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**Rozkład przestrzenny wybranych wskaźników
kontynentalizmu klimatu
w Europie w świetle różnych metod interpolacji**

The spatial distribution of selected indicators of climate continentality in Europe
in view of different interpolation methods

Praca doktorska wykonana w Pracowni Geoinformacji WNoZiGP UMCS

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Streszczenie / Summary

The paper presented the spatial distribution of the indicators of climate continentality in view of different interpolation methods. It was assumed that the results of the spatial interpolation of indicators of climate continentality carried out and based on different theoretical assumptions will differ from each other, which leads to differences in the interpretation of the climate continentality phenomenon in Europe. Furthermore, it was also assumed that multi-dimensional methods would give better results than the one-dimensional methods in modeling and presentation of spatial distribution of climate indicators. Climate continentality indicators were treated as regionalized variables and their spatial distribution was modeled using a residual kriging algorithm. The purpose of this work was to investigate the differences between the spatial distributions of selected indicators of temperature and pluvial indicators of climate continentality in Europe, resulting from the application of different interpolative methods and characterize how the interpolation results are different from the input data.

Analyses were carried out for 595 synoptic meteorological stations in Europe. Meteorological data, which were used to calculate climate indicators, were provided from the NOAA GSOD database and the German meteorological service Deutscher Wetterdienst (DWD). Selected thermal continentality indicators were: Gorczyński (1920), Iwanow (1953), Ewert 2nd (1972). The pluvial indicator chosen in this work was made by Vemić (Mączak, 1959). The following interpolation methods were chosen: Inverse Distant Weighting, Universal Kriging, Regularized Spline, Multiple Linear Regression, Geographically Weighted Regression, Residual Kriging of multivariate regressions and multivariate regressions composed from principal components (as an auxiliary variables).

The spatial distributions of the three thermal and one pluvial indicators of climate continentality presented in this work varies. The results of the spatial interpolation of these indicators, which were carried out and based on different theoretical assumptions, differ from each other.

The choice of interpolation method is very important. It should be done by careful selection, because the differences between the methods may be so large (~ 10% of the continent) that they can lead to an incorrect interpretation of the examined characteristics of climate. The biggest differences in the results of the interpolation of indicators of climate continentality were recorded in upland and mountain areas. Using residual kriging of local and global regression resulted in closeness of estimated values to observed data.

Also, the nature of the interpolated indicator (thermal, pluvial) is causing the difference. Precipitation (especially pluvial indicators) as a discontinuous phenomenon is a specific variable to interpolate. Temperature and thermal indicators, due to the continuity of this phenomenon, make it easier for scientist to perform interpolation. It's easier to select the explanatory variables of created models.

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