

# Monitoring vegetation and surface water dynamics of Oued M'ya using Earth Observation data

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## Abstract

Oued M'ya is located on the northern part of the Algerian Sahara, it represents the main artery of dry Ouedis. The superficial water table outcrops in depressions in form of salty wetlands. These wetlands are influenced by different factors that degrade its environment, leading to the fluctuation of the static level and the augmentation of water, and land salinity, which directly influences the oasis ecosystem. The objective of the present study is to follow the evolution of the vegetation cover and the humid surface state in order to map the changes and to identify the influencing factors. The study is based on the monitoring vegetation cover and water surface of Oued M'ya between the years 1989 and 2018, with the field surveys data and mapping changes obtained from remote sensing satellite images.

**Key words:** Oued M'ya, Vegetation, Remote sensing, Water surface, Monitoring.

## Introduction

Many research studies have been conducted on wetlands, but concerning Saharan wetlands, investigations are very few. This study is focusing on monitoring and following the evolution and degradation of vegetation and surface water dynamics of Oued My'a basin over the course of 30 years from 2018 to 1989. Monitoring vegetation cover and surface water requires a good knowledge of the ground and a cartography that values the potentials of this zone and its constraints. The study of the ground has been difficult because of obstacles related to the climatic conditions and problems of spotting and access to a large deserted space. Therefore, the use of remote sensing has appeared as the solution to follow vegetation and surface water's evolution in time. The results are yet to be obtained because we're still in the process of image processing and analysis so this document reflects only the current progress of the thesis.

Oued M'ya basin contains a lot of small wetlands that have valuable ecological functions, which have various potentials. Yet they are threatened by climatic changes and human activities. These wetlands are being lost and there is a danger that they might disappear.

## Study area

The basin of Oued Mya is located in northern part of the Algerian Sahara; more precisely in the central province between latitudes 32 ° 08 'and 32 ° 46' North and Longitudes: 4 ° 28 'and 5 ° 08' East. It presents a configuration of a depression, elongated and oriented North-East-South-West acquired during the Paleozoic; The basin is limited by: North by the high zone of Djamaâ-Touggour, In the South-East, the Hassi Messaoud mole and in the south by the Mouydir basin. Three sites were selected for the study based on their rich diversity and environmental importance in the area: Sebkhét Sefioun, Hassi Enfel and Mechraa N'sa.

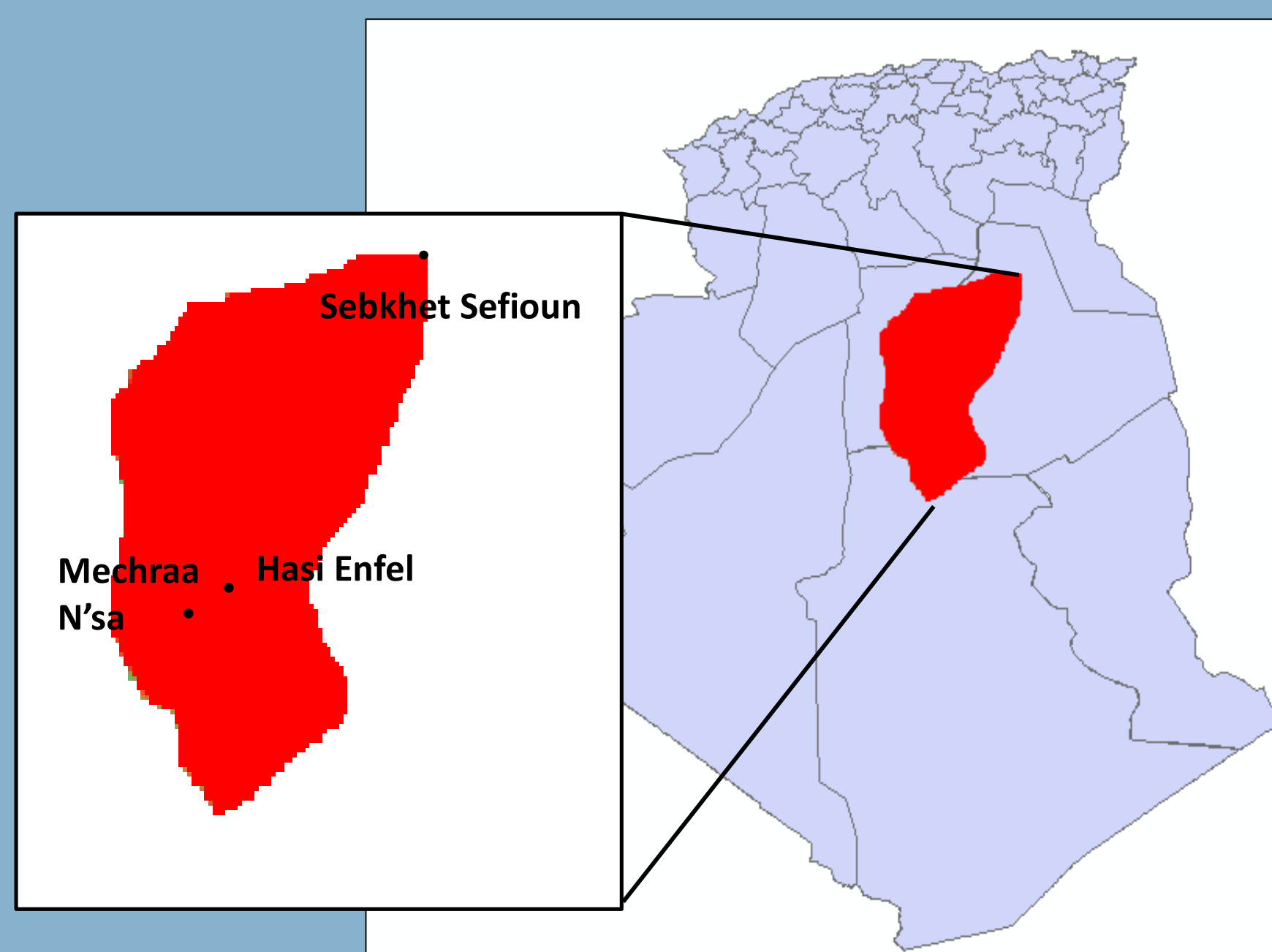


Fig1. Representation of Oued M'ya basin location and study sites locations

## Material and Methods

### Materials

**field surveys materials:** GPS, Meterage.  
**Satellites used:** Landsat TM and ETM+, Sentinel  
**Software used:** ArcGIS 10.4, ERDAS imagine 2014, Global Mapper.

### Method

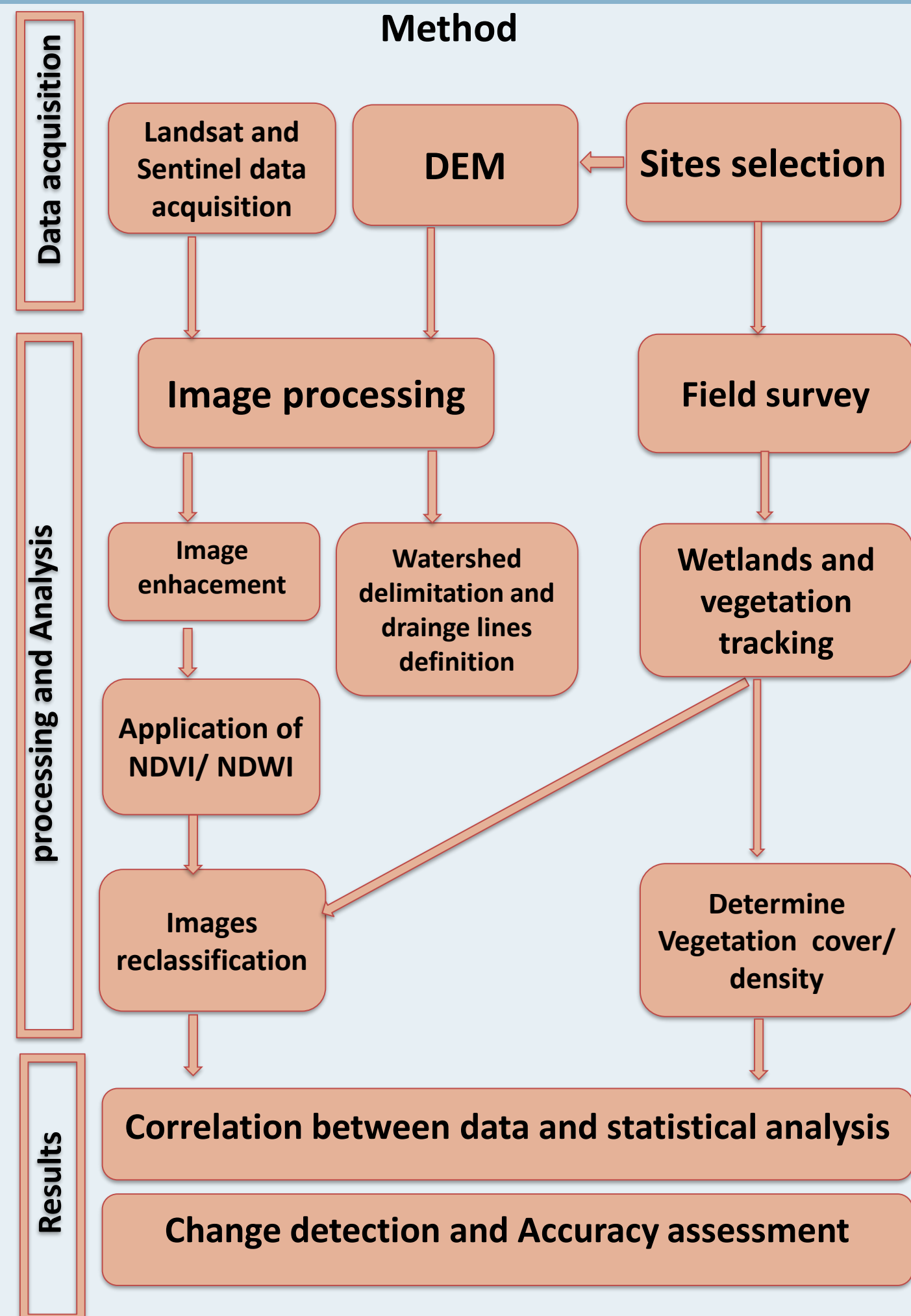


Fig2. Model for image processing and integrating ground data with satellite data

## Conclusion

The vegetation and water surface state in a hyperarid climate are always constraints of extreme climatic factors, which give it a rarity. For this reason, this work is a study of a Watershed basin, situated in Algerian low Sahara and characterized by the presence of a lot of wetlands and Chotts which has an important diversity rate to follow their spatial-temporal evolution since 1989 until 2018 and to determinate the factors of influence. This is being realizing through satellite images and software treatment of change and of cartography.

## References:

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