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EFFECTS OF CHANNELIZATION ON THE SEDIMENT QUALITY OF THE DANUBE AND TISZA RIVERS, HUNGARY

ABSTRACT: SZALAI Z.: *Effects of channelization on the sediment quality of the Danube and Tisza rivers, Hungary.* (IT ISSN 1724-4757, 2007).

The present paper focuses on channelization-induced sediment quality changes in active floodplains. Five transects were established along the River Danube. Samples were taken from active banks, from natural levees (or the line of willow grove) and from the active floodplains and from abandoned channels. Grain size composition and five heavy metals (Cd, Co, Cu, Pb, Zn) were determined from the samples. The samples were physically fractionated into five sediment fractions (<5 mm, 5-10 mm, 10-20 mm, 20-50 mm, >50 mm). The studied elements were also determined from each fraction. Results show that the bank profile and the bank alignment exert an influence on the fractionation of surface deposits. Presence (or absence) of natural levees and crevasses causes variation in the distribution of heavy metals along transects and in the proportions of the grain-size fractions of individual samples.

During the early 20th century the flood control measures of the Danube completely transformed river channel pattern. The braided pattern disappeared and small channels were abandoned. Only the highest floods inundate the floodplain, while typical floods, as a consequence of channelisation-induced incision, remain within the channel. Parallel to this, the grain-size composition of suspended sediment and profiles of heavy metal concentration also changed. This change is manifested both in the surface sediments and the deeper layers. Surface accumulation of heavy metals in the internal parts of floodplains derives from wet and dry deposition of airborne particles. This phenomenon is caused by the filtering function of riparian groves. Heavy metal accumulation on the natural levees is most often associated with the increased heavy metal content of suspended load, while in sediment records it is of two kinds of origin: from old pollution events or a result of natural processes.

KEY WORDS: Heavy metals, Physical speciation, Floodplain, Riverbank, Danube, Tisza (Hungary).

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