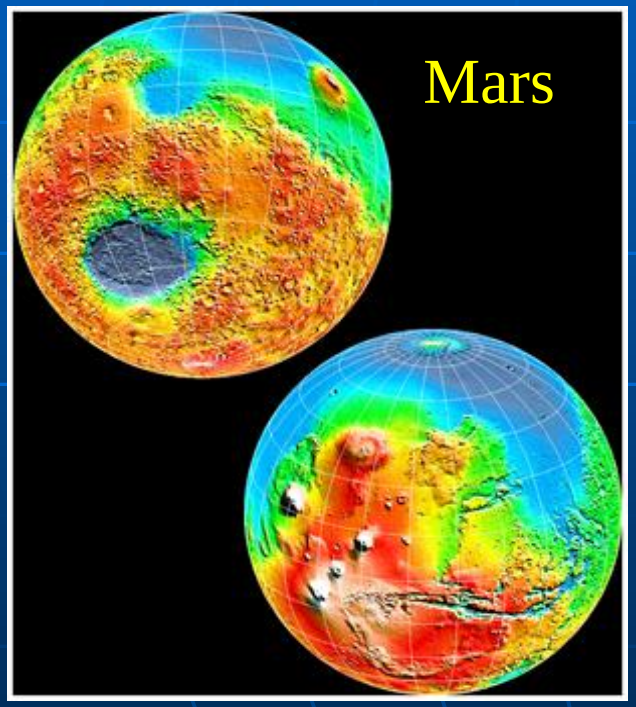
THE INTERNATIONAL HYDROGRAPHIC ORGANIZATION

Crowd-Sourced Bathymetry

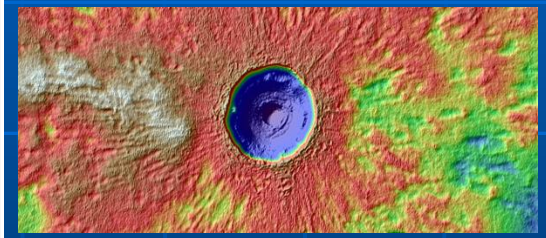
NIOHC16
Chittagong, Bangladesh
14-16 March 2016

We know more about the topography of Mars and our Moon than we do about the topography of our own ocean floor.

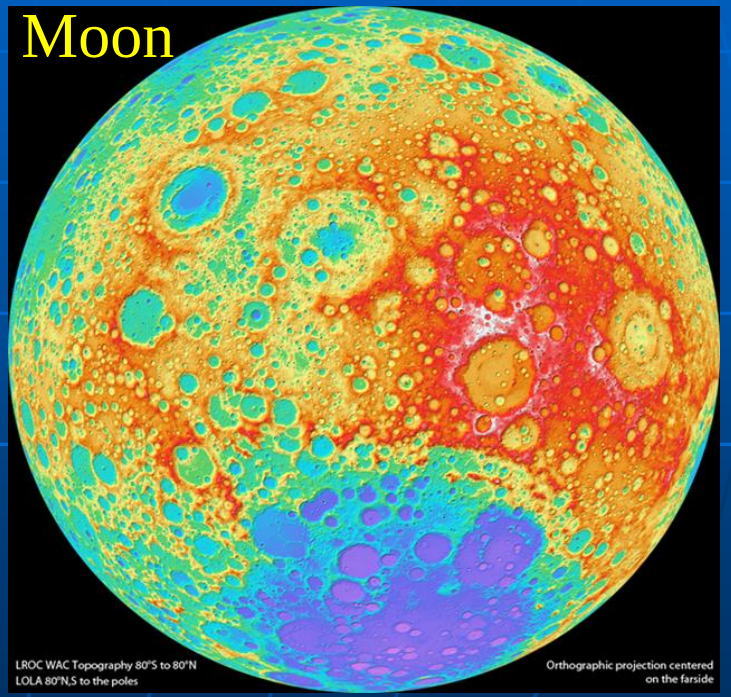


http://tharsis.gsfc.nasa.gov/global_paper.html

1 m DTMs



HIRISE Imagery NASA/JPL/UAriz/USGS
http://www.uahirise.org/dtm

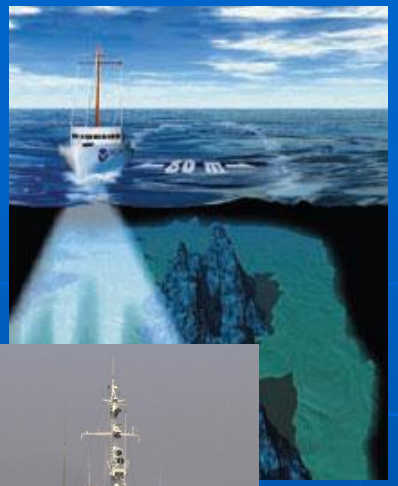


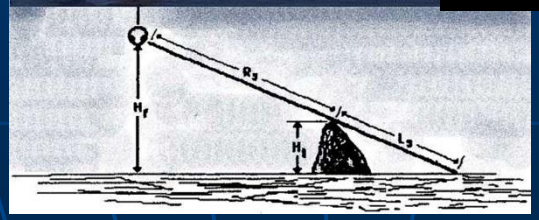
100m pixel resolution

The Hydrographic Customer Challenge

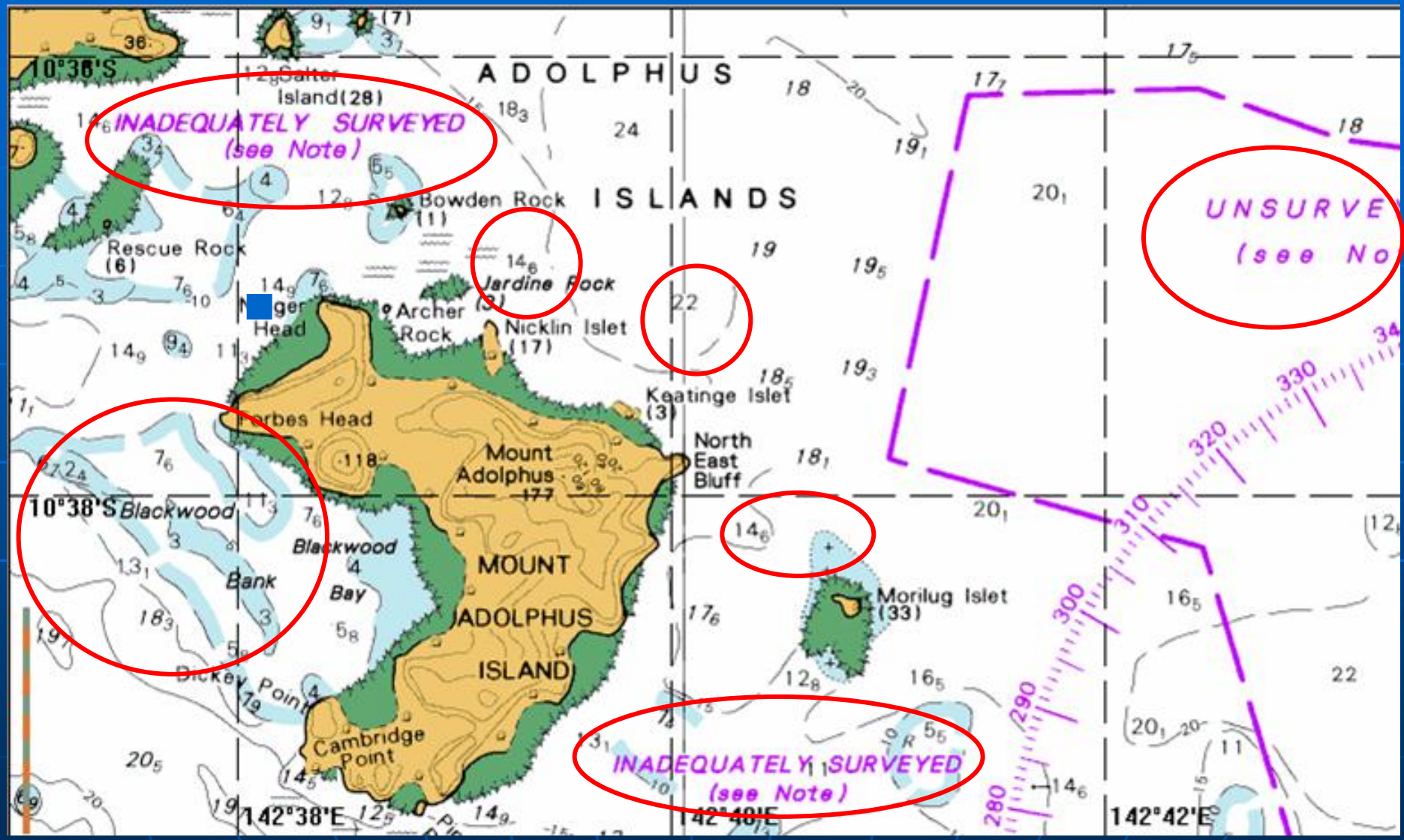
Global surveying capacity

- 35% reduction in government fleet in 25 years





Status of surveying worldwide



Survey and charting status 2015 (source: IHO C-55)

Unsurveyed or **requires better data** (0-200m deep)

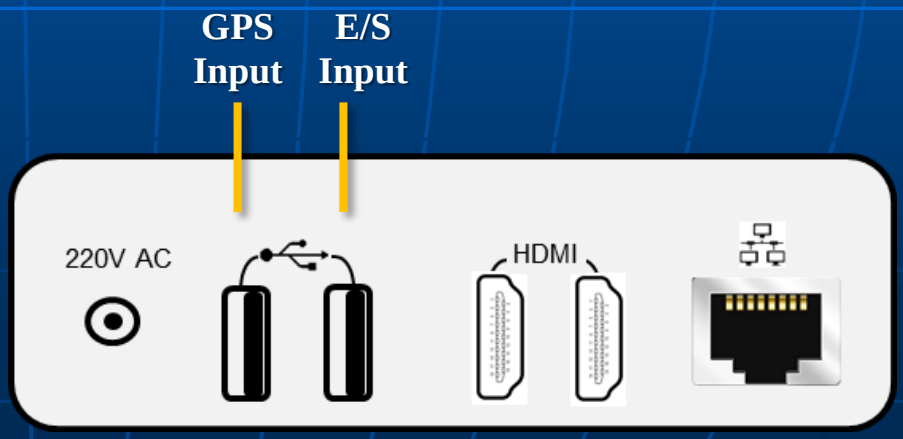
- SW Pacific >95%
- Polar regions > 95%
- W. Africa >80%
- Caribbean >80%
- Australia ~ 65%
- Greece 65%
- USA ~ 40%
- UK 30%
- France 19%

Crowd-Sourced Bathymetry (CSB)

- Low cost – high impact
- Non commercial
  - community based
- IHO/PYA proof of concept initiative
- Mariners' self-help programme
- Logger in every professionally crewed ship
- Working Group established to develop guidelines

Sea-ID LOGGER

- Stable clean 220 V AC power input - UPS is essential
- GPS and Digital echo sounder with standard NMEA string output
- System set up for daily data download of ~200 kb data file
- Suitable location to mount 20 cm logger box
- Logger is believed to work up to 10 years



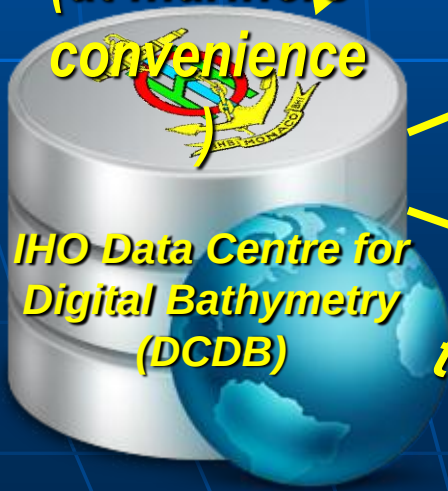
Crowd-sourced data collection

observers send alert to HO *(if appropriate)*

HO produces new or revised chart

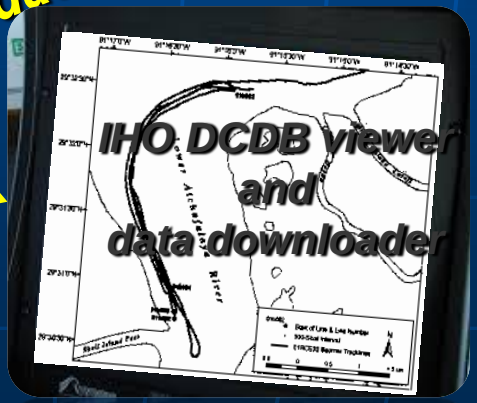
data uploaded (at mariners' convenience

HO's access DCDB for normal chart updating cycle



IHO Data Centre for Digital Bathymetry (DCDB)

Public access to DCDB



- near real-time update
- view all data
- users download and use data "as is"

Bathymetric Mapping Projects

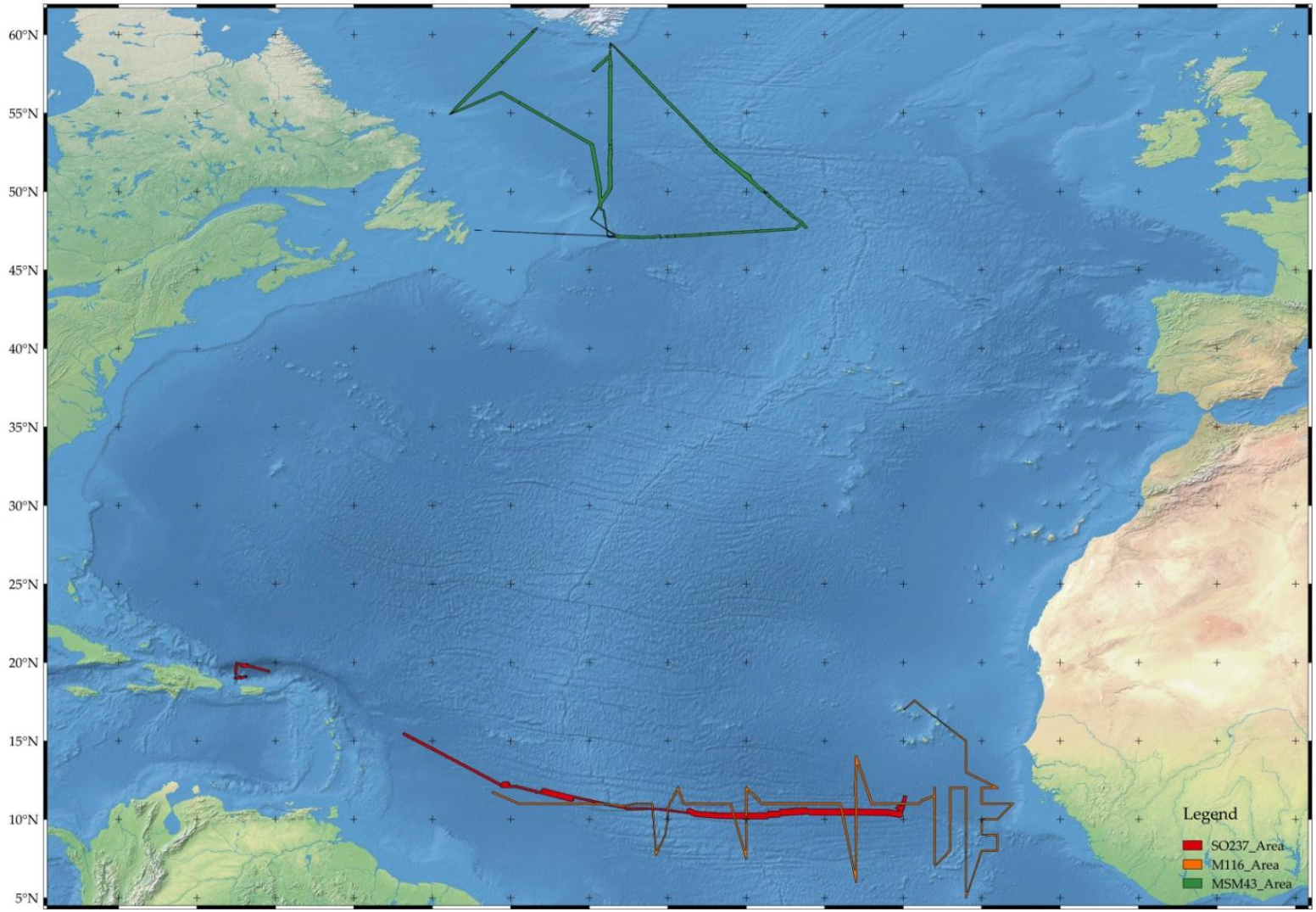
IHO Crowd-sourced Bathymetry Working Group

IHO has initiated a collaborative project to enable qualified mariners and professionally manned vessels to collect “crowd-sourced bathymetry” (CSB).

Pilot Projects: Malaysia, Professional Yachting Association

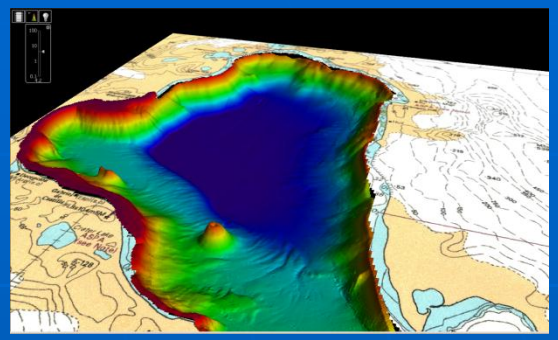
Enhanced IHO DCDB infrastructure and interface will ultimately allow the public to ***upload, search for, display and download*** bathymetric data via a web-based interface.

North Atlantic Seabed Mapping Project



- Transects collected January to February 2015
- Transects during physical oceanography cruise April 2015
- Transects during a physical oceanography cruise May 2015

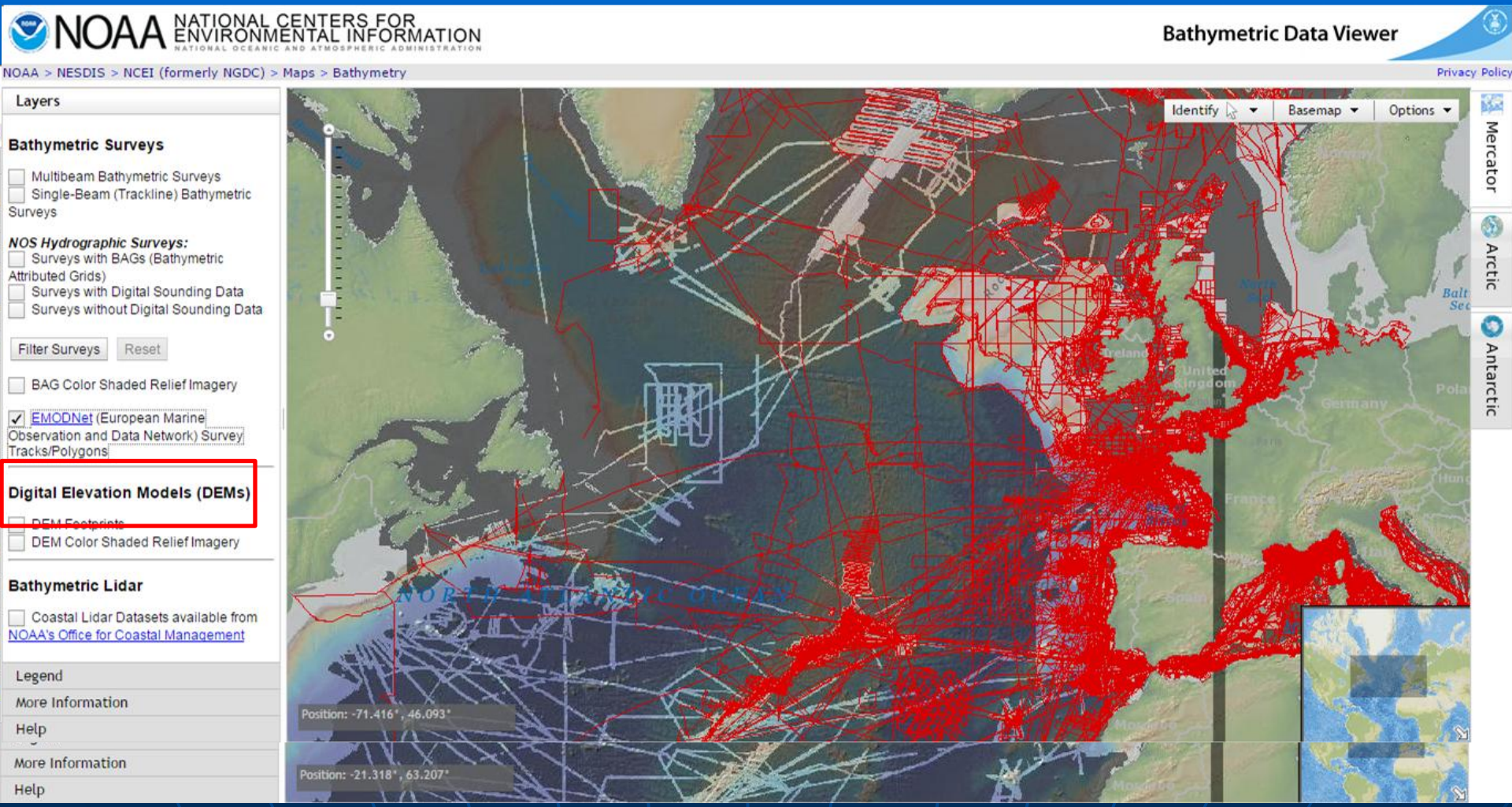
Next steps :



- Gather more data
- Refine upload and download portals on DCDB
- Develop IHO guidelines to assess CSB data quality for use in charts
- Collect more data sets and explore methods for quantifying uncertainty values
- Engage with commercial organizations already established (Olex, TeamSurv, etc.)

Bathymetric Mapping Projects

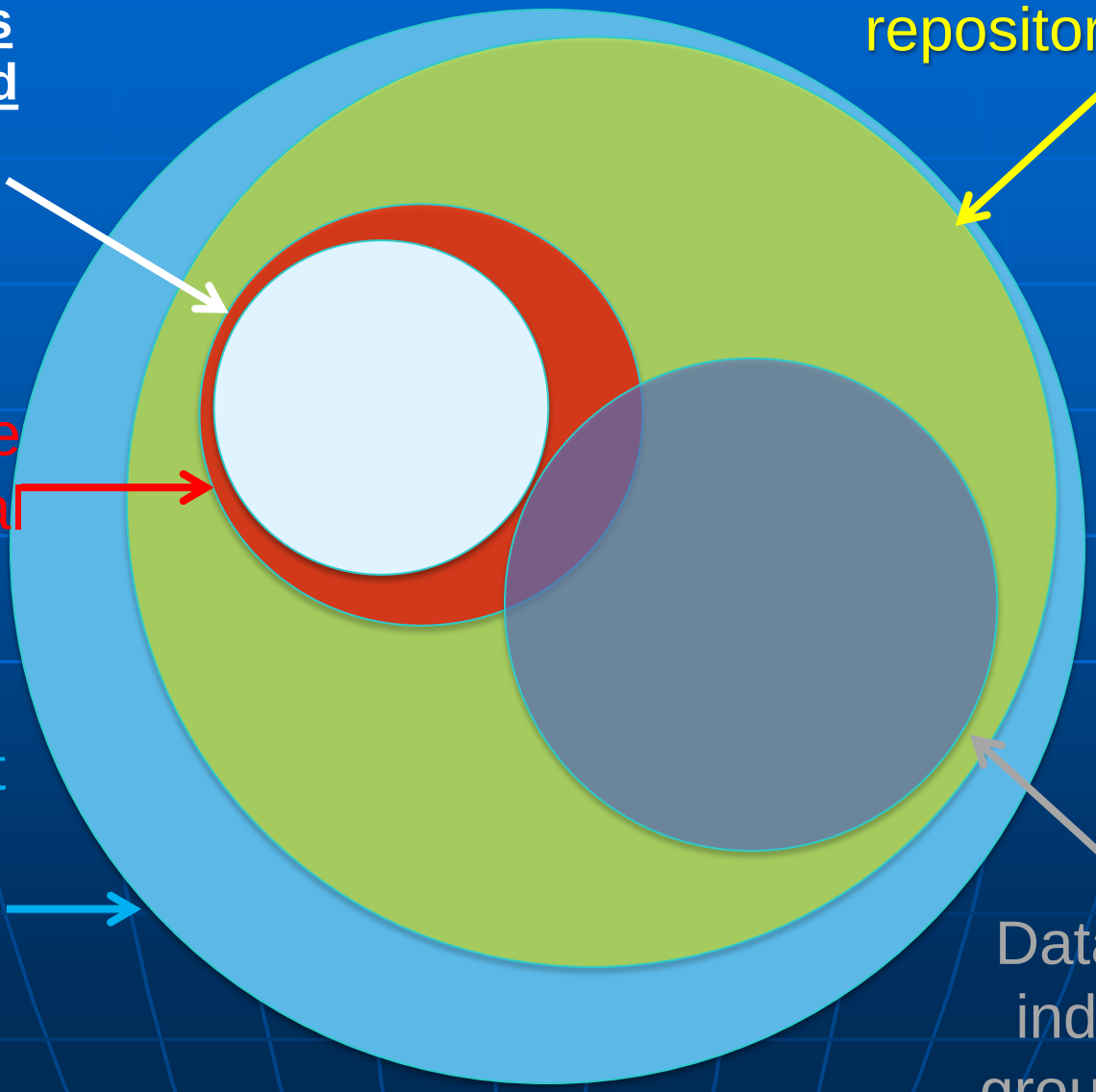
North Atlantic Seabed Mapping Working Group: North Atlantic Data Portal



Global Multi-Resolution Topography (GMRT)
http://www.marine-geo.org/portals/gmrt/

EMODnet Bathymetry portal
http://www.emodnet-bathymetry.eu/

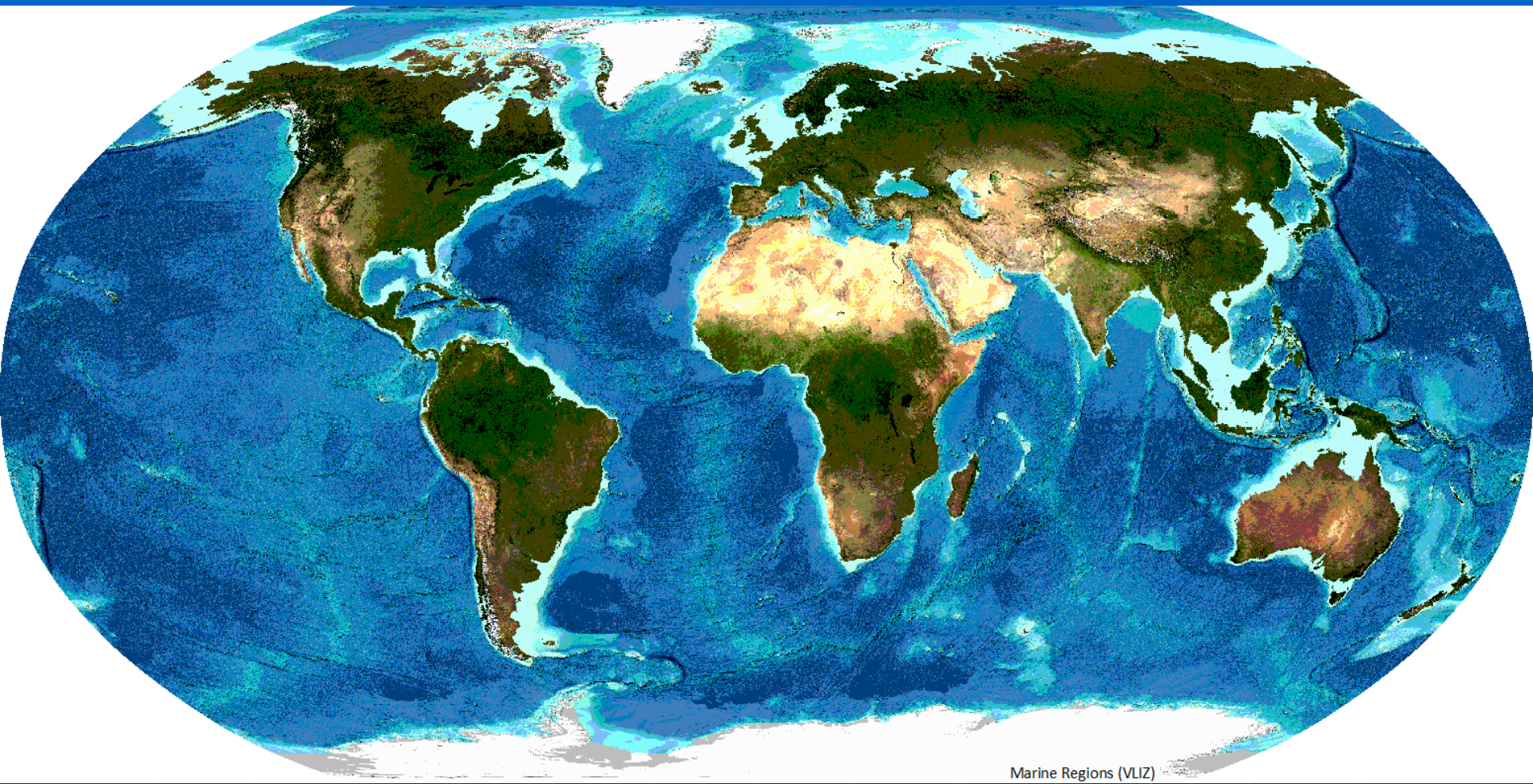
How things look now



More data, better data, accessible data; a recurring challenge, which the GEBCO Project started to address in 1903

HSH Prince Albert I

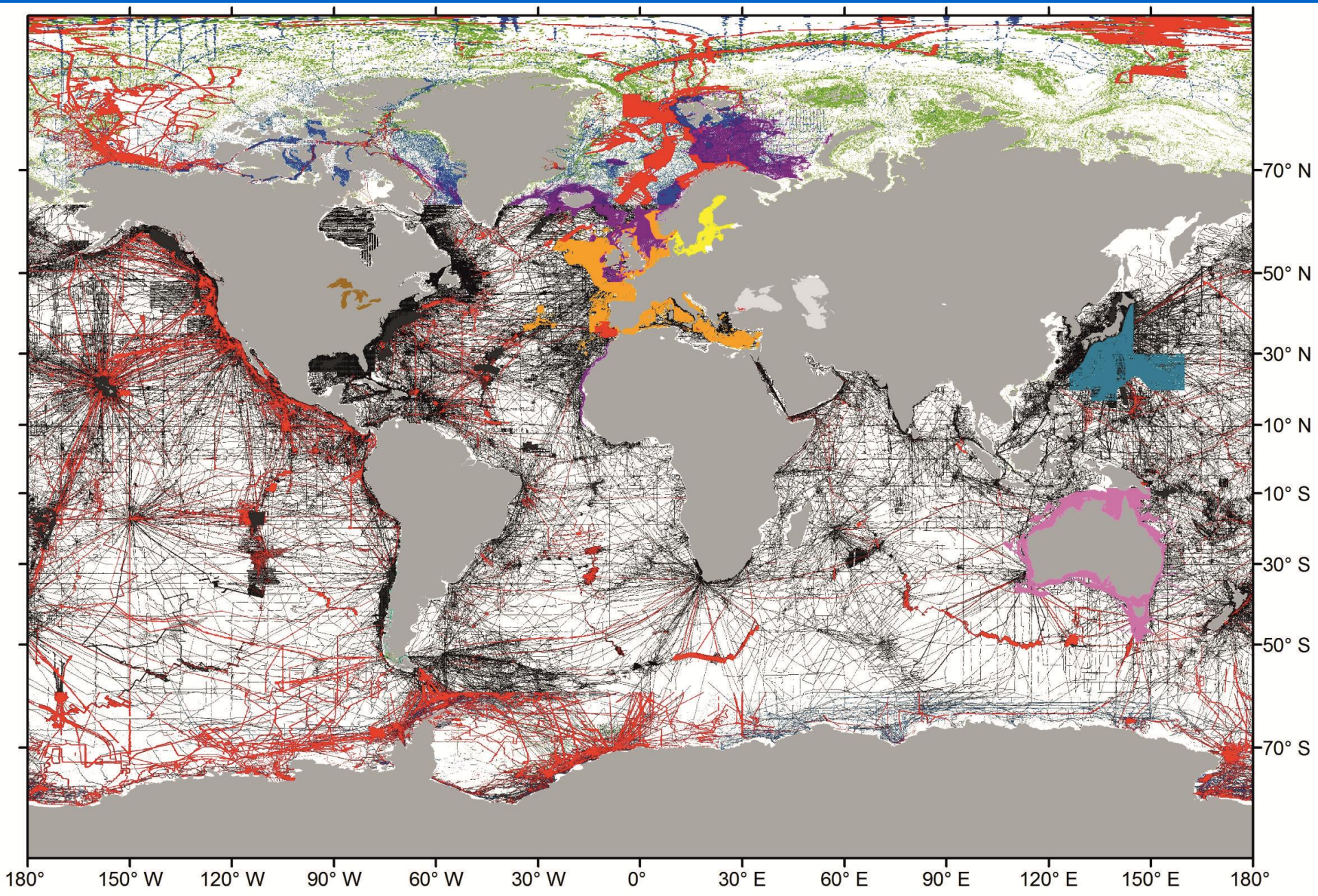
Where we are:



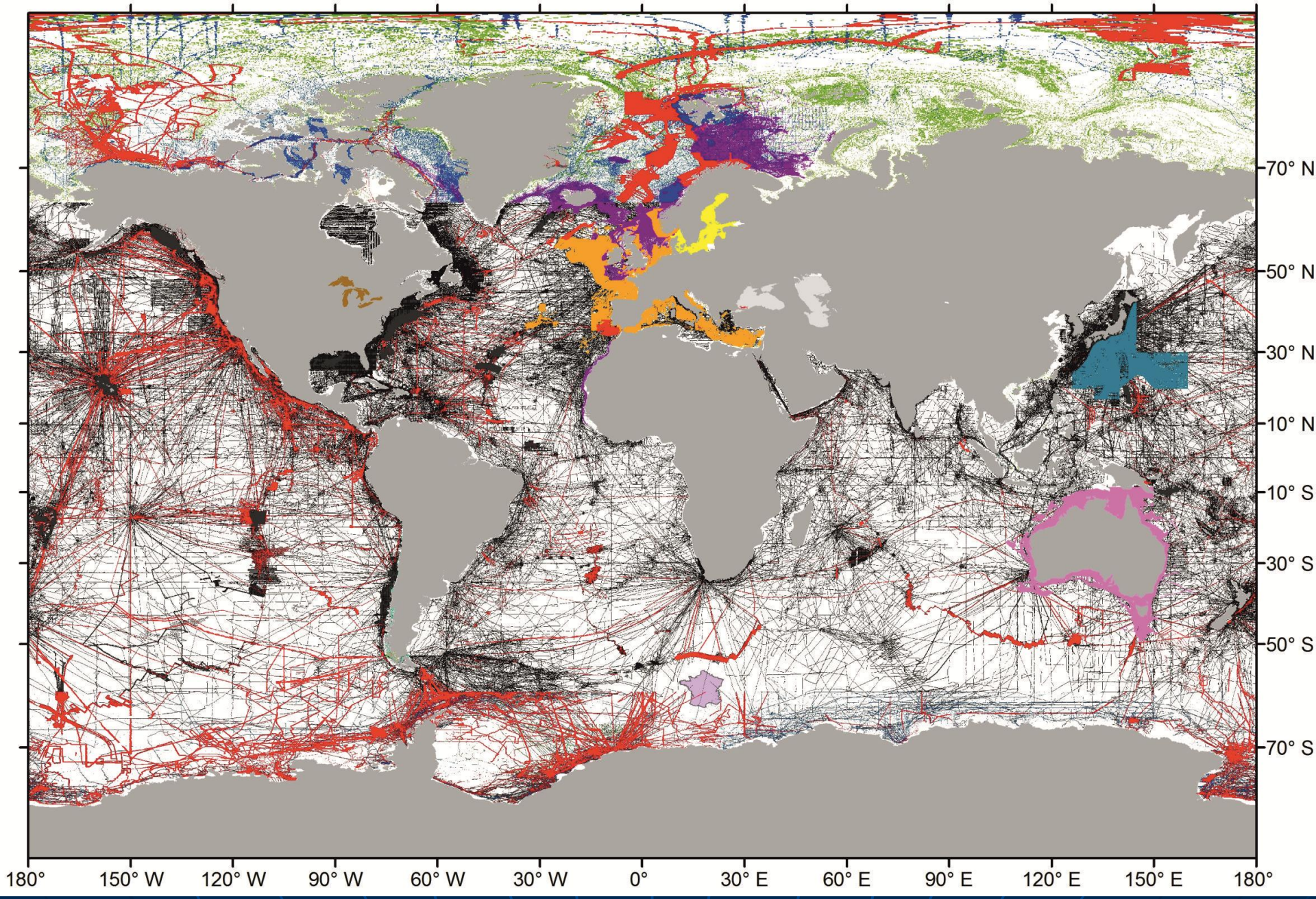
Critical questions:

- What data exists?
  - EMODNet
  - NOAA/NGA/UKHO
  - National data stores, including ‘classified’ data
  - etc.
  - “Hidden” (data not online)
- Is it publically accessible?
- What formats and with what metadata?
- How to make data freely downloadable with necessary metadata?

Known data available via IHO Data Center for Digital Bathymetry



How little data is some areas



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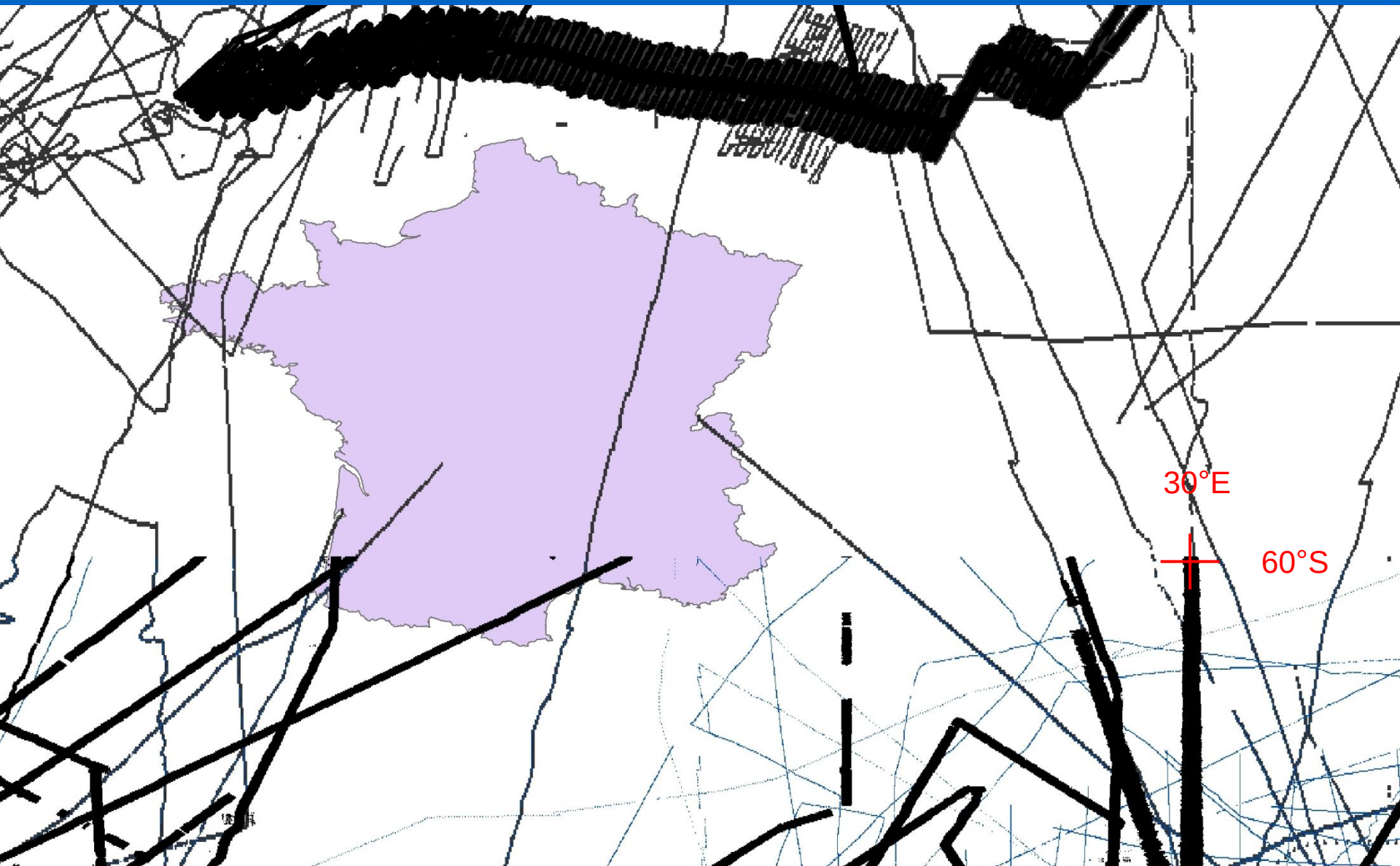


How IHO would like things to look

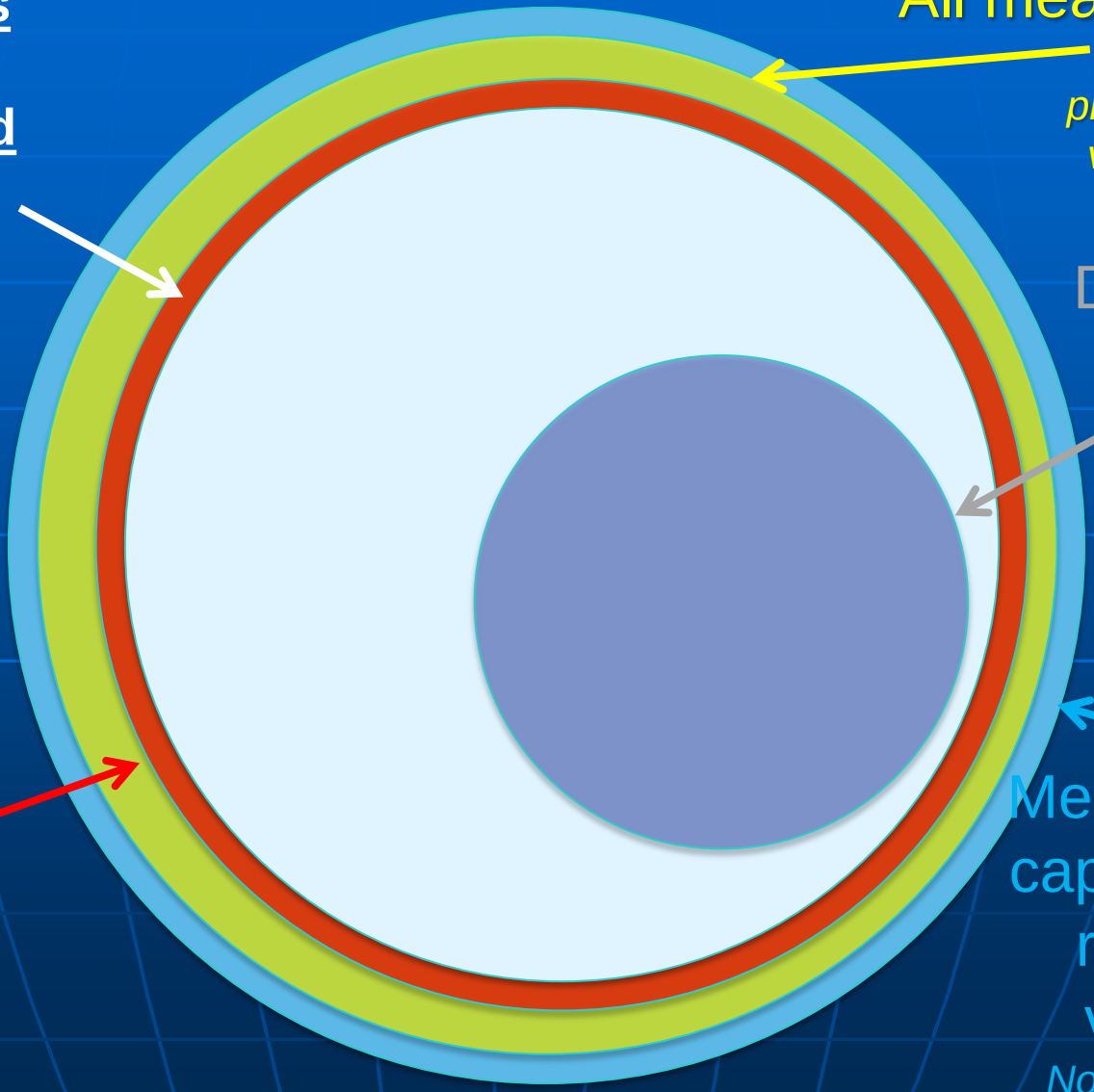
Seafloor maps of most data accessible and visible online

All measured data:
Now a larger proportion of total vessel capacity

Data kept by individuals/ groups locally:
Now accessible

Data accessible through national repositories:
Now larger volume and larger proportion of all measured data

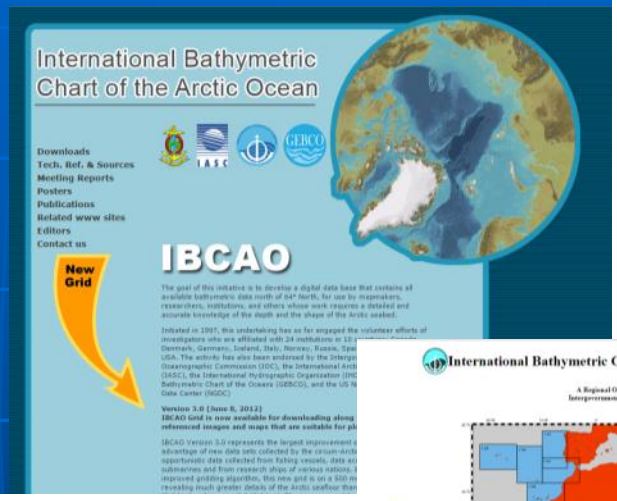
Measurement capacity of all research vessels:
Now being more effectively

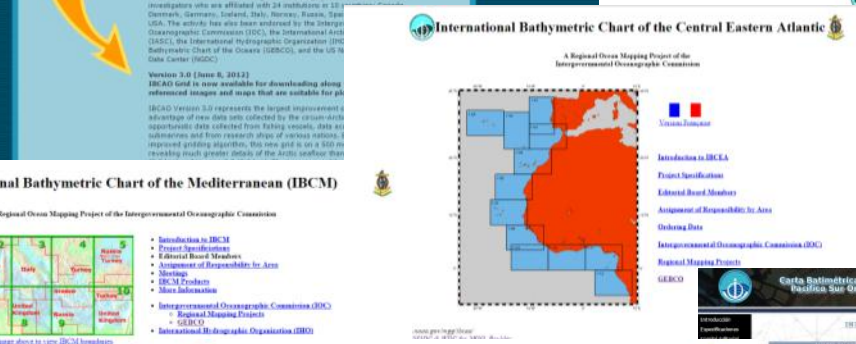


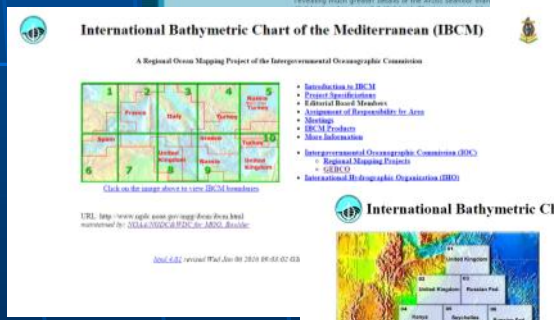
Bathymetric Mapping Projects

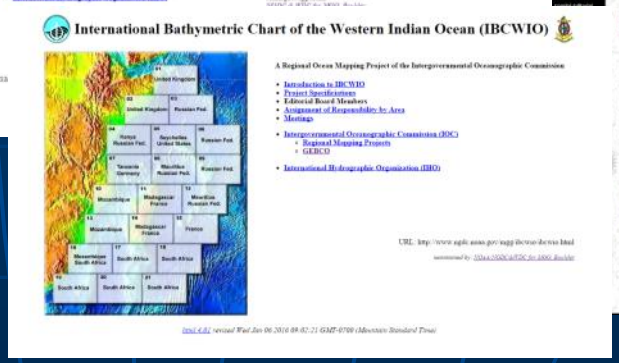
GEBCO Grids

Data are used for a variety of products, including the GEBCO and regional ocean mapping programmes, such as the International Bathymetric Chart (IBC) Series.

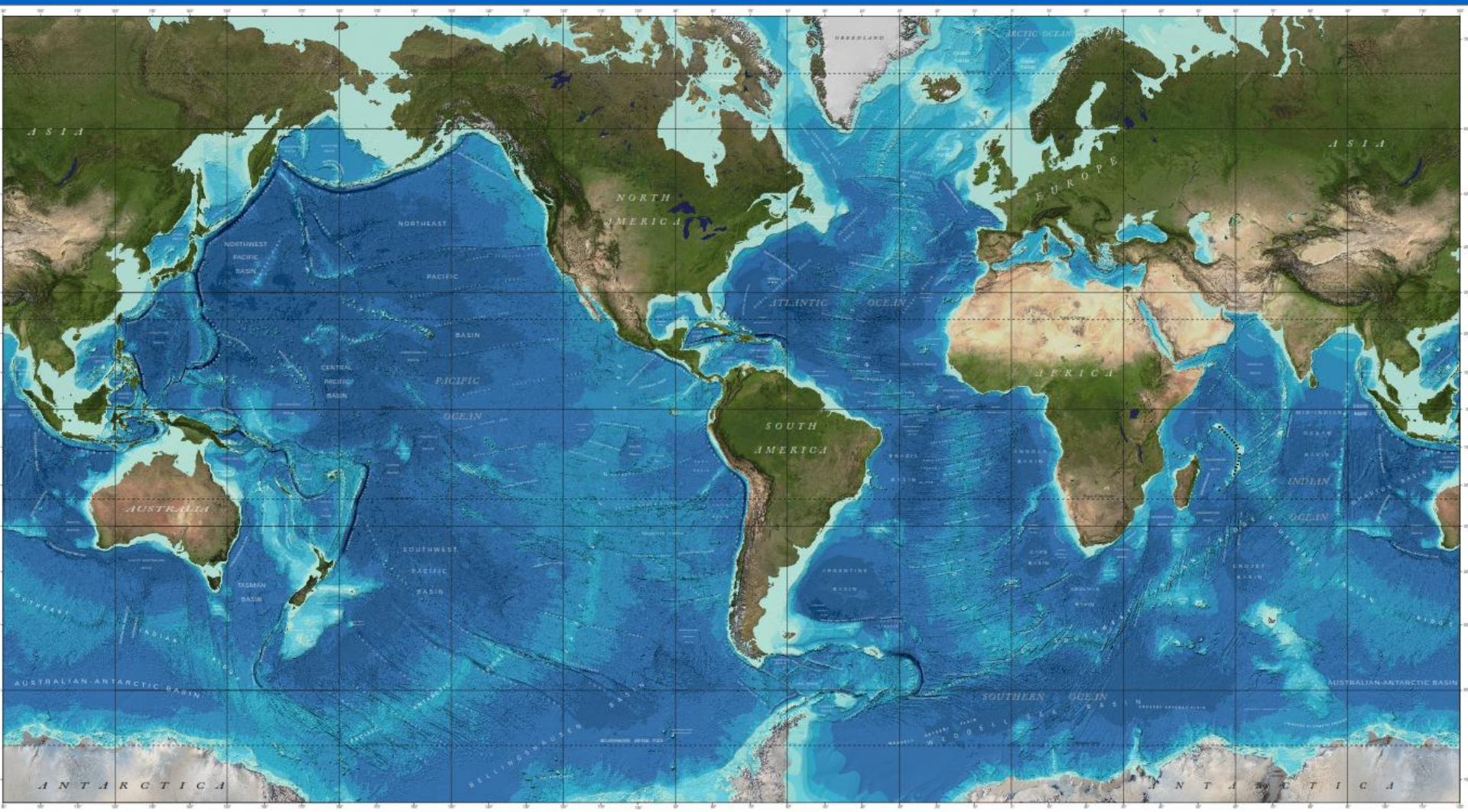








Where we need to be



Data Submission:

The IHO DCDB can accept data via File Transfer Protocol (FTP), e-mail, CD and DVD as well as other mutually agreed upon digital media. Data are preferably in the MGD77 exchange formats, but any well documented format is acceptable.

Mailing Address:

Director IHO DCDB
NOAA/NGDC
E/GC3 325 Broadway
Boulder, CO USA 80305-3328

Take Home Messages

- Collect bathymetric data wherever and whenever possible;
- Release data held in archives, at lower resolution if necessary;
- Not all data appropriate for charting but all data of use to somebody in someway, even if only to confirm not the place to start work.

Thank You

Questions?