RECARE
Preventing and Remediating degradation of soils in Europe through Land Care

RECARE MSc / PhD Research Information

Research Title

PARAMETRIZATION OF RAINFALL-RUNOFF PROCESSES IN RAINFALL-RUNOFF MODELS FOR THE DETECTION OF ANTHROPOGENIC CHANGES IN A FLOOD REGIME

Abstract

Nowadays extreme flood events in a changing natural environment are becoming more common. This increases the need to improve the flood protection of catchments. In this context, hydrological models, especially conceptual rainfall-runoff (r-r) models, are widely used. These models provide powerful and robust tools for water managers in solving many hydrological problems, such as the management of water systems, flood risk management, flood forecasting according to changes in land use evaluations, etc. The research is oriented towards the study and development of physically-based and conceptual schemes of parametrization processes in r-r models (for example, the TUW – "Technische Universität Wien" model, HBV model, etc.), which are capable of the simulation of anthropogenic impacts on extreme runoff from precipitation in small basins (the Myjava catchment) in the specific physiogeographic conditions of Central Europe. In this investigation the processes of evapotranspiration, interception, infiltration, accumulation of snow melt, formation of the individual components of runoff (surface, subsurface, underground) as well as the transport of soil particles in basins will be parametrized. The methods for the parametrization of these processes will be based on knowledge of the properties of vegetation, soil, and topography. The research should bring new knowledge to the field of regime changes and the occurrence of extreme runoff from precipitation in small basins of Central Europe.

Objectives of the research

An overview of the steps in the research: (i) inventory of existing data (terrestrial scanning and photogrammetric mapping), (ii) the development of the structure of the r-r model environment's parametrization, (iii) the development of parametrization schemes for the model modules, (iiii) the validation of the parametrization schemes developed for past and present conditions, (iiiii) the testing of the land management methods, (iiiiii) proposed scientifically-based measures.

RECARE study site

Myjava catchment, Slovakia

Partners in this research

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