

# WASP

<b>Model Uses</b>	WASP is a model used to assess contaminant fate and transport in surface waters.	
<b>Major Categories</b>	Water Quality	<u>Subject Knowledge Level</u> Advanced
<b>Minor Categories</b>	Transport; Nutrient Production	<u>Technical Difficulty Level</u> Intermediate
<b>Model Type</b>	Physical Model	<u>Geographic in Nature?</u> No

## **Abstract**

Water Quality Analysis Simulation Program, WASP5 is a generalized framework for modeling contaminant fate and transport in surface waters. WASP5 is the latest of a series of WASP programs. Based on the flexible compartment modeling approach, WASP can be applied in one, two, or three dimensions. WASP is designed to permit easy substitution of user-written routines into the program structure. Problems that have been studied using the WASP framework include biochemical oxygen demand and dissolved oxygen dynamics, nutrients and eutrophication, bacterial contamination, and organic chemical and heavy metal contamination.

Two WASP models are provided with WASP5. The toxics WASP model, TOX15, combines a kinetic structure adapted from EXAMS2 with the WASP5 transport structure and simple sediment balance algorithms to predict dissolved and absorbed chemical concentrations in the bed and overlying waters. The dissolved oxygen/eutrophication WASP model EUTRO5 combines a kinetic structure adapted from the Potomac Eutrophication Model with the WASP5 transport structure to predict DO and phytoplankton dynamics affected by nutrients and organic material. TOX15 and EUTRO5 are described more fully in sections below.

WASP5 input and output linkages also have been provided to other stand-alone models using formatted ASCII files. Flows and volumes predicted by the link-node hydrodynamic model DYNHYD5 can be read and used by WASP5. Similarly, loading files from PRZM2 and SWMM4 can be reformatted and read by WASP5. DYNHYD5, PRZM2, and SWMM4 are described elsewhere in this paper. The WASP5 package of software includes the scientific modules TOX15, EUTRO5, and DYNHYD5. In addition, a menu-driven user interface is provided, along with an interactive graphical post-processor that can create tables and spreadsheet files.

## **Future Developments**

Unknown

## **Model Limitations**

Unknown

## **Model Features**

- One, Two or Three Dimension capabilities
- Open to user-written routines
- Two included models - Toxics and TOX15.

## **Required Data Types**

Users input through the DOS prompt pertaining to contaminant type, flow rates, etc.

## **Model Outputs**

Standard tabular with option for post-processing (see readme for more information).

**Hardware Requirements**

None specified

Supported Platforms			
DOS	<input checked="" type="checkbox"/>	UNIX	<input type="checkbox"/>

**Software Requirements**

None specified

Windows	<input type="checkbox"/>	Macintosh	<input type="checkbox"/>
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**Cost, Licensing and Availability**

Free - available through link provided below.

**Source**

US Environmental Protection Agency

**Source URL**

<http://www.epa.gov/ceampubl/swater/wasp>