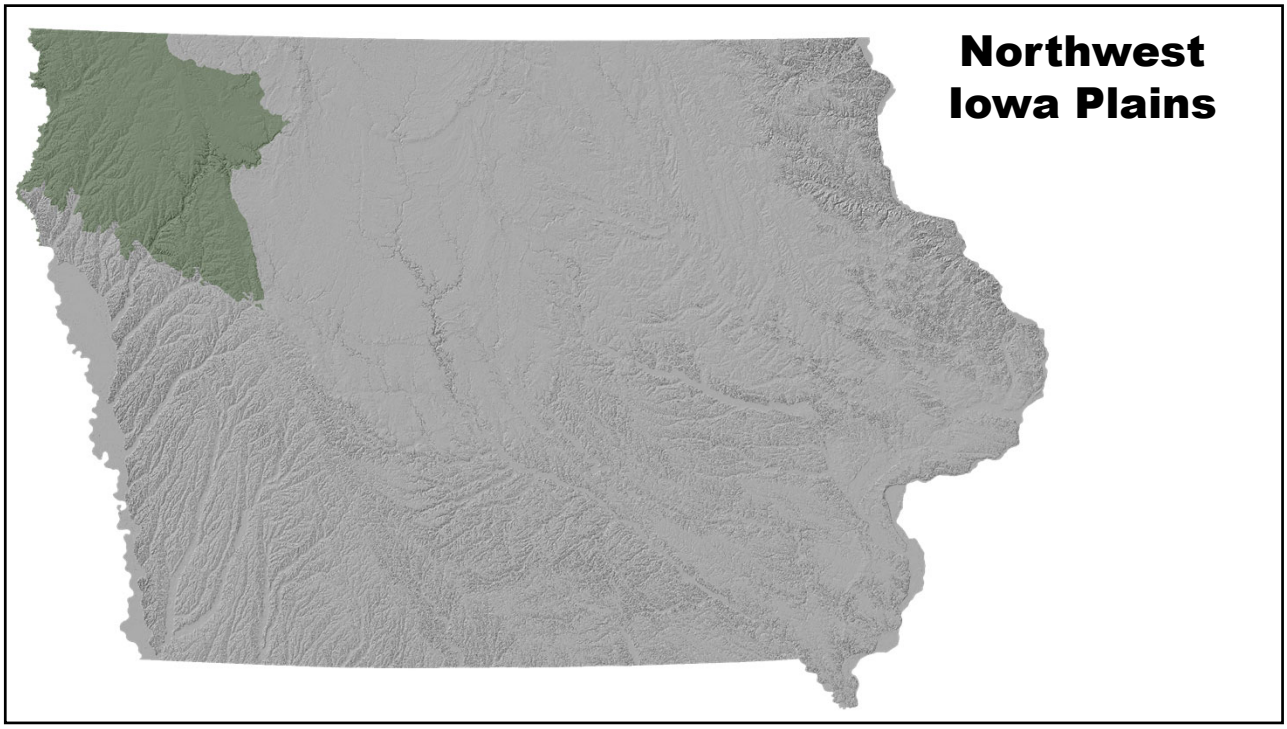

Source: Prior 1991 Landforms of Iowa

Iowan Surface


Iowan
Surface


Iowan
Surface
0.1%
1.0%
14.3%
84.6%
1800s Landcover
Grass
Water
Trees
Houses/ crops
Source: Iowa DNR

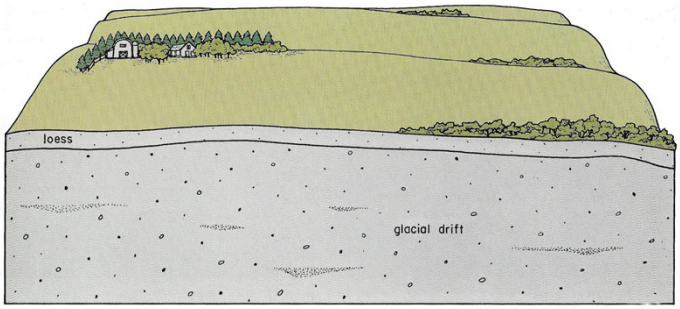

Iowan Surface
2.7%
2.7%
8.8%
85.8%
Today's Landcover
Grass
Water
Trees
Houses/ crops
Source: National Land Cover Dataset (2011)


Northwest Iowa Plains

## Northwest Iowa Plains

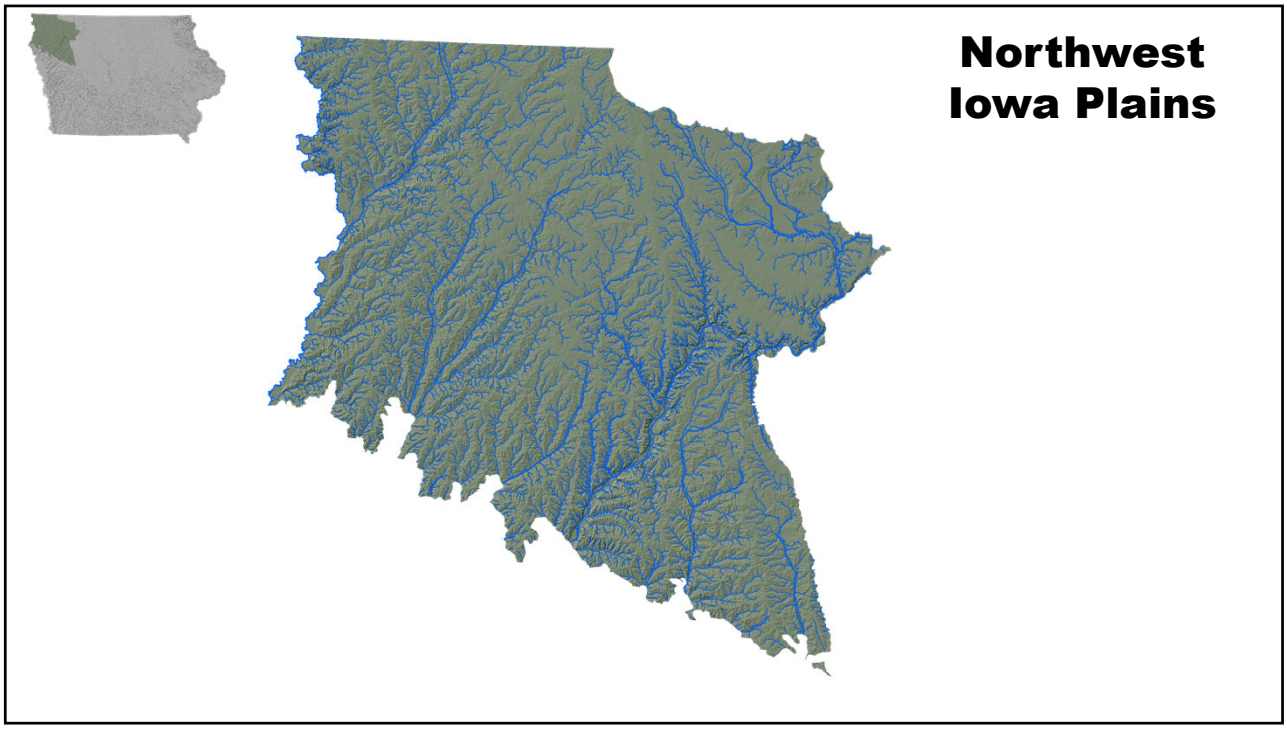
Key Characteristics

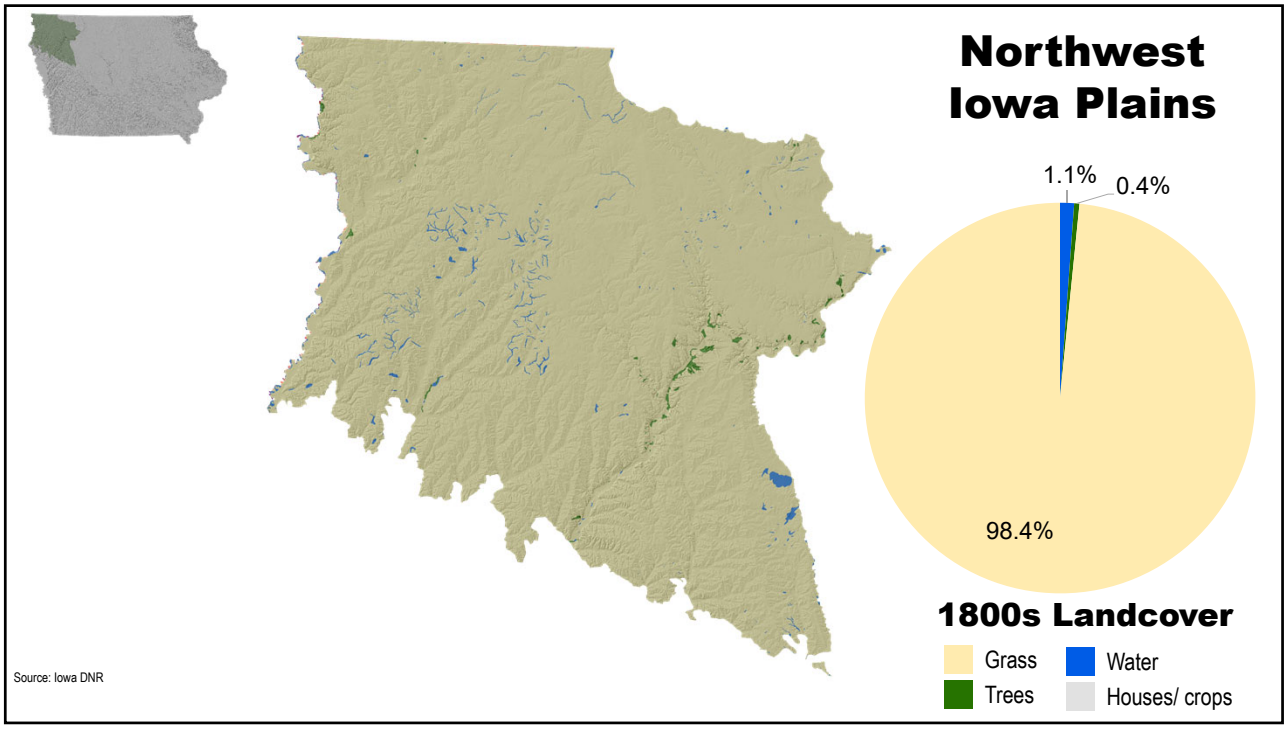
- Mid-Wisconsinan glaciation (~30K years ago)
- Long, gradual slopes.
- Highest elevation, step to northern high plains.
- Well developed drainage but arid.
- Thick loess cover throughout.

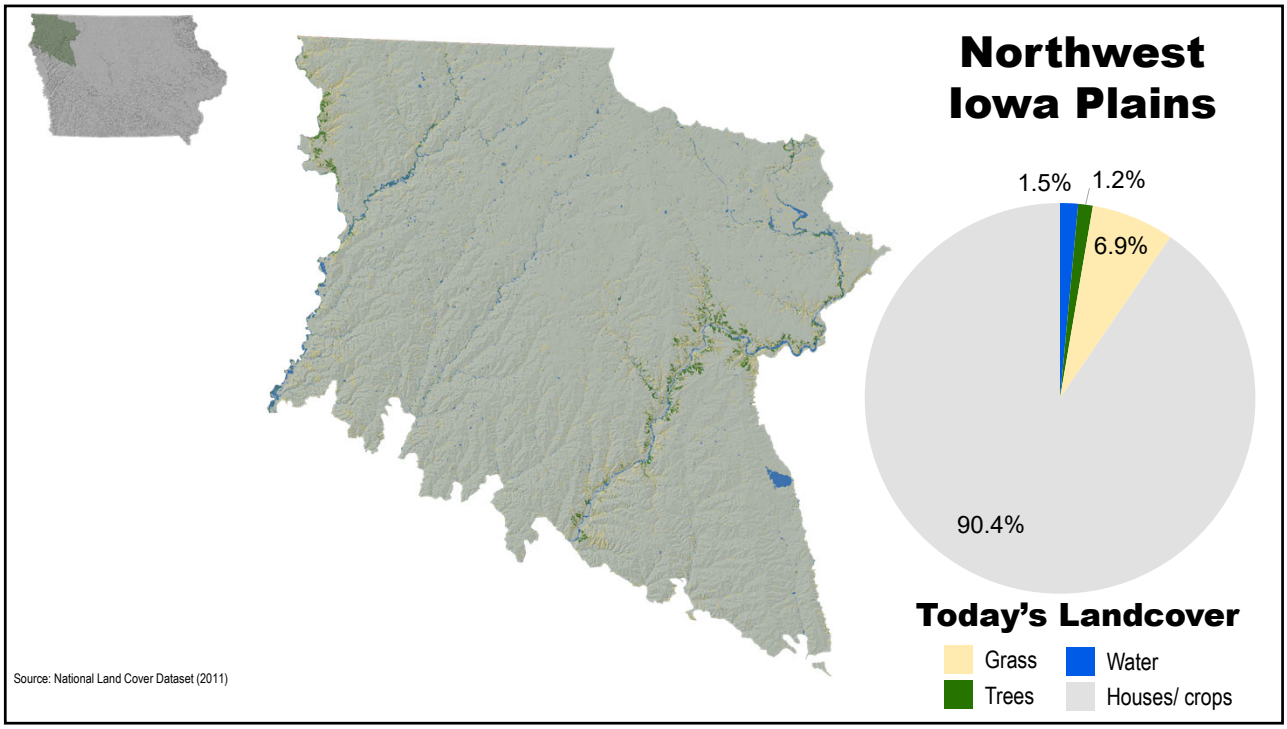


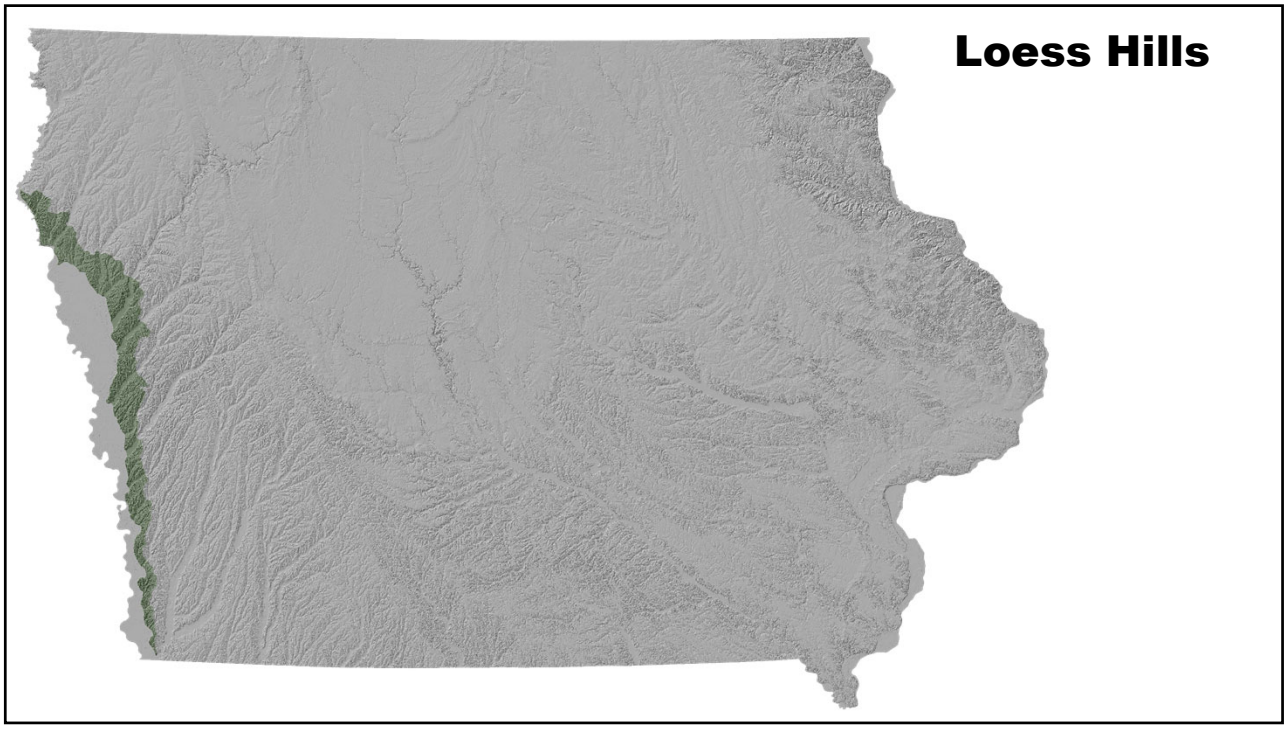

Source: Prior 1991 Landforms of Iowa

## Northwest Iowa Plains


Northwest
Iowa Plains


Northwest
Iowa Plains
1.1%
0.4%
98.4%
1800s Landcover
Grass
Water
Trees
Houses/ crops
Source: Iowa DNR

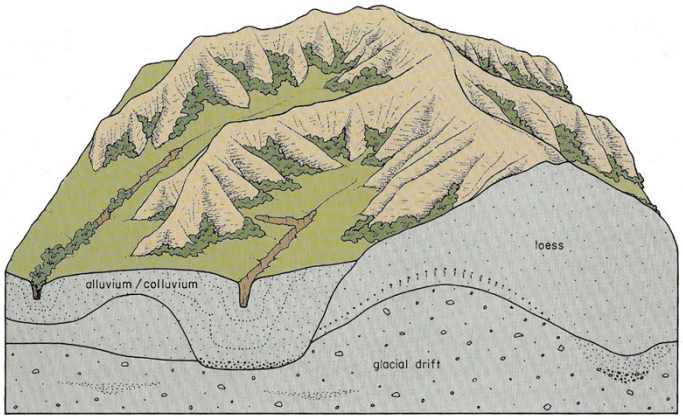

Northwest Iowa Plains
1.5%
1.2%
6.9%
90.4%
Today's Landcover
Grass
Water
Trees
Houses/ crops
Source: National Land Cover Dataset (2011)


Loess Hills

# Loess Hills

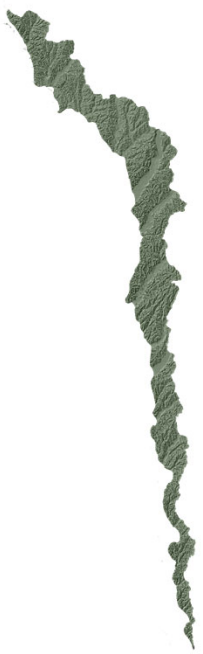
Key Characteristics

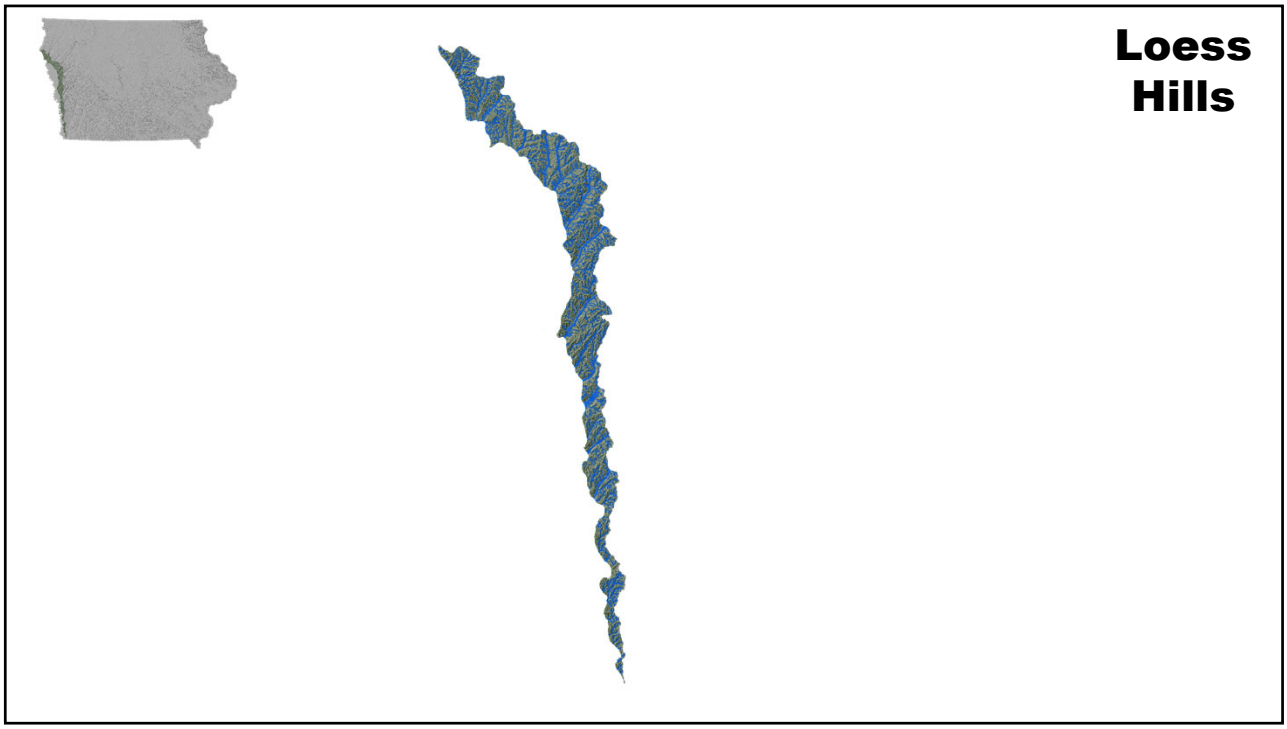
- Deep, rugged loess deposits.
- Western boundary well-defined with floodplain.
- Loess originates in river valleys and accumulates down-wind (east).
- High erosion and drainage development.

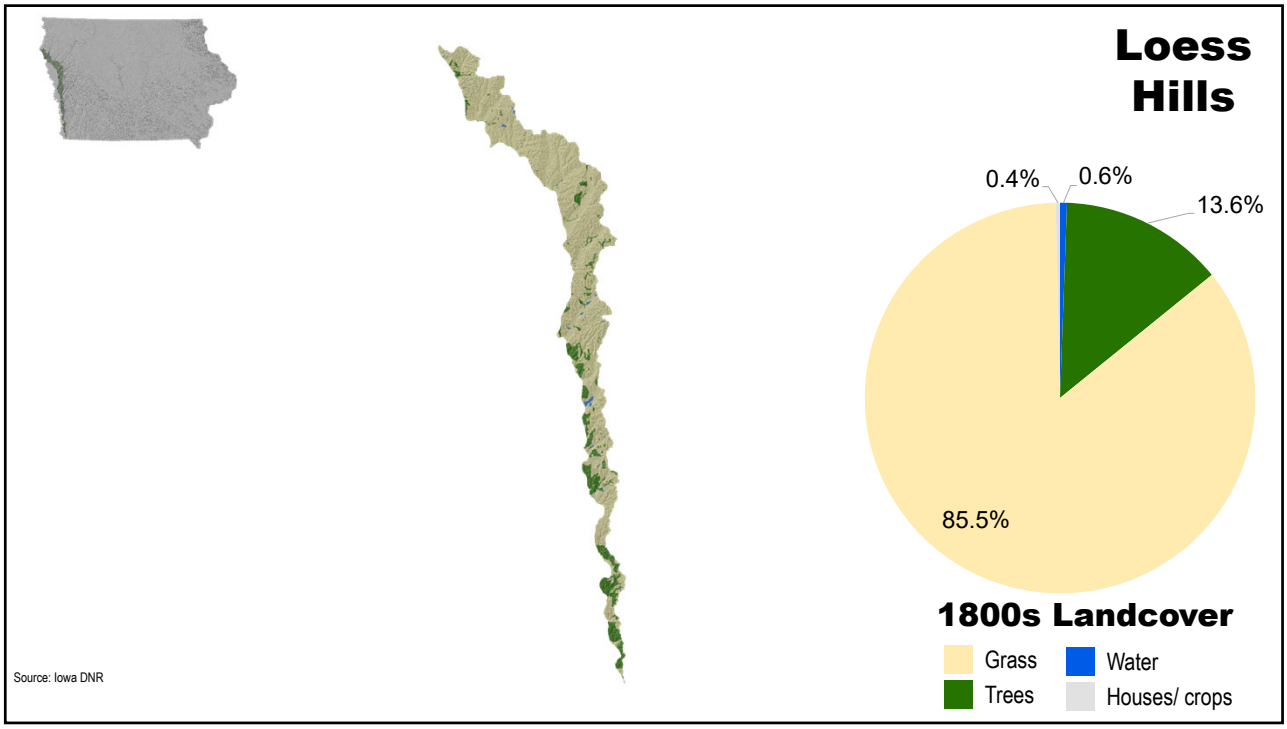


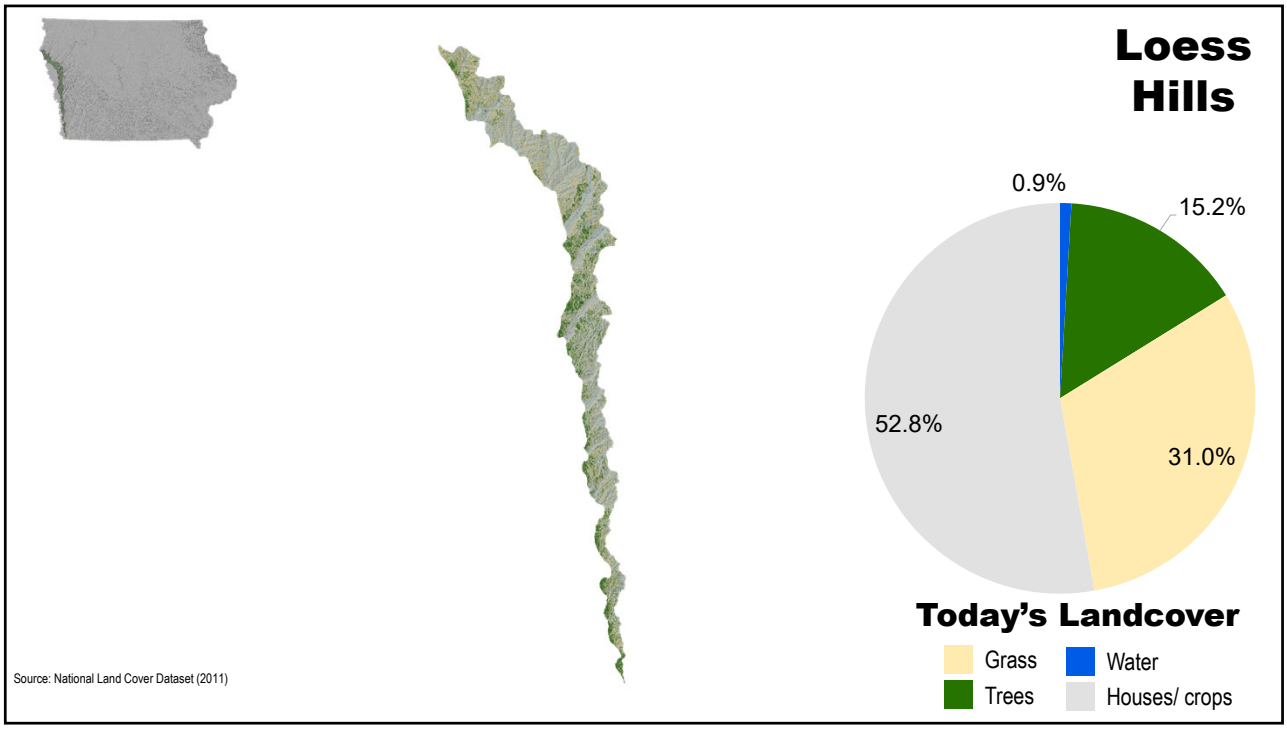

Source: Prior 1991 Landforms of Iowa

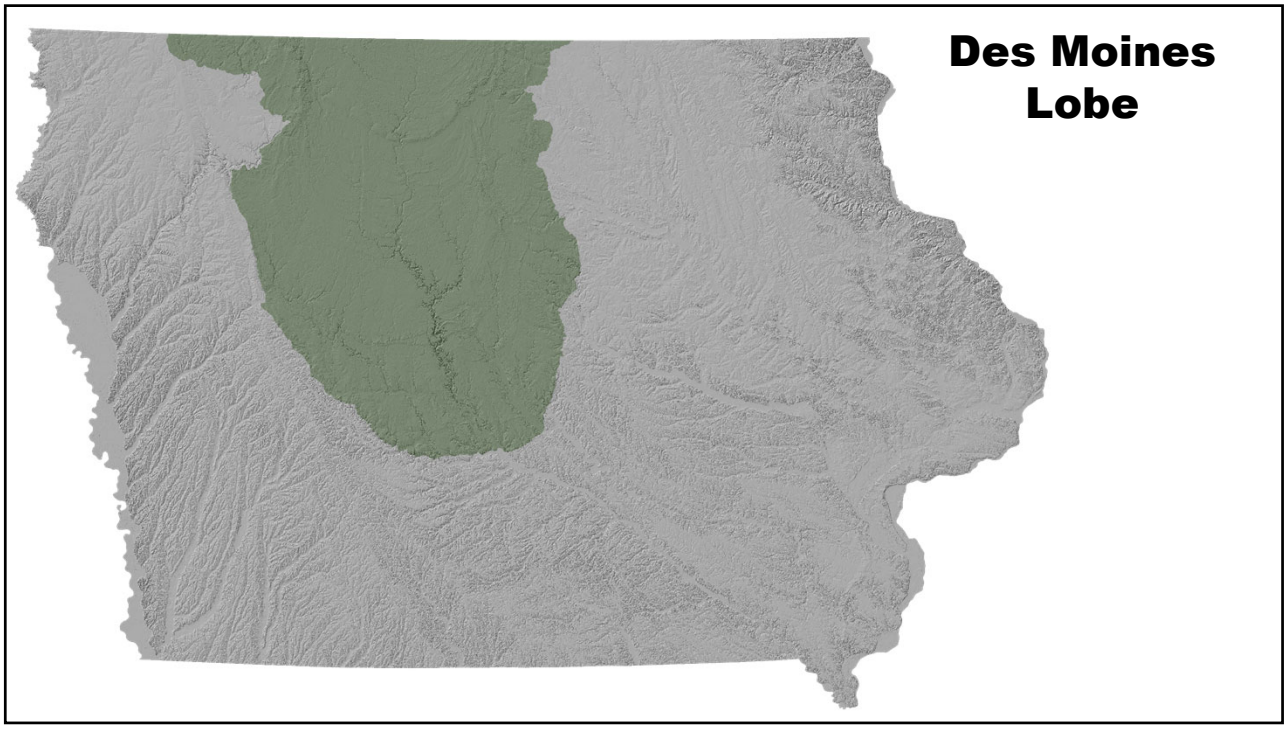
# Loess Hills




Loess
Hills


Loess
Hills
0.4%
0.6%
13.6%
85.5%
1800s Landcover
Grass
Water
Trees
Houses/ crops
Source: Iowa DNR

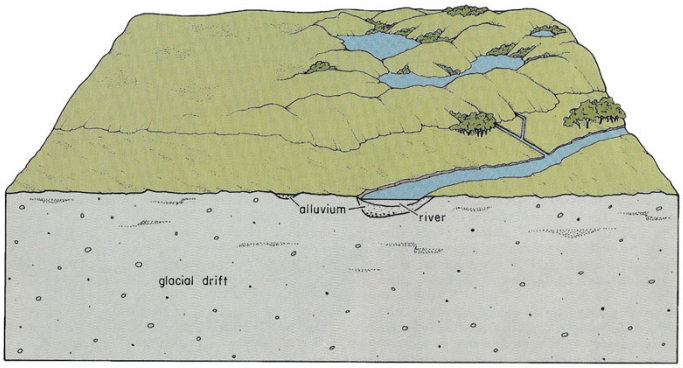

Loess Hills
0.9%
15.2%
52.8%
31.0%
Today's Landcover
Grass
Water
Trees
Houses/ crops
Source: National Land Cover Dataset (2011)


Des Moines Lobe

# Des Moines Lobe

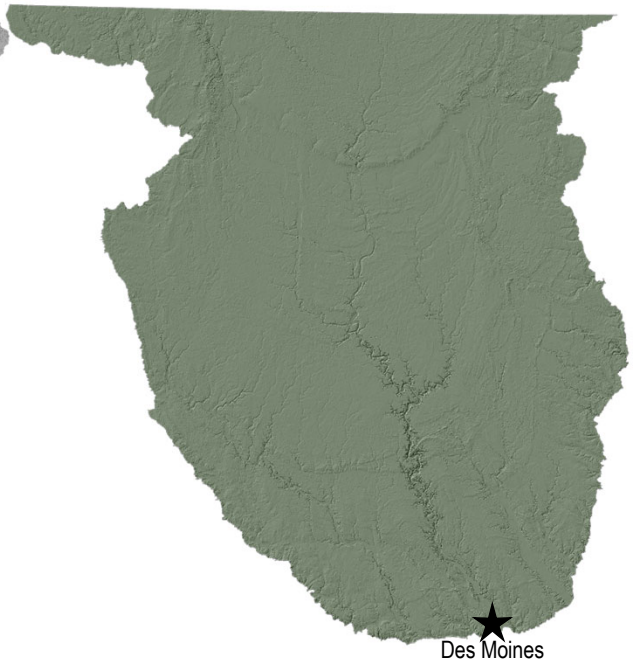
Key Characteristics

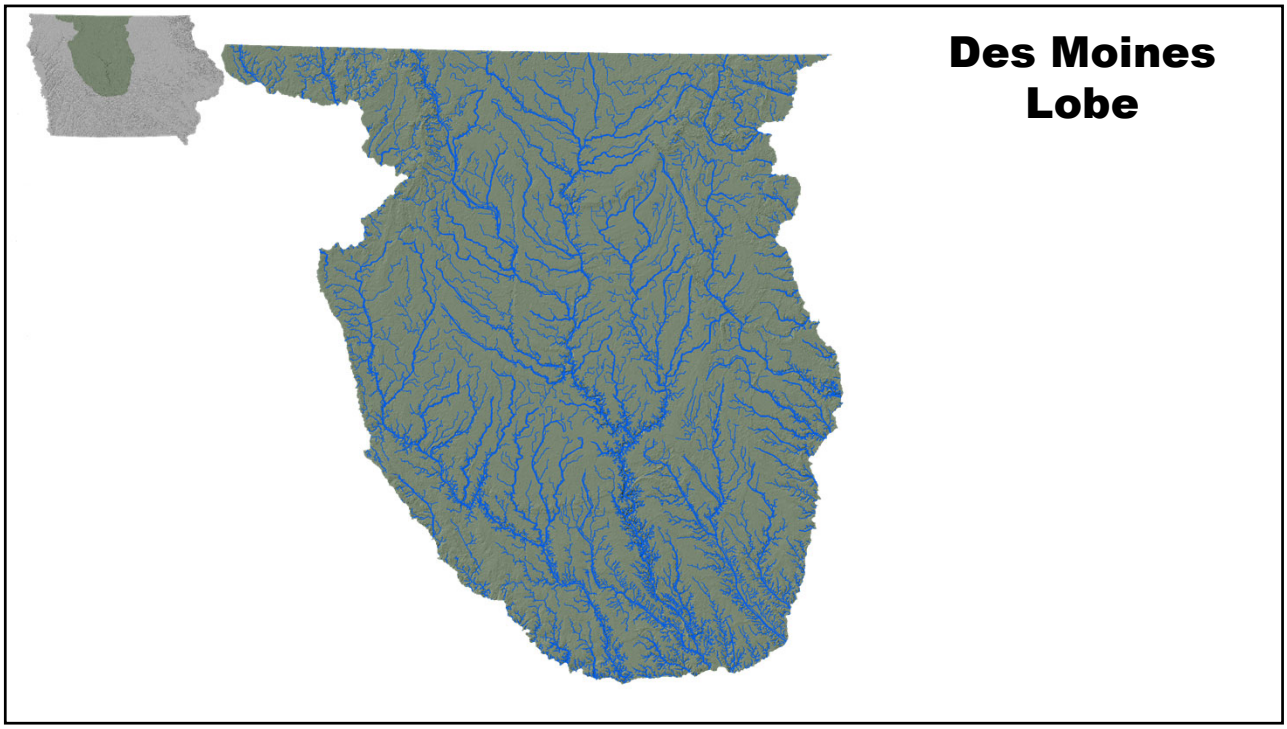
- Only area covered by Wisconsin glacier (10-30K years ago)
- No loess deposition
- Flat, rolling terrain except at moraines.
- Pothole depressions throughout.
- Little drainage development.

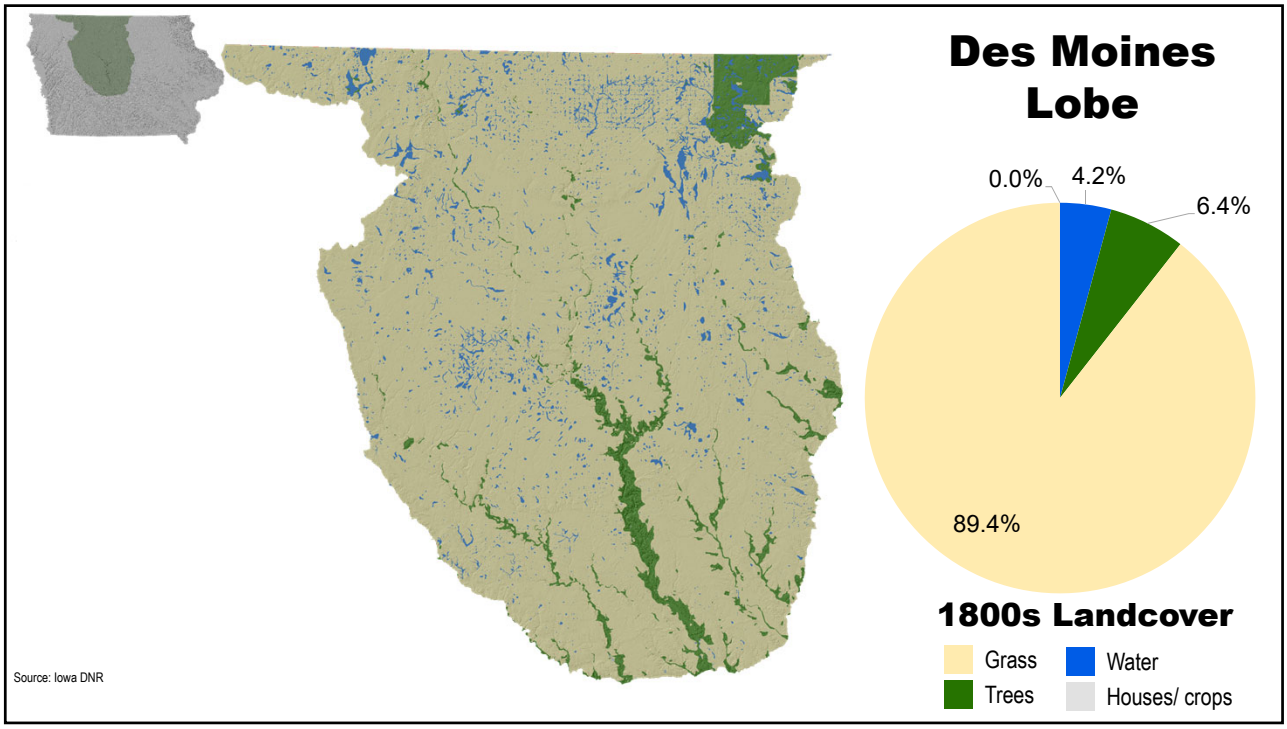


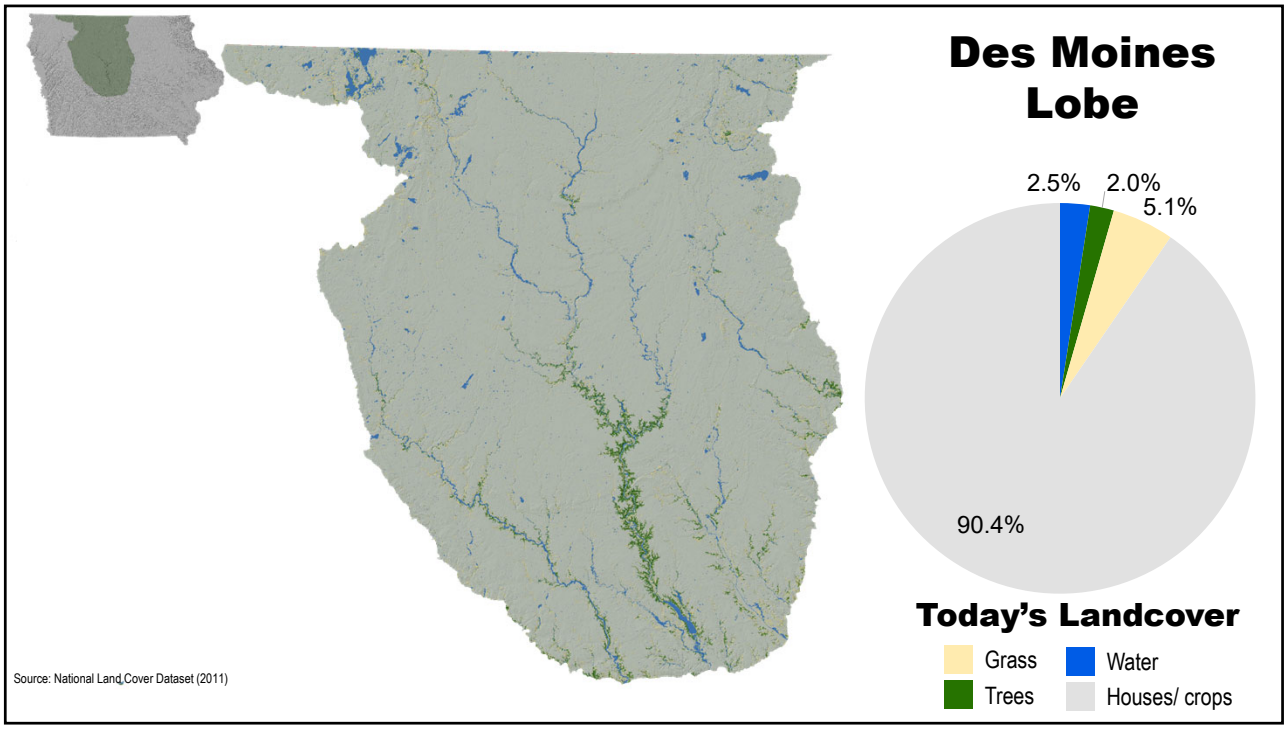

Source: Prior 1991 Landforms of Iowa

# Des Moines Lobe




Des Moines
Lobe


Des Moines
Lobe
0.0%
4.2%
6.4%
89.4%
1800s Landcover
Grass
Water
Trees
Houses/ crops
Source: Iowa DNR

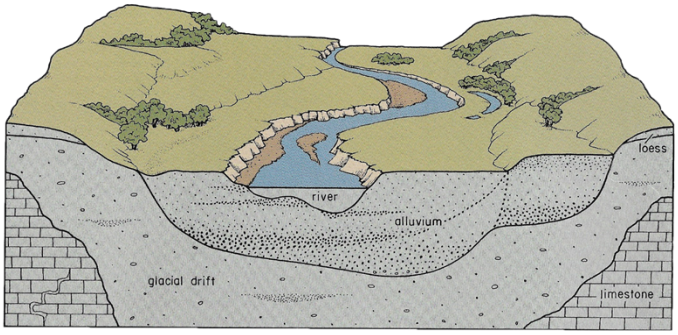

Des Moines Lobe
2.5%
2.0%
5.1%
90.4%
Today's Landcover
Grass
Water
Trees
Houses/ crops
Source: National Land Cover Dataset (2011)


Alluvial Plains

# Alluvial Plains

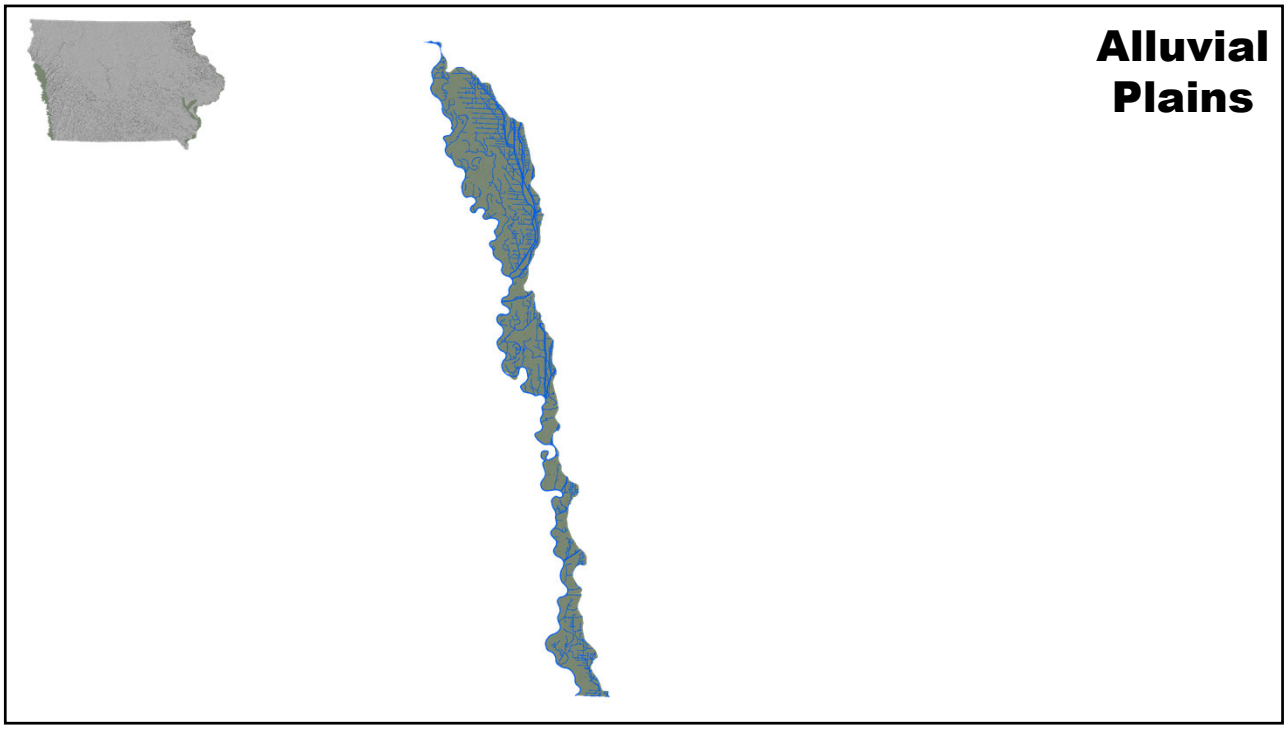
Key Characteristics

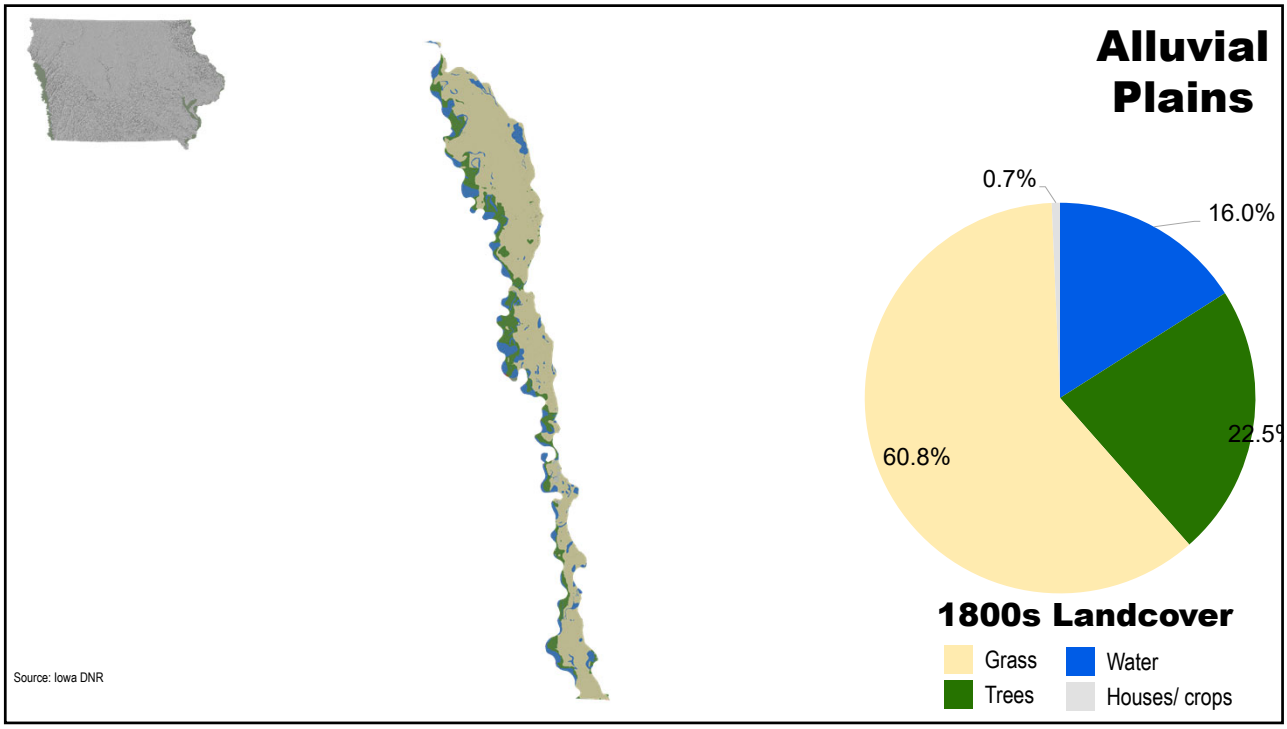
- Frequent redistribution of alluvium with floods.
- Flat, little natural drainage integration.
- Bound by “bluffs”.

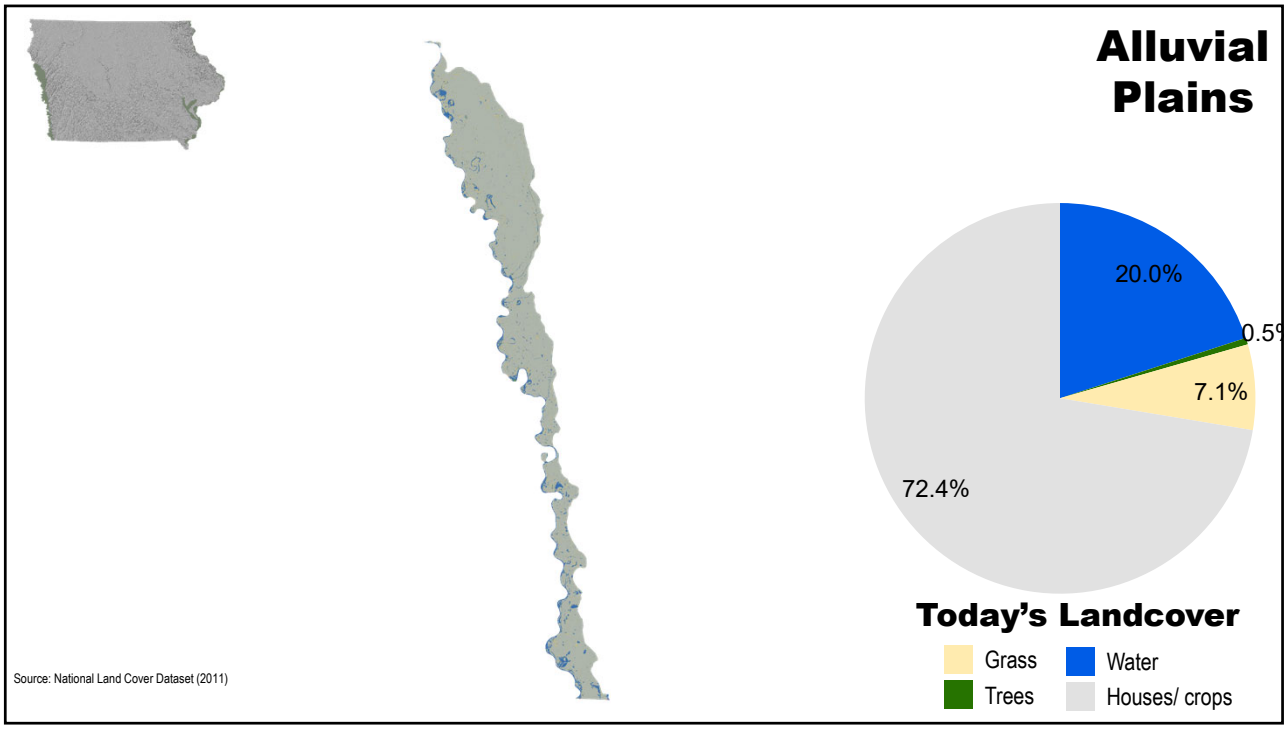


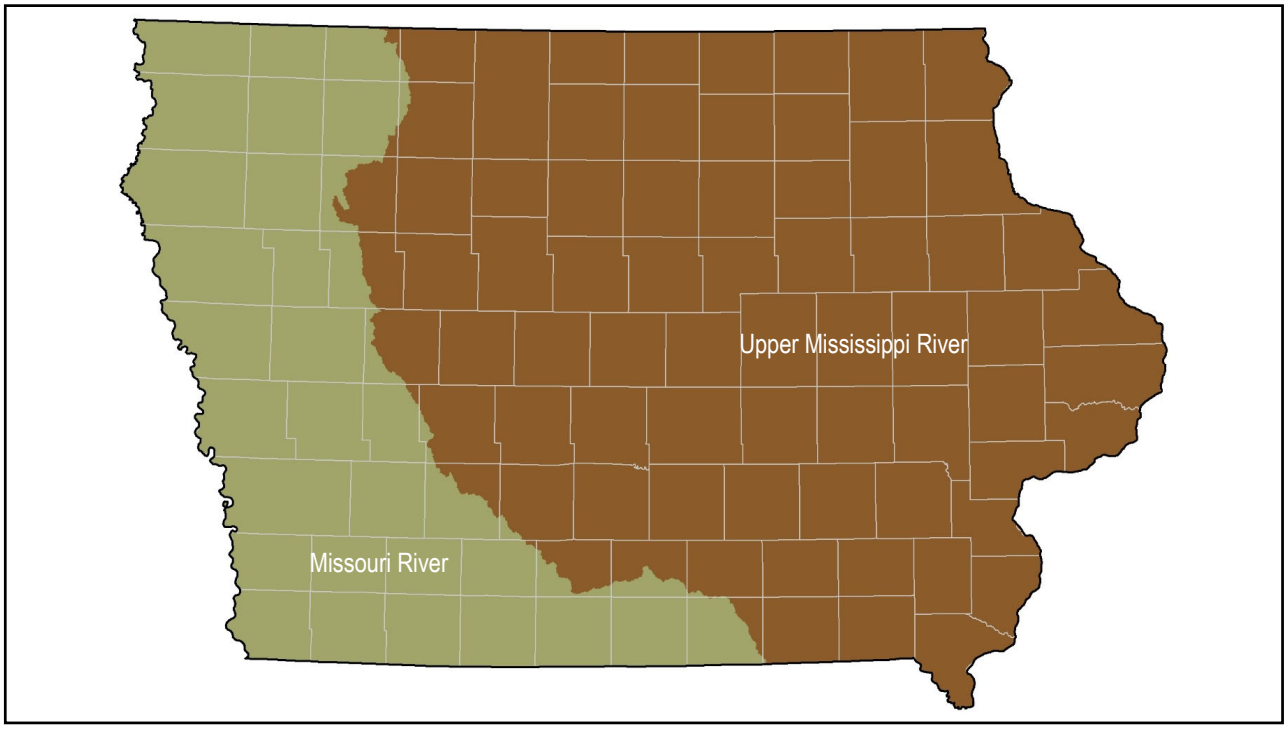

Source: Prior 1991 Landforms of Iowa

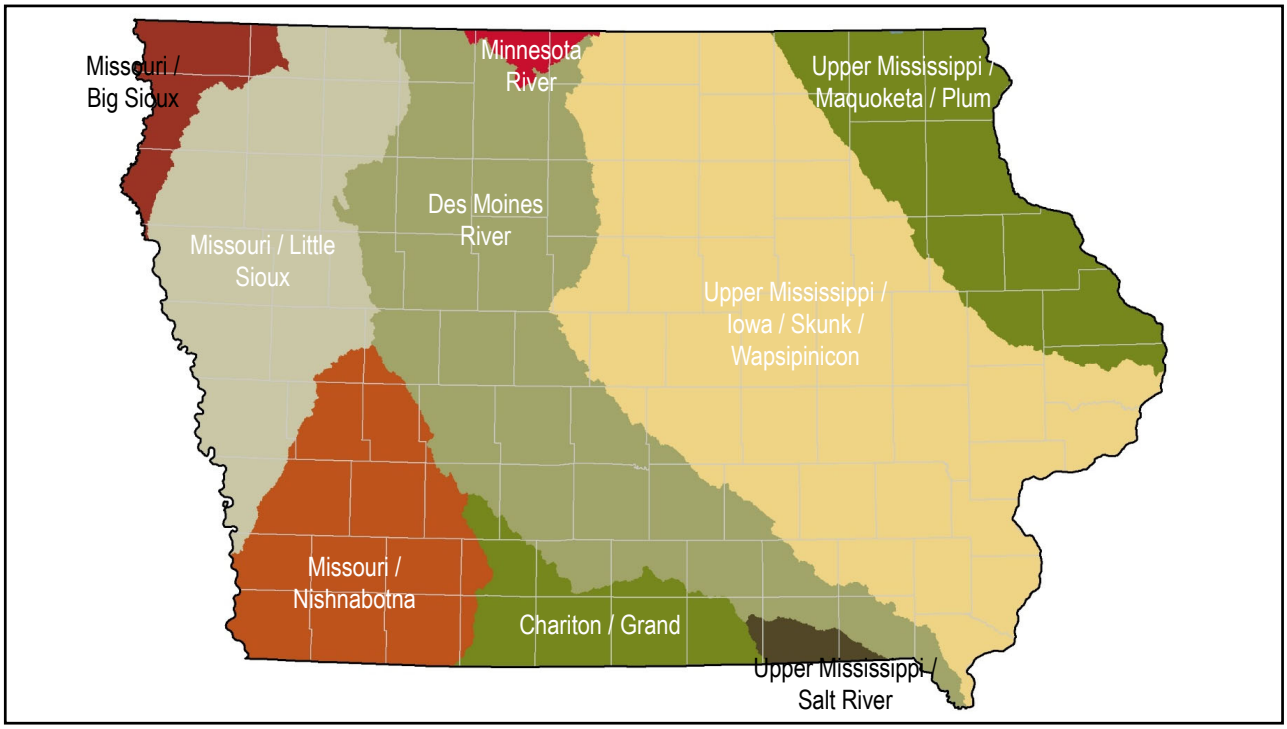
# Alluvial Plains

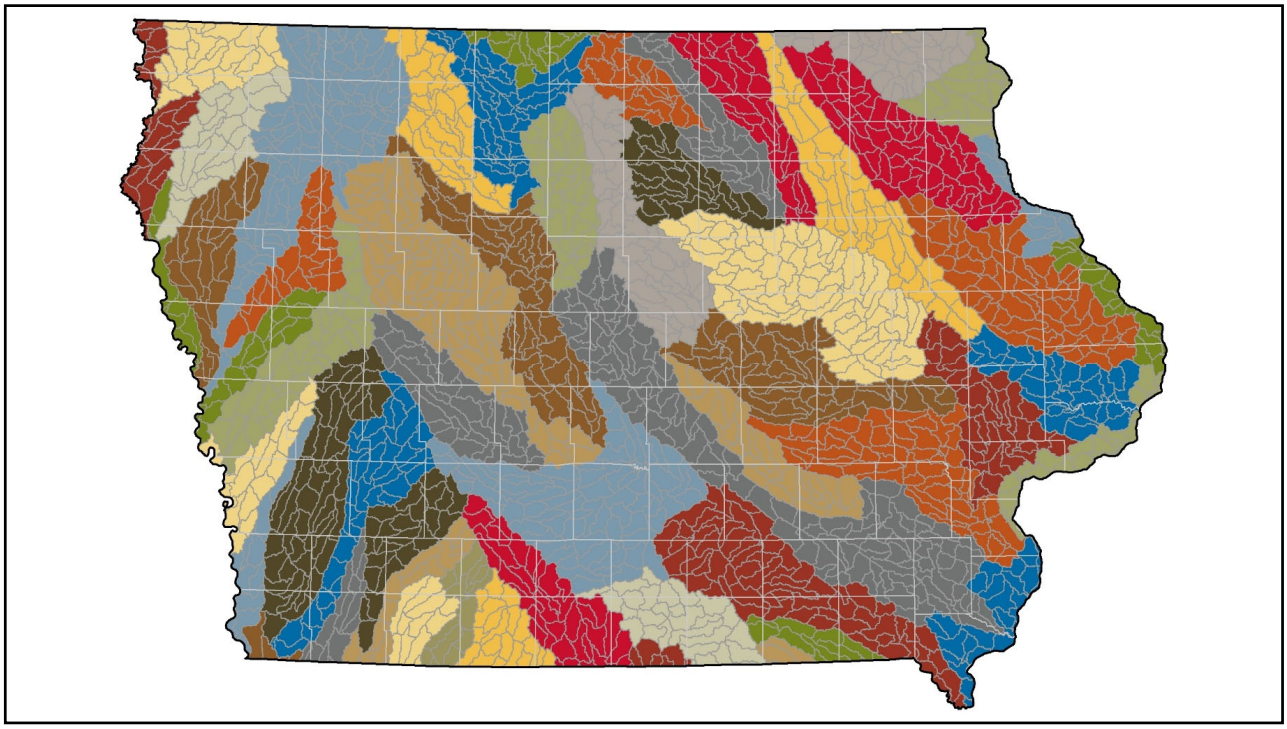

Alluvial
Plains


Alluvial
Plains
0.7%
16.0%
22.5%
60.8%
1800s Landcover
Grass
Water
Trees
Houses/ crops
Source: Iowa DNR

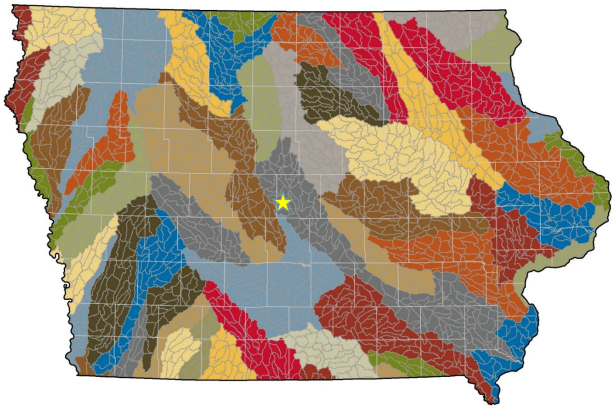

Alluvial Plains
20.0%
0.5%
7.1%
72.4%
Today's Landcover
Grass
Water
Trees
Houses/ crops
Source: National Land Cover Dataset (2011)

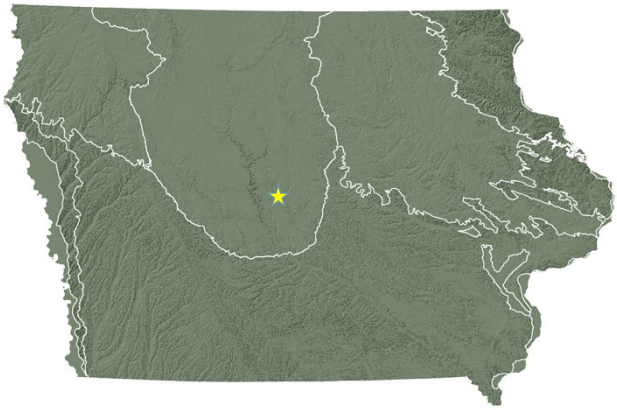

Upper Mississippi River
Missouri River


Missouri /
Big Sioux
Minnesota
River
Upper Mississippi /
Maquoketa / Plum
Des Moines
River
Missouri / Little
Sioux
Upper Mississippi /
Iowa / Skunk /
Wapsipinicon
Missouri /
Nishnabotna
Chariton / Grand
Upper Mississippi /
Salt River

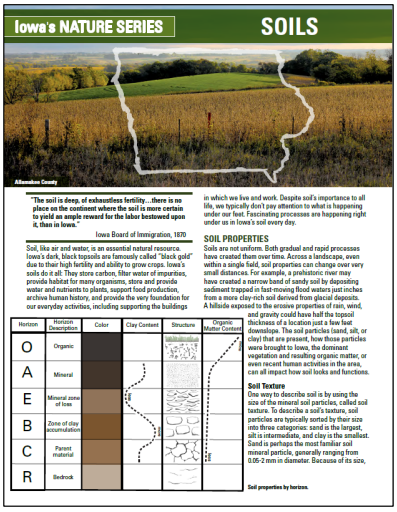


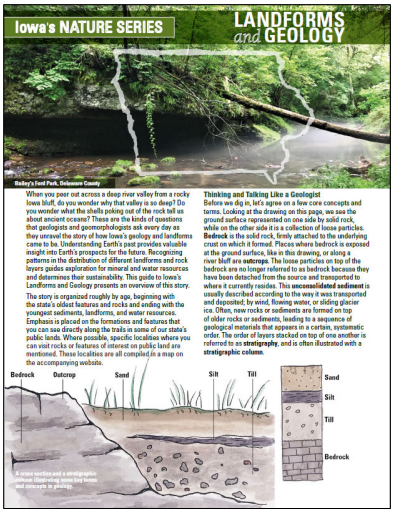
## What landform and watershed do you call home?





## Learn more!

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