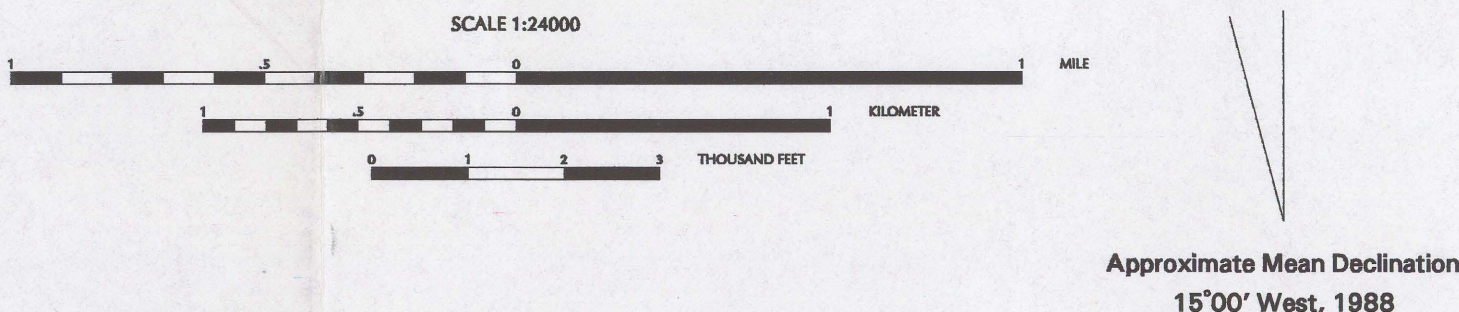


GEOLOGIC UNITS AND OUTCROP MAP



Topography from the Rutland, VT quadrangle (1961 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 1992, 1995-1997.
Digitized by Laura Cadmus*, and Vicki Keegan*.



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STRUCTURE MAP



Description of Map Units

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

- Crataceous Intrusive Rocks**
 - Kb** Fine- to medium-grained, camptonitic dikes with intrusive breccia including partially reabsorbed inclusions of the Mount Holy Complex
 - Kd** Fine-grained, camptonitic or diabase dikes
 - Kfd** Fine-grained to aphanitic, yellow-brown weathering syenitic dikes
 - Ks** Syenite
- Metasedimentary rocks of the Vermont Valley Sequence**
 - Oi** Black, fine-grained, carbonaceous to graphitic quartz phyllite
 - Oi** Dark-gray to black, fine-grained limestone, having black phyllitic partings
- Shelburne Marble (Lower Ordovician)**
 - Os** Light-gray to medium- to dark-blue-gray, thinly layered calcite marble
 - Oas** Gray- to tan-weathering, thinly bedded quartzite, dolomite quartzite
- Clarendon Springs Dolomite (Upper Cambrian)**
 - Ccsp** Steel-gray to dark-gray, massive to very fissile, calcitic dolomite contains beds of highly mottled blue-gray and light-gray bioturbated dolomite
- Winoski Dolomite (Lower Cambrian)**
 - Cw** Highly variegated, dark-gray, gray, yellow-brown and reddish-brown weathering, well bedded dolomite
 - Cwq** Quartzite, feldspathic quartzite and punky-weathering dolomitic quartzite
- Monkton Quartzite (Lower Cambrian)**
 - Cm** Mainly, light gray, siliceous dolomite, and thin bedded, highly cross bedded quartzite and dolomitic quartzite that weathers to a deep-brown porous rind
- Dunham Dolomite (Lower Cambrian)**
 - Cd** Medium- to dark-gray, and light-gray, massive dolomite, containing autoclastic fragments and blocks as much as 1 m in diameter, in beds up to 5 m thick
 - Cdbr** Mappable sedimentary breccia beds of Cd
 - Cdb** Beds of very dark-gray, fissile and spheroidally weathering dolomite
- Cheshire Quartzite (Lower Cambrian)**
 - Cc** Massive, white to pale-tan weathering, vitreous quartzite
- * Dalton Formation (Late Proterozoic and Lower Cambrian)**
 - C2dbs** Dark-gray to black quartz-phyllite, well-laminated phyllitic carbonaceous quartzite and metasilicate
 - C2dd** Beige- to orange-tan-weathering dolomite and siliceous dolomite in beds 1 to 5 m thick
 - C2dq** Light-tan to gray, thinly bedded, muscovitic quartzite and phyllitic-muscovite feldspathic quartzite
 - C2dbq** Dark-gray to black, impure feldspathic quartzite and quartz wackes
 - C2dgmt** A heterogeneous unit consisting of pale-green, lustrous magnetite-chlorite-muscovite-quartz phyllite, greenish-gray, to gray-weathering chloritic to biotite-magnetite-albite-quartz granulites and medium-dark gray quartz-peggite wackes or gneiss
 - C2d** Tan-to-gray-weathering, feldspathic quartzite, granulites and biotite-muscovite feldspathic schist (Dalton Formation undivided)
 - C2dc** Gray biotite-albite-quartz-peggite and quartz-cobble conglomeratic granulites and quartzite
- Mount Holy Complex (Middle Proterozoic)**
 - Yp** Intrusive and migmatitic or metasedimentary rocks
 - Ysp** Muscovite-biotite granite pegmatite
 - Ysp** White, albite-rich, microcline-quartz aplite gneiss
 - Ysp** Gray to pinkish gray, biotite-plagioclase-microcline-quartz gneiss, commonly contains abundant clinzoisite or epidote
 - Ytg** 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 pegmatitic gneiss, greenish gray actinolite-chlorite-plagioclase (albite + epidote) granulite gneiss
 - Ymg** Light-gray to pinkish gray weathering, massive to indistinctly layered, biotite-microcline-plagioclase migmatitic granitic gneiss
- Paragneiss**
 - Ybg** Varies from light-gray to gray and white layered gneiss, has interlayers of amphibolite, hornblende-plagioclase-quartz gneiss, epidote-quartzites, marble and calc-silicate rocks
 - Ybhg** 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 foliated hornblende-garnet
 - Yhg** Medium-gray, hornblende- and biotite-spotted, biotite-hornblende-plagioclase and quartz-plagioclase gneiss
 - Ycs** Calc-silicate rock, includes massive, dark-green to pale-green hornblende-dioctahedral rock, white coarse-grained calcite-phlogopite marble, beige weathering phlogopite-dolomite-talc marble, and diopside-sapolite marble and graphite-calcite marble
 - Ydm** Coarse-grained gray, dolomite marble and fine-grained beige weathering dolomite-phlogopite marble
 - Ym** Mainly white to gray well-layered, graphite-calcite marble, may contain accessory diopside and/or hornblende
 - Yq** 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, a chloritic retrogressed epidote gneiss, phyllitic near thrust faults
- 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-greenish gray magnetite-chlorite-muscovite-quartz schist
 - Ywgc** Schist similar to Yws above but containing abundant clots of chlorite pseudomorphs after garnet and biotite, minor relic garnet
 - Ywsc** Hornblende-dioctahedral rock, interbedded calcite-dioctahedral marble identical to Ycs unit mapped outside the Wilcox Formation
 - Ywq** Yellow-gray to tan, feldspathic quartzite, garnet quartzite and tourmaline-muscovite quartzite

Explanation of Map Symbols

- Contacts**
 - Thrust fault, areas of exposed bedrock examined in this study
 - Thrust fault, teeth on upper plate
 - High angle fault: U = up and D = down, arrows show lateral offset
- Inclined joint (Dip values not plotted, but in database)**
- Vertical joint**
- Foliation term-line (number and triangle shows point of observation)**
 - Strike and dip of inclined foliation
 - Strike and dip of vertical foliation
- Cleavage**
 - Strike and dip of inclined cleavage
 - Strike and dip of vertical cleavage

* On this map the local terminology for the Mendon Formation used in the Citterden Quadrangle (Ratcliffe, 1987a; 1987b) has been abandoned in favor of the Dalton Formation, the change in nomenclature is arbitrary and occurs at the northern boundary of this quadrangle. Colors used in the two quadrangles agree, and indicate the equivalence of units. In general, basal units of the Dalton Formation, C2dc, C2dgmt grade into units typical of the Nickwacket Member of Mendon of the Citterden Quadrangle, and feldspathic quartzites as schists of the Dalton Formation equate generally with similar rock in the Mooseloomie 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 system using PC ARC/INFO version 3.5.1 by Environmental Systems Research Institute, Inc. This report represents new mapping and includes some data from Ratcliffe (1984). The data shown on the geologic units and outcrop map were exported to ARC/INFO version 3.5.1 where solid color fill patterns were generated, and faults were drawn using symbols from a breast (allowing) 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 separate of contour lines from the Rutland (1981 edition) U.S.G.S. 7.5' topographic quadrangle. The negative was scanned on an Anatech Eagle 4080 ET raster-format scanner. The raster image was vectorized using GTX CSB Contour version 2.00 by GTX Corporation, Inc., and converted into an unattributed line coverage in ARC/INFO version 3.5.1.

- 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: AML code and demonstration maps, Version 1.0: U.S. Geological Survey Open-File Report 91-587.
 2. Ratcliffe, N.M., 1994, The Wilcox Formation of Vermont assigned to the Mount Holy Complex, in Stratigraphic Notes, 1992: U.S. Geological Survey Bulletin 2080, p.11-16.
 3. Walsh, G.J., Ratcliffe, N.M., Dudley, J.B., and Merrifield, T., 1994, Digital bedrock geologic map of the Mount Holy and Ludlow quadrangles, Vermont, and geologic map 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 Citterden 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 Citterden 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 conformity with U.S. Geological Survey standards and procedures, and therefore it is not to be used for legal purposes. Any use of trade names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

This plate is part A and the database is part B of this 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

