WATER SUSTAINABILITY ASSESSMENT IN THE TRINITY RIVER BASIN: DEVELOPING AND DEPLOYING A SYSTEMS APPROACH TO UNDERSTANDING CONSERVATION IMPACTS

"The scarcity of usable freshwater on our planet and its uneven distribution makes the sustainable management of this life-preserving resource a necessity."
-M. Erechtchoukova

The Texas A&M AgriLife Research – Blackland Research & Extension Center in Temple, Texas has partnered with Trinity Waters and its cooperators to embark on the critical mission of assessing the effects of watershed and land conservation on water sustainability in the Trinity River basin of Texas. The Trinity River basin runs from its headwaters in north-central Texas and empties into Trinity Bay along the Texas Gulf Coast. On its journey the river touches over 40% of the state's population running through both the Dallas/Fort Worth metroplex and the greater Houston/Galveston region. Though these two major metropolitan areas are highly affected, the majority of the basin remains in more traditional rural ecosystems; thus, the management and conservation of these landscapes are critical to the long-term sustainability and performance of this vital Texas resource. Understanding the effects of land management on water sustainability will provide valuable information to decision-makers and stakeholders as the region continues to expand in both population and economic importance to the State, Nation and world.

Watershed Assessment

Sustainable management of the water resource requires reliable information on its availability and the implications of decisions made with respect to its usage. One of the main avenues of information is the collection of direct measurements across the watershed in a systematic and standardized manner.

Objectives of Watershed Assessment

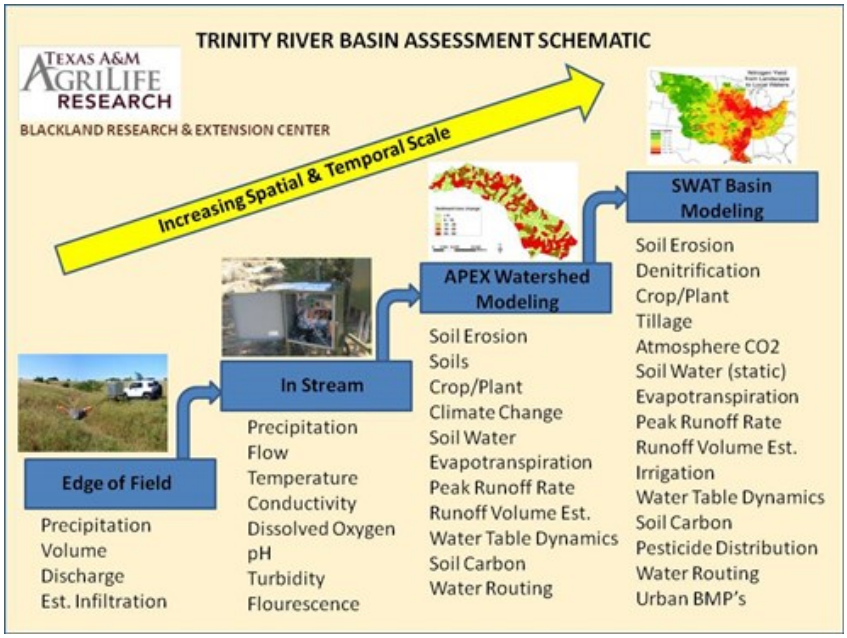
1)Assess trends of key quality/quantity parameters

2)Monitoring attainment of water quality standards

3)Estimation of mass discharge across landscapes

4)Assess environmental effects of conservation

5)General surveillance to flag emerging issues/benefits

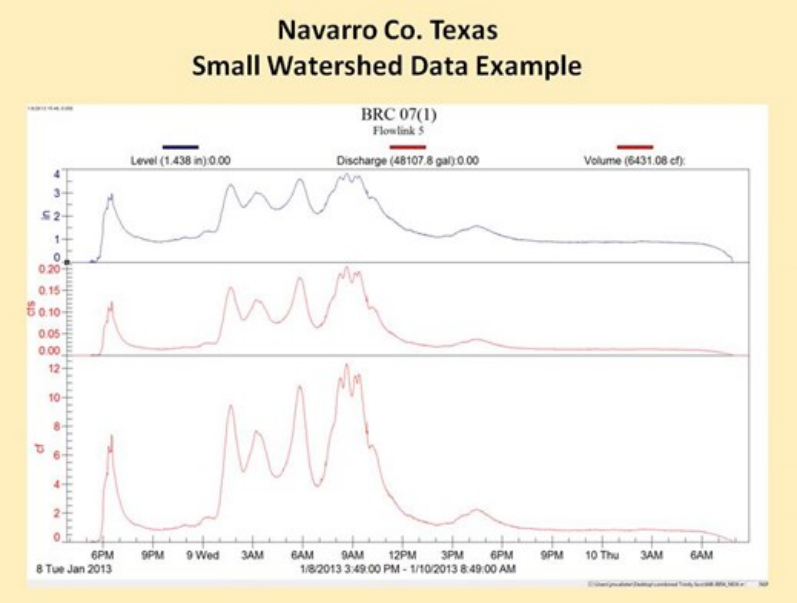


Assessment Strategy

Through the use of a multi-tiered approach, BREC scientists in collaboration with TW and its partners will deploy an assessment network of data collection that ranges from edge of field to in-stream collection. This empirical data can then be used to calibrate and validate globally accepted hydrologic models that provide decision support at the watershed and basin spatial and temporal scales. The combination of field based data with model generated results can then be used by decision-makers and stakeholders in the development of policy that improves the sustainability of the resources.

Metrics & Data Collection

Water sustainability assessment requires a data collection system across multiple spatial and temporal scales and with the addition of parameters measured, an ever increasing cost of collecting information. Our efforts will focus on the "simple" variables of precipitation, volume, discharge and estimated infiltration across multiple representative landscapes in the watershed (i.e. pristine prairie, restored grassland, improved pasture, urban systems). These "simple" variables can act as indicators of basic hydrology and also provide inference that would indicate a need for more detailed measurement. This approach seeks to optimize data collection efficiency costs while indicating if/where more detailed study may be needed.



Watershed Strategy

Tying together multiple, ongoing monitoring efforts with this programs landscape and instream systems assessing impacts of land management and conservation activities provides a powerful tool for decision-makers and stakeholders in the future management of our State's water resources. This strategy provides flexibility and precision with the ability to be transferred to other watersheds with similar management challenges. Building upon our common effort, watershed assessment for sustainability can build towards a stronger future for our State, Nation and the globe.