



Data management for Research and Institutional Decision Making

QGIS

Geographic Information System (GIS)

- A Geographic Information System (GIS) is a computer-based system used for capturing, storing, checking, integrating, analyzing, and displaying geographically referenced information.
- GIS a tool that combines maps with data to help understand relationships and patterns in the world around us.



Applications of GIS

- Agriculture and precision farming
- Land use planning
- Environmental monitoring
- Public health mapping
- Urban development
- Disaster risk management

Global Positioning system (GPS)

- **GPS** stands for **Global Positioning System**. It is a satellite-based navigation system that allows users to determine their exact location (latitude, longitude).

Key Points:

- **Developed by:** United States Department of Defense
- **Satellites involved:** At least 24 operational satellites orbiting Earth

Uses of GPS

- **GPS has a wide variety of uses:**
 - Agriculture
 - Navigation (phones, cars, airplanes)
 - mapping
 - military
 - surveying

Link between GIS and GPS

- The **link between GIS (Geographic Information System) and GPS (Global Positioning System)** lies in how they work together to collect, analyze, and use geographic data.
- **GPS** provides **real-time location data** (coordinates).
- **GIS** uses that location data to **store, analyze, and visualize** it in meaningful ways on maps.

Example:

A GPS device collects the location of dip tanks during animal surveillance.

- GIS software maps those locations and analyzes patterns—e.g., risk of disease outbreaks.

Tools for GIS

GIS Software	Data Collection Tools	Mapping and Visualization
<ul style="list-style-type: none">• QGIS (free, open-source)• ArcGIS (e)commercial, by Esri)• GRASS GIS (open-source, powerful for analysis)• MapInfo (commercial)• gvSIG (open-source)	<ul style="list-style-type: none">• GPS devices• Remote sensing satellites• Drones• Mobile apps (e.g., Collector for ArcG• Survey equipment (e.g., total stations, LiDAR)	<ul style="list-style-type: none">• Spatial analysis tools (in QGIS, ArcGIS)• R• Python• Map viewers (e.g., Google Earth, Leaflet, Mapbox)

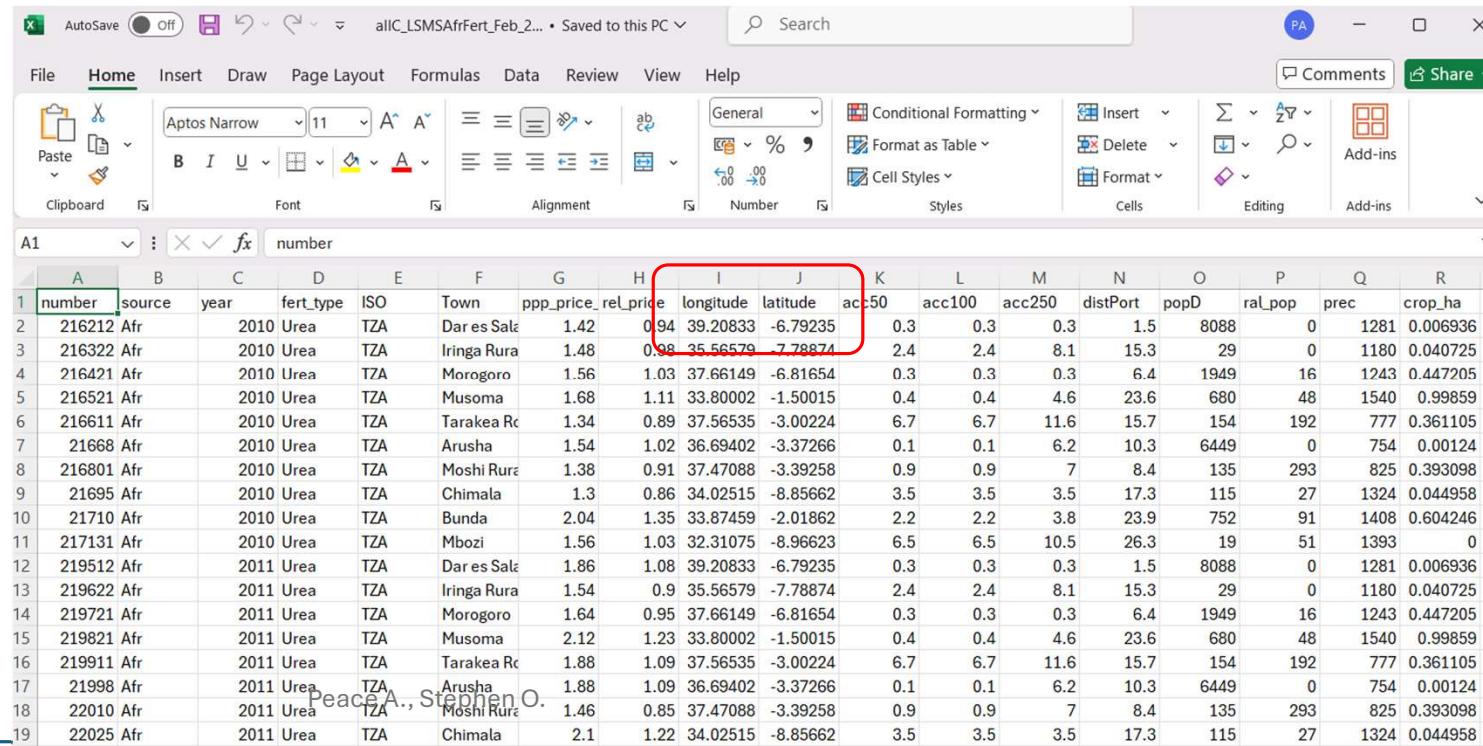
Data description

- File formats include CSV files, shape files(if available) , raster files, images etc
- CSV files includes the location data such as longitude and latitude etc
- Data sets for this session

- [allC_LSMSAfrFert_Feb_2019.csv](#)
- [Country_Yield_data.csv](#)

7/24/2025

Peace A., Stephen O.



A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	
1	number	source	year	fert_type	ISO	Town	ppp_price_rel_price	longitude	latitude	acc50	acc100	acc250	distPort	popD	ral_pop	prec	crop_ha	
2	216212	Afr	2010	Urea	TZA	Dar es Salz	1.42	0.94	39.20833	-6.79235	0.3	0.3	0.3	1.5	8088	0	1281	0.006936
3	216322	Afr	2010	Urea	TZA	Iringa Rura	1.48	0.98	35.56579	-7.78874	2.4	2.4	8.1	15.3	29	0	1180	0.040725
4	216421	Afr	2010	Urea	TZA	Morogoro	1.56	1.03	37.66149	-6.81654	0.3	0.3	0.3	6.4	1949	16	1243	0.447205
5	216521	Afr	2010	Urea	TZA	Musoma	1.68	1.11	33.80002	-1.50015	0.4	0.4	4.6	23.6	680	48	1540	0.99859
6	216611	Afr	2010	Urea	TZA	Tarakea Rd	1.34	0.89	37.56535	-3.00224	6.7	6.7	11.6	15.7	154	192	777	0.361105
7	21668	Afr	2010	Urea	TZA	Arusha	1.54	1.02	36.69402	-3.37266	0.1	0.1	6.2	10.3	6449	0	754	0.00124
8	216801	Afr	2010	Urea	TZA	Moshi Rura	1.38	0.91	37.47088	-3.39258	0.9	0.9	7	8.4	135	293	825	0.393098
9	21695	Afr	2010	Urea	TZA	Chimala	1.3	0.86	34.02515	-8.85662	3.5	3.5	3.5	17.3	115	27	1324	0.044958
10	21710	Afr	2010	Urea	TZA	Bunda	2.04	1.35	33.87459	-2.01862	2.2	2.2	3.8	23.9	752	91	1408	0.604246
11	217131	Afr	2010	Urea	TZA	Mbozi	1.56	1.03	32.31075	-8.96623	6.5	6.5	10.5	26.3	19	51	1393	0
12	219512	Afr	2011	Urea	TZA	Dar es Salz	1.86	1.08	39.20833	-6.79235	0.3	0.3	0.3	1.5	8088	0	1281	0.006936
13	219622	Afr	2011	Urea	TZA	Iringa Rura	1.54	0.9	35.56579	-7.78874	2.4	2.4	8.1	15.3	29	0	1180	0.040725
14	219721	Afr	2011	Urea	TZA	Morogoro	1.64	0.95	37.66149	-6.81654	0.3	0.3	0.3	6.4	1949	16	1243	0.447205
15	219821	Afr	2011	Urea	TZA	Musoma	2.12	1.23	33.80002	-1.50015	0.4	0.4	4.6	23.6	680	48	1540	0.99859
16	219911	Afr	2011	Urea	TZA	Tarakea Rd	1.88	1.09	37.56535	-3.00224	6.7	6.7	11.6	15.7	154	192	777	0.361105
17	21998	Afr	2011	Urea	TZA	Arusha	1.88	1.09	36.69402	-3.37266	0.1	0.1	6.2	10.3	6449	0	754	0.00124
18	22010	Afr	2011	Urea	TZA	Moshi Rura	1.46	0.85	37.47088	-3.39258	0.9	0.9	7	8.4	135	293	825	0.393098
19	22025	Afr	2011	Urea	TZA	Chimala	2.1	1.22	34.02515	-8.85662	3.5	3.5	3.5	17.3	115	27	1324	0.044958

Data description

Country_Yield_data • Saved to this PC

Search

File Home Insert Draw Page Layout Formulas Data Review View Help

Cut Copy Format Painter

Aptos Narrow 11 A A Wrap Text

B I U | Merge & Center

Font Alignment

A1 fx No

No	Country	Latitude	Longitude	Crop	Year	Kg/ha_yield	average_rapesticides	avg_temp
0	Albania	41.1533	20.1683	Maize	1990	3661.3	1485	121 16.37
1	Albania	41.1533	20.1683	Potatoes	1990	6666.7	1485	121 16.37
2	Albania	41.1533	20.1683	Rice, padd	1990	2333.3	1485	121 16.37
3	Albania	41.1533	20.1683	Sorghum	1990	1250	1485	121 16.37
4	Albania	41.1533	20.1683	Soybeans	1990	700	1485	121 16.37
5	Albania	41.1533	20.1683	Wheat	1990	3019.7	1485	121 16.37
81	Albania	41.1533	20.1683	Soybeans	2009	1666.7	1485	1132.5 16.73
82	Albania	41.1533	20.1683	Wheat	2009	4022.9	1485	1132.5 16.73
32	Albania	41.1533	20.1683	Potatoes	1996	10613.8	1485	313.96 15.64
33	Albania	41.1533	20.1683	Soybeans	1996	1548	1485	313.96 15.64
34	Albania	41.1533	20.1683	Wheat	1996	2174.1	1485	313.96 15.64
15	Albania	41.1533	20.1683	Sorghum	1992	374.7	1485	121 16.06
91	Albania	41.1533	20.1683	Maize	2012	6729	1485	766.25 16.7
92	Albania	41.1533	20.1683	Potatoes	2012	25053.8	1485	766.25 16.7
35	Albania	41.1533	20.1683	Maize	1997	3186.2	1485	376.93 15.9
95	Albania	41.1533	20.1683	Maize	2013	6953.3	1485	982.32 17.41
96	Albania	41.1533	20.1683	Potatoes	2013	26011	1485	982.32 17.41
97	Albania	41.1533	20.1683	Soybeans	2013	1000	1485	982.32 17.41
98	Albania	41.1533	20.1683	Wheat	2013	4129.2	1485	982.32 17.41
77	Albania	41.1533	20.1683	Soybeans	2008	O. 2000	1485	1069.54 16.71
78	Albania	41.1533	20.1683	Wheat	2008	4016.8	1485	1069.54 16.71

Metadata

ACC: Deaminase-producing biofertilizer, like *Pseudomonas fluorescens*

Rate: ACC50 = 50 µL/mL or 50 mg/kg; ACC100 = 100 µL/mL or 100 mg/kg; and
 ACC250 = 250 µL/mL or 250 mg/kg

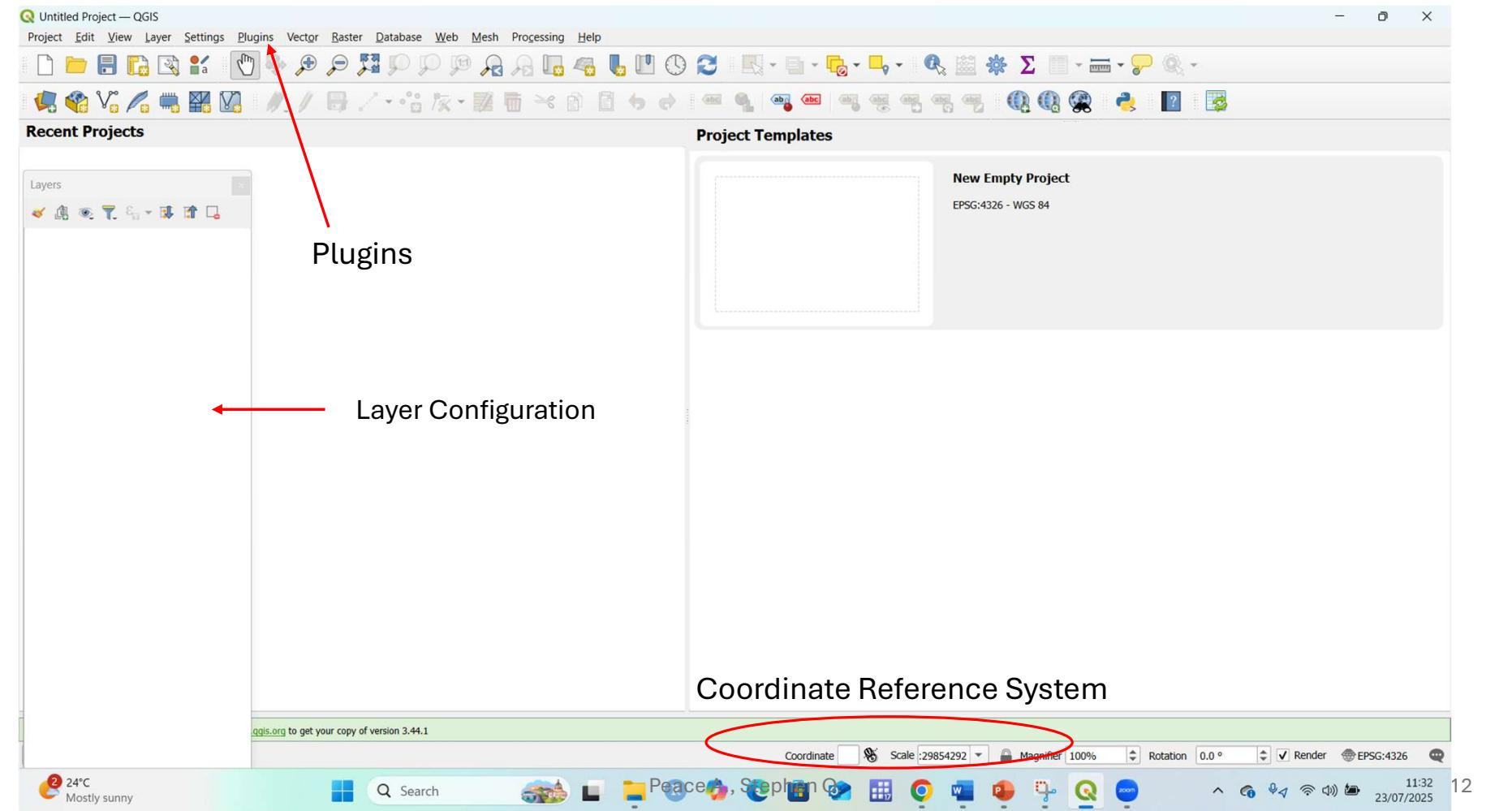
Biofertilizer Dose Metadata Table

Field	ACC50	ACC100	ACC250
Dose Level	Low	Medium	High
Typical Concentration	50 µL/mL or 50 mg/kg	100 µL/mL or 100 mg/kg	250 µL/mL or 250 mg/kg
Purpose	Baseline / minimal effect testing	Optimal growth response	Max effect or stress tolerance testing
Plant Response	Moderate improvement in growth/yield	Strong and balanced growth improvement	May plateau or slightly decrease
Application Context	Low-input or sensitive trials	Standard recommended usage	Intensive trials / stress environments
Risk of Overdose	None	Very low	Possible nutrient or microbial imbalance
Common Use Case	Experimental comparison / resource saving	Routine field application	Research or degraded soils
Example Benefit (Wheat)	~35% biomass increase (low NPK)	~43% yield increase (low NPK)	~45% yield increase or no further benefit

What is QGIS?

- QGIS (Quantum Geographical Information System) is a free, open-source desktop GIS application used for **viewing, editing, analyzing, and visualizing** geospatial data.
- **Key Features:**
 - Supports vector, raster, and database formats (e.g., Shapefile, GeoTIFF, PostGIS)
 - Offers spatial **analysis, geoprocessing tools, and map creation**
 - Integrates **plugins** for advanced workflows
- **GIS uses Global Positioning system (GPS)**

QGIS platform



Untitled Project — QGIS

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

Recent Projects

Project Templates

New Empty Project
EPSG:4326 - WGS 84

Layers

Coordinate Reference System

Coordinate Scale : 29854292 Magnifier 100% Rotation 0.0 ° Render EPSG:4326

qgis.org to get your copy of version 3.44.1

24°C Mostly sunny

Search

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11:32 23/07/2025 12

Plugins

Layer Configuration

QGIS project

- A **Project in QGIS** is a workspace that organizes and stores all elements of your mapping and analysis work. It includes:
 - **Layer Configuration:** Vector and raster layers with symbology, labels, and styling.
 - **Coordinate Reference System (CRS):** Defines spatial reference and projection settings.
 - **Map Layouts:** Saved map compositions for printing or export.
 - **Attribute Data:** Integrated tabular data for analysis and visualization.
 - **Plugins & Tools:** Custom processing scripts and geoprocessing tools.

QGIS Plugins

- **What are QGIS Plugins?**
- QGIS uses **plugins** to add extra tools and features.

Example: **QuickMapServices** plugin helps to generate basemaps

How to add Plugins in QGIS

- **Open QGIS**

- Launch QGIS on your computer.

- **Go to the Plugins Menu**

- Click on Plugins in the top menu bar.
 - Select **Manage and Install Plugins...**

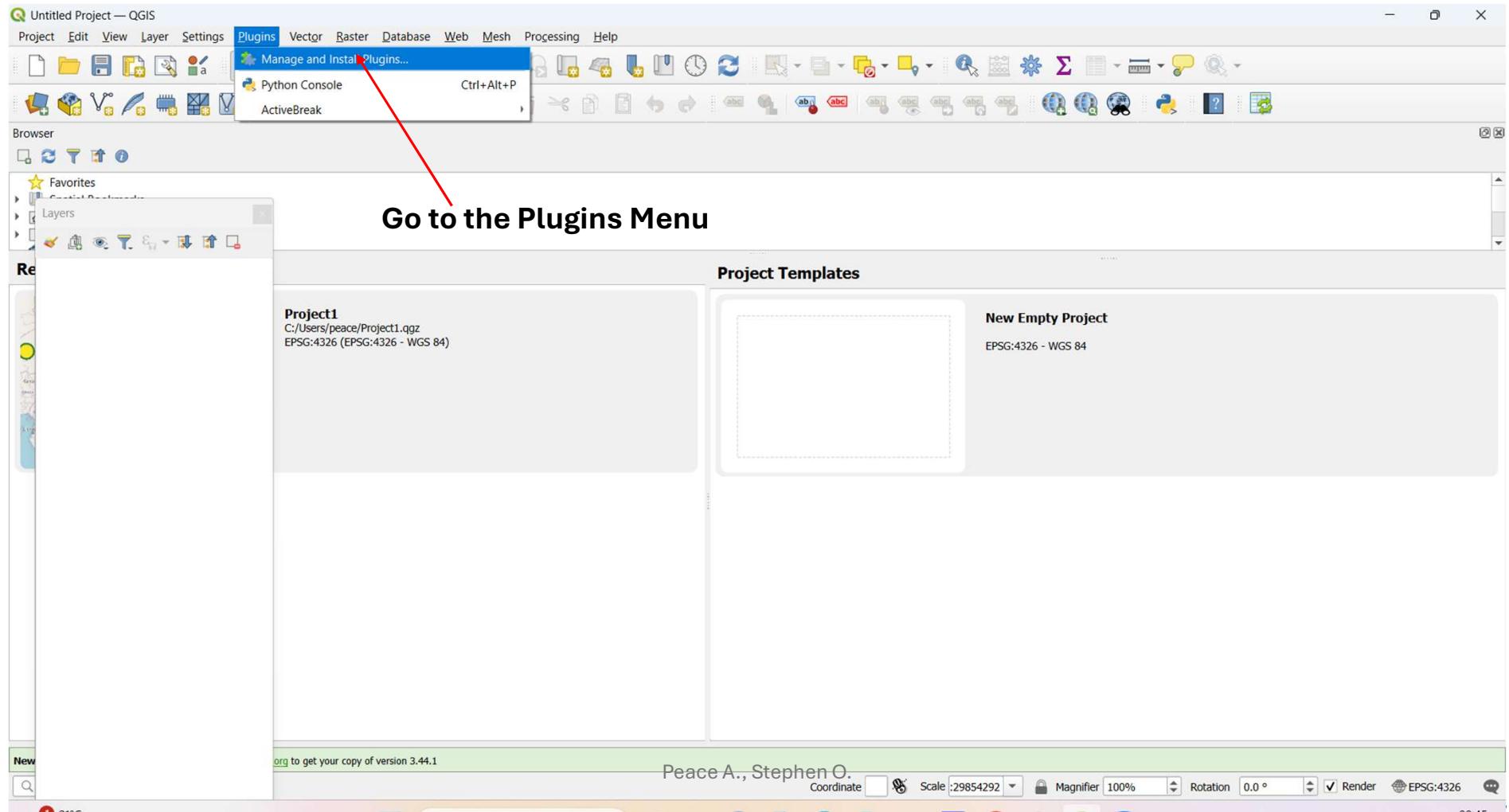
- **Search for the Plugin**

- In the dialog box that appears, go to the **All** tab or use the **Search bar**.
 - Type the name or keyword of the plugin you want (e.g., “QuickMapServices”).

- **Install the Plugin**

- Select the plugin from the list.
 - Click the **Install Plugin** button on the bottom right.

Add Plugin “QuickMapServices”



Search “QuickMapServices”)

Untitled Project – QGIS

Plugins | All (1624)

All

Installed

Not installed

Install from ZIP

Settings

Search...

3D Arcs

3DCityDB Tools

AcATAMa

Accessibility calculator

Actions for relations

Active Fire

ActiveBreak

Adaplin Tool

Add a point road sign

Add Legend Labels to Layer

Add to Felt

Aderyn Data Search

Adjust Style

AdressesFr

Adresssuche

Advanced Line Editor

AemetOpenDataDownload

Aerodrome Utilities

AfpolGIS Data Connector

AGIS

agknow for QGIS

AGT - Archaeological Geo

Aino

AlgoMaps

All Geocoders At Once

Alloy Search Here

ALS Downloader

Altitudecorrector

Amazon Location Service

AmigoCloud

AMII-Assistente de Mana

All Plugins

On the left you see the list of all plugins available for your QGIS, both installed and available for download. Some plugins come with your QGIS installation while most of them are made available via the plugin repositories. You can temporarily enable or disable a plugin. To enable or disable a plugin, click its checkbox or double-click its name... Plugins showing in red are not loaded because there is a problem. They are also listed on the 'Invalid' tab. Click on the plugin name to see more details, or to reinstall or uninstall this plugin.

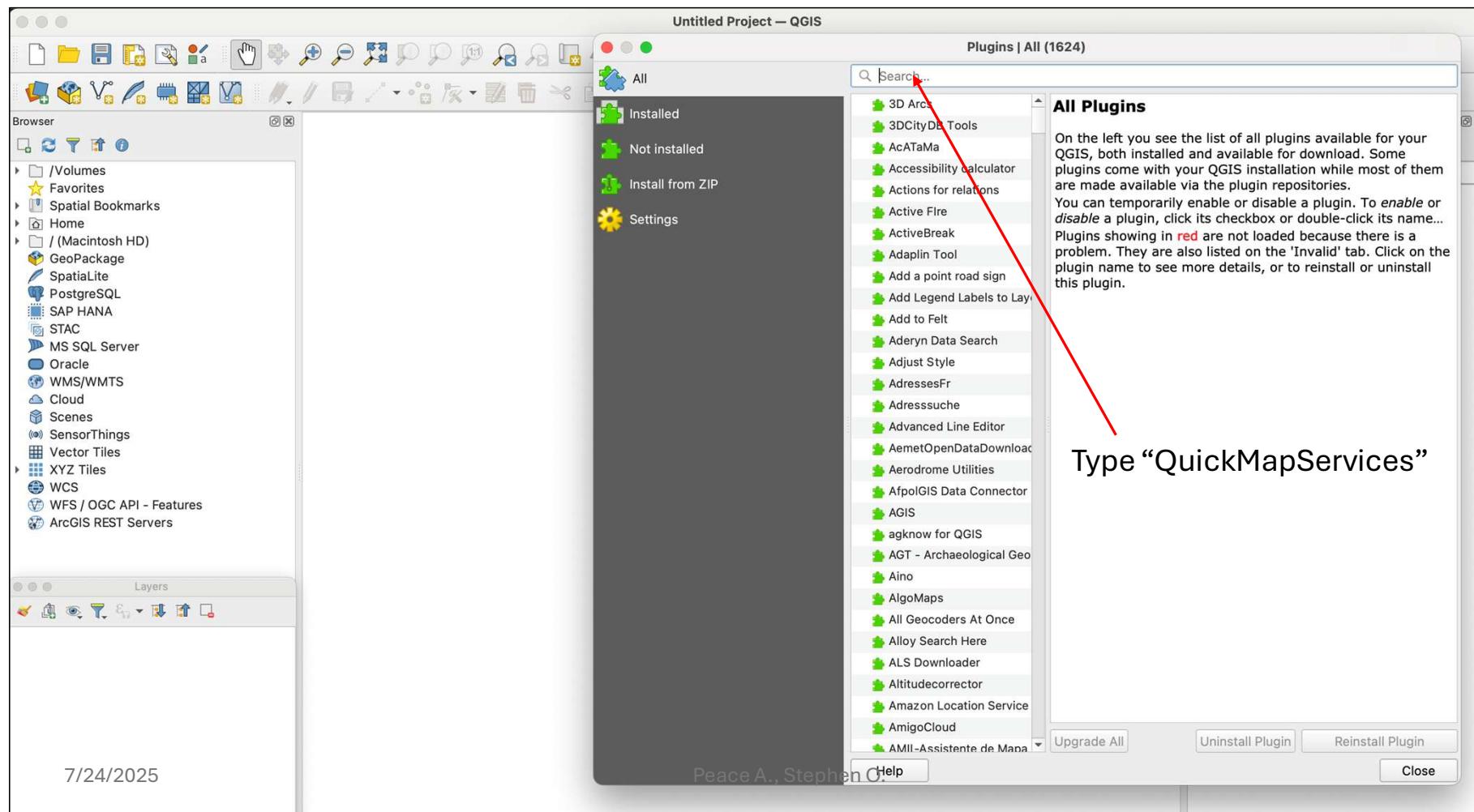
Type “QuickMapServices”

Upgrade All Uninstall Plugin Reinstall Plugin Close

Layers

7/24/2025

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Untitled Project — QGIS

Project Edit View Layer Settings Plugins Vector

Plugins | All (1638)

All

- Installed
- Not installed
- Install from ZIP
- Settings

QuickM

MapTiler
QuickMapServices
QuickMultiAttributeEdit3

QuickMapServices

Easy to add basemaps and geoservices

Easy to use list of services and search for finding datasets and basemaps. Please contribute new services via <https://qms.nextgis.com>. Developed by NextGIS. Any feedback is welcome at <https://nextgis.com/contact>

★★★★★ 2618 rating vote(s), 8751464 downloads

Tags wfs, wms, openstreetmap, osm, service, tms, geojson, internet, qms, basemap

More info homepage bug tracker code repository

Author NextGIS

Available version (stable) 0.21.2 updated at 24/03/2025 15:34 E. Africa Standard Time

Upgrade All

Install Plugin

Close Help

Processing Toolbox

Search...

Recently used

- 3D Tiles
- Cartography
- Check geometry
- Database
- File tools
- Fix geometry
- GPS
- Interpolation
- Layer tools
- Mesh
- Metadata tools
- Network analysis
- Plots
- Point cloud conversion
- Point cloud data management
- Point cloud extraction
- Raster analysis
- Raster creation
- Raster terrain analysis
- Raster tools
- Vector analysis
- Vector coverage
- Vector creation
- Vector general
- Vector geometry
- Vector overlay
- Vector selection
- Vector table
- GDAL
- GRASS

Layers

Type to locate (Ctrl+K)

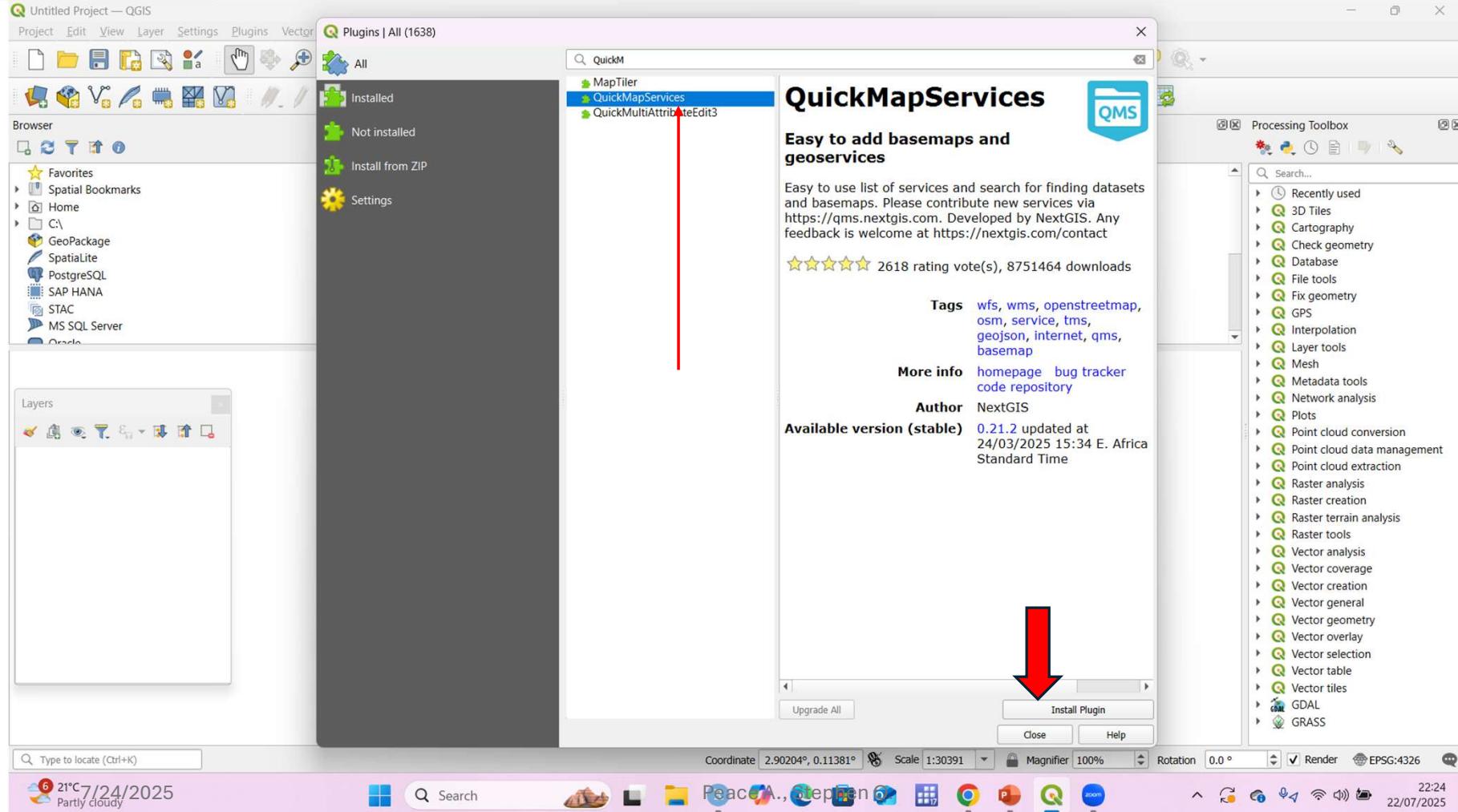
Coordinate 2.90204°, 0.11381° Scale 1:30391 Magnifier 100% Rotation 0.0° Render EPSG:4326

6 21°C 7/24/2025 Partly cloudy

Search

Peace A., Stephen 6 zoom

22:24 22/07/2025

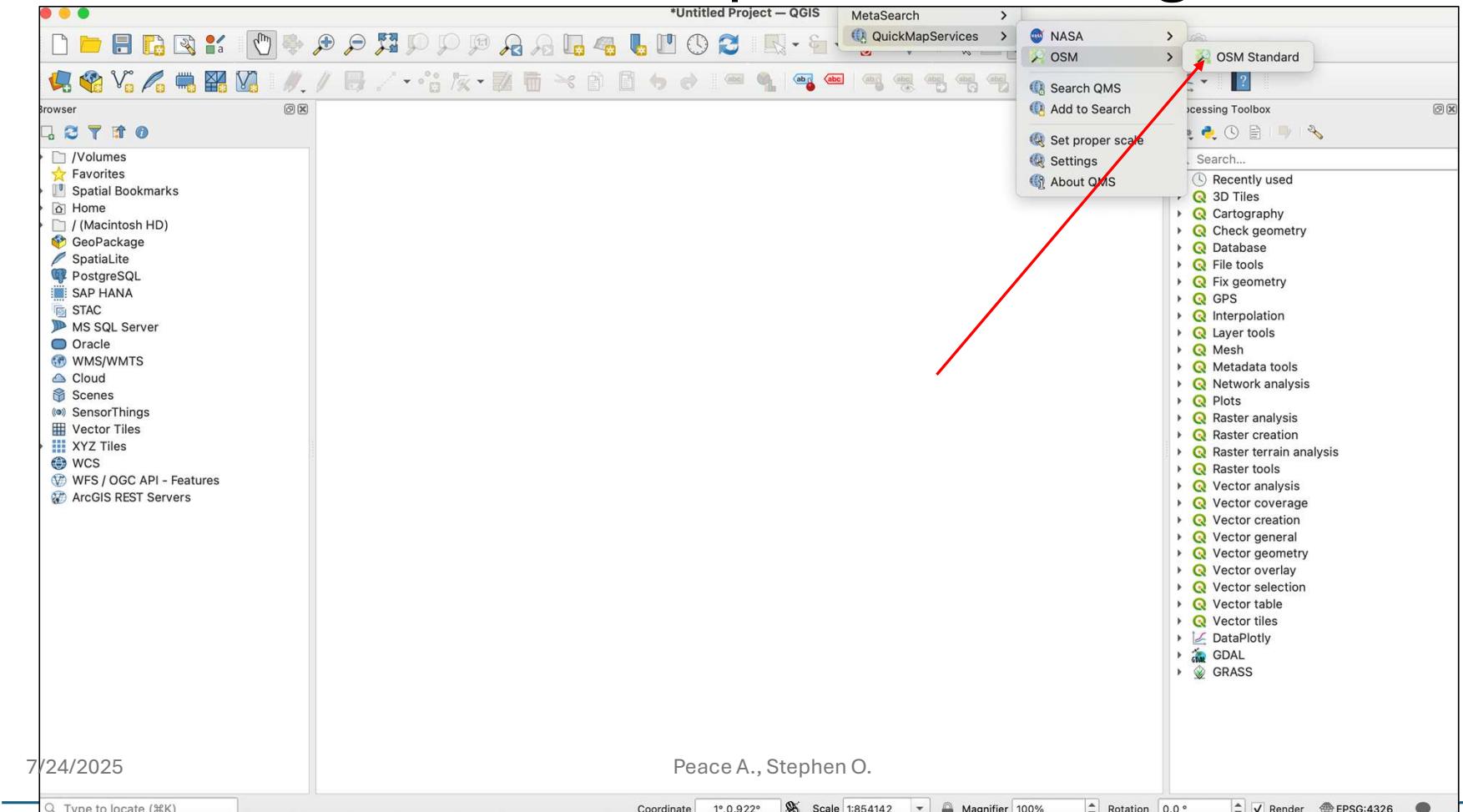


Use “QuickMapServices” Plugin

To use the **QuickMapServices** plugin:

- Go to Web > QuickMapServices > OSM > OSM Standard
- It will load a base map in your QGIS project.

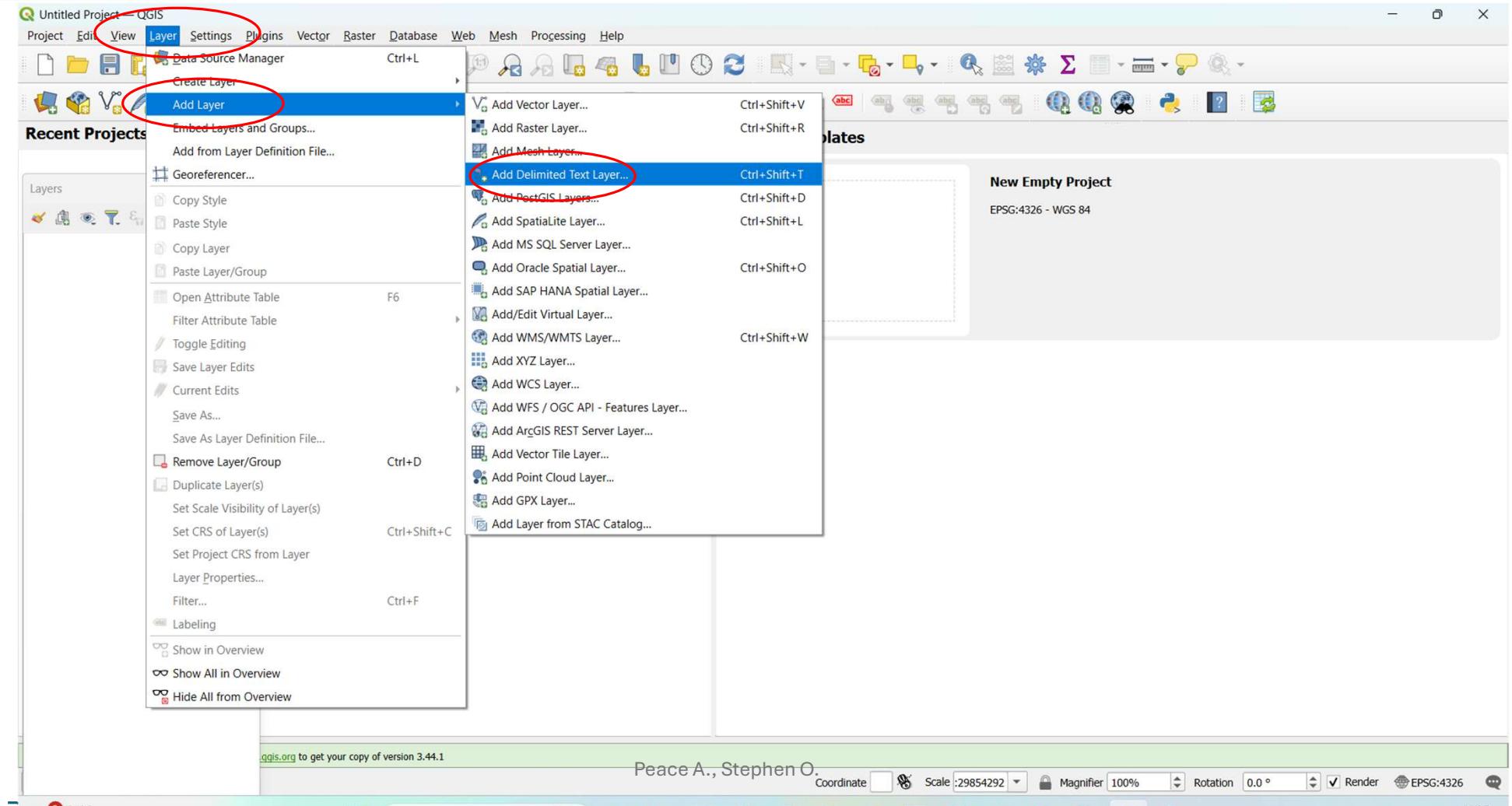
Use “QuickMapServices” Plugin



Loading data into QGIS

- Different files can be used by GIS to extract information.
- Examples include CSV, Shape files for different locations.
- Files should contain location data for mapping.

Loading csv data to QGIS



The screenshot shows the QGIS application interface. The 'Layer' menu is open, and the 'Add Delimited Text Layer...' option is highlighted with a red circle. The QGIS toolbar and various panels like 'Recent Projects' and 'New Empty Project' are visible.

Layer Menu Options:

- Add Vector Layer... (Ctrl+Shift+V)
- Add Raster Layer... (Ctrl+Shift+R)
- Add Mesh Layer...
- Add Delimited Text Layer... (Ctrl+Shift+T)**
- Add PostGIS Layers...
- Add Spatialite Layer...
- Add MS SQL Server Layer...
- Add Oracle Spatial Layer...
- Add SAP HANA Spatial Layer...
- Add/Edit Virtual Layer...
- Add WMS/WMTS Layer...
- Add XYZ Layer...
- Add WCS Layer...
- Add WFS / OGC API - Features Layer...
- Add ArcGIS REST Server Layer...
- Add Vector Tile Layer...
- Add Point Cloud Layer...
- Add GPX Layer...
- Add Layer from STAC Catalog...

Data Source Manager — Delimited Text

File name: ...

Encoding: UTF-8

File Format

CSV (comma separated values)
 Regular expression delimiter
 Custom delimiters

Record and Fields Options

Geometry Definition

Point coordinates X field: Z field:
 Well known text (WKT) Y field: M field:
 No geometry (attribute only table) DMS coordinates Geometry CRS: EPSG:4326 – WGS 84

Layer Settings

Use spatial index Use subset index Watch file

Sample Data

Please select an input file

Help Add Close

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Click on the three dots to access the folder with the csv file



iCloud
iCloud Driv...

Shared

Locations

Network

Tags

Favorites

Media

Music

Photos

Movies

Name
Pre-Survey-quiz-links
Pre-Webinar Survey
Follow_Up_Items_Table
Email_List
Data_Management_Schedule
Step_Meta_data
Crop.qgz
Installing_R_and_RStudio_2025_7
Crop.qmd
Crop.shx
Crop.shp
Crop.dbf
Crop.prj
Crop.cpg
Country_CO.csv
yield_df.csv
Country_Coordinates_yield_data.csv
appendicitis_data.xlsx
area harvested per crop.csv
Epidemiology data.xlsx
Gall bladder dataset-uci.xlsx
yield pa hectare.csv
diabetes prediction.csv

csv file to be uploaded

Country_CO.csv

All files (*.*)

New Folder

Hide Options

Cancel

Open

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Data Source Manager — Delimited Text

File name: /Users/stephenopio/Desktop/Video/Data_Management/redatamanagement/Country_CO.csv

Encoding: UTF-8

File Format

- CSV (comma separated values)
- Regular expression delimiter
- Custom delimiters

Record and Fields Options

Number of header lines to discard: 0

Decimal separator is comma

First record has field names

Trim fields

Detect field types

Discard empty fields

Custom boolean literals

True: False:

Geometry Definition

Point coordinates

X field: Longitude

Y field: Latitude DMS coordinates

Z field:

M field:

Geometry CRS: EPSG:4326 - WGS 84

Layer Settings

Sample Data

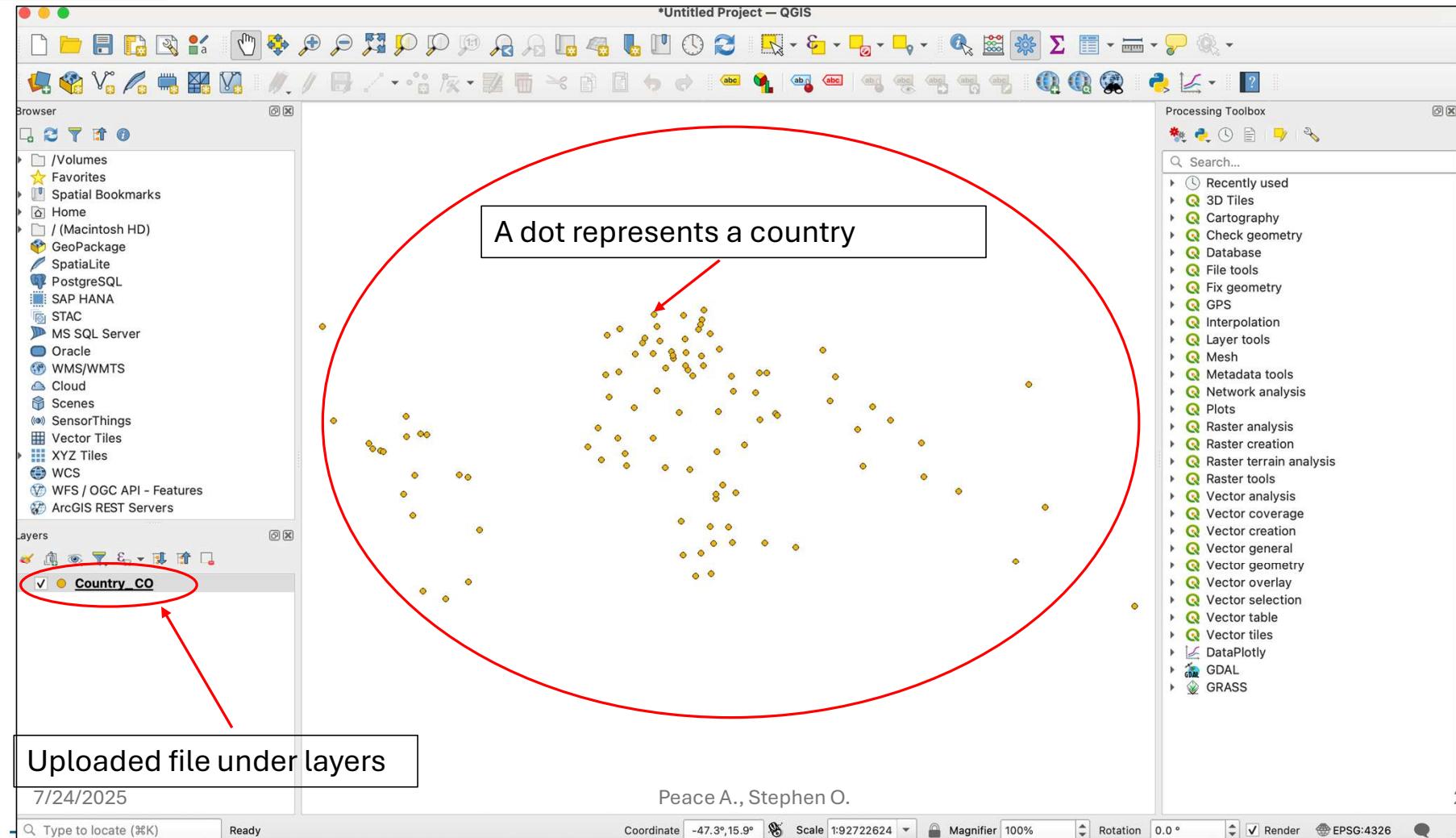
Country	Latitude	Longitude	No	Item	Year	hg/ha_yield	average_rain_fall_mm_per_
1 Albania	41.1533	20.1683	0	Maize	1990	36613	1485
2 Albania	41.1533	20.1683	1	Potatoes	1990	66667	1485
3 Albania	41.1533	20.1683	2	Rice paddy	1990	22222	1485

Add **Close**

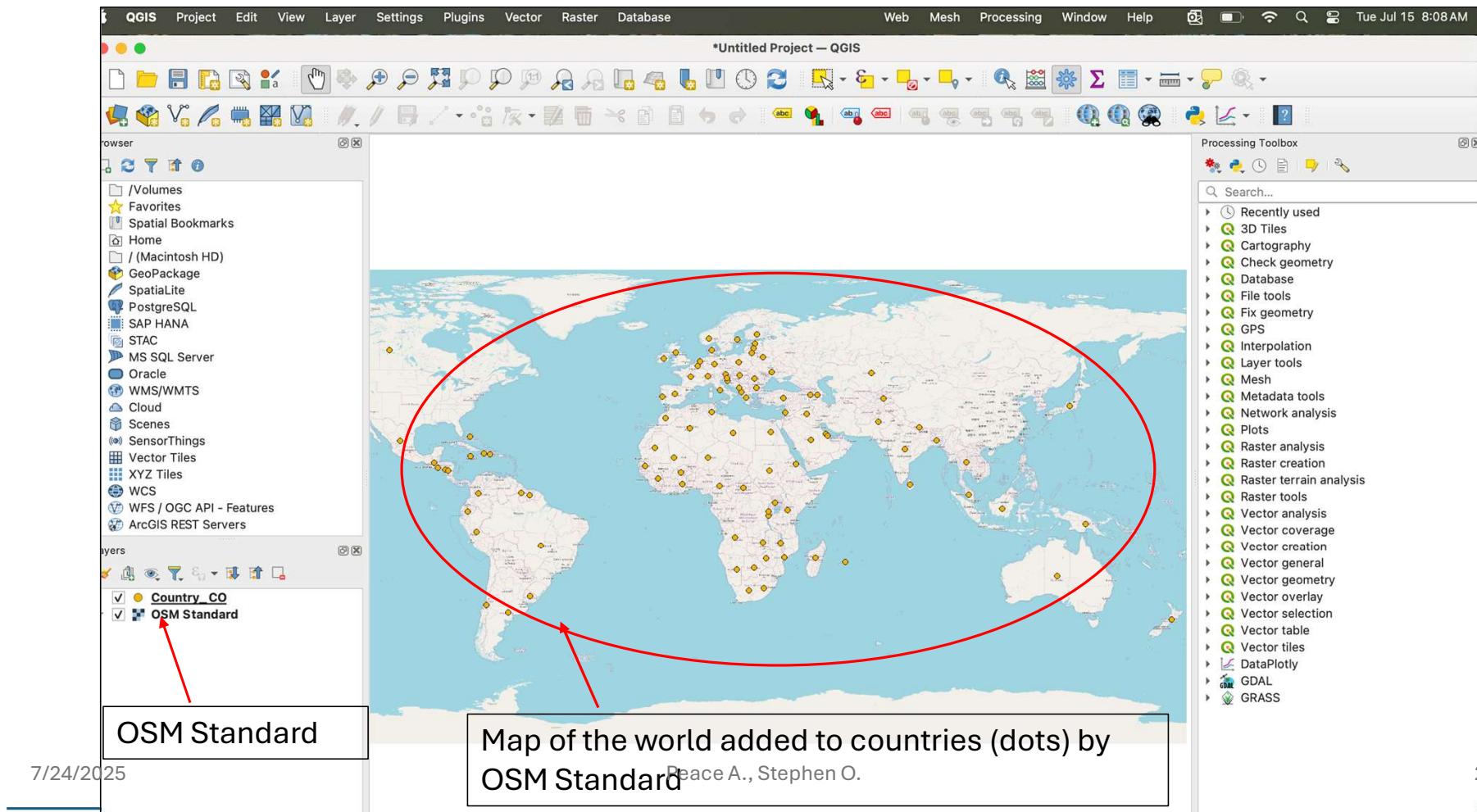
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Help



OSM Standard added to the Layers



The screenshot shows the QGIS application interface with a world map displayed. A red circle highlights a cluster of yellow dots representing countries. The 'OSM Standard' layer is selected in the layers panel, indicated by a red arrow pointing to it. A text box at the bottom left identifies the map as 'Map of the world added to countries (dots) by OSM Standard'.

Map of the world added to countries (dots) by
OSM Standard

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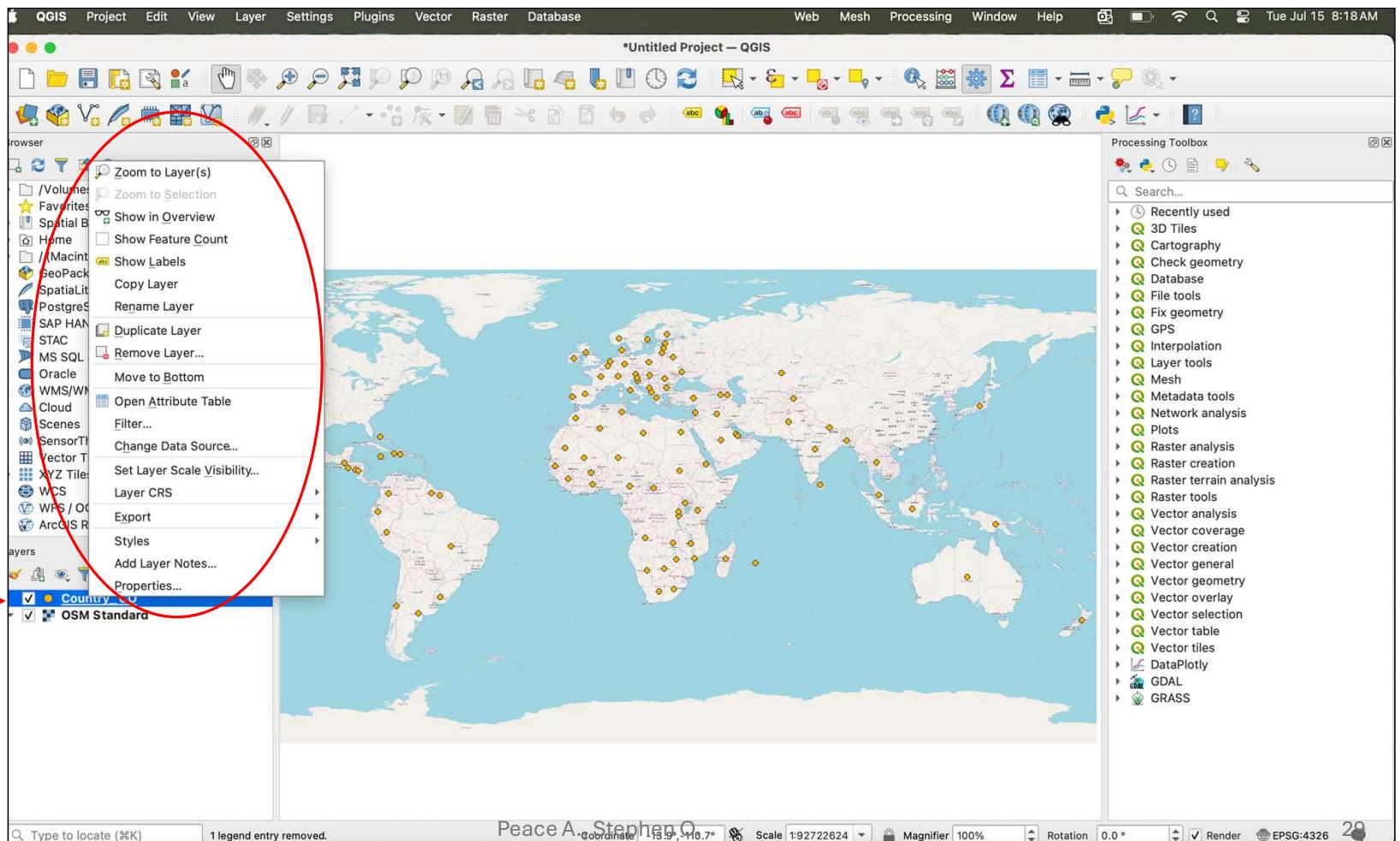
Attribute Table

Attribute table contains all the variables and is also known as the Data set.

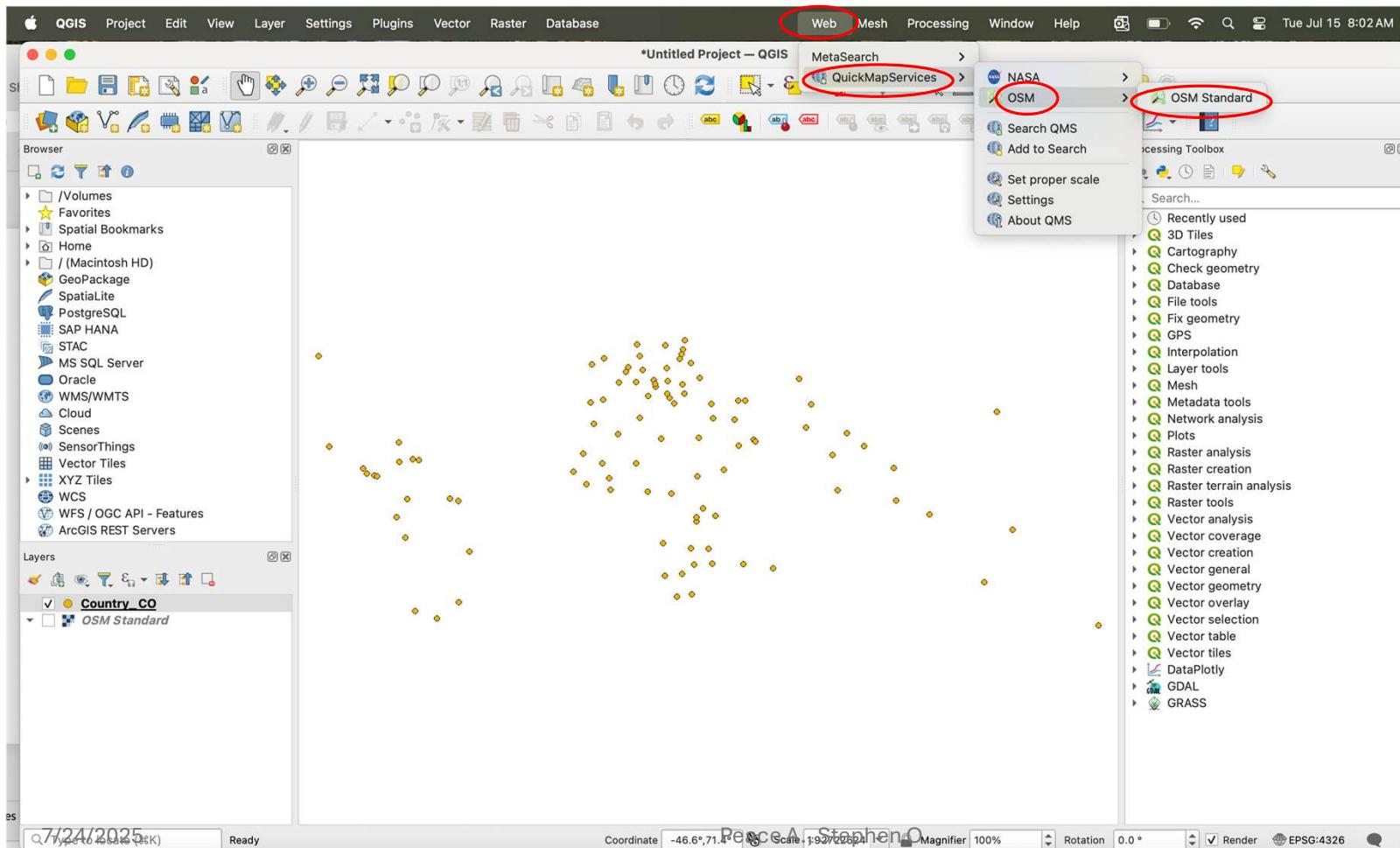
View Attribute Table/Data Set

- Right-click the layer > `Open Attribute Table`
- In the attribute table window, click the `Show as Dock` button (top-right) to dock it in the QGIS interface.
- Click on the righthand lower corner to view the data

Editing

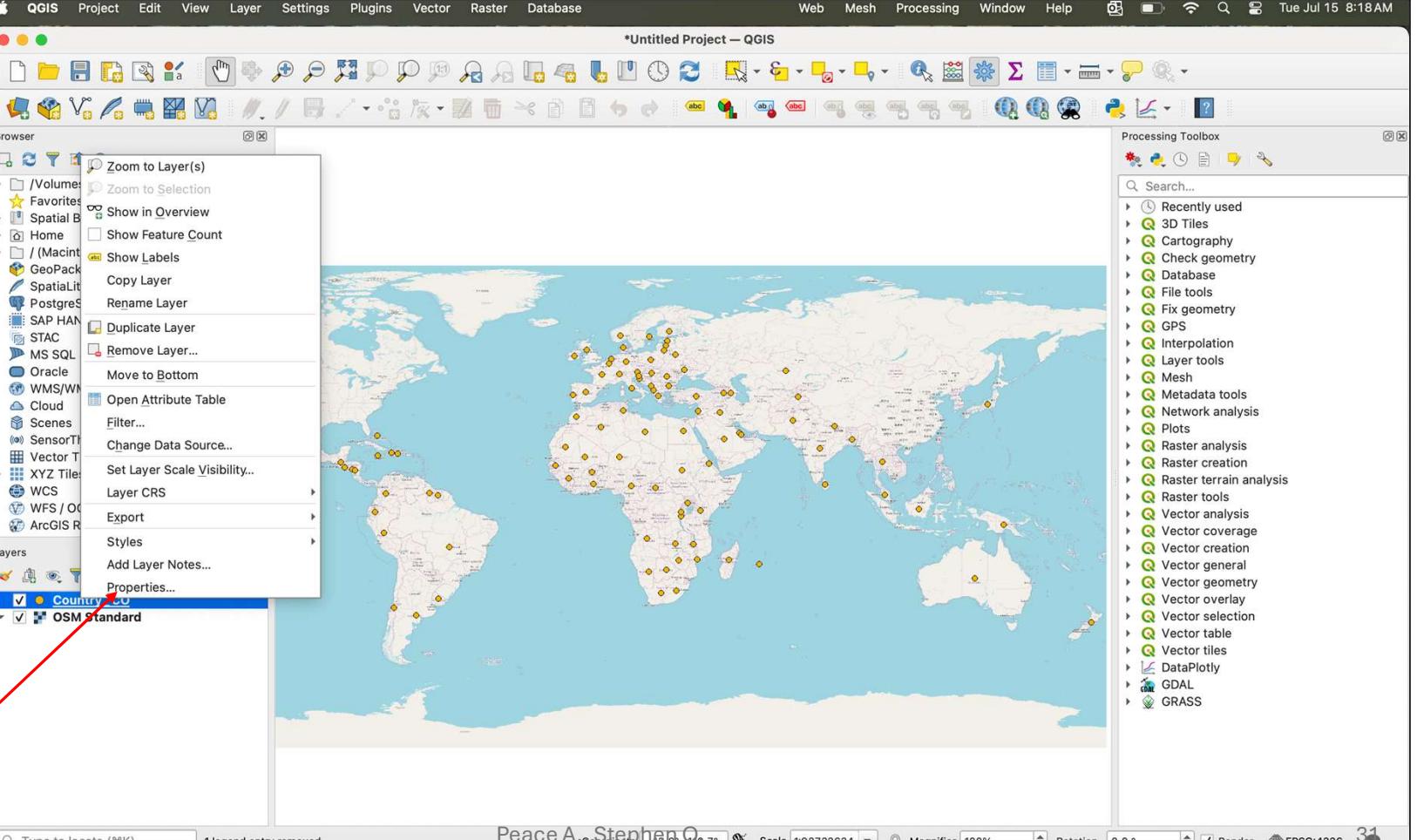


Add basemap using QuickMapServices



Editing

Click on Properties



7/24/2025

Type to locate (%K) 1 legend entry removed.

Peace A. Stephen Q

Coordinate: 15.9°, 16.7° Scale: 1:92722624 Magnifier: 100% Rotation: 0.0° Render: EPSG:4326 31

QGIS Project Edit View Layer Settings Plugins Vector Raster Database *Untitled Project — QGIS

Browser

- Zoom to Layer(s)
- Zoom to Selection
- Show in Overview
- Show Feature Count
- Show Labels
- Copy Layer
- Rename Layer
- Duplicate Layer
- Remove Layer...
- Move to Bottom
- Open Attribute Table
- Filter...
- Change Data Source...
- Set Layer Scale Visibility...
- Layer CRS
- Export
- Styles
- Add Layer Notes...
- Properties...

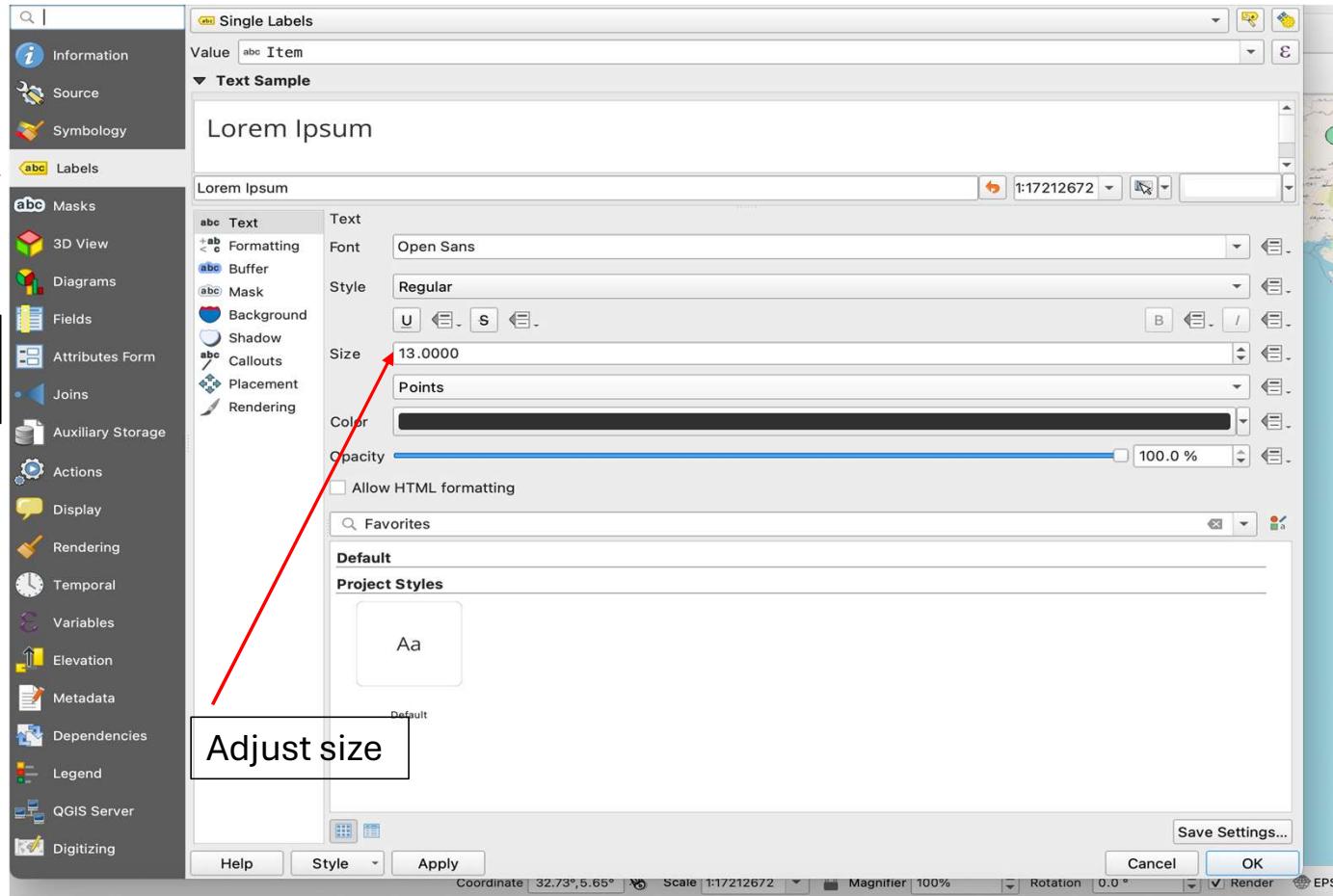
Layers

- Country CO
- OSM Standard

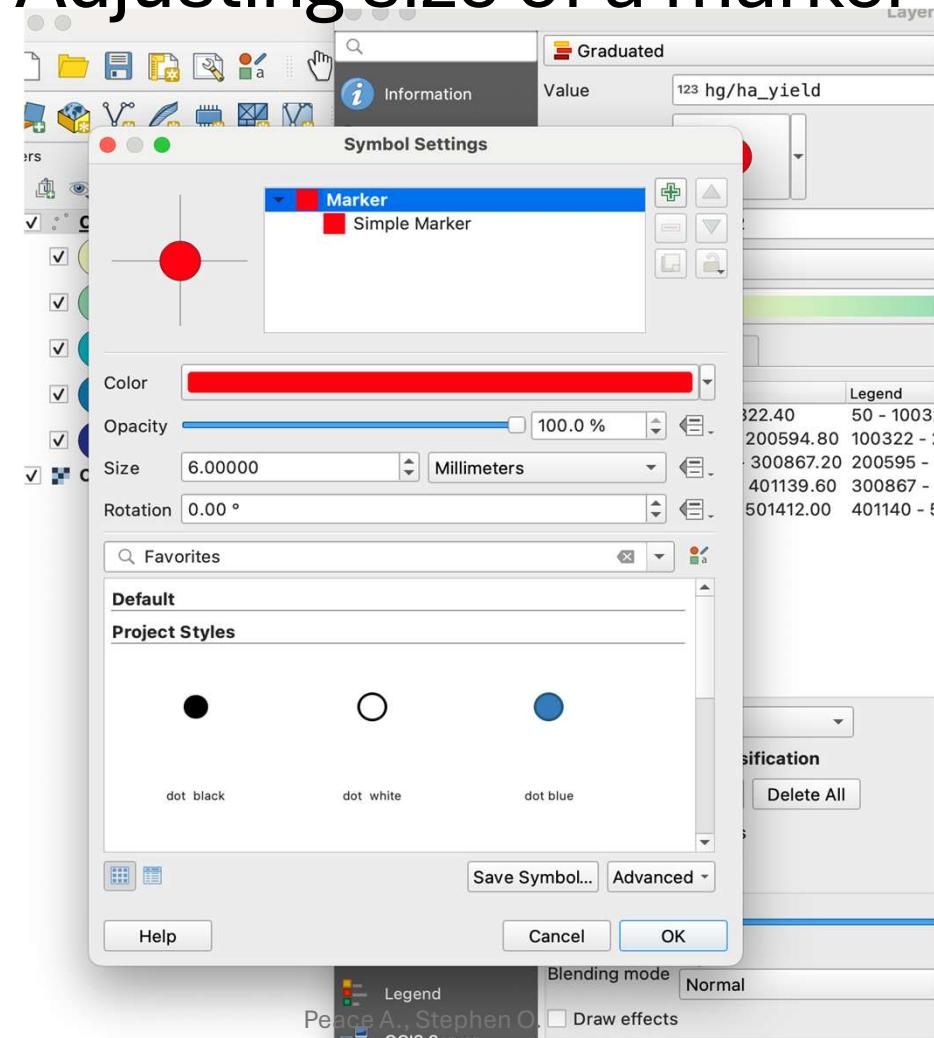
Processing Toolbox

- Recently used
- 3D Tiles
- Cartography
- Check geometry
- Database
- File tools
- Fix geometry
- GPS
- Interpolation
- Layer tools
- Mesh
- Metadata tools
- Network analysis
- Plots
- Raster analysis
- Raster creation
- Raster terrain analysis
- Raster tools
- Vector analysis
- Vector coverage
- Vector creation
- Vector general
- Vector geometry
- Vector overlay
- Vector selection
- Vector table
- Vector tiles
- DataPlotly
- GDAL
- GRASS

Adjusting size of labels



Adjusting size of a marker



Symbology for Visualizing Spatial Data Effectively

Purpose: Symbology defines how geographic features are visually represented on a map (colors, shapes, sizes).

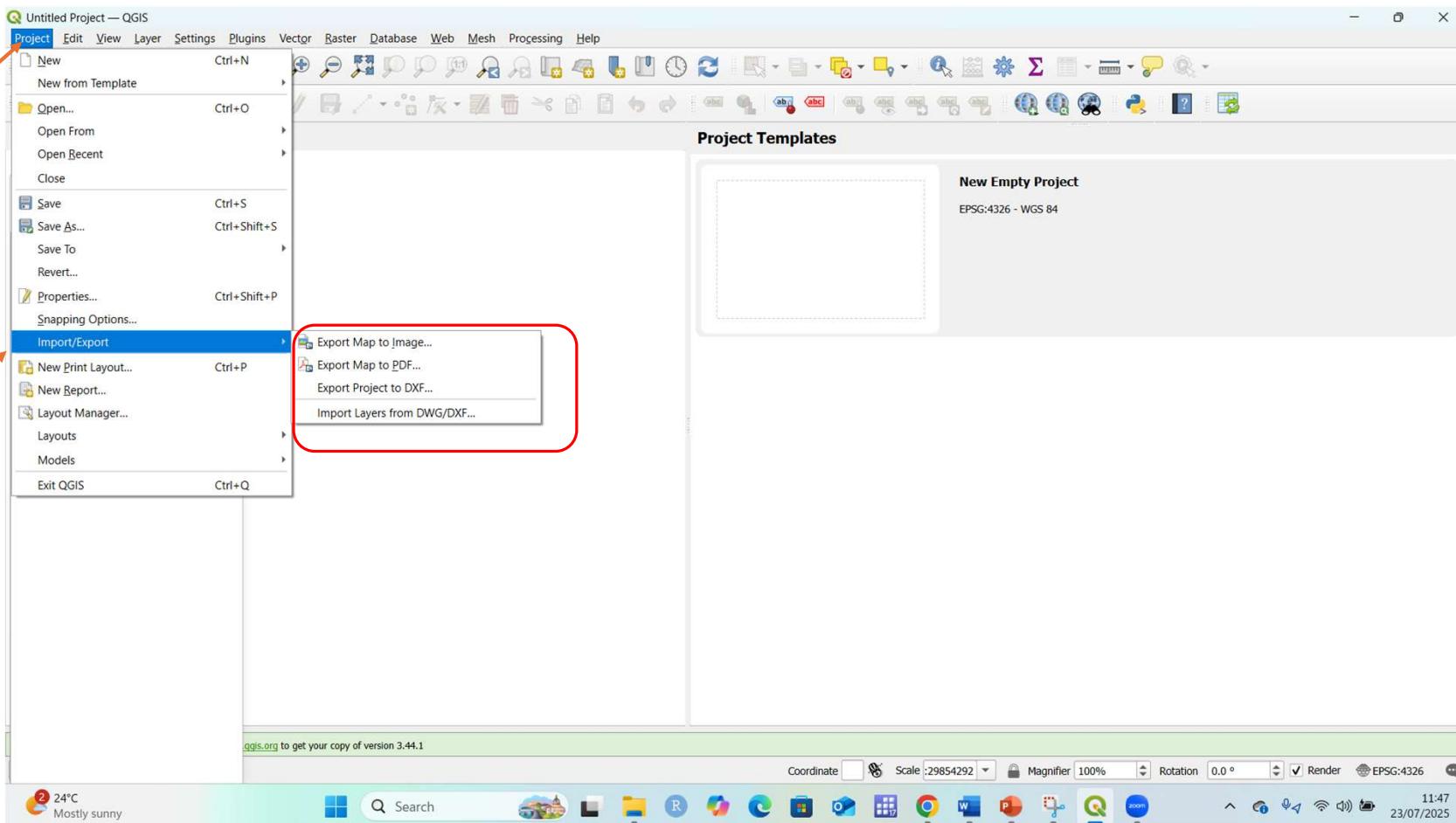
Access:

Right-click layer → *Properties* → *Symbology*

Types of Symbology:

- **Single Symbol:** All features share the same style.
- **Categorized:** Styles based on a categorical attribute (e.g. land use types).
- **Graduated:** Styles based on numeric values (e.g. population size).
- **Rule-based:** Complex styling using logical rules.
- **Heatmap / Point displacement:** Specialized visualizations for density or overlapping points.

Exporting maps out of QGIS





Link to QGIS activity

https://docs.google.com/forms/d/e/1FAIpQLSd2Aueo7bmfBW0hBgJI1ku_izJrVJ1Jrazj4WyaMDxEVPatQ/viewform?usp=dialog



END OF SESSION ONE

Histogram for data distribution

Go to Layer Styling Panel

Select your layer.

Choose "**Symbology**" > "**Graduated**".

Set the **classification field**, color ramp, and number of classes.

View Histogram

Click the **Histogram tab** next to "Classes" in the Symbology panel.

Click "**Load Values**" to generate the histogram.

Histogram

Since the histogram is already rendered:

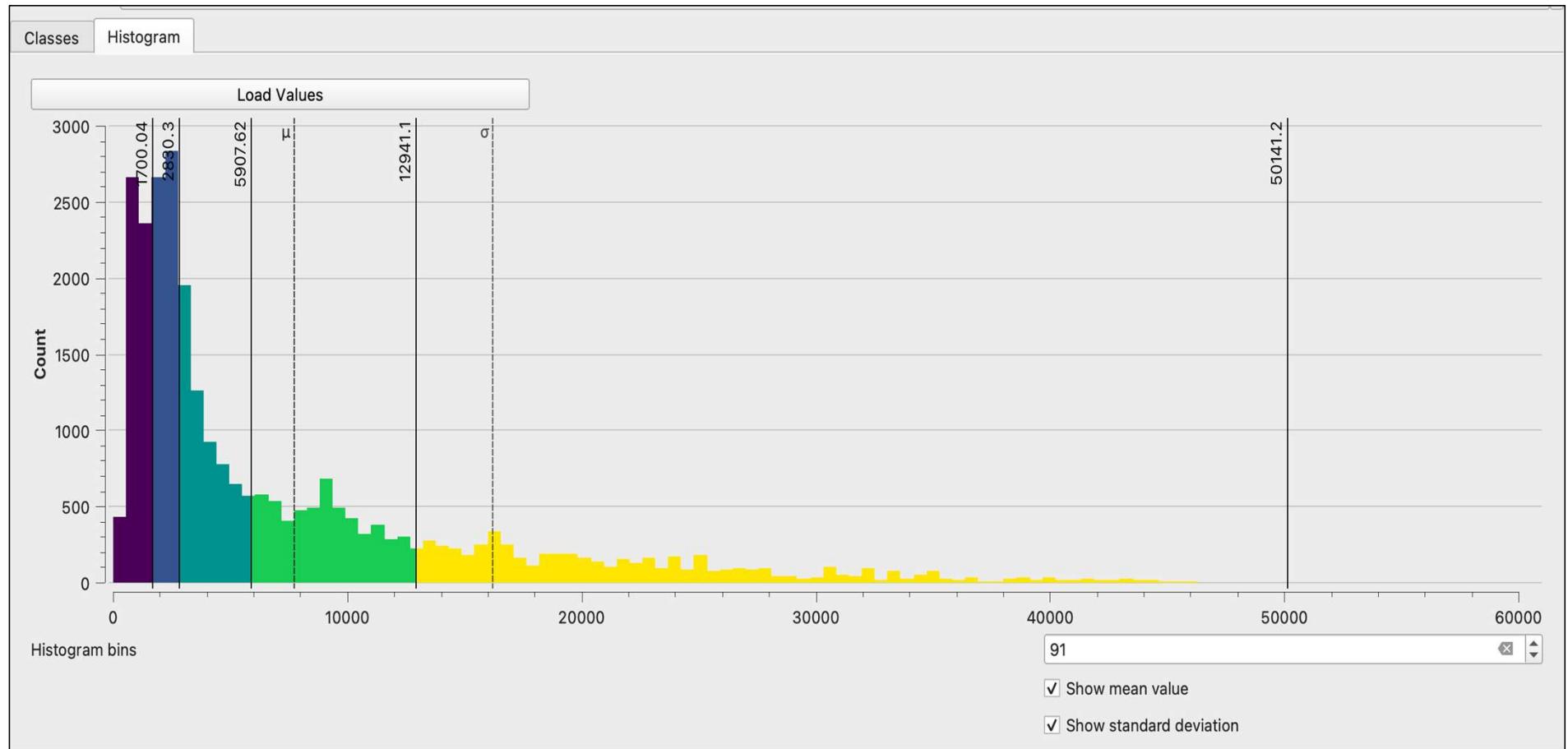
Use a Screenshot Tool

Windows: Use Snipping Tool or Snip & Sketch (Win + Shift + S).

macOS: Press Cmd + Shift + 4 and select the histogram area.

7/24/2025 Peace A., Stephen O.

Histogram for yield



More Plugins

Install plugin for interactive graphs:

- `Data Plotly` (for interactive charts)

Attribute Table

View Attribute Table:

- Right-click the layer > `Open Attribute Table`
- In the attribute table window, click the `Show as Dock` button (top-right) to dock it in the QGIS interface.

Dock the Table:

- Look for these buttons at the top-right corner of the attribute table window
- Click the downward arrow icon (↓) - This is the "Dock" button
- The table will now attach to the bottom of the QGIS interface

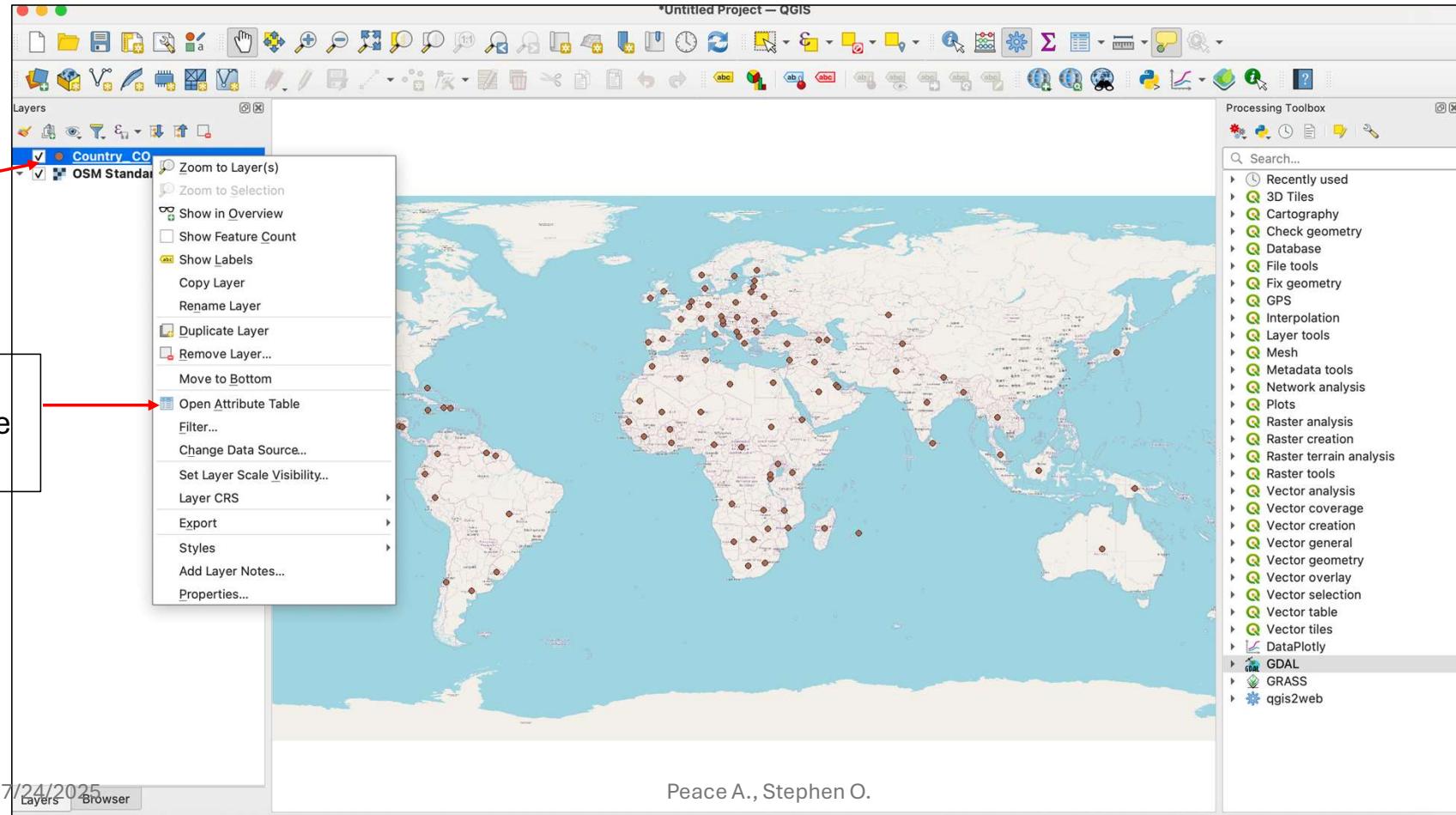
Adjust the Layout:

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Page A. Segmeno

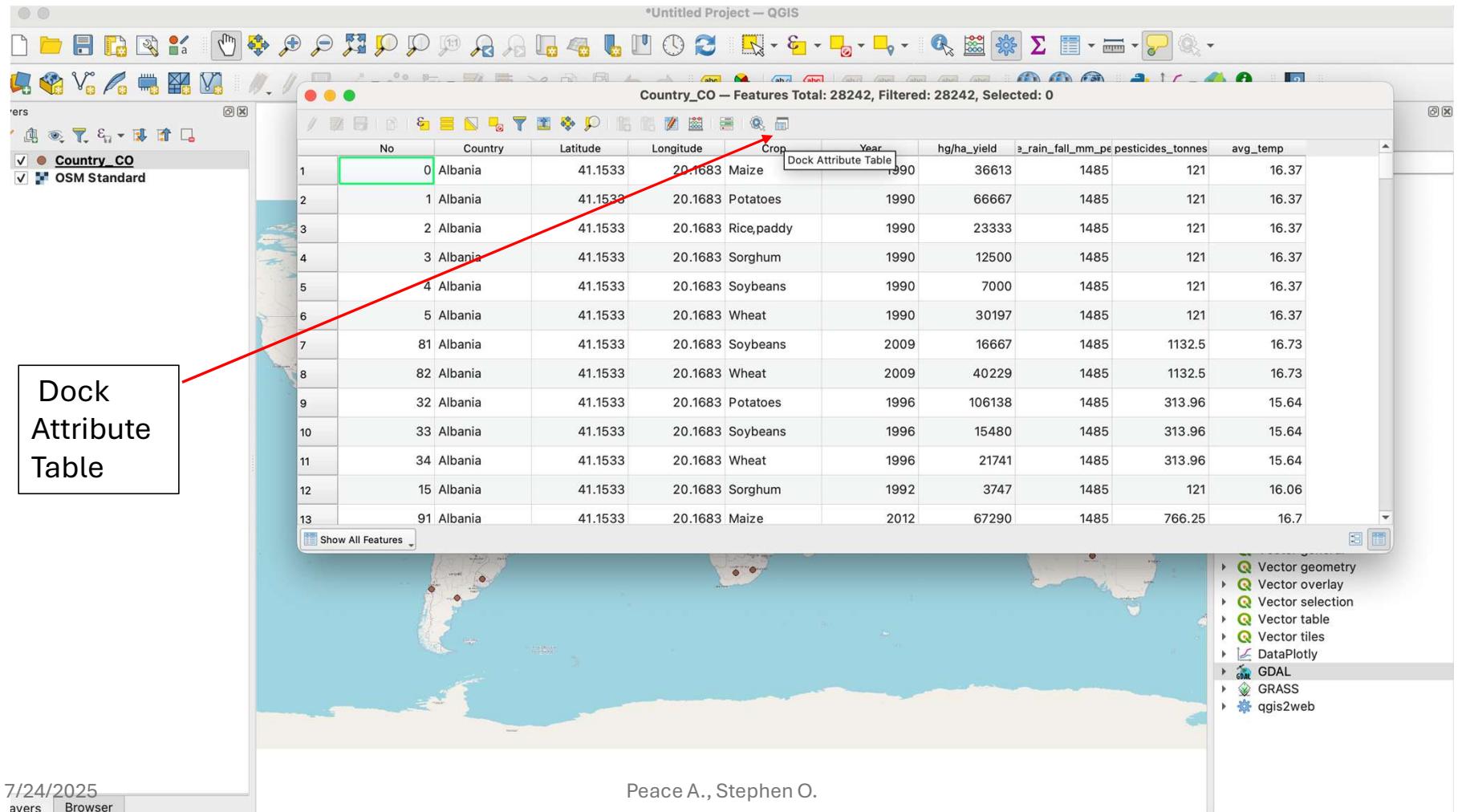
- Resize the docked table by dragging the top border up/down

Open attribute table (Right-click layer > Open Attribute Table)



Click the "Dock" button (top-right corner)

Dock Attribute Table



The screenshot shows the QGIS interface with the following details:

- Project Title:** Untitled Project — QGIS
- Layer List:** Shows 'Country_CO' and 'OSM Standard' layers.
- Attribute Table:** Titled 'Country_CO — Features Total: 28242, Filtered: 28242, Selected: 0'. It displays data for 13 rows, with row 0 selected (highlighted in green).
- Map View:** Shows a map of Albania with several data points.
- Legend:** Located on the right side, it includes items like 'Vector geometry', 'GDAL', 'GRASS', and 'qgis2web'.
- Bottom Left:** Shows the date '7/24/2025' and the word 'Layers'.
- Bottom Center:** Shows the name 'Peace A., Stephen O.'

Position the docked table at bottom of QGIS window

After clicking on the Attribute Table. The table move from the top to the bottom



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Peace A., Stephen O.

Untitled Project – QGIS

Layers: Country_CO, OSM Standard

Processing Toolbox

Country_CO — Features Total: 28242, Filtered: 28242, Selected: 0

No	Country	Latitude	Longitude	Crop	Year	hg/ha_yield	a_rain_fall_mm_pe	pesticides_tonnes
1	0 Albania	41.1533	20.1683	Maize	1990	36613	1485	121
2	1 Albania	41.1533	20.1683	Potatoes	1990	66667	1485	121
3	2 Albania	41.1533	20.1683	Rice,paddy	1990	23333	1485	121
4	3 Albania	41.1533	20.1683	Sorghum	1990	12500	1485	121
5	4 Albania	41.1533	20.1683	Soybeans	1990	7000	1485	121
6	5 Albania	41.1533	20.1683	Wheat	1990	30197	1485	121
7	81 Albania	41.1533	20.1683	Soybeans	2009	16667	1485	1132.5
8	82 Albania	41.1533	20.1683	Wheat	2009	40229	1485	1132.5

Layers Browser Show All Features

Search... Recently used 3D Tiles Cartography Check geometry Database File tools Fix geometry GPS Interpolation Layer tools Mesh Metadata tools Network analysis Plots Raster analysis Raster creation Raster terrain analysis Raster tools Vector analysis Vector coverage Vector creation Vector general Vector geometry Vector overlay Vector selection Vector table Vector tiles DataPlotly GDAL GRASS qgis2web

How to Use the Filter Toolbar

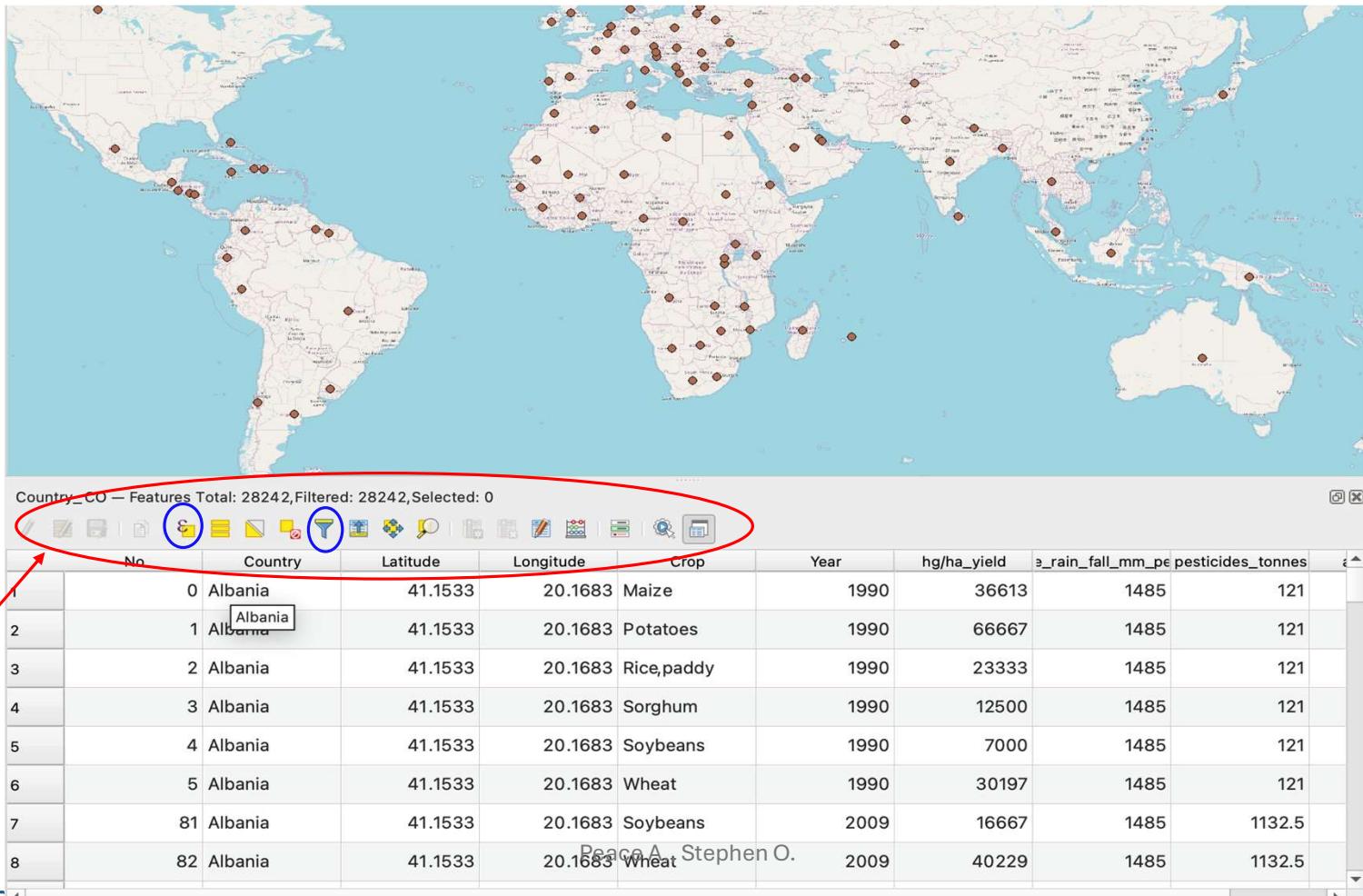
- Find the Filter Toolbar:
 - It is at the top of the attribute table window
 - Look for a small **funnel icon** or the **expression <= icon**

- Apply Quick Filter (Text Search):
 - Use the search box to type keywords (e.g., Cassava)

 - It filters the table to show only rows where any field contains that text

How to Use the Filter Toolbar

Filter Toolbar



Country_CO — Features Total: 28242, Filtered: 28242, Selected: 0

No.	Country	Latitude	Longitude	Crop	Year	hg/ha_yield	e_rain_fall_mm_pe	pesticides_tonnes
1	0 Albania	41.1533	20.1683	Maize	1990	36613	1485	121
2	1 Albania	41.1533	20.1683	Potatoes	1990	66667	1485	121
3	2 Albania	41.1533	20.1683	Rice,paddy	1990	23333	1485	121
4	3 Albania	41.1533	20.1683	Sorghum	1990	12500	1485	121
5	4 Albania	41.1533	20.1683	Soybeans	1990	7000	1485	121
6	5 Albania	41.1533	20.1683	Wheat	1990	30197	1485	121
7	81 Albania	41.1533	20.1683	Soybeans	2009	16667	1485	1132.5
8	82 Albania	41.1533	20.1683	Peace,A Stephen O.	2009	40229	1485	1132.5

7/24/2025

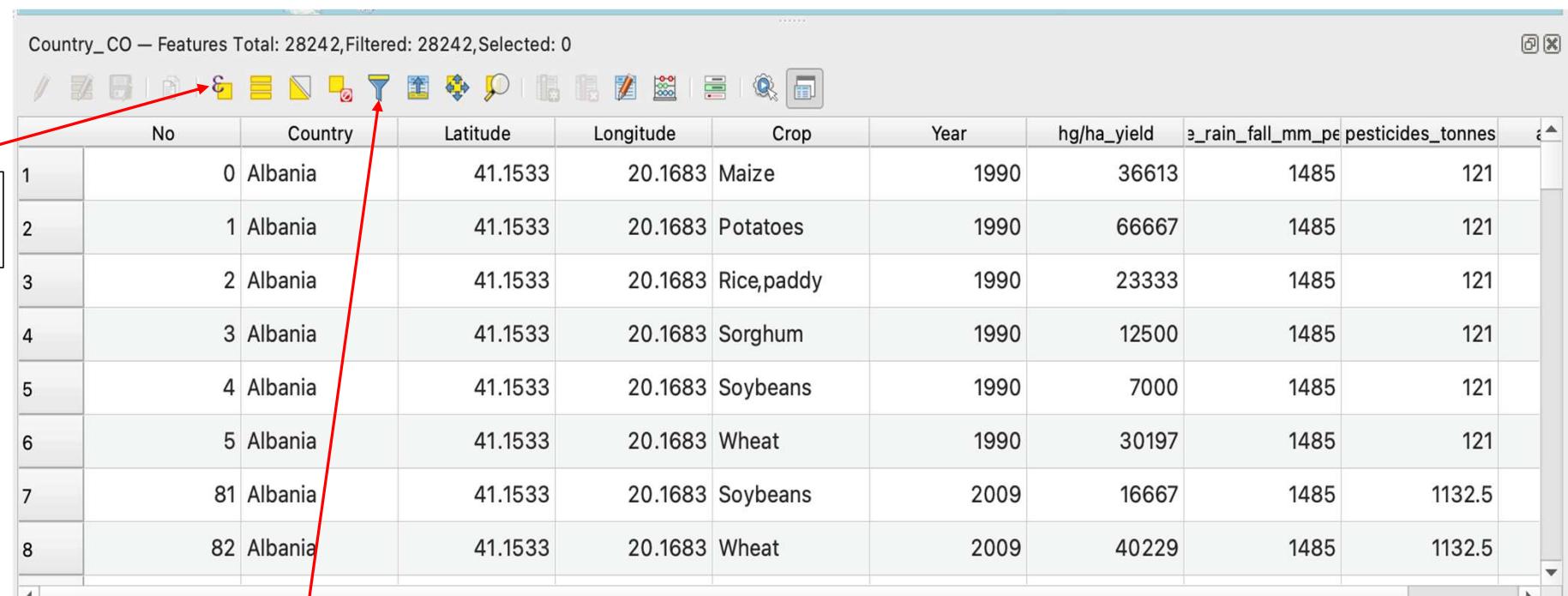
46

Quick Filter (Text Search):

- Find the Filter Toolbar:
 - It is at the top of the attribute table window
 - Look for a small **funnel icon**
- Apply Quick Filter (Text Search):
 - Use the search box to type keywords (e.g., Cassava)
 - It filters the table to show only rows where any field contains that text

How to Use the Filter Toolbar

Country_CO – Features Total: 28242, Filtered: 28242, Selected: 0



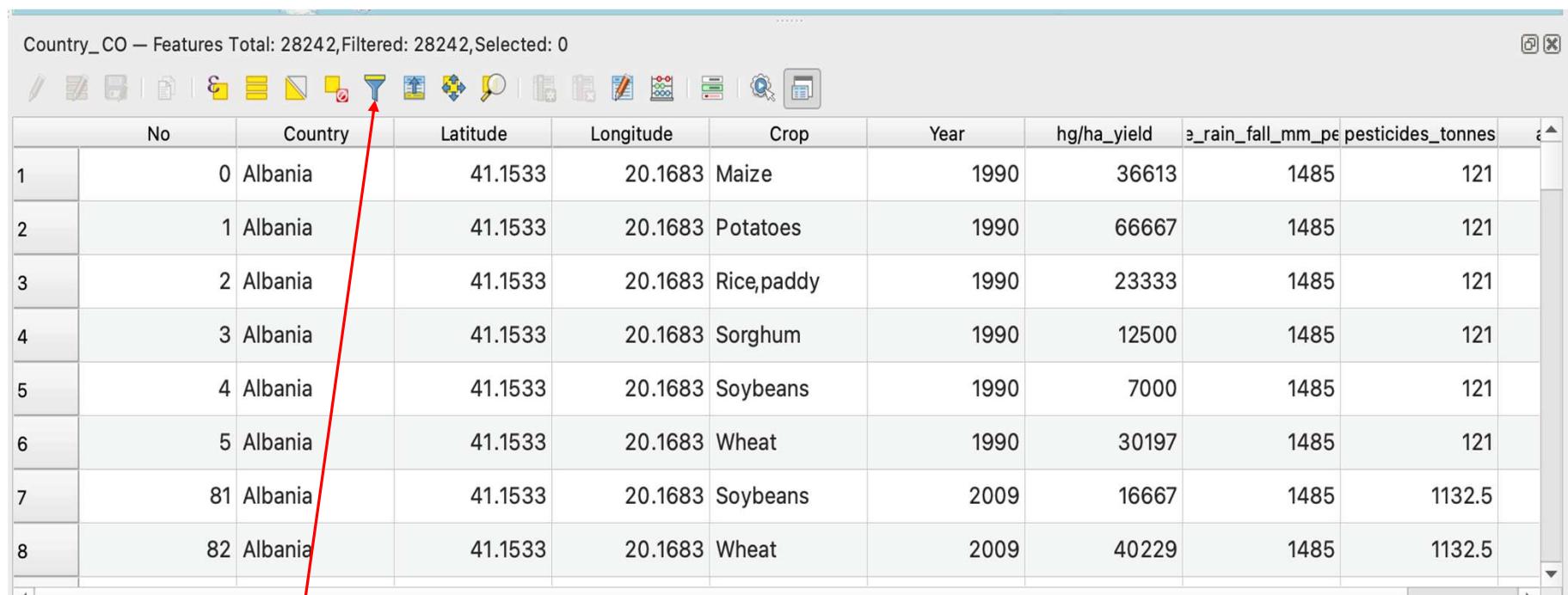
No	Country	Latitude	Longitude	Crop	Year	hg/ha_yield	e_rain_fall_mm_per	pesticides_tonnes
1	0 Albania	41.1533	20.1683	Maize	1990	36613	1485	121
2	1 Albania	41.1533	20.1683	Potatoes	1990	66667	1485	121
3	2 Albania	41.1533	20.1683	Rice,paddy	1990	23333	1485	121
4	3 Albania	41.1533	20.1683	Sorghum	1990	12500	1485	121
5	4 Albania	41.1533	20.1683	Soybeans	1990	7000	1485	121
6	5 Albania	41.1533	20.1683	Wheat	1990	30197	1485	121
7	81 Albania	41.1533	20.1683	Soybeans	2009	16667	1485	1132.5
8	82 Albania	41.1533	20.1683	Wheat	2009	40229	1485	1132.5

expression
(E=) icon

Funnel icon

How to Use Search Filter

Country_CO – Features Total: 28242, Filtered: 28242, Selected: 0



No	Country	Latitude	Longitude	Crop	Year	hg/ha_yield	e_rain_fall_mm_per	pesticides_tonnes
1	0 Albania	41.1533	20.1683	Maize	1990	36613	1485	121
2	1 Albania	41.1533	20.1683	Potatoes	1990	66667	1485	121
3	2 Albania	41.1533	20.1683	Rice,paddy	1990	23333	1485	121
4	3 Albania	41.1533	20.1683	Sorghum	1990	12500	1485	121
5	4 Albania	41.1533	20.1683	Soybeans	1990	7000	1485	121
6	5 Albania	41.1533	20.1683	Wheat	1990	30197	1485	121
7	81 Albania	41.1533	20.1683	Soybeans	2009	16667	1485	1132.5
8	82 Albania	41.1533	20.1683	Wheat	2009	40229	1485	1132.5

Funnel icon

Quick Search: Cassava

Country_Yield_data — Features Total: 28242, Filtered: 28242, Selected: 0

Expression

No	<input type="text"/>	<input type="checkbox"/> Case sensitive	<input type="button" value="Exclude Field"/>
Country	<input type="text"/>	<input type="checkbox"/> Case sensitive	<input type="button" value="Exclude Field"/>
Latitude	<input type="text"/>	<input type="checkbox"/> Case sensitive	<input type="button" value="Exclude Field"/>
Longitude	<input type="text"/>	<input type="checkbox"/> Case sensitive	<input type="button" value="Exclude Field"/>
Crop	<input type="text" value="Cassava"/>	<input type="checkbox"/> Case sensitive	<input type="button" value="Contains"/>
Year	<input type="text"/>	<input type="checkbox"/> Case sensitive	<input type="button" value="Exclude Field"/>
Kg/ha_yield	<input type="text"/>	<input type="checkbox"/> Case sensitive	<input type="button" value="Exclude Field"/>
average_rain_fall_mm_per_year	<input type="text"/>	<input type="checkbox"/> Case sensitive	<input type="button" value="Exclude Field"/>
pesticides_tonnes	<input type="text"/>	<input type="checkbox"/> Case sensitive	<input type="button" value="Exclude Field"/>
avg_temp	<input type="text"/>	<input type="checkbox"/> Case sensitive	<input type="button" value="Exclude Field"/>

A red arrow points from the text "Type Cassava" to the search field containing "Cassava". Another red arrow points from the text "Click Select Features" to the "Select Features" button.

Quick Search: Cassava

Country_CO — Features Total: 28242, Filtered: 2045, Selected: 0



No	Country	Latitude	Longitude	Crop	Year	hg/ha_yield	a_rain_fall_mm_pe	pesticides_tonnes	avg_temp
1	225 Angola	-11.2027	17.8739	Cassava	1992	42295	1010	23	23.96
2	249 Angola	-11.2027	17.8739	Cassava	1996	48077	1010	40	24.11
3	353 Angola	-11.2027	17.8739	Cassava	2011	133649	1010	40	24.15
4	329 Angola	-11.2027	17.8739	Cassava	2008	148084	1010	40	24.27
5	273 Angola	-11.2027	17.8739	Cassava	2000	82992	1010	40	24.41
6	337 Angola	-11.2027	17.8739	Cassava	2009	151759	1010	40	24.33
7	297 Angola	-11.2027	17.8739	Cassava	2004	125605	1010	40	24.22
8	313 Angola	-11.2027	17.8739	Cassava	2006	117201	1010	40	24.14
9	213 Angola	-11.2027	17.8739	Cassava	1990	41177	1010	64	24.12
10	369 Angola	-11.2027	17.8739	Cassava	2013	140517	1010	40	24.55
11	321 Angola	-11.2027	17.8739	Cassava	2007	115387	1010	40	24.24
12	281 Angola	-11.2027	17.8739	Cassava	2001	94072	1010	40	24.43
13	289 Angola	-11.2027	17.8739	Cassava	2002	110071	1010	40	24.79

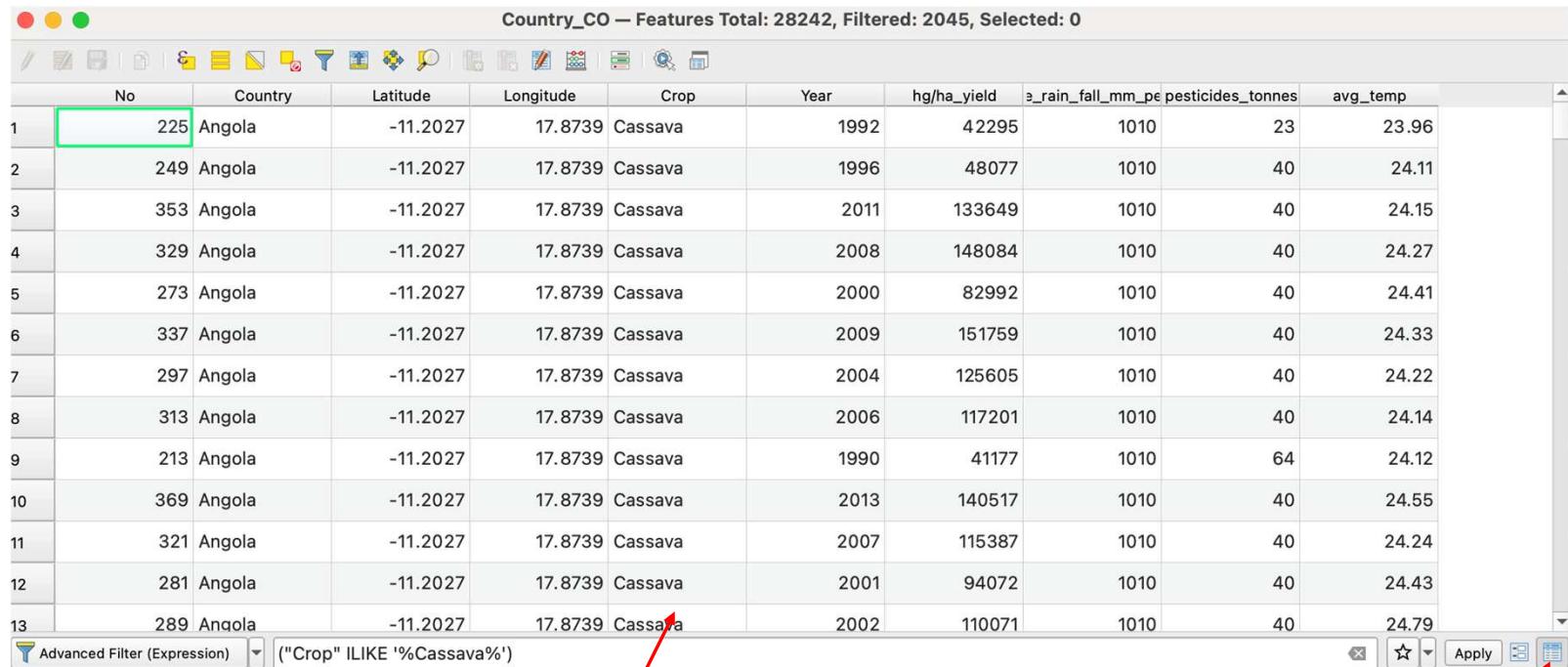
Advanced Filter (Expression) Apply 

Table with only Crop = Cassava

Click switch to Table

Quick Search: Cassava

Country_CO — Features Total: 28242, Filtered: 2045, Selected: 0



The screenshot shows a QGIS interface with a search results table for 'Country_CO'. The table has 13 rows and 10 columns. The columns are: No, Country, Latitude, Longitude, Crop, Year, hg/ha_yield, a_rain_fall_mm_pe, pesticides_tonnes, and avg_temp. Row 13 is highlighted with a green border. A red arrow points from the text 'Table with only Crop = Cassava' to the 'Cassava' entry in the 'Crop' column of row 13. Another red arrow points from the text 'Click switch to Table' to the 'Table' icon in the bottom right corner of the QGIS toolbar.

No	Country	Latitude	Longitude	Crop	Year	hg/ha_yield	a_rain_fall_mm_pe	pesticides_tonnes	avg_temp
1	225 Angola	-11.2027	17.8739	Cassava	1992	42295	1010	23	23.96
2	249 Angola	-11.2027	17.8739	Cassava	1996	48077	1010	40	24.11
3	353 Angola	-11.2027	17.8739	Cassava	2011	133649	1010	40	24.15
4	329 Angola	-11.2027	17.8739	Cassava	2008	148084	1010	40	24.27
5	273 Angola	-11.2027	17.8739	Cassava	2000	82992	1010	40	24.41
6	337 Angola	-11.2027	17.8739	Cassava	2009	151759	1010	40	24.33
7	297 Angola	-11.2027	17.8739	Cassava	2004	125605	1010	40	24.22
8	313 Angola	-11.2027	17.8739	Cassava	2006	117201	1010	40	24.14
9	213 Angola	-11.2027	17.8739	Cassava	1990	41177	1010	64	24.12
10	369 Angola	-11.2027	17.8739	Cassava	2013	140517	1010	40	24.55
11	321 Angola	-11.2027	17.8739	Cassava	2007	115387	1010	40	24.24
12	281 Angola	-11.2027	17.8739	Cassava	2001	94072	1010	40	24.43
13	289 Angola	-11.2027	17.8739	Cassava	2002	110071	1010	40	24.79

Advanced Filter (Expression) : ("Crop" ILIKE '%Cassava%')

Apply

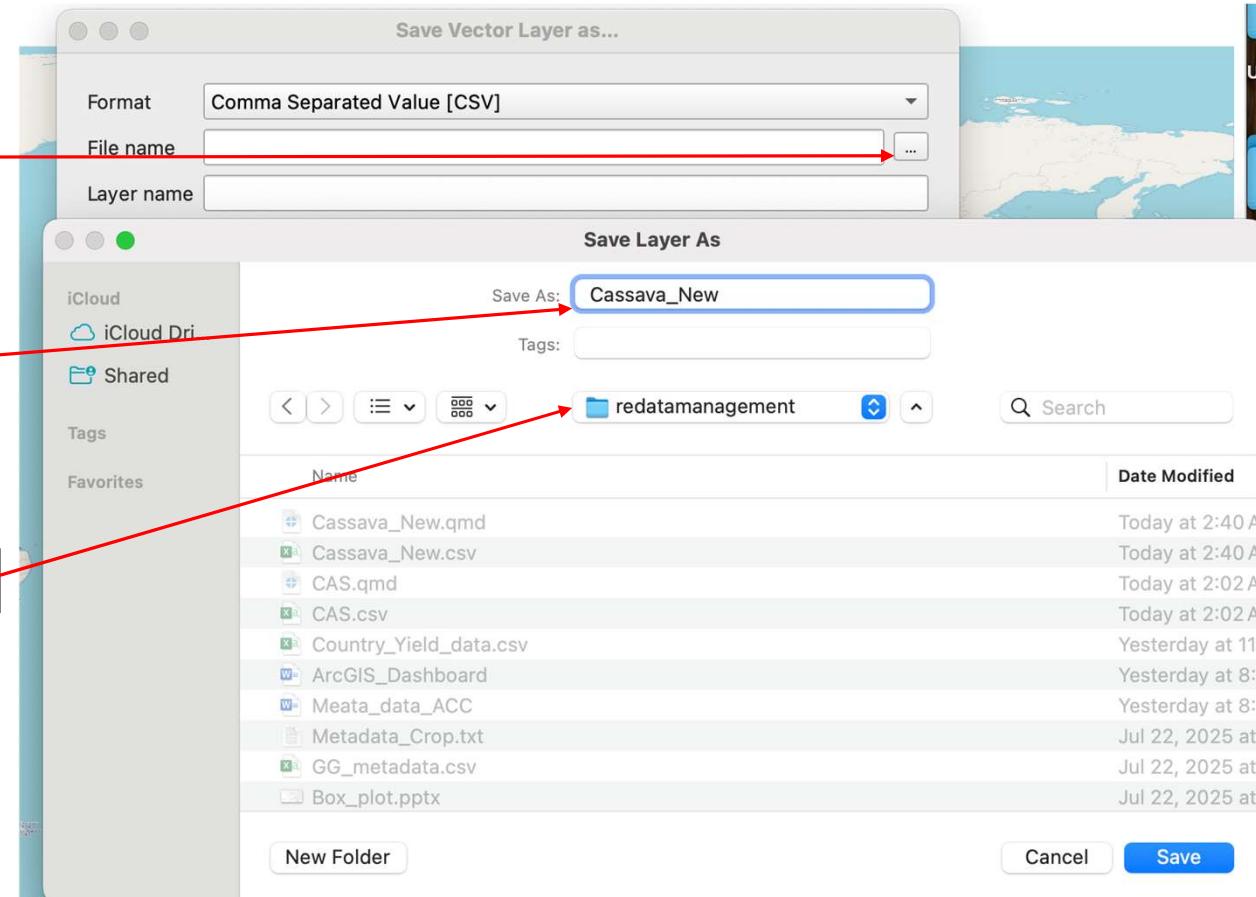
Table with only Crop = Cassava

Click switch to Table

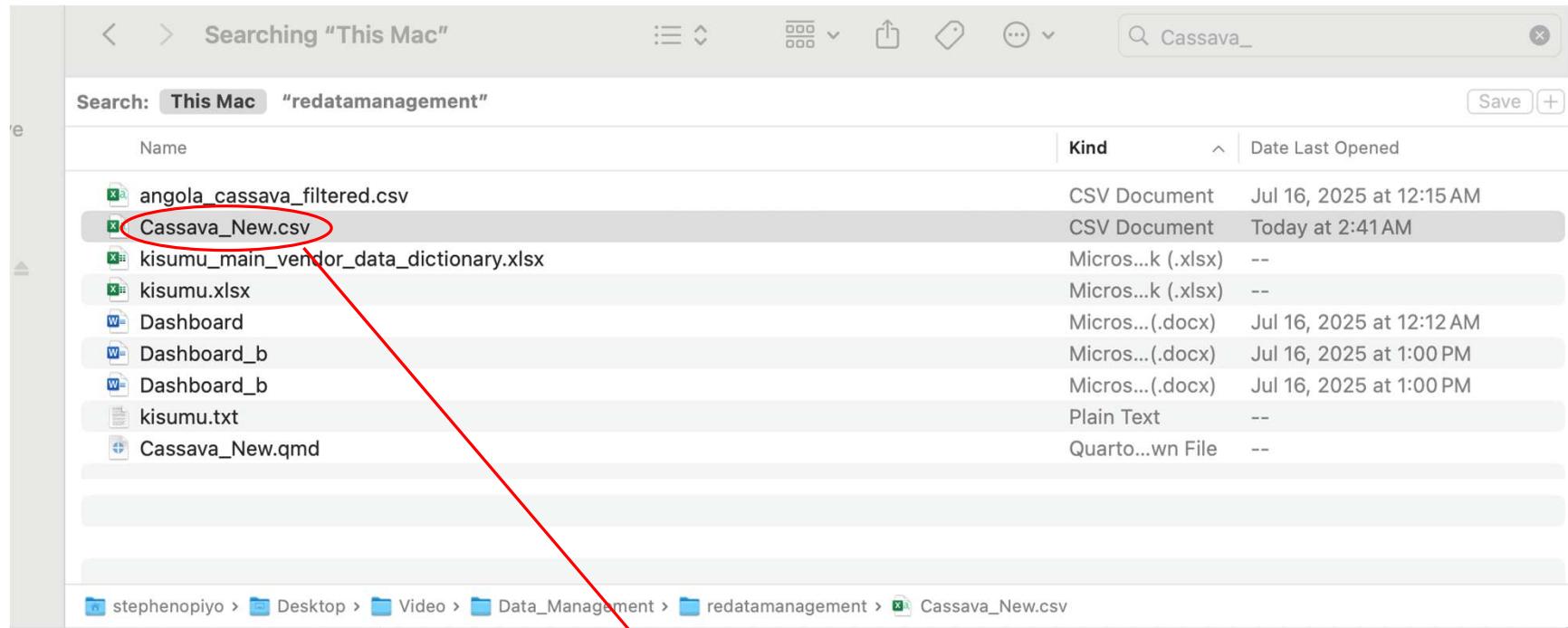
Select the folder

Write file
name
Cassava_New

Folder

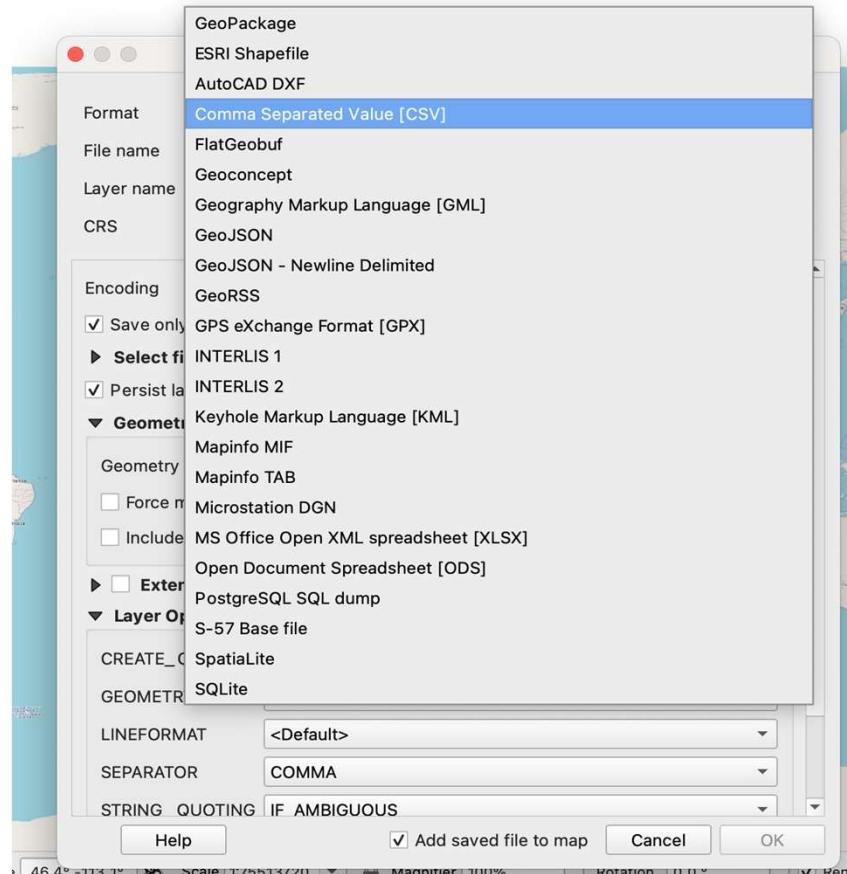


Saved Cassava_New File



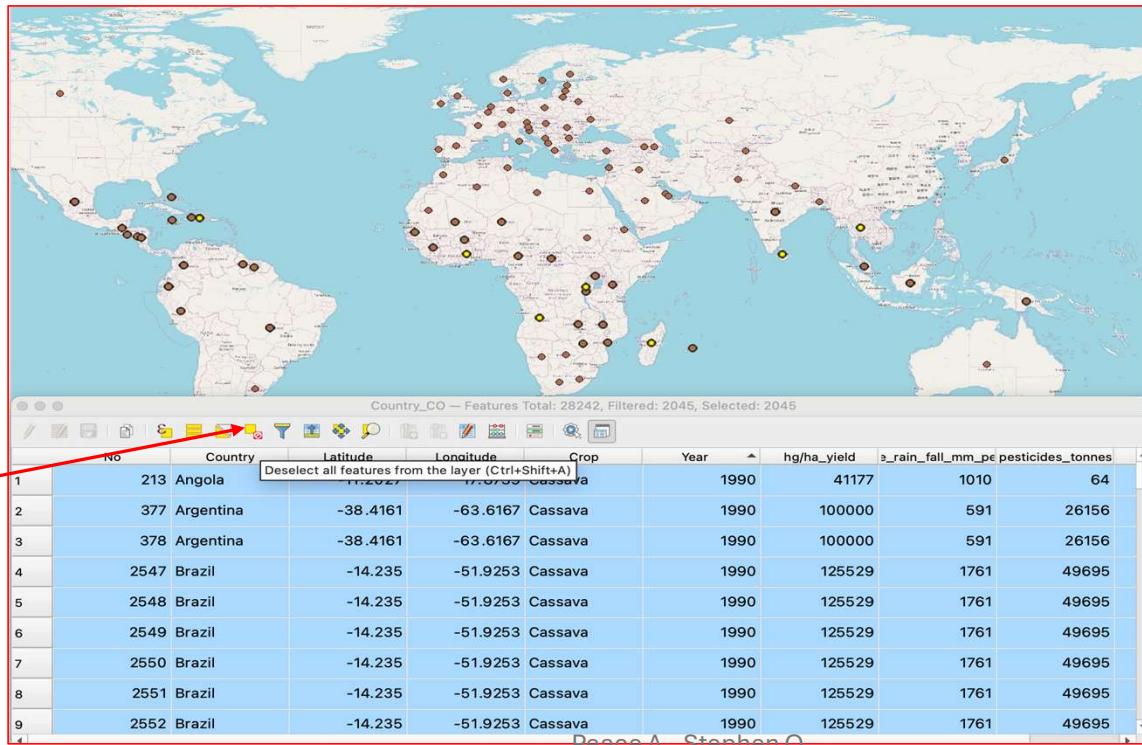
Cassava_New.csv

File format that can Saved



Clear Features

- Click the “Clear filter” (icon with red X) to show all records again



Clear features



Data Visualization in QGIS

DataPlotly

What is DataPlotly?

- DataPlotly is a QGIS plugin that allows users to create interactive plots and charts directly from their spatial and attribute data within QGIS.

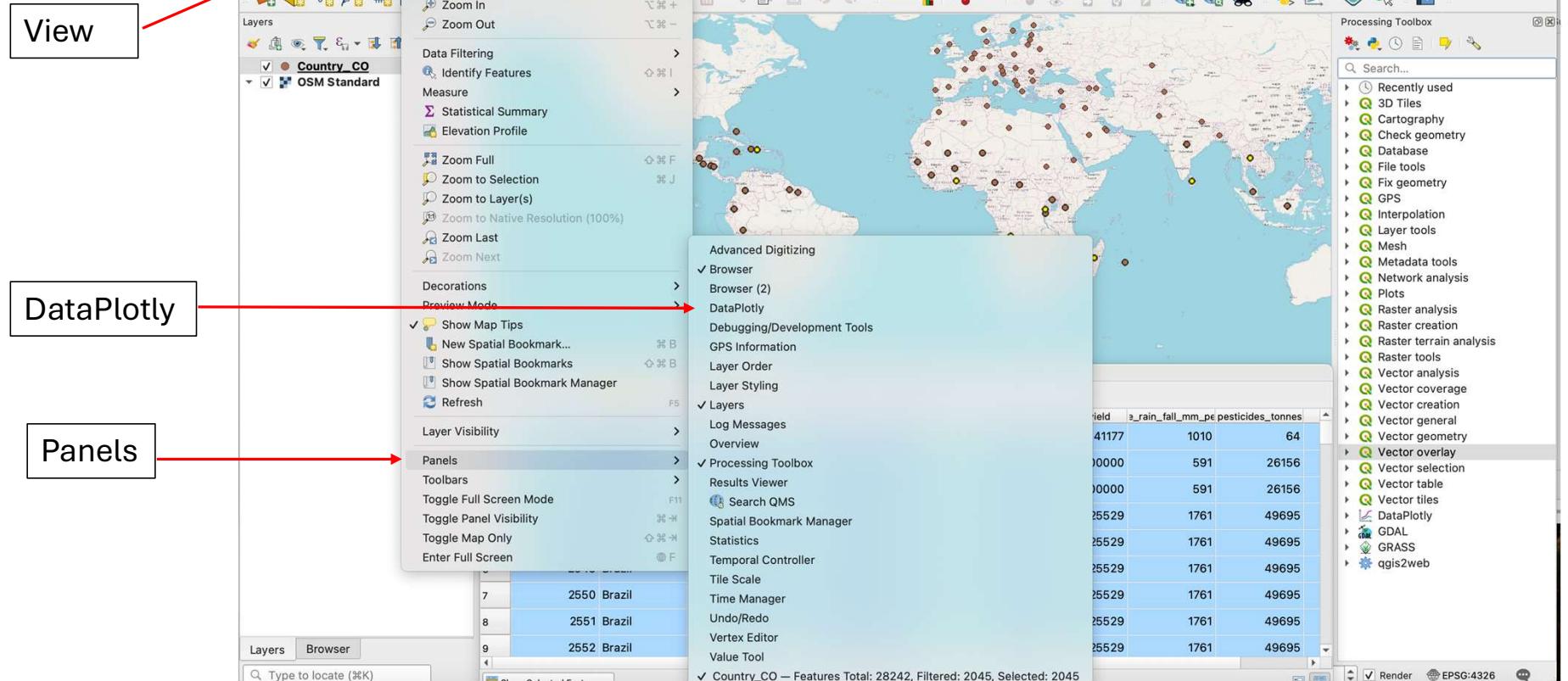
Key Features:

- Create charts: bar, pie, box, scatter, histograms, line plots, and more.
- Works with QGIS **attribute tables** and **spatial selections**.
- Updates dynamically as layers are edited or filtered.

Plotly for Charts

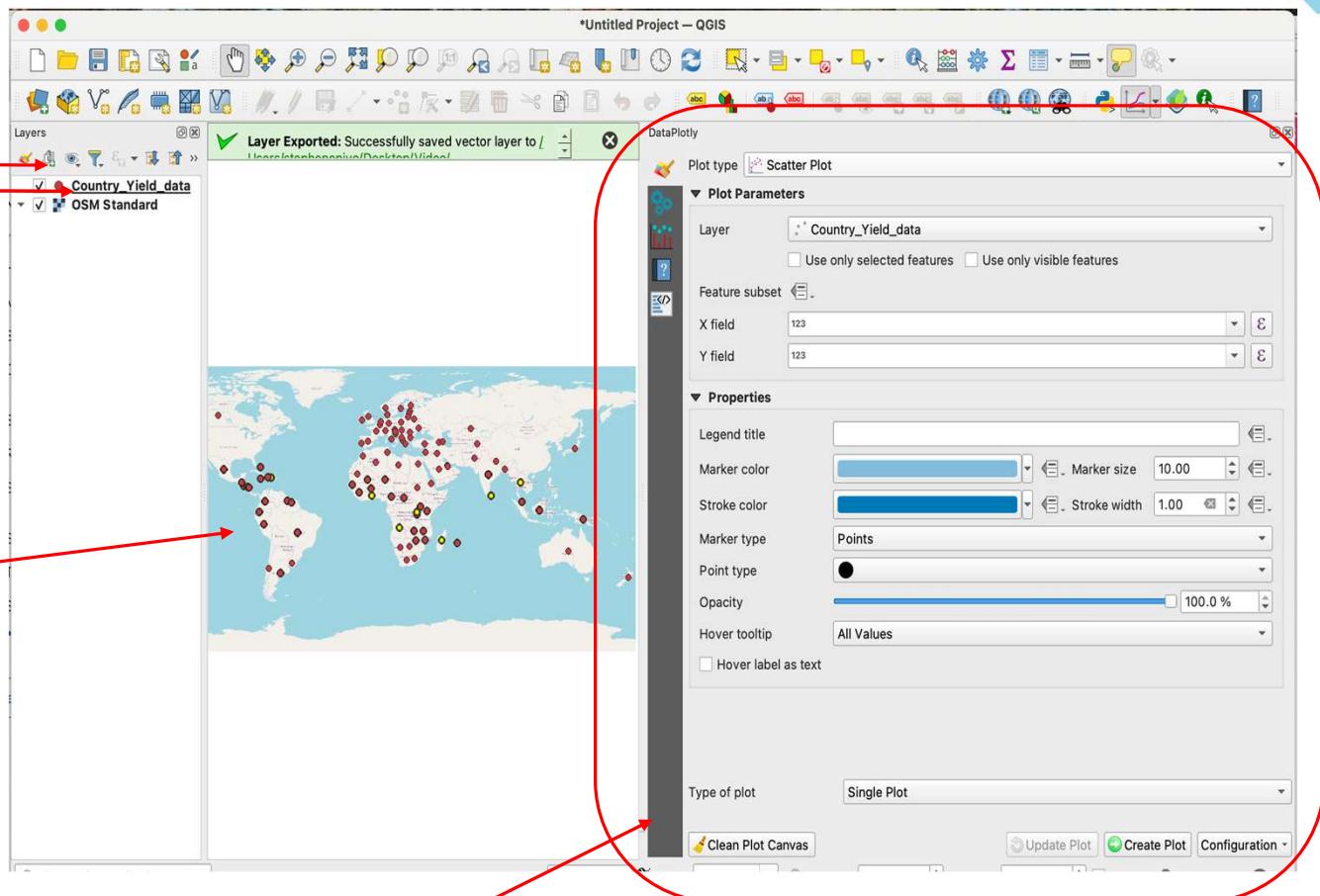
- Open the Data Plotly panel (` View > Panels > Data Plotly `).
- Choose the layer and chart type (Bar, Pie, Scatter, etc.).
- Configure the X and Y fields.

Data Visualization



Data Visualization

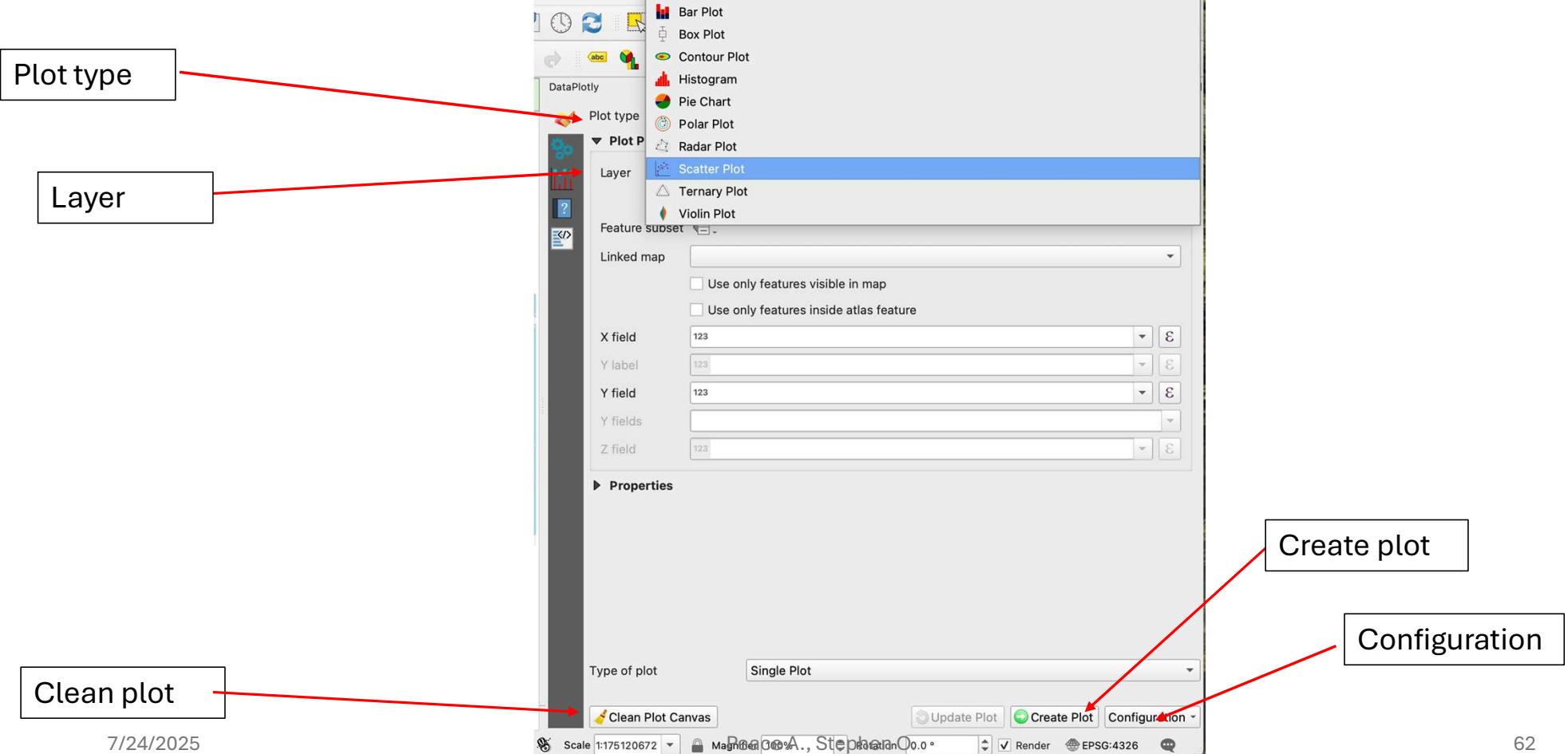
Layers



Map area

DataPlotly Peace A., Stephen O.

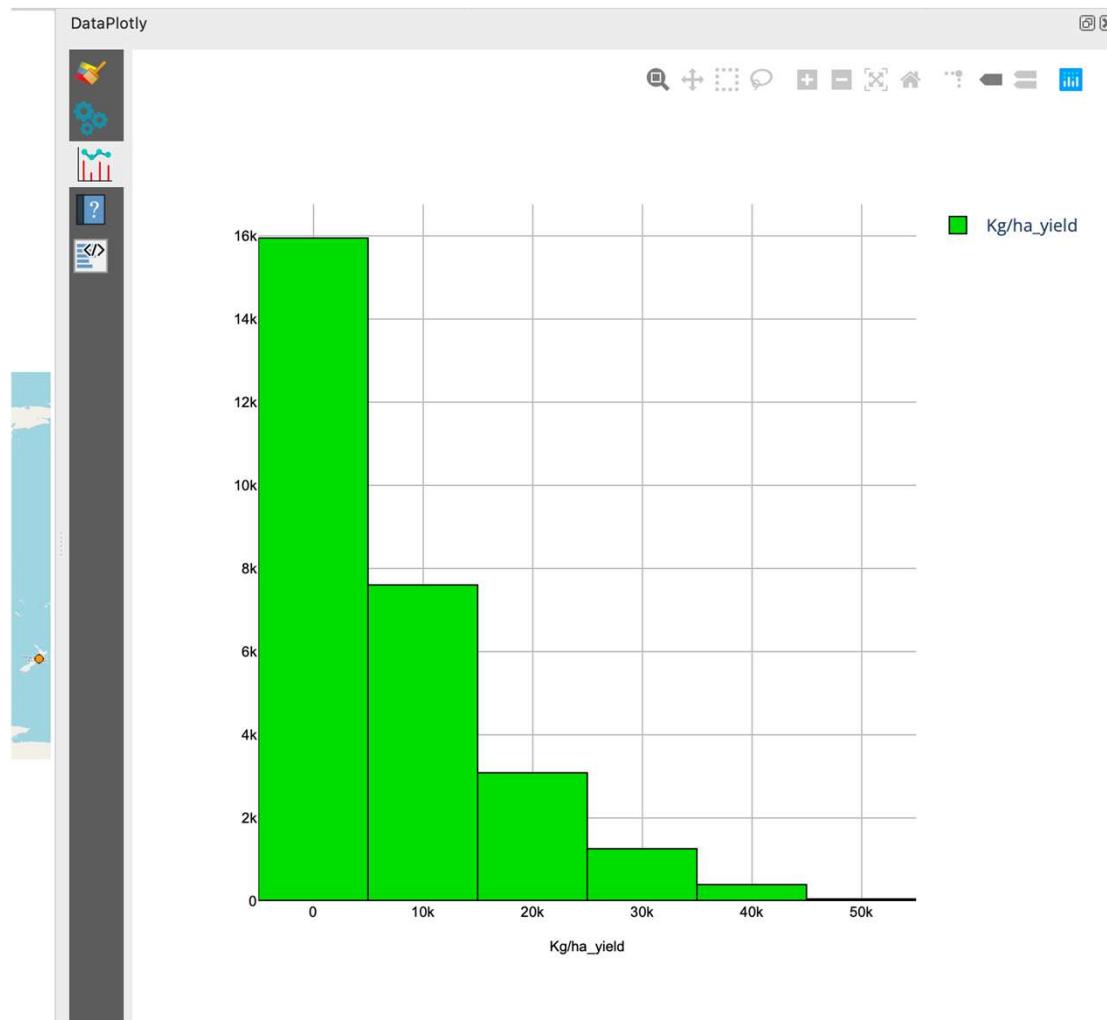
Data Plotly



Draw Histogram of Yield

Steps:

- Go to View > Panels
- Click to check “Data Plotly”
- Open Data Plotly panel
- Plot type: Histogram,
- X field: ”Khg/ha_yield”
- Click "Create Plot"

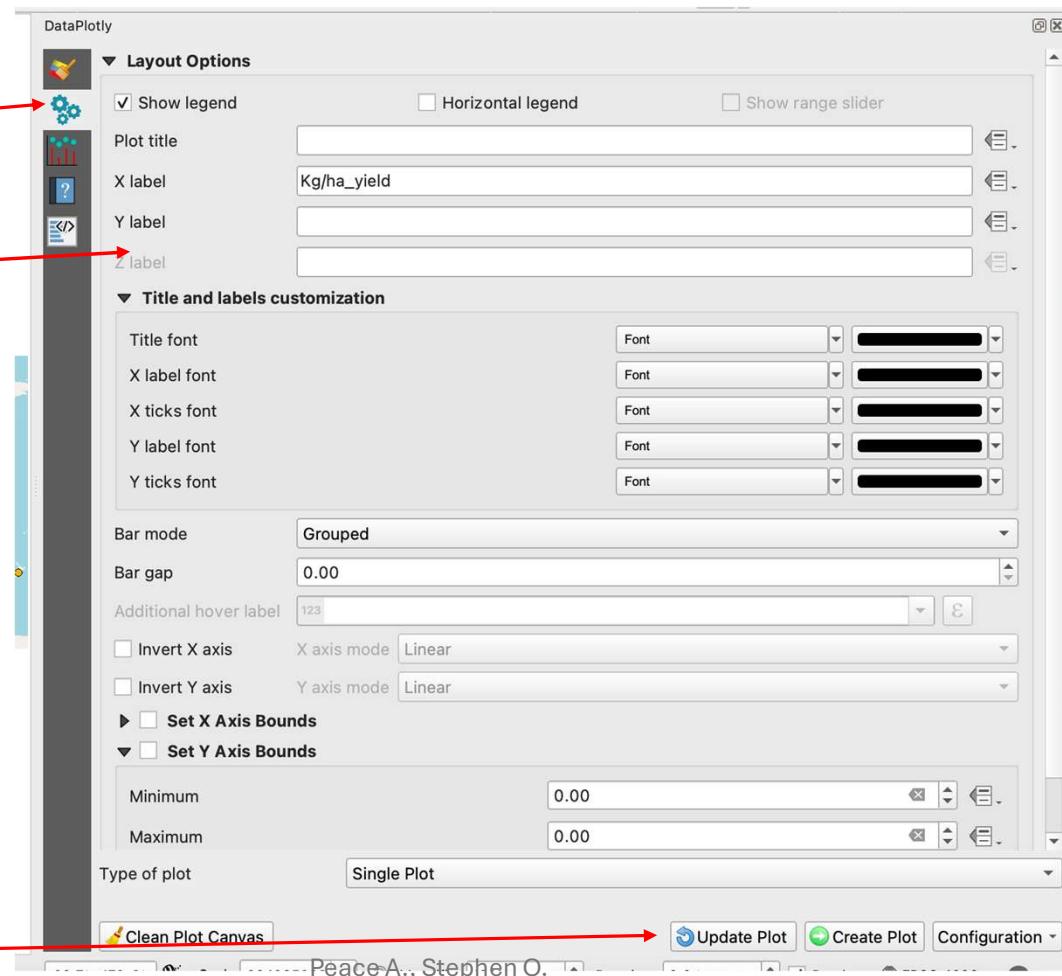


Label plots

Click of settings

Enter labels

Update plots
7/24/2025



The screenshot shows the DataPlotly software interface with the following settings:

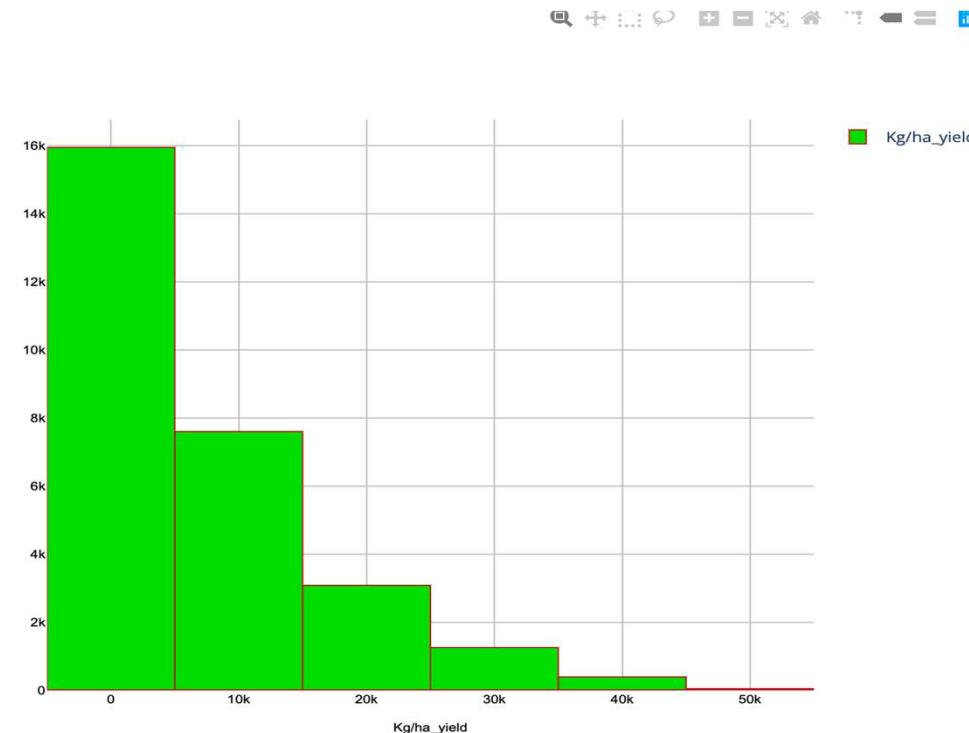
- Layout Options:**
 - Show legend: checked
 - Horizontal legend: unchecked
 - Show range slider: unchecked
 - Plot title: empty input field
 - X label: Kg/ha_yield
 - Y label: empty input field
 - Z label: empty input field
- Title and labels customization:**
 - Title font: Font dropdown, black color swatch
 - X label font: Font dropdown, black color swatch
 - X ticks font: Font dropdown, black color swatch
 - Y label font: Font dropdown, black color swatch
 - Y ticks font: Font dropdown, black color swatch
- Bar mode:** Grouped
- Bar gap:** 0.00
- Additional hover label:** 123
- Invert X axis:** unchecked
- Invert Y axis:** unchecked
- X axis mode:** Linear
- Y axis mode:** Linear
- Set X Axis Bounds:** unchecked
- Set Y Axis Bounds:** unchecked
- Minimum:** 0.00
- Maximum:** 0.00
- Type of plot:** Single Plot

At the bottom of the interface, there is a toolbar with the following buttons from left to right:

- Clean Plot Canvas
- Update Plot
- Create Plot
- Configuration

The status bar at the bottom displays the text "PeaceA., Stephen O.".

Export Graph



Reload

Dynamically update size



Export as Image

Peace A., Stephen O.

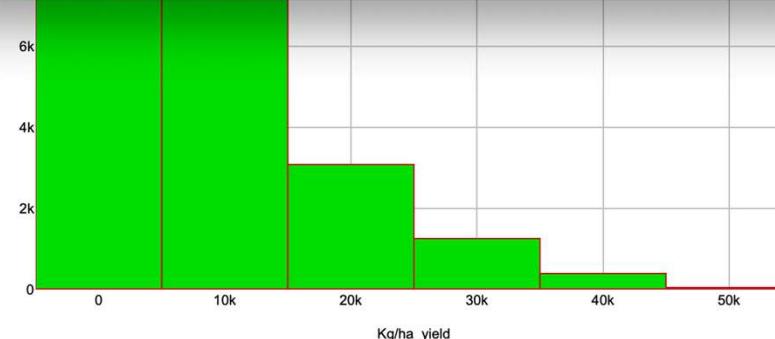
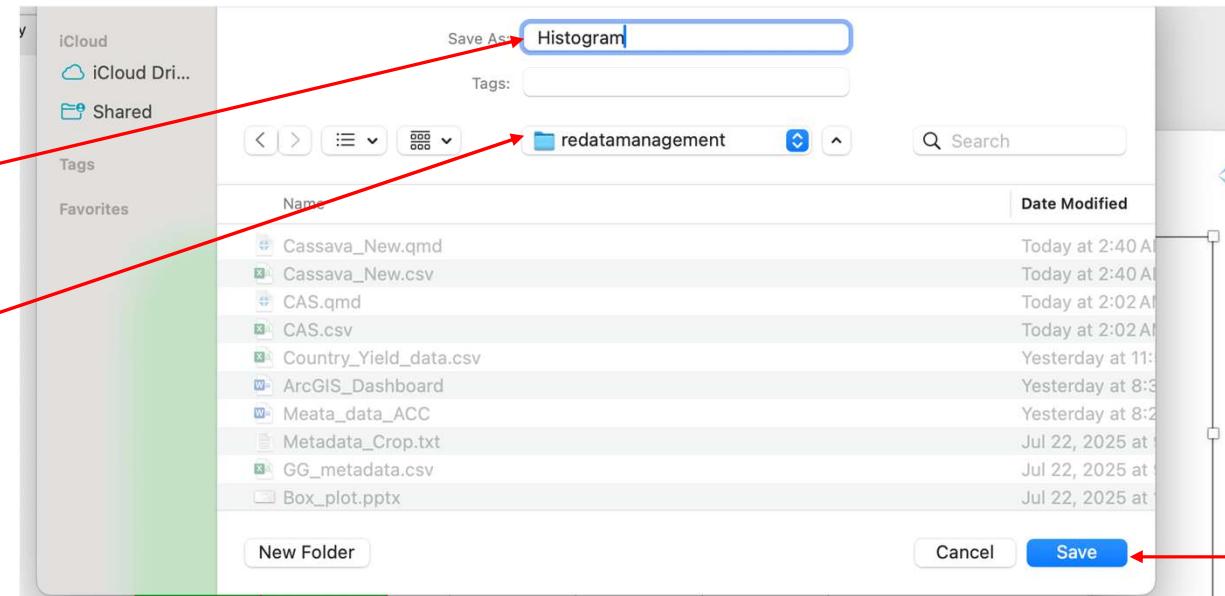
7/24/2025

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Name

Folder

Save



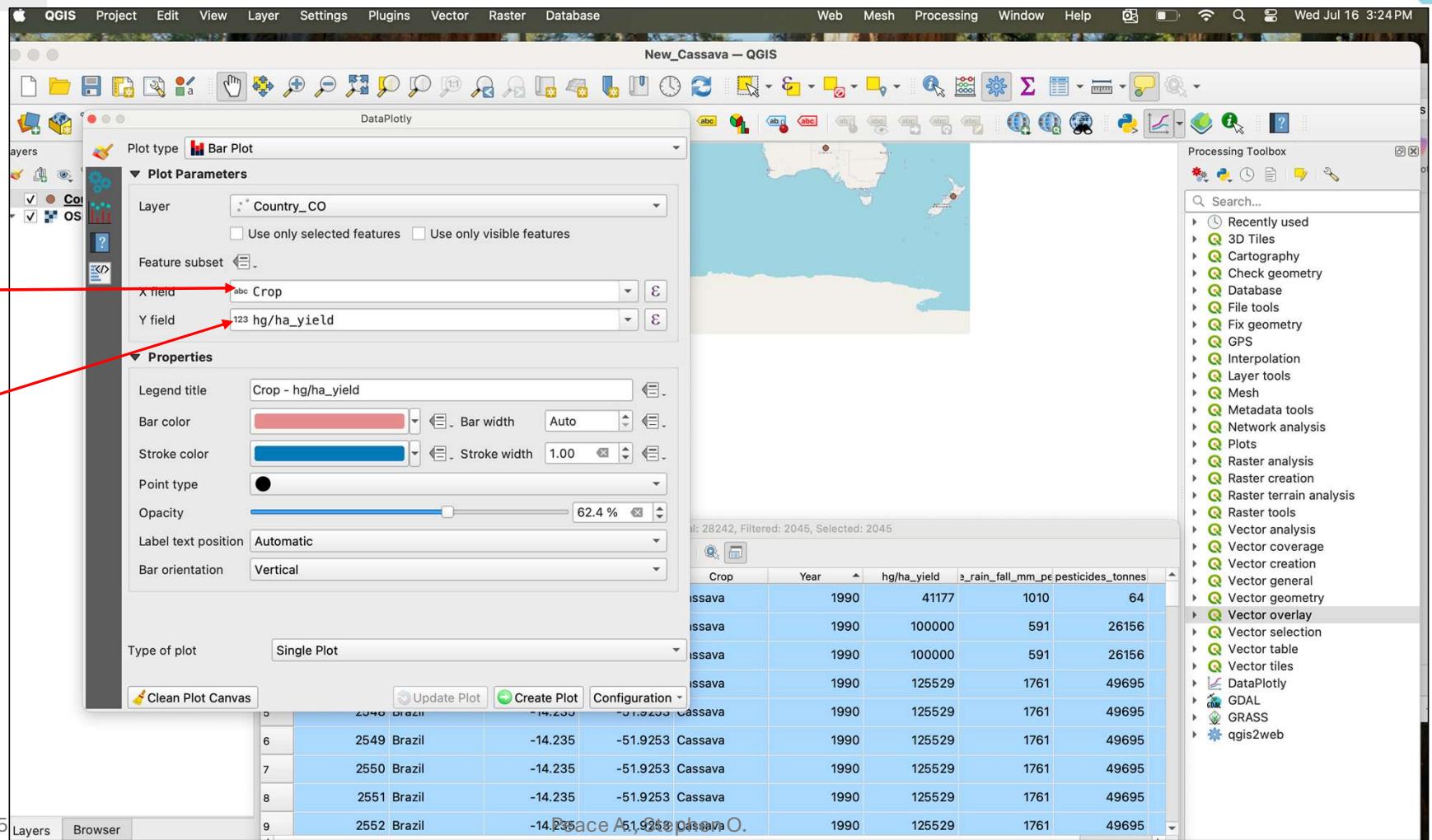


Plot Bar Chart of Crop and Yield

Crop

Yield

7/24/2025



Conntry_AA — QGIS

