HAWQS
Hydrologic and Water Quality System

The Hydrologic and Water Quality System (HAWQS) is a web-based interactive water quantity and quality modeling system that employs as its core modeling engine the Soil and Water Assessment Tool (SWAT), an internationally-recognized public domain model. HAWQS provides users with interactive web interfaces and maps; pre-loaded input data; outputs that include tables, charts, and raw output data; a user guide; and online development, execution, and storage of a user's modeling projects.

HAWQS substantially enhances the usability of SWAT to simulate the effects of management practices based on an extensive array of crops, soils, natural vegetation types, land uses, and other scenarios for hydrology and the following water quality parameters:

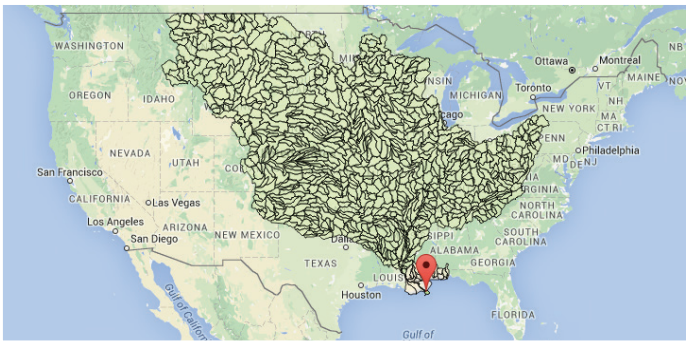
- Sediment
- Pathogens
- Nutrients
- Biological oxygen demand
- Dissolved oxygen
- Pesticides
- Water temperature

HAWQS users can select from three watershed scales, or hydrologic unit codes (HUCs)— 8-digit ~700mi^2, 10-digit ~227 mi^2, 12-digit ~40mi^2—to run simulations. HAWQS allows for further aggregation and scalability of daily, monthly, and annual estimates of water quality across large geographic areas up to and including the continental United States.

The United States Environmental Protection Agency (USEPA) Office of Water supports and provides project management and funding for HAWQS. The Texas A&M University Spatial Sciences Laboratory and EPA subject matter experts provide ongoing technical support including system design, modeling, and software development. The United States Department of Agriculture (USDA) and Texas A&M University jointly developed SWAT and have actively supported the model for more than 25 years.

HAWQS Version 1.0 was released in September 2017. Future versions will be released based on user needs.

HAWQS is capable of modeling very large river basins like the Mississippi River Basin shown below.



EPA United States Environmental Protection Agency

USDA ars Agricultural Research Service

Texas A&M AgriLife Research

Texas A&M University

HAWQS

HAWQS Input Data Sources

Watershed Boundary
USGS, HUC 8, 10, and 12

Livestock and Crops
USDA-NASS

Aerial Deposition
National Atmospheric Deposition Program

Reservoirs
USACE National Inventory of Dams

Soil
USDA-NRCS STATSGO

Land Use
NLCD and CDL

Weather
PRISM (1981–2015)
NCDC (1961–2010)
NEXRAD (2005-2015)

Elevation
USGS National Elevation Dataset

Management Data
NRCS CDL

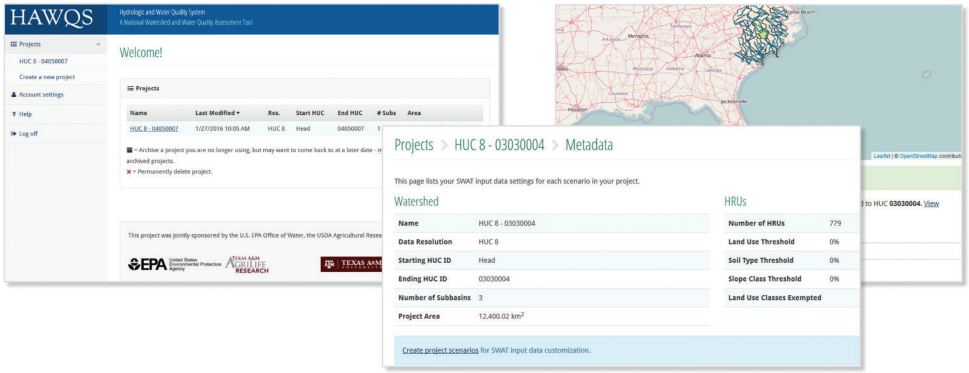
For further details and complete citations, please refer to the HAWQS Help Menu.

FOR FURTHER INFORMATION:
Please visit www.epa.gov/hawqs. To log into the HAWQS interface, go to epahawqs.tamu.edu/. Contact us with questions or comments at hawqs@epa.gov.

HAWQS Version 1.0, September 2017

How HAWQS Works

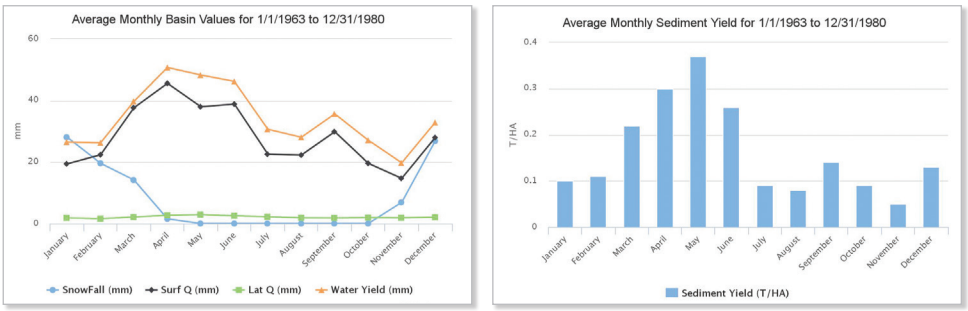
- The user creates a project for a modeling scenario and changes variables and inputs using web interfaces.
- To run the simulation, HAWQS connects with the latest version of the SWAT Model to process the inputs, data and other information for the scenario.
- SWAT finishes processing and generates outputs; HAWQS stores outputs centrally.
- Users can view results through a web interface, save results, and run additional scenarios.



Examples of the HAWQS interactive interface

Why Use HAWQS?

- HAWQS is seamlessly integrated with the latest version of the SWAT Model. SWAT, with more than 2,500 peer-reviewed publications, has been in use for more than 25 years.
- HAWQS integrates SWAT Check to identify potential model problems.
- Scenarios can be run at three different watershed scales.
- HAWQS deploys pre-loaded input data—no need to prepare input data such as point source, land use, and/or agricultural practices. Users can also load custom input data when necessary.
- Modeling projects are performed through a web browser. Projects, scenarios, input data, and output data are centrally stored, reducing users' computing requirements.
- Users can download results in commonly used tabular and chart formats (csv, txt, jpg, png).



Examples of HAWQS output graphs