Jul 12th, 5:10 PM - 5:30 PM

Application of the SWAT model to investigate surface runoff and nitrate flux towards the Mediterranean Sea: case of the Tafna catchment (North-West of Africa)

Amin Zettam
LEGEN, Université de Tlemcen, EcoLab, Université de Toulouse, zettam.amine@gmail.com

Amina Taleb
LEGEN, Université de Tlemcen

Sabine Sauvage
EcoLab, Université de Toulouse

José Miguel Sanchez-Perez
EcoLab, Université de Toulouse

Laurie Boithias
EcoLab, Université de Toulouse

Presenter/Author Information

Amin Zettam, Amina Taleb, Sabine Sauvage, José Miguel Sanchez-Perez, Laurie Boithias, and Nouria Belaidi

International Environmental Modelling and Software Society (iEMSs)
8th International Congress on Environmental Modelling and Software
Toulouse, France, Sabine Sauvage, José-Miguel Sánchez-Pérez, Andrea Rizzoli (Eds.)
http://www.iemss.org/society/index.php/iemss-2016-proceedings

Application of the SWAT model to investigate surface runoff and nitrate flux towards the Mediterranean Sea: case of the Tafna catchment (North-West of Africa)

ZETTAM Amin [a,b] , TALEB Amina [a,] , SAUVAGE Sabine [b], SANCHEZ-PEREZ José Miguel [b], BOITHIAS Laurie [b], BELAIDI Nouria [a]

[a] LEGEN, Université de Tlemcen, Faculté SNVSTU, Tlemcen, Algérie; (zettam.amine@gmail.com)
[b] EcoLab, Université de Toulouse, CNRS, INPT, UPS, Toulouse, France

Abstract: Water in North-West of Africa is an increasingly valuable resource due to high competition between agriculture, industry and drinking water supply, accentuated by frequent drought conditions in a semi-arid climate. For a few decades, the demographic explosion, the development of agriculture and industry, and the building of water infrastructures (dams) have modified the water fluxes and the biogeochemical cycle of nitrogen towards an increased production of nitrates in waters. The objectives of this study are to propose a modelling approach to quantify the contribution of the Tafna coastal watershed (North-West of Africa) to the flux of nitrates into the Mediterranean Sea. The modelling approach is made to identify and to understand (1) the climatic controlling factors of the nitrate exportations, and (2) the role of dams in the retention of nitrates, integrating the impact of current agricultural practices on surface water. This approach will help us to quantify the contribution of the watershed to the eutrophication of the Mediterranean Sea while predicting the load of nitrates carried down to the marine waters. To do so, we applied the Soil and Water Assessment Tool (SWAT), which has been widely used to assess hydrology in various catchments. SWAT helps identify pollution sources, and assesses the impacts of climate change and agricultural management practices. Many authors focused on nitrate but few of them studied the North Africa rivers. The application of SWAT has shown that dams have a great influence on surface runoff and in the retention of nitrates. It also highlighted the necessity to implement a more sustainable water resources management strategy in the Tafna region which water resource is limited and vary greatly with more intense low flow episodes. The results obtained are very encouraging: SWAT makes it possible to correctly represent the dynamics of water and nitrate flow in the Tafna watershed. The study can inspire us to calibrate other parameters such as sediment concentrations and phosphorus. Also, SWAT is an effective tool for planners and stakeholders to manage water in different catchments in Algeria.

Keywords*:* Surface runoff, Nitrates flux, Swat, Tafna catchment.

-