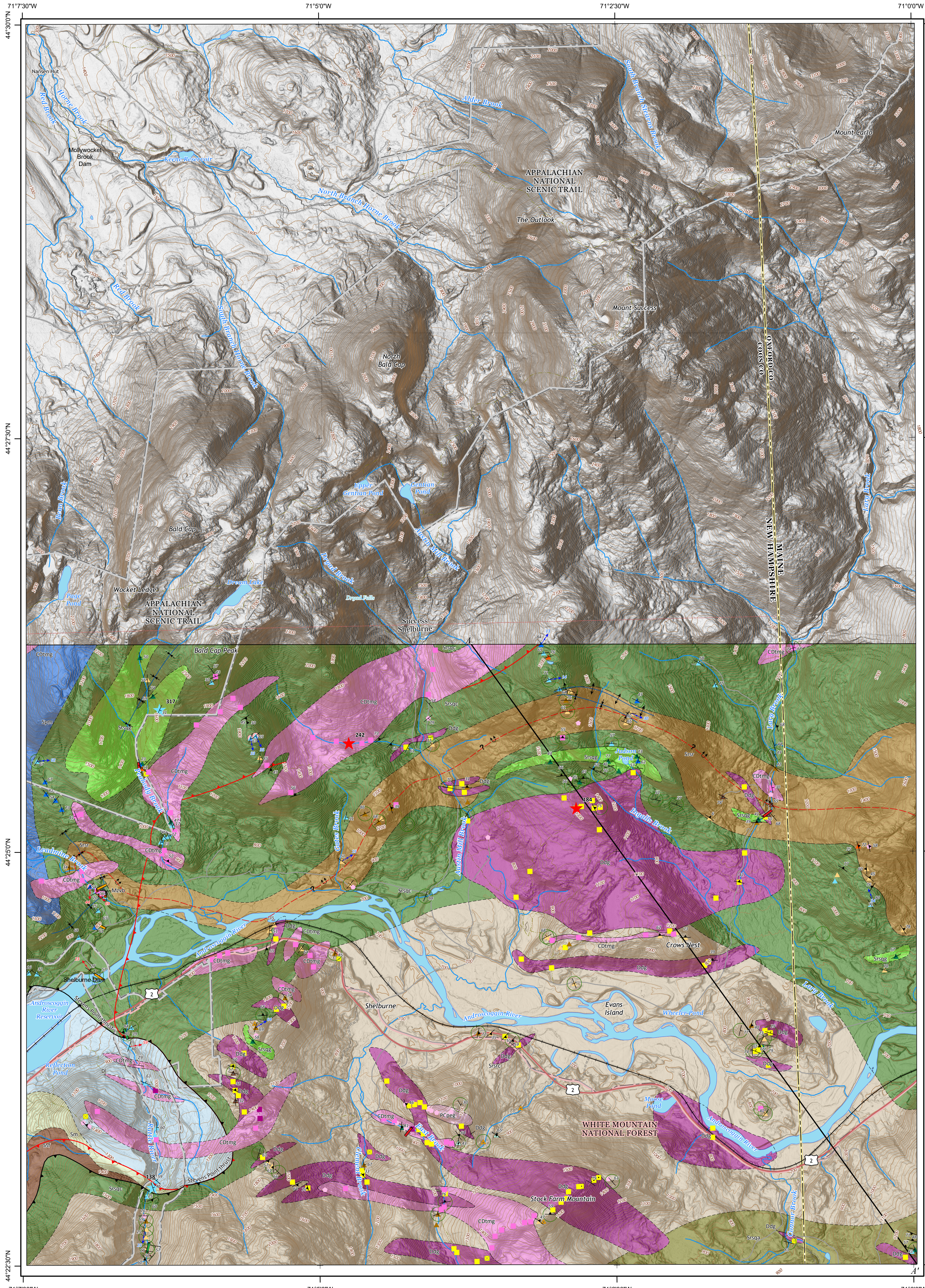


# Bedrock Geologic Map of the Southern Half of the Shelburne 7.5' Quadrangle, New Hampshire, 2022



## DESCRIPTION OF MAP UNITS

### Igneous Rocks

- Basalt dike** – Mesozoic mafic diabase dikes typically .5 to 1 meter in width.
- Granofels dike** – Mesozoic (?) biotite granofels dikes typically .5 to 1 meter in width, identical to mineralogy and appearance of Srsqg (see below) but intrusive. Mesozoic? Remobilized metasedimentary granofels?
- MZvb** – Mesozoic Vent Breccia – 5–10 cm long clasts of porphyritic andesite set in a matrix of pulverized CDtmg (see below) consisting of quartz, feldspar, muscovite, and biotite. One small occurrence in quadrangle on Leadmine Brook.
- PCpeg** – Permian to Carboniferous Pegmatite – Coarse-grained whitish pegmatite with crystals up to 10 cm in dimension. One mappable region on Artist Rock and numerous others too small to map. Mineralogy: potassium feldspar, quartz, plagioclase, muscovite, +/- biotite, +/- tourmaline, +/- garnet.
- CDtmg** – Carboniferous-Devonian Two Mica Granite – Medium-grained whitish granite with distinct flecks of black biotite and clear muscovite and common pegmatite associated with it. Most plutons occur as narrow sills parallel to metasedimentary layering. Mineralogy: potassium feldspar, quartz, plagioclase, muscovite, biotite. Includes subordinate muscovite granite.
- Meta-basalt dike** – Devonian (?) greenish mafic diabase dikes typically .5 to 1 meter in width that are crosscut by PCpeg and CDtmg and intrude into already foliated and migmatized metasedimentary rocks. Devonian?
- Ddg** – Devonian quartz diorite, with lesser diorite and biotite granite – Medium-grained equigranular, "salt-and-pepper" quartz diorite, diorite, and/or biotite granite. Plutons are heterogeneous, most are sills of quartz diorite 1 to 10 meters across with one large pluton near Mt. Cabot. Xenoliths or schlieren of metasedimentary rocks are common. Mineralogy: plagioclase, biotite, quartz.

### Stratified Rocks

- Dl** – Littleton Formation – Well bedded and foliated dark gray coarse schists and light gray fine quartzites of varying thicknesses, with rare garnet cotecule, graded bedding, and coarse muscovite pseudomorphing andalusite and sillimanite. Mineralogy: schist: muscovite, biotite, quartz, sillimanite, plagioclase, garnet; quartzite: quartz, plagioclase, muscovite, biotite.
- Sm** – Madrid Formation – Fine-grained granoblastic medium gray to purple, sometimes calc-silicate bearing granofels with interlayered darker, more biotite-rich granofels, both generally lacking a strong foliation. Mineralogy: quartz, plagioclase, biotite, +/- actinolite, +/- garnet.
- Ssf** – Smalls Falls Formation – Well foliated, interbedded schists and less common quartzites, both weathering to a deep rusty red-brown. Graded bedding is present and layering thickness is generally on the cm-scale. Mineralogy: muscovite, biotite, quartz, plagioclase, pyrrhotite.
- Spm** – Perry Mountain Formation – Light gray quartzites with interbedded but less abundant dark gray schists. Bedding thickness is variable from thinly laminated cm-scale to 10-20 cm layers. Graded bedding is present, rare garnet cotecules, and common coarse muscovite pseudomorphing andalusite and sillimanite. Mineralogy: quartzite: quartz, plagioclase, muscovite, biotite; schist: muscovite, biotite, quartz, sillimanite, plagioclase, garnet.

### Rangeley Formation

- Srsqa** – Interbedded gray schist and quartzite – Dominantly gray mica schist with thin (1-5 cm) quartzite interbeds with minor discontinuous layers of quartz-plagioclase-biotite granofels and calc-silicate granofels (Srsqg, see below for mineralogy). Calc-silicate pods are common throughout the unit. Mineralogy: calc-silicate pods: plagioclase, biotite, grossular, diopside; schist: muscovite, biotite, quartz, sillimanite, plagioclase, garnet; quartzite: quartz, plagioclase, muscovite, biotite.
- Ssrsc** – Red-brown rusty-weathering schist – Red-brown rusty-weathering mica schist with thin (1-5 cm) quartzite interbeds. Minor discontinuous layers of quartz-plagioclase-biotite granofels and calc-silicate granofels (Srsqg, see below for mineralogy) and gray schist. Calc-silicate pods generally less common. Mineralogy: calc-silicate pods: plagioclase, biotite, grossular, diopside; rusty schist: muscovite, biotite, quartz, plagioclase, pyrrhotite; quartzite: quartz, plagioclase, muscovite, biotite.
- Srsqg** – Medium-grained gray granofels and schist – Medium-grained, granoblastic dark gray quartz-plagioclase-biotite granofels, with rare calc-silicate granofels layers and minor gray schist. Mineralogy: quartz, plagioclase, biotite, +/- actinolite, +/- garnet.
- Srsqc** – Interbedded gray schist and quartzite with calc-silicate pods – Heterogeneous unit of variably interbedded gray schist and quartzite (1-5 cm) with four large regions of quartz-plagioclase-biotite granofels (Srsqg, see above for mineralogy). Calc-silicate pods are common throughout the unit. Mineralogy: calc-silicate pods: plagioclase, biotite, grossular, diopside; schist: muscovite, biotite, quartz, sillimanite, plagioclase, garnet; quartzite: quartz, plagioclase, muscovite, biotite.
- Srsr** – Red-brown rusty-weathering mica schist with rare quartzite and granofels – Red-brown rusty-weathering mica schist with rare interbedded quartzite, and minor, discontinuous layers of quartz-plagioclase-biotite granofels (Srsqg, see above for mineralogy). Calc-silicate pods are common throughout the unit. Mineralogy: calc-silicate pods: plagioclase, biotite, grossular, diopside; rusty schist: muscovite, biotite, quartz, plagioclase, pyrrhotite; quartzite: quartz, plagioclase, muscovite, biotite.

## EXPLANATION OF MAP SYMBOLS

- Inclined bedding, showing strike and dip
  - Vertical bedding, showing strike
  - Inclined foliation, showing strike and dip
  - Inclined foliation, showing strike and dip, for stations with multiple measurements
  - Inclined basalt dike, showing strike and dip
  - Vertical basalt dike, showing strike
  - Inclined granofels dike, showing dip
  - Inclined metabasalt dike, showing strike and dip
  - Vertical metabasalt dike, showing strike
  - Migmatite front, teeth on migmatized side (>30% melt)
  - Fold hinge of late fold, showing strike and plunge
  - Fold hinge of F1 fold, showing strike and plunge
  - Axial trace of late syncline
  - Axial trace of late anticline
  - Axial trace of overturned F1 fold, queried
- Contacts**
- Inferred
  - Approximate
  - Accurate
- Faults**
- Stevens point thrust fault
- Geochronologic Samples**
- Zircon U-Pb sample for crystallization age, showing sample number
  - Detrital zircon U-Pb sample for depositional age, showing sample number
- Basemap features**
- US Route
  - Local Road
  - Not Maintained
  - Railroad
  - Lidar Contours (20-foot intervals)
  - Stream
  - Trail
  - Waterbody
  - State Boundary
  - County Boundary
  - Town Boundary
  - Appalachian Trail (National Park Service)
  - Forest Service

## EXPLANATION OF LITHOLOGY SYMBOLS

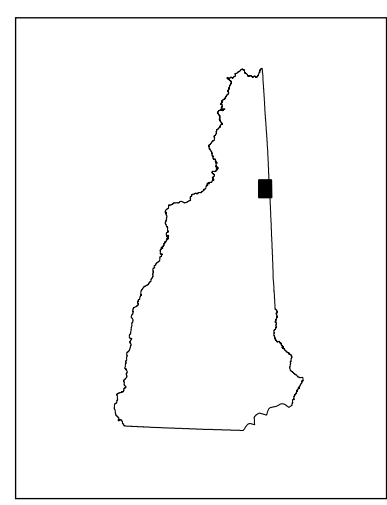
- Biotite granofels
- Calc-silicate pods
- Garnet cotecule
- Gray granofels
- Gray migmatite
- Gray quartzite and schist
- Gray schist and quartzite
- Moderately rusty biotite granofels
- Moderately rusty granofels
- Moderately rusty schist
- Muscovite granofels
- Pegmatite
- Quartz diorite
- Rusty granofels
- Rusty migmatite
- Rusty schist
- Two-mica granite
- Vent

## Brief Bedrock Geologic History of the Shelburne 7.5' Quadrangle, NH

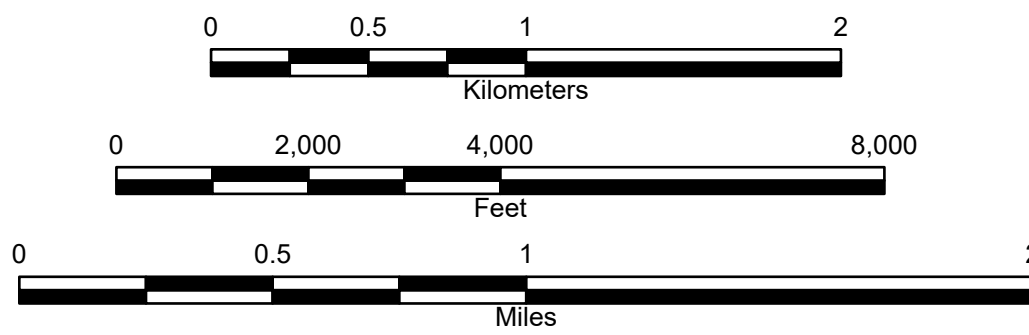
Silurian and Devonian marine sedimentation in the Central Maine Belt in an active tectonic setting, probably a forearc basin, developed first. Deposition is recorded by the Rangeley, Smalls Falls, Madrid, and Littleton Formations. All of these rocks were subsequently deformed and metamorphosed. D1 nappe-stage folding was followed by D2 faulting along the Stevens Point Thrust in the early Devonian Acadian orogeny. D3 folding of the units likely occurred in the Late Acadian or Neocadian Orogeny perhaps coeval with the intrusion of the quartz diorites around 374 Ma, sometime before the end of the Devonian period. Meta-basalt dikes also intruded around this time and may be related to the quartz diorites. Intrusion of the Carboniferous two mica granites and associated pegmatites crystallized around 325 Ma and were likely derived from partial melts of thickened Appalachian crust. Episodes of pegmatite intrusion likely continued from the Carboniferous into the Permian, though radiometric ages are few. Lastly, late mafic and granofels dikes probably developed under tensile stresses in the Jurassic as rifting continued. A more detailed description of the units, ages, geologic history and references can be found in the accompanying companion report.

MILAN	SUCCESS POND	Old Speck Mountain
BERLIN	SHELBURNE	Gilead
CARTER DOVE	WILD RIVER	Speckled Mountain

New Hampshire | Maine

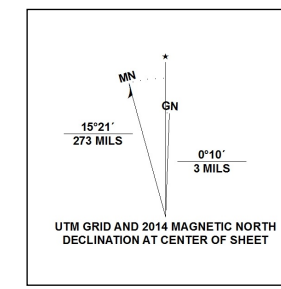


Scale 1:24,000

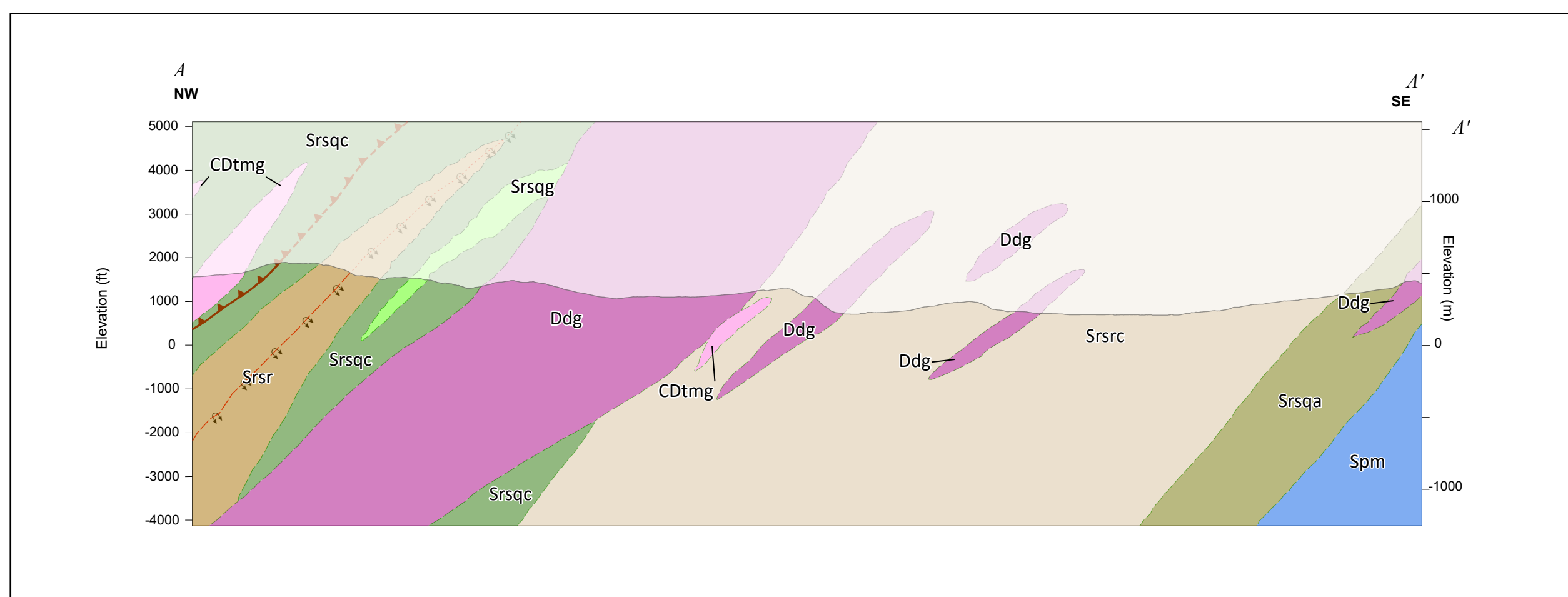


Topographic basemap developed from high resolution (1 meter) LiDAR data (multidirectional hillshade) and The National Map, including National Hydrography Dataset and Geographic Information System (GNIS).

Map Projection: North American Datum 1983 New Hampshire State Plane Feet



## Interpretive Cross Section A - A' (No Vertical Exaggeration)



## Bedrock Geologic map of the Shelburne 7.5' Quadrangle, New Hampshire, 2022

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Bedrock Geologic Map Open-File Series GEO-039-024000-BMOF

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This geologic map was funded in part by the USGS National Cooperative Geologic Mapping Program under StateMap award number #G21AC10863



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