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Volume of Abstracts

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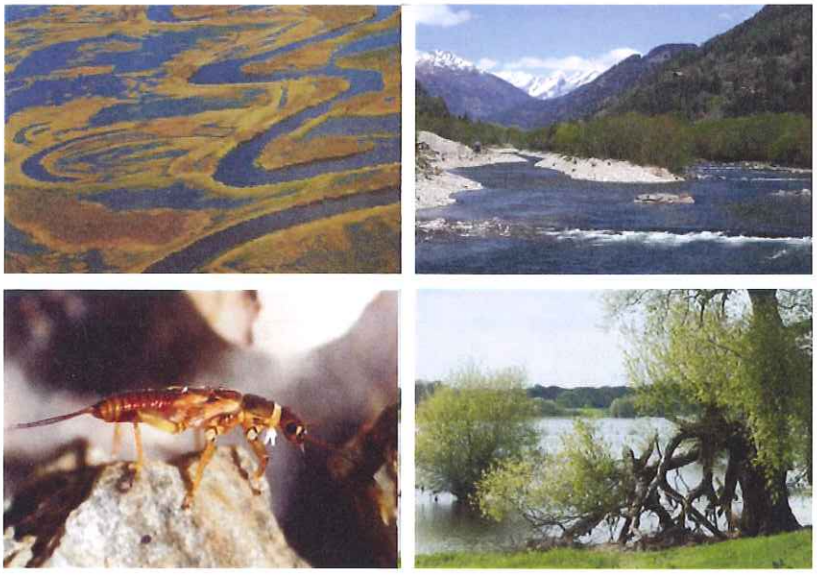

United Nations Educational, Scientific and Cultural Organization

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models (DEMs) of the entire new channel have been developed by means of automatic digital photogrammetry using high resolution aerial photography taken by an unmanned aerial vehicle (UAV). DEMs of difference (DoD) between major flow events have been used to track lateral and longitudinal changes in the channel at a spatial resolution of less than 5cm. Finally, in order to link sedimentological changes in the new channel to its impact on the main stem Ehen, morpho-sedimentary changes of a gravel bar at the confluence have been monitored combining tracers (i.e. RFID) and repeated topographic surveys (i.e. automatic digital photogrammetry).
This paper reports how the integration of these complementary approaches are providing important insights into the evolution of this new channel and its sediment budget, and in turn, what effects its reconnection are likely to have on sediment availability in the Ehen. Understanding these geomorphic processes is critical for assessing the benefits of the reconnection for the Ehen's mussel population.

Abstract number 41 - MODELLING HYDROECOLOGICAL PROCESSES TO DETERMINE RIPARIAN VEGETATION DYNAMICS

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The RVDM (Riparian Vegetation Dynamic Model) is the result of integrating the analysis of the impacts over the riparian vegetation, its evolution and its competition with the terrestrial vegetation. Through daily time step and spatial resolution between 0.5 and 2 metres, this model allows to analyze in detail not only the distribution of the vegetation dynamics in the riverine areas during a simulated period, but also the relative biomass of each unit area. The river dynamics direct effects over the riparian vegetation wellbeing and distribution are considered. Through biomass loss functions, RVDM is capable to translate the stress caused by hydrological extreme events into changes on the vegetation distribution. The main impacts have been established as removal and asphyxia by floods, and wilt by drought. RVDM estimates the effects of the biomass removal through the water shear stress related to a flood event. On the other hand, the effects of asphyxia and wilt are estimated through the water table elevation and the soil moisture, respectively. The natural evolution of the vegetation is in addition considered by RVDM. This model analyses the potential recruitment in clear areas, the vegetation growth and the succession or retrogression between different successional plant functional types (SPFTs). The recruitment occurrence depends on the plant reproductive period and the environmental conditions, and succeeds if seeds presence, germination and seedlings establishment overcome. The vegetation growth in terms of biomass production and the successional evolution are estimated through the light use efficiency (LUE) and the soil moisture.Finally, the competition between riparians and with terrestrials is analyzed considering the advantages between successional patterns under the soil moisture conditions.
The RVDM requires as main input a map of initial vegetation. In addition, other meteorological, morphological, hydrological and hydraulic inputs are required. The model results consist of the simulated vegetation and biomass maps. These maps are considered as new inputs in the following model iteration.
This model integrates the knowledge provided by previous models, representing an upgrade in the way of understanding the riparian hydrobiodynamics.
RVDM has been implemented successfully in a Mediterranean semi-arid river reach and a sensitivity analysis to analyze the influence of the different vegetation parameters has been performed. The results indicate that the model is suitable for global change scenarios analysis and for environmental flows establishment.
