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## *13<sup>th</sup> CSBWG Meeting*

*10 – 12 January 2023  
Boulder, Colorado, USA*

# **SOUTH AFRICAN CROWD-SOURCED BATHYMETRY (CSB) PROJECT UPDATE AND LESSONS LEARNED**

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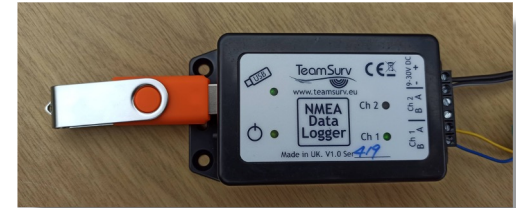
# BACKGROUND



1. Agreement reached to participate in a trial with the IHO and Seabed 2030 by deploying data loggers in RSA waters, for eventual roll-out to SAIHC.
2. SANHO / Institute for Maritime Technology (IMT) technical partnership.
3. The trial concept: **Part 1: Data Collection**
  - Seabed 2030 supplied data loggers to South Africa
    - 50 TeamSurv NMEA Data Loggers (2020)
    - 50 Yacht Devices Voyage Recorder (2021)
  - Technical visits, logger installation, setting to work and initial data processing - IMT.
  - Checking data, QC, rendering and preserving data in central database before distribution to Seabed 2030 community - SANHO.

## **Part 2: Data Sharing**

- Existing survey data / bathymetric datasets / gridded products - Survey / Exploration / Engineering sectors.
- Low density datasets & gridded products (large grid/bin sizes), polygons of areas surveyed/explored where data exists.





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# PART 1: DATA COLLECTION



## Part 1: Data Collection

1. The task of identifying and introducing the concept to local and regional role-players (Part 1 & 2) is ongoing – total of 35 stakeholders have been identified and approached, of which 24 responded favourably. **Ongoing**
  - Commercial fishing industries / Small scale / Subsistence fishing community
  - Recreational boating
  - Government vessels
  - Private sector
2. Currently data loggers installed onboard 5 vessels.



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# PART 1: DATA COLLECTION



**“Sea Lab 1”, IMT**  
– trial deployment, SOP development



**Lower Breede River Conservancy**  
– Patrol Boat (ski-boat)  
– data to be retrieved (TeamSurv)



**“M/V Edinburgh”**  
– Ovenstone Agencies (Tristan Lobster)  
– 4 deployments to Tristan Da Cunha  
– 70% success rate  
– data received/processed (TeamSurv)



**“Why Knot”**  
– Lower Breede River Conservancy  
– private recreational boat  
– data to be retrieved (TeamSurv)



**NSRI Rescue Launches (2)**  
– Station 10 & 17  
– 50% success rate  
– 10: data received/processed (TeamSurv)  
– 17: initially reported as no data recorded (Yacht Devices)



**NSRI Rescue Launches (1)**  
– Undergoing trials  
– 1<sup>st</sup> East Coast vessel (Durban)



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## PART 2: DATA SHARING



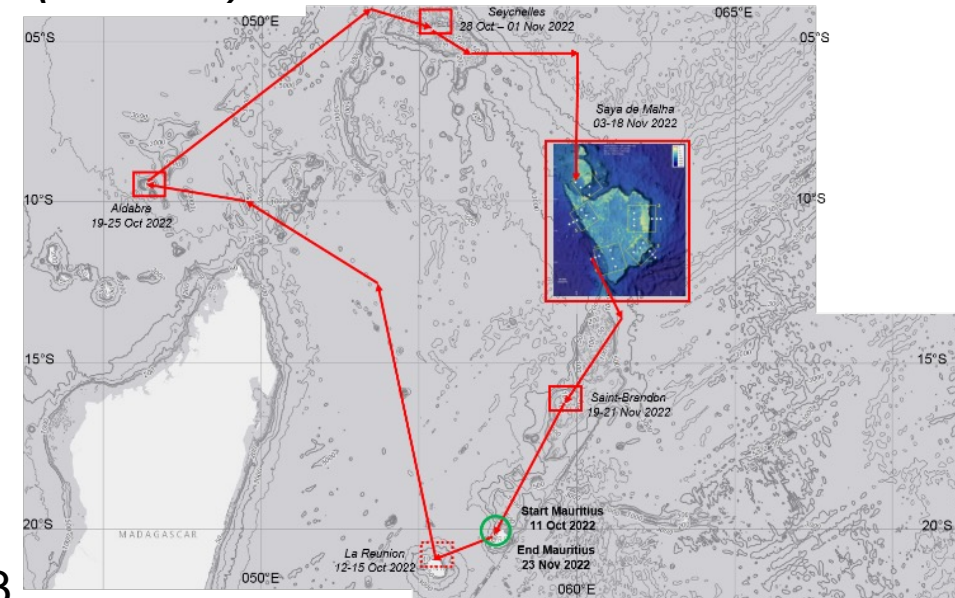
### Part 2: Data Sharing

4. Data Sharing: - **8 stakeholders providing datasets & gridded products,**  
- **1 providing polygons of areas surveyed,**  
- **1 talks in progress, and 5 stakeholders provided further contact information only**  
- **3 new potential stakeholders (loggers and/or data)**  
- **shared data collated, submitted to GEBCO (Feb 2022)**  
- **1 contributor currently processing collected passage soundings:**  
**Monaco Explorations - Indian Ocean Expedition (late 2022)**

5. Establish a feedback loop to coordinate activities and provide up to date information on activities, challenges and opportunities:

**Ongoing**

6. Provide ongoing technical assistance when required: **Ongoing**  
7. Participation credited on SANHO website: **Ongoing**  
8. Inviting SAIHC Member States & Primary Charting Authorities to participate in CSB efforts.





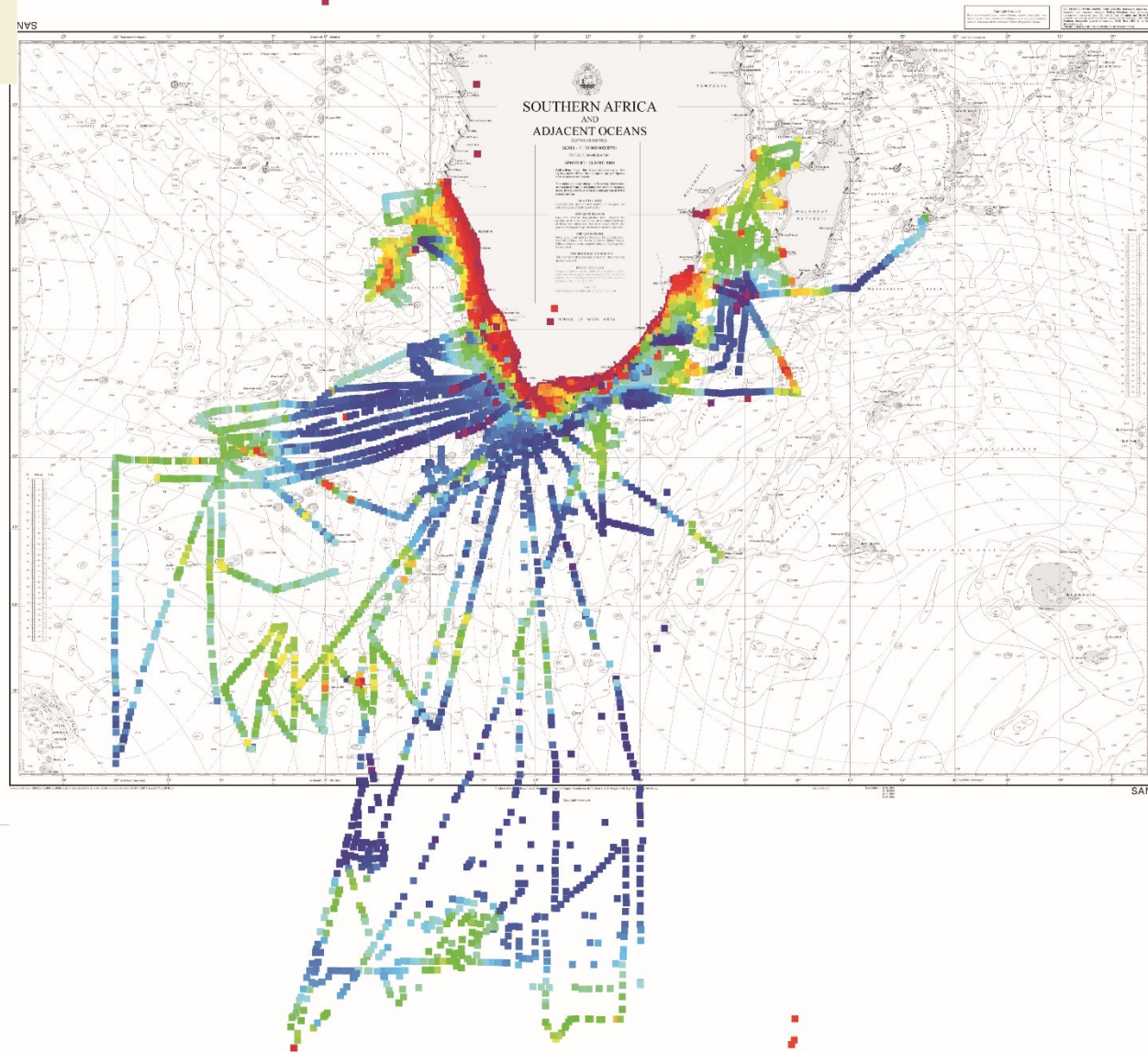
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## PART 2: DATA SHARING



Shared data submitted  
to GEBCO Feb 2022



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# CHALLENGES & OPPORTUNITIES



## Challenges:

- Low / tentative responses from commercial fishing and offshore mining industries: commercial sensitive information → continue talks, application of “Blue Economy” (Operation PHAKISA) initiatives. **Ongoing**
- COVID-19 Pandemic restrictions: quarantined vessels, restrictions on travel/meetings easing off, “recovery mode” – not willing to commit until ops/situation has stabilised. **Ongoing**
- Lengthy decision-making processes for participation approval: → continuous follow-up. **Ongoing**
- Limited off-the-shelf deployments: mostly coastal traffic, used bolster own database and develop “showcase model”. **Ongoing**
- SAIHC Member States not committed to CSB yet: Member States invited to note IHO Circular Letter 06/2020, and encourage authorities to participate in CSB within National Waters of Jurisdiction. **Ongoing**
- Data acquisition and processing: variety of sensors presents variety of data formats, especially with TeamServ loggers → Python open source code adaptable to meet individual data string requirements for processing essential data, but at this point there is no “one code for all” solution. **Ongoing**
- TeamServ USB reliability: 2/4 TeamServ loggers experienced faulty USB devices, resulting in 2<sup>nd</sup> M/V Edinburgh deployment data not being recorded → replace TeamServ USBs with 16GB commercial off the shelf USB devices.
- Data quality: lack of calibration and sensor synchronisation (no 1PPS) presenting possible quality issues to SP-44, as well as challenging processing .



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# CHALLENGES & OPPORTUNITIES



## Challenges:

- Data on NMEA 2000 loggers generally significantly more than logging two NMEA 0183 streams: The sheer amount of data collected on an NMEA 2000 data logger is staggering on newer vessels. Especially with GNSS devices streaming position information at 10Hz, it can quickly fill a memory card → The NMEA 2000 data loggers can be configured to discard certain type of messages from the network, and this configuration information is stored in a small text file on the same memory card that the data is logged on, but often gets cleared when data is submitted and card is formatted, repeating the cycle and filling the card. → On vessels that operate 24/7, the volume of data a NMEA 2000 data logger will collect need to be carefully taken into consideration.
- Boat operators handling data: From vessel operators the following issues presented themselves:
  - Vessel operators typically do not have a great interest in handling data files.
  - They typically do not have free time and motivation to learn on managing the data collected on their vessel(s). They are not paid for this task.
  - Sending bulky data over the Internet is a challenge. Doing this from the boat through a cellular phone connection is costly and a computer is required for this. Typically a laptop is not taken with on a small seagoing boat. If the storage media has to be taken home, the data transfer task has less of a chance to be done.
- A remedy is using larger capacity data storage media, which requires less interaction with data loggers. Even once a year should be sufficient on a 24/7 operated vessel.





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# CHALLENGES & OPPORTUNITIES



## Challenges:

- Corrosion on-board ski-boat: Ski-boats going out to sea does not really have space that is sheltered from salty moist air. The photo below is of a NMEA Tools NMEA0183 logger fitted to a ski-boat under the steering wheel console. This is the only relatively dry part on the boat.



- After a couple of months after installation, the logger and flash drive metal parts were rusted severely.
- As a simple remedy the data loggers on small boats can be installed within an enclosure to prevent ingress of salty moist air. Using the plastic Sandisc cruiser blade USB flash drives should also help reduce issues experienced with corrosion. To keep the salty marine air away from data loggers in small vessels, it was reinstalled within an enclosure.





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# CHALLENGES & OPPORTUNITIES



## Opportunities:

- Primary Charting Authorities: invited to share CSB/GEBCO/Seabed 2030 contributions and activities with appropriate Hydrographic Commission CSB coordinators to track progress, identify challenges and opportunities.
- “First to Jump” willingness: initial challenge turned to opportunity → develop “showcase model” to demonstrate process and results:
  - M/V Edinburgh paved the way.
  - 1<sup>st</sup> 2 NSRI launches proving concept, targeting next 8 launches to be built with loggers fitted as standard.
  - Lower Breede River Conservancy volunteered patrol boat, followed by “Why Knot” → building trust and confidence with other owners/operators hopefully following suit.
  - 2 Small craft harbours and estuarine areas identified for CSB activities – Berg River Estuary & Kleinmond.
- Local benefit: CSB providing opportunity for users of local inshore and estuarine waterways to collect data for creation of navigation aids where no official charts exist/supplement existing charts:
  - direct, tangible benefit to local users in the form of navigation aid.
  - cooperative relationship between SANHO, SA Maritime Safety Authority and boat owners/operators.
  - local zoning of waterways, safety of life and property.

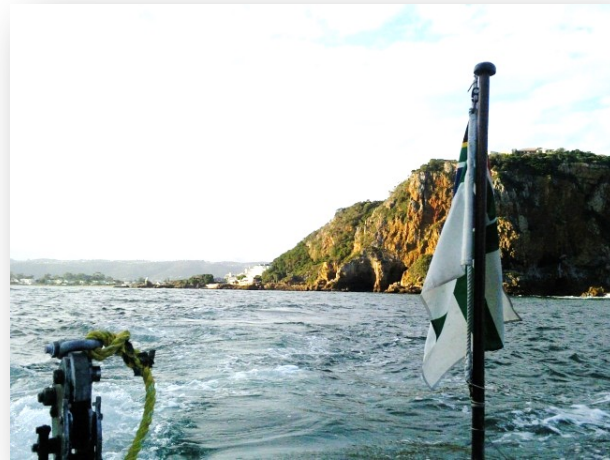


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**Thank You**



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