Le Modèle Numérique Terre-Mer

Litto3D

BACKGROUND

Since the catastrophic Erika and Prestige oil spills, Europe has realised the importance of coastal protection. On 30 May 2002, the European Union has recommended to its member states to carry out a detailed inventory of the littoral.

In April 2003, forward to the recommendation of the French National Council for Geographic Information, the Interdepartmental Sea Committee decided that "*SHOM and IGN should conjugate efforts to produce the geographic reference for the littoral*".

This decision was confirmed by the Prime Minister in September 2004 and the project Litto3D ® started officially.

REQUIREMENTS

Over a hundred activities have been inventoried on the seashore. They were expressed by coastal managers concerned by the protection and exploitation of the littoral and by users of geo-referenced data. Litto3D® should become the core of all future integrated coastal management projects.

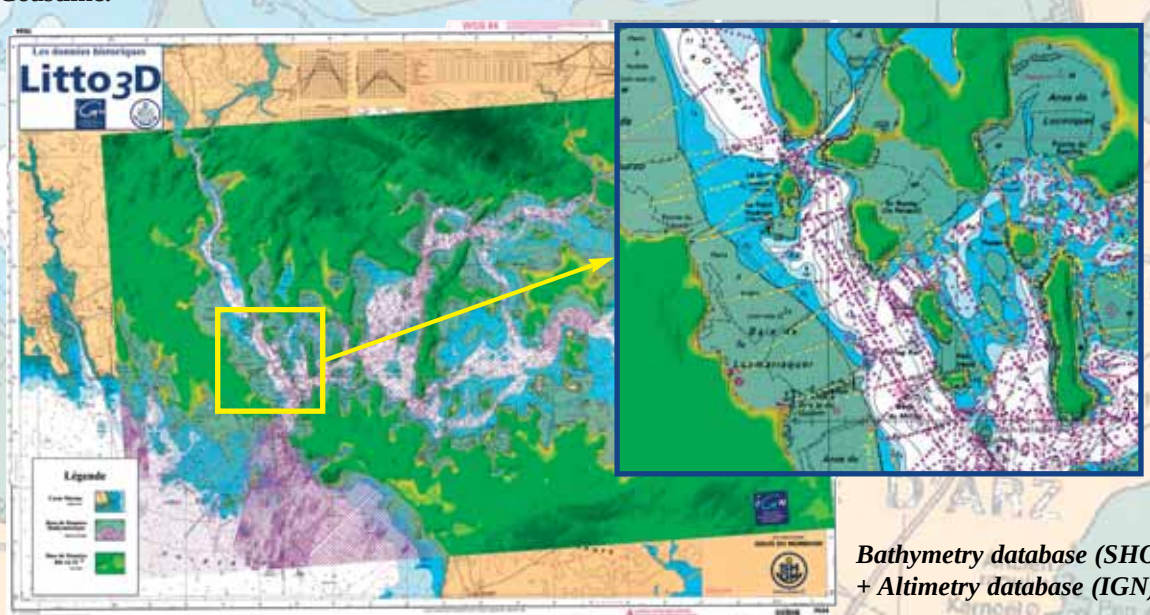
A very good knowledge is required for public maritime delimitation, littoral protection (change of coastline due to erosion, fauna and flora protection …), risks prevention (floods, pollution, safety at sea, natural disasters …), regional development (ports, tourism and industry), mineral and living resources concern, research and scientific studies, military needs (inshore patrol, search and rescue, amphibious operation, mine warfare…).

FINDINGS

Insufficiency of existing data:
- Sea charts and nautical documents are not fully suited to coastal needs as they are mainly dedicated to seamen. The information is condensed on the navigation roads and ports.
- On land, height information usually comes from digitised charts contours (1:25 000 at most) and photogrammetric interpretation. There is a good density but accuracy and resolution are not sufficient to describe precisely the coast and to match with depths.
- The intertidal area is very bad described as not easily reachable by classical means.
Available data do not allow to build continuous models.

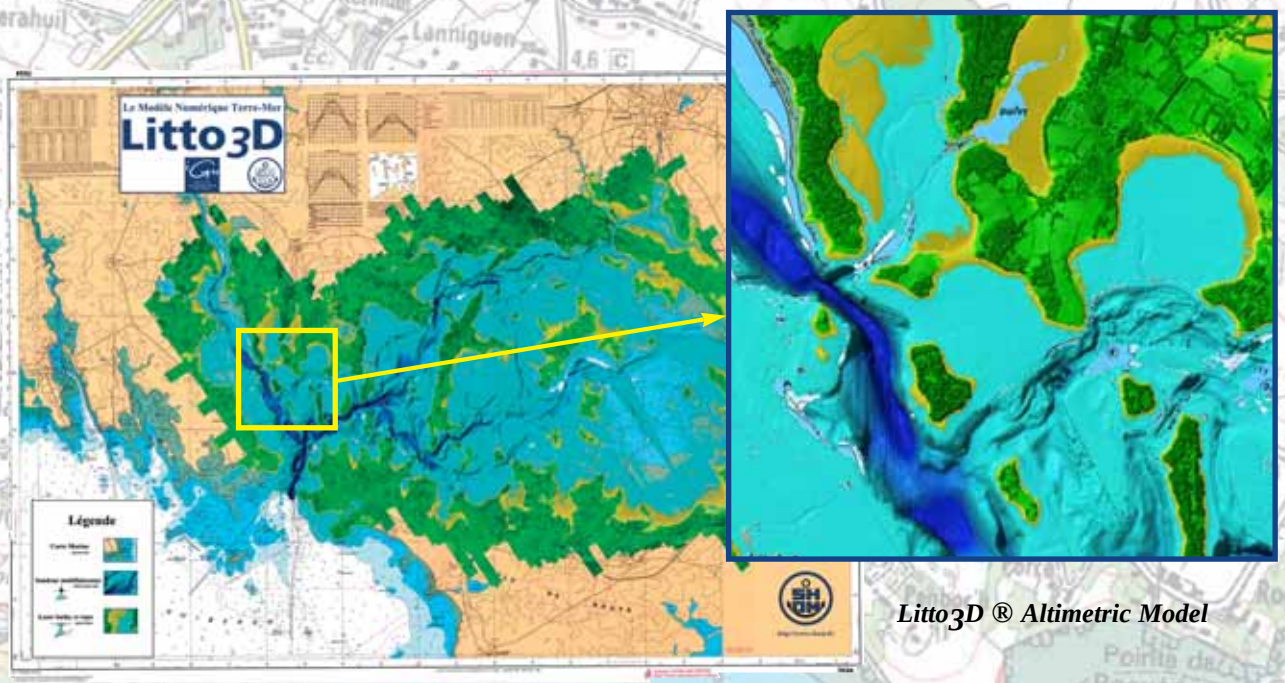
HISTOLITT DATABASE

For many years, SHOM and IGN have managed databases with much more information than information printed on charts and maps. This information is not well known by the external people but is still available in a digital format and, in a first stage; it can contribute rapidly to the littoral inventory. A single database will gather land and sea information :
- Land topography up to the 10 m contour,
- Bathymetry up to six nautical miles,
- Tidal model,
- Coastline.



Bathymetry database (SHOM)
+ Altimetry database (IGN)

GOLFE DU MORBIHAN DEMONSTRATOR



Litto3D ® Altimetric Model

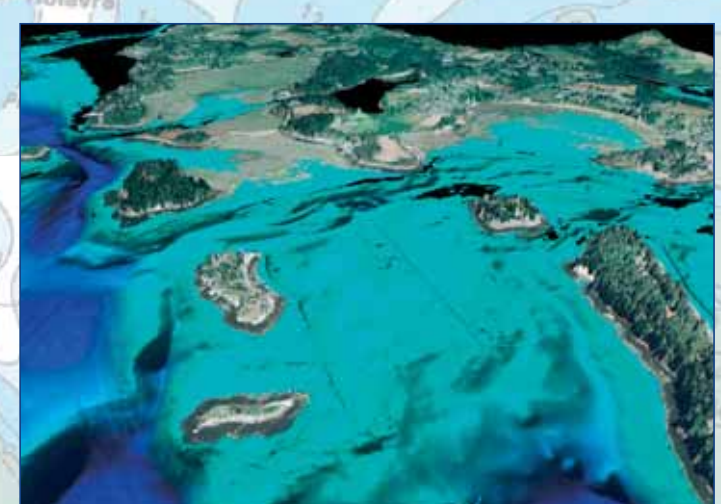
A short while ago, modern acquisition ways have appeared: airborne laser, multi-beam echo sounder and geodetic GPS. In order to validate new surveys concepts and to design corresponding databases, a laser airborne sensor (LIDAR) was used last summer in a small area, in addition to marine and land surveys.

The Golfe du Morbihan was chosen because it offers a wide variety of relief and thematic. It is a good location for a demonstrator as it concentrates all difficulties: 0-50m depths, turbidity, currents, wide inter-tidal area, flat sandy beaches, and rocky coastlines are most representatives of the French littoral.

A survey (topographic and bathymetric airborne laser) was conducted in June 2005. Multi-beam echo sounder data were acquired to complete the area. A precise, seamless Digital Terrain Model was then built.

This experiment enabled SHOM and IGN to develop a methodology applicable everywhere and by everyone.

FUTURE



Litto3D ® Altimetric Model + shore Orthophotos ©

The replication of this demonstrator all along the metropolitan coast and French subdivisions has to be planned. Combined to the SHOM tide model, the information constitutes what is called RGL (Littoral Geographic Reference) and it will become the core of all future integrated coastal management projects.

Data will be directly accessible to users and industrials through a French geographic information portal on a web site.

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http://www.shom.fr/fr_page/en_act_litto3D/index_litto3D_f.htm

July 2006