The Potential of GIS Data for River Nile Hydraulic Modeling

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ABSTRACT:

River Hydraulic is an important element for any institution managing a river. However, there is always a necessity to migrate from old traditional techniques to modern techniques in order to ensure better and more accurate performance for the management process. Since almost two decades, Geographic Information Systems (GISs) are playing a key role for better management of earth's resources. GIS science is always progressing that let more scientists think about integrating GIS works to their researches.

In this research, an example is presented for implementing a river hydraulic analysis using GIS data to estimate water surface profiles and to map the floodplain. A small Reach of the River Nile has been chosen to perform the analysis of this study. The Digital data of the reach were surveyed in a recent hydrographic survey mission by the Nile Research Institute. In addition, flow information about the reach was also available at the institute.

Digital terrain data of the reach were modeled using a tool extension of a desktop GIS. This tool enables interfacing to exchange GIS data with software for river hydraulic analysis. It also enables importing of the hydraulic modeling results and to visualize them.

Throughout this study we show why it is important to convert our traditional methods for river analysis studies to GIS-Hydraulic modeling implementations. We also highlight the future trends for GIS river hydraulic modeling in light of the Open Geospatial Consortium OGC specifications and the ISO standards.