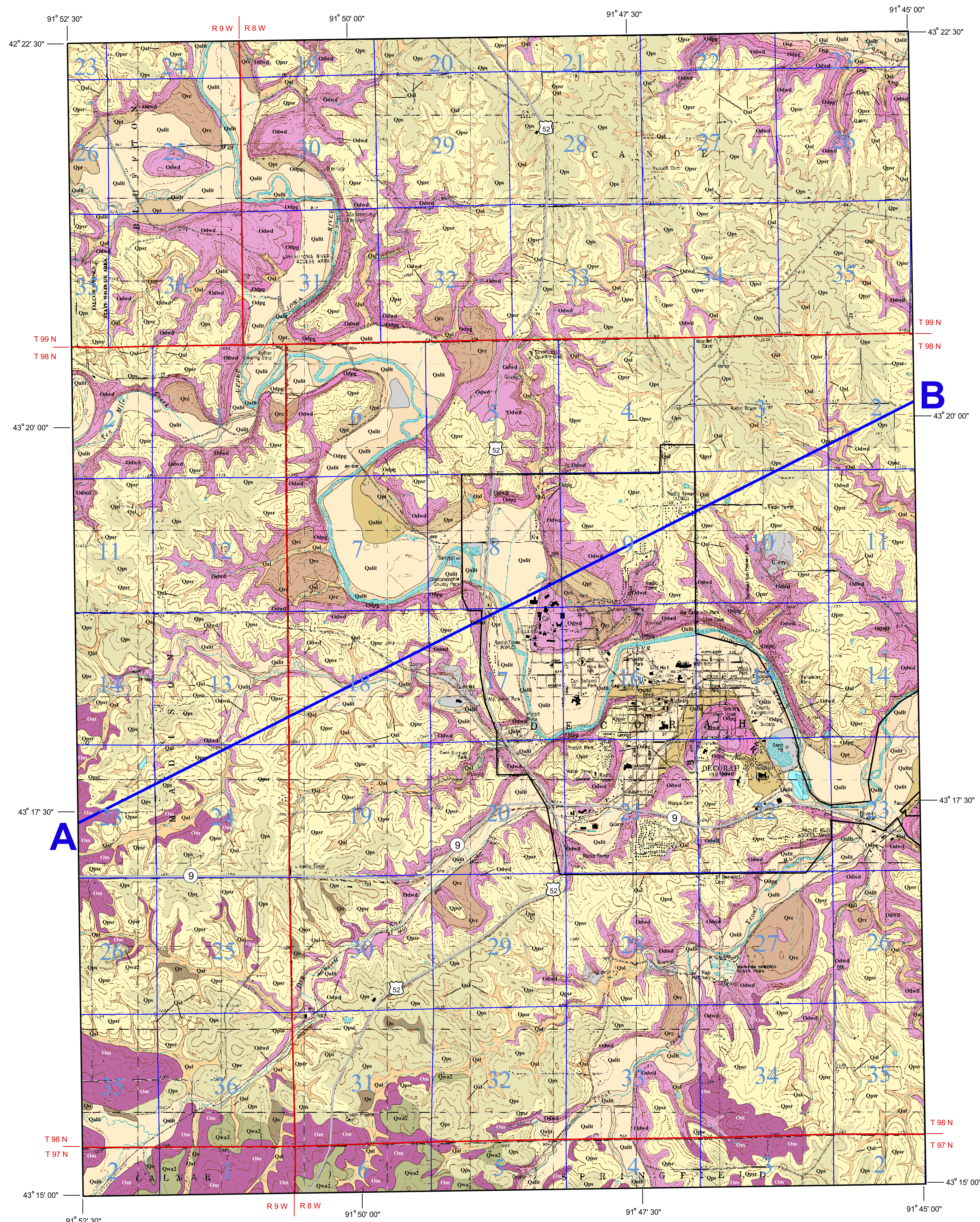


SURFICIAL GEOLOGY OF THE DECORAH (IOWA) 7.5 MINUTE QUADRANGLE



LEGEND CENOZOIC

- QUATERNARY SYSTEM**
- HUDSON EPISODE**
- Qm** Peat and Muck (DeForest Formation-undifferentiated) Generally 2.5 to 6 meters of black to very dark gray, calcareous, muck, peat and silty clay loam colluvium and organic sediments in roadside positions and thalwegs of higher order streams in upland positions. Overlies undifferentiated DeForest Formation, Peoria Formation loess, Pre-Illinoian tills, and the Maquoketa Formation in landscape positions where shallow groundwater discharges in seeps and springs. Supports wetland vegetation and can be permanently covered by water. High water table.
 - Qal** Alluvium (DeForest Formation-undifferentiated) One to four meters of massive to weakly stratified, grayish brown to brown loam, silt loam, clay loam, or loamy sand overlying less than three meters of poorly to moderately well sorted, massive to moderately well stratified, coarse to fine feldspathic quartz sand, pebbly sand, and gravel and more than three meters of pre-Wisconsin or late Wisconsin Noah Creek Formation sand and gravel. Also includes colluvium derived from adjacent map units in stream valleys, on hillslopes, and in closed depressions. Seasonal high water table occurs in this map unit.
 - Qallt** Upper Iowa River Valley - Low Terrace/Modern Channel Belt (DeForest Formation-Camp Creek Member and Roberts Creek Member.) Variable thickness of less than 1 m to 5 m of very dark gray to brown, noncalcareous, stratified silty clay loam, loam, or clay loam, associated with the modern channel belt of the Upper Iowa River valley. Overlies Noah Creek Formation. On-bow lakes and meander scars are common features associated with this terrace level. Post settlement alluvium thickness varies from 0.5 m in higher areas to 2 m along the river course and in lower lying areas. Seasonal high water table and frequent flooding potential.
 - Qallm** Upper Iowa River Valley - Intermediate Terrace (DeForest Formation-Camp Creek Member, Roberts Creek Member, and Gunder Member.) Variable thickness of less than 1 m to 5 m of very dark gray to brown, noncalcareous, stratified silty clay loam to loam that overlies Noah Creek Formation. Occupies low terrace position. Seasonal high water table and frequent flooding potential.
 - Qallh** Upper Iowa River Valley - High Terrace (DeForest Formation-Gunder and Corrington members.) Variable thickness of less than 1 m to 7 m of very dark gray to brown, noncalcareous, silty clay loam, loam alluvium or colluvium. Overlies Noah Creek Formation. Occupies terrace and valley margin position 2-3 meters above the modern floodplain. Eolian silt and sand may be present on the terrace surface. Seasonal high water table and rare flooding potential.
- WISCONSIN EPISODE**
- Qpt** High Terrace- either Late Phase or Early Phase (Peoria Formation - silt and/or sand facies) Two to seven meters of yellowish brown to gray, massive, jointed, calcareous, noncalcareous, silt loam and intercalated fine to medium, well sorted, sand. May grade downward to poorly to moderately well sorted, moderately to well stratified, coarse to fine feldspathic quartz sand, loam, or silt loam alluvium (Late Phase) or may overlie a Farmdale Geosol developed in Roxanna Silt which in turn overlies a well-exposed Sangamon Geosol developed in poorly to moderately well sorted, moderately to well stratified, coarse to fine sand, loam, or silt loam alluvium (Early Phase).
 - Qps** Loess (Peoria Formation-silt facies) Generally 2 to 8 m of yellowish to grayish brown, massive, jointed noncalcareous grading downward to calcareous silt loam to silty clay loam. Overlies massive, fractured, loamy undifferentiated Pre-Illinoian glacial till with or without intervening clayey Farmdale-Sangamon Geosol. In most areas the Pre-Illinoian till is 1 to 5 m thick, but may be up to 12m thick locally. This mapping unit encompasses upland divides, ridgetops and convex sideslopes. Well to somewhat poorly drained landscape. Precise boundary between Qps and Qpsr is uncertain.
 - Qpsr** Loess Over Bedrock (Peoria Formation-silt facies) Generally 2 to 8 m of yellowish to grayish brown, massive, jointed noncalcareous grading downward to calcareous silt loam to silty clay loam. Overlies Ordovician bedrock units or bedrock derived colluvium. This mapping unit encompasses upland divides, ridgetops and convex sideslopes. Well to somewhat poorly drained landscape.
 - Qwa2** Loamy and Sandy Sediment Shallow to Glacial Till (sediment associated with erosion surface) One to three meters of yellowish brown to gray, massive to weakly stratified, well to poorly sorted loamy, sandy and silty erosion surface sediment. Map unit includes some areas mantled with less than two meters of Peoria Silt (loess). Overlies massive, fractured, firm glacial till of the Wolf Creek and/or Alburnett formations. Seasonally high water table may occur in this map unit.
- PLEISTOCENE UNDIFFERENTIATED**
- Qrc** Rock Core Meanders/Structural Benches - Includes rock core meanders associated with Pre-Wisconsin river development and terrace deposits overlying bedrock benches. Some areas occupy positions as much as 15m above the modern floodplain. Consists of undifferentiated alluvial and colluvial fill of unknown age and thickness. May be mantled by 1 to 3 m of Peoria Silt (loess).

PALEOZOIC

- ORDOVICIAN SYSTEM**
- Om** **Shale, Limestone, and Dolostone** (Maquoketa Formation.) A nonresistant slope-forming unit of up to 45 m of green-gray to brown-gray shales with interbedded argillaceous limestone and dolostone. Fragmentary trilobite fossils are common in the basal Elgin Limestone Member. Forms a regional confining unit that bounds a karst system in underlying bedrock units. Forms unstable slopes with discharging groundwater seeps and springs.
 - Odwd** **Limestone** (Dubuque, Wise Lake, and Dunleith formations.) A prominent cliff-forming unit of up to 70-75 m of limestone with minor thin interbedded shales. This is the major karst-forming bedrock unit in the area. The Dubuque Formation consists of 10 m of interbedded limestones and thin shales. The Wise Lake Formation consists of 21 m of massive limestone. The Dunleith Formation consists of 42 m of limestone and argillaceous limestone with chert nodules.
 - Odpq** **Shale, Limestone, and Dolostone** (Decorah, Platteville, and Glenwood formations.) A nonresistant slope-forming unit of up to 20-25 m of green-gray shales, argillaceous limestones and dolostones, and minor green-gray sandstone. Forms a regional confining unit that bounds a karst system in overlying bedrock units. The Decorah Formation consists of 1.1 m of green-gray shales with minor interbedded limestones. The Platteville Formation consists of 7.6 m of limestone, argillaceous limestone, and dolostone. The Glenwood Formation consists of 2 m of green-gray shale and minor sandstone. Forms unstable slopes with discharging seeps and springs; slopes commonly are colluviated, locally with mechanical karst.
 - Osp** **Dominantly Sandstone with variable Shale** (St. Peter Formation.) A resistant cliff-forming unit ranging from 15 up to 190 m in thickness, overlying a high-relief surface of unconformity with underlying units. Reddish to white sandstones range from hard cemented at top to very friable. Forms a local bedrock aquifer where confined by overlying bedrock.

OTHER FEATURES

- Pits and Quarries.** Sand and gravel pits and rock quarries.
- Water Features.** Rivers, lakes and small ponds formed by blockage of drainage ways and river channels.
- Geographic Township Boundary**
- Section Line**
- Section Number**
- City of Decorah Corporate Limits**
- Federal Highway and Number**
- State of Iowa Highway and Number**
- Land Surface Elevation Contour** - from USGS base map c.i.=20 feet
- Geologic Contact** - boundary between map units

GEOLOGIC MAPPING OF THE UPPER IOWA RIVER WATERSHED: PHASE 1: Decorah 7.5' Quadrangle

Iowa Geological Survey
Open File Map OFM-05-1
June 2005

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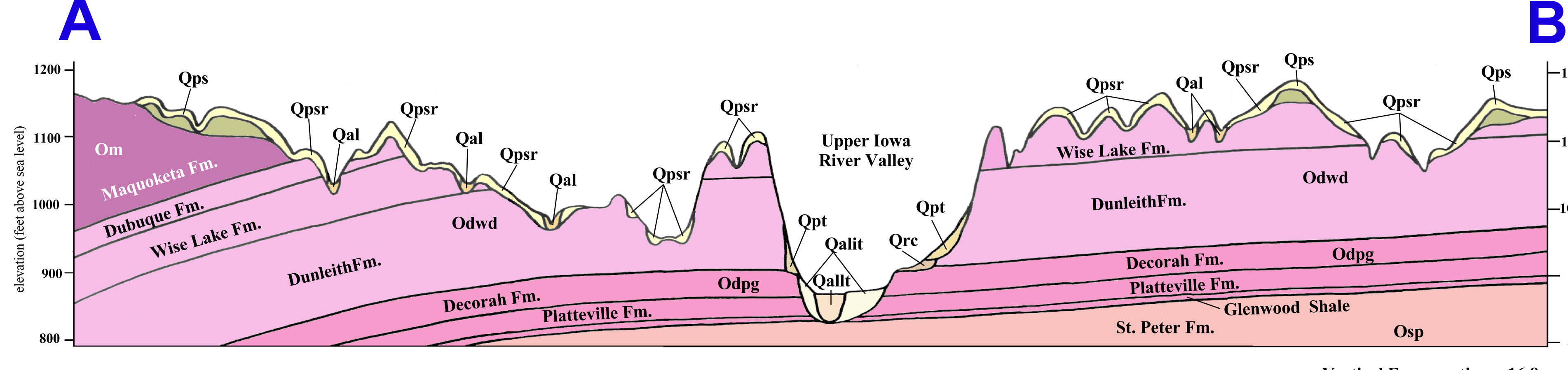
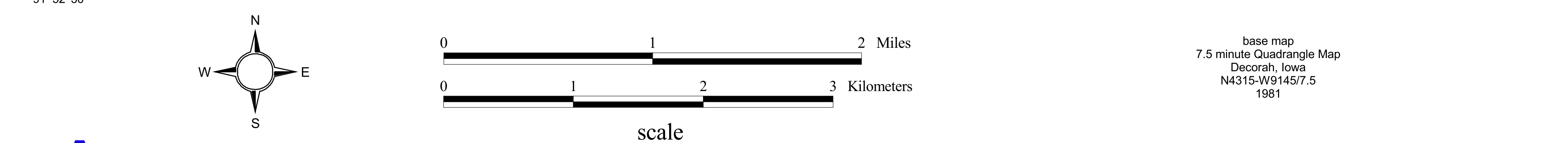
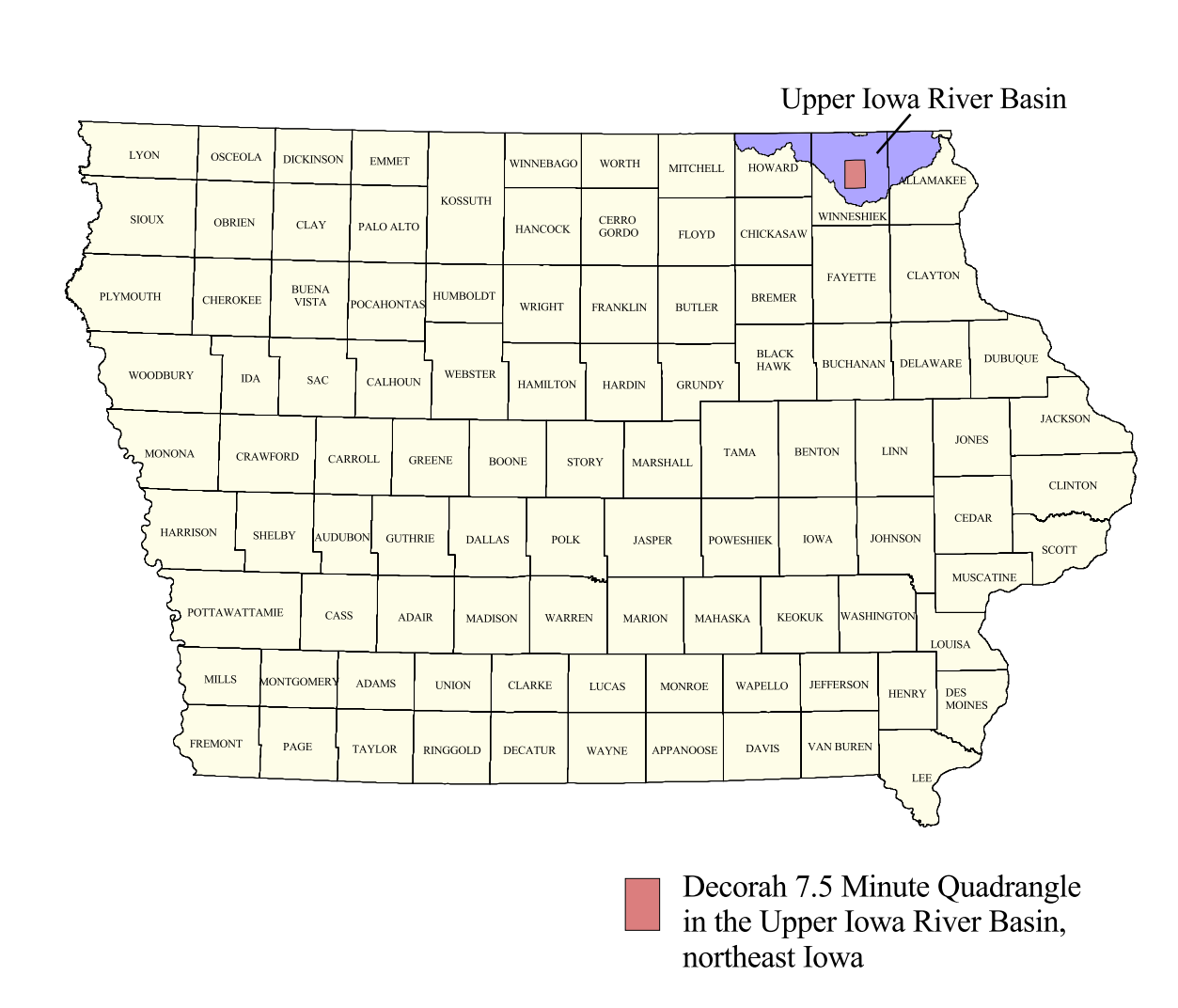
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Supported in part by the U.S. Geological Survey
Cooperative Agreement Number 04HQAG0067
National Cooperative Geologic Mapping Program (STATEMAP)

ACKNOWLEDGEMENTS

We thank Lora Friest and Adam Kiel of the Northeast Iowa RC & D for inspiring, prompting, and supporting our work in the Upper Iowa River watershed. University of Iowa students Ryan Clark, Ben Belgrade, and Darice Roberts worked on this project and produced descriptive logs of water wells in the Decorah Quadrangle that were our principle source of new subsurface data for geologic mapping. Luther College in Decorah actively participated in this project through subcontract 04-73801 for field mapping support. Luther College students Gabriel Demuth, Stefan Merten, Will Viner, Meghan Minner, and Jared Bendel were participants in the field work to support the mapping effort. Drilling in selected sites in the Decorah Quadrangle was provided under contract by Aquadrill, Inc. of Coralville, Iowa. Special thanks to the landowners who graciously allowed access to their land for drilling: Rose Kintelson, Tom Jewel, Bob Jewel, Jr., Duane Kuchner, Corbin Schemp and Lucy Schemp. Other logistical assistance with drilling locations was provided by Dave Stanley of Bear Creek Archaeology in Cresco. Assistance obtaining drilling records and geologic information was provided by staff at Bear Creek Archaeology and Joe Artz at the Office of the State Archaeologist.

Location of the Decorah 7.5 Minute Quadrangle



CROSS-SECTION A-B

Vertical Exaggeration = 16.8 x