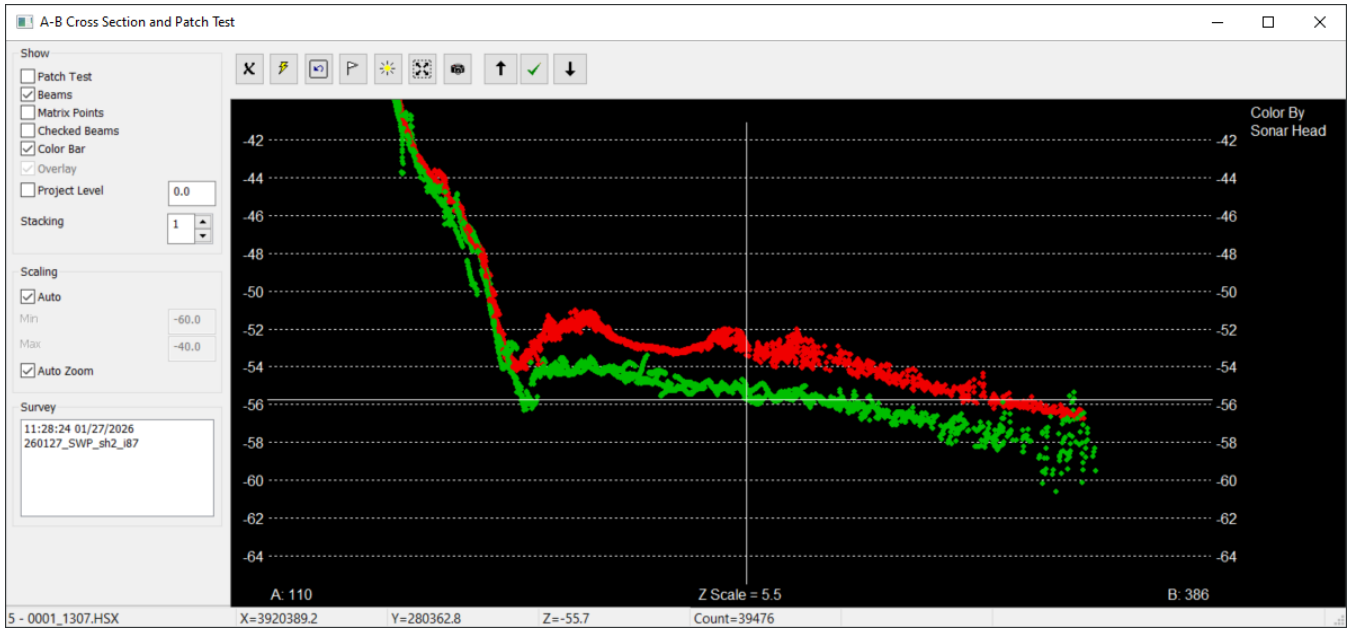
Changes to Support Full Coverage Mapping Through Fluid Mud

by Mike Kalmbach

We've been working with Andrew Oakman and the USACE New Orleans district to make display updates that support mapping through fluid mud. They are using a dual frequency NORBIT WINGHEAD i87S multibeam to collect high (440 kHz) and low (50-80 kHz) frequency data simultaneously. Our goal in HYPACK® is to facilitate data collection and processing to support the creation of the safe navigation surface. See Mapping through fluid mud | Hydro International by Pawel Pocwiardowski for the rationale. Here is a summary of work done in HYPACK® so far.

'Fake' Dual Head

In HYSWEEP® Survey, we interface to the NORBIT using our dual head driver. While the dual head driver is normally used for separated, rotated systems (for extended swath coverage), it is used here to separate high and low frequencies. When *.HSX files are loaded for processing with sonar head colors selected, you will see something similar to the following window. In this example, Sonar Head 1 = Red = High frequency, Sonar Head 2 = Green = Low frequency.



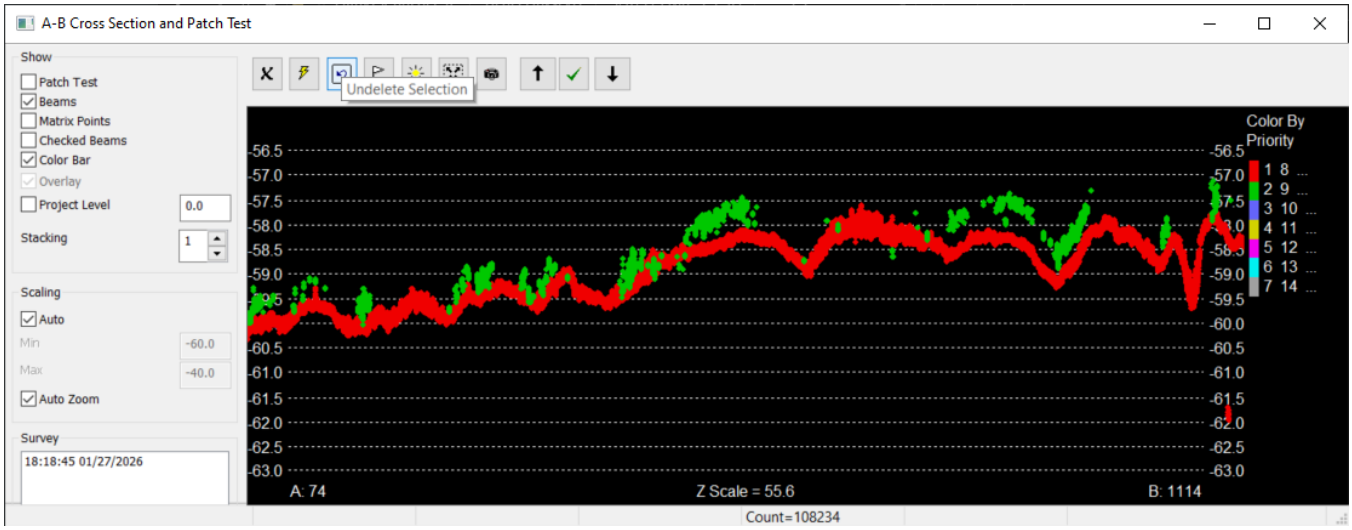
NORBIT S7K Files

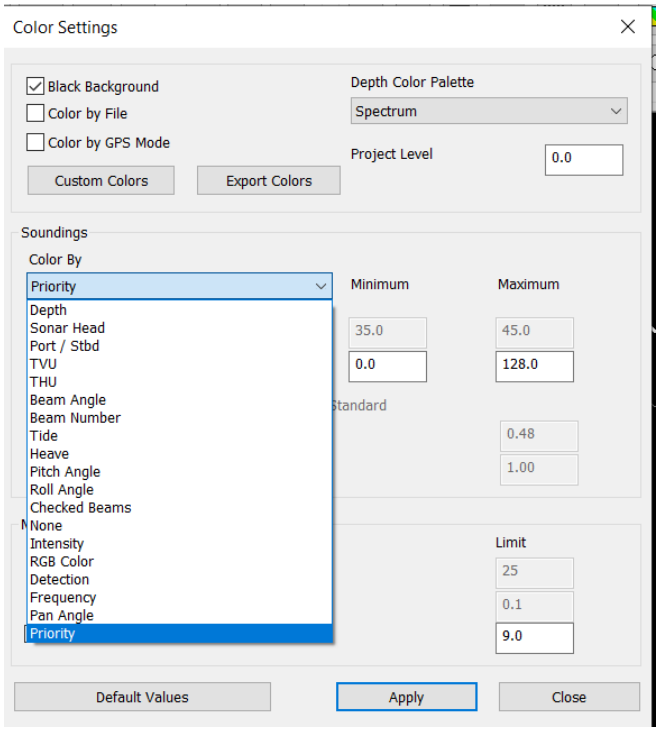
NORBIT logs data to *.S7K files. We can read these files into the HYSWEEP Multibeam Editor (MBMAX64) for processing, but high and low frequencies are not combined as with HYSWEEP *.HSX.

Multiple Detections and Detection Priority

NORBIT uses LMD (Layered Media Detection) to process signals and obtain additional information on detection differences between high and low frequency. I don't fully understand the details but from the HYPACK point of view, LMD provides flagging to indicate which frequency is the best detection, where detection priority code 0 = best (use this frequency). Other coding is related to LMD detection processing, and we do not use those.

We've added the ability to color code frequencies according to detection priority code in the MBMAX64 displays. So detection priority code 0 = color 1 = red, detection priority code 1 = color 2 = green. So in this case, red is the best detection surface as determined by LMD and all others can be discarded.





To color code each frequency by detection priority, open the Color Settings, and from the Soundings -> Color By drop down, select Priority and [Apply]. This is a new MBMAX64 feature included in HYPACK 2026.

Future Work

As USACE determines best practices, we will provide additional updates!

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