Topographic and Bathymetric Lidar Applications in Coastal Research at the Bureau of Economic Geology

John R. Andrews, Jeffrey G. Paine, Caudle L. Tiffany, and Kutalmis Saylam

Bureau of Economic Geology, University of Texas at Austin, University Station, Box X, Austin, Texas 78713

GCAGS Explore & Discover Article #00096*
http://www.gcags.org/exploreanddiscover/2016/00096_andrews_et_al.pdf
Posted September 13, 2016.

*Abstract published in the *GCAGS Transactions* (see footnote reference below) and delivered as an oral presentation at the 66th Annual GCAGS Convention and 63rd Annual GCSSEPM Meeting in Corpus Christi, Texas, September 18–20, 2016.

ABSTRACT

Lidar derived point clouds and digital elevation models (DEMs) have become requisite tools for all manner of coastal research. Since 1999, researchers at the Texas Bureau of Economic Geology have collected, processed, and analyzed lidar data and conducted coastal research supported by data captured with our airborne lidar instruments. We present here an overview of our research including shoreline migration studies and analysis, Quaternary geologic mapping, dynamics of beach and dune systems, and subsidence and faulting. In 2012, we acquired a new lidar system having both topographic and bathymetric imaging capabilities. Bathymetric data acquired with this instrument have opened new approaches to determining nearshore bathymetry, sediment budgets, and waterbody morphology, identifying and mapping submarine infrastructure, and mapping wetlands. We present both the potential for bathymetric lidar in coastal studies and the limitations associated with its deployment in the frequently turbid waters of the Texas Gulf Coast. Finally, we review software written at the Bureau to automate the extraction of geomorphic data from lidar point clouds and derivatives.

Originally published as: Andrews, J. R., J. G. Paine, C. L. Tiffany, and K. Saylam, 2016, Topographic and bathymetric lidar applications in coastal research at the Bureau of Economic Geology: Gulf Coast Association of Geological Societies Transactions, v. 66, p. 911.