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Estimation of sediment capacity of Aswan High Dam Lake utilizing remotely sensed bathymetric data: Case Study Active Sedimentation portion of Lake Nubia

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This study deals with the quantitative estimation of the accumulated sediment capacity within the period from the initiation of the storage process of Lake Nubia in 1964 until 2012, by using field measurements and remote sensing data.. The bed levels of the study area related to year 1964 were extracted from a tri-dimensional model of the lake derived from a topographic map, based on observations anterior to lake filling. This map was compared with the bed levels estimated for the year 2012, which were extracted from remote sensing data, with the aim to estimate the sediment capacity. The utilized technique for estimating the bathymetric data (depths) from satellite images relies on establishing a Multiple Linear Regression (MLR) model between in situ measurements and reflectance data from multi-spectral optical satellite observations. The Multiple Linear Regression (MLR) model showed good results in the correlation between field measurements and remote sensing data. The current approach provides flexibility as well as effective time and cost management in calculating depths from remote sensing data when compared to the traditional method applied by Aswan High Dam Authority (AHDA). This study is in the framework of a bilateral project between ASRT of Egypt and CNR of Italy, which is still running.