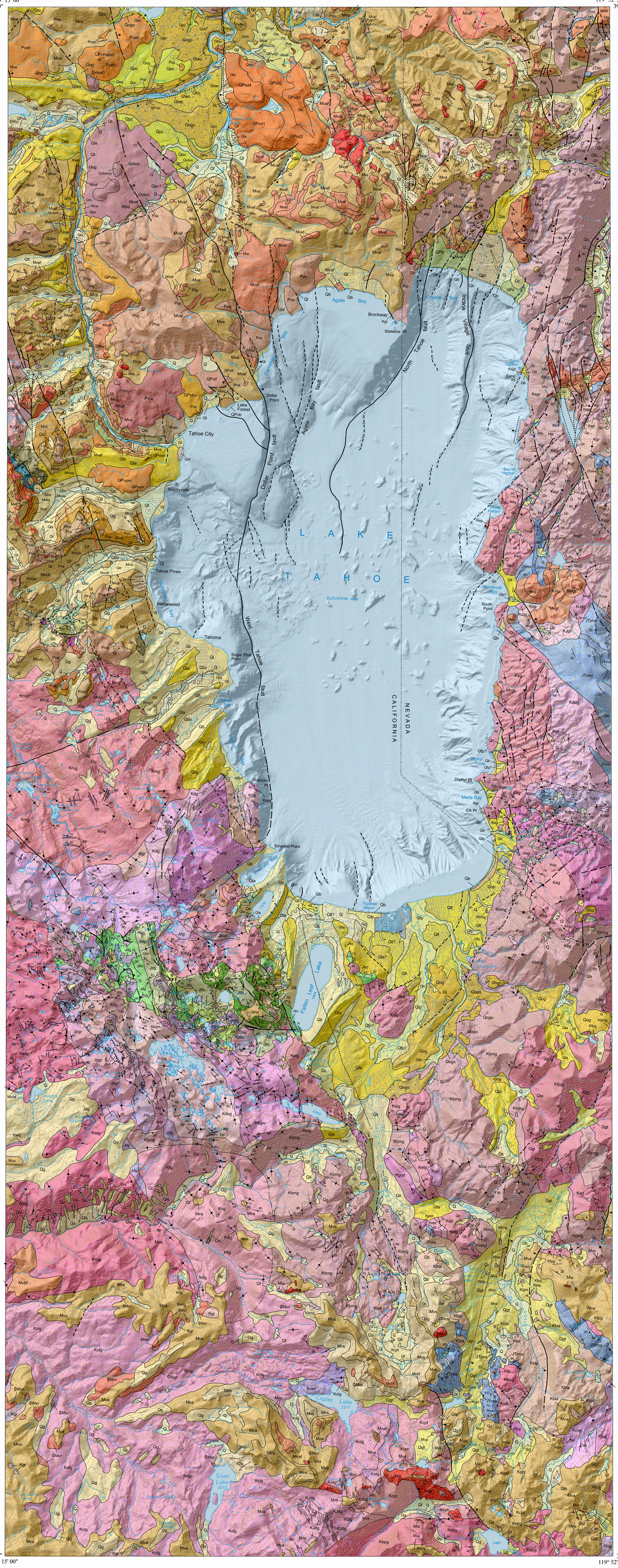


GEOLOGIC MAP OF THE LAKE TAHOE BASIN CALIFORNIA AND NEVADA

Compiled by
George J. Saucedo

Digitized by
Jason D. Little, Sarah E. Watkins, Jennifer R. Davis,
Marina T. Mascorro, Victoria D. Walker and Eric W. Ford

2005

Version 1.0

DESCRIPTION OF MAP UNITS

(See pamphlet for more detailed unit descriptions)

af — Artificial fill (late Holocene)
Qb — Beach deposits (Holocene)
Qfp — Flood-plain deposits (Holocene)
Qt — Talus deposits (Holocene)
Ql — Lake deposits (Holocene)
Qyg — Younger glacial deposits (Holocene)
Qc — Colluvium (Holocene)
Qls — Landslide deposits (Holocene and Pleistocene)
Q — Alluvium (Holocene and Pleistocene)
Qf — Alluvial fan deposits (Holocene and Pleistocene)
Qm — Mudflow deposits (Holocene and (or) Pleistocene)
Qob — Older beach deposits (Pleistocene)
Qol — Older lake deposits (Pleistocene)
Qlt — Lacustrine terrace deposits (Pleistocene)

Tioga glacial deposits (Pleistocene)
Qti — Till
Qtio — Outwash deposits

Tahoe glacial deposits (Pleistocene)
Qta — Till
Qtao — Outwash deposits

Tahoe and Tioga glacial deposits - undivided (Pleistocene)
Qgt — Till

Older glacial deposits - pre-Tahoe deposits (Pleistocene)
Qog — Till
Qogo — Outwash deposits

Glacial deposits undivided (Pleistocene and Holocene?)
Qg — Till
Qgo — Outwash deposits

Qvbm — Bald Mountain olivine latite of Birkeland (1961) (Pleistocene) Qvbmcc - cinder cone deposits
Qjf — Juniper Flat alluvium of Birkeland (1961) (Pleistocene)
Qpc — Prosser Creek alluvium of Birkeland (1961) (Pleistocene)
Qvh — Hirschdale olivine latite of Birkeland (1961) (Pleistocene) Qvhcc - cinder cone deposits; Qvht - basaltic tuff
QPot — Older talus deposits (Pliocene and (or) Pleistocene)
QPvd — Dry Lake volcanic flows of Birkeland (1961); Wise and Sylvester (2004) (Pliocene and (or) Pleistocene) - QPvd1 - QPvd4 (oldest to youngest)
QPvbc — Big Chief basalt of Birkeland (1961) (Pliocene and (or) Pleistocene)
QPvpm — Page Meadow basalt of Wise and Sylvester (2004) (Pliocene and (or) Pleistocene)
QPs — Unnamed gravels, sand and alluvium (Pliocene and (or) Pleistocene)
QPvbu — Burton Creek basalt of Wise and Sylvester (2004) (Pliocene and (or) Pleistocene)
QPvlf — Lake Forest basalt of Wise and Sylvester (2004) (Pliocene and (or) Pleistocene)

Unnamed volcanic and intrusive rocks (Pliocene and (or) Pleistocene)
QPvb — Basalt flows, flow breccia and basaltic ash
QPi — QPia - intrusive andesite and latite; QPib - intrusive basalt
Pvta — Tahoe City trachyandesite of Wise and Sylvester (2004) (Pliocene) Pvtcc - cinder cone deposits
Pvtb — Tahoe City basalt of Wise and Sylvester (2004) (Pliocene)
Pvp — Polaris olivine latite of Birkeland (1961) (Pliocene) Pvpt - latite tuff and tuff breccia
Pvah — Alder Hill basalt of Birkeland (1961) (Pliocene) Pvahcc - cinder cone deposits
Ps — Fluvial and lacustrine deposits (Pliocene)

Unnamed volcanic and intrusive rocks (Pliocene)
Pva — Andesite and basaltic andesite flows
Pval — Andesite lahars
Pvb — Basalt flows - includes Boca Ridge flows of Latham (1985)
Pi — Dikes and intrusives - Pia - andesite; Pib - basalt

Unnamed volcanic and intrusive rocks (Miocene)
Mva — Undivided andesitic and dacitic lahars, flows, breccia and volcaniclastic sediments
Mvaf — Andesite and dacite flows
Mvbf — Basalt flows
Mvs — Fluvial deposits
Mi — Intrusive rocks - Mia - andesite, basaltic andesite and latite; Mib - basalt; Mir - rhyolite
Mvg — Glenbrook volcanic center (Miocene) Mvgi - latite intrusions; Mvgt - vitric-crystal tuff; Mvgf - trachyte flows and vent fill

Upper lahar sequence of Harwood and Fisher (2002) (Miocene)
Mvul — Andesitic lahars
Mvula — Andesite flows
Mvulp — Pumiceous tuff
Mvulr — Rockslide-avalanche deposits

Lower lahar sequence of Harwood and Fisher (2002) (Miocene)
Mvll — Andesitic lahars
Mvlla — Andesite flows

Unnamed volcanic and sedimentary rocks
ΦMvr — Rhyolite tuff (Oligocene and Miocene?)
Φc — Conglomerate and breccia (Oligocene and (or) older Tertiary)

Granitic rocks
ap — Aplite and pegmatite dikes (Cretaceous)
Kelg — Echo Lake granodiorite (Cretaceous)
Kppg — Phipps Pass granodiorite (Cretaceous)
Kbmg — Bryan Meadow granodiorite (Cretaceous)
Kllg — Lovers Leap granodiorite (Cretaceous)
Kgag — Glen Alpine granodiorite (Cretaceous)
Ktlg — Tyler Lake granodiorite (Cretaceous)
Kwlg — Wrights Lake granodiorite (Cretaceous)
Kdlg — Dicks Lake granodiorite (Cretaceous)
Krpa — Alaskite at Rubicon Point (Cretaceous)
Krvg — Rockbound Valley granodiorite (Cretaceous)
Kwpg — Granodiorite of Waterhouse Peak (Cretaceous)
Kgqd — Quartz diorite of Grass Lake (Cretaceous)
Kkgg — Granodiorite of Kingsbury Grade (Cretaceous)
Kwpt — Tonalite West of Waterhouse Peak (Cretaceous)
Keg — Granodiorite of East Peak (Cretaceous)
Ksgr — Monzogranite of Spooner Summit of Grose (1985) (Cretaceous)
Ktcg — Granodiorite of Thornburg Canyon (Cretaceous)
Kcvg — Granodiorite of Charity Valley (Cretaceous)
Kcld — Diorite of Caples Lake (Cretaceous)
Kclg — Granodiorite of Caples Lake (Cretaceous)
Kfpg — Freel Peak granodiorite (Cretaceous)
Kbla — Burnside Lake adamellite of Parker (1961) (Cretaceous)
Kdpg — Granodiorite of Daggett Pass (Cretaceous)
Kcpt — Carson Pass tonalite of Parker (1961) (Cretaceous)
Kfvg — Granodiorite of Faith Valley (Cretaceous)
Kepg — Ebbetts Pass granodiorite of Wilshire (1957) (Cretaceous)
Kklg — Granodiorite of Kinney Lakes (Cretaceous)
bd — Basalt dikes (Cretaceous)
Kdqd — Quartz monzodiorite north of Daggett Pass (Cretaceous?)
Kbp — Breccia pipe (Cretaceous?)
Kcfg — Camper Flat granodiorite (Cretaceous or Jurassic?)
Kdvg — Desolation Valley granodiorite (Cretaceous or Jurassic?)
Kkqm — Keiths Dome quartz monzonite (Cretaceous or Jurassic?)

Unnamed granitic rocks of the Sierra Nevada batholith
Kgr — Granite and granodiorite, undivided (Cretaceous)
Kqd — Quartz diorite and diorite (Cretaceous)
Kdg — Diorite and gabbro (Cretaceous)
KJgr — Granite (Cretaceous and (or) Jurassic)
KJgd — Granodiorite (Cretaceous and (or) Jurassic)
KJdg — Diorite and gabbro (Cretaceous and (or) Jurassic)

Jurassic intrusive rocks:
Jaqd — Quartz diorite at Azure Lake (Late? and Middle Jurassic)
Jpgr — Pyramid Peak granite (Jurassic)
Jdi — Diorite (Jurassic?)
Jdg — Diorite and gabbro (Late? and Middle Jurassic)
Jmd — Microdiorite dikes (Jurassic)
Jmib — Mafic intrusive breccia (Late? and Middle Jurassic)
Ja — Anorthosite (Late? and Middle Jurassic)

Metamorphic rocks

Tuttle Lake Formation of Harwood (1992) (Late? and Middle Jurassic)
Jtlf — Lava flows
Jtlb — Volcanic breccia
Jtls — Tuffaceous sandstone and conglomerate
Jtld — Diamictite
Jsc — Sailor Canyon Formation (Middle and Early Jurassic)
JTrm — Metamorphic rocks undivided (Jurassic and (or) Triassic)
JTrms — Metasedimentary rocks (Jurassic and (or) Triassic)
JTrmv — Metavolcanic rocks (Jurassic and (or) Triassic)
Trls — Limestone (Late Triassic?)

Lake Tahoe Sequence of Harwood (1992)
Jlp — Pelite unit (Jurassic?)
Jle — Ellis Peak Formation (Jurassic)
Jlb — Blackwood Creek Formation (Jurassic)
Mls — Serena Creek Formation (Mississippian? or younger)

MAP SYMBOLS

Contact - solid where well or approximately located; dashed where inferred or gradational.

Fault - solid where well located; dashed where approximately located; short dash where inferred; dotted where concealed; queried where continuation or existence is uncertain. Ball and bar on downthrown side. *(The age and location of the faults in the lake bottom and cutting Quaternary deposits should be considered preliminary interpretations.)*

Thrust fault - solid where well located; dashed where approximately located.

Anticlinal fold - arrow indicates plunge direction.

Synclinal fold - arrow indicates plunge direction.

Glacial moraine crest.

Dikes - andesite, latite, basalt and mafic dikes; dashed where approximately located.

Arrows on landslides indicate direction of movement.

Maar at Lake Forest on the Kings Beach Quadrangle.

Strike and dip of stratified rocks. Number indicates dip angle in degrees when known.

25 — Inclined beds
40 — Inclined beds - ball indicates top direction known
Vertical beds
80 — Overturned beds

Strike and dip of metamorphic and igneous foliation and cleavage.

45 — Foliation or cleavage
Vertical foliation or cleavage
60 — Cleavage parallel to bedding
55 — Cleavage parallel to bedding - ball indicates top direction known

Strike and dip of joints.

70 — Joint
Vertical joint

ABBREVIATED INDEX TO GEOLOGIC SOURCE DATA

(***Primary compilation sources shown in bold type***)

1. Truckee Quadrangle*
Birkeland, P.W. 1961; Burnett, J.L., 1982; Franks, A.L., 1980; Gates, W.C.B., 1994; **Harwood, D.S. and Fisher, G.R., 2002**; Hawkins, F.F., LaForge, R. and Hansen, R.A., 1986; Latham, T.S., Jr., 1985; **Wise, W.S. and Sylvester, A.G., 2004**.

2. Martis Peak Quadrangle*
Birkeland, P.W, 1961; Burnett, J.L., 1982; Franks, A.L., 1980; Gates, W.C.B., 1994; **Latham, T.S., Jr., 1985;** Matthews, R.A., 1968;**Wise, W.S. and Sylvester, A.G., 2004**.

3. Mount Rose Quadrangle*
Lewis, R.L, 1988; Stewart, J.H., 1999.

4. Marlette Lake Quadrangle*
Grose, T.L.T., 1986; Stewart, J.H., 1999.

5. Kings Beach Quadrangle*
Burnett, J.L., 1982; Franks, A.L., 1980; **Wise, W.S. and Sylvester, A.G., 2004**.

6. Tahoe City Quadrangle*
Birkeland, P.W, 1961; Gates, W.C.B., 1994; **Harwood, D.S. and Fisher, G.R., 2002**; Higgins, C.T., 1977; **Wise, W.S. and Sylvester, A.G., 2004**.

7. Homewood Quadrangle*
Harwood, D.S. and Fisher, G.R., 2002; Higgins, C.T., 1977.

8. Meeks Bay Quadrangle*
Burnett, J.L., 1982.

9. Glenbrook Quadrangle*
Grose, T.L.T., 1985; Stewart, J.H., 1999.

10. South Lake Tahoe Quadrangle*
Armin, R.A. and John, D.A., 1983; **Bonham, H.F., Jr. and Burnett, J.L., 1976**.

11. Emerald Bay Quadrangle*
Burnett, J.L., 1982; **Fisher, G.R., 1989**; Loomis, A.A., 1983; **McCaughey, J.W., 2003**; U.S. Department of Agriculture, 1974.

12. Rockbound Valley Quadrangle
Fisher, G.R., 1989; **Loomis, A.A., 1983**; **Sabine, C., 1992**.

13. Pyramid Peak Quadrangle
Connelly, S.F., 1988; John, D.A., Armin, R.A. and Moore, W.J., 1981; **Loomis, A.A., 1983**; **Sabine, C., 1992**; Wagner, D.L. and Spittler, T.E., 1997.

14. Echo Lake Quadrangle*
Burnett, J.L., 1982; Connelly, S.F., 1988; Fisher, G.R., 1989; **John, D.A., Armin, R.A. and Moore, W.J., 1981**; **Loomis, A.A., 1983**; **McCaughey, J.W., 2003**.

15. Freel Peak Quadrangle*
Armin, R.A. and John, D.A., 1983; John, D.A., Armin, R.A. and Moore, W.J., 1981.

16. Carson Pass Quadrangle
Armin, R.A., John, D.A. and Moore, W.J., 1984; Burnett, J.L., 1982; **DeOreo, S.B., 2004**; John, D.A., Armin, R.A. and Moore, W.J., 1981.

17. Caples Lake Quadrangle*
Bedrossian, T.L., 1979; Burnett, J.L., 1982; **DeOreo, S.B., 2004**; **John, D.A., Armin, R.A. and Moore, W.J., 1981**; **McKee, E.H. and Howe, R.A., 1981**.

18. Tragedy Spring Quadrangle
Bedrossian, T.L., 1979.

* Fault additions from: **Schweickert, R.A., Lahren, M.M., Karlin, R.E., Smith, K.D. and Howle, J.F., 2000**.

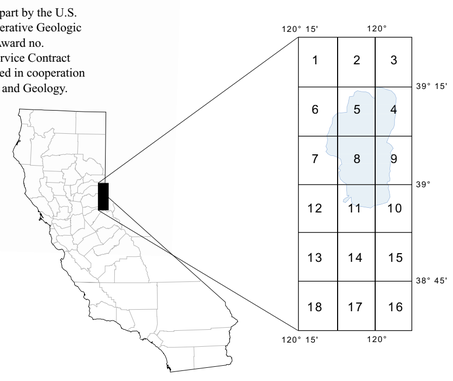
Base Map
Topographic base from U.S.G.S. Placerville, Truckee, Smith Valley and Carson City 30'x60' quadrangles. Shaded topographic and bathymetric base from U.S.G.S. digital elevation models (http://tahoe.usgs.gov/DEM.html). Projection UTM, zone 10, North American Datum 1927.

UTM GRID AND 1994 MAGNETIC NORTH DECLINATION AT CENTER OF MAP
(1°51' / 33 MILS; 15½° / 276 MILS)

SCALE 1:100,000
MILES — KILOMETERS — THOUSAND FEET

CONTOUR INTERVAL 50 METERS

Geology compiled 2001-2004
This geologic map was funded in part by the U.S. Geological Survey National Cooperative Geologic Mapping Program, STATEMAP Award no. 01HQAG0092 and U.S. Forest Service Contract no. 03-CS-11051900-047. Prepared in cooperation with the Nevada Bureau of Mines and Geology.



Copyright © 2005 by the California Department of Conservation California Geological Survey. All rights reserved. No part of this publication may be reproduced without written consent of the California Geological Survey.

The Department of Conservation makes no warranties as to the suitability of this product for any given purpose.