

Watershed Assistance to Improve Water Quality in North Central Texas

Texas Water Resources Institute
FY 03 Federal Appropriated Funds
Project # 03-60768

Quarter no. 6 From 1/8/05 Through 4/7/05

Progress in Meeting Project Milestones and Output Commitments

Task, Deliverables, and Schedules

The Texas Water Resources Institute (TWRI) along with the Texas A&M University Spatial Sciences Laboratory (SSL), Blackland Agricultural Research and Extension Center (BAREC) and Texas Cooperative Extension (TCE) have been diligently working to complete project deliverables. Project efforts during the sixth quarter focused on modeling activities and education. The SSL and BAREC have completed efforts to calibrate and validate the SWAT model for Cedar Creek Reservoir. TCE has developed a public education bulletin entitled “The Watershed Management Approach” and are working on developing a watershed-specific bulletin for Cedar Creek Watershed (delayed waiting for completion of modeling). TCE has also developed a bulletin on Stormwater Management with associated BMPs that can be implemented to improve water quality. TWRI continues to update its Web site containing water quality information, specifically related to project efforts, for scientists, and the general public and to provide project oversight and financial management for the project.

In looking forward to the next quarter, with SWAT modeling activities completed for Cedar Creek Reservoir and Watershed, work will continue on developing BMP scenarios to correct sediment and nutrient loadings. Work associated with Eagle Mountain Reservoir modeling activities will continue. The economics team will initiate the cost effectiveness of different BMP scenarios. TCE specialists will begin identifying and forming stakeholder groups and finalize the Cedar Creek publication.

The status of tasks, milestones and deliverables will be defined using the following terms:

Pending	Work has not started on the deliverable
Initiated	Work has started
Completed	The objectives were achieved and deliverables are finished
Deferred	Work has started, but further action is delayed pending other information, the completion of another objective, staff restraints, etc.
Ongoing	Work will continue throughout the term of the contract

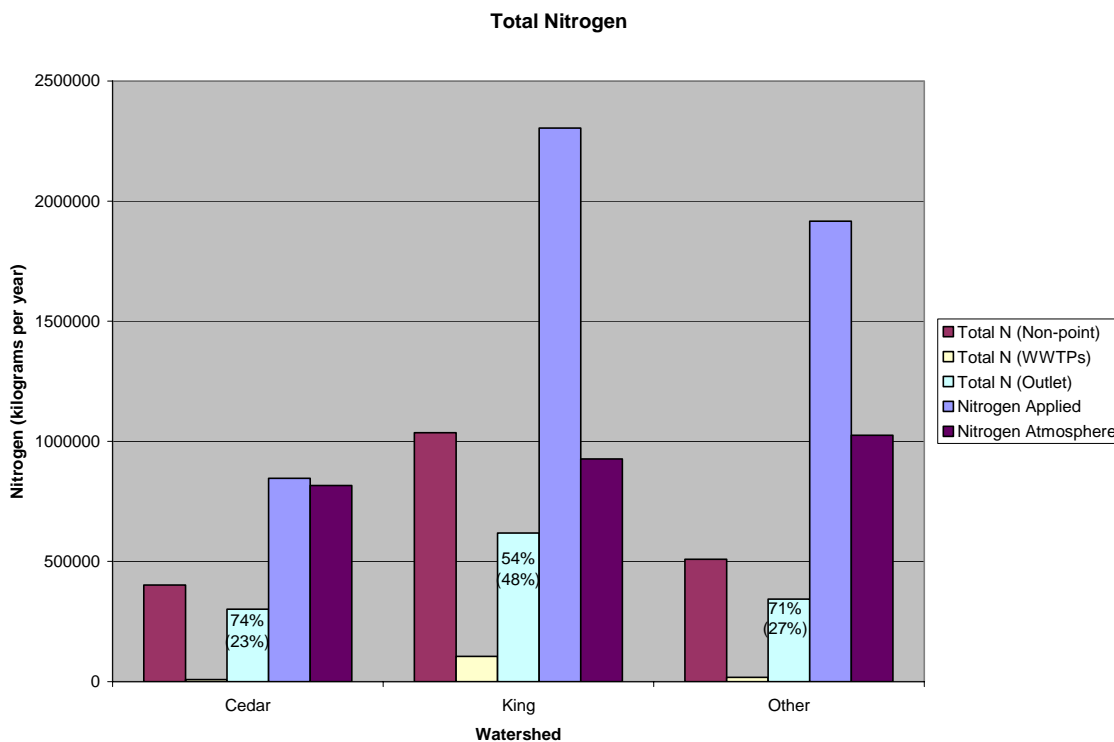
Task 1 SWAT Modeling

Date	Status	Deliverables
1/1/04	Completed	1. Complete model calibration and validation for Cedar Creek Reservoir
1/1/05	Initiated	2. Finish calibration and validation for Eagle Mountain Reservoir
9/1/05	Pending	3. Collect GIS data on wastewater treatment plant discharge required for SWAT modeling of Eagle Mountain and Bridgeport Watersheds

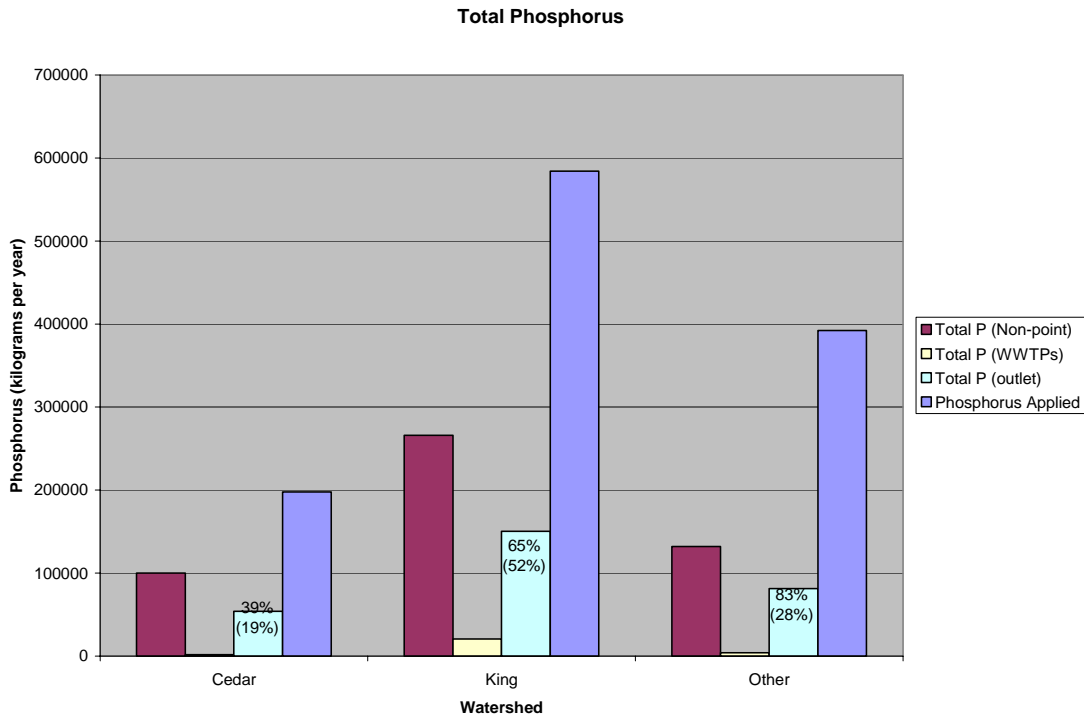
Comments:

- The Spatial Sciences Lab in cooperation with Blackland Agricultural Research and Extension Center has completed the calibration and validation of the SWAT model for Cedar Creek Reservoir. This deliverable is 100 percent complete.
- The Spatial Sciences Lab has delineates the sub-basins for Eagle Mountain Watershed and have begun to format data to input into the model. This deliverable is 15 percent complete.

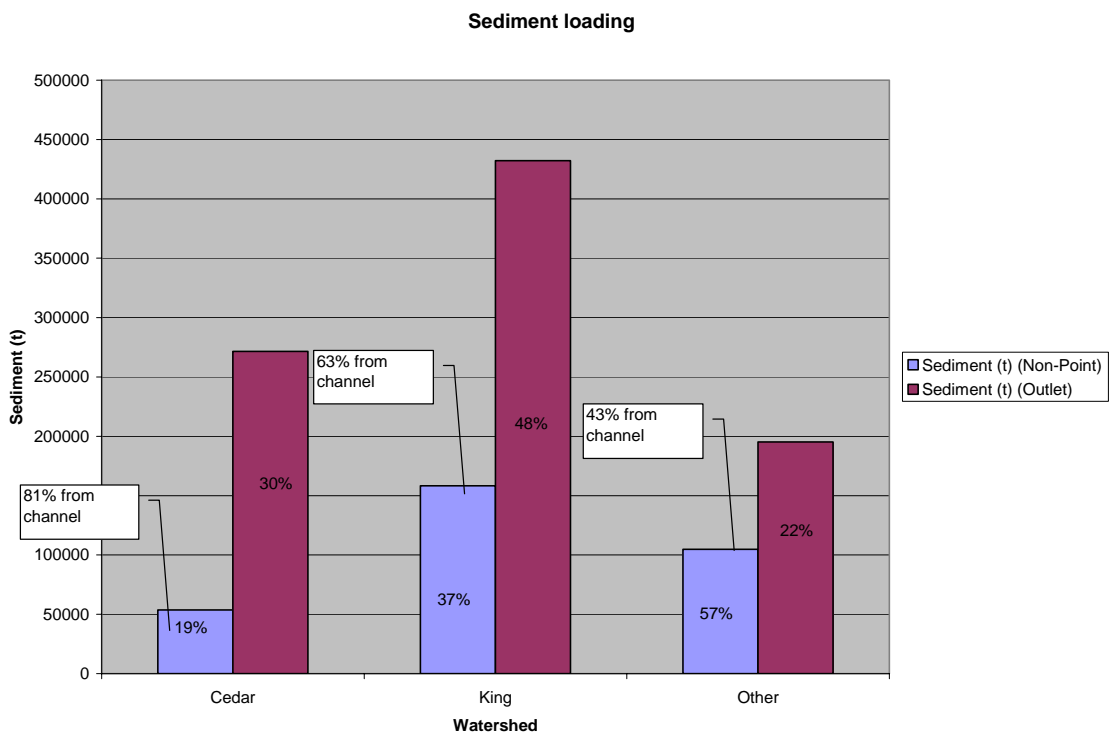
The chart below represents nitrogen loading for Cedar Creek Watershed. 74 percent of the point and non-point source load of nitrogen in Cedar Creek is reaching the reservoir. Cedar Creek is contributing 23 percent of the load into the reservoir while Kings Creek contributes 48 percent and all other tributaries contribute 27 percent.



The chart below represents phosphorus loading for Cedar Creek Watershed. 65 percent of the point and non-point source load of phosphorus in Kings Creek is reaching the reservoir. Kings Creek is contributing 52 percent of the load into the reservoir while Cedar Creek contributes 19 percent and all other tributaries contribute 28 percent.



The chart below represents sediment loads for Cedar Creek Watershed. The channel is contributing 81 percent of the sediment being loaded from Cedar Creek into the reservoir, while 19 percent is being contributed by the watershed. Kings Creek, 63 percent from the channel and 37 percent from the watershed. Other tributaries 43 percent from the channel and 57 percent from the watershed. Kings Creek is contributing 48 percent of all the sediment entering the reservoir.



Task 2 Economic Analysis

Date	Status	Deliverables
9/1/04	Initiated	1. Begin developing input data for economic analysis of alternative BMPs for Cedar Creek Reservoir and Watershed
4/1/05	Pending	2. Conduct economic analyses of alternative BMPs for Cedar Creek Reservoir Watershed
10/1/05	Pending	3. Begin developing input data for economic analyses of Eagle Mountain Watershed

Comments:

- Preliminary work has begun to identify BMPs to be input into the SWAT model to look at reducing nutrient and sediment loadings in Cedar Creek Watershed.
- BMPs being evaluated include: terraces, contour farming, crop residue management, conversion of cropland to grass or urban, grazing management – rotational grazing, fencing of water supply, fertilizer/nutrient management, pasture planting/range seeding, streambank stabilization, sediment retention structures and improving pasture conditions from fair to good.

Task 3 Extension Education

Date	Status	Deliverables
4/1/04	Completed	1. Develop generalized watershed management program bulletin
7/1/04	Completed	2. Conduct two-day watershed management training program for County Extension Agents and other selected resource personnel
10/1/05	Initiated	3. Recruit Cedar Creek stakeholder committee
1/1/05	Deferred	4. Develop Cedar Creek Watershed characteristics fact sheet
1/1/05	Completed	5. Construct demonstration trailer
4/1/05	Completed	6. Hold Cedar Creek public meeting on watershed characteristics and pollution problems
4/1/05	Pending	7. Recruit Eagle Mountain stakeholder committee
4/1/05	Pending	8. Conduct two-day training program on stream erosion for County Extension Agents and other resource personnel
4/1/05	Pending	9. Hold two Cedar Creek stakeholder committee meetings
7/1/05	Initiated	10. Develop Eagle Mountain Watershed characteristics fact sheet
7/1/05	Initiated	11. Conduct two Cedar Creek Extension education meetings on urban storm water quality, agricultural nonpoint source pollution prevention and wastewater
7/1/05	Initiated	12. Develop general fact sheets on:
	Completed	1) Wastewater management options around lakes,
	Pending	2) Urban storm water management, and
	Pending	3) Lawn management
10/1/05	Pending	13. Hold Eagle Mountain stakeholder committee meetings
10/1/05	Pending	14. Hold Eagle Mountain public meeting on watershed characteristics and pollution problems

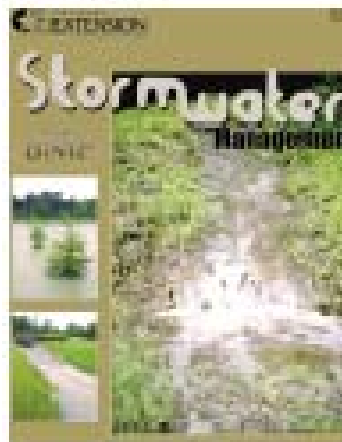
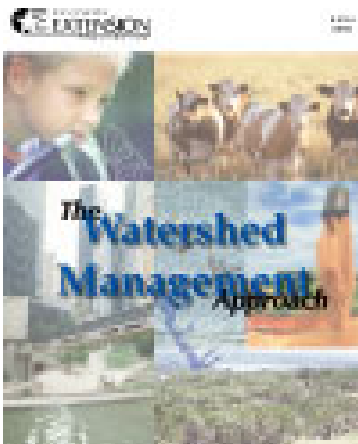
Comments:

- TCE developed a generalized watershed management bulletin entitled “The Watershed Management Approach.” This deliverable is 100 percent complete.
- Extension personnel held a two-day watershed management training on September 16-17, 2004 in Fort Worth. Participants of the training included county extension agents and other Extension personnel, TRWD staff, NRCS and SWCD personnel from counties within Cedar Creek and Eagle Mountain Watersheds.
- Cedar Creek Watershed fact sheet development is in the intermediate stage. This deliverable will be completed once BMP runs have been made through the SWAT model and recommendations have been made on how to reduce loadings into the reservoir. This deliverable is 75 percent complete.
- TCE developed a generalized bulletin on Stormwater Management. This deliverable is 100 percent complete.

- Educational materials for the trailer are under development. The demonstration trailer has been used at over twenty-five events with over 800 participants.
- TCE personnel developed a generalized interactive presentation on the North Central Texas Water Quality Project highlighting project goals and objectives. This informative presentation is auto narrated and can be used by Extension Agents in presentations to individual county groups. This presentation is available through the North Central Texas Water Quality project Web site.
- TCE worked with County Extension Agents in Kaufman, Henderson, Van Zandt and Rockwall counties to gather soil samples as part of a soil sampling campaign aimed to collect data to verify findings of the SWAT model. Over 100 samples were collected.
- Conducted three water quality programs in the Cedar Creek Watershed geared toward agricultural stakeholders on the issues of non-point source pollution.
- Presented a poster on the project at the United States Water Quality Conference in San Diego and at Texas A&M University's Water Week.



Demonstration Stream Trailer
being used for a presentation to
5th grade students



Publications developed by TCE
project personnel for this
project. They are available at
<http://tcebookstore.org>

Task 4 Administration

Date	Status	Deliverables
1/7/04	Completed	1. Quarterly Progress Report
4/7/04	Completed	
7/7/04	Completed	
10/7/04	Completed	
1/7/05	Completed	
4/7/05	Completed	
7/7/05	Ongoing	
10/7/05	Ongoing	2. Final Report

Comments:

- TWRI continually updates the Web site created specifically for the North Central Texas Water Quality Project. The Web site can be accessed at the following address: <http://nctx-water.tamu.edu>.
- Program material presented at the project sponsored watershed management training has been added to the North Central Texas Water Quality Web site. Also included is a generalized interactive presentation highlighting project goals and objectives. This informative presentation is auto narrated and can be used by Extension agents in presentations to individual county groups.
- On February 17, 2005, TWRI representatives meet with NRCS administrators Susan Baggett and Jim Mueller to update them on project progress and accomplishments.
- On March 29, 2005, project participants met at the Dallas Agricultural Research and Extension Center in Dallas, TX to present the status of deliverables and discuss objectives for the upcoming quarter and for year three tasks.
- On April 5, 2005, TWRI Director and NCTXWQ Project Manager meet with Dr. Larry Butler, State Conservationist, to discuss the projects progress and accomplishments.

Problems or Obstacles Encountered and Remedial Actions Taken

The research team has had difficulty in adapting all the parameters for the SWAT/QUAL2E/WASP model. Great strides have been made by the modeling team to configure an accurate up-to-date model, which patterns both the watershed and the reservoir simultaneously for nutrient and sediment loading. Seeing the need for additional data associated with sedimentation within the lake, TRWD and the Texas Water Development Board will be conducting a sediment survey for Cedar Creek Reservoir in early May. This survey will be used to verify sedimentation rates and loads within the reservoir. This information will act as verification to sediment loadings predicted by the SWAT model. SWAT/QUAL2E/WASP model integration is complete and BMP scenario runs should be complete by the next quarter.

Work Planned for Next Reporting Period

Task 1: SWAT Modeling

Continue running the SWAT/QUAL2E/WASP model using select BMP scenarios and looking at total load reductions within the reservoir. Finalize which BMP strategies are most effective and least costly at reducing nutrient, sediment and pollutant loadings into Cedar Creek Reservoir. Initiate model calibration and validation for Eagle Mountain Reservoir.

Task 2: Economics

Begin collecting information and developing input data for economic analysis of alternative BMPs for Cedar Creek Reservoir and Watershed.

Task 3: Education

Finalize watershed specific bulletin relating to Cedar Creek Watershed. Begin process of recruiting the Cedar Creek Watershed stakeholder group. Begin developing material from the scheduled watershed management training meeting.

Task 4: Administration

TWRI will continue working with TRWD, SSL, BAREC and TCE in moving forward with project deliverables and reporting progress on a quarterly basis. Efforts will be made to publicize the project and raise awareness of water quality issues within the study area.

TWRI will work with the NRCS project manager to complete year three plan of work and finalize project budget.