Geophysical Research Abstracts
Vol. 19, EGU2017-3550, 2017
EGU General Assembly 2017
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Large bedrock landslides clusters and geomorphological impacts along the northern margin of the Anatolian Plateau

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Mass movements and surface runoff are the main geomorphic processes controlling the erosion in the northern margin of the tectonically active Anatolian Plateau. In general, the northern margin of the plateau is characterized by extreme orographic precipitation and rapid uplifts in terms of climate and tectonics. Very few studies are available on the dynamic coupling between tectonics, climate, and erosion at the margins of the Anatolian Plateau, although this section of the plateau margin comprises most of the large bedrock landslides compared to other margins which can cause extensive and rapid topographic changes. This study tests the proposed concept that hillslopes adjust to rapid uplift and bedrock incision through an increase in the rate of relief-limiting landsliding rather than gradual slope steepening by investigating the relationship between mean local relief, which I take to be a proxy of long-term erosion rates, and the occurrence of 1290 large (> 1km2) bedrock landslides (n. 1290) over an area 260,406 km2 in the northern margin of the Anatolian Plateau. I found that large landslides have concentrated in three main zones and two of these peak areas of landsliding corresponds to the steepest 6% slope of the topography, where relief is close to its proposed upper strength limit. However, it has been presented that the other incompatible area is mainly located within the deformation zone of North Anatolian Fault, suggesting that the seismic shaking should be considered as an important factor, irrespective of whether threshold hillslopes have developed or not.

Acknowledgements
The author would like to thank the Scientific Research Projects Coordination Unit of Istanbul University (Project number: 54971 [3024]) for their financial support.