



Texas State University System Water Overview

Dr. Andrew Sansom
Executive Director

Presentation to Texas Water Development Board



THE MEADOWS CENTER
FOR WATER AND THE ENVIRONMENT
TEXAS STATE UNIVERSITY



SUL ROSS
SR
STATE UNIVERSITY



THE MEADOWS CENTER FOR WATER AND THE ENVIRONMENT

Rio Grande Research Center



- Create a basin-wide perspective for the sustainable use of water resources within the bi-national Rio Grande watershed.
- Conduct sustainable agricultural water conservation.
- Foster intergovernmental, academic and stakeholder collaboration.
- Conduct outreach and education about the sustainable use of natural resources.



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Sustainable Agricultural Water Conservation

- Collaboration with
 - Lamar University
 - Sam Houston State University
 - Texas State University
 - National Park Service
 - Texas Agrilife
 - Texas A&M
 - New Mexico State University
 - Texas Parks & Wildlife
 - UT-Pan American
 - Rocky Mountain Bird Observatory
 - Utah State University Trans-Pecos Water Trust
 - Brewster County Ground Water District



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Sustainable Agricultural Water Conservation

- Identification and analysis of alternative technologies and methodologies for increasing water use efficiency in agricultural irrigation practices.



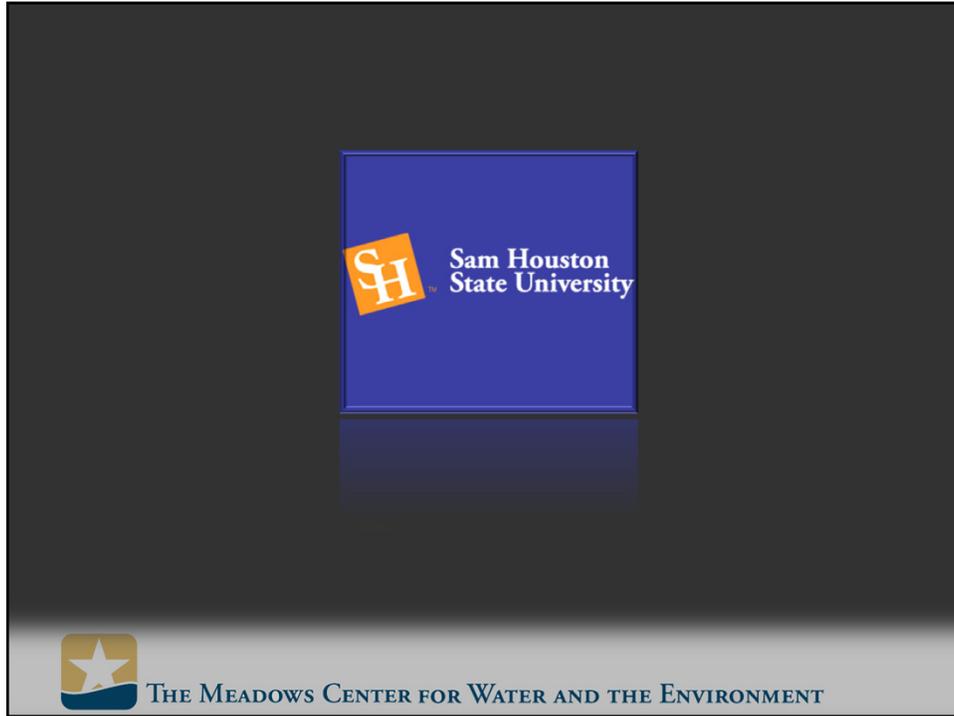
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Deployable Aerobic Aqueous Bioreactor

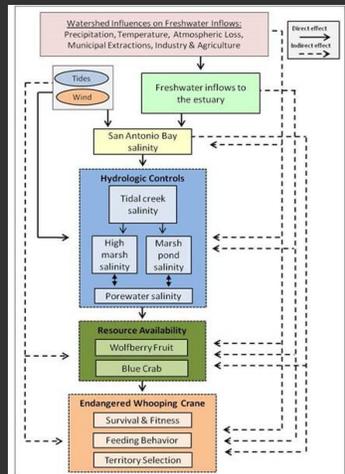
- Wastewater treatment system with high efficiency in a small, modular unit designed to fit within a 20x40 cargo container for transport and use anywhere.
- Collaboration between
 - Texas Institute for Environmental Studies at Sam Houston State
 - Sul Ross State University Department of Biology
 - Lamar University Department of Civil Engineering
 - Army Corps of Engineers Engineer Research and Development Command



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Aquatic Ecosystems Ecology Lab



- Research to apply a broad, holistic ecosystem approach to understanding how hydrologic connectivity and other environmental drivers (both natural and anthropogenic) work to impact coastal marsh processes at varying spatial and temporal scales



Ecosystems, Species, and Wastewater Treatment

- Development of a portable wastewater treatment unit
- Research on ecosystem dynamics around Aransas Bay caused by drought and anthropomorphic changes that affect the endangered whooping crane.



- Research on invasive fish species in West Texas and the Red River.



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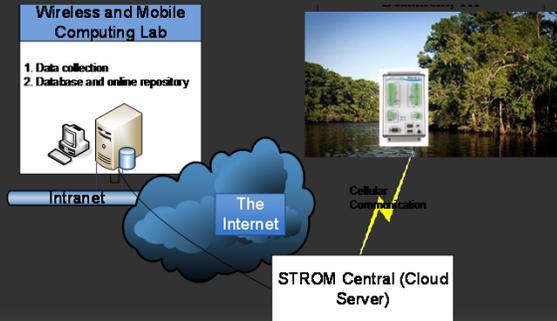
LAMAR UNIVERSITY



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Wireless Sensor Network for Measurement, Modeling, and Prediction in Water Resource Management.

- Accomplish a potentially transformative change in water resource management through application of state-of-the-art Wireless Sensor Networks technology.
- Apply real-time and large-scale water quantity and quality data to characterize interactions among water resources, climate changes, and human impacts, thus providing more accurate prediction for water resource management under different climate scenarios.



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- Investigate Fluid-Hydraulic Structure Interactions and Gulf Highway 87 Shoreline Protections using a tool that simulates river and other geologic processes with remarkable accuracy.



- Provide scientific assessment and technical knowledge for solving wake wash issues, such as its impact on moored ships, coastline erosion, and dike safety.



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- Process Evaluation of Biogas Production for Sustainable Waste Management in Refineries and Paper Industries
- Impact of Global Climate Change on the Precipitation and Acid Deposition in the Rio Grande River Basin Region



- Development & Optimization of Decentralized Wastewater Treatment Systems for Forward Military Operations



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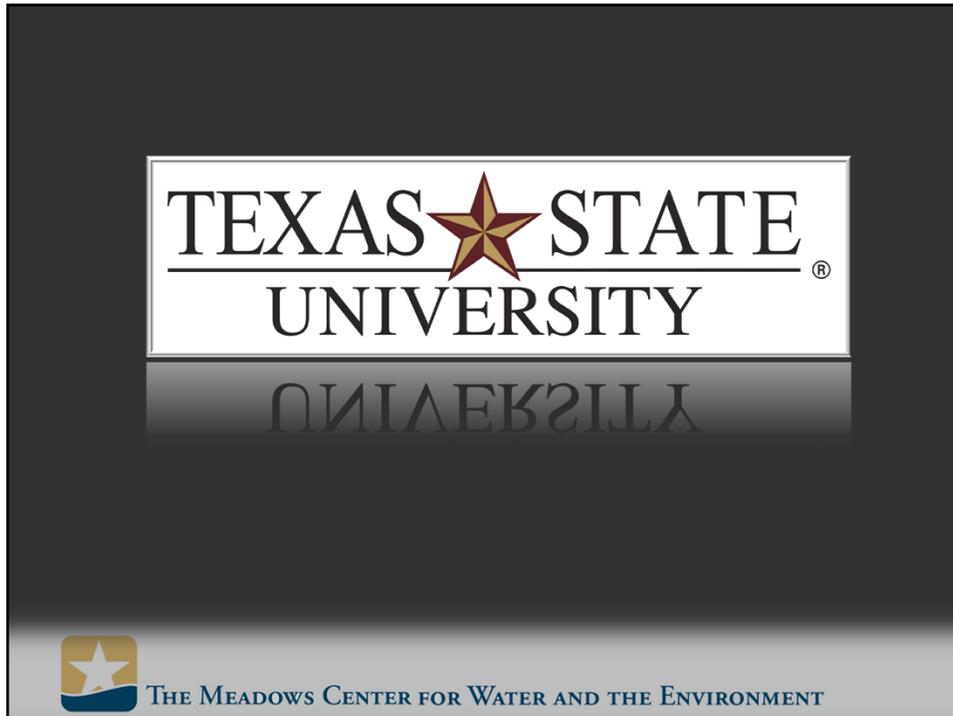


'Nutrient transport and water quality monitoring in the Sabine Lake Bayous'

by Xing Fang (Department of Civil Engineering, College of Engineering, Lamar University), Texas Water Development Board contracted report number 2000483322 (2000).



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Research

Environmental
Flows

Groundwater

Watershed
Protection and
Management

Conservation



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Underwater Archaeological and Scientific Exploration



Monterrey Ship Wreck - Cannon



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Stewardship

Spring Lake
Restoration

Endangered
Species

Cultural
Resources



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Service and Conservation

Texas Stream
Team

Environmental
Policy

Negotiation
and Mediation



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Education

125,000 Visitors
Annually

Conferences

Two Major Book
Series

Conservation
Leadership



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High-Tech Experiential Education

Prototype
Technology
Integration and
Use

- Technology integration test bed
- Accommodate :
 - 17,500 K-12 students in class groups
 - 125,000 children and adults unguided



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High-Tech Experiential Education

- iPad – iPhone for outdoor aquatic science instruction

- Species ID Key
- GPS Photo Scavenger Hunt
- Journaling
- Social-Network Ready
- Games
- Teacher-Friendly,
- QR Code Scanner
- Documents,
- Videos
- Photos
- Links



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SAN MARCOS, Texas (KXAN) — Scientists from Texas State University are part of a command center watching live underwater cameras exploring four shipwrecks sunken in the Gulf of Mexico.

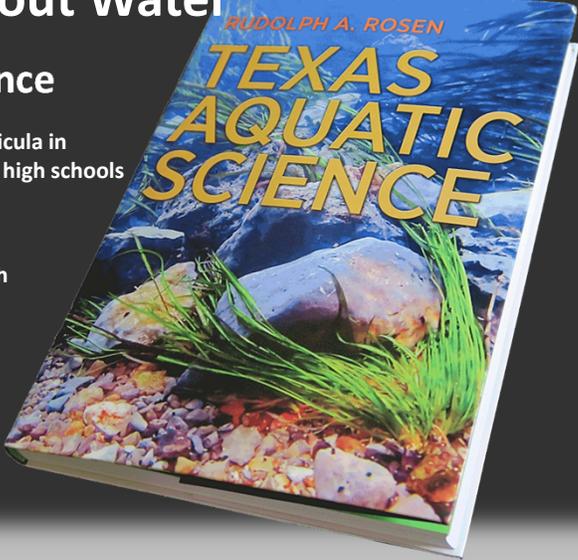


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Effective Pathway for Teaching about Water

Texas Aquatic Science

- Texas' first comprehensive curricula in Aquatic Science for middle and high schools students
- Meets all state standards for education and concurrence with TEKS
- Most extensive curricula of its kind in the nation
- Invited review by all Tx Science Teachers as developed



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Dr. Thom Hardy's Recent TWDB Projects



- Publication with A&M Press of *Texas Riparian Areas*, 2011-2012: \$38,500
- Environmental Flows, Colorado/Lavaca Rivers -Freshwater from the Colorado River to East Matagorda Bay Project (An Evaluation of the Use of Siphons or Pipelines to Deliver Local Inflows to East Matagorda Bay), 2014-2105: \$62,500
- Evaluation of the Use of Channel Cross-Section Data to Estimate Instream Flow Requirements (Creation of a database of historic rivers cross sectional data from Texas river systems database suitable to allow development of a classification scheme), 2010-2014: \$36,000

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Meredith Miller Senior Program Coordinator



- Design, Permitting and Installation of Subdivision-Scale Rainwater Harvesting Systems as a Water Supply Strategy for the Texas Hill Country, 2011-2013: \$73,710 (with an additional \$33,000 match)



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