

Natural Environment Monitoring
2017, No 19(1), 31-39

CONDITIONS AND FUNCTIONING OF THE RÓŻANY STRUMIEŃ CATCHMENT
GEOECOSYSTEM IN POZNAŃ IN THE 2016 HYDROLOGICAL YEAR

Maciej Major, Mikołaj Majewski, Małgorzata Olejarczyk, Małgorzata Zięba

Key words: the Integrated Monitoring of the Natural Environment, Różany Strumień catchment, anthropogenic pressure, air pollution, chemical composition, surface and underground water

Summary

The Różany Strumień Station is the first Base Station under the Integrated Monitoring of the Natural Environment (IMNE) in Poland which is located within a large urban agglomeration and characterised by heavy anthropogenic pressure and the 2016 hydrological year was the first measurement year in the Różany Strumień catchment under the IMNE. The analysed catchment area – located in the northern part of Poznań – is urban in its character. The entire catchment, covering an area of 7.7 km², is sloping south-east to the Warta Valley. The length of the main watercourse amounts to 6.9 km. The catchment area represents a typical young glacial landscape and is located within the marginal zone of the Poznań stadial under the Baltic Glaciation. The research studies in the Różany Strumień was conducted on the grounds of testing plots situated throughout its area. The measurement system and the applied methodology of field research were based on the methodological assumptions for the system operation as well as the objectives and measurement schedule set for the Integrated Monitoring of the Natural Environment. 2016 was a very warm year; its average annual air temperature at 10.2°C was higher by 1.5°C than the multi-year average value for the Poznań-Ławica IMGW PiB [Institute of Meteorology and Water Management/State Research Institute] Station for 1966–2015. The annual precipitation amounted to 652 mm and accounted for 126% of the annual average of this multi-year period. Its precipitation was characterized by a typical annual runoff with predominantly summer rainfall. It can be said that throughout the year nitrate ions had a higher share within precipitation acidogenic factors. Their largest share occurred in April and the smallest one – in August and October. Moreover, in 2016, the highest (third) level of nitrogen saturation was identified. Each month NO₃ concentration was over 50 µeq•dm⁻³. Waters in the Różany Strumień catchment were characterised by a slightly alkaline pH (its annual weighted average at 7.91) and electrolytic conductivity at 94.55 mS•m⁻¹ on average. In terms of the quality of surface waters in 2016, seven of the twelve indicators (reaction, sodium, magnesium, potassium, sulphate sulphur, nitric nitrogen and ammonium nitrogen) were classified into the 1st class, one indicator (phosphates) to the 2nd class and four indicators (electrolytic conductivity, calcium, hydrogen carbonate ions and chlorides) to the 3rd class. The research studies on these underground

waters and their chemical composition showed that most of the analysed parameters were classified to the 1st or 2nd purity class; water was classified to the 3rd class in the case of calcium content only. The hydrogeochemical type of groundwaters was specified to be twocomponent bicarbonate-calcium. Measurements to be conducted in the following years will make it possible to show some causeeffect relationships, trends on changes of the selected components within the geographical environment and formulate short- and long-term forecasts.