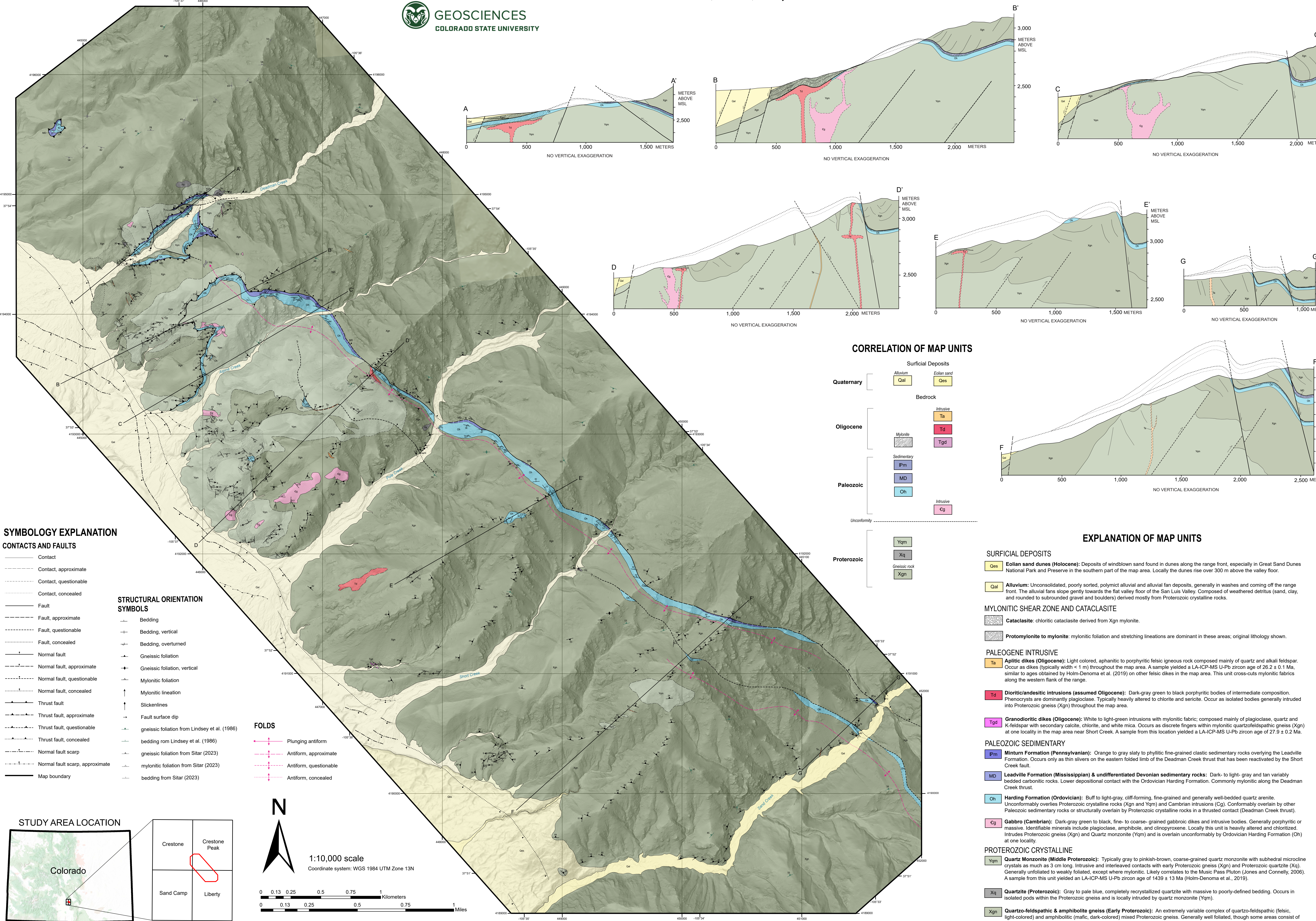


Plate 1: Geologic Map of the Deadman Creek thrust, Sangre de Cristo Range, Colorado

Mapped by Miriam Primus, John Singleton, Dylan Frawley,  
Hunter Broeder, Matt Lodi, Sammy Malavarca



SYMBOLGY EXPLANATION

CONTACTS AND FAULTS

- Contact
- - - Contact, approximate
- · - · Contact, questionable
- - - - Contact, concealed
- Fault
- - - Fault, approximate
- · - · Fault, questionable
- - - - Fault, concealed
- Normal fault
- - - Normal fault, approximate
- · - · Normal fault, questionable
- - - - Normal fault, concealed
- Thrust fault
- - - Thrust fault, approximate
- · - · Thrust fault, questionable
- - - - Thrust fault, concealed
- Normal fault scarp
- - - Normal fault scarp, approximate
- Map boundary

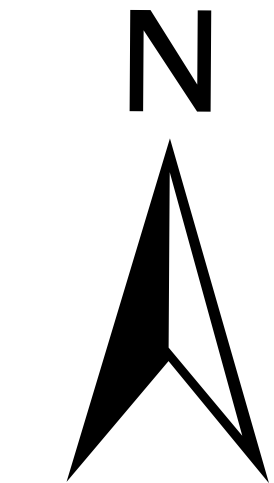
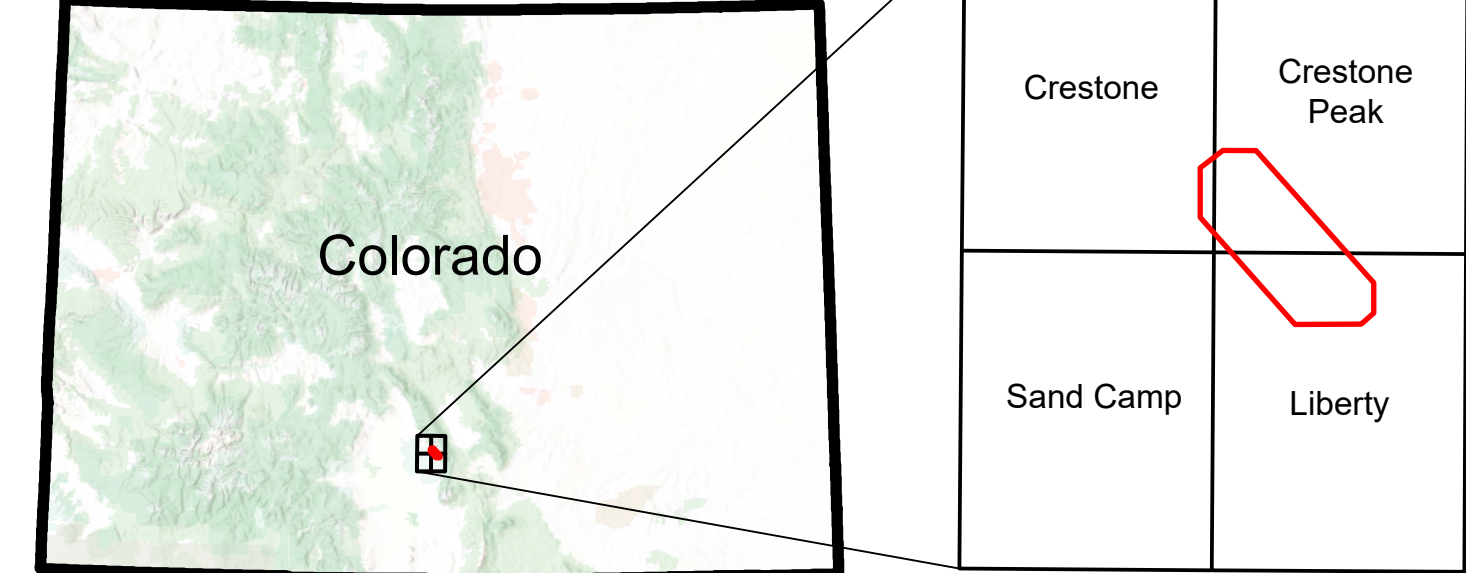
STRUCTURAL ORIENTATION SYMBOLS

- Bedding
- Bedding, vertical
- Bedding, overturned
- Gneissic foliation
- Gneissic foliation, vertical
- Mylonitic foliation
- Mylonitic lineation
- Slickenlines
- Fault surface dip
- gneissic foliation from Lindsey et al. (1986)
- bedding from Lindsey et al. (1986)
- gneissic foliation from Sitar (2023)
- mylonitic foliation from Sitar (2023)
- bedding from Sitar (2023)

FOLDS

- Plunging antiform
- Antiform, approximate
- Antiform, questionable
- Antiform, concealed

STUDY AREA LOCATION

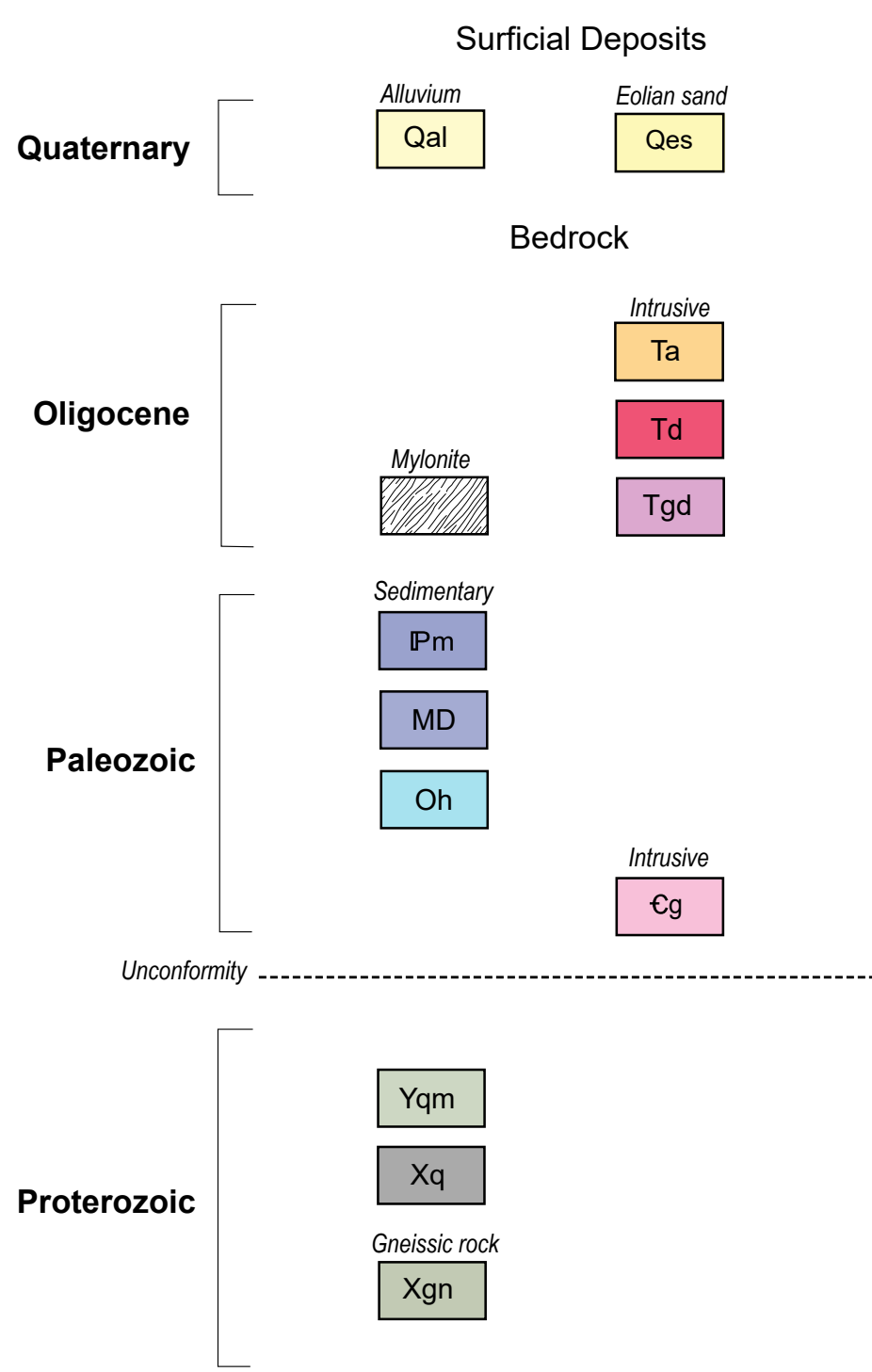


1:10,000 scale

Coordinate system: WGS 1984 UTM Zone 13N



CORRELATION OF MAP UNITS



EXPLANATION OF MAP UNITS

SURFICIAL DEPOSITS

- Qes Eolian sand dunes (Holocene):** Deposits of windblown sand found in dunes along the range front, especially in Great Sand Dunes National Park and Preserve in the southern part of the map area. Locally the dunes rise over 300 m above the valley floor.
- Qal Alluvium:** Unconsolidated, poorly sorted, polymict alluvial and alluvial fan deposits, generally in washes and coming off the range front. The alluvial fans slope gently towards the flat valley floor of the San Luis Valley. Composed of weathered detritus (sand, clay, and rounded to subrounded gravel and boulders) derived mostly from Proterozoic crystalline rocks.

MYLONITIC SHEAR ZONE AND CATACLASITE

- Cataclasite:** chloritic cataclasite derived from Xgn mylonite.
- Protomylonite to mylonite:** mylonitic foliation and stretching lineations are dominant in these areas; original lithology shown.

PALEOGENE INTRUSIVE

- Ta Aplitic dikes (Oligocene):** Light colored, aphanitic to porphyritic felsic igneous rock composed mainly of quartz and alkali feldspar. Occur as dikes (typically width < 1 m) throughout the map area. A sample yielded a LA-ICP-MS U-Pb zircon age of 26.2 ± 0.1 Ma, similar to ages obtained by Holm-Denoma et al. (2019) on other felsic dikes in the map area. This unit cross-cuts mylonitic fabrics along the western flank of the range.
- Td Dioritic/andesitic intrusions (assumed Oligocene):** Dark-gray green to black porphyritic bodies of intermediate composition. Phenocrysts are dominantly plagioclase. Typically heavily altered to chlorite and sericite. Occur as isolated bodies generally intruded into Proterozoic gneiss (Xgn) throughout the map area.
- Tgd Granodioritic dikes (Oligocene):** White to light-green intrusions with mylonitic fabric; composed mainly of plagioclase, quartz and K-feldspar with secondary calcite, chlorite, and white mica. Occurs as discrete fingers within mylonitic quartzofeldspathic gneiss (Xgn) at one locality in the map area near Short Creek. A sample from this location yielded a LA-ICP-MS U-Pb zircon age of 27.9 ± 0.2 Ma.

PALEOZOIC SEDIMENTARY

- Pm Minturn Formation (Pennsylvanian):** Orange to gray slaty to phyllitic fine-grained clastic sedimentary rocks overlying the Leadville Formation. Occurs only as thin silvers in the eastern folded limb of the Deadman Creek thrust that has been reactivated by the Short Creek fault.
- MD Leadville Formation (Mississippian) & undifferentiated Devonian sedimentary rocks:** Dark- to light- gray and tan variably bedded carbonitic rocks. Lower depositional contact with the Ordovician Harding Formation. Commonly mylonitic along the Deadman Creek thrust.
- Oh Harding Formation (Ordovician):** Buff to light-gray, cliff-forming, fine-grained and generally well-bedded quartz arenite. Unconformably overlies Proterozoic crystalline rocks (Xgn and Yqm) and Cambrian intrusions (Cg). Conformably overlain by other Paleozoic sedimentary rocks or structurally overlain by Proterozoic crystalline rocks in a thrust contact (Deadman Creek thrust).
- Cg Gabbro (Cambrian):** Dark-gray green to black, fine- to coarse- grained gabbroic dikes and intrusive bodies. Generally porphyritic or massive. Identifiable minerals include plagioclase, amphibole, and clinopyroxene. Locally this unit is heavily altered and chloritized. Intrudes Proterozoic gneiss (Xgn) and Quartz monzonite (Yqm) and is overlain unconformably by Ordovician Harding Formation (Oh) at one locality.

PROTEROZOIC CRYSTALLINE

- Yqm Quartz Monzonite (Middle Proterozoic):** Typically gray to pinkish-brown, coarse-grained quartz monzonite with subhedral microcline crystals as much as 3 cm long. Intrusive and interleaved contacts with early Proterozoic gneiss (Xgn) and Proterozoic quartzite (Xq). Generally unfoliated to weakly foliated, except where mylonitic. Likely correlates to the Music Pass Pluton (Jones and Connelly, 2006). A sample from this unit yielded an LA-ICP-MS U-Pb zircon age of 1439 ± 13 Ma (Holm-Denoma et al., 2019).
- Xq Quartzite (Proterozoic):** Gray to pale blue, completely recrystallized quartzite with massive to poorly-defined bedding. Occurs in isolated pods within the Proterozoic gneiss and is locally intruded by quartz monzonite (Yqm).
- Xgn Quartzofeldspathic & amphibolite gneiss (Early Proterozoic):** An extremely variable complex of quartzofeldspathic (felsic, light-colored) and amphibolite (mafic, dark-colored) mixed Proterozoic gneiss. Generally well foliated, though some areas consist of weakly foliated granitoid. This unit makes up most of the crystalline basement rock in the mapping area. Locally chloritically altered, especially near the range front.