Unraveling the hydrocarbon potential of deep water Mozambique Channel (THE GIS STORY)

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PRESENTATION OVERVIEW

- Introduction
  - Aim & Objective
- Geologic Background
- Role of GIS
  - Implementation workflow
  - Successes
- Conclusion
INTRODUCTION

AIM & OBJECTIVE

• The aim is to discuss the role of GIS as a mapping tool to integrate Geological, Geophysical and Geochemical spatial data sets in the quest for hydrocarbon.

• The Objective is to showcase the importance and benefits of GIS to SAPETRO’s deep-water Mozambique Channel Project.
INTRODUCTION

Fig 1: SAPETRO’s Juan de Nova and Belo Maritime Profond Acreages
Geologic Background

Fig 2 gives a brief summary of the petroleum geology of the study area.

Modified from AAPG Explorer magazine 2014 Jan issue. Courtesy of MAREX
Role of GIS
Surveys analyzed spatially using GIS

- Gravity
- SAR radar imagery
- Magnetic
- 2D Seismic
- Geochemical slick sampling
- Seabed Coring
Role of GIS

Implementation Workflow

Data Acquisition

Geodatabase & Shapefile

Customization

Integrating GIS data and other exploration tools

Maps & Analysis
Role of GIS

GIS was used to achieve the following objectives:

- Develop a working GIS database for the project.
- Integration of different spatial data sets.
- Mapping and planning of new sampling, study, and survey areas.
- Create accurate spatial information for use in other exploration software.
- To delineate spatial data along the boundary of the two acreages for proper positioning of seamless cross-border data sets.
Role of GIS

- Developing a GIS database for the project

Fig 3 shows a screen capture of developed database on Advanced ArcGIS for desktop software.
Role of GIS

Integration of different spatial data set for proper analysis

Regional Multi-Year SAR Satellite Coverage (4.1)
New Custom Satellite Scenes (4.2)
Dec. 2011 Image used to Locate Slicks 5 Days Prior to Sampling Voyage (4.3)
Role of GIS

Integration of different spatial data set for proper analysis

Slick site to be sampled

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2012 Successful SAR Surface Oil Slick Sampling Campaign
Role of GIS

Mapping and planning of new sampling, study and survey areas

Figure 5 showing slick location on GIS, SAR Imagery and 2D Seismic section.
Role of GIS

Mapping and planning of new sampling, study and survey areas

Fig 6.1 shows prospective area Mapped for further Seabed Coring studies and survey

Fig 6.2 shows 3D seismic Area (Mapped area in green) properly mapped to meet exploration objectives using ArcGIS
Role of GIS

Mapping and planning of new sampling, study and survey areas

Fig 7: 2013 Successful Sea Bed Coring in >2500m of Water for Geochemical Sampling of Targets
Role of GIS

- Create accurate spatial information for use in other exploration software

Fig 8 culture file (Juan de Nova and Belo Profond blocks in brown and purple outlines respectively) from ArcGIS.
Role of GIS

To delineate spatial data along the boundary of the two acreages for proper positioning of seamless cross-border data sets.

Fig 9.1 shows how both blocks in the acreage are delineated properly and demarcating between spatial data from overlying 2D lines.

Fig 9.2 shows 3D seismic area clearly and accurately demarcated into the different blocks and jurisdictions.
CONCLUSION

Utilizing GIS through the Advanced ArcGIS for desktop platform has aided in achieving exploration objectives especially in Geochemical and Seismic programs.

GIS has been used in demarcating clearly the spatial boundaries during survey activities.

GIS played a vital role in aiding SAPETRO’s quest to unravel the hydrocarbon potential of the deep-water Mozambique Channel.

We believe we are on the verge of discovering offshore East Africa’s missing oil deposits and GIS is aiding our search.
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QUESTIONS?