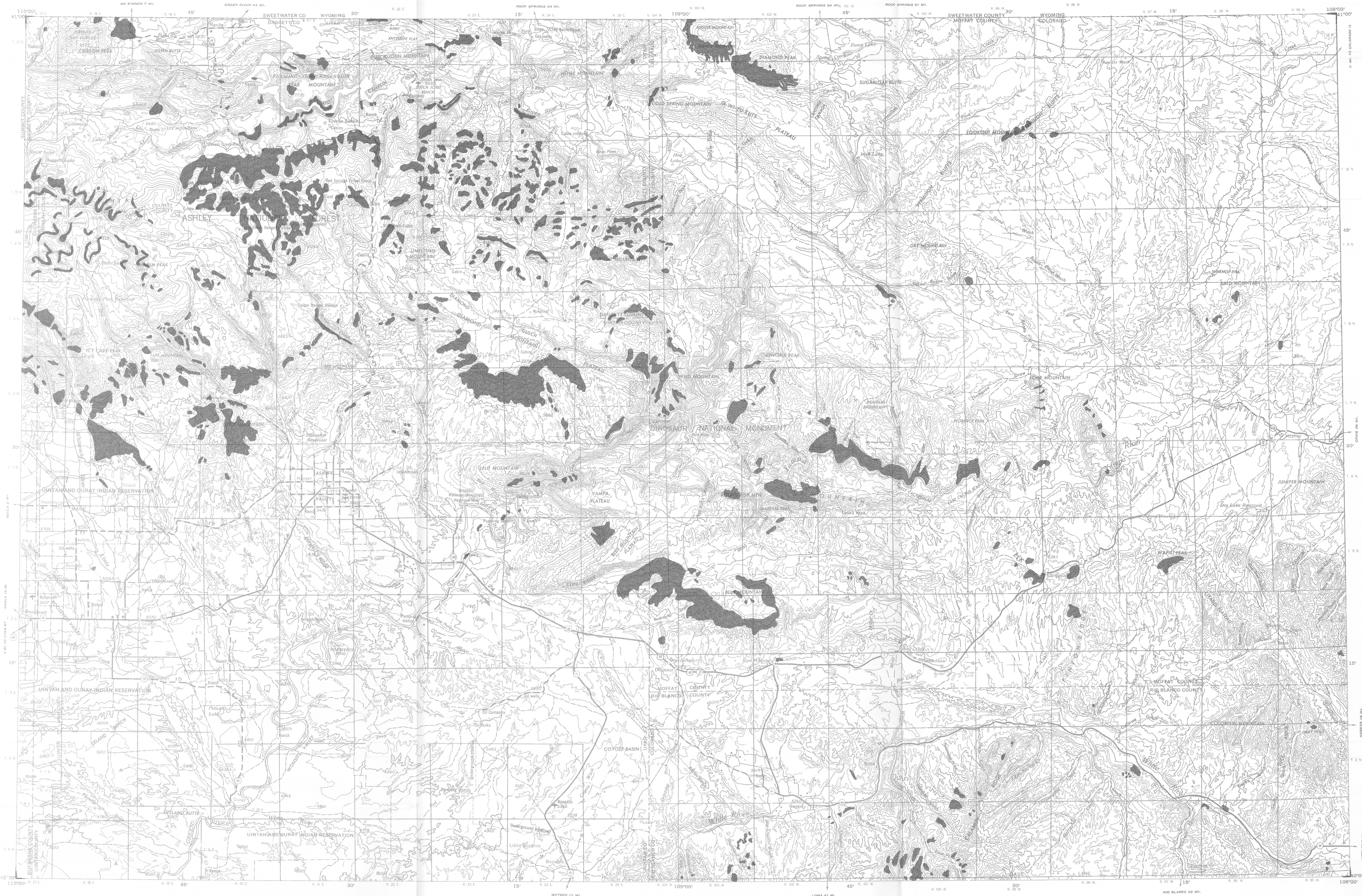
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

MISCELLANEOUS FIELD STUDIES
MAP MF-696



Base from U.S. Geological Survey, 1954-65

Data as of June 1975

Scale 1:250,000

5 0 5 10 15 20 Statute Miles

5 0 5 10 15 20 25 30 Kilometers

5 0 5 10 15 Nautical Miles

CONTOUR INTERVAL 200 FEET
WITH SUPPLEMENTARY CONTOURS AT 100 FOOT INTERVALS
TRANSVERSE MERCATOR PROJECTION

1960 MAGNETIC DECLINATION FOR THIS SHEET VARIES FROM 16°00′ EASTERLY FOR THE CENTER OF THE WEST EDGE TO 15°00′ EASTERLY FOR THE CENTER OF THE EAST EDGE. MEAN ANNUAL CHANGE IS 0°02′ WESTERLY.

PRELIMINARY MAP OF LANDSLIDE DEPOSITS, VERNAL 1°X2° QUADRANGLE COLORADO AND UTAH

By

Paul E. Carrara, Roger B. Colton, Jeffrey A. Holligan, and Larry W. Anderson

1975

EXPLANATION

Areas inferred to be underlain by landslide deposits resulting from landsliding, avalanching, block gliding, debris sliding or flowing, earthflows, mudflows, rocksliding, rockfalls, rotational slides, slab or flake sliding, slumping, talus accumulation, and translational sliding. Rock glacier deposits, colluvium, and solifluction deposits are included in some areas. Some till is mapped with landslide deposits because distinguishing these two deposits from one another is difficult. Furthermore, in some areas till has failed by landsliding and other types of mass movements. Movement within the deposits varies from none to rapid; rates of movement may also be variable in any given landslide within the same year. Ages of deposits range from early Pleistocene to Holocene.

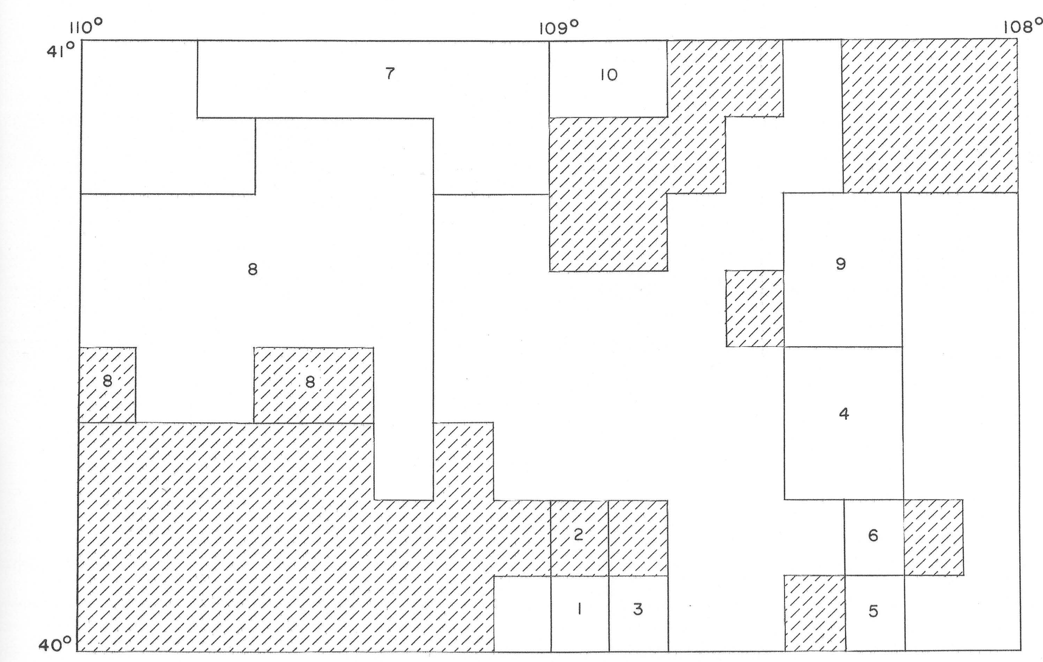
FACTORS AFFECTING MAP ACCURACY*

Landslide deposits that formed since the aerial photographs were taken are not shown. Landslides are more difficult to recognize in heavily forested areas and consequently such areas are less accurately mapped than nonforested areas. Map accuracy varies according to the quality of aerial photographs used. Haze, cloud cover, poor sun angle, and shadows make photointerpretation difficult. Mapping of landslides by photointerpretation presents many problems such as: distinction between terrace-shaped slump-type landslide deposits and alluvial terrace deposits where both are adjacent to stream courses; recognition of landslide deposit boundaries (the upslope boundary is commonly defined by an easily recognized scarp but the toe or downslope boundary is seldom well defined and thus is difficult to locate exactly); recognition of stable masses of bedrock surrounded by landslide deposits, especially where only a small knob projects through; and separation of landslide deposits from glacial deposits.

SUGGESTIONS FOR MAP USERS*

This map should not be used to determine the probability of future landsliding, as geologic and climatic changes during the past few hundred thousand years have altered slope stability and because this map does not provide information regarding composition and type of movement of individual landslide deposits. Therefore, the map is not a substitute for careful detailed large-scale site investigations by engineering geologists and soils engineers. Areas susceptible to landslide and related activity should be carefully studied before any development begins. This map has been prepared to provide a regional context for interpreting detailed site investigations and should be used in conjunction with topographic, slope, surficial, bedrock, and soils maps, aerial photographs, and other available information. The limitations of this map should be obvious inasmuch as one inch (2.54 cm) on the map equals approximately 3.9 miles (6.4 km) on the ground.

*Modified from Nilsen, T. H., 1972, Preliminary photointerpretation map of landslide and other surficial deposits of the Mount Hamilton quadrangle and parts of the Mount Boardman and San Jose quadrangles, Alameda and Santa Clara Counties, California: U.S. Geol. Survey Misc. Field Studies Map MF-339.

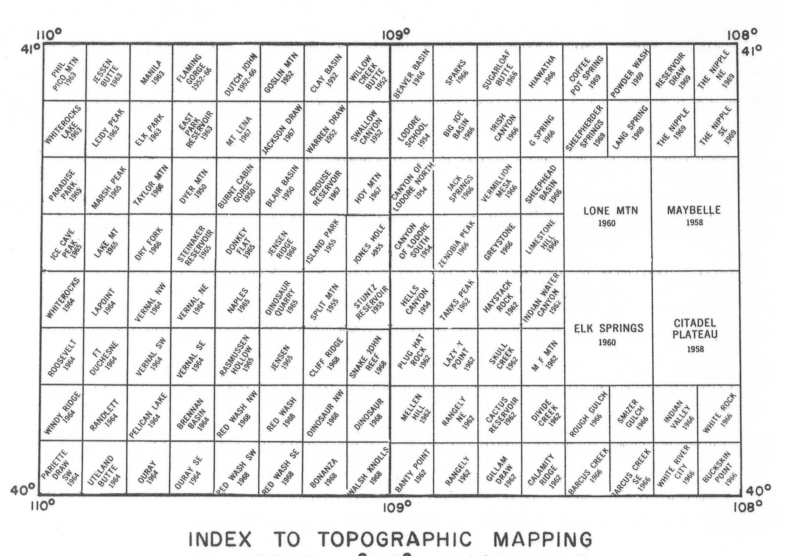


SOURCES OF INFORMATION

Vertical and oblique aerial photographs covering the entire quadrangle at various scales (1:60,000 and larger) and in various years were interpreted by P. E. Carrara and R. B. Colton in 1975. Most aerial photographs used are small-scale (1:60,000) Army Map Service Project 126AP, 1953 (available from U.S. Geological Survey).

Area of no known landslide and related deposits, or area of minor landslides and related deposits too small to be shown at the present scale.

1. Cullins, H. L., 1968, Geologic map of the Banty Point quadrangle, Rio Blanco County, Colorado: U.S. Geol. Survey Geol. Quad. Map GQ-703.
2. Cullins, H. L., 1969, Geologic map of the Mellen Hill quadrangle, Rio Blanco and Moffat Counties, Colorado: U.S. Geol. Survey Geol. Quad. Map GQ-835 [1970].
3. Cullins, H. L., 1971, Geologic map of the Rangely quadrangle, Rio Blanco County, Colorado: U.S. Geol. Survey Geol. Quad. Map GQ-903.
4. Dyni, J. R., 1968, Geologic map of the Elk Springs quadrangle, Moffat County, Colorado: U.S. Geol. Survey Geol. Quad. Map GQ-702.
5. Hail, W. J., Jr., 1972, Preliminary geologic map of the Barcus Creek SE quadrangle, Rio Blanco County, Colorado: U.S. Geol. Survey Misc. Field Studies Map MF-347.
6. Hail, W. J., Jr., 1973, Geologic map of the Smizer Gulch quadrangle, Rio Blanco and Moffat Counties, Colorado: U.S. Geol. Survey Geol. Quad. Map GQ-1131 [1974].
7. Hansen, W. R., 1965, Geology of the Flaming Gorge area, Utah-Colorado-Wyoming: U.S. Geol. Survey Prof. Paper 490, pl. 1.
8. Kinney, D. M., 1955, Geology of the Uinta River-Brush Creek area, Duchesne and Uintah Counties, Utah: U.S. Geol. Survey Bull. 1007, pl. 1.
9. McKay, E. J., 1974, Geologic map of the Lone Mountain quadrangle, Moffat County, Colorado: U.S. Geol. Survey Geol. Quad. Map GQ-1144.
10. Weber, J. R., 1971, Structural geology of the northeastern flank of the Uinta Mountains, Moffat County, Colorado: Colorado School Mines M.S. thesis.



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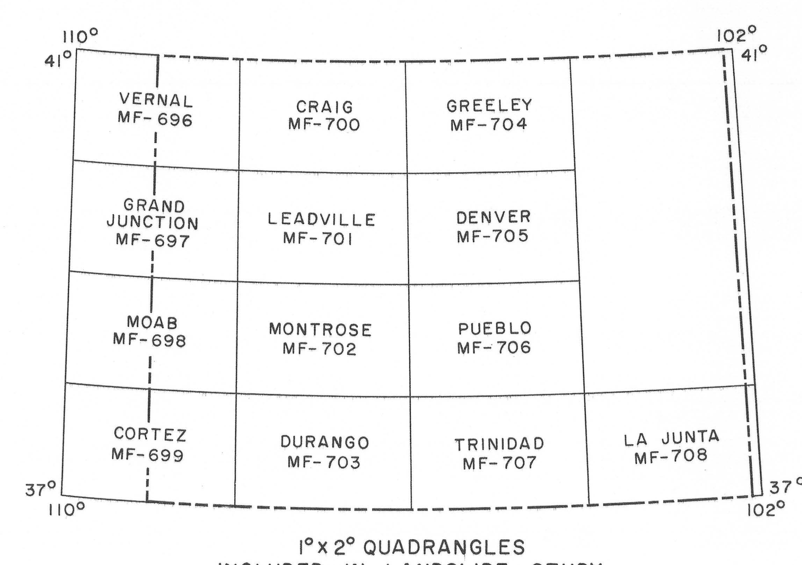

1°X2° QUADRANGLES INCLUDED IN LANDSLIDE STUDY

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