

River Systems Institute

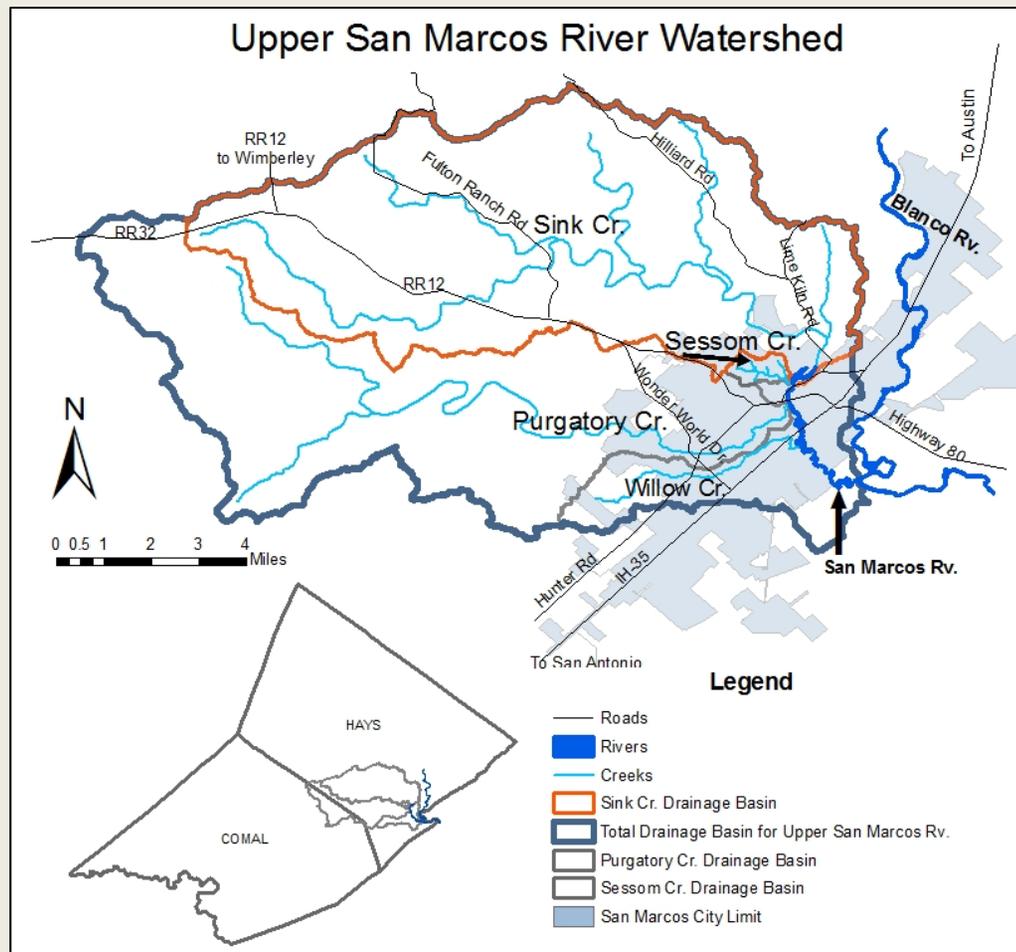
UPPER SAN MARCOS RIVER PROJECTS



Contact us:
River Systems Institute
601 University Drive
San Marcos, TX 78666-
4616

Phone: 512-245-9200
www.rivers.txstate.edu
rivers@txstate.edu

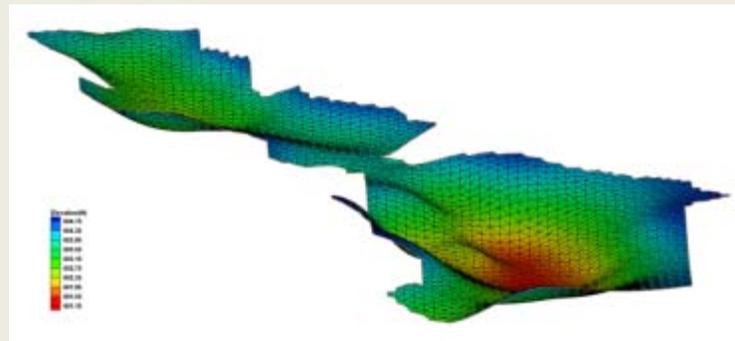
THE PROJECTS



- San Marcos Observing System (SMOS) 2009 - 2011
- Spring Lake Watershed Characterization and Management Recommendations Report 2010 - 2012
- Upper San Marcos Watershed Protection Plan 2012 - 2015

PHYSICAL

- Aquatic Vegetation
- Canopy and Shade
- River Channel Topography
- Riverbed Subsurface



HYDROLOGIC & GEOCHEMICAL



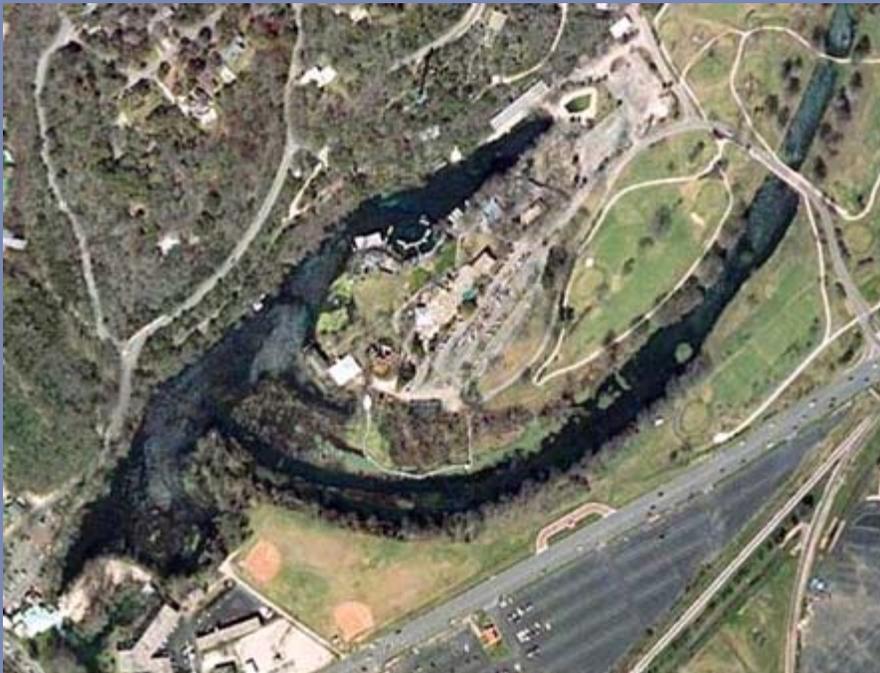
- Sediment and dissolved nutrient loads from storm events
 - To determine how different springs respond in Spring Lake
 - Monitoring and groundwater collection samples are taken from wells in the Sink Creek drainage
 - Continuous and event data is collected from Sessom Creek

BIOLOGICAL



- Determine spatial and temporal trends in occurrence and abundance of macrophytes, macroinvertebrates, and fishes within the upper San Marcos River
- Assess spatial and temporal trends in habitat associations of the upper San Marcos aquatic community

SPRING LAKE WATERSHED CHARACTERIZATION AND RECOMMENDATIONS REPORT



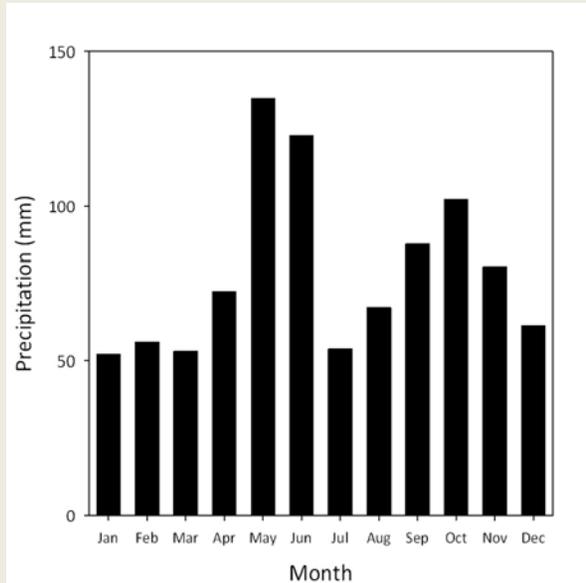
Obtain data
in order to
target
nutrient
inputs to
Spring Lake

Determine
the
influence of
various
sources of
water on
the algae
and
turbidity of
Spring Lake

COMPONENTS

- This project combines data collection and a stakeholder process to result in a Watershed Characterization
 - Phase I is an Existing Data Inventory
 - Phase II is a Data Analysis of new Data Collected in the Project
 - Phase III is an Estimation of Load Reductions

WATERSHED CHARACTERIZATION – PHASE 1: DATA INVENTORY



Mean monthly precipitation at the City of San Marcos (1946 – 2011).

- A Watershed Inventory
- Geographic Representation
- Evaluation of Sink Creek Watershed Land Use Patterns
- Evaluation of NPS groundwater source regions

WATER QUALITY DATA COLLECTION AND MONITORING – PHASE II

- **Continuous Monitoring Program Site Locations and Installation utilizing In-Situ TROLL 9500 Professional-XP customizable probes to collect the following data:**
 - Dissolved oxygen (mg/L)
 - Specific conductance ($\mu\text{S}/\text{cm}$)
 - Temperature ($^{\circ}\text{C}$)
 - pH/oxidation-reduction potential (E_h)
 - Depth (m)
 - Turbidity – self cleaning (NTU).
- **Storm Flow Monitoring Program at 4 locations in Sink Creek**
 - Total phosphorus (TP) concentration
 - Total nitrogen (TN) concentration
 - Nitrate-N
 - Ammonium-N concentration
 - Orthophosphorus (Ortho-P) concentration
 - Total suspended solids (TSS) and/or non-volatile suspended solids (NVSS)
 - Turbidity
 - *Escherichia coli* (*E. coli*).
- **Periodic Monitoring Program via Grab samples**
 - TP concentration
 - TN concentration
 - Nitrate-N concentration
 - Ammonium-N concentration
 - Ortho-P concentration
 - TSS and/or NVSS
 - Turbidity
 - E. Coli

WATERSHED CHARACTERIZATION – PHASE III: IDENTIFICATION OF CAUSES AND SOURCES OF POLLUTION AND ESTIMATION OF POLLUTANT LOADS REPORT

- Watershed Goals and Targets/Management Objectives
- Identify Causes and Sources of Pollution
- Identify Existing Management Efforts
- Estimate Pollutant Loads
- Identify Potential Critical Areas and General Management Measures Which Could Lead to Load Reductions
- Geographic Representation

UPPER SAN MARCOS WATERSHED PROTECTION PLAN

This water body is impaired for elevated TDS, and a WPP will explore management impacts to surface and groundwater resources.

COMPONENTS

- A Stakeholder Process
- Utilize Data from Past Projects: SMOS & Spring Lake
- Modeling and New Data Collection to identify Causes and sources of pollution
- Estimating expected pollution reduction levels
- Identifying critical areas of the watershed
- Describing management measures needed
- Estimating the costs of technical assistance and sources of funding
- Outlining an education outreach component
- Developing a feasible implementation schedule
- Establishing milestones to assess the effectiveness of plan implementation
- Developing criteria for assessing success
- And establishing a long-term monitoring effort

- SMOS:

<http://www.smos-rsi.org/>

- Spring Lake Watershed Characterization (under construction):

<http://www.rivers.txstate.edu/research/rivers/san-marcos-river-projects/spring-lake-watershed-characterization.html>

- And USMWPP (under construction)

http://www.rivers.txstate.edu/research/rivers.html#san_marcos_river

PROJECT
WEBSITES

Thank You

Presented by: Mary Van Zant
waters@txstate.edu
512-245-7551
www.rivers.txstate.edu