

## **Selected Nutrient Projects and Related Projects in Texas**

Nutrient Criteria Development Advisory Workgroup June 20, 2011  
Texas Commission on Environmental Quality Water Quality Standards

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### **Current TCEQ Contract Projects**

1. Texas Nutrient Criteria Development Support Project

George Guillen, Ph.D., Principal Investigator, University of Houston Clear Lake

This project includes a historical review of all nutrient data collected and major nutrient/eutrophication studies performed in Texas on all water body types (excluding reservoirs) and a review of the detailed numerical nutrient criteria plans developed by other states for all water body types.

2. Texas Nutrient Data Collection

Larry Beran, Ph.D., Principal Investigator, Texas AgriLife Research Stephenville

This project involves the sampling of attached periphyton and nutrients at 30 established streams sites in the Lower Brazos River, Lower Colorado River, and Brazos/Colorado Coastal River basins. The project examined the use of quantitative and qualitative periphyton techniques in June and July, 2010, resulting in the first year report "Analysis and Summary of Data Collection Methods for Nutrients in Texas Streams". This project will continue sampling for two sampling events this summer. *Database Analysis to*

3. Support Nutrient Criteria Development

Brian E. Haggard, Ph.D., Principal Investigator; J. Thad Scott, Ph.D., Co-Principal Investigator; and Michelle Evans-White, Ph.D., Co-Principal Investigator  
University of Arkansas

This project will provide analysis of water quality data and information in Texas streams and rivers to assist the Water Quality Standards Staff in the development of numerical nutrient criteria by providing advanced statistical analysis of data, technical support, and expertise to investigate methodologies and options for numeric nutrient criteria development.

### **Current Surface Water Quality Monitoring TCEQ Projects**

1. Texas Aquatic Ecoregion Project: Water Quality, In-stream Habitat, Biotic Integrity and Riparian Characteristics of Least Disturbed Streams in Texas

Bill Harrison, Surface Water Quality Monitoring, TCEQ Project Manager

This project is a continuation of the Texas Aquatic Ecoregion Project that originated in the early to mid-1980s. Since the late 1980's, sampling in least disturbed ecoregion reference streams has decreased. This study will consolidate and evaluate data collected since the original study and conduct additional surveys to further evaluate the current condition of least disturbed streams. During the upcoming 2011 sampling events, periphyton survey techniques may be incorporated to further the available data for possible use in criteria development.

## Other Projects in Texas

1. Linking Observational and Experimental Approaches for the Development of Regional Nutrient Criteria for Wadeable Streams, August 2009, Environmental Protection Agency EPA Region 6 Report  
Ryan King, Ph.D., Principal Investigator, Baylor University

Project "employed a novel approach to developing a defensible, effects-based numerical target concentration of surface-water nutrients for wadeable streams in the Cross Timbers portion of Aggregate Nutrient Ecoregion IX." The project "relied on integration of collected field data from wadeable streams in Texas with experimental data generated from stream mesocosms at the Baylor Experimental Aquatic Research (BEAR) facility." (excerpts from Executive Summary)

2. Development of Biological Indicators of Nutrient Enrichment for Application in Texas Streams, September 2009, TCEQ Water Quality Assessment (WQA) Program Special Study Report  
Ryan King, Ph.D. Principal Investigator, Baylor University

This project "evaluated new indicators of nutrient-related alteration to wadeable stream ecosystems by bridging two complementary ongoing projects in the Subhumid Agricultural Plans (SAP) ecoregion of Texas." (excerpt from General Description of the Special Study)

3. Red River Nutrient Criteria Development Multi-phase Project, In Progress  
EPA Region 6 and United States Department of Agriculture  
Brian E. Haggard, Ph.D., Principal Investigator  
J. Thad Scott, Ph.D., Co-Principal Investigator  
University of Arkansas

The project includes data acquisition, management, and organization in addition to identifying data needs to develop and finalize the process for establishing interstate nutrient criteria. The data that will be compiled from the states within the Red River Basin includes nitrogen, phosphorus, chlorophyll, and transparency.

4. 24-Hour Dissolved Oxygen and Use Attainment Study - Texas, August 2006, United States Geological Survey in cooperation with TCEQ  
Richard L. Kiesling, Michael G. Canova, Susan C. Aragon-Long, and C. Evan Hornig

During May 2003-July 2005, the U.S. Geological Survey collected site-specific data relating to water-quality, algal communities, and biological communities and analyzed site-specific hydraulics for 33 east Texas streams.

5. Nutrient and Biological Conditions of Selected Small Streams in the Edwards Plateau, Central Texas, 2005-06, and Implications for Development of Nutrient Criteria, USGS Scientific Investigations Report 2007-5195 in cooperation with TCEQ  
Jeffrey A. Mabe, USGS

Study evaluated nutrient and biological conditions in small streams in parts of the Edwards Plateau of Central Texas. Landcover analysis was used to select 15 small streams that represented a gradient of conditions with the potential to affect nutrient concentrations. The streams were sampled for water properties, nutrients, algae, benthic invertebrates, and fish in 2005, and eight streams were re-sampled in 2006. (Excerpts from Abstract)

6. Nutrient Effects in Small Brazos Basin Streams Final Report, February 2010, Texas Parks and Wildlife Department, Patricia L. Radloff, Cindy Contreras, Adam Whisenant, and Jennifer Bronson

This project adds to the body of data relating to the effects of nutrient enrichment in small streams and will assist the process of developing numeric criteria for nutrient parameters that are protective of aquatic resources. A secondary objective is to increase knowledge about distribution and status of freshwater mussels in the Brazos River Basin. (excerpt from Executive Summary)

7. Sources, Fate, Transport and Effects of Nutrients on Downstream Ecological Processes in the Galveston Bay Estuary, In progress, EPA Gulf of Mexico Program GOMP funded Project in coordination with Gulf of Mexico Alliance GOMA Nutrient Priority Issue Team  
Antonietta Quigg, Ph.D., Principal Investigator  
Texas A&M University at Galveston

Purpose is to “develop an understanding of nutrient cycling dynamics (sources, fate, transport, effects) from rivers into estuaries and between nutrients and ecosystem response for Galveston Bay estuary.” (excerpt from Final Work Plan)

8. Development of Pilot Nutrient Criteria for an estuary in the Western Gulf of Mexico, In progress, EPA GOMP funded project in coordination with GOMA Nutrient Priority Issue Team  
Edward Buskey, Ph.D., Principal Investigator  
University Texas at Austin, Marine Science Institute

The goal of this project is to characterize the nutrient dynamics of a coastal ecosystem (Mission-Aransas) in the Western Gulf of Mexico in terms of their sources, transport, fate, and effects in coordination with the Gulf of Mexico Alliance (GOMA) Nutrient Priority Issue Team.

Note, the above list of projects and reports is not exhaustive.