

Base hillshade derived from United States Elevation Data (NED), 30-meter Digital Elevation Model (DEM), 2004: azimuth 315°, sun angle 45°, vertical exaggeration 1.4 Projection: Universal Transverse Mercator (UTM), zone 12 North American Datum of 1927 (NAD 27) 10,000-meter grid ticks: UTM, zone 12 25,000-foot grid ticks: Wyoming State Plane Coordinate System, west and west-central zones National Geodetic Vertical Datum of 1929 Wyoming State Geological Survey P.O. Box 1347 - Laramie, WY 82073-1347 Phone: 307-766-2286 - Fax: 307-766-2605 Email: wsgs.sales@wyo.gov

REFERENCES AND SOURCES OF MAP DATA (Numbers are noted in INDEX TO SOURCES OF GEOLOGIC MAPPING)

GN /

UTM grid convergence (GN) and

2016 magnetic declination (MN) at center of map

Diagram is approximate

0°21' / 11°23'

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PRELIMINARY SURFICIAL GEOLOGIC MAP OF THE JACKSON 30' x 60' QUADRANGLE, SUBLETTE, TETON, LINCOLN, AND FREMONT COUNTIES, WYOMING

mapped and compiled by Seth J. Wittke, Jacob D. Carnes, and Derek T. Lichtner 2016

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- the United States: U.S. Geological Survey website, http://earthquakes.usgs.gov/hazards/qfaults, accessed 08/30/2016.
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Map edited by Suzanne C. Luhr Prepared in cooperation with and research supported by the U.S. Geological Survey, National Cooperative Geologic Mapping Program, under USGS award number G15AS00006. The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the U.S. Government.

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Bench deposit (b) Iterates like deposits (rRs), slopewash (rRs), slopewash and colluvium (rRsc), or slopewash and colluvium (rRsc), or slopewash and colluvium (rRsc), or slopewash (rRs), slopewash and colluvium (rRsc), or slopewash (rRs), slopewash (rRs), slopewash and colluvium (rRsc), or slopewash (rRs), slopewash (rRs), slopewash (rRs), or bedrock outcrops (rR), or bedrock outcrops (rR), or bedrock outcrops and clopewash (rRs), with minor components of alluvium (rsa), bedrock outcrops (rRs), bedrock outcrops and clopewash (rRs), with minor components of alluvium (rsa), bedrock outcrops (rRs), bedrock outcrops and clopewash (rRs), or glacial deposits (rsg) Glacial deposits (g) Glacial deposits and colluvium (ga) Glacial deposits and colluvium (gc), at higher elevations these deposits may include rock glaciers Bedrock outcrops and colluvium with minor components of colluvium (Rre), or residuum (Rre), or residuum (Rre) Glacial deposits and collus deposits with minor components of alluvium (gGa), residuum (Rcr), or siduum (Rcr), or residuum (Rsc), or residuum (Rsc), or siduum (Rsc), or s	Be			
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Landslide deposits (1) Residuum and slopewash (rs) with minor components of alluvium (rsa), bedrock outcrops and colluvium (rsRc), or glacial deposits (rsg) Glacial deposits (2) Bedrock outcrops and colluvium with minor components of slopewash (Rcs), residuum and slopewash (rs) with minor components of slopewash (Rcs), residuum (Rcsr), slopewash and residuum (Rcsr), or residuum and slopewash (Rcs), or residuum (Rcsr), slopewash and colluvium (Rrsc) Glacial deposits and colluvium (gc), at higher elevations these deposits may include rock glaciers Bedrock outcrops and residuum with minor components of colluvium (Rrsc) Glacial deposits and colluvium (gc) Glacial deposits and outwash deposits with minor components of alluvium (goa) Glacial deposits and glaciated bedrock outcrops (gC) with minor components of alluvium (goar) Bedrock outcrops and slopewash (Rrs), or residuum (Rscr), or residuum (Rscr), or residuum (Rscr), or residuum (Rscr) Glacial deposits and slopewash (gs) with minor components of bedrock outcrops (grK), glaciated bedrock outcrops (grG), or slopewash (grs) Water Glacial deposits and slopewash (gs) with minor components of glaciated bedrock outcrops (grK), g	La	gravitational influence; earth and rock which become loosened from a hillside, and slide, flow,	Residuum and colluvium with minor components of bedrock outcrops (rcR), or bedrock outcrops and slopewash (rcRs)	
at higher elevations deposits may also include rock glacters Interfect out out of particles Glacial deposits (g) Bedrock outcrops and colluvium with minor components of slopewash (Rcs), residuum (Rcr), slopewash and residuum (Rcr), slopewash and residuum (Rcr), slopewash and residuum (Rcr), slopewash (Rrs), or residuum and slopewash (Rcs), colluvium and slopewash (Rrs), or slopewash and colluvium (Rsc), colluvium and residuum (Rscr), or residuum (Rscr), or residuum (Rscr) Glacial deposits and colluvium (gc), at higher elevations these deposits may include rock glaciers Bedrock outcrops and residuum (Rcsr), or residuum and slopewash (Rrs), or slopewash and colluvium (Rsc), colluvium and slopewash (Rrs), or residuum (Rscr), or residuum (Rscr), or residuum (Rscr) Glacial deposits and collaviated bedrock outcrops (gG) with minor components of alluvium (goa) Water—Areas covered by water in lakes, reservoirs, and perennial streams and rivers Glacial deposits and residuum with minor components of bedrock outcrops (grR), glaciated bedrock outcrops (grG), or slopewash (grs) Water Glacial deposits and slopewash (grs) Glacial deposits and slopewash (grs) Water			Residuum and slopewash (rs) with minor components of alluvium (rsa), bedrock outcrops (rsR), bedrock outcrops and colluvium (rsRc), or glacial deposits (rsg)	
Glacial deposits and alluvium (ga) Glacial deposits and colluvium (gc), at higher elevations these deposits may include rock glaciers Glacial deposits and colluvium (gc), at higher elevations these deposits may include rock glaciers Bedrock outcrops and residuum with minor components of colluvium (Rrc), colluvium and slopewash (Rrcs), slopewash (Rrs), or residuum and slopewash (Rrcs) Glacial deposits and collar deposits (ge) Bedrock outcrops and residuum (Rscr), or residuum (Rscr), or slopewash and colluvium (Rsc), colluvium (Rsc), colluvium (Rsc), colluvium (Rsc), or residuum (Rscr) Glacial deposits and glaciated bedrock outcrops (gG) with minor components of alluvium (goa) Water—Areas covered by water in lakes, reservoirs, and perennial streams and rivers Glacial deposits and residuum with minor components of bedrock outcrops (grR), glaciated bedrock outcrops (grG), or slopewash (grs) Water Glacial deposits and slopewash (grs) Glacial deposits and slopewash (grs) Water	Gla		Bedrock outcrops —Areas where the underlying bedrock is exposed and unaltered (usually lithified) at the surface	
 Glacial deposits and alluvium (ga) Glacial deposits and colluvium (gc), at higher elevations these deposits may include rock glaciers Glacial deposits and eolian deposits (ge) Glacial deposits and outwash deposits (ge) Glacial deposits and outwash deposits with minor components of alluvium (goa) Glacial deposits and glaciated bedrock outcrops (gG) with minor components of alluvium (gosr) Glacial deposits and residuum with minor components of bedrock outcrops (grR), glaciated bedrock outcrops (grG), or slopewash (grs) Glacial deposits and slopewash (gs) with minor components of glaciated bedrock outcrops 		Glacial deposits (g)	Bedrock outcrops and colluvium with minor components of slopewash (Rcs), residuum	
 Glacial deposits and colluvium (gc), at higher elevations these deposits may include rock glaciers Glacial deposits and eolian deposits (ge) Glacial deposits and outwash deposits (ge) Glacial deposits and glaciated bedrock outcrops (gG) with minor components of alluvium (goa) Glacial deposits and glaciated bedrock outcrops (gG) with minor components of alluvium (gGsr) Glacial deposits and residuum with minor components of bedrock outcrops (grR), glaciated bedrock outcrops (grG), or slopewash (grs) Glacial deposits and slopewash (gs) with minor components of glaciated bedrock outcrops Glacial deposits and slopewash (gs) with minor components of glaciated bedrock outcrops Glacial deposits and slopewash (grs) Glacial deposits and slopewash (gs) with minor components of glaciated bedrock outcrops Glacial deposits and slopewash (gs) with minor components of glaciated bedrock outcrops Glacial deposits and slopewash (gs) with minor components of glaciated bedrock outcrops 		Glacial deposits and alluvium (ga)		
Glacial deposits and collan deposits (ge) and residuum (Rscr), or residuum (Rsr) Glacial deposits and outwash deposits with minor components of alluvium (goa) Water—Areas covered by water in lakes, reservoirs, and perennial streams and rivers Glacial deposits and glaciated bedrock outcrops (gG) with minor components of alluvium (gGsr) Water Glacial deposits and residuum with minor components of bedrock outcrops (grR), glaciated bedrock outcrops (grG), or slopewash (grs) Water Glacial deposits and slopewash (gs) with minor components of glaciated bedrock outcrops GrR), glaciated bedrock outcrops				
Glacial deposits and outwash deposits with minor components of alluvium (goa) Water—Areas covered by water in lakes, reservoirs, and perennial streams and rivers Glacial deposits and glaciated bedrock outcrops (gG) with minor components of alluvium (gGsr), or slopewash and residuum (gGsr) Water Glacial deposits and residuum with minor components of bedrock outcrops (grR), glaciated bedrock outcrops (grG), or slopewash (grs) Water Glacial deposits and slopewash (gs) with minor components of glaciated bedrock outcrops Glaciated bedrock outcrops		Glacial deposits and eolian deposits (ge)	Bedrock outcrops and slopewash with minor components of colluvium (Rsc), colluvium and residuum (Rscr) or residuum (Rsr)	
 (gGa), residium (gGr), or slopewash and residuum (gGsr) Glacial deposits and residuum with minor components of bedrock outcrops (grR), glaciated bedrock outcrops (grG), or slopewash (grs) Glacial deposits and slopewash (gs) with minor components of glaciated bedrock outcrops 	8 8 8 8	Glacial deposits and outwash deposits with minor components of alluvium (goa)		
bedrock outcrops (grG), or slopewash (grs) Glacial deposits and slopewash (gs) with minor components of glaciated bedrock outcrops			Water	
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Quaternary faults—Faults which show surface offset of Quaternary-aged units ---- East Gros Ventre fault-The East Gros Ventre fault is primarily concealed by late Pliestocene-Holocene alluvium north and northeast of Jackson Hole along the southeastern base of East Gros Ventre Butte. The ~20 km (12 mi) scarp potentially offsets a portion of the Flat Creek alluvial fan in a normal sense, however it has also been argued that the surface is related to fluvial undercutting of Bull Lake aged outwash deposits. The fault is considered as a Class B fault due to the uncertain origin of the mapped scarp. Locations are approximate. (Machette and Pierce, 2001) The mapped fault trace has been compiled from Love and Taylor (1962) and, due to its poor surface expression and uncertain origin, is included solely in the name of completeness as well as to be consistent with the U.S. Geological Survey's *Quaternary Fault and Fold Database of the United States.*

four sections, is considered to be a Quaternary/late Cenozoic to Holocene normal fault, downthrown to the west, and extends 135 km (84 mi) from eastern Idaho into western Wyoming along the base of the Snake and Salt River Ranges. The Star Valley section is a Pleistocene-Holocene normal fault, downthrown to the west, that extends roughly 52 km (32 mi) and strikes north-south. Dip along the fault is considered to be 10–70 degrees to the west, but an exact angle is unknown. The scarps are extensive and displacement generally ranges from 5–15 m (16–49 ft) in alluvium. The recurrence interval is variable, and may range from 4-7 ka. The most recent surface-rupturing earthquake occurred at about $5,540\pm70^{-14}$ C yr BP, based on paleoseismology investigations. The Star Valley section fault is considered a Class A fault by the USGS, denoting confirmed Quaternary displacement. Locations are approximate (McCalpin et al., 2001).

---- Grand Valley fault (Star Valley section)—The Grand Valley fault system, comprised of

N ---- Greys River fault—The Greys River fault is a Pleistocene-Holocene normal fault, downthrown to the west and bounds the west side of the Wyoming Range. The fault extends approximately 50 km (31 mi) along a N 3° W strike. Dip along the fault is considered to be 10–70 degrees to the west, but an exact angle is unknown. Complex fault scarps within the densely forested terrain are present at the base of the steep range front and can be traced along much of the length of the fault. Fault scarp displacement generally ranges from 3-11 m (10-36 ft) in alluvium. The recurrence interval is variable, and may range from 2.0-5.2 ka. The most recent event occurred 1,910-2,100 yr BP, based on radiocarbon ages. Average slip rate is believed to range between 0.2 mm (0.008 in) and 1.0 mm (0.04 in)/yr, with considerably faster rates over short intervals. The Greys River fault is considered a Class A fault by the USGS, denoting confirmed Quaternary displacement. Locations are approximate (McCalpin, 1994).

---- Hoback Fault—The largely concealed Hoback normal fault was primarily active during Miocene time, although evidence exists for potential early Quaternary offset in the northern section of the fault north of Game Creek; the offset may instead be related to localized landslides. The fault is ~18 km (11 mi) long and dips steeply to the west. The fault is considered Class B due to little evidence of Quaternary offset and the possibility of an aseismic source for Quaternary scarps. The mapped fault trace has been compiled from Schroeder (1974) and Love and Albee (1977), and due to its poor surface expression and uncertain origin, is included solely in the name of completeness as well as to be consistent with the U.S. Geological Survey's Quaternary Fault and Fold Database of the United States.

——— Phillips Valley fault (southern section)—The southern section of the Phillips Valley fault is primarily projected from known offsets in the middle section of the fault, which due to steep terrain scarps are difficult to identify. The section makes up \sim 3 km (2 mi) of the 8 km (5 mi) total length of the fault. The mapped fault trace has been compiled from Oriel and Moore (1985) and, due to indefinite proof of Quaternary offset, is included solely in the name of completeness as well as to be consistent with the U.S. Geological Surveys Quaternary Fault and Fold Database of the United States.

Pierce, K.L., comp., 1998, Fault number 772, Hoback fault, in Quaternary fault and fold database of

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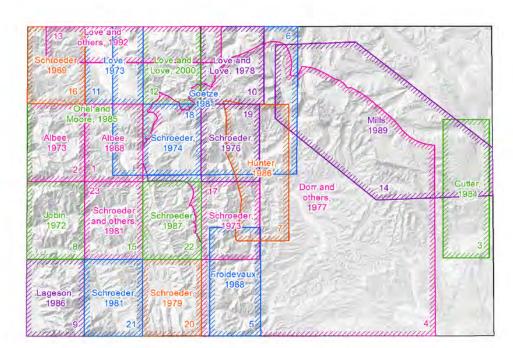
OPEN FILE REPORT 2016-6 Jackson 1:100,000-scale Surficial Geologic Map

EXPLANATION **DESCRIPTION AND CLASSIFICATION OF MAP UNITS**

HSDM 99-2 Bairoil Shirley Basin Laramie Peak Torring OFR 15-1 HSDM 99 Red Desert Basin OFR 15-4 Rawlins Medicine Bow Rock River Chugwater emmerer Rock Springs HSDM 98-6 OFR 06-4 OFR 05-3 OFR 04-4 HSDM 99-4 Evanston Firehole Canyon Kinney Rim Baggs Saratoga Laramie Cheyenne ISGS C-103 OFR 09-2 OFR 09-1 OFR 06-3 OFR 05-2 HSDM 98-5 HSDM 98-4 110°W 109°W 108°W 107°W 106°W 105°W

Current map Published map Compiled map KEY TO ABBREVIATIONS

U.S. Geological Survey maps: Coal Investigation Series (USGS C), Wyoming State Geological Survey maps: Map Series (MS), Open File Report (OFR) and Hazards Section Digital Map (HSDM) INDEX TO 1:100,000-SCALE SURFICIAL GEOLOGIC MAPS **OF WYOMING**



INDEX TO SOURCES OF GEOLOGIC MAPPING (Numbers are noted in REFERENCES AND SOURCES OF MAP DATA)

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