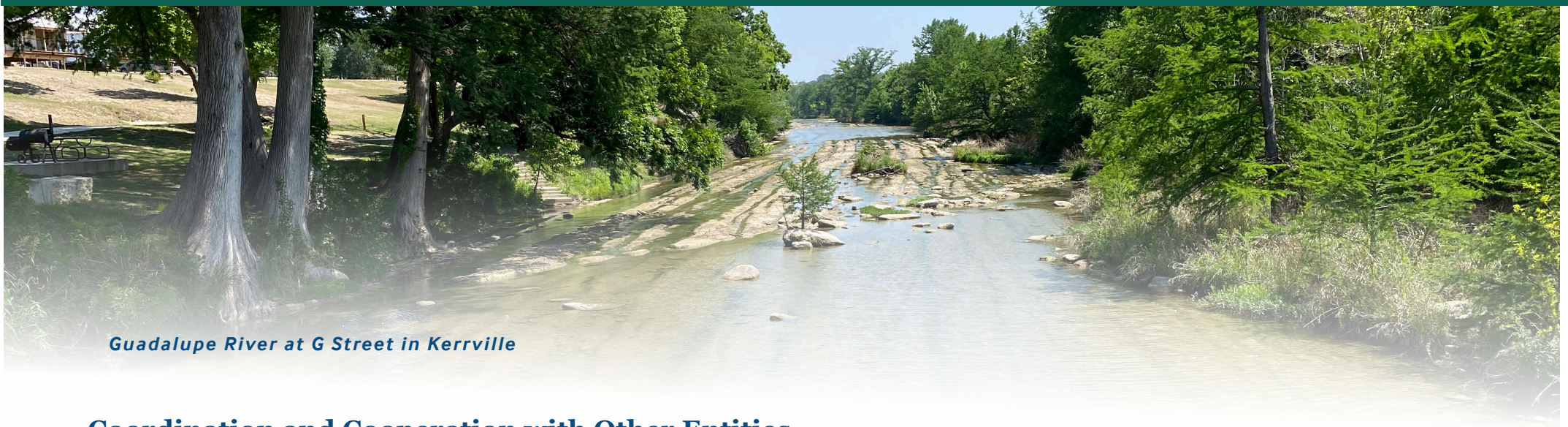
Upper Blanco River

INTRODUCTION

The Basin Summary Report provides a comprehensive review of water quality data with a detailed discussion of data analysis findings for the Guadalupe River and Lavaca-Guadalupe Coastal basins. The report serves to develop a greater understanding of water quality conditions, as well as changes and trends in the river basin. It also serves to enhance the ability to make decisions regarding water quality issues. The report is completed every five years, but the period of record for analysis includes at least ten years so long-term trends are discernible. In addition to the water quality data review, the report contains highlights of events, monitoring activities, and identifies issues and concerns in the Guadalupe River and Lavaca-Guadalupe Coastal basins under the Clean Rivers Program (CRP) as well as opportunities for the public to have input into the program. The CRP is managed by the Texas Commission on Environmental Quality (TCEQ) and funded entirely by fees assessed to wastewater and water rights permit holders. The Guadalupe-Blanco River Authority (GBRA), together with the Upper Guadalupe River Authority (UGRA), carry out the water quality management efforts in these basins under contract with the TCEQ.

Objectives and Goals of the Clean Rivers Program

The Texas Legislature passed the Clean Rivers Act in 1991, which requires water quality assessments for each river basin in Texas. In accordance with the Act, the TCEQ administers the Clean Rivers Program in partnership with river authorities, municipal water authorities, councils of governments, and other regional entities. The goal of the program is to maintain and improve water quality within each river basin through these partnerships. The TCEQ, GBRA, UGRA, Meadows Center for Water and the Environment (MCWE), and Wimberley Valley Watershed Association (WVWA) gather data from the Guadalupe River, its sub-watersheds, and coastal basins in a watershed management approach in order to identify and evaluate water quality issues, establish priorities for corrective action, work to implement those actions, and adapt to changing priorities. Examination of long-term data allows comparison between current and historical water quality data, and statistical analysis can indicate any trends in improvement or deterioration of water quality parameters.



Guadalupe River at G Street in Kerrville

Coordination and Cooperation with Other Entities

GBRA, UGRA, MCWE, and WVWA coordinate with other entities interested in water quality monitoring in the Guadalupe River Basin. Those entities include the TCEQ, United States Geologic Survey (USGS), Texas Parks and Wildlife Department (TPWD), Texas State Soil and Water Conservation Board (TSSWCB), and Texas Stream Team. Annually, all cooperators monitoring in the basin meet to coordinate their activities. This coordination minimizes duplication, focuses monitoring and resources where needed, and helps prevent voids in coverage across the basin.

The Guadalupe River Basin Clean Rivers Program supports Texas Stream Team monitoring groups in the basin. GBRA supplies replacement chemicals and provides training for monitoring and quality assurance to the volunteer monitors in the basin. Currently there are groups monitoring the Guadalupe River near Seguin, Cypress Creek in Wimberley, the San Marcos River, the Blanco River and tributaries, the Comal River and Canyon Reservoir, and Plum Creek and its tributaries.

Another example of the role that CRP plays in the basin is the contribution of quality-assured data used in the watershed planning efforts going on in the river basin. The water quality data collected by the Clean Rivers Program is used by TCEQ to assess streams to determine if they are meeting the stream standards for their designated uses. Secondly, the data is used to determine the need and extent that watersheds could benefit from watershed protection plans (WPP). There are five watershed protection plans currently implemented in the Guadalupe River Basin, including Plum Creek, Geronimo and Alligator Creeks, Cypress Creek, Upper San Marcos River, and Dry Comal Creek and Comal River. With the exception of the Upper San Marcos River WPP, the goals of these plans are to address water quality concerns and impairments through stakeholder education and outreach, best management practice (BMP) implementation, and water quality monitoring to assess the efficacy of the implementation measures. The Upper San Marcos River does not currently have any water quality concerns or impairments; the goal of their plan is to proactively manage water quality through education and BMPs. GBRA assists several of the WPPs in the basin through technical assistance and water quality monitoring.

Overview of the Guadalupe River Basin

The Guadalupe River Basin is located in south central Texas, with the headwaters in the Hill Country region. The main stem of the river is 432-miles-long and flows southeastward through a drainage area of 6,061-square-miles. The land mass that makes up the basin is divided into two distinct regions by the Balcones Escarpment. The northern region consists of the Edwards Plateau of the Great Plains Province. The area has variable topography, with rolling hills divided by limestone-walled valleys. The southern region consists of gently sloping prairie and is referred to as the Gulf Coastal Plains area. The basin's principle tributaries are the North and South Fork of the Guadalupe River, Johnson Creek, the Comal River, the Blanco River, the San Marcos River, Geronimo Creek, Plum Creek, Peach Creek, Sandies Creek, and Coleto Creek.

The key factors influencing water quality in the basin are geology, ground water, soils, climate, vegetation, and land uses. Weather over the ten-year period of this report has been more extreme and less predictable than in previous decades. According to the National Oceanic and Atmospheric Administration (NOAA), 2015 was the wettest year on record in New Braunfels; the area received 43.45 inches of rain while the annual average is 34.95 inches. 2022 was the driest year on record for the same area; only 14.26 inches of rain fell. Though rainfall has increased in recent months, as of the time of this report most of the Guadalupe River Basin is still under drought conditions (Figure 1). The headwaters and upper portion of the basin are currently under extreme to exceptional drought; the Guadalupe River directly above Canyon Lake went dry for several months during 2022 (Photo 1).

Photo 1: Dry Guadalupe River Bed at RR 311 Near Spring Branch

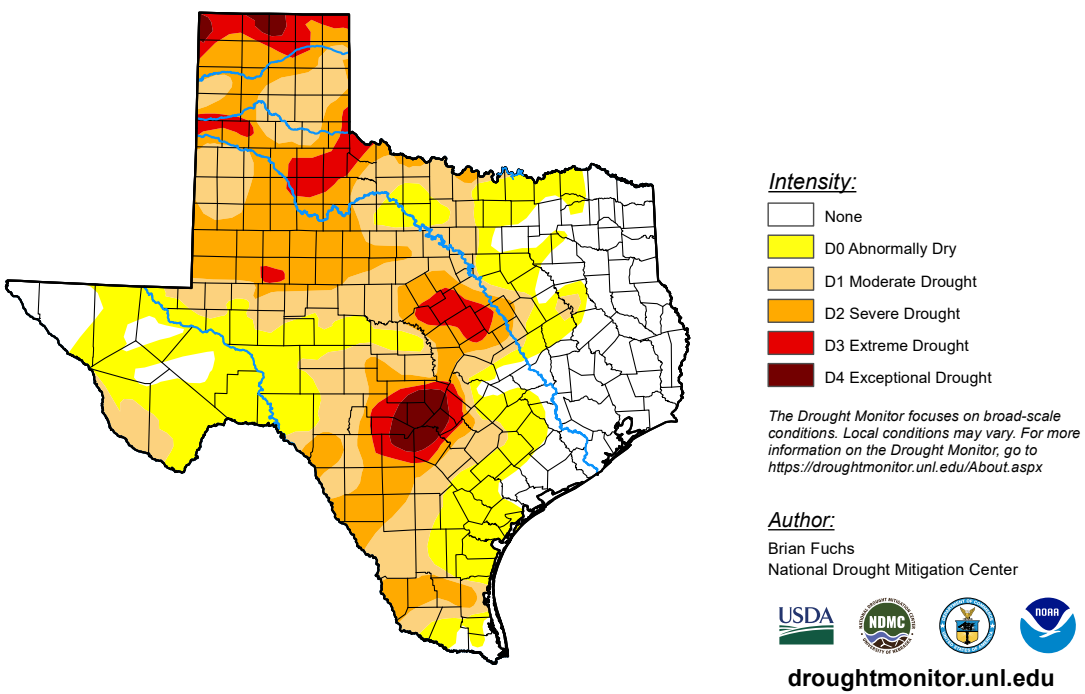


Figure 1: Texas Drought Monitor Map

Summary of Water Quality Characteristics

The water quality of the Guadalupe River is highly influenced by the groundwater that makes up its baseflow. The largest groundwater contribution to the baseflow is the Edwards Aquifer, with additional volume from the Cow Creek, Trinity, Leona, Carrizo, and Gulf Coast aquifers. The headwaters of the Guadalupe are located in Kerr County, and originate from springs in the North and South Forks. The discharge of the Edwards Aquifer from Comal and San Marcos springs form two small, crystal clear lakes, which support aquatic vegetation and wildlife, including the fountain darter and Texas wild rice, two federally endangered species. Springs that come from the Leona Formation, which is high in nitrate-nitrogen, are suspected to be a partial source of the nutrient concern and dissolved solids in Plum and Geronimo creeks.

The Guadalupe River flows through Kerr and Kendall counties and into Canyon Reservoir, the largest reservoir in the basin, located in Comal County. Canyon Lake impounds water for water supply, flood control, and recreation. Downstream of Canyon Reservoir, the Guadalupe River flows over bedrock substrate and through swift water runs. The river is shallow, with few pools until it nears the city of New Braunfels, where it meets with the Comal River and enters the first of six hydroelectric impoundments. From Kerr County to Refugio County, the Guadalupe River receives treated wastewater discharges. The cities of Kerrville, Boerne, Buda, New Braunfels, Kyle, San Marcos, Lockhart, Luling, Seguin, Gonzales, Cuero, and Victoria, along with other small wastewater treatment plants, discharge treated wastewater. Most of these plants provide at least secondary treatment of the wastewater to reduce total suspended solids (TSS) and dissolved organic material.

At the lower end of the basin, the San Antonio River joins the Guadalupe River. The Guadalupe River Diversion Canal and Salt Water Barrier are located below the confluence with the San Antonio River. The Salt Water Barrier is made up of steel gates that are used to prevent salt water intrusion from the bay during times of low river flows. The Guadalupe River Diversion Canal and associated canal system diverts fresh water for irrigation and municipal water supply.