

WaterPUCK - Integrated Information and Prediction Web Service for the surface water and groundwater located in the Puck District (Poland)

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Abstract

WaterPUCK Service is constructed as part of the project with the same name "WaterPUCK". WaterPUCK Service is focused on determination of the current and future environmental status of the surface water and groundwater located in the Puck District (Poland) and its impact on the Bay of Puck environment (the southern Baltic Sea) (Fig. 1). Knowledge related to land-use management impacts on the Baltic Sea coastal ecosystem is limited. Therefore, only the innovative approach integrated with research, such as WaterPUCK, will provide accurate solutions and methods for proper environment management and will enable understanding and prediction of the impacts of land-use in the Baltic Sea region. WaterPUCK method will enable calculation of the sufficient amount of fertilizers, investigation nutrients and pesticides sources and model: the fate and distribution of nutrients and pesticides in the surface water and groundwater; loads of pollution to surface water and groundwater; fluxes of nutrients via submarine groundwater discharge to the Baltic Sea coastal environment; the processes and mechanisms influencing the persistence of nutrients in the environment, and predict the changes in land use and climate change influence on the Bay of Puck ecosystem.

Major goal of WaterPUCK is to foster improvement of natural environment as well as development of regional and national economy.

Methods

Solutions to water access, land degradation, nutrient management and ecosystem services have to be developed in consideration of what influences the environment and communities across landscapes, not just what works influences the farm. Therefore, the main result of the project will be Integrated information and prediction Service "WaterPUCK" developed by both improving the best available models and combining them with new models (Fig. 2).

WaterPUCK is developed based on SWAT (Soil and Water Assessment Tool), groundwater flow model (based on Modflow), 3D EcoPuckBay ecohydrodynamic model of the Bay of Puck (based on the POP code) and integrated agriculture calculator called "CalcGosPuck".



Fig. 1. Location of the Puck District and the Bay of Puck.

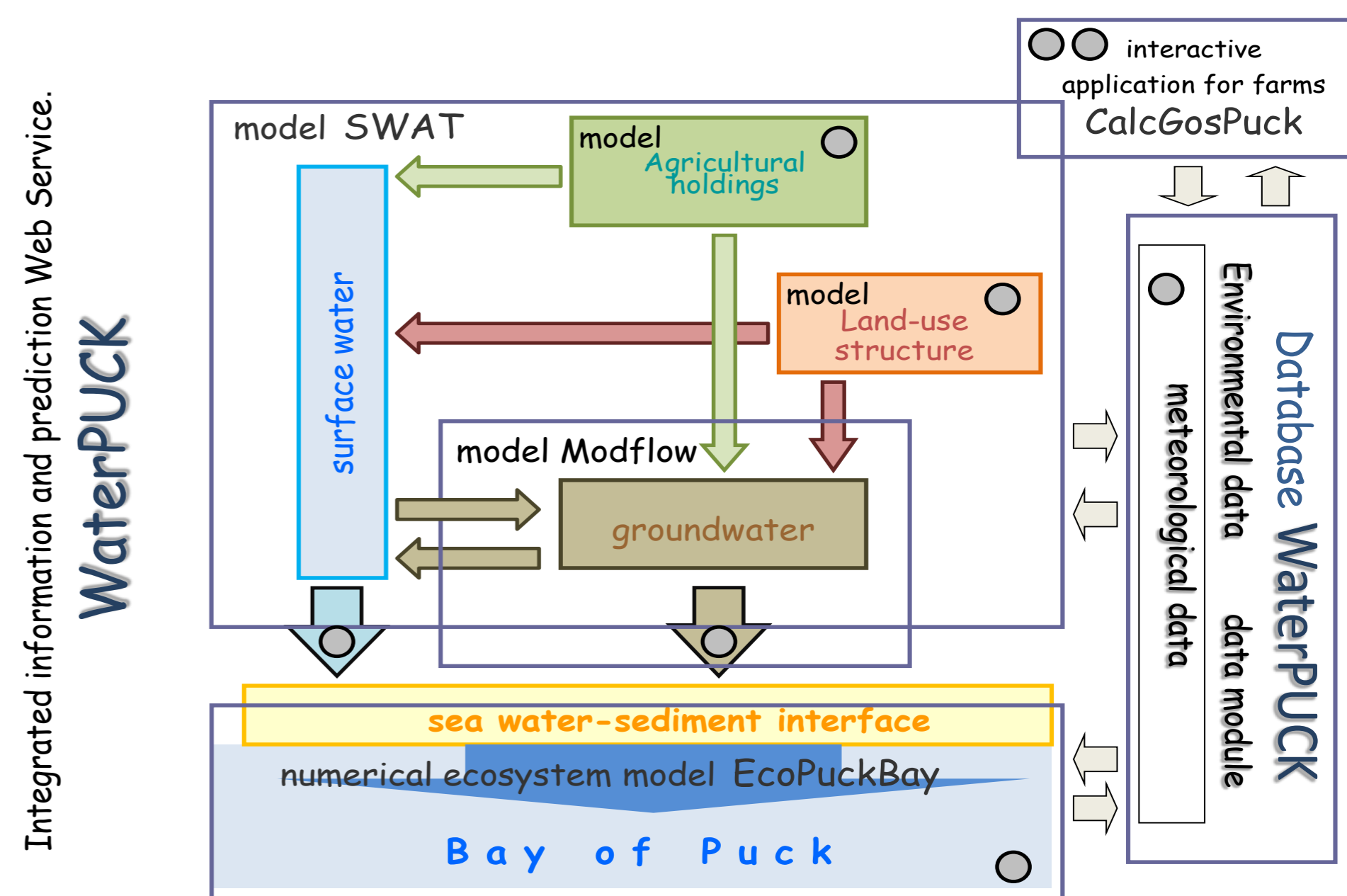


Fig. 2. Schematic of water and contaminant fluxes covered in WaterPUCK.

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