Sedimentation Mapping in Shallow Shoreline of Arid Environments Using Active Remote Sensing Data

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Overview

- Introduction
- Objectives
- Study area
- Methodological framew
- Findings
- Conclusions

Introduction

Remote Sensing Data

- The sedimentation mapping of shallow shorelines is insufficient using passive remote sensing images
- Active remote sensing data can overcome the difficulties of the weather interference and reach to more reliable results

Shoreline Habitats

- The intensity of sea level rise in the Mediterranean region threaten the shorelines and its natural habitat
- Islands and wetland ecosystems are fragile ecosystems and less tolerant to human activities and the climate change

Introduction

Active RS

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Flash Floods

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Sedimentation

Objectives

SAR and change detection techniques

Sedimentation mapping

Wetland delineation

extract the changes detected in the shallow shoreline and the wetlands according to the temporal pattern

Conservation of the natural habitats

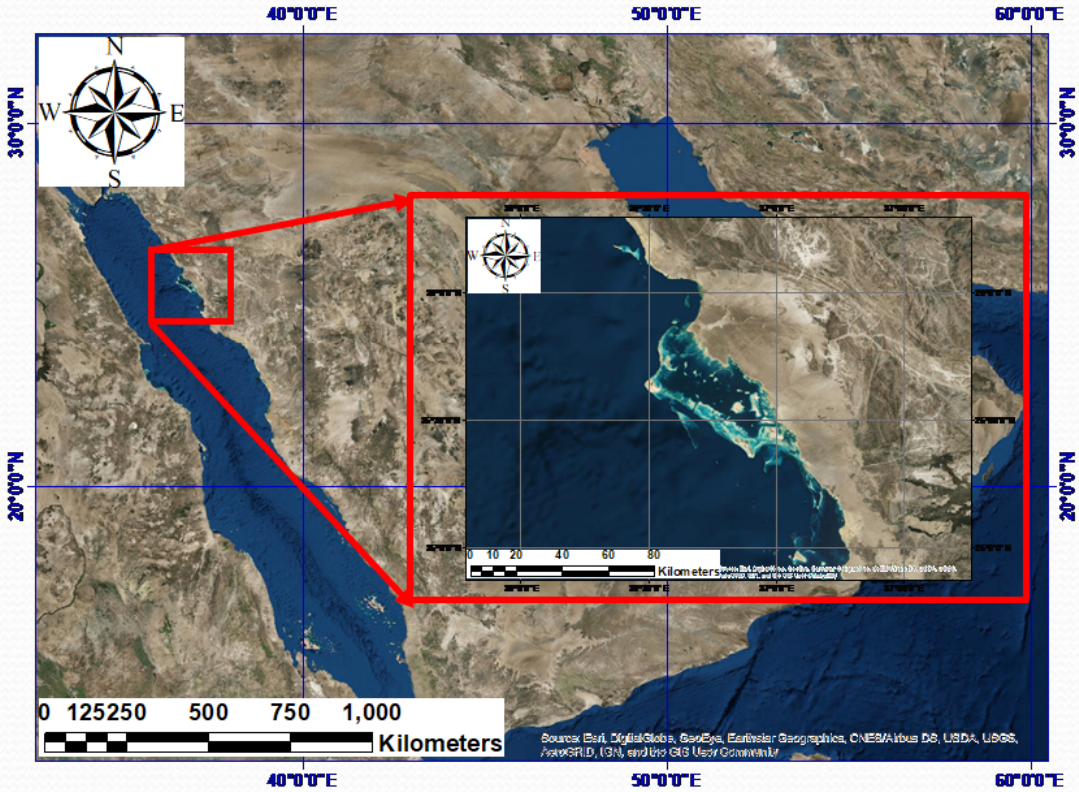
Study area

Umluj city is located on the coast of the Red Sea between the city of the Alwajh north and the city of Yanbu

Salt swamps, lagoons, and mangrove timberlands

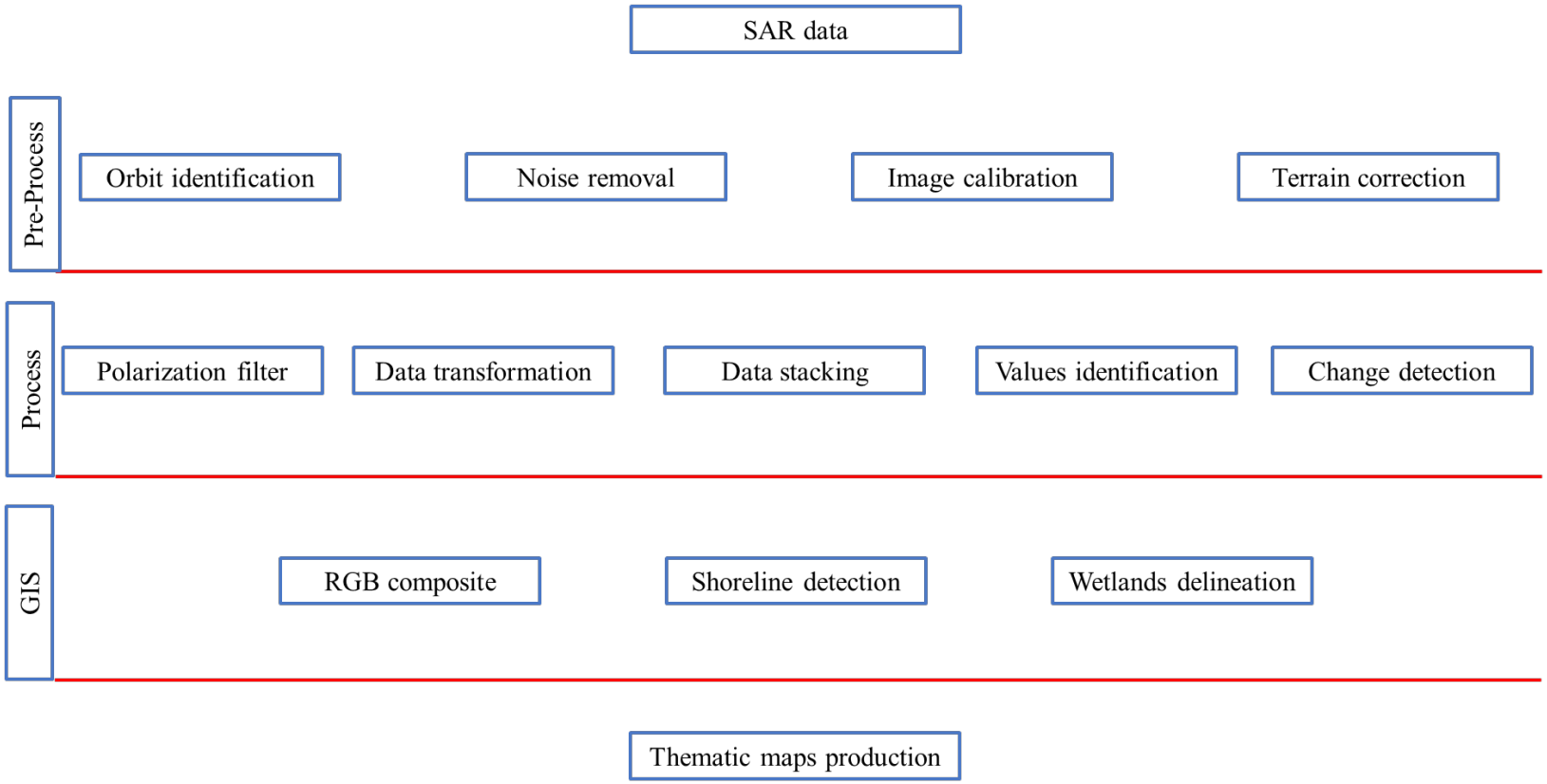
flourished and expanded tourism movement, urban and industrial activities along the city coast.

low rainfall with the high susceptibility to flashfloods that reach 120 mm, sea surface temperatures 21–29 °C.

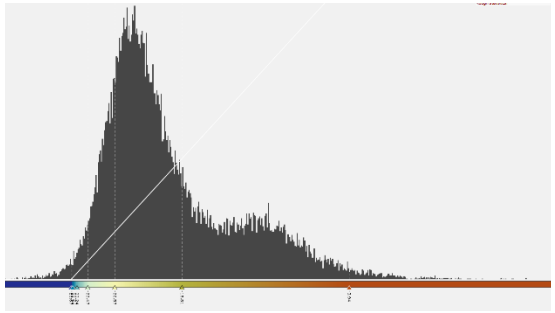


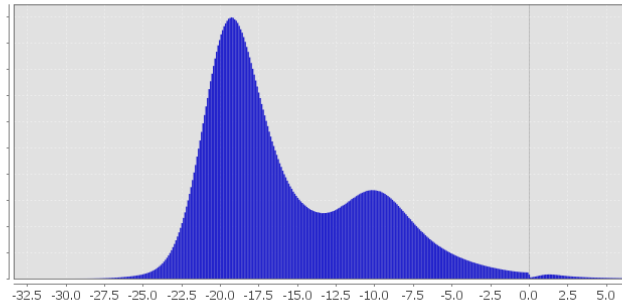
The location of the study area in false color composite

Methodological framework

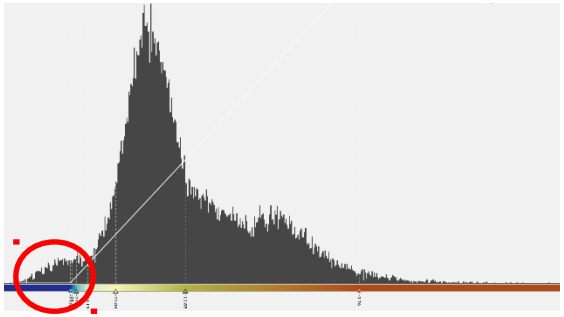


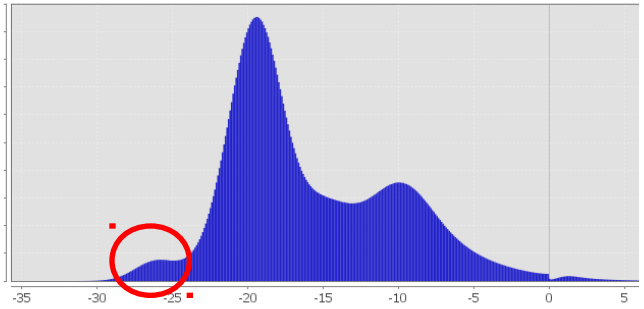
Findings





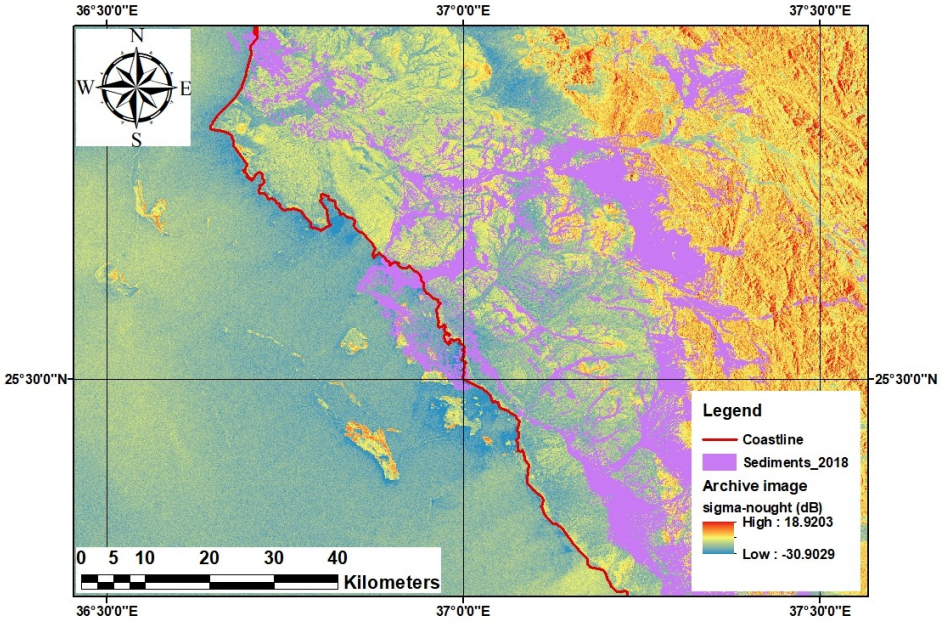
The histogram of the archive image before and after Speckle filtration

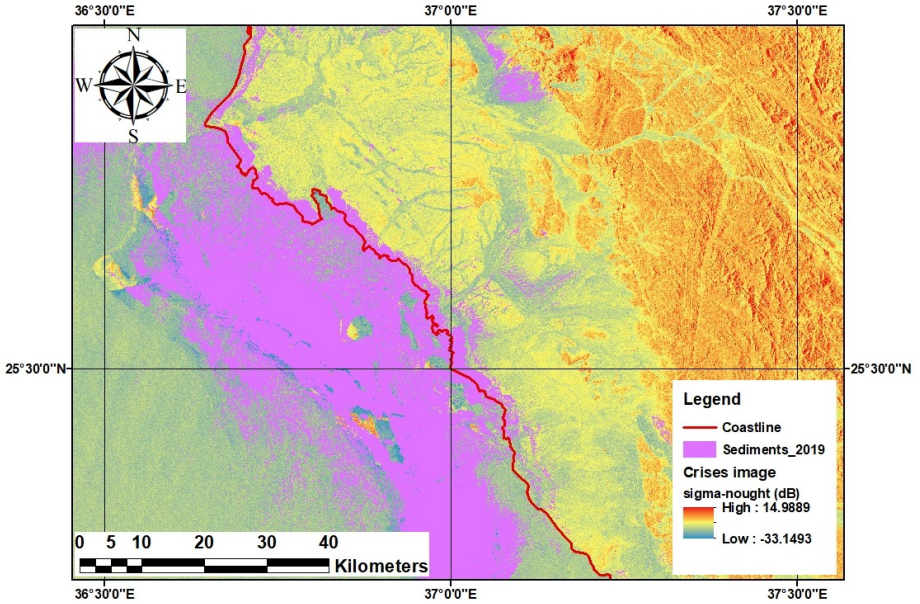




The histogram of the crisis image before and after Speckle filtration

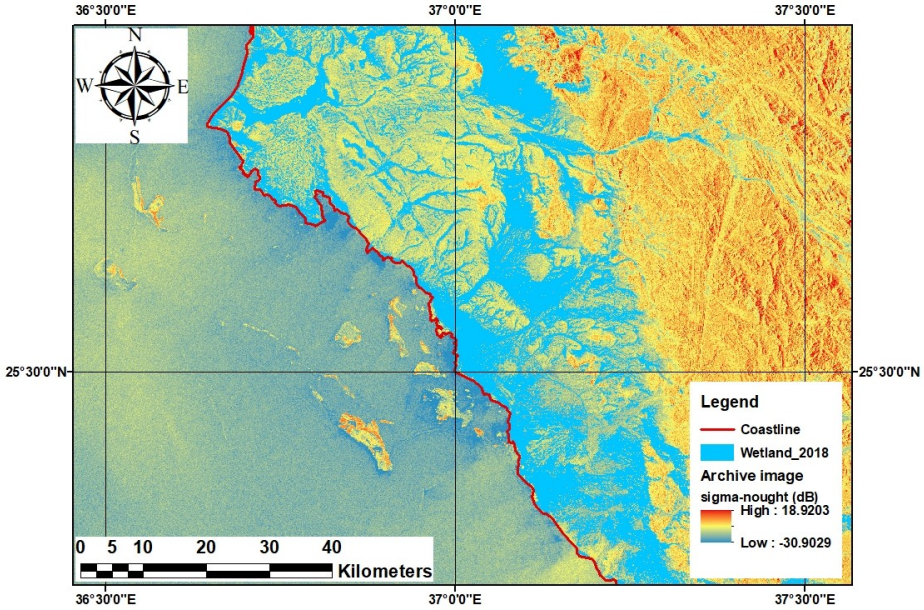
Findings

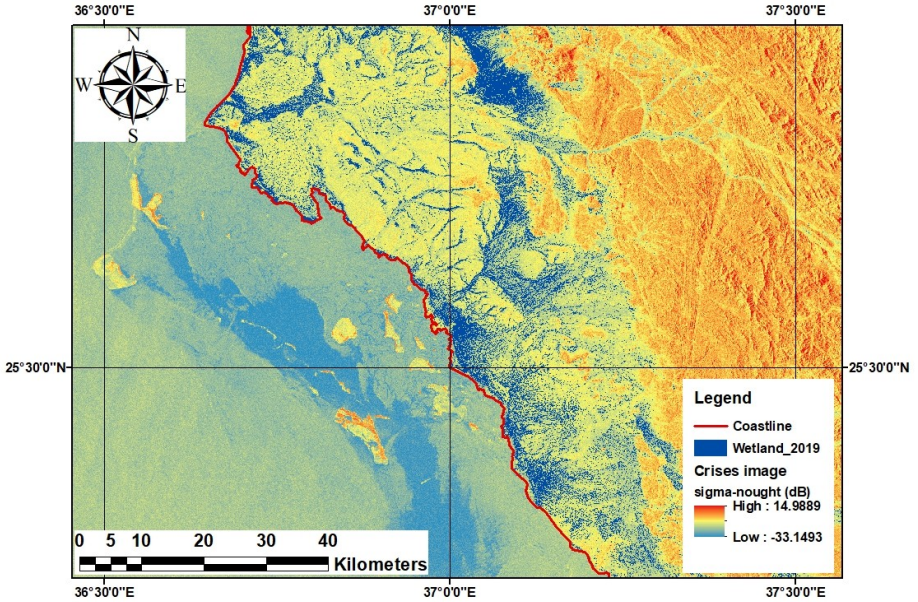




Detection of the sediment deposits before and after

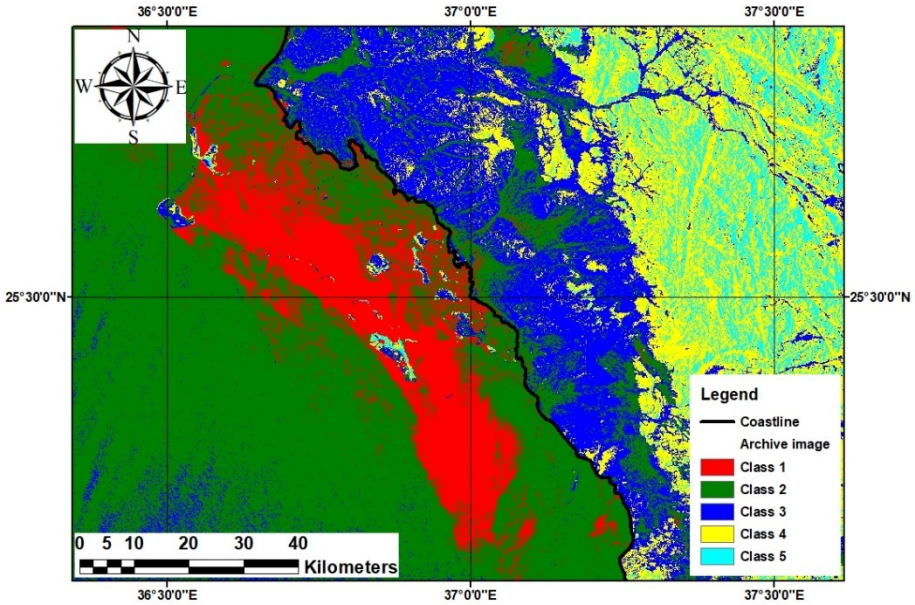
Findings

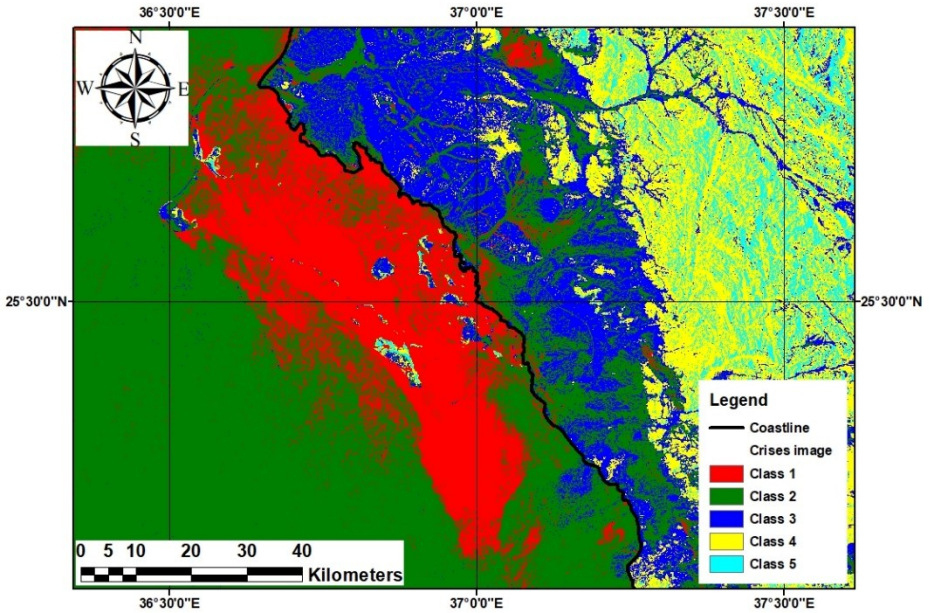




Delineation of the wetland habitats before and after

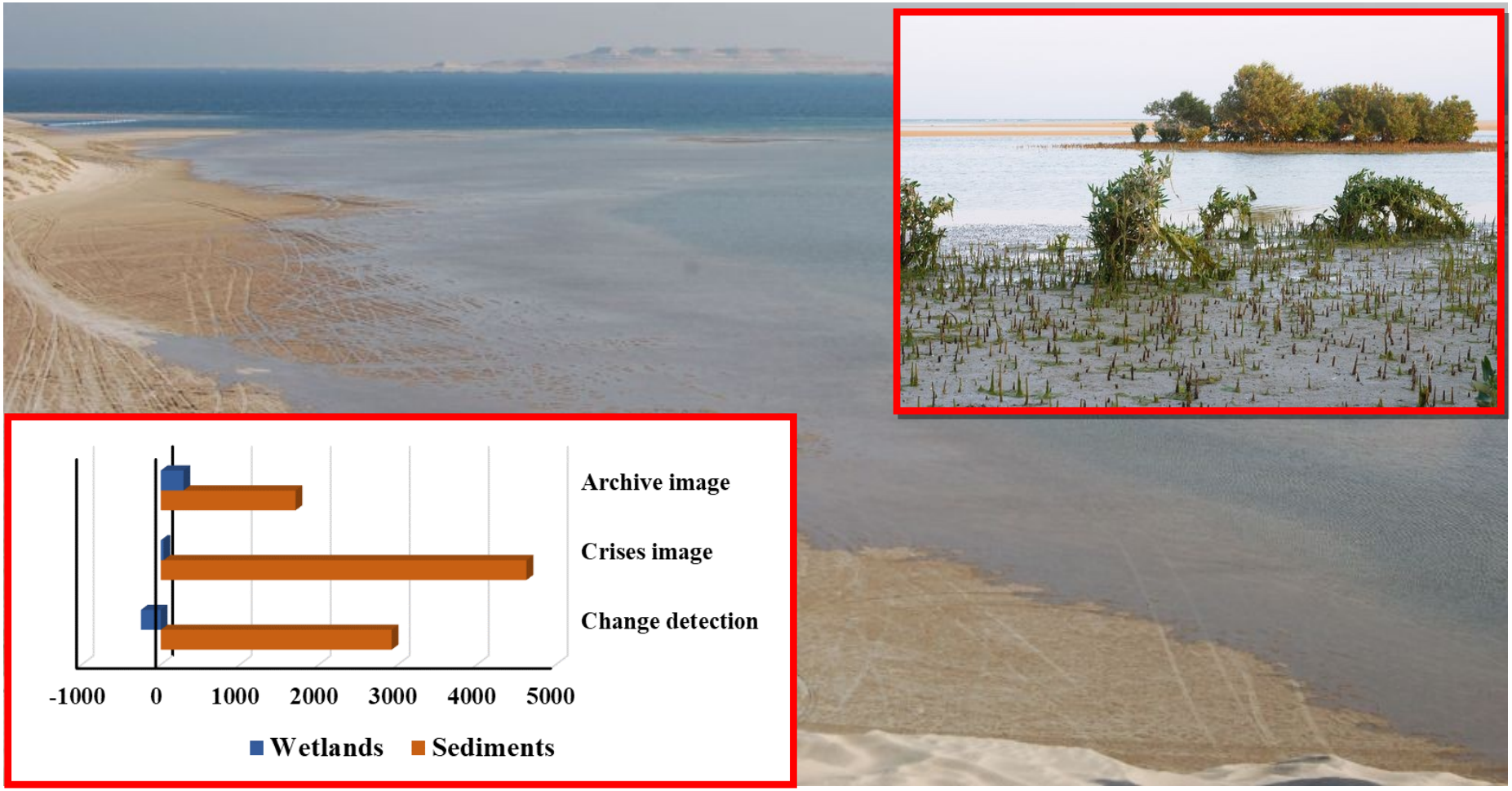
Findings





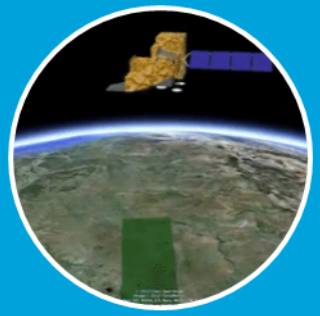
of Expectation Maximization (EM) classification before and after

Findings

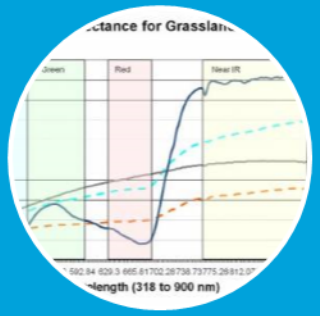


Archive image
Crises image
Change detection
-1000
0
1000
2000
3000
4000
5000
Wetlands
Sediments

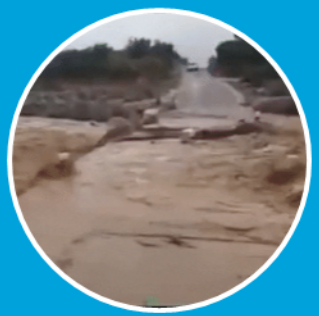
Conclusion & Recommendations



Remote Sensing techniques were satisfactorily implemented in term of sedimentation mapping and wetland delineation



Sediment deposits along the shoreline increased by nearly 171%. Wetland habitats were decreased by nearly 87%



Flash floods monitoring could regulate and adopt more efficient restoration techniques for the natural ecosystems

Thanks for your attention