



## **Gigantic landslides versus glacial deposits: on origin of large hummock deposits in Alai Valley, Northern Pamir**

Natalya Reznichenko

Durham University, Geography, Durham, United Kingdom (natashrez@gmail.com)

As glaciers are sensitive to local climate, their moraines position and ages are used to infer past climates and glacier dynamics. These chronologies are only valid if all dated moraines are formed as the result of climatically driven advance and subsequent retreat. Hence, any accurate palaeoenvironmental reconstruction requires thorough identification of the landform genesis by complex approach including geomorphological, sedimentological and structural landform investigation. Here are presented the implication of such approach for the reconstruction of the mega-hummocky deposits formation both of glacial and landslide origin in the glaciated Alai Valley of the Northern Pamir with further discussion on these and similar deposits validity for palaeoclimatic reconstructions.

The Tibetan Plateau valleys are the largest glaciated regions beyond the ice sheets with high potential to provide the best geological record of glacial chronologies and, however, with higher probabilities of the numerous rock avalanche deposits including those that were initially considered of glacial origin (Hewitt, 1999). The Alai Valley is the largest intermountain depression in the upper reaches of the Amudarja River basin that has captured numerous unidentified extensive hummocky deposits descending from the Zaalai Range of Northern Pamir, covering area in more than 800 km<sup>2</sup>. Such vast hummocky deposits are usually could be formed either: 1) glacially by rapid glacial retreat due to the climate signal or triggered a-climatically glacial changes, such as glacial surge or landslide impact, or 2) during the landslide emplacement. Combination of sediment tests on agglomerates forming only in rock avalanche material (Reznichenko et al., 2012) and detailed geomorphological and sedimentological descriptions of these deposits allowed reconstructing the glacial deposition in the Koman and Lenin glacial catchments with identification of two gigantic rock avalanches and their relation to this glacial deposits. Here are presented a new data on: parameters, extent and probable source for Lenin rock avalanche, travelled 24 km from the back wall of the Lenin Glacier over the glacial Achiktash hummock deposit covering more than 35 km<sup>2</sup>; updated data on Koman rock avalanche deposit, such as its extend and source; the first reconstruction of the Achiktash glacial material deposition with proposed landscape evolution during recent Quaternary in respect to the large landslide in the catchment.

Hewitt, K., 1999. Quaternary moraines vs. catastrophic rock avalanches in the Karakoram Himalaya, Northern Pakistan. *Quaternary Research*, v. 51, p. 220-237.

Reznichenko, N.V., Davies, T.R.H., Shulmeister, J. and Larsen S.H., 2012. A new technique for identifying rock-avalanche-sourced sediment in moraines and some paleoclimatic implications. *Geology*, v. 40, p. 319–322.