

# Water Quality Research Group

## CE-QUAL-W2 Hydrodynamic and Water Quality Model

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## Model Description

CE-QUAL-W2 is a water quality and hydrodynamic model in 2D (longitudinal-vertical) for rivers, estuaries, lakes, reservoirs and river basin systems. W2 models basic eutrophication processes such as temperature-nutrient-algae-dissolved oxygen-organic matter and sediment relationships.

The current model release is Version 4.5 (see model history for details). A beta version of Version 5 is also available for download. The model release includes executables, source codes, and examples for the model and preprocessor. There is also a stand-alone V4 GUI preprocessor as part of the download package. There is a post-processor for W2 model output used since the V3.7 model by the DSI, Inc. group and an Excel macro utility that aids the model user in writing out files compatible with CE-QUAL-W2. A model blog on updates and fixes, the current User Manual, and release notes which document all model changes are included below. Model Versions 3.1, 3.2, 3.5, 3.6, 3.7, 4.0, 4.1, and 4.2 are no longer supported but are available from the download page. There are about 3-4 model downloads/day from around the world and about 10-30 visitors to the web site/day.

**Model Capabilities:** Longitudinal-vertical hydrodynamics and water quality in stratified and non-stratified systems, nutrients-dissolved oxygen-organic matter interactions, fish habitat, selective withdrawal from stratified reservoir outlets, hypolimnetic aeration, multiple algae, epiphyton/periphyton, zooplankton, macrophyte, CBOD, sediment diagenesis model (Version 4), and generic water quality groups, internal dynamic pipe/culvert model, hydraulic structures (weirs, spillways) algorithms including for submerged and 2-way flow over submerged hydraulic structures, dynamic shading algorithm based on topographic and vegetative cover.

**Model Limitations:** Well-mixed in lateral direction (but can be used in a Quasi-3-D mode by use of additional model branches), hydrostatic assumption for vertical momentum equation.

**Model Training:** The next W2 workshop is scheduled as a one-day virtual workshop in January 2026. More details will be posted soon.

### Model License Agreement:

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