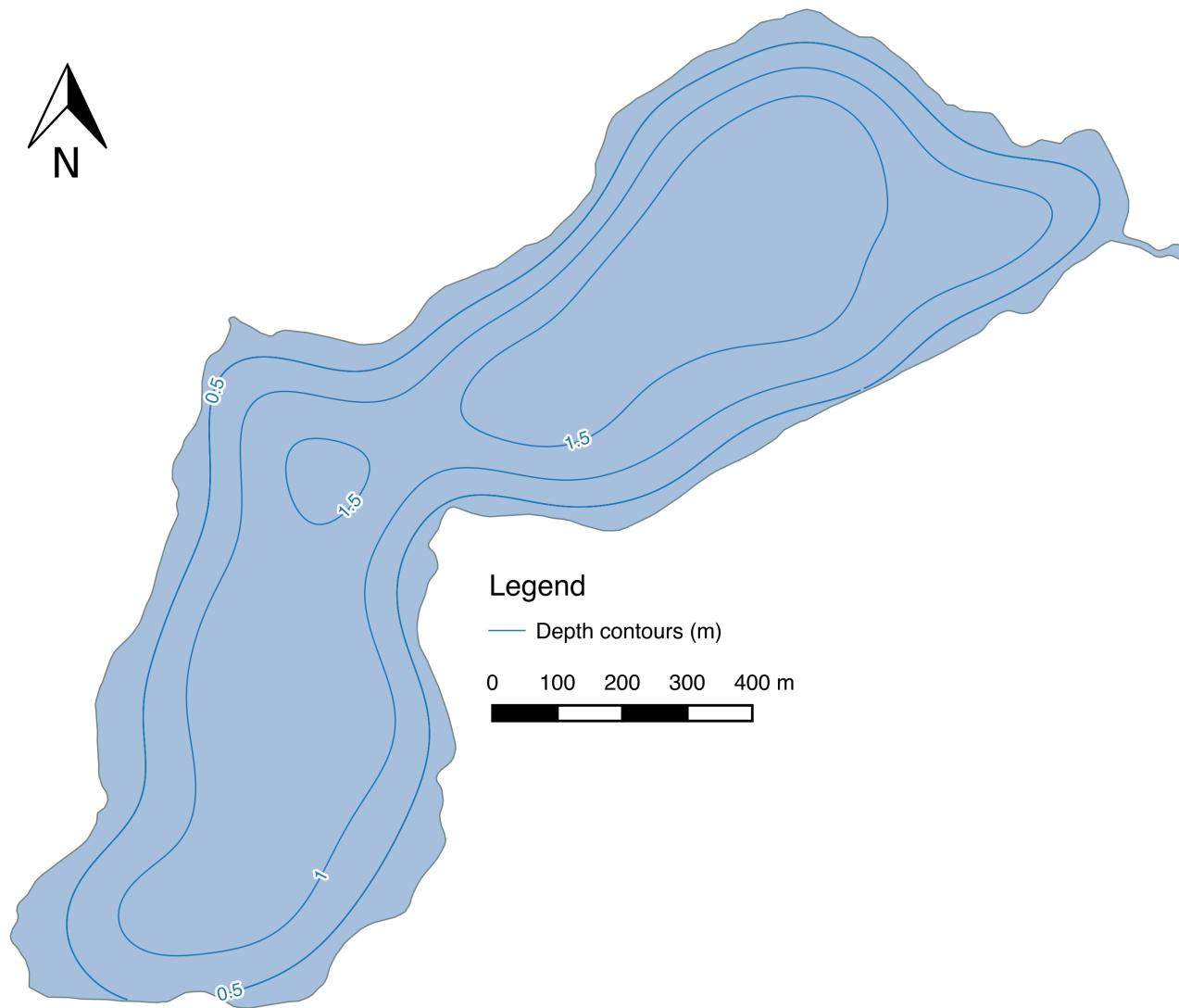


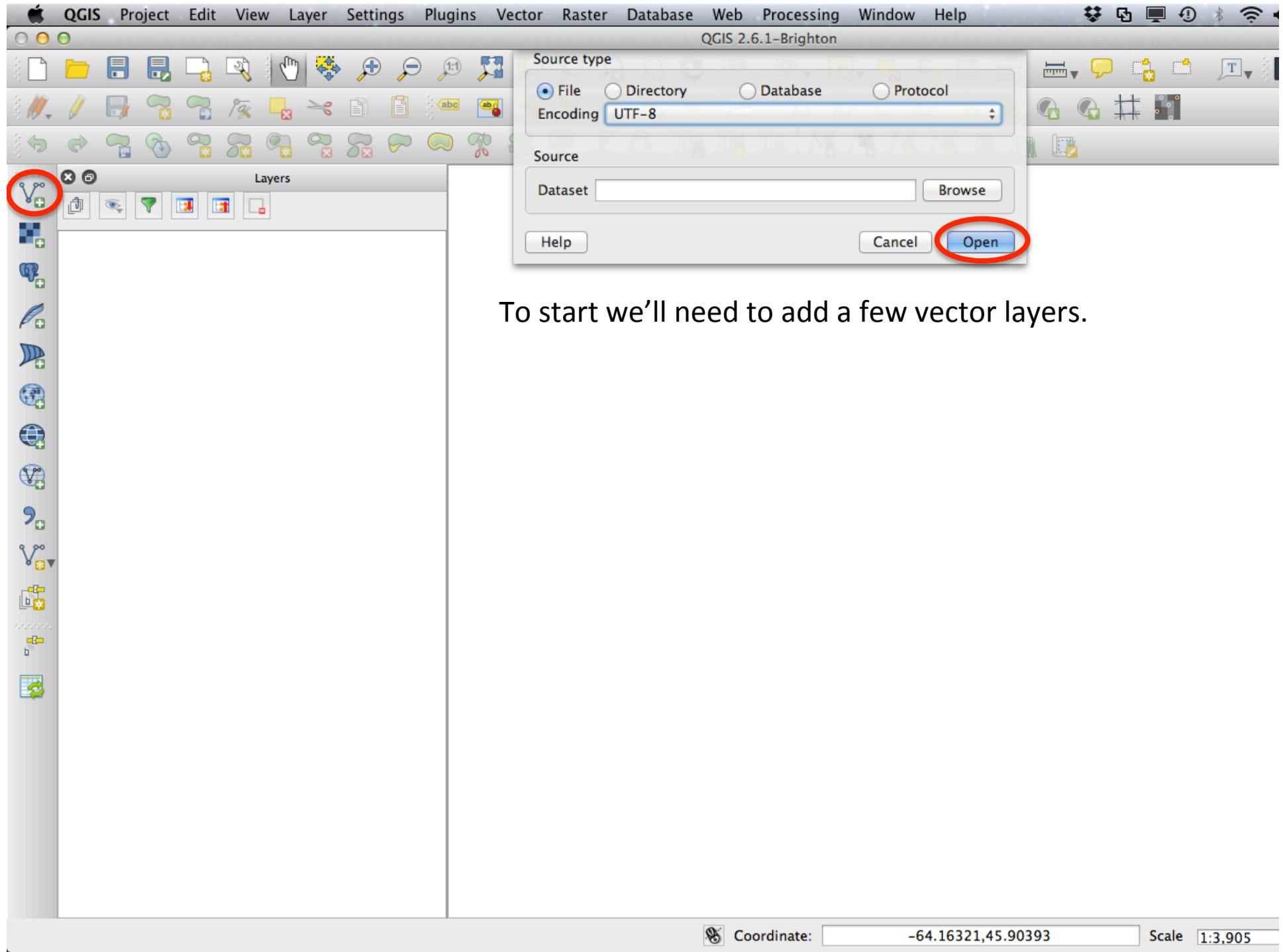
# 10. Interpolation and Contouring

# Purpose

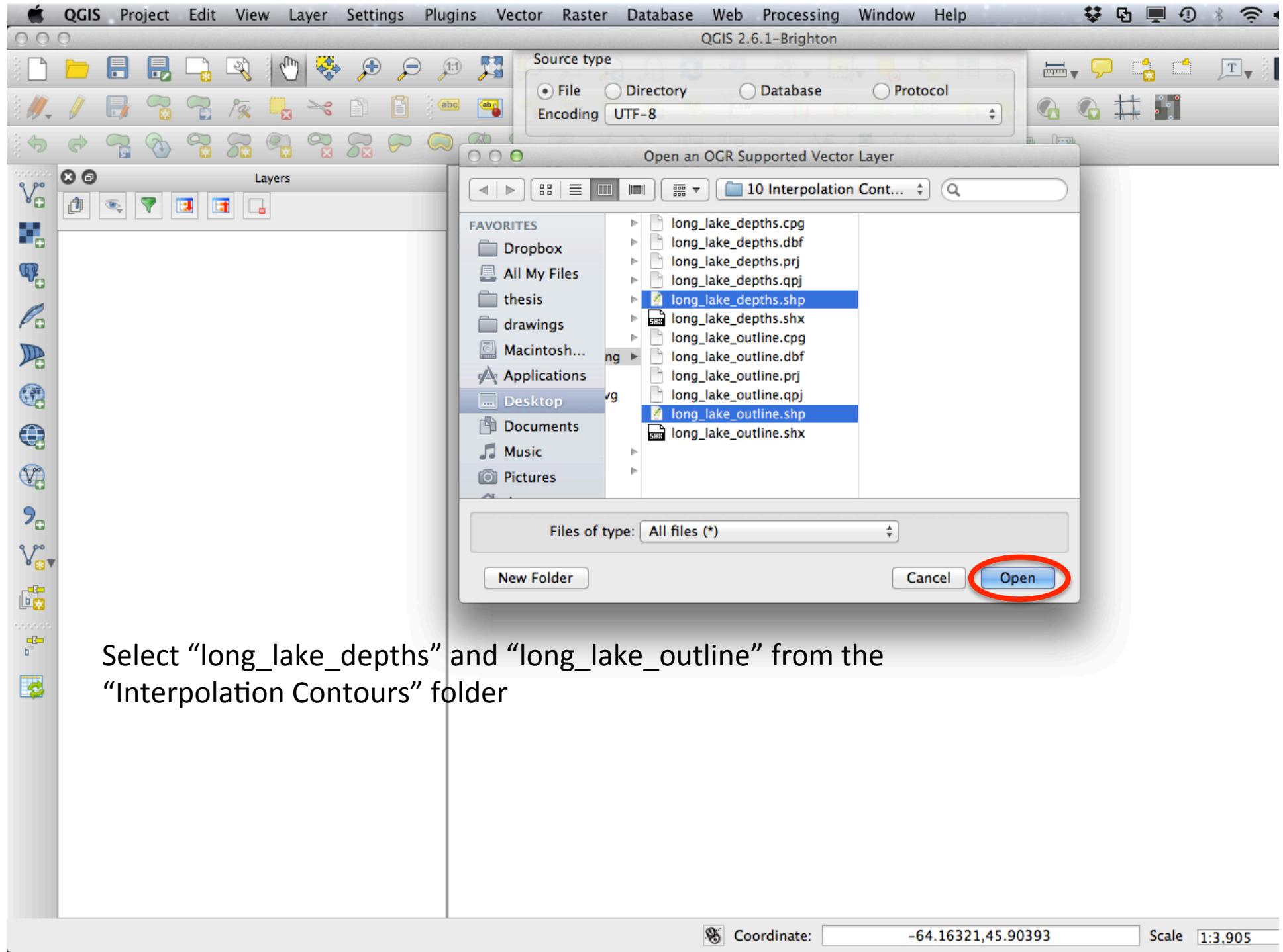
- Learn to use the Processing Toolbox to analyze and manipulate vector and raster data.
- Learn how to contour point data to locate high and low values.

# The Assignment

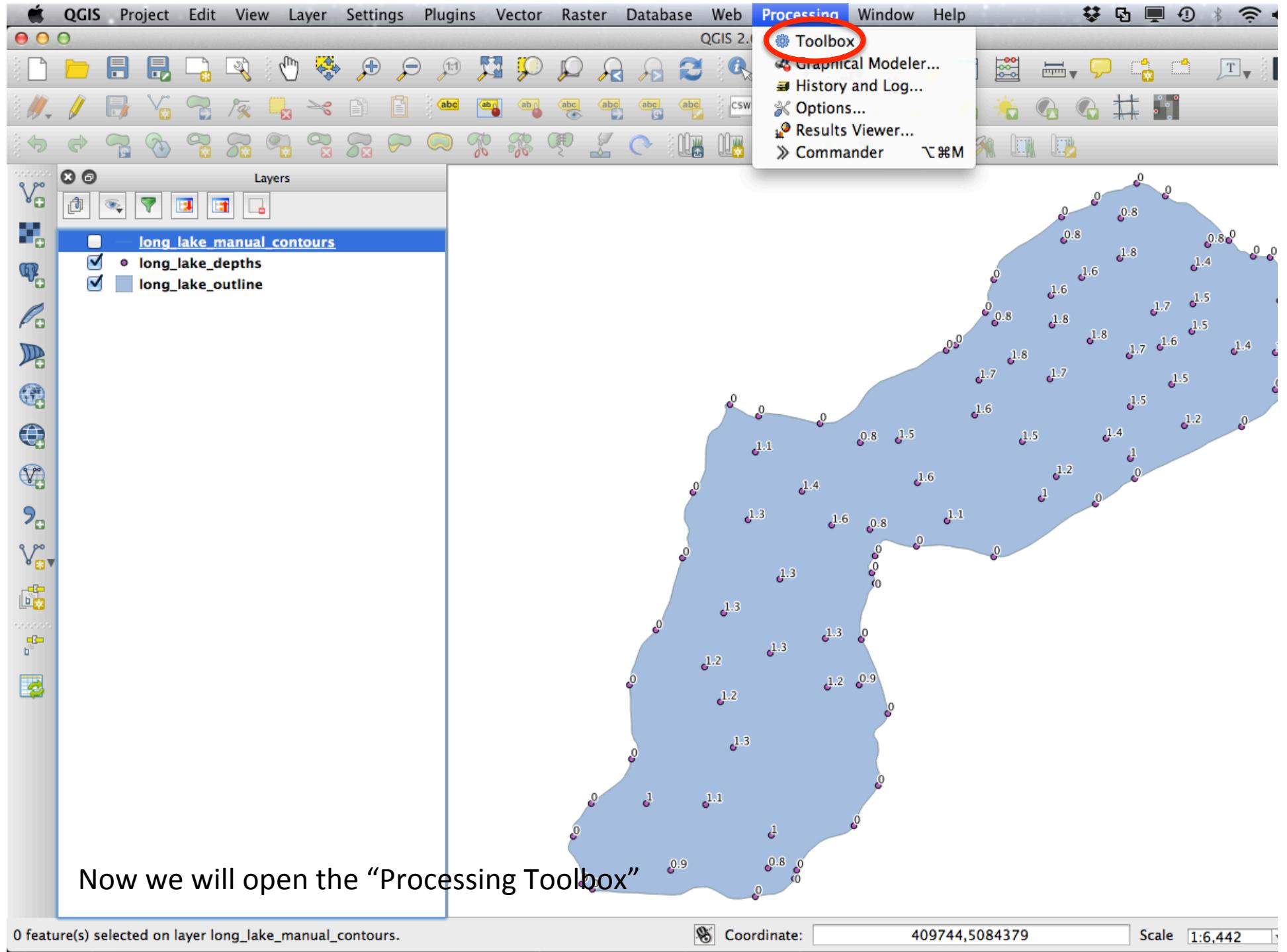


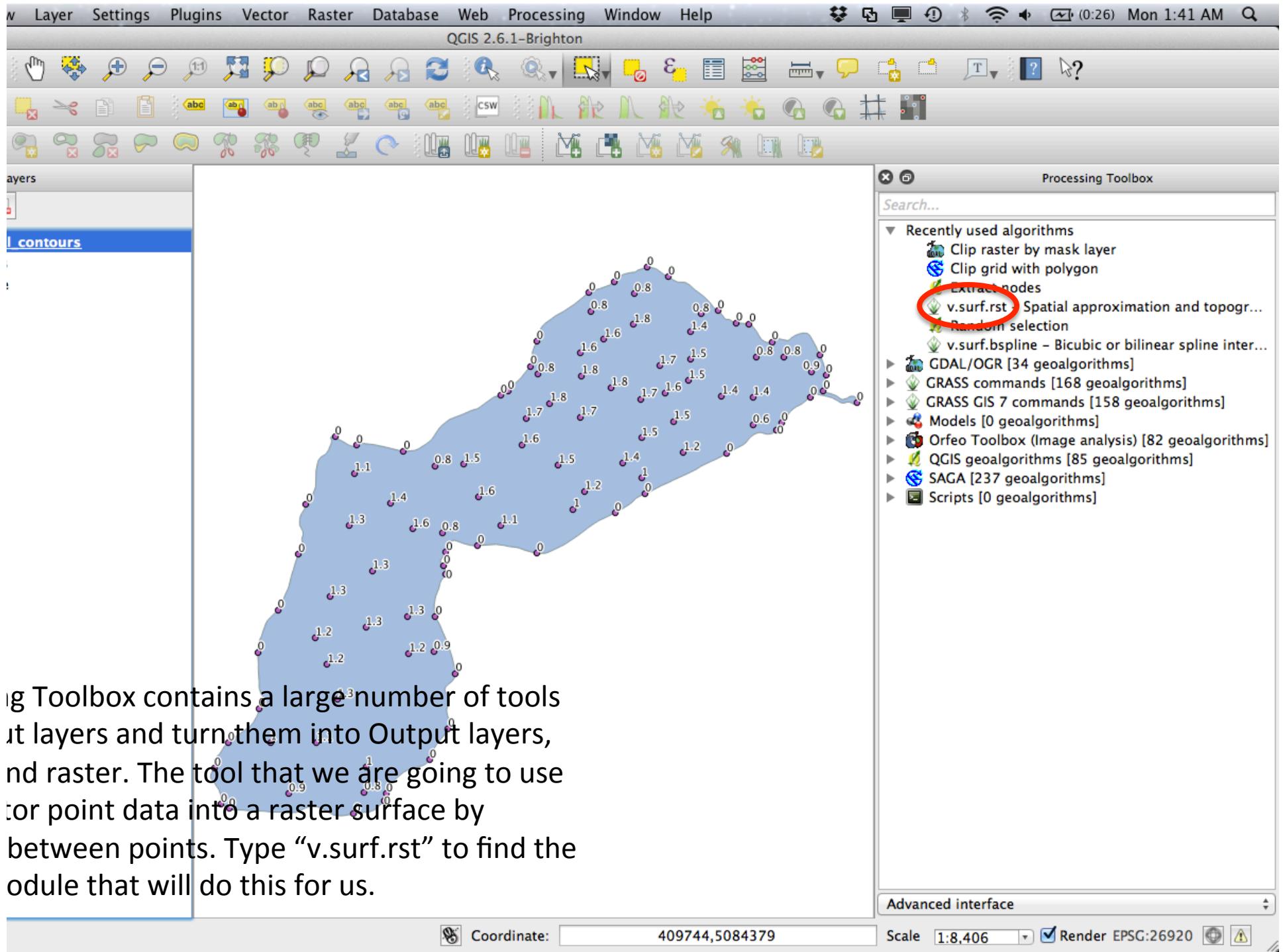


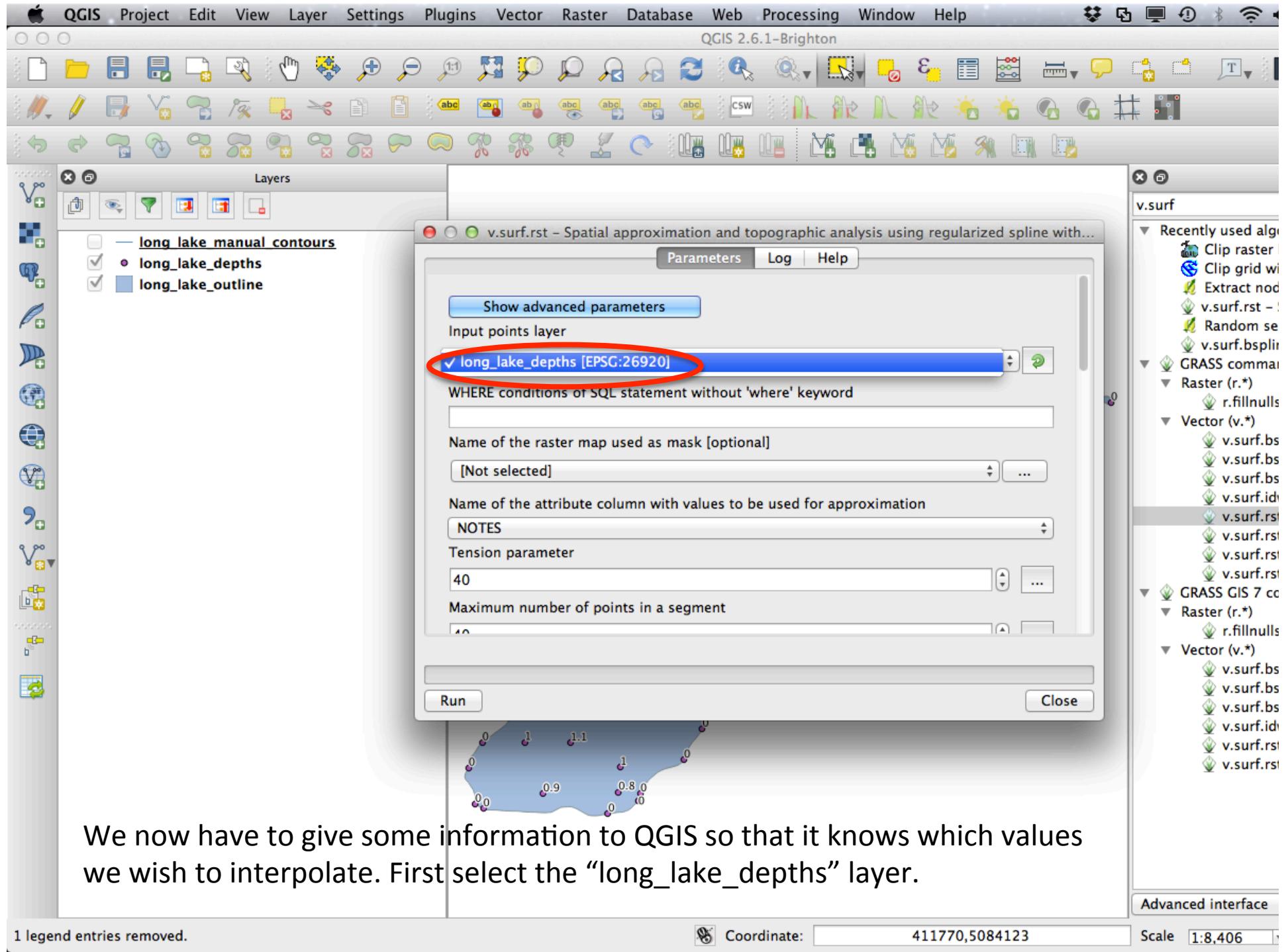
To start we'll need to add a few vector layers.



Select “long\_lake\_depths” and “long\_lake\_outline” from the “Interpolation Contours” folder







We now have to give some information to QGIS so that it knows which values we wish to interpolate. First select the “long\_lake\_depths” layer.

1 legend entries removed.

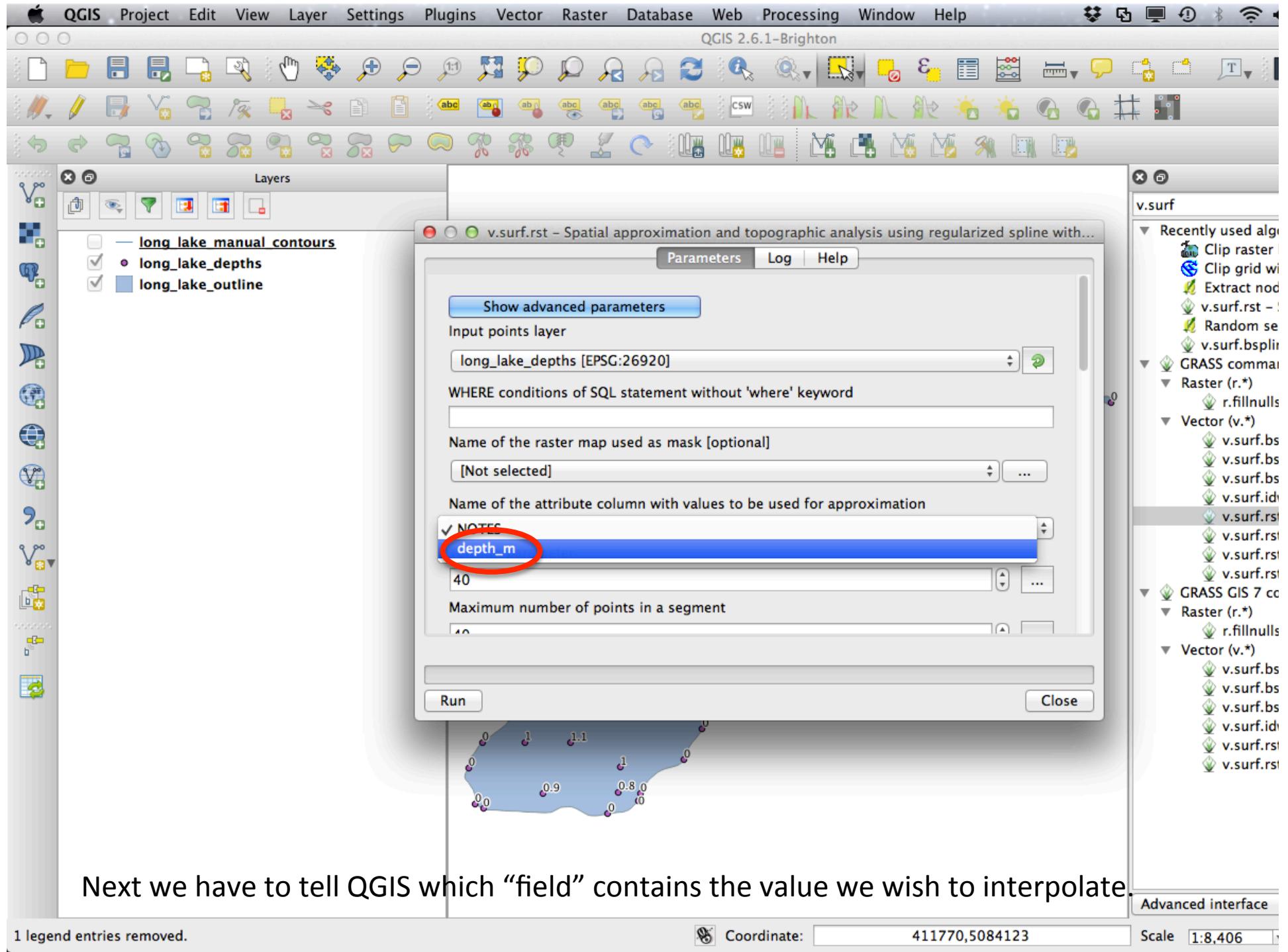


Coordinate:

411770,5084123

Scale

1:8,406



Next we have to tell QGIS which “field” contains the value we wish to interpolate.

1 legend entries removed.

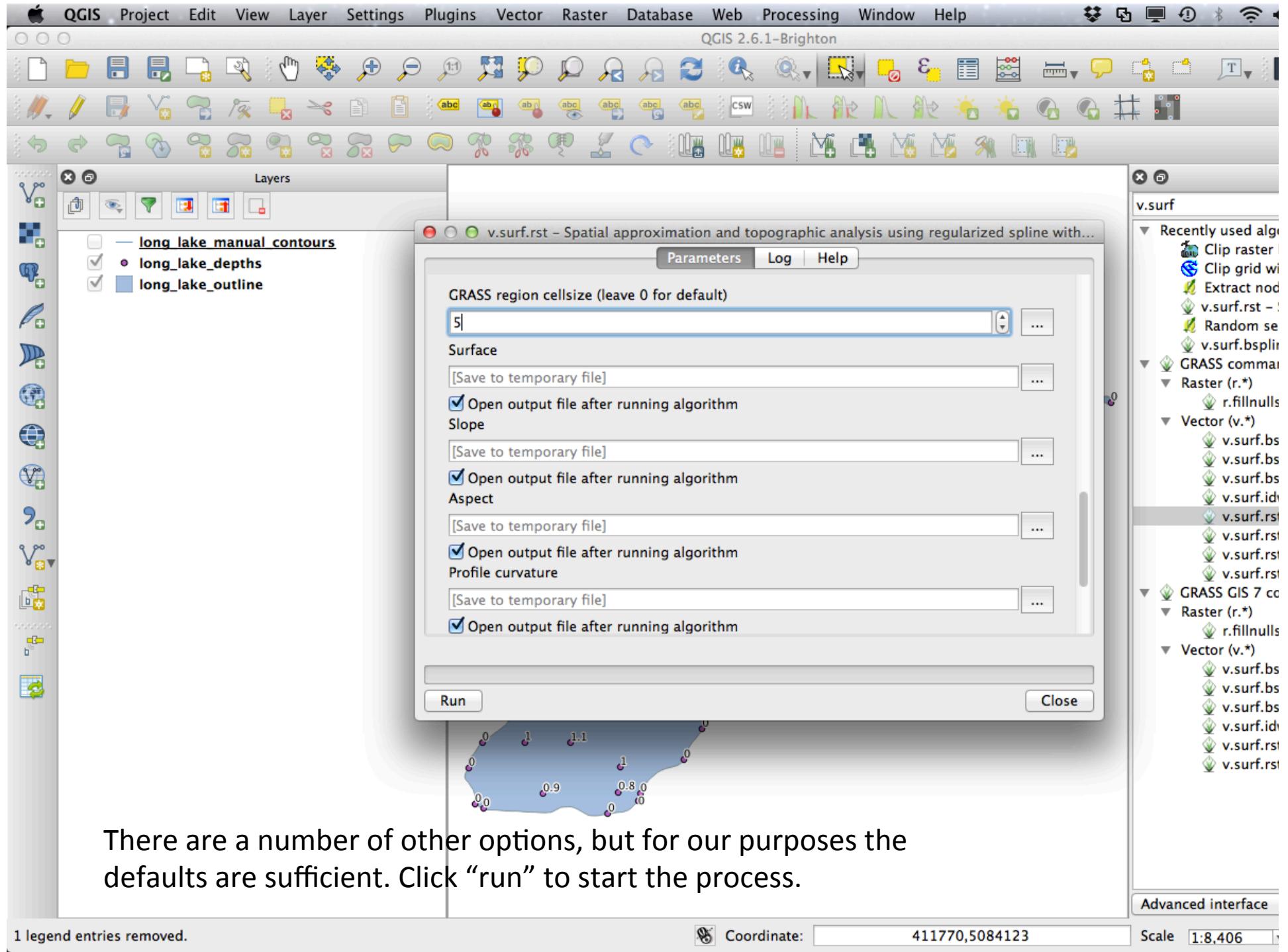


Coordinate:

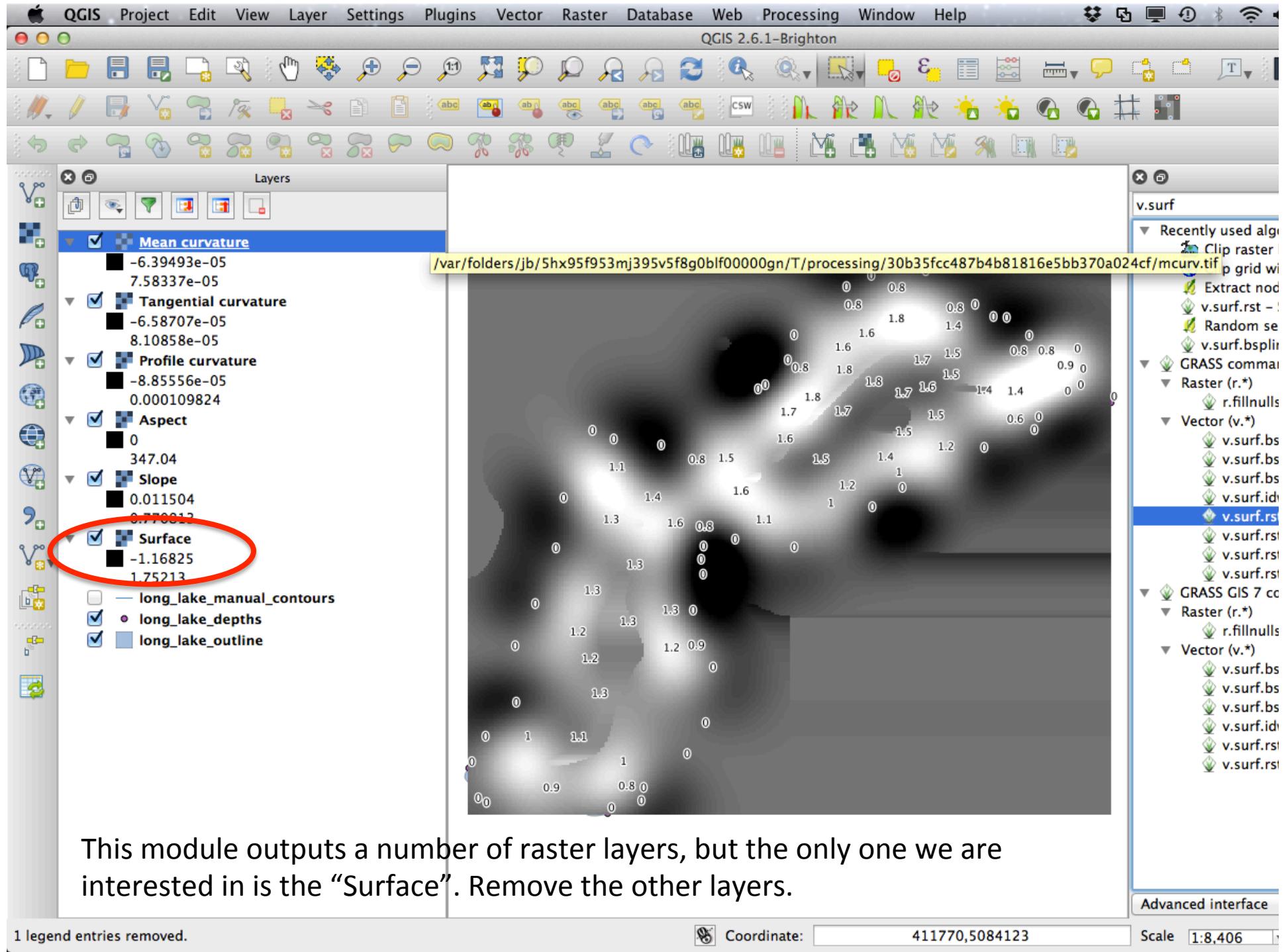
411770,5084123

Scale

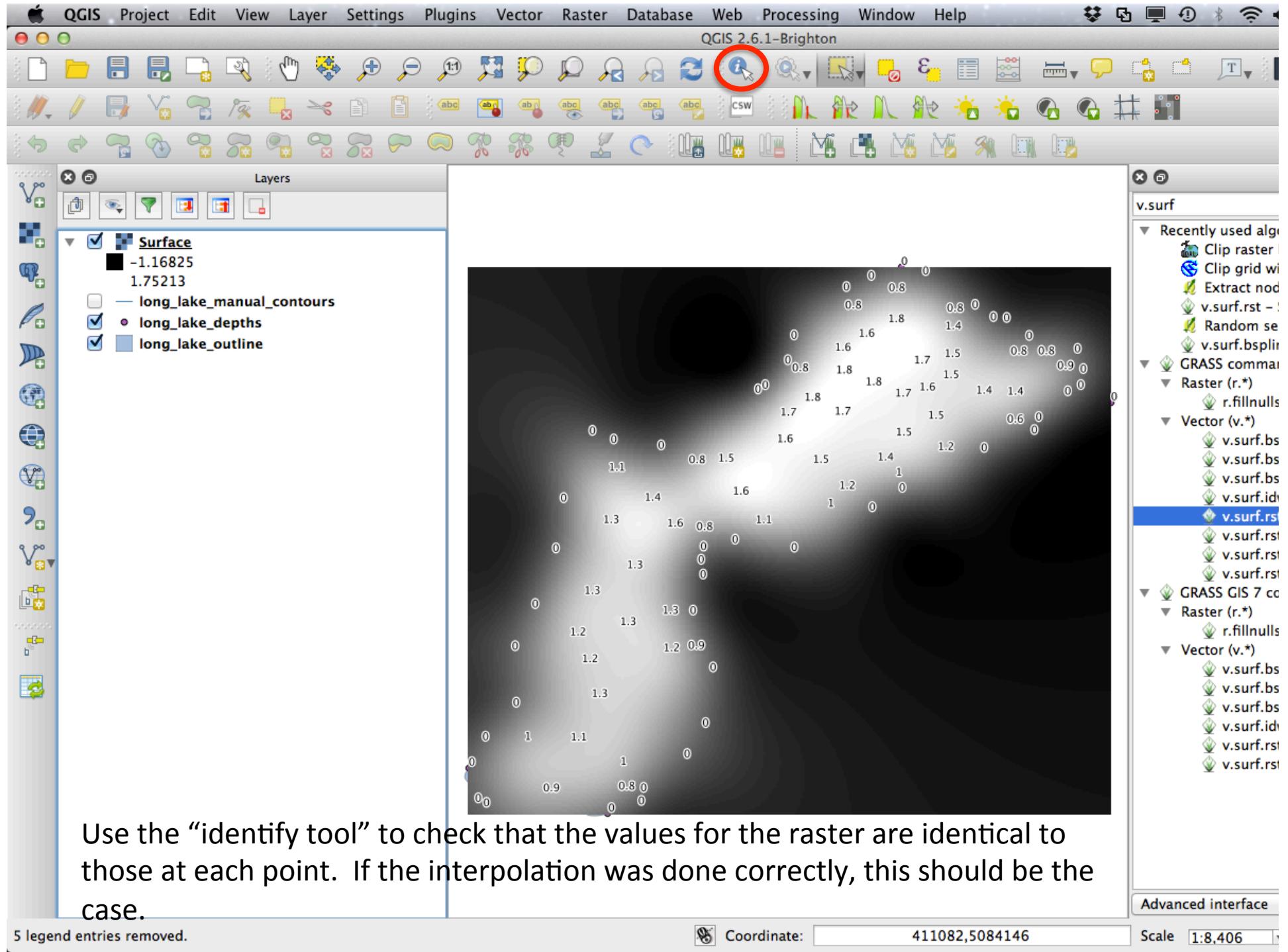
1:8,406



There are a number of other options, but for our purposes the defaults are sufficient. Click “run” to start the process.



This module outputs a number of raster layers, but the only one we are interested in is the “Surface”. Remove the other layers.



Because this interpolation is only relevant for the areas within the lake (depth doesn't matter unless you're in the lake), we want to clip this raster to the edge of the lake.

The screenshot shows the QGIS interface with a grayscale depth raster layer named 'l\_depth' in the layers panel. The Processing Toolbox is open, displaying the 'v.surf' algorithm category. The 'Clip grid with polygon' option is highlighted with a red circle, indicating it is the selected tool for clipping the raster.

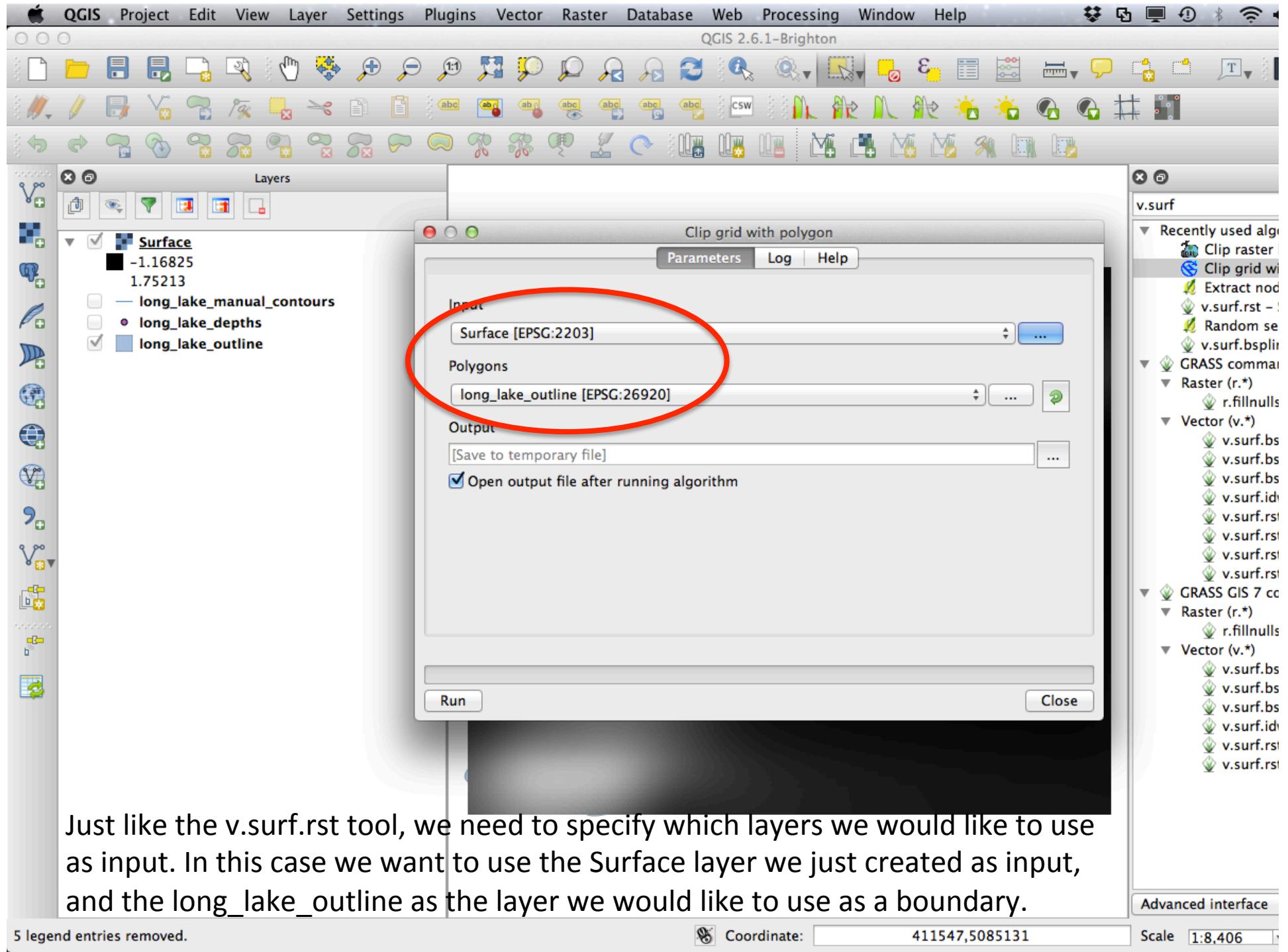
Processing Toolbox

v.surf

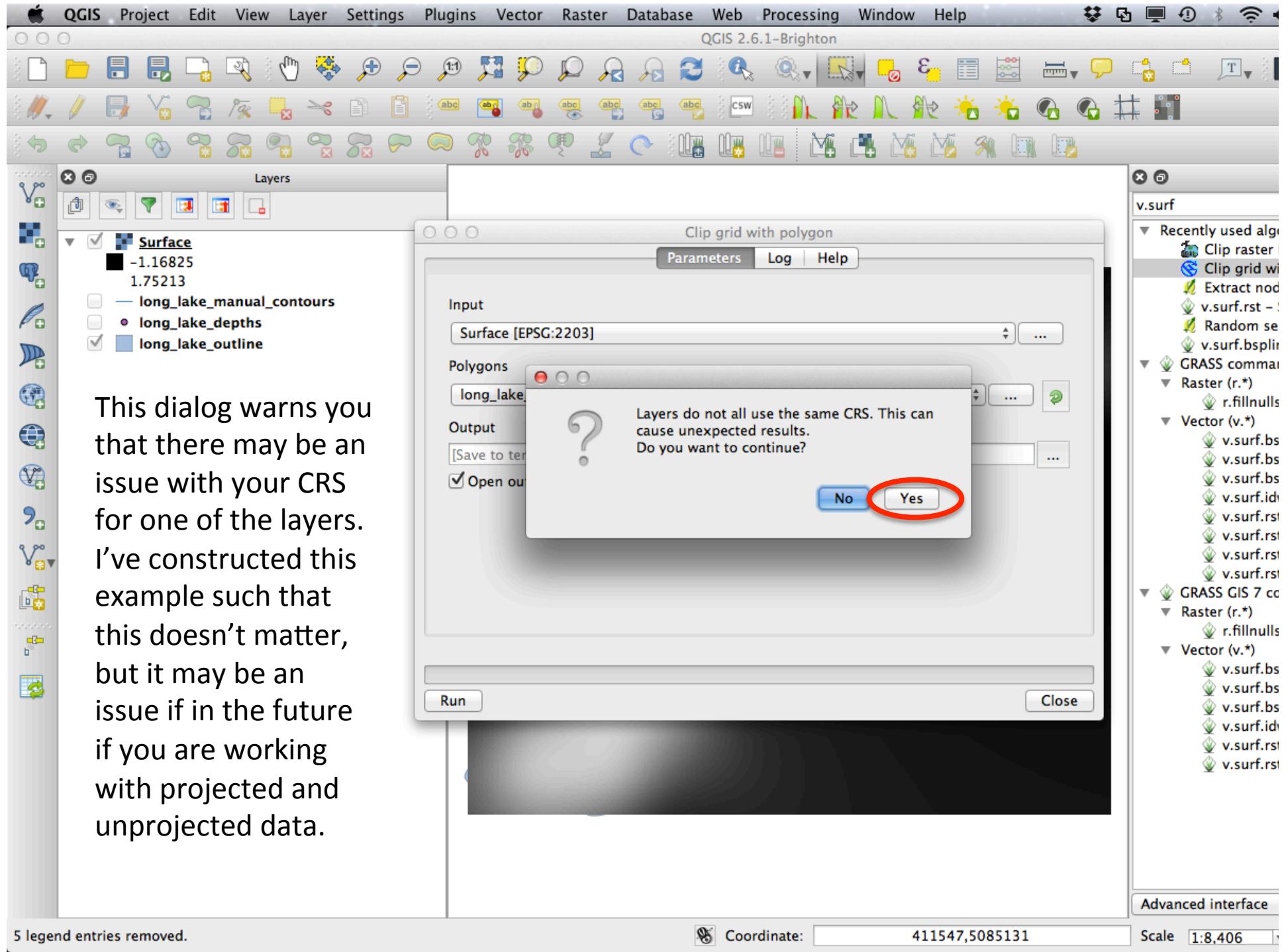
- Recently used algorithms
  - Clip raster by mask layer
  - Clip grid with polygon**
  - Extract nodes
- GRASS commands [168 geoalgorithms]
- Raster (r.\*)
  - r.fillnulls – Fills no-data areas in a raster l...
- Vector (v.\*)
  - v.surf.bspline – Bicubic or bilinear spline i...
  - v.surf.bspline.lambda – Bicubic or bilinear ...
  - v.surf.bspline.sparse – Bicubic or bilinear s...
  - v.surf.idw – Surface interpolation from vec...
  - v.surf.rst – Spatial approximation and top...
  - v.surf.rst.cvdev – Spatial approximation an...
  - v.surf.rst.cvdev.line – Spatial approximatio...
  - v.surf.rst.line – Spatial approximation and ...
- GRASS GIS 7 commands [158 geoalgorithms]
- Raster (r.\*)
  - r.fillnulls – Fills no-data areas in a raster l...
- Vector (v.\*)
  - v.surf.bspline – Bicubic or bilinear spline i...
  - v.surf.bspline.lambda – Bicubic or bilinear ...
  - v.surf.bspline.sparse – Bicubic or bilinear s...
  - v.surf.idw – Surface interpolation from vec...
  - v.surf.rst – Spatial approximation and top...
  - v.surf.rst.cvdev – Spatial approximation an...

Coordinate: 411547,5085131

Scale 1:8,406 Render EPSG:26920



Just like the v.surf.rst tool, we need to specify which layers we would like to use as input. In this case we want to use the Surface layer we just created as input, and the long\_lake\_outline as the layer we would like to use as a boundary.



QGIS Project Edit View Layer Settings Plugins Vector Raster Database Web Processing Window Help

QGIS 2.6.1-Brighton

Layers

v.surf

Recently used algos

- Clip raster
- Clip grid with
- Extract nodes
- v.surf.rst ->
- Random selection
- v.surf.bspli

GRASS commands

Raster (r.\*)

- r.fillnulls

Vector (v.\*)

- v.surf.bs
- v.surf.bs
- v.surf.bs
- v.surf.id
- v.surf.rst
- v.surf.rst
- v.surf.rst
- v.surf.rst

GRASS GIS 7 commands

Raster (r.\*)

- r.fillnulls

Vector (v.\*)

- v.surf.bs
- v.surf.bs
- v.surf.bs
- v.surf.id
- v.surf.rst
- v.surf.rst

Advanced interface

You should now have a layer called “Output” that is the clipped version of your “Surface” layer. You can now remove the original “Surface” layer since you won’t be needing it again.

5 legend entries removed.

Coordinate: 411547,5085131

Scale 1:8,406

Now that we have our raster surface, we can create our contours. We will do this doing the r.contour.step module.

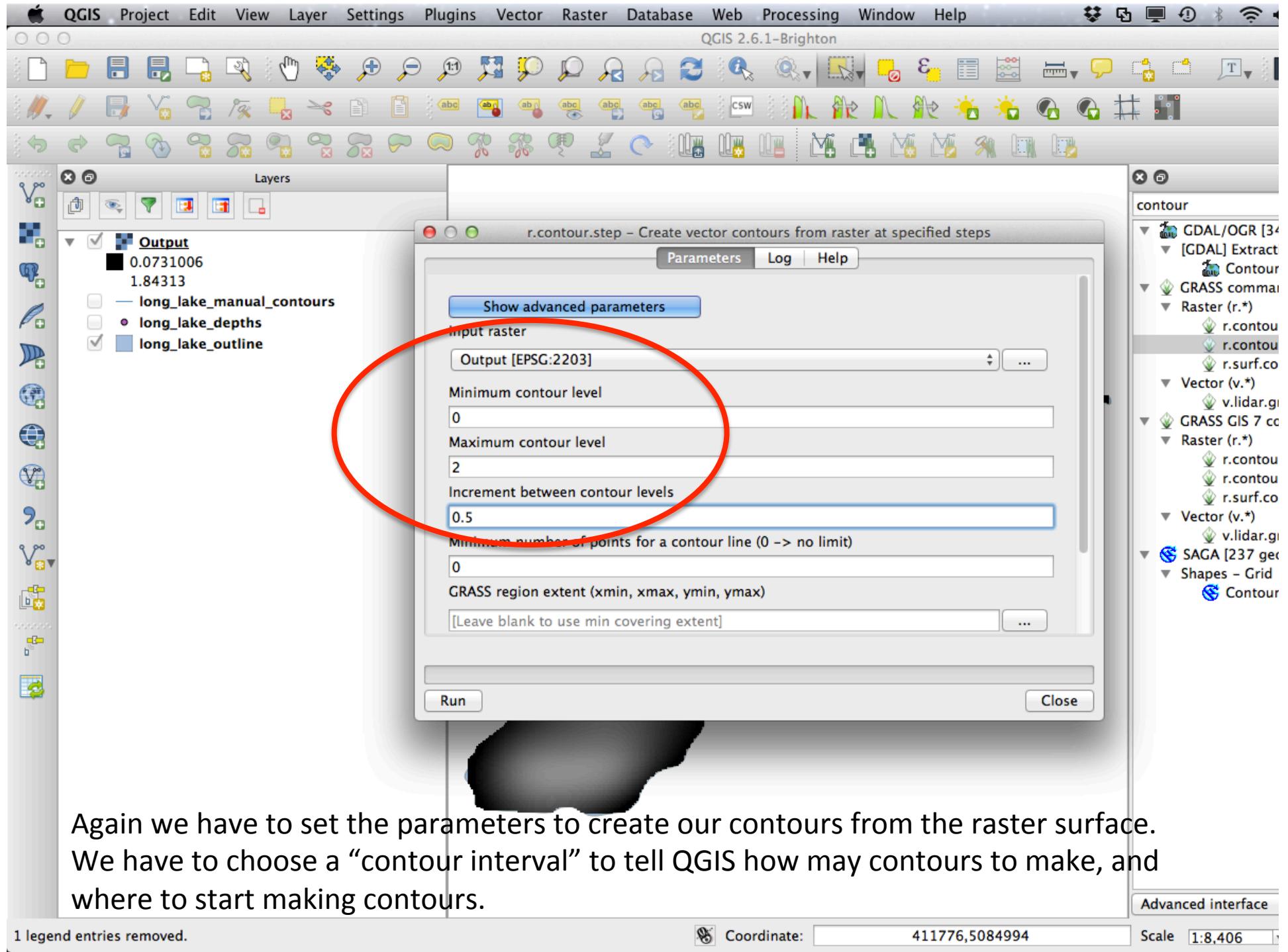
The screenshot shows the QGIS interface with a grayscale raster surface in the main canvas. The raster has a dark, irregular shape on the left and a lighter, more uniform shape on the right. In the top menu bar, the path 'Processing -> Tools -> Vector -> Contour' is highlighted. On the far right, the 'Processing Toolbox' dialog is open, showing a tree view of geoalgorithms. The 'r.contour.step' algorithm under the 'GRASS commands' section is selected and highlighted with a red oval. The 'Processing Toolbox' title bar also displays 'contour'.

Processing Toolbox

contour

- ▼ GDAL/OGR [34 geoalgorithms]
- ▼ [GDAL] Extraction
  - Contour
- ▼ GRASS commands [168 geoalgorithms]
- ▼ Raster (r.\*)
  - r.contour.level – Create vector contour fro...
  - r.contour.step – Create vector contour fro...**
  - r.surf.contour – Surface generation progra...
- ▼ Vector (v.\*)
  - v.lidar.growing – Building contour determi...
- ▼ GRASS GIS 7 commands [158 geoalgorithms]
- ▼ Raster (r.\*)
  - r.contour.level – Create vector contour fro...
  - r.contour.step – Create vector contours fro...
  - r.surf.contour – Surface generation progra...
- ▼ Vector (v.\*)
  - v.lidar.growing – Building contour determi...
- ▼ SAGA [237 geoalgorithms]
- ▼ Shapes – Grid
  - Contour lines from grid

Advanced interface



Again we have to set the parameters to create our contours from the raster surface. We have to choose a “contour interval” to tell QGIS how many contours to make, and where to start making contours.

1 legend entries removed.

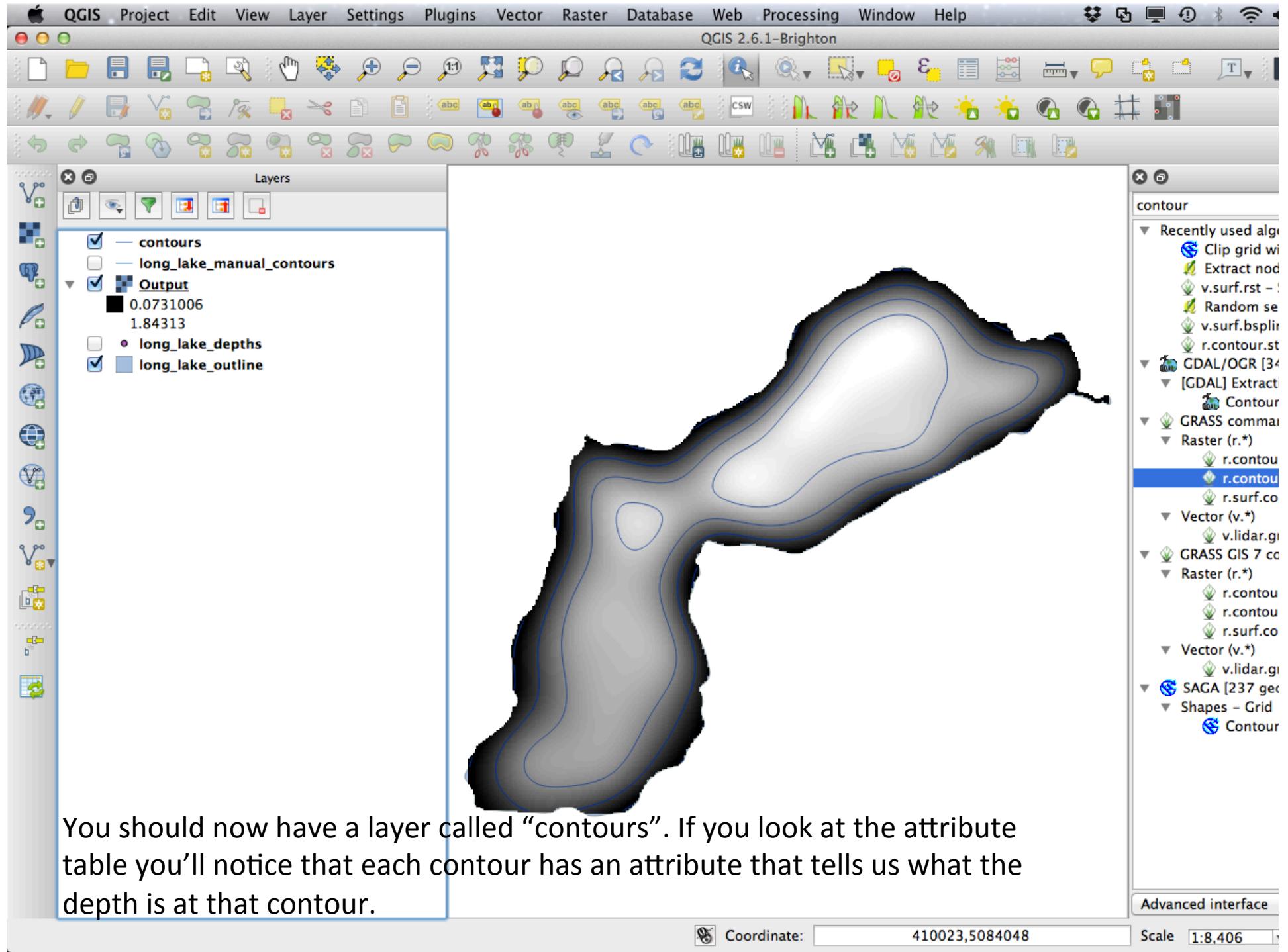


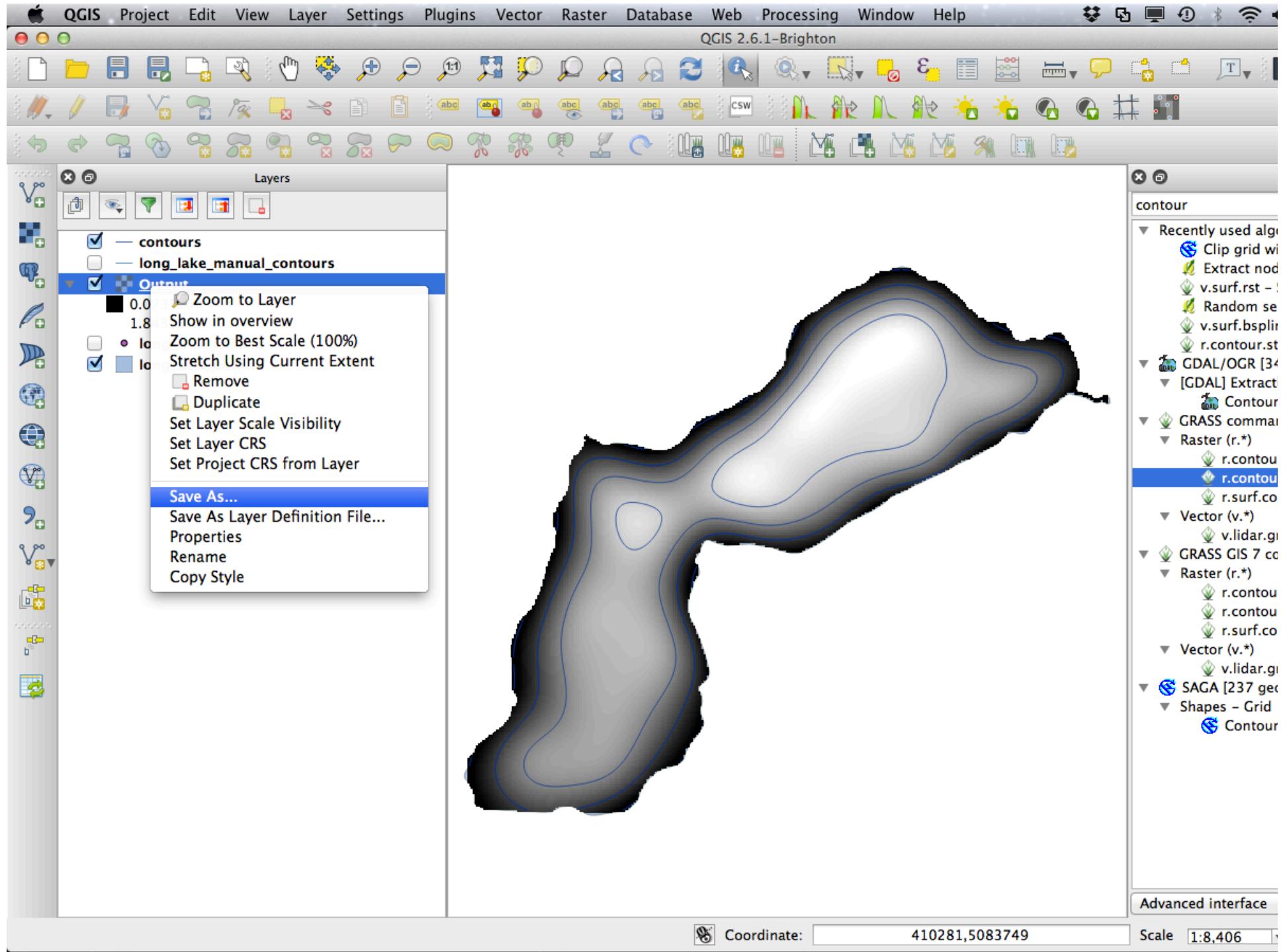
Coordinate:

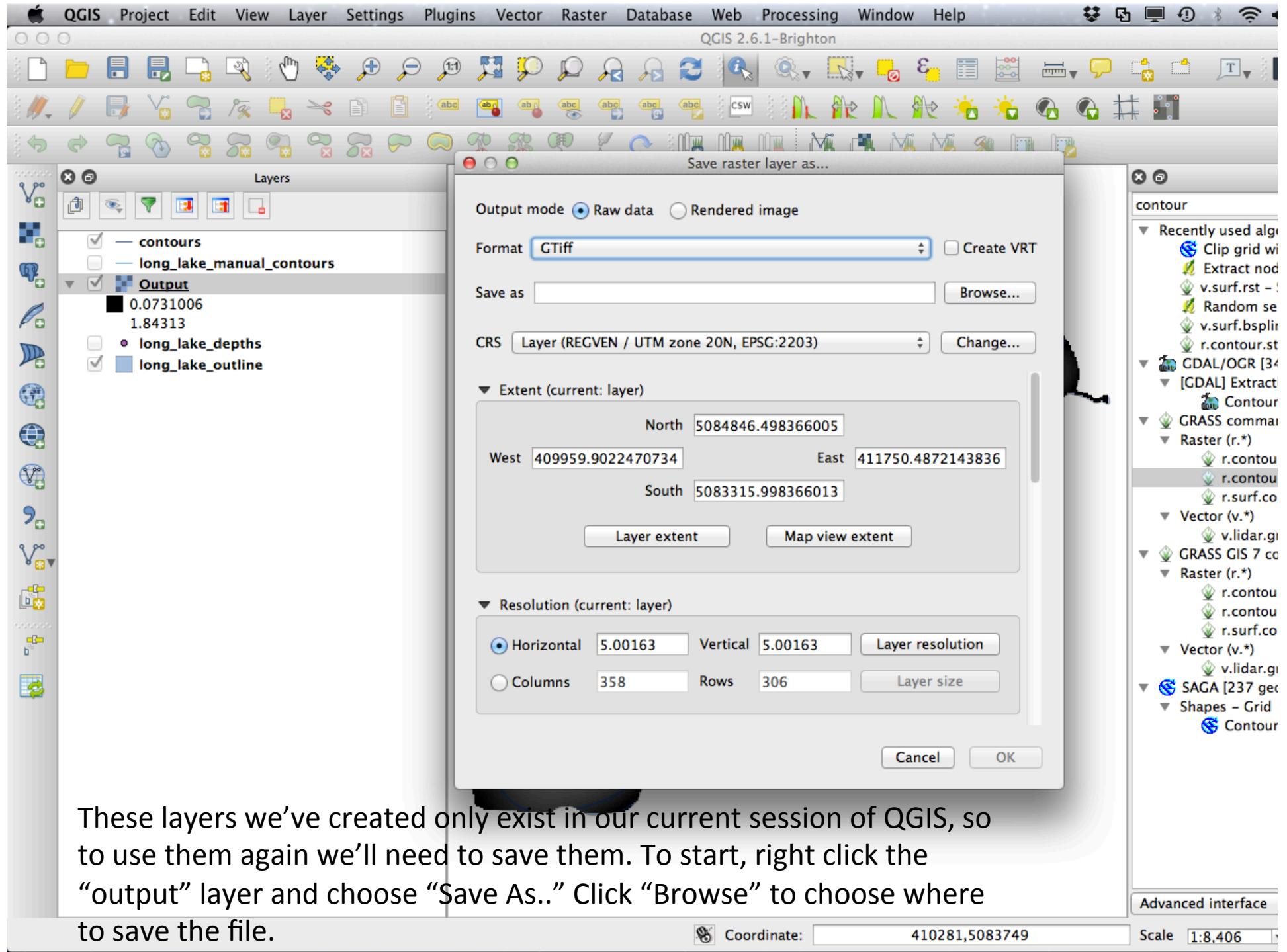
411776,5084994

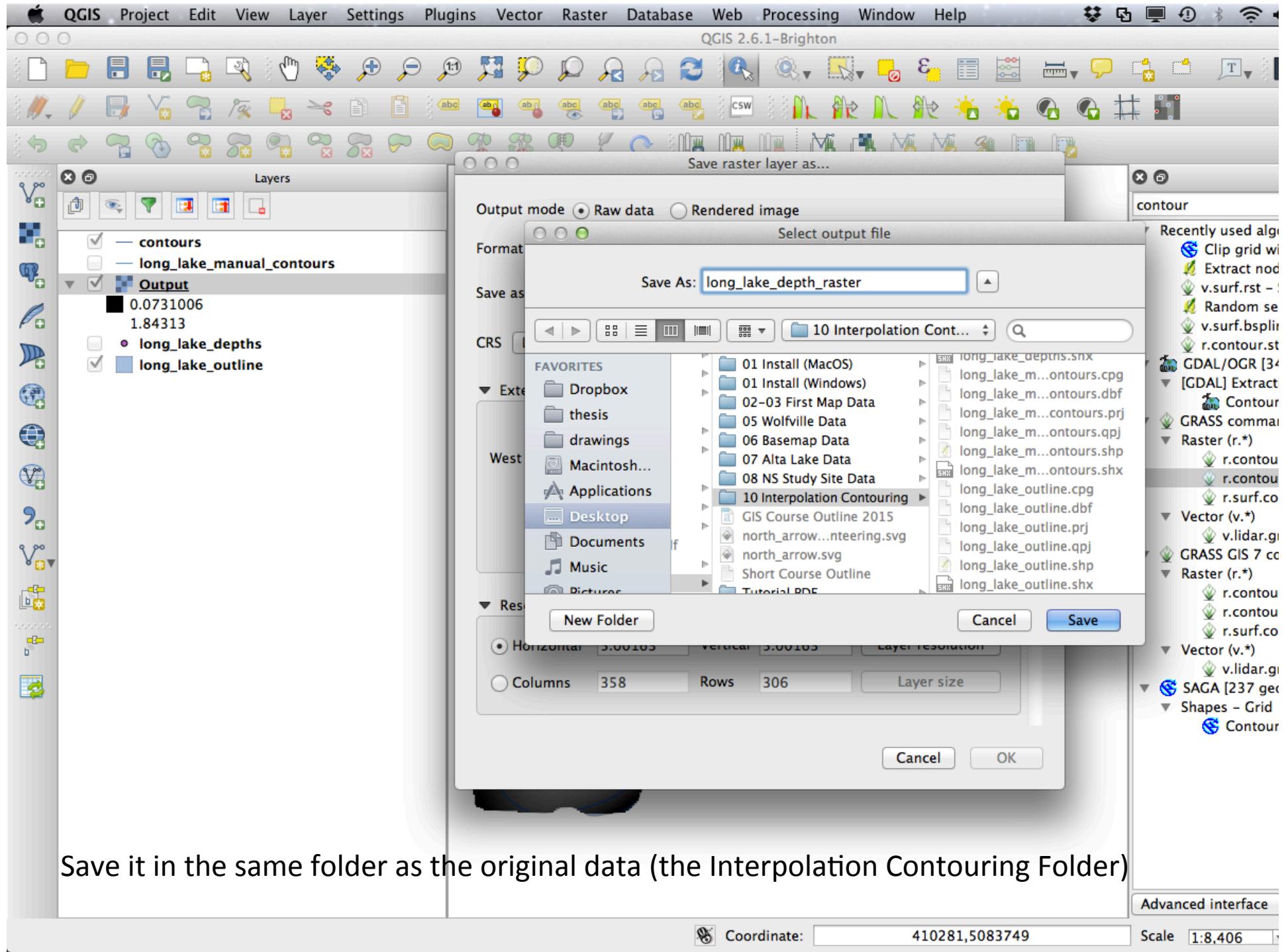
Scale

1:8,406

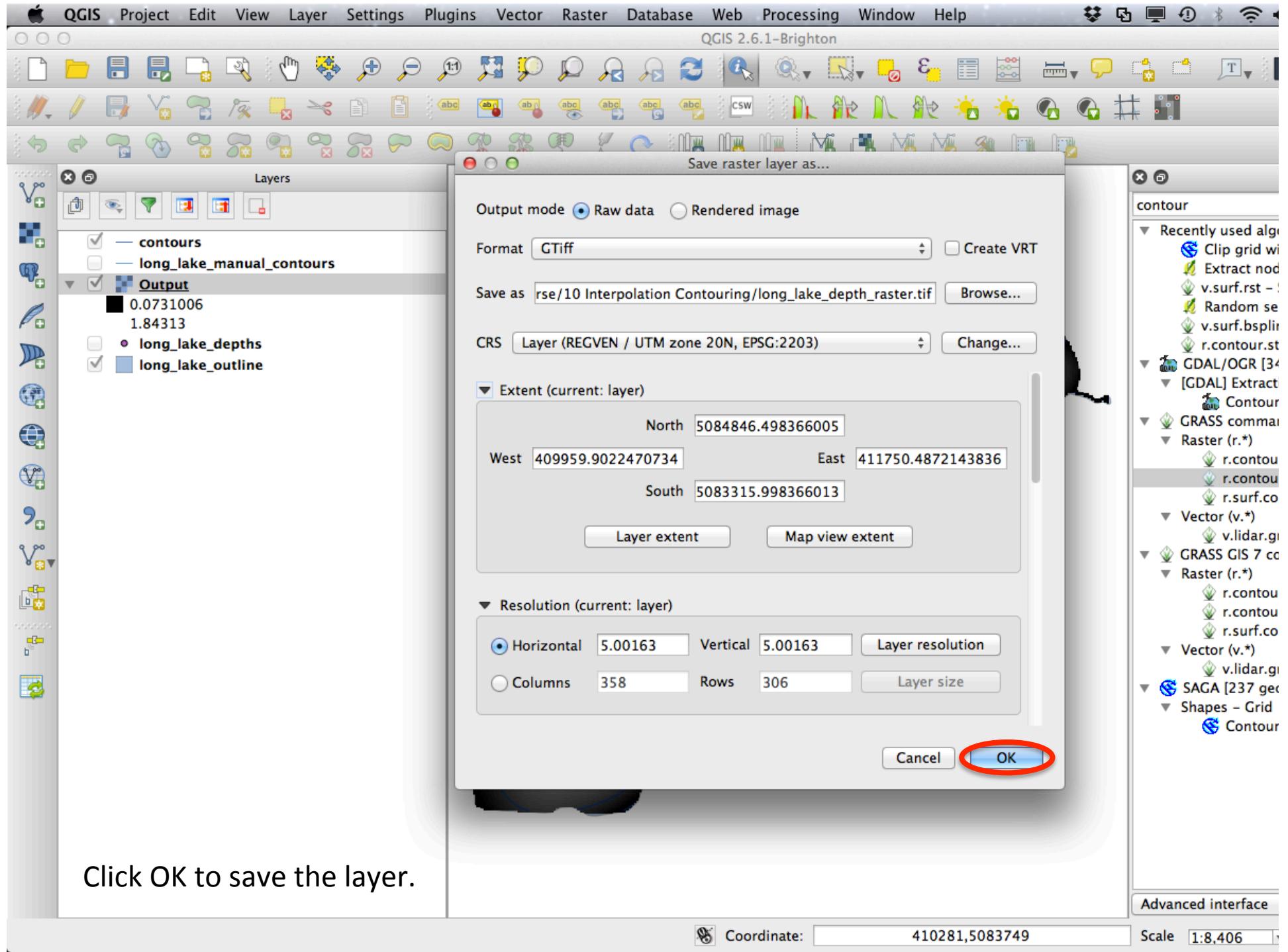


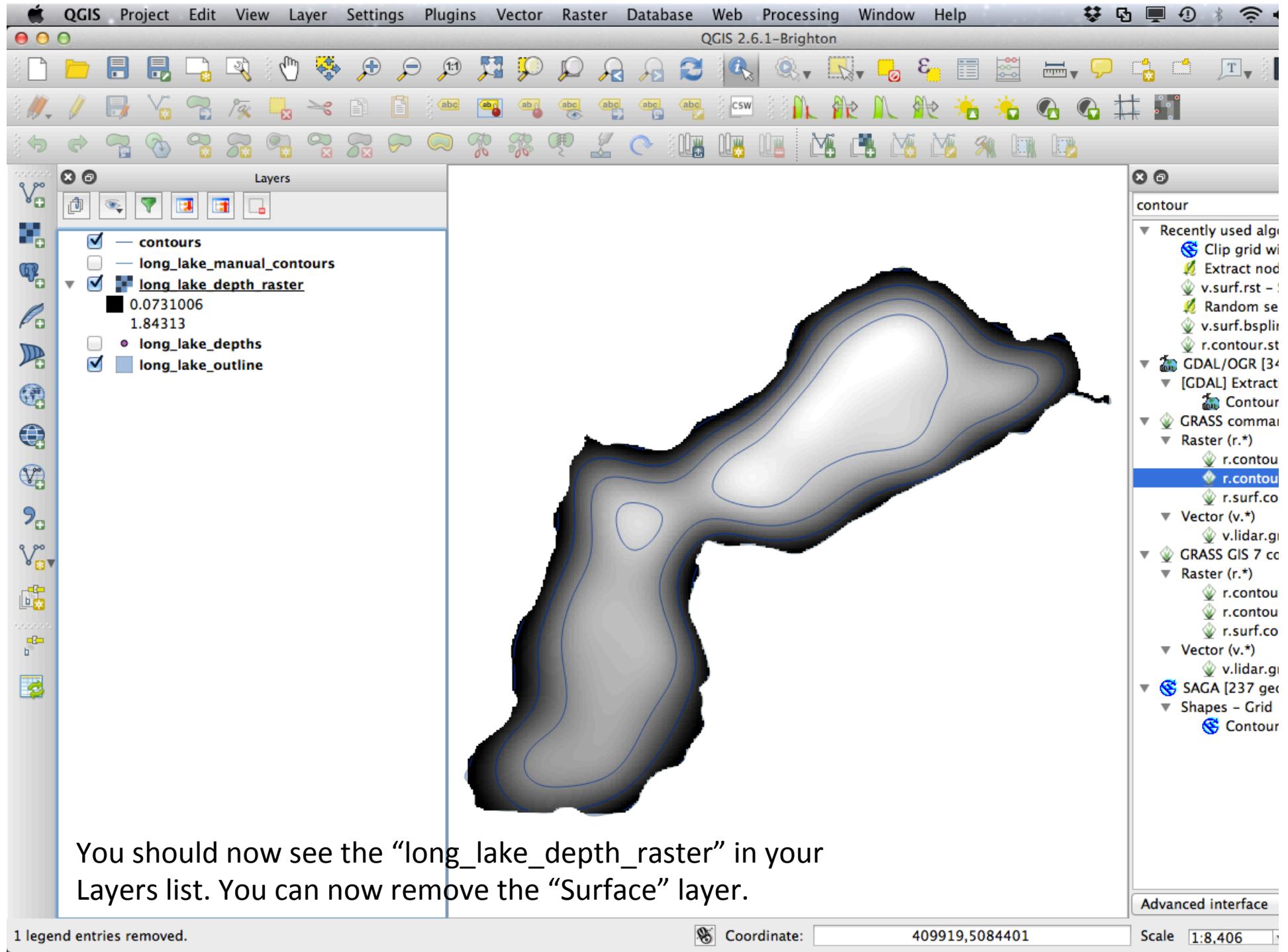


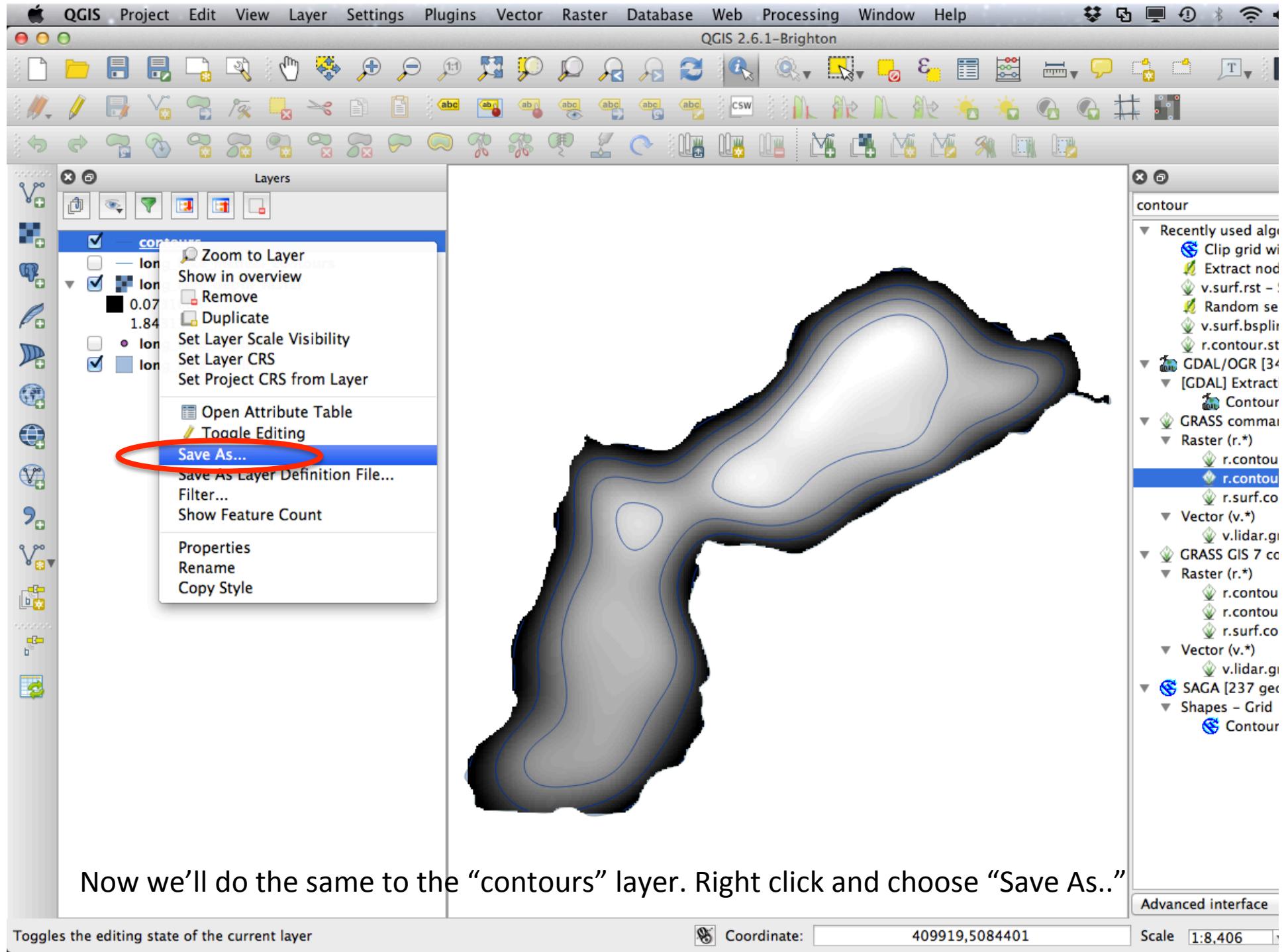




Save it in the same folder as the original data (the Interpolation Contouring Folder)







Now we'll do the same to the "contours" layer. Right click and choose "Save As..."

Toggles the editing state of the current layer

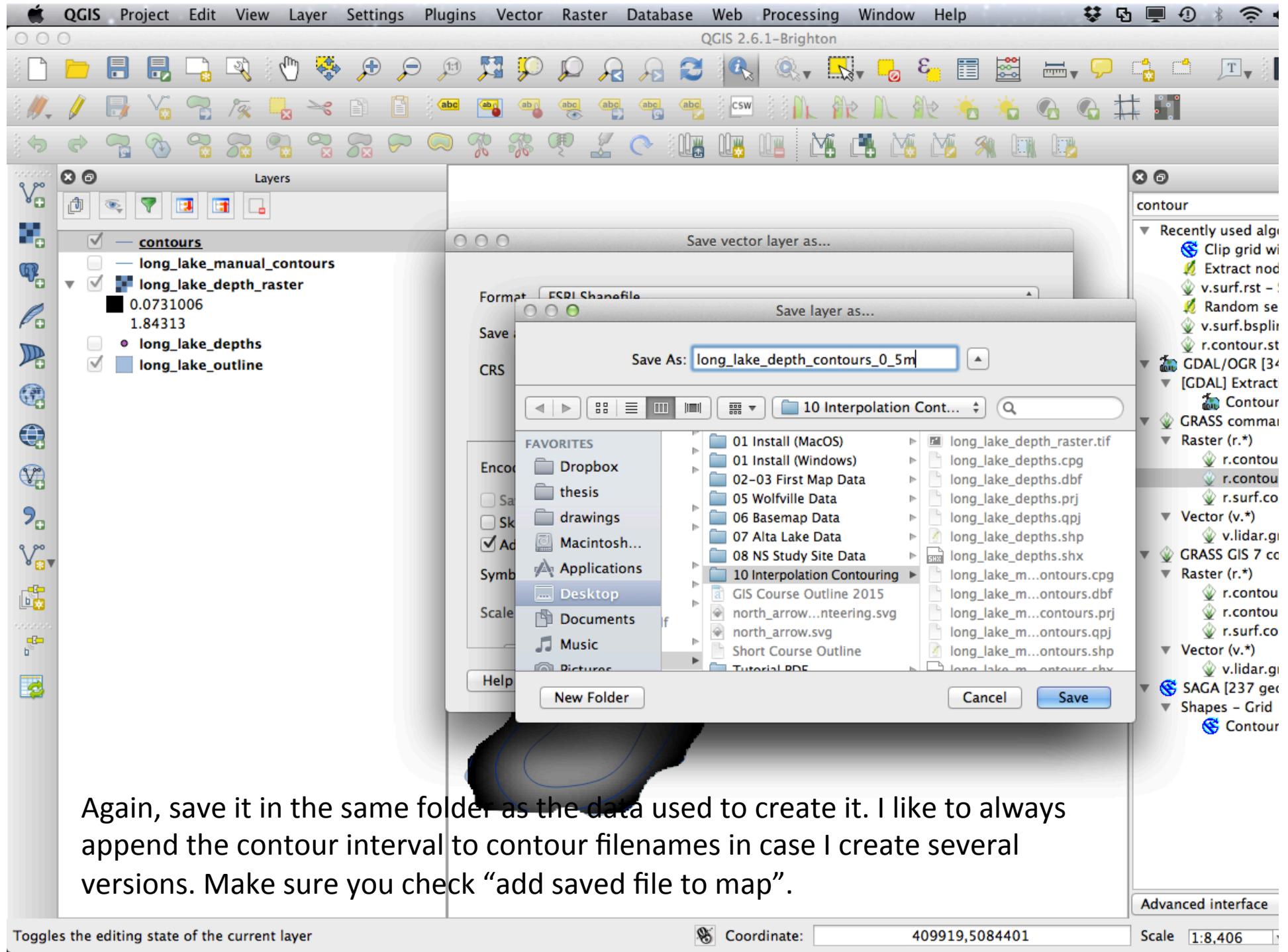


Coordinate:

409919,5084401

Scale

1:8,406



Again, save it in the same folder as the data used to create it. I like to always append the contour interval to contour filenames in case I create several versions. Make sure you check “add saved file to map”.

