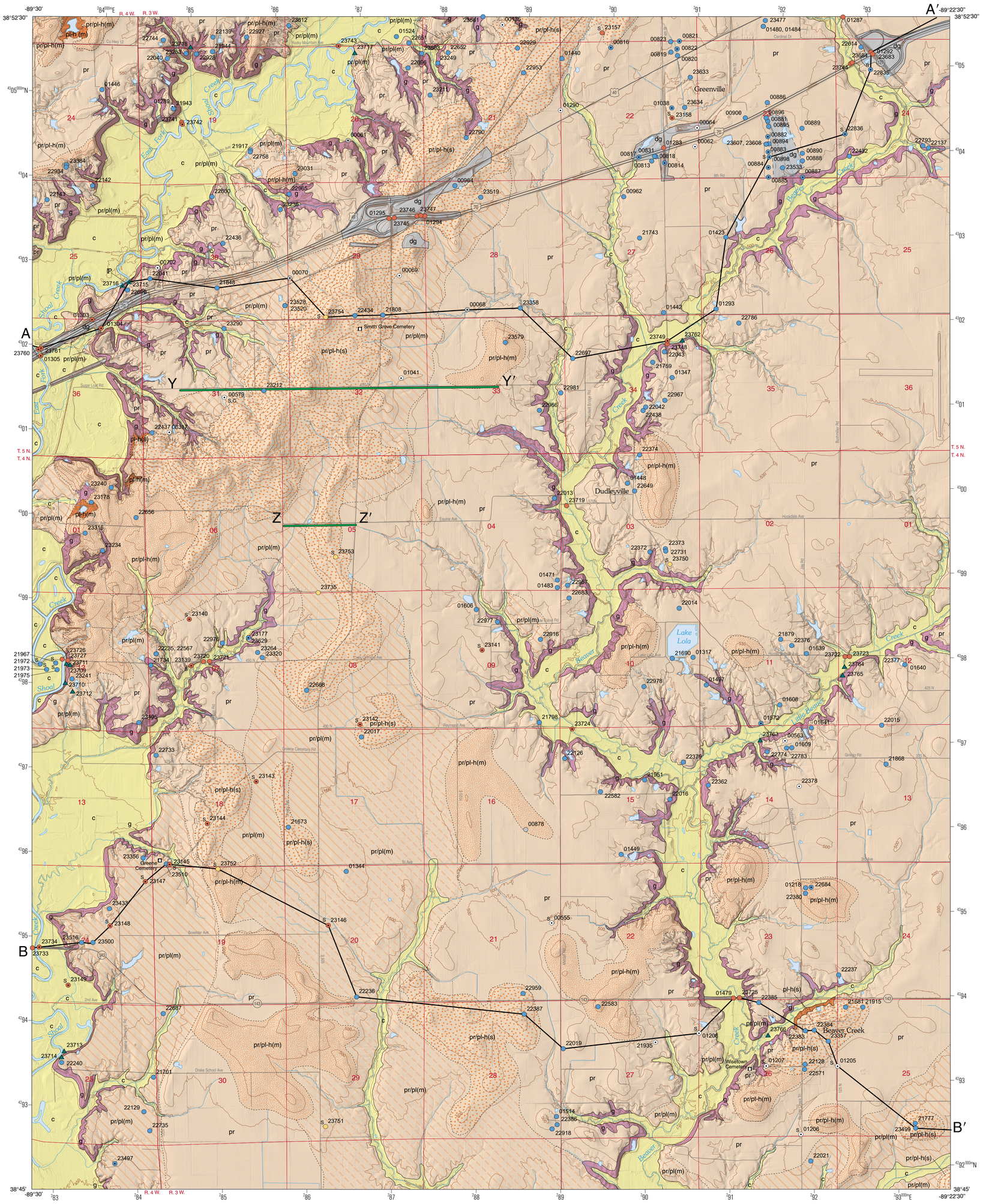
SURFICIAL GEOLOGY OF BEAVER CREEK QUADRANGLE
BOND COUNTY, ILLINOIS

Prairie Research Institute
ILLINOIS STATE GEOLOGICAL SURVEY

David A. Grimley, Piotr Szocinski and Sarah N. Dendy
2019

STATEMAP Beaver Creek-SG



Base map compiled by Illinois State Geological Survey from digital data (2018 US Topo) provided by the United States Geological Survey. Shaded relief derived from 2015 Lidar elevation data.

North American Datum of 1983 (NAD 83)
Projection: Transverse Mercator
1,000-meter ticks: Universal Transverse Mercator grid system, zone 16

Recommended citation:
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SCALE 1:24,000

1 1/2 0 1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 .5 0 1 KILOMETER

BASE MAP CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1988

Geology based on field work by D. Grimley, P. Szocinski, and S. Dendy, 2018–2019.

Digital cartography by Deette Lund and Emily Bunse, Illinois State Geological Survey.

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This map has not undergone the formal Illinois Geologic Quadrangle map review process. Whether or when this map will be formally reviewed and published depends on the resources and priorities of the ISGS.

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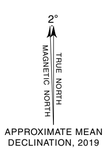
ILLINOIS
Illinois State Geological Survey

Prairie Research Institute
Illinois State Geological Survey
615 East Peabody Drive
Champaign, Illinois 61820-6918
(217) 244-2414
http://www.isgs.illinois.edu

1	2	3
4		5
6	7	8

ADJOINING QUADRANGLES
1 Sorento South
2 Greenville
3 Mulberry Grove
4 Pocahontas
5 Pleasant Mound
6 Saint Rose
7 Stolletown
8 Keyesport



APPROXIMATE MEAN DECLINATION, 2019

ROAD CLASSIFICATION

Interstate Route
U.S. Route
State Route
Local road

QUATERNARY DEPOSITS

Description	Unit	Interpretation
HUDSON EPISODE (~12,000 years before present [B.P.] to today)[1]		
Fill or removed earth; includes fill and compacted earth materials in road and railway embankments; up to 25 feet thick	Disturbed ground: dg	**Anthropogenic fill or excavations**; includes fill associated with Interstate-70 interchanges and crossings, railway embankments and highway embankments in floodplains
Silt loam (mainly) to silty clay loam to sandy loam; may contain thin sandy or loamy beds, especially in lower part; dark brown to grayish brown to very dark gray; massive to weakly stratified; noncalcareous; soft consistency; weakly developed and thin modern soil profile is typical (<1 ft); up to 25 ft thick	Cahokia Formation: c	**Alluvium (river deposits), overbank or channel deposits;** in floodplains of Beaver Creek, Shoal Creek, and other unnamed tributaries; derived mainly from erosion of loess, till, and outwash sediments in adjacent uplands and slopes; includes up to 2 feet of historical deposition
WISCONSIN EPISODE (~60,000–12,000 years B.P.)		
Silt loam to silty clay loam; brown to dark yellowish brown to yellowish brown to grayish brown; contains weak soil structure throughout but strong structure in modern soil solum (upper few feet); soft to moderately stiff; up to 6 ft thick	Peoria and Roxana Silts (>5 ft thick): pr	**Mainly loess (windblown silt) and redeposited loess**; Peoria Silt (upper unit) contains modern soil; the Roxana Silt (lower unit) is pedogenically mixed and not easily distinguishable from the Peoria Silt in the field; overlies the Sangamon Geosol; various Illinois Episode units in the subsurface (of glaciofluvial or ice-contact origin) are indicated on the map by unique patterns (see below) and labels [e.g., pr/pl-h(m)]
SANGAMON AND ILLINOIS EPISODES (~150,000–60,000 years B.P.)		
Silty clay loam to clay loam to sandy clay loam; gray to light grayish brown to light olive brown to brown; mottled; rare to few pebbles; noncalcareous; strong soil structure and cutans in upper few feet of the unit; manganese and iron oxide stains; medium consistency; up to 15 ft thick	Berry Clay Member, Pearl or Glasford Formations (cross sections only): pl-bc	**Accretionary deposits, pedogenically mixed loess, lacustrine, ice-contact, and alluvial deposits;** pedogenically altered, especially upper portions; attributed to the interglacial Sangamon Geosol; includes highly weathered portions of the Pearl or Glasford Formations (Illinois Episode); may also include Teneriffe Silt (loess, lacustrine), occurs below the Peoria and Roxana Silts (loess); can serve as an upper member of either the Pearl Formation or Glasford Formation
ILLINOIS EPISODE (~200,000–130,000 years B.P.)		
Fine sand to loamy sand to coarse sand with gravel; gravel content is mainly <30% and <2 cm in diameter; yellowish brown to grayish brown; sand is typically fine- to medium-grained; stratified below zone of alteration; typically weathered or more clayey in upper portions (sandy loam to clay loam); moderately to well sorted; may be partially cemented by carbonate; leached to calcareous; up to 30 ft thick	Pearl Formation (Mascoutah facies) (cross sections only): pl(m); (in subsurface): high confidence / low confidence or thin deposits	**Outwash**, deposited during ice-margin retreat; diagonal line pattern shown on loess-covered Illinois Episode terraces and outwash plains; upper portion contains alteration in the Sangamon Geosol solum; occurs in the subsurface beneath the Berry Clay Member or Cahokia Formation
Sand to loamy sand to gravelly sand; may contain loamy, silty, or diamicton beds; brown to yellowish brown to light olive brown; upper 5 to 10 feet is weathered to clay loam or sandy loam; otherwise loose to weakly cohesive; noncalcareous to calcareous (typically below ~ 20 ft depth); up to 120 ft thick	Hagarstown Member, Pearl Formation (sandy facies): pl-h(s); (in subsurface)	**Ice-contact sediment**, in glacial hills and ridges, mainly in the southern and western part of the quadrangle; includes eskerine or ice-walled channel deposits; may include kamic deposits, debris flows and melt-out deposits; upper portion contains alteration in the Sangamon Geosol solum; intertongues with the Mascoutah facies and the Glasford Formation; may be overlain by the Berry Clay Member and up to 6 feet of loess
Intermixed sand, sandy loam, clay loam, silt, and diamicton; some gravelly zones; yellowish brown to light olive brown to grayish brown; massive to faintly or well stratified; generally more weathered or clayey in upper portions; leached to calcareous; up to 40 ft thick	Hagarstown Member, Pearl Formation (mixed facies): pl-h(m); (in subsurface)	**Ice-contact and supraglacial sediment**; in glacial hills and ridges; includes debris flows, lacustrine sediment, and melt-out deposits; upper portion contains alteration in the Sangamon Geosol solum; intertongues with the Mascoutah facies, Pearl Formation, and Glasford Formation; may be overlain by the Berry Clay Member and up to 6 feet of loess
Pebbly loam diamicton (Vandalia Member) to silty clay loam diamicton (Smithboro Member, lower unit); some sand and silt lenses; light olive brown to grayish brown to dark gray; contains ~ 2% to 8% pebbles, pebbles (mainly < 2 inches) include sandstone, shale, dolomite, limestone, chert, coal, and granite; oxidized and iron stained along fractures; mainly calcareous, but leached in upper portions; Smithboro Member is a finer-grained lower unit with fewer pebbles and common conifer wood fragments and silt inclusions; medium consistency (Smithboro facies; and upper Vandalia Member) to very stiff and dense (lower Vandalia Member); generally massive, up to 90 ft thick	Glasford Formation: g	**Till and ice-marginal sediment**; upper few feet of diamicton may contain Sangamon Geosol solum (mainly included in the Berry Clay Member); consists mainly of subglacial till (Vandalia facies) with some supraglacial and glaciofluvial sediments in upper 5 to 10 feet; a more fine-grained Smithboro facies (till with more wood fragments) occurs in subsurface in some areas; intertongues with the Pearl Formation; shown on the surficial geology map where is has <5 ft of loess cover;
Fine sand to gravelly sand; may include beds of loamy sand or silt; typically < 30% gravel; light olive brown to dark grayish brown; stratified; moderately to well sorted; loose to very weakly cemented; saturated; pebbles include clastics, carbonate, coal, and igneous types; calcareous; up to 25 ft thick	Grigg tongue, Pearl Formation (cross sections only): pl-g	**Outwash**; proglacial sedimentation during Illinois Episode glacial events; may be hydraulically connected to the Mascoutah facies or other tongues of the Pearl Formation; occurs as a basal tongue of outwash below the Glasford Formation
Silt to silt loam; may include beds of diamicton or fine sand; rare pebbles; dark grayish brown to black; some small conifer wood fragments or organic zones; weakly to strongly calcareous	Petersburg Silt Formation (cross sections only): pb	**Lacustrine or palustrine sediment**; may contain debris flows or resedimented loess; found in former lowlands or depressions; occurs below the Glasford Formation and above the Lierle Clay Member, Banner Formation
PRE-ILLINOIS EPISODE (~700,000–420,000 years B.P.)		
Silty clay loam to silty clay, dark greenish gray to light olive brown; rare small pebbles; mottled; gleyed; common iron oxide stains with a few manganese oxide stains; cumulic soil profile; cutans; may be vaguely laminated or contain minor amounts of fine sand; medium consistency; sticky; noncalcareous to very weakly calcareous; up to 15 feet thick	Lierle Clay Member, Banner Formation (cross sections only): b-l	**Accretionary deposits, pedogenically mixed loess, lacustrine, and alluvial deposits**; strongly pedogenically altered; weathering attributed to the interglacial Yarmouth Geosol; includes highly weathered portions of the Banner Formation (pre-Illinois Episode); occurs below the Glasford Formation, Pearl Formation, or Petersburg Silt
Silt loam to loam to silty clay loam diamicton, with beds of loamy sandy, gravelly sand or silt; olive brown to grayish brown to dark gray; few small pebbles of local (Pennsylvanian) micaceous fine-grained sandstone, bluish gray mudstone, or weathered shale fragments are typical in diamicton; may include beds of sand and gravel up to 20 ft thick in upper and lower part of unit; massive (in diamicton) to stratified; noncalcareous to calcareous; loose to very stiff; up to 50 ft thick	Banner Formation, undifferentiated (cross sections only): b	**Till, ice-marginal sediment, lake deposits, outwash, and colluvium**; may contain Yarmouth Geosol weathering (oxidation, leaching, and pedogenic features) in upper portions; proglacial sand and gravel may occur above, below, or interspersed with diamicton; a few feet of colluvial or preglacial alluvial deposits may occur above bedrock

PENNSYLVANIAN BEDROCK

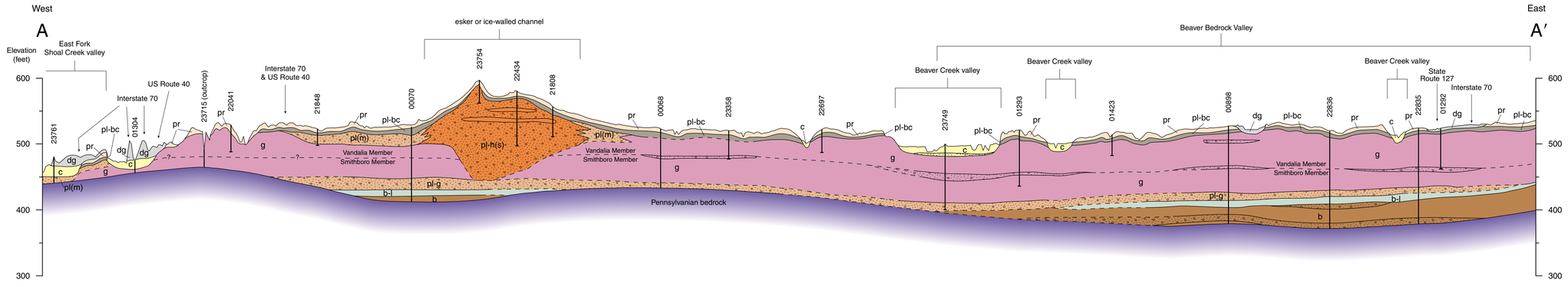
Shale, mudstone, siltstone, limestone, and sandstone; dark greenish gray to dark gray to olive to brown, micaceous; laminated (in shale and mudstone) to bedded; sandstone is typically fine grained and micaceous; noncalcareous to weakly calcareous (in shale) to strongly calcareous (in limestone)	IP	**Bedrock or near-surface bedrock (within 5 ft of land surface)**; shallow marine, deltaic, or terrestrial; one area of bedrock outcrop (<5 ft in thickness) occurs; in the northwestern part of the quadrangle along SE bank of Shoal Creek; includes Bond Formation or Shelburn-Patoka Formation at shallow depths

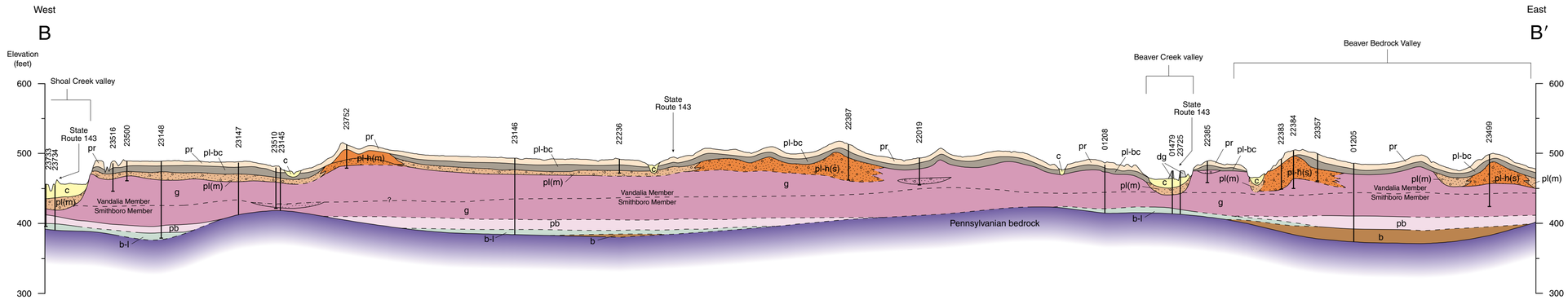
[1] The time periods for the Wisconsin Episode and the Hudson Episode are reported as calibrated radiocarbon years and can be directly compared to calendar years before 1950 (Stuiver et al. 2015).

Data Type

▲	Outcrop	———	Contact
○	Stratigraphic boring	- - - - -	Inferred contact
●	Water-well boring	·····	Buried contact
●	Engineering boring		
○	Oil and gas boring	Z — Z′	Electrical resistivity profile line
S ○ 26211	Labels indicate samples (s). Boring and outcrop labels indicate the county number. A dot indicates the boring or outcrop extends to bedrock.	A — A′	Line of cross section

Note: The county number is a portion of the 12-digit API number on file at the ISGS Geological Records Unit. Most well and boring records are available online from the ISGS website.





Cross Sections

- Diamicton, massive silt, or other fine-grained sediment
- Intermixed sand, loam, and diamicton
- Fine to coarse sand or gravelly sand
- Fine to medium sand
- Contact
- Inferred contact
- Borehole

Horizontal scale: 1 in. = 2,000 ft
Vertical scale: 1 in. = 100 ft
Vertical exaggeration: 20×

- dg — Disturbed ground (mined out, filled)
- c — Cahokia Formation
- pl-bc — Berry Clay Member, Pearl or Glasford Formation
- pl-h(s) — Hagarstown Member, Pearl Formation (sandy facies)
- g — Glasford Formation
- pb — Petersburg Silt Formation
- b — Banner Formation, undifferentiated
- pr — Peoria and Roxana Silts
- pl(m) — Pearl Formation (Mascoutah facies)
- pl-h(m) — Hagarstown Member, Pearl Formation (mixed facies)
- pl-g — Grigg tongue, Pearl Formation
- b-l — Lierle Clay Member, Banner Formation
- bedrock (Pennsylvanian)

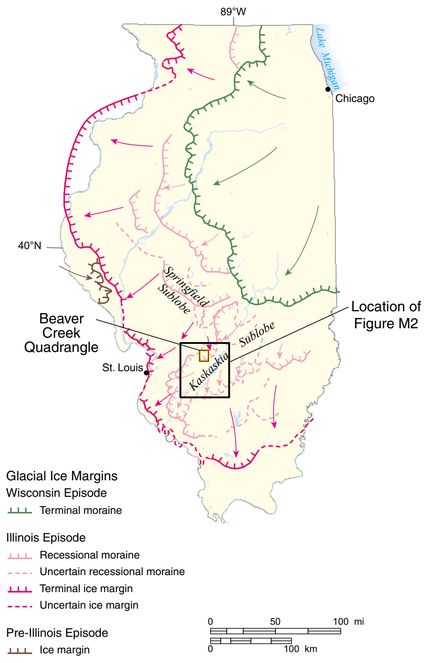


Figure M1 Glacial ice margins in Illinois during the middle to late Pleistocene. The location of Figure M2 is outlined in black. Arrows indicate approximate glacial ice flow directions.

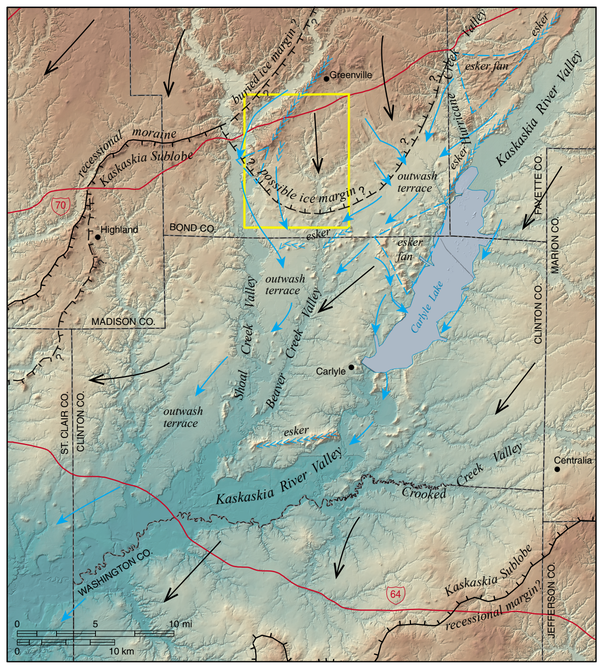


Figure M2 Location of the Beaver Creek Quadrangle, outlined in yellow, within the Kaskaskia Basin showing interpreted recessional moraines and deglacial features of the Kaskaskia and Springfield Sublobes. Blue arrows indicate the path of meltwater flow during deglaciation and ablation of the sublobes in the study area. A late surge of glacial ice from in the Springfield Sublobe may have flowed into the Kaskaskia Basin in Bond County. Black arrows show interpreted glacial flow directions.

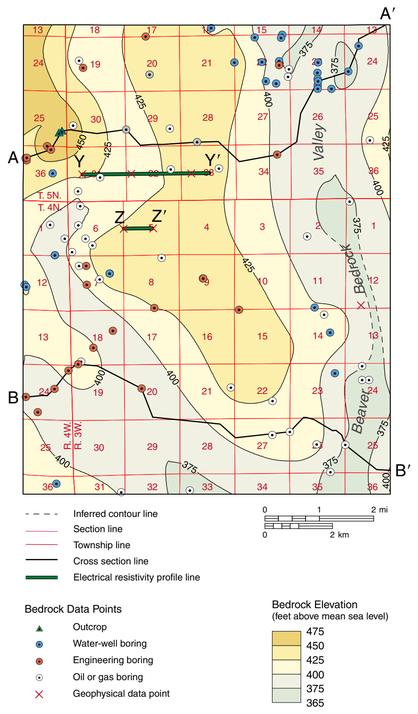


Figure M3 Bedrock topography of the Beaver Creek Quadrangle. Localities of all data that reliably indicate the bedrock surface are shown (many of the oil and gas type data are not shown on the surficial map). The Beaver Bedrock Valley (buried) occurs 1 to 2 miles east of the modern valley and is infilled with Pleistocene sediments. Map scale is 1:100,000.

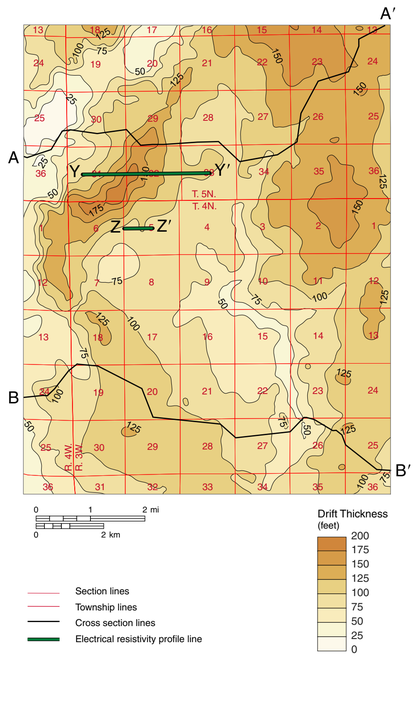
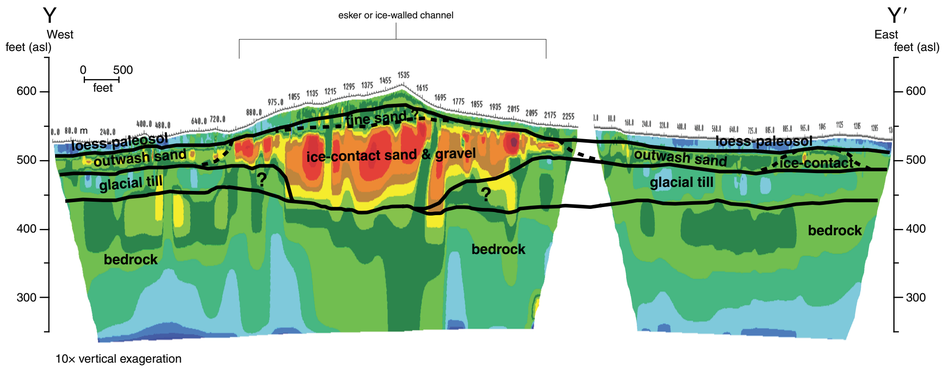


Figure M4 Drift thickness of the Beaver Creek Quadrangle. Drift includes all the unconsolidated sediments above bedrock (e.g., alluvium, loess, till, outwash). Data point locations are the same as in Figure M3. Thick deposits of unconsolidated Quaternary sediment occurs beneath the esker ridge (NW part of quadrangle) and in the infilled Beaver Bedrock Valley (eastern part of quadrangle). Map scale is 1:100,000.



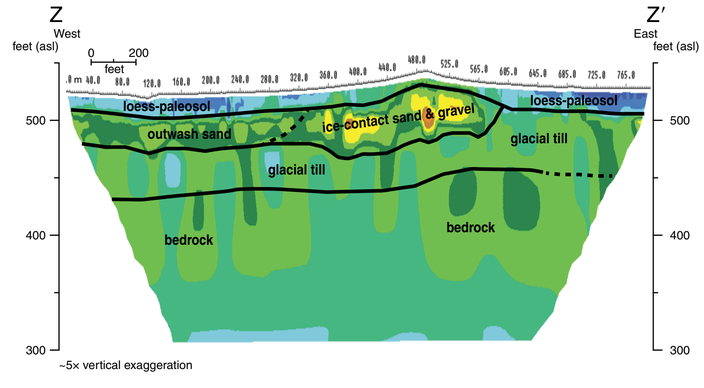


Figure M5 Electrical resistivity transects (Y-Y′ and Z-Z′) acquired in the Beaver Creek Quadrangle (transect locations on surficial geology map). The resistivity values are depicted using a logarithmic scale. More information regarding methods and results are provided in the accompanying report.