Guadalupe Delta Log Jam History & GBRA Operations in the Lower Basin

March 23, 2017
Guadalupe Watershed
Geographic Regions

- Edwards Plateau
- Balcones Escarpment
- Blackland Prairies
- Post Oak Region
- Coastal Prairies
- Delta

Guadalupe River Profile

- 8 feet/mile
- 2.5 feet/mile

Flat
Figure 4. Shaded relief map showing the Guadalupe/San Antonio River delta area.
Delta Geomorphology

Figure 4. Shaded relief map showing the Guadalupe/San Antonio River delta area.

Upper Delta
Middle Delta
Lower Delta

Major Log Jams
Delta Inferred Development of Delta

Paleogeographical interpretative reconstruction of the Guadalupe delta and upper San Antonio Bay area during the Aransas I occupation at the Guadalupe Bay site (41CL2) around 500 B.C. Adapted from CEI graphic.
Figure 5. Inferred development of the Guadalupe/San Antonio delta and upper San Antonio Bay ca. 1 and 550 A.D. Source: Weinstein and Black, 2009; http://www.texasbeyondhistory.net/guadbay/images/Guadalupe-Delta-Aransas.html; from an original by Coastal Environments, Inc.
Figure 6. Inferred development of the Guadalupe delta and upper San Antonio Bay area from about the late part of the Late Prehistoric period 650 years ago (A.D. 1350; Rockport II) to the Protohistoric period (A.D. 1650; Rockport III). Source: Weinstein and Black, 2009, http://www.texasbeyonddistory.net/guadbay/images/Guadalupe-Delta-Aransas.html, from an original by Coastal Environments, Inc.
History – Steam-Boat Traffic
Delta History – Log Jams

- 1848 – Newspaper discuss Steamboat Traffic – logs were issue
- 1857 – 1st Navigation Project awards to GB Dycus to remove jams
  - To removal log below City of Victoria
  - Funding by City – County - State of Texas @ $22,900
- 1860 – Railroad built and provides completion
- 1860s – Civil War interrupted Navigation
- 1875 – Chief Report by COE discuss large jams
- 1880 – Fritz Berner – Barges freights but logs are issue
- 1890 – Sand & Gravel Company start barging operation
- 1907 – River & Harbor Act (1907) – Clears Channel to Victoria
“The character of and the obstructions in the river between Gonzales and its mouth may be considered to consist of two: the first, that part between Gonzales and a point three miles below Victoria in which the average current is about three miles per hour and the average depth about 8 feet... For the second part, from the one hundred and sixth mile to the mouth below Victoria, the character of the river is somewhat different, the average current being one and one-fourth miles per hour and in the neighborhood of the rafts (log jams) scarcely perceptible...”
“In the lower part of the river (below Victoria), the principal obstructions are the rafts (log jams), of which there are four; the first of which completely blocks the river for a distance of 1,850 feet... The first of these rafts is a bad obstruction, and would be difficult of removal, being composed of several layers of heavy trees wedged together and into the banks and bed of the river, the whole forming a compact mass some 12 feet in depth”.
Delta History – Snag Boat (1910)
Delta History – Snag Boat (1910)

Delta History – Log Jams

- 1945 – River & Harbor Act (1945) – Proposes Barge Canal to avoid logs
- 1951 – Victoria Barge Canal – Construction Begins on 14 miles
- 1953 – Victoria Barge Canal -1st Phase complete
- 1965 – Canal at Turning Basin Complete
- 1968 - Docks at Turning Basin Complete
Delta History – Victoria Barge Canal
Victoria Barge Canal at Green Lake (Flood of 1998)
• 1963 – GBRA purchases Calhoun Canal System
• 1963 – GBRA encourages log jam removal
  – Rep. John Young recommends COE clearing jams & tree for 7.5 miles
• 1975 – COE obtains funding to clear log on Guadalupe River
• 1976 – GBRA constructs boat to remove small jams on Guadalupe
• 2009 – GBRA constructs 2nd vessel
Causes of Log Jam
- Erosion causes trees to fall into river
- Slower river velocity
- Obstructions
Delta Log Jam History
Two vessels working in tandem to break-up Jam
Miss Guadalupe II – track hoe breaks up key logs
Logs retrieved from river & stacked on bank
Stacks burned in place
River Conditions Dictate Opportunity for Removal

Optimal Conditions for Log Jam Removal Operations

Graph courtesy of the U.S. Geological Survey
Recent Major Log Jam Removal Projects

• **COE - 1975 - Guadalupe River (selected areas - river mile 3 to 19)**
  – In 1963, GBRA Provide letter to Congress requesting COE funding

• **NRCS - 1999 - Guadalupe & San Antonio River**
  – Funding provided as a result of 1998 Flood Event

• **GBRA – 2008 - San Antonio River Project (River Mile 6 to 8)**
  – GBRA used In-House Personal

• **NRCS – 2016 - San Antonio River Project (River Mile 6 to 9)**
  – NRCS Funded project
Victoria Barge Canal

Location of secondary by-pass box where flap gate will be installed.

Location of primary by-pass box

Union Pacific Railroad Bridge

Victoria Barge Canal

GREEN LAKE

Guadalupe River

Hwy 77 & Union Pacific Bridges

San Antonio River

Salt Water Barrier

Concrete Bridge

Elm Bayou

COE - Log-jam Removal Project - 1975
San Antonio River Debris Removal Project --2008
Logs stacked and burned later (2009)
Victoria Barge Canal

Location of secondary bypass box where flap gate will be installed.

Location of primary bypass box.

Union Pacific Railroad Bridge

Victoria Barge Canal

Guadalupe River

GREEN LAKE

Guadalupe River

San Antonio River

Hwy 77 & Union Pacific Bridges

San Antonio River Debris Removal Project

NRCS - 2016

Salt Water Barrier

Concrete Bridge

Elm Bayou

San Antonio River

Salt Water Barrier

Concrete Bridge

Elm Bayou
San Antonio River Debris Removal Project 2016
Composite Map

Log Jam Locations

Jim Fagan Bridge

Roger Fagan Bridge

Log Jam Locations
San Antonio River Debris Removal Project 2016

Upstream Jim & Ginger Fagan Bridge – Pre-Construction – Site 20
San Antonio River Debris Removal Project 2016

Working at Site 20
San Antonio River Debris Removal Project 2016

Pre-Construction Site 13
San Antonio River Debris Removal Project 2016

Working at Site 13
San Antonio River Debris Removal Project 2016

Working at Site 02
Migration San Antonio River channel 1847 - Present

- Old River Channel (Active Anabranch 1847-1930 to present)
- San Antonio River (Dominant Channel 1847-1939 to present)
- Elm Bayou (Dominant Channel circa 1970 to present)
- Old River Channel (Active Distributary circa 1970 to present)
Figure 3. Topographic cross-section across the delta downstream of the San Antonio-Elm Bayou split. Note the former channel positions,
San Antonio River Sedimentation - 2016

4 ft increase over last 30 years
San Antonio River during drought