Texas A&M AgriLife Research, Blackland Research and Extension Center; USDA-ARS Grassland Soil and Water Research Lab; and USDA-NRCS Conservation Effects Assessment Project

2023 TEEA Winner - Technical/Technology

The "project" is, in fact, an interrelated set of projects that have cooperated in the development of a set of computer-based tools to analyze the sources of water contamination in streams and reservoirs by bacteria, sediment, nitrogen, phosphorus, and pesticides. The tools consist of the following:

- Soil and Water Assessment Tool (SWAT) is a watershed-scale hydrologic and water quality model developed and maintained by USDA-ARS scientists at Temple.
- Hydrologic and Water Quality System (HAWQS) is a user-friendly platform linking SWAT with the soil, landscape, climate, weather, crop, livestock, and management data required, as well as statistical and graphical tools needed to evaluate outputs. HAWQS provides the user a dashboard/interface to quickly and easily build SWAT models to analyze alternative soil and water conservation policies, practices, infrastructure, and weather/climate scenarios for their watersheds.
- Texas Best Management Evaluation Tool (TBET) is a web-based tool for predicting sediment and nutrient losses from agricultural fields under a variety of conservation practices using SWAT. TBET was developed by USDA-ARS scientists at Temple in conjunction with TSSWCB.
- Spatially Explicit Load Enrichment Calculation Tool (SELECT) identifies and estimates potential pathogen loads resulting from various fecal sources in watersheds.

With these tools, researchers around the world are able to quantify and predict a variety of environmental impacts in complex watersheds within minutes. Prior to the creation of these tools, a stream or reservoir predictive analysis would take several weeks to complete. Not only have these

tools transformed how watershed analysis and management evaluations are addressed, they have helped inform and change environmental policy.