



San Marcos River: Spring Lake Watershed Characterization

Water Body	Headwaters of the Upper San Marcos River (Seg 1814)
Location	Hays County
River Basin	Guadalupe River (18)
Contractor	Texas State University - River Systems Institute (RSI)
Project Period	August 18, 2009 to December 31, 2012
Project Total	\$489,483 (Federal 60% and Local Match 40%)

Background

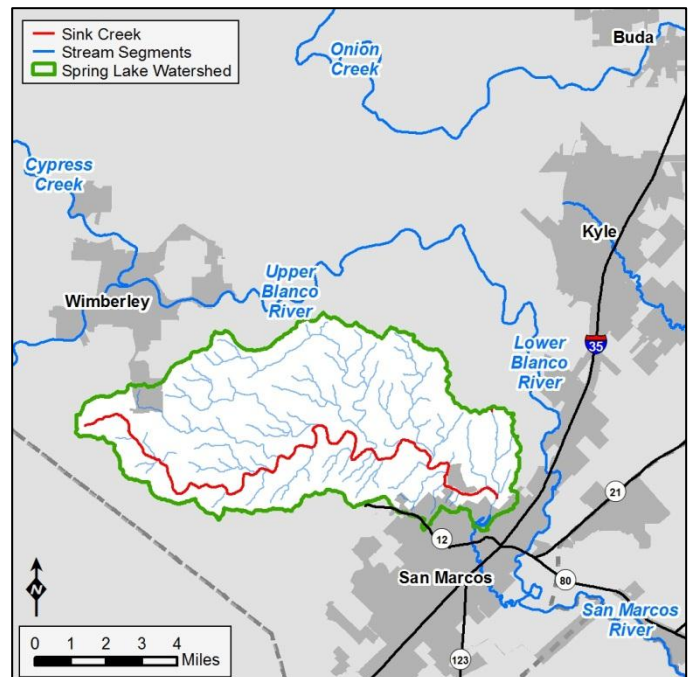
The San Marcos River is an ecologically unique spring-fed ecosystem located along the margin of the Edwards Plateau in central Texas. Spring Lake, located in the City of San Marcos, is the headwaters of the San Marcos River where artesian spring water from the Edwards Aquifer emerges into the lake from approximately 200 openings. This spring system is the second-most productive in the state and has only one significant surface water tributary, Sink Creek.

Due to the relatively large spring water influence, Spring Lake and the upper river reaches are characterized by clear water, abundant and productive macrophytes, and a relatively large number of endemic and native species. However, the potential sensitivity of the headwaters to environmental disturbance, and the limited geographic range of many of the spring-adapted organisms, has led to the designation of five federally-listed species as endangered or threatened.

What is known is that despite the system's high ecological, economic, and cultural value, Spring Lake and the upper San Marcos River experience increased turbidity and major algal blooms following substantial rainfall events and the associated increases in surface and subsurface flows. While there is an obvious and sometimes persistent deterioration of water quality during and after periods of high surface and ground water inputs to the lake, the relative pollutant load contributions of these sources in the watershed is unknown. Thus, determination of the relative nutrient and sediment inputs to the lake from the various hydrological sources is critical for the management and preservation of the lake.

Project Description

The RSI obtained event-based water quality and hydrologic data in order to target sources of nutrient inputs to Spring Lake and determine the influence of various sources of water on the algae and turbidity of



Spring Lake. This was accomplished through: continuous monitoring at the major spring openings in the lake; a Storm Flow Monitoring Program in the Sink Creek watershed; periodic sampling to examine spatial and temporal patterns of nutrients within the lake; and a land use analysis of the Spring Lake watershed. This data was incorporated into a Watershed Characterization Report, including potential management strategies, and was presented to stakeholders for input.

Current Status

The project was completed. A final stakeholder meeting was held December 2012 to review project results and stakeholder recommendations. In addition, the next phase, a watershed protection plan (WPP) for the entire Upper San Marcos River was introduced. The Upper San Marcos WPP process will kick-off in 2013.

For More Information

TCEQ Project Manager

Jack Higginbotham
512.239.6699; Jack.Higginbotham@tceq.texas.gov

Texas State University Project Managers

Mary Van Zant
512.235.7551; waters@txstate.edu

Dr. Weston Nowlin
512.245.8794; wnowlin@txstate.edu

Dr. Benjamin Schwartz
512.245.7608; bs37@txstate.edu

Project Highlights

- 08/2010 – Stakeholder process for Upper San Marcos, focusing on Spring Lake was initiated. The Upper San Marcos Coordinating Group met monthly.
- 06/2011 – The monitoring quality assurance project plan (QAPP) was completed.
- 07/2012 – The modeling QAPP was completed.
- Summer & Fall 2012 – Task Reports were presented to stakeholders for feedback and comments.
- 12/2012 – The final comprehensive report was released and final stakeholder meeting held.