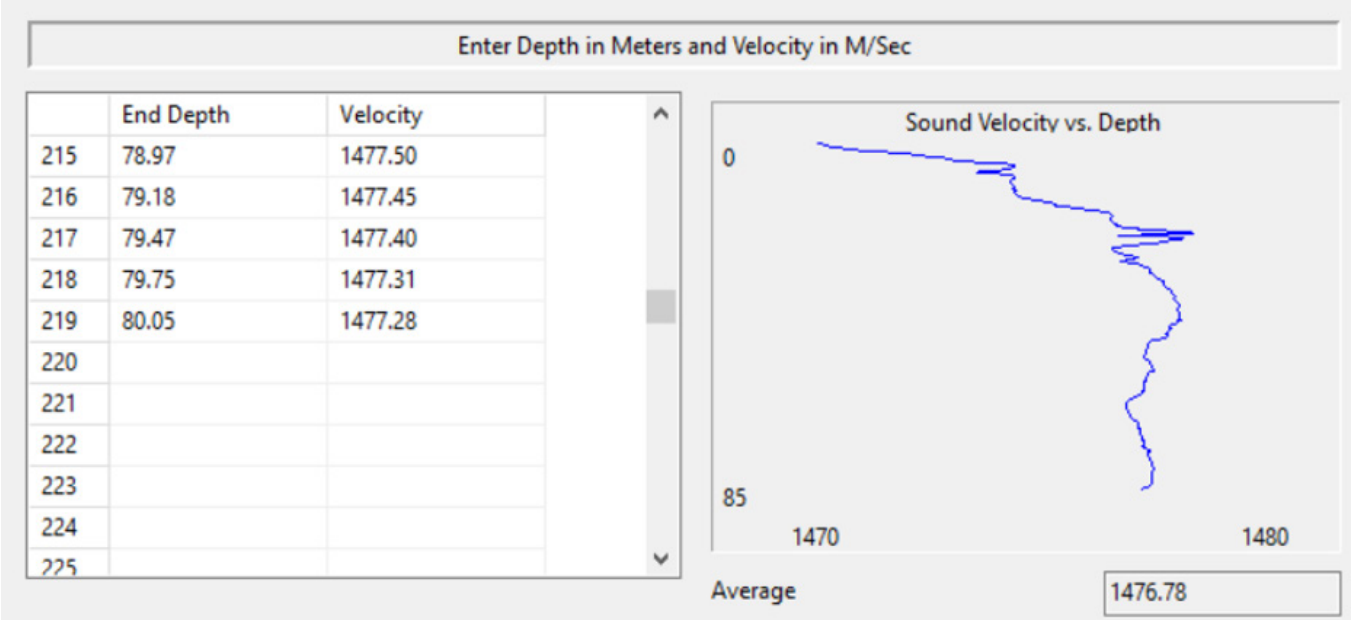
MBMAX64 SVP Notes and Extrapolation Update

by Mike Kalmbach

There was recent confusion from a customer about multibeam soundings in 300 meters of water. MBMAX64 data did not match with historical data from a different software. After looking into this issue, the discrepancy in sounding values between MBMAX64 and the other software was due to the difference in how sound velocity profile (SVP) data is modeled beyond the maximum working depth of the user's SVP sensor.

The image below shows a sound velocity cast that has acquired lots of samples down to 80 meters but nothing beyond that depth. What happens between 80 and 300 meters? We don't know, so there needs to be some kind of extrapolation.



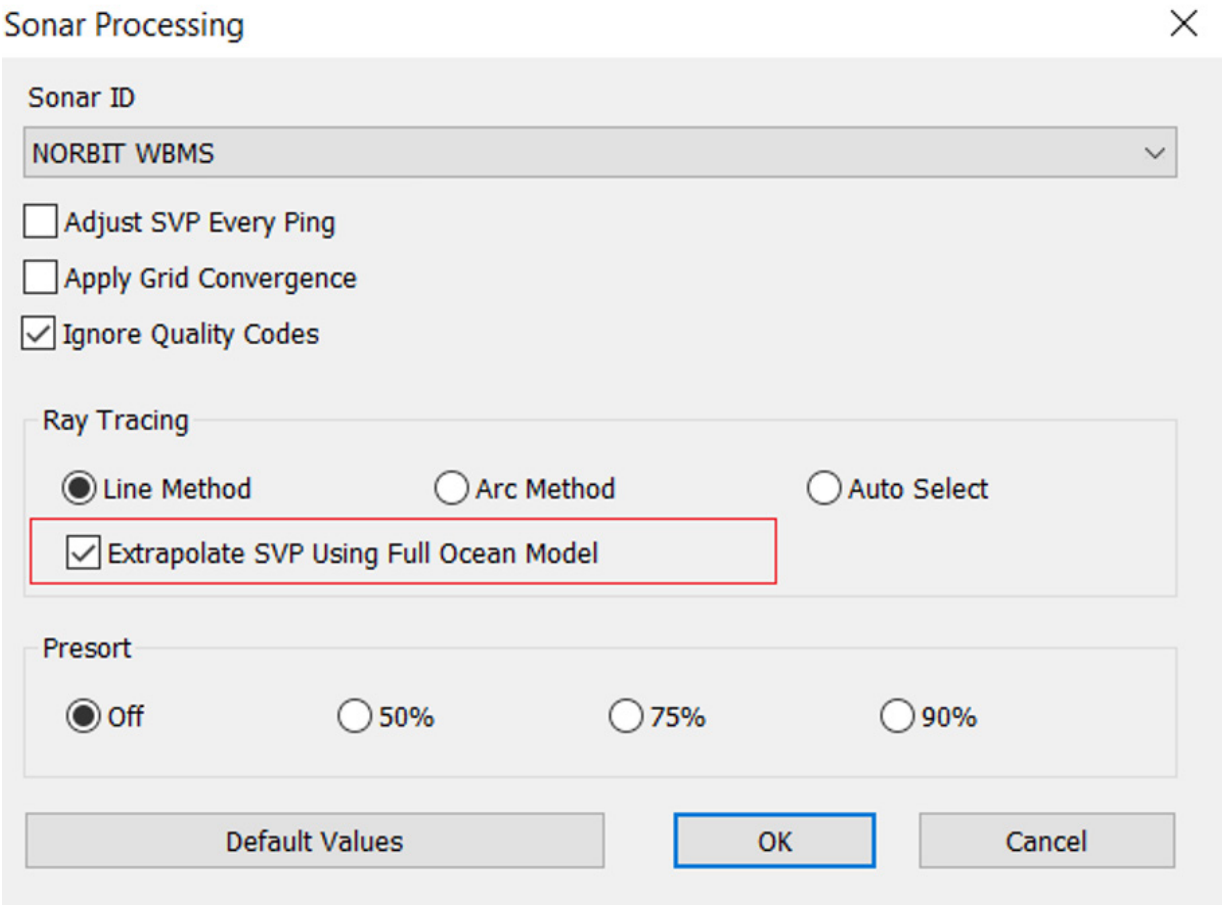
The simplest and most obvious approach to modeling and extrapolation is to extend the last sound velocity measurement all the way down. A second method, the one used by MBMAX64, extends the last measurement down 25 meters (to simplify harbor surveys), and then models ocean sound speed beyond that depth.

So, the differences in the multibeam sounding data shown in MBMAX64 and the historical data in the user's other software are due to different methods of modeling the sound velocity. The other software extended the last measurement to the bottom of the seafloor, while MBMAX64 used water temperature, salinity and pressure to calculate and model the ocean's sound velocity at different depths. For more information on how calculations are made in HYPACK®'s full ocean model for medium and deep water surveys and the reason for its usage, refer to the below Sounding Better article from 2008.

Estimation of the Ocean Sound Velocity Profile by Mike Kalmbach

HYPACK xylem

The latest MBMAX64 software update (version 25.2.4) allows the user to choose either method for approximating the SVP. Check the “Extrapolate SVP Using Full Ocean Model“ box to use HYPACK®’s ocean model, or uncheck the box to extend the last measurement beyond the depth of the final sound velocity cast.



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