



**Monitoring Stations –  
Guadalupe-Lavaca Coastal Basin**  
12536-T Victoria Barge Canal

Sampling sites are labeled in red followed by the letter G (GBRA), T (TCEQ), U (UGRA) or W (Wimberley) indicating who is the monitoring entity.

**Guadalupe-Lavaca Coastal Basin**

**Drainage Area:** 998 square miles  
**Streams and Rivers:** Guadalupe River, Garcitas Creek, Victoria Barge Canal, Mercado Creek, Arenosa Creek  
**Aquifer:** Gulf Coast  
**River Segments:** 2453  
**Cities:** Victoria, Seadrift, Bloomington, Inez, Port O'Connor, Port Lavaca  
**Counties:** Calhoun, Victoria, Jackson  
**EcoRegion:** Gulf Coastal Plains

**Vegetation Cover:**  
 Pasture/Hay - 15.1%      Shrublands - 16.9%  
 Grass/Herbaceous - 13.7%      Deciduous Forest - 8.4%  
 Row Crops - 21.4%      Wetlands - 17.2%

**Climate:** Average annual rainfall: 42 inches  
 Average annual temperature: January 44° July 93°

**Land Uses:** Agriculture Row Crops (cotton, corn, rice and grain sorghum), Urban, Recreation, Oil & Gas Production, Cattle, Hog and Poultry Production, Industry (plastics, chemicals, petrochemicals)

**Water Body Uses:** Aquatic Life Use, Non-contact Recreation Use, Fish Consumption Use, Industrial Cooling  
**Soils:** Clay subsoils, deep black soil, sandy clay, dark clay loam, clay  
**Permitted Wastewater Treatment Facilities:**  
 Domestic: 10  
 Industrial: 5

The Guadalupe-Lavaca Coastal Basin has a drainage basin of 998 square miles. It receives flow from the Guadalupe River, Garcitas Creek, Arenosa Creek and the Victoria Barge Canal, along with other smaller tributaries and bayous. The bay and estuary system is made up of Chocolate Bay, Lavaca Bay, Matagorda Bay and San Antonio Bay. Within the drainage basin are the cities of Inez, Port Lavaca, Port O'Connor and Seadrift.

The area is home to the Whooping Crane, a migratory bird whose population had dwindled to dangerously low numbers, but is making a come back. The cranes are on the federally protected endangered species list. The Aransas Wildlife Refuge is their winter home. Studies are underway that are looking into impacts of reduced fresh water inflows on the bird's habitat and food supply.

### Land use

The land use in the watershed is made up of urban, rural, farming (rice and row crops) and industrial. The industrial plants include facilities for Union Carbide, BP Chemical, Formosa Plastics and Seadrift Coke. These industries manufacture a number of organic chemicals, which produce varying waste streams. These facilities maintain a number of wastewater and stormwater outfalls that discharge to the Victoria Barge Canal. Additionally, the Calhoun County Navigation District operates a Marine Loading facility in Point Comfort.

The area has come to the attention of land developers, looking to build large subdivisions made up of both summer residences and permanent homes. The area will need to increase water and wastewater infrastructure to order to support the growth.



Formosa

### Stakeholder Concerns

Stakeholders have voiced concern for a beneficial land application site in the upper portion of the watershed, near the city of Inez, and Arenosa Creek. The site has been permitted to land apply Class B wastewater sludge at a rate not to exceed 8 dry tons per acre per year on 793.4 acres located within approximately

2,881 acres. The stakeholders' fear is mismanagement that would allow pollutants to leave the property in the runoff. At the request of stakeholders and under CRP, samples of Arenosa Creek were collected prior to the issuance of the permit in order to establish background conditions. Samples were collected monthly from December 2000 to August 2003. The data collected showed that the creek was intermittent with high bacterial concentrations (geometric mean for *E. coli* = 198 organisms per 100 milliliters). The median total phosphorus concentration was 0.22 milligrams per liter.

Another concern of area stakeholders is the reduction of freshwater inflows to the bay and estuary system because of increased demands from upstream. There are additional studies underway looking into the fluctuations in salinity and impacts of reduced freshwater on the biological communities in and living along the bays.

A future concern that will become more important as populations in South Texas rise is the demand to develop desalination as a source of potable water. These facilities will introduce a new waste stream that will need to be handled.

### San Antonio Bay Studies

Two studies were initiated in 2003 to look at the importance and impacts of instream flows into San Antonio Bay and its ecosystem. The studies were to be funded by the partners working to develop the Lower Guadalupe Water Supply Project that would supply water from the lower Guadalupe Basin to the metropolitan areas of Bexar County and the Hill Country. Shortly after the studies were inaugurated funding was pulled by the largest partner, the San Antonio Water System. Recognizing the importance of the studies and that the need for water for the area was not going away, the GBRA and the San Antonio River Authority, continued to fund the two studies. The following is an overview of the objectives and status of the studies.

### The San Antonio Guadalupe Estuarine System (SAGES) Project

The SAGES project, Linking Freshwater Inflows and Marsh Community Dynamics in San Antonio Bay to Whooping Cranes, will help to provide a comprehensive understanding of the relationships between the nature of instream flows and Whooping Crane health along the Texas Gulf Coast, thus allowing state water managers to optimize diversions of freshwater while minimizing impact to this endangered species. The objectives of the study are to quantify patterns of habitat use by the cranes in relation to changes in Blue Crab availability, temperature, and human-induced disturbances; evaluate relationships between changes in water temperature, salinity and dissolved oxygen and the blue crabs; quantify macrophytic responses in marshes to annual variability in inflows and water chemistry; and, develop a model of relationships of inflows into bay to the whooping cranes in the marshes of Aransas Wildlife Refuge. The study is being conducted by teams from Texas A&M University, led by Dr. Douglas Slack, Dr. William Grant and Dr. Stephen Davis, and has completed four years of the six-year study. Project status is available at <http://sages.tamu.edu>.

### Estuarine Responses Project (ERP)

The overall focus of the ERP is the ecological health of the San Antonio Bay estuary, with the objective to assess the effects of instream freshwater inflows on that health. The health of the estuary will be measured by a complex of variables, both inorganic and organic, whose average values and distribution within the bay are characteristic of the estuary. The ERP will address hydrography (physical processes and variables, including morphology, hydrology, internal circulations, tides and other exchanges with the sea, stratification, and sedimentary processes), water quality and biology of the bay. Central to the project is the development and application of models capable of depicting the large-scale variations in key ecosystem parameters and their dependence upon external factors, one of the most important being the fresh water inflows into the bay. Phase I of the project, to gather and inventory historical data on San Antonio Bay, is critical to the development of these models. Because of the loss of the original funding the progress on the project has slowed somewhat. As funding is available the project will proceed in smaller phases. The project team is led by George Ward of the University of Texas at Austin.