

What is Colluvium?

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Introduction

Despite being fundamental terms in Earth science, the definitions for colluvium and alluvium differ between disciplines, countries, and authors. Although the differences and overlaps of the various definitions cause many issues, the most important problem is that they hinder scientific communication and can result in misunderstandings. In geology and geomorphology, colluvium is most often defined by its location at footslopes and implies gravity creeping and/or mass movements. In soil science, distinguishing colluvium from alluvium for mapping purposes, especially in undulating landscapes, is difficult due to the multitude of definitions and the lack of clear field criteria.

The purpose of this poster is to raise awareness about this predicament and begin a compilation of scientists' perspectives on the respective definitions of colluvium and alluvium according to their disciplines.

Selected Examples of Colluvium Definitions

- Occurs at the base of steep slopes and was derived from them by rills, minor streams, sheet runoff, and mass movements. Distinction between alluvium and colluvium is based largely on topography. Alluvium is mapped where the surface of the deposit slopes parallel with the main drainage. Colluvium is shown when the surface of the deposit slopes from adjacent hills toward a main drainage line. (Flint and Denny, 1958)
- Unconsolidated material at the bottom of a cliff or slope, generally moved by gravity alone. It lacks stratification and is usually unsorted: its composition depends upon its rock source, and its fragments range greatly in size. Such deposits include debris and talus. (Lapidus, 1990)
- Loose, non-stratified, poorly sorted, heterogeneous mixture of various size grades found on the lower part and base of slopes. It is generated by three modes of transport: (1) overland flow occurs when the saturation capacity of the soil is exceeded during high rainfall; (2) soil movements involving splash creep as a result of rainsplash impact on frost creep; and (3) downslope displacement of soil as a direct result of ploughing (Kwaad and Mucher, 1979; Imeson et al., 1980). (French, 1992)
- Colluvium is poorly sorted debris that has accumulated at the base of slopes, in depressions, or along small streams through gravity, soil creep, and local wash. It consists largely of material that has rolled, slid or fallen down the slope under the influence of gravity. Accumulations of rock fragments are called talus. The rock fragments in colluvium are usually angular, in contrast to the rounded, water-worn cobbles and stones in alluvium and glacial outwash. (Soil Survey Staff, 1993)
- Detritus, transported by various processes, that is still adjacent to or on its source hillslope. (Pederson, 2000)
- Heterogeneous materials of any particle size, generally composed of soil and/or rock fragments, accumulated on the lower parts of slopes, transported there by gravity, soil creep, sheet flow, rainwash, mudflows or solifluction. (Eggleton, 2001)
- Natural hillslope deposit resulting from the gradual accumulation over short distances of upslope soil materials, saprolite or rock. Colluvium is deposited on the slopes perpendicular to the flow of rivers. They are frequently depleted in clay. (Larousse Agricole, 2002)
- Slope sediments. (Leopold and Völkel, 2007)
- Loose, heterogeneous regolith deposits formed by biologic activity, pedogenic processes, slope wash, creep and landslides. (Schulz, 2008)
- Materials transported over short distances by mass or by diffuse runoff. Their composition is close to the original materials. (Dunod, 2011)
- Unsorted mix of soil and mass movement debris. (Marsh & Kaufman, 2012)
- A sedimentary deposit composed of surface mantle that has accumulated toward the base of a slope as a result of transport by gravity and non-channelized flow. (Millar, 2014)
- (from Latin: co-, with, and alluvium). Footslope deposit. Relatively thin and made of elements which have undergone low transportation compared to alluvium. (Foucault et al, 2014)
- Unconsolidated, unsorted earth material transported under the influence of gravity, assisted by water, and deposited on lower slopes. (Schaetzl and Thompson, 2015)

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