SEHR-ECHO v1.0: a Spatially-Explicit Hydrologic Response model for ecohydrologic applications

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We present here the SEHR-ECHO model, which stands for Spatially Explicit Hydrologic Response (SEHR) model developed at the Laboratory of Ecohydrology (ECHO) of the Ecole Polytechnique Fédérale de Lausanne. The model is being developed for the spatially-explicit simulation of streamflow and transport processes at the catchment scale. The key concept of the model is the formulation of water transport by geomorphologic travel time distributions: the mobilization of water (and possibly dissolved solutes) is simulated at the subcatchment scale and the resulting responses are convolved with the travel paths distribution within the river network to obtain the hydrologic response at the catchment outlet. The Matlab source code of the current version for alpine streamflow simulation is already freely available. A truly free open source version using Python will become available in the future.