



Geomorphic impacts of urbanization at basin scale: channels incisions and downstream sediment delivery in the catchment of the Yzeron River (City of Lyon, France)

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This study focuses on urbanization impacts on river morphology and related sediment transport. It is carried out on the Yzeron River watershed (147 km²), in the western part of the city of Lyon, France, where incisions of upstream branches and sand deposits within the main stems downstream are frequently observed since the increasing urbanization of the last decades. Two complementary approaches are developed to study sediment relations in the hydrographic network.

Firstly, stream and watershed characteristics were analyzed to explain incision occurrence within headwater basins. Data include localization of incised reaches, channel morphology, main physiographic characteristics of watersheds, and an inventory of anthropic elements disrupting flows and bedload transport (storm sewer outlets, weirs...). In addition, a dendrochronological study of the riparian vegetation bordering incised channels has been done to date beginnings of incisions and to compare with ages of storm sewer outlets. Results indicate that drainage area, presence of stormwater outlets and river geomorphic type are the main control factors of incision. Stormwater outlets are mostly representative of the urbanization impact, whereas basin size and river geomorphic typology reflects headwater basins sensitivity to incision.

Secondly, we assessed the impact of upstream incisions on sand transport and deposits in downstream river sections. Previous data were used to quantify the sediment delivery from upstream incisions. In parallel, a field survey was also performed using fluorescent tracking and scour chains to estimate average annual sand transport. It showed that sediment delivery from incised tributaries strongly influences sand dynamics of the Yzeron River.