

## **ANNEX 9**

***Manuals for Development and Operation of GIS Database for Monitoring DPM Action Plan, CBDRM and Disaster Education***





The Project on Capacity Development  
in Disaster Management in Thailand  
(Phase-2)

# Manuals for Development and Operation of GIS Database for Monitoring DPM Action Plan, CBDRM and Disaster Education

November 2013

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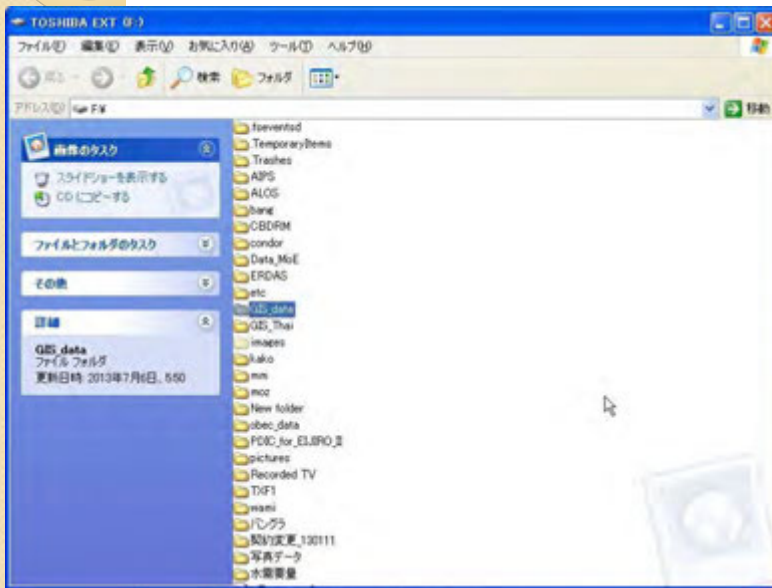
- 
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- 
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# 0. Installation of Quantum GIS

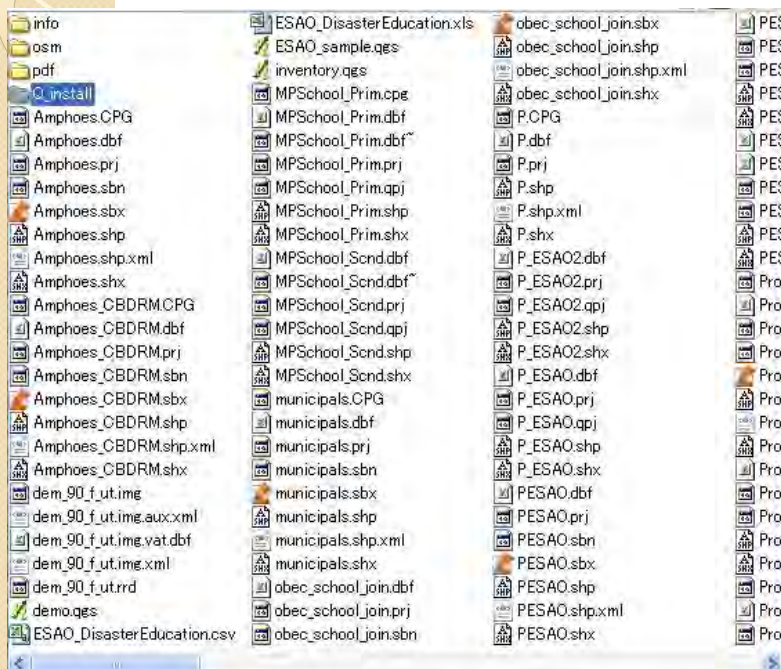
## 0.1 Data copy



Copy "GIS\_data" folder to your PC.

# 0. Installation of Quantum GIS

## 0.1 Data copy

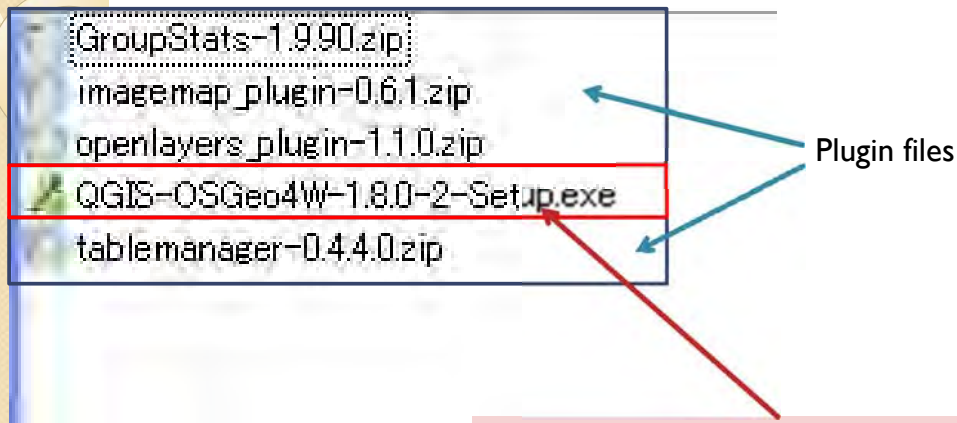


"GIS\_data" folder contains GIS data (shape files and so on) and QGIS installer.

Open "Q\_install" folder.

## 0. Installation of Quantum GIS

### 0.2 Installation (QGIS)

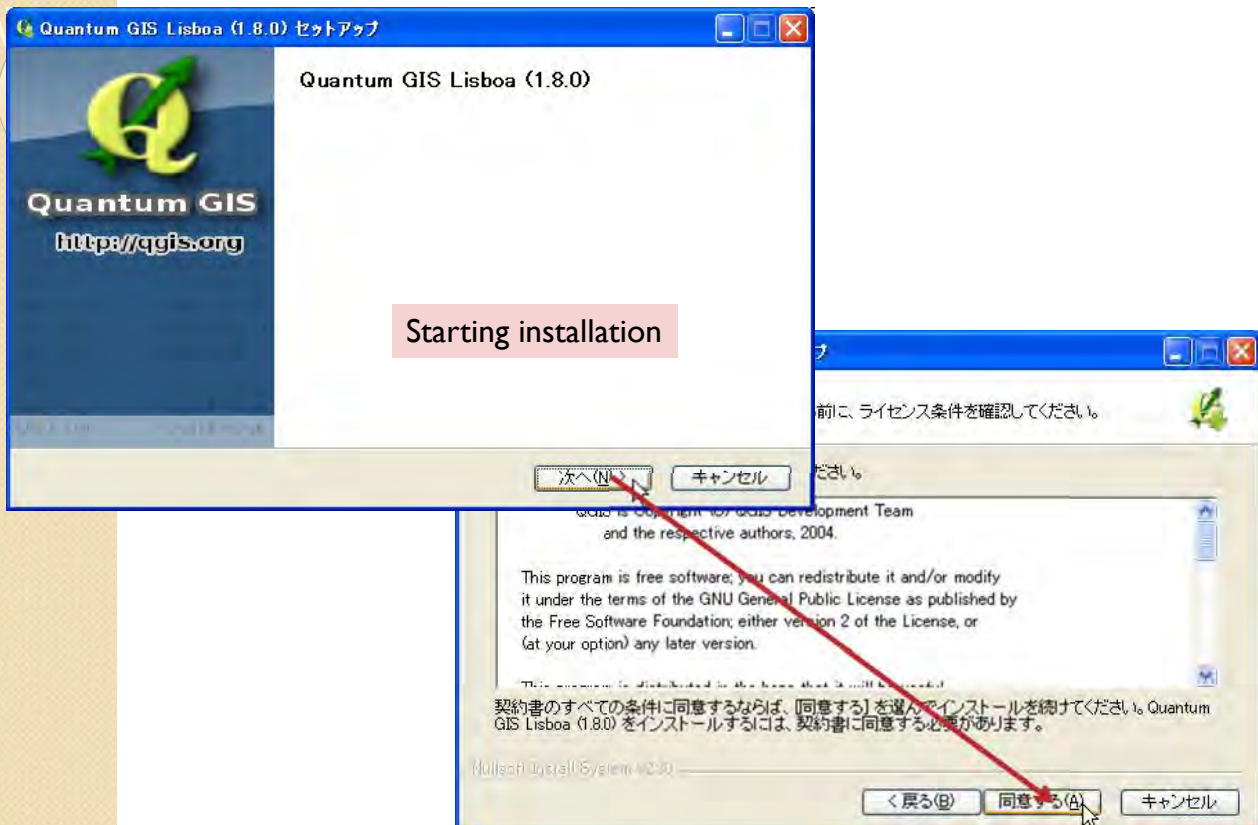


This file is QGIS installer.  
Double click QGIS installer to start set up.

If you use windows 7 or later. In some case, it is necessary to install by administrator. Right click the QGIS installer and select "run as administrator".

## 0. Installation of Quantum GIS

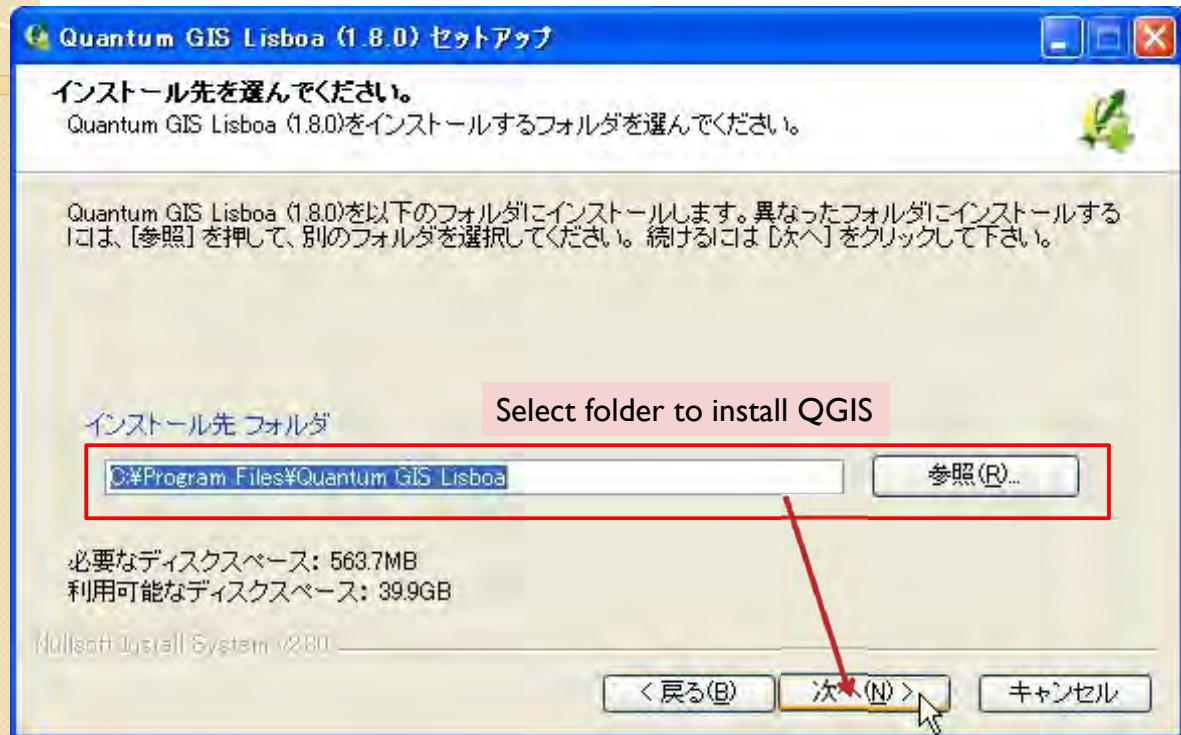
### 0.2 Installation (QGIS)





## 0. Installation of Quantum GIS

### 0.2 Installation (QGIS)



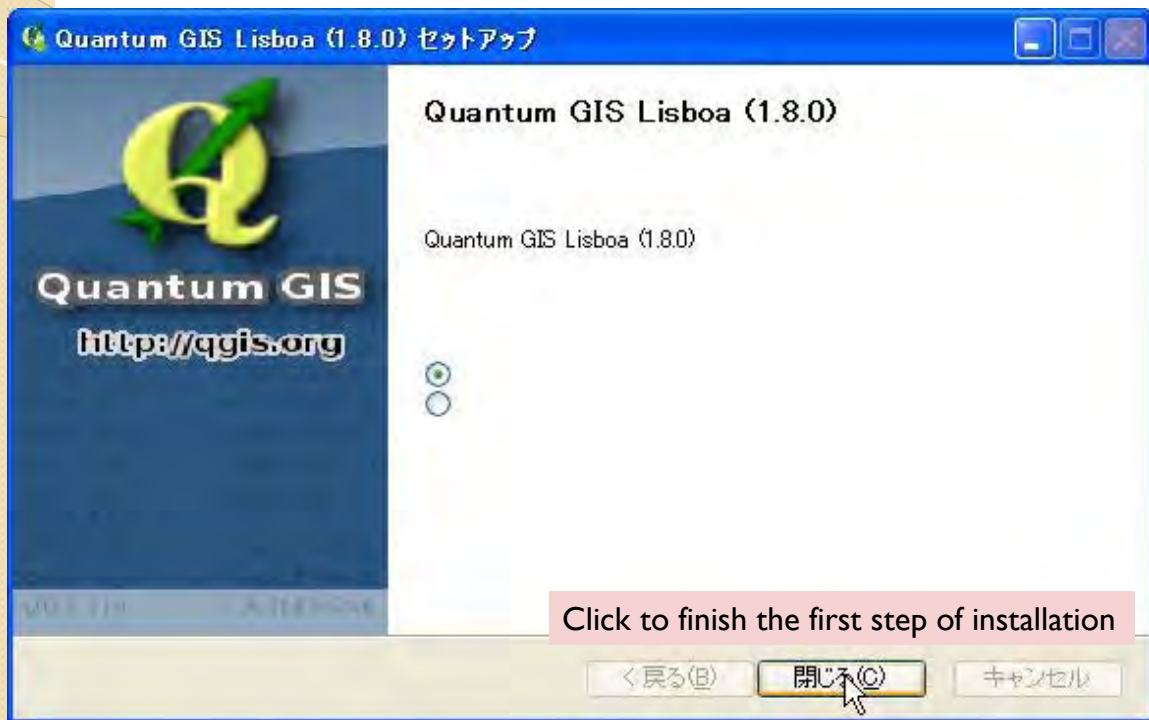
## 0. Installation of Quantum GIS

### 0.2 Installation (QGIS)



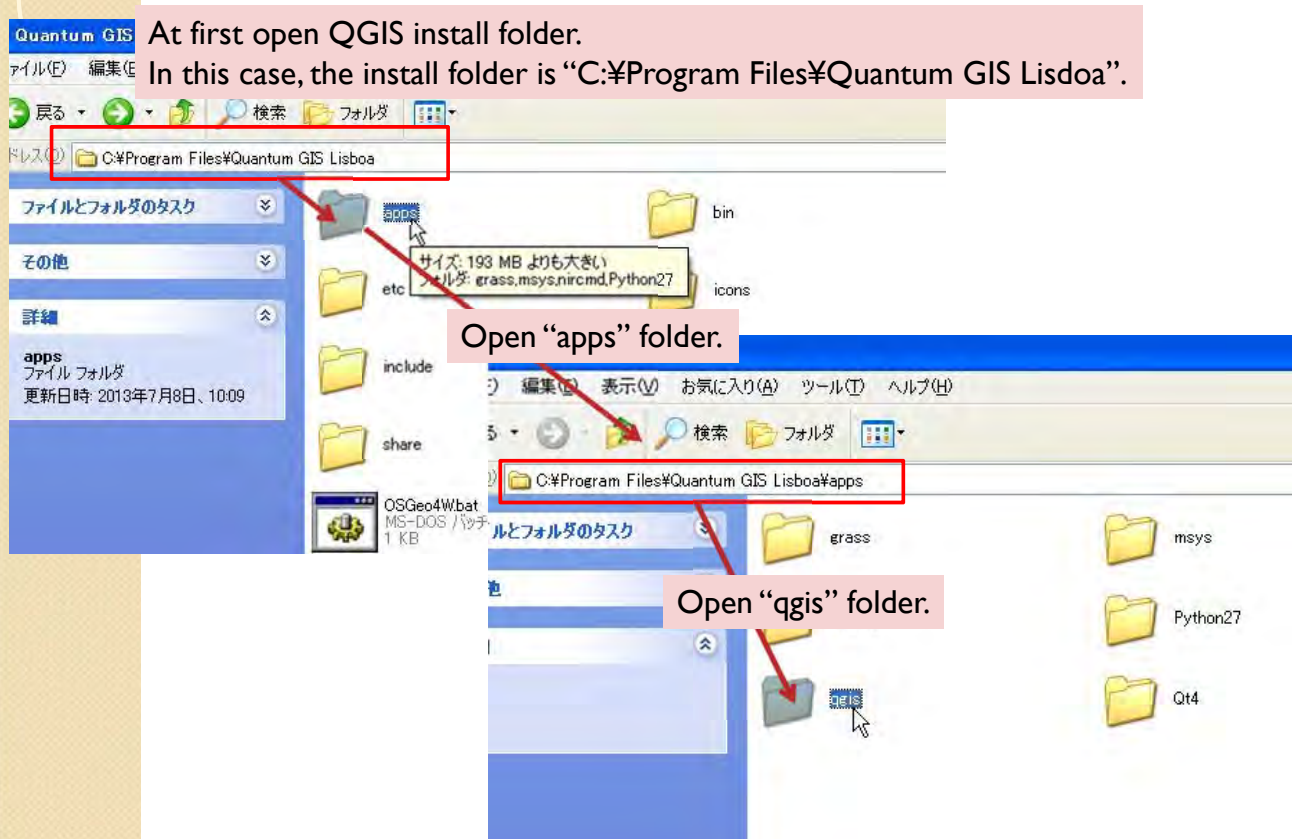
## 0. Installation of Quantum GIS

### 0.2 Installation (QGIS)



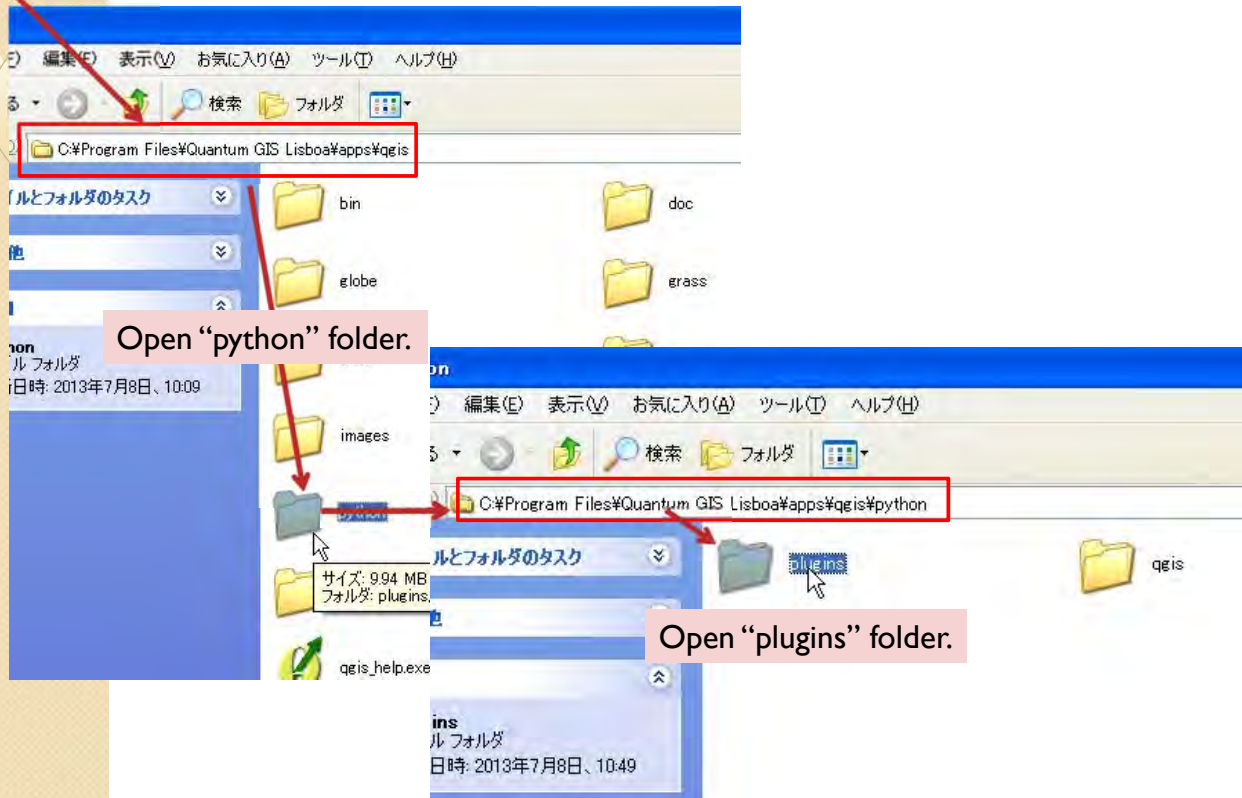
## 0. Installation of Quantum GIS

### 0.2 Installation (plugins and settings)



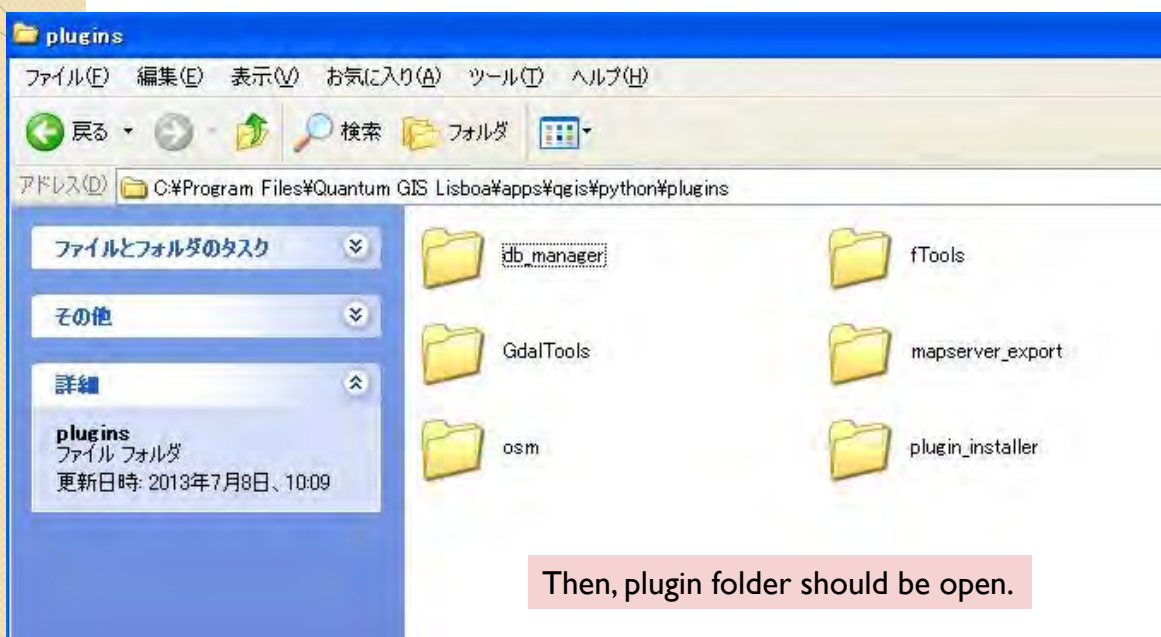
## 0. Installation of Quantum GIS

### 0.2 Installation (plugins and settings)



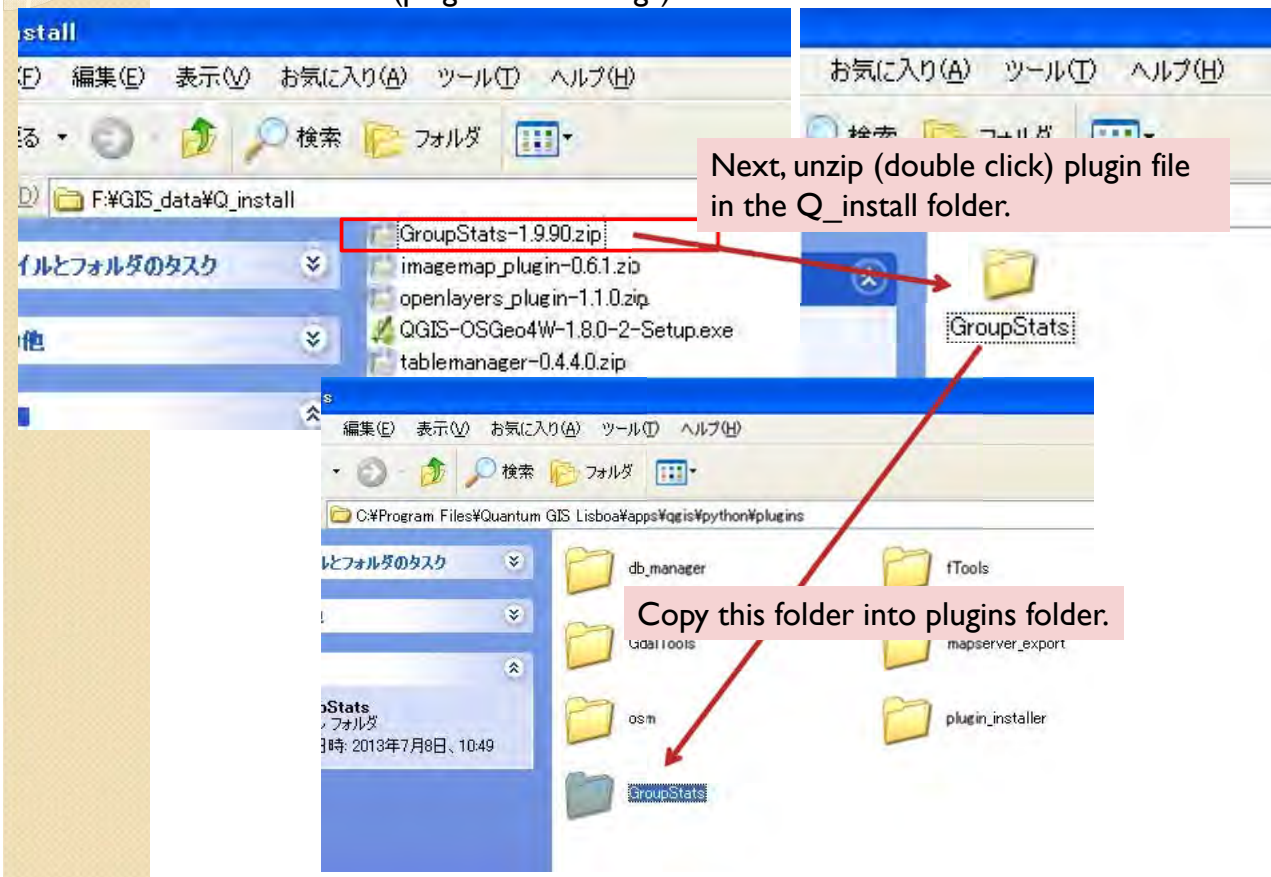
## 0. Installation of Quantum GIS

### 0.2 Installation (plugins and settings)



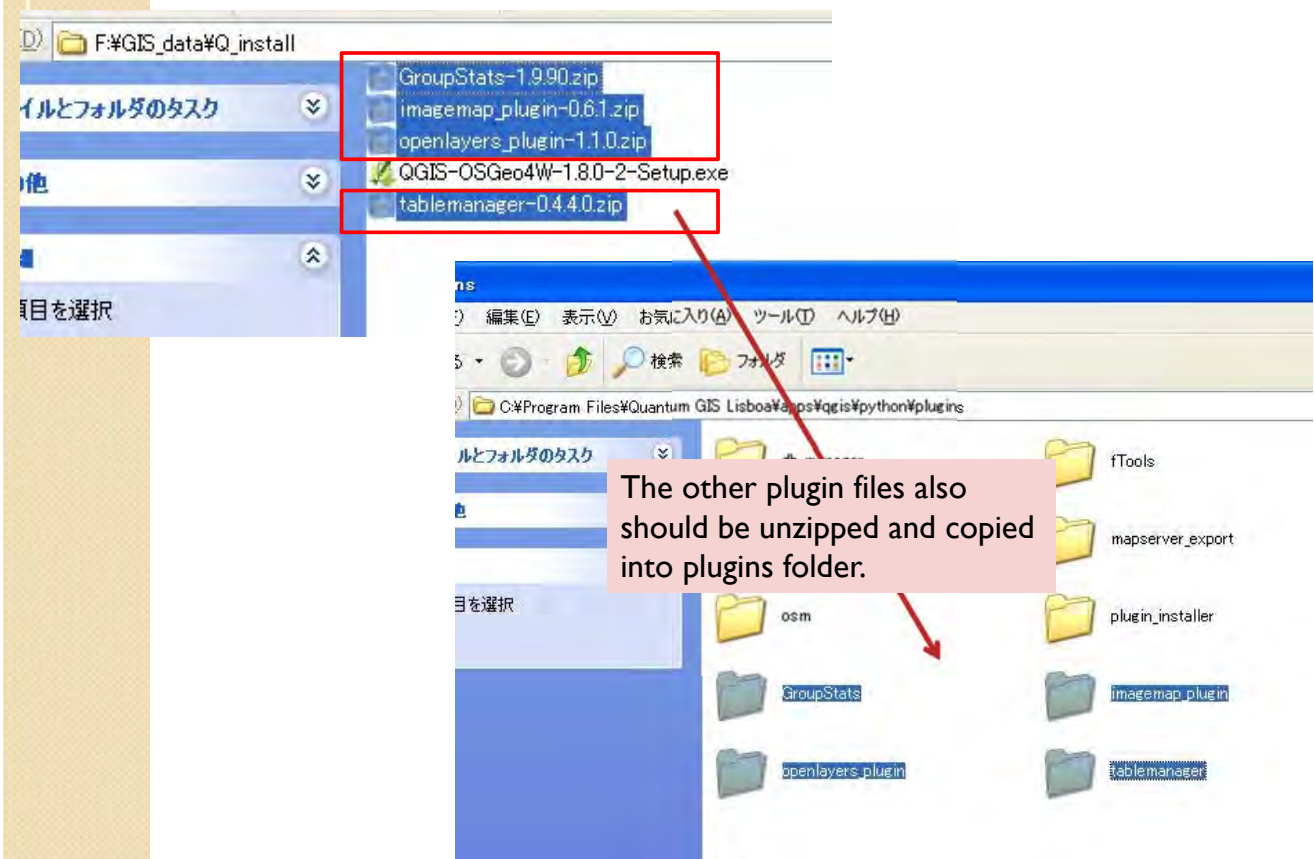
## 0. Installation of Quantum GIS

### 0.3 Installation (plugins and settings)



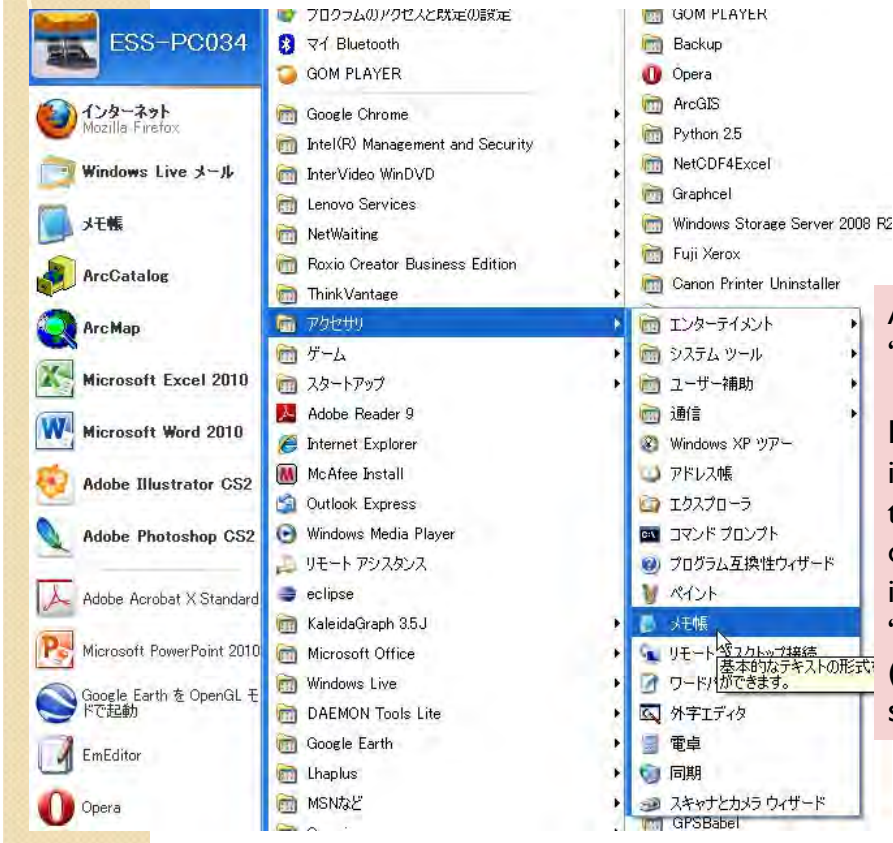
## 0. Installation of Quantum GIS

### 0.3 Installation (plugins and settings)



## 0. Installation of Quantum GIS

### 0.3 Installation (plugins and settings)



At the last of the setting, open "notepad".

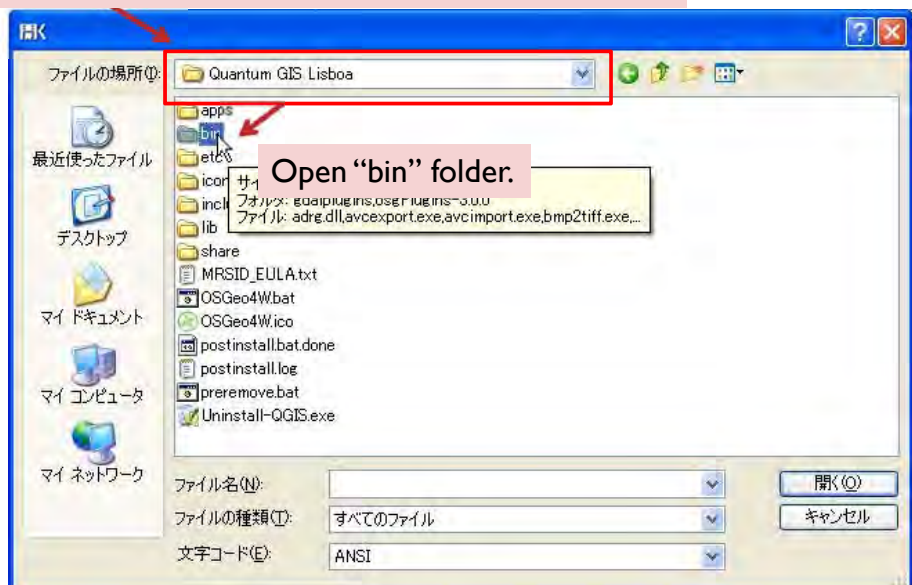
If you use windows 7 or later, in some case (ex. you install the program by "administrator" or into "program files" folder), it is necessary to open the "notepad" as administrator (right click "notepad" and select "run as administrator").

## 0. Installation of Quantum GIS

### 0.3 Installation (plugins and settings)

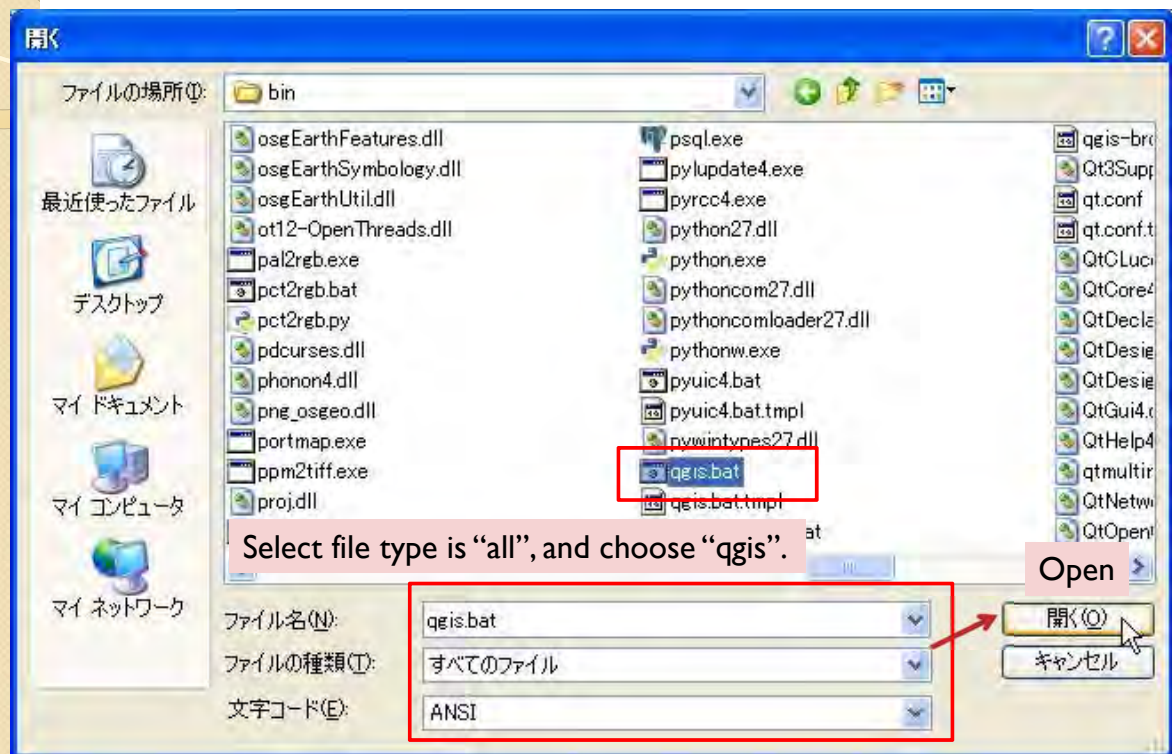


Select open file. Open QGIS install folder. In this case, the install folder is "C:\Program Files\Quantum GIS Lisboa".



## 0. Installation of Quantum GIS

### 0.3 Installation (plugins and settings)



## 0. Installation of Quantum GIS

### 0.3 Installation (plugins and settings)

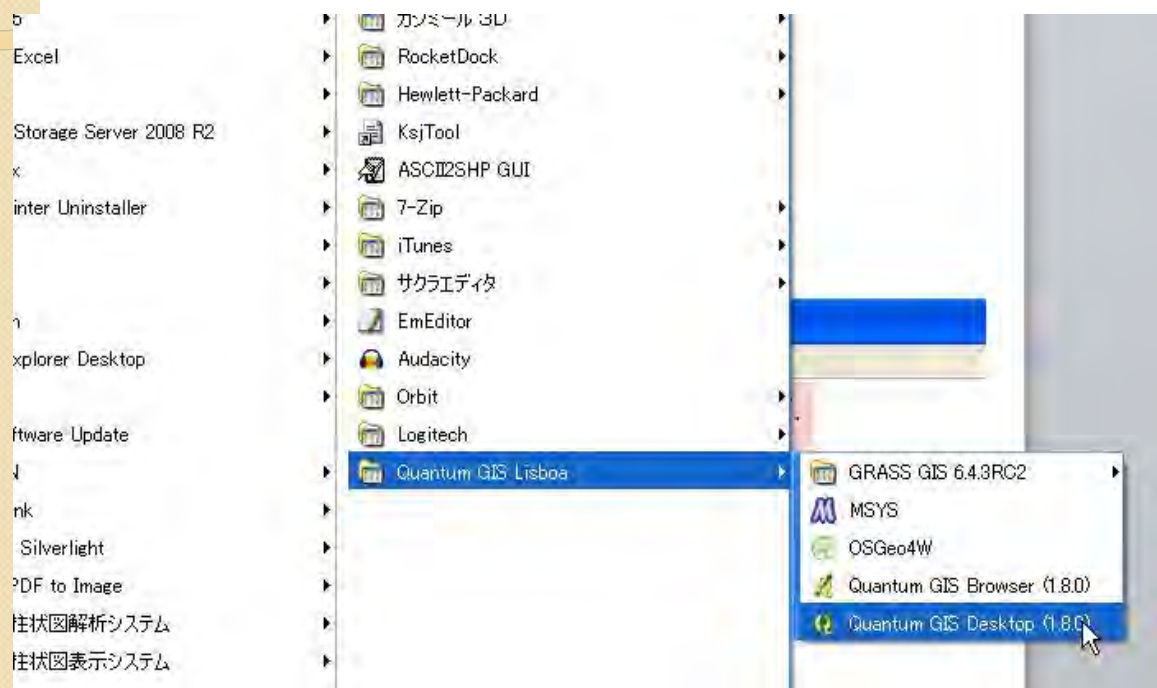
Then, the file is open.

```
qgis.bat - メモ帳
ファイル(F) 編集(E) 書式(O) 表示(V) ヘルプ(H)
@echo off
SET SHAPE_ENCODING=DUMMY
SET OSGeo4W_ROOT=C:\PROGRAM FILES\OSGeo4W
call "%OSGeo4W_ROOT%\bin\o4w_env.bat"
call "%OSGeo4W_ROOT%\apps\grass\grass-6.4.3RC2\etc\env.bat"
@echo off
path %PATH%;%OSGeo4W_ROOT%\apps\qgis\bin;%OSGeo4W_ROOT%\apps\grass\grass-6.4.3RC2\lib
start "Quantum GIS" /B "%OSGeo4W_ROOT%\apps\qgis\bin\qgis.exe %*
```

## 0. Installation of Quantum GIS

### 0.3 Installation (plugins and settings)

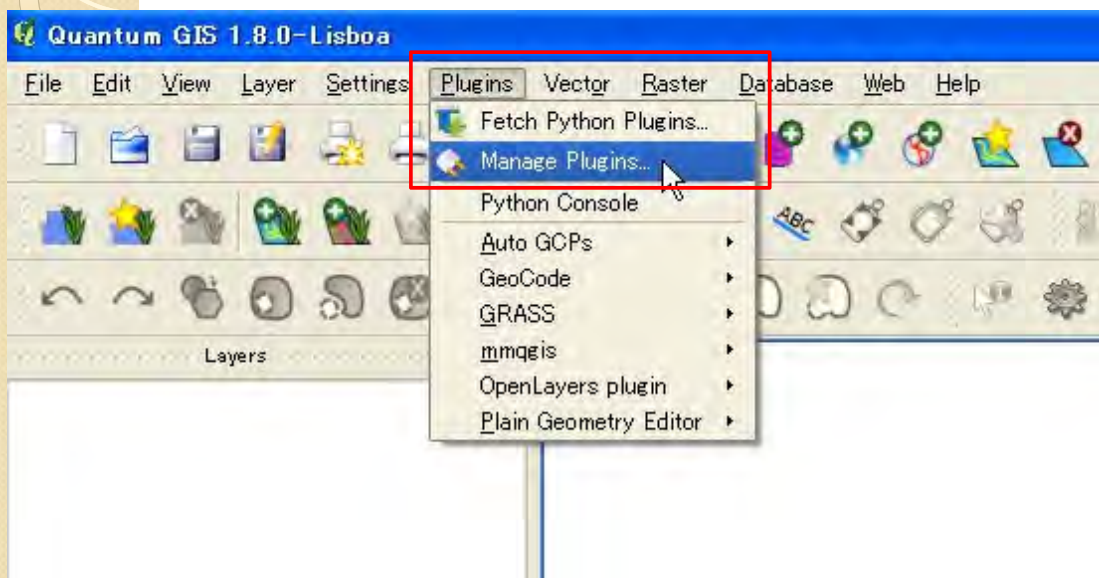
Now, you can start “Quantum GIS Desktop”.



## 0. Installation of Quantum GIS

### 0.3 Installation (plugins and settings)

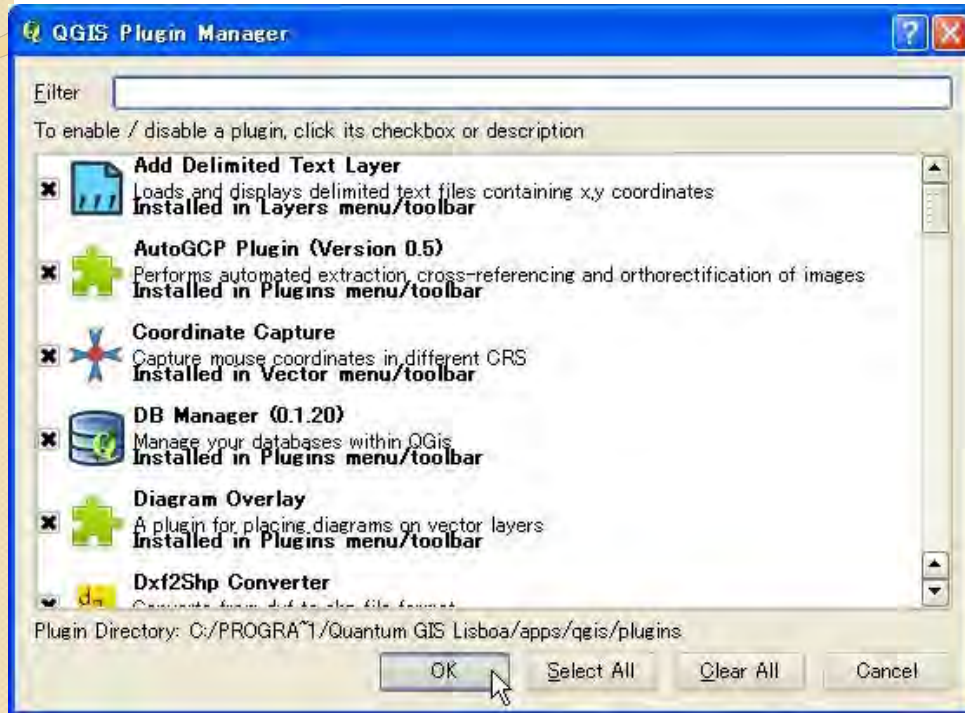
Click “Plugins” – “Manage Plugins”.



## 0. Installation of Quantum GIS

### 0.3 Installation (plugins and settings)

Select all and click OK to enable plugins.



## 0. Installation of Quantum GIS

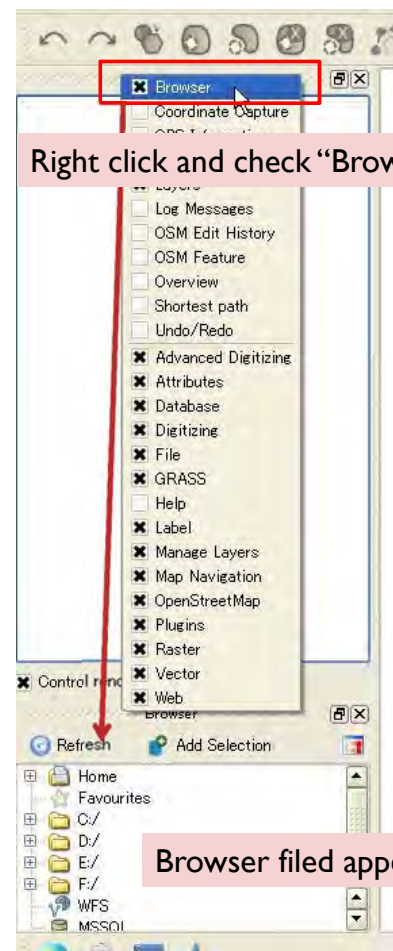
### 0.3 Installation (plugins and settings)

Right click and check "Browser" to show file browser.

Then, it is ready to use QGIS.

Official QGIS HP is below. You may find more information and plugins.

<http://www.qgis.org/>





# I. Constitution of GIS Data and How to Use GIS Software

Example of GIS data...

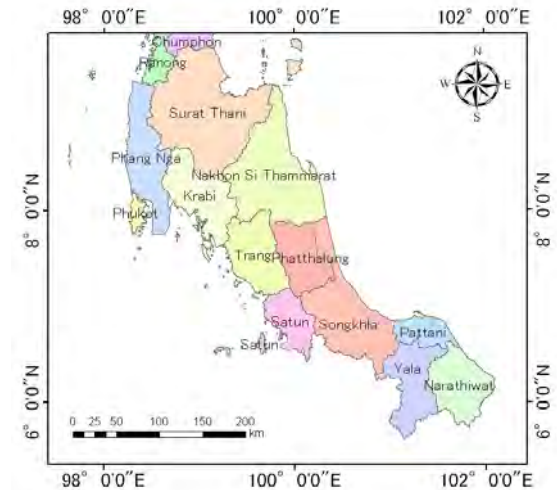
Attribute	Location
...Province Name	...Longitude
...Population	...Latitude
...etc.	...Shape

↔  
referenced

## I.1 GIS data and Outline of the Inventory map

What is GIS data ?

Geographical Information System (GIS) data is attribute database referenced to location information.

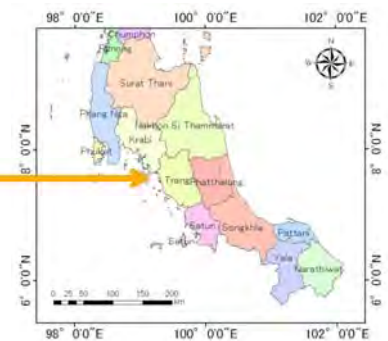


## I. Constitution of GIS Data and How to Use GIS Software

The points, lines and polygons are called “**vector layer**”. Each **vector layer** has attributes such as ID number, name and so on.

The attributes are contained in the GIS database as “Attribute Table”.

AREA	PROV_CODE	PROV_NAM_T	PROV_NAM_E	population	RC_Code	pop_den	
0	1066622	10	กรุงเทพมหานคร	Bangkok	6355144	NULL	4359.59
1	967116	11	เชียงใหม่	Changwat Saen...	1008401	RC03	1083.37
2	6364	12	เชียงราย	Changwat Nakh...	816614	RC01	1283.18
3	1820801	18	กำแพงเพชร	Changwat Path...	677649	RC01	445.59
4	2547348	14	ขอนแก่น	Changwat Pha...	727277	RC01	285.5
5	950497	15	อุบลราชธานี	Changwat Ang...	269419	RC16	283.45
6	6502715	16	เลย	Changwat Lopburi	745506	RC16	114.85
7	817007	17	หนองบัวลำภู	Changwat Sing...	232766	RC16	284.9



Integrate

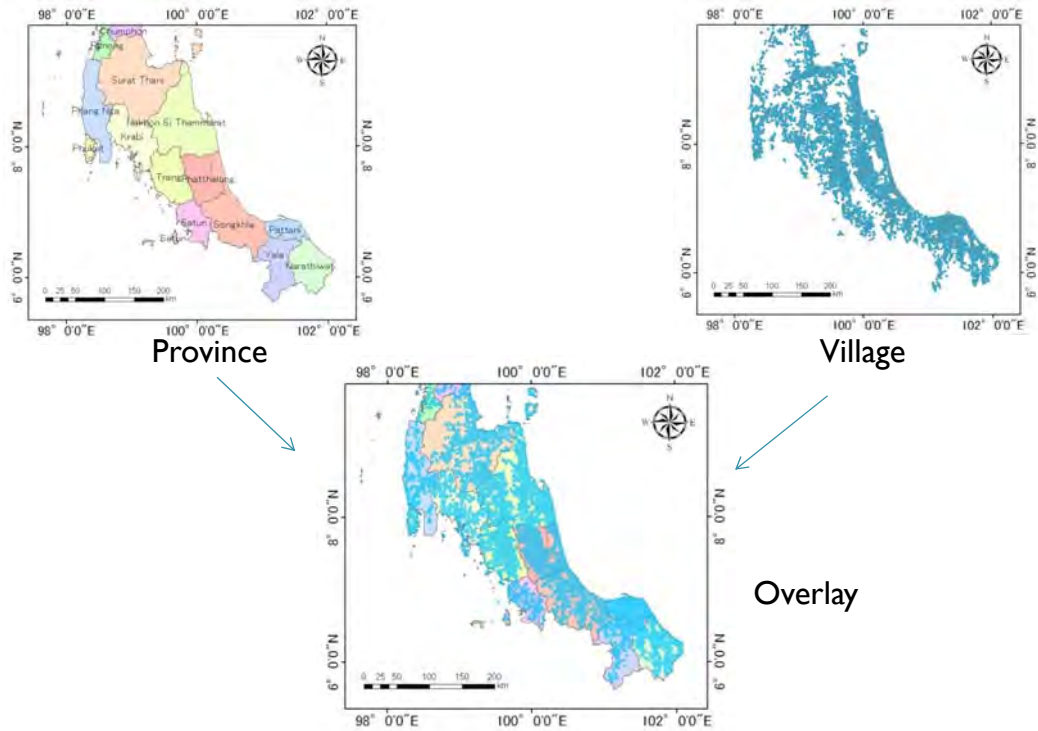
1	2	3	4	5	6	7	8	9	10
Villa_Code	Villa_Name	Prov_Code	Prov_Name	Amp_Code	Amp_Name	CBDRM_done	Type_Flood	Type_Other	Year
1	13011102 บ้านคลองเปรมประชา	13	Pathum Thani	1301	เมือง				40
2	13011103 บ้านบางเขน	13	Pathum Thani	1301	เมือง				40
3	13011105 บ้านบางเขน	13	Pathum Thani	1301	เมือง				48
4	13010201 บ้านคลองลำโพง	13	Pathum Thani	1301	เมือง				48
5	13010202 บ้านคลองลำโพง	13	Pathum Thani	1301	เมือง				48
6	13010203 บ้านคลองลำโพง	13	Pathum Thani	1301	เมือง				48
7	13010204 บ้านคลองลำโพง	13	Pathum Thani	1301	เมือง				48
8	13010205 บ้านบางเขน	13	Pathum Thani	1301	เมือง				49
9	13010206 บ้านบางเขน	13	Pathum Thani	1301	เมือง				49
10	13010501 บ้านคลองลำโพง	13	Pathum Thani	1301	เมือง				50
11	13010502 บ้านคลองลำโพง	13	Pathum Thani	1301	เมือง				50

In order to make inventory map, inventory table (list of the CBDRM conducted village) will be integrated into the “attribute table”.

## I. Constitution of GIS Data and How to Use GIS Software

Each GIS data is able to be overlaid on any other GIS data.

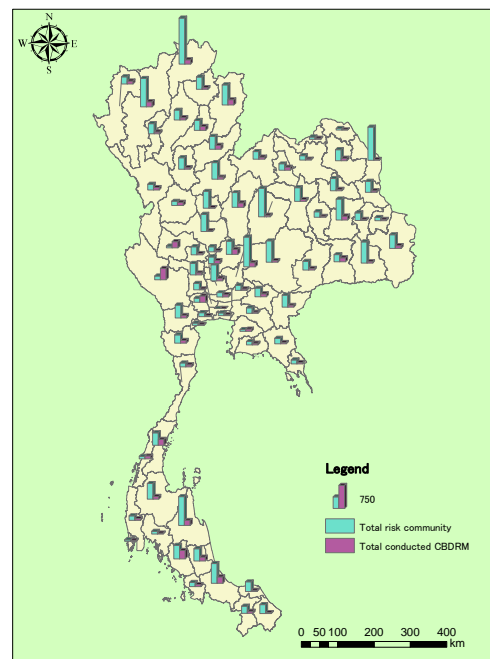
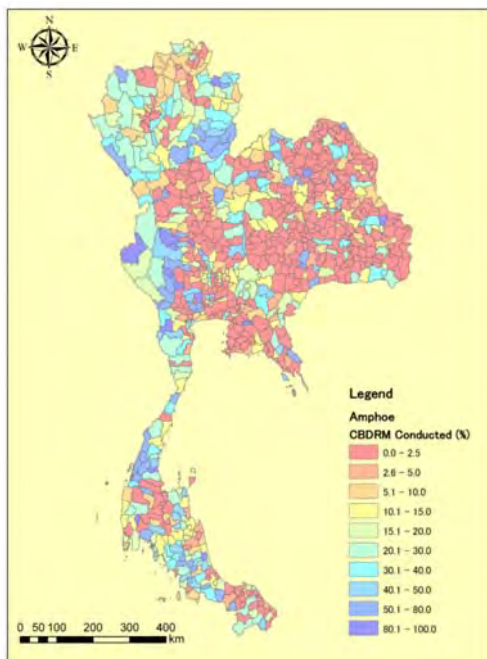
Inventory map may consists of some layers (Province map, Village map and so on).



## I. Constitution of GIS Data and How to Use GIS Software

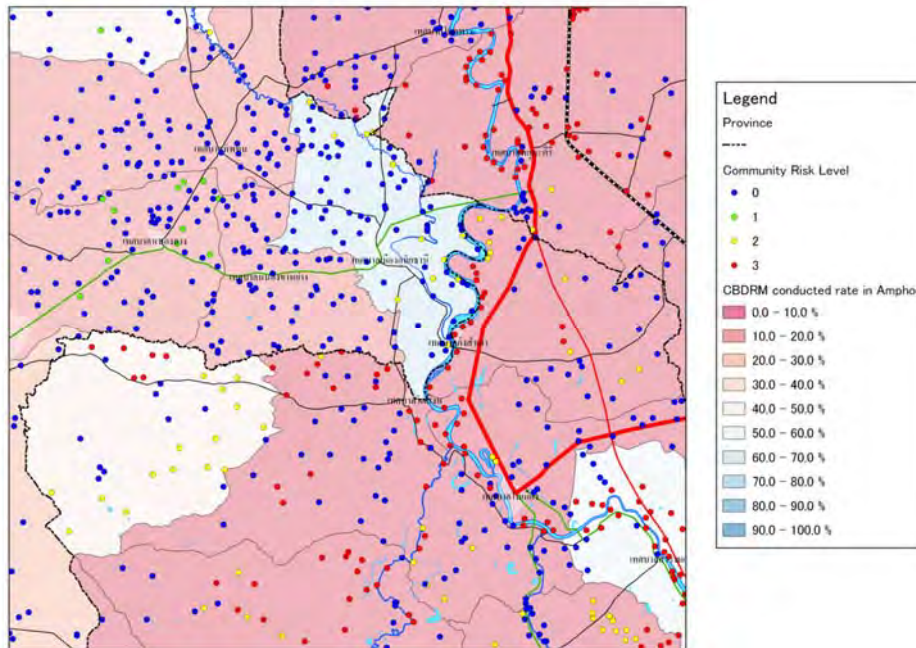
By using attribute table (including CBDRM conducted number of villages), enforcement rate chart and map can be created. The goal is to make inventory map as below.

The inventory maps are helpful to monitor the progress of project activities and useful to make future plan.



## I. Constitution of GIS Data and How to Use GIS Software

GIS enables to display multiple data into one map. Thus, you can easily recognize the progress and issues of the project activities.



Ex) Red points are high risk communities. These are distributed in eastern and southern area, but the CBDRM conducted rate is relatively low in the area (red colored area).

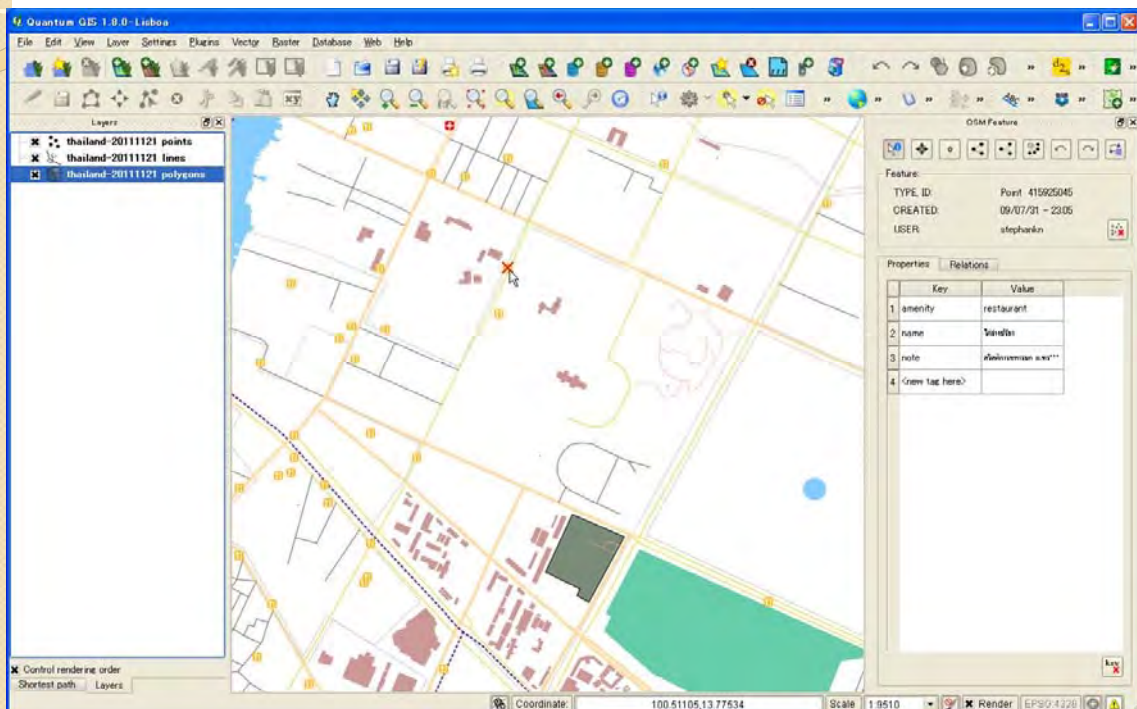
You can judge that the CBDRM activities should be reinforced in the risky area.

## I. Constitution of GIS Data and How to Use GIS Software

### I.2 Examples of GIS Software

#### Quantum GIS

Open source GIS software. Many functions and plugins are packaged.



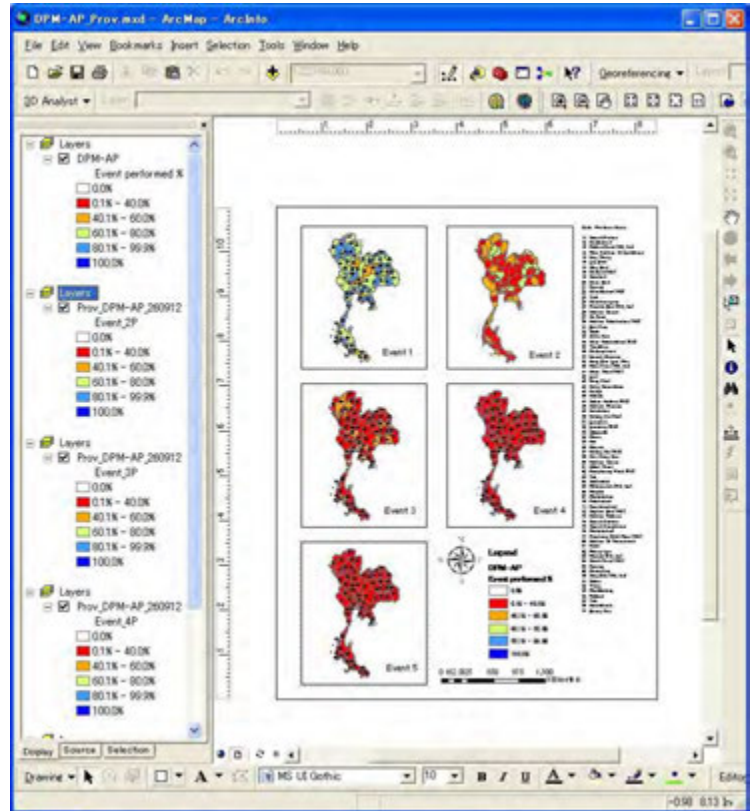
# I. Constitution of GIS Data and How to Use GIS Software

## I.2 Examples of GIS Software

### Arc GIS

Famous GIS software.

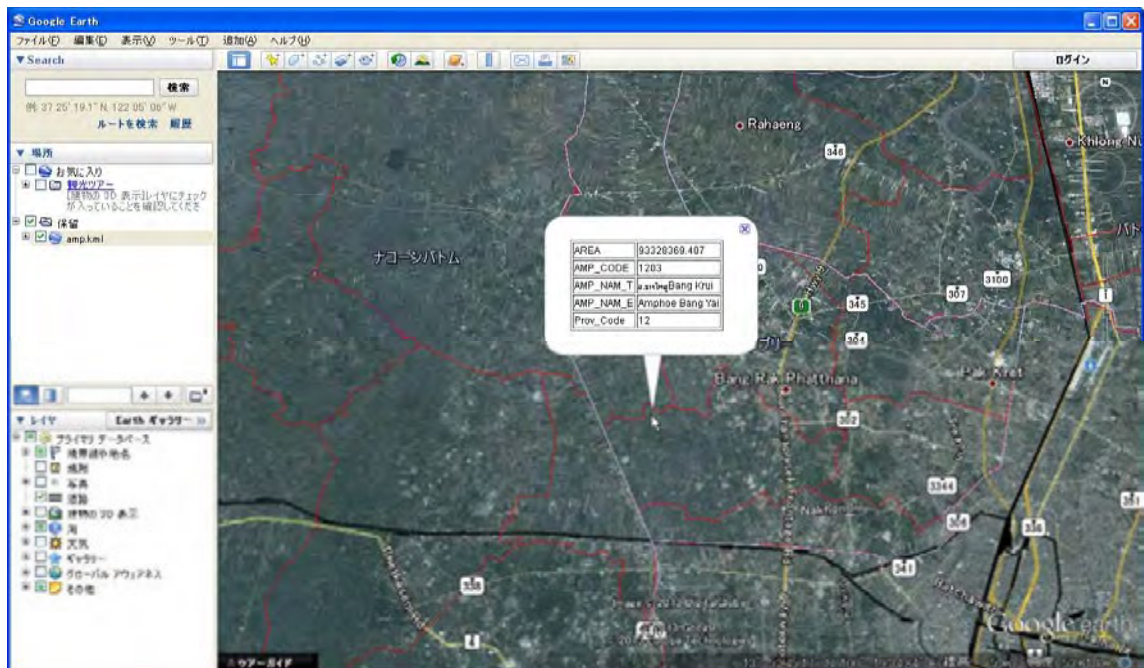
Too expensive...



# I. Constitution of GIS Data and How to Use GIS Software

## I.2 Examples of GIS Software

It is possible to export GIS data to kml file and display by Google Earth, Google Map and etc..



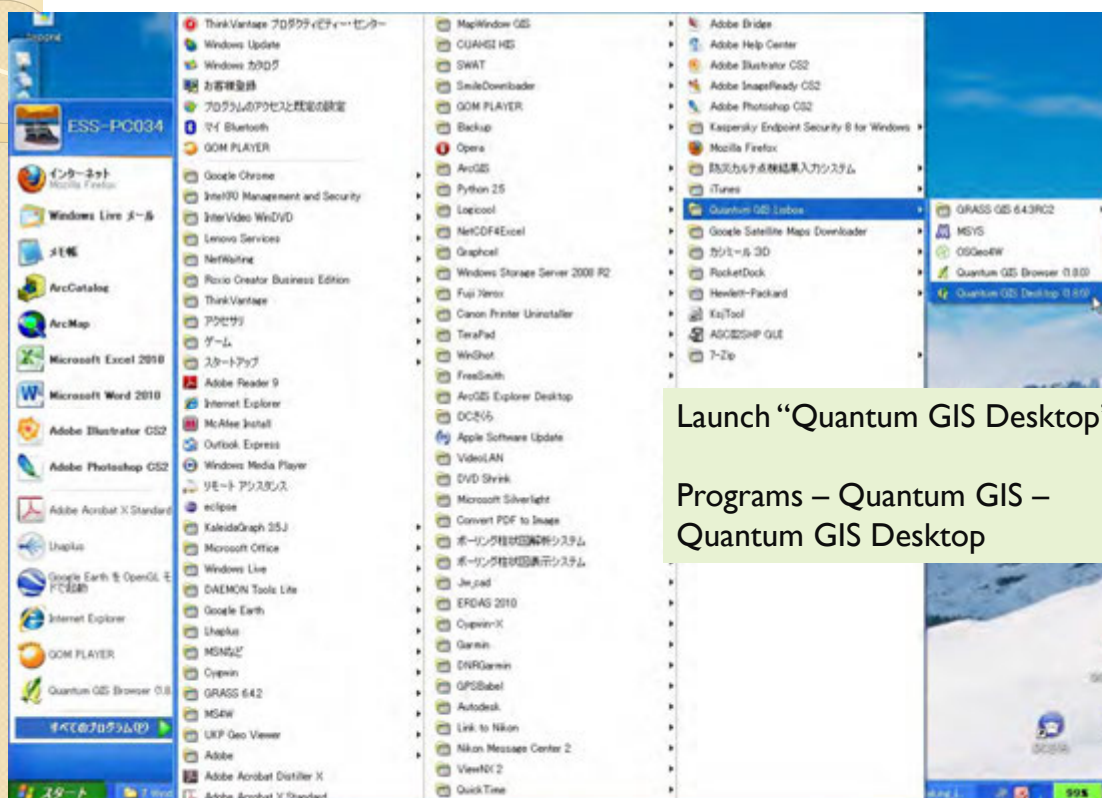
## I. Constitution of GIS Data and How to Use GIS Software

### I.3 How to use GIS Software

- 1) **Quantum GIS**  Quantum GIS Desktop (1.8.0)  
GIS mapping software
- 2) **Microsoft Excel**  Microsoft Excel 2010  
for data input

## I. Constitution of GIS Data and How to Use GIS Software

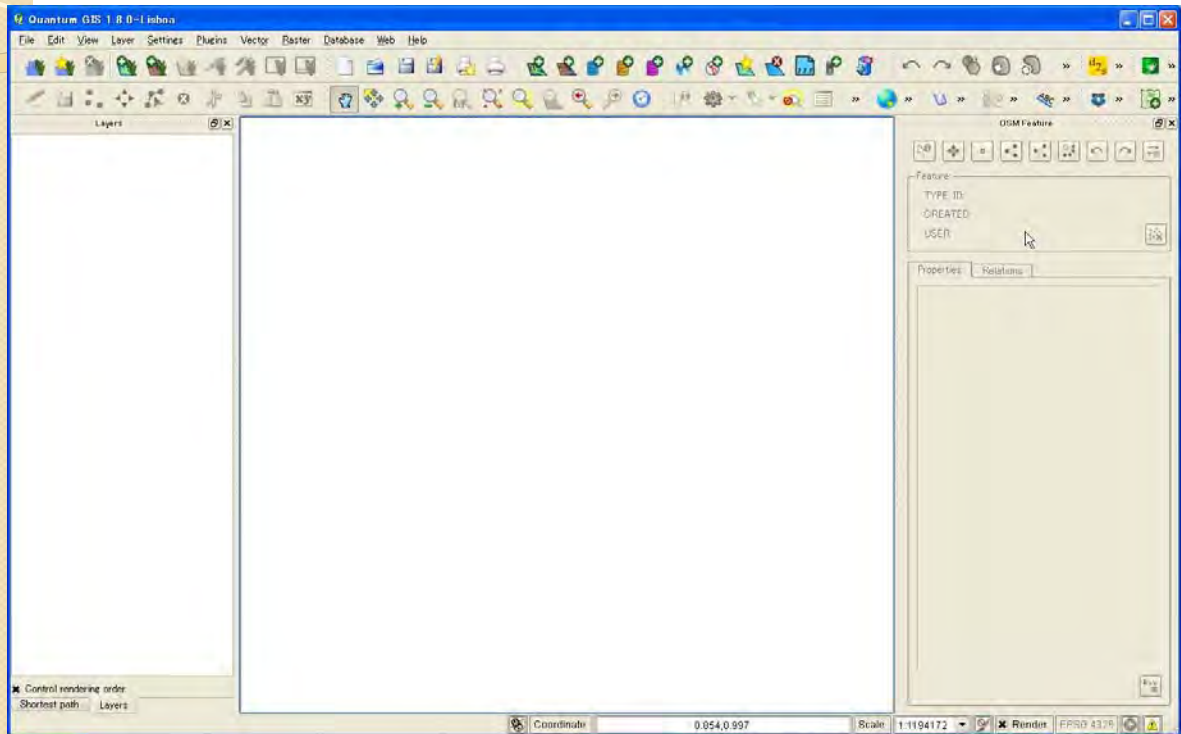
### I.3.1 Quantum GIS (GIS data mapping software)



## I. Constitution of GIS Data and How to Use GIS Software

### I.3.1 Quantum GIS (GIS data Mapping software)

The following window should appear.  
GIS data has not been imported yet.

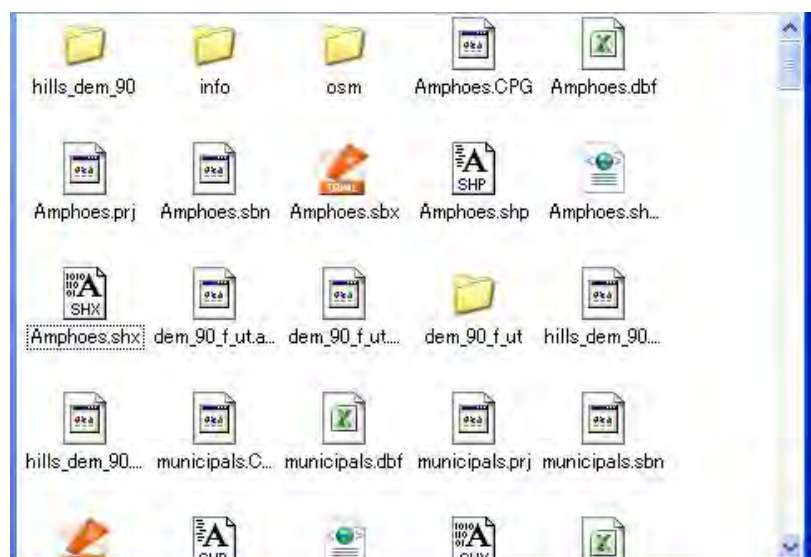


## I. Constitution of GIS Data and How to Use GIS Software

### I.3.1 Quantum GIS (GIS data Mapping software)

#### Kinds of GIS data

Open "C:\GIS\_data" folder.

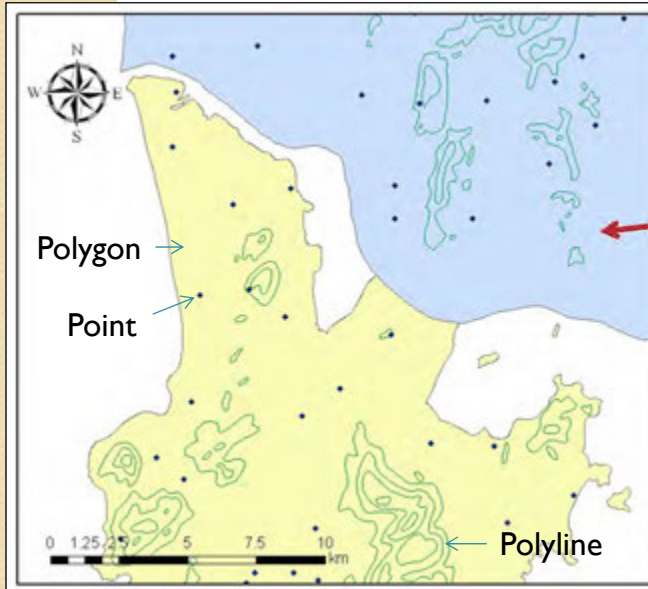


## I. Constitution of GIS Data and How to Use GIS Software

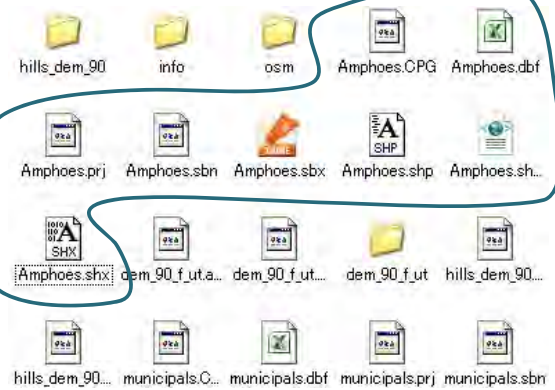
### I.3.1 Quantum GIS (GIS data Mapping software)

#### Kinds of GIS data

Shape files are vector data, such as village (point), province (polygon), contour (Polyline). Shape file consists of several files. Don't move or delete only a part of the file series.



#### shape file (vector data)



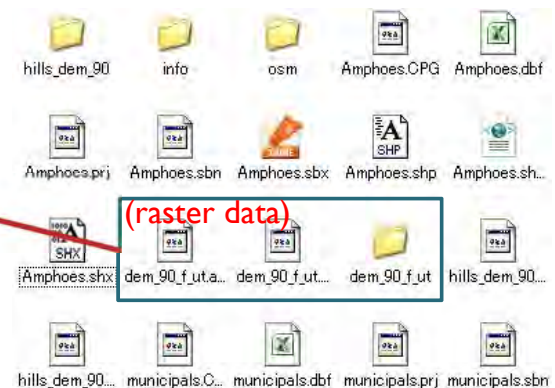
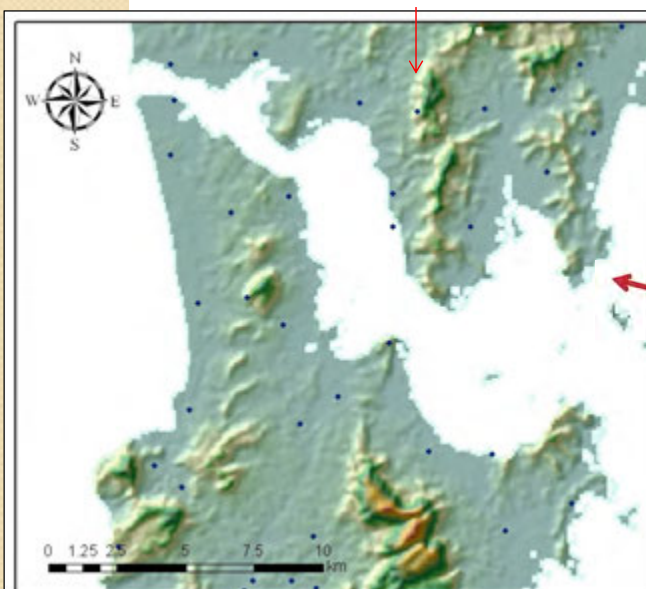
## I. Constitution of GIS Data and How to Use GIS Software

### I.3.1 Quantum GIS (GIS data Mapping software)

#### Kinds of GIS data

Raster Datasets are image data, such as elevation, satellite image.

#### Elevation and topography

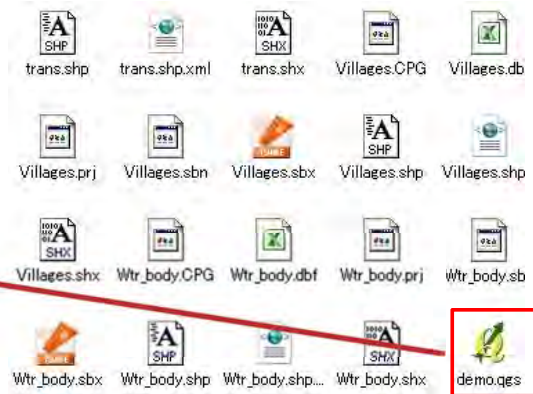
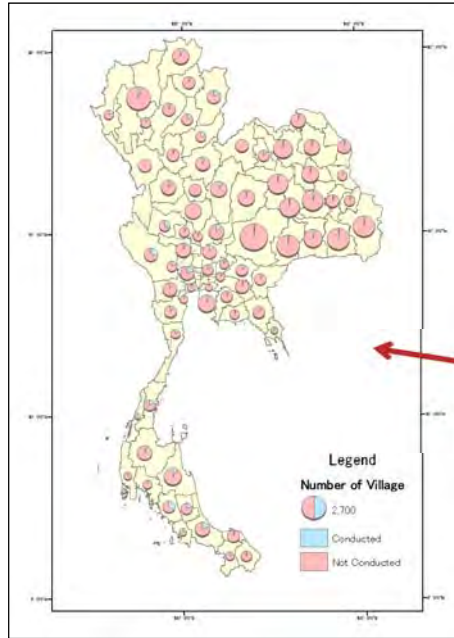


# I. Constitution of GIS Data and How to Use GIS Software

## I.3.1 Quantum GIS (GIS data Mapping software)

### Kinds of GIS data

Qgis files(.qgs) are not GIS data file. These are configuration files of GIS mapping, such as color profile, chart setting and etc..



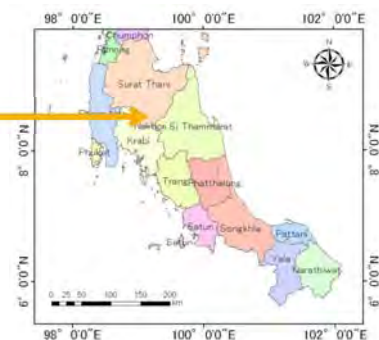
# I. Constitution of GIS Data and How to Use GIS Software

## I.3.1 Quantum GIS (GIS data Mapping software)

It is able to load Excel files into GIS database.

AREA	PROV_CODE	PROV_NAM_T	PROV_NAM_E	population	RC_Code	pop_den
1566.023	10	กรุงเทพมหานคร	Bangkok	6355144	NULL	4056.59
907.1116	11	กรุงเทพมหานคร	Changwat Saen...	1025401	RC03	1063.37
636.4	12	กรุงเทพมหานคร	Changwat Non...	816614	RC01	1283.18
1820.801	13	กรุงเทพมหานคร	Changwat Pat...	877649	RC01	445.59
2547.348	14	กรุงเทพมหานคร	Changwat Ph...	727277	RC01	285.5
950.497	15	กรุงเทพมหานคร	Changwat Ang...	269419	RC16	283.45
6502.715	16	กรุงเทพมหานคร	Changwat Lop...	745506	RC16	114.65
817.007	17	กรุงเทพมหานคร	Changwat Sing...	232766	RC16	264.9

Integrate



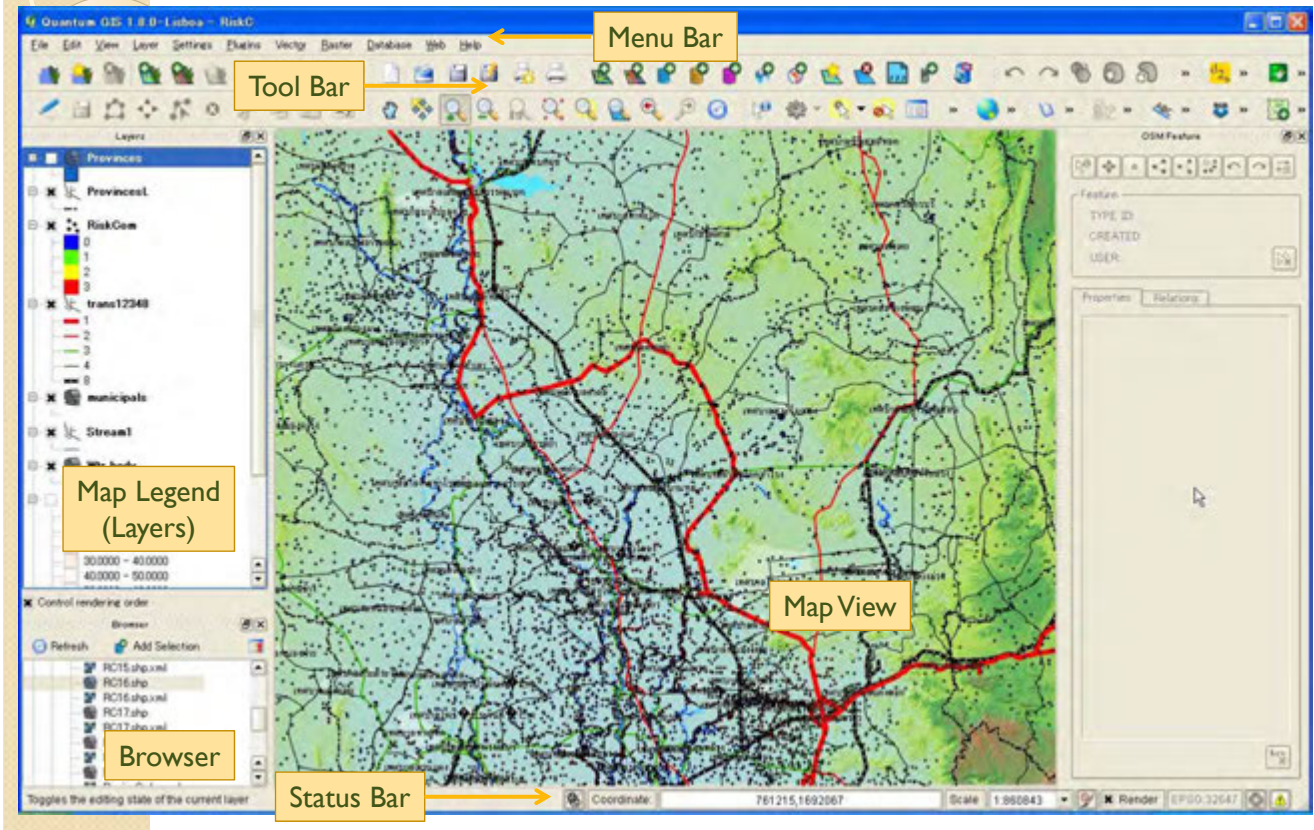
Villa_Code	Villa_Name	Prov_Code	Prov_Name	Amp_Code	Amp_Name	OBDRM_done	Type_Flood	Type_Other	Year
13011102	บ้านคลองบางโพธิ์	13	Pathum Thani	1301	เมือง				40
13011103	บ้านบางเขน	13	Pathum Thani	1301	เมือง		1	1	40
13011105	บ้านบางพลี	13	Pathum Thani	1301	เมือง		1	1	48
13010201	บ้านคลองบางลำพู	13	Pathum Thani	1301	เมือง		1	1	48
13010202	บ้านคลองบางลำพู	13	Pathum Thani	1301	เมือง		1	1	48
13010203	บ้านคลองบางลำพู	13	Pathum Thani	1301	เมือง		1	1	48
13010204	บ้านคลองบางลำพู	13	Pathum Thani	1301	เมือง		1	1	40
13010205	บ้านบางพลี	13	Pathum Thani	1301	เมือง		1	1	49
13010206	บ้านบางพลี	13	Pathum Thani	1301	เมือง		1	1	49
13010501	บ้านคลองสาม	13	Pathum Thani	1301	เมือง		1	0	50
13010502	บ้านคลองสาม	13	Pathum Thani	1301	เมือง		1	0	50



I. Constitution of GIS Data and How to Use GIS Software

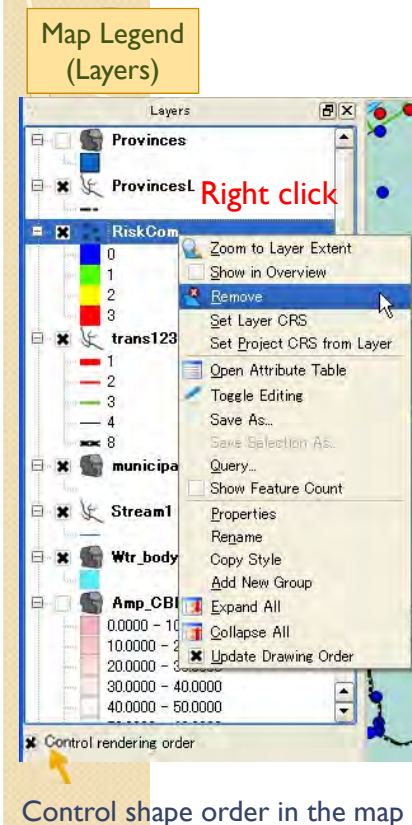
I.3.1 Quantum GIS (GIS data Mapping software)

Window layout of the QGIS is as below.



I. Constitution of GIS Data and How to Use GIS Software

I.3.1 Quantum GIS (GIS data Mapping software)



Explanation of sub windows and fields

1) Map Legend (Layers)

General controls for the map

/ Adding GIS data

/ Indicating loaded GIS data.

/ Removing GIS data from QGIS (data files are not deleted, only disappear from this window)

/ Change color profiles and chart settings of loaded GIS data

/ Make or clear labels

Control shape order in the map

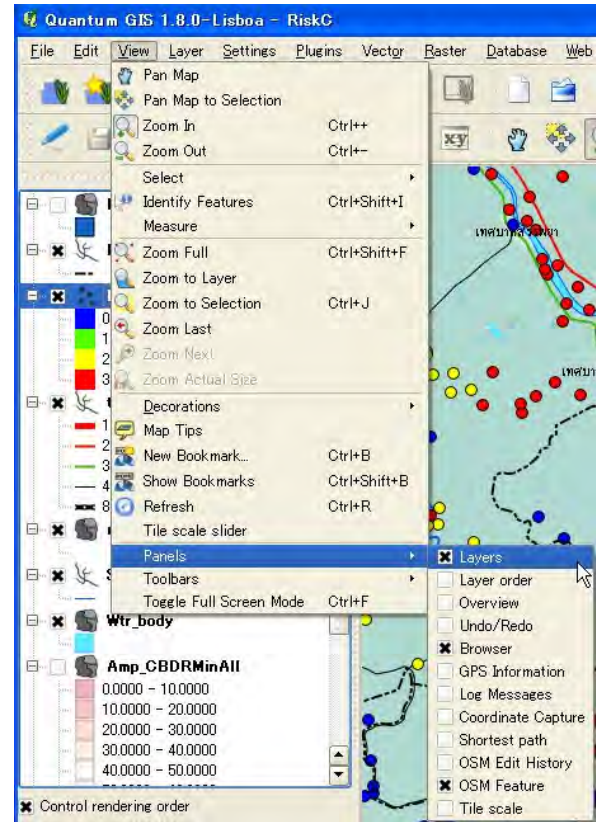
# I. Constitution of GIS Data and How to Use GIS Software

## I.3.1 Quantum GIS (GIS data Mapping software)

### Explanation of sub windows and fields

#### 1) Map Legend (Layers)

If "Layers" disappears in QGIS window, check menu bar [View] – [Panels] – [Layers]



# I. Constitution of GIS Data and How to Use GIS Software

## I.3.1 Quantum GIS (GIS data Mapping software)

### Explanation of sub windows and fields

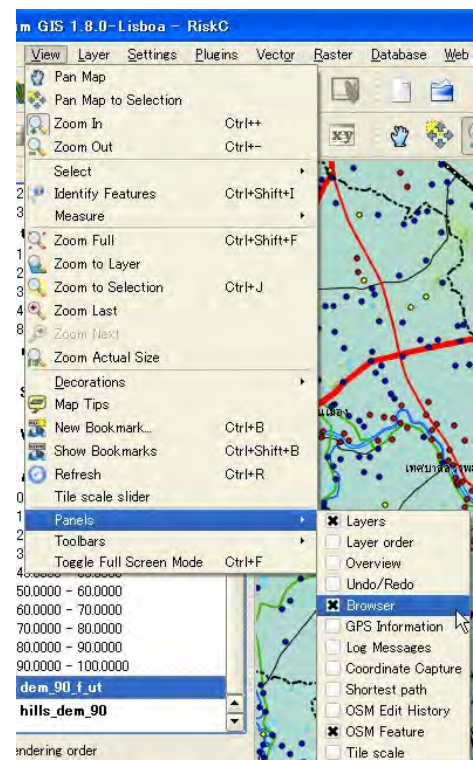
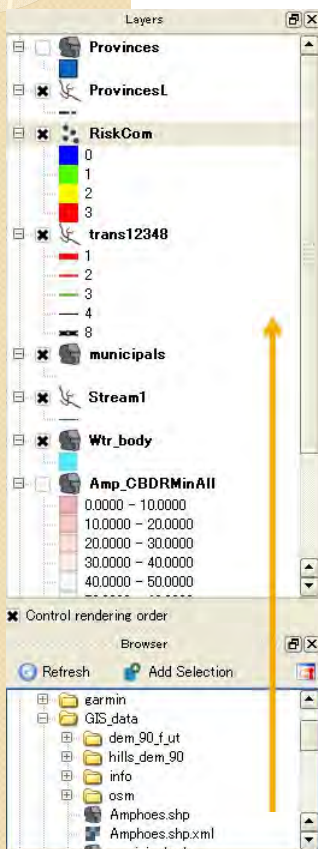
#### 2) Browser

Add GIS data to the map

Drag to import data

If "Browser" disappears in QGIS window, check menu bar [View] – [Panels] – [Layers]

Browser

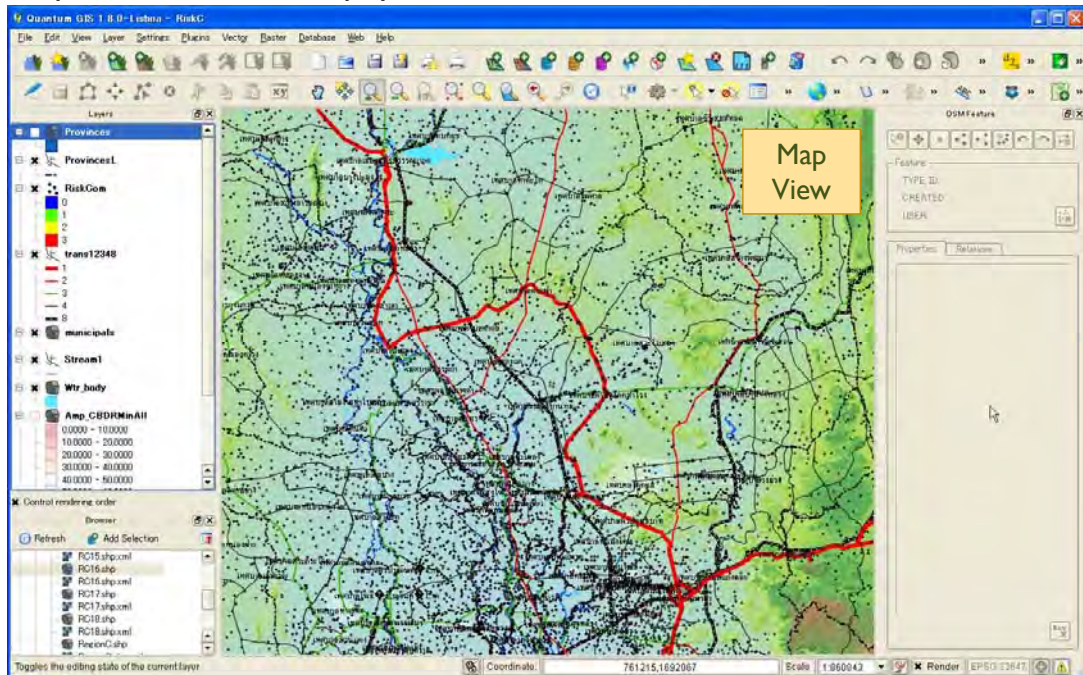


I. Constitution of GIS Data and How to Use GIS Software  
I.3.1 Quantum GIS (GIS data Mapping software)

## Explanation of sub windows and fields

### 3) Map View

Map View is a field to display GIS data.



I. Constitution of GIS Data and How to Use GIS Software  
I.3.1 Quantum GIS (GIS data Mapping software)

## Explanation of sub windows and fields

### 4) Tool bar

/ New Project

/ Open Project

/ Save Project

/ Save Project As



/ New Print Composer

/ Composer Manager

\* Project files (Qgis file) are not GIS data file.  
These are configuration files of GIS mapping,  
such as color profile, chart setting and etc..

\* Print Composer is layout  
canvas for print or export  
pdf or image files.

I. Constitution of GIS Data and How to Use GIS Software

I.3.1 Quantum GIS (GIS data Mapping software)

Explanation of sub windows and fields

4) Tool bar



/ Add Vector Layer  
(point, line and polygon)

/ Add Raster Layer  
(image data like satellite image)

/ Add another data formats file

/ Create New Shapefile Layer (Vector Layer)

/ Remove Layer (remove only from map, source data remains on folder)

I. Constitution of GIS Data and How to Use GIS Software

I.3.1 Quantum GIS (GIS data Mapping software)

Explanation of sub windows and fields

4) Tool bar



/ Toggle Editing  
(Vector Layer)

/ Save Edits

/ Edit Tools

I. Constitution of GIS Data and How to Use GIS Software

I.3.1 Quantum GIS (GIS data Mapping software)

Explanation of sub windows and fields

4) Tool bar

/ Pan Map

/ Pan Map to Selected Feature

/ Zoom In and Out

/ Zoom Full Area of the Map

/ Zoom to Selected Feature or Layer

/ Zoom Last or Next

/ Refresh



I. Constitution of GIS Data and How to Use GIS Software

I.3.1 Quantum GIS (GIS data Mapping software)

Explanation of sub windows and fields

4) Tool bar

/ Feature Information

/ Feature Select and Deselect

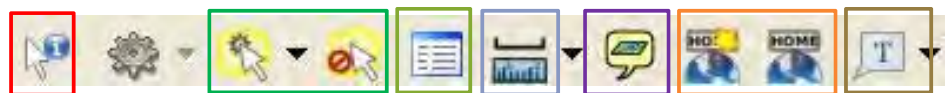
/ Open Attribute Table

/ Measure Line, Area and Angle

/ Map Tips

/ Bookmark Location

/ Annotation (Text Box)



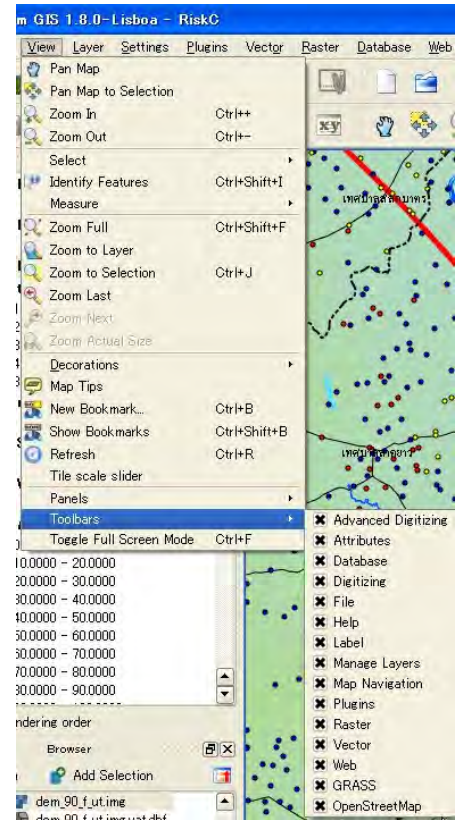
## I. Constitution of GIS Data and How to Use GIS Software

### I.3.1 Quantum GIS (GIS data Mapping software)

## Explanation of sub windows and fields

### 4) Tool bar

If these toolbars disappear in QGIS window, check menu bar [View] – [Toolbars]



## I. Constitution of GIS Data and How to Use GIS Software

### I.3.1 Quantum GIS (GIS data Mapping software)

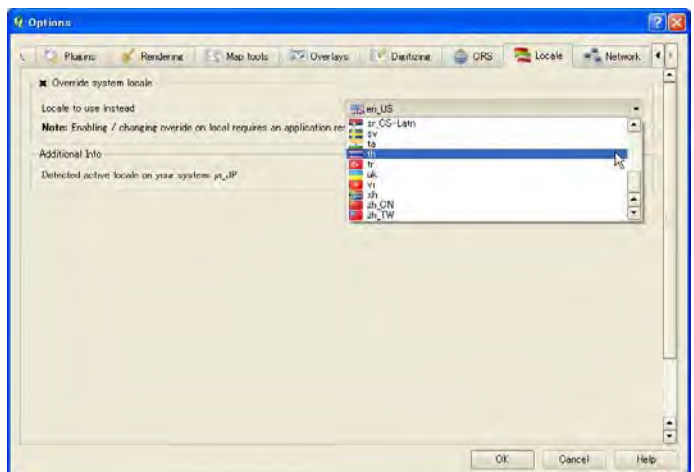
## Locale Setting

You can choose Thai Language.

Select menu [Settings] – [Options] then, “option” window should appear.

Select “Locale” tab and “TH” from pull down field.

As a result, your QGIS should be indicated by Thai language.



## I. Constitution of GIS Data and How to Use GIS Software

### I.3.1 Quantum GIS (GIS data Mapping software)

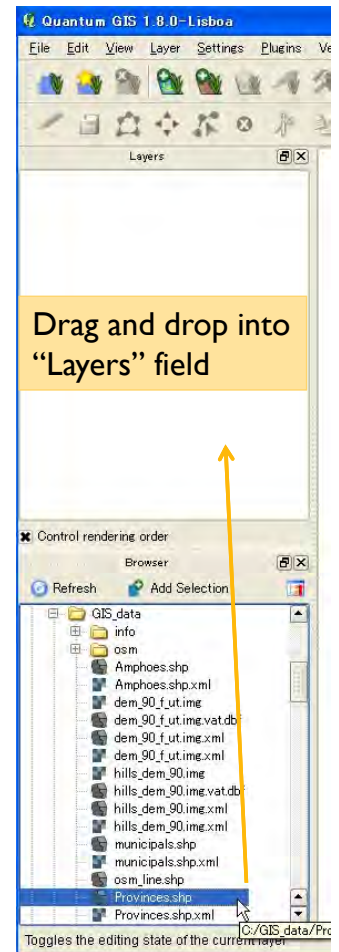
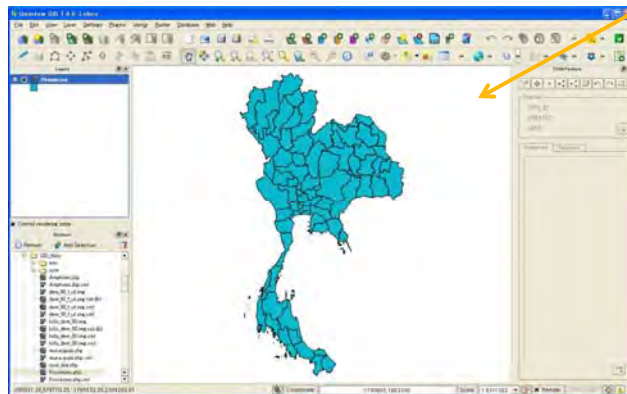
#### Add layers

There are several ways to import GIS data to QGIS.

##### i. Add by “browser”

Choose “GIS\_data” folder and select data you want to import in the “browser” field.

Drag and drop the file into “Layers” field, then the file should be shown in the map.



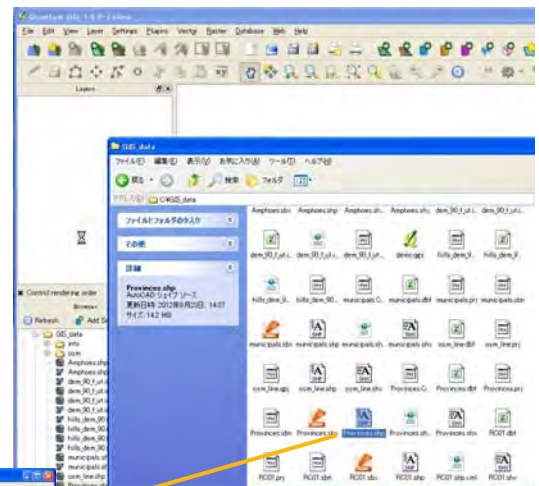
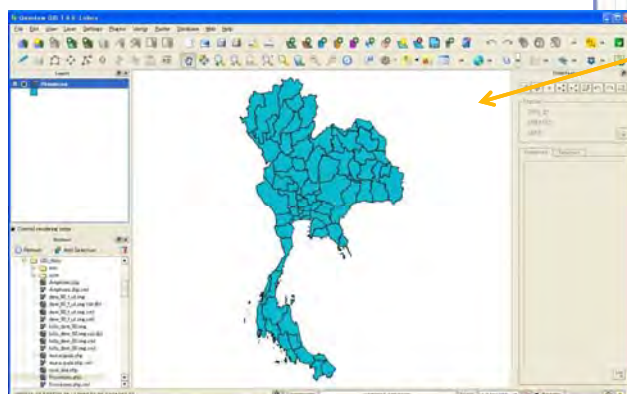
## I. Constitution of GIS Data and How to Use GIS Software

### I.3.1 Quantum GIS (GIS data Mapping software)

#### Add layers

##### ii. Add by explorer

You can drag and drop the file directly from folder window.



Drag and drop

## I. Constitution of GIS Data and How to Use GIS Software

### I.3.1 Quantum GIS (GIS data Mapping software)

#### Add layers

##### iii. Add by toolbar



/ Add Vector Layer  
(point, line and polygon)

/ Add Raster Layer  
(image data like satellite image)

/ Add another data formats file

/ Create New Shapefile Layer (Vector Layer)

/ Remove Layer (remove only from map, source data remains on folder)

## I. Constitution of GIS Data and How to Use GIS Software

### I.3.1 Quantum GIS (GIS data Mapping software)

#### Add layers

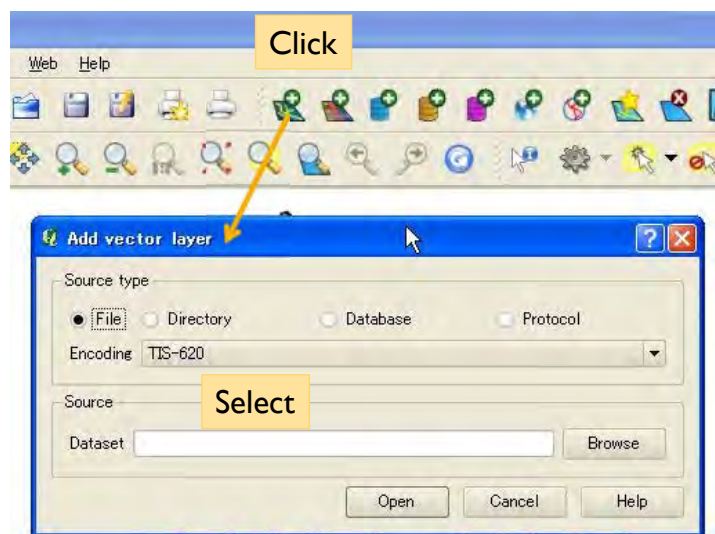
##### iii. Add by toolbar

Click “Add vector layer” and select file type (in this case “File”).

Choose “Encoding” tab as “TIS-620” to import Thai language files.

Click “Browse” button to find data file (in this case, select “GIS\_data” folder and shapefile).

Finally, push “OK” to load the GIS data.





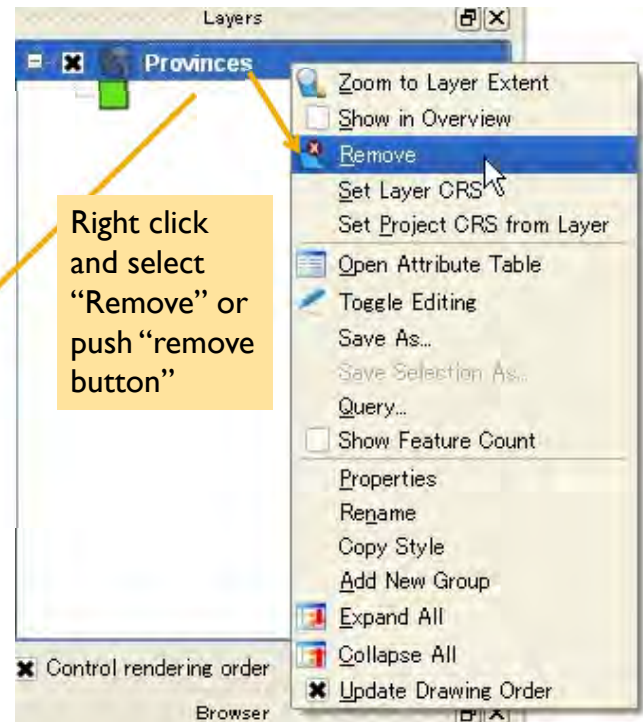
## I. Constitution of GIS Data and How to Use GIS Software

### I.3.1 Quantum GIS (GIS data Mapping software)

#### Remove layers

To remove features, right click and select "Remove".

Other way to remove features, select feature and push remove button in the toolbar.



## I. Constitution of GIS Data and How to Use GIS Software

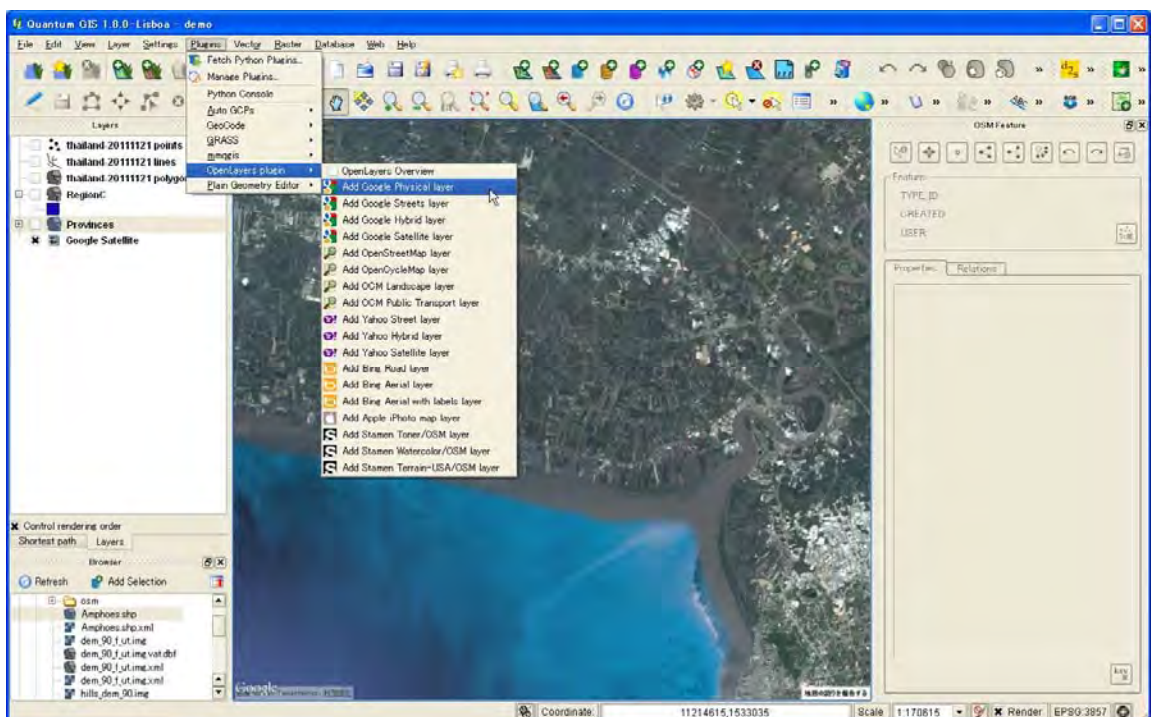
### I.3.1 Quantum GIS (GIS data Mapping software)

#### Add web map layer (online)

Online map layers are able to load into QGIS. (online connection is required)

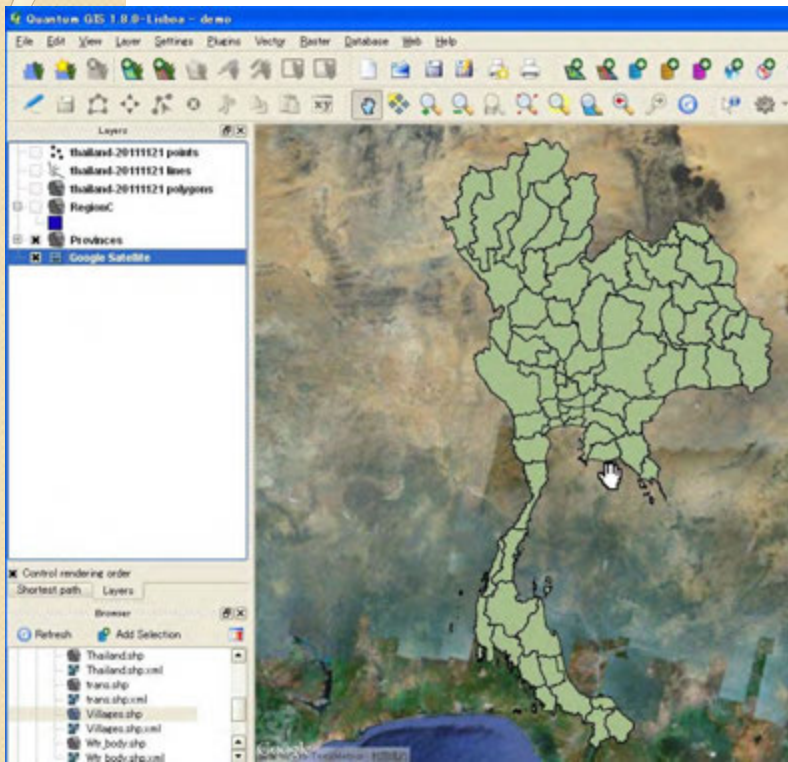
Choose [Plugins] – [Open Layers Plugin] – [map name to load]

It is necessary to pay attention terms of use of online maps.



I. Constitution of GIS Data and How to Use GIS Software  
 I.3.1 Quantum GIS (GIS data Mapping software)

CRS (Coordinate Reference System)



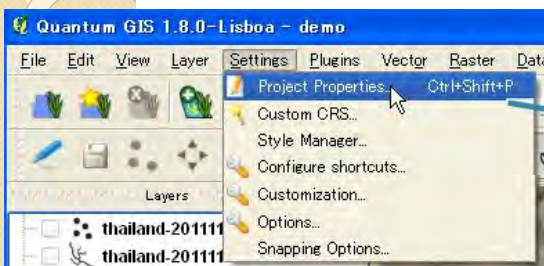
Each layer has CRS (Coordinate Reference System).

Ex.) Longitude and latitude

If the CRS of layers does not match, the layers is not displayed on correct position.

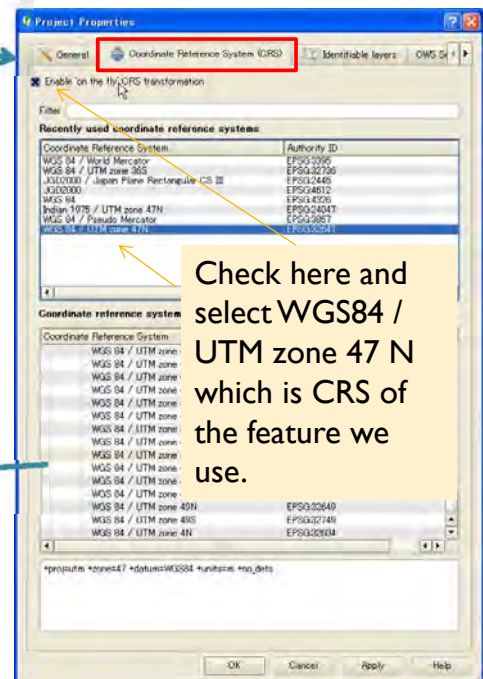
I. Constitution of GIS Data and How to Use GIS Software  
 I.3.1 Quantum GIS (GIS data Mapping software)

CRS (Coordinate Reference System)

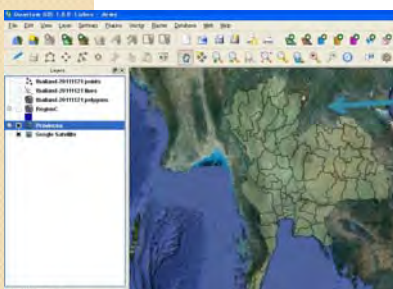


To solve this problem, select [Settings] – [Project Properties].

Then, property window will appear.



Select “Coordinate Reference System (CRS)” tab and check “Enable ‘on the fly’ CRS transformation. Then, you can find the layers move to correct position.



## I. Constitution of GIS Data and How to Use GIS Software

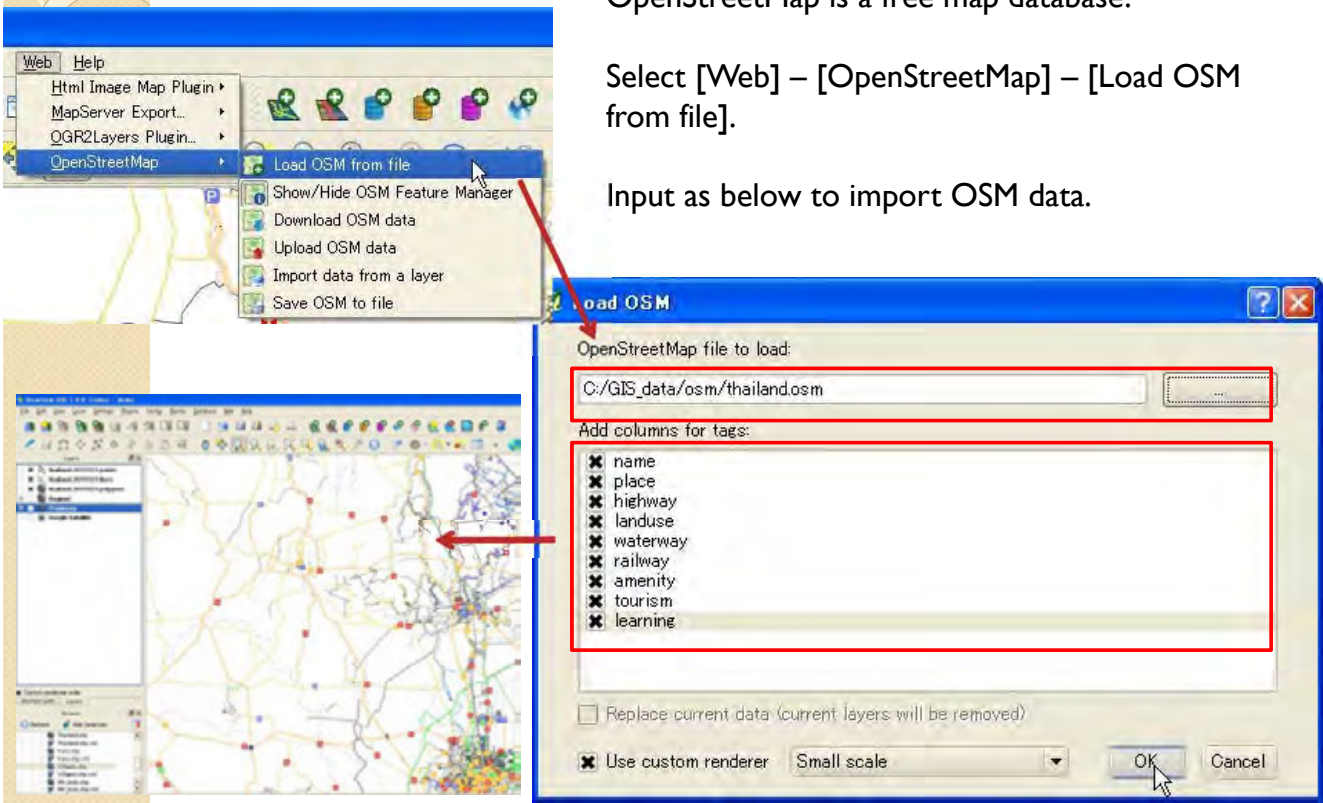
### I.3.1 Quantum GIS (GIS data Mapping software)

#### Open Street Map

OpenStreetMap is a free map database.

Select [Web] – [OpenStreetMap] – [Load OSM from file].

Input as below to import OSM data.



## I. Constitution of GIS Data and How to Use GIS Software

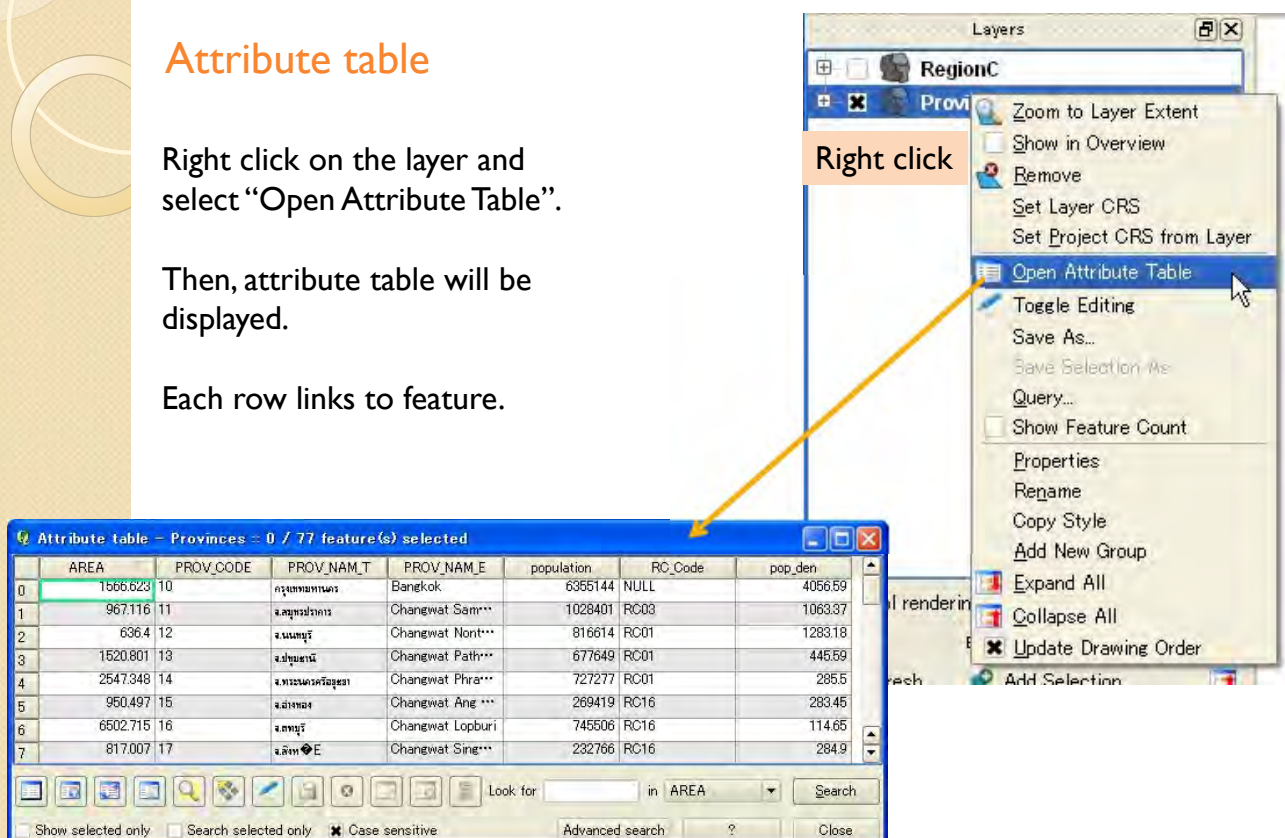
### I.3.1 Quantum GIS (GIS data Mapping software)

#### Attribute table

Right click on the layer and select "Open Attribute Table".

Then, attribute table will be displayed.

Each row links to feature.



## I. Constitution of GIS Data and How to Use GIS Software

### I.3.1 Quantum GIS (GIS data Mapping software)

## Attribute table

### Attribute table functions

Attribute table - Provinces = 0 / 77 feature(s) selected

	AREA	PROV_CODE	PROV_NAM_T	PROV_NAM_E	population	RC_Code	pop_den
0	1566.623	10	กรุงเทพมหานคร	Bangkok	6355144	NULL	4056.59
1	967.116	11	จ.สมุทรปราการ	Changwat Sam...	1028401	RC03	1063.37
2	636.4	12	จ.นนทบุรี	Changwat Nont...	816614	RC01	1283.18
3	1520.801	13	จ.ปทุมธานี	Changwat Path...	677649	RC01	445.59
4	2547.348	14	จ.พระนครศรีอยุธยา	Changwat Phra...	727277	RC01	285.5
5	950.497	15	จ.อ่างทอง	Changwat Ang ...	269419	RC16	283.45
6	6502.715	16	จ.ลพบุรี	Changwat Lopburi	745506	RC16	114.65
7	817.007	17	จ.สิงห์	Changwat Sing...	232766	RC16	284.9

Look for  in AREA Search

Show selected only  Search selected only  Case sensitive Advanced search ? Close

Pan or zoom  
to selected feature

Delete  
selected features

Add and delete columns

Field calculator

Start/stop editing and save editing

## I. Constitution of GIS Data and How to Use GIS Software

### I.3.1 Quantum GIS (GIS data Mapping software)

## Attribute table

### Editing

After "edit" button is pushed, it is possible to edit field values.

Attribute table - Provinces = 0 / 77 feature(s) selected

	AREA	PROV_CODE	PROV_NAM_T	PROV_NAM_E	population	RC_Code	pop_den
0	1566.623	10	กรุงเทพมหานคร	Bangkok	6355144	NULL	4056.59
1	967.116	11	จ.สมุทรปราการ	Changwat Sam...	1028401	RC03	1063.37
2	636.4	12	จ.นนทบุรี	Changwat Nont...	816614	RC01	1283.18
3	1520.801	13	จ.ปทุมธานี	Changwat Path...	677649	RC01	445.59
4	2547.348	14	จ.พระนครศรีอยุธยา	Changwat Phra...	727277	RC01	285.5
5	950.497	15	จ.อ่างทอง	Changwat Ang ...	269419	RC16	283.45
6	6502.715	16	จ.ลพบุรี	Changwat Lopburi	745506	RC16	114.65
7	817.007	17	จ.สิงห์	Changwat Sing...	232766	RC16	284.9

Look for  in Search

Show selected only  Search selected only  Case sensitive Advanced search ? Close

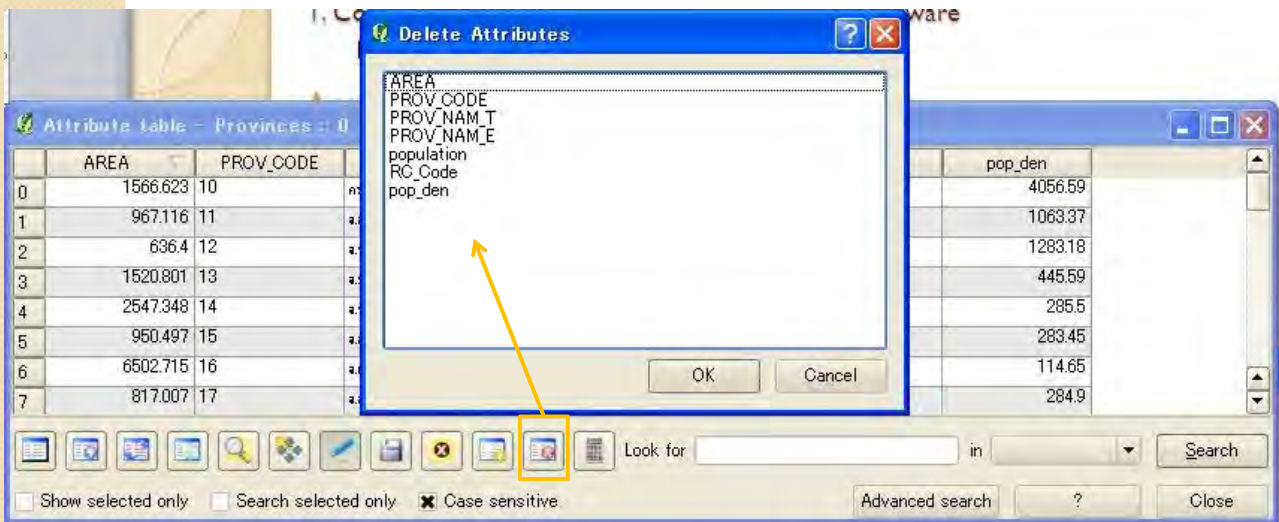
## I. Constitution of GIS Data and How to Use GIS Software

### I.3.1 Quantum GIS (GIS data Mapping software)

#### Attribute table

##### Delete column

To delete column, push “delete column” button and select column name to delete.



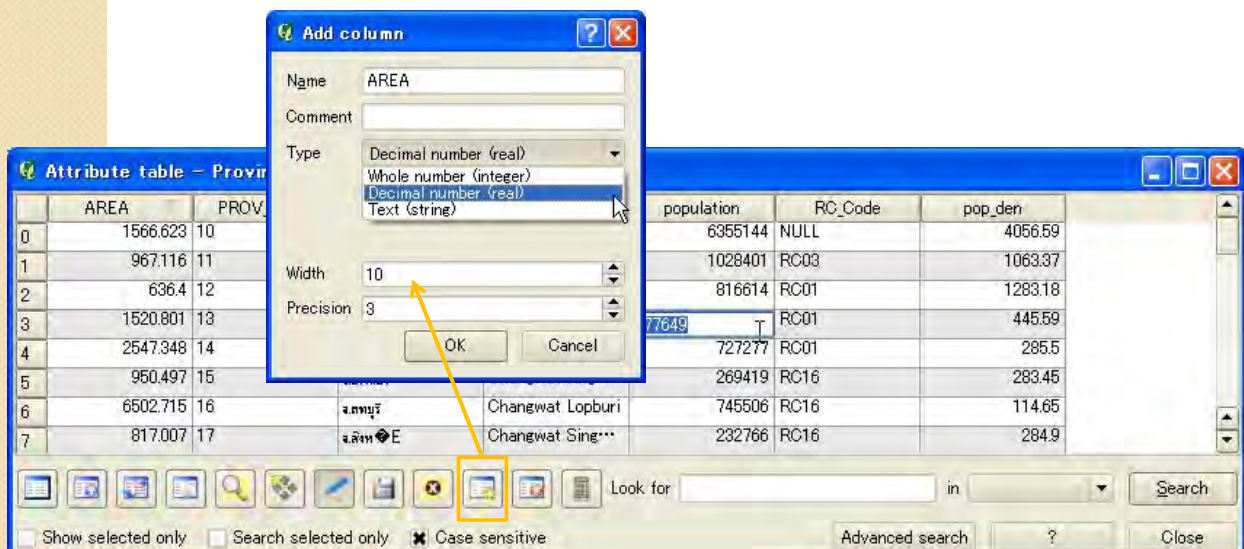
## I. Constitution of GIS Data and How to Use GIS Software

### I.3.1 Quantum GIS (GIS data Mapping software)

#### Attribute table

##### Add column

To add new column, push “new column” button and input column name, type, width (number of character) and precision (number of character under decimal point).



# I. Constitution of GIS Data and How to Use GIS Software

## I.3.1 Quantum GIS (GIS data Mapping software)

### Attribute table

#### Field calculator

Field calculator is a tool to carry out arithmetic operation between columns and to calculate geometry (area, length...).

The screenshot shows the QGIS interface. On the left, an attribute table for 'Provinces' is displayed with columns: AREA, PROV\_CODE, PROV\_NAM\_T, and PRO. The table contains 8 rows of data. On the right, the 'Field calculator' dialog is open. It has two tabs: 'Create a new field' and 'Update existing field'. The 'Update existing field' tab is selected. The 'Output field name' is empty, 'Output field type' is 'Whole number (integer)', and 'Output field width' is 10. The 'Function List' on the left shows categories like Operators, Math, Conversions, String, Geometry, Record, and Fields and Values. The 'Expression' field contains '\$area / 1000000'. The 'Output preview' shows '1566.62347536725'. The 'OK' button is highlighted with a yellow arrow.

	AREA	PROV_CODE	PROV_NAM_T	PRO
0	1566.623	10	กรุงเทพมหานคร	Bangkok
1	967.116	11	จ.สมุทรปราการ	Changwat Samut Prakan
2	636.4	12	จ.นนทบุรี	Changwat Nonthaburi
3	1520.801	13	จ.ปทุมธานี	Changwat Pathum Thani
4	2547.348	14	จ.พระนครศรีอยุธยา	Changwat Phra Nakhon Si Ayutthaya
5	950.497	15	จ.อ่างทอง	Changwat Ang Thong
6	6502.715	16	จ.ตลิ่งชัน	Changwat Talinchan
7	817.007	17	จ.สิงห์บุรี	Changwat Singburi

# I. Constitution of GIS Data and How to Use GIS Software

## I.3.1 Quantum GIS (GIS data Mapping software)

### Attribute table

Select column name to input calculated result

Choose creating a new field to input calculated result or update existing field

This screenshot provides a detailed view of the 'Field calculator' dialog. A red box highlights the 'Create a new field' and 'Update existing field' options. A yellow arrow points to the 'Output field name' field. A blue box highlights the 'Function list' area. A pink box highlights the 'OK' button. The 'Expression' field contains '\$area / 1000000'. The 'Output preview' shows '1566.62347536725'.

Function list

Mathematical expression

Push "OK" to calculate

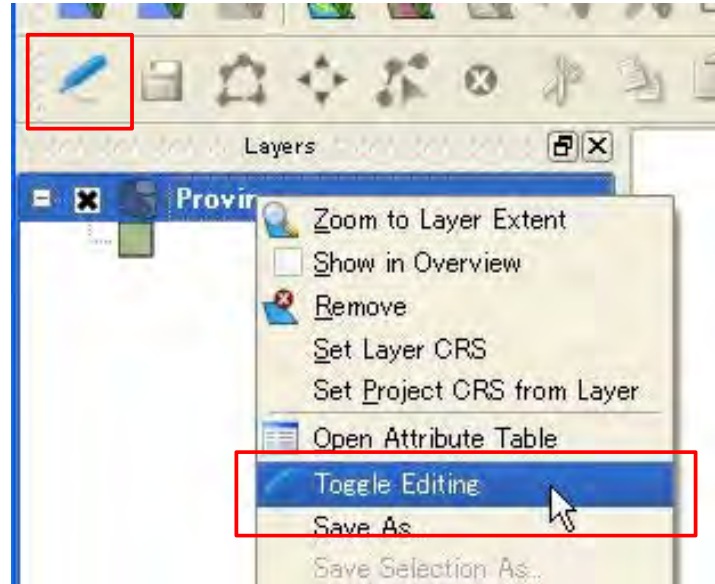
This expression means...  
"\$area" = area of feature (m<sup>2</sup>)

## I. Constitution of GIS Data and How to Use GIS Software

### I.3.1 Quantum GIS (GIS data Mapping software)

#### Editing

Other buttons to start editing are located at “Right click” – “Toggle Editing” or in toolbar.

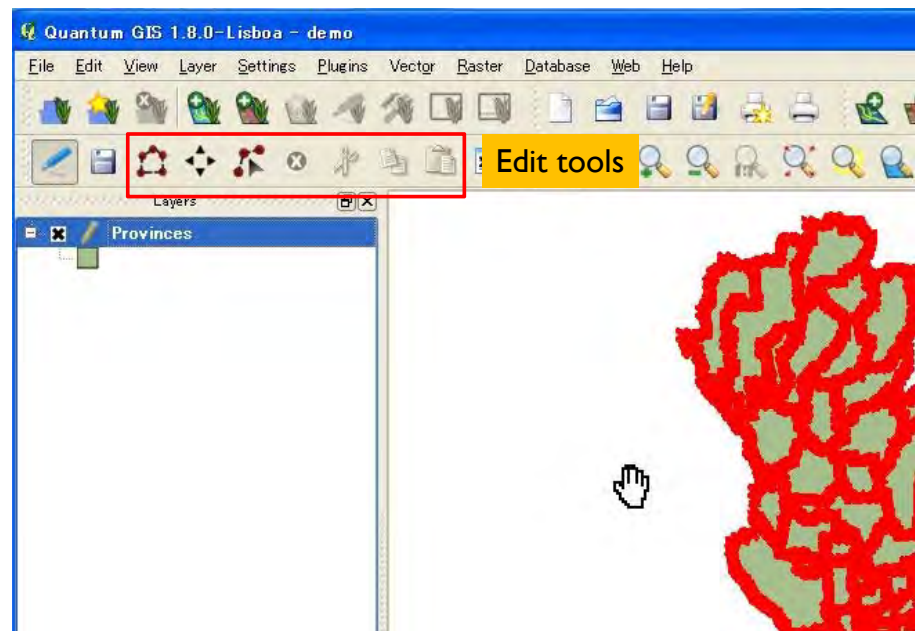


## I. Constitution of GIS Data and How to Use GIS Software

### I.3.1 Quantum GIS (GIS data Mapping software)

#### Editing

While “Edit” button is on, editable features get red. You can use edit tools on the toolbar.

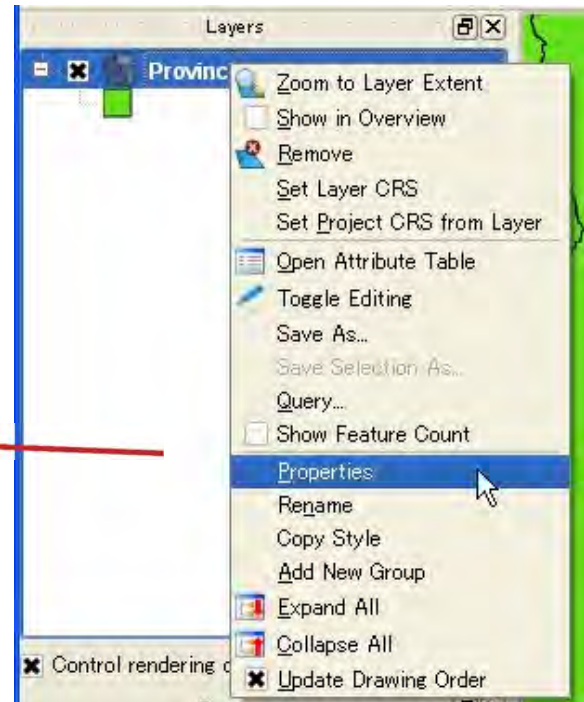
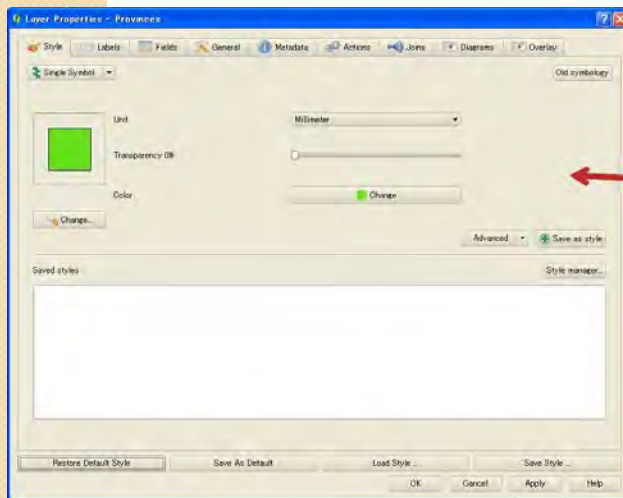


## I. Constitution of GIS Data and How to Use GIS Software

### I.3.1 Quantum GIS (GIS data Mapping software)

#### Properties of layers

Double click or right click and select “Properties” to show layer properties as below.



## I. Constitution of GIS Data and How to Use GIS Software

### I.3.1 Quantum GIS (GIS data Mapping software)

#### Properties of layers



“Style” : color and symbol settings

“Labels” : label setting

“Fields” : add/delete attribute, set alias name of attribute

“General”: change display name, CRS (Coordinate Reference System) and encoding.  
set “query” (screening display data... ex. population > 10,000)

“Metadata”: general information of the layer

“Actions”: set “actions”

“Joins” : join attribute table

“Diagrams”: make text diagrams and pie charts

“Overlay”: make pie charts and bar charts



I. Constitution of GIS Data and How to Use GIS Software

I.3.1 Quantum GIS (GIS data Mapping software)

Properties of layers – “General” settings tab

Display name on the layer

Primary attribute column

CRS (Coordinate Reference System) setting

Text Encoding (TIS-620 is for Thai language)

“query” (screening display data. This example means that if “AREA” column value is higher than 8000, then display feature)

You can restore these settings into style file and apply to other layer

I. Constitution of GIS Data and How to Use GIS Software

I.3.1 Quantum GIS (GIS data Mapping software)

Properties of layers – “Labels” tab

Check to display labels

Select column name to display

Input text for data blank feature

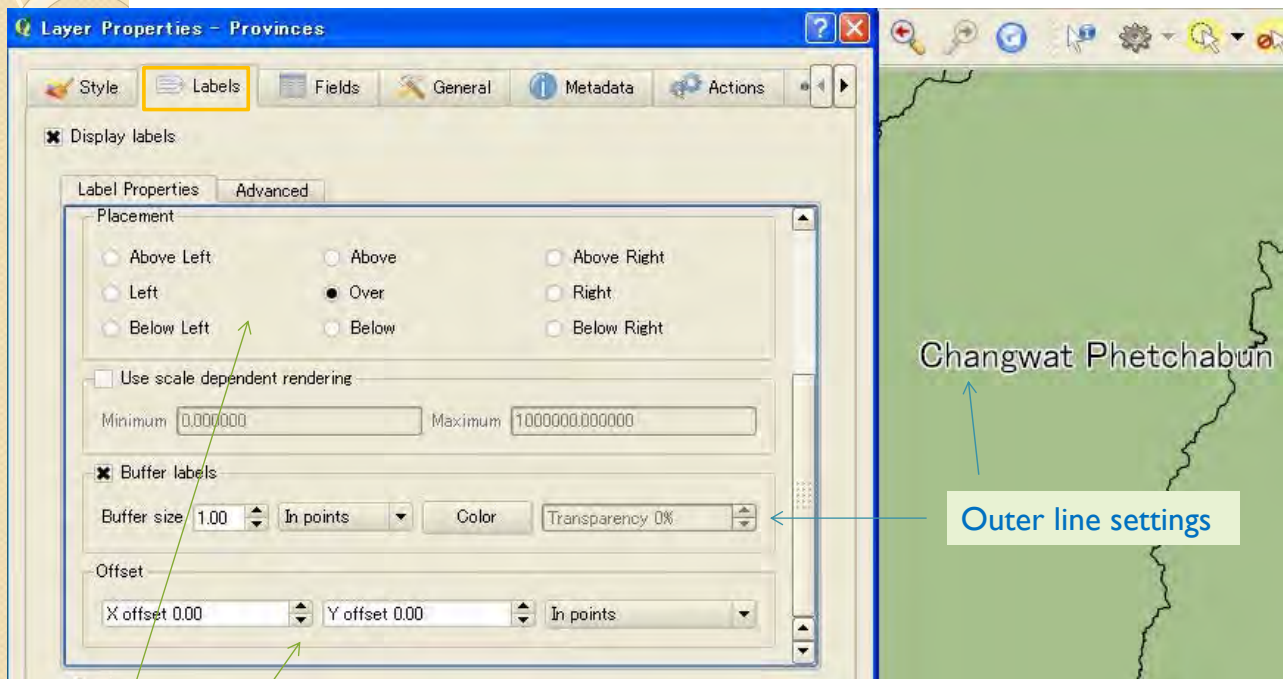
Font and color

Font size setting  
In points ; fixed font size  
In map units ; font size varies depends on scale

# I. Constitution of GIS Data and How to Use GIS Software

## I.3.1 Quantum GIS (GIS data Mapping software)

### Properties of layers – “Labels” tab



Placement settings

Outer line settings

# I. Constitution of GIS Data and How to Use GIS Software

## I.3.1 Quantum GIS (GIS data Mapping software)

### Properties of layers – “Join” tab

	PROV_CODE	PROV_NAM_T	PROV_NAM_E	population	RC_Code	pop_den	AREA
0	10	กรุงเทพมหานคร	Bangkok	6365144	NULL	4056.59	1566.623
1	11	จังหวัดสมุทรปราการ	Changwat Sam...	1028401	RC03	1063.37	967.116
2	12	จังหวัดนนทบุรี	Changwat Nont...	816614	RC01	1283.18	636.4
3	13	จังหวัดปทุมธานี	Changwat Path...	677649	RC01	445.59	1520.801
4	14	จังหวัดนครราชสีมา	Changwat Phra...	727277	RC01	285.5	2547.348
5	15	จังหวัดนครสวรรค์	Changwat Ang ...	269419	RC16	283.45	950.497
6	16	จังหวัดลพบุรี	Changwat Lopburi	745506	RC16	114.65	6502.715
7	17	จังหวัดสิงห์บุรี	Changwat Sing...	232766	RC16	284.9	817.007

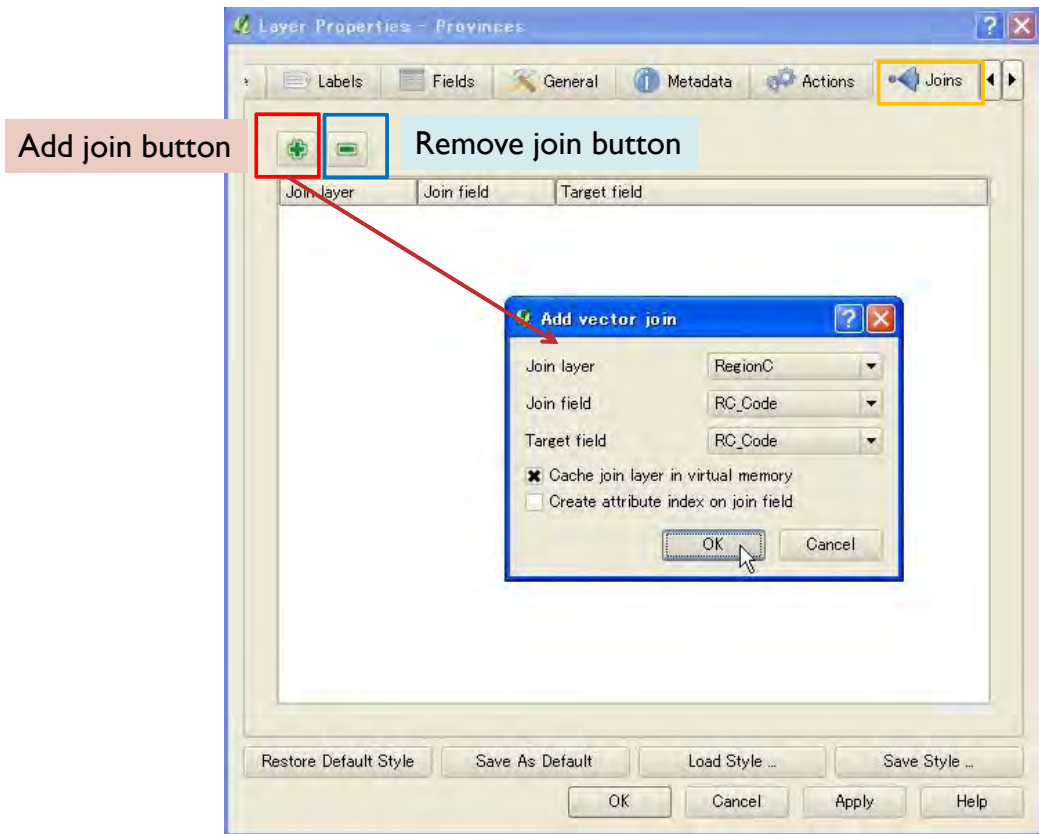
It is able to join plural attribute tables by using key column.

	AREA	RC_Code	R_Name
0	1566.623	NULL	NULL
1	20175.015	RC03	Prachin Buri (R...
2	8192.726	RC01	PathunThani (R...
3	10775.481	RC16	Chainat (RC)
4	17413.6	RC17	Chanthaburi (RC)
5	52367.876	RC05	Nakhon Ratcha...
6	31983.63	RC13	Ubon Ratchath...
7	32948.884	RC14	Udon Thani (RC)

# I. Constitution of GIS Data and How to Use GIS Software

## I.3.1 Quantum GIS (GIS data Mapping software)

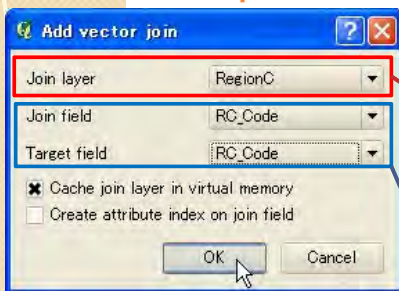
### Properties of layers – “Join” tab



# I. Constitution of GIS Data and How to Use GIS Software

## I.3.1 Quantum GIS (GIS data Mapping software)

### Properties of layers – “Join” tab



Key column to join

Original attribute table

Joined attribute table

	PROV_CODE	PROV_NAM_T	PROV_NAM_E	population	RC_Code	pop_den	AREA	AREA	R_Name
0	10	กรุงเทพมหานคร	Bangkok	6355144	NULL	4056.59	1566.623	1566.623	NULL
1	11	ฉะเชิงเทรา	Changwat Sam...	1028401	RC03	1063.37	967.116	201.75015	Prachin Buri (RC, Ac)
2	12	ชลบุรี	Changwat Nont...	818614	RC01	1283.18	636.4	8192.726	PathunThani (RC, Ac)
3	13	ชัยภูมิ	Changwat Path...	677649	RC01	445.59	1520.801	8192.726	PathunThani (RC, Ac)
4	14	นครราชสีมา	Changwat Phra...	727277	RC01	285.5	2547.348	8192.726	PathunThani (RC, Ac)
5	15	อ่างทอง	Changwat Ang ...	269419	RC16	283.45	950.497	10775.481	Chainat (RC)
6	16	ลพบุรี	Changwat Lopburi	745506	RC16	114.65	6502.715	10775.481	Chainat (RC)
7	17	สิงห์บุรี	Changwat Sing...	232766	RC16	284.9	817.007	10775.481	Chainat (RC)

I. Constitution of GIS Data and How to Use GIS Software

I.3.1 Quantum GIS (GIS data Mapping software)

Properties of layers – “Join” tab

PROV_CODE	PROV_NAME	PROV_NAME	population	RC_Code	pop_jm	AREA	AREA	R_Name
10	กรุงเทพมหานคร	Bangkok	1055744	NULL	4792.55	1566.029	NULL	
11	ฉะเชิงเทรา	Changest Saen	1028481	RC08	1069.37	967.116	20176315	Prachin Buri (RC_Ac)
12	ชลบุรี	Changest Saen	816614	RC01	1283.16	8364	8192726	PathumThani (RC_Ac)
13	ปราจีนบุรี	Changest Path	877649	RC01	440.59	1526.881	8192726	PathumThani (RC_Ac)
14	สุพรรณบุรี	Changest Path	929297	RC08	336.61	2947.548	8192726	PathumThani (RC_Ac)
15	กาญจนบุรี	Changest Aca	298419	RC04	283.45	950.497	10776481	Changest (RC3)
16	สิงห์บุรี	Changest Lachun	749006	RC14	114.65	6902.715	10776481	Changest (RC3)
17	ชัยนาท	Changest Saen	232786	RC16	284.9	817.087	10776481	Changest (RC3)

in layer	Join field	Target field
RegionC	RC_Code	RC_Code

Remove join button

PROV_CODE	PROV_NAME	PROV_NAME	population	RC_Code	pop_jm	AREA	R_Name
10	กรุงเทพมหานคร	Bangkok	1055744	NULL	4792.55	1566.029	
11	ฉะเชิงเทรา	Changest Saen	1028481	RC08	1069.37	967.116	Prachin Buri (RC_Ac)
12	ชลบุรี	Changest Saen	816614	RC01	1283.16	8364	PathumThani (RC_Ac)
13	ปราจีนบุรี	Changest Path	877649	RC01	440.59	1526.881	PathumThani (RC_Ac)
14	สุพรรณบุรี	Changest Path	929297	RC08	336.61	2947.548	PathumThani (RC_Ac)
15	กาญจนบุรี	Changest Aca	298419	RC04	283.45	950.497	Changest (RC3)
16	สิงห์บุรี	Changest Lachun	749006	RC14	114.65	6902.715	Changest (RC3)
17	ชัยนาท	Changest Saen	232786	RC16	284.9	817.087	Changest (RC3)

AREA	RC_Code	R_Name
20176315	RC08	Prachin Buri (RC_Ac)
8192726	RC01	PathumThani (RC_Ac)
10776481	RC08	Changest (RC3)
134131	RC17	Changest (RC3)
8208778	RC08	Nakhon Pathom (RC3)
749006	RC14	Udon Ratchathani (RC3)
384838	RC04	Udon Ratchathani (RC3)

Joined field can be re-separate.

I. Constitution of GIS Data and How to Use GIS Software

I.3.1 Quantum GIS (GIS data Mapping software)

Properties of layers – “Join” tab

If you want to save completely joined attribute table, right click layer and select “save as” to save new file.

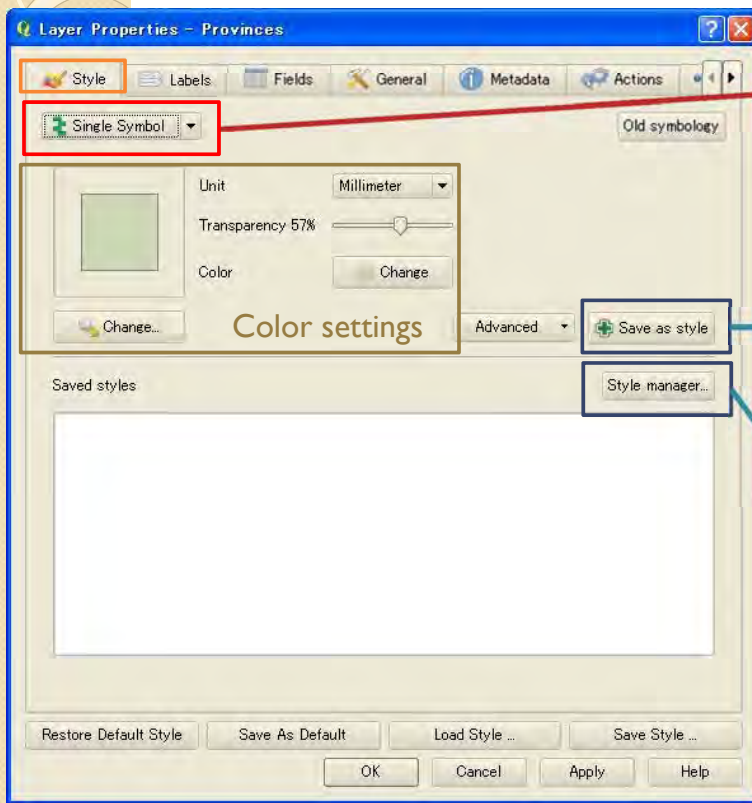
Select format  
Input file name

I. Constitution of GIS Data and How to Use GIS Software

I.3.1 Quantum GIS (GIS data Mapping software)

Properties of layers – “Style” tab

“Style” tab is color setting tab.



Single Symbol : single color feature  
Categorized : set color to each attribute column value  
Graduated : set color to each range of attribute column value

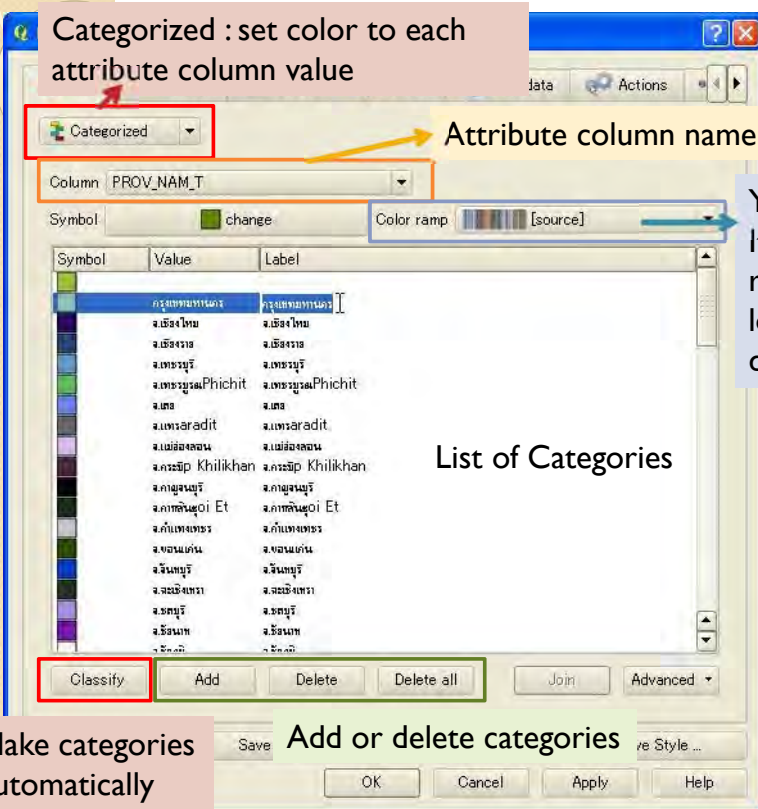
You can save settings as style file and apply same setting to other layers.

Load or manage saved styles.

I. Constitution of GIS Data and How to Use GIS Software

I.3.1 Quantum GIS (GIS data Mapping software)

Properties of layers – “Style” tab



Categorized : set color to each attribute column value

Attribute column name to set color

You can set color ramp here. It is able to make new color ramp by “New Color Ramp...” located at the bottom of pull down.

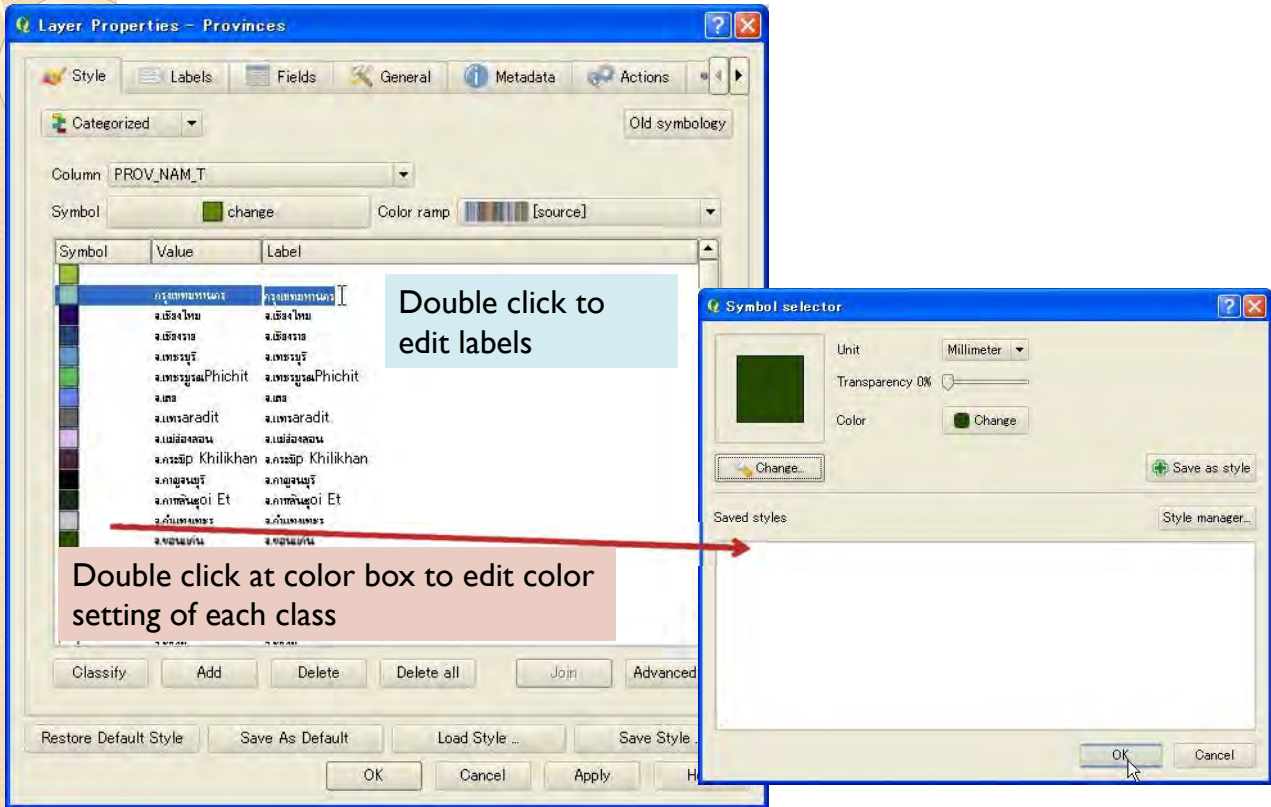
Make categories automatically

Add or delete categories

I. Constitution of GIS Data and How to Use GIS Software

I.3.1 Quantum GIS (GIS data Mapping software)

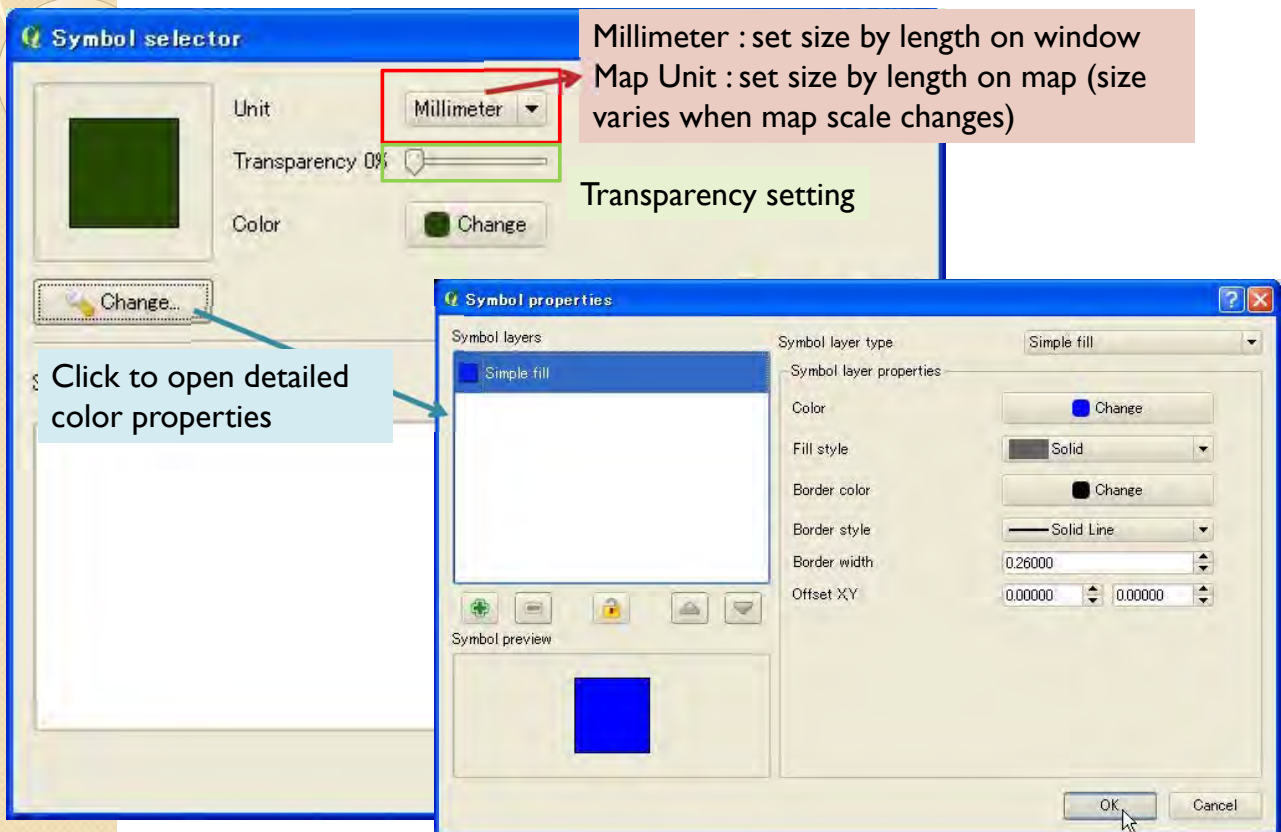
Properties of layers – “Style” tab



I. Constitution of GIS Data and How to Use GIS Software

I.3.1 Quantum GIS (GIS data Mapping software)

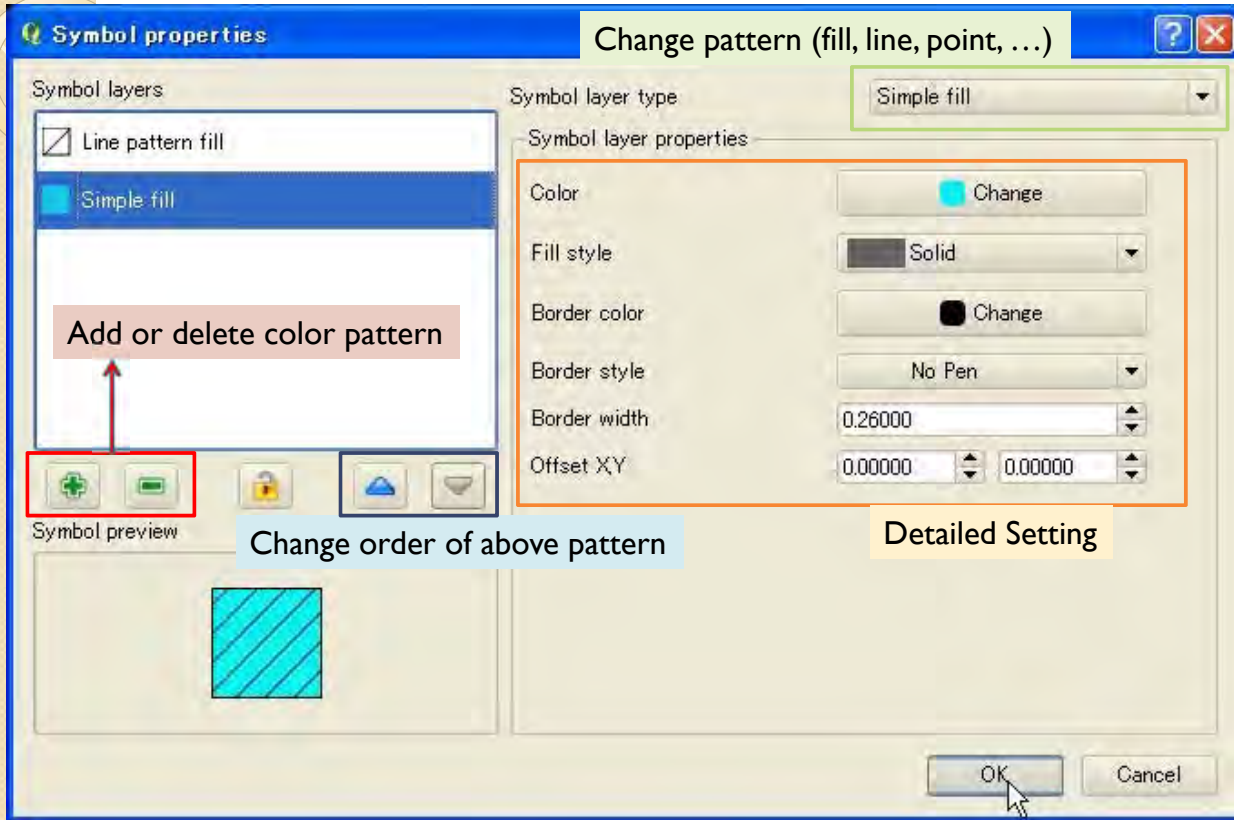
Properties of layers – “Style” tab



I. Constitution of GIS Data and How to Use GIS Software

I.3.1 Quantum GIS (GIS data Mapping software)

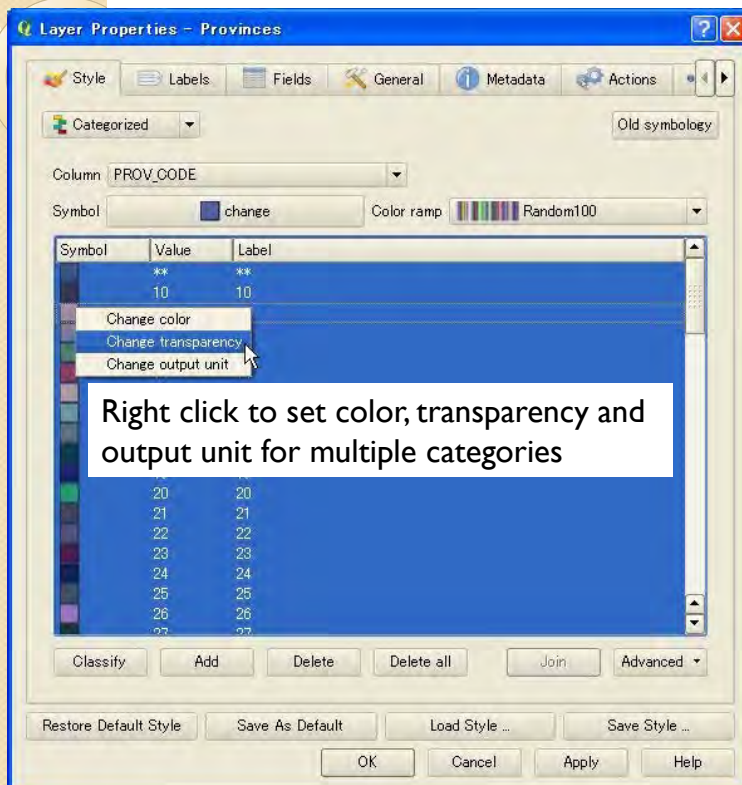
Properties of layers – “Style” tab



I. Constitution of GIS Data and How to Use GIS Software

I.3.1 Quantum GIS (GIS data Mapping software)

Properties of layers – “Style” tab



I. Constitution of GIS Data and How to Use GIS Software

I.3.1 Quantum GIS (GIS data Mapping software)

Properties of layers – “Style” tab

Graduated : set color to each range of attribute column value

Attribute column name to set color

Number of classes and class separation setting

You can set color ramp here. It is able to make new color ramp by “New Color Ramp...” located at the bottom of pull down.

Symbol	Range	Label
	161210.0000 - ...	< 0 Std Dev
	791086.1948 - ...	0 Std Dev - 1 Std Dev
	1564985.5427 - ...	1 Std Dev - 2 Std Dev
	2338884.8906 - ...	2 Std Dev - 3 Std Dev
	3112784.2386 - ...	3 Std Dev - 4 Std Dev
	3886683.5865 - ...	4 Std Dev - 5 Std Dev
	4660582.9344 - ...	5 Std Dev - 6 Std Dev
	5434482.2823 - ...	6 Std Dev - 7 Std Dev
	6208381.6302 - ...	>= 7 Std Dev

List of Classes

Classify Add class Delete class Advanced

Make classes automatically Add or delete classes Save Style ...

I. Constitution of GIS Data and How to Use GIS Software

I.3.1 Quantum GIS (GIS data Mapping software)

Properties of layers – “Diagram” tab

Check to display diagram

Display diagrams Diagram type Text diagram

Select diagram type

Color and font settings

Size and position settings

Add or delete attribute columns to display

Attribute	Color
AREA	
population	



I. Constitution of GIS Data and How to Use GIS Software

I.3.1 Quantum GIS (GIS data Mapping software)

Properties of layers – “Diagram” tab



Layer Properties - Provinces

Fields General Metadata Actions Joins **Diagrams**

Display diagrams Diagram type Pie chart Prit “Pie chart”

Appearance

Scale dependent visibility Minimum -1 Maximum -1

Background color Pen color Pen width 0.00000 Font...

Size

Fixed size 30.00 units

Scale linearly between 0 and the following attribute value / diagram size:

Attribute No\_TotRVil Find maximum value 1497 Size 15

Position

Placement OverPoint Line Options Distance 0.00

Data defined position x None y None

Attributes PROV\_CODE

Attribute	Color
No_R1Vil	
No_R2Vil	
No_R3Vil	

Restore Default Style Save As Default Load Style ... Save Style ...

OK Cancel Apply Help

Select fixed size or variable size according to value of attribute column (see next page)

Add or delete attribute columns to display. Color settings are also here.

I. Constitution of GIS Data and How to Use GIS Software

I.3.1 Quantum GIS (GIS data Mapping software)

Properties of layers – “Diagram” tab

Set size and check here to use fixed scale

mm : set size by length on window  
Map Unit : set size by length on map (size varies when map scale changes)

Size

Fixed size 30.00 Size units mm

Scale linearly between 0 and the following attribute value / diagram size:

Attribute No\_TotRVil Find maximum value 1497 Size 15

Select attribute column to determine size

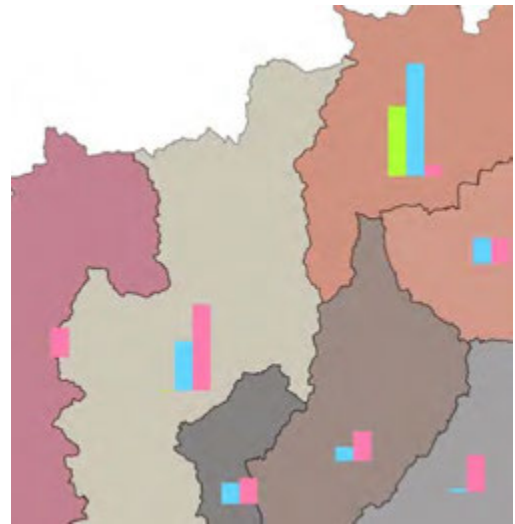
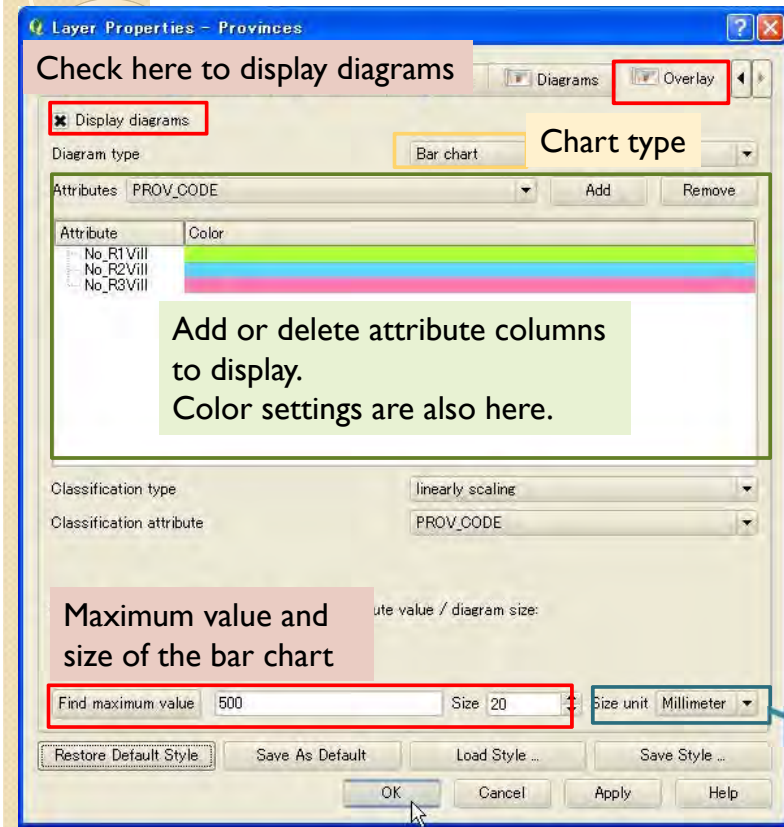
Set maximum value of attribute column value

Set maximum size of pie chart

# I. Constitution of GIS Data and How to Use GIS Software

## I.3.1 Quantum GIS (GIS data Mapping software)

### Properties of layers – “Overlay” tab

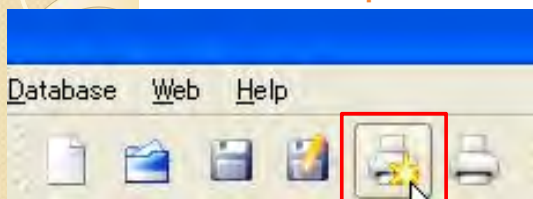


mm : set size by length on window  
Map Unit : set size by length on map (size varies when map scale changes)

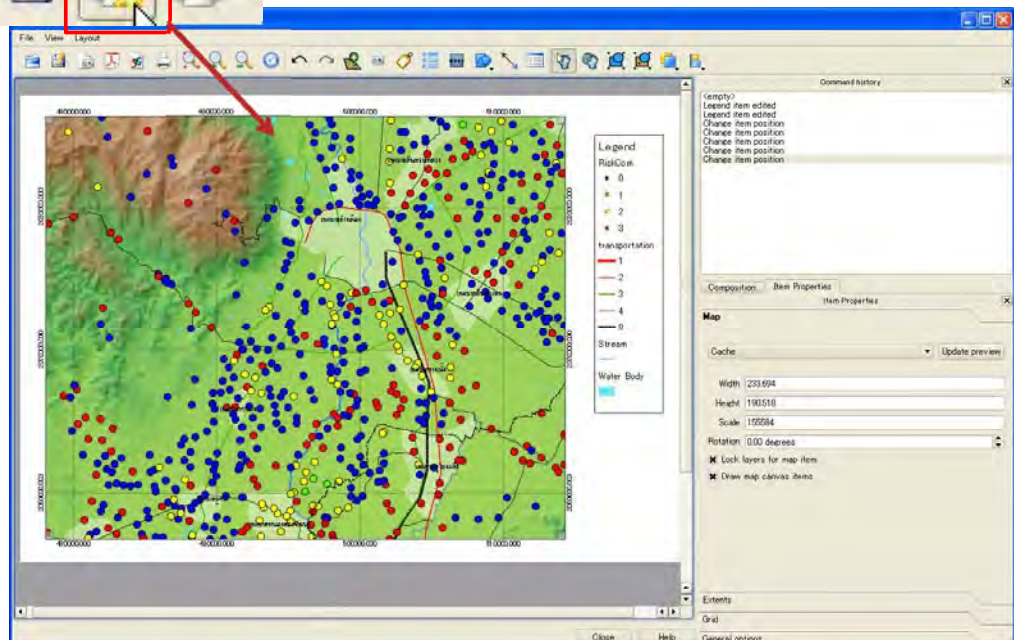
# I. Constitution of GIS Data and How to Use GIS Software

## I.3.1 Quantum GIS (GIS data Mapping software)

### Print composer

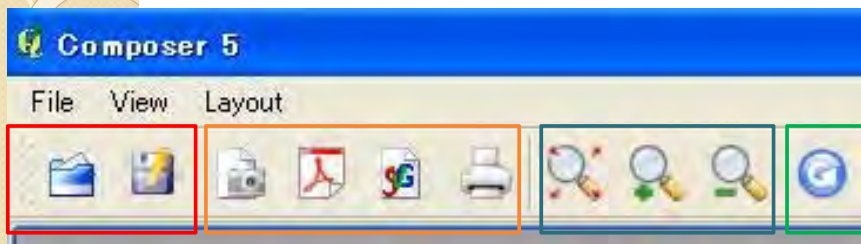


Print composer is canvas window for print or export image file, such as pdf, jpg...



I. Constitution of GIS Data and How to Use GIS Software  
I.3.1 Quantum GIS (GIS data Mapping software)

## Print composer

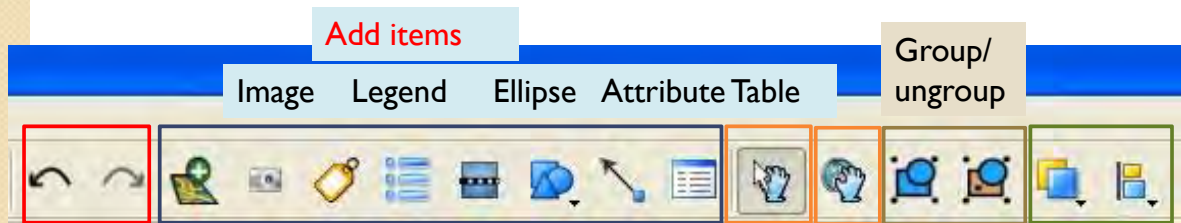


Load and save

Export to file or print

Zoom in/out

Refresh canvas



Add items

Group/ungroup

Redo/undo

Map

Label

Scale bar

Arrow

Move item

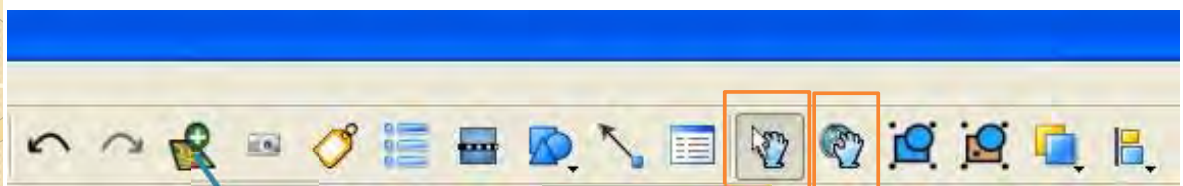
Move item content

Change item order and align

Add items

I. Constitution of GIS Data and How to Use GIS Software  
I.3.1 Quantum GIS (GIS data Mapping software)

## Print composer

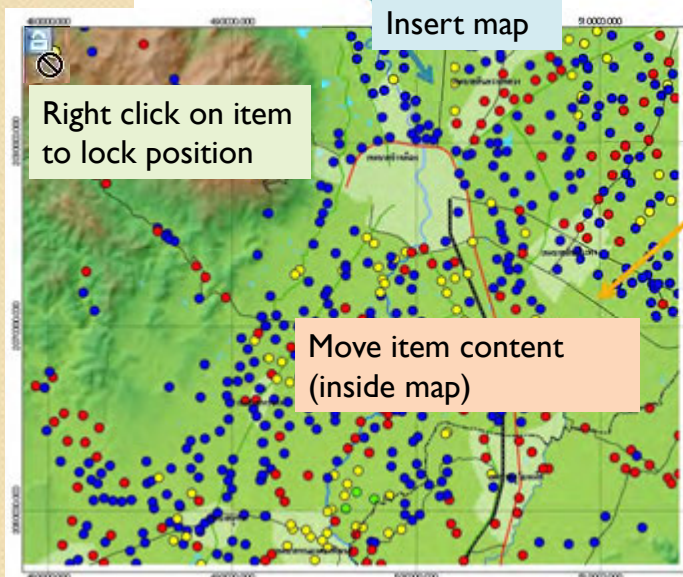


Insert map

Move item

Right click on item to lock position

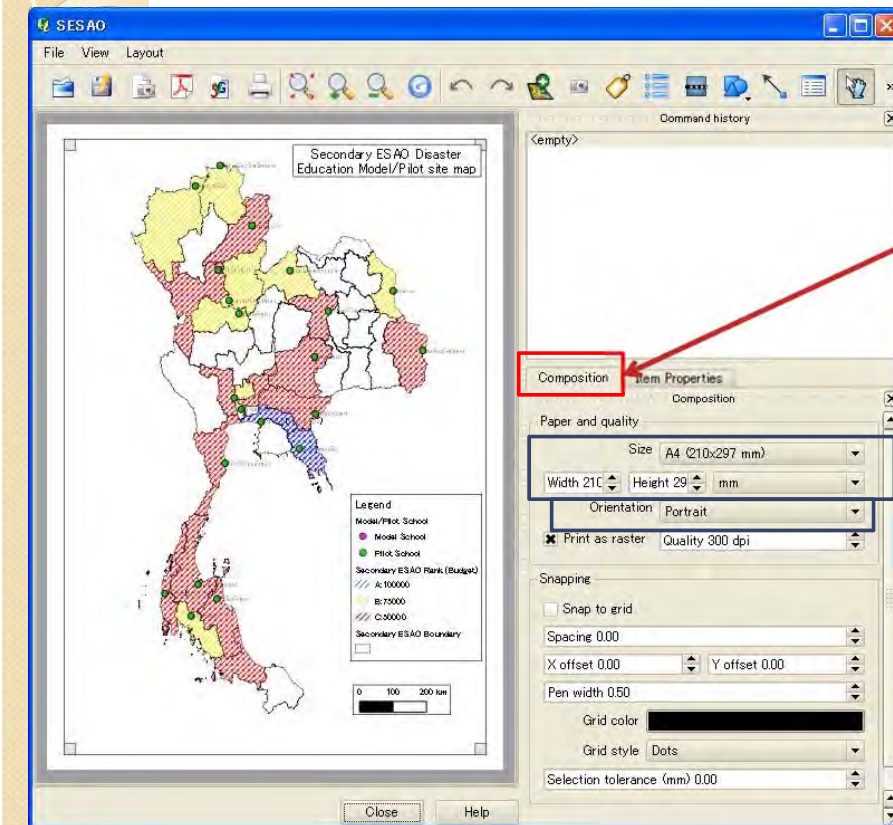
Move item content (inside map)



# I. Constitution of GIS Data and How to Use GIS Software

## I.3.1 Quantum GIS (GIS data Mapping software)

### Print composer



Composition tab is for General settings of the canvas

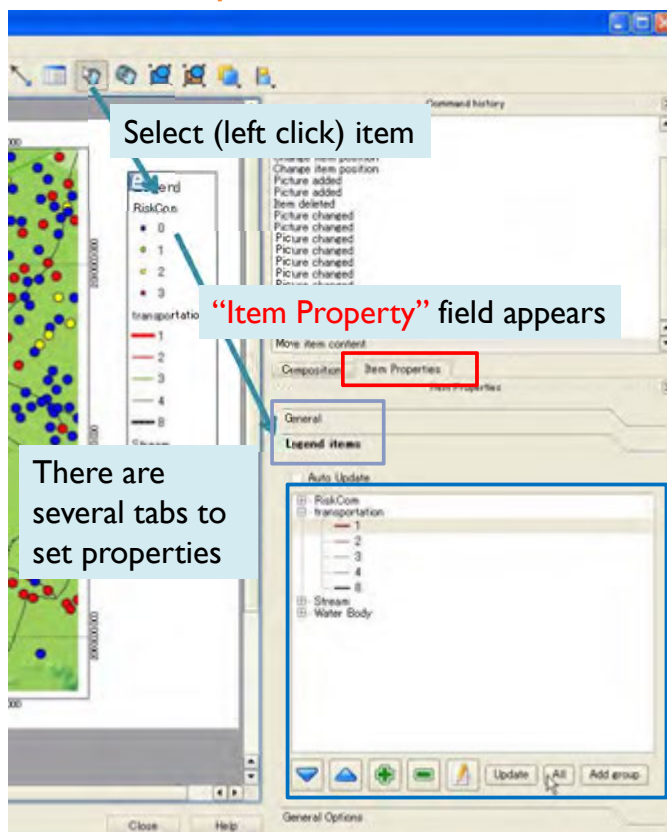
Size

Orientation

# I. Constitution of GIS Data and How to Use GIS Software

## I.3.1 Quantum GIS (GIS data Mapping software)

### Print composer



When you select a item on canvas, property field appears at bottom of right side.

You can arrange several settings.

There are several tabs to set properties

"Item Property" field appears

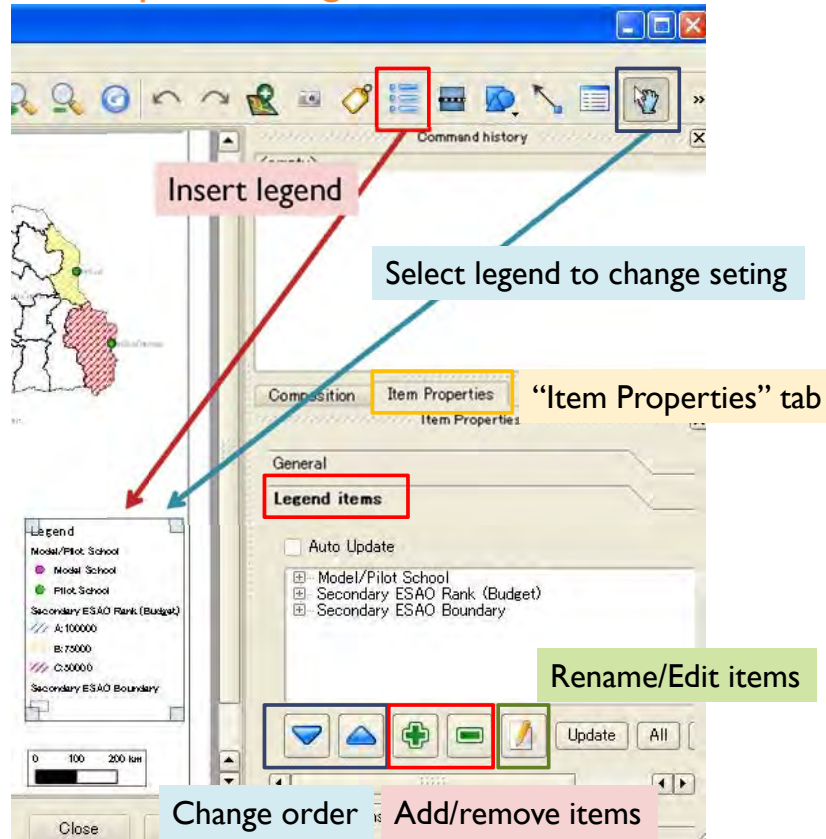
Select (left click) item

You can add, remove or edit legend items.

I. Constitution of GIS Data and How to Use GIS Software

I.3.1 Quantum GIS (GIS data Mapping software)

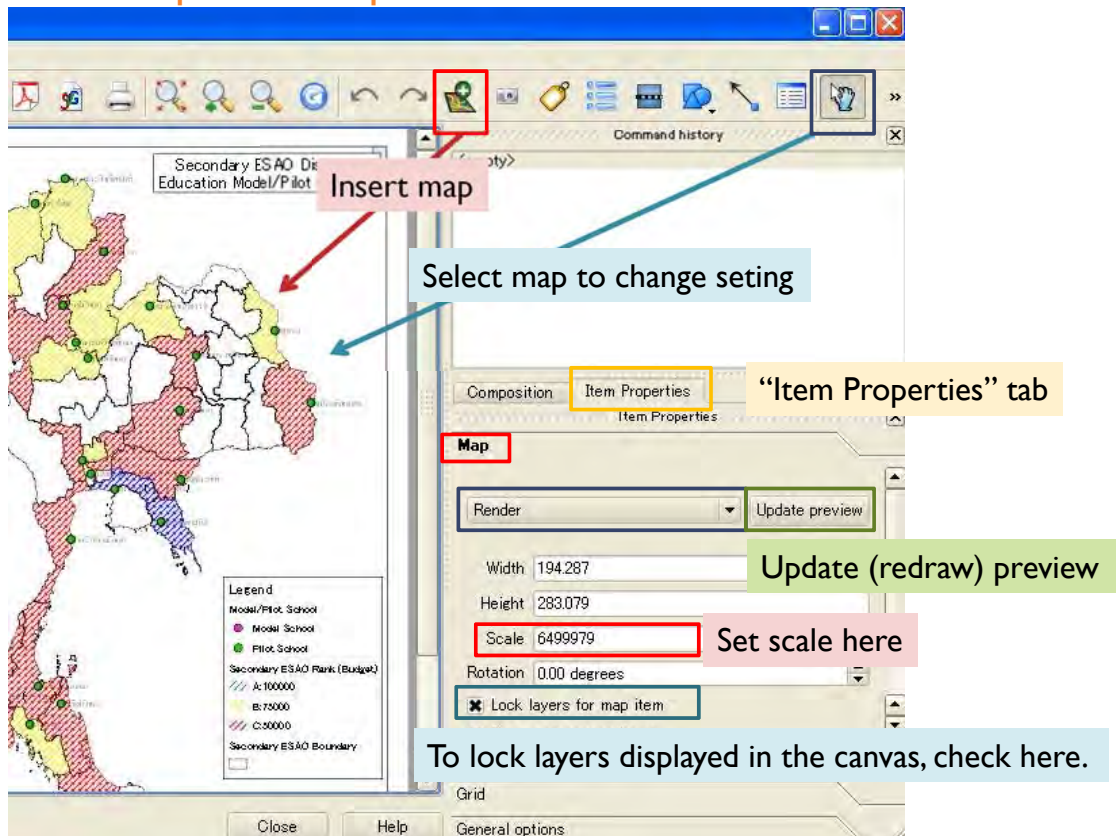
Print composer - Legend



I. Constitution of GIS Data and How to Use GIS Software

I.3.1 Quantum GIS (GIS data Mapping software)

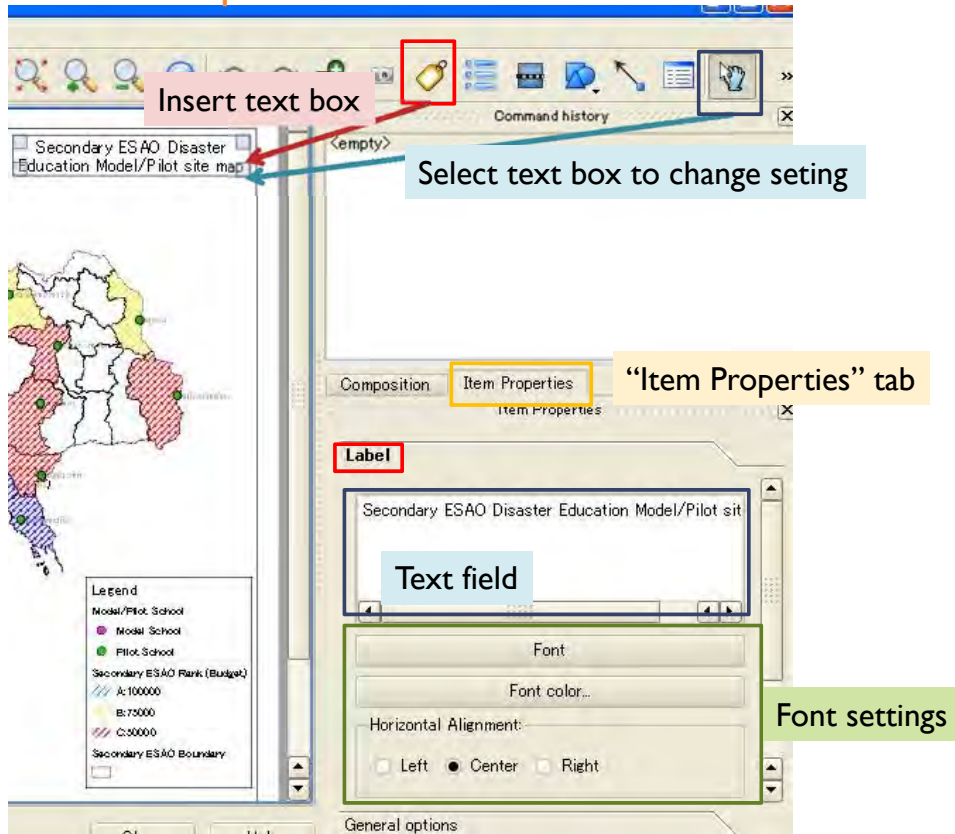
Print composer - Map



I. Constitution of GIS Data and How to Use GIS Software

I.3.1 Quantum GIS (GIS data Mapping software)

Print composer – Text box



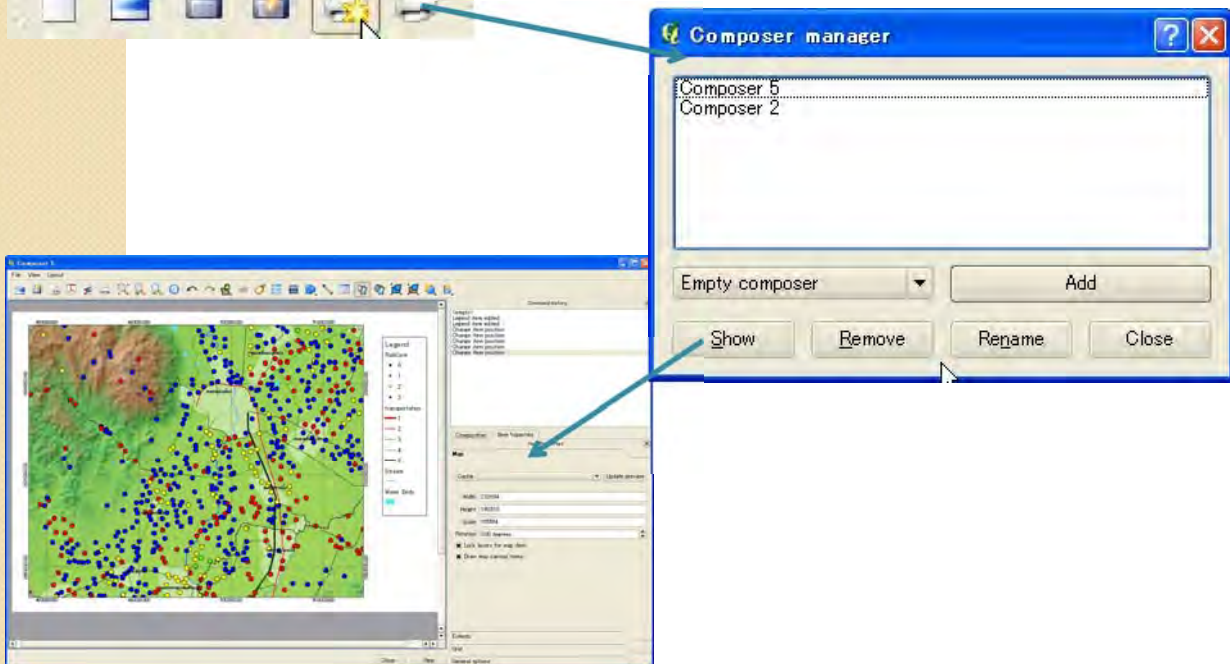
I. Constitution of GIS Data and How to Use GIS Software

I.3.1 Quantum GIS (GIS data Mapping software)

Print composer

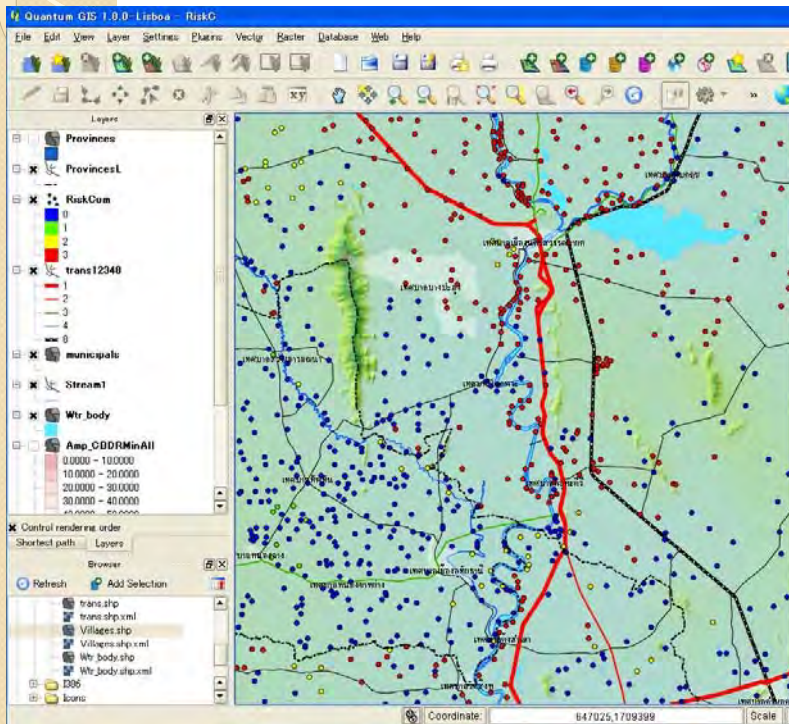


You made composer once, you can reload the composer from this button. You also remove or rename the composer.



## 2. Making Inventory Maps (Risk Community)

### 2.1 Making risk community map



It is important to understand situation about risk community.

In this chapter, we make risk community map by using QGIS and Excel.

Source files

/ Risk\_Community\_N.xls  
(list of risk community)

/ village (shape file)

/ provinces (shape file)

/ RegionC (shape file)

/ trans (shape file)

/ Wtr\_body (shape file)

/ Stream (shape file)

/ thailand.osm (openstreetmap)

/ dem\_90\_u\_ft (image file)

## 2. Making Inventory Maps

### 2.1.1 Make risk community shape file

Risk\_Community\_N.xlsx is Excel format file. This file contains Risk community profiles (location, risk level population ...).

First row is name of attribute column.

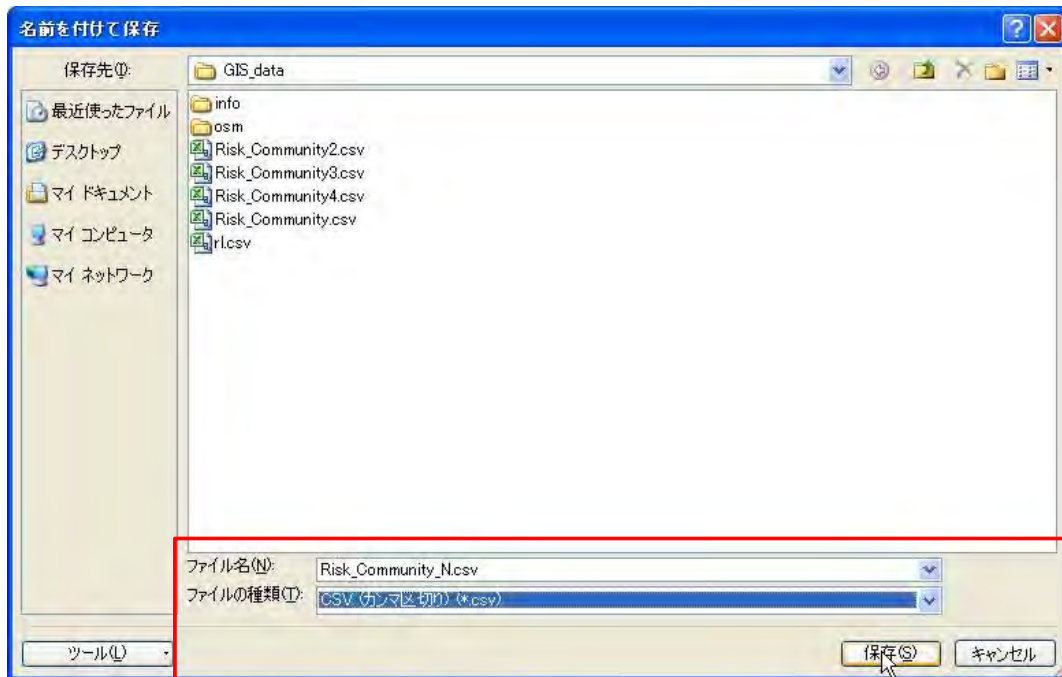
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Vill Code	RC Code	Prov.Co	Amp.Co	Amphoe	Tambon	Moo	Vill Name	Populatk	Househ	Risk lev	Pan_besi	RiverBas	foothill
1	13010100	RC01	13	1301	เมืองสมุทรสาคร	0	คลองโพธิ์	690	179	2			
3	13010100	RC01	13	1301	เมืองสมุทรสาคร	0	ถนนโพธิ์	723	158	2			1
4	13010100	RC01	13	1301	เมืองสมุทรสาคร	0	คลองโพธิ์	588	171	2			1
5	13010401	RC01	13	1301	เมืองสมุทรสาคร	1	คลองโพธิ์	853	299	2			1
6	13010402	RC01	13	1301	เมืองสมุทรสาคร	2	หมู่บ้านโพธิ์	2378	1058	2			1
7	13010403	RC01	13	1301	เมืองสมุทรสาคร	3	คลองโพธิ์	156	35	2			1
8	13010805	RC01	13	1301	เมืองสมุทรสาคร	5	คลองโพธิ์	500	325	2			1
9	13010806	RC01	13	1301	เมืองสมุทรสาคร	6	หมู่บ้านโพธิ์	387	77	2			1
10	13010900	RC01	13	1301	เมืองสมุทรสาคร	0	ชุมชนคลอง	514	149	2			1
11	13010801	RC01	13	1301	เมืองสมุทรสาคร	1	หมู่บ้านโพธิ์	454	116	2			1
12	13010802	RC01	13	1301	เมืองสมุทรสาคร	2	โพธิ์	974	231	2			1
13	13010803	RC01	13	1301	เมืองสมุทรสาคร	3	หมู่บ้านโพธิ์	1278	366	2			1
14	13010804	RC01	13	1301	เมืองสมุทรสาคร	4	คลองโพธิ์	532	107	2			1
15	13010805	RC01	13	1301	เมืองสมุทรสาคร	5	บ้านโพธิ์	3263	1389	2			1
16	13010806	RC01	13	1301	เมืองสมุทรสาคร	6	บ้านโพธิ์	2383	586	2			1
17	13010807	RC01	13	1301	เมืองสมุทรสาคร	7	หมู่บ้านโพธิ์	487	106	2			1
18	13020100	RC01	13		คลองโพธิ์	0	หมู่บ้านโพธิ์	1190	288	2		1	
19	13020116	RC01	13		คลองโพธิ์	16	หมู่บ้านโพธิ์	6272	1836	2		1	
20	13020118	RC01	13		คลองโพธิ์	18	บ้านโพธิ์	826	303	2		1	
21	13020120	RC01	13	1302	คลองโพธิ์	20	บ้านโพธิ์	350	65	2		1	
22	13YYYYYY	RC01	13	13YY	คลองโพธิ์	14	ชุมชนโพธิ์	945	316	2		1	
23	13030201	RC01	13	1303	คลองโพธิ์	1	ชุมชนโพธิ์	2404	1356	2			1
24	13030202	RC01	13	1303	คลองโพธิ์	2	ชุมชนโพธิ์	5295	2541	2			1
25	13030204	RC01	13	1303	คลองโพธิ์	4	ชุมชนโพธิ์	3448	1368	2			1
26	13040501	RC01	13	1304	คลองโพธิ์	1	คลองโพธิ์	566	117	2		1	
27	13040502	RC01	13	1304	คลองโพธิ์	2	หมู่บ้านโพธิ์	455	95	2		1	
28	13040503	RC01	13	1304	คลองโพธิ์	3	หมู่บ้านโพธิ์	686	222	2		1	
29	13040504	RC01	13	1304	คลองโพธิ์	4	หมู่บ้านโพธิ์	490	116	0		1	

Data field

## 2. Making Inventory Maps

### 2.1.1 Make risk community shape file

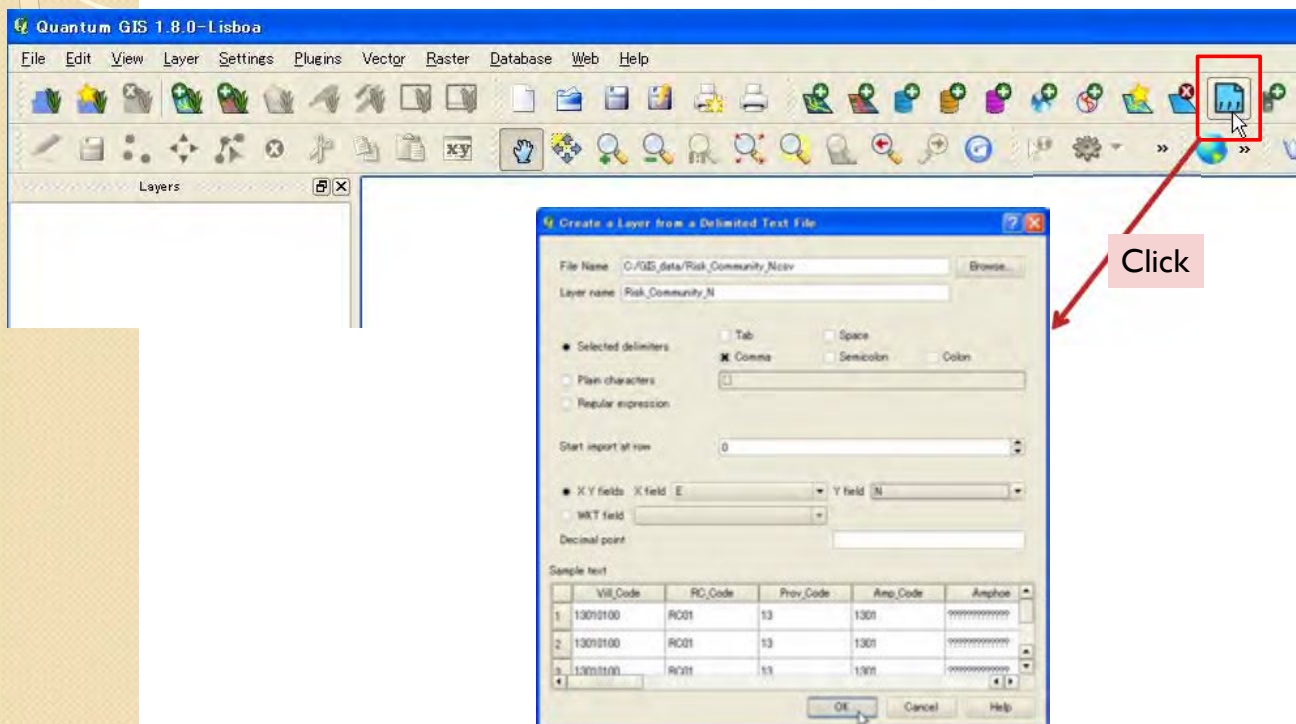
In order to import the Excel data, save the data sheet to “csv” format file.



## 2. Making Inventory Maps

### 2.1.1 Make risk community shape file

Open QGIS and push “Add Delimited Text Layer” button to import the “csv” file.





## 2. Making Inventory Maps

### 2.1.1 Make risk community shape file

File Name: C:/GIS\_data/Risk\_Community\_N.csv

Layer name: Risk\_Community

Selected delimiters:  Comma

X field: E, Y field: N

Sample text:

	Vill_Code	RC_Code	Prov_Code	Amp_Code	Amphoe
1	13010100	RC01	13	1301	??????????
2	13010100	RC01	13	1301	??????????
3	13010100	RC01	13	1301	??????????

Coordinate Reference System Selector (partial view):

Coordinate Reference System	Authority ID
Indian 1975 / UTM zone 47N	EPSG:24047
WGS 84 / UTM zone 47N	EPSG:32647

Coordinate Reference System Selector (partial view):

Coordinate Reference System	Authority ID
Kalianpur 1975 / UTM zone 47N	EPSG:24347
Kertau 1968 / UTM zone 47N	EPSG:24547
WGS 72 / UTM zone 47N	EPSG:32247
WGS 72BE / UTM zone 47N	EPSG:32447
WGS 84 / UTM zone 47N	EPSG:32647

## 2. Making Inventory Maps

### 2.1.1 Make risk community shape file

Specify CRS for layer Risk\_Community\_N

Filter: 47N

Coordinate Reference System Selector (partial view):

Coordinate Reference System	Authority ID
Indian 1975 / UTM zone 47N	EPSG:24047
WGS 84 / UTM zone 47N	EPSG:32647

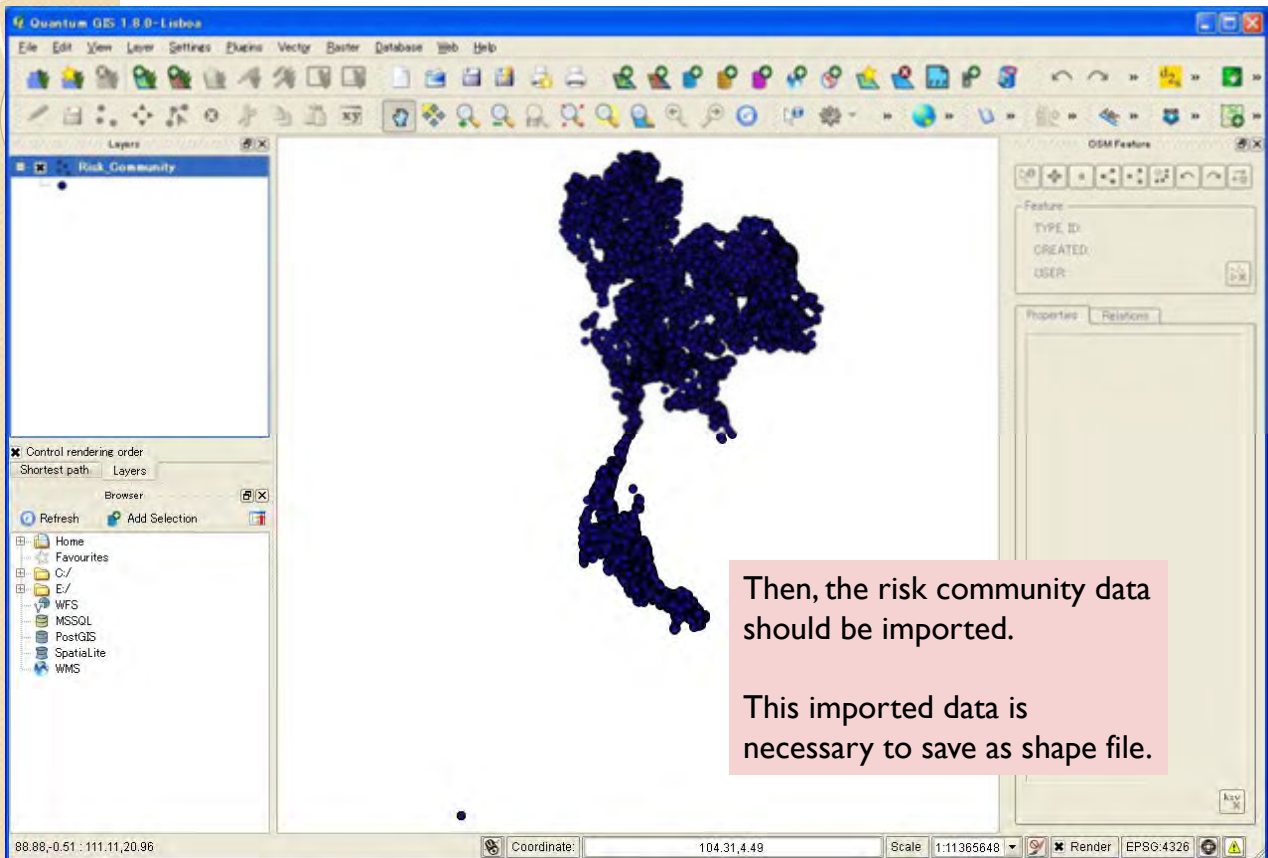
Coordinate Reference System Selector (partial view):

Coordinate Reference System	Authority ID
Kalianpur 1975 / UTM zone 47N	EPSG:24347
Kertau 1968 / UTM zone 47N	EPSG:24547
WGS 72 / UTM zone 47N	EPSG:32247
WGS 72BE / UTM zone 47N	EPSG:32447
WGS 84 / UTM zone 47N	EPSG:32647

+proj=utm +zone=47 +datum=WGS84 +units=m +no\_defs

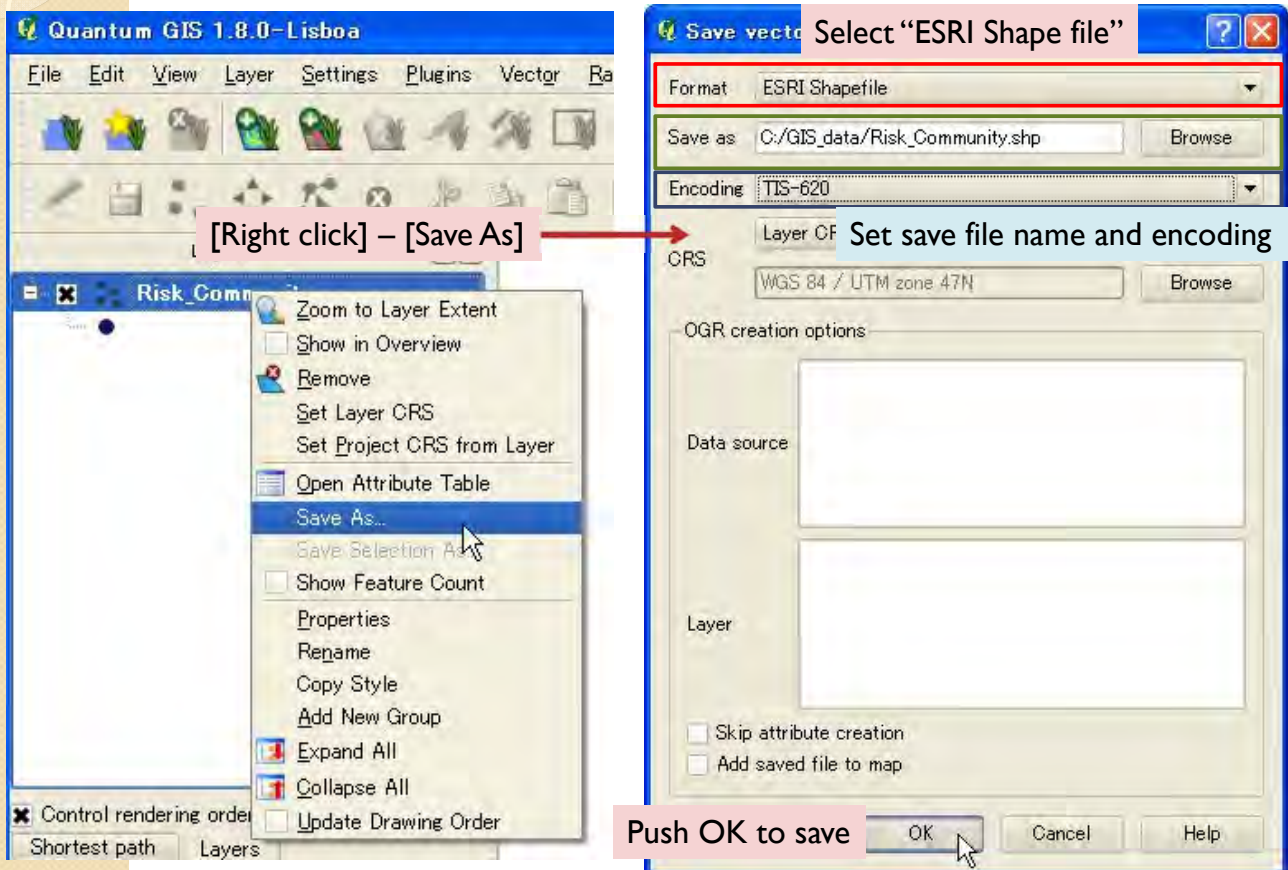
## 2. Making Inventory Maps

### 2.1.1 Make risk community shape file



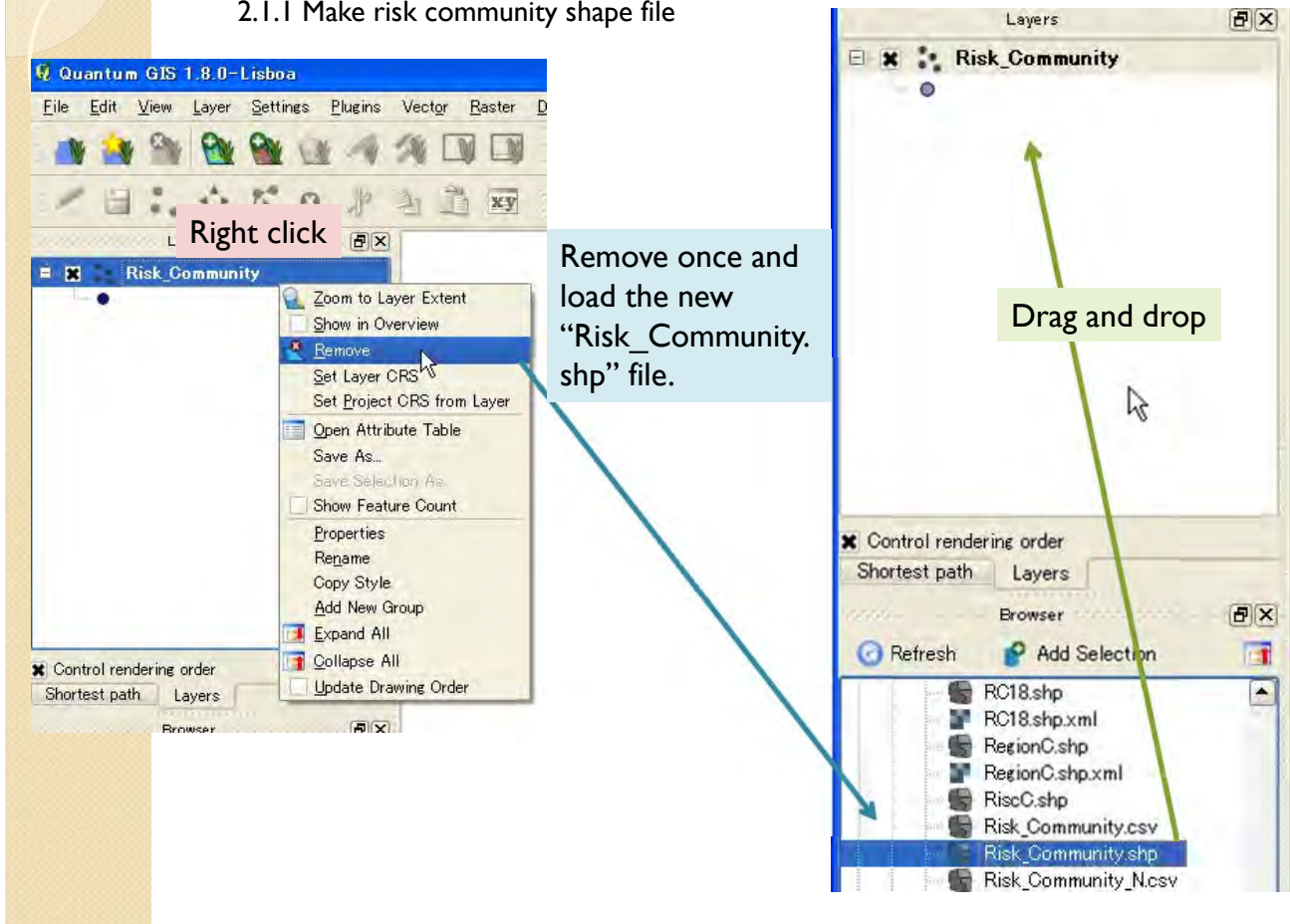
## 2. Making Inventory Maps

### 2.1.1 Make risk community shape file



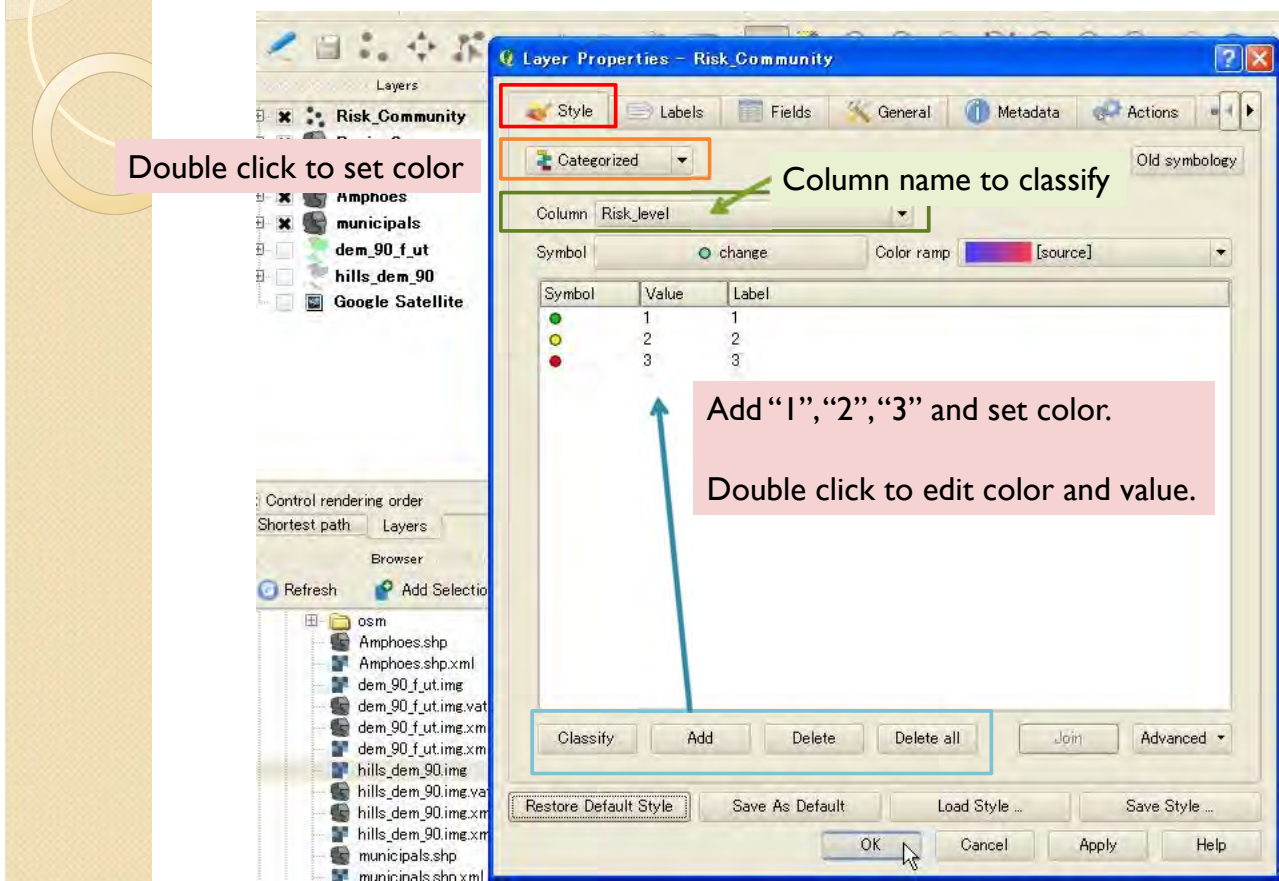
## 2. Making Inventory Maps

### 2.1.1 Make risk community shape file



## 2. Making Inventory Maps

### 2.1.1 Make risk community shape file



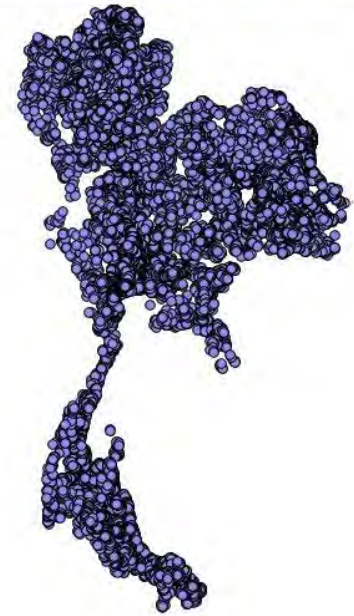
## 2. Making Inventory Maps

### 2.1.1 Make risk community shape file

Notes :

No location information communities are at "0,0".

Other community location data are also imprecise. In addition, some risk communities are double counted in the list (Excel file). Some parts were removed, but it is not perfect. Please pay attention if you use this data.

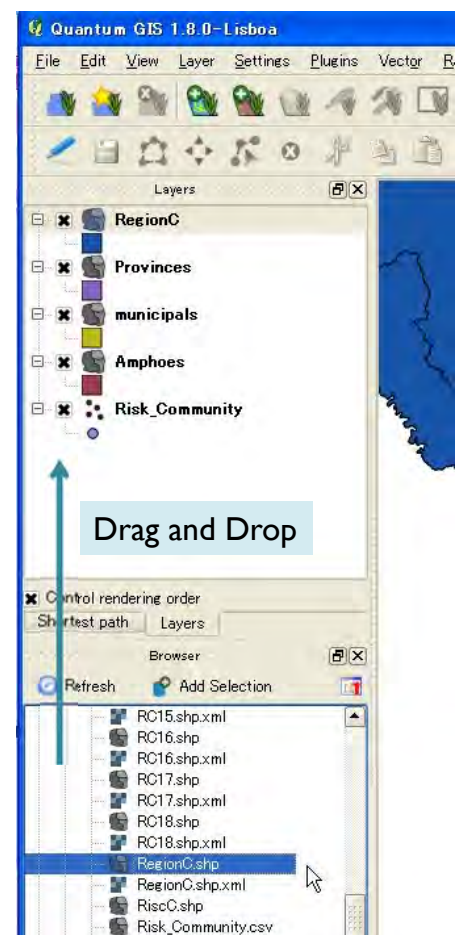


## 2. Making Inventory Maps

### 2.1.2 Import administrative data

Import following administrative data from "GIS\_data" folder.

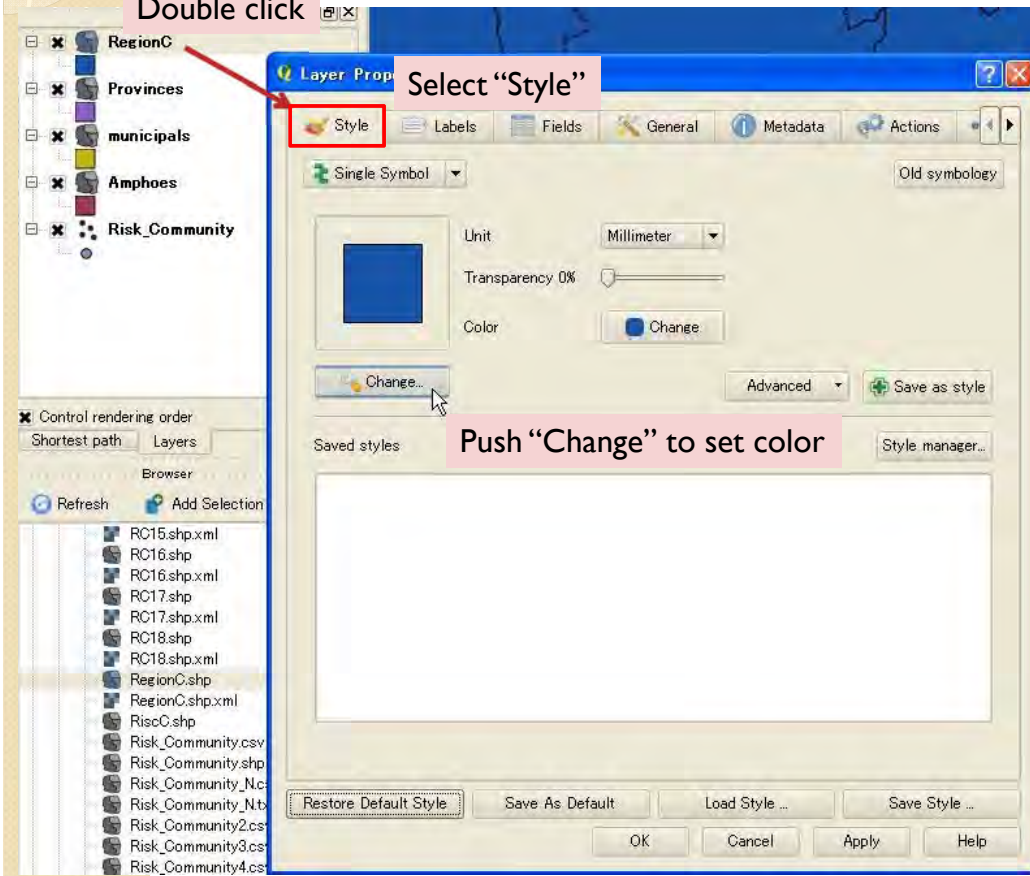
/ RegionC.shp  
/ Provinces.shp  
/ municipals.shp  
/ Amphoes.shp  
/ Villages.shp



## 2. Making Inventory Maps

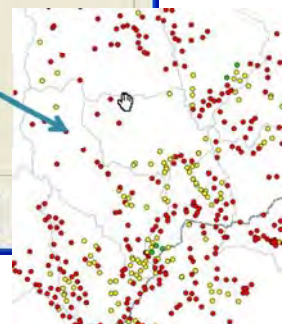
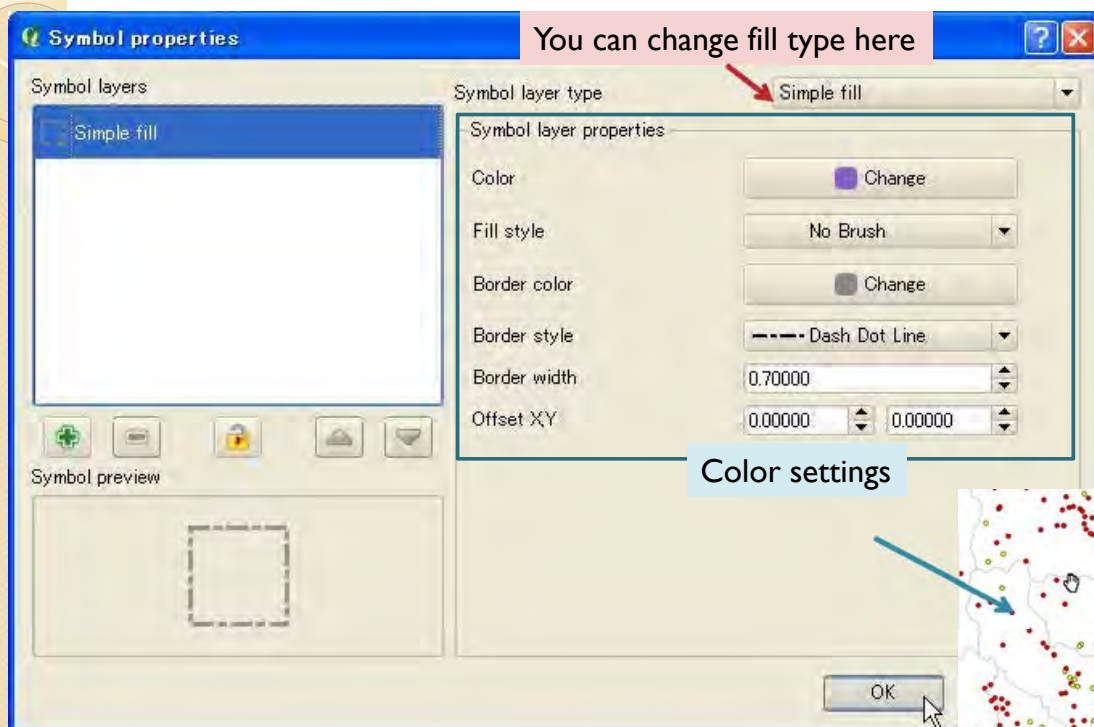
### 2.1.2 Import administrative data

Double click



## 2. Making Inventory Maps

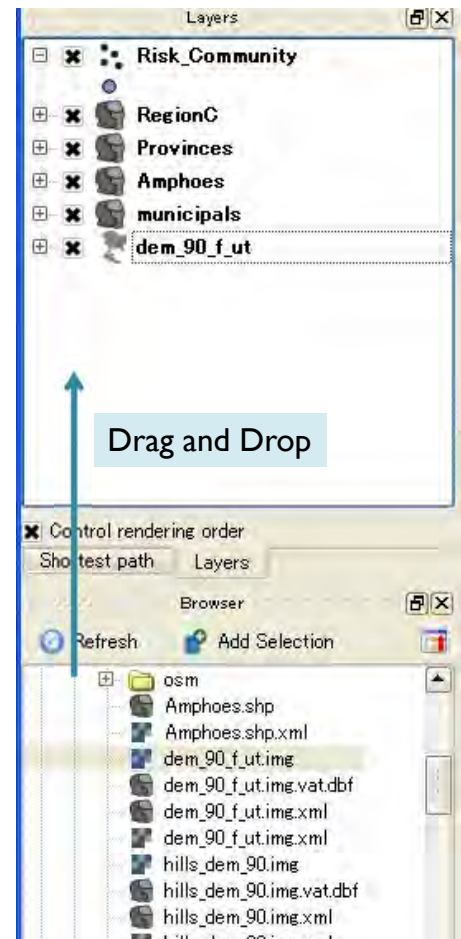
### 2.1.2 Import administrative data



## 2. Making Inventory Maps

### 2.1.3 Import elevation data

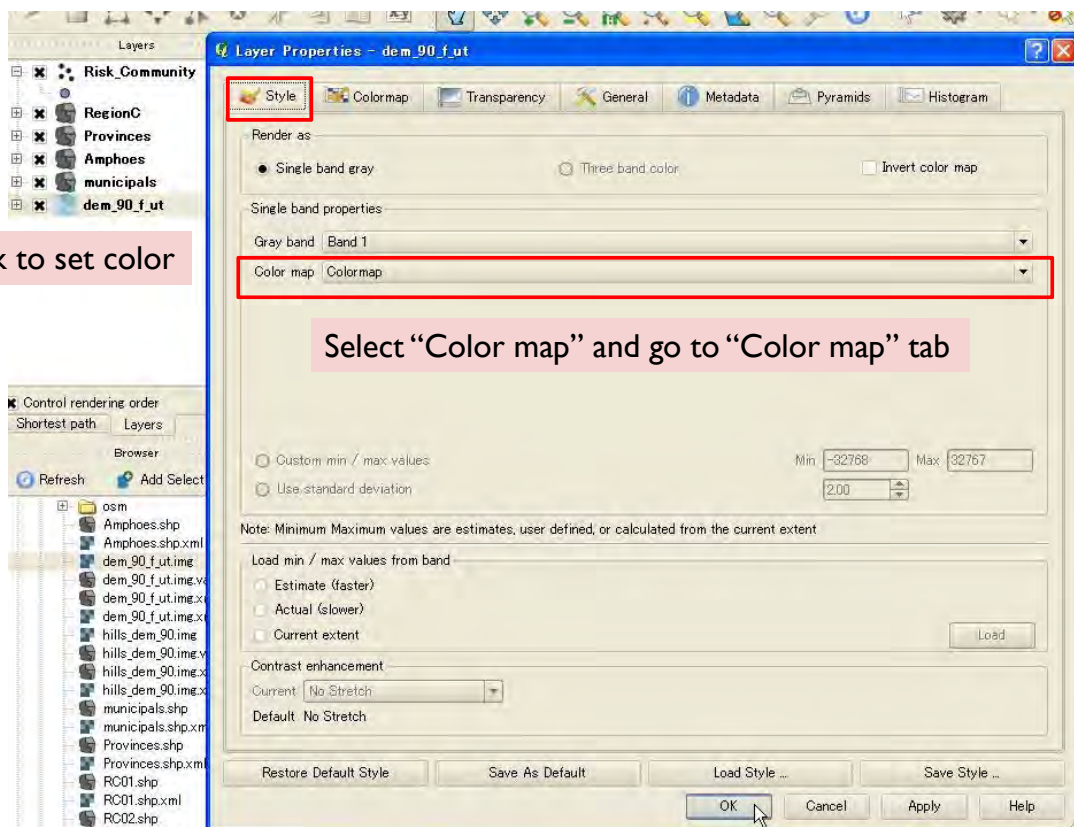
Import “dem\_90\_f\_ut” from “GIS\_data” folder.



## 2. Making Inventory Maps

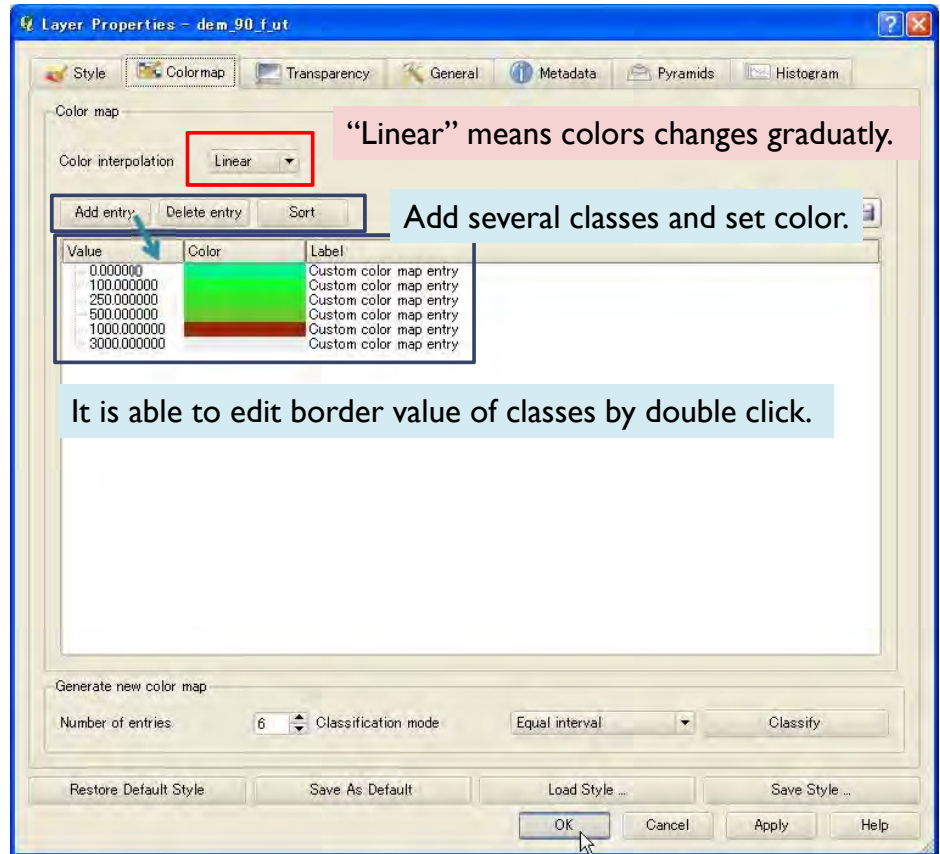
### 2.1.3 Import elevation data

Double click to set color



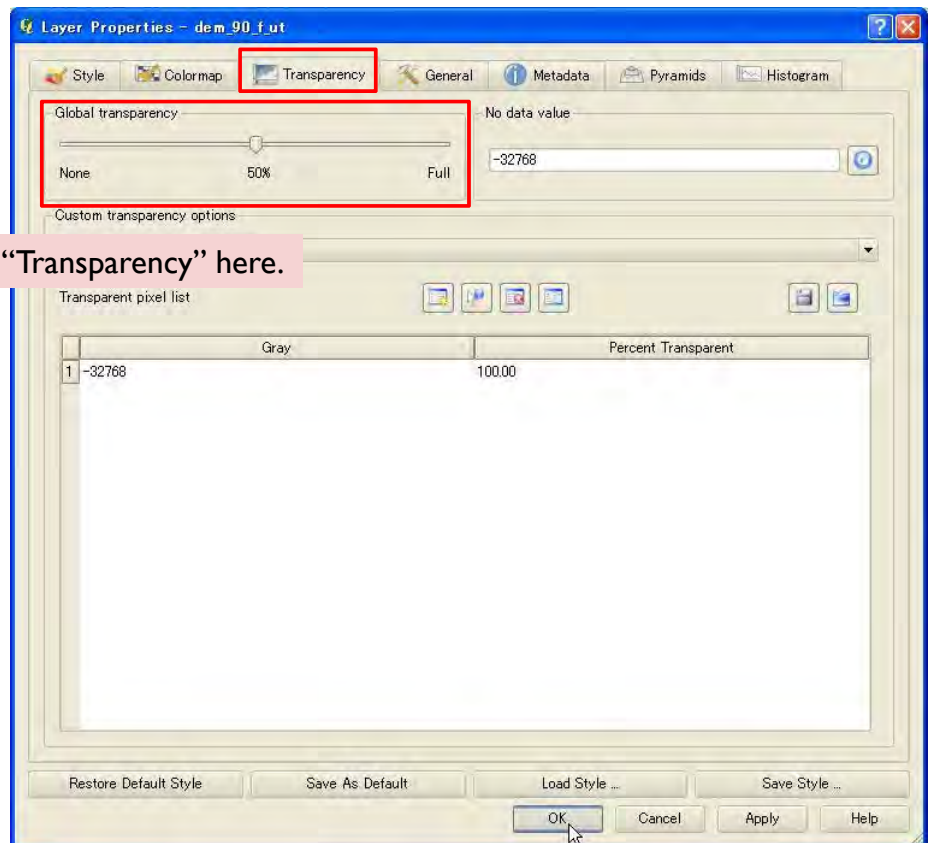
## 2. Making Inventory Maps

### 2.1.3 Import elevation data



## 2. Making Inventory Maps

### 2.1.3 Import elevation data



## 2. Making Inventory Maps

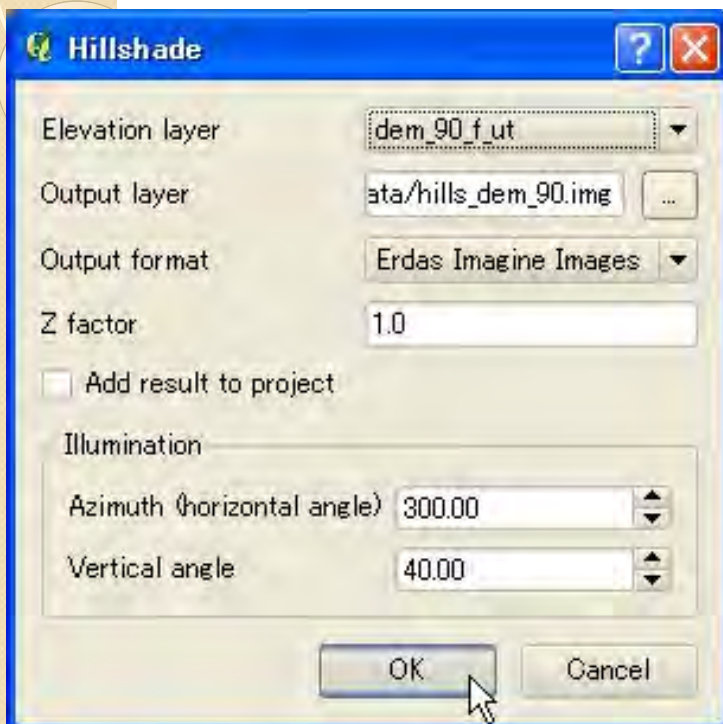
### 2.1.4 Making hill shade data

Select [Raster] – [Terrain analysis] – [Hillshade] to make hill shade.



## 2. Making Inventory Maps

### 2.1.4 Making hill shade data

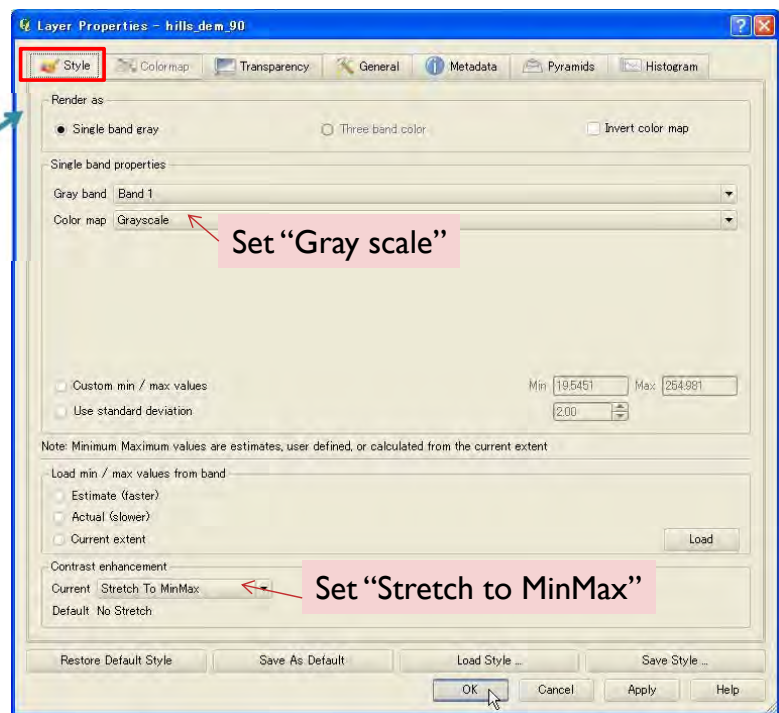
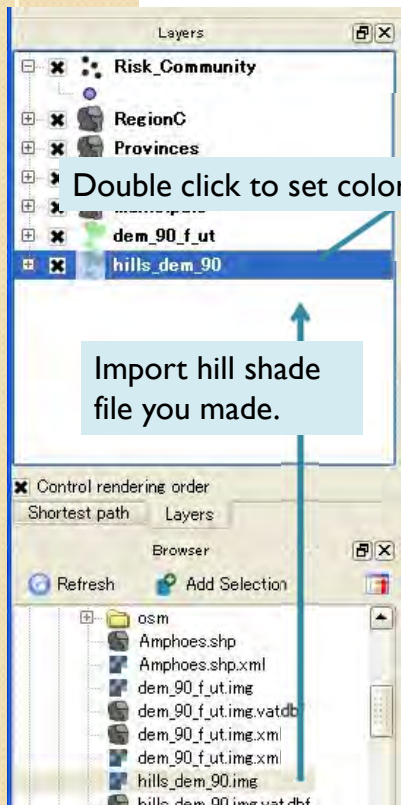


Select as these settings and push OK to make hill shade.



## 2. Making Inventory Maps

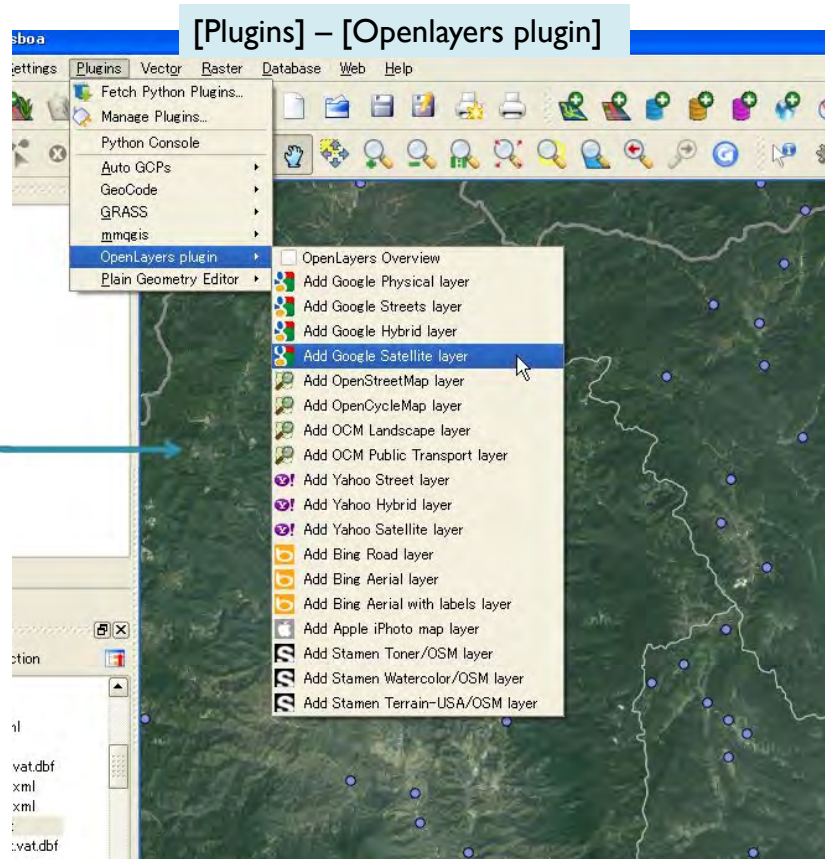
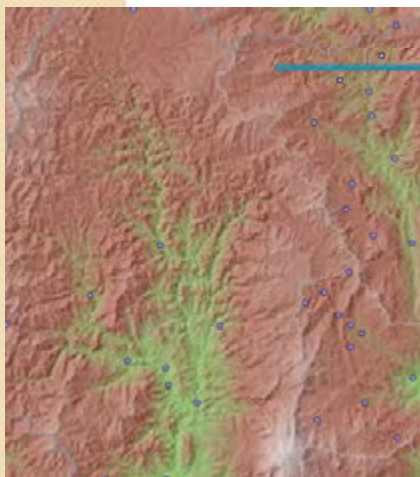
### 2.1.4 Making hill shade data



## 2. Making Inventory Maps

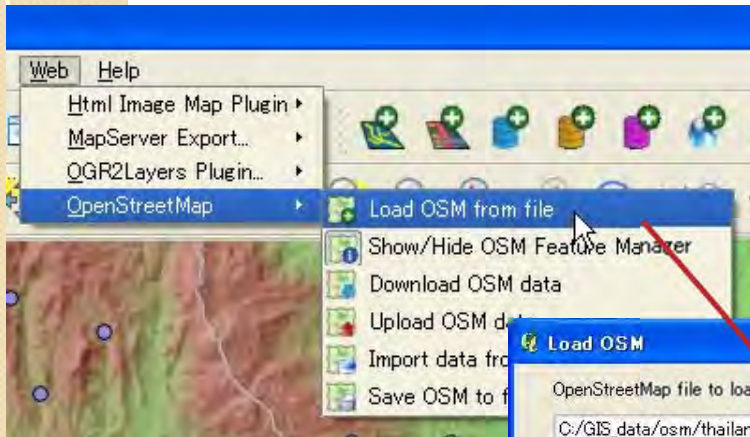
### 2.1.5 Import online Maps

Instead of the hill shade and elevation data, you can use online map when you use internet connection.

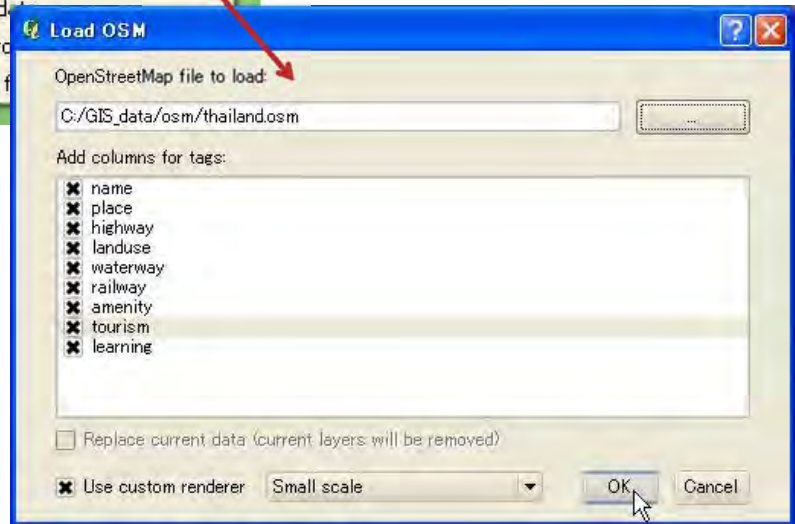


## 2. Making Inventory Maps

### 2.1.6 Import Open Street Map



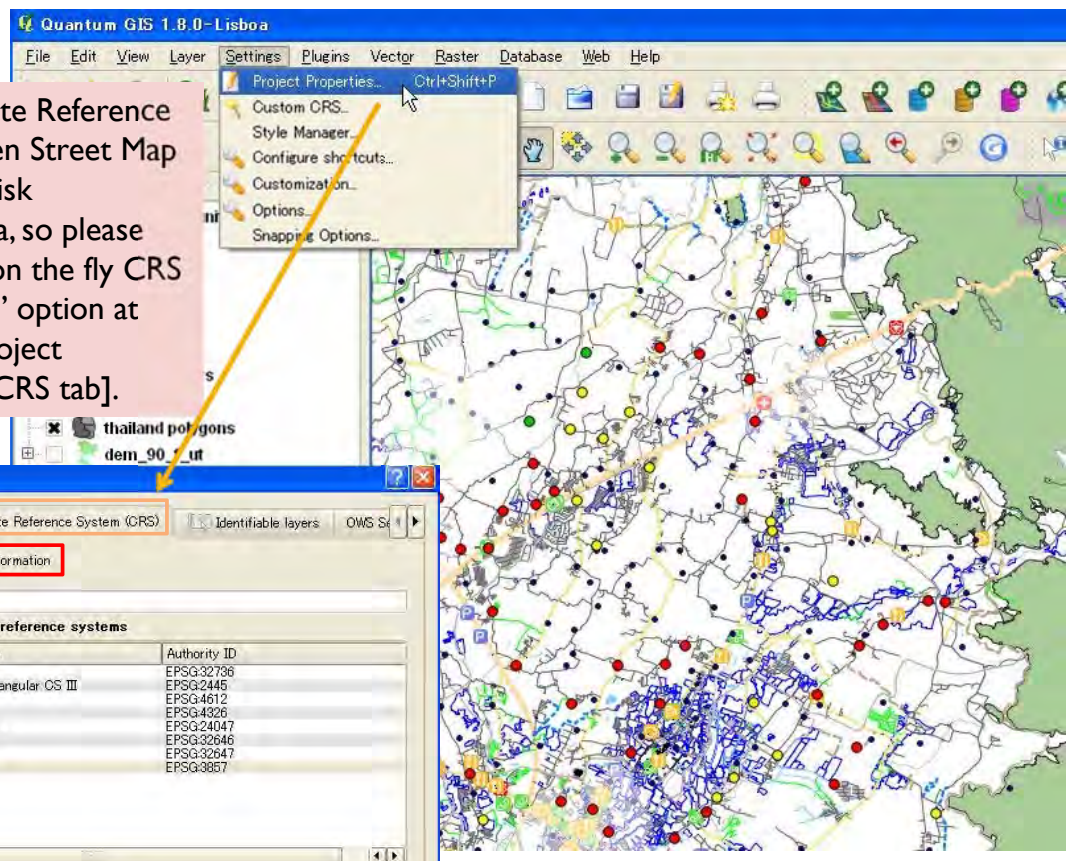
[Web] – [OpenStreetMap]  
– [Load OSM from file] to  
load Open Street Map.



## 2. Making Inventory Maps

### 2.1.6 Import Open Street Map

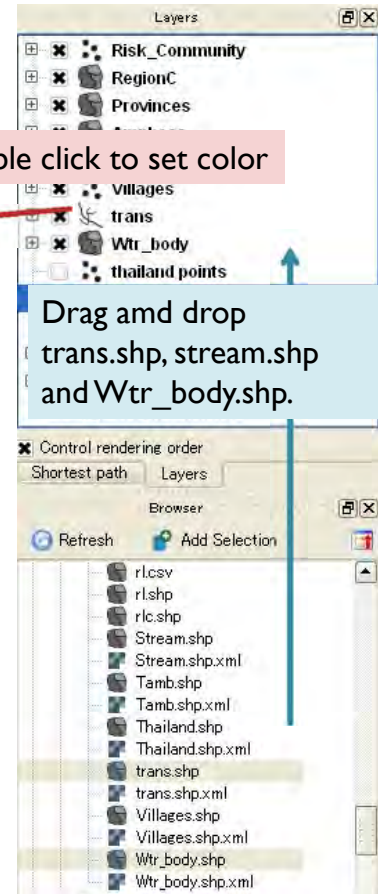
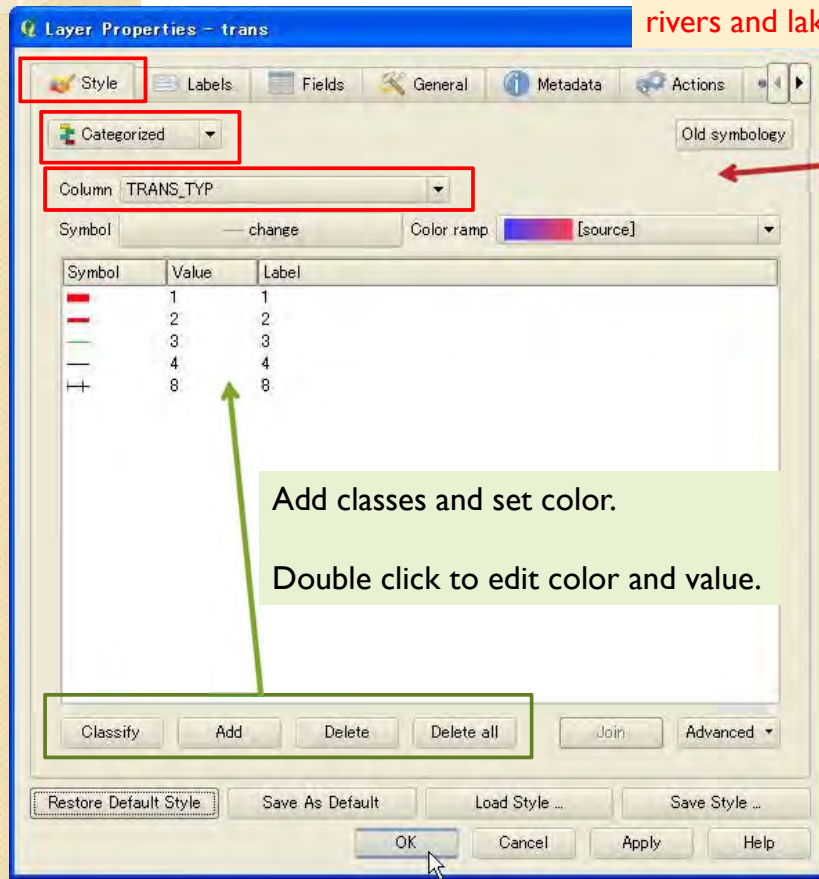
CRS (Coordinate Reference System) of Open Street Map is different to risk community data, so please check "Enable on the fly CRS transformation" option at [Settings] – [Project Properties] – [CRS tab].



## 2. Making Inventory Maps

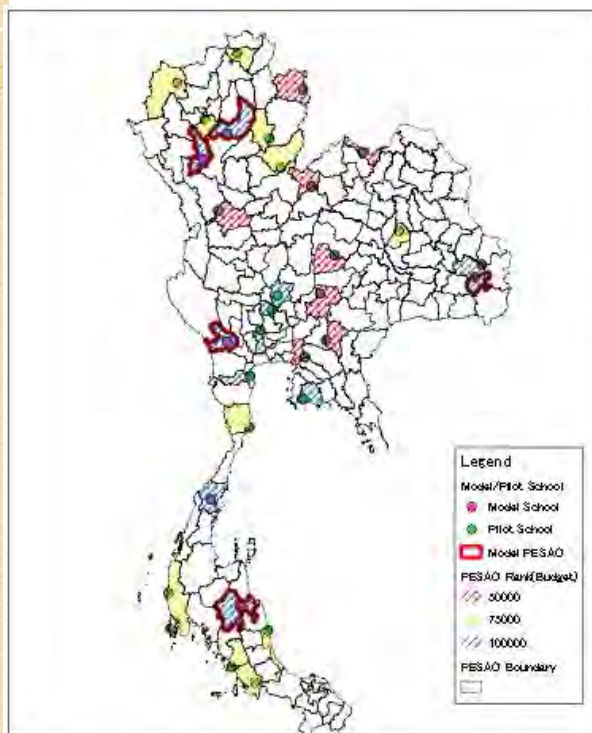
### 2.1.7 Import Other Data

You can import roads, railways, rivers and lakes.



## 3. Making Inventory Maps (Disaster Education)

### 3.1 Making model/pilot schools and ESAO map



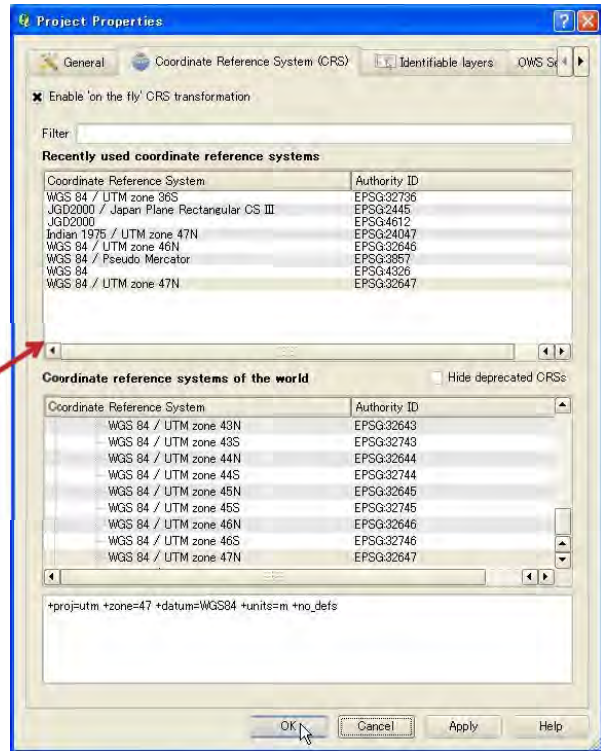
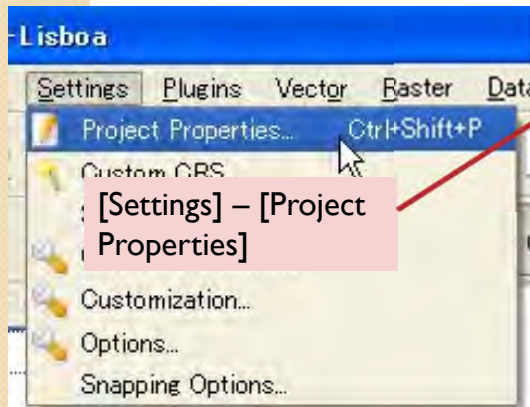
In this chapter, we make model/pilot schools and ESAO map by using QGIS and Excel.

- 1.Import Shape file (geographical data) and Excel file (disaster education information)
- 2.Integrate both into one shape file
- 3.Make coloring
- 4.Make inventory maps
- 5.Import and set color for risk area
- 6.Make risk area map with ESAO

### 3. Making Inventory Maps

#### 3.1.1 Import PESAO and SESAO file

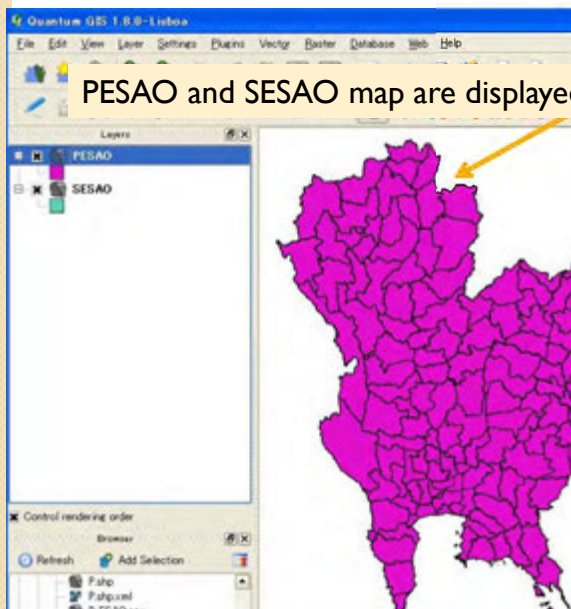
At first, make sure that Coordination Reference System (CRS) is set as WGS84 / UTM 47N and “Enable ‘on the fly’ CRS transformation” is checked.



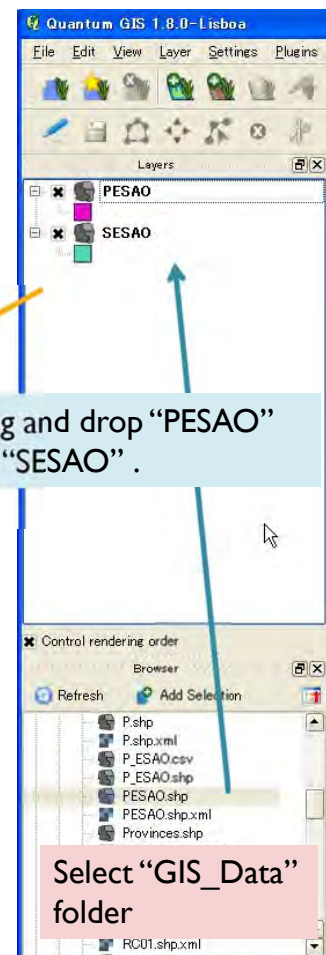
### 3. Making Inventory Maps

#### 3.1.1 Import PESAO and SESAO file

Select “GIS\_Data” folder in the “Browser” field and drag and drop “PESAO” and “SESAO” file into “Layers” folder.



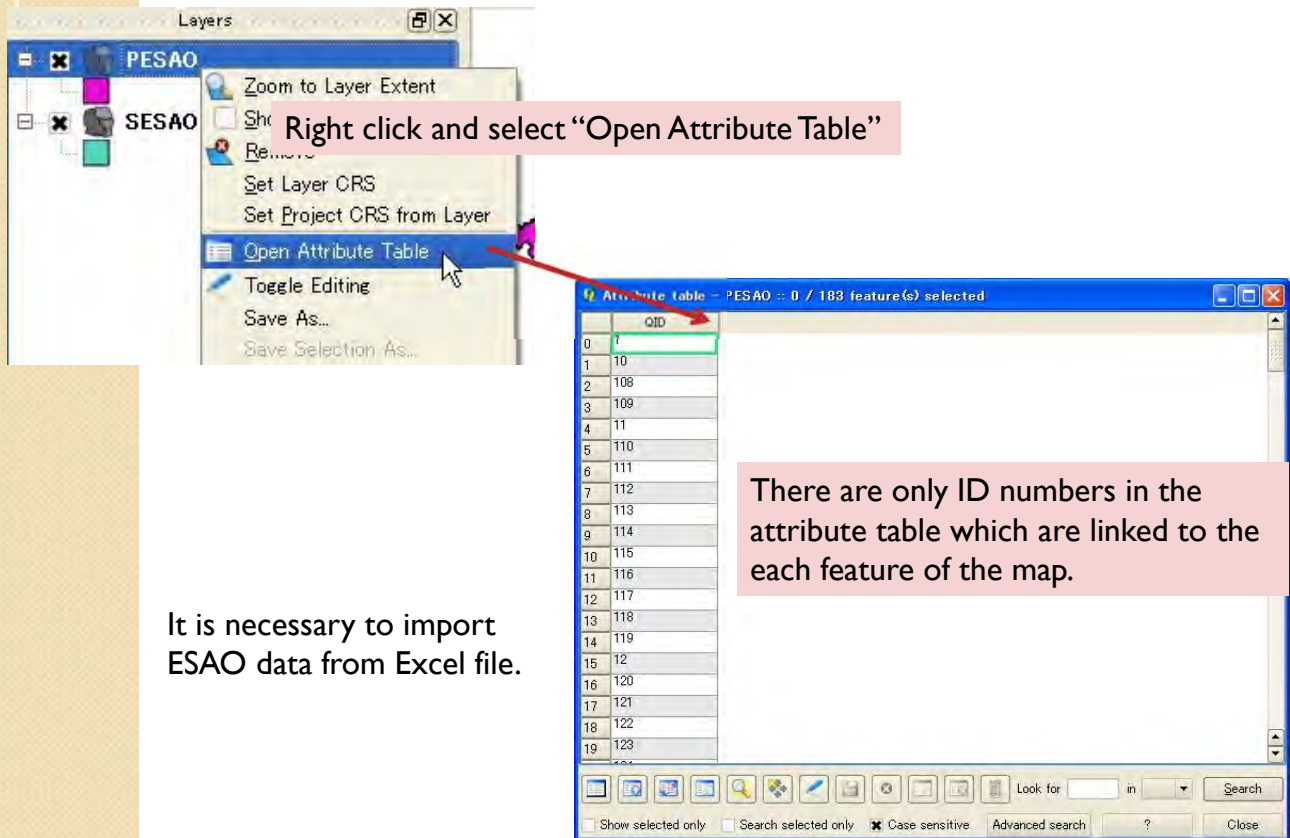
Drag and drop “PESAO” and “SESAO”.



Select “GIS\_Data” folder

### 3. Making Inventory Maps

#### 3.1.1 Import PESAO and SESAO file



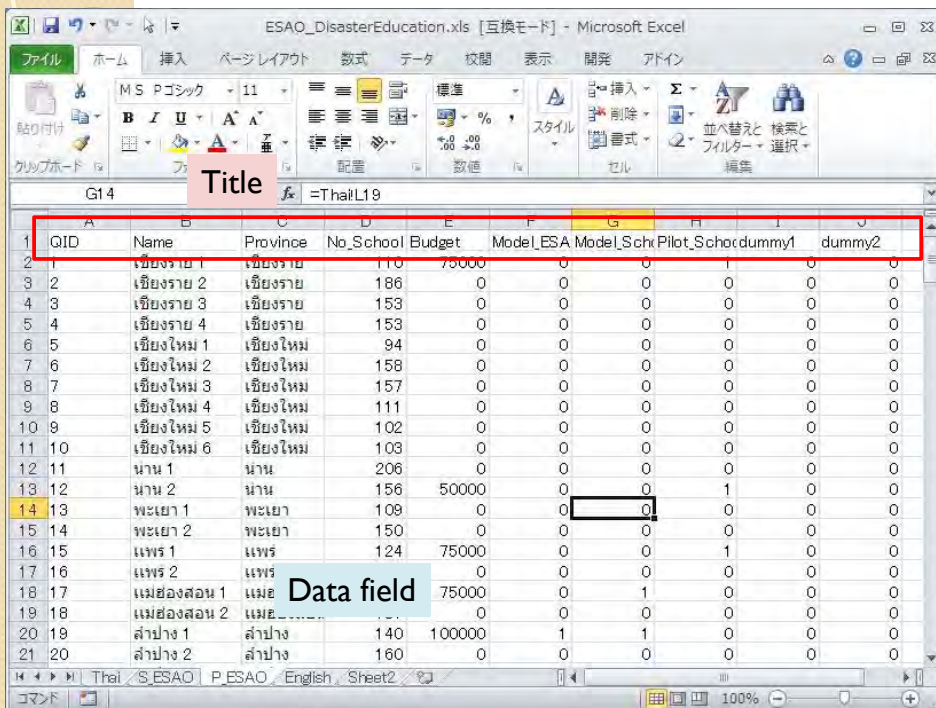
Right click and select "Open Attribute Table"

There are only ID numbers in the attribute table which are linked to the each feature of the map.

It is necessary to import ESASO data from Excel file.

### 3. Making Inventory Maps

#### 3.1.2 Import PESAO and SESAO data from Excxel file



QID	Name	Province	No_School	Budget	Model_ESA	Model_SchPilot	dummy1	dummy2
1	เชียงใหม่ 1	เชียงใหม่	110	75000	0	0	0	0
2	เชียงใหม่ 2	เชียงใหม่	186	0	0	0	0	0
3	เชียงใหม่ 3	เชียงใหม่	153	0	0	0	0	0
4	เชียงใหม่ 4	เชียงใหม่	153	0	0	0	0	0
5	เชียงใหม่ 1	เชียงใหม่	94	0	0	0	0	0
6	เชียงใหม่ 2	เชียงใหม่	158	0	0	0	0	0
7	เชียงใหม่ 3	เชียงใหม่	157	0	0	0	0	0
8	เชียงใหม่ 4	เชียงใหม่	111	0	0	0	0	0
9	เชียงใหม่ 5	เชียงใหม่	102	0	0	0	0	0
10	เชียงใหม่ 6	เชียงใหม่	103	0	0	0	0	0
11	น่าน 1	น่าน	206	0	0	0	0	0
12	น่าน 2	น่าน	156	50000	0	0	1	0
13	พะเยา 1	พะเยา	109	0	0	0	0	0
14	พะเยา 2	พะเยา	150	0	0	0	0	0
15	แพร่ 1	แพร่	124	75000	0	0	1	0
16	แพร่ 2	แพร่	0	0	0	0	0	0
17	แม่ฮ่องสอน 1	แม่ฮ่องสอน	75000	0	0	1	0	0
18	แม่ฮ่องสอน 2	แม่ฮ่องสอน	0	0	0	0	0	0
19	ลำปาง 1	ลำปาง	140	100000	1	1	0	0
20	ลำปาง 2	ลำปาง	160	0	0	0	0	0

Open "ESAO\_DisasterEducation.xls".

Table to import into GIS must be simple table like this figure.

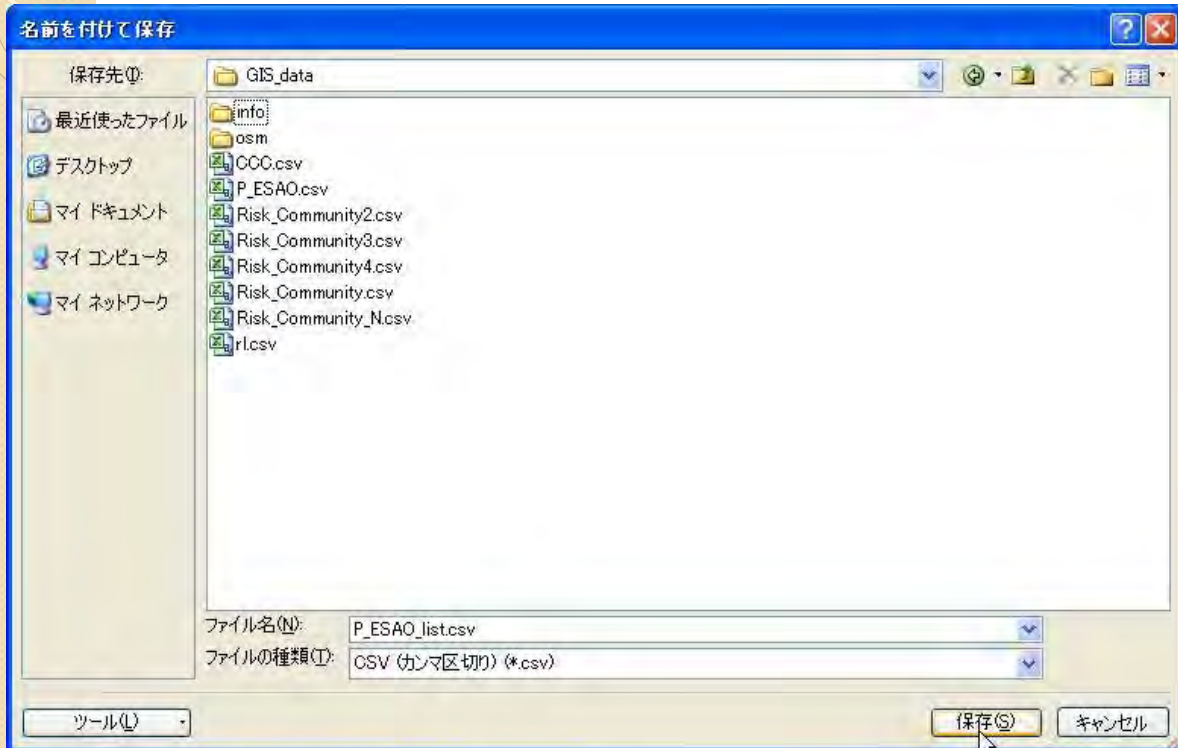
The first row is title of the attribute column. Write only alphabet and "\_". Do not use " " (space), "-", ",", "..."

Data field is below. Do not use " ".

### 3. Making Inventory Maps

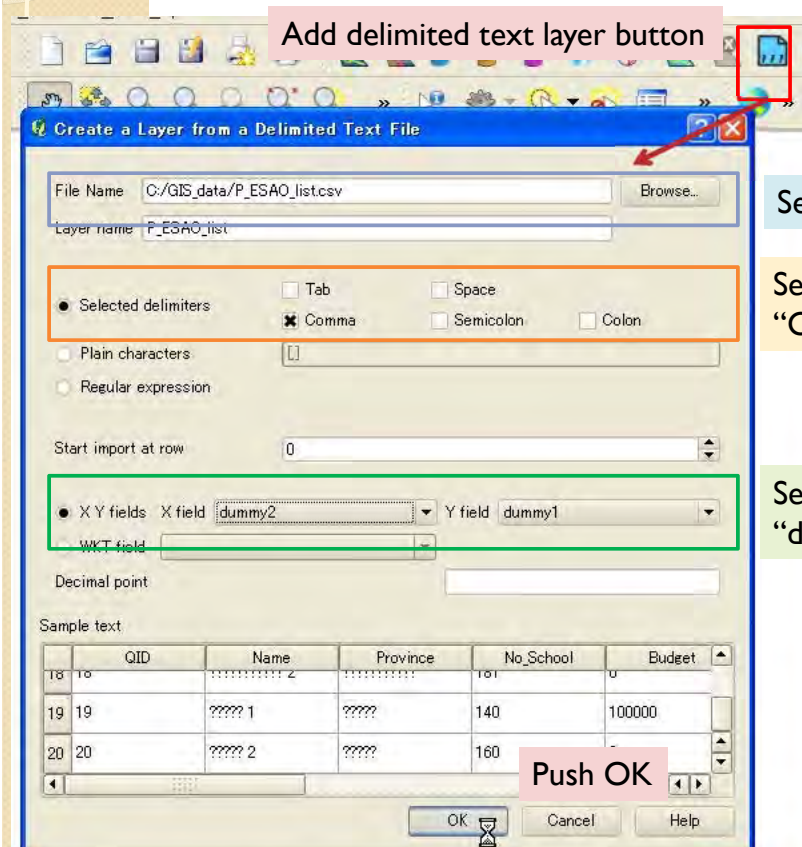
#### 3.1.2 Import PESAO and SESAO data from Excel file

Save “P\_ESAO” and “S\_ESAO” sheet as “P\_ESAO\_list.csv” and “S\_ESAO\_list.csv”. Please use file format as “CSV (comma delimited)”.



### 3. Making Inventory Maps

#### 3.1.2 Import PESAO and SESAO data from Excel file



Load the saved csv file by “Add delimited text layer” button.

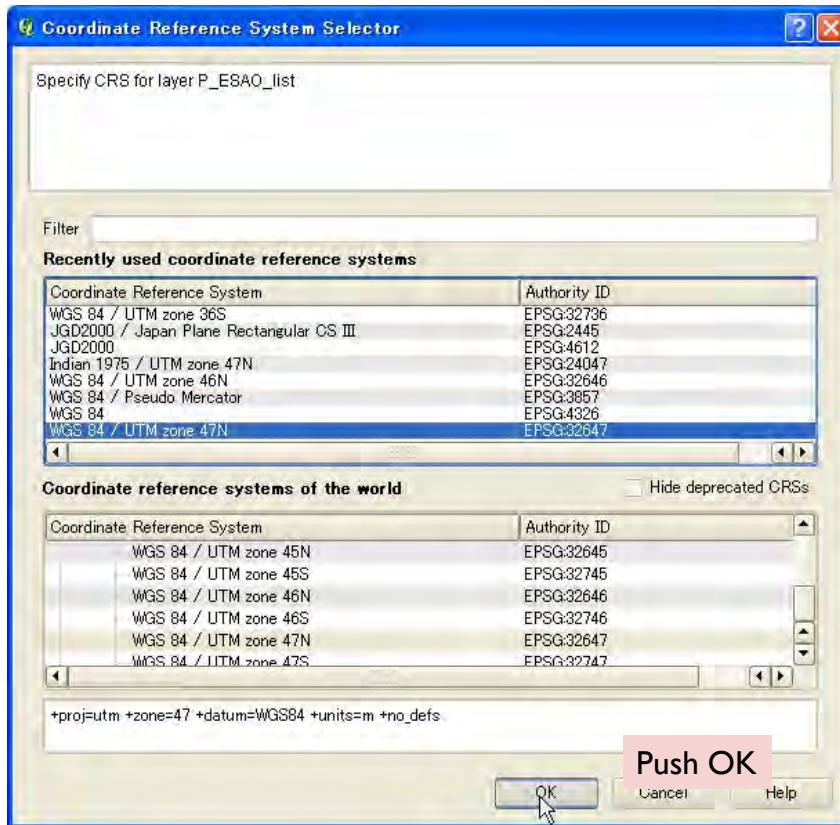
Select file

Select “Selected delimiters” and “Comma” only.

Select “XY fields” and “dummy1” and “dummy2”.

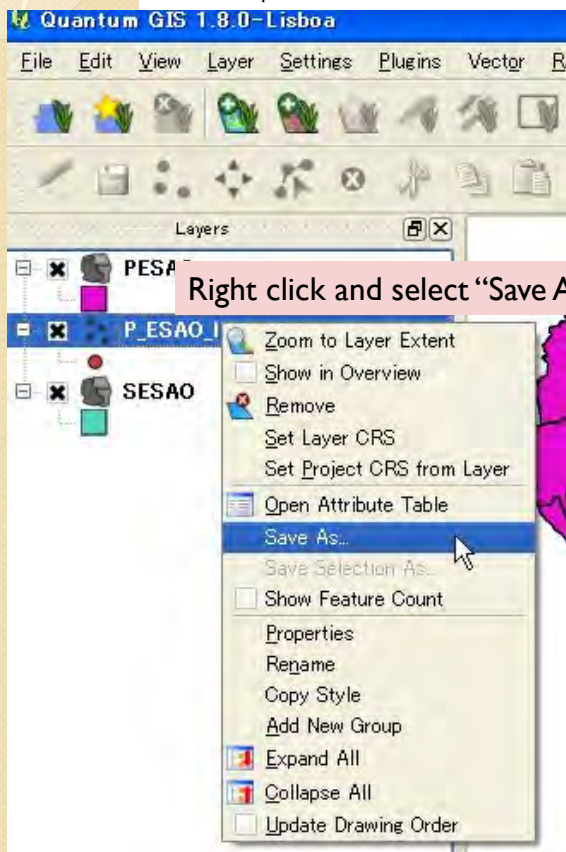
### 3. Making Inventory Maps

#### 3.1.2 Import PESAO and SESAO data from Excel file



### 3. Making Inventory Maps

#### 3.1.2 Import PESAO and SESAO data from Excel file

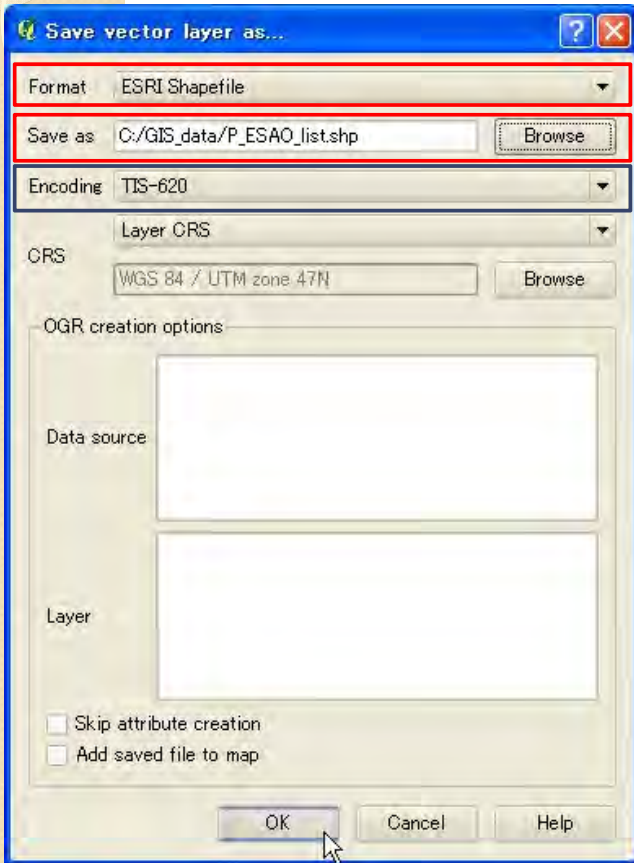


Then, the data will imported.

This is temporary layer, thus save this layer as new file.

### 3. Making Inventory Maps

#### 3.1.2 Import PESAO and SESAO data from Excel file



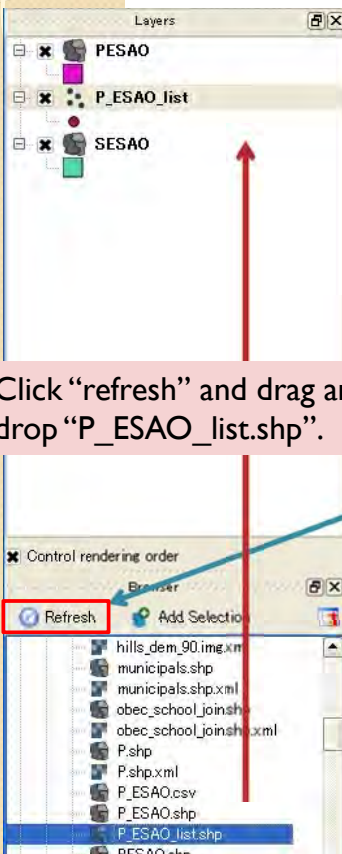
Select format and file name.

Select "Encoding" as "TIS-620".

Push OK

### 3. Making Inventory Maps

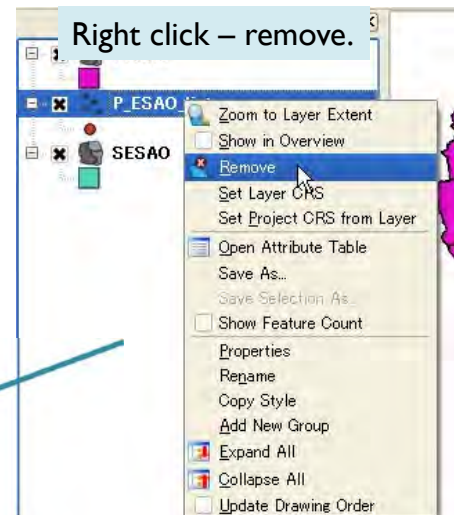
#### 3.1.2 Import PESAO and SESAO data from Excel file



Click "refresh" and drag and drop "P\_ESAO\_list.shp".

Remove the temporary layer.

Click "Refresh" button of "Browser" field, and drag and drop "P\_ESAO\_list.shp" into "Layer" field.



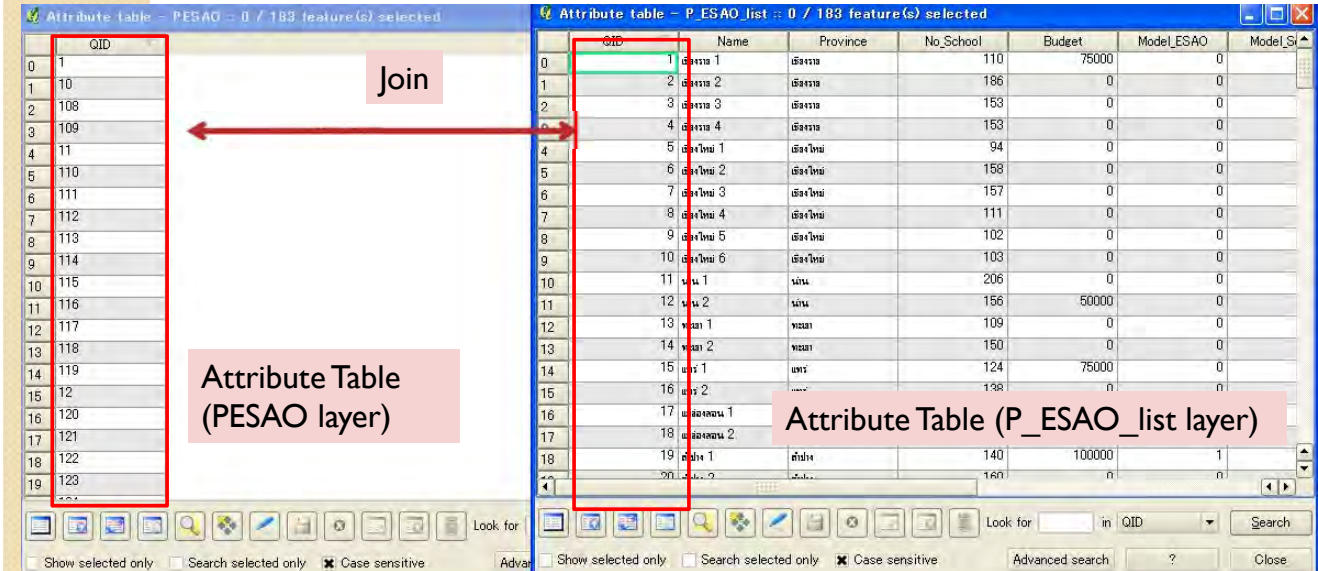
Right click – remove.



### 3. Making Inventory Maps

#### 3.1.3 Join attribute table

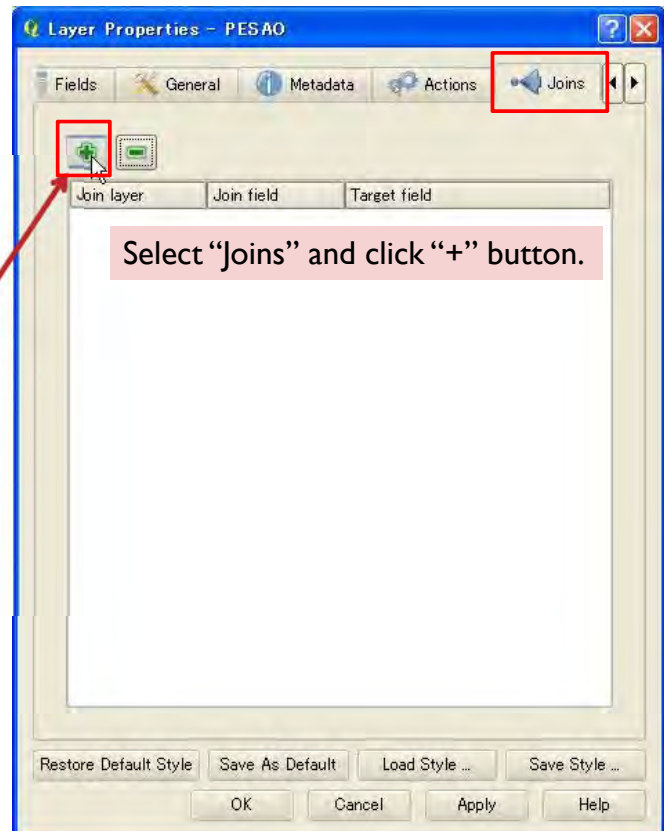
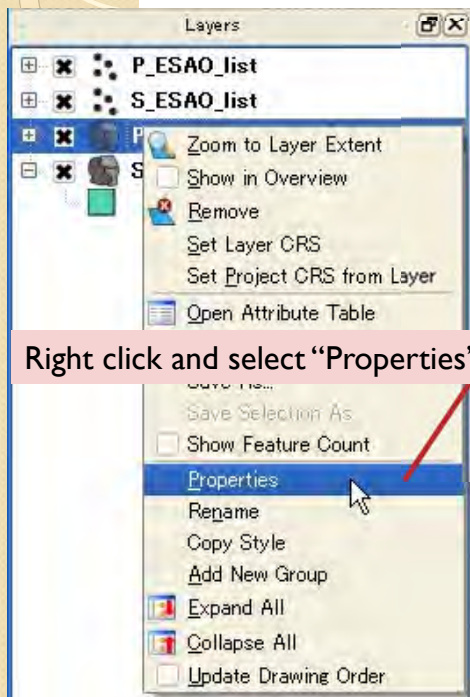
In next step, attribute table of “P\_ESAO\_list” and “S\_ESAO\_list” will be joined into “PESAO” and “SESAO” layers.



### 3. Making Inventory Maps

#### 3.1.3 Join attribute table

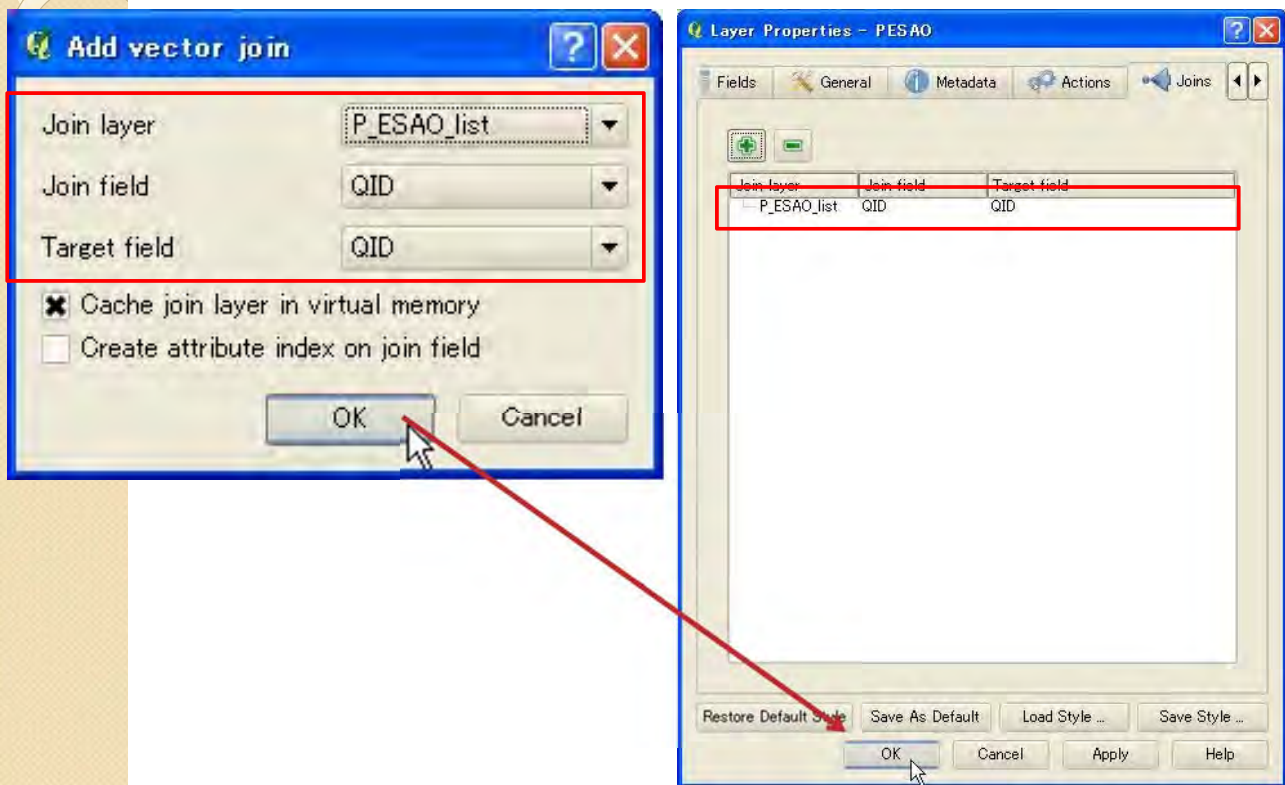
Open “Properties” window and select “Join” tab.



### 3. Making Inventory Maps

#### 3.1.3 Join attribute table

Select “Join layer”, “Join field” and “Target field”.



### 3. Making Inventory Maps

#### 3.1.3 Join attribute table

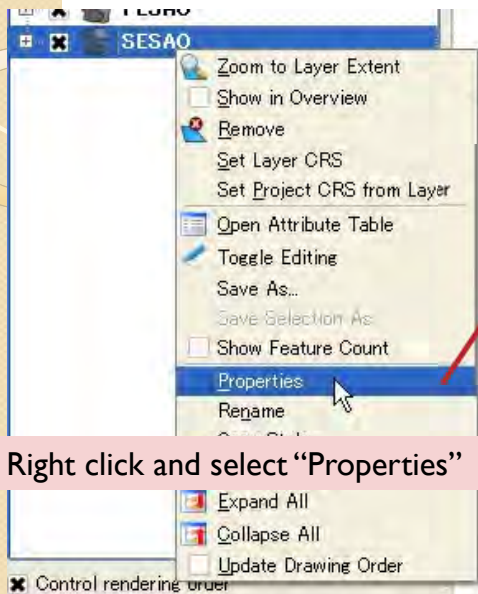
Then, attribute table should be joined.

The image shows the "Attribute table - PESAO" window with 19 rows of data. The 'QID' column is highlighted in green. The table has the following columns: QID, Name, Province, No\_School, Budget, Model\_ESAO, and Model\_Si.

	QID	Name	Province	No_School	Budget	Model_ESAO	Model_Si
0	1	เชียงใหม่ 1	เชียงใหม่	110	75000	0	0
1	10	เชียงใหม่ 6	เชียงใหม่	103	0	0	0
2	108	กรุงเทพมหานคร	กรุงเทพมหานคร	37	0	0	0
3	109	กำแพงเพชร 1	กำแพงเพชร	207	50000	0	0
4	11	น่าน 1	น่าน	206	0	0	0
5	110	กำแพงเพชร 2	กำแพงเพชร	191	0	0	0
6	111	ธัญบุรี	ธัญบุรี	184	0	0	0
7	112	น่านนอก	น่านนอก	137	0	0	0
8	113	น่านปทุม 1	น่านปทุม	129	0	0	0
9	114	น่านปทุม 2	น่านปทุม	123	100000	0	0
10	115	น่านสวรรค 1	น่านสวรรค	172	0	0	0
11	116	น่านสวรรค 2	น่านสวรรค	152	0	0	0
12	117	น่านสวรรค 3	น่านสวรรค	207	0	0	0
13	118	น่านบุรี 1	น่านบุรี	32	0	0	0
14	119	น่านบุรี 2	น่านบุรี	64	0	0	0
15	12	น่าน 2	น่าน	156	50000	0	0
16	120	ปทุมธานี 1	ปทุมธานี	103	0	0	0
17	121	ปทุมธานี 2	ปทุมธานี	67	0	0	0
18	122	พระนครศรีอยุธยา 1	พระนครศรีอยุธยา	192	0	0	0
19	123	พระนครศรีอยุธยา 2	พระนครศรีอยุธยา	166	0	0	0

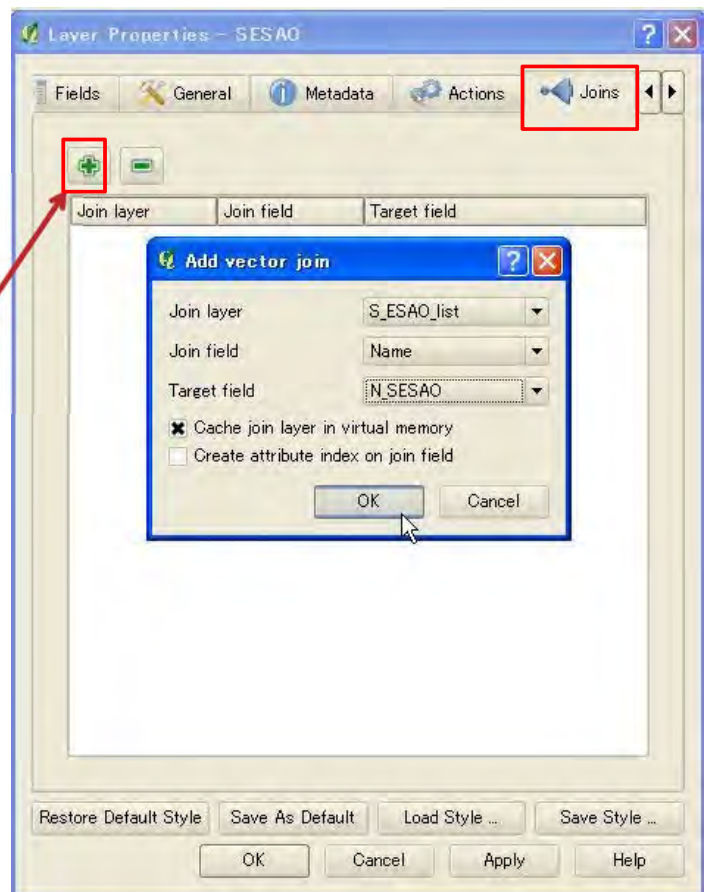
### 3. Making Inventory Maps

#### 3.1.3 Join attribute table



Right click and select "Properties"

Join "SESAO" and "S\_ESAO\_list" also.

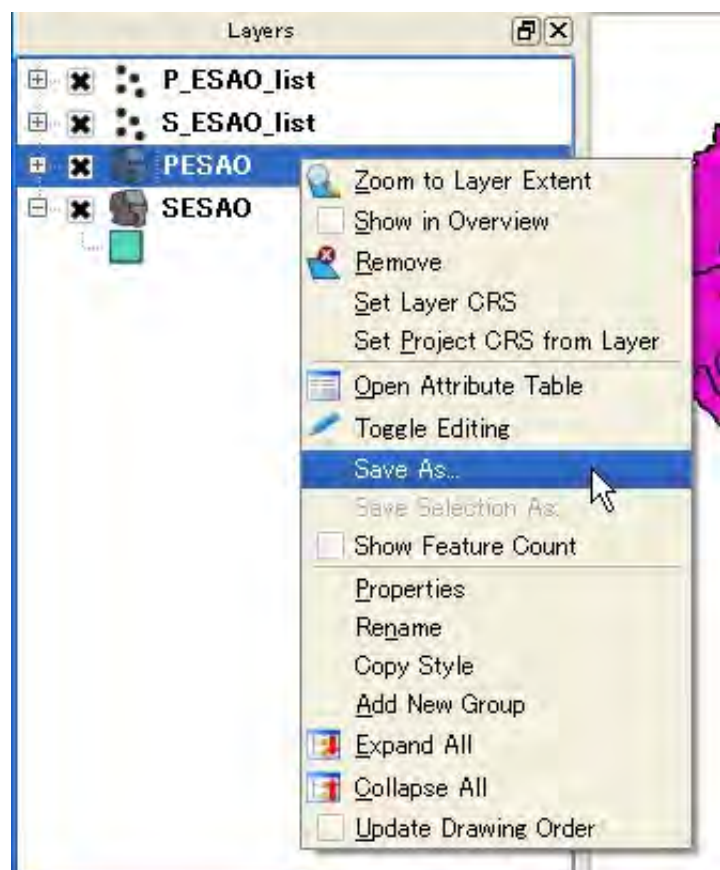


### 3. Making Inventory Maps

#### 3.1.3 Join attribute table

The joined attribute table is re-separable.

To make the joined attribute table permanent, save the "PESAO" and "SESAO" as new file.

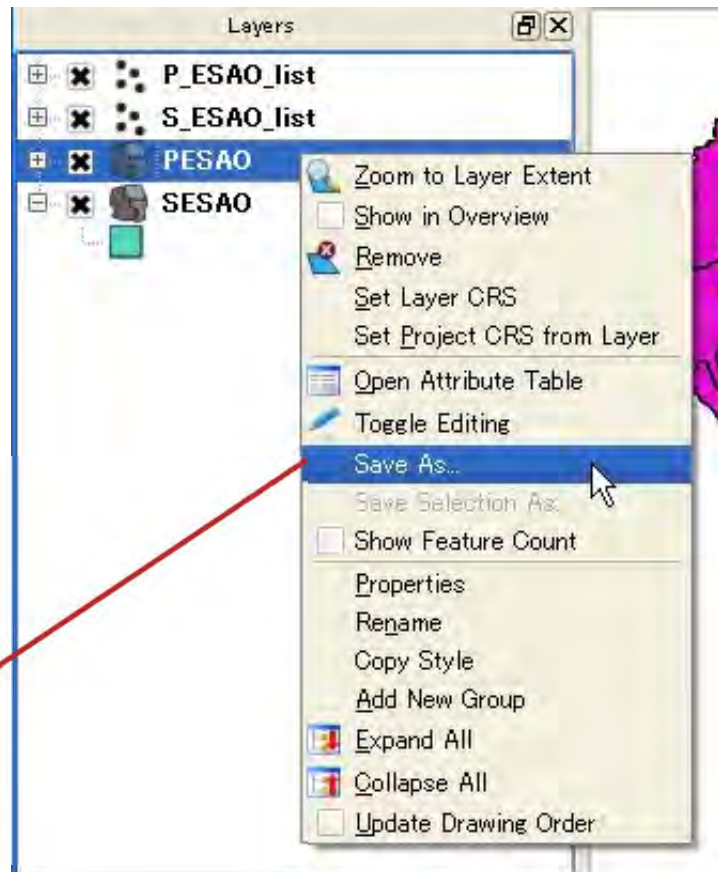
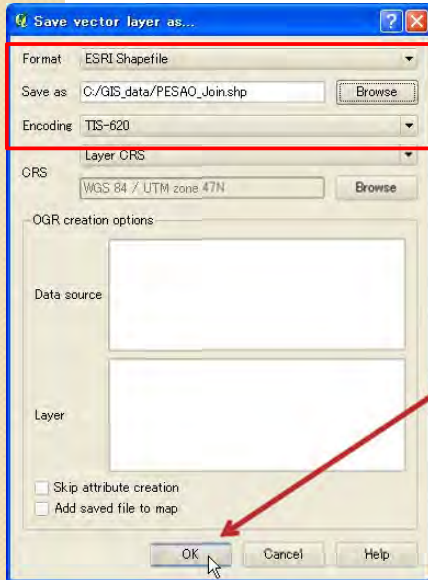


### 3. Making Inventory Maps

#### 3.1.3 Join attribute table

The joined attribute table is re-separable.

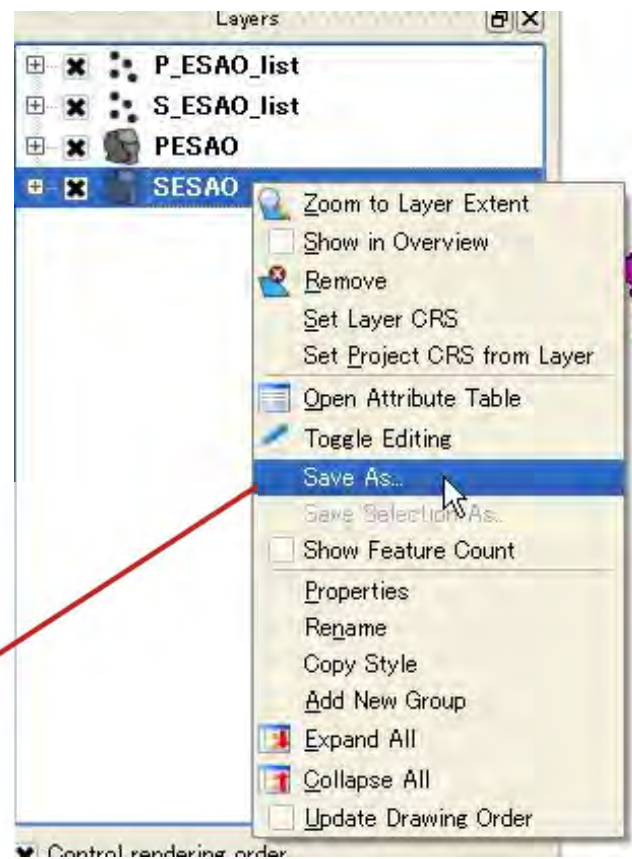
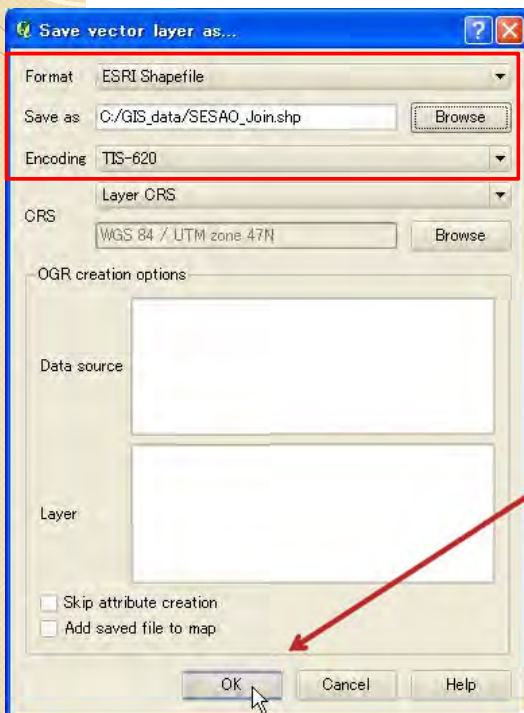
To make the joined attribute table permanent, save the "PESAO" as "PESAO\_Join.shp".



### 3. Making Inventory Maps

#### 3.1.3 Join attribute table

Save the "SESAO" as "SESAO\_Join.shp".



### 3. Making Inventory Maps

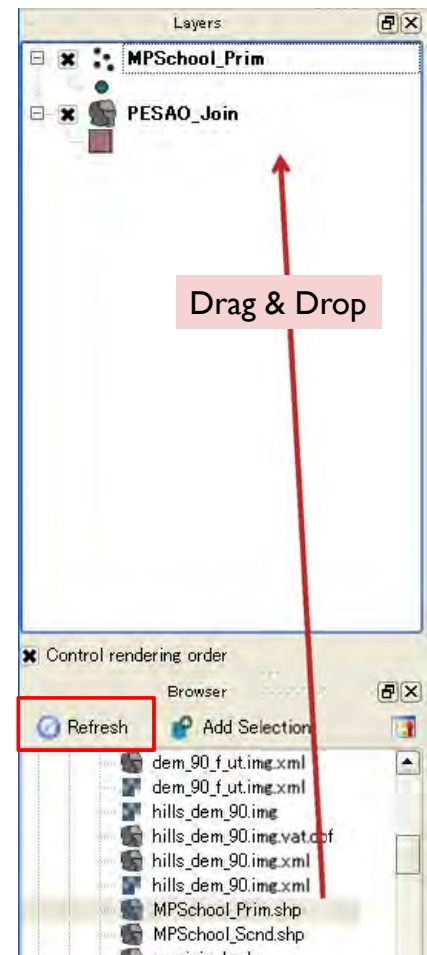
#### 3.2 Making PESAO map

##### 3.2.1 Import data

Click “Refresh”, and drag and drop “PESAO\_Join” and “MPSchool\_Prim” (pilot school data).

After you made joined shape files, “PESAO\_Join” and “SES AO\_Join”, once, it is not necessary to remake these shape file. You can use these file directly to make inventory maps.

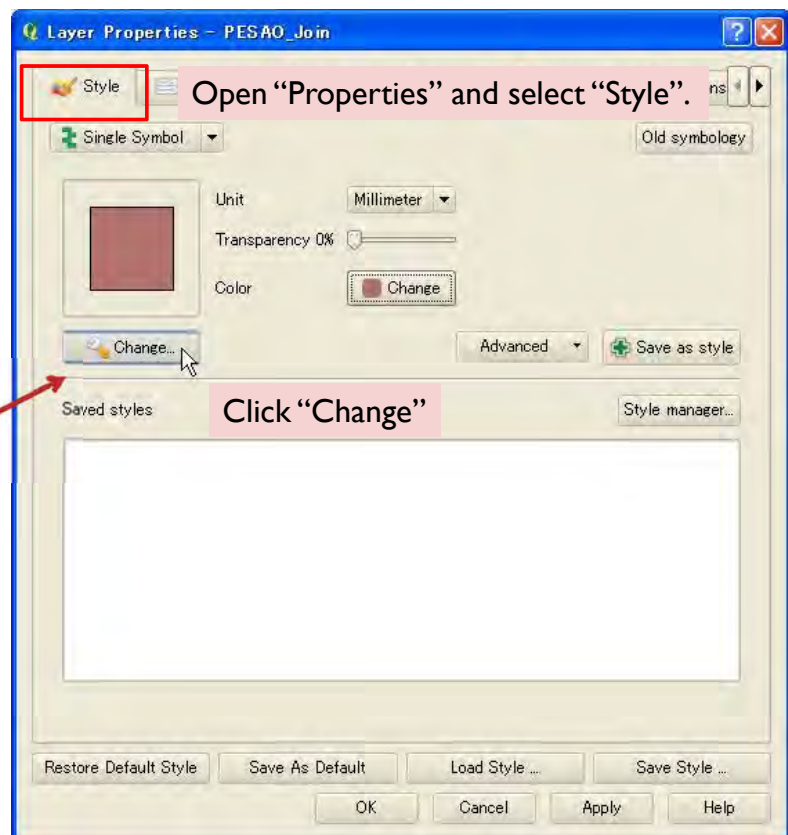
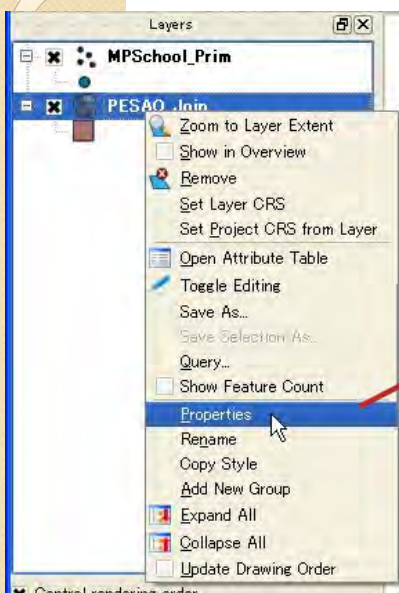
In case you want to update the data, it is required to remake or edit these files.



### 3. Making Inventory Maps

#### 3.2.2 Color setting

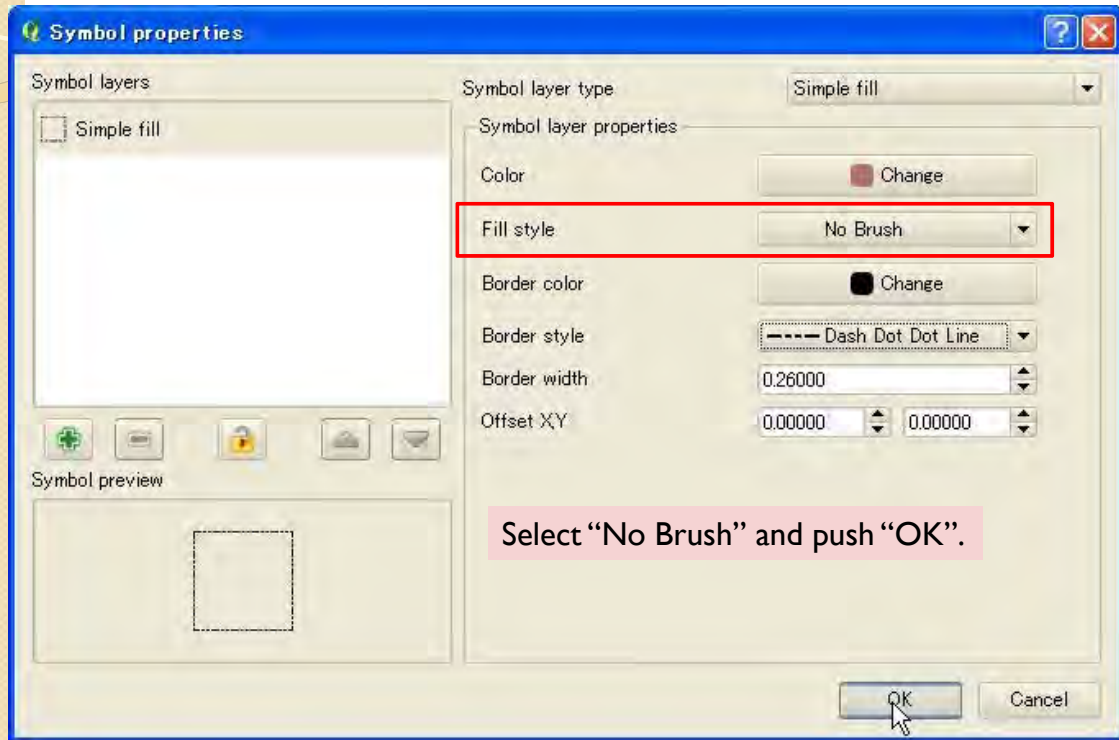
##### Boundary of PESAO



### 3. Making Inventory Maps

#### 3.2.2 Color setting

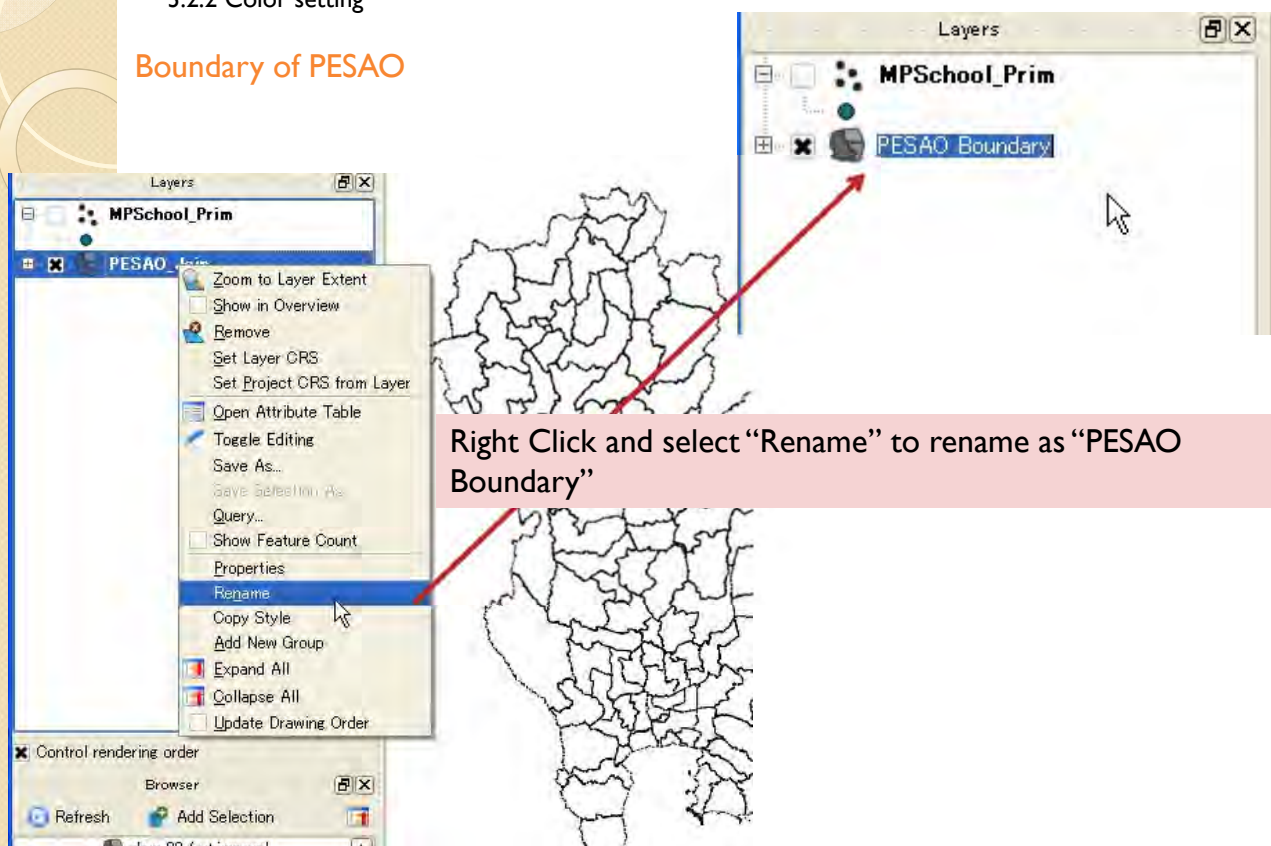
#### Boundary of PESAO



### 3. Making Inventory Maps

#### 3.2.2 Color setting

#### Boundary of PESAO



### 3. Making Inventory Maps

#### 3.2.2 Color setting

#### Model PESAO

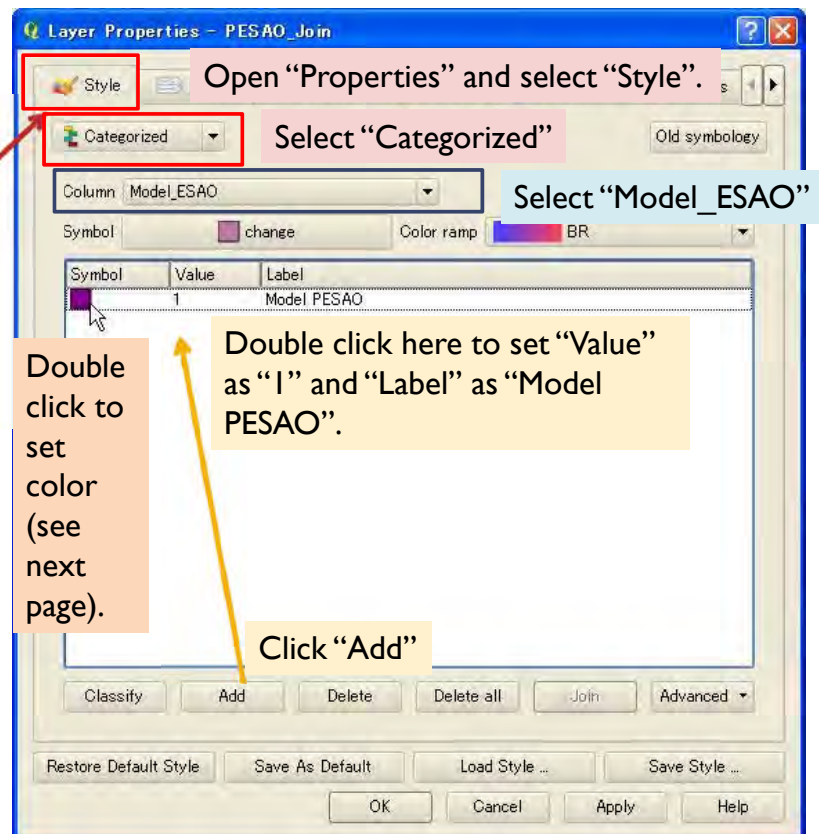
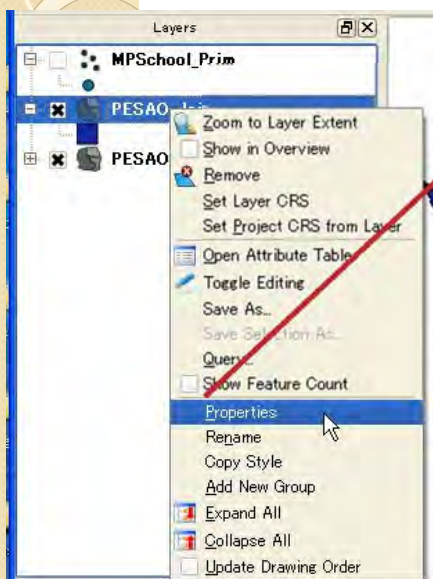
Drag and drop "PESAO\_Join" again.



### 3. Making Inventory Maps

#### 3.2.2 Color setting

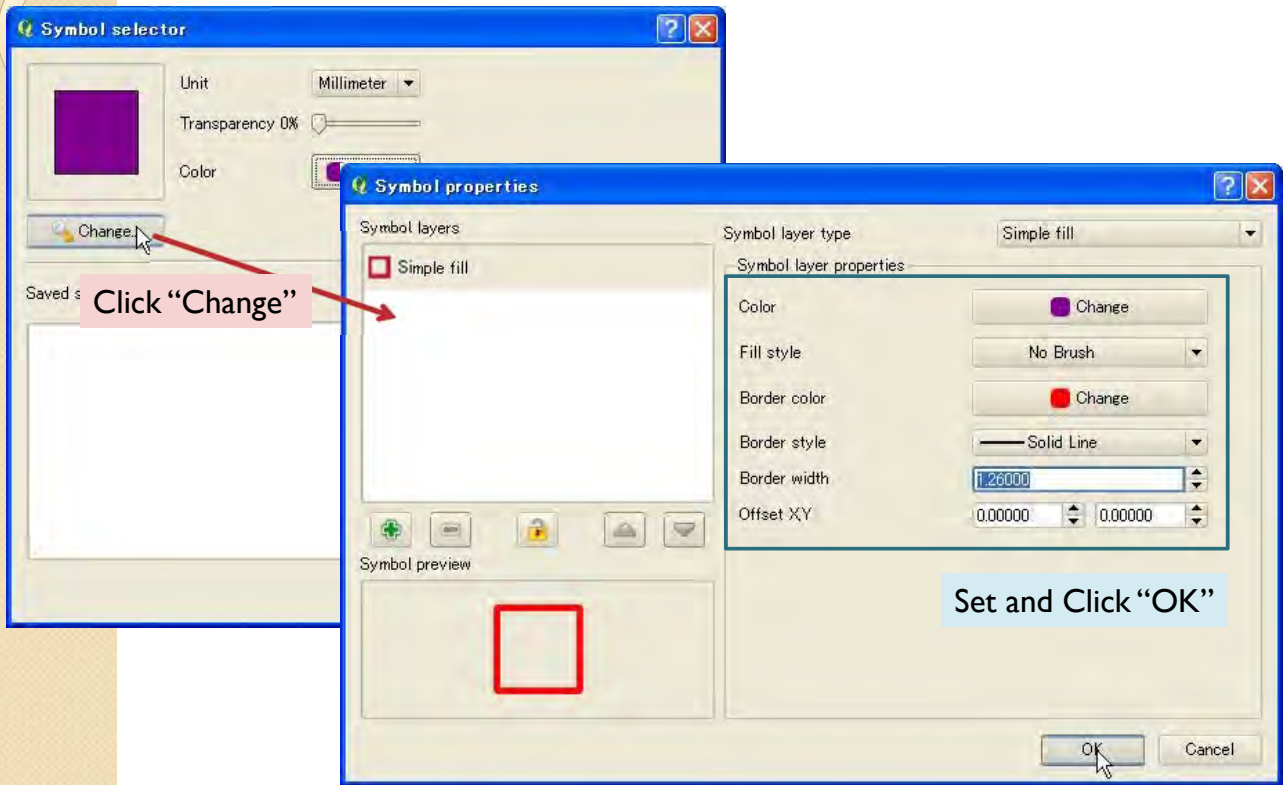
#### Model PESAO



### 3. Making Inventory Maps

#### 3.2.2 Color setting

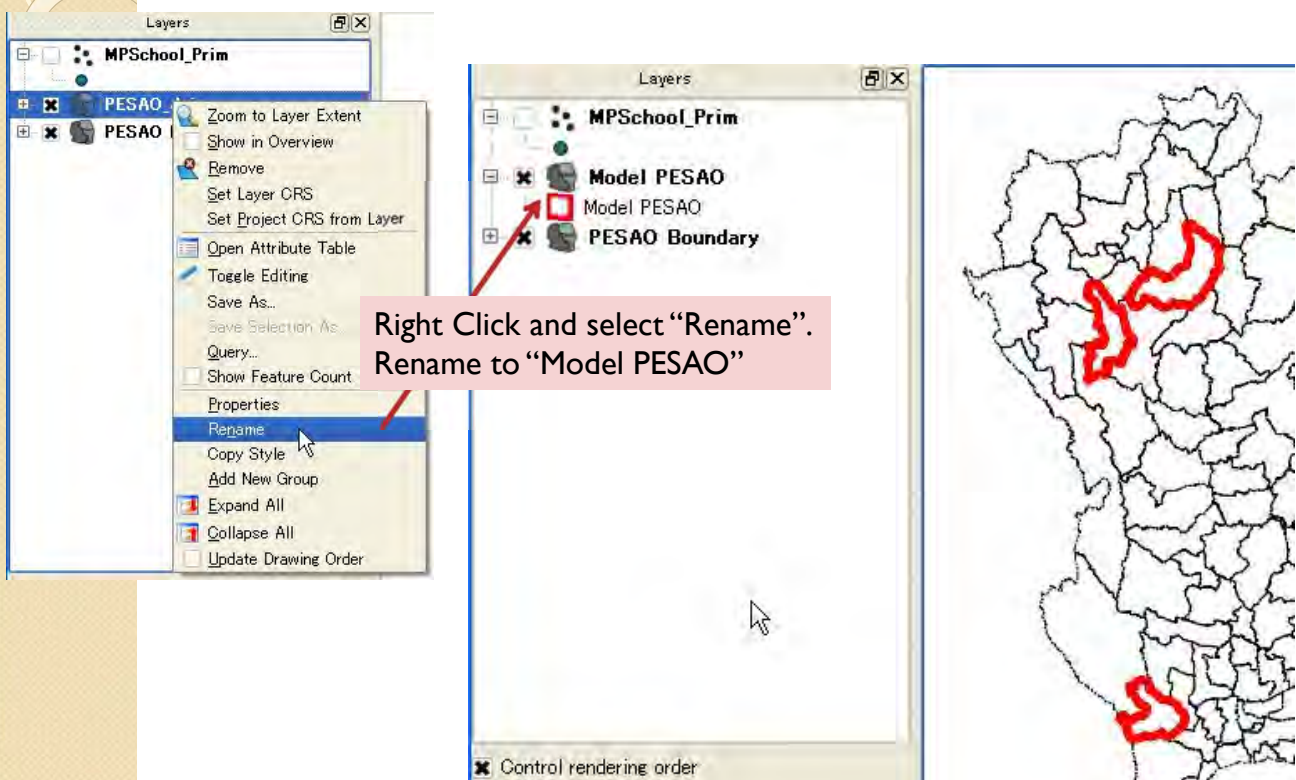
#### Model PESAO



### 3. Making Inventory Maps

#### 3.2.2 Color setting

#### Model PESAO

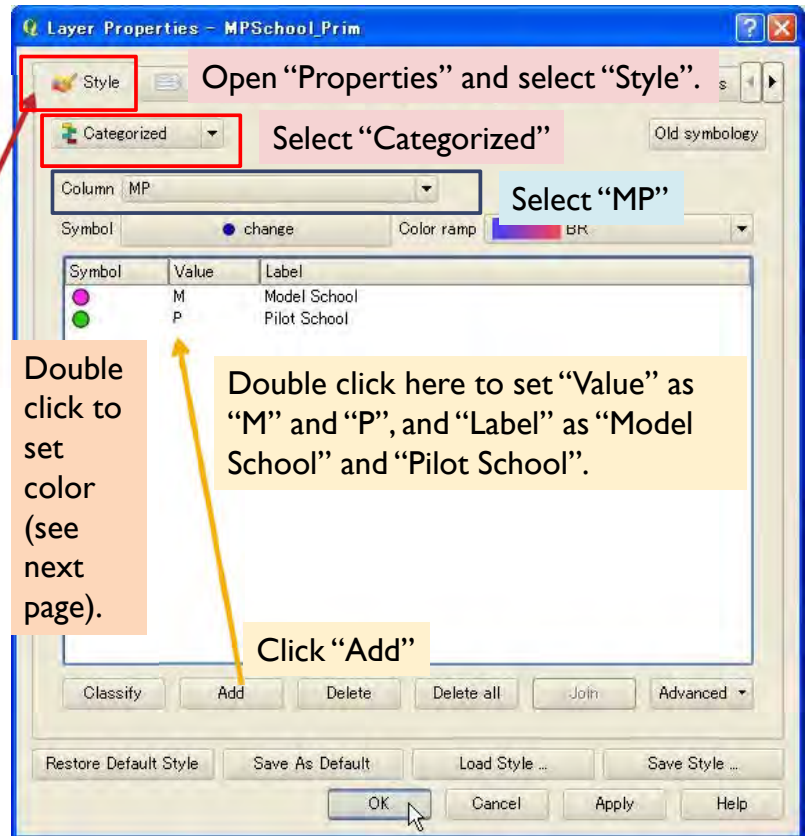
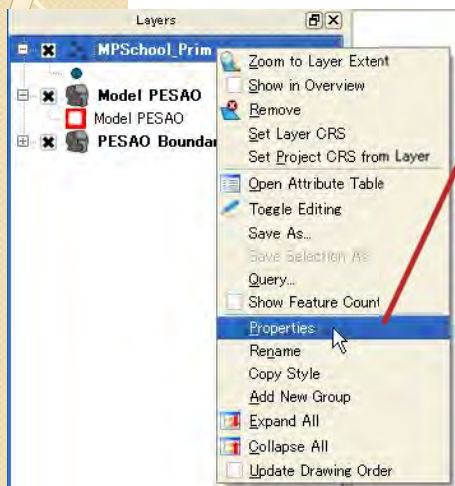




### 3. Making Inventory Maps

#### 3.2.2 Color setting

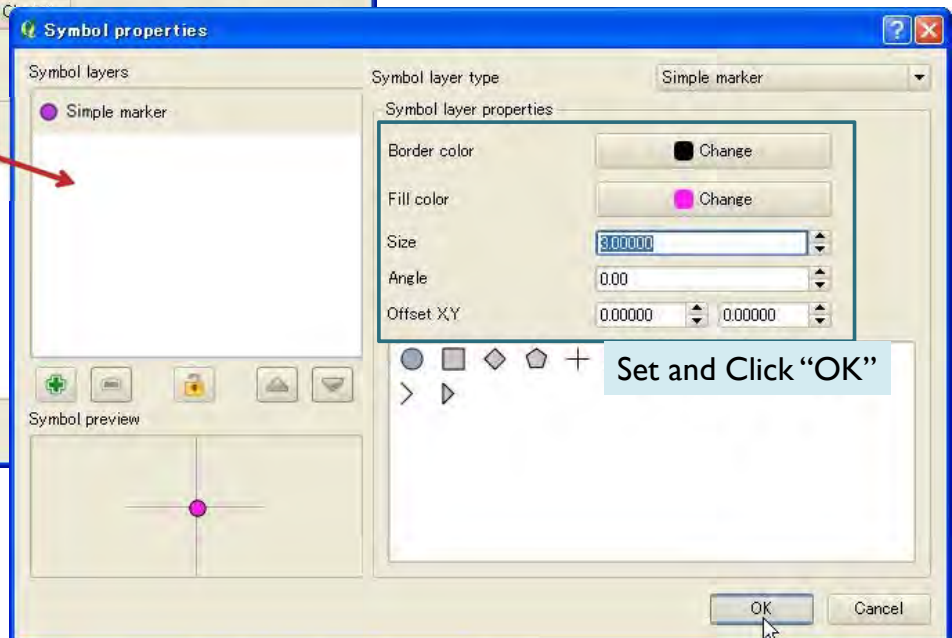
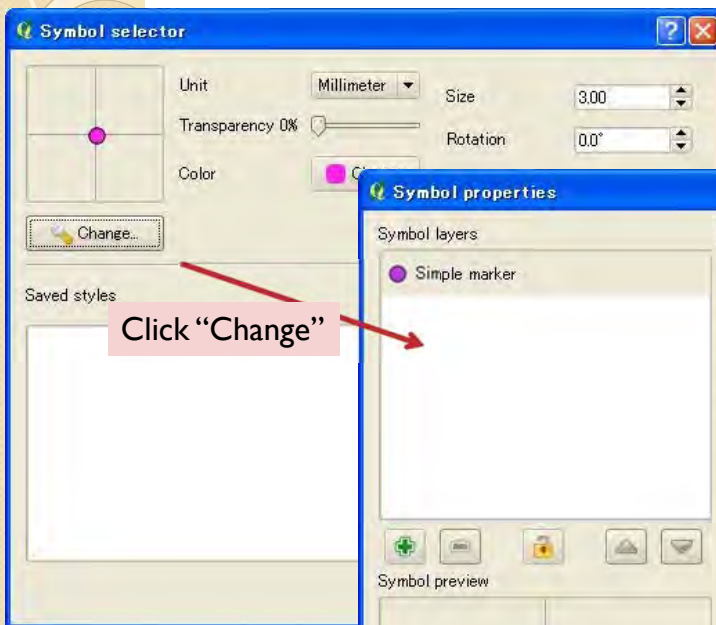
##### Model/Pilot school



### 3. Making Inventory Maps

#### 3.2.2 Color setting

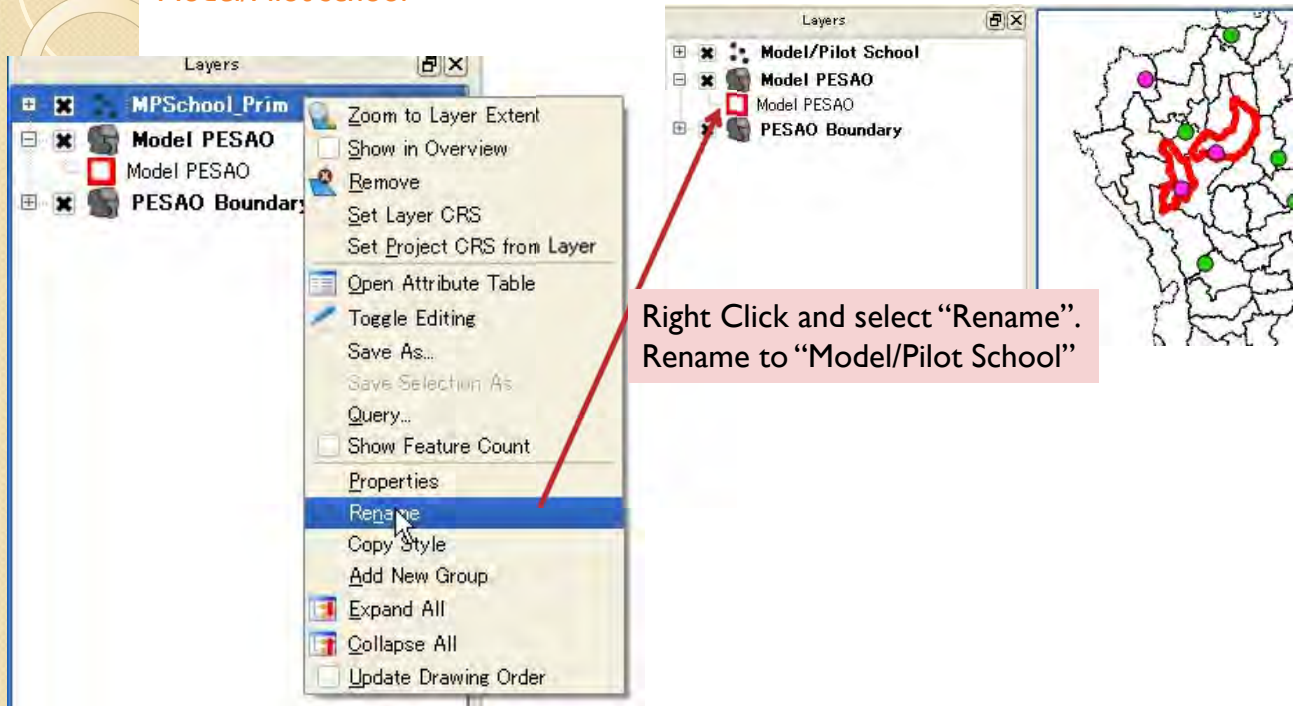
##### Model/Pilot school



### 3. Making Inventory Maps

#### 3.2.2 Color setting

#### Model/Pilot school



### 3. Making Inventory Maps

#### 3.2.2 Color setting

#### Model/Pilot school rank (budget)

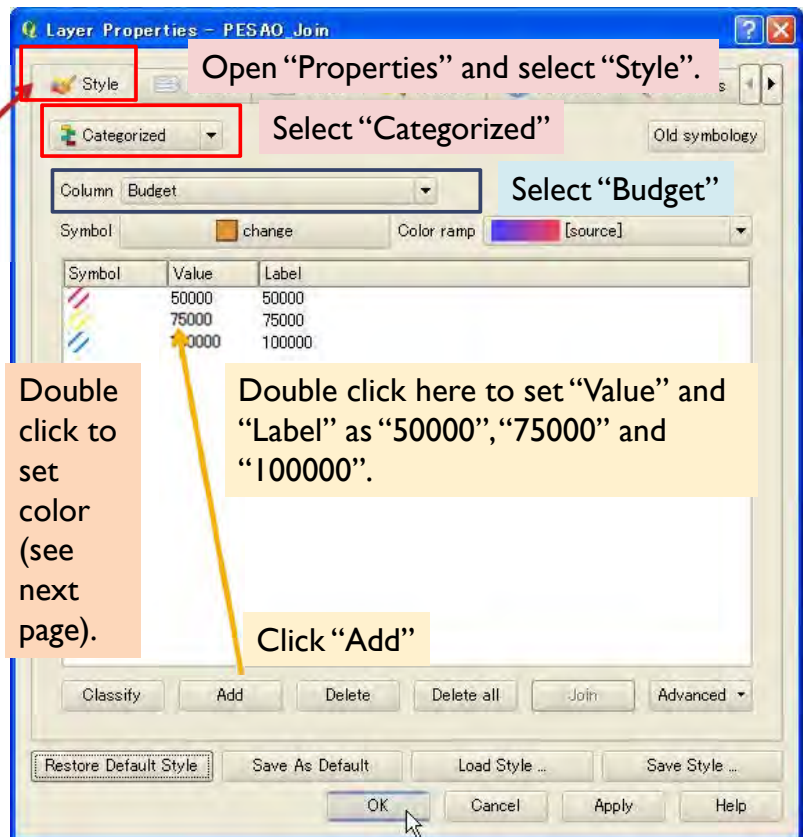
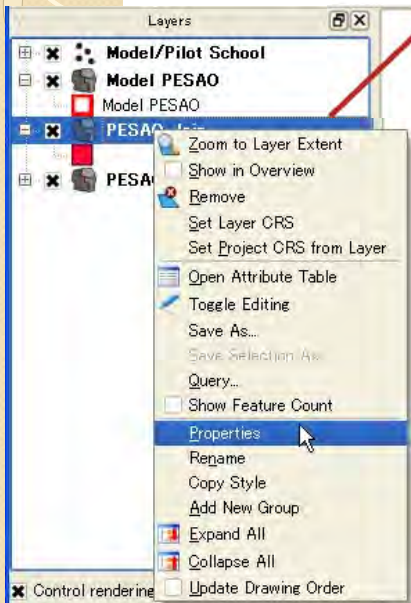
Drag and drop "PESAO\_Join"  
again.



### 3. Making Inventory Maps

#### 3.2.2 Color setting

Model/Pilot school rank  
(budget)



Open "Properties" and select "Style".

Select "Categorized"

Select "Budget"

Double click to set color (see next page).

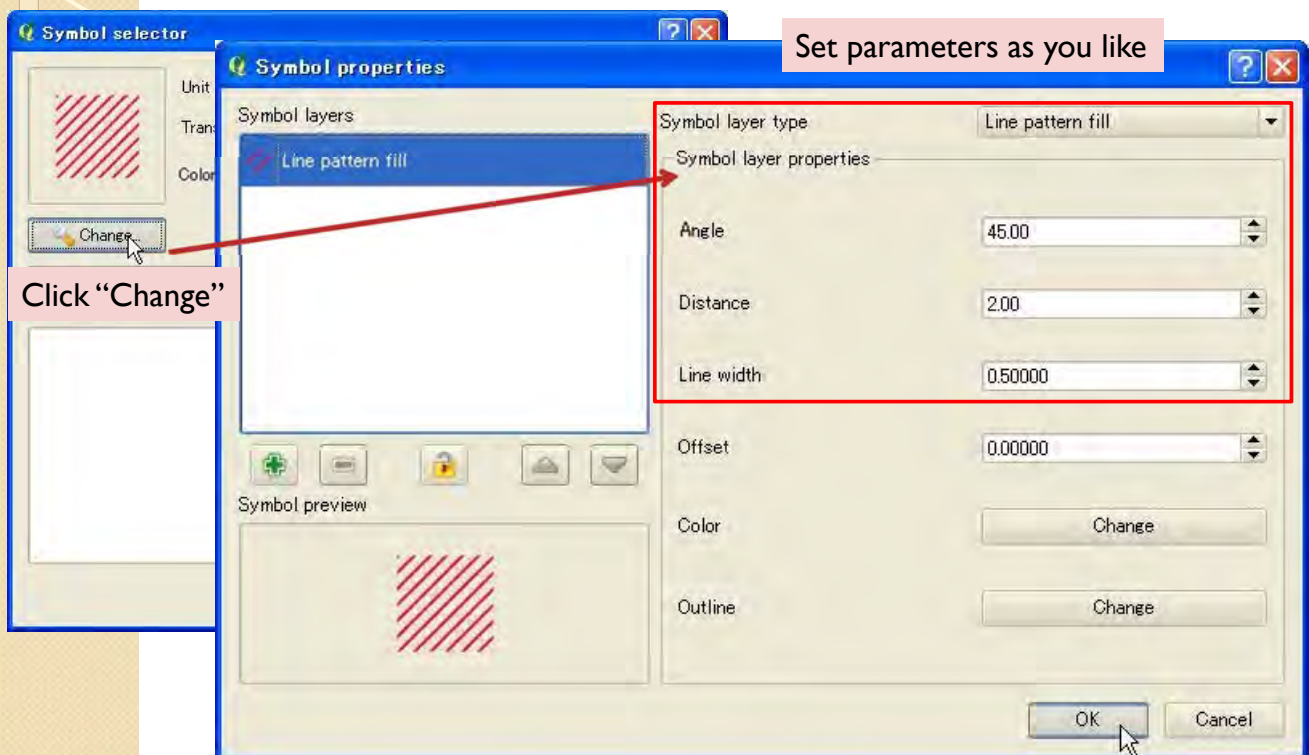
Double click here to set "Value" and "Label" as "50000", "75000" and "100000".

Click "Add"

### 3. Making Inventory Maps

#### 3.2.2 Color setting

Model/Pilot school rank  
(budget)



Set parameters as you like

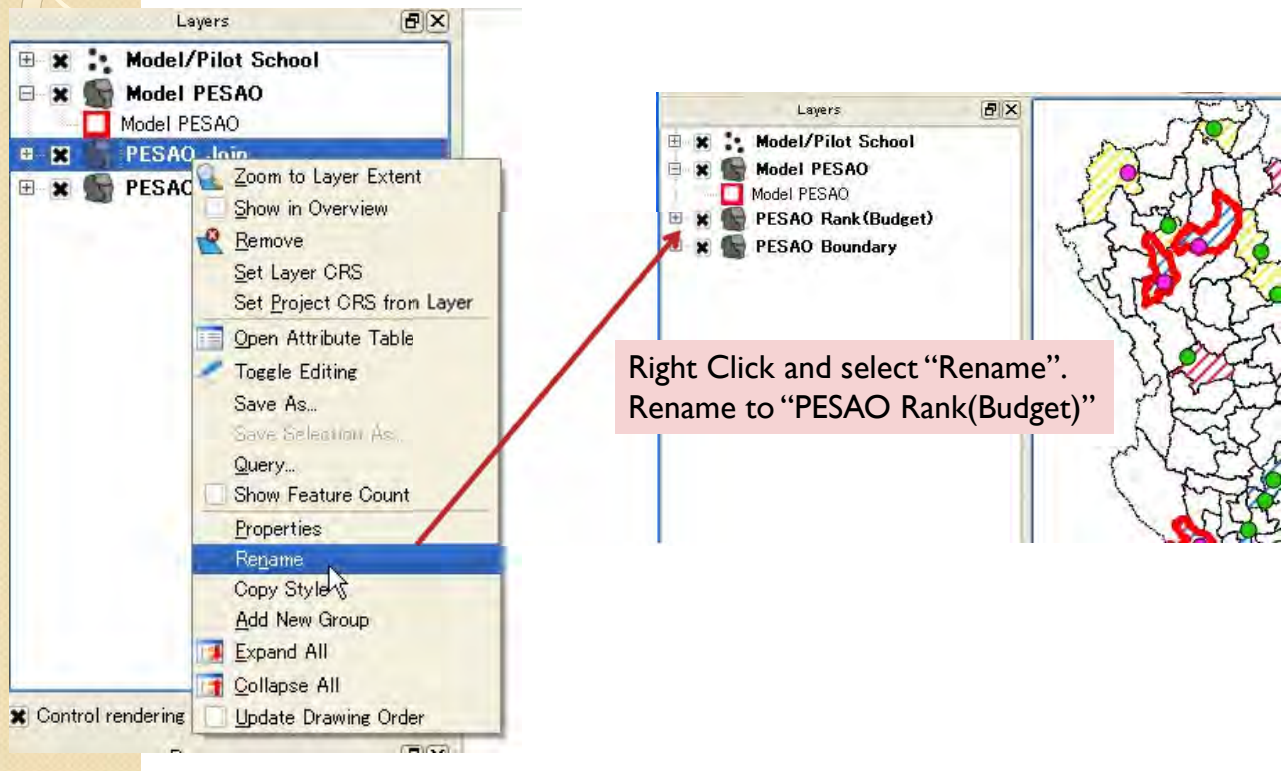
Click "Change"

OK

### 3. Making Inventory Maps

#### 3.2.2 Color setting

#### Model/Pilot school rank (budget)



### 3. Making Inventory Maps

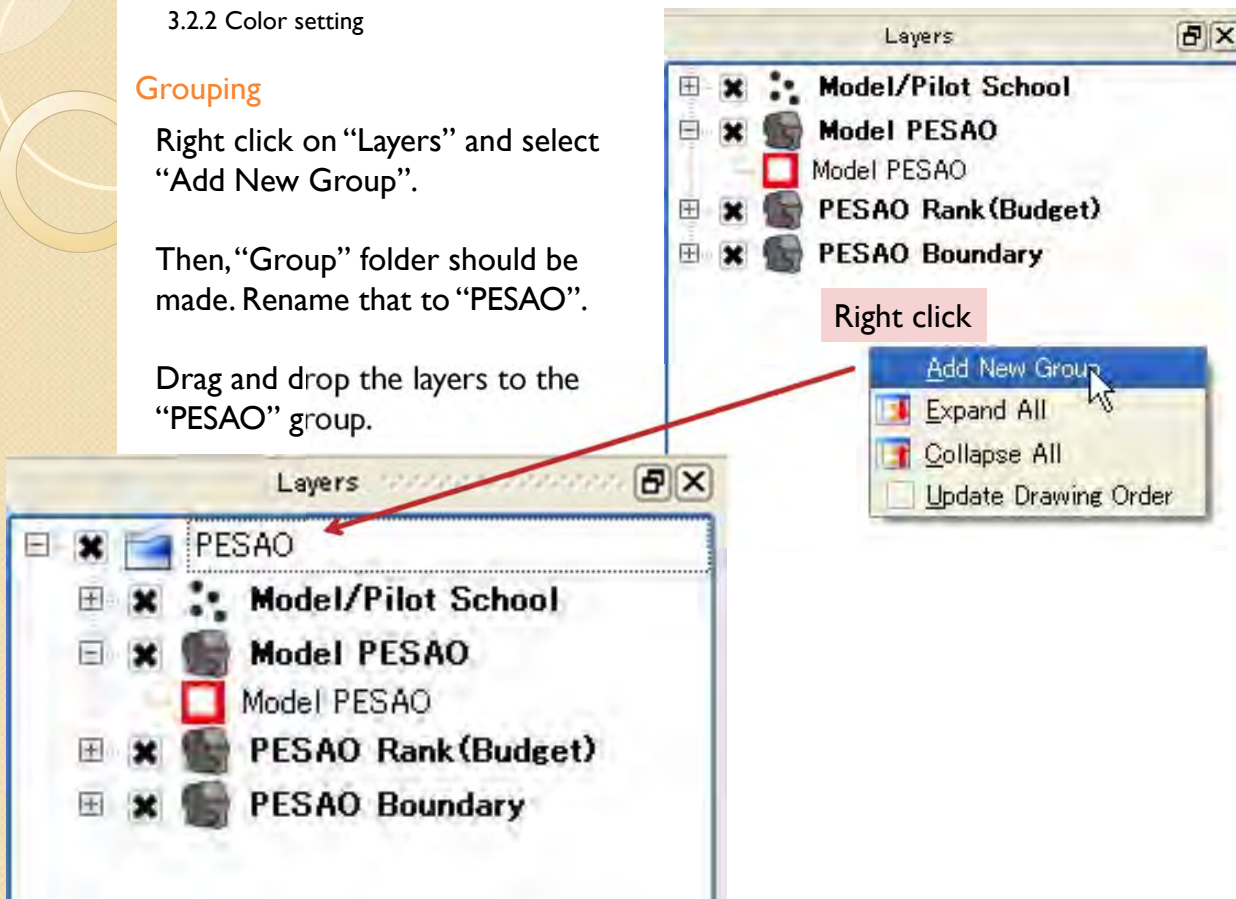
#### 3.2.2 Color setting

#### Grouping

Right click on "Layers" and select "Add New Group".

Then, "Group" folder should be made. Rename that to "PESAO".

Drag and drop the layers to the "PESAO" group.

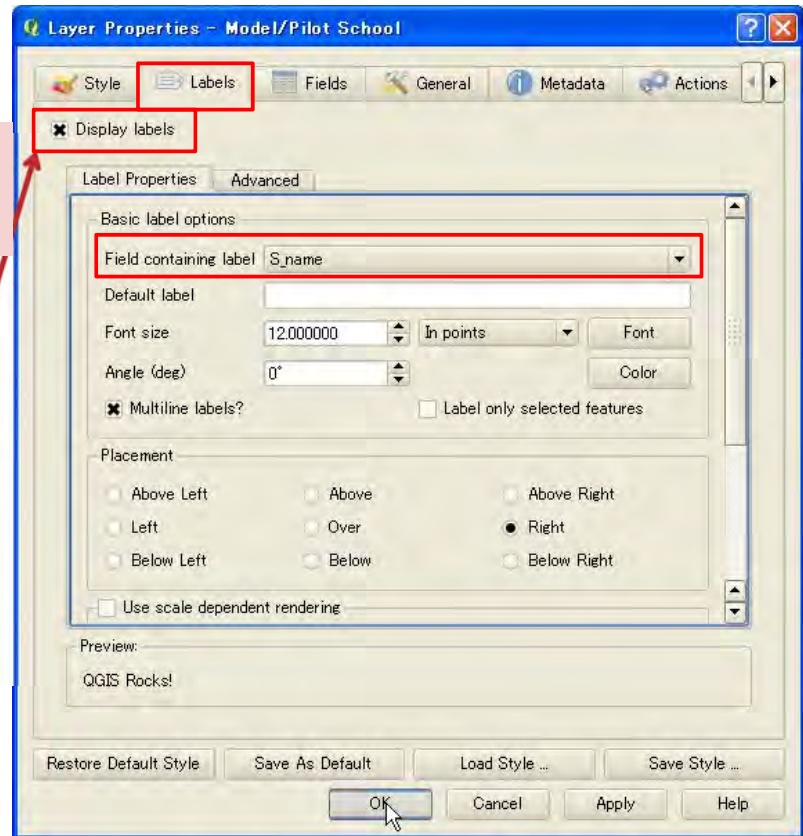
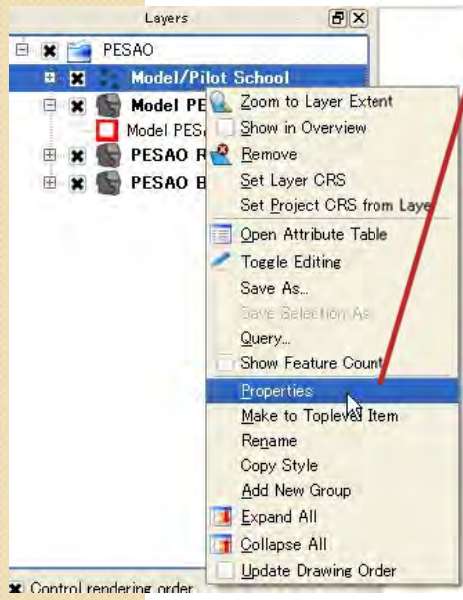


### 3. Making Inventory Maps

#### 3.2.2 Color setting

#### Labeling for schools

Open "Labels" tab in properties window. Check "Display labels" and select "Field containing label".

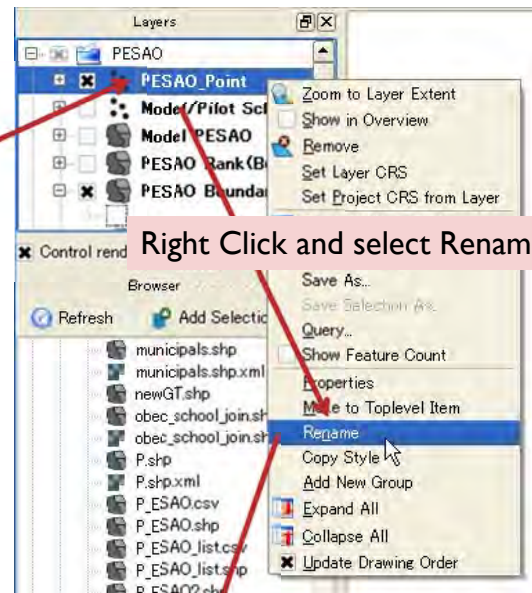
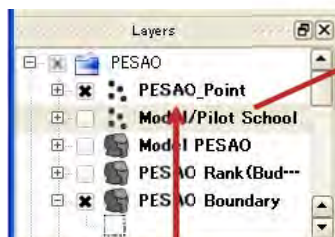


### 3. Making Inventory Maps

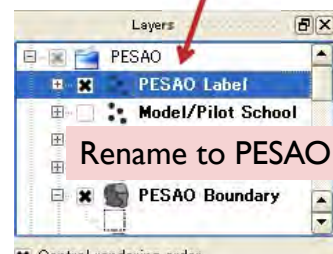
#### 3.2.2 Color setting

#### Labeling for ESAO

Drag and drop "PESAO\_Point.shp" for ESAO label



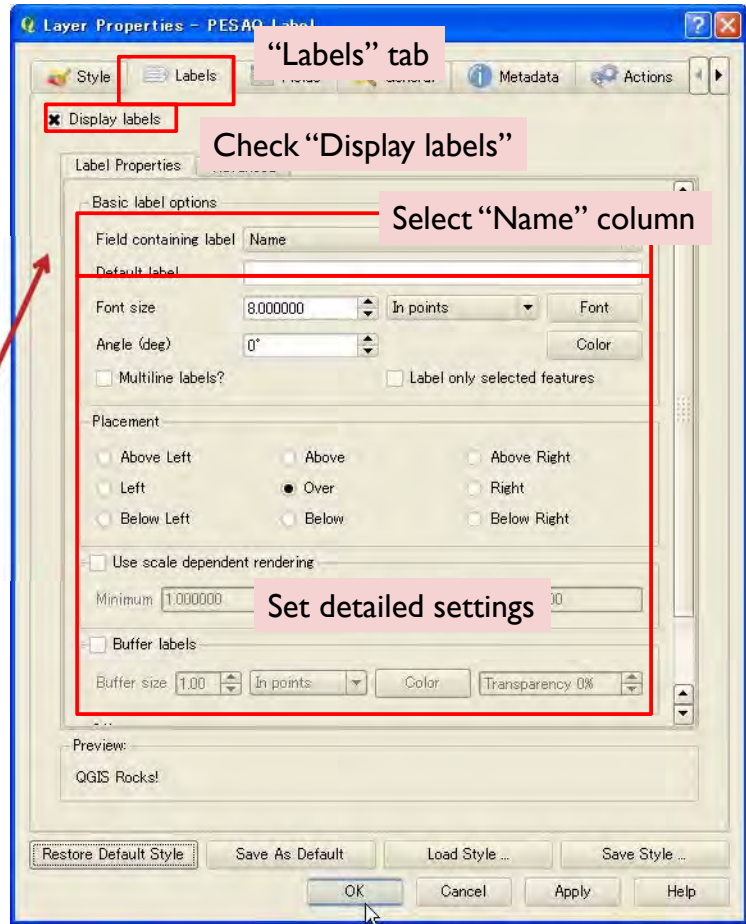
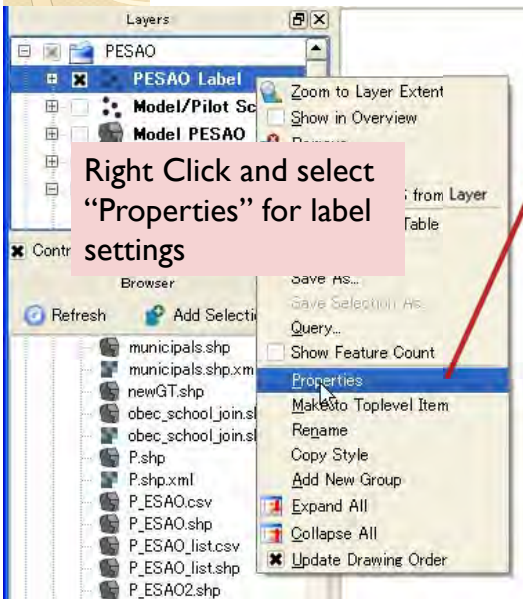
Rename to PESAO Label



### 3. Making Inventory Maps

#### 3.2.2 Color setting

#### Labeling for ESAO

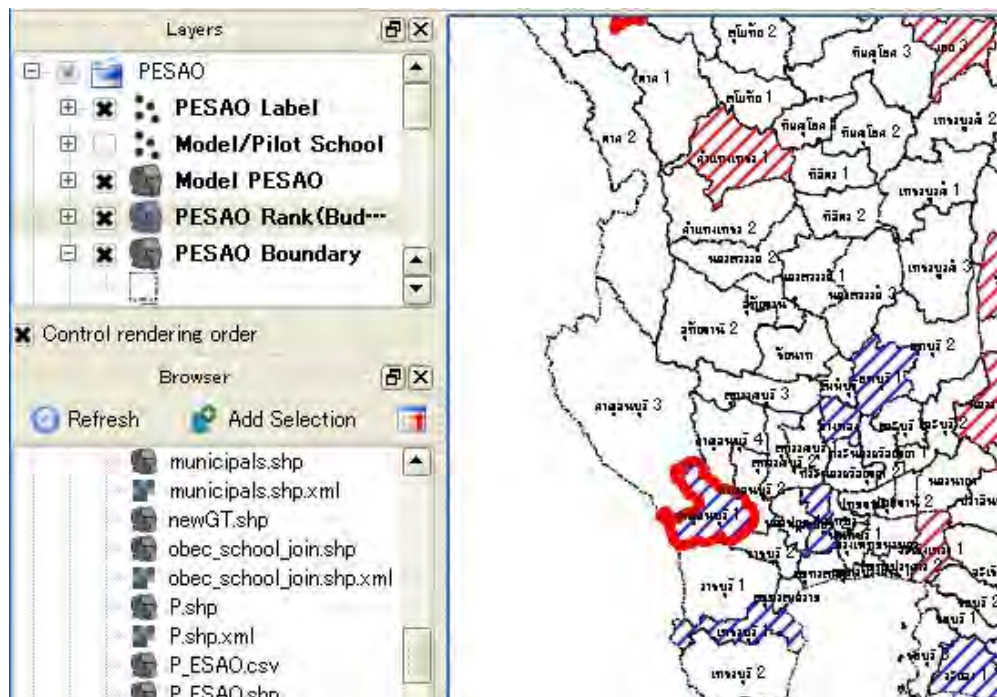


### 3. Making Inventory Maps

#### 3.2.2 Color setting

#### Labeling for ESAO

Then, you can see labels for ESAO.

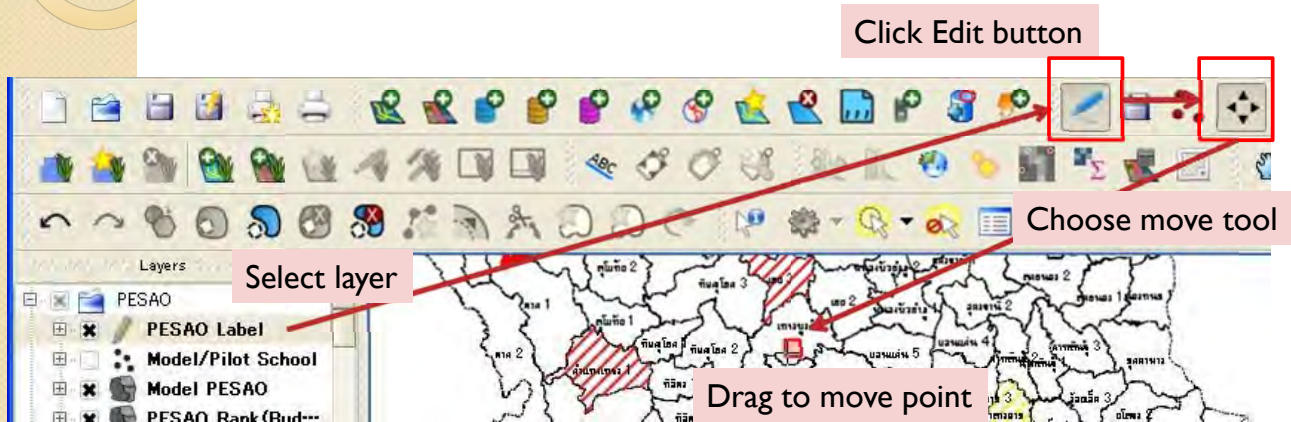


### 3. Making Inventory Maps

#### 3.2.2 Color setting

#### Labeling for ESAO

If there are some overlaps of the labels, you can move the points.

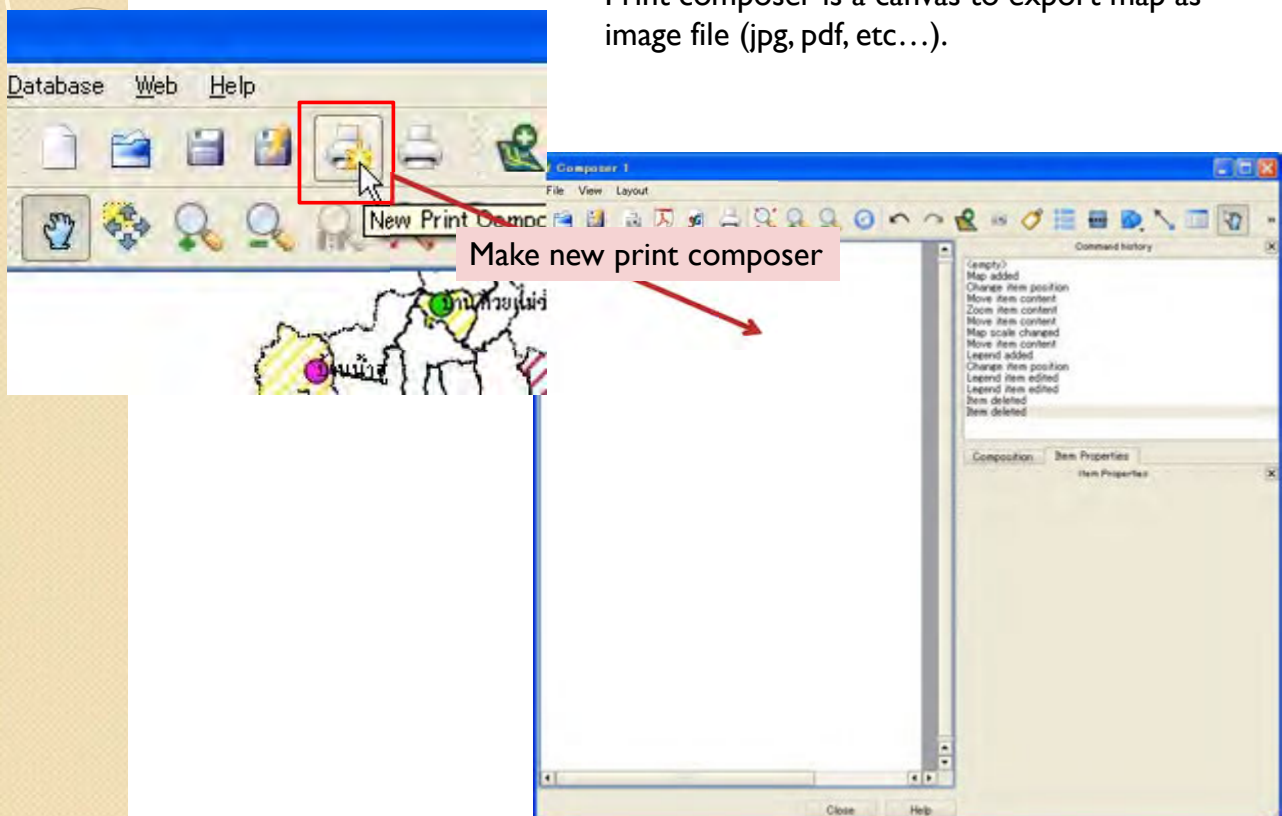


After you finish edit, re-click Edit button and save.

### 3. Making Inventory Maps

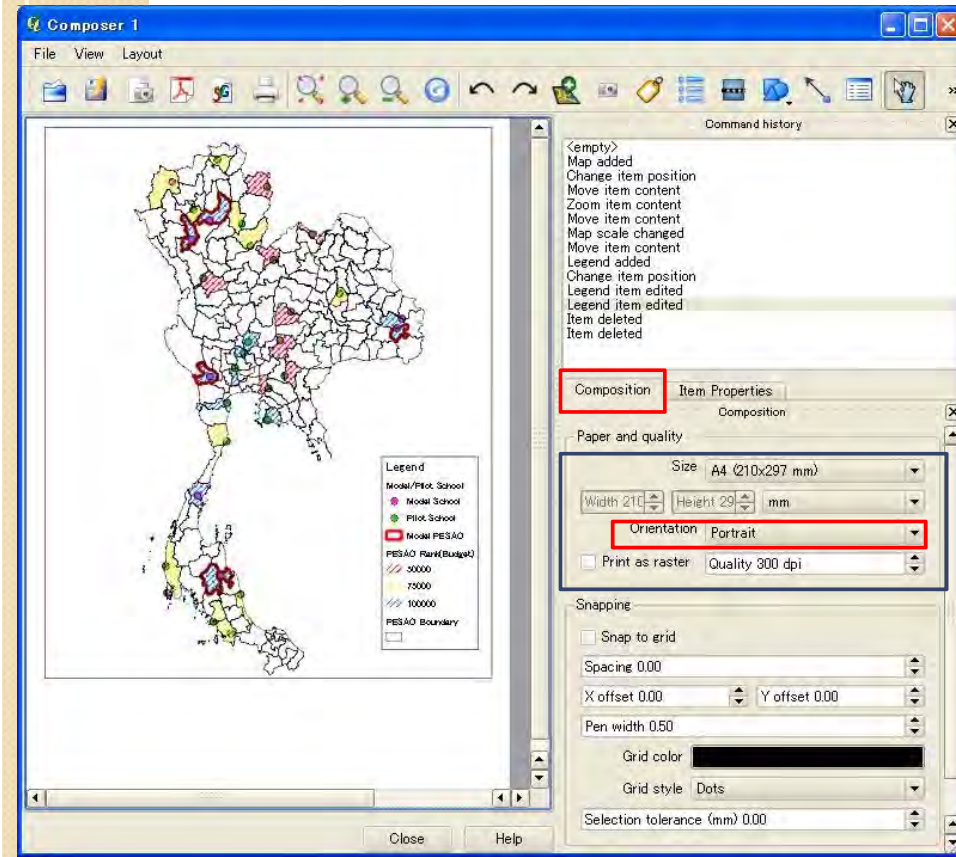
#### 3.2.3 Print composer

Print composer is a canvas to export map as image file (jpg, pdf, etc...).



### 3. Making Inventory Maps

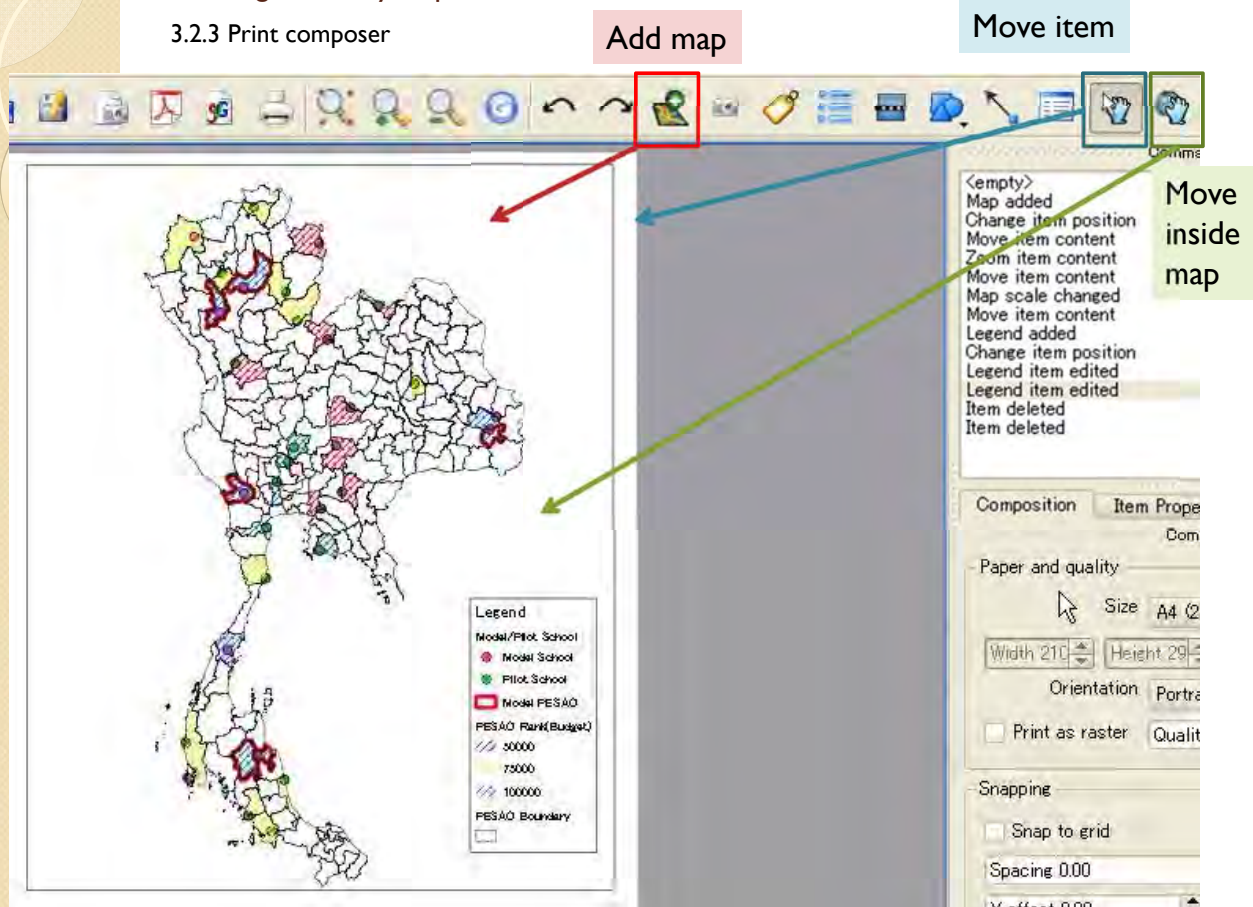
#### 3.2.3 Print composer



Lower right tabs are properties for the canvas.

### 3. Making Inventory Maps

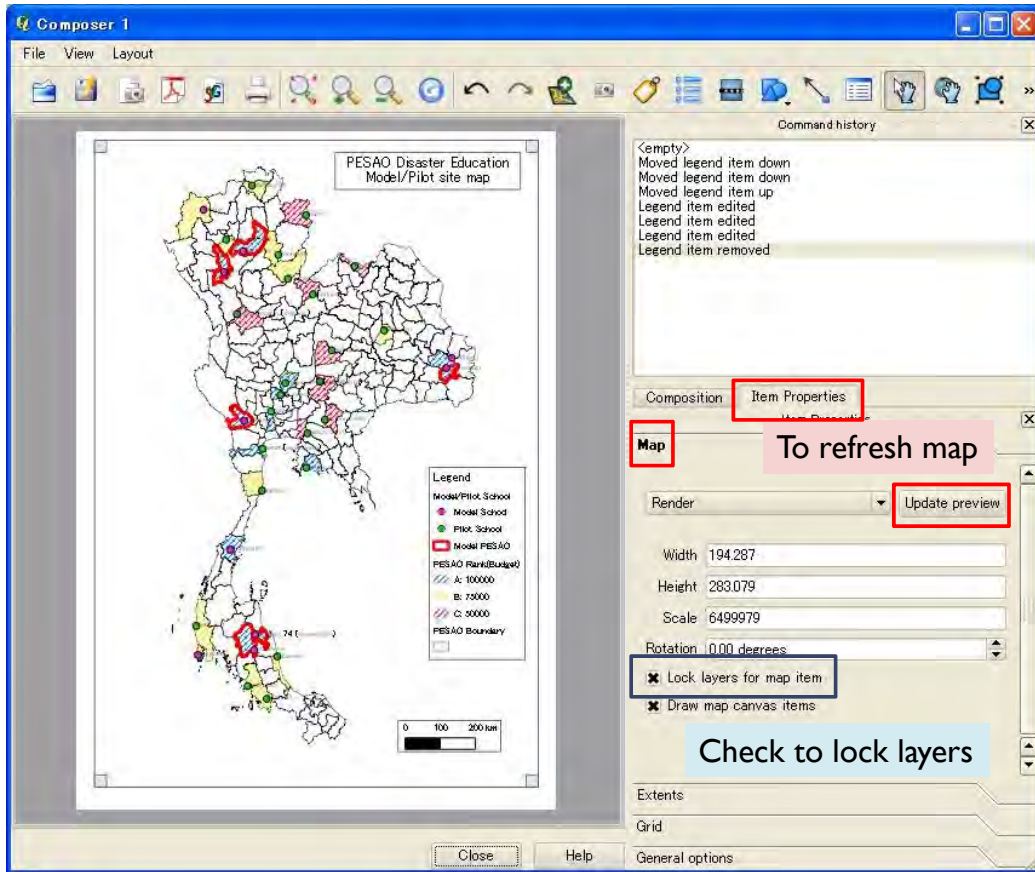
#### 3.2.3 Print composer





### 3. Making Inventory Maps

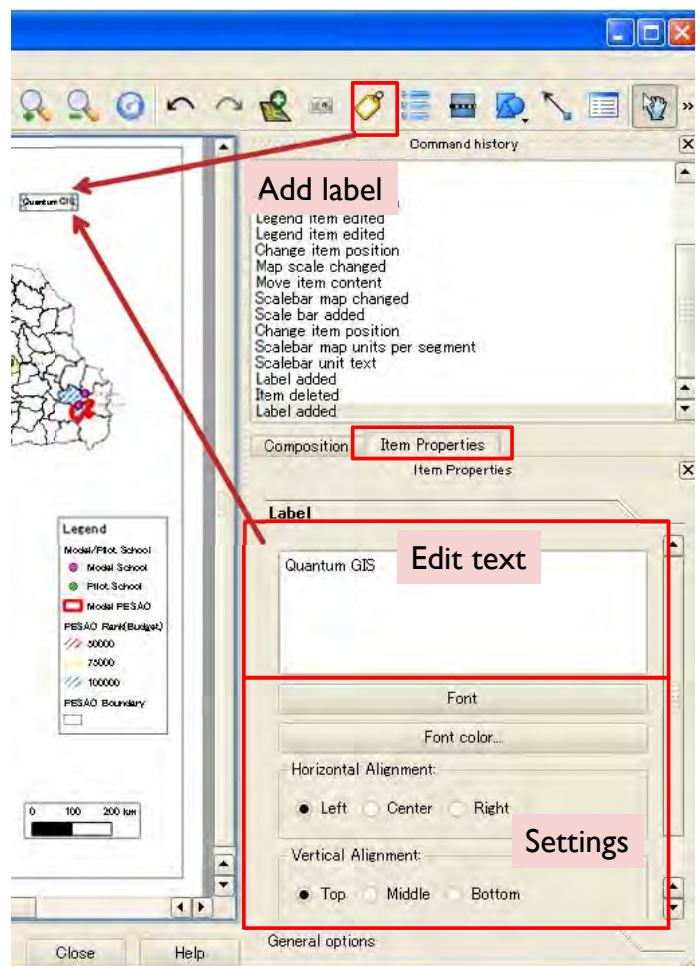
#### 3.2.3 Print composer



### 3. Making Inventory Maps

#### 3.2.3 Print composer

Add label

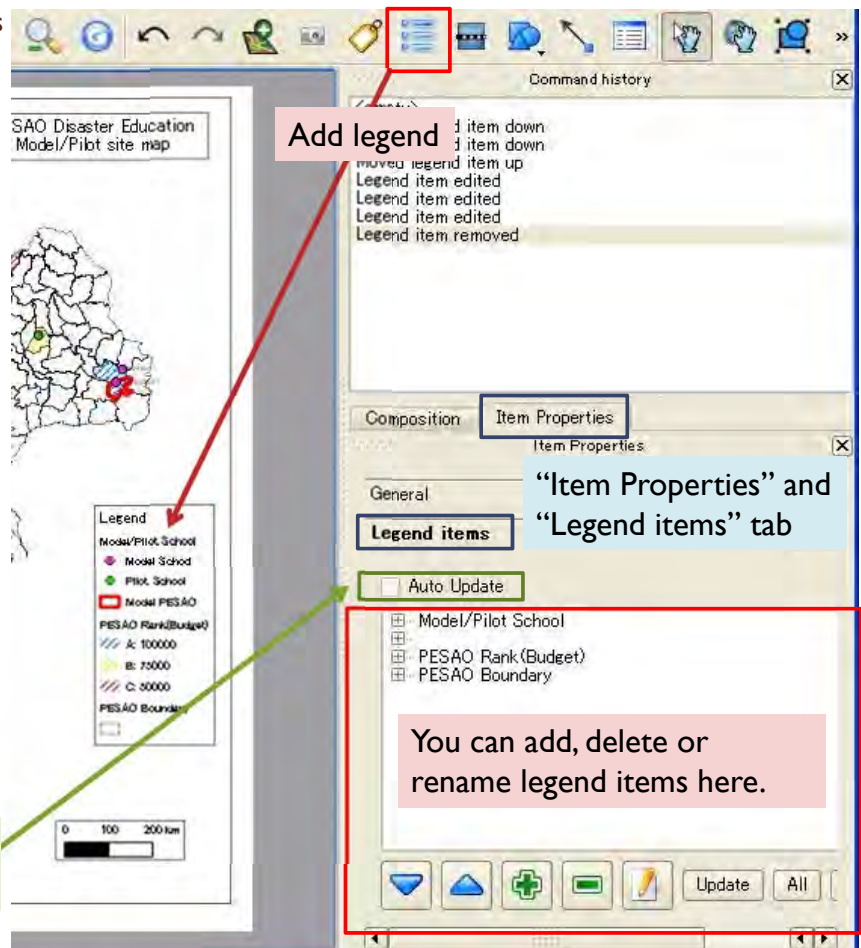


### 3. Making Inventory Maps

#### 3.2.3 Print composer

Add legend

Unselect "Auto Update" to fix the legend items.



### 3. Making Inventory Maps

#### 3.2.3 Print composer

It is able to export map to file.

Export as image file



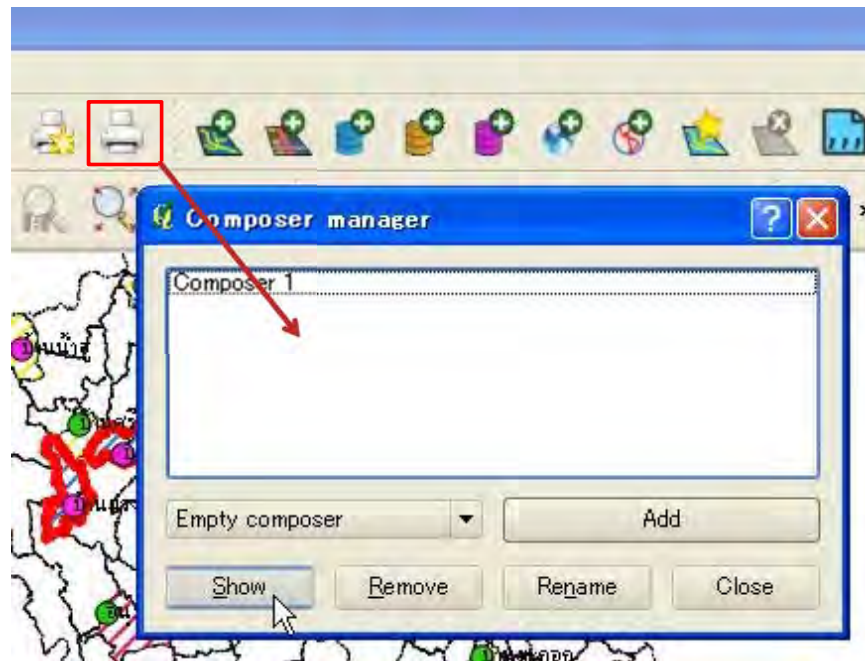
Export as pdf file

Print

### 3. Making Inventory Maps

#### 3.2.3 Print composer

After you made composer once, you can recall the canvas from this button.

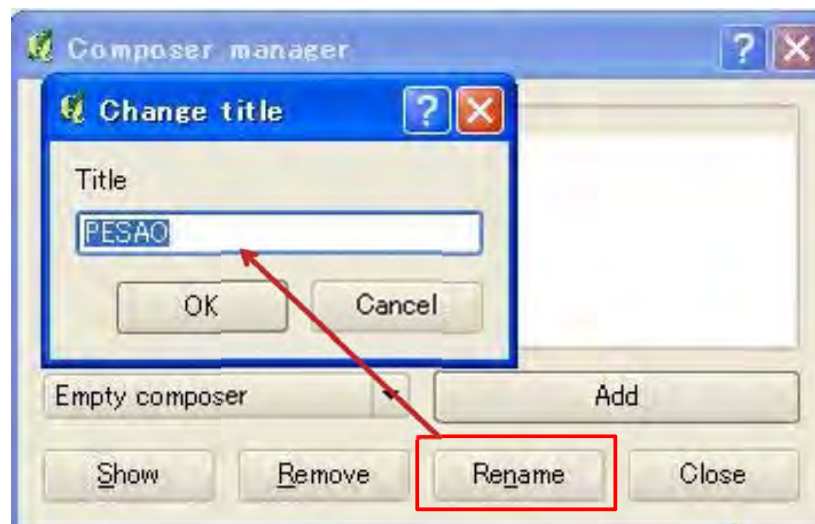


### 3. Making Inventory Maps

#### 3.2.3 Print composer

It is able to rename the canvas.

Please rename the "Composer 1" to "PESAO".



### 3. Making Inventory Maps

#### 3.2.4 Save project

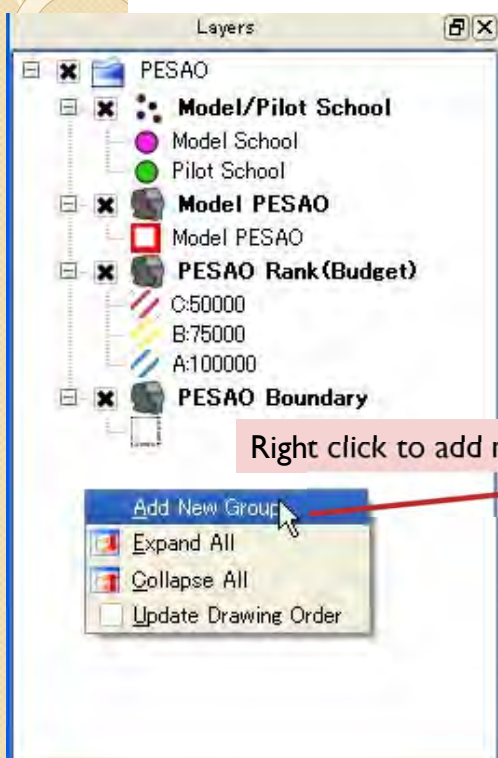


After you made map, please don't forget to save project.

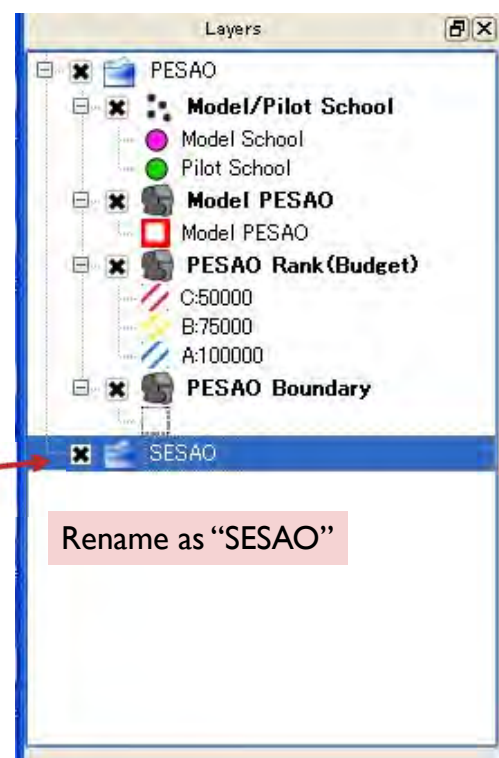
### 3. Making Inventory Maps

#### 3.3 SESAO map

##### 3.3.1 Import data



Right click to add new group



Rename as "SESAO"

### 3. Making Inventory Maps

#### 3.3.1 Import data

Drag and drop “MPSchool\_Scnd.shp” and “SESAO\_Join.shp” into “Layers” field.

After these files are imported, please move these features to under “SESAO” group.



### 3. Making Inventory Maps

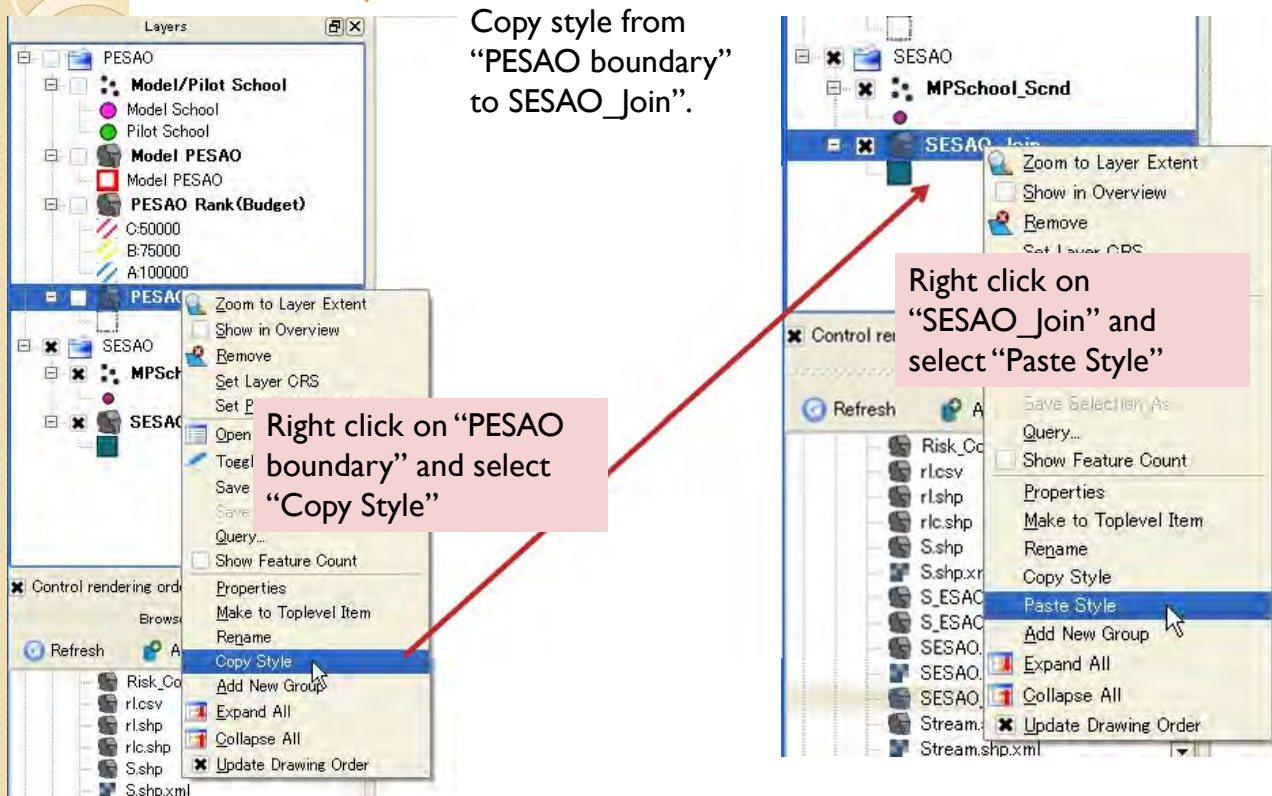
#### 3.3.2 Color settings

##### SESAO boundary

Copy style from “PESAO boundary” to SESAO\_Join”.

Right click on “PESAO boundary” and select “Copy Style”

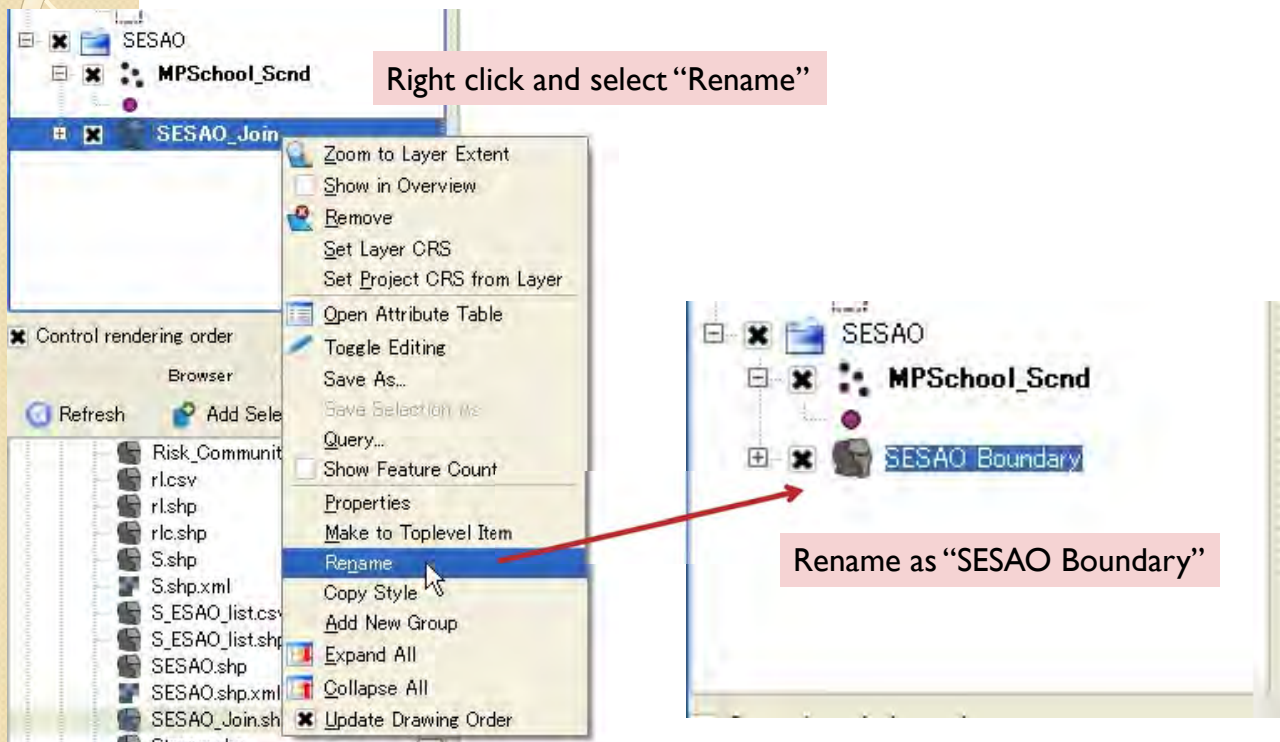
Right click on “SESAO\_Join” and select “Paste Style”



### 3. Making Inventory Maps

#### 3.3.2 Color settings

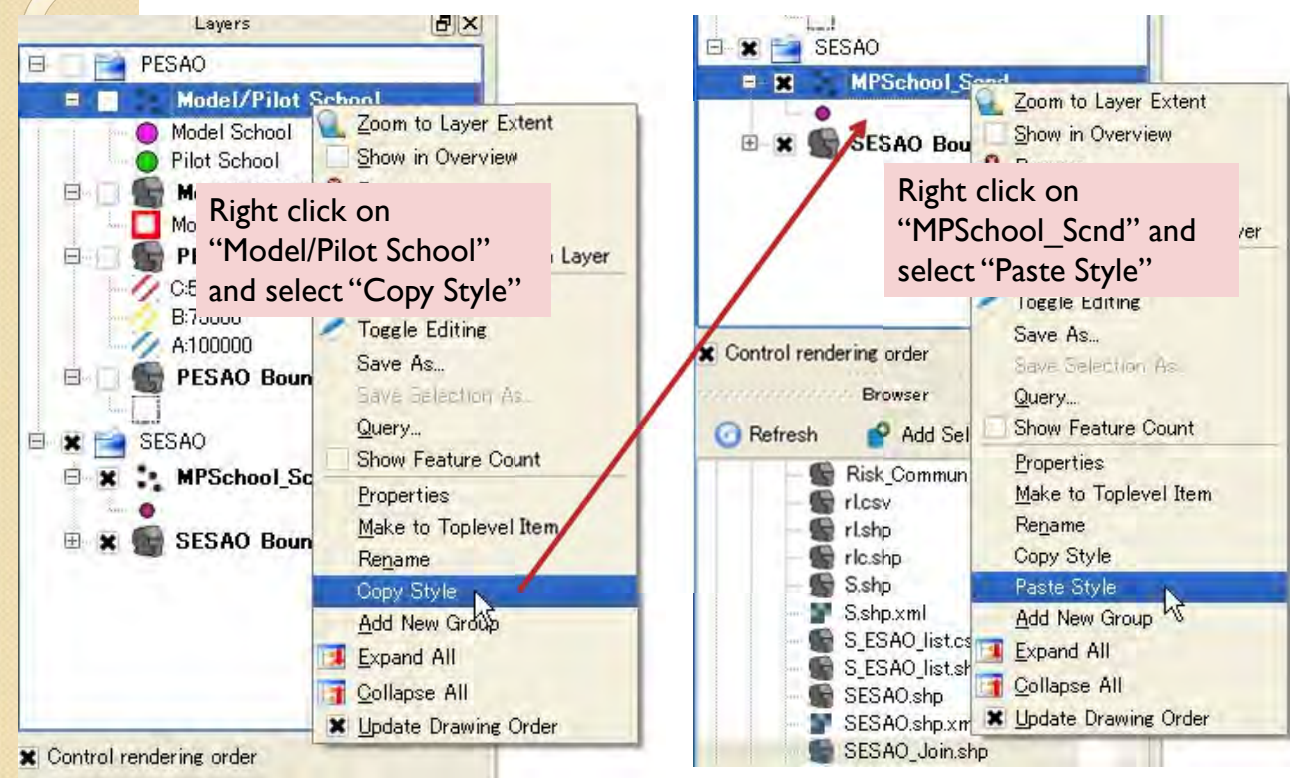
##### SESAO boundary



### 3. Making Inventory Maps

#### 3.3.2 Color settings

##### Model/Pilot schools

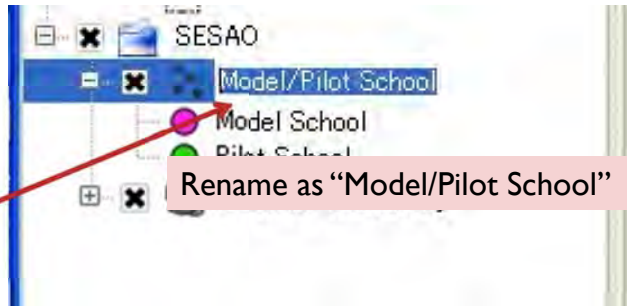
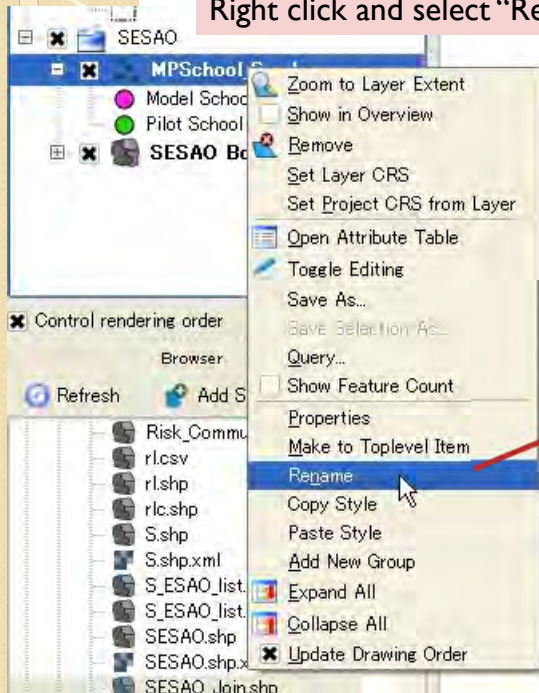


### 3. Making Inventory Maps

#### 3.3.2 Color settings

#### Model/Pilot schools

Right click and select "Rename"



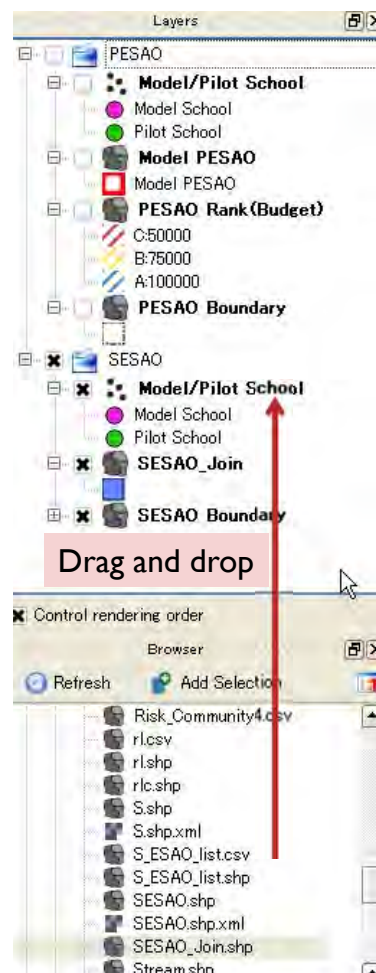
### 3. Making Inventory Maps

#### 3.3.2 Color settings

#### Model/Pilot school rank (budget)

Drag and drop "SESAO\_Join.shp" into "Layers field again.

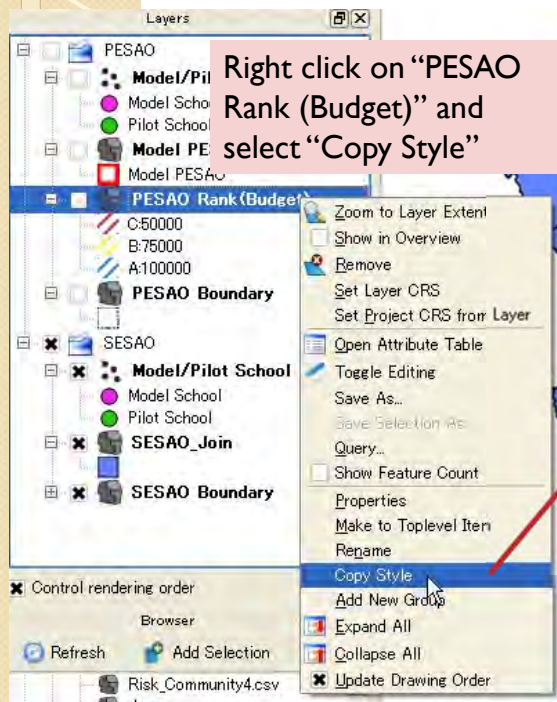
After these file is imported, please move these features to under "SESAO" group.



### 3. Making Inventory Maps

#### 3.3.2 Color settings

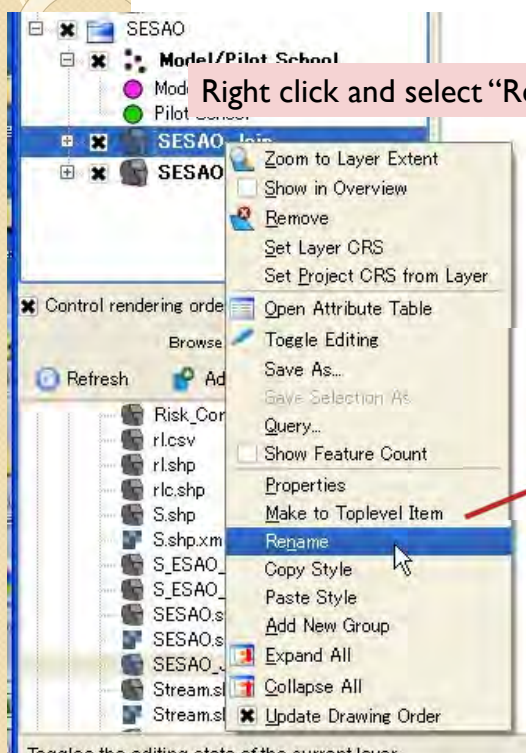
#### Model/Pilot school rank (budget)



### 3. Making Inventory Maps

#### 3.3.2 Color settings

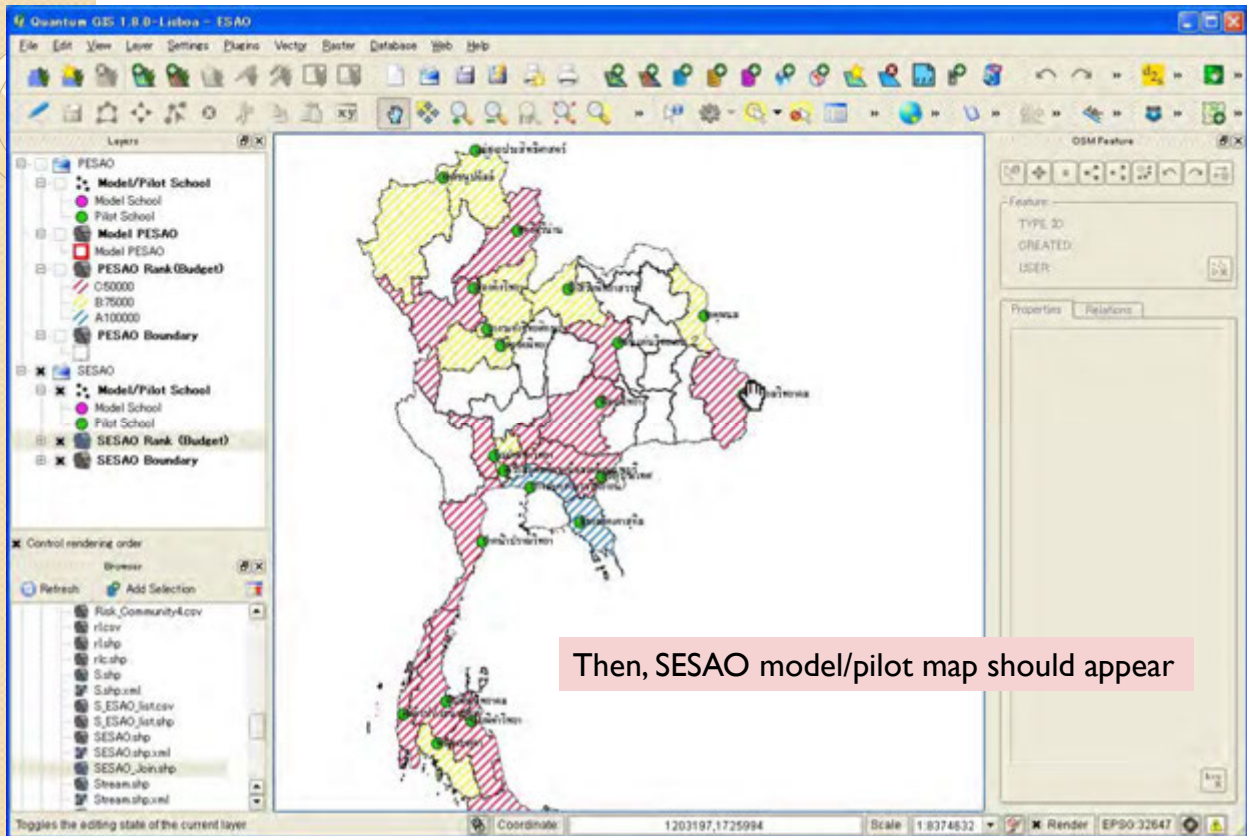
#### Model/Pilot school rank (budget)





### 3. Making Inventory Maps

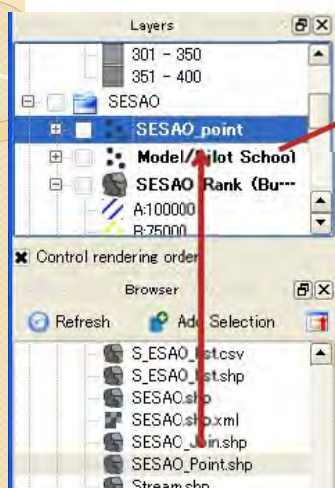
#### 3.3.2 Color settings



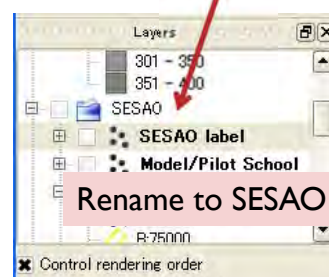
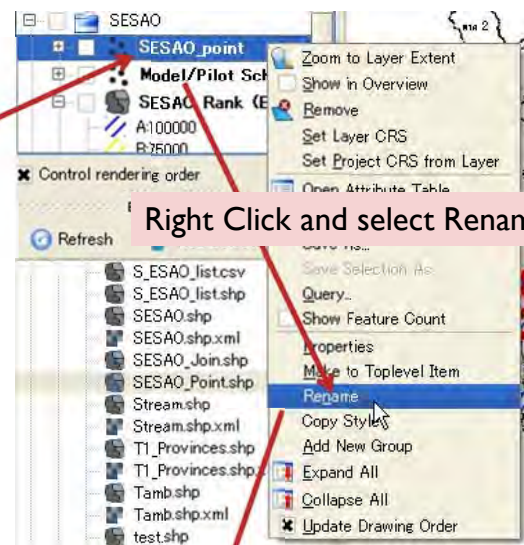
### 3. Making Inventory Maps

#### 3.3.2 Color setting

Labeling for ESAO



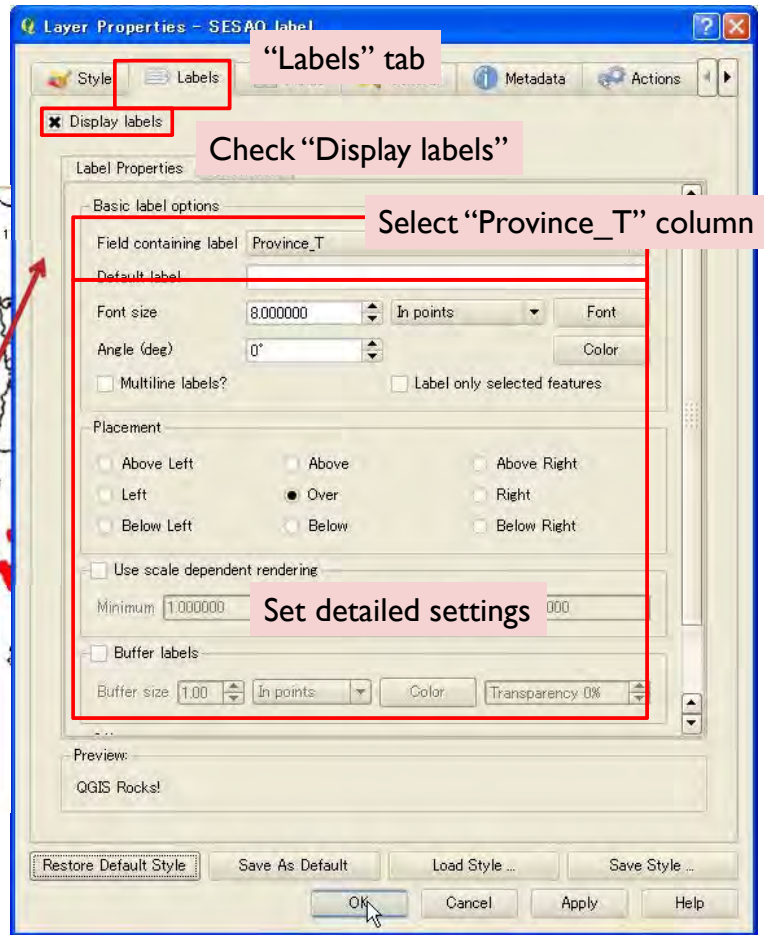
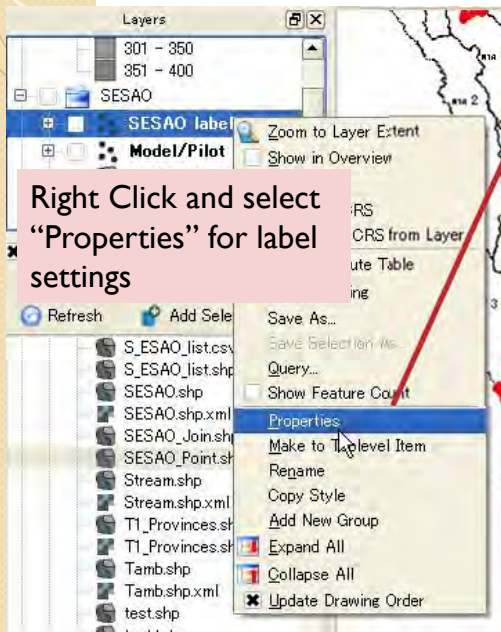
Drag and drop "SESAO\_Point.shp" for ESAO label



### 3. Making Inventory Maps

#### 3.3.2 Color setting

#### Labeling for ESAO

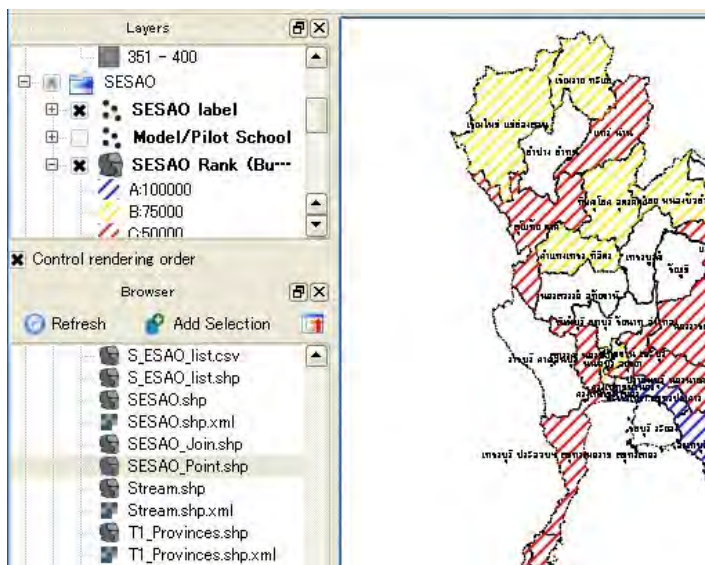


### 3. Making Inventory Maps

#### 3.3.2 Color setting

#### Labeling for ESAO

Then, you can see labels for ESAO.

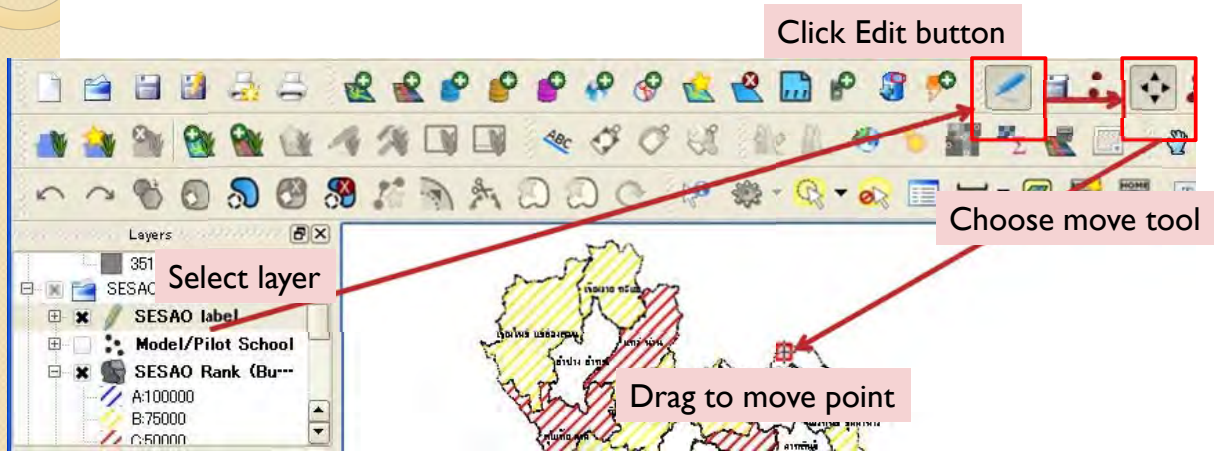


### 3. Making Inventory Maps

#### 3.2.2 Color setting

#### Labeling for ESAO

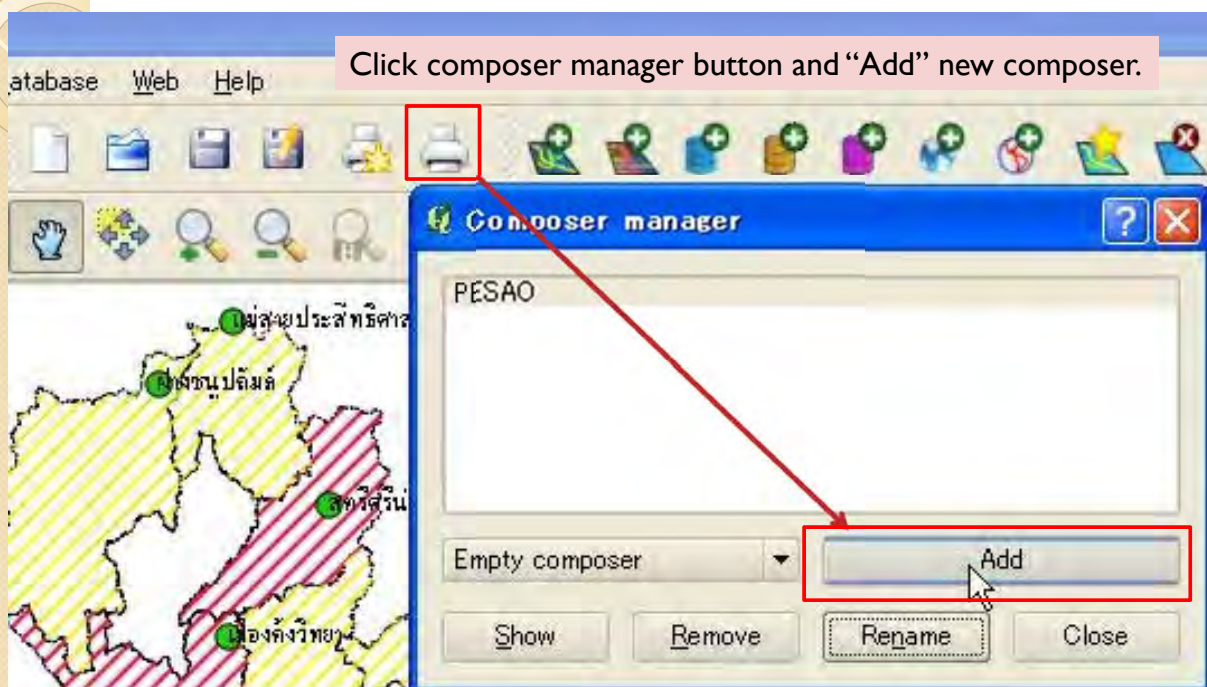
If there are some overlaps of the labels, you can move the points.



After you finish edit, re-click Edit button and save.

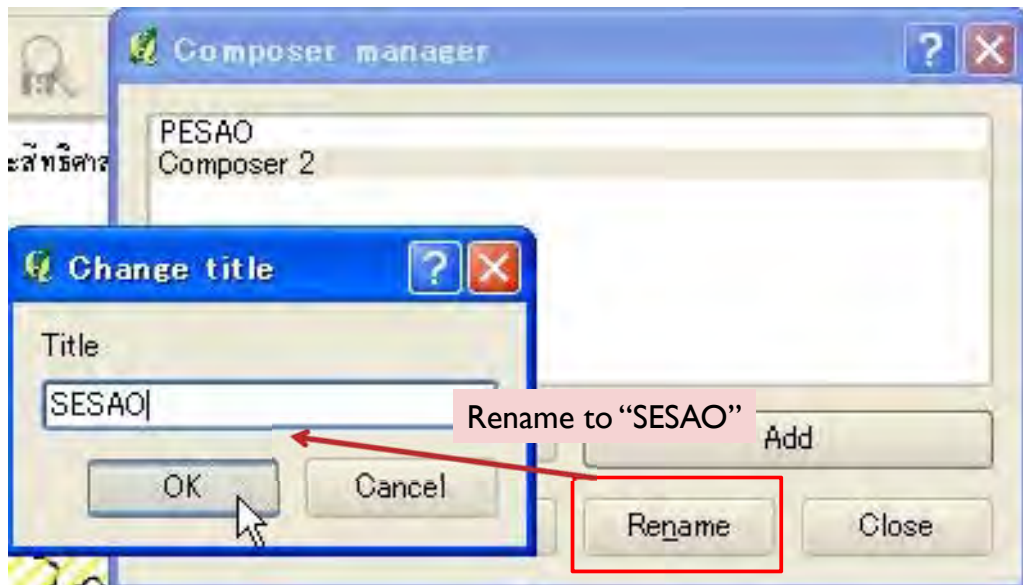
### 3. Making Inventory Maps

#### 3.3.3 Print composer



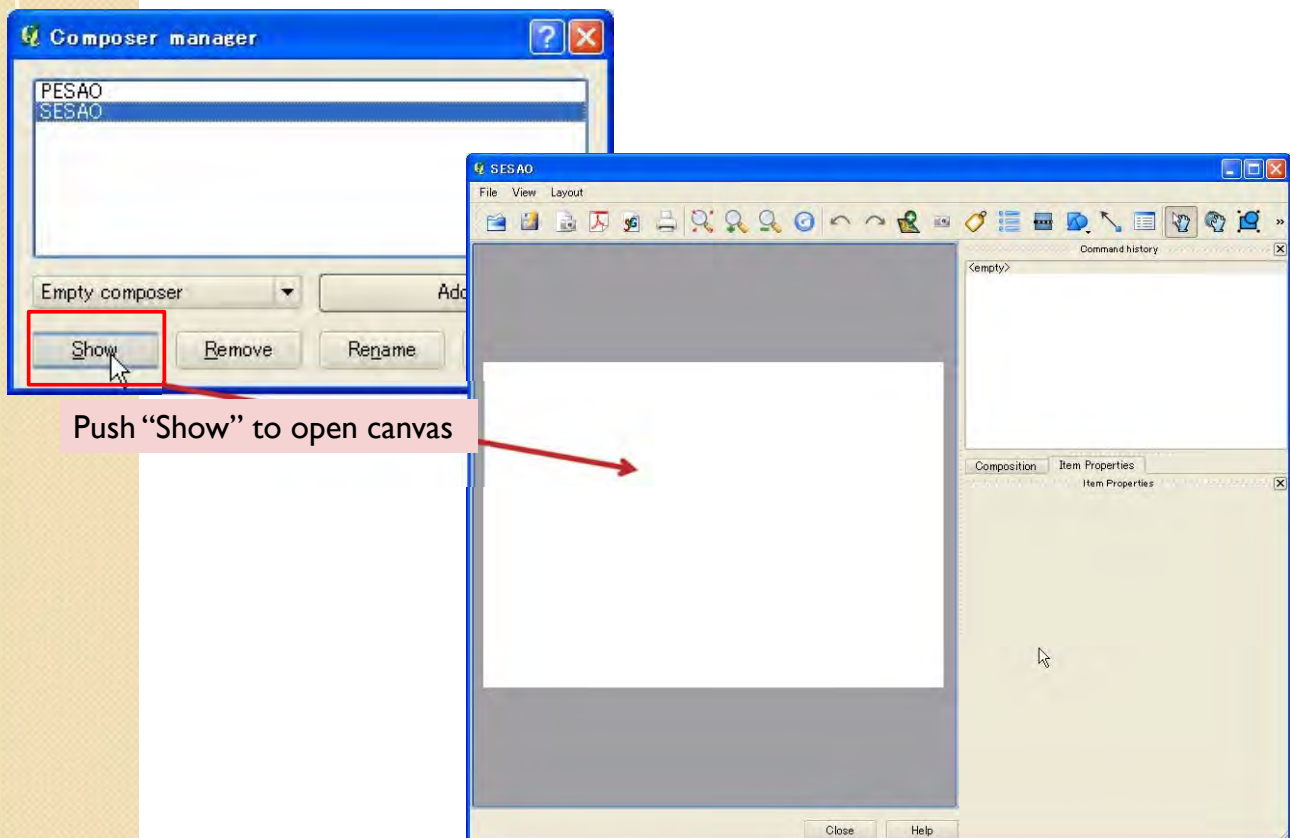
### 3. Making Inventory Maps

#### 3.3.3 Print composer



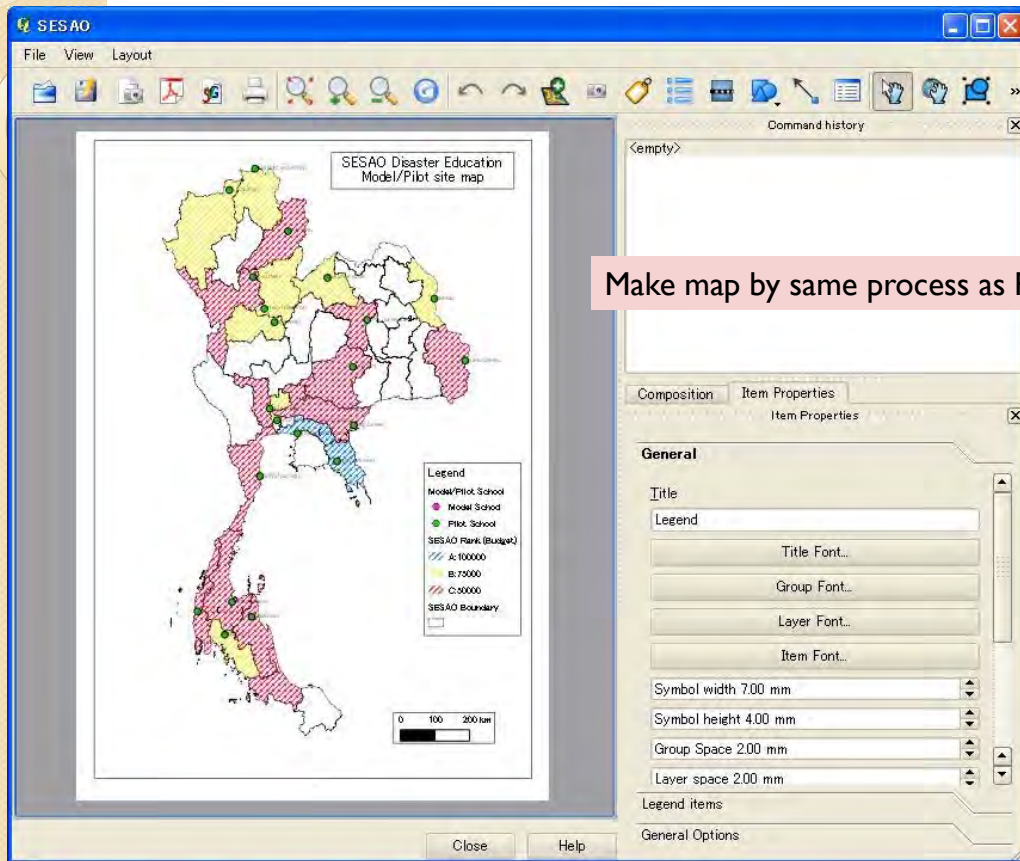
### 3. Making Inventory Maps

#### 3.3.3 Print composer



### 3. Making Inventory Maps

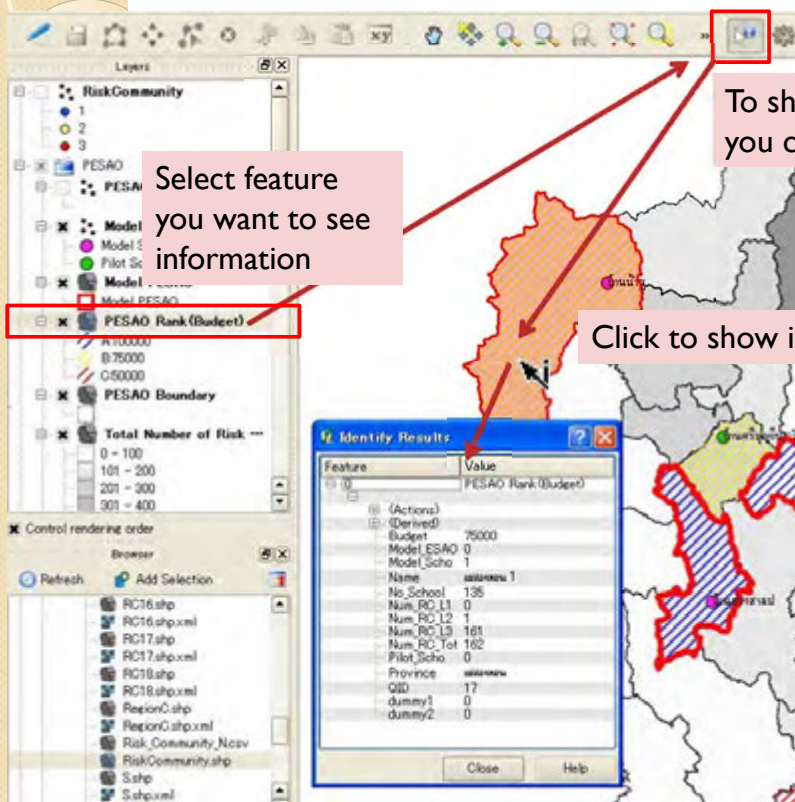
#### 3.3.3 Print composer



Make map by same process as PESAO (3.2.3)

### 3. Making Inventory Maps

#### 3.4 Indicate detailed information



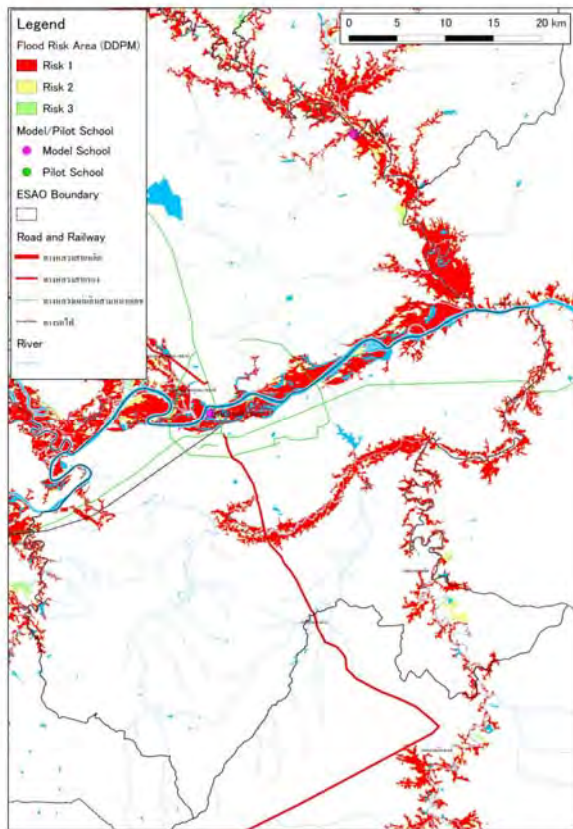
Select feature you want to see information

To show detailed information, you can use "Identify Features".

Click to show information

### 3. Making Inventory Maps

#### 3.5 Making risk area with ESAO map



Risk area information shown with ESAO and pilot/model school location is helpful to understand relation between risk area and school or residence location.

In addition, this type of map will be able to be used to select pilot/model schools and to make action plans.

### 3. Making Inventory Maps

#### 3.5.1 Total numbers of Risk community in ESAO

The ESAO file (PESAO\_Join.shp or SESAO\_Join.shp) contain data of total risk community numbers in each ESAO.

Explanation for the columns of attribution table of PESAO\_Join.shp or SESAO\_Join.shp.

- “No\_R1Vill” : numbers of risk level 1 communities
- “No\_R2Vill” : numbers of risk level 2 communities
- “No\_R3Vill” : numbers of risk level 3 communities (highest)
- “No\_TotRVill” : total (level 1-3) numbers of risk communities

This total numbers of risk communities can be shown with ESAO map you made above.

You can compare the risk community and model/pilot ESAO.

dummy1	dummy2	Num_PC_1	Num_PC_2	Num_PC_3	Num_PC_Tot
0	0	0	114	12	27
1	0	1	40	27	28
2	0	0	0	0	0
3	0	0	7	31	1
4	0	0	124	308	30
5	0	2	78	45	125
6	0	0	39	165	24
7	0	0	165	0	165
8	0	0	21	25	4
9	0	0	11	79	3
10	0	0	0	340	24
11	0	0	19	30	109
12	0	0	14	102	11
13	0	0	0	66	6
14	0	0	0	121	13
15	0	0	90	198	25
16	0	0	24	0	5
17	0	0	74	0	8
18	0	0	1	103	19
19	0	0	0	360	39
20	0	0	52	191	24
21	0	0	100	211	21
22	0	0	31	192	19

### 3. Making Inventory Maps

#### 3.5.1 Total numbers of Risk community in ESAO

Open "Style" tab

Select "Graduated" and "Num\_RC\_Tot" column

Rename as you like

You can import one more P/SESAO\_Join.shp file to indicate risk community number map.

Set color ramp, classes and mode

Double click to edit colors, ranges and labels

"Classify" or "Add class" to make color categories

Symbol	Range	Label
	0.0000 - 200.0000	0 - 200
	200.1000 - 400.0000	201 - 400
	400.1000 - 600.0000	401 - 600
	600.1000 - 800.0000	601 - 800
	800.1000 - 1000.0000	801 - 1000
	1000.1000 - 1200.0000	1001 - 1200
	1200.1000 - 1400.0000	1201 - 1400
	1400.1000 - 1600.0000	1401 - 1600
	1600.1000 - 1800.0000	1601 - 1800
	1800.1000 - 1999.0000	1801 - 1900

### 3. Making Inventory Maps

#### 3.5.1 Total numbers of Risk community in ESAO

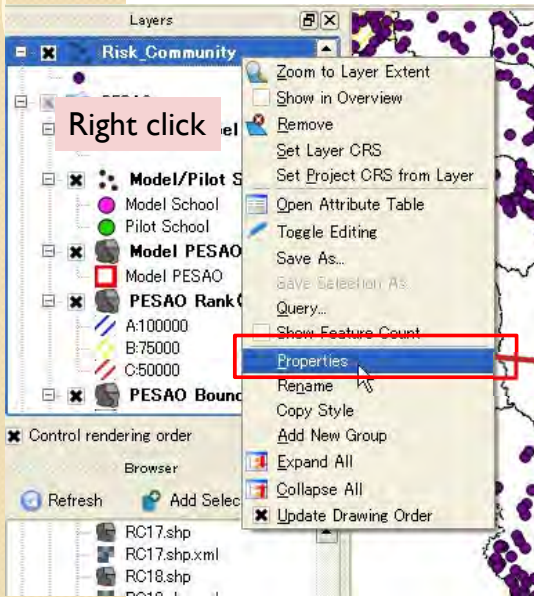
Then, you can show risk community numbers map with ESAO map.



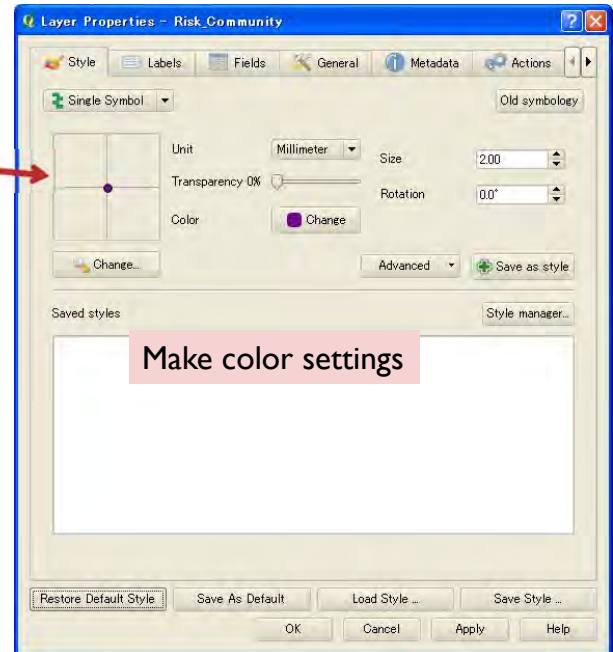


### 3. Making Inventory Maps

#### 3.5.3 Risk community map

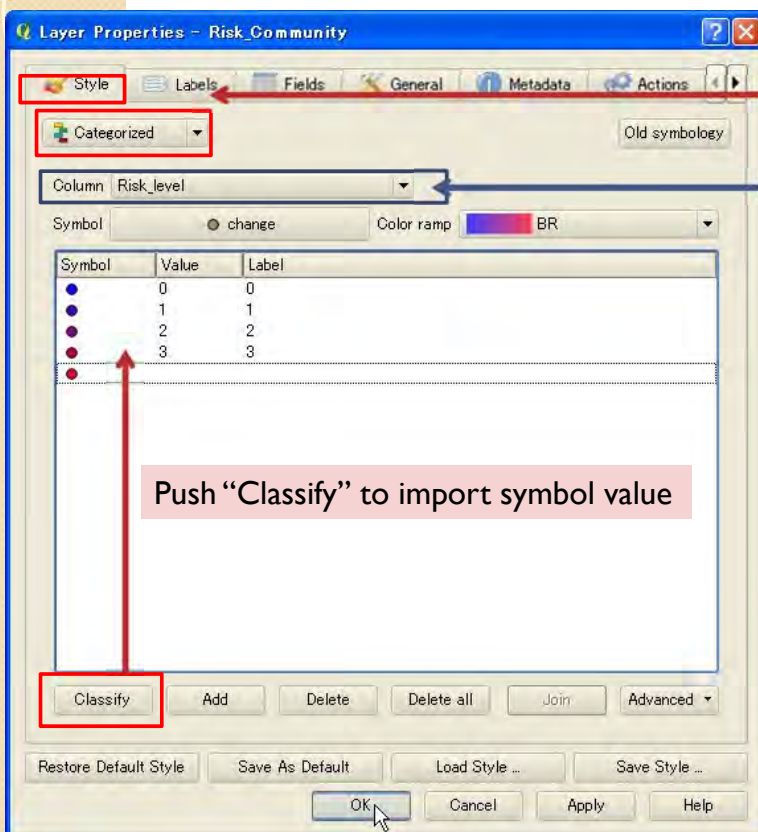


Right click and select "Properties"



### 3. Making Inventory Maps

#### 3.5.3 Risk community map

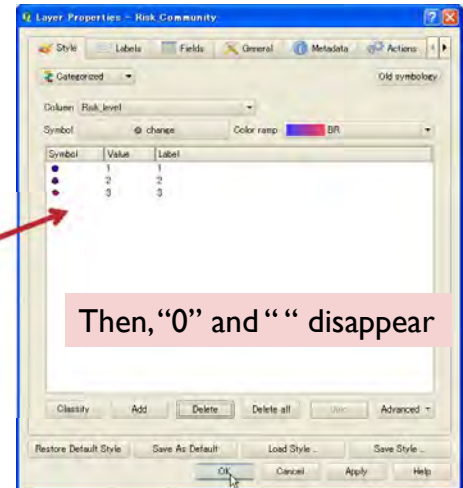
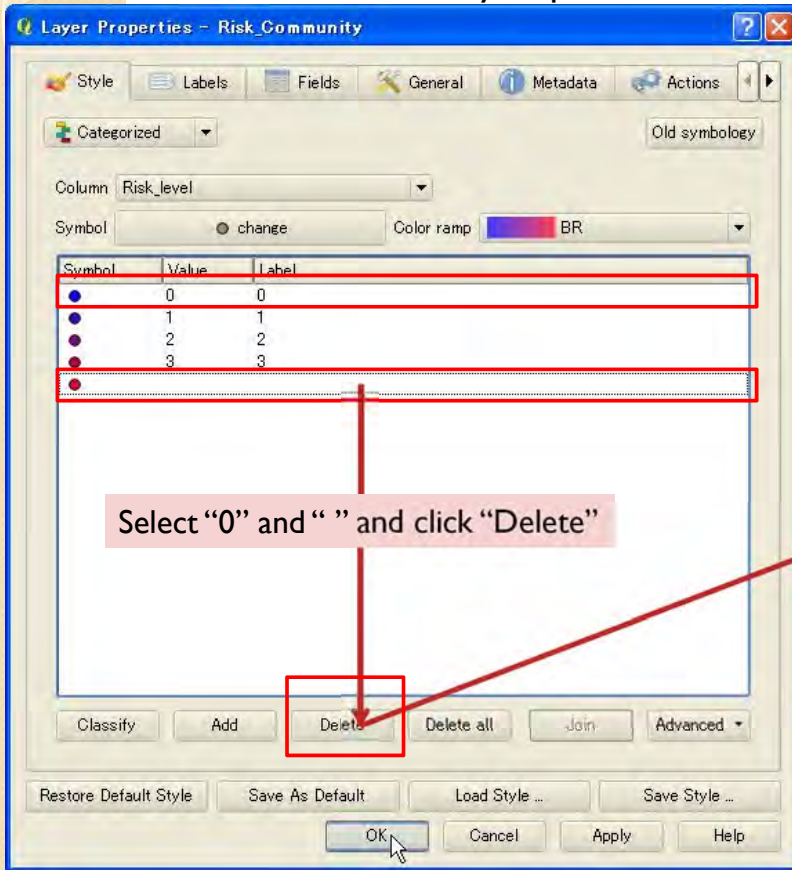


Select "Style" tab and "Categorized"

Target column is "Risk\_level"

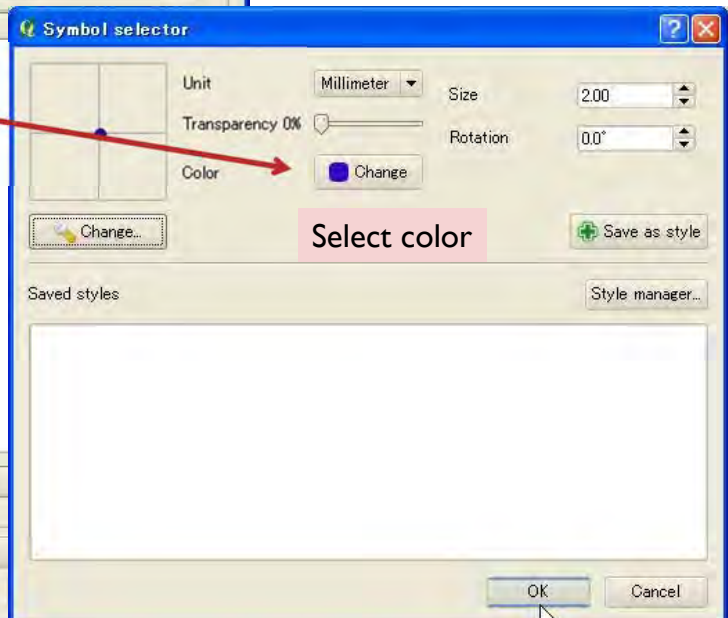
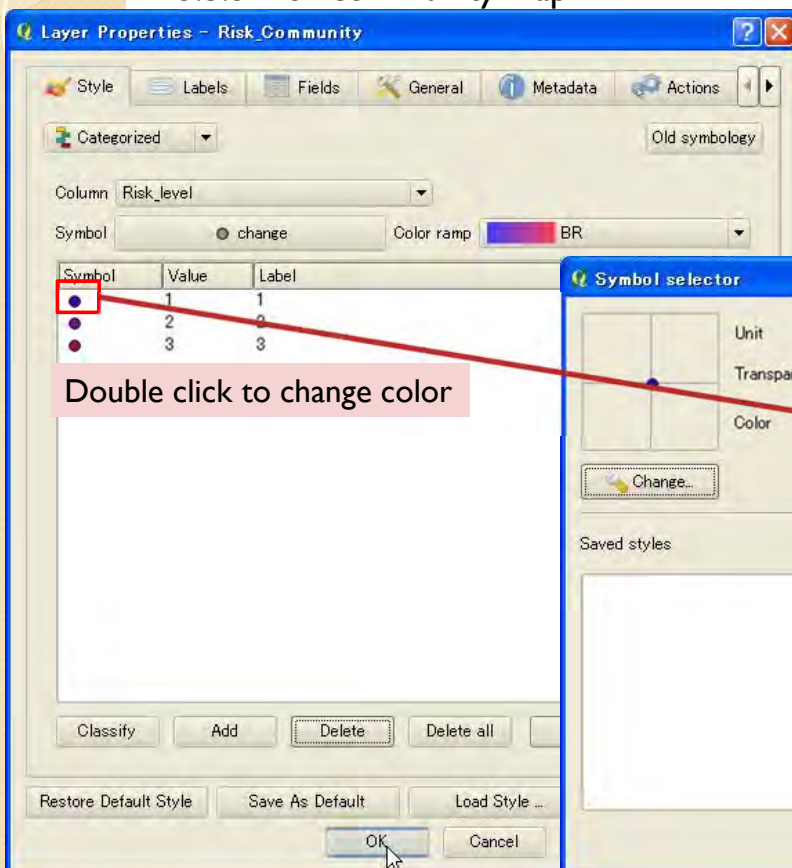
### 3. Making Inventory Maps

#### 3.5.3 Risk community map



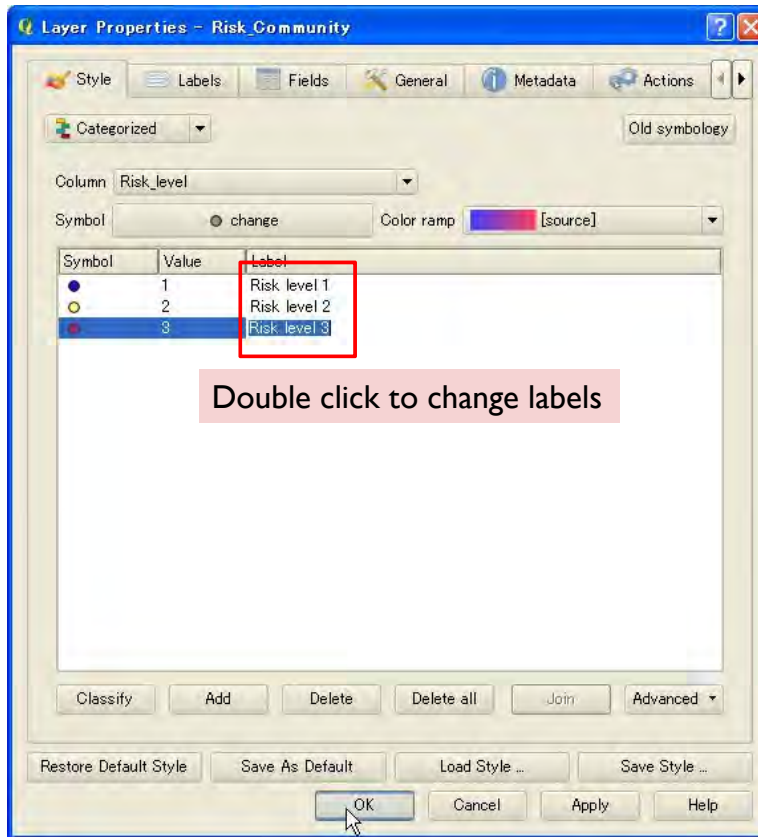
### 3. Making Inventory Maps

#### 3.5.3 Risk community map



### 3. Making Inventory Maps

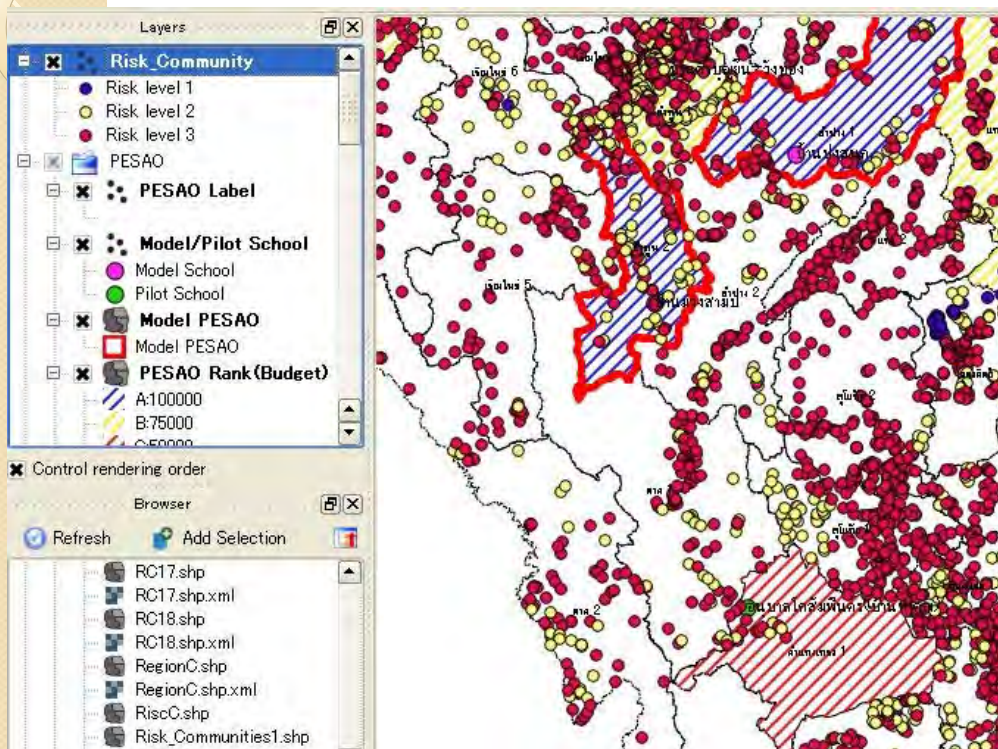
#### 3.5.3 Risk community map



### 3. Making Inventory Maps

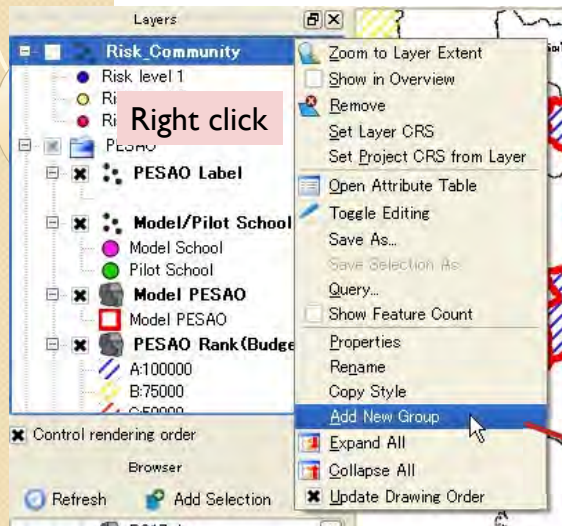
#### 3.5.3 Risk community map

Then, you can see risk community locations.



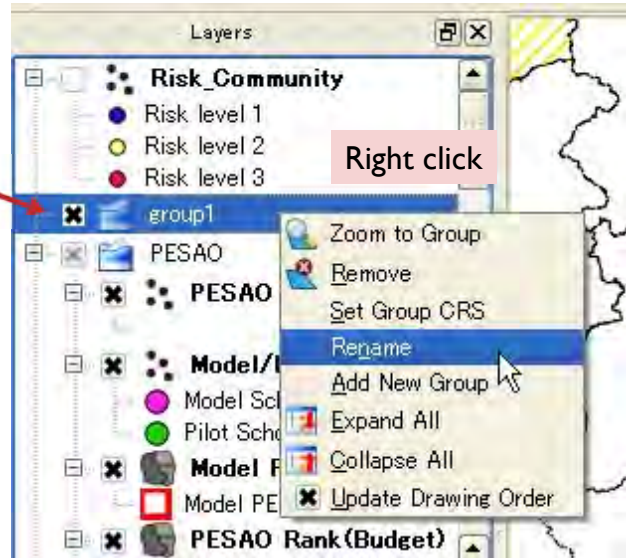
### 3. Making Inventory Maps

#### 3.5.4 Flood risk area map



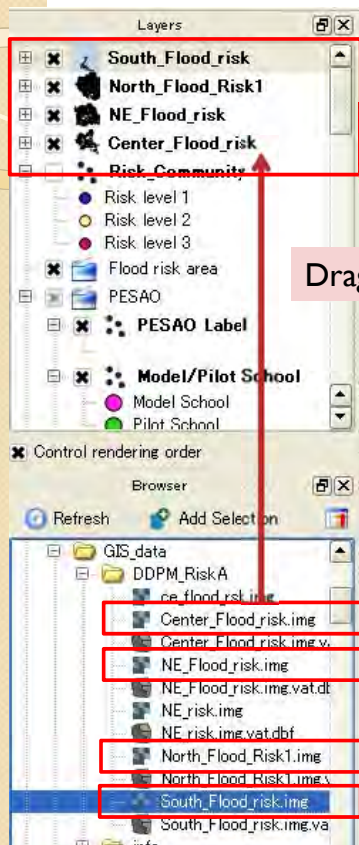
Right click and select “Add New Group”.

And, right click and select “Rename” to Flood risk area.



### 3. Making Inventory Maps

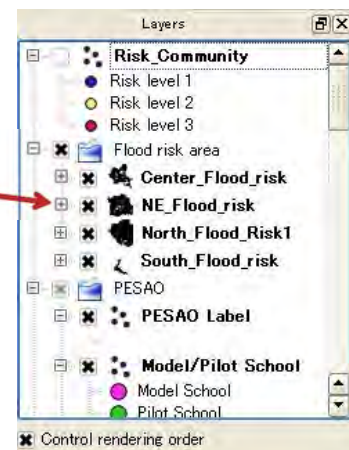
#### 3.5.4 Flood risk area map



Move under the “Flood risk area” folder

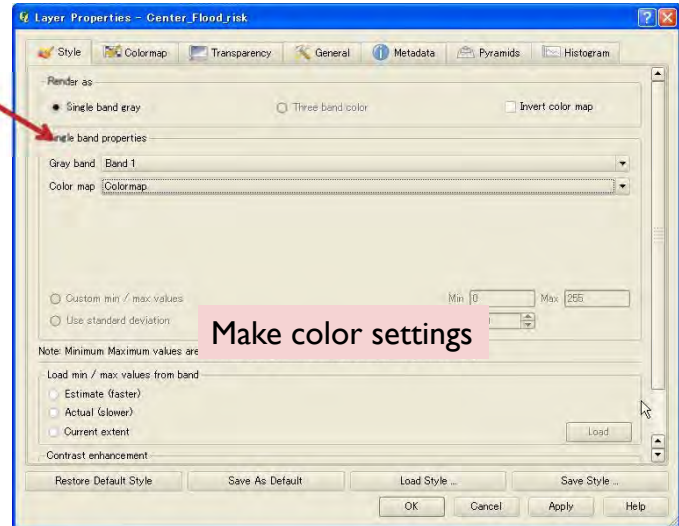
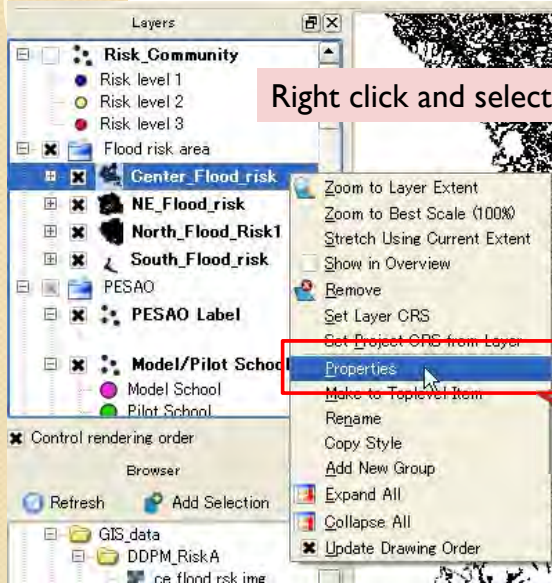
Drag & drop

South\_Flood\_Risk  
North\_Flood\_Risk  
NE\_Flood\_Risk  
Center\_Flood\_Risk



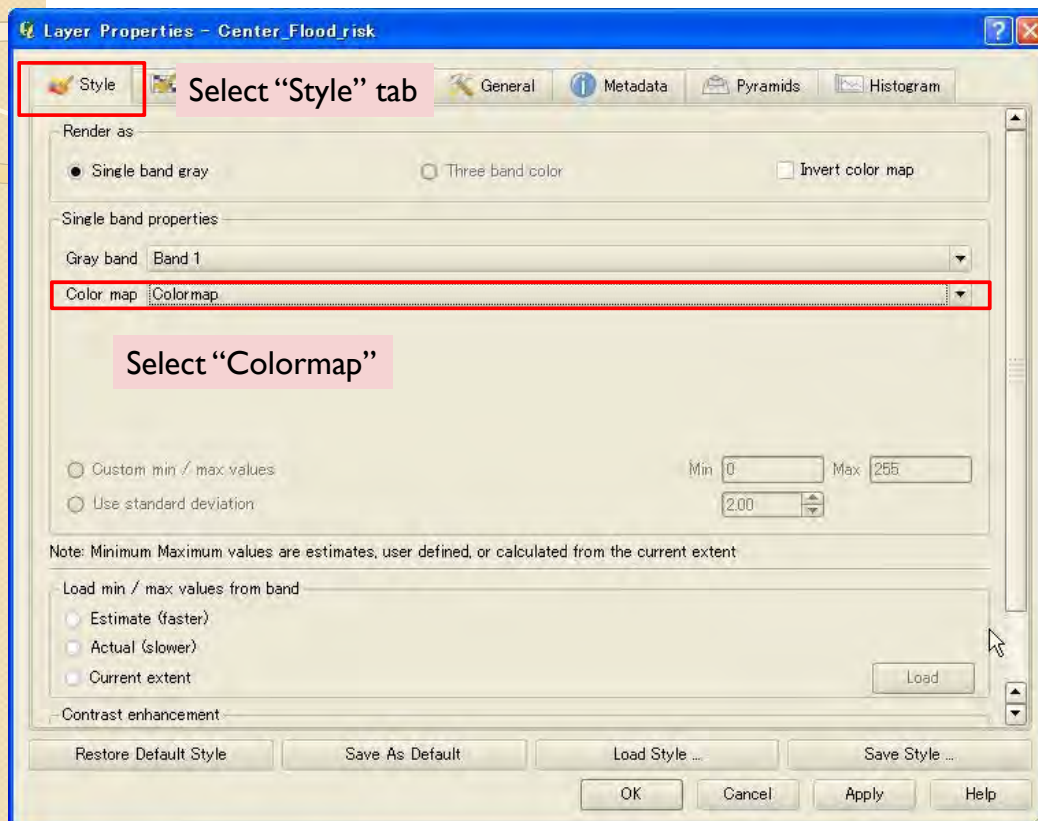
### 3. Making Inventory Maps

#### 3.5.4 Flood risk area map



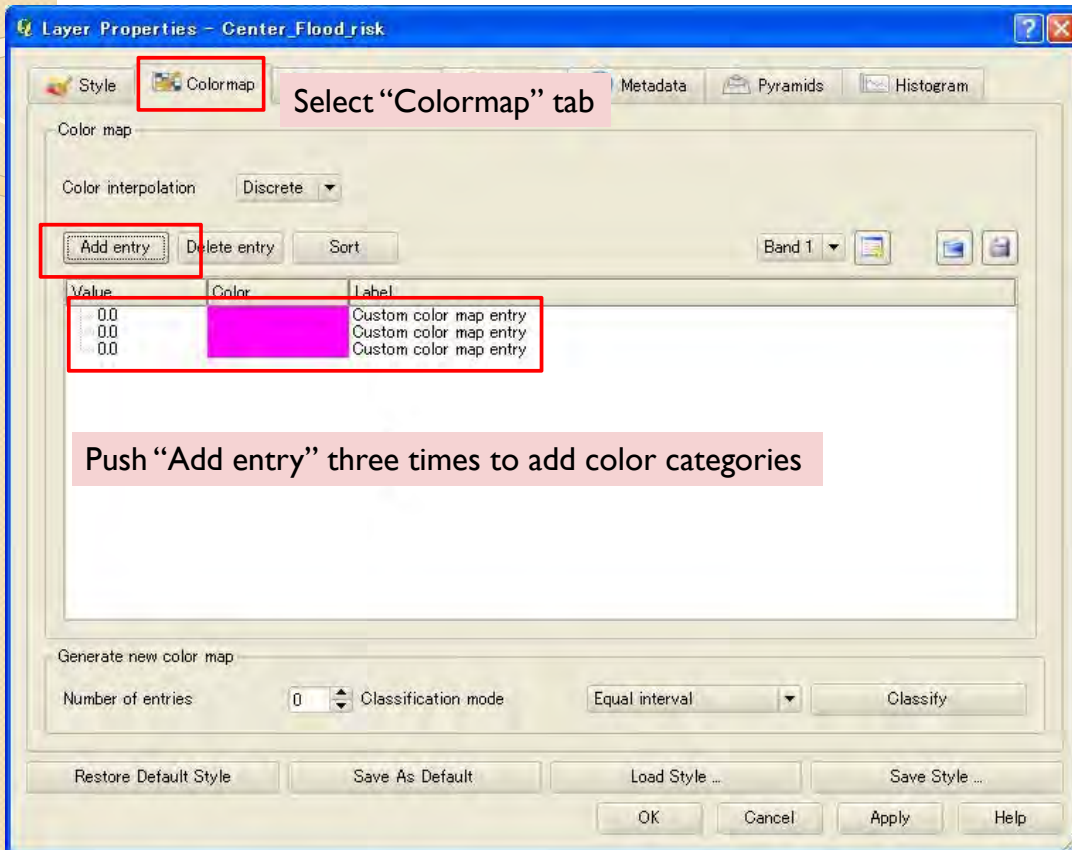
### 3. Making Inventory Maps

#### 3.5.4 Flood risk area map



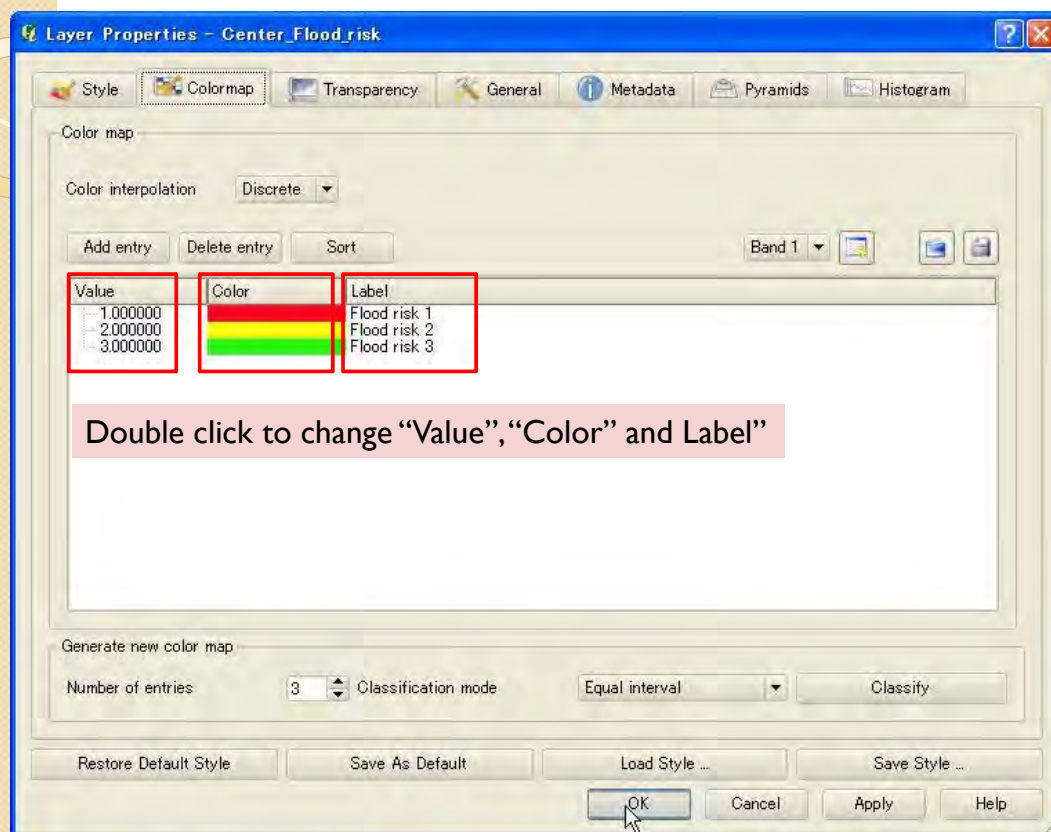
### 3. Making Inventory Maps

#### 3.5.4 Flood risk area map



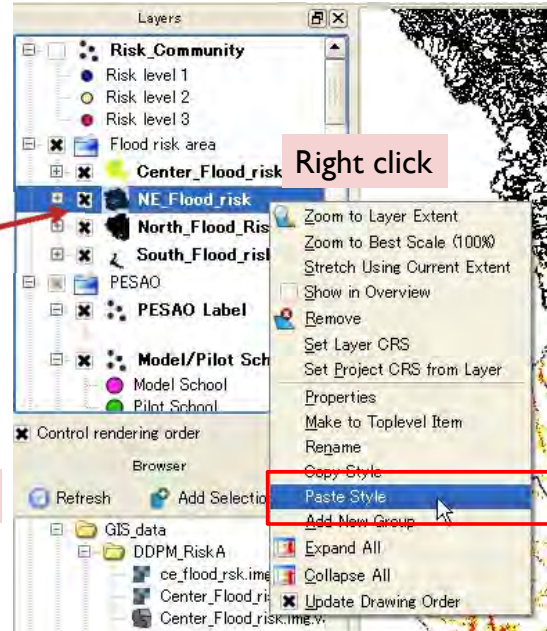
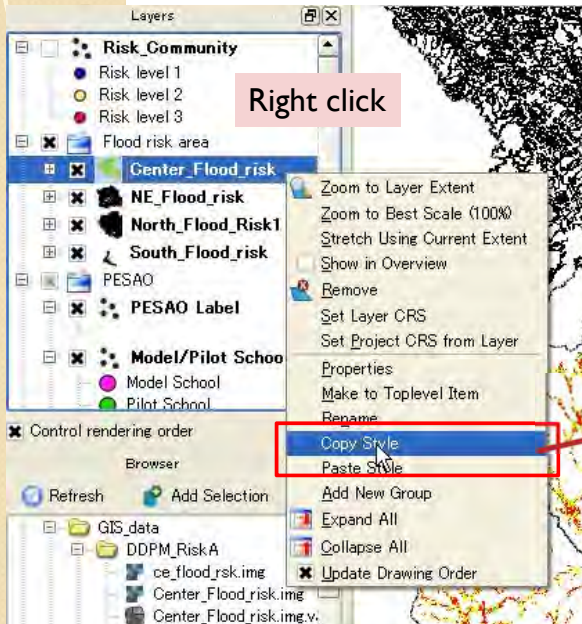
### 3. Making Inventory Maps

#### 3.5.4 Flood risk area map



### 3. Making Inventory Maps

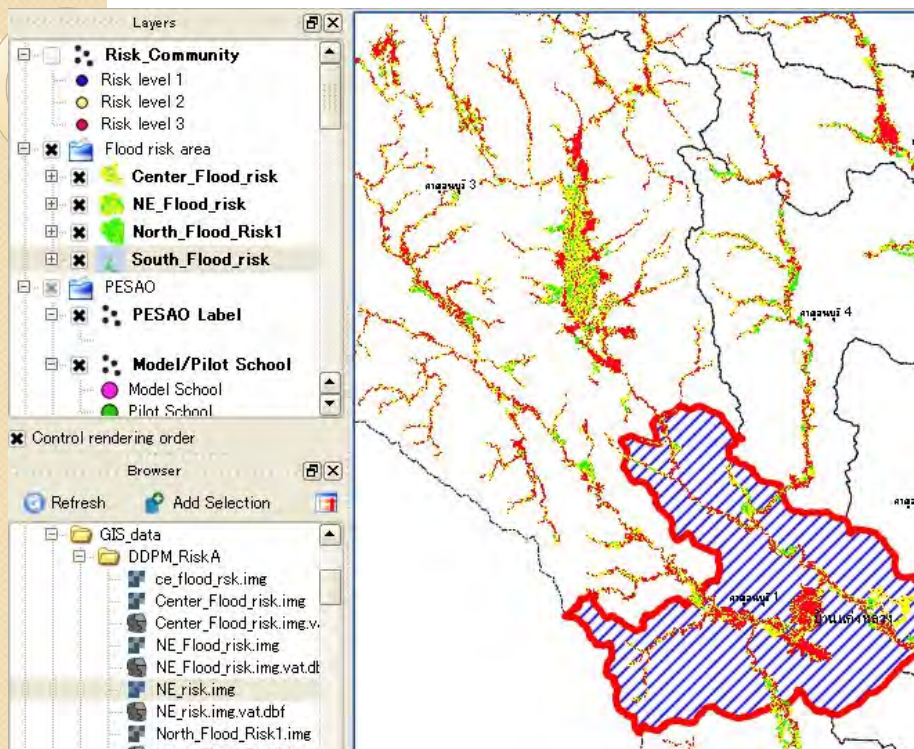
#### 3.5.4 Flood risk area map



Copy and paste style to the others

### 3. Making Inventory Maps

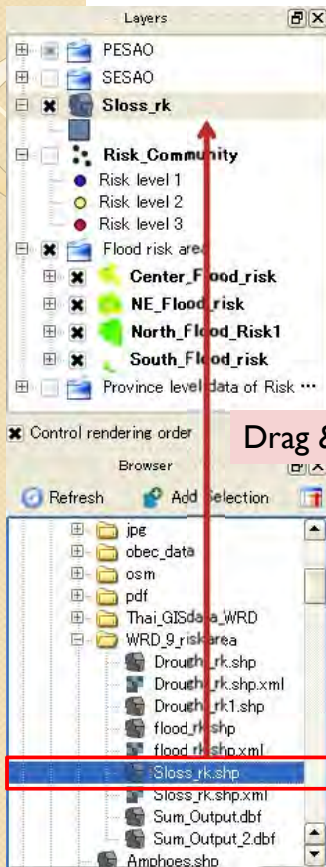
#### 3.5.4 Flood risk area map



Then, you can see flood risk area

### 3. Making Inventory Maps

#### 3.5.5 Sediment disaster risk area map

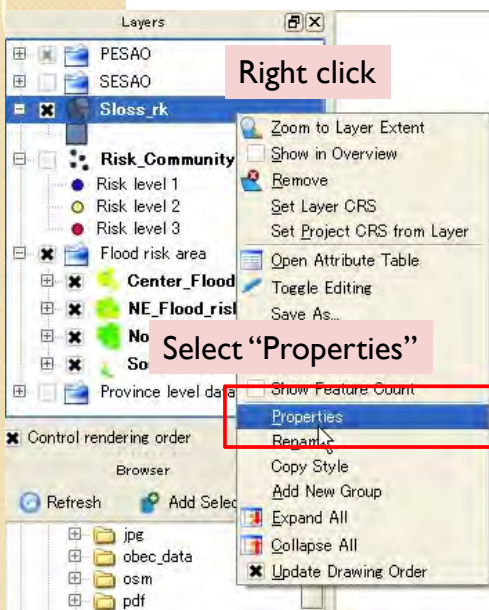


At first, import “Sloss\_rk.shp”

Drag & drop

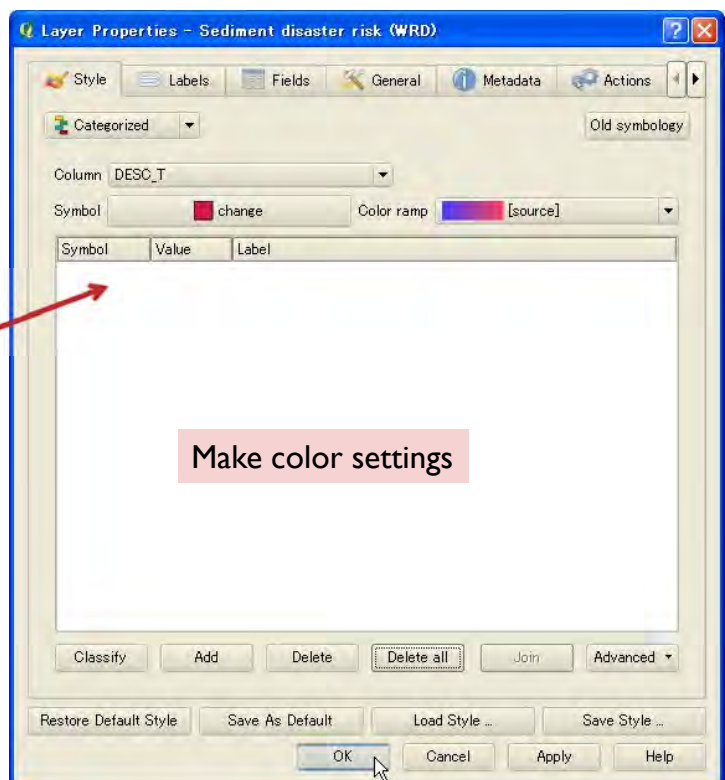
### 3. Making Inventory Maps

#### 3.5.5 Sediment disaster risk area map



Right click

Select “Properties”

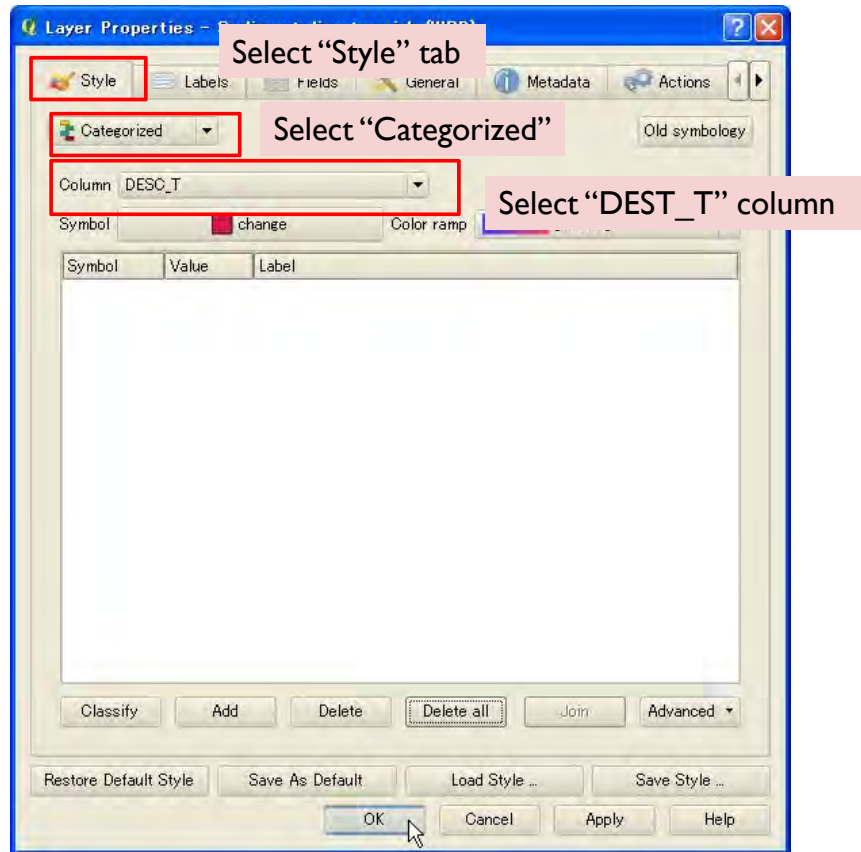


Make color settings



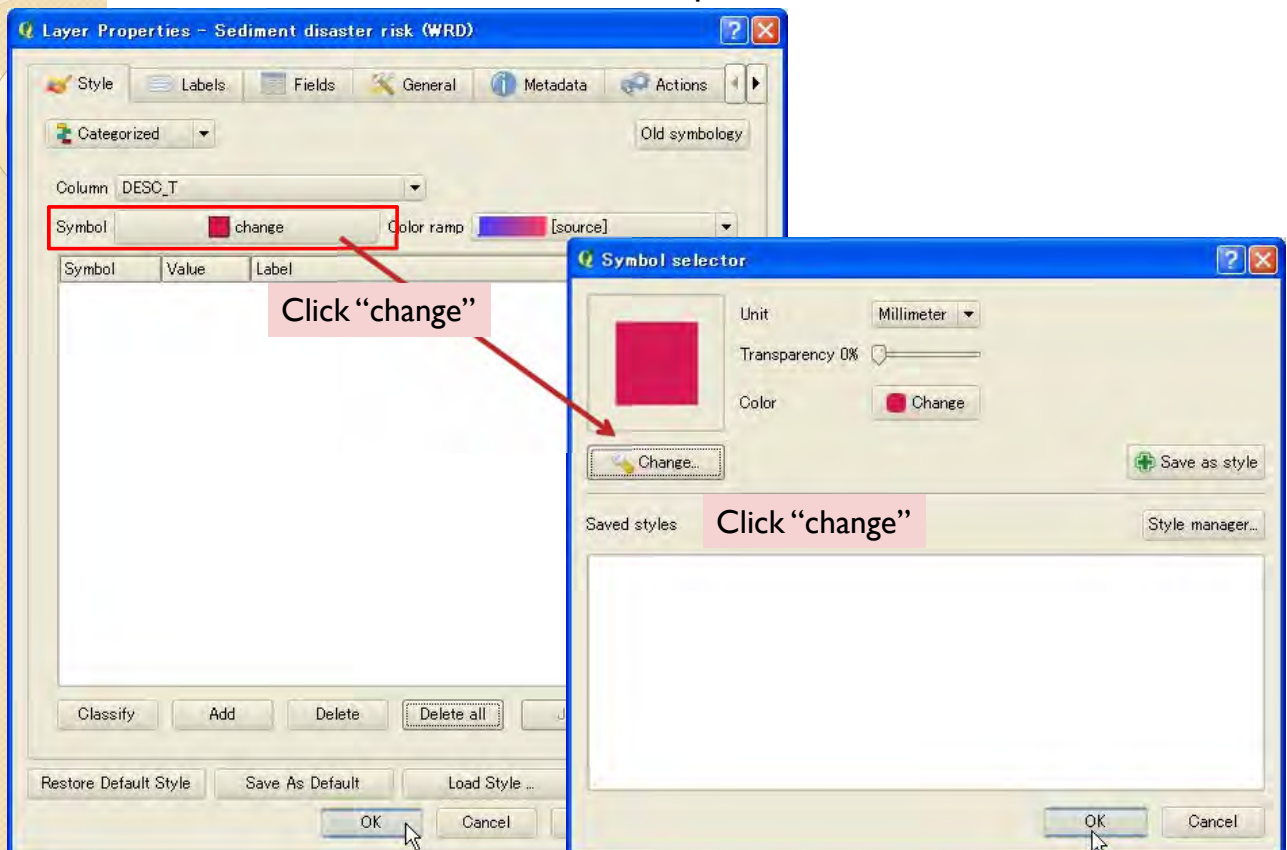
### 3. Making Inventory Maps

#### 3.5.5 Sediment disaster risk area map



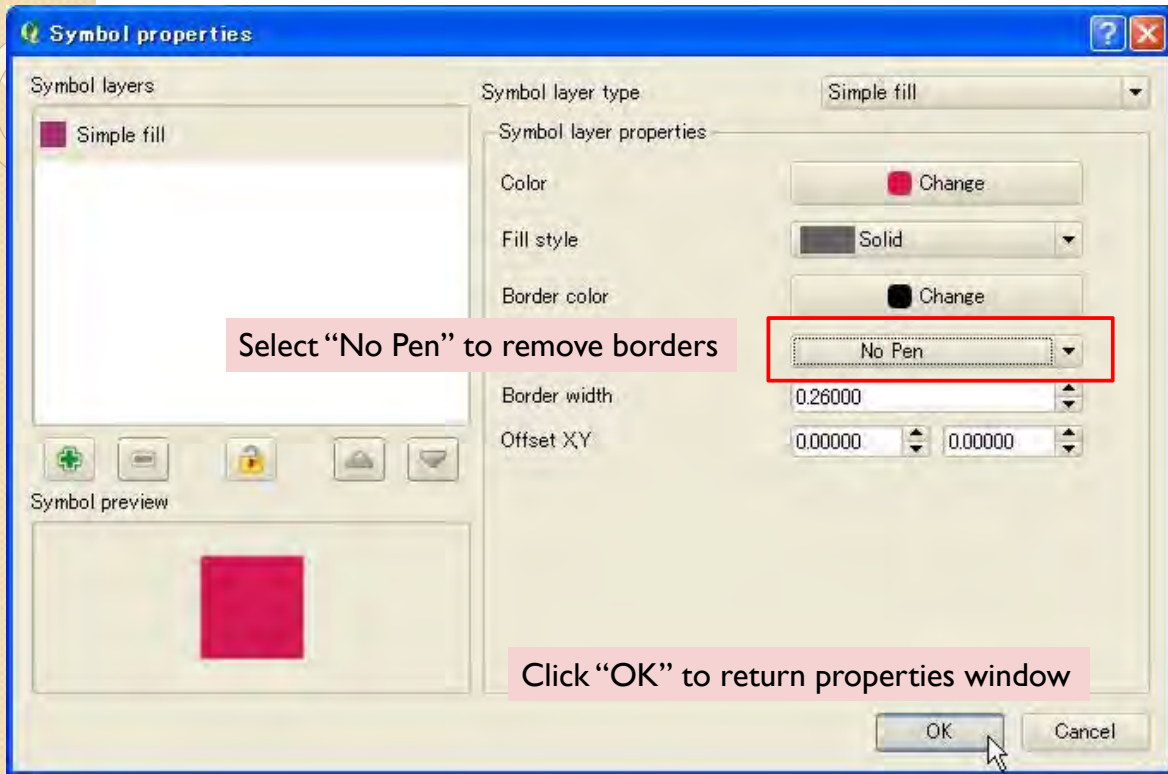
### 3. Making Inventory Maps

#### 3.5.5 Sediment disaster risk area map



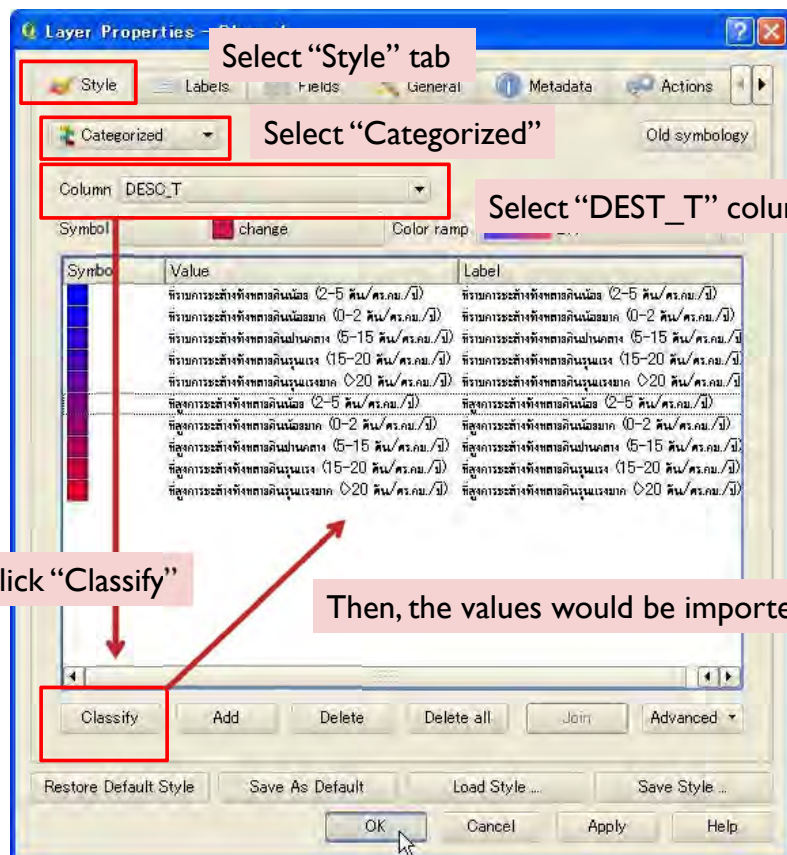
### 3. Making Inventory Maps

#### 3.5.5 Sediment disaster risk area map



### 3. Making Inventory Maps

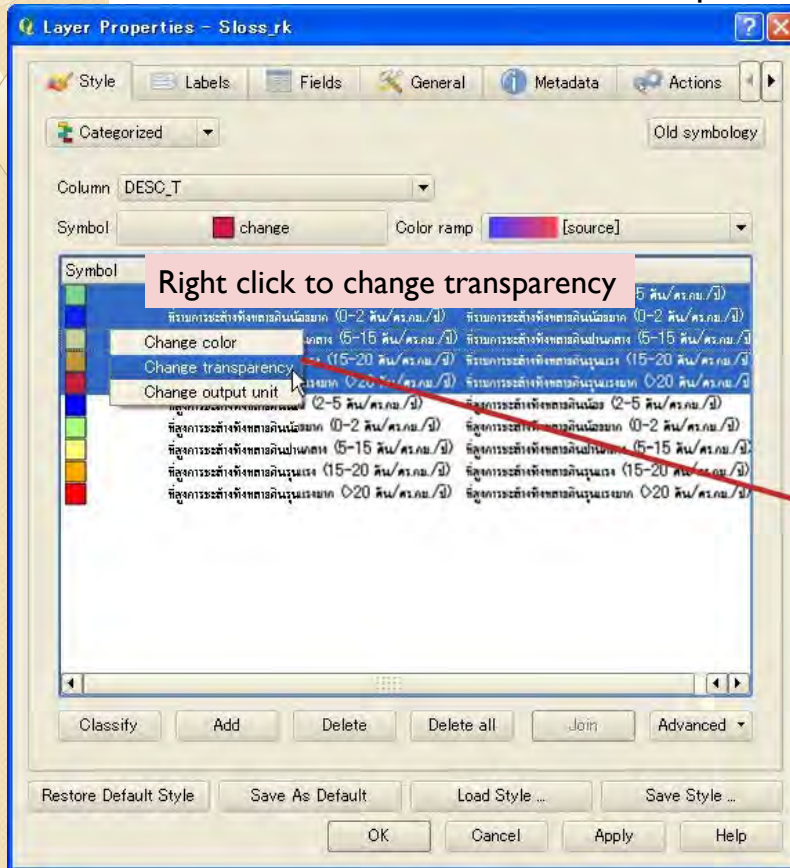
#### 3.5.5 Sediment disaster risk area map





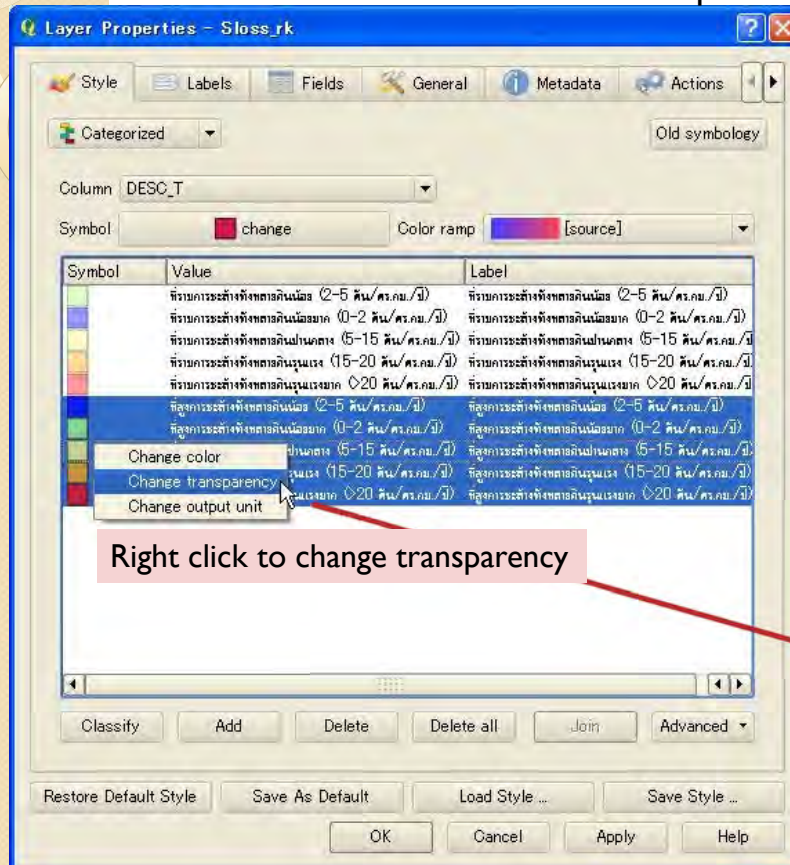
### 3. Making Inventory Maps

#### 3.5.5 Sediment disaster risk area map



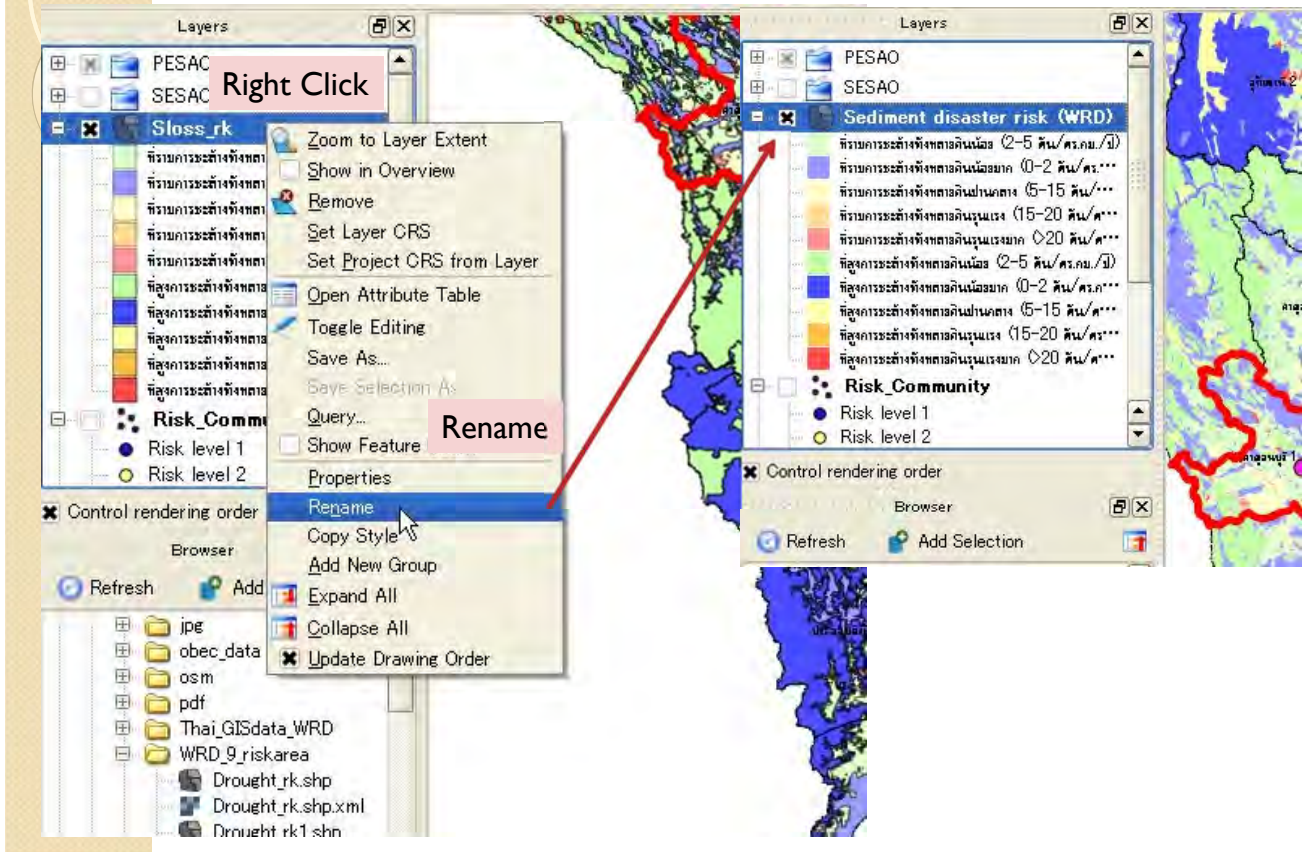
### 3. Making Inventory Maps

#### 3.5.5 Sediment disaster risk area map



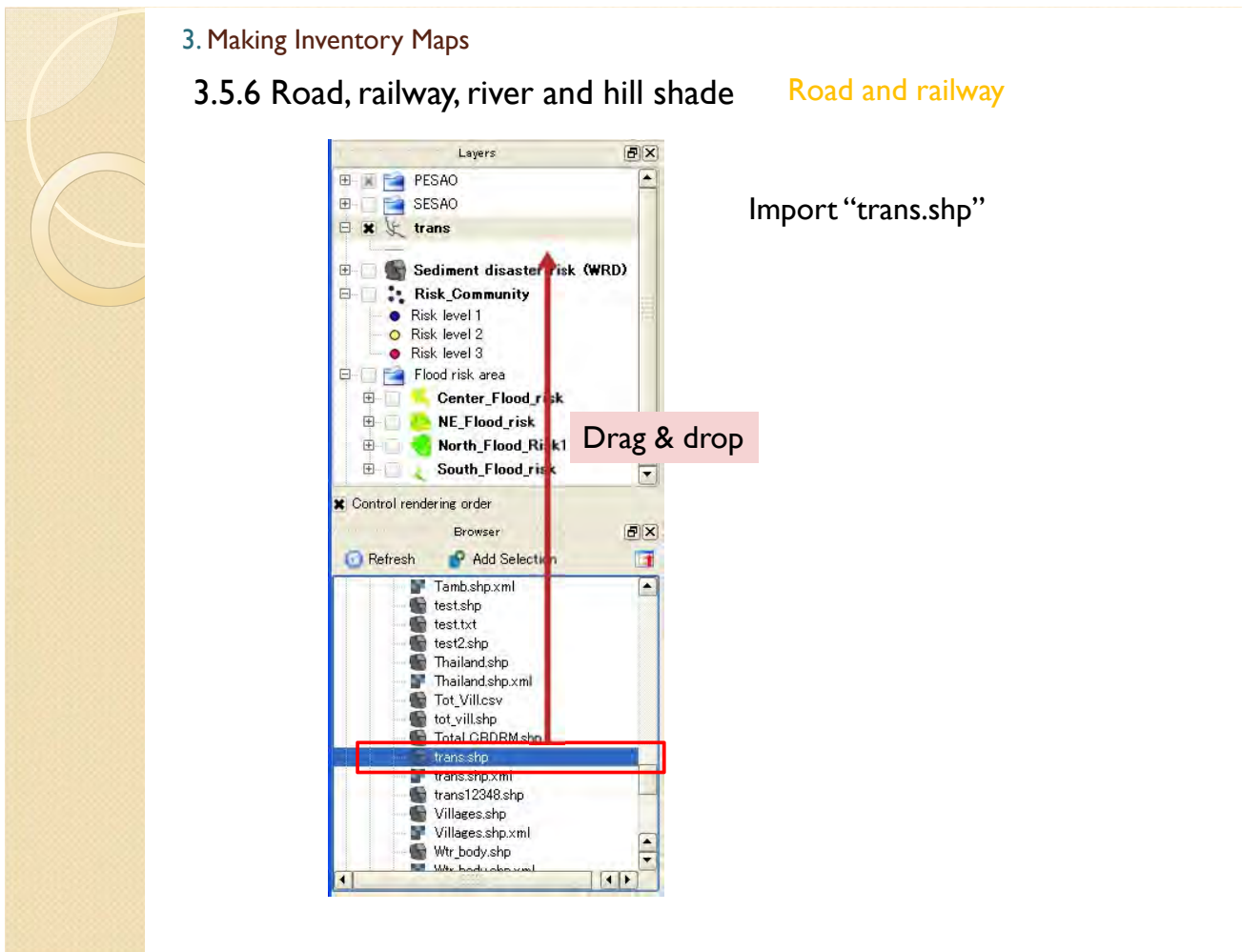
### 3. Making Inventory Maps

#### 3.5.5 Sediment disaster risk area map



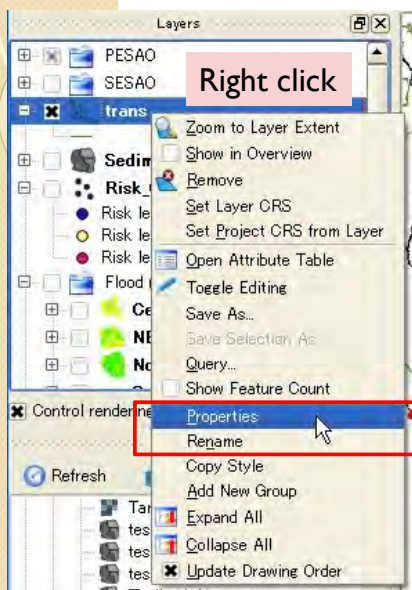
### 3. Making Inventory Maps

#### 3.5.6 Road, railway, river and hill shade Road and railway

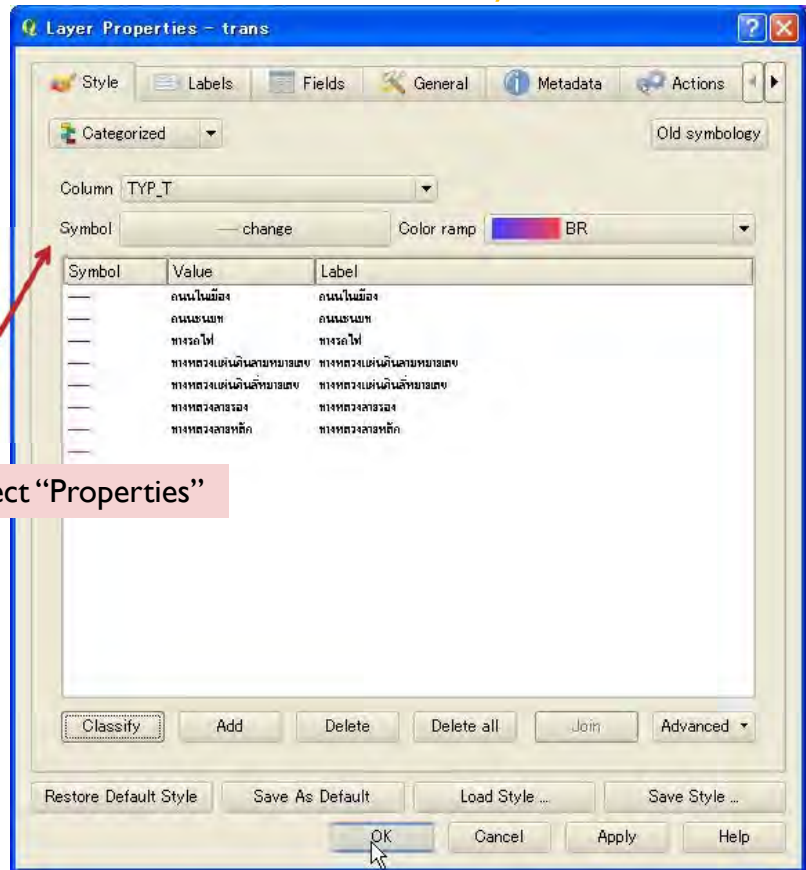


### 3. Making Inventory Maps

#### 3.5.6 Road, railway, river and hill shade Road and railway

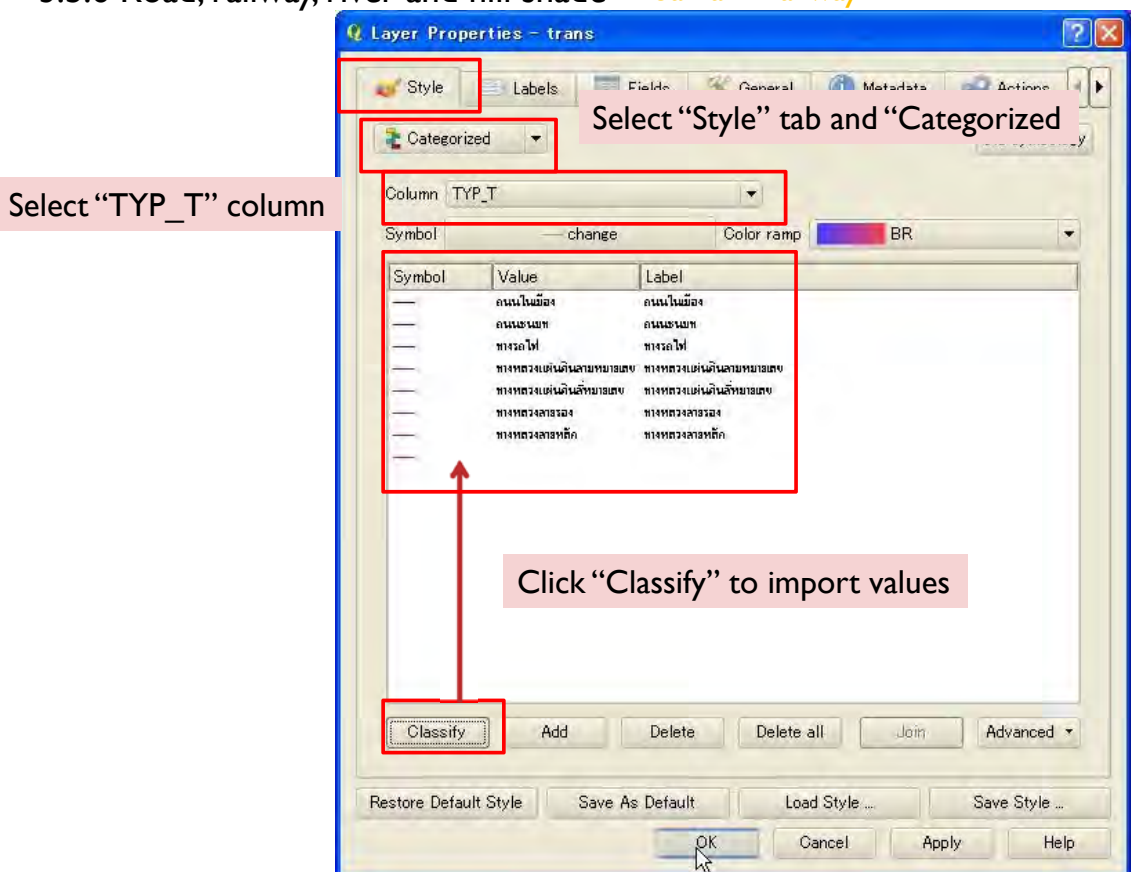


Select "Properties"



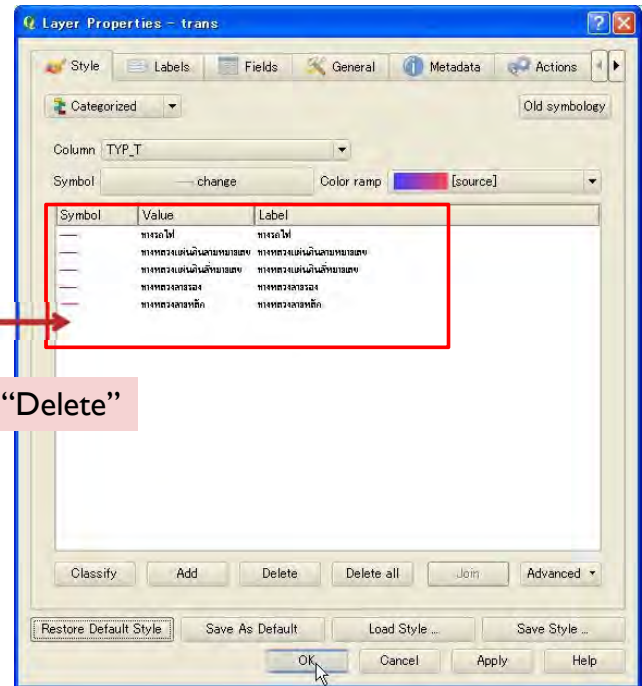
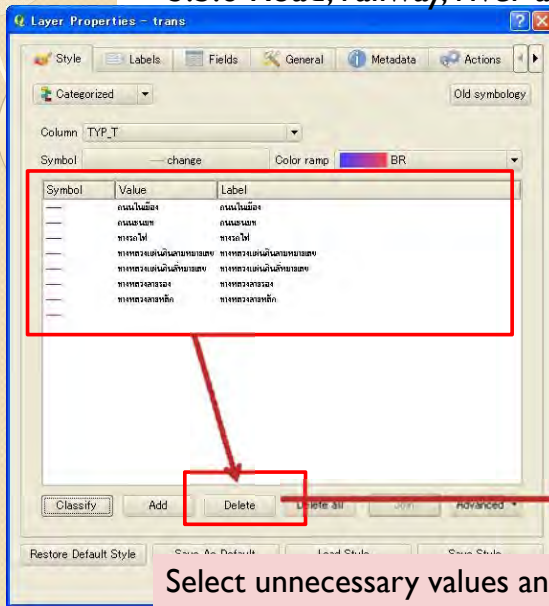
### 3. Making Inventory Maps

#### 3.5.6 Road, railway, river and hill shade Road and railway



### 3. Making Inventory Maps

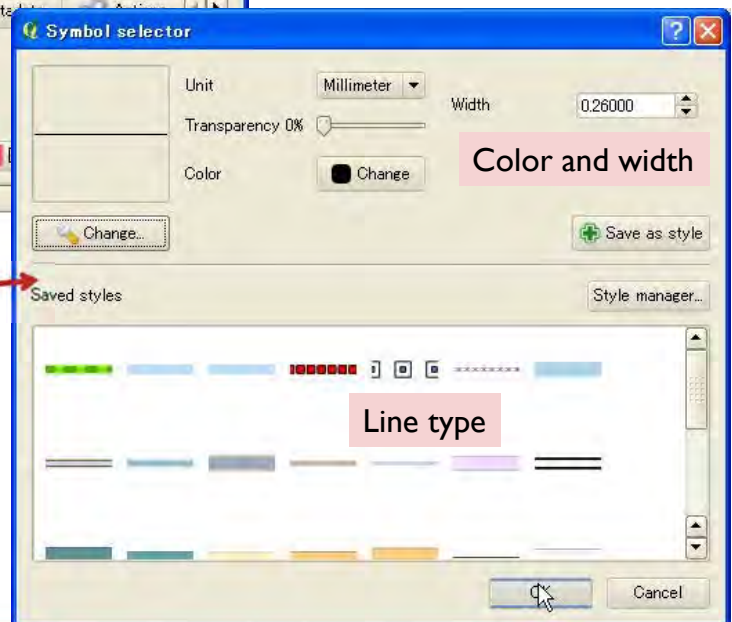
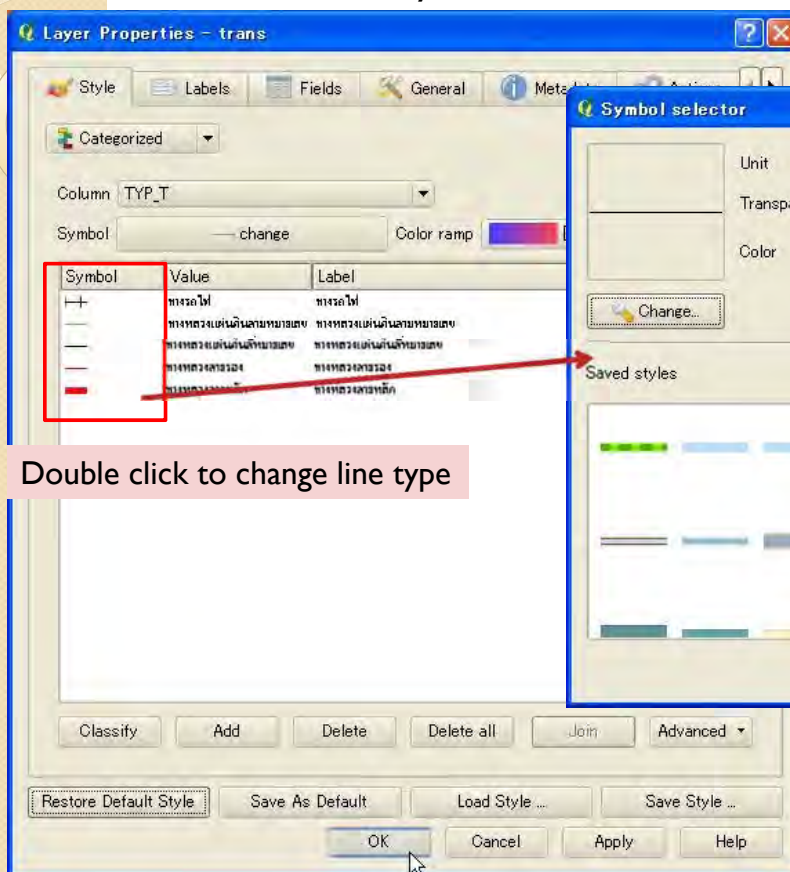
#### 3.5.6 Road, railway, river and hill shade Road and railway



Select unnecessary values and click "Delete"

### 3. Making Inventory Maps

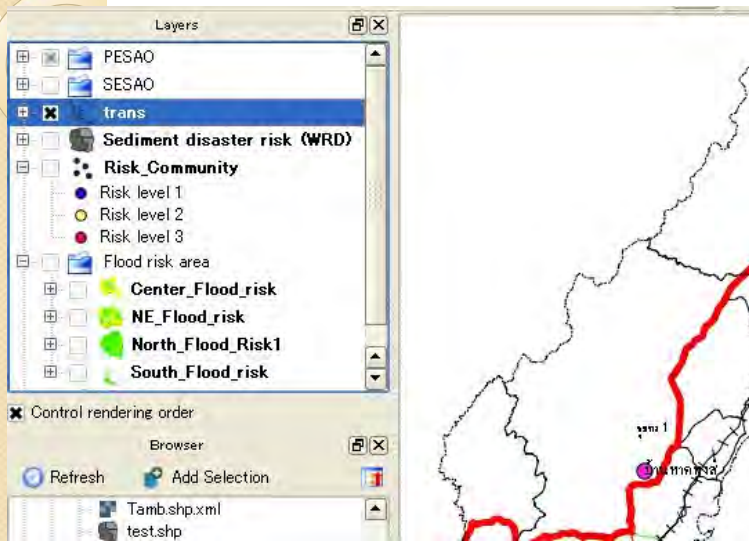
#### 3.5.6 Road, railway, river and hill shade Road and railway



Double click to change line type

### 3. Making Inventory Maps

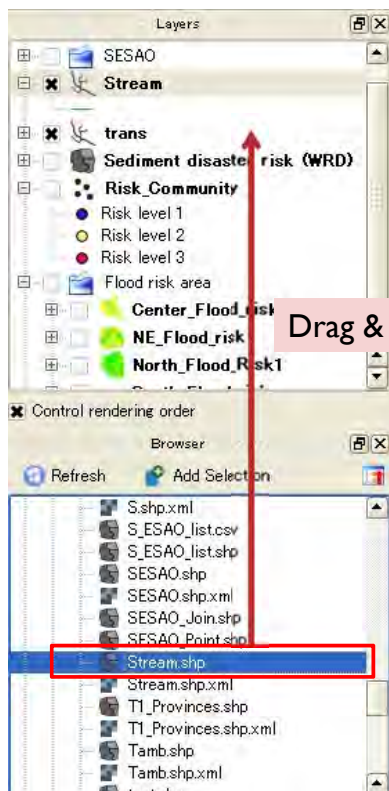
#### 3.5.6 Road, railway, river and hill shade **Road and railway**



Then, you can see transportation map

### 3. Making Inventory Maps

#### 3.5.6 Road, railway, river and hill shade **River**



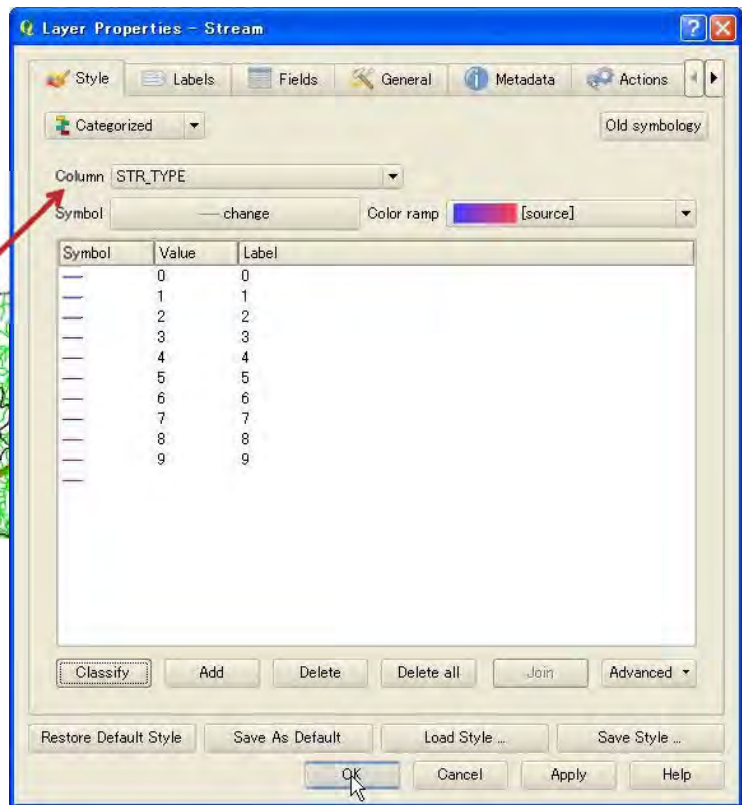
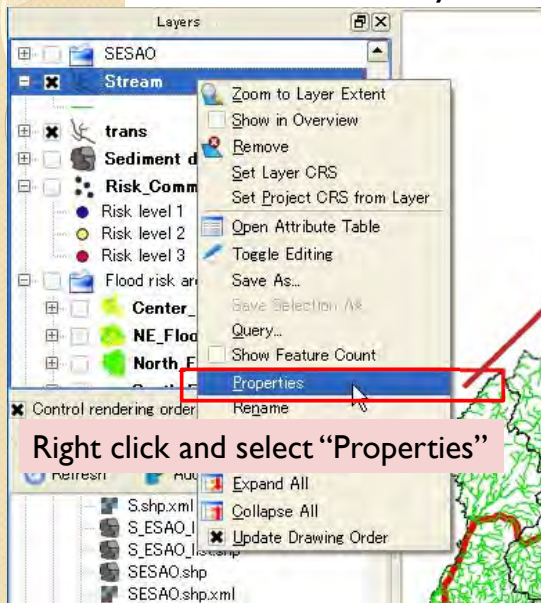
Import "Stream.shp"

Drag & drop



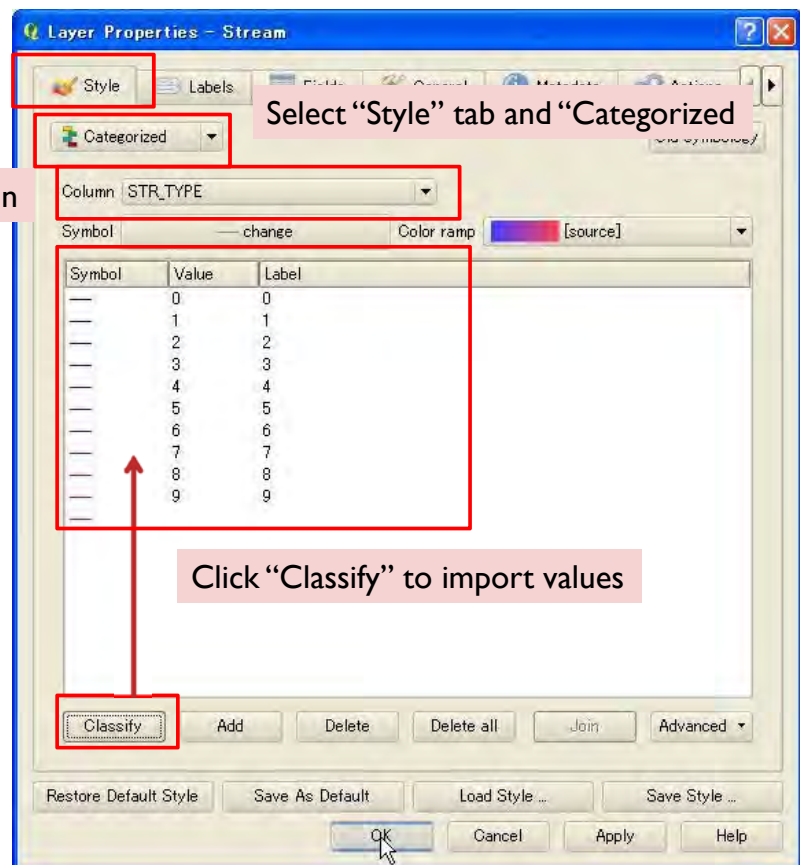
### 3. Making Inventory Maps

#### 3.5.6 Road, railway, river and hill shade River



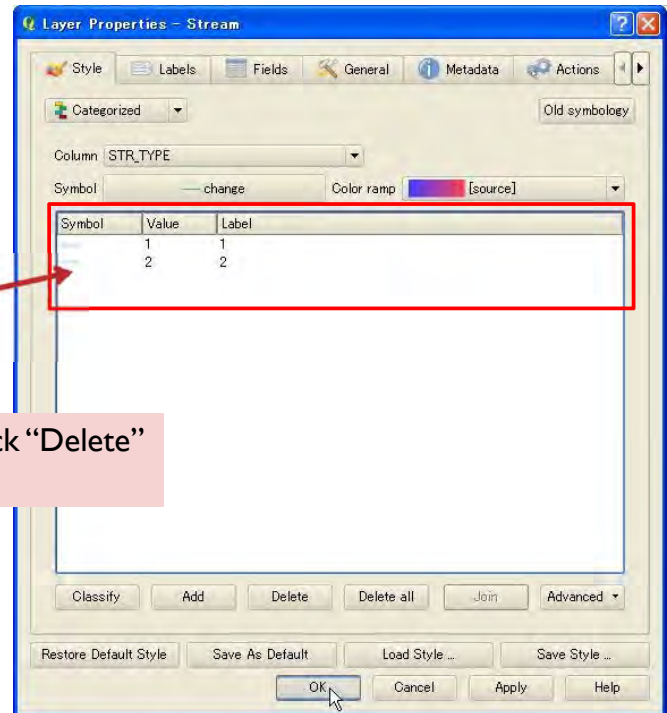
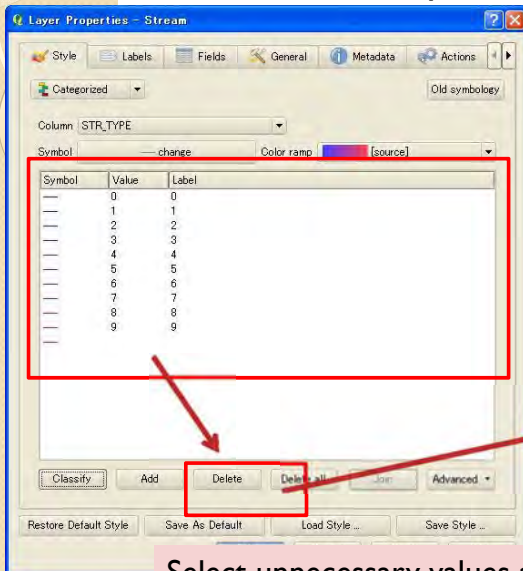
### 3. Making Inventory Maps

#### 3.5.6 Road, railway, river and hill shade River



### 3. Making Inventory Maps

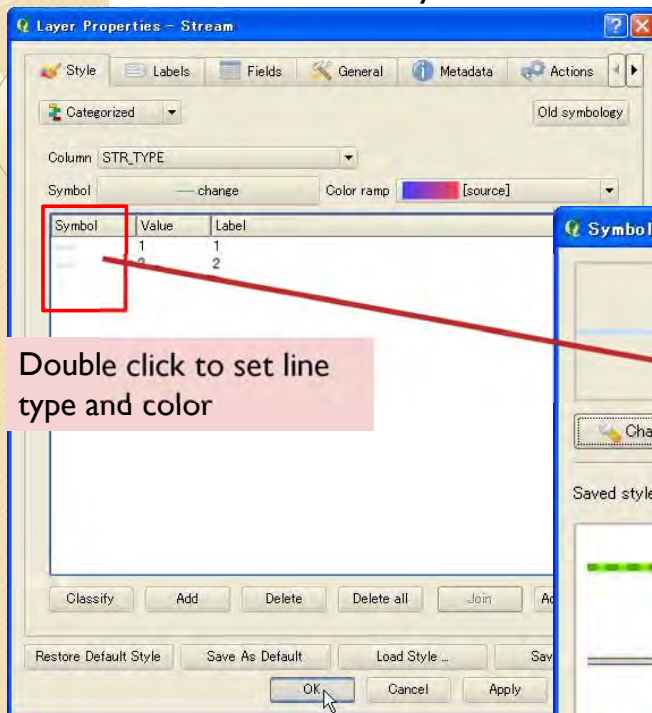
#### 3.5.6 Road, railway, river and hill shade River



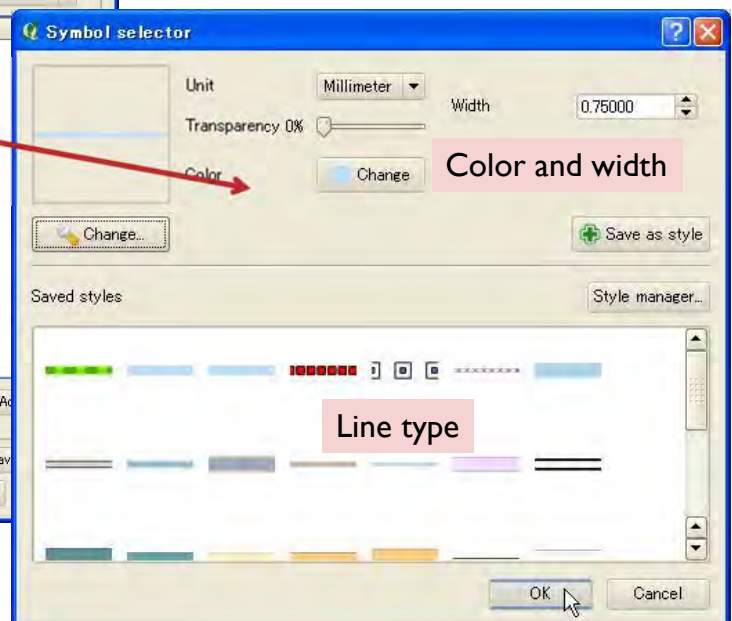
Select unnecessary values and click "Delete"  
("1" and "2" are major rivers)

### 3. Making Inventory Maps

#### 3.5.6 Road, railway, river and hill shade River



Double click to set line  
type and color

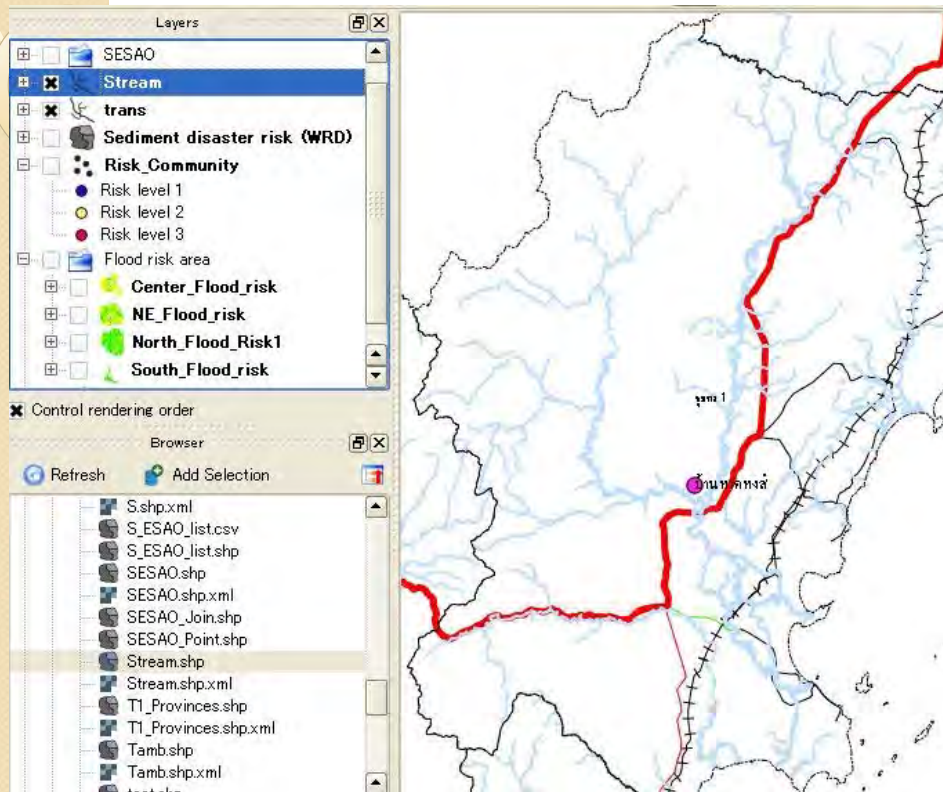


Color and width

Line type

### 3. Making Inventory Maps

#### 3.5.6 Road, railway, river and hill shade **River**



Then, river map is displayed.

### 3. Making Inventory Maps

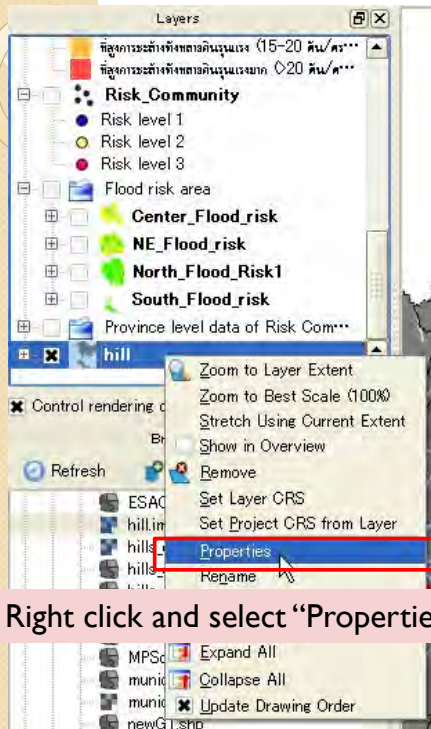
#### 3.5.6 Road, railway, river and hill shade **Hill shade**



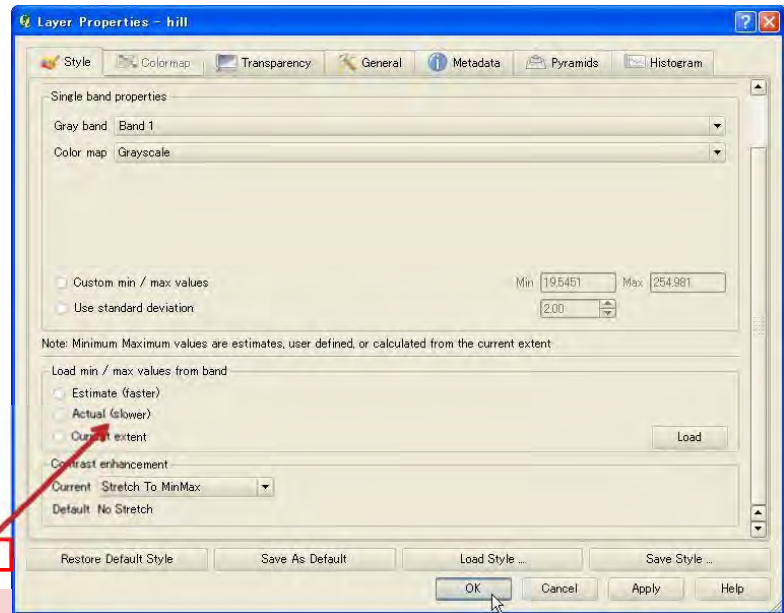
Import "hill.img"

### 3. Making Inventory Maps

#### 3.5.6 Road, railway, river and hill shade Hill shade

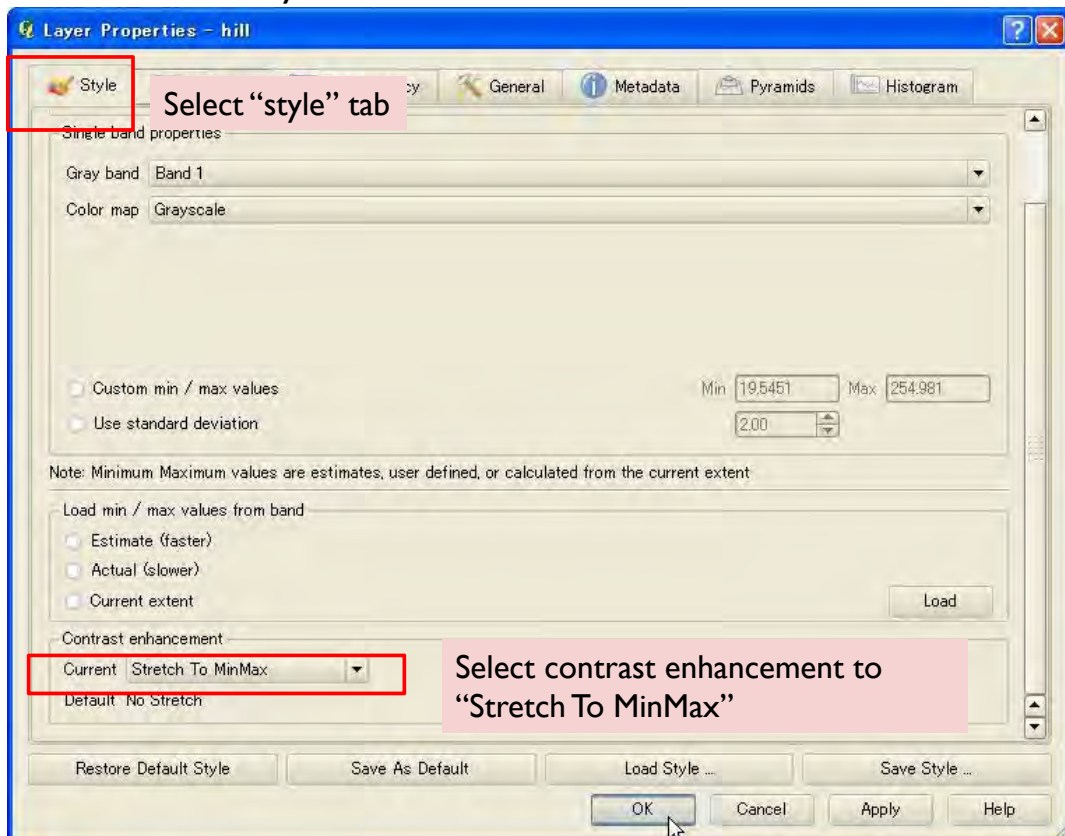


Right click and select "Properties"



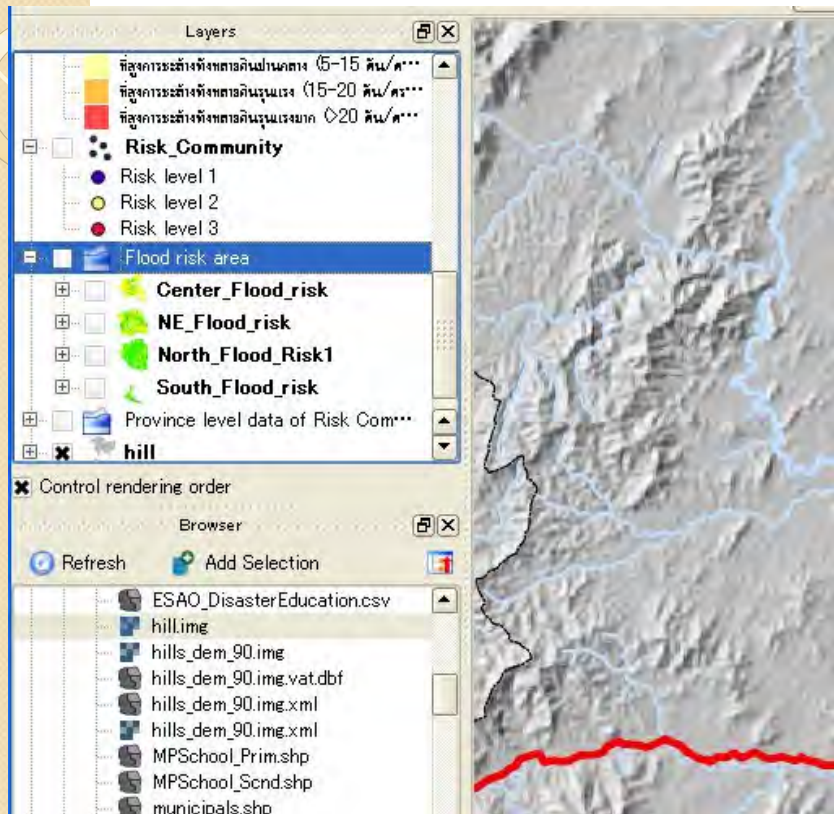
### 3. Making Inventory Maps

#### 3.5.6 Road, railway, river and hill shade Hill shade



### 3. Making Inventory Maps

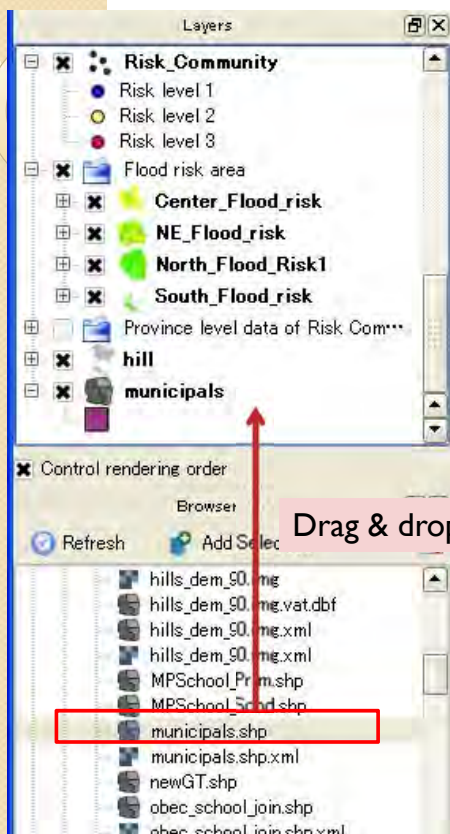
#### 3.5.6 Road, railway, river and hill shade Hill shade



Then, you can display hill shade.

### 3. Making Inventory Maps

#### 3.5.6 Road, railway, river and hill shade City labels

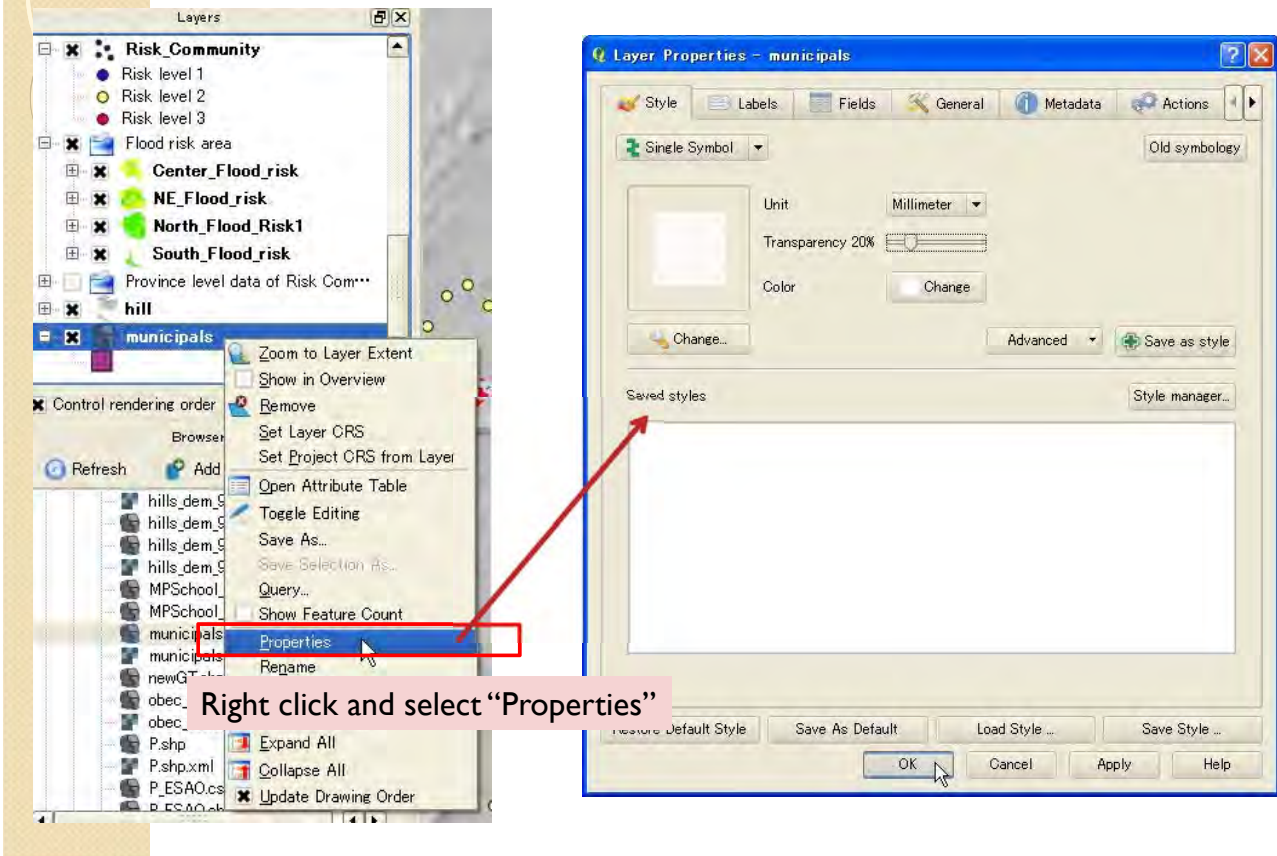


Import "municipals.shp"

Drag & drop

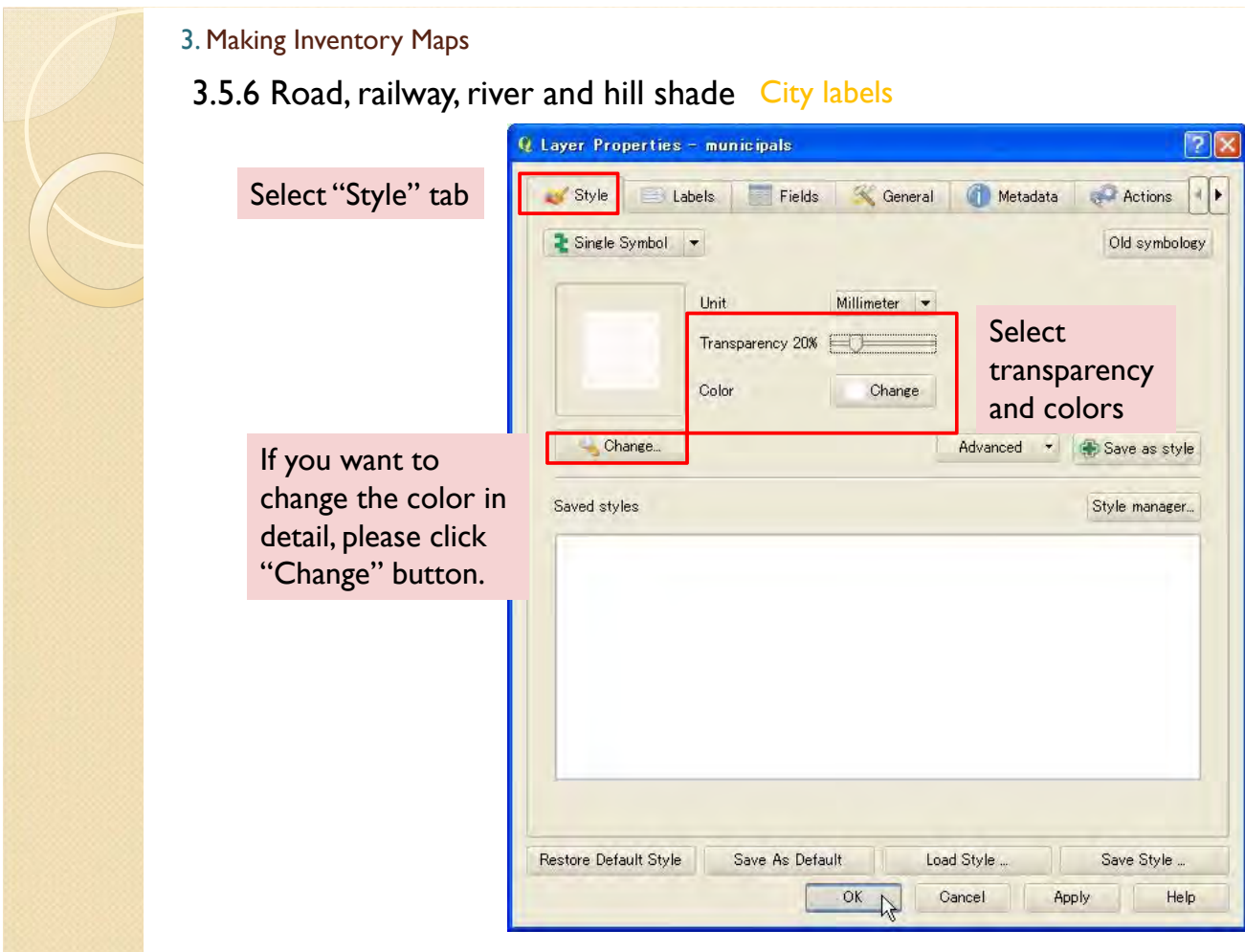
### 3. Making Inventory Maps

#### 3.5.6 Road, railway, river and hill shade City labels



### 3. Making Inventory Maps

#### 3.5.6 Road, railway, river and hill shade City labels

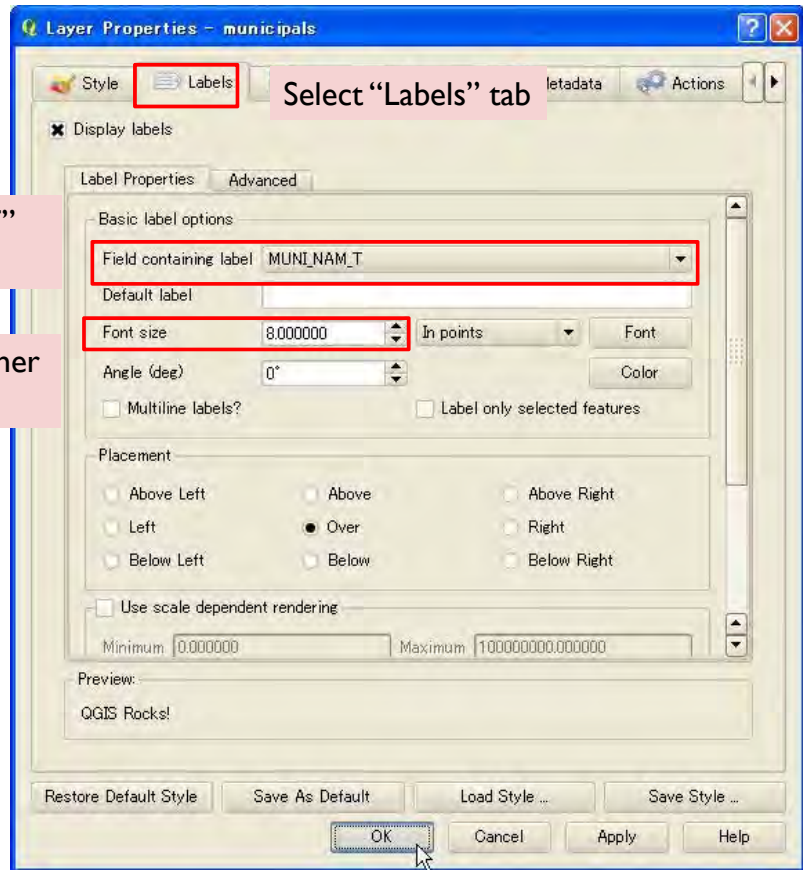


### 3. Making Inventory Maps

#### 3.5.6 Road, railway, river and hill shade City labels

Select "MUNI\_NAM\_T"  
column to display

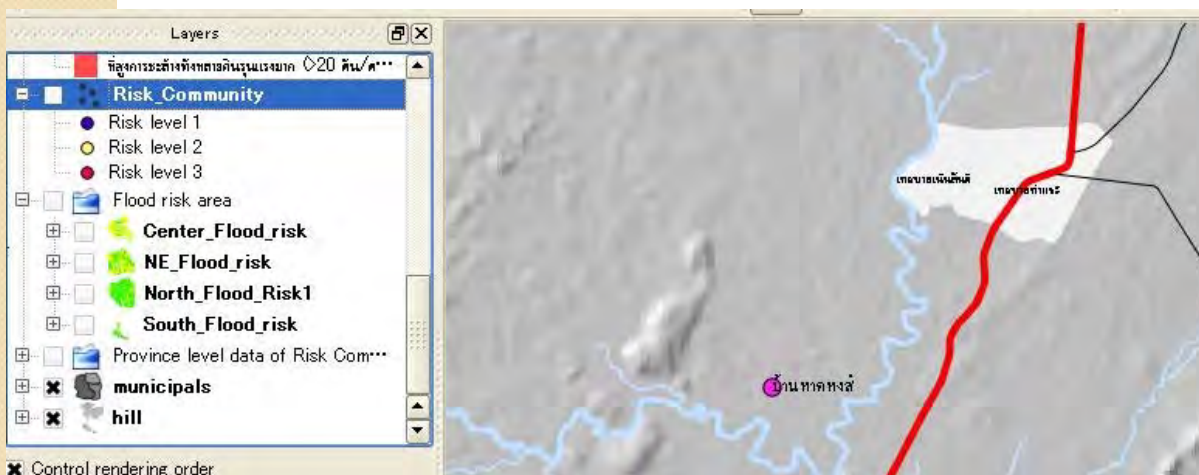
Font size and other  
settings here



### 3. Making Inventory Maps

#### 3.5.6 Road, railway, river and hill shade City labels

Then you can see cities.

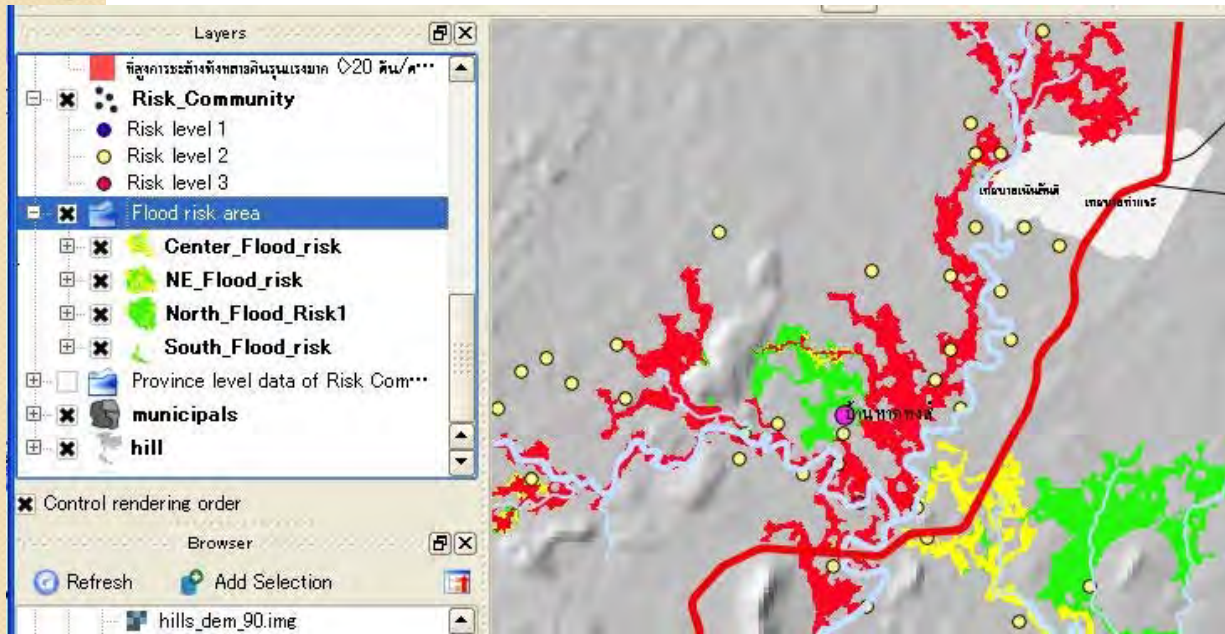


### 3. Making Inventory Maps

#### 3.5.7 Change order and display

You can change display order and layers.

The following example shows risk communities and flood risk area with pilot school. Such information is useful to understand risk area distribution and to make decision about disaster education action plan and pilot/model site.



### 3. Making Inventory Maps

#### 3.5.7 Change order and display

Note: These information is one of indicators for disaster risk. Out of the indicated risk area do not mean actual no risk area.

The data of risk community still contains any wrong and missing locations.

