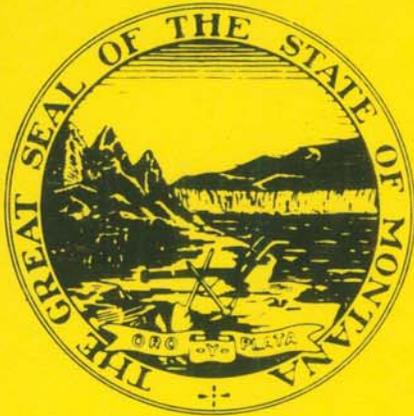
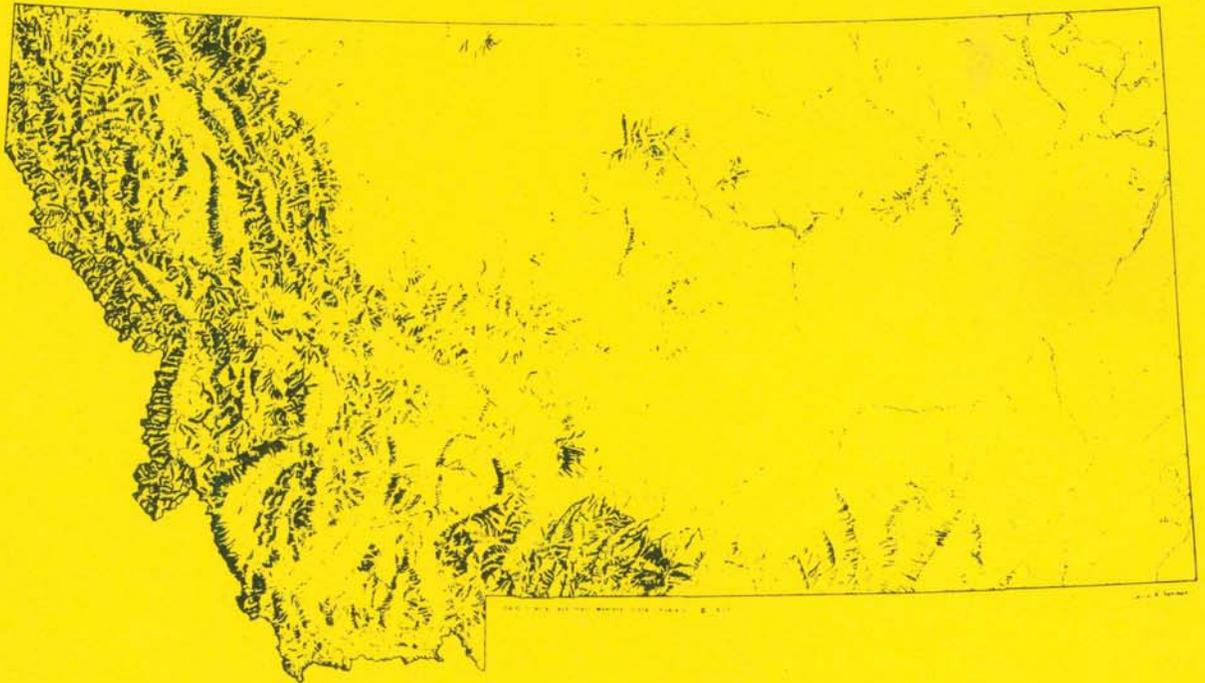


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**CURRENT GEOLOGICAL
AND GEOPHYSICAL STUDIES
IN MONTANA**

compiled by
Richard B. Berg



OPEN-FILE REPORT 216

1989

**Montana Bureau of Mines and Geology
A Department of
Montana College of Mineral Science and Technology**

Preface

This annual list of current geological and geophysical studies would not be possible without the assistance of those who took the time to send us information on their research. We appreciate this cooperation and hope that you will find this list useful.

Most studies are listed under one heading only, but because of the difficulty of assigning some studies to a single category, some are listed under more than one heading. The date following the entry is the expected date of completion. Many of the entries are numbered and plotted on the index maps.

Completed theses are not included in this compilation. Special Publication 88, Compilation and Index of Theses on Montana Geology 1899-1982 may be ordered from the Montana Bureau of Mines and Geology, Butte, Montana 59701, for \$10 postpaid. Compilation of information for an index of theses 1983-1988 is in progress.

Many of the studies listed here are far from being completed. We suggest that anyone who wants more information on a specific project should correspond directly with the investigator.

Richard B. Berg
Economic Geologist
Montana Bureau of Mines and Geology

Butte
June 24, 1989

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FIGURES

- 1 - Index map of Montana
- 2 - Index map of southwestern Montana

AREAL GEOLOGY

INVESTIGATORSUBJECT

Bartholomew, Mervin J.
 Vuke-Foster, Susan
 Berg, Richard B.
 MBMG
 Colton, Roger B.
 USGS, Denver

Geology of the Stockett-Belt coal field area (Stockett and Belt 15-minute quadrangles).
 1 - Fig. 1

Bartholomew, Mervin J.
 MBMG
 Derkey, Robert E.
 Butte

Geology of the Dempsey, Sugarloaf Mtn., Avon, Deer Lodge and Baggs Creek 7 1/2-minute quadrangles. (in press)
 2 - Fig. 1

Bartholomew, Mervin J.
 MBMG

Structural study of the overthrust belt in southwestern Montana. Includes detailed geologic mapping of the Dixon Mountain and Dell 7 1/2-minute quadrangles.
 3 - Fig. 2

Berg, Richard B.
 Vuke-Foster, Susan
 MBMG
 Colton, Roger B.
 USGS, Denver
 O'Brien, Hugh
 Geological Survey of Finland

Geology of the Belt 30x60-minute quadrangle, central Montana. Geologic map at scale of 1:100,000. (in preparation)
 4 - Fig. 1

Bergantino, Robert N.
 Sholes, Brenda, and others
 MBMG

Preparation of maps showing geology, mineral resources, and ground-water resources at a scale of 1:250,000 on 1x2-degree quadrangles.
 (continuing)

Bergantino, Robert N.
 MBMG

Geological aspects of the Lewis and Clark expedition in Montana.

Colton, Robert B., and others
 USGS, Denver
 Vuke-Foster, Susan
 MBMG

Geology of the Glendive 1:100,000-scale quadrangle. (1991)
 5 - Fig. 1

AREAL GEOLOGY

INVESTIGATORSUBJECT

Erslev, Eric
Vargo, Ana
Colorado State University

Basement profile from the southern Madison Range through the Tobacco Root Mountains evaluating Proterozoic reactivation of Archean basement with integrated structural, petrologic and geochemical data.
(continuing)

Hall, William B.
Univ. of Idaho

Study of Central portion of Madison/Gallatin block with emphasis on geomorphology, glacial history, and structural geology.
(continuing)
6 - Fig. 2

Hanneman, Debra
Whitehall, Mont.

Tertiary-Quaternary geology of the Jefferson, Rocker and Divide-Melrose Valleys, southwestern Montana.
7 - Fig. 2

Hanson, Tom
Lundblad, Steve
Reese, Joe
Univ. of Wisconsin, Madison

Geology and structural analysis of an area in the Whitefish Range, Flathead County.
8 - Fig. 1

Hyndman, Donald W.
Univ. of Montana

A geological map of the Boulder batholith and a petrologic compilation and synthesis. (1991)
9 - Fig. 1

Kellogg, Karl S.
USGS, Denver

Tectonic framework of the northwestern Madison Range, southwestern Montana. (1991)
10 - Fig. 2

Lewis, Sharon E.
MBMG

Geology of the Lincoln Gulch 7 1/2-minute quadrangle.
11 - Fig. 2

Lewis, Sharon E.
MBMG

Geology of the Dickie Peak 7 1/2-minute quadrangle. (in press)
12 - Fig. 2

AREAL GEOLOGY

INVESTIGATORSUBJECT

Miller, Fred K
USGS, Spokane

Geology of the Sandpoint 2-degree
quadrangle.
13 - Fig. 1

O'Neill, J. Michael
USGS, Denver

Tectonic framework of the southern
Gravelly and Madison Ranges. (1993)
14 - Fig. 2

Pearson, Robert C.
USGS, Denver

Study of the Bannack mining district
including the geology of the Bannack
7 1/2-minute quadrangle. Also
includes some mapping in the Burns
Mountain, Dalys and Eli Springs 7
1/2-minute quadrangles.
15 - Fig. 2

Perry, William J., Jr.
Skipp, Betty,
USGS, Denver

Geologic mapping of the Lima Peaks
and Gallagher Gulch 7 1/2-minute
quadrangles with emphasis on
structural analysis of Cordilleran
thrust belt/Rocky Mountain foreland
interactions. (continuing)
16 - Fig. 2

Qayyum, Mazhar
Montana Tech

Analysis of Deer Lodge Basin
southwestern Montana. (May 1990)
17 - Fig. 1

Reynolds, Mitchell W.
USGS, Denver

Geology of the White Sulphur Springs
1x2-degree quadrangle.
18 - Fig. 1

Reynolds, Mitchell W.
USGS, Reston
Tysdal, Russell G.
USGS, Denver

Mineral resources of the Sleeping
Giant Wilderness study area.
19 - Fig. 1

Ruppel, Edward T.
Bartholomew, Mervin J.
MBMG
Reynolds, Mitchell W.
USGS, Denver
and many others

Geologic map of Montana.

AREAL GEOLOGY

INVESTIGATORSUBJECT

Ruppel, Edward T.
MBMG

Study of the Proterozoic and Early
Snowcrest Range Paleozoic structure
of the cratonic region, including
mapping of the Swamp Creek and Spur
Mountain 7 1/2-minute quadrangles.
20 - Fig. 2

Sholes, Brenda
MBMG

A bibliographic compilation of index
maps delineating areas covered by
geologic mapping in Montana.
(continuing)

Whipple, James W.
USGS, Spokane

Geology of the Whitefish Range,
northwestern Montana.
21 - Fig. 1

STRUCTURAL GEOLOGY/TECTONICS

<u>INVESTIGATOR</u>	<u>SUBJECT</u>
Anders, Mark Lamont-Doherty Geological Observatory	Thermal and mechanical effects of the Yellowstone hotspot. 22 - Fig. 1
Barnes, William C. Univ. of British Columbia	Structural history of the Overfold Mountain area, southeastern British Columbia (nearly adjacent to Montana). 23 - Fig. 1
Bartholomew, Mervin J. MBMG	Structural study of the overthrust belt in southwestern Montana. Includes detailed geologic mapping of the Dixon Mountain and Dell 7 1/2-minute quadrangles. 3 - Fig. 2
Bonini, William E. Princeton Univ.	Structural modeling of the Beartooth front. (continuing) 24 - Fig. 1
Erslev, Eric Colorado State Univ.	Laramide kinematics of the southeastern Beartooth Mountains. (1991) 25 - Fig. 1
Glaman, Linda R. B. Montana Tech	Geology of Negro Hollow area, southwestern Montana. 26 - Fig. 2
Hanneman, Debra Whitehall, Mont.	Cenozoic evolution of the Sage Creek-Blacktail basin, southwestern Montana. 27 - Fig. 2
Hanneman, Debra Whitehall, Mont.	Cenozoic basin evolution in part of southwestern Montana.
Hanson, Tom Lundblad, Steve Reese, Joe Univ. of Wisconsin, Madison	Geology and structural analysis of an area in the Whitefish Range, Flathead County. 8 - Fig. 1

STRUCTURAL GEOLOGY/TECTONICS

INVESTIGATOR

SUBJECT

Hendrix, Thomas E.
Grand Valley State College

Analysis of multiple duplex
structure at Sandy Hollow, Madison
County. (Late 1989)
28 - Fig. 2

Herbst, Darrin W.
Southern Illinois Univ.

Structural analysis of Precambrian
Cherry Creek-type metamorphic rocks
in the Gravelly Range. (Summer
1989)
29 - Fig. 2

Hess, David F.
Western Illinois Univ.
Vitaliano, Charles J.
Indiana Univ.

Field aspects and structural
relationships of amphibolites and
metamorphic assemblages, Tobacco
Root Mountains. (1990)
30 - Fig. 2

Hyndman, Donald W.
Parker, David
Gunkel, Kristin
Sears, Jim
Alt, Dave
Univ. of Montana

Relationship between granite and
thrust belts in western Montana.
(1991)
31 - Fig. 1

Jolly, Arthur
Univ. of Montana

Paleomagnetic investigation of Two
Medicine volcanic rocks at Wolf
Creek. The intention of this study
is to document possible rotation of
thrust sheets within the disturbed
belt of western Montana. (Spring
1990)
32 - Fig. 1

Kellogg, Karl S.
USGS, Denver

Tectonic framework of the
northwestern Madison Range,
southwestern Montana. (1991)
10 - Fig. 2

STRUCTURAL GEOLOGY/TECTONICS

INVESTIGATOR

SUBJECT

Lageson, David R.
Montana State Univ.

Analysis of rock deformation fabrics in thrust sheets of the Disturbed Belt. Specifically, this project deals with pressure solution cleavages, fractures, boudinage, and other mesoscopic fabrics that may affect the porosity and permeability of potential oil and gas reservoir rocks in the fold and thrust belt. (1990)
33 - Fig. 1

Lageson, David R.
Montana State Univ.

Field study of deeply eroded caldera complexes in the Boulder batholith and Elkhorn Mountains volcanic field, west-central Montana; ash-flow stratigraphy, structural geology, and economic geology (continuing)
34 - Fig. 1

McConnell, David
Kansas State Univ.

Analysis of strain in foreland folds of the Tobacco Root Mountains, southwestern Montana. (Summer 1990)
35 - Fig. 2

Montagne, John
Montana State Univ.

On-going study of the Cenozoic history, geomorphology, and glacial geology of the Yellowstone Valley from Gardiner to Livingston.
36 - Fig. 1

O'Neill, J. Michael
USGS, Denver

Tectonic framework of the southern Gravelly and Madison Ranges. (1993)
14 - Fig. 2

Palmquist, John C.
Lawrence Univ.

Leopard rock protolith for polyphase deformed amphibolite, Beartooth Mountains. (continuing)
36B - Fig. 1

STRUCTURAL GEOLOGY/TECTONICS

INVESTIGATOR

SUBJECT

Perry, William J.
 Sandbreg, Charles A.
 USGS, Denver
 Sando, William J.
 United State National Museum

Structural and stratigraphic characterization of the northern Tendoy Mountains, with emphasis on the structural configuration of shelf-to-basin Mississippian carbonate rocks in the McKenzie thrust system (formerly northern Tendoy, Limekiln and Johnson thrust sheets). (continuing)
 37 - Fig. 2

Pratt, Walden P.
 USGS, Denver

Compilation of available subsurface data on basement lithologies to interpret the extent of lithologic terranes that comprise the Trans-Hudson orogen.

Rutland, Carolyn
 Schmidt, Christopher J.
 Western Michigan Univ.
 Swapp, Susan
 SUNY, Binghamton

Petrology, geochemistry and structural evolution of the eastern boundary of the Boulder batholith. (1989)
 38 - Fig. 2

Qayyum, Mazhar
 Montana Tech

Analysis of the Deer Lodge Basin southwestern Montana. (May 1990)
 17 - Fig. 1

Schmidt, Christopher J.
 Western Michigan Univ.
 O'Neill, J. M.
 USGS, Denver

Development of minor structures and solution cleavage in the frontal thrust belt adjacent to foreland anticlines in the Camp Creek-McCartney Creek area near Melrose. (continuing)
 39 - Fig. 2

Schmidt, Christopher J.
 Western Michigan Univ.
 Garihan, John M.
 Furman Univ.
 Dresser, Hugh
 Montana Tech
 O'Neill, J. M.
 USGS, Denver

Nature of control of earlier structures on basin and range faulting in southwestern Montana. (continuing)

STRUCTURAL GEOLOGY/TECTONICS

INVESTIGATOR

SUBJECT

Schmidt, Christopher J.
Western Michigan Univ.
Hendrix, Thomas E.
Grand Valley State College

Calcite twin strain and cleavage
development in the Kootenai
Formation in the Sandy Hollow duplex
zone between Melrose and Dillon.
(continuing)
40 - Fig. 2

Sears, James W.
Univ. of Montana

Metamorphism and thrusting in
central western Montana. Includes
mapping tectonic fabric and
correlation with metamorphism and
thrust faulting: Reconnaissance and
case studies. (1989)

Sheriff, Steven D.
Univ. of Montana

General paleomagnetic investigations
and gravity/magnetic modelling,
relative to tectonic development of
the northern Rocky Mountains.
(continuing)

Stickney, Michael C.
Bartholomew, Mervin J.
MBMG

Investigation of displacement
histories on Neogene faults in the
northern Basin and Range province.

Teyssier, Christian
Univ. of Minnesota

Tectonic significance of the
Bitterroot shear zone including
study of deformation mechanisms in
its hanging wall. (1989)
41 - Fig. 1

Zimmerman, Jay
Southern Illinois Univ.

Total finite strain analysis of
Cherry Creek-type rocks (Archean)
from two deformed conglomerates in
the central Ruby Range, Madison
County. (1990)
42 - Fig. 2

STRATIGRAPHY, SEDIMENTARY PETROLOGY AND PALEONTOLOGY

INVESTIGATOR

SUBJECT

Basu, Abhijit
Indiana Univ.

Evolution of Tertiary basins in
southwestern Montana. (1990)

Belt, Edward S.
Amherst College

Stratigraphy, sedimentology,
paleobotany and paleomagnetism of
the Lebo Member of the Fort Union
Formation. Location: on either
side of Route 12, at the Powder
River crossing. (1989)
43 - Fig. 1

Bown, T. M.
USGS, Reston

Tertiary geochronology and basin
analysis, Rocky Mountain basins.

Changshan, Li
Montana Tech

Subsurface study of Kootenai
Formation along the Sweetgrass Arch,
northern Montana. (August 1989)
44 - Fig. 1

Clemens, William A.
Univ. of California, Berkeley

Stratigraphy and vertebrate faunas
of the Hell Creek and Tullock
formations in Garfield and McCone
counties.

Coppinger, Walt
Sontag, Leslie J.
Trinity Univ.

Refinement of stratigraphy of the
Precambrian Newland Limestone from
data obtained from cores at the
Golden Sunlight mine, Jefferson
County. Attempts will be made to
establish correlations with Newland
Limestone exposed in the interior of
the basin to the north. (Summer
1989)
45 - Fig. 2

Dyman, Thaddeus S.
USGS, Denver

Cretaceous stratigraphy in
southwestern Montana.

Elston, Donald P.
USGS, Flagstaff

Paleomagnetic studies in the Belt
basin of Montana and Idaho.
(continuing)

STRATIGRAPHY, SEDIMENTARY PETROLOGY AND PALEONTOLOGY

<u>INVESTIGATOR</u>	<u>SUBJECT</u>
Gassaway, Judith S. USGS, Denver	Studies of Paleocene silcrete, southeastern Montana.
Hanneman, Debra Whitehall, Mont.	Cenozoic basin evolution in part of southwestern Montana.
Hanneman, Debra Whitehall, Mont.	Cenozoic evolution of the Sage Creek-Blacktail basin, southwestern Montana. 27 - Fig. 2
Hansen, William B. BLM, Billings Hearn, David Consultant, Billings, MT	Re-evaluation of the environment of deposition of the Eagle Sandstone near Billings. (September, 1989) 46 - Fig. 1
Harrison, Jack E. USGS, Denver	Study of the Precambrian Belt basin.
Hickey, Leo J. Peabody Museum, Yale Univ.	Paleobotany and facies of the Fort Union Formation in the northern Big Horn basin, Montana and Wyoming. (1989) 47 - Fig. 1
Horner, John R. Museum of the Rockies, Montana State Univ.	Evolution of North American, upper Cretaceous dinosaurs and their terrestrial ecosystems. Study in the Two Medicine Formation sediments along the east slope of the Rockies, from the Canadian border to Wolf Creek, Montana. (1991)
James, Harold L. USGS, Port Townsend, Washington	Bedded Precambrian iron deposits of southwestern Montana.
Krause, David W. Dept. of Anatomical Sciences, State Univ. of New York, Stony Brook	Geology and mammalian paleontology of the Paleocene strata in the Crazy Mountains, Powder River, and Williston Basins.

STRATIGRAPHY, SEDIMENTARY PETROLOGY AND PALEONTOLOGY

INVESTIGATOR

SUBJECT

Lofgren, Donald
Univ. of California, Berkeley

Detailed lithostratigraphic and biostratigraphic analysis of the uppermost Hell Creek and lowermost Tullock formations in Garfield and McCone counties.
48 - Fig. 1

Meyers, James H.
Winona State Univ.

Influence of intraforeland uplift on marine Jurassic sedimentation, southwestern Montana. (continuing)

Meyers, James H.
Winona State Univ.
Mack, Greg
New Mexico State Univ.

Tertiary basin evolution and provenance of sandstones in the Oligocene-Miocene Renova Formation, southwestern Montana. (continuing)
49 - Fig. 2

Nichols, Douglas J.
USGS, Denver

Detailed stratigraphic study of the Cretaceous/Tertiary boundary within and adjacent to the Powder River basin in Wyoming and Montana.
(1989)

O'Neill, J. Michael
USGS, Denver

Structural evolution of the Belt basin in and adjacent to the Highland Mountains, southwestern Montana.
50 - Fig. 2

Paull, Rachel K.
Paull, Richard A.
Dept. of Geosciences, Univ. of Wisconsin-Milwaukee

Conodont biostratigraphy of Lower Triassic rocks in southwestern and south-central Montana. (1990)

Porter, Karen
Montana State Univ.

Investigation of stratigraphic sequences and unconformities of the marine Jurassic Ellis Group in western Montana.
51 - Fig. 2

Qayyum, Mazhar
Montana Tech

Analysis of the Deer Lodge Basin southwestern Montana. (May 1990)
17 - Fig. 1

STRATIGRAPHY, SEDIMENTARY PETROLOGY AND PALEONTOLOGY

INVESTIGATOR

SUBJECT

Retallack, Greg J.
Univ. of Oregon

Paleosols across the Cretaceous-Tertiary boundary in Bug Creek, McCone County.
52 - Fig. 1

Rigby, J. Keith, Jr.
Univ. of Notre Dame
Rigby, J. K., Sr.
Brigham Young Univ.
Newman, Karl
Colorado School of Mines
Sloan, R. E.
Univ. of Minnesota

Geology, depositional environments and paleontology of the Fox Hills, Hell Creek, Tullock and Lebo formations of McCone, Roosevelt, Richland and Dawson counties.
(December 1989)

Ritter, Dale
Southern Illinois Univ.
Howes, Susan
Lamar Univ.
Kauffman, Marvin
American Geological Institute

Study of dilution effect on sediment derived from the Stillwater Complex.

Sando, William J.
United States National Museum,
Washington D.C.

Stratigraphy and structure of Mississippian rocks in the Tendoy Range, Beaverhead County.
53 - Fig. 2

Schmitt, James
Montana State Univ.

Sedimentary and tectonic evolution of the Crazy Mountains basin. Investigation involves detailed sedimentologic, biostratigraphic, and structural studies of the Livingston Group and Fort Union Formation.
54 - Fig. 1

Sigleo, Wayne R.
USGS, Reston

Study of paleosols and duripans associated with the Cretaceous/Tertiary boundary and coal-bearing strata in the Powder River basin. (1991)

STRATIGRAPHY, SEDIMENTARY PETROLOGY AND PALEONTOLOGY

INVESTIGATOR

SUBJECT

Suttner, Lee J.
Malone, Andrew
Indiana Univ.

Evaluation of the possible influence of the Belt Island on Late Jurassic (Morrison) sedimentation, northern Tobacco Root Mountains. (January 1990)
55 - Fig. 2

Suttner, Lee J.
Indiana Univ.

Tectonic controls of Mesozoic sedimentation in the foreland basin of western and central Montana. (continuing)

Utgaard, John
Southern Illinois Univ.

Petrology and depositional environments of the Hulett Sandstone Member of the Sundance Formation in the northern Bighorn basin. (continuing)

Vice, Mari A.
Utgaard, John E.
Southern Illinois Univ.

Carbonate petrology of the lower Mission Canyon (Big Goose and Little Tongue Members) in an area extending from the northern Bighorn basin (Cottonwood and Clarks' Fork Canyons, Wyoming) northward into central Montana (Big Snowy and Little Belt Mountains). Fluorescence, cathodoluminescence, stable isotope analysis, scanning electron microscopy, fluid inclusion and clay mineralogical studies, and molecular organic geochemical analysis are planned to supplement data gathered through standard petrographic and field/core studies. (1992)

Wallace, Chester A.
USGS, Denver

Stratigraphy, structural setting and sediment-dispersal system of the middle part of the Missoula Group of the Belt Supergroup. (1992)

Wardlaw, Bruce R.
USGS, Reston

Extinctions at the upper Paleozoic system boundaries in the U.S.

STRATIGRAPHY, SEDIMENTARY PETROLOGY AND PALEONTOLOGY

INVESTIGATOR

SUBJECT

Weishampel, David B.
Johns Hopkins Univ.

A study of late Cretaceous
dinosaurs, northwestern Montana.
(1990)

White, Brian
Smith College

Sedimentology of the Altyn Formation
(Precambrian) of Glacier National
Park: A study of microbiotas,
stromatolites and evaporitic
dolomites in shallowing upward
cycles. (continuing)
56 - Fig. 1

Wilde, Edith M.
MBMG

Coal stratigraphy and correlation in
the Sidney 30x60-minute quadrangle,
eastern Montana and adjacent North
Dakota. (in press)
57 - Fig. 1

Winston, Don
Univ. of Montana

Stratigraphy and sedimentology of
Ravalli and Missoula Group rocks of
the Belt Supergroup, western
Montana. (continuing)

GEOCHEMISTRY, MINERALOGY AND PETROLOGY

INVESTIGATOR

SUBJECT

Brookins, D. G.
Univ. of New Mexico

Geochemistry and economic geology of hydrothermal vein carbonate-fluorspar deposits, western Montana. (continuing)

Carlson, Robert R.
USGS, Denver

Geochemical and analytical studies of the platinum-group elements including samples from the Stillwater Complex.
58 - Fig. 1

Carlson, Robert R.
USGS, Denver
Von Gruenewaldt, Gerhard
Univ. of Pretoria, South Africa

Study of a "pyroxene marker" unit of the Stillwater Complex.
59 - Fig. 1

Coppinger, Walt
Swanson, Matt
Trinity Univ.

Petrologic and geochemical study of late-stage mafic intrusives at the south end of the Bull Mountain, Jefferson County. Will include major, minor, and trace element analyses of primitive basaltic rocks. (Spring 1989)
60 - Fig. 2

Duke, Edward F.
Institute for Study of Mineral Deposits, South Dakota School of Mines and Technology

Origin of graphite vein deposits at the Crystal Graphite mine near Dillon, using geological, geochemical and carbon and oxygen isotopic data. (September 1989)
61 - Fig. 2

Guy, Russell
Virginia Polytechnic Institute and State Univ.

Geochronology and geochemistry of the Archean basement terrain in Yankee Jim and Lamar River Canyons, Montana and Wyoming. (January 1990)
62 - Fig. 1

Hamilton, Wayne L.
Natl. Park Service; Yellowstone National Park and Montana State Univ.

Tracking geothermal flows with radon and mercury anomalies. (1990)

GEOCHEMISTRY, MINERALOGY AND PETROLOGY

<u>INVESTIGATOR</u>	<u>SUBJECT</u>
Hargrave, Phyllis A. Montana Tech	Field relationships and petrology of the Lowland Creek Volcanics in the Browns' Gulch and Flume Gulch areas. (December, 1989) 63 - Fig. 2
Hearn, B. Carter USGS, Reston	Study of kimberlitic diatremes in Montana including chemical and isotopic analysis of mineral separates. (continuing)
Helz, Rosalind T. USGS, Reston	Trace element chemistry of fine-grained rocks from the Stillwater Complex with emphasis on the platinum-group elements and Cu, Ni and Ag. 64 - Fig. 2
Hess, David F. Western Illinois Univ. Vitaliano, Charles J. Indiana Univ.	Petrology and petrochemistry of the Tobacco Root batholith. (Early 1990's) 65 - Fig. 2
Hess, David F. Western Illinois Univ. Vitaliano, Charles J. Indiana Univ.	Geothermometry and geobarometry of amphibolites and relationship to metamorphic history of the Archean rocks of southwestern Montana. (1991)
Hyndman, Donald W. Parker, David Gunkel, Kristin Sears, Jim Alt, Dave Univ. of Montana	Relationship between granite and thrust belts in western Montana. (1991) 31 - Fig. 1
Hyndman, Donald W. Tureck-Schwartz, K. Univ. of Montana	Petrology and geochemistry of the Square Butte laccolith, Highwood Mountains (1991) 66 - Fig. 1
Hyndman, Donald W. Tureck-Schwartz, K. Foland, K. A. Univ. f Montana	Petrology and geochemistry of alkalic and subalkalic rocks of the Bearpaw Mountains. (1990) 67 - Fig. 1

GEOCHEMISTRY, MINERALOGY AND PETROLOGY

INVESTIGATORSUBJECT

Lange, Ian
Univ. of Montana

Mapping, petrology and geochemistry
of the Hog Heaven volcanic field
west of Flathead Lake. (1989)
68 - Fig. 1

Loferski, Patricia J.
USGS, Reston

Petrogenesis of anorthosites of the
Stillwater Complex.
69 - Fig. 1

Luedke, Robert G.
USGS, Reston

Early and middle Cenozoic volcanic
centers, western conterminous United
States.

Maruyama, H.
Akita Univ., Japan
Volborth, Alex
Montana Tech

Petrochemical and isotopic studies
on the Boulder batholith.
70 - Fig. 1

McCallum, I. S.
Irving, A. J.
Univ. of Washington

Petrologic/geochemical study of the
Eocene volcanics of central Montana.
(continuing)
71 - Fig. 1

McCallum, I. S.
Univ. of Washington

Petrologic/geochemical study of the
Stillwater Complex. (continuing)
72 - Fig. 1

McCarty, Douglas
Univ. of Montana

Burial diagenesis of Tertiary
sediments, western Montana. (June
1989)

Mogk, David
Montana State Univ.

Evolution of continental crust in
the Archean basement of southwest
Montana.

Mueller, Paul
Univ. of Florida

Crustal evolution as shown by the
Archean rocks of southwestern
Montana.

GEOCHEMISTRY, MINERALOGY AND PETROLOGY

INVESTIGATOR

SUBJECT

Page, Norman J.
USGS, Reston

Ore deposits and processes in the early magmatic environment.
(includes work in the Stillwater Complex)
73 - Fig. 1

Plymate, Thomas G.
Southwest Missouri State Univ.

Variation in the structural state of alkali feldspars in the Cretaceous/Tertiary sills exposed in Cottonwood Canyon, southeastern Jefferson County.
74 - Fig. 2

Pushkar, Paul
Wright State Univ.
Gutman, James
Wesleyan Univ.

Field geology, petrology and geochemistry of the Lion Mountain volcanic center, Gravelly Range.
75 - Fig. 2

Reichl, Pavel Jan
Univ. of Montana

Drill-core and surface geology, petrology and geochemistry of the mafic and ultramafic rocks in the ultramafic series of the Stillwater Complex in the West Fork Area including the A-H Chromitites.
(Summer 1989)
76 - Fig. 2

Rutland, Carolyn
Schmidt, Christopher J.
Western Michigan Univ.
Swapp, Susan
SUNY, Binghamton

Petrology, geochemistry and structural evolution of the eastern boundary of the Boulder batholith.
(1989)
38 - Fig. 2

Thompson, G. R.
Univ. of Montana

Burial diagenesis of Tertiary continental clastic sediments in the Deerlodge Valley.
77 - Fig. 1

Thompson, G. R.
Univ. of Montana

Nature and origin of bentonite and K-bentonites of the Sweetgrass arch and the disturbed belt.

GEOCHEMISTRY, MINERALOGY AND PETROLOGY

INVESTIGATOR

SUBJECT

Toth, Thomas A.
Indiana Univ.

Comparative study of the clay mineralogy of Cambrian shales and those in the Belt Supergroup, southwestern Montana.

Volborth, Alex
Montana Tech

Mineralogy and geochemistry of the Stillwater palladium, platinum and rhenium mineralization.

78 - Fig. 1

ISOTOPE GEOLOGY AND GEOCHRONOLOGY

<u>INVESTIGATOR</u>	<u>SUBJECT</u>
Bown, T. M. USGS, Reston	Tertiary geochronology and basin analysis, Rocky Mountain basins.
Duke, Edward F. Institute for Study of Mineral Deposits, South Dakota School of Mines and Technology	Origin of graphite vein deposits at the Crystal Graphite mine near Dillon, using geological, geochemical and carbon and oxygen isotopic data. (September 1989) 61 - Fig. 2
Friedman, Irving USGS, Denver	Study of light stable isotopes in thermal waters of Yellowstone National Park area. (continuing) 79 - Fig. 1
Gustin, Mae Sexauer Indiana Univ./Purdue Univ.	Carbon and oxygen isotope study of several talc deposits in southwestern Montana. 80 - Fig. 2
Guy, Russell Virginia Polytechnic Institute and State Univ.	Geochronology and geochemistry of the Archean basement terrain in Yankee Jim and Lamar River Canyons, Montana and Wyoming. (January 1990) 62 - Fig. 1
Hearn, B. Carter USGS, Reston	Study of kimberlitic diatremes in Montana including chemical and isotopic analysis of mineral separates. (continuing)
Lewis, Sharon E. MBMG Russell, Gail Univ. of Southern Mississippi	Radiometric age of Quaternary deposits using U/Th techniques.
Maruyama, H. Akita Univ., Japan Volborth, Alex Montana Tech	Petrochemical and isotopic studies of the Boulder batholith. 70 - Fig. 1

ISOTOPE GEOLOGY AND GEOCHRONOLOGY

INVESTIGATOR

SUBJECT

McCallum, I. S.
Irving, A. J.
Univ. of Washington

Petrologic/geochemical study of the
Eocene volcanics of central Montana.
(continuing)
71 - Fig. 1

McCallum, I. S.
Univ. of Washington

Petrologic/geochemical study of the
Stillwater Complex. (continuing)
72 - Fig. 2

Mueller, Paul
Univ. of Florida

Crustal evolution as shown by the
Archean rocks of southwestern
Montana.

Rye, Robert O.
USGS, Denver

Study of the Spar Lake copper-silver
deposits in conjunction with stable
isotope studies of ore deposits.
Also sulfur isotope studies of the
Yellowstone geothermal system.
(continuing)
81 - Fig. 1

Shuster, Robert D.
Univ. of Nebraska-Omaha

Isotopic studies of the northeastern
Idaho batholith.
82 - Fig. 1

Tatsumoto, Mitsunobu
USGS, Denver

Isotopic studies of mineral
separates from the Stillwater
Complex. (continuing)
83 - Fig. 1

GEOPHYSICS

INVESTIGATOR

SUBJECT

Belt, Edward S.
Amherst College

Stratigraphy, sedimentology,
paleobotany and paleomagnetism of
the Lebo Member of the Fort Union
Formation. (On either side of Route
12, at the Powder River crossing.)
(1989)
43 - Fig. 1

De Noyer, John M.
USGS, Reston

Preparation of gravity and magnetic
maps of Montana.

Elston, Donald P.
USGS, Flagstaff

Paleomagnetic studies in the Belt
basin of Montana and Idaho.
(continuing)

Gunderson, Jay A.
Univ. of Montana

Paleomagnetism of the Late
Cretaceous(?) Adel Mountain
Volcanics near Cascade. (1989)
84 - Fig. 1

Hanna, William F.
USGS, Reston

Interpretative aeromagnetic map and
Bouguer gravity anomaly map of the
Butte 1x2-degree quadrangle.
85 - Fig. 1

Jolly, Arthur
Univ. of Montana

Paleomagnetic investigation of Two
Medicine volcanic rocks at Wolf
Creek. The intention of this study
is to document possible rotation of
thrust sheets within the disturbed
belt of western Montana. (Spring
1990)
32 - Fig. 1

Kleinkopf, M. Dean
USGS, Denver

Gravity and magnetic anomaly data
for the western part of the Belt
basin and the Libby thrust belt.

Lankston, Robert
Univ. of Arkansas

Integrated geophysical study at the
intersection of the Beaverhead and
Blacktail Deer Basins. (May 1990)
86 - Fig. 2

GEOPHYSICS

INVESTIGATOR

SUBJECT

Locke, William
Montana State Univ.
Bartholomew, Mervin J.
MBMG

Assessment of earthquake hazard in
Lewis and Clark County and the
Helena Valley. (December, 1990)
87 - Fig. 1

Nichols, Terry
Montana Tech

Geophysical estimation of aquifer
parameters in the Bozeman Fan.
Gallatin County. (1989)
88 - Fig. 1

Sheriff, Steven D.
Univ. of Montana

General paleomagnetic investigations
and gravity/magnetic modelling,
relative to tectonic development of
the northern Rocky Mountains.
(continuing)

Smith, Robert B.
Univ. of Utah

Operation of Seismograph network in
Hebgen Lake area. (continuous)
89 - Fig. 2

Sternberg, Robert S.
Franklin and Marshall College

Magnetostratigraphy of the Paleocene
Fort Union Formation, southeastern
Montana. (1989)

Stickney, Michael C.
MBMG

Regional seismic monitoring and
seismicity studies in western
Montana. Data collected by a 9-
station seismograph network is used
to locate and catalog earthquake
hypocenters. (continuing)

Stover, C. W.
USGS

Preparation of seismicity maps for a
number of states including Montana.
(continuing)

ECONOMIC GEOLOGY

INVESTIGATOR

SUBJECT

Ambrustmacher, T. G.
USGS, Denver

Geology and resources of thorium,
niobium and tantalum.

Ashley, Roger P.
USGS, Menlo Park

Gold resource appraisal (includes
work in Montana).

Berg, Richard B.
MBMG
Honda, Sakuro
Mining College, Akita Univ., Japan

Chloritic alteration of Precambrian
metamorphic rocks in the Highland
Mountains.
90 - Fig. 2

Blount, Alice M.
Rutgers Univ.

Investigation of the association of
corrensite, mixed-layer silicates,
smectite, etc. with talc in
hydrothermally altered dolomite in
southwestern Montana in an effort to
learn more about the nature of the
hydrothermal fluids and conditions
of talc formation.
91 - Fig. 2

Carlson, Robert R.
USGS, Denver

Geochemical and analytical studies
of the platinum-group elements
including samples from the
Stillwater Complex.
58 - Fig. 1

Czamanske, Gerald K.
USGS, Menlo Park

Magmatic sulfides in mafic rocks.
(Includes work in the Stillwater
Complex.)
92 - Fig. 1

Derkey, Robert E.
Butte
Matsueda, Hiroharu
Hokkaido Univ., Japan

Nature of ore deposits of the
Boulder batholith region,
southwestern Montana. (continuing)
93 - Fig. 1

Earhart, Robert
USGS, Denver

Compilation of data on volcanogenic
massive sulfide deposits including
information from Montana.

ECONOMIC GEOLOGY

INVESTIGATOR

SUBJECT

Elliott, James E.
USGS, Denver

Study of the Wickes district and
Montana Tunnels mine near Jefferson
City.
94 - Fig. 1

Foose, Michael P.
USGS, Reston

Field studies of sulfide occurrences
in the Stillwater Complex as part of
a study of world nickel and cobalt
resources. (continuing)
95 - Fig. 1

Gustin, Mae Sexauer
Indiana Univ./Purdue Univ.

Carbon and oxygen isotope study of
several talc deposits in
southwestern Montana.
80 - Fig. 2

Johnson, Todd W.
Washington State Univ.

Gold in skarn and replacement
deposits in the New World mining
district, Park County. (January
1991)
96 - Fig. 1

Lageson, David R.
Montana State Univ.

Field study of deeply eroded caldera
complexes in the Boulder batholith
and Elkhorn Mountains volcanic
field, west-central Montana; ash-
flow stratigraphy, structural
geology, and economic geology
associated with caldera complexes.
(continuing)
34 - Fig. 1

Lockwood, Mark
New Mexico Institute of Mining and
Technology

Geology of the Virginia City
district, Madison County.
97 - Fig. 2

Page, Norman J.
USGS, Reston

Ore deposits and processes in the
early magmatic environment.
(Includes work in the Stillwater
Complex.)
73 - Fig. 1

ECONOMIC GEOLOGY

INVESTIGATOR

SUBJECT

Pearson, Robert C.
USGS, Denver

Study of the Bannack mining district including the geology of the Bannack 7 1/2-minute quadrangle. Also includes some mapping in the Burns Mountain, Dalys and Eli Springs 7 1/2-minute quadrangles.
15 - Fig. 2

Reynolds, Mitchell W.
USGS, Reston
Tysdal, Russell G.
USGS, Denver

Mineral resources of the Sleeping Giant Wilderness study area.
19 - Fig. 1

Sinclair, Alastair J.
Gareau, M.
Univ. of British Columbia, Canada

Lithogeochemical study of the Golden Sunlight deposit, southwestern Montana. (1989)
98 - Fig. 2

Van Voast, Wayne
Wheaton, John
MBMG

Study of crude bentonite for shot-hole plugging.

Volborth, Alex
Montana Tech

Mineralogy and geochemistry of the Stillwater palladium, platinum and rhenium mineralization.
78 - Fig. 1

Woodward, Lee
Univ. of New Mexico

Tectonic-metallogenic map of White Sulphur Springs 1 x 2-degree quadrangle. (1989)
99 - Fig. 1

Zeihen, Lester
Earll, Fred
Montana Tech
Ishikawa, R.
Ishiyama, D.
Akita Univ., Japan

Investigation of metalliferous veins in the western part of the Butte mining district.
100 - Fig. 2

Zeihen, Lester
Montana Tech

Mineralogy of the Black Pine mine, Granite County. (continuing)
101 - Fig. 1

ECONOMIC GEOLOGY

INVESTIGATOR

Zientek, M. L.
USGS, Menlo Park

SUBJECT

Magmatic sulfide deposits of the
Stillwater Complex. (1991)
102 - Fig. 1

ENERGY

INVESTIGATORSUBJECT

Bartholomew, Mervin J.
Vuke-Foster, Susan
Berg, Richard B.
MBMG
Colton, Roger B.
USGS, Denver

Geology of the Stockett-Belt coal field area (Stockett and Belt 15-minute quadrangles).
1 - Fig. 1

Burruss, R. C.
USGS

Study of the thermal history and fluid migration in sedimentary basins includes analysis of coal samples from the Powder River basin. (1991)

Denson, Norman
USGS, Denver

Tertiary geology and uranium occurrences in the Powder River basin, northeast Wyoming and southeast Montana.

Dolton, Gordon L.
USGS, Denver

Field size, finding rate and play analysis studies for the Minnelusa Formation in the Powder River basin will be utilized in the development of methodology for resource assessment.

Flores, Romeo M.
USGS, Denver

Evolution of the Powder River basin.

Hickcox, David H.
Ohio Wesleyan Univ.

Water management, water policy and coal development in eastern Montana focusing on the Yellowstone and Tongue River basins. (continuing)

Lageson, David R.
Montana State Univ.

Analysis of rock deformation fabrics in thrust sheets of the Disturbed Belt. Specifically, this project deals with pressure solution cleavages, fractures, boudinage, and other mesoscopic fabrics that may affect the porosity and permeability of potential oil and gas reservoir rocks in the fold and thrust belt. (1990)

ENERGY

INVESTIGATORSUBJECT

Pierce, Frances, W.
USGS, Denver

Geostatistical analysis of the coal resources of the Powder River Basin. (1989)

Sholes, Mark A.
Vuke-Foster, Susan
MBMG

Stratigraphy and sedimentology of coal-bearing strata in Montana: A synthesis. (1990)

Sholes, Mark A.
MBMG

Petrographic studies of Montana coals and correlation of petrographic data with chemical and sedimentologic data. (continuing)

Sholes, Mark A.
MBMG
Sugawara, T.
Akita Univ., Japan

Correlation between chemical and petrographic characteristics of Montana coals and the effectiveness of pretreating these coals to reduce sulfur.

Simon, Frederick, O.
USGS, Reston

Study of coal geochemistry includes an investigation of the effect of ground-water composition on the sodium content of coal in the Powder River basin. (1989)

Stanton, Ronald W.
USGS, Reston

Study of coal petrology includes analysis of samples from Wasatch Formation coal beds in Montana and Wyoming. (1989)

Wilde, Edith M.
MBMG

Coal resource evaluation of the Glendive 30x60-minute quadrangle in eastern Montana using the National Coal Resources Data System.
103 - Fig. 1

Wilde, Edith M.
MBMG

Coal resource evaluation of the Sidney 30x60-minute quadrangle in eastern Montana using the National Coal Resources Data System. (1989)
104 - Fig. 1

ENERGY

INVESTIGATOR

SUBJECT

Wilde, Edith M.
MBMG

Coal stratigraphy and correlation in
the Sidney 30x60-minute quadrangle,
eastern Montana and adjacent North
Dakota. (in press)
57 - Fig. 1

HYDROGEOLOGY

INVESTIGATOR

SUBJECT

Appleman, Richard A.
Montana Tech
Stanford, Jack
Univ. of Montana

Characterization of suspended sediment and baseline conditions related to the proposed Cabin Creek Coal mine in the headwaters of the North Fork of the Flathead River. (December 1989)
105 - Fig. 1

Bergantino, Robert N.
Sholes, Brenda, and others
MBMG

Preparation of maps showing geology, mineral resources, and ground-water resources at a scale of 1:250,000 on 1 x 2-degree quadrangles. (continuing)

Briar, David
USGS, Helena

The hydrology and water quality of valley fill deposits on the Fort Belknap Indian Reservation, north central, Montana. (September 1990)
106 - Fig. 1

Cannon, Michael
USGS, Helena

Development of a geographic-information-system (GIS) data base for hydrology of coal areas in southeastern Montana. (September 1990)

Clark, David W.
USGS, Helena

Occurrence of pesticides in ground water and soils in agricultural areas of Montana. Sampling in three areas of Montana with different soil types and agriculture. (September 1989)

Clark, David W.
USGS, Helena

Investigation of mine-spoils geochemistry near Colstrip and Decker mine in southeastern Montana to determine geochemical changes along flow paths. (September 1990)
107 - Fig. 1

Duaime, Terence E.
Sonderegger, John A.
MBMG

Hydrologic projects for the Anaconda smelter site.
108 - Fig. 2

HYDROGEOLOGY

INVESTIGATOR

SUBJECT

Duaime, Terence E.
Moore, Herman R.
Miller, Marvin R.
MBMG

Impacts on water quality from
plowout and saline seep reclamation
practices, Stillwater County,
Montana. (December 1990)
109 - Fig. 1

Duaime, Terence E.
Sonderegger, John A.
MBMG

Monitoring of the Butte mine
flooding. (continuing)
110 - Fig. 2

Duaime, Terence E.
MBMG
Appleman, Richard A.
Montana Tech

Monitoring the effects of
thunderstorms on surface water
quality in the Upper Clark Fork
Basin (in cooperation with the
U.S.G.S.
111 - Fig. 1

Duaime, Terence E.
MBMG
Appleman, Richard A.
Montana Tech
Sonderegger, John A.
Montana Tech
Metesh, John
MBMG

Aquifer test at the Travona Mine in
the Butte district.
112 - Fig. 2

Friedman, Irving
USGS, Denver

Study of light stable isotopes in
thermal waters of Yellowstone
National Park area. (continuing)
79 - Fig. 1

Hamilton, Wayne L.
Natl. Park Service; Yellowstone
National Park and Montana State
Univ.

Tracking geothermal flows with radon
and mercury anomalies. (1990)

Hickcox, David H.
Ohio Wesleyan Univ.

Water management, water policy and
coal development in eastern Montana
focusing on the Yellowstone and
Tongue River basins. (continuing)

HYDROGEOLOGY

INVESTIGATOR

SUBJECT

Metesh, John J.
MBMG

Hydrogeologic investigation of the
Travona Mine and Margret Ann Mine,
Butte. (December 1989)
113 - Fig. 2

Nichols, Terry
Montana Tech

Geophysical estimation of aquifer
parameters in the Bozeman Fan.
Gallatin County. (1989)
88 - Fig. 1

Parrett, Charles
Briar, Daniel
USGS, Helena

Water-resources investigation of the
upper Pryor Creek basin, Crow Indian
Reservation, south-central Montana.
(1992)
114 - Fig. 1

Patton, Thomas W.
Miller, Marvin R.
Sholes, Brenda
Schmidt, Fred
MBMG

Ground water information center
library, basic data, interpretative
and field services. (continuing)

Patton, Thomas W.
MBMG

Turner-Hogeland ground-water
recharge study.
115 - Fig. 1

Patton, Thomas W.
MBMG
Colton, Roger B.
USGS, Denver

Identification of glaciofluvial and
buried preglacial aquifers in the
Havre, Harlem and Whitewater 30 x
60-minute quadrangles.
116 - Fig. 1

Patton, Thomas W.
MBMG

Turner-Hogeland aquifer study.
117 - Fig. 1

Reiten, Jon
MBMG

Brine contamination of shallow
ground-water supplies, Sheridan
County. (continuing)
118 - Fig. 1

HYDROGEOLOGY

INVESTIGATOR

SUBJECT

Reiten, Jon
MBMG

Study of oil field reserve pit
contamination, Richland County.
(continuing)
119 - Fig. 1

Schmidt, Fred
Moore, Herman R.
MBMG

Monitoring of ground water and
surface water in the Poplar River
area.
120 - Fig. 1

Sonderegger, John
Montana Tech

Evaluation of arsenic contamination
of alluvial and Tertiary aquifers
between Beartrap Canyon and Three
Forks. (June 1989)
121 - Fig. 2

Thamke, Joanna
USGS, Helena

Ground-water monitoring network on
the Fort Peck Indian Reservation.
(Dec. 1989)
122 - Fig. 1

Tuck, Lori K.
USGS, Helena

Investigation of the hydrogeologic
framework of the Sweet Grass Hills
in an effort to determine the
feasibility of using ground water to
supplement surface-water resources.
(1992)
123 - Fig. 1

Van Voast, Wayne
Reiten, Jon
Lalley, Joe
Wheaton, John
MBMG

Study includes column leach
experiments to improve ways of
interpretating overburden salinity
data for hydrologic uses.
Overburden salinity data are from
coal deposits in southeastern
Montana. (continuing)

Van Voast, Wayne
Reiten, Jon
Lalley, Joe
Wheaton, John
MBMG

Coal lands hydrologic monitoring
study utilizes more than 200
observation wells in and near active
coal mines. (continuing)

HYDROGEOLOGY

INVESTIGATOR

SUBJECT

Wheaton, John
Reiten, Jon
Van Voast, Wayne
MBMG

Evaluation of ground water for
irrigation use from underground
mines in the Roundup area. (1991)
124 - Fig. 1

Wheaton, John
MBMG

Evaluation of ground water for
irrigation along the north flank of
the Pryor Mountains, south central
Montana. (continuing)
125 - Fig. 1

Wylie, Allan
Univ. of Montana

Hydrologic investigation of Pine
Butte and McDonald swamps in Teton
County.
126 - Fig. 1

GEOMORPHOLOGY AND GLACIAL GEOLOGY

<u>INVESTIGATOR</u>	<u>SUBJECT</u>
Adams, Ken Montana State Univ.	Obsidian hydration dating of naturally abraded samples along the Madison River near West Yellowstone, Montana and in the Yellowstone Lake Basin, Wyoming. 127 - Fig. 1
Carrara, Paul E. USGS, Denver	Quaternary chronology - Glacier National Park. 128 - Fig. 1
Hall, Robert D. Indiana Univ.; Purdue Univ., Indianapolis	Hornblende depletion and etching as an indicator of relative age of glacial deposits in the Tobacco Root Mountains. (continuing) 129 - Fig. 2
Hall, Robert D. Indiana Univ.; Purdue Univ., Indianapolis	Glacial geology of the Bear Gulch, North Meadow, and South Willow Creek valleys, Tobacco Root Mountains. (continuing) 130 - Fig. 2
Hall, William B. Univ. of Idaho	Study of central portion of the Madison/Gallatin block with emphasis on geomorphology, glacial history, and structural geology. (continuing) 6 - Fig. 2
Locke, William Montana State Univ.	Glaciation and glacial climates of western Montana. (continuing)
Montagne, John Montana State Univ.	On-going study of the Cenozoic History, geomorphology, and glacial geology of the Yellowstone Valley from Gardiner to Livingston. 36 - Fig. 1
Murray, Donald R. Montana State Univ.	Late Pleistocene glacier dynamics and paleoclimatic reconstruction of southwestern Montana and northeastern Idaho. (June 1989)

GEOMORPHOLOGY AND GLACIAL GEOLOGY

INVESTIGATOR

Vandeberg, Gregory S.
Montana State Univ.

SUBJECT

Study of glacial geology and
geomorphology of the Tom Miner Basin
to determine temporal and spatial
relationships between Late
Quaternary local ice and the
Yellowstone outlet glacier.
(February 1990)
131 - Fig. 1

ENVIRONMENTAL AND ENGINEERING GEOLOGY

INVESTIGATOR

SUBJECT

<p>Appleman, Richard A. Montana Tech Duaiame, Terence E. Moore, Herman R. MBMG</p>	<p>Monitoring operation at Montana Pole Plant hazardous waste site. (continuing) 132 - Fig. 2</p>
<p>Bartholomew, Mervin J. Wilde, E. M. Stickney, M. C. Daniel, F. MBMG Dresser, H. W. Montana Tech Colton, R. B. Brabb, E. E. USGS</p>	<p>Landslide map of Montana (1:500,000)</p>
<p>Custer, Stephan G. Clozton, Marlow Montana State Univ.</p>	<p>Study of the role of grazing and ground-water discharge in sediment production from a low-order water shed near Ennis. (continuing) 133 - Fig. 2</p>
<p>Custer, Stephan G. Jacobsen, Jeff Kresge, Paul Montana State Univ.</p>	<p>The origin of high extractable potassium soils in the western U.S. (continuing) 134 - Fig. 1</p>
<p>Locke, William Montana State Univ. Bartholomew, Mervin J. MBMG</p>	<p>Assessment of earthquake hazard in Lewis and Clark County and the Helena Valley. (December, 1990) 87 - Fig. 1</p>
<p>Sonderegger, John Montana Tech</p>	<p>Laboratory and field studies of metals mobility in the unsaturated zone of tailings-damaged soils in the southern Deer Lodge Valley. (June 1989) 135 - Fig. 1</p>
<p>Van Voast, Wayne Reiten, Jon Lalley, Joe Wheaton, John MBMG</p>	<p>Study includes column leach experiments to improve ways of interpretating overburden salinity data for hydrologic uses. Overburden salinity data are from coal deposits in southeastern Montana. (continuing)</p>

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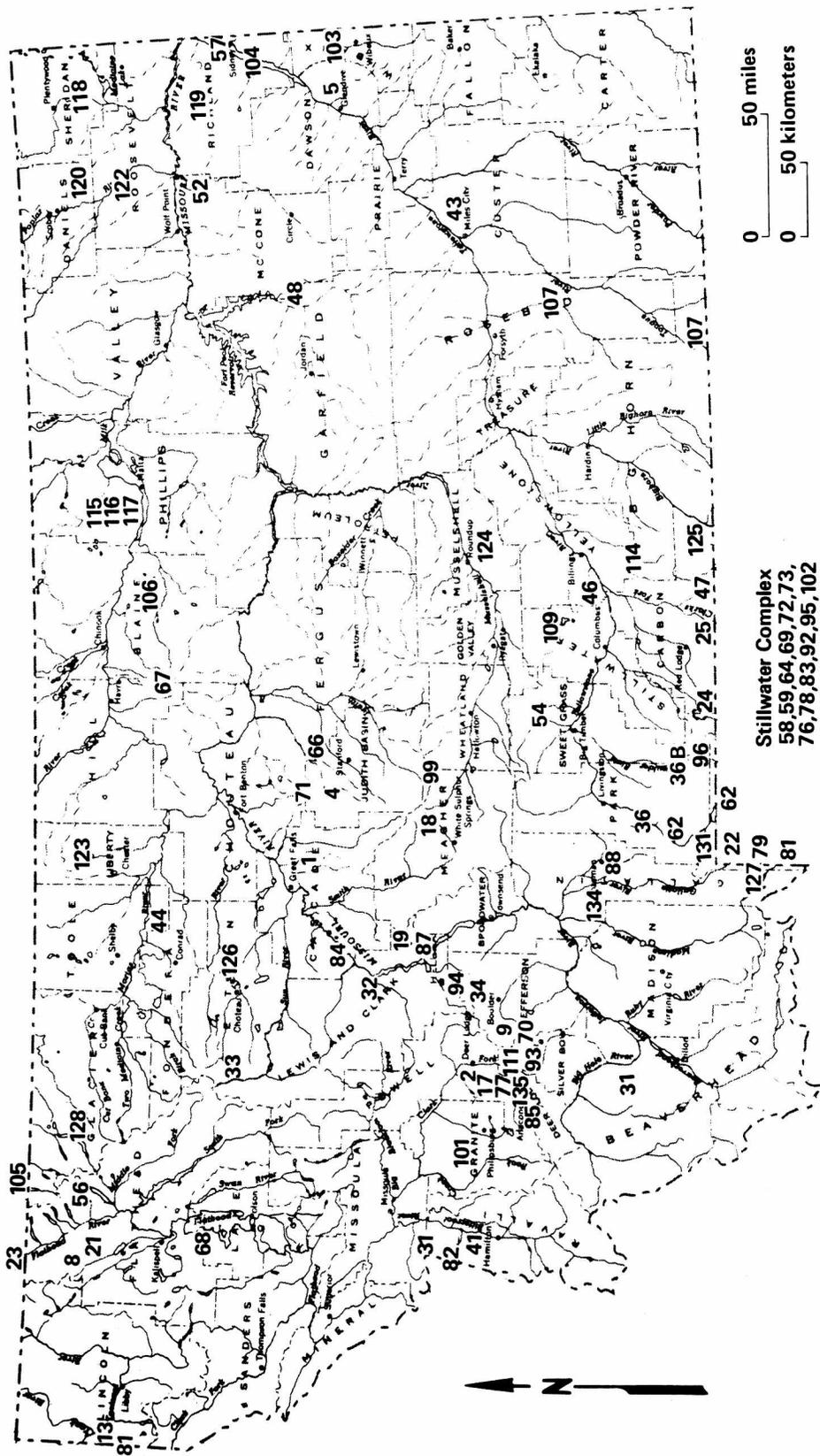


Figure 1 — Index map of Montana.

