

Sedimentary Record of the Landfall of Hurricane Katrina along the Gulf Coast: Implications for Paleotempestology

Benjamin P. Horton¹, Veronica Rossi², Andrea H. Hawkes¹, and Matthew R. Wright³

¹Department of Earth & Environmental Science, University of Pennsylvania, 240 South 33rd St., Philadelphia, PA 19104-6316

²Dipartimento di Scienze della Terra e Geologico-Ambientali, Via Zamboni 67, Bologna 40127, Italia

³U.S. Geological Survey, Eastern Region Earth Surface Processes Team, 12201 Sunrise Valley Dr., Reston, VA 20192

ABSTRACT

Despite the pending disaster along the Gulf Coast having been forecasted since the 19th century, a major obstacle in producing reliable predictions of catastrophic environmental changes is a lack of data on time scales longer than the short instrumental record. Obtaining a record of present and past events, and the extent of coastal impacts, is one means to assess future risk and test the possibility that the recent cluster of hurricane events along the Gulf Coast may be linked to global environmental change.

We rapidly dispatched survey teams to collect the readily available, but perishable data, from Hurricane Katrina's storm surge along the Alabama and Mississippi coastline. We made high-resolution GPS and leveling ground surveys of local topography, storm surge flow depth and flow direction. The maximum run-ups and the water levels of the storm surge were greater than 600 m inland and 8 m above mean sea level, respectively. We examined sediment deposit thickness and character along cross-shore transects at our study sites. We measured and described the deposits in the field and performed sedimentological and microfossils analyses. Generally, the storm surge deposits were shown to be barren of microfossils and contained a lower organic contents and coarser grain sizes than the pre-storm surge deposits.