



Better models are more effectively connected models

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The concept of hydrologic and geomorphologic connectivity describes the processes and pathways which link sources (e.g. rainfall, snow and ice melt, springs, eroded areas and barren lands) to accumulation areas (e.g. foot slopes, streams, aquifers, reservoirs), and the spatial variations thereof. There are many examples of hydrological and sediment connectivity on a watershed scale; in consequence, a process-based understanding of connectivity is crucial to help managers understand their systems and adopt adequate measures for flood prevention, pollution mitigation and soil protection, among others.

Modelling is often used as a tool to understand and predict fluxes within a catchment by complementing observations with model results. Catchment models should therefore be able to reproduce the linkages, and thus the connectivity of water and sediment fluxes within the systems under simulation. In modelling, a high level of spatial and temporal detail is desirable to ensure taking into account a maximum number of components, which then enables connectivity to emerge from the simulated structures and functions. However, computational constraints and, in many cases, lack of data prevent the representation of all relevant processes and spatial/temporal variability in most models. In most cases, therefore, the level of detail selected for modelling is too coarse to represent the system in a way in which connectivity can emerge; a problem which can be circumvented by representing fine-scale structures and processes within coarser scale models using a variety of approaches.

This poster focuses on the results of ongoing discussions on modelling connectivity held during several workshops within COST Action Connecteur. It assesses the current state of the art of incorporating the concept of connectivity in hydrological and sediment models, as well as the attitudes of modellers towards this issue. The discussion will focus on the different approaches through which connectivity can be represented in models: either by allowing it to emerge from model behaviour or by parameterizing it inside model structures; and on the appropriate scale at which processes should be represented explicitly or implicitly. It will also explore how modellers themselves approach connectivity through the results of a community survey. Finally, it will present the outline of an international modelling exercise aimed at assessing how different modelling concepts can capture connectivity in real catchments.