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Development of a comprehensive experimental installation for monitoring the morphodynamic evolution of restored river corridors

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Understanding river and riparian vegetation interactions is becoming increasingly important in view of modern river restoration and ecological management techniques. Within the research project "**RE**stored **COR**ridor **D**ynamics" funded by the ETH Competence Center for Environment and Sustainability, the Thur river in Switzerland is investigated in order to obtain a mechanistic understanding of the evolution of a river section following restoration.

Among the wide spectrum of scientific interests pursued in RECORD, we address the river morphodynamic evolution and, specifically, the role of vegetation roots in stabilizing the non-cohesive sedimentary material that characterizes gravel bars and islands. To this end a comprehensive monitoring campaign for measuring both conventional and non-conventional variables either continuously or discretely is planned. Visible and near-infrared cameras were installed at the top of dedicated towers along the river with the purpose of taking pictures of the reach on a regular time basis. In this way, information about vegetation evolution on river islands, inundation dynamics and related morphological changes is obtained by joining aerial georeferenced images of the reach together with detailed manual surveys of the river bathymetry. A meteorological station is used for measuring hydrologic inputs, but other key variables such as streamflow, moisture within the exposed sediment, and incipient bedload transport

are going to be measured as well. A novel passive acoustic technique is also going to be set up in order to monitor the triggering of the bedload transport. Globally, both vegetation and bed morphology changes will be observed over several time scales and horizons (e.g., 4-5 years) and the data analyzed.

In this paper we discuss the installation setup in the context of modern methodologies of controlling the status and progresses of river restoration in order to improve our knowledge and suggest useful recommendation also transferable to other sites.