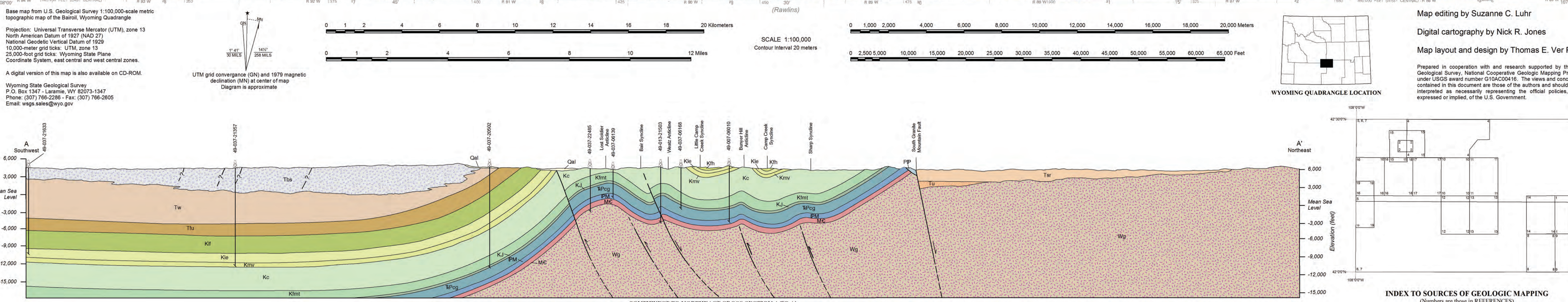
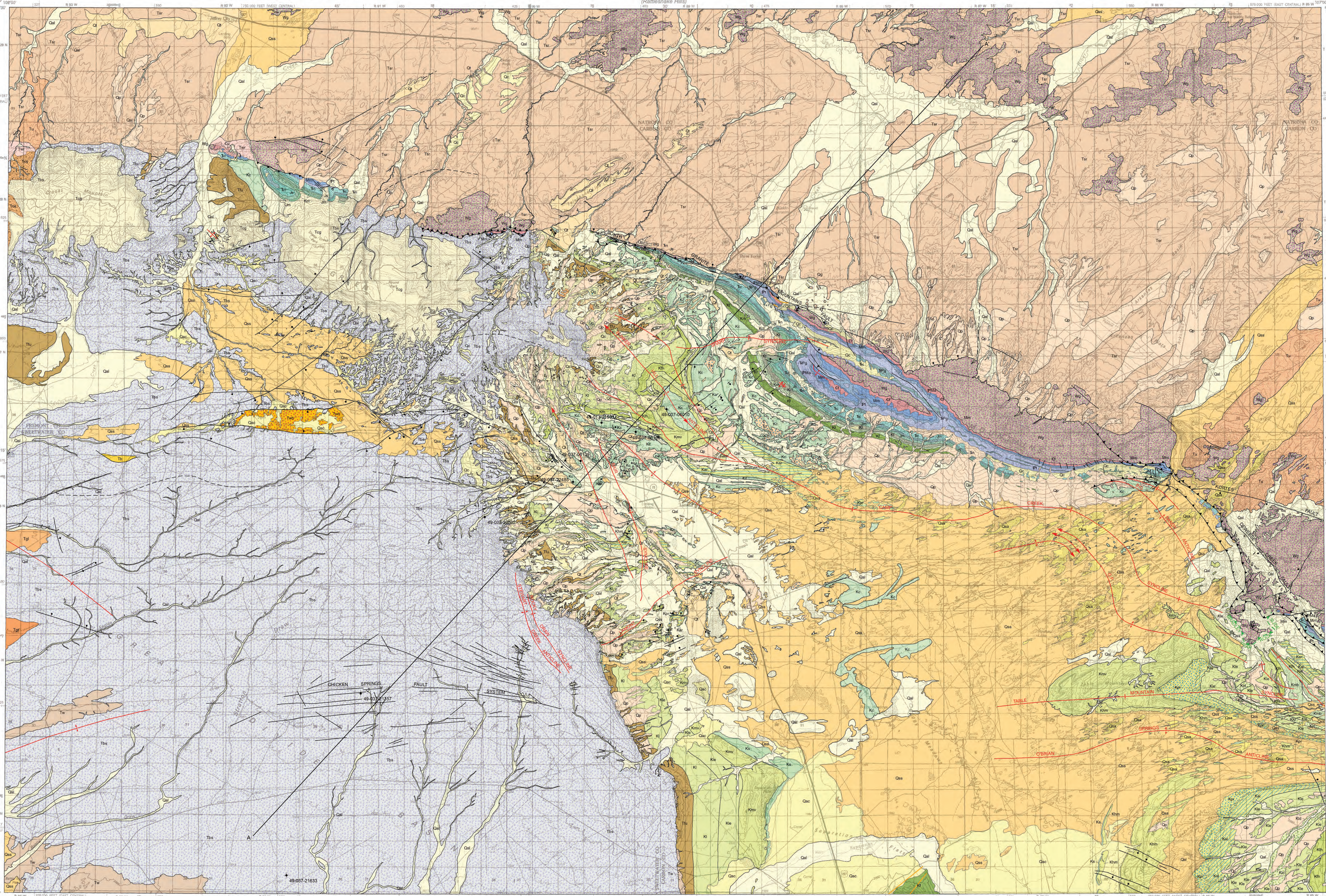




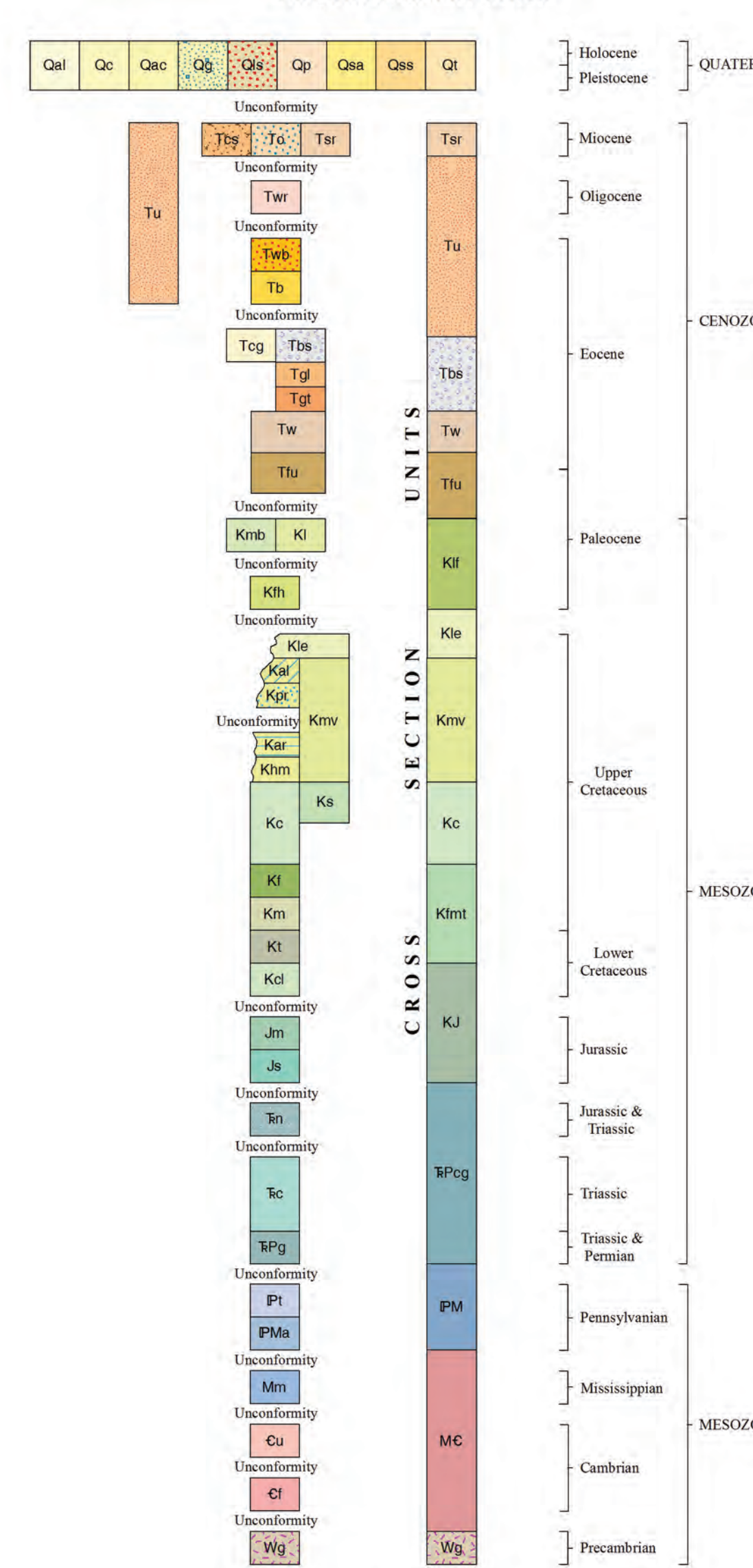
Geology - Interpreting the past - providing for the future



PRELIMINARY GEOLOGIC MAP OF THE BAIROL 30' x 60' QUADRANGLE, CARBON, SWEETWATER, FREMONT, AND NATRONA COUNTIES, WYOMING

Compiled and mapped by
Nick R. Jones, Robert W. Gregory and J. Fred McLaughlin
2011

CORRELATION OF UNITS



MAP SYMBOLS

- Formation
- Fault—Displacement unknown; dashed where inferred (approximately located)
- Normal fault—Dashed where inferred (approximately located), dotted where concealed; bull and bar on downthrown block
- Thrust fault—Sixteenth on upper (technically higher) plate
- Anticline—Arrow on crest or along axis indicates direction of plunge
- Syncline—Arrow on crest indicates direction of plunge
- Bradley Peak gravity slide mass
- Unknown linear feature
- A—Line of cross section
- Drift hole—Used to construct cross section; API number of well shown on cross section; all wells projected to the line of cross section

DESCRIPTION OF MAP UNITS

- Quaternary surficial deposits**
 - Qa** Alluvial deposits (Holocene)—Gravel, sand, silt, and clay, largely unconsolidated and poorly sorted; varies in thickness up to approximately 25 feet (8 m), occurring in flood plains and low-lying terraces.
 - Qc** Colluvium (Holocene/Pleistocene)—Weathered bedrock, slope wash, and soil at base of and on slopes of variable thicknesses, transported mostly by gravity.
 - Qd** Alluvium and colluvium undifferentiated—Gravel, sand, silt, clay, weathered bedrock, and soil deposited along recent and older flood plains; includes slope wash, weathered bedrock, and smaller alluvial fan deposits that coalesce with alluvium.
 - Qe** Boulder gravel—Pebbles and Phosphoric boulders, cobbles, and sand in colluvium and lag deposits. Pebbles and boulders include granite and mafic dikes material derived from Granite Mountains. Phosphoric rock fragments include unconsolidated and poorly sorted boulders derived from Carbonian quartzite and Paleozoic chert. Thickness can reach 700 feet (213 m).
 - Qf** Landslide deposits—Angular blocks of bedrock and finer loose slope debris, largely unconsolidated and poorly sorted, with hummocky topography.
 - Qg** Pollenite deposits—Boulders, cobbles, and pebbles in a sand and silt matrix; forms broad, gently sloping surfaces between drainages; unconsolidated, poorly sorted, and weakly stratified.
 - Qh** Lohs sand (active)—Active wind-blown dunes and dune forms; fine- to medium-grained with scattered coarse material; unconsolidated, fairly sorted; mostly barren of vegetation other than sparse grass on the margins.
 - Qj** Lohs sand (stabilized)—Stabilized wind-blown dunes and dune forms; fine- to medium-grained with scattered coarse material; unconsolidated, fairly sorted; most supports annual vegetation.
 - Qk** Terrace gravel—Cobbles, pebbles, sand, and silt of fluvial origin; unconsolidated, poorly sorted, and largely unstratified; forms broad, near flat to gently sloping surfaces between drainages.
- Tertiary sediments**
 - Ta** Tertiary rocks, unfossiliferous—Boulders, cobbles, pebbles, conglomerate, arkosic sandstone, and minor siltstone. Precambrian boulders of granite and scattered diabase; Phosphoric fragments of quartzite, limestone, and chert, as large as 2.5 feet (0.76 m) in diameter. Conglomerate consists of fragments of Precambrian and Phosphoric rocks, gray, light-yellow, and grayish-white. Arkosic and quartz sandstone is commonly glauconitic. Buff, red, and reddish silty sandstone; poorly to finely indurated. Can reach thicknesses over 900 feet (274 m).
 - Tb** Tertiary conglomerate and sandstone—Precambrian and Phosphoric cobbles, pebbles, conglomerate, and primarily arkosic sandstone, comprised mainly of granitic, diabase, quartzite, limestone, and chert; gray, light-yellow, and grayish-white; sandstone is commonly glauconitic. Can reach several hundred feet in thickness (410 m).
 - Tc** Ogallala Formation—Pale orange-pinkish and yellow-gray-white, poorly sorted, weakly to finely consolidated conglomerate, boulders of granite and diabase, and minor siltstone with interbedded red, yellow, and gray silty sandstone; poorly sorted, weakly to finely consolidated. Boulders, cobbles, and pebbles of Precambrian and Phosphoric age; locally sulfurous; crossbedded; poorly sorted, weakly to finely consolidated.
 - Td** Split Rock Formation—This formation consists of four units (Lore, 1970). From youngest to oldest, they are: Upper unit; green sandstone up to 1000 feet (305 m) thick; conglomerate at base with medium to coarse-grained, gray to buff, crossbedded sandstone; forms broad dip slopes; contains subrounded, frosted Sweetwater cross agates, mostly less than 1 in. (2.5 cm) diameter, moderately indurated; abundant very fine-grained (0.1 mm) diameter magnetite grains; this unit also contains common thin cherty, white, soft, fine-grained, sandy limestone beds. Upper middle unit; silty sandstone; 300-600 feet (91-183 m) thick; fine- to coarse-grained light gray sandstone with silty matrix; sulfurous beds are common along with abundant glass shards, and very fine-grained muscovite. Lower middle unit; clayey sandstone; 100-300 feet (30-91 m) thick; gray, fine- to medium-grained, soft matrix; abundant frosted quartz grains; abundant glass shards and very fine-grained magnetite commonly includes gray to tan siltstone; local bentonitic clayey sandstone beds. Basal unit; porous sandstone coarsest and most widespread of the 4 units; 100-400 feet (30-122 m) thick; fine cherts and steep slopes (eg. Heavy Divide); boulders, cobbles, pebbles of Precambrian granite and mafic igneous rocks; matrix is gray, coarse-grained poorly sorted sandstone with abundant frosted quartz grains and interbedded with conglomerate beds; sandstone and conglomerate beds contain abundant very fine-grained magnetite and glass shards.
 - Te** White River Formation—Fluvial siltstone, silty, arkosic sandstone, and conglomerate; white to grayish-orange, light-pink, yellow, poorly to well-indurated. Local bentonitic sandstone; up to 630 feet (193 m) in thickness.
 - Tf** Wagon Bed Formation—Consists of as many as five depositional units generally comprised of sandstone, claystone, arkosic sandstone. Color range from dull-gray to pale shades of blue, green, and yellow to tan. Volcanic debris, more abundant in the upper three units, is common in the form of buff and sulfurous sandstone, sandstone and claystone. Most of this material was derived from the Yellowstone-Albany region to the northwest and the Battlement Hills area to the northeast. Thicknesses range from 30-300 feet (9-91 m).

EXPLANATION

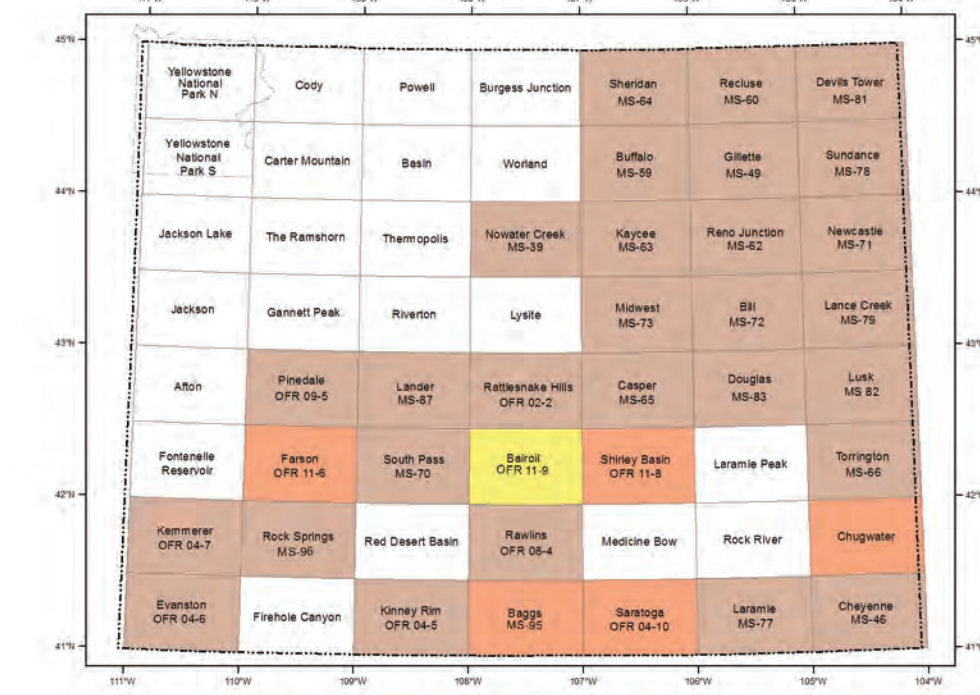
- Bridge Formation**—Siliceous, bentonitic claystone and shale, green, pale-green to blue-green, light-yellow, with thin limestone containing ostracods and algae. Base of formation within this area contains white buff and arkosic. Thicknesses can reach over 500 feet (152 m), although erosion has removed much of the formation in the mapped area.
- Cooks Gap Conglomerate**—Very large, subrounded granitic boulders, up to 40 feet (12 m) across in a pink and gray arkosic and arkosic sandstone matrix; abundant fine to coarse-grained sandstone on most boulders; covers largely as remains of fan deposits, shed by the Granite Mountains. Thicknesses of up to 1,500 feet (457 m).
- Laney Member of the Green River Formation**—Brown oil shale, green shale containing ostracods, local, sandy limestone with mollusks, limy sandstone, and arkosic sandstone and conglomerate. Thickness ranges from 200-300 feet (61-91 m).
- Upton Shale Member of the Green River Formation**—Gray and dark brown marlstone and oil shale, interbedded with thin algal limestone and tan-brown dolomite; thin grayish buff, and thin fossiliferous sandstone; interbedded with carbonaceous shale near base. Thickness ranges from 100-200 feet (30-61 m).
- Battle Spring Formation**—Light-gray, brown, yellowish-tan, medium- to very coarse-grained, pebbly arkosic sandstone and conglomerate, with local greenish-gray sandy mudstone; brownish, carbonaceous sandstone and claystone; yellowish-gray conglomerate interbedded with very coarse conglomerate; poorly indurated, with local well-indurated lenses and pale-channels, cemented with calcite cement; scattered cobbles and boulders over one foot (0.3 m) in diameter with some boulders up to several feet across which may be remnants of Crooks Gap Conglomerate; numerous iron-rich irregular and spheroidal iron-rich concretions. The Battle Spring Formation is lost in economic unmin deposits in many areas of the Great Divide Basin. Thickness varies considerably but generally increases toward irregularly 1,000-3,500 feet (305-1,067 m).
- Vasatch Formation (Eocene)**—Dark to variegated claystone, siltstone and sandstone, carbonaceous shale and coal; locally interbedded with conglomerates around basin margin; interbeds primarily through changes in depositional environments with members and success of the Green River Formation.
- Fort Union Formation (Pliocene)**—Complexly interbedded, commonly lenticular or discontinuous sequence of beds, sandstone, light-brown to gray, argillaceous, very fine- to medium-grained, commonly contains ferruginous concretions, siltstone, brown to orange, commonly ferruginous, argillaceous, shale, light- to dark-gray, locally maroon; locally contains numerous vermicular, common lenticular, and plant fossils; coal beds are generally thin and discontinuous with lenticular thicknesses to as much as 9 feet (3 m). Approximately 1,500 feet (475 m) thick.
- Creaceous sedimentary rocks**
 - Ka** Medicine Bow Formation—Sandstone, very fine- to fine-grained, silty, friable to well-indurated, with plant fossils common; siltstone, slightly carbonaceous, irregular-bedded to laminar, crossbedded, plant fossils, silty, carbonaceous local coal beds.
 - Kb** Lance Formation—Shale, tan to medium-gray to grayish-black, partly silty, partly carbonaceous, siltstone, light-gray to grayish-black, partly sandy, partly carbonaceous; sandstone, light-gray, very fine- to fine-grained, partly silty, coal formation commonly contains dolomite and iron concretions. Thickness ranges from 1,000 to nearly 4,000 feet (305-1,219 m).
 - Kc** Fox Hills Sandstone—Sandstone, pale-gray to light-orange, fine- to very fine-grained, well-sorted, thinly bedded, slightly calcareous, siltstone, light-gray, sandy, light-gray, to gray, local thin coal beds, interbedded with Lewis Shale and Lance Formation. Thickness ranges from 200-800 feet (61-244 m).
 - Kd** Lewis Shale—Shale, marine, gray to greenish, sandy, slightly calcareous, sandstone, gray, very fine to fine grained, friable, silty, calcareous, argillaceous, abundant fine-grained fossils of foraminifera and oyster shells, pelecypods, fossil brachiopods. Thicknesses up to 700 feet (213 m).
 - Ke** Kid Dade Sandstone Member of the Lewis Shale—Thinly bedded sandstone, very fine- to fine-grained, locally consolidated, silty, calcareous, locally concretionary; siltstone, gray, sandy and platy shale, medium- to dark-gray, silty.
 - Kf** Mesaverde Formation (includes Teapot Sandstone)—The Mesaverde Formation is a sequence of mostly non-marine light-gray, tan, and brown fine- to medium-grained, crossbedded sandstone interbedded with shale, carbonaceous shale, and coal; 800-1,200 feet (244-366 m) thick. Includes the following units in the mapped area:
 - Kf1** Almond Formation—Shale, gray to dark-gray, silty, partly carbonaceous, siltstone, gray, sandy, partly carbonaceous, thin fossiliferous, siltstone, gray, fine- to very fine-grained, slightly carbonaceous, irregular-bedded, plant fossils.
 - Kf2** Pine Ridge Sandstone—Sandstone, gray, very fine- to fine-grained, slightly carbonaceous, irregular-bedded, contains plant and wood fossils, siltstone, gray, sandy, partly carbonaceous, carbonaceous shale; local thin coal beds.
 - Kf3** Altus Ridge Formation—Shale, gray to black, partly silty and carbonaceous, siltstone, light- to dark-gray, partly argillaceous and sandy, laminated to irregular-bedded, sandstone, gray, very fine- to fine-grained, slightly carbonaceous, slightly friable, partly crossbedded, local thin coal beds.
 - Kf4** Haystack Mountain Formation (Mesaverde Group)—This formation is a series of interbedded shales, siltstones, and sandstones. Shales are medium- to dark-gray, partly silty, mostly carbonaceous local concretions; siltstones are light- to dark-gray, partly sandy, locally glauconitic, sandstone is light- to medium-gray, fine- to very fine-grained, mostly silty, crossbedded, locally calcareous to carbonaceous, fossil-bearing, and glauconitic local bentonite beds.
 - Kg** Steele Shale—Marine shale, medium- to dark-gray, olive-gray, silty, siltstone, light- to dark-gray, locally sandy or argillaceous, slightly calcareous, locally bentonitic; sandstone, gray to orangish-gray, very fine-grained, silty, partly glauconitic.
 - Kh** Cody Shale—Marine shale, soft, gray to olive-gray, numerous bentonitic shales and siltstones, partly sandy, limestone concretions, sandstone, fine- to very fine-grained, gray to orangish-gray, glauconitic, thin-bedded, true fossils. Lower part of Cody Formation is equivalent to the Nodosa Formation (not present); shale, dark-gray to gray, laminated, calcareous, fossil-rich shale beds near top, light-gray to buff, laminated. Formation thickness ranges from 4,000-6,000 feet (1,219-1,829 m).
 - Ki** Frontier Formation—Marine shale, gray, olive to dark-gray, fossil, platy, with thin olive-gray, fine-grained sandstone beds near base, discontinuous thin bentonitic beds. Upper part of formation is sandstone, light-gray to grayish-orange, fine-grained, partly silty, calcareous, glauconitic, numerous fossils including ammonites, pelecypods, rare shark teeth, bryozoa, forms prominent ledges and dip slopes (shown as Wall Creek Sandstone in many areas). Thickness ranges from 800-1,000 feet (244-305 m).
 - Kj** Morley Shale—Gray to dark-gray, dense, siliceous, locally lufaceous shale contains abundant fish scales and numerous bentonitic beds; weathers to flaky and blocky, white to olive-gray, with rusty staining along fracture surfaces. Approximately 150 feet (45.7 m) thick.
 - Kk** Thermophilus Shale—Shale in upper part, dark- to medium-gray, soft, silty, contains carbonaceous thin bedded siltstone; middle part is also known as the Muddy Sandstone, light-gray to grayish-orange, fine- to very fine-grained, crossbedded to massive, locally calcareous or carbonaceous, scattered trace fossils, forms ledges and dip slopes. Thickness ranges from 120-250 feet (37-76 m).
 - Kl** Cloverly Formation—Sandstone, conglomeratic at base, tan, yellowish-gray, pale-orange, fine- to coarse-grained, with pebbles of quartz, chert, shale sandstone in matrix of fine- to medium-grained sandstone; well-indurated, locally siliceous, crossbedded, shaly; forms prominent ledges and dip slopes; interbedded, variegated shale, claystone, and carbonaceous shale; upper part of formation is gray to brown fine- to coarse-grained sandstone. Thickness ranges from 75-100 feet (23-30 m).
- Jurassic sedimentary rocks**
 - Ju** Morrison Formation (upper Jurassic)—Pale-green, blue-green, maroon, buff to brown, shaly white, interbedded sandstones and sandstones, mudstones, arkosic, gray, maroon, buff, locally consolidated to competent beds, scattered chert and carbonaceous nodules, local bentonitic and ash beds, sandstone, gray, grayish-yellow to grayish-orange, thinly bedded, local dark-gray to black, discontinuous chert beds; local thin drab limestone beds with scattered chert nodule inclusions. Variable thickness between 150 and 300 feet (46-91 m).
 - Jv** Sandstone Formation (upper and middle Jurassic)—Interbedded sandstone, siltstone, limestone, and shale. Sandstone, grayish-yellow to tan, calcareous, slightly glauconitic, platy, siltstone, olive-gray, glauconitic, numerous marine fossils, shales, greenish to maroon, limestone, brown, abundant marine fossils of pelecypods and cephalopods. Ranges in thickness from 200-250 feet (61-76 m).
- Triassic sedimentary rocks**
 - Tr** Nugget Sandstone (includes Bell Springs Member)—Sandstone and siltstone interbedded. Sandstone, light-brown, tan to buff, reddish-pink, massive, crossbedded, fine- to medium-grained, friable to moderately well-cemented, typically forms ledges. Thickness ranges from 6-250 feet (76 m).
 - Trs** Chaparral Group—Red and gray shale and siltstone with interbedded red to salmon to buff, fine-grained sandstone. Not listed in the Alvord Limestone, a thin fossiliferous, ledge-forming limestone within the Chaparral Group. The units within the Chaparral Group are as follows:
 - Trs1** Pope Age Formation—Medicine, reddish-brown to maroon, with scattered yellow to orange pebbles near base, blocky, locally calcareous, approximately 30-50 feet (9-15 m) thick.
 - Trs2** John Formation—Interbedded sandstone and siltstone, very fine- to coarse-grained, scattered thin sandstone layers, locally calcareous, approximately 350 feet (107 m) thick.
 - Trs3** Pope Age—Medicine, reddish-brown to maroon, with scattered yellow to orange pebbles near base, blocky, approximately 30-50 feet (9-15 m) thick.
 - Trs4** Red Peak Formation—Sandstone, very fine-grained, silty, grades into siltstone, partly calcareous; siltstone, laminated, platy, common ripple marks; approximately 900 feet (274 m) thick.
- Triassic and Permian sedimentary rocks**
 - Trs5** Gose Egg Formation (includes Triassic and Permian upper and lower units of Gose Egg Formation)—Reddish-brown, pale-red, and tan shale and siltstone with gray to light-purple limestone and cherty dolomite, abundant chert nodules. Approximately 300 feet (91 m) thick.
- Permian sedimentary rocks**
 - P** Tensleep Formation—Tan, gray to buff sandstone, fine- to medium-grained, well-sorted, prominent crossbeds, calcareous cement, basal portion commonly contains light-gray to buff, finely crystalline, locally cherty limestone and dolomite beds. Approximately 600-800 feet (183-244 m) thick.
- Pennsylvanian/Mississippian sedimentary rocks**
 - Pm** Anson Formation—Pale-red to reddish-brown, grayish-olive limestone and mudstone interbedded with limestone and silt limestone beds; local sandstone, reddish-brown to orange, fine- to very fine-grained with scattered medium-sized grains. Thickness ranges from 150-200 feet (46-61 m).
 - Pm1** Madison Limestone—Gray, buff, finely crystalline tan limestone and tan to brown dolomite; basal portion commonly contains chert nodules and thin fracture-filling, gray, common portion commonly forms a karst-like dissolution surface. Thickness ranges from 250-300 feet (76-91 m).
- Carbonian sedimentary rocks**
 - C** Carbonian rocks, unfossiliferous—Blue-gray, reddish, yellow, limestone interbedded with greenish, glauconitic shale and very fine-grained, buff, laminated sandstone, siltstone, glauconitic, platy, locally fossiliferous. Approximately 500-600 feet (152-183 m) thick.



- Precambrian crystalline rocks**
 - Pc** Precambrian, unfossiliferous—Includes granite of Lunka Dome, in the Granite Mountains (Stuckless, and others, 1977). Spanish Mine metamorphic suite, Turkey Creek metamorphic suite, Fort Mountain phosnic suite, and the Bear Mountain granite pluton in the Fort Mountain (Bowers and Chatterlain, 2000). Intrusive igneous rocks. Semine gneissic belt metasedimentary and metamorphic rocks, Bradley Peak ultramafics, and the Sunday Morning Creek metamorphic rocks (Hazel, 1994).
- Granite Mountains**
 - Gm** Granite of Lunka Dome—Gray to white, alkali, massive, nonfoliated, leucocratic and biotitic phases which are hydrothermally altered to albite and/or sericitic albite-albite-albite.
- Ferris Mountains**
 - Fm** Bear Mountain granite pluton—Buff-colored medium- to coarse-grained biotite granite with large (up to 1 in. [3 cm]) porphyroblast feldspar.
 - Fm1** Spanish Mine metamorphic suite—Metasedimentary and ultramafic metamorphic igneous rocks, intruded by numerous mafic dikes. Main assemblages include quartzite, pelitic schist, andalusite-garnet-biotite schist, mafic gneiss, and garnet-silica-tremolite schist.
 - Fm2** Turkey Creek metamorphic suite—Massive pink to light-gray, porphyritic granite.
 - Fm3** Turkey Creek metamorphic suite—Predominantly fine-grained granulitic orthogneiss, with lesser tonalite and pink, fine-grained granite.
- Semine Mountains**
 - Sm** Semine Mountain intrusive igneous rocks—Includes granulite, granulite dikes, and foliated felsic gneiss; porphyroblast metagabbro ("banded rock"), and diorite.
 - Sm1** Semine granulite belt metamorphic and metamorphic rocks—Includes volcanoclastic and intermediate to felsic metavolcanics, metasediments, banded iron formation, mafic metavolcanics, and ultramafic schists.
 - Sm2** Bradley Peak ultramafics—Includes metagabbro with apatite and xenophytic texture, and biotitic amphibolites, mafic and ultramafic rocks including serpentinite, metapelite, and mafic amphibolites.
 - Sm3** Sunday Morning Creek metamorphic rocks—Includes mafic metavolcanics and volcanoclastics, amphibolite, mica schist, metagabbro, serpentinite, and chlorite-schist.

REFERENCES AND SOURCES OF GEOLOGIC MAPPING (Numbers refer to INDEX OF GEOLOGIC MAPPING)

- Bowers, N.E., and Chamberlain, K.R., 2006, Precambrian history of the eastern Ferris Mountains and Bear Mountain, south-central Wyoming province. Canadian Journal of Earth Science, v. 43, p. 1467-1487.
- Bailey, R.W., 1968, Geologic map of the Bradley Peak quadrangle, Carbon County, Wyoming. U.S. Geological Survey Geologic Quadrangle Map GQ-773, scale 1:24,000.
- Campbell-Stone, E., Goyette, J., Bywater, S., Finley-Blair, L., 2009, Department of Geology and Geophysics, University of Wyoming; unpublished field map, scale 1:24,000.
- Cooper, H.T., 1951, Geology of the Western Semine Mountains, Wyoming. University of Wyoming M.A. thesis, 90 p.
- Green, G.N., and Drouillard, P.H., 1994, The digital geologic map of Wyoming in ARC/INFO format: U.S. Geological Survey Open File Report OF-94-425, scale 1:500,000.
- Hazel, W.D., 1994, Economic geology of the Semine Mountains mining district, Carbon County, Wyoming. Wyoming State Geological Survey Report of Investigations RI-50, 31 p.
- Love, J.D., 1970, Cenozoic geology of the Granite Mountains area, central Wyoming. U.S. Geological Survey Professional Paper 695-C, 144 p.
- Love, J.D. and Christensen, A.C., 1985, Geologic map of Wyoming. U.S. Geological Survey, scale 1:500,000.
- Love, J.D., Christensen, A.C., Earle, J.L., and Jones, R.W., 1979, Preliminary geologic map of the Casper 1° x 2° quadrangle, central Wyoming. U.S. Geological Survey Open File Report 79-661.
- McAndrews, H., 1963, Geologic map of the Reddick Cut quadrangle, Carbon County, Wyoming. U.S. Geological Survey Miscellaneous Field Studies Map MF-203, scale 1:24,000.
- Merevether, E.A., 1971, Geologic map of the Wild Horse Mountain quadrangle, Carbon County, Wyoming. U.S. Geological Survey Geologic Quadrangle Map GQ-887, scale 1:24,000.
- Reynolds, M.W., 1963, Geologic map of the Whiskey Peak quadrangle, Carbon, Fremont, and Sweetwater Counties, Wyoming. U.S. Geological Survey Geologic Quadrangle Map GQ-772, scale 1:24,000.
- Reynolds, M.W., 1968, Geologic map of the Muddy Gap quadrangle, Carbon County, Wyoming. U.S. Geological Survey Geologic Quadrangle Map GQ-771, scale 1:24,000.
- Reynolds, M.W., 1971, Geologic map of the Bairol quadrangle, Sweetwater and Carbon Counties, Wyoming. U.S. Geological Survey Geologic Quadrangle Map GQ-913, scale 1:24,000.
- Reynolds, M.W., 1971, Geologic map of the Lamont quadrangle, Carbon County, Wyoming. U.S. Geological Survey Geologic Quadrangle Map GQ-912, scale 1:24,000.
- Rosen, R.L., and Stuart, M.H., 1961, Geologic map of the Ferris quadrangle, Carbon County, Wyoming. U.S. Geological Survey Geologic Quadrangle Map GQ-124, scale 1:24,000.
- Riva, R.R., 1959, Sheep Creek-Middle Cottonwood Creek area, Fremont County, Wyoming. Department of Geology and Geophysics, University of Wyoming, thesis, 109 p.
- Schmitt, L.J., Jr., 1977, Geologic map of the Breton Springs quadrangle, Fremont and Sweetwater Counties, Wyoming. Miscellaneous Field Studies Map MF-205, scale 1:24,000.
- Schmitt, L.J., Jr., 1979, Geologic map of the Sagebrush Park quadrangle, Fremont and Sweetwater Counties, Wyoming. U.S. Geological Survey Geologic Quadrangle Map GQ-151, scale 1:24,000.
- Schmitt, L.J., Jr., 1979, Geologic map of the Crooks Peak quadrangle, Fremont and Sweetwater Counties, Wyoming. U.S. Geological Survey Geologic Quadrangle Map GQ-157, scale 1:24,000.
- Sherridan, D.M., 1991, Geology of the Lost Creek schistoclastic deposits, Sweetwater County, Wyoming. U.S. Geological Survey Bulletin 1587-A, p. 37-47.
- Stuckless, J.S., Banker, C.M., Bush, C.A., Diering, W.P., and Scott, J.H., 1977, Geochemical and petrological studies of a granitoid granite from the Granite Mountains, Wyoming. U.S. Geological Survey Journal of Research, v. 8, p. 41-51.



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