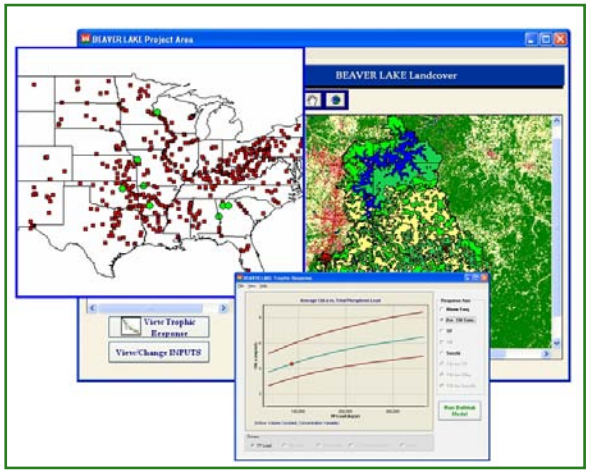
System-Wide Water Resources Program
SWWRP

Trophic Assessment Screening Tool for Reservoirs (TASTR)



Description: TASTR gives resource managers and decision makers a rapid "first cut" estimate of water quality conditions that can be expected in existing or planned reservoir projects in response to continuing or changed land use or climate in the surrounding watershed and changes in reservoir operations (e.g., water levels). TASTR has a "user friendly" interface that includes simple GIS capability for the display, selection, and modification of project and watershed information. TASTR uses the existing USACE model, "Bathtub" and simple watershed export models, as the basis for its predictions about specific reservoirs. This is done with a metamodel approach in which hundreds of model runs on the individual reservoir have been summarized to create statistical models (regression equations) of its behavior. The output shows confidence limits around all predictions, and the tool provides on-line guidance (e.g., references to ERDC expertise) if the results lack the necessary detail or level of confidence. TASTR is designed to have a small "footprint" on the user's computer. It runs under Microsoft Windows (95 through VISTA) operating systems and places minimal demands on system resources (memory, CPU power, or disk storage). It requires minimal third party software (i.e., Microsoft Office) and takes advantage of the Web (when available) to obtain updates from ERDC. However, TASTR can operate without a Web connection and only loads data from the ERDC Web site onto the local machine as needed.

Application: The package has currently been implemented for a number of reservoir projects (e.g., Beaver Lake, AK; Piney Run, MD; Allatoona, West Point, Sidney Lanier, GA; Walter F. George, AL-GA; Cullman, AL; Eau Galle, WI; and Smithville, MO), and this is a dynamically expanding catalog.

Benefits: As a screening level tool, TASTR will provide a rapid, initial assessment of water quality conditions associated with watershed inputs to USACE lakes. It lets the decision-maker quickly see, but only in approximate terms, the likely water quality outcome of continued or altered inputs and operations at a specific impoundment (e.g., in response to land use changes in the surrounding watershed). It can thus provide a quick screen of alternative management approaches (i.e., TMDL measures). It provides a starting point for more precise and expensive approaches if something beyond the "first-cut" is needed and guides the user with contact information and other hints to obtain more advanced assistance.

.

more . . .

Trophic Assessment Screening Tool for Reservoirs (TASTR)

Data Requirements: TASTR is extremely flexible in its data requirements. It can be tailored to the available information and the user needs to take advantage of whatever information exists. Much of the data for a typical TASTR implementation is available on-line from various sources (e.g., USDA USEPA, USGS, and USACE). In general, GIS land use coverage of the watershed is necessary, along with basic hydrology (inflow, outflow, evaporation, and precipitation) and morphometry (area, mean depth, etc.) for the reservoir. Water quality data for the inflows and the reservoir are extremely helpful, but TASTR can be implemented without such data (uncalibrated and unverified mode). For all TASTR data, average seasonal or annual estimates are adequate, but higher resolution data are desirable.

Future Capabilities: More projects are scheduled for addition to the TASTR catalog. Additional projects can be added upon request from cooperators. The use of more sophisticated water quality models (e.g., CE-QUAL-W2) as the basis for TASTR metamodels is an option.

Point of Contact: David M. Soballe, Ph.D., Environmental Laboratory, U.S. Army Engineer Research and Development Center, (601) 634-4631, David.M.Soballe@usace.army.mil.

System-Wide Water Resources Program SWWRP