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HYDROMORPHOLOGICAL MONITORING OF A SEDIMENT REPLENISHMENT OPERATION: THE CASE OF THE SAINT-SAUVEUR DAM IN THE BUËCH RIVER (SOUTHERN ALPS, FRANCE)

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The Buëch River is a right bank tributary to the Durance, a braided river that drains a 1478 km² catchment. The Saint-Sauveur dam was built in 1992 in the middle section of the catchment. Downstream from the dam, a pluri-metric channel incision is observed. In order to restore channel incision, around 44 000 m³ of gravels were excavated in the proximal part of the reservoir and reinjected downstream from the dam in September 2016 by EDF (the power plant company in charge of the dam). Only three weeks after the restoration works, a ten-year flood occurred, allowing for the remobilization of the sediment recharge.

The aim of this study is to understand the evolution of sediments reinjected after a Q10 flood in order to measure (i) the efficiency of the restoration works and (ii) gains for aquatic habitats.

The monitoring of the sediment replenishment impact on channel morphology and aquatic habitats is based on a combination of (i) change detection using sequential high-resolution DTMs (from airborne LiDAR data and from SfM photogrammetry), (ii) bedload tracing using active RFID technology, and (iii) complementary field surveys of channel grain-size distribution and morphology for bedload transport computation.

Preliminary results of the monitoring show that the morphology of the restored site has rapidly changed and that reinjected coarse sediments have dispersed along a 3-km reach. These results allowed us to (i) characterize the morphological change, (ii) quantify the sedimentary balance of the flood, and (iii) analyze dam management impact's during the flood on the sedimentary balance.

Perspectives of this study consist in continuing the monitoring of the restoration works to understand the evolution of the sedimentary deposits associated to the reinjected materials. This operation will be replaced in a larger spatiotemporal scale to propose to the dam manager a sustainable management.

