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Engineer Research and
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National Regional Sediment Management Program Galveston District (SWG):



Geomorphological Investigation of the Brazos River; Phase 2

Description (ERDC and SWG will continue their geomorphic analysis of the Brazos River started in FY18 with Phase 1 of this effort. In coordination with the Brazos River Erosion Feasibility Study, this study will provide valuable insight into the geomorphic character of the Brazos River. The results of this effort will help facilitate a long term, regional sediment management based, solution to the watershed level instability present on the Brazos River.

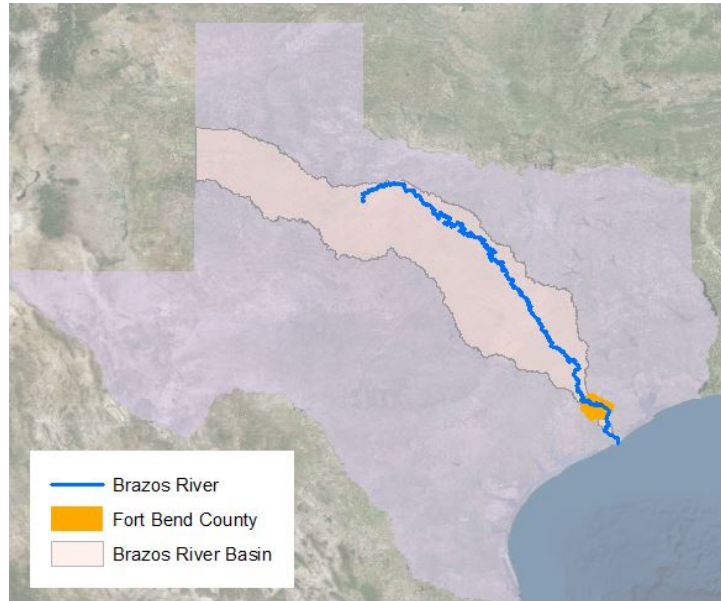


Figure 1. Location of RSM Initiative !



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Issue/Challenge To Address

The Brazos River is a large lowland river that traverses Texas before reaching the Gulf of Mexico. Of particular interest is the Brazos River reach through Fort Bend County, TX. This area is rapidly developing and as such there are concerns regarding infrastructure near the river. Rivers maintain a state of dynamic equilibrium wherein the system makes adjustments to external perturbations. This is of no concern in the abstract; the boundary conditions for the river change and the river adjust to accommodate the change. However, because of development near the river, natural river adjustment can have catastrophic consequences. For example, bank failure along the Brazos River in Fort Bend County threatens SH 99, a major hurricane evacuation route, as well as flood control levees and county offices.

A primary item of concern in the area is exceptionally high sediment loading from tributaries. Previous aerial imagery shows a widening of tributary valleys over just the past few years. This displaced sediment has been introduced to the Brazos River. The flood risk management issues are twofold: (1) high sediment loading, such as that observed, increases the instability and risks system adjustments beyond geomorphic thresholds that cause risk to flood control structures, e.g., levees, and (2) the additional sediment input causes adjustments in channel geometry that can increase uncertainty regarding expected water-surface elevations since prior flood studies are predicated on the geometry at the time of study.

Successes Lessons Learned

Lessons learned will be compiled during the duration of this study.

Estimated Benefits & Cost Savings

- Protection of existing FRM Infrastructure
- Geomorphic understanding of the Brazos River watershed for future and ongoing efforts
- Cost benefits will be tied to the stabilization methods developed from the findings of this study

Expected Products

- Geomorphic Analysis and Characterization
- Sediment Budget Creation
- Final Report and Presentation

Stakeholders/Users

There is a wide variety of local stakeholders that have been engaged throughout the process that have an interest in the outcome of this study. These include: Fort Bend County, Fort Bend County Drainage District, Fort Bend County Toll Road Authority, Brazos River Authority, and several Levee Improvement Districts and Municipal Utility Districts. These stakeholders will be engaged to emphasize the regional nature of the problem and to thereby encourage regional solutions.

Projected Benefits Value Added

The value added through this initiative is in formulating regional solutions to regional problems. There are multiple agencies in the area all of whom are



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interested in the issues with the Brazos River. Cost savings are realized by ensuring the problems and potential solutions are well documented such that narrowly applied fixes are not undermined by continuing regional issues.

Leveraging Opportunities

The results of this effort will provide critical geomorphic considerations to several ongoing modeling efforts, development plans, and the ongoing Brazos River Erosion

Points of Contact

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Participating Partners

Fort Bend County, Texas and the Galveston District