



ISIS Professional (1D) and ISIS 2D Case Study

Flood risk modelling: Siret River, Romania



Cost-effective integrated modelling solutions

The Siret Basin, situated in the east of the Carpathians mountains in Romania, is the third largest

catchment of any Danube tributary and extends over 28,000 km². The Siret flows from its source in Ukraine through Romania, joined along the way by the main tributary rivers – Suceava, Moldova, Bistrita, Trotus, Barlad and Buzau. A critical flood defence function is performed by several major reservoirs and an extensive network of dykes.

A major flood event in 2005 caused many fatalities and the evacuation of thousands of people from their homes. Damages of €500m were estimated for losses to crops alone. The flood burst through dykes and inundated built-up areas by more than 3m depth. The peak flow was recorded at 4,650m³/s.

Other significant flood events have occurred in the last 40 years and these floods, together with the need to meet the requirements of the EU Flood Directive, were key drivers for a major flood management project awarded by the Water Directorate of Siret.

The project improves the local capabilities in flood risk management and includes extensive flood mapping which has been generated using the ISIS suite of programs.

ISIS 1D has been used to model over 700km of main river and major tributaries. In rural areas the floodplain has been modelled using extended sections in ISIS 1D, whereas in urban areas ISIS 2D has been used for the floodplain. There are over 68km of

coupled ISIS 1D and ISIS 2D model covering the urban flood prone areas.

ISIS Mapper has been used to bring together the topographic and bathymetric survey information with the aerial photography and vector data to help build the ISIS 1D and 2D models and process results. Time savings of 4 weeks have been achieved through the use of ISIS Mapper to:

- Extend ISIS 1D cross sections across the rural floodplain
- Generate ISIS 1D 'spill' unit data sets to represent embankment crests (including use of the ISIS Mapper feature which searches for the highest point near to the nominal embankment top polyline)
- Automatically generate the link lines that connect the ISIS 1D and ISIS 2D model domains
- Generate flood extents and depth grids for both the ISIS 1D and ISIS 2D model outputs

The modelling has helped to develop a greater understanding of the flood risks, flooding mechanisms, potential climate change and urbanisation effects and response options.

Contact us

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