

EGU24-1425, updated on 17 Mar 2025

<https://doi.org/10.5194/egusphere-egu24-1425>

EGU General Assembly 2024

© Author(s) 2025. This work is distributed under the Creative Commons Attribution 4.0 License.



Occurrence of drought in groundwater over the last 12 years

Valeria Slivova and Michaela Kurejova Stojkova

Slovak Hydrometeorological Institute, Jeseniova 17, Bratislava, Slovakia (valeria.slivova@shmu.sk)

Groundwater is a very important component of water circulation in nature, it is indispensable in every country's wealth. Ensuring protection of its sustainable use is the most important requirement for preserving the quality of life, health of natural conditions and economic development of each sector. Groundwater is the main source of drinking water in Slovakia. This contribution assesses groundwater drought occurrence recorded at 207 objects in the Slovak groundwater monitoring network. This comprises 141 groundwater level boreholes and 66 spring yield gauging stations. The Sandre method was used for this assessment. This method is based on a statistical comparison of the average monthly values of the hydrological year evaluated with the long-term monthly average over the reference period 1981-2010. For each month of the reporting period, five separate categories are established on the basis of the statistical treatment of the average monthly values of spring yields and groundwater levels. The period of the last 12 years (2011-2012) has been evaluated.

The results show that 3 years (2012, 2019 and 2022) were assessed as the dry years, 3 years were assessed as wet (2011, 2013 and 2021) and 6 years were assessed as average (period 2014 - 2016, 2018 and 2020). Within each years, groundwater drought occurred most frequently in winter, spring and summer. The main source of groundwater is the spring melting of snow. In the last years we can see, there is earlier melting of the snow as a result of warm winters and has been a lack of snow cover in the lower positions in the Slovakia. These are the main causes of the occurrence of droughts in groundwater in the winter and spring period. During the summer period, groundwater drought is caused by high evapotranspiration and rainfall deficits. The occurrence of local storms does not have a significant impact on the replenishment of groundwater resources.

Keywords: groundwater drought, rainfall deficit, spring yield, groundwater level

