Implementing Marine SDI Through Capacity Building

A TopoBathy Database for Mozambique

NIOHC – Colombo, 20th – 23rd March 2012

Introduction

- The term Spatial Data Infrastructure (SDI) is used to describe the base technologies, policies and institutional arrangements that facilitate the availability and access to spatial data

- A Marine SDI encompasses marine geographic components and related business information

- Bringing Land and Sea data together is a key aspect of Marine SDI and is the focus of this presentation

Foundation for the Mozambique project

- Coast-Map-IO project: '*To increase the capacity of countries to collect and use bathymetric and topographical data to support management of tsunami risk in coastal areas*'

- Participating Countries : Tanzania, Kenya, Madagascar, Mauritius, Mozambique, Seychelles, Comoros, Maldives, Bangladesh, Myanmar, Sri Lanka, Thailand

- CARIS was involved in delivering training

- The IHO/IOC made a technical visit to Mozambique and identified the need for integrated bathymetric and topographic data management

The Next Step: Partners for Water

- Dutch organization supported by the government with a 5 year focus to water related projects in Mozambique, Bangladesh, Egypt, Indonesia and Vietnam
- Partners for Water program supplied a grant to CARIS
- To implement a TopoBathy Database at INAHINA for the pilot areas of Beira & Quelimane in Mozambique

BMT ARGOSS caris INAHINA REPÚBLICA DE MOÇAMBIQUE PARTNERS VOOR WATER Bundeling van krachten

Participants in the TopoBathy Database Pilot Project

Mozambique Organisations	
INAHINA Instituto Nacional de Hidrografia e Navegaçao	Bathymetric Data
CENACARTA Centro Nacional de Cartografia e Teledetecção	Topographic Data
INAM Instituto Nacional de Meteorologia	Tsunami Modeling
Industry	
CARIS	Software & Expertise
BMT-ARGOSS	Satellite Bathymetry

Project: Software, Data, Training and Support

INAHINA

3 weeks CARIS Bathy Database Training & Consultancy

2 x CARIS BASE Manager & Bathy DataBASE Server Licence

1 Year of Updates & Technical support

BMT ARGOSS: Bathymetric Datasets for pilot areas Beira & Quelimane

CENACARTA & INAM

1 week CARIS BASE Editor Training

1 x CARIS BASE Editor Evaluation licence for 6 months (from February 2012)

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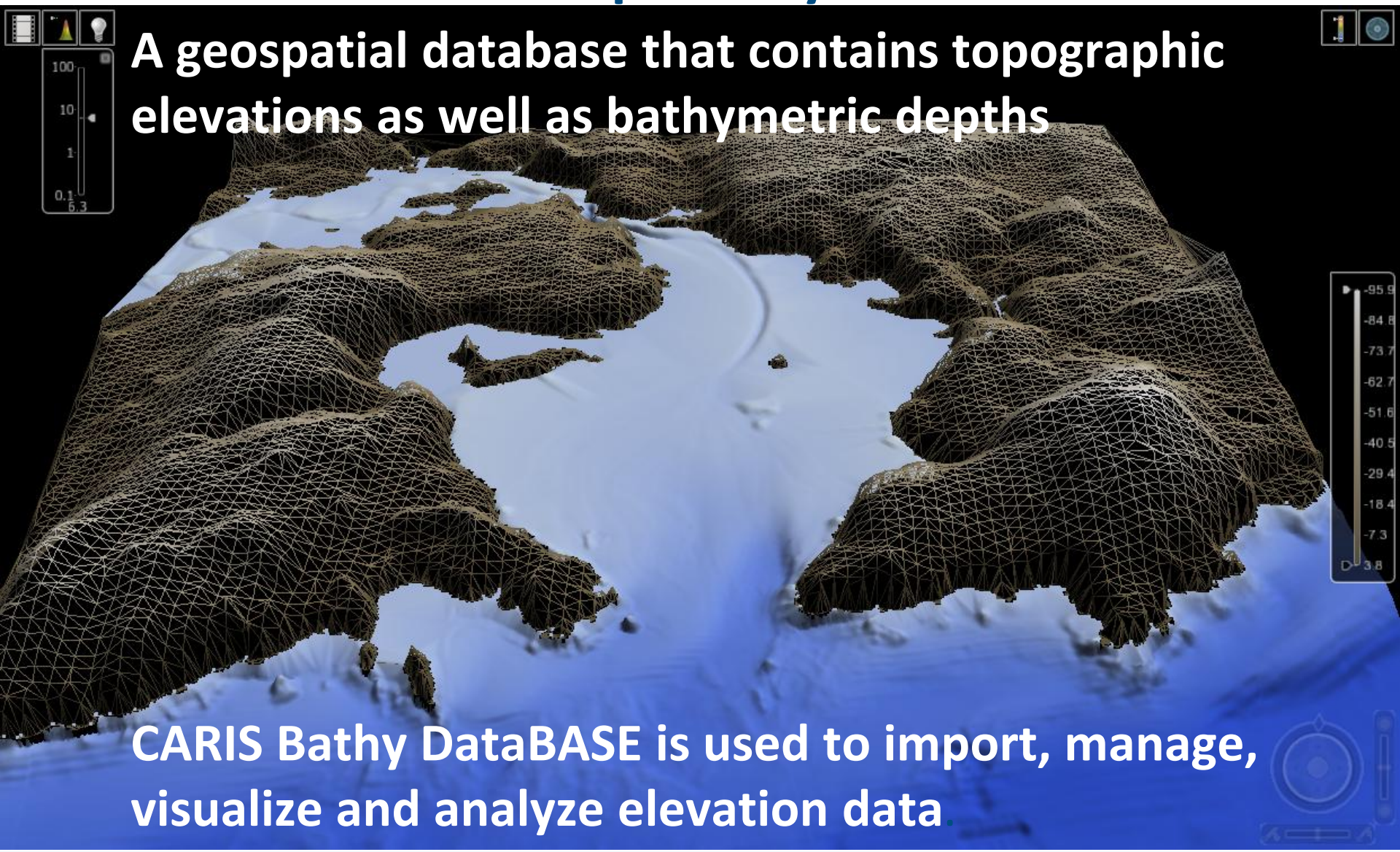
What is a TopoBathy Database

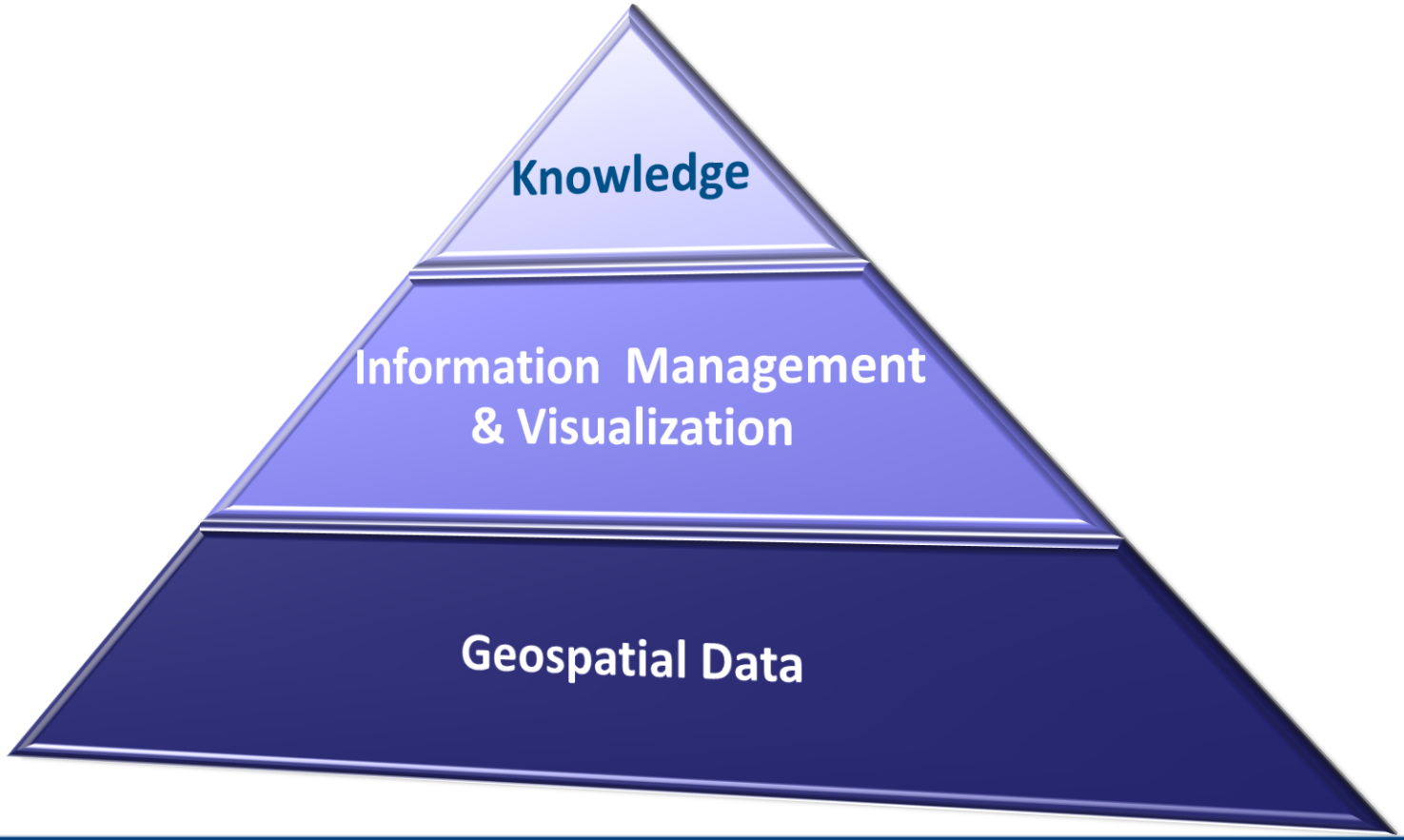


A geospatial database that contains topographic elevations as well as bathymetric depths

CARIS Bathy DataBASE is used to import, manage, visualize and analyze elevation data.

Pyramid of Knowledge

Managing & visualizing geospatial data in a database, leads to information, which creates knowledge, thus enabling good decision making.



Knowledge to make Decisions

- The TopoBathy database should provide a single centrally accessible location for elevation data
- The database could provide a basis for paper, electronic chart and map production
- Tool for Coastal Zone Management
- Input model for Disaster Protection (tsunami/cyclones, flood modelling)

Knowledge to Protect

Access to geospatial information helps to protect against natural disasters:

'Given its geographic location, Mozambique is highly vulnerable to natural disasters, in particular those of a hydro-meteorological nature (such as floods, drought and cyclones). The terrain of the country is mostly coastal lowland, with a vast network of rivers and tributaries emptying into the Indian Ocean. The coastline is highly susceptible to cyclones and tropical storms.'

Source: Climate Change Assessment for Mozambique - UN Habitat, 2009.

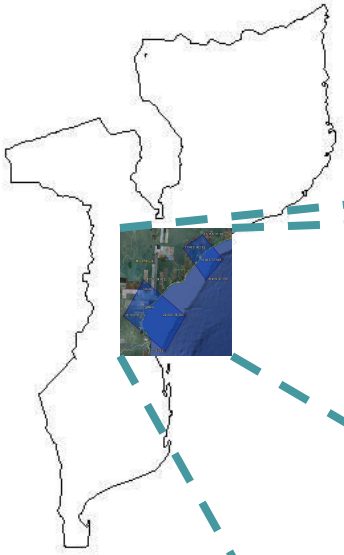
Project Agenda

Planning	Data	Deliverable(s)
Assessment and conversion of available analogue and digital data. (INAHINA & CENACARTA)	10 Oct.-30 Dec. 2011	Digital datasets to be imported in BathyDB
Selection and processing of satellite images. (BMT ARGOSS)	10 Oct.-30 Dec. 2011	Digital datasets to be imported in BathyDB
Import digital datasets, convert to same reference system and combine as seamless elevation model in BathyDB. (CARIS)	2 Jan.- 3 Feb. 2012.	Seamless elevation model of first Pilot Area (Beira)
Create Training Manual for Beira Pilot Area	2 Jan.- 3 Feb. 2012.	Training Manual

Project Agenda

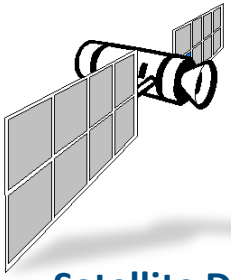
Planning	Data	Deliverable(s)
Maputo: Training Workshop Pilot for Area-1 : Beira **(INAHINA, CENACARTA, INAM, CARIS)**	6 Feb.-17 Feb. 2012.	-Training manual -Combined Dataset Beira
Execution of Pilot for Area-2: Quelimane **(INAHINA).** CARIS HelpDesk Support	March – June 2012.	-Combined Dataset Quelimane
Documenting of the workflows, experiences and results. **(INAHINA)**	March – June 2012	-INAHINA Report
Maputo: Consultancy & Presenting of the results. **(INAHINA, CENACARTA, INAM, CARIS)**	1 week July/August 2012	-Final Datasets Beira & Quelimane -Final Report

Pilot Project Location

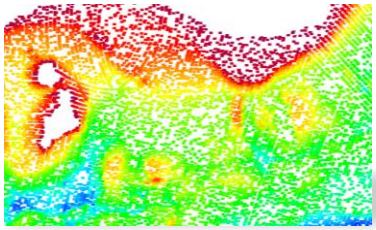


Mozambique

Beira & Quelimane Pilot Project Workflow

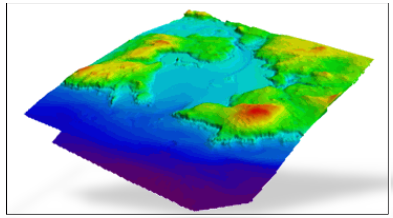


Satellite Data



Bathymetric & Topographic Data
(BMT ARGOSS, ASTER, GEBCO)

CARIS Bathy DataBASE:
Data Storage, Processing & Visualization
(CARIS & INAHINA)



Seamless Digital Elevation Model
(INAM & INGC)

Land & Bathymetric Survey Data
(INAHINA & CENACARTA)

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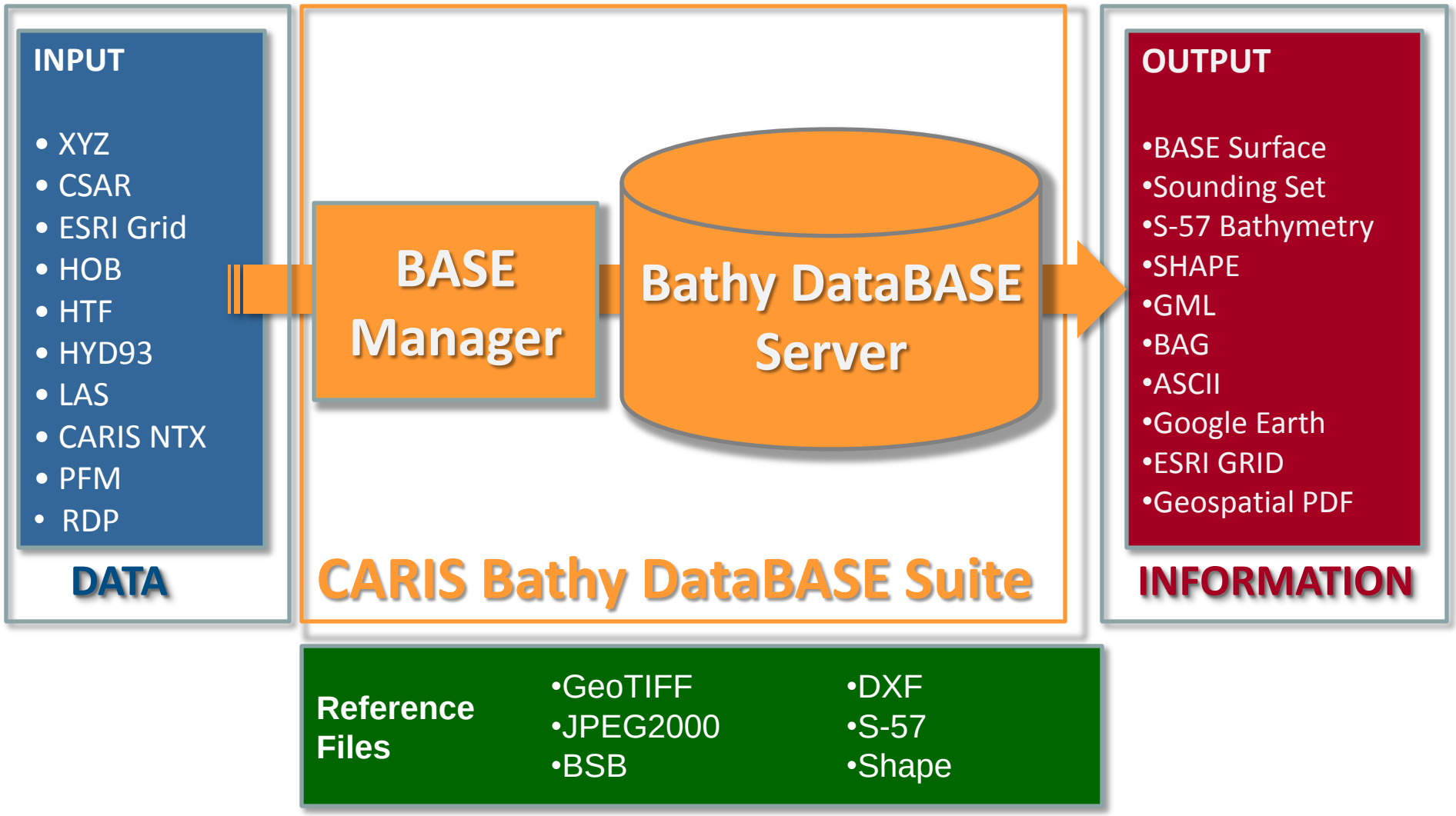
Bathy DataBASE Workflow



Geospatial Source Datasets

Organization	Type	Source	Vertical Datum	Resolution
INAHINA	Bathymetric	Survey	LAT	30
BMTARGOSS	Bathymetric	Satellite	LAT	50
GEBCO	Bathymetric	Survey/ Satellite	MSL	100
CENACARTA	Topographic	Survey	MSL	50
ASTER	Topographic	Satellite	MSL	100

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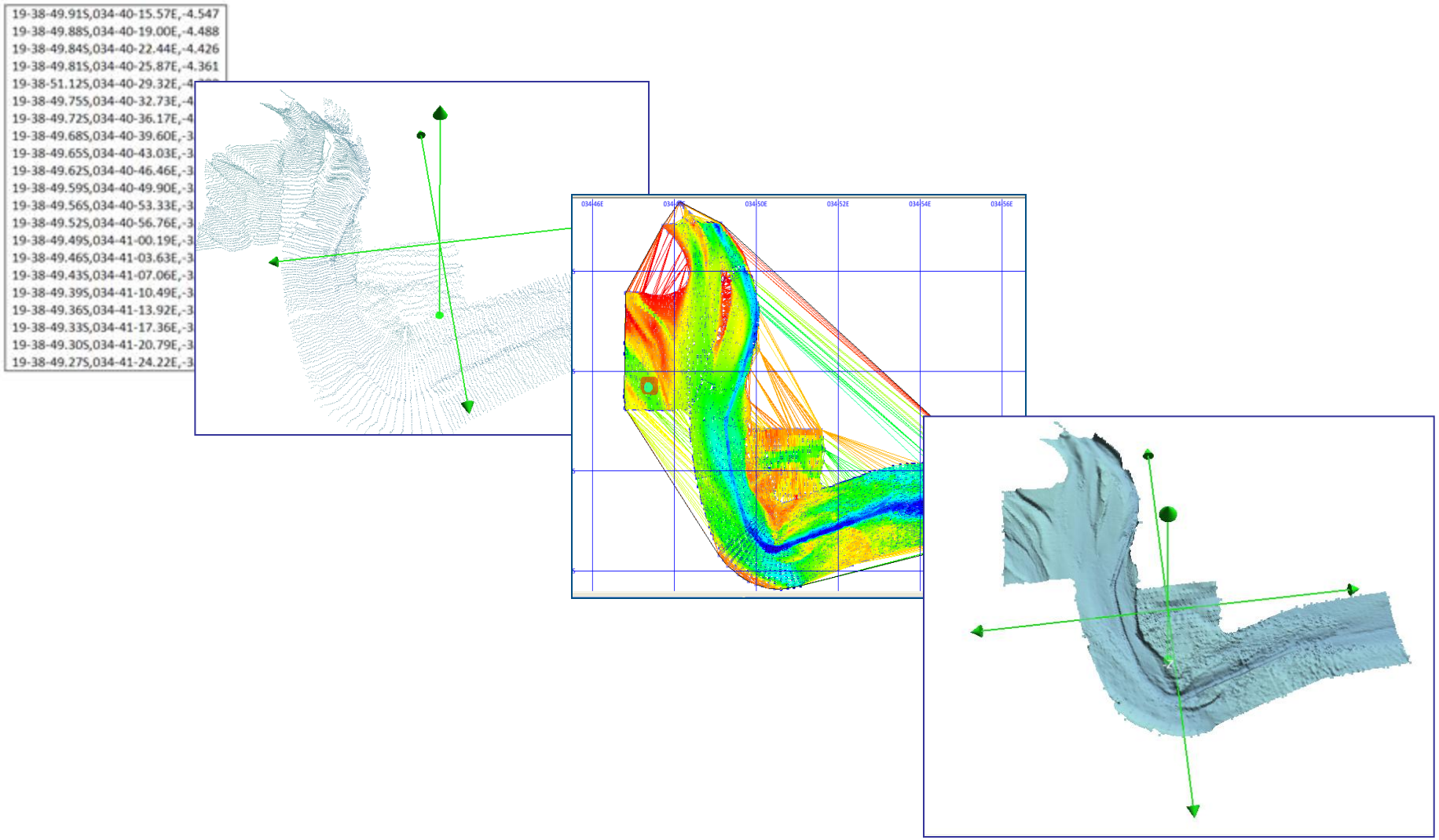
Importing data into the Bathy DataBASE



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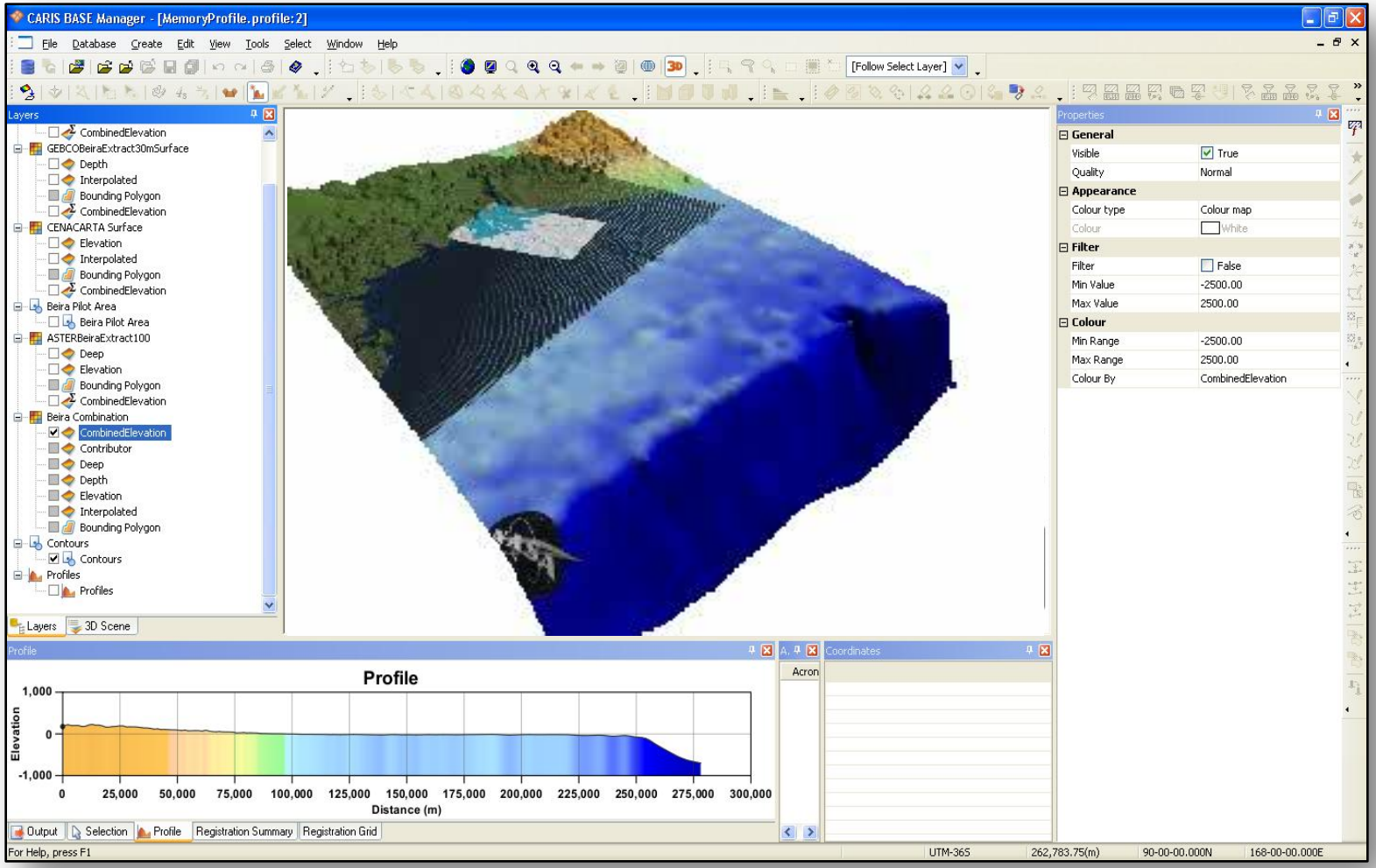
Combined Elevation Model for Beira



After the Pilot Project

- Expand the Mozambique TopoBathy Database in **Time** and **Space**
  - ➢ Continuously improve the model by adding new bathymetric and topographic datasets into the model
  - ➢ Expand database coverage to other parts of Mozambique
- Optimize the data for production of Nautical Charts and for use as a basis for other scientific analysis
- Use the TopoBathy Database for Coastal & Disaster Management

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