

## Using QGIS for contouring depths from the OpenCPN Survey\_pi plugin

### Purpose

To demonstrate a workflow for creating contour lines for the soundings obtained from the OpenCPN plugin Survey\_pi.

### Requirements

#### QGIS

This can be downloaded here:

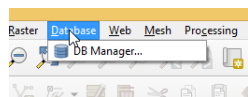
<https://www.qgis.org> (Windows, Linux, MacOS)

This guide was written using the Windows version.

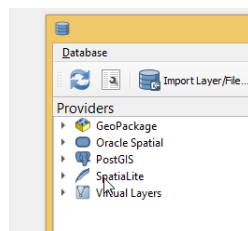
Name	Date modified	Type	Size
OSGeo4W Shell	22/04/2020 07:15	Shortcut	2 KB
QGIS Desktop 3.12.2 with GRASS 7.8.2	22/04/2020 07:15	Shortcut	2 KB
QGIS Desktop 3.12.2	22/04/2020 07:15	Shortcut	2 KB
Qt Designer with QGIS 3.12.2 custom wid...	22/04/2020 07:15	Shortcut	3 KB
SAGA GIS (2.3.2)	22/04/2020 07:15	Shortcut	3 KB

Not sure if GRASS is necessary but this was the QGIS version used.

Survey\_pi holds all the soundings data in an sqlite database. First check that QGIS can find the data.



Use the 'spatialite' option.



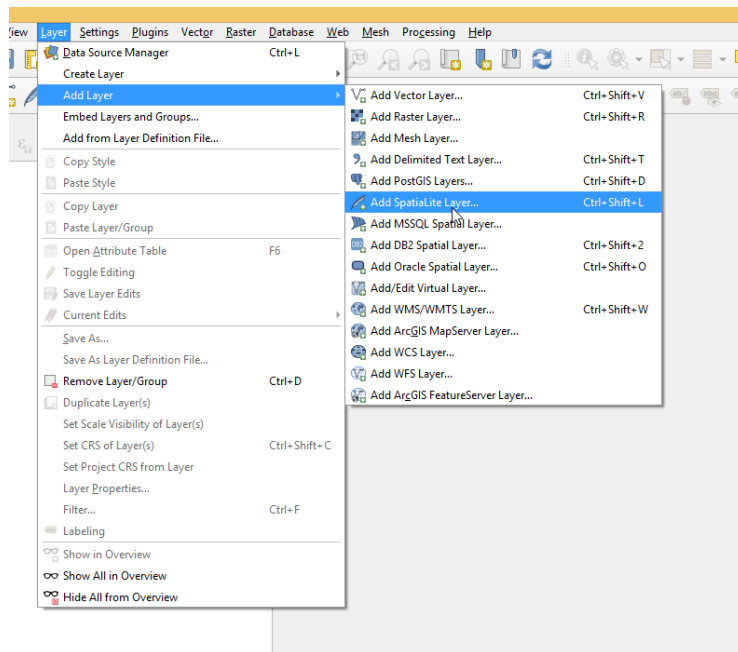
The drop-down shows the tables in your database. I only had one survey to work with. With more than one survey the workflow may differ

DB Manager					
Database		Table			
Providers		Info	Table	Preview	
GeoPackage					
Oracle Spatial					
PostGIS					
Spatialite					
survey.sqlite					
soundings					
survey					
tide_height					
Virtual Layers					
		sounding_id	depth	measured	survey_id
1	2447	-0.67	2015-11-16 13:1...	3	0.0
2	2448	-1.13	2015-11-16 13:1...	3	0.0
3	2449	-0.86	2015-11-16 13:1...	3	0.0
4	2450	3.26	2015-11-16 13:1...	3	0.0
5	2451	3.34	2015-11-16 13:1...	3	0.0
6	2452	-0.05	2015-11-16 13:1...	3	0.0
7	2453	0.4	2015-11-16 13:1...	3	0.0
8	2454	-0.88	2015-11-16 13:1...	3	0.0
9	2455	-0.18	2015-11-16 13:1...	3	0.0
10	2456	0.16	2015-11-16 13:1...	3	0.0
11	2457	-0.09	2015-11-16 13:1...	3	0.0
12	2458	-1.19	2015-11-16 13:1...	3	0.0

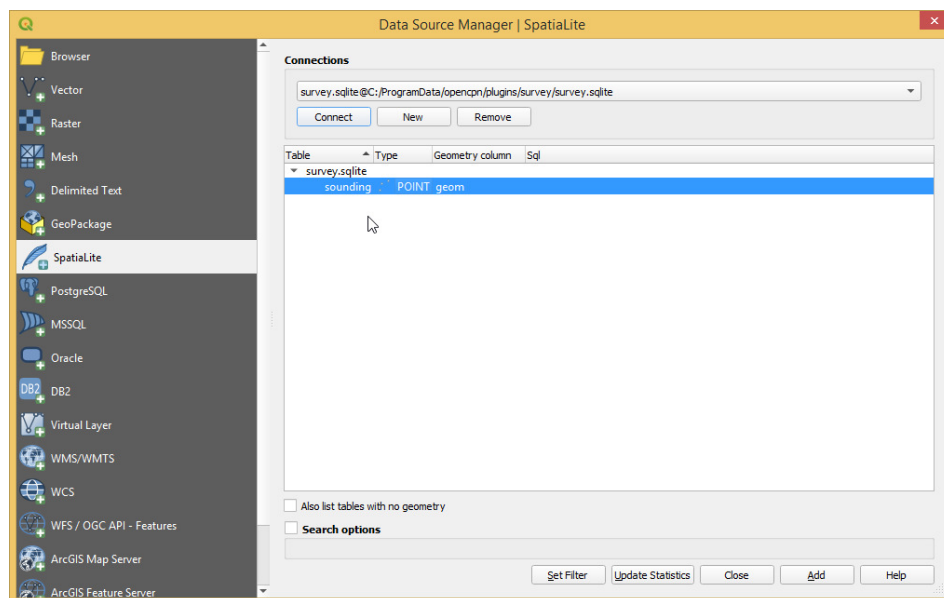
Now we know that the data is available return to the main screen of QGIS.

'Add Layer'

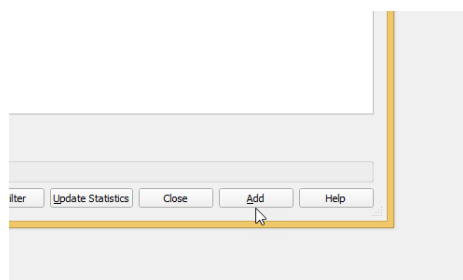
'Add Spatialite Layer'



You see the database connection and can select the 'sounding' table. Notice the POINT geometry.

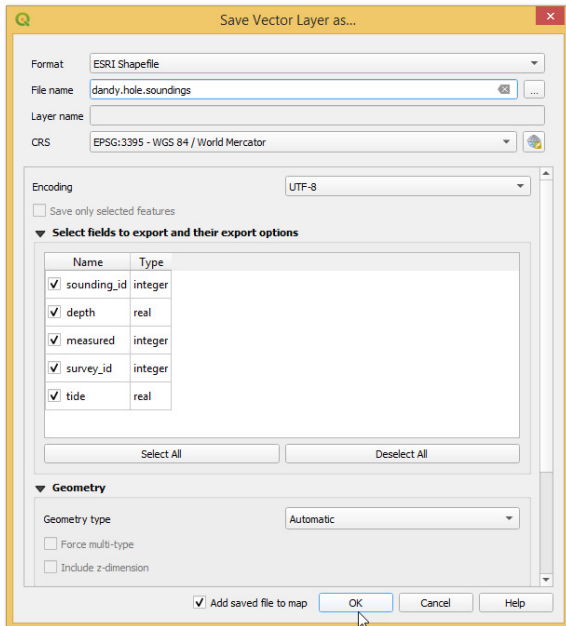


Add the database to your project.

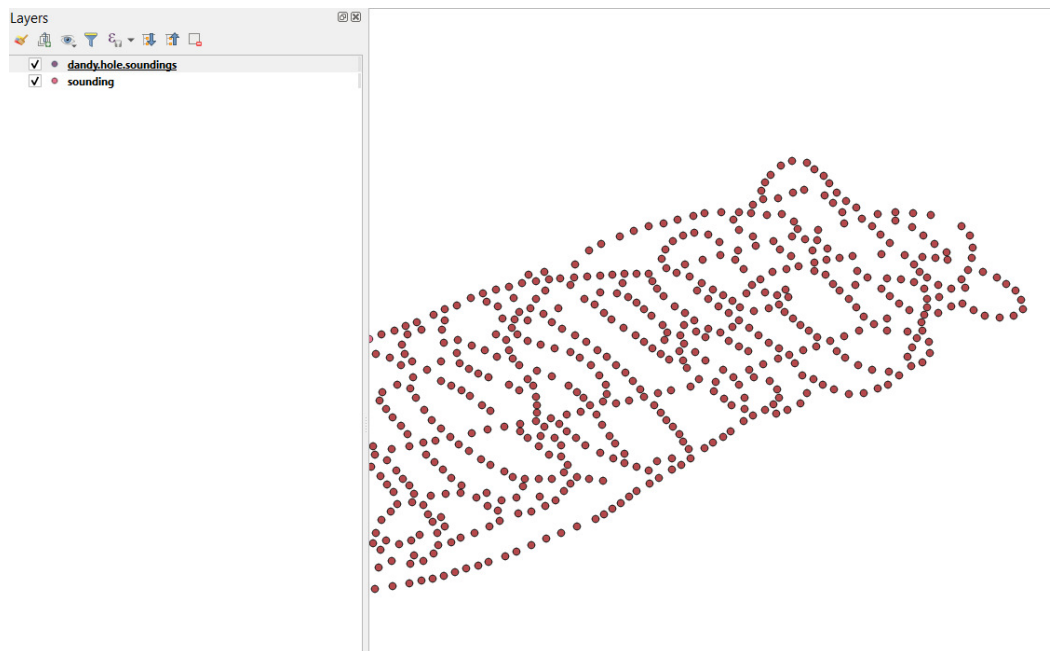


The connection to the data has been established.  
'Right-Click' on the 'soundings' layer to save a Shapefile.

'Export'  
'Save Features As...'

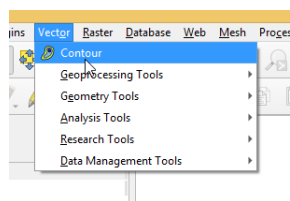


'Right-Click' again on the Shapefile. 'Zoom to Layer' shows you the location of the soundings. This demonstrates the density of soundings required if contouring is going to be successful. The survey lines are about 10 metres apart.



Now the interesting bit.

Select 'Vector','Contour' from the menu at the top of the screen.



The input is the shapefile of soundings. 'depth' is the data value. If you go through the list of options and set things up correctly QGIS will work out min/max depth and you can choose a suitable contour interval. I needed to play with the number of contours but eventually a list appeared in the text box. It is possible to apply colours but probably better to use a single colour.

Q

Contour

✕

Input

Point layer

dandy.hole.soundings

Data value

1.2 depth

⌵

⌵

☐ Use selected points only

Remove duplicate points

☐ Tolerance 0.001

☐ Use grid based contouring

Contouring 1114 points (not in regular grid)

Contouring

☒ contour lines
 ☐ filled contours
 ☐ both
 ☐ contour layers

Method

Fixed contour interval

⌵

Interval

1.0000

⌵

Number

12

⌵

Minimum

☒ Set

-2.4300

⌵

Maximum

☒ Set

4.8800

⌵

Extend

Fill below minimum and above maximum contour

⌵

Output

Layer name

dandy.hole.soundings\_depth

Label precision

4

⌵

Trim zeros

☐ Units

Apply colours

☐

⌵

reverse

☐

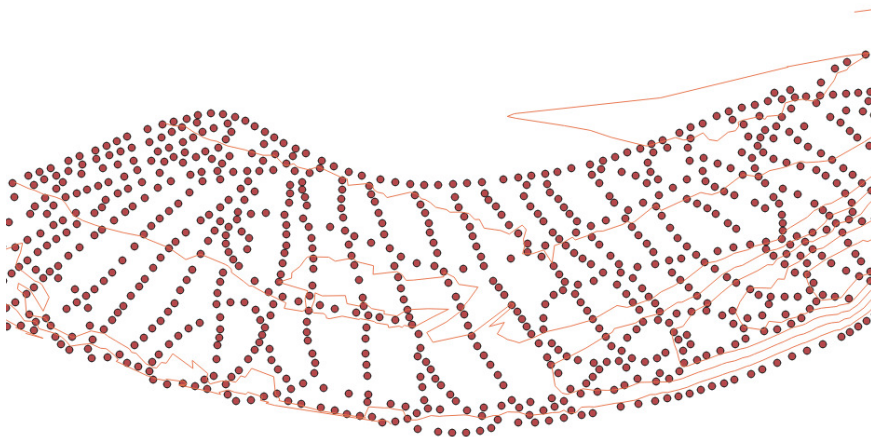
0%

Help

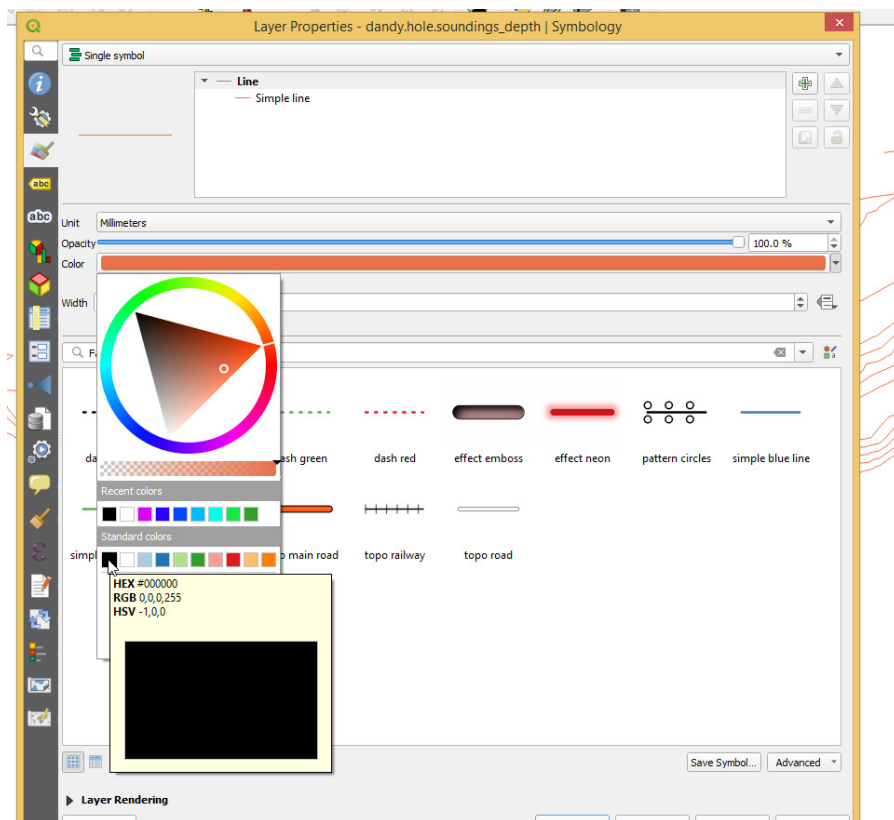
Add

Close

Magic. The contours appear.

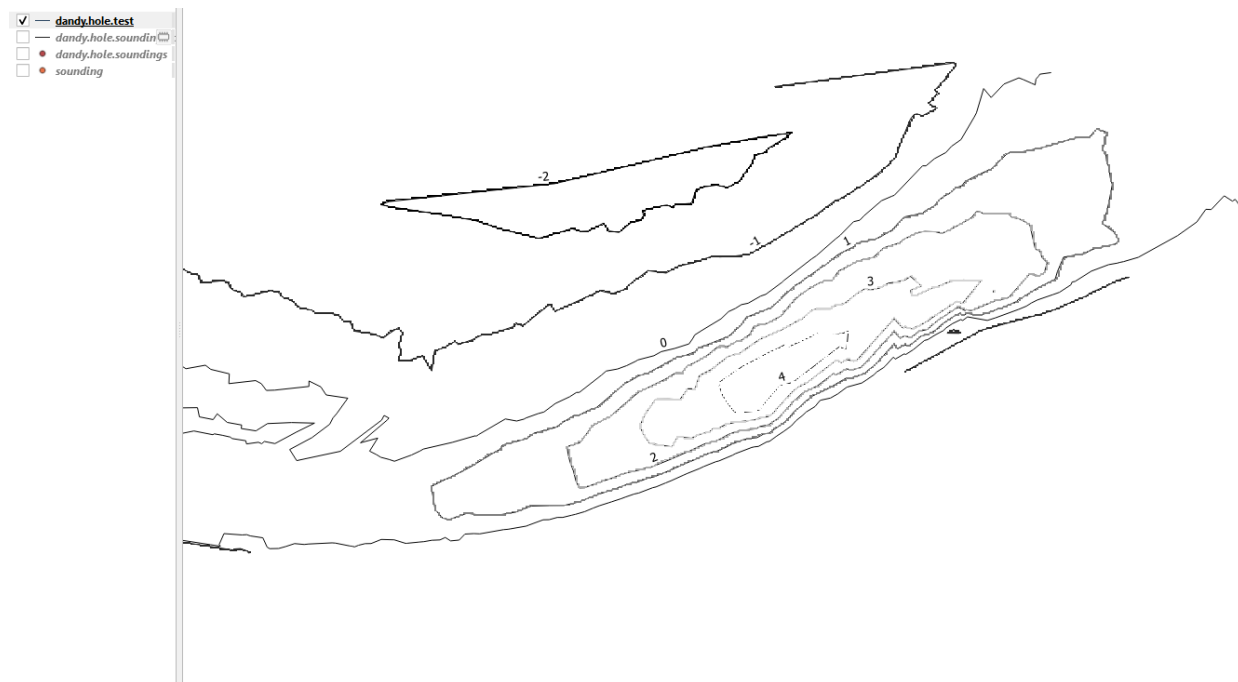
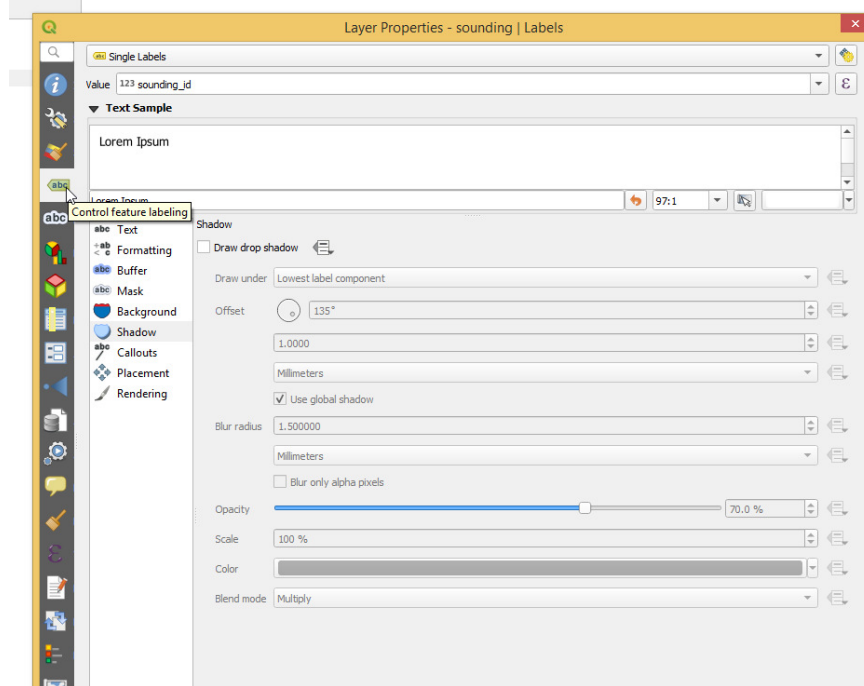


To make the contours display better 'Right-Click'. Black will show the contours best.

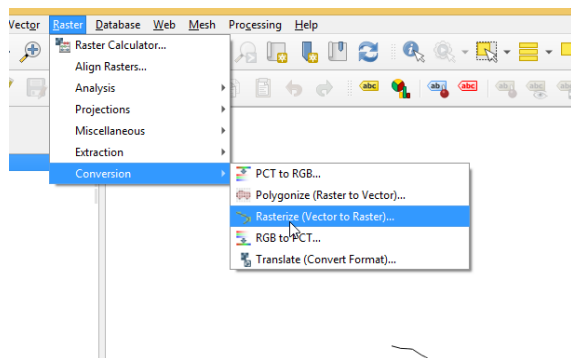


We now add labels to the contours.

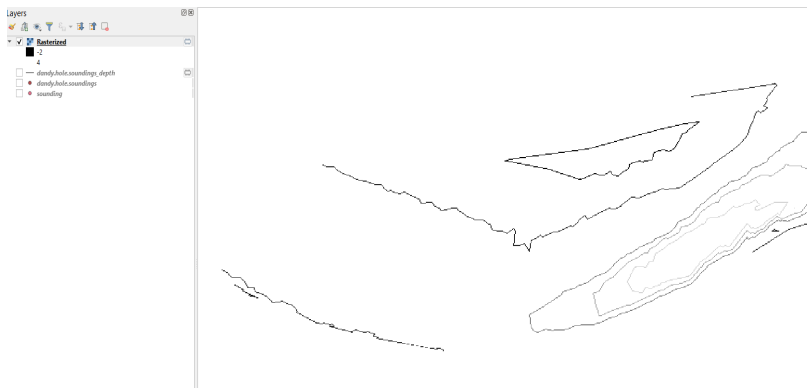
'Properties'



The shapefile is in vector format. It has to be converted to raster before it can be exported as a geotiff.

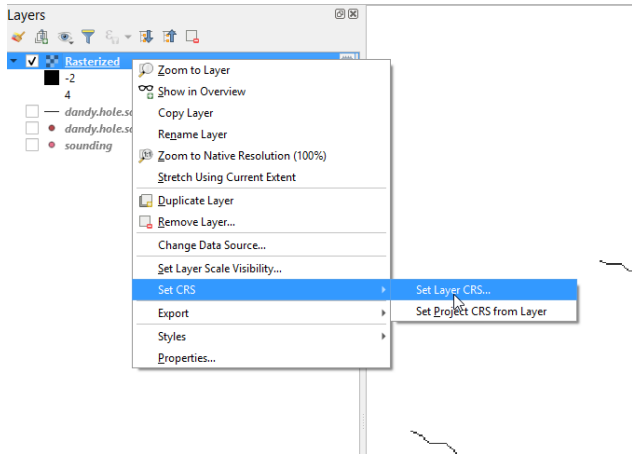


Raster output is shown. Some of the contours are faded but that will not affect their display. Unfortunately contour labels disappear. Also the datum line (0)

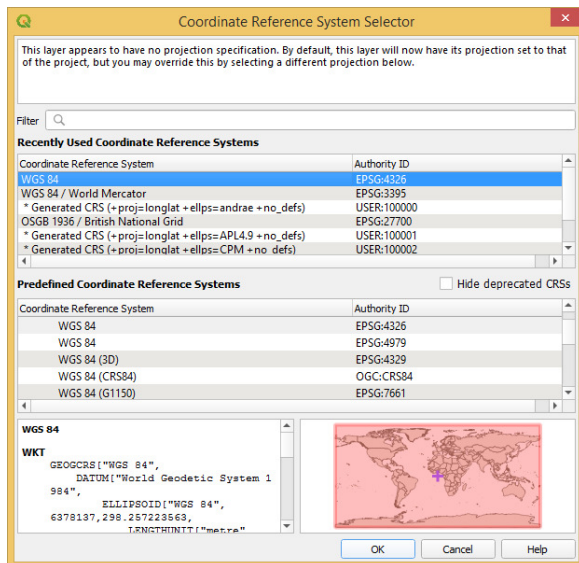


Survey\_pi uses the coordinate reference system (CRS) EPSG:3395 (metres east/north). To create a geotiff that can be used in OpenCPN the CRS has to be set to EPSG:4326 (lat/lon). Both CRS are WGS 84 projection.

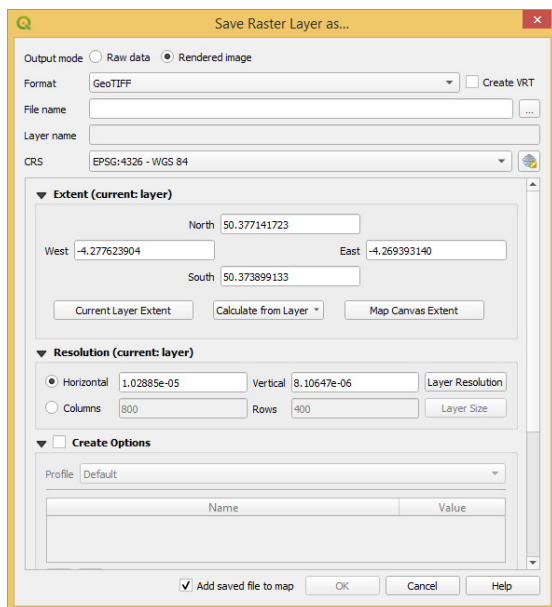
'Right-Click'



Set the CRS to EPSG:4326.

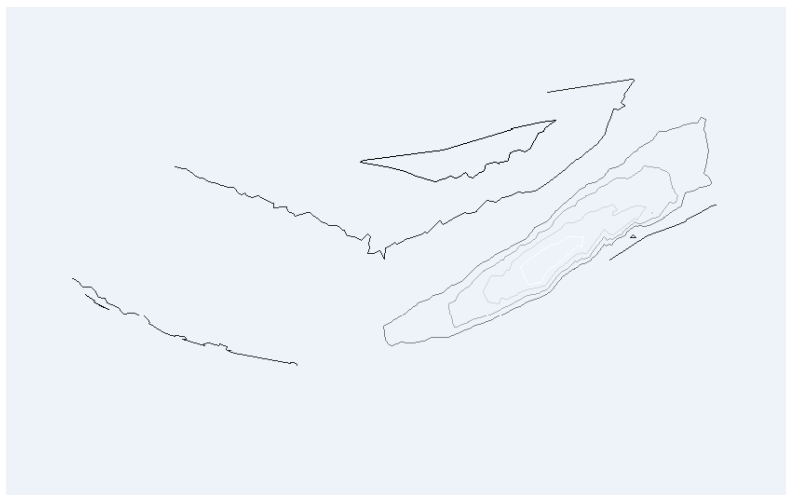


'Right-Click' and 'Export', 'Save as...'  
**Very important that 'Rendered image' is used.**



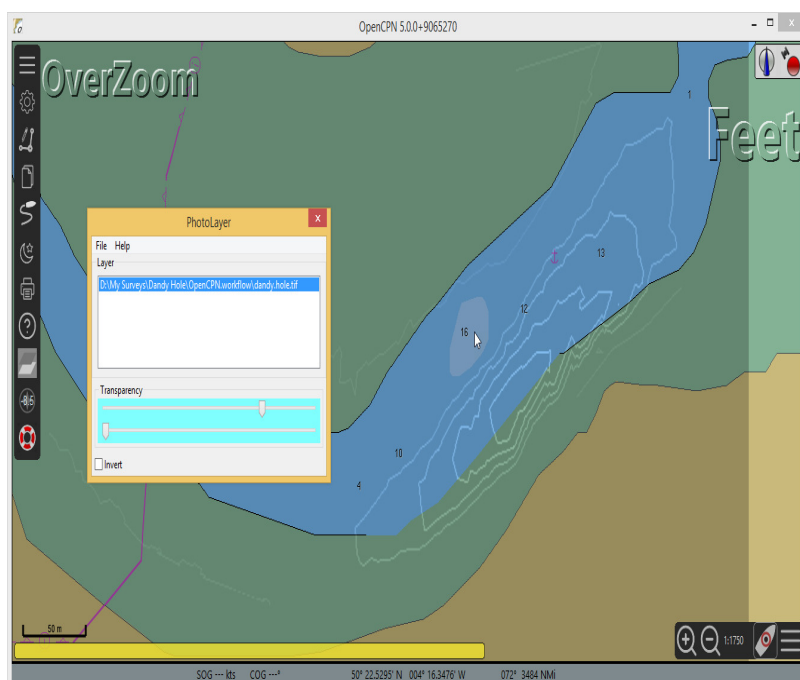
This creates the geotiff of the contour lines.

QGIS displays correctly but initially colours may be reversed when viewing the geotiff file.



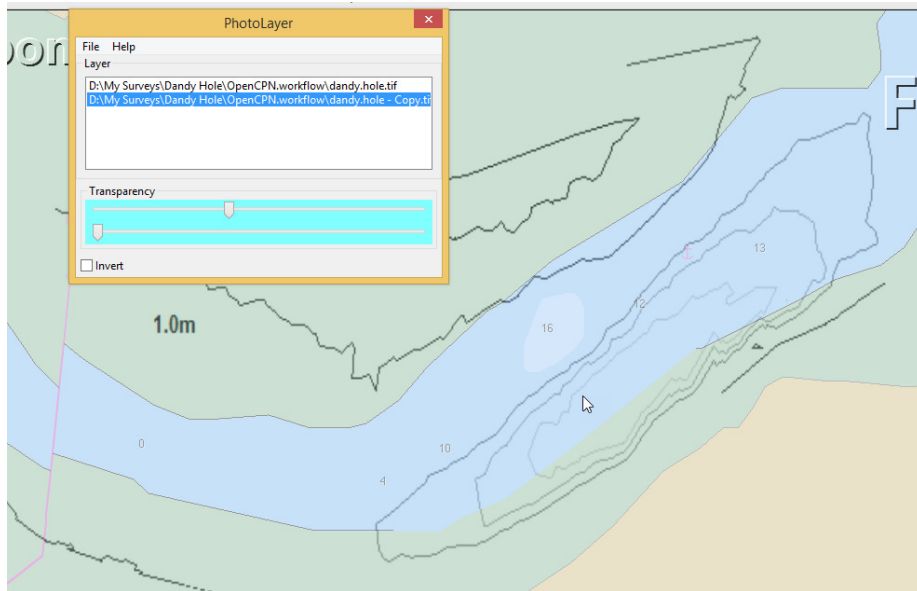
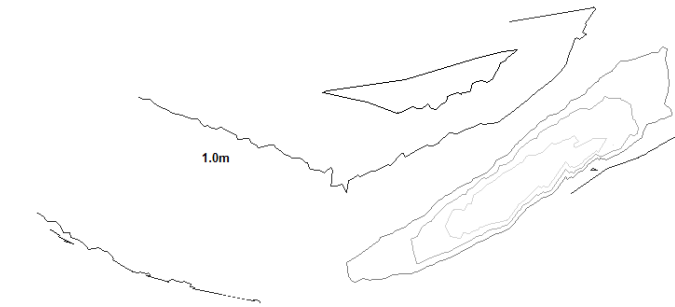
The survey can be displayed on OpenCPN with PhotoLayer\_pi and compared with other charts.

The results for this area were significantly different from official sources. Recently the author met a yachtman who had anchored at Dandy Hole in what was thought to be the deepest position. The boat grounded at low water!



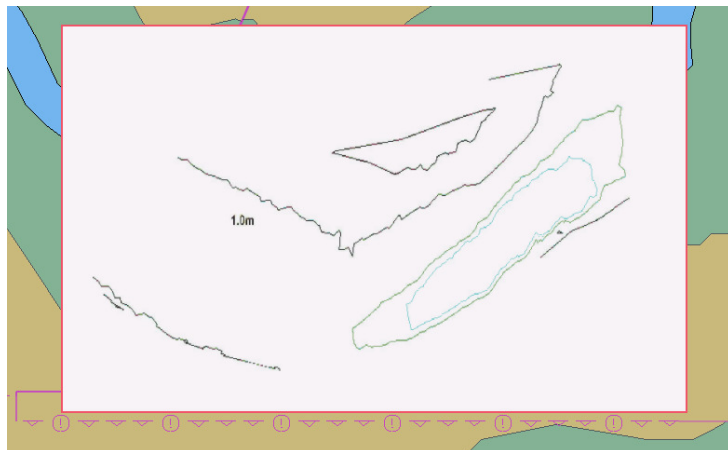
Geotiffs can only be edited with Microsoft Paint, as far as is known. At one point editing resulted in the contour lines turning black. Notes can be added with 'Paint'. Numbers against contour lines do not seem to be carried through to the geotiff when exporting geotiff using QGIS. Notice the lack of the datum line (0)





It has not been found possible to export a kap chart from PhotoLayer. The conversion of GeoTiff to kap can be made with MAPC2MAPC.

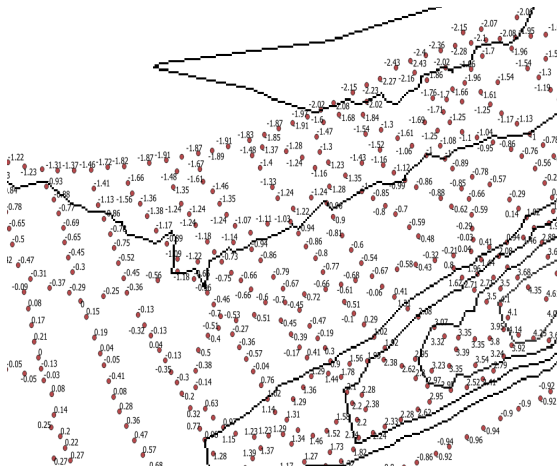
<https://www.the-thorns.org.uk/mapping/>



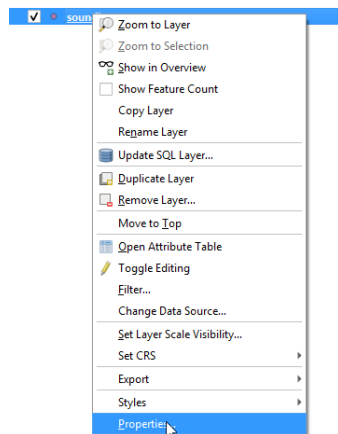
The problem is that the 'official' data is obscured.

### Labelling the contours

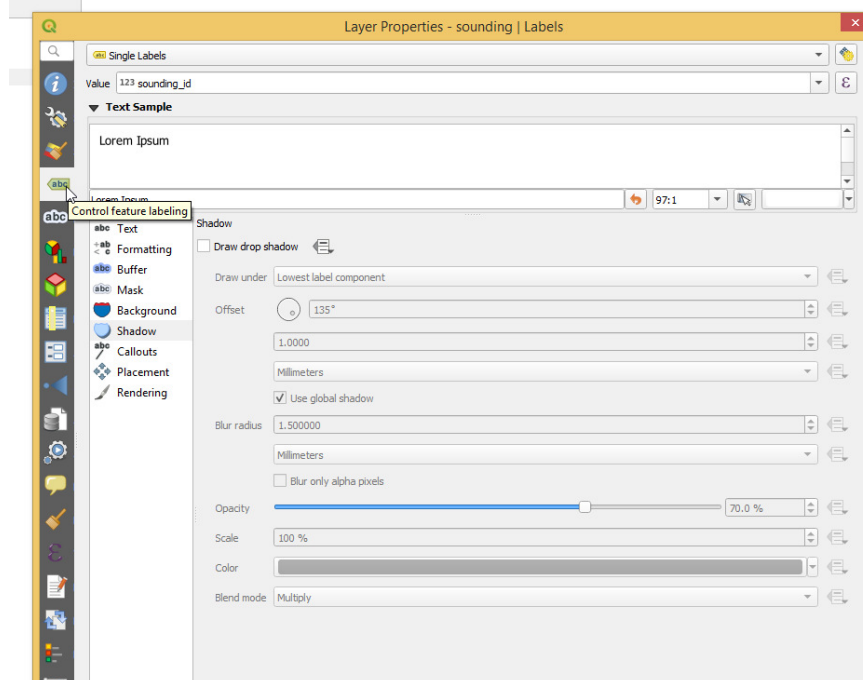
This can be useful for adding labels to contours with **Microsoft Paint**. The value for each contour is indicated by the sounding around it or you can use the contour labels from QGIS described earlier.

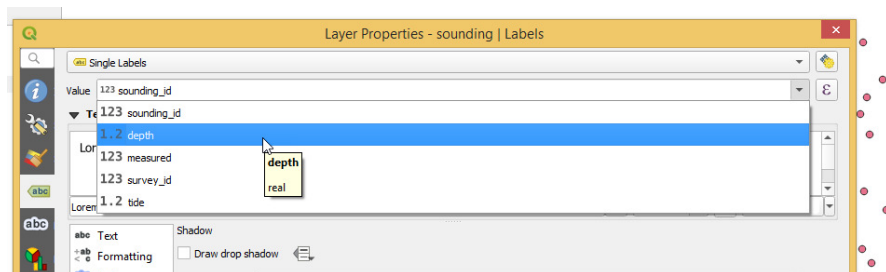


'Right-Click' on the soundings file.



For value use 'depth'.





'Apply'

'OK'

