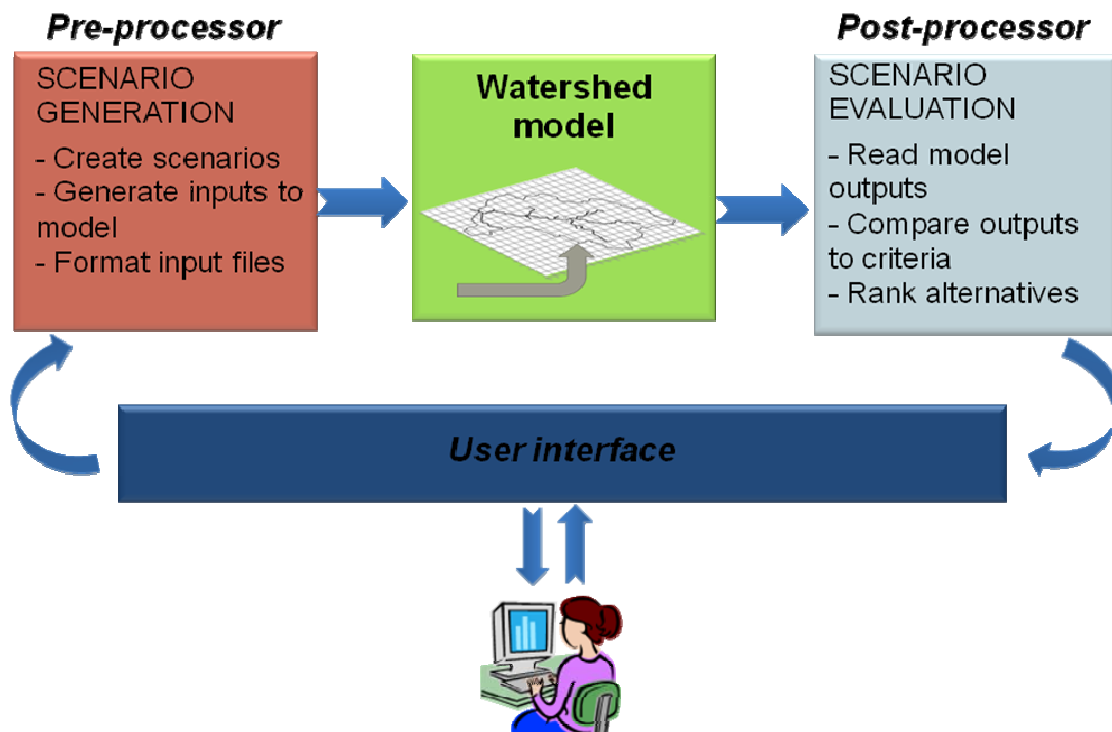


The Cypress Creek Decision Support System

Impacts of development on spring flows and in-stream water quality must be considered when planning for the future of the Wimberley Valley. The complexity of community and water resource planning means that decisions cannot be undertaken without recognizing how those decisions affect the community, political, economic, and natural systems in the region. A systems approach does not seek to optimize a single output to define a long-term management strategy, but rather uses a holistic perspective that takes into account the various biophysical, economic, legal, environmental, and other factors that impact the availability and use of local resources.

Partnering with the River Systems Institute, and including input from diverse stakeholder groups, researchers at Texas State University are developing a Decision Support System (DSS) for the Cypress Creek watershed. A DSS is a set of computer-oriented tools specifically designed to help people in making decisions. It incorporates both numerical modeling and qualitative information for evaluation of management and policy impacts using a systems approach.

The Cypress Creek DSS will be a software package (see figure below) that incorporates stakeholder preferences with hydrologic analyses for use in negotiating long-term management strategies for the watershed. The package will consist of: 1) a database management system to house the available biophysical, social, and economic data; 2) a watershed model that can simulate the watershed response to alternative scenarios of land development, climate change, etc.; 3) a multi-criteria decision analysis module that will evaluate results from watershed simulations relative to stakeholder-specified objectives and criteria; and 4) a graphical interface to assist users in performing “what if” scenario analyses.



The Cypress Creek DSS will allow users to:

- Input basic simulation configurations, i.e. increasing impervious cover to simulate stages of urbanization through a graphical interface;
- Define and save simple scenarios;
- Execute hydrologic simulations based on these scenarios;
- Evaluate impacts of land use changes on in-stream flow and pollutant loadings;
- Identify potential trends in watershed response to management-related stresses
- Identify potential trends in watershed response to climate change
- Evaluate the outcomes of management scenarios and rank alternative management plans;
- Facilitate consensus-building among stakeholders.

The Cypress Creek DSS will not:

- Directly evaluate and address effects of activities occurring outside the watershed;
- Give exact predictions of future in-stream flows and water quality;
- Determine sustainable water supply nor environmental flows;
- Provide accurate evaluations beyond the constraints of available data and current best watershed science.

Development of the DSS will proceed through an iterative series of stakeholder workshops and technical development. The DSS for the Cypress Creek watershed will provide information and tools to allow decision makers to assess the relative costs and benefits of alternative development strategies based on sound science and a participatory process, rather than relying solely on the political process. This knowledge can help decision makers maximize benefits for the greatest number of people and minimize environmental, litigation, and other unforeseen costs that can result from development, land use change, and policy implementation.