UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

Preliminary map showing known and suspected active faults in western Montana

Compiled by Irving J. Witkind

Open-file report 75-285

1975

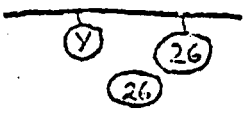
INTRODUCTION

Known and suspected active faults in the northern Rocky Mountains are plotted on the State map of western Montana (scale 1:500,000), which accompanies this report.

Each active fault is identified by a random number and a letter. Pertinent data about each fault are recorded on file cards, copies of which are included in this text. The letter refers to the youngest beds broken by that fault. The range extends from historic breaks (R) to other faults that have been recurrently active since the middle Miocene (B). Details are given in the Explanation (page 2). All faults, no matter what their age, are considered potentially dangerous, and liable to cause severe earthquakes if reactivated.

These data are made available in preliminary form to assist local, State, and federal agencies. Although most active faults are shown, it seems very likely that not all active faults are included. As additional information becomes available, these other active faults will be added.

EXPLANATION



FAULT--Known and inferred; approximately located

NUMBER IDENTIFYING FAULT--See accompanying material describing fault

CATEGORIES OF FAULTS

(R) Break along fault that occurred during historic time.

(O) Youngest beds broken are of Holocene age.

(Y) Youngest beds broken are of late Quaternary age (essentially Wisconsin time in the Pleistocene).

(Q) Youngest beds broken are of Quaternary age (essentially Pleistocene time).

(B) Fault has been recurrently active since middle Miocene time (essentially during last 20 million years).

(P) Other fault that may be active.

NUMBER- 4 Active Faults Map

Name of fault - Centennial fault
Latest movement - Late Quaternary (Yellow) - Fault scarp cuts
(Age of fault) Some old surf. dep, but is buried by others.
Type of fault - High-angle normal - Flt strikes east, dips north
Rel. dir. movement - N side down thrown

Length of fault - 40 miles - formerly longer, extending both to west + east
Attitude of fault - Strikes east, dips valleyward (north)
Susceptibility to eq. - Great.
Confidence (reliability) level - High.
Recurrence interval - None in historic times - Seismic activity present now
Fault density - Only major scarp noted

Historic - Red - 1237
Holocene - Orange - 1214
Maj Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal. - Purple 1210

Source - I. J Witkind
Address U.S. G.S.
Fed. Ctr, Denver, Colo, 80225
Phone - (303) - 234 - 3242
State map - Montana
County - Beaverhead
Reference - Geol. map - Centennial fault
I -

Province -
Remarks -
- Strip map along Cent fault.
- Seismic activity - Cluster of epicenters north of Cent Valley (Scattered)
- Scarp abt 40 feet high.

NUMBER- 5 Active Faults Map

Name of fault - Madison Range fault
Latest movement - On most - Late Quat. (Yellow). On some Historic (Red)
(Age of fault)
Type of fault - High-angle normal
Rel. dir. movement - West side downthrown

Length of fault - 54-55 miles
Attitude of fault - Trends about N. 20-30° W., dip SW.
Susceptibility to eq. - High
Confidence (reliability) level - Great.
Recurrence interval -
Fault density - Only one scarp now shows

Historic - Red - 1237
Holocene - Orange 1214
Maj Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal. - Purple 1210

Source - I. J Witkind (+ others below)
Address U.S.G.S. - Fed. Ctr,
Denver, Colo, 80225
Phone - (303) - 234 - 3242
State map - Montana and Idaho
County - Madison - Mont
Fremont - Id.
Reference - Pardee - 1951, GSA V. 61, #4
U.S.G.S. P.P. 435; USGS I-781-A

Province -
Remarks -
Fault scarp 20-40 feet high
Historic scarp near Storm Rand - 2'-3'
A major fault of southwestern Montana

NUMBER- 6 Active Faults Map

Name of fault - Hebgen fault
Latest movement - Historic - 1959
(Age of fault)
Type of fault - High-angle normal
Rel. dir. movement - West side downthrown

Length of fault - Abt. 6 miles.
Attitude of fault - Trends N55°W. ; dips 60°-80°SW
Susceptibility to eq. -
Confidence (reliability) level -
Recurrence interval - No prev. historic fltng
Fault density - Many small scarps parallel main fault

Historic - Red - 1237
Holocene - Orange 1214
Maj Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal. - Purple 1210

Source - I. J. Witkind
Address U.S.G.S., Fed. Ctr.,
Denver, Colo., 80225
Phone - (303) - 234-3242
State map - Montana
County - Gallatin
Reference - U.S.G.S. P. P. 435, p. 40

Province -
Remarks -

1. Scarp height 2 to 20 feet. Many small breaks parallel it.

NUMBER- 7 Active Faults Map

Name of fault - Red Canyon fault
Latest movement - Historic - 1959 (Red)
(Age of fault)
Type of fault - High-angle normal
Rel. dir. movement - South side downthrown

Length of fault - 14 miles
Attitude of fault - Curving - Trends generally N55-60W
Susceptibility to eq. - Large
Confidence (reliability) level - High
Recurrence interval - First one in recent geol. time, (None known historically)
Fault density - Many small scarps within 1000 feet each side of fault

Historic - Red - 1237
Holocene - Orange 1214
Maj Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal. - Purple 1210

Source - I. J. Witkind
Address U.S.G.S. - Fed. Ctr.
Denver, Colo, 80225
Phone - (303) - 234-3242
State map - Montana
County - Gallatin
Reference - USGS P. P. 435, p. 38-39

Province -
Remarks -

1. Scarp height as much as 22 feet. Averages 10'

NUMBER-8 Active Faults Map

Name of fault - Red Rock fault zone

Latest movement - "Historic scarp between Big and Little Sheep Creek, abt 1'-2' high" (Age of fault) (Ryder from Schalen) Mostly Maj Late Quad - Yellow

Type of fault - High-angle normal fault

Rel. dir. movement - East side down/Basin-(Valleyward)

Length of fault - About 16 miles - Marked by striking fault scarp (40'±)

Attitude of fault - Trends abt. N. 40 W, dip NE at hi-∠. Valley side down

Susceptibility to eq. - Large

Confidence (reliability) level - High

Recurrence interval - Since mid-Miocene

Fault density - Only one scarp - cuts "modern alluvial fans", but Basin fans are buried by younger fans

Historic - Red - 1237
Holocene - Orange - 1214
Maj Late Quad - Yellow 1209
Maj. Quad. - Green 1208
Late Cenoz. - Blue 1206
Other anomal - Purple 1210

Source - Robert T. Ryder

Address USGS Fed. Ctr, Denver, Colo, 80225 (Bldg 53)

Phone - (303) - 234 - 4127

State map - Montana

County - Beaverhead

Reference - Scholten + Ryder - GSA T. 84, No. 3 (Beaverhead paper)

Scholten and others - V. 66 #4, p. 387

Province -

Remarks -

1. Fault trace shown on Fig. 3 of Sch + Ryder.
2. Fault much longer on border. (No agreement on Scholten's part).
3. Historic break abt 2' high scarp according to Scholten (thru Ryder 3/5/75). In Dillon newspaper (early 1900's) - some damage.

NUMBER-9 Active Faults Map

Name of fault - East Muddy Creek fault.

Latest movement - Late Cenoz (Blue) (Age of fault)

Type of fault - High-angle normal.

Rel. dir. movement - SW side down

Length of fault - Abt. 15 miles

Attitude of fault - Trends abt N. 15W, dips westward (valleyward)

Susceptibility to eq. - Low - Mod

Confidence (reliability) level -

Recurrence interval - Not moved since Oligocene?

Fault density -

Historic - Red - 1237
Holocene - Orange 1214
Maj Late Quad - Yellow 1209
Maj. Quad. - Green 1208
Late Cenoz. - Blue 1206
Other anomal - Purple 1210

Source - Robert T. Ryder

Address USGS - Fed. Ctr, Denver, Colo., 80225 (Bldg 53)

Phone - (303) - 234 - 4127

State map - Montana

County - Beaverhead

Reference - Scholten + Ryder - GSA V. 84, no 3

Scholten et al. V. 66, #4, p. 387

Province -

Remarks -

1. E-W Muddy Creek faults bound Muddy C - an intramontane basin (Graben)

NUMBER- 10 Active Faults Map

Name of fault - West Muddy Creek fault
Latest movement - Late Cenoz (Blue) - Cuts "Olig-cenoz?" beds
(Age of fault)
Type of fault - High-angle normal
Rel. dir. movement - East side (valley side) downthrown

Length of fault - Mot. 12 miles)
Attitude of fault - Trends N.15W, dips eastward (valleyward)
Susceptibility to eq. - Low - Mod.
Confidence (reliability) level - Low - Mod.
Recurrence interval - Not moved since Oligo.
Fault density - No fresh breaks

Historic - Red - 1237
Holocene - Orange 1214
Maj. Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal. - Purple 1210

Source - Robert T. Ryder
Address USGS - Fed. Ctr.,
Denver, Colo., 80225 (Bldg 53)
Phone - (303) - 234 - 4127
State map - Montana
County - Beaverhead
Reference - Scholten + others (GSA, p. 66, #4, p. 337)

Province -
Remarks -
1. Dist. scarp along mtn front.

NUMBER- 11 Active Faults Map

Name of fault - Deadman fault
Latest movement - "Late Tert or Quat" - Late Cenoz. (Blue) (p. 385 - v. 66 #4)
(Age of fault)
Type of fault - High-angle normal (block fault)
Rel. dir. movement - SW side (valley) downthrown

Length of fault - 22-25 miles)
Attitude of fault - Trends N45°W, dips SW
Susceptibility to eq. -
Confidence (reliability) level -
Recurrence interval -
Fault density -

Historic - Red - 1237
Holocene - Orange 1214
Maj. Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal. - Purple 1210

Source - Robert T. Ryder
Address USGS - Fed. Ctr.,
Denver, Colo., 80225 (Bldg 53)
Phone - (303) - 234 - 4127
State map - Montana
County - Beaverhead
Reference - Scholten - Ryder; v. 84, #3, fig. 3.
Scholten + others (GSA - v. 66 #4), p. 385

Province -
Remarks -
1. No "fresh" or modern scarp, but slickenside
2. Trends Tenderly to SW west.

NUMBER- 12 Active Faults Map

Name of fault - Kissick fault (see pl. 1 of Scholten et al, GSA, v. 66, #4)
Latest movement - Late Cenoz (Blue) - Active "at least as late as Miocene" - p. 386, v. 66 #4.
(Age of fault)
Type of fault - High-angle normal
Rel. dir. movement - SW side down thrown (Valley side down)

Length of fault - Not 9-10 miles)
Attitude of fault - Trends N 20° W., dips SW.
Susceptibility to eq. - Low - Moderate
Confidence (reliability) level - Low
Recurrence interval - Not active since Miocene?
Fault density - High with front

Historic - Red - 1237
Holocene - Orange 1214
Maj Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal - Purple 1210

Source - Robert T. Ryder
Address USGS - Fed. Ctr.
Denver, Colo., 80225 (Bldg. 53)
Phone - (303) - 234 - 4127
State map - Montana
County - Beaverhead
Reference - Scholten - Ryder GSA v. 84, no. 3
Scholten + others " v. 66, no. 4

Province -
Remarks -
1. Bounds Tendoy Rg on west.
2. No scarp along trace

NUMBER- 13 Active Faults Map

Name of fault - Blacktail fault
Latest movement - Late Cenoz (Blue) cuts Miocene beds - p 387 - v. 66, no. 4
(Age of fault)
Type of fault - High-angle normal (block fault)
Rel. dir. movement - NE side (valley) down thrown

Length of fault - 20 miles ±
Attitude of fault - Trends N 40° W, dips valleyward (to NE)
Susceptibility to eq. - Low -
Confidence (reliability) level -
Recurrence interval - Not moved since Miocene
Fault density - No scarplets.

Historic - Red - 1237
Holocene - Orange 1214
Maj Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal - Purple 1210

Source - Robert T. Ryder
Address USGS - Fed. Ctr.
Denver, Colo, 80225 (Bldg. 53)
Phone - (303) - 234 - 4127
State map - Montana
County - Beaverhead
Reference -
Scholten et al - GSA - v. 66, #4, p. 387
Pardee, v. 61 #4

Province -
Remarks -
1. Front east face of Blacktail Rg.
2. Present trace covered by Quat fanglomerate
3. Pardee (1950, p. 386) believes much of movt occurred during Pleistocene

NUMBER- 14 Active Faults Map

Name of fault - Unnamed
Latest movement - Late Cenoz. (Cuts Beaverhead) Blue
(Age of fault)
Type of fault - High-angle normal
Rel. dir. movement - SW Side(valley) down

Length of fault - 5-6 miles
Attitude of fault - Trends N30W, dips SW
Susceptibility to eq. - Low
Confidence (reliability) level -
Recurrence interval -
Fault density -

Historic - Red - 1237
Holocene - Orange 1214
Maj Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal - Purple 1210

Source - Robert T. Ryder
Address USGS, Fed. Ctr.
Denver, Colo, 80225, (Bldg 53)
Phone - (303) - 234-4127
State map - Montana
County - Beaverhead
Reference - Ryder + Scholtz - GSA V. 84, #3, pg. 3

Province -
Remarks -

NUMBER- 15 Active Faults Map

Name of fault - Emigrant fault
Latest movement - Late Quat - probably Holocene - Cuts Pleistocene deposits.
(Age of fault) Scarplet present - (Orange)
Type of fault - High-angle normal
Rel. dir. movement - West side downthrown

Length of fault - 35 miles
Attitude of fault - Trends N40E, dips valleyward - NW
Susceptibility to eq. - Moderate
Confidence (reliability) level - High.
Recurrence interval - Cuts Pleistocene deposits - Scarplet along pts of trace
Fault density - Generally one scarp

Historic - Red - 1237
Holocene - Orange 1214
Maj Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal - Purple 1210

Source - George D. Fraser
Address USGS, Fed. Ctr.
Denver, Colo, 80225
Phone (303) - 234 - 5042
State map - Montana
County - Park
Reference - Fraser - 1277, p. 74 AKA - USGS Bull
Pardee, GSA V. 61, #4, p. 377-379
Horberg Jour Geol., 56-48, #3, p. 280-282

Province -
Remarks -
1. Fit bounds west flank of Beartooth Plateau (Sp. mtns have called Sinang Range)
2. Hot springs along fault trace.

NUMBER-28 Active Faults Map

Name of fault - Gardiner fault
Latest movement - Cuts Pleistocene deposits - Cub Holocene - Orange - (Age of fault)
Type of fault - High-angle normal at depth - Hi ∠ reverse
Rel. dir. movement - SW side down thrown
Length of fault -
Attitude of fault - Trends at N50W, dips SW
Susceptibility to eq. - High
Confidence (reliability) level - High
Recurrence interval - Prob 500 - 1500 years.
Fault density - Many small scarps - See Fl. 1 - Bull. 1277

Historic - Red - 1237
Holocene - Orange 1214
Maj Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal - Purple 1210

Source - George D. Fraser
Address U.S.G.S., Fed Ctr
Denver, Colo, 80225
Phone - (303) - 234 - 5042
State map - Mont.
County - Park
Reference - USGS Bull. 1277 -

Province -
Remarks -
1. Travertine fmd in Plist - Holocene broken.

NUMBER-29 Active Faults Map Ed Reppl.

Name of fault - Mammoth fault.
Latest movement - Generally breaks travertine, so probably Holocene - Orange (Age of fault)
Type of fault - High angle normal
Rel. dir. movement - NE side down thrown
Length of fault - 8-10 miles
Attitude of fault - Curving - from NE - trends gen NW
Susceptibility to eq. - High
Confidence (reliability) level - High
Recurrence interval -
Fault density -

Historic - Red - 1237
Holocene - Orange 1214
Maj Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal - Purple 1210

Source - George D. Fraser
Address USGS - Fed Ctr
Denver, Colo. 80225
Phone (303) - 234 - 5042
State map - Wyo - Mont Wyo (C-1) Mont (H-3)
County - Y. N. P.
Reference - Fraser - Bull. 1277 (near Gardiner)
Braun GSA v. 72 #8 - See for trace of fault in Park.
Province -
Remarks -
1. Flt south Gardiner flt or north and extends into Wyo. - Eastern fault that bounds a graben - Western fault is Reese Creek (Gardiner) fault. (#30)
2. Conflict bet Ed and George. - I follow Ed in YNP and George north of Park.

NUMBER- 30 Active Faults Map

Name of fault - Reese Creek fault - (East Gallatin fault)
Latest movement - Ripple Slate p. A51 - "Latest movement - cut glacial deposits" Orange
(Age of fault)
Type of fault - High angle normal - determines east face Gallatin Rg.
Rel. dir. movement - East side (Valley) down thrown

Length of fault - Trends north - abt 30 miles
Attitude of fault - Trends north, dips east.
Susceptibility to eq. - High
Confidence (reliability) level - High
Recurrence interval -
Fault density -

Historic - Red - 1237
Holocene - Orange 1214
Maj Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal - Purple 1210

Source - E. T. Ripley
Address USGS. Fed Ctr.
Denver, Colo 80225
Phone - (303) - 234-2650
State map - Mont + Wyo
County - Y NP
Reference -
USGS. P.P. 729-A., p. A51

Province -
Remarks -
1. This fault butts into Gardiner fault on north.

NUMBER- 38 Active Faults Map

Name of fault - Bridger Creek - Bear Canyon faults
Latest movement - Late Cenoz - (No Pleist deposits cut) Blue
(Age of fault) P. 1428
Type of fault - High-angle normal
Rel. dir. movement - West side down

Length of fault - At least 30 miles
Attitude of fault - Trends about N 15 W, dips SW
Susceptibility to eq. - Low to moderate
Confidence (reliability) level - Moderate
Recurrence interval -
Fault density -

Historic - Red - 1237
Holocene - Orange 1214
Maj Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal - Purple 1210

Source - W. J. McMannis Paper - GSA.
Address (Deceased)

Phone -
State map - Montana (B-3)
County - Gallatin
Reference -
McMannis, 1955, GSA, v. 66 #11, p. 1428

Province -
Remarks -
1. Farther north faults in same zone - north Jib-mile Creek - show recent activity (Hardie, 1927)

NUMBER- 39 Active Faults Map

Name of fault - Unnamed fault at east edge of Clarkston Basin
Latest movement - (Faults west side Horseshoe Hills) Blue
(Age of fault)
Type of fault - High-angle normal
Rel. dir. movement - West side downthrown
Length of fault - At least 10 miles
Attitude of fault - Strikes N, dips West.
Susceptibility to eq. - High
Confidence (reliability) level - High
Recurrence interval - Last mvd in 1925
Fault density -

Historic - Red - 1237
Holocene - Orange 1214
Maj. Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other cenozoic - Purple 1210

Source -
Address

Phone -
State map - Montana (B-3)
County - Gallatin
Reference - Pardee, 1927, P.P. 147

Province -
Remarks -
Fault is not exposed, but is believed to be responsible for Montana Eq of June 27, 1925 (pl I.)
(See also p. 22)

NUMBER- 40 Active Faults Map

Name of fault - Unnamed fault that cuts across Sixmile Creek
Latest movement - Late Cenoz - Blue
(Age of fault)
Type of fault - High-angle normal
Rel. dir. movement - SW side (valley) down
Length of fault - About 5-6 miles
Attitude of fault - Trends NNW, dips SW.
Susceptibility to eq. - Low
Confidence (reliability) level - Low
Recurrence interval -
Fault density -

Historic - Red - 1237
Holocene - Orange 1214
Maj. Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other cenozoic - Purple 1210

Source - G. D. Robinson
Address

Phone -
State map - Montana (B-3)
County Broadwater - Gallatin
Reference - Pardee - U.S.P. # 534, p. 32
Robinson - Toston Quad, I-486

Province -
Remarks -
1. McMannis reports to Pardee who thinks these faults are active (See fault #38)
2. See also Pardee, 1950, p. 61, #4, Pl. I

NUMBER- 41 Active Faults Map

Name of fault - Unnamed fault along east edge of Townsend Valley
Latest movement - Late Cenoz. (Robinson shows Mio-Plio beds offset by fit)
(Age of fault)
Type of fault - High-angle normal
Rel. dir. movement - SW side down
Length of fault - 8-10 miles
Attitude of fault - Trends abt N21W, dips SW
Susceptibility to eq. - Low to Mod
Confidence (reliability) level -
Recurrence interval -
Fault density -

Historic - Red - 1237
Holocene - Orange - 1214
Maj Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal. - Purple 1210

Source - G. D. Robinson.
Address
Phone -
State map - Montana
County - Broadwater
Reference - Robinson, I - 486 - x-sect - Pardee, GSA, v. 61, #4, A. I (1950) Robinson, Billings GS; 10th Guidebk. p. 35
Province -
Remarks -

NUMBER- 42 Active Faults Map

Name of fault - Unnamed echelon faults that form west side by Bull
Latest movement - (Form east side of Townsend Valley) - Late Cenoz -
(Age of fault) Blue - Break Tertiary sed.
Type of fault - High angle normal
Rel. dir. movement - SW side (valley) down thrown
Length of fault - 30-40 miles
Attitude of fault - Trend abt N30W, dip SW
Susceptibility to eq. - Low - Mod.
Confidence (reliability) level -
Recurrence interval -
Fault density -

Also see Bull 72, p. 55
Also see Nelson - Bull 1121 - J (Toston Quad)

Historic - Red - 1237
Holocene - Orange - 1214
Maj Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal. - Purple 1210

Source - G. D. Robinson
Address
Phone -
State map - Montana
County - Broadwater
Reference - Robinson - BGS - Guide - 10th - p 35 and p 39 (See also GP - 444 - p 5)
Province -
Remarks -
1. These echelon faults began in middle or early Tert time and have been active since.
2. Nelson shows fault along east edge of basin

NUMBER- 43 Active Faults Map

Name of fault - Morgan fault
Latest movement - Late Cenoz - Blue (breaks Tert beds)
(Age of fault)
Type of fault - High-angle normal
Rel. dir. movement - SW side down

Length of fault - 8 miles+
Attitude of fault - Trends generally north through Meadow quad.
Susceptibility to eq. - Low
Confidence (reliability) level - Low
Recurrence interval -
Fault density -

Historic - Red - 1237
Holocene - Orange - 1214
Maj Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal - Purple 1210

Source - Betty Skipp
Address USGS - Fed. Ctr
Denver, Colo., 80225
Phone (303) - 234-2885
State map - Montana (B-3)
County - Gallatin
Reference - Betty Skipp Meadow
quad. - I-452

Province -
Remarks -
Range-front fault in this part of Montana

NUMBER- 44 Active Faults Map

Name of fault - Hilger fault along NE side Hilger Valley
Latest movement - Quat-Late Cenoz - Green (Range front fault)
(Age of fault)
Type of fault - High-angle normal
Rel. dir. movement - South block (valley) down thrown

Length of fault - Abt 12 miles (As shown longer than mostly Robinson)
Attitude of Fault - Trends N 60 W., dips SW.
Susceptibility to eq. - Low
Confidence (reliability) level -
Recurrence interval -
Fault density - No scarplets

Historic - Red - 1237
Holocene - Orange 1214
Maj Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal - Purple 1210

Source - G. D. Robinson
Address

Phone -
State map - Montana (C-2)
County - Lewis and Clark
Reference - Robinson - Upper Holter Lake
GQ-840

Province -
Remarks -
1. Pardee, 1950, GSA, v. 61 # 4 p. 383-85
* final mvmt not older than late Pleist (Qt)
2. Robinson does not show fault for full
length of valley as does Pardee
3 Mitch Reynolds thinks it's a combo of
strike slip + dip slip

NUMBER- 45 Active Faults Map

Name of fault - Unnamed fault at east edge of Scratchgravel Hills
Latest movement - Late Cenoz - Blue
(Age of fault)

Type of fault - High angle normal
Rel. dir. movement - NE side - (valley) down/reason

Length of fault - Abt 6 miles
Attitude of fault - Trends abt N15W
Susceptibility to eq. - High
Confidence (reliability) level - High
Recurrence interval -
Fault density - No grd breakage

Historic - Red - 1237
Holocene - Orange 1214
Maj Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal - Purple 1210

Source - Harry Smeds
Address

Phone -
State map - Montana
County - Lewis and Clark
Reference - Pardee - GSA-V.61 #4, p. 383-23
Knopf - I-31 - Deer'l Shaw

Province -
Remarks -
1. Pardee believes there is a fault here on basis of aligned spurs. Stokes (p. 383) - "mints continuing into late Pleistocene"

NUMBER- 46 Active Faults Map

Name of fault - Prickly Pear fault
Latest movement - Historic - but no grd breakage - Historic eqs 1925 - Red
(Age of fault)

Type of fault - Probably high-angle normal dipping NE
Rel. dir. movement - NE side (valley) down

Length of fault - 8 miles
Attitude of fault - Trends abt N50 W., dips NE
Susceptibility to eq. - High
Confidence (reliability) level - High
Recurrence interval - Last eq in 1935 Many quakes in past.
Fault density -

Historic - Red - 1237
Holocene - Orange 1214
Maj Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal - Purple 1210

Source - Harry Smeds
Address

Phone -
State map - Montana (B2)
County - Lewis and Clark
Reference - Pardee, V.61, #4, p. 382-383
Scott Mont Bur Mine rpt. No. 16 -
Knopf - I-31 - Deer'l Shaw

Province -
Remarks -
1. Position shown - Scott & Helena may be wrong - fault may be NE of Helena
2. Scott believes that mint on this fault is responsible for 1925 eq.

NUMBER- 47 Active Faults Map

Name of fault - Unnamed fault bet n. edge Elkhorn Mts + Spokane Hills
Latest movement - Unknown Prob Late Cenoz - Blue
(Age of fault)

Type of fault - High-angle normal
Rel. dir. movement - SW side (valley) down thrown

Length of fault - 25-30 miles -
Attitude of fault - Trends ~N40W, dips SW
Susceptibility to eq. - High
Confidence (reliability) level - Low
Recurrence interval -
Fault density -

Historic - Red - 1237
Holocene - Orange - 1214
Maj Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal. - Purple 1210

Source - Harry Smeba
Address

Phone -
State map - Montana (B-2, B-3)
County - Broadwater; Lewis + Clark
Reference -
GP-444 - See p. 5, and x-sect A-A'
+ x-sect B-B'

Province -
Remarks -

NUMBER- 48 Active Faults Map

Name of fault - Unnamed fault - forms west flk of graben bet
Latest movement - Elkhorn Mts and Spokane Hills.
(Age of fault) Prob Late Cenoz - Blue

Type of fault - High-angle normal
Rel. dir. movement - Down thrown on NE

Length of fault - 5-6 miles
Attitude of fault - Trends N40W, dips NE
Susceptibility to eq. - High
Confidence (reliability) level -
Recurrence interval -
Fault density -

Historic - Red - 1237
Holocene - Orange 1214
Maj Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal. - Purple 1210

Source - Harry Smeba
Address USGS - Fed. Ctr.,
Denver, Colo., 80225
Phone - (303) - 234 - 5940
State map - Montana
County - Broadwater - Jefferson
Reference -
GP-444 - x-sect B-B'

Province -
Remarks -
1. Faults in this general area are based on geophysical data

NUMBER- 49 Active Faults Map

Name of fault - Unnamed fault along east flank of graben
Latest movement - Pst Underlies Canyon Ferry Reservoir
(Age of fault) Late Cenoz - Blue
Type of fault - High-angle normal
Rel. dir. movement - Down on NE

Length of fault - At least 11 miles
Attitude of fault - Dips NE - Trends N40W
Susceptibility to eq. - High
Confidence (reliability) level -
Recurrence interval -
Fault density -

Historic - Red - 1237
Holocene - Orange 1214
Maj Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal - Purple 1210

Source - Harry Smoots
Address USGS, Fed. Ctr.
Denver, Colo, 80225
Phone - (303) - 234 - 3940
State map - Montana
County - Broadwater; Lewis + Clark
Reference -
GP. 444 - X-Sect B-B'

Province -
Remarks -
1. Data based on geophysical studies

NUMBER- 50 Active Faults Map

Name of fault - (St. Mary's fault) NE flank Silver Valley
Latest movement - Pst Late Cenoz. Blue
(Age of fault) Schmidt - Calls it high-angle - (Monthly rept. - Jan. 1975)
Pardee - Shows as high-angle normal
Type of fault - Harrison + others - as major right lateral
Rel. dir. movement - Down on SW.

Length of fault - 8-10 miles
Attitude of fault - Trends abt N. 60 W., dips SW.
Susceptibility to eq. - Low
Confidence (reliability) level -
Recurrence interval -
Fault density -

Historic - Red - 1237
Holocene - Orange 1214
Maj Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal - Purple 1210

Source - Jack Harrison
Address USGS, Fed. Ctr.
Denver, Colo., 80225
Phone (303) - 234 - 3940
State map - Montana
County - Lewis and Clark
Reference -
Pardee, 1950, V. 61, #4, Pl. I.
Schmidt Jan, 1975 Monthly rept

Province -
Remarks -
1. No discussion in Pardee
2. But Harrison says he has no evidence of any Tert. mvmt. McCallum thinks he seen evidence of some movement.
3. Bob Schmidt sits is mapping area thinks its a high-angle normal fault.

NUMBER- 51 Active Faults Map

Name of fault - Unnamed fault along NE edge of Avon Valley
Latest movement - Late Cenoz - Blue
(Age of fault)

Type of fault - High-angle normal
Rel. dir. movement - SW block down

Length of fault - 23.25 miles
Attitude of fault - Trends N45W, dips SW
Susceptibility to eq. - Low
Confidence (reliability) level -

Recurrence interval -
Fault density -

Historic - Red - 1237
Holocene - Orange 1214
Maj Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal. - Purple 1210

Source - Jack E. Harrison
Address

Phone -
State map - Montana (B-2, C-2)
County - Powell
Reference -
Pardee, U.S. 61st #4, Pl. I (No detailed geol. work done here).
Province -
Remarks -
1. Check with Jack whether this fit extends NW to connect with others
2. Univ. Mont. grad stud studying this area
3. See also p 19 of Montfile Rep. 16

NUMBER- 52 Active Faults Map

Name of fault - Unnamed fault at east edge of Beaverhead Valley
Latest movement - Prob Late Cenoz - maybe Maj Quat - Blue
(Age of fault)

Type of fault - High-angle normal
Rel. dir. movement - NW block down/drawn

Length of fault - About 25 miles)
Attitude of fault - Trends abt N35E
Susceptibility to eq. - Low
Confidence (reliability) level -

Recurrence interval -
Fault density - No samples

Historic - Red - 1237
Holocene - Orange 1214
Maj Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal. - Purple 1210

Source - Ken Wier
Address USGS, Fed. Ctr.
Denver, Colo., 80225
Phone - (303) - 234 - 3455
State map - Montana (A2, B2)
County - Madison
Reference -
Pardee, GSA, v. 61, #4, p 385

Province -
Remarks -
1. Fltng clearly Tertiary, but "not older than Pleistocene".
2. Forms mtn flanking Ruby Range
3. Mentions that basalts near north edge of Ruby Range are broken - basalt is dated at 4 m.y.

NUMBER- 53 Active Faults Map

Name of fault - Unnamed fault at east side of Jefferson Valley
Latest movement - Prob Late (Cenoz.
(Age of fault)
Type of fault - High-angle normal
Rel. dir. movement - NW side (valley) down thrown
Length of fault -
Attitude of fault - N 30 E, dips NW
Susceptibility to eq. - Low
Confidence (reliability) level -
Recurrence interval -
Fault density -

Source -
Address
Phone -
State map - Montana (A 2)
County - Madison
Reference - Reader, v. 61 #4, p. 325
Province -
Remarks -
1. Forms west flank of Tobacco Root Mtns
2 "Chiefly Tertiary" - but "not older than Neist."

Historic - Red - 1237
Holocene - Orange 1214
Maj. Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other cenozoic - Purple 1210

NUMBER- 54 Active Faults Map

Name of fault - Continental fault (East of Butte, Mont.) forms west side of Rampart Mtns
Latest movement - Meinzer - suggests Holocene; Head suggests Historic
(Age of fault) - Orange -
Type of fault - High-angle normal
Rel. dir. movement - SW side (valley) down thrown
Length of fault - Abt 12 miles
Attitude of fault - Trends N. 20 W, dips SW
Susceptibility to eq. - High
Confidence (reliability) level - High
Recurrence interval -
Fault density -

Source -
Address
Phone -
State map - Montana
County - Silver Bow
Reference - Reader, v. 61 #4, p. 327
Head, 1912, P.P. 74, p. 47-49
Corry (thesis)
Meinzer - WSP 345, p. 88
Province -
Remarks -
1. Tenuous evid suggests movmt in Holocene time (Meinzer)
and precise leveling implies fit movmt in historic time

Historic - Red - 1237
Holocene - Orange 1214
Maj. Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other cenozoic - Purple 1210

NUMBER- 71 Active Faults Map

Name of fault - Unnamed fault along east side Deer Lodge Park (Divide Creek)
Latest movement - Late Cenoz - Blue
(Age of fault)
Type of fault - High-angle normal
Rel. dir. movement - West side (valley) down/known
Length of fault - 18 miles
Attitude of fault - Trends abt. N 10-15 E., dips NW (valleyward)
Susceptibility to eq. -
Confidence (reliability) level -
Recurrence interval -
Fault density -

Source - Henry Smith
Address USGS - Fed. Ctr, Denver, Colo
Phone - (303) - 234 - 3940
State map - Montana
County -
Reference -
Smith - Openfile Map 536
Pardee - GSA. B. 61 #4, p. 388
Province -
Remarks -

Historic - Red - 1237
Holocene - Orange 1214
Maj Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal - Purple 1210

NUMBER- 72 Active Faults Map

Name of fault - Unnamed fault east side Little Whitetail Valley
Latest movement - Late Cenoz. - Blue
(Age of fault)
Type of fault - High-angle normal
Rel. dir. movement - West side (valley) down/known
Length of fault - 14-15 miles
Attitude of fault - Trends abt. N 10 W., dips SW.
Susceptibility to eq. - Low - Moderate
Confidence (reliability) level -
Recurrence interval -
Fault density -

Source -
Address
Phone -
State map - Montana (B-2)
County - Jefferson
Reference - Pardee, GSA. B. 61 #4, pl. 1 (Qbi)
Province -
Remarks -
1. Pardee refers to this as probable fault - Tert beds dip into both flanks.

Historic - Red - 1237
Holocene - Orange 1214
Maj Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal - Purple 1210

NUMBER- 81 Active Faults Map

Name of fault - Unnamed fault along east side Melrose Valley
Latest movement - Prob Late Cenoz. Blue
(Age of fault)
Type of fault - High-angle normal
Rel. dir. movement - SW block downthrown
Length of fault - 14 miles
Attitude of fault - Trends N30W, dips SW
Susceptibility to eq. -
Confidence (reliability) level -
Recurrence interval -
Fault density -

Historic - Red - 1237
Holocene - Orange 1214
Maj Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue - 1206
Other anomal. - Purple 1210

Source - Harry Smeby
Address USGS, Fed. Ctr.
Denver, Colo., 80225
Phone - (303) 234-3940
State map - Montana (B-2
County - Silver Bow
Reference -
Pardee, GSA, v. 61 #4, p. 401

Province -
Remarks -
1. Just a statement by Pardee that a probable fault lies at east side Melrose Valley.

NUMBER- 82 Active Faults Map

Name of fault - Elk Park fault along west side Elk Park
Latest movement - Prob Late Cenoz. Blue
(Age of fault)
Type of fault - High-angle normal (with some left-lateral movement)
Rel. dir. movement - SE block downthrown
Length of fault - 11 miles
Attitude of fault - Trends N25E, SE side down
Susceptibility to eq. -
Confidence (reliability) level -
Recurrence interval -
Fault density -

Historic - Red - 1237
Holocene - Orange 1214
Maj Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal. - Purple 1210

Source - Harry Smeby?
Address
Phone -
State map - Montana (B-2)
County - Jefferson
Reference - Pardee GSA, v. 61 #4, p. 387-388
Corry - Unpubld thesis, Mont. Sch. Mines
Smeby - MF 246

Province -
Remarks -
1. Corry thinks Pardee's Mtn (most fault) moved southward. Vert. disp. of several hundred feet.

NUMBER- 83 Active Faults Map

Name of fault - En echelon series of unnamed faults along east side
Latest movement - of Willow Creek - Kirk Creek trench
(Age of fault)
Type of fault - High-angle normal
Rel. dir. movement - West side down
Length of fault - All told - abt 30 miles)
Attitude of fault - Trends nrly N. "dips 50° W - Pardee, USGS, v. 61 #4, p. 388
Susceptibility to eq. - Low
Confidence (reliability) level -
Recurrence interval -
Fault density -

Historic - Red - 1237
Holocene - Orange 1214
Maj. Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal - Purple 1210

Source -
Address
Phone -
State map - Montana (B-2)
County - Granite
Reference - Pardee, GSA, v. 61 #4, p. 388
Province -
Remarks -

NUMBER- 88 Active Faults Map

Name of fault - Bitterroot fault
Latest movement - Historic near Curlew Mine (14 miles N. of Hamilton)
(Age of fault) Late Cenoz (Blue) for most of the fault. But Major Quat (Green) for parts
Type of fault - High-angle normal
Rel. dir. movement - East block down thrown
Length of fault - About 80 miles)
Attitude of fault - Trends north, dips east.
Susceptibility to eq. - Moderate to High
Confidence (reliability) level -
Recurrence interval -
Fault density -

Historic - Red - 1237
Holocene - Orange 1214
Maj. Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal - Purple 1210

Source -
Address
Phone -
State map - Montana
County -
Reference - Pardee, GSA, v. 61 #4, p. 384-390
Lindgren, M. 27, p. 49 (for Recent sediment)
" " " p. 87 (for sediment that one body is in fill dat. Eocene and Plaist. gravels.
Province -
Remarks -
1. One of the major faults in area, part of which has moved in Historic time.

NUMBER- 89 Active Faults Map

Name of fault - Ninemile fault
Latest movement - Prob. Maj Quat. - Green - Pliocene or early Pleistocene
(Age of fault) Green
Type of fault - High-angle normal
Rel. dir. movement - SW block down

Length of fault - 45 miles)
Attitude of fault - Trends abt N55° W, dips SW

Source - Pardee, Jack Harrison
Address USGS - Fed Ctr
Denver, Colo, 80225
Phone - (303) - 234-3890
State map - Montana (C-1, C-2)
County - Missoula
Reference - Pardee, GSA, v. 61, #4, p. 370-372

Susceptibility to eq. -
Confidence (reliability) level -
Recurrence interval -
Fault density -

Historic - Red - 1237
Holocene - Orange 1214
Maj Late Quat - Yellow 1209
Maj Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal. - Purple 1210

Province -
Remarks -
1. Runs north of and near Missoula
2. See also Jack's compilation

NUMBER- 91 Active Faults Map

Name of fault - Jocko fault
Latest movement - Prob. Maj Late Quat. - Yellow
(Age of fault)
Type of fault - High-angle normal
Rel. dir. movement - West side down (Ritter)

Length of fault - Abt 10 miles long
Attitude of fault - Strikes N 30° E, dips NW

Source -
Address

Phone -
State map - Montana (C-2)
County - Missoula
Reference - Pardee, GSA, v. 61, #4, p. 372-373

Susceptibility to eq. - Low - Moderate
Confidence (reliability) level -
Recurrence interval -
Fault density -

Historic - Red - 1237
Holocene - Orange 1214
Maj Late Quat - Yellow 1209
Maj Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal. - Purple 1210

Province -
Remarks -
1. Moraine at mouth of Big Knife Creek is offset (p. 373 - Pardee).

NUMBER- 92 Active Faults Map

Name of fault - Mission fault
Latest movement - "Late Tertiary or early Quat" - Pardee, p. 395
(Age of fault) Prob Late Cenoz. - Blue
Type of fault - High-angle normal
Rel. dir. movement - West block down/Arrows

Length of fault - 55-60 miles +
Attitude of fault - Trends North, dips west

Susceptibility to eq. - Low to Moderate
Confidence (reliability) level -
Recurrence interval -
Fault density -

Historic - Red - 1237
Holocene - Orange 1214
Maj Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal - Purple 1210

Source -
Address

Phone -
State map - Montana (C-2
County - Lake
Reference - Pardee, GSA, v. 61, #4, p. 395

Province -
Remarks -
1. Pardee has ext. disc - p. 395 -

NUMBER- 93 Active Faults Map

Name of fault - Swan fault
Latest movement - Prob. Late Cenoz - Blue
(Age of fault)
Type of fault - High-angle normal
Rel. dir. movement - Down/Arrows on SW).

Length of fault - 90 miles)
Attitude of fault - Trends abt N25 W, dips SW

Susceptibility to eq. - Low to Moderate
Confidence (reliability) level -
Recurrence interval -
Fault density -

Historic - Red - 1237
Holocene - Orange 1214
Maj Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal - Purple 1210

Source -
Address

Phone -
State map - Montana (C-2, D-2)
County - Lake - Flathead
Reference - Pardee, GSA, v. 61, #4, p. 395

Province -
Remarks -
1. Age uncertain - possibility that some moraines are cut by fault.

NUMBER- 94 Active Faults Map

Name of fault - Unnamed fault at northeast edge Blackfoot Valley
Latest movement - (En echelon faults) Holo. Late Cenoz - Blue
(Age of fault)
Type of fault - High-angle normal (En echelon faults)
Rel. dir. movement - Down/Basin on SW
Length of fault - 30 miles ±
Attitude of Fault - Trends abt N60W, dips SW
Susceptibility to eq. - Low
Confidence (reliability) level -
Recurrence interval -
Fault density -

Historic - Red - 1237
Holocene - Orange 1214
Maj. Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal. - Purple 1210

Source -
Address
Phone -
State map - Montana (C-2)
County - Powell
Reference - Fardee, GSA, v. 61 #4, p. 394
Province -
Remarks -
1. No statement abt age - but he obviously includes all faults along trench w/ Late Cenoz.

NUMBER- 95 Active Faults Map

Name of fault - Unnamed - Trends across Elk Park (near Butte)
Latest movement - Late Cenoz - (Blue)
(Age of fault)
Type of fault - Strike-slip
Rel. dir. movement - North block moved NE
Length of fault - 18 miles +
Attitude of fault - Vertical
Susceptibility to eq. - Low
Confidence (reliability) level - Low
Recurrence interval -
Fault density -

Historic - Red - 1237
Holocene - Orange 1214
Maj. Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal. - Purple 1210

Source - Harry W. Smedes
Address USGS - Fed Ctr.
Denver, Colo. 80225
Phone - (303) - 234-3240
State map - Montana (B-2)
County - Silver Bow
Reference - Stearns MF-246 (Elk Park Quad).
Province -
Remarks -
1. Harry suggests that strike-slip faults are younger than high-angle normal that bound Elk Park (#82)

NUMBER-96 Active Faults Map

Name of fault - Unnamed fault along NE edge Elk Park (near Butte)
Latest movement: Late Cenoz - Blue
(Age of fault)
Type of fault - Strike-Slip
Rel. dir. movement - North side moves NE (?)

Length of fault - About 10 miles
Attitude of fault - Vertical

Susceptibility to eq. - Low
Confidence (reliability) level - Low

Recurrence interval -
Fault density -

Historic - Red - 1237
Holocene - Orange 1214
Maj Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal. - Purple 1210

Source - Harry W. Smede
Address USGS, Fed Ctr
Denver, Colo, 80225
Phone - (303) - 234-3940
State map - Montana - (B-2)
County - Silver Bow
Reference - IMF Map - 246 (Elk Park Quad).

Province -

Remarks -
1- Harry believes Rawlins are younger than high-angle normal fault on Elk Park

NUMBER-97 Active Faults Map

Name of fault - Unnamed en echelon faults - West side Divide Creek
Latest movement - Late Cenoz - Blue
(Age of fault)
Type of fault - High-angle normal
Rel. dir. movement - East block down thrown

Length of fault - 12 miles
Attitude of fault - Trend N 20 E, dip eastward (valleyward)

Susceptibility to eq. - Low
Confidence (reliability) level - Low

Recurrence interval -
Fault density -

Historic - Red - 1237
Holocene - Orange 1214
Maj Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal. - Purple 1210

Source - Harry W. Smede
Address USGS - Fed. Ctr.,
Denver, Colo.
Phone (303) - 234-3940
State map - Mont. (6-2)
County - Silver Bow
Reference -

Province -

Remarks -
1. Harry shows these faults on orig his work sheet - (Butte South quad).

NUMBER- 119 Active Faults Map

Name of fault - Flathead fault - along NE flank Flathead trough

Latest movement - Prob. Late Cenoz. - Blue
(Age of fault)

Type of fault - High-angle normal

Rel. dir. movement - SW side downthrown

Length of fault - 40 miles

Attitude of fault - Trends abt N35W, dips SW

Susceptibility to eq. - Low

Confidence (reliability) level -

Recurrence interval -

Fault density -

Historic - Red - 1237
Holocene - Orange 1214
Maj. Late Quat. - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal. - Purple 1210

Source - Mel Mudge
Address USGS - Fed. Ctr.
Denver, Colo., 80225
Phone - (303)-234-3693
State map - Montana (C-1, C-2)
County - Glacier National Park
Reference - Pardee, GSA v. 61, #2
p. 397-398
See also Ross-Grif. -
Province -
Remarks -

NUMBER- 120 Active Faults Map

Name of fault - Unnamed fault along SW flank of Flathead trough

Latest movement - Prob. Late Cenoz. Blue
(Age of fault)

Type of fault - High-angle normal

Rel. dir. movement - Down on NE

Length of fault - In three segments - about 30 miles

Attitude of fault - Trends abt N 40-45W, dips NE

Susceptibility to eq. - Low

Confidence (reliability) level -

Recurrence interval -

Fault density -

Historic - Red - 1237
Holocene - Orange 1214
Maj. Late Quat. - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal. - Purple 1210

Source -
Address
Phone -
State map - Mont. (C-1, C-2)
County - Flathead
Reference - Pardee, GSA v. 61, #2
p. 397-398
Province -
Remarks -
"P. 397 - "Basin Miocene or Pliocene est."

NUMBER- 121 Active Faults Map

Name of fault - Unnamed fault - Southwest flank of Flathead Range
Latest movement - Prob. Late Cenoz - Blue
(Age of fault)
Type of fault - High-angle normal
Rel. dir. movement - Downthrown on SW side

Length of fault - 23 miles)
Attitude of fault - Trend abt N25W, dips SW

Susceptibility to eq. - Low
Confidence (reliability) level -
Recurrence interval -
Fault density -

Historic - Red - 1237
Holocene - Orange 1214
Maj Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal. - Purple 1210

Source - Mel Mudge
Address USGS - Fed. Ctr,
Denver, Colo., 80225
Phone - (303) - 234 - 3693
State map - Montana (C-2)
County - Flathead
Reference - Pardee, GSA, v. 61 #4, p. 398

Province -
Remarks -
1. No age of faulting given by Pardee - but implication is that it is late mid-Miocene.

NUMBER- 122 Active Faults Map

Name of fault - South Fork Flathead River fault
Latest movement - Prob late Cenoz - Blue
(Age of fault)
Type of fault - High-angle normal
Rel. dir. movement - Downthrown on SW

Length of fault -
Attitude of fault - Trends abt N30W.

Susceptibility to eq. - Moderate to High
Confidence (reliability) level -
Recurrence interval -
Fault density -

Historic - Red - 1237
Holocene - Orange 1214
Maj Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal. - Purple 1210

Source - Mel Mudge
Address USGS - Fed Ctr
Denver, Colo, 80225
Phone - (303) - 234 - 3693
State map - Montana (B-2, C-2)
County - Powell and Flathead
Reference - Pardee, GSA, v. 61, #4 p. 398
GSA -
Province -
Remarks -
"Breaks mid-Tertiary peneplain"

NUMBER- 123 Active Faults Map

Name of fault - Hope fault (Pend Oreille Lake)
Latest movement - Prob. Late Cenoz. Blue (ca Late SW)
(Age of fault)
Type of fault - High-angle normal
Rel. dir. movement - SW side down (hanging wall)

Length of fault - About 70 miles
Attitude of fault - Trends ~NE 1/40 Mi, dips SW

Susceptibility to eq. - Low
Confidence (reliability) level -
Recurrence interval -
Fault density -

Historic - Red - 1237
Holocene - Orange 1214
Maj Late Quat - Yellow 1209
Maj Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal. - Purple 1210

Source -
Address

Phone -
State map - Montana and Idaho
County - Idaho (C1), Mont (B1-C-1)
Reference - Pardee, GSA, v. 61 #4, p. 399
G&SM - Bull. 96 - Pl. 9
Province -
Remarks -

"Fault displ occurred not later than early Pleistocene" - Pardee, p. 399

NUMBER- 125 Active Faults Map

Name of fault - Bull Lake fault, Swamp Lake fault, O'Brien Creek fault
Latest movement - Pleist. Maj. Quat - Yellow
(Age of fault)

Type of fault - High-angle normal
Rel. dir. movement - West side down

Length of fault - Abt 28 miles
Attitude of fault - In general, trends N, dips west

Susceptibility to eq. - Low to moderate
Confidence (reliability) level -
Recurrence interval -
Fault density -

Historic - Red - 1237
Holocene - Orange 1214
Maj Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal - Purple 1210

Source -
Address

Phone -
State map - Montana (C-1)
County - Sanders - Lincoln
Reference - Pardee, GSA, v. 61 #4, p. 401
Gibson - Bull GL, M. I
Province -
Remarks -
Pardee" A Pleistocene age for most of the faulting. - "
See also - Wills Johns - Montana Mines - Geol Bull 79, p. 62

NUMBER- 126 (?) Active Faults Map

Name of fault - Unnamed fault - SE of Missoula (University Mtn - Jumbo Mtn)
Latest movement - Pleist Late Cenoz. - Blue
(Age of fault)

Type of fault - High-angle normal
Rel. dir. movement - NW side down

Length of fault - 4 miles)
Attitude of fault - Trends about N20E

Susceptibility to eq. - Low
Confidence (reliability) level -
Recurrence interval -
Fault density -

Historic - Red - 1237
Holocene - Orange 1214
Maj Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal - Purple 1210

Source -
Address

Phone -
State map - Montana (B-2)
County - Missoula
Reference - Pardee, GSA, v. 61 #4, p. 401

Province -
Remarks -
Pardee suggests that the fault may be present. No concrete evidence - [illegible]

NUMBER- 127 Active Faults Map

Name of fault - Unnamed fault (?) along west side Libby Valley
Latest movement - Prob Late Cenoz. Blue
(Age of fault)
Type of fault - High-angle normal
Rel. dir. movement - East side down
Length of fault - Two segments - Abt 23 miles
Attitude of fault - Trends abt N20W, dip NE
Susceptibility to eq. - Low
Confidence (reliability) level -
Recurrence interval -
Fault density -

Source -
Address
Phone -
State map - Montana (C 1)
County - Lincoln
Reference -
Pardee, GSA, v. 61 #4, p. 401
Gibson, Bull 458, pl. 9 - x-sect.
Province -
Remarks -
Pardee suggests

Historic - Red - 1237
Holocene - Orange 1214
Maj Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal. - Purple 1210

NUMBER- 128 Active Faults Map

Name of fault - Possible fault(?) along east side of Libby Valley
Latest movement - Prob Late Cenoz - Blue
(Age of fault)
Type of fault - High-angle normal
Rel. dir. movement - Downthrown on west side
Length of fault - 14 miles
Attitude of fault - Trends N15°W, dips SW
Susceptibility to eq. - Low
Confidence (reliability) level -
Recurrence interval -
Fault density -

Source -
Address
Phone -
State map - Montana (C-1)
County - Lincoln
Reference - Pardee, v. 61 #4, p 401
Province -
Remarks -
Pardee suggests that this is a fault

Historic - Red - 1237
Holocene - Orange 1214
Maj Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal. - Purple 1210

NUMBER- 129 Active Faults Map

Name of fault - Unnamed fault along W. bdy NE of Lincoln
Latest movement - Prob Late Cenoz. Blue
(Age of fault)
Type of fault - High-angle normal
Rel. dir. movement - Down on SW
Length of fault - 11 miles
Attitude of fault - Trends N 60 W, dips SW
Susceptibility to eq. - Low
Confidence (reliability) level -
Recurrence interval -
Fault density -

Historic - Red - 1237
Holocene - Orange 1214
Maj. Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal. - Purple 1210

Source -
Address
Phone -
State map - Montana (B-2)
County - Lewis and Clark
Reference - Hardee, GSA, S. 61 #4
p. 401
Province -
Remarks -
"fault strongly suggested"

NUMBER- 130 Active Faults Map

Name of fault - Unnamed fault along Wise River - Fishtrap Mts
Latest movement - Prob. Late Cenoz - Blue
(Age of fault)
Type of fault - Unknown
Rel. dir. movement -
Length of fault - Uncertain - abt 14 miles
Attitude of fault - Trends N 25 E
Susceptibility to eq. -
Confidence (reliability) level -
Recurrence interval -
Fault density -

Historic - Red - 1237
Holocene - Orange 1214
Maj. Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal. - Purple 1210

Source -
Address
Phone -
State map - Mont (H-2)
County - Beaverhead
Reference - Hardee, GSA, S. 61 #4,
p. 401
Province -
Remarks -
Only brief comment in Hardee

NUMBER- 152 Active Faults Map

Name of fault - Unnamed - Extends south from Lake Helena
Latest movement - "Quaternary fault scarp" by Schmidt - Green
(Age of fault)
Type of fault - High-angle normal
Rel. dir. movement - West side down
Length of fault - 4-5 miles
Attitude of fault - Trends abt N10W, dips SW
Susceptibility to eq. - Moderate to High
Confidence (reliability) level -
Recurrence interval -
Fault density -

Historic - Red - 1237
Holocene - Orange 1214
Maj. Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue - 1206
Other anomal - Purple 1210

Source - Bob Schmidt
Address USGS - Reston, Virginia
Phone -
State map - Montana (B-2, B-3)
County - Lewis and Clark
Reference -
Letter and sketch from Schmidt Monthly report Jan-1975
Province -
Remarks -

NUMBER- 157 Active Faults Map

Name of fault - Unnamed fault along Middle Fork - Flathead River
Latest movement - Prob. Late Cenozoic - Blue
(Age of fault)
Type of fault - High-angle normal
Rel. dir. movement - SW block down
Length of fault - 35 miles ±
Attitude of fault - N25W, dips SW
Susceptibility to eq. - Moderate to High.
Confidence (reliability) level -
Recurrence interval -
Fault density -

Historic - Red - 1237
Holocene - Orange 1214
Maj. Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal - Purple 1210

Source - Mel Mudge
Address USGS - Fed Ctr
Denver, Colo, 80225
Phone - (303) - 234-3693
State map - Montana (C-2)
County - Flathead
Reference - Oral comm.
GSA, v. 81, #2
Province -
Remarks -

NUMBER- 158 Active Faults Map

Name of fault - Unnamed - along NE flank Hoodoo Mtn
Latest movement - Prob Late Cenoz
(Age of fault)
Type of fault - High-angle normal
Rel. dir. movement - Down on NE

Length of fault - 30 miles
Attitude of fault - Trends abt N 55W, dips NE
Susceptibility to eq. - Low
Confidence (reliability) level -
Recurrence interval -
Fault density -

Historic - Red - 1237
Holocene - Orange 1214
Maj Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal - Purple 1210

Source - Hal Machette
Address USGS - Fed Ctr
Denver, Colo. 80225
Phone - (303) - 234 -
State map - Montana (B-2) Butte 2° Sheet
County - Powell
Reference - Grd comm.

Province -
Remarks -

1. Hal is uncertain about latest movmt, but he thinks there has been recurrent movement since mid-Tertiary
2. Striking escarpment here

NUMBER- 159 Active Faults Map

Name of fault - Unnamed - near Nevada Creek (Butte 2° Sheet)
Latest movement - Prob Late Cenoz
(Age of fault)
Type of fault - High-angle normal
Rel. dir. movement - Down on NE

Length of fault - 3 miles
Attitude of fault - Trends about N 50W, dips NE
Susceptibility to eq. - Low
Confidence (reliability) level -
Recurrence interval -
Fault density -

Historic - Red - 1237
Holocene - Orange 1214
Maj Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal - Purple 1210

Source - Hal Machette
Address USGS - Fed Ctr
Denver, Colo
Phone - (303) - 234 - 2854
State map - Montana (B-2)
County - Powell
Reference - Butte 2° Sheet

Province -
Remarks -

NUMBER- 192 Active Faults Map

Name of fault - Rainy Creek fault
Latest movement - Historic - July 2, 1964 - Red
(Age of fault)
Type of fault - High-angle normal _ Data from Johns - Geol.
Rel. dir. movement - NE side down Lincoln, Flathead Co., Mont.

Length of fault - 22 miles)
Attitude of fault - Trends abt N30W., dips NE
Susceptibility to eq. - High
Confidence (reliability) level -
Recurrence interval -
Fault density -

Historic - Red - 1237
Holocene - Orange 1214
Maj. Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal. - Purple 1210

Source - Willis Johns
Address Mont Bur Mines + Geol.
Butte, Mont
Phone - 8(406)-723-6561 (FTS) 792-8321
State map - Montana
County -
Reference -
Willis Johns - Bull 74 Mont. Bur. Mines + Geol - 1970
Province -
Remarks -

1. Date on historic mvmt from fine print article in "Rock Mechanics - American Northwest" 3d Congr. Eng. Geol. - 1974, p. 220
2.

NUMBER- 195 Active Faults Map

Name of fault - Pine Creek Valley fault
Latest movement - Late Quat. Yellow
(Age of fault)
Type of fault - Strike-Slip
Rel. dir. movement - Northblock has moved east - Rt. lateral

Length of fault - Est. 2 miles
Attitude of fault - Trends abt N80°E
Susceptibility to eq. - Low
Confidence (reliability) level -
Recurrence interval -
Fault density -

Historic - Red - 1237
Holocene - Orange 1214
Maj. Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal. - Purple 1210

Source - Willis Johns.
Address Mont. Bur. Mines + Geol.
Butte, Mont.,
Phone - FTS - 8-406 - 723-6561 792-8321
State map - Montana (C) - Kalispell
County - Lincoln
Reference - Oral comm on 4/2/75
"Also mentioned in Trans" guide by Johns.
Province -
Remarks -

Willis Johns says that it breaks through Late Pleistocene age.

NUMBER- 289 Active Faults Map

Name of fault - Whitefish fault - Bounds east/west City Mtn limits
Latest movement - Prob. Late Cenoz - Blue
(Age of fault)
Type of fault - High-angle normal
Rel. dir. movement - SW side down
Length of fault - At least 80 miles in U.S.
Attitude of fault - Trends abt N30W, dips SW.
Susceptibility to eq. - Low to moderate
Confidence (reliability) level -
Recurrence interval -
Fault density -

Source -
Address
Phone -
State map - Mont. (C-1, C-2) - Kalispell 2°
County - Flathead
Reference - Ferde, USGS, I-61 #4, p. 394
(See also Jack Hamilton's compilation)
Province -
Remarks -

Historic - Red - 1237
Holocene - Orange 1214
Maj. Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal. - Purple 1210

NUMBER- 290 Active Faults Map

Name of fault - Un-named - possibly part of Whitefish fault
Latest movement - Prob. Late Cenoz - Blue
(Age of fault)
Type of fault - High-angle normal
Rel. dir. movement - SW side down
Length of fault - Abt 25± miles
Attitude of fault - Trends abt N40W, dips SW
Susceptibility to eq. -
Confidence (reliability) level -
Recurrence interval -
Fault density -

Source -
Address
Phone -
State map - Mont (C-1) - Kalispell 2°
County - Flathead
Reference - Ferde, GSA, I-61, #4, p. 394
also pl. I.
Province -
Remarks -

Historic - Red - 1237
Holocene - Orange 1214
Maj. Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal. - Purple 1210

NUMBER- 291 Active Faults Map

Name of fault - Un-named - along west flank Rocky Mtn trench
Latest movement - Prob Late Cenoz. - Blue
(Age of fault)
Type of fault - High-angle normal
Rel. dir. movement - SW side down

Length of fault - At least 80 miles
Attitude of fault - Trends abt N 30 W, dips SW
Susceptibility to eq. -
Confidence (reliability) level -
Recurrence interval -
Fault density -

Historic - Red - 1237
Holocene - Orange 1214
Maj Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal - Purple 1210

Source -
Address
Phone -
State map - Mont (C-1) - Kalispell 2°
County - Flathead - Lincoln
Reference - This fault traced from Thomson's compilation
Province -
Remarks -

NUMBER- 292 Active Faults Map

Name of fault - Un-named fault near Helena
Latest movement - Prob. Maj Quat. - Green
(Age of fault)
Type of fault - High-angle normal ?
Rel. dir. movement - SW side down

Length of fault - Abt 7 miles
Attitude of fault - Trend abt N 60 W, dips SW
Susceptibility to eq. - Moderate to High
Confidence (reliability) level -
Recurrence interval -
Fault density -

Historic - Red - 1237
Holocene - Orange 1214
Maj Late Quat - Yellow 1209
Maj. Quat. - Green 1208
Late Cenoz. - Blue 1206
Other anomal - Purple 1210

Source - Bo Schmidt
Address USGS - Reston, Virginia
Phone -
State map - Mont (B-2, B-3)
County - Lewis and Clark
Reference -
Province -
Remarks -
(1) See also Henry Smokes