
Hurricane Rita, 2005: Assessment of a Storm-Induced Geological Event along the Southwestern Louisiana Coast and Adjacent Interior Marsh

Walter S. Guidroz¹, Gregory W. Stone², and Dane Dartez³

¹BP America, Inc., 501 Westlake Park Dr., Houston, TX 77079

²Louisiana State University, Coastal Studies Institute and Department of Oceanography and Coastal Sciences,
Baton Rouge, LA 70803

³Hurricane Center, Louisiana State University, Baton Rouge, LA 70803

ABSTRACT

The landfall of Hurricane Rita on September 24, 2005 significantly altered physical and morphological characteristics along the western Louisiana coast as well as marshes approximately 25 km inland. Storm-surge measurements show super elevated water levels around 15 ft (4.6 m) were measured in the Cameron area to the east. A helicopter overflight of central and southwestern Louisiana, undertaken by the Coastal Studies Institute of Louisiana State University about three weeks after Hurricane Rita's landfall, revealed major storm-induced sedimentologic phenomena directly attributable to the passage of this Category 3 storm. Overwash deposits (predominantly fine sand) and evidence of excessive storm surge and salt-water intrusion were clearly evident in Cameron and Vermilion parishes, Louisiana. These responses became progressively more pronounced farther west, culminating at the point of eyewall impact near Sabine Pass on the border between Texas and Louisiana. Widespread damage to physical infrastructure was also noted within several communities located on or near the coast, particularly in Cameron and Holly Beach, Louisiana. Excessive salinity levels resulting from salt-water intrusion severely impacted local vegetation several kilometers inland and, over the longer term, may exacerbate existing problems linked to coastal erosion through the loss of vegetation that retards coastal erosion and attenuates waves and storm surge during high-energy events. However, initial post-storm beach recovery was also noted early post-storm landfall. Bar welding to the lower shoreface was evident as sediment was being reworked onshore by waves. Follow-up observations will focus on documenting continued post-storm recovery as well as the potential effects of future tropical cyclones that may impact the area.