

# **Assessment of environmental vulnerability of Maputo bay using Remote Sensing data and GIS**

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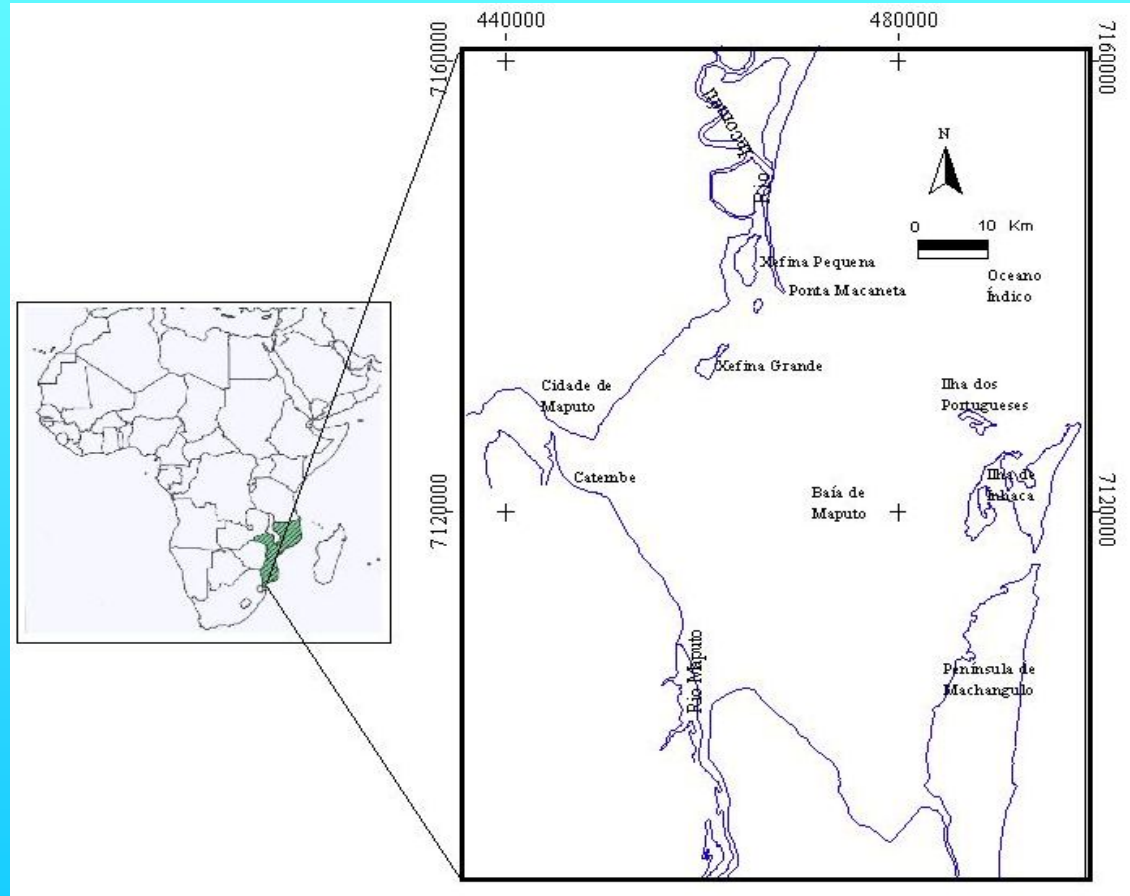
National Directorate of Geology, Mozambique

# Sequence

- **Introduction**
- **Morphological and environmental background**
- **Methodology**
- **Interpretation**
- **Conclusions**

# Introduction

- Location
- Surrounded by the Maputo city in north, Matola city in west and Catembe village in south;
- Maputo bay is about 40 km long and 30 km wide covering 1200 square km



# Introduction

- The principal constraint :
  - rising of tidal level (global warming) ;
  - Anthropogenic factors (use of mangrove trees for construction of the houses, small boat and use as fuel wood)
  - Pollution and oil spillage within the bay
- The objective :
  - Establish the sensibility index to address the pollution problems along the bay

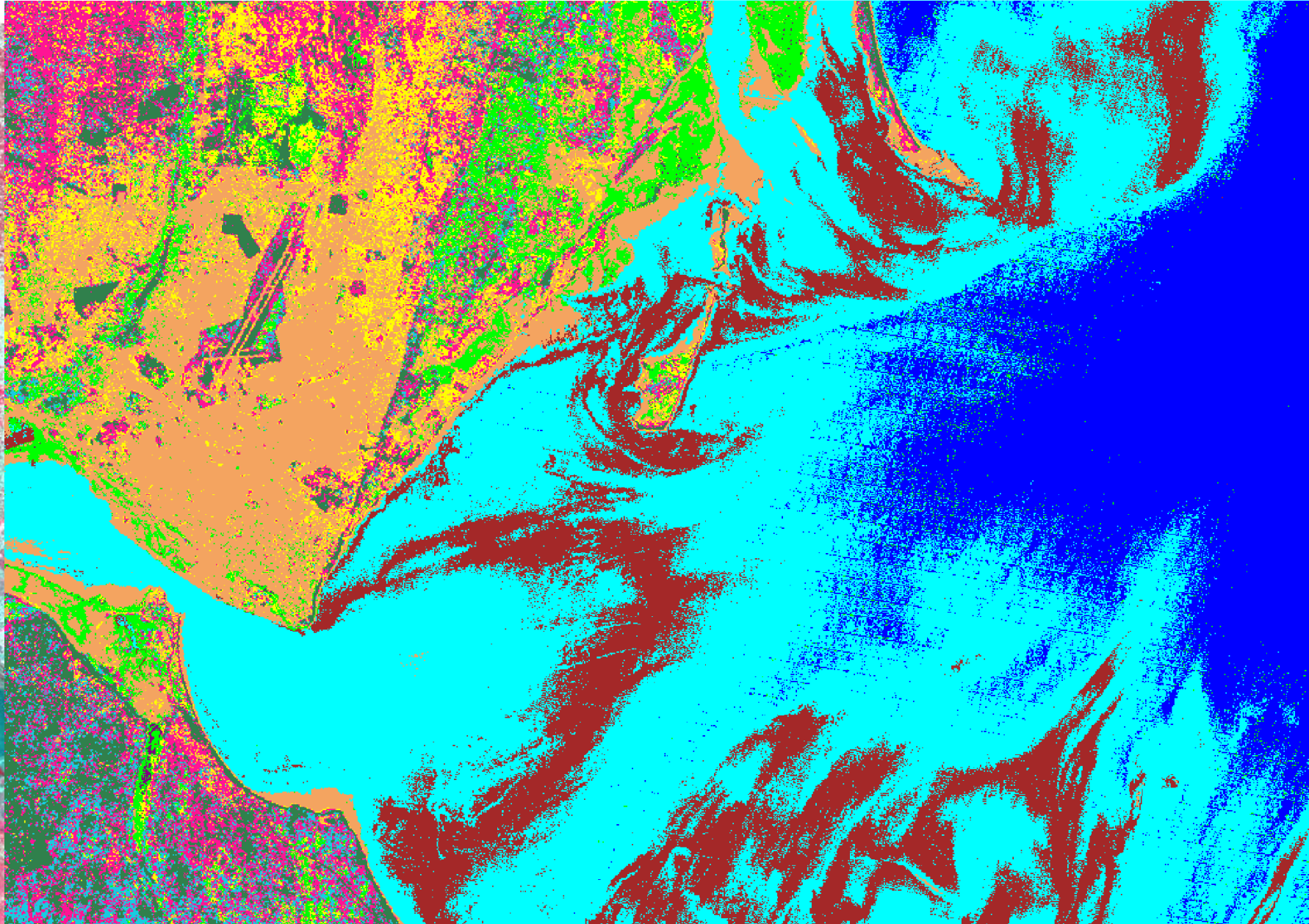
# Methodology

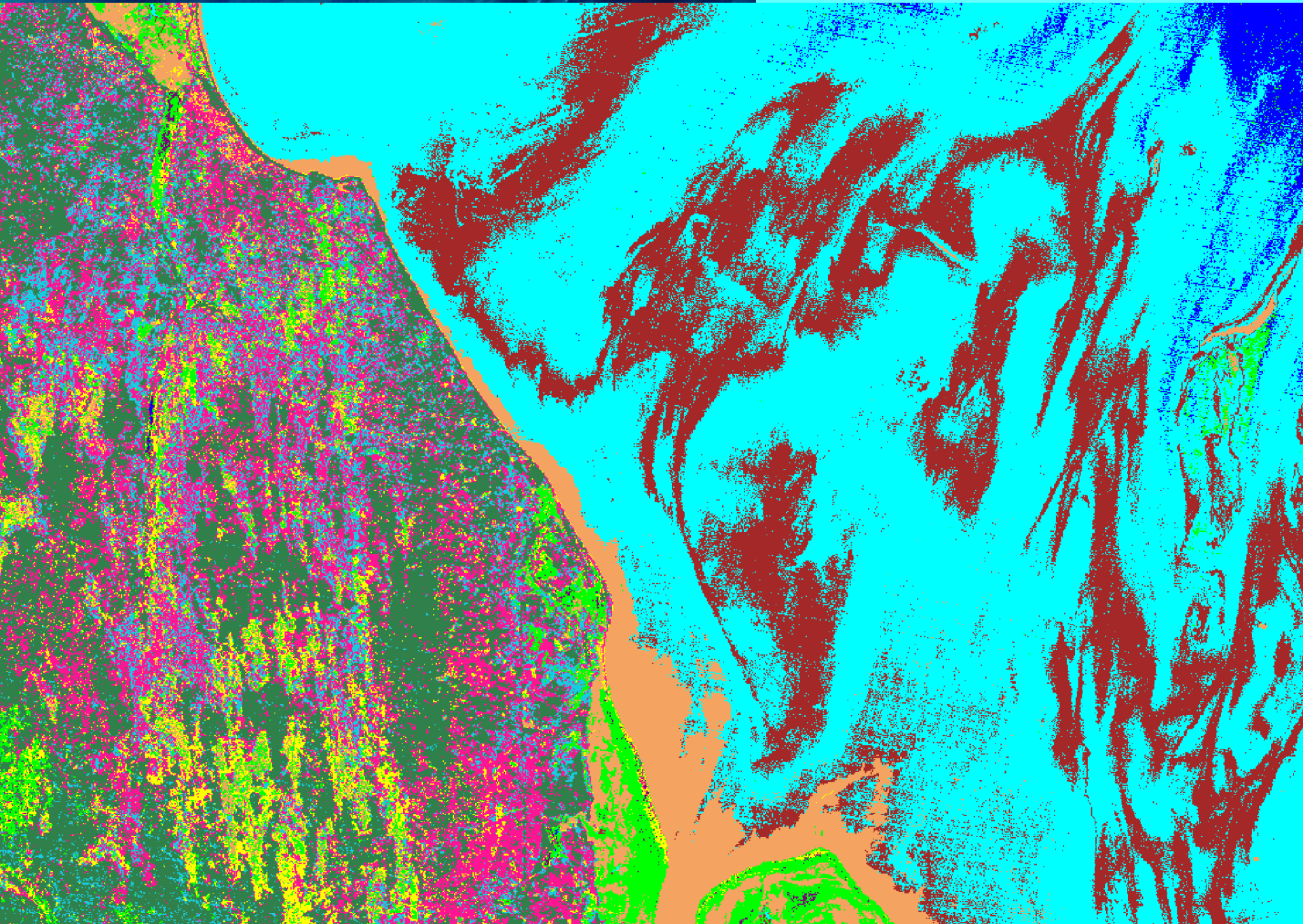
- The following bands from Landsat TM were the most applicable:

		<b>Spectral signal</b>	<b>information</b>
• <b>R</b> (Red)	4	0,76-0,90 $\mu\text{m}$	vegetation
• <b>G</b> (Green)	3	0,63-0,69 $\mu\text{m}$	soils
• <b>B</b> (Blue)	2	0,52-0,60 $\mu\text{m}$	water body

- ISA table for the Bay was established as an indicator for environmental sensitivity related to petroleum permeability in different surface material along the beach. ISA 1 as less sensitive and ISA 10 as most sensitive areas.

# Morphology of the Maputo bay

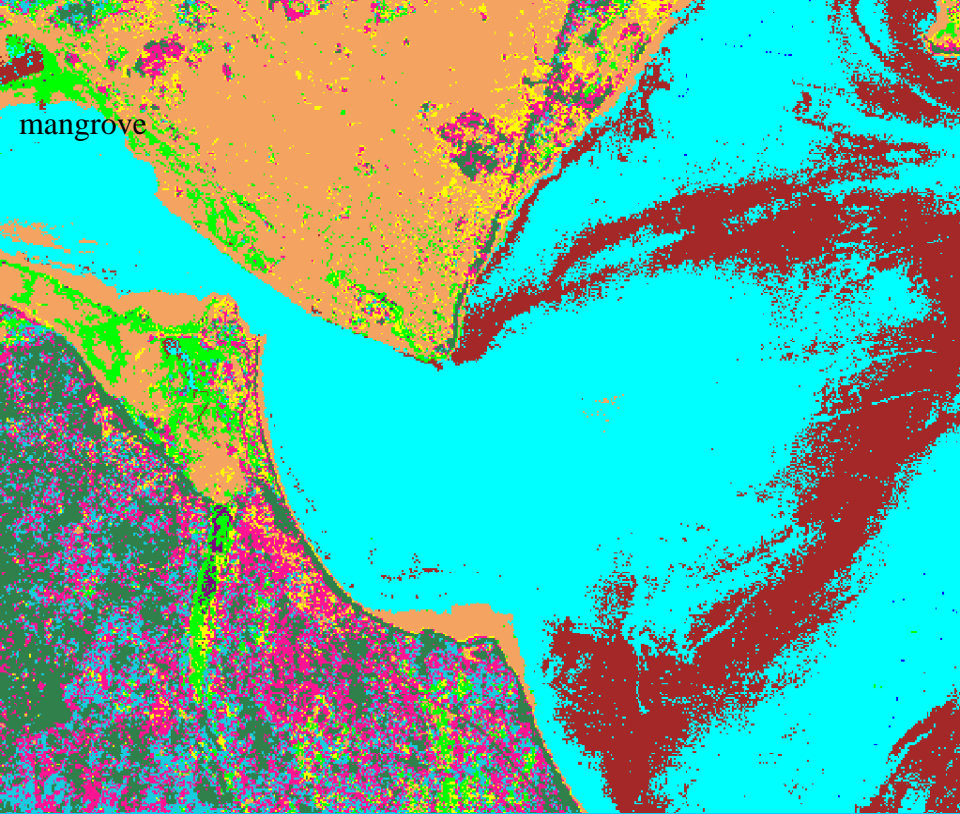
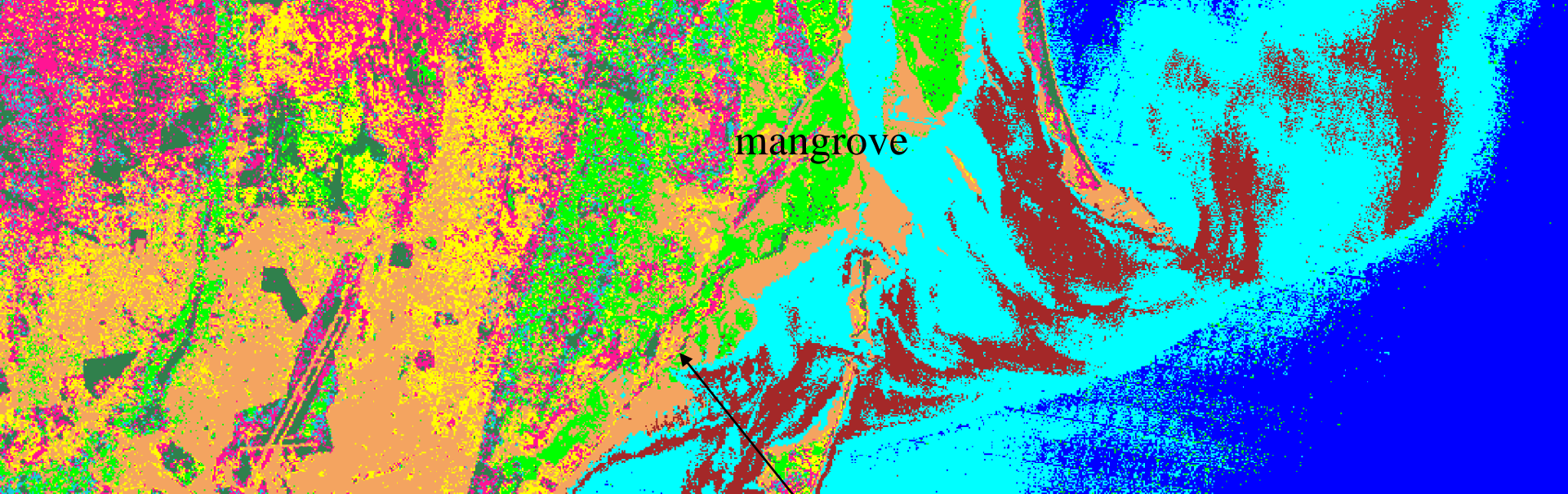




# Interpretation

- Xefina Island located in NE protect Costa do Sol beach for tide waves from the ocean as a result it was classified as low grade compared to Macaneta beach which is open to ocean. However the Costa do Sol beach was classified as very sensitive (index 10) due to mangrove deforestation.

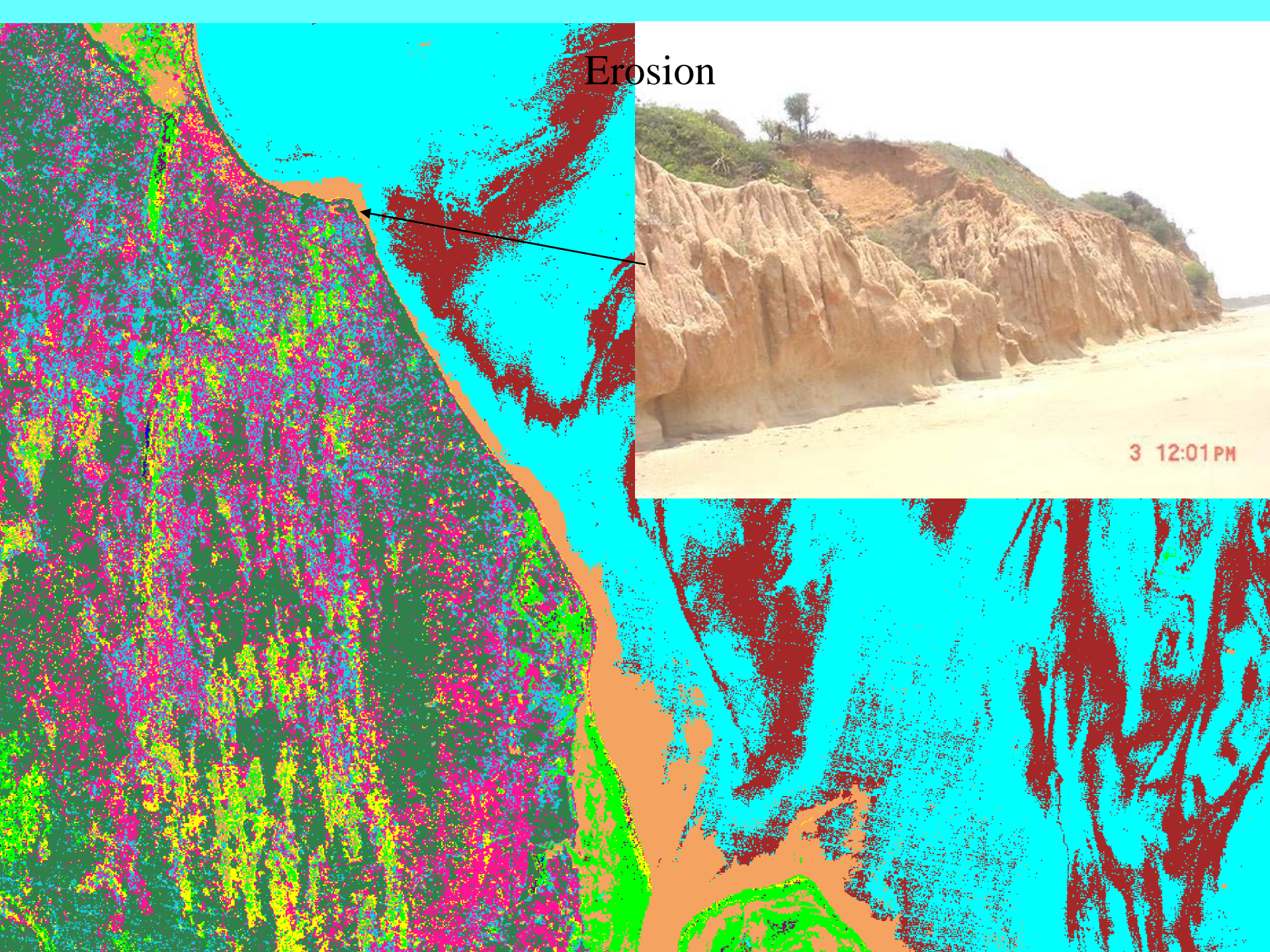




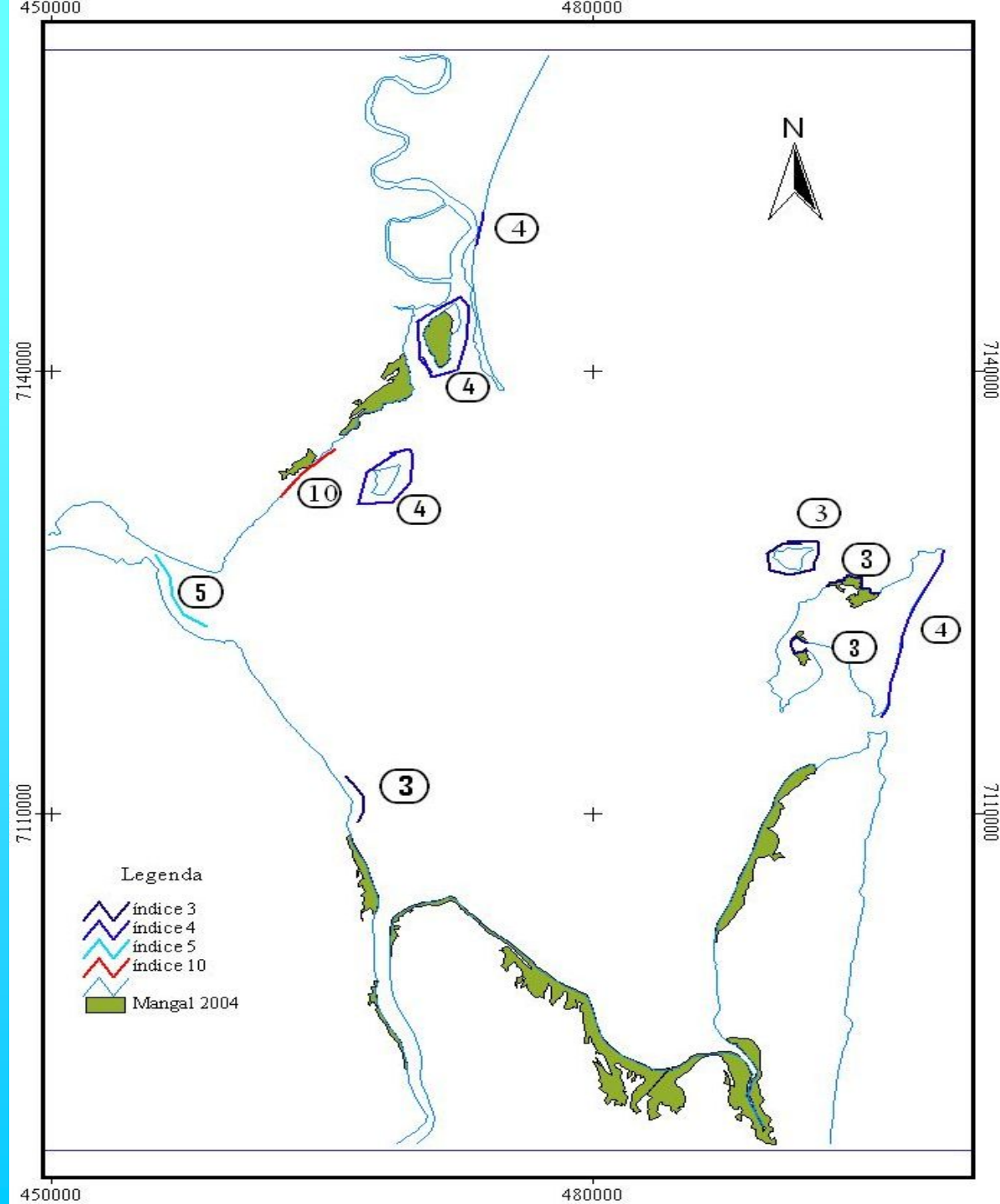
# Interpretation cont.

- Catembe beach near Ponta Três Marias it is composed by fine sand leading to less permeability, also the slope is very high in this beach contribute to rapid cleaning in case of oil spillage, resulting in low sensitivity index.

Erosion



# Sensibility index map for Maputo bay



# Conclusions

- Costa do Sol area, west part of Inhaca Island, Catembe and Xefina Island are sensitive areas due to expose of mangrove vegetation to anthropogenic factors (drastic reduction of mangrove).
- The Industrial city of Matola plays a major role for pollution in the bay.
- Landsat TM images are useful data for general assessment for environmental change.

Thank you for attention

My thanks for GDEST 2008  
organizers