Canadian Hydrographic Conference and
National Surveyors Conference 2008

Integration of Hydrographic Data Products in a Global Web Based 2D and 3D GIS

Session 5

Data integration and management: problems and solutions

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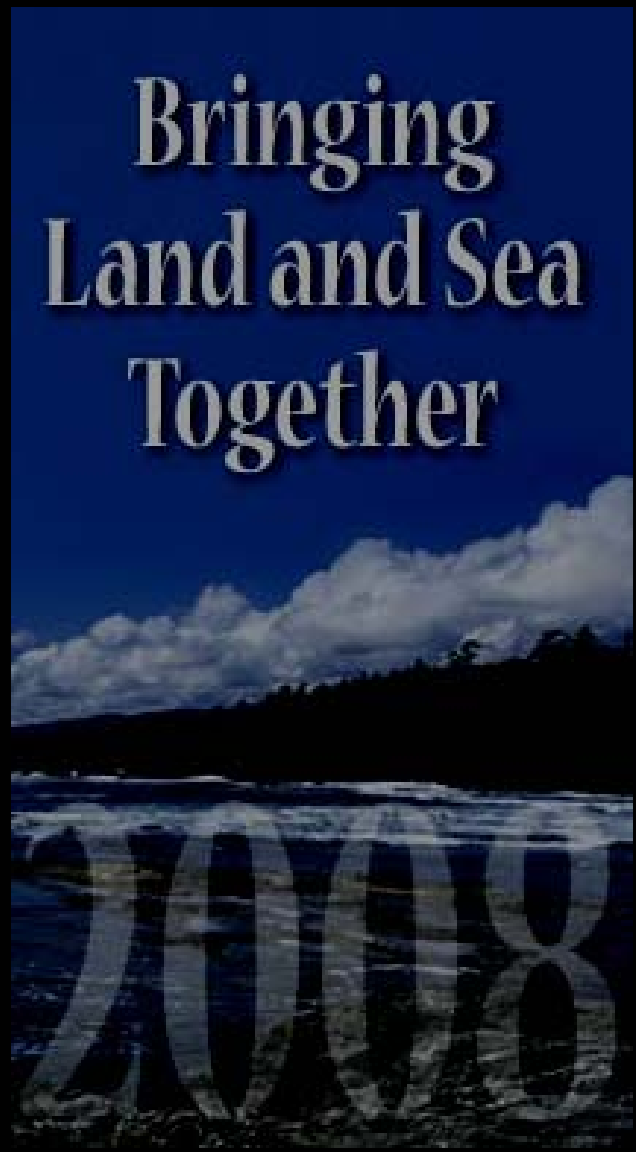
May 2008



SUMMARY

1. Introduction

2. Background

3. InforM@r Project

4. Hydrographic Products

5. Results

6. Conclusions

1. INTRODUCTION

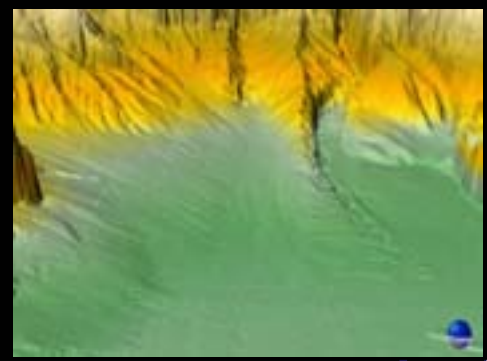
SEAFLOOR MORFOLOGY

One of the main subjects of ocean research

High quality bathymetric data ⟷ Significant potential

This potential hasn't been fully explored

Possible Solution
Web-GIS



2. BACKGROUND

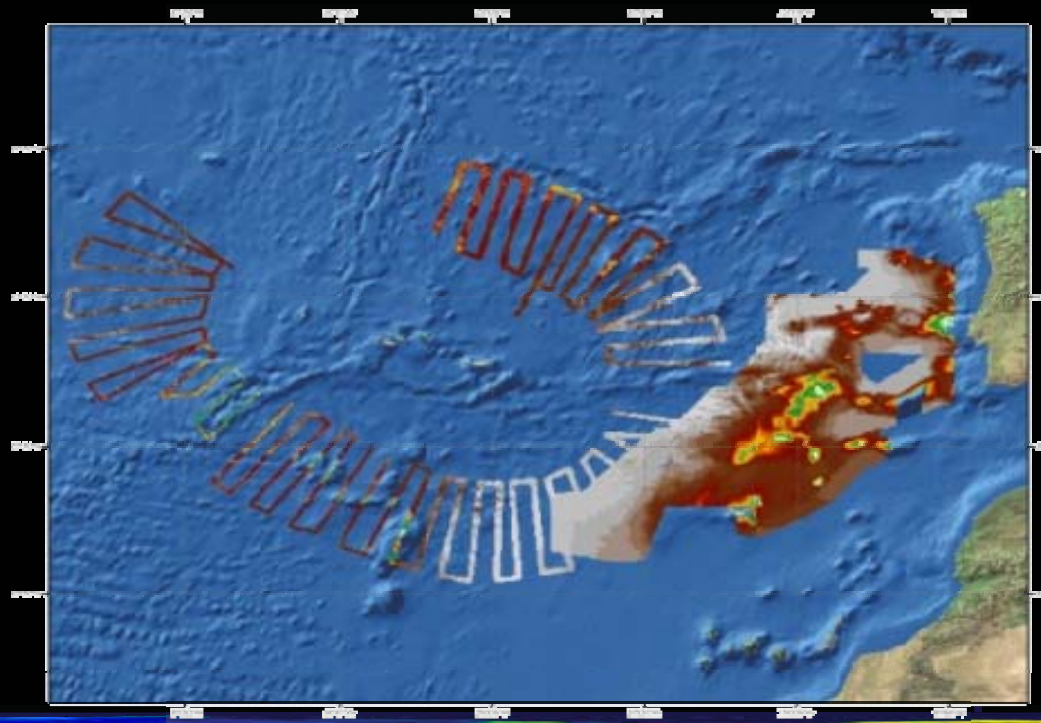
PORTUGUESE PROJECT FOR THE EXTENSION OF THE CONTINENTAL SHELF

Integrated in works of Portuguese Task Group for the Extension of the Continental Shelf

Data colected through portuguese navy hydrographic vessels

Multibeam echo sounders

+ 1.000.000 km² surveyed
+ 300 .000.000 soundings



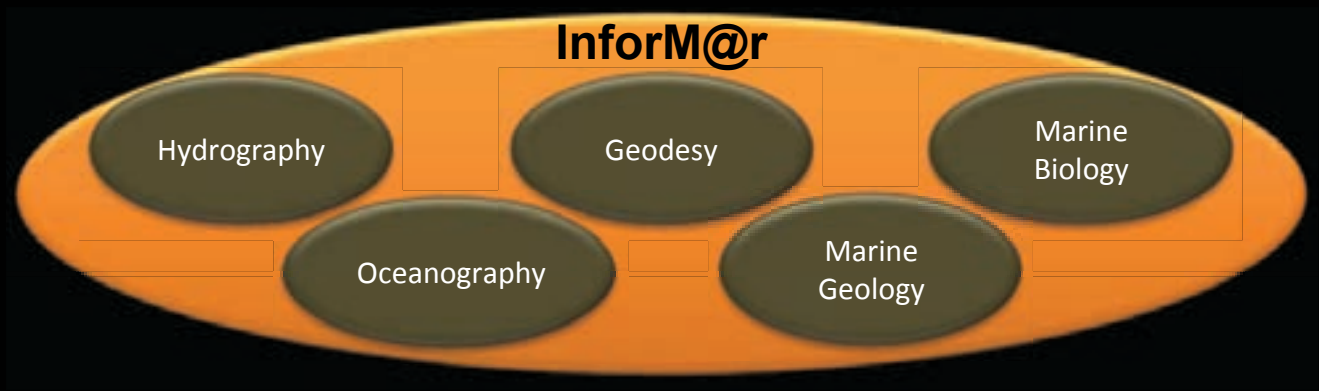
2. BACKGROUND

INFORM@R PROJECT

Objective: Integrate ocean data from different disciplines

Stage 1 → Support EMEPC works

Stage 2 → Establish a framework to assemble all the Portuguese ocean data



3. HYDROGRAPHIC PRODUCTS

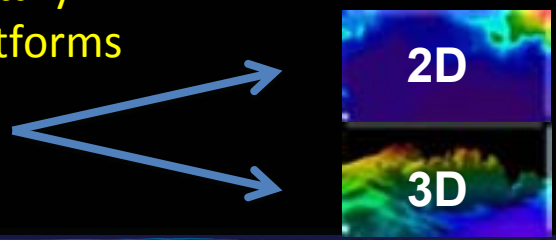
INFORM@R PORTAL www.emepc.gov.pt

InforM@r website was created to make available some of the ocean data collected by EMEPC

BATHYMETRY AS A FUTURE DEVELOPMENT AREA IN INFORM@R WEBSITE

- Include EMEPC bathymetric data
- Link it to other complementary geographic information platforms

Types of products considered



3. HYDROGRAPHIC PRODUCTS

PRODUCTS VISUALIZATION

Data viewer platforms considered:

- Local geographic information viewer, namely ArcIMS, which actually supports the InforM@r web site;
- Global geographic information viewers, e.g. Google Earth, NASA World Wind or Microsoft Virtual Earth;
- Dedicated software to visualize and explore geographic datasets.

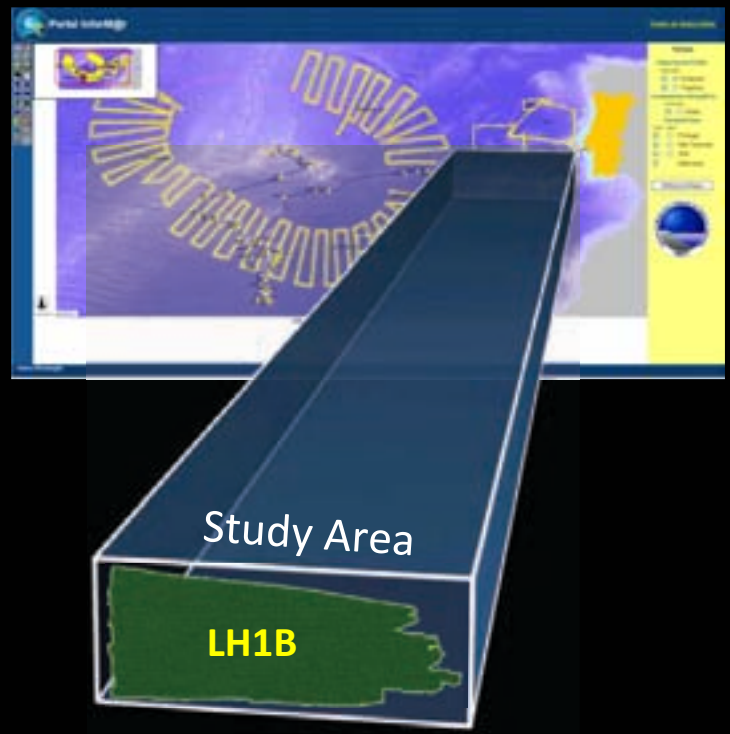
4. RESULTS

BATHYMETRIC DATA

Owned by EMEPC

High resolution data collected using multibem echo sounder systems

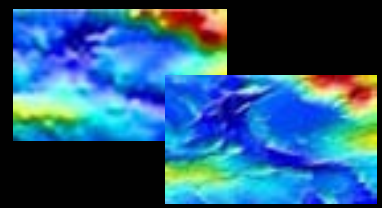
Product generation for other survey areas follows a similar approach



Objective

To make available a geographic dataset better than other public data available for the region

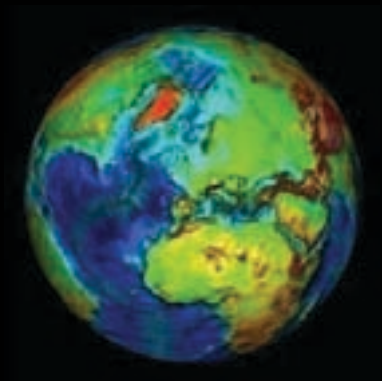
> Resolution; > Quality



4. RESULTS

GLOBAL GRIDS

ETOPO 2



2’ resolution

GEBCO

1’ resolution

InforM@r → Reference spacing → 30’’

4. RESULTS

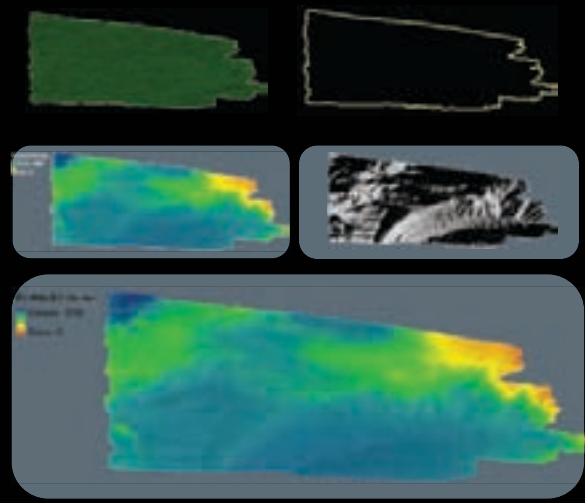
PRODUCT GENERATION

Product development guidelines:

- Use EMEPC web page as the central platform for distribution;
- Use a global geographic information viewer in the product distribution, allowing the users to combine EMEPC information with their own geographic data;
- Develop solutions that allow a higher interaction between the users and the geographic information through basic exploration tools;
- Develop bidimensional and tridimensional products, increasing the flexibility for the users.

4. RESULTS

PRODUCT 1 – INFORM@R PORTAL



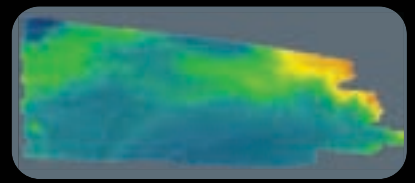
Data Preparation

Surface Generation and Format

Availability of Data throught
InforM@r Webpage (ArcIMS)

4. RESULTS

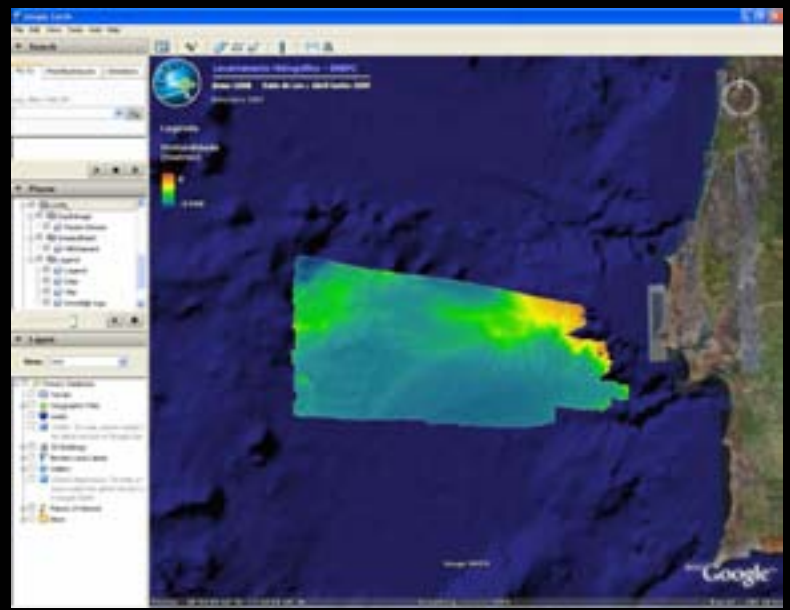
PRODUCT 2 – KML 2D



Surfaces Conversion to KML files

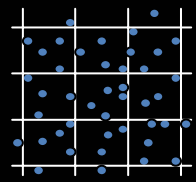
Screen Overlay Generation

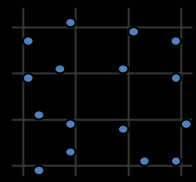
Final KML File Creation



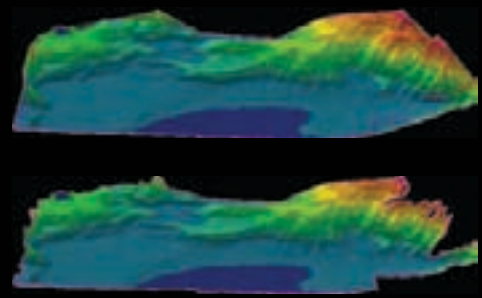
4. RESULTS

PRODUCT 3 – KML 3D



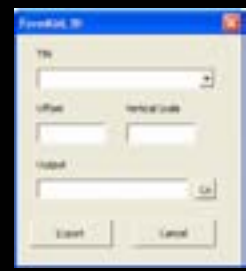


Initial Data Resampling

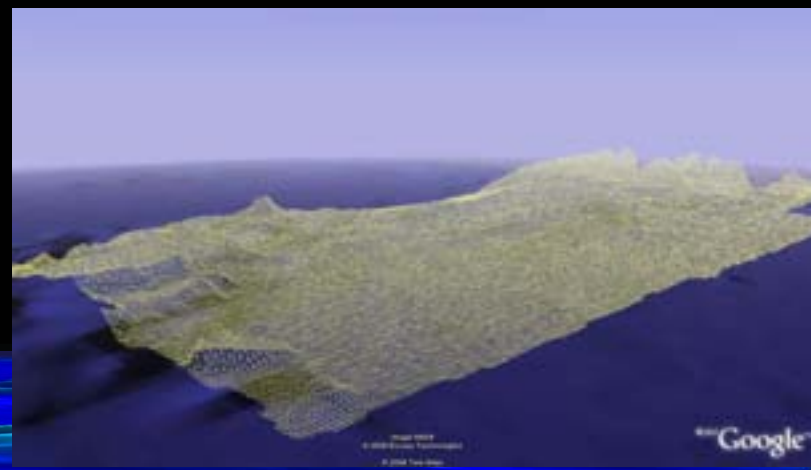


TIN Generation and Editing

ArcGIS Tool Development – Export TIN to KML file

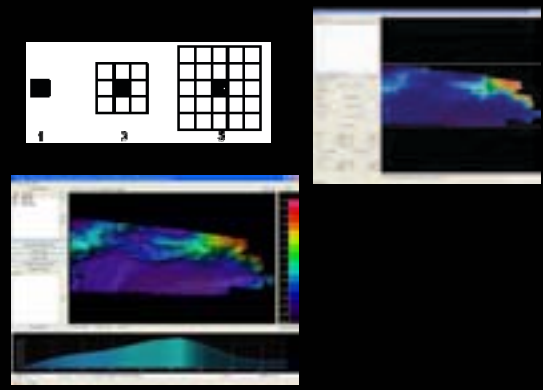


KML Generation and Formating



4. RESULTS

PRODUCT 4 – FLEDERMAUS

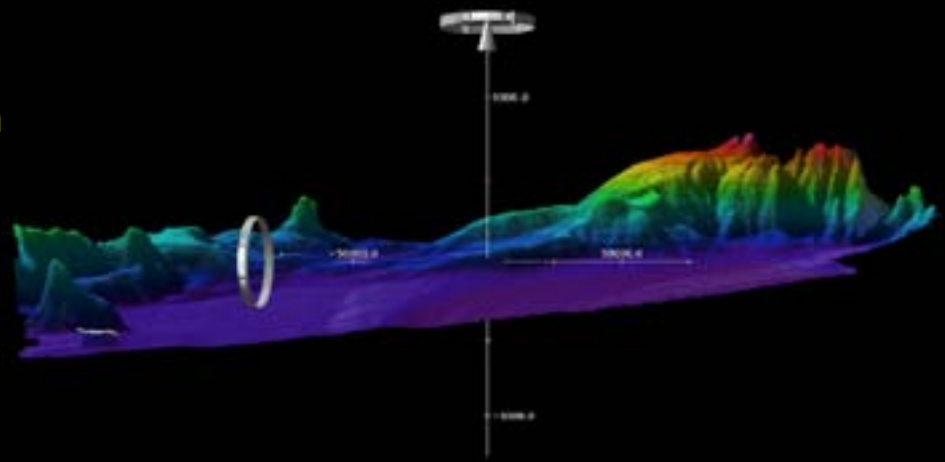


Data Formatting

Grid computation (Avggrid)

Surface Formatting (DMagic)

Fledermaus Object Generation



5. CONCLUSIONS

BATHYMETRY DERIVED PRODUCTS

High quality bathymetric information potential is being partially wasted

Web-GIS can have an important role in data potential maximization

It doesn´t exists one unique bathymetric product that satisfies all the determined requirements

Solution → **Diversification**

5. CONCLUSIONS

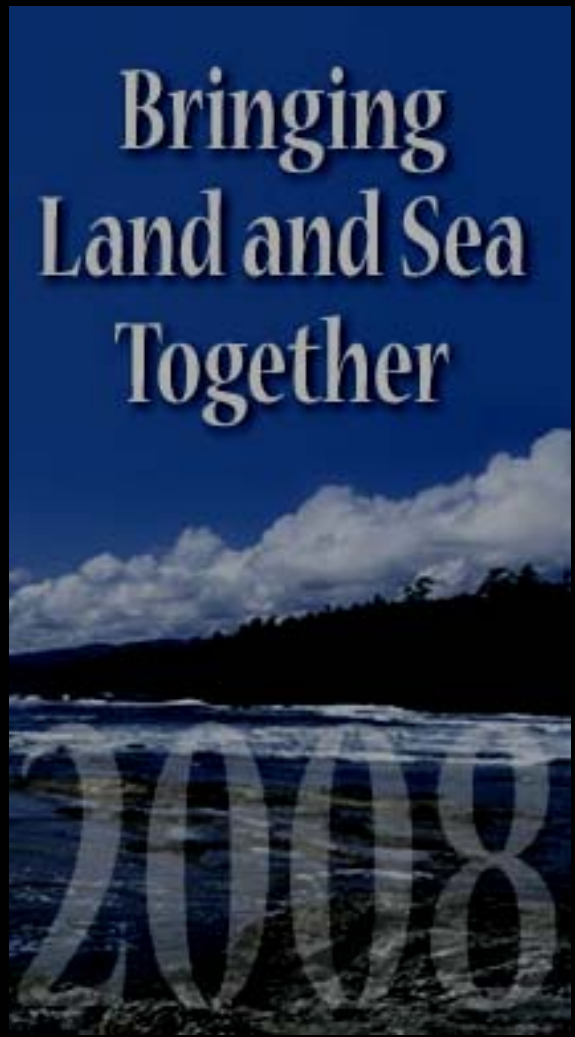
ArcIMS	Allows the combination of bathymetry with all InforM@r data
KML 2D	Allows the combination of batymetric data with user's geographic information
KML 3D	Integrate advantages of a 3D surface into a GIS application acessible to the user
Fledermaus	Permits a higher interaction between the user and the surface

FUTURE WORK

- Make all bathymetric products available for all EMEPC surveyed areas (after project conclusion – May 2009)

- Combine other kinds of geographic data with the develop surfaces, namely in 3D products

Integration of Hydrographic Data Products in a Global Web Based 2D and 3D GIS



… thank you for your attention!