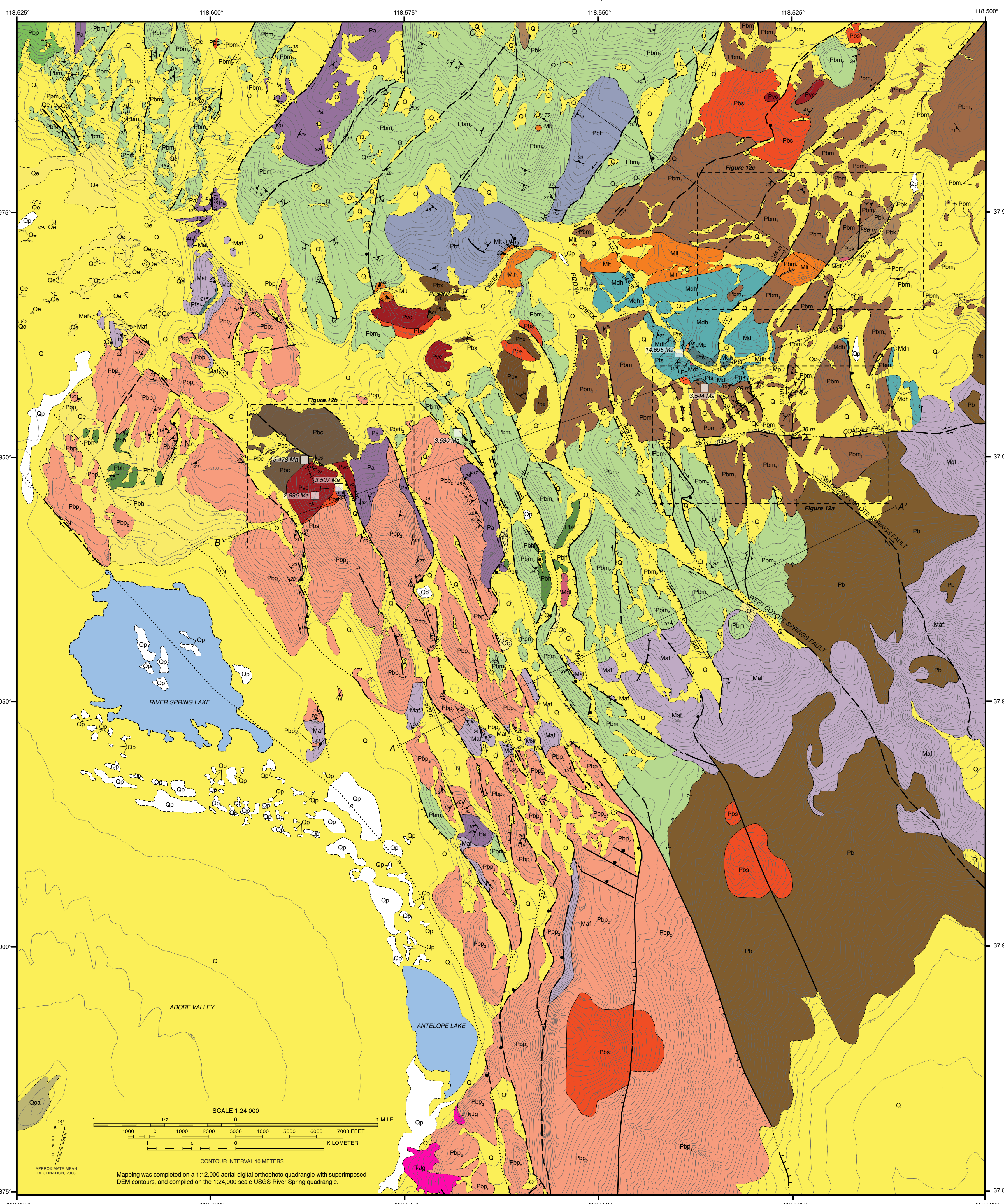


GEOLOGIC MAP OF THE RIVER SPRING AREA, CALIFORNIA-NEVADA



MAP UNITS

Sedimentary and Volcanic Rocks

- Quaternary**
- Qe** Eolian tuffaceous sand. White to light tan fine-grained sand, composed mostly of quartz grains, glass shards, and some lithics.
 - Q** Undifferentiated sediments. Eolian tuffaceous sand, and fan and playa deposits following Reheis et al. (2002).
 - Qp** Playa deposits. White silt to mud-sized shallow-water deposits.
 - Qc** Basalt colluvium. Angular basalt cobble to boulder-sized clasts sourced up slope.
 - Qoa** Older alluvium. Deposit composed of a range of clast sizes, degree of rounding, and lithologies.

- Pliocene**
- Pbs** Basalt scoria deposits.
 - Pvc** Cinder cone. Basalt breccia blocks, cinder, scoria, and scarce volcanic bombs. Groundmass plagioclase $^{40}\text{Ar}/^{39}\text{Ar}$ age from a cross-cutting dike: 2.996 ± 0.063 Ma (this study).
 - Basalt and andesite lava flows and dikes.
 - Pbp₂** Pyroxene basalt lava flow. Groundmass plagioclase $^{40}\text{Ar}/^{39}\text{Ar}$ age: 3.361 ± 0.020 Ma (this study).
 - Pbc** Glomerocrystic olivine basalt lava flow. Groundmass plagioclase $^{40}\text{Ar}/^{39}\text{Ar}$ ages: 3.482 ± 0.037 Ma, 3.478 ± 0.020 Ma, 3.474 ± 0.010 Ma (this study).
 - Pbh** Aphanitic basalt lava flow.
 - Pbx** Weakly phryic olivine basalt flow.
 - Pa** Weakly phryic andesite lava flow. Groundmass plagioclase $^{40}\text{Ar}/^{39}\text{Ar}$ age: 3.507 ± 0.008 Ma (this study).
 - Pbm₂** Weakly phryic olivine basalt lava flow. Groundmass plagioclase $^{40}\text{Ar}/^{39}\text{Ar}$ age: 3.530 ± 0.010 Ma (this study).
 - Pbf** Weakly phryic olivine and pyroxene basalt lava flow.
 - Pbm₁** Weakly phryic olivine basalt lava flow. Groundmass plagioclase $^{40}\text{Ar}/^{39}\text{Ar}$ age: 3.544 ± 0.007 Ma (this study).
 - Pbk** Poikilitic basalt lava flow.
 - Pbp** Weakly phryic basalt lava flow.
 - Pb** Basalt lava flow, undifferentiated.
 - Pg** Gravel deposits comprised of clasts of Miocene latite.
 - Pts** Tuffaceous sandstone.

- Miocene**
- Mlt** Welded latite ignimbrite. Plagioclase $^{40}\text{Ar}/^{39}\text{Ar}$ age: 11.399 ± 0.041 Ma* (Nagorsen-Rinke et al., 2013).
 - Mp** Pumaceous tuff.
 - Mdf** Volcanic debris flow with clasts of dacite, latite, and andesite.
 - Mdh** Hornblende dacite debris flows, lava flows, and dikes. Groundmass plagioclase $^{40}\text{Ar}/^{39}\text{Ar}$ age: 14.695 ± 0.816 Ma (this study).
 - Maf** Crystal rich andesite flow.
- Mz**
- TJg** Triassic granodiorite.



Adjoining 7.5' Quadrangles and Sources of Mapping

1	2	3	1 West of Huntoon Spring
4	5	6	2 Huntoon Spring
7	8	9	3 Jacks Spring
			4 Indian Meadows
			5 River Spring
			6 Truman Meadows
			7 Glass Mountain
			8 Benton Hot Springs
			9 Benton

a. This study.
b. Krauskopf and Bateman, 1977.

SYMBOLS

Contacts

Solid where well-located (≤ 10 m), dashed where approximately located (11-20 m), dotted where concealed, queried where speculative

Quaternary contact

Faults

Normal fault, ball on the hanging wall; solid well-located (≤ 10 m), dashed where approximately located (11-20 m), dotted where concealed

Strike slip fault, paired arrows indicate relative sense of lateral slip, hachures indicate scarp facing direction; solid well-located (≤ 10 m) dashed where approximately located (11-20 m), dotted where concealed

50 m

magnitude of lateral offset

Dikes

basalt dike

dacite dike

Attitudes

strike and dip of bedding

strike and dip of lava flow foliation

strike and dip of flattened fiamme

Lava flow ridgelines

Samples

$^{40}\text{Ar}/^{39}\text{Ar}$ geochronology sample location

*sample age recalculated using a revised age of 28.7348 Ma for the Taylor Creek sandline standard (Fleck and Calvert, 2016) so that the age is comparable to astronomical age of Kuiper et al. (2016)