QGIS Training Modules

Module 3 Digitisation

Digitisation

1. Introduction

This QGIS module focuses on data digitisation and creation of new shapefiles. The instructions are written for Q-GIS 3.2 version and above.

At the end of this module you will be able to do the following:

- Adding new layers to Q-GIS project
- Create bookmarks
- Geo-referencing
- Create new points, polygons and lines

1.1. Data Folder

To access data for this module, please contact Cefas at gissupport@cefas.co.uk and we will share the data with you and a link to a supplementary tutorial video.

The data folder contains the following:

- survey.png
- coastline.zip (please unzip in your working folder)

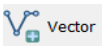
The description of the data can be found in the section 4.3 Metadata.

2. Instructions

2.1. Open Blank QGIS Project:

Navigate to the Windows Taskbar and type in QGIS- double click to open “QGIS Desktop”

2.2. Open coastline shapefile:

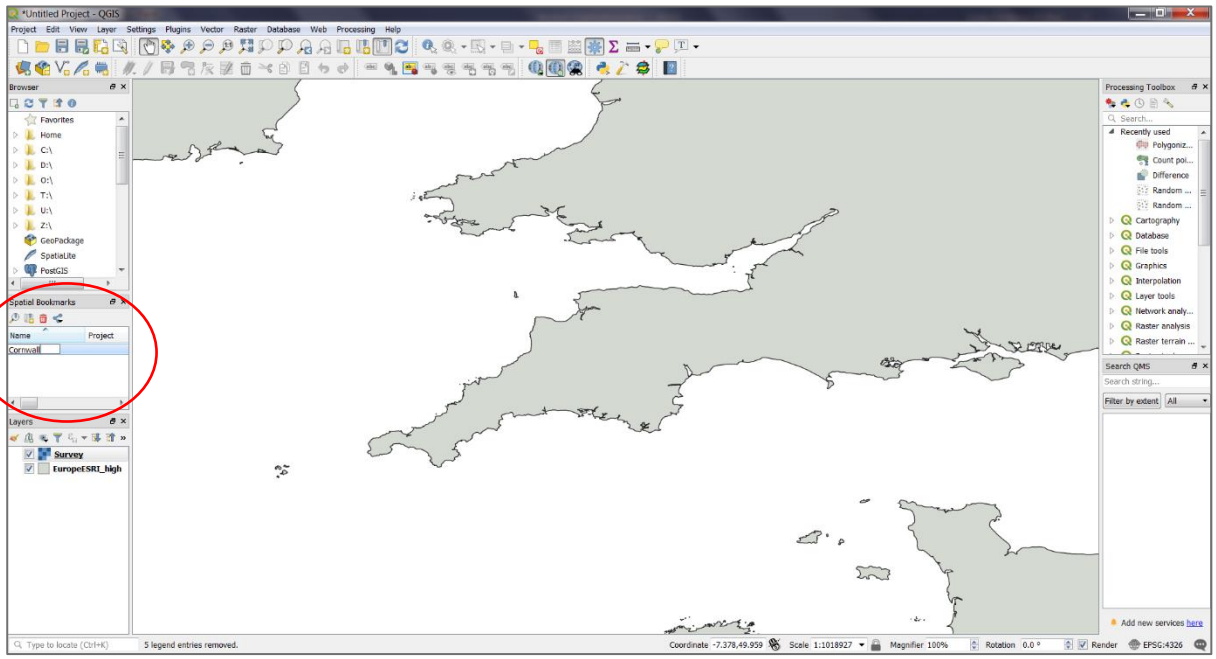
Open *Data Source Manager* (CTRL+L) or click on  and click on *Add vector* 

, navigate to the the place where you downloaded the UK coastline and add coastline.shp layer as a source. Click *Add* and *Close*.

2.3. Create Bookmark for Cornwall:

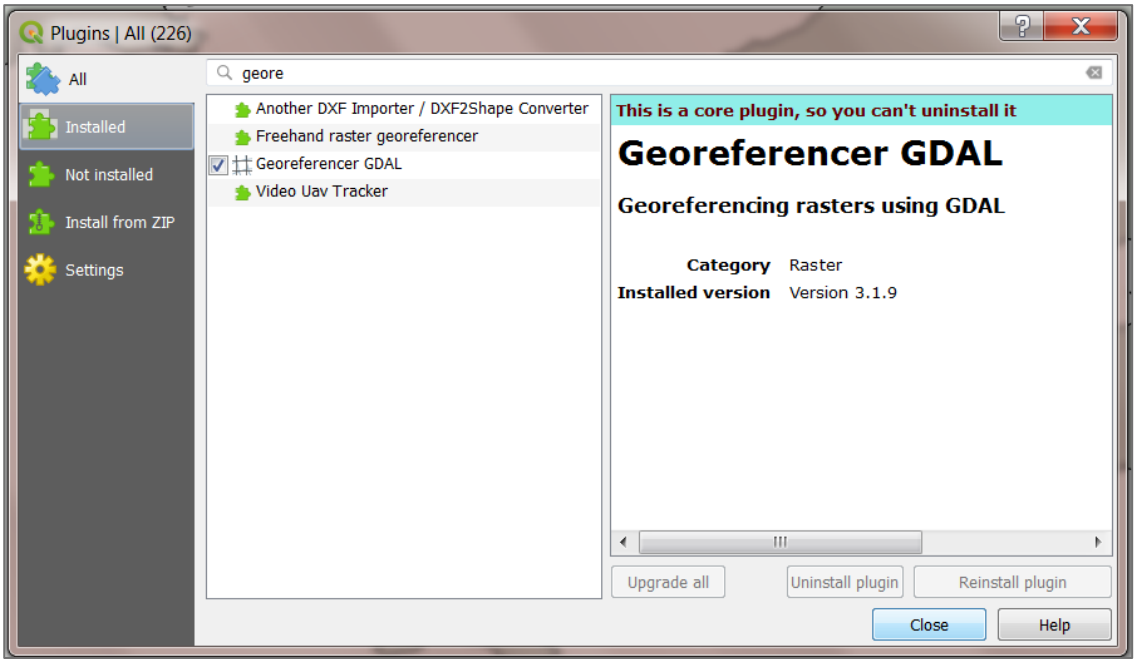
Zoom to the area of Cornwall (below): *Then go to View → New Bookmark* and type a name of the bookmark in the *Spatial Bookmarks Panel*. If you change the zoom,

you can apply the bookmark zoom by*: left-click on the bookmark* (highlights) and click on 



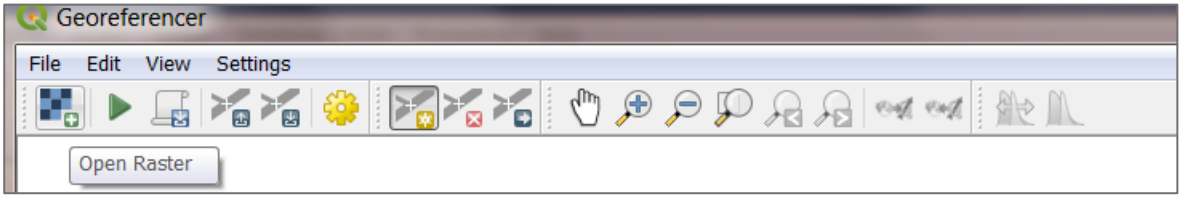
2.4. Activate Georeferencer GDAL Plugin:

Plugins → Manage and Install Plugins and type in *Georeferencer GDAL*. Check the box next to the plugin and *Close*. This plugin will appear under *Raster* tab at the top of the Q-GIS project.



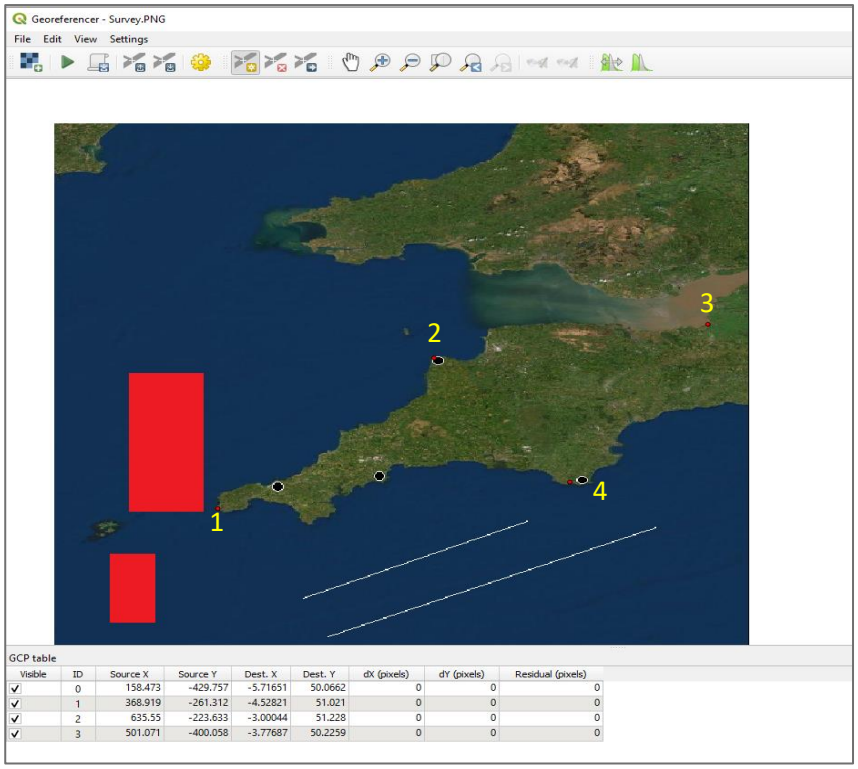
2.5. Open Georeferencer GDAL tool:

Raster → Georeferencer GDAL**.** A new georeferencing window will pop up. Load raster Survey image by clicking on *Open Raster:*

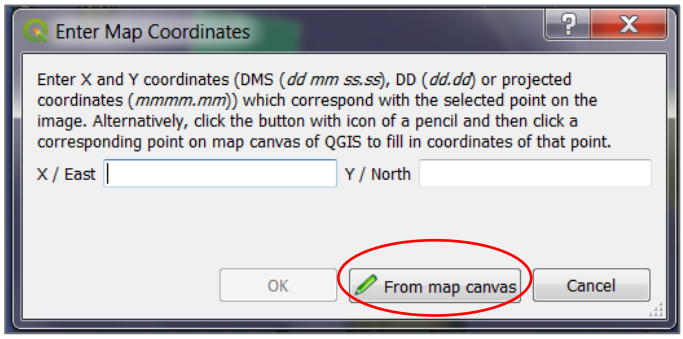


2.6. Goreferencing

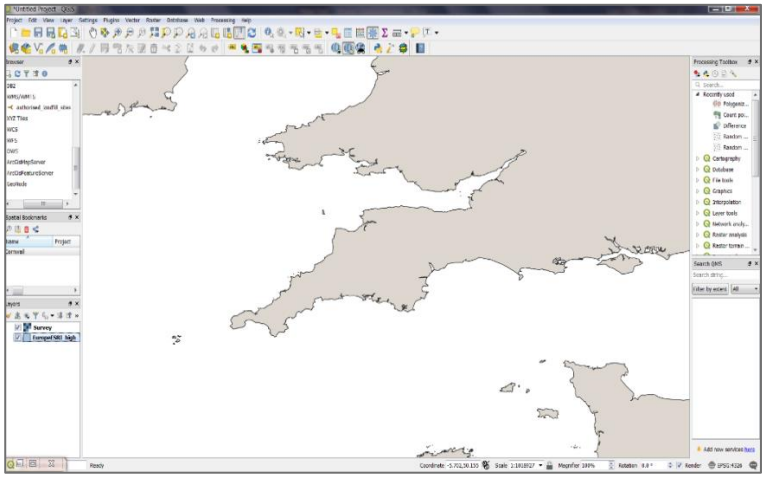
Click  to add ground control points. Navigate to locations in the screenshot below (red points), click on the location of red points in a map and the panel (*Enter Map Coordinates*) where you can insert coorindates appears. In the *Enter Map Coordinates panel*, select *From map canvas* which will navigate you back to the Europe shapefile. Use the bookmark created to zoom to Cornwall and pick the same spot as in the georeferencer. In theory, you need 3 evenly distributed ground control points for georeferencing. In this case, we added 6 points in order for the Survey.png align the coastline better. The GCP table becomes populated with the X and Y coordinates from the shapefile (see below).



1. Add GCPs



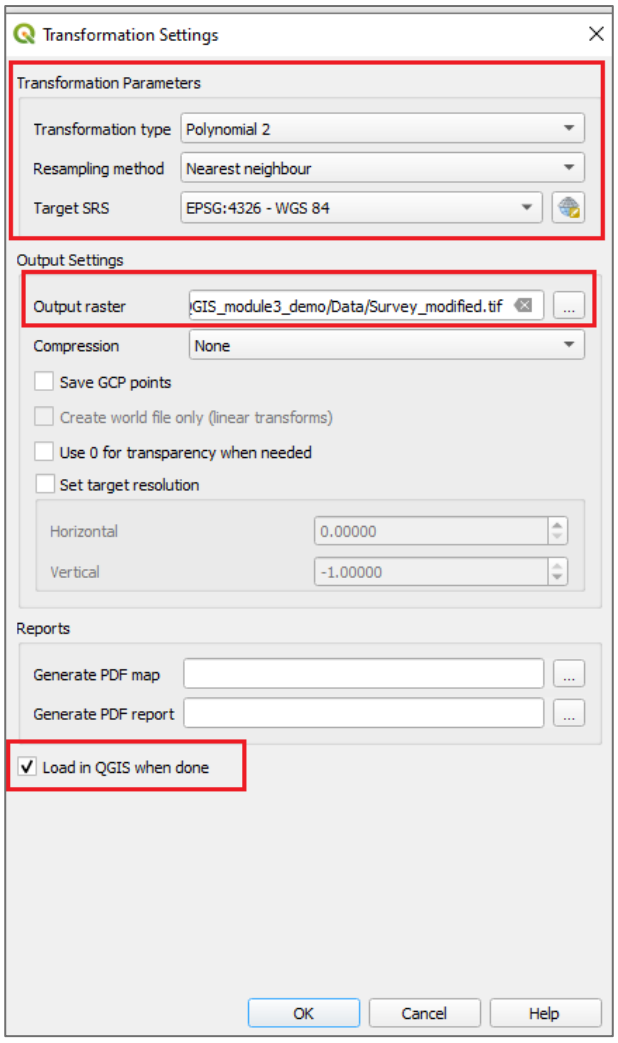
2. Add coordinates from map canvas



3. Select corresponding point from map canvas

In the Georeferencer panel go to *Settings* → *Transformation Settings* and fill the settings with the parameters below (*save raster to your working folder). Then press *Start Georeferening* . After georeferencing is finished, the new layer will be added to QGIS project. After setting-up your georeferencing

settings, you will see that the residual pixels are calculated. This shows how well your control points match the referencing surface. If some of them seem too high, this is most likely due to human error and you should consider changing them or remove them from the georeferencing.



2.7. Transparency

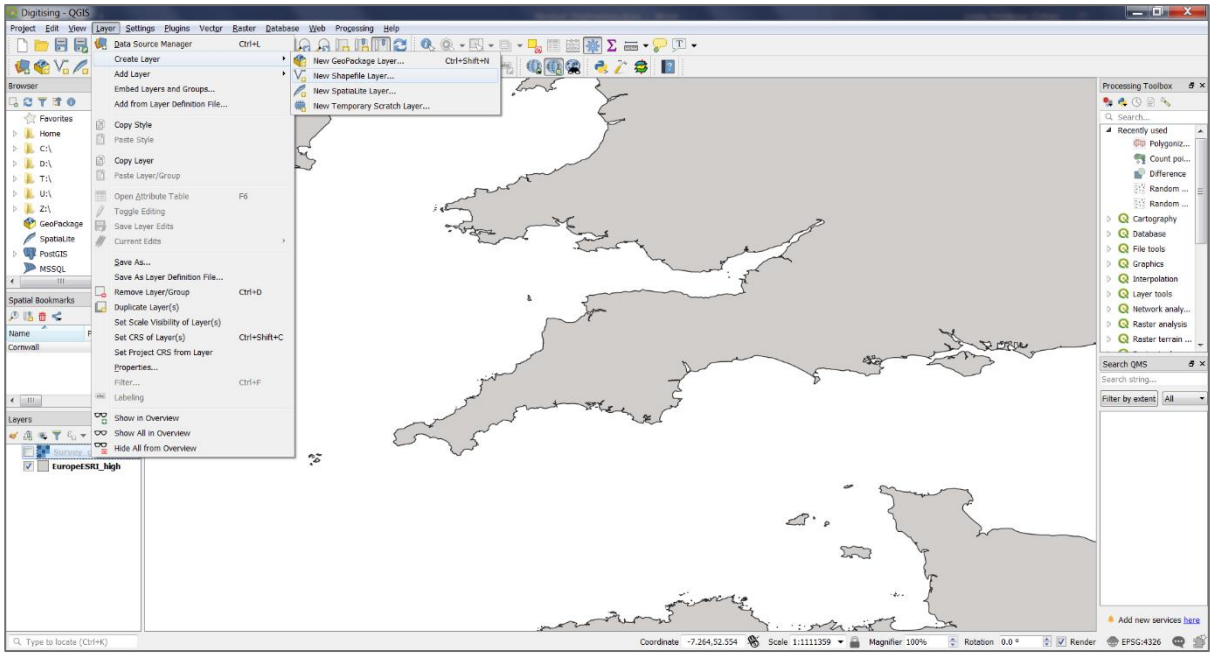
To check how accurate the georeferencing was, we can change the transparency of the georeferenced layer. Right click survey_modified_georef.tif → Properties → *Transparency* and change *Global Opacity to 50%.* If unsatisfied with the georeferenced layer, you can remove/add ground control points in the georeferencer panel and compute new outputs.

2.8. Saving

To save your project: The top tab Project → Save As and navigate to your working folder

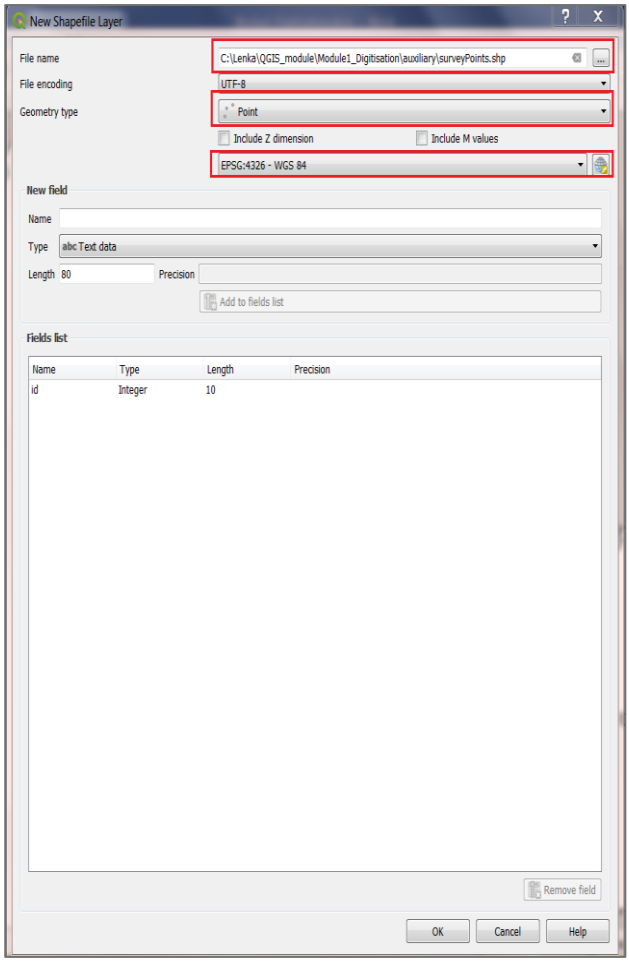
2.9. Digitising

We are going to create 3 types of shapefiles- points, lines and polygons. To create a shapefile: the top tab *Layer* → *Create Layer* → *New Shapefile (*as below*)*.



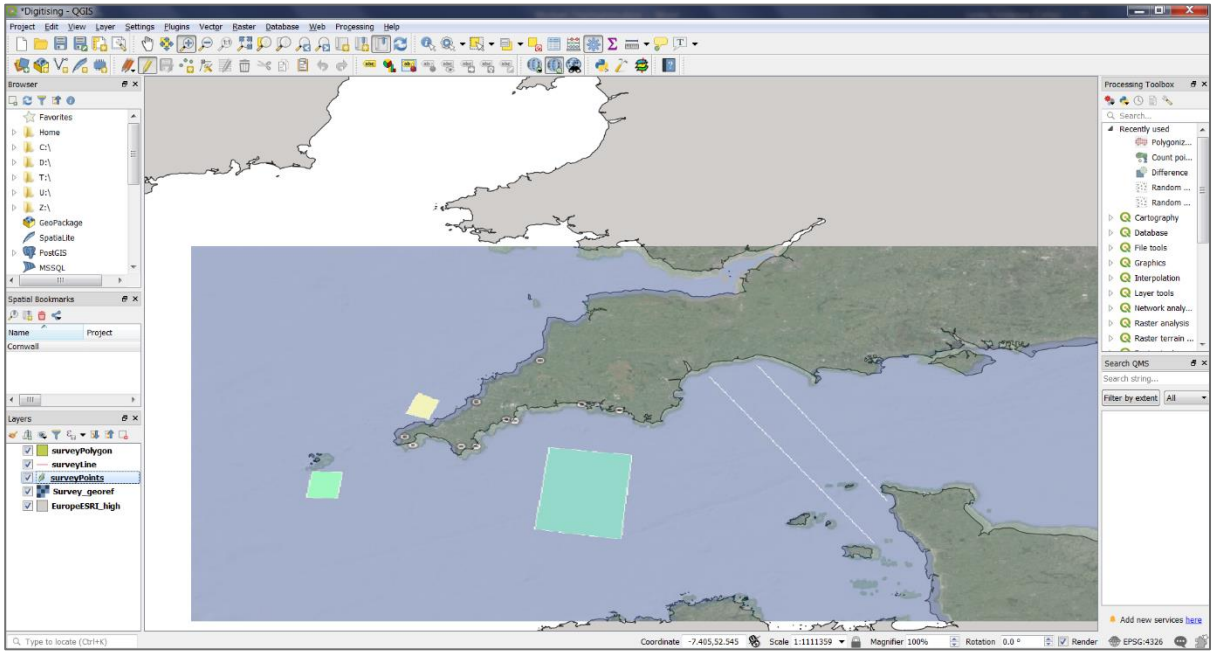
2.10. New Shapefile Layer

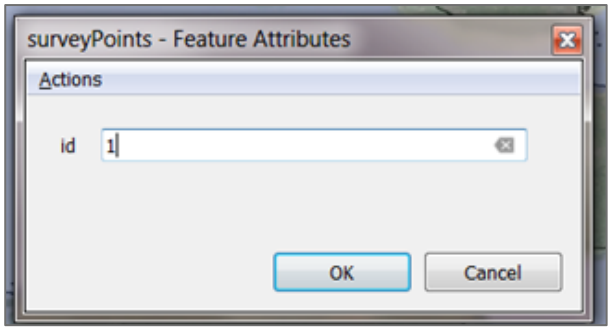
To create a new point shapefile, fill in the *File name* (save in your working folder), *Geometry type* → *Point* and the *Coordinate Reference System* (already pre-defined for you as WGS 84). Repeat the same steps and create surveyLines.shp (Geometry type= Line) and surveyPolygons(Geometry type= Polygon).



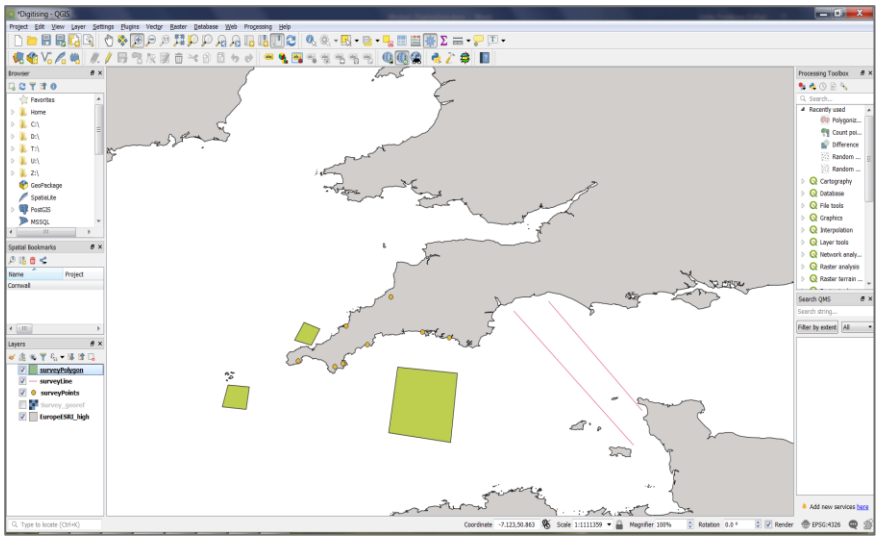
2.11. Digitising points

In your table of contents, right click on surveyPoints.shp to highlight it. Press Toggle Editing to active the editing mode as shown below. Then click on  to add *Point Features*. Click on the point features around the coast. For each feature, you have to add a feature ID as shown below.





When all the point features are digitised, press Save Layer Edits and Toggle Editing again to get out of the edit mode. Repeat the same steps for lines and polygons. When adding the last vertex of a line or polygon, left click to finish the feature and that's when the feature attribute table opens. For more information please follow the accompanying video. At the end you should have 3 shapefiles as shown next:



3. Additional Resources

https://www.qgistutorials.com/en/docs/3/advanced_georeferencing.html

https://docs.qgis.org/3.10/en/docs/training_manual/forestry/stands_digitazing.html

https://docs.qgis.org/2.8/en/docs/user_manual/plugins/plugins_georeferencer.html#available-transformation-algorithms

4. Acknowledgement

4.1. Authors

Lenka Fronkova (lenka.fronkova@cefas.co.uk)

4.2. Links

Material for cover page:

1. https://images.app.goo.gl/oqQ2ies3WvbBNZDA9
2. https://moderndiplomacy.eu/2019/02/26/seize-the-opportunities-of-digital-technology-to-improve-well-being-but-also-address-the-risks/

4.3. Metadata

Nature of Data	Name	Source	Citation	Licence	Source Link	Data Processing	Date Accessed
Non-georeferenced screenshot	Survey.tif	Cefas	Please note that the data/ dataset is fictional and has been created solely for the purposes of training and must only be used for this training module. Resemblance or links to any person or natural entity directly or indirectly is purely coincidental.	Training Module Purposes only	http://mdrviewer/#/View/20993	Information in the source link	N/A
World coastline	coastline.shp	NOAA	COPYINGv3 and COPYING.LESSERv3.	GNU Lesser General Public License (LGPL)*	https://shoreline.noaa.gov/data/datasheets/wvs.html	No, Only level 1 f used (full resolution)	2020

*GNU OGL- https://www.gnu.org/licenses/lgpl-3.0.en.html