

# Carters Creek Total Maximum Daily Load Implementation Project

## Education and Outreach Report: Task 6

Texas Water Resources Institute TR-487  
January 2016



# **Carters Creek Total Maximum Daily Load Implementation Project**

---

## **Education and Outreach Report: Task 6**

**Project Funded by:**  
Texas Commission on Environmental Quality: Award: 582-13-30059

**Cooperating Entities:**  
Texas A&M AgriLife Research, Texas Water Resources Institute  
Texas A&M AgriLife Research, Department of Soil and Crop Sciences  
City of Bryan  
City of College Station  
Brazos County Health Department  
Brazos County Road and Bridge Department  
Texas A&M University - Environmental Health and Safety  
Texas Department of Transportation – Bryan District

**Prepared by:**  
Lucas Gregory and Cassian Schulz

**Texas Water Resources Institute Technical Report TR-487  
January 2016**

Funding support for this project was provided in part through a Clean Water Act §319(h) Nonpoint Source Grant from the Texas Commission on Environmental Quality and the U.S. Environmental Protection Agency

## **Table of Contents**

List of Acronyms.....	ii
Introduction .....	1
Project Background.....	1
Introduction .....	2
Stakeholder Engagement .....	2
Project Meetings .....	2
Project Website .....	4
Project and General Water Quality Awareness .....	5

## List of Acronyms

COB	City of Bryan
COCS	City of College Station
GIS	Geographic Information System
IP	Implementation Plan
NAWA	Nutrient and Water Analysis
SAML	Soil and Aquatic Microbiology Laboratory
SCSC	Soil and Crop Sciences
TAMU	Texas A&M University
TCEQ	Texas Commission on Environmental Quality
TMDL	Total Maximum Daily Load
TST	Texas Stream Team
TWRI	Texas Water Resources Institute
TxDOT	Texas Department of Transportation

## **Introduction**

### **Project Background**

All states are required to identify waters that either do not meet or are not expected to meet water quality standards. After identifying these waters, the state must develop a Total Maximum Daily Load (TMDL) for each pollutant that impairs the uses of the water body. In Texas, the responsibility of ensuring TMDLs are developed is tasked to the Texas Commission on Environmental Quality (TCEQ).

In 2007, TCEQ's TMDL Team began the process of developing a TMDL and a TMDL Implementation Plan (I-Plan) for the Carters Creek watershed. Watershed stakeholders were engaged in the process to develop recommendations for management measures needed to restore water quality in the Carters Creek watershed. Through discussions with stakeholders, a recurring need for an improved understanding of the current state of water quality in waterbodies throughout the watershed was expressed. In concert with this expressed need is the need to provide this information to watershed stakeholders for use in future watershed related decision making.

To address this need, a project proposal titled “Carters Creek Total Maximum Daily Load Implementation” was developed and submitted to TCEQ for funding consideration in the fall of 2011. The project was selected for funding and began in September 2012. This project was developed to fill these needs through enhanced water quality monitoring, a watershed source survey and delivery of information to watershed stakeholders through a variety of avenues. Specific project goals are to:

1. conduct extensive water quality monitoring throughout the watershed on a spatial and temporal scale that will provide additional data to identify sub-watersheds where bacteria and other pollutant contributions are problematic
2. conduct a multi-faceted watershed source survey utilizing geo-referenced field observations, and geographic information system (GIS) to identify potential sources of bacteria and other pollutant loading in the watershed
3. document watershed source survey results using GIS so that information can be integrated with available digital data on existing nonpoint and point source pollutants in the watershed
4. organize and establish a volunteer monitoring group through the Texas Stream Team (TST) program as a means to provide supplemental water quality data that will help local watershed managers further refine their knowledge of the spatial and temporal distribution of instream water quality variability

Education and outreach is an equally important aspect of this project that is not clearly defined in the project goals. Specifically, its purpose is to engage watershed stakeholders throughout the course of the project and facilitate information transfer that will further stakeholder understanding of the watershed and its water quality. To accomplish this, a stakeholder engagement component was built in to the project. This report focuses specifically on the outcomes of the stakeholder engagement task.

## Introduction

Communication is the cornerstone of all effective efforts, and water quality projects are no exception. Open and effective lines of communication were established through this project with the purpose of conveying project findings, plans for upcoming work and to support discussion with stakeholders about evolving needs in the watershed. To accomplish this, three primary mechanisms were utilized to engage watershed stakeholders and included focused project meetings, a project website, and general project awareness through non-traditional outlets such as education events on riparian ecosystem health and function, water quality monitoring training, education courses and others.

## Stakeholder Engagement

Stakeholders were engaged throughout the course of the project through yearly project specific meetings and TMDL implementation plan update meetings that focused on the implementation activities completed in the watershed during the previous year. A project website was established and updated as a source of project specific information and other related information. Project awareness was also increased by delivering educational programs, developing and disseminating educational materials and generally keeping water quality related information in front of people.

## Project Meetings

Regular meetings were held with watershed stakeholders to update them on the project and the progression of water quality monitoring. Meetings typically occurred on an annual basis and routinely included representatives from Brazos County, the City of Bryan, City of College Station, the local Natural Resource Conservation Service, TCEQ, Texas A&M University, the Texas Department of Transportation and interested citizens and students from the community.

Meetings generally included discussion on routine, stormwater, and reconnaissance monitoring and water quality findings to date were discussed. Development of the watershed geographic information system (GIS) that includes the potential sources of *E. coli* across the watershed from all jurisdictions into a single platform was also a key discussion item during several meetings. Input from stakeholders present was sought

regarding specific information that should be included in the GIS. Comments received aided the project team in refining its development. The watershed *E. coli* source survey was also a point of discussion as results from surveys completed to date were conveyed appropriately. Each meeting concluded with an update on the projected work for the upcoming year and a general question and answer session regarding the project and watershed.

The first meeting was held May 7, 2013 and provided a general overview of the project and project partners. At this point, three water quality data points were available for each site; however, these preliminary data were still presented and discussed. Comparisons of data quality were also made between the routine and reconnaissance data to illustrate their relative similarities. Finally, details of the watershed survey were discussed and feedback was received to refine the survey approach.

The second project meeting was held May 23, 2014, and focused on continuing discussions regarding routine, storm, and reconnaissance monitoring data. Comparisons between data from volunteer monitoring and routine monitoring were highlighted and data from all monitoring stations across the watershed was discussed. Data were presented in an upstream to downstream fashion to clearly illustrate how water quality changes throughout the watershed. A demo of the watershed GIS in its current state of development was provided and discussed as well with watershed stakeholders to receive feedback on additional data needs.

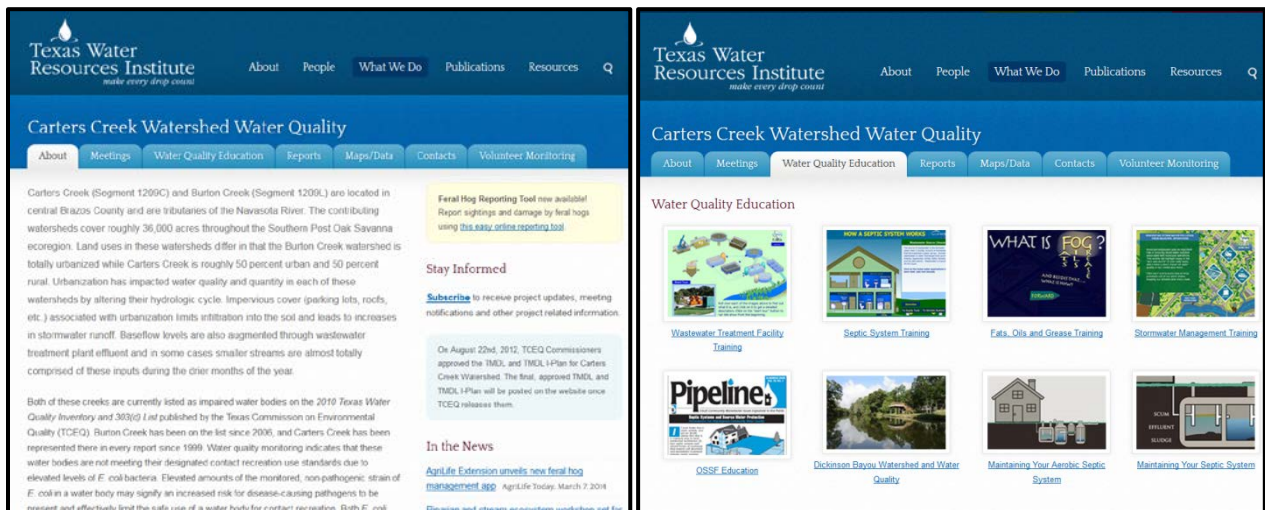
The third stakeholder meeting was held June 1, 2015. The primary focus of this meeting was to summarize water quality data collected throughout the course of the project. All originally planned data collection was completed at this point and findings were conveyed accordingly. Current watershed survey findings were also presented and an overview of the project timeline was discussed, including the need for a project extension to utilize monies saved throughout the course of the project. Details for an intensive sampling project developed in concert with the City of Bryan and City of College Station were presented as well. An overview of a similar water quality project on the Navasota River was also provided to the group. Carters Creek flows into the Navasota River and thus impacts its water quality. The need for the project and planned approach were discussed.

Meetings to discuss progress made implementing the Carters Creek TMDL I-Plan specifically were also held each year. In 2013 and 2014, meetings were held in August while the 2015 meeting was held in conjunction with the June 1<sup>st</sup> stakeholder meeting. These meetings reconvened the parties responsible for implementing aspects of the Carters Creek TMDL I-Plan which also forms the core stakeholder group for the watershed. Progress made implementing each management measure and control action in the I-Plan was provided by responsible parties during these meetings.

## Project Website

At the outset of the project, TWRI developed a project website that highlights the project and provides a platform to keep stakeholders informed and also serve as a repository for project documents and information. The website (<http://cartersandburton.tamu.edu/>) was maintained throughout the course of the project and kept up-to-date with pertinent information related to the project and the watershed. Information within the website includes project background information, yearly meeting records and upcoming meeting announcements, links to water quality education resources, quarterly progress reports, maps, project contacts, news articles, and details about volunteer monitoring.

The project website served as a great tool for expanding the reach and accessibility to useful educational resources. A 'Water Quality Education' resources page within the website contained links to locally, regionally and nationally developed videos, interactive module based learning tools, relevant newsletters and other appropriate websites. Videos were included on topics of stormwater management, proper disposal of fats, oils and grease, pharmaceutical disposal, motor oil disposal, and septic system function and maintenance. Interactive learning modules were also included and covered topics such as wastewater treatment facility components and function, septic system function and maintenance, stormwater management and the effects of fats, oils and grease on wastewater infrastructure.



Screenshots from [cartersandburton.tamu.edu](http://cartersandburton.tamu.edu)

Maps and water quality data were also made available through the project website. Data produced through the project were added to TCEQ's Surface Water Quality Monitoring Information System and as such are available to the public. A step-by-step instruction guide for accessing the data through the TCEQ database was provided along with a



direct link to the database. General watershed maps were also posted to the website that clearly defines the watershed extent and boundaries as well as the sampling stations monitored through the project.

Information regarding volunteer monitoring opportunities in the watershed was provided through this website as well. The information on the website included: an overview of the volunteer monitoring effort in the watershed; a description of how water quality data collected by volunteers will be integrated into overall project findings; and a link to sign up to become a volunteer monitor in the watershed. Volunteer monitoring resources were also provided through this page for easy access. Instructional videos were created and are posted on the site as well.

### **Project and General Water Quality Awareness**

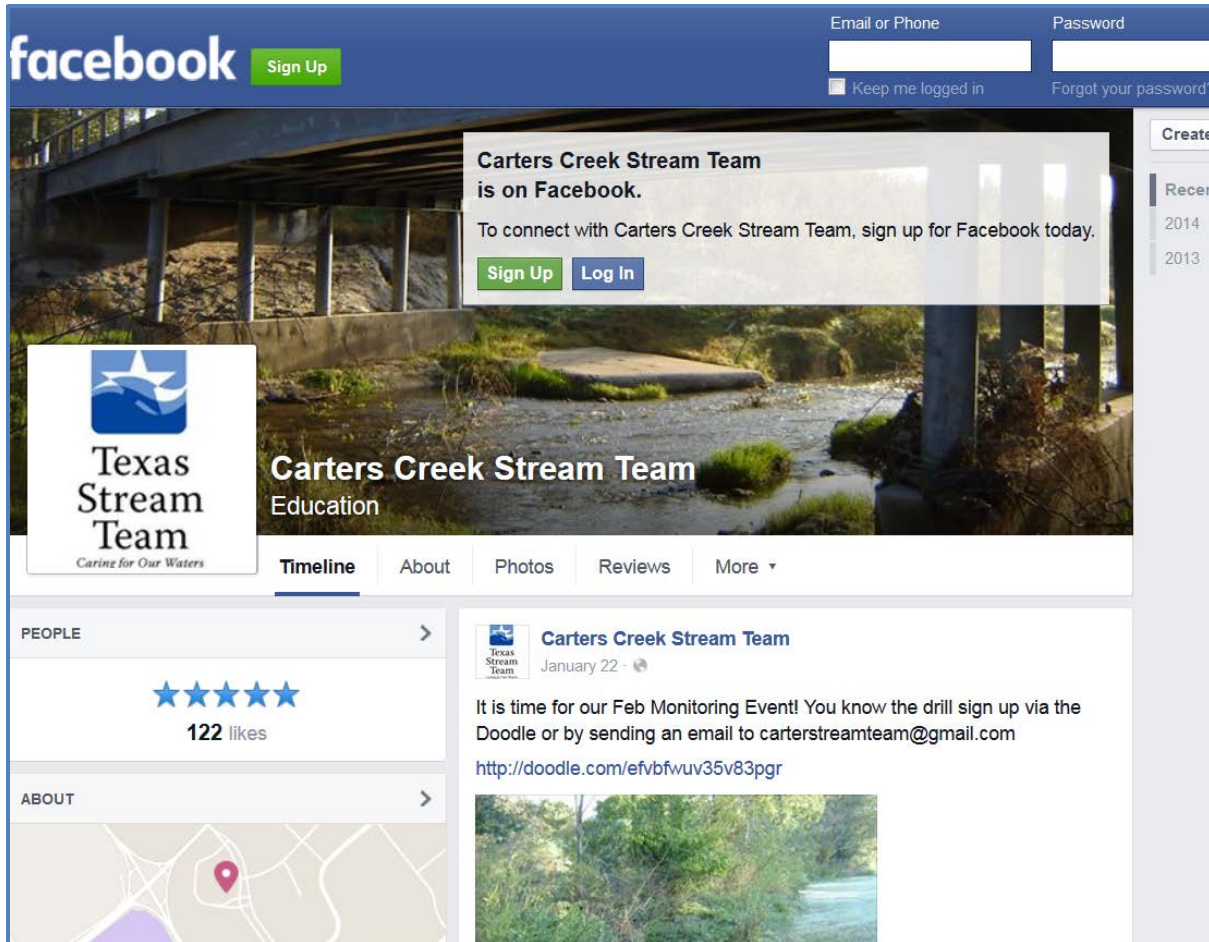
Several other avenues were useful for providing extra information to watershed stakeholders and maintaining communication with volunteers and stakeholders alike. These included news articles regarding project activities, delivery of topical education and outreach programs and the use of Facebook to engage volunteers.

News releases were developed and disseminated through the Texas A&M AgriLife's news outlet AgriLife TODAY. This is an online publication that distributes releases immediately. These releases are commonly picked up by other local media such as newspapers, radio and television. Several articles were developed specifically for project meetings while others were created to advertise educational programs delivered in and near the watershed. These included releases for the Riparian and Stream Ecosystem workshop in College Station, and the Texas Watershed Steward workshops in College Station and in Navasota to name a few.

These workshops were delivered locally to provide additional information about two specific topics: riparian and stream ecosystem health and function; and watershed function and management. The riparian and stream ecosystem program focused on the need for improved riparian area management and the benefits it provides. These include improved habitat, decreases in erosion, mitigation of flood flows and improved water quality to the local stream network and downstream areas. Similarly, the Texas Watershed Steward program provides a basic primer on watersheds, water quality, types and sources of pollution and how the management of the watershed directly relates to water quality and quantity observed in stream.

Facebook was also used to effectively engage people in activities in and around the Carters Creek watershed. The 'Carters Creek Stream Team' page was established primarily for communicating with the numerous student volunteers who participated in monthly water quality monitoring events. Volunteer sign-ups were distributed via the

Facebook page as were the monitoring training resources created for the project. The Facebook page was started with the beginning of monitoring in February 2013 and used through February 2015 for the final monitoring event. Other water related information such as water conservation tips and relevant news stories were posted to the page to keep user activity high. This platform proved especially effective with younger audiences.



Carters Creek Stream Team Facebook Page

Brazos Valley Earth Day provided another opportunity to spread the word about water conservation and good stewardship of water resources. The TWRI team helped staff a booth hosted by Brazos Clean Water. This is a group created by the Brazos Basin Stormwater Education Committee and consists of key watershed stakeholders. During the annual Earth Day events, information about water quality, water conservation and being good stewards of local water resources were handed out along with games and gadgets for the kids and reminder type items such as magnets and pens for adults.