Automated Classification of Climate Regions for complex Climatology Classification in GIS Environment

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With the development of the automated processing of climatological maps became actual problem of automated classification of climate regions. In our presentation some methods for solutions of this problem are presented using both GIS environment and some external statistical procedures. We demonstrate these methods for the case of Quitt's climate classification (1) for the Czech Republic, period 1961-2000.

Quitt's classification is based on combination of following 14 climate characteristics: Number of summer days, Number of days with mean temperature 10˚C and more, Number of days with frost, Number of ice-days, Mean January temperature, Mean July temperature, Mean April temperature, Mean October temperature, Mean number of days with precipitation equal to 1 mm and more, Sum of precipitation in the vegetation period, Sum of precipitation in the winter, Number of days with snow cover, Number of cloudy days, Number of cloudless days. These characteristics are then grouped into several not disjunct classes, e.g. 8 classes for Number of summer days. Classification distinguishes 3 regions: cold, moderately warm and warm. Cold region is divided into 7 units, moderately warm into 11 and warm into 5 units. Originally this classification was computed for period 1901-1950. It was based on average values of pixels 3x3 km. The borders between units (or/and regions) were hand-made designated on the base of the number of changes of climate characteristics classes (the border was highlighted where the greatest number of changes occurred).

We demonstrate here a way to create an automated climate classification maps in GIS environment (for grid of 500x500 m). For creating of borders between regions and units we used fuzzy-methods.

[1] **Quitt,E**. Climatic regions of Czechoslovakia, *Stud.Geograph., NO. 16, Czechoslovak Academy of Science – Institute of Geography, Brno, 1971, 79 pp, 1 map*