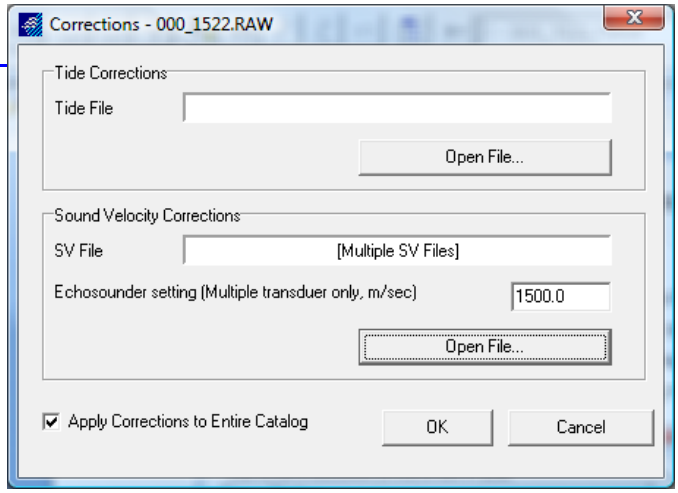
Using Multiple Sound Velocity Casts

by Monicque Lee

Sound Velocities are important for a variety of reasons for both single beam and multibeam surveys. Sound Velocities are affected by the conditions of the survey area, and can change throughout the course of the day, and from day-to-day drastically enough to alter your data and produce negative issues with your data set. HYPACK® 2009a allows for applying multiple sound velocity casts when editing.

FIGURE 1. *Loading Multiple Soudn Velocity Profiles*

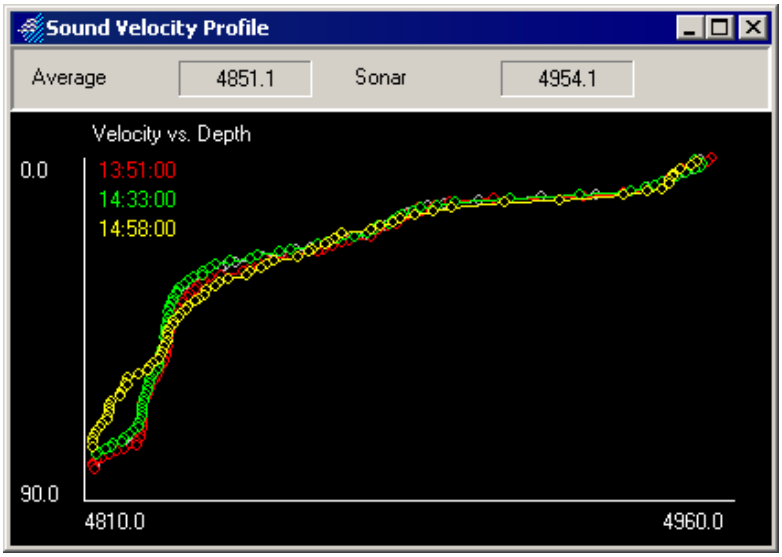


Deep water surveys can produce a large variation of sound velocity values due to thermal changes. Shallow water can be affected where tidal changes can bring in salt water mixing with fresh, or even something as simple as a monsoon and flash flooding into an inland river system in a inconsistant bottom can attribute to errors. The only time you would not be concerned with sound velocity is when you are working in a consistent environment, where you are sure that the water in which you are surveying is sufficiently mixed with no thermal variations, keeping refraction to a minimum.

Sound velocity errors are probably the most common type of multiband issues, which usually manifest themselves in the notorious 'Horns of Satan' we have all seen at some point looking at us through our multibeam data sets over uniform bottoms.

You can utilize multiple sound velocity casts in SINGLE BEAM EDITOR and in the HYSWEEP® EDITOR for when you are working in areas where your sound velocity is varying throughout the day.

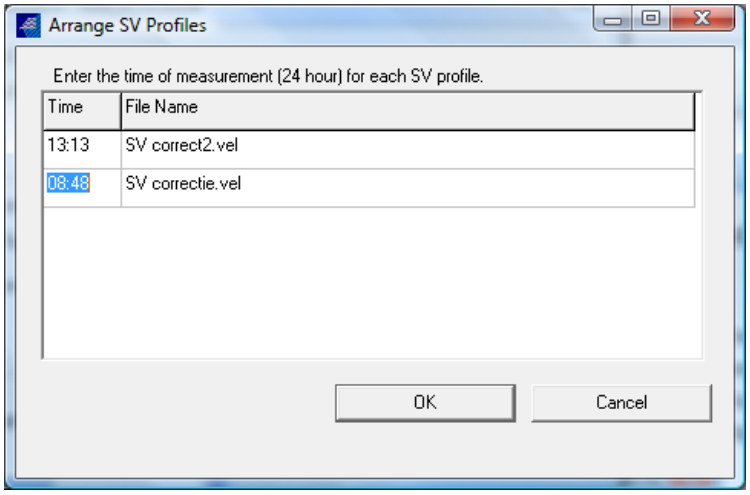
FIGURE 2. *Each Sound Velocity Profile Displayed in a Different Color*



First open the editing program appropriate for your data, either the SINGLE BEAM EDITOR or HYSWEEP® EDITOR and load your data. The Corrections dialog has the option to load Tide files and Sound Velocity Files. This is where you can now load multiple VEL files.

1. Click [Open file] and a File Selection Dialog will appear.
2. Hold the Control key down and select the VEL files you want to use. The files will be listed in the Arrange SV Profiles dialog.
3. Edit the times to match the times you took the sound velocity casts if necessary.

FIGURE 3. *Editing the Sound Velocity Profile Times*



The editor will interpolate the sound velocities for the intermittent times between casts by using the time tags within the cast data.