U.S. Department of the Interior
National Park Service
Natural Resource Stewardship and Science Directorate
Geologic Resources Division

Yellowstone National Park

GRI Ancillary Map Information Document

Produced to accompany the Geologic Resources Inventory (GRI) Digital Geologic-GIS Data for Yellowstone National Park

yell_geology.pdf

Version: 6/29/2020

Geologic Resources Inventory Map Document for Yellowstone National Park

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Geologic Resources Inventory Map Document

Yellowstone National Park, Wyoming, Montana, and Idaho

Document to Accompany Digital Geologic-GIS Data

yell_geology.pdf

Version: 6/29/2020

This document has been developed to accompany the digital geologic-GIS data developed by the Geologic Resources Inventory (GRI) program for Yellowstone National Park, Wyoming, Montana, and Idaho (YELL).

Attempts have been made to reproduce all aspects of the original source products, including the geologic units and their descriptions, geologic cross sections, the geologic report, references and all other pertinent images and information contained in the original publication.

This document contains the following information:

1) **About the NPS Geologic Resources Inventory Program** – A brief summary of the Geologic Resources Inventory (GRI) Program and its products. Included are web links to the GRI GIS data model, and to the GRI products page where digital geologic-GIS datasets, scoping reports and geology reports are available for download. In addition, web links to the NPS Data Store and GRI program home page, as well as contact information for the GRI coordinator, are also present.

2) **GRI Digital Maps and Source Citations** – A listing of all GRI digital geologic-GIS maps produced for this project along with sources used in their completion. In addition, a brief explanation of how each source map was used is provided.

3) **Map Unit List** – A listing of all geologic map units present on maps for this project, generally listed from youngest to oldest.

4) **Source Map Geologic Units**– A listing of all units with links to source map unit descriptions for each source map the unit is present on.

5) **Geologic Cross Sections** – Geologic cross section graphics with source geologic cross section abbreviations.

6) **Ancillary Source Map Information** – Geologic unit descriptions and additional source map information presented by source map. For each source map this may include a stratigraphic column, index map, map legend, report and/or map notes.

7) **GRI Digital Data Credits** – GRI digital geologic-GIS data and ancillary map information document production credits.

For information about using GRI digital geologic-GIS data contact:

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About the NPS Geologic Resources Inventory Program

Background

Recognizing the interrelationships between the physical (geology, air, and water) and biological (plants and animals) components of the earth is vital to understanding, managing, and protecting natural resources. The Geologic Resources Inventory (GRI) helps make this connection by providing information on the role of geology and geologic resource management in parks.

Geologic resources for management consideration include both the processes that act upon the Earth and the features formed as a result of these processes. Geologic processes include: erosion and sedimentation; seismic, volcanic, and geothermal activity; glaciation, rockfalls, landslides, and shoreline change. Geologic features include mountains, canyons, natural arches and bridges, minerals, rocks, fossils, cave and karst systems, beaches, dunes, glaciers, volcanoes, and faults.

The Geologic Resources Inventory aims to raise awareness of geology and the role it plays in the environment, and to provide natural resource managers and staff, park planners, interpreters, researchers, and other NPS personnel with information that can help them make informed management decisions.

The GRI team, working closely with the Colorado State University (CSU) Department of Geosciences and a variety of other partners, provides more than 270 parks with a geologic scoping meeting, digital geologic-GIS map data, and a park-specific geologic report.

Products

Scoping Meetings: These park-specific meetings bring together local geologic experts and park staff to inventory and review available geologic data and discuss geologic resource management issues. A summary document is prepared for each meeting that identifies a plan to provide digital map data for the park.

Digital Geologic Maps: Digital geologic maps reproduce all aspects of traditional paper source maps, including notes, legend, and cross sections. Bedrock, surficial, and special purpose maps such as coastal or geologic hazard maps may be used by the GRI to create digital Geographic Information Systems (GIS) data and meet park needs. These digital GIS data allow geologic information to be easily viewed and analyzed in conjunction with a wide range of other resource management information data.

For detailed information regarding GIS parameters such as data attribute field definitions, attribute field codes, value definitions, and rules that govern relationships found in the data, refer to the NPS Geology-GIS Data Model document available at: http://science.nature.nps.gov/im/inventory/geology/GeologyGISDataModel.cfm

Geologic Reports: Park-specific geologic reports identify geologic resource management issues as well as features and processes that are important to park ecosystems. In addition, these reports present a brief geologic history of the park and address specific properties of geologic units present in the park.

For a complete listing of Geologic Resource Inventory products and direct links to the download site visit the GRI publications webpage: http://go.nps.gov/gri_products

GRI geologic-GIS data is also available online at the NPS Data Store Search Application: http://irma.nps.gov/App/Reference/Search. To find GRI data for a specific park or parks select the appropriate park(s), enter “GRI” as a Search Text term, and then select the Search Button.

For more information about the Geologic Resources Inventory Program visit the GRI webpage: https://www.nps.gov/subjects/geology/gri.htm, or contact:

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The Geologic Resources Inventory (GRI) program is funded by the National Park Service (NPS) Inventory and Monitoring (I&M) Division.

GRI Digital Maps and Source Map Citations

The GRI digital geologic-GIS maps for Yellowstone National Park, Wyoming, Montana, and Idaho (YELL). Listed with each map is its source map(s).

Digital Geologic-GIS Map of the Yellowstone National Park and Vicinity, Wyoming, Montana and Idaho (*GRI MapCode YELL*)

The above map was produced using source maps listed directly below, as well as compiled from the individual component GRI digital geologic-GIS maps also listed below.

Christiansen, R.L., and Wahl, R.R., 1999, Digital Geologic Map of Yellowstone National Park, Idaho, Montana, and Wyoming and Vicinity: U.S. Geological Survey, Open-File Report OF-99-174, scale 1:125,000 (Yellowstone National Park (digital)). (*GRI Source Map ID 3013*).

The GRI extracted the extent that covers the Crowne Butte, Mount Holmes, Eagle Peak, Warm River Butte, and Sunlight Peak 15' quadrangles from this source map. All geologic features within those extents were captured with the exception of the Sunlight Peak extent. Only Linear Geologic Units and Dikes (GLN) were captured for the Sunlight Peak extent.

U.S. Geological Survey, 1972, Geologic Map of Yellowstone National Park: U.S. Geological Survey, Miscellaneous Geologic Investigations Map I-711, scale 1:125,000 (Yellowstone National Park). (*GRI Source Map ID 11168*).

The GRI captured additional features on this source map that were not present in the source digital geologic map like fault symbology, volcanic point features, and mine point features.

Berg, Richard B., Lonn, Jeffrey D., and Locke, William W., 1999, Geologic Map of the Gardiner 30' x 60' Quadrangle, South-Central Montana: Montana Bureau of Mines and Geology, MBMG-387, scale 1:100,000 (Gardiner 30' x 60' Quadrangle). (*GRI Source Map ID 3022*).

The GRI used the full extent of the source map presented above, and captured all geologic features within its extent.

U.S. Geological Survey, 1956, Bedrock (?) Geologic Map of the Sunlight Peak Quadrangle, Wyoming: U.S. Geological Survey, unpublished mylar, scale 1:62,500 (Sunlight Peak 15' Quadrangle (northwest part)). (*GRI Source Map ID 75608*).

The GRI used the full extent of the source map presented above, and captured all geologic features within its extent.

Digital Geologic-GIS Map of the Abiathar Peak 15' Quadrangle, Wyoming (*GRI MapCode ABPE*)

U.S. Geological Survey, 2007, Digital Geologic Map of the Abiathar Peak Quadrangle, Yellowstone National Park, Wyoming and Montana: U.S. Geological Survey, unpublished digital data, scale 1:62,500 (Abiathar Peak 15' Quadrangle). (*GRI Source Map ID 74795*).

Prussia, H.J., Rappel, E.T., Christiansen, R.L., 1975, Geologic Map of the Abiathar Peak Quadrangle, Yellowstone National Park, Wyoming and Montana: U.S. Geological Survey, Geologic Quadrangle Map GQ-1244, scale 1:62,500 (Abiathar Peak 15' Quadrangle (digital)). (*GRI Source Map ID 3024*).

The GRI used the full extent of the source digital geologic map presented above, and captured additional features not present in the source digital geologic map like fault symbology, volcanic point features, and mine point features from the paper source map.

Digital Geologic-GIS Map of the Buffalo Lake 15' Quadrangle, Wyoming, Montana and Idaho (*GRI MapCode BULA*)

Christiansen, R.L., 2007, Mylar of the Buffalo Lake Quadrangle: U.S. Geological Survey, unpublished mylar, scale 1:62,500 (Buffalo Lake 15' Quadrangle). (*GRI Source Map ID 6724*).

The GRI used the full extent of the source map presented above, and captured all geologic features within its extent.

Digital Geologic-GIS Map of the Canyon Village 15' Quadrangle, Wyoming (*GRI MapCode CAVI*)

U.S. Geological Survey, 2007, Digital Geologic Map of the Canyon Village Quadrangle, Yellowstone National Park, Wyoming: U.S. Geological Survey, unpublished digital data, scale 1:62,500 (Canyon Village 15' Quadrangle (digital)). (*GRI Source Map ID 74797*).

Christiansen, R.L., Blank, H.R., 1975, Geologic Map of the Canyon Village Quadrangle, Yellowstone National Park, Wyoming: U.S. Geological Survey, Geologic Quadrangle Map GQ-1192, scale 1:62,500 (Canyon Village 15' Quadrangle). (*GRI Source Map ID 3254*).

The GRI used the full extent of the source digital geologic map presented above, and captured additional features not present in the source digital geologic map like fault symbology, volcanic point features, and mine point features from the paper source map.

Digital Geologic-GIS Map of portions of the Cooke City 15' Quadrangle, Wyoming and Montana (*GRI MapCode COCI*)

Elliott, J.E., 1979, Geologic Map of the southwest part of the Cooke City Quadrangle, Montana and Wyoming: U.S. Geological Survey, Miscellaneous Investigations Series Map I-1084, scale 1:24,000 (Cooke City Quadrangle (southwest part)). (*GRI Source Map ID 3014*).

The GRI used the full extent of the source map presented above, and captured all geologic features within its extent.

Digital Geologic-GIS Map of the Frank Island 15' Quadrangle, Wyoming (*GRI MapCode FRIS*)

U.S. Geological Survey, 2007, Digital Geologic Map of the Frank Island Quadrangle, Yellowstone National Park, Wyoming: U.S. Geological Survey, unpublished digital data, scale 1:62,500 (Frank Island 15' Quadrangle (digital)). (*GRI Source Map ID 74802*).

Blank, H.R., Prussia, H.J., Keefer, W.R., Christiansen, R.L., 1974, Geologic Map of the Frank Island Quadrangle, Yellowstone National Park, Wyoming: U.S. Geological Survey, Geologic Quadrangle Map GQ-1209, scale 1:62,500 (Frank Island 15' Quadrangle). (*GRI Source Map ID 6348*).

The GRI used the full extent of the source digital geologic map presented above, and captured additional features not present in the source digital geologic map like fault symbology, volcanic point features, and mine point features from the paper source map.

Digital Geologic-GIS Map of the Grassy Lake Reservoir 15' Quadrangle, Wyoming (*GRI MapCode GRLA*)

U.S. Geological Survey, 2007, Digital Geologic Map of the Grassy Lake Reservoir Quadrangle, Yellowstone National Park and Vicinity, Wyoming: U.S. Geological Survey, unpublished digital data, scale 1:62,500 (Grassy Lake Reservoir 15' Quadrangle (digital)). (*GRI Source Map ID 74803*).

Christiansen, R.L., Blank, H.R., Love, J.D., Reed, J.C., 1978, Geologic Map of the Grassy Lake Reservoir Quadrangle, Yellowstone National Park and Vicinity, Wyoming: U.S. Geological Survey, Geologic Quadrangle Map GQ-1459, scale 1:62,500 (Grassy Lake Reservoir 15' Quadrangle). (*GRI Source Map ID 6351*).

The GRI used the full extent of the source digital geologic map presented above, and captured additional features not present in the source digital geologic map like fault symbology, volcanic point features, and mine point features from the paper source map.

Digital Geologic-GIS Map of the Huckleberry Mountain 15' Quadrangle, Wyoming (*GRI MapCode HUMO*)

Love, J.D., 2003, Digital Geologic Map of the Huckleberry Mountain Quadrangle, Yellowstone National Park and Vicinity, Wyoming: U.S. Geological Survey, unpublished digital data, scale 1:62,500 (Huckleberry Mountain 15' Quadrangle (digital)). (*GRI Source Map ID 7311*).

The GRI used the full extent of the source map presented above, and captured all geologic features within its extent.

Digital Geologic-GIS Map of the Madison Junction 15' Quadrangle, Wyoming (*GRI MapCode MAJU*)

Christiansen, R.L., Blank, H.R., 2007, Digital Geologic Map of the Madison Junction Quadrangle, Yellowstone National Park, Wyoming: U.S. Geological Survey, unpublished digital data, scale 1:62,500 (Madison Junction 15' Quadrangle (digital)). (*GRI Source Map ID 74799*).

Christiansen, R.L., Blank, H.R., 1974, Geologic Map of the Madison Junction Quadrangle, Yellowstone National Park, Wyoming: U.S. Geological Survey, Geologic Quadrangle Map GQ-1190, scale 1:62,500 (Madison Junction 15' Quadrangle). (*GRI Source Map ID 3256*).

The GRI used the full extent of the source digital geologic map presented above, and captured additional features not present in the source digital geologic map like fault symbology, volcanic point features, and mine point features from the paper source map.

Digital Geologic-GIS Map of the Mammoth 15' Quadrangle, Wyoming and Montana (*GRI MapCode MAMM*)

Christiansen, R.L., Prussia, H.J., Rappel, E.T., Smedes, H.W., 1972, Geologic Map of the Mammoth Quadrangle, Wyoming and Montana: U.S. Geological Survey, unpublished mylar, scale 1:62,500 (Mammoth 15' Quadrangle). (*GRI Source Map ID 75605*).

The GRI used the full extent of the source map presented above, and captured all geologic features within its extent.

Digital Geologic-GIS Map of the Mount Hancock 15' Quadrangle, Wyoming (*GRI MapCode MOHA*)

Love, J.D., 2003, Digital Geologic Map of the Mount Hancock Quadrangle, Yellowstone National Park and Vicinity, Wyoming: U.S. Geological Survey, unpublished digital data, scale 1:62,500 (Mount Hancock 15' Quadrangle (digital)). (*GRI Source Map ID 7312*).

The GRI used the full extent of the source map presented above, and captured all geologic features within its extent.

Digital Geologic-GIS Map of the Norris Junction 15' Quadrangle, Wyoming (*GRI MapCode NOJU*)

Christiansen, R.L., 2007, Digital Geologic Map of the Norris Junction Quadrangle, Yellowstone National Park, Wyoming: U.S. Geological Survey, unpublished digital data, scale 1:62,500 (Norris Junction 15' Quadrangle (digital)). (*GRI Source Map ID 74800*).

Christiansen, R.L., 1974, Geologic Map of the Norris Junction Quadrangle, Yellowstone National Park, Wyoming: U.S. Geological Survey, Geologic Quadrangle Map GQ-1193, scale 1:62,500 (Norris Junction 15' Quadrangle). (*GRI Source Map ID 3257*).

The GRI used the full extent of the source digital geologic map presented above, and captured additional features not present in the source digital geologic map like fault symbology, volcanic point features, and mine point features from the paper source map.

Digital Geologic-GIS Map of the Old Faithful 15' Quadrangle, Wyoming (*GRI MapCode OLFA*)

Christiansen, R.L., Blank, H.R., 1974, Geologic Map of the Old Faithful Quadrangle, Yellowstone National Park, Wyoming: U.S. Geological Survey, Geologic Quadrangle Map GQ-1189, scale 1:62,500 (Old Faithful 15' Quadrangle). (*GRI Source Map ID 3255*).

Christiansen, R.L., Blank, H.R., 2007, Digital Geologic Map of the Old Faithful Quadrangle, Yellowstone National Park, Wyoming: U.S. Geological Survey, unpublished digital data, scale 1:62,500 (Old Faithful 15' Quadrangle (digital)). (*GRI Source Map ID 74798*).

The GRI used the full extent of the source digital geologic map presented above, and captured additional features not present in the source digital geologic map like fault symbology, volcanic point features, and mine point features from the paper source map.

Digital Geologic-GIS Map of the Pelican Cone 15' Quadrangle, Wyoming (*GRI MapCode PECN*)

U.S. Geological Survey, 2007, Digital Geologic Map of the Pelican Cone Quadrangle, Yellowstone National Park and Vicinity, Wyoming: U.S. Geological Survey, unpublished digital data, scale 1:62,500 (Pelican Cone 15' Quadrangle (digital)). (*GRI Source Map ID 74796*).

Prussia, H.J., Smedes, H.W., Christiansen, R.L., 1975, Geologic Map of the Pelican Cone Quadrangle, Yellowstone National Park and Vicinity, Wyoming: U.S. Geological Survey, Geologic Quadrangle Map GQ-1243, scale 1:62,500 (Pelican Cone 15' Quadrangle). (*GRI Source Map ID 3249*).

The GRI used the full extent of the source digital geologic map presented above, and captured

additional features not present in the source digital geologic map like fault symbology, volcanic point features, and mine point features from the paper source map.

Digital Geologic-GIS Map of the Pilot Peak 15' Quadrangle and part of the Cooke City 15' Quadrangle, Wyoming (*GRI MapCode PIPK*)

Elliott, J.E., 1979, Geologic Map of the southwest part of the Cooke City Quadrangle, Montana and Wyoming: U.S. Geological Survey, Miscellaneous Investigations Series Map I-1084, scale 1:24,000 (Cooke City Quadrangle (southwest part)). (*GRI Source Map ID 3014*).

The GRI used the full extent of the source map presented above, and captured all geologic features within its extent.

Digital Geologic-GIS Map of the Tepee Creek 15' Quadrangle, Wyoming and Montana (*GRI MapCode TECR*)

Witkind, I.J., 1969, Geology of the Tepee Creek Quadrangle, Montana-Wyoming: U.S. Geological Survey, Professional Paper 609, scale 1:62,500 (Tepee Creek 15' Quadrangle). (*GRI Source Map ID 3020*).

The GRI used the full extent of the source map presented above, and captured all geologic features within its extent.

Digital Geologic-GIS Map of the Tower Junction 15' Quadrangle, Wyoming and Montana (*GRI MapCode TOJU*)

U.S. Geological Survey, 2007, Digital Geologic Map of the Tower Junction Quadrangle, Yellowstone National Park, Wyoming and Montana: U.S. Geological Survey, unpublished digital data, scale 1:62,500 (Tower Junction 15' Quadrangle (digital)). (*GRI Source Map ID 74794*).

Prussia, H.J., Blank, H.R., Christiansen, R.L., Rappel, E.T., 1975, Geologic Map of the Tower Junction Quadrangle, Yellowstone National Park, Wyoming and Montana: U.S. Geological Survey, Geologic Quadrangle Map GQ-1247, scale 1:62,500 (Tower Junction 15' Quadrangle). (*GRI Source Map ID 3018*).

The GRI used the full extent of the source digital geologic map presented above, and captured additional features not present in the source digital geologic map like fault symbology, volcanic point features, and mine point features from the paper source map.

Digital Geologic-GIS Map of the Two Ocean Pass 15' Quadrangle, Wyoming (*GRI MapCode TWOC*)

U.S. Geological Survey, 2007, Digital Geologic Map of the Two Ocean Pass 15' Quadrangle, Yellowstone National Park and Vicinity, Wyoming: U.S. Geological Survey, unpublished digital data, scale 1:62,500 (Two Ocean Pass 15' Quadrangle (digital)). (*GRI Source Map ID 74793*).

Smedes, H.W., M'Gonigle, J.W.; Prussia, H.J., 1989, Geologic Map of the Two Ocean Pass 15' Quadrangle, Yellowstone National Park and Vicinity, Wyoming: U.S. Geological Survey, Geologic Quadrangle Map GQ-1667, scale 1:62,500 (Two Ocean Pass 15' Quadrangle). (*GRI Source Map ID 2644*).

The GRI used the full extent of the source digital geologic map presented above, and captured

additional features not present in the source digital geologic map like fault symbology, volcanic point features, and mine point features from the paper source map.

Digital Geologic-GIS Map of the West Thumb 15' Quadrangle, Wyoming (*GRI MapCode WETH*)

U.S. Geological Survey, 2007, Digital Geologic Map of the West Thumb Quadrangle, Yellowstone National Park, Wyoming: U.S. Geological Survey, unpublished digital data, scale 1:62,500 (West Thumb 15' Quadrangle (digital)). (*GRI Source Map ID 74801*).

Christiansen, R.L., 1974, Geologic Map of the West Thumb Quadrangle, Yellowstone National Park, Wyoming: U.S. Geological Survey, Geologic Quadrangle Map GQ-1191, scale 1:62,500 (West Thumb 15' Quadrangle). (*GRI Source Map ID 3260*).

The GRI used the full extent of the source digital geologic map presented above, and captured additional features not present in the source digital geologic map like fault symbology, volcanic point features, and mine point features from the paper source map.

Digital Geologic-GIS Map of the West Yellowstone 15' Quadrangle, Wyoming, Montana and Idaho (*GRI MapCode WEYE*)

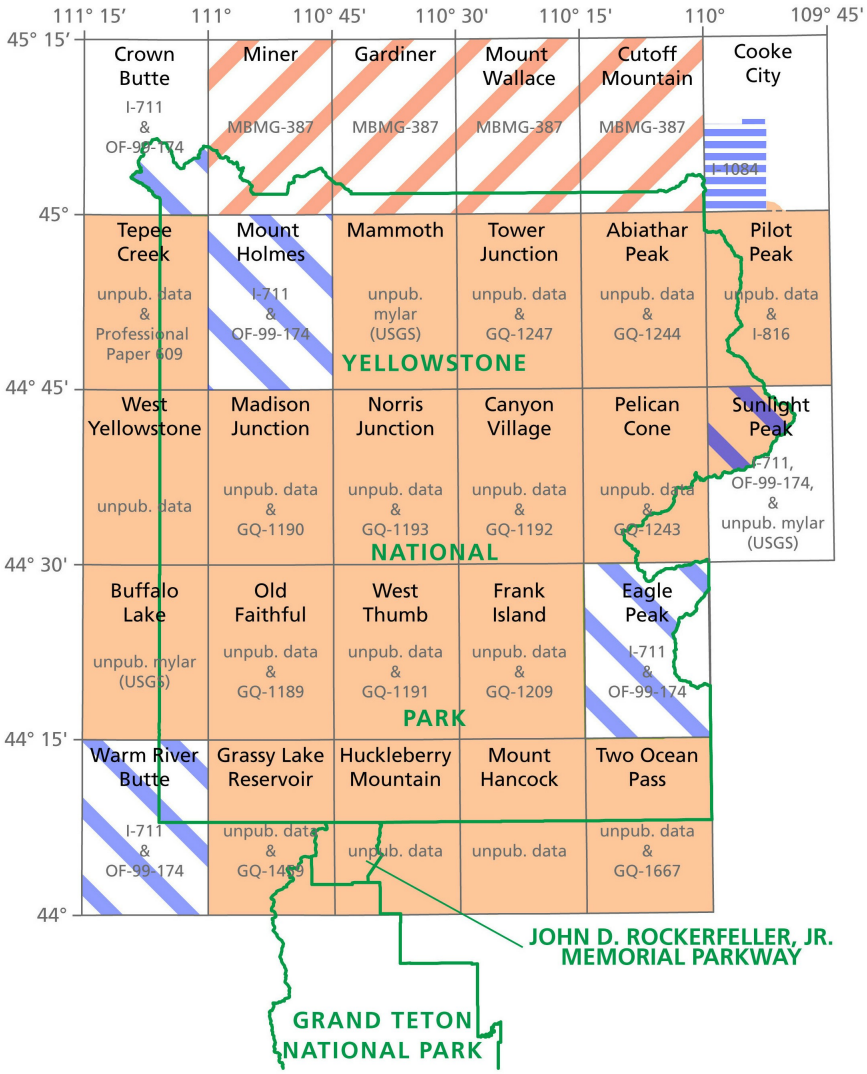
Christiansen, R.L., 2007, Mylar of the West Yellowstone Quadrangle: U.S. Geological Survey, unpublished mylar, scale 1:62,500 (West Yellowstone 15' Quadrangle). (*GRI Source Map ID 6721*).

The GRI used the full extent of the source map presented above, and captured all geologic features within its extent.

Additional information pertaining to each source map is also presented in the GRI Source Map Information (YELLMAP) table included with the GRI geologic-GIS data.

Index Map

The following index map displays the extents of the GRI digital geologic-GIS maps produced for Yellowstone National Park (YELL). The boundary for Yellowstone National Park (as of March, 2020) is outlined in green. 1:62,500 scale source map extents are shown in salmon shading, whereas the extent of the 1:125,000 source maps used for Mount Holmes, Crown Butte, Eagle Peak, Sunlight Peak, and Warm River Butte are shown with blue stripes, and 1:100,000 scale source map extents for Miner, Gardiner, Mount Wallace and Cutoff Mountain are shown in red stripes. The GRI utilized both 1:62,500 and 1:125,000 data for the Sunlight Peak quadrangle.



Index Map by Jake Suri, James Chappell, and James Winter (Colorado State University).

Map Unit List

The geologic units present in the digital geologic-GIS data produced for Yellowstone National Park, Wyoming, Montana, and Idaho (YELL) are listed below. Units are listed with their assigned unit symbol and unit name (e.g., Qd - Mine dumps and mill tailings). Units are listed from youngest to oldest. Information about each geologic unit is also presented in the GRI Geologic Unit Information Table (yellunit) included with the GRI geologic-GIS data. Some source unit symbols, names and/or ages may have been changed in this document and in the GRI digital geologic-GIS data. This was done if a unit was considered to be the same unit as one or more units on other source maps used for this project, and these unit symbols, names and/or ages differed. In this case a single unit symbol and name, and the unit's now recognized age, was adopted. Unit symbols, names and/or ages in a unit descriptions, or on a correlation of map units or other source map figure were not edited. If a unit symbol, name or age was changed by the GRI, the unit's source map symbol, name and/or age appears with the unit's source map description.

Cenozoic Era

Quaternary Period

Qd - Mine dumps and mill tailings
Qy - Undifferentiated surficial deposits
Qc - Colluvial deposits
Qaf - Alluvial fan deposits
Qal - Alluvium of modern channels and flood plains
Qef - Earthflow deposits
Qrsd - Rock slide deposits
Qe - Esker deposits
Qs - Detrital deposits
Qa - Alluvium and glaciofluvial deposits
Qls - Landslide deposits
Qr - Rock glacier or block field
Qsw - Swamp deposits
Ql - Lacustrine and glaciolacustrine deposits
Qt - Talus, colluvium, and avalanche deposits
Qh - Hot spring deposits
Qhi - Ice contact deposits localized by hot springs
Qhs - Silicious hot spring deposits
Qhc - Calcareous hot spring deposits
Qhe - Hydrothermal explosion deposits
Qgu - Glacial deposits, undivided
Qg - Glaciofluvial deposits
Qo - Outwash deposits
Qmo - Morainal deposits
Qkt - Kame terrace deposits
Qgt - Glacial till
Qgl - Glacial lake deposit
Qtr - Travertine deposit
Qba - Basalt
Qgc - Basalt of Geode Creek, lava flow
Qgcd - Basalt of Geode Creek, dike
Qgcc - Basalt of Geode Creek, cinder and scoria cone of basalt
Qpcp - Pitchstone Plateau flow
Qpcg - Grants Pass flow
Qpci - Gibbon River flow
Qpcf - Solfatara Plateau flow
Qpch - Hayden Valley flow
Qpcy - West Yellowstone flow

Qpco - Tuff of Cold Mountain Creek
Qpct - Trischman Knob dome
Qpck - Douglas Knob dome
Qpcr - Bechler River flow
Qpcs - Summit Lake flow
Qpcn - Nez Perce Creek flow
Quf - Sediments of Upper Falls
Qpcu - Spruce Creek flow
Qpce - Elephant Back flow
Qpcw - West Thumb flow
Qpca - Aster Creek flow
Qpcb - Buffalo Lake flow
Qpcc - Spring Creek flow
Qpcl - Tuff of Bluff Point
Qpcm - Mary Lake flow
Qpcd - Dry Creek rhyolite flow
Qob - Osprey Basalt
Qpm - Mallard Lake flow
Qmr - Madison River Basalt
Qprc - Cougar Creek dome
Qprs - Crystal Spring flow
Qpro - Obsidian Cliff flow
Qprr - Riverside flow
Qi - Sediments of Inspiration Point
Qpow - Willow Park dome
Qpoa - Apollinaris Spring dome
Qpol - Landmark dome
Qpoc - Geyser Creek dome
Qpoh - Gibbon Hill dome
Qpop - Paintpot Hill dome
Qpog - Rhyolite basalt mixed lavas of Gardner River
Qpoz - Rhyolite basalt mixed lavas of Grizzly Lake
Qpud - Dunraven Road flow
Qpuc - Canyon rhyolite flow
Qpus - Tuff of Sulphur Creek
Qput - Tuff of Uncle Tom's trail
Qpul - Scaup Lake flow
Qpub - Biscuit Basin flow
Qpuf - Falls River Basalt
Qpusl - Swan Lake Flat Basalt
Qpuslm - Swan Lake Flat Basalt, mixed lava
Qpug - Gerrit Basalt
Qb - Till of Bechler Meadows
Qf - Sediments of Lower Falls
Qm - Sediments of Flat Mountain Arm
Qylu - Lava Creek Tuff, undivided
Qylb - Lava Creek Tuff, Member B
Qyla - Lava Creek Tuff, Member A
Qylau - Lava Creek Tuff, upper part of Member A
Qylal - Lava Creek Tuff, lower part of Member A
Qufb - Undine Falls Basalt
Qjf - Flat Mountain flow
Qjw - Wapiti Lake flow
Qjs - Stonetop Mountain flow
Qjh - Mount Haynes flow
Qjl - Harlequin Lake flow
Qjm - Moose Creek Butte flow

Qmb - Big Bear Lake flow
Qw - Basalt of Warm River
Qn - Sediments and basalts of the Narrows
Qiw - Island Park Rhyolite, Warm River Butte dome
Qym - Island Park Rhyolite, Mesa Falls Tuff
Qlg - Landslide and glacial debris
Qlc - Lewis Canyon Rhyolite
Qel - Pyroxene andesite and basalt of Emerald Lake
Qhru - Huckleberry Ridge Tuff, undivided
Qhrc - Huckleberry Ridge Tuff, Member C
Qhrb - Huckleberry Ridge Tuff, Member B
Qhra - Huckleberry Ridge Tuff, Member A
Qbc - Rhyolite of Broad Creek
Qj - Junction Butte Basalt
Qg2 - Glacial debris of second major glaciation
Qg4 - Morainal debris of youngest major glaciation
Qog - Outwash gravel
Qsb - Slump Blocks
Qjlm - Morainal debris of Jackson Lake
Qslt - Obsidian sandstone, siltstone and claystone
Qbrm - Morainal debris of Buried Ridge

Quaternary and Tertiary Periods
QTt - Yellowstone Tuff
QTml - Basalt of Mariposa Lake
QTh - Heart Lake Conglomerate
QTi - Igneous dike
QTs - Unnamed Scoria
QTba - Basalt

Tertiary Period
T - Tertiary units, undivided
Tsu - Sediment or sedimentary rocks, undivided
Tcct - Conant Creek Tuff
Te - Gravel of Mount Everts
Trlf - Rhyolite of Yellowstone Point, rhyolite porphyry lava flows
Tri - Rhyolite of Yellowstone Point, rhyolite porphyry dike
Twig - Wiggins Formation
Twigk - Wiggins Formation, key bed
Twigv - Wiggins Formation, vent facies rocks
Twigvk - Wiggins Formation, vent facies rocks, key bed
Twigl - Wiggins Formation, lava flows
Twigi - Wiggins Formation, intrusive rocks
Tab - Andesite breccia
Ts - Shoshonite
Tql - Quartz latite porphyry
Trpo - Rhyodacite porphyry
Ta - Porphyritic andesite and andesite porphyry
Tlp - Latite porphyry
Tat - Augite trachyandesite
Td - Dikes of trachyandesite, basalt, and dacite dikes, sills, and larger irregular intrusive bodies
Tdn - Diorite and niorite
Trl - Rhyodacite porphyry of Lulu Pass
Trh - Rhyodacite porphyry of Henderson Mountain
Tbp - Porphyritic basalt and basalt porphyry
Tr - Rhyolite or rhyolitic sediment

Tlpl - Latite and porphyritic latite
Trpq - Quartz "eye" rhyodacite porphyry
Tfpy - Felsic pyroclastic rocks
Tmz - Monzodiorite of Independence area
Tia - Andesite dikes
Tdaf - Dacite? flows
Tdap - Dacite porphyry
Tda - Dacite? intrusive
Thr - Hominy Peak Formation
Tiru - Intrusive rocks, undivided
Tav - Absaroka Volcanics Supergroup, undivided
Tto - Two Ocean Formation
Ttoa - Two Ocean Formation, ash bed
Ttok - Two Ocean Formation, key bed
Ttol - Two Ocean Formation and Langford Formation, intrusive rocks
Tl - Langford Formation
Tlir - Langford Formation, intrusive rocks
Tlv - Langford Formation, vent facies deposits
Tla - Langford Formation, alluvial facies deposits
Tlak - Langford Formation, alluvial facies deposits, key bed
Tlf - Langford Formation, lava flows
Tlpm - Langford Formation, Promontory Member
Ttpu - Trout Peak Trachyandesite, undivided
Tt - Trout Peak Trachyandesite, main body
Tti - Trout Peak Trachyandesite, dikes of shoshonite
Ttppc - Trout Peak Trachyandesite, Pacific Creek Tuff Member
Tta - Trout Peak Trachyandesite, andesitic volcanic sediments
Ttpr - Trout Peak Trachyandesite, lava flow of rhomb porphyry type
Trql - Rhyodacite, quartz latite, quartz monzonite, and granodiorite in the Gallatin Ridge
Tf - Complex of Fisher Mountain Area
Tbae - Breccia of Alice E. Mine Area
Tbh - Breccia of Homestake Mine Area
Tv - Volcaniclastic rocks of uncertain correlation
Tw - Wapiti Formation
Twa - Wapiti Formation, alluvial facies
Twv - Wapiti Formation, vent facies
Twf - Wapiti Formation, mafic lava flows
Tch - Crescent Hill Basalt
Tm - Mount Wallace Formation, main body
Tms - Mount Wallace Formation, Slough Creek Tuff Member
Tb - Olivine basalt laccolith
Ti - Quartz monzonite prophyry
Tlr - Lamar River Formation
Tlrd - Lamar River Formation, Sulphur Creek stock
Tlra - Lamar River Formation, alluvial facies
Tli - Lamar River Formation, autobrecciated intrusive andesite
Tic - Lamar River and Cathedral Cliffs Formations, intrusive andesite
Tlrv - Lamar River Formation, vent facies
Tec - Lamar River Formation, Elk Creek Basalt Member
Tlrf - Lamar River Formation, andesite flows
Tlc - Lamar River Formation and Cathedral Cliffs Formation, undivided
Tai - Absaroka Volcanic Supergroup, intrusive rocks
Tse - Sepulcher Formation
Tseu - Sepulcher Formation, unknown member
Tsf - Sepulcher Formation, Fortress Mountain Member
Tsd - Sepulcher Formation, Daly Creek Member
Tslc - Sepulcher Formation, Lost Creek Tuff Member

Tsec - Sepulcher Formation, Elk Creek Basalt Member
Tsc - Sepulcher Formation, non volcanic conglomerate
Tcc - Cathedral Cliffs Formation
Tc - Crandall Conglomerate
Tae - Andesite, epiclastic of Hyalite Peak Volcanics
Tanf - Andesite flows of Hyalite Peak Volcanics
Tavv - Vent facies of Hyalite Peak Volcanics
Tds - Diorite of Scotch Bonnet Mountain
Ttp - Trachyandesite porphyry
Tdp - Dacite porphyry
Twr - White River Formation
Tbc - Tuff of Boone Creek
Tbr - Unnamed basalt breccia
Tco - Colter Formation
TpCi - Intermediate and mafic Intrusive rocks

Cenozoic and Mesozoic Eras

Tertiary and Cretaceous Periods
TKp - Pinyon Conglomerate
TKv - Volcanic rocks, undivided

Mesozoic Era

Cretaceous Period
Kdi - Diorite
Ks - Sedimentary rocks, undivided
Kql - Quartz latite porphyry
Ksy - Syenite of Goose Lake
Krp - Rhyodacite porphyry
Kh - Harebell Formation
Kb - Bacon Ridge Sandstone
Kl - Landslide Creek Formation
Klf - Landslide Creek formation through Frontier Formation
Ke - Everts Formation?
Kev - Eagle Sandstone, Virgelle Sandstone Member
Ktc - Telegraph Creek Formation
Kc - Cody Shale
Kf - Frontier Formation
Km - Mowry Shale
Kmt - Mowry Shale and Thermopolis Shale, undivided
Kmfr - Mowry Shale through Fall River Sandstone, undivided
Kmk - Mowry Shale, Thermopolis Shale, and Kootenai Formation, undivded
Kt - Thermopolis Shale
Ktu - Thermopolis? Shale, upper part
Kts - Thermopolis? Shale, sandstone member
Kmd - Thermopolis Shale, Muddy Sandstone Member
Ktrb - Thermopolis Shale, Rusty Beds Member

Cretaceous and Jurassic Periods
KJmv - Thermopolis Shale, variegated sequence underlying Rusty Beds Member

Cretaceous Period
Kss - Lenticular sandstone/shale sequence

Ksb - Unnamed lenticular sandstone/shale/bedrock sequence
Kk - Kootenai Formation

Cretaceous and Jurassic Periods
KJcm - Cloverly Formation and Morrison Formation, undivided

Jurassic Period
Jm - Morrison Formation
Jsg - Sundance Formation and Gypsum Spring Formation, undivided
Jus - Upper Sundance Formation
Jls - Lower Sundance Formation
Jgs - Gypsum Spring Formation
Je - Swift Formation, Rierdon Formation, and Sawtooth Formation, undivided

Jurassic and Triassic Periods
JTRs - Sedimentary rocks, undivided

Triassic Period
TRc - Chugwater Formation, undivided
TRp - Chugwater Formation, Popo Agie Member
TRrp - Chugwater Formation, Red Peak Member
TRa - Chugwater Formation, Alcova Limestone Member
TRcd - Chugwater Formation and Dinwoody Formation, undivided
TRtw - Thaynes? Formation and Woodside Siltstone, undivided
TRtwd - Thyanes? Formation, Woodside Siltstone and Dinwoody Formation, undivded
TRd - Dinwoody Formation

Paleozoic Era

Permian, Pennsylvanian, and Mississippian Periods
PPNMs - Sedimentary rocks, undivided

Paleozoic Era
PZs - Sedimentary rocks, undivided

Permian Period
Pp - Phosphoria Formation
Psh - Shedhorn Sandstone

Pennsylvanian Period
PNq - Quadrant Sandstone
PNqa - Quadrant Sandstone and Amsden Formation

Pennsylvanian and Mississippian Periods
PNMta - Tensleep Sandstone and Amsden Formation
PNMa - Amsden Formation

Mississippian Period
Mmu - Madison Group, undivided
Mml - Madison Limestone
Mmmcll - Madison Group, Mission Canyon Limestone and Lodgepole Limestone, undivided

Mississippian to Cambrian Periods
MCu - Upper Mississippian to Middle Cambrian Rocks, undivided

Mississippian Period
Ml - Lodgepole Limestone

Devonian and Ordovician Periods
DOs - Sedimentary rocks, undivided

Devonian Period
Dt - Three Forks Formation
Dtj - Three Forks Formation and Jefferson Formation, undivided

Devonian and Ordovician Periods
DOt - Three Forks Formation, Jefferson Formation, and Bighorn Dolomite, undivided

Devonian Period
Dd - Darby Formation
Dj - Jefferson Formation

Ordovician Period
Ob - Bighorn Dolomite

Ordovician and Cambrian Periods
OCbg - Bighorn Dolomite and Gallatin Limestone, undivided
OCbp - Bighorn? Dolomite, Snowy Range Formation, and Pilgrim Limestone undivded

Cambrian Period
Cu - Upper and Middle Cambrian rocks, undivided
Csr - Snowy Range Formation
Csrp - Snowy Range Formation and Pilgrim Formation, undivided
Cpi - Pilgrim Formation
Cgp - Gallatin Limestone and Park Shale, undivided
Cs - Sedimentary rocks, undivided
Cgv - Gros Ventre Formation, undivided
Cgvls - Gros Ventre Formation, top of nodular limestone and interbedded green shale unit
Cdc - Death Canyon Limestone
Cp - Park Shale
Cpf - Park Shale, Meagher Limestone, Wolsey Shale and Flathead Sandstone, undivided
Cm - Meagher Limestone
Cw - Wolsey Shale
Cwf - Wolsey Shale and Flathead Sandstone, undivided
Cf - Flathead Sandstone

Precambrian Era

Proterozoic and Archean Eons
PCim - Mafic intrusive rocks

Precambrian Era
PCmu - Metamorphic rocks, undivided
PCd - Diabase
PCp - Pegmatite
PCqd - Quartz dolerite
PCm - Metadolerite
PCom - Olivine metagabbro
PCmp - Metadolerite porphyry
PCg - Granitic rocks

PCu - Ultramafic rock
PCgn - Layered gneiss
PCmy - Mylonite
PCq - Quartzite
PCt - Tremolite marble
PCms - Mica schist
PCa - Amphibolite
PCdo - Dolomite
PCn - Noritic gabbro
PCs - Schist and gneiss
PCgg - Granitic gneiss

Archean Eon
Aamh - Amphibolite and hornblende gneiss, Stillwater Complex
Agn - Gneissic rocks
Agr - Granitic rocks
As - Biotite schist
Ash - Schist and hornfels

unknown age
qz-v - Quartz vein
cd - Carbonate dike

Source Map Geologic Units

The source maps each unit is present on are mentioned in the unit listing that follows. For each unit present in the GRI compilation, each source map's unit symbol, unit name and unit age are listed along with a link to view the source map unit description. Unit descriptions for all units are listed with each source map section in the Ancillary Source Map Information section of this document.

Qd - Mine dumps and mill tailings (Recent)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

d - Mine dumps and mill tailings (Holocene)
Geologic unit present on source map: Cooke City 15' Quadrangle (southwest part) Geologic Units

Qy - Undifferentiated surficial deposits (Holocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit description for that specific source map):

Qu - Undifferentiated Surficial Deposits (Holocene)
Geologic unit present on source map: Cooke City 15' Quadrangle (southwest part) Geologic Units

Qc - Colluvial deposits (Holocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qc - Colluvium
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Qc - Colluvium
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

Qc - Colluvial deposits (Recent)
Geologic unit present on source map: Tepee Creek 15' Quadrangle Geologic Units

Qc - Colluvial, talus, and avalanche deposits (Holocene)
Geologic unit present on source map: Two Ocean Pass 15' Quadrangle Geologic Units

Qaf - Alluvial fan deposits (Holocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qf - Alluvial fan deposits
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Qf - Alluvial fan deposits

Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

Qf - Alluvial fan deposits (Recent)
Geologic unit present on source map: Tepee Creek 15' Quadrangle Geologic Units

Qf - Alluvial fan deposits (Holocene)
Geologic unit present on source map: Two Ocean Pass 15' Quadrangle Geologic Units

Qal - Alluvium of modern channels and flood plains (Holocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qal - Alluvium (Holocene)
Geologic unit present on source map: Cooke City 15' Quadrangle (southwest part) Geologic Units

Qal - Alluvium of modern channels and flood plains (Holocene)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

Qal - Alluvium of modern channels and flood plains
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Qal - Alluvium of modern channels and flood plains
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

Qal - name unknown
Geologic unit present on source map: Sunlight Peak 15' Quadrangle (northwest part) Geologic Units

Qal - Alluvium (Recent)
Geologic unit present on source map: Tepee Creek 15' Quadrangle Geologic Units

Qef - Earthflow deposits (Holocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit description for that specific source map):

Qef - Earthflow deposits (Recent)
Geologic unit present on source map: Tepee Creek 15' Quadrangle Geologic Units

Qrsd - Rock slide deposits (Holocene and Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit description for that specific source map):

Qrs - Rock slide deposits (Recent)
Geologic unit present on source map: Tepee Creek 15' Quadrangle Geologic Units

Qe - Esker deposits (Holocene and Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit description for that specific source map):

Qe - Esker deposits (Pleistocene)
Geologic unit present on source map: Tepee Creek 15' Quadrangle Geologic Units

Qs - Detrital deposits (Holocene and Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qs - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Qs - Detrital deposits (Holocene and Pleistocene)
Geologic unit present on source map: Yellowstone National Park Geologic Units

Qa - Alluvium and glaciofluvial deposits (Holocene and Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qa - Alluvium and glaciofluvial deposits (Holocene and Pleistocene)
Geologic unit present on source map: Abiathar Peak 15' Quadrangle Geologic Units

Qa - name unknown
Geologic unit present on source map: Buffalo Lake 15' Quadrangle Geologic Units

Qa - Alluvium and glaciofluvial deposits (Holocene and Pleistocene)
Geologic unit present on source map: Canyon Village 15' Quadrangle Geologic Units

Qa - Alluvium and glaciofluvial deposits (Holocene and Pleistocene)
Geologic unit present on source map: Frank Island 15' Quadrangle Geologic Units

Qao - Alluvium, older, undivided (Holocene and Pleistocene?)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

Qa - Alluvium (Holocene and Pleistocene)
Geologic unit present on source map: Grassy Lake Reservoir 15' Quadrangle Geologic Units

Qa - Alluvium
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Qa - Alluvium and glaciofluvial deposits (Holocene and Pleistocene)
Geologic unit present on source map: Madison Junction 15' Quadrangle Geologic Units

Qa - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Qa - Alluvium
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

Qa - Alluvial and glaciofluvial deposits (Holocene and Pleistocene)
Geologic unit present on source map: Norris Junction 15' Quadrangle Geologic Units

Qa - Alluvium and glaciofluvial deposits (Holocene and Pleistocene)
Geologic unit present on source map: Old Faithful 15' Quadrangle Geologic Units

Qa - Alluvial and glaciofluvial deposits (Holocene and Pleistocene)
Geologic unit present on source map: Pelican Cone 15' Quadrangle Geologic Units

Qal - Alluvium (Pleistocene and Holocene)
Geologic unit present on source map: Pilot Peak 15' Quadrangle Geologic Units

Qa - Alluvium and glaciofluvial deposits (Holocene and Pleistocene)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Qa - Alluvial and glaciofluvial deposits (Holocene and Pleistocene)
Geologic unit present on source map: Two Ocean Pass 15' Quadrangle Geologic Units

Qa - Alluvium and glaciofluvial deposits (Holocene and Pleistocene)
Geologic unit present on source map: West Thumb 15' Quadrangle Geologic Units

Qa - name unknown
Geologic unit present on source map: West Yellowstone 15' Quadrangle Geologic Units

Qls - Landslide deposits (Holocene and Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qs - Landslide deposits (Holocene and Pleistocene)
Geologic unit present on source map: Abiathar Peak 15' Quadrangle Geologic Units

Qs - Landslide deposits (Holocene and Pleistocene)
Geologic unit present on source map: Canyon Village 15' Quadrangle Geologic Units

Ql - Landslide deposits (Holocene and Pleistocene)
Geologic unit present on source map: Cooke City 15' Quadrangle (southwest part) Geologic Units

Qs - Landslide deposits (Holocene and Pleistocene)
Geologic unit present on source map: Frank Island 15' Quadrangle Geologic Units

Qls - Landslide deposit (Holocene)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

Qls - Landslide deposits (Holocene and Pleistocene)
Geologic unit present on source map: Grassy Lake Reservoir 15' Quadrangle Geologic Units

Qls - Landslide debris
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Qls - Landslide debris
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

Qs - Landslide deposits (Holocene and Pleistocene)
Geologic unit present on source map: Norris Junction 15' Quadrangle Geologic Units

Qs - Landslide deposits (Holocene and Pleistocene)
Geologic unit present on source map: Pelican Cone 15' Quadrangle Geologic Units

Ql - Landslide deposits (Holocene and Pleistocene)
Geologic unit present on source map: Pilot Peak 15' Quadrangle Geologic Units

Ql - Landslide deposits (Recent)
Geologic unit present on source map: Tepee Creek 15' Quadrangle Geologic Units

Qs - Landslide deposits (Holocene and Pleistocene)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Qls - Landslide deposits (Holocene and Pleistocene)
Geologic unit present on source map: Two Ocean Pass 15' Quadrangle Geologic Units

Qs - Landslide deposits (Holocene and Pleistocene)
Geologic unit present on source map: West Thumb 15' Quadrangle Geologic Units

Qr - Rock glacier or block field (Holocene and Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit description for that specific source map):

Qr - Rock glacier or block field (Holocene and Pleistocene)
Geologic unit present on source map: Pilot Peak 15' Quadrangle Geologic Units

Qsw - Swamp deposits (Holocene and Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit description for that specific source map):

Qsw - Swamp deposits (Holocene and Pleistocene)
Geologic unit present on source map: Grassy Lake Reservoir 15' Quadrangle Geologic Units

Qs - Swamp deposits
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Qs - Swamp deposits
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

Ql - Lacustrine and glaciolacustrine deposits (Holocene and Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Ql - Lacustrine and glaciolacustrine deposits (Holocene and Pleistocene)
Geologic unit present on source map: Abiathar Peak 15' Quadrangle Geologic Units

Ql - Lacustrine and glaciolacustrine deposits (Holocene and Pleistocene)
Geologic unit present on source map: Canyon Village 15' Quadrangle Geologic Units

Ql - Lacustrine and glaciolacustrine deposits (Holocene and Pleistocene)
Geologic unit present on source map: Frank Island 15' Quadrangle Geologic Units

Ql - Lacustrine deposits (Holocene and Pleistocene)
Geologic unit present on source map: Grassy Lake Reservoir 15' Quadrangle Geologic Units

Ql - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Qlg - Landslide or glacial debris
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

Ql - Lacustrine and glaciolacustrine deposits (Holocene and Pleistocene)
Geologic unit present on source map: Norris Junction 15' Quadrangle Geologic Units

Ql - Lacustrine and glaciolacustrine deposits (Holocene and Pleistocene)
Geologic unit present on source map: Pelican Cone 15' Quadrangle Geologic Units

Ql - Lacustrine and glaciolacustrine deposits (Holocene and Pleistocene)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Ql - Lacustrine and glaciolacustrine deposits (Holocene and Pleistocene)
Geologic unit present on source map: West Thumb 15' Quadrangle Geologic Units

Qt - Talus, colluvium, and avalanche deposits (Holocene and Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qt - Talus (Holocene and Pleistocene)
Geologic unit present on source map: Abiathar Peak 15' Quadrangle Geologic Units

Qt - name unknown
Geologic unit present on source map: Buffalo Lake 15' Quadrangle Geologic Units

Qt - Talus and colluvium (Holocene and Pleistocene)
Geologic unit present on source map: Canyon Village 15' Quadrangle Geologic Units

Qt - Talus (Holocene and Pleistocene)
Geologic unit present on source map: Frank Island 15' Quadrangle Geologic Units

Qt - Talus and colluvium (Holocene and Pleistocene)
Geologic unit present on source map: Grassy Lake Reservoir 15' Quadrangle Geologic Units

Qt/Qtl - Talus
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Qt - Talus and colluvium (Holocene and Pleistocene)
Geologic unit present on source map: Madison Junction 15' Quadrangle Geologic Units

Qt - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Qt - Talus
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

Qt - Talus (Holocene and Pleistocene)
Geologic unit present on source map: Norris Junction 15' Quadrangle Geologic Units

Qt - Talus and colluvium (Holocene and Pleistocene)
Geologic unit present on source map: Old Faithful 15' Quadrangle Geologic Units

Qt - Talus and colluvium (Holocene and Pleistocene)
Geologic unit present on source map: Pelican Cone 15' Quadrangle Geologic Units

Qtl - name unknown
Geologic unit present on source map: Sunlight Peak 15' Quadrangle (northwest part) Geologic Units

Qt - Talus (Holocene and Pleistocene)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Qt - Talus, colluvium, and avalanche deposits (Holocene and Pleistocene)
Geologic unit present on source map: West Thumb 15' Quadrangle Geologic Units

Qt - name unknown
Geologic unit present on source map: West Yellowstone 15' Quadrangle Geologic Units

Qh - Hot spring deposits (Holocene and Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit description for that specific source map):

Qhs - Hot Spring Deposits
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Qh - hot spring deposits (Holocene and Pleistocene)
Geologic unit present on source map: Yellowstone National Park Geologic Units

Qhi - Ice contact deposits localized by hot springs (Holocene and Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qhi - Ice contact deposits localized by hot springs (Holocene and Pleistocene)
Geologic unit present on source map: Abiathar Peak 15' Quadrangle Geologic Units

Qhi - name unknown
Geologic unit present on source map: Buffalo Lake 15' Quadrangle Geologic Units

Qhi - Ice contact deposits (Holocene and Pleistocene)
Geologic unit present on source map: Canyon Village 15' Quadrangle Geologic Units

Qhi - Ice contact deposits localized by hot springs
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Qhi - Ice contact deposits localized by hot springs (Holocene and Pleistocene)
Geologic unit present on source map: Madison Junction 15' Quadrangle Geologic Units

Qhi - Ice contact deposits localized by hot springs (Holocene and Pleistocene)
Geologic unit present on source map: Norris Junction 15' Quadrangle Geologic Units

Qhi - Ice contact deposits localized by hot springs (Holocene and Pleistocene)
Geologic unit present on source map: Old Faithful 15' Quadrangle Geologic Units

Qhi - Ice contact deposits (Holocene and Pleistocene)
Geologic unit present on source map: Pelican Cone 15' Quadrangle Geologic Units

Qhi - Ice contact deposits localized by hot springs (Holocene and Pleistocene)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Qci - Cemented ice contact deposits localized by hot springs (Holocene and Pleistocene)
Geologic unit present on source map: Yellowstone National Park Geologic Units

Qhs - Silicious hot spring deposits (Holocene and Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qhs - name unknown
Geologic unit present on source map: Buffalo Lake 15' Quadrangle Geologic Units

Qhs - Siliceous hot spring deposits (Holocene and Pleistocene)
Geologic unit present on source map: Canyon Village 15' Quadrangle Geologic Units

Qhs - Silicious sinter (Holocene and Pleistocene)
Geologic unit present on source map: Grassy Lake Reservoir 15' Quadrangle Geologic Units

Qhs - Silicious hot spring deposits (Holocene and Pleistocene)
Geologic unit present on source map: Madison Junction 15' Quadrangle Geologic Units

Qhs - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Qhs - Silicious hot spring deposits (Holocene and Pleistocene)
Geologic unit present on source map: Norris Junction 15' Quadrangle Geologic Units

Qhs - Silicious hot spring deposits (Holocene and Pleistocene)
Geologic unit present on source map: Old Faithful 15' Quadrangle Geologic Units

Qhs - Silicious hot spring deposits (Holocene and Pleistocene)
Geologic unit present on source map: Pelican Cone 15' Quadrangle Geologic Units

Qhs - Siliceous hot spring deposits (Holocene and Pleistocene)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Qhs - Silicious hot spring deposits (Holocene and Pleistocene)
Geologic unit present on source map: West Thumb 15' Quadrangle Geologic Units

Qhc - Calcareous hot spring deposits (Holocene and Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qhc - Calcareous hot spring deposits (Holocene and Pleistocene)
Geologic unit present on source map: Abiathar Peak 15' Quadrangle Geologic Units

Qhc - Calcareous hot spring deposits (Holocene and Pleistocene)
Geologic unit present on source map: Madison Junction 15' Quadrangle Geologic Units

Qhc - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Qhc - Calcareous hot spring deposits (Holocene and Pleistocene)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Qhe - Hydrothermal explosion deposits (Holocene and Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qhe - Hydrothermal explosion deposits (Holocene and Pleistocene)
Geologic unit present on source map: Canyon Village 15' Quadrangle Geologic Units

Qhe - Hydrothermal-explosion deposits (Holocene and Pleistocene)
Geologic unit present on source map: Madison Junction 15' Quadrangle Geologic Units

Qhe - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Qhe - Hydrothermal explosion deposits (Holocene and Pleistocene)
Geologic unit present on source map: Pelican Cone 15' Quadrangle Geologic Units

Qhe - Hydrothermal explosion deposits (Holocene and Pleistocene)
Geologic unit present on source map: West Thumb 15' Quadrangle Geologic Units

Qgu - Glacial deposits, undivided (Holocene and Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qg - Glacial deposits (Holocene and Pleistocene)
Geologic unit present on source map: Abiathar Peak 15' Quadrangle Geologic Units

Qg - name unknown
Geologic unit present on source map: Buffalo Lake 15' Quadrangle Geologic Units

Qg - Glacial deposits (Holocene and Pleistocene)
Geologic unit present on source map: Canyon Village 15' Quadrangle Geologic Units

Qg - Glacial Deposits (Pleistocene)
Geologic unit present on source map: Cooke City 15' Quadrangle (southwest part) Geologic Units

Qg - Glacial deposits (Holocene and Pleistocene)
Geologic unit present on source map: Frank Island 15' Quadrangle Geologic Units

Qg - Glacial deposits, undivided (Holocene and Pleistocene)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

Qg - Glacial deposits (Pleistocene)
Geologic unit present on source map: Grassy Lake Reservoir 15' Quadrangle Geologic Units

Qg - Undifferentiated glacial debris
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Qg - Glacial deposits (Holocene and Pleistocene)
Geologic unit present on source map: Madison Junction 15' Quadrangle Geologic Units

Qg - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Qg - Undifferentiated glacial debris
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

Qg - Glacial deposits (Holocene and Pleistocene)
Geologic unit present on source map: Norris Junction 15' Quadrangle Geologic Units

Qg - Glacial deposits (Holocene and Pleistocene)
Geologic unit present on source map: Old Faithful 15' Quadrangle Geologic Units

Qg - Glacial deposits (Holocene and Pleistocene)
Geologic unit present on source map: Pelican Cone 15' Quadrangle Geologic Units

Qm - Morainal deposits (Pleistocene and Holocene)
Geologic unit present on source map: Pilot Peak 15' Quadrangle Geologic Units

Qg - name unknown
Geologic unit present on source map: Sunlight Peak 15' Quadrangle (northwest part) Geologic Units

Qg - Glacial deposits (Holocene and Pleistocene)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Qg - Glacial deposits (Pleistocene)
Geologic unit present on source map: Two Ocean Pass 15' Quadrangle Geologic Units

Qg - Glacial deposits (Holocene and Pleistocene)
Geologic unit present on source map: West Thumb 15' Quadrangle Geologic Units

Qg - name unknown
Geologic unit present on source map: West Yellowstone 15' Quadrangle Geologic Units

Qg - Glaciofluvial deposits (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit description for that specific source map):

Qg - Glaciofluvial deposits (Pleistocene)
Geologic unit present on source map: Tepee Creek 15' Quadrangle Geologic Units

Qo - Outwash deposits (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qo - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Qo - Outwash deposits (Pleistocene)
Geologic unit present on source map: Tepee Creek 15' Quadrangle Geologic Units

Qmo - Morainal deposits (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit description for that specific source map):

Qm - Morainic deposits (Pleistocene)
Geologic unit present on source map: Tepee Creek 15' Quadrangle Geologic Units

Qkt - Kame terrace deposits (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit description for that specific source map):

Qkt - Kame terrace deposits (Pleistocene)
Geologic unit present on source map: Tepee Creek 15' Quadrangle Geologic Units

Qgt - Glacial till (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit description for that specific source map):

Qgt - Glacial till (Pleistocene)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

Qgl - Glacial lake deposit (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit description for that specific source map):

Qgl - Glacial lake deposit (Pleistocene)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

Qtr - Travertine deposit (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit description for that specific source map):

Qtr - Travertine deposit (Pleistocene)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

Qba - Basalt (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit description for that specific source map):

Qba - Basalt (Pleistocene)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

Qgc - Basalt of Geode Creek, lava flow (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit description for that specific source map):

Qgc - Basalt of Geode Creek, lava flow (Pleistocene)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Qgcd - Basalt of Geode Creek, dike (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit description for that specific source map):

Qgcd - Basalt of Geode Creek, dike (Pleistocene)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Qgcc - Basalt of Geode Creek, cinder and scoria cone of basalt (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit description for that specific source map):

Qgcc - Basalt of Geode Creek, cinder and scoria cone of basalt (Pleistocene)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Qpcp - Pitchstone Plateau flow (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qpcp - Plateau Rhyolite, Central Plateau Member, Pitchstone Plateau flow (Pleistocene)
Geologic unit present on source map: Grassy Lake Reservoir 15' Quadrangle Geologic Units

Qpcp - Central Plateau Member, Pitchstone Plateau flow
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Qpcp - Plateau Rhyolite, Central Plateau Member, Pitchstone Plateau flow (Pleistocene)
Geologic unit present on source map: Old Faithful 15' Quadrangle Geologic Units

Qpcp - Plateau Rhyolite, Central Plateau Member, Pitchstone Plateau flow (Pleistocene)
Geologic unit present on source map: West Thumb 15' Quadrangle Geologic Units

Qpcg - Grants Pass flow (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit description for that specific source map):

Qpcg - Plateau Rhyolite, Central Plateau Member, Grants Pass flow (Pleistocene)
Geologic unit present on source map: Old Faithful 15' Quadrangle Geologic Units

Qpci - Gibbon River flow (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit description for that specific source map):

Qpci - Plateau Rhyolite, Central Plateau Member, Gibbon River flow (Pleistocene)
Geologic unit present on source map: Norris Junction 15' Quadrangle Geologic Units

Qpcf - Solfatara Plateau flow (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qpcf - Plateau Rhyolite, Central Plateau Member, Solfatara Plateau flow (Pleistocene)
Geologic unit present on source map: Canyon Village 15' Quadrangle Geologic Units

Qpcf - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Qpcf - Plateau Rhyolite, Central Plateau Member, Solfatara Plateau flow (Pleistocene)
Geologic unit present on source map: Norris Junction 15' Quadrangle Geologic Units

Qpch - Hayden Valley flow (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qpch - Plateau Rhyolite, Central Plateau Member, Hayden Valley flow (Pleistocene)
Geologic unit present on source map: Canyon Village 15' Quadrangle Geologic Units

Qpch - Plateau Rhyolite, Central Plateau Member, Hayden Valley flow (Pleistocene)
Geologic unit present on source map: Norris Junction 15' Quadrangle Geologic Units

Qpcy - West Yellowstone flow (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qpcy - name unknown
Geologic unit present on source map: Buffalo Lake 15' Quadrangle Geologic Units

Qpcy - Plateau Rhyolite, Central Plateau Member, West Yellowstone Flow (Pleistocene)
Geologic unit present on source map: Madison Junction 15' Quadrangle Geologic Units

Qpcy - Plateau Rhyolite, Central Plateau Member, West Yellowstone Flow (Pleistocene)
Geologic unit present on source map: Old Faithful 15' Quadrangle Geologic Units

Qpcy - name unknown
Geologic unit present on source map: West Yellowstone 15' Quadrangle Geologic Units

Qpco - Tuff of Cold Mountain Creek (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit description for that specific source map):

Qpco - Plateau Rhyolite, Central Plateau Member, Tuff of Cold Mountain Creek (Pleistocene)
Geologic unit present on source map: Old Faithful 15' Quadrangle Geologic Units

Qpct - Trischman Knob dome (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit description for that specific source map):

Qpct - Plateau Rhyolite, Central Plateau Member, Trischman Knob dome (Pleistocene)
Geologic unit present on source map: Old Faithful 15' Quadrangle Geologic Units

Qpck - Douglas Knob dome (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit description for that specific source map):

Qpck - Plateau Rhyolite, Central Plateau Member, Douglas Knob dome (Pleistocene)
Geologic unit present on source map: Old Faithful 15' Quadrangle Geologic Units

Qpcr - Bechler River flow (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qpcr - Plateau Rhyolite, Central Plateau Member, Bechler River flow (Pleistocene)
Geologic unit present on source map: Grassy Lake Reservoir 15' Quadrangle Geologic Units

Qpcr - Plateau Rhyolite, Central Plateau Member, Bechler River flow (Pleistocene)
Geologic unit present on source map: Old Faithful 15' Quadrangle Geologic Units

Qpcr - Plateau Rhyolite, Central Plateau Member, Bechler River flow (Pleistocene)
Geologic unit present on source map: West Thumb 15' Quadrangle Geologic Units

Qpcs - Summit Lake flow (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qpcs - name unknown
Geologic unit present on source map: Buffalo Lake 15' Quadrangle Geologic Units

Qpcs - Plateau Rhyolite, Central Plateau Member, Summit Lake flow (Pleistocene)
Geologic unit present on source map: Grassy Lake Reservoir 15' Quadrangle Geologic Units

Qpcs - Plateau Rhyolite, Central Plateau Member, Summit Lake flow (Pleistocene)
Geologic unit present on source map: Madison Junction 15' Quadrangle Geologic Units

Qpcs - Plateau Rhyolite, Central Plateau Member, Summit Lake flow (Pleistocene)
Geologic unit present on source map: Old Faithful 15' Quadrangle Geologic Units

Qpcl - Plateau Rhyolite, Central Plateau Member, Summit Lake flow (Pleistocene)
Geologic unit present on source map: Yellowstone National Park Geologic Units

Qpcn - Nez Perce Creek flow (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qpcn - Plateau Rhyolite, Central Plateau Member, Nez Perce Creek flow (Pleistocene)
Geologic unit present on source map: Madison Junction 15' Quadrangle Geologic Units

Qpcn - Plateau Rhyolite, Central Plateau Member, Nez Perce Creek flow (Pleistocene)
Geologic unit present on source map: Norris Junction 15' Quadrangle Geologic Units

Quf - Sediments of Upper Falls (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qu - Sediments of upper Falls (Pleistocene)
Geologic unit present on source map: Canyon Village 15' Quadrangle Geologic Units

Qu - Sediments of upper Falls (Pleistocene)
Geologic unit present on source map: Norris Junction 15' Quadrangle Geologic Units

Qpcu - Spruce Creek flow (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit description for that specific source map):

Qpcu - Plateau Rhyolite, Central Plateau Member, Spruce Creek flow (Pleistocene)
Geologic unit present on source map: Norris Junction 15' Quadrangle Geologic Units

Qpce - Elephant Back flow (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qpce - Plateau Rhyolite, Central Plateau Member, Elephant Back flow (Pleistocene)
Geologic unit present on source map: Canyon Village 15' Quadrangle Geologic Units

Qpce - Plateau Rhyolite, Central Plateau Member, Elephant Back flow (Pleistocene)
Geologic unit present on source map: Frank Island 15' Quadrangle Geologic Units

Qpce - Plateau Rhyolite, Central Plateau Member, Elephant Back flow (Pleistocene)
Geologic unit present on source map: Madison Junction 15' Quadrangle Geologic Units

Qpce - Plateau Rhyolite, Central Plateau Member, Elephant Back flow (Pleistocene)
Geologic unit present on source map: Norris Junction 15' Quadrangle Geologic Units

Qpce - Plateau Rhyolite, Central Plateau Member, Elephant Back flow (Pleistocene)
Geologic unit present on source map: West Thumb 15' Quadrangle Geologic Units

Qpcw - West Thumb flow (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qpcw - Plateau Rhyolite, Central Plateau Member, West Thumb flow (Pleistocene)
Geologic unit present on source map: Canyon Village 15' Quadrangle Geologic Units

Qpcw - Plateau Rhyolite, Central Plateau Member, West Thumb flow (Pleistocene)
Geologic unit present on source map: Frank Island 15' Quadrangle Geologic Units

Qpcw - Plateau Rhyolite, Central Plateau Member, West Thumb flow (Pleistocene)
Geologic unit present on source map: Norris Junction 15' Quadrangle Geologic Units

Qpcw - Plateau Rhyolite, Central Plateau Member, West Thumb flow (Pleistocene)
Geologic unit present on source map: West Thumb 15' Quadrangle Geologic Units

Qpca - Aster Creek flow (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qpca - Plateau Rhyolite, Central Plateau Member, Aster Creek flow (Pleistocene)

Geologic unit present on source map: Frank Island 15' Quadrangle Geologic Units

Qpca - Plateau Rhyolite, Central Plateau Member, Aster Creek flow (Pleistocene)
Geologic unit present on source map: West Thumb 15' Quadrangle Geologic Units

Qpcb - Buffalo Lake flow (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qpcb - name unknown
Geologic unit present on source map: Buffalo Lake 15' Quadrangle Geologic Units

Qpcb - Plateau Rhyolite, Central Plateau Member, Buffalo Lake flow (Pleistocene)
Geologic unit present on source map: Old Faithful 15' Quadrangle Geologic Units

Qpcb - name unknown
Geologic unit present on source map: West Yellowstone 15' Quadrangle Geologic Units

Qpcb - Plateau Rhyolite, Central Plateau Member, Buffalo Lake flow (Pleistocene)
Geologic unit present on source map: Yellowstone National Park Geologic Units

Qpcc - Spring Creek flow (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qpcc - Plateau Rhyolite, Central Plateau Member, Spring Creek flow (Pleistocene)
Geologic unit present on source map: Old Faithful 15' Quadrangle Geologic Units

Qpcc - Plateau Rhyolite, Central Plateau Member, Spring Creek flow (Pleistocene)
Geologic unit present on source map: West Thumb 15' Quadrangle Geologic Units

Qpcl - Tuff of Bluff Point (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qpcl - Plateau Rhyolite, Central Plateau Member, Tuff of Bluff Point (Pleistocene)
Geologic unit present on source map: Norris Junction 15' Quadrangle Geologic Units

Qpcl - Plateau Rhyolite, Central Plateau Member, Tuff of Bluff Point (Pleistocene)
Geologic unit present on source map: West Thumb 15' Quadrangle Geologic Units

Qpcm - Mary Lake flow (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit description for that specific source map):

Qpcm - Plateau Rhyolite, Central Plateau Member, Mary Lake flow (Pleistocene)

Geologic unit present on source map: Norris Junction 15' Quadrangle Geologic Units

Qpcd - Dry Creek rhyolite flow (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit description for that specific source map):

Qpcd - Plateau Rhyolite, Central Plateau Member, Dry Creek flow (Pleistocene)
Geologic unit present on source map: West Thumb 15' Quadrangle Geologic Units

Qob - Osprey Basalt (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qo - Osprey Basalt (Pleistocene)
Geologic unit present on source map: Abiathar Peak 15' Quadrangle Geologic Units

Qo - Osprey Basalt (Pleistocene)
Geologic unit present on source map: Pelican Cone 15' Quadrangle Geologic Units

Qo - Osprey Basalt (Pleistocene)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Qpm - Mallard Lake flow (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qpm - Plateau Rhyolite, Mallard Lake Member, Mallard Lake flow (Pleistocene)
Geologic unit present on source map: Madison Junction 15' Quadrangle Geologic Units

Qpm - Plateau Rhyolite, Mallard Lake Member, Mallard Lake flow (Pleistocene)
Geologic unit present on source map: Norris Junction 15' Quadrangle Geologic Units

Qpm - Plateau Rhyolite, Mallard Lake Member, Mallard Lake flow (Pleistocene)
Geologic unit present on source map: Old Faithful 15' Quadrangle Geologic Units

Qpm - Plateau Rhyolite, Mallard Lake Member, Mallard Lake flow (Pleistocene)
Geologic unit present on source map: West Thumb 15' Quadrangle Geologic Units

Qmr - Madison River Basalt (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qmr - Madison River Basalt (Pleistocene)
Geologic unit present on source map: Madison Junction 15' Quadrangle Geologic Units

Qmr - name unknown

Geologic unit present on source map: West Yellowstone 15' Quadrangle Geologic Units

Qmr - Madison River Basalt (Pleistocene)
Geologic unit present on source map: Yellowstone National Park Geologic Units

Qprc - Cougar Creek dome (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit description for that specific source map):

Qprc - Plateau Rhyolite, Roaring Mountain Member, Cougar Creek dome (Pleistocene)
Geologic unit present on source map: Madison Junction 15' Quadrangle Geologic Units

Qprs - Crystal Spring flow (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit description for that specific source map):

Qprs - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Qpro - Obsidian Cliff flow (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit description for that specific source map):

Qpro - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Qprr - Riverside flow (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit description for that specific source map):

Qprr - name unknown
Geologic unit present on source map: West Yellowstone 15' Quadrangle Geologic Units

Qi - Sediments of Inspiration Point (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit description for that specific source map):

Qi - Sediments of Inspiration Point (Pleistocene)
Geologic unit present on source map: Canyon Village 15' Quadrangle Geologic Units

Qpow - Willow Park dome (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit description for that specific source map):

Qpow - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Qpoa - Apollinaris Spring dome (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit description for that specific source map):

Qpoa - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Qpol - Landmark dome (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit description for that specific source map):

Qpol - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Qpoc - Geyser Creek dome (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit description for that specific source map):

Qpoc - Plateau Rhyolite, Obsidian Creek Member, Geyser Creek dome (Pleistocene)
Geologic unit present on source map: Norris Junction 15' Quadrangle Geologic Units

Qpoh - Gibbon Hill dome (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit description for that specific source map):

Qpoh - Plateau Rhyolite, Obsidian Creek Member, Gibbon Hill dome (Pleistocene)
Geologic unit present on source map: Norris Junction 15' Quadrangle Geologic Units

Qpop - Paintpot Hill dome (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit description for that specific source map):

Qpop - Plateau Rhyolite, Obsidian Creek Member, Paintpot Hill dome (Pleistocene)
Geologic unit present on source map: Norris Junction 15' Quadrangle Geologic Units

Qpog - Rhyolite basalt mixed lavas of Gardner River (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit description for that specific source map):

Qpog - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Qpoz - Rhyolite basalt mixed lavas of Grizzly Lake (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qpoz - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Qpoz - Plateau Rhyolite, Obsidian Creek Member, rhyolite basalt mixed lavas of Grizzly Lake (Pleistocene)
Geologic unit present on source map: Yellowstone National Park Geologic Units

Qpud - Dunraven Road flow (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qpud - Plateau Rhyolite, Upper Basin Member, Dunraven Road flow (Pleistocene)
Geologic unit present on source map: Canyon Village 15' Quadrangle Geologic Units

Qpud - Plateau Rhyolite, Upper Basin Member, Dunraven Road flow (Pleistocene)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Qpuc - Canyon rhyolite flow (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qpuc - Plateau Rhyolite, Upper Basin Member, Canyon flow (Pleistocene)
Geologic unit present on source map: Canyon Village 15' Quadrangle Geologic Units

Qpuc - Plateau Rhyolite, Upper Basin Member, Canyon flow (Pleistocene)
Geologic unit present on source map: Norris Junction 15' Quadrangle Geologic Units

Qpuc - Plateau Rhyolite, Upper Basin Member, Canyon flow (Pleistocene)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Qpus - Tuff of Sulphur Creek (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qsl - Plateau Rhyolite, Swan Lake Flat basalt (Pleistocene)
Geologic unit present on source map: Geologic unit present on source map: Yellowstone National Park Geologic Units

Qsf - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Qput - Tuff of Uncle Tom's trail (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Qput - Plateau Rhyolite, Upper Basin Member, Tuff of Uncle Tom's trail (Pleistocene)
Geologic unit present on source map: Canyon Village 15' Quadrangle Geologic Units

Qpul - Scaup Lake flow (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qpul - Plateau Rhyolite, Upper Basin Member, Scaup Lake flow (Pleistocene)
Geologic unit present on source map: Old Faithful 15' Quadrangle Geologic Units

Qpul - Plateau Rhyolite, Upper Basin Member, Scaup Lake flow (Pleistocene)
Geologic unit present on source map: West Thumb 15' Quadrangle Geologic Units

Qpub - Biscuit Basin flow (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qpub - Plateau Rhyolite, Upper Basin Member, Biscuit Basin flow (Pleistocene)
Geologic unit present on source map: Madison Junction 15' Quadrangle Geologic Units

Qpub - Plateau Rhyolite, Upper Basin Member, Biscuit Basin Flow (Pleistocene)
Geologic unit present on source map: Old Faithful 15' Quadrangle Geologic Units

Qpuf - Falls River Basalt (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qfr - Falls River Basalt (Pleistocene)
Geologic unit present on source map: Grassy Lake Reservoir 15' Quadrangle Geologic Units

Qf - Plateau Rhyolite, Falls River Basalt (Pleistocene)
Geologic unit present on source map: Geologic unit present on source map: Yellowstone National

Park Geologic Units

Qpusl - Swan Lake Flat Basalt (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qsl - Plateau Rhyolite, Swan Lake Flat basalt (Pleistocene)
Geologic unit present on source map: Geologic unit present on source map: Yellowstone National Park Geologic Units

Qsf - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Qpuslm - Swan Lake Flat Basalt, mixed lava (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qsfc - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Qpug - Gerrit Basalt (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qge - name unknown
Geologic unit present on source map: Buffalo Lake 15' Quadrangle Geologic Units

Qb - Till of Bechler Meadows (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qb - Till of Bechler Meadows (Pleistocene)
Geologic unit present on source map: Grassy Lake Reservoir 15' Quadrangle Geologic Units

Qf - Sediments of Lower Falls (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Qf - Sediments of Lower Falls (Pleistocene)
Geologic unit present on source map: Canyon Village 15' Quadrangle Geologic Units

Qm - Sediments of Flat Mountain Arm (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Qm - Sediments of Flat Mountain Arm (Pleistocene)
Geologic unit present on source map: Frank Island 15' Quadrangle Geologic Units

Qylu - Lava Creek Tuff, undivided (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qlc - Lava Creek Tuff, undivided (Pleistocene)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

Qyl - Lava Creek Tuff (Holocene and Pleistocene)
Geologic unit present on source map: Pilot Peak 15' Quadrangle Geologic Units

Qyl - name unknown
Geologic unit present on source map: Sunlight Peak 15' Quadrangle (northwest part) Geologic Units

Qylb - Lava Creek Tuff, Member B (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qylb - Lava Creek Tuff, Member B (Pleistocene)
Geologic unit present on source map: Abiathar Peak 15' Quadrangle Geologic Units

Qylb - name unknown
Geologic unit present on source map: Buffalo Lake 15' Quadrangle Geologic Units

Qylb - Lava Creek Tuff, Member B (Pleistocene)
Geologic unit present on source map: Canyon Village 15' Quadrangle Geologic Units

Qylb - Lava Creek Tuff, Member B (Pleistocene)
Geologic unit present on source map: Frank Island 15' Quadrangle Geologic Units

Qylb - Member B of the Lava Creek Tuff (Pleistocene)
Geologic unit present on source map: Grassy Lake Reservoir 15' Quadrangle Geologic Units

Qlb/Qylb - Lava Creek Tuff, Member B
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Qylb - Lava Creek Tuff, Member B (Pleistocene)
Geologic unit present on source map: Madison Junction 15' Quadrangle Geologic Units

Qylb - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Qylb - Lava Creek Tuff, Member B
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

Qylb - Lava Creek Tuff, Member B (Pleistocene)
Geologic unit present on source map: Norris Junction 15' Quadrangle Geologic Units

Qylb - Lava Creek Tuff, Member B (Pleistocene)
Geologic unit present on source map: Pelican Cone 15' Quadrangle Geologic Units

Qylb - Lava Creek Tuff, Member B (Pleistocene)

Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Qylb - Lava Creek Tuff, Member B (Pleistocene)
Geologic unit present on source map: West Thumb 15' Quadrangle Geologic Units

Qylb - name unknown
Geologic unit present on source map: West Yellowstone 15' Quadrangle Geologic Units

Qylb - Lava Creek Tuff, Member B (Pleistocene)
Geologic unit present on source map: Yellowstone National Park Geologic Units

Qyla - Lava Creek Tuff, Member A (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qyla - Lava Creek Tuff, Member A (Pleistocene)
Geologic unit present on source map: Canyon Village 15' Quadrangle Geologic Units

Qyla - Lava Creek Tuff, Member A (Pleistocene)
Geologic unit present on source map: Frank Island 15' Quadrangle Geologic Units

Qyla - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Qyla - Lava Creek Tuff, Member A (Pleistocene)
Geologic unit present on source map: Norris Junction 15' Quadrangle Geologic Units

Qyla - Lava Creek Tuff, Member A (Pleistocene)
Geologic unit present on source map: Yellowstone National Park Geologic Units

Qylau - Lava Creek Tuff, upper part of Member A (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qylu - Lava Creek Tuff, upper part of Member A (Pleistocene)
Geologic unit present on source map: Madison Junction 15' Quadrangle Geologic Units

Qylu - name unknown
Geologic unit present on source map: West Yellowstone 15' Quadrangle Geologic Units

Qylal - Lava Creek Tuff, lower part of Member A (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qyll - Lava Creek Tuff, lower part of Member A (Pleistocene)
Geologic unit present on source map: Madison Junction 15' Quadrangle Geologic Units

Qyll - name unknown

Geologic unit present on source map: West Yellowstone 15' Quadrangle Geologic Units

Qufb - Undine Falls Basalt (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Quf - Undine Falls Basalt (Pleistocene)
Geologic unit present on source map: Canyon Village 15' Quadrangle Geologic Units

Quf - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Quf - Undine Falls Basalt (Pleistocene)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Qjf - Flat Mountain flow (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Qjf - Mount Jackson Rhyolite, Flat Mountain flow (Pleistocene)
Geologic unit present on source map: Frank Island 15' Quadrangle Geologic Units

Qjw - Wapiti Lake flow (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qjw - Mount Jackson Rhyolite, Wapiti Lake flow (Pleistocene)
Geologic unit present on source map: Canyon Village 15' Quadrangle Geologic Units

Qjw - Mount Jackson Rhyolite, Wapiti Lake flow (Pleistocene)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Qjs - Stonetop Mountain flow (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Qjs - Mount Jackson Rhyolite, Stonetop Mountain flow (Pleistocene)
Geologic unit present on source map: Canyon Village 15' Quadrangle Geologic Units

Qjh - Mount Haynes flow (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Qjh - Mount Jackson Rhyolite, Mount Haynes flow (Pleistocene)
Geologic unit present on source map: Madison Junction 15' Quadrangle Geologic Units

Qjl - Harlequin Lake flow (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Qjl - Mount Jackson Rhyolite, Harlequin Lake flow (Pleistocene)
Geologic unit present on source map: Madison Junction 15' Quadrangle Geologic Units

Qjm - Moose Creek Butte flow (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Qmm - Mount Jackson Rhyolite, Moose Creek Butte flow (Pleistocene)
Geologic unit present on source map: Yellowstone National Park Geologic Units

Qmb - Big Bear Lake flow (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qjm - name unknown
Geologic unit present on source map: Buffalo Lake 15' Quadrangle Geologic Units

Qjb - name unknown
Geologic unit present on source map: West Yellowstone 15' Quadrangle Geologic Units

Qw - Basalt of Warm River (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Qw - Basalt of Warm River (Pleistocene)
Geologic unit present on source map: Yellowstone National Park Geologic Units

Qn - Sediments and basalts of the Narrows (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qn - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Qn - Sediments and Basalts of the Narrows (Pleistocene)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Qiw - Island Park Rhyolite, Warm River Butte dome (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Qiw - Island Park Rhyolite, Warm River Butte dome (Pleistocene)
Geologic unit present on source map: Yellowstone National Park Geologic Units

Qym - Island Park Rhyolite, Mesa Falls Tuff (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Qym - Island Park Rhyolite, Mesa Falls Tuff (Pleistocene)
Geologic unit present on source map: Yellowstone National Park Geologic Units

Qlg - Landslide and glacial debris (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Qlg - Landslide and glacial debris
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Qlc - Lewis Canyon Rhyolite (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qlc - Lewis Canyon Rhyolite (Pleistocene)
Geologic unit present on source map: Grassy Lake Reservoir 15' Quadrangle Geologic Units

Qlc - Lewis Canyon Rhyolite
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Qel - Pyroxene andesite and basalt of Emerald Lake (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Qel - Pyroxene andesite and basalt of Emerald Lake
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

Qhru - Huckleberry Ridge Tuff, undivided (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Thr - Huckleberry Ridge Tuff of Yellowstone Group, undivided (Pliocene)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

Qh - Huckleberry Ridge Tuff of Yellowstone Group
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Qh - Huckleberry Ridge Tuff of Yellowstone Group
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

Qyh - name unknown
Geologic unit present on source map: Sunlight Peak 15' Quadrangle (northwest part) Geologic Units

Qhrc - Huckleberry Ridge Tuff, Member C (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qyhc - Huckleberry Ridge Tuff, Member C (Pleistocene)
Geologic unit present on source map: Frank Island 15' Quadrangle Geologic Units

Qyhc - Huckleberry Ridge Tuff, Member C (Pleistocene)
Geologic unit present on source map: Grassy Lake Reservoir 15' Quadrangle Geologic Units

Qhc - Huckleberry Ridge Tuff of Yellowstone Group, Member C
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Qyhc - Huckleberry Ridge Tuff of Yellowstone Group, Member C
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

Qyhc - Huckleberry Ridge Tuff, Member C (Pleistocene)
Geologic unit present on source map: West Thumb 15' Quadrangle Geologic Units

Tyhc - Huckleberry Ridge Tuff, Member C (Pleistocene)
Geologic unit present on source map: Yellowstone National Park Geologic Units

Qhrb - Huckleberry Ridge Tuff, Member B (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qyhb - Huckleberry Ridge Tuff, Member B (Pleistocene)
Geologic unit present on source map: Canyon Village 15' Quadrangle Geologic Units

Qyhb - Huckleberry Ridge Tuff, Member B (Pleistocene)
Geologic unit present on source map: Grassy Lake Reservoir 15' Quadrangle Geologic Units

Qhb/Qyhb - Huckleberry Ridge Tuff of Yellowstone Group, Member B
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Qyhb - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Qyhb - Huckleberry Ridge Tuff of Yellowstone Group, Member B
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

Qyhb - Huckleberry Ridge Tuff, Member B (Pleistocene)
Geologic unit present on source map: Pelican Cone 15' Quadrangle Geologic Units

Qyhb - Huckleberry Ridge Tuff, Member B (Pleistocene)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Qyhb - Huckleberry Ridge Tuff, Member B (Pleistocene)
Geologic unit present on source map: West Thumb 15' Quadrangle Geologic Units

Qyhb - name unknown
Geologic unit present on source map: West Yellowstone 15' Quadrangle Geologic Units

Tyhb - Huckleberry Ridge Tuff, Member B (Pleistocene)
Geologic unit present on source map: Yellowstone National Park Geologic Units

Qhra - Huckleberry Ridge Tuff, Member A (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qyha - Huckleberry Ridge Tuff, Member A (Pleistocene)
Geologic unit present on source map: Canyon Village 15' Quadrangle Geologic Units

Qyha - Huckleberry Ridge Tuff, Member A (Pleistocene)
Geologic unit present on source map: Grassy Lake Reservoir 15' Quadrangle Geologic Units

Qha/Qyha - Huckleberry Ridge Tuff of Yellowstone Group, Member A
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Qyha - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Qyha - Huckleberry Ridge Tuff, Member A (Pleistocene)
Geologic unit present on source map: Pelican Cone 15' Quadrangle Geologic Units

Qyha? - name unknown
Geologic unit present on source map: Sunlight Peak 15' Quadrangle (northwest part) Geologic Units

Qyha - Huckleberry Ridge Tuff, Member A (Pleistocene)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Qyha - Huckleberry Ridge Tuff, Member A (Pleistocene)
Geologic unit present on source map: West Thumb 15' Quadrangle Geologic Units

Qyha - name unknown
Geologic unit present on source map: West Yellowstone 15' Quadrangle Geologic Units

Tyha - Huckleberry Ridge Tuff, Member A (Pleistocene)
Geologic unit present on source map: Yellowstone National Park Geologic Units

Qbc - Rhyolite of Broad Creek (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qbc - Rhyolite of Broad Creek (Pleistocene)
Geologic unit present on source map: Canyon Village 15' Quadrangle Geologic Units

Qbc - Rhyolite of Broad Creek (Pleistocene)
Geologic unit present on source map: Pelican Cone 15' Quadrangle Geologic Units

Qj - Junction Butte Basalt (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qj - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Qj - Junction Butte Basalt (Pleistocene)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Qg2 - Glacial debris of second major glaciation (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qg2 - Glacial debris of Second Major Glaciation
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Qg2 - Undifferentiated glacial debris
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

Qg4 - Morainal debris of youngest major glaciation (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Qg4, Qml - Morainal debris of youngest major glaciation
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

Qog - Outwash gravel (Pleistocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Qog - Outwash gravel
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Qog - Outwash gravel
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

Qsb - Slump Blocks (Pleistocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Qsb - Slump Blocks
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

Qjlm - Morainal debris of Jackson Lake (Quaternary)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Qjlm - Morainal debris of Jackson Lake
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Qslt - Obsidian sandstone, siltstone and claystone (Quaternary)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Qslt - Obsidian sandstone, siltstone, and claystone
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Qbrm - Morainal debris of Buried Ridge (Quaternary)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Qbrm - Morainal debris of Jackson Lake
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

QTt - Yellowstone Tuff (Pleistocene or Pliocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

QTt - Yellowstone Tuff (Pliocene or Pleistocene)
Geologic unit present on source map: Tepee Creek 15' Quadrangle Geologic Units

QTml - Basalt of Mariposa Lake (Pleistocene or Upper Tertiary)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

QTml - Basalt of Mariposa Lake (Pleistocene or Upper Tertiary)
Geologic unit present on source map: Two Ocean Pass 15' Quadrangle Geologic Units

QTh - Heart Lake Conglomerate (Pleistocene or Pliocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

QTh - Heart Lake Conglomerate
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

QTh - Heart Lake Conglomerate (Pleistocene or Pliocene)
Geologic unit present on source map: West Thumb 15' Quadrangle Geologic Units

QTi - Igneous dike (Quaternary and Tertiary)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

QTi - Dikes of igneous rock
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

QTs - Unnamed Scoria (Quaternary and Tertiary)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

QTs - Unnamed scoria
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

QTba - Basalt (Quaternary or Pliocene/ Miocene?)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Tba - Basalt (Pliocene/Miocene?)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

QTb - Basalt of uncertain age
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

T - Tertiary units, undivided (Tertiary)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

T - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Tsu - Sediment or sedimentary rocks, undivided (Tertiary)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Ts - Sediment or sedimentary rocks, undivided (Tertiary)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

Tcct - Conant Creek Tuff (Pliocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Tc - Conant Creek Tuff (Pliocene)
Geologic unit present on source map: Grassy Lake Reservoir 15' Quadrangle Geologic Units

Te - Gravel of Mount Everts (Pliocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

QTe - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Trlf - Rhyolite of Yellowstone Point, rhyolite porphyry lava flows (upper Tertiary)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Tr - Rhyolite of Yellowstone Point, rhyolite porphyry lava flows (upper Tertiary)
Geologic unit present on source map: Two Ocean Pass 15' Quadrangle Geologic Units

Tri - Rhyolite of Yellowstone Point, rhyolite porphyry dike (upper Tertiary)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Tri - Rhyolite of Yellowstone Point, rhyolite porphyry dike (upper Tertiary)
Geologic unit present on source map: Two Ocean Pass 15' Quadrangle Geologic Units

Twig - Wiggins Formation (upper? and middle Eocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Twi - Wiggins Formation
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

Tw - Absaroka Volcanic Supergroup, Wiggins Formation (upper? and middle Eocene)
Geologic unit present on source map: Two Ocean Pass 15' Quadrangle Geologic Units

Twigk - Wiggins Formation, key bed (upper? and middle Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

k - Absaroka Volcanic Supergroup, Wiggins Formation, Key bed (upper? and middle Eocene)
Geologic unit present on source map: Two Ocean Pass 15' Quadrangle Geologic Units

Twigv - Wiggins Formation, vent facies rocks (upper? and middle Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Twv - Absaroka Volcanic Supergroup, Wiggins Formation, vent facies rocks (upper? and middle Eocene)
Geologic unit present on source map: Two Ocean Pass 15' Quadrangle Geologic Units

Twigvk - Wiggins Formation, vent facies rocks, key bed (upper? and middle Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

k - Absaroka Volcanic Supergroup, Wiggins Formation, vent facies rocks, Key bed (upper? and middle Eocene)
Geologic unit present on source map: Two Ocean Pass 15' Quadrangle Geologic Units

Twigl - Wiggins Formation, lava flows (upper? and middle Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Twl - Absaroka Volcanic Supergroup, Wiggins Formation, lava flows (upper? and middle Eocene)
Geologic unit present on source map: Two Ocean Pass 15' Quadrangle Geologic Units

Twigi - Wiggins Formation, intrusive rocks (upper? and middle Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Twi - Absaroka Volcanic Supergroup, Wiggins Formation, intrusive rocks (upper? and middle Eocene)
Geologic unit present on source map: Two Ocean Pass 15' Quadrangle Geologic Units

Tab - Andesite breccia (Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Tab - Andesite breccia (Eocene)
Geologic unit present on source map: Tepee Creek 15' Quadrangle Geologic Units

Tab - name unknown
Geologic unit present on source map: West Yellowstone 15' Quadrangle Geologic Units

Ts - Shoshonite (Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Ts - Shoshonite (Eocene)
Geologic unit present on source map: Tepee Creek 15' Quadrangle Geologic Units

Tql - Quartz latite porphyry (Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Tql - Quartz Latite Porphyry (Eocene)
Geologic unit present on source map: Cooke City 15' Quadrangle (southwest part) Geologic Units

Trpo - Rhyodacite porphyry (Eocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Tli - Rhyodacite porphyry (Eocene)
Geologic unit present on source map: Canyon Village 15' Quadrangle Geologic Units

Trp - Rhyodacite Porphyry (Eocene)
Geologic unit present on source map: Cooke City 15' Quadrangle (southwest part) Geologic Units

Ta - Porphyritic andesite and andesite porphyry (Eocene and Paleocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Ta - Porphyritic Andestite and Andesite Porphyry (Eocene and Paleocene)
Geologic unit present on source map: Cooke City 15' Quadrangle (southwest part) Geologic Units

Tlp - Latite porphyry (Eocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Tlp - Latite Porphyry (Eocene)
Geologic unit present on source map: Cooke City 15' Quadrangle (southwest part) Geologic Units

Ts - Latite Porphyry (Eocene)
Geologic unit present on source map: Pilot Peak 15' Quadrangle Geologic Units

Tat - Augite trachyandesite (Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Tr - Augite trachyandesite (Eocene)
Geologic unit present on source map: Pilot Peak 15' Quadrangle Geologic Units

Td - Dikes of trachyandesite, basalt, and dacite dikes, sills, and larger irregular intrusive bodies (Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Dikes - Trachyandesite, basalt, and dacite dikes, sills, and larger irregular intrusive bodies (Eocene)
Geologic unit present on source map: Pilot Peak 15' Quadrangle Geologic Units

Tdn - Diorite and niorite (Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Tdn - Dioritite and Niorite (Eocene)
Geologic unit present on source map: Pilot Peak 15' Quadrangle Geologic Units

Trl - Rhyodacite porphyry of Lulu Pass (Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Trl - Rhyodacite Porphyry of Lulu Pass (Eocene)
Geologic unit present on source map: Cooke City 15' Quadrangle (southwest part) Geologic Units

Trh - Rhyodacite porphyry of Henderson Mountain (Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Trh - Rhyodacite Porphyry of Henderson Mountain (Eocene)
Geologic unit present on source map: Cooke City 15' Quadrangle (southwest part) Geologic Units

Tbp - Porphyritic basalt and basalt porphyry (Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Tb - Porphyritic Basalt and Basalt Porphyry (Eocene)
Geologic unit present on source map: Cooke City 15' Quadrangle (southwest part) Geologic Units

Tr - Rhyolite or rhyolitic sediment (Eocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Tr - Rhyolite (Eocene)
Geologic unit present on source map: Cooke City 15' Quadrangle (southwest part) Geologic Units

Tr - Rhyolite or rhyolitic sediment (Eocene)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

Tlpl - Latite and porphyritic latite (Eocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Tl - Latite and porphyritic latite (Eocene)
Geologic unit present on source map: Cooke City 15' Quadrangle (southwest part) Geologic Units

Tl - Latite and porphyritic latite (Eocene)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

Trpq - Quartz "eye" rhyodacite porphyry (Eocene and Paleocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Trpq - Quartz "Eye" rhyodacite porphyry (Eocene and Paleocene)
Geologic unit present on source map: Cooke City 15' Quadrangle (southwest part) Geologic Units

Tfpy - Felsic pyroclastic rocks (Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Tfpy - Felsic pyroclastic rocks (Eocene)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

Tmz - Monzodiorite of Independence area (Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Tmz - Monzodiorite of Independence area (Eocene)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

Tia - Andesite dikes (Eocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Tia - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Tia - Andesite dikes (Eocene)
Geologic unit present on source map: Yellowstone National Park Geologic Units

Tdaf - Dacite? flows (Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Tdaf - Dacite? flows (Eocene)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

Tdap - Dacite porphyry (Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Tdap - Dacite porphyry (Eocene)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

Tda - Dacite? intrusive (Eocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Tda - Dacite? intrusive (Eocene)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

Tid - Dacitic intrusions (Eocene)
Geologic unit present on source map: Grassy Lake Reservoir 15' Quadrangle Geologic Units

Tid - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Tid - Dacite intrusive rocks (Eocene)
Geologic unit present on source map: Yellowstone National Park Geologic Units

Thr - Hominy Peak Formation (Eocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Th - Hominy Peak Formation (Eocene)
Geologic unit present on source map: Grassy Lake Reservoir 15' Quadrangle Geologic Units

Th - Hominy Peak Formation
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Tiru - Intrusive rocks, undivided (Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Ti - Intrusive rocks, undivided (Eocene)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

Tav - Absaroka Volcanics Supergroup, undivided (Eocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Tav - Absaroka Volcanics Supergroup (Eocene)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

Ta - name unknown
Geologic unit present on source map: Sunlight Peak 15' Quadrangle (northwest part) Geologic Units

Tto - Two Ocean Formation (middle Eocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

To - Two Ocean Formation
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

Tto - Two Ocean Formation (middle Eocene)
Geologic unit present on source map: Two Ocean Pass 15' Quadrangle Geologic Units

To - Two Ocean Formation (Eocene)
Geologic unit present on source map: Yellowstone National Park Geologic Units

Ttoa - Two Ocean Formation, ash bed (middle Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

A - Two Ocean Formation, ash bed (middle Eocene)
Geologic unit present on source map: Two Ocean Pass 15' Quadrangle Geologic Units

Ttok - Two Ocean Formation, key bed (middle Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

k - Two Ocean Formation, key bed (middle Eocene)
Geologic unit present on source map: Two Ocean Pass 15' Quadrangle Geologic Units

Ttol - Two Ocean Formation and Langford Formation, intrusive rocks (Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Tli - Intrusive rocks of Two Ocean and Langford Formations (Eocene)
Geologic unit present on source map: Yellowstone National Park Geologic Units

Tl - Langford Formation (lower middle Eocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Tla - Langford Formation (Eocene)
Geologic unit present on source map: Abiathar Peak 15' Quadrangle Geologic Units

Tla - Langford Formation (Eocene)

Geologic unit present on source map: Canyon Village 15' Quadrangle Geologic Units

Tl - Langford Formation
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Tl - Langford Formation
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

Tl - Langford Formation (Eocene)
Geologic unit present on source map: Pilot Peak 15' Quadrangle Geologic Units

Tl - Langford Formation (lower middle Eocene)
Geologic unit present on source map: Two Ocean Pass 15' Quadrangle Geologic Units

Tl - Langford Formation (Eocene)
Geologic unit present on source map: Yellowstone National Park Geologic Units

Tlir - Langford Formation, intrusive rocks (Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Tli - Absaroka Volcanic Supergroup, Langford Formation, Intrusive rocks (Eocene)
Geologic unit present on source map: Pelican Cone 15' Quadrangle Geologic Units

Tlv - Langford Formation, vent facies deposits (lower middle Eocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Tlv - Langford Formation, Vent facies deposits (Eocene)
Geologic unit present on source map: Frank Island 15' Quadrangle Geologic Units

Tlv - Langford Formation, Vent facies deposits (Eocene)
Geologic unit present on source map: Pelican Cone 15' Quadrangle Geologic Units

Tlv - Langford Formation, Vent facies deposits (lower middle Eocene)
Geologic unit present on source map: Two Ocean Pass 15' Quadrangle Geologic Units

Tla - Langford Formation, alluvial facies deposits (lower middle Eocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Tla - Langford Formation, Alluvial facies deposits (Eocene)
Geologic unit present on source map: Frank Island 15' Quadrangle Geologic Units

Tla - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Tla - Langford Formation, Alluvial facies

Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

Tla - Langford Formation, Alluvial facies deposits (Eocene)
Geologic unit present on source map: Pelican Cone 15' Quadrangle Geologic Units

Tla - Langford Formation, alluvial facies (Eocene)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Tla - Langford Formation, Alluvial facies deposits (lower middle Eocene)
Geologic unit present on source map: Two Ocean Pass 15' Quadrangle Geologic Units

Tlak - Langford Formation, alluvial facies deposits, key bed (lower middle Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

k - Langford Formation, Alluvial facies deposits, Key bed (lower middle Eocene)
Geologic unit present on source map: Two Ocean Pass 15' Quadrangle Geologic Units

Tlf - Langford Formation, lava flows (Eocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Tlf - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Tlf - Langford Formation, andesitic lava flows (Eocene)
Geologic unit present on source map: Pelican Cone 15' Quadrangle Geologic Units

Tlf - Langford Formation, lava flows (Eocene)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Tlf - Absaroka Volcanic Supergroup, Langford Formation, Andesite Lava Flows (Eocene)
Geologic unit present on source map: Yellowstone National Park Geologic Units

Tlpm - Langford Formation, Promontory Member (lower middle Eocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Tlp - Langford Formation, Promontory Member (Eocene)
Geologic unit present on source map: Frank Island 15' Quadrangle Geologic Units

Tlp - Absaroka Volcanic Supergroup, Promontory Member (Eocene)
Geologic unit present on source map: Pelican Cone 15' Quadrangle Geologic Units

Tlp - Promontory Member (lower middle Eocene)
Geologic unit present on source map: Two Ocean Pass 15' Quadrangle Geologic Units

Tlp - Langford Formation, Promontory Member (Eocene)
Geologic unit present on source map: Yellowstone National Park Geologic Units

Ttpu - Trout Peak Trachyandesite, undivided (lower middle Eocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Tt - Trout Peak Trachyandesite (Eocene)
Geologic unit present on source map: Canyon Village 15' Quadrangle Geologic Units

Tt - Trout Peak Trachyandesite (Eocene)
Geologic unit present on source map: Frank Island 15' Quadrangle Geologic Units

Tt - Trout Peak Trachyandesite, massive dark colored lava flows and breccias of basalt and trachyandesite with minor tuff (Eocene)
Geologic unit present on source map: Pilot Peak 15' Quadrangle Geologic Units

Ttp - Trout Peak Trachyandesite (middle Eocene)
Geologic unit present on source map: Two Ocean Pass 15' Quadrangle Geologic Units

Tt - Trout Peak Trachyandesite (Eocene)
Geologic unit present on source map: Yellowstone National Park Geologic Units

Tt - Trout Peak Trachyandesite, main body (Eocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Tt - Trout Peak Trachyandesite, main body (Eocene)
Geologic unit present on source map: Abiathar Peak 15' Quadrangle Geologic Units

Tt - Trout Peak Andesite, main body
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Tt - Trout Peak Andesite, main Body
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

Tt - Trout Peak Trachyandesite, Main body (Eocene)
Geologic unit present on source map: Pelican Cone 15' Quadrangle Geologic Units

Tti - Trout Peak Trachyandesite, dikes of shoshonite (Eocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Tti - Trout Peak Trachyandesite, dikes of shoshonite (Eocene)
Geologic unit present on source map: Abiathar Peak 15' Quadrangle Geologic Units

Tti - Trout Peak Trachyandesite, Dikes of shoshonite (Eocene)
Geologic unit present on source map: Pelican Cone 15' Quadrangle Geologic Units

Tti - name unknown
Geologic unit present on source map: Sunlight Peak 15' Quadrangle (northwest part) Geologic Units

Ttppc - Trout Peak Trachyandesite, Pacific Creek Tuff Member (Eocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Ttp - Trout Peak Trachyandesite, Pacific Creek Tuff Member (Eocene)
Geologic unit present on source map: Pelican Cone 15' Quadrangle Geologic Units

Ttp - Trout Peak Trachyandesite, Pacific Creek Tuff Member (Eocene)
Geologic unit present on source map: Yellowstone National Park Geologic Units

Tta - Trout Peak Trachyandesite, andesitic volcanic sediments (Eocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Tta - Trout Peak Trachyandesite, Andesitic volcanic sediments (Eocene)
Geologic unit present on source map: Pelican Cone 15' Quadrangle Geologic Units

Tta - Trout Peak Trachyandesite, volcanic conglomerate and sandstone (Eocene)
Geologic unit present on source map: Pilot Peak 15' Quadrangle Geologic Units

Ttpr - Trout Peak Trachyandesite, lava flow of rhomb porphyry type (middle Eocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

R - Trout Peak Trachyandesite, Lava flow of rhomb porphyry type (middle Eocene)
Geologic unit present on source map: Two Ocean Pass 15' Quadrangle Geologic Units

Trql - Rhyodacite, quartz latite, quartz monzonite, and granodiorite in the Gallatin Ridge (Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Ti - Rhyodacite, quartz latite, quartz monzonite, and granodiorite in the Gallatin Ridge (Eocene)
Geologic unit present on source map: Yellowstone National Park Geologic Units

Tf - Complex of Fisher Mountain Area (Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Tf - Complex of Fisher Mountain Area (Eocene)
Geologic unit present on source map: Cooke City 15' Quadrangle (southwest part) Geologic Units

Tbae - Breccia of Alice E. Mine Area (Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Tba - Breccia of Alice E. Mine Area (Eocene)
Geologic unit present on source map: Cooke City 15' Quadrangle (southwest part) Geologic Units

Tbh - Breccia of Homestake Mine Area (Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Tbh - Breccia of Homestake Mine Area (Eocene)
Geologic unit present on source map: Cooke City 15' Quadrangle (southwest part) Geologic Units

Tv - Volcaniclastic rocks of uncertain correlation (Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Tv - Volcaniclastic rocks of uncertain correlation (Eocene)
Geologic unit present on source map: Two Ocean Pass 15' Quadrangle Geologic Units

Tw - Wapiti Formation (Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Tw - Wapiti Formation (Eocene)
Geologic unit present on source map: Cooke City 15' Quadrangle (southwest part) Geologic Units

Twa - Wapiti Formation, alluvial facies (Eocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Twa - Wapiti Formation, alluvial facies (Eocene)
Geologic unit present on source map: Abiathar Peak 15' Quadrangle Geologic Units

Twa - Wapiti Formation, Alluvial facies (Eocene)
Geologic unit present on source map: Pelican Cone 15' Quadrangle Geologic Units

Twa - Wapiti Formation, volcanic conglomerate and sandstone, and polylithologic breccia with

minor amounts of monolithologic breccia and volcanic flows (Eocene)
Geologic unit present on source map: Pilot Peak 15' Quadrangle Geologic Units

Twa - Wapiti Formation, alluvial facies (Eocene)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Twv - Wapiti Formation, vent facies (Eocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Twv - Wapiti Formation, ment facies (Eocene)
Geologic unit present on source map: Abiathar Peak 15' Quadrangle Geologic Units

Twv - Wapiti Formation, Vent facies (Eocene)
Geologic unit present on source map: Pelican Cone 15' Quadrangle Geologic Units

Tw - Wapiti Formation, mostly dark brown crudely bedded andesitic volcanic breccia and lenticular lava flows (Eocene)
Geologic unit present on source map: Pilot Peak 15' Quadrangle Geologic Units

Twf - Wapiti Formation, mafic lava flows (Eocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Twf - Wapiti Formation, mafic lava flows (Eocene)
Geologic unit present on source map: Abiathar Peak 15' Quadrangle Geologic Units

Twf - Wapiti Formation, Mafic lava flows (Eocene)
Geologic unit present on source map: Pelican Cone 15' Quadrangle Geologic Units

Twf - Wapiti Formation, lava flows mapped separately (Eocene)
Geologic unit present on source map: Pilot Peak 15' Quadrangle Geologic Units

Tch - Crescent Hill Basalt (Eocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Tch - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Tch - Crescent Hill Basalt (Eocene)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Tm - Mount Wallace Formation, main body (Eocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Tm - Mount Wallace Formation (Eocene)
Geologic unit present on source map: Abiathar Peak 15' Quadrangle Geologic Units

Tm - Mount Wallace Formation, Main body (Eocene)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Tm - Mount Wallace Formation (Eocene)
Geologic unit present on source map: Yellowstone National Park Geologic Units

Tms - Mount Wallace Formation, Slough Creek Tuff Member (Eocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Tms - Mount Wallace Formation (Eocene)
Geologic unit present on source map: Abiathar Peak 15' Quadrangle Geologic Units

Tms - Slough Creek Tuff Member, Mount Wallace Formation (Eocene)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

Tms - Mount Wallace Formation, Slough Creek Tuff Member (Eocene)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Tb - Olivine basalt laccolith (Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Tb - Olivine basalt laccolith (Eocene)
Geologic unit present on source map: Abiathar Peak 15' Quadrangle Geologic Units

Ti - Quartz monzonite prophyry (Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Ti - Quartz monzonite prophyry (Eocene)
Geologic unit present on source map: Abiathar Peak 15' Quadrangle Geologic Units

Tlr - Lamar River Formation (Eocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Tlr - Lamar River Formation (Eocene)
Geologic unit present on source map: Canyon Village 15' Quadrangle Geologic Units

Tlr - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Tlrd - Lamar River Formation, Sulphur Creek stock (Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Tlrd - Lamar River Formation, Sulphur Creek stock (Eocene)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Tlra - Lamar River Formation, alluvial facies (Eocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Tlr - Lamar River Formation, alluvial facies (Eocene)
Geologic unit present on source map: Abiathar Peak 15' Quadrangle Geologic Units

Tlr - Lamar River Formation, Alluvial facies (Eocene)
Geologic unit present on source map: Pelican Cone 15' Quadrangle Geologic Units

Tlr - Lamar River Formation, medium brown and yellowish brown well bedded andesitic volcanic conglomerate, breccia, sandstone, and tuff, and minor intrusive andesite (Eocene)
Geologic unit present on source map: Pilot Peak 15' Quadrangle Geologic Units

Tlr - Lamar River Formation, alluvial facies (Eocene)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Tli - Lamar River Formation, autobrecciated intrusive andesite (Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Tli - Lamar River Formation, light to dark gray and brown autobrecciated intrusive andesite (Eocene)
Geologic unit present on source map: Pilot Peak 15' Quadrangle Geologic Units

Tic - Lamar River and Cathedral Cliffs Formations, intrusive andesite (Eocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Tic - Intrusive Andesite, Cathedral Cliffs Formation, and Lamar River Formation (Eocene)
Geologic unit present on source map: Abiathar Peak 15' Quadrangle Geologic Units

Tlri - Lamar River Formation, Bodies of intrusive breccia and dikes associated with the Sulphur Creek stock (Eocene)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Tlrv - Lamar River Formation, vent facies (Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Tlrv - Lamar River Formation, Vent facies (Eocene)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Tec - Lamar River Formation, Elk Creek Basalt Member (Eocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Tec - Lamar River Formation, Elk Creek Basalt Member (Eocene)
Geologic unit present on source map: Abiathar Peak 15' Quadrangle Geologic Units

Tec - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Tec - Lamar River Formation, Elk Creek Basalt Member (Eocene)
Geologic unit present on source map: Pilot Peak 15' Quadrangle Geologic Units

Tec - Lamar River Formation, Elk Creek Basalt Member (Eocene)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Tlrf - Lamar River Formation, andesite flows (Eocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Tlrf - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Tlrf - Lamar River Formation, Andesite flows (Eocene)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Tlc - Lamar River Formation and Cathedral Cliffs Formation, undivided (Eocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Tcc - Cathedral Cliffs Formation (Eocene)
Geologic unit present on source map: Abiathar Peak 15' Quadrangle Geologic Units

Tlc - Lamar River and Cathedral Cliffs Formations (Eocene)
Geologic unit present on source map: Cooke City 15' Quadrangle (southwest part) Geologic Units

Tlc - Lamar River and Cathedral Cliffs Formations, undivided (Eocene)

Geologic unit present on source map: Pilot Peak 15' Quadrangle Geologic Units

Tai - Absaroka Volcanic Supergroup, intrusive rocks (Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Tad - Intrusive rocks of Absaroka Volcanics Supergroup
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Tse - Sepulcher Formation (Eocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Tse - Sepulcher Formation (Eocene)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

Tsa - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Ts - Sepulcher Formation, Main body (Eocene)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Ts - Sepulcher Formation (Eocene)
Geologic unit present on source map: Yellowstone National Park Geologic Units

Tseu - Sepulcher Formation, unknown member (Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

unknown - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Tsf - Sepulcher Formation, Fortress Mountain Member (Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Tsf - Sepulcher Formation, Fortress Mountain Member (Eocene)
Geologic unit present on source map: Yellowstone National Park Geologic Units

Tsd - Sepulcher Formation, Daly Creek Member (Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Tsd - Sepulcher Formation, Daly Creek Member (Eocene)
Geologic unit present on source map: Yellowstone National Park Geologic Units

Tslc - Sepulcher Formation, Lost Creek Tuff Member (Eocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Tslc - Lost Creek Tuff Member of Sepulcher Formation (Eocene)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

Tlc - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Tlc - Sepulcher Formation, Lost Creek Tuff Member (Eocene)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Tsec - Sepulcher Formation, Elk Creek Basalt Member (Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Tsec - Elk Creek Basalt Member of Sepulcher Formation (Eocene)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

Tsc - Sepulcher Formation, non volcanic conglomerate (Eocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Tsc - Sepulcher Formation, Nonvolcanic conglomerate (Eocene)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Tsc - Sepulcher Formation, Nonvolcanic conglomerate, fangflomerate, and breccia facies (Eocene)
Geologic unit present on source map: Yellowstone National Park Geologic Units

Tcc - Cathedral Cliffs Formation (Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Tcc - Absaroka Volcanic Supergroup, Cathedral Cliffs Formation (Eocene)
Geologic unit present on source map: Pilot Peak 15' Quadrangle Geologic Units

Tc - Crandall Conglomerate (Eocene)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Tc - name unknown
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

Tc - Crandall Conglomerate (Eocene)
Geologic unit present on source map: Pilot Peak 15' Quadrangle Geologic Units

Tae - Andesite, epiclastic of Hyalite Peak Volcanics (Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Tae - Andesite, epiclastic, of Hyalite Peak Volcanics (Eocene)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

Tanf - Andesite flows of Hyalite Peak Volcanics (Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Tanf - Andesite flows of Hyalite Peak Volcanics (Eocene)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

Tavv - Vent facies of Hyalite Peak Volcanics (Eocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Tavv - Vent facies of Hyalite Peak Volcanics (Eocene)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

Tds - Diorite of Scotch Bonnet Mountain (Paleocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Tds - Diorite of Scotch Bonnet Mountain (Paleocene)
Geologic unit present on source map: Cooke City 15' Quadrangle (southwest part) Geologic Units

Ttp - Trachyandesite porphyry (Paleocene)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Ttp - Trachyandesite Porphyry (Paleocene)
Geologic unit present on source map: Cooke City 15' Quadrangle (southwest part) Geologic Units

Tdp - Dacite porphyry (Tertiary)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Tdp - Dacite porphyry (Tertiary)
Geologic unit present on source map: Tepee Creek 15' Quadrangle Geologic Units

Twr - White River Formation (Tertiary)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Twr - White River Formation
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

Tbc - Tuff of Boone Creek (Tertiary)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Tb - Tuff of Boone Creek
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Tbr - Unnamed basalt breccia (Tertiary)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Tbr - Unnamed basalt breccia
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Tbr - Unnamed basalt breccia
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

Tco - Colter Formation (Tertiary)

Tc - Colter Formation
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

TpCi - Intermediate and mafic Intrusive rocks (Eocene and Precambrian)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

TpCi - Intermediate and mafic Intrusive rocks (Eocene and Precambrian)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

TKp - Pinyon Conglomerate (Paleocene and Upper Cretaceous)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

TKp - Pinyon Conglomerate (Paleocene and Upper Cretaceous)
Geologic unit present on source map: Grassy Lake Reservoir 15' Quadrangle Geologic Units

TKp/Tp - Pinyon Conglomerate
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

TKp - Pinyon Conglomerate
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

TKp - Pinyon Conglomerate (Paleocene and upper Cretaceous)
Geologic unit present on source map: West Thumb 15' Quadrangle Geologic Units

TKv - Volcanic rocks, undivided (Paleocene and Upper Cretaceous)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

TKv - Volcanic Rocks (Paleocene and Upper Cretaceous)
Geologic unit present on source map: Yellowstone National Park Geologic Units

Kdi - Diorite (Upper Cretaceous)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Kdi - Diorite (Upper Cretaceous)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

Ks - Sedimentary rocks, undivided (Cretaceous)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Ks - Sedimentary rocks, undivided (Cretaceous)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

Kql - Quartz latite porphyry (Upper Cretaceous)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Kql - Quartz Latite Porphyry (Upper Cretaceous)
Geologic unit present on source map: Cooke City 15' Quadrangle (southwest part) Geologic Units

Ksy - Syenite of Goose Lake (Upper Cretaceous)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Ks - Syenite of Goose Lake (Upper Cretaceous)
Geologic unit present on source map: Cooke City 15' Quadrangle (southwest part) Geologic Units

Krp - Rhyodacite porphyry (Upper Cretaceous)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Krp - Rhyodacite Porphyry (Upper Cretaceous)
Geologic unit present on source map: Cooke City 15' Quadrangle (southwest part) Geologic Units

Kh - Harebell Formation (Upper Cretaceous)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Kh - Harebell Formation (Upper Cretaceous)
Geologic unit present on source map: Frank Island 15' Quadrangle Geologic Units

Kh - Harebell Formation
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Kh - Harebell Formation
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

Kb - Bacon Ridge Sandstone (Upper Cretaceous)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Kb - Bacon Ridge Sandstone (Upper Cretaceous)
Geologic unit present on source map: Frank Island 15' Quadrangle Geologic Units

Kb - Bacon Ridge Sandstone
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Kb - Bacon Ridge Sandstone

Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

Kl - Landslide Creek Formation (Upper Cretaceous)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Kl - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Klf - Landslide Creek formation through Frontier Formation (Upper Cretaceous)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Klf - Landslide Creek formation through Frontier Formation (Upper Cretaceous)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

K - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Kl - Landslide Creek Formation, Everts Formation, Eagle Sandstone, Telegraph Creek Formation, Cody Shale, and Fronier Sandstone (Upper Cretaceous)
Geologic unit present on source map: Yellowstone National Park Geologic Units

Ke - Everts Formation? (Upper Cretaceous)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Ke - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Kev - Eagle Sandstone, Virgelle Sandstone Member (Upper Cretaceous)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Kev - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Ktc - Telegraph Creek Formation (Upper Cretaceous)

This unit appears on the following source map(s)(s) (click link to view geologic unit descriptions for that specific source map):

Ktc - name unknown

Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Kc - Cody Shale (Upper Cretaceous)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Kc - Cody Shale (Upper Cretaceous)
Geologic unit present on source map: Frank Island 15' Quadrangle Geologic Units

Kc - Cody Shale
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Kc - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Kc - Cody Shale
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

Kf - Frontier Formation (Upper Cretaceous)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Kf - Frontier Formation (Upper Cretaceous)
Geologic unit present on source map: Grassy Lake Reservoir 15' Quadrangle Geologic Units

Kf - Frontier Formation
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Kf - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Kf - Frontier Formation
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

Km - Mowry Shale (Cretaceous)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Kmr - Mowry Shale
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Kmt - Mowry Shale and Thermopolis Shale, undivided (Cretaceous)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Kmt - Mowry and Thermopolis Shales

Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Kmt - Mowry and Thermopolis Shales
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

Kmfr - Mowry Shale through Fall River Sandstone, undivided (Upper and Lower Cretaceous)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Kmfr - Mowry Shale through Fall River Sandstone, undivided (Upper and Lower Cretaceous)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

Kmk - Mowry Shale, Thermopolis Shale, and Kootenai Formation, undivded (Lower Cretaceous)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Km - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Kmk - Mowry Shale, Thermopolis Shale, and Kootenai Formation (Lower Cretaceous)
Geologic unit present on source map: Yellowstone National Park Geologic Units

Kt - Thermopolis Shale (Lower Cretaceous)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Kt - Thermopolis Shale
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Kt - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Ktu - Thermopolis? Shale, upper part (Lower Cretaceous)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Ktu - Thermopolis? Shale upper part (Lower Cretaceous)
Geologic unit present on source map: Tepee Creek 15' Quadrangle Geologic Units

Kts - Thermopolis? Shale, sandstone member (Lower Cretaceous)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Kts - Thermopolis? Shale sandstone member (Lower Cretaceous)
Geologic unit present on source map: Tepee Creek 15' Quadrangle Geologic Units

Kmd - Thermopolis Shale, Muddy Sandstone Member (Lower Cretaceous)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Kmd - Muddy Sandstone Member
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Ktrb - Thermopolis Shale, Rusty Beds Member (Lower Cretaceous)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Kcvr - Rusty Beds member
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

KJmv - Thermopolis Shale, variegated sequence underlying Rusty Beds Member (Cretaceous and Jurrasic)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

KJmv - Variegated sequence underlying Rusty Beds Member
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Kss - Lenticular sandstone/shale sequence (Cretaceous)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Ks - Lenticular sandstone/shale sequence
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Ks - Lenticular sandstone and shale sequence
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

Ksb - Unnamed lenticular sandstone/shale/bedrock sequence (Cretaceous)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Ksb - Unnamed lenticular sandstone/shale/bedrock sequence
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Kk - Kootenai Formation (Lower Cretaceous)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Kk - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Kk - Kootenai Formation (Lower Cretaceous)
Geologic unit present on source map: Tepee Creek 15' Quadrangle Geologic Units

Kk - name unknown
Geologic unit present on source map: West Yellowstone 15' Quadrangle Geologic Units

KJcm - Cloverly Formation and Morrison Formation, undivided (Lower Cretaceous and Upper Jurassic)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

KJcm - Cloverly and Morrison Formations (Lower Cretaceous and Upper Jurassic)
Geologic unit present on source map: Frank Island 15' Quadrangle Geologic Units

KJm - Cloverly and Morrison Formations
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

KJm - Cloverly and Morrison Formations
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

Jm - Morrison Formation (Upper Jurassic)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Jm - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Jm - Morrison Formation (Upper Jurassic)
Geologic unit present on source map: Tepee Creek 15' Quadrangle Geologic Units

Jm - Morrison Formation (Upper Jurassic)
Geologic unit present on source map: Yellowstone National Park Geologic Units

Jsg - Sundance Formation and Gypsum Spring Formation, undivided (Upper and Middle Jurassic)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Jsg - Sundance and Gypsum Spring Formations (upper and middle Jurassic)
Geologic unit present on source map: Frank Island 15' Quadrangle Geologic Units

Ju - Sundance and Gypsum Spring Formations
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Jus - Upper Sundance Formation (Upper and Middle Jurassic)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Jus - Upper Sundance Formation
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Jls - Lower Sundance Formation (Upper and Middle Jurassic)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Jls - Lower Part of Sundance Formation (Upper and Middle Jurassic)
Geologic unit present on source map: Grassy Lake Reservoir 15' Quadrangle Geologic Units

Jls - Lower Sundance Formation
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Jls - Lower Sundance Formation
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

Jgs - Gypsum Spring Formation (Jurassic)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Jgs - Gypsum Spring Formation
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Jgs - Gypsum Spring Formation
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

Je - Swift Formation, Rierdon Formation, and Sawtooth Formation, undivided (Upper and Middle Jurassic)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Je - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Je - Ellis Group, Swift, Rierdon, and Sawtooth Formations undivided (Upper and Middle Jurassic)
Geologic unit present on source map: Tepee Creek 15' Quadrangle Geologic Units

Je - Ellis Group, sandstone, shale, and limestone (Upper and Middle Jurassic)
Geologic unit present on source map: Yellowstone National Park Geologic Units

JTRs - Sedimentary rocks, undivided (Jurassic and Triassic)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

JTRs - Sedimentary rocks, undivided (Jurassic and Triassic)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

TRc - Chugwater Formation, undivided (Upper and Lower Triassic)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

TRc - Chugwater Formation (Upper and Lower Triassic)
Geologic unit present on source map: Grassy Lake Reservoir 15' Quadrangle Geologic Units

TRc - Chugwater Formation
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

TRc - Chugwater Formation
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

TRp - Chugwater Formation, Popo Agie Member (Triassic)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

TRp - Popo Agie Member
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

TRrp - Chugwater Formation, Red Peak Member (Triassic)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

TRrp - Red Peak Member
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

TRa - Chugwater Formation, Alcova Limestone Member (Triassic)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

TRa - Alcova Limestone Member
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

TRcd - Chugwater Formation and Dinwoody Formation, undivided (Upper and Lower Triassic)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

TRcd - Chugwater and Dinwoody Formation, Undivided (Upper and Lower Triassic)
Geologic unit present on source map: Grassy Lake Reservoir 15' Quadrangle Geologic Units

TRcd - Chugwater and Dinwoody Formation, undivided
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

TRcd - Chugwater and Dinwoody Formation, undivided
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

TRtw - Thaynes? Formation and Woodside Siltstone, undivided (Lower Triassic)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

TRtw - Thaynes? Formation and Woodside Siltstone undivided (Lower Triassic)
Geologic unit present on source map: Tepee Creek 15' Quadrangle Geologic Units

TRtwd - Thyanes? Formation, Woodside Siltstone and Dinwoody Formation, undivded (Lower Triassic)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Tru - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

TRw - name unknown
Geologic unit present on source map: West Yellowstone 15' Quadrangle Geologic Units

TRt - Thyanes?, Woodside, and Dinwoody Formations (Lower Triassic)
Geologic unit present on source map: Yellowstone National Park Geologic Units

TRd - Dinwoody Formation (Lower Triassic)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

TRd - Dinwoody Formation (Lower Triassic)
Geologic unit present on source map: Grassy Lake Reservoir 15' Quadrangle Geologic Units

TRd - Dinwoody Formation
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

TRd - Dinwoody Formation
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

TRd - Dinwoody Formation (Lower Triassic)
Geologic unit present on source map: Tepee Creek 15' Quadrangle Geologic Units

PPNMs - Sedimentary rocks, undivided (Permian, Pennsylvanian, and Mississippian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

PMs - Sedimentary rocks, undivided (Permian, Pennsylvanian, and Mississippian)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

PZs - Sedimentary rocks, undivided (Paleozoic)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Pzs - Sedimentary rocks, undivided (Paleozoic)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

Pp - Phosphoria Formation (Lower Permian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Pp - Phosphoria Formation (Permian)
Geologic unit present on source map: Grassy Lake Reservoir 15' Quadrangle Geologic Units

Pp - Phosphoria Formation

Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Pp - Phosphoria Formation
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

Pp - Phosphoria Formation (lower Permian)
Geologic unit present on source map: Two Ocean Pass 15' Quadrangle Geologic Units

Psh - Shedhorn Sandstone (Permian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Psh - Shedhorn Sandstone (Permian)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

Ps - Shedhorn Sandstone (Permian)
Geologic unit present on source map: Tepee Creek 15' Quadrangle Geologic Units

Ps - Shedhorn Sandstone (Permian)
Geologic unit present on source map: Yellowstone National Park Geologic Units

PNq - Quadrant Sandstone (Pennsylvanian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

PNq - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

PNq - Quadrant Sandstone (Pennsylvanian)
Geologic unit present on source map: Tepee Creek 15' Quadrangle Geologic Units

PNqa - Quadrant Sandstone and Amsden Formation (Middle and Lower Pennsylvanian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

PNq - Quadrant Sandstone and Amsden Formation (Lower and Middle Pennsylvanian)
Geologic unit present on source map: Yellowstone National Park Geologic Units

PNMta - Tensleep Sandstone and Amsden Formation (Middle and Lower Pennsylvanian and Upper Mississippian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

PNMta - Tensleep Sandstone and Amsden Formation (Pennsylvanian and Mississippian)

Geologic unit present on source map: Grassy Lake Reservoir 15' Quadrangle Geologic Units

PNMta - Tensleep Sandstone and Amsden Formation
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

PNMta - Tensleep Sandstone and Amsden Formation
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

PNMta - Tensleep Sandstone and Amsden Formation (Middle and Lower Pennsylvanian and Upper Mississippian)
Geologic unit present on source map: Two Ocean Pass 15' Quadrangle Geologic Units

PNMa - Amsden Formation (Middle and Lower Pennsylvanian and Upper Mississippian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

PNa - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

PNMa - Amsden Formation (Middle and Lower Pennsylvanian and Upper Mississippian)
Geologic unit present on source map: Tepee Creek 15' Quadrangle Geologic Units

Mmu - Madison Group, undivided (Upper and Lower Mississippian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Mm - Madison Group, undivided (Upper and Lower Mississippian)
Geologic unit present on source map: Abiathar Peak 15' Quadrangle Geologic Units

Mm - Madison Group, undivided (Mississippian)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

Mm - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

Mm - Madison Group (Upper and Lower Mississippian)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Mm - Madison Group (Lower and Upper Mississippian)
Geologic unit present on source map: Yellowstone National Park Geologic Units

Mml - Madison Limestone (Upper and Lower Mississippian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Mm - Madison Limestone (Upper and Lower Mississippian)
Geologic unit present on source map: Cooke City 15' Quadrangle (southwest part) Geologic Units

Mm - Madison Limestone (Upper and Lower Mississippian)
Geologic unit present on source map: Grassy Lake Reservoir 15' Quadrangle Geologic Units

Mm - Madison Limestone
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Mm - Madison Limestone
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

Mm - Madison Limestone (Upper and Lower Mississippian)
Geologic unit present on source map: Pilot Peak 15' Quadrangle Geologic Units

Mm - Madison Limestone (Upper and Lower Mississippian)
Geologic unit present on source map: Two Ocean Pass 15' Quadrangle Geologic Units

Mmmcll - Madison Group, Mission Canyon Limestone and Lodgepole Limestone, undivided (Upper and Lower Mississippian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Mm - Madison Group Mission Canyon Limestone and Lodgepole Limestone, undivided (Upper and Lower Mississippian)
Geologic unit present on source map: Tepee Creek 15' Quadrangle Geologic Units

MCu - Upper Mississippian to Middle Cambrian Rocks, undivided (Middle Cambrian to Upper Mississippian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

MCu - Upper Mississippian to Middle Cambrian Rocks Undivided (Upper Mississippian to Lower Cambrian)
Geologic unit present on source map: Abiathar Peak 15' Quadrangle Geologic Units

Ml - Lodgepole Limestone (Lower Mississippian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Ml - Lodgepole Limestone (Lower Mississippian)
Geologic unit present on source map: Abiathar Peak 15' Quadrangle Geologic Units

DOs - Sedimentary rocks, undivided (Devonian and Ordovician)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

DOs - Sedimentary rocks, undivided (Devonian and Ordovician)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

Dt - Three Forks Formation (Upper Devonian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Dt - Three Forks Formation (Upper Devonian)
Geologic unit present on source map: Abiathar Peak 15' Quadrangle Geologic Units

Dt - Three Forks Formation (Upper Devonian)
Geologic unit present on source map: Cooke City 15' Quadrangle (southwest part) Geologic Units

MDt - Three Forks Formation (Lower Mississippian)
Geologic unit present on source map: Tepee Creek 15' Quadrangle Geologic Units

Dtj - Three Forks Formation and Jefferson Formation, undivided (Upper Devonian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Dtj - Three Forks and Jefferson Formations, undivided (Upper Devonian)
Geologic unit present on source map: Abiathar Peak 15' Quadrangle Geologic Units

MDtj - Three Forks and Jefferson Formations (Lower Mississippian and Upper Devonian)
Geologic unit present on source map: Pilot Peak 15' Quadrangle Geologic Units

DOt - Three Forks Formation, Jefferson Formation, and Bighorn Dolomite, undivided (Devonian and Ordovician)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

DOt - Three Forks Formation, Jefferson Formation, and Bighorn Dolomite, undivided (Ordovician and Devonian)
Geologic unit present on source map: Yellowstone National Park Geologic Units

Dd - Darby Formation (Upper Devonian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Dd - Darby Formation (Upper Devonian)
Geologic unit present on source map: Grassy Lake Reservoir 15' Quadrangle Geologic Units

Dd - Darby Formation
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

Dj - Jefferson Formation (Upper Devonian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Dj - Jefferson Formation (Upper Devonian)
Geologic unit present on source map: Abiathar Peak 15' Quadrangle Geologic Units

Dj - Jefferson Formation (Upper Devonian)
Geologic unit present on source map: Cooke City 15' Quadrangle (southwest part) Geologic Units

Dj - Jefferson Formation (Upper Devonian)
Geologic unit present on source map: Tepee Creek 15' Quadrangle Geologic Units

Dj - Jefferson Formation (Upper Devonian)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Ob - Bighorn Dolomite (Upper Ordovician)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Ob - Bighorn Dolomite (Upper Ordovician)
Geologic unit present on source map: Abiathar Peak 15' Quadrangle Geologic Units

Ob - Bighorn Dolomite (Upper Devonian)
Geologic unit present on source map: Cooke City 15' Quadrangle (southwest part) Geologic Units

Ob - Bighorn Dolomite (Upper Ordovician)
Geologic unit present on source map: Grassy Lake Reservoir 15' Quadrangle Geologic Units

Ob - Bighorn Dolomite
Geologic unit present on source map: Mount Hancock 15' Quadrangle (digital) Geologic Units

Ob - Bighorn Dolomite (Upper Ordovician)
Geologic unit present on source map: Pilot Peak 15' Quadrangle Geologic Units

Ob - Bighorn Dolomite (Upper Ordovician)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

OCbg - Bighorn Dolomite and Gallatin Limestone, undivided (Upper Ordovician and Upper Cambrian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

OCbg - Bighorn Dolomite and Gallatin Limestone, undivided (Upper Ordovician and Upper Cambrian)
Geologic unit present on source map: Grassy Lake Reservoir 15' Quadrangle Geologic Units

OCbp - Bighorn? Dolomite, Snowy Range Formation, and Pilgrim Limestone undivded (Upper Ordovician and Upper Cambrian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

OCbp - Bighorn? Dolomite, Snowy Range Formation, and Pilgrim Limestone undivded (Upper Ordovician and Upper Cambrian)
Geologic unit present on source map: Tepee Creek 15' Quadrangle Geologic Units

Cu - Upper and Middle Cambrian rocks, undivided (Upper and Middle Cambrian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Cu - Upper and Middle Cambrian rocks, undivided (Upper and Middle Cambrian)
Geologic unit present on source map: Abiathar Peak 15' Quadrangle Geologic Units

Cu - Upper and Middle Cambrian rocks, undivided (Upper and Middle Cambrian)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Csr - Snowy Range Formation (Upper Cambrian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Csr - Snowy Range Formation (Upper Cambrian)
Geologic unit present on source map: Abiathar Peak 15' Quadrangle Geologic Units

Cs - Snowy Range Formation (Upper Cambrian)
Geologic unit present on source map: Cooke City 15' Quadrangle (southwest part) Geologic Units

Cs - Snowy Range Formation (Upper Cambrian)
Geologic unit present on source map: Pilot Peak 15' Quadrangle Geologic Units

Csr - Snowy Range Formation (Upper Cambrian)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Csrp - Snowy Range Formation and Pilgrim Formation, undivided (Cambrian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Csrp - Snowy Range and Pilgrim Formations (Cambrian)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

Cs - Snowy Range Formation and Pilgrim Formation (Cambrian)
Geologic unit present on source map: Yellowstone National Park Geologic Units

Cpi - Pilgrim Formation (Upper Cambrian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Cpi - Pilgrim Limestone (Upper Cambrian)
Geologic unit present on source map: Abiathar Peak 15' Quadrangle Geologic Units

Cpi - Pilgrim Limestone (Upper Cambrian)
Geologic unit present on source map: Cooke City 15' Quadrangle (southwest part) Geologic Units

Cp - Pilgrim Limestone (Upper Cambrian)
Geologic unit present on source map: Pilot Peak 15' Quadrangle Geologic Units

Cpi - Pilgrim Limestone (Upper Cambrian)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Cgp - Gallatin Limestone and Park Shale, undivided (Upper and Middle Cambrian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Cgp - Gallatin Limestone and Park Shale Member of Gros Ventre Formation (Upper and Middle Cambrian)
Geologic unit present on source map: Grassy Lake Reservoir 15' Quadrangle Geologic Units

Cgp - Gallatin Limestone and Park Shale Member of Gros Ventre Formation
Geologic unit present on source map: Huckleberry Mountain 15' Quadrangle (digital) Geologic Units

Cs - Sedimentary rocks, undivided (Cambrian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Cs - Sedimentary rocks, undivided (Cambrian)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

Cgv - Gros Ventre Formation, undivided (Middle Cambrian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Cgv - Gros Ventre Formation (Middle Cambrian)
Geologic unit present on source map: Pilot Peak 15' Quadrangle Geologic Units

Cgvls - Gros Ventre Formation, top of nodular limestone and interbedded green shale unit (Middle Cambrian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

ls - Gros Ventre Formation, top of nodular limestone and interbedded green shale unit (Middle Cambrian)
Geologic unit present on source map: Pilot Peak 15' Quadrangle Geologic Units

Cdc - Death Canyon Limestone (Middle Cambrian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Cdc - Death Canyon Limestone Member of Gros Ventre Formation (Middle Cambrian)
Geologic unit present on source map: Grassy Lake Reservoir 15' Quadrangle Geologic Units

Cp - Park Shale (Middle Cambrian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Cpa - Park Shale (Middle Cambrian)
Geologic unit present on source map: Abiathar Peak 15' Quadrangle Geologic Units

Cp - Park Shale (Middle Cambrian)
Geologic unit present on source map: Cooke City 15' Quadrangle (southwest part) Geologic Units

Cpa - Park Shale (Middle Cambrian)
Geologic unit present on source map: Tepee Creek 15' Quadrangle Geologic Units

Cpf - Park Shale, Meagher Limestone, Wolsey Shale and Flathead Sandstone, undivided (Cambrian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Cpf - Park, Meagher, Wolsey, and Flathead Formation (Cambrian)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

Cp - Park Shale, Meagher Limestone, Wolsey Shale and Flathead Sandstone (Cambrian)
Geologic unit present on source map: Yellowstone National Park Geologic Units

Cm - Meagher Limestone (Middle Cambrian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Cm - Meagher Limestone (Middle Cambrian)
Geologic unit present on source map: Abiathar Peak 15' Quadrangle Geologic Units

Cm - Meagher Limestone (Middle Cambrian)
Geologic unit present on source map: Cooke City 15' Quadrangle (southwest part) Geologic Units

Cm - Meagher Limestone (Middle Cambrian)
Geologic unit present on source map: Tepee Creek 15' Quadrangle Geologic Units

Cm - Meagher Limestone (Middle Cambrian)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Cw - Wolsey Shale (Middle Cambrian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Cw - Wolsey Shale (Middle Cambrian)
Geologic unit present on source map: Cooke City 15' Quadrangle (southwest part) Geologic Units

Cw - Wolsey Shale (Middle Cambrian)
Geologic unit present on source map: Tepee Creek 15' Quadrangle Geologic Units

Cwf - Wolsey Shale and Flathead Sandstone, undivided (Middle Cambrian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Cwf - Wolsey Shale and Flathead Sandstone (Middle Cambrian)
Geologic unit present on source map: Abiathar Peak 15' Quadrangle Geologic Units

Cwf - Wolsey Shale Member of Gros Ventre Formation and Flathead Sandstone, undivided (Middle Cambrian)
Geologic unit present on source map: Grassy Lake Reservoir 15' Quadrangle Geologic Units

Cwf - Wolsey Shale and Flathead Sandstone (Middle Cambrian)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Cf - Flathead Sandstone (Middle Cambrian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Cf - Flathead Sandstone (Middle Cambrian)
Geologic unit present on source map: Cooke City 15' Quadrangle (southwest part) Geologic Units

Cf - Flathead Sandstone (Middle Cambrian)
Geologic unit present on source map: Pilot Peak 15' Quadrangle Geologic Units

Cf - Flathead Sandstone (Middle Cambrian)
Geologic unit present on source map: Tepee Creek 15' Quadrangle Geologic Units

PCim - Mafic intrusive rocks (Proterozoic and Archean)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

pCim - Mafic intrusive rocks (Archean and Proterozoic)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

PCmu - Metamorphic rocks, undivided (Precambrian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

pCg - Metamorphic rocks, undivided (Precambrian)
Geologic unit present on source map: Abiathar Peak 15' Quadrangle Geologic Units

pCg - Granitic rocks (Precambrian)
Geologic unit present on source map: Pilot Peak 15' Quadrangle Geologic Units

PCd - Diabase (Precambrian Y or X)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

YXd - Diabase (Precambrian Y or X)
Geologic unit present on source map: Grassy Lake Reservoir 15' Quadrangle Geologic Units

PCp - Pegmatite (Precambrian X or W)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

XWp - Pegmatite (Precambrian X or W)
Geologic unit present on source map: Grassy Lake Reservoir 15' Quadrangle Geologic Units

PCqd - Quartz dolerite (Precambrian W)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Wqd - Quartz dolerite (Precambrian W)
Geologic unit present on source map: Cooke City 15' Quadrangle (southwest part) Geologic Units

PCm - Metadolerite (Precambrian W)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Wm - Metadolerite (Precambrian W)
Geologic unit present on source map: Cooke City 15' Quadrangle (southwest part) Geologic Units

PCom - Olivine metagabbro (Precambrian W)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Wom - Olivine metagabbro (Precambrian W)
Geologic unit present on source map: Cooke City 15' Quadrangle (southwest part) Geologic Units

PCmp - Metadolerite porphyry (Precambrian W)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Wmp - Metadolerite porphyry (Precambrian W)
Geologic unit present on source map: Cooke City 15' Quadrangle (southwest part) Geologic Units

PCg - Granitic rocks (Precambrian W)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Wg - Granitic rocks (Precambrian W)
Geologic unit present on source map: Cooke City 15' Quadrangle (southwest part) Geologic Units

pCg - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

PCu - Ultramafic rock (Precambrian W)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Wu - Ultramafic rock (Precambrian W)
Geologic unit present on source map: Grassy Lake Reservoir 15' Quadrangle Geologic Units

pCu - name unknown
Geologic unit present on source map: Mammoth 15' Quadrangle Geologic Units

PCgn - Layered gneiss (Precambrian W)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Wgn - Layered gneiss (Precambrian W)
Geologic unit present on source map: Grassy Lake Reservoir 15' Quadrangle Geologic Units

pCgn - name unknown
Geologic unit present on source map: West Yellowstone 15' Quadrangle Geologic Units

PCmy - Mylonite (Precambrian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

pCmy - Mylonite (Precambrian)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

PCq - Quartzite (Precambrian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

pCq - Quartzite (Precambrian)
Geologic unit present on source map: Tepee Creek 15' Quadrangle Geologic Units

pCq - name unknown
Geologic unit present on source map: West Yellowstone 15' Quadrangle Geologic Units

PCt - Tremolite marble (Precambrian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

pCt - Tremolite marble (Precambrian)
Geologic unit present on source map: Tepee Creek 15' Quadrangle Geologic Units

PCms - Mica schist (Precambrian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

pCm - Mica schist (Precambrian)
Geologic unit present on source map: Tepee Creek 15' Quadrangle Geologic Units

PCa - Amphibolite (Precambrian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

pCa - Amphibolite (Precambrian)
Geologic unit present on source map: Tepee Creek 15' Quadrangle Geologic Units

pCam - name unknown
Geologic unit present on source map: West Yellowstone 15' Quadrangle Geologic Units

PCdo - Dolomite (Precambrian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

pCd - Dolomite (Precambrian)
Geologic unit present on source map: Tepee Creek 15' Quadrangle Geologic Units

PCn - Noritic gabbro (Precambrian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

pCn - Noritic Gabbro (Precambrian)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

PCs - Schist and gneiss (Precambrian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

pCs - Schist and Gneiss (Precambrian)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

pCg - Gneiss and Schist (Precambrian)
Geologic unit present on source map: Yellowstone National Park Geologic Units

PCgg - Granitic gneiss (Precambrian)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

pCg - Granitic gneiss (Precambrian)
Geologic unit present on source map: Tepee Creek 15' Quadrangle Geologic Units

pCg - Granitic Gneiss (Precambrian)
Geologic unit present on source map: Tower Junction 15' Quadrangle Geologic Units

Aamh - Amphibolite and hornblende gneiss, Stillwater Complex (Archean)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Aamh - Amphibolite and hornblende gneiss, Stillwater Complex (Archean)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

Agn - Gneissic rocks (Archean)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Agn - Gneissic rocks (Archean)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

Agr - Granitic rocks (Archean)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Agr - Granitic rocks (Archean)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

As - Biotite schist (Archean)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

As - Biotite schist (Archean)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

Ash - Schist and hornfels (Archean)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

Ash - Schist and Hornfels (Archean)
Geologic unit present on source map: Gardiner 30' x 60' Quadrangle Geologic Units

qz-v - Quartz vein (Unknown)

This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

qz-v - name unknown
Geologic unit present on source map: West Yellowstone 15' Quadrangle Geologic Units

cd - Carbonate dike (Unknown)

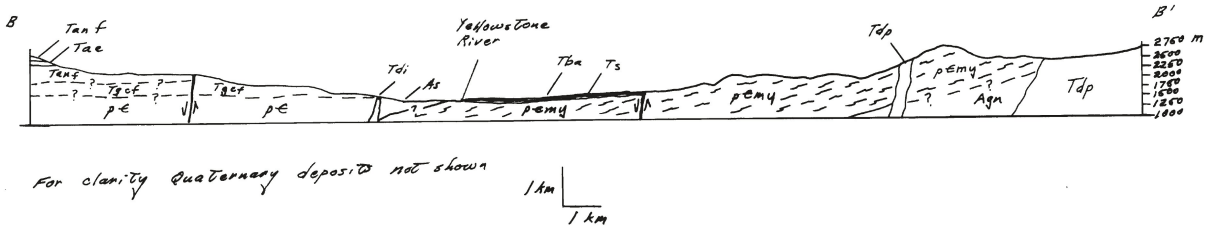
This unit appears on the following source map(s) (click link to view geologic unit descriptions for that specific source map):

cd - Carbonate dike (Unknown)
Geologic unit present on source map: Pilot Peak 15' Quadrangle Geologic Units

Geologic Cross Sections

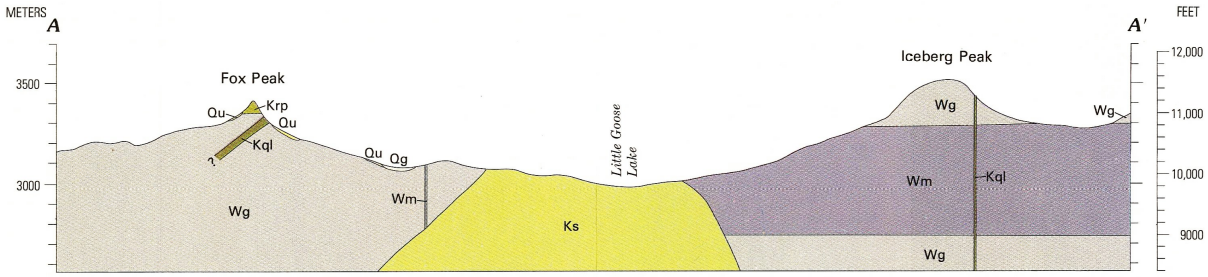
The geologic cross sections present in the GRI digital geologic-GIS data produced for Yellowstone National Park, Wyoming, Montana, and Idaho (YELL) are presented below. Note that some cross section abbreviations (e.g., A - A') have been changed from their source map abbreviation in the GRI digital geologic-GIS data so that each cross section abbreviation is unique. Cross section graphics were scanned at a high resolution and can be viewed in more detail by zooming in (if viewing the digital format of this document).

Cross Section A-A'



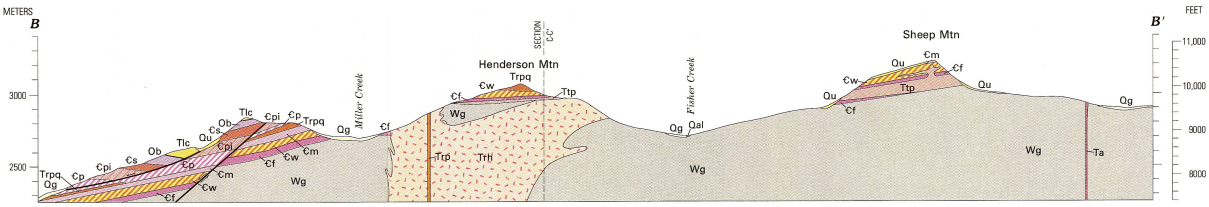
Graphic from source map: Gardiner 30' x 60' Quadrangle. Cross section B-B' on source map.

Cross Section B-B'



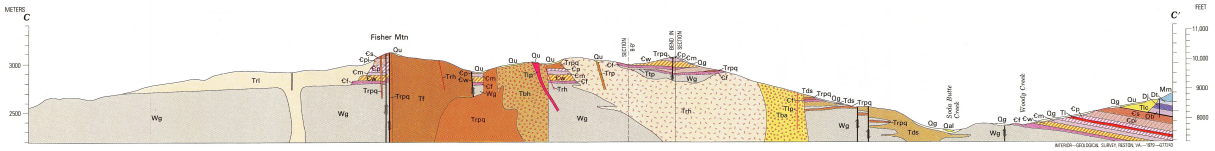
Graphic from source map: Cooke City 15' Quadrangle (southwest part). Cross section A-A' on source map.

Cross Section C-C'



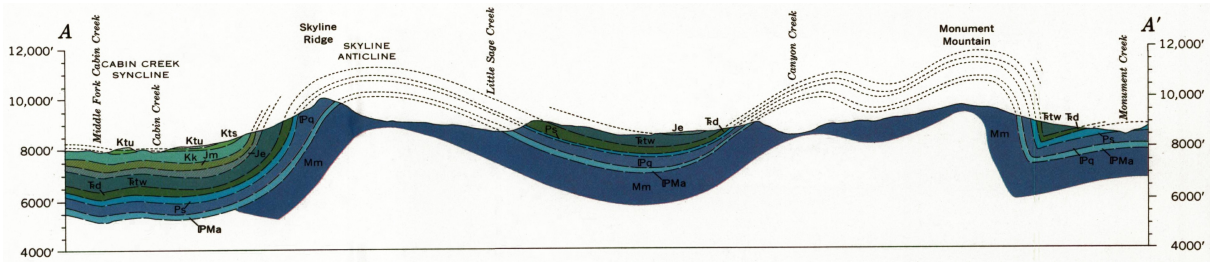
Graphic from source map: Cooke City 15' Quadrangle (southwest part). Cross section B-B' on source map..

Cross Section D-D'



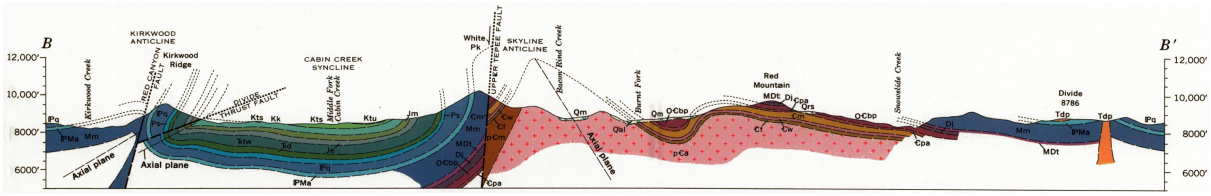
Graphic from source map: Cooke City 15' Quadrangle (southwest part). Cross section C-C' on source map.

Cross Section E-E'



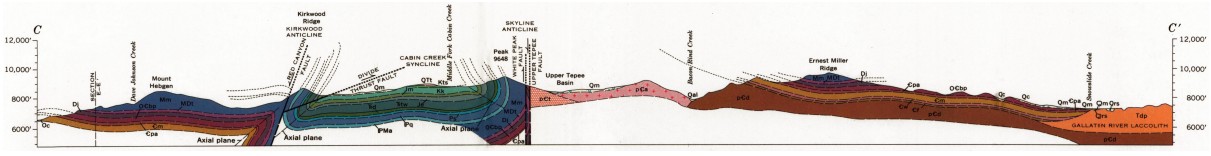
Graphic from source map: Tepee Creek 15' Quadrangle. Cross section A-A' on source map.

Cross Section F-F'



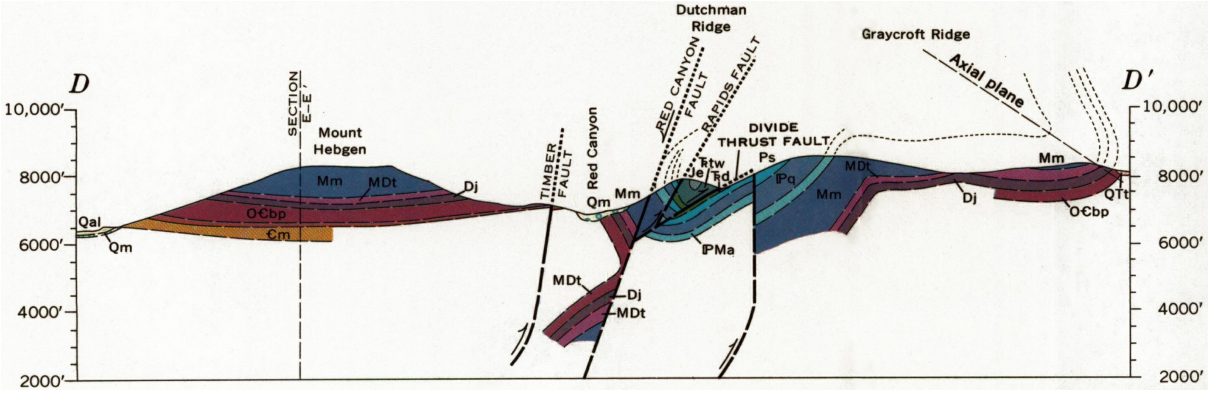
Graphic from source map: Tepee Creek 15' Quadrangle. Cross section B-B' on source map.

Cross Section G-G'



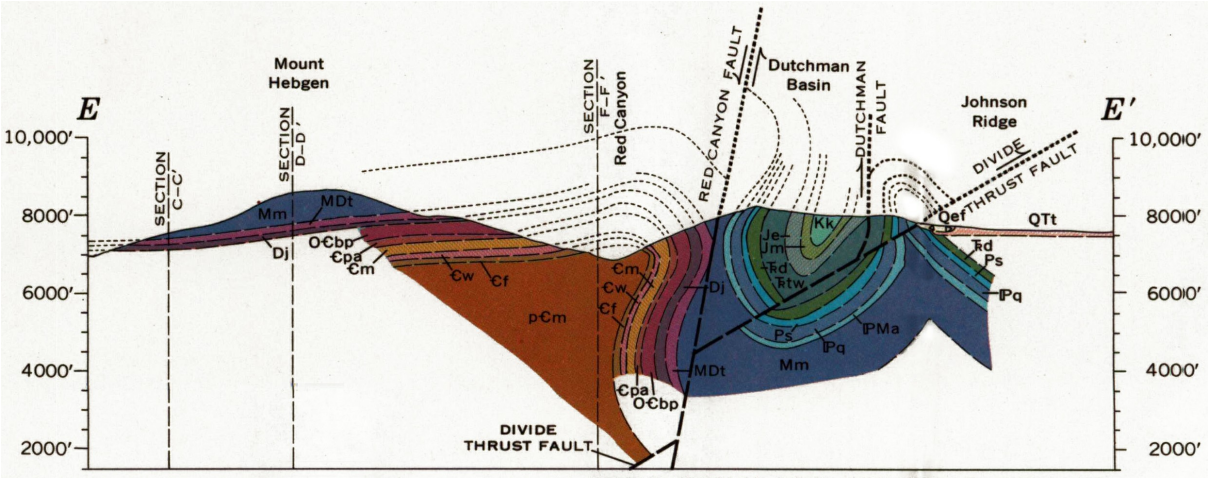
Graphic from source map: Tepee Creek 15' Quadrangle. Cross section C-C' on source map.

Cross Section H-H'



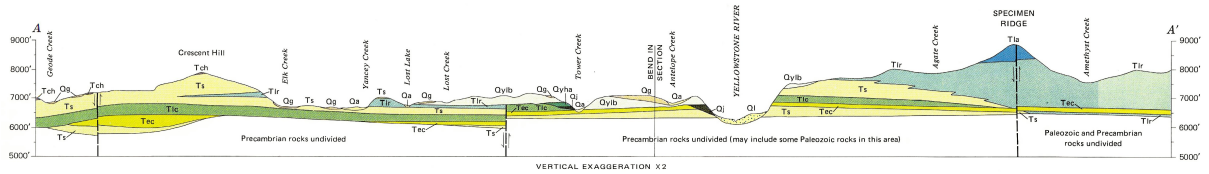
Graphic from source map: Tepee Creek 15' Quadrangle. Cross section D-D' on source map.

Cross Section I-I' and J-J'



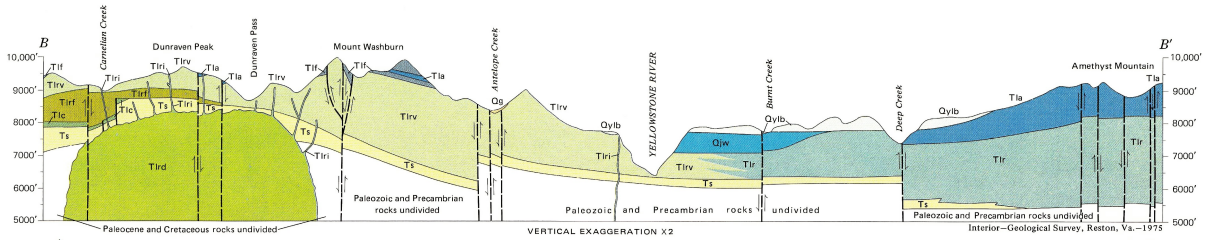
Graphic from source map: Tepee Creek 15' Quadrangle. Cross section E-E' on source map. On the Tepee Creek source map, cross section F-F' does not have its own dedicated graphic and only appears as part of the E-E' graphic.

Cross Section K-K'



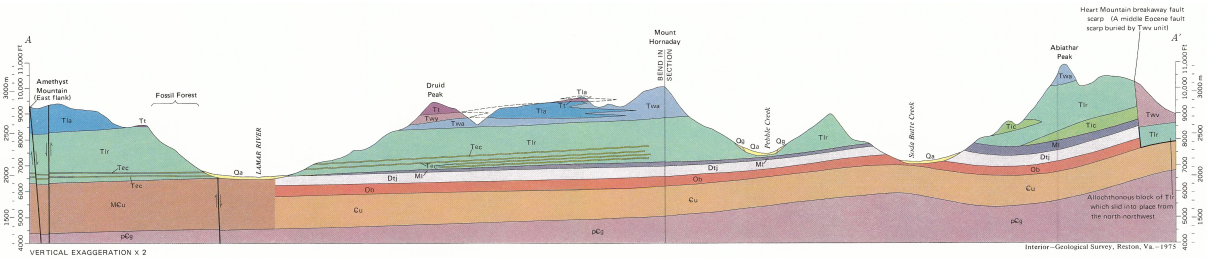
Graphic from source map: Tower Junction 15' Quadrangle. Cross section A-A' on source map.

Cross Section L-L'



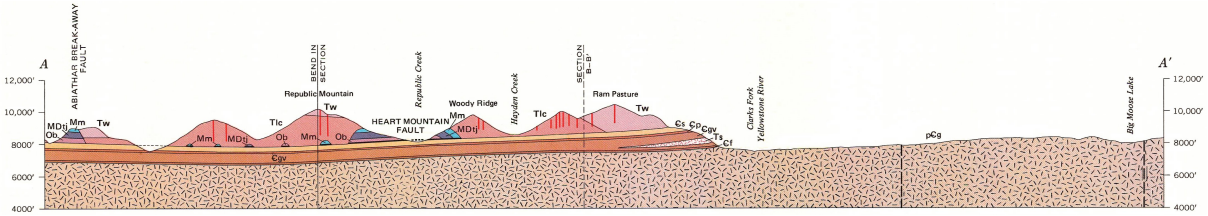
Graphic from source map: Tower Junction 15' Quadrangle. Cross section B-B' on source map.

Cross Section M-M'



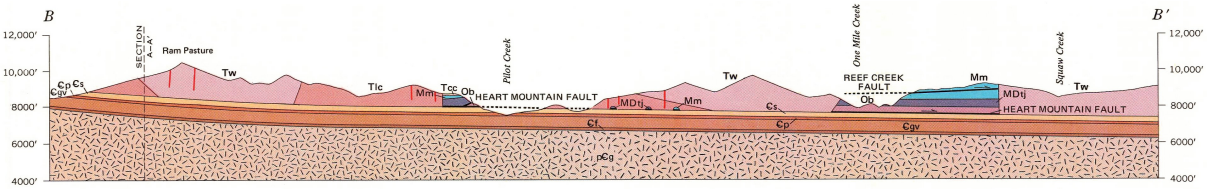
Graphic from source map: Abiathar Peak 15' Quadrangle. Cross section A-A' on source map.

Cross Section N-N'



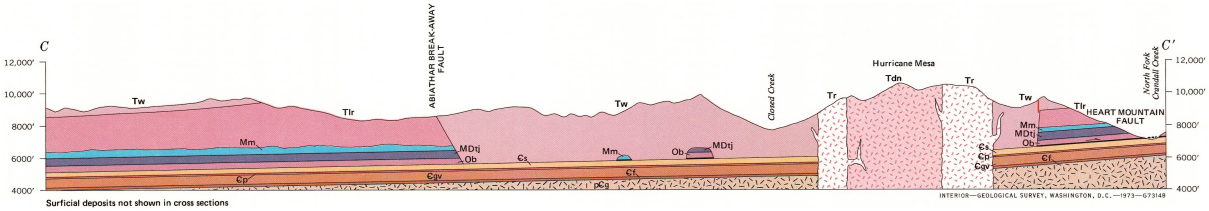
Graphic from source map: Pilot Peak 15' Quadrangle. Cross section A-A' on source map.

Cross Section O-O'



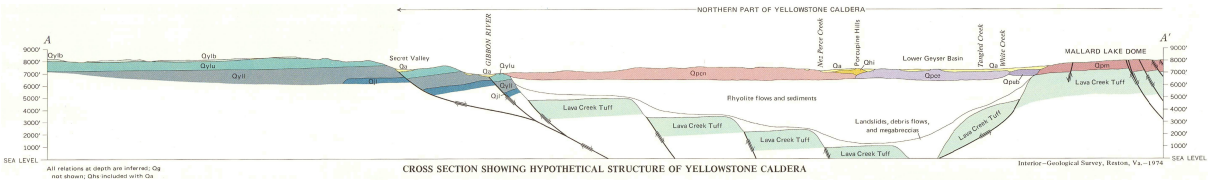
Graphic from source map: Pilot Peak 15' Quadrangle. Cross section B-B' on source map.

Cross Section P-P'



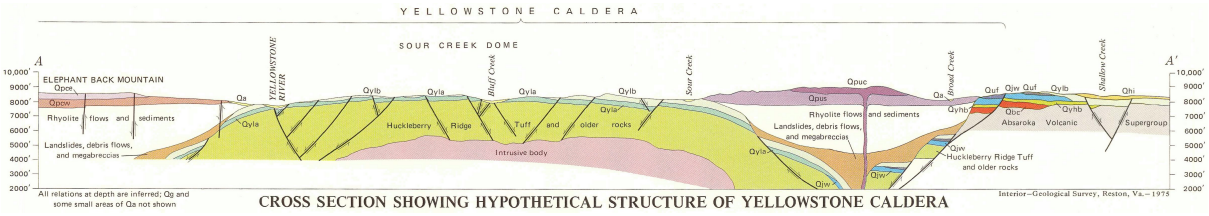
Graphic from source map: Pilot Peak 15' Quadrangle. Cross section C-C' on source map.

Cross Section Q-Q'



Graphic from source map: Madison Junction 15' Quadrangle. Cross section A-A' on source map.

Cross Section R-R'



Graphic from source map: Canyon Village 15' Quadrangle. Cross section A-A' on source map.

Ancillary Source Map Information

The following sections present ancillary source map information, including unit descriptions, associated with the source maps used for this project. Unit symbols mentioned in source map text are as per the source map, and not necessarily the unit symbol present in the GRI digital geologic-GIS data.

Abiathar Peak 15' Quadrangle

The formal citation for this source.

> Prussia, H.J., Rappel, E.T., Christiansen, R.L., 1975, Geologic Map of the Abiathar Peak Quadrangle, Yellowstone National Park, Wyoming and Montana: U.S. Geological Survey, Geologic Quadrangle Map Gb-1244, scale 1:62,500 (*GRI Source Map ID 3024*).

Digital data associated with this map was converted from a third-party data source and checked against a georeferenced copy of the above paper source map.
The citation for this digital data:

> U.S. Geological Survey, 2007, Digital Geologic Map of the Abiathar Peak Quadrangle, Yellowstone National Park, Wyoming and Montana: U.S. Geological Survey, unpublished digital data, scale 1:62,500 (*GRI Source Map ID 74795*).

Description of geologic units, prominent graphics and text associated with the paper source map.

Description of Map Units

Qa - Alluvium and glaciofluvial deposits (Holocene and Pleistocene)
Unconsolidated coarse- to fine-grained moderately well sorted and moderately well bedded stream-channel, overbank, and fan deposits, glacial outwash, and stream-laid ice-contact deposits.

Qs - Landslide deposits (Holocene and Pleistocene)
Unconsolidated poorly sorted slide deposits which have hummocky, generally bouldery surfaces.

Ql - Lacustrine and glaciolacustrine deposits (Holocene and Pleistocene)
Unconsolidated well-sorted and well-bedded silts and sands deposited in or adjacent to open or ice-dammed lakes.

Qt - Talus (Holocene and Pleistocene)
Unconsolidated coarse angular debris deposited on slopes by rockfalls; locally includes other surficial deposits.

Qhi - Ice contact deposits localized by hot springs (Holocene and Pleistocene)
Commonly well sorted, irregularly bedded sandstones and conglomerates deposited against ice from melt waters localized by hot springs. Cemented by zeolites and opaline silica.

Qhc - Calcareous hot spring deposits (Holocene and Pleistocene)
Generally white to light-gray travertine in mounds or terraces around active or extinct hot springs.

Qg - Glacial deposits (Holocene and Pleistocene)
Till, in many places lacking distinct morainal form.

Qo - Osprey Basalt (Pleistocene)
Dark-gray columnar-jointed intracanyon lava flows of dense aphanitic basalt containing sparse plagioclase phenocrysts; generally interlayered with well-sorted yellowish-brown gravels. Whole rock dated by K-Ar method at about 208,000 years (J. D. Obradovich, written commun., 1972). 0-50 feet (0-15 m) thick.

Qylb - Lava Creek Tuff, Member B (Pleistocene)
Medium-gray to dark-gray, brown, purple, and pink densely welded, mostly devitrified rhyolitic ash-flow tuff; crude columnar joints and locally platy joints; weathers to coarse angular grus; contains rhyolite lithic fragments, collapsed pumice, and large, fairly abundant phenocrysts of quartz, sanidine, and sodic plagioclase. Lowermost 6-12 feet (2-4 m) of unit is dark-gray glassy vitrophyre overlying light-gray nonwelded air-fall ash and pumice. Sanidine dated by K-Ar method by J. D. Obradovich at 600,000 years (Christiansen and Blank, 1972). 0-400 feet (0-122 m) thick.

Tla - Langford Formation, Alluvial Facies (Eocene)
Light-gray to medium-gray well-sorted, massively bedded alluvial facies volcanic breccia consisting of dark-gray subangular clasts of pyroxene andesite in a light-gray to medium-gray ash-rich matrix. Lower part of unit interfingers with alluvial facies of Wapiti Formation (Twa) and main body of Trout Peak Trachyandesite (Tt) on The Needle and in the south part of Mount Hornaday. 0-500 feet (0-152 m) thick.

Tt - Trout Peak Trachyandesite, main body (Eocene)
Medium-gray to dark-gray and reddish-brown columnar-jointed lava flows and flow breccias of shoshonite and absarokite (trachyandesite) containing minor interbeds of light-gray pumiceous tuff. Lava flows, 0-60 feet (0-18 m) thick, are finely to coarsely porphyritic. Lower part of unit interfingers with alluvial facies of Langford Formation (Tla) and alluvial facies of Wapiti Formation (Twa) on Mount Hornaday and northeast of The Thunderer and pinches out at north end of Mirror Plateau. 0-1,000 feet (0-305 m) thick.

Tti - Trout Peak Trachyandesite, dikes of shoshonite (Eocene)

Twa - Wapiti Formation, alluvial facies (Eocene)
Dark-brown massively bedded well-sorted to poorly sorted volcanic breccias and minor tuffaceous volcanic sandstone; consists of subangular clasts of pyroxene andesite and shoshonite (trachyandesite) in a tuffaceous matrix. Unit thickens northward and pinches out to the southwest. 0-1,200 feet (0-366 m) thick.

Twv - Wapiti Formation, ment facies (Eocene)
Dark-reddish-brown crudely-bedded mudflow breccia, flow breccia, and thin lenticular lava flows of pyroxene andesite and shoshonite. Unit thickens toward the east and pinches out to the northwest. 0-1,500 feet (0-457 m) thick.

Twf - Wapiti Formation, mafic lava flows (Eocene)
Lava flows and flow breccias occurring locally in southeastern part of quadrangle. 0-400 feet (0-122 m) thick.

Tm - Mount Wallace Formation (Eocene)
Medium- to dark-gray and reddish-brown lava flows and flow breccias of shoshonite and pyroxene andesite that inter-finger with basal part of alluvial facies of Wapiti Formation (Twa). This unit becomes much thicker northwest of the quadrangle. 0-200 feet (0-61 m) thick.

Tb - Olivine basalt laccolith (Eocene)
Medium- to dark-gray autobrecciated olivine basalt laccolith along upper Cache Creek but exposed mainly in the Pilot Peak quadrangle to the east. Phenocrysts of olivine and augite are enclosed in an intergranular groundmass of plagioclase and pyroxene. Doming of alluvial facies

of Lamar River Formation (Tlr) by intrusion of laccolith was pre-Wapiti Formation in age.

Ti - Quartz monzonite prophyry (Eocene)
Light-pinkish-gray porphyry containing phenocrysts of plagioclase, potassium feldspar, and biotite, 1-10 mm long, in an aphanitic groundmass. Small exposure near northeast corner of quadrangle.

Tlr - Lamar River Formation, alluvial facies (Eocene)
Medium- to light-brown, yellow, and green well-bedded alluvial-facies volcanic conglomerate, sandstone, tuff, and well-sorted breccia. Fragments are sub-angular to sub-rounded clasts of pyroxene andesite and pyroxene-hornblende andesite; lower 100 feet (30 m) of unit locally contains as much as 10 percent Precambrian metamorphic and Paleozoic sedimentary rock fragments. This unit becomes darker eastward as light-colored tuffs and volcanic sandstones, which compose about 50 percent of the formation in the west half of the quadrangle, diminish to less than 20 percent of the formation along the east border. Fossil trees, common throughout this unit, are especially abundant in the finer grained beds. Lower part of formation interfingers northeastward with Cathedral Cliffs Formation (Tcc) and is cut by numerous small irregular intrusive bodies of andesite. 80-2,200 feet (24-670 m) thick.

Tic - Intrusive Andesite, Cathedral Cliffs Formation, and Lamar River Formation (Eocene)
A mixed unit consisting of 60-70 percent of intertonguing Cathedral Cliffs Formation (Tcc) and lowermost alluvial facies of Lamar River Formation (Tlr) which have been extensively and intricately invaded, 30-40 percent, by podlike to irregularly shaped bodies of autobrecciated andesite. Intrusives are light- to medium-gray and brown colored grading into variably altered zones that are shades of pink, purple, and reddish brown; predominant lithologies are hornblende andesite and hypersthene-hornblende andesite. 0-800 feet (0-244 m) thick.

Tec - Lamar River Formation, Elk Creek Basalt Member (Eocene)
Two to four lava flows of shoshonite (trachyandesite), each as much as 40 feet (12 m) thick, interlayered with volcaniclastic rocks of alluvial facies of Lamar River Formation (Tlr) in the lower 500 feet (152 m) of the formation.

Tcc - Cathedral Cliffs Formation (Eocene)
Light-brown, gray, buff, and pink mudflow breccia, and near-vent alluvial-facies volcanic conglomerate and sandstone, and vitric tuffs. Clasts are of many different colors and varieties of hornblende and pyroxene andesites, some containing sparse biotite; vitric tuffs are quartz latite and trachyte. Lower 100 feet (30 m) contains sparse Precambrian metamorphic and Paleozoic sedimentary rock fragments and locally is cut by small irregularly shaped intrusive bodies of andesite mapped with the Cathedral Cliffs. The formation inter-fingers southwestward with the lower part of alluvial facies of Lamar River Formation (Tir) and is much thicker in the vent areas to the north and northeast, outside of the quadrangle. 0-560 feet (0-170 m) thick.

Mm - Madison Group, undivided (Upper and Lower Mississippian)
Mostly Lodgepole Limestone. Upper several feet (several meters) may be Mission Canyon Limestone (Upper and Lower Mississippian), which is medium-gray to pale-yellowishbrown fine- to coarse-grained thick-bedded and massive limestone and dolomite; nodules of brownish-gray chert are common; massive dolomite at base of formation.

Ml - Lodgepole Limestone (Lower Mississippian)
Light-brownish-gray to medium-gray fine- to medium-grained limestone interbedded with calcareous siltstone and silty limestone; contains abundant fossils; lower half of formation locally contains abundant nodules and thin irregular beds of yellowish-brown to dark-gray chert. About 500 feet (150 m) thick.

MCu - Upper Mississippian to Middle Cambrian Rocks Undivided (Upper Mississippian to Lower Cambrian)

Dt - Three Forks Formation (Upper Devonian)

Trident Member equivalent - Grayish-red and grayish-green calcareous mudstone and shale and interbedded light-gray fossiliferous limestone, grading downward into yellowish-brown to grayish-green mudstone and shale. About 50 feet (15 m) thick.

Logan Gulch Member equivalent - Brecciated limestone and dolomite in upper 30 feet (10 m), underlain by light-olive to dark-gray shale and mudstone that includes thin interbeds of yellowish-brown fine-grained limestone. 80 feet (24 m) thick.

Dtj - Three Forks and Jefferson Formations, undivided (Upper Devonian)

Dj - Jefferson Formation (Upper Devonian)

Pale-brown to pale-yellowishbrown fine-grained sugary dolomite and dolomitic limestone. About 175 (53 m) thick.

Ob - Bighorn Dolomite (Upper Ordovician)

Light-brownish-gray very fine grained to fine-grained partly laminated dolomite containing light-gray to yellowish-orange chert in lenses as much as 5 feet (1.5 m) long. Dolomite is thin bedded to massive with massive units most common in upper part of formation. 100-200 feet (30-61 m) thick.

Cu - Upper and Middle Cambrian rocks, undivided (Upper and Middle Cambrian)

Shown on cross section only.

Csr - Snowy Range Formation (Upper Cambrian)

Snowy Range Formation (upper Cambrian) - Includes three members not mapped separately: Grove Creek Limestone Member - Brownish gray to yellowish-orange very fine to medium-grained dolomitic limestone, dolomite, and dusky-blue shale. 0-40 feet (0-12 m) thick.

Sage Limestone Member - Pale-yellowish-brown to medium-gray very fine grained partly glauconitic limestone, irregularly ribboned with grayish- or dark-yellowishorange sandy limestone and calcareous sandstone; in beds about 1 foot (0.3 m) thick; interbeds as much as 3 feet (0.9 m) thick of similarly colored, mottled limestone; contains abundant fossils; Collenia magna beds at base of member. About 150 feet (46 m) thick.

Dry Creek Shale Member - Greenish-gray to light-olive-gray shale; interbeds less than 1 foot (0.3 m) thick of very fine grained calcareous sandstone and siltstone. Top of member includes interbeds of gray very fine grained oolitic glauconitic limestone and limestone-pebble conglomerate. 40-50 feet (12-15 m) thick.

Cpi - Pilgrim Limestone (Upper Cambrian)

Upper part of formation is medium-gray, mottled yellowish-gray to pale-yellowish-brown, largely oolitic thick-bedded to massive limestone; about 100-150 feet (30-46 m) thick. Lower part of formation is interbedded medium-gray very fine grained thin-bedded limestone ribboned with grayish-orange silty limestone, interbedded with thin-bedded medium-gray oolitic glauconitic fossiliferous limestone; a few beds of limestone-pebble conglomerate and grayish-green shale; 75-100 feet (23-30 m) thick.

Cpa - Park Shale (Middle Cambrian)

Grayish-green to medium-dark-gray shale and mudstone. Upper part of formation includes thin interbeds of yellowish-gray to grayish-green argillaceous or glauconitic pisolitic limestone. Lower part of formation includes a few thin interbeds of limestone coquina, glauconitic limestone, and limestone-pebble conglomerate. 100-120 feet (30-37 m) thick.

Cm - Meagher Limestone (Middle Cambrian)

Mottled medium-gray to medium dark-gray and yellowish-gray to grayish-orange very fine grained, thin- to thick-bedded limestone. Thin interbeds of grayish-green shale. About 200 feet (61 m) thick.

Cwf - Wolsey Shale and Flathead Sandstone (Middle Cambrian)
Wolsey Shale and Flathead Sandstone (middle Cambrian)

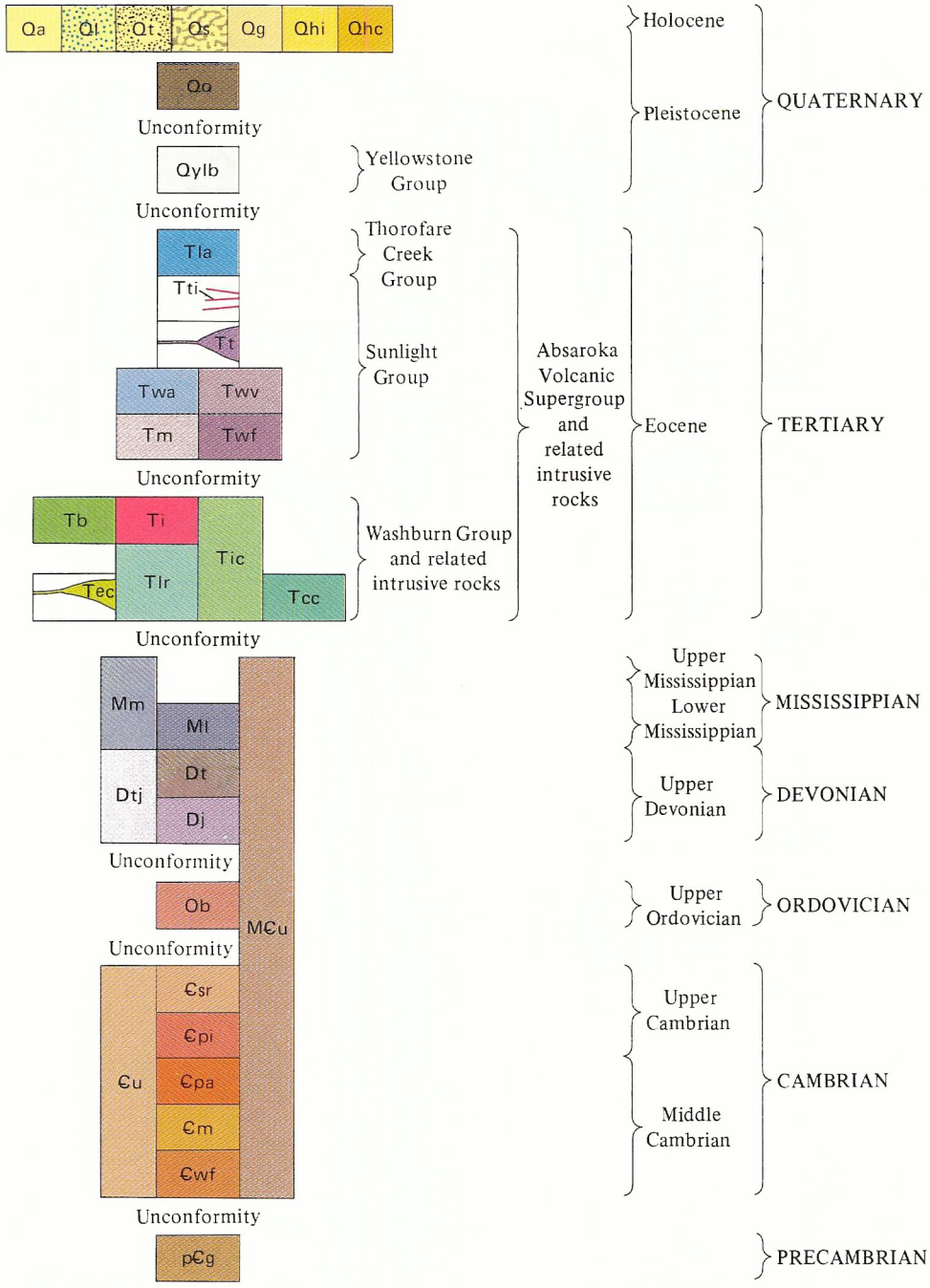
Wolsey Shale - Greenish-gray micaceous and sandy shale; thin interbeds of argillaceous calcareous sandstone and siltstone and glauconitic sandy limestone. Upper 20 feet (6 m) of formation is gradational into overlying Meagher Limestone. About 100 feet (30 m) thick.

Flathead Sandstone - Yellowish-gray to grayish-orange-pink fine- to medium-grained quartzitic sandstone, partly laminated or cross-laminated. Basal part of formation includes poorly sorted sandstone and conglomerate. 100-120 feet (30-37 m) thick.

pCg - Metamorphic rocks, undivided (Precambrian)
Mainly medium-gray to orange-pink medium-crystalline to coarsely crystalline granitic gneiss composed of potassium feldspar, quartz, plagioclase, and biotite. Unit includes dark-gray to grayish-black amphibolite and light-gray to pale-red coarse-grained granite pegmatite.

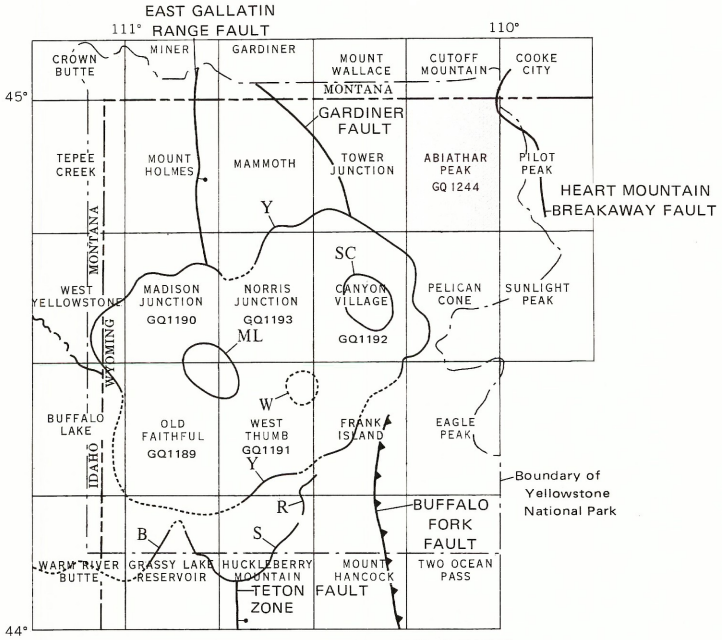
Text from source map: Abiathar Peak 15' Quadrangle

Correlation of Map Units



Graphic from source map: Abiathar Peak 15' Quadrangle

Index Map

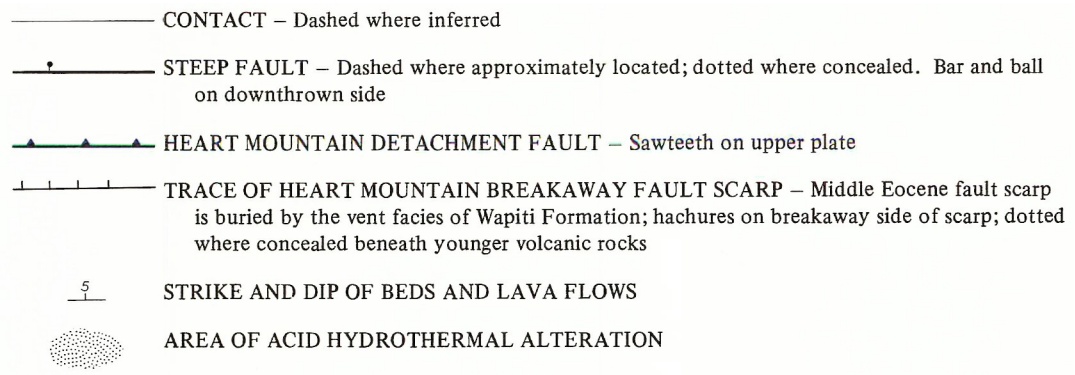


INDEX MAP OF YELLOWSTONE NATIONAL PARK SHOWING LOCATION OF 15-MINUTE QUADRANGLES AND MAJOR STRUCTURAL FEATURES
Location of this quadrangle indicated by color

	Fault – Bar and ball on downthrown side
	Thrust fault – Sawteeth on upper plate
	Outline of dome
	Approximate topographic rim of caldera – Dotted where buried
W	West Thumb caldera rim – Caldera formed by collapse resulting from eruption of tuff of Bluff Point
ML	Mallard Lake dome – Dome formed by magmatic resurgence beneath Yellowstone caldera
SC	Sour Creek dome – Dome formed by magmatic resurgence beneath Yellowstone caldera
Y	Yellowstone caldera rim – Caldera formed by collapse resulting from eruptions of Lava Creek Tuff
R, S, B	Red Mountains, Snake River, and Big Bend Ridge caldera-rim segments – Remnants of a caldera formed by collapse resulting from eruptions of Huckleberry Ridge Tuff

Graphic from source map: Abiathar Peak 15' Quadrangle

Map Legend



Graphic from source map: Abiathar Peak 15' Quadrangle

References

Christiansen, R. L., and Blank, H. R., Jr., 1972, Volcanic stratigraphy of the Quaternary rhyolite plateau in Yellowstone National Park: U.S. Geol. Survey Prof. Paper 729-B, 18 p.

Ruppel, E. T., 1972, Geology of pre-Tertiary rocks in the northern part of Yellowstone National Park, Wyoming: U.S. Geol. Survey Prof. Paper 729-A, 66 p. [1973].

Smedes, H. W., and Prostka, H. J., 1972, Stratigraphic framework of the Absaroka Volcanic Supergroup in the Yellowstone National Park region: U.S. Geol. Survey Prof. Paper 729-C, 33 p.

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References from source map: Abiathar Peak 15' Quadrangle

Buffalo Lake 15' Quadrangle

The formal citation for this source.

> Christiansen, R.L., 2007, Mylar of the Buffalo Lake Quadrangle: U.S. Geological Survey, unpublished mylar, scale 1:62,500 (*GRI Source Map ID 6724*).

Listing of geologic unit symbols present on the source map. The source map did not contain a legend, unit descriptions, or any additional information.

Map Unit Listing

Qa, Qt, Qhi, Qhs, Qg, Qpcy, Qpcs, Qpcb, Qge, Qylb and **Qjm**

List from source map: Buffalo Lake 15' Quadrangle

Canyon Village 15' Quadrangle

The formal citation for this source.

> Christiansen, R.L., Blank, H.R., 1975, Geologic Map of the Canyon Village Quadrangle, Yellowstone National Park, Wyoming: U.S. Geological Survey, Geologic Quadrangle Map GQ-1192, scale 1:62,500 (*GRI Source Map ID 3254*).

Digital data associated with this map was converted from a third-party data source and checked against a georeferenced copy of the above paper source map.
The citation for this digital data:

> U.S. Geological Survey, 2007, Digital Geologic Map of the Canyon Village Quadrangle, Yellowstone National Park, Wyoming: U.S. Geological Survey, unpublished digital data, scale 1:62,500 (*GRI Source Map ID 74797*).

Description of geologic units, prominent graphics and text associated with the paper source map.

Description of Map Units

Qa - Alluvium and glaciofluvial deposits (Holocene and Pleistocene)
Unconsolidated coarse- to fine-grained moderately well sorted and well bedded stream-channel, overbank, and fan deposits, glacial outwash, and stream-laid ice-contact deposits.

Qs - Landslide deposits (Holocene and Pleistocene)
Unconsolidated poorly sorted slide deposits with hummocky, generally bouldery surfaces.

Ql - Lacustrine and glaciolacustrine deposits (Holocene and Pleistocene)
Unconsolidated well-sorted and well-bedded silts, sands, and minor gravels deposited in or adjacent to open or ice-dammed lakes. Includes sediments deposited in landslide-dammed lakes near Sevenmile Hole (on Yellowstone River at north quadrangle boundary) that may be in part older than the other six units listed here as surficial deposits.

Qt - Talus and colluvium (Holocene and Pleistocene)
Unconsolidated generally coarse angular debris deposited on slopes by rockfalls or debris flows.

Qhi - Ice contact deposits (Holocene and Pleistocene)
Commonly well sorted irregularly bedded sandstones and conglomerates deposited against ice from melt waters localized by hot springs. Cemented by zeolites and opaline silica.

Qhs - Siliceous hot spring deposits (Holocene and Pleistocene)
Generally white to light-gray siliceous sinter in mounds or sheets around active or extinct hot springs.

Qhe - Hydrothermal explosion deposits (Holocene and Pleistocene)
Fine- to coarse-grained poorly sorted and poorly bedded deposits forming rings around Fern, Turbid, and Squaw Lakes and Mary Bay; each deposit probably ejected from enclosed basin in episodes of explosive steam generation. (See Muffler and others, 1971).

Qg - Glacial deposits (Holocene and Pleistocene)
Till, generally lacking distinct morainal form.

Plateau Rhyolite, Central Plateau Member:
Large rhyolitic lava flows, each containing a wide variety of lithologies and distinguishable from one another only by topographic forms and zonal development of various textural features and emplacement structures. Most exposures are dark pitchstone or obsidian vitrophyres of flow-layered or flow-brecciated rhyolite, but gray to red pumiceous rhyolite and gray, brown, or varicolored crystalline rhyolite also are common; all varieties can occur within a single flow. All flows contain 1-3 mm phenocrysts of quartz, sanidine, opaque oxides, and, in glassy zones, sparse clinopyroxene and fayalitic olivine; a few flows also contain minor sodic plagioclase phenocrysts.

Qpcf - Plateau Rhyolite, Central Plateau Member, Solfatara Plateau flow (Pleistocene)

Qpch - Plateau Rhyolite, Central Plateau Member, Hayden Valley flow (Pleistocene)

Qpce - Plateau Rhyolite, Central Plateau Member, Elephant Back flow (Pleistocene)

Qpcw - Plateau Rhyolite, Central Plateau Member, West Thumb flow (Pleistocene)

Qu - Sediments of upper Falls (Pleistocene)
Generally well bedded sequence of unconsolidated lacustrine and fluvial sands, gravels, silts, clays, and some till. Overlain by Hayden Valley flow; underlain by Canyon flow.

Qi - Sediments of Inspiration Point (Pleistocene)
Generally highly altered sandstones and siltstones along both rims of upper Grand Canyon. In many exposures distinguished from altered rhyolites only with difficulty.

Qpud - Plateau Rhyolite, Upper Basin Member, Dunraven Road flow (Pleistocene)
Similar to rhyolites of Central Plateau Member but contains abundant phenocrysts of sodic plagioclase; clinopyroxene phenocrysts are more abundant.

Qpuc - Plateau Rhyolite, Upper Basin Member, Canyon flow (Pleistocene)
Large rhyolitic lava flow. Most exposures are brown or dark-gray crystallized rhyolite, but black pitchstone vitrophyre and gray pumiceous rhyolite occur at the margins. Contains abundant 1-5 mm phenocrysts of quartz and sodic plagioclase, and, in glassy zones, clinopyroxene. No sanidine phenocrysts.

Qpus - Plateau Rhyolite, Upper Basin Member, Tuff of Sulphur Creek (Pleistocene)
Air-fall tuff, well bedded and well sorted. In most exposures agglutinated (welded) to resemble welded ash-flow tuff. Generally devitrified, gray to brown; basal zone glassy, forming a black vitrophyre where densely agglutinated, yellowish where friable. Phenocrysts like those of Canyon flow. Exposures along Broad Creek below Wapiti Lake Trail crossing, in northeastern part of map, are friable, nonagglutinated, and locally reworked and have large cemented chimneys of brown chaotically bedded material that probably represent sites of fumaroles that formed just after tuff was first deposited; these exposures probably represent material deposited in a small lake. At most agglutinate localities, bedding was highly contorted by flowage folding during cooling and crystallization; where strongly altered in upper Grand Canyon, unit is very difficult to distinguish from Canyon flow.

Qput - Plateau Rhyolite, Upper Basin Member, Tuff of Uncle Tom's trail (Pleistocene)
Nonwelded lithic-vitric ash-flow tuff. Pale yellowish and friable. Characterized by angular inclusions, as much as about 30 cm across, of fine-grained gray biotite diorite. Locally, at base of section near Lower Falls, contains reworked rhyolitic cobbles from older unexposed flow of Upper Basin Member lithology.

Qf - Sediments of Lower Falls (Pleistocene)

Cemented diamicton containing abundant large angular fragments of fine-grained gray biotite diorite, sparse cobbles of white quartzite, and even more sparse cobbles of andesitic flow rock.

Qylb - Lava Creek Tuff, Member B (Pleistocene)
Gray to pinkish- or purplish-gray ash-flow tuff. Devitrified throughout; generally densely welded except for partially welded vapor-phase zone at top; locally in Stonetop Mountain area, in southeastern part of Sour Creek dome, most of unit is partially welded vapor-phase zone. Abundant lithic inclusions, especially in partially welded tuff of Stonetop Mountain area; many inclusions in that area are of vitrophyric welded tuff, but elsewhere reddish or purplish rhyolite is most common. Abundant 1-5 mm phenocrysts of quartz, sanidine, and sodic plagioclase; some sanidine phenocrysts as much as about 1 cm; sparse opaque oxides, clinopyroxene, and fayalitic olivine phenocrysts. Thin basal zone of phenocryst-poor tuff grades downward from densely welded to partly welded.

Qyla - Lava Creek Tuff, Member A (Pleistocene)
Similar to member B but generally brown. Mainly devitrified, but black vitrophyre and gray microspherulitic zone at base. Contains abundant large phenocrysts throughout.

Quf - Undine Falls Basalt (Pleistocene)
Dark-gray to black basalt (brown where altered) containing abundant plagioclase and sparse olivine phenocrysts; vent area is marked by small scoria cone.

Qjw - Mount Jackson Rhyolite, Wapiti Lake flow (Pleistocene)
Gray glassy to crystallized rhyolite flow containing moderately abundant 1-3 mm phenocrysts of quartz, sanidine, and sodic plagioclase and sparse clinopyroxene.

Qjs - Mount Jackson Rhyolite, Stonetop Mountain flow (Pleistocene)
Single small poor exposure of crystallized rhyolite at west end of Sulphur Hills, about 4 km southwest of Stonetop Mountain.

Qyhb - Huckleberry Ridge Tuff, Member B (Pleistocene)
Gray to brown devitrified generally densely welded ash-flow tuff. Generally contains abundant phenocrysts of quartz, sanidine, and sodic plagioclase and sparse opaque oxides, clinopyroxene, and fayalitic olivine; phenocrysts particularly abundant and large (as much as 5 mm) in upper part, very sparse in lower part. Two types of welded pumice in upper part, one very dark and scoriaceous, the other light colored and compact.

Qyha - Huckleberry Ridge Tuff, Member A (Pleistocene)
Similar to member B but generally brown; mainly devitrified, but black vitrophyre and gray microspherulitic zone at base. Phenocrysts of same type as member B, abundant in lower part, become progressively less abundant upward.

Qbc - Rhyolite of Broad Creek (Pleistocene)
Rhyolite flow , partly glassy and partly crystallized. Contains moderately abundant 1-2 mm phenocrysts of quartz and sanidine.

Tli - Rhyodacite porphyry (Eocene)
Light-olive-gray microcrystalline rock containing abundant phenocrysts of sanidine, plagioclase, biotite, and hornblende. Thought to be part of much larger intrusive body.

Tla - Langford Formation, Alluvial Facies (Eocene)
More than 360 feet of light-gray, brown, and buff coarsely bedded well-sorted epiclastic volcanic breccia, conglomerate, and tuffaceous sandstone. Clasts consist chiefly of hornblende andesite and pyroxene andesite.

Tt - Trout Peak Trachyandesite (Eocene)

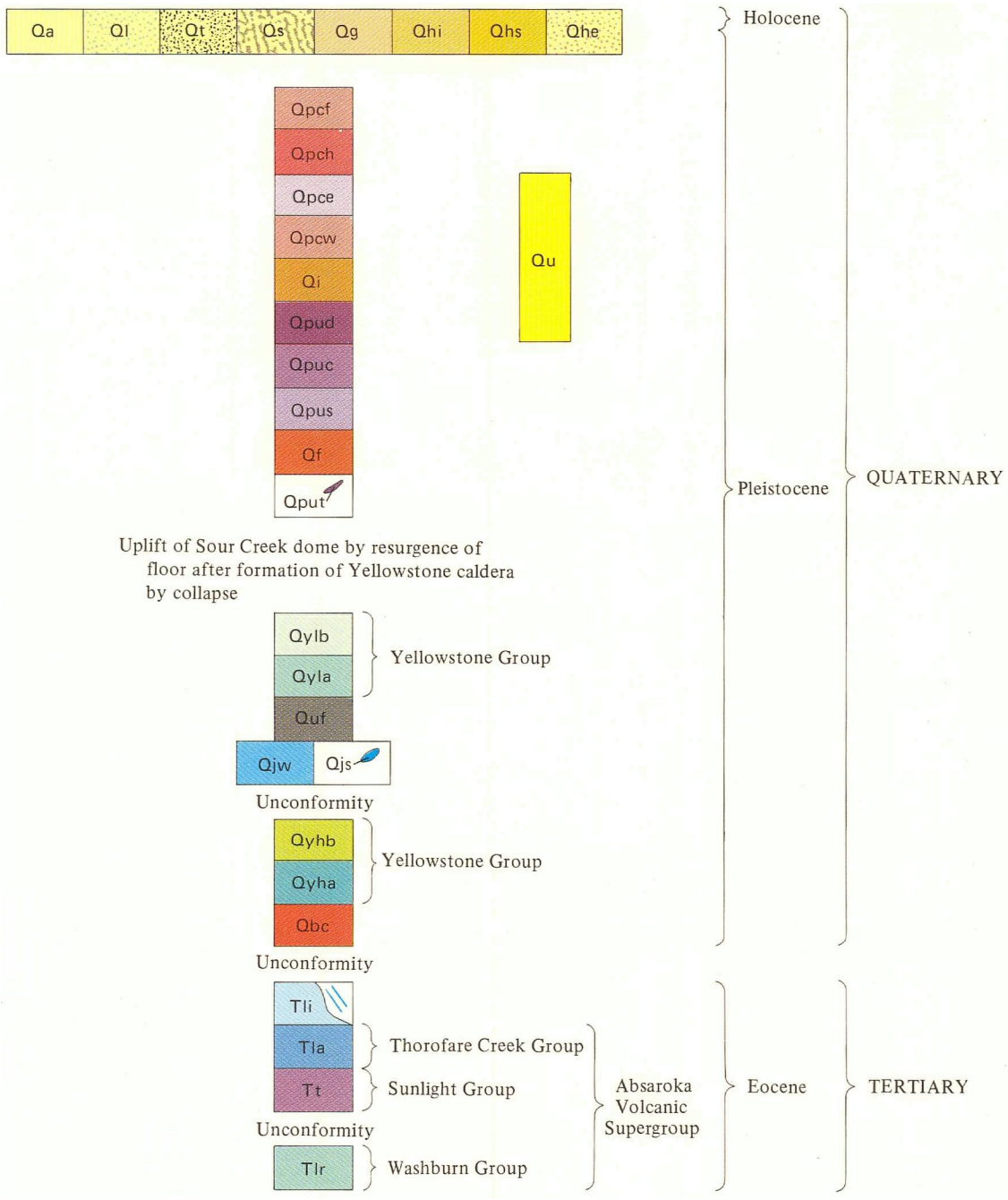
More than 160 fleet of medium to dark-gray and brown columnar-jointed lava flows and scoriaceous flow breccia of trachyandesite (shoshonite and absarokite) containing phenocrysts of plagioclase, augite, and olivine.

Tlr - Lamar River Formation (Eocene)

20 feet of medium-brown coarsely bedded volcanic breccia and tuff. Breccia clasts consist of pyroxene andesite and hornblende andesite.

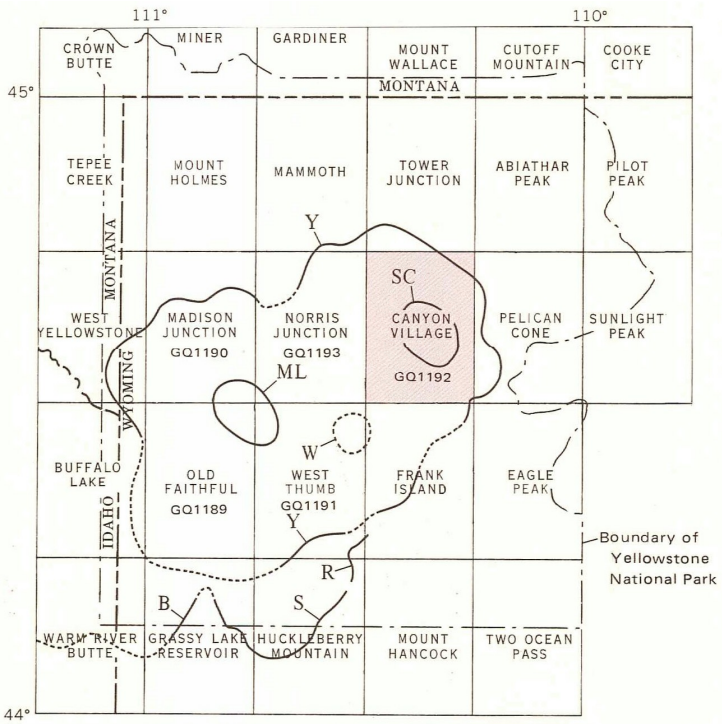
Text from source map: Canyon Village 15' Quadrangle

Correlation of Map Units



Graphic from source map: Canyon Village 15' Quadrangle

Index Map



INDEX MAP OF YELLOWSTONE NATIONAL PARK SHOWING LOCATION OF 15-MINUTE QUADRANGLES AND MAJOR STRUCTURAL FEATURES

Location of this quadrangle indicated by color

Outline of dome

Approximate topographic rim of caldera – Dotted where buried

W — West Thumb caldera rim – Caldera formed by collapse resulting from eruption of tuff of Bluff Point

ML — Mallard Lake dome – Dome formed by magmatic resurgence beneath Yellowstone caldera

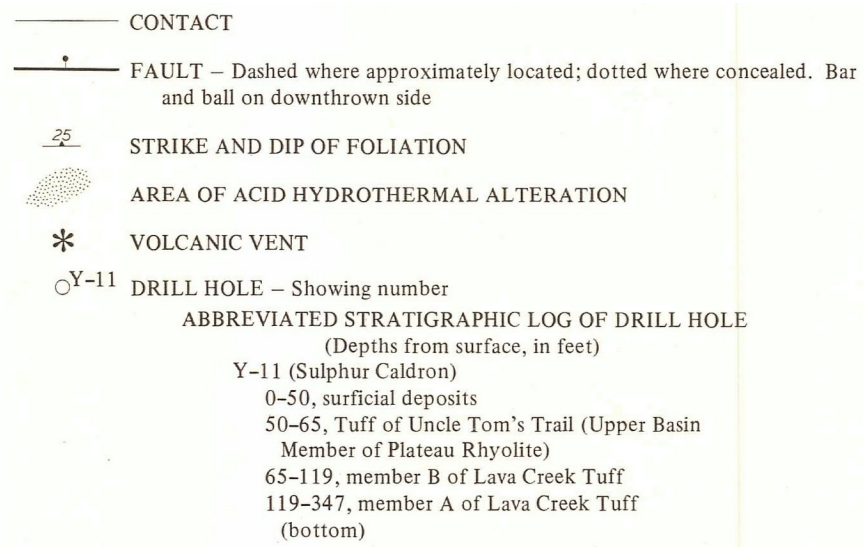
SC — Sour Creek dome – Dome formed by magmatic resurgence beneath Yellowstone caldera

Y — Yellowstone caldera rim – Caldera formed by collapse resulting from eruptions of Lava Creek Tuff

R, S, B — Red Mountains, Snake River, and Big Bend Ridge caldera-rim segments – Remnants of a caldera formed by collapse resulting from eruptions of Huckleberry Ridge Tuff

Graphic from source map: Canyon Village 15' Quadrangle

Map Legend



Graphic from source map: Canyon Village 15' Quadrangle

References

Christiansen, R. L., and Blank, H. R., Jr. 1972, Volcanic stratigraphy of the Quaternary rhyolite plateau in Yellowstone National Park: U.S. Geol. Survey Prof. Paper 729-B, 18p.

Ruppel, E. T., 1972, Geology of pre-Tertiary rocks in the northern part of Yellowstone National Park, Wyoming; U.S. Geol. Survey Prof. Paper 729-A, 66 p. (1973).

Smedes, H. W., and Protska, H. J., 1972, Stratigraphic framework of the Absaroka Volcanic Supergroup in the Yellowstone National Park region: U.S. Geol. Survey Prof. Paper 729-C, 33 p.

U.S. Geological Survey 1972, Geologic Map of Yellowstone National Park: U.S. Geol. Survey Misc. Geol. Inv. Map I-711.

References from source map: Canyon Village 15' Quadrangle

Cooke City 15' Quadrangle (southwest part)

The formal citation for this source.

Elliott, J.E., 1979, Geologic Map of the southwest part of the Cooke City Quadrangle, Montana and Wyoming: U.S. Geological Survey, Miscellaneous Investigations Series Map I-1084, scale 1:24,000 (*GRI Source Map ID 3014*).

Description of geologic units, prominent graphics and text associated with this source map.

Description of Map Units

d - Mine dumps and mill tailings (Holocene)

Qu - Undifferentiated Surficial Deposits (Holocene)
Includes talus, colluvium, and neoglacial deposits.

Qal - Alluvium (Holocene)
Unconsolidated silt, sand, gravel, and boulders along stream valleys.

Ql - Landslide deposits (Holocene and Pleistocene)
Rock debris from slumps and landslides.

Qg - Glacial Deposits (Pleistocene)
Till and fluvioglacial deposits undifferentiated.

Tql - Quartz Latite Porphyry (Eocene)
Dike in lower Miller Creek, light greenish gray, unaltered, 48 percent phenocrysts including plagioclase (30 percent), biotite and hornblende (11 percent), quartz (5 percent), potassium feldspar (1 percent), and other (1 percent) in aphanitic potassium feldspar-rich groundmass; color index (volume percent of mafic minerals) is 11.

Trp - Rhyodacite Porphyry (Eocene)
Dikes, very light gray, little altered, abundant rounded quartz, plagioclase, and fine-grained fresh biotite phenocrysts, 20-35 percent phenocrysts in aphanitic potassium feldspar-rich groundmass; color index ranges from 5 to 10.

Ta - Porphyritic Andestite and Andesite Porphyry (Eocene and Paleocene)
Dikes and sills, dark to medium light gray, commonly greenish, unaltered to strongly propylitized, phenocryst content mostly from 10 to 25 percent with average of 20 percent, consisting mostly of plagioclase, hornblende, and biotite, in an aphanitic groundmass, trachytic in places. Color index ranges from 5 to 32. Dikes and sills of several ages included; some are definitely related to the diorite of Scotch Bonnet Mountain and others are related to the period of volcanism associated with the Lamar River-Cathedral Cliffs and Wapiti Formations.

Tlp - Latite Porphyry (Eocene)
Dikes, medium dark gray to greenish gray, weak to moderate propylitic alteration,rounded quartz phenocrysts common, high content of mafic minerals; phenocryst content ranges from 15 to 40 percent with average of 24 percent, mostly plagioclase, biotite, hornblende and quartz in order of abundance; clinopyroxene present locally. Felty to trachytic potassium feldspar-rich groundmass; color index mostly in the range of 5 to 10.

Trl - Rhyodacite Porphyry of Lulu Pass (Eocene)
Laccolith extending north and west of Lulu Pass, minor dikes, mostly light gray, moderate propylitic to sericitic alteration . Few small rounded quartz phenocrysts, low content of mafic

minerals. 25-40 percent phenocrysts, mostly plagioclase and biotite, in fine-grained potassium feldspar-rich groundmass which has a distinctive weakly developed spherulitic texture. Color index ranges from 5 to 15.

Trh - Rhyodacite Porphyry of Henderson Mountain (Eocene)
Major stock and associated dikes, mostly light to medium greenish gray, weak to moderate alteration. usually propylitic. high content of mafic minerals and phenocrysts, quartz phenocrysts rare or absent; orange-weathering plagioclase phenocrysts. phenocryst content ranges from about 25 to 40 percent with average of about 34 percent, consisting mostly of plagioclase, hornblende, and biotite in aphanitic potassium feldspar-rich groundmass. color index mostly in the range of 10 to 15. Fission-track data in zircon indicates an age of 44.0±4.1 m.y. (C. W. Naeser, written commun., 1973).

Tb - Porphyritic Basalt and Basalt Porphyry (Eocene)
Minor dikes, mostly dark to medium dark gray, unaltered to propylitized. Contains 0 to 20 percent phenocrysts consisting mostly of calcic plagioclase, clinopyroxene, and olivine in an aphanitic trachytic groundmass. Color index up to about 40.

Tr - Rhyolite (Eocene)
Minor dikes, very light gray, commonly pinkish or yellowish, weak to moderate propylitic alteration. Usually less than 5 percent phenocrysts in an aphanitic, commonly flow-banded, potassium feldspar-rich groundmass. Color index less than 5.

Tl - Latite and porphyritic latite (Eocene)
Dikes and sills, medium to very light gray with pinkish, Yellowish, and greenish shades, moderately to strongly propylitized. Phenocryst content ranges from less than 5 to 25 percent with average of 13 percent, consisting mostly of plagioclase, biotite, and hornblende; quartz phenocrysts are rare or absent; aphanitic potassium feldspar-rich groundmass. Color index usually in range of 5 to 10.

Trpq - Quartz "Eye" rhyodacite porphyry (Eocene and Paleocene)
Sills, dikes, and small stocks, light to very light gray with shades of pink, yellow, and green, moderate to strong propylitic and sericitic alteration, contains abundant rounded to strongly embayed quartz phenocrysts. Phenocryst content ranges from 15 to 40 percent with average of 27 percent, consisting mostly of plagioclase, quartz, biotite, and hornblende in order of abundance; aphanitic potassium feldspar-rich groundmass. Color index usually less than 10. Several ages of intrusives are included; fission-track data on zircon from a sample near the Homestake Mine indicates an age of 40.6+/-3.5 m.y. (C. W. Naeser, written commun., 1973). In this area this unit was intruded by rhyodacite porphyry of Henderson Mountain.

Tf - Complex of Fisher Mountain Area (Eocene)
Composed principally of felsite and felsite breccia (explosion-collapse), both intruded by quartz-rich rhyodacite porphyry and porphyritic and aphanitic dikes. The complex is strongly feldspathized, silicified, sericitized and/or argillitized, and pyritized.

Tba - Breccia of Alice E. Mine Area (Eocene)
Explosion-collapse(?) breccia consisting of fragments of mostly Pilgrim Limestone, Park Shale, and Wolsey Shale in a pulverized rock-flour matrix; locally strongly altered and mineralized, intruded by dikes (not shown on map) of weakly altered, light-colored quartz latite porphyry. This porphyry contains abundant phenocrysts of rounded quartz, pale-green to colorless clinopyroxene and/or amphibolite, plagioclase, and sparse large potassium feldspars in an aphanitic potassium feldspar-rich groundmass.

Tbh - Breccia of Homestake Mine Area (Eocene)
Explosion-collapse breccia pipe composed of blocks of limestone, shale, and sandstone representative of all of the Cambrian units, quartz-rich rhyodacite porphyry, trachyandesite

porphyry, andesite, and andesite breccia probably of the Lamar River Formation, and gneissic rocks of Precambrian age, in a pulverized chloritic rock-flour matrix. The breccia is locally strongly altered and mineralized and is intruded by later dikes and small plugs of rhyodacite and latite porphyry.

Tw - Wapiti Formation (Eocene)
Dark-colored andesitic and basaltic volcaniclastic rocks and lava flows, unaltered, aphanitic with plagioclase and augite phenocrysts, mostly monolithologic.

Tlc - Lamar River and Cathedral Cliffs Formations (Eocene)
Dominantly dark-colored andesitic volcaniclastic rocks, lava flows, and lighter colored intrusive breccias, unaltered to weak propylitic alteration, aphanitic with plagioclase, augite, and hornblende phenocrysts, commonly heterolithologic.

Tds - Diorite of Scotch Bonnet Mountain (Paleocene)
Major stock of Scotch Bonnet Mountain and smaller plutons in vicinity of Cooke City, mostly dark gray to medium dark gray, unaltered to propylitized, predominantly equigranular fine grained (less than 1 mm) with mostly subhedral granular texture. Most common essential minerals are plagioclase and clinopyroxene; hypersthene is common and biotite and/or hornblende, olivine or pseudomorphs after olivine, and some quartz and potassium feldspar are present. Color index ranges from 10 to 35 with average of 23. range in composition from diorite to monzodiorite, age determination on biotite by potassium-argon method indicates 55.3 ±0.7 m.y. (C. E. Hedge, written commun., 1976).

Ttp - Trachyandesite Porphyry (Paleocene)
Mostly as sills but including some dikes, usually dark greenish gray to greenish gray but also brownish, yellowish, and olive gray; moderately to strongly propylitized, argillized or sericitized, and bleached. Contains 5 to 30 percent phenocrysts with average of 17 percent, mostly of altered plagioclase and hornblende, with biotite also common, in an aphanitic to felty or trachytic groundmass. Color index mostly in range of 5 to 10.

Kql - Quartz Latite Porphyry (Upper Cretaceous)
Sills and dikes, light gray, pinkish or yellowish gray, weakly to strongly propylitized, argillized, and pyritized. Phenocrysts range from 20 to 40 percent with average of about 32 percent, mostly of plagioclase and green hornblende, in an aphanitic groundmass consisting of quartz and potassium feldspar. Color index ranges from 3 to 9.

Ks - Syenite of Goose Lake (Upper Cretaceous)
Stock and small plug; stock is multi-stage and multi-phase and includes monzonite, quartz monzonite, syenite porphyry, and intrusive breccia in addition to syenite; the syenite is generally light to medium gray, fine to medium phaneritic, locally porphyritic, with mostly anhedral to mostly subhedral granular texture. Principal minerals are (in order of abundance) potassium feldspar, plagioclase, augite, aegirine augite, biotite, hornblende, and quartz. Color index ranges from 3 to 24 with average of 12. copper mineralization associated with secondary potassium feldspar is widespread but best developed near the center of the stock. Fission-track data on sphene from the stock indicates an age of 84.6±11.2 m.y. (C. W. Naeser, written commun., 1973).

Krp - Rhyodacite Porphyry (Upper Cretaceous)
Sills and dikes, medium gray to greenish gray, moderately propylitized, commonly about 25 percent phenocrysts of plagioclase and hornblende in an aphanitic groundmass consisting of quartz and potassium feldspar. Color index ranges from 12 to 15.

Mm - Madison Limestone (Upper and Lower Mississippian)
Limestone, thick bedded, approximately 45 m maximum thickness, found only in Heart Mountain fault blocks.

Dt - Three Forks Formation (Upper Devonian)
Siltstone, shale, and dolomite, thin bedded, as much as 30 m thick, found only in Heart Mountain fault blocks.

Dj - Jefferson Formation (Upper Devonian)
Dolomite and limestone, medium bedded, as much as 76 m thick, found only in Heart Mountain fault blocks.

Ob - Bighorn Dolomite (Upper Devonian)
Dolomite and limestone, thick bedded, as much as 48 m thick, in part autochthonous and in part in allochthonous Heart Mountain fault blocks.

Cs - Snowy Range Formation (Upper Cambrian)
Shale, limestone-pebble conglomerate, limestone, and dolomite; thin bedded. includes Grove Creek Member at top, approximately 70 m thick.

Cpi - Pilgrim Limestone (Upper Cambrian)
Limestone and limestone-pebble conglomerate, thick bedded, approximately 75 m thick.

Cp - Park Shale (Middle Cambrian)
Shale and limestone, thin bedded, approximately 75 m thick.

Cm - Meagher Limestone (Middle Cambrian)
Limestone, thin bedded, approximately 30 m thick.

Cw - Wolsey Shale (Middle Cambrian)
Shale and sandstone, thin bedded, approximately 55 m thick.

Cf - Flathead Sandstone (Middle Cambrian)
Sandstone, medium bedded, approximately 30 m thick.

Intrusives:
All the mafic dikes are correlated with Mueller and Rogers' (1973) group I and II dikes of the southern Beartooth Mountains which have an age of about 2,550 m.y. The granitic rocks are part of the approximately 2,750 m.y. old terrain that includes much of Wyoming and southeastern Montana (Gast and others, 1958; Giletti, 1968).

Wqd - Quartz dolerite (Precambrian W)
Dikes, dark gray to medium dark gray, weakly to strongly altered, fine to medium grained with ophitic to subophitic texture. Composed of plagioclase, clinopyroxene, orthopyroxene, and hornblende, olivine occurs in some and minor amounts of quartz and potassium feldspar with interstitial micrographic texture are common. Color index ranges from 30 to 55, averaging about 44.

Wm - Metadolerite (Precambrian W)
Dikes and irregular plutons, medium gray to brownish, greenish, and grayish black, weakly to strongly altered, fine to medium grained with subophitic texture. Composed of clouded plagioclase, clinopyroxene, hornblende, and orthopyroxene. Color index ranges from about 35 to 80, averaging about 50.

Wom - Olivine metagabbro (Precambrian W)
Dike, grayish black, moderately altered, fine to medium grained mostly subhedral granular. Composed of clinopyroxene, altered olivine and clouded plagioclase. color index is 65 to 70.

Wmp - Metadolerite porphyry (Precambrian W)

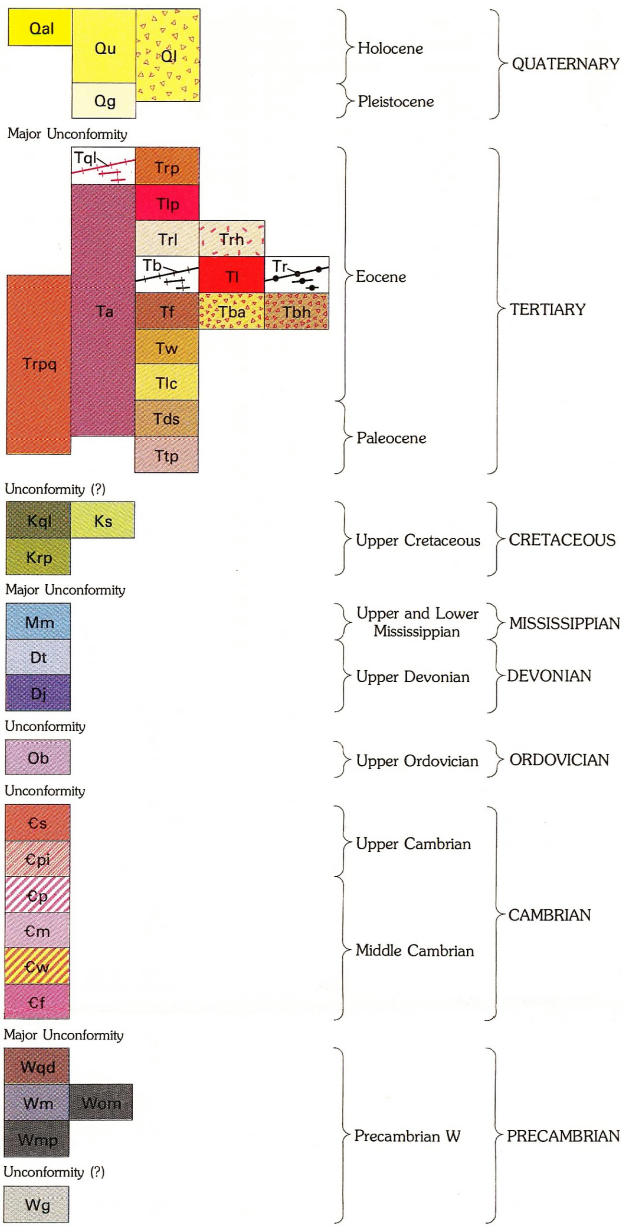
"Leopard rock" dikes, groundmass same color and texture as metadolerite, strongly altered, contains as much as about 50 percent sausseritized plagioclase phenocrysts as much as 15 cm in size.

Wg - Granitic rocks (Precambrian W)

Mainly granitic gneiss, includes minor schist, amphibolite, and quartzite; weakly to strongly foliated.

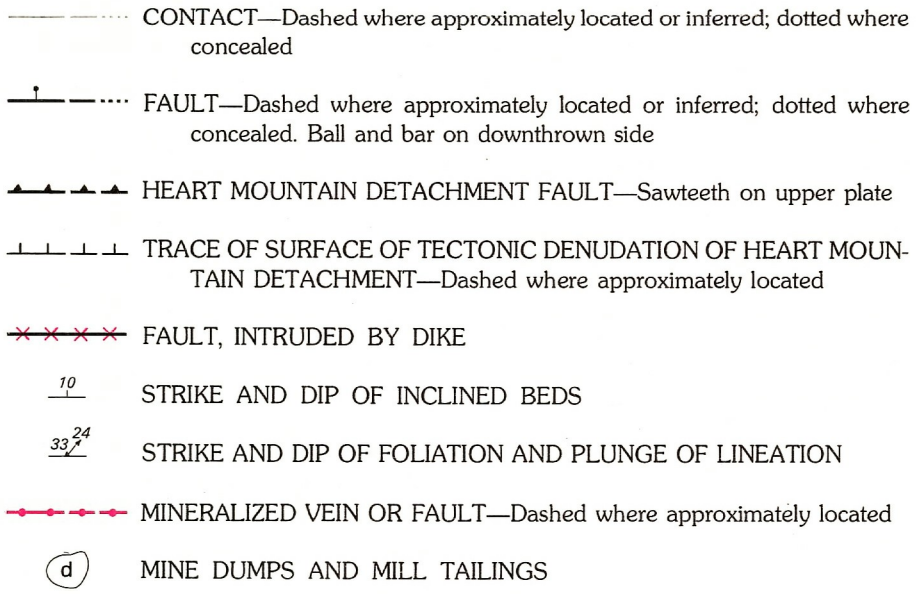
Text from source map: Cooke City 15' Quadrangle (southwest part)

Correlation of Map Units



Graphic from source map: Cooke City 15' Quadrangle (southwest part)

Map Legend



Graphic from source map: Cooke City 15' Quadrangle (southwest part)

Heart Mountain Fault Report

HEART MOUNTAIN DETACHMENT FAULT

The Heart Mountain fault is well exposed in the south and southwest parts of the Cooke City area. Features of the Heart Mountain fault have been described by Pierce (1957, 1960). Many features crucial to the interpretation of the fault mechanism are exposed in and near the Cooke City area. The "break-away" fault is exposed a short distance west of the southwest corner of the map area and the trace of this fault to the north parallels 110°00' to the northernmost exposures of it just west of the upper Stillwater River. Two large and several small Heart Mountain fault blocks are present in this area. One is well exposed at the north end of Republic Mountain; it contains Bighorn Dolomite, Jefferson Formation, Three Forks Formation, and Madison Limestone. Another probable Heart Mountain fault block with the same units exposed crops out both north and south of the divide between Sheep Creek and the upper Stillwater River. Throughout most of the Cooke City area the volcanic rocks, principally Lamar River Formation, rest on the tectonically denuded surface of the Heart Mountain fault.

The major displacement along the Heart Mountain fault occurred during the deposition of the Lamar River Formation. Volcanic rocks, including all of the Cathedral Cliffs Formation and most of the Lamar River Formation, and Paleozoic sedimentary rocks east of the break-away fault were transported southeastward on the Heart Mountain fault. The youngest part of the Lamar River Formation was deposited after Heart Mountain faulting (Pierce and others, 1973).

Text from source map: Cooke City 15' Quadrangle (southwest part)

References

Gast, P. W., Kulp, J. L., and Long, L. E., 1958, Absolute age of early Precambrian rocks in the Bighorn Basin of Wyoming and Montana, and southeastern Manitoba: Am. Geophys. Union Trans., v. 39, no. 2, p. 322–334.

Giletti, B. J., 1968, Isotopic geochronology of Montana and Wyoming, in Hamilton, E. I., and Farquhar, R. M., eds., Radiometric dating for geologists: New York, Interscience Publishers, p. 111-146.
Mueller, P. A., and Rogers, J. J. W., 1973, Secular chemical variation in a series of Precambrian mafic rocks, Beartooth Mountains, Montana and Wyoming: Geol. Soc.America Bull., v. 84, no. 11, p. 3645–3652.

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Pierce, W. G., Nelson, W. H., and Prostka, H. J., 1973, Geologic map of the Pilot Peak quadrangle, Park County, Wyoming: U.S. Geol. Survey Misc. Geol. Inv. Map 1-816 (1974).

References from source map: Cooke City 15' Quadrangle (southwest part)

Frank Island 15' Quadrangle

The formal citation for this source.

> Blank, H.R., Prostka, H.J., Keefer, W.R., Christiansen, R.L., 1974, Geologic Map of the Frank Island Quadrangle, Yellowstone National Park, Wyoming: U.S. Geological Survey, Geologic Quadrangle Map GQ-1209, scale 1:62,500 (*GRI Source Map ID 6348*).

Digital data associated with this map was converted from a third-party data source and checked against a georeferenced copy of the above paper source map.
The citation for this digital data:

> U.S. Geological Survey, 2007, Digital Geologic Map of the Frank Island Quadrangle, Yellowstone National Park, Wyoming: U.S. Geological Survey, unpublished digital data, scale 1:62,500 (*GRI Source Map ID 74802*).

Description of geologic units, prominent graphics and text associated with the paper source map.

Description of Map Units

Qa - Alluvium and glaciofluvial deposits (Holocene and Pleistocene)
Unconsolidated coarse- to fine-grained moderately well sorted and well bedded stream-channel, overbank, and fan deposits, glacial outwash, and stream-laid ice-contact deposits.

Qs - Landslide deposits (Holocene and Pleistocene)
Unconsolidated poorly sorted slide deposits with hummocky, generally bouldery surfaces.

Ql - Lacustrine and glaciolacustrine deposits (Holocene and Pleistocene)
Unconsolidated well-sorted and well-bedded silts, sands, and minor gravels deposited in or adjacent to open or ice-dammed lakes.

Qt - Talus (Holocene and Pleistocene)
Unconsolidated generally coarse angular debris deposited on slopes by mass movements and rockfalls.

Qg - Glacial deposits (Holocene and Pleistocene)
Till, generally lacking distinct morainal form.

Plateau Rhyolite:
Large rhyolitic lava flows, each containing a wide variety of lithologies and distinguishable from one another only by topographic forms and zonal development of various textural features and emplacement structures. Most exposures are dark pitchstone or obsidian vitrophyres of flow-layered or flow-brecciated rhyolite, but gray to red pumiceous rhyolite and gray, brown, or varicolored crystalline rhyolite also are common; all varieties can occur within a single flow. All flows contain abundant 1-3 mm phenocrysts of quartz, sanidine, opaque oxides, and, in glassy zones, sparse clinopyroxene and fayalitic olivine.

Qpce - Plateau Rhyolite, Central Plateau Member, Elephant Back flow (Pleistocene)
Qpcw - Plateau Rhyolite, Central Plateau Member, West Thumb flow (Pleistocene)
Qpca - Plateau Rhyolite, Central Plateau Member, Aster Creek flow (Pleistocene)

Qm - Sediments of Flat Mountain Arm (Pleistocene)
Unconsolidated moderately well sorted sand and silt having irregular lenticular bedding. Gravel contains numerous clasts of Central Plateau Member. A thin tuff interlayered with the sediments is probably the tuff of Bluff Point of the Central Plateau Member of Plateau Rhyolite.

Qylb - Lava Creek Tuff, Member B (Pleistocene)
Gray to pinkish- or purplish-gray rhyolitic ash-flow tuff. Generally devitrified but vitrophyric at base; generally densely welded except for partially welded vapor-phase zone at top; moderately abundant lithic inclusions and 1-5 mm phenocrysts of quartz, sanidine, and sodic plagioclase; some sanidine phenocrysts as much as about 1 cm; sparse opaque oxides, clinopyroxene, and fayalitic olivine phenocrysts. Thin basal zone of relatively phenocryst-poor tuff.

Qyla - Lava Creek Tuff, Member A (Pleistocene)
Similar to member B but generally brown. Mainly devitrified, but black vitrophyre and gray microspherulitic zone at base. Contains abundant large phenocrysts throughout.

Qjf - Mount Jackson Rhyolite, Flat Mountain flow (Pleistocene)
Gray glassy to pinkish crystallized rhyolite flow containing small, rather sparse, phenocrysts of quartz, sanidine, and sodic plagioclase.

Qyhc - Huckleberry Ridge Tuff, Member C (Pleistocene)
Brown rhyolite ash-flow tuff mainly devitrified, but locally glassy at base; commonly shows strong lineation of stretched welded pumice and aligned phenocrysts; compaction foliation commonly deformed by flowage folding. Small aphanitic lithic inclusions common. Quartz, sanidine, and sodic plagioclase phenocrysts abundant, but generally small (less than 1 mm).

Tlv - Langford Formation, Vent facies deposits (Eocene)
Light-gray, pink, green, and buff pumiceous laharic breccias and minor lava flows and flow breccias of hornblende andesite and pyroxene andesite. 560 feet (155 m) thick.

Tla - Langford Formation, Alluvial facies deposits (Eocene)
Light-gray, brown, and buff coarsely bedded, well-sorted epiclastic volcanic breccia and conglomerate. Contains minor interbedded pumiceous volcanic sandstone and tuff. Breccia clasts consist chiefly of hornblende andesite and pyroxene andesite, 880 feet (268 m) thick.

Tlp - Langford Formation, Promontory Member (Eocene)
Dark- to medium-brown massively bedded well-sorted epiclastic volcanic breccia consisting of angular to slightly rounded clasts of pyroxene andesite and hornblende andesite in a tuffaceous matrix. Mapped is the thickest of several eastward-thinning tongues of the Promontory Member. 0-480 feet (0-146 m) thick.

Tt - Trout Peak Trachyandesite (Eocene)
Medium- to dark-gray and brown, columnar-jointed lava flows and scoriaceous flow breccias of trachyandesite (shoshonite and absarokite) containing abundant small phenocrysts of plagioclase, augite, and olivine. 800+ feet (244+ m) thick.

Kh - Harbell Formation (Upper Cretaceous)
Olive-drab to gray, fine-grained, hard, slabby sandstone, tuffaceous in part; interbedded with gray, dull-green, mustard-yellow, and black siltstone, claystone, and shale. 0-4,000 feet (0-1,219 m) thick.

Kb - Bacon Ridge Sandstone (Upper Cretaceous)
Light-gray, fine- to medium-grained, salt-and-pepper, massive to thick-bedded to crossbedded sandstone; partings and thin beds of gray siltstone, claystone, and shale; abundant marine and brackish-water fossils. 500 feet (152 m) thick.

Kc - Cody Shale (Upper Cretaceous)
Dull-bluishgray, silty, soft, evenly bedded shale; contains many thin beds of fine-grained silty sandstone; persistent greenish-gray hard glauconitic sandstone marker bed, 100 feet thick, is

about 375 feet below top. 1,700 feet (518 m) thick.

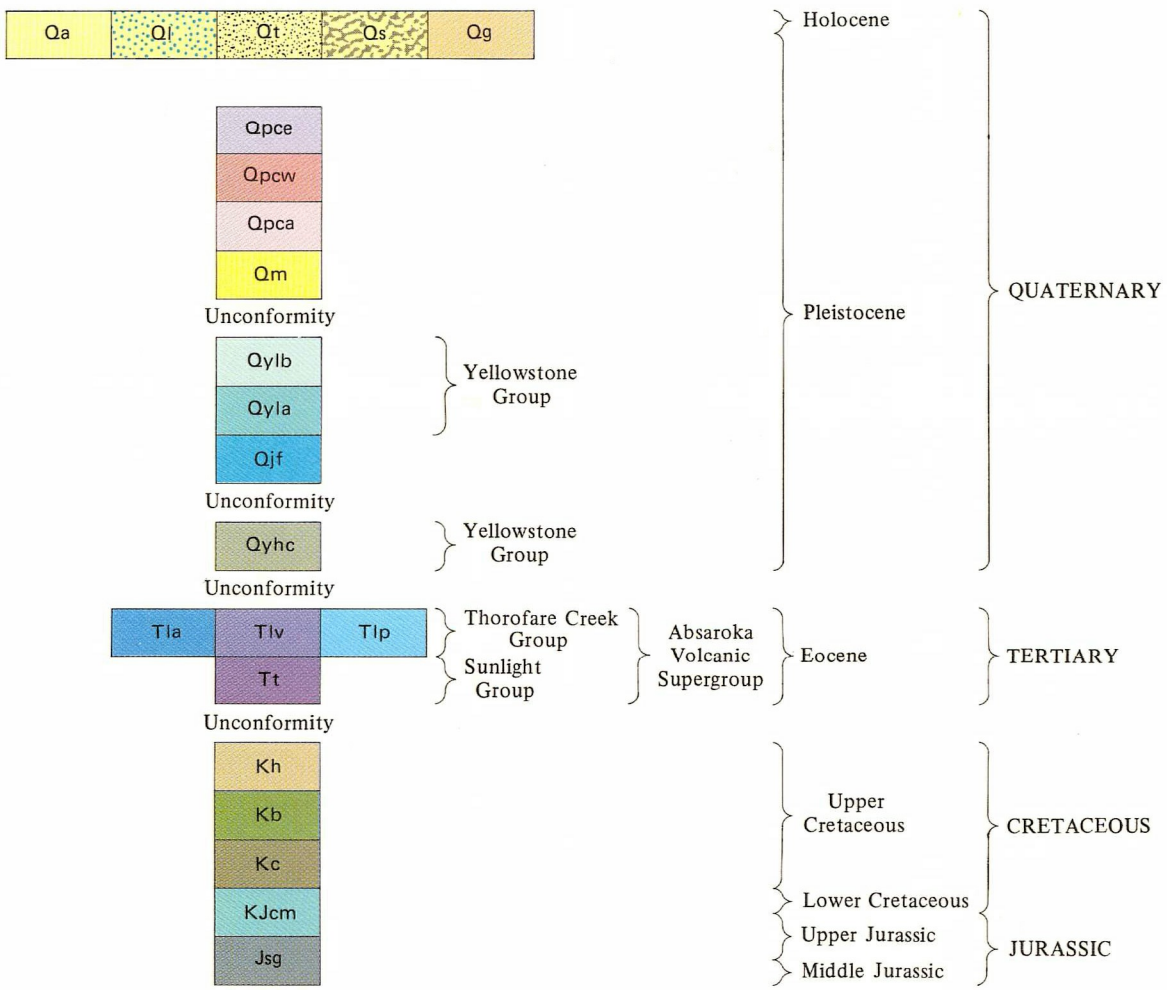
KJcm - Cloverly and Morrison Formations (Lower Cretaceous and Upper Jurassic)
At top, rusty-brown hard fine-grained ripple-marked quartzitic sandstone; middle part, variegated plastic clay-stone; lower part, dull-pink and gray silty sandstone and claystone. 600 feet (183 m) thick.

Jsg - Sundance and Gypsum Spring Formations (upper and middle Jurassic)
Total thickness of 520 feet (158 m).
Sundance Formation (upper Jurassic) - Upper part, gray glauconitic sandstone and gray fossiliferous limestone, 85 feet (26 m) thick. Lower part, gray soft limy splintery, locally fossiliferous, shale and thin shaly limestone beds; 385 feet (117 m) thick.

Gypsum Spring Formation (middle Jurassic) - Dark-red shale, gray shaly dolomite, and a white gypsum bed, 20-30 feet (6-9 m) thick, at base. 50 feet (15 m) thick.

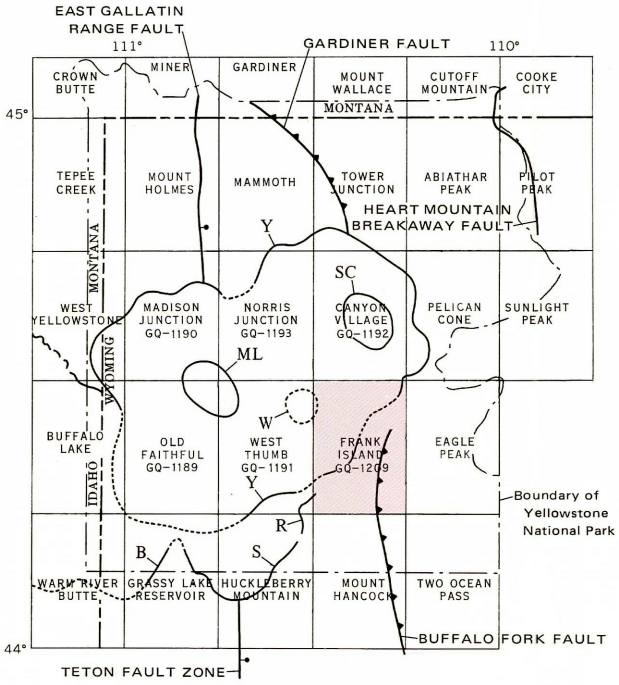
Text from source map: Frank Island 15' Quadrangle

Correlation of Map Units



Graphic from source map: Frank Island 15' Quadrangle

Index Map



INDEX MAP OF YELLOWSTONE NATIONAL PARK SHOWING LOCATION OF 15-MINUTE QUADRANGLES AND MAJOR STRUCTURAL FEATURES
Location of this quadrangle indicated by color

Fault – Bar and ball on downthrown side

Thrust fault – Sawteeth on upper plate

Outline of dome

Approximate topographic rim of caldera – Dotted where buried

W West Thumb caldera rim – Caldera formed by collapse resulting from eruption of tuff of Bluff Point

ML Mallard Lake dome – Dome formed by magmatic resurgence beneath Yellowstone caldera

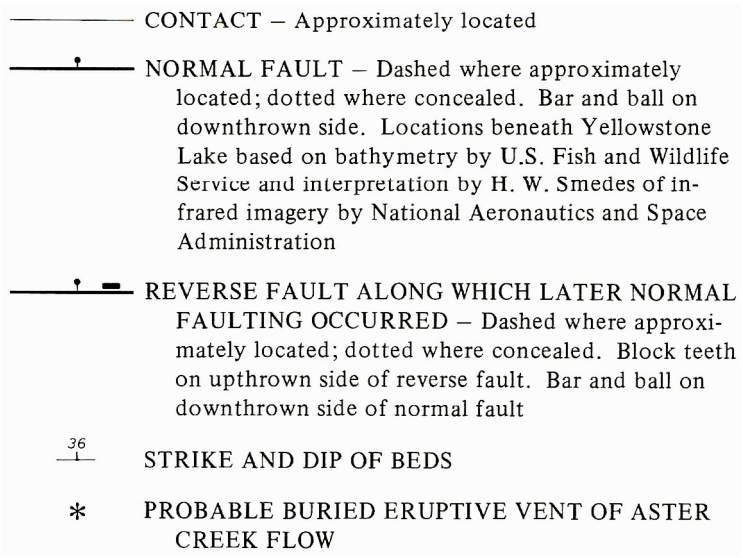
SC Sour Creek dome – Dome formed by magmatic resurgence beneath Yellowstone caldera

Y Yellowstone caldera rim – Caldera formed by collapse resulting from eruptions of Lava Creek Tuff

R, S, B Red Mountains, Snake River, and Big Bend Ridge caldera-rim segments – Remnants of a caldera formed by collapse resulting from eruptions of Huckleberry Ridge Tuff

Graphic from source map: Frank Island 15' Quadrangle

Map Legend



Graphic from source map: Frank Island 15' Quadrangle

References

Christiansen, R. L., and Blank, H. R., Jr. 1972, Volcanic stratigraphy of the Quaternary rhyolite plateau in Yellowstone National Park: U.S. Geol. Survey Prof. Paper 729-B, 18p.

Love, J. D., and Keefer, W. R., 1969, Basin Creek uplift and Heart Lake Conglomerate, southern Yellowstone National Park, Wyoming, in Geological Survey Research, 1969: U.S. Geol. Survey Prof. Paper 650-D, p. D122-D130.

Smedes, H. W., and Protska, H. J., 1972, Stratigraphic framework of the Absaroka Volcanic Supergroup in the Yellowstone National Park region: U.S. Geol. Survey Prof. Paper 729-C, 33 p.

References from source map: Frank Island 15' Quadrangle

Gardiner 30' x 60' Quadrangle

The formal citation for this source.

Berg, Richard B., Lonn, Jeffrey D., and Locke, William W., 1999, Geologic Map of the Gardiner 30' x 60' Quadrangle, South-Central Montana: Montana Bureau of Mines and Geology, MBMG-387, scale 1:100,000 (*GRI Source Map ID 3022*).

The report text and figures in this help file are a subset of what is present in MBMG-387. To view the report in its entirety, visit the following site: http://www.mbmg.mtech.edu/pdf_100k/gardiner-text.pdf

Description of geologic units, prominent graphics and text associated with this source map.

Description of Map Units

Qal - Alluvium of modern channels and flood plains (Holocene)
Younger alluvium generally confined to the present flood plain developed along active rivers and streams.

Qao - Alluvium, older, undivided (Holocene and Pleistocene?)
Includes gravel deposits at elevations above present active flood plains and some deposits that contain a significant glaciofluvial component.

Qls - Landslide deposit (Holocene)
Landslides are typically developed at the unconformity between Tertiary volcanic units and the Precambrian basement, possibly in bentonite beds situated at the base of the Tertiary volcaniclastic sequence.

Qg - Glacial deposits, undivided (Holocene and Pleistocene)
Dominantly unsorted and unstratified sediment of Pleistocene glacial moraines and other associated glacial and glaciofluvial deposits. Also includes Holocene glacial deposits and rock glacier deposits. May include subordinate alluvium, colluvium, talus, landslide deposits, and boulder fields (after Wilson and Elliott, 1977, also shown for those area mapped by Van Gosen, et al., 1993 and U.S. Geological Survey, 1972).

Qgt - Glacial till (Pleistocene)
Unsorted to poorly sorted sediment ranging for cobble to sand and silt size. Unit may not be significantly different than Qg.

Qgl - Glacial lake deposit (Pleistocene)
Glacial lake deposits shown only in the Tom Miner and Cinnabar basins and along the Yellowstone Valley where they consist of varved silt and clay.

Qtr - Travertine deposit (Pleistocene)
Deposits of travertine on the east side of the Yellowstone Valley above Gardiner have been quarried for many years for decorative stone. Two distinct U-Th ages have been reported for this travertine deposit - 19.57 + - 0.12 ka and 22.64 +- 0.17 ka (Pierce et al., 1991). Modern travertine at La Duke hot springs and at Chico hot springs are too small to show at the scale of this map.

Qba - Basalt (Pleistocene)
Basalt flows in the Gardiner area (after Van Gosen, et al., 1993).

Qlc - Lava Creek Tuff, undivided (Pleistocene)
Welded ash flows. Shown in Yellowstone National Park (after U.S. Geological Survey, 1972).

Thr - Huckleberry Ridge Tuff of Yellowstone Group, undivided (Pliocene)

Welded ash flows. Shown for Yellowstone National Park (after U.S. Geological Survey, 1972) Since publication of the USGS map in 1972, a 40Ar/ 39Ar date of 2 ma has been obtained on this unit (Christiansen, 2001, p. G22).

Tba - Basalt (Pliocene/Miocene?)
Two basalt flows are exposed on Hepburn's Mesa. A K-Ar date on the upper flow yields a date of 8.4 Ma (Bush, 1967). However Locke, et al. (1995) suggest that the basalt on Hepburn's Mesa is correlative with basalt west of Emigrant that has a 2.2 Ma date. The upper flow exposed on Hepburn's Mesa is black to dark gray and generally contains scattered plagioclase and olivine phenocrysts whereas the lower flow contains labradorite, augite, and olivine phenocrysts (Bush, 1967).

Ts - Sediment or sedimentary rocks, undivided (Tertiary)
Includes the middle Miocene Hepburn's Mesa Formation (exposed at the mesa of the same name) that consists of sediments deposited in and adjacent to a perennial saline lake (Barnosky, 1989). Also included are tan-weathering silty claystones that contain unaltered volcanic glass that are poorly exposed west of the Yellowstone Valley in the northwestern part of the Gardiner quadrangle.

Tr - Rhyolite or rhyolitic sediment (Eocene)
Generally massive and porphyritic with large quartz and feldspar phenocrysts in a chocolate brown, glassy matrix. At some localities appears altered with green alteration product. May be associated with welded tuff included within Tfpy.

Tl - Latite and porphyritic latite (Eocene)

Tfpy - Felsic pyroclastic rocks (Eocene)
Includes thin planar pumiceous beds that are interpreted to represent air fall deposition. These beds also contain a few andesite pebbles. Also included in Tfpy is welded tuff with large phenocrysts of quartz and feldspar. These tuffaceous beds are altered to mottled purple and gray bentonitic clay that contains sand-size material consisting of quartz, biotite, and lithic fragments.

Tmz - Monzodiorite of Independence area (Eocene)
Stock composed of multiple phases of andesitic intrusive breccia, monzodiorite, quartz monzodiorite, and quartz monzonite; cut by minor granite dikes (After Van Gosen et al., 1993).

Tdaf - Dacite? flows (Eocene)
Reddish to gray, altered, hornblende porphyry with sparse feldspar laths. In hand specimen the rock appears massive, but when viewed from a distance flow geometry is obvious. Some flow breccia. Shown in area west of the Yellowstone River.

Tdap - Dacite porphyry (Eocene)
Stock, laccoliths, sills, dikes, plugs, and irregular-shaped bodies; includes some andesitic and rhyolitic rocks (After Van Gosen et al., 1993).

Tda - Dacite? intrusive (Eocene)
Pink to light gray, fine-grained, feldspar-hornblende porphyry. Small hornblende phenocrysts much more abundant than feldspar phenocrysts. Shown in area west of the Yellowstone River.

Ti - Intrusive rocks, undivided (Eocene)
Dikes, sills, and irregular-shaped bodies; andesite, quartz latite, dacite, and rhyolite; commonly porphyritic (After Van Gosen et al., 1993).

Tav - Absaroka Volcanics Supergroup (Eocene)
Volcanic and volcaniclastic rocks including basaltic, andesitic, and dacitic flows and flow

breccias, rhyolitic ash-flow tuff and vitrophyre, tuff breccias, lahars, agglomerates, agglutinates, conglomerate, and minor andesitic and dacitic intrusive bodies (In part after Van Gosen et al., 1993).

Tms - Slough Creek Tuff Member, Mount Wallace Formation (Eocene)
Light-colored ash flow tuff.

Tse - Sepulcher Formation (Eocene)
Dominantly light-colored andesitic rocks.

Tslc - Lost Creek Tuff Member of Sepulcher Formation (Eocene)
Light-colored rhyodacite ash flow tuff.

Tsec - Elk Creek Basalt Member of Sepulcher Formation (Eocene)

Tae - Andesite, epiclastic, of Hyalite Peak Volcanics (Eocene)
Well to poorly stratified. This unit is thought to be correlative with the Sepulcher. Formation of the Washburn Group as mapped by the U.S. Geological Survey near the northern boundary of Yellowstone National Park (1972) (After Chadwick, 1982).

Tanf - Andesite flows of Hyalite Peak Volcanics (Eocene)
Commonly autobrecciated; includes some epiclastic lenses. This unit is thought to be correlative with the Mount Wallace Formation of the Sunlight Group as mapped by the U.S. Geological Survey near the northern boundary of Yellowstone National Park (1972) (After Chadwick, 1982).

Tavv - Vent facies of Hyalite Peak Volcanics (Eocene)
(After Chadwick, 1982).

TpCi - Intermediate and mafic Intrusive rocks (Eocene and Precambrian)
Dikes and sills of andesite and basalt (After Van Gosen et al., 1993).

Kdi - Diorite (Upper Cretaceous)

Ks - Sedimentary rocks, undivided (Cretaceous)
(After Wilson and Elliott, 1997 and USGS, 1972).

Klf - Landslide Creek formation through Frontier Formation (Upper Cretaceous)
In the northernmost part of the Gardiner quadrangle this designation includes the Cody and Frontier formations; in the area southwest of Corwin Springs it includes the Eagle Sandstone, Virgelle Sandstone, and Everts Formation; east of the Yellowstone River it includes the Landslide Creek Formation, Everts Formation, Eagle Sandstone, Telegraph Creek Formation, Cody Shale, and Frontier Formation.

Kmfr - Mowry Shale through Fall River Sandstone, undivided (Upper and Lower Cretaceous)

JTRs - Sedimentary rocks, undivided (Jurassic and Triassic)
(After Wilson and Elliott, 1997).

PMs - Sedimentary rocks, undivided (Permian, Pennsylvanian, and Mississippian)

Pzs - Sedimentary rocks, undivided (Paleozoic)
(After Van Gosen et al. 1993).

Psh - Shedhorn Sandstone (Permian)
Sandstone, dolomite, and chert (after U.S. Geological Survey, 1972).

Mm - Madison Group, undivided (Mississippian)
Limestone and dolomite (after USGS, 1972).

DOs - Sedimentary rocks, undivided (Devonian and Ordovician)
Includes Three Forks Shale, Jefferson Formation, and Bighorn Dolomite; shale, limestone, and dolomite (after Van Gosen et al. 1993 and USGS, 1972).

Csrp - Snowy Range and Pilgrim Formations (Cambrian)

Cs - Sedimentary rocks, undivided (Cambrian)
Includes Grove Creek Formation, Snowy Range Formation, Pilgrim Limestone, Park Shale, Meagher Limestone, Wolsey Shale, and Flathead Sandstone; limestone, sandstone, siltstone, and shale (after Van Gosen et al. 1993).

Cpf - Park, Meagher, Wolsey, and Flathead Formation (Cambrian)

pCim - Mafic intrusive rocks (Archean and Proterozoic)
Includes sills, dikes., stock, and irregular-shaped bodies of alkali olivine dolerite, metadolerite, metanorite, metagabbro, and quartz dolerite and dikes of uncertain or unknown affinities (After Van Gosen et al. 1993).

pCmy - Mylonite (Precambrian)
The Snowy shear zone separates high-grade gneisses to the southeast from andalusite-bearing biotite-staurolite schists to the northwest (Erslev, 1992).

Aamh - Amphibolite and hornblende gneiss, Stillwater Complex (Archean)
Mostly tabular and lensoid bodies enclosed in granitic gneiss and migmatite (after Van Gosen et al. 1993).

Agn - Gneissic rocks (Archean)
Predominately granitic gneiss and migmatite; commonly consists of alternating bands of more felsic and more mafic gneiss; contains inclusions of metasedimentary and metaigneous rocks (after Van Gosen et al. 1993).

Agr - Granitic rocks (Archean)
Includes stocks and irregular-shaped bodies of fine-, medium-, and coarse-grained quartz monzonite and aplite of the Stillwater area and of granite in the Gardiner area (after Van Gosen et al. 1993).

As - Biotite schist (Archean)
Includes minor quartzite, iron formation, and amphibolite (after Van Gosen et al. 1993).

Ash - Schist and Hornfels (Archean)
Metasedimentary rocks consisting predominately of schist and hornfels with minor quartzite, amphibolite, and iron formation; contact metamorphosed to hornblende hornfels and pyroxene hornfels facies at and near the base of the Stillwater Igneous Complex; host for Homestake-type gold deposits near Jardine (after Van Gosen et al, 19930).

Text from source map: Gardiner 30' x 60' Quadrangle

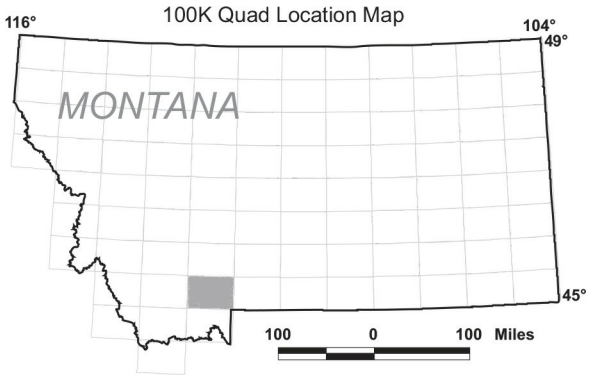
Index Map

Quad index

BOZEMAN	LIVINGSTON	BIG TIMBER
ENNIS	GARDINER	RED LODGE
HEBGEN LAKE	*YELLOW-STONE NAT PARK N*	*CODY*

Graphic from source map: Gardiner 30' x 60' Quadrangle

Quadrangle Location Map



Graphic from source map: Gardiner 30' x 60' Quadrangle

Map Legend

	Ti	intrusive rocks, undivided (dikes)
	TpЄi	intermediate and mafic intrusive rocks
	pЄm	mafic intrusive rocks

Graphic from source map: Gardiner 30' x 60' Quadrangle

Grassy Lake Reservoir 15' Quadrangle

The formal citation for this source.

> Christiansen, R.L., Blank, H.R., Love, J.D., Reed, J.C., 1978, Geologic Map of the Grassy Lake Reservoir Quadrangle, Yellowstone National Park and Vicinity, Wyoming: U.S. Geological Survey, Geologic Quadrangle Map GQ-1459, scale 1:62,500 (*GRI Source Map ID 6351*).

Digital data associated with this map was converted from a third-party data source and checked against a georeferenced copy of the above paper source map.
The citation for this digital data:

> U.S. Geological Survey, 2007, Digital Geologic Map of the Grassy Lake Reservoir Quadrangle, Yellowstone National Park and Vicinity, Wyoming: U.S. Geological Survey, unpublished digital data, scale 1:62,500 (*GRI Source Map ID 74803*).

Description of geologic units, prominent graphics and text associated with the paper source map.

Description of Map Units

Qa - Alluvium (Holocene and Pleistocene)
Stream-laid deposits of gravel, sand, silt, and clay in valley bottoms; fan deposits; glacial outwash and stream-laid ice-contact deposits; includes fine-grained swamp deposits in northern part of quadrangle.

Qls - Landslide deposits (Holocene and Pleistocene)
Chaotically mixed boulders and fine-grained rock debris marked by hummocky, generally bouldery surfaces.

Qsw - Swamp deposits (Holocene and Pleistocene)
Dark-gray and brown clay, silt, and fine sand rich in vegetal material; mapped separately only in southern part of quadrangle.

Ql - Lacustrine deposits (Holocene and Pleistocene)
Unconsolidated well-sorted and well-bedded silts and fine sands deposited in open lakes.

Qt - Talus and colluvium (Holocene and Pleistocene)
Locally derived coarse angular rock fragments that accumulate on steep slopes and at the base of cliffs; slope wash of silt- to boulder-sized fragments derived from underlying and adjacent formations.

Qhs - Silicious sinter (Holocene and Pleistocene)
White to light-gray.

Qg - Glacial deposits (Pleistocene)
Till, commonly having distinct morainal form but also includes ground moraine. Thin patchy remnants of till and lag gravels from very old moraines are not shown. Details of glacial deposits are on map by Richmond (1973).

Plateau Rhyolite:
Large rhyolitic lava flows, each containing a wide variety of lithologies and distinguishable from one another only by topographic forms and by zonal development of various textural features and emplacement structures. Most exposures are dark pitchstone or obsidian virtrophyre of flow-layered or flow-brecciated rhyolite, but gray to red pumiceous rhyolite and gray, brown, or varicolored crystalline rhyolite also are common; all varieties can occur within a single flow. All

flows contain abundant 1-3 mm phenocrysts of quartz, sanidine, opaque oxides, and, in glassy zones, sparse clinopyroxene and fayalitic olivine.

Qpcp - Plateau Rhyolite, Central Plateau Member, Pitchstone Plateau flow (Pleistocene)

Qpcr - Plateau Rhyolite, Central Plateau Member, Bechler River flow (Pleistocene)

Qpcs - Plateau Rhyolite, Central Plateau Member, Summit Lake flow (Pleistocene)

Qfr - Falls River Basalt (Pleistocene)
Medium- to light-gray basalt flows containing moderately abundant plagioclase phenocrysts.

Qb - Till of Bechler Meadows (Pleistocene)
Small outcrop of weathered till beneath Summit Lake flow just north of Bechler Meadows.

Qylb - Member B of the Lava Creek Tuff (Pleistocene)
Simple cooling unit of gray to brown generally densely welded and devitrified ash-flow tuff with basal zone of black glass. In northern part of outcrop area contains moderately abundant 1-5 mm phenocrysts of quartz, sanidine, and sodic plagioclase; some sanidine phenocrysts as large as 1 cm; sparse opaque oxides, clinopyroxene, and fayalitic olivine phenocrysts. Phenocrysts sparse and smaller in southern part of outcrop area. Thickness, 0-250 feet (0-80 m).

Qlc - Lewis Canyon Rhyolite (Pleistocene)
Rhyolitic lava flows locally glassy containing phenocrysts of quartz, plagioclase, sanidine, and clinopyroxene.

Huckleberry Ridge Tuff:
Compound cooling unit of ash-flow tuff. Gray to brown generally densely welded and devitrified but locally glassy or partly welded. Most parts contain abundant phenocrysts of quartz, sanidine, and sodic plagioclase; sparse opaque oxides, clinopyroxene, and fayalitic olivine.

Qyhc - Huckleberry Ridge Tuff, Member C (Pleistocene)
Entirely devitrified; commonly shows strong lineation of stretched welded pumice and aligned phenocrysts; compaction foliation commonly deformed by flowage folding. Abundant lithic inclusions. Phenocrysts abundant but generally smaller (less than 1 mm) than in members A and B. Thickness, 0-300 feet (0-90 m).

Qyhb - Huckleberry Ridge Tuff, Member B (Pleistocene)
Entirely devitrified. Phenocrysts abundant and particularly large (as much as 5 mm) in upper part, sparse in lower part. Two types of welded pumice in upper part: one very dark and scoriaceous, the other light-colored and compact. Thickness, 0-500 feet (0-150 m).

Qyha - Huckleberry Ridge Tuff, Member A (Pleistocene)
Mainly devitrified, but black vitrophyre at base. Phenocrysts, abundant in lower part, become progressively less abundant upward. Thickness, 0-700 feet (0-210 m).

Tc - Conant Creek Tuff (Pliocene)
Gray to buff and pale lavender phenocryst-poor slabby hard welded tuff; black welded-tuff obsidian near base, underlain in places by white to gray friable tuff. Thickness, 0-300 feet (0-90 m).

Tid - Dacitic intrusions (Eocene)
Light gray coarse-grained; porphyritic in part. In and near Birch Hills.

Th - Hominy Peak Formation (Eocene)

Andesitic mudflow breccia, vent breccia, conglomerate, and sandstone. Brown to dull green with light gray tuff and thin claystone zones at base and near top; lenses of gold-bearing quartzite boulder conglomerate in lower part; fossil trees common. Contains slide blocks of Precambrian, Paleozoic, and Mesozoic rock from 10 to 150 feet (3-46 m) in diameter. Thickness about 2,000 feet (600 m).

TKp - Pinyon Conglomerate (Paleocene and Upper Cretaceous)
Brown boulder conglomerate composed of highly rounded quartzite fragments in rusty sandstone matrix; sporadic boulders of older conglomerate and quartzite 5-8 feet (1.5-2.5 m) in diameter. Thickness about 2,000 feet (600 m).

Kf - Frontier Formation (Upper Cretaceous)
Gray fine- to coarse-grained sandstone pebbly and highly glauconitic near top: interbedded with gray and black shale; bentonite and porcellanite beds in lower part. Thickness about 1,000 feet (300 m).

Jls - Lower Part of Sundance Formation (Upper and Middle Jurassic)
Gray limy soft shale interbedded with shaly limestone; one or two red shale zones 35-70 feet (11-21 m) thick, commonly present in middle part. "Lower Sundance" of many reports. Thickness about 400 feet (120 m).

TRc - Chugwater Formation (Upper and Lower Triassic)
Brick red siltstone and shale interbedded with fine-grained red sandstone; upper part not exposed. Partial thickness about 800 feet (240 m).

TRcd - Chugwater and Dinwoody Formation, Undivided (Upper and Lower Triassic)

TRd - Dinwoody Formation (Lower Triassic)
Brown hard thin-bedded dolomitic siltstone. Thickness, 200 feet (60 m).

Pp - Phosphoria Formation (Permian)
Gray cherty sandy dolomite; some black shale and phosphorite beds. Thickness, 200 feet (60 m).

PNMta - Tensleep Sandstone and Amsden Formation (Pennsylvanian and Mississippian)
Tensleep (Pennsylvanian) is light gray hard fine-grained cherty brittle sandstone about 380 feet (115 m) thick.

Amsden (Pennsylvanian and Mississippian) is dolomite, red and green shale, chert, and sandstone about 230 feet thick (65 m).

Mm - Madison Limestone (Upper and Lower Mississippian)
Bluegray limestone, gray dolomite, and, near top, thin beds of black and red shale and sandstone. Thickness about 1,100 feet (330 m).

Dd - Darby Formation (Upper Devonian)
Brown fetid dolomite interbedded with yellow, gray, pink, and black shale and thin sandstone. Thickness about 350 feet (100 m).

Ob - Bighorn Dolomite (Upper Ordovician)
White brittle very fine-grained Leigh Dolomite Member at top. Thickness of Leigh Dolomite Member about 50 feet (15 m). Lower unit gray hard siliceous cliff-forming dolomite; thickness of lower unit about 375 feet (115 m).

OCbg - Bighorn Dolomite and Gallatin Limestone, undivided (Upper Ordovician and Upper Cambrian)

Cgp - Gallatin Limestone and Park Shale Member of Gros Ventre Formation (Upper and Middle Cambrian)
Gallatin (upper Cambrian) is tan to gray mottled glauconitic; contains edgewise conglomerate beds; thickness 200-250 feet (60-80 m).

Park Shale Member of Gros Ventre (middle Cambrian) is soft fissile green shale with red-weathering glauconite-rich layers and some thin limestones; thickness about 240 feet (70 m).

Cdc - Death Canyon Limestone Member of Gros Ventre Formation (Middle Cambrian)
Blue gray hard mottled cliff-forming limestone; 25 feet (8 m) of green shale about 65 feet (20 m) above base; thickness, 300 feet (90 m).

Cwf - Wolsey Shale Member of Gros Ventre Formation and Flathead Sandstone, undivided (Middle Cambrian)
Wolsey Shale Member is green fissile soft shale, sandy near base; thickness about 100 feet (30 m).

Flathead is red, brown, and gray hard cross bedded, quartzite in part, pebbly near base; thickness about 175 feet (53 m).

YXd - Diabase (Precambrian Y or X)
Dark greenish gray fine- to medium-grained; in undeformed but slightly metamorphosed dike.

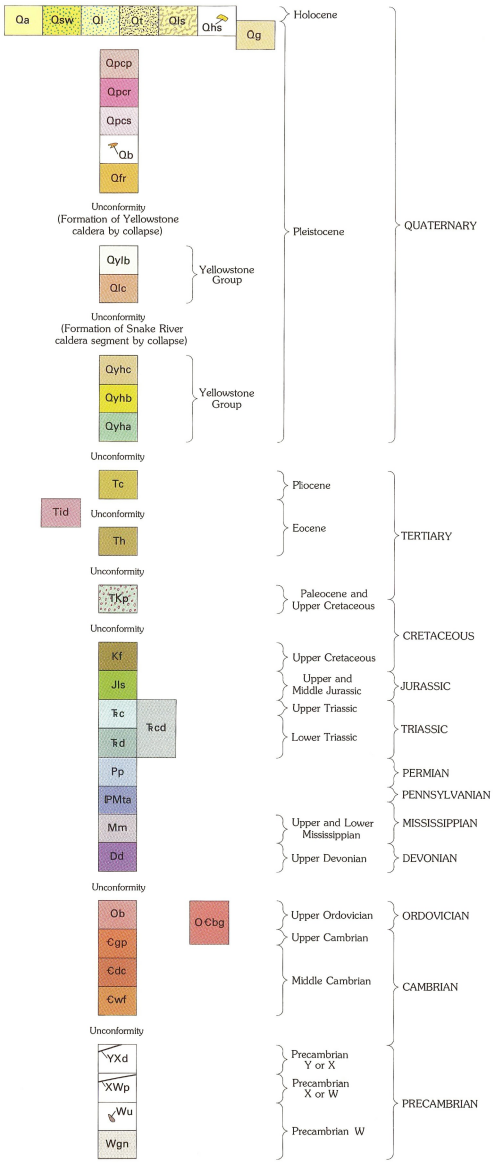
XWp - Pegmatite (Precambrian X or W)
Coarsely crystalline rich in muscovite and biotite; related to Mount Owen Quartz Monzonite of central part of Teton Range; distribution of dikes shown is, in part, diagrammatic.

Wu - Ultramafic rock (Precambrian W)
Dark green coarse-grained serpentinite; contains veins of asbestos.

Wgn - Layered gneiss (Precambrian W)
Interlayered dark- to medium-greenish gray amphibolite and amphibolitic gneiss and schist, fine- to medium-grained biotite and biotite-garnet gneiss, and fine-grained light-gray to white quartz-plagioclase gneiss; layers range from less than 1 cm to several meters in thickness and are continuous for distances of tens of meters.

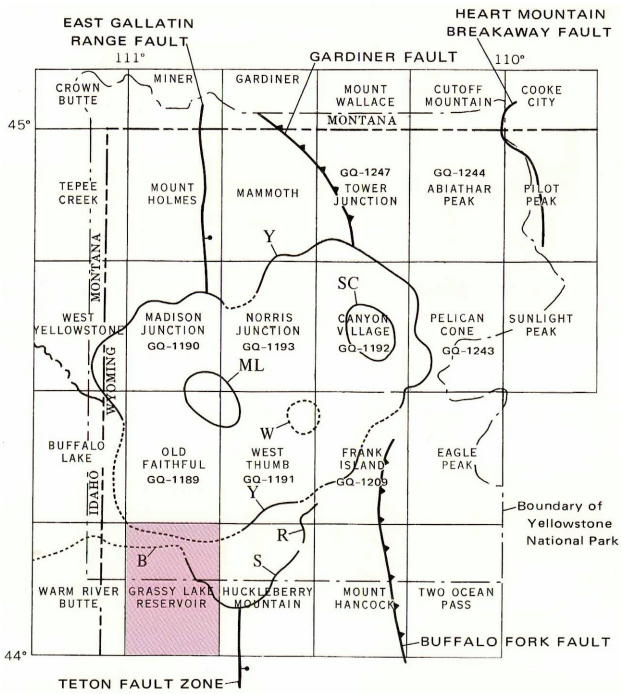
Text from source map: Grassy Lake Reservoir 15' Quadrangle

Correlation of Map Units



Graphic from source map: Grassy Lake Reservoir 15' Quadrangle

Index Map



INDEX MAP OF YELLOWSTONE NATIONAL PARK SHOWING LOCATION OF 15-MINUTE QUADRANGLES AND MAJOR STRUCTURAL FEATURES

Location of this quadrangle indicated by color

Fault—Bar and ball on downthrown side

Thrust fault—Sawteeth on upper plate

Outline of dome

Approximate topographic rim of caldera—Dotted where buried

W — West Thumb caldera rim—Caldera formed by collapse resulting from eruption of tuff of Bluff Point

ML — Mallard Lake dome—Dome formed by magmatic resurgence beneath Yellowstone caldera

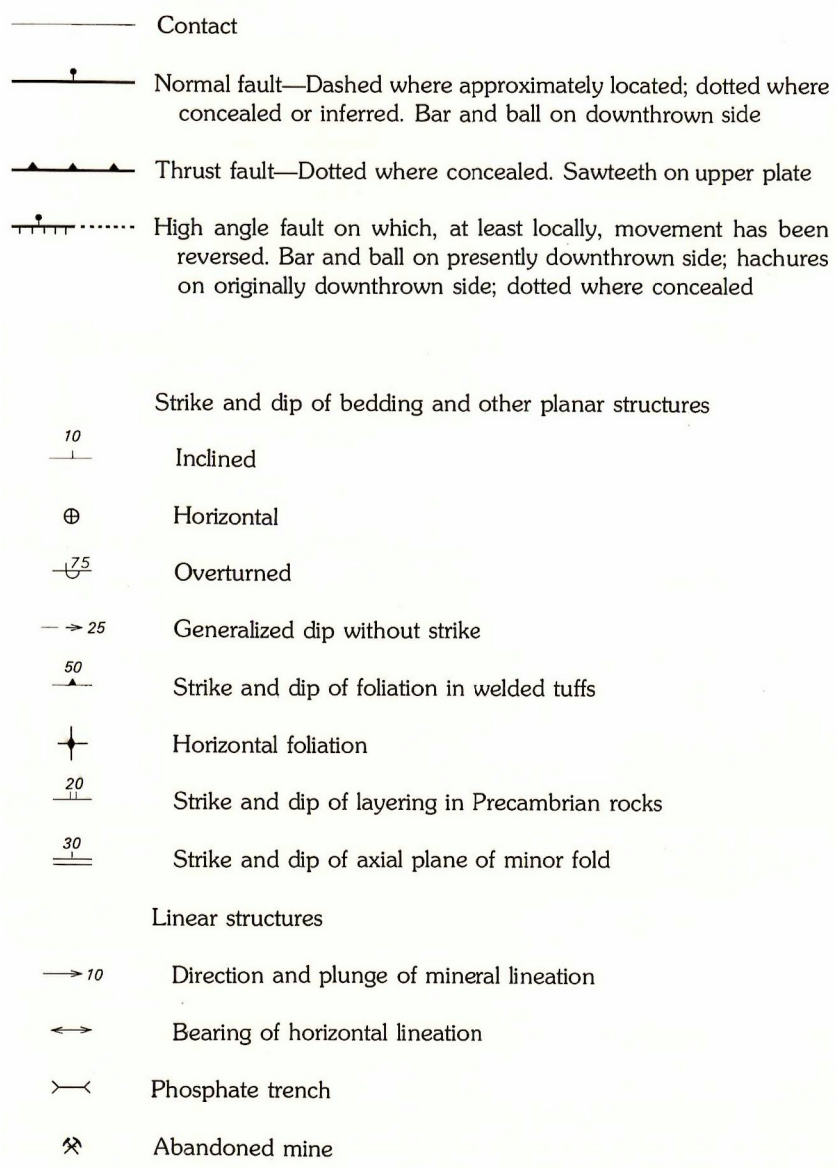
SC — Sour Creek dome—Dome formed by magmatic resurgence beneath Yellowstone caldera

Y — Yellowstone caldera rim—Caldera formed by collapse resulting from eruptions of Lava Creek Tuff

R, S, B — Red Mountains, Snake River, and Big Bend Ridge caldera-rim segments—Remnants of a caldera formed by collapse resulting from eruptions of Huckleberry Ridge Tuff

Graphic from source map: Grassy Lake Reservoir 15' Quadrangle

Map Legend



Graphic from source map: Grassy Lake Reservoir 15' Quadrangle

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References from source map: Grassy Lake Reservoir 15' Quadrangle

Huckleberry Mountain 15' Quadrangle (digital)

The formal citation for this source.

> Love, J.D., 2003, Digital Geologic Map of the Huckleberry Mountain Quadrangle, Yellowstone National Park and Vicinity, Wyoming: U.S. Geological Survey, unpublished digital data, scale 1:62,500 (*GRI Source Map ID 7311*).

Listing of geologic unit symbols and unit names present on the source map. The source map did not contain a legend, unit descriptions, or any additional information.

Map Unit Listing

Qc - Colluvium

Qf - Alluvial fan deposits

Qal - Alluvium of modern channels and flood plains

Qs - Swamp deposits

Qa - Alluvium

Qls - Landslide debris

Qt/Qtl - Talus

Qhi - Ice-contact deposits localized by hot springs

Qhs - Hot spring deposits

Qg - Undifferentiated glacial debris

Qpcp - Central Plateau Rhyolite, Pitchstone Plateau flow

Qlb/Qylb - Lava Creek Tuff, Member B of Yellowstone Group

Qlg - Landslide and glacial debris

Qlc - Lewis Canyon Rhyolite

Qh - Huckleberry Ridge Tuff of Yellowstone Group

Qhc - Huckleberry Ridge Tuff of Yellowstone Group, Member C

Qhb/Qyhb - Huckleberry Ridge Tuff of Yellowstone Group, Member B

Qha/Qyha - Huckleberry Ridge Tuff of Yellowstone Group, Member A

Qg2 - Glacial debris of second major glaciation

Qog - Outwash gravel

Qjlm - Morainal debris of Jackson Lake

Qslt - Obsidian sandstone, siltstone and claystone

Qbrm - Morainal debris of Burned Ridge

QTh - Heart Lake Conglomerate

QTi - Dike of igneous rock

Th - Hominy Peak Formation

Tl - Langford Formation

Tt - Trout Peak Andesite, main body

Tad - Intrusive rocks of Absaroka Volcanics Supergroup

Tb - Tuff of Boone Creek

Tbr - Unnamed basalt breccia

TKp/Tp - Pinyon Conglomerate

Kh - Harebell Formation

Kb - Bacon Ridge Sandstone

Kc - Cody Shale

Kf - Frontier Formation

Kmr - Mowry Shale

Kmt - Mowry and Thermopolis Shales

Kt - Thermopolis Shale

Kmd - Muddy Sandstone Member

Kcvr - Rusty Beds Member

KJmv - Variegated sequence underlying Rusty Beds Member

Ks - Lenticular sandstone/shale sequence

Ksb - Unnamed lenticular sandstone/shale/bedrock sequence

KJm - Cloverly and Morrison Formations

Ju - Sundance and Gypsum Spring Formations

Jus - Upper Sundance Formation

Jls - Lower Sundance Formation

Jgs - Gypsum Spring Formation

TRc - Chugwater Formation

TRp - Popo Agie Member

TRrp - Red Peak Member

TRa - Alcova Limestone Member

TRcd - Chugwater and Dinwoody Formations, undivided

TRd - Dinwoody Formation

Pp - Phosphoria Formation

PNMta - Tensleep Sandstone and Amsden Formation

Mm - Madison Limestone

Cgp - Gallatin Limestone and Park Shale of the Gros Ventre Formation

List from source map: Huckleberry Mountain 15' Quadrangle (digital)

Madison Junction 15' Quadrangle

The formal citation for this source.

Christiansen, R.L., Blank, H.R., 1974, Geologic Map of the Madison Junction Quadrangle, Yellowstone National Park, Wyoming: U.S. Geological Survey, Geologic Quadrangle Map GQ-1190, scale 1:62,500 (*GRI Source Map ID 3256*).

Digital data associated with this map was converted from a third-party data source and checked against a georeferenced copy of the above paper source map.
The citation for this digital data:

Christiansen, R.L., Blank, H.R., 2007, Digital Geologic Map of the Madison Junction Quadrangle, Yellowstone National Park, Wyoming: U.S. Geological Survey, unpublished digital data, scale 1:62,500 (*GRI Source Map ID 74799*).

Description of geologic units, prominent graphics and text associated with the paper source map.

Description of Map Units

Qa - Alluvium and glaciofluvial deposits (Holocene and Pleistocene)
Unconsolidated coarse-to fine-grained moderately well sorted and well bedded stream-channel, overbank, and fan deposits, glacial outwash, and stream-laid ice-contact deposits.

Qt - Talus and colluvium (Holocene and Pleistocene)
Unconsolidated generally coarse angular debris deposited on slopes by rockfalls or debris flows.

Qhi - Ice contact deposits localized by hot springs (Holocene and Pleistocene)
Commonly well sorted irregularly bedded sandstones and conglomerates deposited against ice from melt waters localized by hot springs. Cemented by zeolites and opaline silica.

Qhs - Silicious hot spring deposits (Holocene and Pleistocene)
Generally white to light-gray siliceous sinter in mounds or sheets around active or extinct hot springs. Locally includes black manganiferous sinter.

Qhc - Calcareous hot spring deposits (Holocene and Pleistocene)
Generally white to light-gray travertine in terraces and mounds around active or extinct hot springs.

Qhe - Hydrothermal-explosion deposits (Holocene and Pleistocene)
Coarse blocky poorly sorted and generally poorly bedded deposits forming rings around small basins west of Fountain Flats and near Twin Buttes; deposits ejected from the enclosed basins in episodes of explosive steam generation. (See Muffler and others, 1971).

Qg - Glacial deposits (Holocene and Pleistocene)
Till, generally lacking distinct morainal form except near mouth of Madison Canyon.

Pleateau Rhyolite, Central Plateau Member:
Large rhyolitic lava flows, each containing a wide variety of lithologies and distinguishable from one another only by topographic forms and zonal development of various textural features and emplacement structures. Most exposures are dark pitchstone or obsidian vitrophyres of flow-layered or flow-brecciated rhyolite, but gray to red pumiceous rhyolite and gray, brown, or varicolored crystalline rhyolite also are common; all varieties can occur within a single flow. All flows contain abundant 1-3 mm phenocrysts of quartz, sanidine, opaque oxides, and, in glassy

zones, sparse clinopyroxene and fayalitic olivine; a few flows also contain minor sodic plagioclase phenocrysts.

Qpcy - Plateau Rhyolite, Central Plateau Member, West Yellowstone Flow (Pleistocene)

Qpcs - Plateau Rhyolite, Central Plateau Member, Summit Lake flow (Pleistocene)

Qpcn - Plateau Rhyolite, Central Plateau Member, Nez Perce Creek flow (Pleistocene)

Qpce - Plateau Rhyolite, Central Plateau Member, Elephant Back flow (Pleistocene)

Qpm - Plateau Rhyolite, Mallard Lake Member, Mallard Lake flow (Pleistocene)
Lithologically and petrographically like flows of Central Plateau Member, but most glassy parts have been eroded off. Phenocrysts of quartz, sanidine, and minor opaque oxides. NOTE: The Mallard Lake Member is younger than the Upper Basin Member, rather than older as stated by Christiansen and Blank (1972).

Qmr - Madison River Basalt (Pleistocene)
Gray to black basalt flows containing abundant phenocrysts of plagioclase and olivine. Underlies West Yellowstone flow; overlies Cougar Creek dome.

Qprc - Plateau Rhyolite, Roaring Mountain Member, Cougar Creek dome (Pleistocene)
Small rhyolitic dome or stubby lava flow. Mostly black obsidian or gray spherulitic rhyolite. Sparse small (less than 1 mm) phenocrysts of quartz, sanidine, opaque oxides, clinopyroxene, and fayalitic olivine.

Qpub - Plateau Rhyolite, Upper Basin Member, Biscuit Basin flow (Pleistocene)
Black perlitic vitrophyre of flow-layered or flow-brecciated rhyolite and gray to brown crystallized rhyolite. Contains abundant phenocrysts, as much as 5 mm, of deeply embayed and sieved plagioclase, moderately abundant quartz and clinopyroxene, and sparse sanidine and opaque oxides.

Qylb - Lava Creek Tuff, Member B (Pleistocene)
Gray, brown, or pinkish-gray ash-flow tuff. Devitrified throughout; generally densely welded except for partially welded vapor-phase zones at top and bottom. Lithic inclusions locally abundant. Abundant 1-5 mm phenocrysts of quartz, sanidine, and sodic plagioclase; some sanidine phenocrysts as much as about 1 cm; sparse opaque oxides, clinopyroxene, and fayalitic olivine phenocrysts. Thin basal zone of phenocryst-poor tuff grades downward from densely welded to partly welded.

Qylu - Lava Creek Tuff, upper part of Member A (Pleistocene)
Similar to member B. Brown to bright pink. Densely welded throughout. Devitrified except for minor vitrophyric lenses in lower part. Contains abundant phenocrysts as much as 5 mm and larger of quartz, sanidine, and sodic plagioclase, moderately abundant opaque oxides and hornblende, and sparse allanite.

Qyll - Lava Creek Tuff, lower part of Member A (Pleistocene)
Generally pinkish gray to light gray nonwelded to partly welded ash-flow tuff. Glassy to vapor-phase zone. Contains abundant lithic inclusions and some very large pumice blocks (some nearly 1 m). Contains moderately abundant small (generally 1 mm or less) phenocrysts of quartz, sanidine, and sodic plagioclase, moderately abundant hornblende and opaque oxides, and sparse allanite.

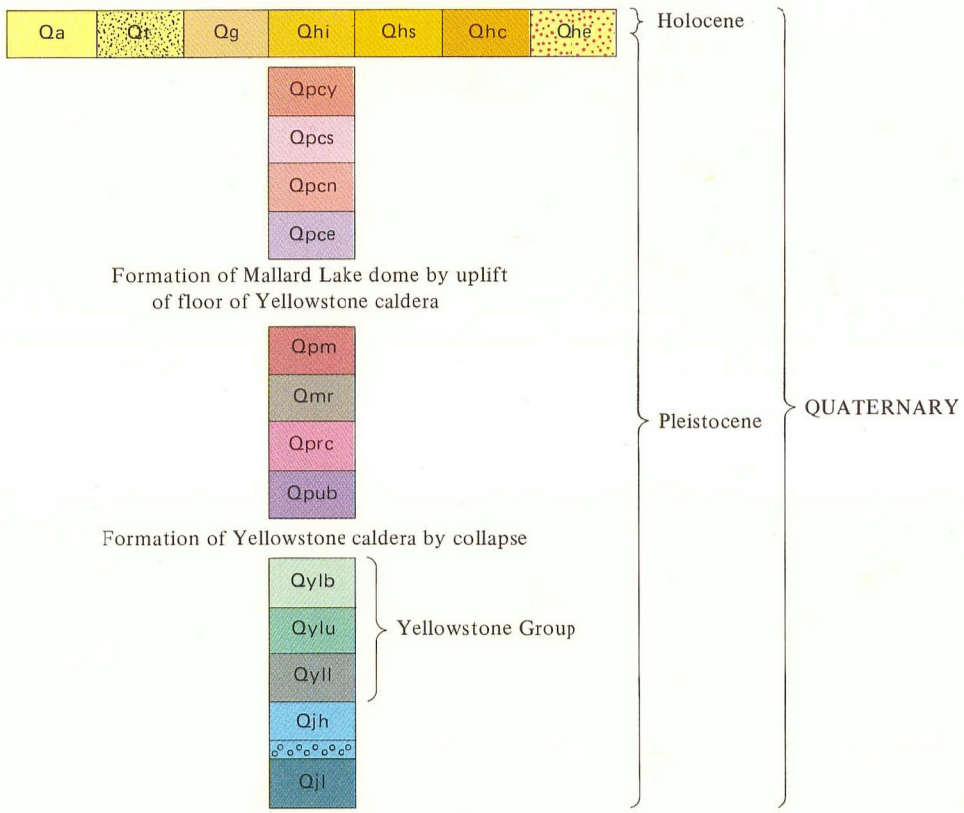
Mount Jackson Rhyolite:
Mainly gray crystalline rhyolite with local light-gray vitrophyric margins. Contains 1-3 mm phenocrysts of quartz, sanidine, plagioclase, and opaque oxides.

Qjh - Mount Jackson Rhyolite, Mount Haynes flow (Pleistocene)
Coincident ash data indicates basal zone of fused air-fall tuff of similar mineralogy to Mount Haynes flow.

Qjl - Mount Jackson Rhyolite, Harlequin Lake flow (Pleistocene)

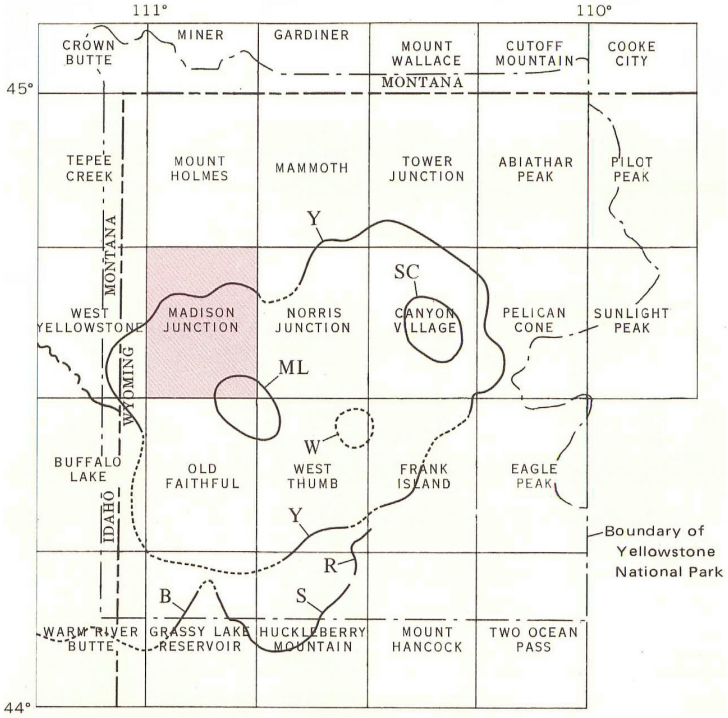
Text from source map: Madison Junction 15' Quadrangle

Correlation of Map Units



Graphic from source map: Madison Junction 15' Quadrangle

Index Map



INDEX MAP OF YELLOWSTONE NATIONAL PARK SHOWING LOCATION OF 15-MINUTE QUADRANGLES AND MAJOR STRUCTURAL FEATURES
Location of this quadrangle indicated by color

Outline of dome

Approximate topographic rim of caldera – Dotted where buried

W — West Thumb caldera rim – Caldera formed by collapse resulting from eruption of tuff of Bluff Point

ML — Mallard Lake dome – Dome formed by magmatic resurgence beneath Yellowstone caldera

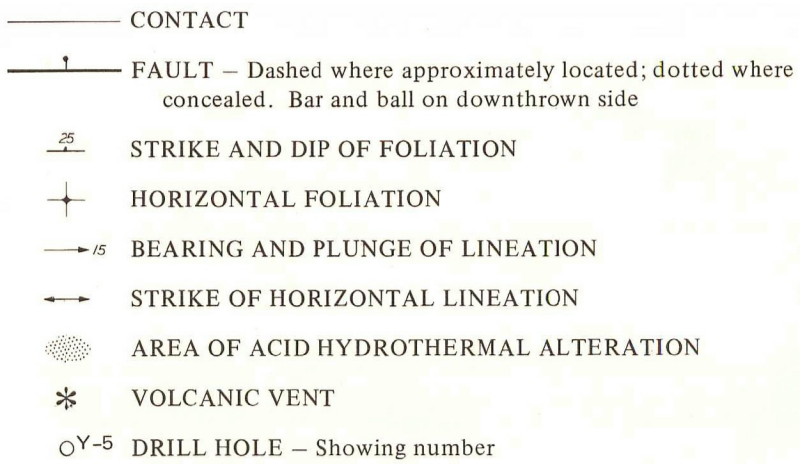
SC — Sour Creek dome – Dome formed by magmatic resurgence beneath Yellowstone caldera

Y — Yellowstone caldera rim – Caldera formed by collapse resulting from eruptions of Lava Creek Tuff

R, S, B — Red Mountains, Snake River, and Big Bend Ridge caldera-rim segments – Remnants of a caldera formed by collapse resulting from eruptions of Huckleberry Ridge Tuff

Graphic from source map: Madison Junction 15' Quadrangle

Map Legend



Graphic from source map: Madison Junction 15' Quadrangle

Abbreviated Stratigraphic Logs of Drill Holes

Depths from surface in feet

Y-2 (Firehole Lake)
- 0-104, surficial deposits
- 104-403, Elaphant Back flow and related pyroclastic rocks
- 403-516, Mallard Lake flow and related pyroclastic rocks (bottom)

Y-3 (Ojo Caliente Spring)
- 0-139, surficial deposits
- 139-234, Nez Perce Creek flow
- 234-514, unnamed flow of Central Plateau Member (bottom)

Y-4 (Nez Perce Creek)
- 0-6, surficial deposits
- 6-691, Nez Perce Creek flow (bottom)

Y-5 (Rabbit Creek)
- 0-32, surficial deposits
- 32-140, member B(?) of Lava Creek Tuff
- 140-538, member A(?) of Lava Creek Tuff (bottom)

Y-13 (Porcupine Hills)
- 0-54, surficial deposits
- 54-230, Nez Perce Creek flow
- 230-456, Elephant Back(?) flow (bottom)

Text from source map: Madison Junction 15' Quadrangle

References

Christiansen, R. L., and Blank, H. R., Jr. 1972, Volcanic stratigraphy of the Quaternary rhyolite plateau in Yellowstone National Park: U.S. Geol. Survey Prof. Paper 729-B, 18p.

Muffler, L. J. P., White, D. E., and Truesdell, A. H., 1971, Hydrothermal explosion craters in Yellowstone National Park: Geol. Soc. America Bull., v. 82, no. 3, p. 723-740.

References from source map: Madison Junction 15' Quadrangle

Mammoth 15' Quadrangle

The formal citation for this source.

> Christiansen, R.L., Prostka, H.J., Ruppel, E.T., Smedes, H.W., 1972, Geologic Map of the Mammoth Quadrangle, Wyoming and Montana: U.S. Geological Survey, unpublished mylar, scale 1:62,500 (*GRI Source Map ID 75605*).

Listing of geologic unit symbols present on the source map. The source map did not contain a legend, unit descriptions, unit names, or any additional information.

Map Unit Listing

Qs, Qa, Ql, Qt, Qhs, Qhc, Qhe, Qg, Qo, Qpcf, Qprs, Qpro, Qpow, Qpoa, Qpol, Qpog, Qpoz, Qsf, Qsfc, Qylb, Qyla, Quf, Qn, Qyhb, Qyha, Qj, T, QTe, Tia, Tid, Tla, Tlf, Tch, Tlr, Tec, Tlrf, Tsa, unknown unit, Tlc, Kl, K, Ke, Kev, Ktc, Kc, Kf, Km, Kt, Kk, Jm, Je, Tru, PNq, PNa, Mm, pCg and **pCu**.

List from source map: Mammoth 15' Quadrangle

Mount Hancock 15' Quadrangle (digital)

The formal citation for this source.

> Love, J.D., 2003, Digital Geologic Map of the Mount Hancock Quadrangle, Yellowstone National Park and Vicinity, Wyoming: U.S. Geological Survey, unpublished digital data, scale 1:62,500 (*GRI Source Map ID 7312*).

Listing of geologic unit symbols and unit names present on the source map. The source map did not contain a legend, unit descriptions, or any additional information.

Map Unit Listing

Qc - Colluvium

Qf - Alluvial fan deposits

Qal - Alluvium of modern channels and flood plains

Qs - Swamp deposits

Qa - Alluvium

Qls - Landslide debris

Qlg - Landslide and glacial debris

Qt - Talus

Qhc, Qyhc - Huckleberry Ridge Tuff of the Yellowstone Group, Member C

Qg - Undifferentiated glacial debris

Qylb - Lava Creek Tuff, Member B

Qel - Pyroxene andesite and basalt of Emerald Lake

Qh - Ridge Tuff of the Yellowstone Group

Qyhb - Ridge Tuff of the Yellowstone Group, Member B

Qg2 - Undifferentiated glacial debris

Qg4, Qml - Morainal debris of youngest major glaciation

Qog - Outwash gravel

Qsb - Slump blocks

QTs - Unnamed scoria

QTb - Basalt of uncertain age

Twi - Wiggins Formation

To - Two Ocean Formation

Tl - Langford Formation

Tla - Alluvial facies

Tt - Trout Peak Andesite, main body

Tc - Colter Formation

Twr - White River Formation

Tbr - Unnamed basalt breccia

TKp - Pinyon Conglomerate

Kh - Harebell Formation

Kb - Bacon Ridge Sandstone

Kc - Cody Shale Formation

Kf - Frontier Formation

Kmt - Mowry and Thermopolis Formations

Ks - Lenticular sandstone and shale sequence

KJm - Cloverly and Morrison Formations

Jls - Lower Sundance Formation

Jgs - Gypsum Spring Formation

TRc - Chugwater Formation

TRcd - Chugwater and Dinwoody Formations, undivided

TRd - Dinwoody Formation

Pp - Phosphoria Formation

PNMta - Tensleep Sandstone and Amsden Formation

Mm - Madison Limestone

Dd - Darby Formation

Ob - Bighorn Dolomite

List from source map: Mount Hancock 15' Quadrangle (digital)

Norris Junction 15' Quadrangle

The formal citation for this source.

> Christiansen, R.L., 1974, Geologic Map of the Norris Junction Quadrangle, Yellowstone National Park, Wyoming: U.S. Geological Survey, Geologic Quadrangle Map GQ-1193, scale 1:62,500 (*GRI Source Map ID 3257*).

Digital data associated with this map was converted from a third-party data source and checked against a georeferenced copy of the above paper source map.
The citation for this digital data:

> Christiansen, R.L., 2007, Digital Geologic Map of the Norris Junction Quadrangle, Yellowstone National Park, Wyoming: U.S. Geological Survey, unpublished digital data, scale 1:62,500 (*GRI Source Map ID 74800*).

Description of geologic units, prominent graphics and text associated with the paper source map.

Description of Map Units

Qa - Alluvial and glaciofluvial deposits (Holocene and Pleistocene)
Unconsolidated coarse- to fine-grained moderately well sorted and well bedded stream-channel, overbank, and fan deposits, glacial outwash, and stream-laid ice-contact deposits.

Qs - Landslide deposits (Holocene and Pleistocene)
Unconsolidated poorly sorted slide deposits with hummocky, generally bouldery surfaces.

Ql - Lacustrine and glaciolacustrine deposits (Holocene and Pleistocene)
Unconsolidated well sorted and well bedded silts and sands deposited in or adjacent to open or ice-dammed lakes.

Qt - Talus (Holocene and Pleistocene)
Unconsolidated coarse angular debris deposited on slopes by rockfalls.

Qhi - Ice contact deposits localized by hot springs (Holocene and Pleistocene)
Commonly well sorted irregularly bedded sandstones and conglomerates deposited against ice from melt waters localized by hot springs. Cemented by zeolites and opaline silica.

Qhs - Silicious hot spring deposits (Holocene and Pleistocene)
Generally white to light-gray siliceous sinter in mounds or sheets around active or extinct hot springs.

Qg - Glacial deposits (Holocene and Pleistocene)
Till, generally lacking distinct morainal form except locally in Gibbon Meadows.

Plateau Rhyolite, Central Plateau Member:
Large rhyolitic lava flows, each containing a wide variety of lithologies and distinguishable from one another only by topographic forms and zonal development of various textural features and emplacement structures. Most exposures are dark pitchstone or obsidian vitrophyres of flow-layered or flow-brecciated rhyolite, but gray to red pumiceous rhyolite and gray, brown, or varicolored crystalline rhyolite also are common; all varieties can occur within a single flow. Flows generally contain abundant 1-3 mm phenocrysts of quartz, sanidine, opaque oxides, and, in glassy zones, sparse clinopyroxene and fayalitic olivine; a few flows also contain minor sodic plagioclase phenocrysts.

Qpce - Plateau Rhyolite, Central Plateau Member, Elephant Back flow (Pleistocene)

Qpci - Plateau Rhyolite, Central Plateau Member, Gibbon River flow (Pleistocene)

Qpcf - Plateau Rhyolite, Central Plateau Member, Solfatara Plateau flow (Pleistocene)

Qpch - Plateau Rhyolite, Central Plateau Member, Hayden Valley flow (Pleistocene)

Qpcn - Plateau Rhyolite, Central Plateau Member, Nez Perce Creek flow (Pleistocene)
Queried map symbols indicate outcrops in Gibbon Canyon area correlated uncertainly with Nez Perce Creek flow.

Qpcm - Plateau Rhyolite, Central Plateau Member, Mary Lake flow (Pleistocene)

Qpcu - Plateau Rhyolite, Central Plateau Member, Spruce Creek flow (Pleistocene)
Queried map symbols indicate outcrops in central Hayden Valley correlated uncertainly with Spruce Creek flow.

Qpcw - Plateau Rhyolite, Central Plateau Member, West Thumb flow (Pleistocene)

Qpcl - Plateau Rhyolite, Central Plateau Member, Tuff of Bluff Point (Pleistocene)
Small poor exposure of glassy partly welded ash-flow tuff containing abundant 1-3 mm phenocrysts of quartz, sanidine, and sodic plagioclase and sparse clinopyroxene and opaque oxides. This informal unit previously was considered part of the Shoshone Lake Tuff Member which has been found to comprise more than one stratigraphic unit and is hereby abandoned.

Qu - Sediments of upper Falls (Pleistocene)
Generally well bedded sequence of unconsolidated lacustrine and fluvial sands, gravels, silts, and clays and some till. Overlain by Hayden Valley flow; underlain by Canyon flow.

Qpm - Plateau Rhyolite, Mallard Lake Member, Mallard Lake flow (Pleistocene)
Lithologically and petrographically like flows of Central Plateau Member, but most glassy parts have been eroded off. Phenocrysts of quartz, sanidine, and minor opaque oxides. NOTE: The Mallard Lake Member is younger than the Upper Basin Member, rather than older as stated by Christiansen and Blank (1972).

Plateau Rhyolite, Obsidian Creek Member:
Large rhyolitic lava flows, each containing a wide variety of lithologies and distinguishable from one another only by topographic forms and zonal development of various textural features and emplacement structures. Most exposures are dark pitchstone or obsidian vitrophyres of flow-layered or flow-brecciated rhyolite, but gray to red pumiceous rhyolite and gray, brown, or varicolored crystalline rhyolite also are common; all varieties can occur within a single flow. Flows generally contain abundant 1-3 mm phenocrysts of quartz, sanidine, opaque oxides, and, in glassy zones, sparse clinopyroxene and fayalitic olivine; a few flows also contain minor sodic plagioclase phenocrysts.

Qpoc - Plateau Rhyolite, Obsidian Creek Member, Geyser Creek dome (Pleistocene)

Qpoh - Plateau Rhyolite, Obsidian Creek Member, Gibbon Hill dome (Pleistocene)

Qpop - Plateau Rhyolite, Obsidian Creek Member, Paintpot Hill dome (Pleistocene)
Extrusive rhyolitic domes, each with a core of gray crystalline rhyolite and a shell of black vitrophyre or gray pumiceous flow breccia. Contain 1-2 mm phenocrysts of quartz, sanidine, sodic plagioclase, opaque oxides, and sparse clinopyroxene. Age relations between individual domes or between the Obsidian Creek and Upper Basin Members uncertain.

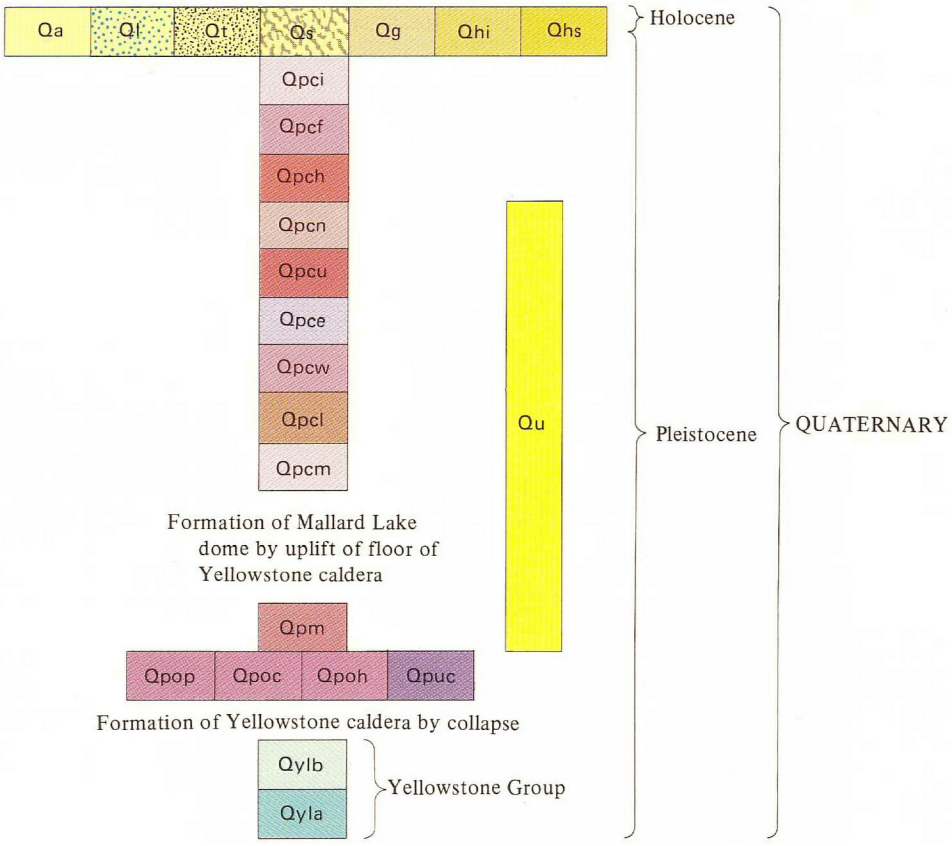
Qpuc - Plateau Rhyolite, Upper Basin Member, Canyon flow (Pleistocene)
Rhyolitic lava flow. Brown to gray crystallized rhyolite and black pitchstone vitrophyre. Contains abundant 1-5 mm phenocrysts of quartz and sodic plagioclase, and, in glassy zones, clinopyroxene. No sanidine phenocrysts.

Qylb - Lava Creek Tuff, Member B (Pleistocene)
Gray, brown, or pinkish-gray ash-flow tuff. Devitrified throughout; generally densely welded except for partially welded vapor-phase zones at top and bottom. Lithic inclusions locally abundant. Abundant 1-5 mm phenocrysts of quartz, sanidine, and sodic plagioclase; some sanidine phenocrysts as much as about 1 cm; sparse opaque oxides, clinopyroxene, and fayalitic olivine phenocrysts. Thin basal zone of phenocryst-poor tuff grades downward from densely welded to partly welded and is underlain locally by thin well-bedded crystal ash.

Qyla - Lava Creek Tuff, Member A (Pleistocene)
Similar to member B but generally brown. Mainly devitrified, but black vitrophyre and gray microspherulitic zone at base. Contains abundant large phenocrysts throughout.

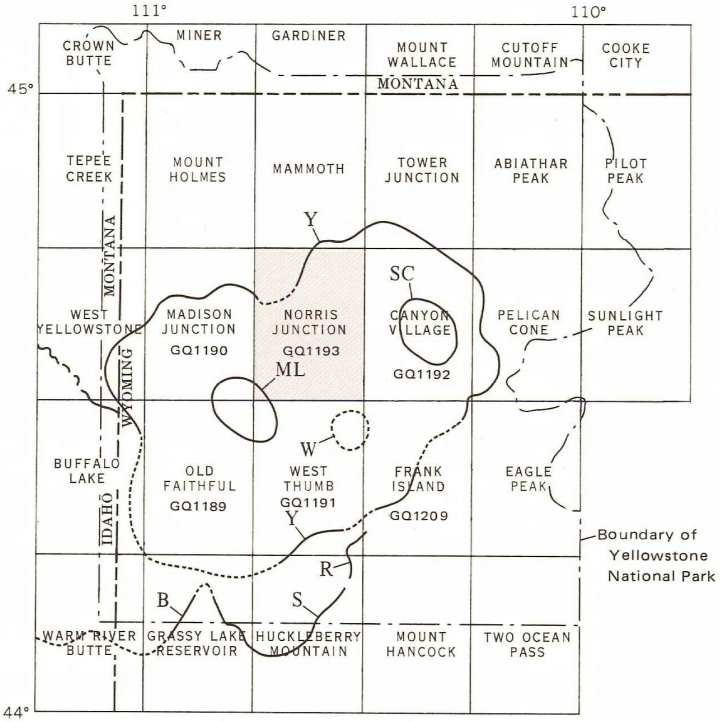
Text from source map: Norris Junction 15' Quadrangle

Correlation of Map Units



Graphic from source map: Norris Junction 15' Quadrangle

Index Map



INDEX MAP OF YELLOWSTONE NATIONAL PARK SHOWING LOCATION OF 15-MINUTE QUADRANGLES AND MAJOR STRUCTURAL FEATURES

Location of this quadrangle indicated by color

Outline of dome

Approximate topographic rim of caldera – Dotted where buried

W — West Thumb caldera rim – Caldera formed by collapse resulting from eruption of tuff of Bluff Point

ML — Mallard Lake dome – Dome formed by magmatic resurgence beneath Yellowstone caldera

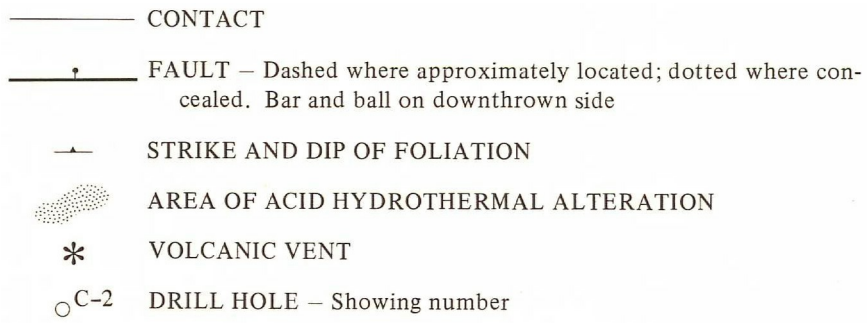
SC — Sour Creek dome – Dome formed by magmatic resurgence beneath Yellowstone caldera

Y — Yellowstone caldera rim – Caldera formed by collapse resulting from eruptions of Lava Creek Tuff

R, S, B — Red Mountains, Snake River, and Big Bend Ridge caldera-rim segments – Remnants of a caldera formed by collapse resulting from eruptions of Huckleberry Ridge Tuff

Graphic from source map: Norris Junction 15' Quadrangle

Map Legend



Graphic from source map: Norris Junction 15' Quadrangle

Abbreviated Stratigraphic Logs of Drill Holes

Depths from surface, in feet

C-2 (Norris Geyser Basin)
0-78, member B of Lava Creek Tuff
78-265, member A of Lava Creek Tuff (bottom)

Y-9 (Norris Geyser Basin)
0-4, surficial deposits
4-128, member B of Lava Creek Tuff
128-812, member A of Lava Creek Tuff (bottom)

Y-12 (Norris Geyser Basin)
0-10, surficial deposits
10-124, member B of Lava Creek Tuff
124-1,088, member A of Lava Creek Tuff (bottom)

Text from source map: Norris Junction 15' Quadrangle

References

Christiansen, R. L., and Blank, H. R., Jr. 1972, Volcanic stratigraphy of the Quaternary rhyolite plateau in Yellowstone National Park: U.S. Geol. Survey Prof. Paper 729-B, 18p.

References from source map: Norris Junction 15' Quadrangle

Old Faithful 15' Quadrangle

The formal citation for this source.

Christiansen, R.L., Blank, H.R., 1974, Geologic Map of the Old Faithful Quadrangle, Yellowstone National Park, Wyoming: U.S. Geological Survey, Geologic Quadrangle Map GQ-1189, scale 1:62,500 (*GRI Source Map ID 3255*).

Digital data associated with this map was converted from a third-party data source and checked against a georeferenced copy of the above paper source map.
The citation for this digital data:

Christiansen, R.L., Blank, H.R., 2007, Digital Geologic Map of the Old Faithful Quadrangle, Yellowstone National Park, Wyoming: U.S. Geological Survey, unpublished digital data, scale 1:62,500 (*GRI Source Map ID 74798*).

Description of geologic units, prominent graphics and text associated with the paper source map.

Description of Map Units

Qa - Alluvium and glaciofluvial deposits (Holocene and Pleistocene)
Unconsolidated coarse- to fine-grained moderately well sorted and well bedded stream-channel, overbank, and fan deposits, glacial outwash, and stream-laid ice-contact deposits.

Qt - Talus and colluvium (Holocene and Pleistocene)
Unconsolidated generally coarse angular debris deposited on slopes by rockfalls or debris flows.

Qhi - Ice contact deposits localized by hot springs (Holocene and Pleistocene)
Commonly well sorted irregularly bedded sandstones and conglomerates deposited against ice from melt waters localized by hot springs. Cemented by zeolites and opaline silica.

Qhs - Silicious hot spring deposits (Holocene and Pleistocene)
Generally white to light-gray siliceous sinter in mounds or sheets around active or extinct hot springs. Locally includes black manganiferous sinter.

Qg - Glacial deposits (Holocene and Pleistocene)
Till, generally lacking morainal form.

Plateau Rhyolite:
Large rhyolitic lava flows, each containing a wide variety of lithologies and distinguishable from one another only by topographic forms and zonal development of various textural features and emplacement structures. Most exposures are dark pitchstone or obsidian vitrophyres of flow-layered or flow-brecciated rhyolite, but gray to red pumiceous rhyolite and gray, brown, or varicolored crystalline rhyolite also are common; all varieties can occur within a single flow. All flows contain abundant 1-3 mm phenocrysts of quartz, sanidine, opaque oxides, and, in glassy zones, sparse clinopyroxene and fayalitic olivine.

Qpcp - Plateau Rhyolite, Central Plateau Member, Pitchstone Plateau flow (Pleistocene)

Qpcg - Plateau Rhyolite, Central Plateau Member, Grants Pass flow (Pleistocene)

Qpcy - Plateau Rhyolite, Central Plateau Member, West Yellowstone Flow (Pleistocene)

Qpct - Plateau Rhyolite, Central Plateau Member, Trischman Knob dome (Pleistocene)

Qpck - Plateau Rhyolite, Central Plateau Member, Douglas Knob dome (Pleistocene)

Qpcr - Plateau Rhyolite, Central Plateau Member, Bechler River flow (Pleistocene)

Qpcs - Plateau Rhyolite, Central Plateau Member, Summit Lake flow (Pleistocene)

Qpcb - Plateau Rhyolite, Central Plateau Member, Buffalo Lake flow (Pleistocene)

Qpcc - Plateau Rhyolite, Central Plateau Member, Spring Creek flow (Pleistocene)
Queried map symbol indicates outcrops southwest of Shoshone Lake correlated uncertainly with Spring Creek flow

Qpco - Plateau Rhyolite, Central Plateau Member, Tuff of Cold Mountain Creek (Pleistocene)
Multiple-flow cooling unit of ash-flow tuff. Nonwelded to partly welded, largely glassy but locally crystallized in vapor-phase zone. Contains abundant 1-3 mm phenocrysts of quartz and sanidine, and sparse sodic plagioclase, clinopyroxene, and opaque oxides. Age relations between tuff of Cold Mountain Creek, West Yellowstone flow, Trischman Knob dome, and Douglas Knob dome are uncertain. This informal unit previously was considered part of the Shoshone Lake Tuff Member which has been found to comprise more than one stratigraphic unit and is hereby abandoned.

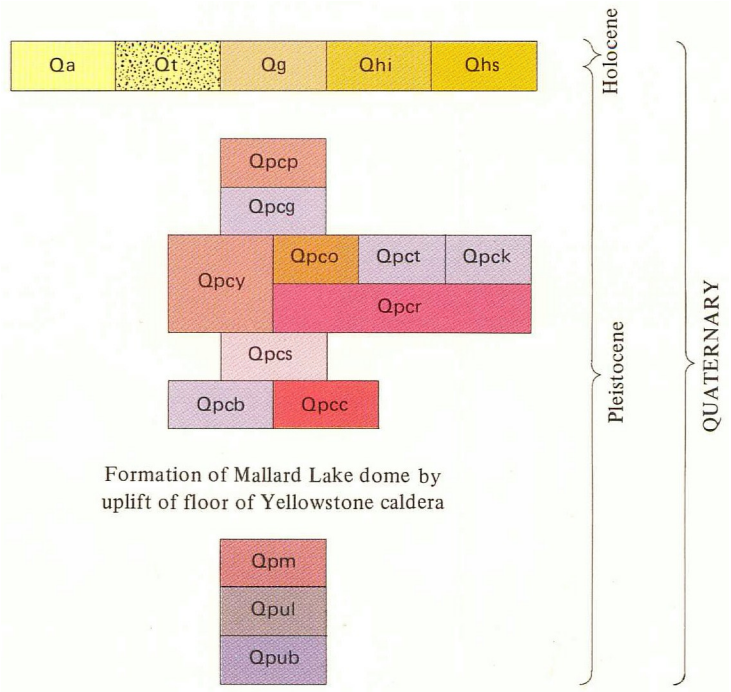
Qpm - Plateau Rhyolite, Mallard Lake Member, Mallard Lake flow (Pleistocene)
Lithologically and petrographically like flows of Central Plateau Member, but most glassy parts have been eroded off. Phenocrysts of quartz, sanidine, and minor opaque oxides. NOTE: The Mallard Lake Member is younger than the Upper Basin Member, rather than older as stated by Christiansen and Blank (1972).

Qpul - Plateau Rhyolite, Upper Basin Member, Scaup Lake flow (Pleistocene)
Similar to rhyolites of Central Plateau Member but contains, in addition, moderately abundant phenocrysts of sodic plagioclase, and clinopyroxene phenocrysts are more abundant.

Qpub - Plateau Rhyolite, Upper Basin Member, Biscuit Basin Flow (Pleistocene)
Generally exposed as black perlitic vitrophyre of flow-brecciated rhyolite. Contains abundant phenocrysts, as much as 5 mm, of deeply embayed and sieved plagioclase, moderately abundant quartz and clinopyroxene, and sparse sanidine and opaque oxides.

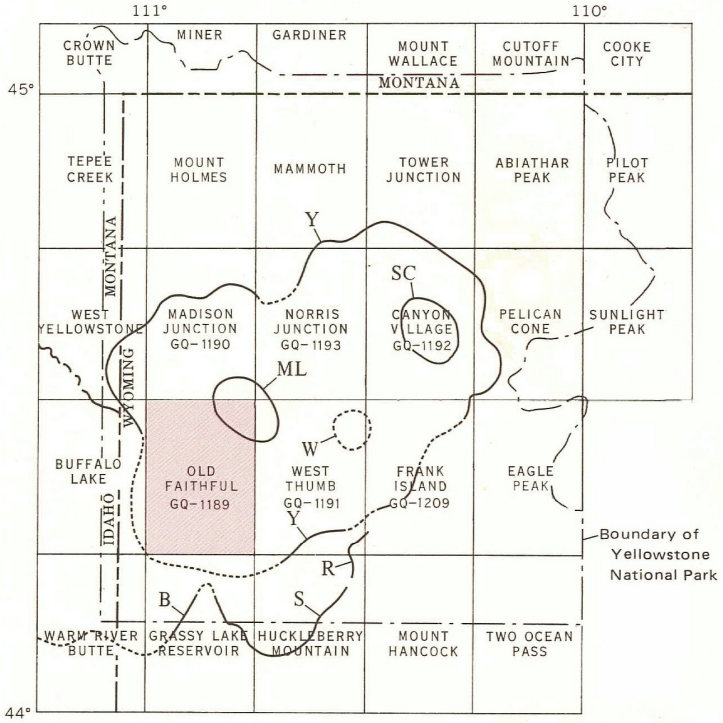
Text from source map: Old Faithful 15' Quadrangle

Correlation of Map Units



Graphic from source map: Old Faithful 15' Quadrangle

Index Map



INDEX MAP OF YELLOWSTONE NATIONAL PARK SHOWING LOCATION OF 15-MINUTE QUADRANGLES AND MAJOR STRUCTURAL FEATURES
Location of this quadrangle indicated by color

Outline of dome

Approximate topographic rim of caldera – Dotted where buried

W — West Thumb caldera rim – Caldera formed by collapse resulting from eruption of tuff of Bluff Point

ML — Mallard Lake dome – Dome formed by magmatic resurgence beneath Yellowstone caldera

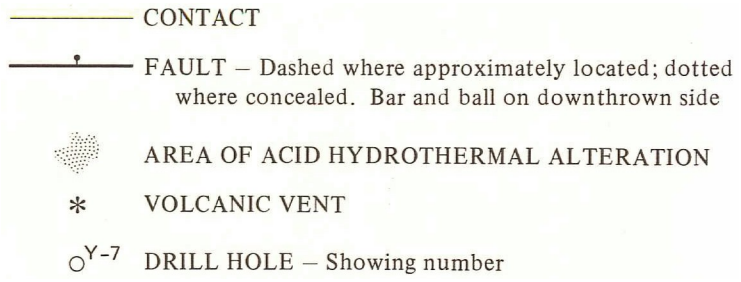
SC — Sour Creek dome – Dome formed by magmatic resurgence beneath Yellowstone caldera

Y — Yellowstone caldera rim – Caldera formed by collapse resulting from eruptions of Lava Creek Tuff

R, S, B — Red Mountains, Snake River, and Big Bend Ridge caldera-rim segments – Remnants of a caldera formed by collapse resulting from eruptions of Huckleberry Ridge Tuff

Graphic from source map: Old Faithful 15' Quadrangle

Map Legend



Graphic from source map: Old Faithful 15' Quadrangle

Abbreviated Stratigraphic Logs of Drill Holes

Depths from surface, in feet

Y-1 (Black Sand Basin)
0-212, surficial deposits
212-215, Biscuit Basin flow (bottom)

Y-6 (Lone Star Geyser)
0-69, surficial deposits
69-500, Scaup Lake flow (bottom)

Y-7 (Biscuit Basin)
0-173, surficial deposits
173-242, Biscuit Basin flow (bottom)

Y-8 (Biscuit Basin)
0-181, surficial deposits
181-503, Biscuit Basin flow and related pyroclastic rocks (bottom)

C-1 (Myriad Creek)
0-220, surficial deposits
220-406, Biscuit Basin flow (bottom)

Text from source map: Old Faithful 15' Quadrangle

References

Christiansen, R. L., and Blank, H. R., Jr. 1972, Volcanic stratigraphy of the Quaternary rhyolite plateau in Yellowstone National Park: U.S. Geol. Survey Prof. Paper 729-B, 18p.

References from source map: Old Faithful 15' Quadrangle

Pelican Cone 15' Quadrangle

The formal citation for this source.

Prostka, H.J., Smedes, H.W., Christiansen, R.L., 1975, Geologic Map of the Pelican Cone Quadrangle, Yellowstone National Park and Vicinity, Wyoming: U.S. Geological Survey, Geologic Quadrangle Map GQ-1243, scale 1:62,500 (*GRI Source Map ID 3249*).

Digital data associated with this map was converted from a third-party data source and checked against a georeferenced copy of the above paper source map.
The citation for this digital data:

U.S. Geological Survey, 2007, Digital Geologic Map of the Pelican Cone Quadrangle, Yellowstone National Park and Vicinity, Wyoming: U.S. Geological Survey, unpublished digital data, scale 1:62,500 (*GRI Source Map ID 74796*).

Description of geologic units, prominent graphics and text associated with the paper source map.

Description of Map Units

Qa - Alluvial and glaciofluvial deposits (Holocene and Pleistocene)
Unconsolidated coarse- to fine-grained moderately well-sorted and well-bedded stream-channel. over-bank, and fan deposits, glacial outwash, and stream-laid ice contact deposits.

Qs - Landslide deposits (Holocene and Pleistocene)
Unconsolidated, poorly sorted slide deposits which have hummocky, generally bouldery surfaces.

Ql - Lacustrine and glaciolacustrine deposits (Holocene and Pleistocene)
Unconsolidated well-sorted and well-bedded silts, sands, and minor gravels deposited in or adjacent to open or ice-dammed lakes.

Qt - Talus and colluvium (Holocene and Pleistocene)
Unconsolidated generally coarse angular debris deposited on slopes by rockfalls or debris flows.

Qhi - Ice contact deposits (Holocene and Pleistocene)
Commonly well-sorted irregularly bedded sandstones and conglomerates deposited against ice from melt waters localized by hot springs. Cemented by zeolites and opaline silica.

Qhs - Silicious hot spring deposits (Holocene and Pleistocene)
Generally white to light-gray siliceous sinter in mounds or sheets around active or extinct hot springs.

Qhe - Hydrothermal explosion deposits (Holocene and Pleistocene)
Fine- to coarse-grained poorly sorted and poorly bedded deposits around Turbid Lake (off map to west) and in the group of hot springs (northwest part of map); deposits probably ejected from enclosed lake basins during episodes of explosive steam generation. (See Muffler and others, 1971).

Qg - Glacial deposits (Holocene and Pleistocene)
Till generally lacking distinct morainal form.

Qo - Osprey Basalt (Pleistocene)
Dark-gray, commonly columnar jointed lava flows of dense aphanitic basalt containing sparse

plagioclase phenocrysts; locally interlayered with well-sorted yellowish-brown gravels. Whole rock dated by K-Ar method at about 208,000 years (J. D. Obradovich, written commun., 1972). 0-400 feet (0-122 m) thick.

Qylb - Lava Creek Tuff, Member B (Pleistocene)
Gray, brown or pinkish-gray rhyolitic ash-flow tuff. Mainly devitrified but glassy or microspherulitic at base; generally densely welded except for partially welded vapor-phase zone at top. Lithic inclusions locally abundant. Abundant 1-5 mm phenocrysts of quartz, sanidine, and sodic plagioclase; some sanidine phenocrysts as much as about 1 cm; sparse opaque oxides, clinopyroxene, and fayalitic olivine phenocrysts. Thin basal zone of phenocryst-poor tuff is locally underlain by well-bedded light-gray nonwelded air-fall ash and pumice. Sanidine, dated by K-Ar method by J. D. Obradovich at 600,000 years (Christiansen and Blank, 1972). 0-640 feet (0-195 m) thick.

Qyhb - Huckleberry Ridge Tuff, Member B (Pleistocene)
Medium-gray to brown devitrified welded rhyolitic ash-flow tuff. Phenocrysts of quartz, sanidine, and sodic plagioclase and sparse opaque oxides, clinopyroxene, and fayalitic olivine; phenocrysts particularly abundant and large (as much as 5 mm) in upper part, very sparse in lower part. Two types of welded pumice in upper part, one very dark, the other light colored. Sanidine dated by K-Ar method by J. D. Obradovich at about 2 m.y. (million years) (Christiansen and Blank, 1972). 0-240 feet (0-73 m) thick.

Qyha - Huckleberry Ridge Tuff, Member A (Pleistocene)
Medium-gray to brown, mostly devitrified welded rhyolitic ash-flow tuff. Lower part of member contains abundant (40-50 percent) phenocrysts of quartz, oligoclase, and sanidine that decrease in abundance upward. Basal part of unit consists of a thin black vitrophyric welded tuff overlain by dark-gray microspherulitic densely welded tuff. 0-200 feet (0-61 m) thick.

Qbc - Rhyolite of Broad Creek (Pleistocene)
Rhyolite lava flow, partly glassy and partly crystallized. Contains moderately abundant 1-2 mm phenocrysts of quartz and sanidine.

Tli - Absaroka Volcanic Supergroup, Langford Formation, Intrusive rocks (Eocene)
Medium-gray to light-gray dikes and plugs of andesite, dacite, and diorite porphyry containing phenocrysts of plagioclase, pyroxene, hornblende, and biotite.

Tlv - Langford Formation, Vent facies deposits (Eocene)
Light- to medium-gray and brown andesitic laharic breccias, autoclastic flow breccias, thin discontinuous lava flows,-and tuffs, all variably altered to shades of red, purple, and yellowish gray. These rocks have primary dips of as much as 70 degrees, and form part of a composite, deeply eroded, andesitic volcanic cone in the southwestern corner of the quadrangle. Unit locally strongly hornfelsed by intrusive (Tli) plug southwest of Crow Creek Pass. 0-1,200 feet (0-366 m) thick.

Tla - Langford Formation, Alluvial facies deposits (Eocene)
Light-gray to medium-gray well-sorted, massively bedded alluvial-facies volcanic breccia and conglomerate consisting of dark-gray subangular to subrounded clasts of pyroxene andesite and hornblende andesite in a light- to medium-gray ash-rich matrix. 0-1,200 (0-366 m) thick.

Tlf - Langford Formation, andesitic lava flows (Eocene)
Gray, brown, and reddish-brown massive and platy-jointed thick lava flows and flow breccias of hornblende-pyroxene andesite and pyroxene andesite. Unit forms conspicuous craggy peaks. 0-720 feet (0-219 m) thick.

Tlp - Absaroka Volcanic Supergroup, Promontory Member (Eocene)
Westward-thickening tongues of medium- to dark-brown well-sorted, massively bedded alluvial-

facies andesitic volcanic breccia and conglomerate consisting of clasts of andesite in a tuffaceous matrix. 0-950 feet (0-290 m) thick.

Tt - Trout Peak Trachyandesite, Main body (Eocene)
Medium-gray to dark-gray and reddish-brown columnar-jointed lava flows and flow breccias of shoshonite and absarokite (trachyandesite) containing minor interbeds of light-gray pumiceous tuff and brown volcanic conglomerate. Lava flows, 0-60 feet (0-18 m) thick, are finely to coarsely porphyritic containing phenocrysts of plagioclase, augite, and olivine. 160-1,600 feet (49-488 m) thick.

Tti - Trout Peak Trachyandesite, Dikes of shoshonite (Eocene)

Ttp - Trout Peak Trachyandesite, Pacific Creek Tuff Member (Eocene)
Light-yellowish-gray and yellowish-brown rhyodacite welded ash-flow tuff containing mafic lithic fragments, pumice, and abundant phenocrysts of anorthoclase, plagioclase, and biotite. Unit missing throughout most of its original extent because of pre-Langford erosion. 0-150 feet (0-46 m) thick.

Tta - Trout Peak Trachyandesite, Andesitic volcanic sediments (Eocene)
Medium-brown well-sorted andesitic volcanic breccia, conglomerate, and tuffaceous sandstone that compose westward-thining tongues in the main body (Tt) in the southeastern part of quadrangle. 0-400 feet (0-122 m) thick.

Twa - Wapiti Formation, Alluvial facies (Eocene)
Medium- to dark-brown massively bedded well-sorted to poorly sorted volcanic breccias and minor amounts of tuffaceous volcanic sandstone. Consists of subangular clasts of pyroxene andesite and shoshonite (trachyandesite) in a tuffaceous matrix. Unit thickens northward. 0-560 feet (0-171 m) thick.

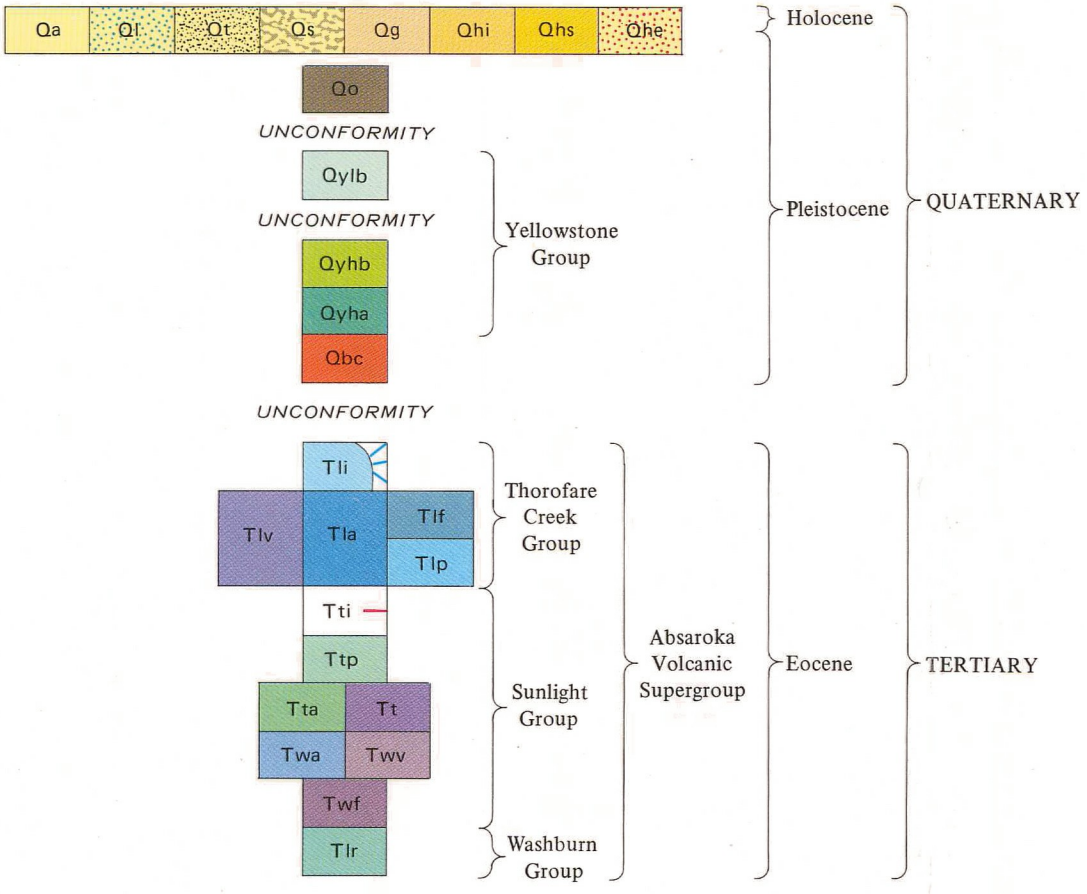
Twv - Wapiti Formation, Vent facies (Eocene)
Medium- to dark-brown and reddish-brown, crudely bedded laharic breccia, autoclastic flow breccia, tuff, and thin lenticular lava flows of pyroxene andesite and shoshonite that form part of a composite volcanic cone centered east of the quadrangle. 0-2,400 feet (0-732 m) thick.

Twf - Wapiti Formation, Mafic lava flows (Eocene)
Dark-reddish-brown mafic lava flows restricted to northeastern part of quadrangle. 0-90 feet (0-27 m) thick.

Tlr - Lamar River Formation, Alluvial facies (Eocene)
Medium- to light-brown, yellow, and green well-bedded alluvial-facies volcanic conglomerate, sandstone, tuff, and well-sorted breccia; fragments are subangular to subrounded clasts of pyroxene andesite and pyroxene-hornblende andesite. Fossil trees, common throughout this unit, are especially abundant in the finer grained beds. 0-850 feet (0-259 m) thick.

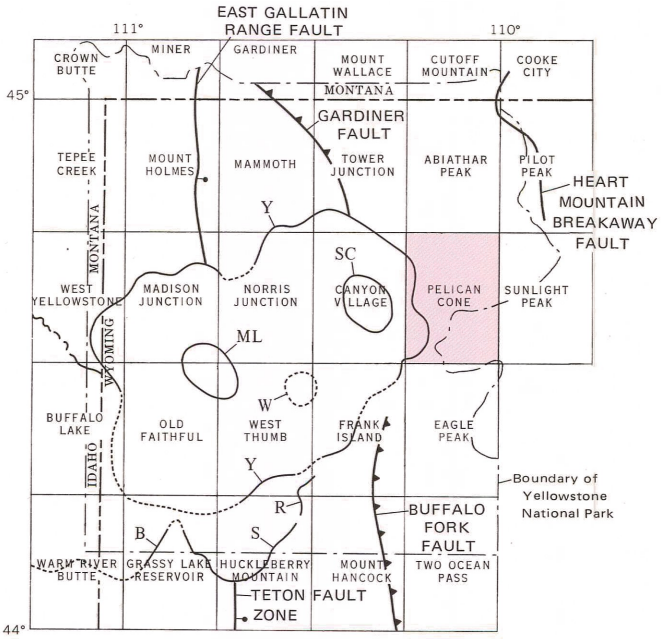
Text from source map: Pelican Cone 15' Quadrangle

Correlation of Map Units



Graphic from source map: Pelican Cone 15' Quadrangle

Index Map



INDEX MAP OF YELLOWSTONE NATIONAL PARK, SHOWING LOCATION OF 15-MINUTE QUADRANGLES AND MAJOR STRUCTURAL FEATURES

Location of this quadrangle indicated by color

Fault – Bar and ball on downthrown side

Thrust fault – Sawteeth on upper plate

Outline of dome

Approximate topographic rim of caldera – Dotted where buried

W — West Thumb caldera rim – Caldera formed by collapse resulting from eruption of tuff of Bluff Point

ML — Mallard Lake dome – Dome formed by magmatic resurgence beneath Yellowstone caldera

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Y — Yellowstone caldera rim – Caldera formed by collapse resulting from eruptions of Lava Creek Tuff

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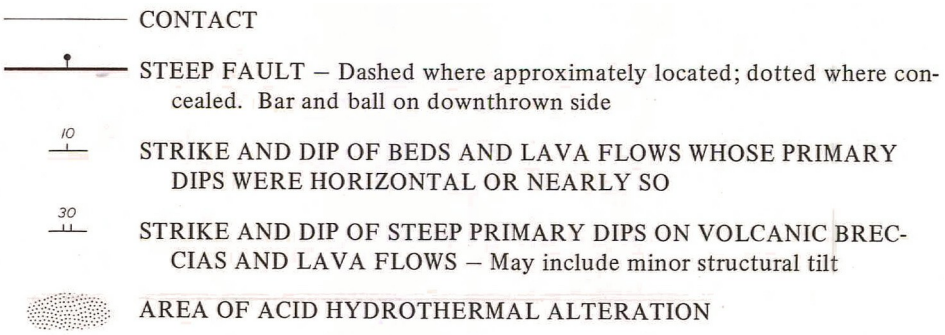
Graphic from source map: Pelican Cone 15' Quadrangle

Map Legend



Graphic from source map: Pelican Cone 15' Quadrangle

References

Christiansen, R. L., and Blank, H. R., Jr., 1972, Volcanic stratigraphy of the Quaternary rhyolite plateau in Yellowstone National Park: U.S. Geol. Survey Prof. Paper 729-B, 18 p.

Muffler, L. J. P., White, D. E., and Truesdell, A. H., 1971, Hydrothermal explosion craters in Yellowstone National Park: Geol. Soc. America Bull., v. 82, no. 3, p. 723-740.

Smedes, H. W., and Prostka, H. J., 1972, Stratigraphic framework of the Absaroka Volcanic Supergroup in the Yellowstone National Park region: U.S. Geol. Survey Prof. Paper 729-C, 33 p.

References from source map: Pelican Cone 15' Quadrangle

Pilot Peak 15' Quadrangle

The formal citation for this source.

Pierce, W.G., Nelson, W.H., Prostka, H.J., 1973, Geologic Map of the Pilot Peak Quadrangle, Park County, Wyoming: U.S. Geological Survey, Miscellaneous Geologic Investigations Map I-816, scale 1:62,500 (*GRI Source Map ID 6380*).

Description of geologic units, prominent graphics and text associated with this source map.

Description of Map Units

Qal - Alluvium (Pleistocene and Holocene)
Mostly unconsolidated deposits of silt, sand, and gravel, forming alluvial fans and valley flood-plain deposits. Locally grades upslope into and includes colluvium and avalanche debris. Locally includes small areas of moraine between fans.

Ql - Landslide deposits (Holocene and Pleistocene)
Heterogeneous deposits of rock debris emplaced by mass movement.

Qr - Rock glacier or block field (Holocene and Pleistocene)
Blocky rock waste. In cirques forms rock glaciers that have a lobate form with flow ridges and furrows. The main block fields mapped are near Hurricane Mesa.

Qm - Morainal deposits (Pleistocene and Holocene)
Mostly glacial till; commonly displays morainal form. Locally grades upslope into talus in cirque areas. Includes small areas of alluvial fan and avalanche deposits.

Qyl - Lava Creek Tuff (Holocene and Pleistocene)
Rhyolitic ash-flow tuff of the Yellowstone group.

Ts - Latite Porphyry (Eocene)
light to medium-gray finely porphyritic sill.

Tr - Augite trachyandesite (Eocene)
Ring dike of dark-gray aphanitic rock with large phenocrysts of augite, olivine, and plagioclase.

Tir - Dikes (Eocene)
Trachyandesite, basalt, and dacite dikes, sills and larger irregular intrusive bodies. Incompletely mapped, especially in central one-third of quadrangle.

Tdn - Dioritite and Niorite (Eocene)
Plug of light- to medium-gray diorite and norite.

Tl - Langford Formation (Eocene)
Light-colored pumiceous andesitic volcanic conglomerate, sandstone, breccia, and tuff. Thickness 400 feet.

Tt - Trout Peak Trachyandesite, massive dark colored lava flows and breccias of basalt and trachyandesite with minor tuff (Eocene)
Massive dark-colored lava flows and breccias of basalt and trachyandesite (shoshonite and absarokite) with minor tuff. Thickness 1,500 feet.

Tta - Trout Peak Trachyandesite, volcanic conglomerate and sandstone (Eocene)
Volcanic conglomerate and sandstone. Thickness 0-1,200 feet.

Twa - Wapiti Formation, volcanic conglomerate and sandstone, and polylithologic breccia with minor amounts of monolithologic breccia and volcanic flows (Eocene)
Volcanic conglomerate and sandstone, and polylithologic breccia with minor amounts of monolithologic breccia and volcanic flows. Thickness 0-600 feet.

Tw - Wapiti Formation, mostly dark brown crudely bedded andesitic volcanic breccia and lenticular lava flows (Eocene)
Mostly dark-brown crudely bedded andesitic volcanic breccia (dominant) and lenticular lava flows, with subordinate volcanic conglomerate and sandstone; lava flows and clasts contain phenocrysts of plagioclase, olivine, and augite. Breccia mostly monolithologic, nonreworked, near-vent material. Conglomerate, sandstone, and a minor amount of crudely bedded breccia; composed of andesitic fragments of various textures and shades of brown and reddish brown; interpreted to be mudflow and alluvial deposits. Thickness > 2,800 feet.

Twf - Wapiti Formation, lava flows mapped separately (Eocene)
Lava flows mapped separately. Thickness 0-500 feet.

Lamar River:
Before deposition of the Lamar River Formation was complete, volcanic rocks and Paleozoic sedimentary rocks east of the Abiathar break-away fault were transported southeastward on the Heart Mountain fault. Transported volcanic rocks include all of the Cathedral Cliffs Formation and most of the Lamar River Formation. The youngest part of the Lamar Aver Formation was deposited after Heart Mountain faulting. Upper part of Lamar River Formation is equivalent to lower part of Wapiti Formation in areas previously mapped to the southeast. Thickness < 2,200 feet.

Tlr - Lamar River Formation, medium brown and yellowish brown well bedded andesitic volcanic conglomerate, breccia, sandstone, and tuff, and minor intrusive andesite (Eocene)
Medium-brown and yellowish-brown well-bedded andesitic volcanic conglomerate, breccia, sandstone, and tuff and minor intrusive andesite. Clasts are pyroxene andesite and hornblende andesite.

Tli - Lamar River Formation, light to dark gray and brown autobrecciated intrusive andesite (Eocene)
Light- to dark-gray and brown autobrecciated intrusive andesite; occurs as irregular pods that locally contain abundant inclusions.

Tec - Lamar River Formation, Elk Creek Basalt Member (Eocene)
lava flows of trachyandesite (shoshonite and absarokite) and interlayered volcanic sediments. Thickness < 700 feet.

Tlc - Lamar River and Cathedral Cliffs Formations, undivided (Eocene)
Andesitic, rhyodacitic and latitic volcanic sedimentary rocks and subordinate intrusive rocks that contain hornblende, plagioclase, augite, and hypersthene phenocrysts.

Tcc - Absaroka Volcanic Supergroup, Cathedral Cliffs Formation (Eocene)
Volcanic sandstone, siltstone, breccia, conglomerate, and tuff; light to medium olive and greenish gray; component fragments include andesite, latite, and rhyodacite, quartzite, sparse to locally abundant limestone and granitic rocks, quartz, plagioclase, potassium feldspar, hornblende, augite, biotite, and opaque minerals. Top of formation locally marked by detached limestone blocks emplaced by the Reef Creek fault. Thickness 0-900 feet.

Tc - Crandall Conglomerate (Eocene)
Stream-channel deposit of well-cemented coarse conglomerate. Roundstones mostly derived

from Madison, Jefferson, and Bighorn Formations, a few from older formations. Thickness more-than 350 feet.

Mm - Madison Limestone (Upper and Lower Mississippian)
Blue-gray massive limestone, dolomitic in part; upper half somewhat thicker bedded and more massive than lower half. Thickness as much as 600 feet but indeterminate as top not present.

MDtj - Three Forks and Jefferson Formations (Lower Mississippian and Upper Devonian)
Three Forks Formation, of Late Devonian and Early Mississippian age, is yellow, greenish-gray, and dark-gray dolomitic siltstone, black fissile shale, and silty dolomite. Thickness about 100 feet.Jefferson Formation, of Late Devonian age, is fetid brown dolomite and light-gray and tan limestone; uppermost part is mottled yellowish-orange dolomite and yellowish-gray siltstone. Thickness about 300 feet.

Ob - Bighorn Dolomite (Upper Ordovician)
Gray massive cliff-forming dolomite and dolomitic limestone. Thickness about 300 feet.

Cs - Snowy Range Formation (Upper Cambrian)
Gray-green shale and greenish flat-pebble conglomerate. Grove Creek Member at top consists of about 40 feet of gray, buff, and orange limestone and dolomite, green shale, and gray-green limestone-pebble conglomerate. Thickness of formation about 300 feet.

Cp - Pilgrim Limestone (Upper Cambrian)
Massive light gray mottled oölite limestone; forms a prominent ledge locally called The Reef. Thickness about 120 feet.

Cgv - Gros Ventre Formation (Middle Cambrian)
Green micaceous shale, thin-bedded gray limestone, and limestone-pebble conglomerate. Thickness, 500-600 feet.

ls - Gros Ventre Formation, top of nodular limestone and interbedded green shale unit (Middle Cambrian)
Top of nodular limestone and interbedded green shale unit, 30 to 50 feet thick and about 200 feet above base of formation; probably equivalent to the Meagher Limestone (Middle Cambrian) in Montana.

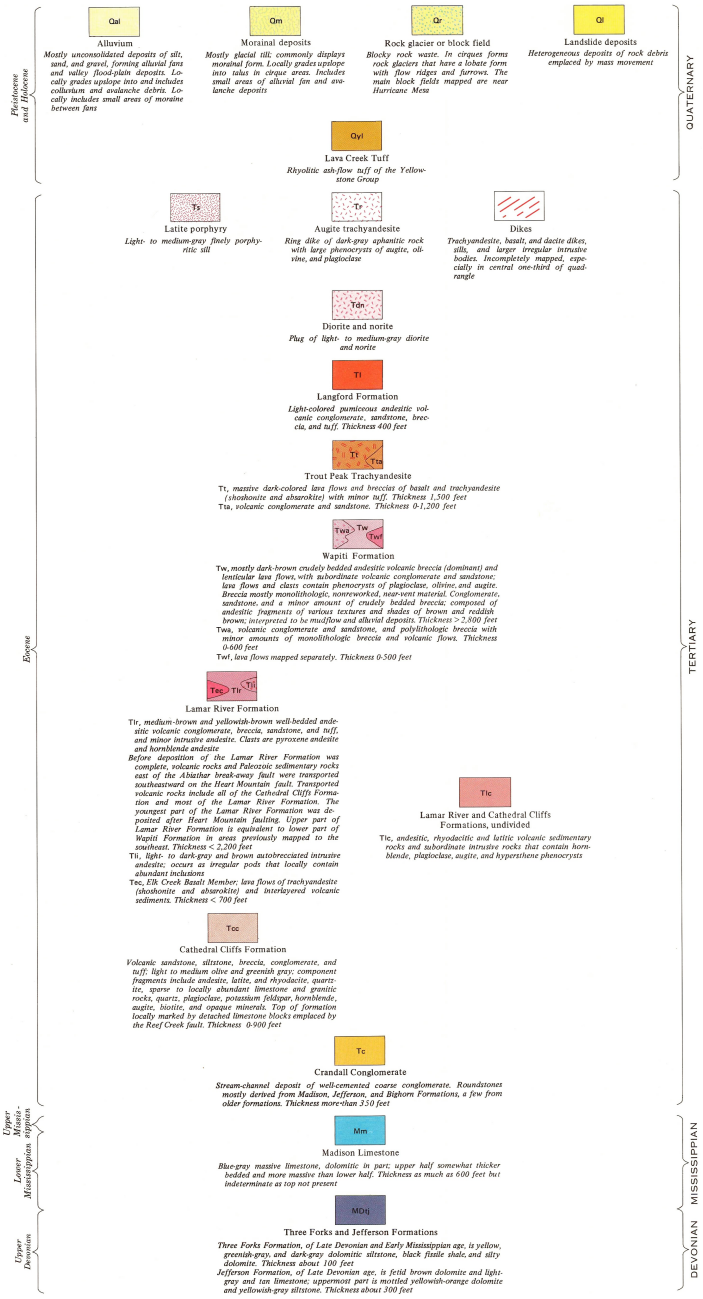
Cf - Flathead Sandstone (Middle Cambrian)
Reddish or yellowish quartzitic sandstone, locally conglomeratic at base; softer and brown speckled in upper part. Thickness about 100 feet.

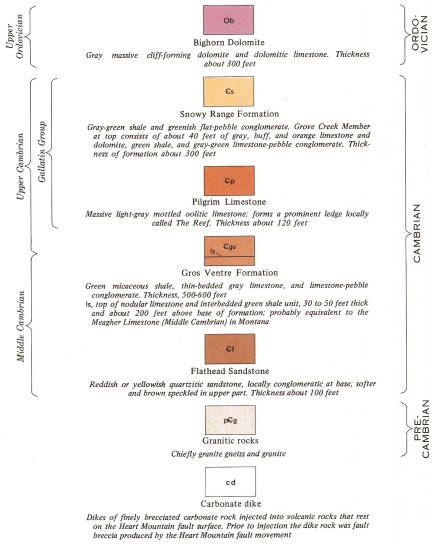
pCg - Granitic rocks (Precambrian)
Chiefly granite gneiss and granite.

cd - Carbonate dike (Unknown)
Dikes of finely brecciated carbonate rock injected into volcanic rocks that rest on the Heart Mountain fault surface. Prior to injection the dike rock was fault breccia produced by the Heart Mountain fault movement.

Text from source map: Pilot Peak 15' Quadrangle

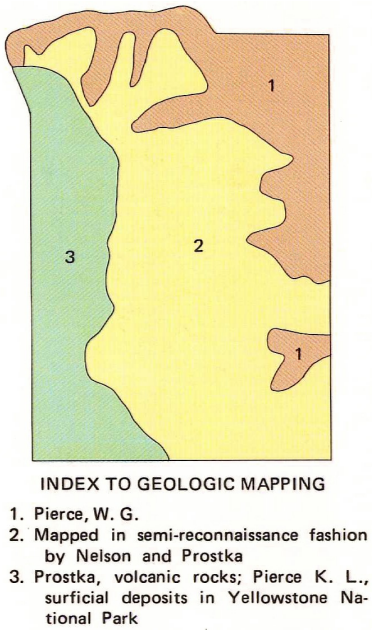
Correlation of Map Units





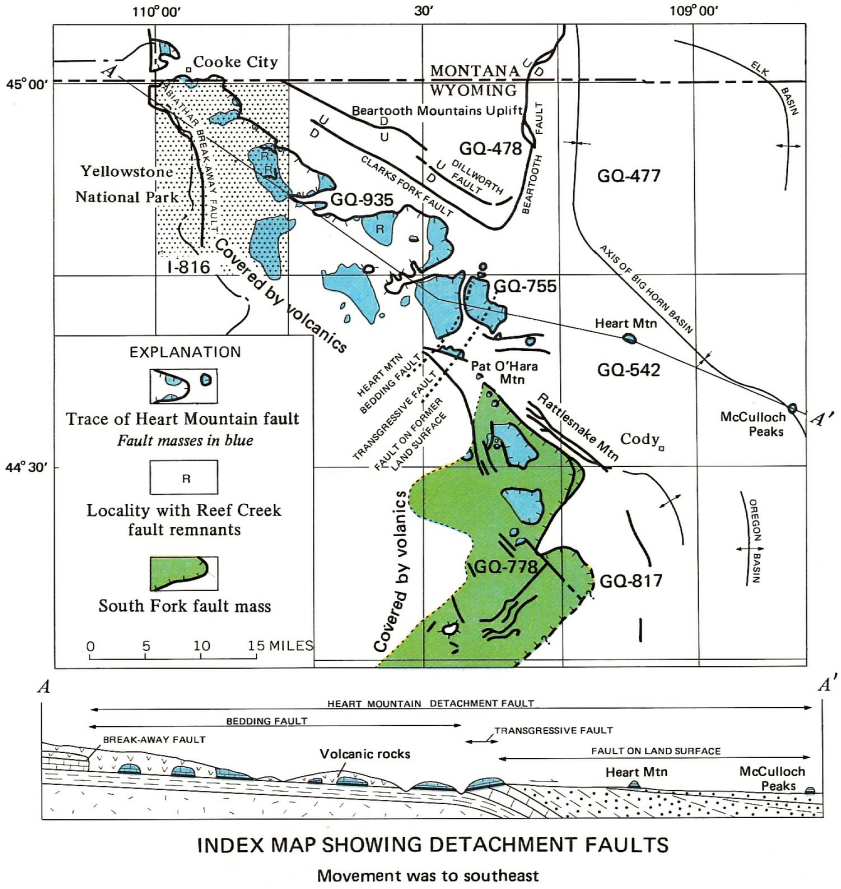
Graphic from source map: Pilot Peak 15' Quadrangle

Index Map



Graphic from source map: Pilot Peak 15' Quadrangle

Index Map of Detachment Faults

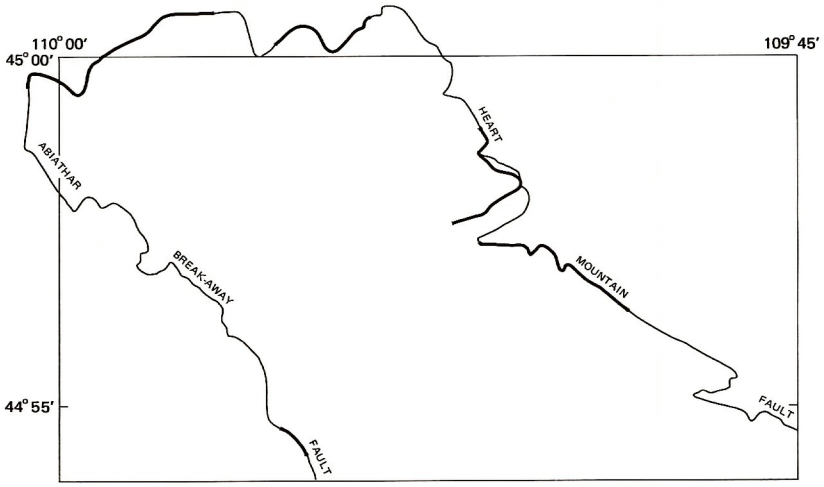


INDEX MAP SHOWING DETACHMENT FAULTS

Movement was to southeast

Graphic from source map: Pilot Peak 15' Quadrangle

Sketch of Heart Mountain and Abiathar Faults

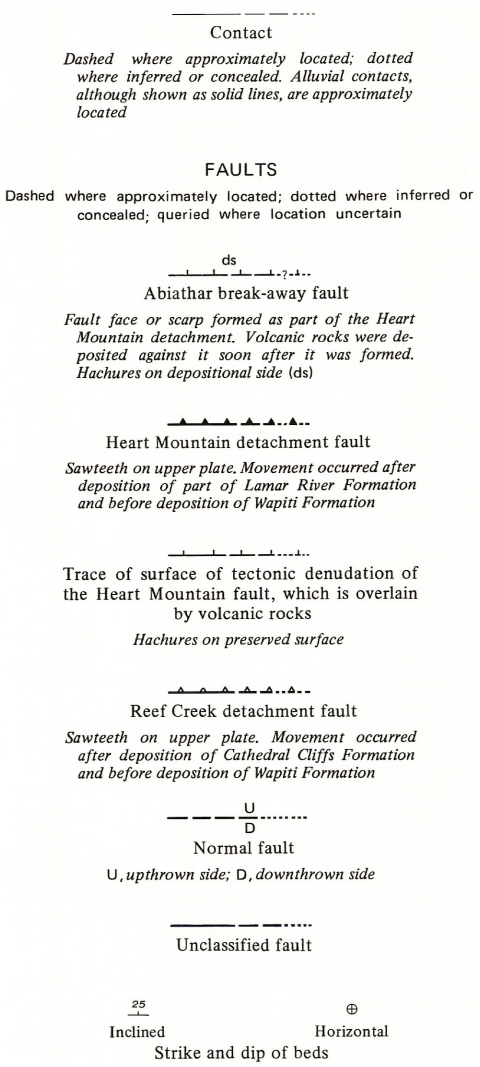


SKETCH OF HEART MOUNTAIN AND ABIATHAR FAULTS IN NORTHERN PART OF QUADRANGLE

Heavy line indicates places along these faults where Prostka believes that units Tlr and Tlc are in fault contact with underlying or adjacent volcanic and sedimentary rocks. Nelson and Pierce believe that these units are in depositional contact, as shown on the map and cross sections, except possibly for some undifferentiated parts within them.

Graphic from source map: Pilot Peak 15' Quadrangle

Map Legend



Graphic from source map: Pilot Peak 15' Quadrangle

Sunlight Peak 15' Quadrangle (northwest part)

The formal citation for this source.

> U.S. Geological Survey, 1956, Bedrock (?) Geologic Map of the Sunlight Peak Quadrangle, Wyoming: U.S. Geological Survey, unpublished mylar, scale 1:62,500 (*GRI Source Map ID 75608*).

Listing of geologic unit symbols present on the source map. The source map did not contain a legend, unit descriptions, unit names, or any additional information.

Map Unit Listing

Qal, **Qtl, Qg, Qyl, Qyh, Qyha?,** T**a** and **Tti.**

List from source map: Sunlight Peak 15' Quadrangle (northwest part)

Tepee Creek 15' Quadrangle

The formal citation for this source.

Witkind, I.J., 1969, Geology of the Tepee Creek Quadrangle, Montana-Wyoming: U.S. Geological Survey, Professional Paper 609, scale 1:62,500 (*GRI Source Map ID 3020*).

The report text and figures in this help file are a subset of what is present in Professional Paper 609. To view the report in its entirety, visit the following site: https://pubs.usgs.gov/pp/0609/report.pdf

List of geologic units, their unit symbols, unit names and unit ages, prominent graphics, and text associated with this source map.

Map Unit Listing

Qc - Colluvial deposits (Recent)

Qf - Alluvial fan deposits (Recent)

Qal - Alluvium (Recent)

Qef - Earthflow deposits (Recent)

Qrs - Rock slide deposits (Recent)

Qe - Esker deposits (Pleistocene)

Ql - Landslide deposits (Recent)

Qg - Glaciofluvial deposits (Pleistocene)

Qo - Outwash deposits (Pleistocene)

Qm - Morainic deposits (Pleistocene)

Qkt - Kame terrace deposits (Pleistocene)

QTt - Yellowstone Tuff (Pliocene or Pleistocene)

Tab - Andesite breccia (Eocene)

Ts - Shoshonite (Eocene)

Tdp - Dacite porphyry (Tertiary)

Ktu - Thermopolis? Shale upper part (Lower Cretaceous)

Kts - Thermopolis? Shale sandstone member (Lower Cretaceous)

Kk - Kootenai Formation (Lower Cretaceous)

Jm - Morrison Formation (Upper Jurassic)

Je - Ellis Group, Swift, Rierdon, and Sawtooth Formations undivided (Upper and Middle Jurassic)

TRtw - Thaynes? Formation and Woodside Siltstone undivided (Lower Triassic)

TRd - Dinwoody Formation (Lower Triassic)

Ps - Shedhorn Sandstone (Permian)

PNq - Quadrant Sandstone (Pennsylvanian)

PNMa - Amsden Formation (Middle and Lower Pennsylvanian and Upper Mississippian)

Mm - Madison Group Mission Canyon Limestone and Lodgepole Limestone, undivided (Upper and Lower Mississippian)

MDt - Three Forks Formation (Lower Mississippian)

Dj - Jefferson Formation (Upper Devonian)

OCbp - Bighorn? Dolomite, Snowy Range Formation, and Pilgrim Limestone undivded (Upper Ordovician and Upper Cambrian)

Cpa - Park Shale (Middle Cambrian)

Cm - Meagher Limestone (Middle Cambrian)

Cw - Wolsey Shale (Middle Cambrian)

Cf - Flathead Sandstone (Middle Cambrian)

pCq - Quartzite (Precambrian)

pCt - Tremolite marble (Precambrian)

pCm - Mica schist (Precambrian)

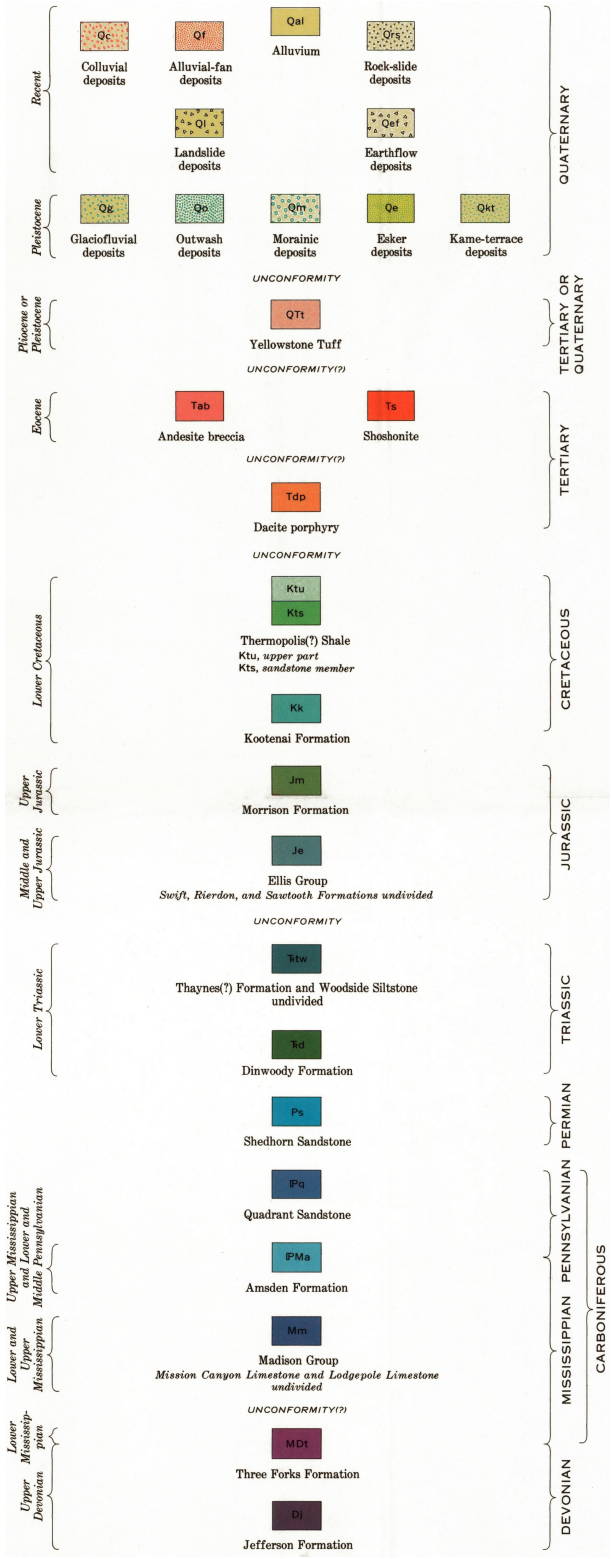
pCa - Amphibolite (Precambrian)

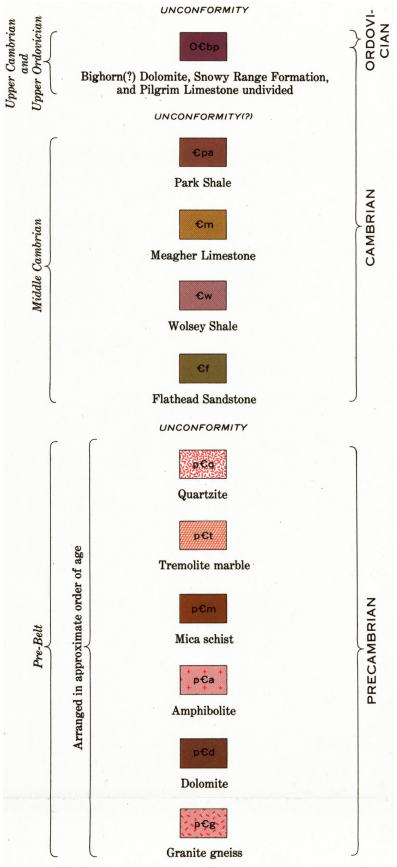
pCd - Dolomite (Precambrian)

pCg - Granitic gneiss (Precambrian)

Text from source map: Tepee Creek 15' Quadrangle

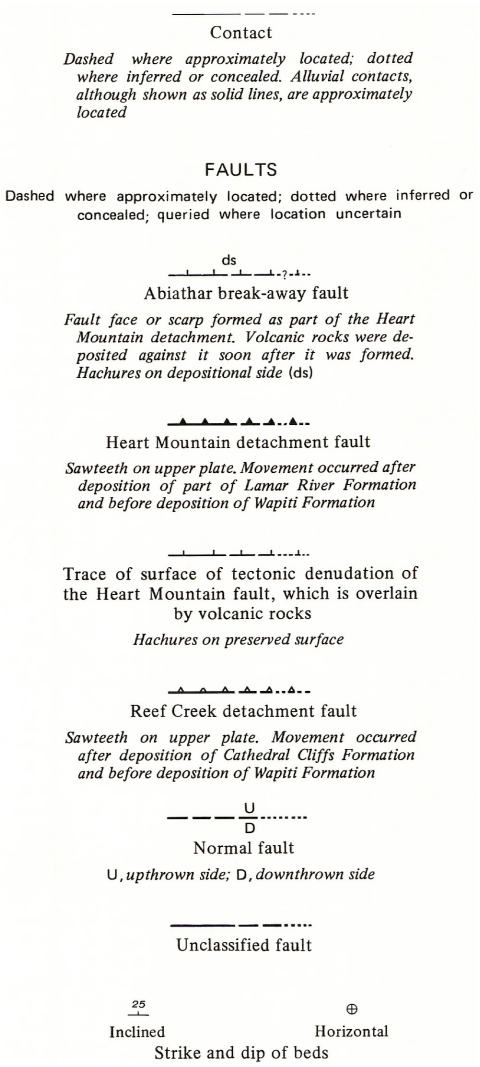
Correlation of Map Units





Graphic from source map: Tepee Creek 15' Quadrangle

Map Legend



Graphic from source map: Tepee Creek 15' Quadrangle

Tower Junction 15' Quadrangle

The formal citation for this source.

> Prostka, H.J., Blank, H.R., Christiansen, R.L., Ruppel, E.T., 1975, Geologic Map of the Tower Junction Quadrangle, Yellowstone National Park, Wyoming and Montana: U.S. Geological Survey, Geologic Quadrangle Map GQ-1247, scale 1:62,500 (*GRI Source Map ID 3018*).

Digital data associated with this map was converted from a third-party data source and checked against a georeferenced copy of the above paper source map.
The citation for this digital data:

> U.S. Geological Survey, 2007, Digital Geologic Map of the Tower Junction Quadrangle, Yellowstone National Park, Wyoming and Montana: U.S. Geological Survey, unpublished digital data, scale 1:62,500 (*GRI Source Map ID 74794*).

Description of geologic units, prominent graphics and text associated with the paper source map.

Description of Map Units

Qa - Alluvium and glaciofluvial deposits (Holocene and Pleistocene)
Unconsolidated coarse to fine-grained moderately well sorted and well bedded stream-channel, overbank, and fan deposits, glacial outwash, and stream-laid ice-contact deposits.

Qs - Landslide deposits (Holocene and Pleistocene)
Unconsolidated poorly sorted slide deposits which have hummocky, generally bouldery surfaces.

Ql - Lacustrine and glaciolacustrine deposits (Holocene and Pleistocene)
Unconsolidated well-sorted and well-bedded silts and sands deposited in or adjacent to open or ice-dammed lakes.

Qt - Talus (Holocene and Pleistocene)
Rubble deposited on slopes by rockfalls; locally includes other surficial deposits.

Qhi - Ice contact deposits localized by hot springs (Holocene and Pleistocene)
Commonly well sorted irregularly bedded sandstones and conglomerates deposited against ice from melt waters localized by hot springs. Cemented by zeolites and opaline silica.

Qhs - Siliceous hot spring deposits (Holocene and Pleistocene)
Generally white to light-gray siliceous sinter in mounds or sheets around active or extinct hot springs.

Qhc - Calcareous hot spring deposits (Holocene and Pleistocene)
Generally white to light-gray travertine in mounds or terraces around active or extinct hot springs.

Qg - Glacial deposits (Holocene and Pleistocene)
Till, generally lacking distinct morainal form.

Qgc - Basalt of Geode Creek, lava flow (Pleistocene)
Medium-gray massive dense aphanitic, locally swirl-banded, basalt containing sparse plagioclase phenocrysts.

Qgcd - Basalt of Geode Creek, dike (Pleistocene)

Medium-gray massive dense aphanitic, locally swirl-banded, basalt containing sparse plagioclase phenocrysts.

Qgcc - Basalt of Geode Creek, cinder and scoria cone of basalt (Pleistocene)
Locally reddened by oxidation.

Qo - Osprey Basalt (Pleistocene)
Dark-gray, columnar-jointed intra canyon lava flows of dense aphanitic basalt containing sparse plagioclase phenocrysts; locally interlayered with well-sorted yellowish-brown gravels. Whole rock, dated by K-Ar method, at about 208,000 years (J. D. Obradovich, written commun., 1972).

Plateau Rhyolite:
Rhyolitic lava flows, each containing a variety of lithologies; flows are distinguishable from one another by topographic forms, zonal development of textural features, and emplacement structures. Most exposures are dark pitchstone or obsidian vitrophyres of flow-layered or flow-brecciated rhyolite, but gray to red pumiceous rhyolite and gray, brown, or varicolored crystalline rhyolite also are common; all lithologies can occur within a single flow. All flows contain phenocrysts of quartz, sanidine, sodic plagioclase, opaque oxides, and sparse clinopyroxene and fayalitic olivine.

Qpud - Plateau Rhyolite, Upper Basin Member, Dunraven Road flow (Pleistocene)

Qpuc - Plateau Rhyolite, Upper Basin Member, Canyon flow (Pleistocene)
Large rhyolitic lava flow. Most exposures are brown or dark-gray crystallized rhyolite, but black pitchstone vitrophyre and gray pumiceous rhyolite occur at flow margins. Contains abundant 1-5 mm phenocrysts of quartz and sodic plagioclase, and, in glassy zones, clinopyroxene. No sanidine phenocrysts.

Qpus - Plateau Rhyolite, Upper Basin Member, Tuff of Sulphur Creek (Pleistocene)
Air-fall tuff, well bedded and well sorted. In most exposures agglutinated (welded) and resembles welded ash-flow tuff. Generally devitrified, gray to brown; basal zone is glassy, forming a black vitrophyre where densely agglutinated, yellowish-brown where friable. Phenocrysts are like those of Canyon flow.

Qylb - Lava Creek Tuff, Member B (Pleistocene)
Gray, brown, or pinkish-gray ash-flow tuff. Devitrified throughout; generally densely welded except for partially welded vapor-phase zones at top and bottom. Lithic inclusions locally abundant. Abundant 1-5 mm phenocrysts of quartz, sanidine, and sodic plagioclase; some sanidine phenocrysts roughly as much as 1 cm; sparse opaque oxides, clinopyroxene, and fayalitic olivine phenocrysts. Thin basal zone of phenocryst-poor tuff grades downward from densely welded to partially welded and is locally underlain by thin well-bedded crystal ash. Sanidine, dated by K-Ar method by J. D. Obradovich, at 600,000 years old (Christiansen and Blank, 1972).

Quf - Undine Falls Basalt (Pleistocene)
Dark-gray columnar-jointed intra canyon lava flow of dense aphanitic basalt containing abundant plagioclase and sparse olivine phenocrysts; locally overlies well-sorted yellowish-brown gravel mapped with the basalt.

Qjw - Mount Jackson Rhyolite, Wapiti Lake flow (Pleistocene)
Gray glassy to crystallized rhyolite flow containing moderately abundant 1-3 mm phenocrysts of quartz, sanidine, and sodic plagioclase and sparse clinopyroxene. Sanidine, from equivalent flows in the Madison Canyon area, dated by K-Ar method by J. D. Obradovich at 640,000 and 790,000 years old (Christiansen and Blank, 1972).

Qn - Sediments and Basalts of the Narrows (Pleistocene)
Yellowish-brown well-sorted gravels and interlayered dark-gray columnar-jointed lava flows of dense aphanitic basalt containing plagioclase phenocrysts; unit occupies pre-Lava Creek Tuff paleovalley, and has been dated at about 1.5 m.y. (million years) on the basis of a K-Ar age on sanidine from an interbedded ash (Christiansen and Blank, 1972).

Qyhb - Huckleberry Ridge Tuff, Member B (Pleistocene)
Gray to brown devitrified mostly densely welded ash-flow tuff. Generally contains abundant phenocrysts of quartz, sanidine, and sodic plagioclase and sparse opaque oxides, clinopyroxene, and fayalitic olivine; phenocrysts particularly abundant and large (as much as 5 mm) in upper part, very sparse in lower part. Two types of welded pumice in upper part, one very dark and scoriaceous, the other light colored and compact. Sanidine, dated by K-Ar method by J. D. Obradovich, at about 2 m.y. (Christiansen and Blank, 1972).

Qyha - Huckleberry Ridge Tuff, Member A (Pleistocene)
Similar to member B but generally brown. Mainly devitrified, but with black vitrophyre and gray microspherulitic zone at base. Phenocrysts of same type as in member B, abundant in lower part, become progressively less abundant upward.

Qj - Junction Butte Basalt (Pleistocene)
Dark-gray basalt lava flows characterized by well-developed two-tiered columnar jointing. Basalt is dense, aphanitic, and contains sparse plagioclase phenocrysts; locally overlies gravel, sand, and silt that are mapped with the basalt. Whole rock dated at about 2 m.y. by J. D. Obradovich (written commun., 1973).

Tla - Langford Formation, alluvial facies (Eocene)
Light-gray to medium-gray well-sorted, massively bedded alluvial-facies volcanic breccia and conglomerate consisting of dark-gray subangular to subrounded clasts of pyroxene andesite and hornblende andesite in a light- to medium-gray ash-rich matrix. Included in "Early basic breccia" by Hague and others (1896). 2,000 feet (610 m) thick.

Tlf - Langford Formation, lava flows (Eocene)
Gray, brown, and reddish-brown massive and platy-jointed lava flows and flow breccias of hornblende-pyroxene andesite and pyroxene andesite. Unit occurs only in lower part of Langford Formation in the Washburn Range. 0-400 feet (0-122 m) thick.

Twa - Wapiti Formation, alluvial facies (Eocene)
Dark-brown, massively bedded well-sorted to poorly sorted volcanic breccia and minor tuffaceous volcanic sandstone; consists of subangular clasts of pyroxene andesite and shoshonite (trachyandesite) in a tuffaceous matrix. Equivalent to upper part of "Early basic breccia" of Hague and others (1896). 0-400 feet (0-122 m) thick.

Tch - Crescent Hill Basalt (Eocene)
Two lava flows and scoriaceous flow breccias of dark-gray, brown, and reddish-brown shoshonite (trachyandesite) containing abundant small phenocrysts of labradorite, augite, and olivine, and sparse biotite. Lava flows locally pillowed, very vesicular, and bleached light gray by hydrothermal alteration. 0-50 feet (0-15 m) thick.

Tm - Mount Wallace Formation, Main body (Eocene)
Medium- to dark-gray and reddish-brown lava flows and flow breccias of shoshonite (trachyandesite) and pyroxene andesite; flows are columnar and platy jointed. This unit is much thicker and very widespread northwest of the quadrangle. 0-700 feet (0-213 m) thick.

Tms - Mount Wallace Formation, Slough Creek Tuff Member (Eocene)
Medium- to light-gray, brown, and yellow densely welded ash-flow tuff of trachyte containing abundant phenocrysts of sanidine and plagioclase, and sparse biotite. 0-40 feet (0-12 m) thick.

Tlrd - Lamar River Formation, Sulphur Creek stock (Eocene)
Medium- to dark-gray, fine- to medium-grained diorite containing variable amounts of biotite, hornblende, and pyroxene. Probably a multiple intrusive related to the Tlri dikes.

Tlr - Lamar River Formation, alluvial facies (Eocene)
Medium- to light-brown, yellow, and green, well-bedded alluvial-facies volcanic conglomerate, sandstone, tuff, and well-sorted breccia; fragments are subangular to subrounded clasts of pyroxene andesite and pyroxene-hornblende andesite; lower 100 feet (30 m) of unit locally contains sporadic Precambrian metamorphic rock fragments. Fossil trees, common throughout this unit, are especially abundant in the finer grained beds. This unit grades into and interfingers with the Sepulcher Formation (Ts) to the west, and with the vent facies (Tlrv) of the Lamar River Formation to the southwest. Equivalent to lower two-thirds of "Early basic breccia" of Hague and others (1896). 80-1,400 feet (24-427 m) thick.

Tlri - Lamar River Formation, Bodies of intrusive breccia and dikes associated with the Sulphur Creek stock (Eocene)
In southern part of quadrangle, they are medium-to light-gray dikes of pyroxene andesite and hornblende pyroxene andesite. Along Lamar River and Amethyst Creek, they are a mixed complex of dikes and podlike bodies of medium-gray and brown autobrecciated andesite which contain numerous septa and inclusions of Sepulcher Formation (Ts) and alluvial facies (Tlr-) of Lamar River Formation.

Tlrv - Lamar River Formation, Vent facies (Eocene)
Medium- to dark-gray and brown laharic breccias, autoclastic flow breccias, thin discontinuous lava flows, and tuffs; all variably altered to shades of red, purple, and light yellowish gray. Lava flows and rock fragments are of pyroxene andesite and pyroxene-hornblende andesite. These deposits have primary dips of as much as 30 degrees and form part of the Mount Washburn composite volcano centered in the southwestern corner of the quadrangle. This unit grades into and interfingers with the alluvial facies (Tlr) northward and northeastward away from the volcanic center. Approximately equivalent to lower two-thirds of "Early basic breccia" of Hague and others (1896). 0-3,000 feet (0-914 m) thick.

Tec - Lamar River Formation, Elk Creek Basalt Member (Eocene)
Medium- to dark-gray and brown columnar-jointed lava flows and reddish-brown scoriaceous flow breccias of shoshonite. Phenocrysts of plagioclase, pyroxene, and olivine occur in highly variable amounts and sizes from flow to flow. Unit is at different localities a member of the Sepulcher or the Lamar River Formation and is interlayered with lower parts of both formations. 0-400 feet (0-122 m) thick.

Tlrf - Lamar River Formation, Andesite flows (Eocene)
Medium-gray and brown platy-jointed lava flows and flow breccias of hypersthene-hornblende andesite and dacite. This unit forms a small volcanic shield in the lower part of the Mount Washburn composite volcano. 0-1,400 feet (0-427 m) thick.

Ts - Sepulcher Formation, Main body (Eocene)
Light-brown to yellowish-gray and greenish-gray epiclastic volcanic breccia, conglomerate, sandstone, and tuffs. Clasts are a variety of colors-gray, green, purple, red, brown, and yellow-of hornblende- and biotite-bearing pyroxene andesite, quartz latite, and dacite. Fragments of Precambrian metamorphic rocks occur locally in lower 100 feet (30 m) of unit. Fossil trees are especially abundant in some horizons, and fossil leaves occur in thin porcelaneous tuff beds. Proportion of coarser beds increases eastward and southward as the unit grades into and interfingers with the alluvial facies (Tlr) of the Lamar River Formation. Equivalent to the "Early acid breccia" of Hague and others (1896). 0-1,400 feet (0-427 m) thick.

Tlc - Sepulcher Formation, Lost Creek Tuff Member (Eocene)

Gray, green, purple, and yellow welded ash-flow tuff of trachyte-rhyodacite, locally contains fragments of Precambrian metamorphic rocks and pieces of charred wood. Central densely welded zone has platy and columnar joints. Unit is interlayered with lower part of Sepulcher Formation (Ts) and thins eastward and pinches out near west end of Lamar Canyon. Dated at 48-49 m.y. by K-Ar method on sanidine and biotite by J. D. Obradovich (Smedes and Prostka, 1972). Equivalent to "Trachytic rhyolite" of Hague and others (1896). 0-1,000 feet (0-305 m) thick.

Tsc - Sepulcher Formation, Nonvolcanic conglomerate (Eocene)

Composed of boulders, cobbles, and pebbles of Precambrian gneiss and schist in a coarse arkosic matrix. Unit has very limited distribution as a local basal conglomerate that underlies and interfingers with the lower parts of Sepulcher and Lamar River Formations. 0-110 feet (0-34 m) thick.

Mm - Madison Group (Upper and Lower Mississippian)

Medium-gray to pale-yellowish-brown, fine- to coarse-grained limestone and dolomite in beds 1-5 feet (0.3-1.5 m) thick or massive; nodules of brownish-gray chert are common. About 80 feet (24 m) thick.

Dj - Jefferson Formation (Upper Devonian)

Pale-brown to pale-yellowish-brown fine-grained sugary dolomite and dolomitic limestone in beds 0.2-4.0 feet (6.1-121.9 cm) thick. Formation about 175 feet (53 m) thick.

Ob - Bighorn Dolomite (Upper Ordovician)

Light-brownish-gray, very fine grained to fine-grained dolomite; partly laminated; partly containing light-gray to yellowish-orange chert in lenses as much as 5 feet (1.5 m) long; in beds 0.1 foot (3 cm) thick to massive; massive units most common in upper part of formation. 100-200 feet (30-61 m) thick.

Cu - Upper and Middle Cambrian rocks, undivided (Upper and Middle Cambrian)

Includes Snowy Range Formation, Pilgrim Limestone, Park Shale, Meagher Limestone, Wolsey Shale, and Flathead Sandstone.

Csr - Snowy Range Formation (Upper Cambrian)

Includes three members not mapped separately
Grove Creek Limestone Member - Brownish-gray to yellowish-orange, very fine to medium-grained dolomitic limestone, dolomite, and dusky-blue shale. 0-40 feet (0-12 m) thick.Sage Limestone Member - Pale-yellowish-brown to medium-gray, very fine grained, partly glauconitic limestone, irregularly ribboned with grayish- or dark-yellowish-orange sandy limestone and calcareous sandstone, in beds about 1 foot (0.3 m) thick; interbeds, as much as 3 feet (0.9 m) thick, of similarly colored mottled limestone; contains abundant fossils; Collenia magna beds at base of member. About 150 feet (46 m) thick.

Dry Creek Shale Member - Greenish-gray to light-olive-gray shale; interbeds less than 1 foot (0.3 m) thick of very fine grained calcareous sandstone and siltstone. Top of member includes interbeds of gray very fine grained oolitic, glauconitic limestone and limestone-pebble conglomerate. 40-50 feet (1215 m) thick.

Cpi - Pilgrim Limestone (Upper Cambrian)

Upper part of formation is medium-gray, mottled yellowish-gray, and pale yellowish-brown, largely oolitic, thick-bedded to massive limestone. Lower part of formation is medium-gray very fine grained limestone in beds 0.2-0.5 foot (6.1-15.2 cm) thick ribboned with grayish-orange silty limestone, interbedded with medium-gray oolitic, glauconitic fossiliferous limestone in beds 0.2-3.0 feet (6.1-91.4 cm) thick; a few beds of limestone-pebble conglomerate and grayish-green shale. 200-250 feet (61-76 m) thick.

Cm - Meagher Limestone (Middle Cambrian)
Mottled, medium-gray to medium-dark-gray and yellowish-gray to grayish-orange very fine grained limestone in beds 0.1-3.0 feet (3.091.4 cm) thick. Thin interbeds of grayish-green shale. About 200 feet (61 m) thick.

Cwf - Wolsey Shale and Flathead Sandstone (Middle Cambrian)
Greenish-gray micaceous and sandy shale; thin interbeds of argillaceous calcareous sandstone and siltstone and glauconitic sandy limestone; upper 20 feet (6 m) of unit grades into overlying Meagher Limestone. About 100 feet (30 m) thick.Flathead Sandstone - Yellowish-gray to grayish-orange-pink fine-to medium-grained quartzitic sandstone in beds 0.2-3.0 feet (6.1-91.4 cm) thick; partly laminated or cross-laminated; basal part includes poorly sorted sandstone and conglomerate. About 100-160 feet (30-49 m) thick.

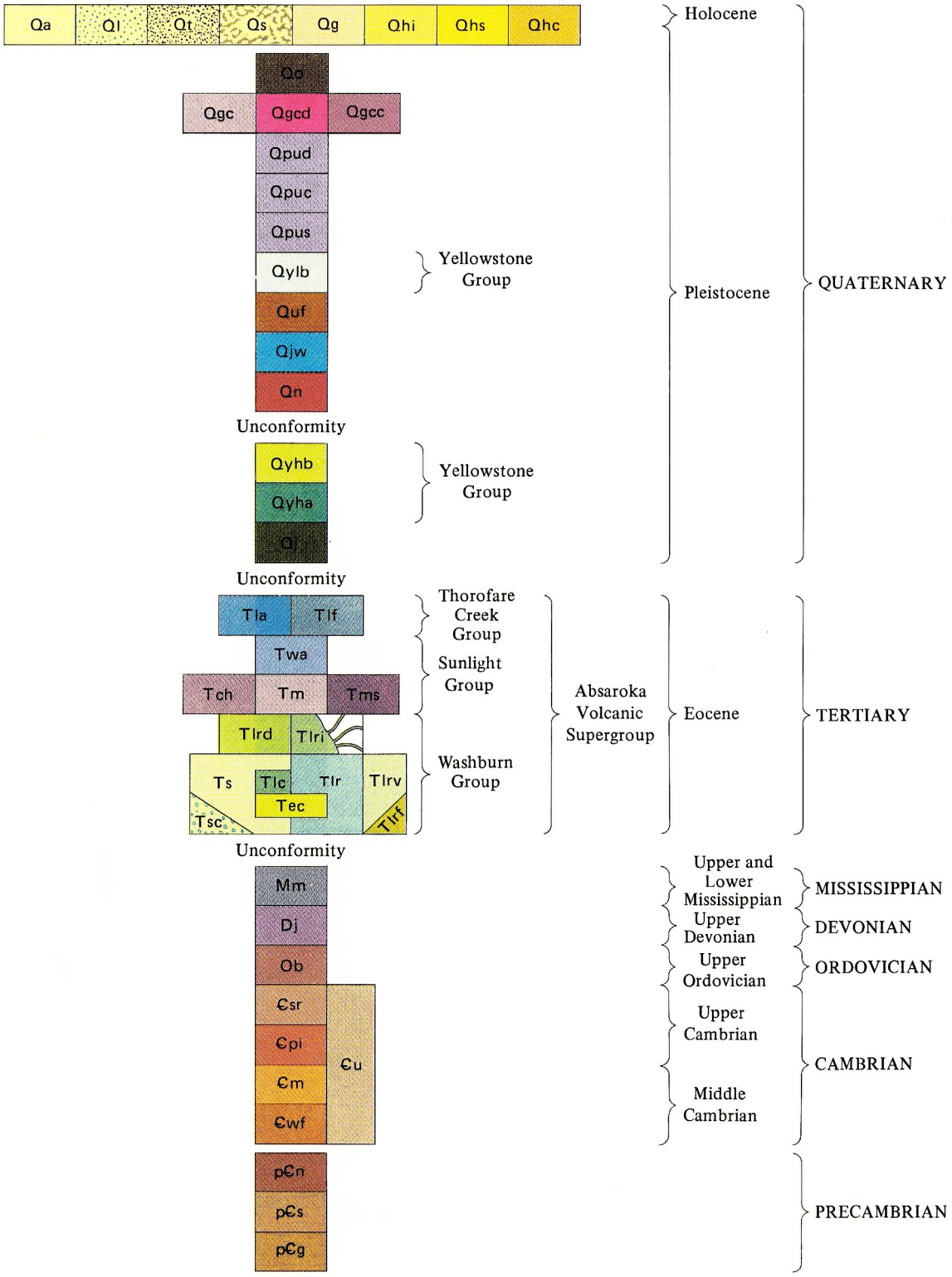
pCn - Noritic Gabbro (Precambrian)
Dark-gray medium-grained nonfoliated gabbro. Consists of calcic plagioclase, augite, and hypersthene.

pCs - Schist and Gneiss (Precambrian)
Medium-gray, light-gray, and brown schist and schistose gneiss; locally contains light-gray and pink coarse-grained granitic laminae; schist consists of quartz, oligoclase, and biotite; garnet locally abundant. Includes sparse dark-gray amphibolite.

pCg - Granitic Gneiss (Precambrian)
Medium-gray, light-gray, and pinkish-orange medium- to coarse-grained granitic gneiss; consists of quartz, microcline, sodic plagioclase, and biotite. Includes coarse-grained granite, pegmatite, and sparse amphibolite.

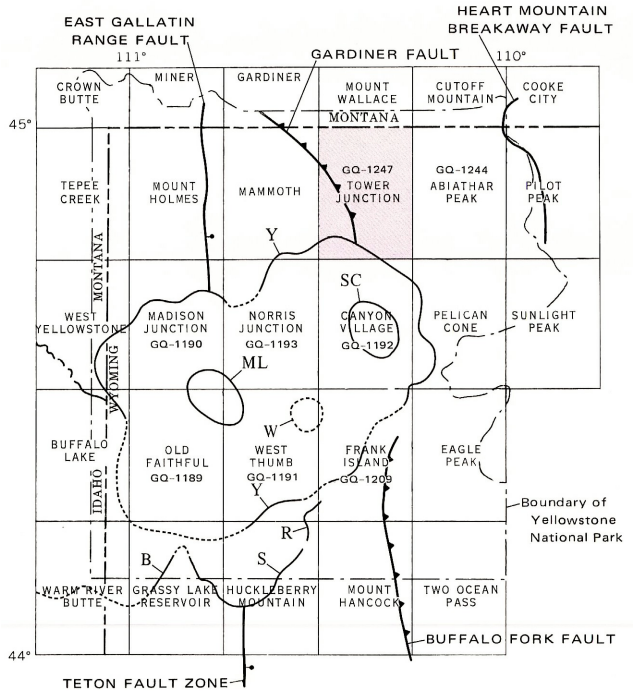
Text from source map: Tower Junction 15' Quadrangle

Correlation of Map Units



Graphic from source map: Tower Junction 15' Quadrangle

Index Map



INDEX MAP OF YELLOWSTONE NATIONAL PARK SHOWING LOCATION OF 15-MINUTE QUADRANGLES AND MAJOR STRUCTURAL FEATURES

Location of this quadrangle indicated by color

Fault – Bar and ball on downthrown side

Thrust fault – Sawteeth on upper plate

Outline of dome

Approximate topographic rim of caldera – Dotted where buried

W — West Thumb caldera rim – Caldera formed by collapse resulting from eruption of tuff of Bluff Point

ML — Mallard Lake dome – Dome formed by magmatic resurgence beneath Yellowstone caldera

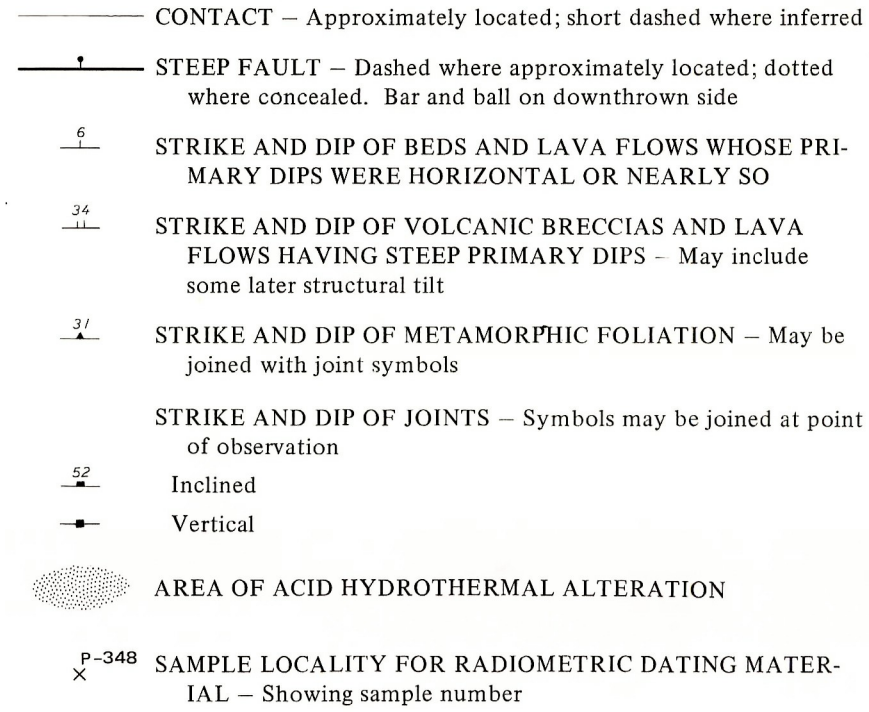
SC — Sour Creek dome – Dome formed by magmatic resurgence beneath Yellowstone caldera

Y — Yellowstone caldera rim – Caldera formed by collapse resulting from eruptions of Lava Creek Tuff

R, S, B — Red Mountains, Snake River, and Big Bend Ridge caldera-rim segments – Remnants of a caldera formed by collapse resulting from eruptions of Huckleberry Ridge Tuff

Graphic from source map: Tower Junction 15' Quadrangle

Map Legend



Graphic from source map: Tower Junction 15' Quadrangle

References

Christiansen, R. L., and Blank, H. R., Jr., 1972, Volcanic stratigraphy of the Quaternary rhyolite plateau in Yellowstone National Park: U.S. Geol. Survey Prof. Paper 729-B, 18 p.

Hague, Arnold, Weed, W. H., and Iddings, J. P., 1896, Description of the Yellowstone National Park, Wyoming: U.S. Geol. Survey Geol. Atlas, Folio 30.

Ruppel, E. T., 1972, Geology of pre-Tertiary rocks in the northern part of Yellowstone National Park, Wyoming: U.S. Geol. Survey Prof. Paper 729-A, 66 p., (1973).

Smedes, H. W., and Prostka, H. J., 1972, Stratigraphic framework of the Absaroka Volcanic Supergroup in the Yellowstone National Park region: U.S. Geol. Survey Prof. Paper 729-C, 33 p.

References from source map: Tower Junction 15' Quadrangle

Two Ocean Pass 15' Quadrangle

The formal citation for this source.

> Smedes, H.W., M'Gonigle, J.W.; Prostka, H.J., 1989, Geologic Map of the Two Ocean Pass 15' Quadrangle, Yellowstone National Park and Vicinity, Wyoming: U.S. Geological Survey, Geologic Quadrangle Map GQ-1667, scale 1:62,500 (*GRI Source Map ID 2644*).

Digital data associated with this map was converted from a third-party data source and checked against a georeferenced copy of the above paper source map.
The citation for this digital data:

> U.S. Geological Survey, 2007, Digital Geologic Map of the Two Ocean Pass 15' Quadrangle, Yellowstone National Park and Vicinity, Wyoming: U.S. Geological Survey, unpublished digital data, scale 1:62,500 (*GRI Source Map ID 74793*).

Description of geologic units, prominent graphics and text associated with the paper source map.

Description of Map Units

Qc - Colluvial, talus, and avalanche deposits (Holocene)
Unconsolidated, generally coarse, angular debris; deposited by solifluction, rockfalls, or debris flows.

Qf - Alluvial fan deposits (Holocene)
Unconsolidated, coarse to fine, poorly sorted.

Qa - Alluvial and glaciofluvial deposits (Holocene and Pleistocene)
Unconsolidated, coarse to fine, moderately well sorted and moderately well bedded stream-channel and overbank, glacial outwash, and stream-laid ice-contact deposits.

Qls - Landslide deposits (Holocene and Pleistocene)
Unconsolidated, poorly sorted deposits that have hummocky, generally bouldery surfaces. The deposit north of Pacific Creek probably was an earth flow or mudflow. The landslides along the upper Yellowstone River are large and forested, and consist of kame gravelly sand containing large masses of rock in upper parts that slumped from headwall cliffs.

Qg - Glacial deposits (Pleistocene)
Till and glacial rubble that generally lack distinct morainal form; unit includes kame deposits and, locally, glaciolacustrine clay and silt.

QTml - Basalt of Mariposa Lake (Pleistocene or Upper Tertiary)
Mediumgray, dense basalt lava flows that filled an old valley cut into the Wiggins and Two Ocean Formations on the northern part of the Two Ocean Plateau; the flows also occur as two small remnants on the ridge between Badger and Phlox Creeks. The lavas are here interpreted as predating the Lava Creek Tuff (K-Ar age 600,000 yrs - Christiansen and Blank, 1972, p. 9), because no Lava Creek is preserved beneath the basalt. Thickness 0-50 m (0-165 ft).

Tr - Rhyolite of Yellowstone Point, rhyolite porphyry lava flows (upper Tertiary)
Dark- and brownish-gray, aphanitic lava containing conspicuous phenocrysts of quartz; light-tan ash bed occurs above basal flow. On upland surface southeast of Yellowstone Point. At least four individual flows are preserved; total thickness is nearly 150 m (500 ft).

Tri - Rhyolite of Yellowstone Point, rhyolite porphyry dike (upper Tertiary)
Merges upward into the rhyolite porphyry lava flows (Tr) and is presumed to be a feeder conduit for them.

Tw - Absaroka Volcanic Supergroup, Wiggins Formation (upper? and middle Eocene)
Andesitic volcaniclastic rocks of vent and alluvial facies and subordinate lava flows. Phenocrysts in the clasts and lava flows are biotite and hornblende, hornblende, pyroxene, and hornblende and pyroxene; plagioclase generally occurs as phenocrysts, although some rocks have mafic minerals only. Principally composed of beds of light-olive-gray mudflow breccia and conglomerate (lahars) as thick as 75 m (250 ft); interbedded fluvial, medium-gray, coarse-grained andesitic sandstone and conglomerate; and thin beds and lenses of very light gray and white airfall pumice and ash, in places reworked and admixed with andesitic silt and sand. Ash beds abruptly increase in frequency and thickness southward from the upper reaches of Jay Creek (near south edge of quadrangle). The upper part of the formation contains several distinctive units of vent-facies rocks (Twv) and lava flows (Twl), mapped to determine changes of fades and nature of intraformational erosional unconformities, some of which are channels as deep as 35 m (115 ft), which separate many beds. Top not preserved; maximum remnant thickness about 500 m (1,600 ft).

k - Absaroka Volcanic Supergroup, Wiggins Formation, Key bed (upper? and middle Eocene)

Twv - Absaroka Volcanic Supergroup, Wiggins Formation, vent facies rocks (upper? and middle Eocene)
Composition as described above. Rock types include crudely bedded, unsorted, thick units of agglomerate and other coarse, rubbly breccias; lava-flow breccias chaotically intermingled with agglomerate and mudflow conglomerate. Mudflow and lava-flow breccia contain dispersed lava pods and, in places, pillow lavas.

k - Absaroka Volcanic Supergroup, Wiggins Formation, vent facies rocks, Key bed (upper? and middle Eocene)

Twl - Absaroka Volcanic Supergroup, Wiggins Formation, lava flows (upper? and middle Eocene)
Distinctive sequence of as many as three complexly overlapping flows of amygdaloidal andesitic lava near the summit of The Trident, in northeastern part of quadrangle, which extend several miles to the northeast at about 10,800-ft elevation where they are overlain by >260 m (>850 ft) of mudflows and other volcaniclastic rocks indistinguishable from those below the lavas. Total thickness about 75 m (250 ft).

Twi - Absaroka Volcanic Supergroup, Wiggins Formation, intrusive rocks (upper? and middle Eocene)
Hornblende and pyroxene-hornblende andesite in dikes as wide as 6 m (20 ft) on the south flank of The Trident, as small plugs of andesite breccia just northwest of the dikes, and in a large pluton near the mouth of Mountain Creek (near north edge of quadrangle). The rocks resemble many of the clasts in the mudflows and flow breccias of the Wiggins Formation. Narrow zones of baked rock extend outward from the dikes for a distance of about twice the dike width. In these zones, the clasts of the host-rock breccia or conglomerate are etched by weathering to form concavities; in contrast the clasts in nonmetamorphosed host rocks form knobs.

Tto - Two Ocean Formation (middle Eocene)
Dark-colored, andesitic volcaniclastic rocks dominantly of the coarse alluvial facies. Mainly coarse, poorly sorted and crudely bedded sheet and channel-fill deposits of conglomerate that form conspicuous cliffs and ledges above the more-subdued slopes of the Langford Formation (Tl). The clasts are cobbles and boulders of subvitreous to dull, porphyritic andesite containing

phenocrysts of hornblende or pyroxene, or both, plagioclase, and sparse biotite. Clasts embedded in a matrix of sand, silt, and ash. Locally, sparse, dark-colored vent-facies flow breccias, mudflows, and agglomerate occur at top and base. Between Jay Creek and Two Ocean Creek the unit contains four conspicuous light-colored ash beds. Base of formation is an erosional unconformity having as much as 160 m (520 ft) of relief. The formation is absent locally, as on the south flank of The Trident. Top of formation is an erosional unconformity having as much as 30 m (100 ft) of relief and, as a result, a key ash bed (A), in the middle of the formation in southwestern part of quadrangle, is missing in places. Beyond southeast edge of quadrangle, the Two Ocean Formation loses its identity as it grades into lighter colored vent-facies deposits that resemble the Wiggins Formation, and as it loses its characteristic ledge form. Maximum thickness about 185 m (600 ft).

A - Two Ocean Formation, ash bed (middle Eocene)

Alluvial-facies, very light gray, water-laid ash that grades upward into airfall ash composed of chunk pumice which is rich in biotite dated as 47.9±1.3 Ma on sanidine and 48.5±1.3 Ma on biotite (J.D. Obradovich, in Smedes and Prostka, 1972, p. C29). In places, the bed is entirely airfall ash containing sparse lithic lapilli. Occurs near middle of formation. Thickness as much as 5 m (15 ft).

k - Two Ocean Formation, key bed (middle Eocene)

Tl - Langford Formation (lower middle Eocene)

Andesitic vent-facies and epiclastic alluvial-facies deposits; dominantly light colored. Exposed section is as thick as 370 m (1,200 ft) near the mouth of Phlox Creek, where it consists entirely of alluvial-facies rocks; formation thins to about 80 m (245 ft) by onlap onto pre-volcanic strata near southwest corner of quadrangle.

Tlv - Langford Formation, Vent facies deposits (lower middle Eocene)

Light- to medium-gray tuff, brown andesitic laharic breccias, autoclastic flow breccias, thin discontinuous andesite lava flows, and tuff breccias, all variably altered to shades of red, purple, and yellowish gray. Rocks have primary dips of as much as 40°, and form part of a composite, deeply eroded andesitic volcano complex centered north and northeast of quadrangle. Vent-facies rocks compose the entire exposed section of the Langford Formation in eastern half of quadrangle except for small areas at Hawks Rest and in the lower reaches of Jay Creek. Overprint pattern indicates area where unit has undergone low-grade metamorphism adjacent to pluton (Twi) at north edge of quadrangle. Thickness as much as 250 m (800 ft).

Tla - Langford Formation, Alluvial facies deposits (lower middle Eocene)

Light- to medium-gray, well-sorted, thin-bedded to massive, epiclastic volcanic breccia, conglomerate, and sandstone consisting of dark-gray, subangular to subround clasts of pyroxene andesite and hornblende andesite in a light- to medium-gray, ash-rich matrix. The alluvial fades was formed by erosion and redeposition of rocks of the vent facies (TIv), as described by Smedes and Prostka (1972). In western half of quadrangle the alluvial facies is dominant, but grades into and interfingers with rocks of the vent facies (TIv). In that area it generally occurs as a unit about 120-140 m (365-425 ft) thick at the top of the Langford, and in irregularly distributed zones lower in the section. In places, the upper alluvial unit closely resembles the overlying beds of the Two Ocean Formation (Tto). Thickness at least 365 m (1,200 ft) near the mouth of Phlox Creek and 120 m (400 ft) near southwest corner of quadrangle.

k - Langford Formation, Alluvial facies deposits, Key bed (lower middle Eocene)

Tlp - Promontory Member (lower middle Eocene)

Dark-colored, massive bed of conglomerate of alluvial facies. Occurs only along north edge of quadrangle on the east wall of the Yellowstone River valley. North of quadrangle it makes up

one of four eastward-thinning tongues interbedded with the more-typical light-colored strata of the Langford. These tongues are interpreted as extensions of the original depositional unit which lay to the northwest but which is now buried by rhyolites of the Yellowstone Plateau. Entire unit in quadrangle has undergone low-grade metamorphism in proximity to pluton (Twi). Thickness about 18 m (60 ft).

Ttp - Trout Peak Trachyandesite (middle Eocene)

As mapped includes Pacific Creek Tuff Member and lava flows and flow breccias. The Pacific Creek Tuff Member and the lava flows and flow breccias pinch out about 100 m (about 300 ft) west of quadrangle over a prevolcanic topographic high on the Madison Limestone but occur as outliers 2.7-3.5 km (1.7-2.2 mi) farther west.

Pacific Creek Tuff Member - Pale-brown to yellow, poorly resistant, partly welded rhyodacite ash-flow tuff containing abundant phenocrysts of anorthoclase or sanidine and biotite, fragments of andesite, and broken crystals of labradorite and augite derived from older rocks, all in a groundmass of glass or devitrified glass. Called trachytic rhyolite by J.P. Iddings (in Hague and others, 1899, p. 325). The member discontinuously overlies lava flows and flow breccias that form the main part of the Trout Peak Trachyandesite owing to intravolcanic erosion. The member is partly mantled by glacial till and interbedded locally with the uppermost Trout Peak lavas north of quadrangle. The K-Ar age of biotite from a sample of the Pacific Creek Tuff Member at the type area 1.9 km (1.18 mi) east and 2.83 km (1.76 mi) north of southwest corner of quadrangle, low in the cliffs on the north side of Pacific Creek at an elevation of 8,400 ft, is 48.0±1.3 Ma (J.D. Obradovich, in Smedes and Prostka, 1972, p. C27). Locally, the thickness of the Pacific Creek Tuff Member is as much as 25 m (80 ft), but generally its thickness is <1 m (<3 ft) or it is absent.

Lava flows and flow breccias - Gray to dark-gray, dark-greenish-gray, and reddish-brown lava flows and rubbly flow breccias of shoshonite and absarokite (trachyandesite). Flows are dominantly massive and columnar jointed to blocky. Lava contains large phenocrysts of augite and smaller olivine in a dense to sugary textured groundmass containing abundant potassium feldspar. Sparse rubbly flow breccias occur between some flows. The upper half of the unit is characterized by some flows that contain abundant phenocrysts and clusters of phenocrysts of labradorite resembling the rhomb porphyries of the Oslo region in Norway. The feldspathic lavas have vesicular zones and scoriaceous tops, both of which are deuterically altered and crumbly. Thickness 12-270 m (40-900 ft).

R - Trout Peak Trachyandesite, Lava flow of rhomb porphyry type (middle Eocene)

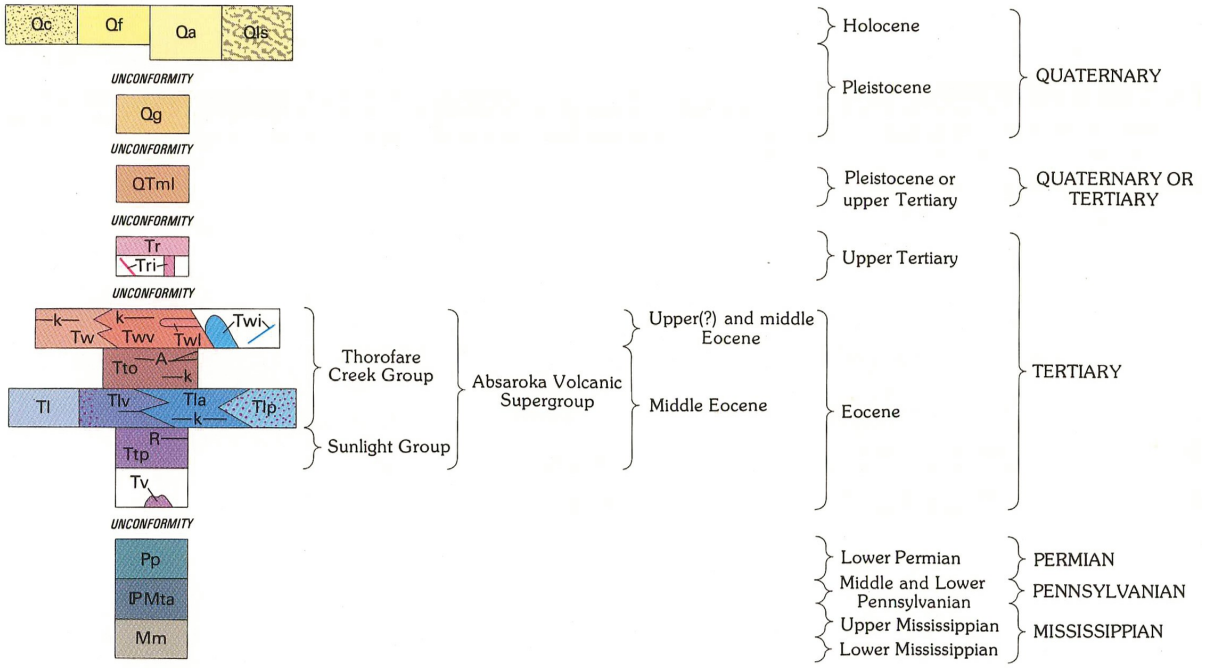
Single flow at least 12 m (40 ft) thick mantled with a discontinuous veneer of the Pacific Creek Tuff Member. Base of flow mapped to delineate structure in this part of quadrangle.

Tv - Volcaniclastic rocks of uncertain correlation (Eocene)

Medium to dark-gray and light-olive-gray, poorly sorted, andesitic siltstone and sandstone of alluvial facies. Unit poorly exposed in several small patches along south edge of quadrangle where it appears to be interbedded with the lower part of the Trout Peak Trachyandesite, but more extensive exposures just south of quadrangle demonstrate that these strata lie beneath the Trout Peak. The unit may be a lateral equivalent of part of either the Aycross Formation (middle Eocene) or the Wapiti Formation (middle Eocene), which crops out 80 km (50 mi) to the northeast (Antweiler and others, 1989, pl. 1). Regional relations suggest that the source of the volcaniclastic rocks was to the north and northeast. These strata pinch out a few miles south of quadrangle by onlap onto the pre-volcanic surface. Maximum thickness about 150 m (500 ft).

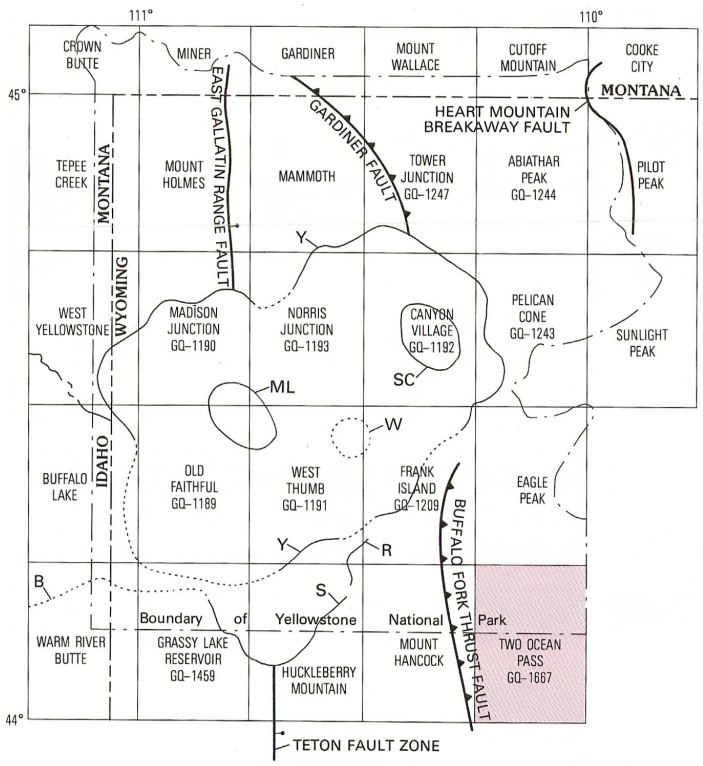
Text from source map: Two Ocean Pass 15' Quadrangle

Correlation of Map Units



Graphic from source map: Two Ocean Pass 15' Quadrangle

Index Map



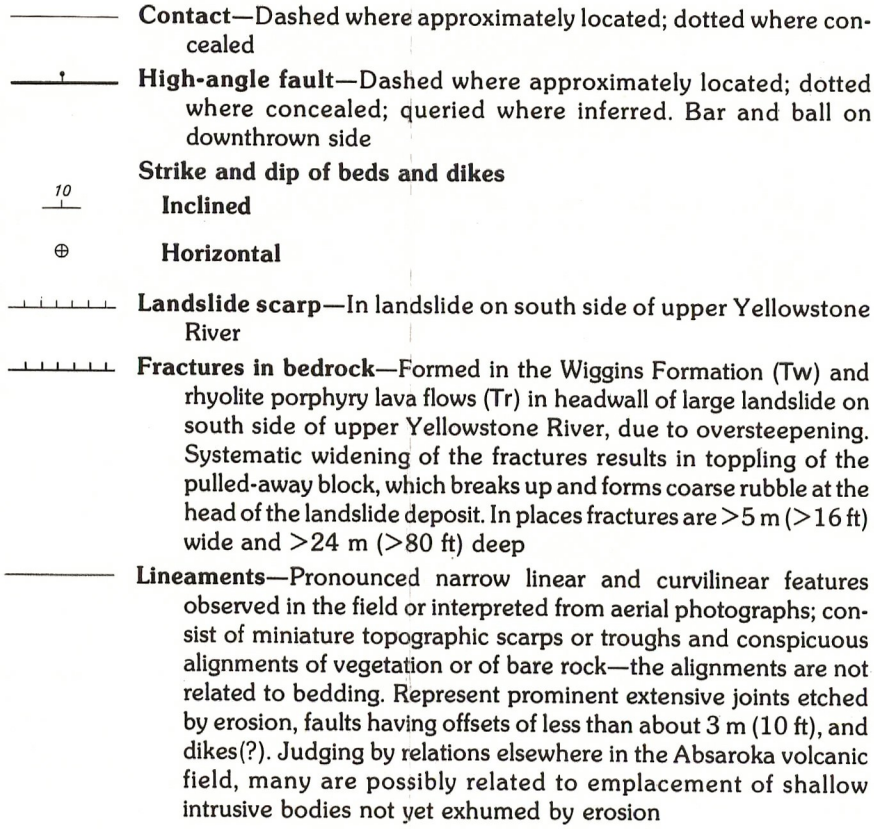
INDEX MAP OF YELLOWSTONE NATIONAL PARK SHOWING LOCATION OF 15–MINUTE QUADRANGLES AND MAJOR STRUCTURAL FEATURES

EXPLANATION

	Normal fault—Bar and ball on downthrown side
	Thrust fault—Sawteeth on upper plate
	Outline of dome
	Approximate topographic rim of caldera—Dotted where buried
W	West Thumb caldera rim—Caldera formed by collapse resulting from eruption of tuff of Bluff Point
ML	Mallard Lake dome—Dome formed by magmatic resurgence beneath Yellowstone caldera
SC	Sour Creek dome—Dome formed by magmatic resurgence beneath Yellowstone caldera
Y	Yellowstone caldera rim—Caldera formed by collapse resulting from eruptions of Lava Creek Tuff
R, S, B,	Red Mountains, Snake River, and Big Bend Ridge caldera-rim segments—Remnants of a caldera formed by collapse resulting from eruptions of Huckleberry Ridge Tuff

Graphic from source map: Two Ocean Pass 15' Quadrangle

Map Legend



Graphic from source map: Two Ocean Pass 15' Quadrangle

General Structure

GENERAL STRUCTURE

The prevolcanic rocks in the southwest corner of the quadrangle lie along the north limb of a northwest-trending anticline of the partly exhumed ancient Washakie Range. They dip about 15° northeasterly and are unconformably overlain by rocks of the Eocene Absaroka Volcanic Supergroup.

A few high-angle faults cut the rocks in the quadrangle. Most of these faults have displacements of less than 35 m (<115 ft). Faults that displace surficial deposits along the walls of the Yellowstone River valley are interpreted as resulting from the latest movement along a fault zone that bounds a bedrock graben beneath the valley.

Except for these faults, the structure of the volcanic rocks is that of irregular warps whose culminations and depressions are probably the result principally of vertical magmatic forces. This structure is demonstrated by the relief on the base of the Two Ocean Formation, excluding the graben of the Yellowstone River valley, which is only 365 m (1,200 ft); the maximum local relief over a distance of 1 km (0.6 mi) is only about 240 m (785 ft). All dips are less than 12°. The base of the Two Ocean Formation was chosen as a structural datum because that formation is composed of sheets of alluvial deposits laid down on a bevelled surface on the underlying vent-facies deposits of the Langford Formation. In the quadrangle, which lies mainly south of the southern flank of a large dome centered around Sylvan Pass 24 km (15 mi) to the north, the base of the Two Ocean is at an altitude of 8,400–9,600 ft. At the summit of that dome, the projected base of the Two Ocean Formation is

above 11,000 ft. The north rim of the Trident Plateau, near the north edge of the Two Ocean Pass 15' Quadrangle, marks the regional south edge of the dome. However, because of its subdued nature and the fact that the dome lies mostly to the north, the general form of the warped domal surface is not apparent from the geologic map.

Text from source map: Two Ocean Pass 15' Quadrangle

References

Antweiler, J.C., Love, J.D., Prostka, H.J., Williams, F.E., Jinks, J.E., and Light, T.D., 1989, Mineral resources of the Teton Wilderness and adjacent areas, Teton, Fremont, and Park Counties, Wyoming, with a section on Interpretation of geophysical data by D.M. Kulik and L.A. Anderson: U.S. Geological Survey Bulletin 1781, 105 p.

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Hague, Arnold, Iddings, J.P., Weed, W.H., Walcott, C.D., Girty, G.H., Stanton, T.W., and Knowlton, F. H., 1899, Descriptive geology, petrography, and paleontology, pt. 2 of Geology of the Yellowstone National Park: U.S. Geological Survey Monograph 32, 893 p., and atlas of 27 folio sheets.

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Smedes, H.W., and Prostka, H.J., 1972, Stratigraphic framework of the Absaroka Volcanic Supergroup in the Yellowstone National Park region: U.S. Geological Survey Professional Paper 729-C, 33 p.

References from source map: Two Ocean Pass 15' Quadrangle

West Thumb 15' Quadrangle

The formal citation for this source.

> Christiansen, R.L., 1974, Geologic Map of the West Thumb Quadrangle, Yellowstone National Park, Wyoming: U.S. Geological Survey, Geologic Quadrangle Map GQ-1191, scale 1:62,500 (*GRI Source Map ID 3260*).

Digital data associated with this map was converted from a third-party data source and checked against a georeferenced copy of the above paper source map.
The citation for this digital data:

> U.S. Geological Survey, 2007, Digital Geologic Map of the West Thumb Quadrangle, Yellowstone National Park, Wyoming: U.S. Geological Survey, unpublished digital data, scale 1:62,500 (*GRI Source Map ID 74801*).

Description of geologic units, prominent graphics and text associated with the paper source map.

Description of Map Units

Qa - Alluvium and glaciofluvial deposits (Holocene and Pleistocene)
Unconsolidated coarse- to fine-grained moderately well sorted and well bedded stream-channel, overbank, and fan deposits, glacial outwash, and stream-laid ice-contact deposits.

Qs - Landslide deposits (Holocene and Pleistocene)
Unconsolidated poorly sorted slide deposits with hummocky, generally bouldery surfaces.

Ql - Lacustrine and glaciolacustrine deposits (Holocene and Pleistocene)
Unconsolidated well-sorted and well-bedded silts, sands, and minor gravels deposited in or adjacent to open or ice-dammed lakes.

Qt - Talus, colluvium, and avalanche deposits (Holocene and Pleistocene)
Unconsolidated generally coarse angular debris deposited on slopes by mass movements, rockfalls, or debris flows.

Qhs - Silicious hot spring deposits (Holocene and Pleistocene)
Generally white to light-gray siliceous sinter in mounds or sheets around active or extinct hot springs.

Qhe - Hydrothermal explosion deposits (Holocene and Pleistocene)
Fine- to medium-grained poorly sorted and poorly bedded deposits forming a partial ring around Duck Lake, just west of West Thumb; probably ejected from basin of Duck Lake in a single episode of explosive steam generation. (See Muffler and others, 1971.).

Qg - Glacial deposits (Holocene and Pleistocene)
Till, generally lacking distinct morainal form except in some small valleys of the Red Mountains.

Plateau Rhyolite:
Large rhyolitic lava flows, each containing a wide variety of lithologies and distinguishable from one another only by topographic forms and zonal development of various textural features and emplacement structures. Most exposures are dark pitchstone or obsidian vitrophyres of flow-layered or flow-brecciated rhyolite, but gray to red pumiceous rhyolite and gray, brown, or varicolored crystalline rhyolite also are common; all varieties can occur within a single flow. All flows contain abundant 1-3 mm phenocrysts of quartz, sanidine, opaque oxides, and, in glassy zones, sparse clinopyroxene and fayalitic olivine; a few flows also contain minor sodic

plagioclase phenocrysts.

Qpcp - Plateau Rhyolite, Central Plateau Member, Pitchstone Plateau flow (Pleistocene)

Qpcr - Plateau Rhyolite, Central Plateau Member, Bechler River flow (Pleistocene)

Qpce - Plateau Rhyolite, Central Plateau Member, Elephant Back flow (Pleistocene)

Qpcw - Plateau Rhyolite, Central Plateau Member, West Thumb flow (Pleistocene)

Qpca - Plateau Rhyolite, Central Plateau Member, Aster Creek flow (Pleistocene)

Qpcc - Plateau Rhyolite, Central Plateau Member, Spring Creek flow (Pleistocene)
Age relations to other flows of Central Plateau Member older than Bechler River flow are uncertain.

Qpcl - Plateau Rhyolite, Central Plateau Member, Tuff of Bluff Point (Pleistocene)
Multiple-flow cooling unit of ash-flow tuff. Non-welded to partly welded, commonly glassy but locally crystallized in vapor-phase zone, especially near Bluff Point on west shore of West Thumb. Contains abundant 1-3 mm phenocrysts of quartz and sanidine, sparse sodic plagioclase, and very sparse clinopyroxene and opaque oxides. This informal unit previously was considered part of the Shoshone Lake Tuff Member which has been found to comprise more than one strati-graphic unit and is hereby abandoned.

Qpcd - Plateau Rhyolite, Central Plateau Member, Dry Creek flow (Pleistocene)

Qpm - Plateau Rhyolite, Mallard Lake Member, Mallard Lake flow (Pleistocene)
Lithologically and petrographically like flows of Central Plateau Member, but most glassy parts have been eroded off. Phenocrysts of quartz, sanidine, and minor opaque oxides. NOTE: The Mallard Lake Member is younger than the Upper Basin Member, rather than older as stated by Christiansen and Blank (1972).

Qpul - Plateau Rhyolite, Upper Basin Member, Scaup Lake flow (Pleistocene)
Similar to rhyolites of Central Plateau Member but contains, in addition, moderately abundant phenocrysts of sodic plagioclase, and clinopyroxene phenocrysts are more abundant.

Qylb - Lava Creek Tuff, Member B (Pleistocene)
Erosional remnants of simple cooling unit of ash-flow tuff in Red Mountains area. Gray to brown; generally densely welded and devitrified, but locally glassy and partly welded at base. Abundant 1-5 mm phenocrysts of quartz, sanidine, and sodic plagioclase; some sanidine phenocrysts as large as about 1 cm; sparse opaque oxides, clinopyroxene, and fayalitic olivine phenocrysts.

Ridge Tuff:
Compound cooling unit of ash-flow tuff in Red Mountains area. Gray to brown, generally densely welded and devitrified but locally glassy and partly welded. Most parts contain abundant phenocrysts of quartz, sanidine, and sodic plagioclase and sparse opaque oxides, clinopyroxene, and fayalitic olivine.

Qyhc - Huckleberry Ridge Tuff, Member C (Pleistocene)
Entirely devitrified; commonly shows strong lineation of stretched welded pumice and aligned phenocrysts; compaction foliation commonly deformed by flowage folding. Lithic inclusions common and are exceptionally abundant in topmost part, exposed just northwest of Mount Sheridan. Phenocrysts abundant but generally smaller (less than 1 mm) than in members A and B.

Qyhb - Huckleberry Ridge Tuff, Member B (Pleistocene)
Entirely devitrified. Phenocrysts abundant and particularly large (as much as 5 mm) in upper part, very sparse and small in lower part. Two types of welded pumice in upper part-one very dark and scoriaceous, the other light-colored and compact.

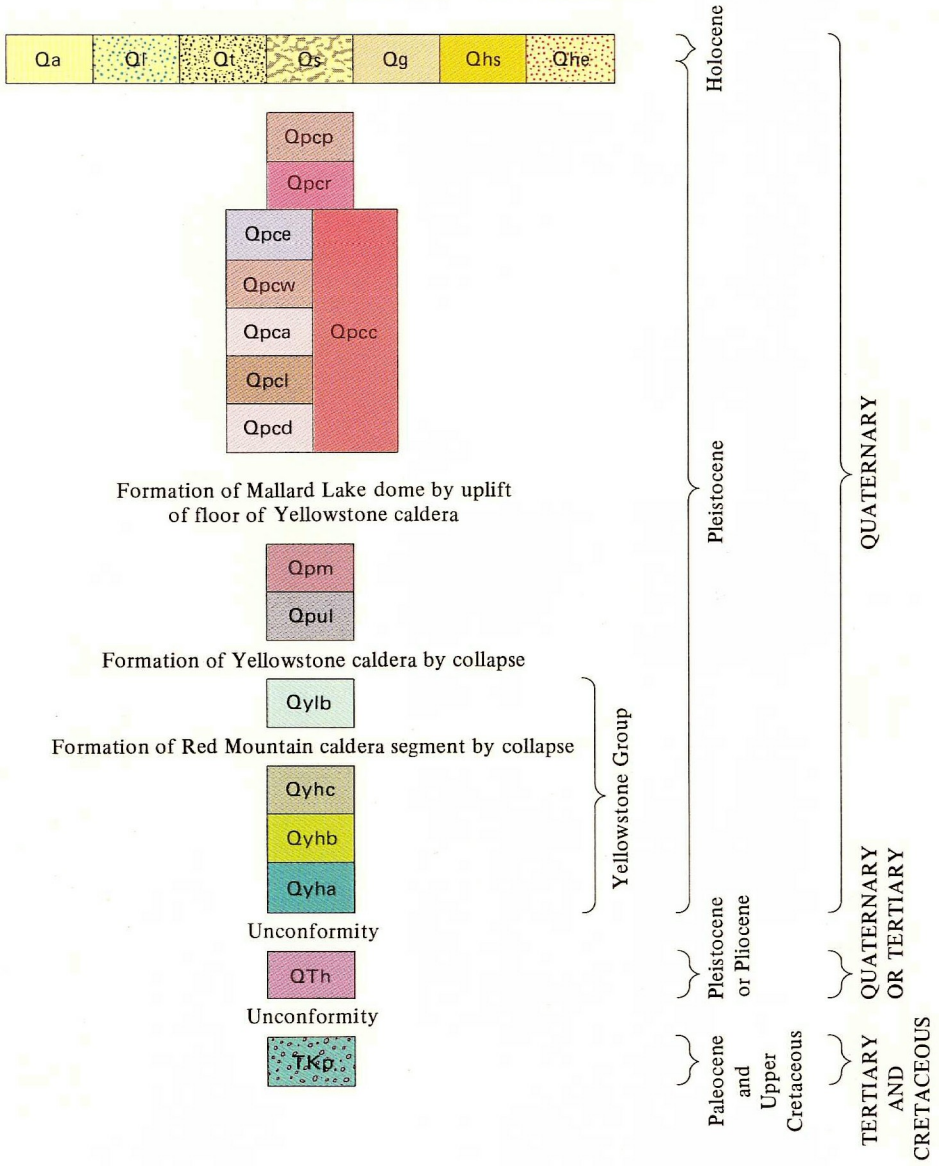
Qyha - Huckleberry Ridge Tuff, Member A (Pleistocene)
Mainly devitrified but black vitrophyre at base. Phenocrysts, abundant in lower part, become progressively less abundant upward.

QTh - Heart Lake Conglomerate (Pleistocene or Pliocene)
Well to poorly indurated, poorly sorted, and poorly bedded conglomerate. Coarse clasts are mainly limestone; sparse rhyolitic fragments. Underlies Huckleberry Ridge Tuff according to Love and Keefer (1969).

TKp - Pinyon Conglomerate (Paleocene and upper Cretaceous)
Well indurated, moderately well sorted and bedded quartzite conglomerate.

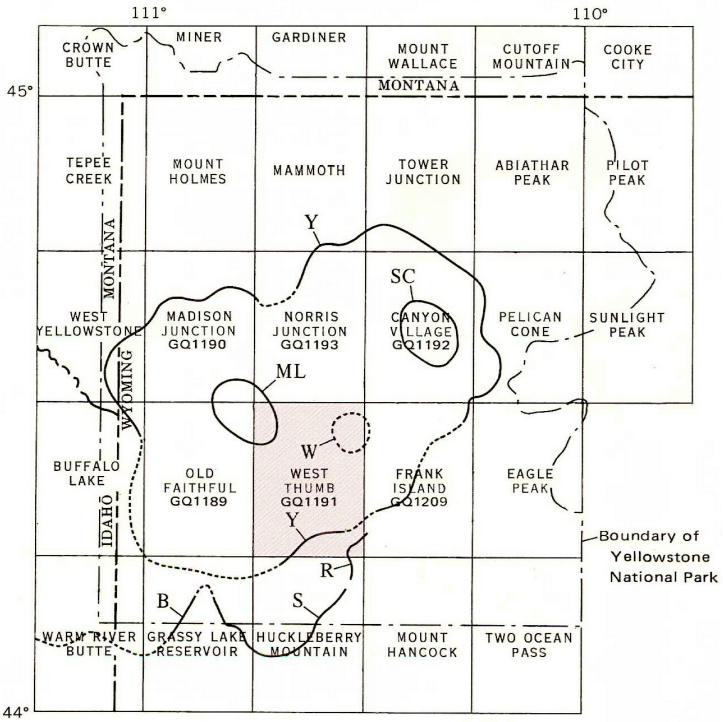
Text from source map: West Thumb 15' Quadrangle

Correlation of Map Units



Graphic from source map: West Thumb 15' Quadrangle

Index Map



INDEX MAP OF YELLOWSTONE NATIONAL PARK SHOWING LOCATION OF 15-MINUTE QUADRANGLES AND MAJOR STRUCTURAL FEATURES
Location of this quadrangle indicated by color

Outline of dome

Approximate topographic rim of caldera – Dotted where buried

W — West Thumb caldera rim – Caldera formed by collapse resulting from eruption of tuff of Bluff Point

ML — Mallard Lake dome – Dome formed by magmatic resurgence beneath Yellowstone caldera

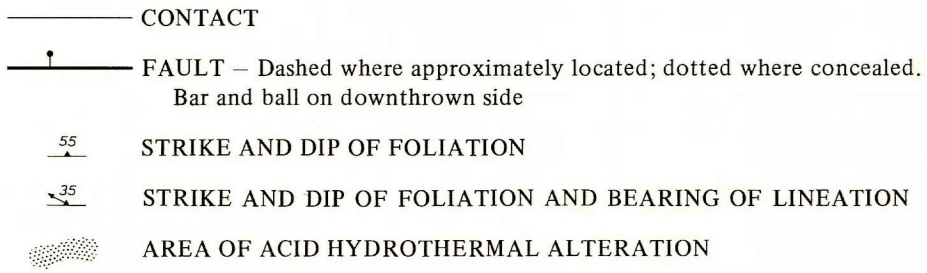
SC — Sour Creek dome – Dome formed by magmatic resurgence beneath Yellowstone caldera

Y — Yellowstone caldera rim – Caldera formed by collapse resulting from eruptions of Lava Creek Tuff

R, S, B — Red Mountains, Snake River, and Big Bend Ridge caldera-rim segments – Remnants of a caldera formed by collapse resulting from eruptions of Huckleberry Ridge Tuff

Graphic from source map: West Thumb 15' Quadrangle

Map Legend



Graphic from source map: West Thumb 15' Quadrangle

References

Christiansen, R. L., and Blank, H. R., Jr., 1972, Volcanic stratigraphy of the Quaternary rhyolite plateau in Yellowstone National Park: U.S. Geol. Survey Prof. Paper 729-B, 18 p.

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References from source map: West Thumb 15' Quadrangle

West Yellowstone 15' Quadrangle

The formal citation for this source.

> Christiansen, R.L., 2007, Mylar of the West Yellowstone Quadrangle: U.S. Geological Survey, unpublished mylar, scale 1:62,500 (*GRI Source Map ID 6721*).

Listing of geologic unit symbols present on the source map. The source map did not contain a legend, unit descriptions, or any additional information.

Map Unit Listing

Qa, Qt, Qg, Qpcy, Qpcb, Qmr, Qprr, Qylb, Qylu, Qyll, Qjb, Qyhb, Qyha, Tab, Kk, TRw, pCgn, pCq, pCam and **qz-v**

List from source map: West Yellowstone 15' Quadrangle

Yellowstone National Park

The formal citation for this source.

> U.S. Geological Survey, 1972, Geologic Map of Yellowstone National Park: U.S. Geological Survey, Miscellaneous Geologic Investigations Map I-711, scale 1:125,000 (*GRI Source Map ID 11168*).

A GIS version of the above publication was used for this project and checked against the above paper source map to ensure all geologic features were captured.
The citation for this digital data:

> Christiansen, R.L., and Wahl, R.R., 1999, Digital Geologic Map of Yellowstone National Park, Idaho, Montana, and Wyoming and Vicinity: U.S. Geological Survey, Open-File Report OF-99-174, scale 1:125,000 (*GRI Source Map ID 3013*).

Listing of geologic unit symbols, names, and prominent graphics and text associated with the paper source map.

Map Unit Listing

Qs - Detrital deposits (Holocene and Pleistocene)

Qh - hot spring deposits (Holocene and Pleistocene)

Qci - Cemented ice contact deposits localized by hot springs (Holocene and Pleistocene)

Qpcl - Plateau Rhyolite, Central Plateau Member, Summit Lake flow (Pleistocene)

Qpcb - Plateau Rhyolite, Central Plateau Member, Buffalo Lake flow (Pleistocene)

Qmr - Madison River Basalt (Pleistocene)

Qpoz - Plateau Rhyolite, Obsidian Creek Member, rhyolite basalt mixed lavas of Grizzly Lake (Pleistocene)

Qf - Plateau Rhyolite, Falls River Basalt (Pleistocene)

Qsl - Plateau Rhyolite, Swan Lake Flat basalt (Pleistocene)

Qylb - Lava Creek Tuff, Member B (Pleistocene)

Qyla - Lava Creek Tuff, Member A (Pleistocene)

Qmm - Mount Jackson Rhyolite, Moose Creek Butte flow (Pleistocene)

Qw - Basalt of Warm River (Pleistocene)

Qiw - Island Park Rhyolite, Warm River Butte dome (Pleistocene)

Qym - Island Park Rhyolite, Mesa Falls Tuff (Pleistocene)

Tyhc - Huckleberry Ridge Tuff, Member C (Pleistocene)

Tyhb - Huckleberry Ridge Tuff, Member B (Pleistocene)

Tyha - Huckleberry Ridge Tuff, Member A (Pleistocene)

Tia - Andesite dikes (Eocene)

Tid - Dacite intrusive rocks (Eocene)

To - Two Ocean Formation (Eocene)

Tli - Intrusive rocks of Two Ocean and Langford Formations (Eocene)

Tl - Langford Formation (Eocene)

Tlf - Absaroka Volcanic Supergroup, Langford Formation, Andesite Lava Flows (Eocene)

Tlp - Langford Formation, Promontory Member (Eocene)

Tt - Trout Peak Trachyandesite (Eocene)

Ttp - Trout Peak Trachyandesite, Pacific Creek Tuff Member (Eocene)

Ti - Rhyodacite, quartz latite, quartz monzonite, and granodiorite in the Gallatin Ridge (Eocene)

Tm - Mount Wallace Formation (Eocene)

Ts - Sepulcher Formation (Eocene)

Tsf - Sepulcher Formation, Fortress Mountain Member (Eocene)

Tsd - Sepulcher Formation, Daly Creek Member (Eocene)

Tsc - Sepulcher Formation, Nonvolcanic conglomerate, fangflomerate, and breccia facies (Eocene)

TKv - Volcanic Rocks (Paleocene and Upper Cretaceous)

Kl - Landslide Creek Formation, Everts Formation, Eagle Sandstone, Telegraph Creek

Formation, Cody Shale, and Fronier Sandstone (Upper Cretaceous)

Kmk - Mowry Shale, Thermopolis Shale, and Kootenai Formation (Lower Cretaceous)

Jm - Morrison Formation (Upper Jurassic)

Je - Ellis Group, sandstone, shale, and limestone (Upper and Middle Jurassic)

TRt - Thyanes?, Woodside, and Dinwoody Formations (Lower Triassic)

Ps - Shedhorn Sandstone (Permian)

PNq - Quadrant Sandstone and Amsden Formation (Lower and Middle Pennsylvanian)

Mm - Madison Group (Lower and Upper Mississippian)

DOt - Three Forks Formation, Jefferson Formation, and Bighorn Dolomite, undivided (Ordovician and Devonian)

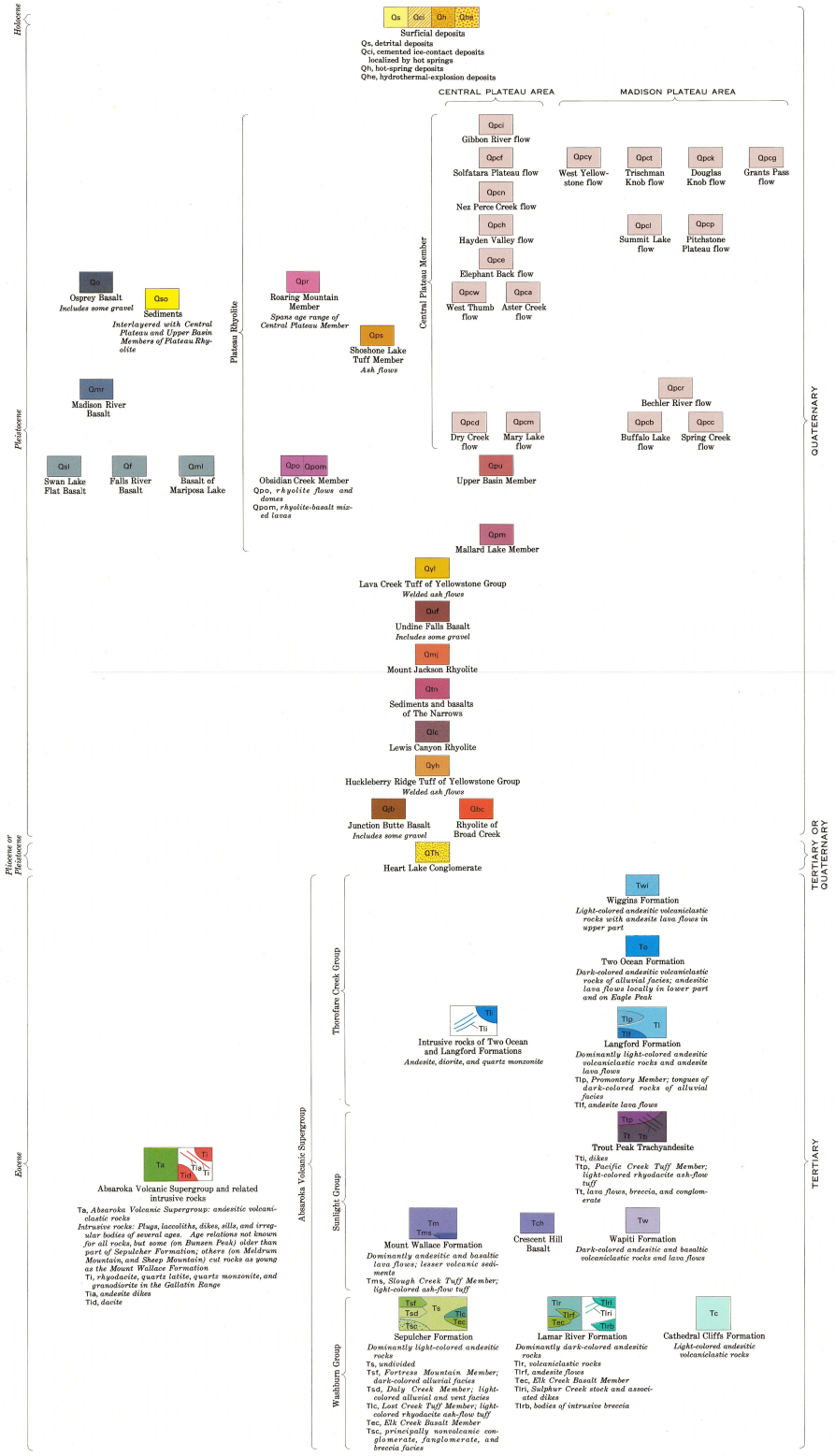
Cs - Snowy Range Formation and Pilgrim Formation (Cambrian)

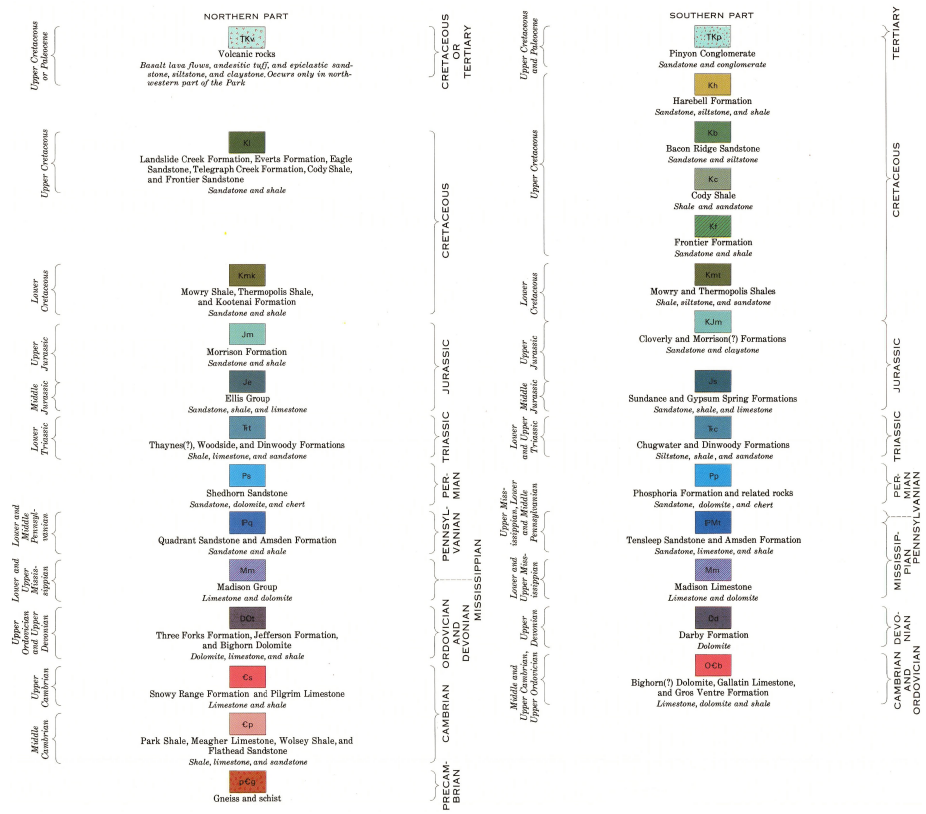
Cp - Park Shale, Meagher Limestone, Wolsey Shale and Flathead Sandstone (Cambrian)

pCg - Gneiss and Schist (Precambrian)

Text from source map: Yellowstone National Park

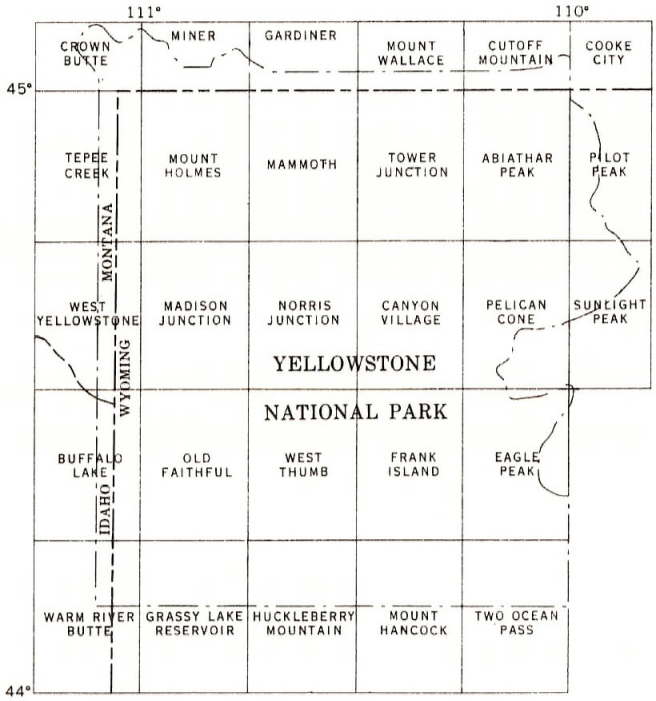
Correlation of Map Units





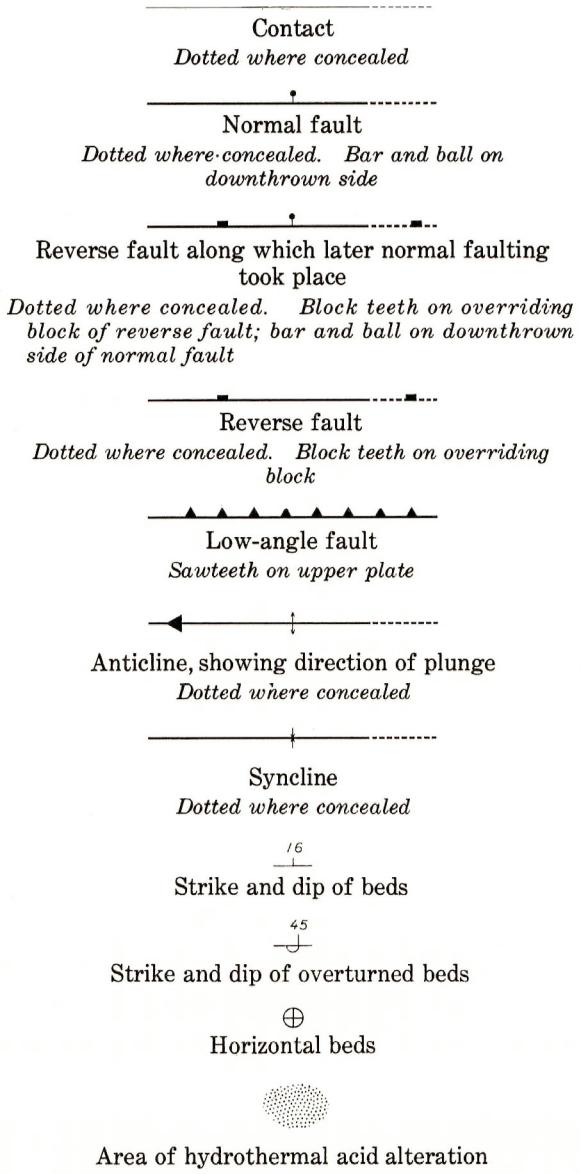
Graphic from source map: [Yellowstone National Park]

Index Map



Graphic from source map: Yellowstone National Park

Map Legend



Graphic from source map: Yellowstone National Park

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GRI Digital Data Credits

This document was developed and completed by Jake Suri and James Chappell (Colorado State University) for the NPS Geologic Resources Division (GRD) Geologic Resources Inventory (GRI) Program. Quality control of this document by Jim Chappell, James Winter, and Stephanie O'Meara (Colorado State University).

The information in this document was compiled from GRI source maps, and intended to accompany the digital geologic-GIS map(s) and other digital data for Yellowstone National Park, Wyoming, Montana, and Idaho (YELL) developed by James Winter, James Chappell, Philip Reiker, Jason Isherwood, Stephanie O'Meara, Ron Karpilo, Sarah Lowe, Jake Suri, Georgia Hybels, and Chase Winters (Colorado State University and NPS GRD) (see the GRI Digital Maps and Source Map Citations section of this document for all sources used by the GRI in the completion of this document and related GRI digital geologic-GIS map(s)).

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