CO-197

AN INFLUENCE OF SPATIAL RANGE OF INPUT DATA SET ON TERRAIN RELIEF FORM CLASSIFICATION HOMOGENEITY FOR GLACIAL AREA

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Geographical space is very complex and described by many features. The same situation we have for geomorphological space. Statistical methods can be helpful to describe geographic phenomena and analyse many features at the same time, especially these with ability to be applied in multidimensional analyses.

In this article, author describes an experiment that lies on comparing a classification of periglacial areas containing the glacial area itself to a classification of the same area, but excluding the glacial area. The most important question to answer was: does this exclusion influence the final classification result? If so, what is the strength of this influence and does the difference spread to all dimensions or is it accumulated in one parameter only?

The experiment was run as a comparison between results of two morphometric classifications of SW Spitsbergen (Svalbard). The basic area size is 15 km x 18 km. The subarea of SW Spitsbergen was obtained by cutting out the part containing lakes and glacier. It is about two times smaller than the first one. An input data was described by five morphometrical variables (relative elevation, slope, aspect and plan and profile curvature) obtained from DEM with resolution 10 m x 10 m in ArcGIS software. To eliminate extreme values and unexpected fail median filter was applied for variables.

Because of non symmetric distribution for relative elevation, slope and aspect k-median classification method was used. Manhattan metrics was used instead Euclidian metrics because of aspect which is a directional variable.

For classification of area W1 the number of groups was delimited from 4 to 9. For area W2 the range was between 3 and 8 groups. Both results were compared both visually and in statistics view. A further, more detailed analysis was described for classification results for 5 and 7 groups of W1 compared to results for 4 and 6 group of W2.

Standard deviation for variables in W2 is usually lower than in W1 what allows deducting, that classes in W2 classification are more homogeneous than in W1 case. This trend is more remarkable for $k = 6$ than for $k = 4$. The difference of standard deviation for all variables in both areas is on similar level. Therefore, none of the morphometric variables used can be indicated as the most responsible for homogeneity increase.

It is important for clustering that input data should be properly prepared. All areas like waters, forests and others not being in the scope of interest should be excluded from the analysis. Otherwise, they will decrease homogeneity of result classes and therefore, decrease the usefulness of the classification itself. Further planned researches on k-median method on this area are to analyse the influence of particular morphometric parameters on classification results.