Removing Heave Drift in HYSWEEP®

By Mike Kalmbach

INTRODUCTION

Sometimes, due to changes in boat speed or abrupt turns, heave compensators can lose their zero. Figure 1shows how the heave measurement should look; the boat motion is up and down in the water centered about zero.

FIGURE 1. *Heave Graph - No Heave Drift*

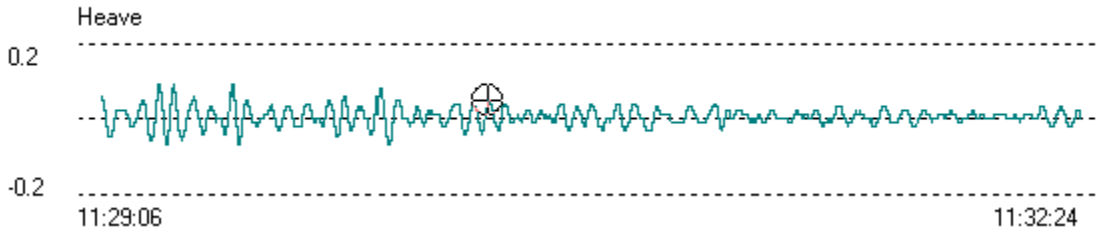
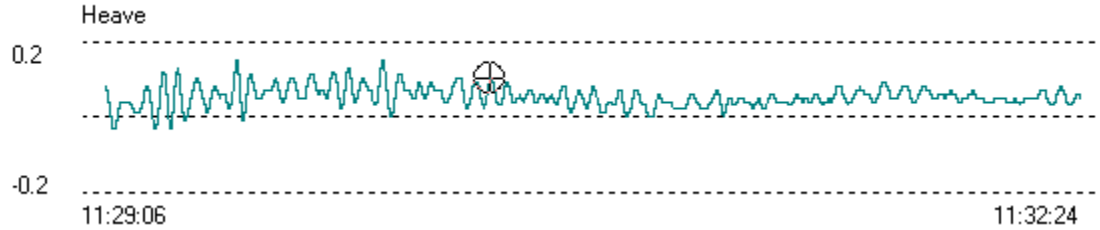


Figure 2 shows heave drift. Boat motion is still apparent, but the entire graph has 'drifted' slightly upward.

FIGURE 2. *Heave Graph - Heave Drift*



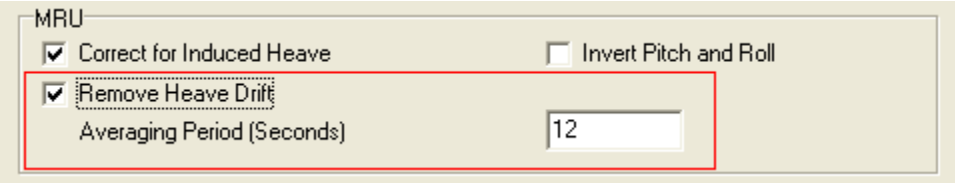
Obviously, a survey corrected with heave drift will show depths shoaler or deeper than actual.

REMOVING HEAVED DRIFT IN HYSWEEP

Heave drift is removed in the HYSWEEP® EDITOR program (MBMax). There are two methods. Both use the same calculations, but the first applies the calculations to the entire survey while the second applies only to sections selected by the user.

Entire Survey: In the Read Parameters, Advanced tab select 'Remove Heave Drift'. The Averaging Period is described in "How it Works:" on page 2. 12 seconds is a good default value.

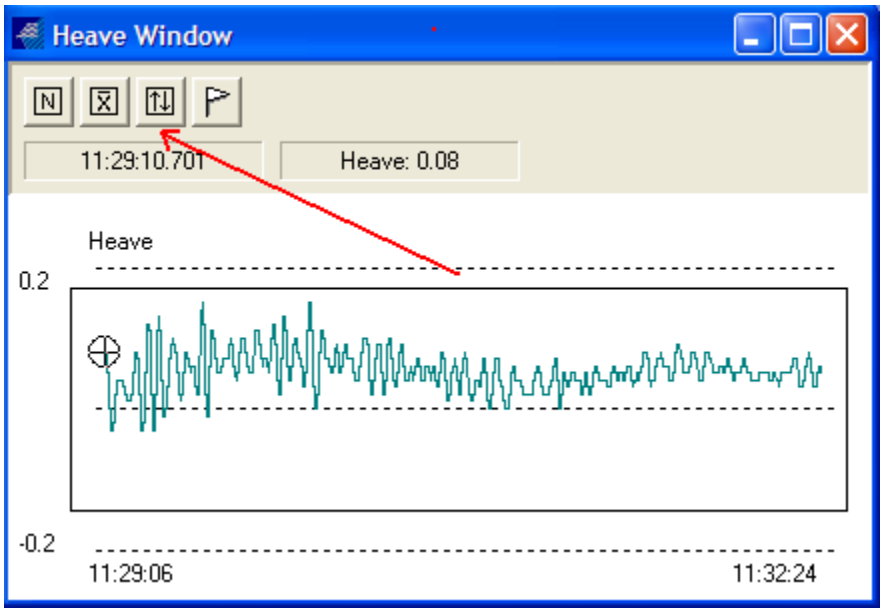
FIGURE 3. Removing Heave Drift from the Entire Survey



Selected Sections: It's typical (and recommended!) fto inspect the heave graph of each survey line. When heave drift is apparent, the offending section can be blocked out, then clicking the up/down arrow icon removes drift from all measurements inside the block.

In the example, heave has drifted throughout the survey line. But that's not always the case. Often it's seen only at the beginning of the line.

FIGURE 4. Heave Drift Often Shows Only at the Beginning of the Line



How it Works

The key assumption is that heave is centered about zero. In other words, over time heave will average out to zero.

The HYSWEEP® calculations look at each heave sample. An average is calculated for the sample using heave before and after. The number of samples before and after depends on the Averaging Period entered in Advanced Read Parameters. For example, a 12 second period, the average is taken from six seconds before to six seconds after.

Remember, the assumption is that *heave will average to zero*. If it doesn't, the average is added to the sample to make it so for each period until all heave drift is removed.