

Flood Modeller Pro

Navigation improvements on the River Danube using Flood Modeller

The purpose of this project is to identify solutions to ensure navigation conditions on the Romanian-Bulgarian common sector of the River Danube meet with the recommendations of the Danube Commission, in particular to improve the depth and width of the navigation fairway at 12 critical locations.

This section of the river is unregulated and the depth of water varies according to the river flow. At low flows navigation becomes difficult or unsafe in the critical locations due to the shallow depth and narrow width of the fairway, caused by movement of sediment in the river. This restricts the use of the river which is an important international transport route. Modelling has been used to help better understand the causes of channel constriction and test solutions to improve the safety and reliability of the channel for navigation in the critical locations.



Flood Modeller TIN of the Popina critical location in the lower Danube and 1D model network

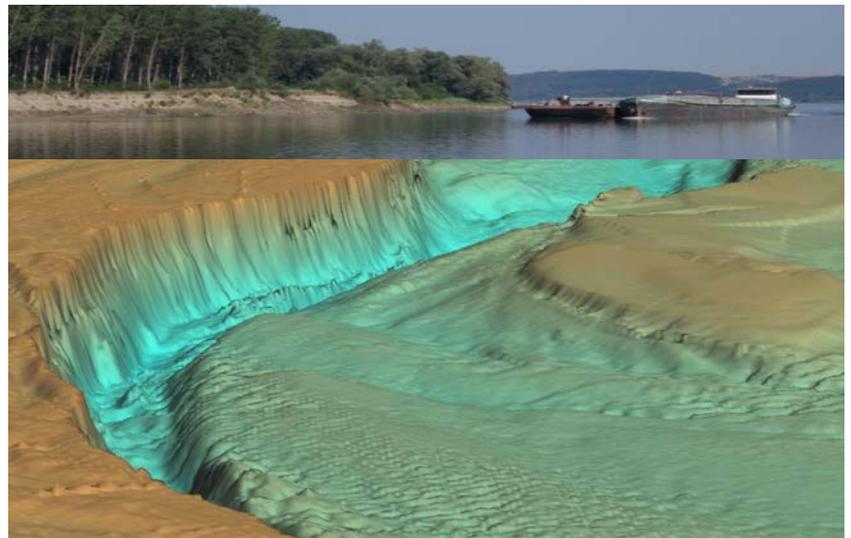
A Flood Modeller 1D model of the entire study area (485km of river) has been built and calibrated using bathymetric and LIDAR data. The model calculates water levels, flows and suspended sediment loads.

The model has been used to determine water level and flow conditions at the critical locations in order to provide boundary data for detailed local 2D models of the critical locations.

Flood Modeller's Sediment Transport add-on has been used to simulate longer term movement of sediment and identify areas of erosion and deposition in the study area, as well as to assess the long-term dredging needs to maintain the navigation fairway.

The 1D flood mapping tool within Flood Modeller has been used to produce maps of the available water depth in the river channel at low flow using a detailed DEM of the river bed bathymetry, a TIN created from the 1D channel cross-sections and model simulation results for water levels at low flow.

The Flood Modeller 3D Viewer is being used to help visualise the river bathymetry and the changes in river bed levels between successive bathymetric surveys.



Flood Modeller's 3D Viewer was used to assess channel bathymetry at the Popina critical location. The photo shows a vessel navigating the channel at the same location

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With a legacy stretching back 40 years, Flood Modeller allows users to model rivers, floodplains and urban areas, using our powerful 1D and 2D solvers.