

***Tutorial: Creating a Context Map using QGIS***

QGIS is a powerful open-source Geographic Information System (GIS) software that provides advanced mapping, analysis, and data management capabilities. It is suitable for professionals and users who require extensive spatial analysis functionality. You can visualize, manage, edit, analyse data, and compose printable maps. QGIS offers an advanced data editing capability for its users to digitize and modify geospatial data. It is a highly customizable where users can adjust map styles, labels, symbology, and layout to create visually appealing maps. It serves a great purpose in remote sensing where it can integrate remote sensing data and perform tasks like image classification, change detection and orthorectification. Thus, QGIS is a strong tool to support multiple RAAM methodologies as well as supports reduced access teams through its analysis functions.

QGIS is a volunteer-driven project and welcomes contributions in the form of code, bug fixes, bug reports, contributed documentation, advocacy, and more. Users are encouraged to participate and support one another through mailing lists, user fora, and [gis.stackexchange.com](https://gis.stackexchange.com/).

**QGIS runs on Linux, Unix, Mac OSX, Windows, and Android and supports numerous vector, raster, and database formats and functionalities. It is free and open-source and does not require a purchased license.**

**QGIS Overview:**

* What is QGIS used for? – Mapping and Geospatial analysis
* What prerequisites are needed for QGIS? – None
* When should I use QGIS? When you want to make maps or analyse geospatial data
* How do I get started? – Free access available here: <https://www.qgis.org/en/site/>
* Are QGIS data sources flexible? Yes, users can use data stored on a local machine, including shapefiles, geoJSON, and other file formats. Also, online data sources such as WMS, WFS, and XYZ Tiles from the internet can be used as base maps or additional layers. QGIS can also connect to databases like PostGIS, SQLite, and MySQL, allowing you to work with large datasets efficiently. It can be connected to GPS devices and mobile devices, enabling data collection in the field especially areas with reduced access.
* Does QGIS have *offline* capabilities? Yes. This makes it valuable for RAAM and reduced access setups. **NOTE:** Always ensure you have local copies of the data you need for offline use. The offline usage of QGIS is a feature which is a critical asset for RAAM because it enables fieldwork and geospatial data management in areas with limited or unreliable internet access.

***First layer of your context map: Program-relevant locations***

Mapping program-relevant locations using QGIS involves the process of geospatially representing and visualizing locations that are relevant to your program or project. Here's a step-by-step guide on how to do this:

1. Get a csv data containing the GPS coordinates(x,y) of all program-relevant locations as shown below:



1. Now add your csv data to your map layer in QGIS by following these steps.



Click on these menus in the following order as shown above; 1. “Layer” 2. “Add Layer” 3. “Add Delimited Text Layer…” The next dialogue box you will see should look like this.



1. Navigate to the csv file in your folder by clicking on the highlighted button in front of the File Name space and add. The moment this is done, you should see the added file in the dialogue box like this one below.



1. Now that you have selected the correct point data csv file, check the highlighted properties of the file to be added and make sure everything is in order.

✓ The file name should be the right one.

✓ Layer name should be the same with the one in your folder

✓ The file type should conform with the chosen format (i.e. CSV in the above example)

✓ The geometry definition should be “point” with the correct X and Y fields selected

✓ The layer geometry Coordinate Reference System – CRS is correct

✓ Click the add button and then close the dialogue box

After adding the point data, you should see an interface like this.



***Second layer of your context map: Pre-existing vulnerabilities***

Creating a second layer for pre-existing vulnerabilities on a context map using QGIS involves importing or creating the data for these vulnerabilities and overlaying them on your base map. Here's a step-by-step guide:

**Prepare Your Data:** Before adding a second layer, make sure you have the data for pre-existing vulnerabilities ready. This data can be in various formats, such as shapefiles, GeoJSON, or CSV.

**Open QGIS:** Launch the QGIS application on your computer.

**Load Your Base Map:** If you haven't already, load your base map into QGIS. This can be a map of the area or region you are interested in.

Add a New Vector Layer:

Click on the "Layer" menu at the top.

Choose "Add Layer" and then "Add Vector Layer."

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**Select Your Pre-existing Vulnerabilities Data:**

In the "Data Source Manager" dialog that appears, click the "Source" tab.

Click the "Browse" button to navigate to your pre-existing vulnerabilities data file.

**Set the Data Source:**

Select your data source type (e.g., Shapefile, GeoJSON, etc.) from the "Source Type" dropdown.

Use the "Browse" button to locate and select your data file.

**Specify the Coordinate System:**

If your data does not have a defined coordinate system, you will need to specify one here. QGIS will try to detect it automatically if possible.

**Add the Layer:**

Click "Add" to add the data layer to your project.

**Style and Symbolize:**

The new layer may not be visible initially, or it might be displayed in a default style. You can adjust the symbology by right clicking the new layer in the Layers panel and selecting "Properties."

In the "Layer Properties" dialog, you can set the style, colour, and labels for your pre-existing vulnerabilities layer.

**Adjust Layer Order:**

To control the drawing order, you can drag and drop layers in the Layers panel. Make sure your pre-existing vulnerabilities layer is above your base map layer so that it's visible.

**Configure Labels and Pop-ups:**

If you want to display labels or pop-up information for your pre-existing vulnerabilities, you can configure these settings in the "Layer Properties" dialog.

**Save Your Project:**

It's a good practice to save your QGIS project so that you can easily return to your work later.

**Interact and Analyse:**

You can now interact with your map, analyse data, and assess the relationships between pre-existing vulnerabilities and your base map features.

That's it! You've successfully added a second layer for pre-existing vulnerabilities to your context map in QGIS. You can further refine the appearance and symbology to make the map more informative and visually appealing.

***Third layer of your context map: Contextual factors***

Follow the steps of the second layer, using the data sources for contextual factors.

***Export the map***

Now we want to create a printable output of our map and export it in PDF or image format.

Click Project > Layout Manager

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Next step is to click on “Create” as below

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Then, give your layout a name with which you will save it.

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The next view you will see should be like this.

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Then, add your map to the layout with the “Adds a new Map to the layout” tool.



Click on the tool and drag from top left to bottom right.

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Then add all required map elements from the “Add Item” menu as highlighted in the screenshot below.



Export your map to PDF or Image (or SVG) file for use in your documents or direct consumption by the stake holders.



**Training Resources**:

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| Resource | Link |
| **QGIS Desktop User Guide** | <https://docs.qgis.org/3.34/en/docs/user_manual/index.html> |