

## Workshop on Crowdsourced Bathymetry (CSB)



Þ



## Dr Mathias Jonas IHO



## Jennifer Jencks NOAA



## Workshop on Crowdsourced Bathymetry (CSB)

Jennifer Jencks Chair, IHO CSB Working Group



jennifer.jencks@noaa.g

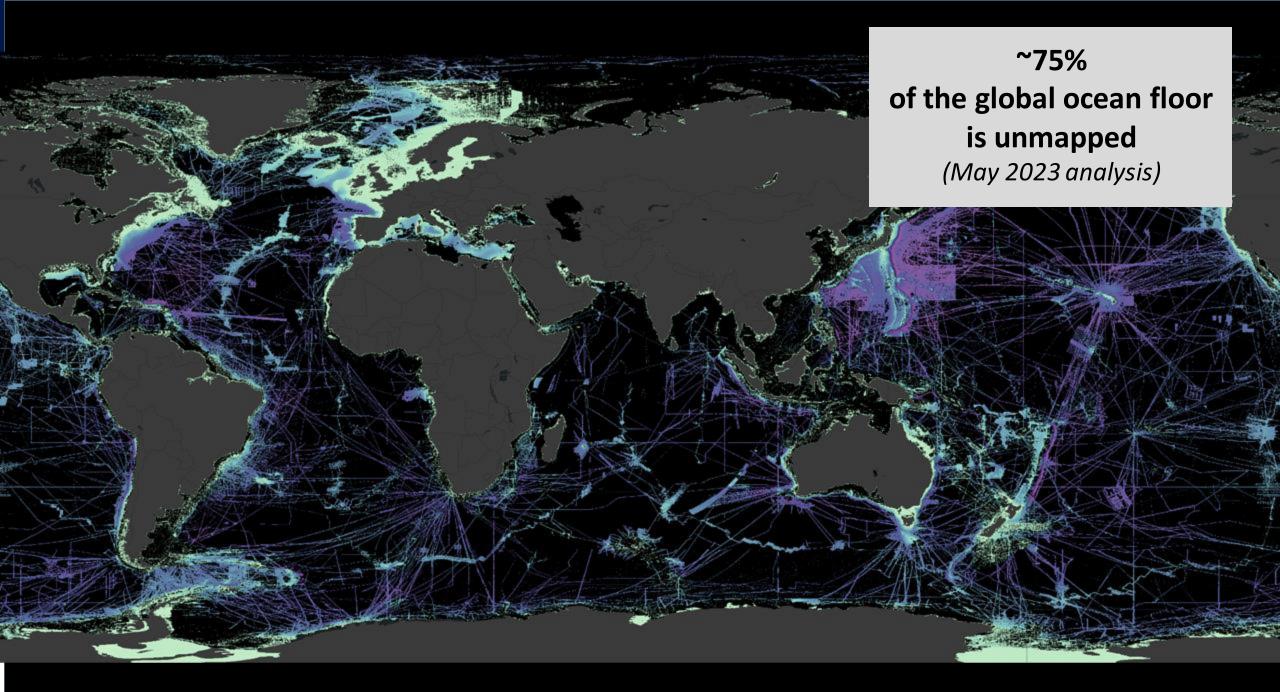
International Hydrographic Organization

26 April

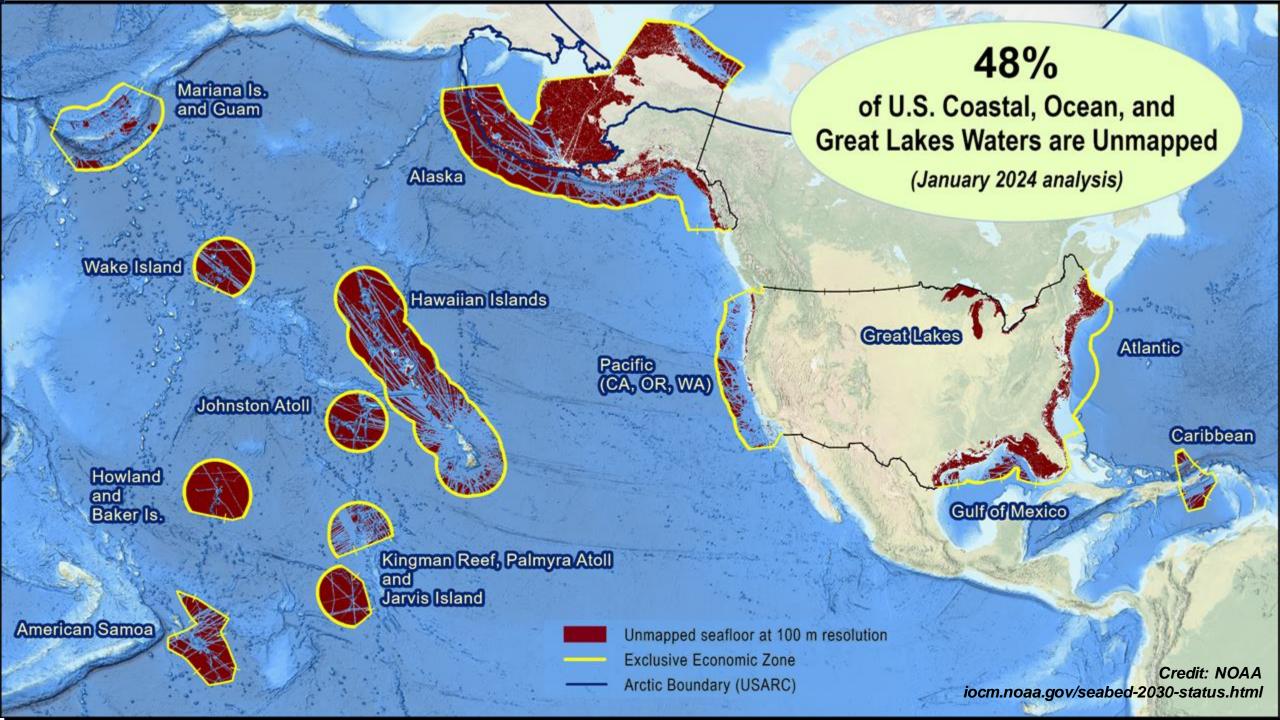


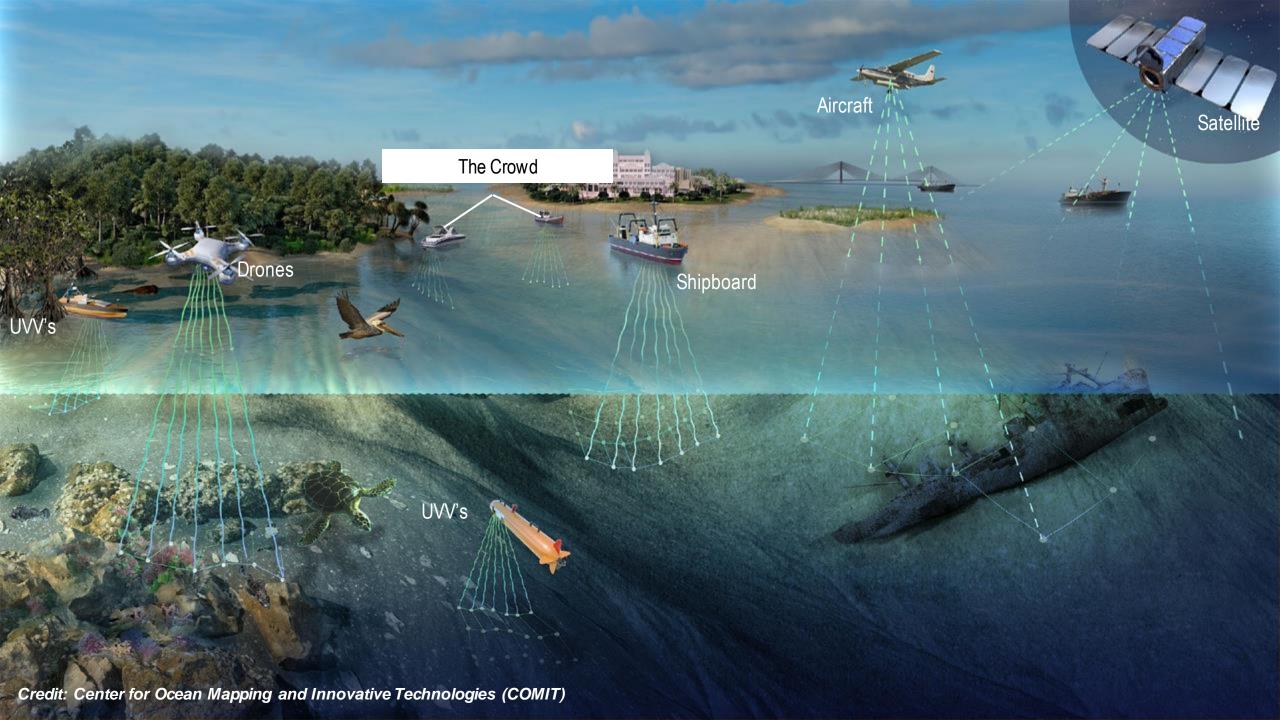
# *To facilitate an informed discussion and to provide advice at and within the IHO IRCC.*





Credit: Vicki Ferrini, LDEO







# Google: How many boats are on the water?

- ...roughly speaking, there are around <u>100,000</u> <u>vessels globally</u> which includes <u>bulk carriers</u>, tankers, container ships, and other types of cargo and passenger vessels (<u>these do not include</u> smaller specialty vessels, fishing vessels, yachts and other recreational boats, and military fleets).
- 2. AIS signals from some <u>180,000 vessels</u> are monitored daily
- 3. In 2022, there were about <u>11.77 million registered</u> <u>vessels</u> in the United States
- https://community.magicport.ai/t/how-many-ships-are-there-in-theworld/727#:~:text=But%20roughly%20speaking%2C%20the%20are,boats%2C%20and% 20military%20fleets).
- https://gijn.org/tracking-ships-at-sea/

1.

2.

In 2014, the IHO initiated a collaborative project to encourage mariners to collect and contribute "crowdsourced bathymetry".

Drones

UVV's

The Crowd

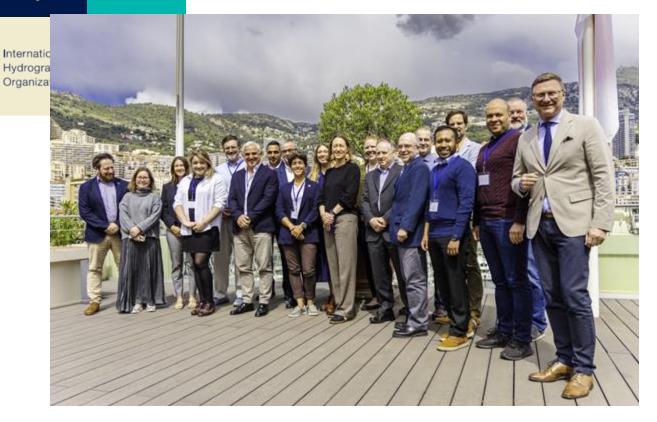
UVV's

Credit: Center for Ocean Mapping and Innovative Technologies (COMIT)

NOAA Chart 16281 "Alaska - South and West Coasts; Anchorages and Harbors" 12th Edition, 1974.

ALASKA PENINSULA

### IHO Crowdsourced Bathymetry Working Group



#### CSBWG15 - Monaco

Crowdsourced bathymetry (CSB) is the collection and sharing of depth measurements from vessels, using standard navigation instruments, while engaged in routine maritime operations.

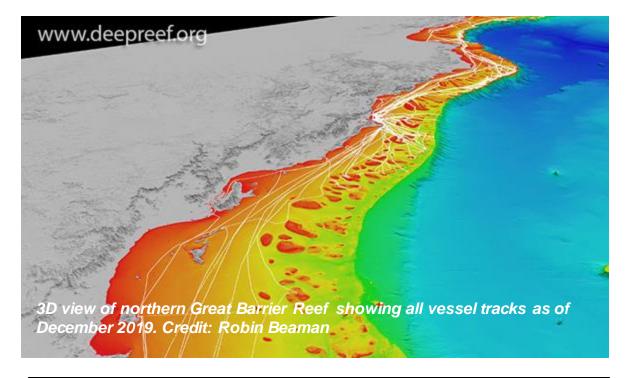


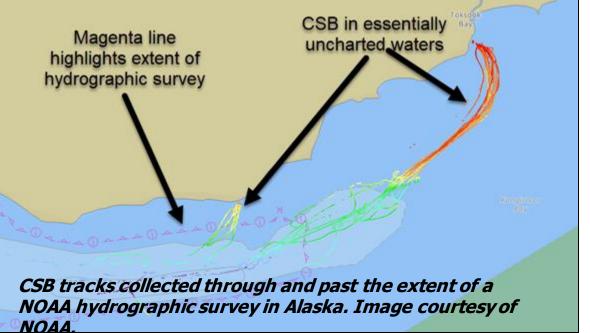


## The Value of CSB Data

International Hydrographic Organization

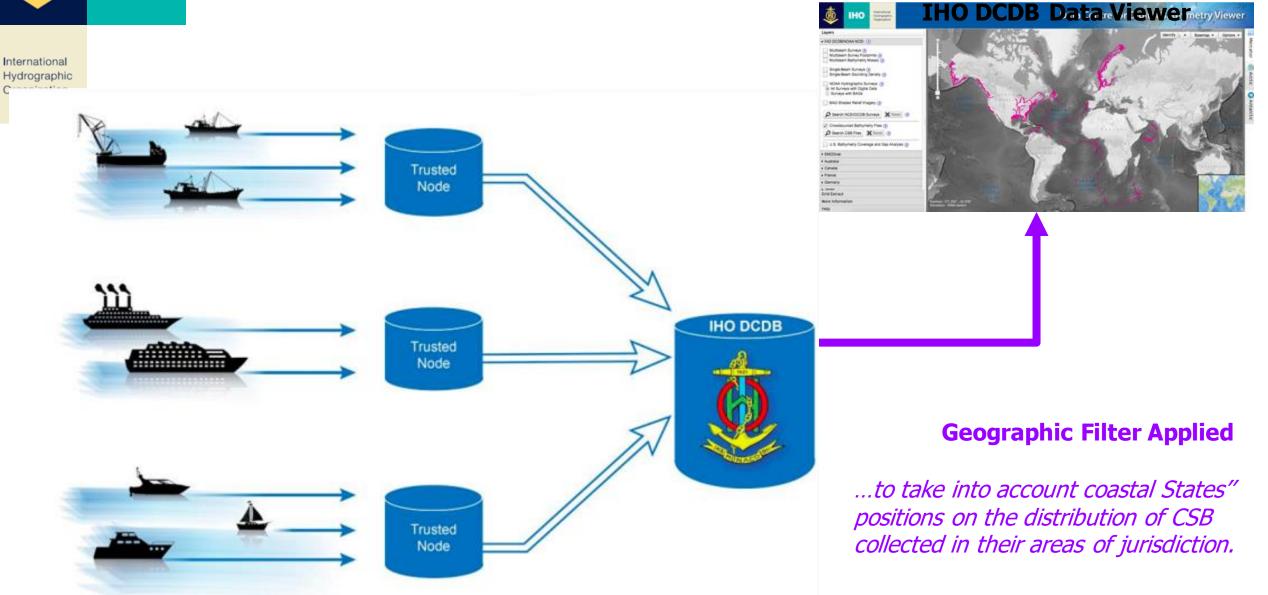
- Data with scientific, commercial & research value at little to no cost to the public sector
- Fill gaps where data is scarce (eg: Large Pacific Ocean States)
- Improving safety of navigation
- Supporting priorisation for Hydrographic Authorities







## IHO CSB Data Flow



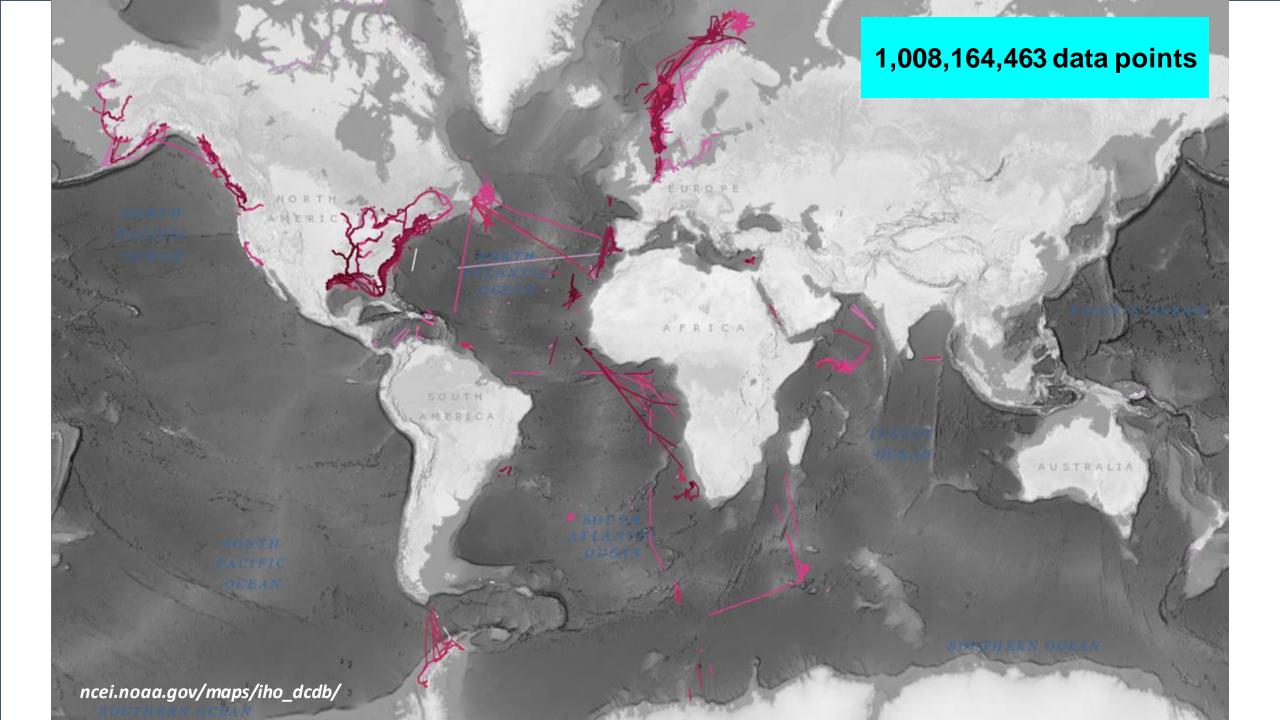


## **IHO** National Policy

International Hydrographic Organization

> Coastal states were requested by the IHO to indicate their position on the public sharing of CSB data collected within waters subject to their national jurisdiction.

To date, 35 coastal states (green) have replied positively to IHO CL 21/2020 & IRCC CL 1/2020



"If we got 1% of all seagoing vessels logging data, and on average they spent half their time at sea, then that's about <u>5</u> billion data points a day.

- Tim Thornton, TeamSurv

NAME AND ADDRESS

jennifer.jencks@noaa.gov

iho.int/en/crowdsourced-bathymetry



IHO

### Why we have invited you all here today

International Hydrographic Organization

- To learn more about CSB
- Explore common misconceptions
- Articulate the potential of CSB
- Invite feedback and understanding of the requirements of HOs

	SESSION 1	
1320-1335	How CSB is supporting the UN Decade, GEBCO, & The IHO Strategic Plan	Belen Jimenez Baron
1335-1340	Q&A	All
1340-1355	Legal Considerations & Misconceptions	Steve Keating
1355-1400	Q&A	All
1400-1415	BREAK	
	SESSION 2	
1415-1430	Utility of CSB (The NOAA Example)	Anthony Klemm
1430-1435	Q&A	All
1435-1450	Implementation of CSB in waters of national jurisdiction: the FRANCE case.	Laurent Kerléguer
1450-1455	Q&A	All
1455-1510	CSB and the world of Yachting: the experience of the Yacht Club de Monaco (YCM)	YCM (speaker TBD)
1510-1515	Q&A	All
1515-1530	FINAL WRAP-UP AND DISCUSSION on Developing CSB inside and outside the IHO Community	IHO Secretariat Jennifer Jencks
	END OF WORKSHOP	

After each presentation there will be  $\sim$ 5 minutes for questions, comments and responses for that topic.

At the end of the workshop, there will be an additional opportunity for Q&A.

Questions should be submitted via the chat window.

We acknowledge that not all questions will be answered within this workshop.

We encourage ALL to submit their questions and the speakers will do their best to respond post-workshop via the appropriate mechanisms.



## Session 1



## Belen Jimenez Baron NIWA

## **IRCC Workshop on Crowdsourced Bathymetry**

## How CSB is supporting the UN Decade, GEBCO, & The IHO Strategic Plan

**Belen Jimenez Baron** Vice-chair, IHO CSB Working Group





International Hydrographic Organization Organisation Hydrographique Internationale 26<sup>th</sup> April 2024 Monaco



International Hydrographic Organization

Hydrographic offices are facing significant challenges that shape the context in which the IHO builds the strategy to fulfil its vision:

- Growing needs for hydrographic knowledge, for increasingly diversified customers
- Progress in sensors, carriers and IT technology
- Data revolution, transforming the hydrographic ecosystem of gathering, processing and provision
- Increasing environmental, societal and economic attention to the Ocean

IHO Strategic Plan

INTERNATIONAL HYDROGRAPHIC ORGANIZATION

Strategic Plan 2021-2026

#### Vision

The vision of the IHO is to be the authoritative worldwide hydrographic body which actively engages all coastal and interested States to advance maritime safety and efficiency and which supports the protection and sustainable use of the marine environment.

#### Mission

The mission of the IHO is to create a global environment in which States provide adequate, standardized and timely hydrographic data, products and services and ensure their widest possible use.

#### Object

shells

The Organization has a consultative and technical nature. It is the object of the Organization:

- To promote the use of hydrography for the safety of navigation and all other marine purposes and to raise global awareness of the importance of hydrography;
- To improve global coverage, availability and quality of hydrographic data, information, products and services and to facilitate access to such data, information, products and services;
- c. To improve global hydrographic capability, capacity, training, science and techniques;
- To establish and enhance the development of international standards for hydrographic data, information, products, services and techniques and to achieve the greatest possible uniformity in the use of these standards;
- e. To give authoritative and timely guidance on all hydrographic matters to States and international organizations;
- f. To facilitate coordination of hydrographic activities among the Member States; and
- g. To enhance cooperation on hydrographic activities among States on a regional basis.



## **IHO Strategic Plan**

International Hydrographic Organization

GOAL 1	Evolving the hydrographic support for safety and efficiency of maritime navigation, undergoing profound transformation
GOAL 2	Increasing the use of hydrographic data for the benefit of society
GOAL 3	Participating actively in international initiatives related to the knowledge and the sustainable use of the Ocean

IHO Strategic Plan - Summary



## 2024 OCEAN DECADE CONFERENCE BARCELONA STATEMENT

### 12 April 2024

Barcelona, Spain

the UN Ocean Decade Challenges

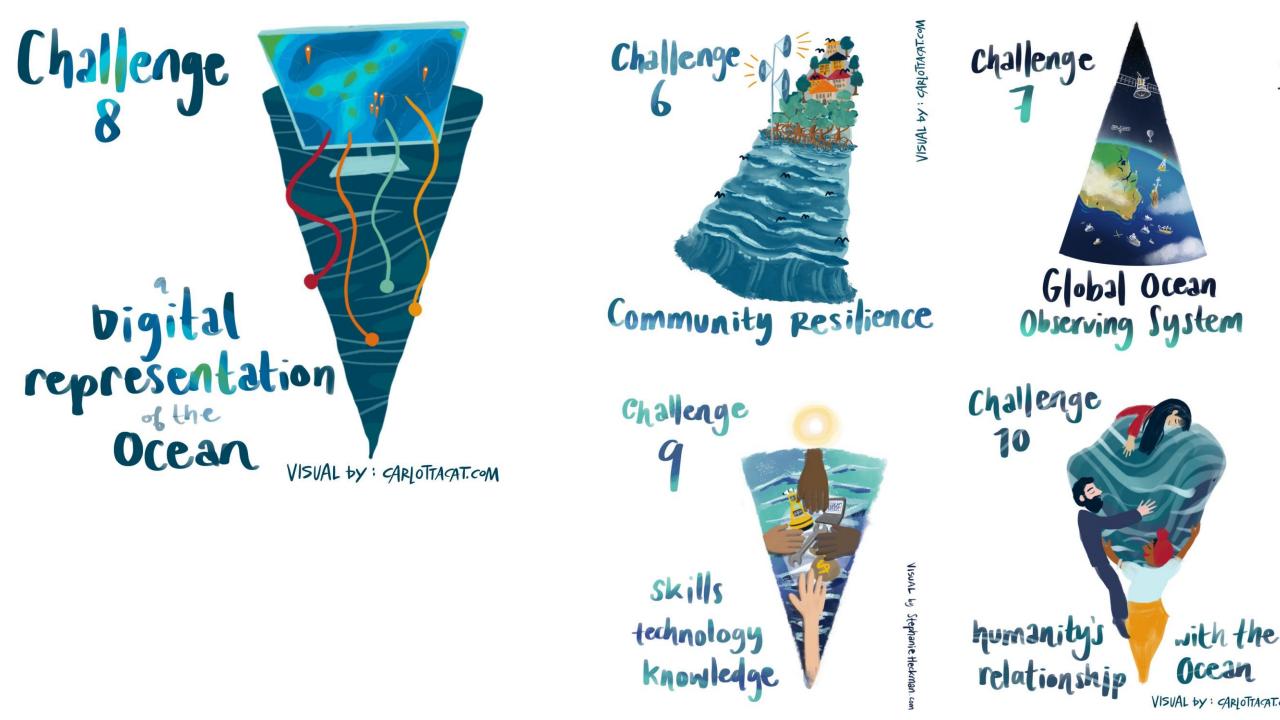


## the UN Ocean Decade Challenges





THE OCEAN DECADE The Science We Need for the Ocean We Want

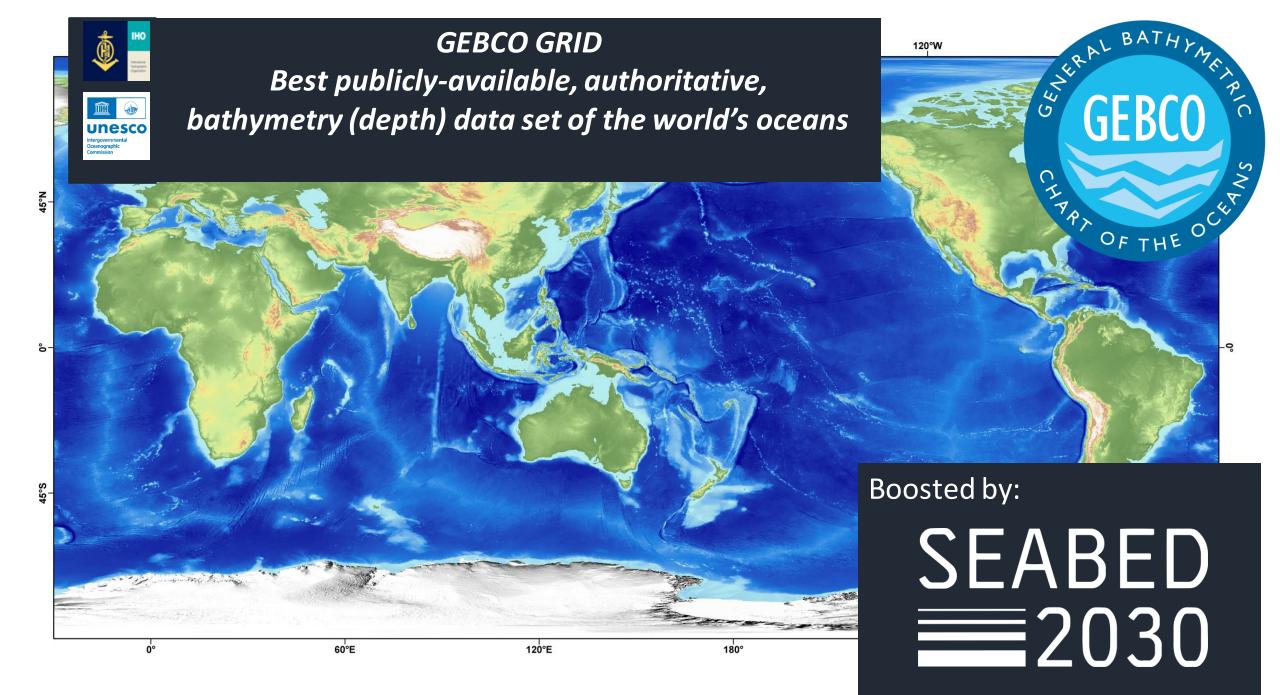




How do we leverage the Need for hydrographic offices to remain at the center of this conversation?

It is our responsibility to ensure that Depth Data is given the importance it deserves in terms of policy making, funding and prioritization

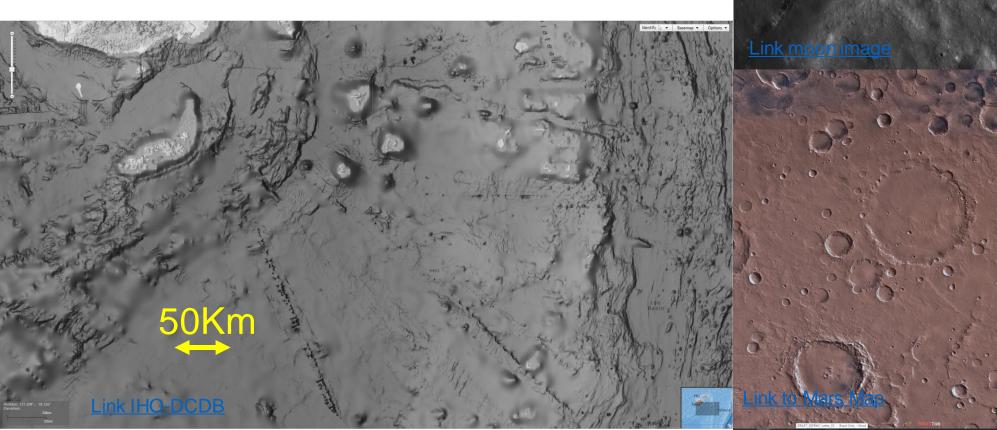






International Hydrographic Organization

## "We know the surface of Mars and the Moon better than our own planet"





International Hydrographic Organization

### Crowdsourced Bathymetry Supports the objectives, strategies and vision of

- UN Decade of Ocean Science
- International Hydrographic Organization Strategic plan
- GEBCO-Seabed2030

### You can also contribute to supporting this by:

- Joining CSBWG
- Reaching out to your <u>RHC CSB/Seabed2030 Coordinator</u>
- Allow for the provision of data within your national jurisdiction by signing the <u>IHO CL</u> <u>21/2020 & IRCC CL 1/2020</u>
- Engaging in and promoting CSB within your country/region



### CSB is a low entry way to take part in the UN Decade.

Hydrographic expertise blends with innovative technology through collaborative networks that foster community engagement and empowerment





Q&A



## Steve Keating NGA



## Crowdsourced Bathymetry (CSB) : Legal Considerations & Misconceptions Inter Regional Coordination Committee Workshop on CSB IHO Headquarters, Monaco

Steven G. Keating, United States Observer to the Advisory Board on the Law of the Sea

26 April 2024

Approved for Public Release, 2024-00785

UNCLASSIFIED

### Acknowledgement

## Thanks to:

- The IHO Secretariat,
- The IHO Crowdsourced Bathymetry Working Group (CSBWG), and
- IHO Member State Hydrographers

CAVEAT

### While I am here in my official capacity, my remarks are my

own and do not necessarily reflect those of the United

States Government, the U.S. Department of Defense, or the

U.S. National Geospatial-Intelligence Agency.

NGA

### **Purpose of Presentation**

 A candid conversation to advocate for international cooperation to ensure that billions of CSB depth soundings are freely made available as the common heritage of humankind

• Dispel misconceptions regarding the acquisition, aggregation, and dissemination of CSB.

NGA

## Defining Crowdsourced Bathymetry

Crowdsourced bathymetry (CSB) is the collection and sharing of depth measurements from vessels, using standard navigation instruments (SNI), while engaged in routine maritime operations (RMO).\*



Images in Public Domain Courtesy of IHO CSBWG

<u>SNI</u> – Not defined in SOLAS, closest analogue is "shipborne navigational systems and equipment" found in SOLAS, 1974, Chapter V, Regulation 19.2, includes Compasses, Echosounders, Radar, etc.

<u>**RMO</u>**—Also not defined in treaty or code; RMO is intended to mean maritime operations which are not hydrographic surveying nor Marine Scientific Research, but rather activities such as transiting from one point to another, passenger carriage, yachting, fishing, towing, etc.</u>

\*Definition from IHO Publication B-12, Guidance on Crowdsourced Bathymetry, page 3



UNCLASSIFIED

### **FACTS ABOUT CSB – Dispelling Misconceptions**

### CSB Data Cycle

#### **ACQUISITION**

At the point a vessel is collecting passage soundings, mandated by SOLAS, Chapter V, Regulation 19, paragraph 2.3 or best navigation practices

"All ships of 300 gross tonnage and upwards and passenger ships irrespective of size **shall**, in addition to meeting the requirements of paragraph 2.2, be fitted with: an echo sounding device, or other electronic means, to measure and display the available depth of water."

NOT HYDROGRAPHIC SURVERYING NOT MARINE SCIENTIFIC RESEARCH

BUT ACQUISITION INCIDENTAL TO SAFE NAVIGATION PURSUANT TO INTERNATIONAL LAW AND CUSTOM



UNCLASSIFIED

### **FACTS ABOUT CSB** – Dispelling Misconceptions

#### **ACQUISITION**

At the point a vessel is collecting passage soundings, mandated by SOLAS, Chapter V, Regulation 19, paragraph 2.3 or best navigation practices

"All ships of 300 gross tonnage and upwards and passenger ships irrespective of size **shall**, in addition to meeting the requirements of paragraph 2.2, be fitted with: an echo sounding device, or other electronic means, to measure and display the available depth of water."

NOT HYDROGRAPHIC SURVERYING NOT MARINE SCIENTIFIC RESEARCH

BUT ACQUISITION INCIDENTAL TO SAFE NAVIGATION PURSUANT TO INTERNATIONAL LAW AND CUSTOM

### CSB Data Cycle

#### AGGREGATION

This occurs when vessels and/or Trusted Nodes upload CSB data to the DCDB

There is no express prohibition on the recordation and sharing of passage soundings (i.e., CSB data) in UNCLOS, SOLAS, or other international law conventions

In fact, Voyage Data Recorders are authorized (mandated for passenger ships, and other covered ships in SOLAS), and data is intended to be shared in the event of maritime disaster (Chapter V, Reg. 20)

CSB data is factual data, LAT/LONG/DEPTH plus metadata

FACTS are not subject to copyright



#### UNCLASSIFIED

### **FACTS ABOUT CSB – Dispelling Misconceptions**

### CSB Data Cycle

#### **ACQUISITION**

At the point a vessel is collecting passage soundings, mandated by SOLAS, Chapter V, Regulation 19, paragraph 2.3 or best navigation practices

"All ships of 300 gross tonnage and upwards and passenger ships irrespective of size **shall**, in addition to meeting the requirements of paragraph 2.2, be fitted with: an echo sounding device, or other electronic means, to measure and display the available depth of water."

NOT HYDROGRAPHIC SURVERYING NOT MARINE SCIENTIFIC RESEARCH

BUT ACQUISITION INCIDENTAL TO SAFE NAVIGATION PURSUANT TO INTERNATIONAL LAW AND CUSTOM

#### AGGREGATION

This occurs when vessels and/or Trusted Nodes upload CSB data to the DCDB

There is no express prohibition on the recordation and sharing of passage soundings (i.e., CSB data) in UNCLOS, SOLAS, or other international law conventions

In fact, Voyage Data Recorders are authorized (mandated for passenger ships, and other covered ships in SOLAS), and data may be shared in the event of maritime disaster (Chapter V, Reg. 20)

CSB data is factual data, LAT/LONG/DEPTH plus metadata

FACTS are not subject to copyright

#### **DISSEMINATION & USE**

Dissemination of CSB data by the DCDB does not create liability for a coastal State's Hydrographic Office (HO) because the CSB data is merely factual information recorded by a vessel as part of its passage/transit soundings.

Data in the DCDB is not represented as a product endorsed by coastal State HO.

Even if HOs choose not to use CSB soundings for safety of navigation products, they should not prevent other parties from accessing CSB data for other uses

The use of CSB data from the DCDB for scientific research does not render the initial recordation of echo sounded depth by a vessel's data logger MSR

# Conclusion

- The active and positive support of IHO Member States to make CSB freely available without CAVEAT through the DCDB is ESSENTIAL in order to achieve the goals established by The UN Decade on Ocean Science and Sustainability, GEBCO, and SEABED 2030
- The concept is FREE CSB to Map the Seabed

NGA



Approved for Public Release,



Q&A



# Break





# Session 2



# Anthony Klemm NOAA

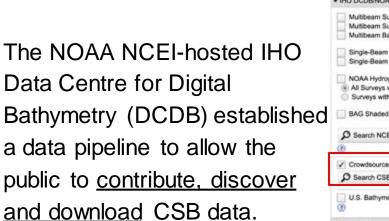


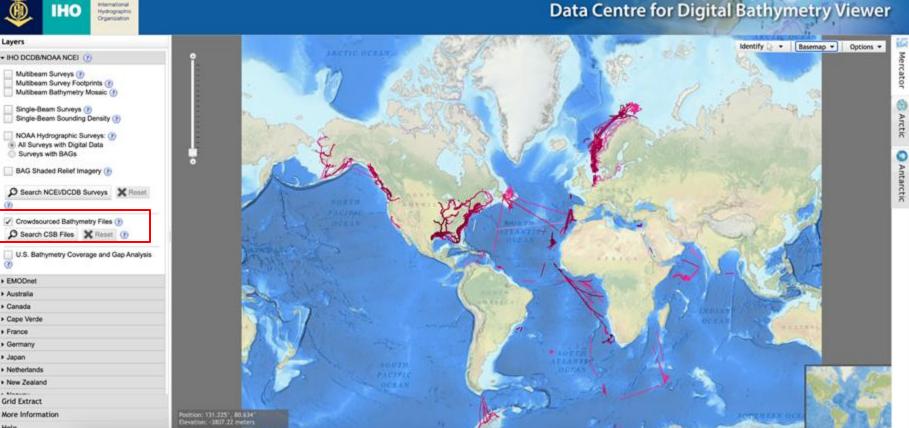
# The Utility of Crowdsourced Bathymetry Data A NOAA Perspective

Anthony Klemm, NOAA Coast Survey Development Lab 26 April 2024



# Early NOAA Support -DCDB Development





#### Funded by NOS OCS



### ncei.noaa.gov/maps/iho\_dcdb

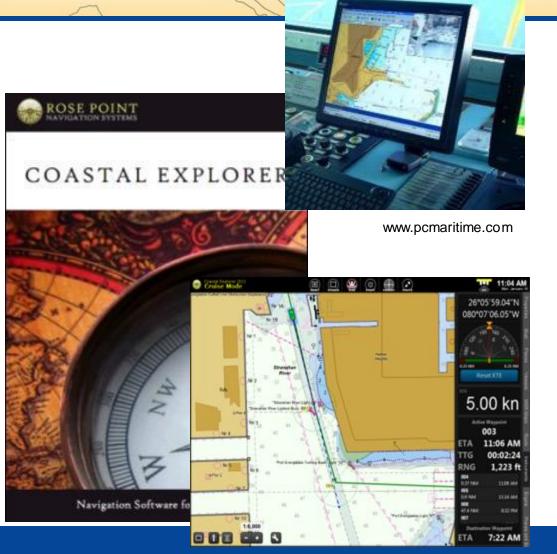


# Early NOAA Support - Pilot

- NOAA (OCS and NCEI) teamed up with Rose Point Navigation Systems
- Using their navigational system software (Coastal Explorer), mariners can enable a modified electronic charting system log file to record position, depth and time.

9 1.

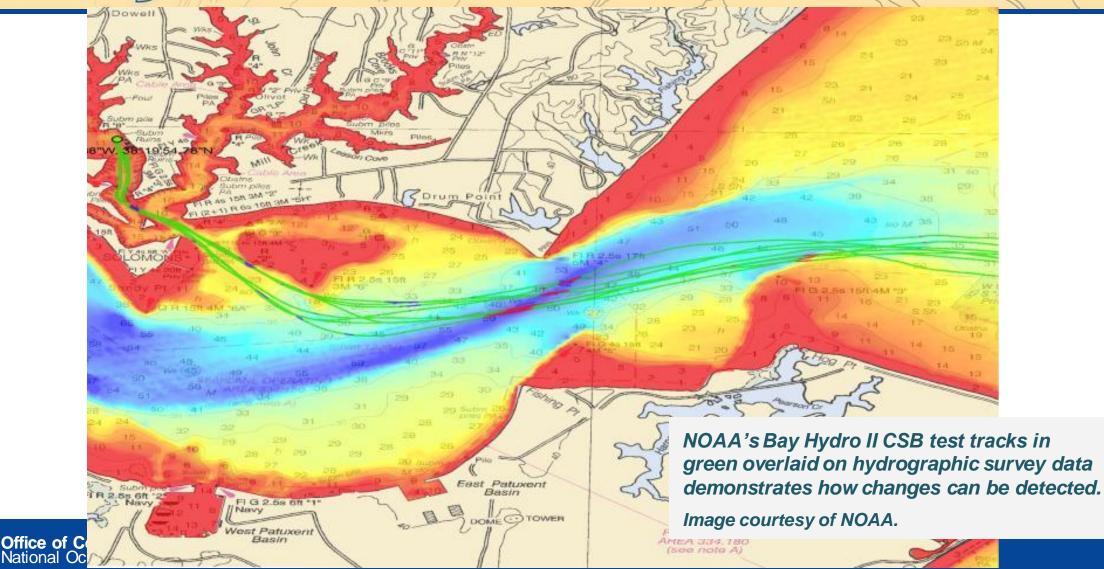
- Mariners can capture metadata about vessel and equipment.
- Whenever the mariner updates the software or chart catalog, the data is submitted to the DCDB via HTTPS post.
- noaacoastsurvey.wordpress.com/2016/06/14/beta-test-csb/







# **Early NOAA Support - Pilot**



9 11

# **Early NOAA Support - Pilot**

```
"crs": 4
        "horizontal": {
             "type": "EPSG",
             "value": 4326
        },
        "vertical": "Transducer"
    },
     "providerContactPoint": {
        "orgName": "Example Cruises Inc",
        "email": "support@example.com",
        "logger": "Rose Point ECS",
        "loggerVersion": "1.0"
    },
     "convention": "XYZ CSB 3.0",
     "dataLicense": "CC0 1.0",
     "platform": {
        "uniqueID": "EXAMPLE-f8c469f8-df38-11e5-b86d-9a79f06e9478",
        "correctors": {
             "positionReferencePoint": "GNSS"
                                    LON, LAT, DEPTH, TIME
CSB data log file
```

#### Funded by NOS OCS

(with JSON

Office of Coast Survey

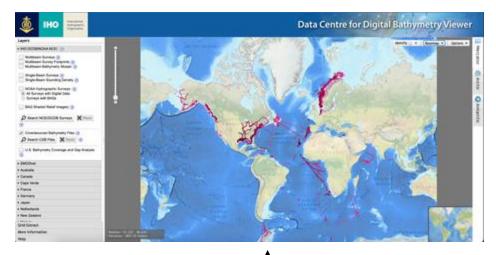
*metadata* string)



#### 68.499214, 15.832683, 59.3, 2020-02-25T01:08:06Z 68.499151, 15.832738, 59.3, 2020-02-25T01:08:07Z 68.498965, 15.832905, 61.3, 2020-02-25T01:08:11Z 68.498965, 15.832905, 61.3, 2020-02-25T01:08:11Z 68.498655, 15.833184, 61.3, 2020-02-25T01:08:15Z 68.498592, 15.833239, 61.3, 2020-02-25T01:08:16Z 68.498213, 15.833567, 55.3, 2020-02-25T01:08:23Z 68.49815, 15.833622, 55.3, 2020-02-25T01:08:24Z 68.49815, 15.833622, 55.3, 2020-02-25T01:08:24Z 68.497713, 15.83401, 54.3, 2020-02-25T01:08:30Z 68.497399, 15.834287, 53.3, 2020-02-25T01:08:35Z 68.497399, 15.834287, 53.3, 2020-02-25T01:08:36Z 68.497336, 15.834341, 53.3, 2020-02-25T01:08:36Z 68.497147, 15.834506, 59.3, 2020-02-25T01:08:39Z 68.497147, 15.834506, 59.3, 2020-02-25T01:08:40Z 68.497084, 15.83456, 59.3, 2020-02-25T01:08:40Z 68.496959, 15.83467, 59.3, 2020-02-25T01:08:43Z 68.496897, 15.834725, 59.3, 2020-02-25T01:08:44Z 68.496897, 15.834725, 59.3, 2020-02-25T01:08:44Z 68.496708, 15.83489, 54.3, 2020-02-25T01:08:47Z 68.496708, 15.83489, 54.3, 2020-02-25T01:08:47Z 68.496646, 15.834946, 54.3, 2020-02-25T01:08:48Z 68.496457, 15.835112, 49.3, 2020-02-25T01:08:50Z 68.496457, 15.835112, 49.3, 2020-02-25T01:08:51Z 68.496205, 15.835332, 53.3, 2020-02-25T01:08:55Z National Oceanic and Atmosph 68.496143, 15.835387, 53.3, 2020-02-25701:08:552

9 11

### Data discovery and access via map viewer.



Data and identifying token are submitted to DCDB via HTTPS post

Frequent update of viewer

86

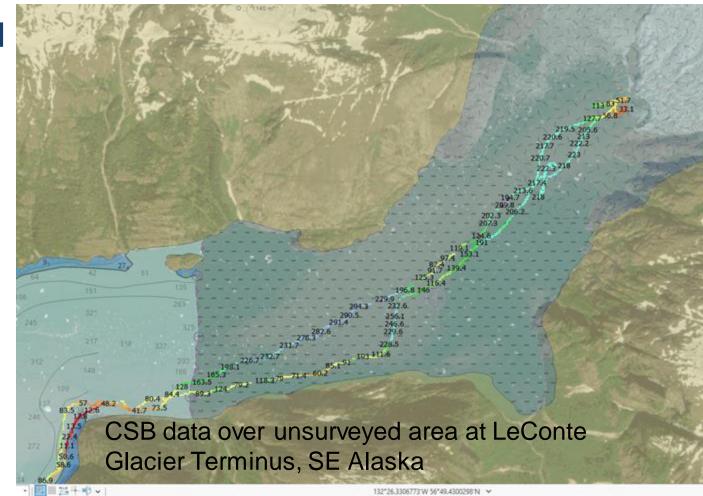




## Introduction: Utility of CSB Data to NOAA

# KEY USE CASES FOR CSB WITHIN NOAA:

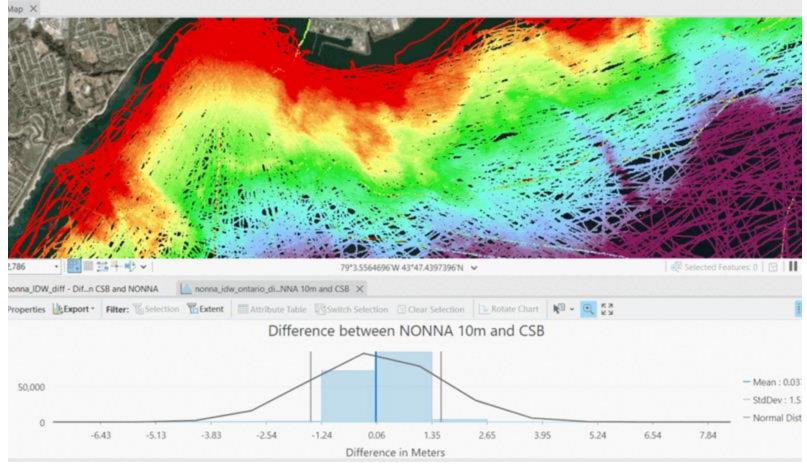
- Filling in gaps and improving our bathymetric record (i.e. crowd-tochart)
- Detection of chart discrepancies and change detection
- Reconnaissance to increase efficiency and safety of field hydrography







# The Value of CSB Data



• Data with scientific, commercial & research value at little to no cost to the public sector

- Fill gaps where data is scarce (eg: Arctic, Small Island Developing States (SIDS))
- Useful along shallow, complex coastlines
- Identify uncharted features
- Assist in verifying charted information
- Confirm whether charts are appropriate for the latest traffic patterns.

Processed CSB Data in Lake Ontario using Canadian Hydrographic Service NONNA reference bathymetry



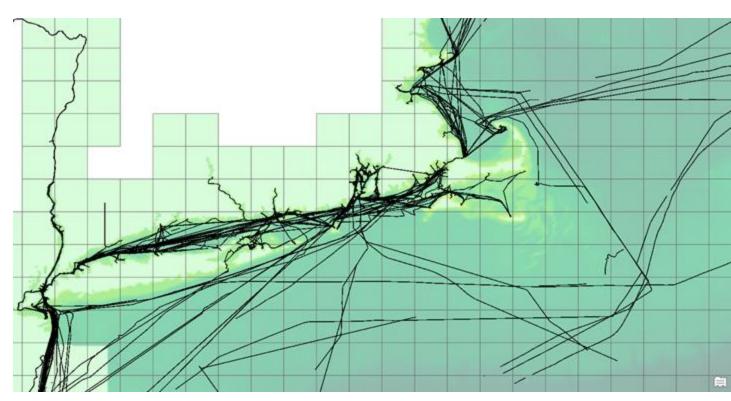
## The Value of CSB Data A full Crowd-to-Chart Data Pipeline

## Automated data pipeline currently in beta testing

 Scraper developed to programmatically extract CSB data from DCDB via API

- Automated tide corrections via API
- Vertical bias detection and comparative analysis against reference bathymetry of known accuracy
- Finalizing first-pass uncertainty estimation and metadata format for CSB-specific External Source Data pipeline





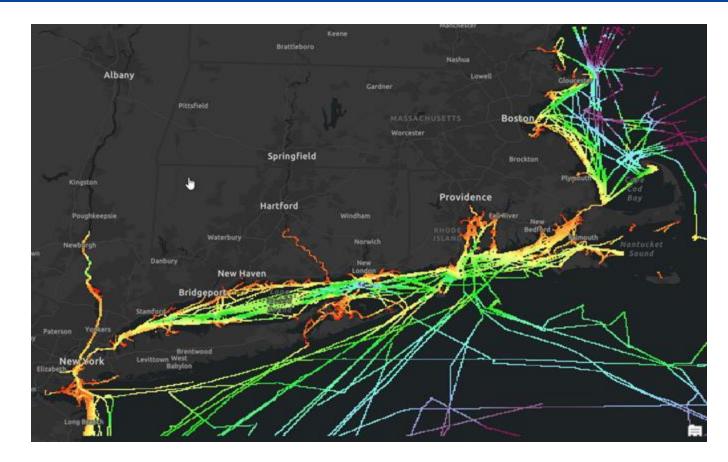


## The Value of CSB Data A full Crowd-to-Chart Data Pipeline

## Automated data pipeline currently in beta testing

- Scraper developed to programmatically extract CSB data from DCDB
- Automated tide corrections via API
- Vertical bias detection and comparative analysis against reference bathymetry of known accuracy
- Finalizing first-pass uncertainty estimation and metadata format for CSB-specific External Source Data pipeline





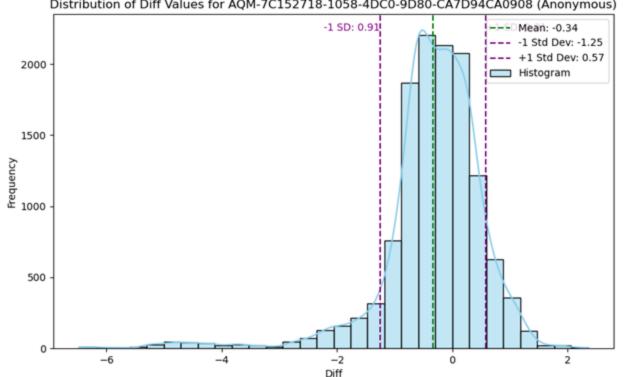


# The Value of CSB Data A full Crowd-to-Chart Data Pipeline

## **Automated data pipeline** currently in beta testing

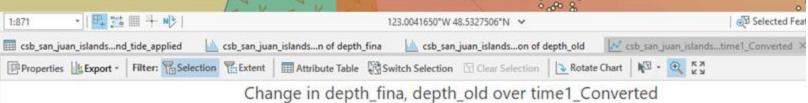
- Scraper developed to programmatically extract CSB data from DCDB
- Automated tide corrections via API
- Vertical bias detection and comparative analysis against reference bathymetry of known accuracy
- Finalizing first-pass uncertainty estimation and metadata format for **CSB-specific External Source Data** pipeline

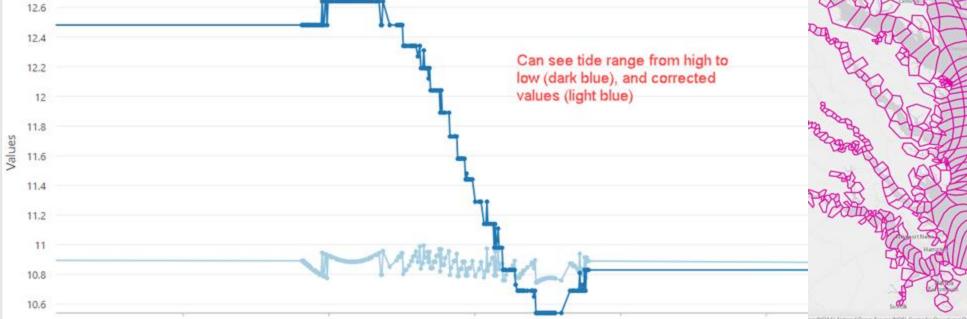


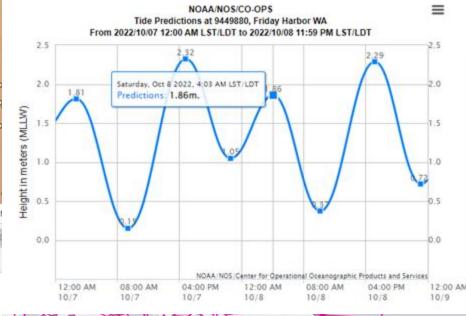


Distribution of Diff Values for AQM-7C152718-1058-4DC0-9D80-CA7D94CA0908 (Anonymous)

# Automated tide correction using Discrete Tide Zoning



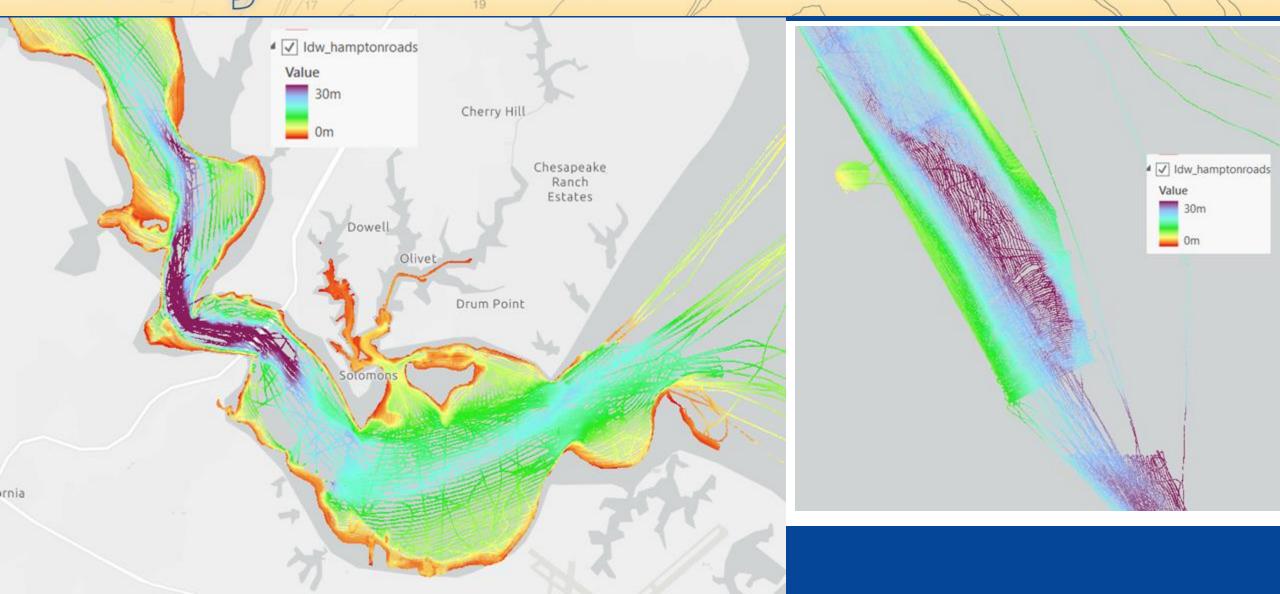




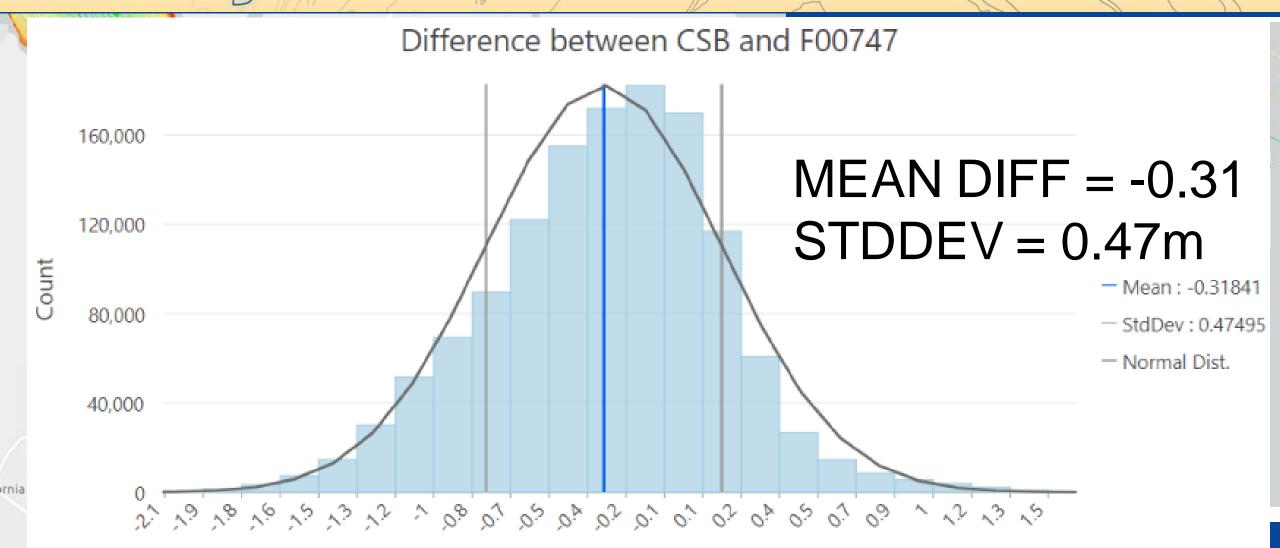




# CSB Quality Assessment - Bay Hydro II collected CSB during hydrographic surveys.



# **COST CSB Quality Assessment - Bay Hydro II** collected CSB during hydrographic surveys.

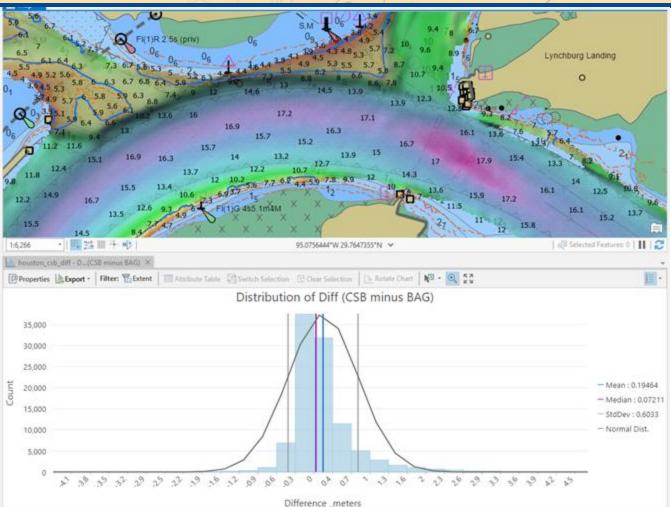


Depth Difference in meters



# Preliminary results are promising

8



Office of Coast Survey National Oceanic and Atmospheric Administration

### Houston, TX

# Comparison of CSB to recent survey:

86

### Mean difference: 0.19 m Standard deviation: 0.60 m



# Processed CSB Quality Characterization:

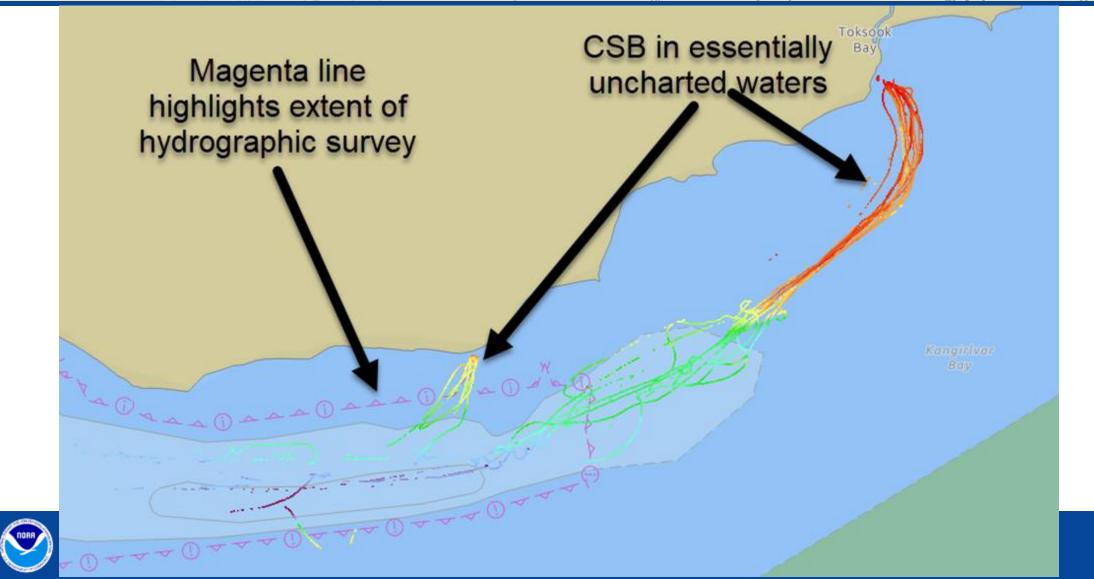
# Processed CSB accuracy is generally CATZOC C capable (or better)

#### Table 4-1 – ZOC Categories

zoc	Position accuracy	Depth accuracy	Seafloor coverage
A1	± 5 m + 5% depth	0.50 m + 1% depth	Full area search undertaken. Significant seafloor features detected and depths measured.
A2	± 20 m	1.00 m + 2% depth	Full area search undertaken. Significant seafloor features detected and depths measured.
В	± 50 m	1.00 m + 2% depth	Full area search not achieved; uncharted features hazardous surface navigation are not expected but may exist
С	± 500 m	2.00 m + 5% depth	Full area search not achieved, depth anomalies may be expected.
D	Worse than ZOC C	Worse than ZOC C	Full area search not achieved, large depth anomalies may be expected.
U	Unassessed – The quality of the depth data has yet to be assessed.		

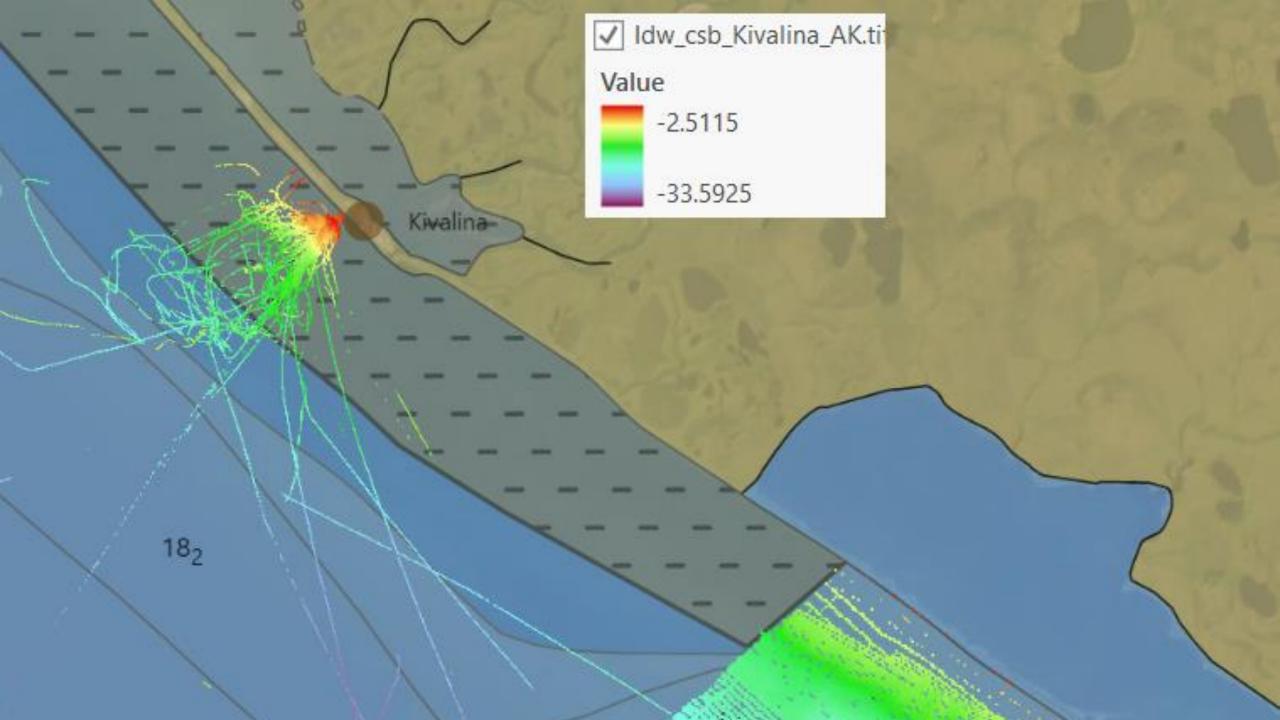


# Toksook Bay Approach - Filling in NBS Gaps where mariners navigate



# Ninglick River - Filling in NBS Gaps where mariners navigate





# Brooklyn, NYC - Filling in NBS Gaps where mariners navigate







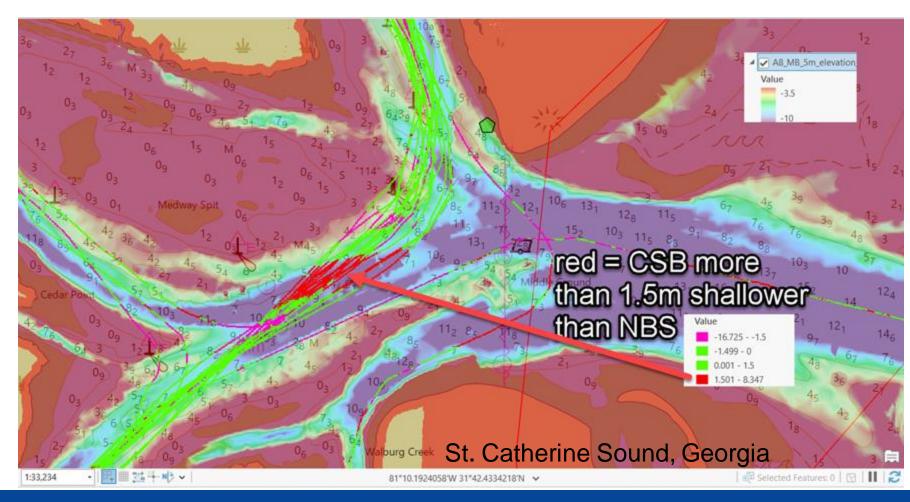
# Brooklyn, NYC - Filling in NBS Gaps where mariners navigate



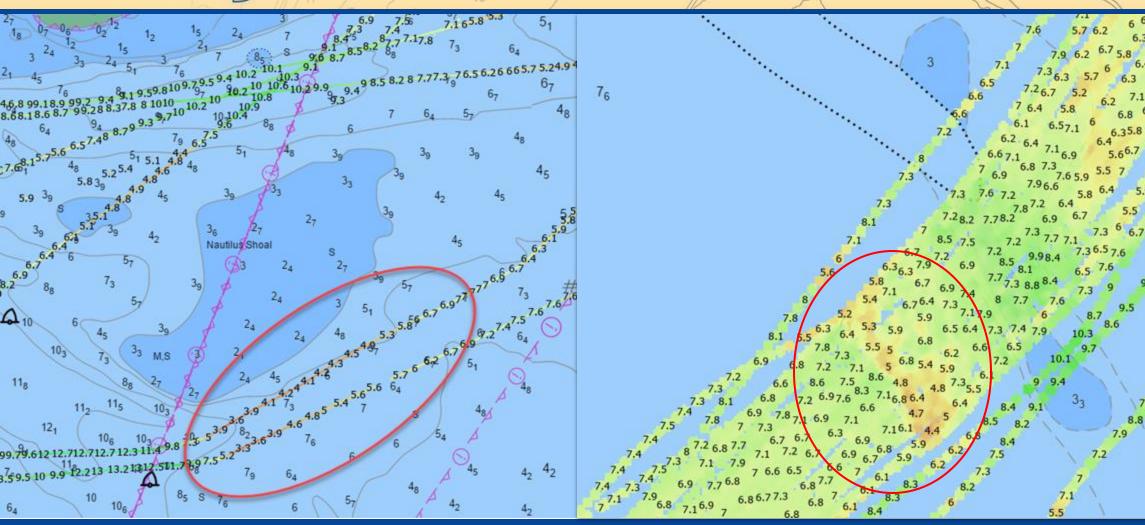


## The Value of CSB Data NBS Discrepancy Modelling

- Detecting coastal change over time and bathymetric discrepancies in NBS
- Automated change
   detection product
   updated as new
   data is processed



# Mischarted Shoals Detected in Chesapeake and Delaware Bays





86

9.1 8.6

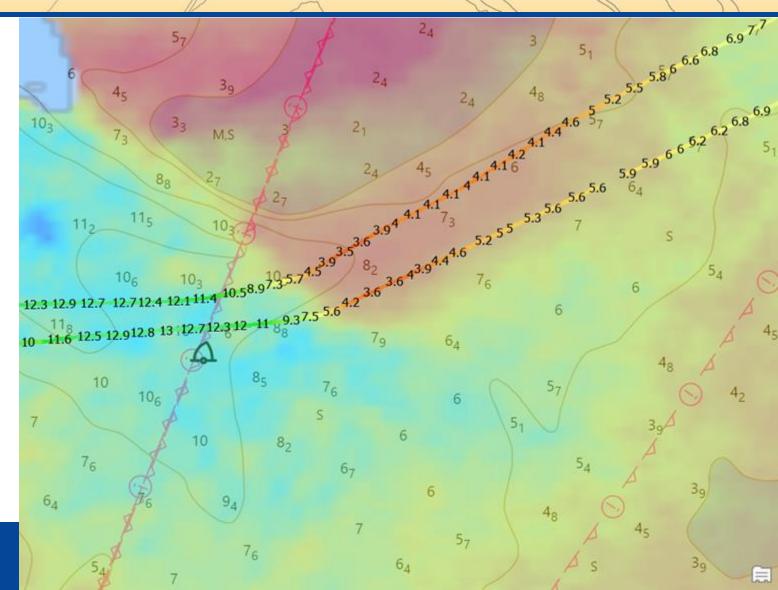
> 8.4 7.6



# The Value of CSB Data - SDB correlation and groundtruthing

 CSB detected and SDB confirmed shift of Nautilus Shoal in Mouth of Chesapeake Bay

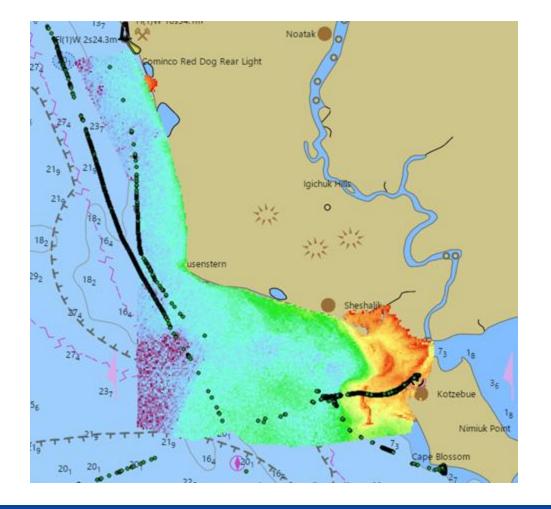
> Office of Coast Survey National Oceanic and Atmospheric Administration





# The Value of CSB Data - SDB correlation and groundtruthing

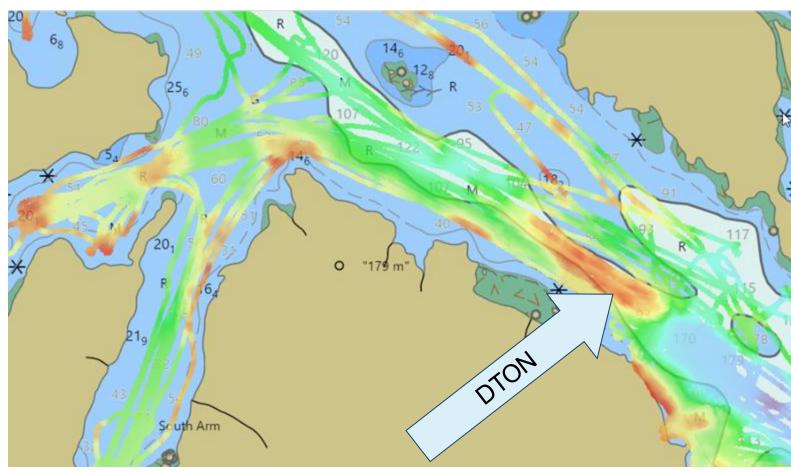
### CSB used in analysis of Satellite-Derived Bathymetry Products in Remote Alaskan Arctic





# Reconnaissance - Detecting Dangers to Navigation before deploying field hydrographers

 Fairweather 2023 Dixon Entrance Project - CSB identified over half of fieldsubmitted DTONs ahead of time

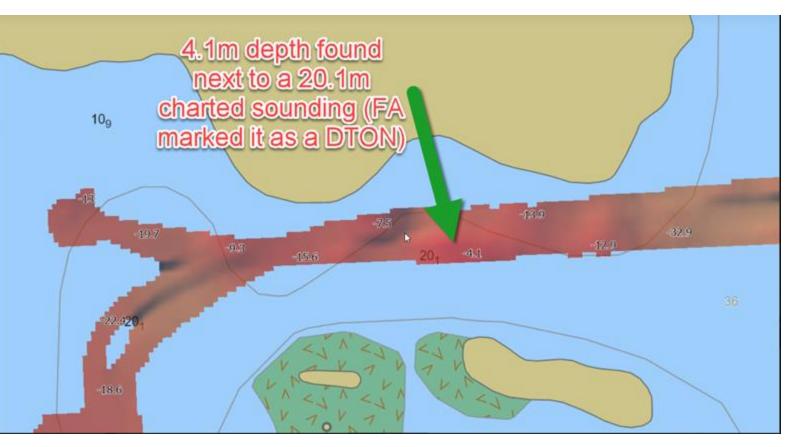






## Reconnaissance - Detecting Dangers to Navigation before deploying field hydrographers

 Fairweather 2023 Dixon Entrance Project - CSB identified over half of fieldsubmitted DTONs ahead of time







# We need a larger crowd





## Part 4: Questions / Next steps / Vision

8



19

The available CSB data is a drop in the bucket compared to available AIS data.

We need to support the adoption, contribution, publicization, and use of CSB data.



83

# Thank you!

## Questions/comments:

### anthony.r.klemm@noaa.gov

iho.int/en/crowdsourced-bathymetry

ncei.noaa.gov/maps/iho\_dcdb/



Q&A



# Laurent Kerleguer SHOM



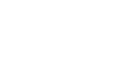
### **CROWDSOURCED BATHYMETRY** FRENCH NATIONAL POSITION

# Workshop on Les Crowdsourced Bathymetry (CSB)

Friday 26 April 2024, 13:00 - 15:30 CEST

IHO

Hybrid Event: In-person at the IHO Secretariat – Monaco & online Open to all

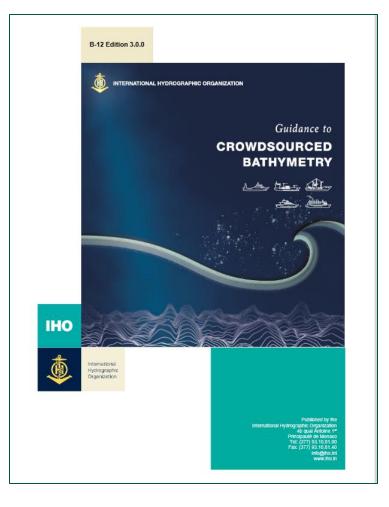




## **Crowdsourced Bathymetry - General definition**

### **B-12 IHO publication**

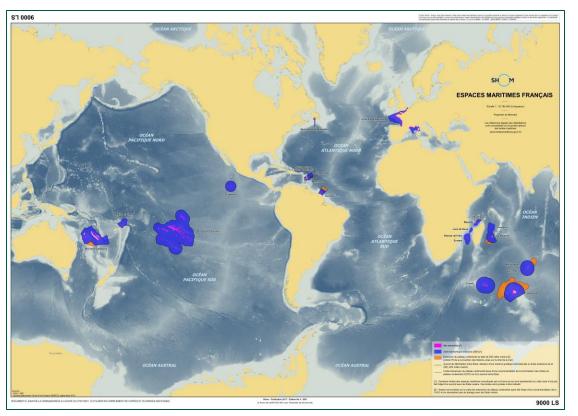
- Crowdsourced bathymetry (CSB) is the collection and sharing of depth measurements from vessels, using standard navigation instruments, while engaged in routine maritime operation
- France is member of the Crowd Source Bathymetry Working Group since 1<sup>st</sup> CSBWG





## FACTS

- France has a 10.2 million km2 of rather poorly measured EEZ;
- Shom supports CSB;
- French national official position on CSB established by *Prime minister - secrétariat général de la mer*;
- The quality of the data is key to the acceptation and the benefit of CSB, mediocrity is the ennemy that can ruin the concept.





# French legislation applicable to bathymetric and geophysical surveys

- « **Code minier** » for research and exploitation of mineral ressource.
  - all information part of geophysical survey in French EEZ relative to safety of navigation (includes bathymetry) is falling in the public domain (must be transmitted to Shom)
- « Code de la recherche» for marine scientific research.
  - integrates in the French legislation UNCLOS Marine Scientific Research (Part XIII)
  - > Metadata/data flows meeting this legal framework in place and efficient
  - Manages commercial protection/scientific caveats. E.g: moratorium before data release if requested by the data owner



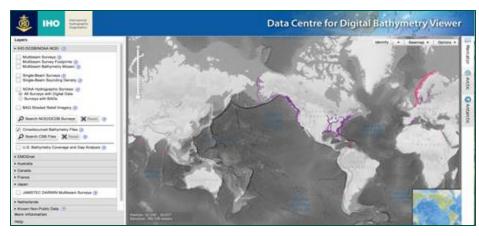
# Instruction relative to CSB signed by Prime Minister 22/11/2022

- Subject to compliance with the regulations in force (e.g. regulations regarding areas prohibited to navigation) measurements collection in marine areas under the sovereignty or jurisdiction of France, is possible <u>without prior</u> <u>authorization</u> under the following conditions:
  - Depth measurements from <u>non-specialized vessels</u>, using <u>standard navigation instruments</u>, during <u>routine</u> <u>marine operations</u>, once validated and released by Shom
  - <u>Excludes</u> measurements acquired as part of <u>an</u> <u>operation</u> to describe the underwater topography, whether this description is the end goal or an intermediate step for another objective.

RÉPUBLIQU	E FRANÇAISE
Première mini	stre
	Instruction de la Première ministre du 22 novembre 2022 relative à la bathymétrie participative
	NOR : []
	Le 22 novembre 2022.
	А
	destinataires in fine :
Références	: a) Instruction du Premier ministre du 8 avril 2020 relative au recueil, à la transmission, au traitement et à la diffusion de l'information nautique (PRMM2002228A).
	b) Publication OHI B-12 : guide sur la bathymétrie participative.
	<li>c) Article R.3416-3 du code de la défense définissant la mission du Service hydrographique et océanographique de la marine (SHOM).</li>
Pièces jointes	: glossaire.
Textes abrogés	. Minut

Legend: writting in blue = France CSB caveats



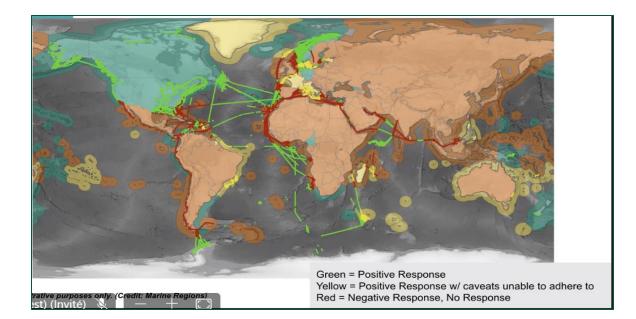


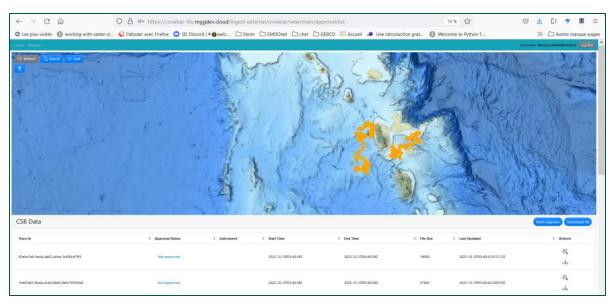
- Measurements collected in French waters must be transmitted as a priority to Shom, or to trusted nodes (EMODnet Ingestion or IHO DCDB)
- <u>Notwithstanding the reception node</u>, measurements have to be made known to Shom as the national hydrographic service, prior to any local, national or international distribution.
- It is only after Shom has made sure those measurements conform with CSB definition and conform with protected areas that they become CSB data available for ingestion in DCDB.



## Implementation

- France has replied positively to IHO CL 21/2020, IRCC CL 01/2020 with the caveat "All data to be reviewed by HO before ingestion into DCDB";
- IHO DCDB CSB dataset **geographical filtering** based on the marine zonings and acceptance list;
- Acceptance/Refusal tool for HO (Crowbar) currently being developped by IHO DCDB;
- Shom internal data flow mechanisms and associated tools currently being improved.

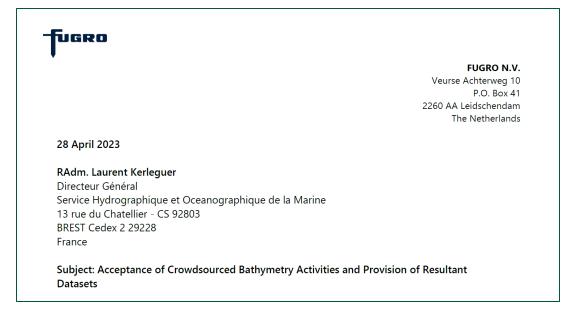






## **Ensuring a clear distinction between MSR and CSB**

- On April 2023, following acceptation of CSB by France, Fugro exposes in good faith bathymetric data acquired in transit;
- Following B12 and French regulation this is not CSB, this is MSR: two reasons 1) data acquired from a specialized vessel, 2) data acquired using a dedicated geophysical device.
- Not being clear about the status of RSM when it is RSM would lead to a loss of confidence detrimental to the CSB
- Shom considers RSM has enough flexibility to foster contribution of research vessel in transit to general knowledge of the ocean : flexibility on areas and time frame of a request.





## **Concluding remarks**

CSB, Shom's feedback :

- Identify and communicate with competent administration (Secretariat général de la mer);
- Use of B-12 documentation within the French legislation, adding necessary caveats;
- Ensure unambiguous understanding of the distinction between MSR and CSB (ambiguity spoils the concept);
- Provide technical assurance (implementation of data flow / acceptation tools).



Q&A



# Claudia Batthyany Yacht Club de Monaco



### H.S.H. PRINCE ALBERT II

# *"It is our commitment that will help us to reconcile the use and preservation of the Seas and Oceans."*





#### GEBCO TEAM AT YCM





#### **1. IHO & YCM : SIGNING OF A LETTER OF COOPERATION**



Monaco, le 06. 07 2002

The Yacht Club de Monaco, Represented by Mr. Bernard d'ALESSANDRI, General Manager

Mana

no, Matting-The IHO Secretariat,

The IHO Secretariat, N Dr Mathias JONAS, Secretary General

A.F.





Letter of Cooperation

BETWEEN

The Secretariat of International Hydrographic Organization (herein referred to as "IHO Secretariat"), an intergovernmental organization, having its office in 4b quai Antoine I", 98000 Monaco,

AND

The **Yacht Club de Monaco** is an association under Monegasque law (herein referred to as "YCM"), the head office of which is in the Principality of Monaco, Quai Louis II, 98000 Monaco, and represented by Mr. Bernard d'ALESSANDRI, in his capacity as General Secretary, and having all the powers necessary for the purpose hereof,





#### 2. ALFREDO GIACON : installation of a data logger





#### 2. ALFREDO GIACON : sailing crossing with data logger







Dans le cadre de notre démarche «Monaco Capital of Advanced Yachting» et à l'occasion de l'arrivée à Monaco du voilier *Janeris*, nous avons le plaisir de vous convier au Cocktail Dinatoire qui sera offert vendredi 22 juillet 2022 à partir de 18h30 sur le Quai Louis II

à l'occasion duquel sera présentée la mission

« A Sail for the Blue »

et l'aventure humaine et exploratoire d'**Alfredo Giacon** 

Événement organisé avec le soutien de l'OHI et coordination de Michele Florentino

Batthyany | +377 93 10 65 35 | c.batthyany@ycm.org







#### 2. IHO & YCM : MEDIA EXPOSURE



#### Yacht Club Monaco e l'IHO insieme per scandagliare i fondali marini

DI AMP MONACO · PUBBLICATO 02/08/2022 · AGGIORNATO 31/07/2022

L'arrivo e l'ancoraggio alla banchina dello Yacht Club di Monaco (YCM), lo scorso 22 luglio, di JANCRIS, barca a vela su cui dal 1993 Alfredo Giacon e la moglie viaggiano per sensibilizzare l'opinione pubblica sullo stato di degrado dei nostri mari, è stata occasione per ufficializzare una lettera di cooperazione siglata tra lo stesso YCM e l'Organizzazione Idrografica Internazionale nell'ambito di un progetto che aspira a realizzare, grazie al crowdsourcing, la mappatura dei fondali marini entro il 2030.

Giacon, infatti, proveniente da Cap Canaveral, ha fatto scalo a Monaco, dopo aver percorso quasi 4.000 miglia di navigazione all'arrivo a Genova il 28 luglio scorso. Sul palco dello Yacht Club di Monaco, il navigatore è stato invitato a raccontare questa esperienza vissuta a Jancris, un ketch di 16 metri su cui, nel mese di giugno, ha installato uno strumento (logger) che gli ha permesso di raccogliere autonomamente i dati durante la navigazione: gli stessi, una volta inviati in forma anonima e riservata secondo quanto prevede il programma GEBCO - parte del progetto Seabed2030 della Nippon Foundation - potranno contribuire a fornire informazioni in crowdsourcing sulla batimetria, branca dell'oceanografia che intende misurare e rappresentare graficamente il profilo morfologico dei fondali oceanici. Di guesta iniziativa ne abbiamo parlato nell'ultimo numero di OE, descrivendo la cerimonia condotta da Claudia Batthyany, Project Manager del reparto 'Monaco Capital of Advanced Yachting' dello YCM, il cui Segretario Generale, Bernard d'Alessandri e lo stesso Ammiraglio Luigi Sinani (direttore IHO) sono stati tra i protagonisti principali di un sintetico intervento nel quale, ognuno dal proprio punto di vista, ha spiegato l'importanza dell'accordo sottoscritto.

#### Yacht Club de Monaco 20 210 abonnés 2 j • ©

MONACO CAPITAL OF ADVANCED YACHTING - Under the aegis of 'Monaco, Capital of Advanced Yachting', #YCM and the International Hydrographic Organisation have signed a letter of cooperation making official their bathymetry #datacollection partnership, "#Crowdsourced Bathymetry". A data logger was sent to skipper #AlfredoGiacon before his Atlantic crossing which ended in Monaco on Friday 22nd July. #MonacoAdvancedYachting #YachtClubMonaco #OHI Fondation Prince Albert II de Monaco Extended Ionaco



#### membri ne faranno uso. In ogni caso sono davvero molto contento che lo YCM si presti a questa iniziativa che si integra perfettamente nell'ambito del 'Monaco Capital of Advanced Yachting', attività in cui l'uso delle nuove tecnologie si presta a migliorare non solo le performance delle imbarcazioni ma anche stimolare una navigazione responsabile e eco-sostenibile ha affermato D'Alessandri. "L'IHO fornirà allo YCM queste niccole annarecchiature che, una volta consegnate agli armatori che lo vorranno, potranno raccogliere i dati inviati a dei centri di raccolta, elaborati successivamente da un unico database mondiale, e contribuire ad aggiornare la cartografia nautica attuali. Ciò permette d





Des données utile

#### bathymetry, rispetta protocolli e normative proprie degli Stati sovrani che hanno aderito, in tutto o in parte. al progetto. E' inoltre interessante sapere che il 2% delle coste dell'Italia sono state mappati facendo riferimento a dati dell'inizio del '900 con ali strumenti dell'epoca. L' accordo concluso tra l'IHO e lo YCM è il primo nell'ambito dello yachting per questo specifico aspetto, e l'obiettivo è trasformare chi ne fa parte in ambasciatore di questa

### AZETTE

#### INVIRONNEMENT

Plus de 75% des fonds marins restent à référencer Le vendredi 22 juillet marquera l'arrivée du journaliste et skipper, Alfredo Giacon, à naco appàs cino sama nes passées à traverser l'océan Atlantique. Loin d'une croisi nce, il s'agit d'une réelle mission pour le relevé impératif de données utiles à la trie, soutenue par le Yacht Club de Monaco et l'organization hydrographique rmationale (OHI)



Such marine a power link de sambrera accidenti de navitera. A parte da la la navitera a por consiguente des accianse collectores actidenti de navitera. A parte da la la navitera se accommando i italiate des accianse collectores actidenti a l'objectif da popert e . Razendoré a resultore 20% en este popoledaré de colectores MELE, pour podenti coras dépitivas de politica marine nandaca de da da popoledaré accessible à douz ». Poraquei ne-ce fantamental ? Pour phasem mission, comme organedes à la collectore se al politica de la devine de la devine de la devine de la devine numerita de la collectore da douz ». Poraquei ne-ce fantamental ? Pour phasem mission de devine numerita la resources habitatiques ou granarit la alcenti de los tenanes (1 bas tenanes (1 bas tenanes de la devine devine e de la nel la conse conse mente operande e consequences de la devine devine devine de la devine devine devine de la devine devine de la devine devine de la devine dev référencés. « La conscience collective représente l'un des plus grands diffic du conscience collective représente l'un des plus grands diffic du conscience collective représente l'un des plus grands diffic du consciences de la données auxonenait beaucoup plus repuisement », affirme Claudia Batthyany, chef de projet de Monaco Capital of Advanced Yaching.

#### Un objectif rendu possible par l'aide de tous

Un objectir trendit possible par 1 alice de tois la popie 5 seleci 3 obiectanis la participación de ciclaga e de nomes nel na participación e distribu-tar popie 5 seleci 3 obiectanis la participación de ciclaga e de nombranes institutos non llancia. Commo colle da Journaline, erroranie et antigenes inaliane, Alfredo Guccon qui a levi l'ancre a Port Canzeval, are Estar-Distri, e qui depart paisera sensaice del si, silconse les sares que or l'anarrer vanded procchas en Precipanta l'empletions ne conseguida su no vorges constituyes praioqu'elle a por maintos de recutalité des doubles no encensaire à la tudiportaria, l'italé que ca can logar a. appareil enregistre les différentes profondeurs et distances marines, récoltées pour établir de cartographies représentatives. Ce petit boîtier situé sous la quille du bateau est facile à positionner et Catographies representatives. Cor point course since some acquire do tassen en catine a pointenne et respecte la vierprise du baten annän gio de son ekspinger. Ce demire hi ni de fourni dan le cathe d'un partenariat entre la VCM et l'OHI. et J'OHI possibile la technologie, le Tache Chila quare à lui dispose des members et d'une voic(prise à l'Unermatismal angrés des annes clubes, y soutient Claudia Bathyany. Elle sepire ainsi e présenter et offrir est appareil aux zignataires de son projet », lors de l'artivée du n

#### Monaco yachting



XXII

17 juillet 2022, 13h22

Padova Eventi

4MIN553D JANCRIS EXPECIMINENT, L'oquipaggio di Janeris, arricchito per l'occasione, in una foto poco prima della interne di Cara Comportal, negli Usa, Domani Parrico a Monaro e nel tampa Bude a Generali La barca di Alfredo e Nicoletta Giacon ha effettuato la traversata dagli Usa in Europa con a bordo una ricercatrice del Bo che ha studiato le microplastiche

#### "Jancris" in Atlantico per studiare il mare

LA SPEINZONE Transaction of the sense in Media transaction of the sense transaction of the se	a) Justi i stato seche la instituita di turo i structurati intitui di giumni sele atel 2005. CUELTION Deprinta constructurati di aportazione di rittori e data professi di anteresa deri titori e data professi di anteresa di cherche. Constructione di turo di anteresa di cherche. Los SUPPER-e-NENTIDIE EDENI DI OCENIO	re, receive per stabilitie mappe sector of the stability mapped with the breach of the stability of the stability of the stability of the stability of the stability of the stab	Interference of the second sec
MONACO I RISULTATI Dello strumento Che ha Rilevato i dati Sulle profondità	FRA CALME PIATTE E TIFONI CHE CI Inseguivano, prossima Tappa genova»	mito equipaggio per arrivare da Cape Cansveral sile isole Azzor- re non isonno disatteso le aspe- tutive. Dai tre giorni di calma pintra surresile, al tropical storm Alex con i suoi sestanta nodi di vento che ci ha seguito per alcumi giorni. Un viaggio in- tenso, preggio di apauti e tosto	Cinema PADOVA PASTRA ARENA Via Jacob di Montgawa chi Parce
NITE PROME La base in Oceano /	Utation seeights a us are	per la tota durante UE STUDIO La mave avventura occasita per primorta, la baccasa di ante ante la contra di ante ante ante ante la contra di ante ante ante ante de capor Camerra di ornetta An- tores. 2000 miglia da percorta- ta mana ventita di perci. Du- de riportera a scata Jancha, di e quanta di ante ante ante ante ante padoratora. Aqueisa meriporta padoratora. Aqueisa meriporta padoratora ante ante ante ante ante padoratora ante ante ante ante ante ante padoratora ante ante ante ante ante ante ante padoratora ante ante ante ante ante ante ante ant	Нашей раз (14.04.07.003) на стоя стоя стоя самона собрата и собрата и собрата заявия почилая почилая посновая собрата на собрата и собрата и собрата и собрата и собрата на собрата и собрата и собрата и собрата и собрата на собрата и собрата и собрата и собрата и на собрата и собрата и собрата и собрата и собрата и



one: oli stessi, una volta n forma anonima e riservata secondo quanto prevede il programma GEBCO - parte del progetto Seabed2030 della Nippon Foundation - potrann contribuire a fornire informazioni in crowdsourcing sulla batimetria, branca dell'oceanografia che intende misurare e rappresentare graficamente il profilo morfologio dei fondali oceanici. L'iniziativa è stata presentata nel corso di una cerimonia condotta da Claudia Batthyany, Project Manager del reparto 'Monaco Capital of Advanced Yachting' Jello YCM, il cui Segretario Generale, Bernard d'Alessandri e lo stesso Ammiraglio Lui Sinapi (direttore IHO) sono stati tra i protagonisti principali di un sintetico intervento nel Sinapi (direttore IHO) sono stati tra i protagonisti principali di un sintetico intervento nel sinapi di principali di un sintetico intervento nel sinopi di principali di principali di un sintetico intervento nel sinopi di principali di principali di principali di un sintetico intervento nel sinopi di principali di principali di principali di un sintetico intervento nel sinopi di principali di principali di principali di un sintetico intervento nel sinopi di principali di principali di un sintetico intervento nel sinopi di principali di principali di principali di un sintetico intervento nel sinopi di principali d quale, ognuno dal proprio punto di vista, ha spiegato l'importanza dell'accordo sottoscritti In concreto, d'ora in avanti, i membri del Club che lo desiderano, possono far richiesta di questo strumento dotato di microscheda su cui, senza interferire sulla strumentazione

YCM e Organizzazione Idrografica Internazionale insieme per mappare i fondali marini

vo e l'ancoraggio alla banch

allo Yacht Club di Monaco (YCM)

acon e la moglie viaggiano per

ibilizzare l'opinione pubblica stato di degrado dei nostri ma

ettera di coonerazione sicilata

esso YCM e l'Organizzazione

rafica Internazionale nell'ambito

ogetto che aspira a realizzar

tura dei fondali marini entro il Giacon, infatti, proveniente d

anaveral, in scalo a Monaco

trumento (logger) che gli

te di racconliere mente i dati durante la

di raggiungere Genova nei giorni, ha ricevuto un

è stata occasione per ufficializzare

al crowdsourcing, la

scorso 22 luglio, di JANCRIS. arca a vela su cui dal 1993 Alfredo

. sistente provvede a raccocliere dati sui fondali che incrementeranno quelli già utilizzati stenti e condivise. "E' difficile da dire quanti del nost 20 mgoazne

nice-matin Jeudi 28 juillet 2022 **Comment les plaisanciers** œuvrent pour la cartographie

C'est l'esprit de l'accord récemment signé entre le Yacht-club de Monaco et l'Organisation hydrographique internationale pour inciter les usagers de la mer à collecter des donné

## Emma-Louise DUPOUE



#### **3. YCM DINNER CONFERENCE : MAP THE GAP**





#### 3. YCM DINNER CONFERENCE : MAP THE GAP



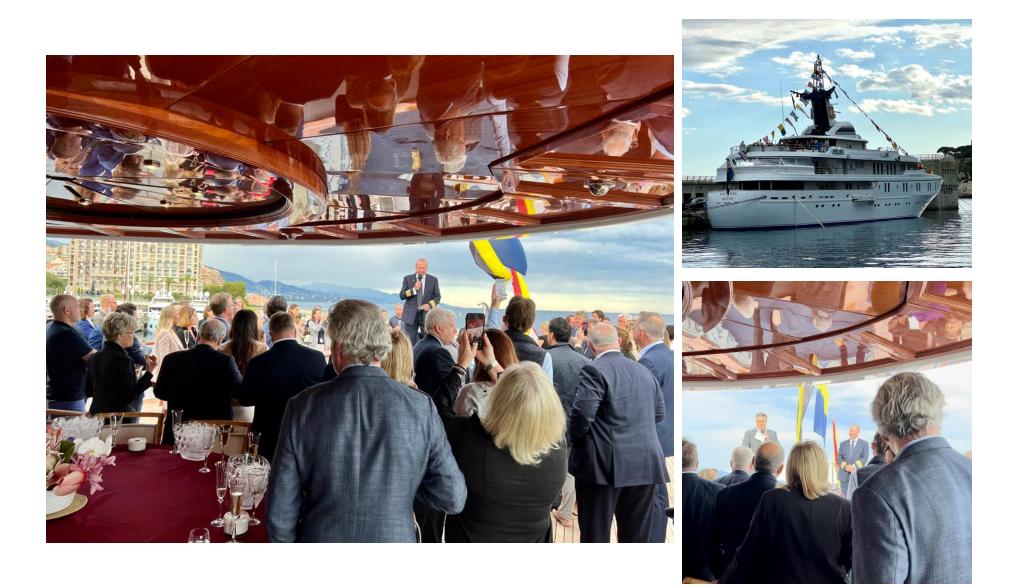


#### 4. IYBA & MYBA RENDEZ-VOUS





#### 5. WHITE ROSE OF DRACHS ON BOARD RECEPTION





#### 6. IHO AT MONACO YACHT SHOW 2023





#### 7. CORRIERE DELLA SERA FAM-TRIP WITH RIVA





Q&A



# Luigi Sinapi IHO



# Jennifer Jencks NOAA



### WE ALSO ENCOURAGE ALL HYDROGRAPHIC AUTHORITIES TO ATTEND FUTURE CSBWG MEETINGS WHERE THEIR CONCERNS, SUGGESTIONS, AND WORK WOULD BE MOST WELCOME.

CSBWG16 WILL BE HOSTED BY NEW ZEALAND IN MARCH 2025 AND WILL INCLUDE A HANDS ON WORKSHOP FOCUSES ON THE VARIETY OF OPEN SOURCE TOOLS THAT SUPPORT THE END TO END FLOW OF CSB DATA.



- CSB IS A LOW ENTRY WAY TO TAKE PART IN THE UN DECADE AND THO STRATEGIC GOALS
- CSB IS FULLY CONSISTENT WITH THE LAW OF THE SEA, LEVERAGING
   DATA REQUIRED BY SOLAS
- CSB HOLDS SIGNIFICANT VALUE. AND THE MORE CSB, THE BETTER.
- FRANCE PROVIDED AN EXCELLENT AND DETAILED EXAMPLE OF ONE IMPLEMENTATION OF CSB IN WATERS OF NATIONAL JURISDICTION PROCESS

AN EXPERIENCE OF CSB IN THE YACHTING COMMUNITY



# **THANK YOU**







International Hydrographic Organization