

Description of Map Units

- Quaternary**
  - Qal** Alluvium: Brownish red, poorly sorted, rounded pebbles to boulders with sand, silt, and clay matrix. Thickness is less than 15 feet (5 m).
  - Qc** Colluvium: Unsorted, light gray to reddish gray, angular to subangular boulders and cobbles of quartzite with a silty matrix. Thickness ranges from a thin veneer to more than 100 feet (30 m).
  - Qt** Terrace deposits: Reddish brown, sandy and clayey mixture of unconsolidated pebbles to cobbles of sandstone, vein quartz, and quartzite. Thickness ranges from a thin veneer to more than 10 feet (3 m).
- Triassic**
  - Tg** Gettysburg Formation: Medium red to reddish gray, silty, mudstone to claystone with thin interbeds of medium- to coarse-grained sandstone. Sandstone exhibits sharp bases, shale pebble lag conglomerates, and fine up-section. Claystone intervals are thoroughly root-mottled and contain light gray, calcite carbonated nodules. Thickness is in question, but may be as much as 8,000 feet (2,438 m).
  - Tn** New Oxford Formation: Brownish red to reddish brown, medium- to coarse-grained sandstone interbedded with red, variegated claystone and micaceous siltstone. Conglomerate at the base of formation (Tn1) is light reddish gray, subangular to subrounded, quartz and limestone conglomerate. Clasts are predominantly gray limestone, tan dolomite, or quartz pebbles with a matrix of a reddish brown, calcareous mudstone. Sandstones (Tn2) exhibit sharp bases with shale pebble lag conglomerates, and fine up-section. Claystone intervals are thoroughly root-mottled and contain light gray, calcite carbonate nodules. Poorly exposed, and thickness is in question. Thickness is in excess of 10,000 feet (3,048 m) (Brezinski, 2004a, b).
- Carboniferous**
  - Cf** Frederick Formation: Dark gray, very thin to medium-bedded limestone, dolomitic limestone with thin intervals of shaly sandy limestone and breccia. Because of the numerous lithologies present in this unit, it is herein recommended that the term formation be used when discussing the Frederick. Four members are recognized within the Frederick Formation by Reinhardt (1974) and Brezinski (2004a, b), but only the Adamstown Member and the Rocky Springs Station Member occur in the Catoctin Furnace Quadrangle.
    - Cf1** Adamstown Member: Thinly interbedded, medium dark gray to dark gray, argillaceous, fine-grained limestone and dusky yellow to medium dark gray, silty dolomite. Limestone beds range from 0.1 to 2.0 inches (0.3 to 5.1 cm) in thickness. Several thin (6.0 to 30 feet or 1.8 to 9.1 m), dark greenish gray to greenish black, light olive brown weathering, silty, calcareous shale intervals are present throughout the member. The top of the member is mapped at the base of the lowest medium to thick bed of sandy or algal limestone. Thickness is approximated at 1,000 feet (305 m).
    - Cf2** Rocky Springs Station Member: Interbedded, dark gray, thin-bedded, lime mudstone, dark gray shale, medium gray, tan weathering dolomite, and medium gray, polymictic breccias (Cf2b). The Rocky Springs Station outcrop belt in the Catoctin Furnace Quadrangle is largely restricted to the Lewistown inlier, along the base of Catoctin Mountain. Thickness is approximated at 1,200 feet (366 m).
- Lower Cambrian**
  - 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 feet (275 m).
  - Cwe** Owens Creek Member: Predominantly light gray to gray quartzite, conglomerate, and graywacke. Three members make up the Weverton Formation on Catoctin Mountain. These are, in ascending order: the Buzzard Knob, Maryland Heights, and Owens Creek members (Brezinski, 1992).
  - Cwm** Maryland Heights Member: Interbedded, dark greenish gray, phyllitic, highly cleaved, metaquartzite and metasilstone. A massive, light gray quartzite near top of member (Cwm2) is the main ridge former on Catoctin Mountain and forms Bobs Hill and Cat Rock in the Catoctin Furnace Quadrangle. This subunit rarely exceeds 50 feet (15 m). Thickness of the member is estimated at 200 to 300 feet (61 to 91 m).
  - Ckb** Buzzard Knob Member: Light to medium gray, medium-bedded, cross-bedded quartzite with dark gray, argillaceous layers and granular conglomerate layers up to 1.5 inch (3.8 cm) thick. The Buzzard Knob Member has an estimated thickness of 150 to 200 feet (46 to 61 m).
  - Cld** Loudoun Formation: Medium to dark gray, medium-bedded, sandy, quartz phyllite, conglomeratic phyllite, and medium to dark gray, granular, phyllitic conglomerate. The Loudoun Formation ranges in thickness from 75 to 200 feet (23 to 61 m).
  - Zm** 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 is estimated at greater than 1000 feet (305 m).

References

Brezinski, D. K., 1992. Lithostratigraphy of the western Blue Ridge cover rocks in Maryland. Maryland Geological Survey, Report of Investigations 55, 69 p.

\_\_\_\_\_, 2004a. Stratigraphy of the Frederick Valley and its relationship to karst development. Maryland Geological Survey, Report of Investigations 75, 101 p.

\_\_\_\_\_, 2004b. Geologic Map of the Catoctin Furnace Quadrangle, Frederick County, Maryland. Maryland Geological Survey, Quadrangle Geologic Map, scale 1:24,000 (CATOCGE02004.1).

Reinhardt, J., 1974. Stratigraphy, Sedimentology and Cambro-Ordovician Paleogeography of the Frederick Valley, Maryland. Maryland Geological Survey, Report of Investigations 23, 73 p.

Supplemental Information

**Use Constraints:** These data represent the results of data collection/processing for a specific Department of Natural Resources, Maryland Geological Survey activity and indicate general existing conditions. As such they are only valid for the intended use, content, time, and accuracy specifications. The user is responsible for the results of any application of the data for other than their intended purpose. The Maryland Geological Survey makes no warranty, expressed or implied, as to the use or appropriateness of the licensed data, and there are no warranties of merchantability or fitness for a particular purpose of use. The Maryland Geological Survey makes no representation to the accuracy or completeness of the data and may not be held liable for human error or defect. Data are only valid at 1:24,000 scale. Data should not be used at a scale greater than that.

**Acknowledgements:** This map was funded in part by the Maryland State Highway Administration.

**Field mapping of karst features was conducted in 2004. Field mapping of the geology was completed in 2003-2004. This karst map was compiled in digital form by Heather Quinn, Maryland Geological Survey and Brent Anderson and Catherine Lashburn, Towson University, Center for Geographic Information Sciences.**

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Version: CATOCKST004.1  
Released June 2004

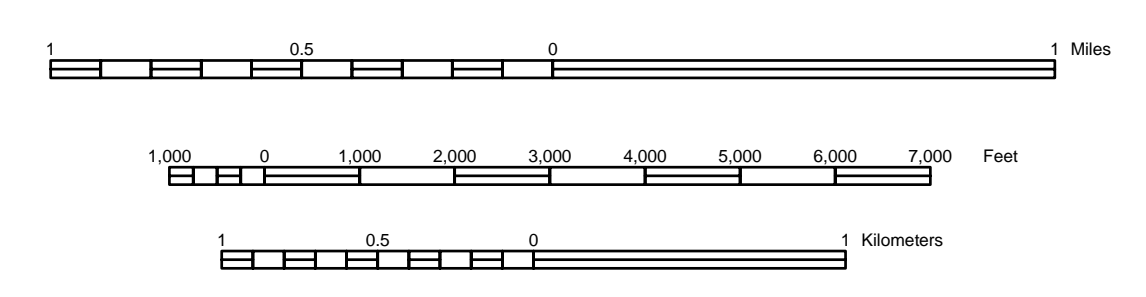
Base layers derived from U.S. Geological Survey (USGS) 7.5-minute Series (Topographic) Catoctin Furnace Quadrangle 1953 (photorevised 1986) Digital line graphs for hydrography, topography, transportation and boundaries (1:24,000) (Topography by photogrammetric methods from aerial photographs taken 1943. Field checked 1944. Culture revised by USGS 1953. Map edited in 1983 by USGS based on aerial photographs taken 1981 and other sources; this information not field checked.) Cultural features shown from USGS Geographic Names Information System database (To determine current magnetic declination see: <http://www.ngd.com.gov/cgi-bin/seg/mag/ldbath1.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 ticks and coordinates shown in black Geographic coordinates (latitude-longitude) shown near corners and 2.5' intervals (in black)

Karst Features Map of the Catoctin Furnace Quadrangle, Frederick County, Maryland

By David K. Brezinski 2004

Scale 1:24,000

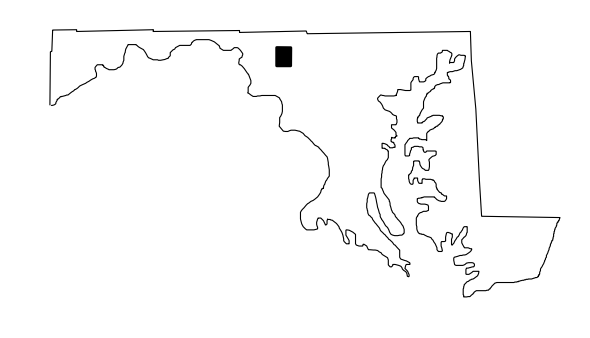


Contour Interval 20 Feet  
National Geodetic Vertical Datum of 1929  
(To convert elevations to the North American Vertical Datum of 1988, subtract 1 foot)  
(To convert from feet to meters, multiply by 0.3048)

Adjoining 7.5' Quadrangle Names  
Catoctin Furnace Quadrangle, shaded

1	2	3
4	5	6
7	8	

1. Smithburg  
2. Blue Ridge Summit  
3. Emmitsburg  
4. Myersville  
5. Woodboro  
6. Middletown  
7. Frederick  
8. Walkersville



**Explanation of Map Symbols**

<b>Geologic Symbols</b>	<b>Faults</b>
<b>Contacts</b>	U Upland side
Geologic contact: approximately located	D Downtown side
dotted where concealed	Fault: concealed
<b>Karst Features</b>	Fault: inferred
Active Sinkhole	
Depression	
Spring	
<b>Base Map Symbols</b>	<b>Topography</b>
Primary route, class 1 (divided, lanes separated)	Topographic index contour (100-ft interval)
Primary route, class 1 (undivided)	Topographic intermediate contour (20-ft interval)
Secondary route, class 2	<b>Hydrography</b>
Light duty road or street, class 3	Stream
Unimproved road or street, class 4	Water body (eg. lakes, ponds, rivers)
Trail	<b>Culture</b>
Railroad, railroad siding or spur	Boundary, Incorporated Village, Town, or Borough
Power transmission line	Miscellaneous Park, Reservation, or Monument
Substation	Small Park
	State Park
	Airport
	Cemetery
	Church
	School

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