Texas Watershed Planning Training Project Final Report 2017

Texas Water Resources Institute TR-503
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Texas Water Resources Institute
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Texas Water Resources Institute

Texas Watershed Planning Training Project

Final Report 2017

The Texas Watershed Planning Short Course is hosted and coordinated by the Texas Water Resources Institute, part of Texas A&M AgriLife Research, the Texas A&M AgriLife Extension Service, and the College of Agriculture and Life Sciences at Texas A&M University.

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Delivery of a Watershed Coordinator Development Program Final Report 2017

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Project Summary

Watershed planning remains a high priority to address the more than 568 impaired water body segments in Texas. To ensure that watershed protection efforts are adequately planned, coordinated and implemented, proper training of watershed coordinators and water professionals is necessary. The Delivery of a Watershed Coordinator Development Program or Texas Watershed Planning Short Course (WPSC) project provides this training and is funded by the U.S. Environmental Protection Agency (EPA) through the Texas State Soil and Water Conservation Board (TSSWCB).

Through a coordinated effort led by the Texas Water Resources Institute (TWRI) with many partners with the Texas A&M AgriLife Extension Service (AgriLife Extension), Texas A&M AgriLife Research (AgriLife Research), TSSWCB, Texas Commission on Environmental Quality (TCEQ), EPA, and the Texas Institute for Applied Environmental Research (TIAER), TetraTech, Practical Stats to develop and conduct the watershed planning training project.

The project supports the Texas Nonpoint Source Management Program's goal of protecting and restoring water quality. It provides training to water professionals and supports the goal of data collection and assessment and implementation by providing these water and natural resource professionals with knowledge and tools to conduct studies to determine sources of pollution and to develop and implement strategies to address pollution in impaired water bodies.

The Short Course, the main course of the project, provides guidance on stakeholder coordination, education and outreach; meeting EPA's nine key elements of a watershed protection plan; data collection and analysis; and tools available for plan development. Watershed professionals use these tools to work with stakeholders for successful watershed planning efforts. The short course was conducted October 19-23 in Bandera for 26 attendees.

Along with the Short Course, water professionals are invited to attend biannual Texas Watershed Coordinator Roundtables that cover a variety of topics and issues at each one. TWRI also continued its efforts in watershed training programs by developing and conducting three additional courses: Watershed Modeling using Load Duration Curves (LDC) and the Spatially Explicit Load Enrichment Calculation Tool (SELECT); Introduction to Modeling Courses; and Fundamentals to Developing a Water Quality Monitoring Plan. TWRI also coordinated and hosted Stakeholder Facilitation Workshops with Tetra Tech.

Besides the training courses, the project maintains the Texas Watershed Planning website and the Watershed Coordinators Listserv, with 419 subscribers receiving training updates and announcements. The listserv and the roundtables provide a forum for maintaining dialogue between watershed coordinators, facilitating interactive solutions to common watershed issues and adding to the fundamental knowledge conveyed at the Short Course. The website had 6,723 visits from 4,804 unique visitors and 13,639 page views to date for Fiscal Years 2014-March 2017.

The first in the state and only course in the country on the required EPA nine elements, this project has educated many water professionals, ensuring watershed protection efforts are adequately implemented and improving water quality restoration efforts statewide.

Introduction and Project Description

According to the 2014 Texas Water Quality Inventory and 303(d) List, 568 water bodies in Texas are listed as impaired. To address these impairments and improve water quality across the state, a coordinated watershed planning approach implemented by well-trained water resource professionals is needed to provide the framework for focusing public and private sector efforts. The project will ensured the proper training and encouraged coordination of watershed coordinators and water resource professionals by continuing the annual delivery of the Texas Watershed Planning Short Course and other relevant trainings, and coordination of the semi-annual Watershed Coordinator Roundtables. These activities have led to significant improvements in planning and implementation efforts in Texas and are needed to ensure that new watershed planning efforts continue to be adequately planned, coordinated, and implemented and the results properly assessed and reported.

Project Description

TWRI has assembled and coordinated closely with a Project Team made up of TSSWCB, TCEQ, EPA, AgriLife Extension, and TIAER. This Project Team guided the development of the Texas Watershed Planning Short Course (WPSC) under the previous project and continues to guide the delivery of the WPSC to water resource professionals throughout Texas. This Project Team meets at least annually to review planned and ongoing project activities and provide recommendations and guidance.

This Project Team has been and will continue to be involved in the delivery of the WPSC. This course was developed to train watershed coordinators on how to develop each of the nine key elements of a watershed protection plan (WPP). Experts from around the nation will continue to be brought in to discuss topics such as obtaining stakeholder involvement, developing each section of the WPP, identifying appropriate best management practices (BMPs), designing a monitoring program, and finding funding resources for implementing a WPP. Sessions on obtaining stakeholder involvement utilizing such guides as EPA's Getting in Step were provided. Additionally, stakeholder involvement through such State programs as the Texas Watershed Steward Program and Texas Stream Team are also highlighted.

In addition to the Texas WPSC, ten additional training opportunities were provided on watershed modeling, stakeholder coordination, and other tools for watershed plan development and implementation. Trainings included the following eleven workshops: Introduction to Modeling, a two-day training on Load Duration Curve (LDC) and SELECT models, (2) Stakeholder Facilitation, (2) Getting in Step, (2) Social Marketing, (2) Fundamentals of Water Quality Monitoring Plans, and an Applied Environmental Statistics Course. Based on guidance provided by TSSWCB and interest in these courses, the trainings offered were adjusted to best meet the needs of the State and the watershed coordinators.

Finally, TWRI worked with the planning team to coordinate Watershed Coordinator Roundtables throughout the project. In order to build upon the fundamental knowledge conveyed through the WPSC, there is an evident need to continue dialogue between watershed coordinators to facilitate interactive solutions to common issues being faced by watershed coordinators statewide. Seven roundtables were held semi-annually throughout the state typically during January and July.

This collaborative project between EPA, TSSWCB, TCEQ, AgriLife Extension, TIAER, and TWRI supports development of WPPs and promote sustainable proactive approaches to managing water quality at the state level.

Project Administration

TWRI has worked to effectively administer, coordinate, and monitor all work performed under this project including technical and financial supervision and preparation of status reports. TWRI also maintained web-based watershed planning resources for Texas watershed coordinators.

This collaborative effort started when the contract was signed and the project period began on October 1, 2013 through September 30, 2016. During the project a budget revision and no-cost extension were approved extending the project to March 31, 2017.

The contract kickoff meeting was held in College Station on January 21, 2014 to discuss roles and responsibilities, major tasks, contract terms and conditions, scope of work and schedule of deliverables of the project. TWRI provided technical and fiscal oversight of the staff and subcontractors to ensure Tasks and Deliverables were completed and within the budget.

TWRI will host and maintain an Internet website for information sharing and use by watershed coordinators (http://watershedplanning.tamu.edu/). Information presented through the website includes:

- Project reports
- Short course, workshop, and roundtable agendas and participant lists
- Roundtable presentations generated, and roundtable agendas and summaries
- Schedule of upcoming programs
- Resources for Watershed Planning and Implementation
- Links to other training opportunities
- Links to EPA tools for Watershed Planning

Quarterly Progress Reports (QPRs)

TWRI prepared electronic quarterly progress reports (QPRs) for submission to the TSSWCB. QPRs documented all activities performed within a quarter and were submitted by the 15th of January, April, July and October

TWRI prepared and submitted Quarterly Progress Reports, which can be viewed online at http://watershedplanning.tamu.edu/projects/.

Quarterly Progress Reports Links

- Q13, 1/1/2017 - 3/31/2017
- Q11, 7/1/2016 - 9/30/2016
- Q10, 4/1/2016 - 6/30/2016
- Q9, 1/1/2016 - 3/31/2016
- Q8, 10/1/2015 - 12/31/2015
- Q7, 7/1/2015 - 9/30/2015
- Q6, 4/1/2015 - 6/30/2015
- Q5, 1/1/2015 - 3/31/2015
- Q4, 10/1/2014 - 12/31/2014
- Q3, 7/1/2014 - 9/30/2014
- Q2, 4/1/2014 - 6/30/2014
- Q1, 1/1/2014 - 3/31/2014

Planning Team Coordination

TWRI hosted coordination meetings or conference calls, at least quarterly, with the Planning Team of project partners to discuss project activities, project schedule, communication needs, deliverables, and other requirements. The Planning Team discussed and assisted in the planning of timing and location as well as agendas for the trainings throughout the project. TWRI developed lists of action items needed following each project coordination meeting and distributed to project personnel.

TSSWCB reviewed and approved all agendas, registration forms, and news releases for the trainings throughout the contract prior to their release and use in advertising.

Professional Trainings, Roundtables, and Watershed Planning Short Couse Coordination

TWRI provided training, coordination, and professional development for watershed planners and coordinators throughout Texas and across the nation to ensure consistent, high quality WPPs are developed, implemented, and water quality improvements are achieved and sustained.

TWRI coordinated with Texas A&M University faculty, Tetra Tech staff, and others to provide professional development and training for water resource professionals and watershed coordinators in Texas. Over the project duration, TWRI was able to offer eleven professional training programs on watershed modeling, stakeholder facilitation, watershed outreach, and other tools for watershed plan development and implementation (i.e. 3-4 trainings/year). It was expected that each course would provide training for at least 15-20 water resource professionals for a total of 150-200 participants. We had over 276 attendees at all of the professional trainings. The roundtable attendance ranged from 45-74 per meeting with a total of 337 all together. The following training programs were delivered:

- Introduction to Modeling – 1 event
- Watershed modeling using LDC (Load Duration Curves) and SELECT (Spatially Explicit Load Enrichment Calculation Tool) – 1 event
- Stakeholder facilitation – 2 events
- Watershed outreach using “Getting in Step” – 2 events
- Practical Environmental Statistics – 1 event
- Fundamentals of Developing a Water Quality Monitoring Plan – 2 events
- Social Marketing Training – 2 events

TWRI worked closely with TSSWCB and the Project Team, to ensure that the most appropriate and needed trainings were offered that best meet the needs of the State and the watershed coordinators. TWRI coordinated with the TSSWCB, TCEQ, and EPA to organize and facilitate a total of seven (7) semi-annual Watershed Coordinator Roundtables. These face-to-face Roundtables built upon the fundamental knowledge conveyed through the WPSC and established a continuing dialogue between watershed coordinators in order to facilitate interactive solutions to common issues being faced by watershed coordinators statewide. These were typically held in January and July at various locations around the state.

TWRI coordinated and offered a Watershed Planning Short Courses (WPSC). TWRI, with assistance from the Project Team, identified key speakers for the course, made arrangements for facilities, advertised the WPSC,

conducted registration, and facilitated the delivery of a minimum of one Texas WPSC to water resource professionals in Texas, as well as other states. The WPSC agenda and speakers are modified to better meet the needs of watershed coordinators based on the past course evaluation results.

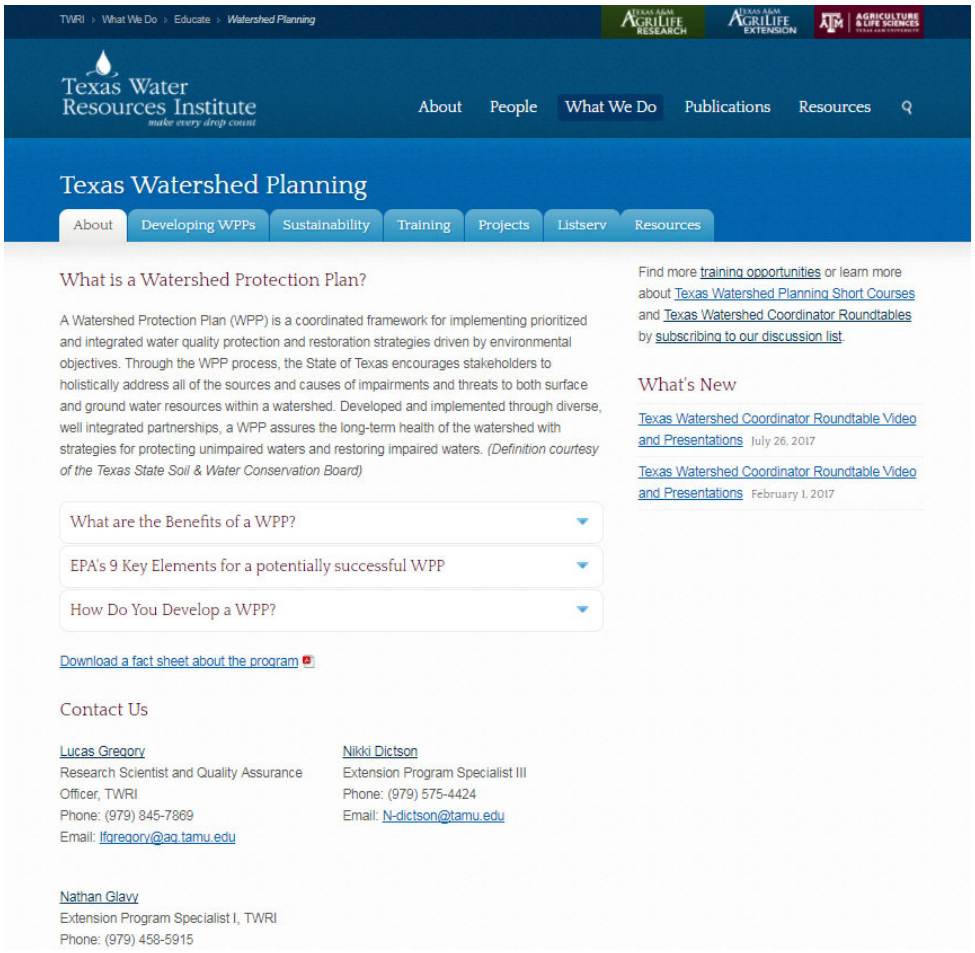
TWRI developed and administered training evaluations to gauge the knowledge gained, how effective the program was for each participant, and get input on future programs.

Watershed Training Webpage

TWRI hosts and maintains an Internet website for information sharing and use by watershed coordinators (http://watershedplanning.tamu.edu). Watershed coordinators are supported with a website, listserv, and professional development opportunities to equip them in all aspects of watershed planning.

The TWRI Program Coordinator met with TWRI Website Developer to update the watershed training website to portray information for the new project. The "projects" tab was updated to include Texas Watershed Planning Project III and related materials.

The website has all of the training materials, videos, presentations, and manuals available for download. TWRI maintains, manages, and sends watershed related information as well as advertises trainings on the Watershed Coordinators Listserv, which has more than 414 subscribers.

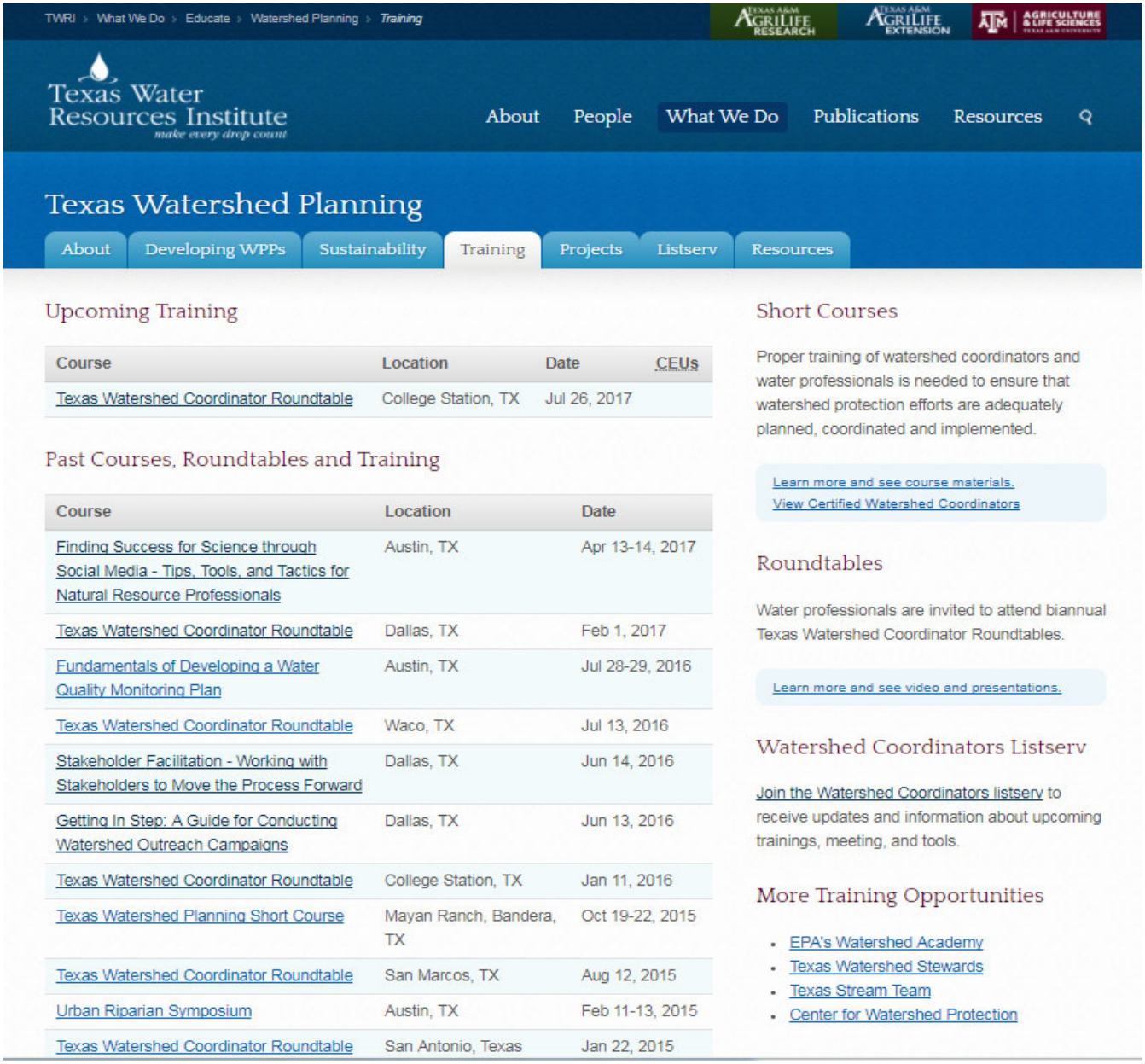


The Texas Watershed Planning Short Course in 2015 was conducted and the course registration, information and materials can be found online on the Texas Watershed Planning Website at (http://naturalresourcestraining.tamu.edu/schedule/2015/oct-19-23-2015-texas-watershed/).

TWRI created webpages for each of the following trainings to advertise the trainings, including the agendas and registration forms:

a. Fundamentals of Developing a Water Quality Monitoring Plan trainings – http://naturalresourcestraining.tamu.edu/schedule/2015/aug-6-7-2015-water-quality-monitoring/ http://naturalresourcestraining.tamu.edu/schedule/2016/july-28-2016-developing-wqmp/
b. Watershed Modeling using LDC and SELECT http://select.tamu.edu/education/feb-27-28-2014-watershed-modeling-using-ldc-and-select/
c. Texas Watershed Coordinators Roundtables –
    - http://watershedplanning.tamu.edu/developing/roundtable/january-22-2015/
    - http://watershedplanning.tamu.edu/developing/roundtable/august-12-2015/
    - http://watershedplanning.tamu.edu/developing/roundtable/january-11-2016/
    - http://watershedplanning.tamu.edu/developing/roundtable/july-13-2016/
    - http://watershedplanning.tamu.edu/training/feb-1-2017-watershed-roundtable/
    - http://watershedplanning.tamu.edu/training/july-26-2017-watershed-roundtable/
d. Content, Conversations and Discoverability – Quality Outreach and the Internet for Natural Resource Professionals - http://naturalresourcestraining.tamu.edu/schedule/2014/june-18-19-2014-social-marketing/ http://nrt.tamu.edu/schedule/2014/june-18-19-2014-social-marketing/
e. http://watershedplanning.tamu.edu/developing/roundtable/july-30-2013/
f. Introduction to Modeling training – http://nrt.tamu.edu/schedule/2013/aug-13-2013-introduction-to-modeling/
g. Stakeholder Facilitation Trainings were advertised on the website http://naturalresourcestraining.tamu.edu/schedule/2014/sep-30-2014-stakeholder-facilitation/ http://watershedplanning.tamu.edu/training/june-14-2016-stakeholder-facilitation/ .
h. Getting in Step – Top 10 outreach Tips that Won't Break the Bank - http://nrt.tamu.edu/schedule/2014/sep-29-2014-getting-in-step/ http://watershedplanning.tamu.edu/training/june-13-2016-getting-in-step/
i. Applied Environmental Statistics - http://nrt.tamu.edu/schedule/2014/aug-24-29-2014-applied-env-stats/

The Watershed Training Webpage is updated with all of the upcoming and past trainings and on the website.



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Texas Watershed Planning

About | Developing WPPs | Sustainability | Training | Projects | Listserv | Resources

Upcoming Training

Course	Location	Date	CEUs
Texas Watershed Coordinator Roundtable	College Station, TX	Jul 26, 2017	

Past Courses, Roundtables and Training

Course	Location	Date
Finding Success for Science through Social Media - Tips, Tools, and Tactics for Natural Resource Professionals	Austin, TX	Apr 13-14, 2017
Texas Watershed Coordinator Roundtable	Dallas, TX	Feb 1, 2017
Fundamentals of Developing a Water Quality Monitoring Plan	Austin, TX	Jul 28-29, 2016
Texas Watershed Coordinator Roundtable	Waco, TX	Jul 13, 2016
Stakeholder Facilitation - Working with Stakeholders to Move the Process Forward	Dallas, TX	Jun 14, 2016
Getting In Step: A Guide for Conducting Watershed Outreach Campaigns	Dallas, TX	Jun 13, 2016
Texas Watershed Coordinator Roundtable	College Station, TX	Jan 11, 2016
Texas Watershed Planning Short Course	Mayan Ranch, Bandera, TX	Oct 19-22, 2015
Texas Watershed Coordinator Roundtable	San Marcos, TX	Aug 12, 2015
Urban Riparian Symposium	Austin, TX	Feb 11-13, 2015
Texas Watershed Coordinator Roundtable	San Antonio, Texas	Jan 22, 2015

Short Courses

Proper training of watershed coordinators and water professionals is needed to ensure that watershed protection efforts are adequately planned, coordinated and implemented.

Learn more and see course materials.
View Certified Watershed Coordinators

Roundtables

Water professionals are invited to attend biannual Texas Watershed Coordinator Roundtables.

Learn more and see video and presentations.

Watershed Coordinators Listserv

Join the Watershed Coordinators listserv to receive updates and information about upcoming trainings, meeting, and tools.

More Training Opportunities

- EPA's Watershed Academy
- Texas Watershed Stewards
- Texas Stream Team
- Center for Watershed Protection

Past Courses, Roundtables and Trainings: Online Schedule

Course	Location	Date
Finding Success for Science through Social Media - Tips, Tools, and Tactics for Natural Resource Professionals	Austin, TX	Apr 13-14, 2017
Texas Watershed Coordinator Roundtable	Dallas, TX	Feb 1, 2017
Fundamentals of Developing a Water Quality Monitoring Plan	Austin, TX	Jul 28-29, 2016
Texas Watershed Coordinator Roundtable	Waco, TX	Jul 13, 2016
Stakeholder Facilitation - Working with Stakeholders to Move the Process Forward	Dallas, TX	Jun 14, 2016
Getting In Step: A Guide for Conducting Watershed Outreach Campaigns	Dallas, TX	Jun 13, 2016
Texas Watershed Coordinator Roundtable	College Station, TX	Jan 11, 2016

Course	Location	Date
Finding Success for Science through Social Media - Tips, Tools, and Tactics for Natural Resource Professionals	Austin, TX	Apr 13-14, 2017
Texas Watershed Planning Short Course	Mayan Ranch, Bandera, TX	Oct 19-22, 2015
Texas Watershed Coordinator Roundtable	San Marcos, TX	Aug 12, 2015
Texas Watershed Coordinator Roundtable	San Antonio, Texas	Jan 22, 2015
Content, Conversations, and Discoverability - Quality Outreach and the Internet for Natural Resource Professionals	Houston, TX	Oct 28-29, 2014
Stakeholder Facilitation – Working with Stakeholders to Move the Process Forward	Austin, TX	Sep 30, 2014
Getting In Step – Top 10 Outreach Tips that Won't Break the Bank	Austin, TX	Sep 29, 2014
Applied Environmental Statistics	College Station, TX	Aug 25-29, 2014

Course	Location	Date
Finding Success for Science through Social Media - Tips, Tools, and Tactics for Natural Resource Professionals	Austin, TX	Apr 13-14, 2017
Texas Watershed Coordinator Roundtable	Waco, Texas	Jul 31, 2014
Content, Conversations, and Discoverability - Quality Outreach and the Internet for Natural Resource Professionals	Texas A&M University, College Station, TX	Jun 18-19, 2014
Watershed Modeling using LDC and SELECT	Texas A&M University, College Station, TX	Feb 27-28, 2014

Conduct Watershed Planning Short Course

Watershed Planning Short Course Event

TWRI coordinated and offered a Watershed Planning Short Course multi-day training. To accomplish this, TWRI with assistance from the Project Team, identified key speakers for the course, make arrangements for facilities, advertise the WPSC, conduct registration, and facilitate the delivery of a Texas WPSCs. Certificates were provided to participants upon completion of the course. A registration fee was charged to WPSC participants. A scholarship was offered to assist those who lack funds to attend the WPSC. TWRI worked closely with TSSWCB and the Project Team to assess the need for and timing of these courses to best meets the needs of the state. As needed, travel for speakers was paid for through project funds and registration fees.

The Short Course is the only watershed planning course of its kind in the nation, and as such there are usually attendees from out of state. The 4-day course combines 35 oral presentations by 9 state and national experts with discussions, case studies, and critical networking to provide a unique learning format. The agenda is routinely updated to deliver the latest information on new techniques and based on the evaluation comments from the previous trainings. Watershed coordinators from ongoing Texas projects also provide examples of WPP development. Participants are supported with a website, listserv, and professional development opportunities to equip them in all aspects of watershed planning.

Since initiation of the course, watershed protection plans and the stakeholder driven watershed planning process instilled through the course have become the foundation for water quality improvement efforts in Texas. Practitioners developing both WPPs and TMDL Implementation Plans have participated in the course and are now using the techniques learned to address water quality issues statewide. Approximately 65 watershed planning efforts including over 20 TMDLs Implementation plans have benefited from the training. Of the more than 254 participants for the 8 Short Courses, a majority are currently involved in watershed planning efforts statewide and elsewhere across the U.S.

Ultimately, the program's success is measured by the improvement of water quality in the state. Such improvements have been or are already being observed in watersheds across Texas by those participating in the course (i.e. Buck Creek), and many more are expected. However, success is also measured in the knowledge gained by participants. Pre- and post- examinations given to Short Course participants have shown increases in knowledge ranging from 32–200% and averaging 85% in knowledge increase, demonstrating the course's success. Participants leave the course very satisfied with their experience (95% mostly or completely satisfaction rating), ready to implement what they have learned.

Besides the multi-day Short Course, water professionals are provided professional development opportunities through other educational courses including: Stakeholder Facilitation, Load Duration Curves and SELECT, Introduction to Modeling and Fundamentals of Developing a Water Quality Monitoring Plan. Further, participants are provided a forum to discuss common watershed issues and solutions through Watershed Coordinator Roundtables. Presentations and resources from all events are posted online and have been accessed 5,465 times by over 3,626 unique visitors and 13,838 page views to the website since June 2011. Further exchange of information is facilitated through the listserv, which has over 414 subscribers and the Natural Resource Training Listserve.

The Training Program Coordinator contacted speakers in regards to travel information; speaker biographies; and presentations and materials. Course binders were prepared for each participant and EPA Handbooks as well as a cd of additional resources were included. The 2015 Texas Watershed Planning Short Course was conducted on October 19-22, 2015 and had 25 attendees.

Administer Evaluations

TWRI administered evaluations to gauge the knowledge gained and how effective the course was for each course participant. Results and comments are used to improve the next training.

During the current grant period starting in 2013-2016, a Short Course, eleven workshops and seven Roundtables have been delivered. Over the years, the planning team has continually improved each course and the website, added new trainings and tailored roundtables based on emerging issues and participant feedback. Evaluations were administered and collected for the all of these courses. The results of each of these were submitted to TSSWCB with the course deliverables.

Success of these trainings is also measured in the knowledge gained by participants. Pre- and post- evaluations given to Short Course participants have shown increases in knowledge of 85%, demonstrating the course's success. Participants leave the course extremely satisfied with their experience (95% mostly or completely satisfied), ready to implement what they have learned. Feedback from these evaluations are reviewed by the planning team and instructors and taken into consideration for improvements or adjustments for the next training.

We asked questions to get additional information about the course, topics and needs. The most significant or valuable things they learned included: how to calculate LDCs, finding funding sources, comparing strengths of different plans, learning the expectations for each off the elements of the WPP and Outreach methods, and how to develop interim milestones and criteria to measure progress. In general, most respondents did not feel like there were any sections that were "least valuable" to the course. However, they did suggest providing the overview of educational programs and watershed resources and tools as just additional resources instead of a presentation.

Participants were overall very satisfied with the course, course materials, sequencing and resources. Overall Satisfaction with the location and facility was very satisfied. Only a few responses were received on what could have been done better including: allowing a 5-10 minute discussion after each topic, include more group work, and refine some slides that were hard to see in the booklets or during presentations.

We also had a question about what other tools, training, capacity building did they feel is needed in greater detail and the majority of the responses included: presenting more case studies, dealing with stakeholders, finding funding, and what are the reasons for doing a WPP. Attendees were also asked about topics of interest that were not covered by the course, these included: implementation of plans, determining which water quality data to use, structural and non-structural examples for protection, urban BMPs, training for models, and grant writing. These are all of the trainings that we were also developing and including as training for watershed coordinators and professionals and plan to continue.

Evaluations were administered and collected at the short course. A pre- and post-course exam was developed to gauge knowledge gained by participants. For the October 2015 course, 25 evaluations were submitted by participants providing input on the course that showed that they were very satisfied with the course. On a scale of 1-5 with 5 being the most satisfied, the overall course rated a 4.6 and the ratings for individual presentations

ranged from 3.96-4.71. Overall the presentations averaged a 4.4 rating. The average score on the pre-course exam was a 42.56 and the average on the post-course exam was an 78.88. This demonstrates a 85% increase in knowledge by participants.

Since the program's inception in 2007, eight Short Courses, 25 workshops and 16 Roundtables have been delivered. Over the years, the planning team has continually improved each course and the website, added new trainings and tailored roundtables based on emerging issues and participant feedback from questionnaires and evaluations.

Provide Professional Development Training

Introduction to Watershed Modeling Training

A one-day course developed by TWRI and Texas A&M University System personnel delivered to watershed coordinators provided an introduction to watershed modeling. Development occurred in year 1 and 2 and trainings were delivered in year 2 and 3. Topics of the course include (1) purposes and limitations of different models, (2) timelines, (3) data needs (watershed characterization, water quality information), (4) cost estimates, (5) literature values vs. monitoring, (6) Quality Assurance Project Plans (QAPPs), (7) request for bids, (8) presenting models to stakeholders, and (9) contractor interaction with stakeholder groups.
The TWRI Program Coordinator met with Dr. R. Srinivasan in regards to setting up a planning meeting for the Introduction to Modeling Training. TWRI also coordinated with TCEQ to reserve a room for the training. Advertising materials were placed on the website about the training and the registration was opened for the training on July 8, 2015. The registration form was updated and the registration fee was determined to be $75 for the one-day training. The training was conducted with 31 participants at the TCEQin Austin, Texas.

A news release was developed titled "Institute to host water modeling workshop July 8 in Austin - AgriLife ..." to help advertise the training and it was sent out on both the Natural Resource Training and the Watershed Planning Trainings Listserves. It was also included in TWRI's other online communications and calendars.

Organize and Deliver Training on Watershed Modeling using LDC and SELECT

LDCs provide a graphical representation of stream flow and pollutant loading whereby real data can be compared to a stream's maximum allowable load to indicate reductions needed and help identify the type of pollutant load (i.e. point source vs. NPS). SELECT provides a spatially explicit analysis of land use/land cover, animals/humans in watersheds, and other parameters to assess/determine potential sources of bacteria. The models are being utilized for Total Maximum Daily Load (TMDL) and WPP development. A two-day course was developed and delivered in subsequent years of the project. A $100 registration fee was charged for the two-day course.

The website with more information on these tools and the training can be found at http://select.tamu.edu/. The "Education" section of the new website includes information on the training; short instructor bios and a link to the natural resources training website (http://select.tamu.edu/education/).

TWRI coordinated the program and advertised for this training. Presentations and the manual were finalized and printed. The computer lab was reserved and contracted for this training at the Horticulture and Forest Science

Building computer lab in the Centeq Building. Computer software and files were provided to the computer IT folks to be placed on the classroom computers for the training. The computers were tested the day before the workshop. TWRI and BAEN conducted the training on February 27-18, 2014 with 18 attendees at the workshop.

Getting in Step & Stakeholder Facilitation Trainings

Stakeholder facilitation and outreach was identified by watershed coordinators as a training need in Texas. Outreach is a powerful tool to get stakeholders involved early in the planning process, promoting behavior change, and enhancing the implementation of your programs. In a world of limited budgets this program provides practical tips and tools to conduct effective outreach without breaking the bank. The topics covered in this training include: Building Blocks for Effective Education and Outreach, What it Takes to Change Behavior, Evaluating Your Outreach Effort, Working with the News Media, and Creating Eye-Catching Outreach Materials.

Stakeholders form the backbone of effective environmental programs. Learn tips on how to get off on the right foot and keep the energy going throughout your program. Topics to be addressed include: determining who needs to be involved, making meetings count, diffusing conflict, making decisions using a consensus-based approach, and sustaining the stakeholder group.

To provide these topics, TWRI coordinated with Charlie MacPherson to instruct both stakeholder facilitation and Getting in Step Trainings consecutively for participants. Participants were allowed to register for only one or both of these trainings. The first Getting In Step: A Guide for Conducting Watershed Outreach Campaigns was titled Top 10 Outreach Tips that Won't Break the Bank was held in Austin September 29, 2014 with 15 participants and was followed on September 30, 2014 with a Stakeholder Facilitation training – Working with Stakeholders to move the process forward that had 14 participants.

The second set of trainings were held in Dallas on June 13, 2016 and June 14, 2016 at the Dallas AgriLife Extension Center. These trainings were advertised online, through the listserv and natural resource trainings listserv. All of the training materials and resources can be found online.

Stakeholder Facilitation Trainings:

http://naturalresourcestraining.tamu.edu/schedule/2014/sep-30-2014-stakeholder-facilitation/
http://watershedplanning.tamu.edu/training/june-14-2016-stakeholder-facilitation/ .

Getting in Step – Top 10 outreach Tips that Won't Break the Bank:

http://nrt.tamu.edu/schedule/2014/sep-29-2014-getting-in-step/
http://watershedplanning.tamu.edu/training/june-13-2016-getting-in-step/

Social Media Training: Content, Conversations, and Discoverability - Quality Outreach and the Internet for Natural Resource Professionals

TWRI coordinated with Amy Hays to conduct two trainings titled: *Content, Conversations, and Discoverability – Quality Outreach and the Internet for Natural Resource Professionals* targeted for natural resource and watershed

professionals. The Web is over 28 years old from the first design by Tim Berners-Lee to what we know today in 2017. Things have changed dramatically in design, writing standards, and search ability. In addition, smart devices have outsold desktops significantly in recent years. This means that outreach and education strategies have to continue to grow our expertise in learning how to connect the consumer to the important information we provide. We need to understand how content is found, how conversations and learning networks start, how to be discovered and what constitutes quality outreach. We have to know where to post, when to posts, and what to build on our websites. We have to learn how to reach our traditional clients as well as new clients. This course covers many successful models that can be used and applied in natural resource outreach and education that can help us down the road of discoverability whether website, facebook, flogs, twitter, and instagram.

TWRI worked with Amy Hays to develop fliers, advertise, and conduct two Social Media Trainings. The first one was held in College Station on June 18-19, 2014 with 16 attendees. Participants were provided an evaluation about the training. The second one in Houston at Houston-Galveston Area Council on October 2014 had 38 attendees the first day and 42 the second for a total of 408 contact hours.

Applied Environmental Statistics

TWRI coordinated with Practical Environmental Statistics to bring their course to College Station, Texas for watershed coordinators and natural resource professionals on August 25-29, 2014. This course filled up quickly with 37 attendees and had a waiting list. This 4.5-day course covers applied statistical methods tailored to the environmental sciences. Exercises using R statistical software at the end of each lesson insure that students can confidently perform each procedure when they return to their office. The course doubles as an introduction to using the free R software. The full course outline can be found at http://practicalstats.com. Topics include:

- Trend analysis -- is it getting better or worse?
- Confidence, prediction, and tolerance intervals.
- How hypothesis tests work.
- Parametric, nonparametric and permutation tests. When to use which.
- How to build a good regression equation.
- Dealing with outliers.
- Introduction to handling nondetect data
- How many samples do I need?

Training on Water Quality Monitoring

TWRI and others developed a training to cover monitoring for (1) watershed characterization and (2) evaluation of water quality improvements and BMP effectiveness from implementation activities. The workshop provided water professionals with tools to develop and implement a surface water quality monitoring program and covered surface water quality monitoring for watershed characterization, evaluation of water quality improvements as well as BMP effectiveness from implementation activities. Through presentations and case studies, it provided participants with an understanding of what monitoring is needed for watershed protection planning. Participants learned about inventorying existing resources, selecting monitoring design, stormwater sampling and considerations to build a successful monitoring plan. This course also includes hands on experience with creating a monitoring plan and equipment demonstrations.
Training topics include:

- Data quality objectives

- Identifying available data
- Determining data gaps and needs
- Monitoring plan development to meet data quality objectives and support modeling
- Selecting monitoring types, locations, equipment and laboratory analysis
- Obtaining stakeholder input
- Developing QAPPs for monitoring and acquiring data
- Workshop for collaboratively creating monitoring plans

The course registration fee was $150, which included course materials and a certificate of completion. The TWRI Project Manager and Program Coordinator met (via conference call) with Dr. Larry Hauck and Anne McFarland both of TIAER to discuss date and participants for the first planning team meeting/conference call to discuss the training. All of the instructors were contacted to determine the best date and their availability. TWRI worked with TSSWCB, EPA, TCEQ, TIAER, USDA ARS, Tarrant Regional Water District and Brazos River Authority to finalize the agenda and identify new speakers to cover those topics for this training. The date was set and advertised for the training August 6-7, 2015 with 23 attendees in Temple at the ARS Facility. Once the agenda was finalized, the materials were placed on the website. Registration was opened and it was advertised on the Watershed Coordinators Listserv, the website and through a news release. Course materials were compiled, and the workshop manual was updated and printed for the course. The second training was held in Austin at TCEQ Headquarters on July 28-29, 2016 with 34 attendees including instructors. The evaluations were updated and conducted at both trainings. News Releases were developed for marketing purposes for each training:

- Fundamentals of water quality monitoring workshop set for Aug. 6-7 ...
- Water quality monitoring plan development focus of July 28-29 ...

Administer Evaluations

TWRI oversaw the administration of evaluations to gauge the knowledge gained and how effective the course was for each course participant. Evaluation were administered at the beginning and end of each course to demonstrate the course's effectiveness and to identify areas needing adjustment.

Introduction to Modeling

Training evaluations were developed and conducted for the Introduction to Modeling workshop held on July 8, 2015. The summary of the evaluations includes: the overall course rating, rating for the how helpful the course information was, and the % that rated the course and information as Good and Excellent. The evaluations also asked what were the most valuable aspects and least valuable aspects of the training. The most valuable aspects included the knowledge of the instructors, learning the pros/cons of each model, the comprehensive overview of different watershed models, interpreting results, and case studies. The overall course had a 90% Good to Excellent rating. The least valuable was the QAPP information and that some example tables and graphs were difficult to read. Each presentation at the training was evaluated on a 1-4 scale of Poor, Average, Good or Excellent and the results are included on the table below.

The evaluations were also used to gather information on the participants including: affiliation, why the training was important and what did they hope to gain, what were their greatest challenges, what tools or methods were they currently using, and what were their greatest needs in that area for feedback on future trainings.

This training was important to participants because they were hoping to bring new skills and understanding to a variety of different watershed projects and to help secure funding and use models to generate better projects and studies. The greatest challenges they were facing were lack of data in particular lack of groundwater and infiltration and stormwater estimations. Since many participants did not have any prior Modeling experience they were hoping to be able to learn what models to use and when. The greatest needs were modeling in terms of watershed planning, estimating pollutant loads and performance of BMPs, interactions between groundwater and surface water, and evaluating load reductions. The tools that are currently being used to estimate loads and load reductions include LDC's and SELECT, BST, SWAT/Tidal Prism, HSPF, WASP, APEX, SWMM, WINSLAMM, and evaluating raw data.

Introduction to Modeling Courses **July 2015**

Presentations	Rating (1-4)	% Good Excellent
Overall Course (Scale of 1-5)	**4.3**	**90**
Introductions & Workshop Overview [Dictson, TWRI]	**3.4**	**97**
Models Overview [S. Srinivasan, SSL]	**3.6**	**100**
Modeling Factors [S. Srinivasan, SSL]	**3.5**	**100**
Using Simple Tools [L. Hauck, TIAER]	**3.4**	**90**
QA Project Plans [Sandra Arismendez, TCEQ]	**2.7**	**55**
Stakeholder Communications [Nikki Dictson, TWRI]	**3.6**	**96**

Watershed Modeling using LDCs and SELECT Training

TWRI Program Coordinator developed evaluations for the LDC/SELECT trainings. Training evaluations were administered and compiled for LDC/SELECT Training held in February 2014. The evaluations were also used to gather information on the participants including: affiliation, why the training was important and what did they hope to gain, what were their greatest challenges, what tools or methods were they currently using, and what were their greatest needs in that area for feedback on future trainings.

This training was important to participants because they wanted to learn more about LDCs and SELECT to either better understand the model and data, be able to run the model, or just be able to explain it. They also wanted to learn how the model is used in watershed planning since many participants were developing or about to start developing a watershed protection plan. The participants' greatest challenges prior to the workshop included lack of necessary data including flow data, scale and resolution, and getting a better understanding of what/where/and how much of a pollutant source exists in a specific watershed. The tools that they were using prior to the workshop included program HSPF, SWAT, existing data with stakeholder input, and WASP. The greatest needs for estimating current loads and reductions were data, determining a threshold of impairment, filling data gaps, and data analysis to inform relevant issues.

The evaluations also asked what were the most valuable aspects and least valuable aspects of the training. The most valuable things noted were working through the examples of LDCs and SELECT using the software, the software, learning how to interpret and create professional LDCs, and quality of instructors and materials. The least valuable things noted were that prior GIS knowledge was required to keep up on SELECT and some participants needed more information on how to work GIS and some excel graphs. Each presentation at the training was evaluated on a 1-4 scale of Poor, Average, Good or Excellent. The summary of the evaluations includes: the overall course rating, rating for the how helpful the course information was, and the % that rated the course and information as Good and Excellent.

Load Duration Curve and SELECT Trainings 2014

Presentations	Rating (1-4)	% Good Excellent
Overall Course (scale of 1-5)	**4.6**	**88**
Introductions & Workshop Overview [Kevin Wagner, TWRI]	3.6	88
Introduction to Load Duration Curves [R. Karthikeyan & K. Borel, AgriLife Research]	4.0	100
LDC Demonstration [R. Karthikeyan & K. Borel, AgriLife Research]	3.9	100
Assignment: Estimating Pollutant Loads for Plum Creek Using LDCs [Group]	3.9	100
Introduction to SELECT [R. Karthikeyan & K. Borel, AgriLife Research]	4.0	100
Gathering animal density data for SELECT [Kevin Wagner, TWRI]	3.9	100
SELECT Demonstration [R. Karthikeyan & K. Borel, AgriLife Research]	3.6	86
Assignment: Estimating Pollutant Sources for Plum Creek Using SELECT [Group]	3.7	100
Wrap Up [Nikki Dictson, TWRI]	3.8	100

Stakeholder Facilitation Training

TWRI administered evaluations to Stakeholder Facilitation Training participants on September 30, 2014 and June 14, 2016. The evaluations were used to gather information on the participants including: affiliation, why the training was important and what did they hope to gain, what were their greatest challenges, what tools or methods were they currently using, and what were their greatest needs in that area for feedback on future trainings.

The training was important for participants because they were already or were about to work with stakeholders and wanted to better engage and involve stakeholders, motivate, build consensus, conflict resolution, resources available, and strategies on how to keep them engaged in the process. Challenges participants were facing before the workshop were getting the key players to participate, keeping stakeholders involved and interested, communicating science and findings to the general public, and understanding what stakeholders really want. Prior to the workshop they were utilizing email, newspaper, websites, bring in guest speakers, fact sheets, local meetings, phone calls, letters, social media, and newsletters in order to keep stakeholders engaged. The most valuable aspects of the training were the experience and real examples from the speaker, tips and tools, group

discussion, facilitation techniques, and how to manage difficult behaviors. The least valuable aspects of the course included not enough time and group anecdotes that did not directly relate to the process of facilitation.

Participant Affiliation:	2014	2016
Environmental Group	1	1
Academia	3	5
Consultant	1	1
Utility		1
City/County Govt.	2	4
Regional Govt.		5
State Govt.	7	1

The summary of the evaluations includes: the overall course rating, rating for the how helpful the course information was, and the % that rated the course and information as Good and Excellent. The evaluations also asked what were the most valuable aspects and least valuable aspects of the training. Each presentation at the training was evaluated on a 1-4 scale of Poor, Average, Good or Excellent.

Stakeholder Facilitation Trainings	2014		2016	
Presentations	Rating (1-4)	% Good Excellent	Rating (1-4)	% Good Excellent
Overall Course (Scale of 1-5)	**4.8**	**100**	**4.7**	**100**
Setting up for Success	**3.5**	**100**	**3.9**	**100**
Using Outreach to Bring Stakeholders to the Table	**3.5**	**92**	**3.8**	**100**
Facilitation 101	**4.0**	**100**	**3.9**	**100**
Keeping the Ball Rolling	**3.8**	**100**	**3.6**	**100**

Getting in Step Trainings

TWRI administered evaluations to Stakeholder Facilitation Training participants on September 30, 2014 and June 14, 2016. The evaluations were used to gather information on the participants including: affiliation, why the training was important and what did they hope to gain, what were their greatest challenges, and what tools or methods were they currently using.

The most valuable aspects of the trainings by participants included were the real world examples, exercises where we applied what we learned, objective to behavior change exercise, building blocks/steps for outreach program, evaluating overall programs, identifying and reaching your target audience, review/critique of outreach materials, and communication tips. The least valuable aspects were social media and formatting outreach materials due to it not being applicable for them. Attendees stated that they planned to apply this new knowledge in their watersheds through utilizing the techniques, targeting their audience, in all of their outreach materials, and by incorporating more program evaluations. Comments also included wishing there had been more time to go into more detail on how to achieve behavior change, addressing specific targeted audiences, and more information on program

evaluation. Overall comments on the program were very positive including: extremely well done, great information on outreach techniques, and it was a high quality training.

Getting in Step Trainings	2014		2016	
Presentations	Rating (1-4)	% Good Excellent	Rating (1-4)	% Good Excellent
Overall Course (Scale of 1-5)	**4.6**	**79**	**4.5**	**99.9**
Building Blocks to Outreach	**3.9**	**100**	**3.8**	**100**
What it Takes to Change Behavior	**3.8**	**100**	**3.38**	**100**
Evaluating Your Outreach Effort	**3.7**	**92**	**3.69**	**92**
Working with the News Media	**3.5**	**92**	**3.3**	**92**
Creating Eye-Catching Outreach Materials	**3.8**	**92**	**3.4**	**92**

Practical Environmental Statistics Course

The evaluations were used to gather information on the course including: overall satisfaction, most valuable aspect, least valuable aspect and presentations. The overall course had a 87% Good to Excellent rating. The most valuable aspects of the training were repeated by many attendees including: multiple regression and trend analysis, learning R statistical software, access to books/scripts/tutorials, the relevant examples, and the applied nature of the class overall. The least valuable aspects of the course were very few but it was noted dealing with non-detects, it was noted that some wanted more time to practice in class while others wrote this as least valuable stating there was too much time in class to practice. The comments were all great except for a few sections where participants thought the instructor went a little fast. Several mentioned it was one of the best continuing education they have taken and many stated it was very applicable to their jobs.

Fundamentals of Developing a Water Quality Monitoring Plan

The evaluations were used to gather information on the participants including: affiliation, why the training was important and what did they hope to gain, what were their greatest challenges, what tools or methods were they currently using, and what were their greatest needs in that area for feedback on future trainings. Training evaluations and questionnaires were administered and compiled for the Fundamentals of Water Quality Monitoring Training on August 6-7, 2015 and July 28-29, 2016.

The training was important for participants because they were already or were about to work on water quality monitoring plans/projects and hoped to learn more about the tools, best practices, methods, timing, and techniques to be able to either conduct the work or evaluate a contractor conducting the monitoring. Many were interested on how monitoring worked into watershed based plans. Challenges participants were facing before the workshop were that many of them had little or no experience, little availability of good examples, expense of monitoring equipment and samples, needing training, gathering resources and available data, matching funds for monitoring grants, and properly planning where and how much to monitor. Prior to the workshop many responded that they were not developing plans or monitoring, while the others were using TCEQ SWQM methods and guidance documents, public outreach, contract out monitoring plan, and reviewing other existing plans. The greatest needs

in regards to design and statistical analysis were deciding which analysis is best, QA and interpreting results were that the QA process is too long, understanding statistical analysis due to limited knowledge of statistics, experimental design methods, and accessible data.

The summary of the evaluations includes the overall course rating, rating for the how helpful the course information was, and the percentage that rated the course and information as Good and Excellent. The evaluations also asked what were the most valuable aspects and least valuable aspects of the training. Each presentation at the training was evaluated on a 1-4 scale of Poor, Average, Good or Excellent. The most valuable aspects were the discussions on statistical tools for analysis, case studies and class exercises, developing a QAPP, and networking were all very valuable. While the least valuable included too many PowerPoint presentations on the first day, DQOs, and many people found the QAPP section important but not necessary to them since they already had experience writing them.

Water Quality Monitoring Trainings	2015		2016	
Presentations	Rating (1-4)	% Good Excellent	Rating (1-4)2	% Good Excellent2
Overall Course (Scale of 1-5)	4.5	100	4.5	95
Data Quality Objectives and Project Planning (Hendon 2015/Uramkin 2016)	3.6	100	3.5	95
Inventorying and Acquiring Existing Resources (Eagle 2015/ Eagle & Baker 2016)	3.6	92	3.4	85
Watershed Characterization and Sufficient Data (McFarland 2015 & 2016)	3.5	92	3.6	100
Selecting Monitoring Design (Hauck 2015 & 2016)	3.7	100	3.7	100
Introduction to Stormwater Sampling (Harmel 2015 & 2016)	3.8	100	3.4	95
Other Considerations & Review Building a Successful Monitoring Plan (Hauck 2015 & 2016)	3.8	100	3.4	85
Quality Assurance Project Plans (Gregory 2015/Uramkin 2016)	3.5	92	3.4	95
Monitoring Demonstrations (Group)	3.7	100	3.7	90
Statistical Tools for Analysis (McFarland 2015 & 2016)	3.2	92	3.5	89
Uncertainty in Monitoring (Harmel 2015 & 2016)	3.6	100	3.5	95
Stakeholder Communications (Hauck 2015)	3.4	92	3.7	100

Social Media Training: Content, Conversations, and Discoverability - Quality Outreach and the Internet for Natural Resource Professionals

The first one was held in College Station on June 18-19, 2014 with 16 attendees. Participants were provided a evaluation about the training. On the survey 99% of participants responded when asked if they will use what they they learned from their job what they learned they will use to enhance their jobs, and 56% of those rating the course a 5/5 for extremely satisfied. The survey also resulted in 81% of participants would recommend this workshop to others. Results when asked about the return on investment 38% thought it was double the return on investment. The second one in Houston at Houston-Galveston Area Council on October 2014 had 38 attendees the first day and 42 the second for a total of 408 contact hours. On the survey 99% of participants said they will use what they learned to enhance their jobs, and 53% of those rating the course a 5/5 for extremely satisfied.

Participants said the training will greatly enhance their job! The survey also resulted in 90% of participants would recommend this workshop to others. Results when asked about the return on investment 37% thought it was double the return on investment or more.

LEVEL OF LEARNING BY TOOL	COLLEGE STATION	HOUSTON
FACEBOOK:		
DID NOT LEARN ANYTHING NEW	6%	3%
LEARNED A LITTLE MORE THAN I ALREADY KNEW	44%	50%
LEARNED A SIGNIFICANT AMOUNT MORE THAN ALREADY KNEW	50%	47%
TWITTER		
DID NOT LEARN ANYTHING NEW	0%	0%
LEARNED A LITTLE MORE THAN I ALREADY KNEW	31%	23%
LEARNED A SIGNIFICANT AMOUNT MORE THAN ALREADY KNEW	63%	73%
MY OWN WEBSITE		
DID NOT LEARN ANYTHING NEW	0%	13%
LEARNED A LITTLE MORE THAN I ALREADY KNEW	50%	30%
LEARNED A SIGNIFICANT AMOUNT MORE THAN ALREADY KNEW	44%	40%
CONTENT WRITING		
DID NOT LEARN ANYTHING NEW	6%	7%
LEARNED A LITTLE MORE THAN I ALREADY KNEW	38%	30%
LEARNED A SIGNIFICANT AMOUNT MORE THAN ALREADY KNEW	56%	60%
INSTAGRAM		
DID NOT LEARN ANYTHING NEW	13%	10%
LEARNED A LITTLE MORE THAN I ALREADY KNEW	13%	20%
LEARNED A SIGNIFICANT AMOUNT MORE THAN ALREADY KNEW	75%	57%

Texas Watershed Coordinator Roundtables

Facilitate Watershed Coordinator Roundtables

TWRI will coordinate with TSSWCB, TCEQ and EPA to organize and facilitate a total of seven (7) semi-annual Watershed Coordinator Roundtables. The task initially was for six trainings, but were able to also include the next January training under this grant as well for a total of seven roundtables. These face-to-face Roundtables continue to build upon the fundamental knowledge conveyed through the WPSC and establish a continuing dialogue between watershed coordinators in order to facilitate interactive solutions to common issues being faced by watershed coordinators statewide.

Administer Evaluations

TWRI administered evaluations to gauge the knowledge gained and how effective the Roundtable was for each participant. Evaluations were administered at the end of each Roundtable to determine future topics of discussion. Training evaluations were developed and conducted for the Texas Watershed Coordinator roundtables conducted

on March 17, 2014, July 31, 2014, January 22, 2015, July 1, 2015, January 11, 2016, July 13, 2016 and February 1, 2017.

The March 2014 Roundtable: Improving Watershed Program Efficiency & Success
This was a smaller group that was invited to have participate in a smaller group to kick off a state discussion on *Catalyzing Success* for Watershed Planning in Texas. All of the discussion was written up and sent out to the group.

Group Discussion covered the following topics:

- How do you define Success and what are the key elements of success that should be considered?
- What do we need to do to achieve success?
- List BMPs used in Current WPPs and what has worked well?
- List key implementation projects that have made an impact.
- What are barriers to success?
- Tracking success – what is doable?
- Discuss reporting success in your watershed.
- What things have you done/observed that worked best?
- WPP effectiveness evaluation: monitoring for success?
- What actions need to be taken to achieve improvements in water quality?
- How can we motivate our stakeholders to participate in these actions?

The July 2014 Roundtable: Watershed Planning Resources

Received 51 evaluations from the 61 participants for an 84% response rate. The most valuable topics included 319 NPS grant funding, Bacterial Source Tracking, 2014 Farm Bill, OSSF Identification and Panel Discussions from the March 2014 Roundtable. Topics participants wanted addressed or more information included WPP development strategies and approval process, non-agricultural funding ideas, and the EPA 9 elements. Suggestions for topics of future roundtables included networking breaks, how to effectively run/facilitate a stakeholder meeting, CWSRF funding, and funding outside of EPA 319.

The January 2015 Roundtable:

Received 30 evaluations from 55 participants for a 55% response rate. The most valuable topics discussed were the SRF incentives and funding, panel discussions, improving implementation, and the roundtable workgroups. Topics that should have been addressed more thoroughly were match funding, surveys and evaluations, and more case studies. Suggestions for topics at future meetings experimental BMPs, funding resources, case studies, and alternatives to WPPs.

The August 2015 roundtable: Partner Programs for Watershed Planning

We received 45 evaluations out of 66 participants for a 68% response rate. The most valuable topics included water quality success stories, land data and statewide trends, streamlining WPP, and the Texas Stream Team and other programs that can be used in implementation. Respondents stated that the following topics should have been addressed more thoroughly: how to incorporate changing demographics into watershed plans, water quality management plans, partnerships with municipalities, and universal BMP list. Suggestions for future roundtables included feral hog update, developing data for economic benefits of WPPs, and incentivizing municipal/county governments to support and fund WPP development and implementation.

The January 2016 Roundtable: Addressing Wildlife and Exotic/Invasive Species in Watershed Planning

We received 56 evaluations out of the 74 participants, for a response rate of 76%. The most valuable topics discussed at the roundtable were NPS Program Perspectives, how to deal with feral hogs, BST, management measures for addressing wildlife sources, and exotics and invasive presentation. The topics that should have been addressed more included bacteria fate, transport, and growth, practical and attainable solutions to wildlife management, and discussion on a larger variety of species and the overall contribution of wildlife. Suggestions for the next roundtable included climate change and the future of surface water quality and quantity, water quality standards for aquatic life, training on how to convey science to stakeholders, and funding sources outside of 319 for implementation.

The July 2016 Roundtable:

We received 51 evaluations out of the 69 participants, for a response rate of 74%. The topics that attendees found most valuable were the Water Quality Standards presentation, the landowner tools from Texas A&M Forest Service, RUAA updates, and the NPS grant program panel. Respondents thought the following topics should have been addressed more thoroughly at the roundtable: 319 success stories, crosswalk or bridge documents, TMDL progress and updates, and Quantitative Microbial Risk Assessment. Suggestions for topics at future meetings included match opportunities, non-federal funding strategies, other tools similar to the TFS landowner tool, current research projects, and modeling approaches for WPPs.

The February 1, 2017 Roundtable:

We received 34 evaluations out of 78 participants, for a response rate of 44%. The topics that were found most valuable included novel watershed partnerships, the watershed efforts of the Tarrant Regional Water District and the City of Austin, Water education programs, Funding opportunities, and networking. The topics that should have been addressed more thoroughly included implementing watershed based plans, how to develop and trust, non-profit, or foundation, outreach methods for businesses, communities, school children, and TCEQ and EPA roles in a more detailed form. Suggestions for topics at future meetings included funding full time coordinators, urban program, and ordinances that cities and municipalities have had success with regarding water quality improvements.

Roundtables	Course Rating (1-4)	Course Good/Excellent	Info Help	Information that will Help Good/Excellent
Jul 2014	3.6	100%	3.5	98%
Jan 2015	3.6	100%	3.4	97%
Aug 2015	3.6	98%	3.4	91%
Jan 2016	3.6	100%	3.4	93%
Jul 2016	3.7	98%	3.6	98%
Feb 2017	3.5	91%	3.4	91%
Avg	**3.6**	**97.8%**	**3.5**	**94.7%**

Throughout the different roundtable meetings, the participants suggested topics were incorporated into future roundtables to try to cover those needed topics. Participants consistently agreed that the LID information, the social media tools, the bacteria survival and growth techniques, and the statewide land trends and impacts on water quality and quantity discussions were the topics they found most interesting as well as most valuable to them. When asked about topics they wanted to see addressed more thoroughly, the answers varied from BST methods to outreach to use of different technologies and management practices. The recommendations that have been given on how to further improve the next roundtable consist of more in depth discussions on 319 plans as well as an expansion on already discussed topics like state water plans or developing grant proposals. Overall, there was a positive reaction to the Roundtable meetings and many of those surveyed did not find anything in need of changing.

Appendices

Appendix A: Watershed Training Schedule

Workshop	Instructor	Workshop Date	Location	Course Attendees
Short Course	Multiple	October 19-23, 2015	Bandera	26
Introduction to Modeling Training	Srini	July 8, 2015	Austin	31
Getting in Step Training	MacPherson	September 29, 2014	Austin	15
Getting in Step Training	MacPherson	June 13, 2016	Dallas	19
LDC/SELECT Training	Karthi	February 27, 2014	College Station	12
Stakeholder Facilitation Training	MacPherson	September 30, 2014	Austin	14
Stakeholder Facilitation Training	MacPherson	June 14, 2016	Dallas	23
Texas Watershed Coordinator Roundtable (Kickoff Discussion)	Multiple	March 17, 2014	Temple	23
Texas Watershed Coordinator Roundtable	Multiple	July 31, 2014	Waco	45
Texas Watershed Coordinator Roundtable	Multiple	January 22, 2015	San Antonio	61
Texas Watershed Coordinator Roundtable	Multiple	July 1, 2015	San Marcos	66
Texas Watershed Coordinator Roundtable	Multiple	January 11, 2016	College Station	74
Texas Watershed Coordinator Roundtable	Multiple	July 13, 2016	Waco	68
Social Marketing Training	Hays	June 18, 2014	College Station	18
Social Marketing Training	Hays	October 28, 2014	Houston	40
Applied Environmental Statistics		August 25, 2014	College Station	35
Water Quality Monitoring Training	Larry Hauck	August 6-7, 2015	Temple	20
Water Quality Monitoring Training	Larry Hauck	July 28 -29, 2016	Austin	23

Appendix B: Watershed Planning Short Course Manual Outline

Texas Watershed Planning Short Course

CD Table of Contents

Ag BMPs

Arroyo Colorado WPP Implementation Resources

- Sustainability
- Bimonthly updates & Newsletter
- O&E and Presentations
- Workgroup Agendas and Summaries
- Steering Committee Agendas and Summaries
- Publications and the Pachanga (Public Release of WPP)
- Pre Survey Watershed Assessment

Clueless Template

EPA Handbook, Getting In Step Guide, & WBP Review Guide

LDC Guidance

Monitoring Guidance

Plum Creek WPP Development Resources

Presentations

- Monday Presentations
- Tuesday Presentations
- Wednesday Presentations
- Thursday Presentations
- Friday Presentations

TCEQ Publications

- TX Surface WQ
- Preserving & Improving WQ
- Rights to Surface Water
- Texas Clean Rivers Program
- Procedures to Implement TWQS

Urban BMPs

Watershed Plans

- Texas WPPs
  - Plum Creek WPP
  - Upper San Antonio WPP
  - Arroyo WPP
- Other WPPs
  - Crab Orchard Creek Watershed Plan
  - Millers Creek Plan
  - Blacks Creek Plan
  - Deckers Creek Plan
  - Mill Creek WIP
  - Beaver & Little Creek TMDL-IP
  - Yellow Bank Creek Watershed Plan
  - South Branch Yellow Medicine River IP
  - Corsica River Plan

Appendix C: Short Course Instructor Biographies

Texas Watershed Planning Short Course

Instructor Biographies

Michael R. Bira is with the U.S. Environmental Protection Agency Region 6 Water Quality Protection Division, in the Watershed Section. Mike graduated from the University of Tampa with a BS degree in Marine Biology and Chemistry. He then earned his MS in Aquatic Biology from Southwest Texas State University.

After college, Mike worked for five years as an Aquatic Biologist/Field Investigator for the Texas Water Commission (now Texas Commission on Environmental Quality), performing inspections and sampling of domestic, municipal, industrial, and agricultural wastewater dischargers, and coordinating the Commission's North Central Texas surface water monitoring program.

Mike began his career with EPA as an Environmental Scientist at Region 6 in Dallas in 1988. As a Hazardous Waste Enforcement Coordinator, his duties included coordination of Federal enforcement actions against violators of regulations under the Resource Conservation and Recovery Act (RCRA). Since 1990 Bira has been in the Water Quality Protection Division and worked in the Clean Lakes Program, Nonpoint Source Program, water quality standards, watersheds, nutrient criteria development, and water quality outreach.

As Volunteer Monitoring Coordinator for the region, Bira has been actively involved with citizen monitoring programs and assisting states and communities with addressing water quality problems through education and the watershed protection approach. He has helped conceptualize and develop volunteer water quality monitoring programs in Texas, Oklahoma, Louisiana, and Arkansas. He has assisted with training of State personnel and volunteer monitors and has assisted with federal financial support for citizen monitoring efforts.

Bira's current responsibilities for EPA Region 6 include Nutrient Coordinator, Volunteer Monitoring Coordinator, and Technical Lead for Nonpoint Source Program implementation in the State of Texas.

Mike lives in the Dallas area with his wife, Kristi. He also has two grown unmarried daughters who are out of the house but still in his wallet. Mike loves to get outside whenever he can, and immensely enjoys fishing, hunting, and shooting, and fishing some more. He grew up in Missouri, and has always needed to be near or in water. When he was very young, his Mom worried that he might grow gills. In his 30's he finally realized he could never be a fish, so he took up hunting. He eats a lot better now.

William D. Butler has worked for Texas Stream Team in both part time and full time capacities. Prior to taking the position of GIS and Research Associate, Will worked as a GIS Technician at DrillingInfo, Inc., and as a Research Specialist at Texas Stream Team.

Butler received a Bachelor of Science in Physical Geography from Texas State University and a Master of Arts in Geography from Kansas State University, where he studied slope failures such as rock slides and debris flows in Grand Teton National Park. He lives in Austin, and spends much of his free time tubing, swimming, or kayaking on Town Lake, Barton Springs, and the San Marcos River.

Thomas E. Davenport has worked for the U.S. Environmental Protection Agency since 1984 and has been EPA's National NPS Expert since 1991. He administers the Section 319 National Nonpoint Source Monitoring

Program and provides technical and program assistance to the watershed, urban storm water wetlands, lakes, and TMDL and NPS programs nationally.

Davenport received a Bachelor of Science in Forestry and Natural Resource Management from the University of Wisconsin-Stevens Point in 1977 and a Master of Science from the University of Washington in Forest Hydrology in 1981. In 1982, he received a Master of Public Administration from Sangamon State University.

Davenport previously led the Water Program for the Great Lakes/Baltic Seas Watershed Management Capacity Building Project and was technical manager on the Chile Free Trade Environmental Project and Panama Canal Expansion Training. He serves as a resident faculty member and co-designer/manager of the Watershed Partnership Seminar for the Office of Personnel Management. He is currently working with Canada on the implementation of the Great Lakes Water Quality Agreement' Annex 4 provisions, and on an ongoing basis, he provides management and technical assistance to EPA Programs at the regional, national, and international levels.

While at the Illinois Environmental Protection Agency, Davenport assisted in the development and establishment of the State's Watershed, Clean Lakes and Nonpoint Source Programs. His responsibilities included the management of the USDA Rural Clean Water Program's Comprehensive Monitoring and Evaluation Project for Highland Silver Lake and the Blue Creek Special Water Quality Project.

Davenport has authored "The Watershed Project Management Guide" and coauthored the urban management measures chapter of the "Coastal Zone NPS Management Guidance" and the urban nonpoint source management chapter in the UNESCO publication, "Assessment and Control of Nonpoint Source Pollution of Aquatic Ecosystems/A Practical Guide." He previously served on the editorial board of EPA's Nonpoint Source News Notes newsletter and the Center for Watershed Protection's Watershed Protection Techniques Bulletin, and was agency advisor to the Conservation Technology Information Center and an associate research editor of the Journal of Soil and Water Conservation, as well as editorial board member.

Nikki Dictson is an Extension Program Specialist III for the Texas A&M Institute for Renewable Natural Resources and Texas Water Resources Institute in College Station. She received her bachelor's, with a double major in Wildlife Science and Fisheries Science, at New Mexico State University and her master's in Wildlife and Fisheries Science at Texas A&M University. Dictson is coordinating the Texas Stream and Riparian Ecosystem Education and the Texas Watershed Planning Training programs, while also working on watershed planning and TMDL projects at the institute. Dictson coordinates a variety of professional and landowner trainings through these programs, as well as roundtables, group presentations, and conferences across the state. In addition, she manages the programs websites, listserv, and outreach efforts of each program. During the previous seven years with Texas A&M University's Soil and Crop Sciences Department, Dictson was the Coordinator for the Plum Creek Watershed Protection Plan and Implementation Program, developed many educational publications and outreach programs, and was on the team conducting the Geronimo and Alligator Creeks Watershed Protection Plan and the Texas Watershed Steward Educational Program. She has been on the planning team, a facilitator, and instructor at the Watershed Planning Short Course since the course's beginning.

Dictson has been with Extension for almost 14 years, beginning in the Rangeland Ecology and Management (RLEM) Unit where she coordinated the Water for Texans Educational Program — a statewide educational program of paired plot watershed demonstrations evaluating various management practices on runoff and sediment loss. While with the RLEM Unit, she also developed rangeland stream, riparian and upland health educational materials; developed an online RLEM 101 agent training course; and conducted field day trainings and educational programs

across the state. Dictson has also been an instructor for workshops of the Texas Riparian Association and is currently on its Board. Prior to working with Extension, she was a Natural Resource Consultant in Seattle, working on a variety of watershed issues with a focus on biological assessments of major construction projects for endangered species issues with local, state and federal agencies.

Lucas Gregory currently serves as a project specialist and the quality assurance officer for the institutes. In this role, he develops effective and efficient projects and provides leadership for multiple watershed assessment, planning and implementation projects, focusing on water quality impairments in rural Texas water bodies.

Gregory's research Interests include: 1) bacteria fate and transport in aquatic and soil environments, 2) watershed assessment, planning and management, 3) watershed assessment tool application and development, 4) water quality monitoring, 5) efficient water resource utilization, 6) implications of water policy on local watershed decision making, and 7) groundwater hydrology.

Dr. Daren Harmel is a Research Agricultural Engineer and Director of the USDA-Agricultural Research Service (ARS) Laboratory in Temple, Texas. His research focuses on developing practical guidance for runoff and water quality data collection, determining the uncertainty in measured hydrology and water quality data, and quantifying the impacts of land use on water quality and hydrology.

Harmel received his doctorate in Biosystems and Agricultural Engineering from Oklahoma State University in 1997 with a major in Hydrology and Water Quality. Harmel represents USDA-ARS on the National Water Monitoring Council Methods and Data Comparability Board.

Dr. Larry Hauck is the Lead Scientist at the Texas Institute for Applied Environmental Research (TIAER) at Tarleton State University located in Stephenville, Texas. He has been employed at TIAER for more than 20 years, and prior to his present employment worked for various governmental agencies and environmental consulting firms resulting in 30-plus years of professional experience. He obtained his doctorate from The University of Texas at Arlington in Civil and Environmental Engineering. As manager of the environmental sciences and economic program at TIAER, Hauck supervises a staff of about 20 full-time professionals, including chemists, biologists, economists, hydrologists and soil scientists, and typically six or more student workers and graduate assistants.

Hauck's research interests include landscape loading of nutrients and indicator bacteria, biological and chemical response of receiving waters to nutrient enrichment, connection of land management of agricultural and urban practices to receiving water quality, and development and application of watershed loading models and hydrologic/water quality models. He is currently involved in projects involving recreational and aquatic life uses of water bodies and applying various tools and models to evaluate bacteria and dissolved oxygen in receiving waters. He is presently the Project Manager for several projects through the TCEQ Water Quality Planning Division.

Tina Hendon is the Watershed Program Manager for Tarrant Regional Water District. She has over 25 years of experience in watershed protection. Previous work includes Nonpoint Source Program Manager and Water Quality Standards Coordinator with the U.S. Environmental Protection Agency environmental consulting, and research on the effects of land use practices on Texas receiving waters.

Travis Tidwell joined the Texas Stream Team in June of 2012. Before taking the position as the Volunteer Coordinator, Travis worked with the National Oceanic and Atmospheric Administration on the Natural Resource

Damage Assessment of the Deepwater Horizon oil spill. Prior to that, he worked for the Texas Parks and Wildlife Department at the AE Wood Fish Hatchery in San Marcos, Texas, and he also worked for the National Marine Fisheries Service as a Fishery Observer in the Gulf of Alaska and Bering Sea.

Tidwell received a Bachelor of Science in Biology from the University of Texas at Austin and a Master of Science in Marine Science from the University of Texas Marine Science Institute in Port Aransas, where he studied the early life history of billfish. Tidwell lives in New Braunfels, where he spends as much of his free time as he can fly fishing and kayaking on the Guadalupe River.

Dr. Kevin Wagner is Associate Director of the Texas Water Resources Institute and Adjunct Professor in the Department of Soil and Crop Sciences at Texas A&M University. He provides leadership and administration for institute water programs; works with stakeholders in identifying priorities for water resources programs; and develops inter-disciplinary teams for addressing these high priority issues.

He received his bachelor's degree in Biology at Howard Payne University, his master's degree in Environmental Science from Oklahoma State University, and his doctorate in Agronomy at Texas A&M University. Wagner has more than 20 years of experience in watershed assessment and planning, project implementation, and program management. His work seeks to: (1) determine the environmental and agricultural response of watersheds to management, particularly effects on water quality and quantity, (2) develop and evaluate management systems designed to sustain agricultural productivity and protect soil and water resources, (3) train water professionals and students on watershed planning, assessment and water policy; and (4) conduct watershed assessment, planning and stakeholder engagement to address water issues.

Appendix D: Watershed Planning Short Course Agenda

Texas Watershed Planning Short Course

Course Agenda – October 19-22, 2015

Monday, October 19, 2015 **Facilitator: Kevin Wagner**

11:00 – 1:00 pm **Registration (Distribute Knowledge Assessment)**

A pre-course examination will determine the knowledge level of each participant prior to going through the course. The pre-course exam results will be compared to the post-course exam results to assess course impact/knowledge gained.

1:00 – 1:10 pm **Welcome ..... Womble**

1:10 – 1:30 pm **Introduction ..... Wagner**

This session will provide (1) the opportunity for participants to introduce themselves and the watersheds they are working in, (2) information on facilities and ground rules, and (3) an overview of the course and its purpose and structure.

1:30 – 2:00 pm **Watershed Basics..... Dictson**

An introduction to watersheds.

2:00 – 3:00 pm **Working with Stakeholders to Move the Process Forward .. Wagner/Gregory**

Stakeholders form the backbone of your watershed planning effort. Learn tips on how to get off on the right foot and keep the energy going throughout your watershed planning and implementation program. Topics to be addressed include: determining who needs to be involved, making meetings count, diffusing conflict, making decisions using a consensus-based approach, and sustaining the stakeholder group.

3:00 – 3:20 pm **Break**

3:20 – 4:05 pm **Partnership Building Experiences in Plum Creek ..... Dictson**

Experiences in Plum Creek watershed with getting local involvement, announcing meetings, setting up the committee and subcommittees, publicizing the effort, what needs to be discussed/decided at each meeting, and timelines will be discussed. Sample invitation letters, ground rules, press releases, and other materials will be provided.

:05 – 4:35 pm **Expectations for Element A..... Bira**

The expectations for and an example of Element A will be reviewed and discussed to provide participants an understanding of what is necessary to identify causes and sources of water quality impairments and concerns.

4:35 – 5:30 pm **Gathering data to assess your watershed ..... Hendon**

What data do you need? Where do you find the data? How do you get info from TCEQ and other agencies? This session will examine (1) materials from Chapters 5-6 of the

Handbook; (2) how GIS may be used for watershed analysis, source identification and watershed characterization; and (3) sources of data in Texas and how best to obtain it.

6:45 pm **Dinner**

Tuesday, October 20, 2015 Facilitator: Nikki Dictson

7:00 – 8:00 am **Breakfast**

8:00–8:30 am **Gathering animal density data ..... Wagner**

8:30 – 9:00 am **Estimating OSSF density in watersheds ..... Gregory**

This session will discuss an approach to estimating on-site sewage facility (OSSF) numbers and locations in watersheds.

9:00 – 10:00 am **Analyzing Data to Characterize Your Watershed ..... Davenport**

How do you analyze your data? What tools are available? Is modeling needed? This session will review Chapters 7 and 8.1-8.2 of the *Handbook* in order to provide participants an understanding of the methods/options available for analyzing watershed data and estimating pollutant loads. Simplistic methods for calculating loads and assessing sources will be presented. The session will also examine refining goals, identifying management objectives, and determining load reductions needed (Chapter 9 of the *Handbook*).

10:00 – 10:20 am **Break**

10:20 – 10:50 am **Expectations for Element B ..... Hendon**

The expectations for Element B will be reviewed and discussed to provide participants with an understanding of the level of detail and effort needed to determine 'acceptable' pollutant loadings, and whether or not load reductions are needed to reach acceptable levels.

10:50 – 11:20 am **Overview of Models for Estimating Pollutant Loads & Reductions..... Hauck**

If modeling is needed, what models are available and how do you select a model? This session will provide an overview of models available, expectations for what each model can deliver, costs, and factors to consider when selecting models.

11:20–12:00 pm **Introduction to Load Duration Curves ..... Gregory**

12:00 – 1:00 pm **Lunch**

1:00–1:50 pm **Load Duration Curve (LDC) Demonstration ..... Gregory**

1:50–2:50 pm **Assignment: Estimating Pollutant Loads for Attoyac Bayou Using LDCs**

2:50–3:10 pm **Break**

3:10 – 3:30 pm **Discuss LDC Assignment**

3:30 – 4:00 pm **Overview and Expectations for Element C ..... Bira**

This session will provide a discussion of expectations for Element C as well as steps to select management practices.

4:00 – 4:50 pm **Agricultural NPS Measures ..... Wagner**

Agricultural nonpoint source measures in Texas are typically implemented through SWCDs, TSSWCB, and NRCS. This session discusses (1) agricultural BMPs, (2) how to develop a preliminary list of agricultural BMPs to address the issues of concern, (3) finding information on the effectiveness of agricultural BMPs, and (4) estimating BMP implementation costs.

4:50 – 5:30 pm **Texas Riparian and Stream Ecosystems ..... Dictson**

This session will present information on riparian and stream ecosystems and their function and benefits.

6:45 pm **Dinner**

Wednesday, October 21, 2015 **Facilitator: Nikki Dictson**

7:00 – 8:00 am **Breakfast**

8:00 – 8:50 am **Urban NPS Measures ..... Davenport**

This session will provide an overview of (1) urban NPS measures, (2) how to develop a preliminary list of urban BMPs to address the issues of concern, (3) finding information on the effectiveness of urban BMPs, (4) estimating BMP implementation costs; and (5) stormwater permitting.

8:50 – 9:35 am **Wastewater Treatment Systems, Issues, and Permits ..... Gregory**

This session briefly reviews wastewater treatment systems (WWTFs and OSSFs), their impacts, and effectiveness in removing pollutants in addition to identifying and addressing wastewater treatment system issues in your watershed.

9:35 – 10:00 am **Other Common Measures (Wildlife, Pets, etc.) ..... Wagner**

10:00 – 10:20 am **Break**

10:20 – 11:00 am **Targeting Critical Areas ..... Davenport**

To achieve the most effective and immediate benefit, BMP implementation must be targeted to the most critical areas. This session discusses the targeting of control measures and the importance of this to the ultimate success of the WPP.

11:00 – 11:30 pm **Estimating Load Reductions from BMPs.....Wagner**

11:30 – 12:00 pm **Assignment: Estimating Load Reductions from BMPs**

12:00 – 1:00 pm **Lunch**

1:00 – 1:15 pm **Discuss BMP Load Reduction Assignment**

1:15 – 1:30 pm **Expectations for Element E ..... Bira**

The expectations for and an example of Element E will be reviewed and discussed to provide participants with an understanding of the information/ education components of the WPP.

1:30 – 2:15 pm **Using Outreach to Develop and Implement WPPs .....Dictson**

Outreach is a powerful tool to get stakeholders involved early in the planning process, promote behavior change in the watershed, and enhance implementation of management strategies in the watershed. Learn tips and tools to conduct effective outreach without breaking the bank.

2:15 – 2:45 pm **Overview of Educational Programs..... Gregory**

This session provides an overview of the Texas Watershed Steward, Texas Well Owner Network, Lone Star Healthy Streams, and other education programs. Incorporation of these programs into WPP efforts provides stakeholders with the knowledge to make informed decisions about water resources.

2:45 – 3:00 pm **Watershed Resources and Tools Available .....Dictson**

Presentation provides an overview of watershed resources and tools available, kiosks, online modules, web apps, and TWRI's watershed planning website.

3:00 – 3:20 pm **Break**

3:20 – 4:20 pm **Designing & Implementing Effectiveness Monitoring – Element I ..... Hauck**

This session will provide guidance on selecting an appropriate experimental design that incorporates previous and ongoing monitoring efforts.

4:20 – 4:30 pm **Break / Hayride to River for Next Presentation**

Please note: This is a light field exercise at the Medina River. Appropriate field attire for expected weather is recommended. Participants will divide into 3 groups for the presentations below.

4:30 – 5:30 pm **Water Quality Monitoring:**

Practical Guidelines & Lessons Learned .....Harmel/Gregory/Butler/Jonescu

An overview of the how to use automated samplers, multi-probes, flow meters, and Texas Stream Team volunteer monitoring kits will be provided. ***sessions are 20 minutes each***

6:45 pm **Dinner**

Thursday, October 22, 2015, 2013 **Facilitator: Kevin Wagner**

7:00 – 8:00 am **Breakfast**

8:00 – 8:30 am **Expectations for Elements F, G, and H ..... Bira**

The expectations for Element F, G, and H will be reviewed to provide insight on the level of detail and effort needed to schedule implementation, describe interim milestones, and establish criteria to determine if load reductions are achieved.

8:30 – 9:10 am **Developing Interim Milestones & Criteria to Measure Progress.... Davenport**

This session will discuss developing interim measurable milestones (Element G) and establishing a set of criteria to measure progress (Element H) toward meeting water quality goals (Chapter 12.4-12.5 of the *Handbook*). This is the point in the WPP where you define in realistic terms how you will determine (1) if you are on track and making progress or not, (2) how/when you evaluate your progress, and (3) what to do if watershed improvements are not on track.

9:10 – 9:40 am **Scheduling Management Measure Implementation..... Hendon**

9:40 – 10:00 am **Break**

10:00 – 10:45 am **Assignment: Consistency Review of Elements F, G, and H**

10:45 – 12:00 pm **Discuss Elements F, G, and H Assignment**

12:00 – 1:00 pm **Lunch**

1:00 – 1:25 pm **Expectations for Element D..... Bira**

This session will discuss expectations for Element D which describes the financial and technical assistance needs and identifies the sources/authorities that will be relied on for implementation (Chapter 12.7 of the *Handbook*).

1:25 – 2:10 pm **Implementation Costs and Sources of Funding..... Wagner**

This session will discuss sources of funding in Texas for implementation of WPPs along with match requirements and the mechanisms for requesting it.

2:10 – 2:30 pm **Course Wrap-Up……...Wagner**

This session will discuss assembling a WPP, gaining stakeholder approval, and submitting the WPP for state and federal review.

2:30 – 3:00 pm **Knowledge Assessment/Course Evaluation**

A post-course examination will be distributed to determine course impact and knowledge gained. A course evaluation will also be distributed to gain feedback on how to improve the course.

3:00 pm **Adjourn**

Certificates will be distributed as the class turns in their post-course exam and course evaluations.

Appendix E: Watershed Planning Short Course Evaluation

Texas Watershed Planning Short Course Evaluation
October 19-22, 2015

Name_____

1. Overall, how would you rate the short course?

Unsatisfactory **Most Satisfactory**

1 □ **2** □ **3** □ **4** □ **5** □

2. Using the scale above, how <u>satisfied</u> were you with each of the course topics below?

TOPICS	<u>Level of Satisfaction</u>				
Introduction *(Wagner)*	1	2	3	4	5
Watershed Basics *(Dictson)*	1	2	3	4	5
Working with Stakeholders to Move the Process Forward *(Wagner/Gregory)*	1	2	3	4	5
Partnership Building Experiences in Plum Creek *(Dictson)*	1	2	3	4	5
Expectations for Element A *(Bira)*	1	2	3	4	5
Gathering Data to Assess your Watershed *(Hendon)*	1	2	3	4	5
Gathering Animal Density Data *(Wagner)*	1	2	3	4	5
Estimating OSSF Density in Watersheds *(Gregory)*	1	2	3	4	5
Analyzing Data to Characterize your Watershed *(Davenport)*	1	2	3	4	5
Expectations for Element B *(Hendon)*	1	2	3	4	5
Overview of Models for Estimating Pollutant Loads & Reductions *(Hauck)*	1	2	3	4	5
Introduction to Load Duration Curves *(Gregory)*	1	2	3	4	5
Load Duration Curve (LDC) Demonstration *(Gregory)*	1	2	3	4	5
Overview and Expectations for Element C *(Bira)*	1	2	3	4	5
Agricultural NPS Measures *(Wagner)*	1	2	3	4	5
Texas Riparian and Stream Ecosystems *(Dictson)*	1	2	3	4	5
Urban NPS Measures *(Davenport)*	1	2	3	4	5
Wastewater Treatment Systems, Issues, and Permits *(Gregory)*	1	2	3	4	5
Other Common Measures (Wildlife, Pets, etc.) *(Wagner)*	1	2	3	4	5
Targeting Critical Areas *(Davenport)*	1	2	3	4	5
Estimating Load Reductions from BMPs *(Wagner)*	1	2	3	4	5
Expectations for Element E *(Bira)*	1	2	3	4	5
Using Outreach to Develop and Implement WPPs *(Dictson)*	1	2	3	4	5

TOPICS	Level of Satisfaction				
Overview of Educational Programs *(Gregory)*	1	2	3	4	5
Watershed Resources and Tools Available *(Dictson)*	1	2	3	4	5
Designing & Implementing Effectiveness Monitoring – Element I *(Hauck)*	1	2	3	4	5
Water Quality Monitoring *(Harmel, Gregory, Butler)*	1	2	3	4	5
Expectations for Elements F, G, and H *(Bira)*	1	2	3	4	5
Developing Interim Milestones & Criteria to Measure Progress *(Davenport)*	1	2	3	4	5
Scheduling Management Measure Implementation *(Hendon)*	1	2	3	4	5
Expectations for Element D *(Bira)*	1	2	3	4	5
Implementation Costs and Sources of Funding *(Wagner)*	1	2	3	4	5
Course Wrap Up *(Wagner)*	1	2	3	4	5

3. **If you were <u>not</u> "completely satisfied" with the short course, please tell us what we could have done better in order for you to have been "completely satisfied?"**

4. **What was the most significant thing(s) you learned from this short course?**

5. **Which topic(s) covered by this short course, if any, would you have liked discussed in greater detail?**

6. **What topic(s), if any, did you have a particular interest in but was <u>not</u> covered by the short course?**

7. **What topic(s), if any, should be omitted from future short courses?**

8. **Overall how <u>satisfied</u> were you with the following aspects of the course (please check one of the boxes below):**

	Completely	Mostly	Somewhat	Slightly	Not at all
Quality of Course Materials					
Sequencing of Topics					

Training Location and Facility					

9. **What will be the first 3 steps you'll implement as a result of taking this training?**

10. **Looking beyond the course, in your opinion what could the state and/or federal agencies do to best serve you in your WPP efforts?**

11. **What other tools, training, capacity building, etc. (if any) would you suggest to serve your efforts in WPP planning?**

12. **How would you rate the WPP you are involved in as meeting the intent of EPA's WPP guidelines?**

13. **In your watershed, what are the local strengths for success?**

14. **In your watershed what are the local obstacles for success?**

Appendix F: Agendas for Roundtables and Trainings

Texas Watershed Coordinator Roundtable

July 31, 2014
9:30 a.m. — 3:30 p.m.

Texas Farm Bureau Conference Center
7420 Fish Pond Rd, Waco, TX

9:30 – 9:45 a.m.	Welcome & Introductions	Kevin Wagner
9:45 – 10:30 a.m.	Panel Discussion on Clean Water Act §319(h) NPS Grant Program	
	• EPA Region 6	Henry Brewer
	• TCEQ	Kyle Girten
	• TSSWCB	TJ Helton
10:30 – 11:15 a.m.	Discussion of outcomes from March 2014 Workshop: *Improving Watershed Program Efficiency & Success*	Kevin Wagner
11:15 – 11:45 a.m.	Identifying OSSFs in your watershed	Lucas Gregory
11:45 – 12:30 p.m.	Catered networking lunch (or bring your own) [RSVP required]	
12:30 – 1:00 p.m.	Review of Bacterial Source Tracking in Texas	Kevin Wagner
1:00 – 1:30 p.m.	The 2014 Farm Bill and its impact on NRCS programs	Kyle Wright
1:30 – 1:50 p.m.	Feral Hog Educational Programs	Mark Tyson
1:50 – 2:10 p.m.	Plum Creek Feral Hog Program	Nick Dornak
2:10 – 2:30 p.m.	Texas Forest Information Portal	Hughes Simpson
2:30 – 3:00 p.m.	Arroyo Dashboard	Allen Berthold
3:00 – 3:30 p.m.	Wrap-Up	Nikki Dictson

- Upcoming Trainings:
  - Applied Environmental Statistics (Full) August 25-29, 2014
  - Getting in Step in Austin – September 29, 2014
  - Stakeholder Facilitation in Austin – September 30, 2014
  - Quality Outreach and the Internet in Houston - October 28-29, 2014
  - Short Course TBD 2015
  - Introduction to Modeling TBD 2015
  - Fundamentals of Developing a Water Quality Monitoring Plan TBD 2015
  - Texas Watershed Steward
  - Texas Well Owner Network
  - Texas Riparian and Stream Ecosystem
  - Texas Stream Team
- Next Roundtable
  - Date: January 2015

Texas Watershed Coordinator Roundtable

January 22, 2015
9:30 a.m. — 3:30 p.m.

San Antonio Water System
San Antonio, TX

9:30 – 9:45 a.m.	Welcome & Introductions	Kevin Wagner
9:45 – 10:30 a.m.	Clean Water Act §319(h) NPS Grant Program Panel • Henry Brewer, EPA Region 6 State & Tribal Programs Section • Brad Lamb, EPA Region 6 Watershed Management Section • Kyle Girten, Texas Commission on Environmental Quality • TJ Helton, Texas State Soil and Water Conservation Board	Kevin Wagner
10:30 – 10:45 a.m.	Analysis of WPP Impacts	Kevin Wagner
10:45 – 11:00 a.m.	Break	
11:00 – 11:45 a.m.	Watershed Coordinator Panel on Improving Implementation • Kenny Banks, City of Denton • Justin Bower, Houston Galveston Area Council • Nikki Dictson, Texas Water Resources Institute • Jaime Flores, Texas Water Resources Institute	Lucas Gregory
11:45 – 12:30 p.m.	Catered networking lunch (or bring your own) [RSVP required]	
12:30 – 1:00 p.m.	*Roundtable Discussion on Issue #1 – Implementation Incentives*	
1:00 – 1:30 p.m.	*Roundtable Discussion on Issue #2 – Implementation Monitoring*	
1:30 - 1:45 p.m.	Break	
1:45 – 2:30 p.m.	Panel Discussion on SRF Funding • Ashley Howard, EPA Region 6 SRF Section • Mark Evans, Texas Water Development Board • Nick Dornak, Plum Creek Watershed Partnership	Kevin Wagner
2:30 – 3:00 p.m.	*Roundtable Discussion on Issue #3 – Implementation Funding*	
3:00 – 3:15 p.m.	Summarize Actions, Outline Next Steps & Identify Leads	Kevin Wagner
3:15 – 3:30 p.m.	Wrap-Up • Upcoming Trainings • Next Roundtable	Nikki Dictson

Texas Watershed Coordinator Roundtable

August 12, 2015
9:30 a.m. — 3:30 p.m.

San Marcos Activity Center
501 E. Hopkins, San Marcos, TX

9:30 – 9:45 a.m.	Welcome & Introductions	Kevin Wagner
9:45 – 10:15 a.m.	Clean Water Act §319(h) NPS Grant Program Panel • Henry Brewer, EPA Region 6 State & Tribal Programs Section • Mike Bira, EPA Region 6 Watershed Management Section • Kyle Girten, Texas Commission on Environmental Quality • TJ Helton, Texas State Soil and Water Conservation Board	Kevin Wagner
10:15 – 10:35 a.m.	San Marcos River: Native Riparian Habitat Restoration	Eric Weeks
10:35 – 10:50 a.m.	Break	
10:50 – 11:30 a.m.	Texas Stream Team Support for WPPs	Meredith Miller
11:30 – 1:00 p.m.	Lunch on your own	
1:00– 1:20 p.m.	Discuss Streamlining WPP Development & Stakeholder Efforts	Allen Berthold
1:20 – 1:50 p.m.	Statewide Land Trends & Impacts on Water Quality & Quantity	Roel Lopez
1:50 – 2:10 p.m.	Break	
2:10 – 2:40 p.m.	Voluntary Land Stewardship and Watershed Planning	Roel Lopez
2:40 – 3:00 p.m.	NRCS Regional Conservation Partnership Program, Statewide Priorities, and funding levels	Kyle Wright
3:00 – 3:20	TPWD Land Stewardship Programs	Melissa Parker/Arlene Kalmbach Doug Phillips, USFWS
3:20 – 3:30 p.m.	Wrap-Up • Upcoming Trainings • Next Roundtable	Kevin Wagner

Texas Watershed Coordinator Roundtable
Addressing Wildlife and Exotic/Invasive Species in Watershed Planning
DRAFT FINAL AGENDA
January 11, 2016
9:30 a.m. — 3:30 p.m.

Texas A&M Equine Complex
College Station, TX

9:30 – 9:45 a.m.	Welcome & Introductions	John Tracy
9:45 – 10:15 a.m.	Wildlife and Watershed Planning – Issue Overview	Kevin Wagner
10:15 – 10:45 a.m.	Wildlife populations in Texas	Matt Wagner
10:45 – 11:15 a.m.	Break	
11:15 – 11:45 a.m.	Bacteria Fate, Transport, Growth & Persistence Study Results	Lucas Gregory
11:45 – 12:30 p.m.	Catered networking lunch (or bring your own) [RSVP required]	
12:30 – 1:30 p.m.	Management Measures for Addressing Wildlife Sources • Common Management Measures & BMPs – Kevin Wagner • NRCS Wildlife Practice Standards – Russell Castro • Feral Hog Abatement & Landowner Education – Mark Tyson • TPWD Wildlife Management Plans – Matt Wagner	Nikki Dictson
1:30 - 1:45 p.m.	Break	
1:45 – 2:30 p.m.	Watershed Coordinator Efforts to Address Wildlife/Exotics • Feral Hog Control Efforts – Nick Dornak • Exotics / Exclosures – Tom Arsuffi • Private Land Stewardship To Manage For Wildlife & Water – Brian Hays	Lucas Gregory
2:30 – 3:15 p.m.	NPS Program Perspectives • Henry Brewer, EPA Region 6 State & Tribal Programs Section • Mike Bira, EPA Region 6 Watershed Management Section • Kyle Girten, Texas Commission on Environmental Quality • TJ Helton, Texas State Soil and Water Conservation Board	Kevin Wagner
3:15 – 3:30 p.m.	Wrap-Up • Upcoming Trainings • Next Roundtable	Nikki Dictson

Texas Watershed Coordinator Roundtable

July 13, 2016
9:30 a.m. — 3:30 p.m.

Texas Farm Bureau Conference Center
7420 Fish Pond Rd., Waco, TX

9:30 – 9:45 a.m.	Welcome & Introductions	Dr. Gregory, TWRI
9:45 – 10:45 a.m.	Texas Water Quality Standards & RUAA Update	Joe Martin, TCEQ
10:45 – 11:00 a.m.	Break	
11:00 – 11:30 a.m.	New 303(d) Vision	Chris Loft, TCEQ
11:30 – 12:00 p.m.	Water Quality Standards and TMDL Panel • Joe Martin, TCEQ Water Quality Standards • Chris Loft, TCEQ TMDL • Miranda Hodgkiss, EPA TMDL	Dr. Gregory, TWRI
12:00 – 12:45 p.m.	Catered networking lunch (or bring your own) [RSVP required]	
12:45– 1:30 p.m.	Galveston Bay Comprehensive Conservation Management Plan Revision	Dr. Bernhardt, GBEP
1:30 – 2:00 p.m.	Texas Forest Service Landowner Tool	Hughes Simpson, TFS
2:00 – 2:15 p.m.	Break	
2:15 – 3:00 p.m.	Clean Water Act §319(h) NPS Grant Program Panel • Henry Brewer, EPA Project Manager for TSSWCB NPS Program • Anthony Suttice, EPA Project Manager for TCEQ NPS Program • Mike Bira, EPA Program Manager for TSSWCB NPS Program • Randy Rush, EPA Program Manager for TCEQ NPS Program • Kyle Girten, NPS Program Coordinator for Texas Commission on Environmental Quality • TJ Helton, NPS Program Coordinator for Texas State Soil and Water Conservation Board	Nikki Dictson
3:00 – 3:20 p.m.	Quantitative Microbial Risk Assessment	Anna Gitter, TWRI
3:20 – 3:30 p.m.	Wrap-Up • Upcoming Trainings • Next Roundtable	Nikki Dictson, TWRI

Introduction to Modeling Training

Texas Commission on Environmental Quality • Austin
July 8, 2015
Agenda

Wednesday, July 8 ***9 a.m. to 5 p.m.***

9:00 a.m.	**Introductions, Overview & How Modeling fits into Watershed Planning** .....Nikki Dictson, TWRI *Provide participants with an introduction to watershed modeling and models available for use. Participants will gain an understanding of what model is needed for watershed protection planning, how modeling results fit in to 9 Elements, and the resources needed to take next steps.*
9:30 a.m.	**Models Overview: Purposes and Limitations** .....R. Srinivasan, TAMU *This presentation will provide a broad overview of purposes and limitations of currently available models including their strengths and weaknesses; validation and calibration.* *Handout: EPA Guidelines Decision Matrix*
10:30 a.m.	**Break**
10:45 a.m.	**Models Overview: Purposes and Limitations** … ..... continued
12:15 p.m.	**Lunch** *(catered lunch or bring your own)*
1:00 p.m.	**Factors to Consider when Modeling: Time & Money** .....R. Srinivasan, TAMU *What are the data needs and requirements for models? This presentation will discuss model capabilities; time; money; etc. and the data available for calibrating/validating models.*
2:00 p.m.	**Using Simple Tools or Non-Model Tools**..... Larry Hauck, TIAER *This presentation will discuss how to model with limited observations as well as minimum data or analysis needed (LDC, estimator, export coefficient, literature values, GIS landuse based)*
2:45 – 3:00 p.m.	**Break**
3:00 – 4:00 p.m.	**Quality Assurance Project Plans (QAPPs)**..... Sandra Arismendez, TCEQ *Present on QAPPs from a conceptual standpoint. What needs to be covered; how the data need to be described; references to uncertainty estimation and sensitivity analysis; requirements for gathering existing data.*
4:00 – 4:45 p.m.	**Stakeholder Communications and Modeling**.....Nikki Dictson, TWRI *Provide examples on the process of bringing stakeholders to the table to understand the model, get consensus approval of inputs and presenting modeling results to engage stakeholders in implementation.*
4:45 – 5:00 p.m.	**Wrap Up** .....Nikki Dictson, TWRI

Watershed modeling using LDC and SELECT
February 27-28, 2014

Texas A&M University • Centeq Bldg. • Lab 212

Agenda

Thursday, Feb 27 ***10 a.m. to 5:00 p.m.***

10–10:30 a.m.	**Introductions & Workshop Overview** [K. Wagner, TWRI]
10:30–11:15 a.m.	**Introduction to Load Duration Curves** [R. Karthikeyan & A. Virani, AgriLife Research]
11:15–12 p.m.	**LDC Demonstration** [R. Karthikeyan & A. Virani, AgriLife Research]
12–1:00 p.m.	Lunch (*catered lunch provided or bring your own*)
1:00–2:00 p.m.	**Assignment:** Estimating Pollutant Loads for Attoyac Bayou Using LDCs [Group]
2:00–3:00 p.m.	**Discuss LDC Assignment** [Group]
3:00–3:20 p.m.	Break
3:20–5:00 p.m.	**Introduction to BASINS and SELECT** [R. Karthikeyan & A. Virani, AgriLife Research]

Friday, Feb 28 **9 a.m. to 3:30 p.m.**

9–9:30 a.m.	**Gathering animal density data for SELECT** [K. Wagner, TWRI]
9:30–11 a.m.	**SELECT Demonstration** [R. Karthikeyan & A. Virani, AgriLife Research]
11–11:20 a.m.	Break
11:20–12 p.m.	**Assignment:** Estimating Pollutant Sources for Little Brazos River Using SELECT [Group]
12–12:45 p.m.	Lunch (*catered lunch provided or bring your own*)
12:45–2:15 p.m.	**Complete SELECT Assignment** [Group]
2:15–3:15 p.m.	**Discuss SELECT Assignment** [Group]
3:15–3:30 p.m.	**Wrap Up** [N. Dietson, TWRI]

Getting In Step – Top 10 Outreach Tips that Won't Break the Bank

Building Blocks for Effective Education and Outreach
By following six simple steps, you can conduct effective outreach. From identifying outreach and education goals to evaluating success, participants will learn about each of the six steps and how they build on each other.

What It Takes to Change Behavior
Instead of selling products or services, social marketing sells ideas, attitudes, and behaviors. In this session, participants will learn how to incorporate social marketing techniques into an outreach program to generate behavior changes. In addition, participants will learn, through a group exercise, how to identify and overcome barriers to behavior change.

Evaluating Your Outreach Effort
Continuously evaluating your outreach program will help ensure that your goals will be met. Learn how to build in evaluation during the six steps of outreach.

Working with the News Media
Learn how to effectively work with the media to get your message out.

Creating Eye-Catching Outreach Materials

Receive tips on how to create attractive outreach materials. Examples of outreach materials from around the country will also be highlighted. Finally, through a group exercise, participants will evaluate sample outreach materials by using what they've learned in the workshop.

Adjourn

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AGENDA

September 29, 2014

Texas Commission on Environmental Quality
Building A, Room 172A
12100 Park 35 Circle
Austin, TX 78753

9:00 AM – 4:00 PM

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Getting In Step – Top 10 Outreach Tips that Won't Break the Bank

Building Blocks for Effective Education and Outreach
By following six simple steps, you can conduct effective outreach. From identifying outreach and education goals to evaluating success, participants will learn about each of the six steps and how they build on each other.

What It Takes to Change Behavior
Instead of selling products or services, social marketing sells ideas, attitudes, and behaviors. In this session, participants will learn how to incorporate social marketing techniques into an outreach program to generate behavior changes. In addition, participants will learn, through a group exercise, how to identify and overcome barriers to behavior change.

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Creating Eye-Catching Outreach Materials

Receive tips on how to create attractive outreach materials. Examples of outreach materials from around the country will also be highlighted. Finally, through a group exercise, participants will evaluate sample outreach materials by using what they've learned in the workshop.

Adjourn

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AGENDA

June 13, 2016

Texas A&M AgriLife
Research and Extension
Center - Dallas
17360 Coit Rd
Dallas, TX 75252

9:00 AM – 4:00 PM

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Stakeholder Facilitation - Working with Stakeholders to Move the Process Forward

Introductions, course objectives and expectations

Part 1: Setting Up for Success

- Context/driving forces
- Stakeholder analysis
- Roles and responsibilities
- Organizational structures
- Decision-making methods

Part 2: Getting Stakeholders to the Table

- Concerns/needs
- Matching needs to goals
- Encouraging participation

Part 3: Facilitation 101

- Elements of effective meetings
- Making decisions
- Building an agreement
- Diffusing/resolving conflict

Part 4: Keeping the Ball Rolling

- Motivating existing members
- Bringing in new members

Adjourn

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AGENDA

September 30, 2014

Texas Commission on Environmental Quality
Building A, Room 172A
12100 Park 35 Circle
Austin, TX 78753

9:00 AM – 4:00 PM

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Stakeholder Facilitation - Working with Stakeholders to Move the Process Forward

Introductions, course objectives and expectations

Part 1: Setting Up for Success

- Context/driving forces
- Stakeholder analysis
- Roles and responsibilities
- Organizational structures
- Decision-making methods

Part 2: Getting Stakeholders to the Table

- Concerns/needs
- Matching needs to goals
- Encouraging participation

Part 3: Facilitation 101

- Elements of effective meetings
- Making decisions
- Building an agreement
- Diffusing/resolving conflict

Part 4: Keeping the Ball Rolling

- Motivating existing members
- Bringing in new members

Adjourn

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AGENDA

June 14, 2016

Texas A&M AgriLife
Research and Extension
Center - Dallas
17360 Coit Rd
Dallas, TX 75252

9:00 AM – 4:00 PM

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Content, Conversations, and Discoverability - Quality Outreach and the Internet for Natural Resource Professionals

The Web is now 25 years old from the first design by Tim Berners-Lee to what we know today in 2014. Things have changed dramatically in design, writing standards and search ability. In addition, smart devices have outsold desktops significantly in the last 5 years. What does that mean to those in outreach and education? It means we have to continue to grow our expertise in learning how to connect the consumer to the important information we provide. We need to understand how content is found, how conversations and learning networks start, how to be discovered and what constitutes quality outreach. We have to know where to post, when to post and what to build on our websites. We have to learn how to reach our traditional clients as well as new clients. There are many successful models that can be used and applied in natural resource outreach and education that can help us down the road of discoverability.

Location: TAMU Agriculture & Life Science Bldg. Room 113, 600 John Kimbrough Blvd., College Station

To Register For One or Both Days Visit:
http://watershedplanning.tamu.edu/training/
June 18th 1 p.m. - 4 p.m. (no lunch)
June 19th 8:30 a.m. - 3:30 p.m. (lunch provided)

JUNE 18TH - DAY 1 - 1 PM-4 PM

June 18th (1/2 day) - **Facebook and Twitter**

This half-day is designed to help you get onboard with these two popular social networks. Designed to help beginners who need help learning best practices, and for those who use these tools but would like to get more out of them. We will cover getting accounts, designing strategies, learning best practices, analyzing outreach and planning schedules.

JUNE 19TH - DAY 2 - 8:30-3:30

June 19th (Full Day) - **Writing Discoverable Content, Twitter PLUS, Instagram**

Learn how to make what you do on the web more discoverable. This day will go over tips and tricks for your websites, your blogs, Facebook , Twitter and about anywhere you post. Learn what makes content more searchable, sharable and liked.

Twitter PLUS - Thought you knew everything about Twitter? There's more. Learn how to use Twitter to listen better, to find and discover more information, and how to curate Twitter to create better program outreach

Instagram - Learn how this popular tool can be used for outreach

Register for Any One Day, or Both Days! Bring your own Device.
$40 registration fee— Wednesday only $50 registration fee - Thursday only
$80 registration fee for Wed-Thurs. Combo

TEXAS A&M AGRILIFE

Content, Conversations, and Discoverability - Quality Outreach and the Internet for Natural Resource Professionals

Houston-Galveston Area Council

The Web is now 25 years old from the first design by Tim Berners-Lee to what we know today in 2014. Things have changed dramatically in design, writing standards, and search ability. In addition, smart devices have outsold desktops significantly in the last 5 years. What does that mean to those in outreach and education? It means we have to continue to grow our expertise in learning how to connect the consumer to the important information we provide. We need to understand how content is found, how conversations and learning networks start, how to be discovered, and what constitutes quality outreach. We have to know where to post, when to post, and what to build on our websites. We have to learn how to reach our traditional clients as well as new clients. There are many successful models that can be used and applied in natural resource outreach and education that can help us down the road of discoverability.

Location:
Houston-Galveston Area Council
Conference Room A, Second Floor
3555 Timmons Lane, Suite 120
Houston, TX 77027

OCTOBER 28 - DAY 1 - 1 PM-4 PM

Oct. 28 (1/2 day) - **Facebook and Twitter**

This half-day is designed to help you get onboard with these two popular social networks. Designed to help beginners who need help learning best practices, and for those who use these tools but would like to get more out of them. We will cover getting accounts, designing strategies, learning best practices, analyzing outreach, and planning schedules.

NO LUNCH

OCTOBER 29 - DAY 2 - 8:30AM-3:30PM

Oct. 29 (Full Day) - **Writing Discoverable Content, Twitter PLUS, Instagram**

Learn how to make the most of what you do on the web more discoverable. This day will go over tips and tricks for your websites, your blogs, Facebook , Twitter, and about anywhere you post. Learn what make content more searchable, sharable, and liked.

Twitter PLUS - Thought you knew everything about Twitter? There's more. Learn how to use Twitter to listen better, to find and discover more information, and how to curate Twitter to create better program outreach

Instagram - Learn how this popular tool can be used for outreach

LUNCH PROVIDED

Register for Any One Day, or Both Days!

$40 registration fee— Tuesday only $50 registration fee - Wednesday only (lunch provided)

$80 registration fee for Tues-Wed. Combo

Trainer:
Amy E. Hays

Texas A&M AgriLife

APPLIED ENVIRONMENTAL STATISTICS

Dennis R. Helsel and Edward J. Gilroy

August 25-29, 2014
College Station, TX

DAY 1

Introduction	Helsel/Gilroy 8:00 a.m.
Describing Data (Chap. 1) & Graphical Data Analysis (Chap. 2)	Gilroy 8:30 a.m.
characteristics of environmental data	
from samples to populations	
dealing with outliers, transformations	
why use graphics	
boxplots, quantile plots, probability or Q-Q plots	
PROBLEM: describing data	
General Hypothesis Testing (Chapter 4)	Helsel 11:00 a.m.
5 categories of hypothesis tests	
α levels and p-values	
1-sided and 2-sided tests	
exact test vs. large-sample approximations	
LUNCH 12:00 - 1:00 p.m.	
PROBLEM: how hypothesis tests work	Helsel 1:00 p.m.
Statistical intervals (Chapter 3)	Gilroy 1:30 p.m.
Coping with uncertainty	
Confidence intervals, skewed data ?	
PROBLEM: Intervals and transforms	Gilroy 2:30 p.m.
Some other intervals	
prediction, tolerance, how to compute	
PROBLEM; the three intervals	

FINISHED 4:30 p.m.

DAY 2

Comparing Two Groups of Data (Chapters 5 & 6)	Helsel 8:00 a.m.
Two paired groups	
Example & exercise	
Have standards been met? Exercise	
Quantile test & Exercise	
Two unpaired (independent) groups	
Permutation Tests	
PROBLEM: testing for significant differences	
LUNCH 12:00 - 1:00 p.m.	
Comparing More Than Two Groups of Data (Chapter 7)	Gilroy 1:00 p.m.
one- and two-factor ANOVA	
non-parametric alternatives	
multiple comparison tests: who's different?	

PROBLEM: parametric and nonparametric tests

Sample size & power curves — Gilroy 3:00 p.m.

Testing differences in Variability — Gilroy 3:45 p.m.
- Characterizing differences in variability
- Levene's & Squared Ranks tests
- PROBLEM: variability of concentrations

FINISHED 4:30 p.m.

DAY 3

Correlation Review (Chapter 8) — Helsel 8:00 a.m.
- Patterns of association with indicators
- PROBLEM: Three correlation coefficients
- Kendall's linear model
- PROBLEM: Kendall slope estimator

Linear Regression (Chapter 9) — Helsel 9:00 a.m.
- Building a good regression model
- determining improvements over background noise
- PROBLEM: modeling environmental quality
- hypothesis tests, confidence and prediction intervals

LUNCH 12:00 - 1:00 p.m.

PROBLEM: estimating total flux — Helsel 1:00 p.m.

Multiple Regression (Chapter 11) — Gilroy 1:45 p.m.
- measures of a good model
- plot the data !
- multi-collinearity
- model selection: surpassing stepwise
- PROBLEM: estimating urban non-point loads

FINISHED 4:30 p.m.

DAY 4

Analysis of Covariance (Chapter 11) — Gilroy 8:00 a.m.
- Discrete explanations
- PROBLEM: how many regression lines are needed?

Trend Analysis (Chapter 12) — Helsel 10:00 a.m.
- selecting a trend test:
- regression vs. Mann-Kendall approaches
- removing exogenous effects
- monotonic vs. step trends
- PROBLEM: Four approaches to trend tests
- censored data
- dealing with seasonality

LUNCH 12:00 - 1:00 p.m.

PROBLEM: A trend for all seasons? — Helsel 1:00 p.m.

	FINAL EXAM PROBLEM	Gilroy 2:00 p.m.
	Class Discussion and Applications	All 3:30 p.m.
	FINISHED 4:30 p.m.	

DAY 5.

	Making Sense of Nondetects	Helsel 8:00 a.m.
	Contingency Tables (Chapter 14) PROBLEM: Is uranium OK?	Gilroy 9:30 a.m.
	Logistic Regression (Chapter 15) PROBLEM: Estimating atrazine wash-off	Helsel 10:15 a.m.
	Wrap-up	Helsel 11:30 a.m.
	FINISHED 12:00 noon	

Fundamentals of Developing a Water Quality Monitoring Plan
August 6-7, 2015

USDA ARS Facility in Temple, Texas

Agenda

Thursday, August 6 ***9:00 a.m. to 5 p.m.***

9:00 – 9:30 a.m. **Introductions & Workshop Overview** ..... *Larry Hauck, TIAER*
Group introductions and Workshop purpose: Provide participants with the tools to develop and implement a monitoring program for watershed characterization and evaluation of water quality improvements and BMP effectiveness from implementation activities. Brief watershed overview of case studies presented throughout the day.

9:30 – 10:00 a.m. **Data Quality Objectives & Project Planning** ..... *Tina Hendon, TRWD*
Defining the water quality problem, determining monitoring objectives, and establishing data quality objectives at the outset. Long term data needs of the watershed; analytical framework to determine loadings in a watershed protection plan; routine monitoring vs. BMP evaluation (Elements H and I)

10:00 – 10:15 a.m. **Case Study:** Introduction

10:15 – 10:30 a.m. **Break**

10:30 – 11:00 a.m. **Inventorying and Acquiring Existing Resources** ..... *Sarah Eagle, TCEQ*
Review 305(b) process & existing monitoring framework
Inventory existing/historic monitoring sites & data (TCEQ, USGS, others); Acquiring existing data

11:00 – 11:45 a.m. **Watershed Characterization & Sufficient Data** ..... *Anne McFarland, TIAER*
Review/select experimental/statistical design – reconnaissance/synoptic, plot, single watershed/before-after, above-and-below watersheds, paired watersheds, multiple watersheds, trend stations
Assess ability of existing data to meet objectives & identify data gaps and data needs
Assessing # of additional sites, samples, and frequency needed

11:45 – 12:00 p.m. **Case Study:** Defining the problem, monitoring objectives, and data quality Inventorying and acquiring existing data, selecting experimental design, and assessing data sufficiency and data gaps.

12:00 – 1:00 p.m. **Lunch** *(catered lunch or bring your own)*

1:00 – 2:15 p.m. **Selecting Monitoring Design** ..... *Larry Hauck, TIAER*
Scale – point, plot, field, watershed
Sample type – grab, composite – time or flow weighted, depth integrated, continuous
Variables monitored (cost & cost cutting considerations)
Sample locations, sampling frequency, and monitoring duration
Station types – discharge measurement, water sample collection – grab vs automated, precip
Collection & Analysis Methods – collection, preservation, transport, analysis, QA/QC
Routine monitoring vs. BMP evaluation; flow and surrogates for flow
National Water Quality Monitoring Handbook

2:15 – 2:45 p.m. **Introduction to Stormwater Sampling** ..... *Daren Harmel, USDA-ARS*
Understanding the why's and how's of stormwater sampling.

2:45 – 3:00 p.m. **Break**

3:00 – 3:30 p.m. **Other Considerations & Review Building a Successful Monitoring Plan** ..... *Larry Hauck, TIAER*
Monitoring plan development to meet data quality objectives and Support Modeling; equipment; budgets; personnel constraints and available resources; and the importance of project planning.

3:30 – 4:00 p.m. **Case Study:** Selecting Monitoring Design

4:00 – 5:00 p.m. **Workshop: Create a Monitoring Plan**.....*Group*
Divide into six groups and outline and develop a monitoring plan using National WQ Handbook worksheet. [watershed assessment; effectiveness monitoring (watershed scale; BMPs)]
**EPA QA Training*

Friday, August 7 ***8:30 a.m. to 3:30 p.m.***

8:30 – 9:30 a.m. **Workshop Follow Up: Present/Discuss Monitoring Plan**.....*Group*
Each group presents monitoring plan (10 minutes per group).

9:30 – 10:00 a.m. **Quality Assurance Project Plans**.....*Lucas Gregory, TWRI*
Integrating monitoring design into QAPPs & QAPP development tips; session will also review different QAPP types and templates.

10:00 – 10:15 a.m. **Break & Travel to Monitoring Site**

10:15 – 12:00 p.m. **Monitoring Demonstrations** .....*Cypher/Tidwell/Harmel*
- *Robin Cypher (TCEQ) - routine monitoring*
- *Daren Harmel (USDA-ARS) & Russell Park - stormwater monitoring (ISCO)*
- *Travis Tidwell (Texas Stream Team) - volunteer monitoring*

**30 minutes per station*

12:00 – 1:00 p.m. **Travel to Workshop Location & Lunch** *(catered lunch or bring your own)*

1:00 – 2:00 p.m. **Statistical Tools For Analysis**.....*Anne McFarland, TIAER*
Review and demonstrate common statistical analysis for water quality data analysis. Discuss role of statistics in final reporting of data, how they are tied back to overall monitoring objectives, and use for evaluating BMP effectiveness and quantifying load reductions.

2:00 –2:30 p.m. **Uncertainty in Monitoring** ..... *Daren Harmel, USDA-ARS*

2:30 – 3:00 p.m. **Stakeholder Communications**.....*Larry Hauck, TIAER*
Determining BMPs; incorporating analysis of sampling uncertainty and translating both to stakeholders; getting information up front.
*include list of contacts for regional offices; RRC, etc. (who to contact for complaints)

3:00 – 3:30 p.m. **Wrap Up**.....*Larry Hauck, TIAER*
Discuss how monitoring folds into watershed based plans and ties back to watershed-based planning efforts.

Fundamentals of Developing a Water Quality Monitoring Plan
July 28-29, 2016
TCEQ Building A, Room 173, Austin

Agenda

Thursday, July 28 ***9:00 a.m. to 5 p.m.***

9:00 – 9:30 a.m. **Introductions & Workshop Overview** ..... *Larry Hauck, TIAER*
Group introductions and Workshop purpose: Provide participants with the tools to develop and implement a monitoring program for watershed characterization and evaluation of water quality improvements and BMP effectiveness from implementation activities. Brief watershed overview of case studies presented throughout the day.

9:30 – 10:00 a.m. **Data Quality Objectives & Project Planning** ..... *Jessica Uramkin, TCEQ*
Defining the water quality problem, determining monitoring objectives, and establishing data quality objectives at the outset. Long term data needs of the watershed; analytical framework to determine loadings in a watershed protection plan; routine monitoring vs. BMP evaluation (Elements H and I)

10:00 – 10:15 a.m. **Case Study:** Introduction ..... *Kevin Wagner, TWRI*

10:15 – 10:30 a.m. **Break**

10:30 – 11:00 a.m. **Inventorying and Acquiring Existing Resources** ..... *TBD*
Review 305(b) process & existing monitoring framework
Inventory existing/historic monitoring sites & data (TCEQ, USGS, others); Acquiring existing data

11:00 – 11:45 a.m. **Watershed Characterization & Sufficient Data** ..... *Anne McFarland, TIAER*
Review/select experimental/statistical design – reconnaissance/synoptic, plot, single watershed/before-after, above-and-below watersheds, paired watersheds, multiple watersheds, trend stations
Assess ability of existing data to meet objectives & identify data gaps and data needs
Assessing # of additional sites, samples, and frequency needed

11:45 – 12:00 p.m. **Case Study:** Defining the problem, monitoring objectives, and data quality Inventorying and acquiring existing data, selecting experimental design, and assessing data sufficiency and data gaps.

12:00 – 1:00 p.m. **Lunch** *(catered lunch or bring your own)*

1:00 – 1:30 p.m. **Quality Assurance Project Plans** ..... Jessica Uramkin, TCEQ
Integrating monitoring design into QAPPs & QAPP development tips; session will also review different QAPP types and templates.

1:30 – 2:45 p.m. **Selecting Monitoring Design** ..... *Larry Hauck, TIAER*
Scale – point, plot, field, watershed
Sample type – grab, composite – time or flow weighted, depth integrated, continuous
Variables monitored (cost & cost cutting considerations)
Sample locations, sampling frequency, and monitoring duration
Station types – discharge measurement, water sample collection – grab vs automated, precip
Collection & Analysis Methods – collection, preservation, transport, analysis, QA/QC
Routine monitoring vs. BMP evaluation; flow and surrogates for flow
National Water Quality Monitoring Handbook

2:45 – 3:00 p.m. **Break**

3:00 – 3:30 p.m. **Other Considerations & Review Building a Successful Monitoring Plan** ..... *Larry Hauck, TIAER*
Monitoring plan development to meet data quality objectives and Support Modeling; equipment; budgets; personnel constraints and available resources; and the importance of project planning.

3:30 – 4:00 p.m. **Case Study:** Selecting Monitoring Design ..... *Kevin Wagner, TWRI*

4:00 – 5:00 p.m. **Workshop: Create a Monitoring Plan** ..... *Group*
Divide into six groups and outline and develop a monitoring plan using National WQ Handbook worksheet. [watershed assessment; effectiveness monitoring (watershed scale; BMPs)]
**EPA QA Training*

Friday, July 29 ***8:30 a.m. to 3:30 p.m.***

8:30 – 9:30 a.m. **Workshop Follow Up: Present/Discuss Monitoring Plan** ..... *Group*
Each group presents monitoring plan (10 minutes per group).

9:30 – 10:00 a.m. **Introduction to Stormwater Sampling** ..... *Daren Harmel, USDA-ARS*
Understanding the why's and how's of stormwater sampling.

10:00 – 10:15 a.m. **Break & Travel to Monitoring Site**

10:15 – 12:00 p.m. **Monitoring Demonstrations** ..... *TBD /Harmel/Walker*
- *TBD (TCEQ) - routine monitoring*
- *Daren Harmel (USDA-ARS) - stormwater monitoring (ISCO)*
- *Jenna Walker (Texas Stream Team) - volunteer monitoring*

**30 minutes per station*

12:00 – 1:00 p.m. **Travel to Workshop Location & Lunch** *(catered lunch or bring your own)*

1:00 – 2:00 p.m. **Statistical Tools for Analysis** ..... *Anne McFarland, TIAER*
Review and demonstrate common statistical analysis for water quality data analysis. Discuss role of statistics in final reporting of data, how they are tied back to overall monitoring objectives, and use for evaluating BMP effectiveness and quantifying load reductions.

2:00 –2:30 p.m. **Uncertainty in Monitoring** ..... *Daren Harmel, USDA-ARS*

2:30 – 3:00 p.m. **Stakeholder Communications** ..... *Larry Hauck, TIAER*
Determining BMPs; incorporating analysis of sampling uncertainty and translating both to stakeholders; getting information up front.
*include list of contacts for regional offices; RRC, etc. (who to contact for complaints)

3:00 – 3:30 p.m. **Wrap Up** ..... *Larry Hauck, TIAER*
Discuss how monitoring folds into watershed based plans and ties back to watershed-based planning efforts.