

Analyzing Organic Carbon and Particle Size in Sediment Deposited by the Mississippi River Flood of 2019

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Fig. 1: A Google Earth map dated November 15th, 2019 of the Bonnet Carre Spillway and Lake Pontchartrain.

A. Background

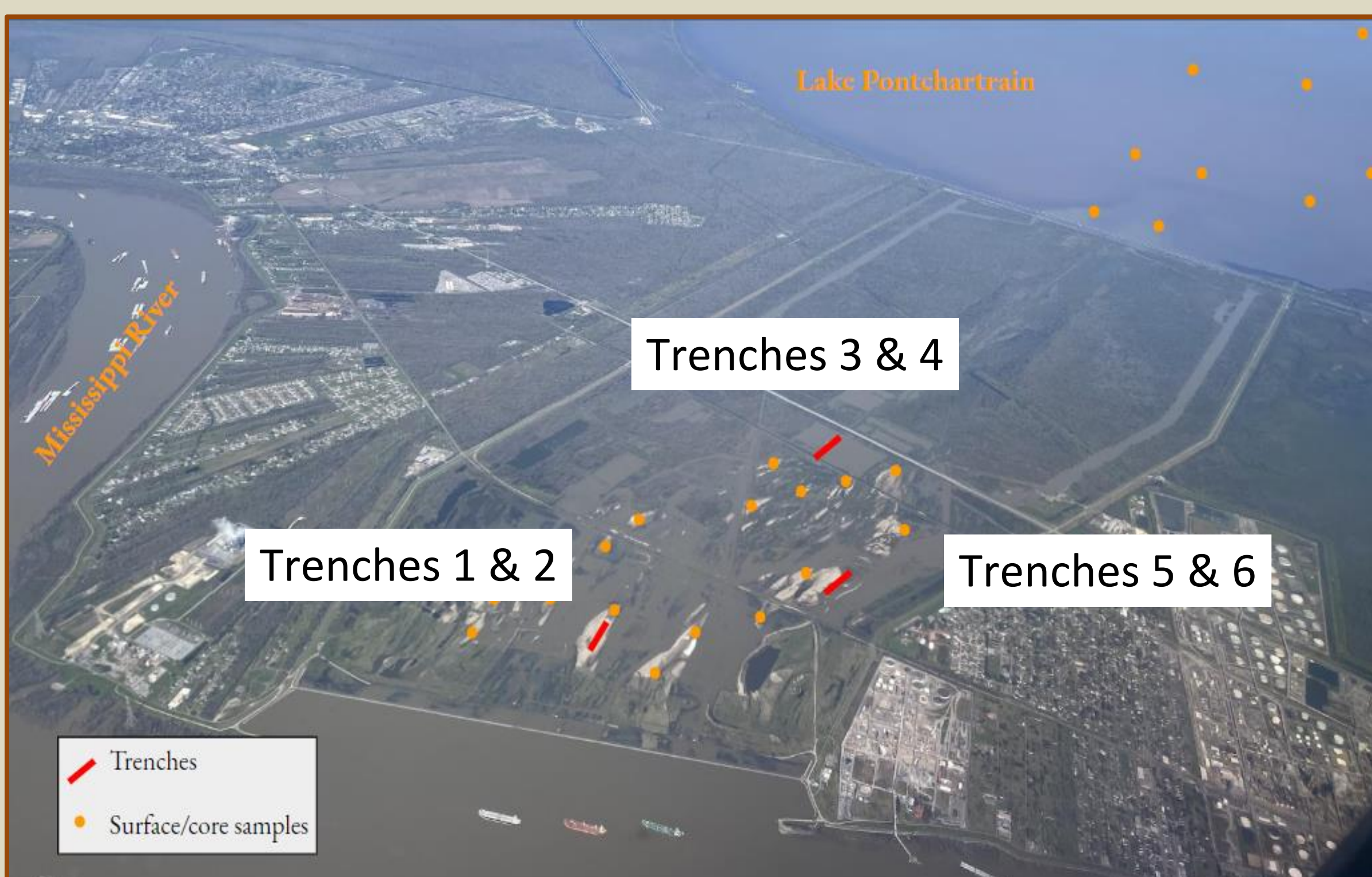
- The Mississippi River flood of 2019 was the longest on record at the time.
- In November 2019, the Building DELTAS research team assembled in New Orleans to examine sediment deposited by the flood in the Bonnet Carre Spillway and Lake Pontchartrain.

B. Motivation.

- Coastal restoration plans of the Mississippi Delta hinge upon sediment diversion projects to build new land.
- The sources of organic sediment and spatial patterns in organic carbon deposition will inform models for future sediment diversion projects.

C. Project Goals

- Constrain the contribution from organic carbon and mineral sediment deposited in the Bonnet Carre Spillway.
- Compare organic content in different sedimentary facies
- Characterize proximal-to-distal change in the organic content of deposited sediment.



D. Methods

- Sediment facies in trenches were mapped, photographed and sampled.
- Georeferenced grab samples from Lake Pontchartrain and surface samples from the spillway Pontchartrain
- The organic fraction in all samples was calculated by measuring the loss in mass upon ignition.

Fig. 2: Locations of the trenches and surface samples are shown in this perspective overhead image of Bonnet Carre Spillway. (Image credit to Madeline Cross & Miles Beech)

E. Results

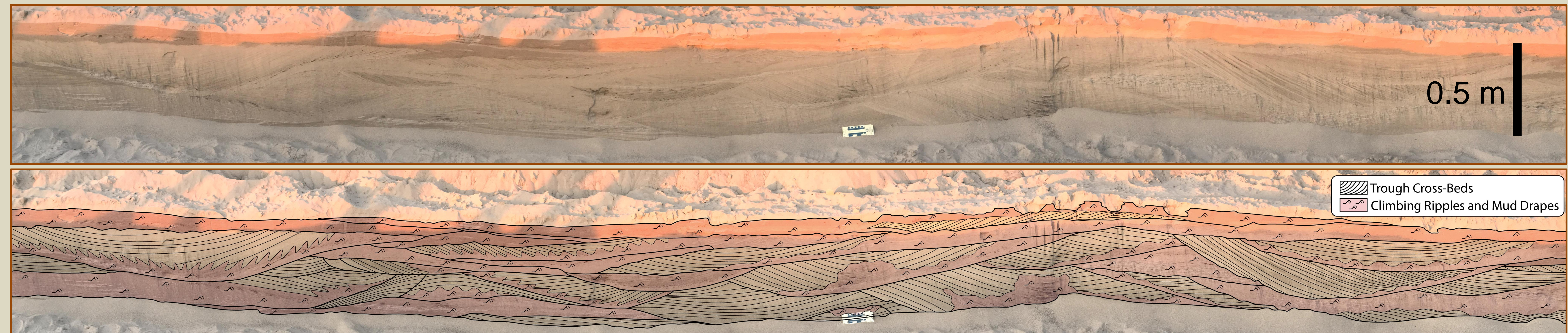


Fig. 3: Trough cross-beds, ripples and mud drapes in Trench 2. View is orthogonal to flow direction.

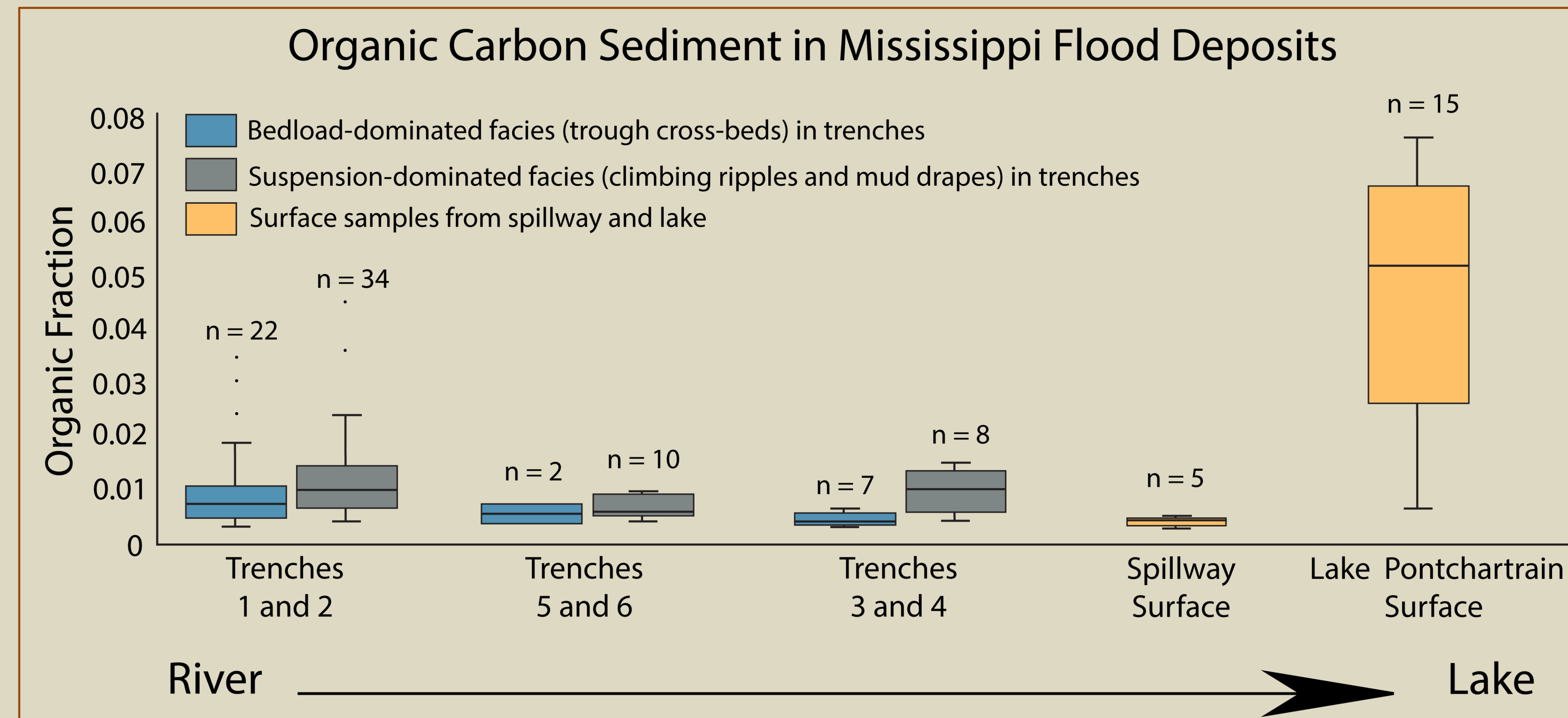


Fig. 4: The distributions of the organic fraction moving away from the Mississippi River.

- The fraction of organic carbon in bedload sediment shows a broad decrease from the river to the lake, possibly due to decreasing deposition rates away from the river. Note: The small number of bedload samples from trenches 3-6 may render the observed change in organic carbon content statistically insignificant.
- The abundance of climbing ripples in the spillway sediment indicate large volumes of sediment deposited from suspension.
- Lake Pontchartrain sediment contained approximately 5 times the organic carbon content than seen in the spillway samples, likely due to the lower degree of reworking in this low energy environment.

F. Sedimentary Facies

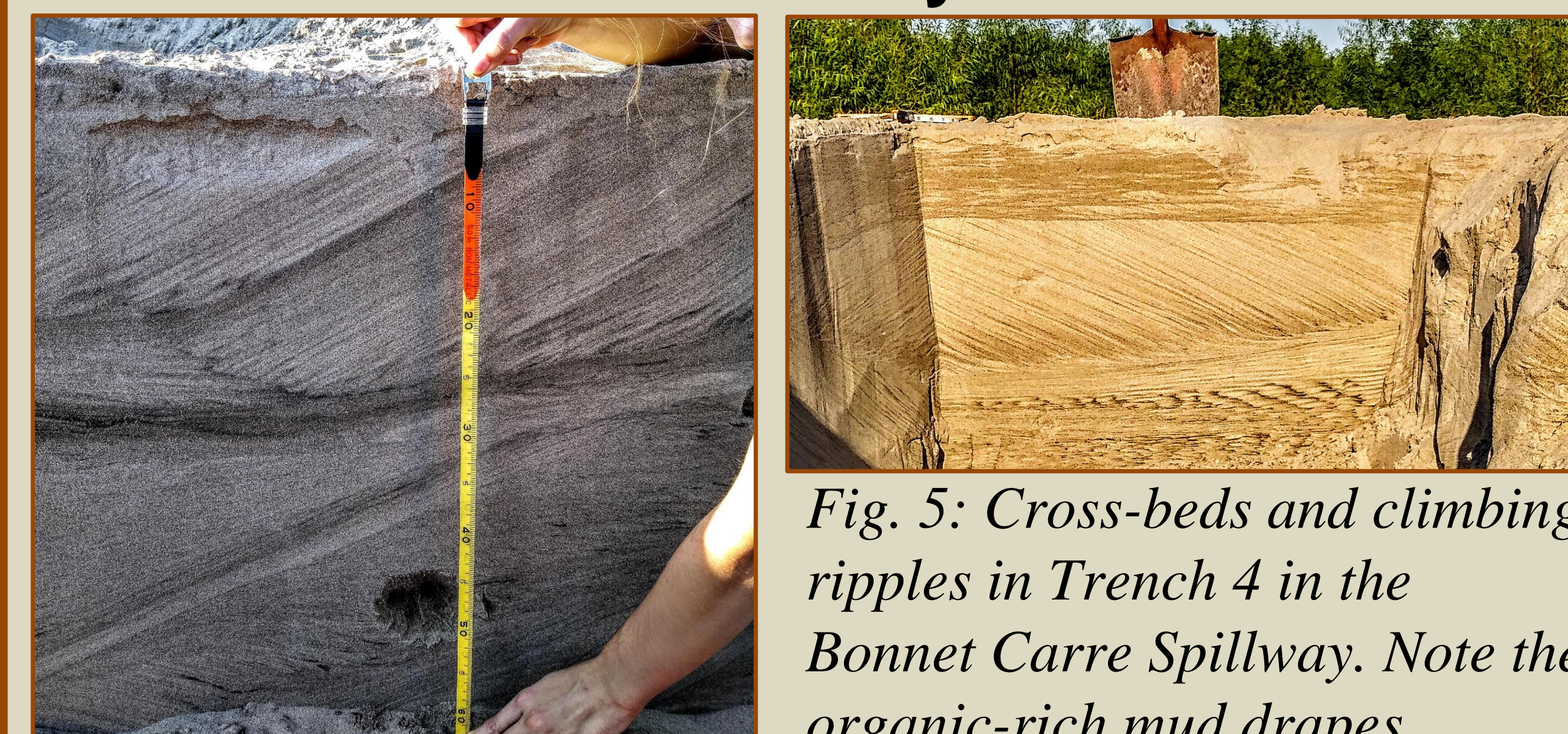


Fig. 5: Cross-beds and climbing ripples in Trench 4 in the Bonnet Carre Spillway. Note the organic-rich mud drapes.

G. Video Presentation



Follow the QR code or click on [THIS LINK](#) to access my Google Drive folder with a video presentation of the poster and my CV.
I'm looking at graduate programs for Fall 2022!

H. Acknowledgements

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