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SEASONAL VARIATION OF PHYSICO-CHEMICAL PARAMETERS IN THE DRINKING WATER SUPPLY NETWORK OF SATU MARE CITY, NW ROMANIA

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Abstract

We assessed the variability of the main physico-chemical parameters of drinking water: oxidability, turbidity, conductivity, water hardness, free chlorine concentration, chlorides and nitrates across the four seasons (Spring, Summer, Autumn of 2013 and Winter of 2014). We collected data from several points in the supply network of Satu Mare city, NW of Romania, where the source of drinking water is groundwater.
The results revealed significant higher average values in spring for some of the considered parameters such as oxidability, turbidity, water hardness, free chlorine, chlorides. The lowest average values of these parameters were registered in winter for oxidability, turbidity, chlorides and water hardness while the lowest values of free chlorine were in summer.
At the entrance of the distribution network the average values of the considered parameters were: oxidability 0.257 mg O_2/L in spring while in winter was 0.157 mg O_2/L, turbidity in nephelometric turbidity units (NTU) was 0.42 in spring and 0.08 in winter, water hardness in German degree was 9.92 in spring and 8.165 in winter, the content of chlorides was 5.98 mg/L in spring and 4.96 mg/L in winter. Free chlorine showed the highest value of 0.4 mg/L in spring and the lowest in summer (0.2 mg/L).
Our study contributes to adding new data about the seasonal variability of the parameters of drinking water from groundwater in a temperate region. In addition, we built mathematical models to capture this seasonal variability through nonlinear functions. We hope these models will be useful in predicting seasonal variability of the parameters of drinking water.

Key words: groundwater, mathematical modeling, residual chlorine, seasonal variability, turbidity

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