Technical Study Summaries: Lower Sabine River
Hydrologic Data

Flows in Lower Sabine River have changed over past 80 years

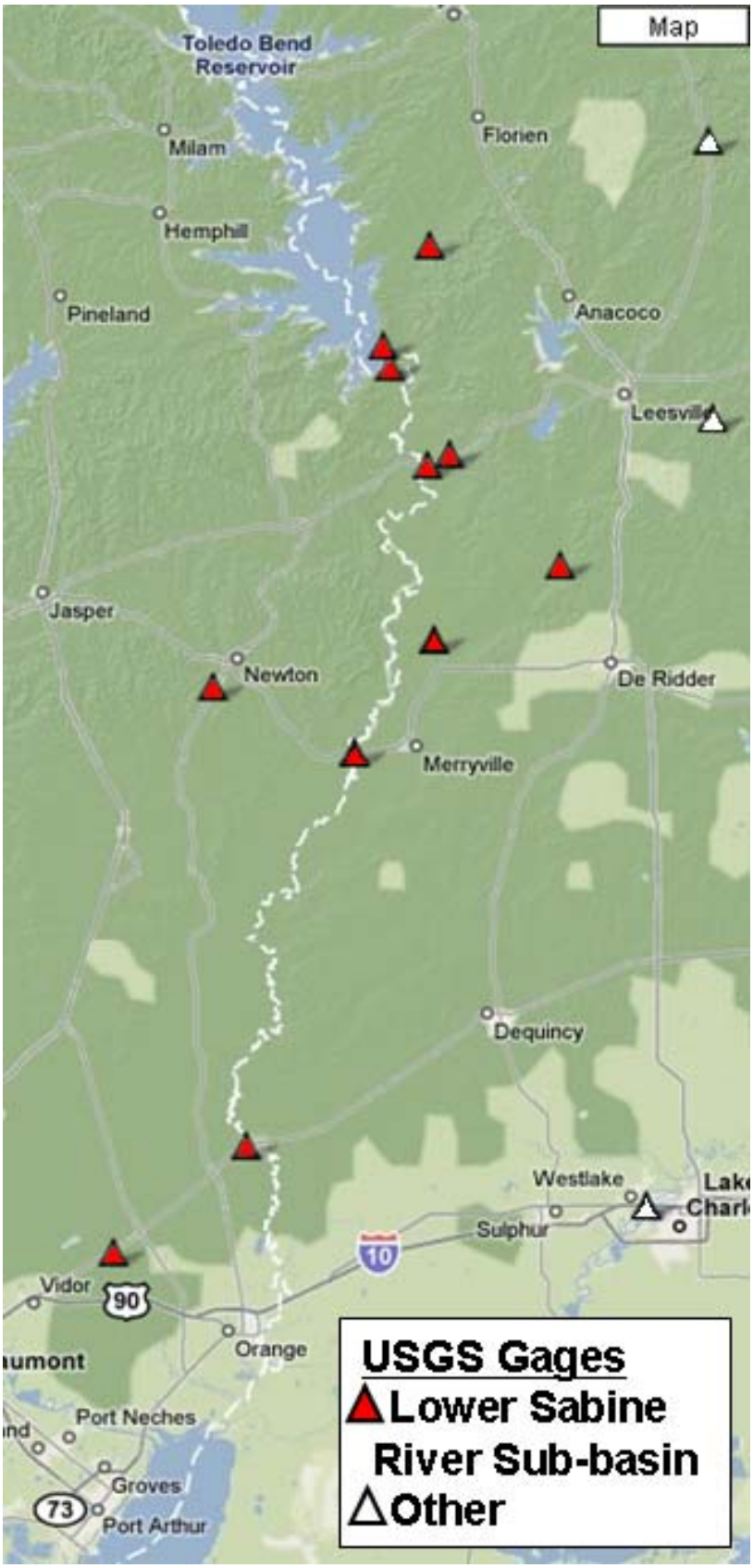
The seasonal pattern of water flow in the Lower Sabine River has changed over the past 80 years, according to data collected from a gage maintained by the US Geological Survey. As shown in the figure below, the median flow of the river at Ruliff, TX from May to September has changed when comparing values from the time periods 1925-1959 and 1970-2006. Median flows have decreased during the month of May, and increased for the months of July, August, and September. Median daily flows are relatively the same for other months. The hydrologic character of the basin can be analyzed using similar techniques and data from a network of USGS gages within the Lower Sabine River sub-basin. A list of current and historical gages of interest to this is study is provided in the table below. The relative location of gages currently maintained by the USGS is shown in the map of the following page.

Figure 1. Median of daily discharge values for USGS gage #08030500, Sabine River at Ruliff, TX.

Table 1. Historical and Current USGS Gages of Interest in the Lower Sabine River Sub-basin.

Gage #	Gage Name	Earliest Record	Latest Record	Median Flow (cfs)	Drainage Area (mi^2)
08025360	Sabine Rv at Toledo Bd Res nr Burkeville, TX	1971	Present	3,660	7,178
08025500	Bayou Toro near Toro, LA	1955	Present	33	148
08025850	Pearl Creek at St. Hw. 111, at Burr Ferry, LA (peak flow only)	1965	Present		9.66
08026000	Sabine Rv nr Burkeville, TX	1955	Present	2,750	7,482
08028000	Bayou Anacoco near Rosepine, LA	1951	Present	147	365
08028200	Bayou Anacoco near Knight, LA	1969	1973		425
08028500	Sabine Rv nr Bon Wier, TX	1923	Present	3,700	8,229
08028700	Hoosier Ck nr Merryville, LA	1955	1981		13.1
08029500	Big Cow Ck nr Newton, TX	1952	Present	66	128
08030000	Cypress Ck nr Buna, TX	1952	1983		69.2
08030500	Sabine Rv nr Ruliff, TX	1924	Present	4,780	9,329
08031000	Cow Bayou nr Mauriceville, TX	1952	Present	8.4	83.3

Figure 2. Relative location of current USGS stream gages near the Lower Sabine River sub-basin.



Results of streamflow gain-loss studies in Texas, with emphasis on gains from and losses to major and minor aguifers (2002)
By R.M. Slade, J.T. Bentley, and D. Michaud (US Geological Survey)

Interaction between groundwater and surface water is not particularly large, according a gain-loss study conducted in the Lower Sabine River sub-basin. Data from the study is summarized in a report which includes results of 366 gain-loss studies conducted throughout Texas since 1918. The gain-loss study of the Lower Sabine was conducted by the USGS in 1963. Discharge was measured at 30 sites on the Sabine River between Carthage and Rulliff, TX (approximately 208 miles of river), as well as additional sites on surface water tributaries and at withdrawal points. The study found gains from groundwater of less than 0.8 cfs per river mile. Average daily flow at the Ruliff gage ranged from 470 to 485 cfs during the time of the study.

Full report:
http://pubs.usgs.gov/of/2002/ofr02-068/

Indicators: Lower Sabine River
Hydrology / Hydraulics

Hydrology Objectives

- Manage flow regimes which accommodate human needs while sustaining river and floodplain ecosystems

Hydrologic Indicators

Category	Indicator	Explanation
Flow regime components	Overbank flows (frequency, timing, duration, rate of change, and magnitude)	Infrequent, high magnitude flow events that enter the floodplain. • Maintenance of riparian areas • Transport of sediment and nutrients • Allow fish and other biota to utilize floodplain habitat during and after floods • Riparian and floodplain connectivity to the river channel
	High pulse flows (frequency, timing, duration, rate of change, and magnitude)	Short duration, high magnitude within channel flow events • Maintain physical habitat features along the river channel • Provide longitudinal connectivity along the river corridor for many species (e.g., migratory fish) • Provide lateral connectivity (e.g., connections to oxbow lakes)
	Base habitat flows (frequency, timing, duration, rate of change, and magnitude)	Range of average or “normal” flow conditions • Provide instream habitat quantity and quality needed to maintain the diversity of biological communities • Maintain water quality conditions • Recharge groundwater • Provides for recreational or other uses
	Subsistence flows (frequency, timing, duration, rate of change, and magnitude)	Low flows maintained during times of very dry conditions • Maintain water quality standards • Prevent loss of aquatic organisms
Natural variability	Natural	Determination of the natural variability of the above indicators, based on the older portions of gage records, presumably less impacted by human activity. The exact time period may vary by site.
	Current	Variability of the above indicators based on the last 20-25 years of gage records.