Interpretation of Sands Deposited in Buffalo Bayou during Hurricane Harvey

Sarah Meyer[1], Jerome Kendall[2], and Joel Saylor[1]

[1]University of Houston

[2]University of New Mexico

ABSTRACT

Hurricane Harvey was an extreme precipitation event which took place August 25–31, 2017. The event had huge impacts on the city of Houston. The hurricane stalled out to the southwest of the Houston area causing many areas in the region to reach or exceed their 1000-year flood event return period. Intense flooding caused a massive volume of runoff in the rivers that drain the Houston region, especially in Buffalo Bayou where the river peaked at almost 40 feet. Due to controlled releases from the Addicks and Barker reservoirs in the month following Hurricane Harvey, Buffalo Bayou remained at flood stage until late September 2017. In the following month, after water levels returned to normal, 11 sand peels were collected from the deposits in the Johnny Steele Dog Park area along Buffalo Bayou. These peels record the sedimentation patterns during Hurricane Harvey and the controlled releases in the form of flood deposit layers, channel cuts, and cross stratification. This detailed description and interpretation of the sedimentary structures in the sand peels provides information on flow direction and erosion or deposition during Hurricane Harvey and the flood following. In addition to interpreting sand peels, we also perform detrital zircon (DZ) geochronology on sand bar deposits from Hurricane Harvey and fluvial channel deposits from the Pleistocene Beaumont Formation. These DZ analyses will allow us to determine the provenance of both formations and observe any differences between the two units. Interpretation of sand peels, determining flow direction, and DZ analysis can allow us to observe how drainage systems behave during extreme events such as Hurricane Harvey.

Meyer, S., J. Kendall, and J. Saylor, 2019, Interpretation of sands deposited in Buffalo Bayou during Hurricane Harvey: GeoGulf Transactions, v. 69, p. 567.