Geophysical Research Abstracts
Vol. 19, EGU2017-957, 2017
EGU General Assembly 2017

Establishment area and biogeomorphic feedback window of three pioneer riparian Salicaceae species within a dynamic riparian corridor (Allier River, France)

Borbála Hortobágyi (1,2), Dov Corenblit (1,2), Johannes Steiger (1,2), Jean-Luc Peiry (1,2)

(1) Université Clermont Auvergne, Université Blaise Pascal, GEOLAB, BP 10448, 63000 Clermont-Ferrand, France (borbala.hortobagyi@univ-bpclermont.fr), (2) CNRS, UMR 6042, GEOLAB - Laboratoire de géographie physique et environnementale, 63057 Clermont-Ferrand, France

Within riparian corridors, biotic-abiotic feedback mechanisms occur between woody vegetation which is highly influenced by hydrogeomorphic constraints (e.g. sediment transport and deposition, shear stress, hydrological variability), fluvial landforms and morphodynamics, which in turn are modulated by established vegetation. During field investigations in spring 2015 we analysed on 16 alluvial bars (e.g. point and lateral bars) within the dynamic riparian corridor of the Allier River, France, the aptitude of three pioneer riparian Salicaceae tree species (*Populus nigra* L., *Salix purpurea* L. and *Salix alba* L.) to establish and to act as ecosystem engineers by trapping sediment and constructing fluvial landforms. Our aim was to empirically identify the preferential *establishment area* (EA; i.e. the local areas where species establish) and the preferential *biogeomorphic feedback window* (BFW; i.e. where and to what extent the species affect geomorphology) of these three species on alluvial bars within a river reach of a length of 20 km. Our results show that the EA and BFW of all three species significantly varied along the longitudinal, i.e. upstream-downstream exposure on the alluvial bars, and the transverse gradient, i.e. main channel-floodplain gradient of hydrological connectivity. In the current context of the Allier River it appeared that *P. nigra*, which is the most abundant species, acts as the main engineer species affecting landform dynamics at the bar scale; *S. purpurea* establishes and acts as an ecosystem engineer in the locations on the alluvial bars which are the most exposed to hydrosedimentary flow dynamics, while *S. alba* establishes on the bar tail in the vicinity of secondary channels and affects geomorphology in mixed patches with *P. nigra*. Thus, our study underlines the role of functional trait diversity of riparian engineer species in controlling the extent of fluvial landform construction along geomorphic gradients within riparian corridors exposed to frequent hydrogeomorphic disturbances.