

**DETERMINATION OF SHALLOW WATER DEPTH USING  
LANDSAT-8 SATELLITE IMAGES**

**A Thesis by**

**SRI BUWANEKABAHU PATABENDALAGE LAHIRU VIRAJ DAYANANDA**

**SUR.SC. /16/001**

**Supervised by**

**Mr. G.P. Gunasinghe**

**Mr. R.K.A. Ariyaratna**

**Mr. R.M.D.I. Rathnayake**

**Submitted in partial fulfilment of the requirements for the award of BSc (Hons) in Surveying  
Sciences Degree**

**Faculty of Built Environment and Spatial Sciences**

**GENERAL SIR JOHN KOTELAWALA DEFENCE UNIVERSITY**

**2019 December**

## ABSTRACT

Temptation to determine the bathymetry data goes to the era when humans launched ships to discover the world. Bathymetry survey is the science of identifying and preparing charts about the behaviour of the ocean's floor. The bathymetric data provide an important foundation for the process of the generating profile of the seafloor, charts for navigation, coastal area erosion, sea level variations, biological oceanography, and so on. From ancient times to the present date, there were a number of methods that are used to do bathymetric surveys. Those methods were by applying either active sensors, like ship based sounding, LiDAR, sonar or passive multispectral images which were taken based on space-born platforms such as Ikonos, WorldView, Landsat and QuickBird. The LiDAR, ship based echo-sounding survey and commercially available space born multispectral satellite platforms such as Ikonos, WorldView and QuickBird are very expensive methods to obtain ocean depth data for the developing countries. But the satellite images which are provided by Landsat satellites, are totally free and it contains commonly obtainable satellite data by providing global coverage. The present study was launched to determine the bathymetry data of the northern coastal region of Sri Lanka by applying the nonlinear inversion algorithm which was formulated by Stumpf *et al.* (2003) on the Landsat-8 satellite image bands of blue, green and NIR. Results of created satellite derived bathymetry (SDB) map represented a respectable relationship among the algorithms calculated values and hydrographically collected sounding values.

**Keywords:** Satellite Derived Bathymetry; Landsat-8; Non-linear inversion algorithm