

**수질을 고려한 수자원 공급의 정량적 분석을 위한
WRAP-SALT 개발**
**Development of WRAP-SALT for Quantitative Analysis of Water
Supply Capabilities considering Water Quality**

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Abstract

The Texas Commission on Environmental Quality(TCEQ) WAM(Water Availability Modeling) System consists of the generalized Water Rights Analysis Package(WRAP) river/reservoir system water management simulation model, 22 sets of WRAP hydrology and water rights input files for the 23 river basins of Texas, geographic information system tools, and other supporting databases. The WRAP/WAM modeling system, as routinely applied since the late 1990s, has not included consideration of water quality.

Recently developed WRAP-SALT(Water Rights Analysis Package) is designed primarily for computing concentration frequency statistics and supply reliability indices at locations of interest in a river system for alternative water development and management scenarios. Though motivated primarily by natural salt pollution, WRAP-SALT water quality modeling features are applicable to essentially any conservative water quality constituent. The Brazos River studies discussed in this paper focus on total dissolved solids, though the available observed data also includes chloride and sulfate which can be modeled as individual constituents.

The WRAP-SALT salinity input file contains loads or concentrations of salinity inflows during each month of the hydrologic period-of-analysis and reservoir storage at the beginning of the simulation. The WRAP-SALT model computes salt loads and concentrations for each control point of a river/reservoir system for inflows and outflows during the month and end-of-month reservoir storage for each month of the hydrologic period-of-analysis, for given loads entering the system. River reaches connect control points. The mass balance algorithms proceed from upstream to downstream, with outflow from one river reach contributing to inflow to the next downstream reach. In a given month, for each control point in sequence, the inflow loads are first computed. Loads and concentrations of outflows and reservoir storage at the control point are then determined. Complete mixing during the month is assumed at locations without reservoir storage.

Keywords : reservoirs, rivers, salinity, simulation, water supply

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