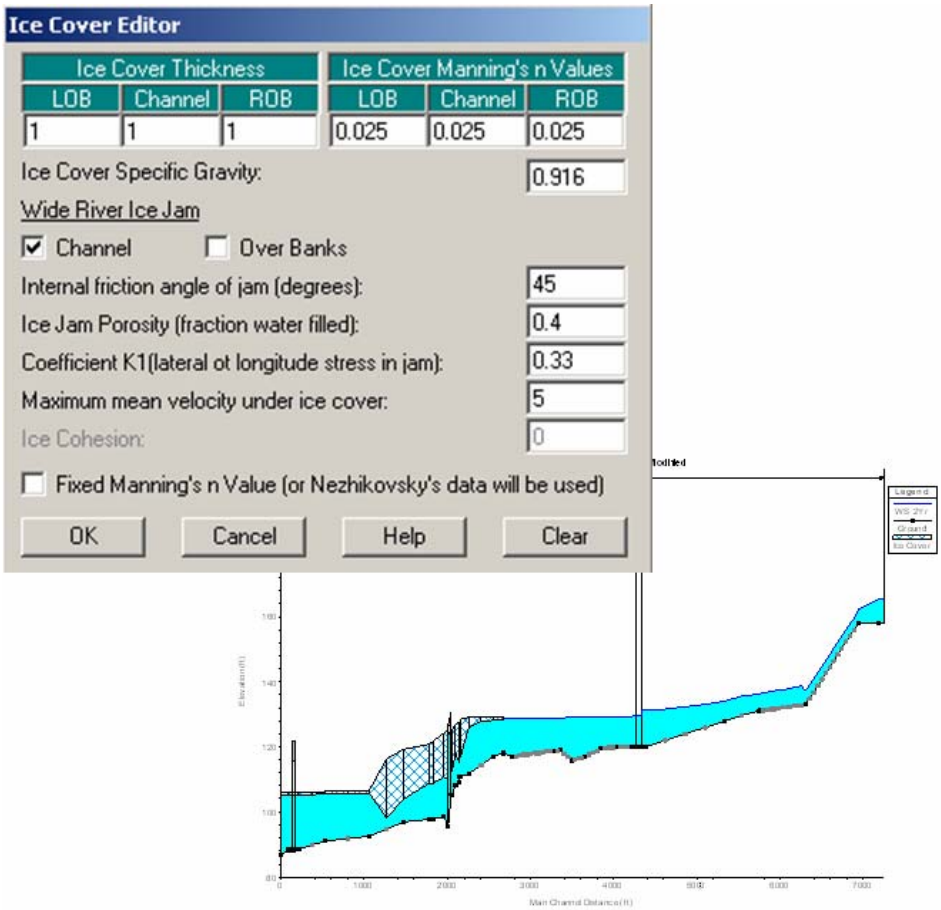
US Army Corps of Engineers®

Flood&Coastal Storm Damage Reduction R&D Program

Modeling River Ice with HEC-RAS

Description

The Hydrologic Engineering Center's River Analysis System (HEC-RAS) includes the ability to model ice-covered channels. The ice cover thickness and hydraulic roughness can be entered by the user or the ice cover can be modeled as a wide-river ice jam, in which case the jam thickness is estimated by HEC-RAS. For the wide-river jam, the user enters the material properties of the ice jam and its extent. Information describing the ice cover and ice properties can be entered for each individual cross section using an ice information editor or it can be entered for a number of cross sections using a table. Results can be viewed in tabular or graphical form. Graphical output includes cross-section plots, profile plots, and perspective plots displaying the ice cover extent and thickness. In addition, profile plots of other ice information, such as thickness and volume, can be readily displayed.



Benefits

The river ice modeling capabilities of RAS will assist Corps engineers to easily estimate the impacts of river ice covers and river ice jams on river stage and estimate the resultant

flood levels. This analysis is required to estimate ice-affected stages for flood-control projects, dam –removal studies, and other investigations where ice can influence stages and flows.

Status

Ice modeling is available in the latest release of HEC-RAS. The ability to output estimated ice jam thickness into GEO-RAS for mapping with GIS is currently completing development. Planned improvements include addition of water flow through jam capability.

Distribution Source(s)

HEC-RAS with ice modeling capability can be obtained from the HEC Web site at the following location: http://www.hec.usace.army.mil

Available Documentation

Documentation for river ice modeling is available in the HEC-RAS manuals, which is also downloadable from the HEC Web site. In addition to the user's manual, the software comes with an example data set.

Available Training

There is currently no separate training course on river ice modeling in HEC-RAS. However a variety of teaching aids are available from CRREL.

Available Support

Support for ice modeling with HEC-RAS is available to all Corps employees. Corps users can either e-mail or call HEC with questions and/or comments.

Application

The river ice modeling capabilities of HEC-RAS have been used in a variety of studies by the Corps Districts and ERDC-CRREL. These studies include estimation of water surface profiles for levee and channel design, dam removal, navigation, and a variety of other studies.

Point of Contact

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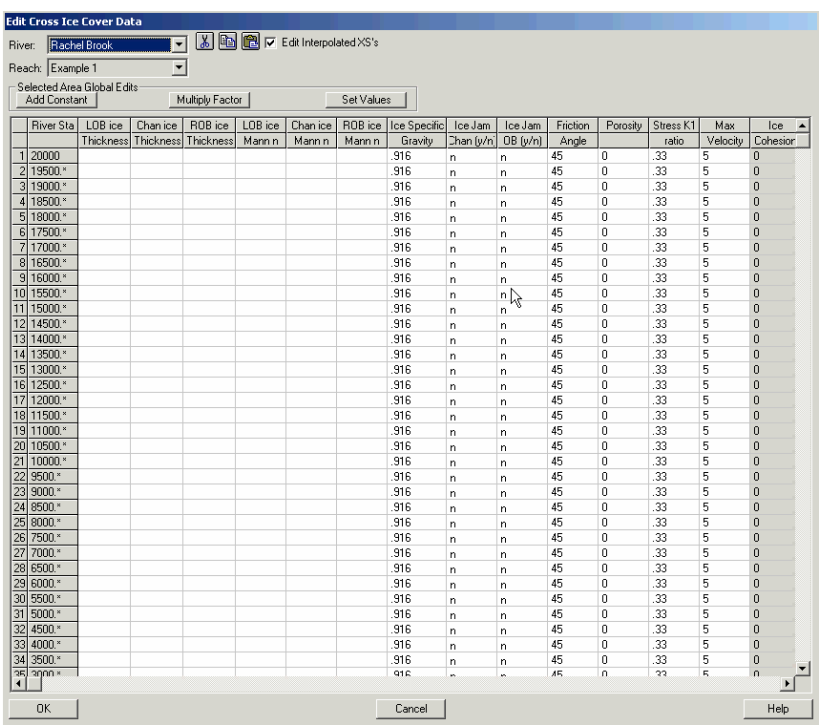
Partners

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