Snowmelt Floods after Rain-on-snow Events in a small lowland Catchment

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Snowmelt periods and floods in a small agricultural river catchment (23 km^2, Mazowian Lowlands, central Poland) have been investigated with the aim of recognizing relationship between air temperature and snowmelt process. The research was carried out during winter seasons between 2002 and 2007. The deep of snow, water equivalent, temperature of air, ground and water; discharge of water were measured at Czarna gauging station on Zagozdzonka river. Maximum and average discharge, total volume of runoff, surface runoff, underground runoff, suspended sediment concentration and total mass of transported sediment were calculated for each flood. Analysis of changeability of air temperature and meteorological conditions shows that the process of freezing and refreezing of snow depends on air temperature, especially maximum daily temperature. If the temperature is over 0°C even for few hours during the day snowmelt appears and the process can be stop when the temperature decreases, which is noticeable in the hydrograph. On Zagożdżonka catchment warming and thawing mostly appears with the rain, so all analyzed spring floods were snowmelt-rainfall ones. Results: 11 snowmelt periods was recorded with the duration: 1 day -3 events, 2 days-2 events, 4 days- 4 events, 8 days – 1 event, 10 days – 1 event. The water equivalent at the beginning of each snowmelt period fluctuated between 80- 26 mm, total daily rainfall for each snowmelt period was measured as 0.5-38.8 mm and maximum air temperature was 0.4-15.1^{o}C. Maximum discharge during the flood fluctuated between 1.1-3.4 m^3/s, average discharge: 0.09-1.2 m^3/s, total volume of runoff: 33.9 – 399*10^3 m^3. The data from Zagożdżonka river demonstrated the individuality of

snowmelt floods and show how important role in runoff generation play rain-on-snow conditions. The snowmelt depended from maximum air temperature more than from average daily temperature.