GEOLOGIC MAP OF THE IDAHO CITY 30 x 60 MINUTE QUADRANGLE, IDAHO

Mapped and Compiled by
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Digital cartography by Jane S. Freed at the Idaho Geological Survey's Digital Mapping and GIS Lab.
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Base map from digitally scanned USGS 1:100,000 composite film base, 1982.

Roads from USGS, 1:100,000 Digital Line Graph data.

Projection and 10,000-meter grid, zone 11, Universal Transverse Mercator. 25,000-foot grid ticks based on Idaho coordinate system, west and central zones. 1927 North American Datum.

UTM Grid and 1971 Magnetic North Declination at Center of Map

SCALE 1:100,000

1 0 1 2 3 4 5 KILOMETERS

1 0 1 2 3 MILES

Contour Interval 50 Meters

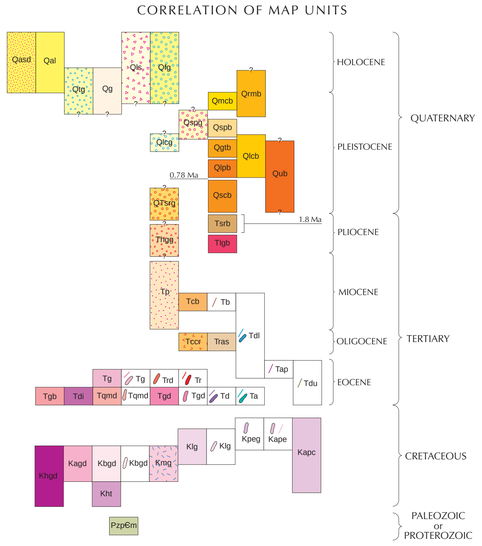
IDAHO

QUADRANGLE LOCATION

INTRODUCTION

Most of this map was compiled from field work done for the Hailey 1° x 2° geologic map under the U.S. Geological Survey's CUSMAP program (Worl and others, 1991). The original geology produced on 7.5-minute field sheets by Thor Kiilsgaard for the Hailey project was digitally captured to form the basis of this map and a GIS database. Additional published and unpublished mapping, photogeology, and field work provided further information on the surficial and basalt units (see Index to Sources of Geologic Mapping).

CORRELATION OF MAP UNITS



DESCRIPTION OF MAP UNITS

Qal **Alluvium (Holocene)**—Modern stream alluvium; sand, gravel, cobbles, and boulders. Includes some glacial outwash gravel and alluvial fans mostly composed of debris-flow deposits.

Qasd **Sandy alluvium of side streams (Holocene and Pleistocene)**—Medium to coarse sand interbedded with silty fine sand and silt. Mostly derived from weathered granite (Othberg and Stanford, 1992).

Qlg **Alluvial fan gravels (Holocene and Pleistocene)**—Sandy pebble and cobble gravel; sand and granule gravel where formed from weathered granite. Primarily formed by debris flows and local high-energy streams (Pierce and Scott, 1982).

Qls **Landslide deposits (Holocene and Pleistocene)**—Slope failure in *Kbgd*.

Qtg **Terrace gravel (Holocene and Pleistocene)**—Sand, gravel, cobbles, and boulders. Partially derived from glacial advances upstream. Benches as much as 600 feet (183 m) above modern streams. Commonly capped by alluvial fans mostly composed of debris-flow deposits.

Qg **Glacial deposits, undivided (Holocene and Pleistocene)**—Includes till, glaciolacustrine sediments, outwash gravel, and some stream alluvium. Landforms include moraines, lake basins, outwash plains, and terraces. Deposited by small isolated glaciers, valley glaciers, and large ice cap-centered outlet glaciers originating in the Sawtooth and Trinity Mountains. Relative dating of deposits indicates at least three glaciations in the Sawtooth Mountains (Stanford, 1982).

Qub **Basalt, undivided (Pleistocene?)**—Basalt flows of uncertain age.

Qmcb **Basalt of Mores Creek (Pleistocene)**—One canyon-filling flow from unknown vent in Mores Creek valley (Howard and others, 1982). Dark gray, vesicular, olivine-rich basalt. It is composed of lathlike crystals of plagioclase (labradorite) set in a matrix that is chiefly augite, ilmenite, and magnetite but which also contains olivine. Normal magnetic polarity. Thickness of 20 feet (6 m).

Qrmb **Basalt of Red Mountain (Holocene or late Pleistocene)**—Basalt erupted from Red Mountain and flowed down Fall Creek (Bennett, 1980).

Qspg **Gravel overlying the Smith Prairie Basalt and basalt of Gowen Terrace (Pleistocene)**—Fan gravel and sand deposited onto, and stream deposits formed in water dammed behind, Smith Prairie Basalt and mostly coarse sand deposited onto the basalt of Gowen Terrace. Thickness up to 100 feet (30 m) adjacent to canyon walls.

Qspb **Smith Prairie Basalt, undivided (Pleistocene)**—Includes three canyon-filling basalts (Howard and Shervais, 1973): two porphyritic basalts separated by a microporphyritic basalt. Normal magnetic polarity. Mostly diktytaxitic and dark gray. Contains plagioclase, brown clinopyroxene, olivine, and opaques. Maximum measured thickness of 400 feet (120 m).

Qlcg **Gravel overlying basalt of Lava Creek (Pleistocene)**—Fan gravel deposited onto, and stream deposits formed in water dammed behind, basalt of Lava Creek.

Qlcb **Basalt of Lava Creek (Pleistocene)**—Dark to medium gray, very fine-grained basalt. Normal magnetic polarity.

Qglb **Basalt of Gowen Terrace (Pleistocene)**—Four flows of medium gray olivine basalt. Canyon-filling basalt probably erupted in Smith Prairie (Howard and others, 1982). Normal magnetic polarity. Olivine phenocrysts up to 1-3 mm in diameter. Age of 0.572 Ma ± 0.210 Ma (potassium-argon date from Othberg and Stanford, 1992). Forms terrace up to 600 feet (183 m) above the river. Thickness of about 200 feet (61 m).

Qlqb **Basalt of Lucky Peak (Pleistocene)**—Single flow of dark gray to black, aphyric, very fine-grained basalt. Canyon-filling basalt probably erupted in Smith Prairie (Howard and others, 1982). Normal magnetic polarity. Thickness of about 121 feet (37 m).

QTsrg **Gravel overlying both the basalt of Smith Creek and Steamboat Rock Basalt (Pleistocene and Pliocene)**—Fan gravel deposited onto, and stream deposits formed in water dammed behind, Smith Creek and Steamboat Rock basalts. Also includes some fan gravels deposited on the Steamboat Rock Basalt surface downstream from Long Gulch.

Qscb **Basalt of Smith Creek (Pleistocene)**—Medium to light gray and almost aphyric basalt. Xenocrysts and xenoliths of granitic rocks are common. Reverse magnetic polarity.

Tsrb **Steamboat Rock Basalt (Pliocene)**—Numerous flows of olivine basalt. Upper flows are medium gray plagioclase-phyric basalt and diabase. Lower flows are dark to medium gray microporphyritic basalt. Reverse magnetic polarity. Maximum thickness of 580 feet (180 m; Howard and Shervais, 1973). Age of 1.8 Ma ± 0.3 Ma (potassium-argon date from Howard and others 1982).

Tlgb **Basalt and gravel of Long Gulch (Pliocene?)**—Two basalt flows and gravel above and between the flows. Light gray and very fine-grained aphyric upper flow. The lower flow is black and mostly glass. Normal magnetic polarity. May be basalt of Lucky Peak (Othberg and others, 1995).

Tbgg **High gravel (Pliocene)**—Consists of poorly sorted to unsorted sand, gravel, cobbles, and boulders eroded from rocks of the Idaho batholith and from various dikes. Gravel may be equivalent to the gravel of Bonneville Point of Othberg and Stanford (1992).

Tp **Payette Formation (Miocene)**—Stratified, tan to gray, loosely consolidated arkosic sandstone and siltstone and interstratified conglomerate and thin-bedded, dark gray to black shale in which are abundant impressions of upper middle to lower upper Miocene leaves and plant fragments. Minimum thickness of 574 feet (175 m).

Tcb **Columbia River Basalt Group (Miocene)**—Dark gray to black basalt, commonly porphyritic with euhedral lathlike phenocrysts of plagioclase (andesine to labradorite) up to 4 mm in length. Olivine is a common mineral in most samples, occurring as phenocrysts larger than those of plagioclase.

Tb **Basaltic dikes (Miocene)**—Dark green microporphyritic basaltic andesite and basalt dikes consisting mostly of labradorite and augite. Most probably correlate with the Columbia River Basalt Group, but those in the southernmost part of the Idaho batholith may be younger.

Tccr **Rhyolite of Clear Creek (Oligocene)**—Light gray, almost white, very fine-grained, crystal poor rhyolite. It consists of a matrix of quartz and potassium feldspar in which are angular pieces of quartz, sanidine, and oligoclase that range from 1 to 3 mm long. Age of about 34 Ma ± 2.4 Ma (zircons using the fission track method; Kiilsgaard and others, 1997).

Tras **Rhyolitic ash and arkose (Oligocene)**—Water-lain rhyolitic ash, conglomerate, and arkose. Age of 32.7 Ma ± 2.7 Ma (zircons using the fission track method; Kiilsgaard and others, 1997).

Ta **Andesite (Eocene)**—Dark gray to black, fine-grained, and weakly porphyritic. The phenocrysts are plagioclase and commonly 2 to 4 mm long.

Tdl **Diabase and lamprophyre dikes (Eocene)**—Includes diabase with medium-grained, ophitic to subophitic texture and lamprophric dikes in which ferromagnesium phenocrysts are set in a dark aphanitic groundmass.

Tr **Rhyolite dikes and plugs (Eocene)**—Pink, tan, and light gray, highly to sparsely porphyritic rhyolite with phenocrysts of potassium feldspar, quartz, plagioclase, and biotite.

Trd **Rhyodacite dikes (Eocene)**—Pink to gray-green, porphyritic rhyodacite with phenocrysts of plagioclase, hornblende, biotite, and embayed quartz.

Td **Dacite (Eocene)**—Dark greenish to gray porphyritic dacite. Most of the phenocrysts are plagioclase, but some are quartz, which is commonly resorbed and rounded. Small phenocrysts of hornblende and biotite are common.

Tg **Granite (Eocene)**—Pink to light gray, coarse- to medium-grained, equigranular to porphyritic biotite granite in which perthitic potassium feldspar and dark quartz are the principal components.

Tgd **Granodiorite (Eocene)**—Granodiorite grading to quartz monzodiorite and granite. Gray to dark gray, medium-grained, equigranular to porphyritic rock in which zoned andesine is the principal component; hornblende and sphene are common.

Tqmd **Quartz monzodiorite (Eocene)**—Greenish gray, highly porphyritic stocks and dikes with a fine-grained groundmass. Commonly contains 10 to 30 percent green hornblende. Phenocrysts in the rock are chiefly strongly zoned plagioclase, although some are quartz. Another conspicuous feature is fresh-appearing, vitreous, euhedral biotite.

Tdi **Diorite (Eocene)**—Dark gray, equigranular, and fine- to medium-grained. Green hornblende is the principal mafic mineral and may account for as much as 40 percent of the rock. Augite and hypersthene also are common constituents.

Tdu **Undifferentiated dikes (Tertiary)**

Tgb **Gabbro (Eocene)**—Dark gray, equigranular, and medium- to fine-grained. It is layered and consists chiefly of cumulus aggregates of plagioclase (labradorite grading to andesine), hypersthene, augite, and olivine.

Tap **Aplite dikes (Eocene)**—Pink, fine-grained aplite.

Kpeg **Pegmatite dikes (Cretaceous)**—Coarsely crystalline dikes consisting principally of quartz, feldspar, biotite, and muscovite.

Kape **Pegmatite and aplite dikes (Cretaceous)**—Light gray, fine-textured aplite with quartz and feldspar minerals the principal constituents. Pegmatites are light gray to white and distinguished by the large grain size of contained minerals.

Kapc **Pegmatite and aplite complex (Cretaceous)**—Aplite and pegmatite dikes cross-cutting subordinate amounts of biotite granodiorite.

Klg **Leucocratic granite (Cretaceous)**—Light gray and fine- to medium-grained biotite granite with a distinctive anhedral texture. Similar to aplite.

Kmg **Biotite-muscovite granite (Cretaceous)**—Massive, light gray, medium- to coarse-grained, and equigranular to porphyritic muscovite-biotite (two-mica) granite, grading to granodiorite.

Kbgd **Biotite granodiorite (Cretaceous)**—Light gray, medium- to coarse-grained, equigranular to porphyritic granodiorite in which oligoclase is the chief component. Grades to granite.

Kagd **Altered biotite granodiorite (Cretaceous)**—Iron-stained, medium- to coarse-grained, equigranular to porphyritic granodiorite. Biotite is altered to chlorite or to iron oxides, which account for the characteristic reddish stain. Feldspars in the rock are altered to clay minerals or sericite.

Khgd **Hornblende biotite granodiorite (Cretaceous)**—Gray, medium-grained hornblende-biotite granodiorite. Present only as two small exposures southwest of Atlanta.

Kht **Tonalite (Cretaceous)**—Gray to dark gray, medium-grained, equigranular tonalite in which andesine is the principal component. May contain as much as 20 percent biotite and hornblende. Contains primary epidote. Locally foliated; grades to granodiorite.

PzpEm **Roof pendant (Proterozoic or Paleozoic)**—Garnet-diopside gneiss, quartzite, and biotite-sillimanite schist of uncertain age.

SYMBOLS

- Contact: dashed where approximately located or inferred
- Fault: dashed where approximately located, dotted where concealed; bar and ball on downthrown side
- Strike and dip of beds
- Strike and dip of foliation
- Quartz vein: arrow indicates dip of vein
- Igneous breccia
- Volcanic crater or vent

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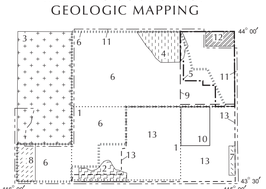

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