



IGU 2014 Book of Abstracts
IGU2014 – 1201

The landform geodiversity assessment method – a comparative analysis for Polish and Swiss mountainous landscape

Najwer A., Zwoliński Z.

Institute of Geoecology and Geoinformation, Adam Mickiewicz University in Poznan

As an example of applying geoconservation results in landscape studies and environmental conservation one can refer to the problem of the landform geodiversity. The concept of geodiversity was created relatively recently and, therefore, little progress has been made in its objective assessment and mapping. Considering this it is essential to develop a universal method giving good results for different types of landscape or similar areas e.g. according to the landform energy but at the same time differing in morphogenesis.

The main objective of this presentation is to demonstrate a new methodology for the assessment of the selected natural environment components, visualization of the landform geodiversity using the opportunities offered by the geoinformation environment and especially comparison of the obtained results for Polish and Swiss mountainous landscape. The study area consists of two peculiar alpine valleys: Illgraben and Derborence, located in the Swiss Alps as well as similar from the morphometry point of view Sucha Woda valley in Polish part of Tatra Mountains and Wrzosowka valley in Sudety Mountains. All of the above research areas are under protection and recognized as geosites of national importance.

The basis of the assessment is the selection of the appropriate geomorphometric parameters. As a sample the following parameters with distinct contribution to the geodiversity were prepared for each area: General Curvature, Topographic Openness, Potential Incoming Solar Radiation, Topographic Position Index, Topographic Wetness Index, Convergence Index, Relative Heights. Input maps were then standardized and resulted from map algebra operations carried out by multi-criteria evaluation (MCE) with GIS-based Weighted Sum technique. Weights for particular classes were calculated using pair-comparison matrixes method. The final stage of deriving landform geodiversity maps was the reclassification procedure with the use of natural breaks (Jenks) method.

The final maps of landform geodiversity were generated with the use of the same methodological algorithm and multiplication of each factor map by its given weight. However, the results that were obtained were radically different. The obtained maps were reviewed during the field exploration with positive results, which gives a basis to conclude that the methodology used is correct and can be applied for other similar areas but at the same time the research results also led to a conclusion that the accuracy of the obtained maps is strongly influenced by: the quality of the source data and the cell size of the basic assessment. Therefore, it is essential to establish certain standards, guidelines,

IGU Regional Conference, Kraków, Poland
18-22 August 2014



depending on the target spatial scale of the intended studies. For future reference it is essential to develop and test an algorithm that could be successfully used for both areas: with high landform energy – such as high mountains, as well as lowland areas - with potentially low geodiversity.