Hands On

Working with sea level and NGDC data

Ocean Teacher Global Academy (OTGA)
Training Course on
Geospatial Techniques for Coastal Mapping and Monitoring
(using QGIS)
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United Nations Educational, Scientific and Cultural Organization
Intergovernmental Oceanographic Commission
IODE International Oceanographic Data and Information Exchange
OceanTeacher GLOBAL ACADEMY
ITCOocean
ESSO
INCOIS

Overview

- Plotting sea level data
- Visualising sea level tide gauge stations in QGIS
- Plotting sea level data in QGIS
- Working with NCEI(NGDC) historical tsunami data

Data credits

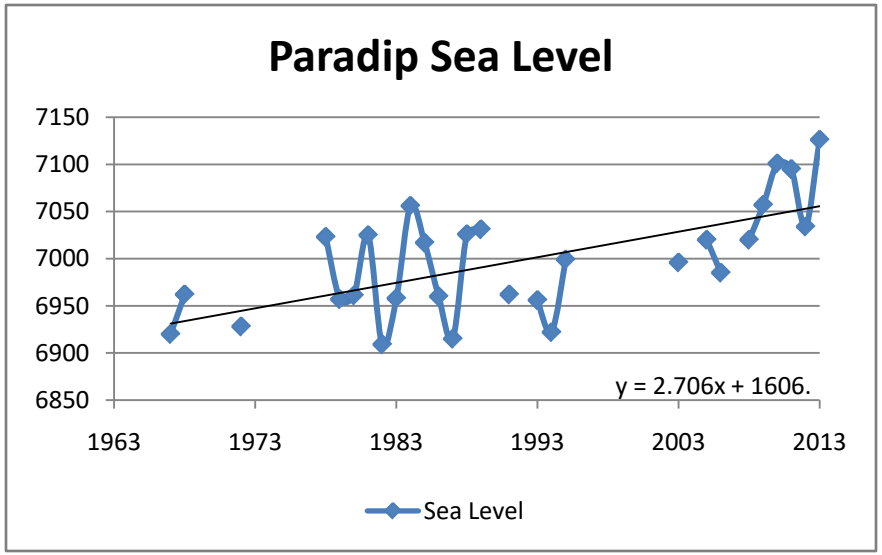
www.naturalearthdata.com
https://www.ngdc.noaa.gov/hazard/tsu_db.shtml
https://www.gloss-sealevel.org/data

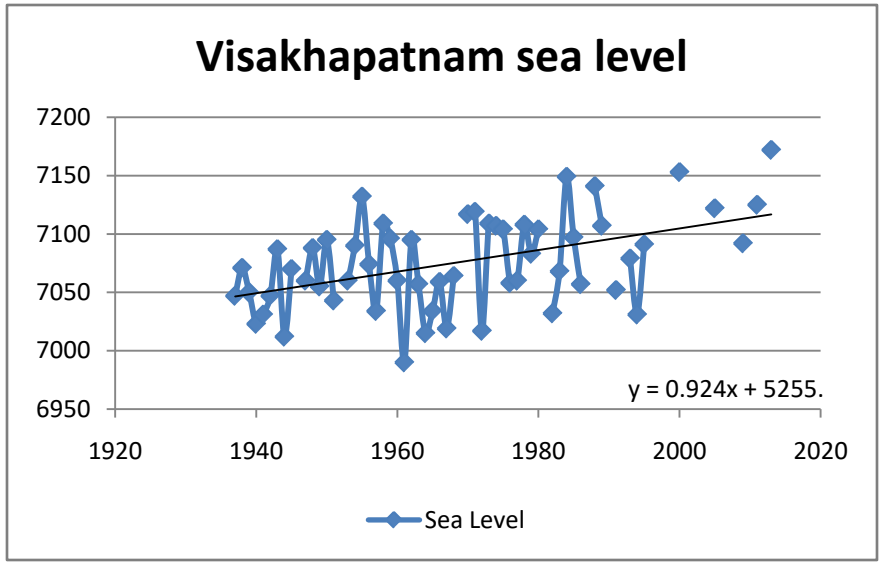
Plotting sea level data

- Go to Exercise folder and open paradip_annual_sea_level.csv & vskp_annual_sea_level.csv in MS-EXCEL

•Select year and sea level columns → Go to Insert menu and create scatter plot with trend line and equation

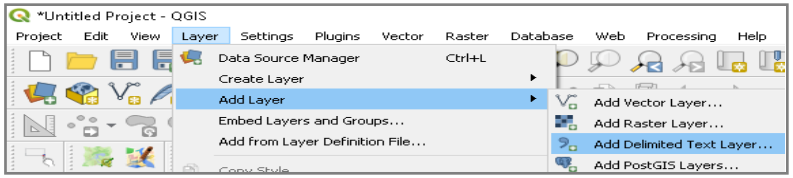
•Save plots as image files





Visualising sea level tide gauge station locations

- Go to Layer → Add Layer → Add Delimited Text layer 

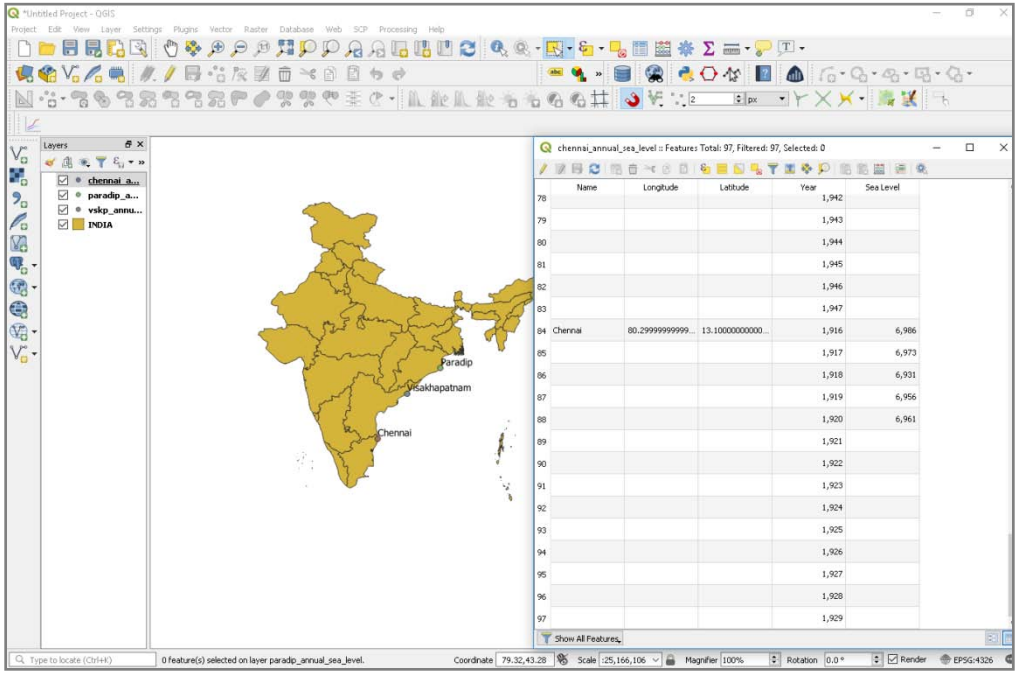


- Browse to Exercise folder and Select the below vector layers and add them to canvas

  paradip_annual_sea_level.csv
  vskp_annual_sea_level.csv
  INDIA.shp

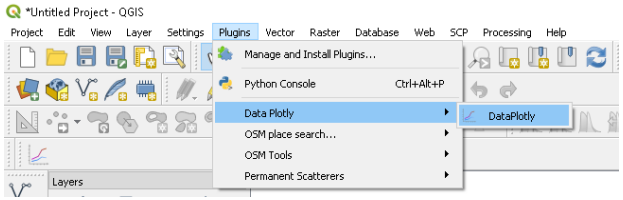
- Label each feature by Right click on Layer → Properties →Single Labels → Label with **Station Name** → OK

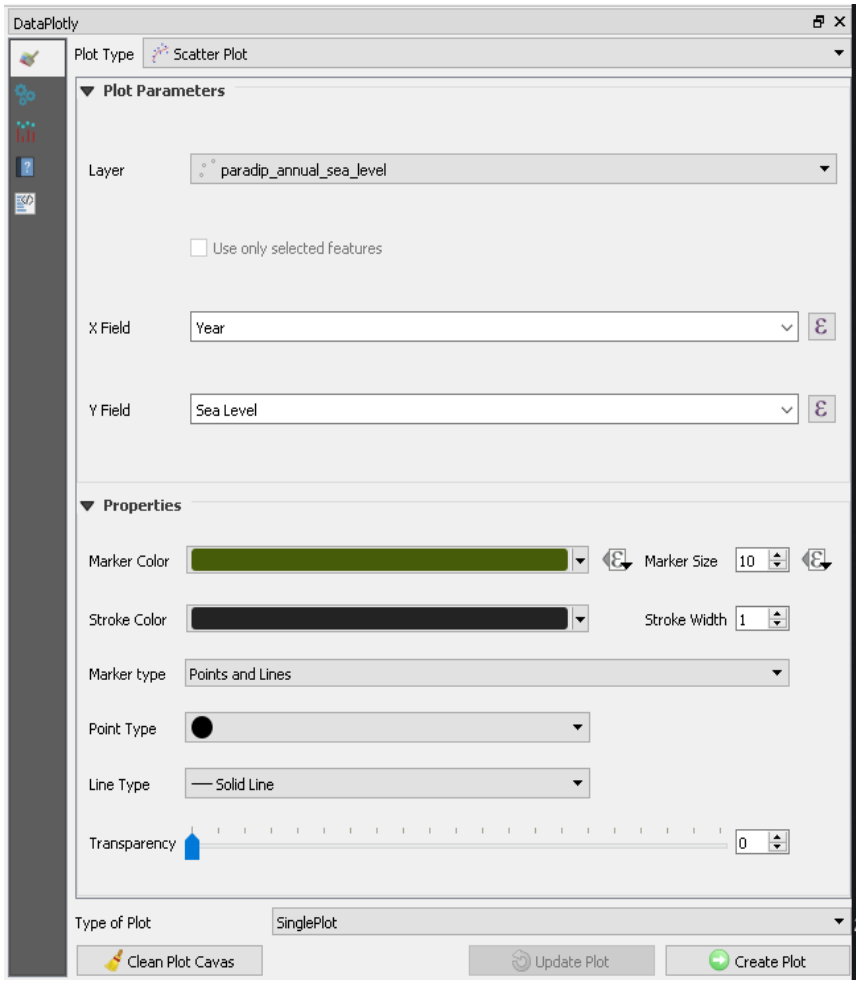
- Open attribute table of added layers and check the sea level and year columns representing annual sea level data.



Plotting sea level data in QGIS

- Go to Plugins menu → DataPlotly → click on **Dataplotly**





← •Select **Scatter Plot** for plot type

← •Select **Paradip_annual_sea_level** layer

← •Select **Year as** X field

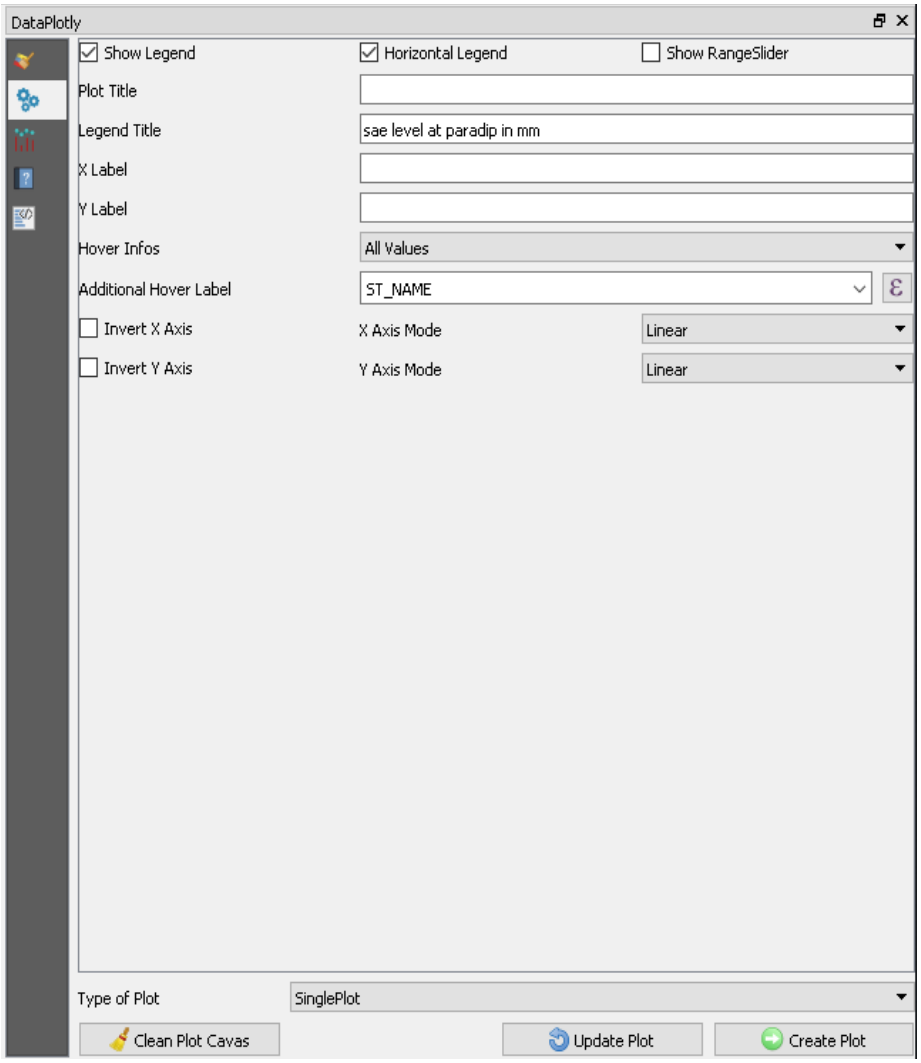
← •Select **Sea Level** as Y field

← •Select **Points and Lines** for Marker type

← •Select **SinglePlot** for Type of plot

Plotting sea level data in QGIS

•Go to plot settings 



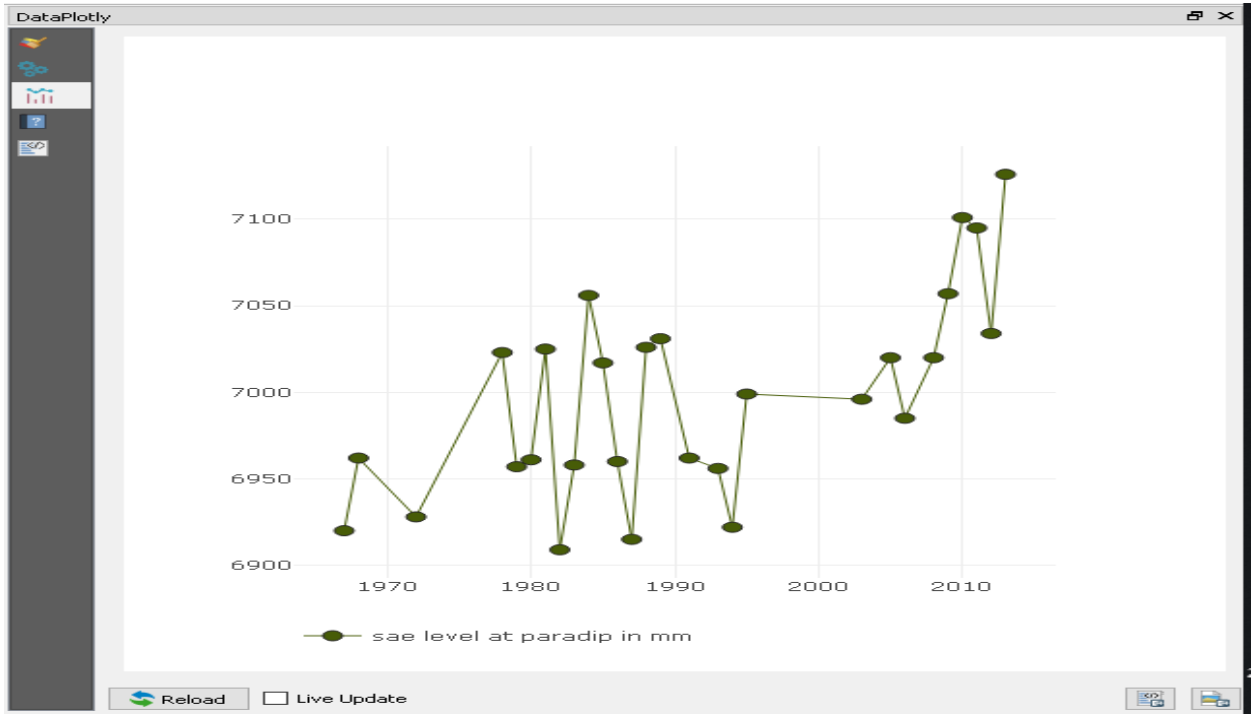
← •Tick Show legend & Horizontal Legend

← •Enter Legend title (Sea level at paradip in mm)

← •Click Create Plot 

Plotting sea level data in QGIS

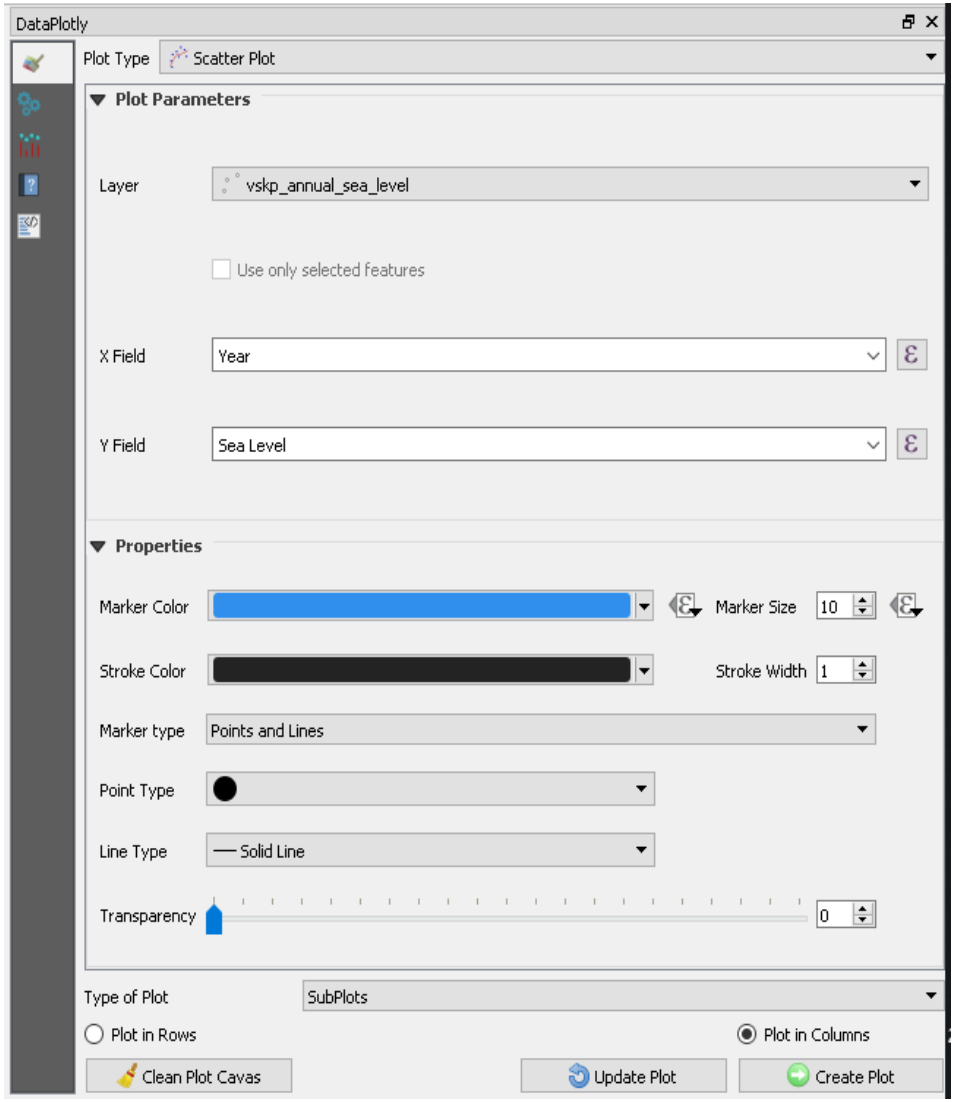
- Check the sea level plot created on the Plot Canvas



- Let us add another sea level plot to the canvas

Plotting sea level data in QGIS

• Go to plot creation menu 



← • Select vskp_annual_sea_level layer

← •Select **Year as** X field

← •Select **Sea Level** as Y field

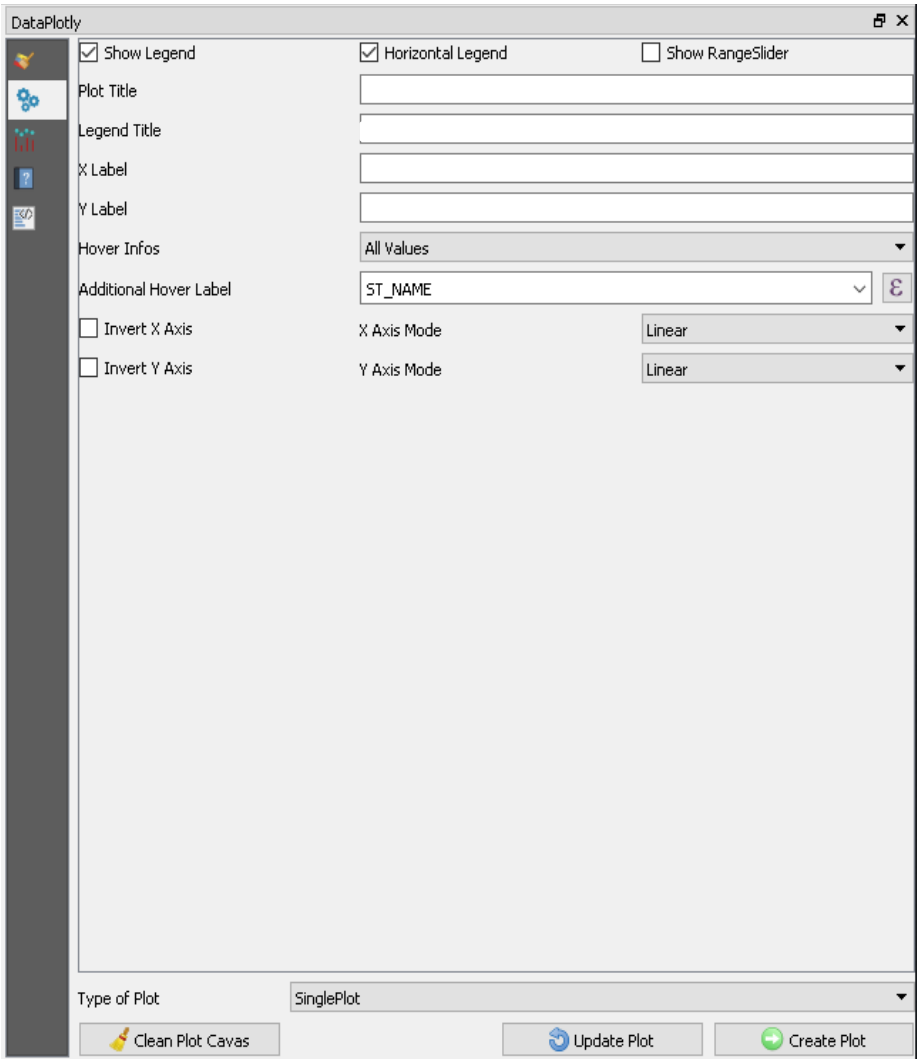
← •Select **Points and Lines** for Marker type

← •Select **Subplot** for type of plot and

← • Select **Plot In Columns**

Plotting sea level data in QGIS

•Go to plot settings 

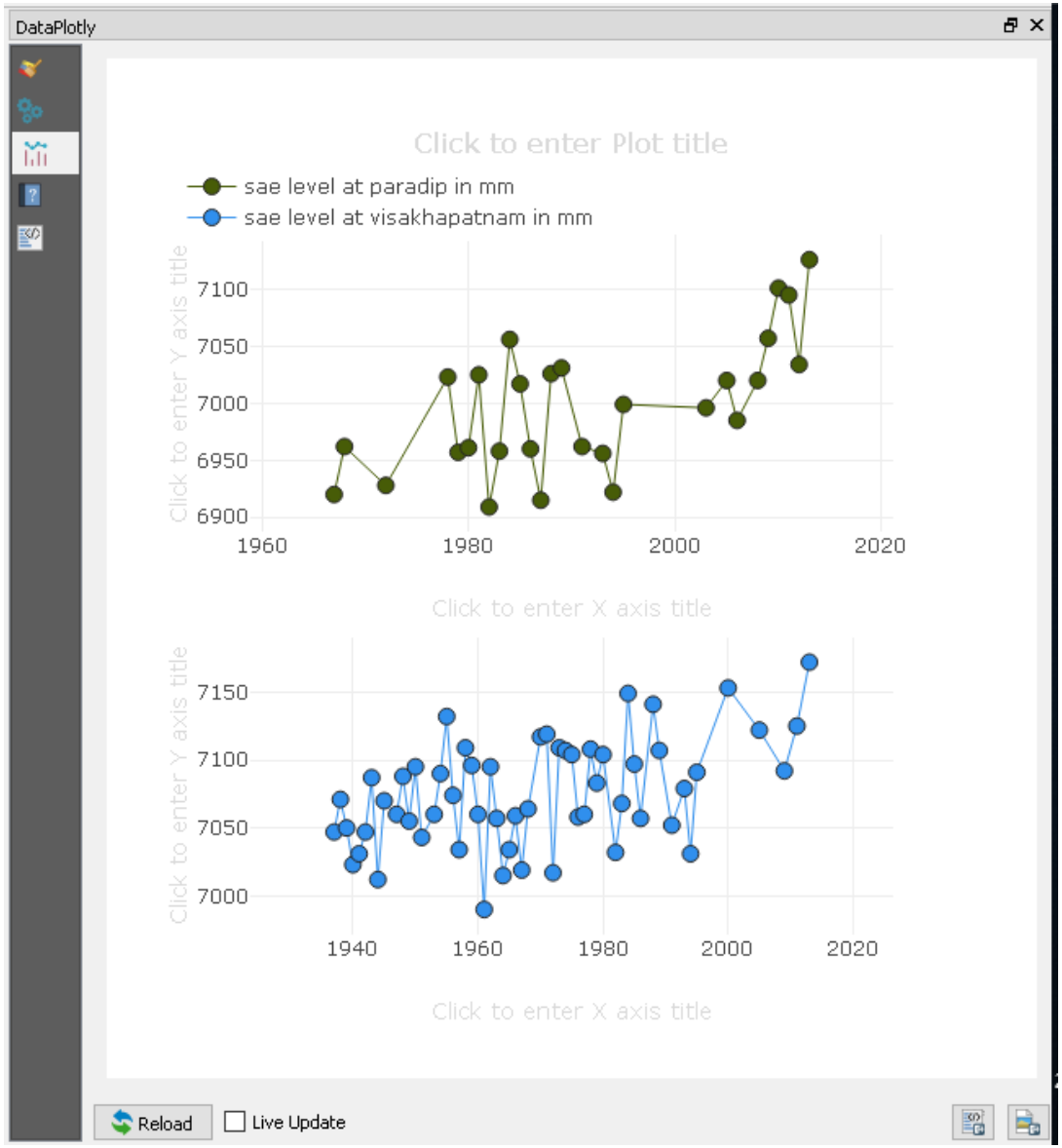


•Tick Show legend & Horizontal Legend

•Enter Legend title (Sea level at vskp in mm)

•Click Create Plot 

Plotting sea level data in QGIS



- Check the sea level plots created on the Plot Canvas

Plotting sea level data in QGIS

•Go to HTML tab 

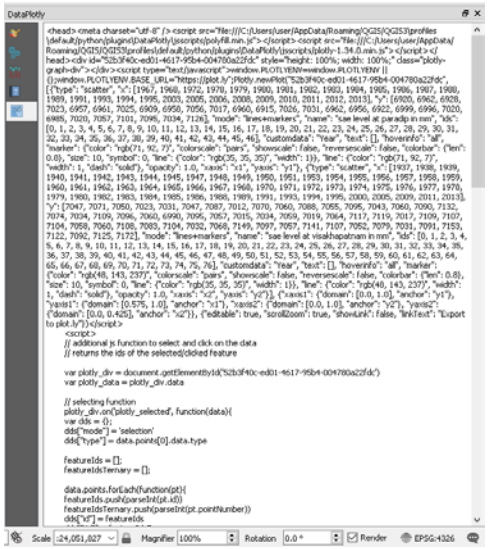
Right click on the HTML code

↓

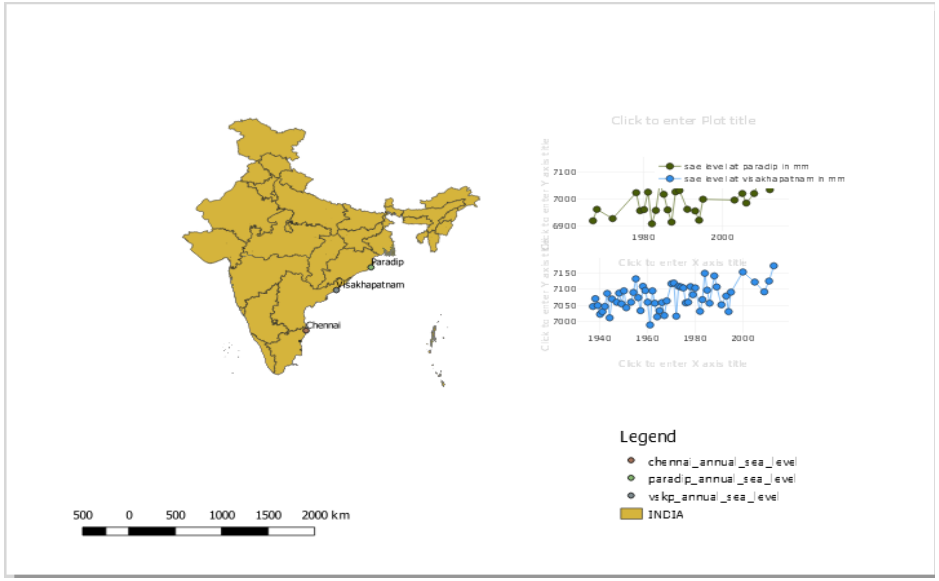
Select All

↓

Copy

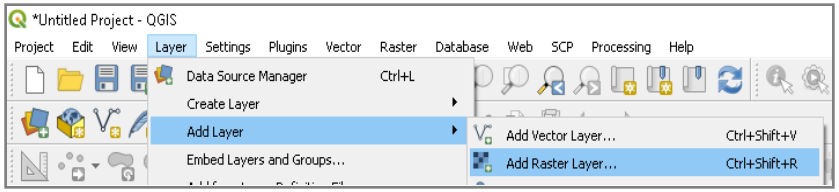
→ 

•Copied HTML code and plot images saved in EXCEL will be used to visualise Plots while composing sea level maps.



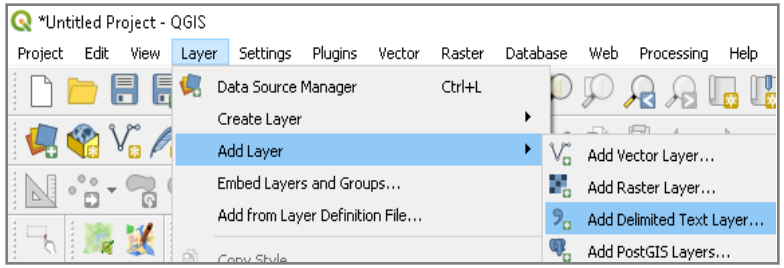
Working with NCEI(NGDC) historical tsunami data

- Go to Layer → Add Layer → Add Raster layer 



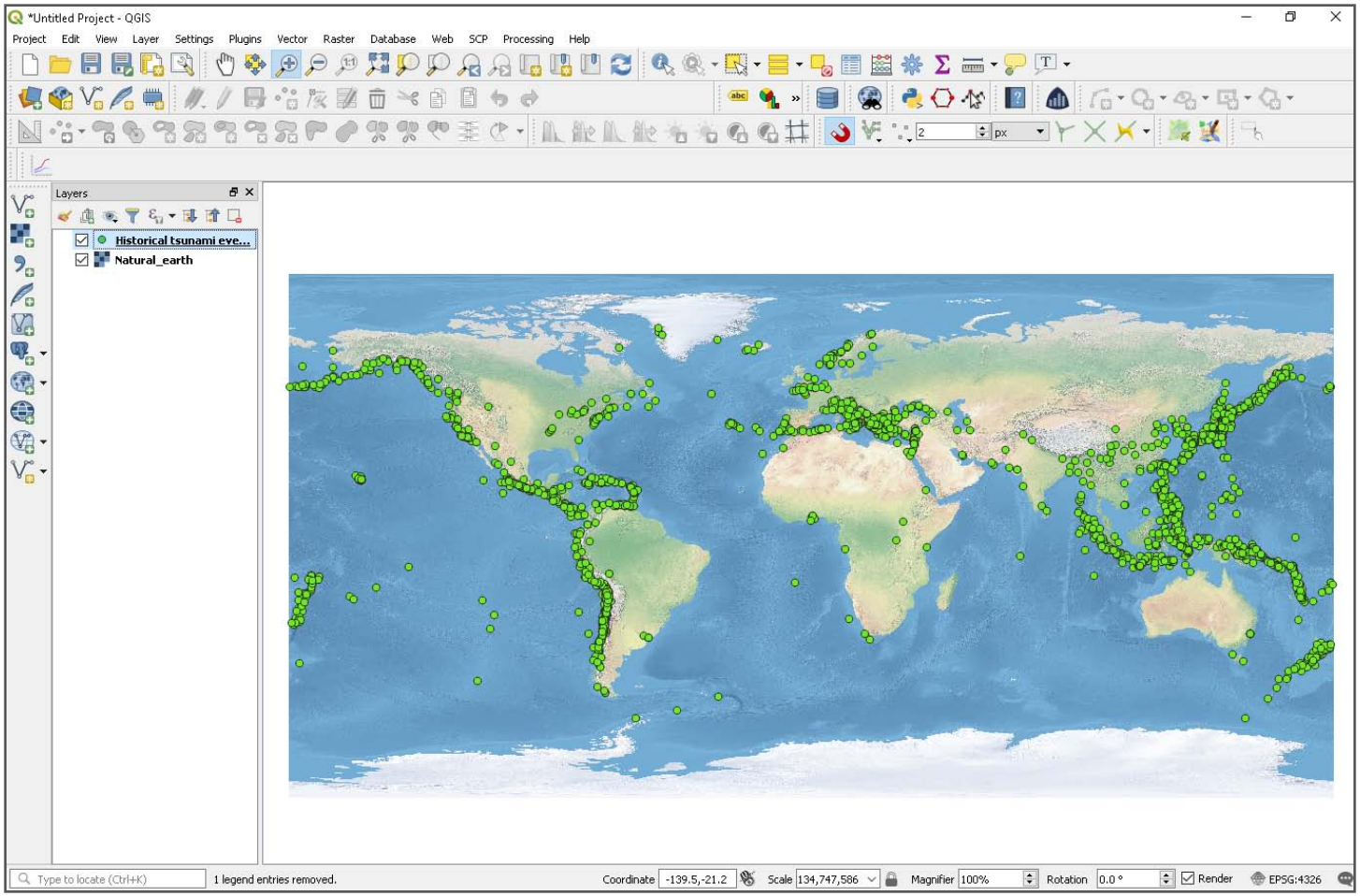
- Browse to Exercise folder and Select the Natural_earth.tif

- Go to Layer → Add Layer → Add Delimited Text layer 



- Browse to Exercise folder and Select the Historical_Tsunami_Events.csv

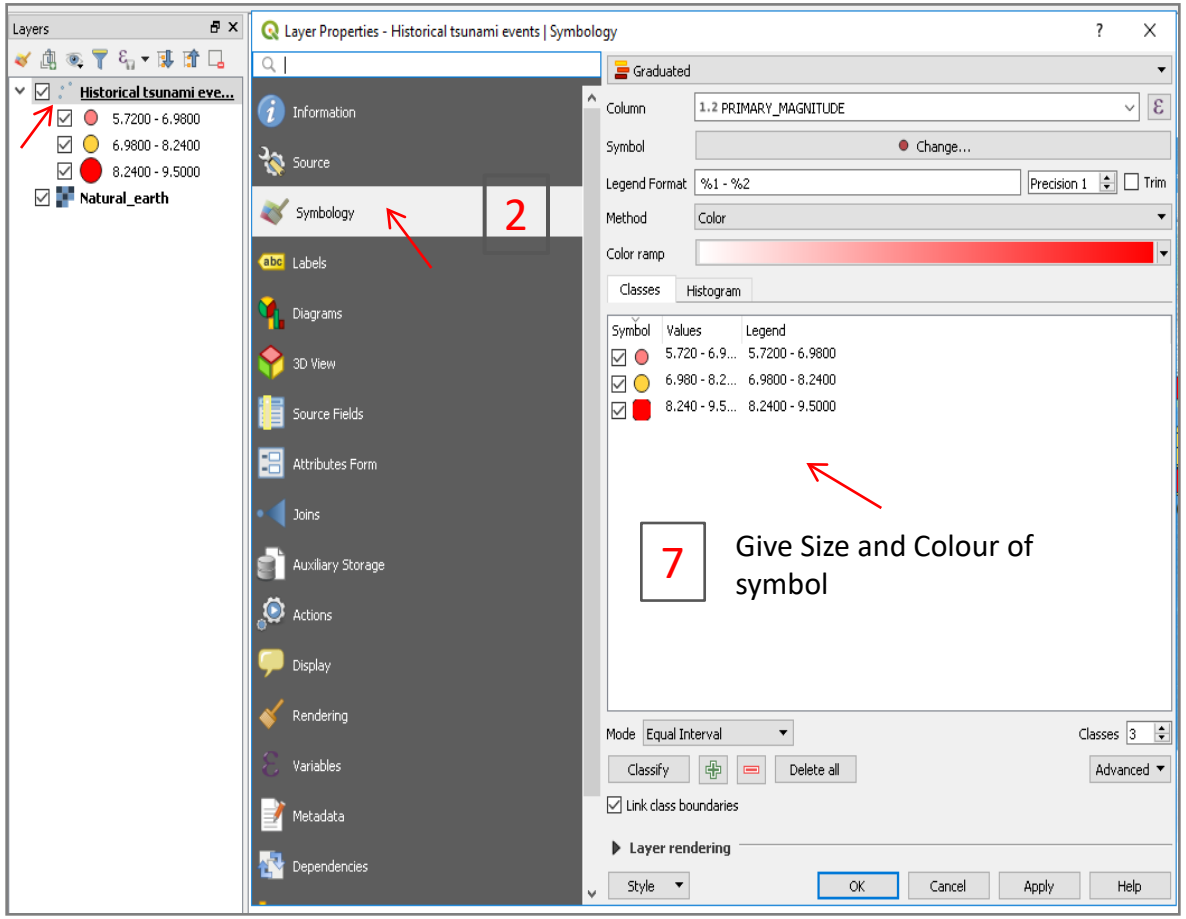
Working with NCEI(NGDC) historical tsunami data



- Let us categorise the symbols using Primary Magnitude field

Working with NCEI(NGDC) historical tsunami data

• Double-click the **Historical_tsunami_Events** layer → Go to Symbology 



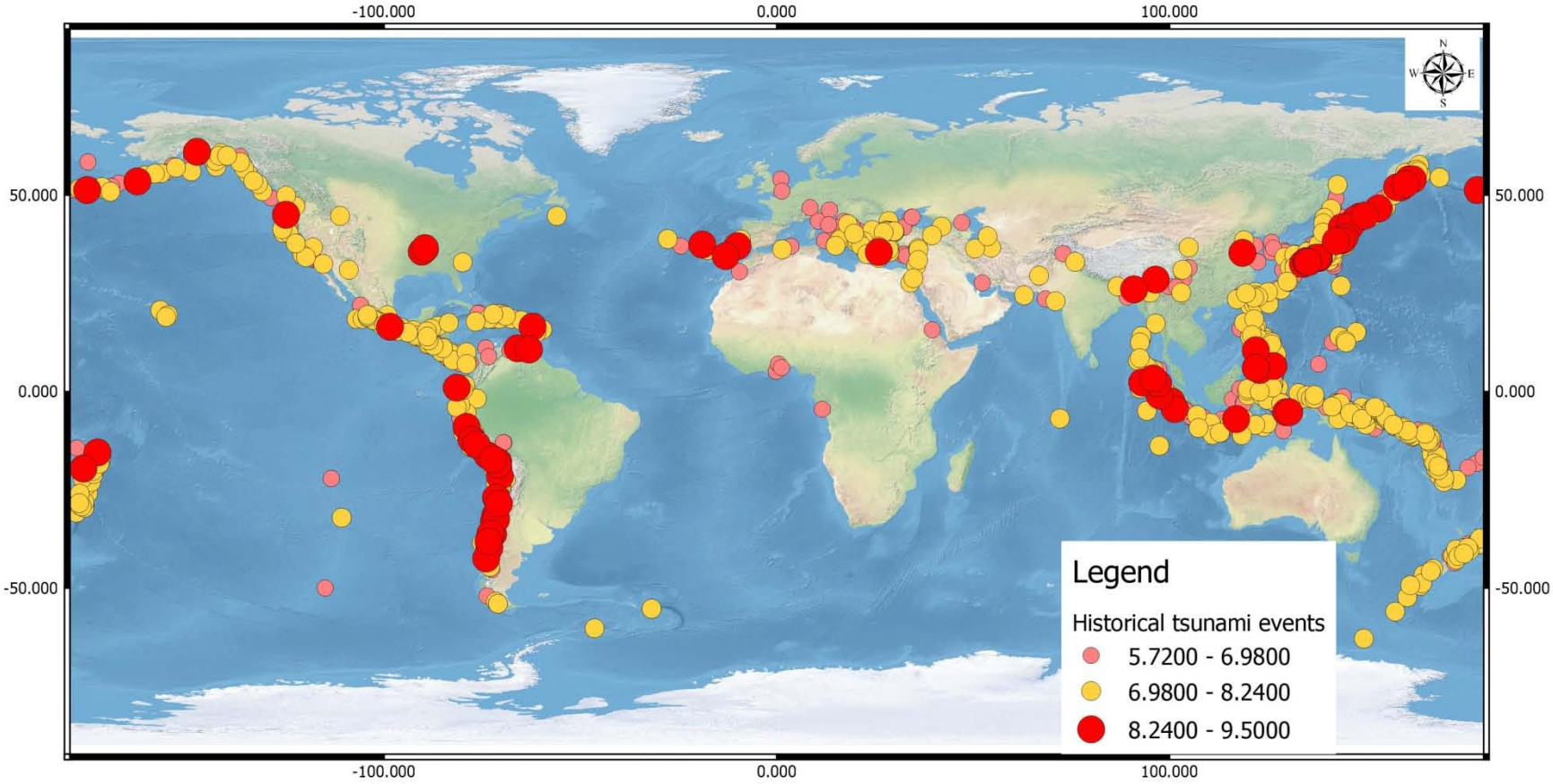
← • Select Graduated 3

← • Select PRIMARY_MAGNITUDE 4

← • Enter 3 in classes option 5

← • Click Classify 6

← • Click Apply & OK 8



Compose map of historical tsunamis using QGIS print layout