Hassenruck-Gudipati, H.J., Passalacqua, P., and Mohrig, D., 2022, Natural levees increase in prevalence in the backwater zone: Coastal Trinity River, Texas, USA: Geology, v. 50, https://doi.org/10.1130/G50011.1

Description of Supplementary Materials

Supplementary Tables S1-S14 can be collocated with the transect ID, which corresponds to the 50m spaced intervals of the centerline points.

Supplementary Table S1: Centerline location (UTM Zone 15N), transect ID, and centerline distance downstream. The centerline was found every 50m using the Stream Restoration Toolbox of the National Center for Earth-surface Dynamics
https://repository.nced.umn.edu/browser.php?current=author&author=35&dataset_id=15

Supplementary Table S2: Thalweg location for centerline-perpendicular transects and associated transect ID. The thalweg was determined by weighting the distance to the centerline (30%) and minimum elevation (70%). Only transect points that are within 200m of the centerline and do not extent beyond other centerline points are considered.

Supplementary Table S3: Levee number corresponding to each levee extent outline in (Figure 1) and associated transect ID. The corresponding levee extent was found based on the spatial intersect between each transect and a levee polygon, the area between the levee crest and levee extent. Any spatial intersects of transects and levee polygons beyond the ones directly located on the transect's river banks were manually remove.

Supplementary Table S4: Pointbar polygon number and associated transect ID. The corresponding transect ID was found based on the spatial intersect between each transect and pointbar polygons, which were manually defined on the DEM. Any spatial intersects of transects and polygons beyond the ones directly located on the transect's river banks were manually remove.

Supplementary Table S5: Counter pointbar polygon number and associated transect ID. The corresponding transect ID was found based on the spatial intersect between each transect and counter pointbar polygons, which were manually defined on the DEM. Any spatial intersects of transects and polygons beyond the ones directly located on the transect's river banks were manually remove.

Supplementary Table S6: Inactive surface polygon number and associated transect ID. The corresponding transect ID was found based on the spatial intersect between each transect and inactive surface polygons, which were manually defined on the DEM. Any spatial intersects of transects and polygons beyond the ones directly located on the transect's river banks were manually remove.

Supplementary Table S7: Channel adjustment polygon number and associated transect ID. The corresponding transect ID was found based on the spatial intersect between each transect and channel adjustment polygons, which were manually defined on the DEM. Any spatial intersects of transects and polygons beyond the ones directly located on the transect's river banks were manually remove.

Supplementary Table S8: Erosional surface polygon number and associated transect ID. The corresponding transect ID was found based on the spatial intersect between each transect and erosional surface polygons, which were manually defined on the DEM. Any spatial intersects of transects and polygons beyond the ones directly located on the transect's river banks were manually remove.

Supplementary Table S9: Levee extent location (UTM Zone 15N) for each transect with a levee number (Table S3) and associated transect ID for banks on the left of the centerline.

Supplementary Table S10: Levee extent location (UTM Zone 15N) for each transect with a levee number (Table S3) and associated transect ID for banks on the right of the centerline.

Supplementary Table S11: Levee crest location (UTM Zone 15N) each transect between the levee extent (Tables S9) and the river centerline (Tables S1) for banks on the left of the centerline. Levee crests were identified as the tallest feature between these two points. Levee crest, identified as anthropogenic features and the tallest feature, were manually adjusted to reflect the levee crest and recorded in columns 6-8.

Supplementary Table S12: Levee crest location (UTM Zone 15N) for each transect between the levee extent (Tables S10) and the river centerline (Tables S1) for banks on the right of the centerline. Levee crests were identified as the tallest feature between these two points. Levee crest, identified as anthropogenic features and the tallest feature, were manually adjusted to reflect the levee crest and recorded in columns 6-8.

Supplementary Table S13: 2nd degree polynomial fit to both left and right bank levee crest values with distance downstream (Tables S11 and S12), using the Matlab function polyfit. The best fit is $y = 4.58*10^{-10} x^2 + 2.24*10^{-4} x + 22.95$ (Norm of the residuals = 9.34). The norm of residuals for a 2nd degree polynomial fit was better than that of a linear fit ($y = 1.55*10^{-4} x + 20.95$; Norm of residuals = 22.43). Both y, elevation, and x, distance downstream, are expressed in meters. Additionally, the residuals of the linear fit were not randomly distributed with distance downstream. The residuals systematically decrease and then increase downstream, indicating that a linear fit was not appropriate to describe the levee crest elevation fit.

Supplementary Table S14: Mean and standard deviation of water surface elevation for four USGS gaging stations Romayor, TX (USGS 08066500), at Liberty, TX (USGS 08067000), Moss Bluff, TX (USGS 08067100) and Wallisville, TX (USGS 08067252) for four flood events 01/01/2012 – 02/15/2012, 10/30/2015 – 12/02/2015, 05/03/2019 – 05/24/2019, and 08/29/2017 – 09/09/2017. For each event, stages at all four gaging stations were collected when Romayor discharge was within 10 m^3/s of the flood discharge of interested: 1169.5 m^3/s, 1432.8 m^3/s, 1826.4 m^3/s, and 2660 m^3/s, respectively.