Selected Nutrient Projects and Related Projects in Texas

Surface Water Quality Standards Advisory Workgroup, March 28, 2012
Texas Commission on Environmental Quality Water Quality Standards (WQS)

TCEQ WQS Contract Projects

1. Database Analysis to Support Nutrient Criteria Development, Ongoing
   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 was initiated in 2011. It will provide advanced statistical analyses of water quality data and watershed information in Texas streams, rivers, and estuaries. Results will assist TCEQ in the development of numerical nutrient criteria by identifying potential groupings of water bodies associated with similar characteristics, and investigating statistical methodologies to detect changes in response variables to nutrient concentrations.

2. Texas Nutrient Criteria Development Support Project, August 31, 2011
   George Guillen, Ph.D., Principal Investigator, University of Houston Clear Lake

This project included a historical review of (1) all nutrient data collected and conclusions of major nutrient/eutrophication studies performed in Texas on all water body types (excluding reservoirs) and (2) a review of the detailed numerical nutrient criteria plans developed by other states for all water body types.

3. Texas Nutrient Data Collection, Final Report August 31, 2011
   Larry Beran, Ph.D., Principal Investigator, Texas AgriLife Research Stephenville

This project involved 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, and the relationship with nutrients.

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 2012 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 GOMA Nutrient Priority Issue Team.

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