



Geologic Map 84

# Quaternary Fault Map of Jefferson County, Southwest Montana

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This Quaternary fault map identifies faults that demonstrate evidence of earthquake surface ruptures based on lidar data, geomorphic and topographic analyses, field checks, and, when available, published geological maps (Fig. 1). Faults are considered potentially active and hazardous if fault displacement occurred during the Quaternary period (past 2.6 million years) and produced surface deformation during an earthquake, typically expressed as fault scarps. All Quaternary faults in Jefferson County have a predominantly normal sense of slip and accommodate extension (Fig. 2), associated with the Northern Rockies Basin and Range.

**Latest Quaternary faults** are those that have evidence of fault displacement within the past 15,000 years. Faults in this category have well-constrained locations with fault scarps that cut Holocene or late Pleistocene aged sediments.

**Late Quaternary faults** are those that have evidence of fault displacement within the past 130,000 years. Faults in this category have well-constrained locations with fault scarps that cut Late Pleistocene or Bull Lake age sediments.

**Middle to Late Quaternary faults** are those that have evidence of fault displacement within the past 1.8 million years. Faults in this category have well- to moderately constrained locations with bedrock fault scarps or fault-controlled topographic lineaments that deform Quaternary sediments.

**Undifferentiated Quaternary—Class B faults** are those suspected to have fault displacement within the past 2.6 million years. Faults in this category have well- to moderately constrained locations or may be concealed but inferred to deform Quaternary sediments.

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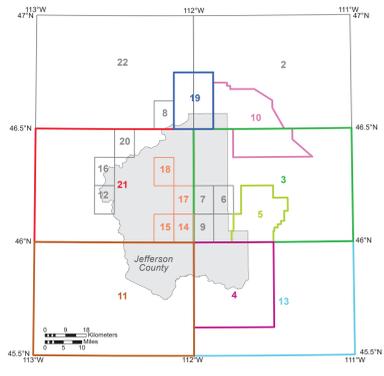
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Figure 1. Previous mapping in the study area.

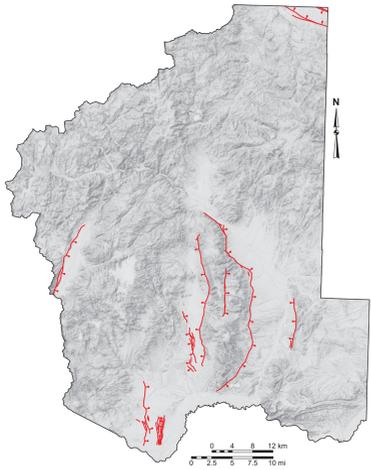
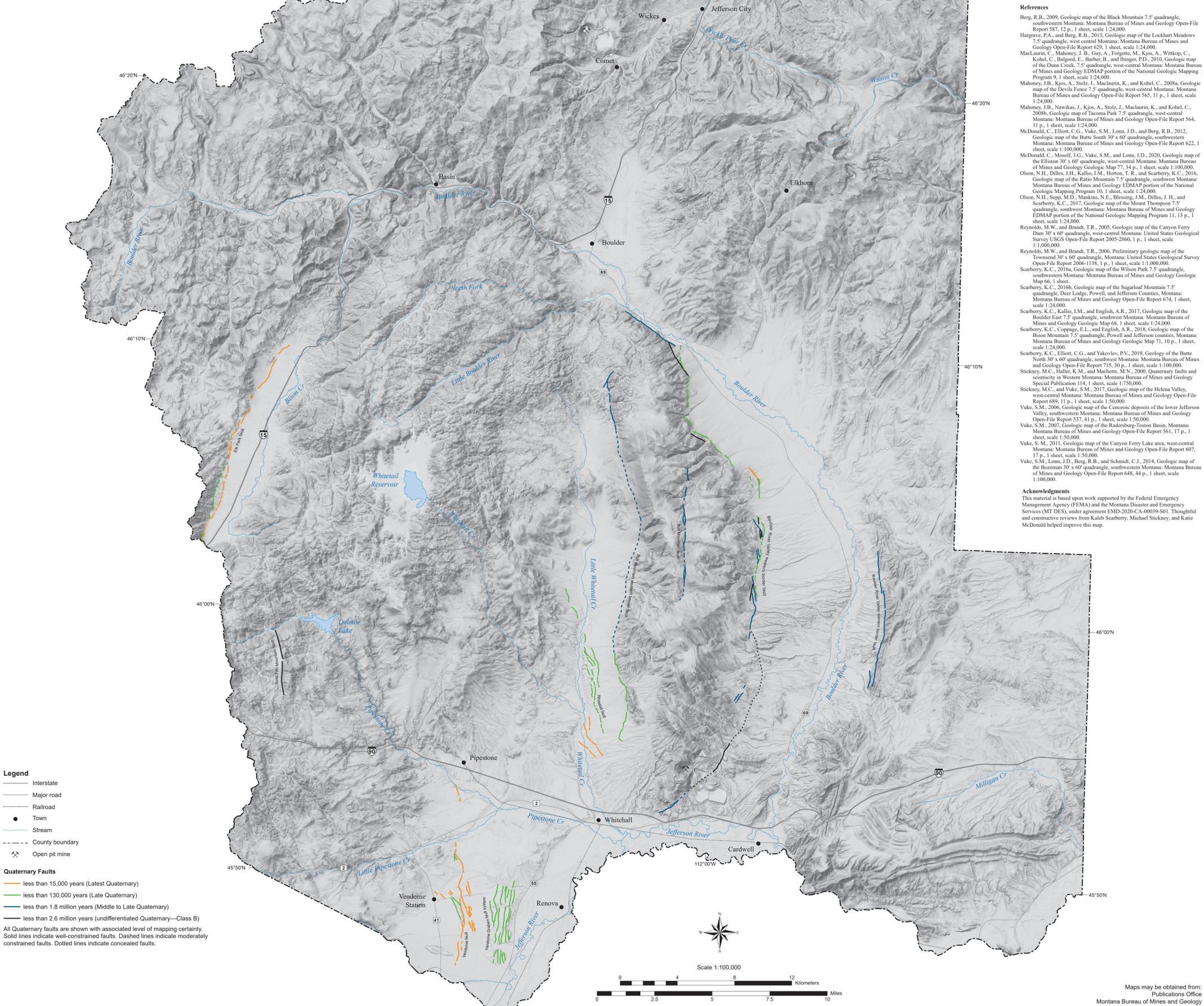


Figure 2. Generalized tectonic map of Jefferson County showing fault slip along normal faults.



- Legend**
- Interstate
  - Major road
  - Railroad
  - Town
  - Stream
  - County boundary
  - Open pit mine
- Quaternary Faults**
- less than 15,000 years (Latest Quaternary)
  - less than 130,000 years (Late Quaternary)
  - less than 1.8 million years (Middle to Late Quaternary)
  - less than 2.6 million years (undifferentiated Quaternary—Class B)
- All Quaternary faults are shown with associated level of mapping certainty. Solid lines indicate well-constrained faults. Dashed lines indicate moderately constrained faults. Dotted lines indicate concealed faults.