



A WHOLE NEW VISION UNDERWATER

FarSounder Customer Data Collection Project

A brief overview of the progress FarSounder has made collecting crowdsourced ocean data from our users for the CSBWG9 meeting

Heath Henley

Software Engineer

heath.henley@farsounder.com

Matthew Zimmerman

VP Engineering

matthew.zimmerman@farsounder.com

Abstract

FarSounder has been collecting sonar data from customers in remote locations around the globe for a few years now. We have received more than 30 TB of sonar data from customers' expeditions. The data collected is from many fascinating areas including a transit of the Northwest Passage, from Boston to Antarctica, following the west coast of South America, and the South Pacific. When in poorly charted or uncharted waters, the interesting bathymetric features and navigational hazards that can be observed in this data are invaluable. FarSounder began participating in the Crowd Sourced Bathymetry initiative as a Trusted Node so that willing customers can now share portions of their data with the DCDB database to benefit the entire community.

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Project Summary

FarSounder Introduction

FarSounder develops and manufactures 3D Forward Looking Sonar systems for navigation and obstacle avoidance in real-time. Products range from a maximum hazard detection range of 350m to 1000m. Many customers use FarSounder's sonar to help navigate remote, poorly charted waters, in real-time. Hazards are detected in front of the vessel out to the maximum detection range, and in water less than 50m in depth of the seafloor ahead of the vessel is detected. These depth measurements are obviously useful in real time to the current user, however, if they are collected and stored, they can be used to the benefit of any future mariners in that area. With this motivation, FarSounder has been developing the capability to collect and share this bathymetric data, and working with Crowdsourced Bathymetry Working Group to allow willing customers to submit their data.

Project Background

FarSounder has been collecting data from a select group of customers for years, including data from FarSounder's 3D Forward Looking Sonar (3D-FLS), along with data from other sensors including position, inertial and depth sounders. In January of 2019, our Expedition Sourced Ocean Data Collection Program was officially launched and participation opened up to a wider range of our customer base. We have received more than 30 TB of data from our users for various locations around the world.

Figure 1 shows an overview of all of the places from which we have received data to date. The symbols on the map represent a handful of pings of FarSounder 3D-FLS data, along with the associated metadata and the data from other sensors aboard the vessel.

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Figure 1 - Overview of all of FarSounder's global database.

Each distinct color in *Figure 1* corresponds to a cruise with a unique vessel. A trip from Boston, MA to Antarctica, a transit of the Northwest Passage, a transatlantic voyage and some data from the South Pacific are some of the trips included.

Progress - Data Collection & Submission

Two main objectives that we achieve via collecting data from users of our equipment in the field:

1. Analyze and improve performance of our systems in different sets of environmental conditions.
2. Allow users willing to participate, to volunteer the data they've collected with their system back into the DCDB Crowdsourced Bathymetry Database to be made openly available.

Objective 1 helps us to develop and improve our products to best fit our customers needs.

Objective 2 though, allows our customers to directly contribute their bathymetric data to the community. Our progress in fulfilling this objective so far includes becoming an IHO/NOAA Trusted Node, so that we can submit data that our customers have collected, and with their

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permission, submit it to the open database for the community to use to their benefit. At this point, we have submitted datasets including Northwest Passage transit, the transit from Boston to Antarctica, and some data from the south coast of New Zealand. The data that we are submitting at this time includes the vessel's depth sounder data fused with the time and GPS data from the trip (along with additional metadata).

A look ahead

Currently, we are collecting data from select users of our 3D-FLS systems, along with the other sensor data, as mentioned above. At this point, we have started by submitting only "single track" data from the vessels, or the depth data reported by the vessel's echosounder, not by the 3D-FLS system. This is how we decided to get started, because the current crowdsourced bathymetry pipeline is set up to accept this format of data - eg a line of soundings, with a position and timestamp, and some metadata. However, a FarSounder 3D-FLS generates a swath of bathymetric data, similar in width to a MBES in shallow water (FarSounder's navigational 3D-FLS products detect bottoms shallower than 50 meters). This type of bathymetric, a swath along the vessel's path, is more valuable than a line of soundings, so in the future, it would be beneficial, especially in remote areas that have either not been surveyed, or have not been recently surveyed, to submit this data into the public database.

Conclusion

In summary, FarSounder is glad to report that we have been receiving more and more data from users out in remote areas. We currently have 11 customers collecting data with their systems in remote locations. As the data comes in we work to process it and incorporate it into our own database, and then upload in batches to the DCDB Crowdsourced Bathymetry Database.

If you have any questions about the project or ideas or suggestions, or if you're a customer who would like to begin collecting data, we'd love to hear from you! You can contact us via our emails above, or at: info@farsounder.com

Further if you would like to stay up to date with FarSounder news, you can sign up for our monthly newsletter at (in the page footer): <http://www.farsounder.com/>

Additional Reading

Below we've included some additional references related the project, and to collecting bathymetric data using a FarSounder 3D Forward Looking Sonar:

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1. A FarSounder Tech Blog providing a project update and showing what some 3D-FLS swath bathymetry data looks like:
<http://www.farsounder.com/technology/blog/expedition-sourced-data-collection-program-progress-update>
2. The FarSounder Tech Blog introducing the project in January 2019:
<http://www.farsounder.com/technology/blog/expedition-sourced-ocean-surveying-seafloor-program>
3. A qualitative overview and comparison of some 3D-FLS data and MBES data in Portsmouth, NH:
<http://www.farsounder.com/technology/blog/surveying-seafloor-looking-ahead-see-below>
4. A conference paper comparing the accuracy of FarSounder 3D-FLS data NOAA MBES survey data in Narragansett Bay, RI, presented at OCEANS in Anchorage, 2017:
http://www.farsounder.com/files/3dfls_applications_oceans_2017.pdf

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