

GEOLOGIC UNITS AND OUTCROP MAP

STRUCTURE MAP



Description of Map Units

(Not necessarily in stratigraphic order; minerals listed in order of increasing abundance)

- Kb** Cratonaceous Intrusive Rocks
- Kd** Fine- to medium-grained, camptonitic dike with intrusive breccia including partially resorbed inclusions of the Mount Holy Complex
- Kdi** Fine-grained, camptonitic or diabase dikes
- Ks** Fine-grained to aphanitic, yellow-brown weathering syenitic dikes
- Si** Syenite
- Ma** Metasedimentary rocks of the Vermont Valley Sequence
- Ma** Isotone Formation (Middle and Upper Ordovician?)
- Oi** Black, fine-grained, carbonaceous to graphitic quartz phyllite
- Oj** Dark gray to black, fine-grained limestone, having black phyllitic partings
- Os** Shelburne Marble (Lower Ordovician)
- Oss** Light-gray to medium- to dark-blue-gray, thinly layered calcite marble
- Ost** Gray- to tan-weathering, thinly bedded quartzite, dolomite quartzite
- Cosp** Clarendon Springs Dolomite (Upper Cambrian)
- Cow** Steel-gray to dark-gray, massive to very fissile, calcitic dolostone contains beds of highly mottled blue-gray and light-gray bioturbated dolostone
- Cw** Winslow Dolomite (Lower Cambrian)
- Cwq** Highly variegated, dark-gray, gray, yellow-brown and reddish-brown weathering, well-bedded dolostone
- Cm** Quartzite, feldspathic quartzite and punky-weathering dolomitic quartzite
- Cd** Monkton Quartzite (Lower Cambrian)
- Cdb** Mainly, light-gray, siliceous dolostone, and thin bedded, highly cross bedded quartzite and dolomitic quartzite that weathers to a deep-brown porous rhind
- Cd** Durham Dolomite (Lower Cambrian)
- Cdb** Medium- to dark gray, and light-gray, massive dolostone, containing autoclastic fragments and blocks as much as 1 m in diameter, in beds up to 5 m thick
- Cdb** Mappable sedimentary breccia beds of Cd
- Cdb** Beds of very dark-gray, fissile and spheroidally weathering dolostone
- Cc** Cheshire Quartzite (Lower Cambrian)
- Cc** Massive, white- to pale-tan weathering, vitreous quartzite
- Czba** Dalton Formation (Late Proterozoic and Lower Cambrian)
- Czbd** Dark gray to black quartz-phyllite, well-laminated phyllite, carbonaceous quartzite and metasilstone
- Czdd** Beige- to orange-tan-weathering dolostone and siliceous dolostone in beds 1 to 3 m thick
- Czde** Light-tan to gray, thinly bedded, muscovitic quartzite and plagioclase-muscovite feldspathic quartzite
- Czdf** Dark-gray to black, impure feldspathic quartzite and quartz wacke
- Czdg** A heterogeneous unit consisting of pale-green, lustrous magnetite-chlorite-muscovite-quartz phyllite, generally gray- to gray-weathering chloritic to biotite-magnetite-albite-quartz granofels and medium-dark gray quartz-pegmatite wacke or grit
- Czd** Tan-to-gray-weathering, feldspathic quartzite, granofels and biotite-muscovite feldspathic schist (Dalton Formation undivided)
- Czdc** Gray biotite-albite-quartz-pegmatite and quartz-cobble conglomeratic granofels and quartzite
- Yp** Mount Holy Complex (Middle Proterozoic)
- Yp** Intrusive and migmatitic or metasedimentary rocks
- Yp** Muscovite-biotite granite pegmatite
- Yq** White, albite-rich, microcline-quartz spilitic gneiss
- Yq** Gray to pinkish gray, biotite-plagioclase-microcline-quartz gneiss, commonly contains abundant clinoclase or epidote
- Yq** Light gray to pinkish-gray, medium- to coarse-grained, microcline-plagioclase-quartz-magnetite gneiss, grades into well-layered migmatitic gneiss having 1- to 5-cm layers of plagioclase-rich pegmatite gneiss, greenish gray actinolite-chlorite-plagioclase (albite + epidote) granofelsic gneiss
- Ym** Light gray to pinkish gray weathering, massive to indistinctly layered, biotite-microcline-plagioclase migmatitic gneiss
- Yp** Paragneiss
- Yb** Varies from light gray to gray and white layered gneiss, has interbedded amphibolite, hornblende-plagioclase quartz gneiss, epidote-quartzite, marble and calc-alicite rocks
- Ybb** Very dark-gray biotite-rich gneiss, epidote-biotite gneiss and more massive magnetite-biotite-plagioclase-quartz gneiss
- Ya** Dark gray-green, amphibolite, hornblende-plagioclase-quartz amphibolite and fine-grained, highly jointed hornblende-garnet amphibolite
- Yng** Medium gray, hornblende- and biotite-spotted, biotite-hornblende-plagioclase and quartz-plagioclase gneiss
- Yca** Calc-alicite rock, includes massive, dark-green to pale-green hornblende-dioptase rock, white coarse-grained calcite-ophiolite marble, beige weathering plagioclase-dolomite-silicite marble, and diopside-epidote marble and graphite-calcite marble
- Ydm** Coarse-grained gray, dolomitic marble and fine-grained beige weathering dolomite-ophiolite marble
- Ym** Mainly white to gray well-layered, graphite-calcite marble, may contain accessory diopside and/or hornblende
- Yn** Gray- to tan-weathering, vitreous muscovite-tourmaline quartzite, chlorite-spotted (after garnet) and garnet bearing quartzite
- Ypg** Massive, coarse-grained, light gray, biotite-microcline-quartz plagioclase-megacrystic gneiss
- Ys** Light gray to greenish gray, chlorite-muscovite quartz schist, interbedded quartzite, chlorite-muscovite quartz schist, phyllitic near thrust faults
- Yws** Wilcox Formation (Middle Proterozoic)
- Yws** Predominantly rusty-gray-brown, lustrous phyllite, containing layers of chlorite or biotite spotted feldspathic schist, garnet-bearing quartzite and light gray magnetite-chlorite-muscovite-quartz schist
- Ywgs** Schist similar to Yws above but containing abundant clots of chlorite pseudomorphs after garnet and biotite, minor relic garnet
- Ywca** Hornblende-dioptase rock, interbedded calcite-dioptase marble identical to Yca unit mapped outside the Wilcox Formation
- Ywc** Yellow-gray to tan, feldspathic quartzite, garnet quartzite and tourmaline-muscovite quartzite

Explanation of Map Symbols

- C** Contacts
- O** Outcrop (areas of exposed bedrock examined in this study)
- T** Thrust fault, teeth on upper plate
- U/D** High angle fault; U = up and D = down, arrows show lateral offset
- I** Inclined joint (Dip values not plotted, but in database)
- V** Vertical joint
- F** Foliation form-line (number and triangle shows point of observation)
- 70** Strike and dip of inclined foliation
- 90** Strike and dip of vertical foliation
- 110** Cleavage
- 110** Strike and dip of inclined cleavage
- 110** Strike and dip of vertical cleavage

* On this map the local terminology for the Mendon Formation used in the Chittenden Quadrangle (Ratcliffe, 1977; 1978) has been abandoned in favor of the Dalton Formation; the change in nomenclature is arbitrary and occurs at the northern boundary of the quadrangle. Colors used in the two quadrangles agree, and indicate the equivalence of unit designations. In general, basal units of the Dalton Formation, CZde, CZdmt grade into units typical of the Kickwack Member of Mendon of the Chittenden Quadrangle, and feldspathic quartzites as schists of the Dalton Formation equate generally with similar rock in the Moosalamoo Member of the Mendon Formation to the north.

This plate is a paper representation of the digital bedrock geologic information of the Rutland quadrangle located in Rutland County, Vermont. The bedrock geologic data were digitally compiled on a personal computer using PC ARC/INFO version 3.5.1 by Environmental Systems Research Institute, Inc. The report represents new mappings and corrections to some data from Ratcliffe (1984). The data shown on the geologic units and outcrop map were exported to ARC/INFO version 3.0 where color codes and patterns were generated, and facilities were drawn using symbols from a dataset (alwgnr) from ALACARTE software (Fitzgibbon and Wentworth, 1991). The compilation procedures discussed in Walsh and others (1994) were used in the preparation of this report, with the exception of the topography. The topography was obtained from a photographic negative sequence of contour lines from the Rutland (1981 edition) U.S. G.S. 7.5 topographic quadrangle. The negative was scanned on an Anapack Eagle 4500 11 raster-format scanner. The raster image was vectorized using GTX DSR Contour version 2.00 by GTX Corporation, Inc. and converted into an unattributed line coverage in ARC/INFO version 7.1.

This report and reference number 2 provide the complete geologic information for this area.

1. Fitzgibbon, T. T., and Wentworth, C. M., 1991, ALACARTE user interface, ARC code and demonstration manual, Version 1.0, U.S. Geological Survey Open-File Report 91-887.
2. Ratcliffe, N. M., 1984, The Wilcox Formation of Vermont assigned to the Mount Holy Complex, in *Stratigraphic Notes*, 1982, U.S. Geological Survey Bulletin 2050, p.11-18.
3. Walsh, C. J., Ratcliffe, N. M., Dudley, J. B., and Merrifield, T., 1994, Digital bedrock geologic map of the Mount Holy and Ludlow quadrangles, Vermont, and explanation of the bedrock geologic database in the Vermont Geographic Information System: U.S. Geological Survey Open-File Report 94-229, scale 1:24000.
4. Ratcliffe, N. M., 1987A, Preliminary bedrock geologic map of the Chittenden Quadrangle, Rutland County, Vermont: U.S. Geological Survey Open-File Report, 87-703, scale 1:24000.
5. Ratcliffe, N. M., 1987A and B, Digital and Preliminary bedrock geologic map of the Chittenden Quadrangle, Rutland County, Vermont: U.S. Geological Survey Open-File Report, 87-854A and B, scale 1:24000.

This report is preliminary and has not been reviewed for accuracy. Use of trade names or product names is for identification only and does not imply endorsement by the U.S. Government.

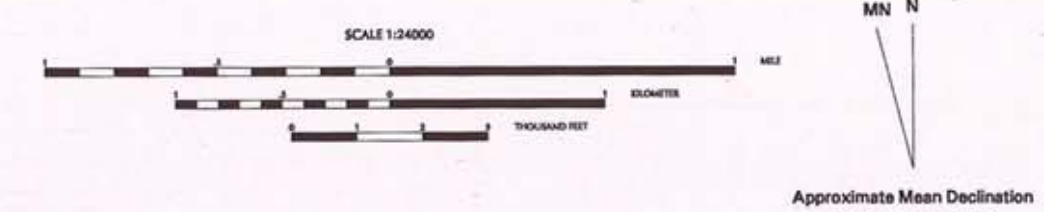
How to use this map and the database part of the Open-File Report: Both parts are available from the Vermont Geological Survey, telephone (802) 241-3800.



Digital and Preliminary Bedrock Geologic Map of the
Rutland Quadrangle, Vermont
by
N.M. Ratcliffe¹
1998

Topography from the Rutland, VT quadrangle (1981 edition)
Contour interval 20 feet
Digital map units in State Plane Coordinate System
National Geodetic Horizontal Datum of 1983
Roads and town boundaries from the Vermont Center for Geographic Information, Inc.

Geology mapped by Ratcliffe in 1982, 1995-1997.
Digitized by Jonathan Kim¹ and Vicki Keegan¹.



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