A circular path of geologic adventures through consulting, state service, and academia

Rich D. Koehler, Ph.D., P.G
rkoehler@unr.edu

Education and Professional Experience

University of California, Santa Cruz: *B.A.,* Earth Science, 1992

- Gary Griggs Consulting, 1991-1992
- USDA Forest Service, Cave Exploration Team, Prince of Wales and Dall Islands, Alaska, 1993

Humboldt State University, Humboldt, CA: *M.S.*, Environmental Systems (Geology), 1997

- US Geological Survey, paleoseismology field assistant, Puget Sound, Wa, 1998-2003
- Natural Resources Management Corporation, Eureka, CA, Staff Geologist, 1998-1999
- Louisiana-Pacific Corporation, Calpella, CA, Watershed Geomorphologist, 1997
- Research Assistant, Cascadia tsunami studies 1994-1997

William Lettis & Associates, Inc. (WLA), Walnut Creek, CA, Staff-Project Geologist, 1999-2004

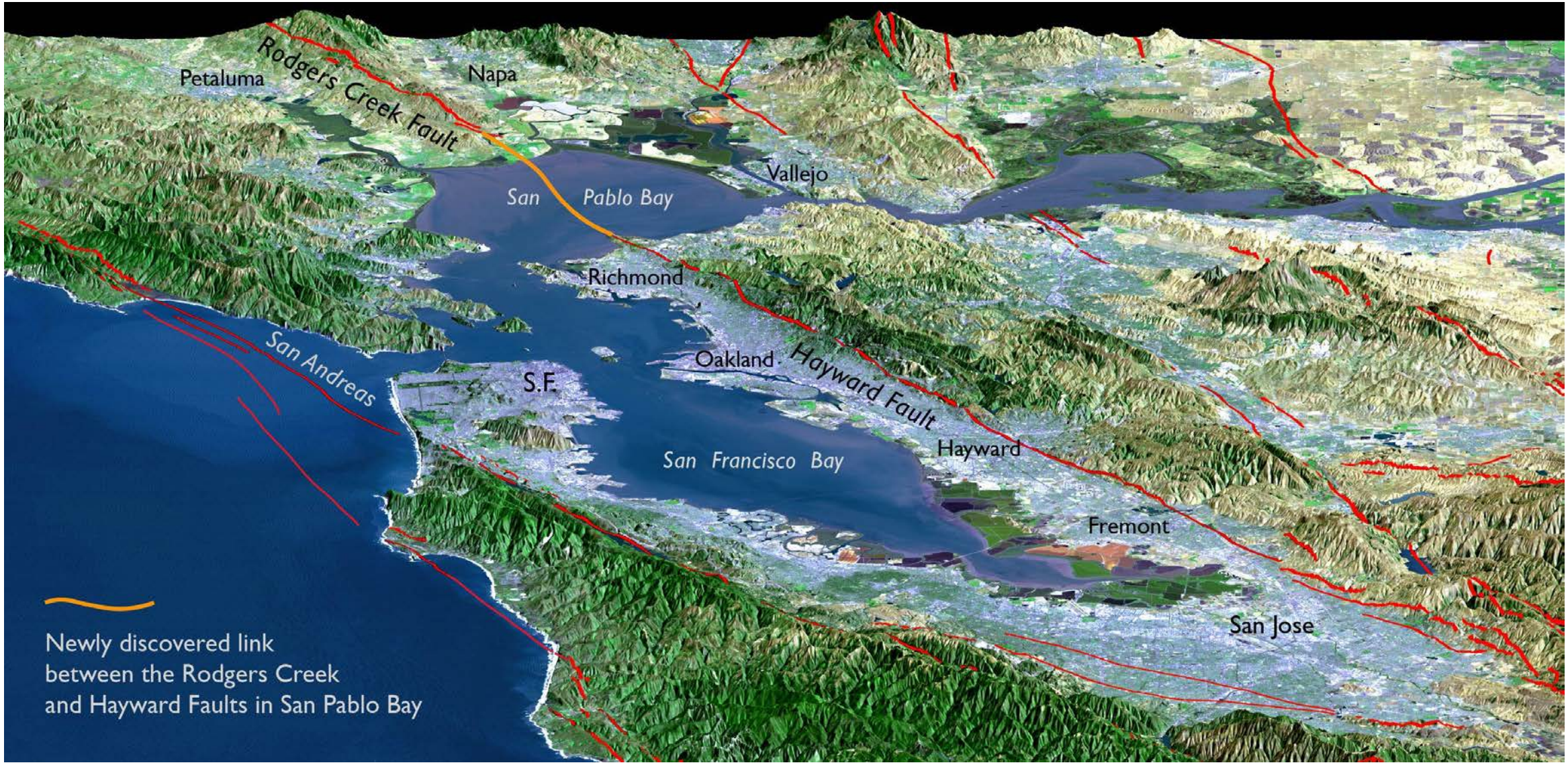
Education and Professional Experience

University of Nevada Reno, NV, Center for Neotectonic Studies Ph.D. 2004- 2009

State of Alaska, Dept. of Geological and Geophysical Surveys, Earthquake Geologist 2009-2015

University of Nevada, Reno, Nevada Bureau of Mines and Geology, Mackay School of Earth Sciences and Engineering, Assistant Professor, 2015-present

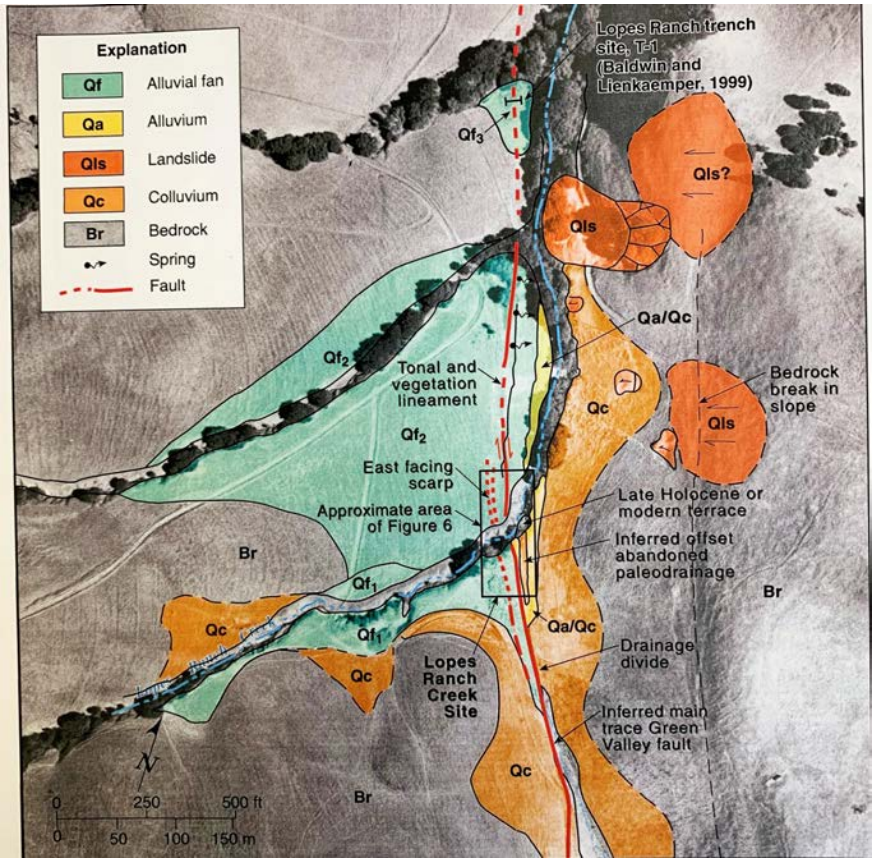
Consulting: Working at WLA

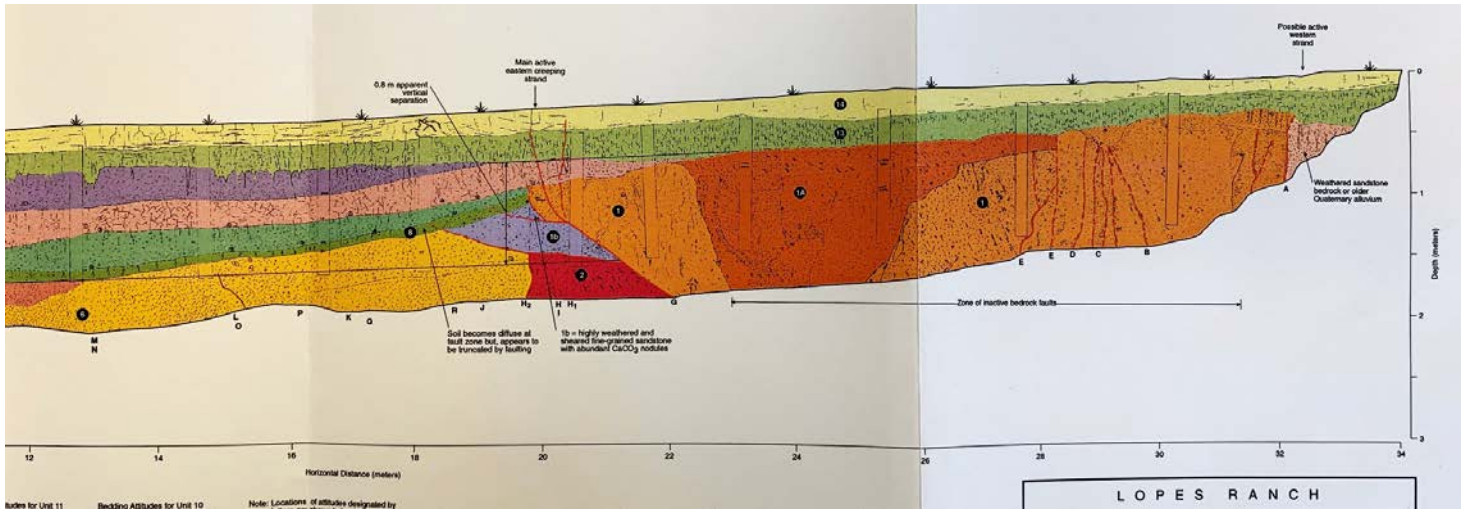


Consulting: Working at WLA

Developed skills in

- Field geology: mapping, drilling, logistics
- Office analysis: cross sections, literature reviews
- Proposal and report writing
- Presentations to clients and peers
- Marketing
- Project/budget management





Green Valley fault

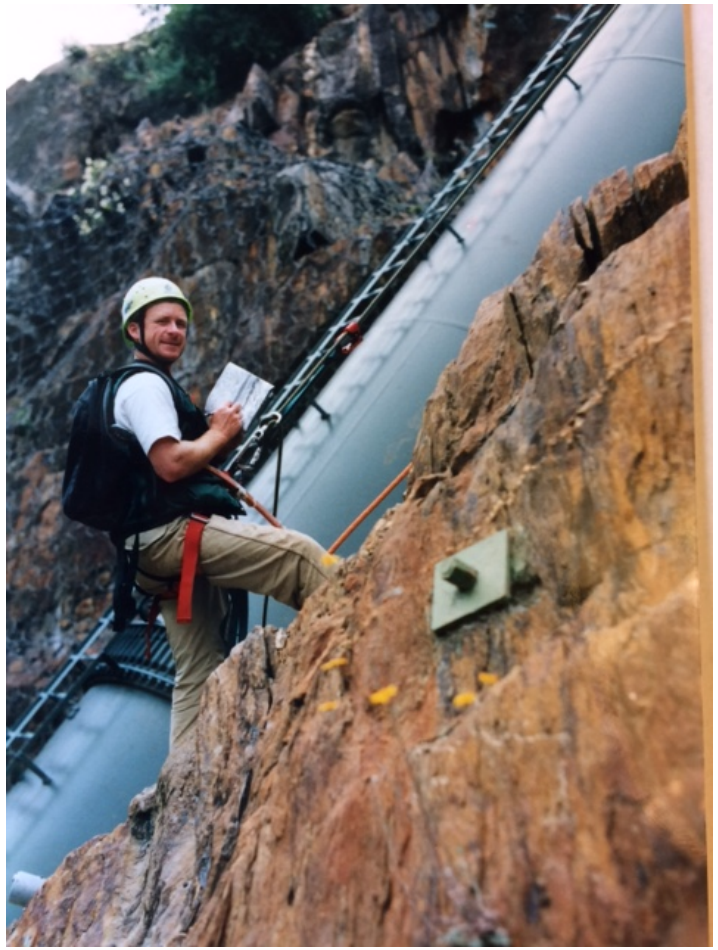
Consulting: Working at WLA

San Andreas fault

Calaveras fault

Hayward fault

Consulting: Working at WLA



Geotechnical investigation of Ralston Penstock American River, CA
Rock fall hazards, slope stability

American Canyon
Vallejo, California

Landslide Investigations
and construction montoring

Landslide removal monitoring

Consulting: Working at WLA

Baku-Tilibishi pipeline project, Turkey, 2004

Chi Chi earthquake, Taiwan, 1999

Alaska Division of Geological & Geophysical Surveys
Hazards Geologist, Engineering Geology Division.

- Hazards studies for
  infrastructure projects
- Tsunami inundation
- Quaternary fault database
- Quaternary mapping
- Collaborative work with USGS
- Technical review of PSHA
  Susitna dam
  Pebble Mine
  Oil and gas pipelines

Alaska Division of Geological & Geophysical Surveys
Hazards Geologist, Engineering Geology Division.

Infrastructure corridor
Reports and maps

ASSESSMENT OF GEOMORPHOLOGY AND GEOLOGIC HAZARDS IN THE PARKS HIGHWAY-MINTO FLATS-DALTON HIGHWAY INFRASTRUCTURE CORRIDOR: COOK INLET TO PRUDHOE BAY, ALASKA

Rich D. Koehler, Richard D. Reger, Eleanor R. Spangler, and Trent D. Hubbard

Report of Investigation 2019-8

Published by
STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
2019

Report of Investigations 2015-4

INVESTIGATION OF POTENTIALLY ACTIVE TECTONIC FAULTS ALONG THE ROUTE OF THE PROPOSED ALASKA STAND ALONE PIPELINE, LIVENGOOD TO COOK INLET, ALASKA

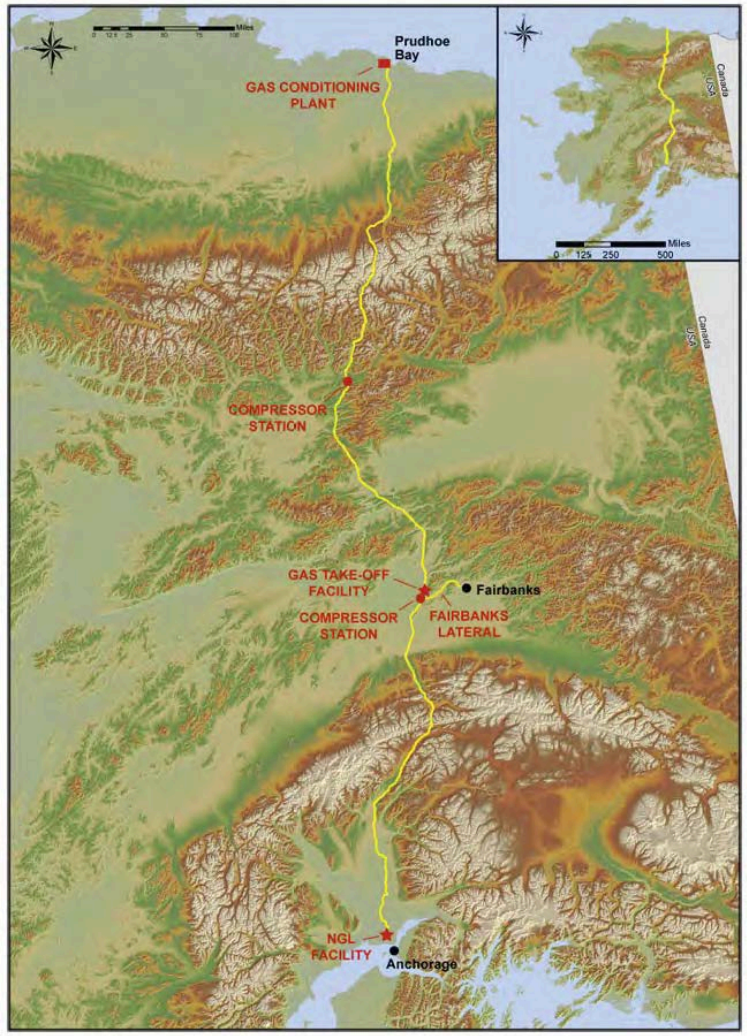
Rich D. Koehler, Richard D. Reger, Eleanor R. Spangler, and Alexander I. Gould

Aerial photograph of Panorama Mountain and the Nenana River, looking south along the proposed ASAP pipeline route. Photo by Rich Koehler.

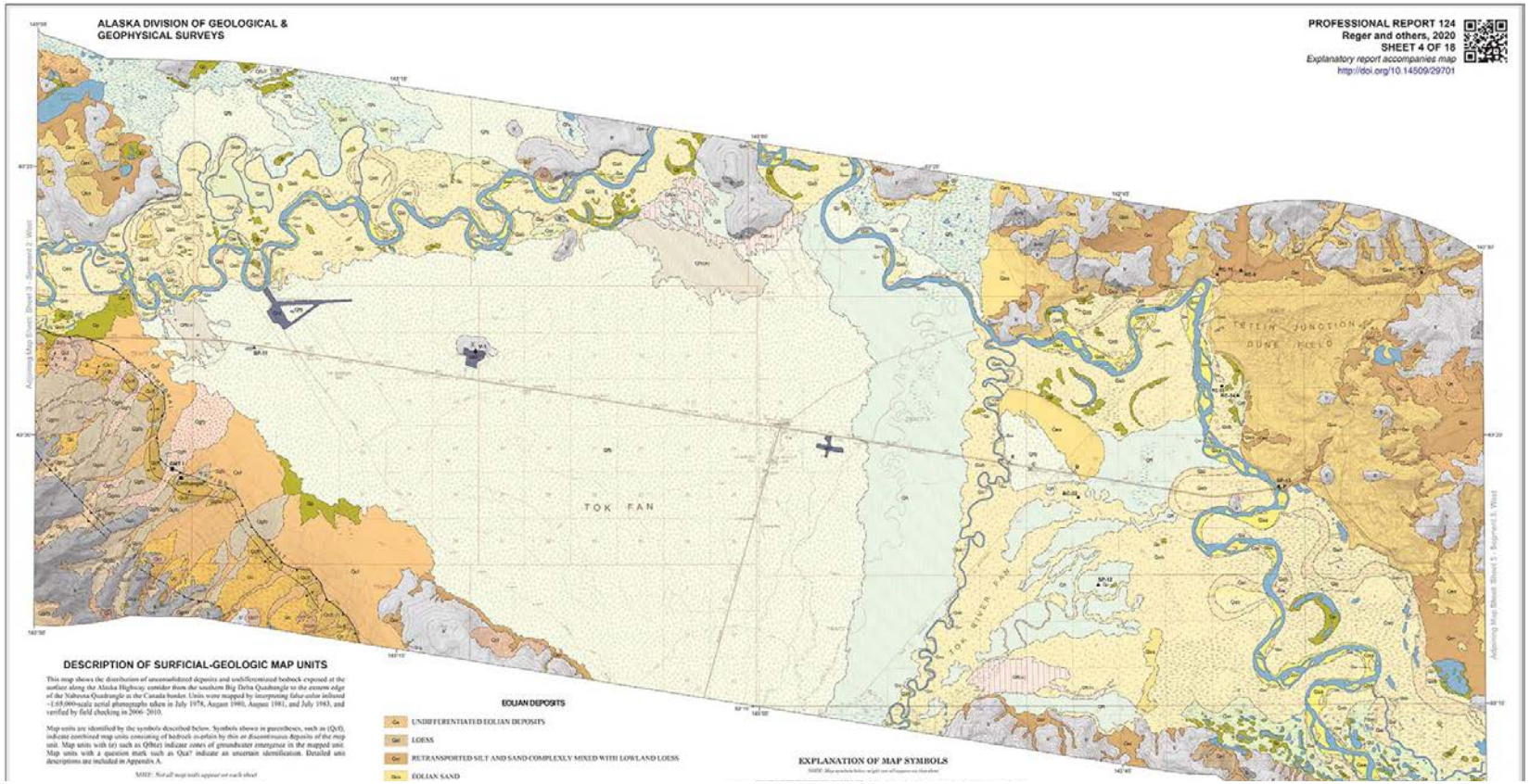
April 2015

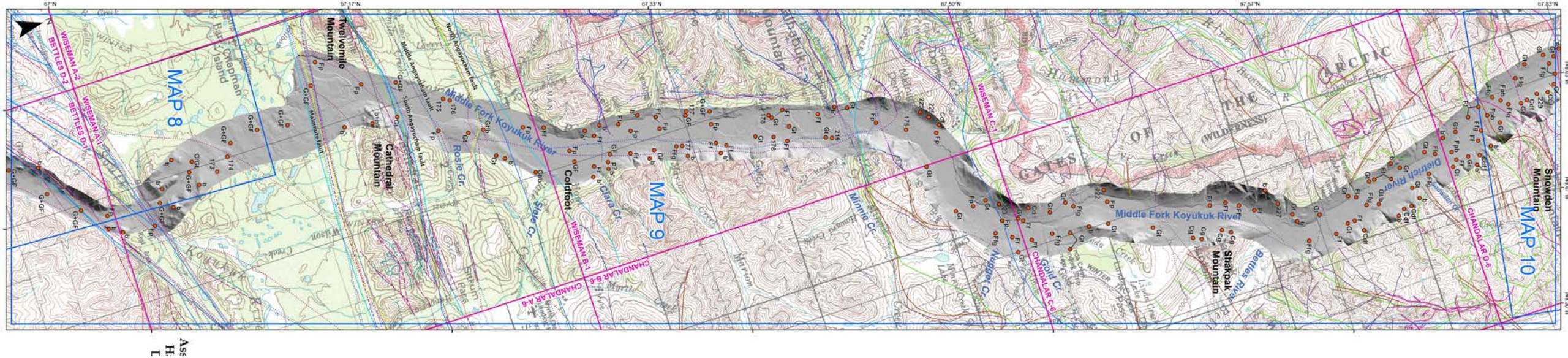
Published by

STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
3354 College Road
Fairbanks, Alaska 99709-3707

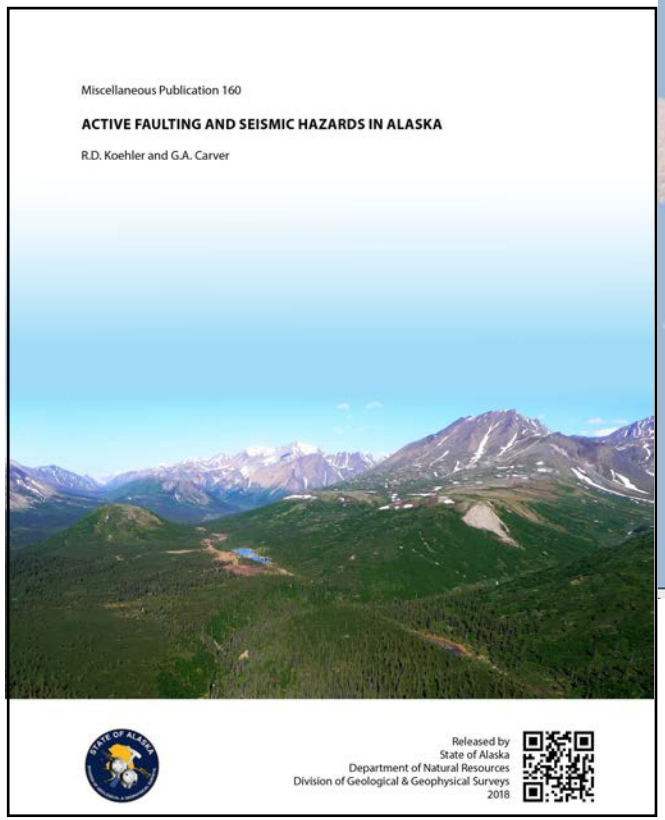


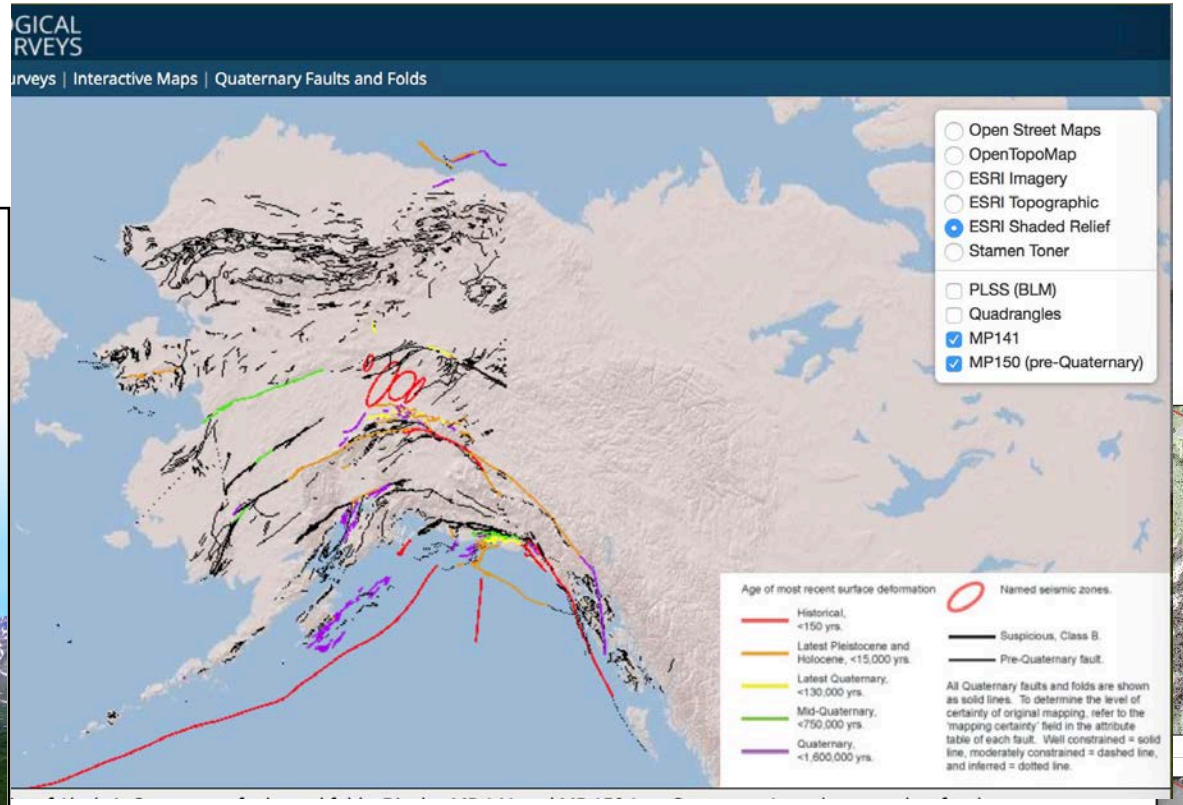
- Quaternary geologic maps
- Geologic hazard point observations



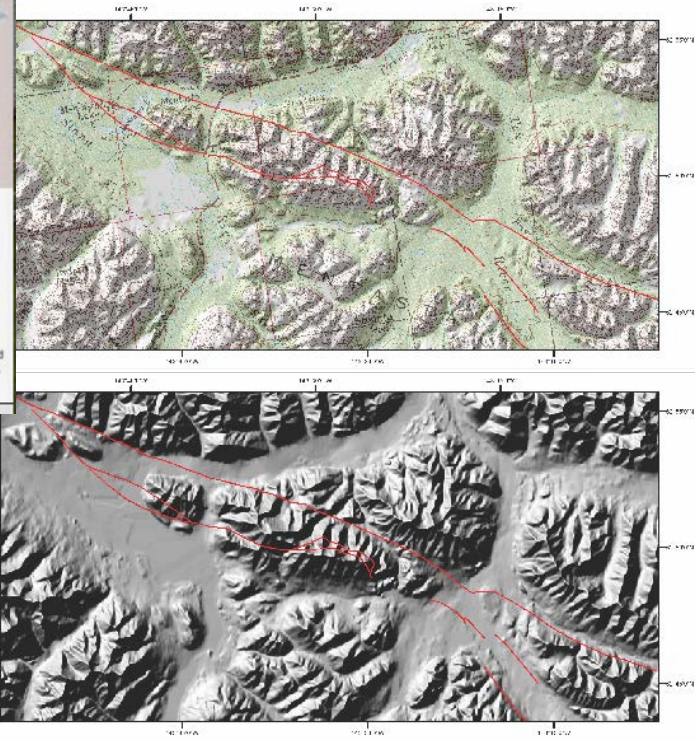


Alaska Division of Geological & Geophysical Surveys
Hazards Geologist, Engineering Geology Division.





Quaternary fault and fold database



Ongoing tsunami research Aleutian Islands

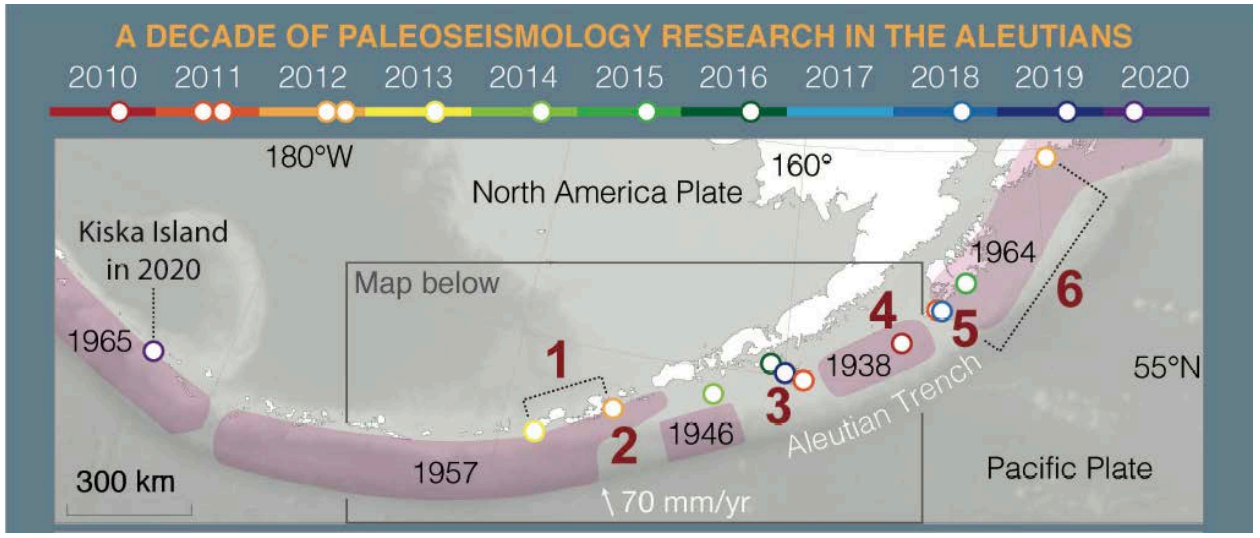
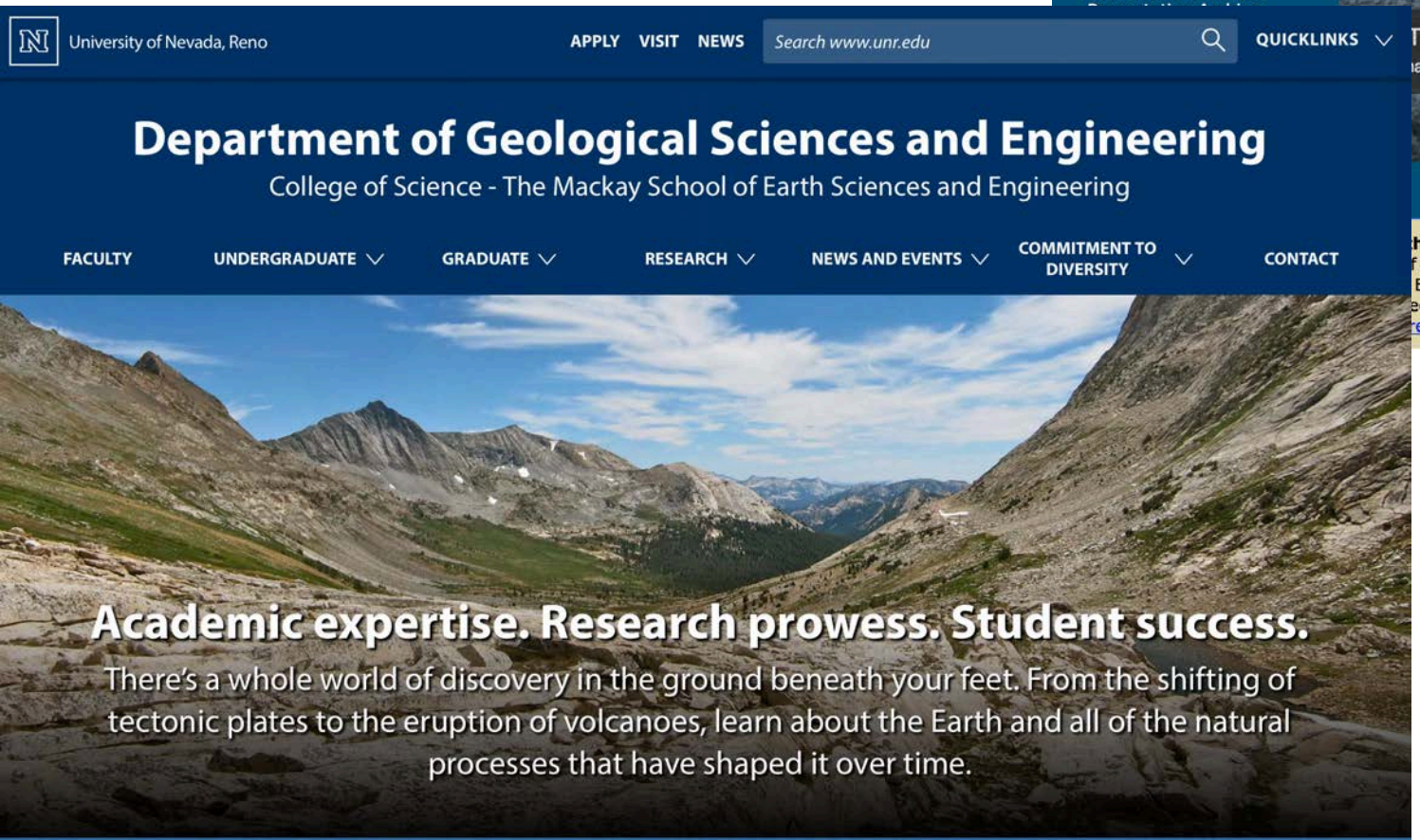


Fig credit: Rob Witter

University of Nevada, Reno

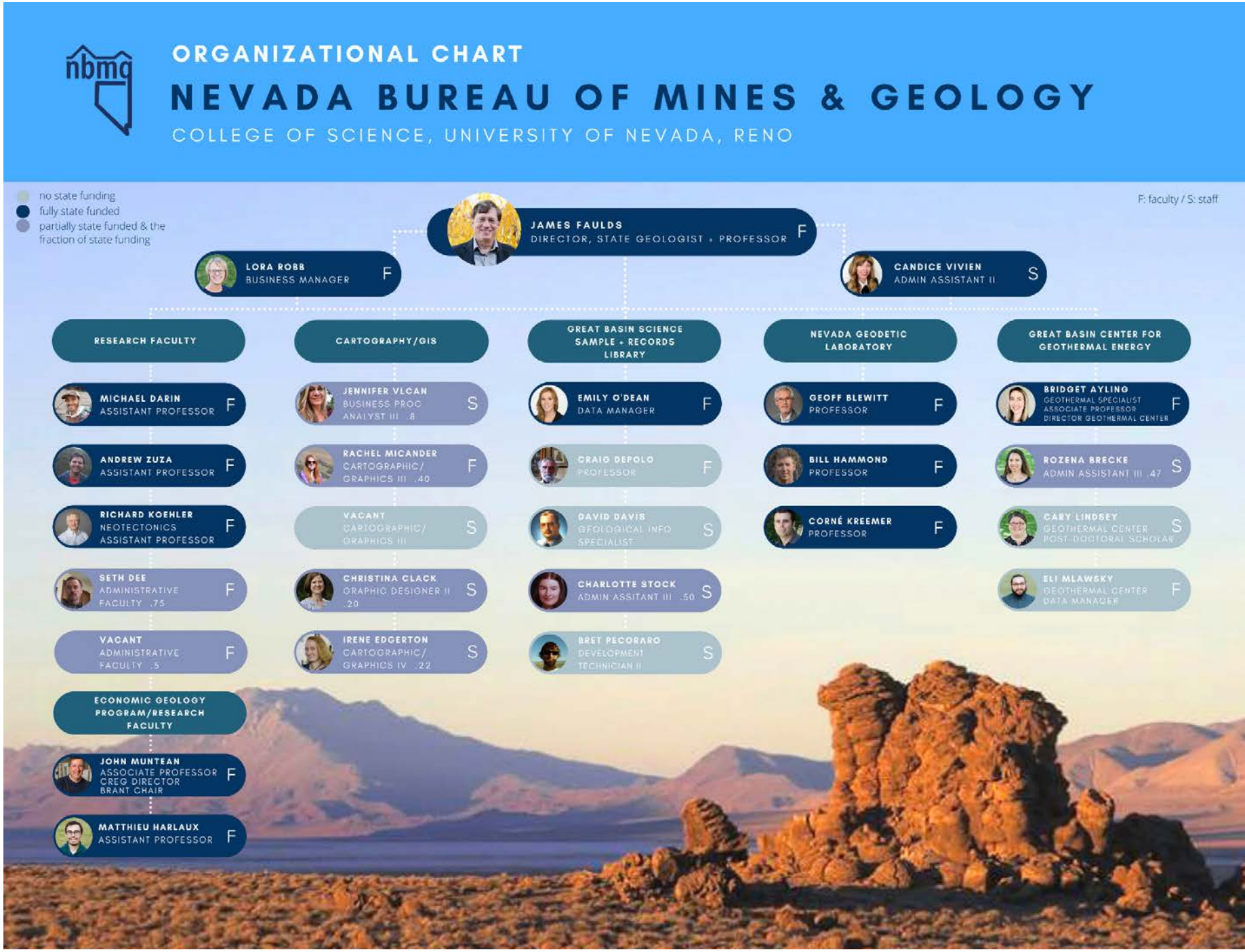


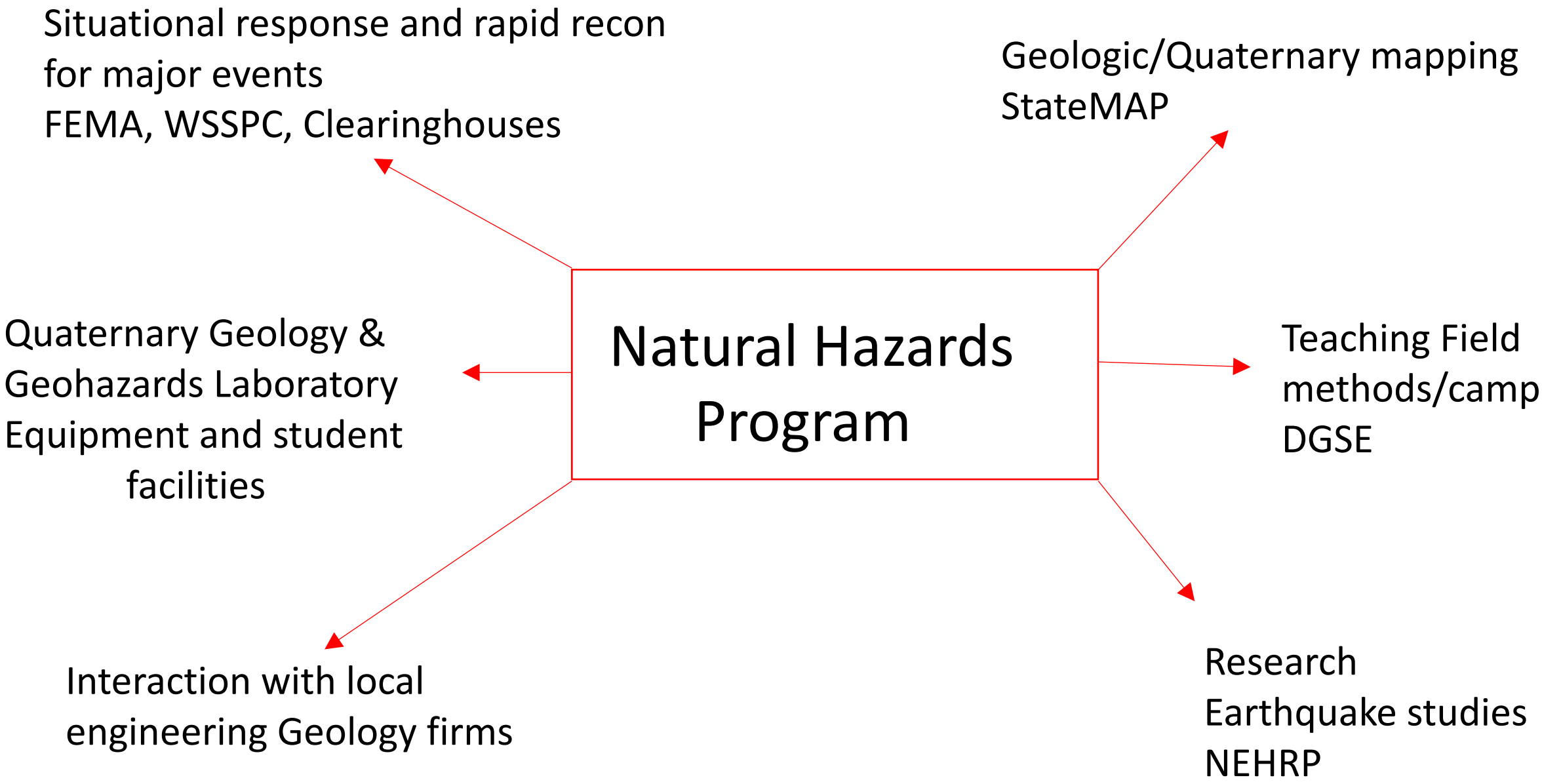
Nevada Bureau of Mines and Geology

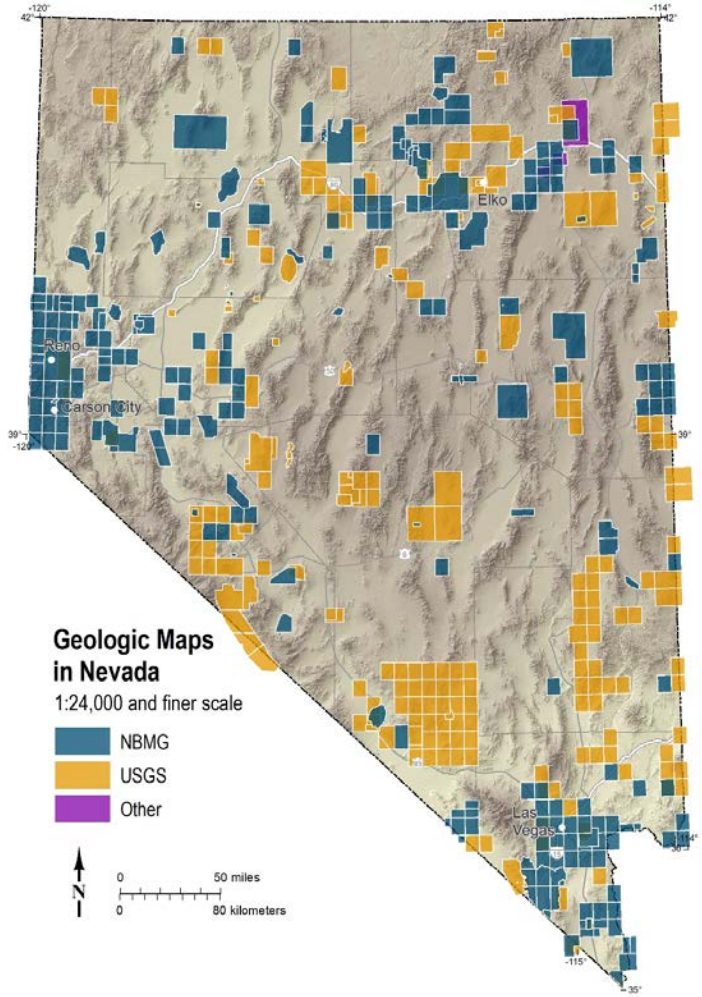
- Teaching
- Research
- Public service
- StateMap

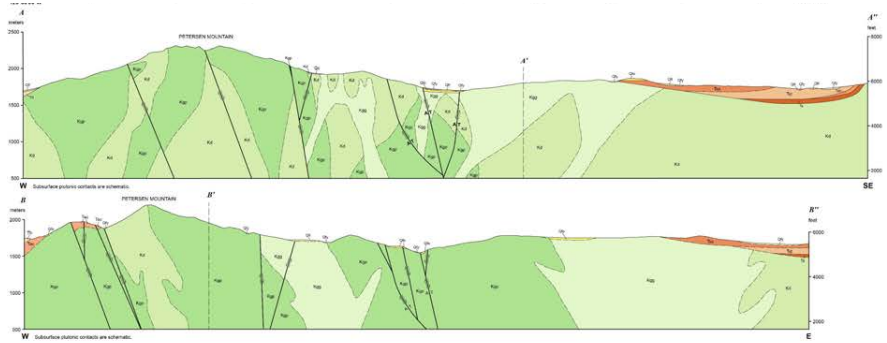
NBMG Applied Research Programs

- **Geologic Framework Studies – Geologic mapping program**
- **Geologic Hazards Program**
- **Economic geology – CREG**
- **Geothermal energy – GBCGE**
- **Nevada Geodetic Laboratory**
- **Basic and applied research at multiple scales**
- **Cartographic/GIS group**
- **GBSSRL**
- **Data sharing and management**
- **Teaching activities**
- **Advisement duties to State agencies.**




Situational response and rapid recon
for major events
FEMA, WSSPC, Clearinghouses
Geologic/Quaternary mapping
StateMAP
Quaternary Geology &
Geohazards Laboratory
Equipment and student
facilities
Natural Hazards
Program
Teaching Field
methods/camp
DGSE
Interaction with local
engineering Geology firms
Research
Earthquake studies
NEHRP

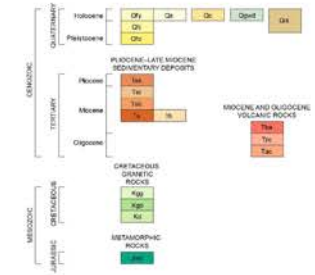




GEOLOGIC MAP OF THE GRANITE PEAK QUADRANGLE, WASHOE COUNTY, NEVADA

Seth Dee
Nevada Bureau of Mines and Geology,
University of Nevada, Reno

2019



Contact Solid where certain, dashed where approximately located, dotted where concealed; queried if identity or existence uncertain

Gradational contact Approximately located

Normal fault Solid where certain, dashed where approximately located, dotted where concealed; queried if identity or existence uncertain. Showing dip; ball on downthrown side. In cross section, arrows show relative movement

Oblique-slip, right-lateral fault Solid where certain, dashed where approximately located, dotted where concealed; queried if identity or existence uncertain. Showing dip; ball on downthrown side; diamond-tipped arrow indicates bearing and plunge of dickensheet in cross section, *A*, away from observer, *T*, toward observer

Anticline Dashed where approximately located

Landslide scarp Hachures point down scarp

Strike and dip of bedding and layering

Strike and dip of foliation in intrusive igneous rocks

Strike and dip of compaction foliation in ash-flow tuff

Strike and dip of flow foliation in lava

U-Pb geochronology sample locations

Line of cross section

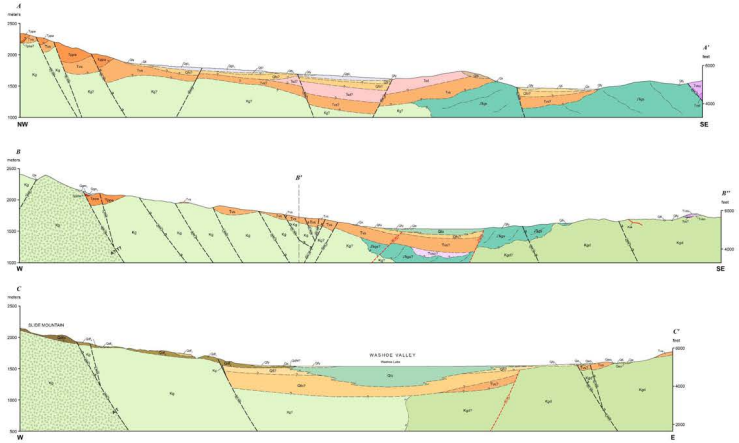
See accompanying text for full unit descriptions and references for this map.

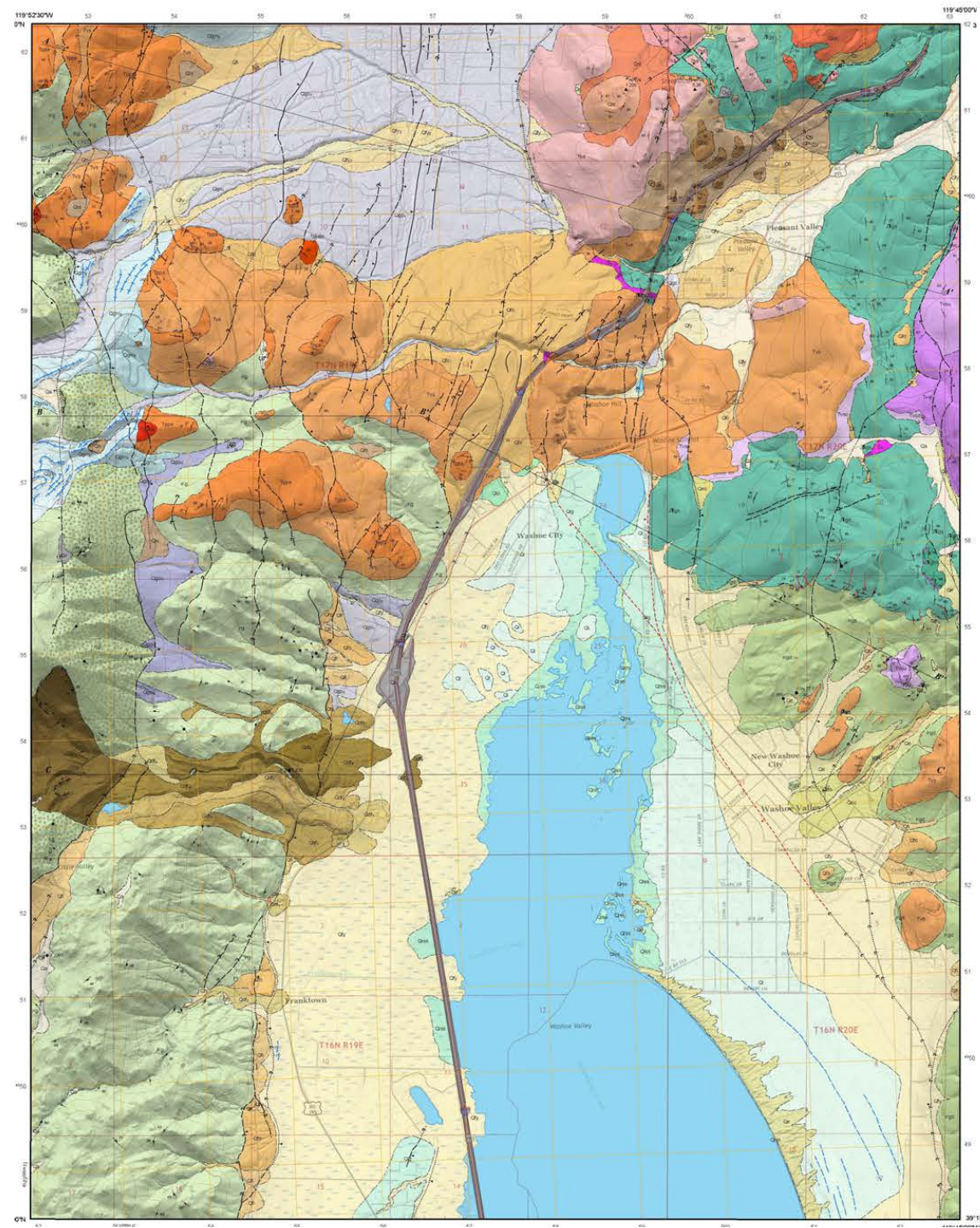
Suggested citation:
Dee, S., 2019, Geologic map of the Granite Peak quadrangle, Washoe County, Nevada: Nevada Bureau of Mines and

GEOLOGIC MAP OF THE WASHOE CITY QUADRANGLE, WASHOE COUNTY, NEVADA

Chad W. Carlson, Richard D. Koehler, and Christopher D. Henry
Nevada Bureau of Mines and Geology, University of Nevada, Reno

2019





QUATERNARY DEPOSITS

- Qx — Disturbed areas and fill (late Holocene)
- Qa — Active alluvium (Holocene)
- Qc — Colluvium (Holocene to Pleistocene?)
- Qe — Eolian deposits (Holocene)
- Qeo — Eolian deposits, older (late Pleistocene)
- Qsi — Sinter deposits (Holocene?)
- Qf_y — Young alluvial-fan deposits (late Holocene)
- Qf_y — Young alluvial-fan deposits (early Holocene)
- Qf — Intermediate-aged alluvial-fan deposits (late Pleistocene)
- Qfo — Older alluvial-fan deposits (middle Pleistocene?)
- Qls — Landslide deposits, undivided (Holocene to Pleistocene?)
- Qlsb — Landslide blocks, undivided (Holocene to Pleistocene?)
- Qlsa — Lacustrine deposits, silt and sand (late Pleistocene)
- Q — Lacustrine deposits, sand (late Pleistocene)
- Qlg — Lacustrine deposits, gravel (late Pleistocene)
- Qlo — Lacustrine deposits, older (late Pleistocene)
- Qlu — Lacustrine deposits, undivided (late Pleistocene) (in cross section only)
- Qdf_h — Debris-flow deposits (historical)
- Qdf_h — Debris-flow deposits (Holocene)
- Qdf_l — Debris-flow deposits (late Pleistocene)
- Qdf_l — Debris-flow deposits (late Pleistocene)
- Qdf_m — Debris-flow deposits (middle Pleistocene?)
- Qdfu — Debris-flow deposits, undivided (Holocene to middle Pleistocene?)
- Qgm_l — Glacial moraine deposits (late Pleistocene)
- Qgm_l — Glacial moraine deposits (late to middle Pleistocene)
- Qgm_m — Glacial moraine deposits (middle Pleistocene)
- Qgo_l — Glacial outwash deposits (late Pleistocene)
- Qgo_l — Glacial outwash deposits (late to middle Pleistocene)
- Qgou — Glacial outwash deposits, undivided (late to middle Pleistocene)

QUATERNARY ROCKS

- Qrv — Rhyolite of Steamboat Hills (late Pleistocene)
- Qst — Tuff of Steamboat Hills (late Pleistocene)
- Qsb — Basaltic andesite of Steamboat Hills (early Pleistocene)

TERTIARY ROCKS

- Tpba — Pyroxene-plagioclase porphyritic basaltic andesite (Miocene)
- Tpa — Plagioclase-pyroxene porphyritic andesite (Miocene)
- Tsd — Dacite of Steamboat Hills (Miocene)
- Tsa — Andesite of Steamboat Hills (Miocene)
- Tvs — Volcaniclastic sedimentary rocks (Miocene)
- Tpbx — Plagioclase-hornblende-pyroxene porphyritic andesite breccia (Miocene)
- Tpa — Sparsely porphyritic basaltic andesite (Miocene)
- Tpba — Platy plagioclase porphyritic basaltic andesite (Miocene)

Virginia City magmatic suite, Steamboat Valley sequence

- Tvss — Volcaniclastic sedimentary rocks of Steamboat Valley (Miocene)
- Tvsu — Lavas of Steamboat Valley, upper (Miocene)
- Tvsl — Lavas of Steamboat Valley, lower (Miocene)
- Tvso — Volcaniclastic sedimentary rocks, older (Miocene)
- Ti — Andesite and dacite intrusions, undivided (Miocene)

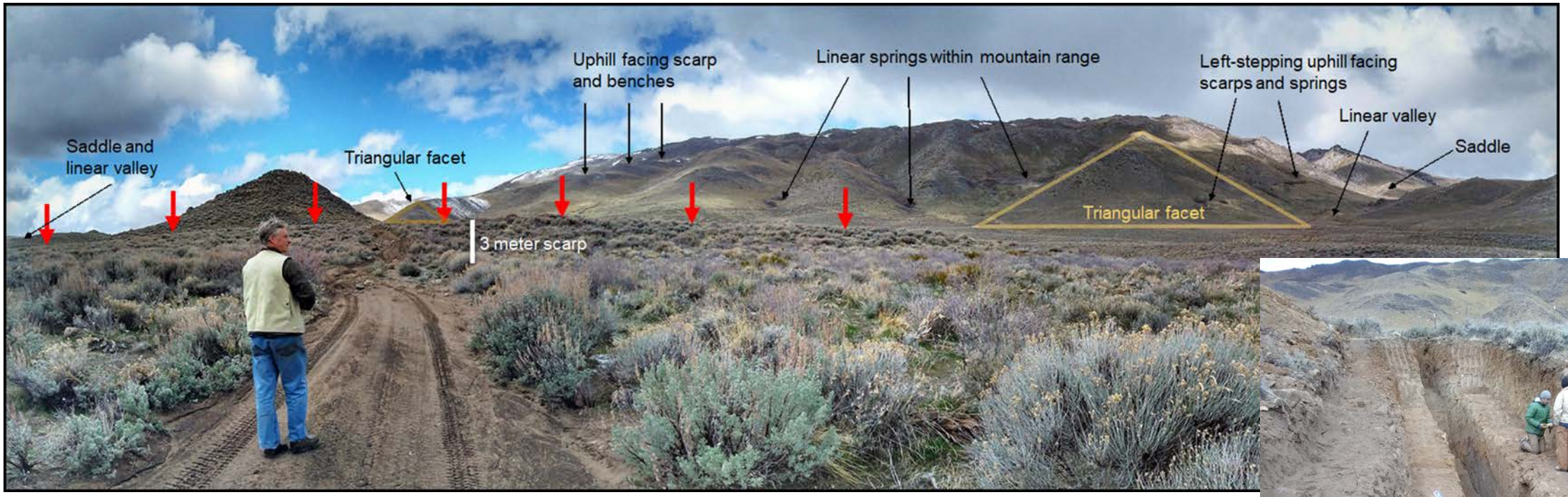
Oligocene ash-flow tuffs

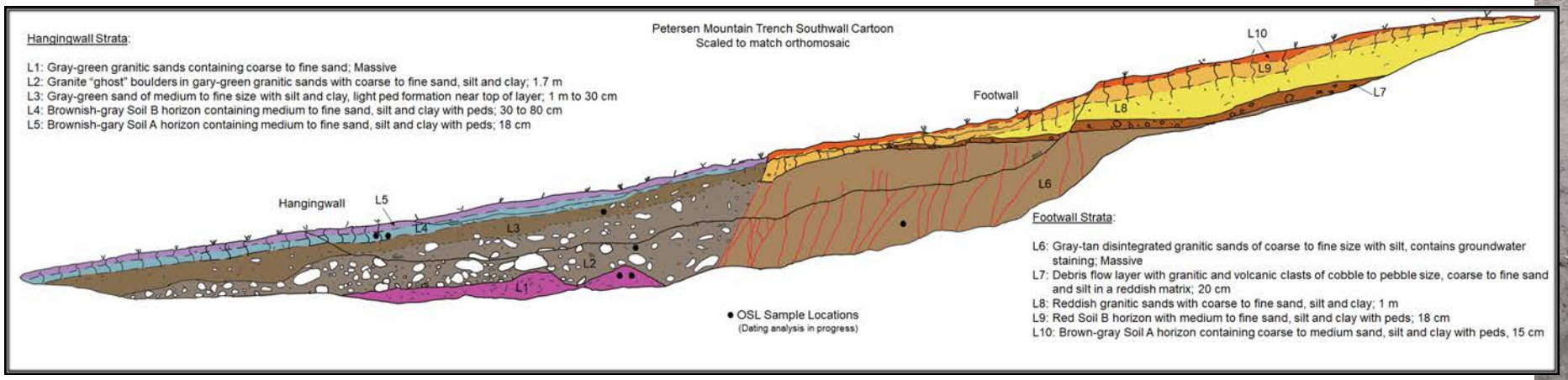
- Tct — Tuff of Chimney Springs (Oligocene)
- Tnh — Nine Hill Tuff (Oligocene)

MESOZOIC ROCKS

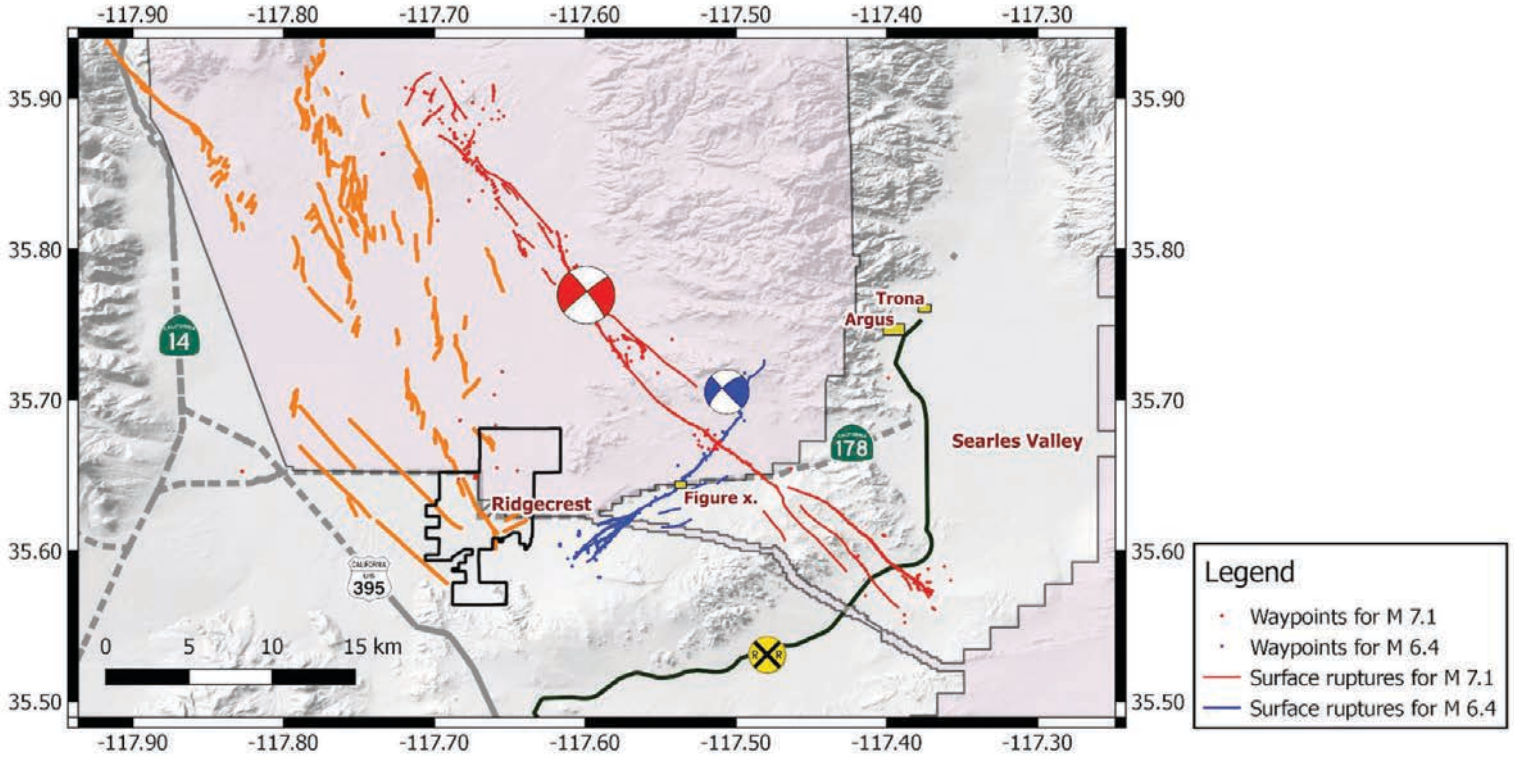
- K_{qz} — Quartz veins (Cretaceous)
- K_{ap} — Aplite-pegmatite dikes (Cretaceous)
- K_g — Granite (Cretaceous)
- Kgd — Biotite-hornblende granodiorite of Steamboat Valley (Cretaceous)
- JTrgn — Metasedimentary rocks, Gardnerville Formation (Jurassic to Triassic)
- JTrgv — Gardnerville Formation, metasedimentary and metavolcanic rock (Jurassic to Triassic)

Petersen Mountain fault



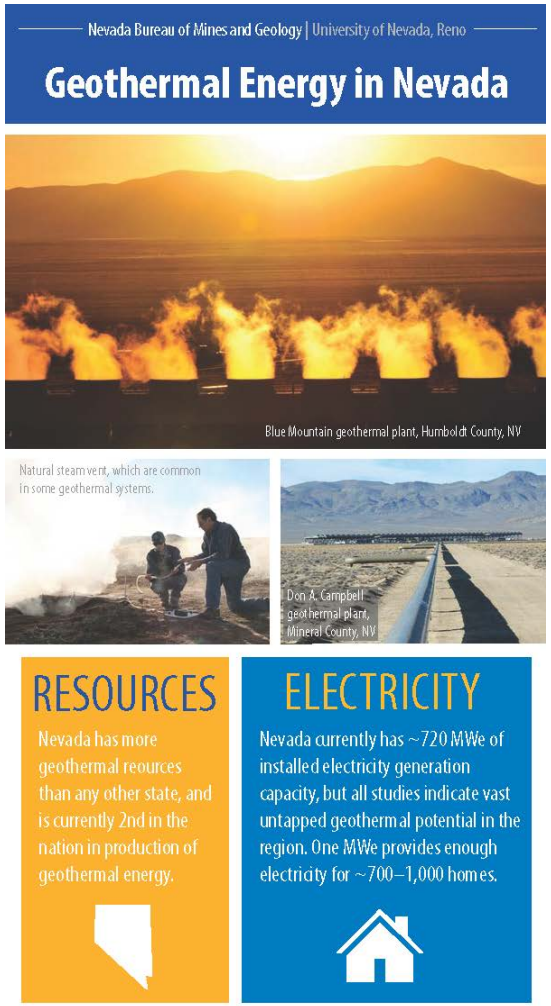


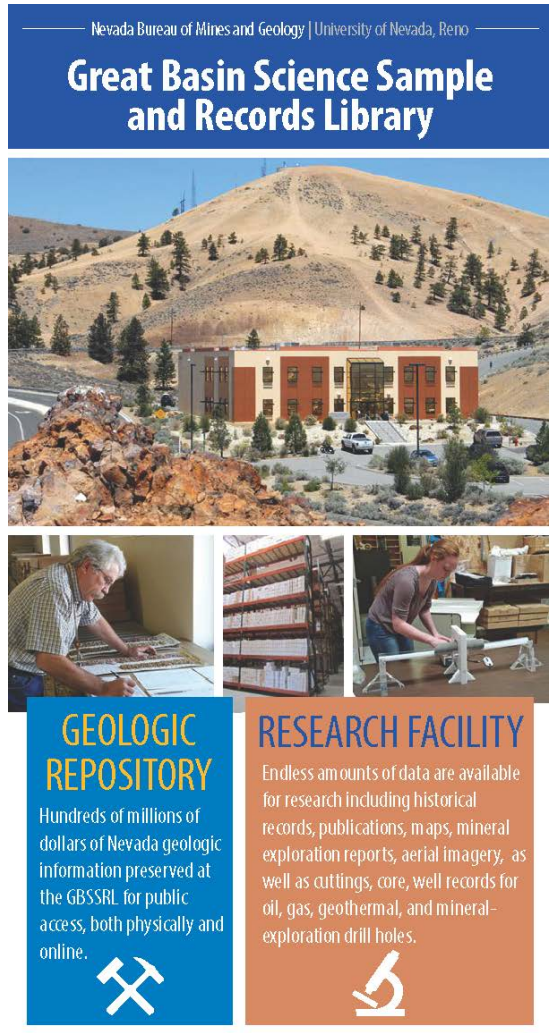
Earthquake Response: July 4 and 5, 2019 Ridgecrest earthquake sequence



NBMG team collaborated with USGS, CGS, and others to evaluate slip distribution, kinematics, and behavior of the fault zone.

NBMG Outreach





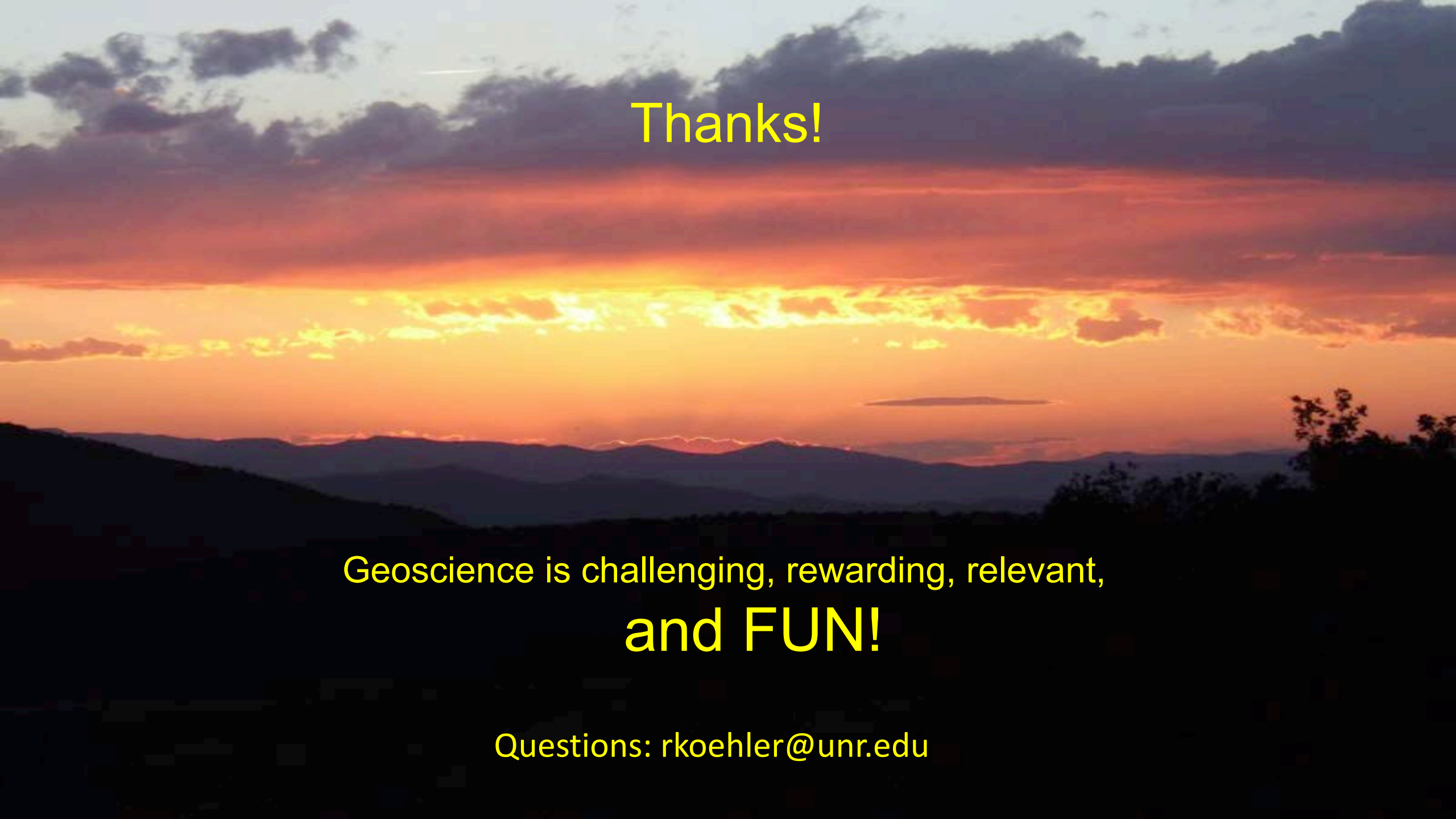
Some Career advice

Although the job market is competitive, rest assured there are plenty of opportunities out there.

Try to surround yourself with expertise to learn from. Volunteer, internships, field trips, etc. This will broaden your experience and open new doors.

Take jobs that interest you but don’t shy away from challenges and/or unforeseen opportunities.

It won’t always be easy, but careers in the geosciences are fascinating and rewarding.


Thanks!
Geoscience is challenging, rewarding, relevant,
and FUN!
Questions: rkoehler@unr.edu