

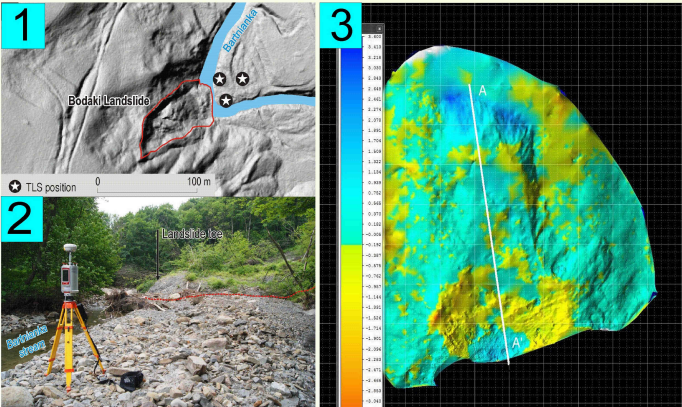
# Activity of Bodaki landslide (Beskid Niski Mts) in 2 years period using terrestrial laser scanning



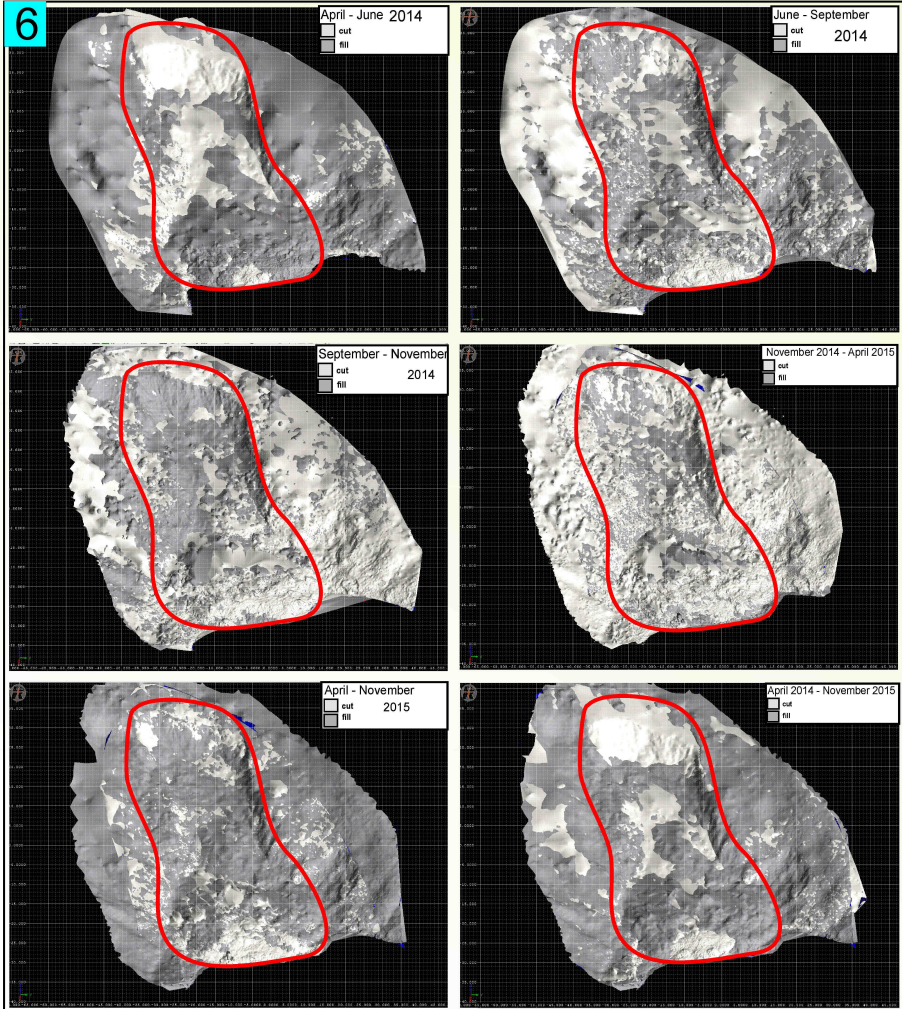
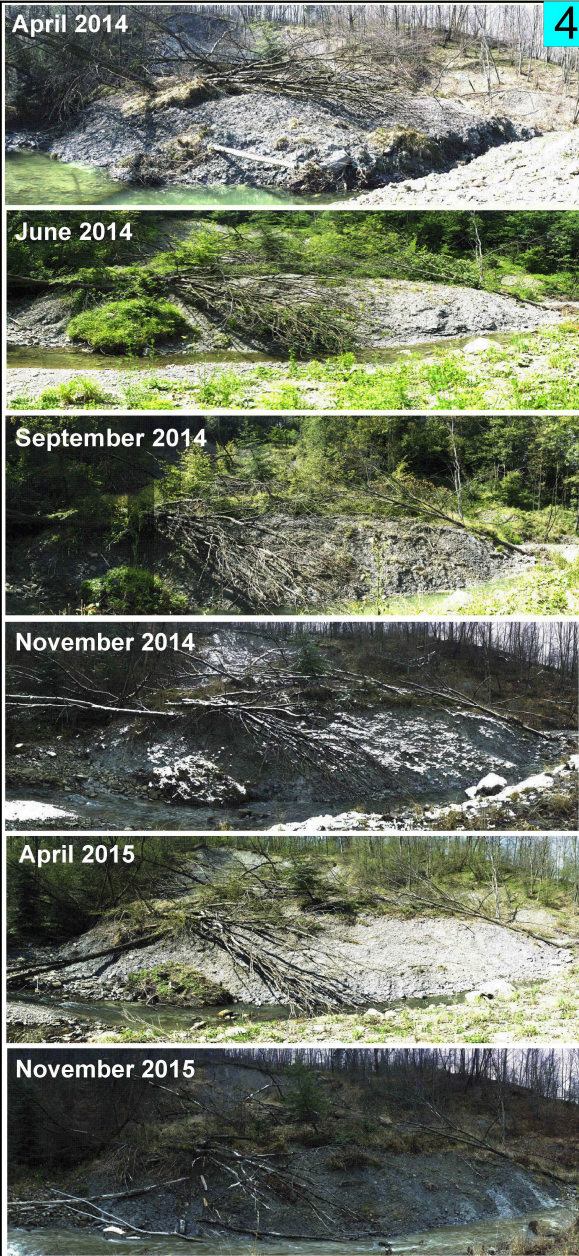
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**Introduction:**  
 The Bodaki landslide is located on the eastern slope of Ostra Góra (759 m a.s.l.) in the western part of the Low Beskids (49°34'50.7"N, 21°18'22.4"E) [1]. It lies in the northern part of Magura Nappe, known as Siary Zone, in this part composed of sandstones from Wątkowa, Inoceramus beds, and variegated shales (Kozarski 1976).

**Results:**  
 The measurements using terrestrial laser scanning (TLS) were taken in the part activated in the autumn of 2013, in an area of 3240 m<sup>2</sup> [2], 83 m long, 35 m wide, and mean slope angle of 17°. The activated landslide foot entered the stream channel, which blocked water flow, so that a small dam lake was created. For differential analysis we used four DEMs generated on the basis of scanning in April, June, September, November 2014 and April, November 2015 [3,4,5]. The largest differences were observed in April–June (2040 m<sup>3</sup> in total): 1972 m<sup>3</sup> of landslide material were removed and 68 m<sup>3</sup> were accumulated. The differences in volume of surface deformation in April–June accounted for 97% of the total changes recorded in 2014 in the studied part of the Bodaki landslide [6]. In the later periods, (November 2014–April 2015) loss of material from the landslide was about 300 m<sup>3</sup>.



Period	Changes in the volume of the material:		All difference between the different terrain models	Balance
	+	-		
April 14 – June 14	67,8	1972,2	2040	1904,4
June 14 – September 14	19,5	115,8	135,8	96,3
September 14 – November 14	31,2	53,4	84,6	22,2
November 14 – April 15	111,2	296,1	407,3	184,9
April 15 – November 15	134,7	348,8	482,7	214,1
April 14 – November 15	86,3	2483,5	2589,8	2397,2



**Summary:**  
 Activity landslides Bodaki during Spring 2014 - autumn 2015 can be classified into 3 periods:  
 A - very large dynamic within the whole landslides (removal from the landslide body about 2,000 cubic meters).  
 B - a period of stagnation: June - September - November 2014, little change, the erosion of the lateral tongue of the landslide by the stream Bartnianka.  
 C - the period reactivate November 2014 - April 2015 - November 2015. Large sums of precipitation in winter and frequent changes in temperature oscillating about 0° led to the re-activation of landslides. Large change across the landslides were observed for the period April - November 2015 despite the fact that in this period precipitation were small.