



# SPATIAL DATA INFRASTRUCTURE (SDI) FOR INTEGRATED COASTAL ZONE MANAGEMENT

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## Introduction/Abstract

Many different local, national and regional government agencies are responsible for different aspects and uses of the coastal zone, e.g. fisheries, environment, transport and urban planning.

Given such diversity of interest groups, stakeholders, managerial authorities and administrative structures that converge at the shore, conflicts are almost inevitable between and among coastal users, managers, as well as between human society and the natural environment (Wright and Bartlett 2000). This has necessitated the need to know (map) the distribution of coastal resources and its abundance, key areas of interests including community alternative livelihood projects as a way of releasing pressure from over exploitation. A **spatial data infrastructure (SDI)** was proposed for this purpose. The objective was to develop a SDI to include mapping of key marine ecosystems surveys, species distribution, mapping of monitoring and restoration sites among others along the entire coastal zone. This activity was funded by KCDP.

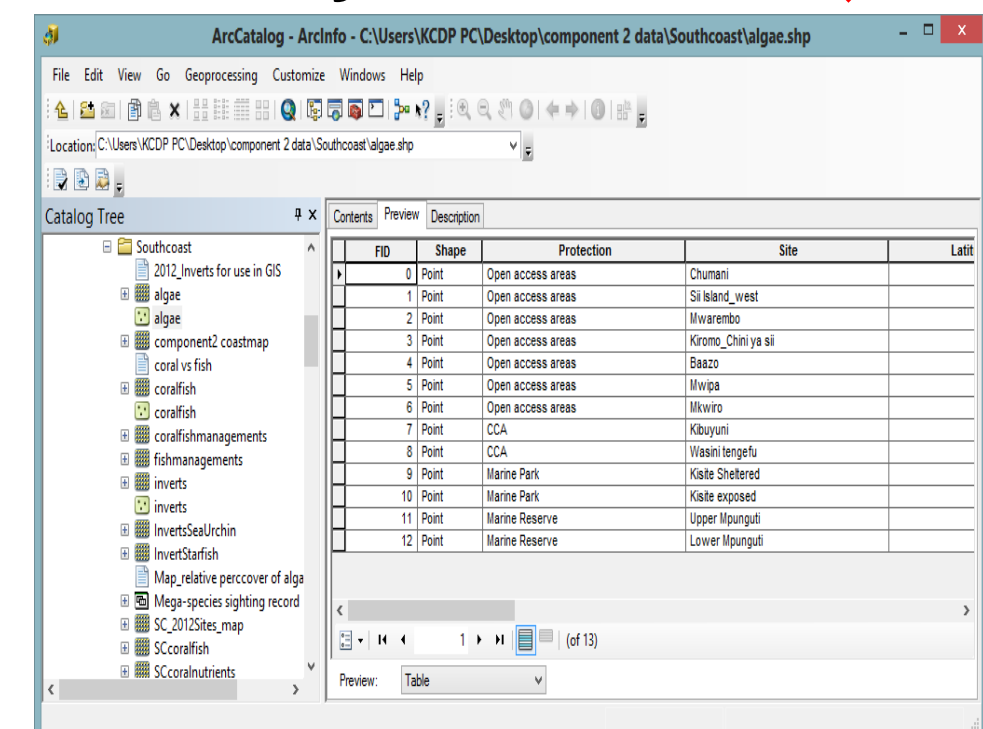
## Method

All the surveys had mapping aspect by use of a GPS (GPSmap 62sc) to collect geographic information and embedded to the data. A spatial database was designed and developed ready for mapping using ArcGIS 10 software. Maps were developed based on different thematic area along the coastal zone.

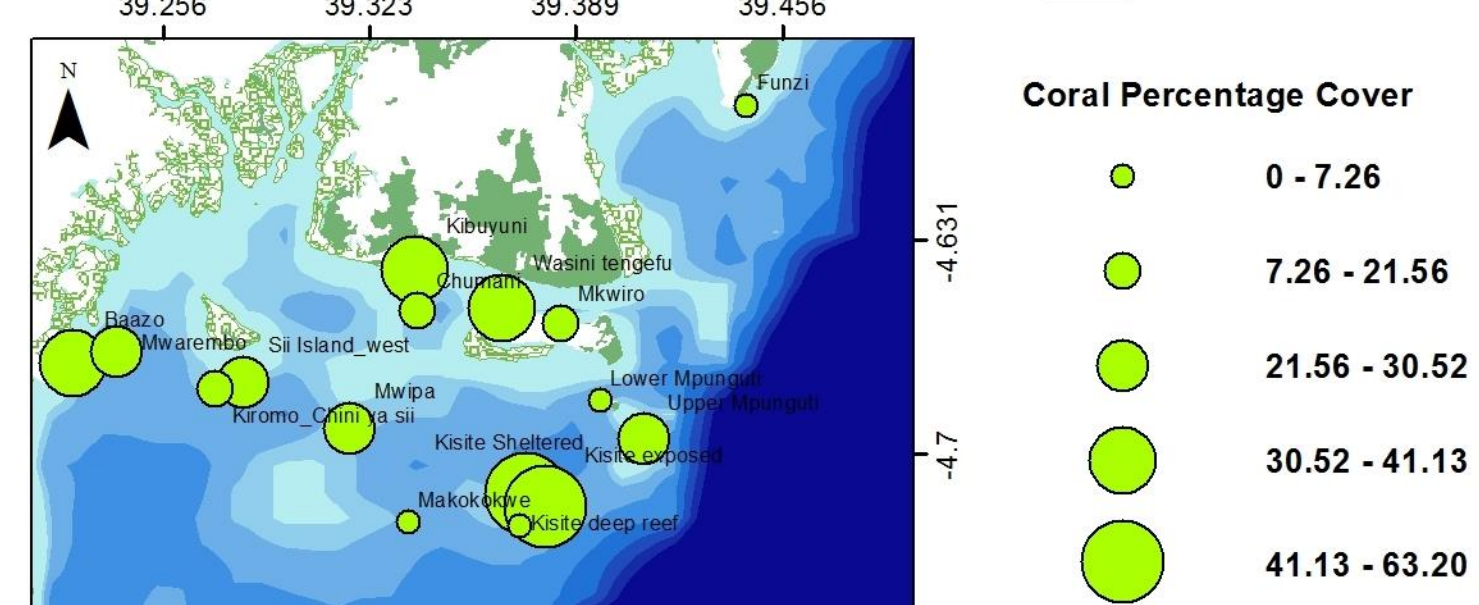
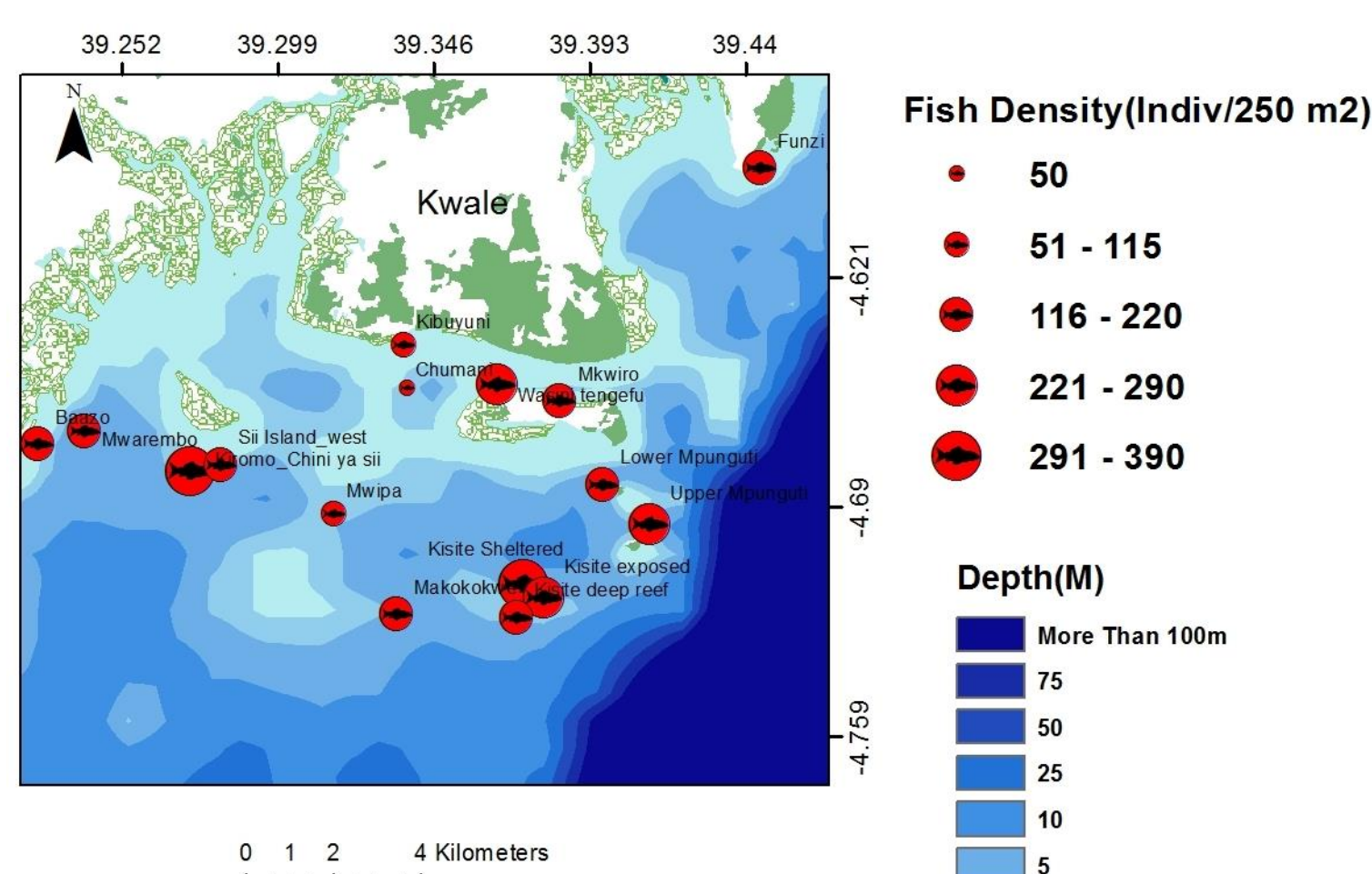
### Surveys



### Geo-referencing of Survey Data



### SDI Database Development



### Thematic Maps Production

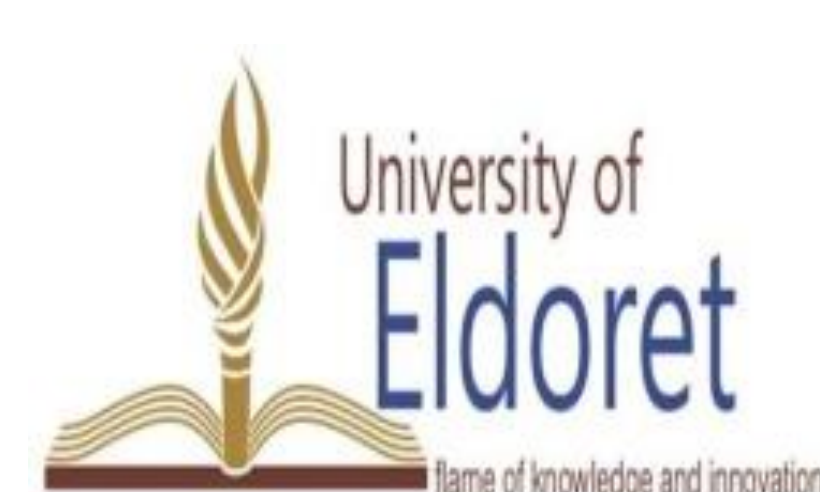
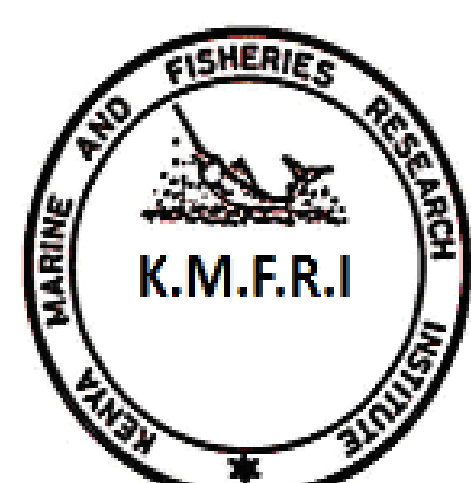
Figure 1. Flowchart showing the SDI development process.

## REFERENCES

Wright, D.J. and Bartlett, D.J., 2000, Marine and Coastal Geographical Information Systems. (London: Taylor and Francis).

Esri. *ArcGIS*. Version 10.2.1. Redlands, CA: Esri, 2014

## Acknowledgement



## Results

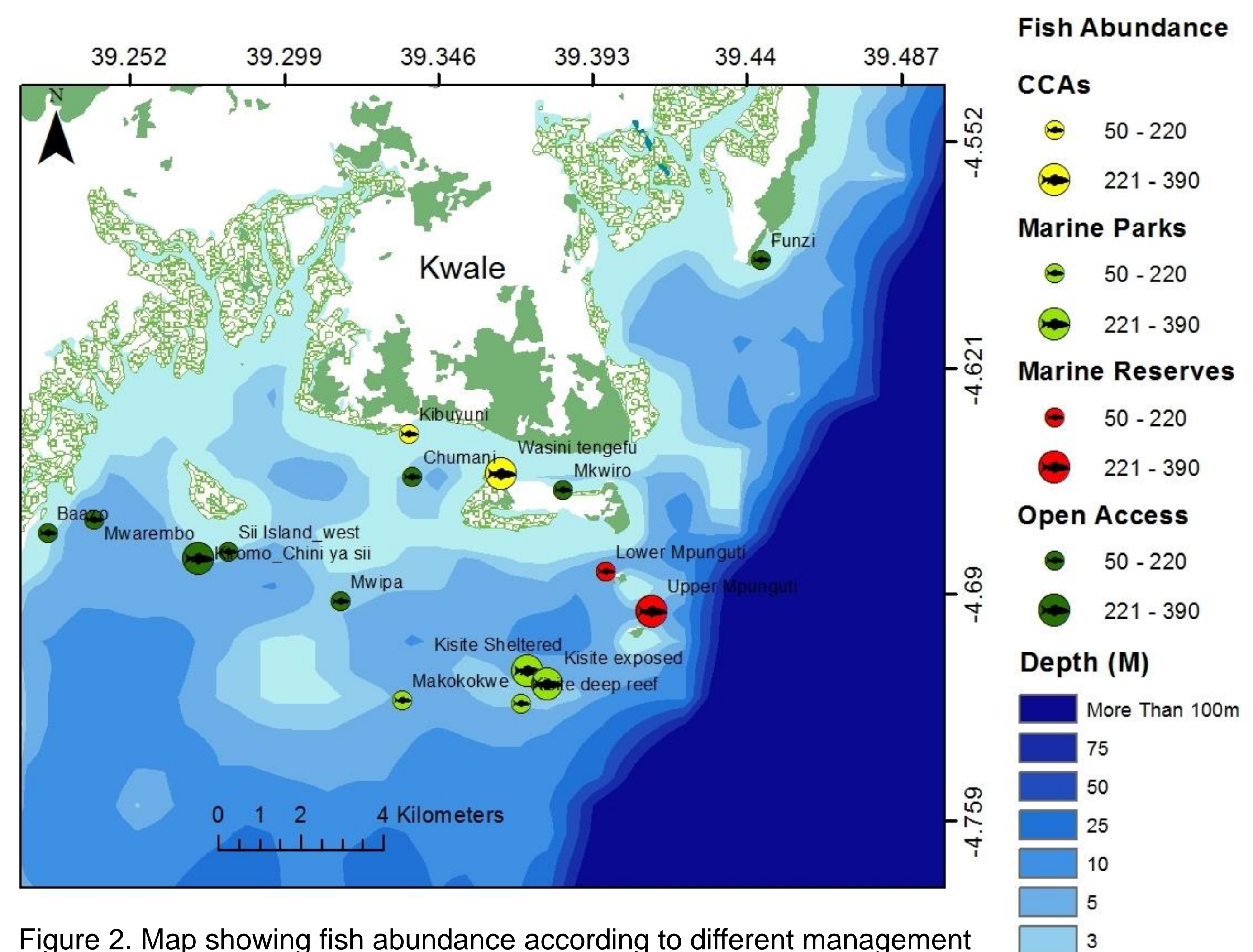


Figure 2. Map showing fish abundance according to different management regimes.

- The results indicate rich biodiversity distribution (South coast) and also the key areas that need management interventions. From the map we can easily point out which areas are under stress. Areas under protection either as marine parks, Community Conserved areas (CCAs) show high species abundance compared to those areas of open access. Also areas with rich coral cover also had great fish species abundance.

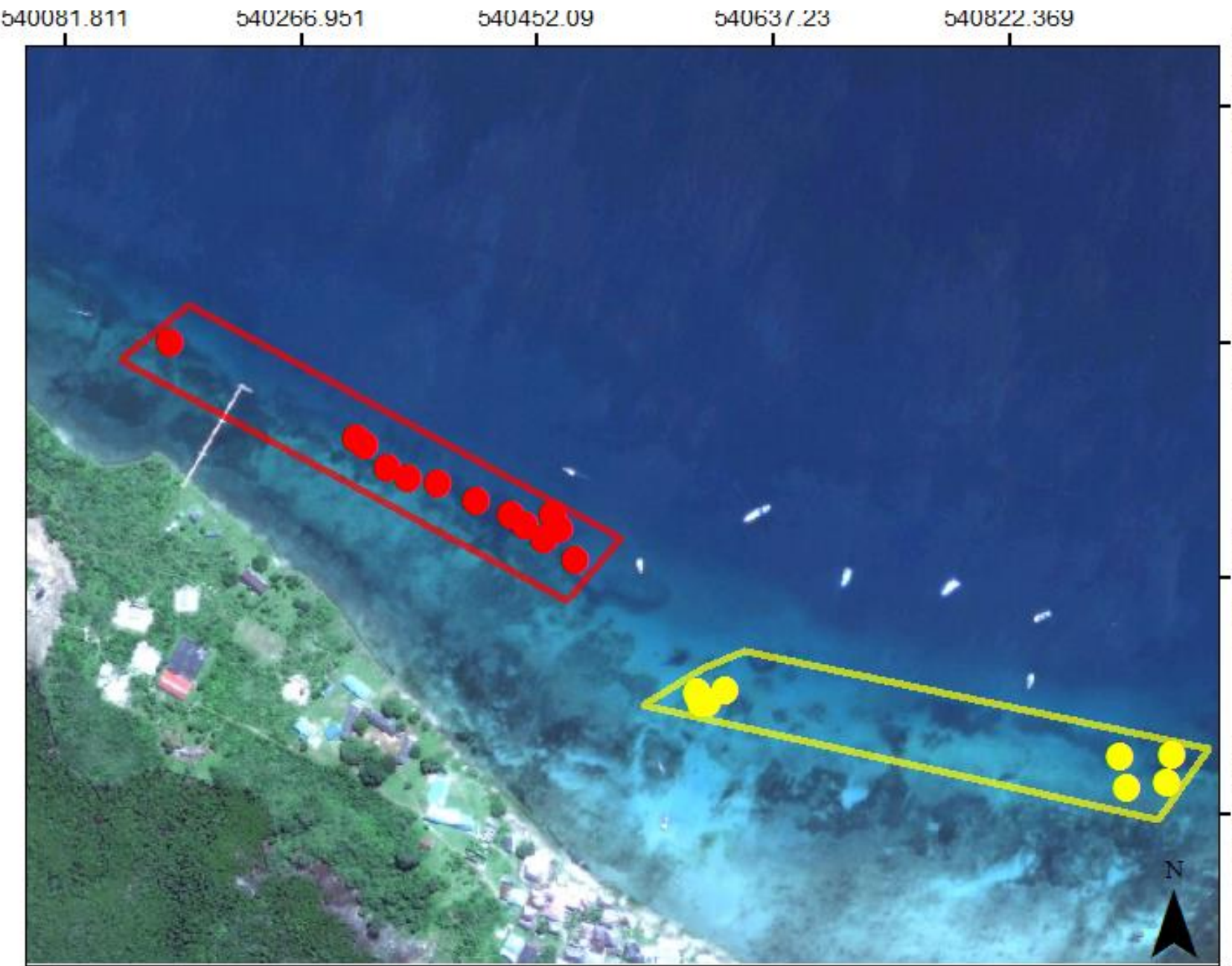


Figure 3. Map showing Corals and Sea grass restoration at Wasini CCA (south coast).

- Areas that were identified as degraded habitats were also mapped and restoration exercises were undertaken

## Conclusion

The study has proven that a spatial data infrastructure is an effective tool that support decision making in area of many stakeholders involvement. The tool will provide support for coastal zone management in a collaborative and adaptive approach. This is a continuous build tool with input from different surveys that will be done even after the exit of KCDP.

## Impact/moving forward

Most institutions are adopting the use of spatial data infrastructure to support their research, management and development at all levels.