

Surficial Geology of the Bluffton (Iowa) 7.5' Quadrangle

GEOLOGIC MAPPING OF THE UPPER IOWA RIVER WATERSHED PHASE 2: Bluffton 7.5' Quadrangle

Iowa Geological Survey
Open File Map OFM-06-5
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prepared by
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LEGEND

Description of Map Units

Cenozoic

Quaternary System

Hudson Episode

- Qal - Alluvium (De Forest Formation-Undifferentiated)** One to four meters (3 to 13 ft) of massive to weakly stratified, grayish brown to brown loam, silty loam, clay loam, or loamy sand overlying less than three meters (10 ft) of poorly to moderately well sorted, massive to moderately well stratified, coarse to fine foliolitic quartz sand, pebbly sand, and gravel, and more than three meters (10 ft) of pre-Wisconsin or late Wisconsin Neah Creek Formation sand and gravel. Also includes colluvium derived from adjacent map units in stream valleys, on hilltops, and in closed depressions. Seasonal high water table and frequent flooding potential.
- Qall - 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 (3 to 16 ft) of very dark gray to brown, monotonous, stratified silty clay loam, loam, or clay loam, associated with the modern channel belt of the Upper Iowa River valley. On-shore lakes and meander scars are common features associated with this terrace level. Post-settlement alluvium thickness varies from 0.5 m (1.5 ft) in higher areas to 2 m (6.5 ft) along the river course and in lower lying areas. Seasonal high water table and frequent flooding potential.
- Qalt - Upper Iowa River Valley - Intermediate Terrace (DeForest Formation-Camp Creek Member, Roberts Member and Gauder Member)** Variable thickness of less than 1 m to 5 m (3 to 16 ft) of very dark gray to brown, monotonous, stratified silty clay loam to loam that overlies calcareous, medium to coarse-grained sand and gravel of Wisconsin (Neah Creek Formation) and/or pre-Wisconsin age. Occupies low terrace position. Seasonal high water table and frequent flooding potential.

Wisconsin Episode

- Qht - High Terrace - either Late Phase or Early Phase (Poria Formation - silt and/or sand facies)** Two to seven meters (6.5 to 23 ft) of yellowish loam to gray, massive, jointed, calcareous or monotonous, silty loam and interstratified fine to medium, well sorted sand. May grade downward to poorly to moderately well sorted, medium to fine foliolitic quartz sand, pebbly sand, loam, or silty loam alluvium (Late Phase) or may overlie a Farnside Gessol developed in Romania Silt which in turn overlies a well-exposed Sangamon Gessol developed in poorly to moderately well sorted, moderately to well stratified, coarse to fine sand, loam, or silty loam alluvium (Early Phase).
- Qpl - Loess (Poria Formation-silt facies)** Generally 2 m to 8 m (6 to 27 ft) of yellowish to grayish brown, massive, jointed monotonous grading downward to calcareous silt loam to silty clay loam. Overlies Ordovician bedrock units or colluvium. This mapping unit encompasses upland divides, ridge tops and convex side-slopes. Well to somewhat poorly drained landscape.
- Qpr - Loess over bedrock (Poria Formation-silt facies)** Generally 2 to 8 m (6 to 27 ft) of yellowish to grayish brown, massive, jointed monotonous grading downward to calcareous silt loam to silty clay loam. Overlies Ordovician bedrock units or colluvium. This mapping unit encompasses upland divides, ridge tops and convex side-slopes. Well to somewhat poorly drained landscape.
- Qps2 - Loamy and Sandy Sediment Shallow to Gashed Till (colluvium associated with erosion surfaces)** One to three meters (3 to 10 ft) of yellowish brown to gray, massive to weakly stratified, with to poorly sorted loamy, sandy and silty erosion surface sediment. May include some areas mantled with less than two meters (6.5 ft) of Poria Formation-silt facies (loam). Overlies massive, fractured, firm glacial till of the Wolf Creek and/or Albertson formations. Seasonal high water table may occur in this map unit.

Pleistocene Undifferentiated

- Qrc - Rock Core Mounds/Structural Benches** Includes rock core mounds associated with the Wisconsin river development and terrace deposits overlying bedrock benches. Some areas occur in positions as much as 10 m (33 ft) above the modern floodplain. Consists of undifferentiated alluvial and colluvial fill of unknown age and thickness. May be mantled by 1 to 3 m (3 to 10 ft) of Poria Formation-silt facies (loam).

Paleozoic

Ordovician System

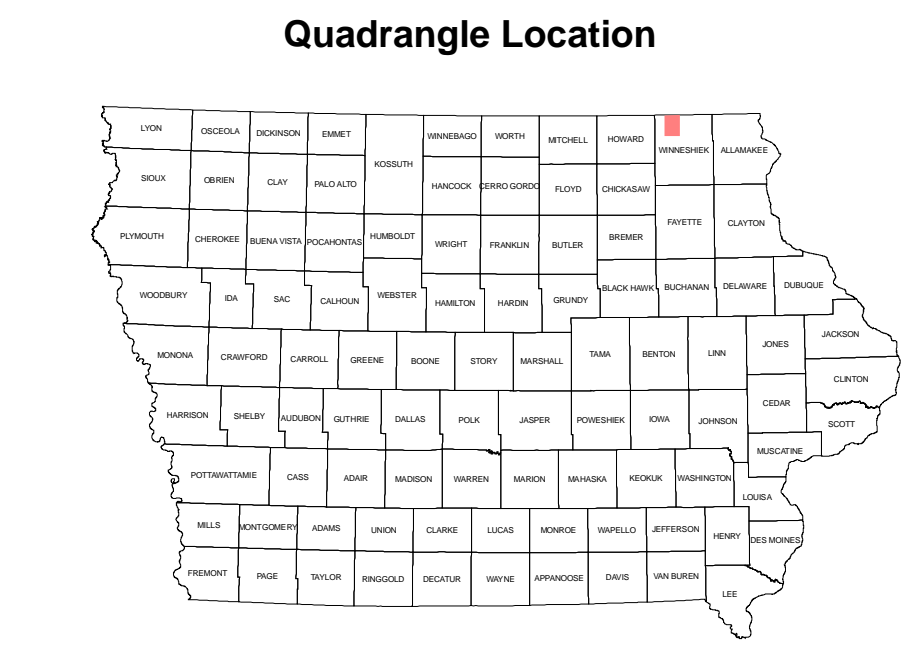
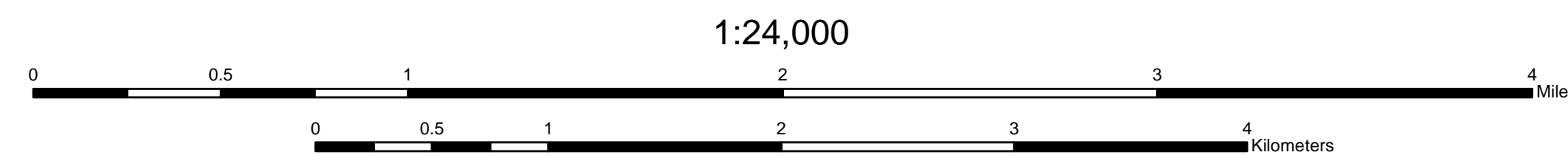
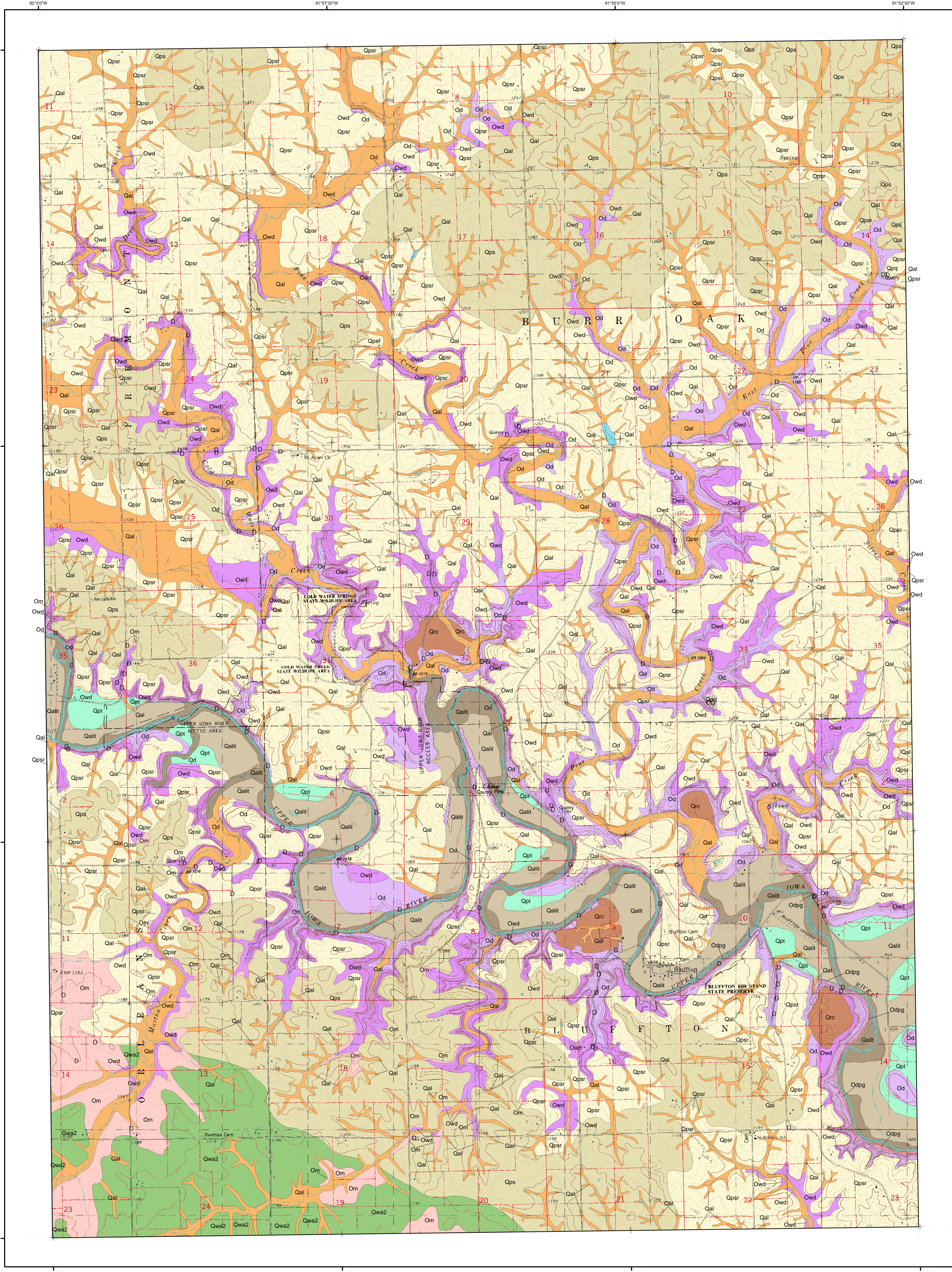
- Om - Shale, Limestone, and Dolomite (Maquoketa Formation)** A prominent slope-forming unit of up to 20 m (66 ft) of interbedded argillaceous limestone, dolomite and gray and brown shale. Fragmentary strobilifer fossils are common in the basal Elgin Limestone Member. Forms a confining unit that bounds a karst system in underlying Wise Lake and Danforth formations, and may host sinkholes in its lower portion.
- Owd - Limestone and minor shale (Wise Lake and overlying Debaque formation)** A prominent ledge and cliff-forming unit of up to 31 m (102 ft) of limestone with notable thin interbedded shale in the upper 6 m (20 ft). This map unit is the upper of two successive major cavern and karst-forming bedrock units in the area. The Wise Lake Formation consists of 21 m (67 ft) of massive limestone portions of which exhibit a distinctive horizontal fabric. The Debaque Formation consists of 10 m (34 ft) of crinoidal limestone and thin interbedded shale. Sinkholes are common to abundant within this map unit. Often mantled by 0 m to 2 m (0 to 6 ft) of loess-derived and weathered bedrock-derived colluvium.
- Odl - Limestone (Danforth Formation)** A prominent ledge and cliff-forming unit of up to 42 m (137 ft) of limestone with minor thin interbedded shale. This is the lower of two successive major cavern and karst-forming bedrock units in the area. The formation consists of fossiliferous limestone and argillaceous limestone with common chert nodules. Maple springs occur near the base and sinkholes and karst features are common. Frequently mantled by 0 m to 2 m (0 to 6 ft) of loess-derived and weathered bedrock-derived colluvium.
- Ods - Shale, Limestone, and Dolomite (Decorah and underlying Plattville and Glenwood formations)** A nonconformal slope-forming unit of green gray shale, dense limestone, argillaceous limestone, and dolomite with average thickness of 26 m to 27 m (85 to 90 ft). Large detached slump blocks of overlying Danforth Formation limestone often rest on the upper surface of this unit. Forms a regional confining unit that serves as the basal boundary of the karst system in the overlying Danforth, Wise Lake and Debaque formations. The upper division, the Decorah Formation, consists of 12 m to 14 m (39 to 46 ft) of green gray fossiliferous shales with minor interbedded limestones. The middle division, the Plattville Formation, consists of 7.5 m (25 ft) of limestone, argillaceous limestone, and dolomite. The lower division, the Glenwood Formation, consists of 2 m to 3 m (7 to 10 ft) of green gray shale with minor chertstone to fine calcstone. This map unit, especially the Decorah and Glenwood subdivisions, is rarely exposed and almost everywhere is mantled by 0 m to 2 m (0 to 6 ft) of loess-derived and weathered bedrock-derived colluvium.

- Qpy - Pits and Quarries** Sand and gravel pits and rock quarries.

Water Features

- Drill Holes

- D Outcrops



Base map from USGS Bluffton 7.5' Digital Raster Graphic (IGS GIS file DRGB38.TIF) which was scanned from the Bluffton 7.5' Topographic Quadrangle map, published by US Geological Survey in 1981. Topographic contours and land features based on 1975 aerial photography, field checked in 1977. Land elevation contours (20' interval) based on NAVD 1929.

Iowa Geological Survey digital cartographic file Blufftonquad06.mxd, version 6/28/06 (ArcGIS 9.0)

Map projection and coordinate system based on Universal Transverse Mercator (UTM) Zone 15, datum NAD83

