



# Crowd-Sourced Bathymetry



# UN Articles and Resolutions

- *SOLAS Chapter V, Regulations 2 and 9*
- *UNCLOS Annex II, Article 3, Paragraph 2*
- *UN General Assembly Resolution A.53/32 (1999) “The year of the Oceans”*
- *UNCLOS Article 75: Charts and lists of geographical coordinates*
- *UN GA Resolution A/55/7 (2001)*
- *UN GA Resolution A/56/12 (2001)*
- *UN GA Resolution A/58/240 (2004)*



# *The Provision of Hydrographic Services*

- ... is an International Obligation under Treaty Law
- ... affecting ALL SOLAS contracting governments.



# ***Governmental Obligations***

SOLAS V/9 – Requires each State to ensure:

- the provision of Maritime Safety Information (MSI)
- surveying and data collection
- the production of charts and nautical publications
- chart maintenance and updating services



# Survey and charting status 2014

(source: IHO C-55)

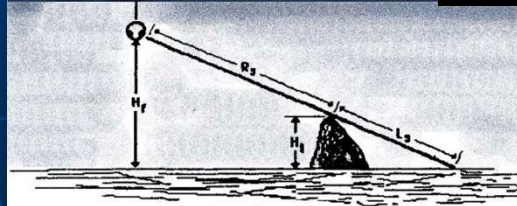
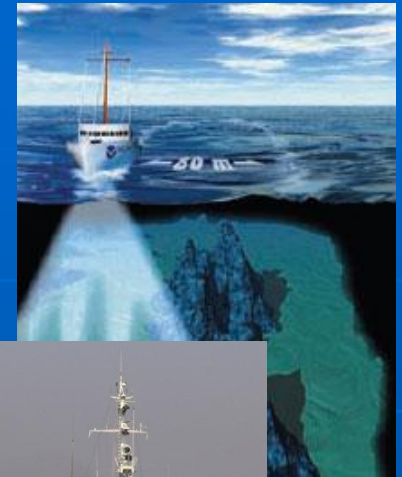
## Unsurveyed or requires better data (0-200m deep)

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



# Global surveying capacity

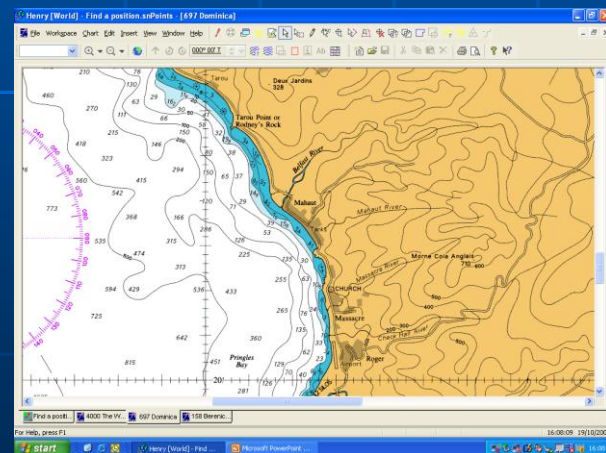
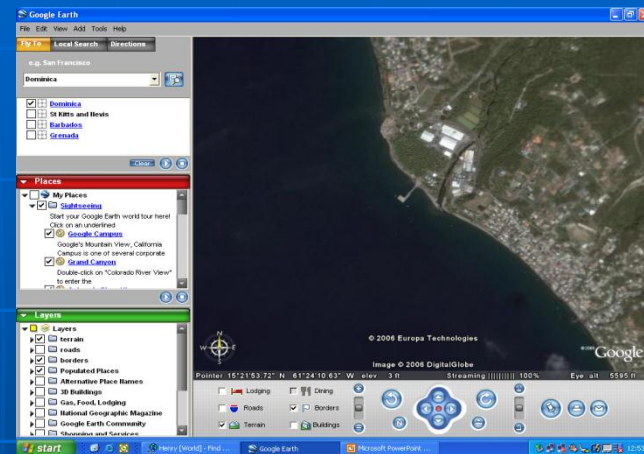
- 35% reduction in government fleet in 25 years



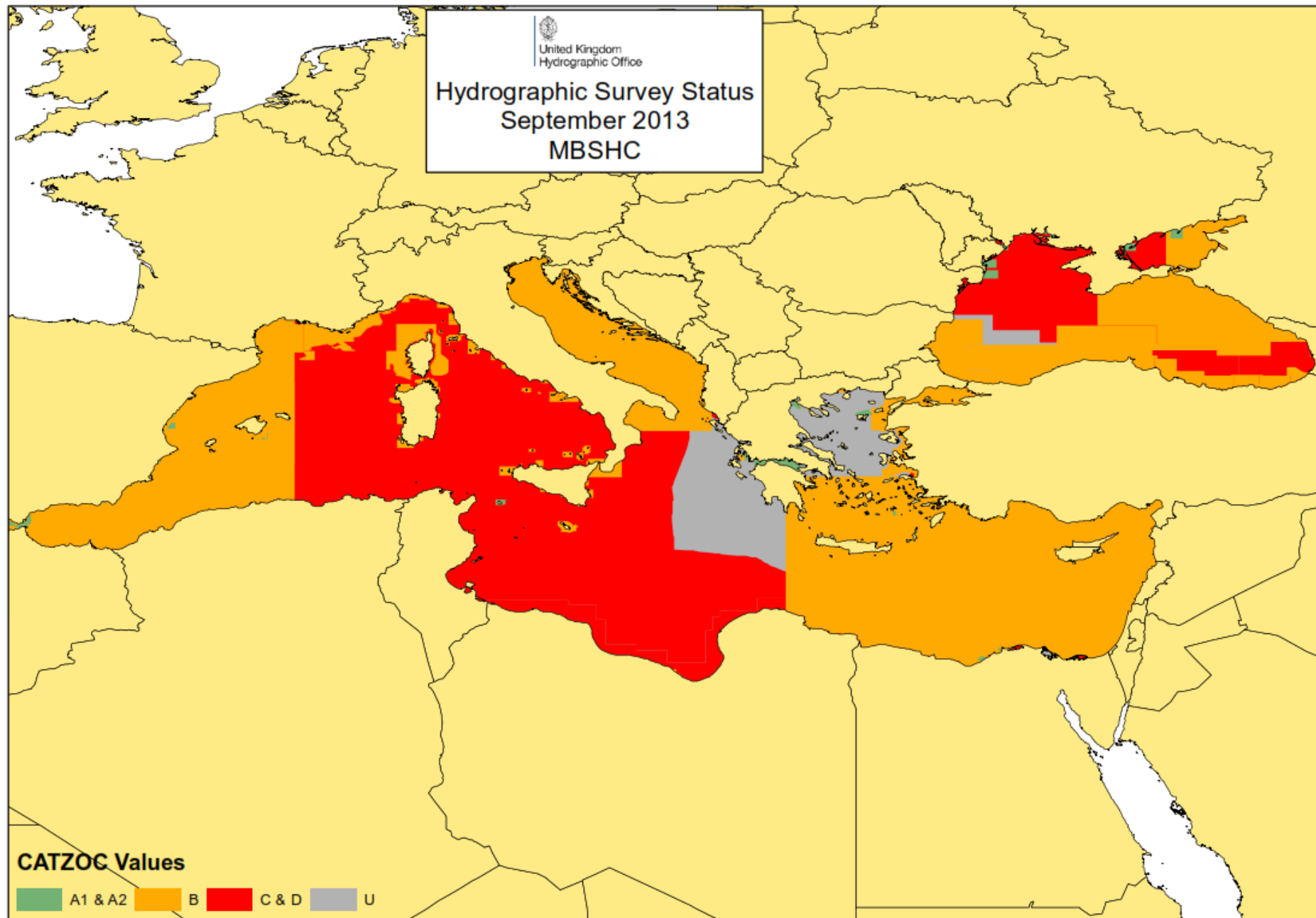


# What is commonly found?

- New jetties and port installations, utilised by high risk vessels (LNG carriers; large passenger vessels), where surveys have not been conducted and information has not been passed to HOs for charting.

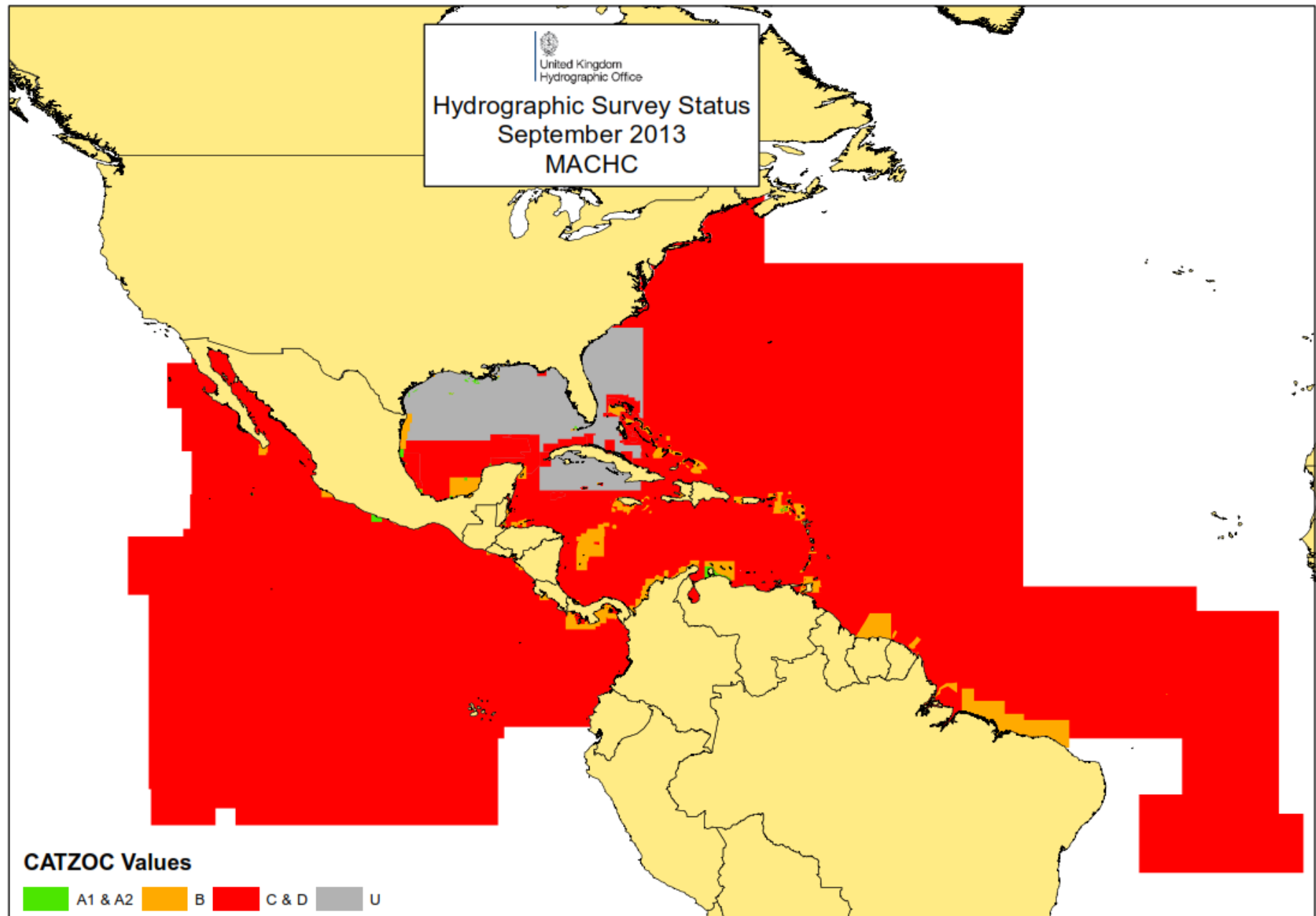


# Data Coverage in Mediterranean Sea



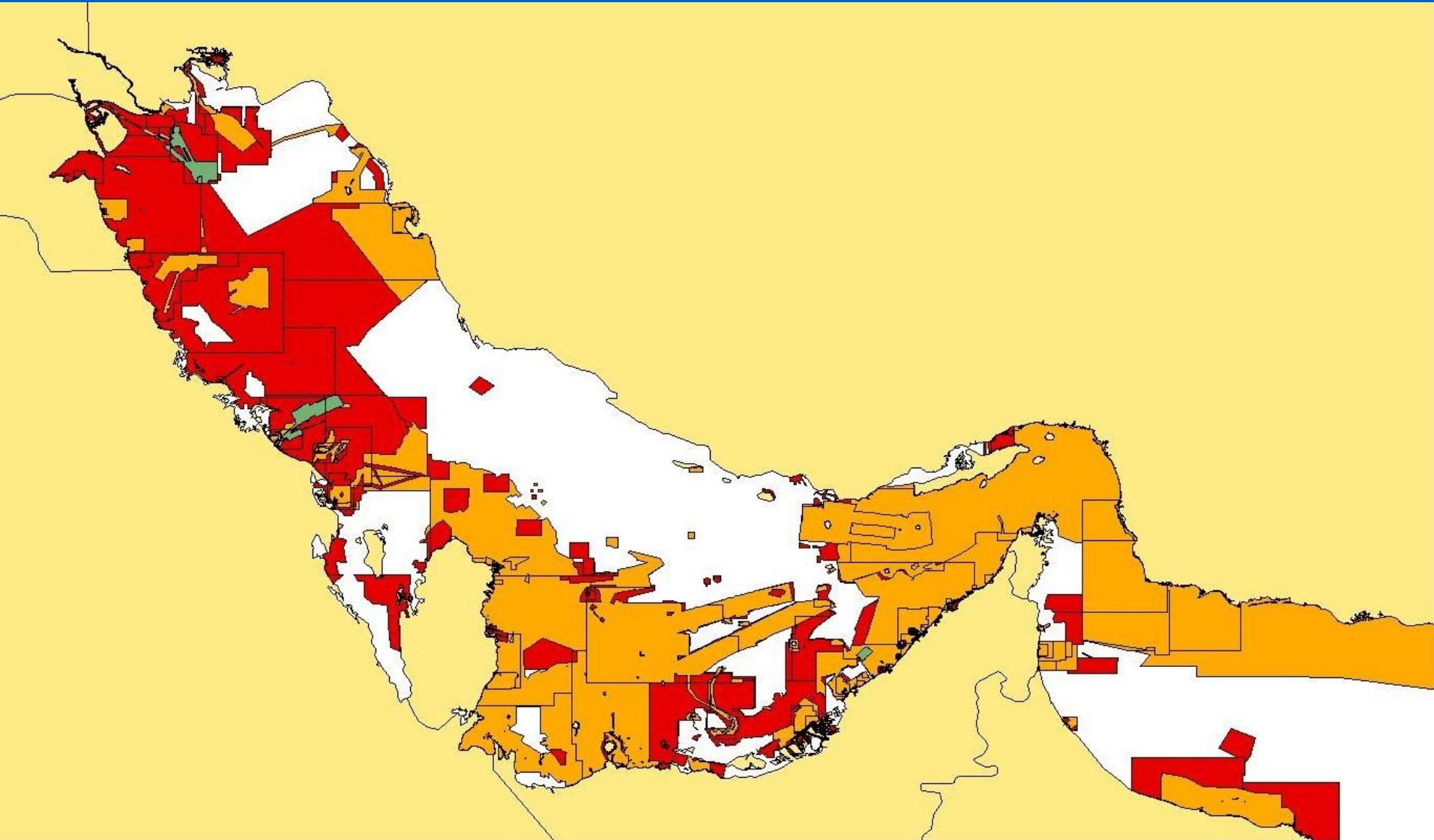


# Data Coverage in Caribbean Sea

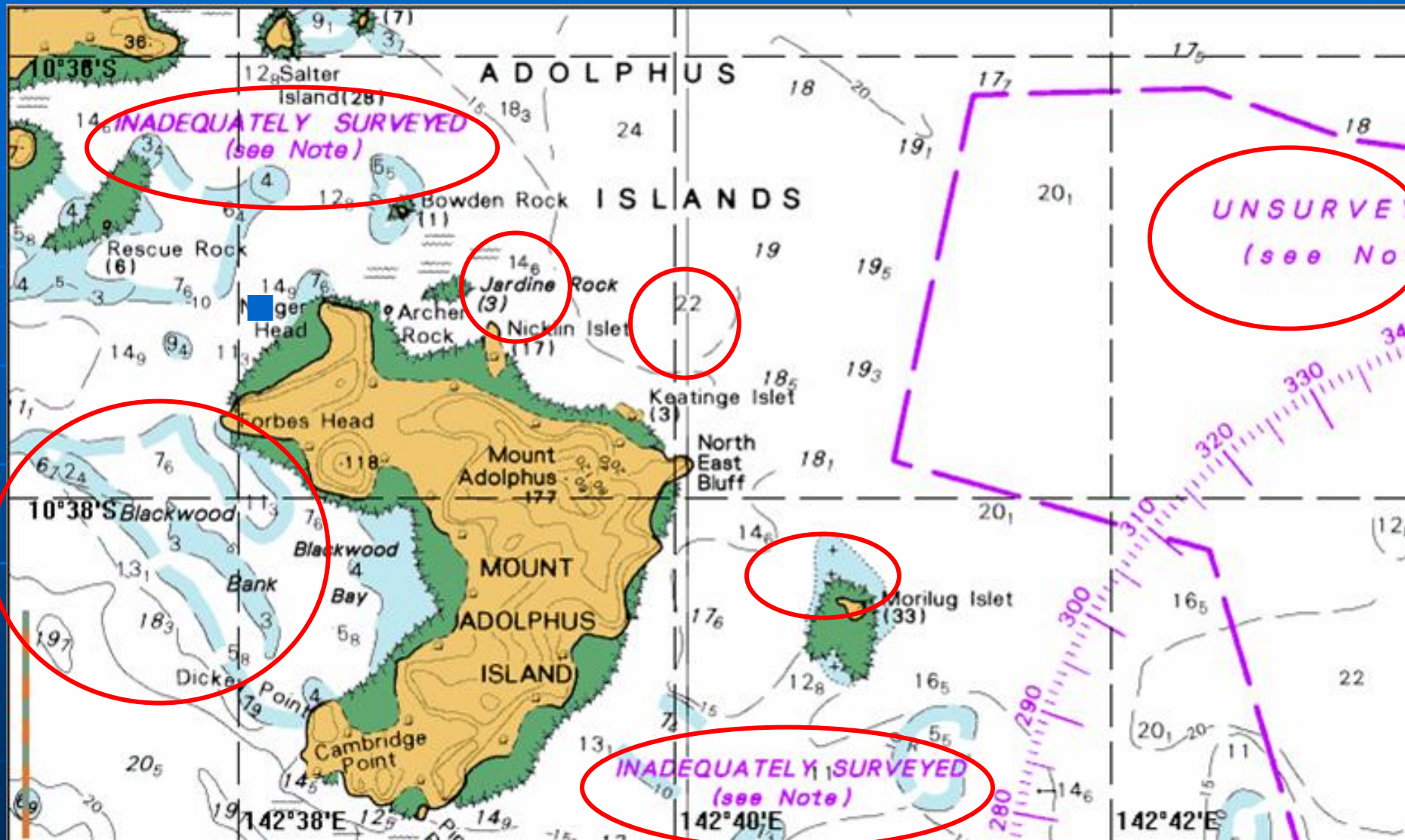


# Data Coverage\* in the Gulf

\*AVCS catzoc assessment September 2013



# Status of surveying worldwide





# Crowd-Sourced Bathymetry (CSB)

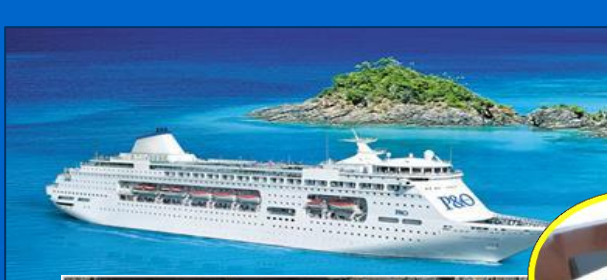
- Low cost – high impact
- Non commercial
  - community based
- IHO/PYA proof of concept initiative
- Already happening!
- Mariners' self-help programme
- Logger in every professionally crewed ship



# Installed Data Logger





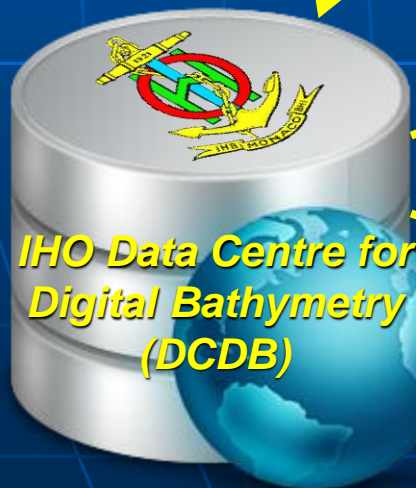


**Crowd-sourced data collection**



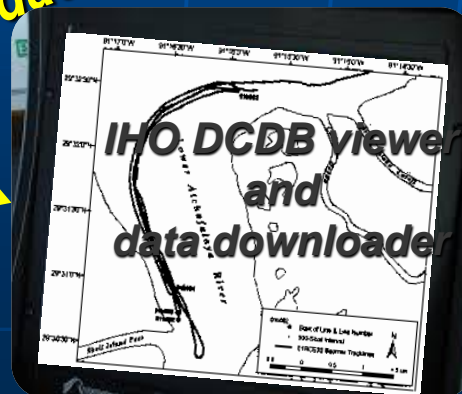
**observers send alert to HO  
(if appropriate)**

**data uploaded  
(at mariners' convenience)**



**HO's access DCDB  
for normal chart  
updating cycle**

**Public  
access  
to DCDB**



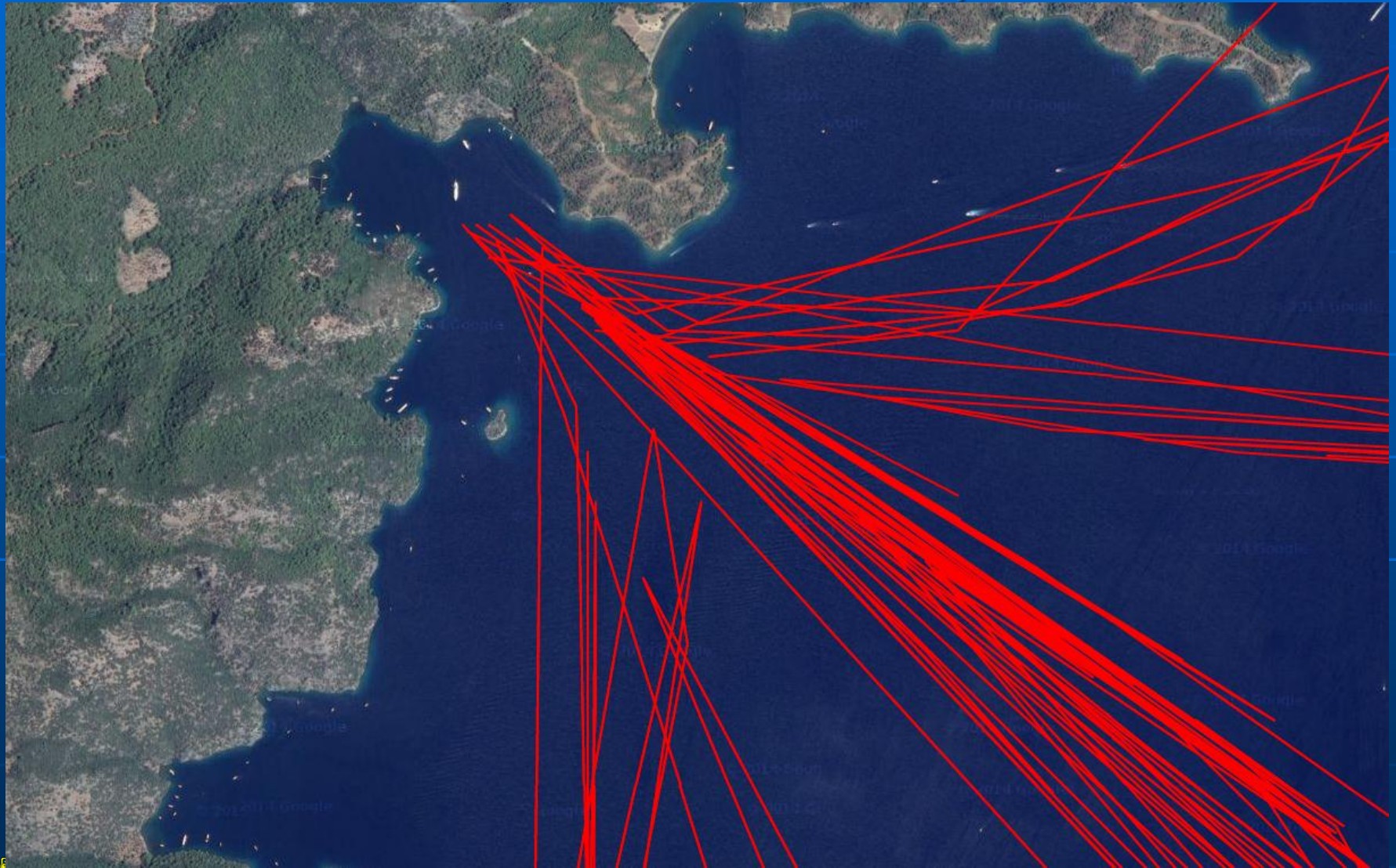
**HO produces  
new or revised  
chart**

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



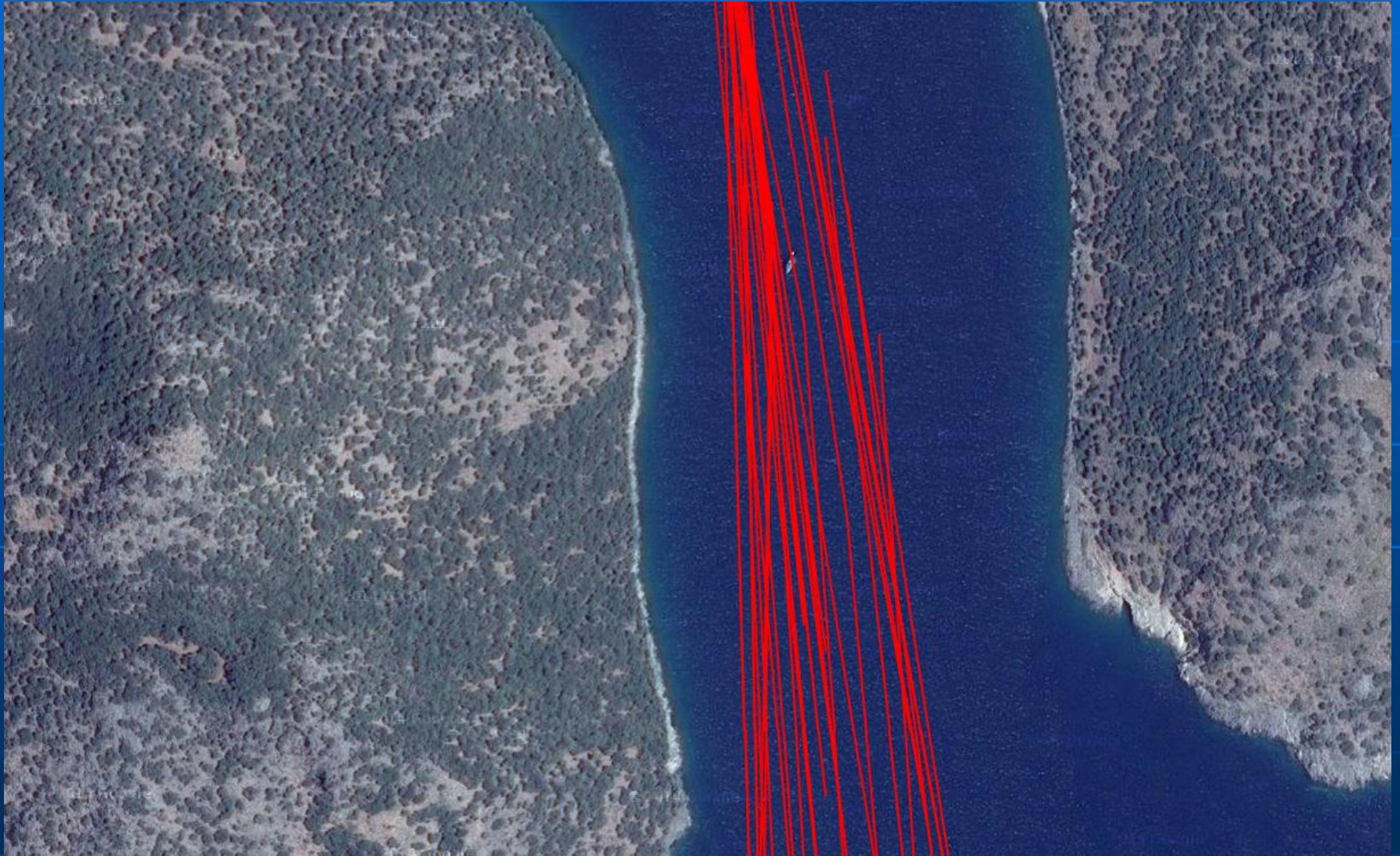


# Sample data set - Tomb Bay, Gocek, Turkey (36°41.65'N 28°52.23'E)

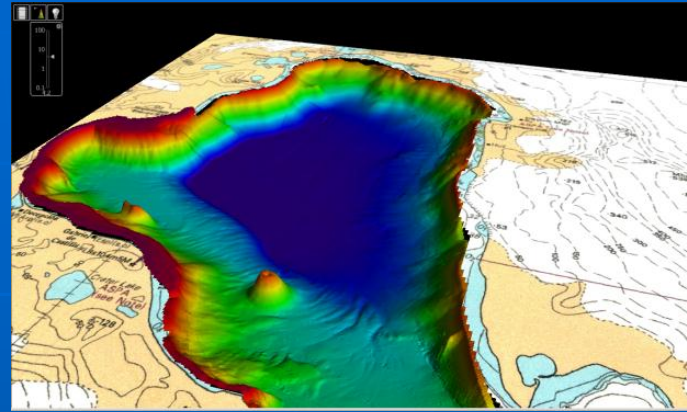




# Sample data set - Chanel between Domuz Island and Tersane Island, Gocek Turkey. (36°39.36'N 28°52.23'E)



# Concept now proven



## Next steps :

- Develop upload and download portals on DCDB
- Develop IHO guidelines to assess CSB data quality for use in charts
- Collect more sample data sets and explore methods for quantifying uncertainty values





# 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:

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Boulder, CO USA 80305-3328





# Thank You

