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GIS based surface erosion model of Lithuania

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Surface runoff and soil erosion are major threats to sustainable agriculture, therefore, assessment of the erosion risk is increasingly needed for land use management. The erosion results from the interaction of different factors. GIS techniques allow effective integration of the large amount of data and different parameters of various formats for calculation of the erosion potential of the region. The field and laboratory experiments provide a base for calibration of impact of particular parameters in the erosion process (e.g. soil type, slope steepness, aspect and length, etc.) that were accordingly incorporated into GIS program. The digital maps of soil type, subsoil lithology, land cover, and relief model were applied to calculate the erosion rate model of Lithuania. The potential shows distinct variations across the country. The erosion rate ranges from $<$0.1mm/year to 3.5mm/year. The minimum values ($<$1mm/a) are identified in the eastern, southeastern, central and southwestern Lithuania. The high erosion potential is identified for the uplands and essentially on the river valley slopes. The main advantage of GIS tools is a possibility of using detailed maps for very large areas. The accuracy of calculations is depended on the input data only and details are not lost even when analyzing large territories. Moreover, the model can be easily updated as more information is collected.