

---

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

November 7-10, 2011

Copyright © 2011 AWRA

---

**REAL-TIME RESERVOIR MANAGEMENT FOR TURBIDITY  
CONTROL USING NYC'S OPERATIONS SUPPORT TOOL**

W. Josh Weiss\*, Mark Zion, Don Pierson, Jim Porter, Grantley Pyke

**ABSTRACT:** The New York City Department of Environmental Protection (DEP) has initiated design of the Operations Support Tool (OST), a state-of-the-art decision support system to provide computational and predictive support for water supply operations and planning. The OST represents a major upgrade of DEP's current linked water supply - water quality model, developed to evaluate alternatives for controlling turbidity in NYC's Catskill reservoirs. While the linked model relies on historical hydrologic and meteorological data, the OST can be driven by forecasted future conditions, providing an analytical framework for quantifying the risks and potential benefits of alternative operating policies over the near term (e.g. one year). It will receive a variety of near-real-time data from DEP sources (SCADA, keypoint monitoring, in-reservoir robotic monitoring), and outside sources (USGS gauges, NWS forecasts). DEP has begun using interim versions of the OST to support operations, including evaluation of operating strategies to reduce turbidity export from the Catskill reservoirs. This paper describes a case study in which the OST was used to evaluate alternative operations following major back-to-back storm events in October and December of 2010. Operational strategies were evaluated based on their predicted effectiveness and water supply impacts. Key questions included: (1) Does a given operational alternative reduce the risk of alum treatment? and (2) Does a given operational alternative have an unacceptable impact on probability of June refill? Ultimately, these OST simulations provided the analytical support for DEP managers to better understand the risks associated with different courses of action. This paper will discuss these risks as well as the knowledge gained from use of the interim tool that can help guide ongoing OST development. This case study demonstrates the value of a system modeling platform for near-term operations support as well as long-term planning. The probabilistic, risk-based framework allows for quantification of tradeoffs among competing objectives and ultimately a more robust and defensible basis for decision-making.

---

\* Senior Principal Engineer, Hazen and Sawyer, PC, 1 South Street, Suite 1150, Baltimore, MD 21202 USA, Phone: 410-539-7681, Fax: 410-539-7682, Email: [jweiss@hazensawsawyer.com](mailto:jweiss@hazensawsawyer.com)