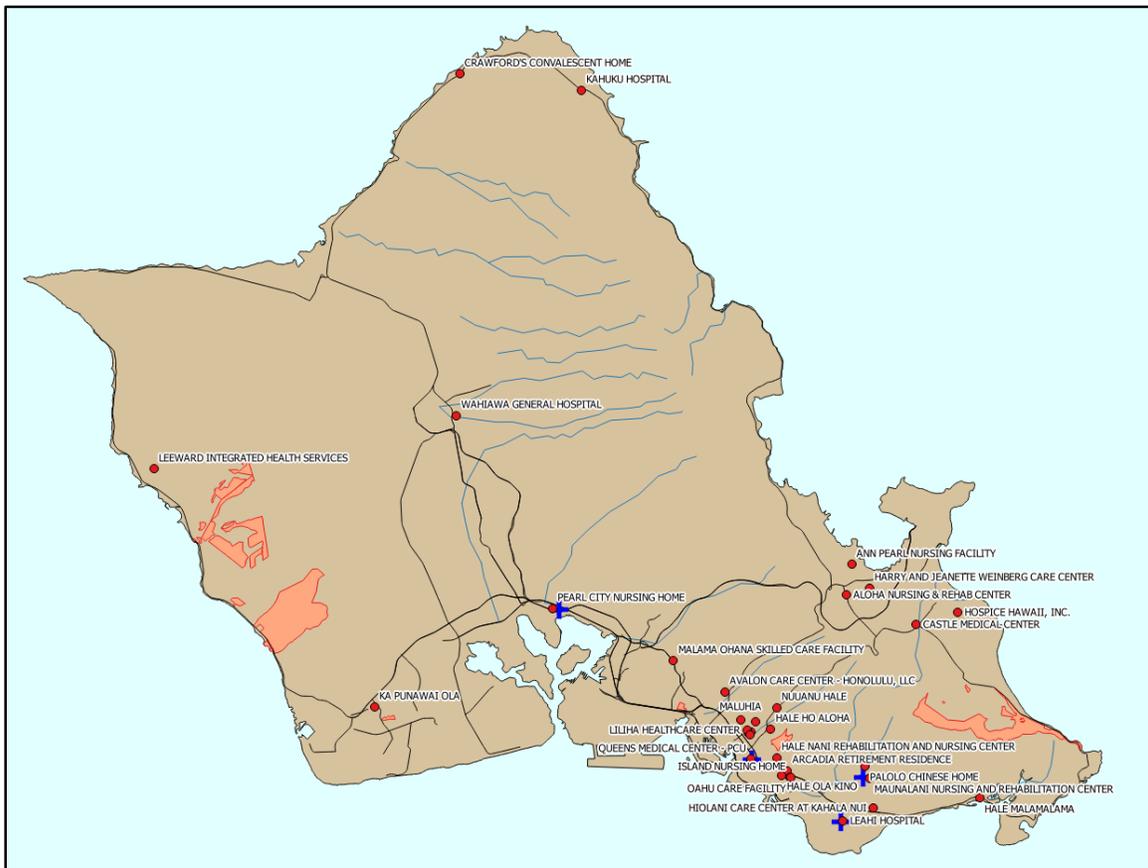


Community Health Maps Lab Series:

Lab 2—Bringing Field Data Into QGIS

Objective: Understand the Basic Layout and Functionality of QGIS Desktop

Document Version: 2015-09-16 (Final)



This course is a collaborative effort between the National Library of Medicine, the Center for Public Service Communications, and Bird's Eye View.

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1. Introduction

This lab will introduce you to QGIS. QGIS is an open-source desktop GIS package. It runs on Windows, Macs, and Linux. You will begin by installing QGIS and will then learn the basic layout and tools. In task 4 you will learn how to bring the data you have collected into QGIS.

2. Objective: Understand the Basic Layout and Functionality of QGIS Desktop

In this lab exercise, you will explore QGIS Desktop. First, you will learn how to install it on each operating system. You will then learn the fundamentals of working with map layers, how to style data, and how to bring field data into QGIS.

- Task 1 – Install QGIS
- Task 2 – A Tour of QGIS—Part 1
- Task 3 – A Tour of QGIS—Part 2
- Task 4 – Add Field Data

3. How Best To Use Video Walkthrough With This Lab

To aid in your completion of this lab, some lab tasks have an associated video that demonstrates how to complete the task. The intent of these videos is to help you move forward if you become stuck on a step in a task, or if you wish to see every step required to complete the tasks.

We recommend that you do not watch the videos before you attempt the tasks. The reasoning for this is that while you are learning the software and searching for buttons, menus, and other features, you will better remember where these items are and, perhaps, discover other features along the way if you discover them on your own. With that being said, please use the videos in the way that will best facilitate your learning and successful completion of this lab.

4. Lab Tasks

Task 1. Install QGIS

QGIS can be quickly and easily installed on Windows, Macs, and Linux from installers found on the [QGIS Download page](#).

Detailed instructions organized by operating system are provided below. Install QGIS on your platform.

Installing QGIS on Windows

For Windows, there are two installation options:

- **QGIS Standalone Installer:** The standalone installer installs the binary version of QGIS and the **Geographic Resource Analysis Support System (GRASS)** using a standard Windows installation tool. You should choose this option if you want an easy installation experience of QGIS.

- **OSGeo4W Network Installer:** This provides you with the opportunity to download either the binary or source code version of QGIS, as well as experimental releases of QGIS. Additionally, the OSGeo4W installer allows you to install other open source tools and their dependencies.

Installing QGIS on Mac OSX

To install QGIS on Mac OSX, the **Geospatial Data Abstraction Library** (GDAL) framework and Matplotlib Python module must be installed first, followed by the QGIS installation. The installation files for GDAL, Matplotlib, and QGIS are available on the [KyngChaos Wiki page](#).

Installing QGIS on Ubuntu Linux

There are two options when installing QGIS on Ubuntu: installing QGIS only or installing QGIS as well as other various FOSSGIS packages. Either of these methods requires the use of the command line, sudo rights, and the apt-get package manager.

Installing QGIS Only

Depending on whether you want to install a stable release or an experimental release, you will need to add the appropriate repository to `/etc/apt/sources.list` file.

With sudo access, edit `/etc/apt/sources.list` and add the following line to install the current stable release's or current release's source code, respectively:

```
Deb    http://qgis.org/debian trusty main
deb-src http://qgis.org/debian trusty main
```

Depending on the release version of Ubuntu you are using, you will need to specify the release name of trusty, saucy, or precise. For the latest list of QGIS releases for Ubuntu versions, visit the [QGIS Download page](#).

With the appropriate repository added, you can proceed with the QGIS installation by running the following commands:

```
sudo apt-get update
sudo apt-get install qgis python-qgis
```

To install the GRASS plugin (recommended), install the optional package by running this command:

```
sudo apt-get install qgis-plugin-grass
```

Installing QGIS and Other FOSSGIS Packages

The ubuntuqgis project installs QGIS and other FOSSGIS packages, such as GRASS on Ubuntu. To install the ubuntuqgis package, remove the `http://qgis.org/debian` lines from `/etc/apt/sources.list` file, then run the following commands:

```
sudo apt-get install python-software-properties
sudo add-apt-repository ppa:ubuntuqgis/ubuntuqgis-unstable
sudo apt-get update
sudo apt-get install qgis python-qgis qgis-plugin-grass
```

QGIS is also available for Android. We have not provided detailed installation instructions because it is in alpha testing at the moment. However, there are plans to have a normalized installation process in a future release. More information can be found on the [QGIS for Android page](#).

The download is on the [QGIS Android Downloads page](#).

A related app has recently been announced named QField for QGIS™. For a short time it was named QGIS Mobile. It is described as a field data capture and management app compatible with QGIS. As of this writing it is in invite-only alpha testing. It is eventually expected to be available in the Android Play Store. More information on this app can be found on the [OpenGIS tech blog](#).

Task 2. A Tour of QGIS—Part 1

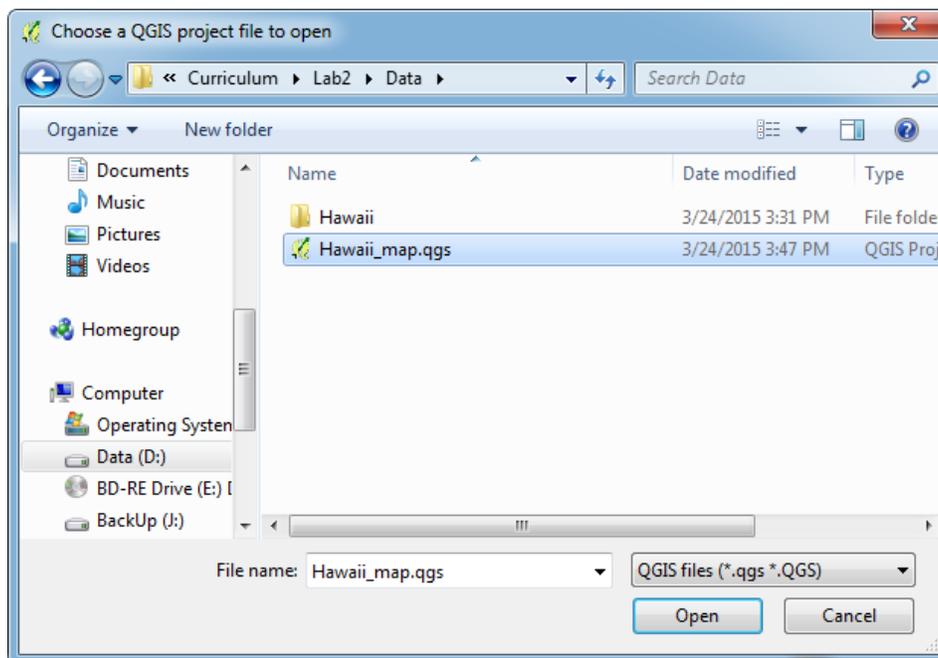
Watch a [Task 2 Video Walkthrough](#) on YouTube.

Now that you have installed QGIS you will learn about the basic layout, how to work with layers, how to work with zooming and panning tools, and how to add basemaps.

QGIS is composed of two programs: QGIS Desktop and QGIS Browser. QGIS Desktop is used for managing, displaying, analyzing, and styling data. QGIS Browser is used to manage and preview data. In this task you will focus on QGIS Desktop.

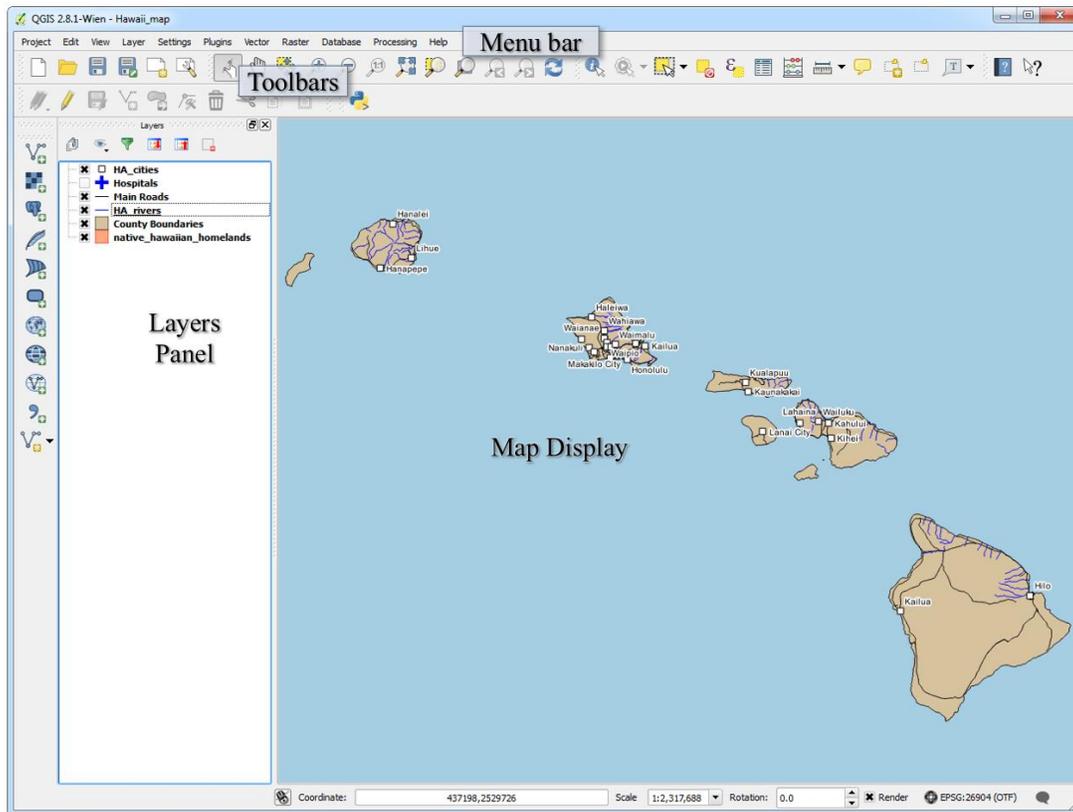
Opening a Map in QGIS Desktop

- 1) Open QGIS Desktop.
- 2) Click on the Project menu and choose Open
- 3) Navigate to the Lab 2/Data folder and open the Hawaii_map.qgs file.



- 4) A map of Hawaii will open.

- 5) The QGIS Desktop interface is divided into four main areas: **menu bar**, **toolbars**, **panels**, and the **map display**. The following screenshot shows QGIS Desktop with all four interface types displayed.



- 6) The Map Display takes up most of the screen space.
- 7) The map shown in the Map Display is composed of layers of spatial information. The following individual map layers are displayed in the Layers Panel:
- HA_cities
 - Hospitals
 - Main Roads
 - HA_rivers
 - County boundaries
 - native_hawaiian_homelands
- 8) The Menu bar and Toolbars provide access to additional QGIS functionality.
- 9) The QGIS project file stores the following types of information:
- Which data layers are in the map
 - Where the data layers are stored on your computer
 - How those layers are styled
 - The extent of the map

Using Navigation Controls

Now you will learn how to pan and zoom around the map with the Map Navigation toolbar.

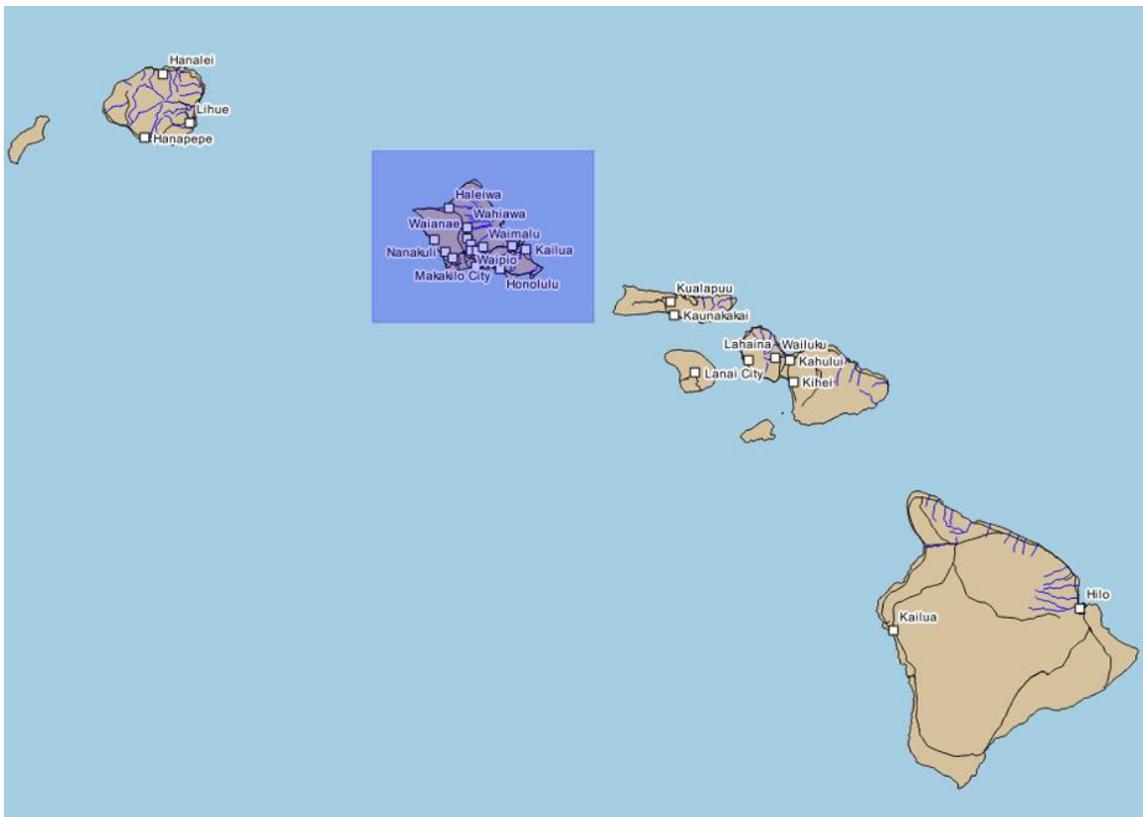
- 1) One of the main toolbars is the Map Navigation toolbar shown below.



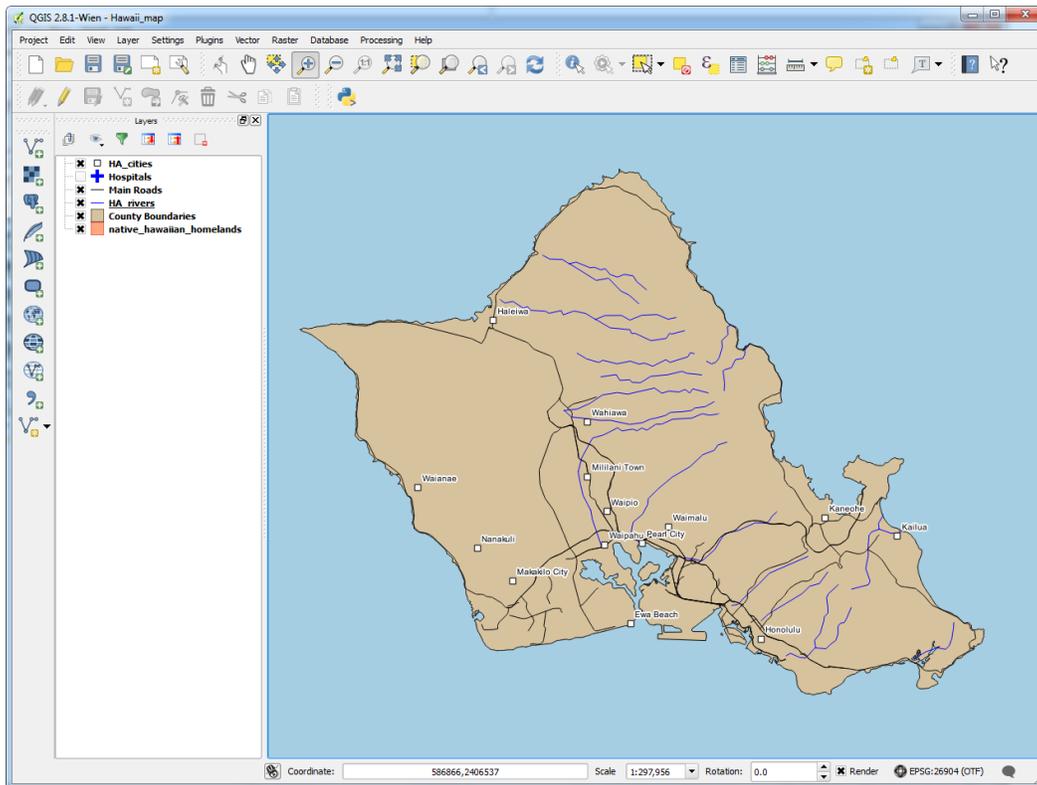
- 2) From left to right, the tools are:

- Touch Zoom and Pan—This can be used with a touchscreen.
- Pan Map—Click and hold the left mouse button to slide the map while maintaining the same scale.
- Pan Map to Selection—Pan to a selected feature.
- Zoom In—Zoom in by dragging the mouse or clicking.
- Zoom Out—Zoom out by dragging the mouse or clicking.
- Zoom to Native Pixel Resolution
- Zoom to Full Extents—Zoom to the full extent of all layers.
- Zoom to Selection—Zoom to the extent of the selected features.
- Zoom to Layer—Zoom to the extent of the active layer.
- Zoom Last—Zoom to the previous extent.
- Zoom Next—Zoom to the next extent.
- Refresh—Redraw the map.

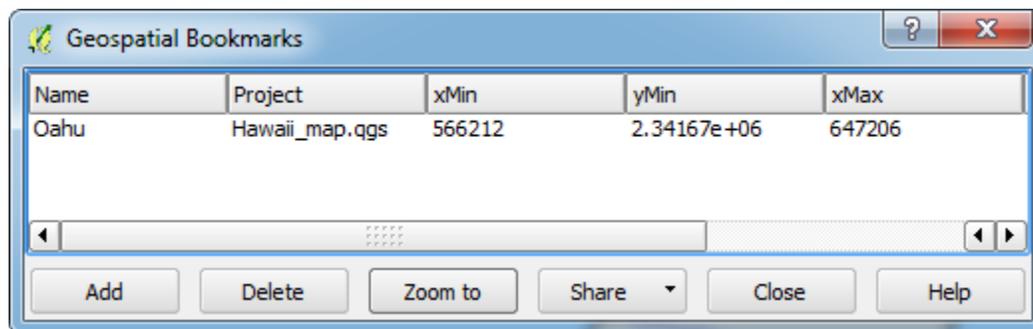
- 3) Click on the  button, and with your left mouse button drag a box around the island of Oahu. (*Hold the mouse button down until you create the rectangle around Oahu and then let go.*)



- 4) The map will zoom into Oahu.



- 5) You can use the  tool to slide the map while staying at the same scale. This is a good way to center the map. Make sure Oahu is centered in your Map Display.
- 6) Now you will set a bookmark for this location. Bookmarks let you store geospatial map extents. Click the **View** menu and choose **New Bookmark**. The Geospatial Bookmarks window will open. Name your bookmark Oahu and click **Close**.



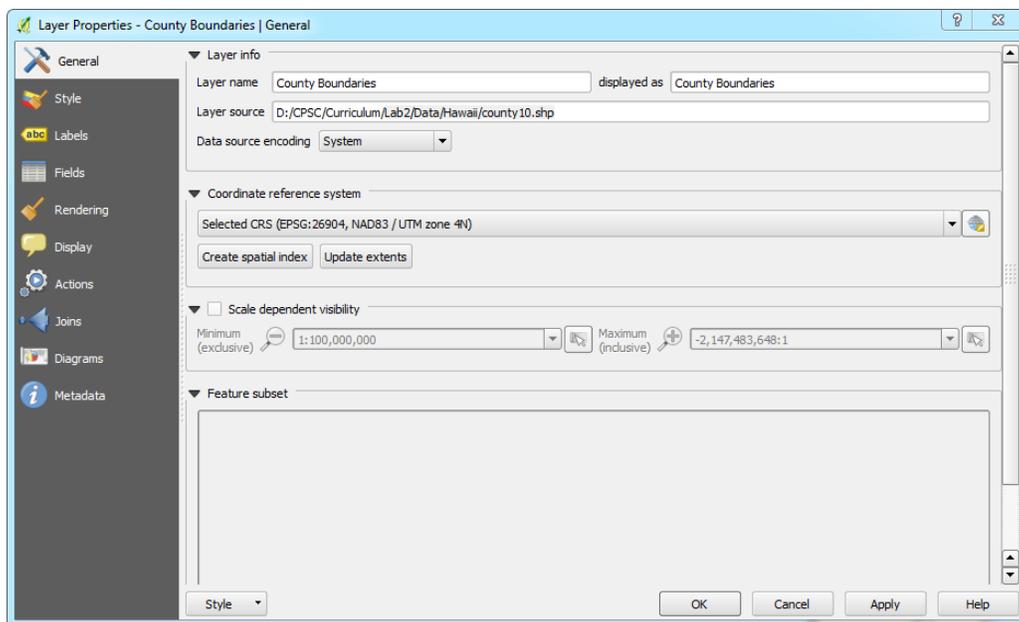
- 7) Now you will always be able to get back to this location by clicking View | Show Bookmarks, selecting the Bookmark and clicking Zoom to. This is useful if there is a particular part of the map you want to be able to get to quickly or for storing the final map extent for a map.

- 8) Click the  button until you are back at the original map extent. This button was activated as soon as you zoomed into Oahu. Along with the  button you can go forward and backward amongst the map extents you've viewed.
- 9) Back at the original extent, click the **View** menu | **Show Bookmarks**. Select the *Oahu* bookmark by clicking on it and then click on **Zoom to**. **Close the Geospatial Bookmarks** window when finished.
- 10) Another useful zoom tool is the  button. This will zoom you out to the full extent of all the data layers in your map. Click it now and you will zoom out to the original extent.

Layer Management

In this next section you will learn how to work with the layers in the Layers Panel.

- 1) Use your Oahu bookmark to zoom to Oahu.
- 2) Double click on the County Boundaries layer to open the **Layer Properties** window. *(You can also right click on the County Boundaries layer and choose Properties from the context menu.)*
- 3) Click on the **General** tab.

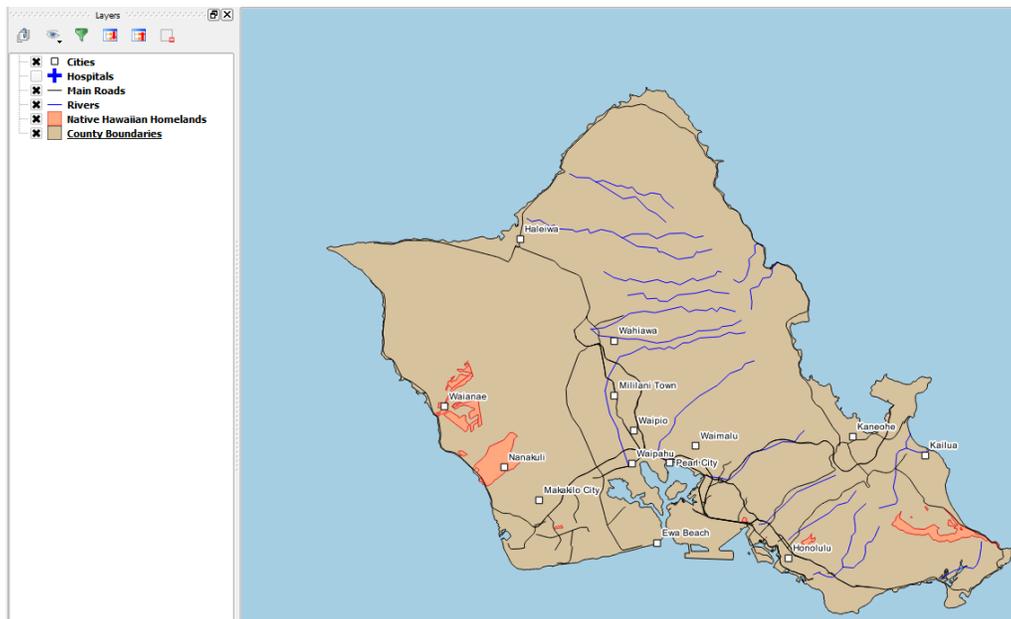


- 4) Here you can see that the **Layer source** is *Lab2/Data/Hawaii/county10.shp* but the **Layer name** is *County Boundaries*.
- 5) County10.shp is the source file for this layer. It is a file format known as a shapefile.
- 6) When a layer is added to QGIS Desktop, it will be given the name of the shapefile by default.
- 7) Here someone has changed the **Layer name** to *County Boundaries*. This is preferable because the **Layer name** is what will appear on a map legend. **Layer names** should be changed to something understandable by the intended map reader.
- 8) Close the **Layer Properties** window.
- 9) Open the **Layer Properties** window for the *native_hawaiian_homelands* layer.

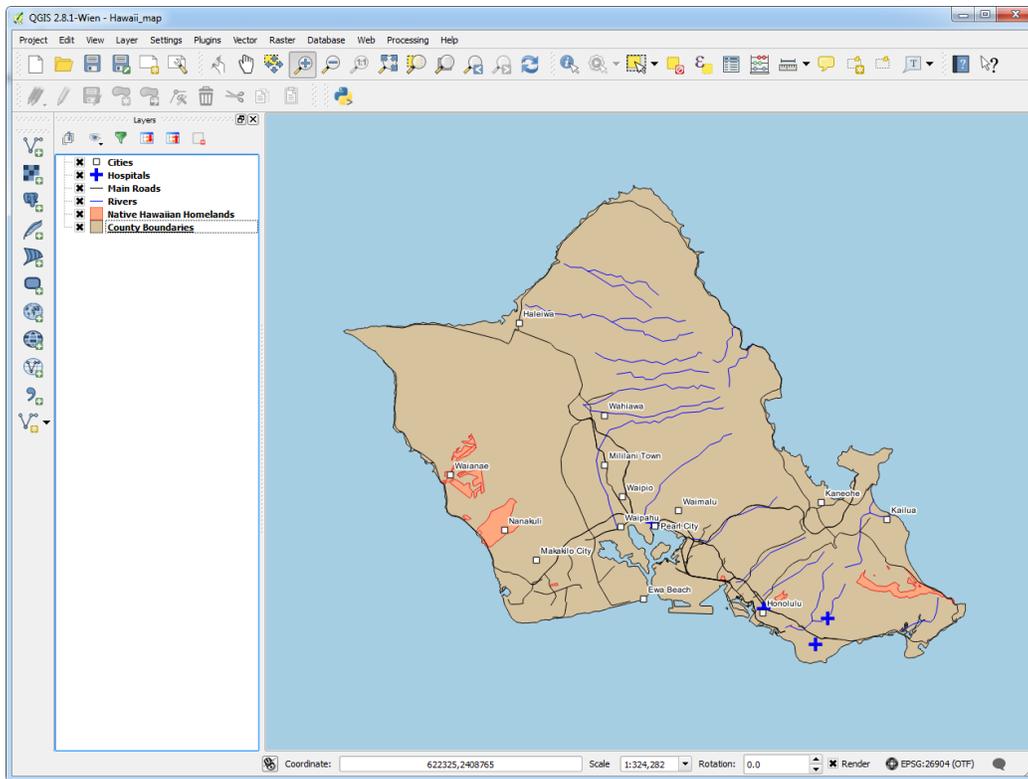
- 10) Change the **Layer name** to *Native Hawaiian Homelands* and close the **Layer Properties** window. Notice that the **Layer Name** has changed in the **Layers Panel**.
- 11) Change the following names in the same fashion:
 - a) HA_rivers to Rivers
 - b) HA_cities to Cities
- 12) Notice that the *Native Hawaiian Homelands* have a peachy/orange colored patch next to the **Layer name** in the **Layers panel**. This patch indicates how the data are styled on the map. However, no orange patches are visible on the map.

The data layers in the **Layers panel** are drawn in the order they appear in. So the layer that is on the top of the list in the **Layers panel** will be drawn on top of the other layers in the **Map view**.

- 13) Click on the *Native Hawaiian Homelands* layer and drag it above the *County Boundaries*. The *Native Hawaiian Homelands* data should now be visible.



- 14) Notice that layers have a checkbox to their left. The *Hospitals* layer is unchecked. This means it is turned off and not visible. Click the checkbox to turn this layer on. You will now see the *Hospital* locations on the map. Layers can be toggled on and off in this way.



- 15) Click the  button to save your QGIS map document. The next time you open this, it will look exactly as it does now.
- 16) If you are moving on to Task 3, click the  button to start a new QGIS Project.
- 17) The File toolbar contains tools for managing QGIS projects.



- 18) From left to right the buttons are:
- New—Open new project.
 - Open—Open existing QGIS project file.
 - Save—Save QGIS project.
 - Save as...
 - New Print Composer—Open new Print Composer.
 - Composer Manager—Open Print Composer Manager.

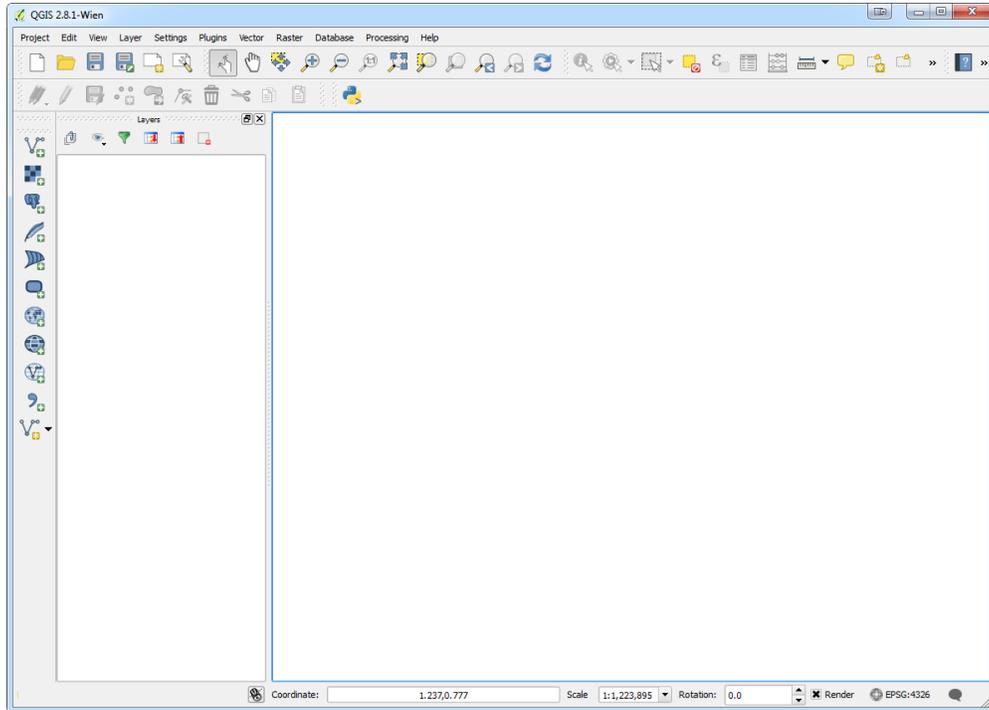
Task 3. A Tour of QGIS—Part 2

Watch a [Task 3 Video Walkthrough](#) on YouTube.

Now that you have begun to familiarize yourself with QGIS Desktop, and the data for Hawaii, you will learn how to build a map from scratch in QGIS Desktop. You will rebuild the Hawaii map.

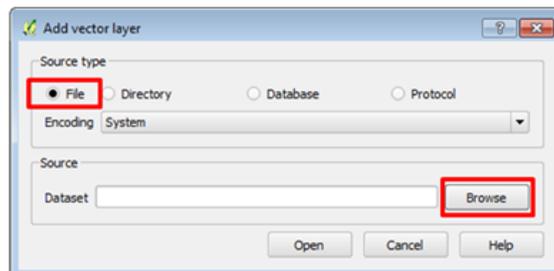
Adding Data to an Empty QGIS Project

- 1) Either open a new QGIS Desktop project as you did in Step 1 of Task 2, or if you are moving on from Task 2 click the  button to start a new QGIS Project. A blank QGIS Desktop window will open.

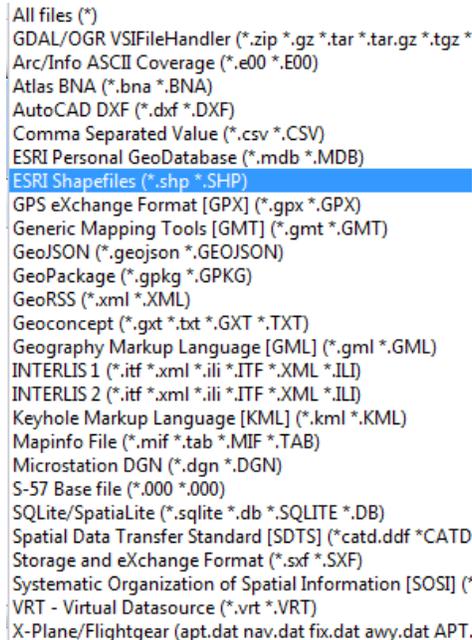


QGIS has Add Data buttons for each major geospatial data model (vector and raster).

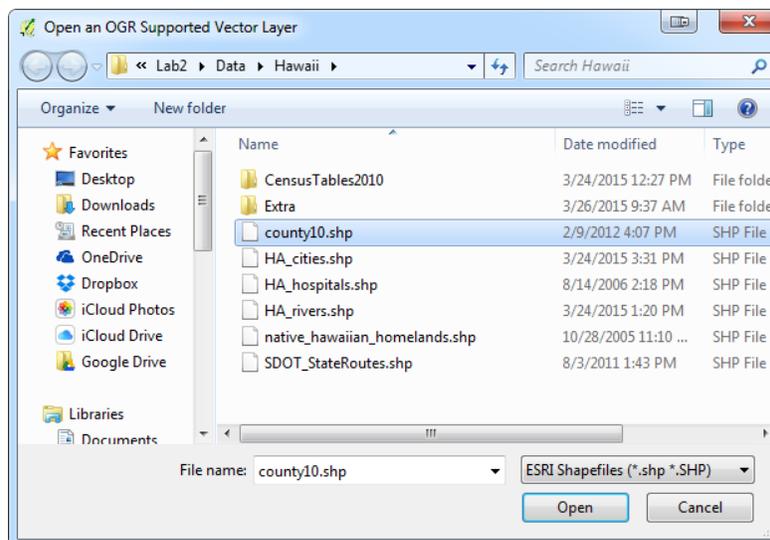
- 2) Click the  button. It is located on the toolbar along the left hand side of the **Layers panel**.
- 3) Alternatively, you can click **Layer | Add Layer | Add Vector Layer**.
- 4) This opens the **Add vector layer** window. Let's add one of the ESRI shapefiles, which is a file-based dataset.
- 5) Keep the Source type "File" which is the default. Then click the Browse button.



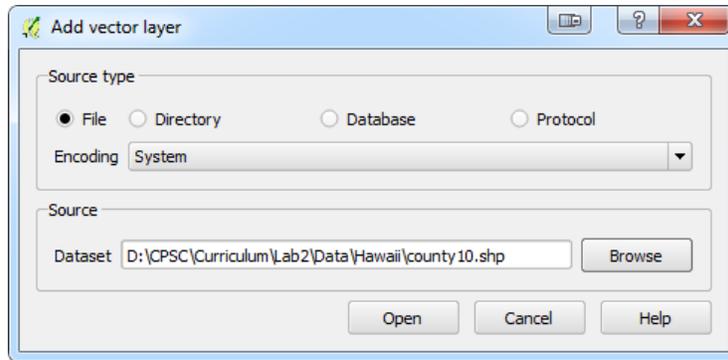
- 6) The **Open an OGR Supported Vector Layer** window opens. (NOTE: OGR is a FOSS4G project with the sole purpose to read and write geospatial vector data files.) The window defaults to all files. Take a moment to see the available options. QGIS can open many different vector file formats! Click the **All files** dropdown box and change to **ESRI Shapefiles** (shown in figure below).



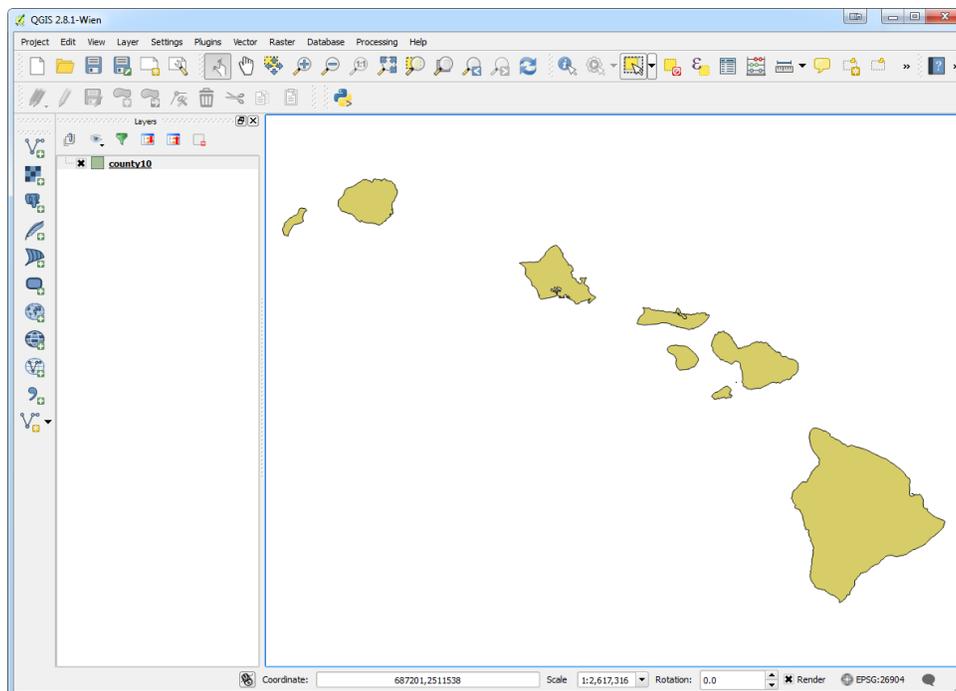
- 7) Select *county10.shp* and click **Open**.



- 8) Now back at the **Add vector layer** window, click **Open** to add the data to QGIS Desktop (see figure below).



- 9) You will now see *county10* in the **Layers panel** and the map features displayed in the **Map canvas**. Vector GIS layers will come in with random colors. You will learn how to change layer styling after all the layers have been added.



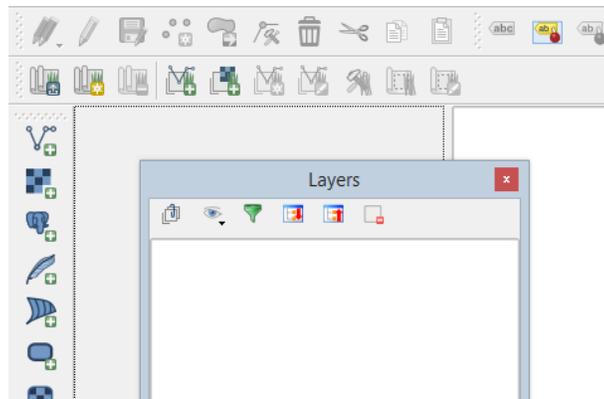
Now you will learn another method of adding data to QGIS Desktop. You will use the QGIS Desktop Browser panel.

- 10) Click **View | Panels** and make sure *Browser* is checked. The **Browser panel** will now be displayed.

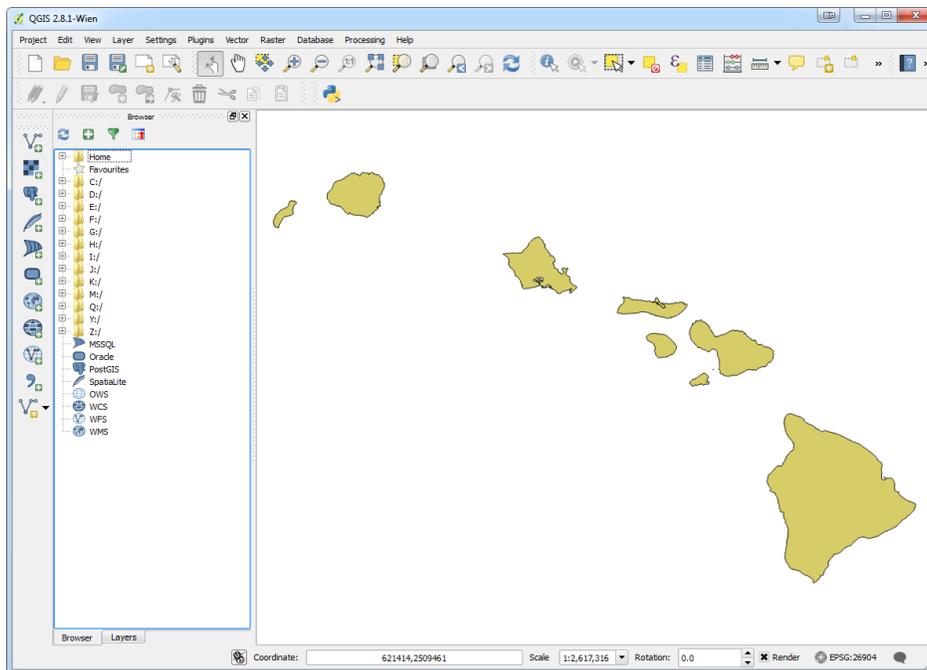
Note: Panels can be docked and undocked from the QGIS Desktop window. To undock a panel, click and drag the panel's top title bar (outlined in figure below) and drag it away from the sides. When you release your mouse button, the panel will be floating freely.



To dock a floating panel, click and drag the title bar, and drag the panel to the left or right side of QGIS Desktop until a rectangle appears underneath the panel. Release the mouse button to dock the panel (docking action shown in figure below).



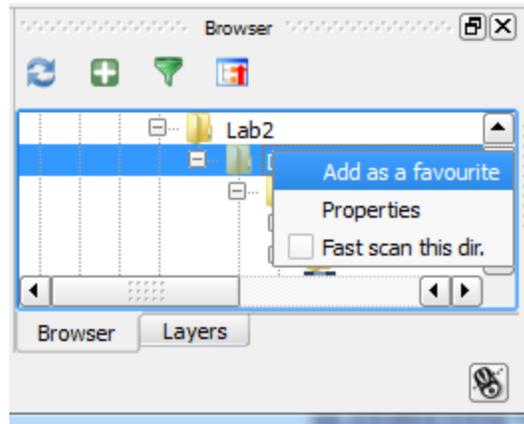
- 11) Drag the title bar of the **Browser panel** and drop it right on the **Layers panel** (without the rectangle appearing). It will then become a tab on the **Layers panel**. With this arrangement, it is always accessible without taking up additional screen space.



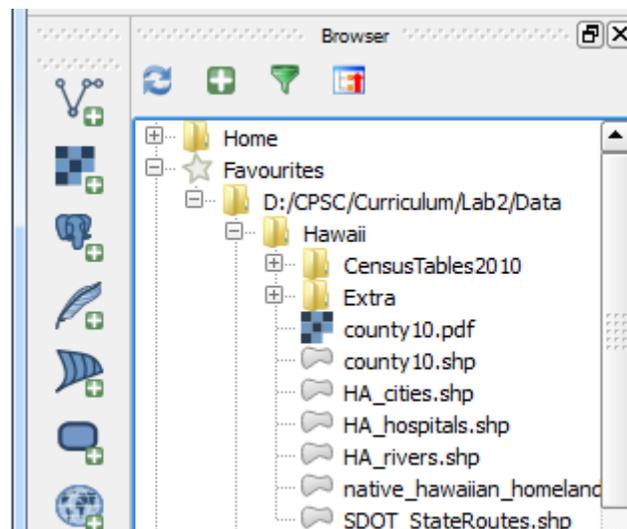
- 12) Note that there is a **Favourites** item. You can identify folders or locations as being **Favourites** in order for them to appear here.

Data is often stored deep inside a series of folders. It is often tedious and time consuming to navigate deep inside the folders to gain access to the data. **Favourites** provide a way to create a shortcut directly to any folder so that you have one-click access to any folder. Let's create a favorite to our lab folder for practice.

- 13) Navigate to the lab data folder in the **Browser panel**. Right click on the Data folder and choose **Add as a Favourite** (see figure below). *Note:* Currently this functionality is reserved only for the **Browser panel** in QGIS Desktop. However, once it is set it will show up as a **Favourite** in **QGIS Browser** as well.

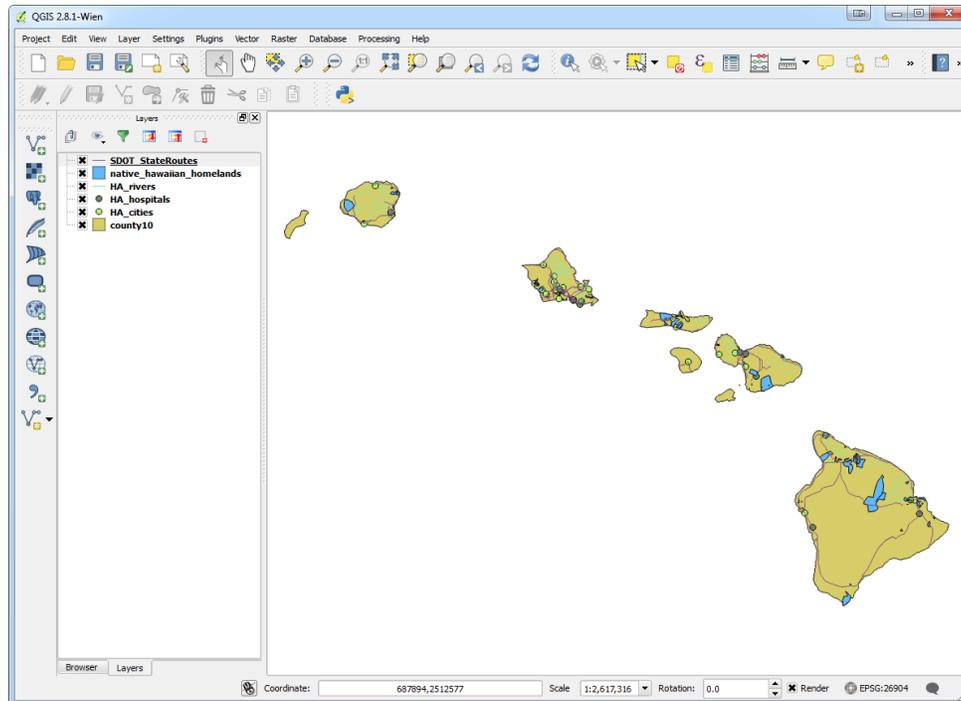


- 14) Now expand **Favourites** near the top of the file tree in the **Browser panel** by clicking the plus sign to the left. You will see the Lab 2 data folder listed. Setting the folder as a **Favourite** allows you to quickly navigate to your working folder.



- 15) You will see 6 shapefiles in the lab data folder:
- county10.shp
 - HA_cities.shp
 - HA_hospitals.shp
 - HA_rivers.shp
 - native_hawaiian_homelands.shp
 - SDOT_StateRoutes.shp
- 16) You can select them all by holding down the Ctrl key on your keyboard while left clicking on each shapefile. Select the five shapefiles you haven't added (HA_cities.shp, HA_hospitals.shp, HA_rivers.shp, native_hawaiian_homelands.shp, and SDOT_StateRoutes.shp).

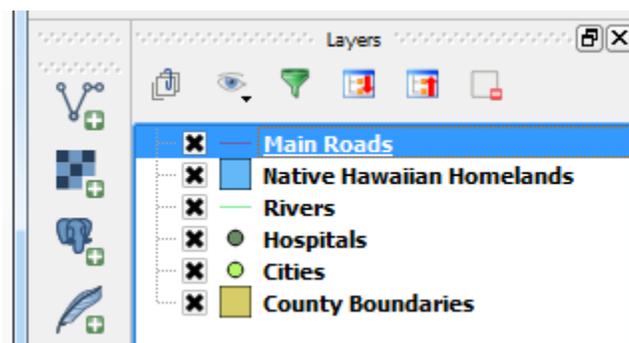
- 17) Drag the five selected shapefiles onto the map canvas from the **Browser panel**. This is another way of adding geospatial data to QGIS Desktop.
- 18) Click the Layers tab to display the **Layers panel**. QGIS Desktop should now look like figure below. The random colors that QGIS assigns to the layers may be different from the figure below but that is fine.



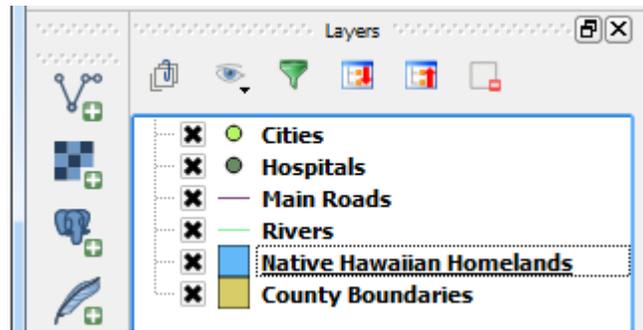
Reordering and Renaming the Layers

Now that the data have been added, you will reorder and rename the layers as you learned in Task 2.

- 1) Now rename the layers as you did in the Layer Management section of Task 2.



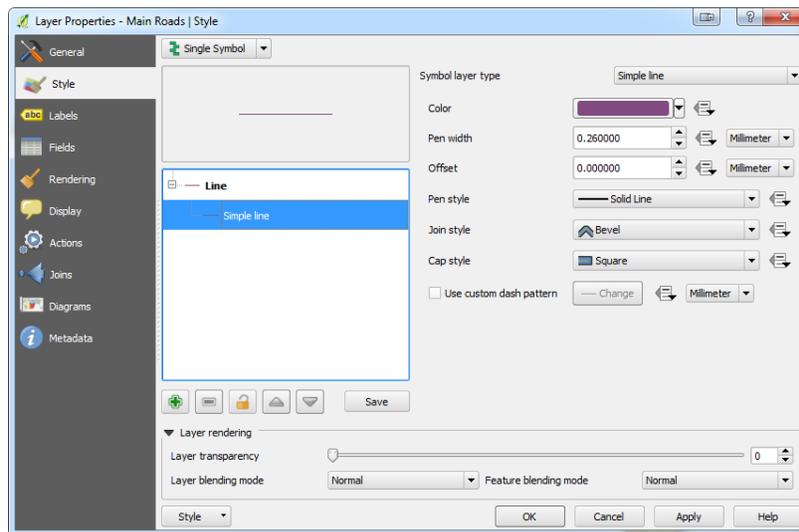
- 2) Now reorder the layers as you did in Step 13 of Task 2 | Layer Management.



Styling the Data Layers

Now you will learn how to style these layers.

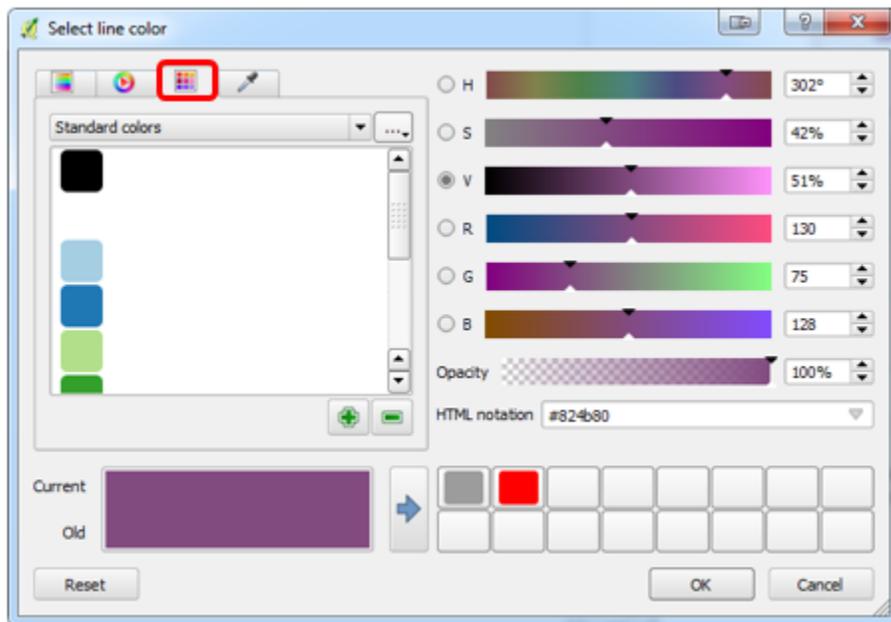
- 1) Double-click on the *Main Roads* layer to open the **Layer Properties** window.
- 2) Click on the **Style** tab.
- 3) In the Symbol layers box, click on **Simple line**.



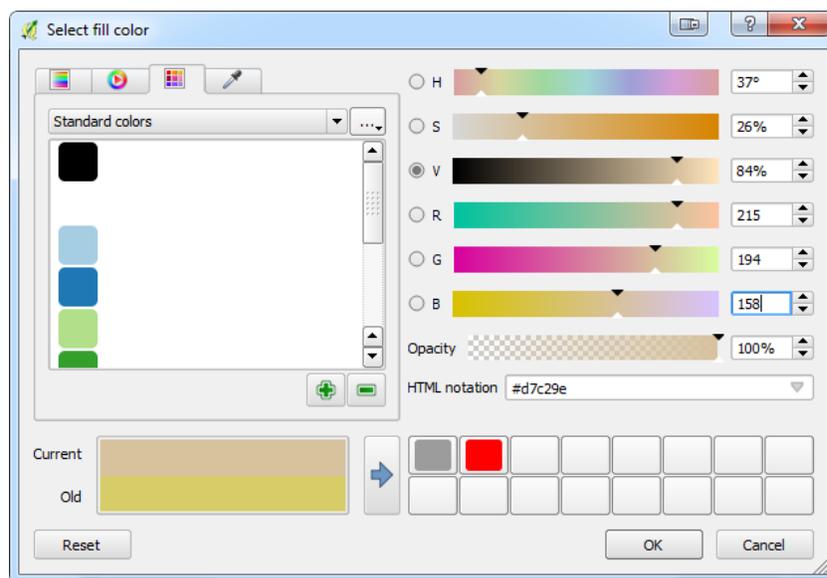
- 4) Find the **Symbol layer type** box on the top right corner of the Layer Properties window. This allows you to change both the color and width for this line layer. Click on the colored box to the right of **Color** to open the Color picker window.

This window has many options for choosing a color. You can use the tabs across the top to open a **color ramp**, **color wheel**, **color swatches**, or a **color picker**. You can also use the HSV and RGB sliders on the right side to define a specific color.

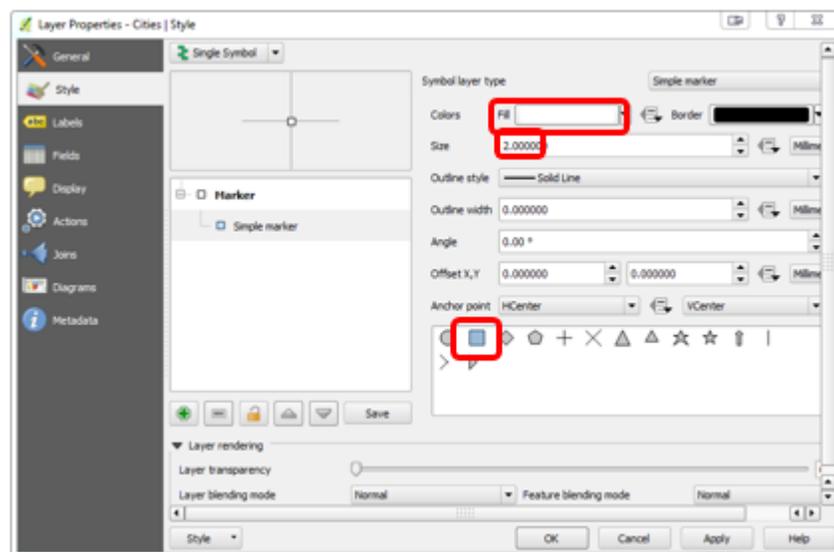
- 5) Click the **Color swatches** tab.



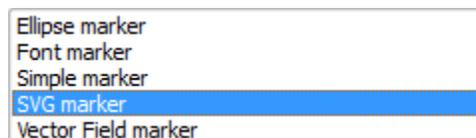
- 6) Choose black from Standard Colors and click **OK**.
- 7) Back at the **Layer Properties** window click **OK** again and see the new style applied to the roads layer.
- 8) Using the same technique, change the *rivers* layer to blue.
- 9) Double click on the County Boundaries layer to open the **Layer Properties | Style** tab.
- 10) In the Symbol layers box click on **Simple fill**.
- 11) This is a polygon layer, so you have the option to change both the **Fill** and **Border** colors and their respective styles.
- 12) Click the fill color patch to open the color picker window.
- 13) Here you will use the Red, Blue, Green (RGB) color slider to define the color. Set the RGB values to R: 215, G: 194, B: 158.



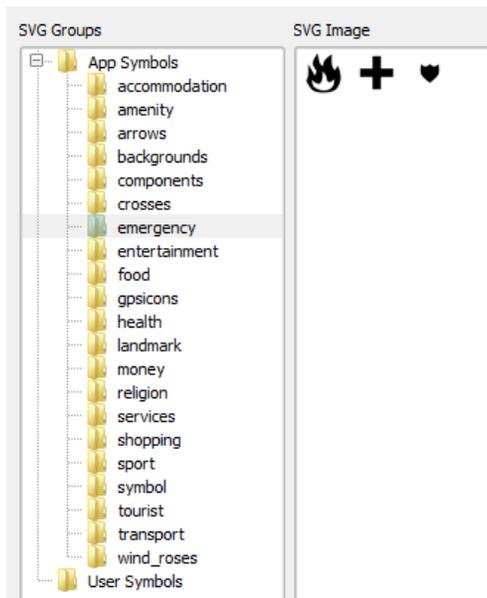
- 14) Click **OK** and then **OK** on the **Layer Properties** window to set the style. Counties should now be a beige color.
- 15) Using the same technique change the fill for *Native Hawaiian Homelands* to the RGB color: R: 255, G: 167, B: 127.
- 16) Change the **Border** color for *Native Hawaiian Homelands* to red from the **Color swatches** tab.
- 17) Now you will style the two point layers: *Cities* and *Hospitals*.
- 18) Open the **Layer Properties | Style** tab for *Cities*.
- 19) Click on **Simple marker**.
- 20) From the available simple markers at the bottom of the **Symbol layer type** choose the square.
- 21) Change the **Fill** to white and the **Size** to 2, and click OK to accept these changes and close the Layer Properties window.



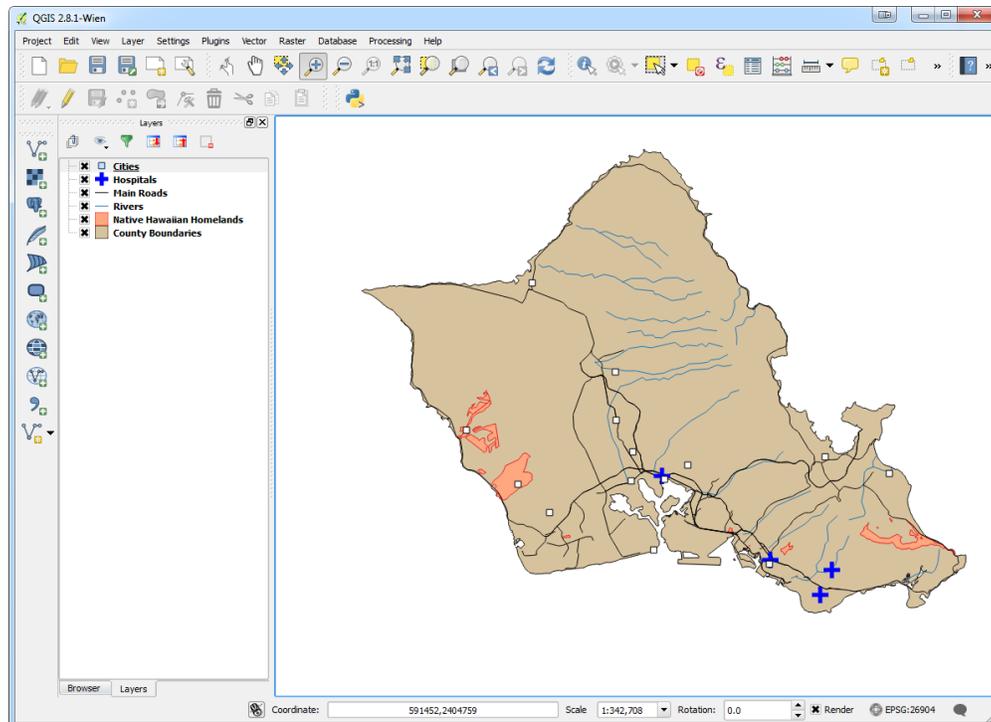
- 22) Open the **Layer Properties | Style** tab for *Hospitals*.
- 23) Click on **Simple marker**.
- 24) Click the dropdown menu for **Symbol layer type**. For point data there are several different sets of marker symbols. Choose **SVG Marker**.



- 25) A large list of **SVG groups** organized by folders will appear in the symbol window. Click on the **emergency** folder.



- 26) Select the cross symbol.
27) You can change the colors and sizes of these SVG symbols. Change the **Fill** color to a dark blue. Leave the **Size** at 7.
28) Zoom in to Oahu. Your map should now resemble the figure below.



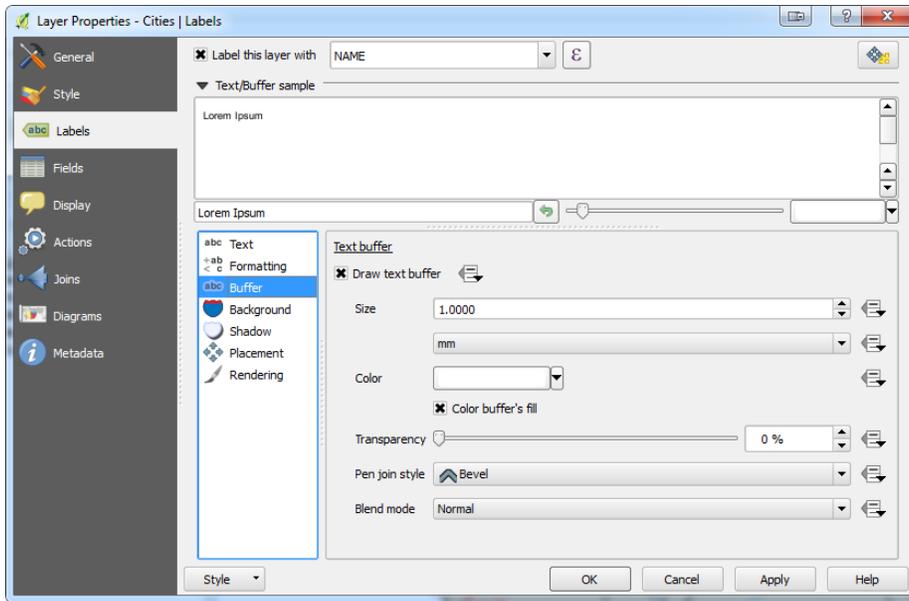
Adding Labels

Finally, you will label the *Cities*. You will use one of the attribute columns to label the layers.

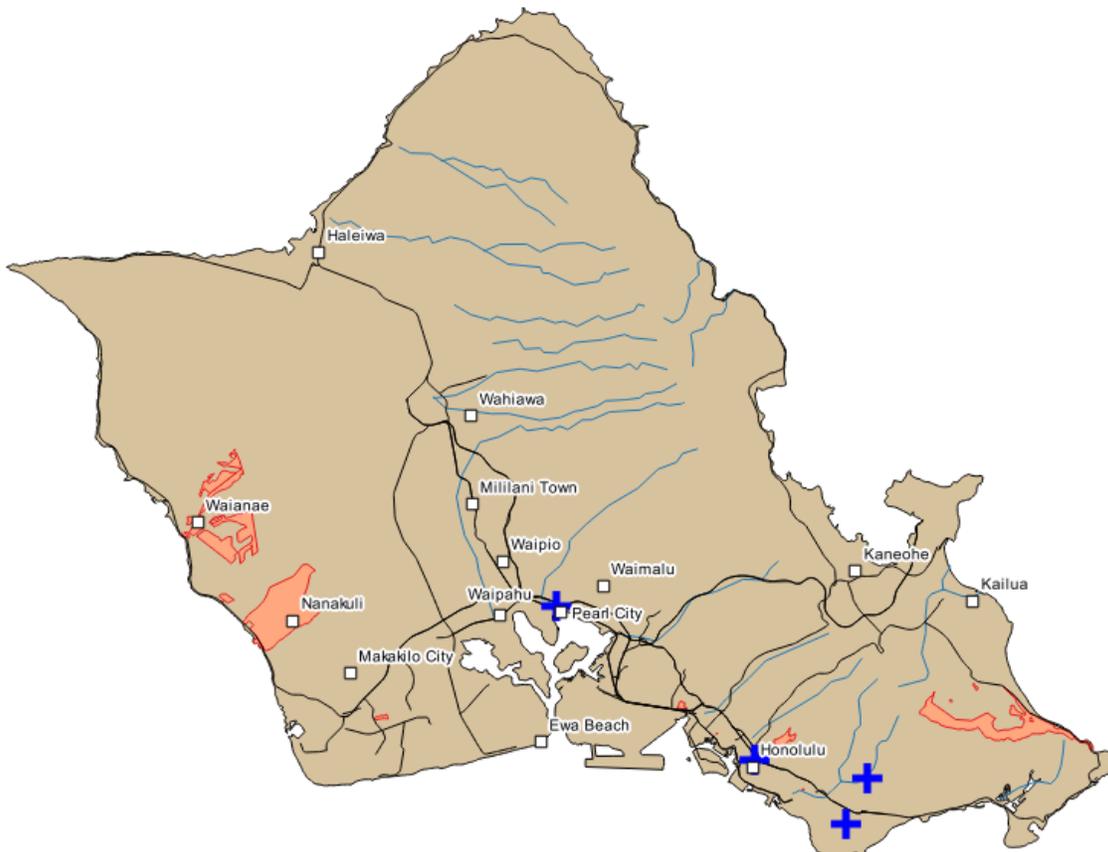
- 1) Right click on *Cities* and choose **Open Attribute table** from the context menu.

OBJECTID	FEATURE	NAME	ST_ABBREV	FIPS	PLACE_FIPS	POP_2000	POP2007	STATUS	
8	20261	no data	Waipio	HI	15003	79860	-99999	11682	NULL
10	20342	no data	Waipahu	HI	15003	79700	-99999	34182	NULL
12	20421	no data	Waimalu	HI	15003	77750	-99999	29312	NULL
21	22949	no data	Wailuku	HI	15009	77450	-99999	14058	County Seat
4	19923	no data	Waiānae	HI	15003	74450	-99999	10585	NULL
5	20030	no data	Wahiawa	HI	15003	72650	-99999	15732	NULL
11	20414	no data	Pearl City	HI	15003	62600	-99999	31202	NULL
6	20133	no data	Nanakuli	HI	15003	53900	-99999	10831	NULL
7	20149	no data	Mililani Town	HI	15003	51050	-99999	28484	NULL
9	20264	no data	Makakōlo City	HI	15003	47750	-99999	15831	NULL
2	17190	no data	Lihue	HI	15007	45200	-99999	6068	County Seat
19	22673	no data	Lanai City	HI	15009	43700	-99999	3717	NULL
20	22837	no data	Lahaina	HI	15009	42950	-99999	10744	NULL
17	22008	no data	Kualapuu	HI	15009	39500	-99999	2249	NULL
23	23213	no data	Kihei	HI	15009	36500	-99999	20304	NULL
18	22131	no data	Kaunakakai	HI	15009	31100	-99999	3089	NULL
14	20635	no data	Kaneohe	HI	15003	28250	-99999	34803	NULL
15	20786	no data	Kailua	HI	15003	23150	-99999	36128	NULL
24	25379	no data	Kailua	HI	15001	23000	-99999	12333	NULL
22	23055	no data	Kahului	HI	15009	22700	-99999	22114	NULL
16	20798	250,000 - 499,999	Honolulu	HI	15003	16999	371657	371657	State Capital
25	26128	no data	Hilo	HI	15001	14650	-99999	45567	County Seat
1	17037	no data	Hanapepe	HI	15007	11800	-99999	2571	NULL
0	16567	no data	Hanalei	HI	15007	11500	-99999	512	NULL
3	19697	no data	Haleiwa	HI	15003	10750	-99999	2182	NULL
13	20574	no data	Ewa Beach	HI	15003	07450	-99999	14582	NULL

- 2) Each table row represents data for one of the city points. You can see that there are 26 cities in the layer.
- 3) Each column contains things you know about each city point. Notice that there is a column called *Name* containing city names. You will use this to label the *Cities*. **Close** the table by clicking the X in the upper right hand corner.
- 4) Open the **Layer Properties | Labels** tab for the *Cities* layer.
- 5) Click the **Label this layer with** checkbox and from the associated dropdown menu choose **NAME** as the attribute to use.
- 6) Along the left side are several labeling tabs that allow you to specify the appearance and behavior of the labels: **Text**, **Formatting**, **Buffer**, **Background**, **Shadow**, **Placement**, and **Rendering**. Click on the **Buffer** item.
- 7) Click the checkbox next to **Draw text buffer**. This will place a halo around the label, making it easier to read against a busy background. Keep the default setting of **Size** = 1 and **Color** = white. Click **OK** on the **Layer Properties** window.



8) Your final map will include city labels.



Task 4. Add Field Data

Watch a [Task 4 Video Walkthrough](#) on YouTube.

Now that you are familiar with the basics of QGIS Desktop, you will add some data collected with iForm to QGIS. This data represents locations of Skilled Nursing staff collected by some community mappers in Hawaii.

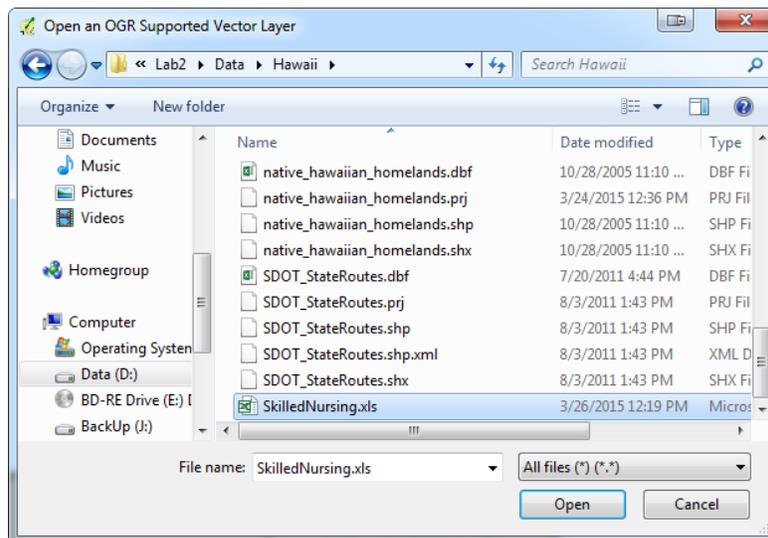
ODK Collect provides the data as a CSV file and iForm as an Excel spreadsheet. In this task, you will be working with an Excel spreadsheet collected with iForm.

Converting a Spreadsheet to a Comma Delimited Text File

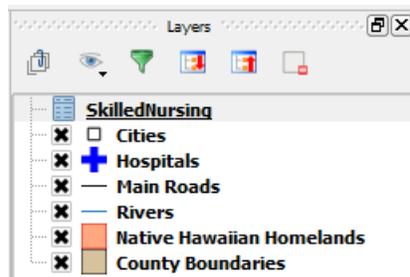
- 1) The Excel spreadsheet data provided by iForm first needs to be converted to a CSV file.
- 2) QGIS provides several tools for adding different types of data to your map.
- 3) The **Add Vector Layer** button can be used to add shapefiles as you saw in Task 3. It can also be used to add an Excel spreadsheet. Click the **Add Vector Layer** button.



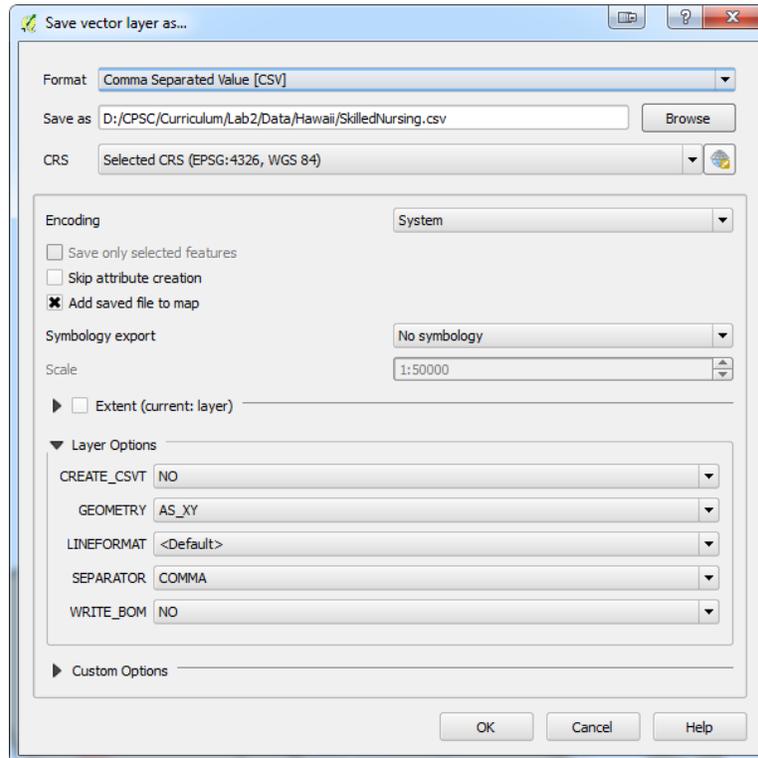
- 4) Click **Browse** on the **Add Vector Layer** window to open the **Open an OGR Supported Vector Layer** window. Set the filter in the lower right corner to **All files**. Navigate to the course data folder and select *SkilledNursing.xls*.



- 5) Click **Open** to add the data to QGIS Desktop. The spreadsheet will be added to the Layers panel with a table icon next to it.



- 6) To convert this to a CSV file, right click on it and choose **Save as** from the context menu.
- 7) In the **Save vector layer as** dialog:
 - a) Choose Comma Separated Values (CSV) as the **Format**
 - b) Click Browse, and navigate to your project folder and name the new copy.
 - c) Click **OK**.
 - d) The CSV version of the data table will be added to QGIS.



- 8) You can preview the CSV file to familiarize yourself with the data structure. To open it within QGIS, right click on the SkilledNursing layer, and choose **Open Attribute Table** from the context menu. Identify the columns with the latitude and longitude. The structure of the table is shown below.

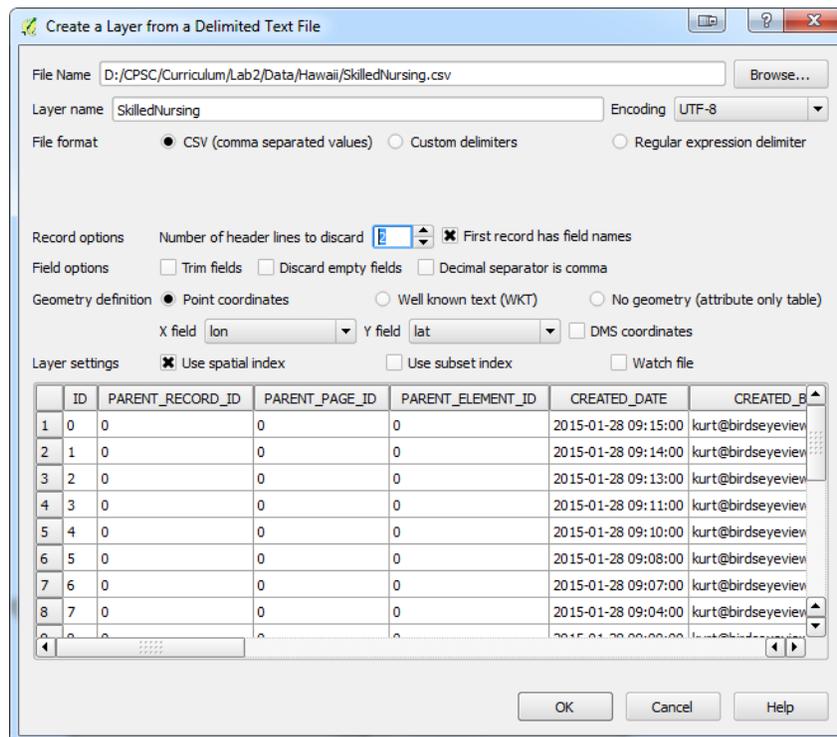
	Field12	Field13	Field14	Field15	Field16	Field17	Field18	Field19	Field20	Field21	Field22	Field23
0	Field12	Field13	Field16	Field17	Field19	Field20	Field21	Field22	Field20	Field21	Field22	Field23
1	MODIFIED_DEVI...	SERVER_MODIFI...	facility_locati...	lat	lon	Address	Name	Zipcode	Type_CerTB			
2	11Sebf20863eb2...	2015-01-28 09:1...	Latitude: 21.3980...	21.398023	-157.798139	450545 KAM HWY.	ALOHA NURSING...	96744	SNF/NF			1
3	11Sebf20863eb2...	2015-01-28 09:1...	Latitude: 21.3980...	21.41466	-157.794975	450181 WAIKAL...	ANN PEARL NUR...	96744	SNF/NF			1
4	11Sebf20863eb2...	2015-01-28 09:1...	Latitude: 21.3980...	21.301425		34 Punahou St.	ARCADIA RETIR...	96822	SNF			1
5	11Sebf20863eb2...	2015-01-28 09:1...	Latitude: 21.3980...	21.345104		30 KAM IV RD.	AVALON CARE C...	96819	SNF/NF			1
6	11Sebf20863eb2...	2015-01-28 09:1...	Latitude: 21.3980...	21.381387	-157.757238	640 Ulukahiki St.	CASTLE MEDICA...	96734	SNF/NF			1
7	11Sebf20863eb2...	2015-01-28 09:0...	Latitude: 21.3980...	21.322998	-157.855022	1900 Bachelot St.	CONVALESCENT ...	96817	SNF/NF			1
8	11Sebf20863eb2...	2015-01-28 09:0...	Latitude: 21.3980...	21.686608	-158.023973	580130 KAM HWY.	CRAWFORD'S C...	96712	NF			5
9	11Sebf20863eb2...	2015-01-28 09:0...	Latitude: 21.3980...	21.324304	-157.84328	2670 PACIFIC H...	HALE HO ALOHA	96813				
10	11Sebf20863eb2...	2015-01-28 09:0...	Latitude: 21.3980...	21.285348	-157.720682	6163 Summer St.	HALE MALAMALA...	96821	SNF/NF			

Mapping Field Data With QGIS

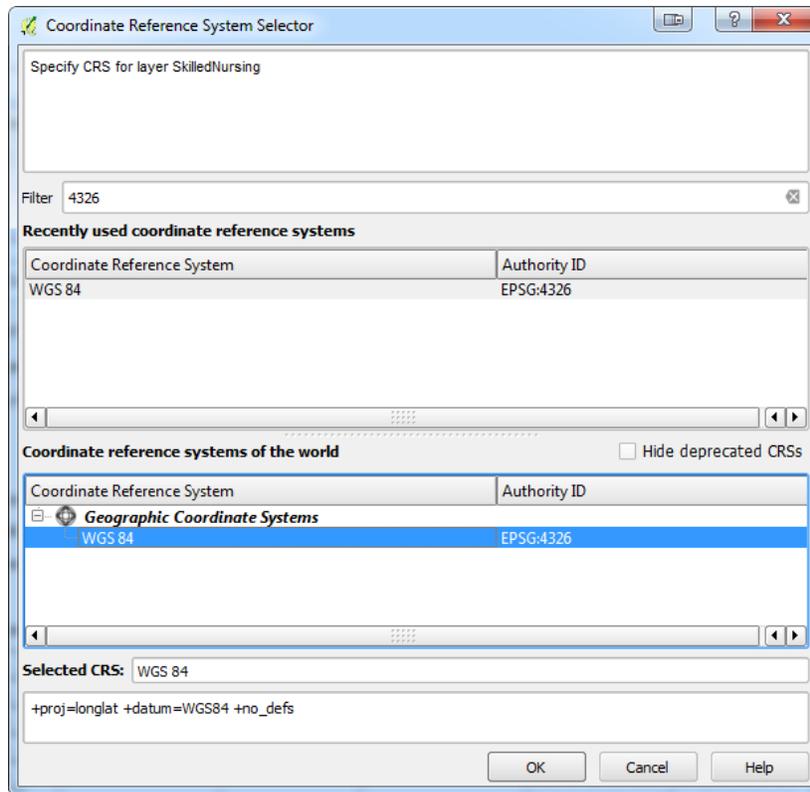
- 1) You will now use the **Add Delimited Text Layer** option to map these data.



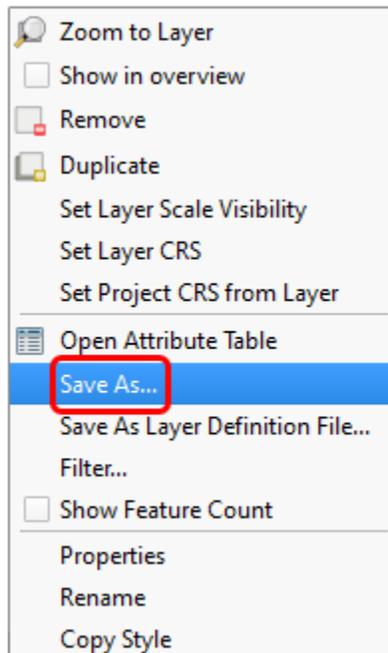
- 2) Populate the **Create a Layer from a Delimited Text File** dialog as below.
 - a) For **File Name** browse to your CSV file.
 - b) Provide an output **Layer name**.
 - c) Choose **CSV** as the delimiter.
 - d) The window below will provide a preview of the parsed file. By default QGIS isn't reading the file correctly.
 - e) Check **First record has field names** and set the **Number of header lines to discard** at 2 so that the field names display correctly.
 - f) Choose the **X** and **Y** fields. Hint: X is longitude and Y is latitude.
 - g) Click **OK**.



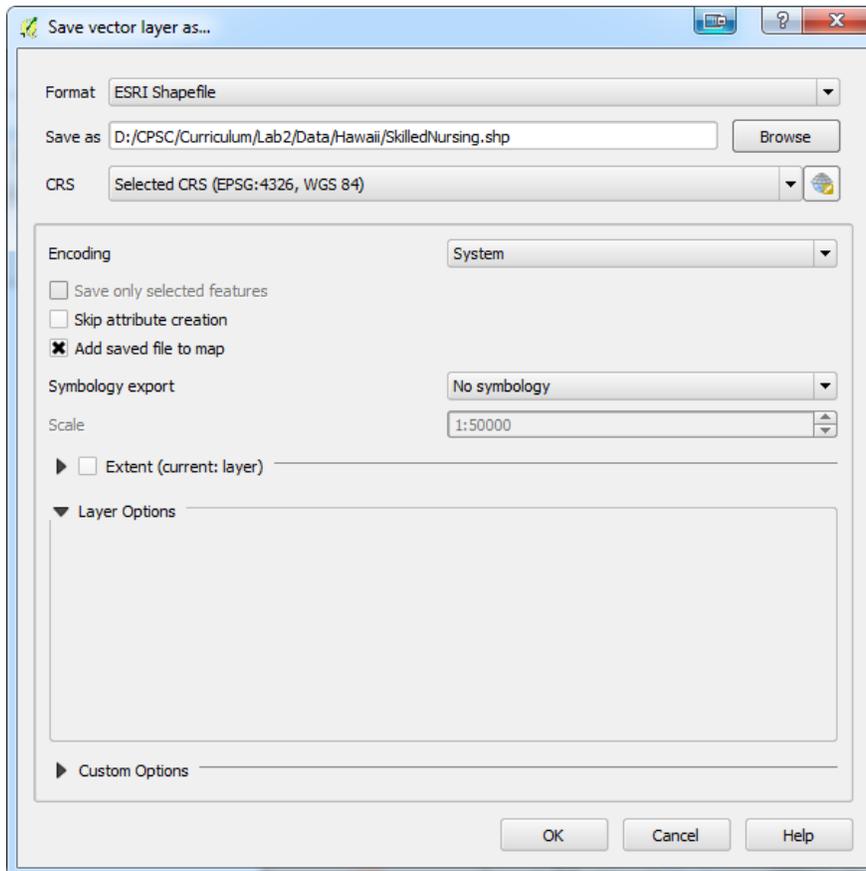
- h) The **Coordinate Reference System Selector** will open asking you to identify the coordinate system of the coordinates. In the **Filter** textbox, type *EPSG:4326* to find the WGS84 coordinate system of the data. Select this CRS. This is the coordinate system used by the GPS system.



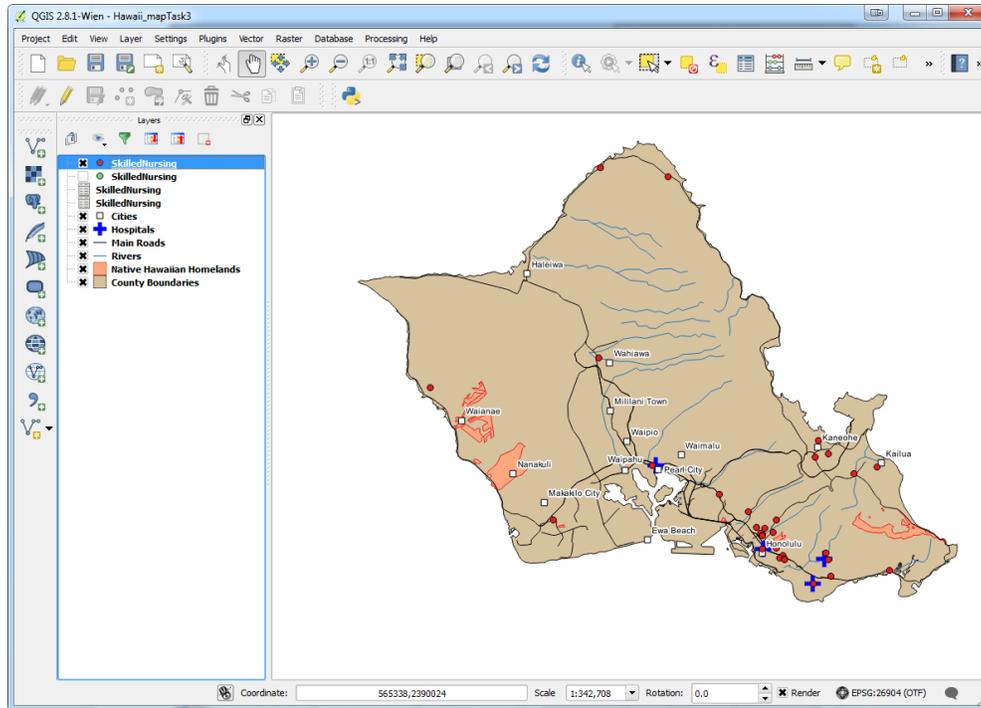
- i) Click **OK**.
- j) The data will show up as a temporary point layer with all the attributes.
- k) To save it as a permanent shapefile, right click on the layer and choose **Save As...** from the context menu.



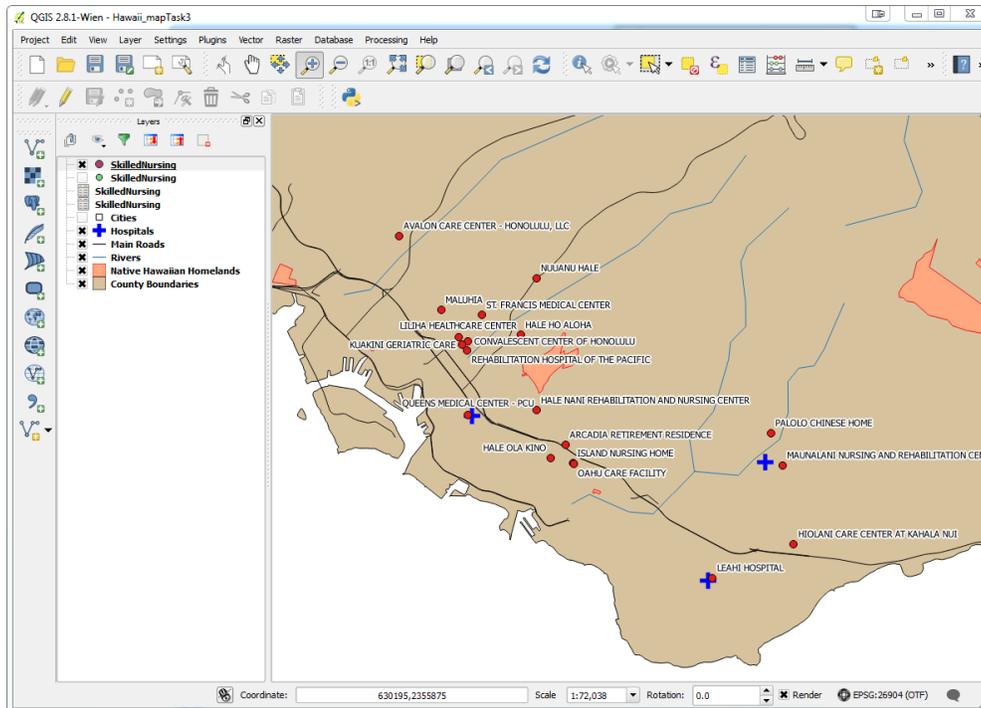
- 1) Fill out the **Save vector layer as...** dialog.
 - i. Set the **Format** to ESRI Shapefile.
 - ii. **Browse** to the lab data folder and name the new shapefile *SkilledNursing.shp*.
 - iii. Click **OK**.



- 3) The new layer is added to QGIS and you have successfully created a permanent mapped layer of your fieldwork!
- 4) Turn off the original SkilledNursing layer so that only the new shapefile version is enabled. Your map will now resemble the figure below.



- 5) Using what you have learned, style these points and label them with the NAME column.
- 6) The following screenshot shows them styled with a large red circle and labeled. The cities have been turned off and we have zoomed in to the Honolulu area.



5. Conclusion

In this lab, you learned the basic layout and functionality of QGIS Desktop. You saw how to add style and label layers of information. You also learned how to bring data collected from iForm into QGIS and map the points.

6. Challenge Assignment

Now that you understand the basics of working with QGIS and importing field data, import the data you collected in Lab 1.