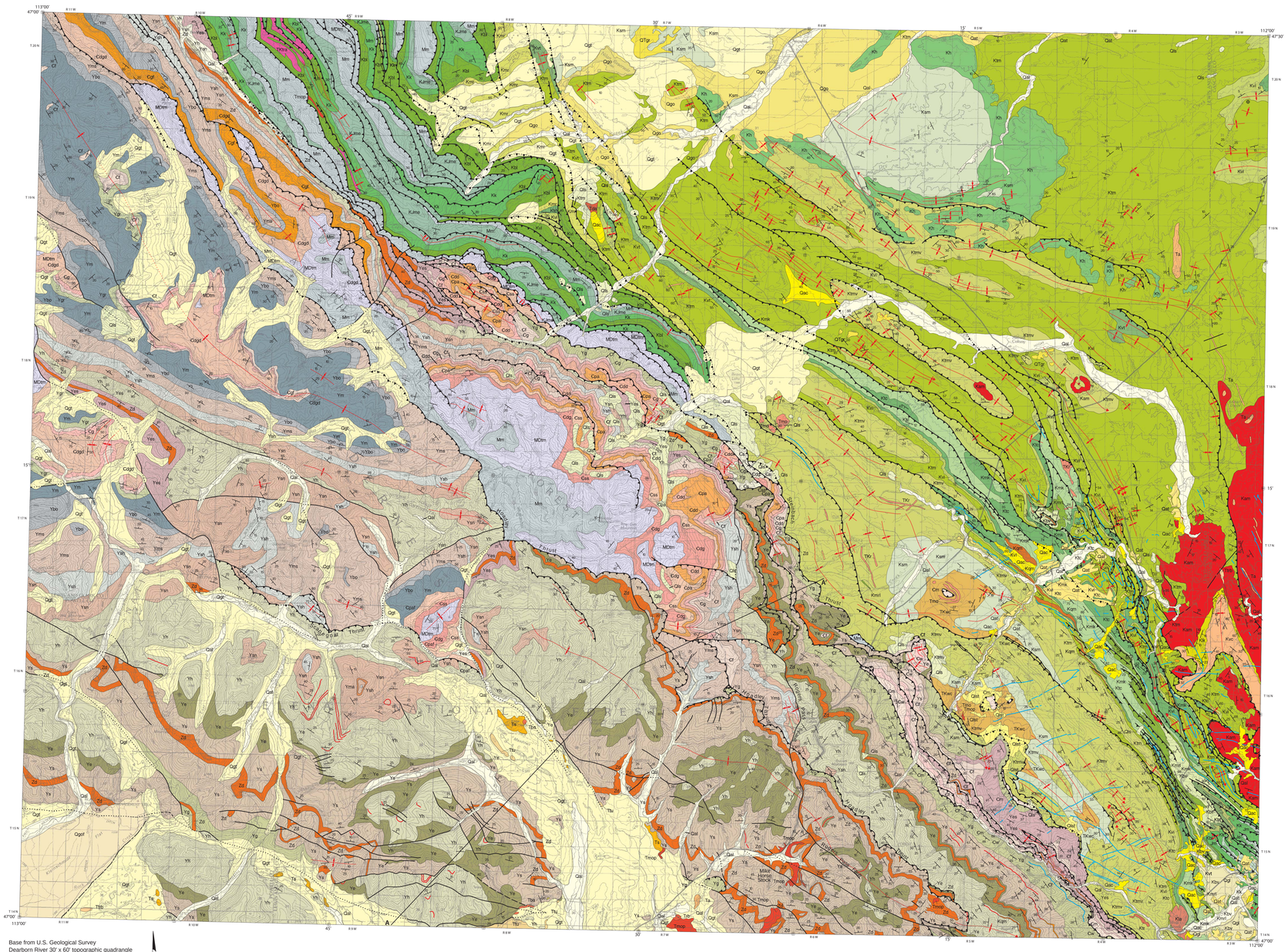


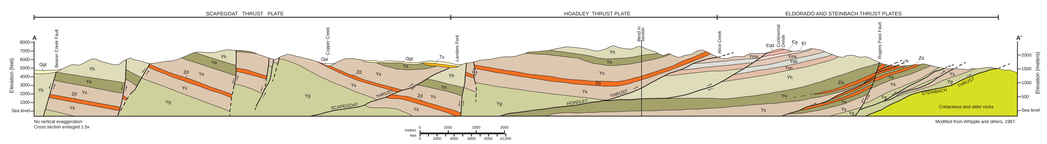
Base from U.S. Geological Survey
Dearborn River 30' x 60' topographic quadrangle
Map date: 1993
Projection: UTM zone 12; 1927 NAD
UTM grid declination 1°06' West
1984 Magnetic North Declination 16.5° East

KILOMETERS 1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
MILES 1 0 1 2 3 4 5 6 7 8 9 10 11 12 13

SCALE 1:100 000
1 CENTIMETER ON THE MAP REPRESENTS 1 KILOMETER ON THE GROUND
CONTOUR INTERVAL 50 METERS
NATIONAL GEODETIC VERTICAL DATUM OF 1929
ELEVATIONS SHOWN TO THE NEAREST METER

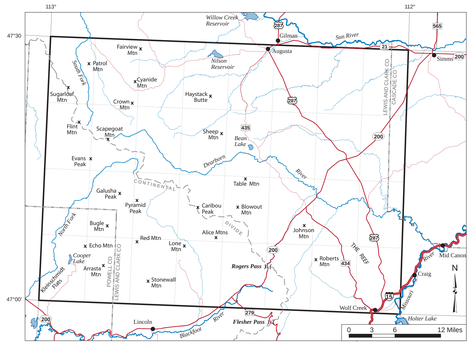
1000 0 5000 10 000 15 000 20 000 METERS
5000 0 10 000 20 000 30 000 40 000 50 000 60 000 70 000 FEET

Maps may be obtained from
Publications Office
Montana Bureau of Mines and Geology
1300 West Park Street, Butte, Montana 59701-8997
Phone: (406) 496-4174 Fax: (406) 496-4451
http://www.mbmg.mtech.edu



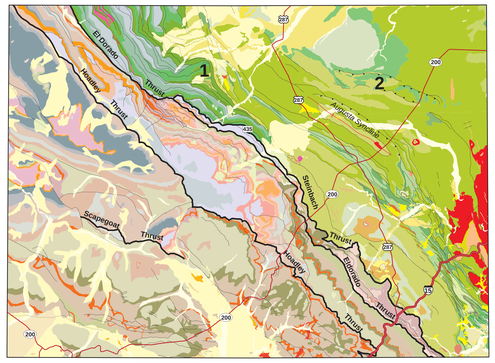
Research supported by the U.S. Geological Survey, National Cooperative Geologic Mapping Program, under USGS award number G10AC00365. The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the U.S. Government.

GIS production: Ken Sandau and Paul Thale, MBMG. Map layout: Susan Smith, MBMG. Editing: Susan Barth, MBMG.



Geographic features in the Dearborn River 30' x 60' quadrangle.

Location of Major Disturbed Belt Structures

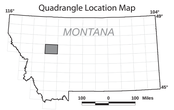


Very little was published on the structure of the Montana Disturbed belt until the regional synthesis and interpretations of Mudge (1970, 1972b) based on his extensive geologic mapping for the U.S. Geological Survey. That mapping led to recognition of the Eldorado, Steinbach, and Hoadley faults in the Dearborn River quadrangle, which, along with the Lewis thrust to the north, form the leading edge of a major thrust slab that places Paleozoic and Mesoproterozoic rock over Mesozoic and Paleozoic rock. Subsequently, much of the Dearborn River quadrangle was mapped in more detail by the U.S. Geological Survey (see sources below). Sears and others (2002, 2005) identified a triangle zone within the eastern part of the Dearborn River quadrangle, the apex of which extends from Highway 200 to north of the northeastern border of the quadrangle in the Sun River area. Henry (2007) mapped and interpreted this triangle zone, which is an extension of the Canadian Rocky Mountain foothills triangle zone. Other duplex zones were also mapped and interpreted in the area (Dolberg, 1986, Johnson, 1988).

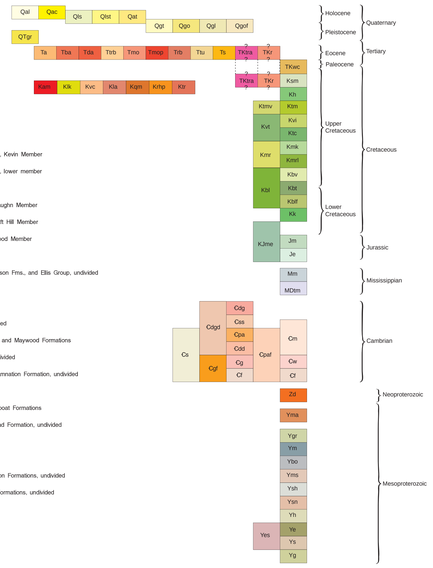
1. Duplex (Dolberg, 1986)
The duplex involves a wedge of 10 or more thrust slices of Paleozoic and Mesozoic rocks beneath the Mesoproterozoic Belt Supergroup rocks of the structurally higher Steinbach-Eldorado roof thrust system.

2. Triangle Zone (Sears and others, 2002, 2005; Henry, 2007)
The triangle zone is composed of complex antiformal wedge structures. Passive roof thrusting raised the Augusta syncline above an east-dipping thrust, analogous to and correlative with a triangle zone associated with the Alberta syncline to the northwest in Canada.

Quadrangle Location Map



CORRELATION CHART



MAP UNITS

- Qal Alluvium
- Qac Alluvium and colluvium, undivided
- Qls Landslide deposit
- Qlst Landslide and talus deposits, undivided
- Qat Alluvial terrace deposit
- Qgf Glacial till
- Qgo Glacial outwash deposit
- Qgl Glacial lake deposit
- Qgof Glacial outwash fan
- QTgr Gravel
- Ta Andesite
- Tba Basalt
- Tda Dacite
- Tmo Monzonite
- Tmop Monzonite porphyry
- Trb Trachybasalt
- Trb Rhyolite
- Ttu Tuff
- Ts Sediment or sedimentary rocks, undivided
- TKra Trachyandesite
- TKr Rhyolite
- TKwc Willow Creek Formation
- TKac Adel Mountain Volcanics
- Klk Lacustrine deposits
- Kvc Volcanic conglomerate
- Kla Latite
- Kqm Quartz monzonite porphyry
- Krp Rhyodacite porphyry
- Klr Trachyte
- Ksm St. Mary River Formation
- Kh Horsethief Formation
- Ktm Two Medicine Formation
- Ktmv Two Medicine Formation, volcanic facies
- Kvf Virgelle and Telegraph Creek Formations, undivided
- Kvi Virgelle Formation
- Ktc Telegraph Creek Formation
- Kmr Marias River Formation
- Kmk Marias River Formation, Kevin Member
- Kmel Marias River Formation, lower member
- Kbl Blackleaf Formation
- Kbv Blackleaf Formation, Vaughn Member
- Kbf Blackleaf Formation, Taft Hill Member
- Kbf Blackleaf Formation, Flood Member
- Kk Kootenai Formation
- KJme Mount Pablo and Morrison Frms., and Ellis Group, undivided
- Jm Morrison Formation
- Je Ellis Group, undivided
- Mm Madison Group, undivided
- MDm Three Forks, Jefferson, and Maywood Formations
- Cs Sedimentary rocks, undivided
- Cdgd Devils Glen through Damnation Formation, undivided
- Cdg Devils Glen Formation
- Csa Switchback and Steamboat Formations
- Cpaf Pagoda through Flathead Formation, undivided
- Cm Meagher Limestone
- Cpa Pagoda Limestone
- Cdd Dearborn and Damnation Formations, undivided
- Cgf Gordon and Flathead Formations, undivided
- Cw Wolsey Shale
- Cg Gordon Shale
- Cf Flathead Formation
- Zd Diorite
- Yma Meta-andesite and metadiorite
- Ygr Garnet Range Formation
- Ym McNamara Formation
- Ybo Bonner Formation
- Yms Mount Shields Formation
- Ysh Shepard Formation
- Ysn Snowslip Formation
- Yh Helena Formation
- Yes Empire and Spokane Formations, undivided
- Ye Empire Formation
- Ys Spokane Formation
- Yg Greyson Formation

For a more detailed description of the map units, please refer to the text accompanying this map.

Approximately located contacts and faults based on aerial photo and satellite image interpretation by compiler.

MAP SYMBOLS

- Contact—Dashed where inferred; dotted where concealed
- Normal Fault—Dashed where inferred; dotted where concealed
- Thrust Fault—Teeth on upper plate; dotted where concealed
- Strike-slip Fault—Arrows indicate relative movement
- Linear Feature—May be a fault
- Anticline axial trace—Showing direction of plunge; dotted where concealed
- Syncline axial trace—Showing direction of plunge; dotted where concealed
- Overturned anticline axial trace—Showing direction of dip of limbs
- Overturned syncline axial trace—Showing direction of dip of limbs
- Tertiary or Cretaceous dike or sill
- Neoproterozoic sill
- 25 Strike and dip of beds—Number indicates dip in degrees
- 80 Strike and dip of overturned beds—Number indicates dip in degrees
- Horizontal beds
- Ash bed

30' x 60' Quadrangle Index

Swan Peak	Choteau	Great Falls N
Seeley Lake	***Dearborn River***	Great Falls S
Missoula East	Elliston	Canyon Ferry Dam

Compilation sources and index of 7.5' quadrangles

113° 112° 47°30' 47°00'

Benchmark	Wood Lake	Double Falls	Nilan Reservoir	Augusta	Couchnour Ranch	Bowmans Corners NW	Bowmans Corners NE
5, 6	5, 6	1, 5, 6	1, 5, 6	5, 6	2	2	5
Flint Mountain	Scapegoat Mountain	Jake Creek	Steamboat Mountain	Bean Lake	Krone Ranch	Bowmans Corners	Henry Creek
5, 6	5, 6	3, 5, 6	3, 5, 6	5, 6	2	2	5
Lake Mountain	Olson Peak	Heart Lake	Caribou Peak	Blowout Mountain	Johnson Mountain	Comb Rock	Coburn Mountain
5, 6	5, 6	11	11	4, 11	4, 11	8	7
Coopers Lake	Arrastra Mountain	Stonewall Mountain	Silver King Mountain	Cadotte Creek	Rogers Pass	Roberts Mountain	Wolf Creek
6	6	11	11	11	11	10, 11	9

1. Dolberg, 1986
2. Henry, 2007
3. Holocombe, 1963
4. Lange, 1963
5. Mudge and Earhart, 1983
6. Mudge and others, 1982
7. Schmidt, 1972a
8. Schmidt, 1972b
9. Schmidt, 1972c
10. Schmidt and Strong, 1972
11. Whipple and others, 1987

Please see text for reference citations.

MBMG Montana Bureau of Mines and Geology

Montana Bureau of Mines and Geology
Open-File Report 649

Preliminary Geologic Map of the Dearborn River 30' x 60' Quadrangle, West-Central Montana

Compiled by Susan M. Vuke

2014