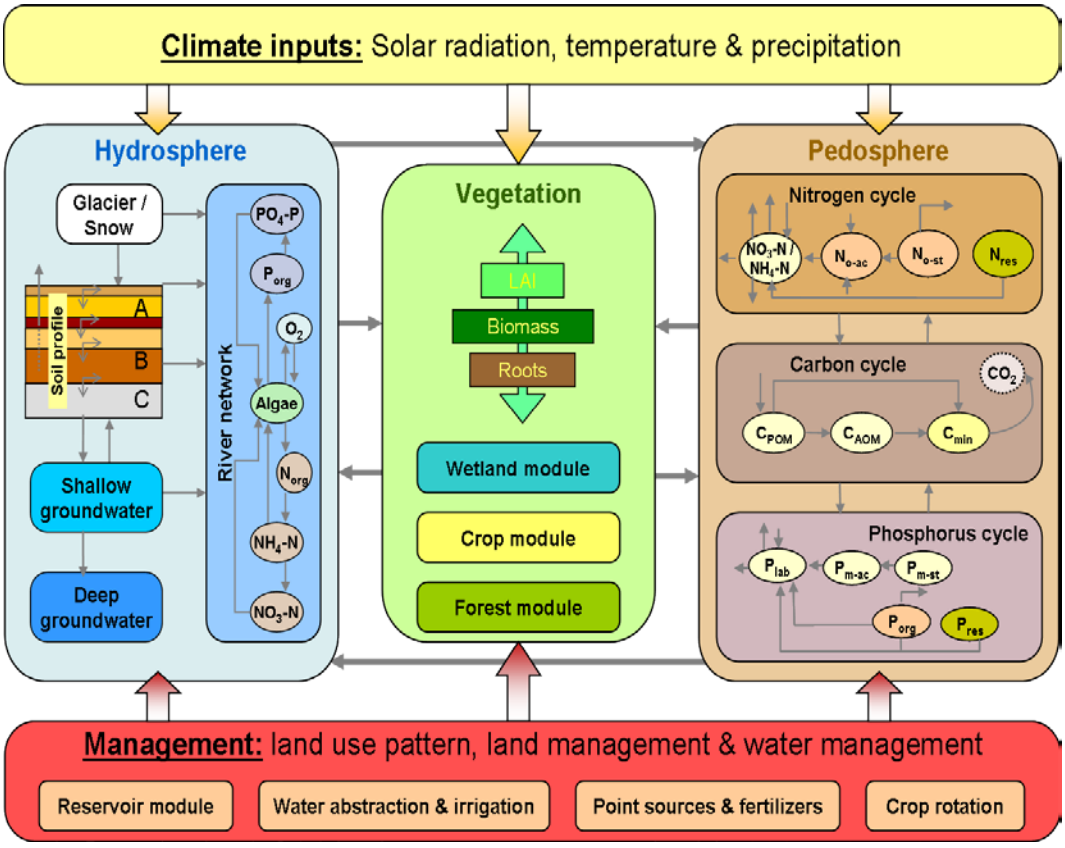
The model

SWIM

The Soil and Water Integrated Model (SWIM) is an eco-hydrological semi-distributed model designed for **climate and land-use change impact assessment**.. SWIM integrates hydrological processes, crop/vegetation growth, nutrients and erosion at the river basin and regional scales. The management of land and water resources is also considered.



Spatial and temporal coverage

Spatial coverage: Several river basins in Europe, Africa, Latin America and East Asia

Spatial resolution: Regional and river basin; adjustable sub-units

Temporal scale: Until 2050 (2100) in daily time step

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SWIM

SIM4NEXUS

Nexus coverage

SWIM was specifically developed to investigate **climate and land use change** impacts at the regional scale, where the impacts are manifested and adaptation measures take place. The model simulates interlinked processes at the mesoscale such as runoff generation, plant and crop growth, nutrient and carbon cycling, and erosion. The approach allows simulation of all interrelated processes within a single model framework at a daily time step using regionally available data (climate, land use and soil) and considering feedbacks.

SWIM models all components of the NEXUS at the regional and water basin scale and related feedbacks, also water related energy production (hydropower, cooling of power plants) and riverine ecology.

Inputs

Outputs

The model uses 3-level disaggregation scheme: basin – subbasins – hydrotopes.

The results are presented as time series and maps for a number of variables.

Recent applications

SWIM is mostly used for climate and land use change applications and definition of adaptation strategies within the water nexus

- Hattermann, F. F., Huang, S., Koch, H. (2014 (Accepted November)): Climate change impacts on hydrology and water resources in Germany. - Meteorologische Zeitschrift
- Koch, H., Vögele, S., Kaltofen, M., Grossmann, M., Grünewald, U. (2014): Security of Water Supply and Electricity Production: Aspects of Integrated Management. Water Resources Management, 28(6), 1767-1780.

Further information

SWIM website

Model manual

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