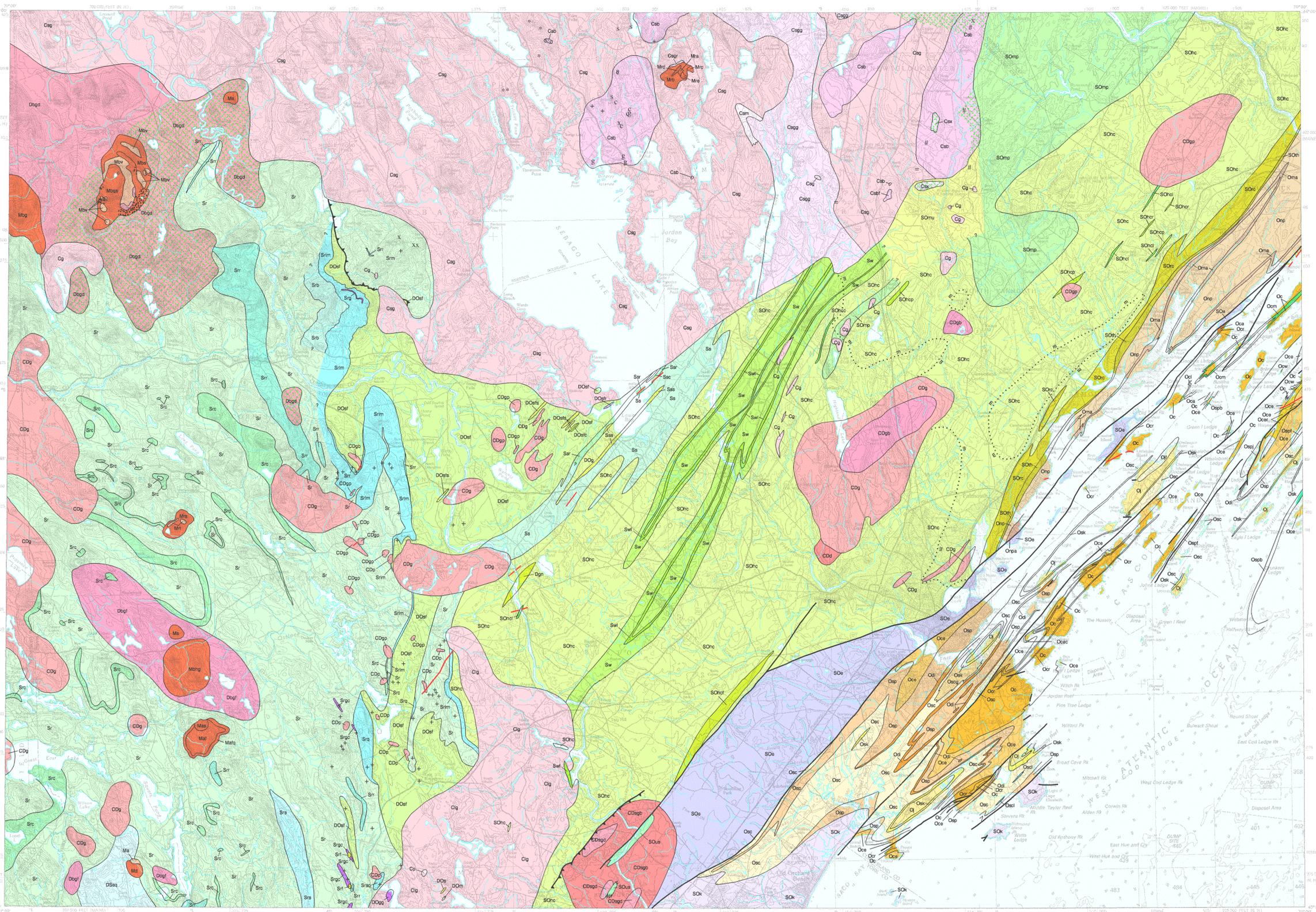


Bedrock Geology of the Portland 1:100,000 Quadrangle, Maine and New Hampshire



Topographic base from U.S. Geological Survey Portland, Maine - New Hampshire 1:100,000-scale metric topographic bathymetric map

Miles (mi) 0 1 2 3 4 5 6 7 8 9 10 11 12

Map Scale 1:100,000

Kilometers (km) 0 2 4 6 8 10 12 14 16 18 20

Contour interval 10 meters. National geodetic vertical datum of 1929. Elevations shown to nearest meter.

INTRUSIVE AND RELATED VOLCANIC ROCKS

- MESOZOIC**
- Randall Mountain Stock**
- Mrt Fragmental trachyte porphyry.
 - Mrs Equigranular to porphyritic biotite-hornblende alkali feldspar syenite.
- Burnt Meadow Mountains Igneous Complex**
- Mbv Volcanic breccia and feldspar porphyry. May include shallow intrusive rocks.
 - Mbs Alkali feldspar syenite. Brown to gray.
 - Mbsq Quartz syenite. Pinkish-tan.
- Acton Stock**
- Ma Dark gray porphyritic and fragmental andesite.
 - Md Medium-grained pyroxene-quartz diorite.
- Rattlesnake Mountain Igneous Complex**
- Mrc Nepheline syenite.
 - Mrd Nepheline-bearing syenite.
 - Mre Fine-grained syenite.
 - Mrf Ferrohastingsite syenite.
 - Mra Biotite-ferrohastingsite syenite.
- Abbott Mountain Stock**
- Mas Light colored syenite.
 - Maf Fayalite-pyroxene syenite.
 - Mafq Fayalite-pyroxene-quartz syenite.
- Other Rocks of the White Mountain Magma Series**
- Ms Fayalite-pyroxene syenite (at Symmes Pond, Boston Hills).
 - Mbs Medium-grained biotite-hornblende granite (at Picket Mountain).
 - Mbr Pink biotite granite. Locally with fine-grained or porphyritic texture (equivalent to the Conway Granite, New Hampshire).
- CARBONIFEROUS**
- Sebago Pluton**
- Csg Muscovite-biotite granite.
 - Csb Biotite granite, non-foliated.
 - Csbf Biotite granite, foliated.
 - Csgg Muscovite-garnet granite.
 - Csx Mixed muscovite-garnet and muscovite-biotite granites.
 - Csm Migmatic muscovite-biotite granite.
 - Csgr Riebeckite-bearing granite (near Rattlesnake Mountain).
- CARBONIFEROUS(?)**
- Lyman Pluton**
- Clg Biotite-muscovite granite and pegmatite.
- Other Plutonic Rocks**
- Cg Granites, mainly muscovite-bearing.
 - Cp Pegmatite, commonly with muscovite, garnet, and black tourmaline.
- CARBONIFEROUS(?) OR DEVONIAN(?)**
- Saco Pluton**
- CDsgh Dark greenish-gray metamorphosed gabbro.
 - CDsgd Hornblende-biotite granodiorite.
- Other Plutonic Rocks**
- CDg Granites, mainly muscovite-bearing.
 - CDgb Biotite granite.
 - CDp Pegmatite, commonly with muscovite, garnet, and black tourmaline.
 - CDg Mixed granite and pegmatite.
 - CDg Dark greenish-gray diorite and gabbro.
- DEVONIAN(?)**
- Dgn Gray gneiss: Foliated biotite-hornblende granodiorite.
 - Dgf Foliated or lineated biotite granite.
 - Dgd Gray biotite granodiorite.

STRATIFIED ROCKS

- Shapleigh Group**
- DSeq Unnamed silvery gray, well bedded sillimanite-garnet-mica schist and quartzite (near Acton).
 - Sr Rindgenere Formation, undifferentiated: Reddish-brown to gray-weathering feldspathic sillimanite-garnet-mica schist and migmatite are most common. Various other types of schist and gneiss occur also.
 - Srr Rusty-weathering schist.
 - Srsm Libby Mountain member: Silvery gray, thin-bedded to medium-bedded sillimanite-garnet-mica schist and quartzite.
 - Ssq Thick-bedded, white quartzite and subordinate quartz-mica schist.
 - Ssq Thin-bedded sillimanite-garnet-mica schist and quartzite.
 - Srs Poorly to moderately well bedded, silvery gray, mica schist and quartzite (near North Alfred).
 - Srb Brown-weathering, feldspathic biotite schist.
 - Srf Muscovite-biotite-feldspar gneiss.
 - Srg Quartz-feldspar-biotite-garnet gneiss.
 - Srg Interfaced calc-silicate gneiss and granular biotite-quartz-feldspar schist. Calcic garnet (grossularite) and vesuvianite are present in some places.
 - Srgs Quartz-feldspar-biotite-garnet gneiss with interfaced calc-silicate gneiss.
 - Ssm Coarse-grained, migmatitic muscovite-biotite-feldspar schist.
- Sebago Lake Sequence**
- DOsf Steep Falls Formation: Quartz-feldspar-biotite gneiss interfaced with variable proportions of diopside-calc-silicate gneiss and thin muscovite schist layers.
 - DOsf Light gray, muscovite-rich schist and gneiss.
 - DOsf Rusty weathering feldspathic schist and dark gray gneiss.
 - DOsf Pale green calc-silicate gneiss.
 - DOg Unnamed biotite-quartz-feldspar gneiss with calc-silicate layers.
 - Ss Standish Formation, undifferentiated: Massive to well layered, gray to rusty-weathering, sillimanite-garnet-mica schist interfaced with feldspathic gneiss.
 - Ssr Rusty-weathering sillimanite-bearing schist, locally migmatitic.
 - Ssa Silvery-gray muscovite-rich schist.
 - Ssc Thinly laminated calc-silicate and biotite-quartz-feldspar gneiss.
- Central Maine Sequence**
- SOmp Unnamed migmatitic muscovite-bearing schist.
 - SOmu Undifferentiated migmatitic schist, gneiss, and granofels.
 - SOus Unnamed massive, brown-weathering, carbonate-rich schist and minor feldspathic granofels.
 - Sw Windham Formation: Massive to thinly bedded biotite-muscovite-garnet-quartz schist. Contains staurolite, kyanite, or sillimanite at appropriate metamorphic grade.
 - Swl Limestone member: Laminated to thinly layered impure marble, calc-silicate gneiss and minor quartzite.
 - SOhc Hutchins Corner Formation: Fluffy, bluish to purplish-gray, biotite-quartz-plagioclase gneiss with thin interbeds of greenish-gray calc-silicate gneiss. When migmatitic, pegmatite layers commonly conform to bedding. May contain minor pelitic schist layers, but not generally in mappable amounts.
 - SOhc Impure marble and calc-silicate rock.
 - SOhc Pelitic schist, gray weathering.
 - SOhc Rusty-weathering schist.
 - SOhc Chalky-weathering, calcareous feldspathic gneiss and granofels. May be metamorphosed volcanic unit.
 - SOhc Diopside-plagioclase calc-silicate gneiss.
 - SOhc Richmond Corner Formation: Garnetiferous quartz-plagioclase-biotite granular schist with minor amphibolite and garnet-quartz-magnetite gneiss.
 - SOhc Torrey Hill Formation: Extremely rusty weathering, sulfidic, graphitic schist.
- Units Isolated within the Lyman Pluton**
- DOm Unnamed migmatitic schist.
 - DOs Unnamed garnet-mica schist.
 - DOg Unnamed garnet granofels and granular schist.
- Falmouth-Brunswick Sequence**
- Ona Mount Ararat Formation: Plagioclase-quartz-biotite schist, amphibolite, and minor impure marble.
 - Onp Nehalem Pond Formation: Light gray, plagioclase-quartz-biotite gneiss with minor amphibolite.
 - Opa Amphibolite.
- Merrimack Group**
- SOc Eliot Formation: Thin-bedded, bluish-gray quartz-plagioclase-biotite gneiss, biotitic phyllite, and calc-silicate gneiss.
 - SOk Kittery Formation: Buff-weathering, thick-bedded quartz-rich aenitic granofels and chlorite-biotite phyllite.

- Central Maine Sequence**
- SOmp Unnamed migmatitic muscovite-bearing schist.
 - SOmu Undifferentiated migmatitic schist, gneiss, and granofels.
 - SOus Unnamed massive, brown-weathering, carbonate-rich schist and minor feldspathic granofels.
 - Sw Windham Formation: Massive to thinly bedded biotite-muscovite-garnet-quartz schist. Contains staurolite, kyanite, or sillimanite at appropriate metamorphic grade.
 - Swl Limestone member: Laminated to thinly layered impure marble, calc-silicate gneiss and minor quartzite.
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 - SOhc Impure marble and calc-silicate rock.
 - SOhc Pelitic schist, gray weathering.
 - SOhc Rusty-weathering schist.
 - SOhc Chalky-weathering, calcareous feldspathic gneiss and granofels. May be metamorphosed volcanic unit.
 - SOhc Diopside-plagioclase calc-silicate gneiss.
 - SOhc Richmond Corner Formation: Garnetiferous quartz-plagioclase-biotite granular schist with minor amphibolite and garnet-quartz-magnetite gneiss.
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- Units Isolated within the Lyman Pluton**
- DOm Unnamed migmatitic schist.
 - DOs Unnamed garnet-mica schist.
 - DOg Unnamed garnet granofels and granular schist.
- Falmouth-Brunswick Sequence**
- Ona Mount Ararat Formation: Plagioclase-quartz-biotite schist, amphibolite, and minor impure marble.
 - Onp Nehalem Pond Formation: Light gray, plagioclase-quartz-biotite gneiss with minor amphibolite.
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- Merrimack Group**
- SOc Eliot Formation: Thin-bedded, bluish-gray quartz-plagioclase-biotite gneiss, biotitic phyllite, and calc-silicate gneiss.
 - SOk Kittery Formation: Buff-weathering, thick-bedded quartz-rich aenitic granofels and chlorite-biotite phyllite.

- Casco Bay Group**
- Ospj Spring Point to Jewell Formations, undifferentiated.
 - Oj Jewell Formation: Light gray to dark gray muscovite-biotite-garnet phyllite to schist, locally carbonaceous or rusty-weathering. (Lithologically like the Scarborough Formation.)
 - Ojf Brownish-gray, chalky-weathering, quartz-biotite phyllite.
 - Osk Spurwink Metalmestone: Fine-grained, metamorphosed limestone with thin interbeds of calcareous quartz-biotite phyllite. Contorted.
 - Osc Scarborough Formation: Light gray to dark gray muscovite-biotite-garnet phyllite to schist, locally carbonaceous or rusty-weathering. (Lithologically like the Jewell Formation.)
 - Oscf Thin-bedded, fine-grained metamorphosed limestone and biotite phyllite.
 - Oscg Greenish-gray quartz-plagioclase-chlorite-biotite-garnet phyllite.
 - Odi Diamond Island Formation: Black, rusty-weathering, quartz-muscovite-graphitic pyrite phyllite.
 - Osp Spring Point Formation: Greenish-gray plagioclase-quartz-biotite +/- chlorite +/- amphibole phyllite, schist, and gneiss representing metamorphosed volcanic tuffs and flows.
 - Ospf Quartz-plagioclase +/- biotite +/- muscovite granofels.
 - Ospb Dark gray amphibolite, locally containing garnet.
 - Oce Cape Elizabeth Formation: Thin-bedded quartz-plagioclase-biotite-muscovite schist and granofels.
 - Ocar Rusty-weathering muscovite-biotite-garnet-staurolite schist and phyllite.
 - Ocsq Quartzose plagioclase-biotite phyllite with garnet-rich granofels (cotecite) beds. (On western House Island, Casco Bay.)
 - Oc Cushing Formation: Medium-gray to light-gray, massive to thin-bedded, quartz-feldspar-biotite gneiss and subordinate schists representing metamorphosed pyroclastic volcanics and volcanogenic sediments. Includes varieties with garnet, hornblende, or relict blue quartz phenocrysts fragments.
 - Ocr Rusty-weathering, fine-grained, plagioclase-quartz-muscovite schist.
 - Ocw Wilson Cove Member: Very sulfidic, rusty-weathering rocks, including garnet-biotite-amphibole gneiss and quartz-muscovite schist.
 - Ocl Impure marble.
 - Oca Amphibolite with minor calc-silicate gneiss and impure marble.
 - Ocm Merepoint Member: Sulfidic quartz-plagioclase-muscovite-biotite schist.

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- EXPLANATION OF SYMBOLS**
- Mesozoic Intrusions**
- Basalt or diabase dike.
- Isolated Paleozoic Intrusions**
- Pegmatite.
 - Aplitite.
 - Muscovite-biotite granite.
 - Garnet-bearing granite.
 - Foliated biotite granite.
- Isolated Paleozoic Metamorphic Occurrences**
- Schist.
 - Calc-silicate rock.
 - Quartz-feldspar-biotite granofels.
- EXPLANATION OF PATTERNS**
- Intrusive rock mixed with abundant metamorphic rock.
 - Syenite with porphyritic texture.
- EXPLANATION OF LINES**
- Approximate migmatite boundary. Separates moderately to strongly migmatitic rocks from weakly or non-migmatitic rocks. "m" toward the migmatitic side. Applies only to stratified rocks in the northeast part of the map. Migmatitic rocks to the west are not delineated separately.
 - Intrusive or stratigraphic contact. Location inferred from nearest mapped bedrock exposures. Inferred where not mapped.
 - Fault, interpreted as a thrust fault. Offset inferred from deformed rock features, mainly ductile fabrics, or from apparently discordant structural or stratigraphic features. Probably of Paleozoic age.
 - Fault, interpreted as a high-angle fault. Offset inferred from deformed rock features, mainly brittle fabrics, or from apparently discordant structural, metamorphic, or stratigraphic features. Of Paleozoic(?) to Mesozoic age.