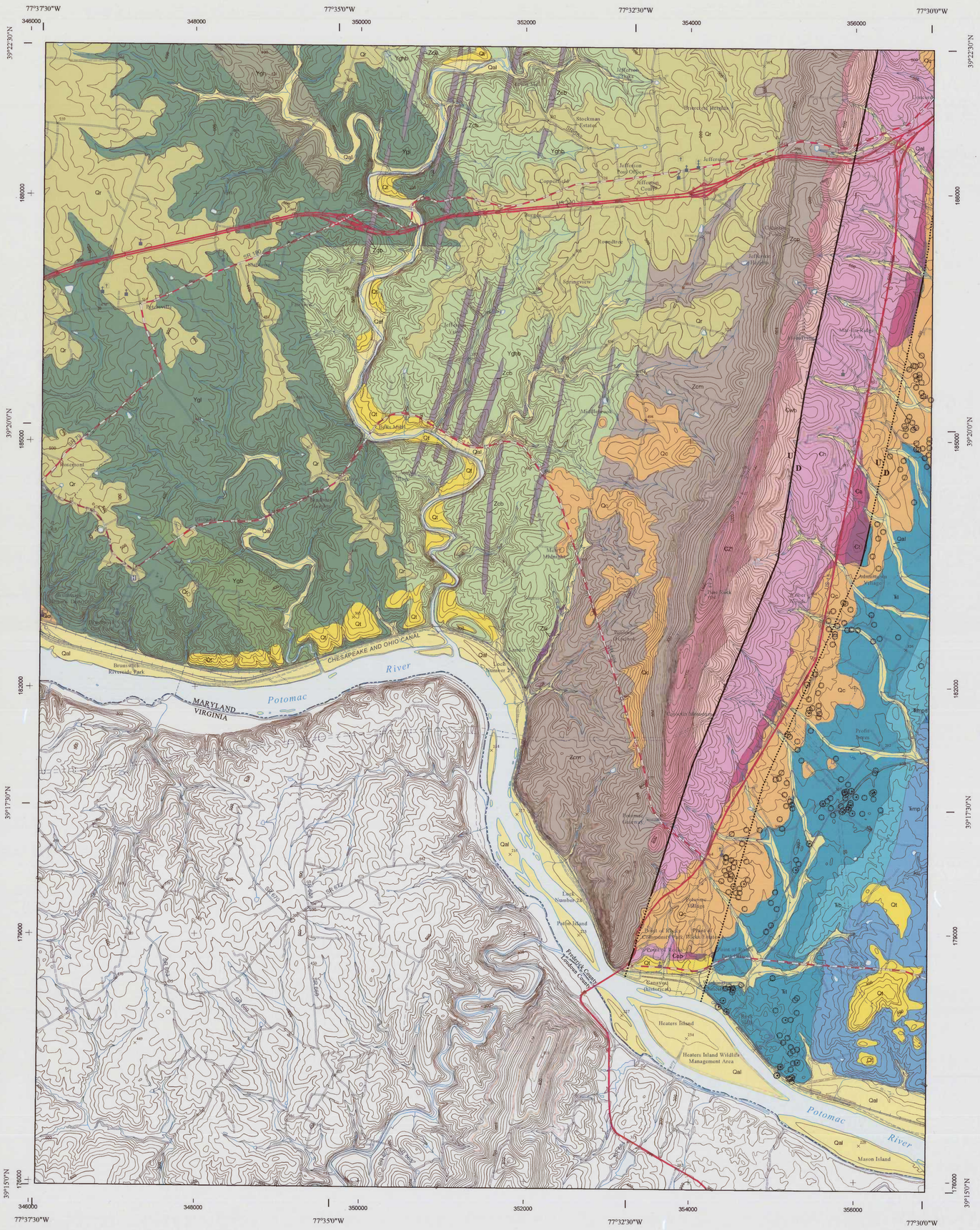

Base layers derived from U.S. Geological Survey (USGS)
7.5-minute Series (Topographic)
Point of Rocks Quadrangle 1970 (photoinspected 1981)
Digital line graphs (DLGs) for hydrography, topography, transportation and boundaries (1:24,000)

Cultural features shown from USGS Geographic Names Information System database

(To determine current magnetic declination see: http://www.ngdc.noaa.gov/cgi-bin/seg/gmag/fldsnth1.pl)

Current map projection:
Maryland State Plane Coordinate System 1987
(Projection: Lambert Conformal Conic, 1980 geodetic reference system)
(Horizontal Datum: North American Datum 1983)

MD State Plane 2000-meter grid ties and coordinates shown in black
Geographic coordinates (latitude-longitude) shown near corners and 2.5' intervals (in black)

Description of Map Units

Quaternary

Qal — Alluvium
Reddish brown, poorly sorted mixture of rounded pebbles to boulder-sized clasts with sand, silt, and clay, as interbeds and interstitial matrix. Locally, layers of moderately well sorted, rounded cobbles or sandstone pebbles are present. Thickness estimated at 1.0 foot to more than 15 feet especially along the Monocacy River.

Qc — Colluvium
Coarse cobbles, boulders, and blocks of quartzite that were transported by gravity and debris flow, and modified by freeze-thaw processes, concentrated in hillslope depressions and hollows on Sugarloaf Mountain; thickness ranges from a thin veneer to greater than 10 feet. Includes subangular to subrounded pebbles and cobbles of quartzite and vein quartz derived from rocks of the Blue Ridge-South Mountain anticlinorium in fan-like aprons covering the strata along the western margin of the Culpeper basin. Thickness ranges from a thin veneer to 3 feet.

Qr — Weathering residuum
Mixture of moderate reddish brown soil and pebbles to blocks of grayish pink to white angular, locally euhedral, quartz. Thickness ranges from a thin veneer to 10 feet.

Qt — Terrace deposits
Reddish brown to brown, sandy and clayey mixture of rounded pebbles to cobbles of sandstone, vein quartz and quartzite. Present along elevated low relief areas above the current floodplains of the Potomac River and Catoctin Creek. Several separate levels of terrace deposits can be observed along the Potomac River, but are not separately mapped here. Thickness ranges from a thin veneer to more than 10 feet.

Triassic

Trl — Leesburg Formation
Light gray to light reddish gray, very thickly bedded to massive, cobble to boulder conglomerate. Clasts are dominantly subangular to subrounded limestone and dolostone of Cambrian and Ordovician age, but locally Triassic age siltstone and sandstone are prevalent. Thickness ranges from 100 to 3000 feet (Lee, 1979).

Trb — Balls Bluff Siltstone
Brownish red to reddish brown, argillaceous, massive siltstone with thin fine-grained sandstone interbeds. Thickness is estimated at 200 to 4500 feet (Lee, 1979).

Trmp, Trmps — Manassass Formation

Poolesville Member
Reddish brown to reddish gray, locally greenish gray, medium-grained sandstone and reddish, variegated claystone. Sandstone beds (Trmps) exhibit sharp convex-down bases, shale pebble lag conglomerates, and fining up-section character. Claystone intervals are thoroughly root mottled and contain light gray caliche carbonate nodules. The thickness of this member is estimated at 500 to 3000 feet (Lee, 1979).

Cambrian

Ct — Tomstown Formation
Medium light gray to medium gray, sugary dolomite with thin (< 0.1 cm) layers of mica. The formation is poorly exposed in the Point of Rocks Quadrangle and cannot be differentiated into members as it is on the western Blue Ridge (Brezinski, 1992). Thickness is estimated at 150 to 300 feet.

Ca, Cap — Antietam Formation
Interbedded, light olive gray to olive gray, medium- to coarse-grained, medium-bedded, locally ferruginous, micaceous, silty sandstone and very fine grained, silty sandstone to sandy siltstone. Thickness is estimated at 200 to 300 feet. Interbedded Antietam phyllite (Cap) - Light gray to medium light gray, highly foliated, micaceaous, siliceous phyllite. Individual foliation planes have a lustrous sheen and papery parting. Thickness estimated a 200 feet.

Ch — Harpers Formation
Brownish gray to dark greenish gray, silty phyllitic shale to highly sheared phyllitic siltstone with intervals of brownish gray, medium-grained, silty sandstone. Thickness is estimated at greater than 900 to 1000 feet.

Late Proterozoic ? - Cambrian ?

Cambrian

Cwb — Weverton Formation

Buzzard Knob Member
The Buzzard Knob Member is light gray to medium gray, medium-bedded quartzite with dark gray, argillaceous layers up to 4 cm thick, separating the quartzite beds. Crossbedding within individual quartzite strata is pervasive. Although truncated along the eastern side of its outcrop belt the Buzzard Knob Member has an estimated thickness of 50 to 150 feet.

CZl — Loudoun Formation
Medium to dark gray, medium-bedded conglomerate, and black, tufaceous phyllite. Lithology is very variable, ranging from a crossbedded quartz-pebble conglomerate to a highly cleaved polymictic conglomerate with a matrix of flattened phyllite pebbles. The localized distribution of this formation may be the result of the original deposition or omission by faulting; however, owing to the colluvial apron of the Weverton this relationship remains obscure. The Loudoun Formation ranges in thickness from 30 to 200 feet in the Point of Rocks Quadrangle.

Late Proterozoic

Zcm — Catoctin Formation

Metabasalt
Medium to dark greenish gray, chloritic, locally amygdaloidal, epidote-rich metabasalt. Some areas are composed of highly sheared chlorite schist. Epidote occurs as light green veins and nodules. Thickness estimated at greater than 1000 feet by Fauth (1977).

Zcp — Phyllite
Light to medium gray phyllite containing highly elongated light gray flecks and blebs. Thickness of this unit appears to be less than 100 feet.

Zcb — Basaltic dike
Dark greenish gray, locally phyllitic, chloritic, basalt. Commonly has strongly developed cleavage. These bodies are present in the basement gneiss complex and appear to represent dikes that once contacted the main Catoctin outcrop belt.

Zsr — Swift Run Formation
Medium gray-brown, silty, sandstone with intervals of very light gray, foliated, micaceous marble. Marble locally quarried for agricultural purposes. Thickness estimated at 0 to 200 feet.

Middle Proterozoic

Basement gneiss complex

Ygl — Leucocratic gneiss
Medium light gray to medium gray, coarse-grained, locally porphyritic, feldspar, quartzose, granite gneiss. Potassium feldspar augen, up to 3 cm in diameter, are commonly present.

Ygb — Biotite gneiss
Medium gray to medium greenish gray, biotite, feldspar, granite gneiss. Typically more fine grained, and more strongly foliated than the leucocratic granite gneiss. Biotite rarely makes up more than 20 percent of the rock.

Ygh — Hornblende gneiss
Medium greenish gray, medium- to coarse-grained, foliated, hornblende, plagioclase gneiss. Hornblende blades up to 0.5 cm long commonly make up 10 to 20 percent of the rock that commonly has a salt-and-pepper appearance on fresh surfaces.

Yghb — Hornblende biotite gneiss
Medium to light greenish gray, medium- to coarse-grained, hornblende biotite gneiss. Hornblende blades make up approximately 10 percent of the rock, and biotite locally makes up more than 10 percent. The gneiss has a salt-and-pepper appearance on fresh surfaces.

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Supplemental Information

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Field mapping of karst features was conducted in 2000 and 2001 and updated in 2002 by David K. Brezinski. Geologic field mapping was conducted in 2000 and 2001. This karst map was compiled in digital form by Liana Dunne and Heather Quinn of the Maryland Geological Survey and Catherine Luckhardt of Towson University, Center for Geographic Information Sciences.

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Version: PTOFRKST2004.1
Released June 2004

Karst Features of Part of the Point of Rocks Quadrangle, Frederick County, Maryland

By
David K. Brezinski
2004

Scale 1:24,000

GN
(State Plane Grid North)

Quadrangle Location

Adjoining 7.5' Quadrangle Names
Point of Rocks Quadrangle, shaded

1	2	3	1. Keedysville 2. Middletown 3. Frederick
4		5	4. Harpers Ferry 5. Buckeystown
6	7	8	6. Purcellville 7. Waterford 8. Poolesville

1 0.5 0 1 Miles

1,000 0 1,000 2,000 3,000 4,000 5,000 6,000 7,000 Feet

1 0.5 0 Kilometers

Contour Interval 20 Feet
Dotted Lines Represent 10 Foot Contours
National Geodetic Vertical Datum of 1929
(To convert elevations to the North American Vertical Datum of 1988, subtract 1 foot)
(To convert from feet to meters, multiply by 0.3048)

Explanation of Map Symbols

Geologic Symbols

Contacts
Geologic contact; approximately located
dotted where concealed

Karst Features
Active Sinkhole
Depression
Spring

Faults
U Upthrown side
D Downthrown side
Fault; concealed

Base Map Symbols

Transportation
Primary route, class 1 (divided, lanes separated)
Primary route, class 1 (undivided)
Secondary route, class 2
Light duty road or street, class 3
Unimproved road or street, class 4
Trail
Railroad, railroad siding or spur
Power transmission line
Substation

Topography
Topographic index contour (100-ft interval)
Topographic intermediate contour (20-ft interval)
Topographic supplemental contour (10-ft interval)

Hydrography
Stream
Ditch or canal
Marsh, wetland, swamp, or bog
Water body (eg. lakes, ponds, rivers)

Culture
State boundary
Boundary, incorporated city, village, or town
Cemetery
Church
School
Hospital

STATE OF MARYLAND
Robert L. Ehrlich, Jr.
Governor

Michael S. Steele
Lieutenant Governor

MARYLAND DEPARTMENT OF NATURAL RESOURCES

DEPARTMENT OF NATURAL RESOURCES
C. Ronald Franks
Secretary

W. P. Jensen
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