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Conditions of the surface runoff dynamics in the light of field experimental research

ABSTRACT

In the conditions of observed climate changes and increasing anthropopressure, an increased frequency of extreme events is noticeable. Precipitation is increasingly characterized by high intensity and short duration. Short-term, intense rainfall poses a threat in urbanized areas as it may contribute to generating flash floods. As a result of intense rainfall surface runoff may form in urban areas due to their significant percentage of impermeable landcovers. This research aimed to identify the conditions of surface runoff and its dynamics depending on the rainfall category, type of landcover and initial soil moisture conditions. The first stage was the identification of pluvial conditions in the study area. Particular attention was paid to extreme rainfall in the Poznań agglomeration. Then, a field research station with a rainfall simulator was designed and constructed. The third stage of the research was to plan and conduct a series of field experiments to investigate the dynamics of surface runoff during various rainfall events. The last stage was the interpretation of data obtained in the field by calculating the water balance of the research station in volume and percentage terms. Surface runoff dynamics curves were also developed and then described using a set of appropriately defined descriptors.

Keywords: surface runoff, extreme events, testing plots, field experiment, rainfall simulator