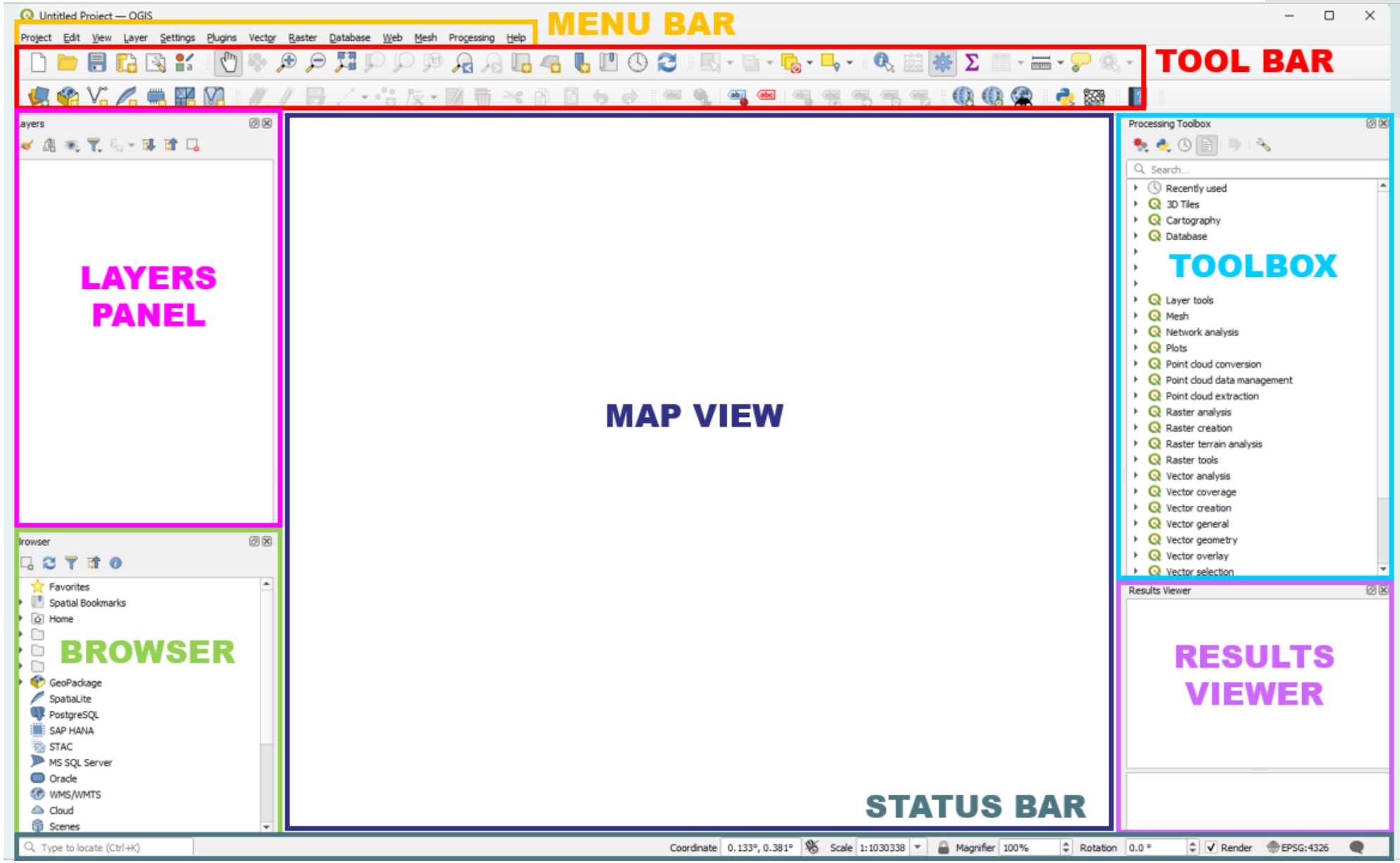
Understand *QGIS* interface

*your interface may look different

- Menu Bar
- Toolbar
- Layers Panel
- Browser
- Map View
- Status Bar
- Toolbox
- Results Viewer



Understand *QGIS* interface

Menu Bar:

Horizontal bar at the top providing asvess to various functions and tools

(Project management, Edit, Plugins, Vector & Raster tools, etc.)

Toolbar:

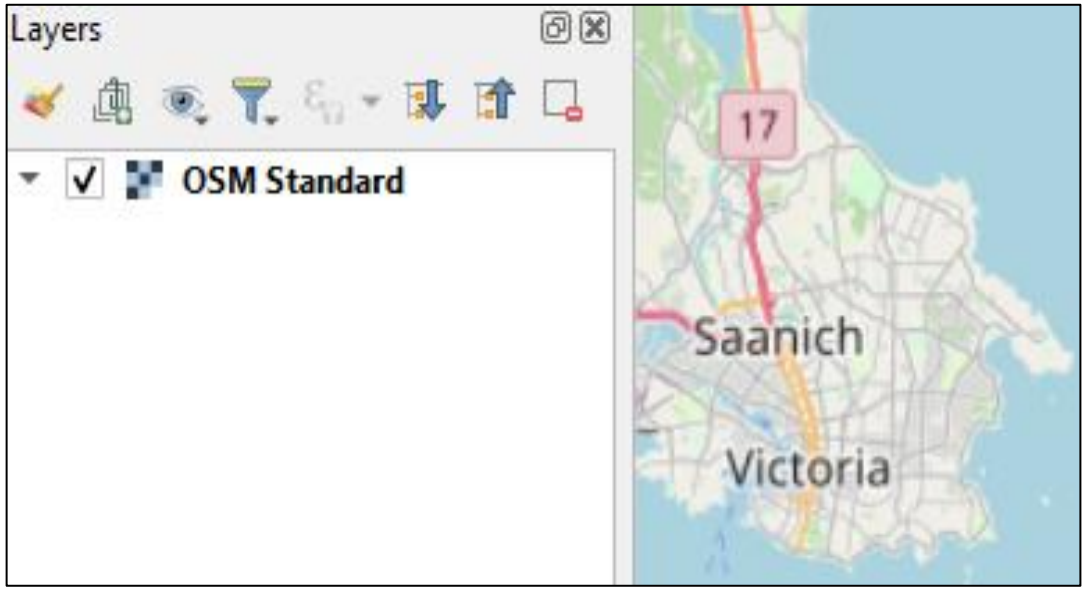
Contains icons for frequently used tools, such as Add Data, Pan, Zoom, Identify, etc.

Quick access to essential operations.

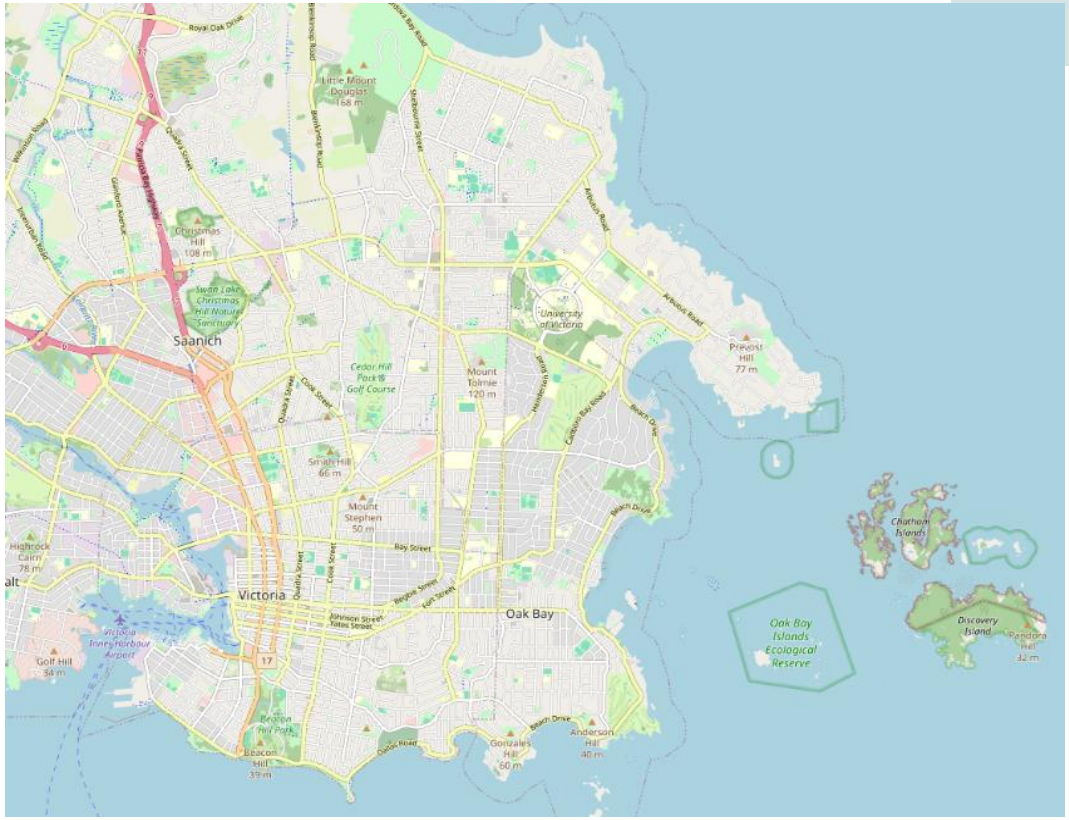
Layers Panel:

Displays all active **Layers** in the project.

Allows users to organize, manage visibility and access properties of layers



Understand *QGIS* interface



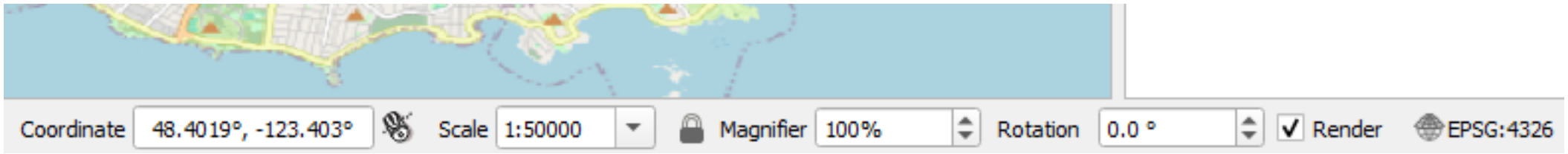
Map View:

The central area where spatial data is displayed.

Users can interact with the map, visualize layers and analyze spatial relationships.

Status Bar:

Located at the bottom, it provides information about current project: coordinate display, scale and CRS settings.



Toolbar essentials

New project, open, and save

Pan

zoom

“**zoom full**”

Add data

Activity #1

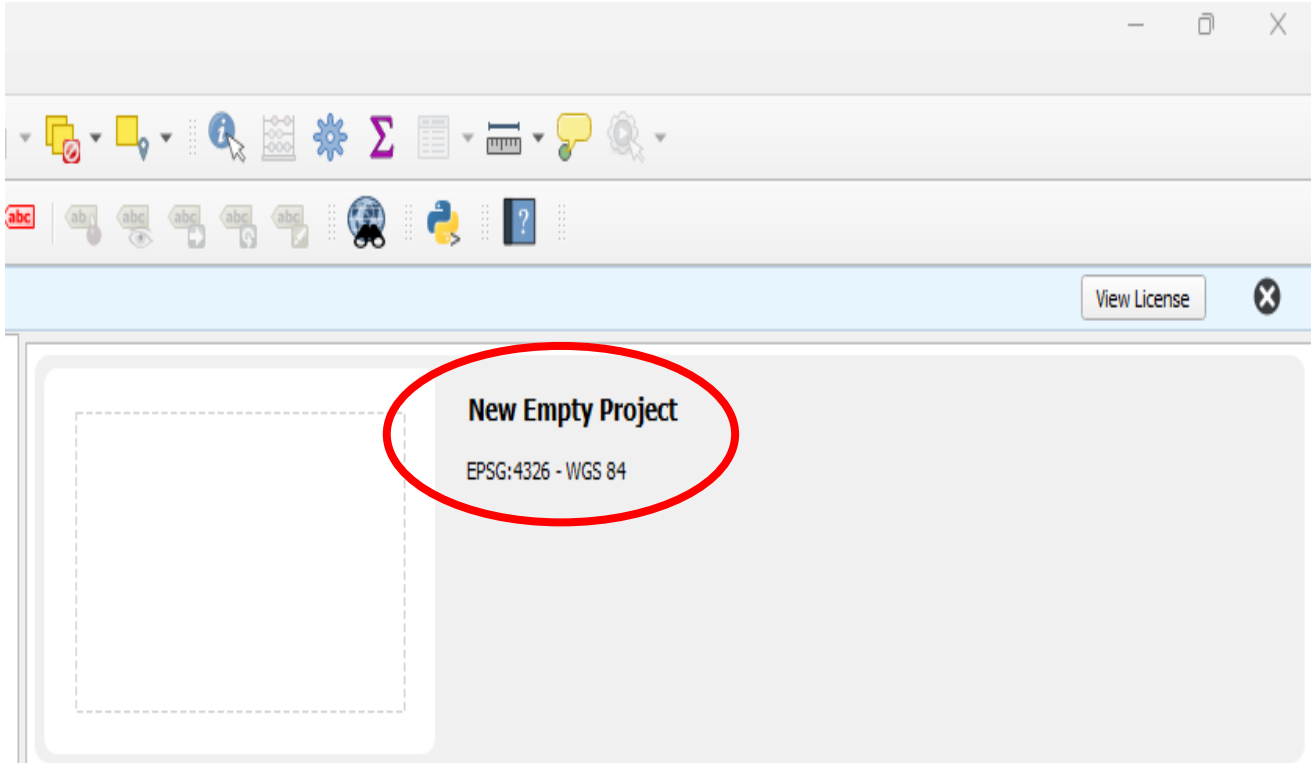
Start *QGIS* *(if you haven't already)*

Download workshop data

- Extract /unzip the .zip file
- Save it where you can find it…

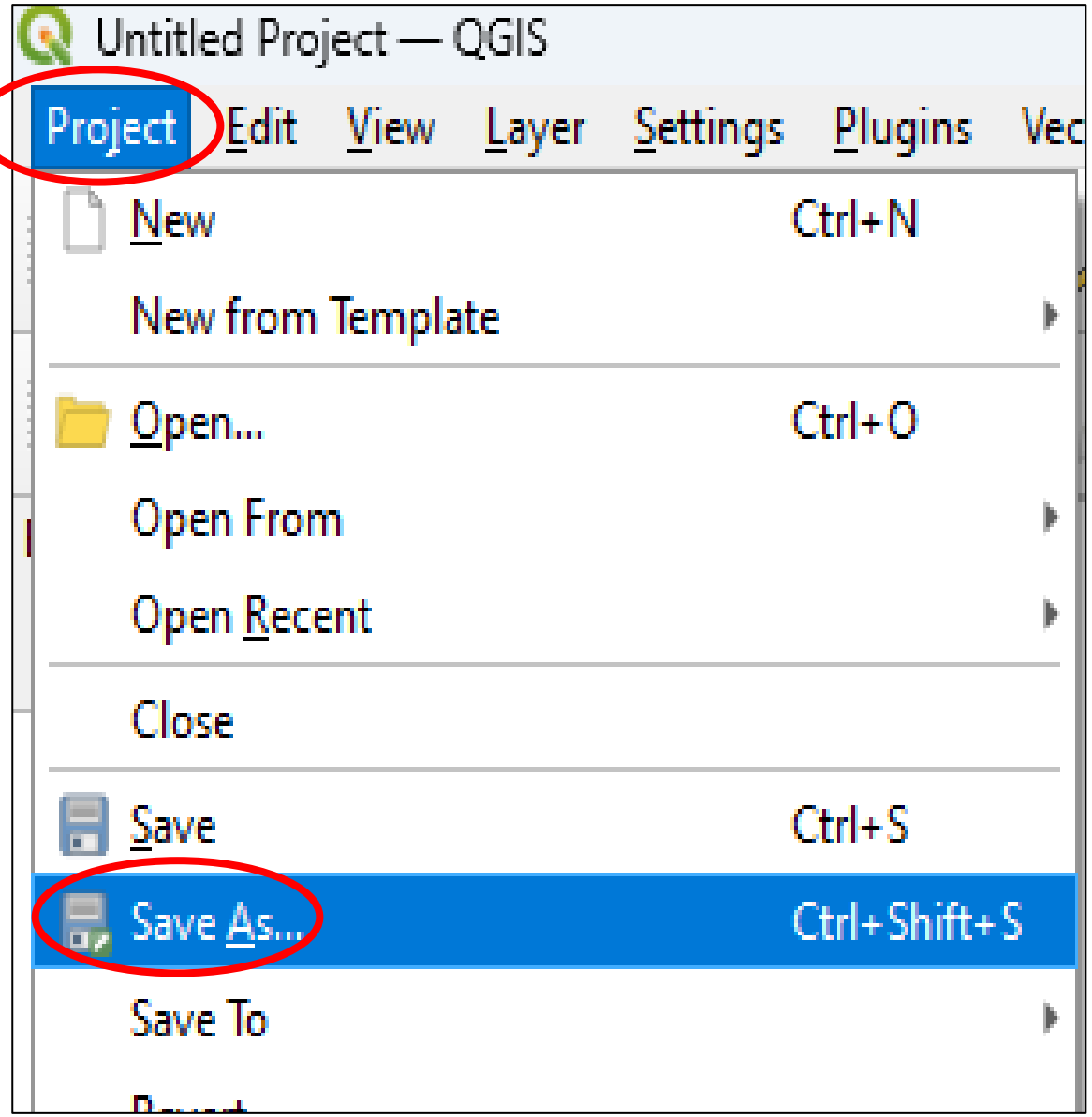
Open QGIS (your version may be different)

- Double click on *New Empty Project*

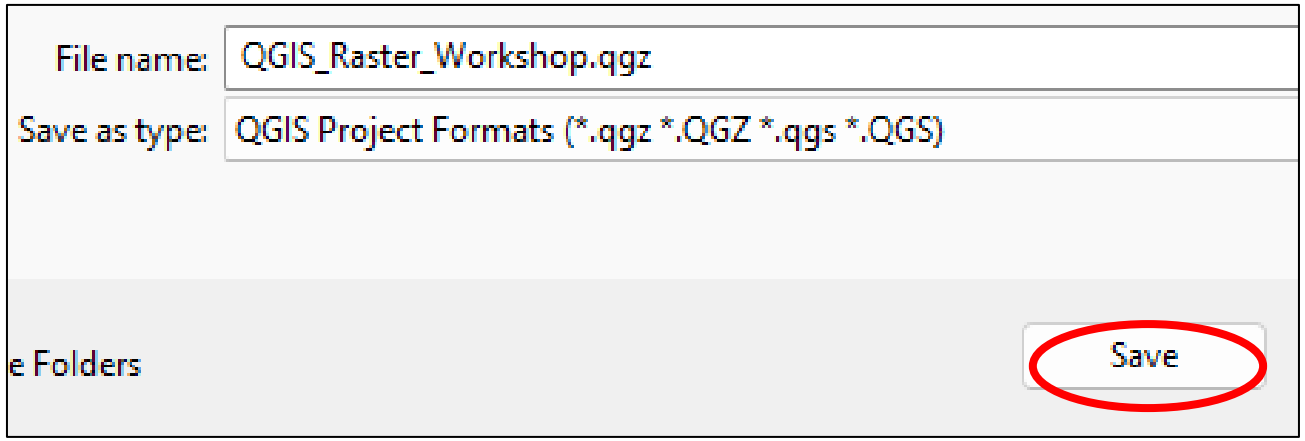


Note: New *QGIS* projects open with Geographic Coordinate System (GCS) **EPSG:4326**

Save new project

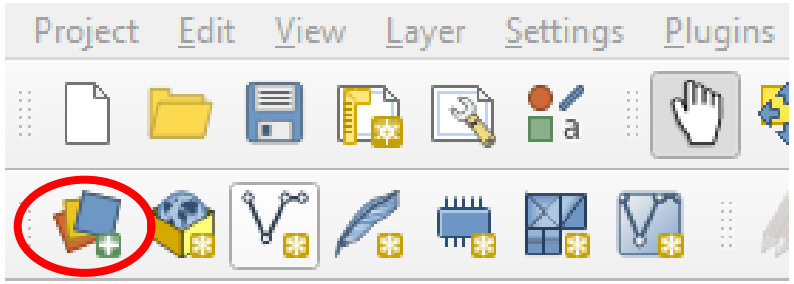


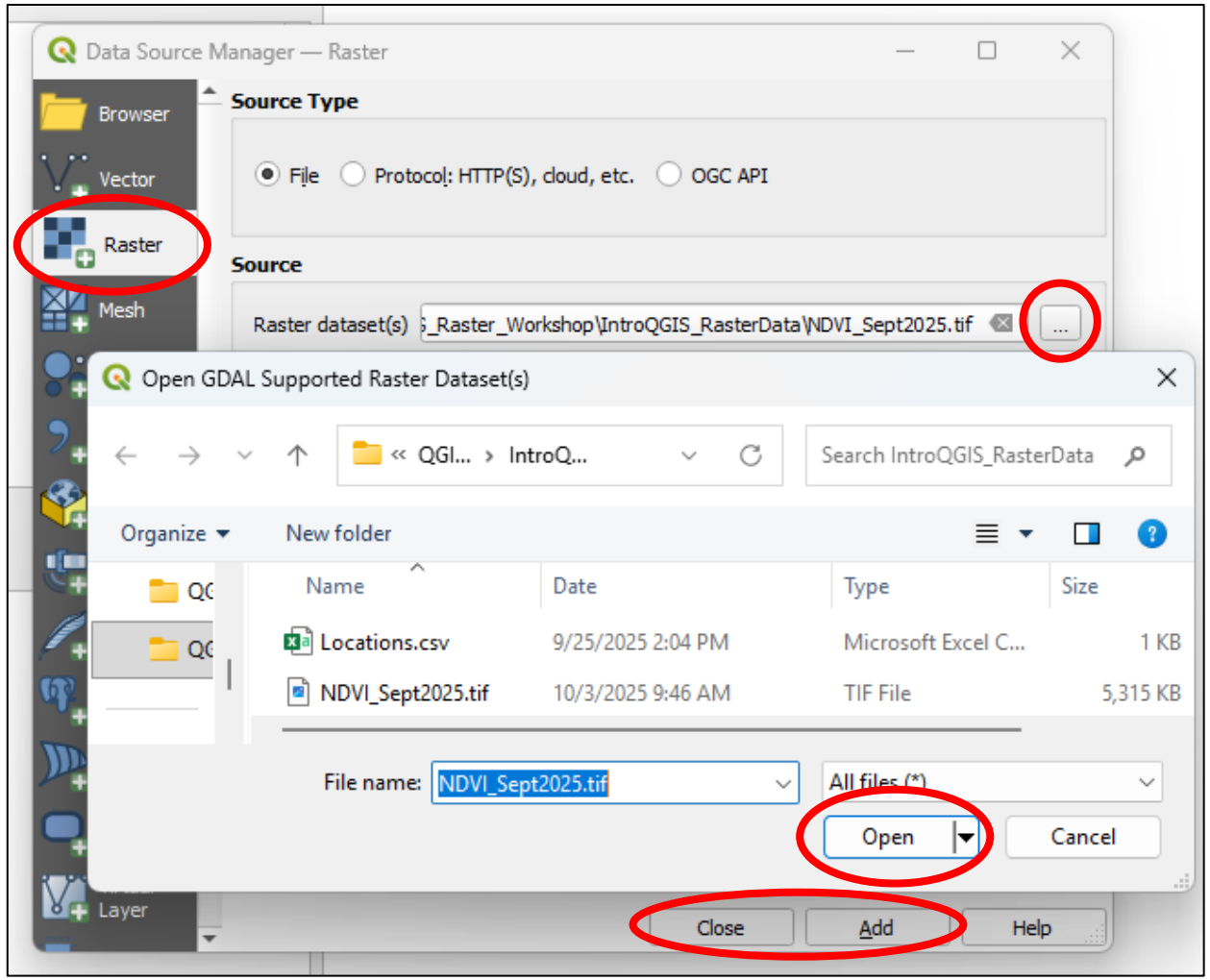
- In *QGIS* Menu Bar, select *Project* then *Save As*
- Name your project "QGIS_Raster_Workshop"
- Save your project as **.qgz** to where you can find it



Note: .qgz is the project file format for *QGIS*

Add NDVI Raster Layer

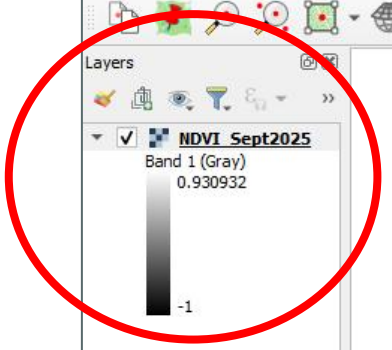




- Select *Open Data Source Manager*
- Select the *Raster* tab
- Under the "Source" heading click the ...
- Navigate to workshop data
- Select **NDVI_Sept2025.tif,** Open
- **Add** and **Close**

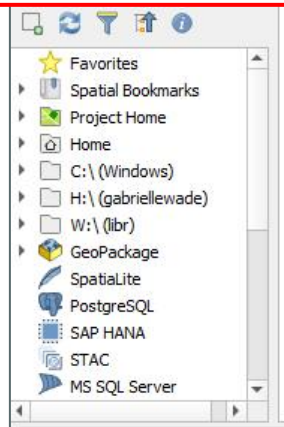
CHECK IN #1

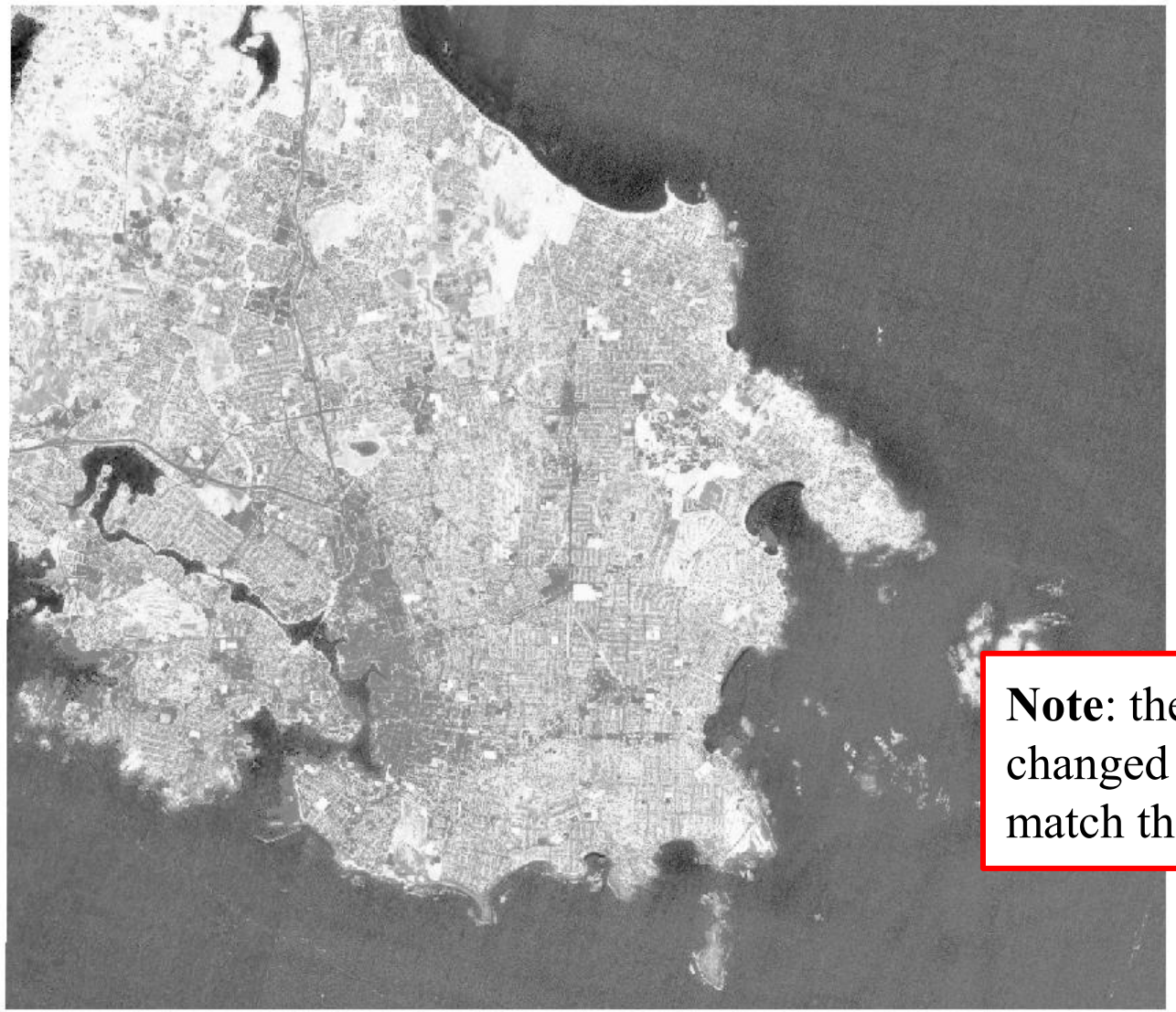
Save your work!



- *Layers* now includes **NDVI_Sept2025** raster
- Gradient represents range of NDVI values in the data

If you need help, ask!





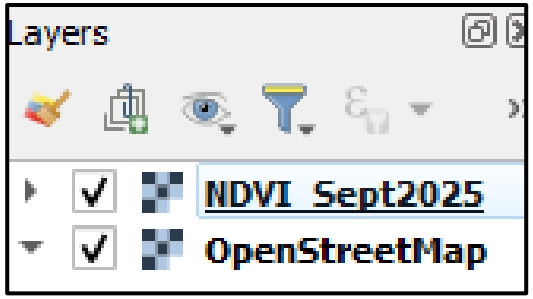
Note: the project PCS has changed to **EPSG:3157** to match the NDVI raster CRS

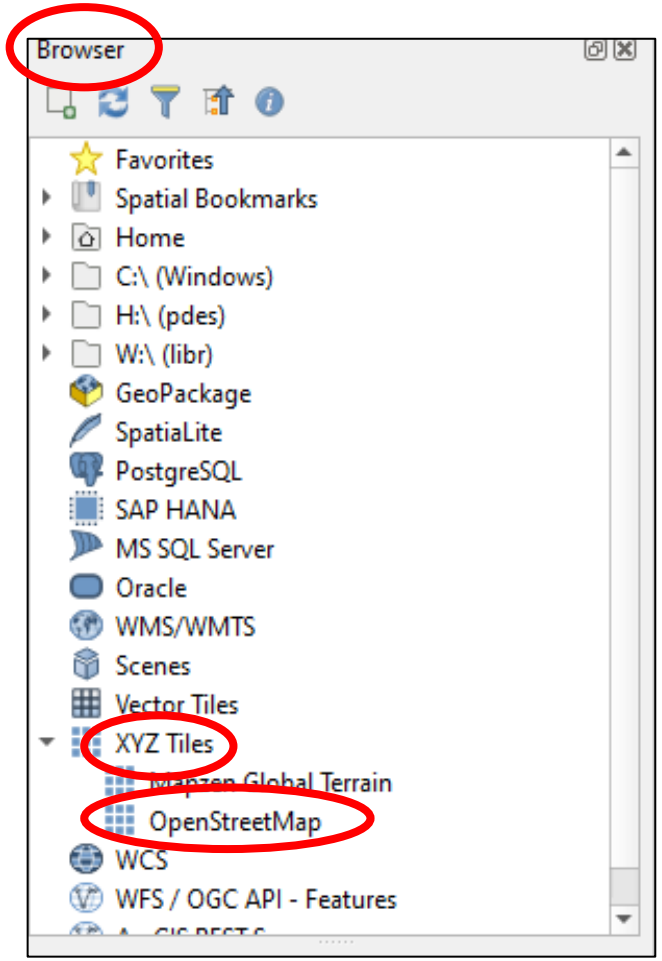
Activity #2

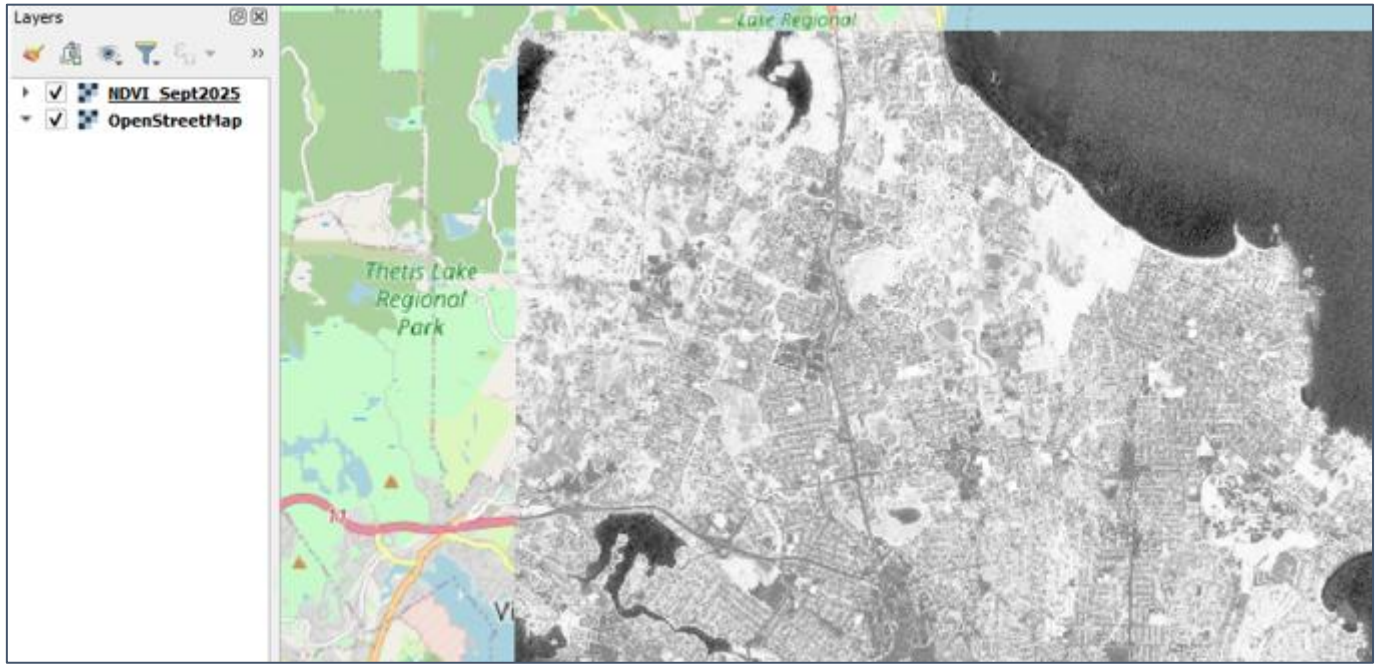
Add a Basemap

Add a **basemap** for location context for **NDVI_Sept2025**

- In the 'Browser', expand *XYZ Tiles*
- Double-click *OpenStreetMap* to add to map (If a warning appears, press **OK)**
- Click and drag to move *OpenStreetMap* layer below **NDVI_Sept2025**



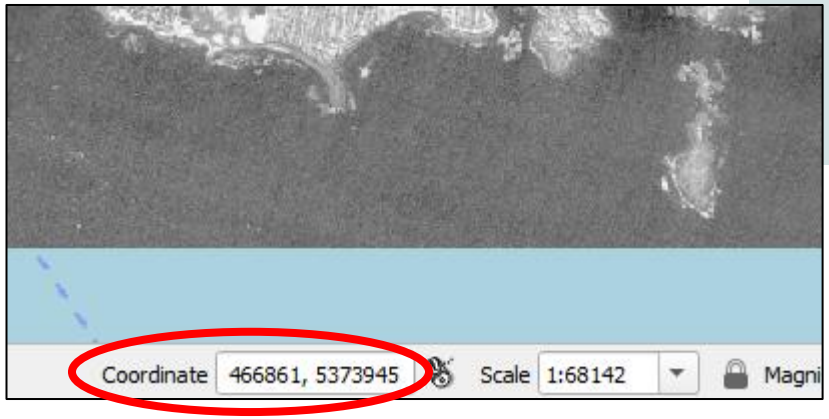


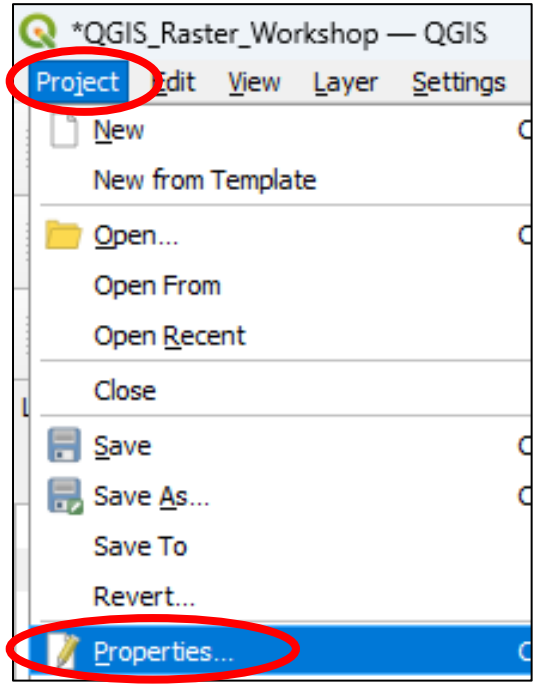


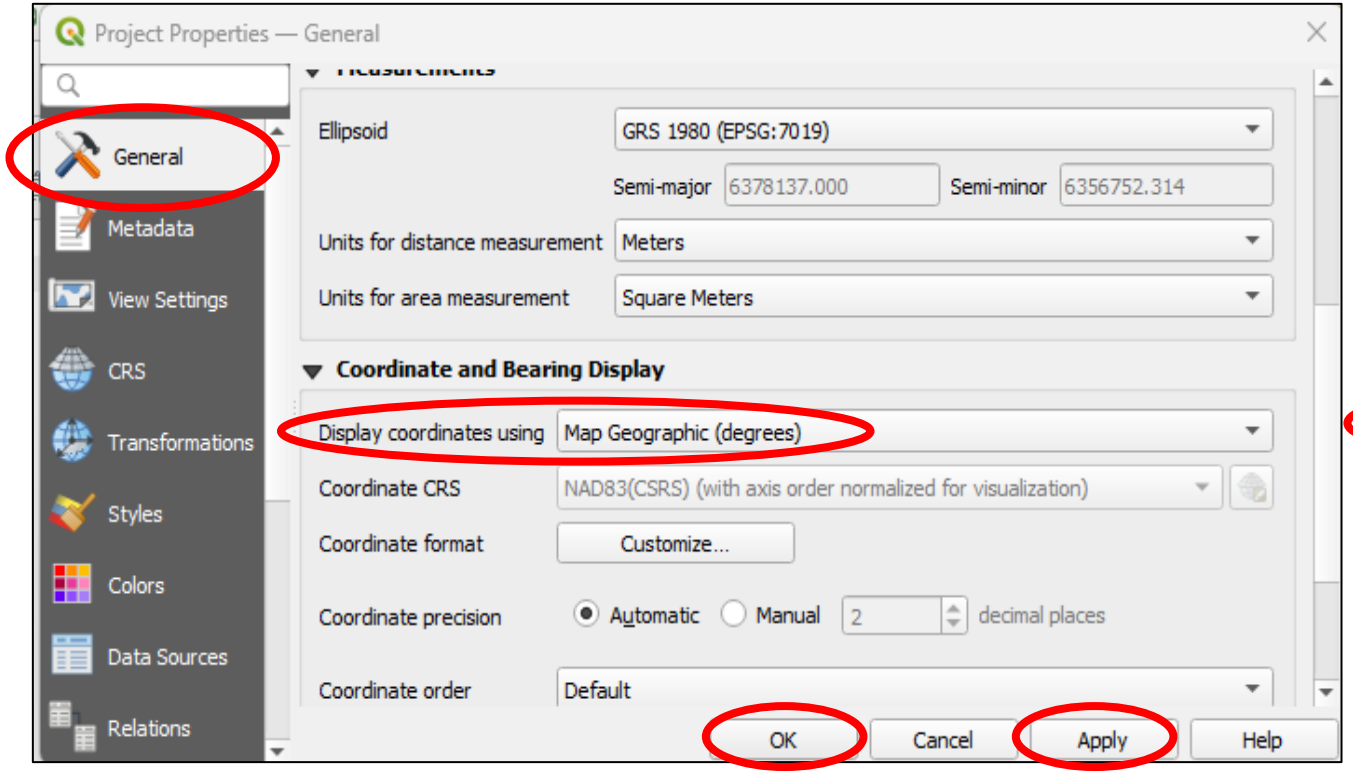
Change coordinate settings

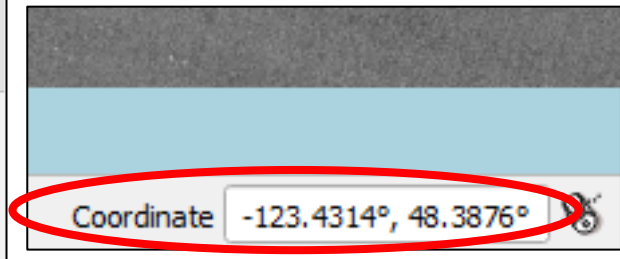
QGIS defaults to *Coordinate* in the Status Bar shown in metres. Change settings so coordinates show in decimal degrees when moving mouse around the map

- In the Menu Bar, go to *Project* then *Properties*
- In the *General* tab, change *Display coordinates using* to **Map Geographic (degrees)**
- **Apply** and **OK**

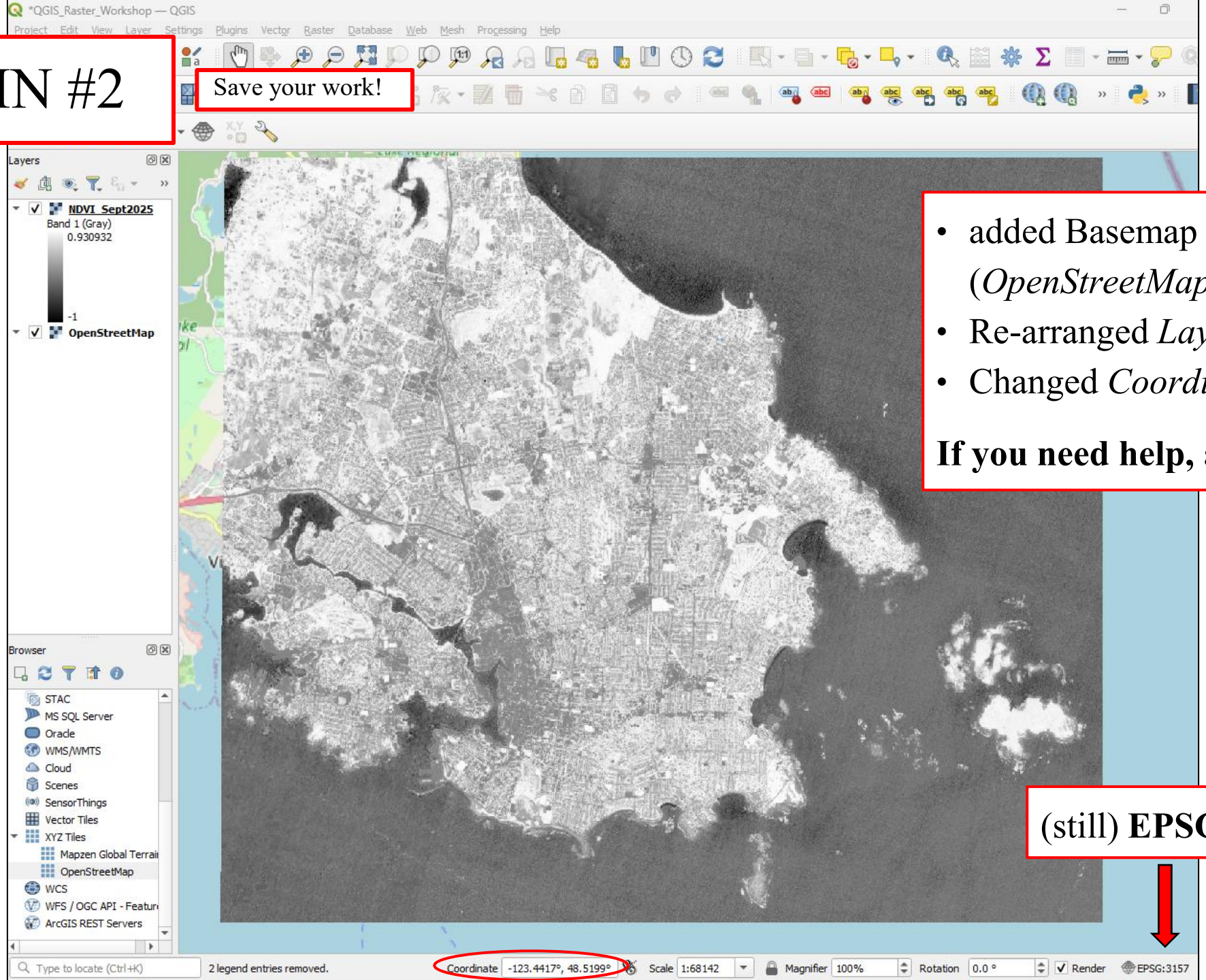








CHECK IN #2



- added Basemap (*OpenStreetMap*)
- Re-arranged *Layers*
- Changed *Coordinate* display

If you need help, ask!

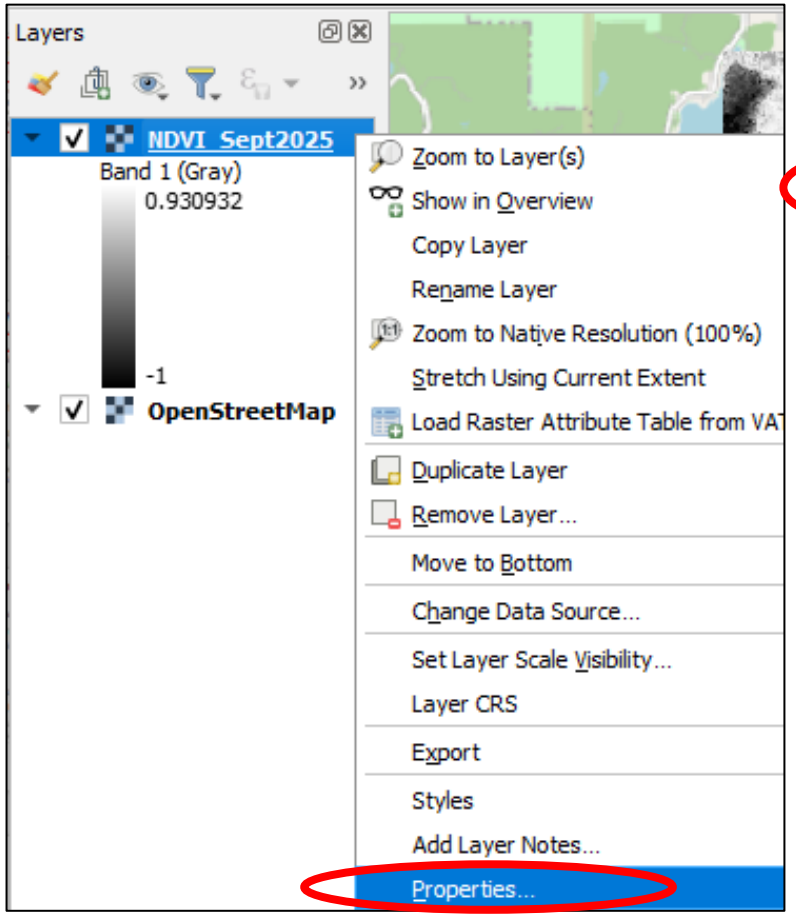
(still) **EPSG:3157**

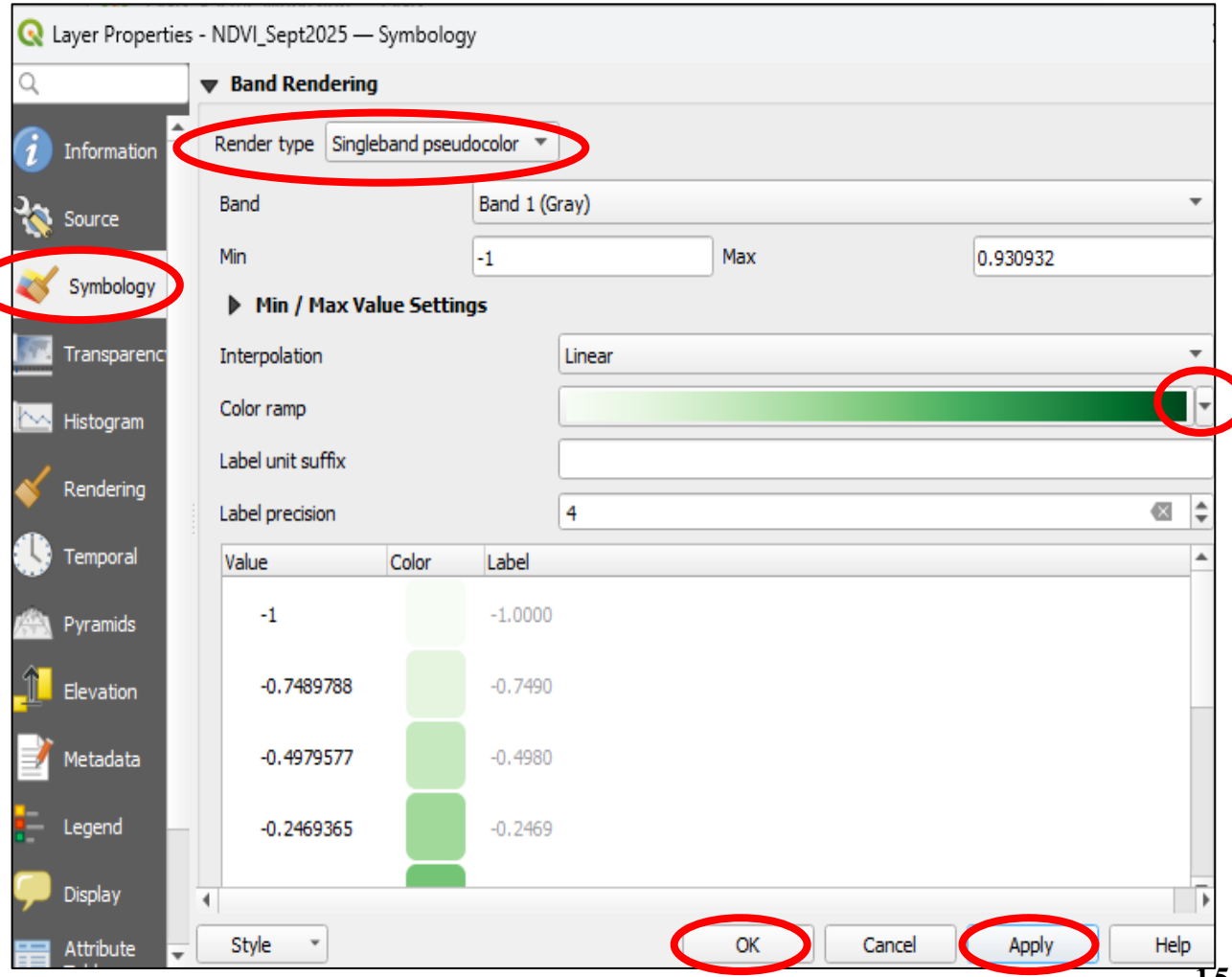
Activity #3

Change NDVI Raster Symbology

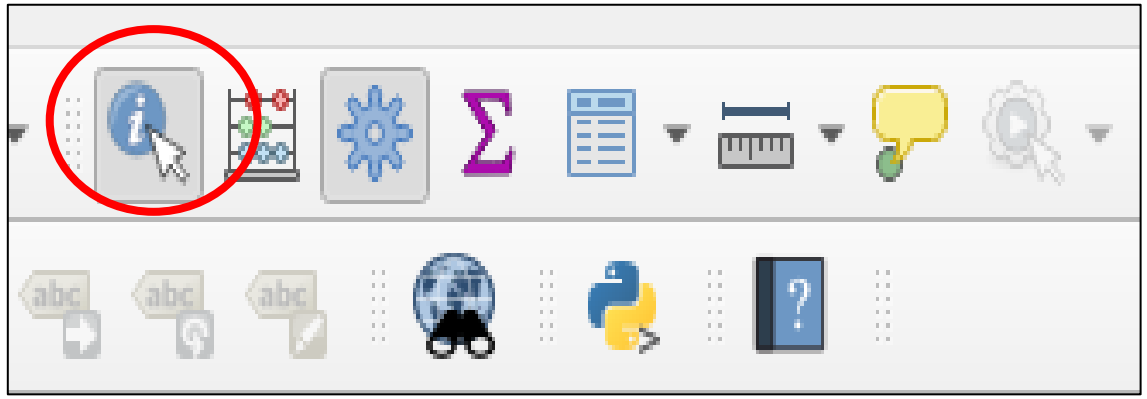
- In the *Layers* panel, right-click **NDVI_Sept2025**
- Select *Properties* then *Symbology*
- Change Render type to "Singleband pseudocolour"
- Change Color ramp to "Greens" using drop-down arrow
- **Apply** and **OK**

Note: this raster has NDVI values from -1 to 0.93

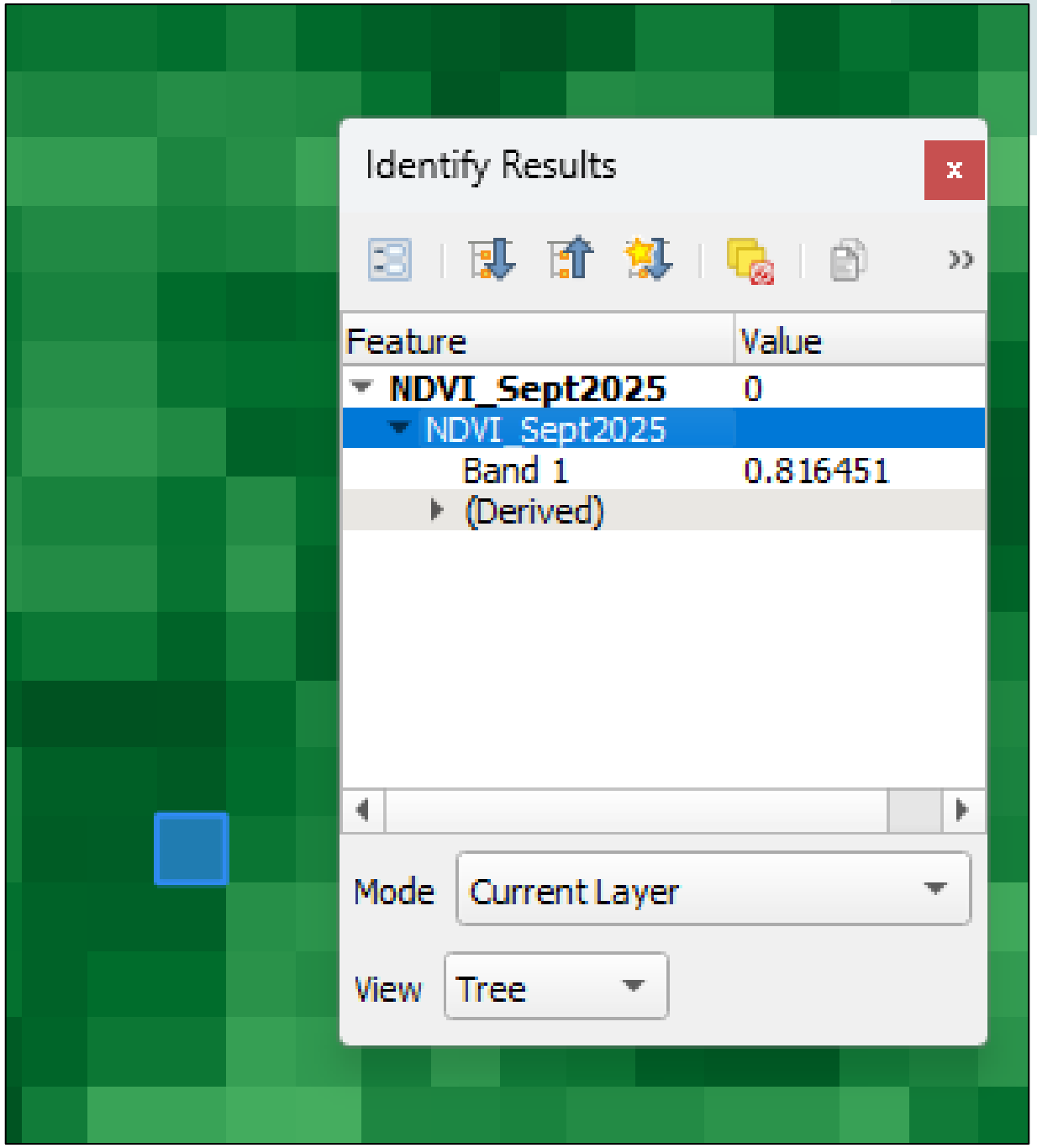




Explore the NDVI raster

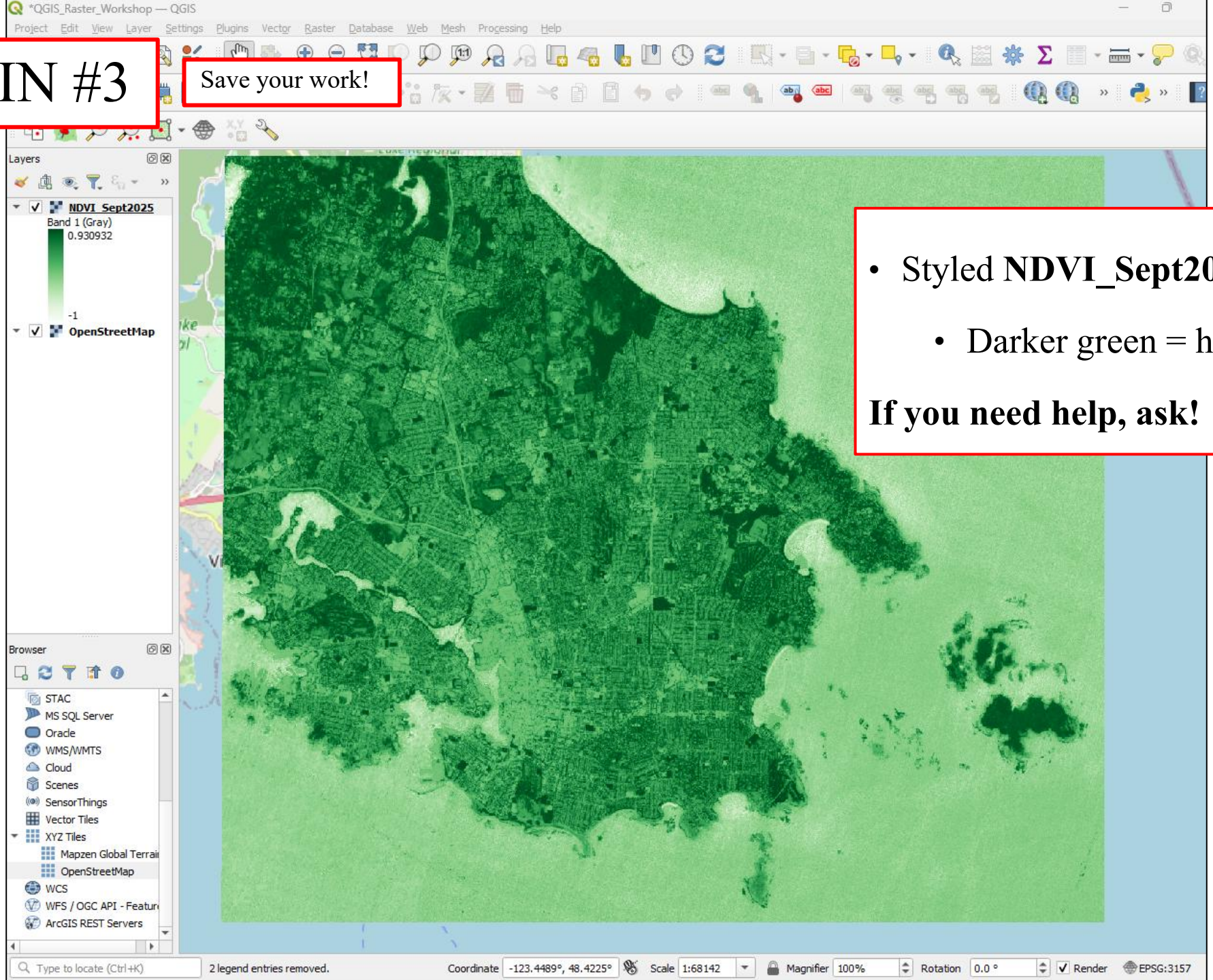


- Select the *Identify Features* tool
- With **NDVI_Sept2025** selected, this tool shows the NDVI values for any pixel in the data set
- 'Band 1' value represents **NDVI** for the 10m x 10m pixel



CHECK IN #3

Save your work!



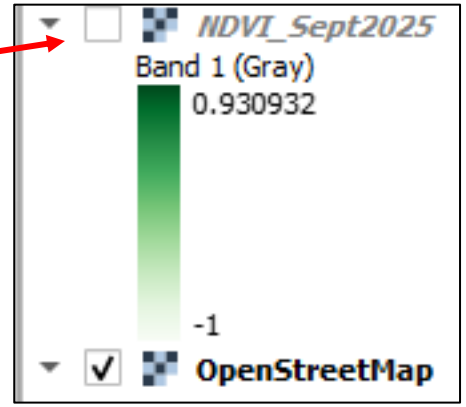
- Styled **NDVI_Sept2025**
  - Darker green = higher NDVI

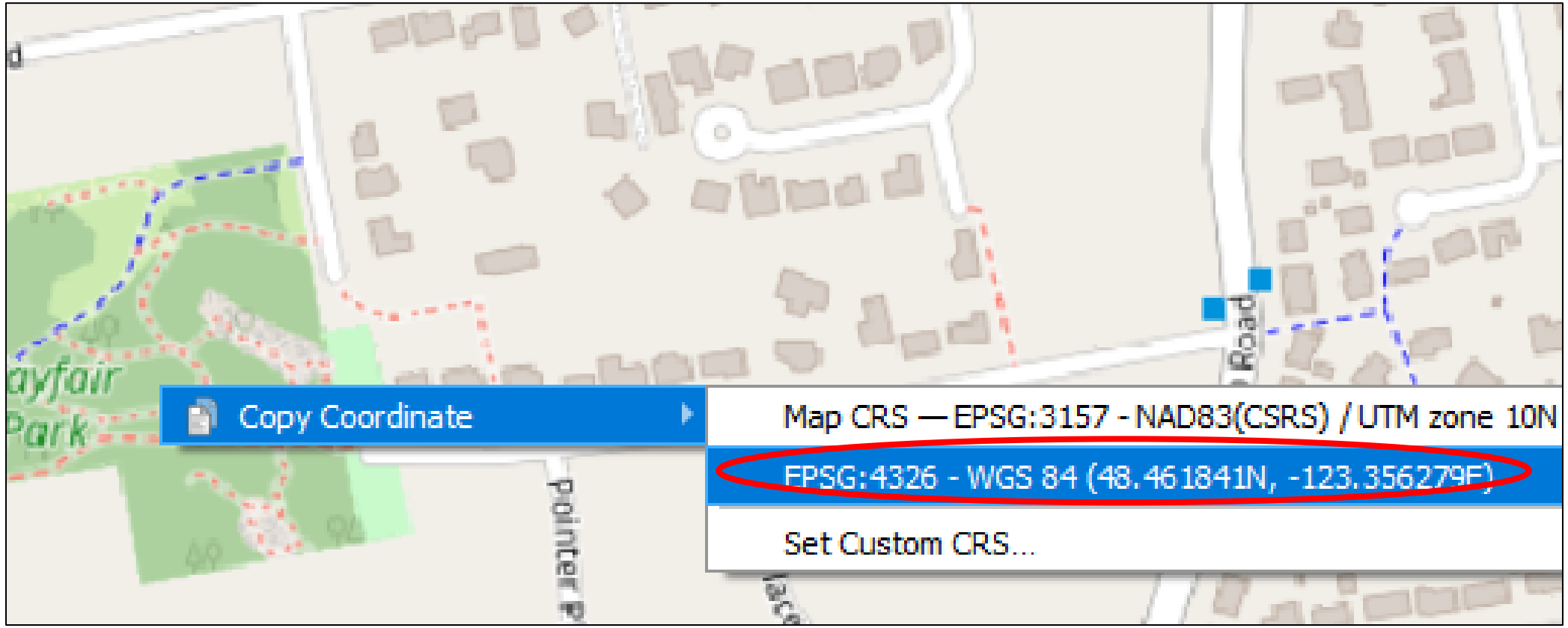
If you need help, ask!

Activity #4

work with Locations.csv point data

- Go to a location in Victoria (within *QGIS* map area)
  - If needed, click off **NDVI_Sept2025** to see the basemap
- Right-click on the location and copy coordinate in **EPSG:4326**
  - Must have *Pan* tool selected
- Paste these Coordinates somewhere
  so you can copy each coordinate individually (see next slide)





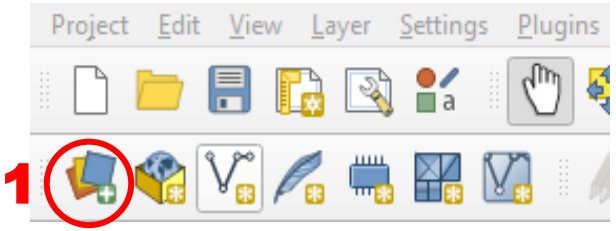
work with Locations.csv point data

- Navigate to workshop data and open **Locations.csv** in Excel or Google Sheets
- Note Name, Latitude, and Longitude columns
- In the row with "**Your Location**" paste in your **Latitude** and **Longitude** and put the name of your location
- Save the .csv **(must be .csv)**

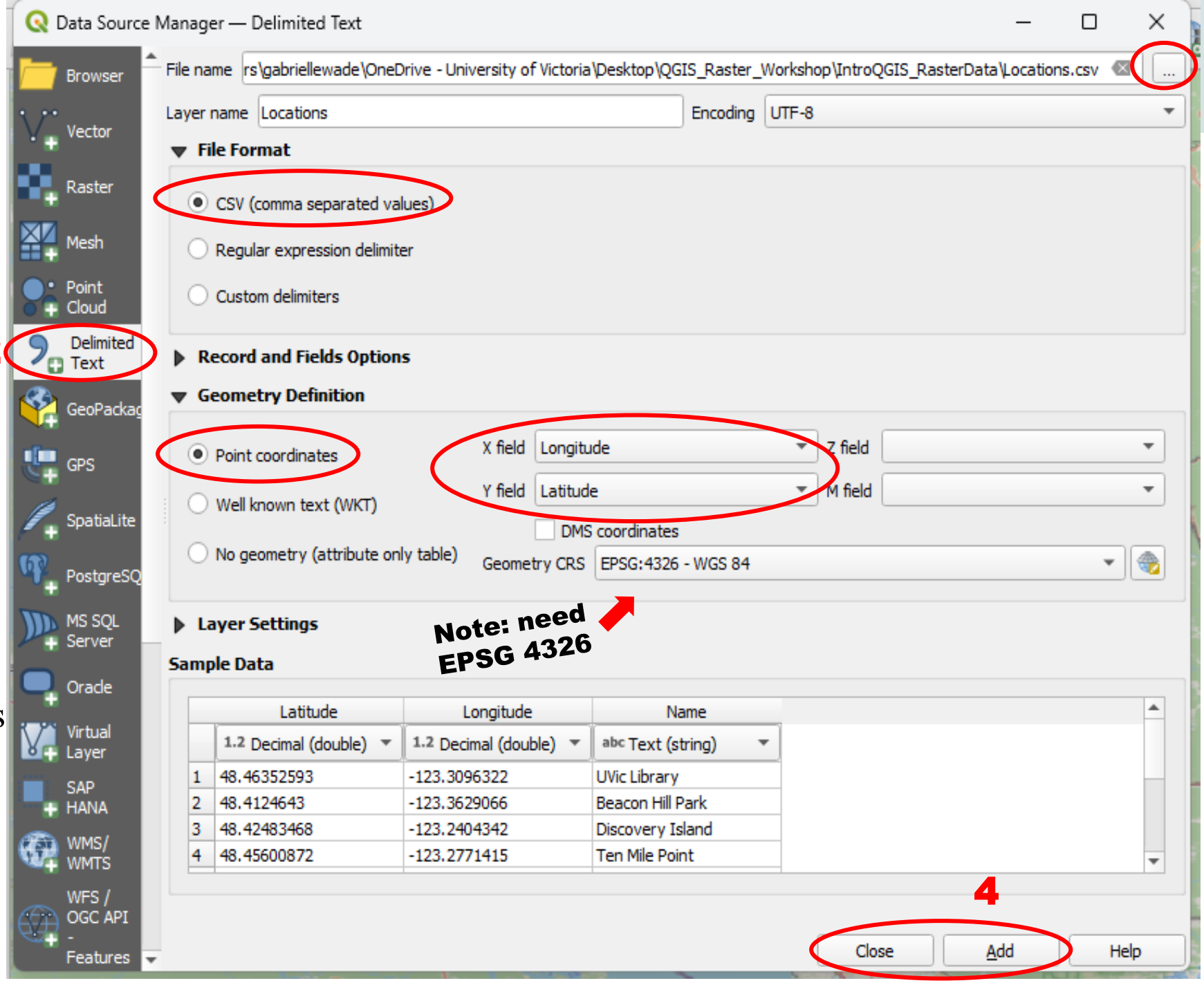
	A	B	C
1	**Name**	**Latitude**	**Longitude**
2	UVic Library	48.46352593	-123.3096322
3	Beacon Hill Park	48.4124643	-123.3629066
4	Discovery Island	48.42483468	-123.2404342
5	Ten Mile Point	48.45600872	-123.2771415
6	Gorge Park	48.44648803	-123.4050312
7	PKOLS	48.49319581	-123.3444634
8	Saxe Point Park	48.42235865	-123.4179118
9	Willow's Beach	48.43307025	-123.3045656
10	Your Location		

Add the Locations.csv point data

- Open *Data Source Manager*

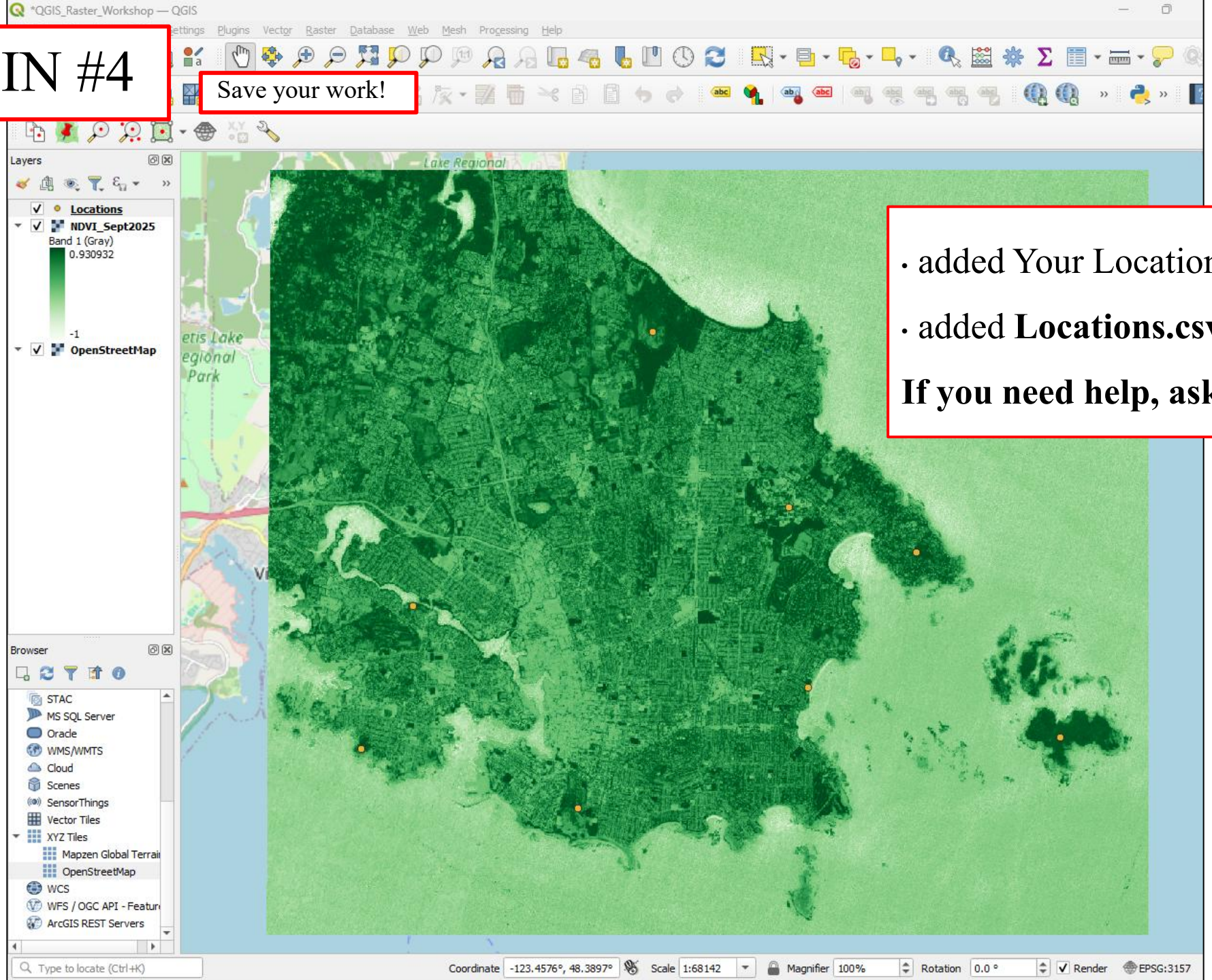


- Select *Delimited Text*
- Navigate to workshop data
- Select and Open **Locations.csv**
- Set other requirements
- **Add** (if a warning pops up, pres OK) then **Close**



CHECK IN #4

Save your work!



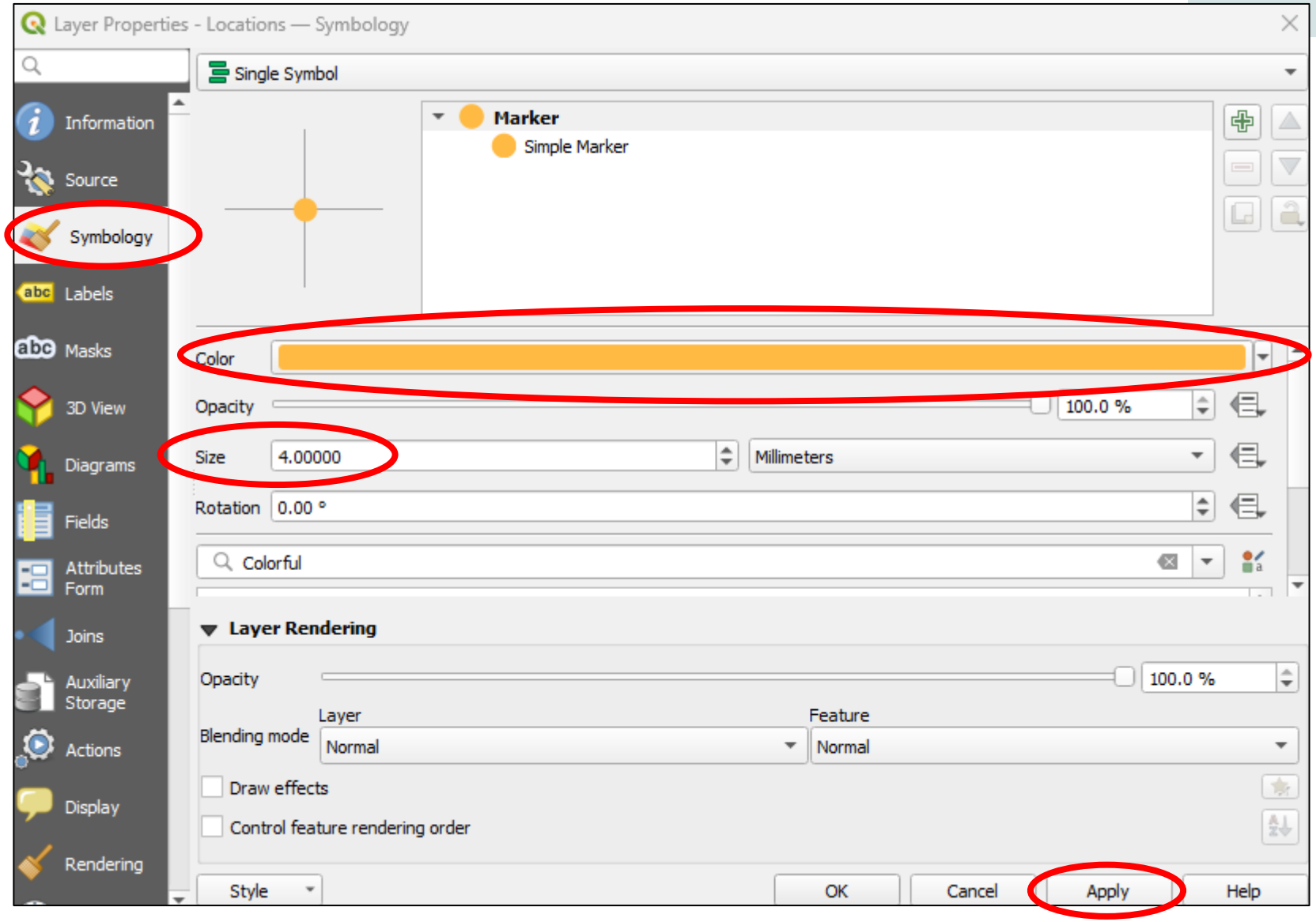
- added Your Location to the .csv file
- added **Locations.csv** to *QGIS*

If you need help, ask!

Activity #5

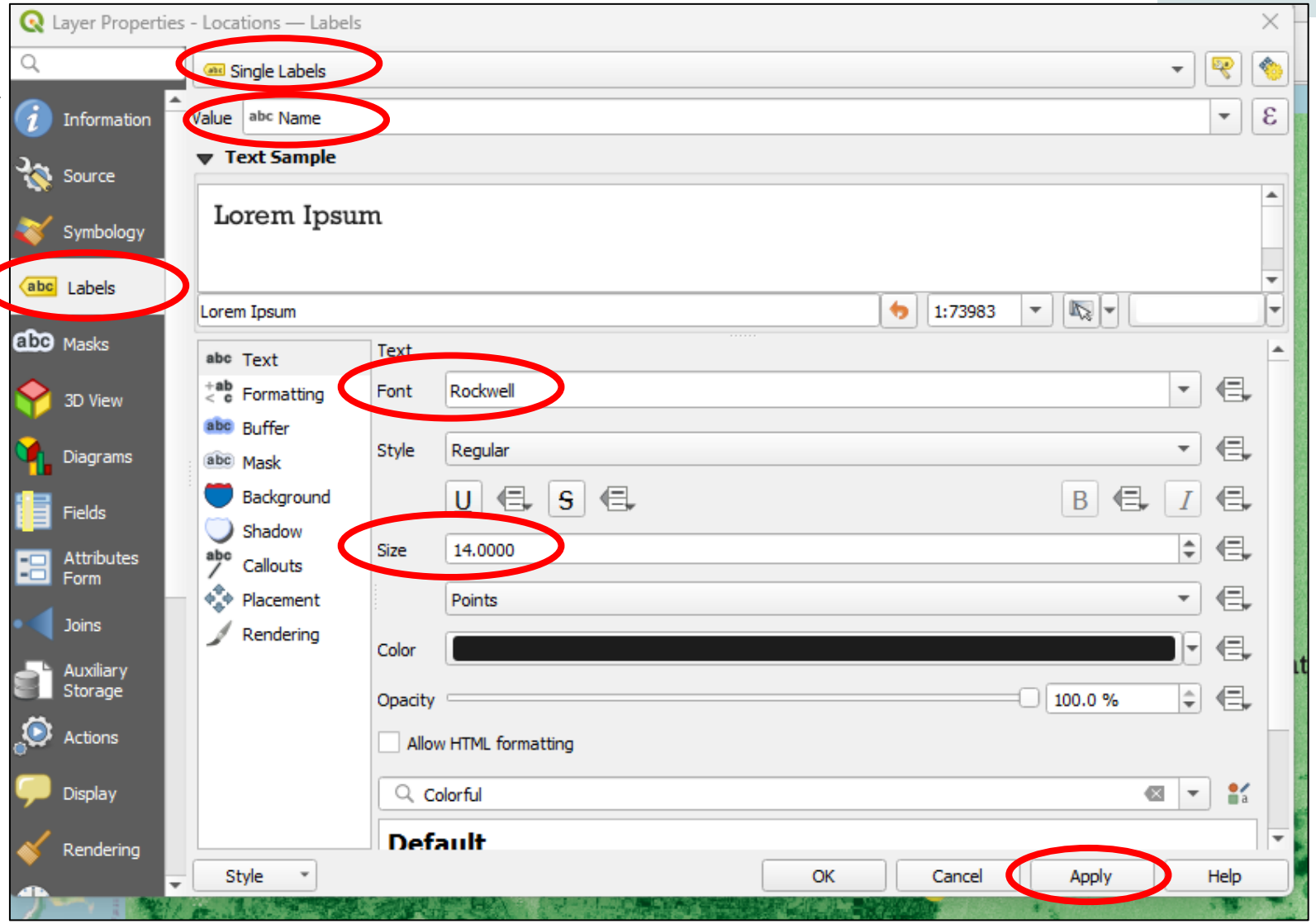
Edit Locations.csv symbology

- In *Layers* panel, double-click **Locations** to open *Properties*
- Select *Symbology*
- Change *Size* to 4.0
- Change *Colour* to a visible colour
- **Apply** but not OK yet



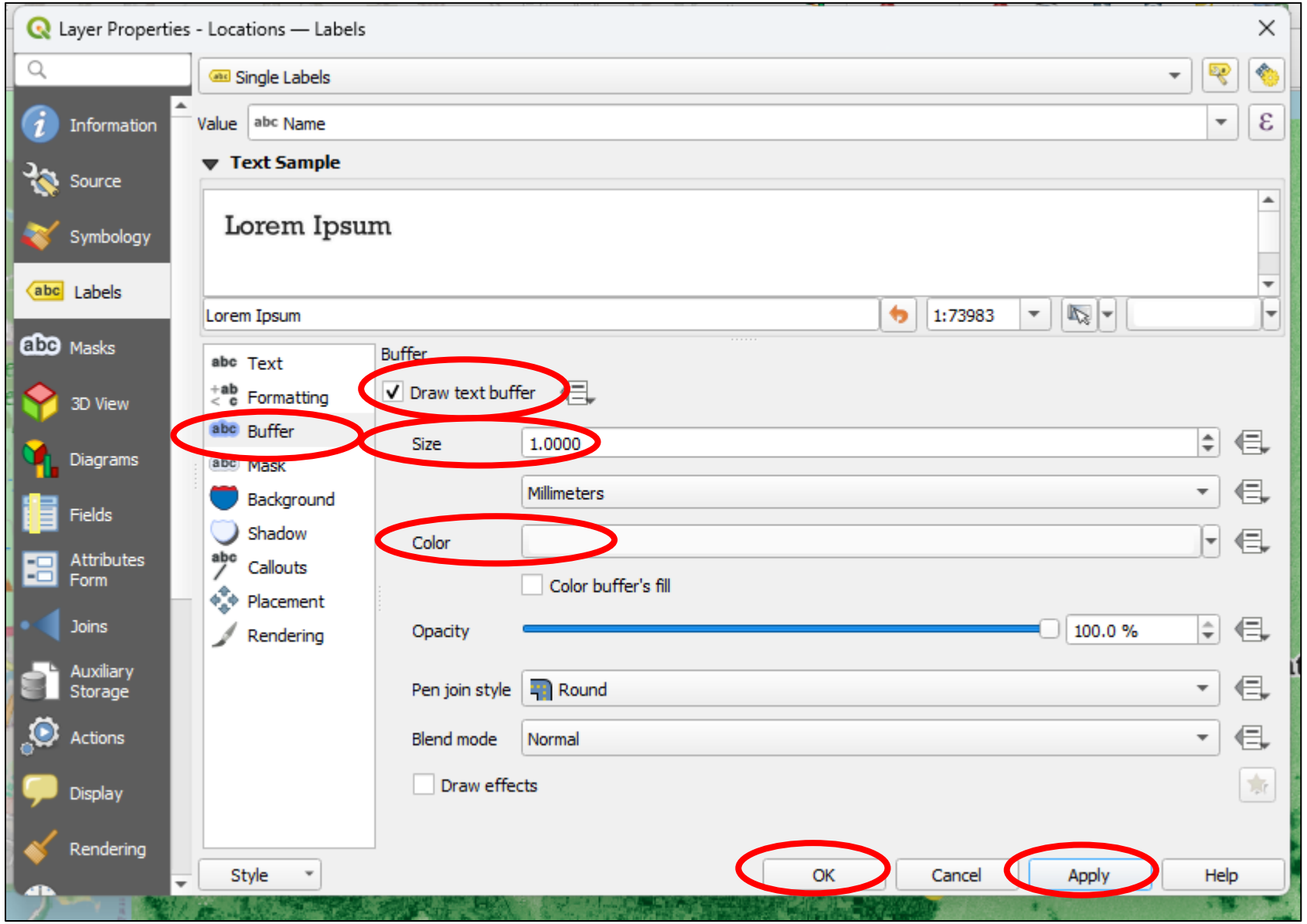
Label Locations.csv

- While still in *Properties*, select *Labels* tab
- Select "Single Labels" from the drop-down
- *Value* should be "Name"
- Change *Font* and *Size* if desired
- *Colour* should be black
- **Apply** but not OK yet



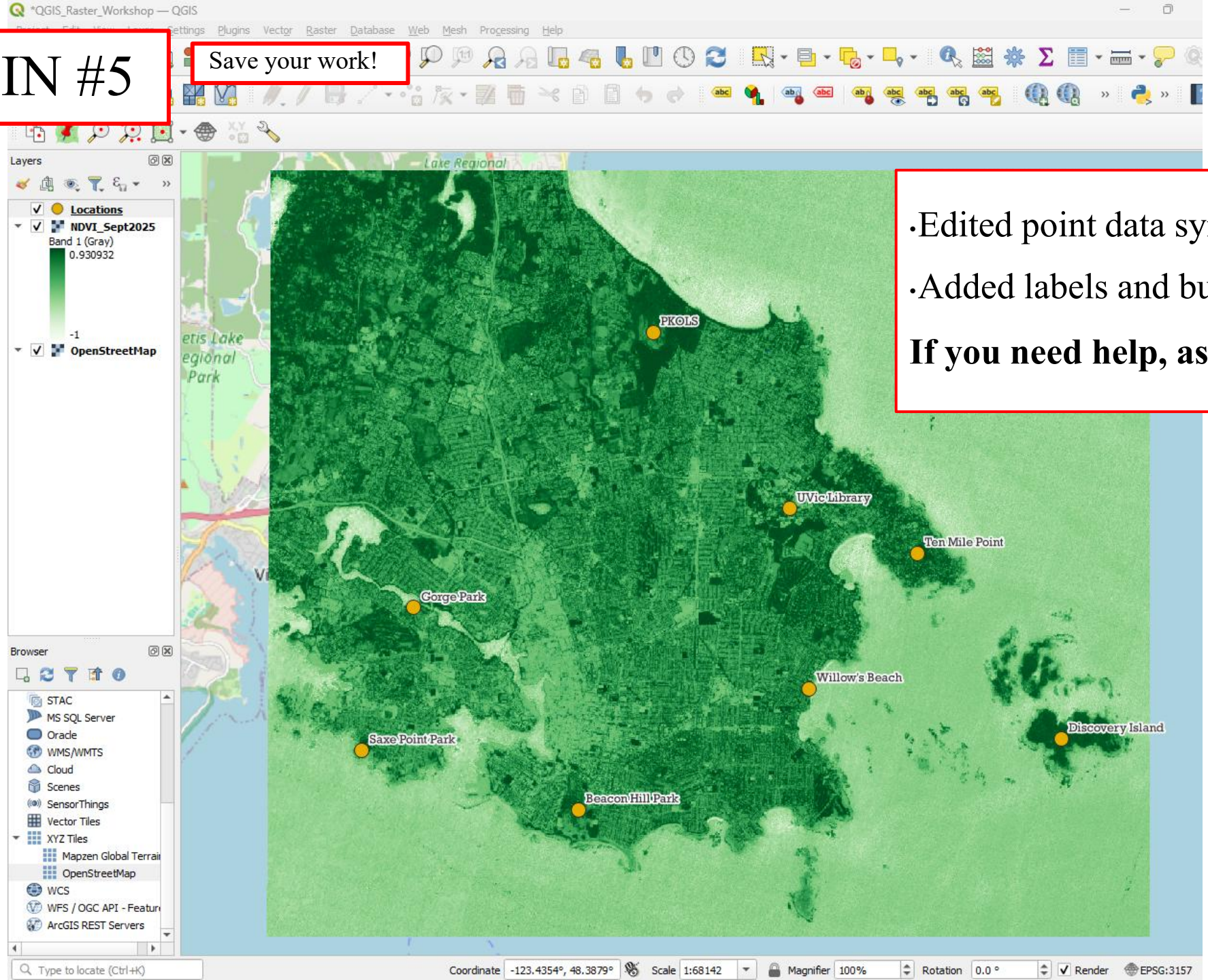
Buffer labels (for Locations.csv)

- While still in *Labels,* select "Buffer"
- Check "Draw text buffer" box
- *Size* 1.0 and *Colour* white
- **Apply** and **OK**



CHECK IN #5

Save your work!



- Edited point data symbology
- Added labels and buffered them

If you need help, ask!

Activity #6

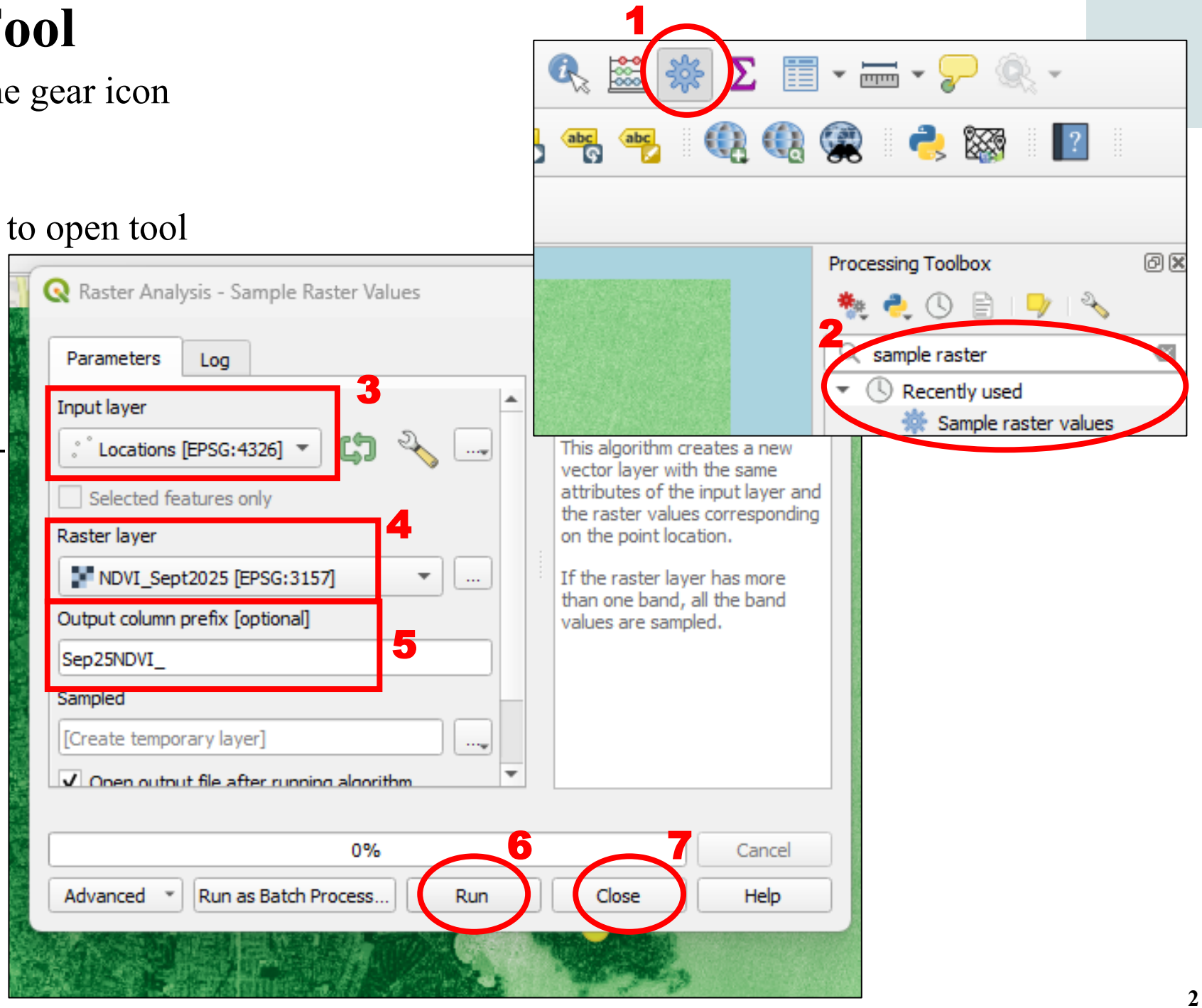
Sample Raster Values Tool

- Open the *Processing Toolbox* with the gear icon
- Search "sample raster"
- Double-click "Sample raster values" to open tool

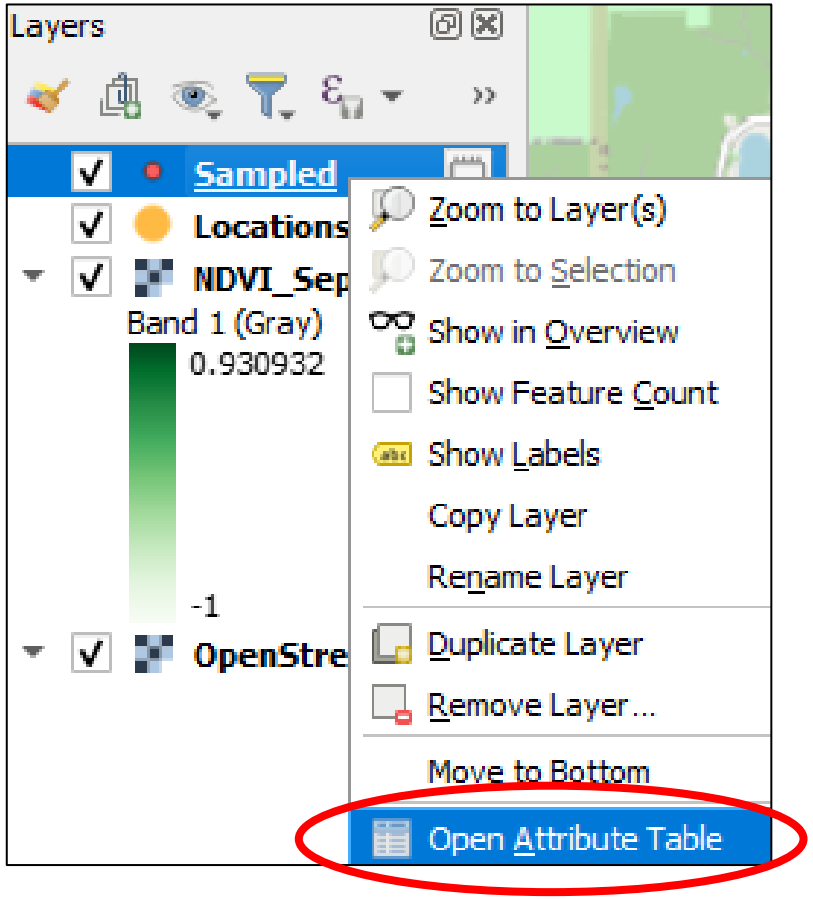
SET

- Input layer: **Locations**
- Raster layer: **NDVI_Sept2025**
- Output column prefix: **Sep25NDVI_**

Run and **Close**



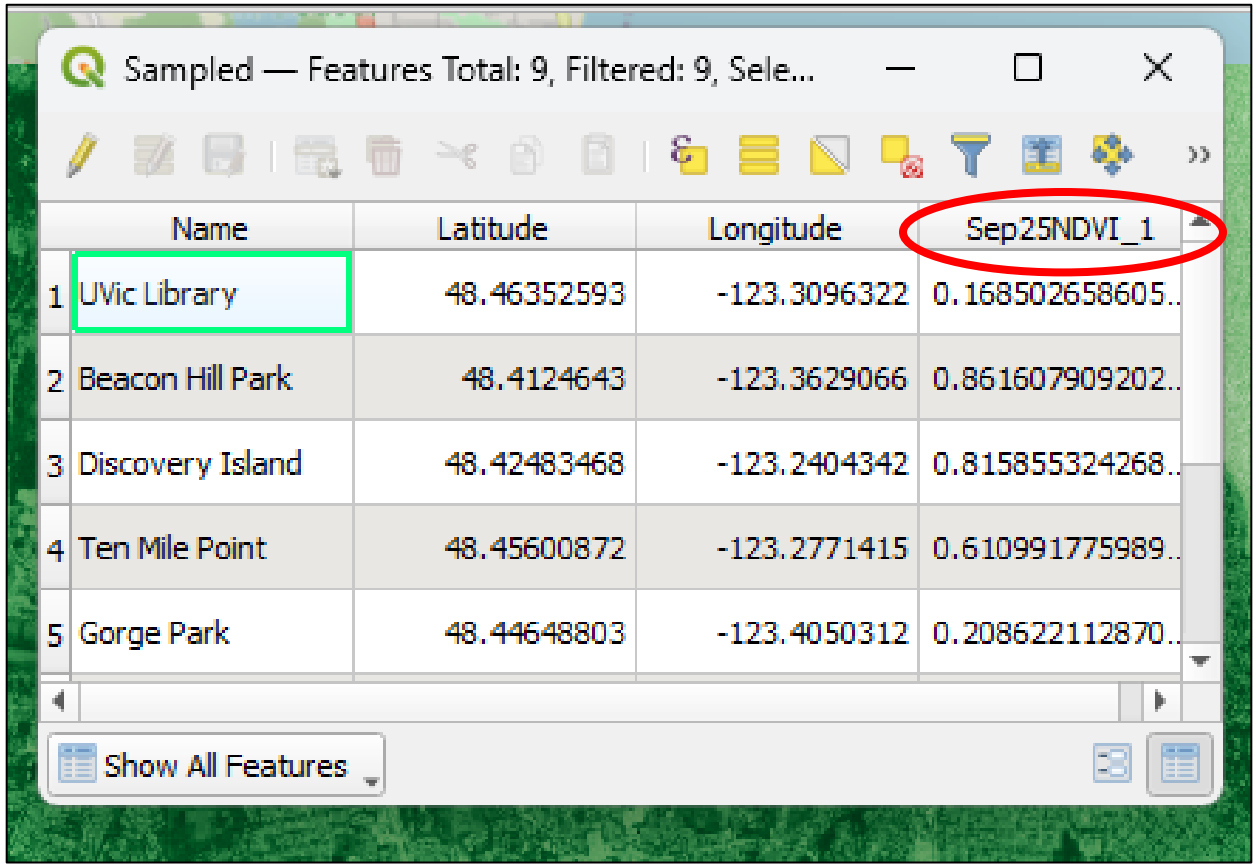
View Sampled (from NDVI raster) layer



- A new temporary layer called **Sampled** will appear
- Right-click on **Sampled** and select *Open Attribute Table*

This table now contains a column for each sample point where the point was assigned the NDVI value of the raster cell

- Notice Beacon Hill Park has a higher NDVI than UVic Library…



	Name	Latitude	Longitude	Sep25NDVI_1
1	UVic Library	48.46352593	-123.3096322	0.168502658605..
2	Beacon Hill Park	48.4124643	-123.3629066	0.861607909202..
3	Discovery Island	48.42483468	-123.2404342	0.815855324268..
4	Ten Mile Point	48.45600872	-123.2771415	0.610991775989..
5	Gorge Park	48.44648803	-123.4050312	0.208622112870..

CHECK IN #6: If you need help, ask!

Activity #7

Export “quick” map

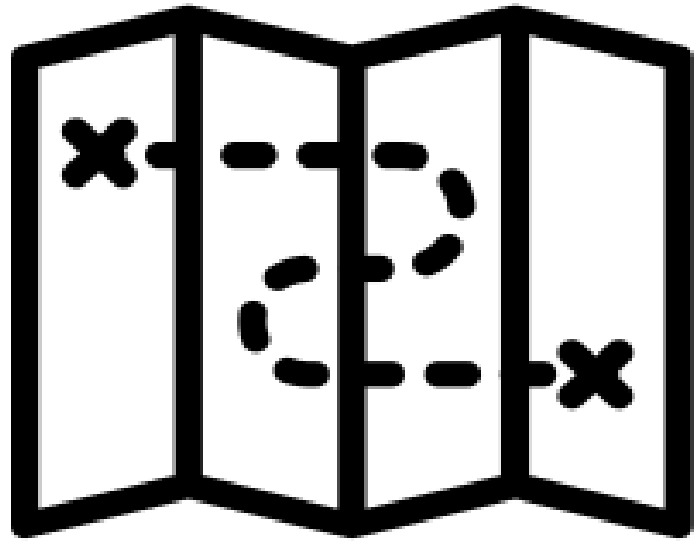
- .pdf
- Several raster files

Note: quick and dirty with limited options

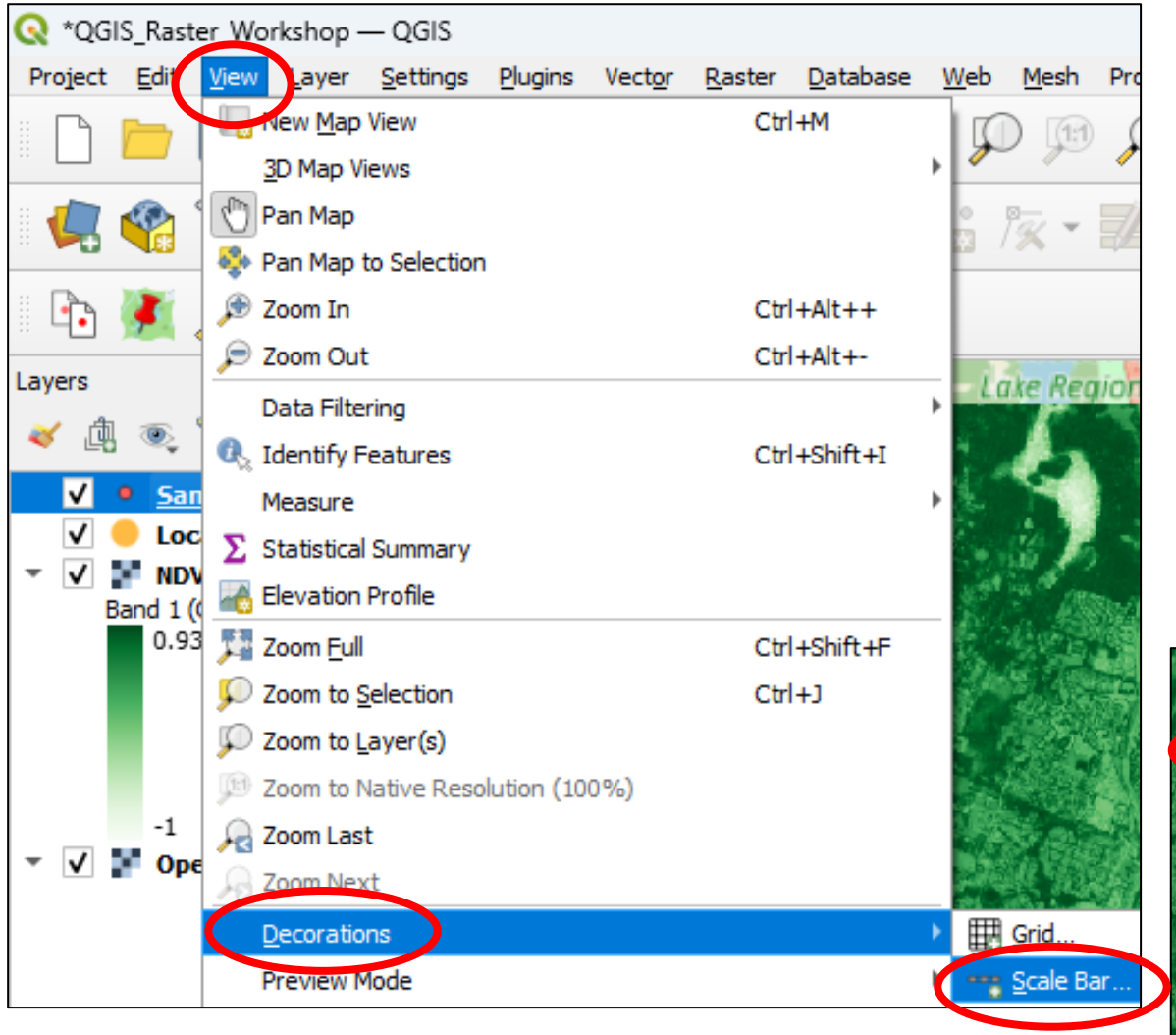
- No legend (unless copy and paste)

“Printer composer layout” is the detailed way to export a map

- NOT today (separate workshop)

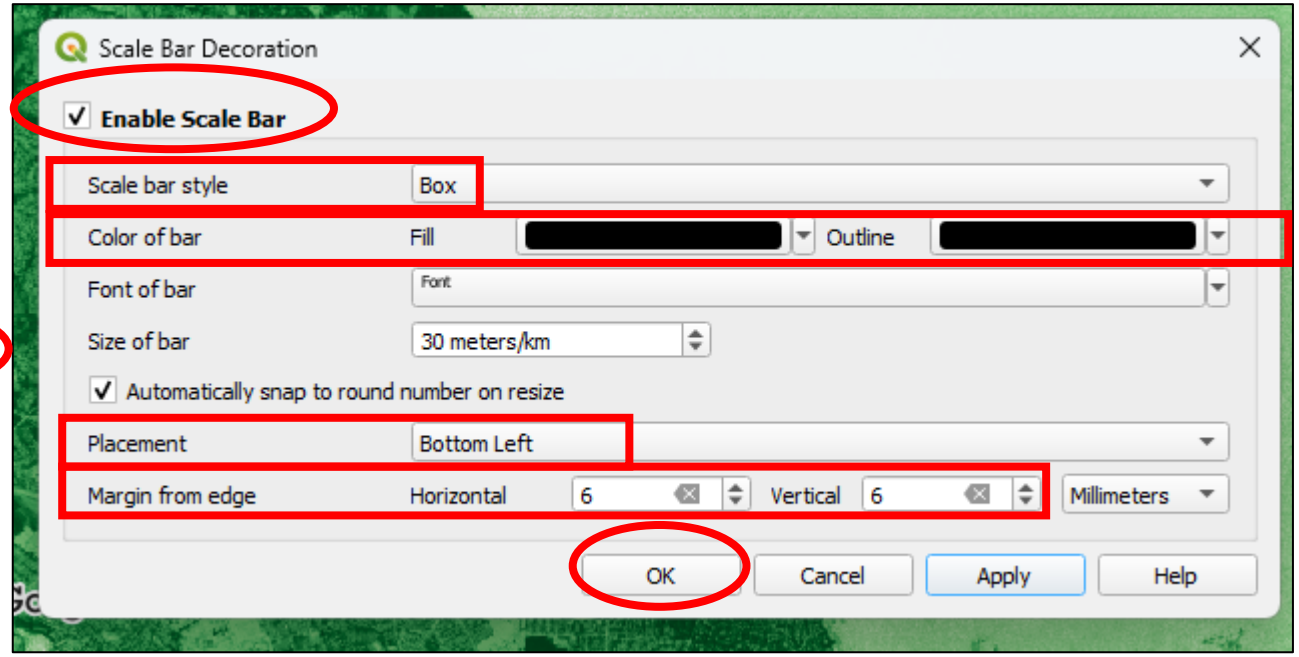


Export “quick” map



Scale bar options:

- Style
- Colour
- Font size
- Size of scale bar
- Placement
- Margin from edge
- Etc.

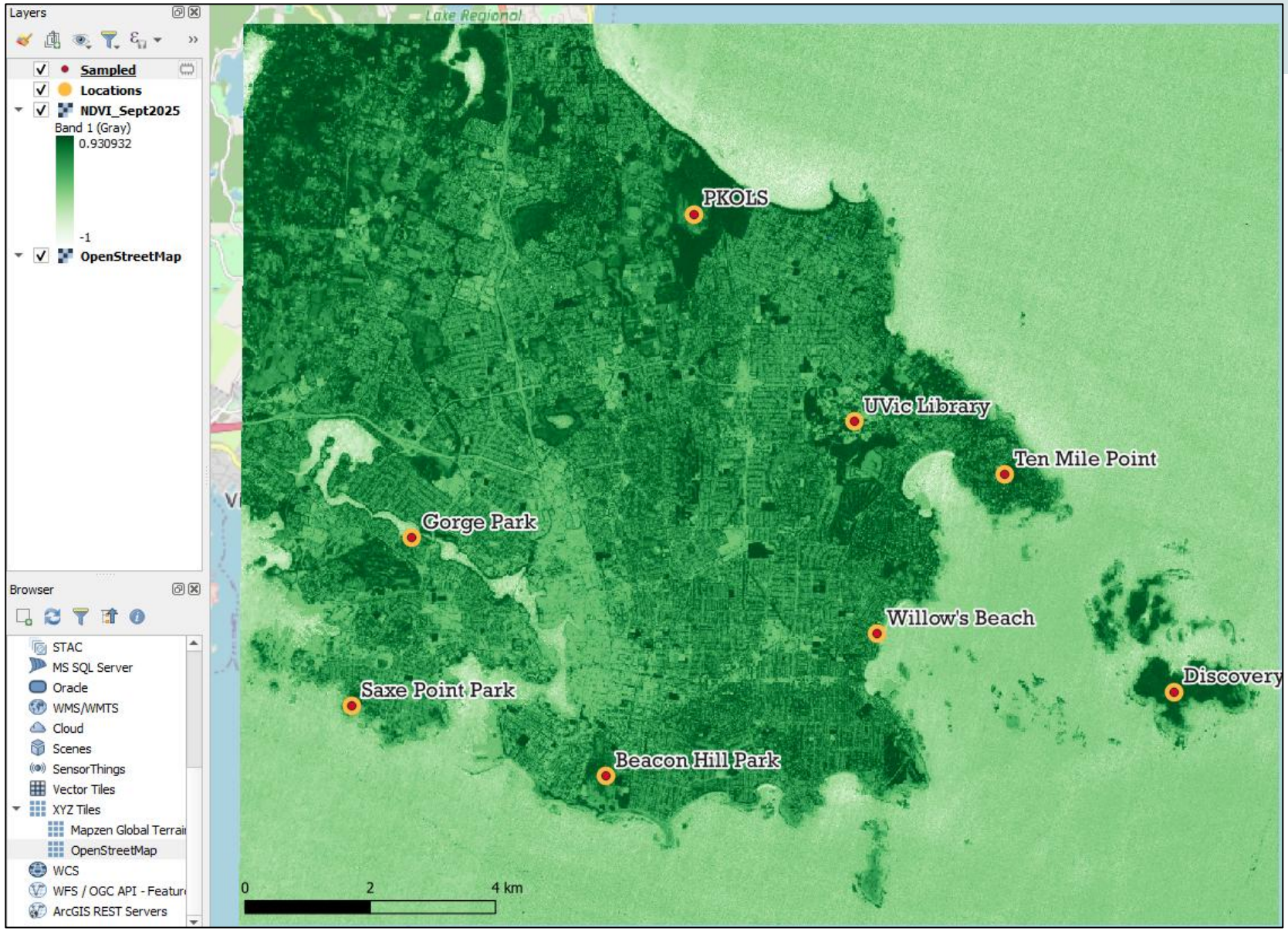


Export “quick” map

Scale bar added →

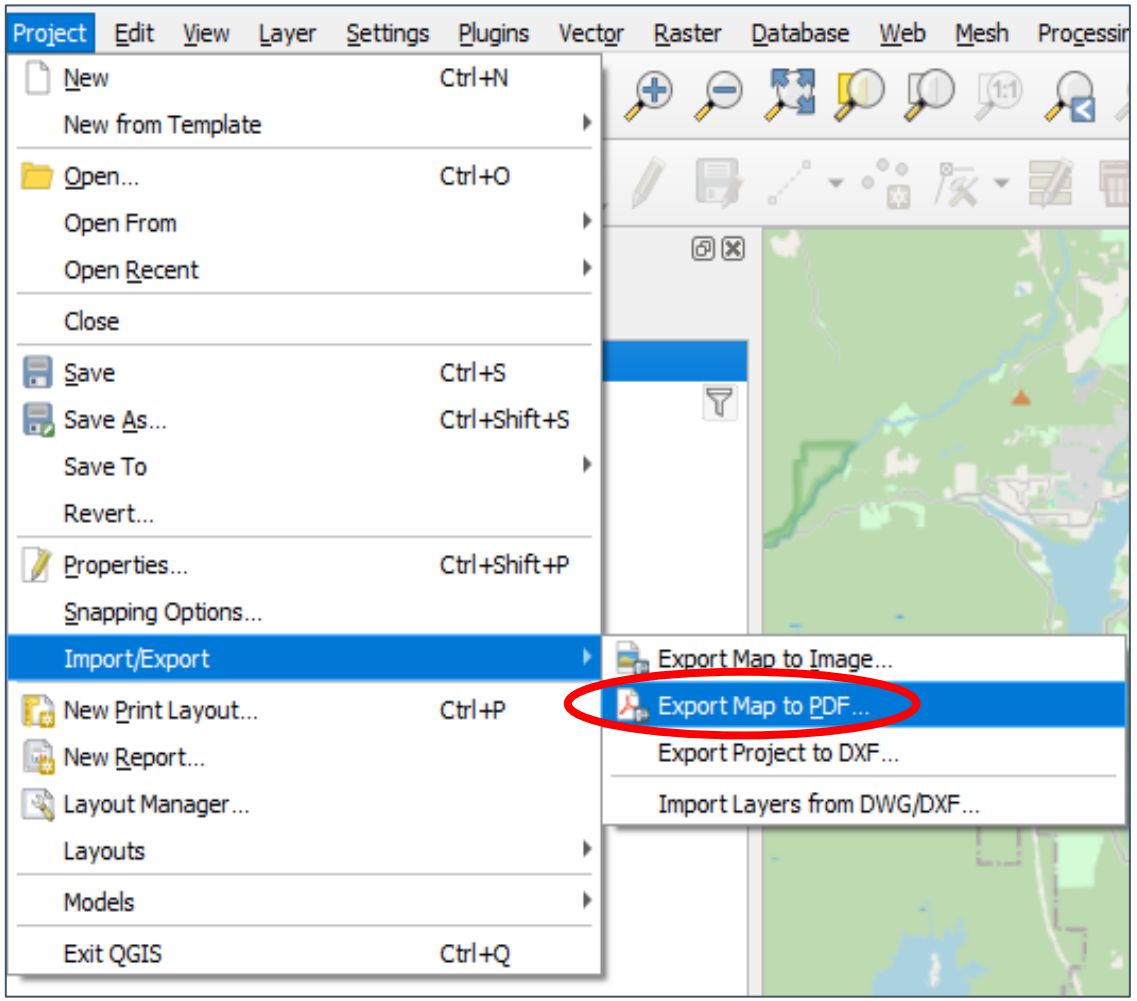
Other options to add (**not** today)
- Title
- North Arrow
- Grid
- Etc.

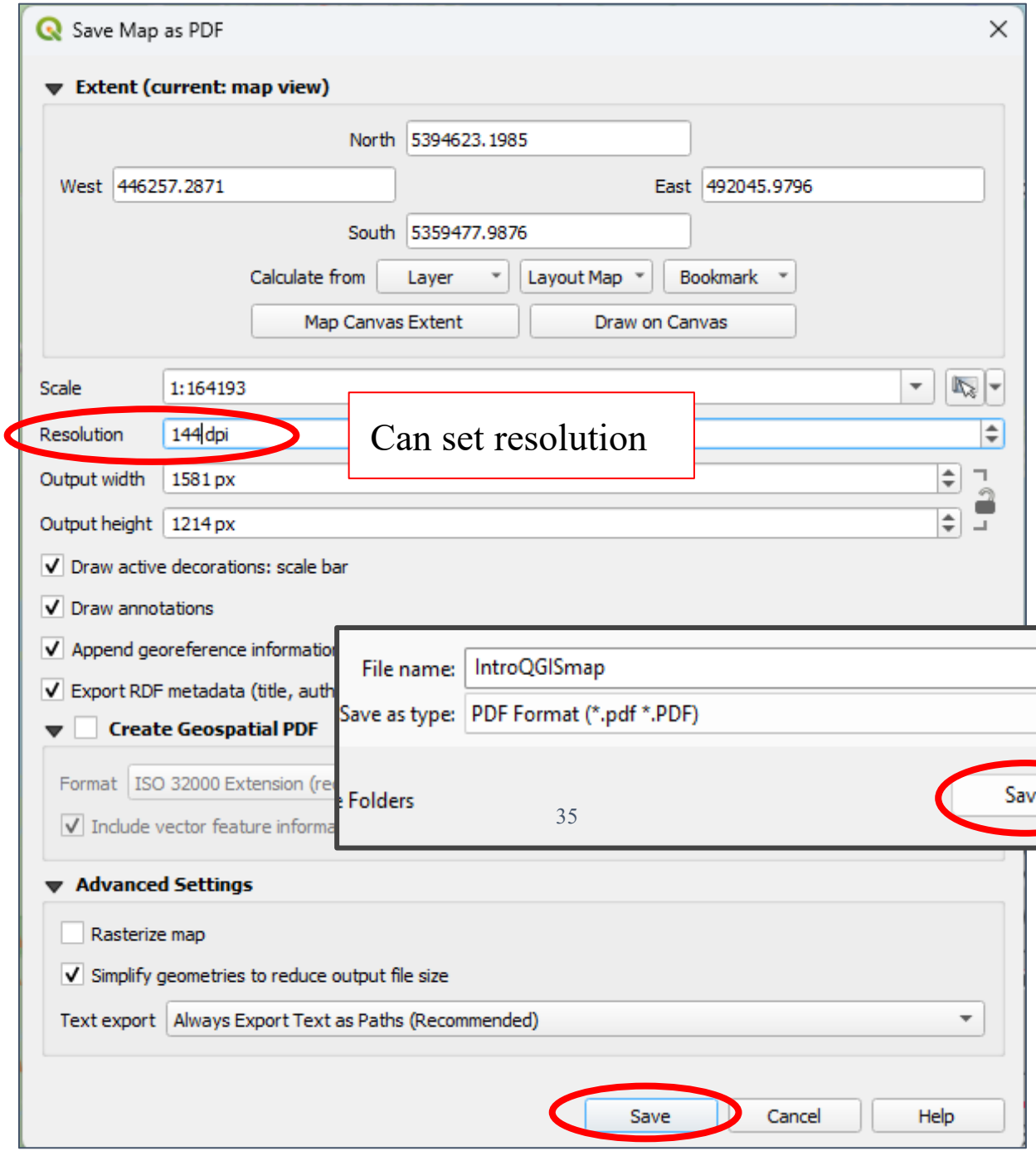
Sampled points are showing overtop of **Locations** points; can toggle them off or change *Symbology* before exporting map



Export “quick” map

Export map



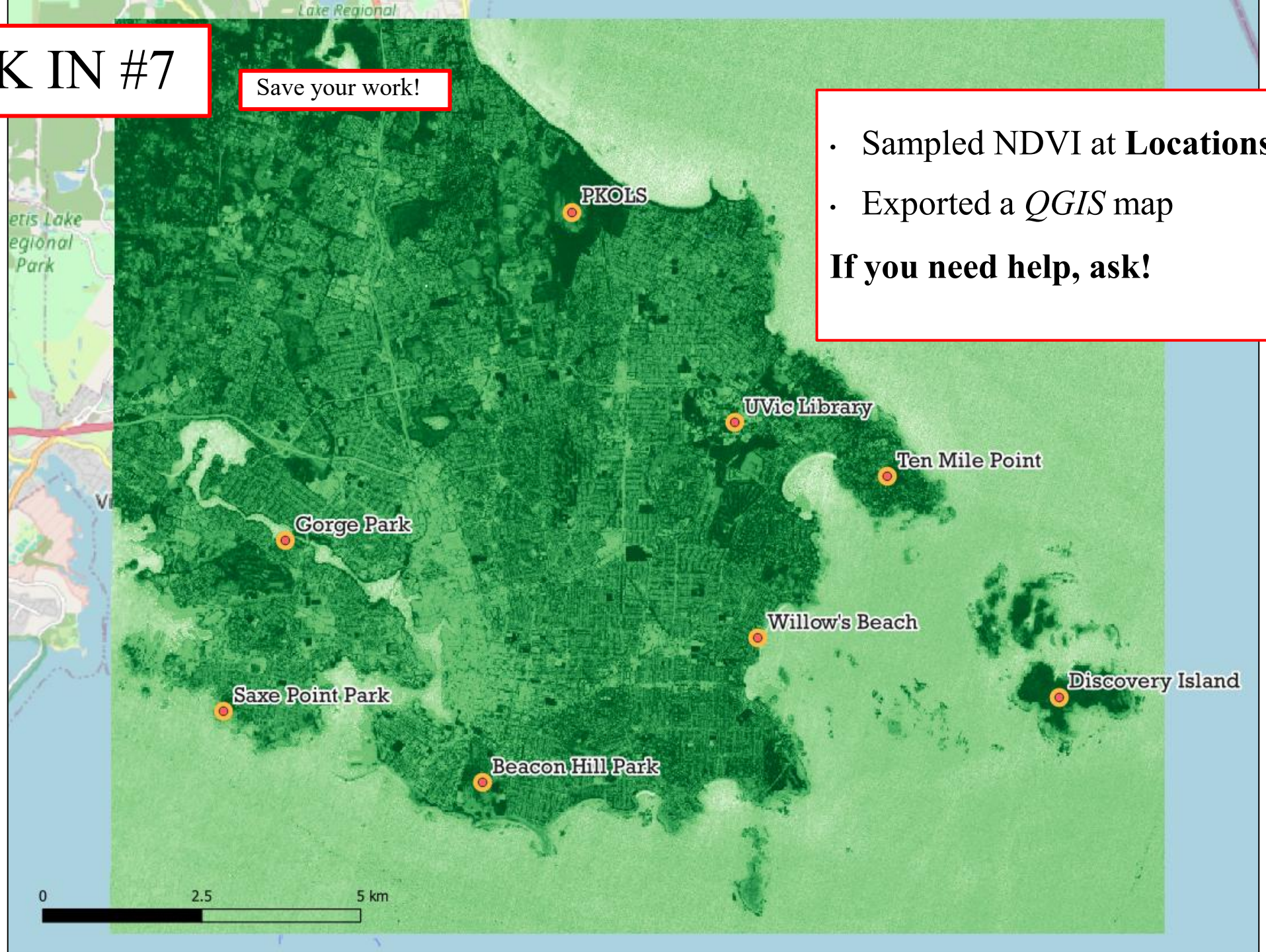


CHECK IN #7

Save your work!

- Sampled NDVI at **Locations.csv** points
- Exported a *QGIS* map

If you need help, ask!



CONGRATULATIONS!

You:

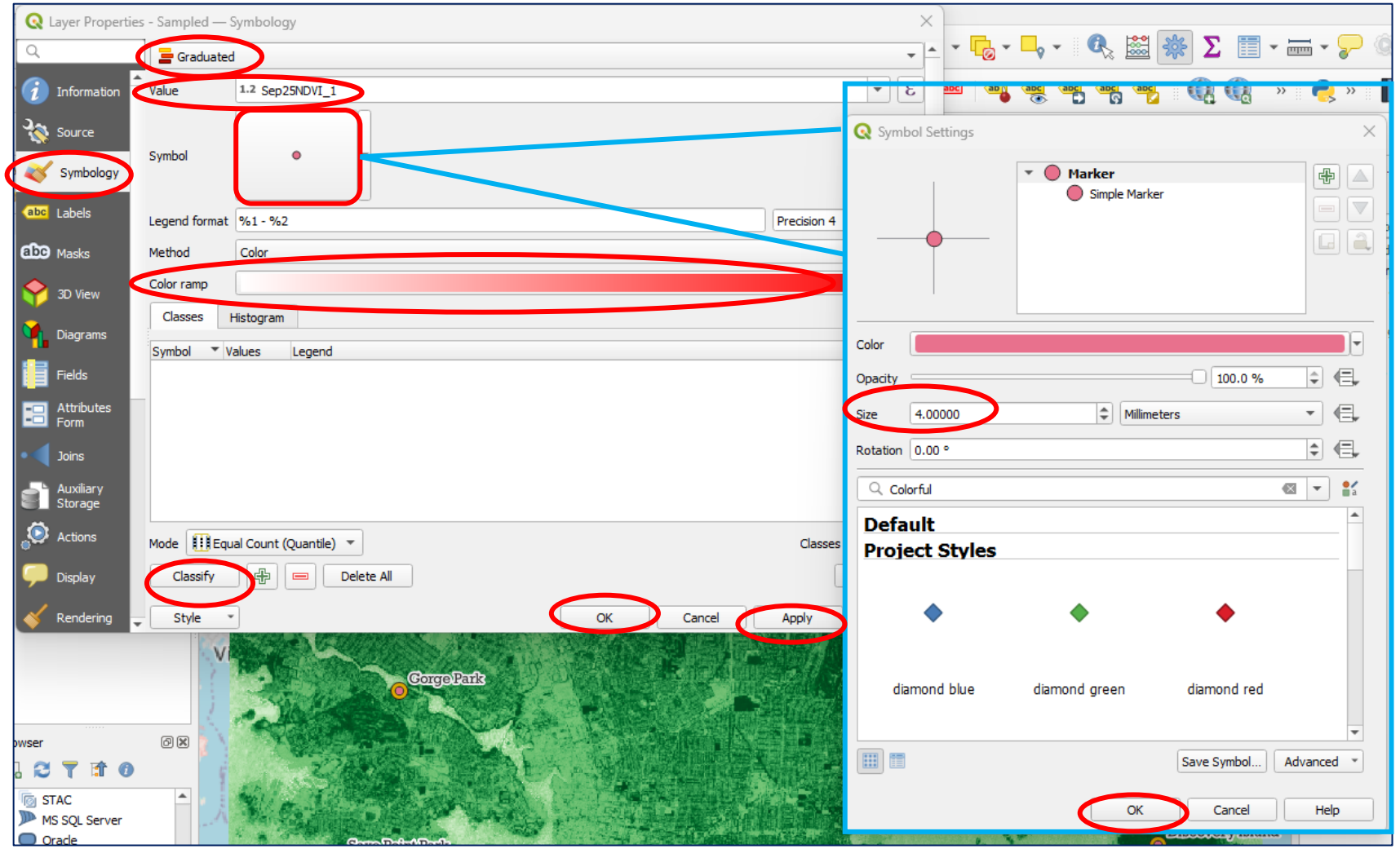
- Styled Raster data to visualize differences in NDVI
- added a sample points .csv
- Sampled raster values by extracting data from specific locations using the .csv
- Created and exported a map in *QGIS*

Next…optional exercise

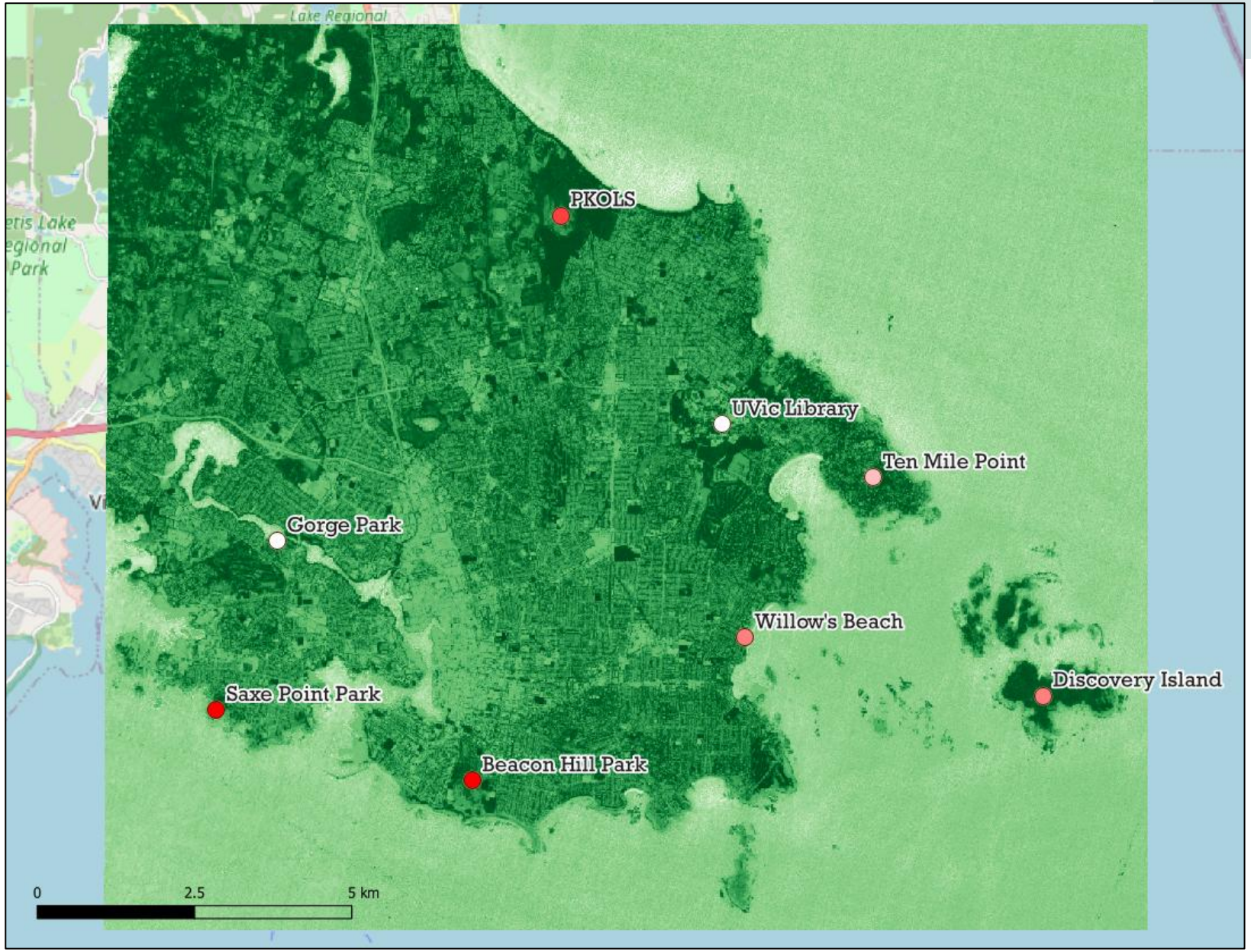
Optional Activity

Optional Activity: ‘Symbol’ points based on NDVI values

- Double-click **Sampled** to open *Properties* then *Symbology*
- Select *Graduated* from drop-down
- Set *Value* as “Sep25NDVI_1”
- Click on *Symbol* box, Change *Size* to 4.0 in the pop-up window, click **OK**
- Change *Colour ramp* to “Reds”
- Click *Classify*
- **Apply** and **OK**



- The **Sampled** points will now be different colours of red based on their NDVI value



You can:

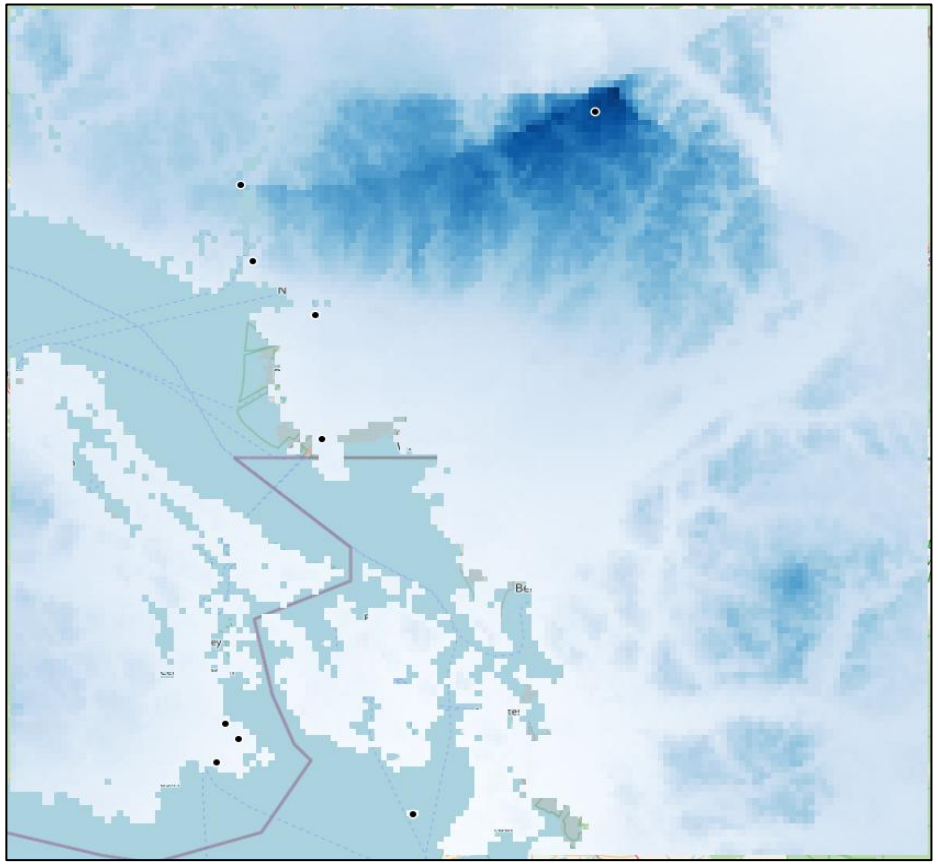
- Distinguish between **GIS** and other web map interfaces
- **Identify** and **navigate** key *QGIS* interface elements
  - *(Layers panel, Menu bar, Map view)*
- **Define** the basics of **raster data**
- Review(?) basics of **vector point data**
- **Explore data layers** using tools such as identify feature
- **Export** a simple map

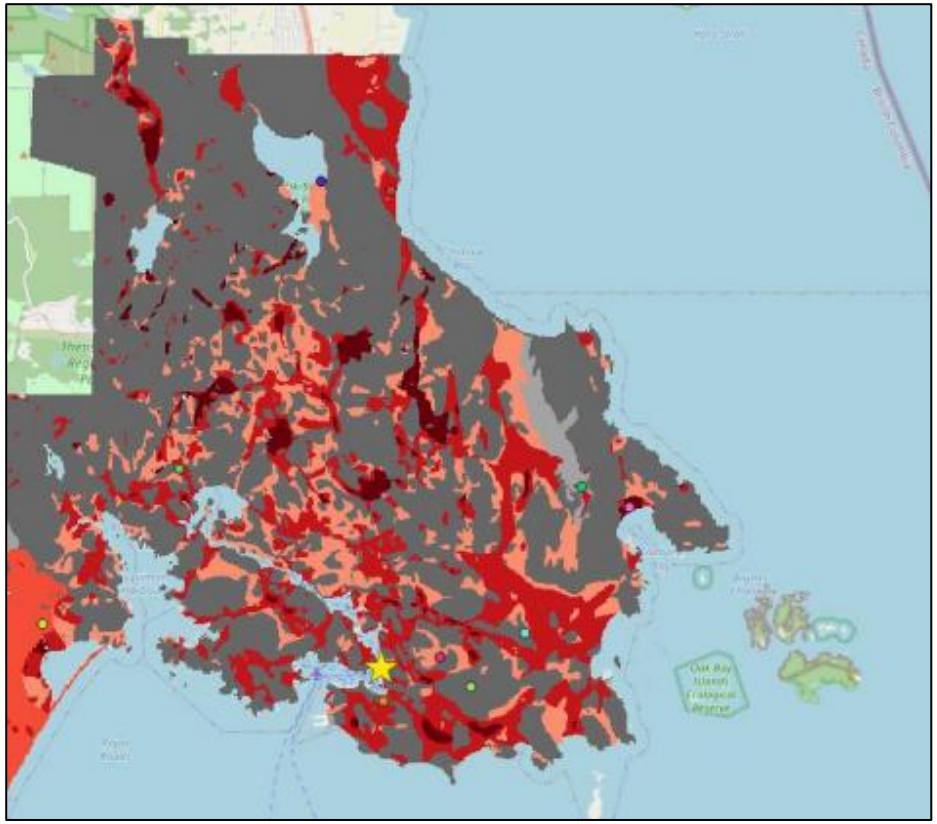
What are other applications of this tutorial?

Other rasters:

- Precipitation
- Temperature
- Air quality
- Earthquake hazard
- Soil pH

Other point locations…





Resources going forward:

QGIS – additional resources:

- QGIS Training Manual: https://docs.qgis.org/3.40/en/docs/training_manual/index.html
- QGIS User Guide: https://docs.qgis.org/3.40/en/docs/user_manual/index.html
- QGIS Tutorials & Tips: https://www.qgistutorials.com/

Find data:

- GeoSpatial Data Guide: http://libguides.uvic.ca/geospatialdata

Questions or problems:

- UVic Geospatial Librarian (danielbm@uvic.ca) or YCW Geospatial Intern (gabriellewade@uvic.ca)

UVic full semester GIS courses in the Department of Geography:

- GEOG222 – Intro to Maps and GIS
- GEOG328 – GIS Analysis

GIS Skills and Mapping Micro-certificate

https://continuingstudies.uvic.ca/science-and-the-environment/programs/gis-skills-and-mapping