Debris-Flow Deposits at the Mouth of Soldier Canyon, Pima County, AZ

by

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September 2008

Arizona Geological Survey Digital Map Series
Debris Flow Map 1B (DM-DF-1B)

Generalized Map Unit Descriptions

In deposits that are identifiable as either levees or snouts, the type of deposit is denoted by subscript letter: L = Debris-flow levees.
S = Debris-flow snouts

Modern debris-flow deposits (2006). Debris-flow deposits in Soldier Canyon emplaced in 2005. The decision to map these modern deposits occurred in late 2007, after significant channel alterations occurred on Soldier Fan adjacent to the Mount Lemmon Short Road. The location and extent of the 2006 debris-flow deposits adjacent to the Mount Lemmon Short Road are based mainly on photographs taken by the USGS and AGS in August and September of 2006. Deposits denoted with a question mark (?) have debris-flow characteristics but may be fluvial-related or re-worked.

Very young debris-flow deposits (latest Holocene to modern). Debris-flow deposits found in and adjacent to active channels near the mountain front and on upper portions of active alluvial fans. Clasts are fresh and unweathered. YD deposits generally are in or immediately adjacent to active debris-flow fan processes, so the extent and characteristics of deposits may change with flow events.

Young debris-flow deposits (middle to late Holocene). Debris-flow deposits found along banks and terraces of active washes typically 1-2 meters above channel floors. Fine-grained matrix sediments are generally absent from YF deposits leaving only clasts that appear fresh and unweathered. Vegetation typically is sparse on boulder levees and snouts.

Intermediate debris-flow deposits (early to middle Holocene). Debris-flow deposits found 2-3 m above active washes near the mountain front and 1-2 m above active washes farther away from the mountain fronts. YF deposits typically are fairly extensive on the upper portions of alluvial fans, but are confined to the valley bottoms along incised drainages farthest from the mountain front. Clasts are generally slightly weathered, with light surface oxidation and light rock fracturing. Clasts in Y1 deposits may be slightly buried from initial deposition and subsequent sedimentation, soil accumulation, or overbank deposition. Soil color varies from grey (10YR) to brown (7.5YR).

Older debris-flow deposits (late Pleistocene to early Holocene). Debris-flow deposits that are partially removed from active fluvial systems, either high-standing or laterally separate from younger deposits. Clasts are slightly to moderately weathered, lightly to moderately strongly oxidized, and commonly exhibit in place fracturing. Surfaces between boulders are slightly redbedded (7.5YR). In some areas clasts are partially to almost completely buried by younger deposits. Clasts from disturbed deposits often have thin, discontinuous carbonate coatings. In some areas Y1 deposits can be further classified into two types:

Y1. Highest standing debris-flow deposits.

Y2. Debris-flow deposits of similar age to Y1 below Y1 deposits.

Pleistocene debris-flow deposits, undifferentiated. - Debris-flow deposits that are either the highest, most weathered deposits in the landscape and have clearly weathered soil (1Y), or are undated deposits that have been buried by younger debris flows and exposed through subsequent erosion.

Boulder-bar deposits. - Elongate cobble and boulder dominated deposits. B deposits resemble debris-flow levees but are often partially buried or possibly reworked by fluvial processes. B deposits are often undated by the sediments either from initial deposition and subsequent abandonment, soil accumulation, or overbank deposition. B deposits were used to define downstream extent of paleo-debris-flow deposits in several canyons.

Description of Debris-Flow Deposit Boundaries

Contact, accurately located
Contact, approximately located
Contact, concealed beneath development

Location Map
