teleconnection index and the extreme rainfall was estimated for both the present time and future period.

The impact of landslides to the landscape evolution in the island of Andros

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This paper presents the impact of landslide phenomena to the landscape evolution of Andros Island. The morphology of Andros Island,was highly affected by tectonism (extensional deformation) in combination with the highly weathered metamorphic rocks of the Cycladic metamorphic massif. These are the two main reasons for the landslide phenomena in the island. The landslides on the island have a specific distribution following the slopes with high angles. These are located on high altitude areas very close to the major tectonic structures, or on the side slopes of highly eroded valleys due to the running water action. The results of the fieldwork and the terrain analysis showed that the landslides are divided into three distinctive groups, corresponding to their scale and their formation conditions. The oldest (1st) group of landslides affects very large parts of mountain slopes that have been moved downwards due to driving forces connected with the tectonic evolution of the area and the deformation faults, but also with the action of weathering and erosion processes. The geological formation of the slope parts is responsible for the generation of the intermediate (2nd) group of landslides. All landslides included in this group of mass movements are manifested in sites which consist of schists with marble intercalations and marble bodies. These formations are intensively fractured. The youngest (3rd) group includes all the synchronous landside phenomena. These landslide phenomena, which affect linear technical works and urban areas, are connected with the geomorphologic conditions, climatic regime as well as human activities, and are presented in many places over the island, mainly during of high precipitation periods.

Application of geological mapping and teledetection techniques for identification of olistostromes and olistoliths in the Outer Carpathians

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Olistostromes formed in the Outer North Carpathians during different stages of the development of flysch basins are quite frequent. They are known from the Cretaceous, Paleogene and Miocene flysch deposits of the main tectonic units (the Pieniny Klippen Belt, the Magura, Dukla, Fore-Magura, Silesian, Subsilesian and Skole nappes and from the Miocene molasse of the Carpathian Foredeep). Detailed field mapping enabled the identification of new localities with olistostromes and large olistoliths. In the inner zones of the Silesian Nappe they were found within the Lower Cretaceous deposits of the Hradište Formation in Żywiec, the Upper Cretaceous Godula Formation in the Silesian Beskid Mts., Late Cretaceous and Middle Eocene in Rożnów Lake surroundings. Olistostromes with large olistoliths, or occasionally olistoplaques, within and above the Oligocene-Early Miocene Krosno Beds occur near Gorlice and Skrzydlna. The Paleogene and Early Miocene olistostromes have been found in the Subsilesian Nappe and olistostromes composed of

Upper Cretaceous, Palaeocene, as well as Oligocene and Miocene strata, were identified in the Skole Nappe. In the Bystrica Subunit of the Magura Nappe olistostromes of Middle Eocene and probably Late Oligocene–Early Miocene age were mapped. In the course of a recently conducted detailed field mapping it was found that large portions of the Pieniny Klippen Belt consist of huge olistostrome bodies.

In some cases, studies of the geological maps also helped to identify olistoliths and olistostromes. The presence of single olistoliths is manifested by single "spots" that remain in lithological and/or stratigraphical contrast with the surrounding strata. Olistostromes create a random (spotty) texture remaining in contrast with ordered linear texture of the surrounding flysch strata. Revision of geological maps revealed that, e.g. the so-called Fore-Magura thrust-sheet between Koniaków and Żywiec is not a separate tectonic unit but a sequence of the Krosno Beds of the Silesian Nappe containing two or three levels of olistostromes as well as solitary olistoliths. East of this area, between Andrychów and Myślenice, numerous individual olistoliths have been recorded within the Krosno Beds. Field observations reveal that these olistoliths are usually associated with debris-flows.

The teledetection techniques (geological interpretation of aerial photographs, satellite images, radar images, condensed contour maps and DEM - Digital Elevation Models) were used by the present authors to identify olistostromes and olistoliths. At first, images of known olistostromes and olistoliths were studied to find the remotely-sensed geomorphological features that would be helpful in the identification of olistostromes at other localities. Subsequently, on the basis of these experiences and relations between morphology of the terrain and the geological structure the authors attempted to identify previously unknown occurrences of olistostromes and olistoliths. The results are satisfactory if olistoliths consisting of rocks more resistant to weathering than the matrix of the surrounding olistostrome body. Such features are clearly observed on DEM and satellite images as random morphological patterns (mound-like texture). On the condensed contour maps olistoliths often appear as small closed ovals of contour lines, marking separate klippen which form hills or mounds. Especially pronounced appear megablocks of the Pieniny Klippen Belt in Poland and Slovakia which are huge olistoliths of the Middle Triassic-Lower Cretaceous carbonate and siliceous rocks embedded within the Cretaceous-Palaeogene flysch of the Złatne Successions in the vicinity of Haligovce village (eastern Slovakia) and the Middle Jurassic-Early Cretaceous limestone olistoliths in the vicinity of Maruszyna (Poland). Spectacular are large olistoliths of the Upper Jurassic limestones of Štramberg and Pavlovské Kopce (Czech Republic) clearly seen on DEM and satellite images. E.g. an irregular mound-like structure marks the occurrence of the Middle Eocene olistostrome in the Bystrica Subunit of the Magura Nappe in north-east part of the Orava region.

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Territorial differentiation of natural recreation potential of Ukraine

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Natural recreation potential of Ukraine includes natural recreation lands, mineral waters, medicinal mud and medicinal raw materials for pharmaceutical industry. The value of country's natural recreation potential was estimated through money cost of free time spent outdoors for recreation; mineral waters and medicinal mud – through value of its exploited stock and on the basis of regional market prices. Average indices of natural recreation potential valuation per unit of territory and per inhabitant (the so-called territorial and economic potential productivity) were taken for 100 points.

With regard to geographical allocation of Ukrainian natural recreation potential (as based on materials of its map modeling), two tendencies are clearly observed: the first is the evidence that two major natural regions – Ukrainian Carpathians and Azovo-Chornomorske Uzberezhzhia (Azov-Black Sea Coast) – accumulate over the half of the initial natural