

A world map showing bathymetry (seafloor topography) with color-coded depths. The map is overlaid with a grid of latitude and longitude lines. The title text is centered over the Atlantic Ocean.

Crowdsourced Bathymetry

A benefit for all States

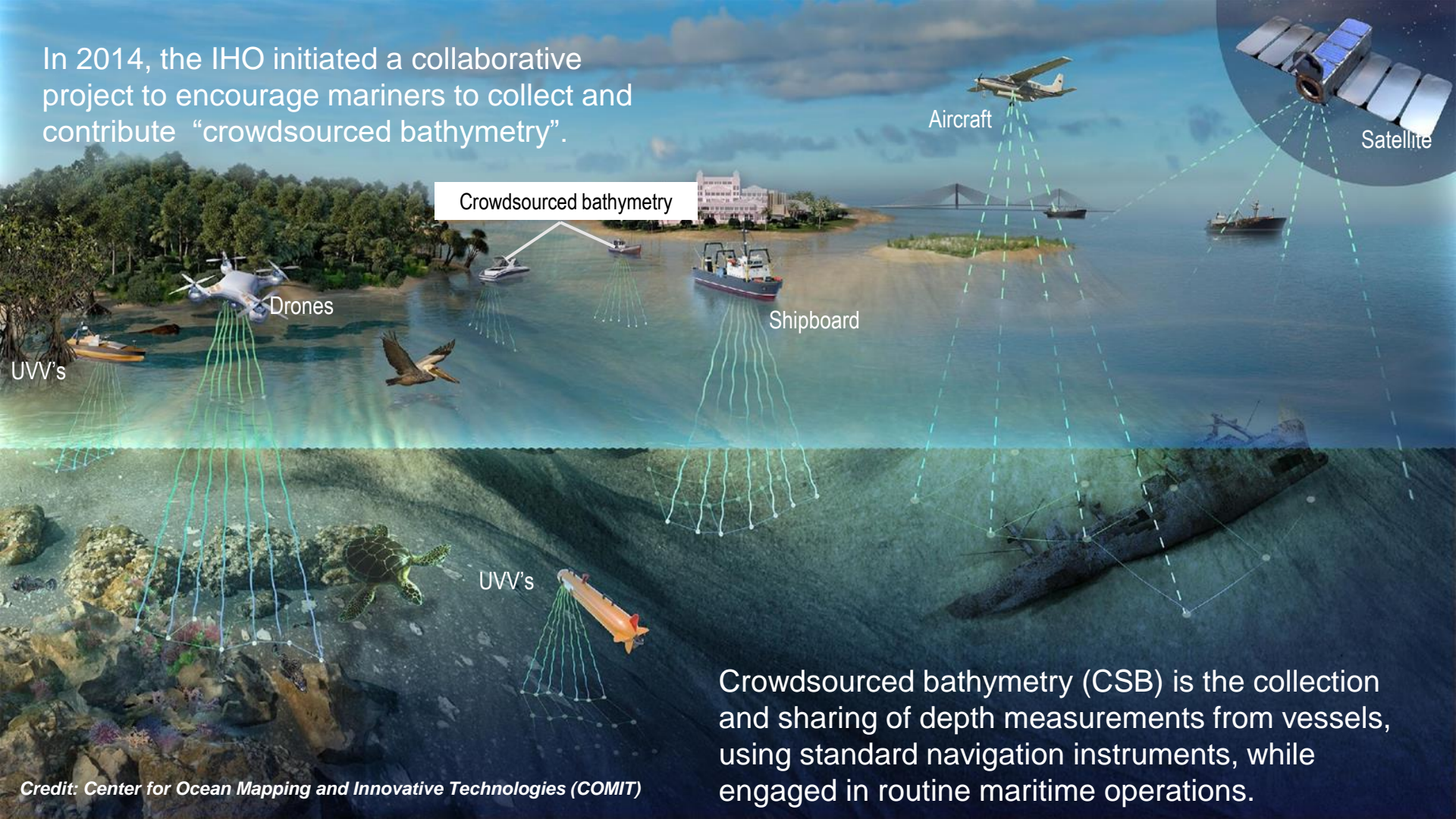
Stuart Caie

SWPHC CSB & Seabed 20230 Coordinator

scaie@linz.govt.nz



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



Crowdsourced bathymetry

Aircraft

Satellite

Drones

Shipboard

UUV's

UUV's

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

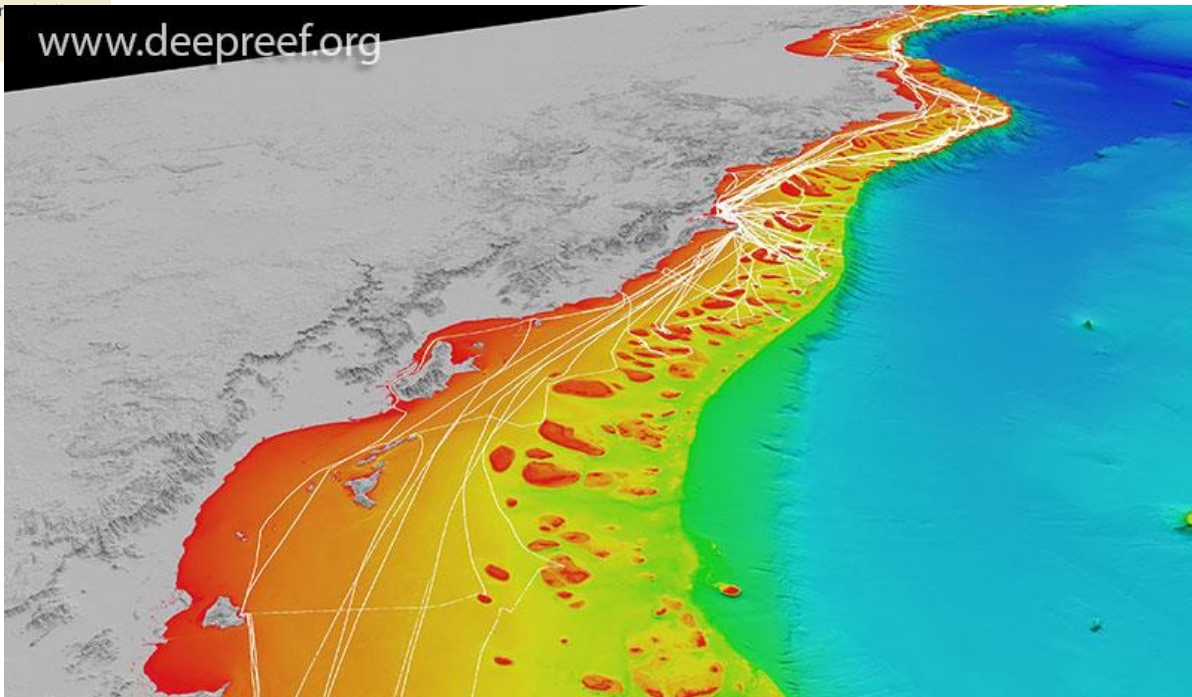


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The Value of CSB Data

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Or

www.deepreef.org



3D view of northern Great Barrier Reef showing all vessel tracks as of December 2019.

Credit: Robin Beaman

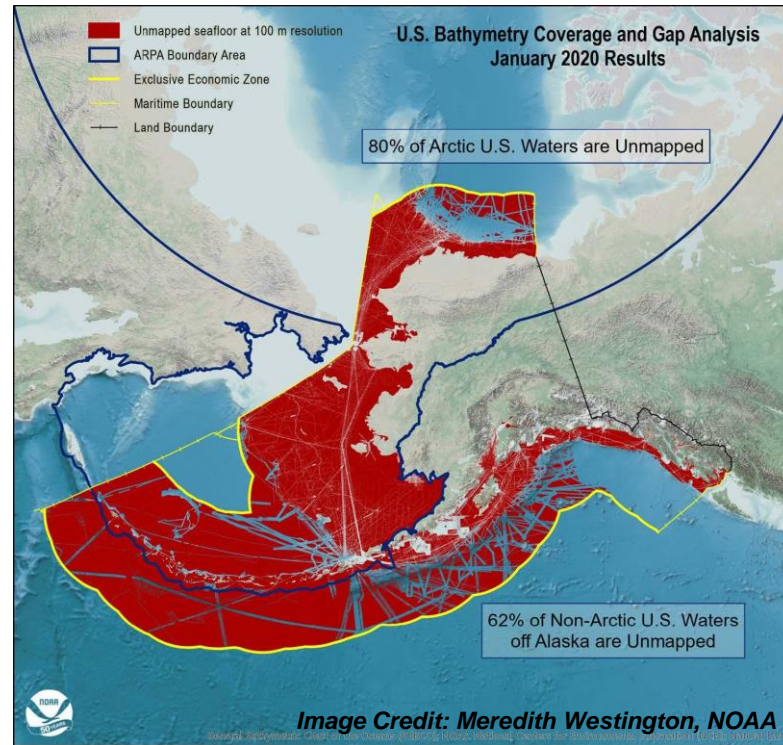
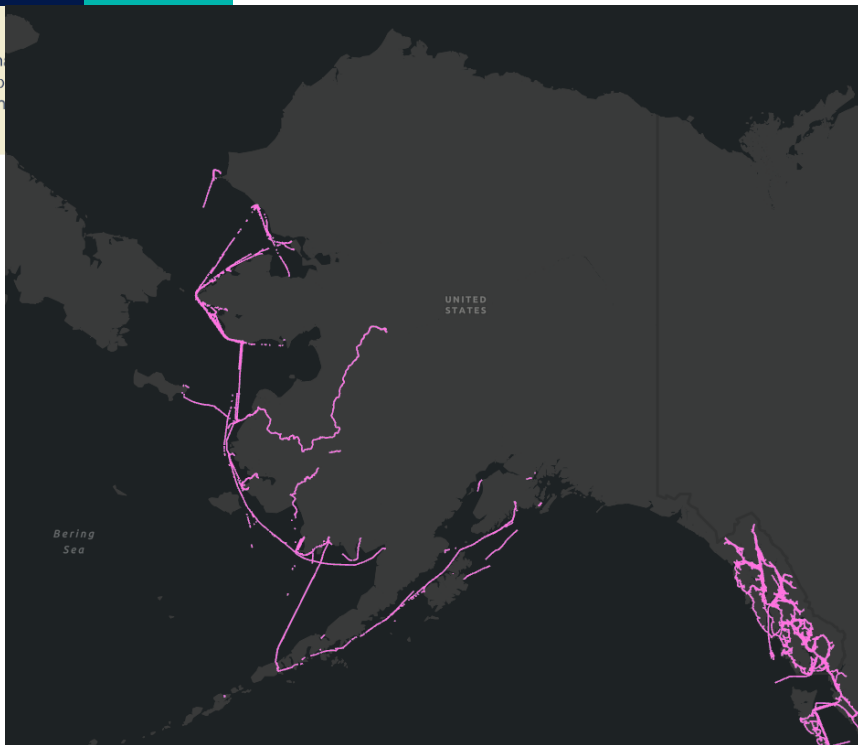
- Data with scientific, commercial & research value at little to no cost to the public sector
- Fill gaps where data is scarce (eg: Large Pacific Ocean States)
- Improving safety of navigation
- Supporting prioritisation for Hydrographic Authorities



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CSB in Alaska

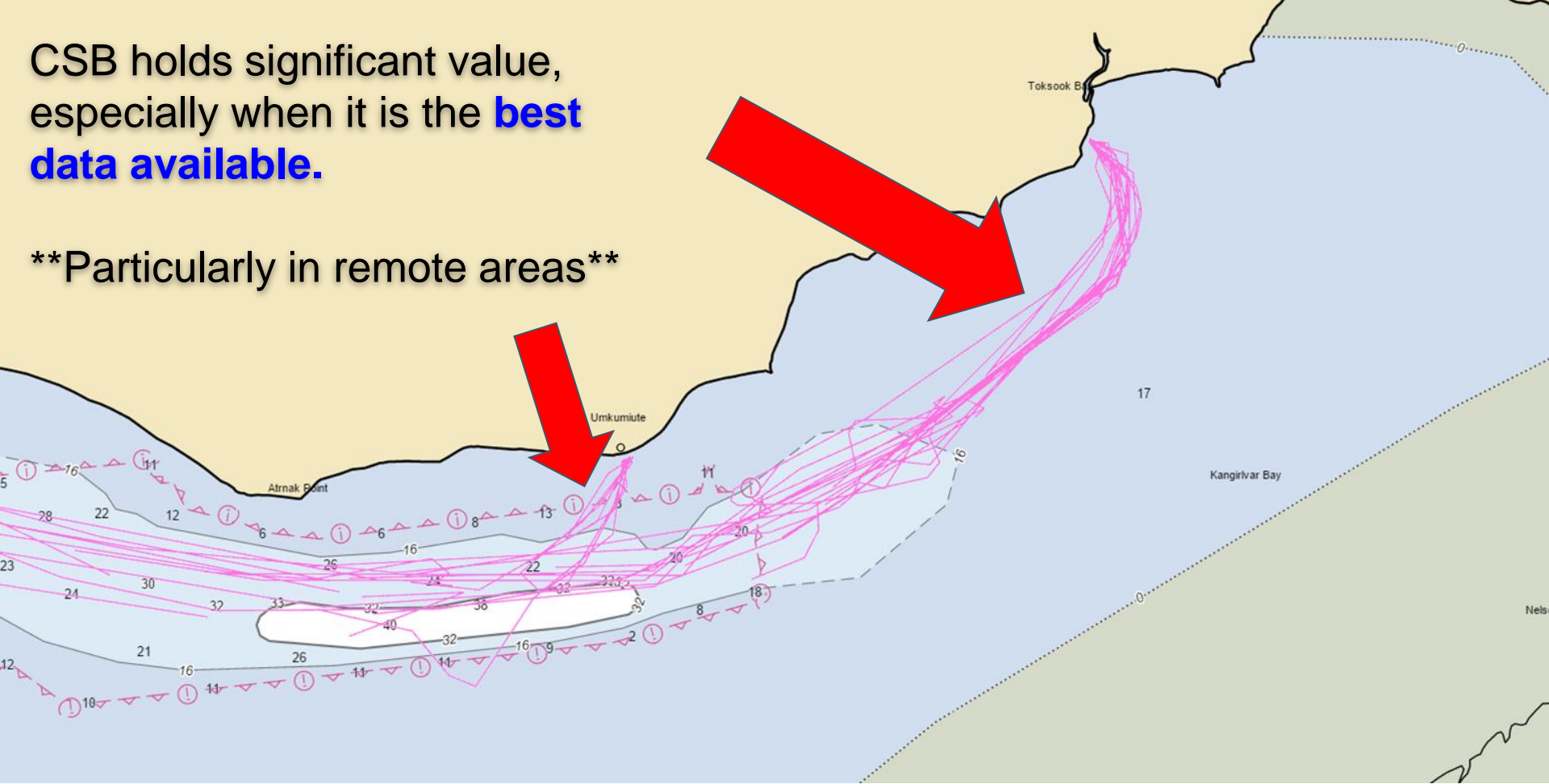
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CSB: a piece of the mapping solution

CSB holds significant value,
especially when it is the **best**
data available.

****Particularly in remote areas****

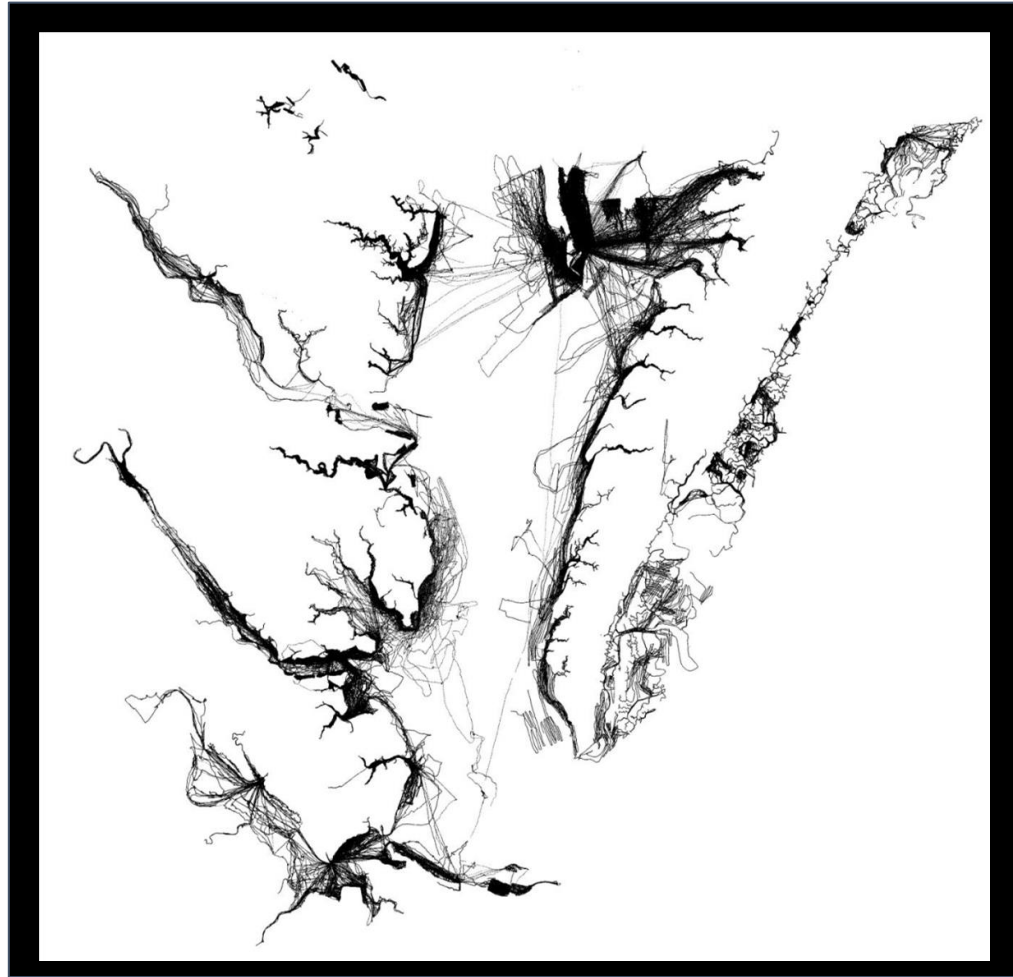




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CSB in Chesapeake Bay, U.S.

- Governor of Virginia asked the Virginia Institute of Marine Science to establish a program that would **hire commercial fishers to remove derelict crab traps**.
- 70 commercial fishers outfitted with Humminbird Side Imaging Sonar units
- While the units were initially used to simply GPS tag the traps for recovery, they were also recording the tracklines and taking depth readings.
- Over 4 year period, > 50 million data points were recorded.
- ***These invaluable data are now being processed and will ultimately result in a better mapped Chesapeake Bay!***



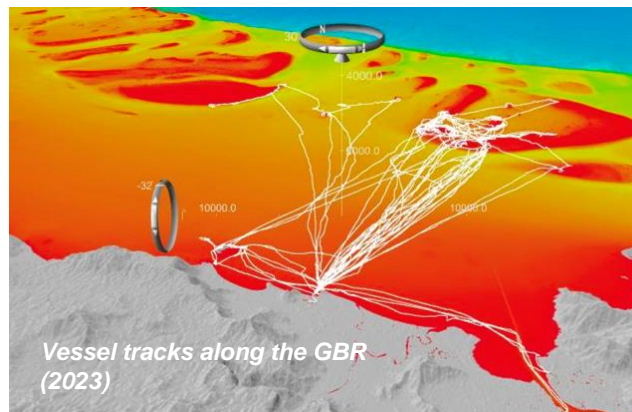
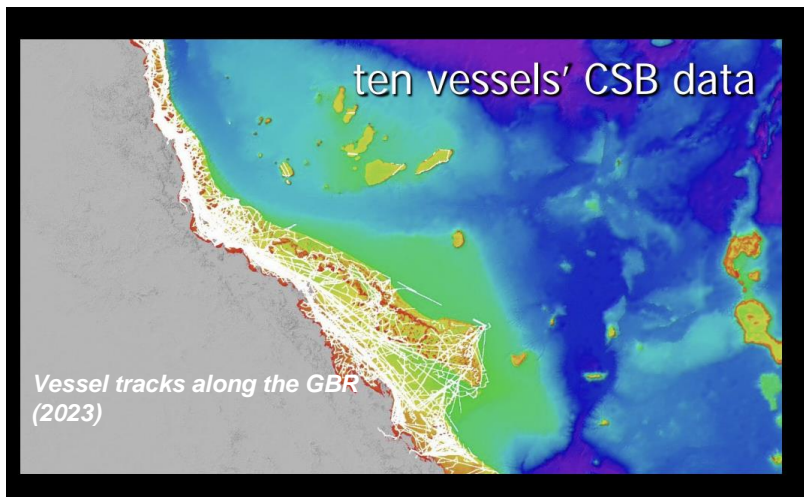


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CSB on the Great Barrier Reef

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“Around 40% of the vast Great Barrier Reef shelf has been mapped with digital depth soundings using modern equipment, but there are some remote areas lacking any digital depth data.” - Dr. Robin Beaman, James Cook University



SmartLog USB data logger

Beaman, R.J.

Publication: Crowdsourced bathymetry: Lessons learned, AusSeabed Community Webinars, 23 March 2023. AusSeabed, Cairns, Australia.



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SWPHC Involvement in CSB

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PALAU

- 17 Data loggers installed
- Data from 6 vessels successfully retrieved and shared with SB23030

KIRIBATI

- 2 Data loggers installed
- Signed the IHO-CL to allow CSB data during SWPHC21

FIJI & SAMOA

- Seabed2030 Data loggers for testing purposes



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CSB-BASED RESOURCES

CURRENT & UNDER DEVELOPMENT



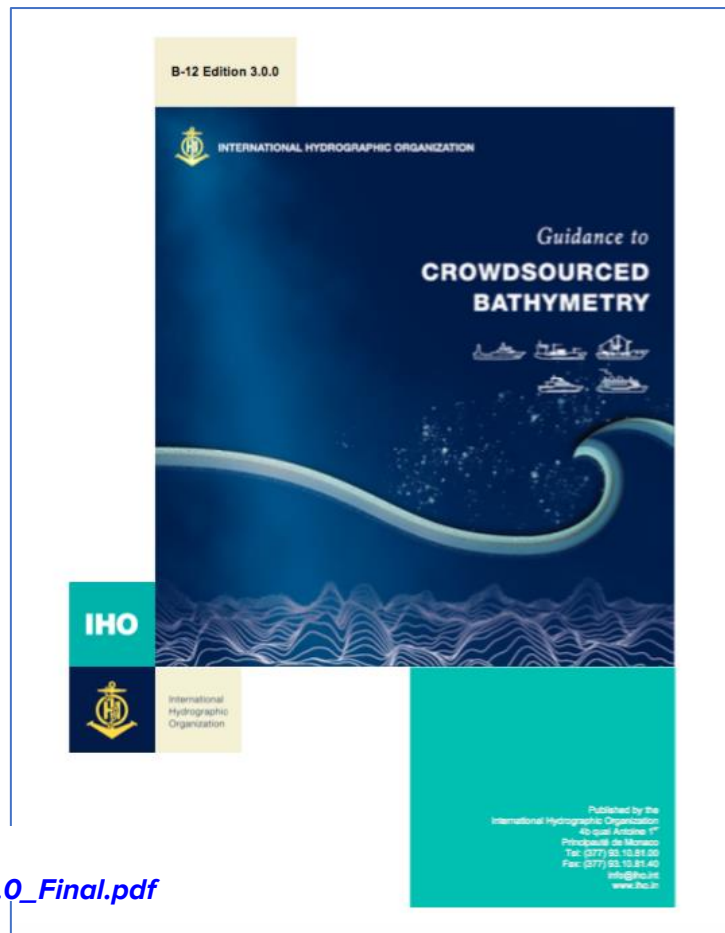
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B-12 IHO Guidance on Crowdsourced Bathymetry

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The CSBWG developed and maintains ***B-12 IHO Guidance on Crowdsourced Bathymetry***, that states the IHO's policy towards, and best practices for, the collection and contribution of CSB.

iho.int/uploads/user/pubs/bathy/B_12_CSB-Guidance_Document-Edition_3.0.0_Final.pdf

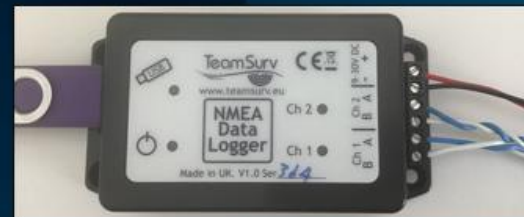


Data Loggers provided by Seabed 2030

Free data loggers provided to the community

Installation support

Assistance with data download and delivery to Seabed 2030 & IHO-DCDB





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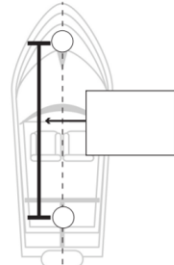
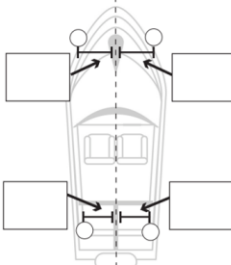
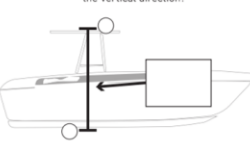
CSB User Tools

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CROWDSOURCED BATHYMETRY - VESSEL OFFSET MEASUREMENTS

Measurement Units (Circle One): meters (m) inches (in)

= Sensors (your GPS Antenna [not console] and Depth Sounder) - - - Vessel's Mid-Line
 ← → Measurements

<p>Measurement 1 How far apart are the sensors in the fore/aft direction?</p>  <p>GPS Antenna forward ← (circle one) → aft (behind) Sonar</p>	<p>Measurement 2 How far from the mid-line of the boat is each sensor*?</p>  <p>*Could be zero (0) if sensor is on midline. NOTE: Only 1 side of the center line needs to be filled in per sensor.</p>
<p>Measurement 3 How far apart are the sensors in the vertical direction?</p> 	<p>Participant Information</p> <p>Name: _____</p> <p>Email: _____</p> <p>Vessel: _____</p> <p>Approx. Draft (optional): _____ in or ft?</p> <p>Vessel Length (optional): _____ in or ft?</p>

Send a picture of this form to cms-comit@usf.edu

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WIBL Install Tutorial

A brief video tutorial of how to install the Wireless Inexpensive Bathymetry Logger (WIBL) developed by UNH CCOM/JHC (Brian Calder et al.). Applicable only to vessels with NMEA 2000 networks - NMEA 0183 tutorial forthcoming.



Vessel Offset Worksheet


A printable version of how to measure vessel offsets when installing a logger aboard a new vessel - or if a vessel has changed its equipment configuration. A picture or scan of the document can be sent to us at cms-comit@usf.edu.



Vessel Offset Online Form

An online option for submitting vessel offset metadata which can be done via a browser window on a laptop or cell phone. Click here to view a larger picture of the offset schematic.

<https://www.marine.usf.edu/comit/csbtools/>



WIBL Install Tutorial
Unlisted

COMIT | Center for Ocean Mapping & Innovative Tech
21 subscribers

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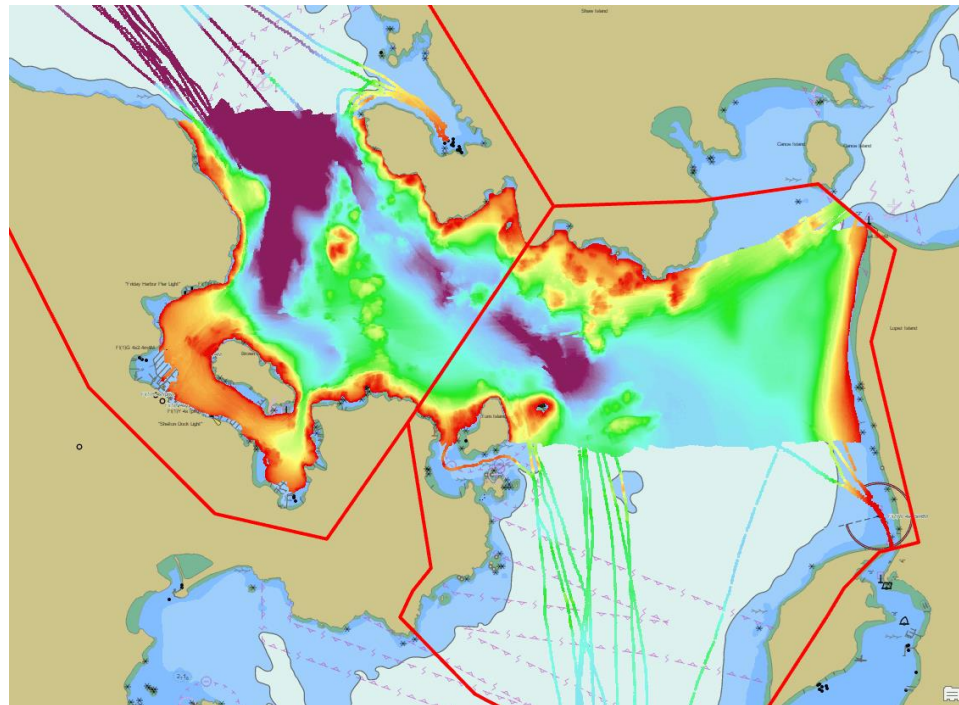


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CSB Processing Tools

NOAA is working to improve a publicly available CSB Processing Tool, including making it compatible with different tide data formats to be used in countries outside the NOAA Tidal Data API network.

- **Filter/Clean data** (i.e. erroneous dates, vessels named “Anonymous,” obvious depth fliers/outliers)
- **Tide correct** using discrete zone tide definitions
- **Derive and apply estimated vertical transducer offset** (transducer draft)
- **Grid/interpolate data**





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YOUR RHC CSB/Seabed 2030 Coordinator

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Suggested Coordinator Activities:

- Ensure that SB2030 & CSB are part of the RHC agenda.
- Liaise with appropriate GEBCO SB2030 Regional Data Centres
- Serve as a member of the IHO CSBWG & as the point of contact to the relevant Seabed 2030 Regional Centers. Attend both meetings.
- Provide updated SB2030 and CSB statistics and information to RHC (presentation and report) to be included in annual IRCC report.
- Encourage positive responses to IHO CL 21/2020 and IRCC CL 01/2020

South West Pacific Hydrographic Commission 2-day Capacity Building Workshop Hydrographic Governance 20-21 February 2023





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CSB Working Group

Representatives from 18 Member States: Canada, China, Denmark, France, Germany, India, Iran, Italy, Lebanon, Mexico, Netherlands, New Zealand, Norway, Portugal, South Africa, Sweden, UK, Uruguay, USA

Observers and expert contributors: CCOM-JHC, CIDCO, CIRES, Da Gama Maritime Ltd, Dongseo U, Dock Tech, ECC AS, ESRI, FarSounder, FLIR Systems AB, Fugro, GMATEK, Inc., Great Lakes Observing System (GLOS), H2i, James Cook U, JAMSTEC, Navico/C-Map, ONE Data Tech Co., Orange Force Marine, PYA, Seabed 2030, Sea-ID, SevenCs/ChartWorld, Teledyne CARIS, World Maritime University, and World Ocean Council



CSBWG14 - Stavanger, Norway, August 2023

The CSBWG is a great way to learn about CSB!

There is active participation from representatives of hardware and software companies along with scientists and hydrographers eager to collect and use these data.

If you want to learn more about the technology, the progress of ongoing projects, and new projects or if you or your Hydrographic Offices have questions or concerns about CSB data collection or sharing, consider joining or just attending the CSBWG.

OR...reach out to you CSB Coordinator!

CSBWG15 - April 2024, Monaco



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CSBWG New Work Items

- A. Maintain and update IHO CSB Guidance Document (B-12)
- B. [Submit IHO CSB initiative as a UN Decade Action](#)
- C. Gather, prioritize and respond to HO-specific issues/opportunities regarding national policy/regulations related to CSB
- D. [Gather and prioritize HO-specific issues relating to CSB data, including but not limited to Nautical Cartography](#)
- E. Support CSB/SB2030 Coordinators in their RHC engagement
- F. [Discuss and propose potential software tool support for HOs](#)
- G. Clarify support identified by current Trusted Nodes needed for current and future Trusted Nodes.
- H. Clarify all aspects of the CSB data cycle and capture known issues, requirements and suggested enhancements.
- I. Develop a communication plan in coordination and collaboration with related efforts (SB2030, GEBCO, etc)
- J. Develop a recognition & incentive strategy plan



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IRCC WORKSHOP ON CROWDSOURCED BATHYMETRY

Tentatively Planned for 26 April 2024

Virtual

[CL 14/2024.](#)



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A BATHYMETRY DATA MANAGEMENT WORKSHOP

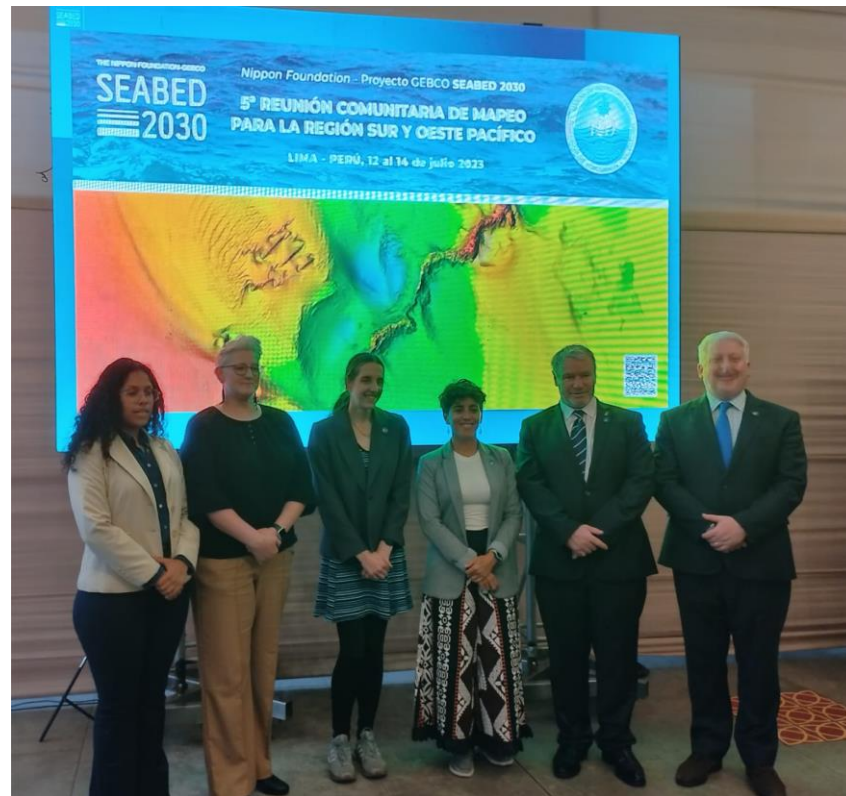
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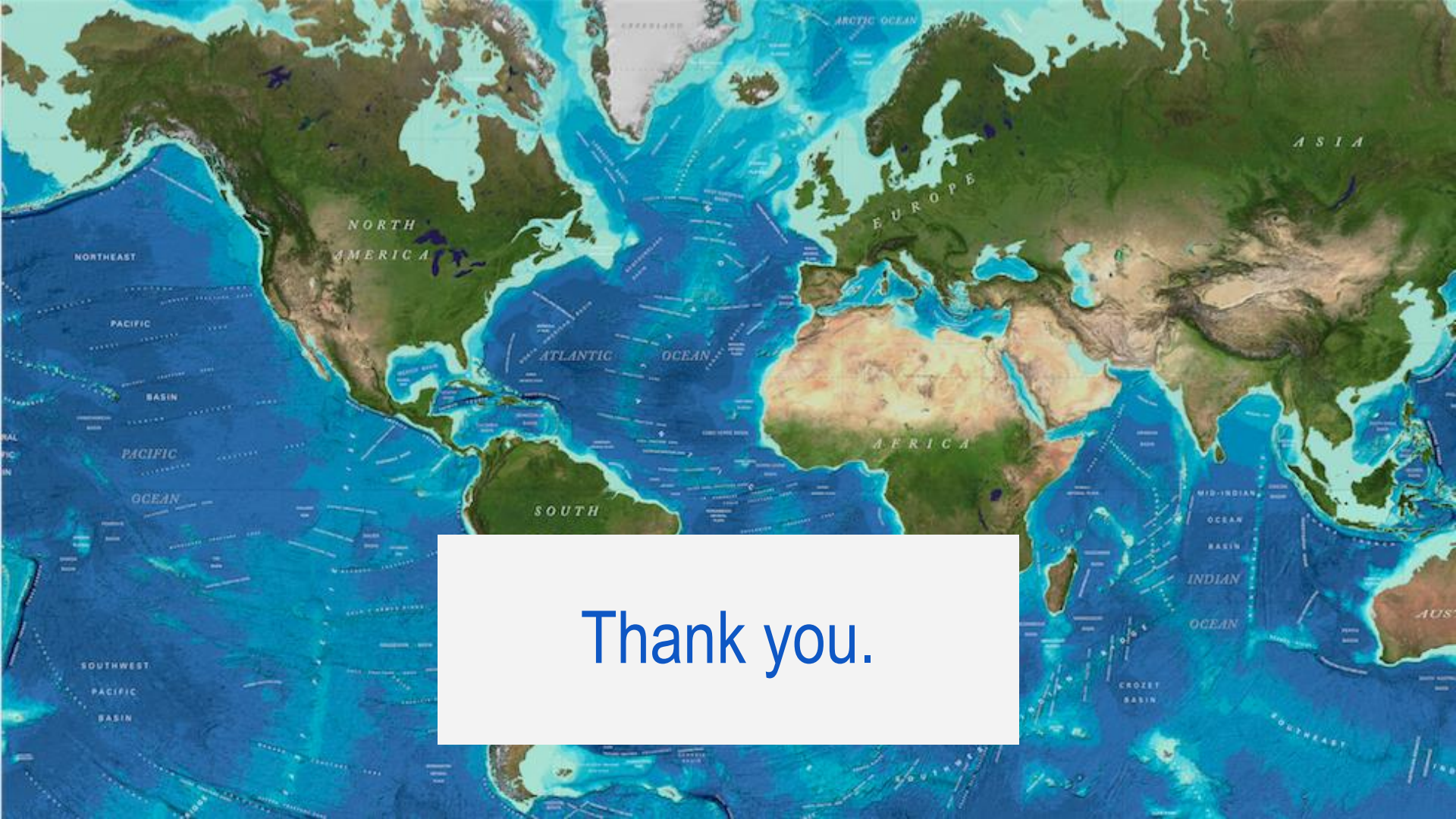
A Proposal:

At November Seabed 2030 Regional Mapping Meeting in Fiji, we propose covering CSB in the Workshop.

Objectives include:

- How to organize CSB data when downloaded from a data logger
- How to manage metadata
- How to send CSB data to SB2030





Thank you.