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Fluvial inheritances of the Cher River floodplain (region Centre, France) as elements of characterization of hydrological dynamics and their past evolutions

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Geomorphological studies of floodplains provide relevant data about evolutions of fluvial landscape over long time-scales and allow a better understanding of palaeo-environnemental evolutions.
The Cher River flows from the "Massif Central" to its junction with the Loire River in the South of the "Bassin de Paris". The long-term fluvial evolutions since the LGM of this medium-sized catchment, are not well documented. However, a first prospection revealed a high potential of fluvial archives. The aim of the present work is to provide elements to characterize past fluvial dynamics based on the analysis of inherited landforms (mainly palaeo-channels) and sedimentary bodies located in the floodplain, using hydrogeomorphological methods. Data are acquired through the analysis of DEM LiDAR, geophysical methods (electric tomography) and cores (boreholes) collected in the floodplain.
The analysis of DEM LiDAR and morpho-sedimentary observations yields palaeo-hydrographical reconstructions and allows two generations of topographic and sedimentary fluvial inheritances to be identified. Most ancient fluvial landforms correspond to mounds slightly higher than the floodplain level, incised by wide and shallow palaeo-channels. A second fluvial pattern, more recent, is characterized by palaeo-meanders. Measuring the width, the amplitude and the curvature, we show that some of the palaeo-meanders are much larger, wider and more sinuous than the current meanders, showing changes in past flow regime.
The analysis of the filling of palaeo-channels allows us to identify firstly the transverse and longitudinal geometry of former channels. These data help us to estimate bank-full discharge of palaeo-channels. Secondly, the morpho-sedimentary analysis highlights their post-abandonment environmental changes. Three main stratigraphic units are identified. (1) At the base, there is medium and coarse sand attributed to fluvial transport. (2) It is overlain by a layer composed of organo-mineral clayey deposits, characteristic of a swampy environment disconnected most of the time from the main river. (3) Finally, the upper part is constituted by a silty layer that may be attributed to an increase in fluvial activity or in erosion dynamics (slope of the catchment, local filling processes . . .)
These first results show a good record of palaeo-environnemental changes in the Cher valley. The comparison with similar works conducted in other catchments of the "Bassin de Paris" shows that these records may describe environmental evolutions during the Pleniglacial, Lateglacial and Holocene. The perspectives of this work is to provide relevant data on the readjustment of the river related with climate changes since the LGM and on the part played by climate changes and ancient societies on the fluvial system during the Holocene.