

ESTIMATION OF RESERVOIR STORAGE CAPACITY USING TERRESTRIAL LIDAR AND MULTIBEAM SONAR, RANDY POYNTER LAKE, ROCKDALE COUNTY, GEORGIA

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Abstract. Randy Poynter Lake is a 650-acre reservoir that was constructed to meet the drinking water needs of Rockdale County. The Lake was formed following impoundment of Big Haynes Creek with the construction of Jack Turner Dam. Suspended sediment monitoring on Big Haynes Creek has indicated excessive sediment yields upstream of the reservoir. An accurate 3-dimensional model of the lake will provide the current storage capacity of the lake as well as establish a baseline for monitoring future sedimentation.

In 2012, the U.S. Geological Survey, in cooperation with Rockdale Water Resources collected topographic and bathymetric data at Randy Poynter Lake simultaneously using a marine-based mobile mapping unit to estimate storage capacity. Bathymetric data were collected using multibeam and singlebeam echo sounders. Topographic data were collected using a marine-based mobile mapping light detection and ranging (LIDAR) system, real-time kinematic global positioning system (GPS), and conventional surveying methods. The mobile mapping unit was operated in conjunction with a position and orientation system and GPS base station. The datasets were combined and a 3-dimensional model was created for the reservoir to generate a stage-storage curve.