

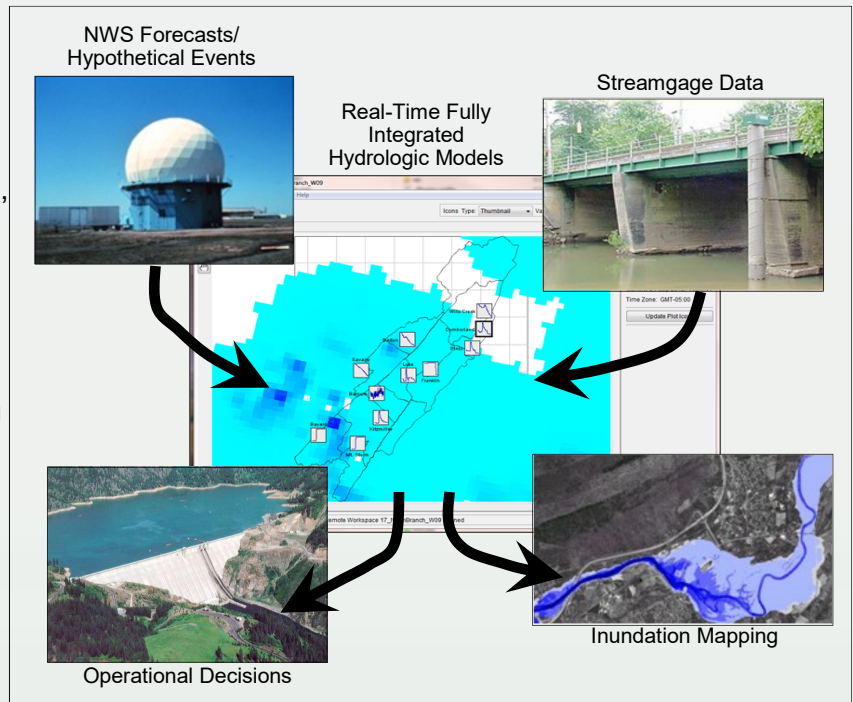


U.S. Army Corps of Engineers (USACE)
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Hydrologic Engineering Center (CEIWR-HEC) Corps Water Management System (CWMS)

Background

- CWMS (Corps Water Management Systems) is the automated information system supporting the U.S. Army Corps of Engineers (USACE) Water Management mission.
- CWMS integrates real-time data acquisition, database storage, flow forecasting of watershed runoff, reservoir operation decision support, river profile modeling, inundated area determination, consequence/damage analysis, and information dissemination into a comprehensive suite of software supporting water management decision processes.
- CWMS incorporates state-of-art client-server architecture; is a Corporate Class IV Automated Information System (AIS).
- Software development began in 1997; development & field deployment continues.

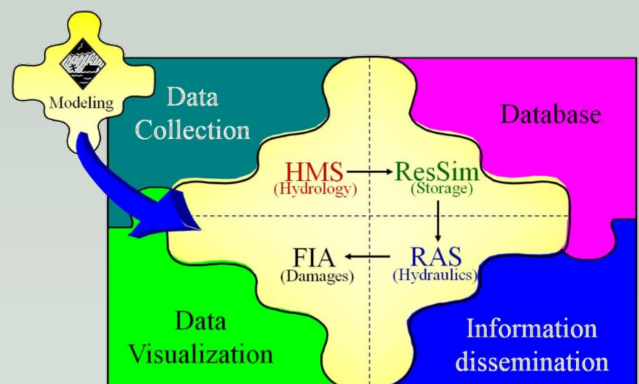


Mission

- USACE is responsible for round-the-clock monitoring & operation of more than 700 reservoir, lock-and-dam projects.
- Provide real-time decision support for the USACE water management mission.
- CWMS is an integrated system of hardware, software and communication resource supporting the USACE real-time water control mission.
- Provides the water control manager with the ability to make short-term forecasts of hydrologic conditions in the watershed.
- Provides a comprehensive watershed forecast that can include flow rates, stages, operations plans, economic impacts, and action to be taken to mitigate the effects of flooding.

CWMS

- A suite of water management tools
- Comprised of five modules - Data Acquisition, Database, Data Dissemination, Model Interface, Control & Visualization Interface (CAVI)
- The above components are five interlocking pieces, with the watershed modeling component being in the middle
- The pieces around the modeling component are part of the data management component: acquiring data, storing data, visualizing data, disseminating data



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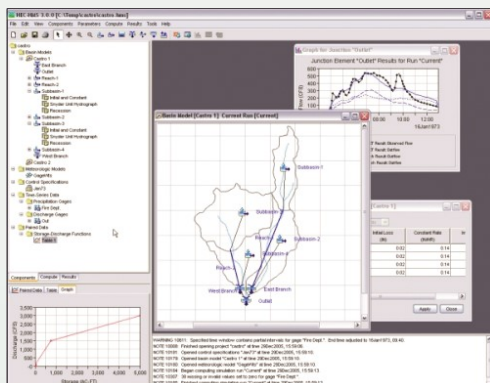
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Modeling Process

- The Control & Visualization Interface (CAVI) enables the user to perform CWMS functions, modeling analysis, and visualize data.
- Discrete models developed outside CWMS & then linked together.
- Evaluate a variety of scenarios: future precipitation amounts & timing; reservoir operation; levee failures.

Hydrologic Modeling System (HEC-HMS)



Simulates the precipitation-runoff processes of watershed systems. Represents a wide range of hydrologic systems. Hydrographs produced by HEC-HMS are used directly or in conjunction with other software to support many types of studies.

Reservoir System Simulation (HEC-ResSim)



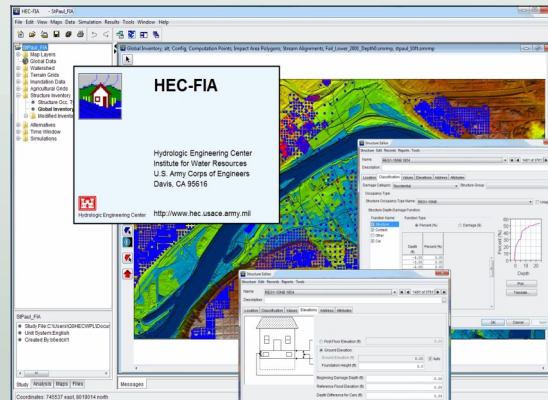
Simulates the operation of systems with one or more reservoirs to meet storage flow targets within a river network. Operating goals are met by rules defining operational limits. Hydrographs produced by HEC-ResSim are used directly or passed to other software.

River System Analysis (HEC-RAS)



Computes river velocities, stages, profiles, and inundated areas given streamflow & geometry. One- & Two-dimensional Unsteady Flow; Steady Flow; Sediment Transport; Water Quality & Temperature. Stages (i.e., hydrographs, values) & inundation maps produced by HEC-RAS are used directly or passed to other software.

Flood Impact Analysis (HEC-FIA)



Calculates post- or forecasted-flood consequences for a user-specified event. Used to determine flood damage reduction benefits attributed to individual flood-control projects & for real-time response activities as part of CWMS.

Future Activities

- Version 3.1; same framework as HEC-WAT
- CURG (CWMS Users Representative Group) & AG (Advisory Group) meetings
- Working with MMC to implement CWMS throughout the U.S. (CWMS National Implementation Plan)

