Technical Study Summaries: Lower San Antonio River
Connectivity Data

Connectivity with-in the study area and to areas outside the study area will be important for our study of the Lower San Antonio River sub-basin. Connectivity with-in the study area includes connectivity along the river channel and between the main channel and floodplain. These types of connectivity are important features of any river ecosystem, but have been the focus of few previous studies of the San Antonio River.

Connectivity with areas outside the study area includes connectivity with upstream and downstream segments, tributaries, and groundwater. Several studies related to this type of connectivity are ongoing or have been completed and are described below.

Simulation of streamflow and estimation of streamflow constituent loads in the San Antonio River watershed, Bexar County, Texas, 1997-2001 (2002)
By D.J. Ockerman and K.C. McNamara

This study provides insight about the hydrologic connection between upper and lower portions of the San Antonio River basin. Results are described in the Hydrology and Hydraulics Technical Studies Summary.

Full report: http://pubs.usgs.gov/wri/wri03-4030/

Freshwater inflow recommendations for the Guadalupe Estuary of Texas (1998)
By Texas Parks and Wildlife Department and Texas Water Development Board

The San Antonio River is an important source of freshwater inflow for the Guadalupe Estuary (San Antonio Bay). This study determined that an annual freshwater inflow of between 1.03 million and 1.29 million acre-feet of water is required each year to maintain the biological health and productivity of the estuary. An annual inflow of 1.15 million acre-feet was found to provide the maximum fisheries harvest. Seasonal timing of inflows is important and recommendations were provided as total volumes of flow for each month of the year. These recommendations were developed based on a state methodology that has been applied to all of Texas' major estuaries.

Full report:
http://midgewater.twdb.state.tx.us/bays_estuaries/Publications/Freshwater%20Inflow%20Recommendation%20for%20the%20Guadalupe%20Estuary%20of%20Texas%20-%201998.pdf

Surface water – groundwater interaction in the Lower San Antonio River watershed (ongoing)
By US Geological Survey

Studies of the interaction of surface water and groundwater in the lower San Antonio River basin are ongoing. A network of wells for monitoring groundwater levels is being developed. Water chemistry and isotope analysis of groundwater and surface water will detail their connectivity in this area. Some preliminary results are described in the Hydrology and Hydraulics Technical Studies Summary.

Link to USGS Active Water Level Network: http://groundwaterwatch.usgs.gov/StateMaps/TX.html

Indicators: Lower San Antonio River

Connectivity

Connectivity Objectives

- Consider interaction of groundwater and surface water
- Determine and maintain connectivity of important habitat features of the river and riparian zone that support basin goal

Connectivity Indicators

Category	Indicator	Explanation
Groundwater/ surface water interaction	Gain or loss in section of river	Difference in the amount of water entering and leaving a specific section of the river channel. Sources of gains include inflow from tributaries, alluvial and deeper aquifers, and discharges to the river. Sources of losses include evaporation, evapo-transpiration from riparian areas, diversions, and recharge of alluvial and deeper aquifers. Indicator may be influenced by shallow groundwater surface elevation and hydraulic head of deeper aquifers.
Habitat features	Connection to river (frequency, duration, and timing)	Periodic connectivity between riparian areas and the river is important to maintain the health of these areas and the organisms that depend on them.
Freshwater inflows to estuary	Volume of flow (monthly and yearly totals) at USGS gage # 08188500 at Goliad	Freshwater inflow requirements for the Guadalupe Estuary (San Antonio Bay) have been studied by other state programs. Recommendations have been made in the form of yearly and monthly volumes of freshwater inflow. The San Antonio River is an important source of inflow for the Guadalupe Estuary. Determining the total volume of flow (yearly and monthly) provided at this gage will allow evaluation of the impact of instream flow recommendations on estuary freshwater inflows.