

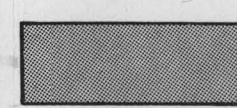
Dolores, Montezuma County, Colorado, Area  
 Geologic Hazards Map  
 by  
 James M. Soule, Colorado Geological Survey

EXPLANATION  
 GENERAL

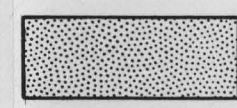
Geologic hazards in the Dolores area are natural geologic conditions that, if unrecognized or poorly planned for, can result in loss of life, damage to structures, and high maintenance costs, especially for homes, roads, and utilities. Several different kinds of potentially hazardous geologic conditions are shown on this map: 1) rockfall-rockslide areas (severe hazard); 2) rockfall "runout" areas (moderate hazard); 3) landslide areas (severe hazard); 4) unstable and potentially unstable slopes (moderate hazard).

HOW TO USE THIS MAP

This map should be used as a guide to location of areas where the indicated geologic condition may cause difficulties for particular land uses. It is not intended to supplant detailed field investigations of individual sites, but rather to signal places where the indicated geologic conditions can be expected to cause difficulties for particular land uses. If this map is used to designate geologic hazard areas as specified by H.B. 1041 (Rogers and others, 1974, p. 120-121), then it is suggested that this map serve as a basis for further investigation of individual sites. Detailed investigation and evaluation may serve as the basis for actual designs, or such studies might indicate that for economic or safety reasons the particular activity is not feasible. Land-use decisions in these areas should be based on technical reviews and planning evaluation of detailed studies and specific site plans.



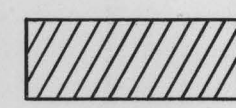
**Rockfall-rockslide area:** area where nearly instantaneous, unpredictable falling, sliding, and rolling downslope of large masses of rock or individual blocks take place. In the Dolores area, predominantly south-facing slopes tend to be more susceptible to rockfalls than predominantly north-facing ones as they are drier and more sparsely vegetated. Consequently their sandstone caprock forms precipitous cliffs from which rock fragments fall, bound, roll, or slide downslope. Mapped rockfall-rockslide areas are only the extensive, obvious areas subject to this geologic process. Many smaller areas prone to rockfalls and rockslides are present in the Dolores area, and the presence of an active rockfall-rockslide area should be considered a possibility whenever evidence such as loose rock fragments on the ground surface or precipitous cliffs up-slope are present.



**Rockfall "runout" area:** area adjacent to and downslope from rockfall-rockslide areas where rocks occasionally roll or bound out onto gently sloping ground until they come to rest. Most falling rocks have insufficient momentum to roll or bound beyond the steeper slopes near their sources, but some, especially the largest rock blocks, do. These areas are not as precisely mapped as the rockfall-rockslide areas as most falling or sliding rocks do not reach these lower slopes. Moreover most of the rocks that accumulated in the past in these areas have been removed or modified by man. Thus, precise determination of the maximum extent of possible rockfall runout is not possible. These are considered to be moderate hazard areas as the frequency of events is considerably less than in the rockfall-rockslide areas.



**Landslide area (severe hazard):** area of active or recent landsliding. The most extensive landslides in the Dolores area are found on predominantly north-facing slopes, where thick, poorly consolidated colluvium and residual soil cover have developed. The development of thick colluvium is enhanced by abundant vegetation cover. Undercutting of slopes by the Dolores River and roadcuts have initiated landslides on the slope immediately south of the river. Landslides on predominantly south-facing slopes are restricted to thick talus-colluvium derived from rockfall of sandstone caprock and weathered residuum of underlying shale and siltstone.



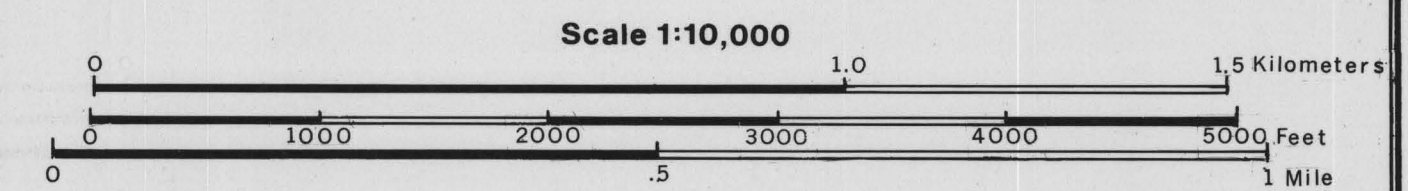
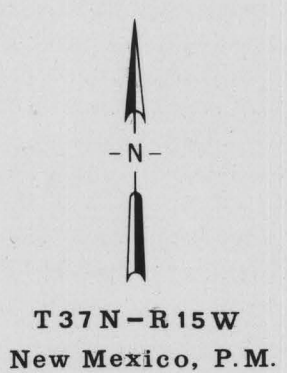
**Unstable slope (moderate to severe hazard):** area of moderate to steep slope underlain by loose unconsolidated material. Nearly all places in the Dolores area underlain by talus-colluvium are highly susceptible to slope failure. Careful planning of man's activities in these areas is necessary because man-caused rockfalls and landslides may result from poorly planned activities, especially those that necessitate cuts of slopes or increased water saturation of the ground.

1] colluvium: loose heterogeneous and incoherent mass of soil material or rock fragments deposited chiefly by mass-wasting, usually at the base of a steep slope or cliff.

REFERENCE

Rogers, W. P., and others, 1974, Guidelines and criteria for identification and land-use controls of geologic hazard and mineral resource areas: Colorado Geol. Survey Spec. Pub. 6, 146 p.

Base from U. S. Geological Survey  
 7-1/2 minute quadrangles



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 Dolores, Montezuma County, Colorado**

by  
 James M. Soule, Colorado Geological Survey  
 September 1975

COLORADO CENTENNIAL

1876

Drafted by Robert H. Gast