



## Capability assessment of two water indexes in remote sensing data in order to water bodies classification (case study: Gorganroud River - North east of Iran)

**edith eishoei** and Mirhassan Miryaghoubzadeh

urmia university, faculty of agricultural science and natural resources, urmia, Iran, Islamic Republic of  
(edith\_101010@yahoo.com)

Normalized Difference Water Index (NDWI) has been widely used to detect water bodies and enhance them in the satellite imagery. In order to determine water bodies in Landsat TM, Mid-Infrared and Green bands are used but this combination is often encountered with vegetation, soil and build-up land noises and the water bodies area was not calculated accurately and most of the time the results are higher than the actual area and was overestimated, NDWI does not remove soil and vegetation noises completely because of using the NIR band reflection, therefore, to eliminate these noises, Modified Normalized Difference Water Index (MNDWI) with different bands in Landsat TM such as Shortwave and Near-Infrared bands has been used and best image that shows water bodies more accurate has been provided. We need to test different band combination and also different NDWI and MNDWI indexes in the range of Red, Near-Infrared, Shortwave Infrared and Mid-Infrared to determine the best performing index. For this purpose, Gorganroud river basin was selected as study area, which is located in north-east of Iran and is one of the largest rivers in Iran and because of 2 dams located in the river basin and long distance of river, studying water bodies could be easier in comparing with other river basins of Iran. we compared NDWI and MNDWI indices and results shown that MNDWI index using Landsat TM bands Green and Mid-infrared has higher accuracy than NDWI and other calculated indices with different bands of Landsat TM. It can remove the vegetation, soil and build-up noises better than NDWI and water bodies can be shown clearly. The MNDWI is more suitable to extract water bodies and study the information of water regions with dominating the soil, vegetation and build-up land noises because of its advantage in reducing or even removing those noises over NDWI.

**Key words:** Normalized Difference Water Index (NDWI), Modified Normalized Difference Water Index (MNDWI), Landsat 5, water bodies, Gorganroud river basin