

FOOTHILL AND MOUNTAINOUS REGIONS IN BOULDER COUNTY, COLORADO THAT MAY BE SUSCEPTIBLE TO DEBRIS/MUD FLOWS DURING EXTREME PRECIPITATION EVENTS

Matthew L. Morgan, Jonathan L. White, F. Scot Fitzgerald, Karen A. Berry and Stephen S. Hart
Colorado Geological Survey, 2014
Open-file Report 14-02

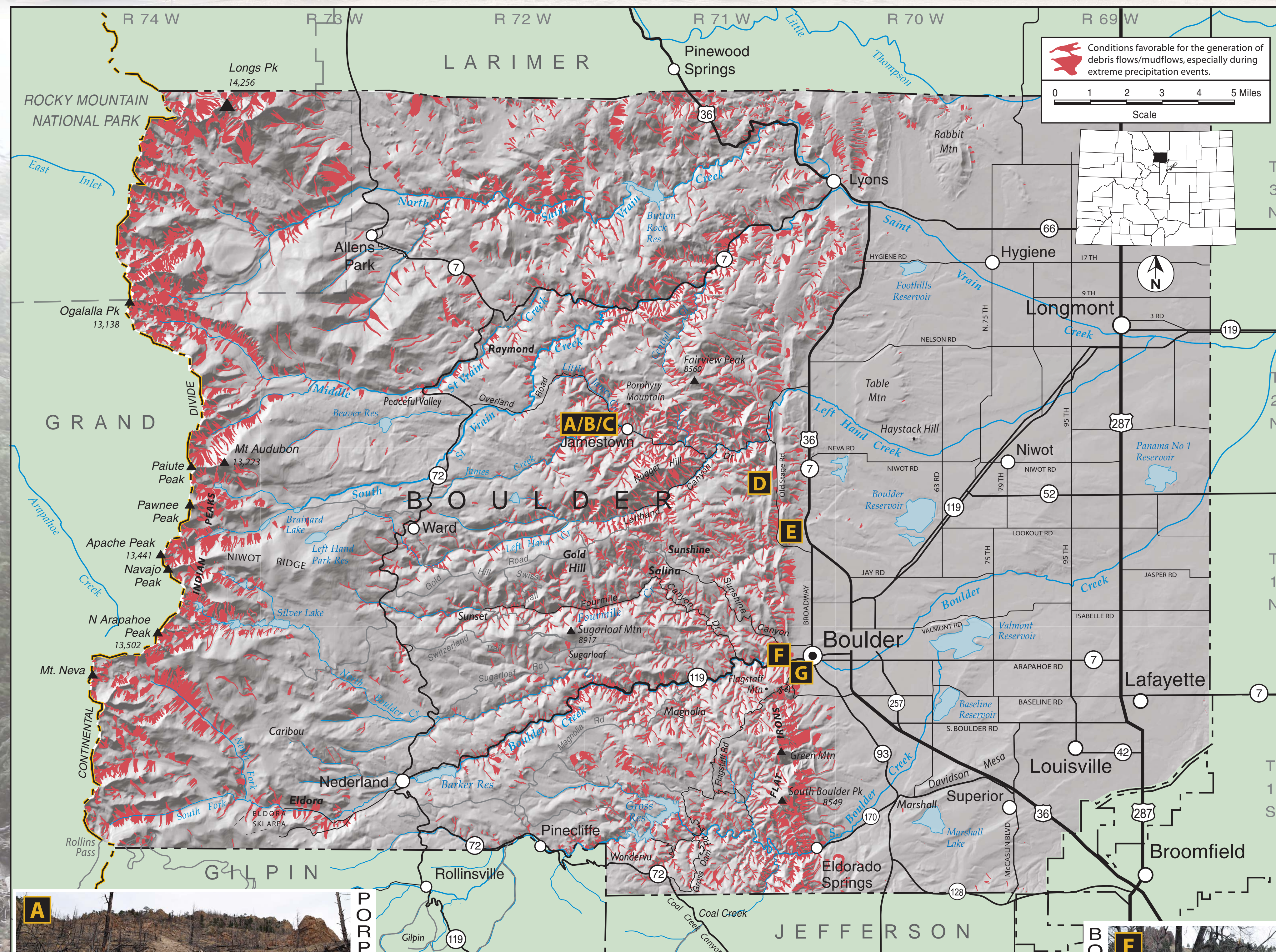
ABOUT THIS MAP

The red polygons on this map represent areas where conditions (e.g. slope angle, channel curvature) are favorable for the generation of debris flows/mudflows, especially during extreme precipitation events. New and existing structures, roadways, bridges and other infrastructure located within these areas may be at risk of sediment inundation. It is recommended that future construction within these zones be evaluated by a professional geologist with consideration given to proper debris flow/mudflow mitigation techniques.

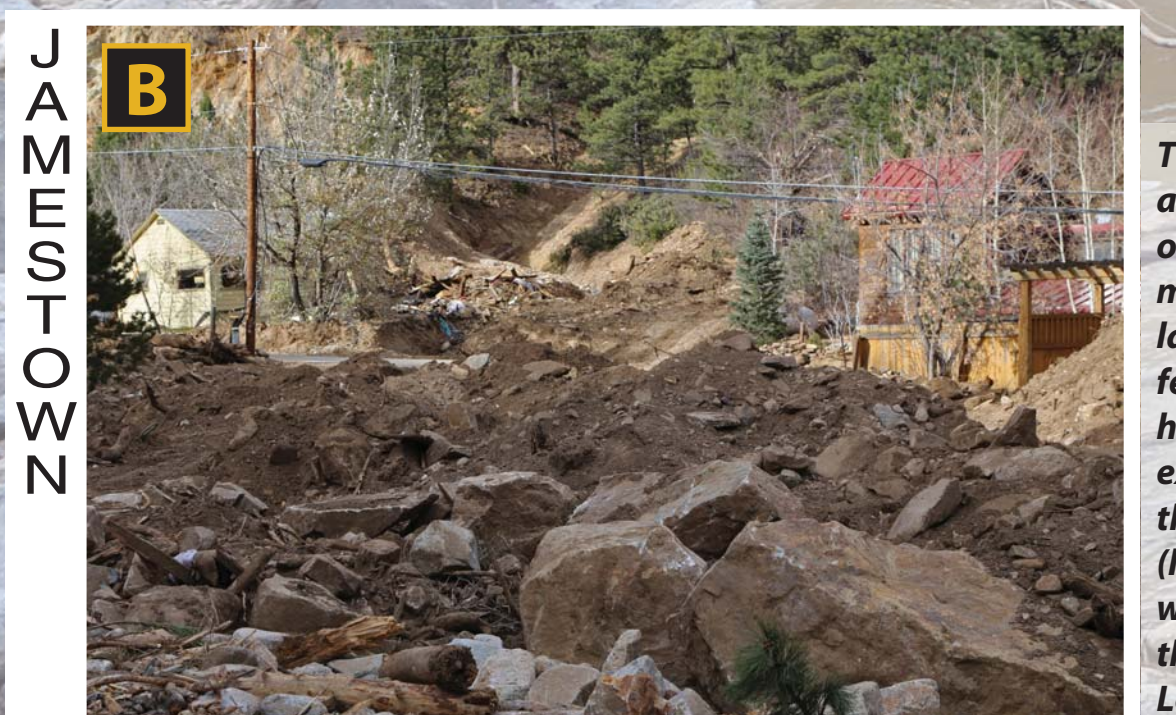
Initial source areas and run-out zones were calculated using Flow-R (Flow path assessment of gravitational hazards at a Regional scale; <http://www.flow-r.org/>), a MATLAB-based flow-path modeling program. The resulting areas were then subject to verification by professional geologists, and geoprocessing functions using GIS, to produce the final hazard polygons.

Limitations of this map relate to the scale of the mapping used to create the dataset and time limitations to conduct extensive field verifications. This map is for general planning purposes and should not be used to assign risk for a specific site or take the place of a detailed site-specific investigation.

The degree of susceptibility to a particular geologic hazard, in any given area, is related to ever changing natural and human-induced conditions. Any alteration in the balance of forces may increase or decrease susceptibility to a particular hazard. This map is based upon the current understanding of existing conditions.



A Levees created by a boulder-rich debris flow on the south side of Porphyry Mountain near Jamestown. The debris flow and associated fan deposits came within 100 feet of a residence. The homeowner reported hearing rocks colliding along with a low rumbling sound. Location 40° 7'13.57"N, 105°23'26.71"W



B JAMESTOWN

This bouldery debris fan was created by a fast-moving debris flow that dropped over 1000 vertical feet in less than 1/2 mile. The flow covered a portion of Overland Road near Jamestown with several feet of rocks, soil, tree limbs, and household debris; some of the rock fragments exceeded 8 feet in diameter. Tragically, the resident of the home on the west side (left side in the image) of the channel was killed when the rock-laden flow cut through the side of the structure. Location 40° 6'58.12"N, 105°23'22.76"W



C ABOVE JAMESTOWN

Debris flows that occur in steep areas where the colluvial soil cover is thin or absent and non-cohesive may scour their channels down to bedrock. These types of debris flows are typically fast moving, carry more sediment within the flow, and depending on the degree of coarseness of the entrained sediment, can be highly erosive. Location 40° 7'18.67"N, 105°23'42.44"W



D BOULDER CANYON

This debris fan along Boulder Canyon Road (Highway 119) impacted the rear of the home, causing half of the structure to move from its foundation. The fan also buried a portion of the parking lot. Location 40° 0'44.51"N, 105°17'50.02"W



E OLD STAGE RD HWY 7

Photos D and E- The combination of heavy precipitation, shallow soils, and steep hillsides often result in soil slips that may quickly mobilize into debris flows. These soil slips originated within thin colluvial soils that became saturated by heavy rainfall and began to flow down the hillside, just missing nearby homes. Location of photo D: 40° 5'42.90"N, 105°18'12.21"W
Location of photo E: 40° 2'43.54"N, 105°17'54.38"W



F FLAGSTAFF ROAD

A mixture of boulders, soil, and plant debris threatened the neighborhood below and caused a portion of Flagstaff Road to collapse. Like many debris flows, it occupied a drainage where debris flows have occurred in the past and will likely affect these areas in the future. Location: 40° 0'11.07"N, 105°17'32.55"W