



# **Extended Delivery of the Texas Watershed Steward Program**

**Final Report**

**TSSWCB Project 15-05**

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## EXECUTIVE SUMMARY

Texas Watershed Stewards (TWS) is a science-based training program designed to educate stakeholders about watersheds, types and sources of water pollution, water law, state and federal water agencies and organizations, best management practices (BMPs) that minimize or prevent water impairment, and community-driven watershed planning. The program was developed through a collaborative effort between the Texas A&M AgriLife Extension Service and the Texas State Soil and Water Conservation Board, in cooperation with other state and federal water and natural resource management and planning agencies, including the Texas Commission on Environmental Quality, local Soil and Water Conservation Districts, Texas Water Development Board, state river authorities, Texas Forest Service, Texas Department of Agriculture, United States Department of Agriculture, Natural Resources Conservation Service, and others. TWS is delivered as an intensive, one day, seven-hour or four-hour training, that utilizes a variety of teaching aids (PowerPoint slides, videos, hands-on stations) and group participation to engage participants in the learning process. Most importantly, the program empowers citizens to become actively involved in local watershed planning efforts to improve and protect their water resources.

To date, a total of 108 workshops have been delivered in watersheds across the state of Texas. Through these events, 4,570 individuals have received a combined total of approximately 26,128 hours of training in topics specifically focused on watershed management and protection. In addition, over 6,937 hours of continuing education units have been provided by the program for a variety of professional licenses and certifications. Specifically regarding Project 15-05, 36 TWS workshops were delivered with a total attendance of 1,328 persons. To enhance flexibility and program access to all interested individuals, an interactive on-line version of the training was created for younger audiences while a new video-based on-line course was developed. Therefore, both school-aged and adult members of the public can now benefit from TWS distance education programming. The original version of the online course was completed by more than 125 individuals, and the redesigned version of the online course under Project 15-05 has been completed by 26 individuals.

Intensive publicity efforts employing key media tools and outlets were utilized to market each event. This included the use of news releases distributed state-wide (targeting absentee landowners and other watershed resource users) and to local outlets, radio, television, e-mail listserves, brochures, and direct contacts with key individuals and partners. In addition, direct contact was made with key local watershed groups, homeowner associations, local city and county officials, Master Gardeners, Master Naturalists, and other groups and organizations located in target watersheds. Local county AgriLife Extension Agents provided direct support for planning, organization, publicity, and delivery of all programs.

Program effectiveness was evaluated using pre- and post-tests at TWS events to determine changes in knowledge and understanding, as well as intentions to adopt appropriate BMPs. A 6-

month follow-up evaluation was employed to assess actions taken and to verify BMP adoption. Overall, knowledge gained by individuals participating in the training was an impressive 33.4%. Additionally, over 60% of participants reported an intention to adopt BMPs to help protect their watershed, and more than 90% believed the TWS program enabled them to be a better steward of their watershed. Results of the 6-month, follow-up evaluation showed that 38% of respondents had participated in at least one community cleanup, 36% had participated in local planning/zoning decisions, and 77% indicated that they had, or intend to, communicate with their elected officials regarding water quality issues.

Approximately 87% of respondents indicated they now more closely monitor individual actions that might impact water quality, and 80% have either adopted or maintained management practices that have a positive impact on water quality. Finally, an overwhelming 94% of respondents were satisfied with the TWS training materials, and 82% have used those resources since the training.

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## INTRODUCTION

Every watershed in Texas is affected to some extent by nonpoint source pollution. Resulting water quality impairments lead to negative impacts, including unsafe water supplies, degraded fisheries, constrained recreation, reservoir siltation, and habitat loss. These consequences affect communities, businesses, and individual citizens in and around the watershed. Moreover, successful management efforts depend on significant local input. As a result, current philosophies in watershed management are based heavily upon securing active stakeholder involvement to restore and protect water resources. This approach to developing watershed-based improvement strategies demands a sustained high level of participation by local citizens to achieve success. However, the vast majority of potential stakeholders are not equipped with a sufficient understanding of watershed concepts to engage effectively in the decision-making and action processes.

To address this challenge, the Texas A&M AgriLife Extension Service (Extension) collaborated with the Texas State Soil and Water Conservation Board (TSSWCB), and numerous other water resource management entities in Texas, to develop a program designed to engage both rural and urban stakeholders and better enable them to become actively and effectively involved in watershed planning efforts (i.e., Watershed Protection Plan (WPP) and Total Maximum Daily Load (TMDL) development). With funding from both the TSSWCB and Clean Water Act §319(h) grant resources through the TSSWCB, the project sought to continue the watershed-based training program. The program was initiated with TSSWCB Project 05-05 entitled, *A Community Based Water Quality Curriculum Which Enhances Stakeholder Involvement in Watershed Protection Initiatives: A Pilot Project*. Now known as the Texas Watershed Steward (TWS) program, it has been continued by the TSSWCB under Projects 07-09, entitled *Statewide Implementation of the Texas Watershed Steward Program*; 11-05, entitled *Continued Statewide Delivery of the Texas Watershed Steward Program*, 15-05, entitled *Extended Delivery of the Texas Watershed Steward Program*, the subject of this final report; 15-55, entitled *Additional Delivery of the Texas Watershed Steward Program*; and 18-05, entitled *Sustained Delivery of the Texas Watershed Steward Program*. The success of the TWS program is attributable to the program's design to develop and deliver science-based, community-responsive watershed education tailored to water quality issues in target watersheds. The curriculum has been employed to educate and train local stakeholders and to facilitate active involvement in current or planned water quality improvement projects in their watershed.

## RESULTS BY TASK

### **TASK 1: Project Administration**

***Subtask 1.1:** Subtask 1.1. Extension will prepare electronic quarterly progress reports (QPRs) for submission to the TSSWCB. QPRs shall document all activities performed within a quarter and shall be submitted by the 15<sup>th</sup> of January, April, July, and October. QPRs will be distributed to all project partners.*

Extension has submitted the required QPRs to the TSSWCB and all project partners for Project 15-05. The QPRs remain on file with the TSSWCB.

***Subtask 1.2:** Extension will perform accounting functions for project funds and will submit appropriate reimbursement forms to TSSWCB at least quarterly.*

Extension has performed the required accounting functions for TWS program-related funds and submitted applicable Reimbursement Forms to the TSSWCB.

***Subtask 1.3:** Extension will host coordination meetings or conference calls, at least quarterly, with project partners to discuss project activities, project schedule, communication needs, deliverables, and other issues. Extension will develop lists of action items needed following each project coordination meeting and distribute to project personnel.*

Extension hosted the required coordination meetings and/or conference calls between the TSSWCB and other project partners. The TWS program schedule, deliverables, and other program needs and requirements were coordinated and revised as needed.

***Subtask 1.4:** Extension, with assistance from SSL, will continue to host and maintain a website (<http://tws.tamu.edu/>) to serve as a public clearing house for all project related information. All workshop information as well as the web-based training program will be available on this website.*

The TWS website has been maintained and continually updated using WordPress software. TWS curriculum materials, access to the online course, and program information were made available for viewing and/or download through the website. All future workshop locations were posted on the website, and an online registration system for those workshops was set up.

***Subtask 1.5:** Extension will develop a final report that summarizes activities completed and conclusions reached during the project, and discusses the extent to which project goals and measures of success have been achieved.*

The submittal of this Final Report for TSSWCB Project 15-05 constitutes the required summary of all project activities.

## **TASK 2: Coordinate and deliver watershed-based TWS trainings in selected watersheds throughout Texas**

*Subtask 2.1: Extension will employ an Extension Program Specialist who will serve as the full-time TWS Program Coordinator and will be responsible for the general oversight and coordination of all project activities and for promoting, coordinating, and delivering the TWS watershed-based training events and computer-based tools.*

Throughout the duration of Project 15-05, Extension employed an Extension Program Specialist to serve as the full-time TWS Program Coordinator.

Collaboration with a multi-disciplinary, multi-agency team of project partners was maintained from the initiation of the program in order to better facilitate these efforts. The team consisted of Extension personnel in the Departments of Soil and Crop Sciences, Biological and Agricultural Engineering, Wildlife and Fisheries, Rangeland Ecology and Management, and Agricultural Leadership Education and Communications; the Texas Water Resources Institute (TWRI); the Spatial Sciences Laboratory; the TSSWCB; Texas Commission on Environmental Quality (TCEQ), Texas Department of Agriculture (TDA); Texas Parks and Wildlife; Texas Forest Service; USDA Natural Resources Conservation Service; state river authorities and the United States Environmental Protection Agency.

*Subtask 2.2: Extension will work in concert with state and local organizations to select locations for the watershed-based TWS training events. Extension will coordinate efforts with state agencies and organizations involved in WPP/TMDL processes or who are planning future WPP/TMDL processes in specific watersheds. Additional watersheds may be selected based on impairment status, environmental sensitivity, and/or other priority issues identified by a partner agency or organization. Extension and TSSWCB will periodically make a collaborative decision to re-prioritize and add to/remove from the list of watersheds.*

Extension and TSSWCB held quarterly teleconferences to prioritize workshop locations. Watersheds were selected for program implementation based on the status of local WPP and/or TMDL projects, as well as steering committee and workgroup development in certain watersheds. Regular communication was conducted via telephone and email between Extension and TSSWCB regarding prioritization of workshop locations. A working schedule of planned and potential future events was developed and revised as needed (Appendix A).

TWS team collaborators, river authorities, watershed coordinators, and others involved in the development and implementation of water quality projects throughout the state were consulted with on a routine basis to obtain suggestions for potential TWS workshop locations. Local interest in the program was also considered when prioritizing watersheds for implementation, and input from all stakeholder groups was welcomed and encouraged throughout the prioritization process. Resultant stakeholder requests were discussed in the quarterly watershed prioritization calls held between Extension and TSSWCB.



*Subtask 2.3: Extension will actively market watershed-based TWS trainings through news releases (A&M AgriLife News and local media outlets), Internet postings, newsletter announcements, public/conference presentations, flyers, etc., to enhance awareness and utilization.*

Each TWS training event was aggressively publicized and marketed to maximize participation by local stakeholders. Marketing materials were designed to appeal to a full range of watershed stakeholders, but were written for a non-technical audience.

Press releases and flyers were developed and distributed approximately one to two months prior to an event (Appendix B). Workshop flyers were posted in Extension offices, local businesses, and public areas. To amplify efforts, materials were sent to media outlets with a wide range of audiences in the attempt to reach the largest stakeholder base possible. Outlets for distribution included newspapers, television, radio, newsletters, and others. County Extension Agents (CEAs) working both within the targeted watershed and in surrounding counties were solicited to assist with distribution of marketing materials. Furthermore, numerous newsletter articles were also distributed through the TSSWCB, local CEAs, Master Naturalist and Master Gardener programs, and other local associations.

Email lists obtained from CEAs, local watershed coordinators, councils of government, municipalities, chambers of commerce, and local organizations were commonly used to promote and announce events. In some rural watersheds, invitations were mailed to landowners and agricultural producers. The invitations were either a letter or postcard, which contained information regarding upcoming TWS trainings in their area (Appendix C).

Presentations and announcements regarding the TWS program were made at various watershed stakeholder meetings, regional conferences, other Extension education events, and to various small groups advocating and raising awareness about the TWS program. Examples include public meetings in the target watershed, the Texas Watershed Planning Short Course, Texas Forest Service roundtable meetings, and other Extension education events. In addition, program updates delivered every six months at the biannual state watershed coordinators roundtable meeting included information regarding future workshop locations.

Extension maintained, and routinely updated, a website posted at <https://tws.tamu.edu> for the program. The website includes all resources related to the program, offers online pre-registration for events, and provides access to the online training course.

TWS program materials, which included access to other references and associated web addresses, were provided to workshop participants. Attendees were encouraged to use and display the materials publically as a means of advertising the program. This was an effective method of creating a sense of community among participants, and materials have been displayed by many Texas Watershed Stewards at several unrelated events and on television.

*Subtask 2.4: Extension will deliver at least 10, 7-hour TWS training events in selected watersheds annually.*

Watershed-based trainings were delivered as one day events and focused on enhancing understanding of watershed systems, watershed impairments, methods for improving watershed function, and community-driven watershed protection and management. After discussions with, and support from, the TSSWCB and other project partners, a four-hour version of the TWS course was also developed and offered in select watersheds to encourage additional participation and watershed stewardship by reaching a constituency that would otherwise be unable to attend the seven-hour course.

The agenda and PowerPoint modules for the event were crafted to integrate pertinent TWS handbook information with the interactive learning stations, leading to a facilitated discussion of local watershed issues (Appendix D). Participants were also provided a copy of the TWS handbook and supplemental literature from Extension and TCEQ (Appendix E).

Training events were conducted by a team of Extension Specialists and included a mixture of PowerPoint slides, videos, and hands-on demonstrations. Much of the information included in the training is applicable to all watersheds, and provides a common base of information for participants. However, each event was carefully tailored to the target watershed by incorporating specific information on land use and cover, water body impairments, and potential pollutant sources. For example, a virtual watershed flyover created using Google Earth software was developed for events. The watershed flyover provides a visual representation of the watershed, illustrates land use patterns and land/water interrelationships, and enhances visualization of nonpoint source pollution concepts. Development of a more intimate understanding of, and connection to, the target watershed is a major strength, and the ultimate goal, of the TWS program.

TSSWCB Project 15-05, which began on October 1, 2015, was originally scheduled to have an end date of September 30, 2018. However, by means of collaborative efforts between stakeholders in target watersheds, other project partners, and the TWS program itself, a six-month no-cost extension of the Workplan for Project 15-05 was able to be performed. In total, 36 TWS workshops were delivered under Project 15-05, six more than initially required by the original Workplan. The workshops attributable to Project 15-05 were attended by 1,328 persons. Since development of the TWS program, 108 workshops have been delivered, resulting in a total of 4,570 attendees, averaging more than 40 persons per workshop. On the next page, a photograph taken at a TWS workshop is provided with a list of all TWS workshops delivered under TSSWCB Project 15-05.



### **Photograph of a Texas Watershed Steward Workshop**

Below: Dates, locations, and associated watersheds of conducted TWS Workshops

- A list of all TWS Workshops completed prior to TSSWCB Project 15-05 is provided online at <https://tws.tamu.edu>.

-----Beginning of TSSWCB Project 15-05-----

- October 14, 2015: Austin, TX (Walnut Creek Watershed)
- October 15, 2015: Austin, TX (Austin Urban Watersheds)
- December 8, 2015: Lockhart, TX (Plum Creek Watershed)
- January 26, 2016: Seguin, TX (Geronimo & Alligator Creeks Watersheds)
- February 17, 2016: La Marque, TX (Highland Bayou Watershed)
- March 10, 2016: Arlington, TX (Village Creek & Lake Arlington Watershed)
- April 26, 2016: Rosenberg, TX (Big Creek Watershed)
- May 6, 2016: Emory, TX (Lake Tawakoni; Lake Fork; and Sandy Creek Watersheds)
- June 21, 2016: Conroe, TX (Lake Conroe Watershed)
- July 12, 2016: Killeen, TX (Lampasas River Watershed)
- September 15, 2016: Boerne, TX (Upper Cibolo Creek Watershed)
- October 4, 2016: Jefferson, TX (Lake O' the Pines/Big Cypress Creek Watershed)

- October 13, 2016: McKinney, TX (Lavon Lake Watershed)
- January 25, 2017: Edna, TX (Lavaca River Watershed)
- February 7, 2017: New Braunfels, TX (Dry Comal Creek/Comal River Watershed)
- March 8, 2017: Denton, TX (Hickory Creek Watershed)
- April 20, 2017: Kenedy, TX (Lower San Antonio River Watersheds)
- May 6, 2017: Junction, TX (Upper Llano River Watershed)
- May 24, 2017: Ennis, TX (Richland-Chambers Reservoir Watershed)
- July 11, 2017: Angleton, TX (Bastrop Bayou and San Bernard River Watersheds)
- October 25, 2017: Sulphur Springs, TX (Running Creek and Elm Creek Watersheds)
- November 7, 2017: Nacogdoches, TX (Attoyac Bayou Watershed)
- December 7, 2017: La Vernia, TX (Mid/Lower Cibolo Creek Watershed)
- January 26, 2018: Brenham, TX (Mill Creek Watershed)
- February 8, 2018: Mont Belvieu, TX (Cedar Bayou Watershed)
- February 15, 2018: Palacios, TX (Carancahua Bay and Tres Palacios Watersheds)
- March 6, 2018: Kaufman, TX (Cedar Creek Lake Watershed)
- March 7, 2018: Bryan, TX (Navasota River Watershed)
- April 12, 2018: Brady, TX (Brady Creek Watershed)
- May 15, 2018: Cameron, TX (Big Elm Creek and Little River Watershed)
- July 17, 2018: Beeville, TX (Mission and Aransas River Watersheds)
- August 2, 2018: Rosenberg, TX (Big Creek Watershed)
- October 9, 2018: Austin, TX (Shoal Creek Watershed)
- December 11, 2018: Jonesboro, TX (Leon River Watershed)
- March 5, 2019: New Braunfels, TX (Geronimo & Alligator Creeks Watersheds)
- March 6, 2019: Harker Heights, TX (Nolan Creek Watershed)

The TWS program obtained/maintained certification to provide continuing education units (CEUs) for a variety of professional affiliations. Providing CEUs was a valuable added incentive for participation of many professionals, and CEU offerings were utilized as a part of the marketing effort. The maximum number of qualified/authorized CEUs offered at workshops by the TWS program include:

- 7 AICP (American Institute of Certified Planners) CM hours for planners (5.5 CM credits, 1.5 CM Law)
- 7 CCA (Certified Crop Advisor) CEUs in Soil & Water Management
- 7 TBPE (Texas Board of Professional Engineers) CEPs for professional engineers
- 7 SBEC (State Board for Educator Certification) CPEs in Science
- 3 TDA (Texas Department of Agriculture) CEUs for pesticide license holders
- 4 TFMA (Texas Floodplain Management Association) CECs for Certified Floodplain Managers

- 4 NM (Nutrient Management Certification) CEUs for Nutrient Management Specialists
- 4 TBPG (Texas Board of Professional Geoscientists) PDHs for professional geoscientists
- 4 TCEQ (Texas Commission on Environmental Quality) Occupational License continuing education credits for each of the following: Landscape Irrigators, On-site Sewage Facility Installers, Public Water System Operators, and Wastewater System Operators

At the conclusion of TWS trainings, participants received a personalized Certificate of Completion. Certificates include the participant's name, date, and location of the event, as well as CEU information. Combined with the event sign-in sheets, certificates also served as proof of attendance for those requesting continuing education.

***Subtask 2.5:** Extension will foster the establishment of local watershed action groups spawned by the TWS program. Extension will work with state and local organizations to develop and/or provide more detailed, resource specific education and training resources and action oriented activities that can be delivered and/or undertaken in watersheds where those issues are identified as most significant.*

One key component of the training program is community-based watershed involvement. Participants were provided examples of how to become involved in local activities aimed at protecting and improving water resources. Moreover, all existing programs provided through Extension and other agencies and organizations were highlighted at each training event. Members of stakeholder groups, water quality monitoring groups, Keep Texas Beautiful, Master Gardeners, Master Naturalists, and other community groups were encouraged to attend and provide information regarding their activities and programs in the watershed.

In addition, each event included an update from the local watershed coordinator, or other appropriate individual, providing the status of local watershed planning and management activities. These presentations served as an introduction to facilitate discussion geared toward promoting dialogue among participants, bolstering support for existing WPP/TMDL efforts and stakeholder groups, creation of new watershed groups, and initiation of community watershed events and activities.

Following completion of workshops, Extension has received additional requests from workshop participants to conduct presentations related to TWS and water quality. Requests received include those from Master Gardener and Master Naturalist groups, teachers, concerned community members, and other individuals and organizations. Extension will continue to serve as an information source to all workshop participants regarding helpful publications and educational materials, upcoming stewardship activities (i.e., stream cleanups, etc.), upcoming project meetings and workshops, etc.

***Subtask 2.6:** Extension will attend and participate in meetings, as appropriate, in order to communicate project goals, activities and accomplishments to affected parties. Such meetings*

*may include, but are not limited to, Clean Rivers Program Basin Steering Committees, the Texas Watershed Planning Short Course, Texas Watershed Coordinator Roundtables, and the TSSWCB Regional Watershed Coordination Steering Committee.*

The TWS Program Coordinator, and co-presenters of the TWS Program, attended the meetings required by Subtask 2.6 of the Workplan for TSSWCB Project 15-05, including the University Council on Water Resources annual conference (2017 & 2018) and Soil and Water Conservation Society's annual conference (2016). At each meeting/event, the TWS Program was highlighted and discussed.

### **TASK 3: Distribute and manage computer-based training tools for the TWS program**

*Subtask 3.1: Extension, with assistance from SSL, will manage and update web-based versions of the TWS program. Program information will be reviewed every six months and updates made as needed.*

Using Toolbook Instructor 9.5, the original interactive training version of the TWS program was created and made available online. Since that time, the online course has undergone several iterations to improve aesthetics, course navigability, and conveyance of information. The newest version of the online course was published in summer 2018 (Appendix F). The online course materials were made accessible from the program website at <https://tws.tamu.edu/online-training-course/>.

The online version of TWS allows those unable to attend a watershed-based workshop to complete the course curriculum, providing more flexible and widespread access to the program. The online TWS course was designed to be an interactive experience, providing videos, user activated animations, and the ability to navigate course material freely. The course can be accessed anonymously; however, participants must enroll in the course and complete the pre- and post-test evaluations in order to receive a certificate of completion. Enrollment in the course is open to all, and requires users to submit their country, state, and city of residence along with a valid email address.

*Subtask 3.2: Extension will actively market computer-based TWS resources through news releases (AgriLife News and local media outlets), Internet postings, newsletter announcements, public/conference presentations, flyers, etc., to enhance utilization of the computer-based tools.*

Participants at watershed-based TWS trainings were made aware of the online course availability and were encouraged to pass that information along. Press releases were distributed, announcing the availability of the TWS online course, and were published through a number of media outlets. Additionally, a video press release for the TWS program, which highlights access to the online course, was promoted along with multiple news interviews (Appendix G). The aforementioned video press release remains available on both the TWS website (<https://tws.tamu.edu>) and via the Texas A&M AgriLife Extension Service YouTube channel.

Extension maintained coordination with TWRI information technology specialists so that the TWS website would be more visible in internet search results. As a result, internet searches containing combinations of keywords such as “Texas”, “Watershed”, and “Online Course” would readily produce a link to the TWS website. Because of these efforts, more than 150 participants have enrolled in and subsequently completed both the original and redesigned versions of the online course operated under TSSWCB Project 15-05.

***Subtask 3.3:** Extension will track website usage and on-line course completion.*

The Moodle platform used to support the online course has built in mechanisms for tracking usage. Online course administrators are able to view participant information and their activity. Moodle provides reports for pre- and post-test responses as well as course access data from those enrolled in the course (Appendix H). The online course allows users to view course content without enrolling in the course; however, only enrolled users are able to complete the pre/post tests and receive a certificate of completion.

Google Analytics was used to track overall website traffic (Appendix I). Since the TWS website went live in 2008 it has been visited over 32,500 times by more than 17,500 unique users. Specifically regarding Project 15-05, the TWS website has been visited more than 9,000 times and included more than 22,500 individual page views. The vast majority of visits originated from users in the USA; however, the website receives traffic from multiple countries.

#### **TASK 4: Evaluate the effectiveness of the watershed-based trainings and computer-based training tools**

***Subtask 4.1:** Extension will conduct pre-/post-test evaluations of watershed- and computer-based trainings to measure knowledge gained by participants regarding watershed principles, impairments, and appropriate BMPs to reduce NPS pollution; to determine participant’s intentions to change their behavior as a result of the program; and, to evaluate participant satisfaction with the program.*

Working with faculty in Agricultural Leadership Education & Communications and Organizational Development, Extension made several revisions to the pre- and post-tests and to methods by which the data are analyzed. The original versions of the pre- and post-tests, developed in 2007, were updated to remove select questions and replace them with questions to more accurately gauge knowledge gained. The revised version of the pre/post-test was first used in October 2008 and has been the version used thereafter (Appendix J). Furthermore, analysis of individual questions from October 2008 until now revealed that seven of the eighteen knowledge questions were answered correctly sufficiently often as to be considered common knowledge for almost 80% of participants as described in Subtask 4.3. These seven questions were therefore excluded from the final analysis, and the remaining eleven questions were used to calculate knowledge gain. Additional questions on the post-test evaluate participant satisfaction of the program along with a participant’s intentions to adopt best management practices (BMPs).

The pre- and post-test evaluation instruments were delivered at TWS workshops. Following the workshops, the pre- and post-tests were mailed to the Agricultural Leadership, Education, and Communications Department at Texas A&M University to be assessed. Results from the TWS workshop pre- and post-tests conducted through March 2019 have been analyzed. While the results are provided in Appendix L, they are detailed further below in the TSSWCB Project 15-05 Final Report discussion of *Subtask 4.3*.

***Subtask 4.2:*** *Extension will administer a 6-month follow-up evaluation to assess actions taken and practice adoption by participants.*

Six months after each workshop, follow-up post-evaluations were distributed to workshop participants, and responses were received electronically via Qualtrics software platform (Appendix K). The post-evaluation itself assesses the watershed stewardship actions, such as adoption of one or more BMPs, taken by previous workshop attendees. Following receipt of completed 6-month post-evaluations, the data was compiled and submitted to the Department of Agricultural Leadership, Education, and Communications at Texas A&M University for analysis. While the results are provided in Appendix M, a discussion regarding them is provided below in the TSSWCB Project 15-05 Final Report discussion of *Subtask 4.3*.

***Subtask 4.3:*** *Extension will analyze results obtained from Phase 1 (pre-/post-tests) and Phase 2 (6-month follow-up) evaluations using descriptive, correlational, and analysis of variance statistical procedures. Results will be used to periodically evaluate and modify TWS program materials and incorporated into the final report.*

Assessment of completed pre- and post-test (Phase 1 evaluations) and six month follow-up evaluations (Phase 2 evaluations) through March 2019 was performed by the Agricultural Leadership, Education, and Communications Department at Texas A&M University. Results from the analysis of Phase 1 and Phase 2 evaluations are discussed below and provided in Appendix L and Appendix M, respectively.

### *Phase 1*

With the assistance of personnel in Organizational Development, Phase 1 pre- and post-test data were collected and analyzed using SPSS software (Appendix L). Individual questions were analyzed for pre/post-test comparison and were cross-tabulated for better interpretation of results. Knowledge gain was derived from 18 pre- and post-test questions pertaining to watersheds, fresh water, pollution, and policy and government. The same 18 questions were used on both evaluations. Knowledge gain for each question was calculated from the difference in percentage points between the number of questions answered correctly on the pre-test versus the number answered correctly on the post-test. For example, if a valid pre-correct response of 70% is reported, and the reported valid post-correct response is 96.7%, the knowledge gain for such a respondent would be 26.7%; i.e., the difference between the valid percent of pre-correct and post-correct responses.



Individual question analysis indicated that almost 80% of all participants answered the same seven questions correctly on both the pre- and post-tests. These seven questions were therefore considered to be common knowledge for the majority of participants and were excluded from the final knowledge gain calculation. The seven questions excluded are pre/post-test questions 1, 4, 5, 6, 11, 12, and 13 (Appendix J).

An overall knowledge gain of 33% was reported for participants. For questions relating to watersheds there was an overall knowledge increase of 27%, and for questions relating to fresh water there was an increase of approximately 38%. Furthermore, there was a knowledge increase of over 35% for pollution questions and an increase of 36% for policy and government questions regarding water quality.

Pre/post-test data indicated a high percentage of participants intended to engage in activities aimed at improving water quality. Out of all respondents, 22% left trainings with the intention to participate in community cleanup activities and 20.2% wanted to get involved in local planning/zoning decisions. Greater than one-quarter of participants reported an intention to communicate water issues with elected officials. Furthermore, over 20% intended to help develop a plan for their watershed, with 19.6% percent intending to help form or become a member of a local watershed group. Most importantly, 64.2% percent of participants reported an intent to adopt BMPs to help protect their watershed, and 97.7% felt that the TWS program provided them with the ability to be a better steward of their watershed.

### Phase 2

Phase 2 evaluations were sent out electronically approximately six months after a training event via email addresses collected through event registrations and sign-in sheets. The evaluation consisted of 15 multiple choice questions relating to adoption of BMPs and utilization of education materials following a training event. Since there was no corresponding pre-test, or any correct/incorrect answers to Phase 2 questions, complex analysis was not required. Responses were compiled into a summarized report for analysis and interpretation (Appendix M).

Six-month follow-up evaluations continued to indicate positive impacts, even several months after the training. Among respondents, 38% had participated in at least one community cleanup in the past six months, and another 41% indicated that they had plans to participate in a future cleanup. Approximately 37% of respondents had participated in local planning/zoning decisions, and another 29% planned to get involved in those types of activities in the near future. Furthermore, 52% stated that they had communicated with their elected officials regarding water quality issues and an additional 25% planned to do so.

Another positive result of TWS trainings, as indicated in the follow-up evaluation data, is the resultant level of TWS attendee involvement in volunteer water quality monitoring programs. Approximately 28% of respondents had participated in such programs, and another quarter planned to become involved.

One of the most desired impacts of the program is to encourage participants to engage in their own community and actively share the knowledge they gained at the trainings. Within six months of receiving TWS training, 36% of respondents had given a water quality presentation to a school class or community group, and an additional 21% planned to do so. Evaluations also show that 67% of respondents had encouraged others to participate in the training.

Over 87% of respondents indicated they now more closely monitor individual actions that might impact water quality and 80.47% have either adopted or maintained management practices that protect water quality. For example, approximately 30% had adopted soil testing practices, and another 38.76% indicated they plan to conduct soil testing in the future to better manage nutrient application.

In regards to satisfaction, an overwhelming 94% of respondents were satisfied with the TWS training materials, and 82% used those resources within six months of the training. Lastly, over half the respondents had already shared the materials with their peers at the time of the 6-month follow-up evaluation, further indicative of the continued interest among the general public in the TWS program.

## CONCLUSIONS

In close coordination with the TSSWCB, and other state, federal, and local partners, the Texas AgriLife Extension Service has conducted 108 Texas Watershed Steward workshops across the state of Texas. The 4,570 stakeholders in attendance at these workshops were educated in the disciplines of water quality and watershed management through approximately 26,128 combined contact hours. Thirty-six of the aforementioned workshops were completed under Project 15-05 to an audience of 1,328 persons. In addition to face-to-face workshops, online training resources have been developed and delivered to citizens to provide flexible access to science-based watershed management information.

Although it is often challenging to measure the impact of educational programs, the success of this project has been demonstrated by measured increases in knowledge, understanding, and adoption of water quality management practices. In addition, the program has documented greater citizen involvement in local watershed programs and activities as a result of the training. Continued statewide implementation of the TWS program will support and enhance current and future watershed management and protection efforts undertaken by water resource management agencies and organizations in Texas. The TWS program will continue to engage and empower local citizens to be the driving force for protection of their watershed.

## Appendix

### Appendix A

Example re-prioritized list of future TWS workshop locations (this schedule originated from the 2019 first-quarter QPR submitted to the TSSWCB in April 2019)

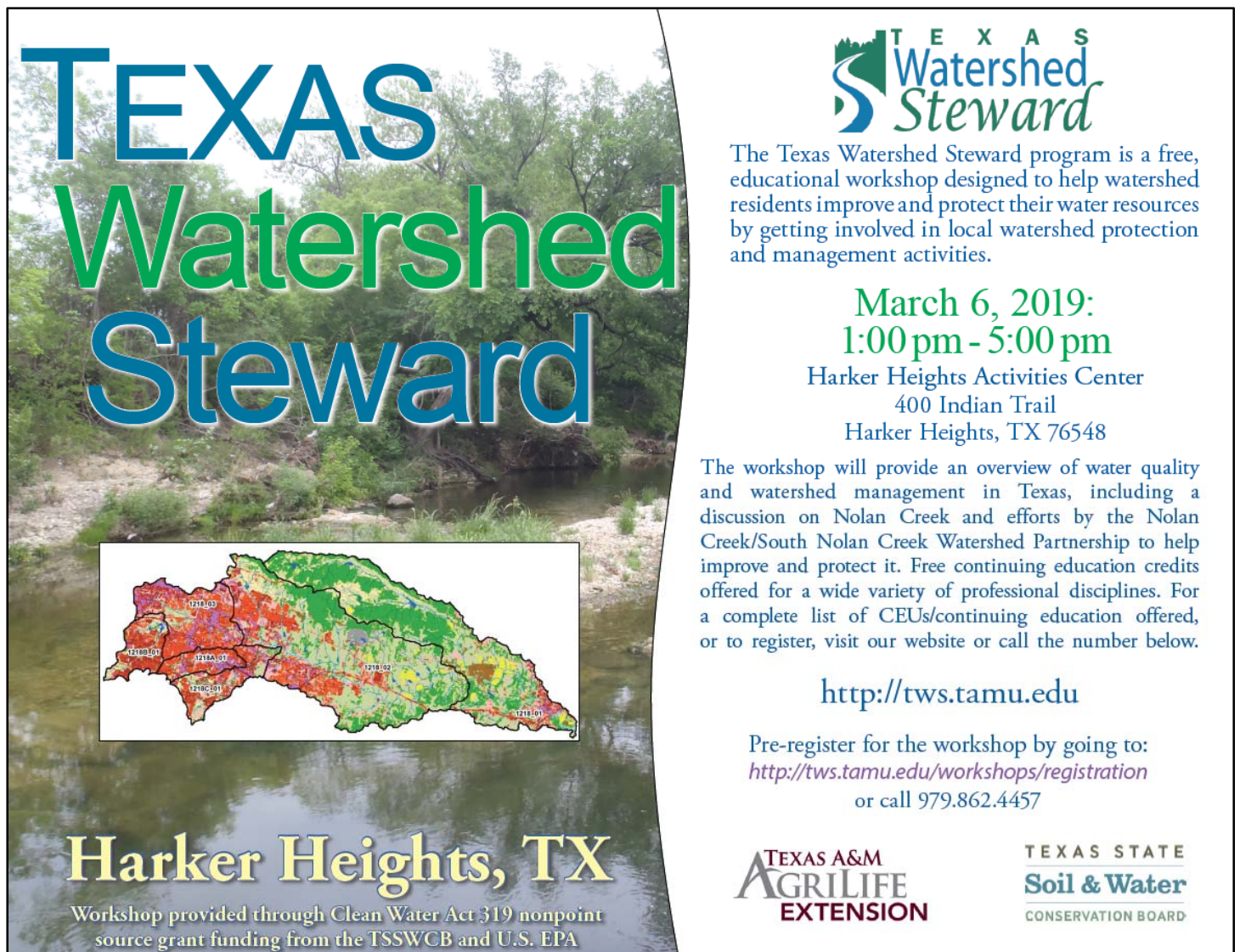
Completed TWS Training
Confirmed Watershed, Date Scheduled
Obligated Watershed, Date Not Yet Scheduled
Suggested Watershed

Texas State Soil & Water Conservation Board **Texas Watershed Steward Program**  
 Texas A&M AgriLife Extension Service Tentative Schedule—Revised 3/31/2019

Watershed	Type	FY	Q	Date	City	County	Contact Name	Affiliation	Attended
Brady Creek	WPP	2018		4/12/2018	Brady	McCulloch	Scott McWilliams & Chuck Brown	UCRA	34
Big Elm Creek/Little River	WPP	2018		5/15/2018	Cameron	Milam	Allan Berthold & Ed Rhodes	TWRI and TCEQ	44
Mission & Aransas Rivers	TMDL	2018		7/17/2018	Beeville	Bee	Allan Berthold	TWRI and TCEQ	20
Watersheds of the Texas Gulf/Big Creek: Multicounty Program	Other	2018		8/2/2018	Rosenberg	Fort Bend	Dr. Philip Shackelford	AgriLife Extension	15
Shoal Creek	WPP	2019		10/9/2018	Austin	Travis	Nick Dornak & Joanna Wolaver	Texas State University/Meadows Center for Water and the Environment; and Shoal Creek Conservancy	33
Leon River	WPP	2019		12/11/2018	Jonesboro	Coryell	Andy James	Texas A&M Natural Resources Institute	37
Geronimo and Alligator Creeks	WPP	2019		3/5/2019	New Braunfels	Comal	Ward Ling	AgriLife Extension	47
Nolan Creek	WPP	2019		3/6/2019	Harker Heights	Bell	Leah Taylor	TIAER	36
Cypress Creek	WPP	2019		4/25/2019	Houston	Harris	Justin Bower	H-GAC	
Lower Neches River	Other	2019		5/21/2019	Jasper	Jasper	Lucas Gregory, Ph.D.; Michael Schramm	TWRI	
Middle Neches & Angelina Rivers	Other	2019		5/22/2019	Lufkin	Angelina	Lucas Gregory, Ph.D.; Michael Schramm	TWRI	
Arroyo Colorado 2	WPP	2019		7/17/2019	Weslaco	Hidalgo	Jaime Flores	TWRI	
Eagle Mountain Lake 2	WPP	2020		11/7/2019	Decatur	Wise	Sarah Grella; Tina Hendon; & James (Todd) Vineyard	Tarrant Regional Water District	
Upper San Marcos	WPP	TBD	TBD		TBD	TBD	Nick Dornak	Texas State University/Meadows Center for Water and the Environment	
Cypress Creek	WPP	TBD	TBD		TBD	TBD	Nick Dornak	Texas State University/Meadows Center for Water and the Environment	
Joe Pool Lake	WPP	2020	January		TBD	TBD	Aaron Hoff	Trinity River Authority, TCEQ	
Spring Creek	WPP	2020	TBD		TBD	TBD	Justin Bower	H-GAC	

## Appendix B

### Example TWS event flyer and press release



The flyer features a background image of a river flowing through a lush, green forest. The title 'TEXAS Watershed Steward' is prominently displayed in large, stylized letters. An inset map shows the state of Texas divided into various watershed regions, with several regions highlighted in red and orange. The event details, including the date, time, and location, are clearly listed. The flyer also includes information about the workshop's content and how to register.

# TEXAS Watershed Steward

The Texas Watershed Steward program is a free, educational workshop designed to help watershed residents improve and protect their water resources by getting involved in local watershed protection and management activities.

**March 6, 2019:  
1:00 pm - 5:00 pm**

Harker Heights Activities Center  
400 Indian Trail  
Harker Heights, TX 76548

The workshop will provide an overview of water quality and watershed management in Texas, including a discussion on Nolan Creek and efforts by the Nolan Creek/South Nolan Creek Watershed Partnership to help improve and protect it. Free continuing education credits offered for a wide variety of professional disciplines. For a complete list of CEUs/continuing education offered, or to register, visit our website or call the number below.

<http://tws.tamu.edu>


Pre-register for the workshop by going to:  
<http://tws.tamu.edu/workshops/registration>  
or call 979.862.4457

**Harker Heights, TX**  
Workshop provided through Clean Water Act 319 nonpoint source grant funding from the TSSWCB and U.S. EPA

**TEXAS A&M  
AGRI LIFE  
EXTENSION**

**TEXAS STATE  
Soil & Water  
CONSERVATION BOARD**

## Water quality training Oct. 9 in Austin will focus on Shoal Creek

 [today.agrilife.org/2018/09/28/water-quality-training-oct-9-in-austin-will-focus-on-shoal-creek/](https://today.agrilife.org/2018/09/28/water-quality-training-oct-9-in-austin-will-focus-on-shoal-creek/)

September 28, 2018

Contact: Michael Kuitu, 979-862-4457, [mkuitu@tamu.edu](mailto:mkuitu@tamu.edu)  
Joanna Wolaver, 512-565-0812, [joanna@shoalcreekconservancy.org](mailto:joanna@shoalcreekconservancy.org)  
Noel Troxclair, 512-854-9600, [noel.troxclair@ag.tamu.edu](mailto:noel.troxclair@ag.tamu.edu)

AUSTIN – A Texas Watershed Steward workshop on water quality related to Shoal Creek will be held from 12:30-4:30 p.m. Oct. 9 at the Lamar Senior Activities Center, 2874 Shoal Crest Ave. in Austin.

The training is free and open to anyone interested in improving water quality in the region. Light refreshments will be provided.

Those interested are also invited to attend an 11 a.m.-noon Shoal Creek stakeholder meeting prior to the workshop.

The workshop is presented by the Texas A&M AgriLife Extension Service and Texas State Soil and Water Conservation Board in cooperation with the Shoal Creek Conservancy and Texas State University Meadows Center for Water and the Environment.

Participants are encouraged to preregister at the Texas Watershed Steward website at <https://tw.s.tamu.edu>.

“This training is designed to help watershed residents improve and protect their water resources by becoming involved in local watershed protection and management activities,” said Michael Kuitu, AgriLife Extension program specialist and coordinator for the Texas Watershed Steward program, College Station.

Kuitu said the workshop will include an overview of water quality and watershed management in Texas, but will primarily focus on Shoal Creek. The training will include a discussion of watershed systems along with types and sources of water pollution. There also will be a group discussion on community-driven watershed protection and management.

“Shoal Creek is an incredible asset of the Austin community, providing resources ranging from recreational use to flood control,” said Joanna Wolaver, executive director of the Shoal Creek Conservancy.

Wolaver said even though Shoal Creek is not designated as impaired by the state, bacteria in the creek is often reported at concentrations in excess of state standards during routine water quality monitoring.

"Therefore, we are working toward developing a watershed action plan for Shoal Creek to address the challenges presented in this urban watercourse," Wolaver added.

With funding assistance from the Texas Commission on Environmental Quality, or TCEQ, the Shoal Creek Conservancy will work in partnership with local stakeholders and Texas State University's Meadows Center for Water and the Environment to develop the plan. More information on this project, including how to become involved, will be presented at the workshop.

"In addition to discussing the Shoal Creek watershed, the workshop will offer a variety of continuing education credits for multiple professional disciplines," said Noel Troxclair, AgriLife Extension agent for Travis County.

Troxclair said he wants to encourage local residents and other stakeholders to attend the workshop to gain more information about water resources and water quality improvement and protection.

Attendees of the workshop will receive a copy of the Texas Watershed Steward Handbook and a certificate of completion. The Texas Watershed Steward program offers four continuing education units in soil and water management for certified crop advisors, four units for professional engineers and certified planners, four credits for certified teachers, and two credits for nutrient management specialists. A total of four professional development hours are available for professional geoscientists.

In addition, three general continuing education units are offered for Texas Department of Agriculture pesticide license holders, and four for certified landscape architects. Four continuing education credits are provided to certified floodplain managers. Four continuing education credits are also offered for each of the following TCEQ occupational licensees: wastewater system operators, public water system operators, on-site sewage facility installers and landscape irrigators. Master Gardeners and Master Naturalists may also earn continuing education.

The Texas Watershed Steward program is funded through a Clean Water Act nonpoint source grant from the Texas State Soil and Water Conservation Board and U.S. Environmental Protection Agency.

For more information on the Texas Watershed Steward program and to preregister, go to the website or contact Kuitu at 979-862-4457, [mkuitu@tamu.edu](mailto:mkuitu@tamu.edu); or Troxclair at 512-854-9600, [noel.troxclair@ag.tamu.edu](mailto:noel.troxclair@ag.tamu.edu).

For more information about watershed protection efforts for Shoal Creek, visit <https://shoalcreekconservancy.org/watershedplan/>, or contact Wolaver at 512-565-0812, [joanna@shoalcreekconservancy.org](mailto:joanna@shoalcreekconservancy.org).

-30-

## Appendix C

### Example TWS workshop invitation letter and postcard

Mr. Anyone  
1111 Somewhere St.  
Anytown, USA 11111



Dear Mr. Anyone,

Are you interested in the quality of water in your local streams, rivers and lakes? Would you like to learn about how to protect these important water resources? If so, join us at the Texas Watershed Steward workshop to be held at *VENUE NAME* located at *Address* in *CITY*, TX on *MONTH DAY* from *START TIME* to *END TIME*.

Texas Watershed Stewards is a one-day educational program sponsored by the Texas A&M AgriLife Extension Service, and Texas State Soil and Water Conservation Board, in coordination with the *LISTER OTHER EVENT/PROJECT PARTNERS*. The program is designed to improve the quality of Texas' water resources by educating and informing local stakeholders about their watershed, potential impairments, and steps that can be taken to help improve and protect water quality.

The focus of the workshop on *DATE* will be the *NAME OF WATERSHED* Watershed which includes parts of *COUNTY NAMES* Counties. *WATERSHED NAME* first appeared on the State's list of impaired waters in *DATE* for elevated levels of *IMPAIRMENT*.

Clean water is important to us all and as a landowner you play a key role in protecting local water resources for future generations. We hope you will take this opportunity to learn more about the water quality issues in your area and what you can do to help.

The training is free and you can pre-register for this event by visiting our website at <http://tws.tamu.edu> or by calling 979-862-4457.

As a part of the free training, we also offer Continuing Education Units for a variety of professions ranging from TDA (Texas Department of Agriculture) CEUs for pesticide license holders to select TCEQ (Texas Commission on Environmental Quality) Occupational license holders. For a complete list of CEUs offered, such as Professional Engineers, Certified Crop Advisors, Certified Planners, and more, visit our website or contact Michael Kuitu via the information given below.

If you have any questions or need more information about the workshop, please contact Michael Kuitu or *COUNTY AGENT'S NAME*.

We hope to see you there.

Michael Kuitu, PG, CFM  
Extension Program Specialist  
979-862-4457  
[mkuitu@tamu.edu](mailto:mkuitu@tamu.edu)

*COUNTY AGENT'S NAME*  
*COUNTY NAME* County Extension Agent  
*PHONE NUMBER*  
*EMAIL*



Attn: Michael Kuitu  
Texas A&M AgriLife Extension Service  
2474 TAMU  
College Station, TX 77843-2474

Name

Address

City, State Zip

TWS advertisement postcard front (*Above*); and back (*Below*)

Texas Watershed Steward Workshop—Dec 11—Free TDA CEUs

Texas A&M AgriLife Extension will host a free Texas Watershed Steward (TWS) workshop in Jonesboro, TX. Water quality related to the Leon River watershed, along with land and watershed management, will be discussed. Three general TDA CEUs available at no cost.

December 11, 2018 || 1:00pm-5:00pm || Jonesboro Community Center  
11625 TX-36, Jonesboro, TX 76538

For more information or to REGISTER, go to:  
[tws.tamu.edu](http://tws.tamu.edu) or call 979-862-4457



A Clean Water Act grant was provided to Texas A&M AgriLife Extension by the Texas State Soil and Water Conservation Board and the U.S. Environmental Protection Agency to implement the TWS Program



**Appendix D**  
Sample agenda for a TWS workshop

**TEXAS WATERSHED STEWARD WORKSHOP: AGENDA**  
TUESDAY– JULY 17, 2018  
MISSION & ARANSAS RIVER WATERSHEDS  
BEEVILLE, TX



---

*Sign-In/Register/Coffee*  
*Pre-test*

---

Introductions (of speakers and participants)  
*Module 1: Program Introduction*

---

***Module 2: Overview of Watershed Systems***

What is a Watershed?  
Watersheds in Texas  
How do Texans Use Watersheds?  
Principles of Watershed Hydrology  
Natural Watershed Features  
Natural Watershed Functions

---

***Module 3: Overview of Watershed Impairments***

Water Quantity and Quality

---

**BREAK**

---

***Module 3: Overview of Watershed Impairments***

Point and Nonpoint Sources of Pollution  
Consequences of Impaired Water Quality  
Water Quality Law and Policy in Texas  
Water Quality Testing, Monitoring and Regulation

---

***Module 4: Managing to Improve Watershed Function***

Using a Watershed Approach  
Water Quality Improvement Projects  
Agricultural Best Management Practices  
Water Quality Stewardship on Small Acreages  
Management of Non-domestic Animals and Wildlife  
Urban Best Management Practices  
Protecting Water Quality Around the Home

---

***Module 5: Community-Driven Watershed Protection and Management***

Importance of Local Watershed Involvement  
Forming and Sustaining Community Watershed Organizations and Partnerships

---

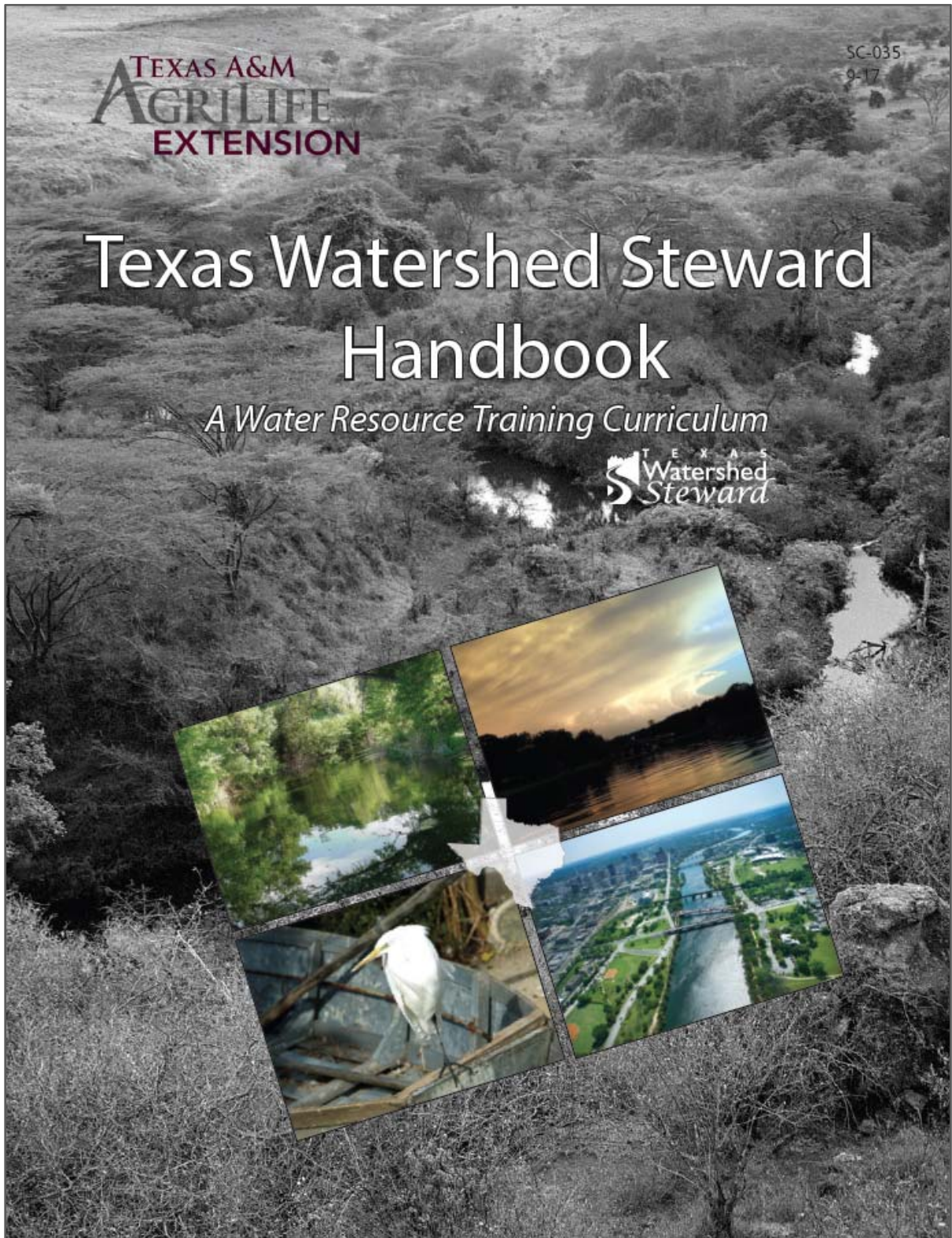
*Questions, Discussions, Conclusions*

---

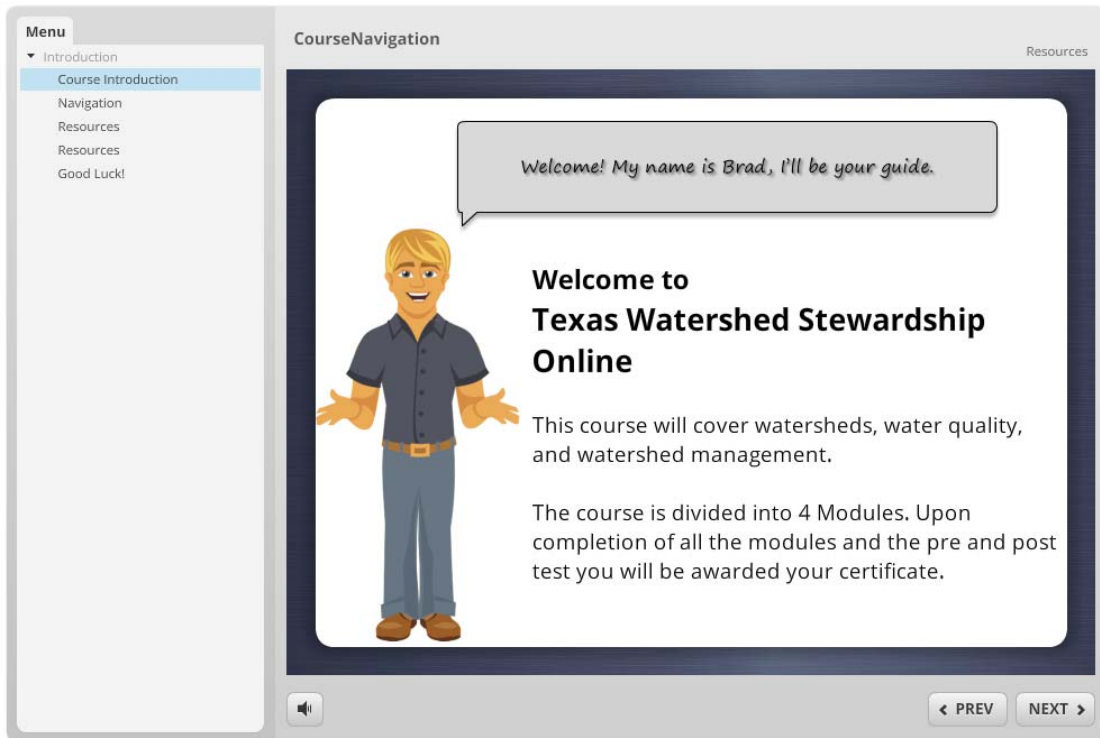
*Post-Test*

---

Appendix E  
Cover page of TWS Curriculum Handbook



## Appendix F

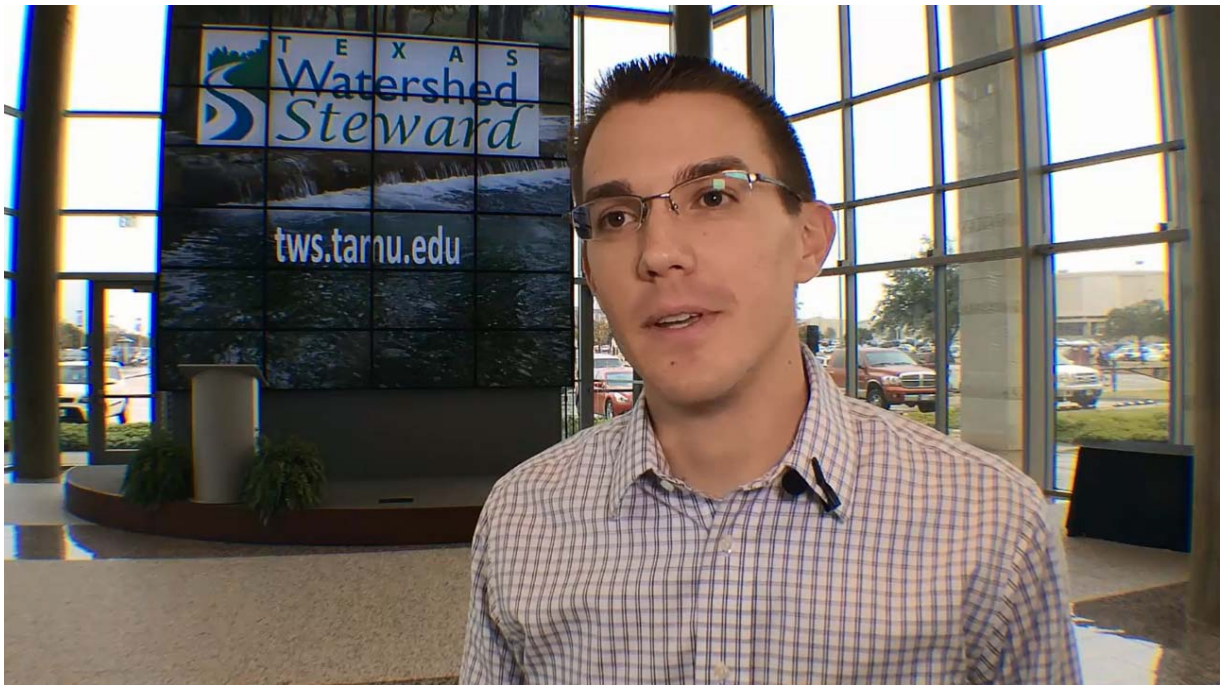


Above: Welcome page of the TWS Junior online course

Below: Video still from Module 3 of the for-credit TWS online course



## Appendix G



Above: Video still from TWS program video press release (<https://tws.tamu.edu>)

Below: Video still from February 2018 news interview for TWS program



# Appendix H

## Instructor page for online course

### Texas Watershed Stewardship- For Credit

Home > Agriculture and Natural Resources > TWSE

Turn editing on

Your progress

#### NAVIGATION


- Home
  - Dashboard
  - Site pages
- Current course
  - TWSE
    - Participants
    - Badges
    - General
    - Module 1: Program Introduction
    - Module 2: Watershed Systems
    - Module 3: Watershed Impairments
    - Module 4: Managing Watersheds
    - Additional Resources
    - Course Wrap Up
  - My courses

#### ADMINISTRATION


- Course administration
  - Turn editing on
  - Edit settings
  - Course completion
  - Users
  - Filters
  - Reports
  - Grades
  - Gradebook setup
  - Badges
    - Backup
    - Restore
    - Import
    - Reset
  - Question bank
- Switch role to...

#### NEED HELP?

Email [learnonline@ag.tamu.edu](mailto:learnonline@ag.tamu.edu) with a brief description of the issue you're having and the course name if it's related to a specific course.



**Texas Watershed Stewards Online**



Welcome to the Texas Watershed Steward online course! Here you will learn about watersheds, water quality, and watershed management and gain access to all of the information supplied in the face-to-face workshops we hold around the state. **THIS COURSE IS INTENDED FOR SCHOOLS AND CONTINUING EDUCATION CREDIT.**

\*\*(Please note that continuing education credits/CEUs for the professional licenses listed on the following website: <http://tws.tamu.edu/workshops/workshop-information/> are currently only available through our in-person workshops and not the online course.)\*\*

\*There is a minimum of 60 minutes required in the course to receive your certificate.

Before you begin Module 1, please complete the following items:

- Complete this Pre-test
- Course Navigation Video

---

### Module 1: Program Introduction

In this module, you will learn about:

- The Texas Watershed Steward (TWS) Program
- Watershed Stewardship
- The importance of water
- Water facts

- Module 1 Presentation

Not available unless: The activity **Complete this Pre-test** is marked complete

---

### Module 2: Watershed Systems

In this module, you will learn about:

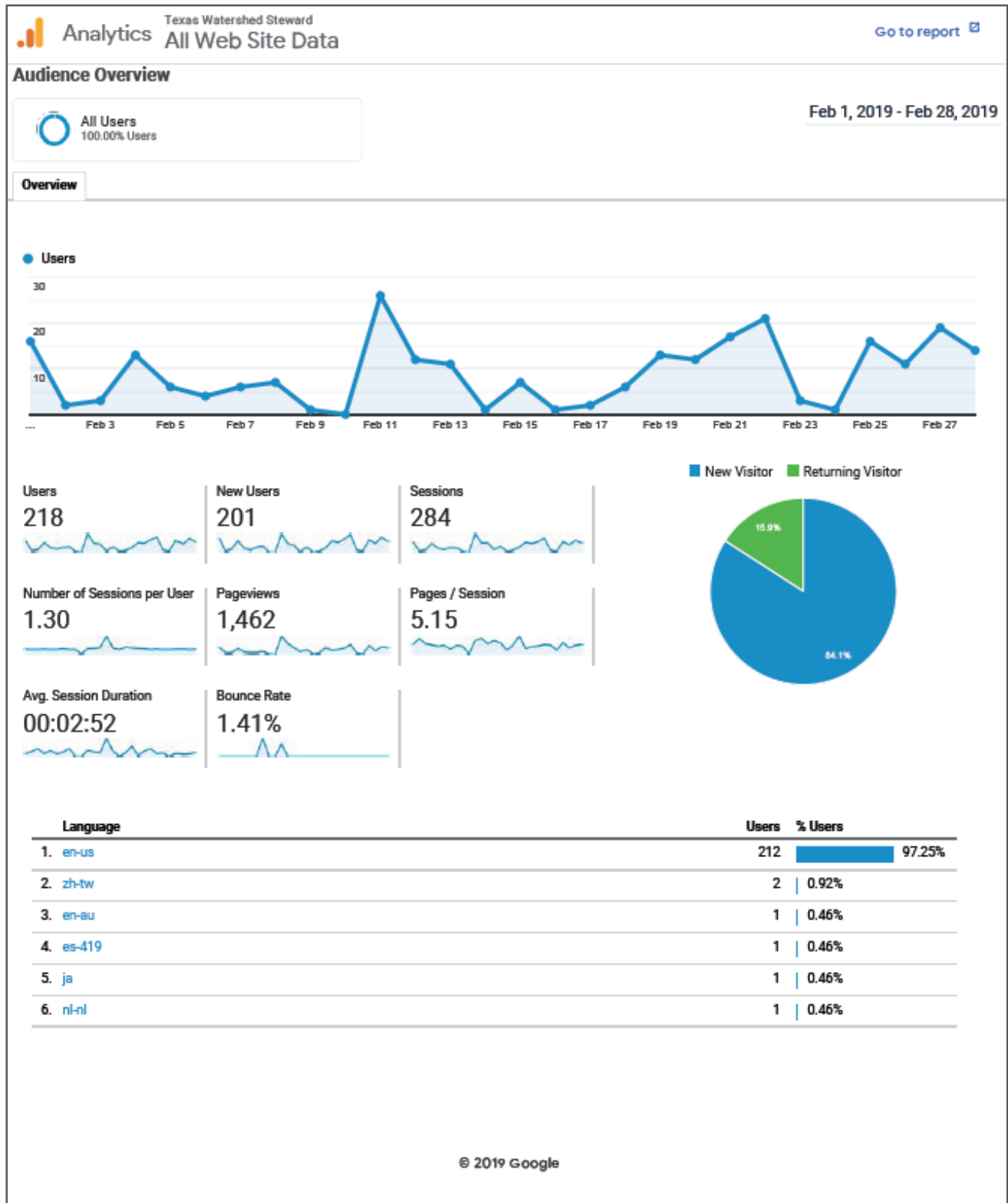
- Watersheds and how they function
- The different ways watersheds are used
- Watersheds in Texas
- Watershed hydrology and the water cycle
- Natural features and functions of watersheds

- Module 2 Presentation



Not available unless: The activity **Module 1 Presentation** is marked complete

## Appendix I

Example cover page from Google Analytics report for TWS website



**Appendix J**  
TWS program Pre- and Post-Tests

 	Last 4 digits of your home phone number: <table border="1" style="display: inline-table; border-collapse: collapse;"><tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr></table>				
Location of Training: _____					

**TEXAS WATERSHED STEWARD PROGRAM**  
**Pretest**

*The purpose of this pretest is to help us learn more about you and to determine baseline data on watershed related information. Please read the following questions and circle the answer you think is correct. Please do not worry if you do not know the answer, simply circle "unsure." THANKS!!!*

**MARKING INSTRUCTIONS**  
CORRECT:  INCORRECT:

1. **Watershed hydrology is the study of how:**
  - Water interacts with various parts of a watershed including the land, the sea, and the sky
  - Water quality and quantity are affected by point and nonpoint source pollution
  - Chemical, physical, and biological water quality parameters change over time
  - Water is formed on the Earth
  - Unsure
  
2. **pH is measured on a scale of:**
  - 1-5
  - 1-12
  - 0-10
  - 0-14
  - 0-20
  - Unsure
  
3. **All of the following are natural features found in healthy, functioning watersheds EXCEPT:**
  - Upland
  - Erosion zone
  - Floodplain
  - Riparian zone
  - Water body
  - Unsure
  
4. **The most commonly tested fecal bacteria indicator in freshwater is:**
  - E. coli
  - Cyanobacteria
  - Streptococcus
  - Giardia
  - Cryptosporidium
  - Unsure

30855

MARKING INSTRUCTIONS

CORRECT: ● INCORRECT: ☒ ☓ ☐ ☑

5. \_\_\_\_\_ is a term used to describe the chemical, physical, and biological characteristics of water.
- Water quantity
  - Water clarity
  - Water quality
  - Water availability
  - Unsure
6. Point source pollution refers to pollution that is discharged from a clearly defined, fixed point such as a pipe, ditch, channel, sewer, or tunnel.
- True
  - False
  - Unsure
7. The most common nonpoint source impairment in Texas is:
- Bacteria
  - Dissolved oxygen
  - Sediment
  - Hazardous and Toxic Substances
  - Unsure
8. All of the following are examples of major sources of nonpoint source pollution, EXCEPT:
- Bacteria
  - Nutrients
  - Algae
  - Sediment
  - Toxic Chemicals
  - Unsure
9. Which nutrients most commonly cause water quality concerns?
- Nitrogen and Potassium
  - Phosphorus and Sulfur
  - Nitrogen and Sulfur
  - Nitrogen and Phosphorus
  - Phosphorus and Potassium
  - Unsure
10. The over-enrichment of water with nutrients is called:
- Apnea
  - Anoxia
  - Aeration
  - Eutrophication
  - Hyperhydrosis
  - Unsure
11. The Clean Water Act of 1972 was passed to:
- Protect the water quality of all of the nation's waterbodies
  - Protect threatened and endangered plant and animal species
  - Enable dredging in water bodies to prevent sedimentation and erosion
  - Increase the funding for water treatment plants
  - Unsure

30855



**MARKING INSTRUCTIONS**

CORRECT:  INCORRECT:

12. Water quality standards exist for surface water, wastewater effluent, and drinking water.

- True     False     Unsure

13. Which state agency is the primary water quality agency in Texas?

- Environmental Protection Agency (EPA)  
 Texas Water Development Board (TWDB)  
 Texas Commission on Environmental Quality (TCEQ)  
 Texas State Soil and Water Conservation Board (TSSWCB)  
 Unsure

14. A flexible framework for managing the quantity and quality of water resources found within specified watershed boundaries is referred to as:

- Environmental planning  
 Watershed approach  
 Restoration strategy  
 Pollution control strategy  
 Community action plan  
 Unsure

15. Which of the following are important types of water quality improvement projects in Texas?

- A. Watershed protection plans (WPP)  
 B. Water quality standards assessment  
 C. Total maximum daily loads (TMDL)  
 A and C  
 B and C  
 Unsure

16. Structural and non-structural practices used to protect water quality are referred to as:

- Environmental protection practices  
 Best management practices  
 Water restoration practices  
 Unsure

17. The Clean Water Act Section \_\_\_\_\_ List is a list of streams and lakes that are impaired for one or more pollutants causing them to not meet state water quality standards.

- 404(a)     303(d)     615(b)     208(b)     503(b)     Unsure

18. The primary regulatory water quality monitoring program in Texas is:

- Texas Coastal Management Program  
 Texas Stream Team  
 Texas Coordinated Monitoring Program  
 Texas Clean Rivers Program  
 Texas Bay Monitoring Program  
 Unsure

30855

**MARKING INSTRUCTIONS**

CORRECT: ● INCORRECT: ☒ ☓ ☐ ☑

19. Please tell us if any of the following items interest you.

ITEM	Not Interested	Possibly Interested	Probably Interested	Definitely Interested
A. Protecting my watershed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
B. Participating in additional watershed education workshops or seminars	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
C. Becoming active in a local watershed group	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
D. Having a leadership role in a local watershed group	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
E. Participating in a volunteer water quality monitoring program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

20. Please answer the following questions by marking YES or NO related to where you have received water quality information. If the question does, not apply, select "NA."

Have you received water quality information from the following sources?	Yes	No	NA
A. Television	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
B. Newspapers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
C. Internet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
D. Texas AgriLife Extension Service (formerly Texas Cooperative Extension)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
E. Texas AgriLife Research (formerly Texas Agricultural Experiment Station)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
F. Universities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
G. Environmental Agencies (government)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
H. Environmental groups (citizens groups)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

21. How did you hear about the Texas Watershed Steward Program?

- Extension
- Newspaper
- Newsletter
- Internet
- Texas Coop Magazine
- Utility insert
- Friend
- Other:

22. How would you best describe yourself? (fill in one only)

- Agency professional
- City/county official/employee
- Non-governmental organization member/employee
- Teacher / educational professional
- Small business owner
- Other:

23. You are . . .  Female  Male

24. Your age?  18 - 24  25 - 29  30 - 34  35 - 39  40 - 44  45 - 49  50 - 54  55 - 59  60 - 64  65 - 69  70 - 74  75+

25. Place of residence?  Farm or ranch 0 - 100 acres  Farm or ranch > 100 acres  Rural area, not a farm / ranch  Town under 10,000  Town or city between 10,000 and 50,000 persons  City between 50,000 and 250,000 persons  City over 250,000 persons

26. Highest level of education obtained?

- Some high school or less
- High school graduate or GED
- Vocational or technical degree
- Some college
- Bachelor degree
- Post-graduate degree(s)

30855

THANK YOU!





Please read the following questions and mark the answer you think is correct. Please do not worry if you do not know the answer, simply mark "unsure." THANKS!!!

MARKING INSTRUCTIONS

CORRECT  INCORRECT

1. Watershed hydrology is the study of how:
  - Water interacts with various parts of a watershed including the land, the sea, and the sky
  - Water quality and quantity are affected by point and nonpoint source pollution
  - Chemical, physical, and biological water quality parameters change over time
  - Water is formed on the Earth
  - Unsure
  
2. pH is measured on a scale of:
  - 1-5
  - 1-12
  - 0-10
  - 0-14
  - 0-20
  - Unsure
  
3. All of the following are natural features found in healthy, functioning watersheds EXCEPT:
  - Upland
  - Erosion zone
  - Floodplain
  - Riparian zone
  - Water body
  - Unsure
  
4. The most commonly tested fecal bacteria indicator in freshwater is:
  - E. coli
  - Cyanobacteria
  - Streptococcus
  - Giardia
  - Cryptosporidium
  - Unsure
  
5. \_\_\_\_\_ is a term used to describe the chemical, physical, and biological characteristics of water.
  - Water quantity
  - Water clarity
  - Water quality
  - Water availability
  - Unsure
  
6. Point source pollution refers to pollution that is discharged from a clearly defined, fixed point such as a pipe, ditch, channel, sewer, or tunnel.
  - True
  - False
  - Unsure
  
7. The most common nonpoint source impairment in Texas is:
  - Bacteria
  - Dissolved oxygen
  - Sediment
  - Hazardous and Toxic Substances
  - Unsure
  
8. All of the following are examples of major sources of nonpoint source pollution, EXCEPT:
  - Bacteria
  - Nutrients
  - Algae
  - Sediment
  - Toxic Chemicals
  - Unsure
  
9. Which nutrients most commonly cause water quality concerns?
  - Nitrogen and Potassium
  - Phosphorus and Sulfur
  - Nitrogen and Sulfur
  - Nitrogen and Phosphorus
  - Phosphorus and Potassium
  - Unsure
  
10. The over-enrichment of water with nutrients is called:
  - Apnea
  - Anoxia
  - Aeration
  - Eutrophication
  - Hyperhydrosis
  - Unsure

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**MARKING INSTRUCTIONS**

CORRECT ● INCORRECT: ☹ ☹ ☹ ☹

11. The Clean Water Act of 1972 was passed to:

- Protect the water quality of all of the nation's waterbodies
- Protect threatened and endangered plant and animal species
- Enable dredging in water bodies to prevent sedimentation and erosion
- Increase the funding for water treatment plants
- Unsure

12. Water quality standards exist for surface water, wastewater effluent, and drinking water.

- True
- False
- Unsure

13. Which state agency is the primary water quality agency in Texas?

- Environmental Protection Agency (EPA)
- Texas Water Development Board (TWDB)
- Texas Commission on Environmental Quality (TCEQ)
- Texas State Soil and Water Conservation Board (TSSWCB)
- Unsure

14. A flexible framework for managing the quantity and quality of water resources found within specified watershed boundaries is referred to as:

- Environmental planning
- Watershed approach
- Restoration strategy
- Pollution control strategy
- Community action plan
- Unsure

15. Which of the following are important types of water quality improvement projects in Texas?

- A. Watershed protection plans (WPP)
- B. Water quality standards assessment
- C. Total maximum daily loads (TMDL)
- A and C
- B and C
- Unsure

16. Structural and non-structural practices used to protect water quality are referred to as:

- Environmental protection practices
- Best management practices
- Water restoration practices
- Unsure

17. The Clean Water Act Section \_\_\_\_\_ List is a list of streams and lakes that are impaired for one or more pollutants causing them to not meet state water quality standards.

- 404(a)
- 303(d)
- 615(b)
- 208(b)
- 503(b)
- Unsure

18. The primary regulatory water quality monitoring program in Texas is:

- Texas Coastal Management Program
- Texas Stream Team
- Texas Coordinated Monitoring Program
- Texas Clean Rivers Program
- Texas Bay Monitoring Program
- Unsure

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**MARKING INSTRUCTIONS**

CORRECT:  INCORRECT:

19. Please indicate your intentions to do the following:

Practice related to . . .	Definitely Will Not	Probably Will Not	Undecided	Probably Will	Definitely Will	Already Adopted
A. Participate in community cleanup activities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
B. Get involved in local planning / zoning decisions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
C. Communicate water issues with elected officials	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
D. Help develop a plan for my watershed (WPP)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
E. Help form or become a member of a local watershed group	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

20. Are there any Best Management Practices (BMPs) that you plan to adopt to help protect your watershed?

Yes     No     Unsure

*if yes, please list the ones you plan to adopt in the space below*

21. Do you feel what you learned in the program provided you the ability to be a better steward of your watershed?

Yes     No     Unsure

22. What is the most significant thing you learned during the program (feel free to list more than one)?

23. How much would you be willing to pay for this program?

\$0 - \$9       \$30 - \$39       \$60 - \$69       \$90 - \$100  
 \$10 - \$19     \$40 - \$49       \$70 - \$79  
 \$20 - \$29     \$50 - \$59       \$80 - \$89

24. What other information do you need pertaining to these topics?

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THANK YOU!

## **Appendix K**

### **TWS 6-month Follow-up Evaluation questions**

**For questions one through eleven, given below, please tell us if you adopted any of the following practices based on what you learned at the Texas Watershed Steward Workshop.**

1. Participated in at least one community cleanup event
2. Gotten involved in local planning/zoning decisions
3. Communicated water issues with elected officials
4. Helped develop a plan for your watershed (Watershed Protection Plan)
5. Helped form or become a member of a local watershed group
6. Gotten involved in a volunteer water quality monitoring program
7. Given a presentation to a school class or other community group on watershed stewardship/water quality issues
8. Encouraged others in your community to attend a TWS workshop
9. More closely monitored individual actions that can impair water quality
10. Adopted/maintained Best Management Practices (BMPs) on your property or in your community related to improving water quality
11. Adopted soil testing practices

**For questions twelve through fifteen, given below, please answer *Yes* or *No*.**

12. Have you used the resources/materials provided to you at the workshop?
13. Have you shared the resources/materials provided to you at the workshop with others?
14. Were you satisfied with the resources/materials provided to you at the workshop?
15. Have you used the TWS on-line modules available at <https://tw.s.tamu.edu/>?

**Appendix L**  
Phase 1 Evaluation (Pre/Post-Test) Data Report



***Texas Watershed – As of March 2019***

**Progress Report for Program  
Implementation**

**(n = 2,079)**



*Summary provided by Paul Pope ([ppope@tamu.edu](mailto:ppope@tamu.edu))*

**Summary.** Listed below are some of the highlights of the pretest and posttest from the Texas Watershed Program.

**KNOWLEDGE (using designated knowledge gain questions only)**

- There was an overall knowledge increase of **+33.4** percentage points from the pretest and post test for questions (original and revised questions combined).
- For *watersheds* questions, there was an overall knowledge increase of **+27.6** percentage points from the pretest and post test (original and revised questions combined).
- For *fresh water* questions, there was an overall knowledge increase of **+38.8** percentage points from the pretest and post test (original and revised questions combined).
- For *pollution* questions, there was an overall knowledge increase of **+36.3** percentage points from the pretest and post test (original and revised questions combined).
- For *policy and government* questions, there was an overall knowledge increase of **+36.1** percentage points from the pretest and post test (original and revised questions combined).

**INTENTIONS TO CHANGE**

- **386 of 1,757 (22.0%)** said they intend to participate in community cleanup activities. **347 (19.7%)** said they have already done this before the program.
- **353 of 1,747 (20.2%)** said they intend to get involved in local planning / zoning decisions. **234 (13.4%)** said they have already done this before the program.
- **519 of 1,758 (29.5%)** said they intend to communicate water issues with elected officials. **260 (14.8%)** said they have already done this before the program.
- **387 of 1,747 (22.9%)** said they intend to help develop a plan for my watershed. **180 (10.3%)** said they have already done this before the program.
- **344 of 1,752 (19.6%)** said they to help form or become a member of a local watershed group. **218 (12.4%)** said they have already done this before the program.

**OTHER POST-EVENT MEASURES**

- **1,112 of 1,733 (64.2%)** said there were Best Management Practices (BMPs) that they plan to adopt to help them be a better steward of their watershed.
- **1,748 of 1,790 (97.7%)** felt what they learned provided them with the ability to be a better steward of their watershed.

**Table 1. Pretest and post test results from trainings.**

Question	Pretest Correct Response	Post Test Correct Response	Pct. Point Diff <sup>1</sup>
1. Watershed hydrology is the study of how:	810 of 1,469 (55.1%)	1,059 of 1,469 (72.1%)	+17.0
2. pH is measured on a scale of:	931 of 1,469 (63.4%)	1,334 of 1,469 (90.8%)	+27.4
3. All of the following are natural features found in healthy, functioning watersheds EXCEPT:	618 of 1,469 (42.1%)	1,113 of 1,469 (75.8%)	+33.7
4. The most commonly tested fecal bacteria indicator in freshwater is:	1,140 of 1,469 (77.6%)	1,365 of 1,469 (92.9%)	+15.3
5. _____ is a term used to describe the chemical, physical, and biological characteristics of water.	1,158 of 1,469 (78.8%)	1,323 of 1,469 (90.1%)	+11.3
6. Point source pollution refers to pollution that is discharged from a clearly defined, fixed point such as a pipe, ditch, channel, . . .	1,256 of 1,469 (85.5%)	1,417 of 1,469 (96.5%)	+11.0
7. The most common nonpoint source impairment in Texas is:	303 of 1,469 (20.6%)	994 of 1,469 (67.7%)	+47.1
8. All of the following are examples of major sources of nonpoint source pollution, EXCEPT:	391 of 1,469 (26.6%)	1,028 of 1,469 (70.0%)	+43.4
9. Which nutrients most commonly cause water quality concerns?	840 of 1,469 (57.2%)	1,227 of 1,469 (83.5%)	+26.3
10. The over-enrichment of water with nutrients is called:	788 of 1,469 (53.6%)	1,129 of 1,469 (76.9%)	+23.3
11. The Clean Water Act of 1972 was passed to:	1,244 of 1,469 (84.7%)	1,428 of 1,469 (97.2%)	+12.5
12. The three types of water quality standards established by the Clean Water Act are surface water, effluent, and drinking water quality standards.	1,151 of 1,469 (78.4%)	1,368 of 1,469 (93.1%)	+14.7
13. Which state agency is the primary water quality agency in Texas	902 of 1,469 (61.4%)	1,269 of 1,469 (86.4%)	+25.0
14. A flexible framework for managing the quantity and quality of water resources found within specified watershed boundaries is referred to as:	804 of 1,469 (54.7%)	1,188 of 1,469 (80.9%)	+26.2
15. Which of the following are important types of water quality improvement projects in Texas?	609 of 1,469 (41.5%)	1,180 of 1,469 (80.3%)	+38.8
16. Structural and non-structural practices used to protect water quality are referred to as:	855 of 1,469 (58.2%)	1,274 of 1,469 (86.7%)	+28.5
17. The Clean Water Act Section _____ List is a list of streams and lakes that are impaired for one or more pollutants causing them to not meet state water quality standards.	647 of 1,469 (44.0%)	1,391 of 1,469 (94.7%)	+50.7
18. The primary regulatory water quality monitoring program in Texas is:	618 of 1,469 (42.1%)	936 of 1,469 (63.7%)	+21.6
<b>OVERALL</b>	<b>15,065 of 26,442 (57.0%)</b>	<b>22,023 of 26,442 (83.3%)</b>	<b>+26.8</b>
<b>KNOWLEDGE GAIN QUESTIONS (2, 3, 7-10, 14-18)</b>	<b>7,404 of 16,159 (45.8%)</b>	<b>12,794 of 16,159 (79.2%)</b>	<b>+33.4</b>

<sup>1</sup>Percentage point change was calculated by the following formula: After % – Before %

**Table 2. Pretest and post test results from questions pertaining to "Watersheds."**

Question	Pretest Correct	Post Test Correct	Pct. Point Chg <sup>1</sup>
1. Watershed hydrology is the study of how:	810 of 1,469 (55.1%)	1,059 of 1,469 (72.1%)	+17.0
2. pH is measured on a scale of:	931 of 1,469 (63.4%)	1,334 of 1,469 (90.8%)	+27.4
3. All of the following are natural features found in healthy, functioning watersheds EXCEPT:	618 of 1,469 (42.1%)	1,113 of 1,469 (75.8%)	+33.7
10. The over-enrichment of water with nutrients is called:	788 of 1,469 (53.6%)	1,129 of 1,469 (76.9%)	+23.3
14. A flexible framework for managing the quantity and quality of water resources found within specified watershed boundaries is referred to as:	804 of 1,469 (54.7%)	1,188 of 1,469 (80.9%)	+26.2
<b>OVERALL – Watersheds</b>	<b>3,951 of 7,345 (53.8%)</b>	<b>5,823 of 7,345 (79.3%)</b>	<b>+25.5</b>
<b>KNOWLEDGE GAIN QUESTIONS (2, 3, 10, 14)</b>	<b>3,141 of 5,876 (53.5%)</b>	<b>4,764 of 5,876 (81.1%)</b>	<b>+27.6</b>

<sup>1</sup>Percentage point change was calculated by the following formula: After % – Before %

**Table 3. Pretest and post test results from questions pertaining to "Fresh Water."**

Question	Pretest Correct	Post Test Correct	Pct. Point Chg <sup>1</sup>
4. The most commonly tested fecal bacteria indicator in freshwater is:	1,140 of 1,469 (77.6%)	1,365 of 1,469 (92.9%)	+15.3
5. _____ is a term used to describe the chemical, physical, and biological characteristics of water.	1,158 of 1,469 (78.8%)	1,323 of 1,469 (90.1%)	+11.3
15. Which of the following are important types of water quality improvement projects in Texas?	609 of 1,469 (41.5%)	1,180 of 1,469 (80.3%)	+38.8
<b>OVERALL – Fresh Water</b>	<b>2,907 of 4,407 (66.0%)</b>	<b>3,868 of 4,407 (87.8%)</b>	<b>+21.8</b>
<b>KNOWLEDGE GAIN QUESTIONS (15)</b>	<b>609 of 1,469 (41.5%)</b>	<b>1,180 of 1,469 (80.3%)</b>	<b>+38.8</b>

<sup>1</sup>Percentage point change was calculated by the following formula: After % – Before %

**Table 4. Pretest and post test results from questions pertaining to "Pollution."**

Question	Pretest Correct	Post Test Correct	Pct. Point Chg <sup>1</sup>
6. Point source pollution refers to pollution that is discharged from a clearly defined, fixed point such as a pipe, ditch, channel, . . .	1,256 of 1,469 (85.5%)	1,417 of 1,469 (96.5%)	+11.0
7. The most common nonpoint source impairment in Texas is:	303 of 1,469 (20.6%)	994 of 1,469 (67.7%)	+47.1
8. All of the following are examples of major sources of nonpoint source pollution, EXCEPT:	391 of 1,469 (26.6%)	1,028 of 1,469 (70.0%)	+43.4
9. Which nutrients most commonly cause water quality concerns?	840 of 1,469 (57.2%)	1,227 of 1,469 (83.5%)	+26.3
16. Structural and non-structural practices used to protect water quality are referred to as:	855 of 1,469 (58.2%)	1,274 of 1,469 (86.7%)	+28.5
<b>OVERALL – Pollution</b>	<b>3,645 of 7,345 (49.6%)</b>	<b>5,940 of 7,345 (80.9%)</b>	<b>+31.3</b>
<b>KNOWLEDGE GAIN QUESTIONS (7-9, 16)</b>	<b>2,389 of 5,876 (40.7%)</b>	<b>4,523 of 5,876 (77.0%)</b>	<b>+36.3</b>

<sup>1</sup>Percentage point change was calculated by the following formula: After % – Before %

**Table 5. Pretest and post test results from questions pertaining to “Policy and Govt.”**

Question	Pretest Correct	Post Test Correct	Pct. Point Chg <sup>1</sup>
11. The Clean Water Act of 1972 was passed to:	1,244 of 1,469 (84.7%)	1,428 of 1,469 (97.2%)	+12.5
12. The three types of water quality standards established by the Clean Water Act are surface water, effluent, and drinking water quality standards.	1,151 of 1,469 (78.4%)	1,368 of 1,469 (93.1%)	+14.7
13. Which state agency is the primary water quality agency in Texas	902 of 1,469 (61.4%)	1,269 of 1,469 (86.4%)	+25.0
17. The Clean Water Act Section _____ List is a list of streams and lakes that are impaired for one or more pollutants causing them to not meet state water quality standards.	647 of 1,469 (44.0%)	1,391 of 1,469 (94.7%)	+50.7
18. The primary regulatory water quality monitoring program in Texas is:	618 of 1,469 (42.1%)	936 of 1,469 (63.7%)	+21.6
<b>OVERALL - Policy and Government</b>	<b>4,562 of 7,345 (62.1%)</b>	<b>6,392 of 7,345 (87.0%)</b>	<b>+24.9</b>
<b>KNOWLEDGE GAIN QUESTIONS (17, 18)</b>	<b>1,265 of 2,938 (43.1%)</b>	<b>2,327 of 2,938 (79.2%)</b>	<b>+36.1</b>

<sup>1</sup>Percentage point change was calculated by the following formula: After % – Before %

**Table 6. Intentions to change<sup>1</sup>.**

Statement	Probably Will	Definitely Will	Combined Percent
Your intentions to participate in community cleanup activities (n= 1,757).	(40.7%)	(22.0%)	62.7%
Your intentions to get involved in local planning / zoning decisions (n= 1,747)	(34.2%)	(20.2%)	54.4%
Your intentions to communicate water issues with elected officials (n= 1,758)	(34.3%)	(29.5%)	63.8%
Your intentions to help develop a plan for my watershed (n= 1,747)	(34.5%)	(22.2%)	56.7%
Your intentions to help form or become a member of a local watershed group (n= 1,752)	(33.5%)	(19.6%)	53.1%

<sup>1</sup>Likert scale defined as 1 = *definitely will not*, 2 = *probably will not*, 3 = *undecided*, 4 = *probably will*, and 5 = *definitely will*.

**Table 7. Satisfaction<sup>1</sup>.**

Statement	Mostly	Completely	Combined Percent
Overall, how satisfied are you with this activity? (n= 1,686)	(28.2%)	(69.9%)	98.1%
How satisfied were you with the quality of course materials? (n= 1,812)	(22.7%)	(76.1%)	98.8%
How satisfied were you with the location of activity? (n= 1,814)	(20.8%)	(72.7%)	93.5%
How satisfied were you with the accuracy of information? (n= 1,787)	(23.0%)	(75.3%)	98.3%
How satisfied were you with the information being new to you? (n= 1,797)	(32.6%)	(27.2%)	59.8%
How satisfied were you with the information being easy to understand? (n= 1,804)	(31.4%)	(64.7%)	96.1%
How satisfied were you with the range of topics covered? (n= 1,807)	(32.2%)	(64.3%)	96.5%
How satisfied were you with the completeness of information given? (n= 1,805)	(31.6%)	(65.0%)	96.6%
How satisfied were you with the timeliness of information (being received in time to be useful)? (n= 1,803)	(28.6%)	(66.1%)	94.7%
How satisfied were you with the helpfulness of the information in decisions about your own situation? (n= 1,799)	(34.1%)	(56.3%)	90.4%
How satisfied were you with the instructor's knowledge level of subject matter? (n= 1,804)	(16.2%)	(82.7%)	98.9%
How satisfied were you with the instructor's responses to questions? (n= 1,804)	(18.9%)	(79.4%)	98.3%

<sup>1</sup>Likert scale defined as 1 = *not at all*, 2 = *slightly*, 3 = *somewhat*, 4 = *mostly*, and 5 = *completely*.

#### Other Data

- 52.2% said they have received water quality information from television.
- 62.8% said they have received water quality information from newspapers.
- 73.6% said they have received water quality information from the Internet.
- 63.1% said they have received water quality information from Texas A&M AgriLife Extension Service.
- 41.8% said they have received water quality information from Texas A&M AgriLife Research.
- 51.9% said they have received water quality information from universities.
- 71.5% said they have received water quality information from Environmental Agencies (government).
- 54.5% said they have received water quality information from Environmental groups (citizens)

**Appendix M**  
Phase 2 Evaluation (6-month Follow-up Evaluation) Data Report

**Phase 2 Evaluation (6-month Post-Evaluation through March 2019) Data Report**

Total Respondents
352

**For questions one through eleven, given below, please tell us if you adopted any of the following practices based on what you learned at the Texas Watershed Steward Workshop.**

**1. Participated in at least one community cleanup event**

Choice	Answer	Bar	Response	%
A	I am still undecided	<div style="width: 9.38%;"></div>	33	9.38%
B	NO, and I don't plan to	<div style="width: 11.08%;"></div>	39	11.08%
C	NO, but I still plan to	<div style="width: 41.48%;"></div>	146	41.48%
D	YES, I did	<div style="width: 38.07%;"></div>	134	38.07%
	Total		352	100.00%

## 2. Gotten involved in local planning/zoning decisions

Choice	Answer	Bar	Response	%
A	I am still undecided		43	12.22%
B	NO, and I don't plan to		76	21.59%
C	NO, but I still plan to		103	29.26%
D	YES, I did		130	36.93%
	Total		352	100.00%

## 3. Communicated water issues with elected officials



Choice	Answer	Bar	Response	%
A	I am still undecided		30	8.52%
B	NO, and I don't plan to		49	13.92%
C	NO, but I still plan to		89	25.28%
D	YES, I did		184	52.27%
	Total		352	100.00%

## 4. Helped develop a plan for your watershed (Watershed Protection Plan)





Choice	Answer	Bar	Response	%
A	I am still undecided		49	13.92%
B	NO, and I don't plan to		82	23.30%
C	NO, but I still plan to		132	37.50%
D	YES, I did		89	25.28%
	Total		352	100.00%







**5. Helped form or become a member of a local watershed group**

Choice	Answer	Bar	Response	%
A	I am still undecided		58	17.01%
B	NO, and I don't plan to		74	21.70%
C	NO, but I still plan to		96	28.15%
D	YES, I did		113	33.14%
	Total		341	100.00%





**6. Gotten involved in a volunteer water quality monitoring program**

Choice	Answer	Bar	Response	%
A	I am still undecided		61	17.89%
B	NO, and I don't plan to		96	28.15%
C	NO, but I still plan to		88	25.81%
D	YES, I did		96	28.15%
	Total		341	100.00%





**7. Given a presentation to a school class or other community group on watershed stewardship/water quality issues**

Choice	Answer	Bar	Response	%
A	I am still undecided		44	12.90%
B	NO, and I don't plan to		101	29.62%
C	NO, but I still plan to		72	21.11%
D	YES, I did		124	36.36%
	Total		341	100.00%





**8. Encouraged others in your community to attend a TWS workshop**

Choice	Answer	Bar	Response	%
A	I am still undecided		22	6.45%
B	NO, and I don't plan to		17	4.99%
C	NO, but I still plan to		72	21.11%
D	YES, I did		230	67.45%
	Total		341	100.00%




**9. More closely monitored individual actions that can impair water quality**

Choice	Answer	Bar	Response	%
A	I am still undecided		11	3.25%
B	NO, and I don't plan to		13	3.85%
C	NO, but I still plan to		17	5.03%
D	YES, I did		297	87.87%
	Total		338	100.00%

**10. Adopted/maintained Best Management Practices (BMPs) on your property or in your community related to improving water quality**



Choice	Answer	Bar	Response	%
A	I am still undecided		16	4.73%
B	NO, and I don't plan to		15	4.44%
C	NO, but I still plan to		35	10.36%
D	YES, I did		272	80.47%
	Total		338	100.00%

### 11. Adopted soil testing practices



Choice	Answer	Bar	Response	%
A	I am still undecided		42	12.43%
B	NO, and I don't plan to		65	19.23%
C	NO, but I still plan to		131	38.76%
D	YES, I did		100	29.59%
	Total		338	100.00%

**For questions twelve through fifteen, given below, please answer Yes or No.**

### 12. Have you used the resources/materials provided to you at the workshop?

Choice	Answer	Bar	Response	%
A	Yes		277	82.44%
B	No		59	17.56%
	Total		336	100.00%

### 13. Have you shared the resources/materials provided to you at the workshop with others?

Choice	Answer	Bar	Response	%
A	Yes		200	59.52%
B	No		136	40.48%
	Total		336	100.00%

**14. Were you satisfied with the resources/materials provided to you at the workshop?**

Choice	Answer	Bar	Response	%
A	Yes		316	94.05%
B	No		20	5.95%
	Total		336	100.00%

**15. Have you used the TWS on-line modules available at <https://tws.tamu.edu/>?**

#	Answer	Bar	Response	%
1	Yes		43	12.80%
2	No		293	87.20%
	Total		336	100.00%