



University of Zabol

Graduate School

Faculty of Water and Soil

Department of Water Engineering

**The Thesis Submitted for the Degree of Master of Science
(In the Field of water Resources Engineering)**

Bathymetry of Hamoun-Sabouri Wetland Using Remote Sensing

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Summer 2021

**Abstract:**

The International Hamoun wetland is a transboundary wetland in eastern part of Iran and Southwest of Afghanistan that largely affects the socioeconomic and environmental status of both countries. The Hamoun-Sabouri wetland, one of the three parts of the Hamoun, receives the Adraskan and Farah basins runoff even when Hirmand river experiencing drought spells. However, with the low inflow into the wetland, measuring the least available water in the wetland and its storage capacity is of most importance when planning for its management. To this end, remote sensing technology is used to calculate the storage capacity of the Hamoun-Sabouri and obtain its bathymetric maps. The Landsat 8 images were processed in ENVI package and verified using a base map of the digital elevation model of the wetland. The Artificial neural network was also used to validate the obtained results. To calculate the coastline changes, the Normalized Difference Water Index (NDWI), Modified Normalized Difference Water Index (MNDWI), and Normalized Difference Moisture Index (NDMI) were calculated. The MNDWI was a better indicator of coastline changes. Considering the base maps of the Hamoun-Sabouri wetland, application of Landsat8 imagery data for the purpose of bathymetry in Hamoun wetland proved to be a reliable approach.

Keywords: Hamoun International Wetland, GIS, ANN, Satellite Images