Changing rivrs in Hungary – case study about river Maros

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 Two different levels appeared on the floodplain of Maros River as a consequence of the long-term channel narrowing. The width of the channel has decreased from 300 m to 150 m in some sections in the last 50 years, parallel to channel deepening. Thus the frequency of the inundation of the floodplain and its area have changed. The aims (1) to determine the date of the beginning of the river incision of the Maros, (2) to reveal the causes, (3) to locate the affected sections, and (4) to measure the rate of incision along the Maros. In addition, my further aim is to determine the way of incision process.

 To detect the scale of the river incision hydrological analyses were made using the gauging data of Arad, Magyarcsanád and Makó stations. Geoinformatical analyses were also carried out under ArcMap 10 and ERDAS IMAGINE 9.1 software using air photos, topographic maps and satellite images. Cross-section surveys were made on 13 sites to reveal the height difference between the different floodplain levels. Their comparison could indicate the scale and the way of the incision process.

 The hydrological data set (1876-2011) of Arad and Makó gauging stations shows that the river incision has taken place in more phases. The spatial changes of low, medium and high water levels show the way of the river incision, while the calculated and measured discharge data of Makó and Arad gauging stations reflect the beginning of the incision.

 The decrease of the area and the cross-section of the river were revealed by geoinformatical methods. The channel is narrowing along the whole studied section while the surface of the bars is decreasing. These bars mostly merged to the river bank and became lower floodplain surfaces located higher than the bankfull-stage of the river. The difference between the low and high floodplains is between 76 cm and 662 cm. Their spatial variation reflects that at least three river incision periods took place, which were initiated by channel regulation works and mining activity, and these incisions initiated at different sections of the river.