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IDENTIFICATION OF NONPOINT SOURCE OF POLLUTION WITH NITROGEN BASED ON SOIL AND WATER ASSESSMENT TOOL (SWAT) IN QINHUANGDAO CITY, CHINA

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Abstract

The identification of the critical source of nonpoint source pollution (NPS) plays an important role in formulation of Best Management Practices (BMPs). SWAT (Soil and Water Assessment Tool) was adopted for NPS nitrogen pollution modeling for Qinhuangdao City. The model was calibrated and validated by Sequential Uncertainty Fitting Version 2 algorithm of SWAT-CUP (SWAT Calibration and Uncertainty Programs) software. The model was used to quantify contributions of different nitrogen sources to rivers total nitrogen (TN) load, and address the spatial-temporal distribution of NPS TN to river. The results show that Changli county, Funing county and Lulong county have the most quantity of TN-to-river. The main sources of TN pollution are livestock, nitrogen fertilizing and atmospheric deposition, which account for 49.47%, 26.14% and 15.31% of river TN load, respectively. Rural residential land has the largest TN load (63.418kg/ha). The quantity of nitrogen from soil and atmosphere is mostly affected by precipitation, and that from livestock, nitrogen fertilizing and rural life is affected by both precipitation and sewage time. So to solve the nonpoint source nitrogen pollution issue, the plan development must take the factors of time, region and type into account.

Key words: critical source areas, non-point sources nitrogen, SUFI2, SWAT

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