



Fluctuation of sediment production during the last millennia in the Ardenne Massif (Belgium)

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In the Ardenne massif, floodplains have recorded fluctuations in the production of sediment and several periods of increased sediment deposition have been identified. Before the first deforestations rivers developed multiple channels in alluvial forests. Floodplains were not well-developed and probably very humid, which explains the presence of peat layers within the alluvial sequences. In the Amblève catchment, the first increased sedimentary deposition of the Holocene occurred during the Bronze Age (3200 BP), in relation to deforestation and the first crop cultures in the area. An organic deposition has occurred around 2700 BP and could correspond with a period of climatic degradation. Several peat layers have also been dated to around 1000 BP and probably indicate very low anthropogenic pressure. From the 11th Century onwards, there was an increase in sedimentation and a greater concentration of charcoal is present in the alluvial deposits. In many catchments there is an important increase in the sedimentation at the end of the 14th century, which can be related to the development of many iron factories. Analyses of slag concentration produced in these former factories allow us to reconstruct the evolution of the floodplain topography since the inception of the iron industries, in relation to the periods of activity. Total sedimentation in the smaller valleys since the initiation of iron industries amounts 0.5 to 1.0 m, which is in most cases about 50% of the total sediment present in the floodplains and corresponds to a mean sedimentation rate ranging between 10 and 20 cm/century. Such values are explained by various former agricultural practises and forest clearings associated with the huge demand for charcoal by the iron industry. About 20 ha of forest were cleared for the yearly consumption of a refining forge or a blast furnace and more than three hundred iron factories existed in the Ardenne Massif between the 14th and the 19th century.