RISK ASSESSMENT OF DRYING UP OF SMALL STREAMS IN THE CZECH REPUBLIC

ZAHRADKOVA, S.[1,2]; HAJEK, O.[2]; TREML, P. [1]; PARIL, P. [1,2]; STRAKA, M.[3]; NEMEJCOVA, D.[1]; POLASEK, M.[1,2]; ONDRACEK, P. [4]

[1] TGM Water Research Institute, p. r. i., Prague and Brno
[2] Department of Botany and Zoology, Masaryk University
[3] WELL Consulting, Ltd.
[4] ENVI-AQUA, Ltd.

Key words: drought — map — stream — precipitation deficit — land cover — benthic macroinvertebrate — bioindication — running water

A categorization of the Czech Republic territory in terms of the risk of drying up of small streams (1st to 4th order by Strahler) was proposed. Three levels of risk (low, medium and high) for basic hydrological units (catchment) were set. The risk levels were defined using selected abiotic characteristics of the hydrological units and their combinations. The selection of characteristics and their limit values were derived using a statistical method of classification trees. The set of sites divided into groups depending on whether they were found drying or not was evaluated. The drying up of streams was detected with the help of a new method of retrospective bioindication. This new method based on the analysis of benthic macroinvertebrates was developed within the comprehensive research of permanent and drying up streams between 2012 and 2015. Using that method 332 sites (1362 samples) located at small streams and monitored in the Czech Republic between 1997 and 2010 were evaluated. The degree of risk was derived from the following characteristics: the precipitation deficit, land cover type, the share of rocks containing clays, geomorphological characteristics and the share of standing waters in the catchment. According to our assessment the area of low risk of drying up of streams up to 4th Strahler order represents 45.3% of the area of the Czech Republic, while the area of medium and high risk 23.3% and 31.3% respectively. Typical catchments with a high risk are those with a predominance of arable land and with the share of standing water bodies greater than 1‰. The proposed categorization is to serve as a basis for decision-making processes, particularly for the water resource management, agriculture and conservation.