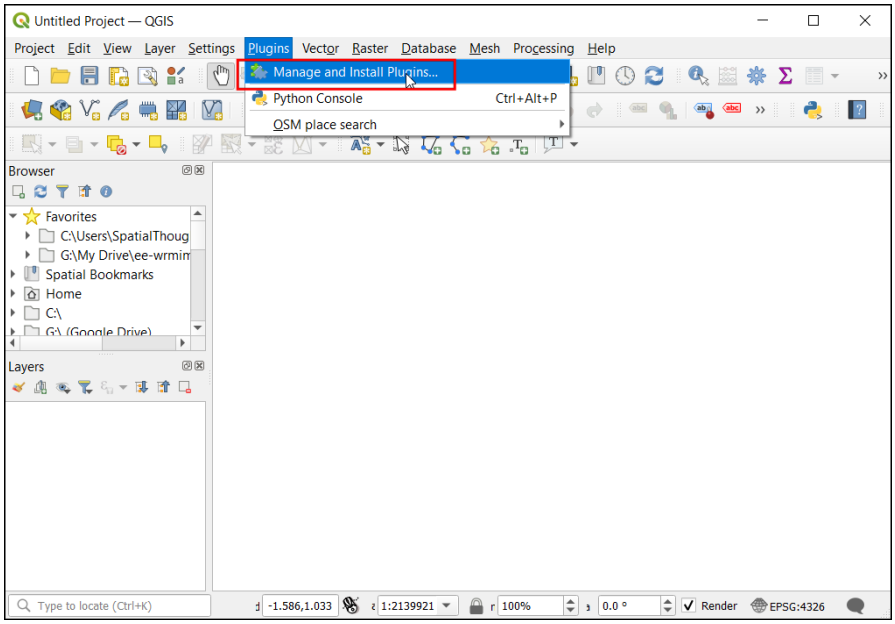
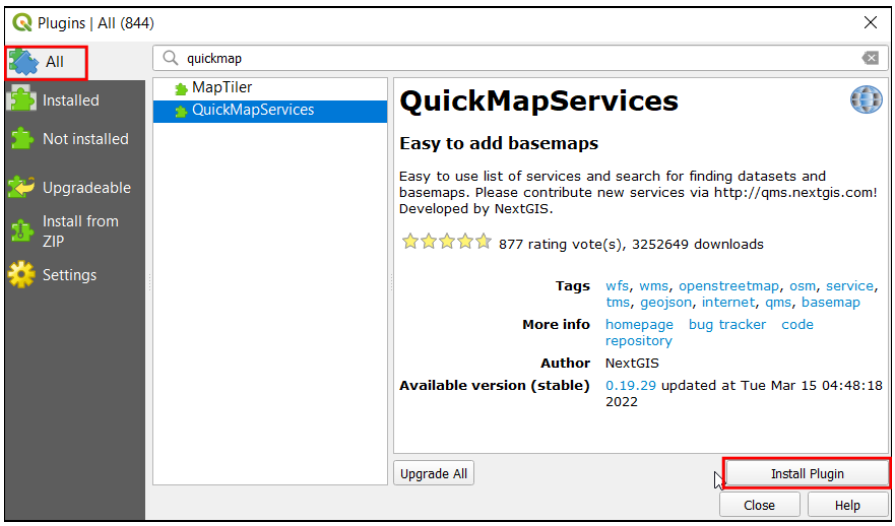
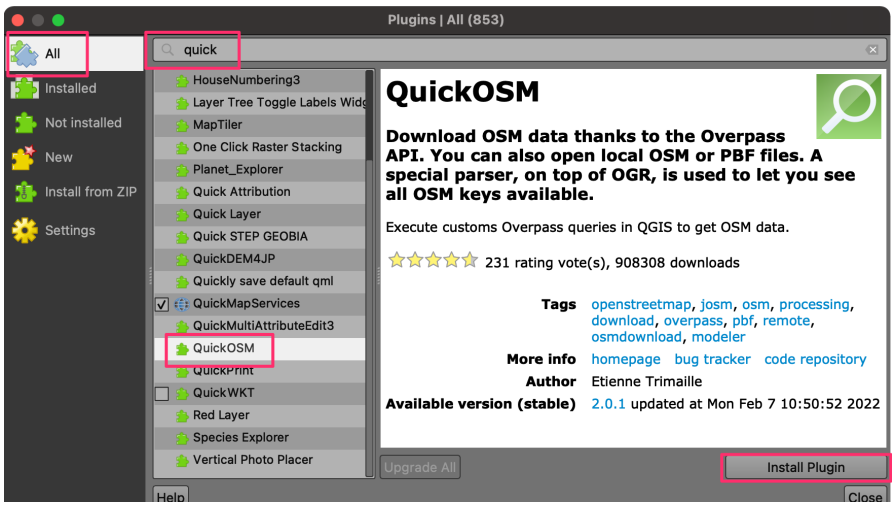
it.

- QuickMapServices
- QuickOSM

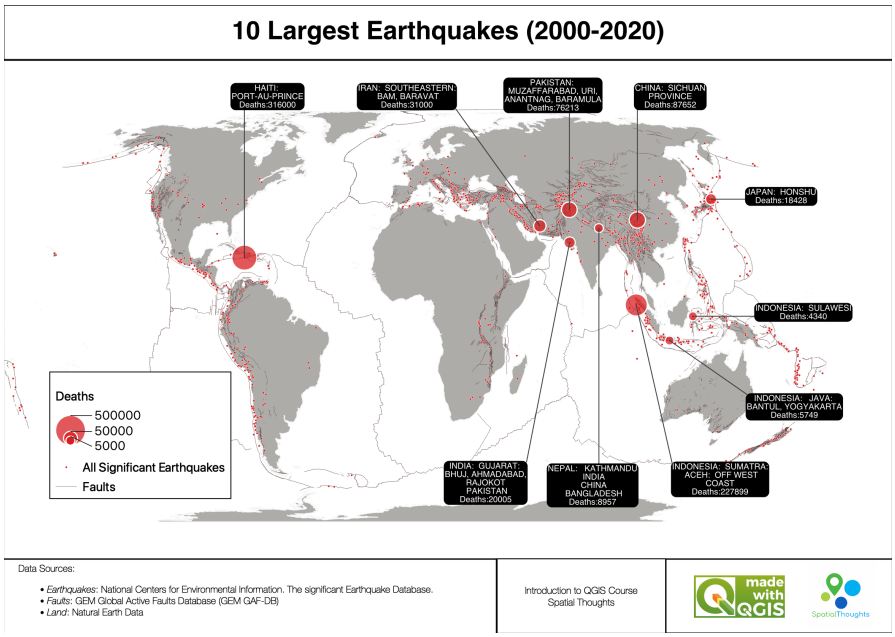






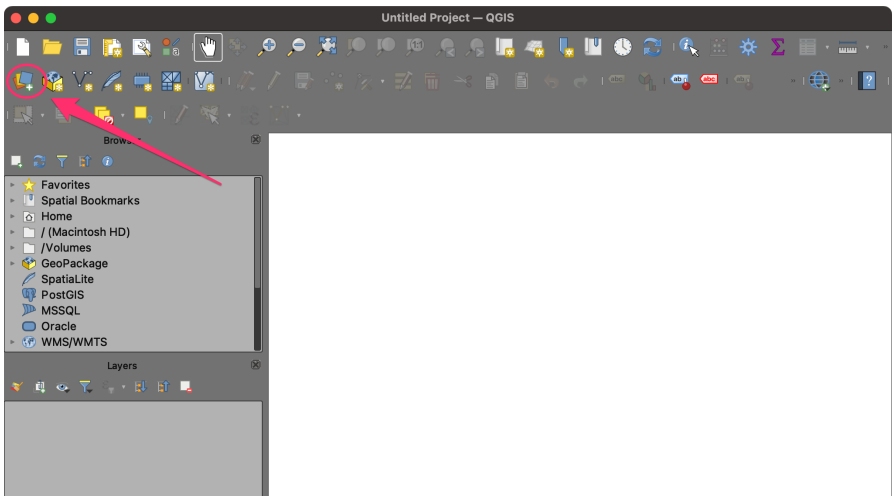
1. Creating Maps

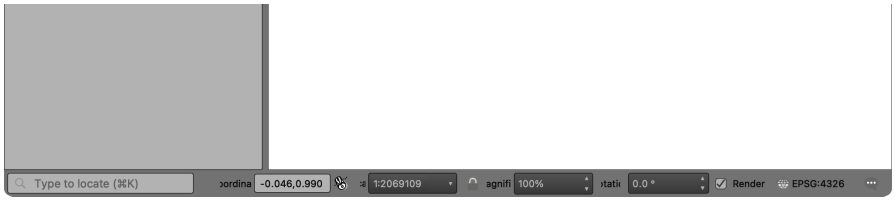
This section is designed to help you get familiar with the basic workflow of importing data layers, applying symbology, adding labels, and designing layouts for maps. We will take a text file containing historical records of earthquakes and turn it into an informative visualization like the one below.



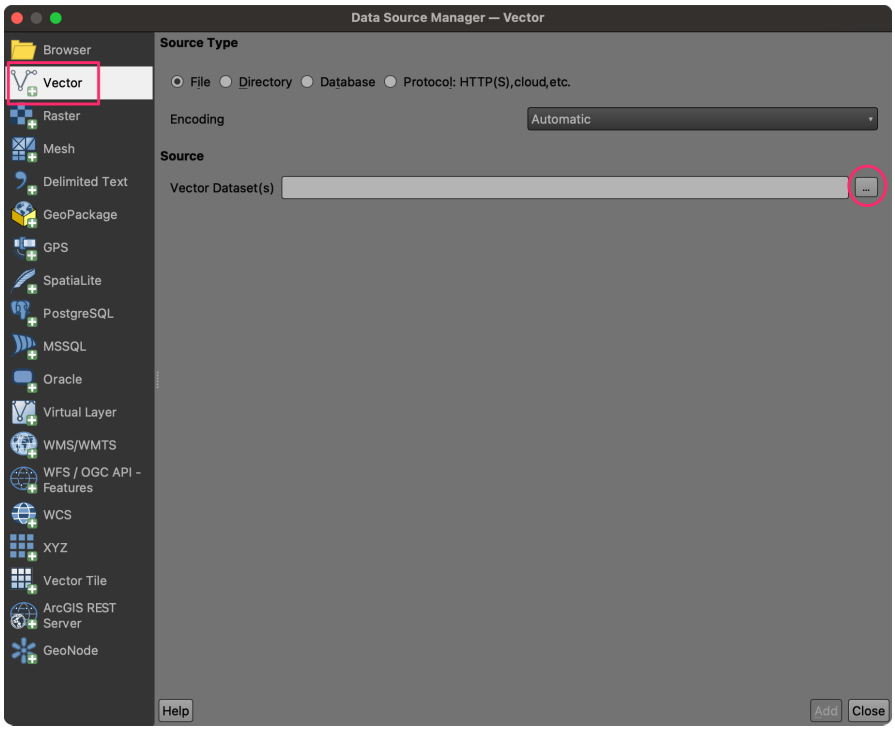
1.1 Importing Vector Data

1. Open QGIS. The first step is to import the source datasets. Click on the *Open Data Source Manager* button.

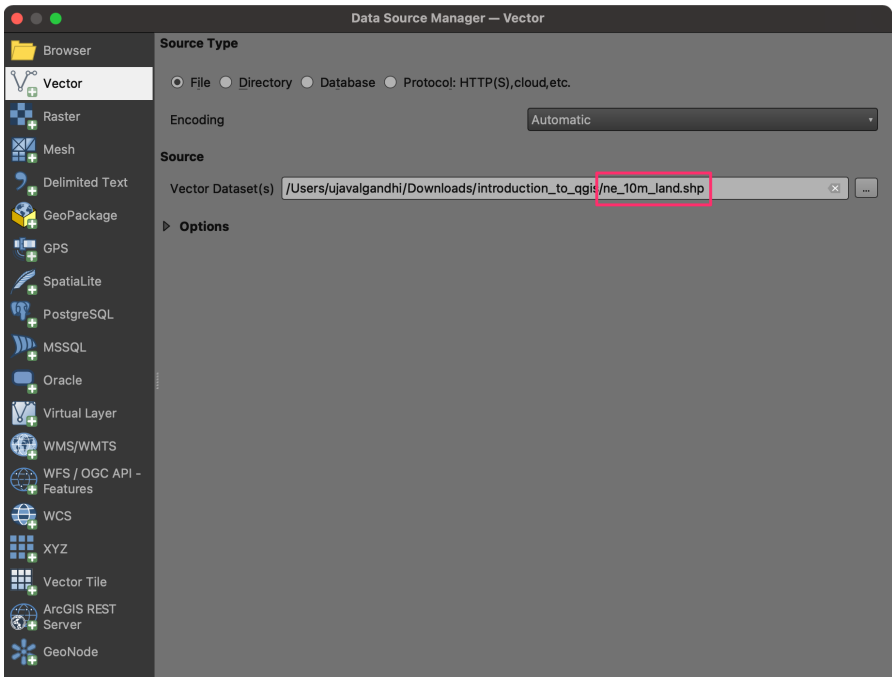




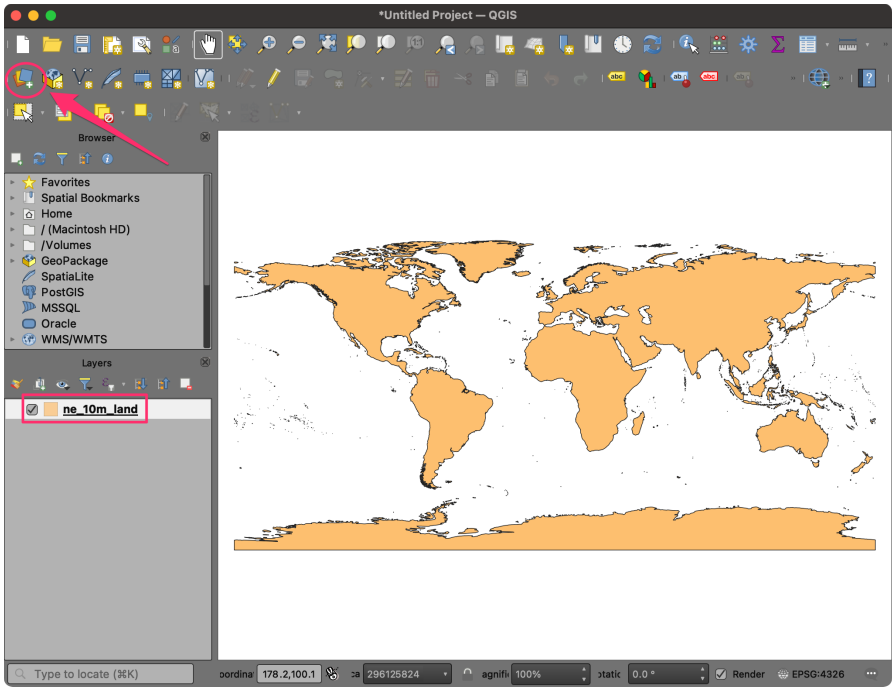
2. Select the *Vector* tab. Click the *…* button next to *Vector Dataset(s)* and browse to the data directory.



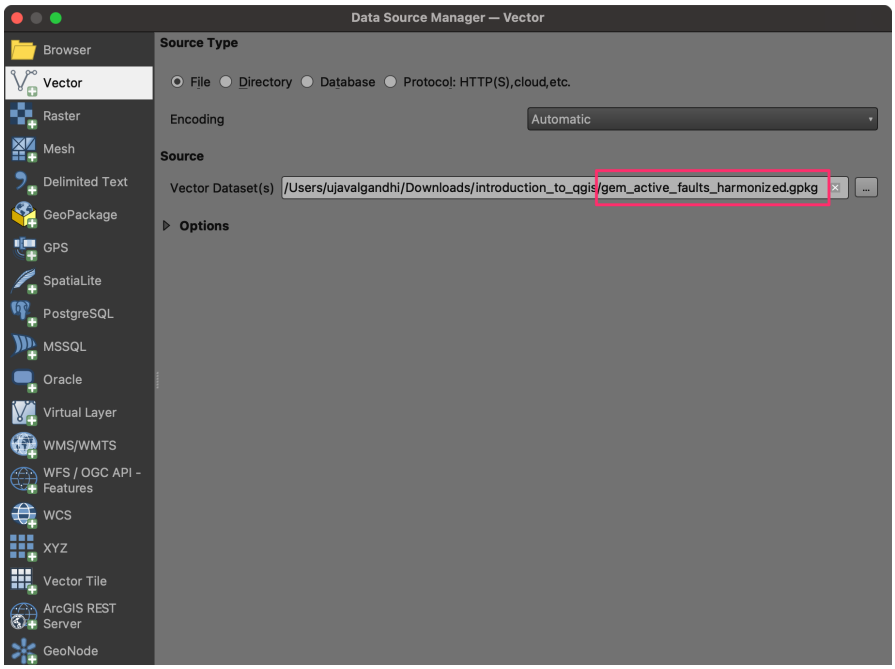
3. Select the `ne_10m_land.shp` file and click *Open*. In the *Data Source Manager* window, click *Add*.



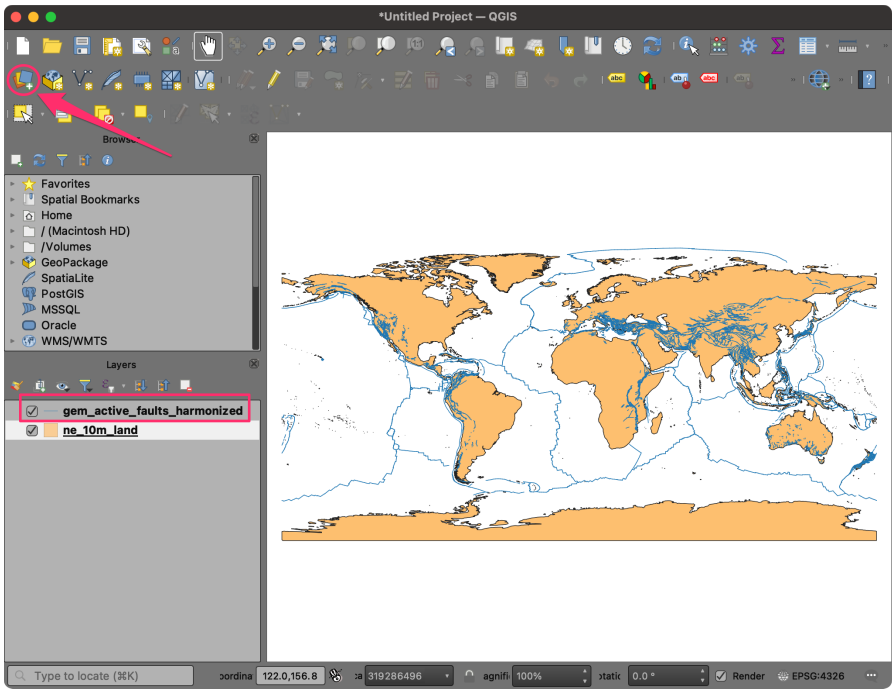
4. A new layer, `ne_10m_land` will be added to the *Layers* panel and displayed on the Canvas. This layer contains polygons representing the land areas of the world. Click on the *Open Data Source Manager* button again.



5. Click the … button next to *Vector Dataset(s)* and browse to the data directory. Select the `gem_active_faults_harmonized.gpkg` file and click *Open* followed by *Add*.

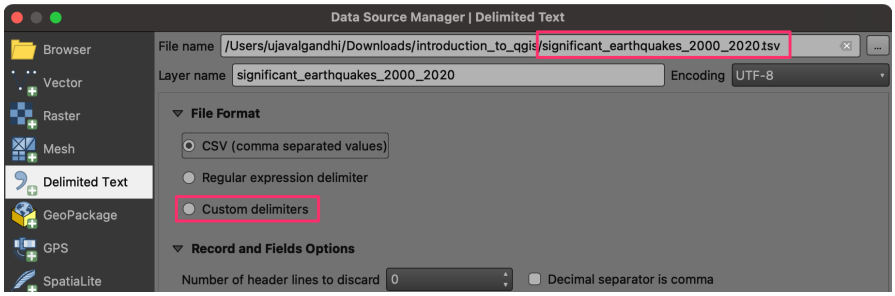


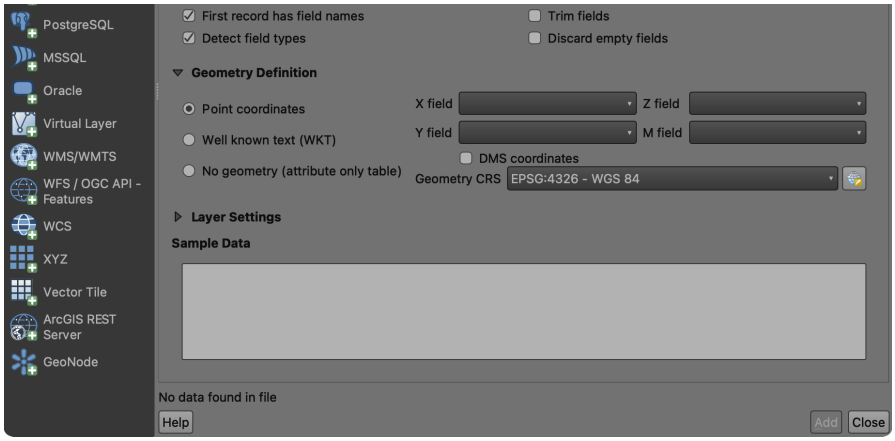
6. A new layer, `gem_active_faults_harmonized` will be added to the *Layers* panel and displayed on the Canvas. This is a global layer containing lines representing all the active faults. We will now import another layer of earthquake points. Click on the *Open Data Source Manager* button again.



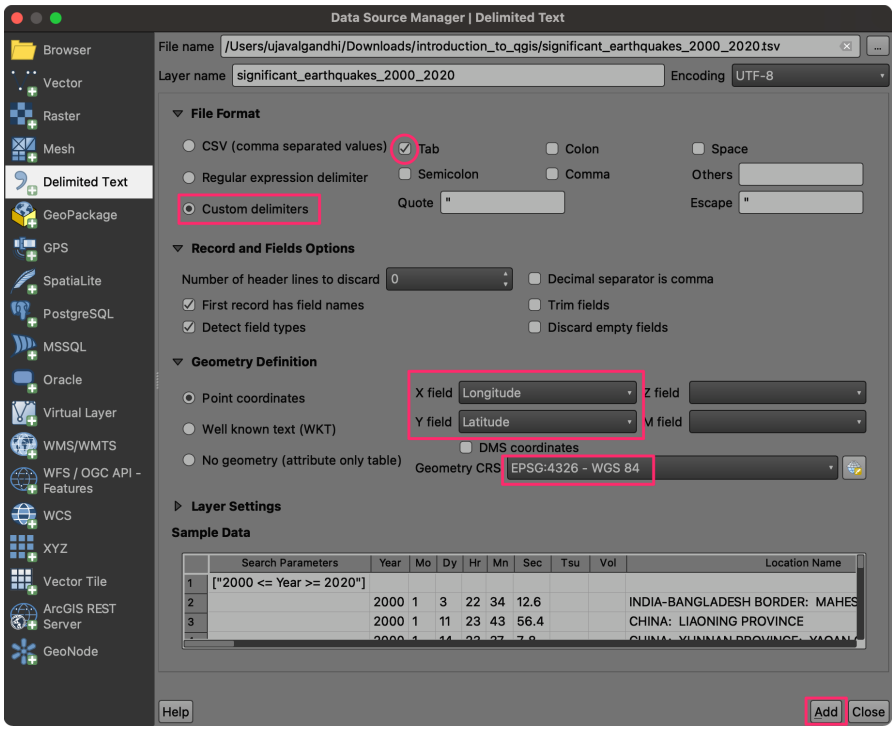
7. Select the *Delimited Text* tab. Click the *…* button next to *File name* and browse to the data directory. Select the `significant_earthquakes_2000_2020.tsv` file. This is a text file in the *Tab-Separated Values (TSV) format*. In the *File Format* section, select *Custom delimiters*.

> Note: Windows users may need to change the *File Type* as **All** in *Choose a Delimited Text File to Open* dialog to see the TSV file.

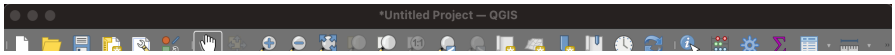


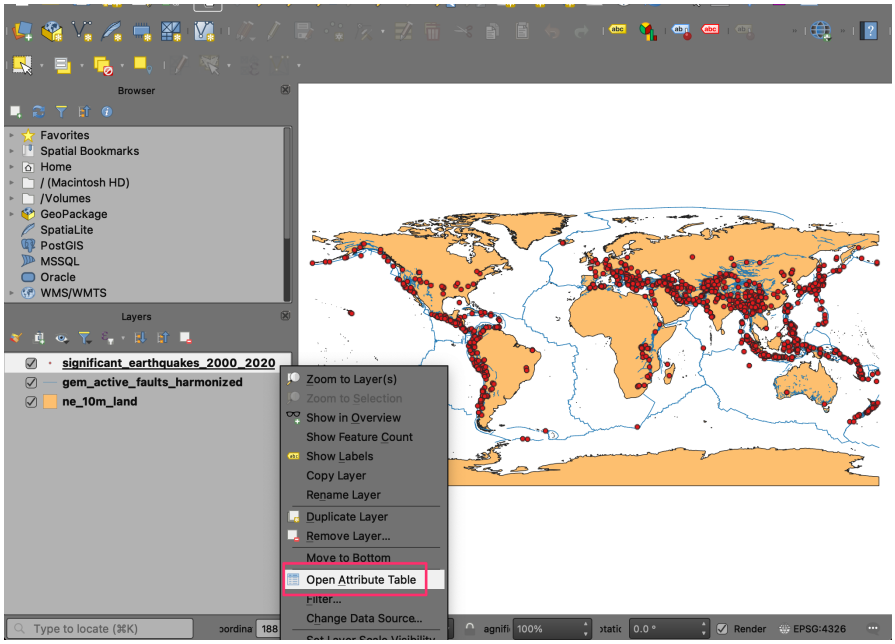


8. Check the *Tab* checkbox. In the *Geometry Definition* section, ensure **Longitude** is selected as the *X Field* and **Latitude** is selected as the *Y Field*. Choose **EPSG:4326** as *Geometry CRS*. Leave other options to their default values and click *Add*.



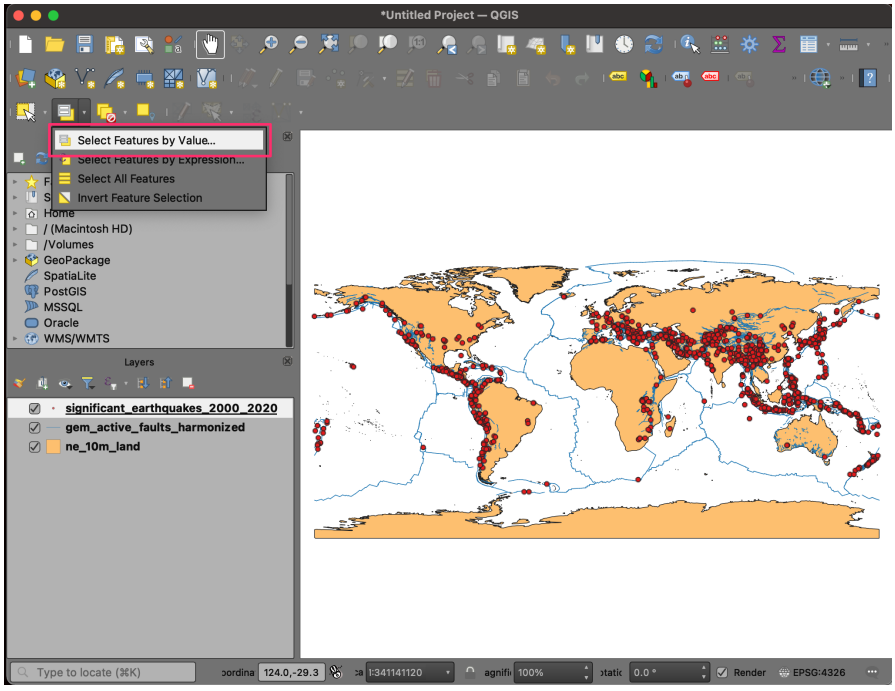
9. A new layer, `significant_earthquakes_2000_2020` will be added to the *Layers* panel and displayed on the Canvas. This layer contains over 1000 records of significant earthquakes recorded between 2000 and 2020. Right-click on the `significant_earthquakes_2000_2020` layer and select *Open Attribute Table*. Examine all the attributes and their values.



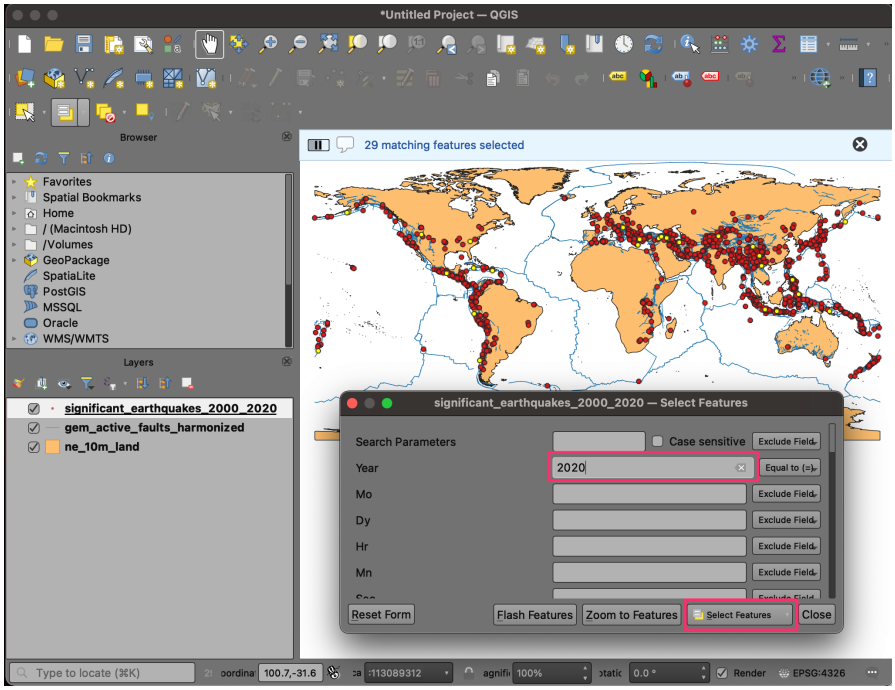


10. We will now learn about some of the tools to query and select records. From the *Selection Toolbar*, click the *Select Features by Value…* button.

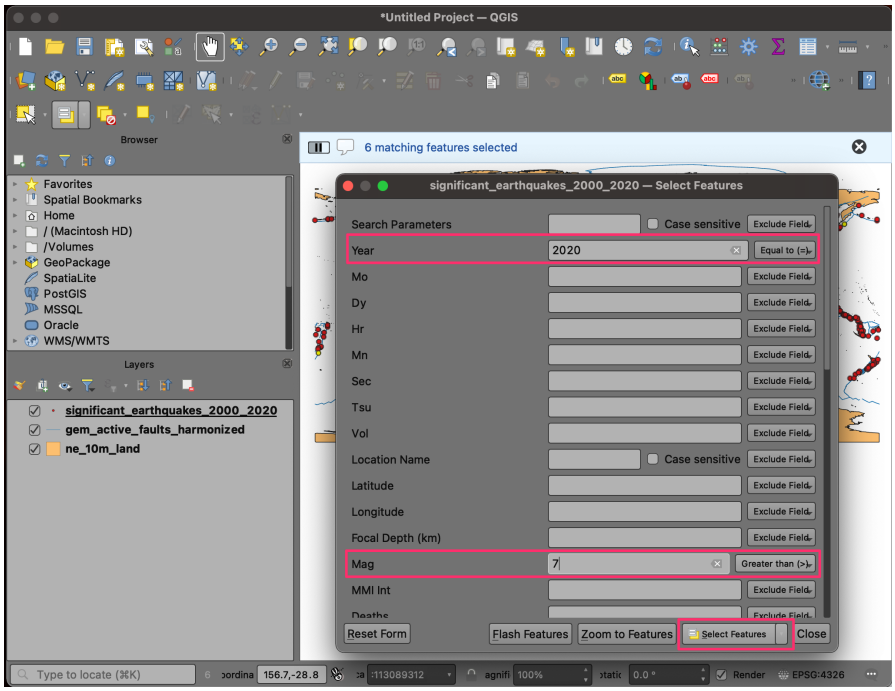
> Note: If the selection toolbar is not enabled, right-click on the toolbar panel and check **Selection Toolbar**.



11. In the *Select Features* dialog, enter **2020** as the *Year* and click the *Select Features* button. You will see all earthquakes that occurred during 2020 will be highlighted in yellow. You may also click the *Flash Features* button to see the selected records blink.

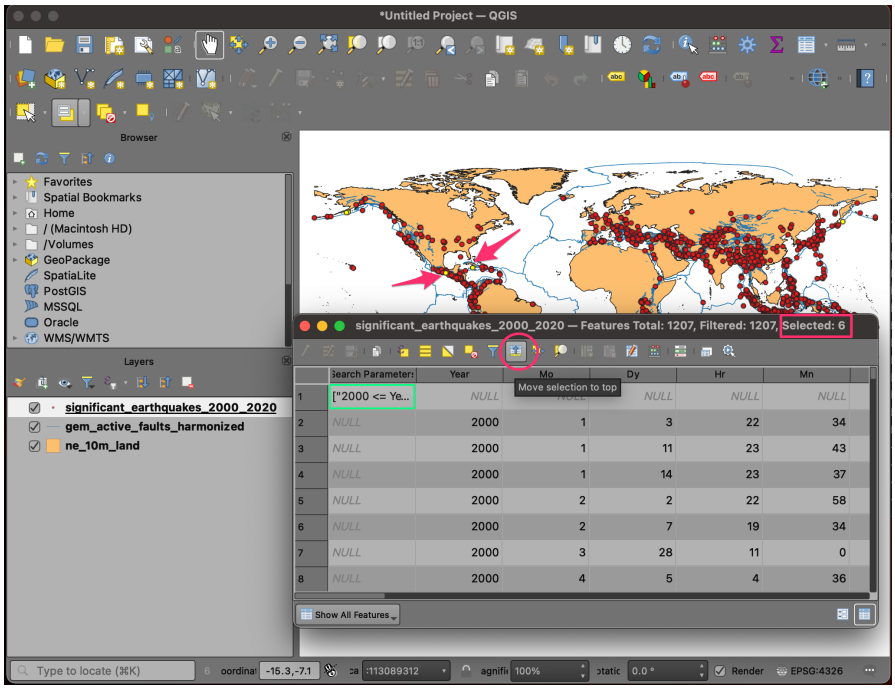


12. Let's refine the query a little more. Enter **7** as the *Mag* parameter and set the criteria as *Greater than (>)*. Click *Select Features*. You will now see only those points where the earthquake occurred in 2020, and its magnitude was greater than 7. Close the window.

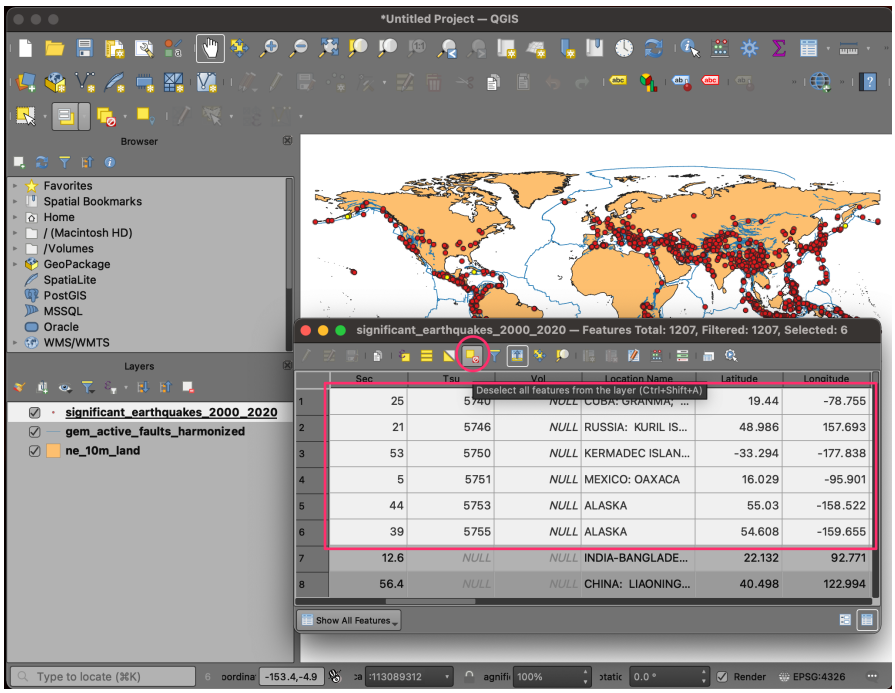


13. Right-click on the `significant_earthquakes_2000_2020` layer and select *Open Attribute Table*. You will see that there are 6 selected features in the layer. If you want to examine their attributes, there is a

handy shortcut. Click the *Move selection to top* button.

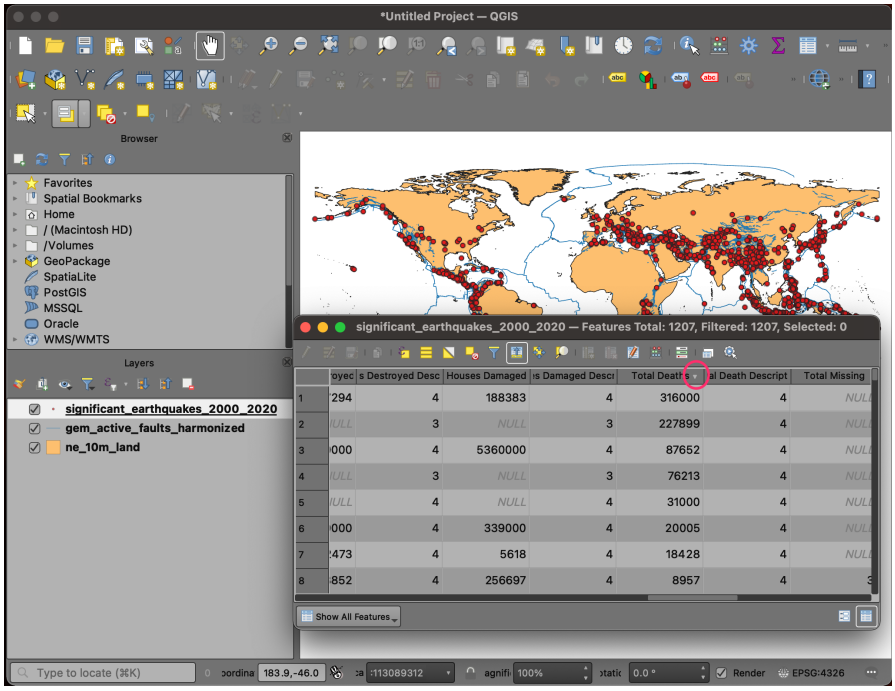


14. All the selected rows will be displayed on the top of the attribute table - making it easy to examine the selected features. Click the *Deselect all features from the layer* button.

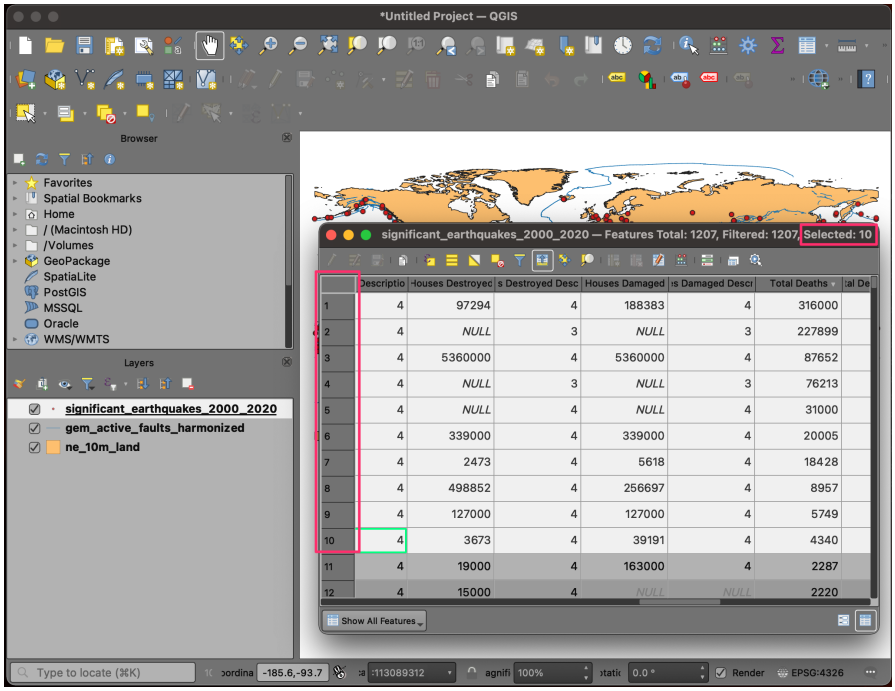


15. For our map, we need another layer of 10 largest earthquakes - so we can style it differently than other earthquakes. For our visualization, we will define the largest earthquakes like the ones that resulted in the

highest number of deaths. Locate the *Total Deaths* attribute and click twice on the column header. This will sort the features in descending order of the values in this column.

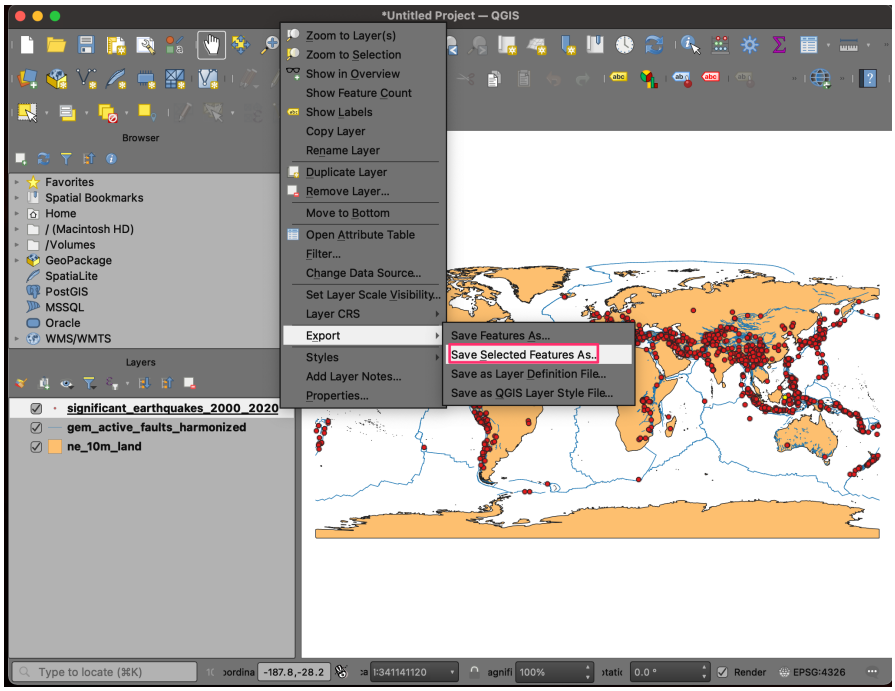


16. Hold the *Shift* key and select the first 10 rows. This selection will be the 10 earthquakes with the high fatalities.

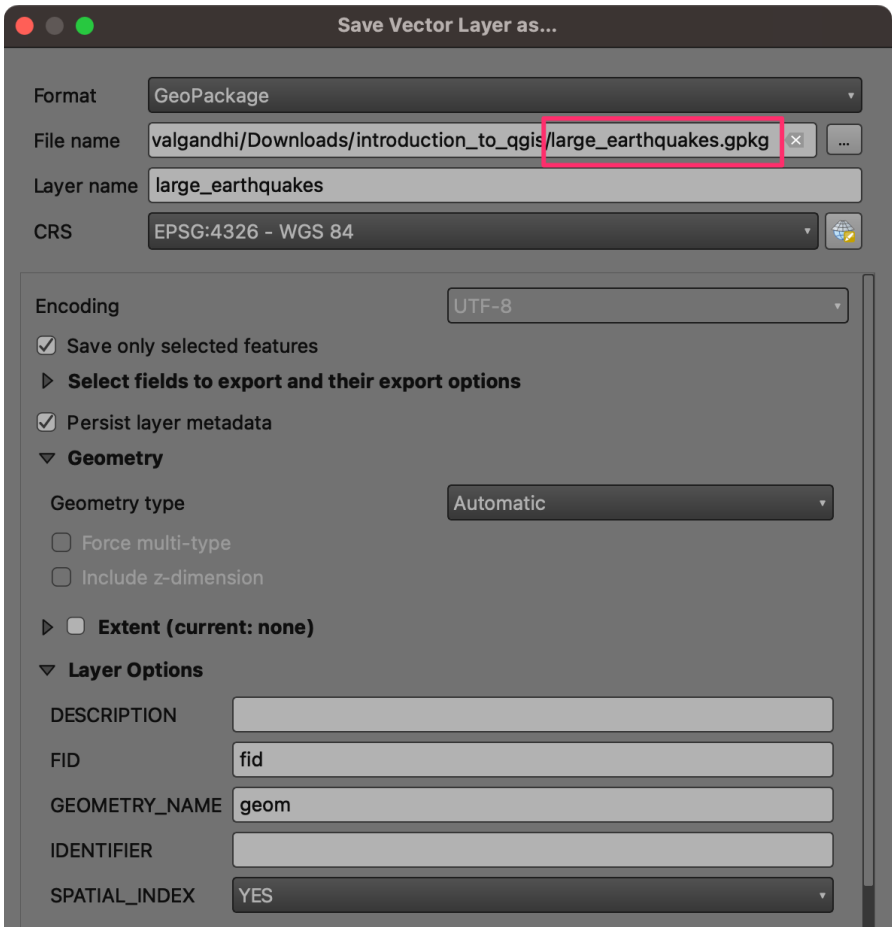


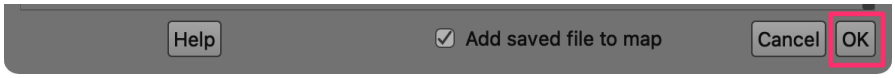
17. We will save the selected 10 features as a new layer. Right-click the `significant_earthquakes_2000_2020` layer and go to *Export* →

Save Selected Features As...

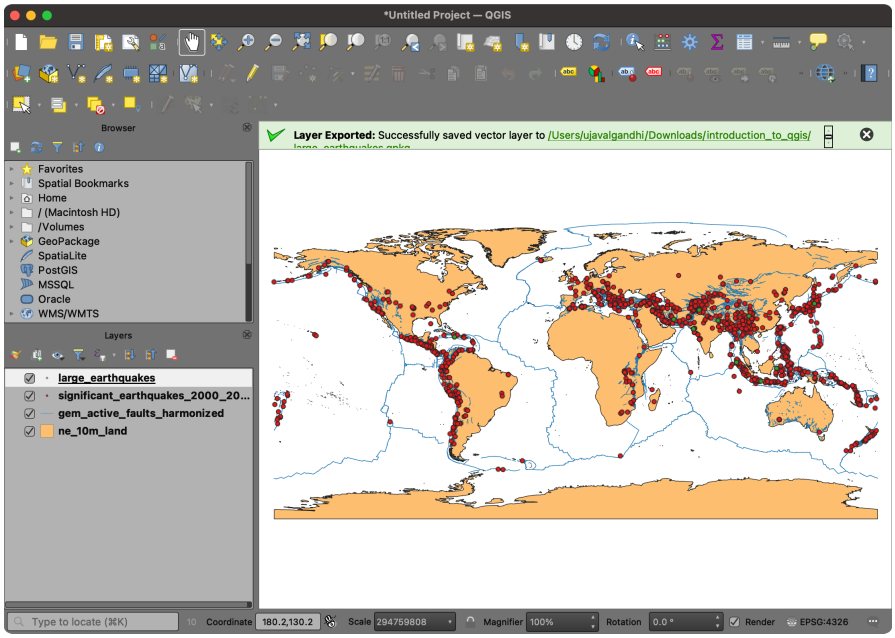


18. Select **GeoPackage** as the *Format*. Click the … button next to *File name* and browse to the data directory. Name the layer as `large_earthquakes.gpkg`. Click *Save*. Click *OK*.

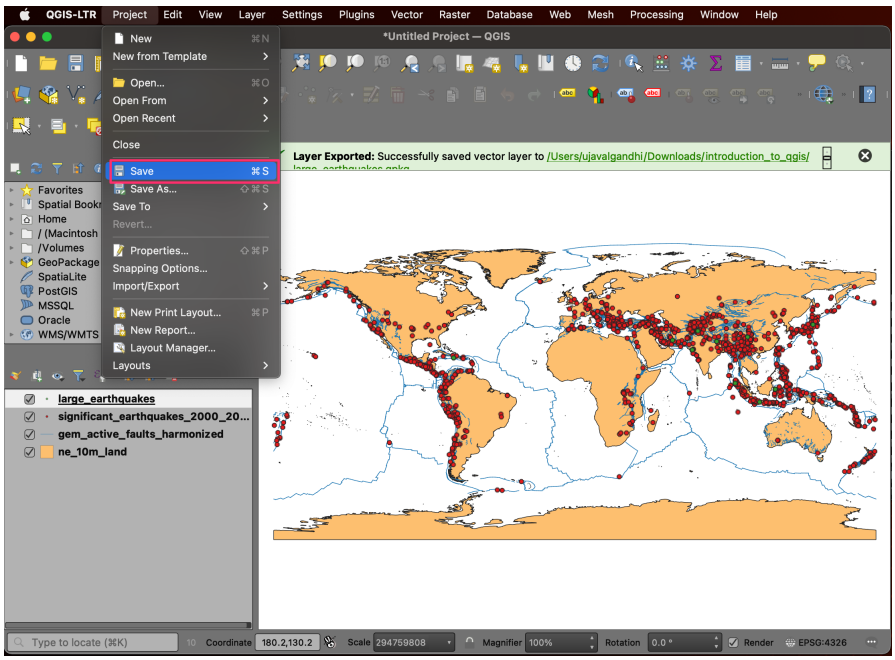




19. A new layer, `large_earthquakes` will be added to the *Layers* panel.



20. Our data preparation is now complete. Let's save our work. Go to *Project* → *Save*. Browse to the data directory and enter the name as **Earthquakes**. Click *Save*.



21. The project will be saved in the *QGZ* format as a file.