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A Case Study in Land and Sea Data Interoperability




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- West Africa




Abuja, Nigeria - 6 - 10 May 2013

Fredericton – Canada • Heeswijk – The Netherlands • Washington DC – United States • Adelaide – Australia

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- Land and Sea interoperability
 - with a harmonised Topo & Bathy Database
- What is topo-bathy database
- From data to knowledge
- Mozambique: an example of a topo-bathy database
- Off –the-shelf marine GIS technology for seamless topo-bathy models
- A topo-bathy database for West Africa – future collaborations?

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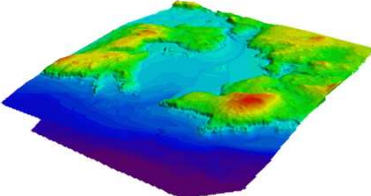
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What is a Topo-Bathy DataBase

Geospatial database:

- Contains simultaneously topography and bathymetry
- Creation seamless digital models for the coastal zone
- Data stored with metadata
- Visualization in 2D & 3D
- Distribution
 - maps and nautical charts
 - geospatial baseline for prediction models (storm-surge, flooding or tsunami run-up modelling)
 - Web map portal



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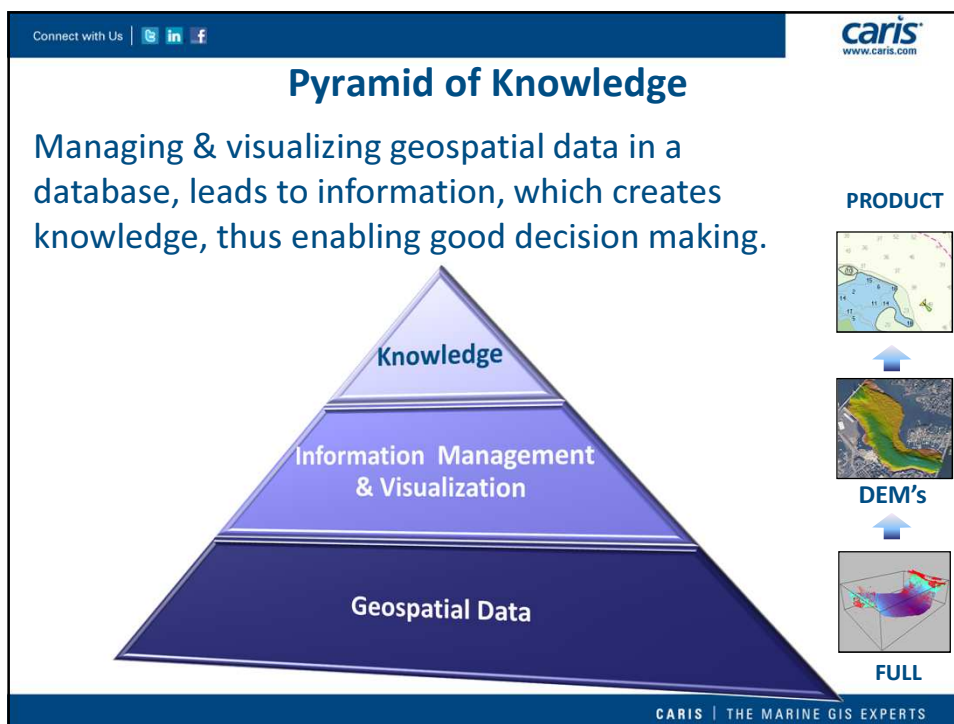
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Why a Topo-Bathy Database

- Central data management and visualization.
- Organisations sharing geospatial information.
- Building a National Spatial Data Infrastructure (SDI).

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Knowledge to make Decisions


- Topo-Bathy Database gives insight in and overview over geospatial data
- Tool for coastal zone management and marine planning
- Input model for Disaster Protection (storm surge, flood, tsunami/cyclones modelling)
- Base to create both paper and electronic charts
- Acts to support local, national & regional socio-economic policies and initiatives.

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Mozambique: an example of a topo-bathy database within Coast-Map-IO Project (2007-2009)



United Nations Educational Scientific and Cultural Organization






Intergovernmental Oceanographic Commission




Objective:
‘Increase capacity of participant countries in collection and analyzing bathymetric and topographic data to support management of tsunami risk in coastal areas.’

Participating countries: Mozambique (INAHINA), Tanzania, Kenya, Madagascar, Mauritius, Seychelles, Comoros, Maldives, Bangladesh, Myanmar, Sri Lanka, Thailand.

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Coast-Map-IO Project Goals

- Improve national expertise to locally produce accurate bathymetric and topographic maps on either side of the coastline.
- Strengthen modelling capacity for inputs to tsunami arrival, run-up and inundation in coastal areas.
- Facilitate the transfer of necessary skills to national disaster Management agencies to use bathymetric and terrestrial datasets in developing targeted maps and services, including inundation maps, determination of set back lines, coastal ecosystem mapping, and zonation for coastal users.

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CARIS has been involved in the Coast-Map-IO project with sponsorship & expert training:

- CARIS HIPS, 2008 & 2009.
Alfred Wegner Institute,
Germany (with delegate of INAHINA)
- CARIS HIPS & BASE Editor, 2009.
Royal Thai Navy, Bangkok,
Thailand (with delegate of INAHINA)





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Partners for Water (2011-2012)






Government of the Netherlands

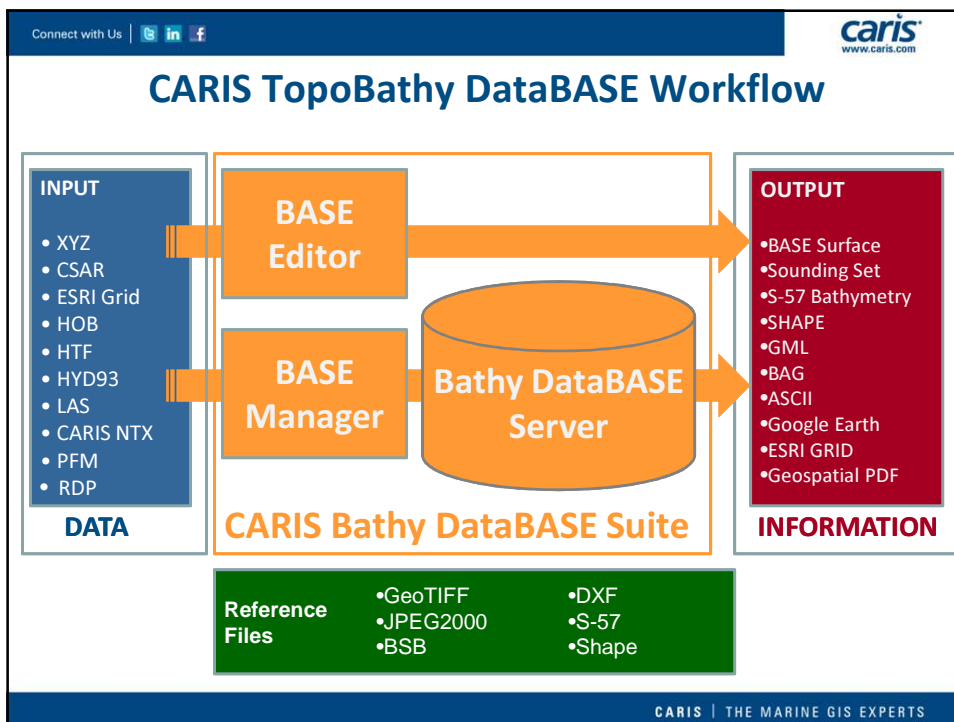
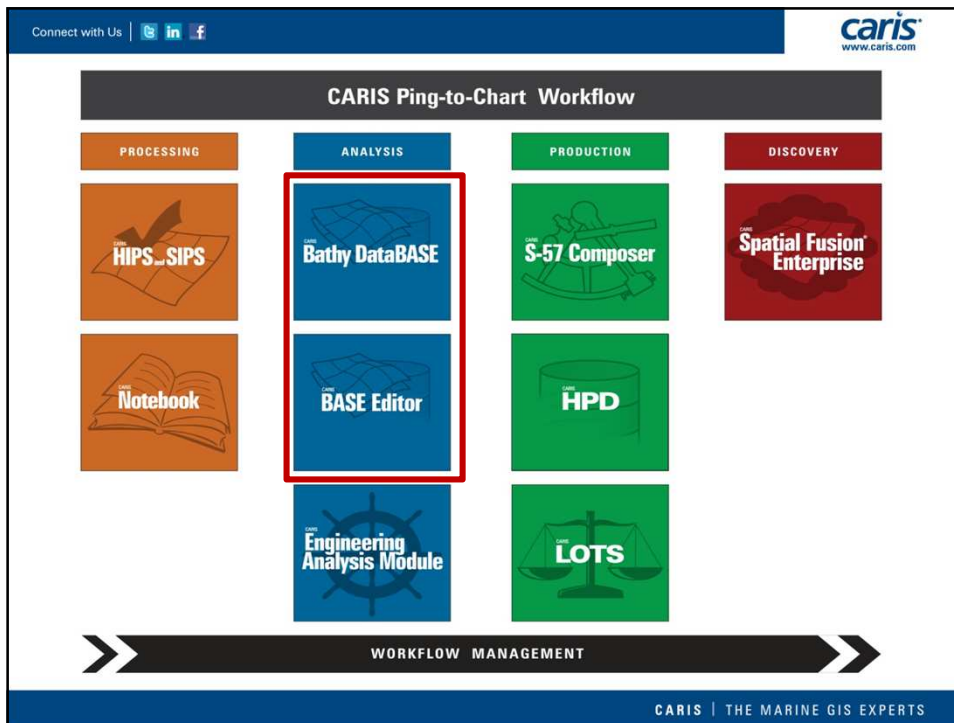


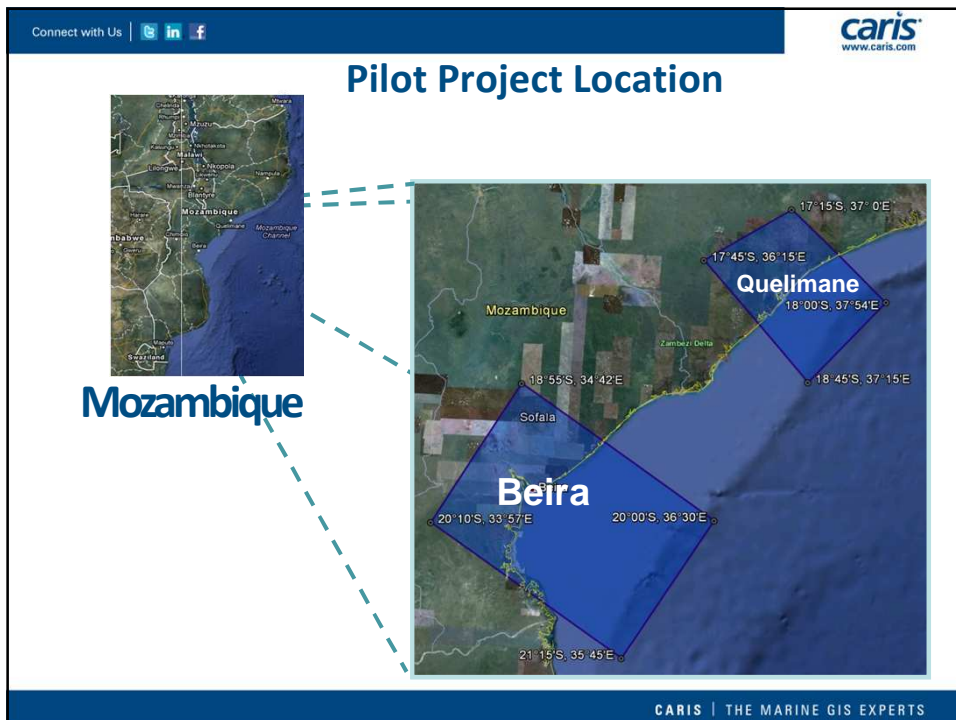
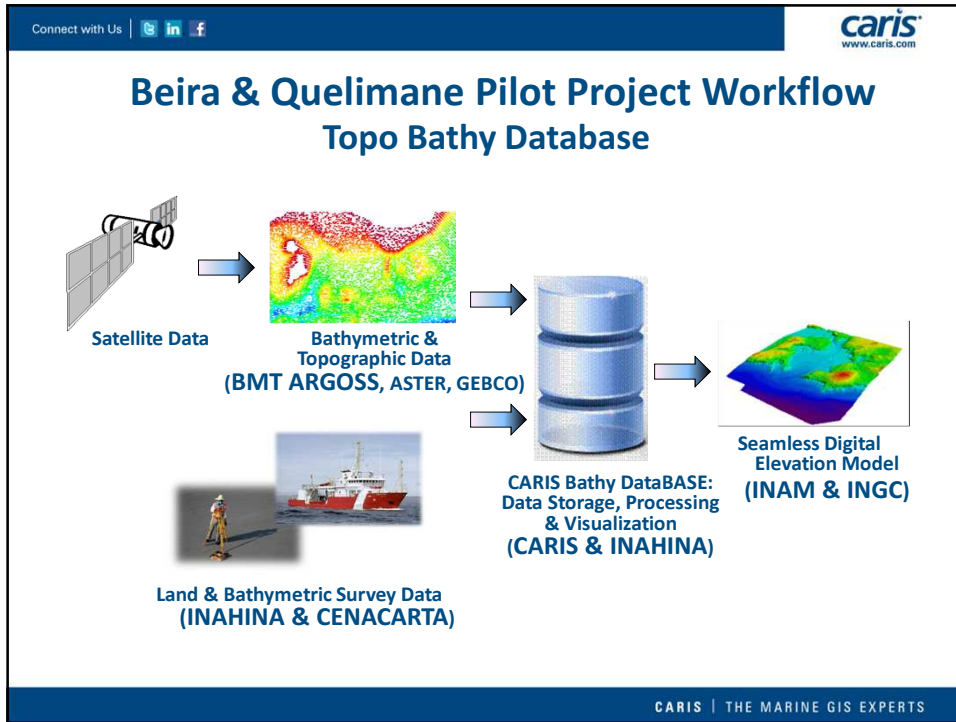
PARTNERS VOOR WATER
Bundeling van krachten


- CARIS & BMT ARGOSS received a grant from the Partners for Water program.
- This grant helped to set up and implement a **TopoBathy Database** at INAHINA for the pilot areas of **Beira & Quelimane**.


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Training: 5 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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West Africa: 5 Geospatial Source Datasets				
Organization	Type	Source	Vertical Datum	Resolution (m)
XXXXXX national agency?	Bathymetric	Survey	LAT	<30
BMTARGOSS	Bathymetric	Satellite	LAT	50
GEBCO	Bathymetric	Survey/ Satellite	MSL	100
XXXXXX Mapping Agency?	Topographic	Survey	MSL	50
XXXXXX local data resellers?	Topographic	Satellite	MSL	100

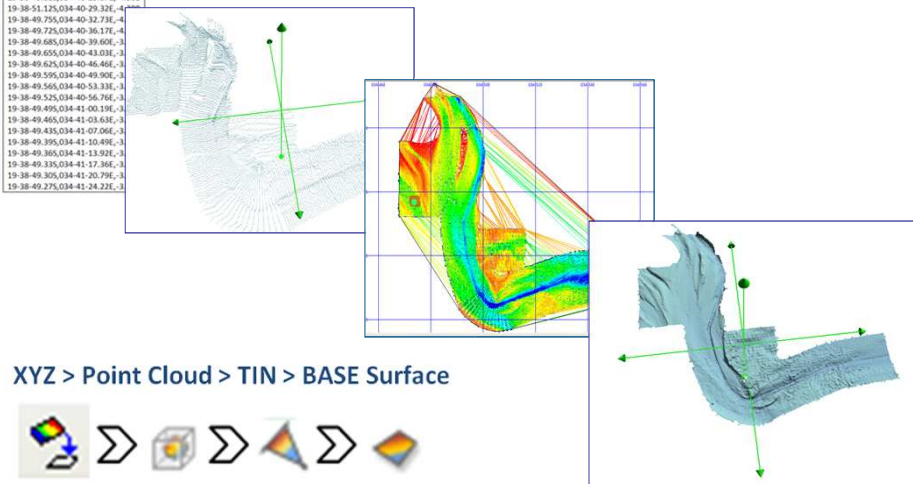
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Imported & Visualized in BASE Editor




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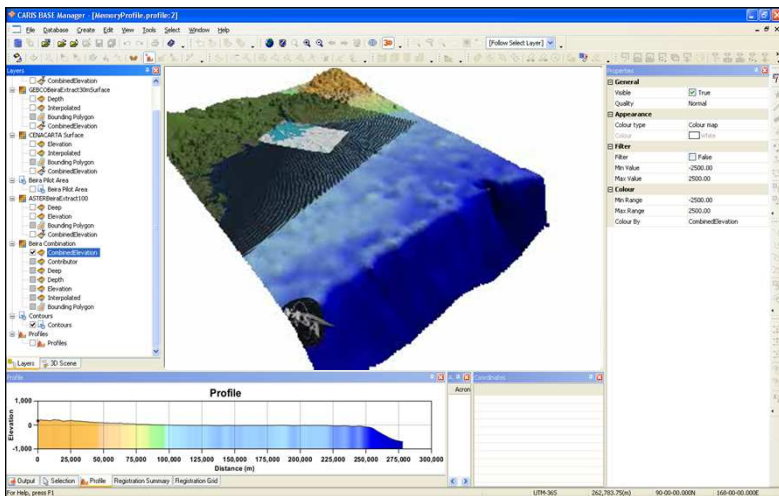


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Combined into One Elevation Model for Beira




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A Topo-Bathy Database for West Africa ?

Gulf Guinea: one of world's most productive marine areas




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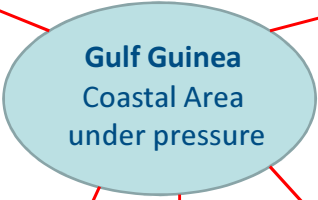
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Coastal Erosion



Exploitation resources

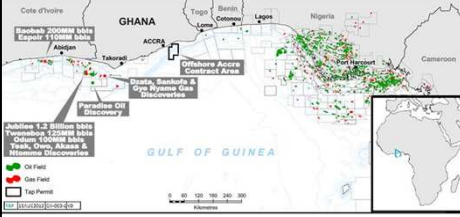





Gulf Guinea Coastal Area under pressure

Oil and gas exploration:


- Increase maritime traffic
- construction infrastructure



Overfishing



Destruction mangrove



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Possible Participants in a WEST AFRICAN Project

Nigeria, Ghana, Gabon, Ivory Coast, Togo, Benin, Liberia, Cameroon...

Stakeholders

National Ports Authority
 National Hydrographic Office
 National Maritime Safety Agency
 Government Depts: Environment, Fisheries, Tourist, Transportation
 Universities, Maritime Colleges, Navy schools could be included to generate useful practical experience and knowledge
 Coastal users and beneficiaries:

- Tourism
- Fishing
- Ports & Marine based trade
- Local coastal communities

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Possible Participants in a WEST AFRICAN Project

What interest is there to develop a real project with results?

Challenges exist

Identifying contributing agencies & authorities 

Engaging with LG authorities who may have cultural and social concerns

Discuss and explain the benefits to departments of Transport, Tourism, Environment, Trade etc

Coastal users and local beneficiaries: 

- Tourism and tourist operators
- Fishing and aquaculture
- Ports and inland waterways need to be commercially competitive
- Hydrocarbon exploitation offshore needs infrastructure
- Trade (SEA trade!) underpins our economies

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Questions?



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