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Hurricane Storm Surge Sedimentation on McFaddin National Wildlife Refuge, Texas: Spatial Variations in Sediment Distribution in the Right-Front Quadrant of Hurricane Ike

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This study investigates spatial variations in sediment distribution in the right-front quadrant of Hurricane Ike, on McFaddin National Wildlife Refuge on the East Texas Gulf Coast. The purpose of this study was to discover how hurricane storm surge sedimentation spatially varies in relation to the landfall location of Hurricane Ike. Fieldwork conducted in 2017-2018 involved digging shallow pits on four coastal marsh transects between Sabine Pass, Texas and High Island, Texas. The transects extend 880-1630 meters, with pit sites beginning near the coastline and extending landward. Results obtained in the field indicate that the Hurricane Ike sediment deposit has been found on all four transects, and that the deposit decreases in thickness moving landward along each transect. Furthermore, the observational results of this study were used in Regression Analyses to model sediment thickness based on pit site distance inland, pit site elevation, and distance from the landfall location of Hurricane Ike. Results indicate that the distance from landfall location was not a significant predictor of deposit thickness, which is very likely due to all four transects being in the right-front quadrant of landfalling Hurricane Ike. The findings of this study provide improved understanding of the spatial relationship between storm surge sedimentation and storm surge heights, valuable knowledge about the sedimentary response of coastal marshes subject to storm surge deposition, and useful guidance to public policy aimed at combating the effects of sea-level rise on coastal marshes along the northern Gulf of Mexico coastline.