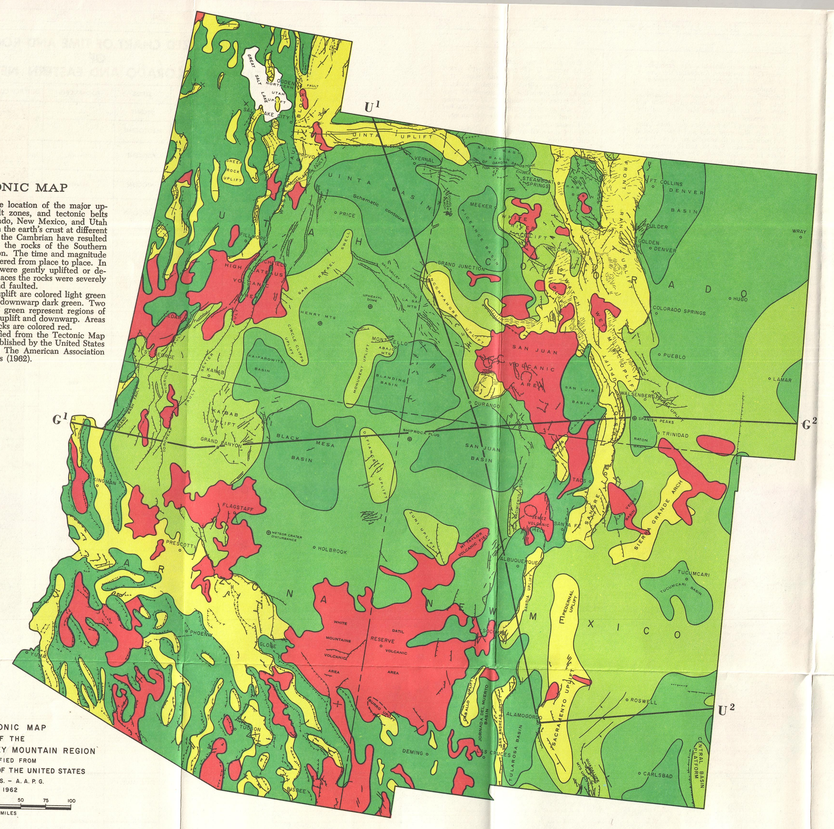
TECTONIC MAP

This map shows the location of the major uplifts, downwarps, fault zones, and tectonic belts in the Arizona, Colorado, New Mexico, and Utah region. Adjustments in the earth's crust at different geological times since the Cambrian have resulted in the deformation of the rocks of the Southern Rocky Mountain Region. The time and magnitude of the deformation differed from place to place. In some areas the rocks were gently uplifted or depressed and in other places the rocks were severely compressed, folded, and faulted.

Areas of maximum uplift are colored light green and areas of maximum downwarp dark green. Two intermediate shades of green represent regions of less intense differential uplift and downwarp. Areas covered by volcanic rocks are colored red.

This map was modified from the Tectonic Map of the United States published by the United States Geological Survey and The American Association of Petroleum Geologists (1962).



TECTONIC MAP
OF THE
SOUTHERN ROCKY MOUNTAIN REGION
MODIFIED FROM
TECTONIC MAP OF THE UNITED STATES
U. S. G. S. – A. A. P. G.
1962

25 0 25 50 75 100
MILES

PHYSIOGRAPHIC MAP

This map shows the configuration and distribution of the major landforms in Arizona, Colorado, New Mexico, and Utah. Geological processes and rock characteristics combine to produce rolling hills and mountains, prairies and plateaus, hogbacks and cuestas.

Landforms of the Southern Rocky Mountain Region are related fundamentally to uplifts and depressions of the earth's crust. Water, ice, and wind are the principal erosional agents that produced the present-day surface irregularities. The type, composition, and texture of the rocks, and the local structure and sequence of the rock layers, are important controlling factors.

The earth's surface is changing continuously. New landforms evolve by alteration and gradual destruction of pre-existing forms and by the accumulation of freshly eroded rock materials.

The physiographic map supplements the other illustrations by showing the names of many surface features, by delineating areas of differential erosion, and by showing regional elevations. The other illustrations supply important information which helps to explain the geological origin of the prominent landforms. The relation of landforms in this area to landforms in adjacent states can be obtained from "Landforms of the United States" by Erwin Raisz (1957).

PHYSIOGRAPHIC MAP
OF THE
SOUTHERN ROCKY MOUNTAIN REGION
MODIFIED FROM
LANDFORMS OF THE UNITED STATES
BY ERWIN RAISZ
1957

25 0 25 50 75 100
MILES

GEOLOGICAL HIGHWAY MAP
SOUTHERN ROCKY MOUNTAIN REGION
UTAH - COLORADO
ARIZONA - NEW MEXICO

Compiled by
Geological Highway Map Committee
of
THE AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS

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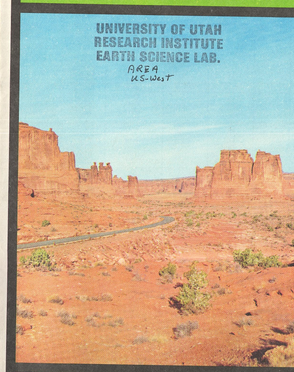
Drafted By Van K. Higginbotham

SOUTHERN ROCKY MOUNTAIN REGION

Geological Highway Map

UTAH - COLORADO
ARIZONA - NEW MEXICO



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Sources of Geological Information of the SOUTHERN ROCKY MOUNTAIN REGION

Primary Sources:

United States Geological Survey, Washington, D. C. 20240
Erwin Raisz, 107 Washington Avenue, Cambridge, Massachusetts 02140
The American Association of Petroleum Geologists, P. O. Box 979, Tulsa, Oklahoma 74101
The Geological Society of America, 231 East 46th Street, New York, N. Y. 10017
Arizona Bureau of Mines, The University of Arizona, Tucson, Arizona 85721
New Mexico State Bureau of Mines and Mineral Resources, Campus Station, Socorro, New Mexico 87801
Utah Geological and Mineralogical Survey, 103 Geological Survey Bldg., Salt Lake City, Utah 84112

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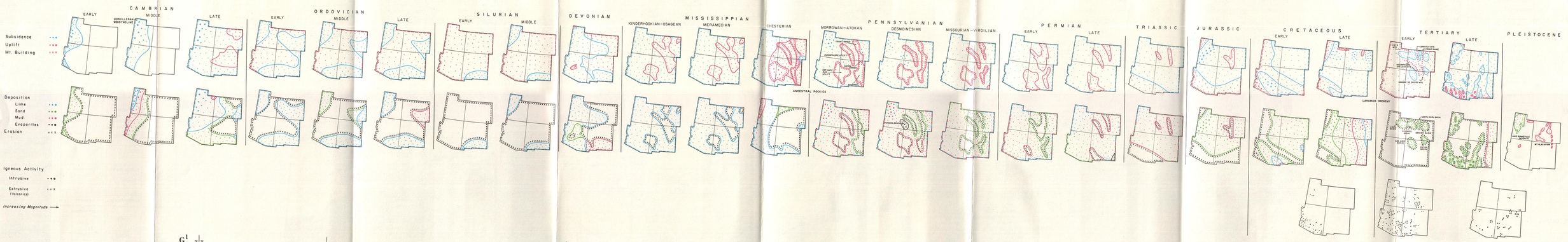
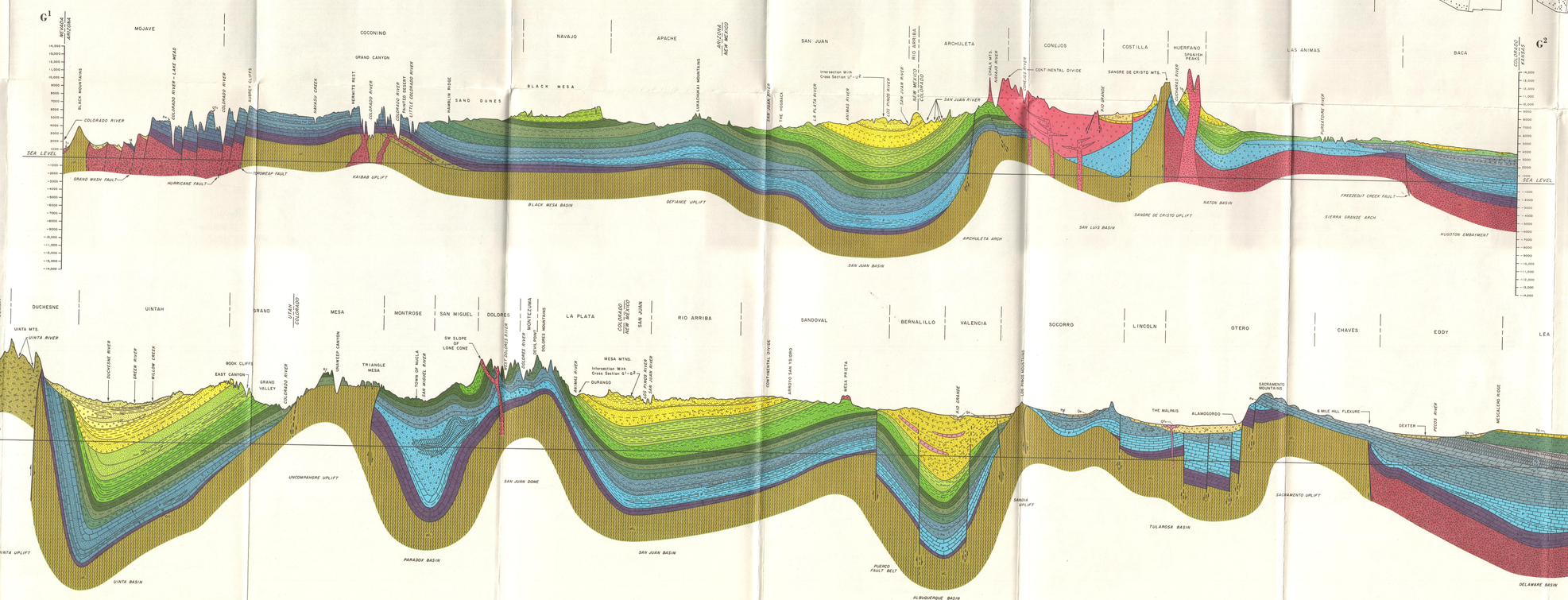
Other Sources:

Geology departments of colleges and universities
Geological Societies:
Albuquerque Geological Society, Albuquerque, New Mexico
Arizona Geological Society, Tucson, Arizona
Four Corners Geological Society, P. O. Box 1501, Durango, Colorado 81302
Hobbs Geological Society, P. O. Box 2081, Hobbs, New Mexico 88240
Intermountain Association of Geologists, P. O. Box 94, Salt Lake City, Utah 84110
New Mexico Geological Society, Campus Station, Socorro, New Mexico 87801
Rocky Mountain Association of Geologists, Room 302, 1554 California Street, Denver, Colorado 80202
The Roswell Geological Society, Inc., P. O. Box 1171, Roswell, New Mexico 88201
Utah Geological Society, Department of Geology, Weber College, Ogden, Utah 84403





SANDSTONE
CONGLOMERATE
SHALE
DOLOMITE
LIMESTONE
CHERT
ANHYDRITE
LAVA
SALT
METAMORPHOSED ROCKS
METASEDIMENT
GRANITE
NORMAL FAULT
THRUST FAULT

50 0 10 20 30 40 50 MILES
GRAPHIC SCALE
VERTICAL EXAGGERATION = 20X

CROSS SECTIONS

The two cross sections illustrate the subsurface geology of the Southern Rocky Mountain Region. The locations of the two lines of section are shown by lines G1—G2, and U1—U2 on the Tectonic Map. These are regional segments of a nation-wide cross-section network prepared for the map series.

The cross sections show (1) the surface configuration, (2) the relation of the underlying rocks to the surface profile, (3) the age, nature, attitude, thickness, distribution, and sequence of the rock layers, and (4) the location, nature, and magnitude of the structural elements. The names, colors, and lithologic symbols are the same as those used in the Geological Highway Map and the Generalized Chart of Time and Rock Units.

The surface profile was constructed from 1:250,000-scale topographic maps (United States Geological Survey). The basement profile was constructed from the Basement Map of North America (The American Association of Petroleum Geologists and the United States Geological Survey, 1967).

The cross sections were compiled from publications of state agencies and universities of Arizona, Colorado, New Mexico, and Utah, as well as federal agencies, national and local geological societies, individual geologists, and other published sources.

GEOLOGICAL HISTORY

The geological history of this area is shown above in summary form. As viewed from left to right, the sequence of small maps pictures the changes as they took place, from ancient to recent times.

For each historically important *epoch* (the time equivalent a of rock *series*) there is shown by individual outline maps (1) the areas of *uplift* and *subsidence*, (2) the areas of *erosion* and *deposition*, and (3) the areas of *igneous activity*, and the *kinds of igneous rocks*. It has been necessary because of space limitation to combine all of the epochs of the Devonian, Triassic, and Jurassic Periods and to group epochs within the Silurian, Mississippian, Pennsylvanian, Permian, and Tertiary Periods.

The relative magnitudes of subsidence, uplift, and deposition are indicated by the size of the symbol: the larger the symbol, the greater the magnitude of the event portrayed. The meaning of each symbol and an explanation of the color scheme are in the legend.

The uppermost sequence of maps shows the areas of subsidence and uplift from the Cambrian on the left to the Pleistocene on the right. The larger blue and red dots indicate areas of greater subsidence and uplift, respectively. The red crosses represent areas of mountain-building activity. A series of related mountain-building events in a particular area, or during a particular interval of time, is called an *orogeny*. These involve substantial folding and faulting of the rock layers, such as are found in the Sangre de Cristo, Uinta, and Front Range Mountains. In other areas uplift may consist only of a gentle doming with moderate tilting of the strata. An example of this is the Defiance uplift.

The middle sequence of maps shows areas undergoing erosion, and areas where deposition was taking place. Areas of erosion are outlined by black crosses. The kind of sedimentary material deposited is shown by color: blue for lime, green for sand, red for mud, and black for evaporites (salt, gypsum, and anhydrite).

The bottom sequence of maps shows the age and kind of igneous activity (intrusive or extrusive). Maps are included only for those intervals of time during which igneous activity occurred.