

Plate 1. Geology and Karst Feature Distribution Map of the Frederick Valley

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2004

Description of Map Units

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|------------|---|---|
| Quaternary | | Alluvium
Reddish brown, poorly sorted boulders, pebbles, sand, silt, and clay that occur along major streams. Thickness estimated at 1.0 foot to more than 15 feet (0.3 to more than 4.6 m) especially along the Monocacy River. |
| | | Colluvium
Unsorted, light reddish gray, subangular boulders to cobbles of quartzite and vein quartz, present near base of the eastern foot of Catoctin Mountain. Some of these mapped deposits may actually represent alluvial fan deposits. Thickness ranges from a thin veneer to more than 100 feet (30 m). |
| | | 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 (3 m). |
| | | 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 Monocacy and Potomac Rivers. Thickness ranges from a thin veneer to more than 10 feet (3 m). |
| | | Diabase dike(s)
Dark gray to black, fine-grained diabase weathering to rusty, red-brown, spheroidal boulders and cobbles. While displayed as a solid unit on the map, the area mapped as diabase dike(s) actually represents an intertonguing with the surrounding bedrock unit(s). |
| Jurassic | CULPEPER BASIN | |
| | | Leesburg Formation
Light gray to light reddish gray, very thickly bedded, limestone conglomerate. Clasts are mainly subangular to subrounded limestone and dolomite of Cambrian and Ordovician age, but locally Triassic age siltstone and sandstone are prevalent. Thickness ranges from 100 to 3000 feet (30 to 910 m) (Lee, 1979). |
| | | 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 (60 to 1400 m) (Lee, 1979). |
| | Manassas Formation | |
| | | Poolsville Member
Reddish brown to reddish gray, locally greenish gray, medium-grained sandstone and reddish, variegated claystone. Sandstone beds (8rps) exhibit sharp convex-down bases, shale-pebble lag conglomerates, and fining up-section character. Claystone intervals are thoroughly root-mottled and contain light gray calcareous carbonate nodules. The thickness of this member is estimated at 500 to 3000 feet (150 to 910 m) (Lee, 1979). |
| | | Tascara Creek Member
Light gray to light reddish gray, subangular to subrounded, limestone and dolomite conglomerate. Clasts are predominantly tan dolomite, but locally reddish siltstone and sandstone and some limestone clasts are prevalent. Matrix is a reddish brown calcareous mudstone to reddish clayey carbonate. Thickness ranges from a feather edge to 100 feet (30 m) (Lee, 1979). |
| | GETTYSBURG BASIN | |
| | | Gettysburg Formation
Reddish brown to reddish gray, silty, mudstone to claystone with thin interbeds of fine-grained sandy, siltstone. Claystone intervals are thoroughly root-mottled and contain light gray, calcareous carbonate nodules. Along the base of Catoctin Mountain a mappable limestone conglomerate (19p) marks the western edge of the Gettysburg Basin in Maryland and is similar in appearance and position to the Leesburg Formation in the Culpeper Basin. Thickness is in question, but may be as much as 8,000 feet (2,438 m). |
| | | New Oxford Formation
Brownish red to reddish brown, medium- to coarse-grained sandstone interbedded with red, variegated claystone and micaceous siltstone. Conglomeratic bed at the base of formation (8rnc) is reddish gray, composed of rounded, quartz- and limestone-pebble conglomerate. Clasts are predominantly tan dolomite, or quartz pebbles with a matrix is a reddish brown, calcareous mudstone. Sandstones (19s) exhibit sharp bases with shale pebble lag conglomerates, and fine up-section. Claystone intervals are thoroughly root-mottled and contain light gray, calcareous carbonate nodules. Poorly exposed and thickness is in question. Thickness is in excess of 10,000 feet (3,048 m) (Brezinski, 2004). |
| | | Grove Formation
Thick-bedded to massive, sandy dolomite at the bottom, overlain by thick-bedded to massive, medium to light gray, algal thrombolitic limestone. Three members are recognized and mapped in the Frederick Valley (Brezinski, 2004). |
| Ordovician | | Woodshoro Member
Interbedded, thin-bedded, dark gray, fine-grained limestone, medium-bedded, bioturbated, dark gray, fine-grained limestone, and thin, wavy-bedded limestone with tan dolomitic partings. Top of Woodshoro Member not exposed because it is covered by the Triassic New Oxford Formation. Thickness is 500 feet (152 m). |
| | | Fountain Rock Member
Very thickly bedded, medium light gray, locally sandy, thrombolitic and stromatolitic algal limestone and medium gray, laminated dolomitic limestone and olive-gray dolomite. Two crossbedded sandstone units recognized in the middle of the formation (Ogf) are mapped. Thickness varies from more than 3,300 feet (1,006 m) along the western flank of the syncline to 1,000 feet (305 m) on the eastern flank. |
| | | Ceresville Member
Medium light gray to medium gray, thick-bedded and crossbedded, arenaceous limestone and sandy dolomitic limestone with thin interbeds (0.3 m) of medium light gray, sandy dolomite. Thickness is approximately 150 to 200 feet (45 to 60 m). |
| | Frederick Formation | |
| | The Frederick Limestone is thin- to medium-bedded limestone and dolomite with thin intervals of shale and sandstone. Because of the numerous lithologies present in this unit, it is herein recommended that the term formation be used when discussing the Frederick. The three members mapped by Reinhardt (1974) were redefined by Brezinski (2004) and a fourth member (Monocacy Member) was added to the base of the formation. This member was informally termed the "Unnamed Member" by Brezinski and Southworth (2001). | |
| | | Lime Kill Member
Interbedded, thinly bedded, dark gray, fine-grained limestone, calcareous shale, and medium-bedded, fine-grained limestone near the base, becoming more thickly interbedded toward the top with medium dark gray, fine-grained limestone with wavy bedding and locally stromatolitic algal beds. Near the top, the member becomes interbedded with crossbedded, sandy, medium light gray limestone. Thickness is approximately 600 feet (180 m). |
| | | 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 0.2 to 4.0 cm in thickness. Several thin (6.6 to 16 feet, 2.0 to 5.0 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 approximately 1000 feet (300 m). |
| | | Rocky Springs Station Member
Interbedded dark gray, thinly bedded, lime mudstone and black dolomitic shale, massive, medium gray, polyimitic breccias, medium gray, sandy limestone, and dark gray flaggy lime mudstone. Thicker, massive breccia beds (Crb) are mapped on the western flank of the syncline but are not evident on the east flank. Top of the member is mapped at the top of the stratigraphically highest polyimitic breccia or sandstone interval. Thickness is approximately 1,200 feet (425 m) on the eastern flank, but is likely much thicker on the western flank. |
| | | Monocacy Member
Predominately black, shaly, lime mudstone with thick intervals of black platy shale at the base and top. Dark gray, dolomitic polyimitic breccia bed characterizes the middle of the member. The thick, black shale unit that defines the top of the member, mapped separately (Ctm). Thickness is approximately 400 feet (120 m). |
| | | Tomstown Formation
Medium light gray to medium gray, sugary dolomite with abundant layers of mica. Only a thin interval of the Tomstown Formation is preserved along the eastern edge of the Blue Ridge at the Triassic Border fault. Thickness is estimated at 150 to 300 feet (45 to 90 m). |
| Cambrian | | Antietam Formation
Interbedded, light olive-gray to light grayish brown, fine- to coarse-grained, thin- to medium-bedded, locally ferruginous, micaceous, silty sandstone and sandy siltstone. Light gray, highly sheared phyllite (Csp) present near the base of the unit in the vicinity of Point of Rocks. Thickness is estimated at 200 to 300 feet (60 to 90 m). |
| | | Harpers Formation
Brownish gray to greenish gray, silty, micaceous, phyllitic shale to highly sheared phyllitic siltstone with intervals of brownish gray, medium-grained, sheared, silty sandstone. Thickness is estimated at greater than 900 to 1000 feet (275 to 300 m). |

References cited

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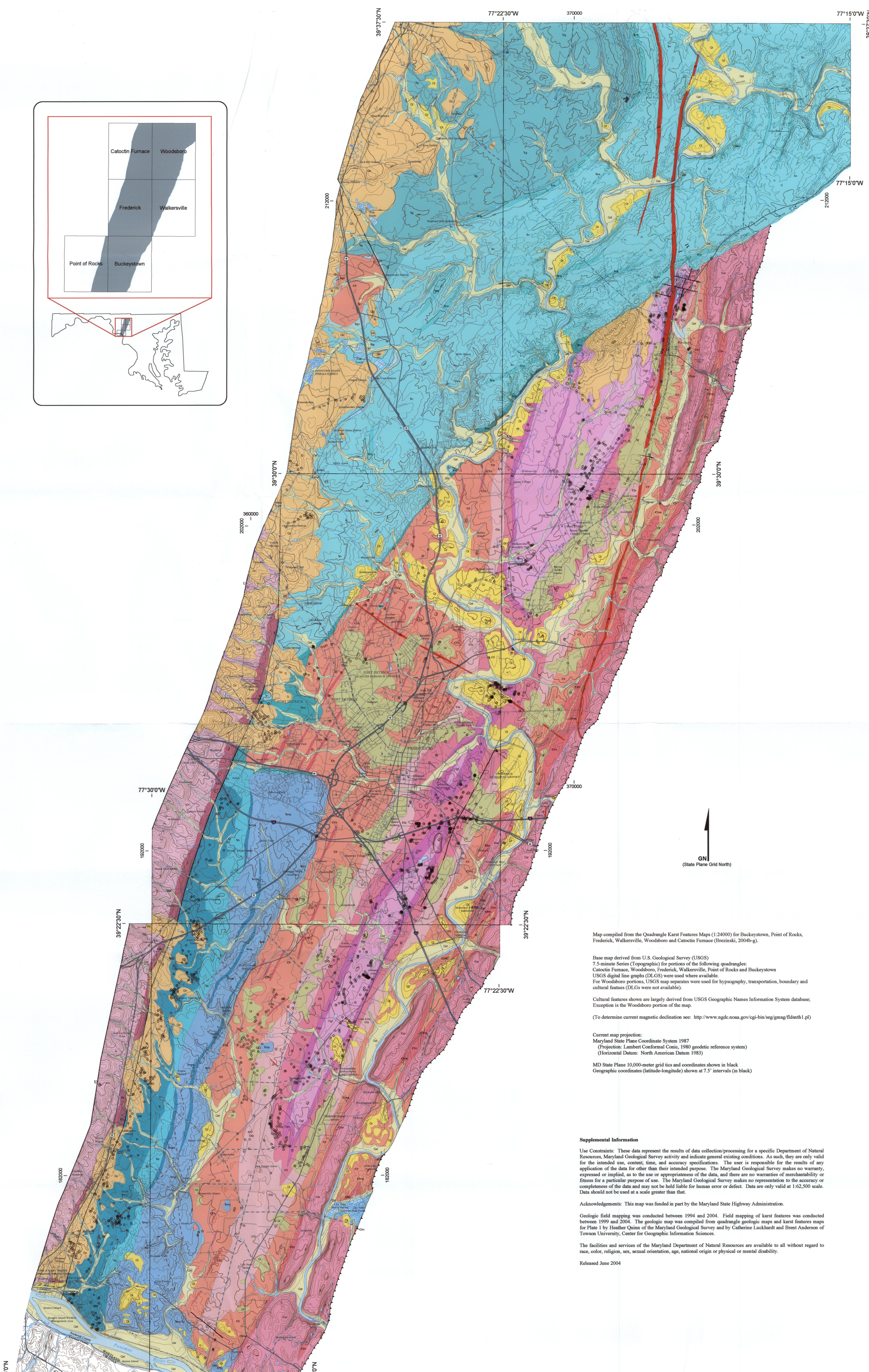
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Map compiled from the Quadrangle Karst Features Maps (1:24,000) for Buckeystown, Point of Rocks, Frederick, Walkersville, Woodshoro and Catoctin Furnace (Brezinski, 2004b-g).

Base map derived from U.S. Geological Survey (USGS) 7.5-minute Series (topographic) for portions of the following quadrangles: Catoctin Furnace, Woodshoro, Frederick, Walkersville, Point of Rocks and Buckeystown. USGS digital line graphs (DLGs) were used where available. For Woodshoro portions, USGS map separates were used for hypsography, transportation, boundary and cultural features (DLGs were not available).

Cultural features shown are largely derived from USGS Geographic Names Information System database. Exception is the Woodshoro portion of the map.

(To determine current magnetic declination see: <http://www.ngs.noaa.gov/cgi-bin/geomag/declm1.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 10,000-meter grid ties and coordinates shown in black (Geographic coordinates (latitude-longitude) shown at 7.5' intervals in black)

Supplemental Information

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

Geologic field mapping was conducted between 1994 and 2004. Field mapping of karst features was conducted between 1999 and 2004. The geologic map was compiled from quadrangle geologic maps and karst features maps for Plate 1 by Heather Quinn of the Maryland Geological Survey and by Catherine Luckhardt and Brent Anderson of Towson University, Center for Geographic Information Sciences.

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Released June 2004

