Engineering; Study Results from University of Texas at Austin Update Understanding of Engineering (Spatial Discrimination of Complex, Low-relief Quaternary Siliciclastic Strata Using Airborne Lidar and Near-surface Geophysics: an Example From the Texas ...)

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2019 APR 30 (VerticalNews) -- By a News Reporter-Staff News Editor at Physics Week -- Researchers detail new data in Engineering. According to news reporting from Austin, Texas, by VerticalNews journalists, research stated, "Depositional units preserved on coastal plains worldwide control lithologic distribution in the shallow subsurface that is critical to infrastructure design and construction, and are also an important repository of information about the large-scale climate change that has occurred during many Quaternary glacial-interglacial cycles. The lateral and vertical lithologic and stratigraphic complexity of these depositional units and their response to climatic and sea-level change are poorly understood, making it difficult to predict lithologic distribution and to place historical and future climate and sea-level change within a natural geologic context."

Financial supporters for this research include State of Texas Advanced Oil and Gas Resource Recovery (STARR) Program at the **Bureau of Economic Geology**, University of Texas at Austin, US Geological Survey (USGS) National Cooperative Geologic Mapping Program.

The news correspondents obtained a quote from the research from the University of Texas at Austin, "Mapping Quaternary siliciclastic depositional units on low-relief coastal plains traditionally has been based on their expression in aerial photographs and low-resolution topographic maps. Accuracy and detail have been hindered by low relief and lack of exposure. High-resolution airborne lidar surveys, along with surface and borehole geophysical measurements, are being used to identify subtle lateral and vertical boundaries of lithologic units on the Texas Coastal Plain within Quaternary strata. Ground and borehole conductivity measurements discriminate sandy barrier island and fluvial and deltaic channel deposits from muddy floodplain, delta-plain, and estuarine deposits. Borehole conductivity and natural gamma logs similarly distinguish distinct lithologic units in the subsurface and identify erosional unconformities that likely separate units deposited during different glacial-interglacial stages. High-resolution digital elevation models obtained from airborne lidar surveys reveal previously unrecognized topographic detail that aids identification of surface features such as sandy channels, clay-rich interchannel deposits, and accretionary features on Pleistocene barrier islands."

According to the news reporters, the research concluded: "An optimal approach to identify lithologic and stratigraphic distribution in low-relief coastal-plain environments employs (1) an initial lidar survey to produce a detailed elevation model; (2) selective surface sampling and geophysical measurements based on preliminary mapping derived from lidar data and aerial imagery; and (3) borehole sampling, logging, and analysis at key sites selected after lidar and surface measurements are complete."

For more information on this research see: Spatial Discrimination of Complex, Low-relief Quaternary Siliciclastic Strata Using Airborne Lidar and Near-surface Geophysics: an Example From the Texas Coastal Plain, Usa. Engineering, 2018;4(5):676-684. Engineering can be contacted at: Elsevier Science Bv, PO Box 211, 1000 Ae Amsterdam, Netherlands. (Elsevier - www.elsevier.com; Engineering - www.journals.elsevier.com/engineering-analysis-with-boundary-elements/)

Our news journalists report that additional information may be obtained by contacting J.G. Paine, University of Texas - Austin, Bur Econ Geol, Jackson School of Geosciences, Austin, TX 78713, United States. Additional authors for this research include E.W. Collins and L. Costard.

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