

# THE METHOD OF PRESENTATION OF THE LAND USE CHANGES BASED ON CROSS-TABULATION MATRIX

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A map of changes in situation on the ground was always a cartographic problem and it is still not solved definitely even with cartographic animations. It is possible however to present actual state together with changes on one map with the legend in the form of cross-tabulation matrix.

The idea of the method is to express changes in situation on the ground with the set theory. Both initial and final states are considered as sets of area elements which can be summed, subtracted or their common area found.

Two examples will be presented on the poster. One is showing the arable land near Tarnobrzeg changed into area of opencast mining. Second example shows changes in metropolitan area of Warsaw in years 1990 - 2000 on the base of Corine land cover data.

These two examples results from studies of changes in land use in the Tarnobrzeg region between 1937 and 1992, on the basis of data through the interpretation of topographic maps and satellite images. The analysis has been carried out using the overlay method and the cross-tabulation matrix, which have enabled the study of the transition of land use elements into other elements. This analysis has also allowed for the evaluation of the extent of changes in land use, expressed by means of the accuracy coefficient kappa.

Digital database covering land use in the Tarnobrzeg region in 1937, 1977, and 1992 has been created. This allowed for preparation of uniform land use maps for the years 1937, 1977 and 1992 as well as a final map showing changes in land use between 1937 and 1992. Land use changes have also been presented by the overlay method and the and the assessment of changes in land use by kappa coefficient.

In conclusion it is noticed that the result obtained by analyzing changes in spatial data concerning land use confirm the usefulness of the overlay method in this type of study. The cross-tabulation matrix allows for the precise analysis of the transition of individual element. The accuracy coefficient kappa shows changes in the matrix as a single value.