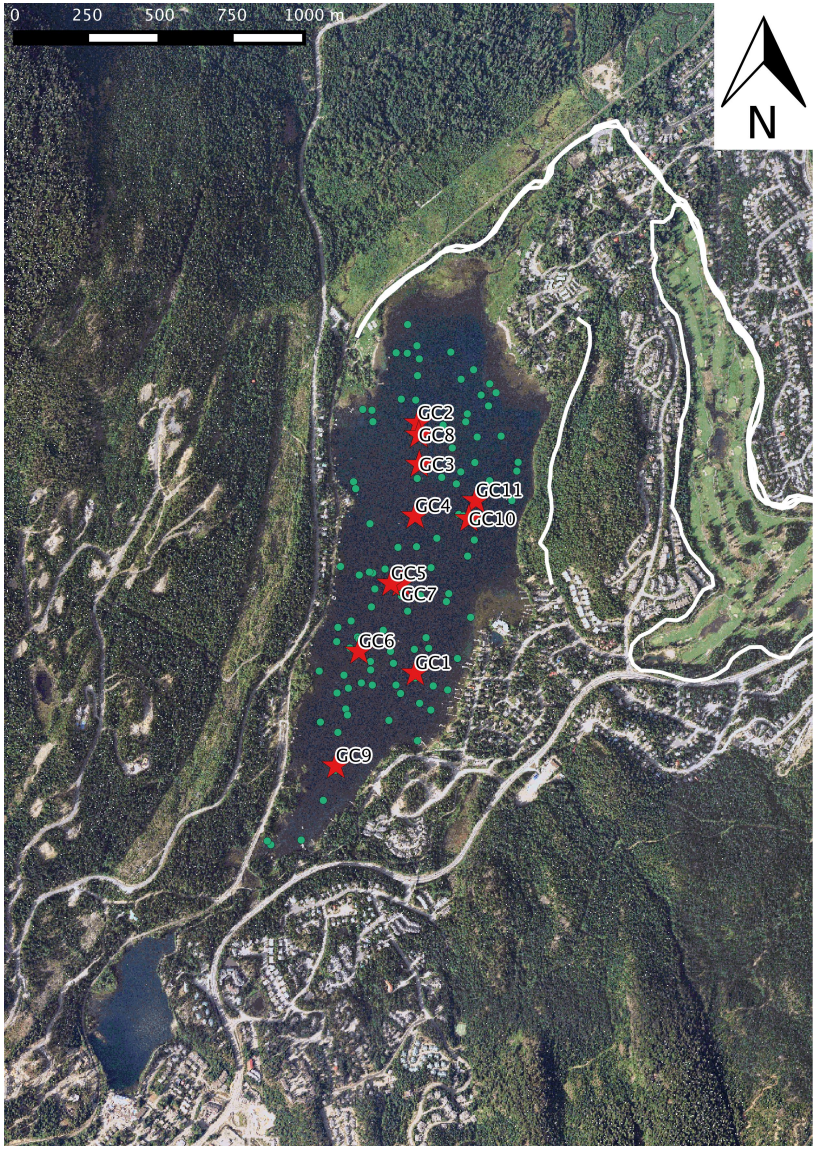
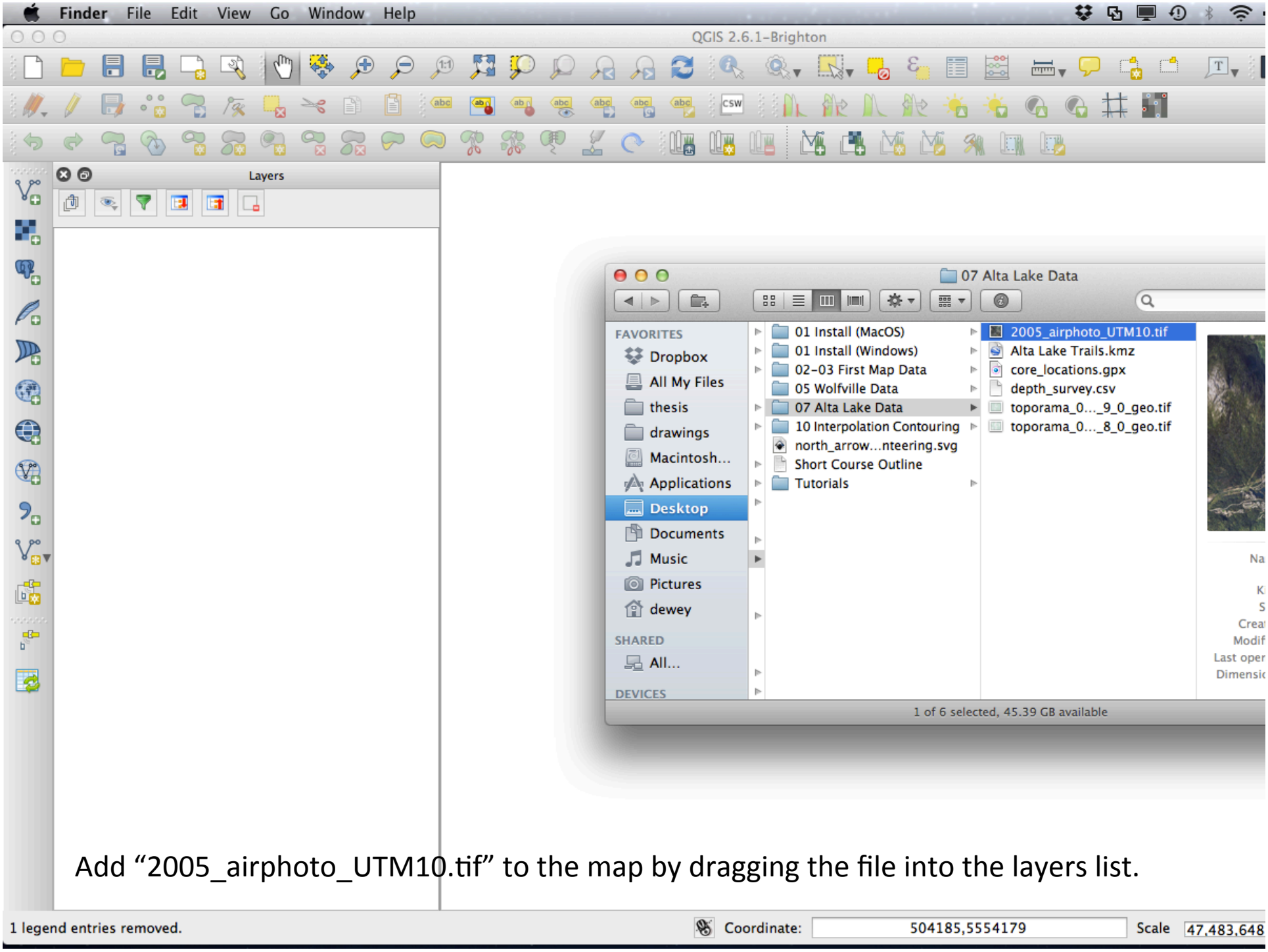
7. Importing Data From GPS, CSV, and Google Earth (KML/KMZ)

Purpose

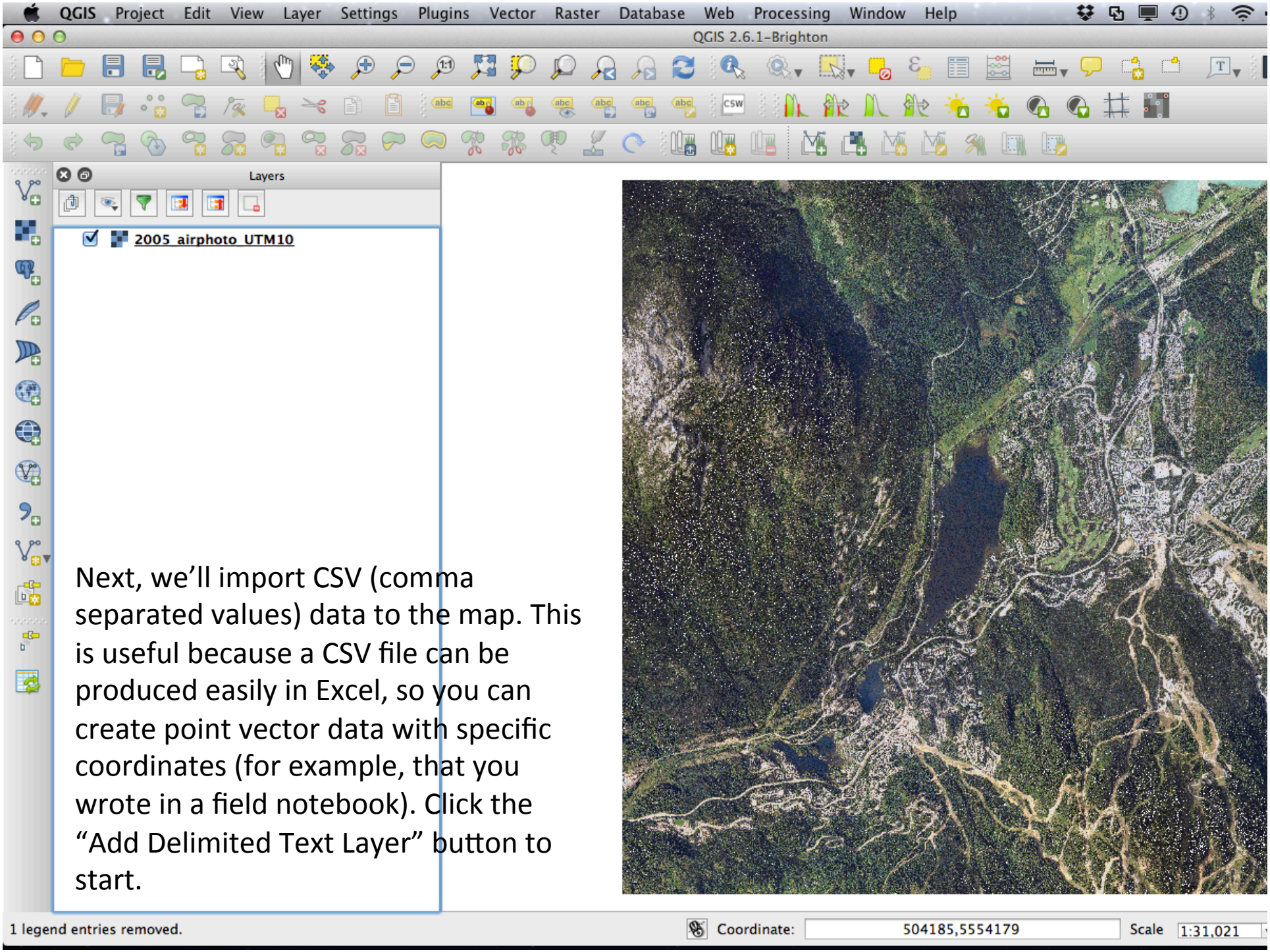
- Learn to import data from multiple sources and formats
- Learn to export data in multiple sources

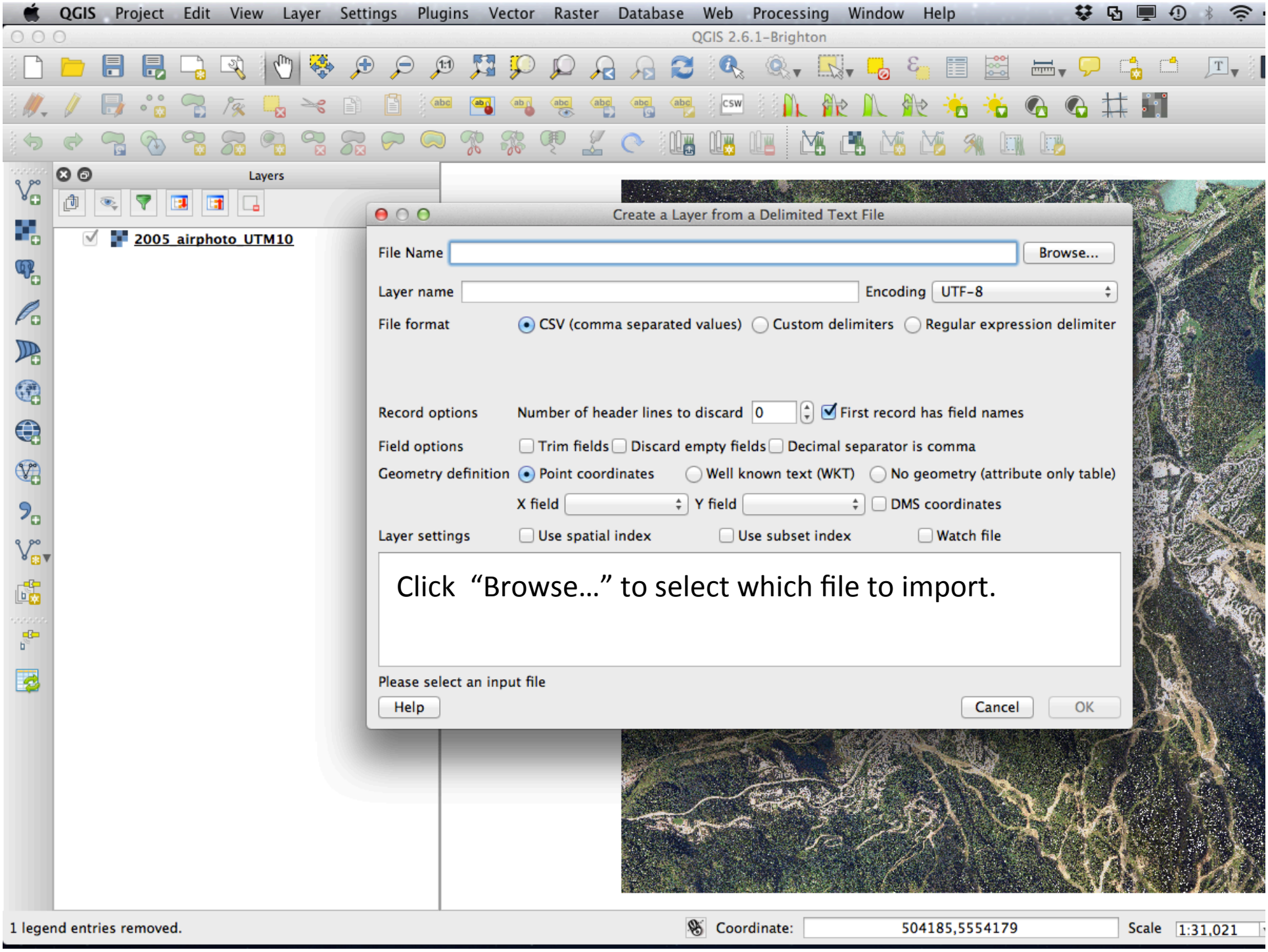
The Assignment

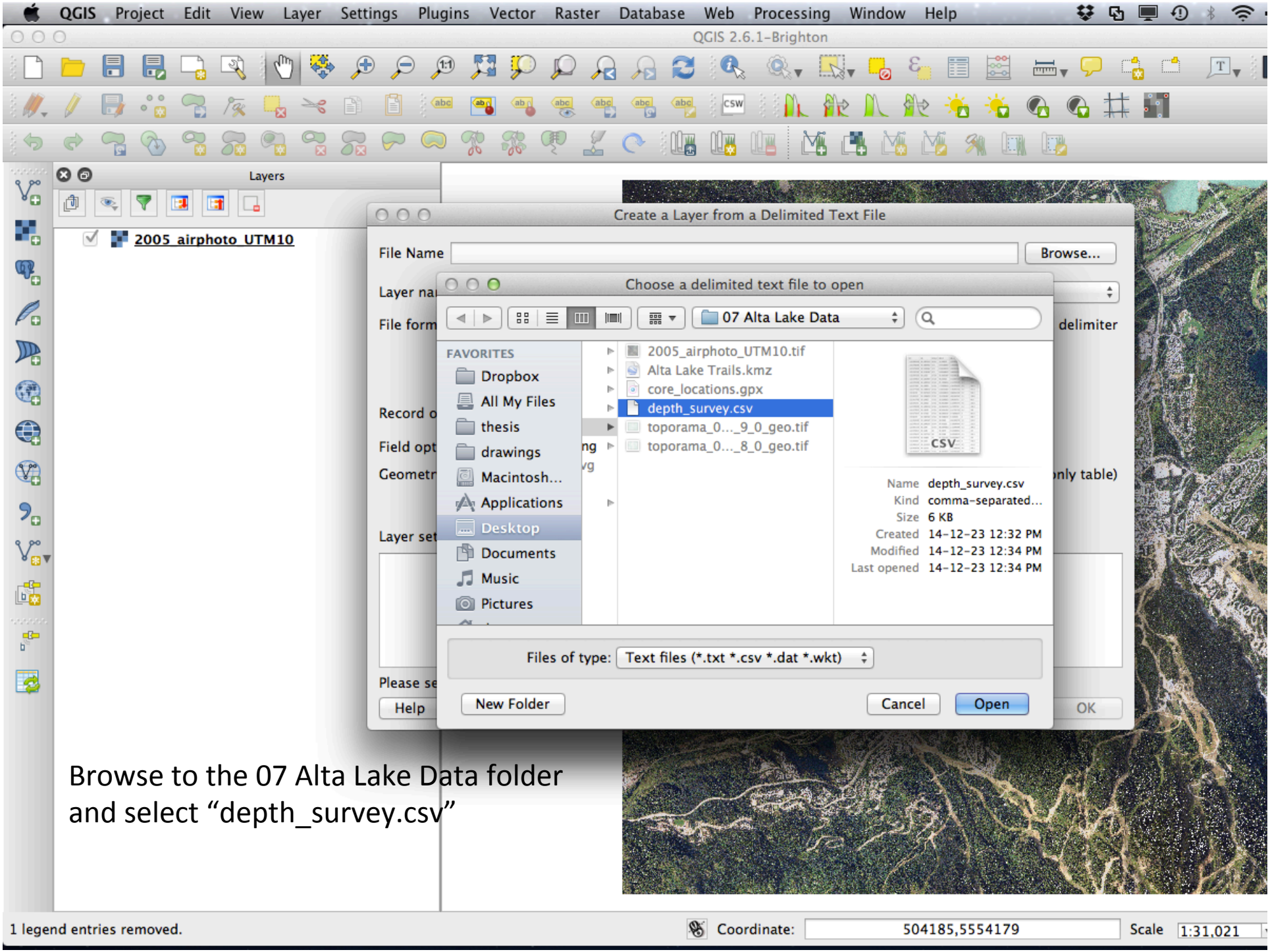




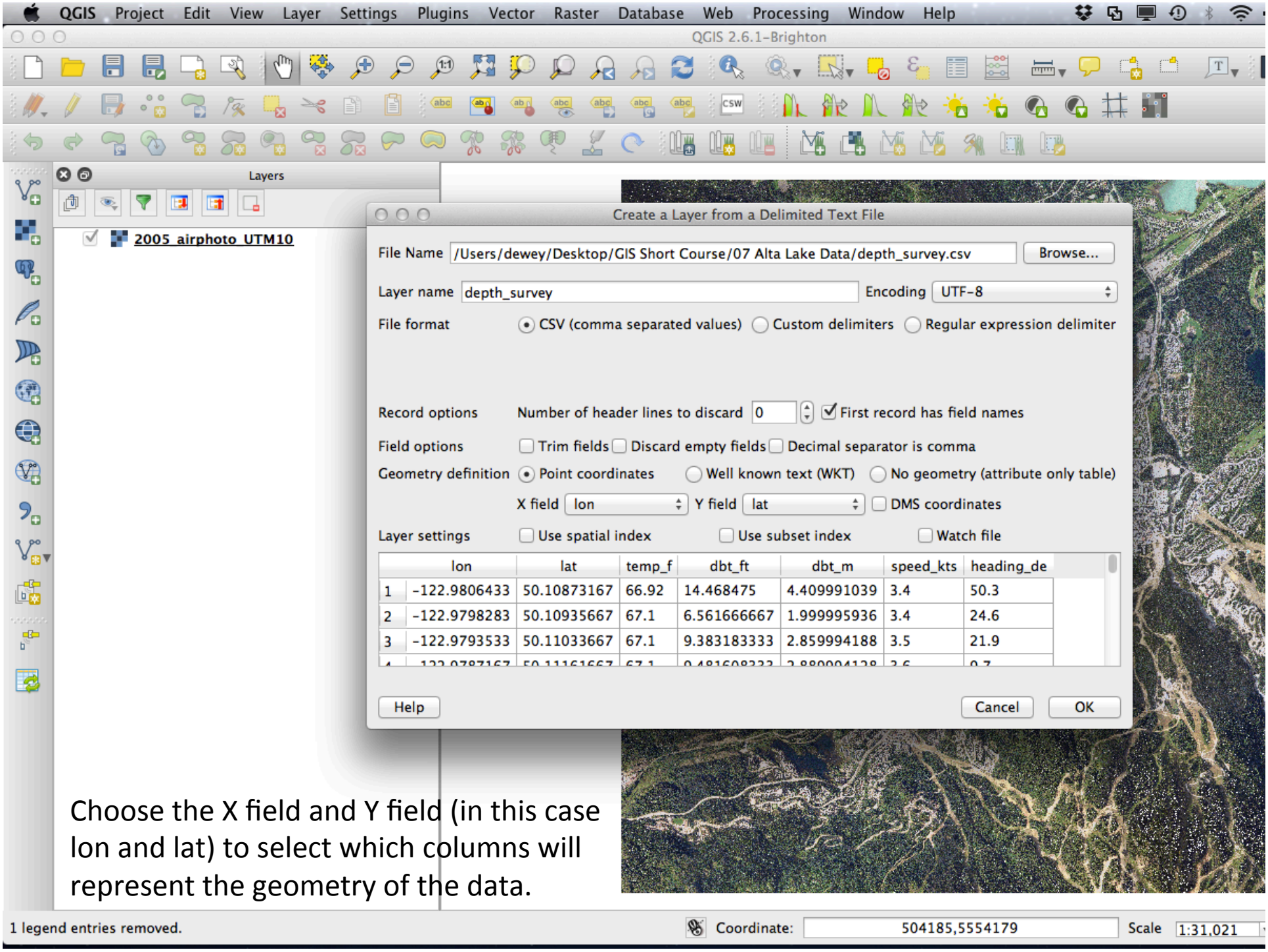
Add “2005_airphoto_UTM10.tif” to the map by dragging the file into the layers list.


QGIS Project Edit View Layer Settings Plugins Vector Raster Database Web Processing Window Help
QGIS 2.6.1-Brighton
Layers
2005_airphoto_UTM10
Next, we'll import CSV (comma separated values) data to the map. This is useful because a CSV file can be produced easily in Excel, so you can create point vector data with specific coordinates (for example, that you wrote in a field notebook). Click the "Add Delimited Text Layer" button to start.
1 legend entries removed.
Coordinate:
504185,5554179
Scale
1:31,021

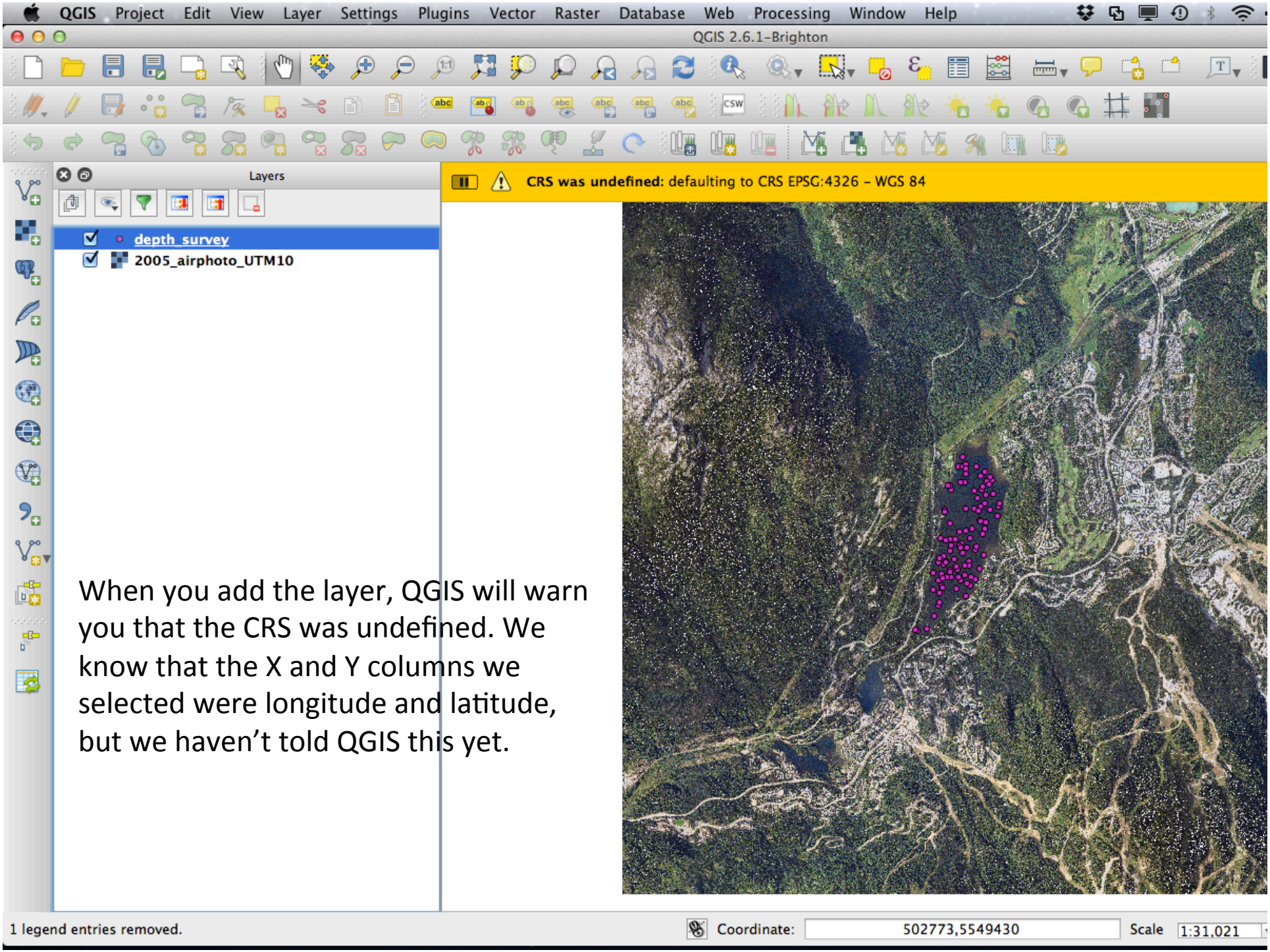

QGIS Project Edit View Layer Settings Plugins Vector Raster Database Web Processing Window Help
QGIS 2.6.1-Brighton
Layers
2005_airphoto_UTM10
Create a Layer from a Delimited Text File
File Name
Browse...
Layer name
Encoding
UTF-8
File format
CSV (comma separated values)
Custom delimiters
Regular expression delimiter
Record options
Number of header lines to discard
0
First record has field names
Field options
Trim fields
Discard empty fields
Decimal separator is comma
Geometry definition
Point coordinates
Well known text (WKT)
No geometry (attribute only table)
X field
Y field
DMS coordinates
Layer settings
Use spatial index
Use subset index
Watch file
Click "Browse..." to select which file to import.
Please select an input file
Help
Cancel
OK
1 legend entries removed.
Coordinate:
504185,5554179
Scale
1:31,021



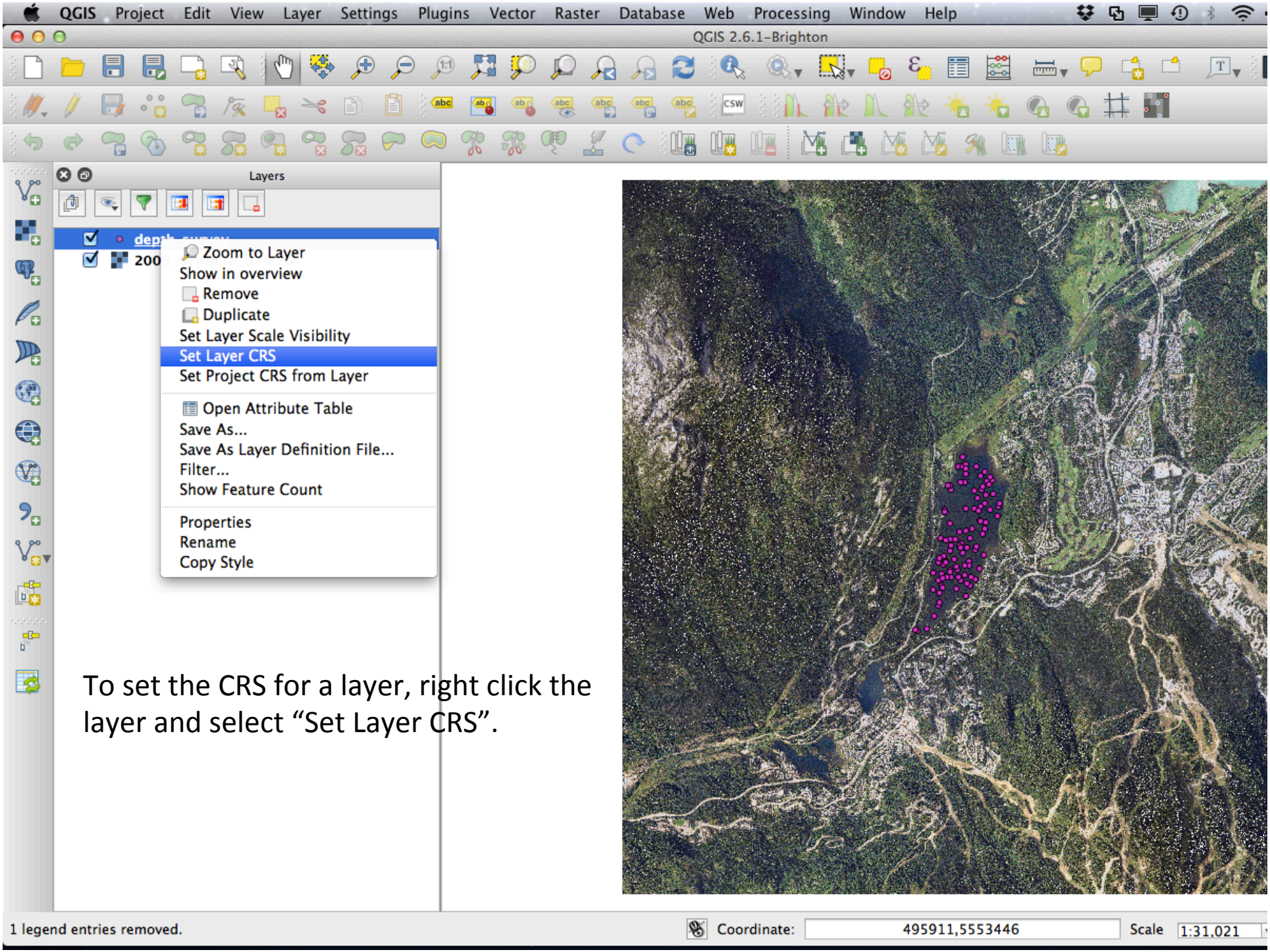
Browse to the 07 Alta Lake Data folder and select “depth_survey.csv”



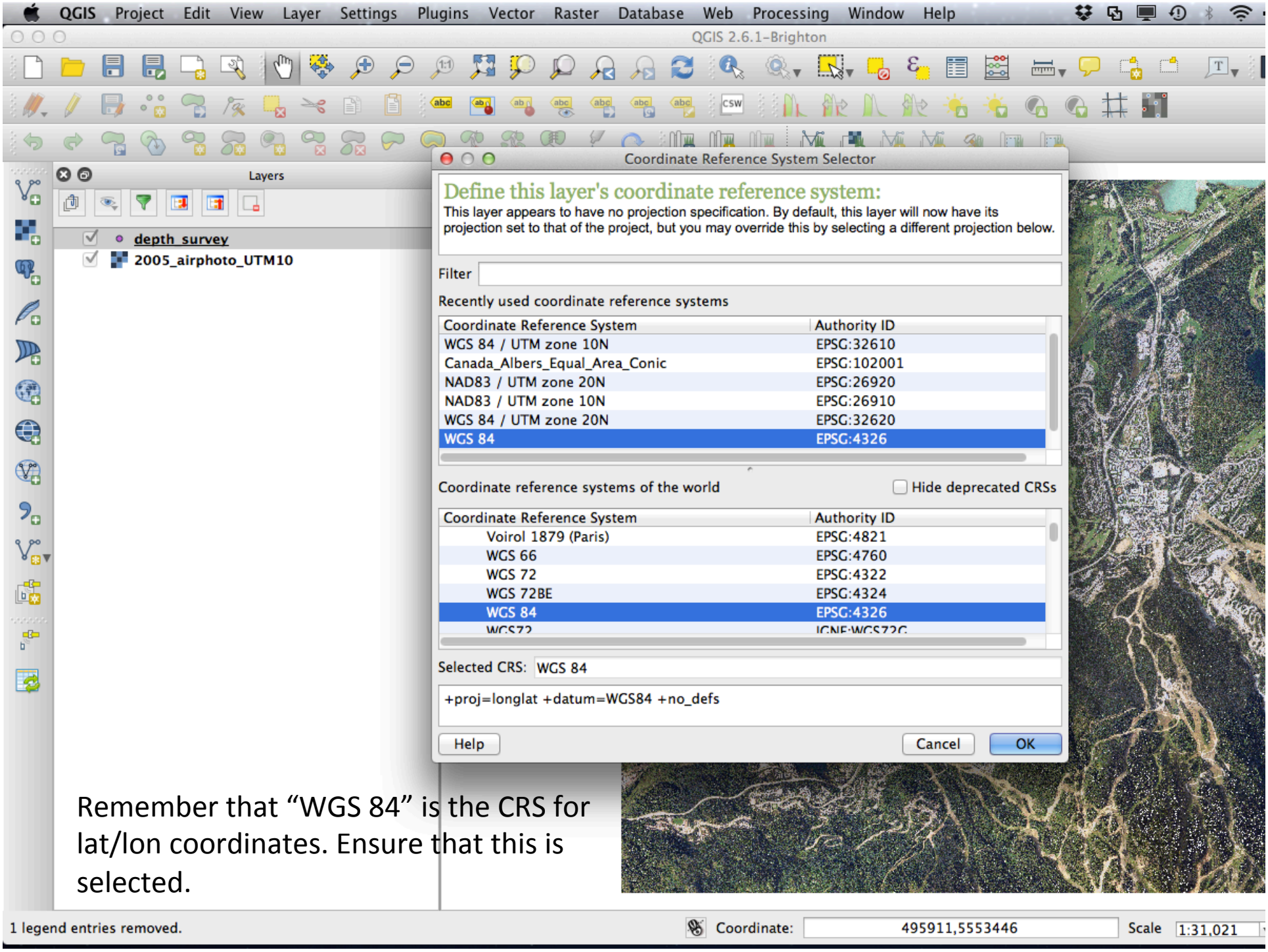
Choose the X field and Y field (in this case lon and lat) to select which columns will represent the geometry of the data.



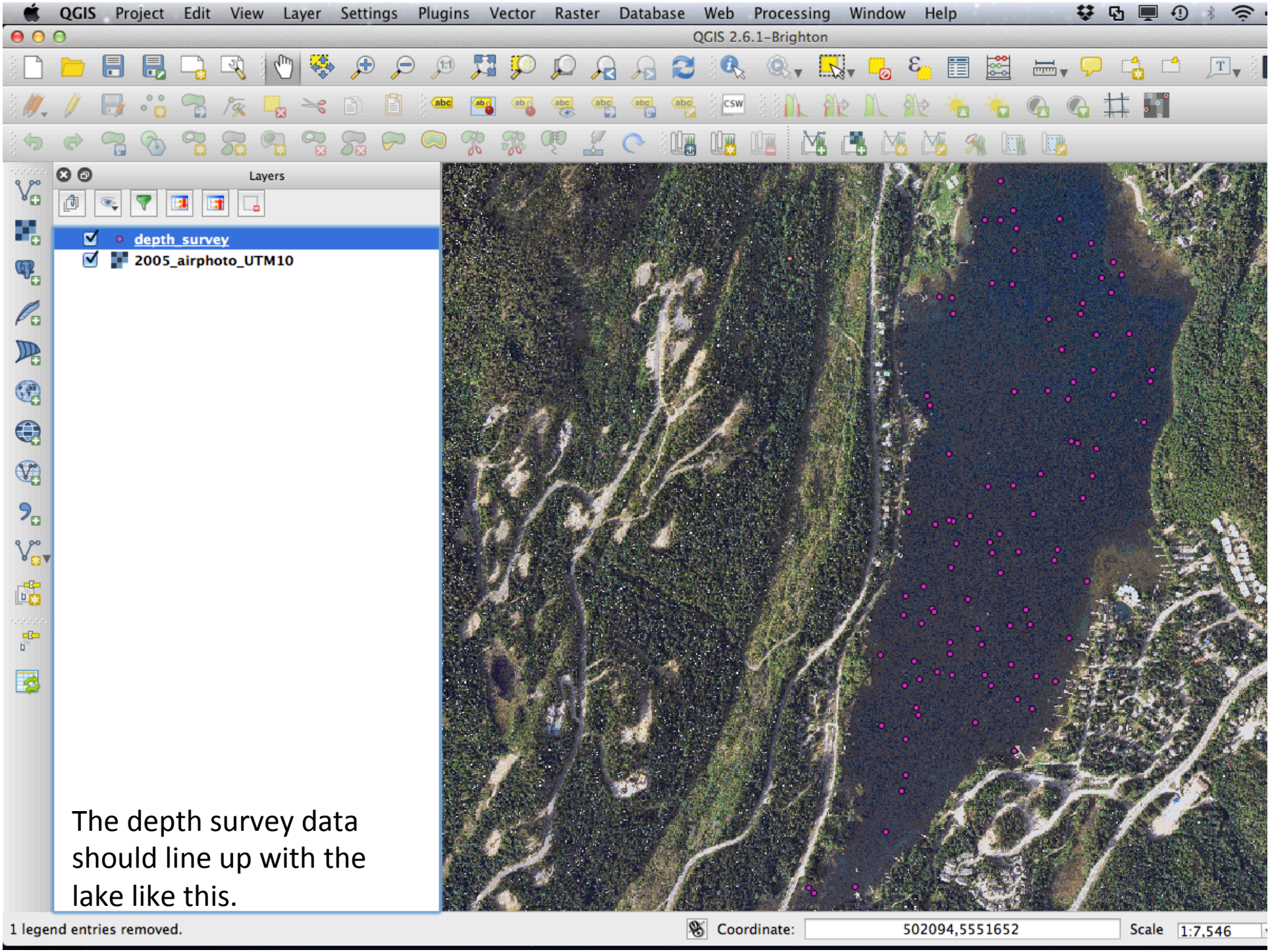
When you add the layer, QGIS will warn you that the CRS was undefined. We know that the X and Y columns we selected were longitude and latitude, but we haven't told QGIS this yet.

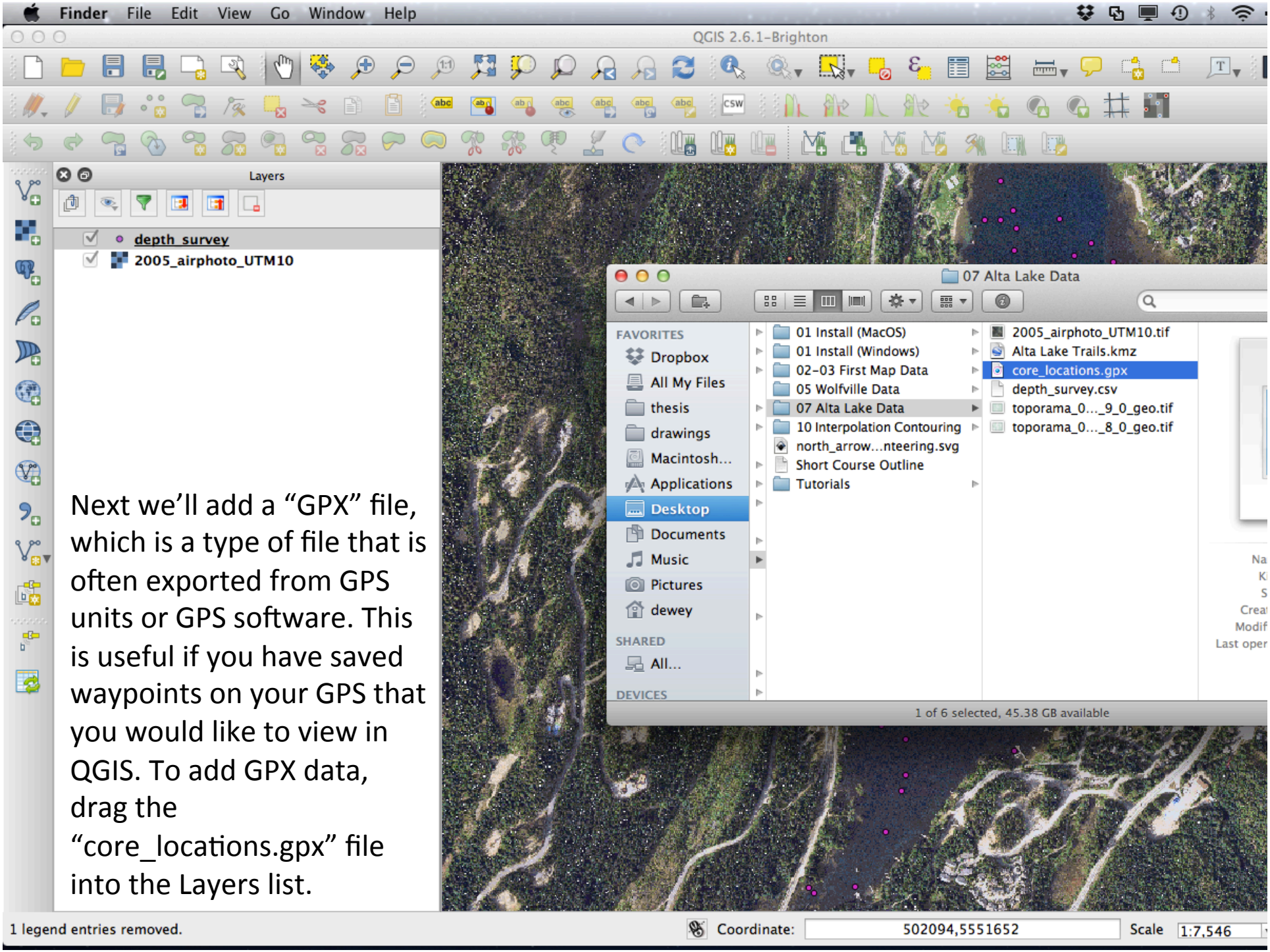


To set the CRS for a layer, right click the layer and select “Set Layer CRS”.

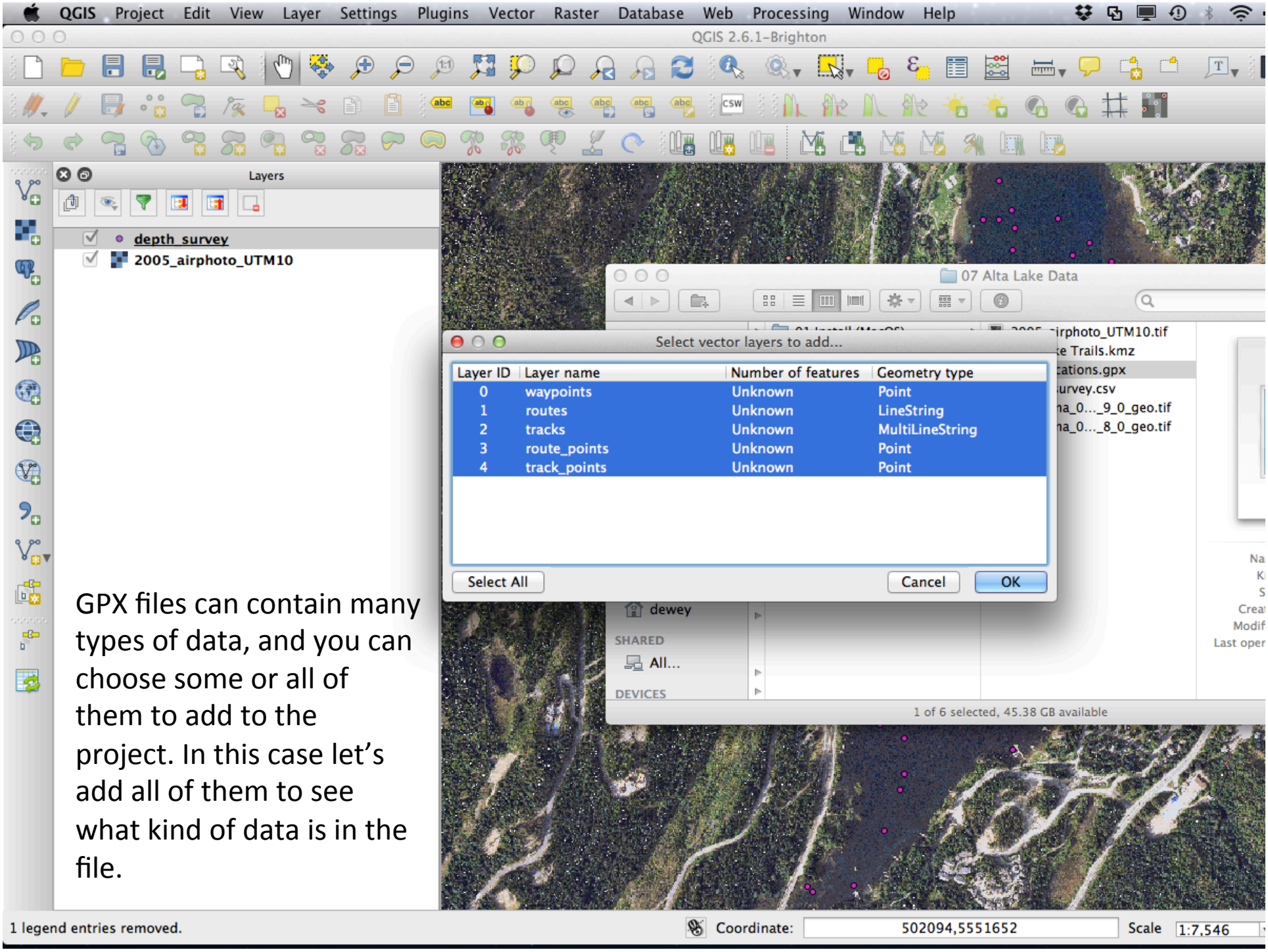


Remember that “WGS 84” is the CRS for lat/lon coordinates. Ensure that this is selected.

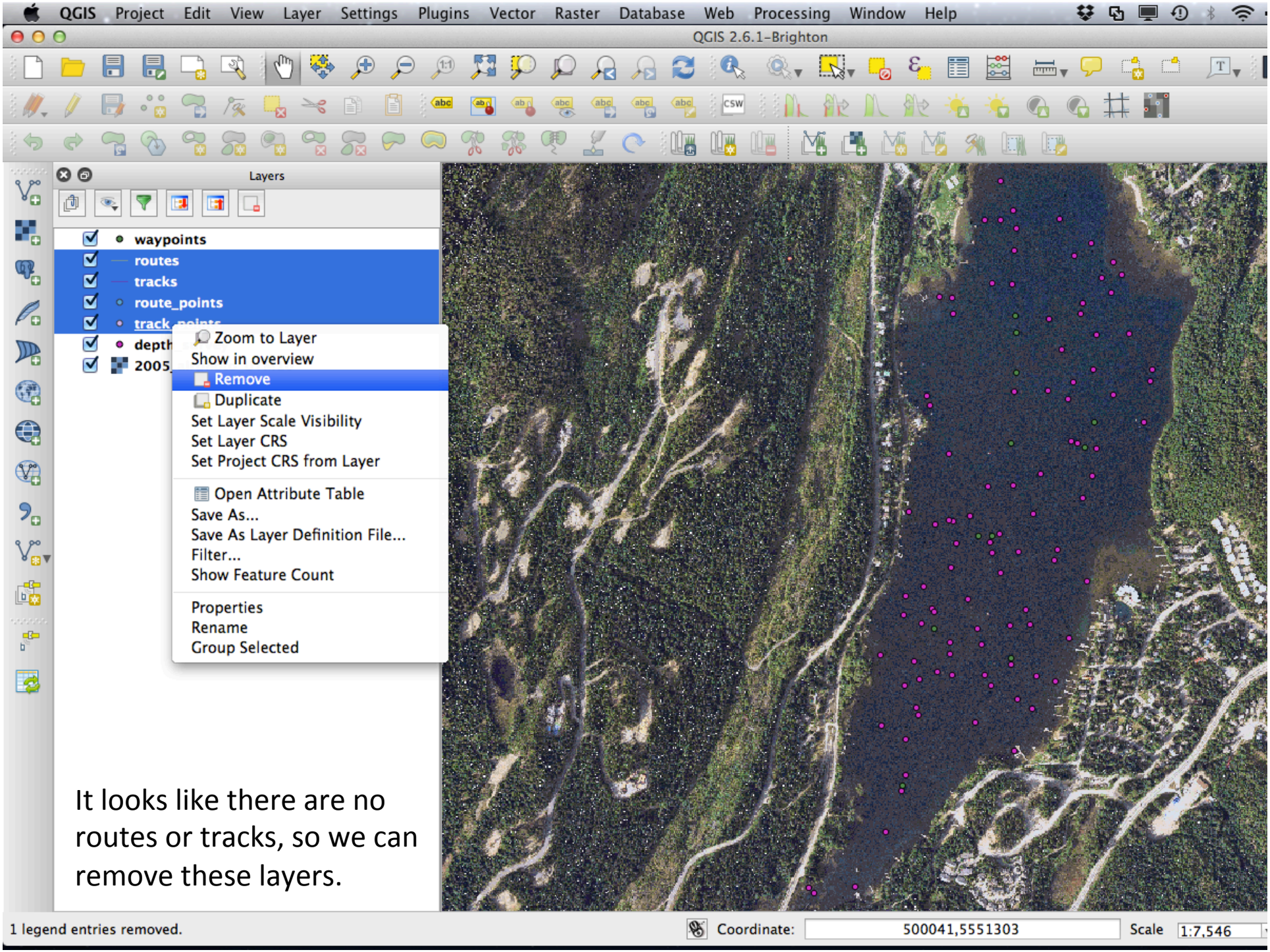

QGIS Project Edit View Layer Settings Plugins Vector Raster Database Web Processing Window Help
QGIS 2.6.1-Brighton
Layers
depth_survey
2005_airphoto_UTM10
The depth survey data should line up with the lake like this.
1 legend entries removed.
Coordinate:
502094,5551652
Scale
1:7,546

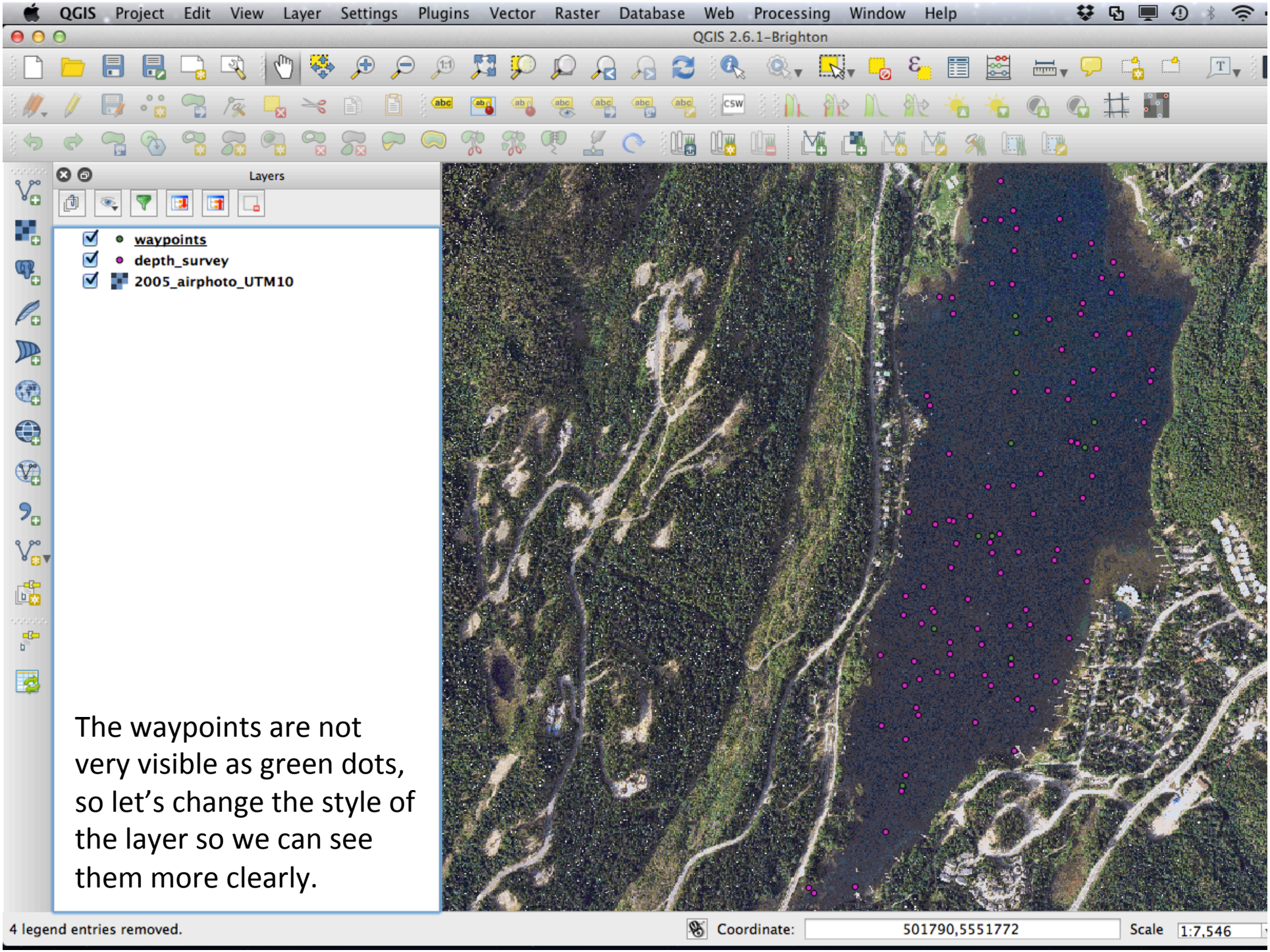


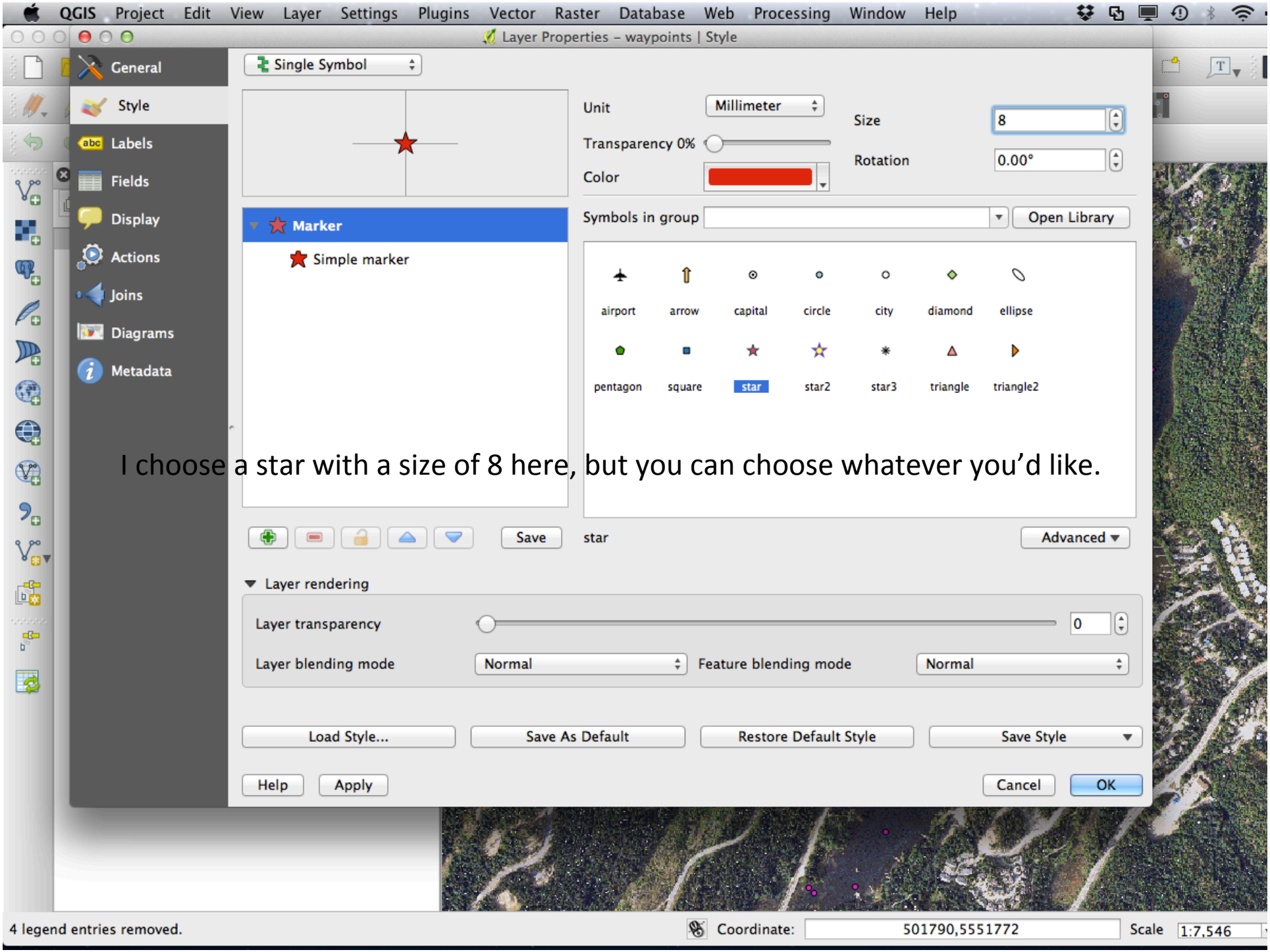
Next we'll add a "GPX" file, which is a type of file that is often exported from GPS units or GPS software. This is useful if you have saved waypoints on your GPS that you would like to view in QGIS. To add GPX data, drag the "core_locations.gpx" file into the Layers list.

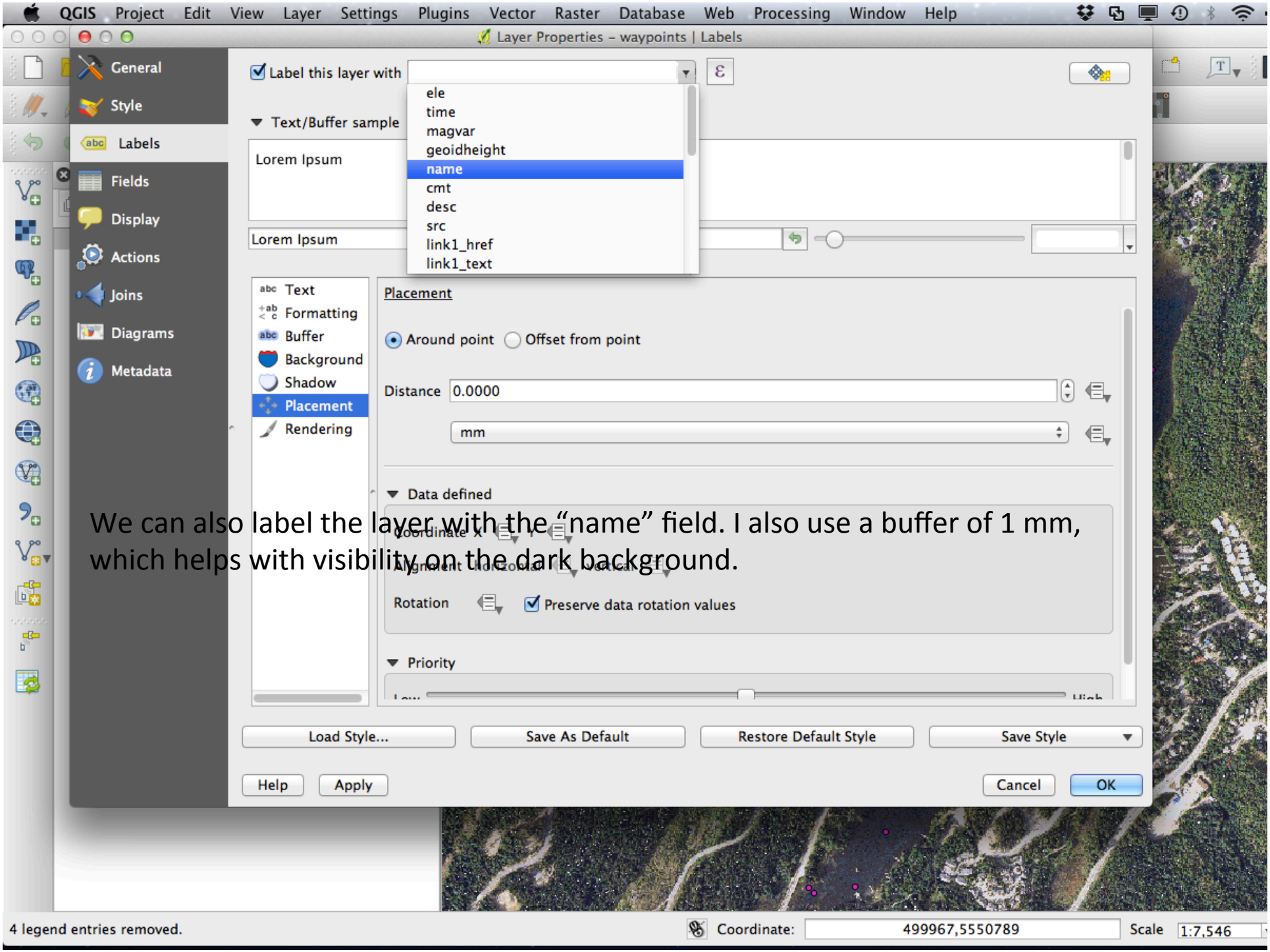


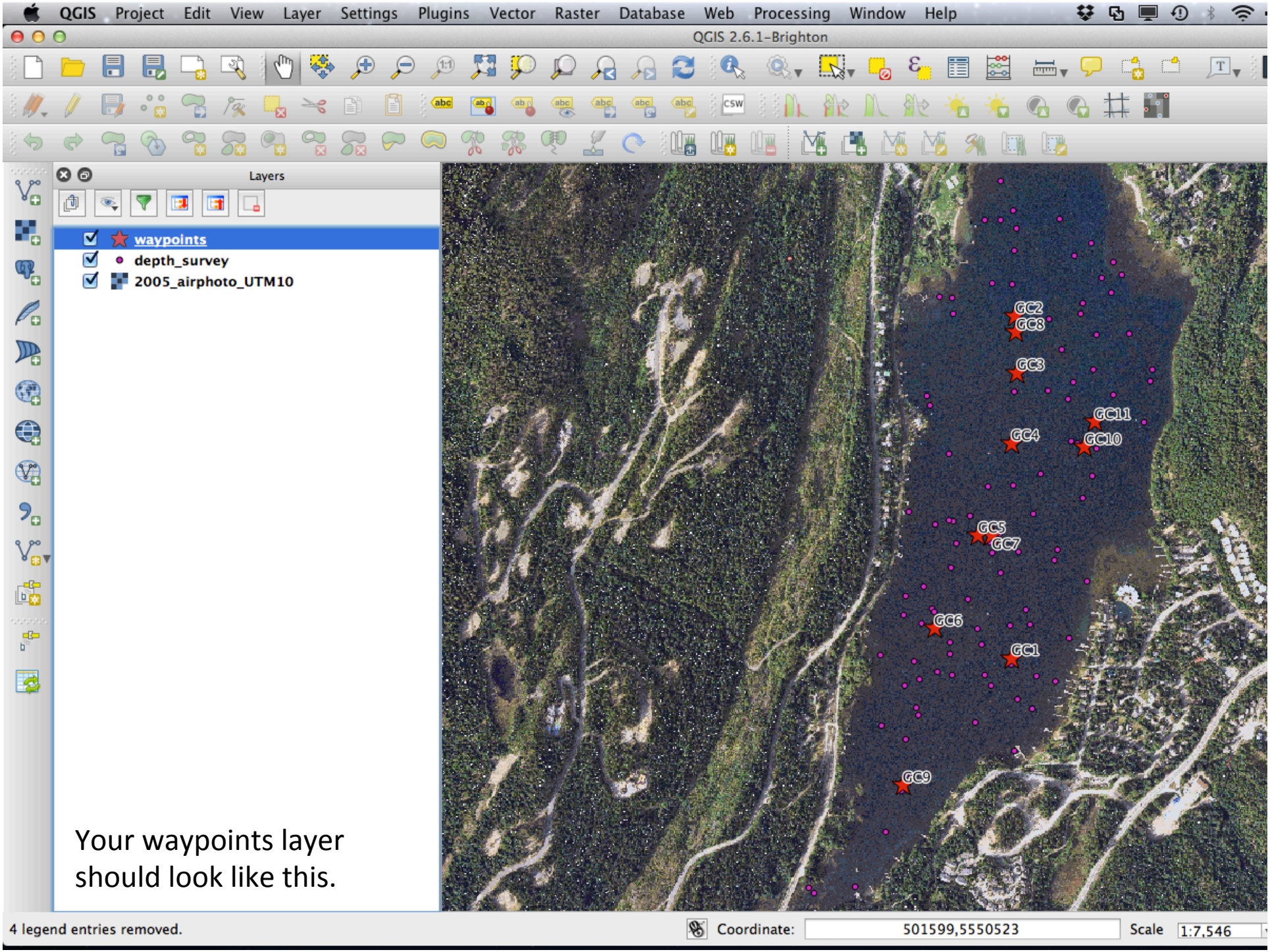
GPX files can contain many types of data, and you can choose some or all of them to add to the project. In this case let's add all of them to see what kind of data is in the file.

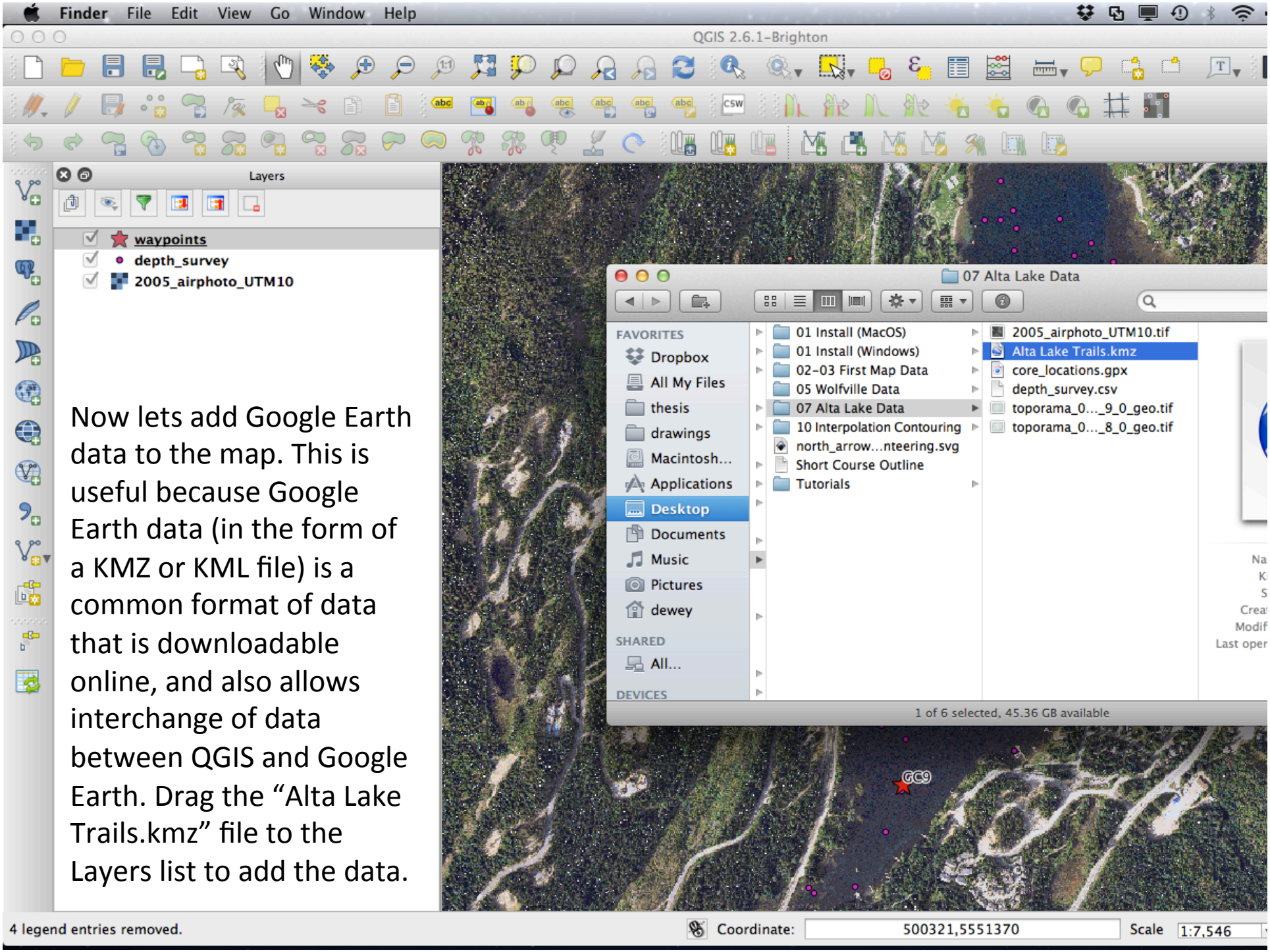

QGIS Project Edit View Layer Settings Plugins Vector Raster Database Web Processing Window Help
QGIS 2.6.1-Brighton
Layers
waypoints
routes
tracks
route_points
track_points
depth
2005
Zoom to Layer
Show in overview
Remove
Duplicate
Set Layer Scale Visibility
Set Layer CRS
Set Project CRS from Layer
Open Attribute Table
Save As...
Save As Layer Definition File...
Filter...
Show Feature Count
Properties
Rename
Group Selected
It looks like there are no routes or tracks, so we can remove these layers.
1 legend entries removed.
Coordinate:
500041,5551303
Scale
1:7,546


QGIS Project Edit View Layer Settings Plugins Vector Raster Database Web Processing Window Help
QGIS 2.6.1-Brighton
Layers
waypoints
depth_survey
2005_airphoto_UTM10
The waypoints are not very visible as green dots, so let's change the style of the layer so we can see them more clearly.
4 legend entries removed.
Coordinate:
501790,5551772
Scale
1:7,546

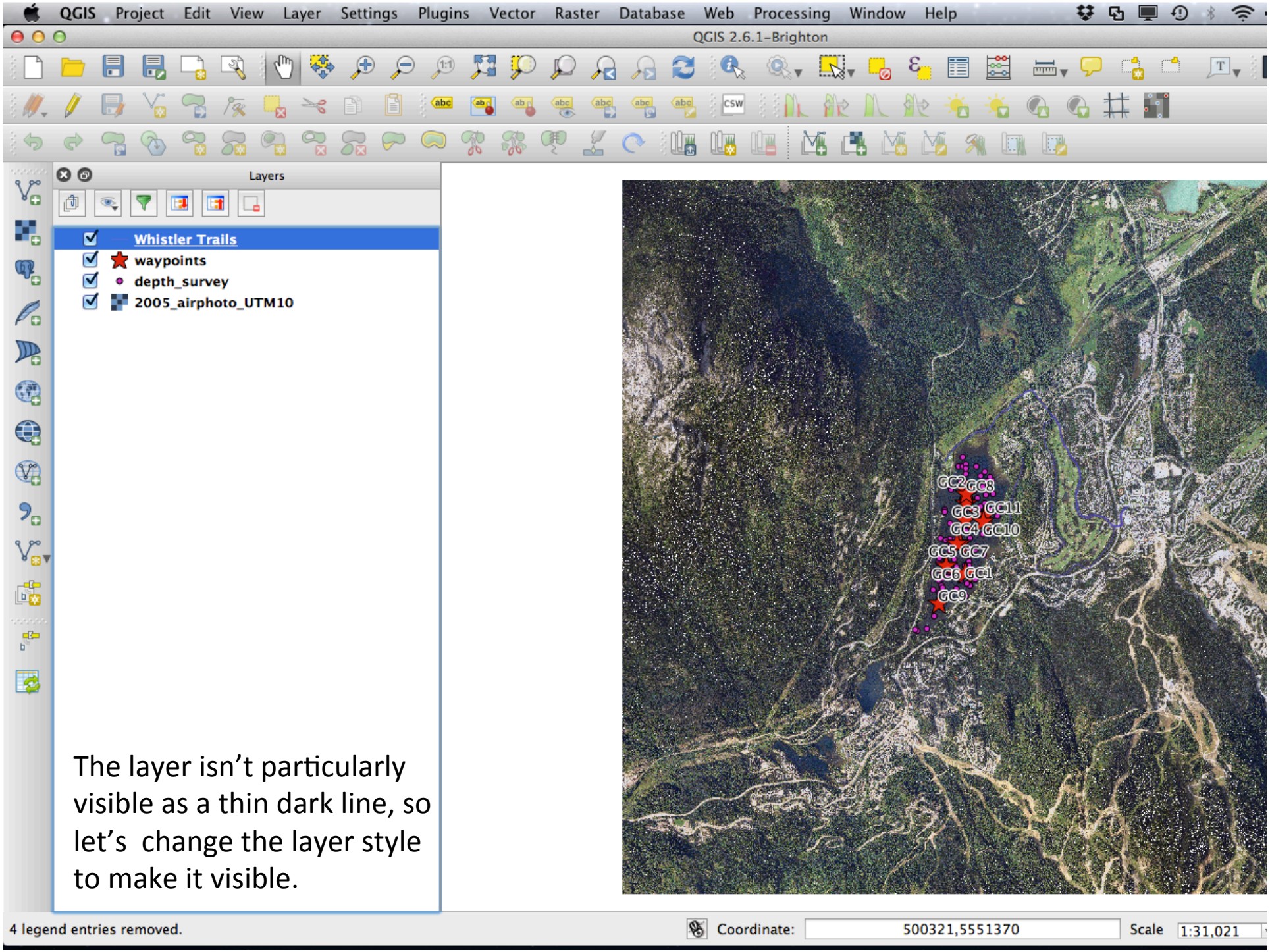

QGIS Project Edit View Layer Settings Plugins Vector Raster Database Web Processing Window Help
Layer Properties – waypoints | Style
General
Style
Labels
Fields
Display
Actions
Joins
Diagrams
Metadata
Single Symbol
Unit
Millimeter
Size
8
Transparency 0%
Rotation
0.00°
Color
Marker
Simple marker
Symbols in group
Open Library
airport
arrow
capital
circle
city
diamond
ellipse
pentagon
square
star
star2
star3
triangle
triangle2
I choose a star with a size of 8 here, but you can choose whatever you'd like.
Save
star
Advanced
Layer rendering
Layer transparency
0
Layer blending mode
Normal
Feature blending mode
Normal
Load Style...
Save As Default
Restore Default Style
Save Style
Help
Apply
Cancel
OK
4 legend entries removed.
Coordinate:
501790,5551772
Scale
1:7,546

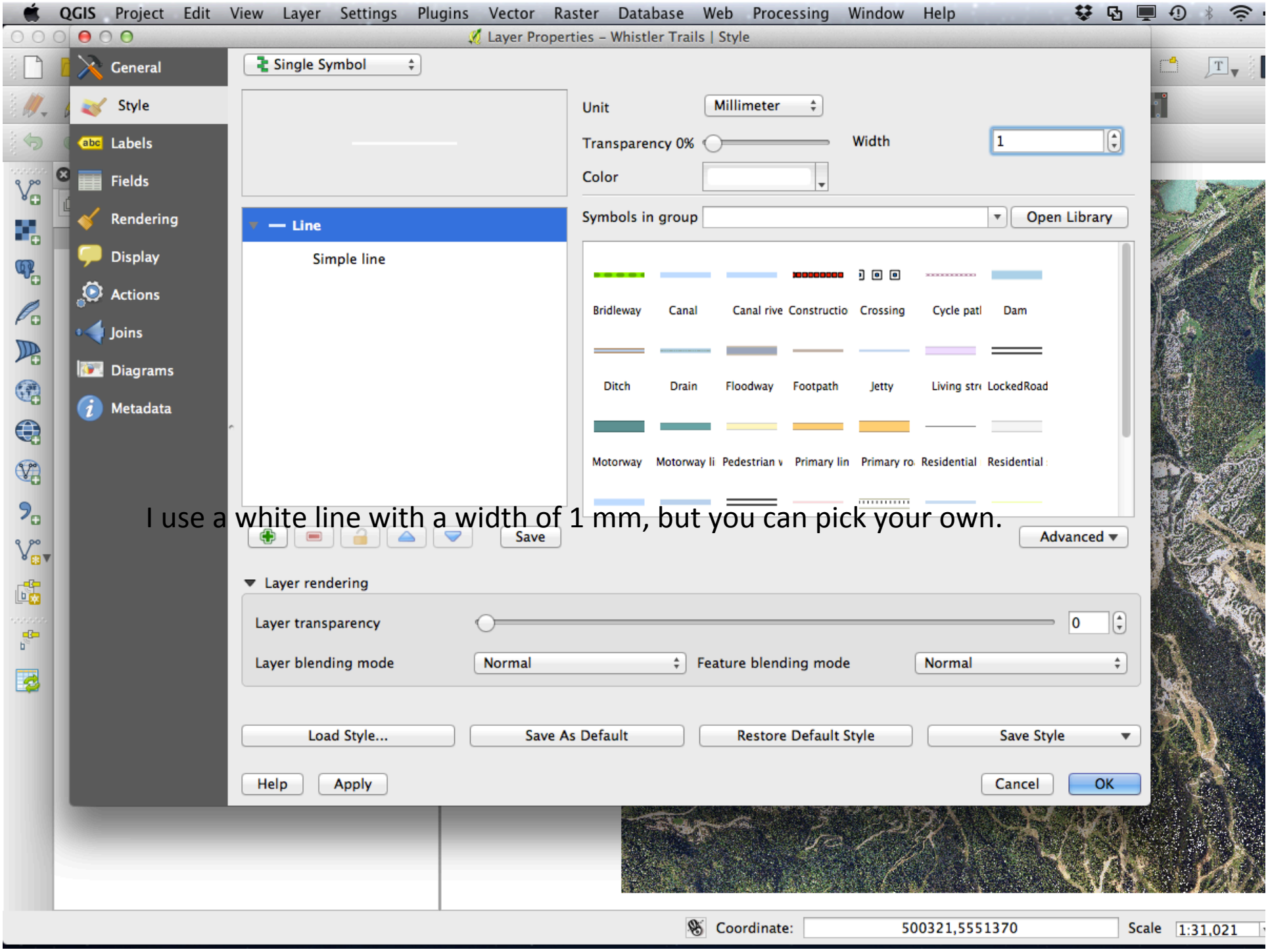

QGIS Project Edit View Layer Settings Plugins Vector Raster Database Web Processing Window Help
Layer Properties – waypoints | Labels
General
Style
Labels
Fields
Display
Actions
Joins
Diagrams
Metadata
Label this layer with
ele
time
magvar
geoidheight
name
cmt
desc
src
link1_href
link1_text
Text/Buffer sample
Lorem Ipsum
Lorem Ipsum
Text
Formatting
Buffer
Background
Shadow
Placement
Rendering
Placement
Around point
Offset from point
Distance
0.0000
mm
Data defined
Rotation
Preserve data rotation values
Priority
Load Style...
Save As Default
Restore Default Style
Save Style
Help
Apply
Cancel
OK
We can also label the layer with the “name” field. I also use a buffer of 1 mm, which helps with visibility on the dark background.
4 legend entries removed.
Coordinate:
499967,5550789
Scale
1:7,546


QGIS Project Edit View Layer Settings Plugins Vector Raster Database Web Processing Window Help
QGIS 2.6.1-Brighton
Layers
waypoints
depth_survey
2005_airphoto_UTM10
GC2
GC8
GC3
GC11
GC4
GC10
GC5
GC7
GC6
GC1
GC9
Your waypoints layer should look like this.
4 legend entries removed.
Coordinate:
501599,5550523
Scale
1:7,546

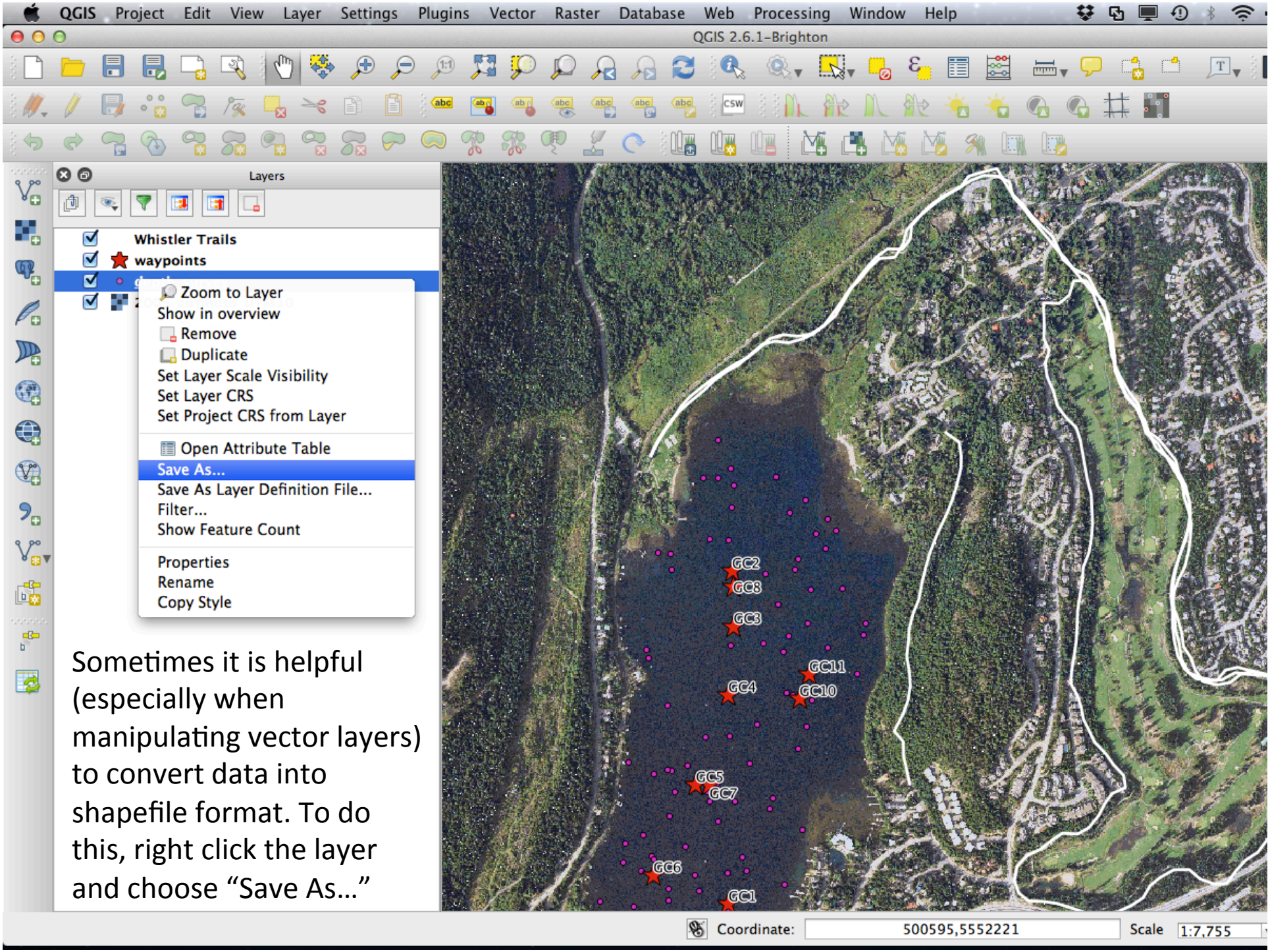


Now lets add Google Earth data to the map. This is useful because Google Earth data (in the form of a KMZ or KML file) is a common format of data that is downloadable online, and also allows interchange of data between QGIS and Google Earth. Drag the “Alta Lake Trails.kmz” file to the Layers list to add the data.

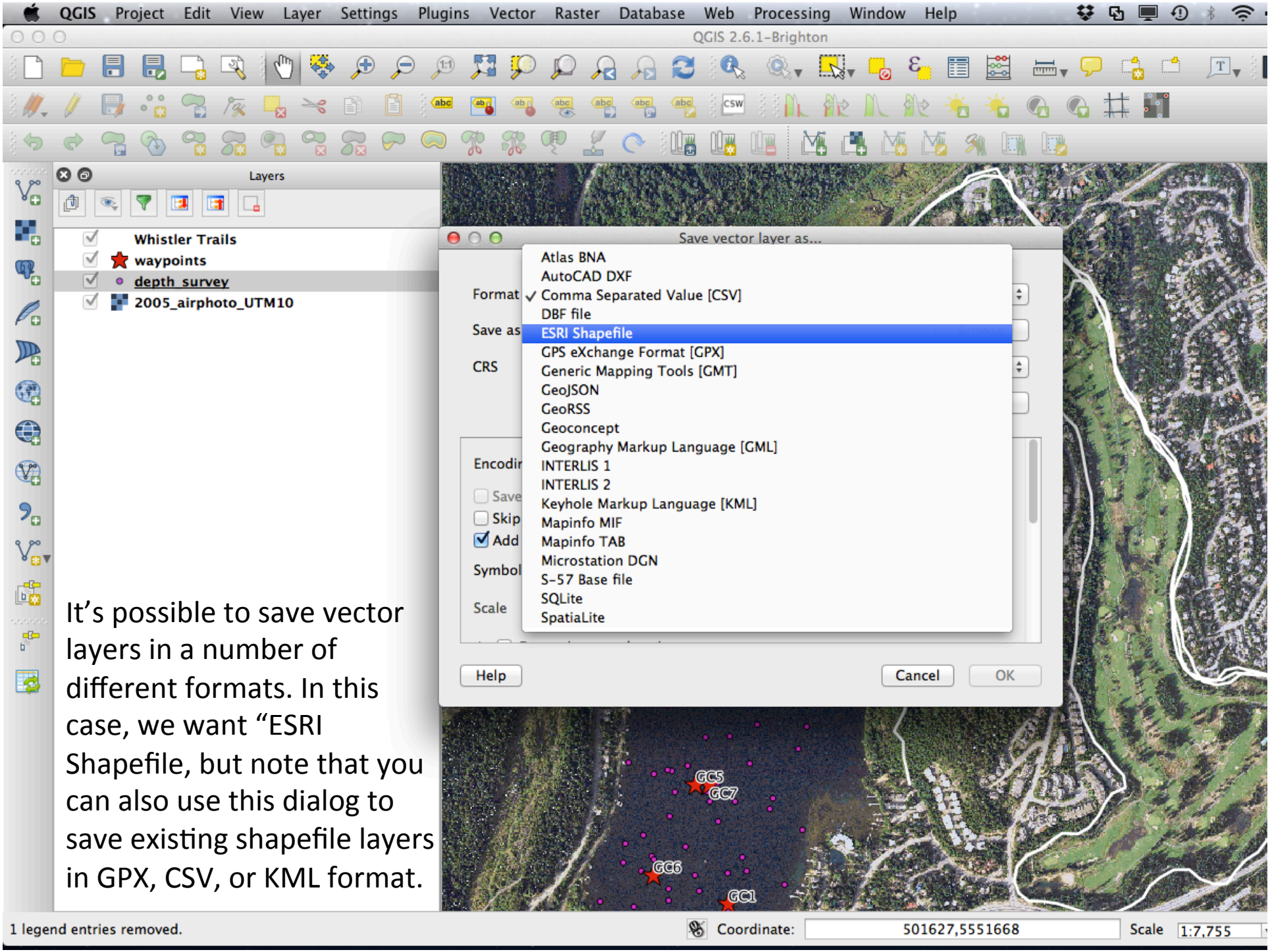

QGIS Project Edit View Layer Settings Plugins Vector Raster Database Web Processing Window Help
QGIS 2.6.1-Brighton
Layers
Whistler Trails
waypoints
depth_survey
2005_airphoto_UTM10
GC2 GC8
GC3 GC11
GC4 GC10
GC5 GC7
GC6 GC1
GC9
The layer isn't particularly visible as a thin dark line, so let's change the layer style to make it visible.
4 legend entries removed.
Coordinate:
500321,5551370
Scale
1:31,021



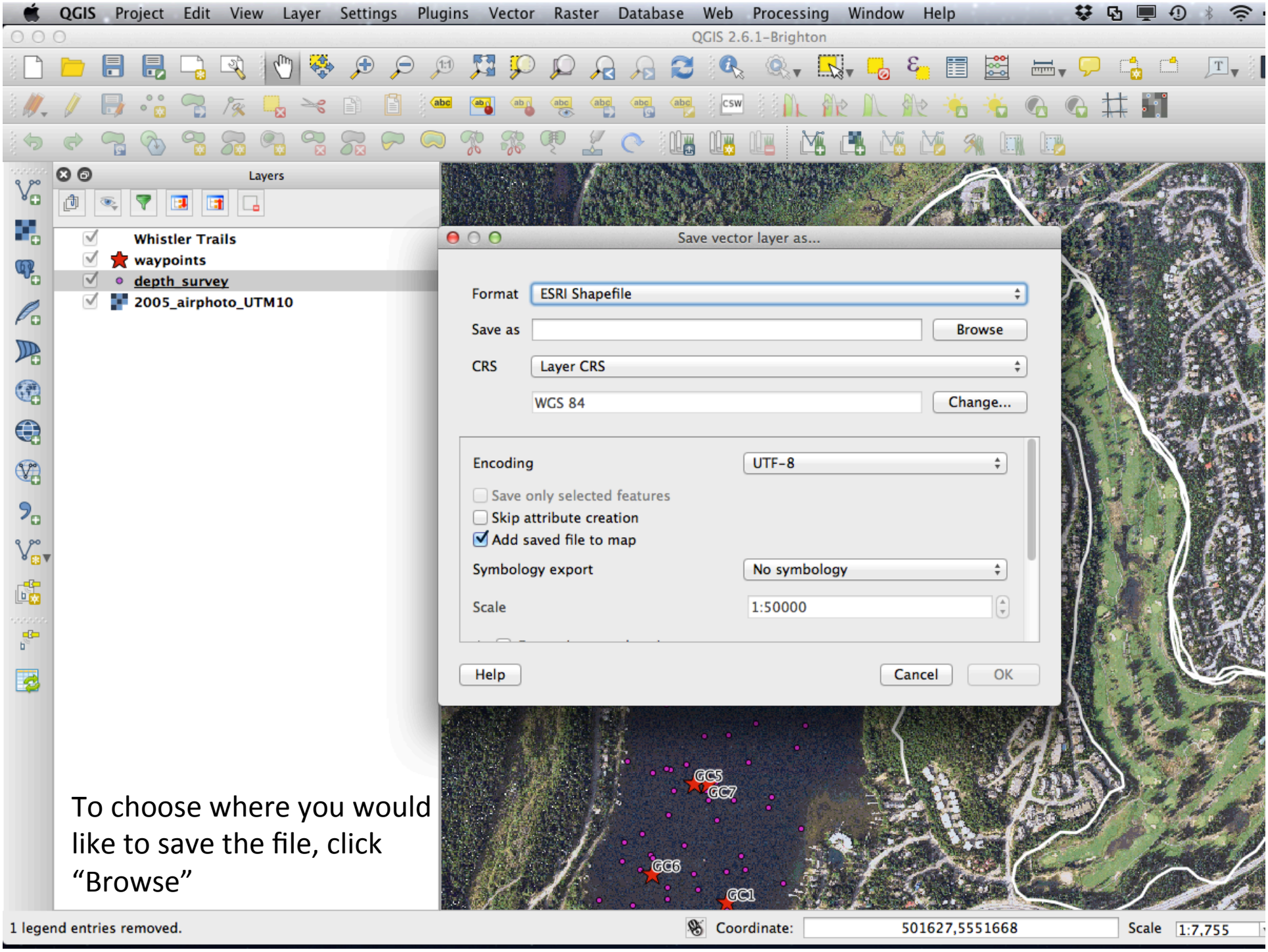
I use a white line with a width of 1 mm, but you can pick your own.



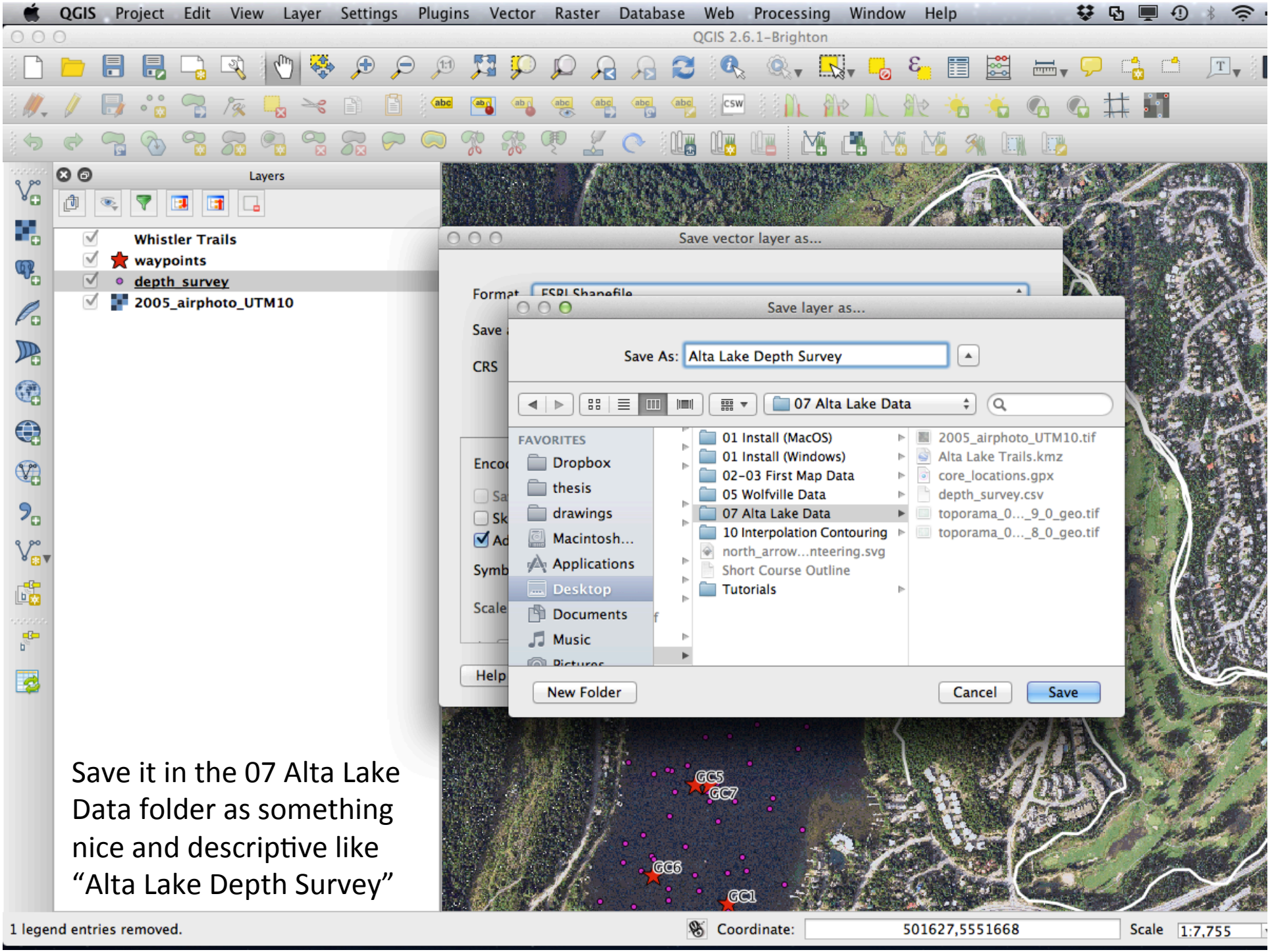
Sometimes it is helpful (especially when manipulating vector layers) to convert data into shapefile format. To do this, right click the layer and choose “Save As…”

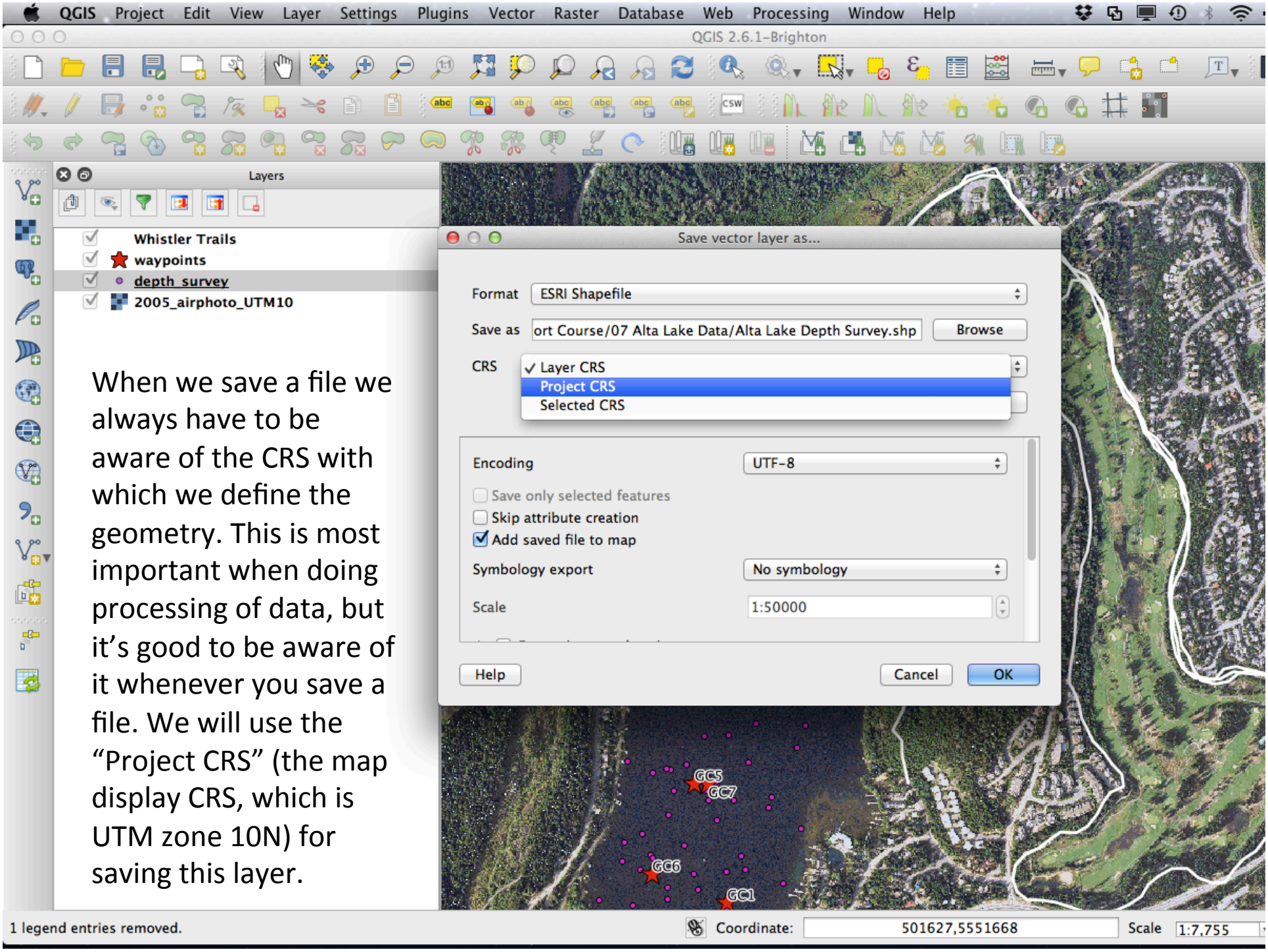


It's possible to save vector layers in a number of different formats. In this case, we want "ESRI Shapefile, but note that you can also use this dialog to save existing shapefile layers in GPX, CSV, or KML format.

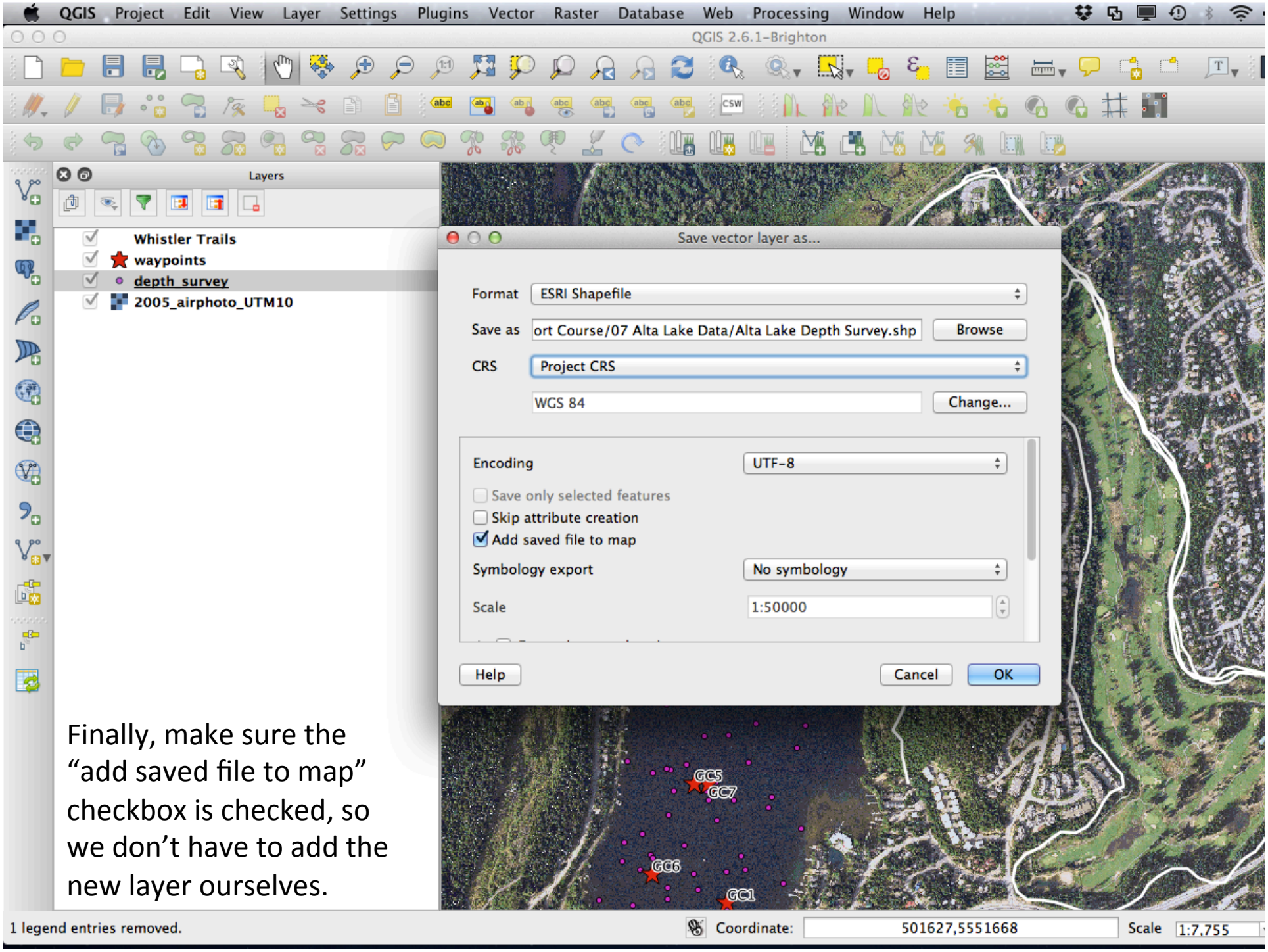


To choose where you would like to save the file, click "Browse"

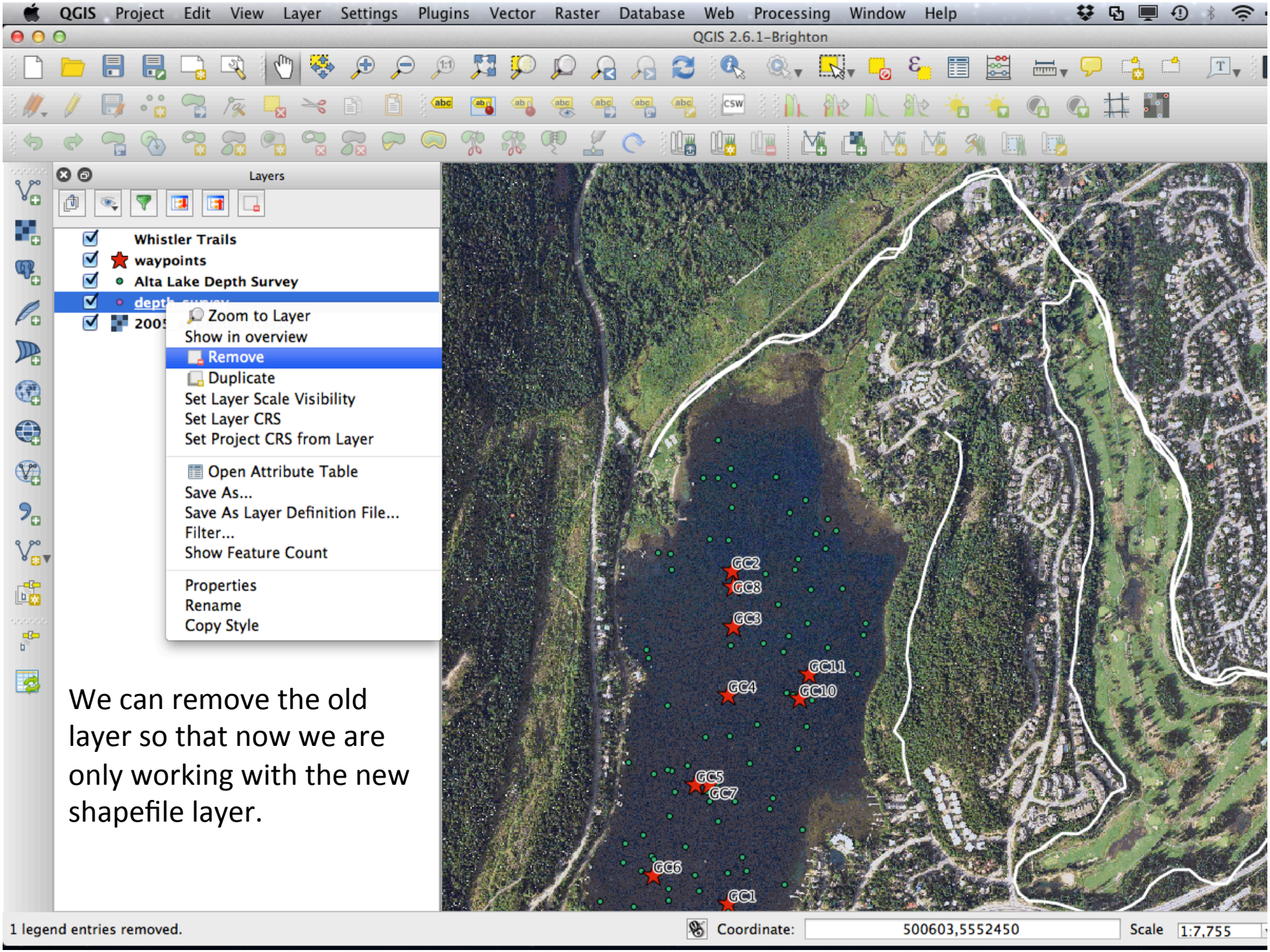

QGIS Project Edit View Layer Settings Plugins Vector Raster Database Web Processing Window Help
QGIS 2.6.1-Brighton
Layers
Whistler Trails
waypoints
depth_survey
2005_airphoto_UTM10
Save vector layer as...
Format
ESRI Shapefile
Save
CRS
Save layer as...
Save As: Alta Lake Depth Survey
07 Alta Lake Data
FAVORITES
Dropbox
thesis
drawings
Macintosh...
Applications
Desktop
Documents
Music
01 Install (MacOS)
01 Install (Windows)
02-03 First Map Data
05 Wolfville Data
07 Alta Lake Data
10 Interpolation Contouring
north_arrow...nteering.svg
Short Course Outline
Tutorials
2005_airphoto_UTM10.tif
Alta Lake Trails.kmz
core_locations.gpx
depth_survey.csv
toporama_0..._9_0_geo.tif
toporama_0..._8_0_geo.tif
Help
New Folder
Cancel
Save
GC5
GC7
GC6
GC1
Save it in the 07 Alta Lake Data folder as something nice and descriptive like “Alta Lake Depth Survey”
1 legend entries removed.
Coordinate:
501627,5551668
Scale
1:7,755



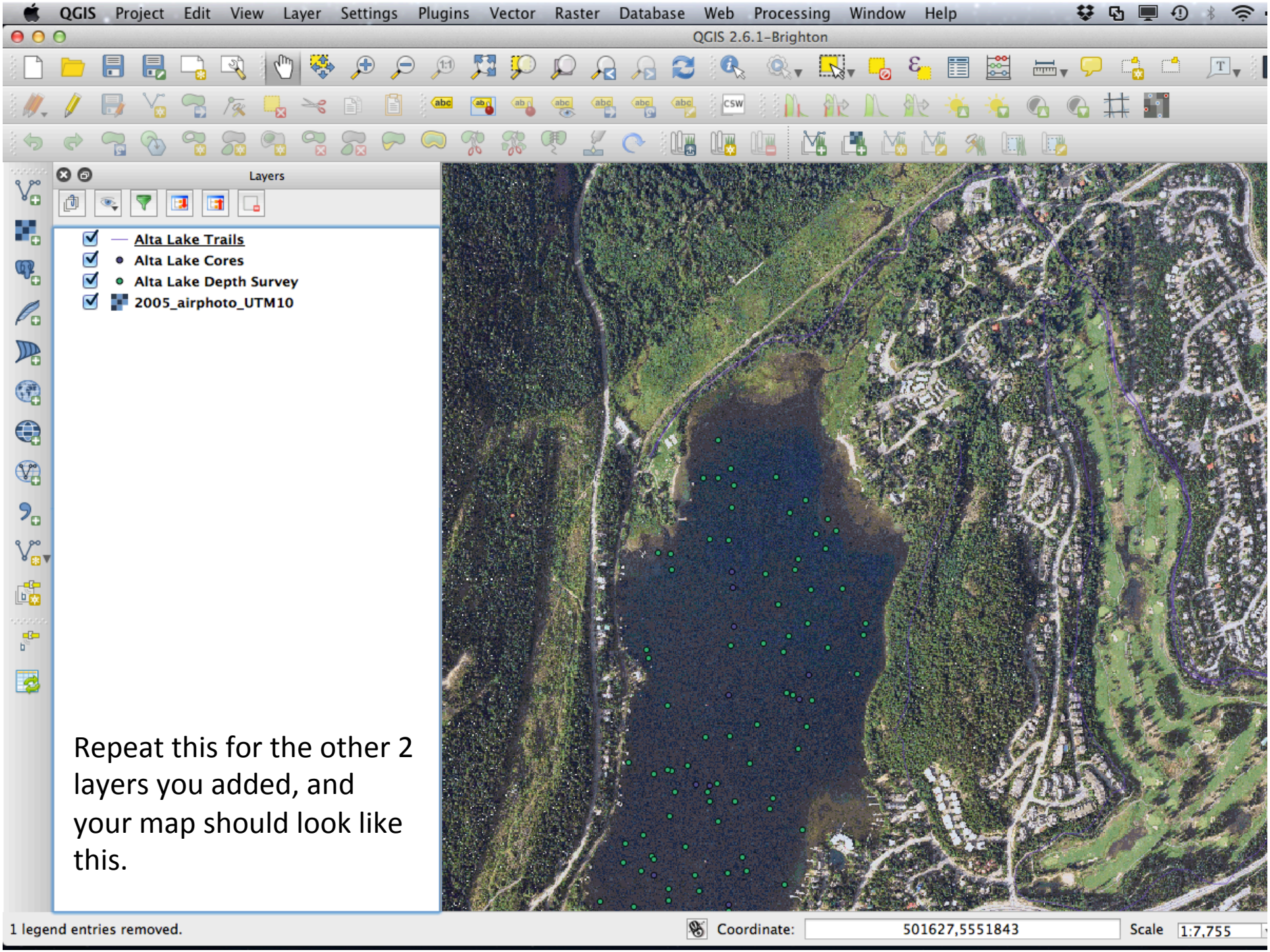
When we save a file we always have to be aware of the CRS with which we define the geometry. This is most important when doing processing of data, but it's good to be aware of it whenever you save a file. We will use the "Project CRS" (the map display CRS, which is UTM zone 10N) for saving this layer.

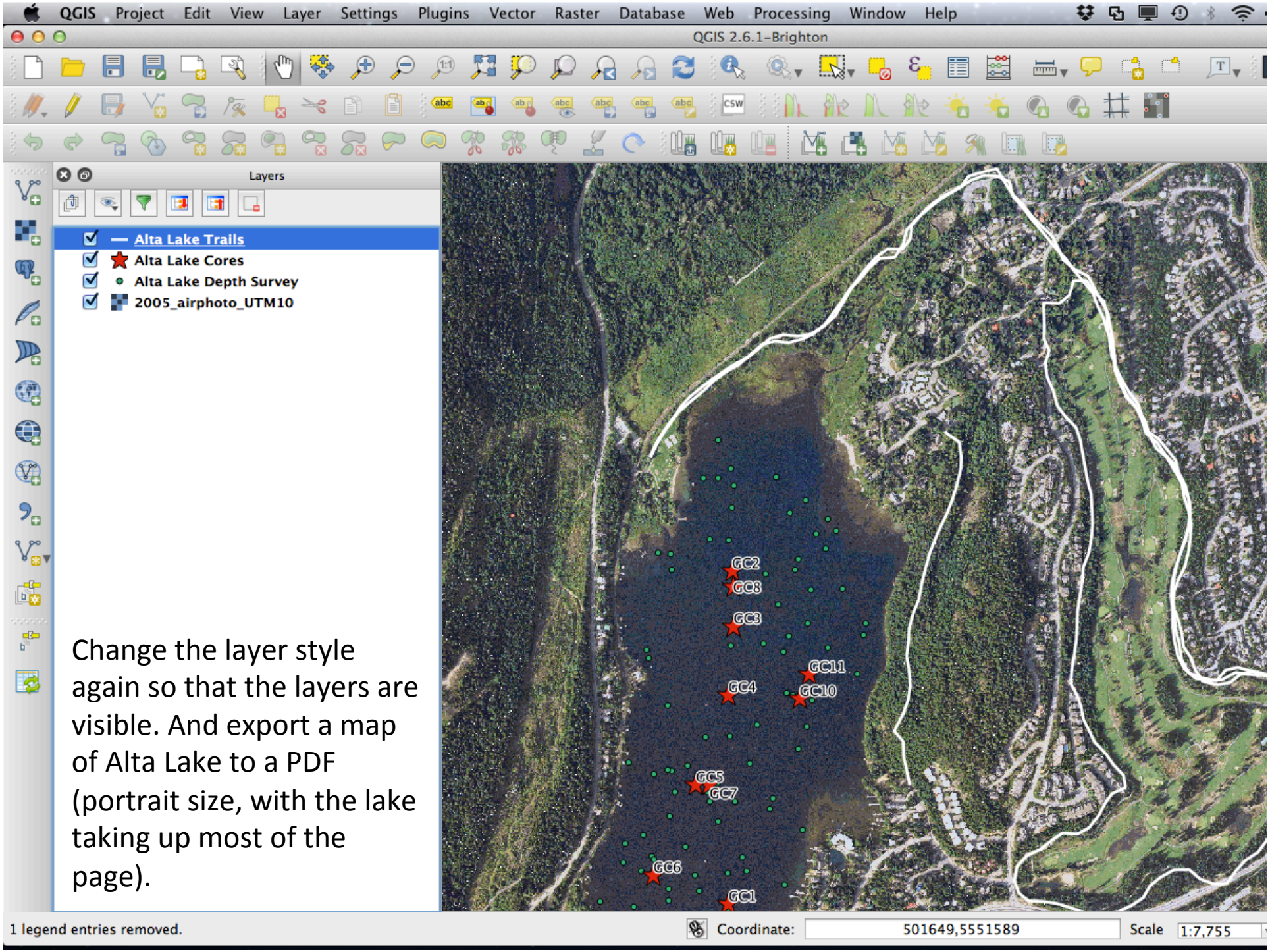


Finally, make sure the "add saved file to map" checkbox is checked, so we don't have to add the new layer ourselves.

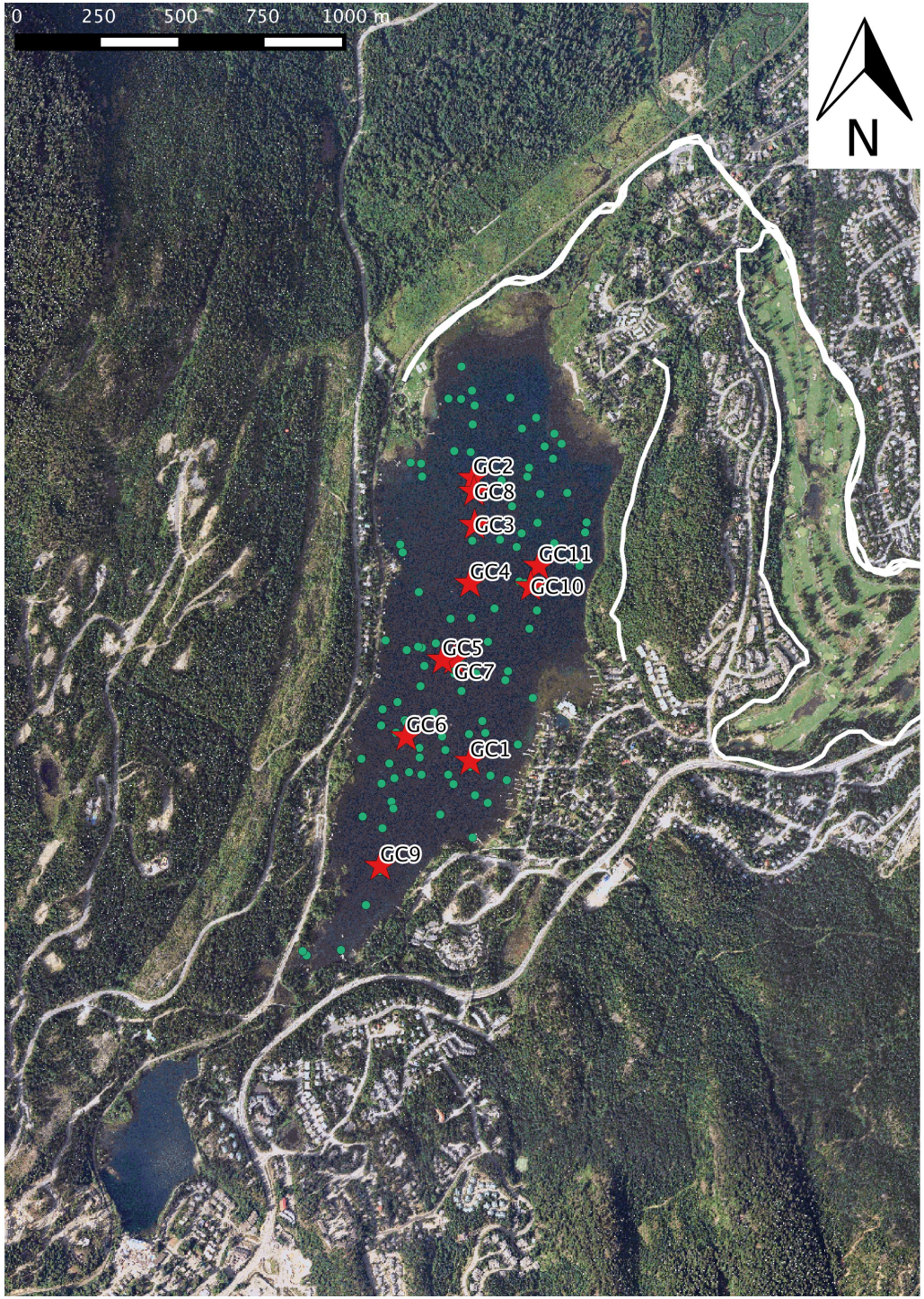


We can remove the old layer so that now we are only working with the new shapefile layer.


QGIS Project Edit View Layer Settings Plugins Vector Raster Database Web Processing Window Help
QGIS 2.6.1-Brighton
Layers
Alta Lake Trails
Alta Lake Cores
Alta Lake Depth Survey
2005_airphoto_UTM10
Repeat this for the other 2 layers you added, and your map should look like this.
1 legend entries removed.
Coordinate:
501627,5551843
Scale
1:7,755



Change the layer style again so that the layers are visible. And export a map of Alta Lake to a PDF (portrait size, with the lake taking up most of the page).


0
250
500
750
1000 m
N
GC2
GC8
GC3
GC11
GC4
GC10
GC5
GC7
GC6
GC1
GC9