Evaluation and Use of Crowd Source Bathymetry in SHOM’s Digital Bathymetric Models

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Context

- SHOM assumes the responsibilities of the French HO in wide areas
- Bathymetric knowledge is limited in some areas (e.g. approx. 30% of the datasets in the English Channel area were collected prior to 1980)
- Data collected from Olex systems were made available to SHOM in 2012 by French Olex reseller
- Recent bathymetric compilations integrate crowd-source bathymetry (CSB) (e.g. IBCAO, GEBCO,...)
- Objectives of the present study: Evaluate CSB dataset in order to integrate it in a Digital Bathymetric Model (DBM) and in SHOM’s bathymetric database

Exploitation in SHOM products

- These data were integrated in the 100m DBM of the Bay of Biscay and the English Channel
- 8% of the nodes of this DBM originate from OLEX data (on the shelf)
- Where the OLEX data have been used, their resolution allows to map most of the sedimentary features in the area (esp. in the English Channel)

Processing

- Data processed: Bay of Biscay, English Channel
- Manual edition using Subset Editor (Caris BDB 3.2)
- 0.7% invalidated soundings out of 120 millions samples

Evaluation

- Comparison with 8 recent multibeam datasets (post 2005)
- Vertical uncertainty is defined as mean difference + 2 standard deviation

- IHO S-44 Order 2 for the vertical precision not reached in general
- Estimated precision between 1.4m ±1.9%D and 4m±1.3%D between 0 and 160m water depth (D)
- Soundings are used below 40m water depth for DBM with grid size above 100m

Conclusion & Perspectives

- CSB data are used in 100m resolution DBM on the continental shelf. Data quality is sufficient for depths ranging from 40m to 200m. Precautions must be taken between 0 and 40m.
- Improvement of the bathymetric knowledge with CSB on the continental shelf allows better morphological feature detection

PERSPECTIVES:
- Improve evaluation tools and processing methods of unstructured bathymetric data (research work)
- Consider other similar sources (INSU, TeamSurv, Piscatus, Maxsea,...)
- Contribute to the 1st Crowd source bathymetry working group (IHO) and share experiences