

## Abstract

The Mesopotamian marshlands faced a massive destruction from the year 1990 till 2003. This destruction led to displace the marsh dwellers and decrease the numbers of flora and fauna in the region.

After the war in 2003 in Iraq the rehabilitation and restoration of the devastated marshland ecosystem started.

In this study we attempt to investigate the water quality of the Hawizeh marshland after restoration took for the period from November 2005 to October 2006 and digital image processing (image enhancement and the digital classification techniques) using ERDAS, version 8.7, package for Landsat-5 and Landsat-7 (ETM+), 3 bands with resolution (14.25m), acquired different times.

The field investigation contains taking water samples from the marsh at two stations of each of the locations (Um-Elwarid and Um-Elniaj). Moreover laboratory tests are carried out for the chemical and physical properties of the marsh water.

It was found that:

- 1- The water quality of the two locations for most of the parameters were tested in this study was good in summer time because of the flood water from Tigris and the other feeders of the marsh, and most of the readings especially for Um-Elniaj location were within the proposed maximum allowable values of the Iraqi drinking standards NO.417/1974.
- 2- The water quality of Um-Elniaj location was better than that of Um-Elwarid location for all the parameters tested and almost for the whole readings measured over the year.
- 3- On the other hand, using of Landsat images for different years, it can be monitored the dramatic changes in the water, vegetation

area in different phases of the drying and re-flooding of the marsh. It can be noticed that the drying of the marshes did not lead to decrease the dry soil area with an efficient percentage, in fact the re-flooding of the marshes decreases this percentage ten times more than the drying period ,and that is because of most desiccated marshes turn to salty soil that can not be used for agriculture . It can be noticed that in the drying period, and with less percentage the pre drying period, the area of marsh vegetation had a large surface area of the clear water class while in the re-flooding phase the issue is different, that is because in the re-flooding time the new flooded areas were still young and the plants did not have the time to grow and distribute in the water yet.

From the satellite images it can be explained that the increment of the medium vegetation area in 2000, were because of the fertile areas that turned from dense vegetation and marsh vegetation areas to medium vegetation areas because of the lack of water due to the drying of the marshes .

A Comparison with the traditional methods of investigation reveals that the Remote Sensing techniques and satellite images are very useful because they are easy to produce, use, store and update, in addition they save in efforts, time and cost.

## Notation

At	Air temperature
AVHRR	Advanced Very High Resolution Radiometer
BC	Before Christian
BCM	Billion Cubic Meter
DN	Digital Number
DO	Dissolved Oxygen
EM	Electromagnetic
EMR	Electromagnetic Radiation
EMS	Electromagnetic Spectrum
EOSAT	Earth Observation Satellite
EROS	Earth Resources Observation Satellite
GCP's	Ground Control points
GPS	Global Positioning System
HRW	Human Rights Watch
IFOV	Instantaneous Field of View
IMET	Italian Ministry of Environment and Territory
IR	Infrared
Landsat	Land Satellite
Lat	Latitude
Long	Longitude
Metosat	Meteorological Satellite
MSS	Multispectral Scanner
NASA	National Aeronautics and Space Administration
NOAA	National Oceanic and Atmospheric Administration
SPOT	System Pour l'Observation de la Terre`
TDS	Total Dissolved Solid
TM	Thematic Mapper
TSS	Total Suspended Solid
UV	Ultra Violet
UTM	Universal Transverse Mercator
WGS'84	World Geodetic System from 1984
Wt	Water temperature

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