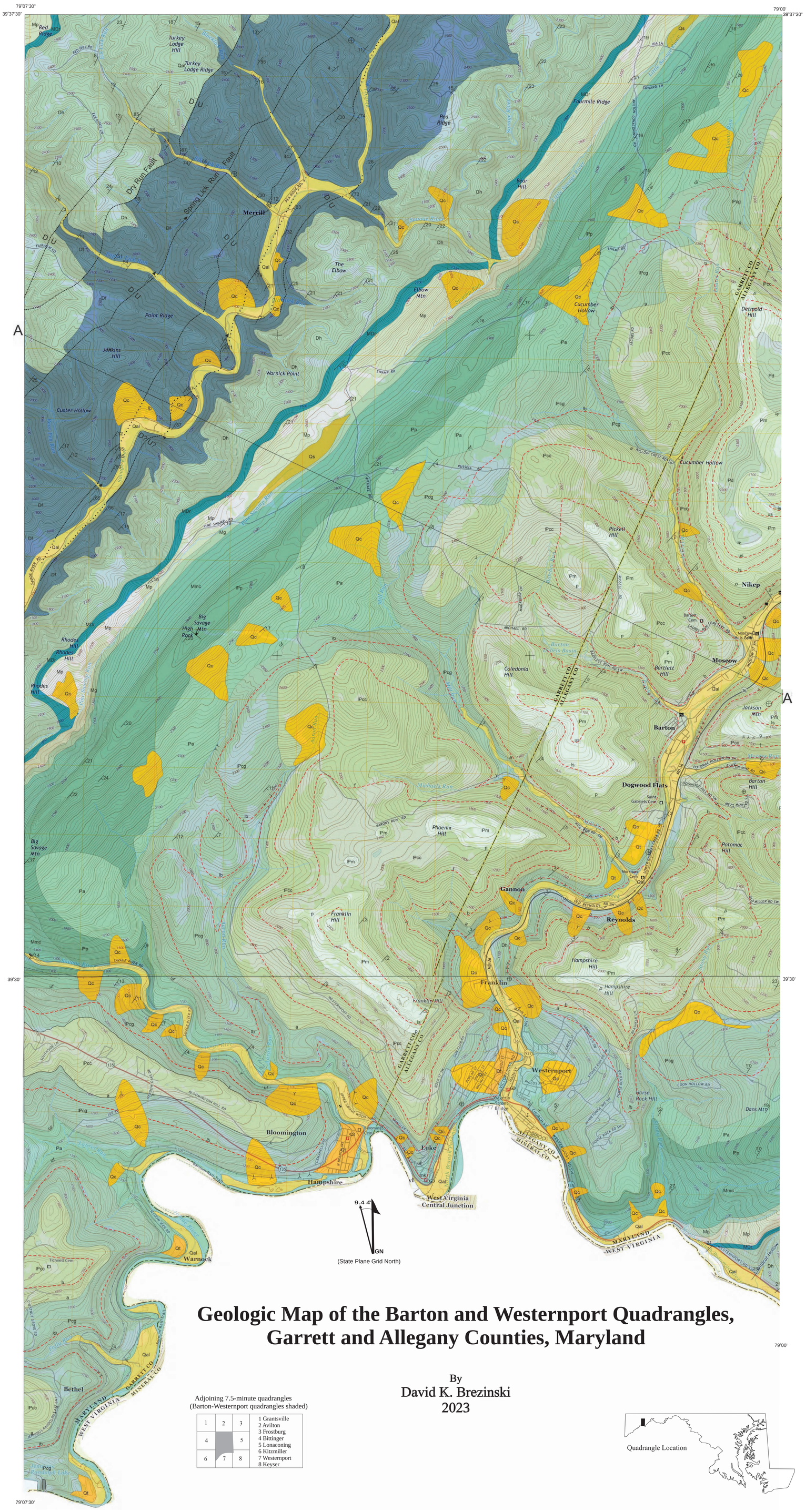

Geologic Map of the Barton and Westernport Quadrangles, Garrett and Allegany Counties, Maryland

By
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Adjoining 7.5-minute quadrangles
(Barton-Westernport quadrangles shaded)

1	2	3	1 Grantsville 2 Avilton 3 Frostburg 4 Bittinger 5 Lonaconing 6 Kitzmiller 7 Westernport 8 Keyser
4		5	
6	7	8	

U.S. Geological Survey (USGS) US Topo 7.5-minute Series
Barton, MD quadrangle, 2014
Westernport, MD, WV quadrangle, 2019
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84)
Geographic coordinates (latitude longitude). Shown near corners
Reported magnetic north declination (center of Barton quadrangle): 9.44°W
To determine current magnetic declination see: (http://www.ngdc.noaa.gov/geomag/declination.shtml)

EXPLANATION

Quaternary

Alluvium
Qal — Pebbles and cobbles in a sandy matrix. Clasts are subrounded to rounded, weathering to a yellowish orange and orange-brown patina. These deposits are present along both modern and relatively recent stream channels, and may have a thick humic component near the top. The thickness of alluvium varies from a thin veneer to more than 30 feet. The thicker accumulations tend to be concentrated where colluvium at the edge of valleys overlaps the alluvium.

Terrace Deposits
Qt — Residual cobbles and boulders in a highly weathered sandy matrix. Clasts are typically tan-weathering, well-rounded, and preserved on low-relief areas elevated above the current Savage and Potomac rivers and Georges Creek.

Swamp Deposits
Qs — Unconsolidated dark gray to black, organic-rich matter to peat. These materials accumulated in poorly drained areas typically underlain by the Greenbrier Formation, and are remnants of late Pleistocene glades and lakes. These sediments are water-logged during parts of the year and are poor agricultural lands. Thickness is typically less than three feet, but may exceed 10 feet near valley walls.

Colluvium/Landslide (undifferentiated)
Qc — Unsorted mass of boulders and cobbles that form on steep slopes overlying and downslope from massive sandstone units. These deposits are largely the result of frost wedging and slow mass movement. Topographically, these accumulations exhibit an irregular upper surface, thin upslope, and rarely have soil cover. Thickness ranges from several feet on steep slopes to more than 50 feet. Landslides consist of coherent masses of bedrock that have been detached and have moved rapidly downhill under the influence of gravity. Many of these features are mapped on LiDAR hillshade imagery. Because some of these deposits intergrade they are not separately identified.

Permian?

Dunkard Formation
Pd — Interbedded, gray siltstone and shale, gray, cross-bedded sandstone, and gray, tan-weathering limestone. Limestones are thin <3.0 feet), argillaceous, and locally contains root casts. They are commonly capped by argillaceous, tan dolomite. Sandstone units are typically are less than 20 feet thick and are lenticular and cross-bedded. This interval in Maryland is interpreted to be equivalent to the Dunkard Group of Pennsylvania and West Virginia based on its stratigraphic interval above the Pittsburgh Coal bed. Its age is questionably Permian to Pennsylvanian. Thickness is estimated to be 100 feet or less in the Barton quadrangle.

Pennsylvanian

Monongahela Formation
Pm (w, us, ls, p) — Interbedded gray shale and siltstone, coals, and thin argillaceous nonmarine limestone. Several thin, lenticular sandstone beds also are present. Mineable coal beds include the Pittsburgh (p) at the base of the formation, directly overlain by the Redstone and then the Lower Sewickley (ls), Upper Sewickley (us), and Waynesburg (w), which lies at the top of the formation. The Monongahela Formation is approximately 250 feet thick in Maryland (Brezinski, 1988).

Conemaugh Group
Interbedded sandstone, shale, siltstone, and nonmarine limestone. The Conemaugh Group is divided into the Casselman and Glenshaw formations (Flint, 1965), and has an aggregate thickness of between 700 to 800 feet in the Upper Potomac Basin.

Casselman Formation
Pcc (f, b) — Interbedded, tan, medium- to coarse-grained, locally conglomeratic, cross-bedded sandstone, gray to reddish gray mudstone, medium gray, silty shale, and siltstone, and light gray to grayish brown, buff-weathering non-marine limestone. Coal beds of the Casselman Formation mined in the Barton and Westernport quadrangles consist of the Barton [b] and Franklin [f]. The Casselman Formation is approximately 700 feet thick in the Barton and Westernport quadrangles.

Glenshaw Formation
Pcg (a, lb, bc) — Gray, tan-weathering, micaceous, medium- to coarse-grained, cross-bedded sandstone containing abundant coaly plant fragments. Interbedded with gray, reddish gray, and locally reddish brown, silty shale and siltstone are light gray, bioturbated, non-marine limestone and brittle, dark gray, fossiliferous, marine shale. The base of the Glenshaw Formation is placed at the top of the Upper Freeport coal bed; and the top of the formation is considered to be at the top of the Ames marine shale and coal [a]. Marginal marine intervals are underlain by mined coal beds; these are the Brush Creek [bc], Lower Bakerstown [lb], and Ames [a] coals. The Glenshaw Formation is approximately 350 feet thick.

Allegheny Formation
Pa (uf, mk, uk) — Interbedded, medium to dark gray shale and siltstone, and tan to light gray, coarse-grained, cross-bedded sandstone, with thin, light gray claystones. The top of the formation is at the top of the Upper Freeport [uf] coal bed, and the base of the formation is the top of the white, massive, conglomeratic, Homewood Member of the underlying Pottsville Formation. The Middle Kittanning [mk] and Upper Kittanning [uk] coal beds are locally mined. The Allegheny Formation is between 200 and 250 feet thick.

Pottsville Formation
Pp — Tan to light grayish brown, medium- to coarse-grained, cross-bedded sandstone and conglomeratic sandstone with abundant coaly plant fragments and thin intervals of dark gray, coaly shale, siltstone, or coal beds. The massive, pebbly to granular, light gray, highly cross-bedded Homewood Sandstone forms a resistant, mappable layer at the top of the formation. Total thickness for the unit is 200 to 250 feet.

Mississippian

Mauch Chunk Formation
Mmc — Interbedded, reddish brown shale, variegated mudstone and siltstone, and reddish brown to greenish gray, medium-grained, micaceous sandstone. Sandstone intervals are lenticular, cross-bedded, exhibit sharp bases, and fine upsection. Several thin, greenish gray, marine calcareous shale to argillaceous limestone units are present near the base of the formation. The Mauch Chunk Formation is approximately 400 feet in thickness in the Barton and Westernport quadrangles.

Greenbrier Formation
Mg — Interbedded, gray to reddish brown, calcareous sandstone, fossiliferous and variegated shale, and fossiliferous limestone. The Greenbrier Formation is subdivided into four members in Maryland (Brezinski, 1989), but are not mapped separately. The basal unit is a light gray, highly cross-bedded, sandy limestone known as the Loyalhanna Member. The Loyalhanna Member is overlain by a thin, Deer Valley Member, a medium-bedded, greenish gray limestone. Above the Deer Valley the Savage Dam Member consists of interbedded, reddish, fossiliferous mudstone, and white to tan and reddish brown, fine-grained sandstone, and reddish brown siltstone and variegated shale. This part of the formation is known as the. The Savage Dam Member is overlain by thin- to medium-bedded, light to medium gray, argillaceous, fossiliferous limestone known as the Wymps Gap Member. The Greenbrier Formation is 150 to 200 feet thick in Garrett County, Maryland.

Purslane Formation
Mp — Tan to light gray, cross-bedded, coarse-grained sandstone to pebbly conglomerate near the base and reddish brown, argillaceous, cross-bedded sandstone at the top of the formation. Thin beds of gray shale and coaly shale are locally interbedded with the sandstone intervals. The Purslane Formation is 250 to 350 feet thick in southern Garrett County.

Devonian

Rockwell Formation
MDr — Interbedded, greenish gray, tan-weathering, argillaceous, bioturbated sandstone, and reddish gray to gray, coaly siltstone and shale. The greenish gray bioturbated sandstones at the base of the formation (Oswayo Member) are locally interbedded with the reddish strata of the upper Hampshire Formation. These basal marine strata are overlain by light gray to tan, thin- to medium-bedded, cross-bedded, lenticular sandstone, and rooted, gray mudstone. The top of the formation consists of well-sorted, burrowed, locally fossiliferous, buff sandstone of the Riddlesburg Member. The Rockwell Formation is between 150 to 200 feet thick in the Barton and Westernport quadrangles.

Hampshire Formation
Dh — Interbedded, reddish brown to reddish gray and brownish red, locally greenish gray, cross-bedded, flaggy, and platy bedded, upward-fining, lenticular sandstone, and reddish brown, rooted, micaceous siltstone, shale, and red-brown to variegated claystone. The Hampshire Formation ranges from approximately 1,600 to 2,000 feet thick in Garrett County.

Foreknobs Formation
Df — Interbedded, olive gray, tan-weathering, medium- to coarse-grained, cross-bedded, bioturbated sandstone and greenish gray to dusky red, fossiliferous shale and siltstone. Top of the formation is mapped at the top of the medium- to thick-bedded, cross-bedded, light gray to white (>30 feet) sandstone considered equivalent to the Pound Sandstone Member of the Valley and Ridge Province. The Foreknobs Formation is approximately 1,500 feet thick in Garrett County.

References Cited

Brezinski, D.K., 1988. Geologic map of the Avilton and Frostburg Quadrangles, Allegany and Garrett Counties, Maryland. Maryland Geological Survey Geologic Map, scale 1:24,000.

Brezinski, D.K., 1989. The Mississippian of Maryland. Maryland Geological Survey Report of Investigations 52, 65 p.

Flint, N.K., 1965. Geology of southern Somerset County, Pennsylvania. Pennsylvania Geological Survey (4th Series) County Report 56A, 267 p.

Explanation of Map Symbols

Contacts
- Geologic contacts; definite and approximate (dotted where concealed)

Planar Features
- Inclined bedding strike and degree of dip shown
- Horizontal bedding
- Contorted/highly folded strata (plunge direction shown)
- Inclined joint strike and degree of dip shown
- Vertical joint strike shown

Transportation
- Primary route, class 1 (divided lanes)
- Number route, class 1 (undivided)
- Light duty road or street, class 3
- Railroad

Faults
- Fault; approximately located. D refers to down thrown side, U to the up thrown side.

Coal Beds
- Projected outcrop trace of coal bed
- Mine prospect/adit

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

Hydrography
- Stream
- Spring
- Water body (eg. lakes, ponds, rivers)

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