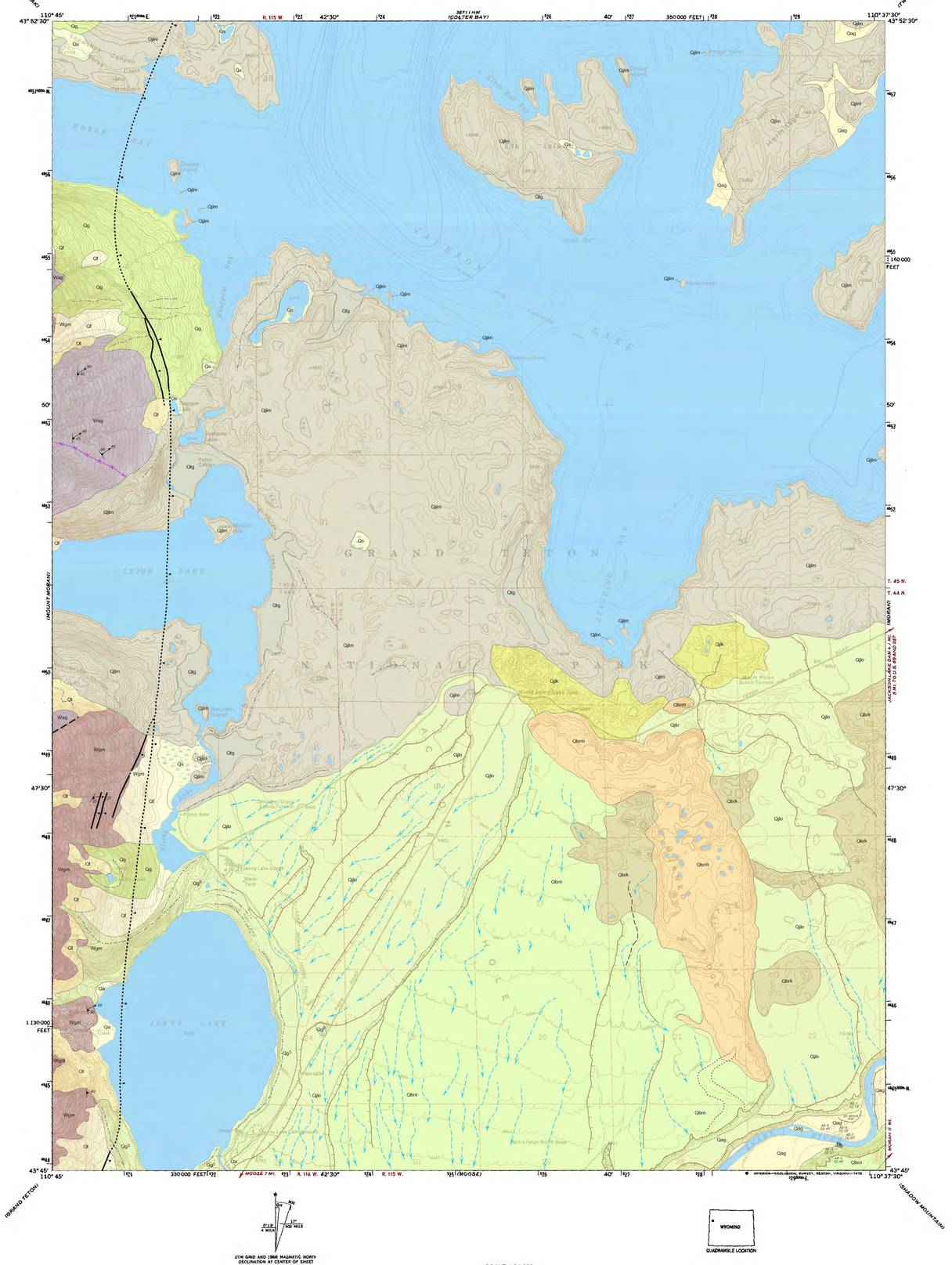
WYOMING STATE GEOLOGICAL SURVEY
Lance Cook, State Geologist
Laramie, Wyoming

Geology -- Interpreting the past to provide for the future

Prepared in cooperation with the
U.S. GEOLOGICAL SURVEY



North American Datum (NAD27). Projection 10,000-foot grid ticks: Wyoming coordinate system, west zone (Lambert conformal conic). Blue 1000-meter Universal Transverse Mercator ticks, zone 12

Hydrography, hypsography, public land survey, and transportation base by U.S. Geological Survey, various years

Digital base files prepared by Wyoming State Geological Survey, 2000

SCALE 1:24,000

1 0.5 0 1 Mile

1,000 500 0 1,000 2,000 3,000 4,000 5,000 6,000 7,000 Feet

1 0.5 0 1 Kilometer

Topographic Contour Interval 40 feet
Bathymetric Interval 25 feet

Geology mapped by J. D. Love, 1952, 1973,J. C. Reed, Jr., 1970-1973,

Digital cartography by Phyllis A. Ranz

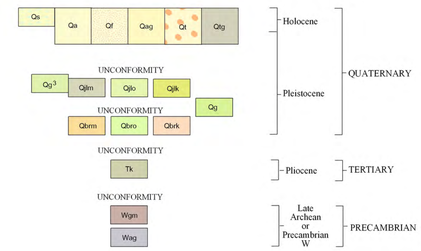
GEOLOGIC MAP OF THE JENNY LAKE QUADRANGLE, TETON COUNTY, WYOMING

by
J. David Love
2003

J. DAVID LOVE HISTORICAL GEOLOGIC MAP SERIES
GEOLOGY OF THE TETON - JACKSON HOLE REGION
Map LMS-12
Jenny Lake Quadrangle, Teton County, Wyoming

E X P L A N A T I O N

CORRELATION OF MAP UNITS



DESCRIPTION OF MAP UNITS

Surficial deposits (Holocene)

Qs — **Swamp deposits**—Clay, silt, and fine sand, dark-gray and brown; rich in vegetal debris

Qa — **Alluvium**— Gravel, sand, silt, and clay along modern streams. In places includes fan glacial outwash and stream-laid ice-contact deposits

Surficial deposits (Holocene and Pleistocene)

Qf — **Alluvial fan deposits (including rock glaciers)**—Fan-shaped, crudely stratified deposits of water-laid gravel, sand, silt, and clay spread outward from mouths of ravines and canyons; show linear sorting along distributaries; finer grained debris becomes progressively more abundant toward downstream margins of fans

Qag — **Gravel deposits**—Gravel deposited along flood channelways of major streams; composed chiefly of quartzite roundstones

Qt — **Talus deposits**—Locally derived coarse angular rock fragments that accumulate on steep slopes and at the base of cliffs within mountains

Qtg — **Terrace gravel**—Predominantly gravel of rounded quartzite fragments deposited by meltwater from adjacent glaciers

Surficial deposits (Pleistocene)

Qg^3 — **Glacial debris of third (Pinedale) major glaciation**—Morainal debris with sharp rough unmodified surface topography, little weathering of rock fragments (composed mostly of Precambrian rocks from the Teton Range), and sparse soil development. Supports abundant coniferous trees. locally may include older glacial deposits

Qjk — **Knob-and-kettle topography on Jackson Lake moraine**—Abundant irregular closed depressions left by melting of local ice masses buried in outwash deposits from the Jackson Lake moraine

Qjlo — **Jackson Lake outwash**—Gravel deposits downstream from Jackson Lake moraine (part of third or Pinedale glaciation); forms terraces graded to Jackson lake moraine

Qjlm — **Jackson Lake moraine**—Part of third (Pinedale) glaciation. Till that is part of the Jackson Lake moraine or that accumulated nearby at the same time; composed largely of locally derived rock fragments. Occurs south and east of Jackson Lake; derived from glacial ice from Teton Range and Yellowstone National Park. Slightly younger than Burned ridge moraine

Qg — **Undifferentiated glacial debris**—Morainal debris deposited by southward-moving ice from area of Yellowstone National Park or eastward-moving ice from the Teton Range; debris at higher elevations has more subdued topography than the Jackson Lake moraine, probably much is contemporaneous with Burned ridge morainal debris

Qbrk — **Knob-and-kettle topography on Burned Ridge moraine**—Abundant irregular closed depressions left by melting of local ice masses buried in outwash deposits from the Burned Ridge moraine

Qbro — **Burned Ridge outwash**—Gravel deposits downstream from Burned Ridge moraine (part of third or Pinedale glaciation); forms terraces graded to Burned Ridge moraine

Qbrm — **Burned Ridge moraine**—Part of third (Pinedale) glaciation. Chiefly a mixture of quartzite clasts and Cretaceous sands and claystone fragments? Extends across the floor of Jackson Hole south of Jackson Lake. Slightly older than Jackson Lake moraine, although recessional deposits may be the same age. Northeastern and eastern source contributed finer debris that resulted in more subdued topography than that of the Jackson Lake moraine

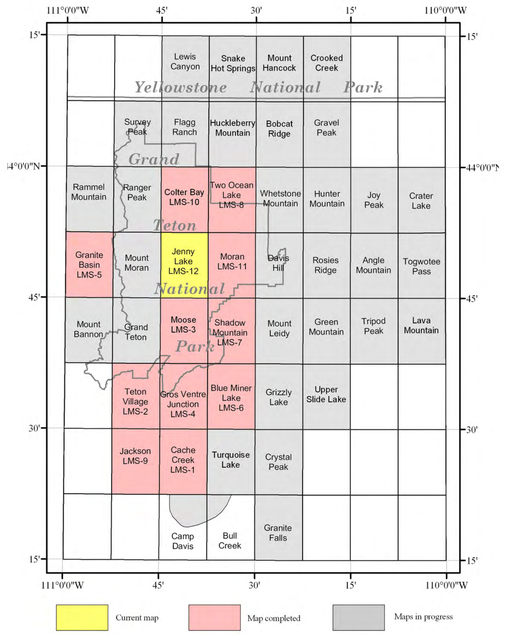
Tertiary volcanic rocks

Tk — **Kilgore Tuff (Pliocene)**—Pale lavender crystal-poor slabby hard rhyolitic welded tuff; black vitrophyric welded tuff at base (where exposed on Two Ocean Lake Quadrangle to the northeast). Potassium-argon (K-Ar) age date on Two Ocean Lake Quadrangle of 5.57 ± 0.19 Ma (Mega-annum or millions of years before present) (Morgan and McIntosh, in press). Previously mapped as Conant Creek Tuff

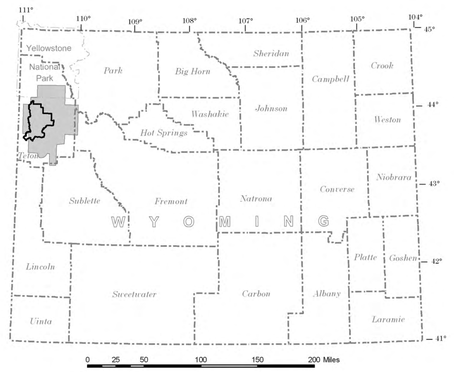
Precambrian metamorphic rocks

Wgm — **Layered gneiss and migmatite (Late Archean or Precambrian W)**— Complexly interlayered fine-to medium-grained biotite gneiss and schist, quartz-plagioclase gneis, amphibole gneiss and schist, and amphibolite. Layers range from 0.4 inches to 6 or 7 feet in thickness; some extend only 6 or 7 fieet, while some are continuous for 600 to 1000 feet or more. Locally sequence contains layers of anthophyllite schist, cordierite gneiss, impure marble, and magmetite iron formation

Wag — **Augen gneiss (Late Archean or Precambrian W)**—Medium-grained strongly foliated and lineated rudely layered to non-layered medium-to dark-gray biotite gneiss containing conspicuous augen of white microcline 0.4 to 1.6 inches in diameter. Locally contains thin layers of amphibolite and biotite gneiss lacking feldspar augen



INDEX TO LOVE MAP SERIES SHOWING LOCATION OF 7.5 MINUTE QUADRANGLES AND MAPPING PROGRESS



GENERAL LOCATION MAP

Shaded area indicates Love Map Series; dark outline is boundary of Grand Teton national Park

MAP SYMBOLS

Formation contact

Normal fault - Dashed where concealed; ball and bar on downthrown side

Strike and dip of beds

10 — **Inclined**

Diabase

20 — **Strike and dip of inclined compositional layering; arrow indicates direction and plunge of inclined fold or mineral lineations**

25 35 — **Strike and dip of inclined foliation; arrow indicates direction and plunge of inclined fold or mineral lineations**

4 — **Generalized direction of dip without strike; arrow without number indicates general dip of beds**

Water well

Linear feature conspicuous on aerial photographs - In bedrock units generally indicates trace of joint, fracture zone, or bedding. In surficial deposits indicates crest of morainal ridge, protalus rampart, ridge on glacier, or outline of talus lobe

Selected stream channelway - most have been abandoned because of subsequent drainage changes

Outlet channel for Jackson Lake

Terrace sequence - dots mark outer boundary of terrace surface; except where terrace marks contact between two mappable units; in those places the contact is shown as solid line with hachures on downslope side. Dotted or solid hachured lines iwhtin mappable unit depict terrace margins; hachures on downslope side; "WT-2 is youngest, WT-3 is oldest. Some local uncorrelated or unnamed terraces may be shown on map by indicating feet abouve river level or other terrace level

Terraces related to opposite sides of Snake River:

West side:
WT-2 About 100 to 120 feet (30 to 36m) above river level
WT-2A 25 feet (7.5m) above WT-2 terrace or 220 to 240 feet (67 to 73m) above river level

East side:
ET-3 About 220 feet (67m) above river level

REFERENCES

Good, J.M. and Pierce, K.L., 1996, Interpreting the landscapes of Grand Teton and Yellowstone National Parks, Recent and ongoing geology: Grand Teton Natural History Association, Moose, Wyoming, 58 p.

Love, J.D., 2001, Geologic map of the Shadow Mountain Quadrangle, Teton County, Wyoming: Wyoming State Geological Survey J. David Love Geologic Map Series Map LMS-7, scale 1:24,000.

Love, J.D., 2002. Geologic map of the Two Ocean Lake Quadrangle, Teton County, Wyoming: Wyoming State Geological Survey J. David Love Geologic Map Series Map LMS-8, scale 1:24,000.

Love, J.D., 2003, Geologic map of the Colter Bay Quadrangle, Teton County, Wyoming: Wyoming State Geological Survey J. David Love Geologic Map Series Map LMS-10, scale 1:24,000.

Love, J.D., 2003, Geologic map of the Moran Quadrangle, Teton County, Wyoming: Wyoming State Geological Survey J. David Love Geologic Map Series Map LMS-11, scale 1:24,000.

Love, J.D., and Love, J.M., 1997, Geologic road log, Jackson to Dinwoody and return: Wyoming State Geological Survey Public Information Circular 20, 38 p.

Love, J.D., and Reed, J.C., Jr., 2001, Geologic map of the Moose Quadrangle, Teton County, Wyoming: Wyoming State Geological Survey J. David Love Geologic Map Series Map LMS-3, scale 1:24,000.

Love, J.D., Reed, J.C., Jr., and Christiansen, A.C., 1992, Geologic map of Grand Teton National Park, Teton County, Wyoming: U.S. Geological Survey Miscellaneous Investigations Series Map I-2031, scale 1:62,500.

Love, J.D., Reed, J.C., Jr., and Pierce, K.L., 2003, Creation of the Teton landscape—A geologic chronicle of Jackson Hole and the Teton Range: Grand Teton Natural History Association, Moose, Wyoming, 131 p.

Morgan, L.H., and McIntosh, W.C., in press, ^{40}Ar-^{39}Ar ages of silicic volcanic rocks in the Hiese Volcanic Field, eastern snake River Plain, Idaho: Timing of volcanism and tectonism , *in* Tectonic and magmatic evolution of the Snake River Plain Volcanic Province: Idaho Geological Survey Bulletin 30.

Pierce, K.L., and Good, J.M., 1992, Field guide to the Quaternary geology of Jackson Hole, Wyoming: U.S. Geological Survey Open-File Report 92-504, 54 p.

Reed, J.C., Jr., 1973, Geologic map of the Precambrian rocks of the Teton Range, Wyoming: U.S. Geological Survey Open-File Report, scale 1:62,500.

Reed, J.C., Jr., and Zartman, R.E., 1973, Geochronology of Precambrian rocks of the Teton Range, Wyoming: Geological Society of America Bulletin, v. 84, p.561-582.