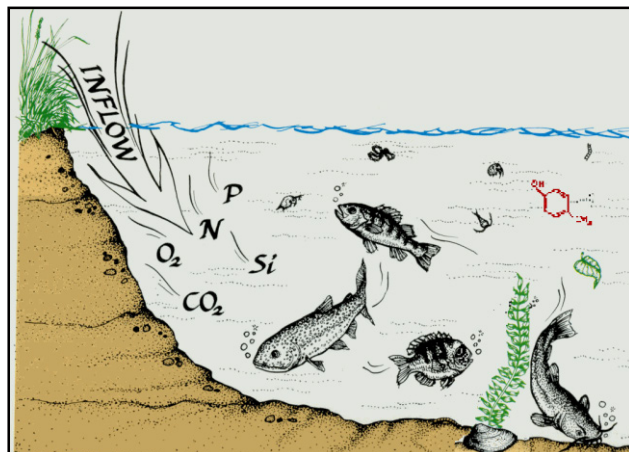


## LINKING WATER QUALITY AND AQUATIC LIFE WITH AQUATOX 3.2

AQUATOX is an ecosystem simulation model that predicts the environmental fate of various pollutants, such as excess nutrients and organic chemicals, and their effects on aquatic ecosystems, including fish, invertebrates, and aquatic plants. AQUATOX is one of the preeminent tools available for ecosystem analysis and management and has been used all over the US and the world in a wide variety of ecological risk assessments. EPA has released AQUATOX Release 3.2 that extends the existing AQUATOX estuarine version to include improved capabilities for situations encountered in the nearshore marine environment. In addition, the graphical user interface was updated and modernized to add capabilities and to increase user friendliness.

### Background

One of the biggest challenges to protecting or restoring our nation's waters is adequately understanding the relationships between the environment and the organisms that live there. Ecosystems are complex, with natural variations over time, and multiple interactions between components. The health of biological communities in many water bodies is impaired, but the causes of the impairment may not be obvious due to numerous environmental stressors. It is difficult to predict how the aquatic community will respond to changes in pollutants or environmental conditions using simple methods of analysis, especially if those methods address only one stressor at a time. A complex simulation model like AQUATOX may be more effective.



### About AQUATOX

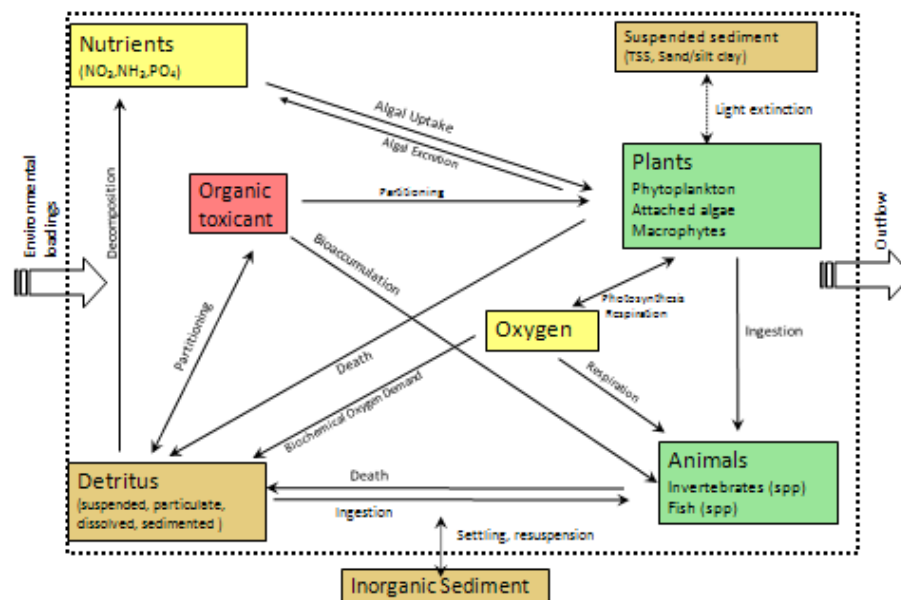
- Simulation model for aquatic ecosystems and impacts on aquatic organisms
  - Streams, rivers, lakes, reservoirs, estuaries
  - Effects on algae, plants, invertebrates, and fish
- Predicts responses of aquatic life to multiple stressors
  - Nutrients, organic loadings, sediments, organic chemicals, and temperature
  - Bioaccumulation of organic chemicals
- Flexible and versatile
  - General or site-specific application
  - Can model just the species and scenarios you need to understand
  - Contains sophisticated uncertainty and sensitivity analysis tools
  - Contains many example studies and data libraries
- PC-based, available at no cost on EPA web site
- Open source software
- User friendly interface, with built-in Help files available to lead users through required model input

## Applications

AQUATOX can be used to better understand the processes relating the chemical and physical environment to the biological community. You can use AQUATOX to:

- Develop and evaluate numeric nutrient targets based on desired biological endpoints.
- Evaluate which of several stressors is causing observed biological impairment.
- Predict effects of pesticides and other toxic substances on aquatic life.
- Predict changes in the ecosystem due to climate change.
- Predict effects of land use on aquatic life by linking to the watershed models in BASINS.
- Estimate time to recovery of fish tissues to safe levels after reducing pollutant loads.

## AQUATOX links water quality to biological endpoints



## What's New

AQUATOX Release 3.2 contains many new enhancements including:

- Additional equations to model the physical complexity of oyster reefs and the marsh-edge environment
- The capability to model size-classes of oysters and crabs within the model
- New invertebrate-modeling capabilities including allometric bioenergetics equations and burrowing refuge from predation
- To better represent marine-biology conventions, the guilds used by AQUATOX to characterize these state variables have been reorganized.
- The database management system has been modernized and now uses SQLite databases
- All model inputs and outputs can now be written in ASCII format
- A command-line version has been added, which allows users to execute and manipulate the model using a DOS command prompt or batch file.

## Additional information

Additional information on AQUATOX is available at <https://www.epa.gov/exposure-assessment-models/aquatox>. You may also contact Brenda Rashleigh in the EPA National Health and Environmental Effects Laboratory at [Rashleigh.Brenda@epa.gov](mailto:Rashleigh.Brenda@epa.gov) or 401-782-3014.