



SPATIAL PREDICTION OF LOESS

STORIES FROM THE PEORIA LOESS SHEET

BRADLEY MILLER



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Peoria Loess Sheet - Classic

- Classic model of loess deposition, Mississippi valley (Chamberlain, 1897)
- Sourced from outwash streams
 - Missouri, Mississippi, Illinois, Wabash, Ohio Rivers



Loess Hills

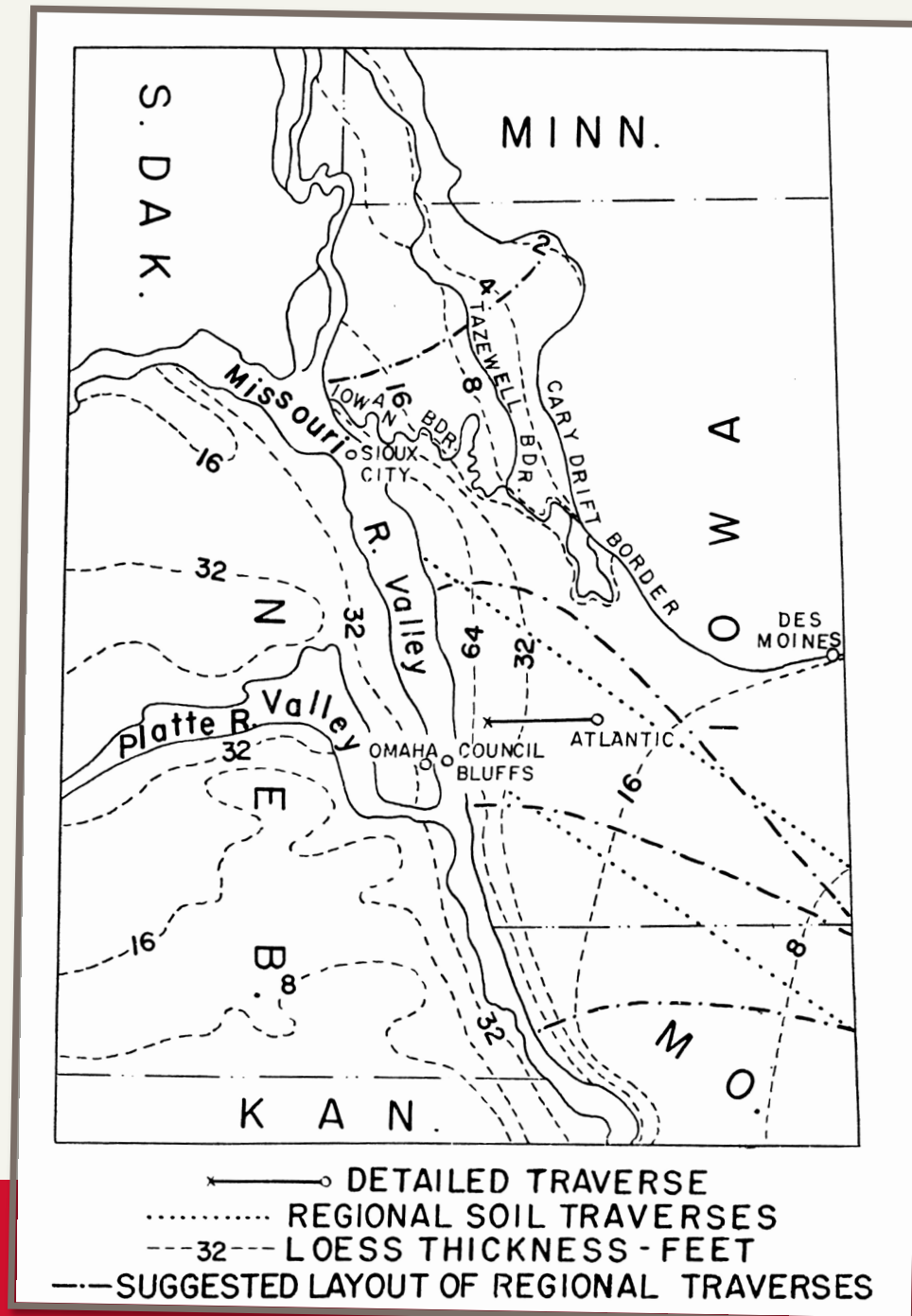


- 20 m thick
- 3 km from Missouri River Valley



Loess Hills

Ruhe
(1954)



- 20 m thick
- 3 km from Missouri River Valley

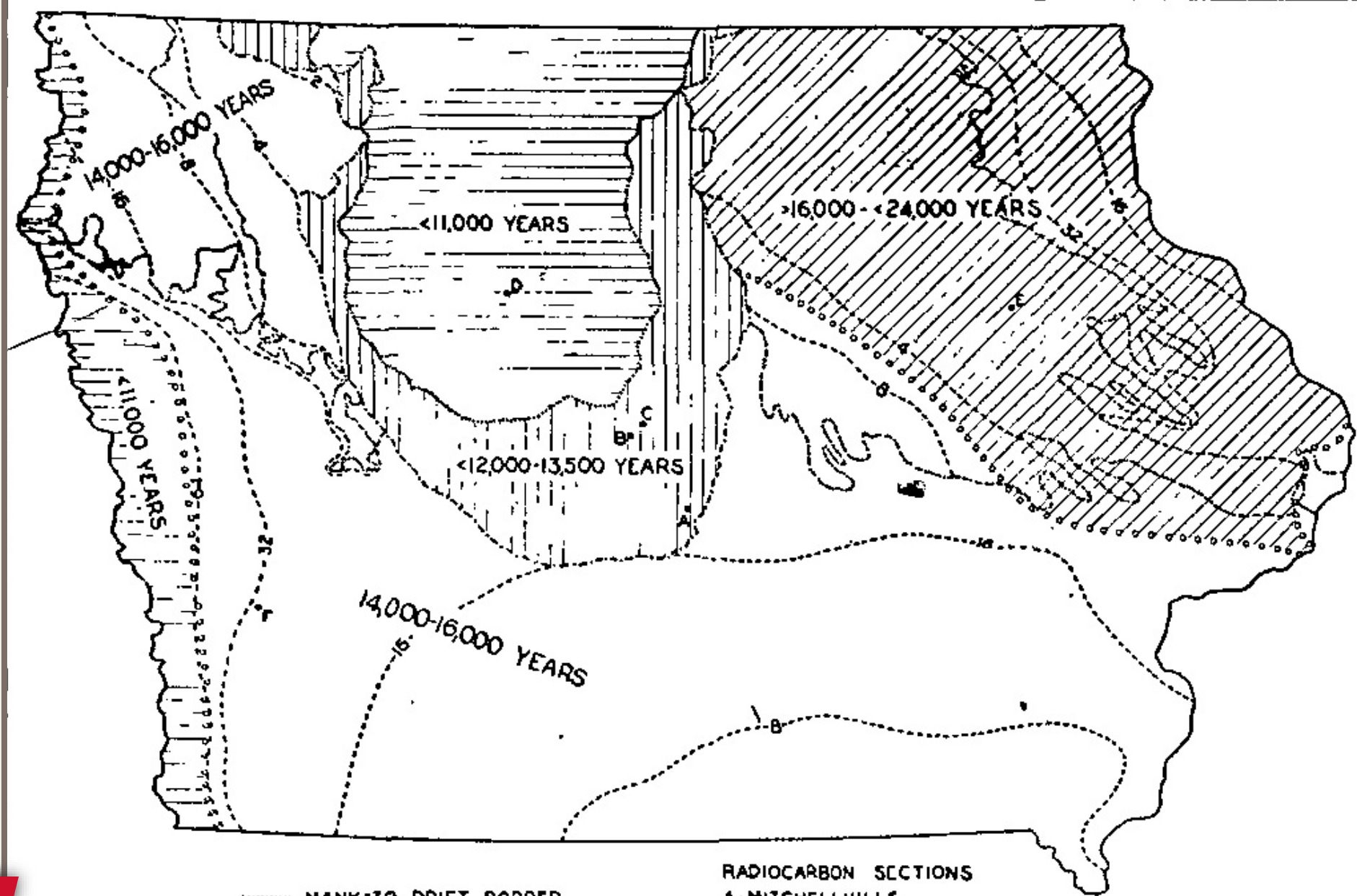


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Age of Loess Sheet in Iowa

Ruhe and Scholtes
(1956)



- MANKATO DRIFT BORDER
- - - - CARY DRIFT BORDER
- TAZEWELL DRIFT BORDER
- - - - IOWAN DRIFT BORDER
- LOESS THICKNESS (FEET)

RADIOCARBON SECTIONS

- A-MITCHELLVILLE
- B-CLEAR CREEK
- C-COOK QUARRY
- D-LIZARD CREEK
- E-INDEPENDENCE
- F-NANCOCK

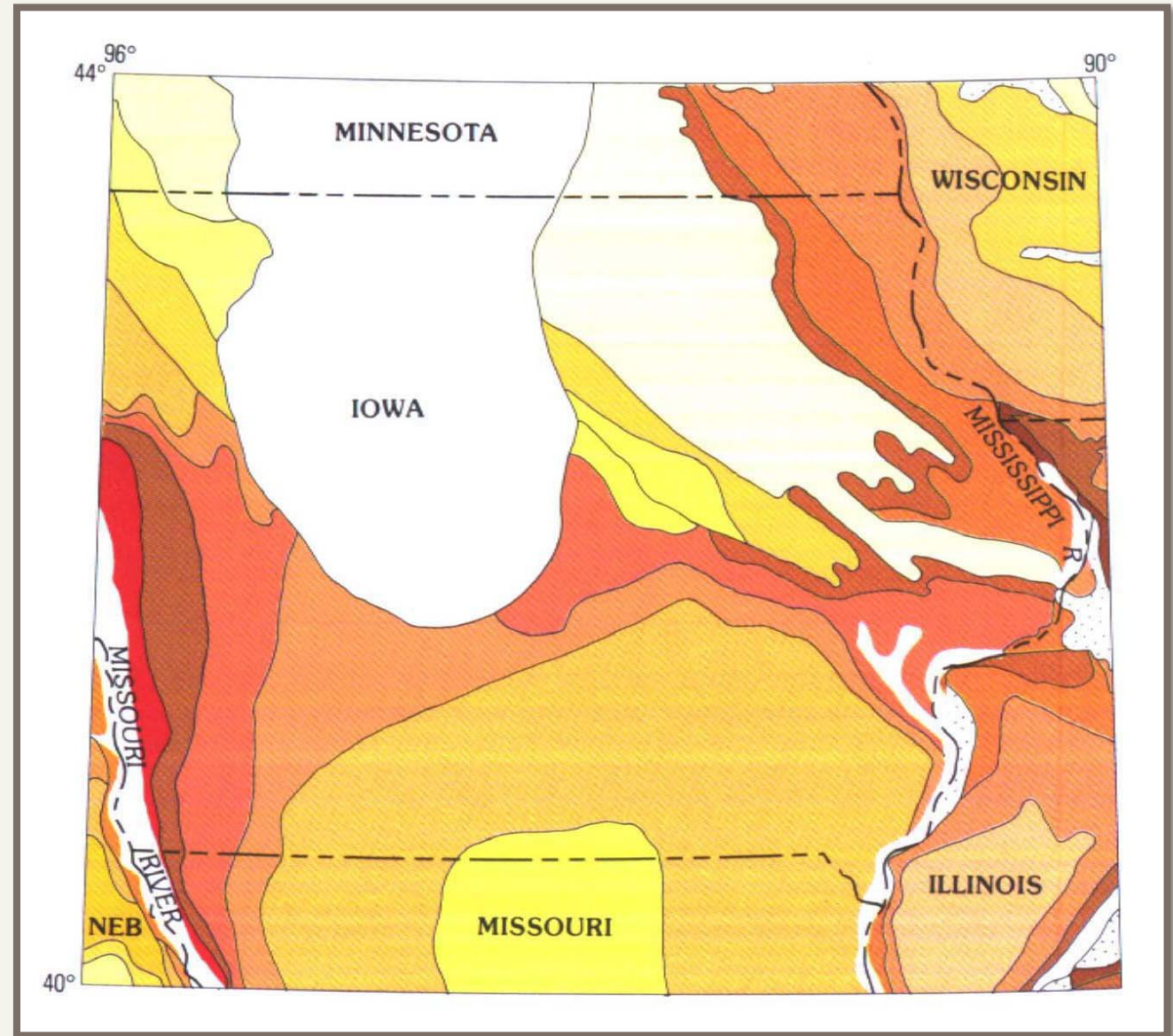
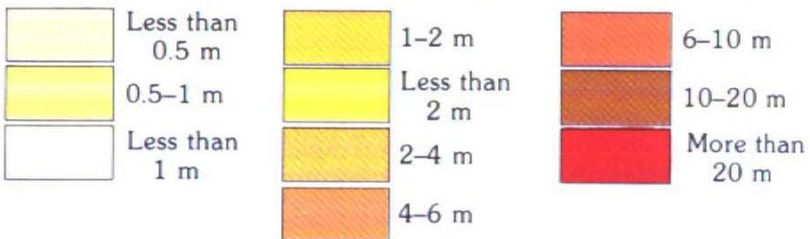


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Loess Thickness

USGS
(1991)

MINNESOTA, WESTERN AND SOUTHERN IOWA, AND MISSOURI

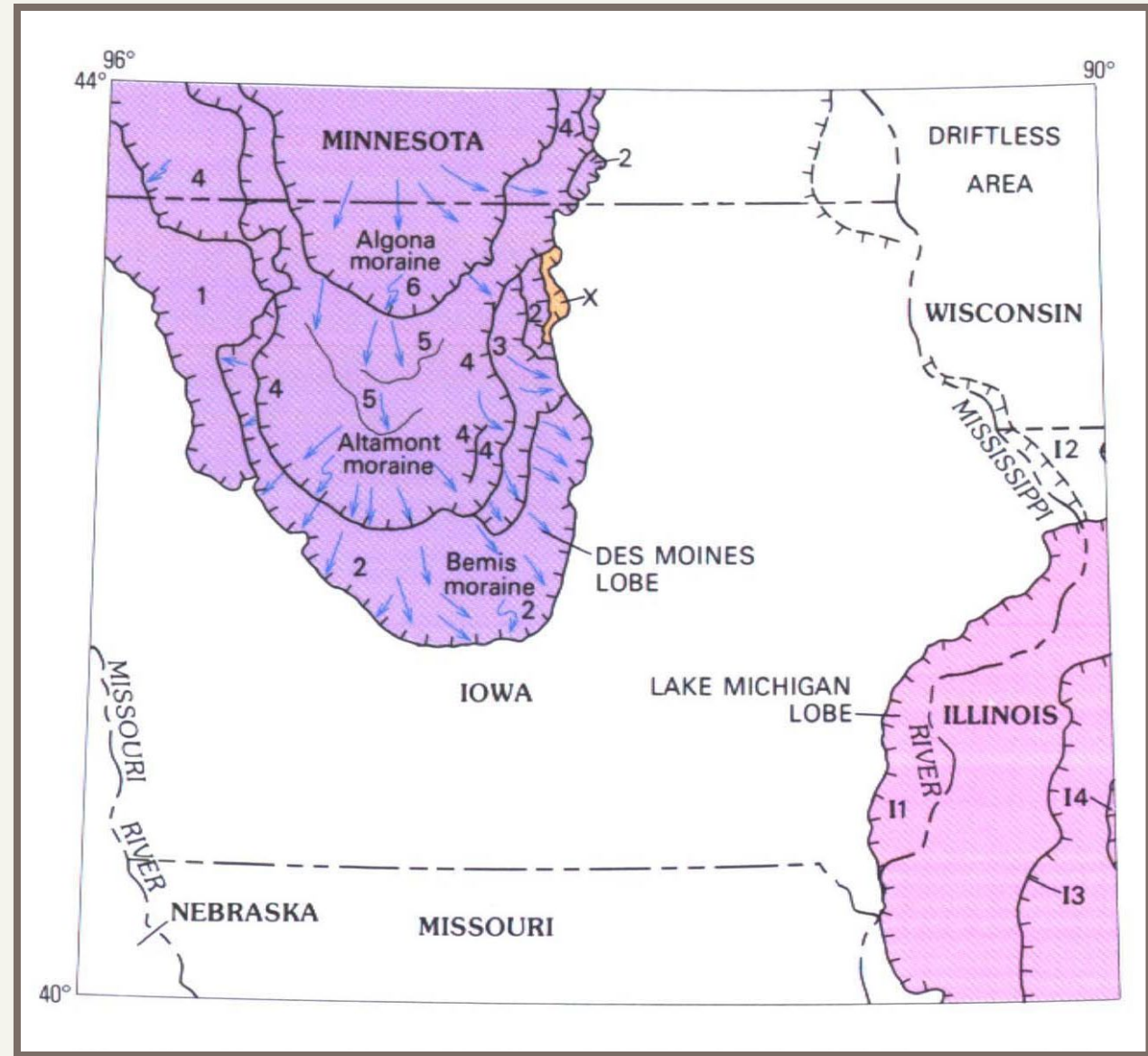


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“Recent” Glaciations

USGS
(1991)



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Laurentide Ice Sheet

Muhs et al.
(2018)



Loess Sources

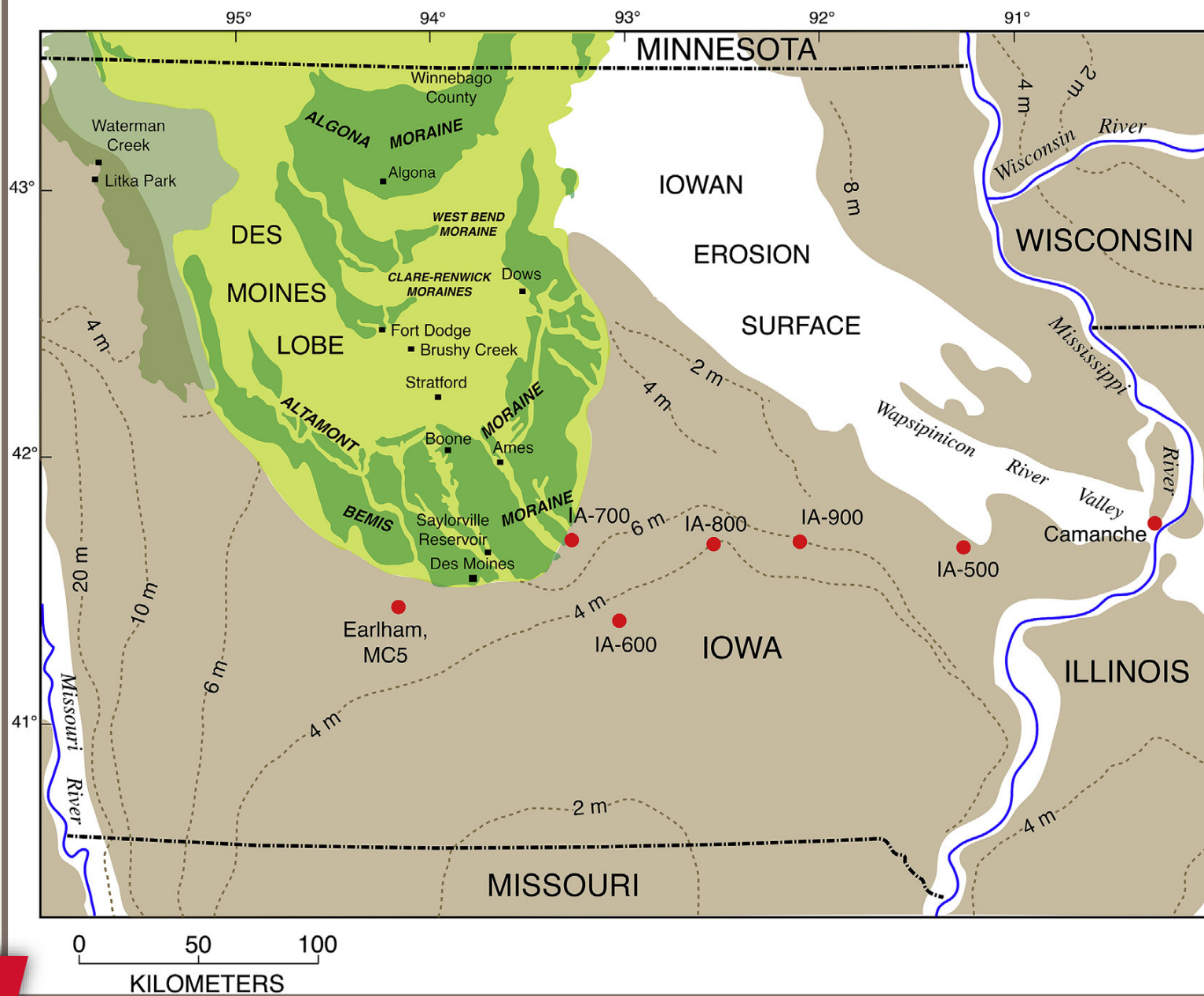
Muhs et al.
(2018)



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Iowa's Loess

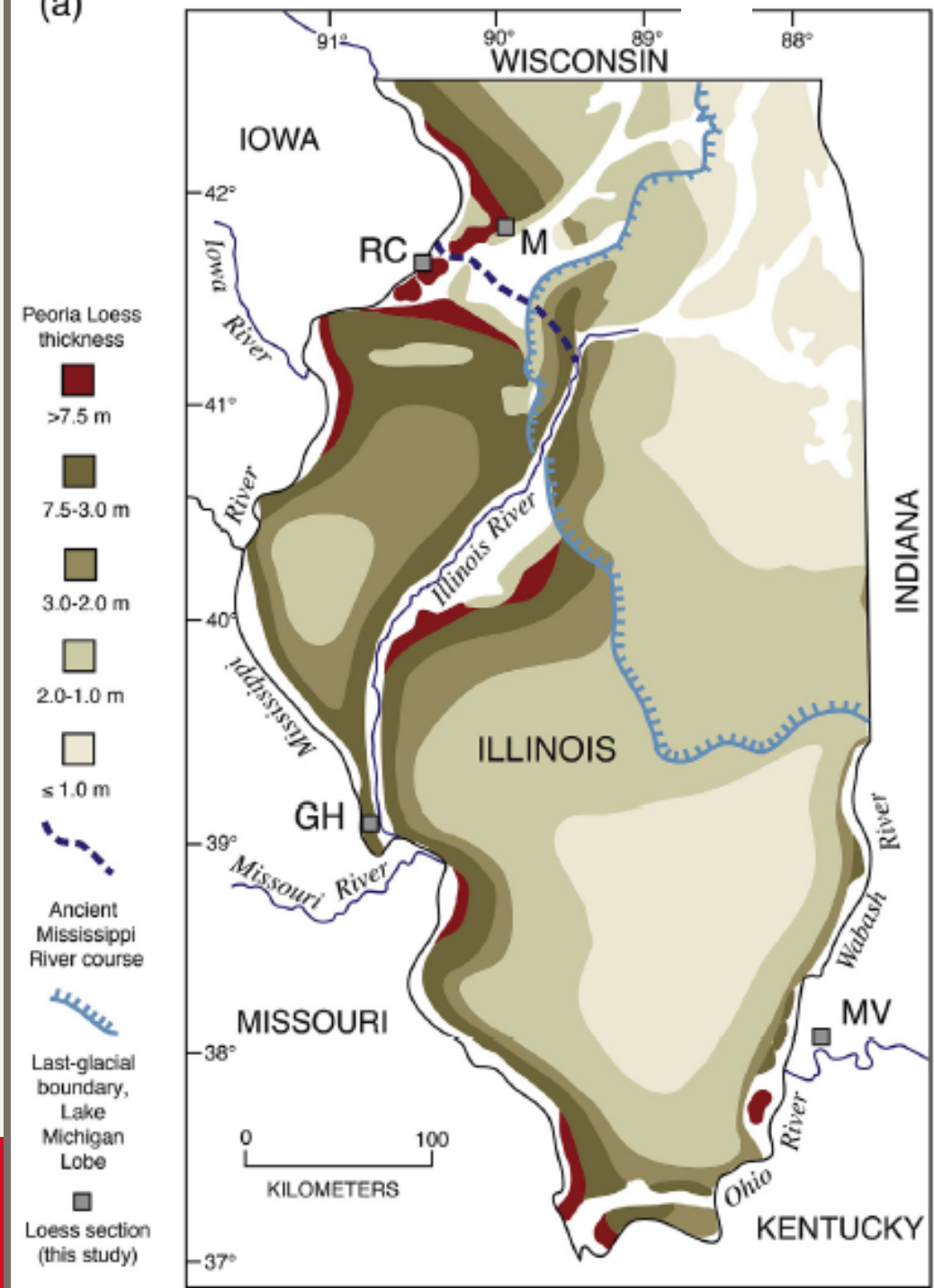
Muhs et al.
(2018)



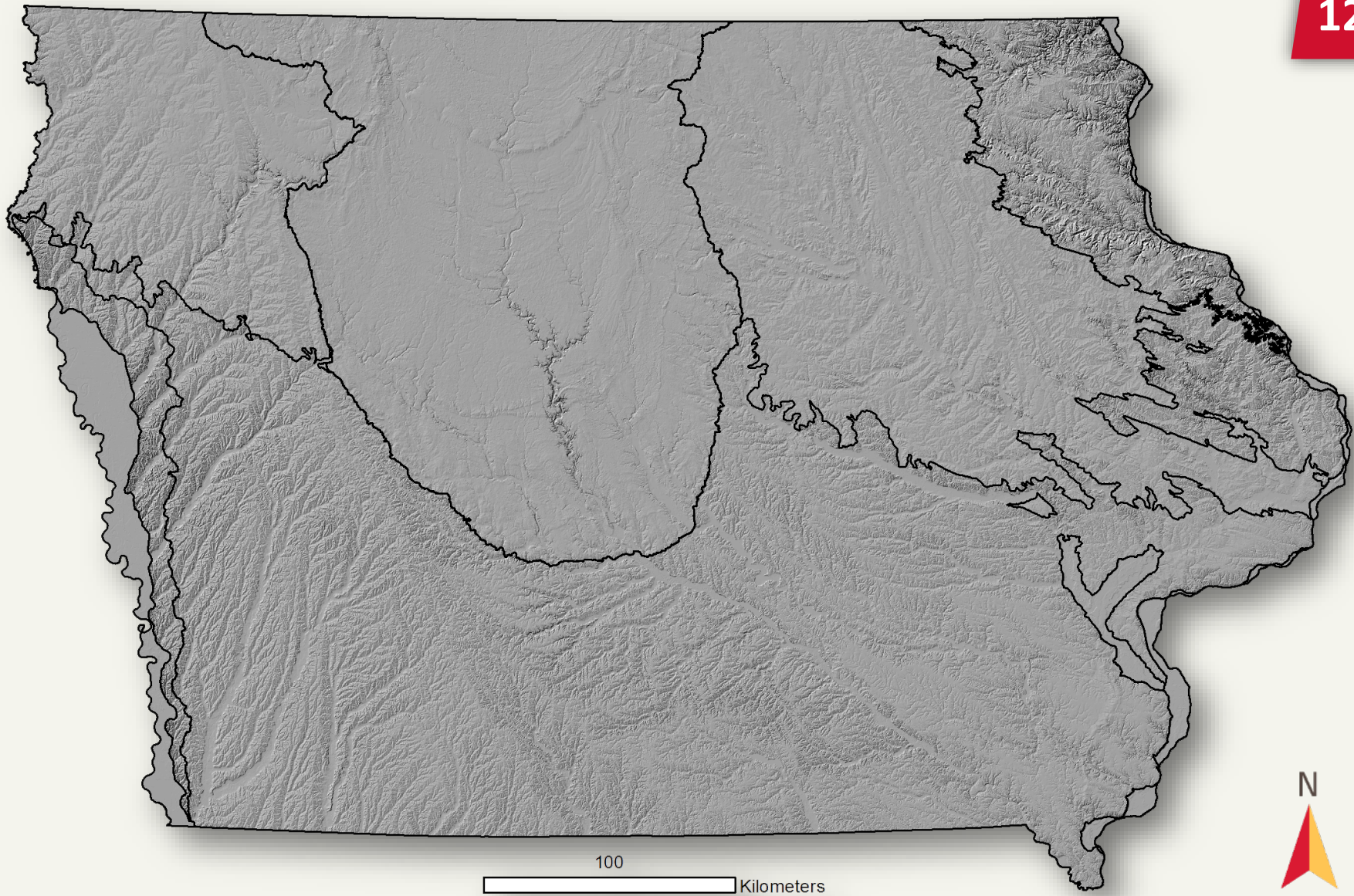
- EXPLANATION**
- Dows Formation till of last-glacial age
 - Dows Formation till of last-glacial age, as prominent end moraine
 - Peoria Loess with a thickness >1 m
 - Sheldon Creek Formation, loess-covered
 - Sheldon Creek Formation
 - IA-800
 - Loess section sampled

Illinois's Loess

Muhs et al.
(2018)



Iowa Regions



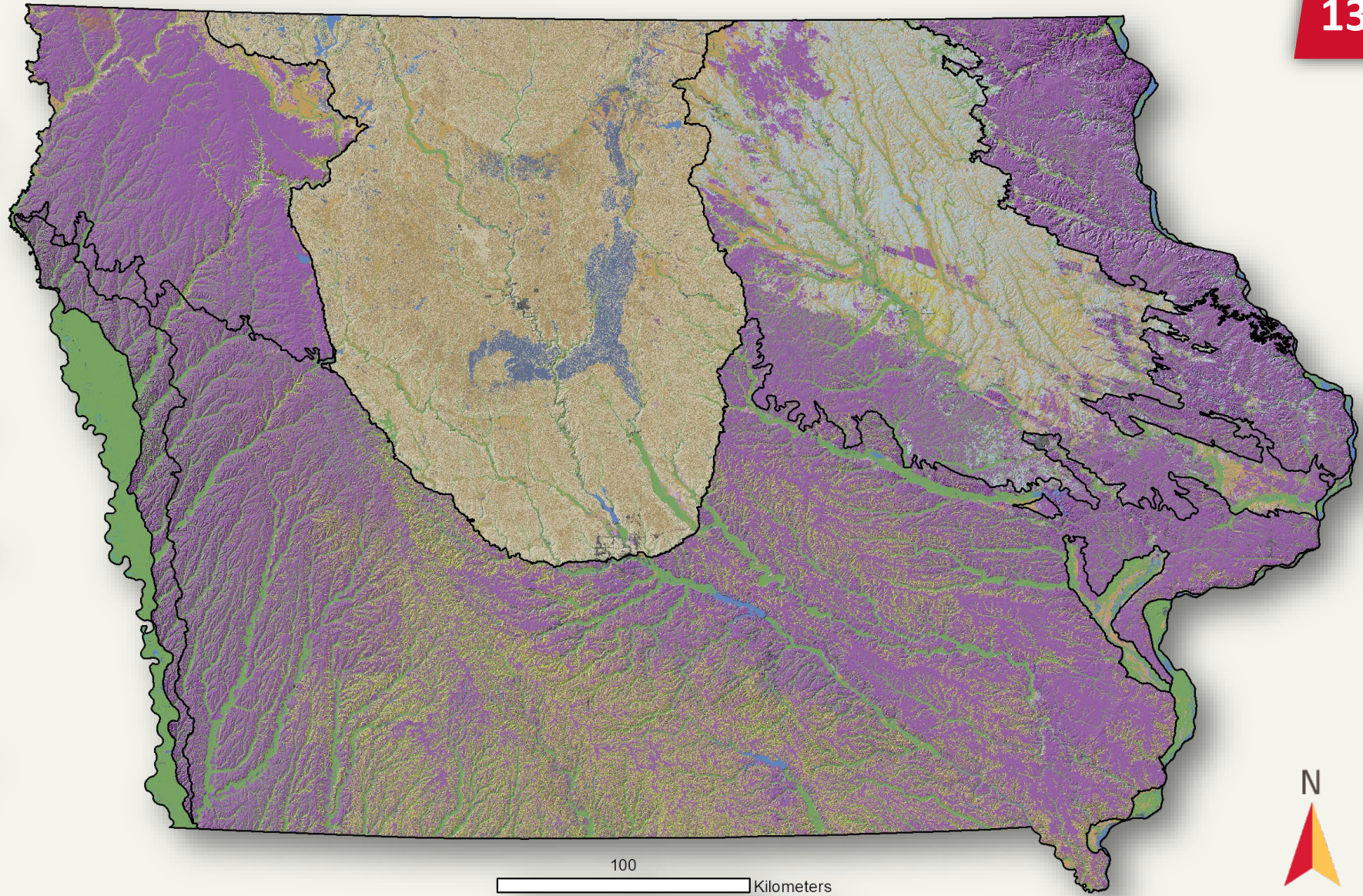
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Parent Material

Surfacial Geology

- Alluvium
- Dows Till
- Dows Till Alluvium
- Sheldon Creek Till
- Pre-IL Till
- Colluvium
- Outwash
- Lake Plain
- Eolian
- Sandy Alluvium
- Peoria Loess
- Sand
- Loamy Sediments
- Rock
- Limestone
- Sandstone
- Shale
- Disturbed & Fill
- Muck & Peat
- Water
- Not Defined

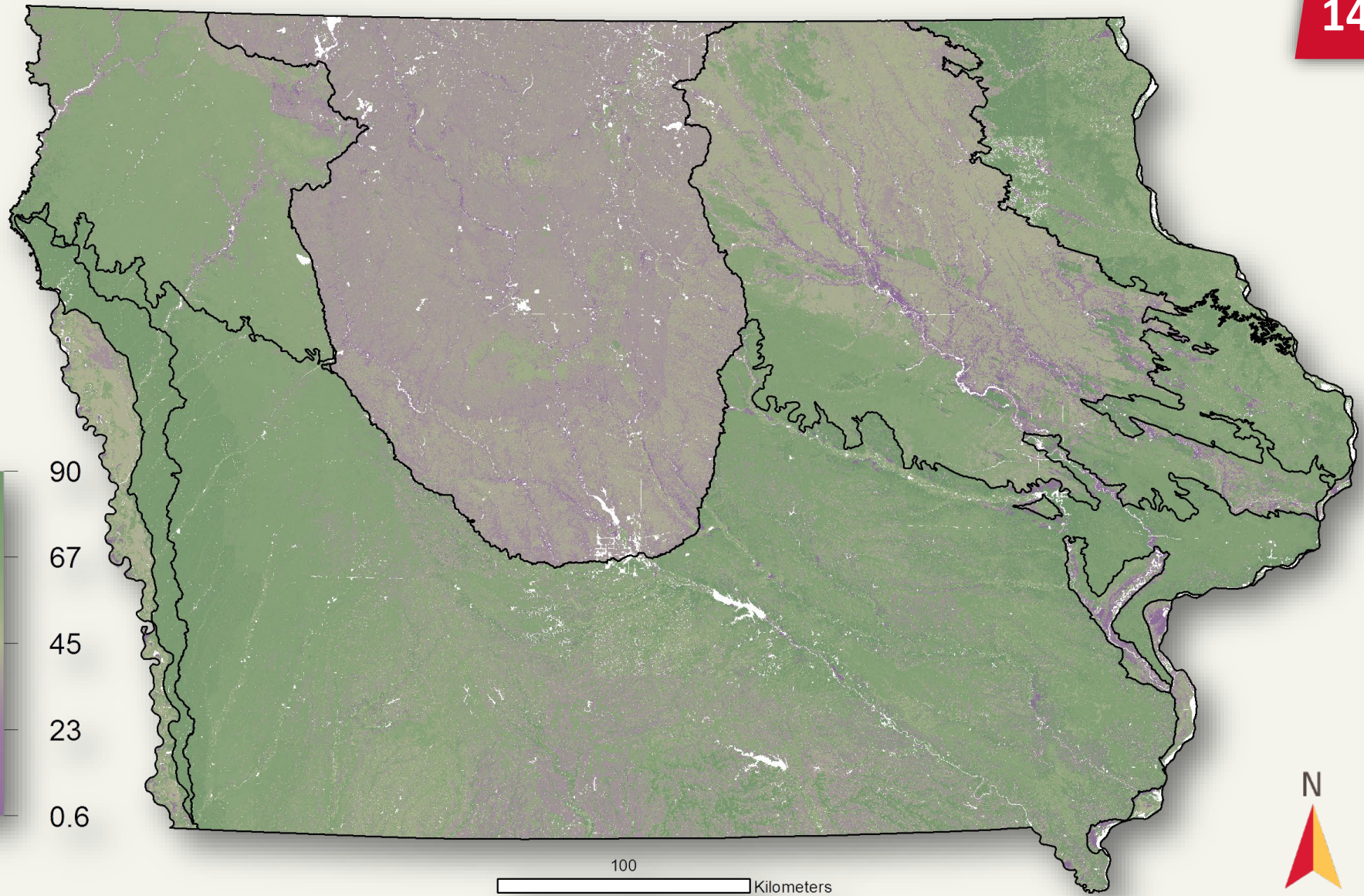


Iowa Soil Survey

Silt %



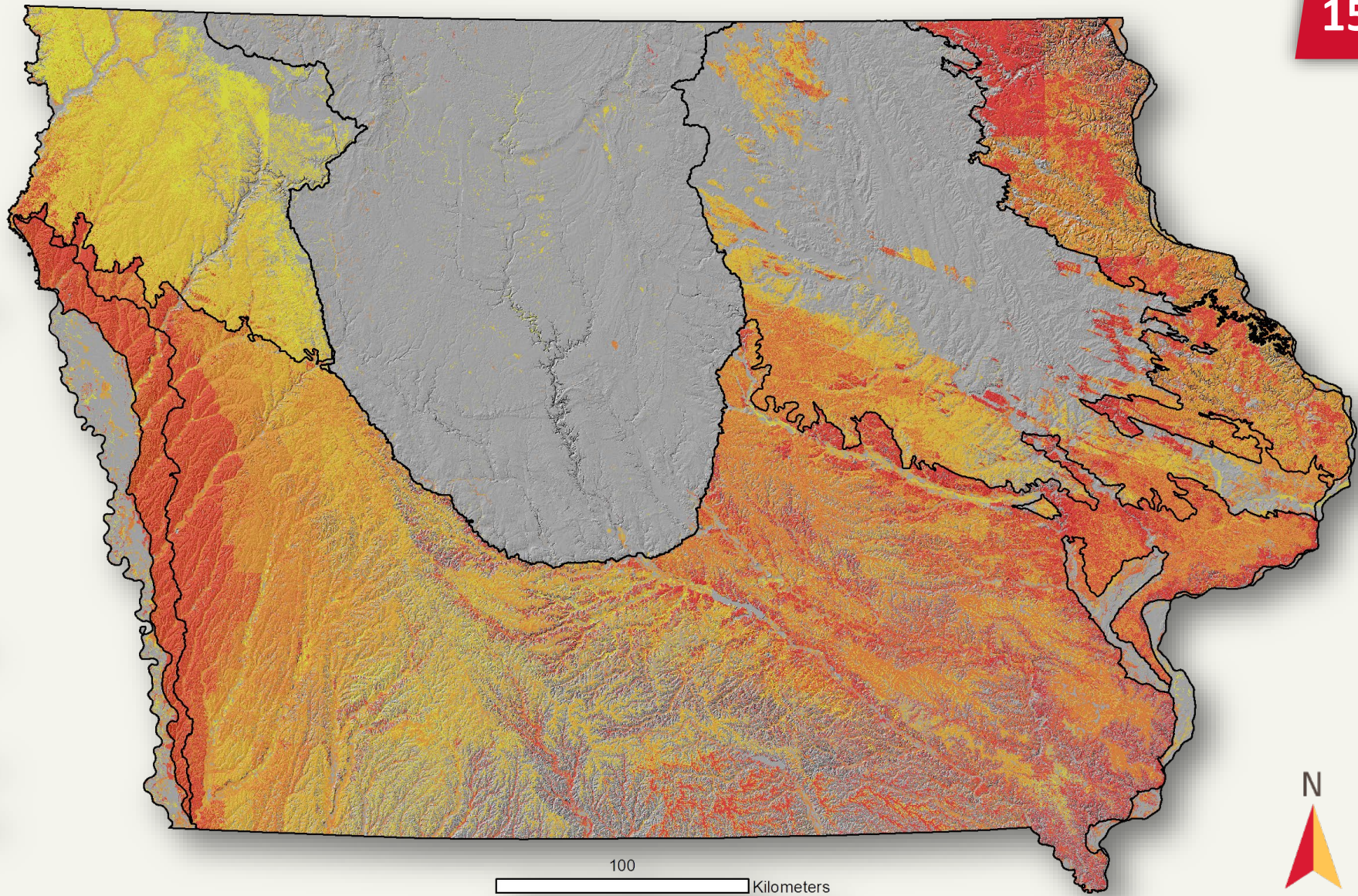
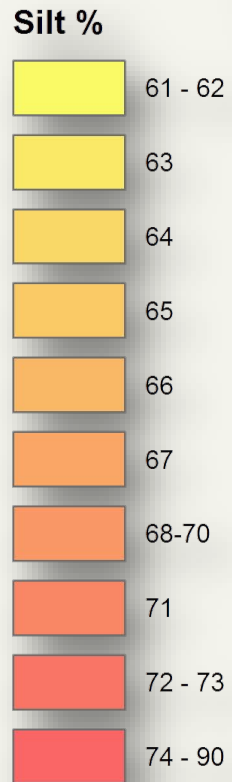
90
67
45
23
0.6



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Iowa Soil Survey

Only
>60%

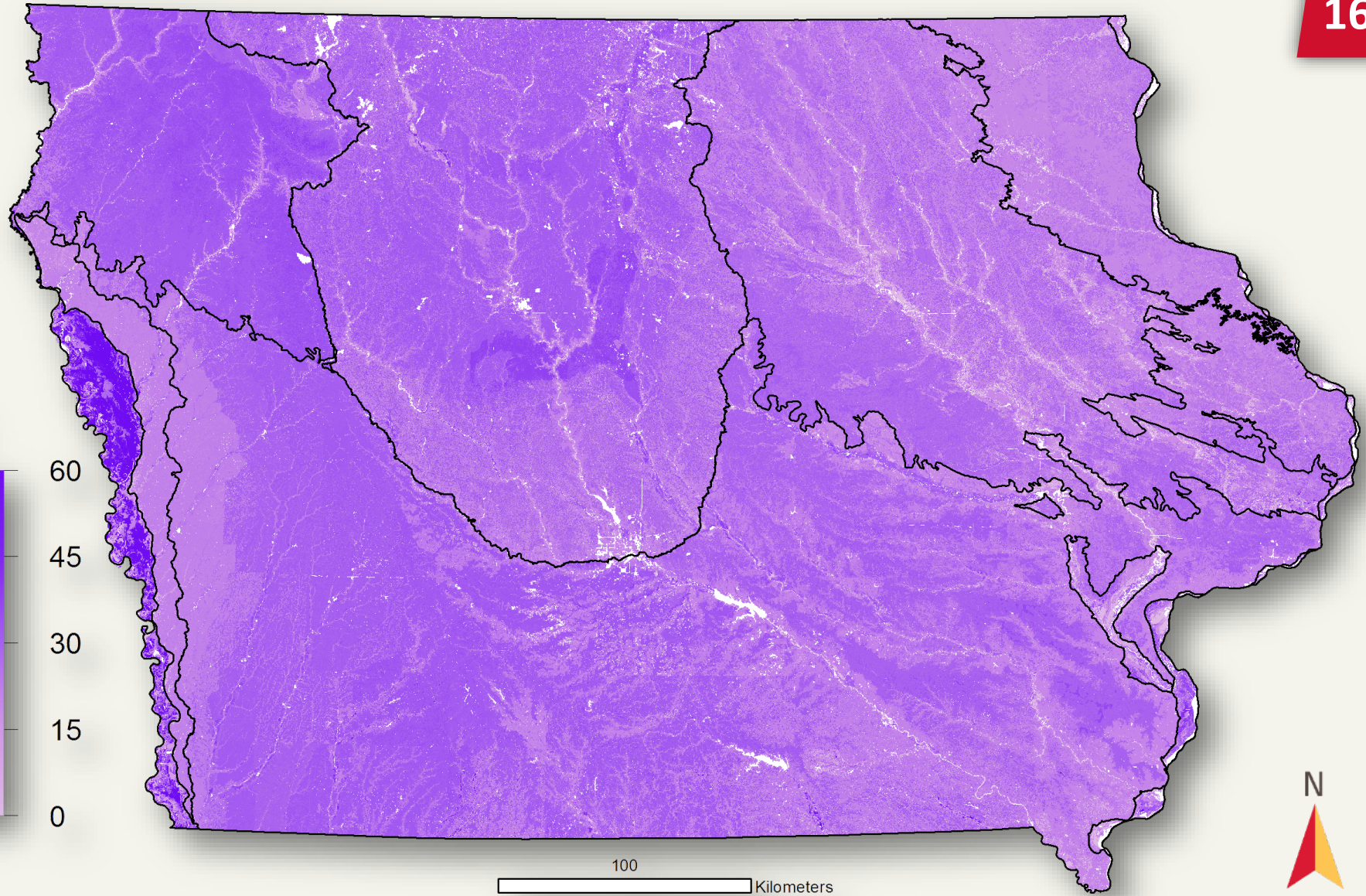


Iowa Soil Survey

Clay %



60
45
30
15
0



100 Kilometers

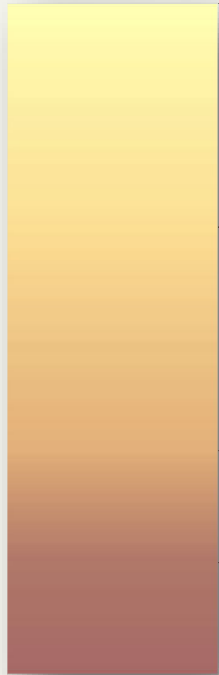


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Iowa Soil Survey

Sand %



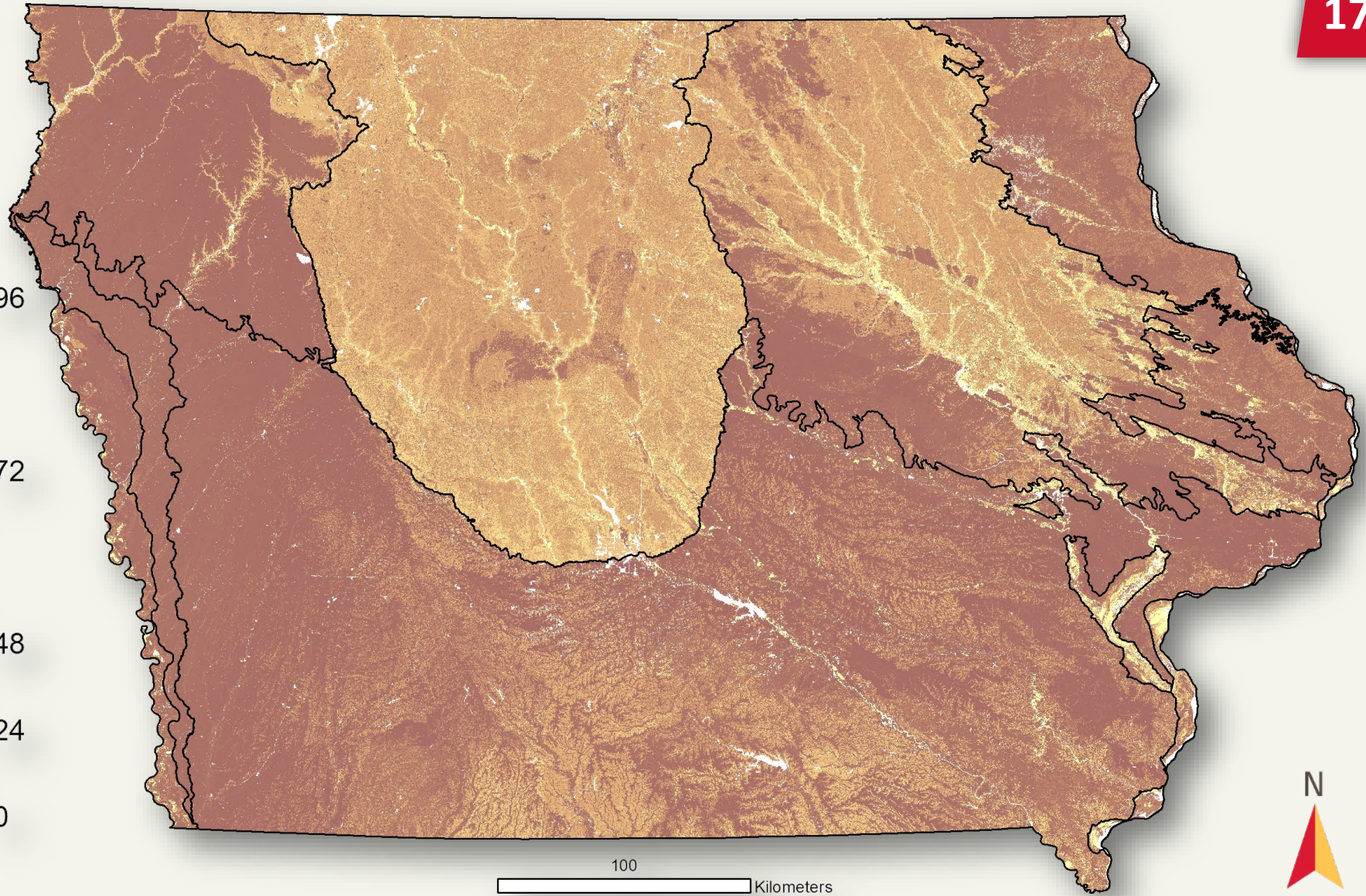
96

72

48

24

0



100

Kilometers

N

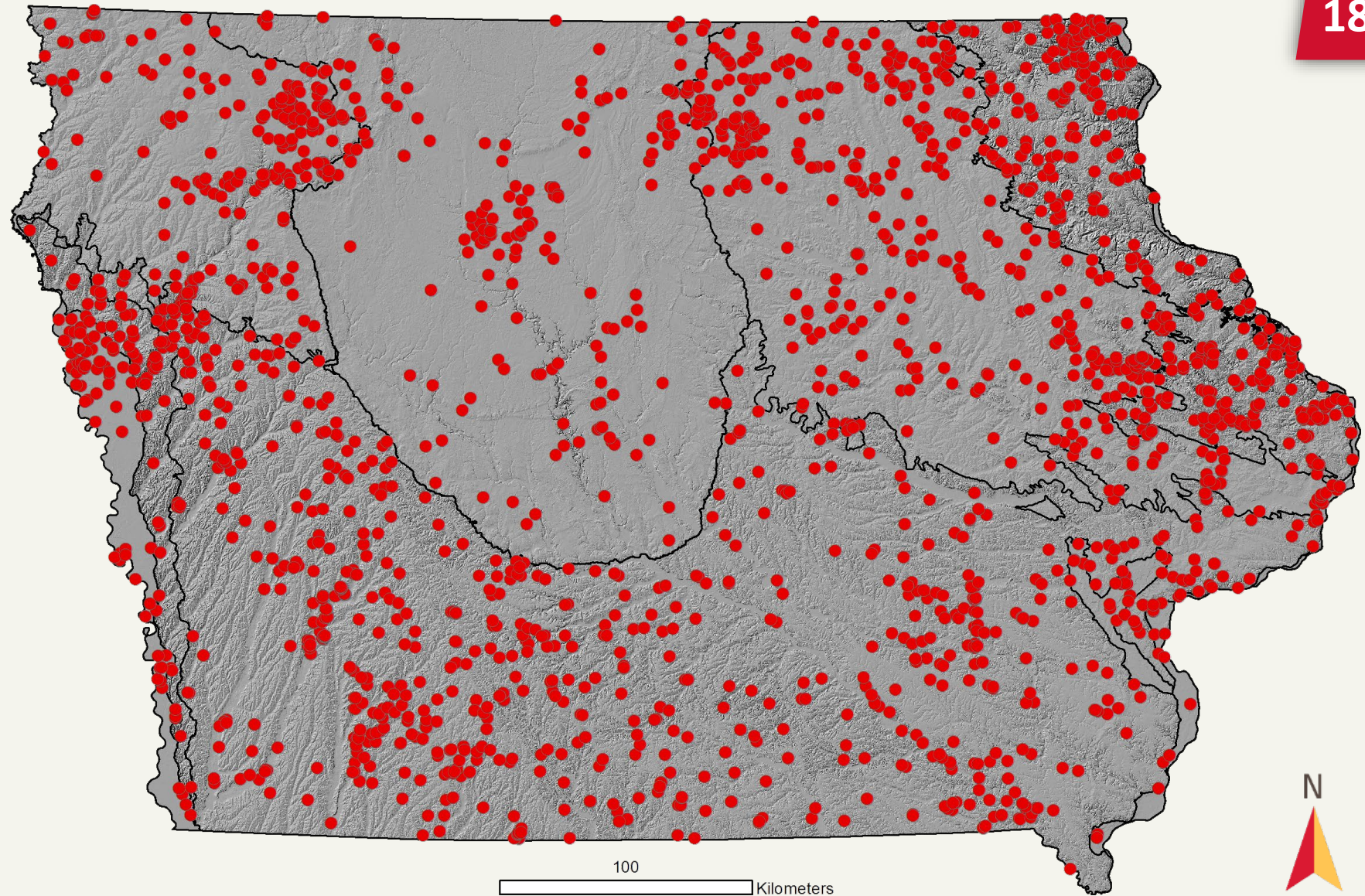


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Digital Soil Map

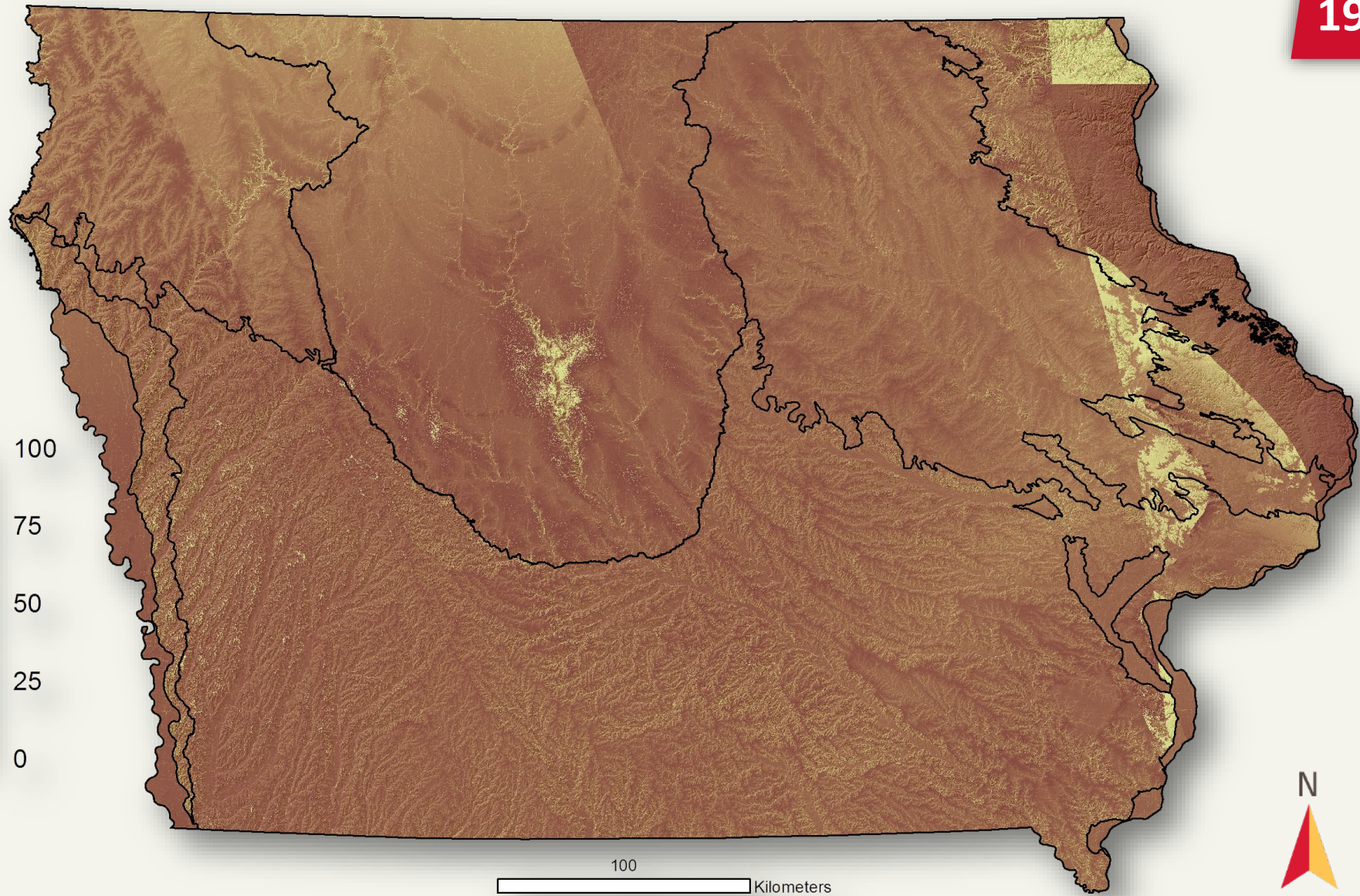
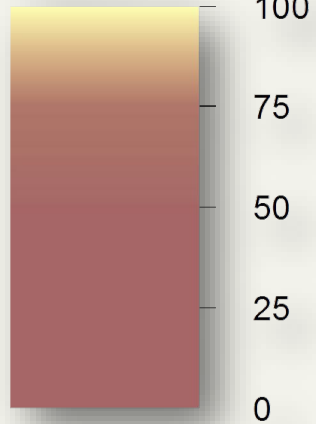
2,700 points



Digital Soil Map

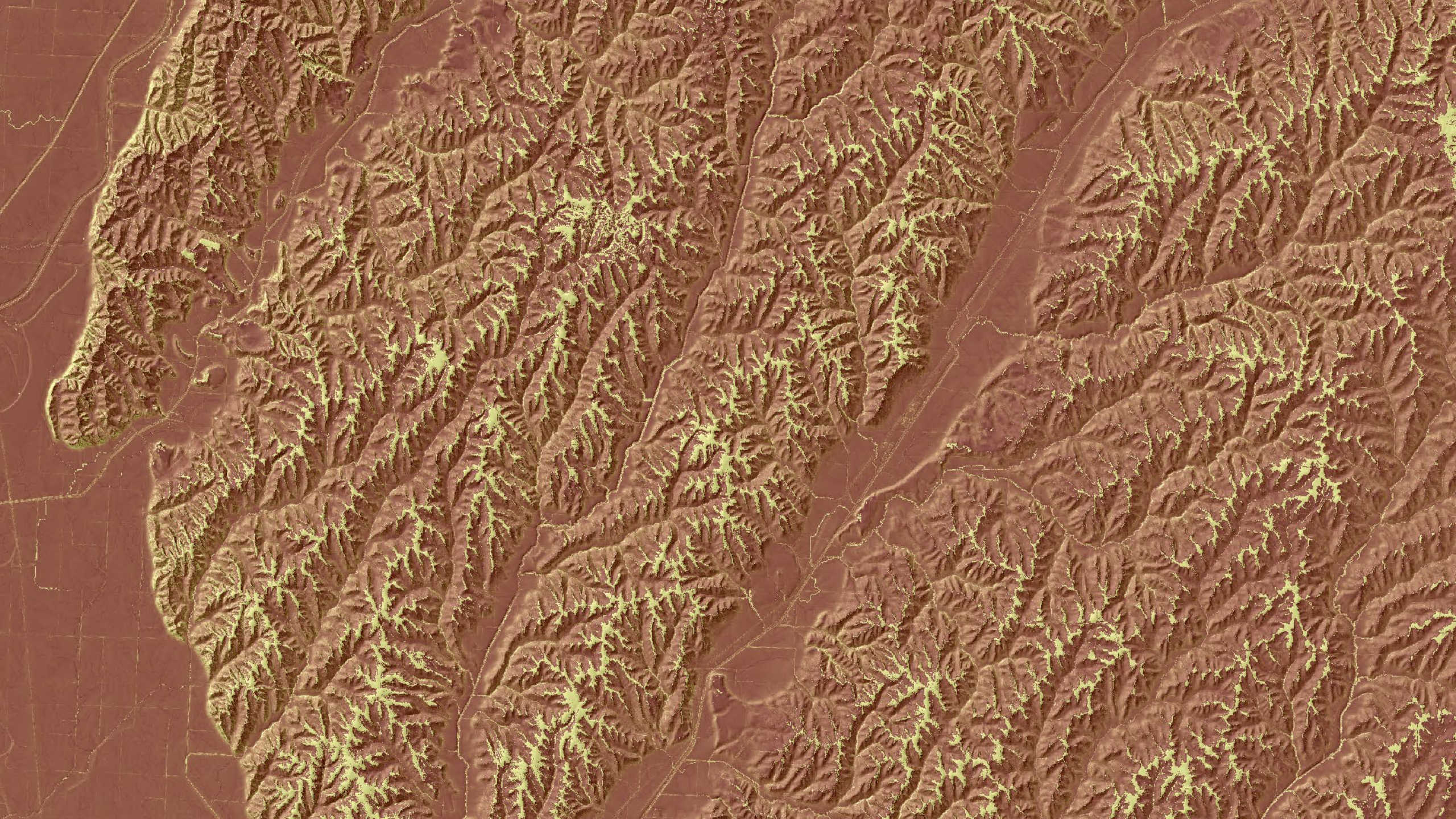
First Draft

Sand %



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Questions?

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