A unified, national soil type map with spatially consistent predictive capabilities was compiled applying traditional and newly tested Digital Soil Mapping classification methods, segmentation of a synthesized image consisting of predictor variables and multi-phase, sequential classification by Classification and Regression Trees, Random Forests and Artificial Neural Networks. Object based classification using spatial-thematic segments was applied to define mapping objects. Classifications were carried out on two levels to achieve better results. Performance of classifiers was continuously assessed and applied for the identification of best performing predictions, which were combined for the production of the final map. Evaluation of the results showed that the object based, multi-level mapping approach performs significantly better than the simple classification techniques. The importance of the newly prepared map could actually be evaluated from the practical point of view. This is the first countrywide soil type map that unifies expert inputs and databases from both the agricultural farmlands and forested areas. As a consequence, this map can be equally used for agricultural or forestry oriented purposes providing interoperability between the sectors. Because of the robustness and huge data background, the map is suitable to be involved in nationwide spatial and land use management planning.

None of the models overperformed 62% accuracy. However, by a proper combination we could finally produce 70% accuracy.

For forest area validation a collection of independent soil observations was set up from monographs, studies, and reports by using 65%.

"The final product: A unified, nationwide soil type map with spatially consistent predictive capabilities.

The NÖFI database was used for forest related point data for soil type and texture class. The point data were weighted with the "Point Grid" (2007). The Hungarian Soil Survey was completed by Hungarian Soil Information System (HARSIS) surveys.

The Hungarian Soil Survey (HSS) was carried out between 1875–1975 by the Hungarian Academy of Sciences, Agriculture and Innovation Centre, National Institute for Soil Sciences and Forests and the Institute for Soil Sciences and Plant Nutrition (HUNGAROCH). The method of soil investigation followed the FAO norms: soil was sampled from the plough layer (~10 cm), 30 cm and 50 cm depth. The soil samples were collected from each field plot (1000 m²) from the economic land use related to each soil type. The data were collected from all 16 soil types, the soil type collection gave a point database of ~1,600 points. The soil data were used for mapping in 1987.

The Hungarian Soil Information System (HARSIS) was developed by the Institute for Soil Sciences and Plant Nutrition (HUNGAROCH) and the National Scientific Research Foundation (OTKA, Grant No. K105167). The database of the HARSIS includes soil type and texture data from various sources.

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