

---

**AWRA 2011 ANNUAL WATER RESOURCES CONFERENCE**  
**Albuquerque, New Mexico**

**November 7-10, 2011**

**Copyright © 2011 AWRA**

---

**IMPLEMENTATION OF THE CORPS WATER MANAGEMENT SYSTEM (CWMS)  
TO SUPPORT REAL-TIME WATER RESOURCES DECISION-MAKING**

Phil Burkhalter\*, Amy Volckens, Shaun Carney, Sandra Bratlie

**ABSTRACT:** The US Army Corps of Engineers Hydrologic Engineering Center's Corps Water Management System (CWMS) was implemented in four (4) watersheds to aid in real-time decision-making and to improve water resources management. Implementation of CWMS required the configuration of real-time data acquisition processes and database storage, the development of forecast modeling components, and the application and customization of site-specific user interfaces. Developed modeling components provide predictions of event-based runoff, reservoir response to hydrologic conditions and specified dam operations, hydraulic routing and river stage, economic damages, and emergency response impacts. The CWMS user interface allows for real-time data stream monitoring and validation, customized data visualization, forecast scenario creation and execution, and access to modeling component parameters as well as model inputs and outputs. The CWMS implementations were developed and deployed in the following watersheds:

The *Ohio-Cumberland basin* (extending from Pennsylvania to Missouri) - Deployment required development of seven (7) runoff models, river hydraulics modeling of 117 miles of the Cumberland River and 181 miles of the Tennessee River, incorporation of an existing hydraulic model of 981 miles of the Ohio River, and reservoir modeling of eight (8) reservoirs. Additionally, a model was created to provide flood impact and emergency response information.

The *Puyallup basin* (Washington) - Deployment required development of a single runoff model, river hydraulics modeling of 11 miles of the White River and 14 miles of the Puyallup River, and a single reservoir model. The Puyallup system also includes impact response reporting capabilities.

The *Jackson-James basin* (Virginia) - Deployment required development of a single runoff model, river hydraulics modeling of 32 miles of the Jackson River, and a single reservoir model. CWMS features for the Jackson-James basin also include impact response reporting and automated emergency management notifications.

The *Juniata basin* (Pennsylvania) - Deployment required development of a single runoff model enhanced with snowmelt prediction, a single reservoir model, calculation of economic damages, and impact and response reporting features.

Each deployment also included model calibration and verification, and stress testing utilizing synthetic events.

---

\* Water Resources Group Leader, Riverside Technology, Inc., 2950 East Harmony Rd., Suite 390, Fort Collins, CO 80528 USA, Phone: 970-484-7573, Fax: 970-484-7593, Email: Phil.Burkhalter@Riverside.com