Cypress Creek Project

PREPARED IN COOPERATION WITH THE
Texas Commission on Environmental Quality
The preparation of this report was financed through grants from the Texas Commission on Environmental Quality.

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River Systems Institute Mission

Founded in 2002, the mission of the River Systems Institute is to develop and promote programs and techniques for ensuring sustainable water resources for human needs, ecosystem health, and economic development. The Institute is committed to helping protect and conserve water resources while promoting economic development and social well-being by:

- advancing scientific and technical knowledge through research on aquatic resources;
- identifying and analyzing socio-economic and political issues affecting water use;
- guiding the development of environmentally sustainable public water policy in Texas;
- cultivating public awareness and education about water resource issues.

At Texas State, the Institute serves as an integrating mechanism for the university's multidisciplinary expertise in aquatic resources. Texas State is home to a distinguished array of departments and research centers engaged in critical scholarly work on water management issues. The Institute's projects create new opportunities to disseminate this significant repository of knowledge and information to the community at large.

By forging partnerships with concerned stakeholders, the Institute hopes to foster practical solutions to the real-world problems of water resource management. As use and sustainability takes center stage in a global economy, cooperative strategies must secure the protection of this irreplaceable resource - water.

RIVER SYSTEMS INSTITUTE
Texas State University

TEXAS STATE UNIVERSITY
SAN MARCOS

Cypress Creek Project Partners

City of Woodcreek

River Systems Institute
Texas State University

GBRA

Texas State University
San Marcos

Texas Stream Team

The County of Hays

United States Environmental Protection Agency

Hays Trinity Groundwater Conservation District

Watershed Science Lab
Texas State University - San Marcos

TCEQ

Wimberley Valley Watershed Association

River Systems Institute
Texas State University

Texas State University
San Marcos

Cypress Creek Project

The main goal for this project is to ensure that the long-term integrity and sustainability of the Cypress Creek watershed is preserved and that water quality standards are maintained for present and future generations. *The project aims to keep Cypress Creek clean and clear.* A core belief is that good water quality is essential to all, and that protection of water resources is an individual as well as governmental responsibility.

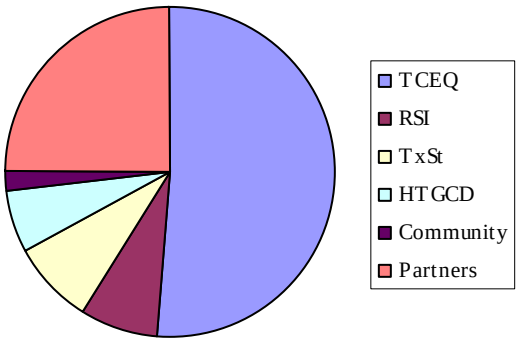
Much of the Cypress Creek community recognizes the balance between growth and protection and between regulation and the rights of individuals is tenuous. Understanding that new development is certain, there is a recognized community need to create a watershed management plan to ensure Cypress Creek water quality conditions are improved and remain healthy.

The Cypress Creek project consists of two phases: Phase One 2008-2010 and Phase Two 2010-2012. The first phase, as outlined in this document, sets a process in motion that creates opportunities to develop a watershed management plan. Phase two involves development and implementation of a watershed management plan. A watershed management plan is a holistic document that approaches water quality and watershed issues through a collaborative approach by recommending management strategies that address more than one watershed and community concern. See page 11 for more information.

The River Systems Institute, through strong Cypress Creek community partnerships, is facilitating this project. The majority of this project is paid for by grant funds from the Texas Commission on Environmental Quality through the Region VI Environmental Protection Agency. River Systems Institute and Texas State University-San Marcos, along with numerous project partners are providing substantial funds to achieve project success.

The TCEQ provides 'seed' money to initiate and facilitate the project. Resources from partner organizations and the community will assist in developing and implementing project activities.

Cypress Creek Project Funding



River Systems Institute
Texas State University

Texas State University
San Marcos

Project Overview:

The work involved in this project is comprised of the following:

(1) watershed **characterization**
(2) Cypress Creek source water **delineation**
(3) **stakeholder** participatory input process
(4) **decision support system** development
(5) **training** for decision support system use
(6) **partnership** development
(7) additional **resource development**
(8) watershed **education**

(1) Compiling, analyzing, and **characterizing** surface water resources. Qualified information from existing sources of water quality information will be used to assess water quality trends, to determine areas of nonpoint source pollution susceptibility, and to identify areas of interest concerning surface and groundwater interactions.

(2) **Delineating** the contributing and recharge zones in the Trinity Aquifer for the source waters of Cypress Creek will begin through a joint partnership with the UGSG, Hays-Trinity Groundwater Conservation District, and Texas State University-San Marcos. Determining the recharge zones and features for Cypress Creek headwaters is significant due to the interconnectedness of spring flow, nonpoint source pollution susceptibility, and water quality in the Cypress Creek basin.

(3) Establish a **stakeholder process** to involve the community in project decisions and conduct a community education campaign. The stakeholders will review modeling inputs and outputs, water quality information, watershed characterizations, development and other nonpoint source issues, and provide input on best management practices that may be incorporated into the Decision Support System. A survey of the community will be designed and distributed to gauge interests and priorities.

(4) Develop the **Decision Support System** incorporating information from modeling efforts, stakeholder input and priorities, best management practices, and watershed characteristics to allow the stakeholder group to assess best management practice (BMP) options to maximize their impacts on reducing NPS pollution. Through an iterative, collaborative process involving stakeholders, the decision support system will be developed to incorporate a database management system, the biophysical and socio-economic models, the evaluation criteria developed in stakeholder workshops, and a graphical user interface to aid decision makers in understanding the results of the model outputs.

(5) **Train** stakeholders to use the decision support system (DSS). A series of training sessions will be held with decision makers to train them in the use of the DSS, including developing an understanding of its capabilities and limitations. In addition, training will be provided to decision makers and/or technical experts on how to modify the model(s) and evaluation criteria so that the DSS may be adapted to changing future needs.

(6) Establish **partnership** efforts that will help guide a stakeholder-driven process to begin the implementation of pollution prevention efforts. Project partners will seek implementation resources and initiate partnerships with the development community within the watershed. Based on results from the watershed characterization, additional resources will be sought to begin on-the-ground implementation where new developments occur in proximity to environmentally sensitive areas. The general approach is to enhance the capacity of the development community to increase BMP pollution mitigation efforts.

(7) Additional **resources** are essential for the successful development and implementation of this project. Grant awards, partner in-kind contributions, volunteers, and other resources will be utilized in this project.

(8) Watershed **education** will occur in various forms to include presentations, curriculum development, special events, education forums, meetings, website, written materials, and other forums.

Year One Project Timeline

January 2008	Project Initiation
January – May	Watershed characterization; grant applications
May 2008 – 2010	Stakeholder process
May 2008	Stakeholder luncheon (inform and discuss project)
June 2008	Public open forum (inform and discuss project);
July 2008	Flood Study/others grant applications
May-August	Initial public input (seek input from community)
August 2008	Characterization report presented
September 2008	Steering Committee development; grant applications
October 2008	Public open forum (feedback to community regarding input and watershed characterization)
November 2008	Community Survey
December 2008	Stakeholder input and steering committee development continued

Voluntary Participation

It is pertinent to emphasize that this project will aim to establish cooperative efforts that will be implemented on a voluntary basis. No one will be required to implement the management strategies recommended though the stakeholder processes; however, sustainable management of the watershed's health may not be realized unless people are willing to collectively cooperate and act to implement the recommended management measures.

Partner Development

One-on-one and small group meetings occur with project staff and potential partners. During these meetings, staff present the project to solicit input and comments from partners. Project partners will receive a project overview and a schedule of events. This initial round of input will provide project managers the opportunity to gauge: interests, opportunities, strengths, and weakness.

Stakeholder and Steering Committees

What do we already know?
Receive background information from stakeholders
Select indicators to measure environmental conditions
Identify issues of concern
Identify driving forces
Develop preliminary goals

Process

1. Identify and engage stakeholders through various forums: interact with the community through public meetings, one-on-one discussions, special events, and others as deemed necessary.

2. Identify categories of stakeholders: landowners, county and regional representatives, local municipality representatives, state and federal agencies, business and industry representatives, citizen groups, community service organizations, religious organizations, schools, environment and conservation groups, soil and water conservation groups, water suppliers, and others.
3. Determine roles and responsibilities - there will be distinct groups of people: decision makers, advisors, and supporters
4. Provide a structure to facilitate stakeholder input
5. Identify stakeholders' skills and resources: accounting, graphics, computer support, fund raising, public relations, technical expertise, facilitation, volunteer coordination, data, equipment, stream access
6. Encourage participation and involvement:

   At home: reading materials, visiting website, completing survey, adopting practices to reduce nonpoint source pollution and water use.

   In the community: participate in the process, talk with friends and neighbors, attend or assist with presentations.

   Action-oriented: storm drain marking, volunteer monitoring, steering committee, stream clean-ups.
7. Conduct outreach to build awareness and gain partners
9. Continue to build stakeholder group
10 Adapt!

The initial round of stakeholder input could focus on the following:

How to define water quality
Identify standards to protect water quality
Identify protection measure already in place
Develop a strategy for action
Identify causes of water quality problems
Identify who can protect water quality
Identify new measures needed

The Decision Support System

Impacts of development and groundwater withdrawals on spring flows and creek water quality must be considered when planning for the future of the Wimberley community. It is not possible to imagine and discuss all possible alternatives for what might happen in the future, but with advances in computer technology, it is possible to create virtual landscapes where different scenarios can be evaluated and decisions can be made accordingly.

Decision support systems (DSS) are designed to provide information for resource managers who are solving complex problems, such as those faced by local planners, managers, and stakeholders wishing to allow for economic growth, while preserving water quality and protecting the local environment. Decision support systems incorporate many different types of information – economic data, population projections, geologic features, biological and physical data, water flows, etc. – into a software system that supports informed decision-making for the future. DSS are increasingly recognized as useful tools to help in the resolution of conflicts involving values, management approaches, strategies, and potential outcomes.

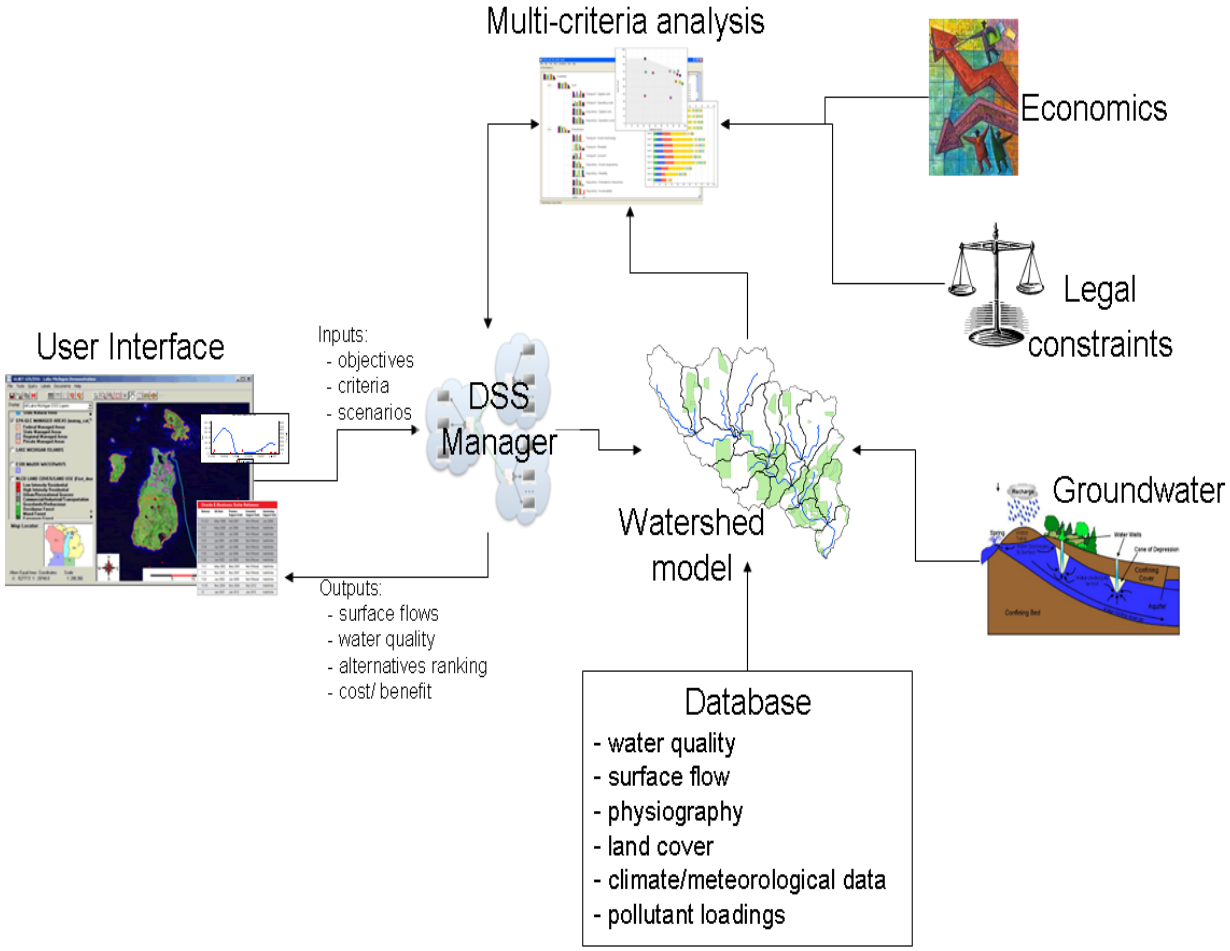
With input from diverse stakeholder groups in the community, researchers at Texas State will be developing a computer model-based Decision Support System (DSS) for the Cypress Creek watershed. The DSS will provide information and tools to allow decision makers to assess the relative costs and benefits of alternative development strategies based on sound science and a participatory process. The DSS will allow for examination of the impacts of proposed development activities and land management

practices on water flows and water quality in the Cypress Creek. This knowledge can help decision-makers maximize the benefits for the greatest number of people and places while and minimizing environmental, quality of life, and other unforeseen costs that can result from land use change and policy implementation.

After the DSS is developed and tested, this tool will be freely available for use by decision-making entities. Examples of eligible groups could include: Hays County, Village of Wimberley, Guadalupe-Blanco River Authority, Hays-Trinity Groundwater Conservation District, City of Woodcreek, Wimberley Valley Watershed Association, Texas State University, and other. Since the DSS should be updated to reflect land changes and community priorities, it is possible that one group will be the point of contact for maintenance and scenario development.

The DSS will consist of the following components:

- A database management system to integrate the available biophysical, social, and economic data;
- A set of integrated analytical, simulation, and/or optimization models that implement the analysis algorithms based on the above data set;
- An output module for the spatial and/or non-spatial depiction of expected future outcomes; and
- A user-friendly interface that will enable stakeholders to perform "what if" scenario analyses.



The DSS will serve four purposes: (1) stakeholders will gain a better understanding of the cause-and-effect relationships that can influence a watershed's response to development strategies; (2) decision makers will objectively compare the effects of a range of possibilities based on sound analyses; (3) the DSS will aid in reaching agreement regarding specific local areas in need of increased protection and the management strategies to be pursued to minimize the environmental impacts of future development; and (4) the DSS will assist ongoing efforts in public outreach and education concerning the watershed management and water quality issues faced by the town of Wimberley and its adjacent areas.

Watershed Management Plans

A watershed management plan (WMP) is a holistic document that approaches water quality and watershed issues through a collaborative approach by recommending management strategies that address more than one watershed and community concern. It includes an in depth overview of the watershed, defines what the watershed is and what its characteristics are and provides some of the history behind the water quality, watershed health, and community issues that are currently and will be faced in the future. One unique characteristic of this project is that it also addresses groundwater quantity and quality.
Concerns voiced by stakeholders about the watershed are discussed in detail; management strategies are recommended, an estimate of costs and technical assistance are provided, timelines for implementing these strategies and a ancillary program to address each priority concern are all included in the WMP. Specific efforts will be made to partner with landowner and developer constituents.
Most of the watershed management plan follows the outline of the Environmental Protection Agency (EPA) Handbook for Developing Watershed Plans to Restore and Protect Our Waters. This handbook provides a solid framework and includes the following sections and addresses watershed concerns in each component associated with the following ten sections:

1. Identifying the causes and sources of pollution
2. Estimating expected pollution reduction levels
3. Identifying critical areas of the watershed
4. Describing management measures needed
5. Estimating the costs of technical assistance and sources of funding
6. Outlining an education outreach component
7. Developing a feasible implementation schedule
8. Establishing milestones to assess the effectiveness of plan implementation
9. Developing criteria for assessing success
10. Establishing a long-term monitoring effort

When all sections of the plan are combined, they provide a holistic approach to describing, managing, funding, implementing, monitoring, and maintaining needed management strategies that focus on improving the health of the Cypress Creek watershed as development and land use change continues. The development of the WMP is not the final answer to water quality, flooding, and quantity problems; it is merely a starting point. New information will undoubtedly be discovered as the implementation process is carried out and the will add to our collective knowledge of how to better manage the watershed. It is likely that new pollutant sources and problem areas will be identified as well. This information will be incorporated into the plan to improve management strategies, refine the areas where specific measures will be incorporated and to better focus resources to achieve maximum benefits.