



Analysis of lateral mobility of channels at different spatial and time scales (Ardenne massif, Belgium)

G. Houbrechts* (1), J. Van Campenhout (1), E. Hallot (1), Y. Cornet (2), F. Petit (1)

(1)University of Liège, Department of Geography, Laboratory of Hydrography and Geomorphology, Sart-Tilman, Belgium (G.Houbrechts@ulg.ac.be)

(2)University of Liège, Department of Geography, Service Universitaire de Recherches Fondamentales et Appliquées en Cartographie et Études Spatiales (SURFACES), Sart-Tilman, Belgium

Lateral mobility of Ardenne rivers has been studied at different scales using three complementary methods.

We firstly compared the layout of channels on topographic maps (since the 18th century) and aerial pictures. Given that these documents have different scales and projection systems, they were transformed into a common referencing system. This method allowed us to study the lateral shifting of channels, however, as the mobility of Ardenne rivers is relatively low, the errors of geometric rectifications are often more important than lateral displacements. Therefore, to visualize these deformations, georeferenced documents were overlaid with a regular grid of points. We represented the imprecision vector based on x and y residual components for each point. These vectors show the direction of the deformation and its amplitude.

Large quantities of iron slag are present in the sediments of Ardenne rivers. These waste products come from hundreds of ironworks built close to rivers since the 14th century. Analyses of slag concentrations in alluvial deposits allowed us to delimitate the sectors of floodplains eroded by rivers during the last centuries. In these sectors, slag elements are present at the contact with the gravel sheet.

Finally, we analysed the topography of floodplains from a DEM-LIDAR. This digital elevation model has been established by the Walloon Region for the cartography of flood risk in floodplains. It presents a Z mean error of only 15 cm and a X-Y resolution of 1 m. In order to reveal paleochannels and topographic alluvial units, we subtracted a surface, corresponding to the longitudinal water surface slope, extracted from the DEM. By using this method, we are able to obtain the relative height of any point of the floodplain with regard to the water surface, projected perpendicularly to the layout, on this point. This procedure reveals paleochannels even if they are almost infilled and allows us to delimitate, for several kilometres, alluvial units, which have been formed at different periods.