

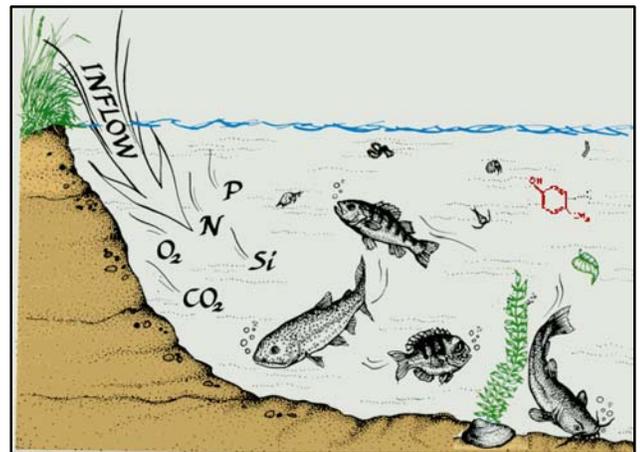


AQUATOX (RELEASE 2.2): MODELING ENVIRONMENTAL FATE AND ECOLOGICAL EFFECTS IN AQUATIC ECOSYSTEMS

AQUATOX is a freshwater ecosystem simulation model that predicts the fate of various pollutants, such as nutrients and organic chemicals, and their effects on the ecosystem, including fish, invertebrates, and aquatic plants. AQUATOX is a valuable tool for ecologists, biologists, water quality modelers, and anyone who performs ecological risk assessments for aquatic ecosystems.

Background

One of the biggest challenges to protecting or restoring our nation's waters is to adequately understand the relationships between the chemical and physical environment and the organisms that live there. Ecosystems are complex, with seasonal and annual variations and multiple interactions among species. The biological communities in many water bodies are impaired, but the causes of the impairment may not be obvious in the face of numerous environmental stressors. It is difficult to predict how the aquatic community will respond to changes in pollutants or environmental conditions with simple methods of analysis, especially if the methods address a single stressor at a time. A complex simulation model may be required.



About AQUATOX

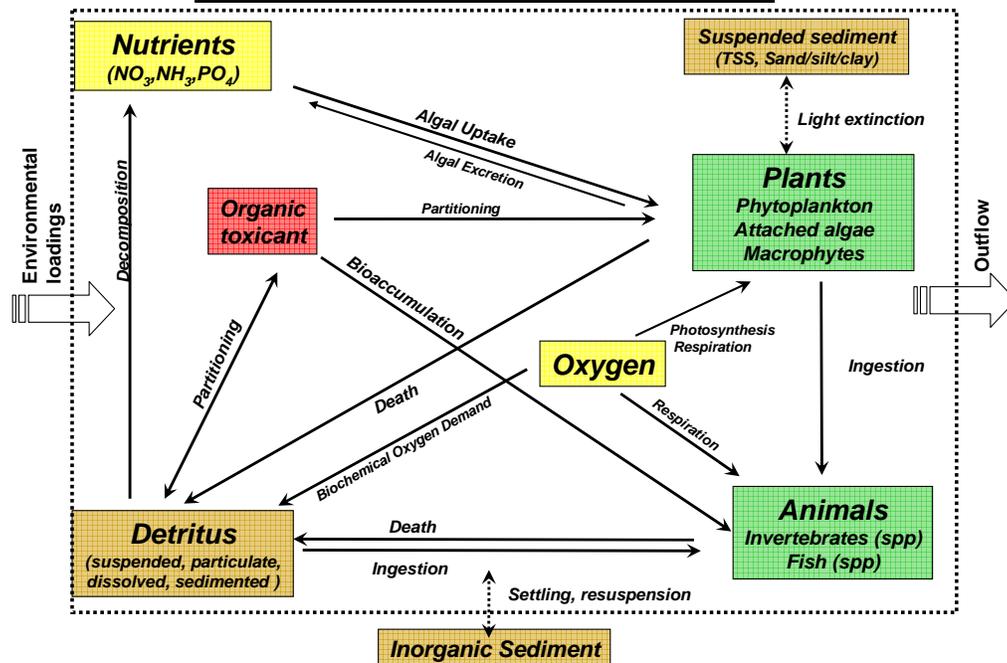
AQUATOX is a PC-based ecosystem model that predicts the fate of nutrients and organic chemicals in water bodies as well as their direct and indirect effects on the resident organisms. AQUATOX simulates the transfer of biomass and chemicals from one compartment of the ecosystem to another. It does this by simultaneously computing important chemical and biological processes over time. AQUATOX simulates multiple environmental stressors (including nutrients, organic loadings, toxic chemicals, and temperature) and their effects on the algal, macrophyte, invertebrate, and fish communities. AQUATOX can help identify and understand the cause and effect relationships between chemical water quality, the physical environment, and aquatic life. It can represent a variety of aquatic ecosystems, including vertically stratified lakes, reservoirs and ponds, and rivers and streams.

AQUATOX Applications

AQUATOX can be used to address a wide variety of issues requiring a better understanding of the processes relating the chemical and physical environment to the biological community. Possible applications of AQUATOX include:

- Developing numeric nutrient targets based on desired biological endpoints.
- Evaluating which of several stressors is causing observed biological impairment.
- Predicting effects of pesticides and other toxic substances on aquatic life.
- Evaluating potential ecosystem responses to invasive species.
- Determining effects of land use changes on aquatic life by using the linkage with BASINS.
- Estimating time to recovery of fish or invertebrate communities after reducing pollutant loads.

AQUATOX Simulates Ecological Processes & Effects within a Volume of Water Over Time



About Release 2.2

AQUATOX Release 2.2 includes several minor updates to Release 2.1. These updates include:

- The model will now calculate reservoir retention time.
- The calculation for light extinction due to blue-green algae was refined, and the model now calculates blue-green algae as a percentage of total algae.
- There were minor corrections made related to the effects of excess temperature in plants, and calculation of initial conditions
- There is an improved algal parameter set and updated example applications.
- There is an improved graphical user interface for more easily assigning toxicity data, and graphing model results

Additional information

Additional information on AQUATOX is available at

<http://www.epa.gov/waterscience/models/aquatox/>. You may also contact Marjorie Coombs Wellman at 202-566-0407 (phone) or wellman.marjorie@epa.gov.