Abstract

Analysis of underwater bathymetry data using single-beam and multi-beam echo sounders has been recognized as an effective tool in estimation of sedimentation in a reservoir. However, the accuracy of sediment volume calculation depends on the quality of the backscatter data, received from the echo sounder. The echo signal reflection is sensitive to physical properties of medium, submerged vegetation and sediment characteristics. In this paper a novel approach is made by applying different gridding and signal processing techniques on a backscattered echo signal acquired form a natural lake formed in the western guards. This lake is selected as it is naturally formed with lots of sediment inflow due to change in agricultural practices. The data used for this study was collected at regular interval (i.e. 2003, 2013 and 2016). Data of 2003 and 2013 were used as input data and the performance validation was carried out in comparison with 2016 data, which is measured with the highest precession technology (i.e. RTK-DGPS) after completion the dredging process. The standard tools estimating the bathymetry suffers lack of adaptive modern filter capacities and hence results in erroneous depth measurement, which in turn leads to underestimation or overestimation of the capacity.
The most advanced adaptive filters are applied on this lake data, and their performance was compared with reference to 2016 capacity estimation.

References


Index Terms

Computer Science

Signal Processing
Keywords