



US Army Corps  
of Engineers®

## Flood & Coastal Storm Damage Reduction R&D Program

# HEC-ResSim

### Description

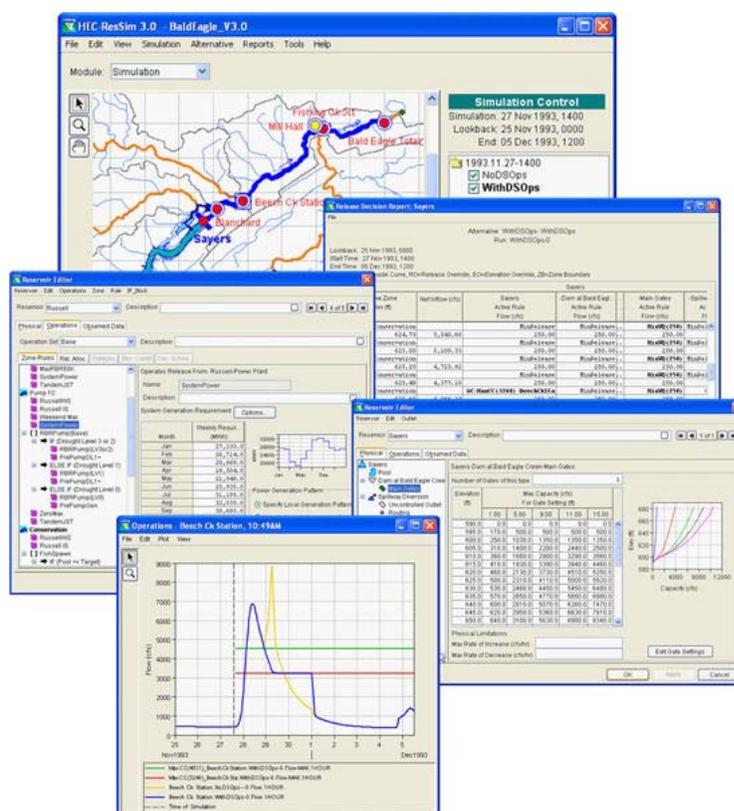
The Hydrologic Engineering Center-Reservoir System Simulation Program (HEC-ResSim) is a computer program that simulates reservoir operations for flood management and low flow augmentation. Its capabilities are being expanded to provide support for water supply analyses. The program comprises a graphical user interface (GUI); a computation engine that represents release decision logic and flow computations; data storage and management capabilities; mapping; graphics; and reporting features.

HEC-ResSim has been developed by the Hydrologic Engineering Center of the U.S. Army Corps of Engineers to aid engineers and planners in predicting the behavior of reservoir systems in water resources studies and to help reservoir operators plan releases in real-time during day-to-day and emergency operations. Although HEC-ResSim is an original program, sharing no code with earlier reservoir programs, it serves the analysis needs previously met by the HEC-5 program.

HEC-ResSim is unique among reservoir simulation models because it attempts to reproduce the decision-making process that human reservoir operators must use to set releases. The program represents the physical behavior of reservoir systems with a combination of hydraulic computations for flows through control structures, and hydrologic routing to represent the lag and attenuation of flows through segments of streams. It represents operating goals and constraints with an original system of rule-based logic that has been specifically developed to represent the decision-making process of reservoir operation.

### Benefits

The generalized nature of HEC-ResSim, its flexible scheme for describing reservoir operations, its ability to allocate release to a hierarchy of outlet structures, and its ability to



represent complex multiple-reservoir systems, make it applicable for modeling almost any single- or multipurpose reservoir system.

<b>Status</b>	The current release version of HEC-ResSim is version 3.0. This version can perform analyses of single- and multiple-reservoir systems operating to meet flood-control and flow augmentation goals specified both at dam sites and downstream control points. Version 3.0 also includes capabilities for analysis of pump-back storage and multi-reservoirs system operation to meet power generation goals. Version 3.1, scheduled for release in early 2008, will improve the program's ability to represent emergency spillway operations and operations to meeting flow goals at points downstream from multiple reservoirs. This version will also provide tools to support the use of a ResSim model as a component in an integrated modeling system like HEC-WAT or Delft-FEWS. A design for a ResSim component that will perform firm-yield analysis is under development, and planned for inclusion in version 3.2.
<b>Distribution Source(s)</b>	HEC-ResSim can be obtained from the HEC Web site at the following location: <a href="http://www.hec.usace.army.mil">www.hec.usace.army.mil</a> .
<b>Available Documentation</b>	Documentation for HEC-ResSim currently consists of a User's Manual and a Quick Start Guide, which are also downloadable from the HEC Web site. In addition, the software comes with some example data sets, which can be used as a learning aid.
<b>Available Training</b>	HEC offers training in HEC-ResSim through the PROSPECT system. "Reservoirs System Analysis with HEC-ResSim" provides an introduction to the basic use of the program. A new course in advanced features of HEC-ResSim is under development, and will be surveyed for FY 2009. To find out more about these classes, and when they are offered, visit the HEC Web site under the training area.
<b>Available Support</b>	Support for HEC-ResSim is available to all Corps employees. Corps users can either e-mail or call HEC with questions and/or comments. Additionally, all users of HEC-ResSim can provide Bug reports or comments with suggestions through the HEC Web site, from the HEC-ResSim page.
<b>Application</b>	HEC-ResSim has been used widely across the Corps for real-time decision support and in reservoir reoperation studies, regulated-flow flood-frequency analyses, power generation studies, and Federal Energy Regulatory Commission (FERC) relicensing studies. The program also has a growing number of non-Corps users in consulting firms, utility companies, and government agencies in and out of the United States.
<b>Points of Contact</b>	Joan Klipsch, Hydrologic Engineering Center, Davis, CA, (530) 756-1104, Email: <a href="mailto:Joan.D.Klipsch@usace.army.mil">Joan.D.Klipsch@usace.army.mil</a>  Thomas Evans, Hydrologic Engineering Center, Davis, CA, (530) 756-1104, Email: <a href="mailto:Thomas.A.Evans@usace.army.mil">Thomas.A.Evans@usace.army.mil</a>
<b>Partners</b>	N/A.