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Crowd Sourced Bathymetry - how can a grass root movement be legally framed?

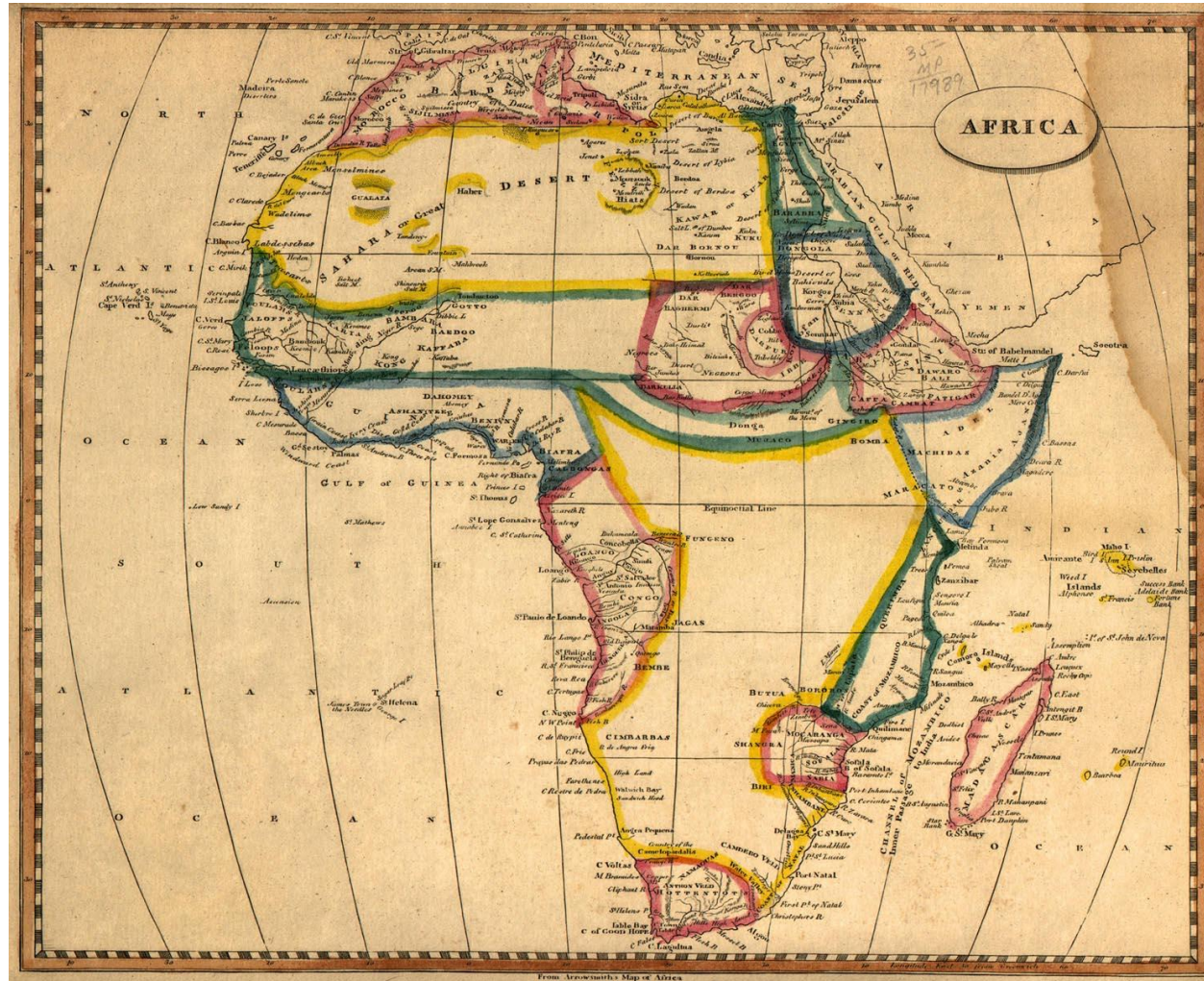
Mathias Jonas
Secretary-General IHO



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The nineteenth century – the great age of geography

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The map of the
African continent in 1812

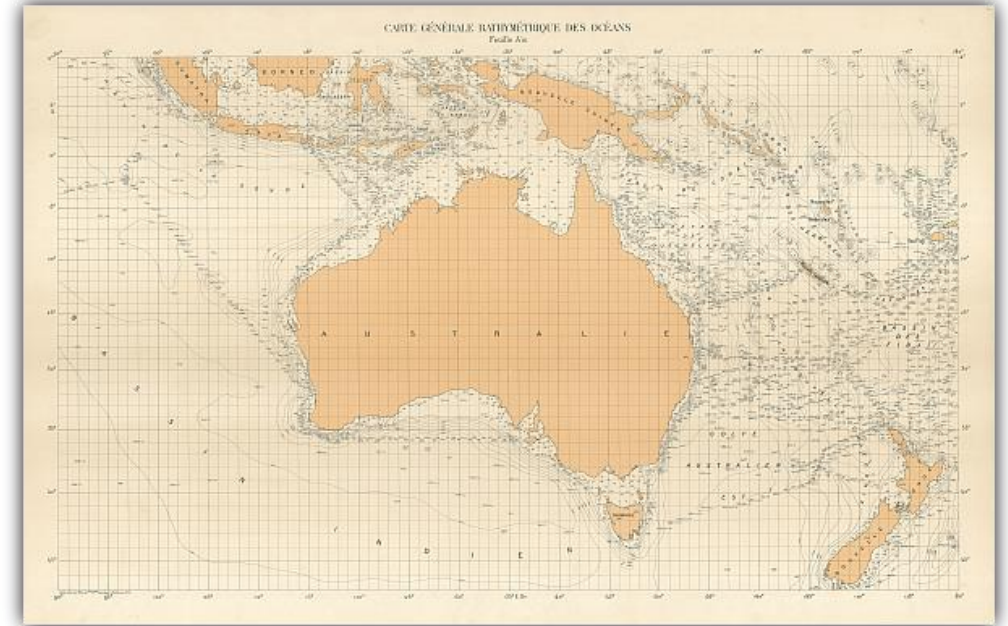
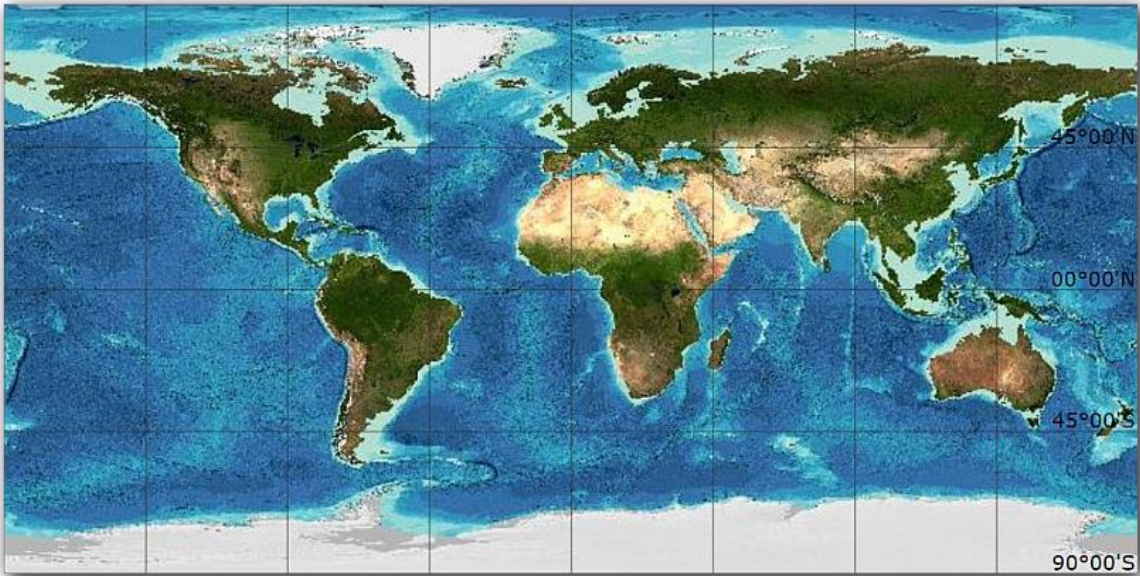


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It all started with the GEBCO Project:
Five editions of GEBCO printed charts that were produced between 1904 and 1982.

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The first edition (also known as the Monaco Chart) took just 7 months to compile and was published in 1903. The lithoprinted maps were presented at the Paris Academy of Science in January 1904 and the Eighth International Geographical Congress held in Washington, D.C later in the year.



Since the early 1990s, GEBCO has moved to producing and making available digital bathymetric data sets products.

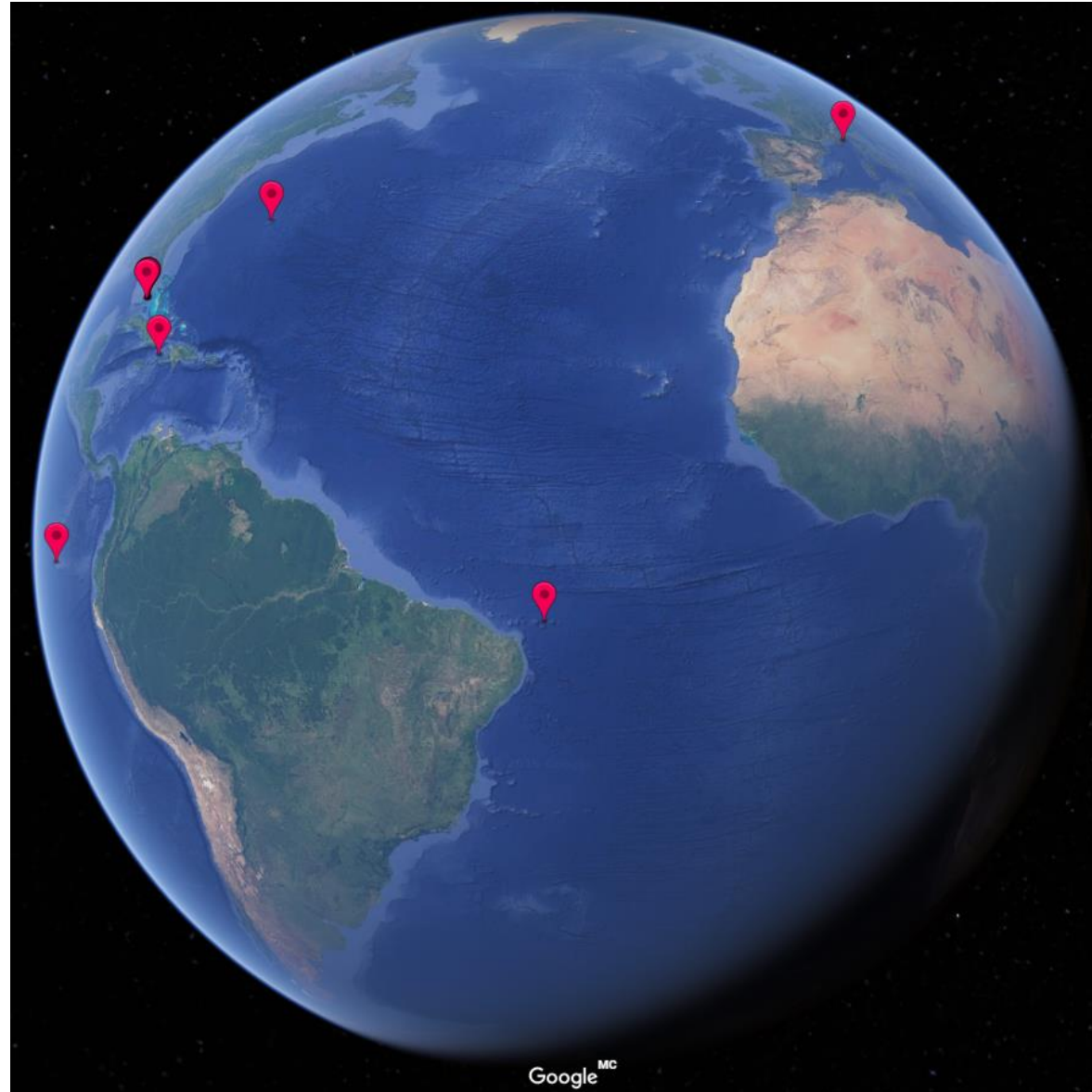


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GEBCO Grid:

The best image of global seabed topography you can get

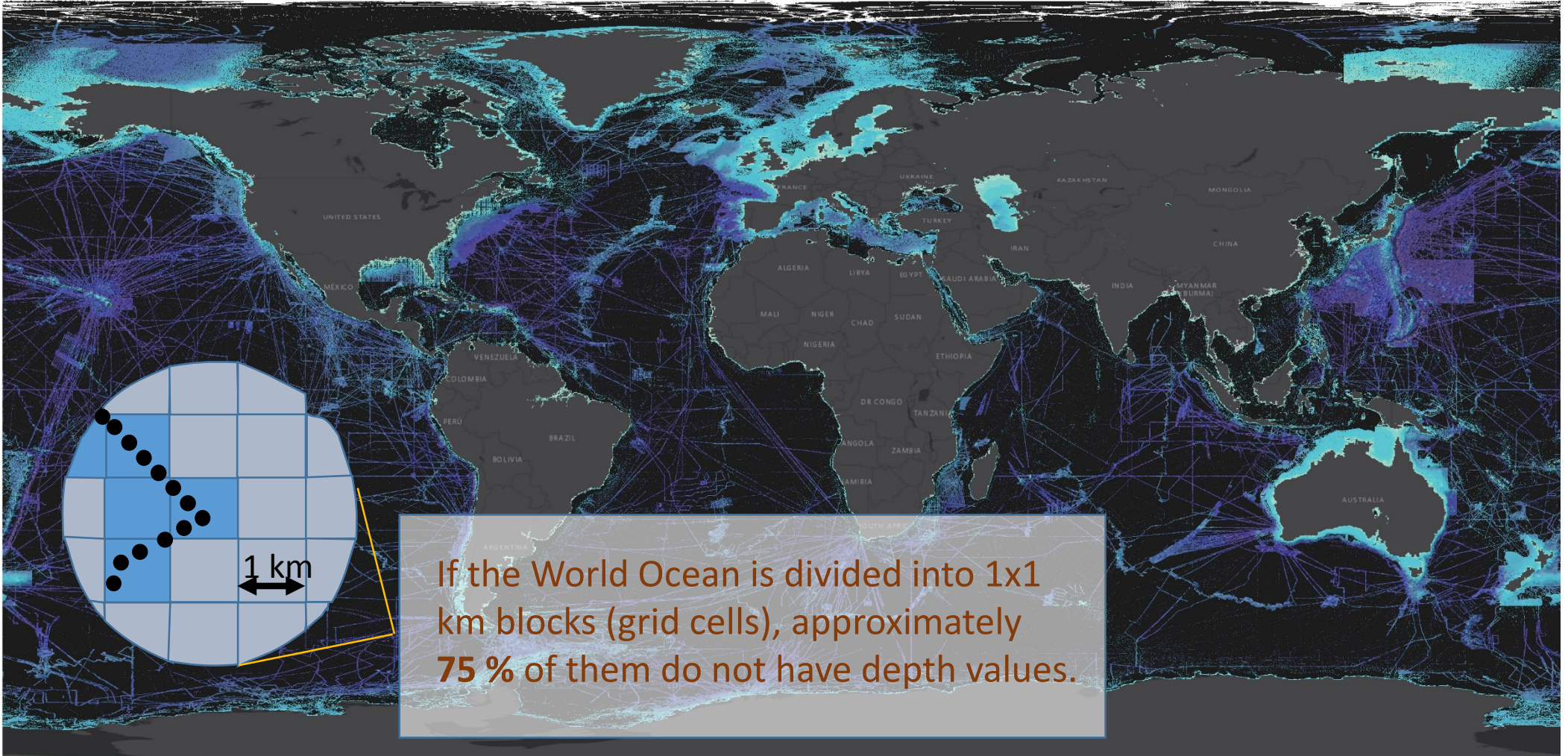




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GEBCO Grid: ... and this is the coverage and quality of available data: 15% in decent quality

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How to improve the situation?

- Increase governmental survey capacity and activity
 - Engage with governments on all levels to explain the compelling need, work on technical standardization and help to build capacity.
- Develop more efficient and cost effective survey technology
 - Autonomous surface and subsurface carriers
 - Horizontal radar
 - Airborne: bathymetric laser scanning (LIDAR)
 - Spaceborne: satellite imagery

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How to improve the situation?

- Unveil existing survey data from private sector
- Take profit from ongoing activities to measure water depths for various purposes:
 - Scientific investigations projects in oceanography
 - Professional survey activities for all sorts of exploration and future exploitation



**The Nippon Foundation-GEBCO
Seabed 2030 Project**



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How to improve the situation?

- Make smarter use of routine activities to measure water depths for navigation purposes on all classes of seagoing vessel:
 - Commercial Ships
 - Fishery
 - Non commercial vessels (Super Yachts)
 - Leisure boats of decent size

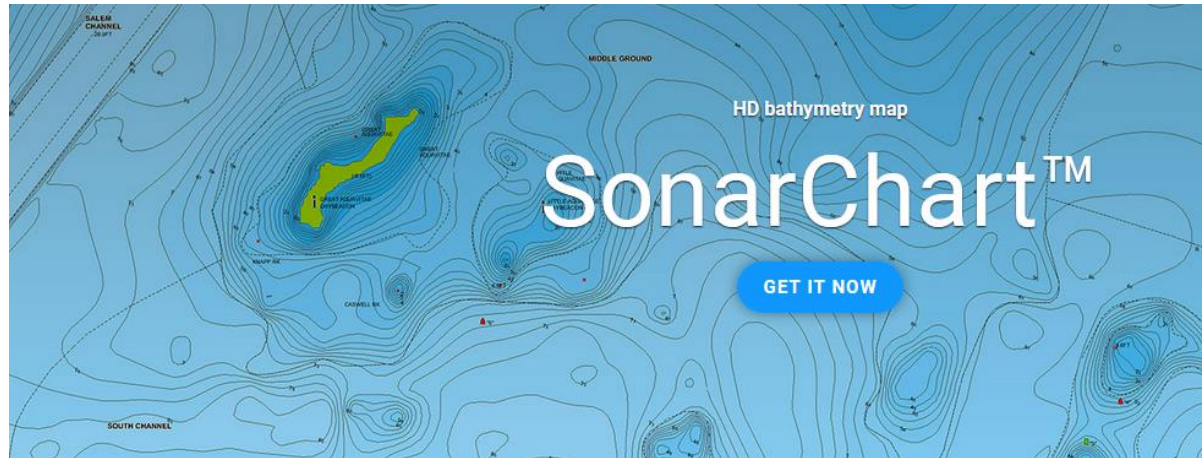
Crowd Sourced Bathymetry (CSB)
(citizen science, amateur contributions)



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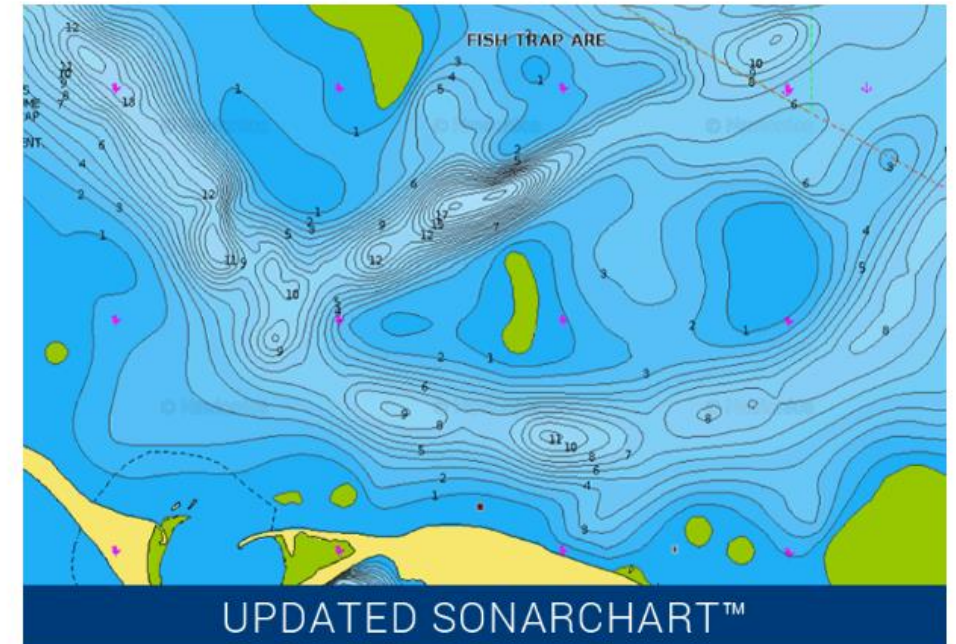
Private company CSB mechanism – focused on fisheries and boaters!

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Want better charts? Go boating!

SonarChart is constantly enhanced by millions of sonar logs contributed by boaters such as you. Navionics accepts sonar logs recorded with the vast majority of sonar/plotter brands and mobile devices. These are integrated with existing data, updating SonarChart to reflect the ever-changing conditions of sea, lake and river bottoms. Watch the [video](#), and learn more from this [article](#) and SonarChart [stories](#).

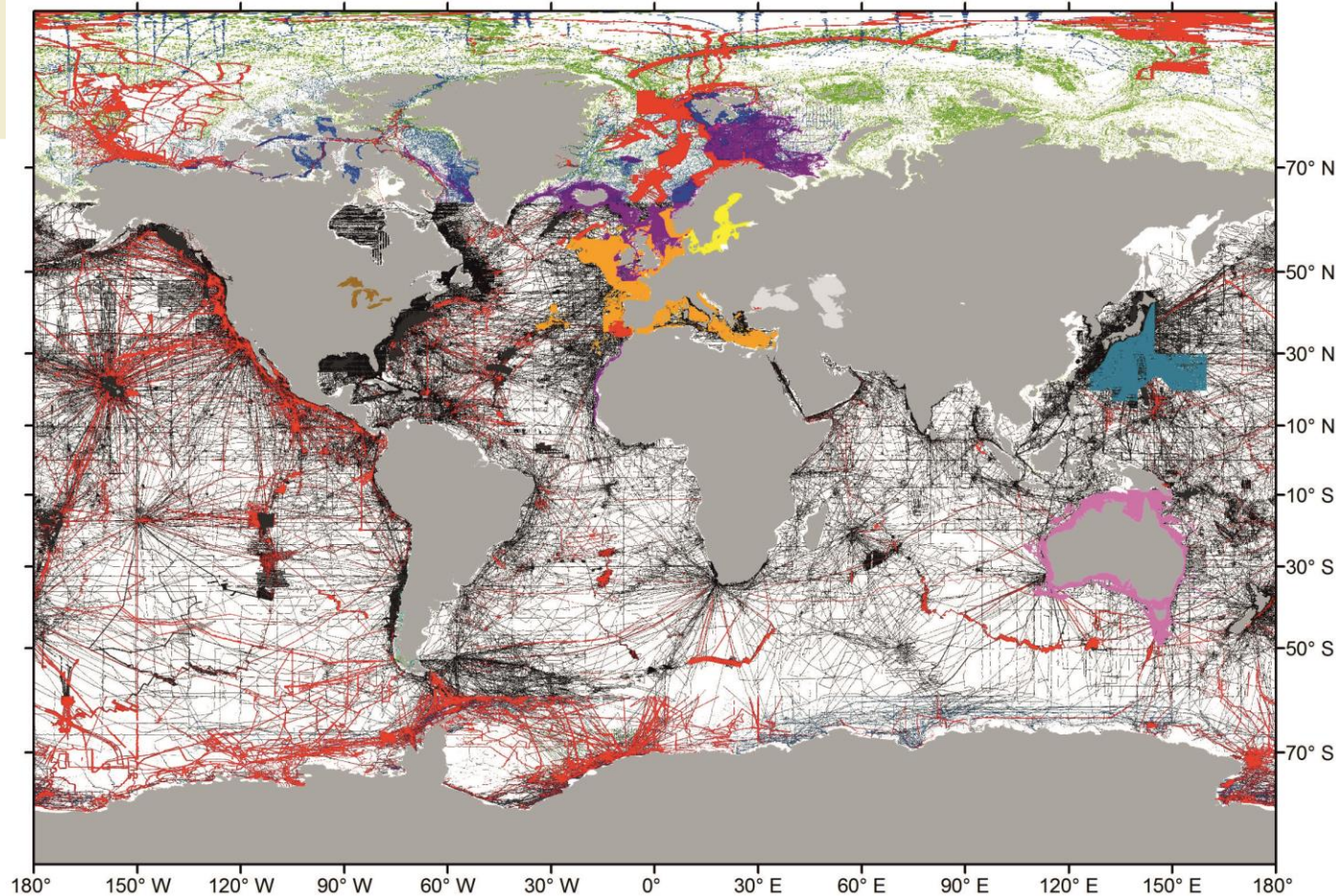




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Apply CSB to commercial shipping – seams to be logic and easy

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“If we got 1% of all seagoing vessels logging data, and on average they spent half their time at sea, then that’s about 5 billion data points a day.”

- Tim Thornton,
TeamSurv



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IHO's CSB Project – seems to be logic and easy?

What is needed:

Technical standardization

IHO B-12 Technical Guideline for CSB (adopted May 2019) ✓

Database Infrastructure to absorb collected data and make them available

IHO Data Centre for Digital Bathymetry at NOAA /USA ✓

Encourage data gatherers (digital philanthropy)

Early adopters to provide data ✓

Resulting products

Free download, GEBCO Grid – updated annually ✓

Legal clarity

IHO Questionnaire on positive support for CSB in national waters ✓



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IHO's questionnaire sent to its 90 Member States to create a future CSB positive list

Coastal State	IHO Member State	General support of CSB activity waters of national jurisdiction	No restrictions in all waters of national jurisdiction	Restrictions in territorial waters only	Seeking information about arrival of new CSB data sets	Review of incoming new CSB data sets prior to ingestion into the DCDB data base	Caveats on the further dissemination of the ingested data



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IHO's current CSB positive list of 14 Countries accepting CSB in their waters of jurisdiction

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Member State	Area	Specific actions required
Argentina	EEZ only	Provide copy of dataset to Hydrographic Office
Brazil	EEZ only	Provide copy of dataset to Hydrographic Office
Cyprus	All waters	Provide copy of dataset to Hydrographic Office
Denmark	All waters	Inform Hydrographic Office of any variance with published chart
Georgia	All waters	Provide copy of dataset to Hydrographic Office
Germany	All waters	Inform Hydrographic Office of new dataset
Monaco	All waters	Provide copy of dataset to Hydrographic Office
Netherlands	All waters	Inform Hydrographic Office of new dataset
New Zealand	All waters	Inform Hydrographic Office of new dataset
Norway	All waters – no multibeam activity without prior permission	Inform Hydrographic Office of new dataset
Philippines	Shipping routes and transit passages only	None
South Africa	EEZ only	Provide copy of dataset to Hydrographic Office
Sweden	EEZ only	Inform Hydrographic Office of new dataset
USA	All waters	None

14 out of 34 responding IHO Member States replied confirmation



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Lessons learned from the questionnaire

Coastal states are formally committed to open data policy (UN Shared Guiding Principles for Geospatial Information Management),



- b) **Collaboration and coordination:** encourage national, regional and global collaborations fundamental to the facilitation' of improvements in the development, management, use and exchange of geospatial information, as well as the integration of statistical data and other information, in order to create new knowledge and supply products and services meeting user needs.

but for CSB have

- Worries about detection of apparent deficiencies of their official charts and the liability issues related to,
- Concerns because of national defense issues,
- Uncertainty about the status of CSB in terms of UNCLOS.



Main issue: what is CSB in terms of UNCLOS?

Is CSB Maritime Scientific Research (MSR)?

- UNCLOS Article 246 (2): MSR in the exclusive economic zone and on the continental shelf shall be conducted with the consent of the coastal state.

Is CSB hydrographic survey?

- UNCLOS 40: During passage, foreign ships, including scientific research and hydrographic survey ships, may not carry out any research or survey activities without prior authorization of the States bordering straits.

If a vessel transits through

- EEZ and /or territorial waters,

Is CSB data gathering allowed? How can the vessel be sure about?

Ambition: Initiate a discourse about the status of CSB in terms of UNCLOS. CSB is not illegal survey!



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IHO approaches ABLOS to:

Initiate a discourse about the status of CSB in terms of UNCLOS.

Argue that
CSB is not illegal survey!

Convey that
CSB provides great contribution to the better knowledge of seabed topography for the benefit of all who have a use and a managing role with the seas and oceans!