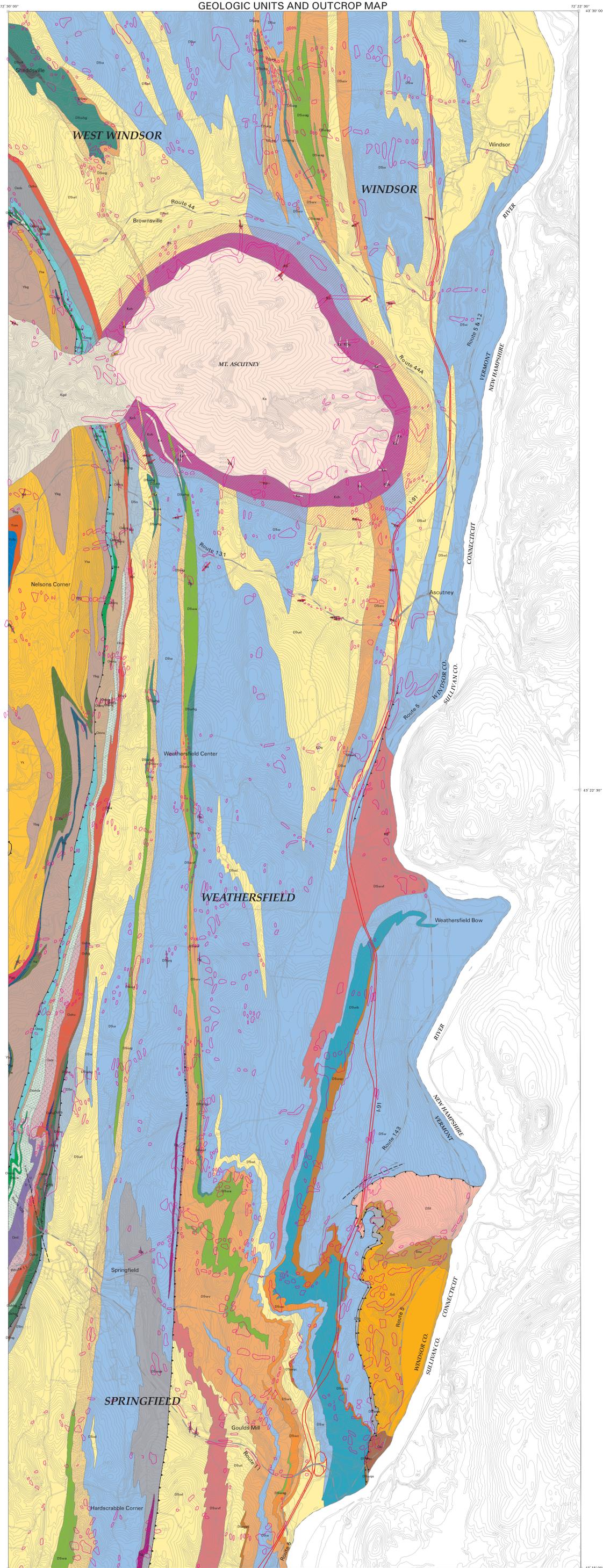


GEOLOGIC UNITS AND OUTCROP MAP



Description of Map Units

(Not necessary in stratigraphic order; materials listed in order of increasing abundance)

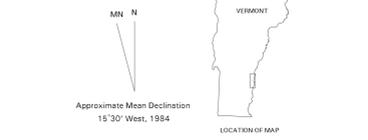
- CRETACEOUS POST-METAMORPHIC INTRUSIVE ROCKS**
 - Kd Lamprophyre, camptonite, or diabasic dikes
 - Kt Trachyte dikes
 - Kfd Spherulitic felsic dike
 - Ks Undifferentiated, medium-grained, hornblende-biotite syenite and lesser granite at Mount Ascutney
 - Kgs Undifferentiated, coarse-grained, hornblende-biotite gabbro and medium to coarse-grained, locally porphyritic, biotite-hornblende diorite at Mount Ascutney
- CRETACEOUS CONTACT METAMORPHIC ROCKS AT MOUNT ASCUTNEY**
 - hmfels Approximate limit of undifferentiated hornfels
 - Kch Cordierite hornfels
- DEVONIAN AND CRETACEOUS LATE-METAMORPHIC TO POST-METAMORPHIC ROCKS**
 - KDq Quartz veins
- DEVONIAN LATE-METAMORPHIC INTRUSIVE ROCKS**
 - Dg Massive to weakly foliated, muscovite-biotite-quartz-microcline-plagioclase granite to granodiorite dikes and sills that cross-cut foliated country rocks
- ROCKS OF THE NEW HAMPSHIRE SEQUENCE**
 - DSf Sulfidic, pyrrhotite-biotite-chlorite-muscovite-plagioclase-quartz granofels and schist, interlayered with massive epizone-quartz-calcite-dolomite marble
 - Scu Silurian Clough Formation
 - Well bedded vitreous quartzite, biotite-chlorite-muscovite-plagioclase-quartz schist, plagioclase-muscovite-garnet-quartz-chlorite schist with garnet porphyroblasts, and discordant horizons of muscovite-plagioclase-quartz polymictic conglomerate near base
 - Sci Massive polymictic conglomerate with chiorite-muscovite-plagioclase-quartz schistose to granular matrix, and horizons of gray carbonaceous sulfidic schist near base
 - Op Oriskany Partridge Formation
 - Rusty to tan-weathering, dark to light-gray, pyrrhotite ilmenite-muscovite-chlorite-plagioclase-quartz + f-garnet + staurolite schist, and minor epidote-chlorite-hornblende-plagioclase amphibolite
 - Silurian and Devonian unnamed schist unit
 - DSb Dark-gray to blackish-gray weathering, finely laminated, carbonaceous, pyrrhotite-plagioclase-chlorite-quartz-muscovite schist and phyllite
- ROCKS OF THE CONNECTICUT VALLEY SEQUENCE**
 - DSwl Dark to light-gray, locally rusty weathering, lustrous, carbonaceous chiorite-muscovite-plagioclase-quartz schist and phyllite with interbedded dark blue-gray, dark brown weathering, siliceous limestone, quartz-rich limy schist, and gray calcareous to non-calcareous quartzite
 - DSw Dark to light-gray, lustrous, carbonaceous chiorite-muscovite-plagioclase-quartz schist and phyllite, locally interbedded with thin gray quartzite, tan to gray feldspathic quartzite, and gritty plagioclase-quartz granofels
 - DSwq Gray quartzite and tan to gray feldspathic quartzite
 - DSwq Dark-gray muscovite-chlorite-plagioclase quartz-rich schist and quartzite
 - DSwb Dark gray to coaly black, fine-grained, carbonaceous, biotite-plagioclase-chlorite-muscovite-quartz schist with brown-colored muscovite porphyroblasts, and light-gray to tan, medium-grained chiorite-muscovite-plagioclase-quartz metagranulite
 - DSwqc Quartz-cobble and cobble conglomerate with ilmenite-chlorite-muscovite-quartz matrix
 - DSwq Dark gray plagioclase-chlorite-muscovite-quartz schist and phyllite with zones of matrix-supported quartzite-pebble, vein-quartz-pebble, and rare metaclastic-pebble conglomerate
 - DSwvf Silurian and Lower Devonian Metavolcanic Rocks of the Waits River Formation
 - Felsic volcanic member - Silvery-green muscovite-quartz-chlorite-plagioclase phyllite to schist; light-gray to whitish pale-green-grained, feldspathic schist and granofels locally with quartz and granofels; massive, fine to medium-grained, feldspathic granofels with quartz and plagioclase porphyroblasts; and gneiss; contains accessory sulfides
 - DSwv Heterogeneous, laminated to layered, green and white, in places rusty-weathering, fine to medium-grained, muscovite + biotite-chlorite-quartz-plagioclase schist; silvery-green, fine to medium-grained, muscovite + biotite-chlorite-quartz-plagioclase schist; gray-green, medium-grained, muscovite + biotite-chlorite-quartz-plagioclase granofels; gray to light-gray, + carbonate - f-garnet-biotite-chlorite-muscovite-quartz-plagioclase granofels with plagioclase and quartz porphyroblasts; greenstone; and silvery gray, rusty weathering calcite-muscovite-chlorite-quartz-plagioclase schist. Contains accessory calcite and ilmenite
 - DSwg Silvery-gray to light-gray, in places rusty weathering, epidote-muscovite-chlorite-garnet-hornblende-quartz-plagioclase schist with distinctive sprays of hornblende and large garnet porphyroblasts
 - DSwa Massive, fine-grained epidote-chlorite-hornblende-plagioclase amphibolite with white plagioclase porphyroblasts
 - DSwg Laminated to massive, epidote-carbonate-actinolite-chlorite-plagioclase greenstone
 - DSwg Medium to very coarse-grained, epidote-chlorite + garnet-hornblende-plagioclase schist with roughly equal percentages of hornblende and plagioclase
 - DSwf Light-gray, tan-weathering, biotite-quartz-plagioclase gneiss, and medium-gray, feldspathic biotite quartzite and granofels
 - Lower Devonian and Silurian Northfield Formation
 - DSn Dark-gray to silvery gray, carbonaceous, fine-grained, muscovite-biotite-plagioclase-quartz schist or phyllite with garnet porphyroblasts
 - DSng Medium to dark-gray to steel-gray-weathering, biotite-plagioclase-quartz granofels, impure quartzite and minor quartz-pebble conglomerate
 - DSnc Light-gray-green to gray-weathering, medium-grained zoisite-magnetite-phyllonitic calc-silicate granofels
 - DSv Silurian and Devonian unnamed amphibolite, quartzite, and volcaniclastic rocks
 - DSca Heterogeneous unit of interbedded rusty, slabby quartz-amphibolite, gray quartzite, feldspathic granofels and biotite schist
 - DSa Slabby quartz-amphibolite
- PRE-SILURIAN COVER SEQUENCE ROCKS**
 - Ochb Dark-gray to dull black-weathering, very fine-grained, siliceous phyllite and phyllitic metasilicite; pale gray-green to steel-gray-weathering, sulfidic, cummingtonite-magnetite-plagioclase-quartz amphibolite, and very rusty, manganeseiferous garnet quartzite and coteculite
 - Ochg Hornblende-plagioclase greenstone
 - Ochng Medium to coarse-grained, garnet-biotite-hornblende-plagioclase-quartz granofels with sprays of large hornblende, biotite amphibolite, and hornblende-garnet amphibolite
 - Ocha Pale gray-brown to whitish tan-weathering, fine-grained, biotite-garnet-muscovite schist and carbonaceous phyllite; dark-gray to slightly rusty weathering siliceous phyllite or schist and quartzite. Locally contains garnet quartzite or coteculite ("c" on map)
 - Ochq Steel-gray to yellow-tan-weathering quartzite and quartz-pebble conglomerate
 - Ochv Heterogeneous unit consisting of well-layered, felsic biotite-hornblende-quartz-plagioclase gneiss, hornblende-biotite-plagioclase amphibolite, hornblende-plagioclase granofels and gneiss, rusty-weathering biotite-muscovite-quartz schist, feldspathic granofels, and coteculite
 - Ortr Oriskany intrusive rocks of the North River Igneous Suite
 - Massive, medium-grained, biotite + f-garnet-quartz-plagioclase tonalitic gneiss
 - Ormor Oriskany Moretown Formation
 - Oml Light-gray to pinkish-gray-weathering, striped, + /-hornblende-biotite-plagioclase-quartz granofels and quartzite
 - Omhfs Light-gray to gray-green, chlorite-muscovite-biotite-plagioclase-quartz schist and granofels with sprays of hornblende and large porphyroblasts of biotite, cordierite, coteculite and greenish light gray biotite-quartz granofels like Oml
 - Omr Dark-gray to rusty-brown-weathering, sulfidic, muscovite-biotite-quartz-plagioclase schist and amphibolite
 - Omsa Rusty-weathering hornblende amphibolite
 - Omb Dark-gray to silvery-gray, garnet-biotite-muscovite-carbonaceous schist, and associated rusty-weathering muscovite-biotite-quartz schist
 - Omg Light-tan-weathering muscovite-biotite-plagioclase quartzite
 - Omg Light-gray to gray-green-weathering, garnet-biotite-chlorite-muscovite-quartz schist and schistose biotite-garnet-plagioclase-quartz granofels
 - Omg Light-green to pale-gray-green, lustrous, chlorite-biotite-muscovite-quartz schist and light gray feldspathic granofels; coarse-grained garnet schist; striped, chlorite-muscovite-plagioclase-quartz schist and granofels; coteculite ("c" on map); and amphibolite
 - Oma Epidote-biotite-hornblende and hornblende-plagioclase amphibolite
- MIDDLE PROTEROZOIC CORE ROCKS OF THE CHESTER DOME**
 - Yt Intrusive Rocks of the Mount Holly Complex
 - Baileys Mills Tonalite Gneiss - Coarse biotite-felsic, medium-grained, biotite-quartz-plagioclase tonalitic gneiss that passes into more leucocratic, biotite tonalitic gneiss
 - Yta Augen gneiss facies of the Baileys Mills Tonalite Gneiss - Very well foliated, mylonitic, biotite tonalite gneiss with plagioclase augen set in a mylonitic biotite-rich matrix
 - Ygg Biotite-quartz-microcline-plagioclase granite to migmatite gneiss
 - Metasedimentary and Metavolcanic Rocks of the Cavendish Formation
 - Ycfs Either rusty-weathering, light to medium-dark gray, white-plagioclase-speckled, biotite-quartz granofels or a biotite-rich porphyroblastic schist with isolated augen of plagioclase set in a phylloitic matrix of biotite, muscovite, epidote, and quartz
 - Ycm Phylloitic calcite-dolomite and quartz-knotted marble, actinolite-rich dolomitic marble, phylloitic-talc(1)-tremolite-dolomite marble; all associated with calc-silicate gneiss and/or actinolite quartzite
 - Other layered gneiss of the Mount Holly Complex
 - Ybg Biotite-quartz-plagioclase + /-epidote gneiss; magnetite-muscovite-biotite-plagioclase-quartz gneiss and hornblende-speckled gneiss; biotite-rich plagioclase-quartz gneiss and epidote quartzite; and albite-speckled biotite-quartz gneiss
 - Ya Biotite-hornblende and hornblende-garnet-plagioclase amphibolite
 - Yrg Rusty muscovite-biotite-plagioclase-quartz schist, schistose quartzite, biotite-garnet quartzite, and rusty sulfidic amphibolite

Explanation of Map Symbols

- Outcrops (areas of exposed bedrock examined in this study)
- Thrust fault, teeth on upper plate
- Shear zone
- High angle fault; U = up and D = down, arrows show lateral offset

This plate is a derivative product and should not serve as the primary source for the complete geologic information for this area; the correct reference should be number 2 below:

1. Fitzgibbon, T.T., and Wentworth, C.M., 1991, ALACARTE user interface: AMI, code and demonstration maps, Version 1.0; U.S. Geological Survey Open-File Report 91-587.
2. Walsh, G.J., Armstrong, T.R., and Ratcliffe, N.M., 1996, Preliminary bedrock geologic map of the Vermont part of the 7.5 x 15 minute Mount Ascutney and Springfield quadrangles, Windsor County, Vermont; U.S. Geological Survey Open-File Report 96-719, scale 1:24,000.
3. Walsh, G.J., Ratcliffe, N.M., Dutley, J.B., and Merfield, T., 1994, Digital bedrock geologic map of the Mount Holly and Ludlow quadrangles, Vermont; U.S. Geological Survey Open-File Report 94-229, scale 1:24,000.



Topography from the Mt. Ascutney, VT-NH 7.5' x 15' quadrangle (1984 edition) and the Springfield, VT-NH 7.5' x 15' quadrangle (1984 edition)
Contour Interval 6 meters
Digital map units in State Plane Coordinate System
National Geodetic Horizontal Datum of 1927
Roads and town boundaries from the Vermont Center for Geographic Information, Inc.



Geology mapped by Walsh, Armstrong, and Ratcliffe in 1994-1996.
Digitized by David Greiner, Gregory Walsh, and Douglas Reddy.

Digital Bedrock Geologic Map of the Vermont Part of the
7.5 x 15 Minute Mount Ascutney and Springfield Quadrangles, Vermont

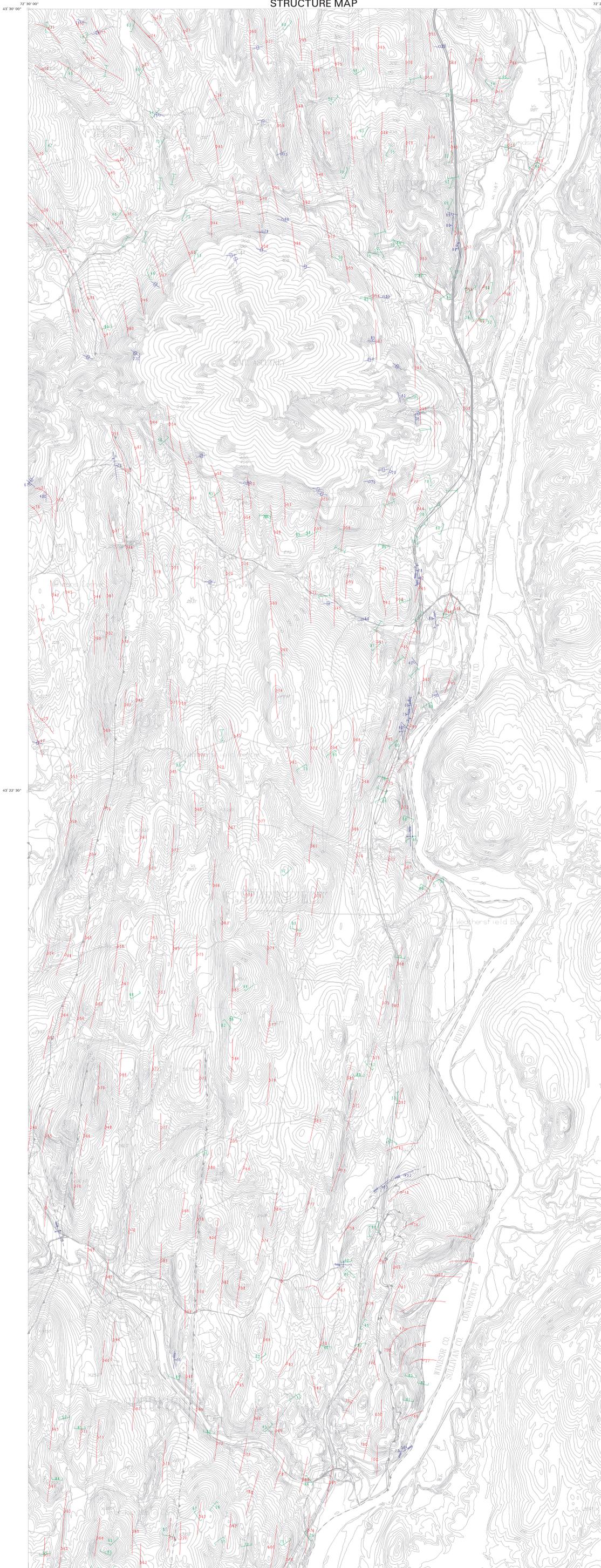
by
G.J. Walsh¹, T.R. Armstrong¹, and N.M. Ratcliffe¹

1996

AFFILIATIONS:
U.S. Geological Survey
Reston, Virginia 20192
Vermont Agency of Natural Resources,
Vermont Geological Survey,
Waterbury, Vermont 05671

This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards and with the North American Stratigraphic Code. Any use of trade names or product names is for identification only and does not constitute an endorsement by the U.S. Government.
This plate is part of a series of digital bedrock geologic maps of Vermont. Both parts are available from the Vermont Geological Survey, telephone (802) 241-3500.

STRUCTURE MAP



Explanation of Map Symbols

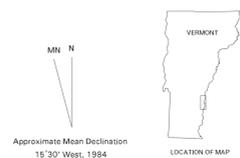
- Foliation
- Strike and dip of inclined foliation on interpretive form-lines
 - Strike and dip of vertical foliation on interpretive form-lines
- Brittle Features
- Relative lateral displacement of brittle fault
 - Relative vertical displacement of brittle fault, U = up and D = down
 - Strike and dip of inclined brittle fault
 - Strike and dip of vertical brittle fault
 - Strike and dip of inclined joint
 - Strike and dip of vertical joint
- Cleavage
- Strike and dip of inclined cleavage
 - Strike and dip of vertical cleavage
- Quarries and Mines
- Location approximate
 - Granite
 - Road Metal
 - Inactive quarry

This is a derivative structure map.
More comprehensive data can be found
in Walsh and others (1996) (see 2 below).

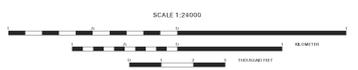
This plate is a paper representation of the digital bedrock geologic information for the Vermont part of the Mount Ascutney and Springfield quadrangles located in Windsor county, Vermont. All of the bedrock geology data were obtained from Walsh and others (1996), and were digitally compiled on a personal computer system using PC ARC/INFO version 3.4.2 by Environmental Systems Research Institute, Inc. The data shown on the geologic units and outcrop map were exported to ARC/INFO version 7.0 where solid color fill patterns were generated, and faults were drawn using symbols from a lineset (alcwcp1) 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 photographic negative separates of contour lines from the Mount Ascutney and Springfield (1984 editions) U.S.G.S. 7.5 x 15 minute topographic quadrangles. The negatives were scanned on an IDEAL FSS 8000 raster-format scanner. The raster image was vectorized using GTX OSR Contour version 2.00 by GTX Corporation, Inc. and converted into an unstructured line coverage in ARC/INFO version 7.0.

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Geology mapped by Walsh, Armstrong, and Ratcliffe in 1994-1996.
Digitized by David Dreher, Gregory Walsh, and Douglas Reedy.

Digital Bedrock Geologic Map of the Vermont Part of the
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This report is preliminary and has not been reviewed for
accuracy, and the U.S. Geological Survey editorial standards
and style cannot be applied to this report. It is intended
only for descriptive purposes only and does not
warrant 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) 241-3608.