

How to Make 2-D Images Show Distance (m or ft)

A 2-D image is represented by a *.grd file, which is a “GS ASCII” format text file. The first line of that file has the “DSAA” word only, the second line contains the number of horizontal and vertical points, the third line contains the minimum and maximum horizontal coordinates, etc. By default SurfSeis uses “stations” for horizontal coordinates (Table 1). The resulting image will show station numbers on the horizontal scale (Figure 1).

The automatic replacement of stations with meters (or ft) starting from 0 can be easily done using the station interval information. However, this option has been deliberately avoided because of losing the information with the actual acquisition locations. Thus, we leave it to the users to decide how they want to apply it. In this example it only takes the replacement of two values in a text file.

DSAA	
200	100
1024.00	1043.00
-35.53	7.94
366.95	1149.91

Table 1

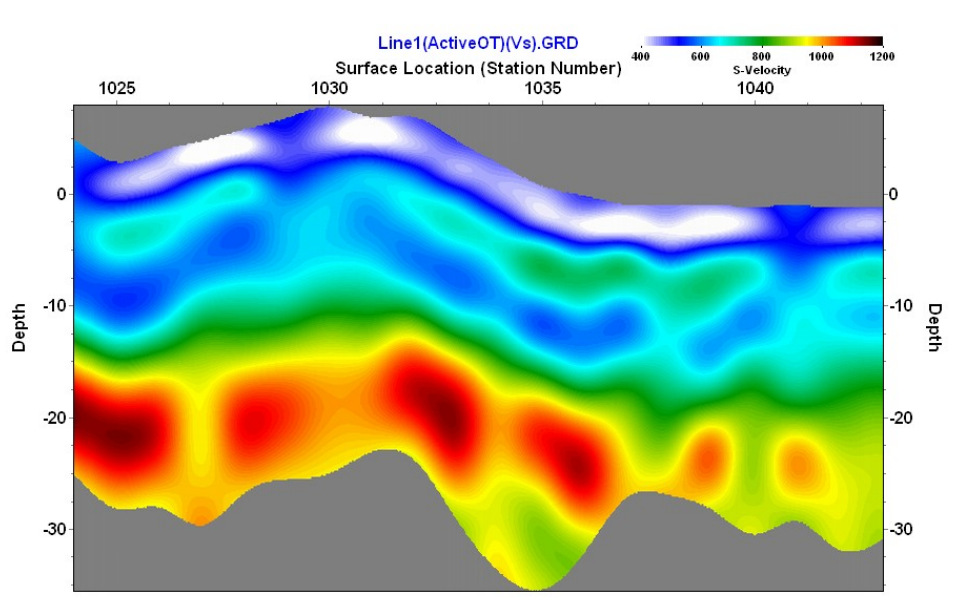


Figure 1. A 2-D MASW Vs section image with horizontal coordinates as “Stations.”

Option 1 – Rescale stations to meters without changing the minimum horizontal coordinate

We usually prefer this option because one can easily go from stations to meters and go back to stations by multiplying or dividing the values with the station interval.

The third line of the text *.grd file can be edited and replace with minimum and maximum metric values instead of stations. An easy way to do this is to multiply the minimum and maximum station number from Table 1 by the station interval, e.g., 4 m. Thus, line 3 values can be replaced by 4096.00 and 4172.00 (Table 2) and the text *.grd file can be saved with a new file name (e.g., Line1(ActiveOT)(m)(Vs).GRD). When this file is opened, the 2-D Vs images will display metric horizontal coordinates (Figure 2). Notice, however, that the “(Station Number)” label is still there. This is because the *.grd “GS ASCII” format does not have indicators for dimensions and SurfSeis assumes by default that the horizontal coordinates are Stations. Users will need to ignore this label, or they can fix it by masking the text or fixing it in a graphics editing program (such as PhotoShop).

DSAA	
200	100
4096.00	4172.00
-35.53	7.94
366.95	1149.91

Table 2

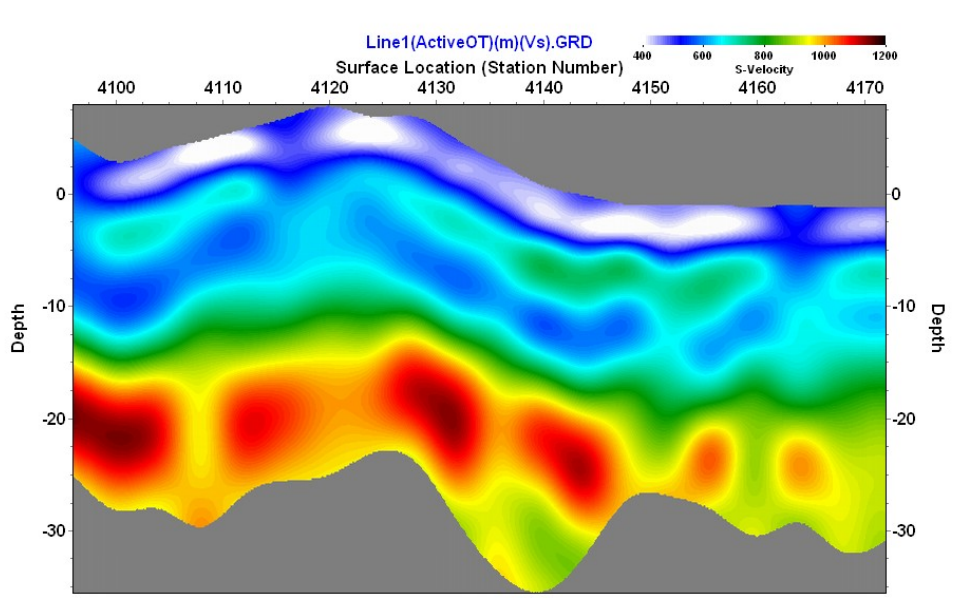


Figure 2. A 2-D MASW Vs section image with horizontal coordinates converted to meters. In this example the axis title should be ignored.

Option 2 – Rescale stations to meters and change the minimum horizontal coordinate to 0

We usually avoid this option because the relationship between stations and meters can be lost.

Still, if users prefer to begin the horizontal coordinates at 0—not at 4096 as in Option 1—the value “4096” can be subtracted from the minimum and maximum metric horizontal coordinates 4096.00 and 4172.00 (Table 2), obtaining new values of 0.00 and 76.00 (Table 3). This text *.grd file can be saved with another file name (e.g., Line1(ActiveOT)(m-from0)(Vs).GRD). When this file is opened, the 2-D Vs images will display metric horizontal coordinates from 0 to 76 (Figure 3). By using coordinates starting at 0 the connection with the station numbers used during the acquisition/geometry can very easily be lost, so we would warn users to keep proper notes before they apply Option 2. In Option 1 (Table 2) the connection is maintained by the station interval.

DSAA	
200	100
0.00	76.00
-35.53	7.94
366.95	1149.91

Table 3

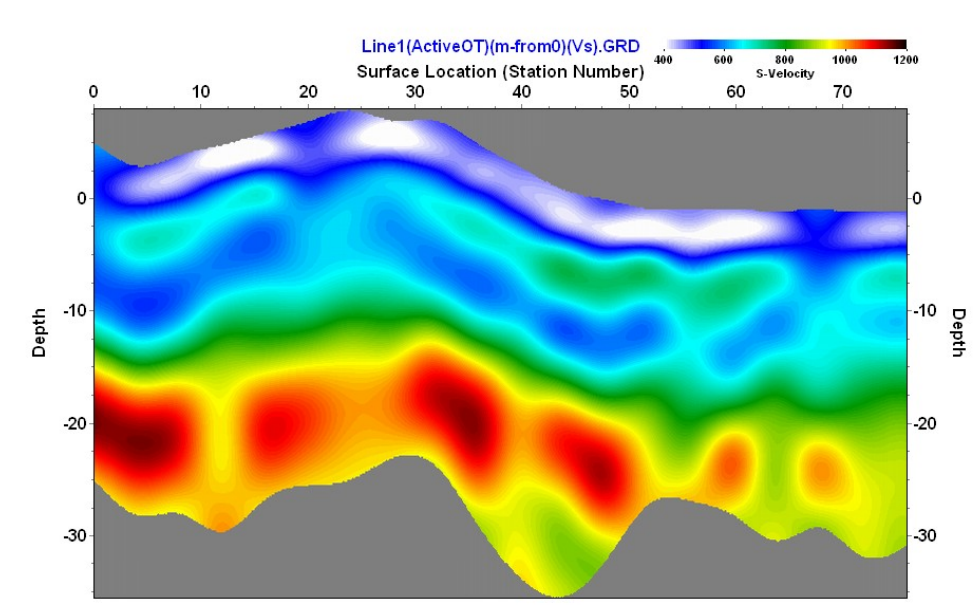


Figure 3. A 2-D MASW Vs section image with horizontal coordinates converted to meters and starting from 0. In this example the axis title should be ignored.

In a similar fashion users can edit the first column (which has station numbers) of the three-column text file used for making the *.grd file (e.g., Line1(ActiveOT)(Vs).txt). This can be easily done using spreadsheet software (e.g., Excel).