



A tentative of Holocene sediment budget for the Seulles catchment (western France)

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Geomorphological and paleoenvironmental researches on Holocene sedimentation in the valleys of Normandy provide evidence for fluvial system changes related to climate and human activities in the Paris basin. Alluvial and colluvial deposits are important as archives of past environments changes. They can be used to construct the temporal frameworks for historical erosion and to give an indication of the past erosion processes. Few studies attempts to make long-term soil erosion and sediment storage in the valley bottom in North-western France. This work put into forward results of a research on Holocene sediment budget. This study focuses in the Seulles catchment (430 km^2), located in Normandy at the junction between the Armorican massif (upstream part) and the sedimentary Paris Basin (downstream part). In order to reconstruct the Holocene sediment budget, different approaches were used to quantify sediment deposit within the floodplain, soil erosion rates and colluvial deposition.

To characterize and quantify the sediment storage into the valley bottoms, 32 partial or complete cross-sections, regularly placed along the valley bottom, were established. These field investigations allow to evaluate the global bulk of fluvial sediment storage into the catchment. In a second step, the assessment of dry bulk densities permits to convert volumetric data into weight. To establish the chronology of the alluvial filling, 6 drilling cores were realized on selected cross-sections to sample organic material content for AMS radiocarbon dating. In total, 38 dates were obtained at the catchment scale and numerous are in process. In the same way, we evaluated Holocene slope erosion and sediment storage using soils profiles descriptions determined from auger coring transects of two small catchments (15 Km^2).

Results demonstrate the existence until 2500 BP of two morpho-sedimentary units (a model related to sediments dynamics into the catchment and a second one related to the hydrological context of the basin) covered by an important silty sedimentation mainly constituted by overbank and colluvial deposits. Datations underline that Iron and Antique period (2800 – 1600 cal. BP) appears to be a key period in the triggering of the silting up of valley bottom according to farming changes which increase soils erosion rates and landscape connectivity. These results are finally discussed and compared to actual soil erosion rate and transfers processes.