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Sounding Better!

Collecting and Applying SV (Speed of Sound) Profiles in HYSWEEP SURVEY

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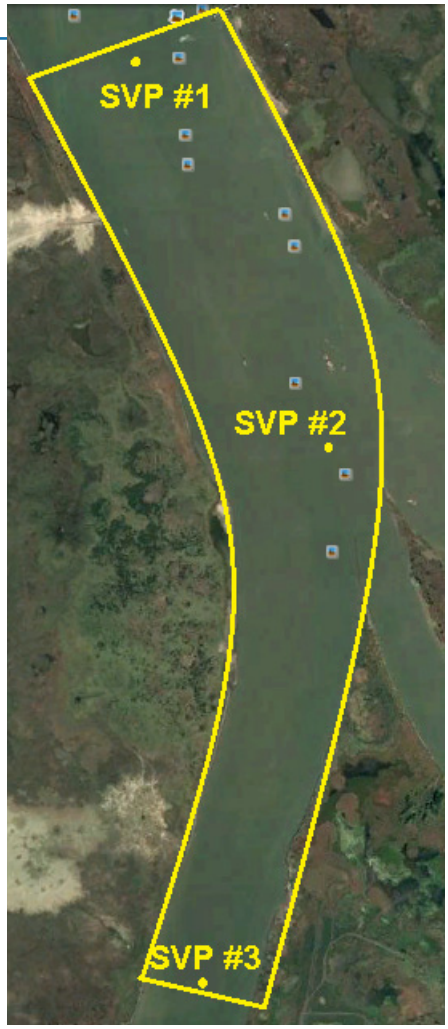
SV Profile Collection

When you are performing a multibeam survey, it is typically required that you collect a minimum of two SV profiles during the course of the day.

- Collect the SV profiles
- Note the time and location of each SV profile.

FIGURE 1. *Sound Velocity Profile Locations*



Using the F5 (Target) button is the quickest and easiest way to do this. Another option is described as follows:

When

- Prior to starting your survey
- Just after completing your survey
- If the survey will span a long time, more at a specified time-interval.
- At specified tide cycles—high and low
- If the temperature changes significantly throughout the day. In the morning, the upper part of the water column is cooler, but as the sun rises, the upper part of the water column heats up and could dramatically change the Speed of Sound in this upper part.

You can set an alarm in HYSWEEP® SURVEY to remind you to collect a new SV profile. (See Setting an Alarm)

Where (Location)

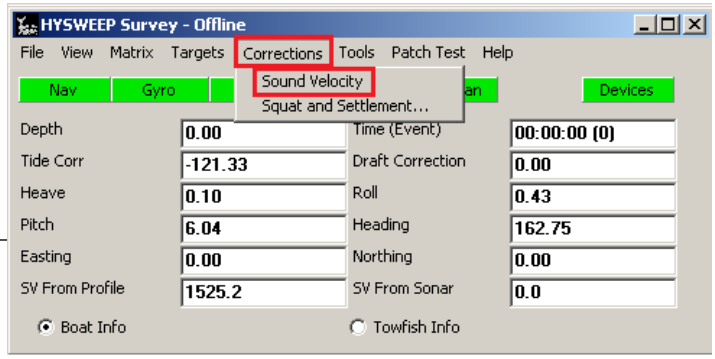
- At the extreme ends of your survey area
- Possibly one in the middle of your survey area
- If your survey area is long and narrow, at set distance intervals.
- At locations of brackish mix (salt/fresh water)

The collection of SV profile data is definitely one of the ‘more is better’ scenarios.

SV PROFILE APPLICATION

DURING DATA COLLECTION IN HYSWEEP SURVEY

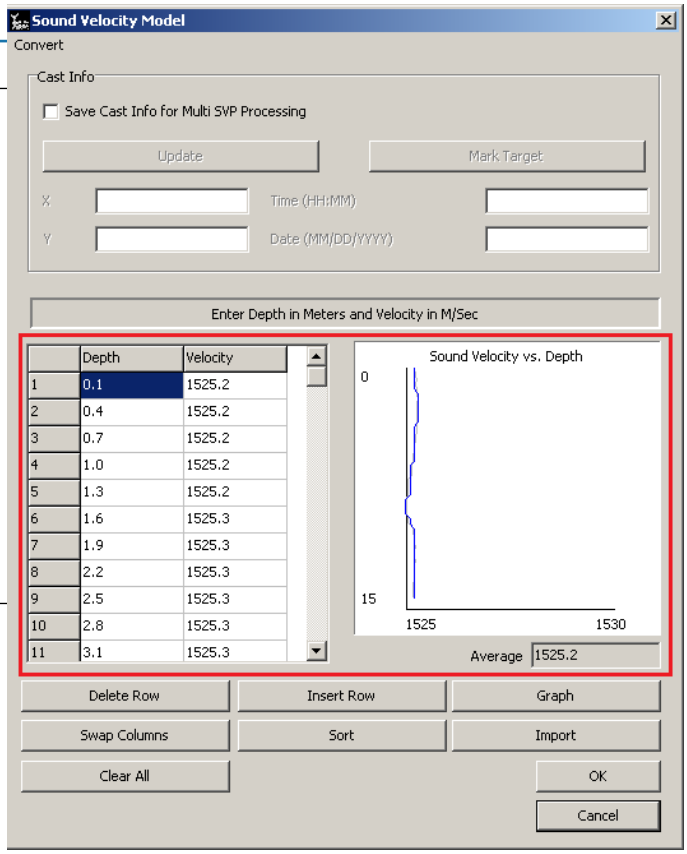
If you want to have your real-time (Beam Profile, Matrix, etc.) displays affected by the most current SV profile, you can load it directly into the HYSWEEP® SURVEY program while you are collecting the data.



NOTE: The raw beam angles and slant ranges from the sonar are *not* modified in the HSX files by the SV profile loaded in HYSWEEP® SURVEY, *only the real-time displays are affected*.

In HYSWEEP® SURVEY, open the Sound Velocity Model window. (Select CORRECTIONS-SOUND VELOCITY.) If there was a previously loaded SV profile, it will appear in the window.

FIGURE 2. *Sound Velocity Model in*



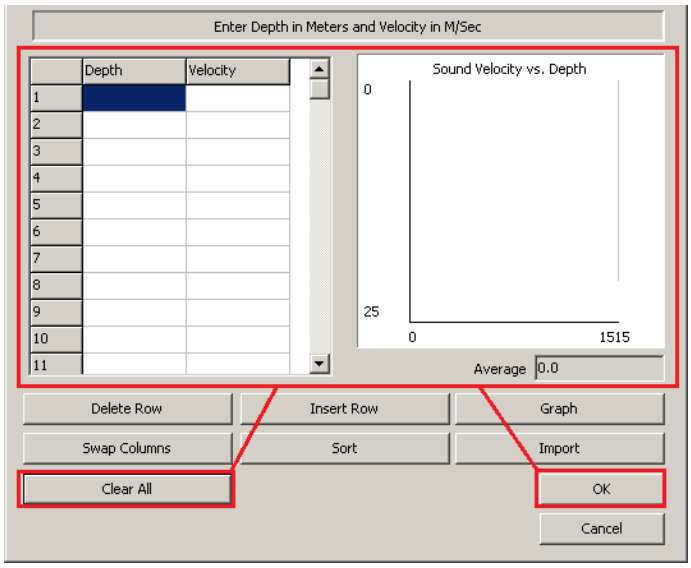
IMPORTANT: The last SV profile is stored in the HYSWEEP.ini file. Therefore, if you do not perform a multibeam survey for an extended period of time, when you begin the next survey, you must remember that the last SV profile is still stored and will be applied and saved into the HSX files of your current survey.

You must decide whether to keep, remove, or replace this SV profile when you start the HYSWEEP® SURVEY program.

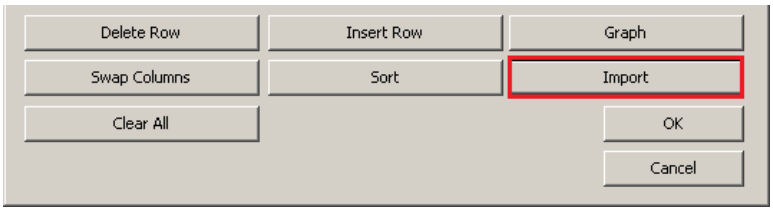
- **To keep the embedded SV profile**, do nothing when HYSWEEP® SURVEY is started.

- **To remove' the embedded SV profile**, click [Clear All]. You will see the embedded SV profile disappear from the Graph window. Click [OK].

FIGURE 3. *Removing the SV Profile*

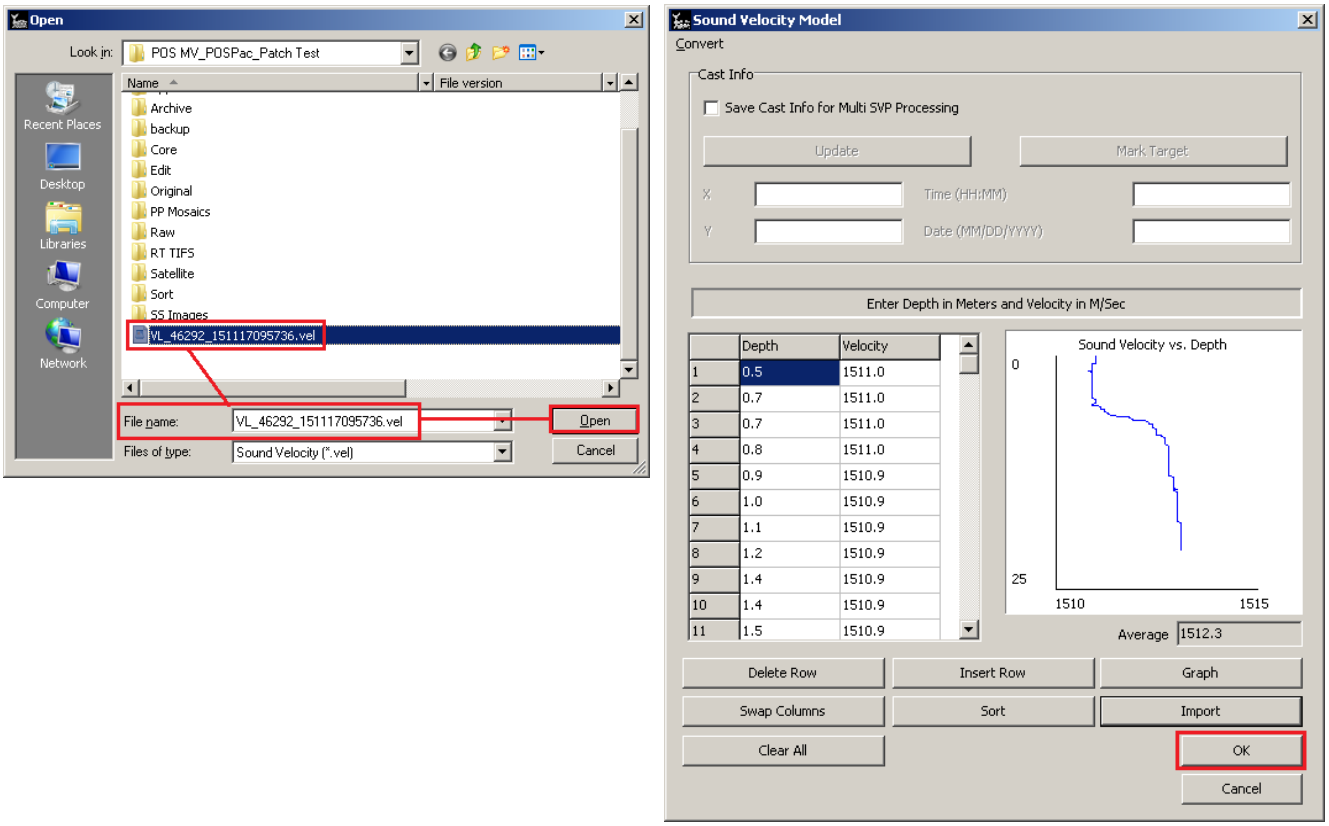


- **To 'replace' the embedded SV profile**,
  a. **Click [Import]**.
  b. **Locate the new *.VEL file and click [Open].** The new SV profile appears in the Graph window.



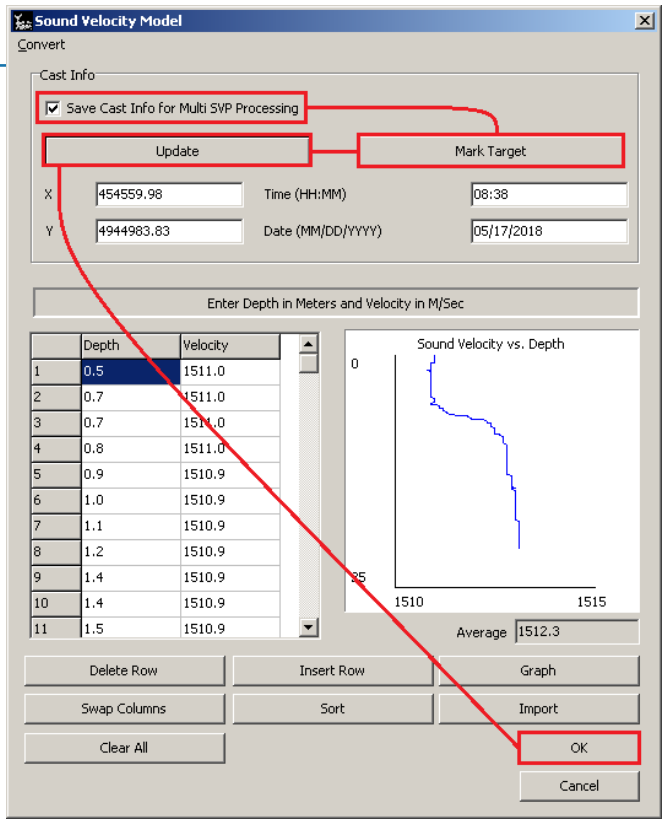
IMPORTANT: If the SV profile that you loaded does not already include the position, time, and date, you can add that information here.

FIGURE 4. *Loading the New SV Profile (*.VEL)*



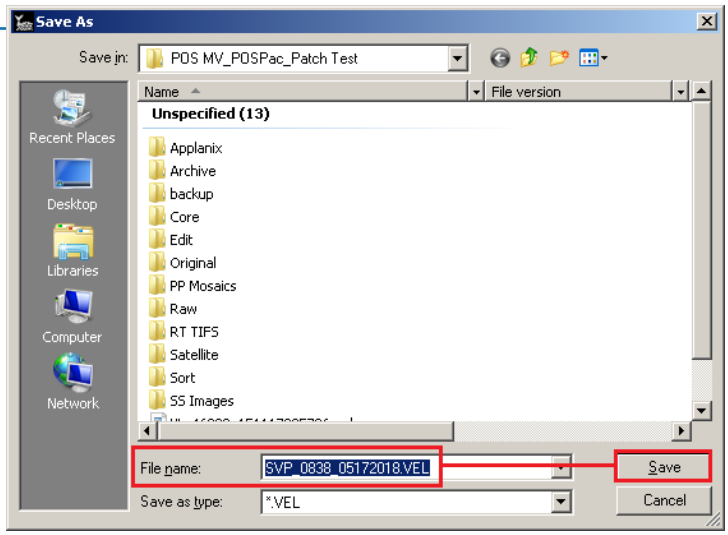
c. **Check the Save Cast Info for Multi SVP Processing option**.

FIGURE 5. Saving the Cast with Time and Position Information



d. Assuming the Boat is at the location of where the SV profile was collected, **store the cast location in the profile**.
   i. **Click [Mark Target].**
   ii. **Click [Update].** The Position, Time, and Date information will now be populated in their respective fields.
   iii. **Click [OK].**

FIGURE 6. Saving the SV Profile



The Save As window appears with the Time and Date information as the FileName. (You may change this, if needed.)

It also shows the location where the SVP file will be stored. You may change this, as well. Once you have verified and modified any of these settings,

iv. **Click [Save]**.

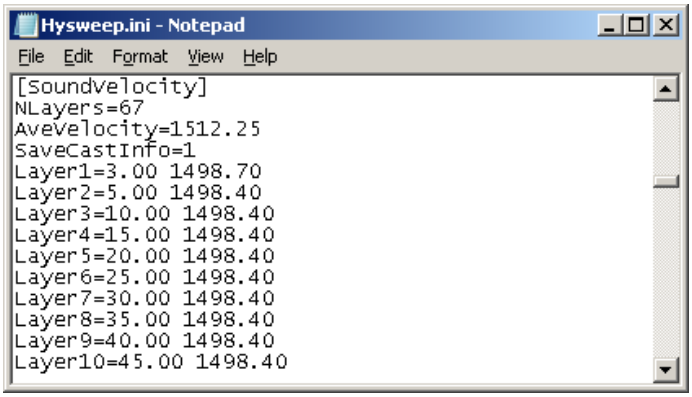
IMPORTANT: Storing the SV cast time and position will prove to be beneficial when you process your data in MBMAX64, as it enables you to load your Multiple SV profiles and use the Time or Time and Position options.

This new SV profile information is stored in the Header of every HSX file collected, until a new SV profile is loaded.

As previously mentioned, the SV profile is also stored in the HYSWEEP.ini file and remains there until the next SV profile is loaded in HYSWEEP® SURVEY or until it is removed from HYSWEEP® SURVEY.

FIGURE 7. *SV Profile in the HSX Header (left) and in the Hysweep.ini (right)*

```
FTP NEW 2
HSX 7
VER 10.0.9.0
TND 14:54:22 06/17/2010
INF "" "" "" "" 0.49 0.00 1498.41
HSP 5.0 100.0 100.0 100.0 75 75 1 1 1.6 0.0 1 53
DEV 0 52 "Hypack Navigation"
DV2 0 f4 0 1
OF2 0 0 0.0 0.0 1.3 0.00 0.00 0.00 0.00
OF2 0 1 0.0 0.0 0.0 0.00 0.00 0.00 0.00
OF2 0 2 0.0 0.0 1.3 0.00 0.00 0.00 0.00
PRI 0
DEV 1 32784 "Reson Seabat 7101"
DV2 1 9 0 1
OF2 1 3 -0.6 3.8 2.9 0.50 0.95 0.00 0.00
MBI 1 3 0 1b01 511 0 0.000 0.000
SSI 1 0 1001 1001
DEV 2 544 "Applanix POS/MV Network"
DV2 2 220 0 1
OF2 2 1 0.0 0.0 0.0 0.00 0.00 0.00 0.00
OF2 2 2 0.0 0.0 1.3 0.00 0.00 -2.14 0.00
LIN 2
PTS 294181.0 379009.0
PTS 294011.0 378887.0
LBP 294181.0 379009.0
LNN 1
EOL
SVC 0.0 3.0 1498.70
SVC 3.0 5.0 1498.40
SVC 5.0 10.0 1498.40
SVC 10.0 15.0 1498.40
SVC 15.0 20.0 1498.40
SVC 20.0 25.0 1498.40
SVC 25.0 30.0 1498.40
SVC 30.0 35.0 1498.40
SVC 35.0 40.0 1498.40
SVC 40.0 45.0 1498.40
EOH
```

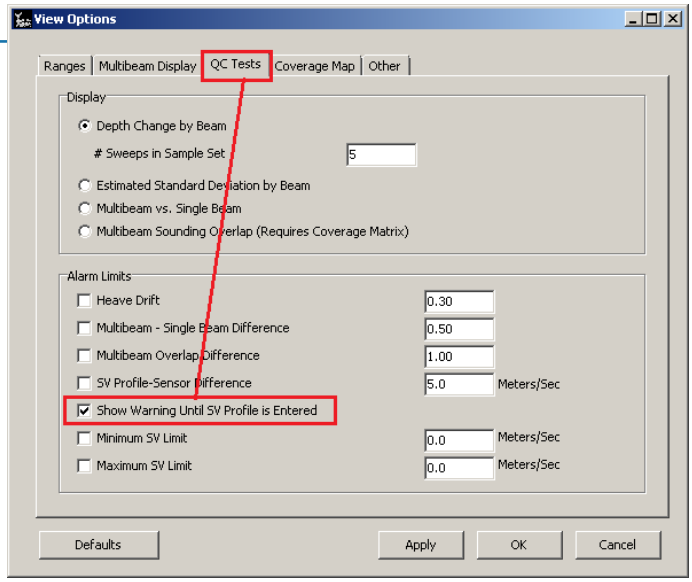


SETTING AN ALARM

There is an option to set an alarm in HYSWEEP® SURVEY that will remind you to collect and load a new SV profile.

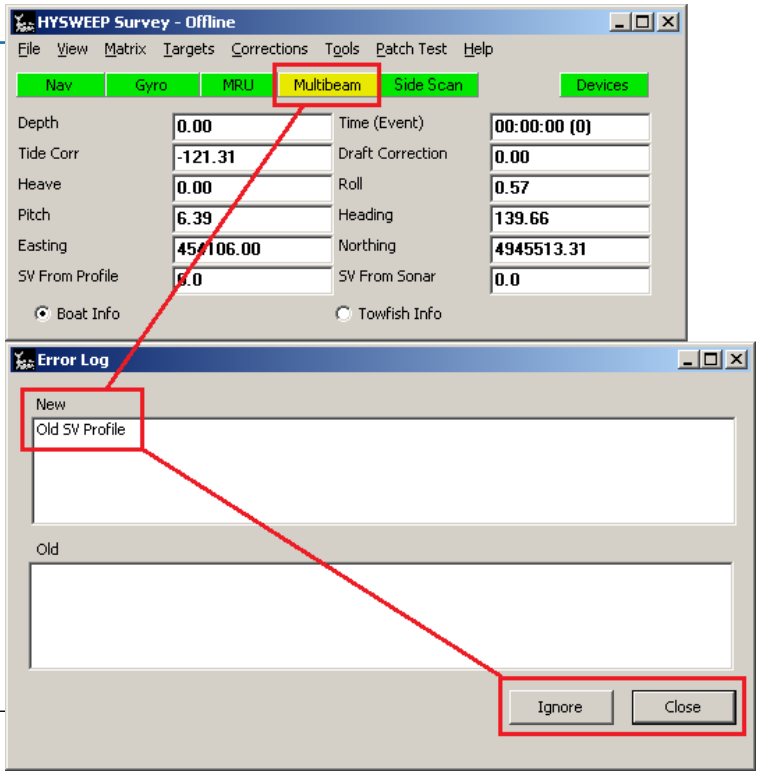
1. In the HYSWEEP® SURVEY main window, **select VIEW-OPTIONS-QC TESTS**.
2. **In the QC Tests of the View Options dialog, check "Show Warning Until SV Profile is Entered"**.

FIGURE 8. Setting the SV Profile Alarm



The next time you start HYSWEEP® SURVEY, the Multibeam button/light will turn from GREEN to YELLOW, alerting you that something is wrong with the multibeam system or its data.

FIGURE 9. The Multibeam Alarm in HYSWEEP® SURVEY



3. **Click on the Multibeam alarm.** You will see the message "Old SV Profile".
   - Click [Ignore] to acknowledge the message and the Multibeam alarm will return to GREEN.
   - Click [Close] and the Multibeam alarm will remain YELLOW until you click it again and click [Ignore].

Opting to keep, remove, or replace will determine whether SVC records are stored in the Header of the HSX file.

IMPORTANT: If SVC records are stored in your HSX files, the HYSWEEP® Editors automatically use this information when the HSX files are loaded.

Advantages of Collecting and Embedding SV Profile Information During Data Collection

- It puts you in the rhythm of collecting the SV profile data, as they are critical to your survey.
- Helps you to define the collection interval (time and/or position) of the SV profiles.
- It embeds the SV profile data in your files.

BEWARE! If you do *not* set an Alarm to remind you to collect a new SV profile, and you forget to collect one, you may have to fabricate a SV profile to override the embedded old SV profile when you load the data into the Editor.