



## **Geoarchaeological interpretation of historical cartography to understand the human-Induced modification on fluvial landscapes**

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### **GEOARCHAEOLOGICAL INTERPRETATION OF HISTORICAL CARTOGRAPHY TO UNDERSTAND THE HUMAN-INDUCED MODIFICATION ON FLUVIAL LANDSCAPES**

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Fluvial environments have always played a crucial role in human history. The necessity of fertile land and fresh water for agriculture has led populations to settle floodplains more frequently than other environments. Since anthropogenic activities started altering the evolution of natural landscapes, floodplains represented complex and dynamic human–fluvial systems, where the interplay between geomorphological processes, land use, ecosystems, and human activities was distinctive and fundamental in shaping natural environments.

Being land-use changes a dynamic process linking natural and human spheres, the historical reconstruction of such processes is mandatory to evaluate the reciprocal interactions between anthropogenic activities and fluvial environment.

Historical maps, if available, offer a valuable archive of data to understand the causes, mechanisms, timing, and consequences of the human-induced changes in fluvial landforms and support river management at any scale. Moreover, the combination of historical data with geoarchaeological interpretation and remote sensing analysis of the landscape is essential to study the relationship between natural events (e.g. floods and river diversions) and land-use changes through time. The digitalization and GIS elaboration of historical cartography is therefore fundamental to interpret landscape and land-use changes in a region. The use of Structure-from-Motion (SfM) photogrammetric techniques is a suitable procedure that responds to the necessity of digitalizing historical maps and documents avoiding any direct contact with the often-fragile analogic support. In this contribution, we discuss to the application of SfM photogrammetry to reconstruct the historical evolution of two fluvial environments: (i) the central Po Plain (Emilia Romagna, Italy), and (ii) the upper Rhone basin (Valais, Switzerland). In both cases, the application of a geo-historical multidisciplinary approach enables the quantification of the impact of human activities on the development of the fluvial environment during the Middle Ages (Po Plain) and at the end of the Little Ice Age (Rhone basin).