Quaternary Geologic Map of the Blackhawk Quadrangle

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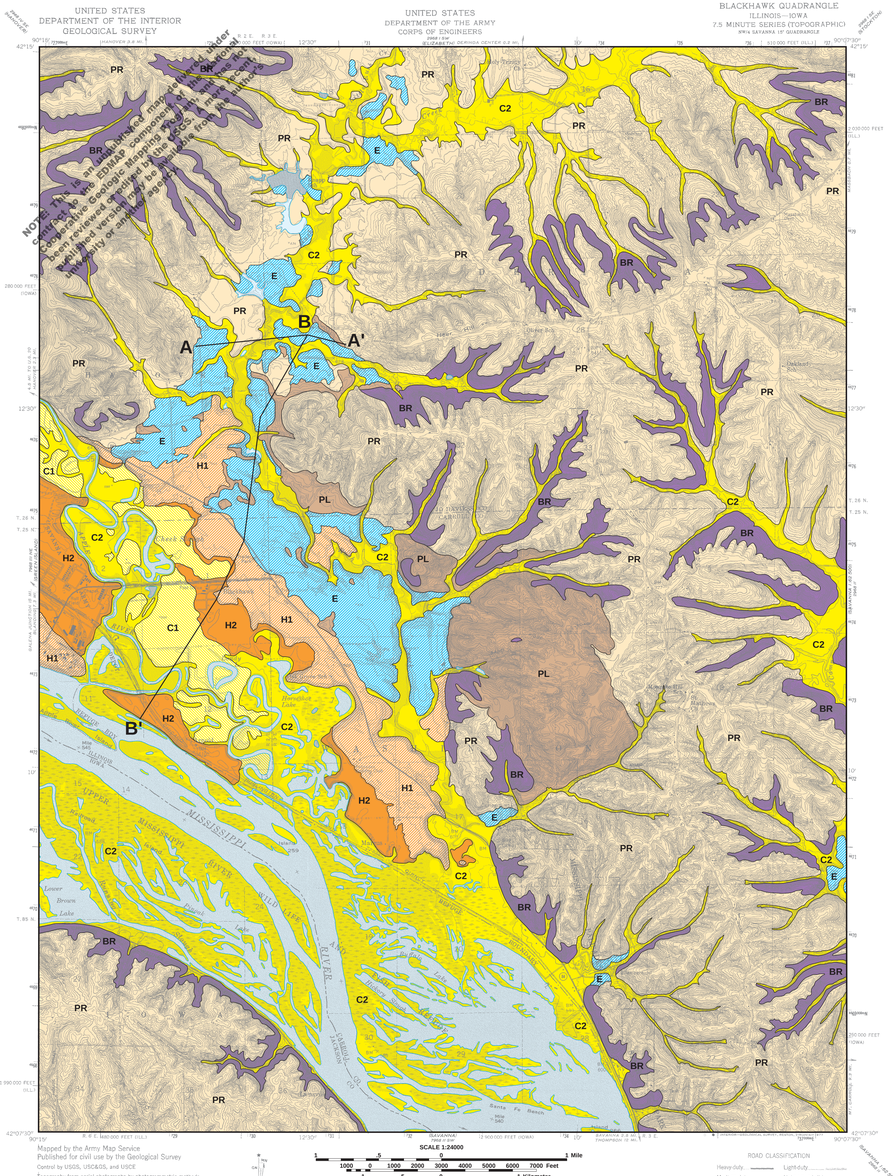
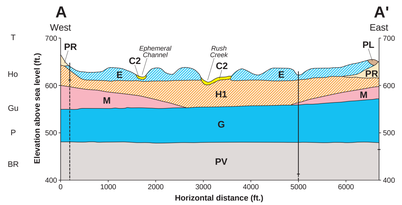
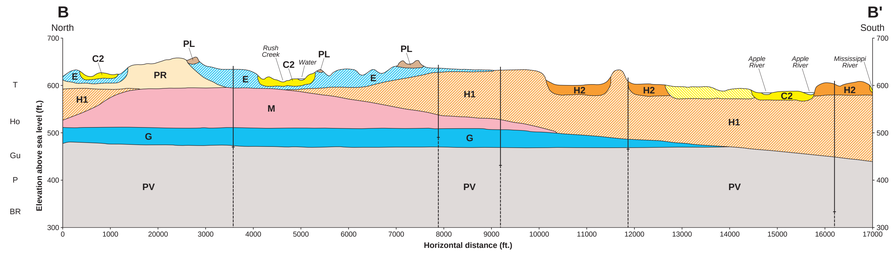






Map Units and Correlations

Hudson Episode Units (Holocene)

- C2 — Cahokia Formation – Alluvium; primarily silt or fine sand reworked from Wisconsin episode materials. Two terrace levels included in this formation: Cahokia I and Cahokia II.
- C1 — Cahokia II consists of recent alluvial materials deposited in modern floodplains while Cahokia I consists of an older alluvial terrace occupying the Apple River Valley.

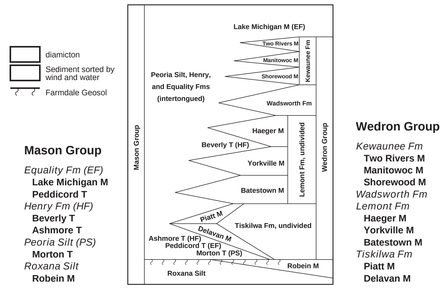
Wisconsin Episode Units

Mason Group Deposits

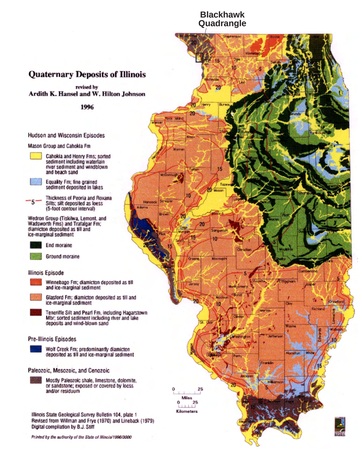
- PL — Parkland Sand – well sorted, fine, stratified sand found as sheet sands or in eolian dunes on top of Henry and Equality Formation Terraces as well as upland areas. (Not mapped separately where it appears as small deposits on the Henry Formation terraces.) Consists of fluvial sands later transported and deposited by eolian processes. While this unit was deposited at various times, it has been placed at the top of the Wisconsin Episode units to correlate with the presence of Parkland Sand dunes on top of the Equality Formation terraces.
- H2 — Henry Formation – stratified sands and gravels up to 200 feet thick along the Mississippi River. Some eolian dunes are found on the surface of terraces. Two levels included in this formation: Henry I and Henry II. Both are composed of fluvial sands and gravels, but Henry II represents a later depositional event. The two terraces levels are separated by as much as twenty feet of elevation at some locations.
- H1
- E — Equality Formation – slackwater terrace deposits of silt and clay, laminated in some areas. Consists of alternating red and gray sediments believed to be deposited from drainage events involving glacial lakes Agassiz and Superior. Found on this map in thick deposits primarily along Rush Creek and Camp Creek.
- PR — Peoria and Roxana Silts – eolian loess found deposited on uplands and as colluvium on slopes. Reworked as alluvium in upland ephemeral stream valleys.

Bedrock Units (Paleozoic)

- BR — Bedrock – rock units present in this quadrangle include Silurian-aged dolomite (Alexandrian and Niagaran Series) and Ordovician-aged dolomites and shales (Platteville, Galena, and Maquoketa Groups). No differentiation is made between bedrock units on the surface map, though most bedrock exposed at the surface consists of Silurian dolomite. However, Silurian dolomite did not appear in logs used to make cross-sections for this map and, as a result, was not listed separately in the legend.
- M — Maquoketa Group – Dolomitic silty shale, though lower half of group contains some argillaceous lenses of dolomite. Extends under the eastern part of the terraces on map.
- G — Galena Group – Dolomite; some silty beds near the top of the group, while cherty beds are found near the bottom. The contact with the Platteville Group below consists of wavy, lenticular bedding.
- PV — Platteville Group – Dolomite, though finer grained and thinner beds than Galena Group dolomite. Chert, lenticular bedding, and a corrosion surface are present.



(Hansel and Johnson, 1996)



ABSTRACT

While located in the Driftless Area of Northwestern Illinois, the Quaternary materials present in the Blackhawk Quadrangle nevertheless owe their presence to glacial meltwater flowing down the Mississippi River from the receding Laurentide Ice Sheet. As large volumes of meltwater were released from Glacial Lakes Superior and Agassiz, slackwater terraces of alternating red and gray clays were deposited to form the Savanna Terraces (Flock, 1983). These Equality Formation terraces can be traced up several tributary valleys, including the Apple River, Rush Creek, and Camp Creek, all included (in part) on this map. Also present in this area are several younger terrace levels formed from the Henry Formation sands and the Cahokia Alluvium sediments. The Parkland Sand, outwash sand redeposited by eolian processes, is found in thick deposits along the carbonate bluffs along the back of the terraces and compose several dunes on top of the clay terraces. While there are also some eolian dunes present on the Henry Formation terraces, they are difficult to distinguish from the Henry Formation materials, particularly in well logs (Grimley, 1997b).

Radiocarbon dating was performed on organic material found in the Equality Formation clays in 1982 to provide date of 13,100 yr. B.P. to 9,500 yr. B.P. This window for deposition is further narrowed by the fact that loess of the Peoria and Roxana Silts are present on the highlands of this area. The last date of loess deposition is believed to be 12,300 yr. B.P (Flock, 1983).

Bedrock exposed at the surface and that appears in well logs includes Ordovician-aged dolomite and shale and Silurian-aged dolomite. Ordovician formations present include the Platteville, Galena, and Maquoketa Groups. Frankie (2001) presents a stratigraphic column for the Mississippi Palisades State Park along the southern edge of the map that differentiates the Silurian rocks into the Alexandrian and Niagaran Series, but those same rocks are not differentiated by McGarry (1997 and 2000) or in well logs. Most of the bedrock exposed at the surface consists of Silurian dolomite (not differentiated on surface map).

MAPPING METHODS

Initial survey of the mapping area included the examination of aerial photographs in conjunction with observations of landform characteristics defined both in the field as well as on the topographic base map and DEM. Determination of initial map units was aided by surficial and geologic maps created by Grimley (1997), McGarry (1997 and 2000), and Riggs (2000) as well as by United States Department of Agriculture soil survey maps. Surficial field investigations and ground truth verifications were conducted with Dual Tube 22 sediment cores collected by a Geoprobe 6600 direct push rig. Lithologic logs from Illinois Department of Transportation engineering borings as well as numerous water well logs were also used to refine the subsurface distribution of lithologic units. Several roadcuts and stream valleys were examined to measure the extent of some surface units. Texture (grain size), clast lithology, bedrock lithology, and sedimentary structures were the primary characteristics used for correlation of stratigraphic units. Fluvial terraces were mapped based on lithologic characteristics, morphostratigraphic sequence, and topography.

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