Geophysical Research Abstracts
Vol. 14, EGU2012-8875-1, 2012
EGU General Assembly 2012

Morphometric analyze for flood hazard map using DTM built with LIDAR and Echo-sounder data in Danube Delta

A Constantinescu, I. Nichersu, C Trifanov, I. Nichersu, and M. Mierla

Danube Delta National Institute for Research and Development, Information Systems, Tulcea, Romania (kris@indd.tim.ro, 0040240533547)

High definition morphometric data acquired with a multibeam sonar is used to develop studies of past and future riverbed and shores dynamics on the Lower Danube at two bifurcations, one upstream from Tulcea city (Ceatal Ismail) and one downstream from Tulcea City (Ceatal Sf. Gheorghe). These studies help in understanding the tendency of the evolution of the Danube Delta in terms of river morphology, discharges, sediments and navigation between the three main branches which are: Chilia with an average flow of 60%, Sulina with an average flow of 18% and Sf. Gheorghe with an average flow of 22%. The most significant issue is the erosion of the shores of Pătlăgeanca town which represents the 1st bifurcation (Ceatal Izmail). Another intriguing issue is the presence of a current diversion dike located at the first bifurcation, the studies and models will show its importance and impact on the river morphology and biodiversity.

Historical maps are used to determine the initial state of the area and will allow analyses of various types. Back in 2010 there was a high flooding in this area and 6 km downstream on Chilia branch the water broke the right side (Romanian side) dyke where used to be an old channel and flooded a 4570 Ha agricultural polder called Sireasa. It is imperative to know if the route of that flooding can shape the 4th branch of the Danube Delta. The dykes that are protecting the villages and the agricultural polders in this area are over raised but they are still in danger because they can still be flooded through infiltrations or from behind the dyke through upstream flooded polders.

The situation in which the current diversion dyke is modified by increasing its length towards the downstream (act already happened), the shores from downstream and of Pătlăgeanca village will utterly alterate the river morphology, discharges, quantity of sediments and navigation in the whole Danube Delta. The resulted high definition data aquired with a multibeam sonar will be merged with high quality LIDAR data available for the whole area and the accurate DTM result will help in better understanding of the morphology of the area, with acurate models and flooding scenarios.

It is well known that is difficult to determine and delineate on the topographic maps, the floods limit, which is essential in the preparation of hazard maps. To perform a morphometric analysis for real floods is needed to be defined precisely on the 3D model. In this paper, we wish to present an analysis of flooding phenomenon in the Danube Delta, based on the study of digital models.