

Delta Front Mass Wasting and its Potential Effects on Oil and Gas Infrastructure

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Mudflows on the Mississippi River Delta Front (MRDF) are a recognized hazard to oil and gas infrastructure in the shallow Gulf of Mexico. Preconditioning of the seafloor for failure results from high sedimentation rates coupled with slope over-steepening, under-consolidation, and abundant biogenic gas production. Cyclical loading of the seafloor by waves from passing major storms appears to be a primary trigger, but the role of smaller (more frequent) storms and background oceanographic processes is largely unconstrained. From May 19-26, 2017, a team of USGS scientists and collaborators from Louisiana State University carried out a pilot high-resolution seafloor mapping and seismic imaging cruise about the *R/V Point Sur* across portions of the MRDF as part of a multi-agency/university effort to characterize mudflow hazards in the area. The primary objective of the cruise was to test various geophysical tools for seafloor mapping and shallow sub-surface imaging in the challenging environmental conditions (e.g., variably-distributed water column stratification and wide-spread biogenic gas in the shallow sub-surface) present across the entire delta front. More than 600 km of high-resolution multibeam bathymetry/acoustic backscatter/water column data, 425 km of high-resolution towed chirp data, and more than 500 km of multi-channel seismic data (240 km of boomer and 300 km of mini-sparker data recorded on a 32-channel solid-state streamer) were collected during the cruise. These new data imaged the varied mudflow gully/lobe and pro-delta morphologies, in addition to identifying the current location of the moving *SS Virginia*, in selected survey areas from Pass A Loutre to Southwest Pass