

USE OF THE MACROMODEL DNS/SWAT TO CALCULATE THE NATURAL BACKGROUND OF TN AND TP IN SURFACE WATERS FOR THE RAC PARAMETER

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Abstract

Total nitrogen (TN) and total phosphorus (TP) get into surface waters from both natural and anthropogenic sources. Anthropogenic sources have been relatively well recognised but the natural emission of nutrients into the rivers, in the case of many catchments, remains a mystery. The paper describes the possibility of using a tool, the Macromodel DNS/SWAT (Discharge Nutrient Sea/Soil and Water Assessment Tool), to estimate the concentration and load of natural background (Natural Pollutant Concentration – NPC and Natural Pollution Load – NPL) for TN and TP and thus to specify the previously developed method of river absorption capacity – RAC. A variant scenario was developed allowing for a “virtual” change in the use of the area of an analysed catchment. This allowed the simulation of the amount of TN and TP in the waters of the main river, the Warta, in a situation where there was no anthropogenic phenomenon in the area. NPC and NPL results were obtained for six calculation profiles located on the central Warta main stream. On this basis, the total absorbency of the Total River Absorption Capacity – RACT River was calculated. The obtained results indicate an increasing pollution of the analyzed river on subsequent Surface Water Bodies (SWB). The values of RAC and RACT parameters for both TN and TP were reduced between the opening and closing profiles of the analyzed catchment by 2651 t/y (TN) and 86 t/y (TP), respectively.

Keywords: Natural background; Total nitrogen; Total phosphorus, RAC parameter, Macromodel DNS/SWAT.