

**Texas State Soil and Water Conservation Board
 State Nonpoint Source Grant Program
 FY 2019 Workplan 19-51**

| SUMMARY PAGE | | | |
|---|--|---|------------------------|
| Title of Project | Update and Enhance the Texas Best Management Practice Evaluation Tool | | |
| Project Goals | Update and convert the Texas Best Management Practice Evaluation Tool (TBET) to an open platform web application. This tool is designed to assist land managers and agency planners in conservation practice decision-making related to on-farm (field-scale) alternatives and effectiveness and facilitate evaluation and reporting of agricultural nonpoint source load reductions from WQMP implementation. | | |
| Project Tasks | 1. Project Administration; (2) Implement TBET in an open platform web application | | |
| Measures of Success | Ability to easily run TBET software on an open platform web application platform. The Texas BMP Evaluation Tool effectively provides alternative BMP choices in WQMP development based on environmental impact and efficiently and accurately estimates load reductions from selected BMPs prescribed in WQMPs. | | |
| Project Type | Implementation (); Education (); Planning (); Assessment (X); Groundwater () | | |
| Status of Waterbody on <i>2014 Texas Integrated Report</i> | <u>Segment ID</u> All Watersheds in Texas | <u>Parameter of Impairment or Concern</u> sediment, forms of N and P | <u>Category</u> all |
| Project Location (Statewide or Watershed and County) | Statewide | | |
| Key Project Activities | Hire Staff (); Surface Water Quality Monitoring (); Technical Assistance (); Education (); Implementation (); BMP Effectiveness Monitoring (); Demonstration (); Planning (X); Modeling (X); Bacterial Source Tracking (); Other () | | |
| <i>2017 Texas NPS Management Program Reference</i> | <ul style="list-style-type: none"> • Component 1: LTG • Component 1: STG 1C | | |
| Project Costs | \$89,636 | | |
| Project Management | Texas A&M University Spatial Sciences Lab | | |
| Project Period | February 1, 2019 – February 28, 2021 | | |

Part I – Applicant Information

| Applicant | | | | | | | |
|------------------|-----------------|--|--------------|-------|------------|----------|------------|
| Project Lead | | Dr. R. Srinivasan | | | | | |
| Title | | Director, Texas A&M Spatial Sciences Laboratory | | | | | |
| Organization | | Texas A&M University Department of Ecosystem Sciences and Management | | | | | |
| E-mail Address | | r-srinivasan@tamu.edu | | | | | |
| Street Address | | Texas A&M University Mail Stop 2120, 534 John Kimbrough Bldg. 305 | | | | | |
| City | College Station | County | Brazos | State | TX | Zip Code | 77843-2120 |
| Telephone Number | | | 979-777-9822 | | Fax Number | | |

| Project Partners | |
|--|--|
| Names | Roles & Responsibilities |
| Texas State Soil and Water Conservation Board (TSSWCB) | Provide state oversight and management of all project activities and ensure coordination of activities with related projects and TCEQ. |
| Texas A&M University Spatial Sciences Laboratory (SSL) | Conduct all project activities and ensure coordination of activities with TSSWCB |

Part II – Project Information

| Project Type | | | | | | | | | |
|--|-------------------------------------|-------------|--------------------------|--|--|----------------|--------------------------|----|-------------------------------------|
| Surface Water | <input checked="" type="checkbox"/> | Groundwater | <input type="checkbox"/> | | | | | | |
| Does the project implement recommendations made in (a) a completed WPP, (b) an adopted TMDL, (c) an approved I-Plan, (d) a Comprehensive Conservation and Management Plan developed under CWA §320, (e) the <i>Texas Coastal NPS Pollution Control Program</i> , or (f) the <i>Texas Groundwater Protection Strategy</i> ? | | | | | | Yes | <input type="checkbox"/> | No | <input checked="" type="checkbox"/> |
| If yes, identify the document. | | | | | | | | | |
| If yes, identify the agency/group that developed and/or approved the document. | | | | | | Year Developed | | | |

| Watershed Information | | | | |
|------------------------------|---------------------------------|------------|---------------------|--------------|
| Watershed or Aquifer Name(s) | Hydrologic Unit Code (12 Digit) | Segment ID | Category on 2014 IR | Size (Acres) |
| Statewide | N/A | N/A | N/A | N/A |

| Water Quality Impairment |
|---|
| Describe all known causes (i.e., pollutants of concern) and sources (e.g., agricultural, silvicultural) of water quality impairments or concerns from any of the following sources: <i>2014 Texas Integrated Report</i> , Clean Rivers Program Basin Summary/Highlights Reports, or other documented sources. |
| This project will have impact on water quality impairments statewide related to agricultural nonpoint sources including N, P and sediment. |

Project Narrative

Problem/Need Statement

The TSSWCB, SWCDs, and USDA-NRCS have been collaborating with agricultural producers [cooperators] to implement best management practices (BMPs) to protect natural resources on Texas farms and ranches for decades. Through the TSSWCB Water Quality Management Plan (WQMP) Program, technical assistance is provided by TSSWCB Regional Office staff, SWCD Technicians, and USDA-NRCS Field Office staff [planners] to assist cooperators in developing and implementing whole-farm, resource management systems (WQMPs). A WQMP is a site-specific plan which includes a suite of appropriate land treatment practices, production practices, management measures, and technologies that prevent and abate agricultural and silvicultural nonpoint source (NPS) water pollution. The BMPs prescribed in a WQMP are defined in the USDA-NRCS Field Office Technical Guide (FOTG). The FOTG represents the best available technology and is tailored to meet the needs of local SWCDs.

Conservation planners need simple, accurate, web-accessible tools to guide conservation practice implementation and increase cost-effectiveness. The method/platform should use public data sources and methods and should be capable of supporting analyses of multiple types of water quality concerns, including runoff, sediment and nutrients (N and P forms). The method/platform should be a free and open-source, internet-accessible, and use a point-and-click interface and powerful output visualization tools.

Project Narrative

General Project Description (Include Project Location Map)

The Texas BMP Evaluation Tool allows conservation planners and land managers to take advantage of the predictive power of a complex hydrologic water quality model to develop better WQMPs by evaluating the water quality impact arising from proposed BMPs. The Tool allows TSSWCB to better gauge the programmatic effectiveness (fiscal and environmental) of the WQMP Program and associated state and federally sponsored cost-share funding mechanisms.

The Texas BMP Evaluation Tool is simple enough, yet scientifically valid, so that cost-effective conservation practice alternatives can be examined and appropriate options chosen based on field-specific soil, crop, livestock, and climatic information. The Tool provides scientifically-valid estimates of the environmental effects of conservation practices, i.e., impacts on water quality. These estimates will provide resource conservation savings (for example tons of soil saved or lbs of P kept out of streams).

The overall objective of this project is to convert the Texas Best Management Practice Evaluation Tool (TBET) to an open platform web application. Through this project SSL will modify and update TBET to operate in an open platform web application.

| Tasks, Objectives and Schedules | | | |
|---------------------------------|--|---------|-----------------|
| Task 1 | Project Administration | | |
| Costs | \$12,575 | | |
| Objective | To effectively administer, coordinate and monitor all work performed under this project including technical and financial supervision and preparation of status reports. | | |
| Subtask 1.1 | SSL will prepare electronic quarterly progress reports (QPRs) for submission to the TSSWCB. QPRs shall document all activities performed within a quarter and shall be submitted by the 1 st of December, March, June and September. QPRs shall be distributed to all Project Partners. | | |
| | Start Date | Month 1 | Completion Date |
| Subtask 1.2 | SSL will perform accounting functions for project funds and will submit appropriate Reimbursement Forms to TSSWCB at least quarterly. | | |
| | Start Date | Month 1 | Completion Date |
| Subtask 1.3 | SSL will host meetings or conference calls, at least quarterly, with Project Partners to discuss project activities, project schedule, communication needs, deliverables, and other requirements. will develop lists of action items needed following each project coordination meeting and distribute to project personnel. | | |
| | Start Date | Month 1 | Completion Date |
| Deliverables | <ul style="list-style-type: none"> • QPRs in electronic format • Reimbursement Forms and necessary documentation in either electronic or hard copy format | | |

| Tasks, Objectives and Schedules | | | |
|---------------------------------|---|----------|-----------------|
| Task 2 | Convert the Texas Best Management Practice Evaluation Tool (TBET) to an open platform web application. | | |
| Costs | \$77,061 | | |
| Objective | Develop an open platform web application to host the Texas Best Management Practice Evaluation Tool (TBET). | | |
| Subtask 2.1 | Research how to handle running TBET model/long running tasks on the backend. | | |
| | Start Date | Month 1 | Completion Date |
| Subtask 2.2 | Design and implement database for storing data as needed for TSSWCB. | | |
| | Start Date | Month 4 | Completion Date |
| Subtask 2.3 | Implement backend web api for connecting to the database, storing/retrieving data, launching model run task, and running long calculations tasks and the model. | | |
| | Start Date | Month 13 | Completion Date |
| Subtask 2.4 | Create user interface using a javascript framework, hook up user interface, user database and permissions/roles to backend web api and front end. | | |
| | Start Date | Month 18 | Completion Date |
| Deliverables | <ul style="list-style-type: none"> • Operational TBET software in an open platform web application. | | |

Project Goals (Expand from Summary Page)

Conservation planners need simple yet accurate tools to predict sediment and nutrient losses from agricultural fields to guide conservation practice implementation and increase cost-effectiveness. The Texas Best Management Practice Evaluation Tool (TBET), which serves as an input/output interpreter and vastly simplified interface for the Soil and Water Assessment Tool (SWAT), was developed to predict mean annual runoff, sediment, nitrogen (N), and phosphorus (P) losses from agricultural fields in Texas under a variety of management scenarios and conservation practices. In its current configuration, TBET is not as secure as it needs to be for TSSWCB applications. As a result, it needs to be incorporated into an open platform web application using a point-and-click interface and powerful output visualization tools.

Measures of Success (Expand from Summary Page)

This project will be considered a success if it substantially increases the ability of TSSWCB staff and cooperators to easily and cost-effectively conduct spatially explicit assessments of the impacts of conservation practices on nonpoint sources of sediment, and nutrient contamination of Texas streams, rivers, and reservoirs.

2017 Texas NPS Management Program Reference (Expand from Summary Page)

Components, Goals, and Objectives

Component 1-Explicit short and long term goals, objectives, and strategies to restore and protect surface and groundwater, as appropriate.

Long Term Goal- Protect and restore water quality affected by nonpoint source pollution through assessment, implementation, and education. Objective B- Support the implementation of state, regional, and local programs to prevent nonpoint source pollution through assessment, implementation and education.

Short-Term Goal One – Data Collection and Assessment. Coordinate with appropriate federal, state, regional, and local entities, and stakeholder groups to target water quality assessment activities in high priority, NPS-impacted watersheds, vulnerable and impacted aquifers, or areas where additional information is needed.

Short-Term Objective: Evaluate the condition of the state's waters, on a biennial basis, and prepare a report containing this evaluation, as required by CWA §305(b) Texas Nonpoint Source Management Program 24 to determine: a) waters not meeting water quality standards due, at least in part, to NPS pollution, and b) the cause of the impairment or degradation. C. Conduct special studies to determine sources of NPS pollution and gain information to target water quality planning and BMP implementation.

Part III – Financial Information

| Category | Total |
|------------------------|-----------|
| Personnel | \$ 56,347 |
| Fringe Benefits | \$ 16,904 |
| Travel | \$ 0 |
| Equipment | \$ 0 |
| Supplies | \$ 4,693 |
| Contractual | \$ 0 |
| Construction | \$ 0 |
| Other | \$ 0 |
| Total Direct Costs | \$ 77,944 |
| Indirect Costs (≤ 15%) | \$ 11,692 |
| Total Project Costs | \$ 89,636 |

Budget Justification Texas A&M Agrilife Research

| Category | Total Amount | Justification |
|-----------------|--------------|---|
| Personnel | \$ 56,347 | Senior Programmer – 3 months = \$20,500 Junior Analyst – 5 months = \$16,250 Principle Research Scientist – 1 month = \$19,597 *named positions are budgeted with a 3% annual pay increase in all years; TBD positions and graduate students are budgeted with a 3% pay increase in years after year 1 *(Salary estimates are based on average monthly percent effort for the entire contract. Actual percent effort may vary more or less than estimated between months; but in the aggregate, will not exceed total effort estimates for the entire project.) |
| Fringe Benefits | \$ 16,904 | For fulltime staff such as Senior/junior programmer, and Scientists the fringe benefits are calculated @30% of their monthly salary *(Fringe benefits estimates are based on salary estimates listed. Actual fringe benefits will vary between months coinciding with percent effort variations; but in the aggregate, will not exceed the overall estimated total.) |
| Travel | \$ 0 | N/A |
| Equipment | \$ 0 | N/A |
| Supplies | \$ 4,693 | A server to host the TBET software |
| Contractual* | \$ 0 | N/A |
| Construction | \$ 0 | N/A |
| Other | \$ 0 | N/A |
| Indirect | \$ 11,692 | 15% of Modified Total Direct Cost |