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

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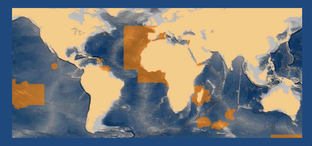
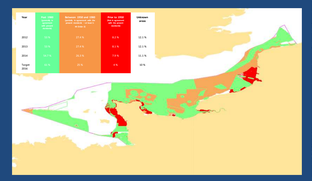
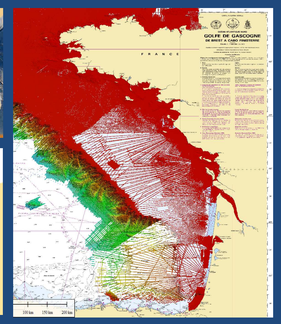
## Context



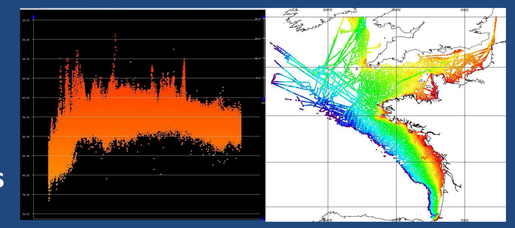





- ✓ SHOM assumes the responsibilities of the French HO in wide areas
- ✓ Bathymetric knowledge is limited in some areas (e.g. approx. 30% of the datasets in the English Channel area were collected prior to 1980)
- ✓ Data collected from Olex systems were made available to SHOM in 2012 by French Olex reseller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

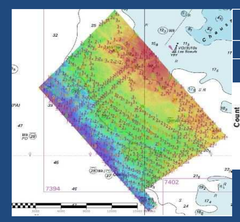
## Processing

- ✓ 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

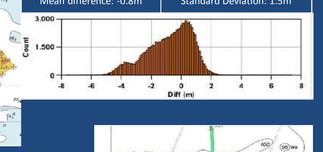


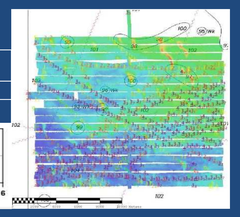
## Evaluation

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

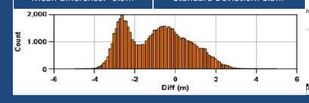


| | |
|---|---|
| Minimum difference: -7.6m | Number of soundings compared: 96312 |
| Maximum difference: 7.3m | Average water depth: 28m |
| Mean difference: -0.8m | Standard Deviation: 1.5m |

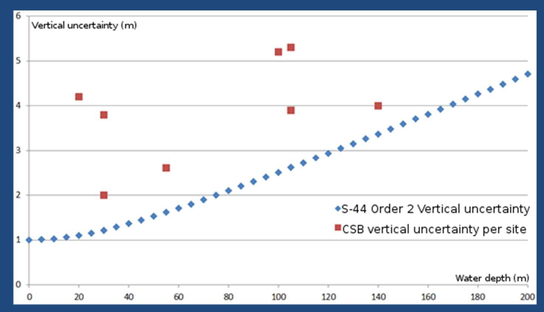


| | |
|---|---|
| Minimum difference: -4.9m | Number of soundings compared: 64079 |
| Maximum difference: 5m | Average water depth: 104m |
| Mean difference: -0.9m | Standard Deviation: 1.5m |



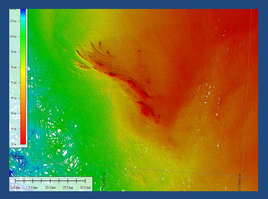

- ✓ IHO S-44 Order 2 for the vertical precision not reached in general
- ✓ Estimated precision between 1.4m +1.9%D and 4m+1.3%D between 0 and 160m water depth (D)

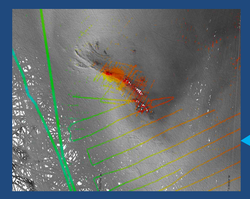



- ✓ Soundings are used below 40m water depth for DBM with grid size above 100m

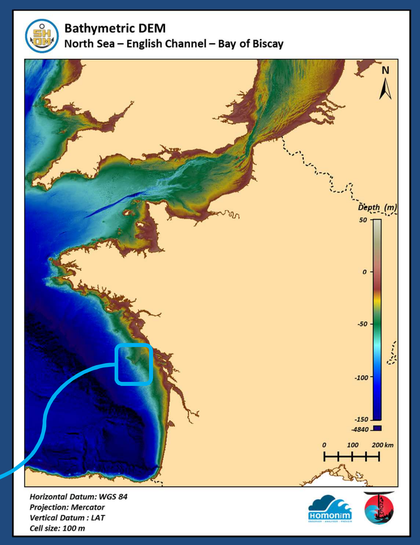
## Exploitation in SHOM products

- ✓ 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)





Area of the « Plateau de Rochebonne ».
(left) color coded OLEX bathymetric coverage.
(right) Gray coded: OLEX coverage vs. Color coded: SHOM bathymetric data




## 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

Acknowledgements: Olex, MAgic Instinct software