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Investigation of the spatial distribution of the maximum water retention capacity of soil in a small river basin

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The maximum water retention capacity of soils is crucial for runoff generation, flow regime and hence also for the watershed behaviour during rainfall events. High infiltration rates of soils lead to a decreased in peak discharge reducing flood risk in river basins. In catchments where agricultural lands are prevailing, American Soil Conservation Service (SCS) - Runoff Curve Number Method is widely used for estimate surface runoff. The method requires catchment characteristics (hydrologic soil group, land use, vegetation cover, soil conservation measures, antecedent soil moisture conditions) which are the basis of catchment runoff determination.
The main objective of the presented study is the determination of the spatial distribution of the retention parameter "S" of the CN method. The evaluation and comparison of the spatial distribution pattern of the S-value in the sub-basins is the basis for an examination of the suitability of the CN method to explain different hydrologic behaviour. The study area is the Celone river basin, a small catchment located in the South of Italy. Two methods were used to calculate the S-value for the Celone river basin. In the first approach, the S-value of the CN method was evaluated by means of the Soil and Water Assessment Tool, which is an integrated river basin model. In the second approach, a GIS procedure was used. This two different methods were used to achieve the best possible spatial differentiation of the water retention capacity and thus looked for a suitable method. The achieved results of the investigation of the spatial distribution of the maximum water retention capacity are presented and documented.