

## Appendix 5

GIS operation guide (Hue)

# GIS Operation Guide

T.T. Hue Province

## Contents

### Object of Training Course

#### **Course 1 View**

- [1-1] Base Map
- [1-2] Add raster
- [1-3] Setting up raster property
- [1-4] Save layer status

#### **Course 2 Reclass**

- [2-1] Preparation
- [2-2] Reclass (Flood 2m)
- [2-3] Reclass (Flood 5m)
- [2-4] Raster to Polygon

#### **Course 3 Overlay**

- [3-1] Preparation
- [3-2] Intersect (Main Road and Flood 2m)
- [3-3] Intersect (Houses and Flood 2m)
- [3-4] Intersect (Point Data and Flood 2m)
- [3-5] Erase

#### **Course 4 Attribute Table (1)**

- [4-1] Preparation
- [4-2] Change Layer Display
- [4-3] Counting
- [4-4] Rename of Field
- [4-5] Field Calculator

#### **Course 5 Attribute Table (2)**

- [5-1] Field Calculator
- [5-2] Change Layer Display
- [5-3] Join Attribute from Table (Excel Data)

#### **Course 6 Application of Simulation Result**

- [6-1] Preparation
- [6-2] Intersect
- [6-3] Merge of Polygon
- [6-4] Calculate Geometry
- [6-5] Finalize

#### **Course 7 Conversion from Simulation Results of MIKE**

- [7-1] Add Excel Data
- [7-2] Export Data
- [7-3] Point Data to TIN
- [7-4] Tin to Raster
- [7-5] Import Layer File

#### **Course Additional 1 Add Point Shapefile from GPS**

- [A1-1] Add Point Data from Excel Table
- [A1-2] Change Coordination System from WGS84 to VN2000

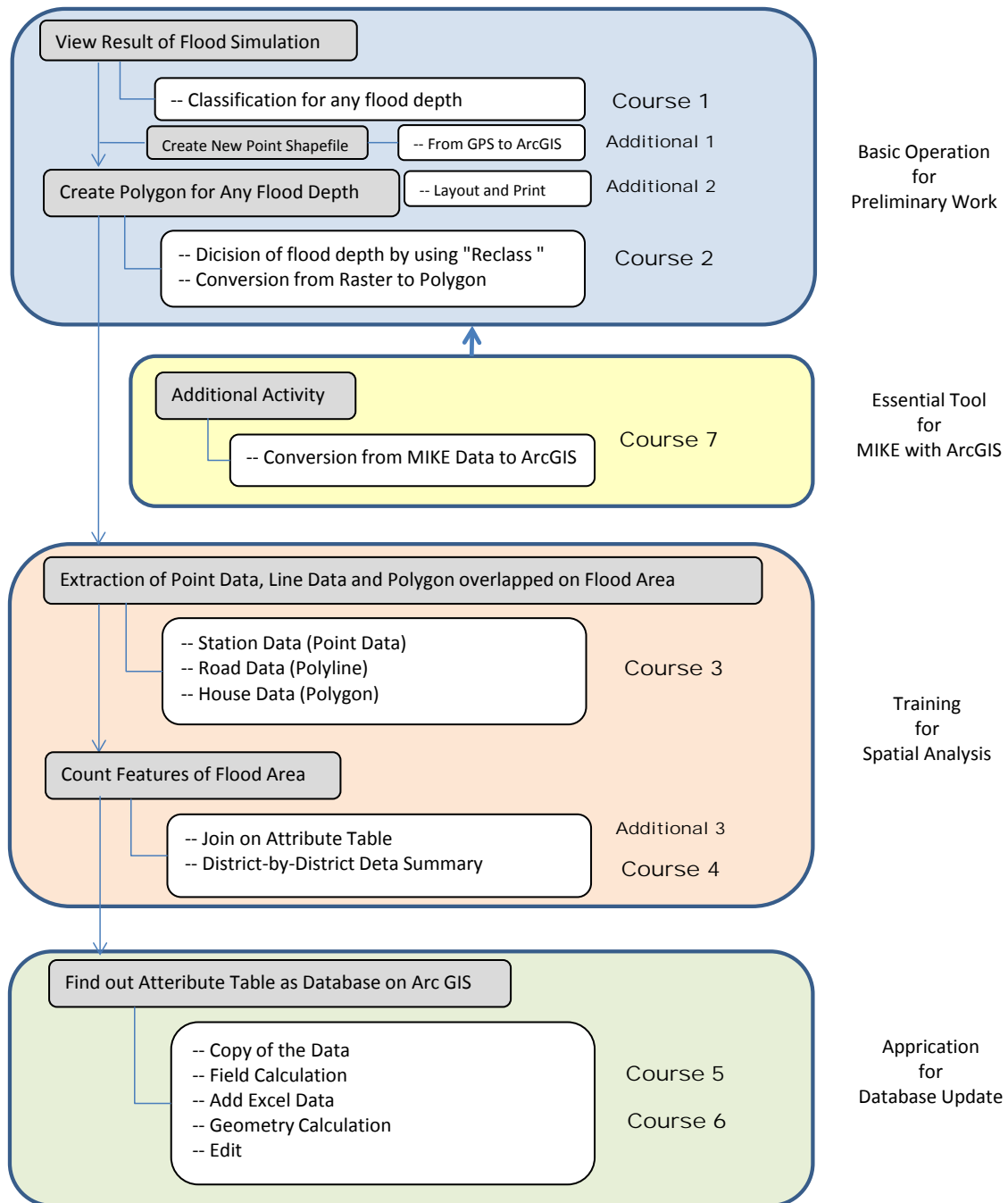
#### **Course Additional 2 Layout and Printing**

- [1] Mapfile
- [2] Page and Print Setup
- [3] Scale
- [4] Data Frame Setting
- [5] Layout of the Map
- [6] Printing

January 2012



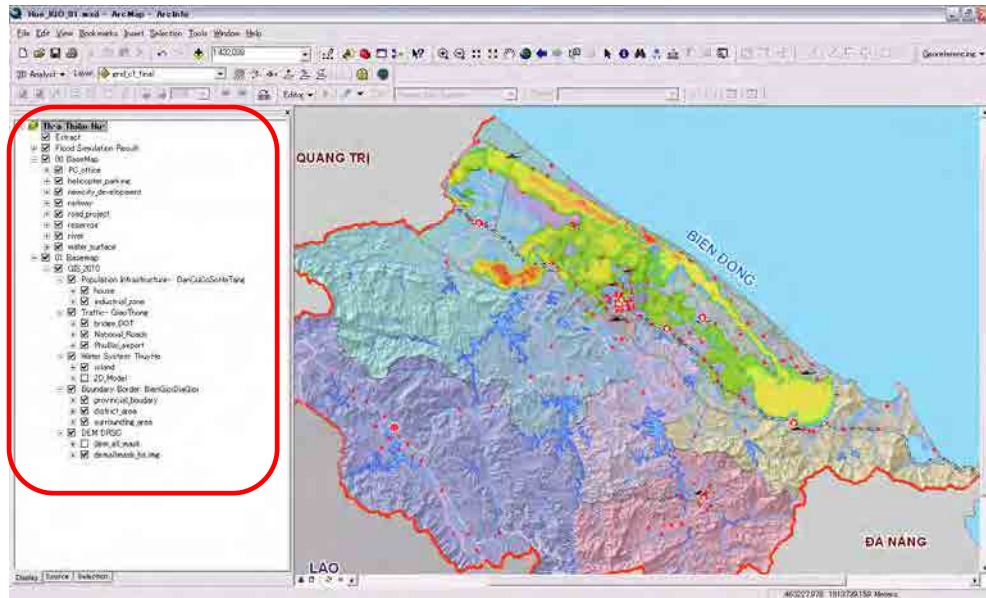
**Object of Training Course**



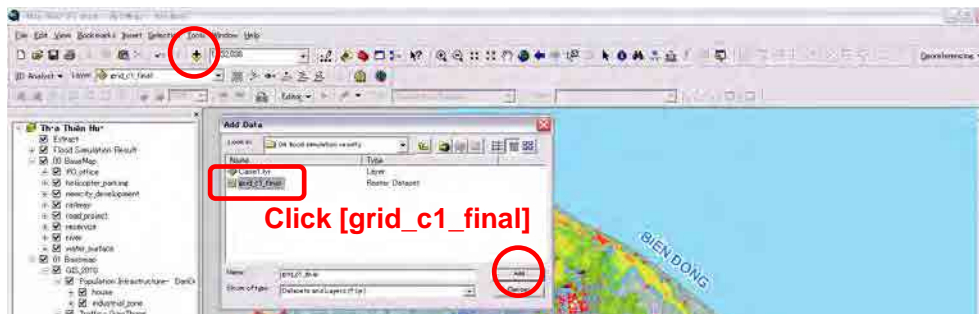
## Course 1 View

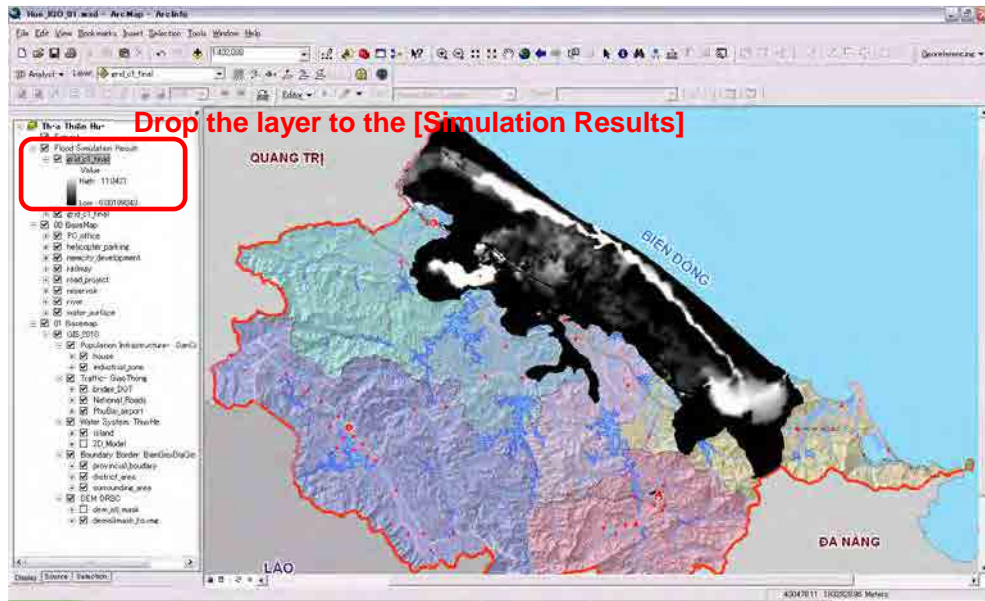
### [1-1] Base map

Confirm layers of T.T.Hue on the window.

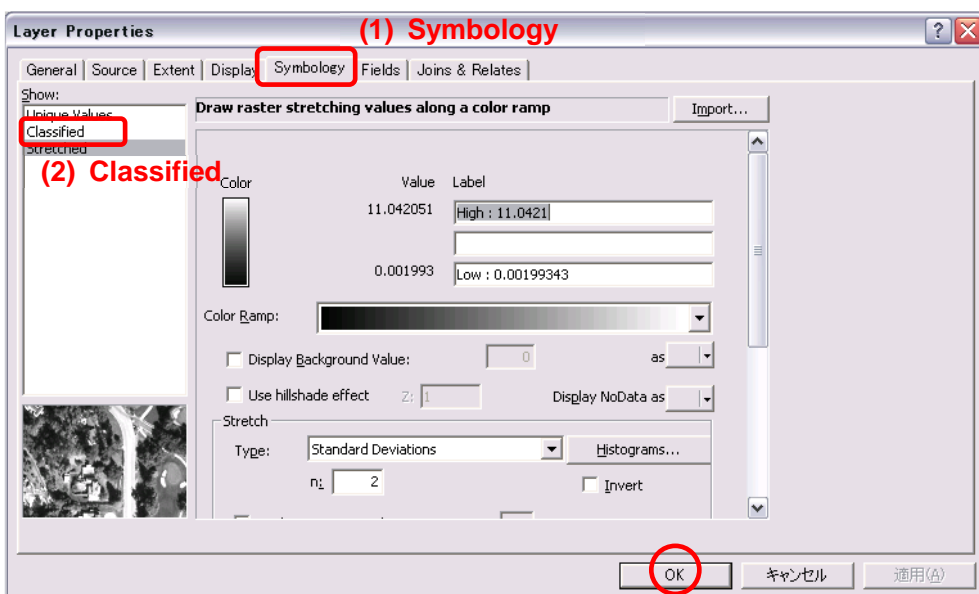
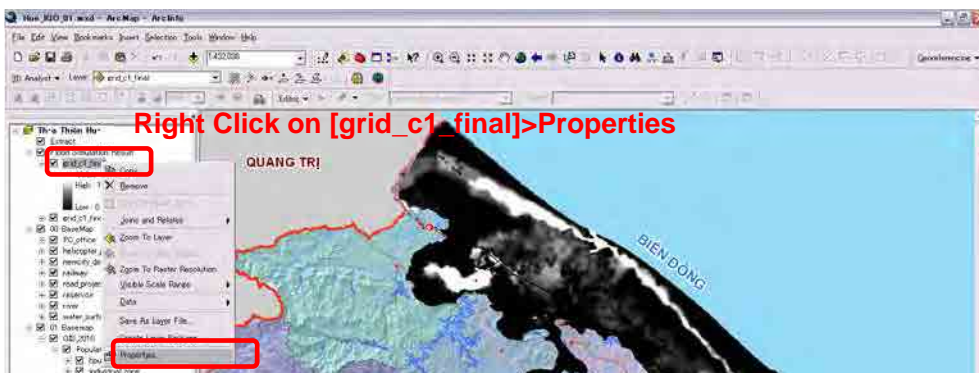


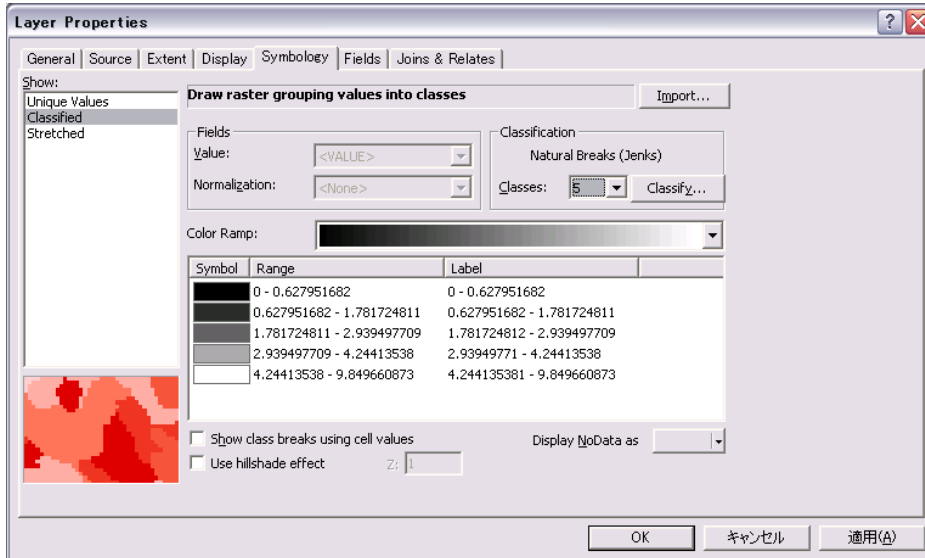
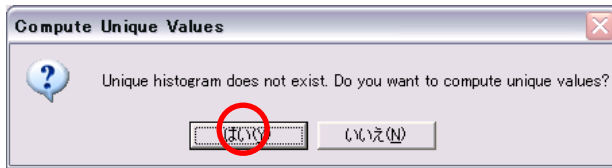
### [1-2] Add raster



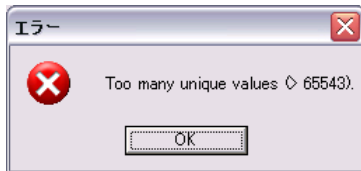


【1-3】 Setting up raster property

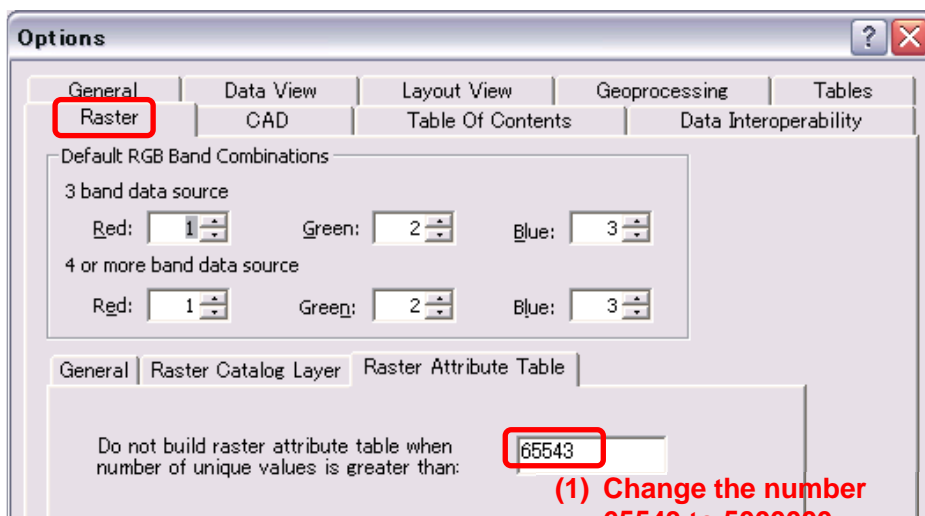


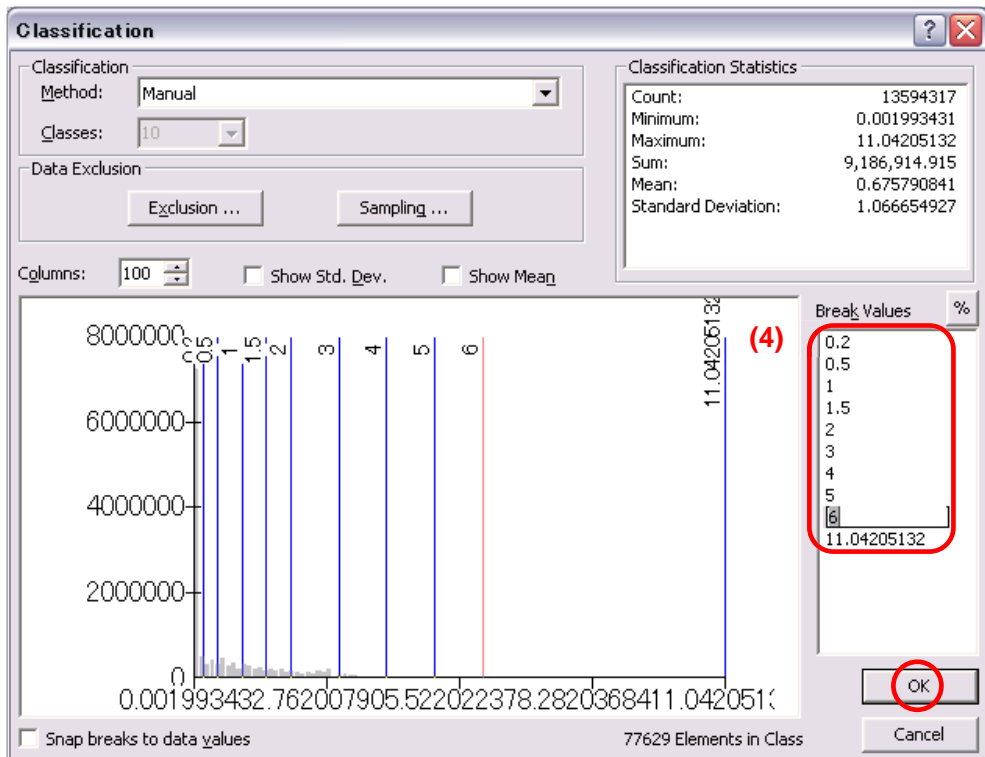
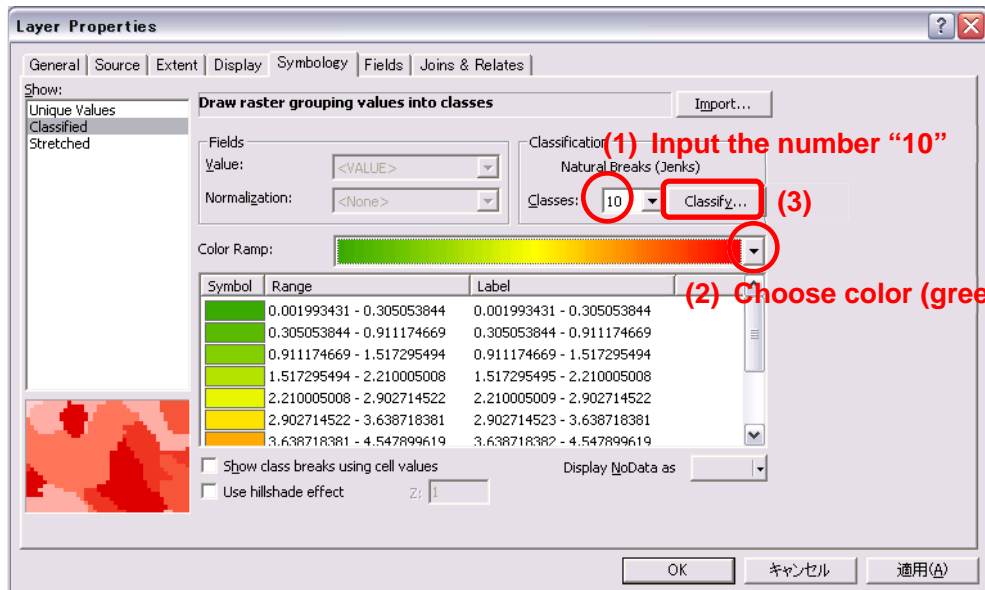


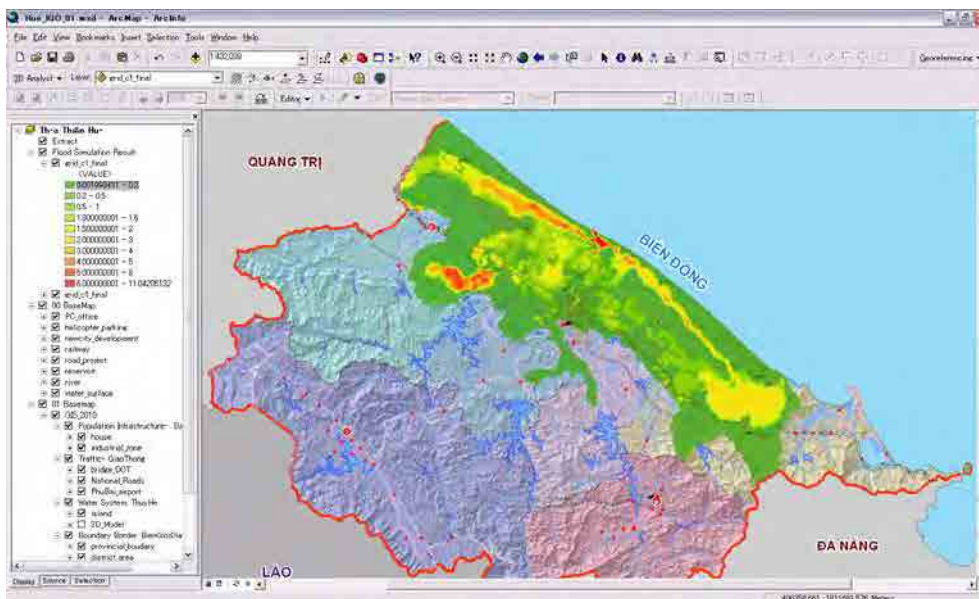
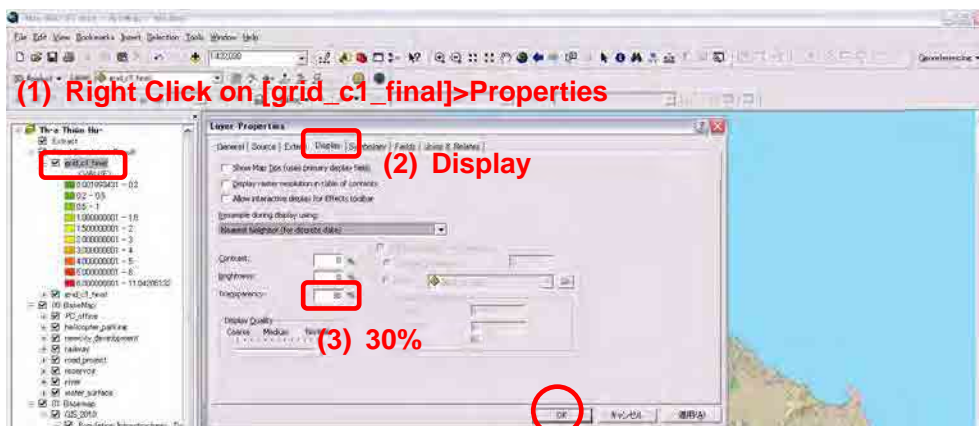
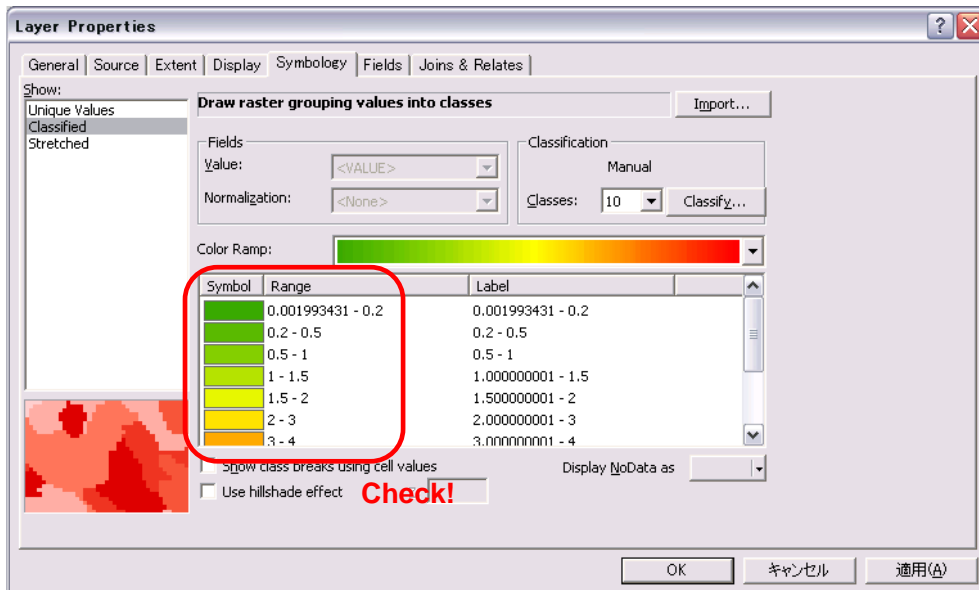
If this type of error is shown, you can change configuration.



Tools>Options>Raster

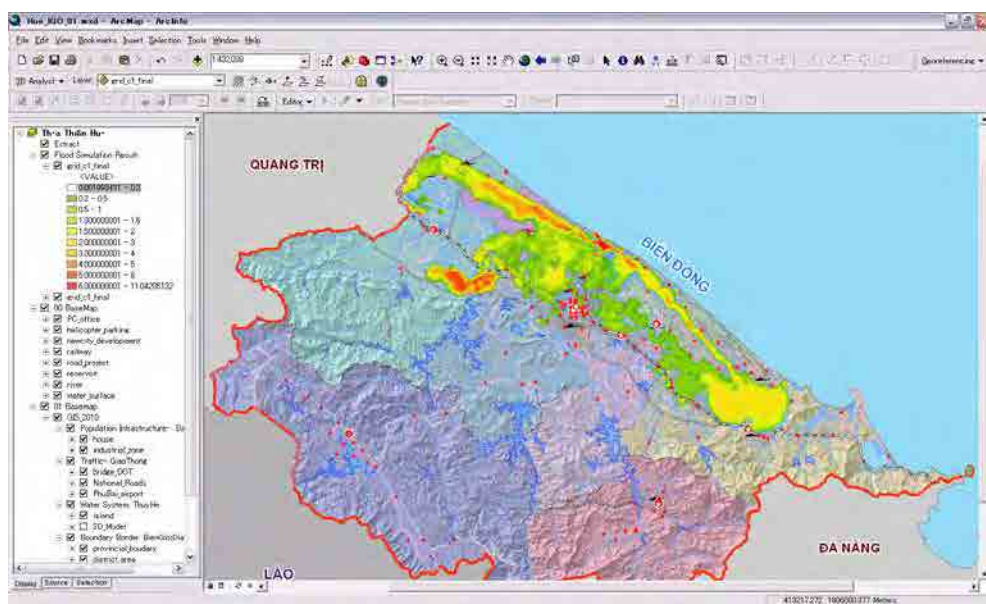
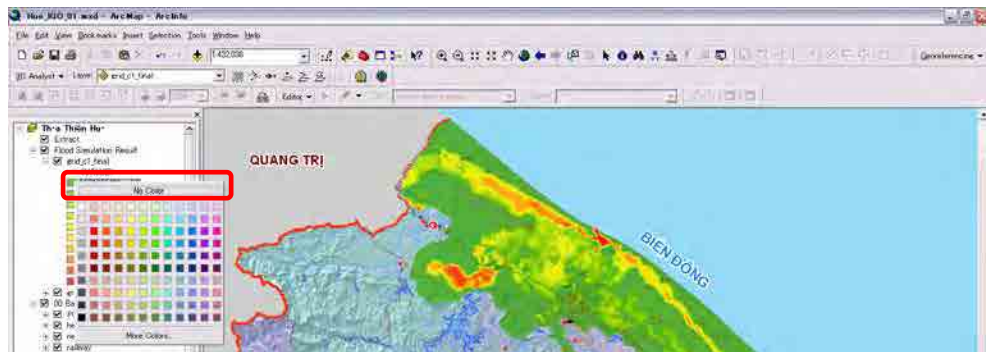






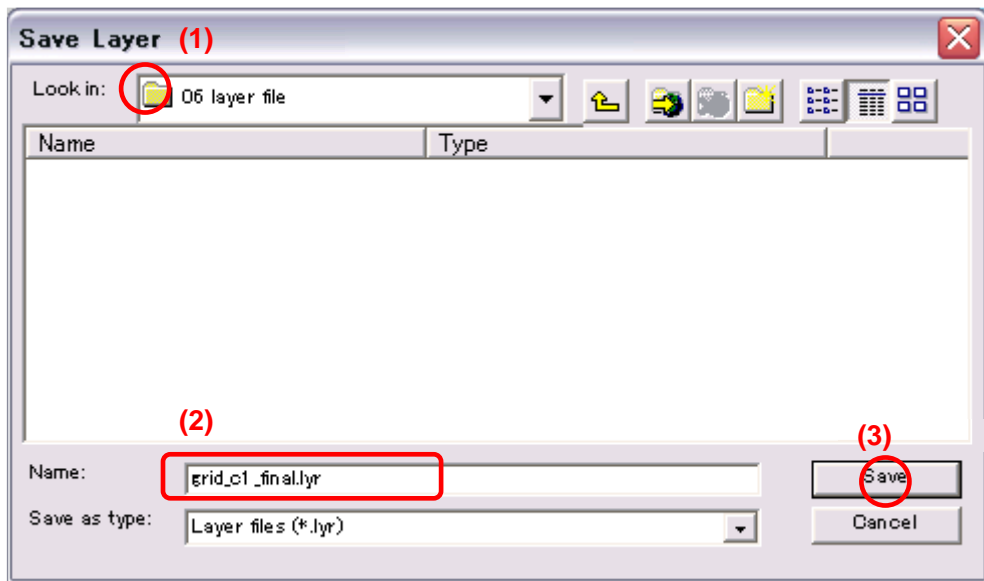


Remove “green” color on “0.001993431-0.2”



[1-4] Save layer status

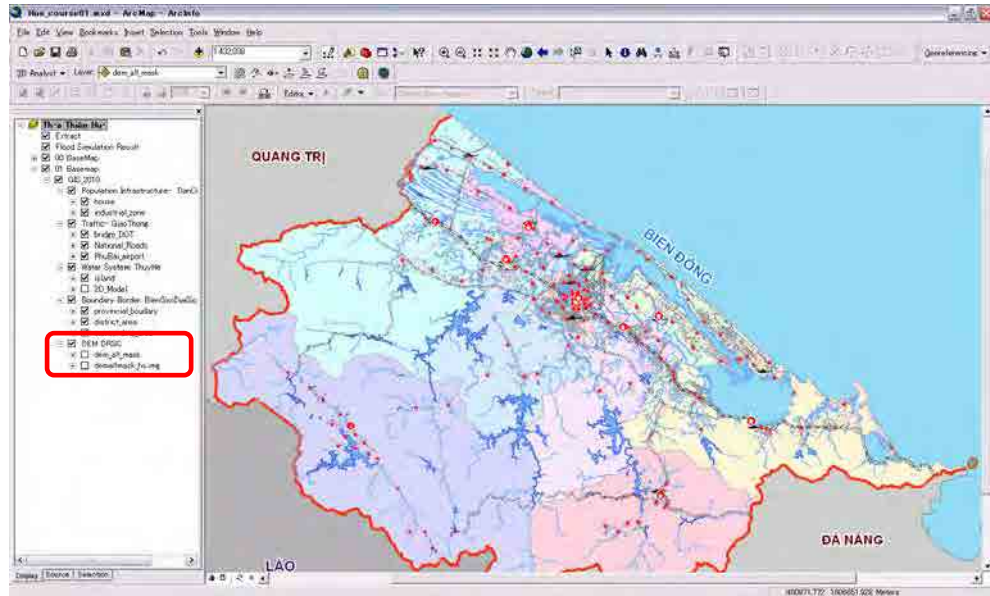




## Course 2 Reclass

### 【2-1】 Preparation

[Hide DEM Hill shade]

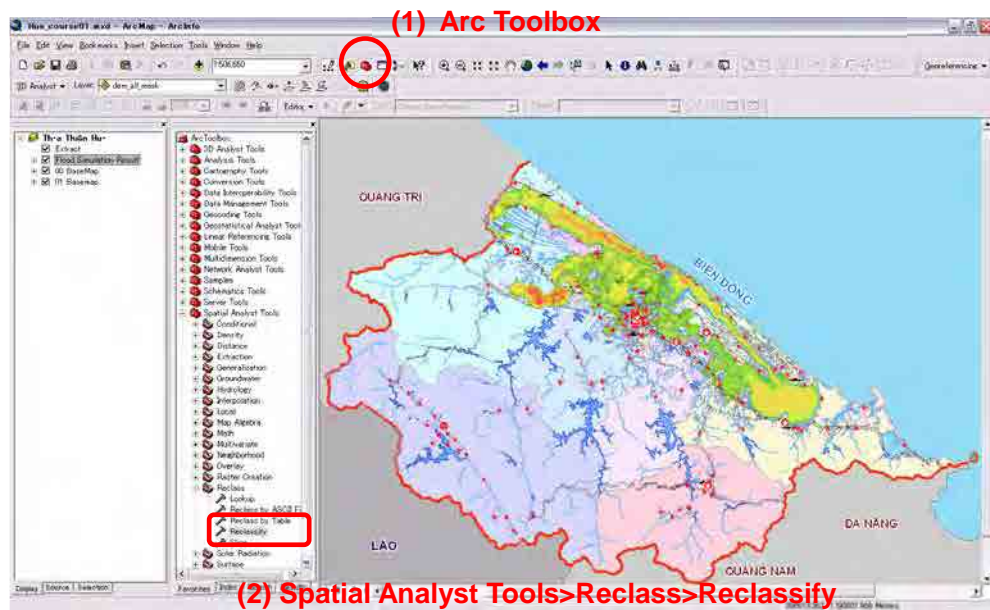


### 【2-2】 Reclass (2m)

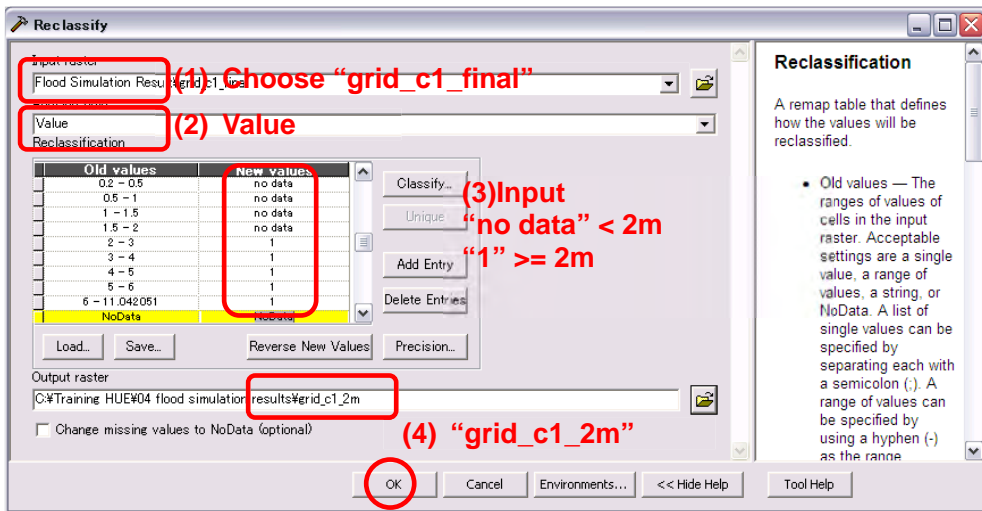
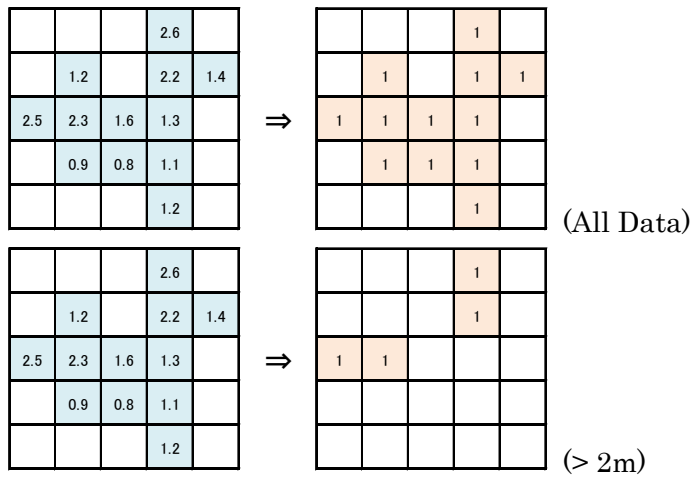
Let us extract 2m flooded area.

[Open the Arc Toolbox]

Spatial Analyst Tools>Reclass>Reclassify

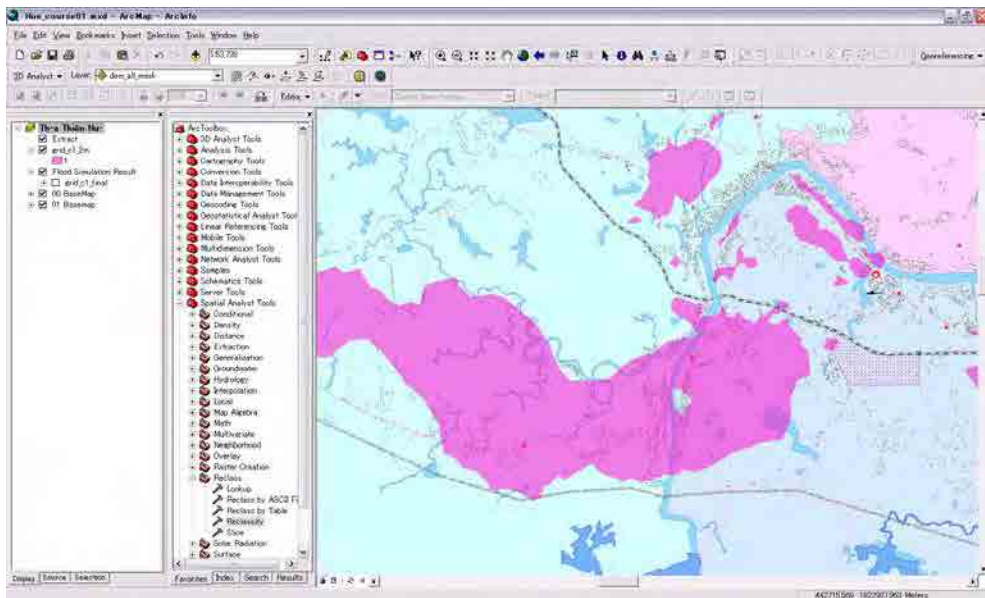
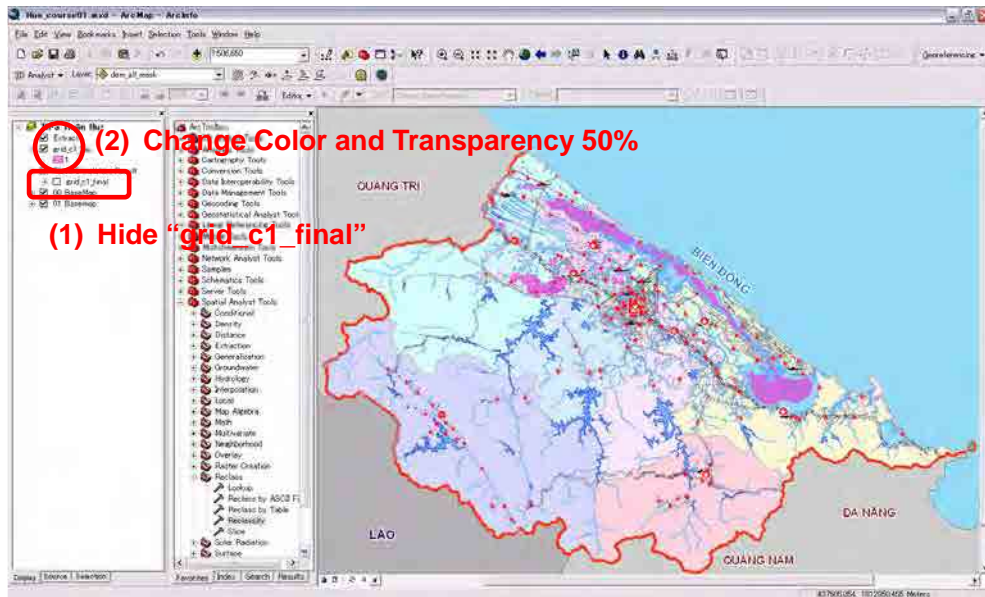


Concept of “Reclassify” on DEM



[Hide “grid\_c1\_final”]

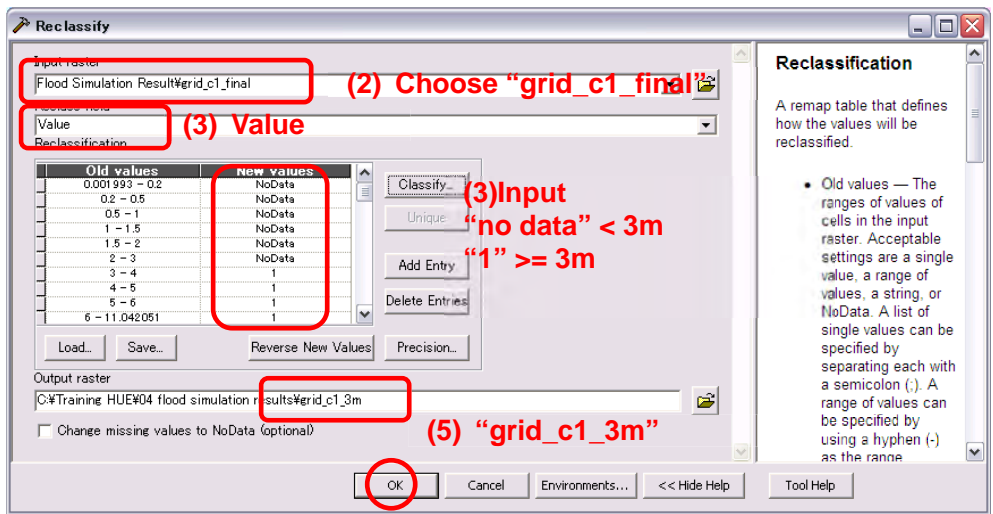
[Change color to blue and transparency 50% on “grid\_c1\_2m”]



Look at the map more carefully.

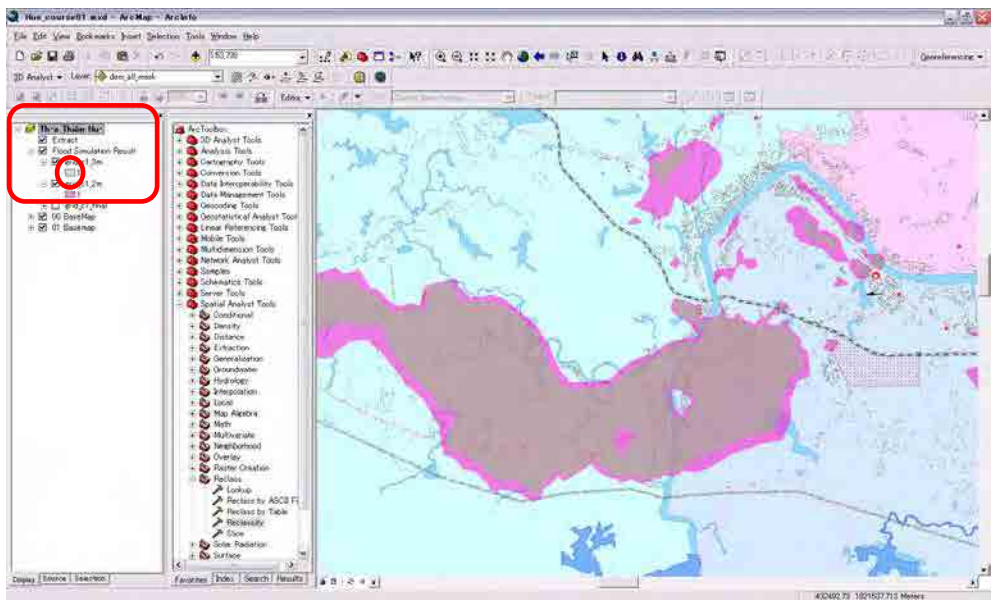
**[2-3] Reclass (3m)**

***Let us try to extract more than 3m flood on “grid c1 final”.***



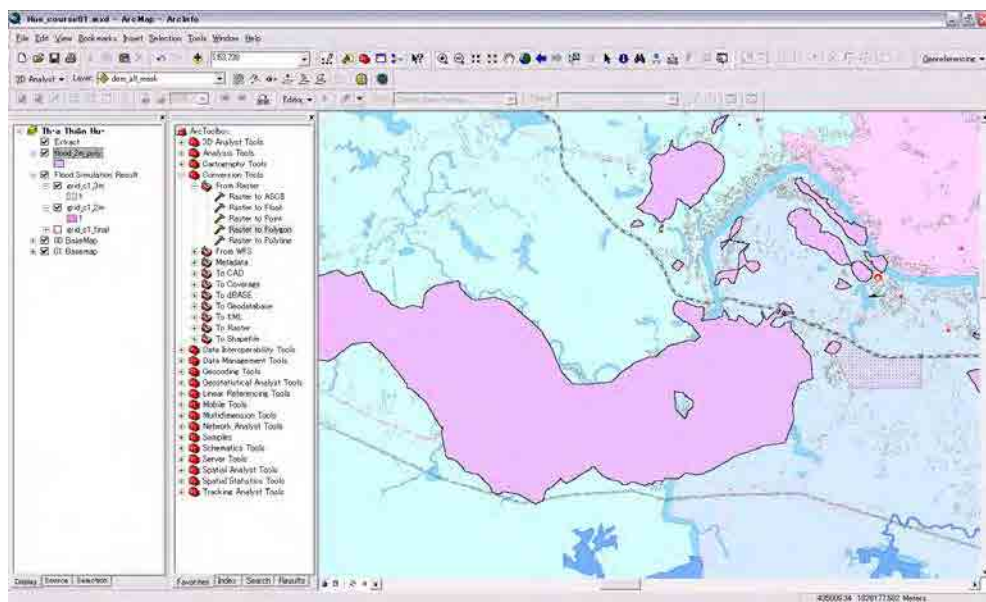
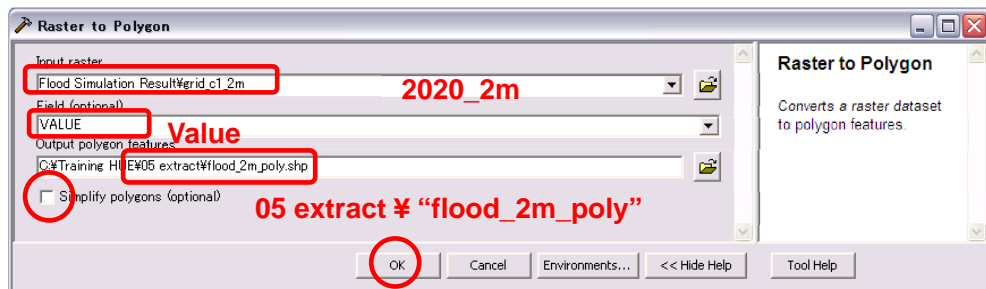
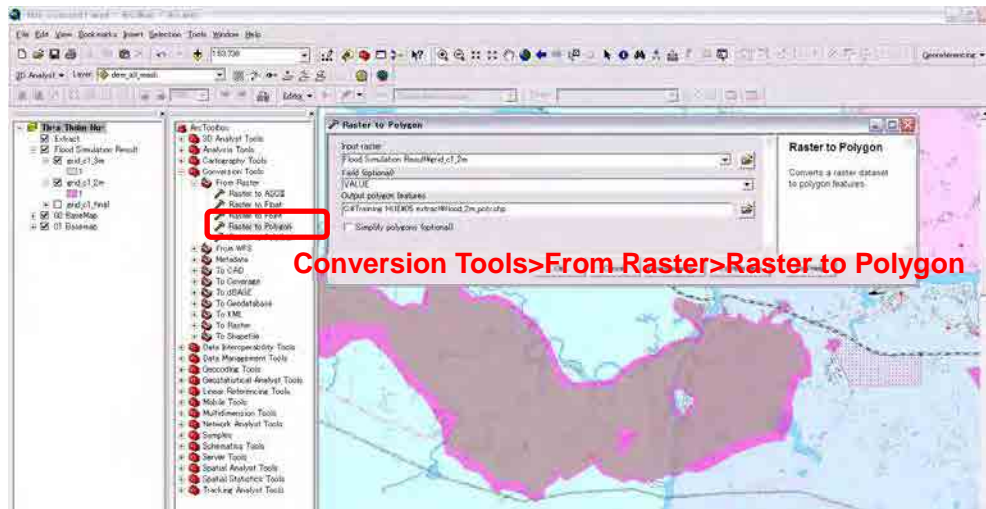
[Drop "grid\_c1\_2m" and "drid\_c1\_3m" layer to "Extract" group]

[Change transparency of "grid\_c1\_3m" to 50%.]



## [2-4] Raster to polygon

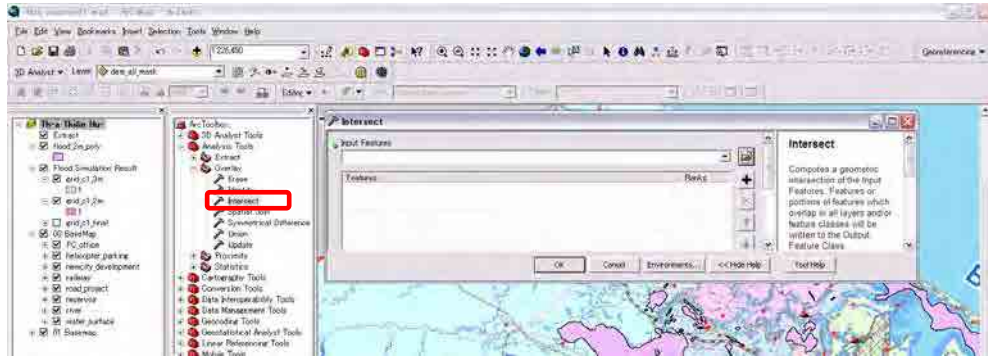
Conversion Tools>From Raster>Raster to Polygon



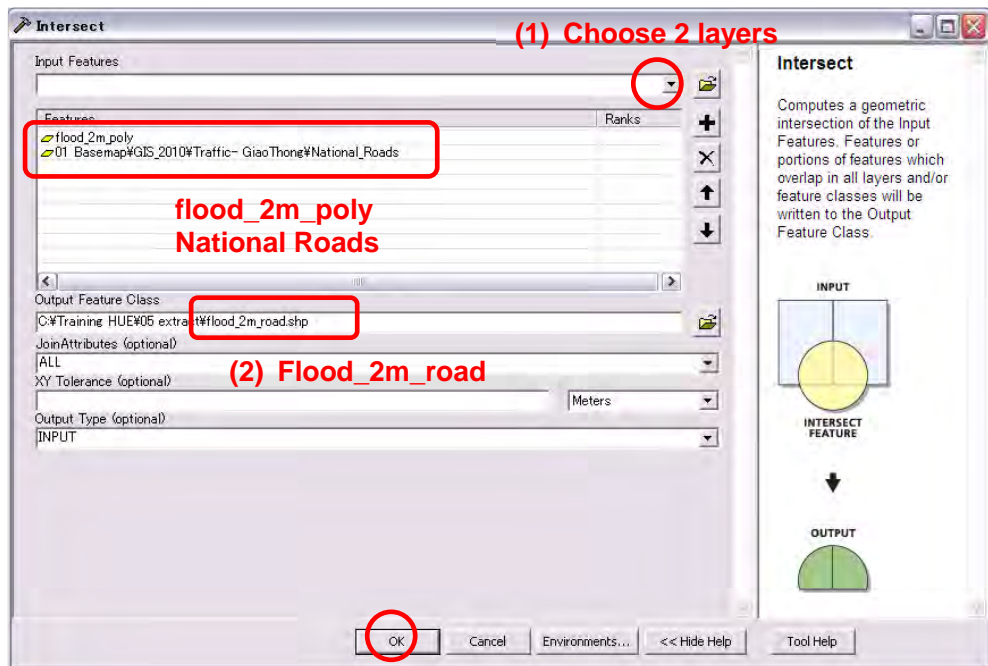
## Course 3 Overlay

### 【3-1】 Preparation

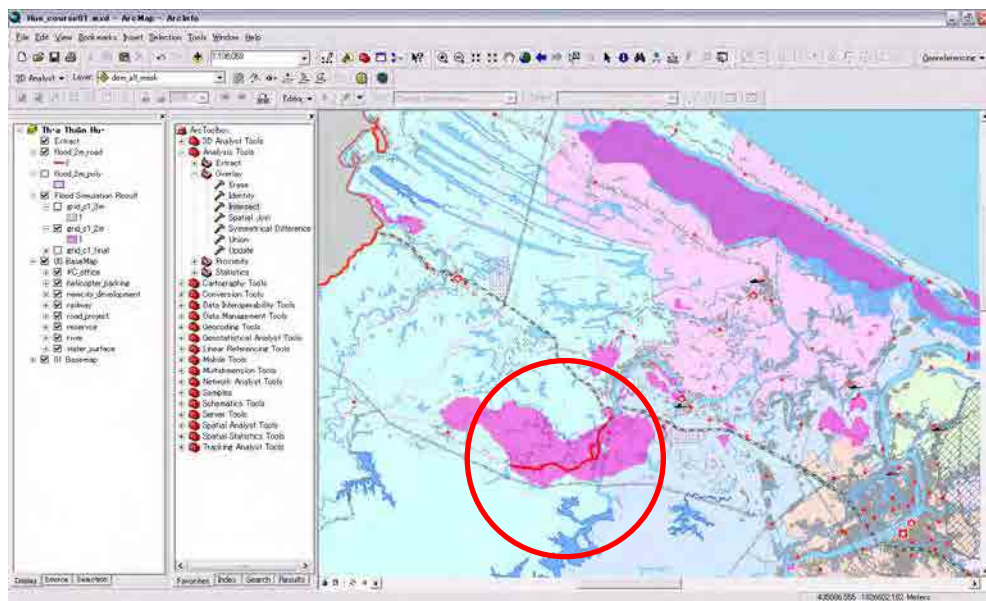
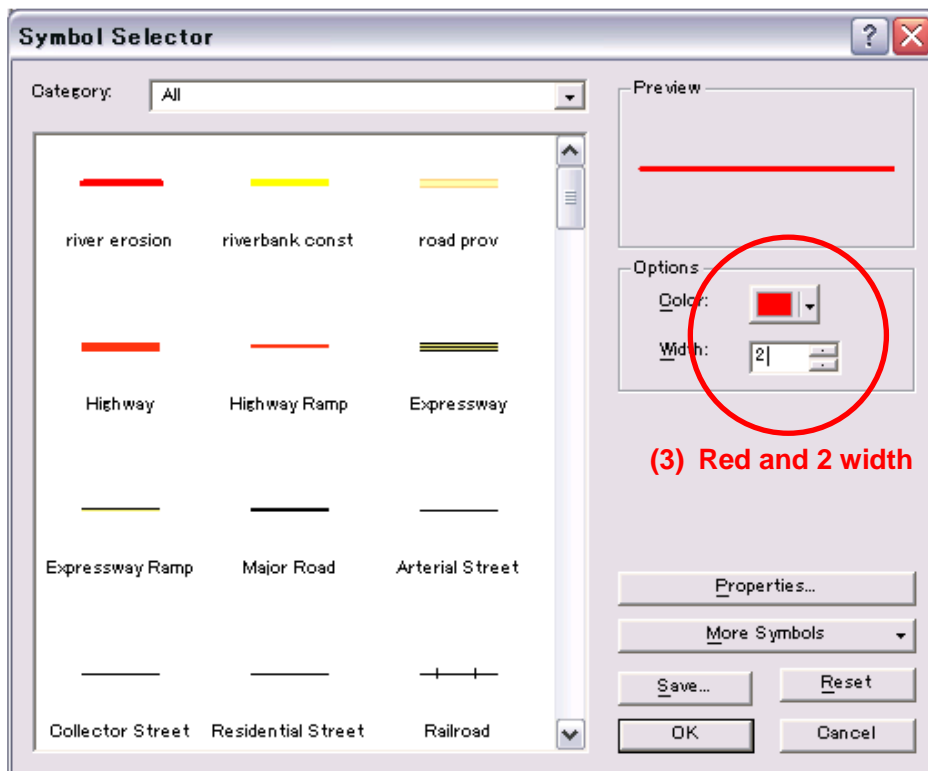
Analysis Tools > Overlay > Intersect



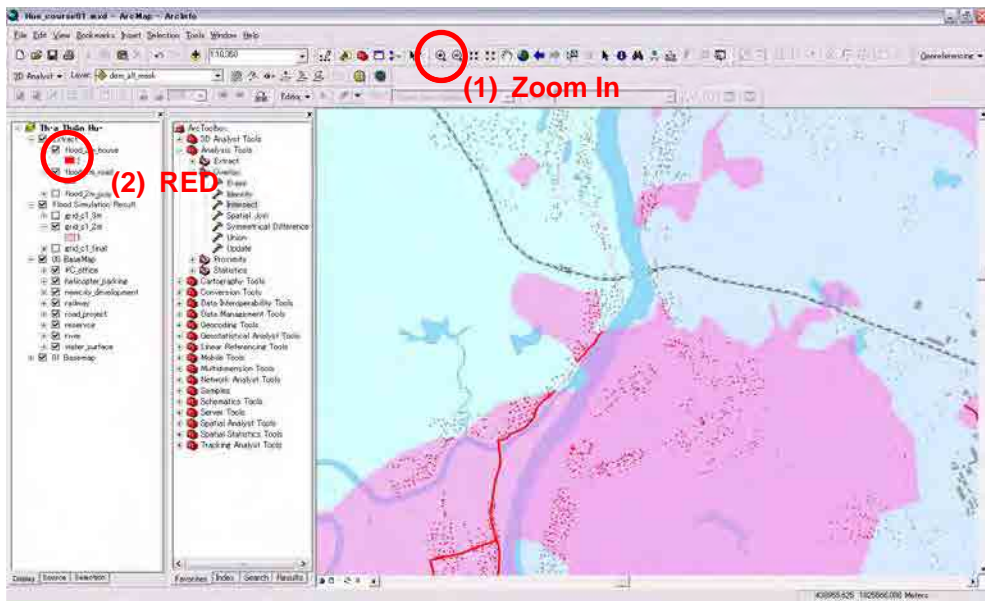
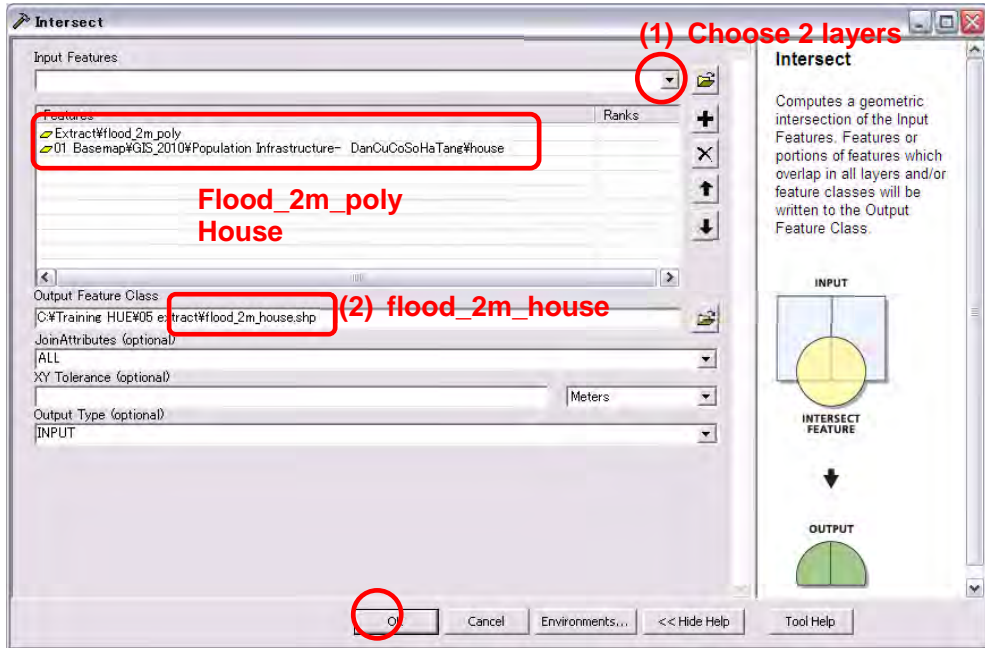
### 【3-2】 Intersect (Road and Flood 2m)



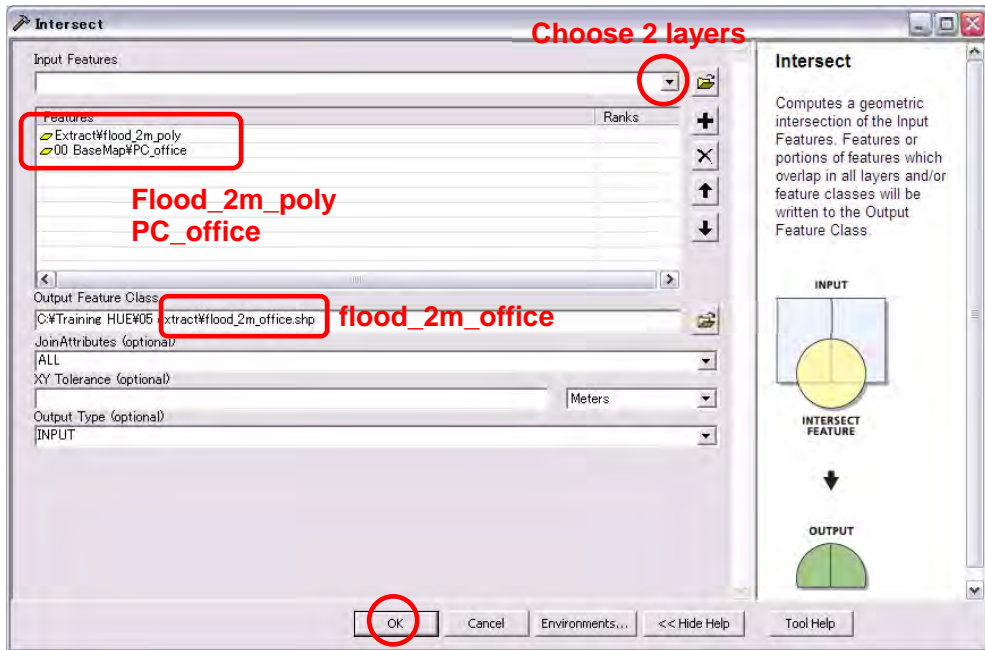




【3-3】 Intersect (Houses and Flood 2m)

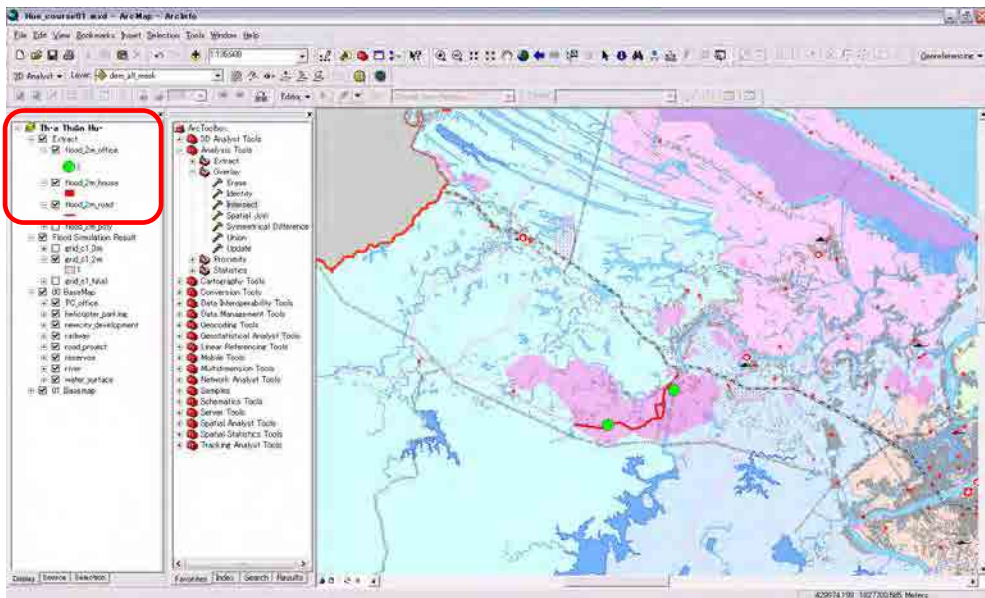


【3-4】 Intersect (Point Data and Flood 2m)



[Drop “station\_2m” to “Extract” group]

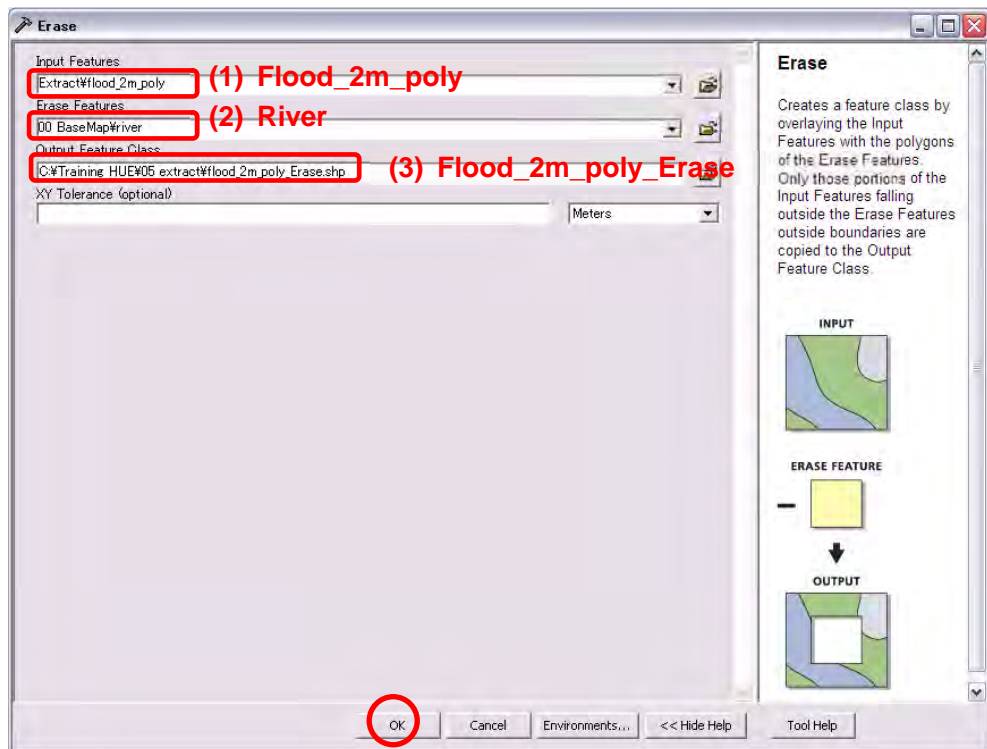
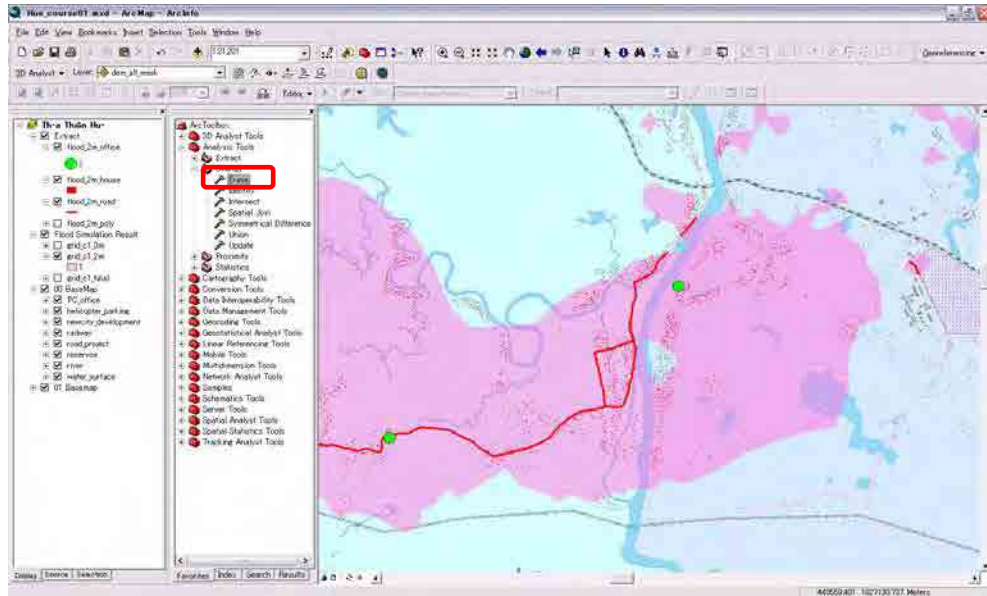
[Change color and symbol of the “flood\_2m\_office”]

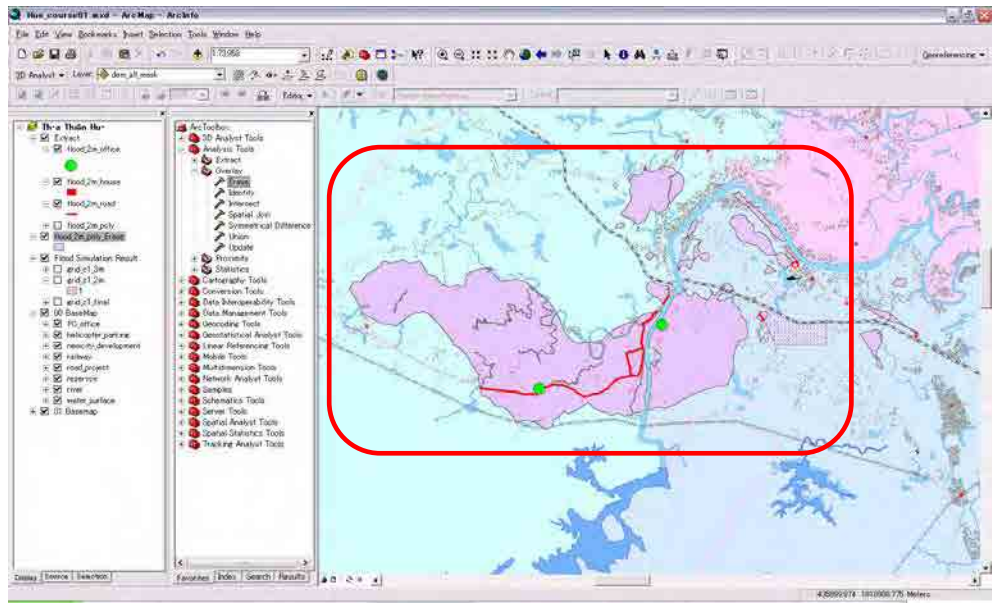


**[3-5] Erase**

Analysis Tools>Overlay>Erase

[Zoom in to Thu Bon River]



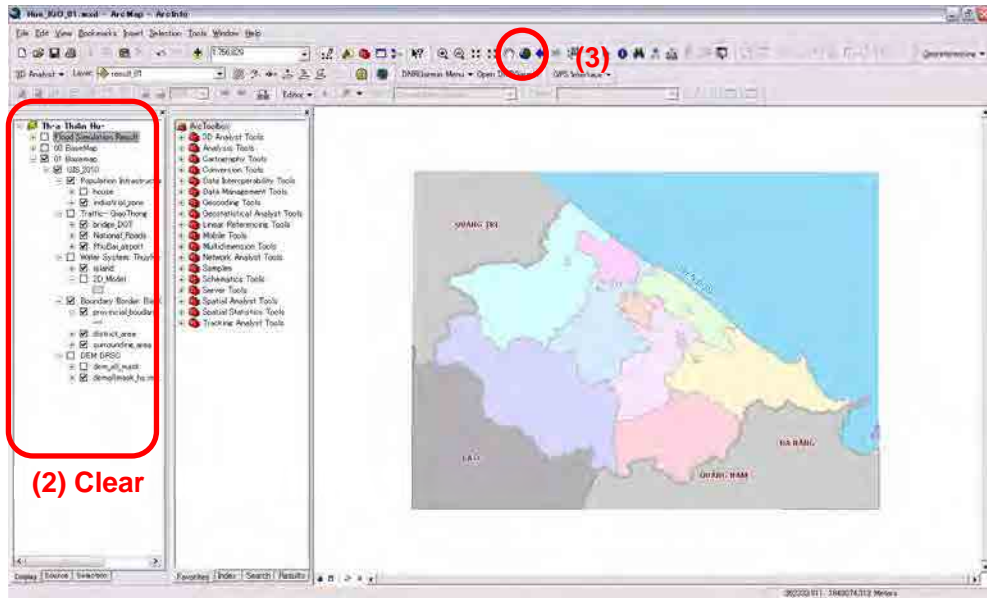


## Course 4 Attribute Table

### [4-1] Preparation

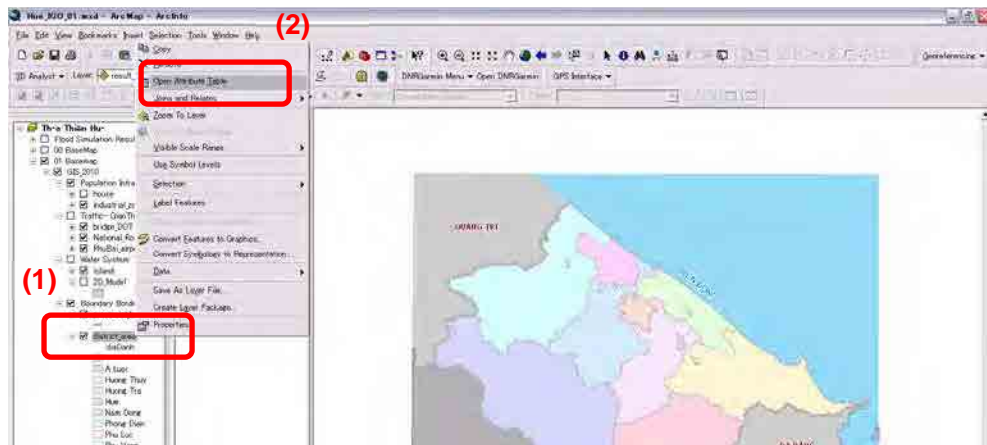
[Click the “Full Extent” button]

[Click off to clear data]



[Open Attribute Table]

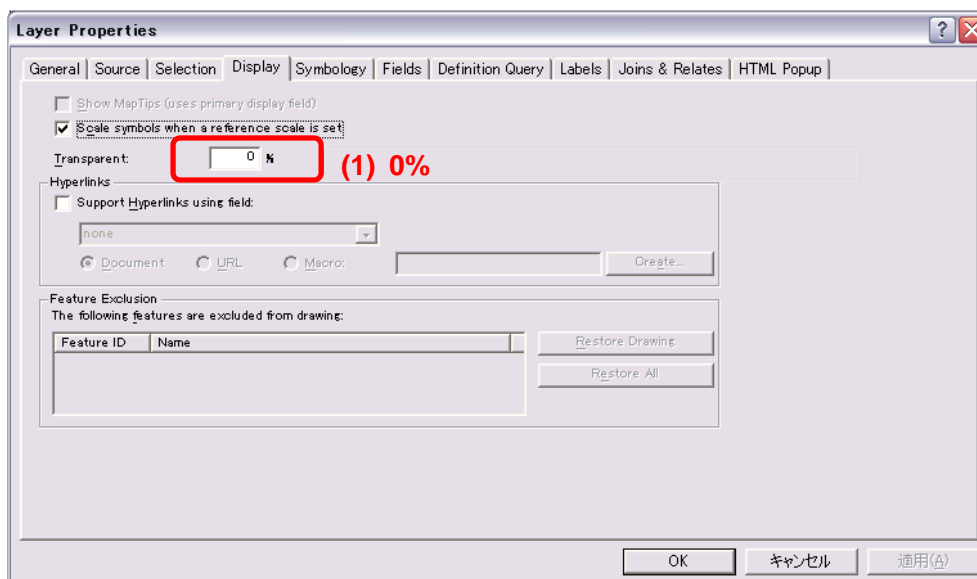
District\_Area3



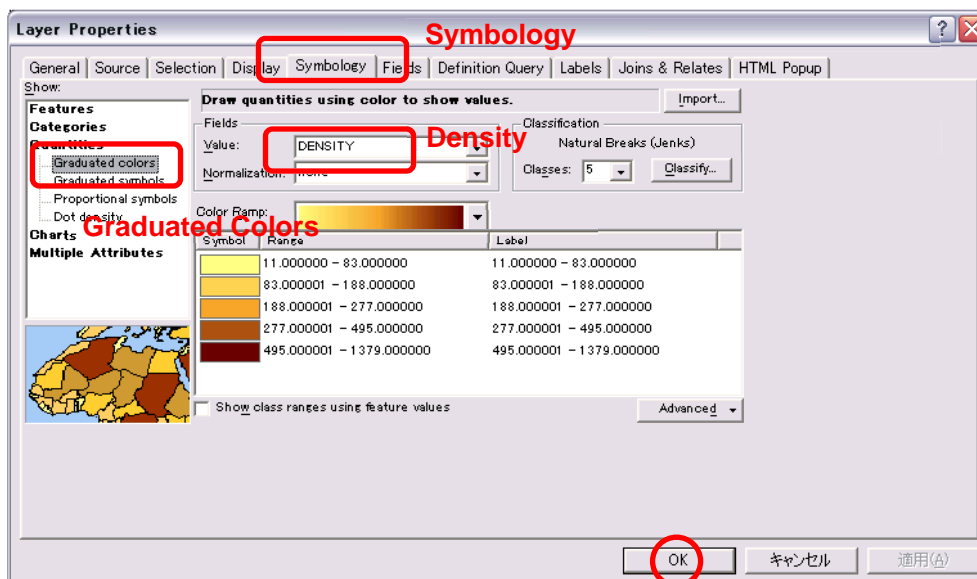
[Look at the Attribute Table]

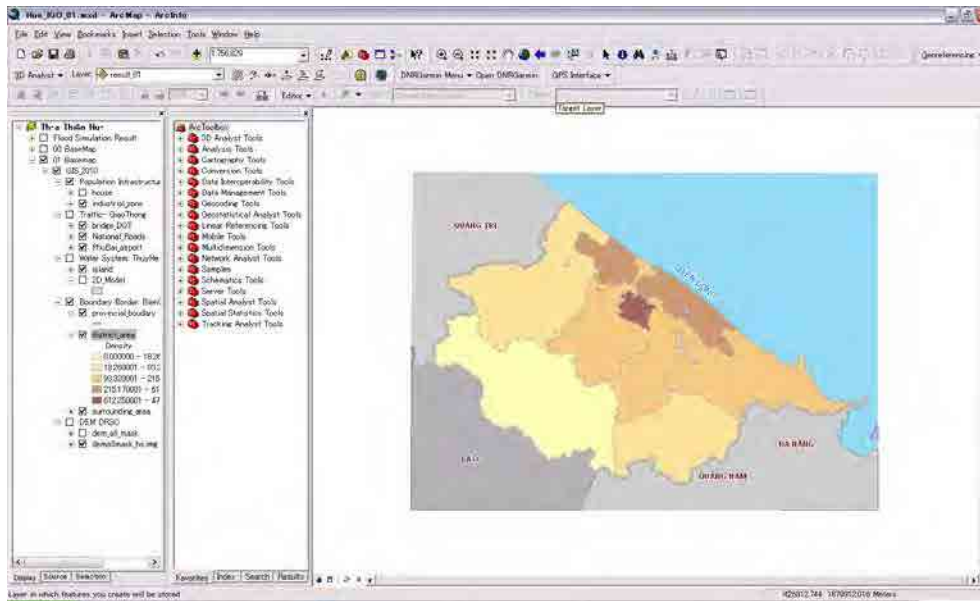
ID	Shape	OBJECTID	malhanhans	ngayThuaTh	ngayCapth	maBoiLuong	maBonVinh	dashTuChen	diabanh	dienTich	Shape_Length	Shape_Area	Population	Density
1	Polygon	1	-HAU-	-HAU-	AD02	478	banh anh	hu	70.89	62690.402440	7080516.9463	300094	4762.56	
2	Polygon	2	-HAU-	-HAU-	AD02	478	hu/th	phong th	955.59	216455.013052	949157132.02	89029	92.32	
3	Polygon	3	-HAU-	-HAU-	AD02	477	hu/th	gach ng	183.24	77708.099616	164117411.276	83538	511.59	
4	Polygon	4	-HAU-	-HAU-	AD02	478	hu/th	phu vang	280.83	105568.314291	278417212.09	171363	612.25	
5	Polygon	5	-HAU-	-HAU-	AD02	479	thi xa	hting thuy	480.26	100106.488898	458288943.214	98309	210.2	
6	Polygon	6	-HAU-	-HAU-	AD02	480	hu/th	hting tre	822.2	182468.802289	3158603184.898	112027	215.17	
7	Polygon	7	-HAU-	-HAU-	AD02	481	hu/th	al lth	1232.79	220860.110352	1224640530.67	22504	18.28	
8	Polygon	8	-HAU-	-HAU-	AD02	483	hu/th	nam phong	652.09	145063.613265	647742350.411	45490	69.17	
9	Polygon	9	0.0000	-HAU-	AD02	482	hu/th		729.31	5634.012278	1518000.57069	136225	0	
10	Polygon	10	-HAU-	-HAU-	AD02	482	hu/th	phu l th	729.31	184200.418425	711434164.852	138228	188.88	

## [4-2] Change the Layer display

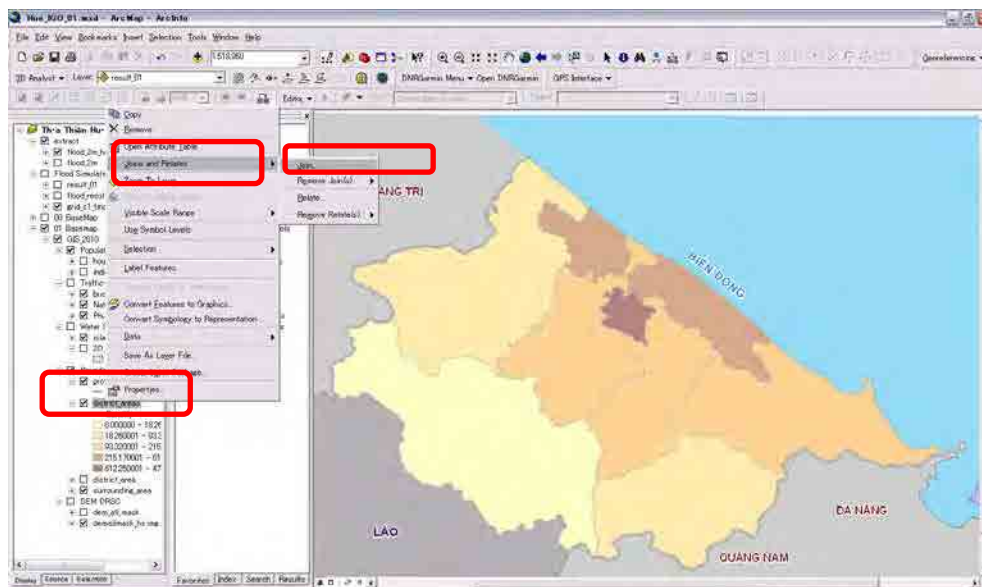


[Display the population density]





- [4-3] Counting
- [Open the “Join” command]
- Properties>Joins and Relates>Join



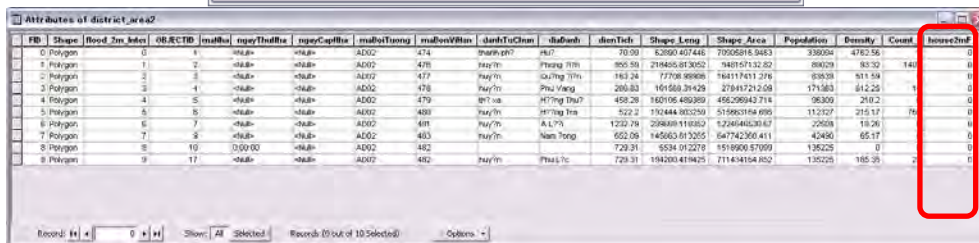
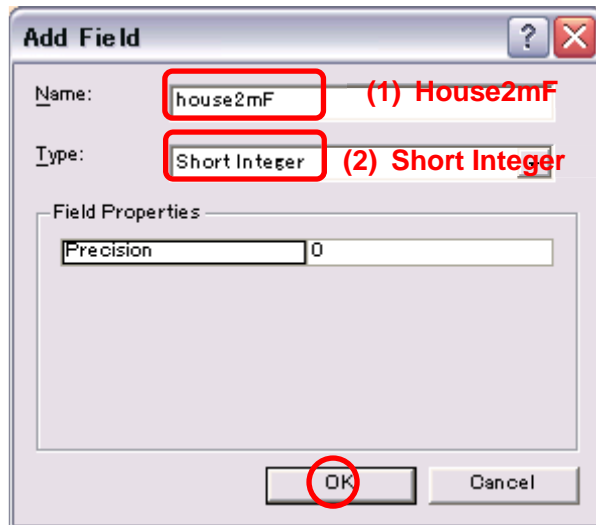
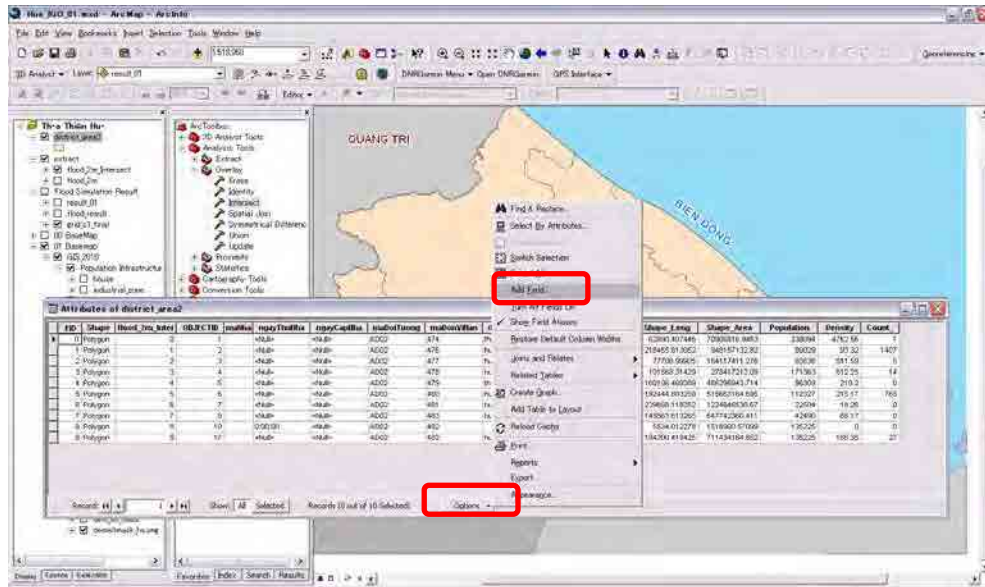




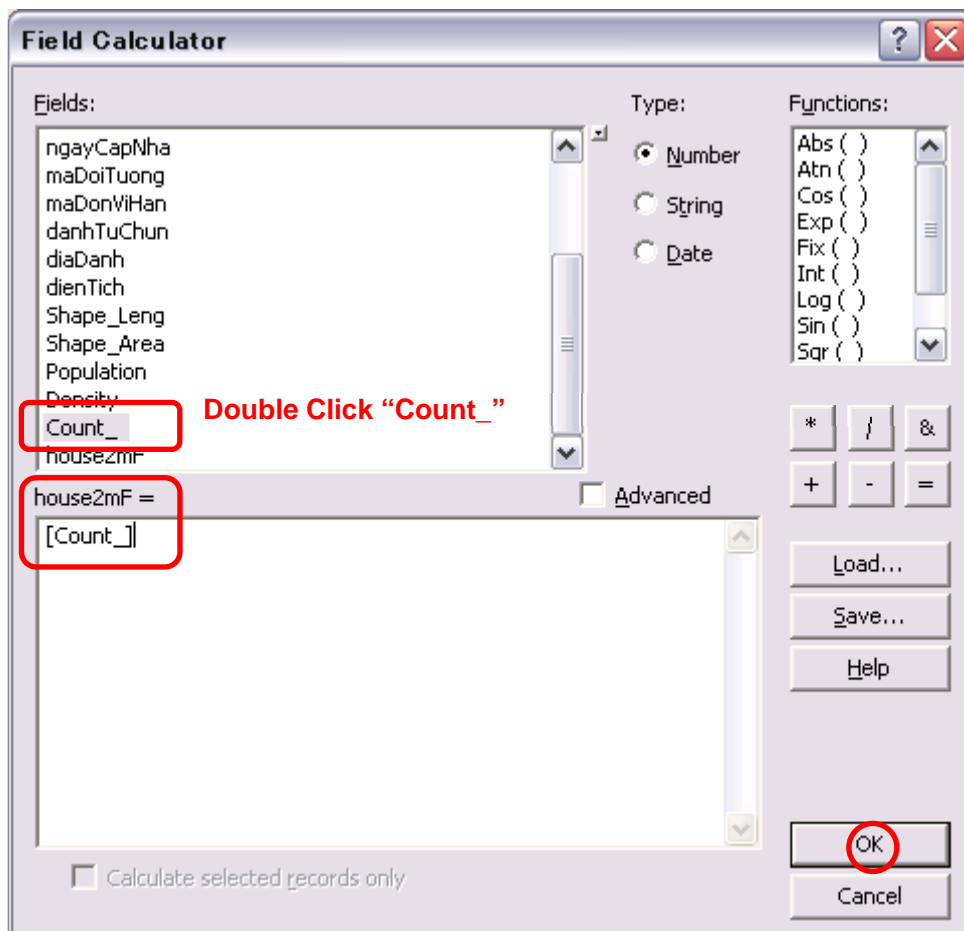
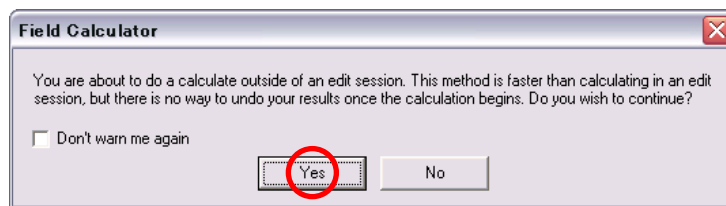
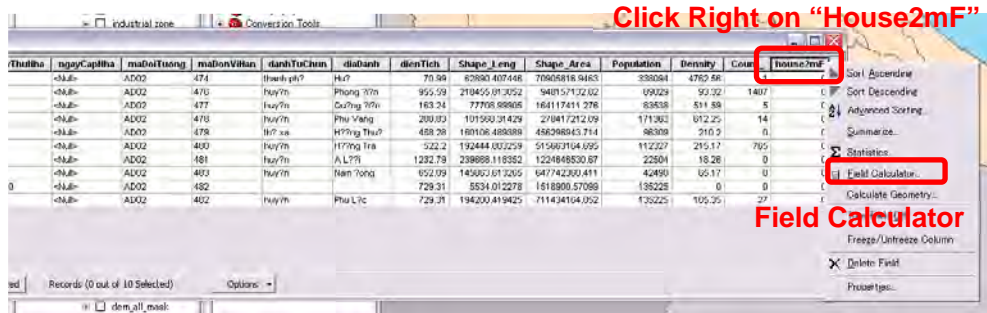
[4-4] Rename of the “Field”

[Open “Add Field”]

Options>Add Field



[4-5] Field Calculator  
 [Open “Field Calculator”]



Click Right on "Count\_"


ha	maBoiTuong	maDonVitan	danhTuChun	diaDanh	dienTich	Shape_Leng	Shape_Area	Population	Densit	Count_
AD02	474		thanh ph?	Hu?	70.99	62990.407446	70905916.9463	338094	4762.96	
AD02	476		huy?n	Phong ?n	955.59	216455.813052	948157132.82	89029	93.32	140
AD02	477		huy?n	Qu?ng ?n	163.24	77708.99905	164117411.276	83538	511.59	
AD02	478		huy?n	Phu Vang	280.83	101568.31429	278417212.09	171363	612.25	1
AD02	479		th? xa	H?ng Thu?	458.28	160106.489389	456296943.714	96309	210.2	
AD02	480		huy?n	H?ng Tra	522.2	192444.803259	515663164.695	112327	215.17	76
AD02	481		huy?n	A L ?i	1232.79	239668.118352	1224646530.67	22504	18.26	1
AD02	483		huy?n	Nam ?ong	652.09	145863.613265	647742360.411	42490	65.17	1
AD02	482				729.31	5534.012278	1518900.57099	135225	0	
AD02	482		huy?n	Phu L?c	729.31	194200.419425	711434164.852	135225	185.35	2

at of 10 Selected) Options

- Sort Ascending
- Sort Descending
- Advanced Sorting...
- Summarize...
- Statistics...
- Field Calculator...
- Calculate Geometry...
- Turn Field Off
- Freeze/Unfreeze Column
- Delete Field**
- Properties...

Delete

**Confirm Delete Field** ✕

 Warning, deleting fields can not be undone.

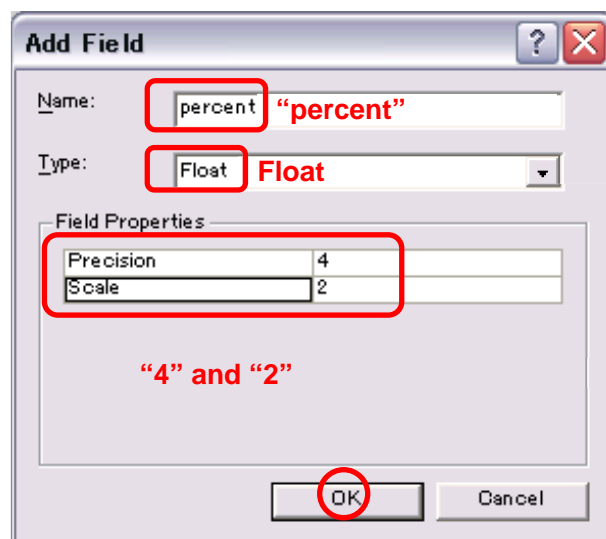
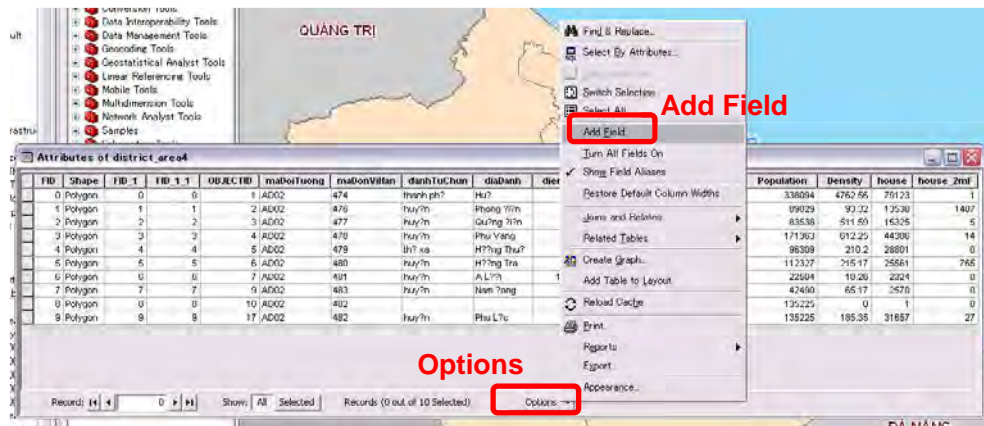
Are you sure you want to delete the currently selected field, 'Count\_'?

## Course 5 Attribute Table (2)

### [5-1] Field Calculator

Open “Field calculator”

[Add “New Field”]



### ***Keyword: Data Type***

Short Integer -- -32,768 ~ 32767

Long Integer -- -2,147,483,648 ~ 2,147,483,647

Float – Total Place (precision) 1~6, Decimal place (Scale) 1~6

Double -- Total Place (precision) 7~, Decimal place (Scale) 0~

Attributes of district\_area4

FID_1	FID_1_1	OBJECTID	maDoiTuong	maDonWiHan	danhTuChun	diaDanh	dienTich	Shape_Leng	Shape_Area	Population	Density	house	house_2mF	percent
0	0	1	AD02	474	thanh ph?	Hu?	70.99	62090.407446	70005916.9463	330094	4762.56	791.23	0	
1	1	2	AD02	476	huy?n	Phong ??n	955.59	219455.813052	948157132.82	89029	93.32	13538	140	0
2	2	3	AD02	477	huy?n	Gu?ng ??n	163.24	77708.99905	164117411.276	83538	511.59	15325	0	0
3	3	4	AD02	478	huy?n	Phu Vang	280.83	101568.31429	278417212.09	171363	612.25	44306	0	0
4	4	5	AD02	479	th? xa	H?ng Thu?	458.28	160106.489389	456296943.714	96309	210.2	28801	0	0
5	5	6	AD02	480	huy?n	H?ng Tra	522.2	192444.803259	515663164.695	112327	215.17	25561	78	0
6	6	7	AD02	481	huy?n	A L?n	1232.79	239668.118352	1224646530.67	22504	18.26	2324	0	0
7	7	8	AD02	483	huy?n	Nam ?ng	652.09	145863.813265	647742360.411	42480	65.17	2570	0	0
8	8	10	AD02	482	huy?n	Nam ?ng	729.31	5534.012278	1516900.57099	135225	0	1	0	0
9	9	17	AD02	482	huy?n	Phu L?c	729.31	194200.419425	711434164.852	135225	185.35	31657	0	0

Records: 10 | 0 | Show: All Selected | Records (0 out of 10 Selected) | Options

Check!

[Field Calculator]

Attributes of district\_area4

FID_1	FID_1_1	OBJECTID	maDoiTuong	maDonWiHan	danhTuChun	diaDanh	dienTich	Shape_Leng	Shape_Area	Population	Density	house	house_2mF	percent
0	0	1	AD02	474	thanh ph?	Hu?	70.99	62090.407446	70005916.9463	330094	4762.56	791.23	0	
1	1	2	AD02	476	huy?n	Phong ??n	955.59	219455.813052	948157132.82	89029	93.32	13538	140	0
2	2	3	AD02	477	huy?n	Gu?ng ??n	163.24	77708.99905	164117411.276	83538	511.59	15325	0	0
3	3	4	AD02	478	huy?n	Phu Vang	280.83	101568.31429	278417212.09	171363	612.25	44306	0	0
4	4	5	AD02	479	th? xa	H?ng Thu?	458.28	160106.489389	456296943.714	96309	210.2	28801	0	0
5	5	6	AD02	480	huy?n	H?ng Tra	522.2	192444.803259	515663164.695	112327	215.17	25561	78	0
6	6	7	AD02	481	huy?n	A L?n	1232.79	239668.118352	1224646530.67	22504	18.26	2324	0	0
7	7	8	AD02	483	huy?n	Nam ?ng	652.09	145863.813265	647742360.411	42480	65.17	2570	0	0
8	8	10	AD02	482	huy?n	Nam ?ng	729.31	5534.012278	1516900.57099	135225	0	1	0	0
9	9	17	AD02	482	huy?n	Phu L?c	729.31	194200.419425	711434164.852	135225	185.35	31657	0	0

Records: 10 | 0 | Show: All Selected | Records (0 out of 10 Selected) | Options

To calculate “risk percentage” of “flood 2m”

Field Calculator

Fields:

- maDoiTuong
- maDonWiHan
- danhTuChun
- diaDanh
- dienTich
- Shape\_Leng
- Shape\_Area
- Population
- Density
- house
- house\_2mF
- percent

Type:

- Number
- String
- Date

Functions:

- Abs ( )
- Atn ( )
- Cos ( )
- Exp ( )
- Fix ( )
- Int ( )
- Log ( )
- Sin ( )
- Sqr ( )

percent =

[house\_2mF] / [house]

**[house\_2mF] / [house]\*100**

Calculate selected records only

OK

Cancel

Attributes of district\_area4

FID_1	FID_1_1	OBJECTID	maBoiTuong	maBonVhan	danhTuChun	diabanh	dienTich	Shape_Leng	Shape_Area	Population	Density	house_zmf	percent
0	0	5	AD02	474	thanh ph?	Hu?	70.99	62090.407446	70305916.9463	338094	4762.56	7912	0
1	1	2	AD02	476	huy?n	Phong ??n	955.59	216455.813052	948157132.32	89029	93.32	135	0
2	2	3	AD02	477	huy?n	Qu?ng ??n	163.24	77708.99905	164117411.276	83536	511.59	153	5 0.03
3	3	4	AD02	478	huy?n	Phu Vang	280.83	101568.31429	278417212.09	171363	612.25	443	14 0.03
4	4	5	AD02	479	th? xa	H?ng Thu?	458.28	160106.489389	456266943.714	96309	210.2	268	0 0
5	5	6	AD02	480	huy?n	H?ng Tra	522.2	192444.803259	515663164.695	112327	215.17	258	765 2.99
6	6	7	AD02	481	huy?n	AL?n	1232.79	239688.118352	122466530.67	22504	18.26	23	0 0
7	7	9	AD02	483	huy?n	Nam ?ng	652.09	145663.613265	647742360.411	42490	65.17	25	0 0
8	8	10	AD02	482	huy?n		729.31	6534.012278	1516800.57099	13525	0	0	0 0
9	9	17	AD02	482	huy?n	Phu L?c	729.31	194200.419425	711434164.652	135225	185.35	316	27 0.09

Records: 14 | 0 | Show: All Selected | Records (0 out of 10 Selected) | Options

Check!

[5-2] Change Layer Display

Layer Properties

General | Source | Selection | Display | **Symbology** | Fields | Definition Query | Labels | Joins & Relates | HTML Popup

Show: **Quantities** (Graduated colors selected)

Draw quantities using color to show values.

Fields: Value: percent

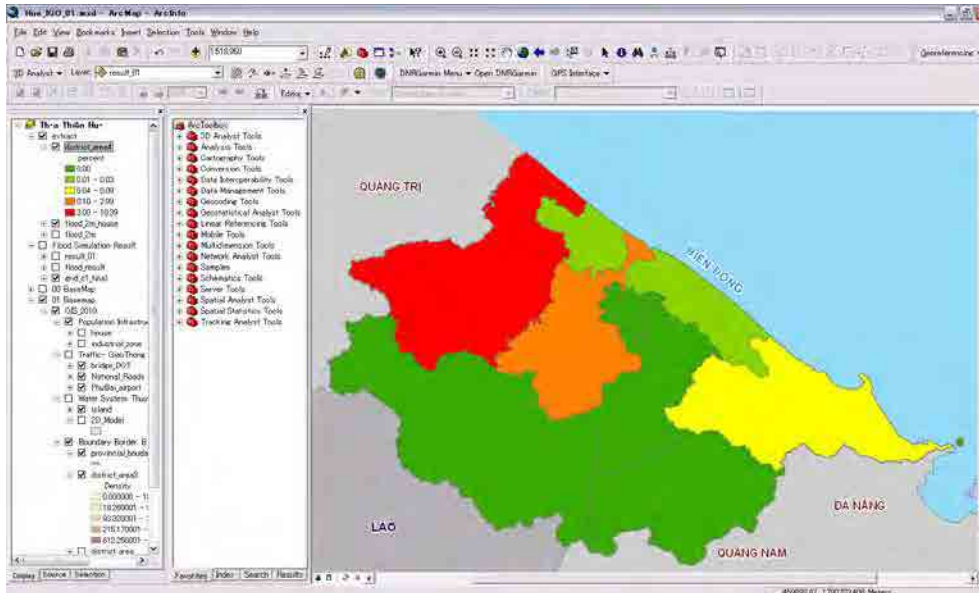
Classification: Natural Breaks (Jenks)

Classes: 5

Symbol	Range	Label
Green	0.00	0.00
Light Green	0.01 - 0.03	0.01 - 0.03
Yellow	0.04 - 0.09	0.04 - 0.09
Orange	0.10 - 2.99	0.10 - 2.99
Red	3.00 - 10.39	3.00 - 10.39

Show class ranges using feature values

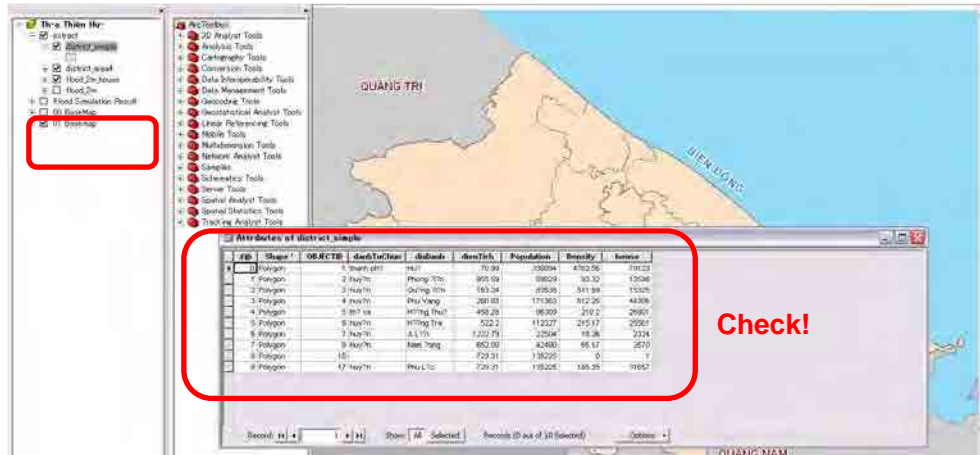
OK | キャンセル | 適用(A)



**[5-3] Join Attribute from Table (Excel Data)**

[Add “district\_simple” polygon]

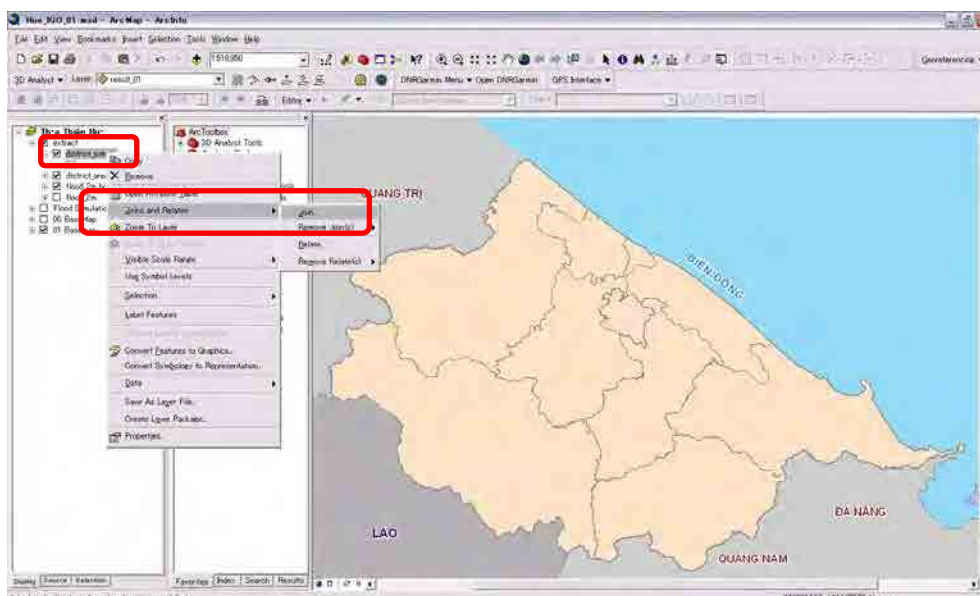
[Open Attribute Table of “district\_simple”]



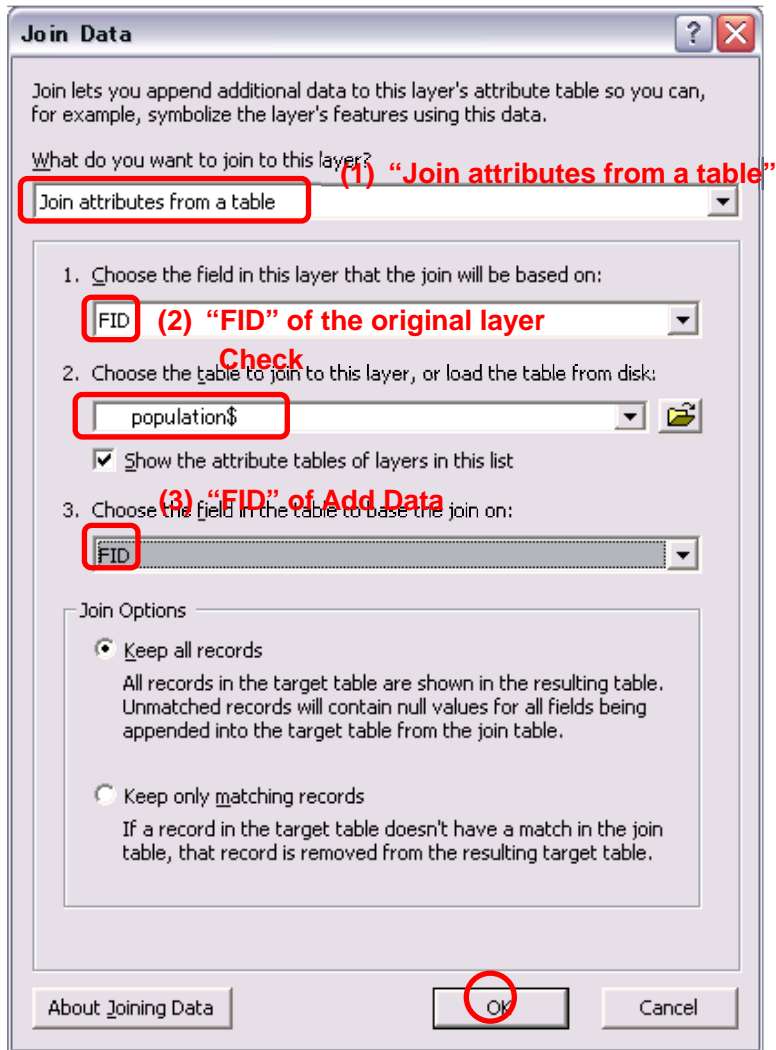
[To Update Database] This table is one of example on excel file.

FID	diaDanh	Popu 2015
0	Hue	350000
1	Phong Dien	90000
2	Quang Dien	80000
3	Phu Vang	180000
4	Huong Thuy	100000
5	Huong Tra	110000
6	A Luoi	30000
7	Nam Dong	50000
8		0
9	Phu Loc	140000

[Open Join of “district\_simple”] Joins and Relates>Join







**Attributes of district\_simple**

FID	Shape	OBJECTID	danhTuChun	diaDanh	dienTich	Population	Density	house	FID	diaDanh	Popu 2015
0	Polygon	1	thanh ph?	Hu?	70.99	338094	4762.56	79123	0	Hue	350000
1	Polygon	2	huy?n	Phong ?i?n	955.59	89029	93.32	13538	1	Phong Dien	90000
2	Polygon	3	huy?n	Qu?ng ?i?n	163.24	83538	511.59	15325	2	Quang Dien	80000
3	Polygon	4	huy?n	Phu Vang	280.83	171363	612.25	44306	3	Phu Vang	180000
4	Polygon	5	th? xa	H?ng Thu?	458.28	96309	210.2	28801	4	Huong Thuy	100000
5	Polygon	6	huy?n	H?ng Tra	522.2	112327	215.17	25561	5	Huong Tra	110000
6	Polygon	7	huy?n	A L?i	1232.79	22504	18.26	2324	6	A Luoi	30000
7	Polygon	9	huy?n	Nam ?ong	652.09	42490	65.17	2570	7	Nam Dong	50000
8	Polygon	10			729.31	135225	0	1	8	-Null-	0
9	Polygon	17	huy?n	Phu L?c	729.31	135225	185.35	31657	9	Phu Loc	140000

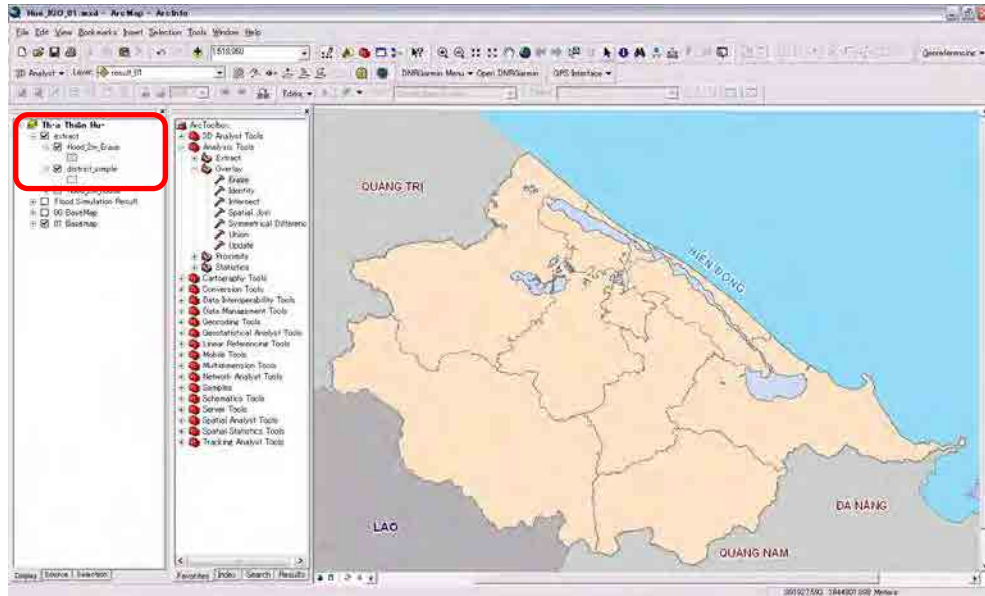
Record: 1 | Show: All Selected | Records (0 out of 10 Selected) | Options

Check

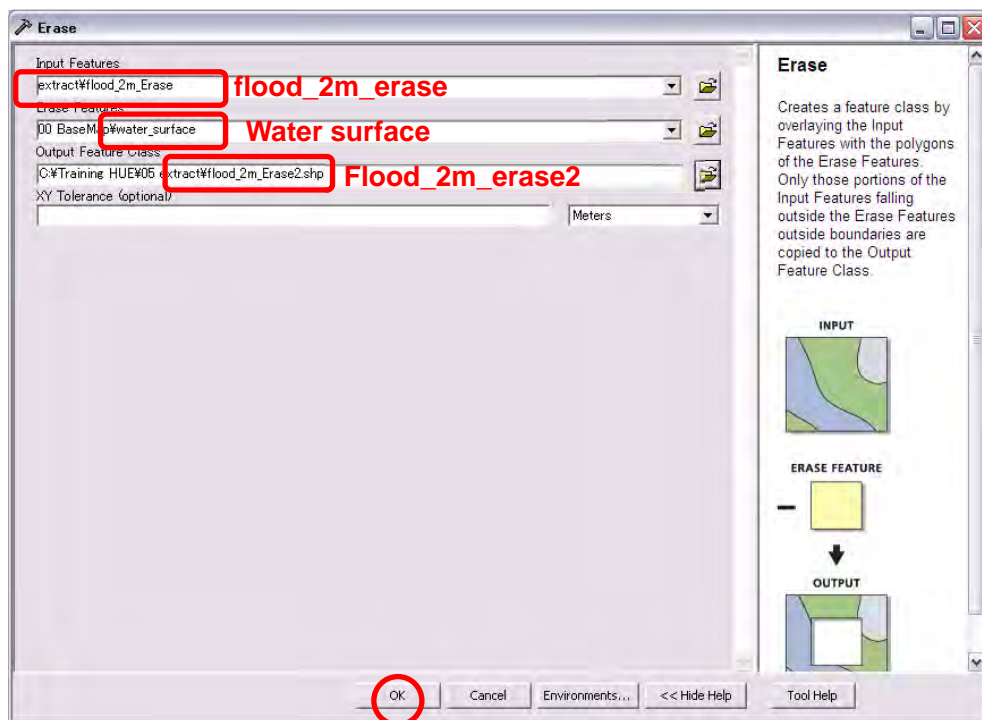
## Course 6 Application of the Simulation Result

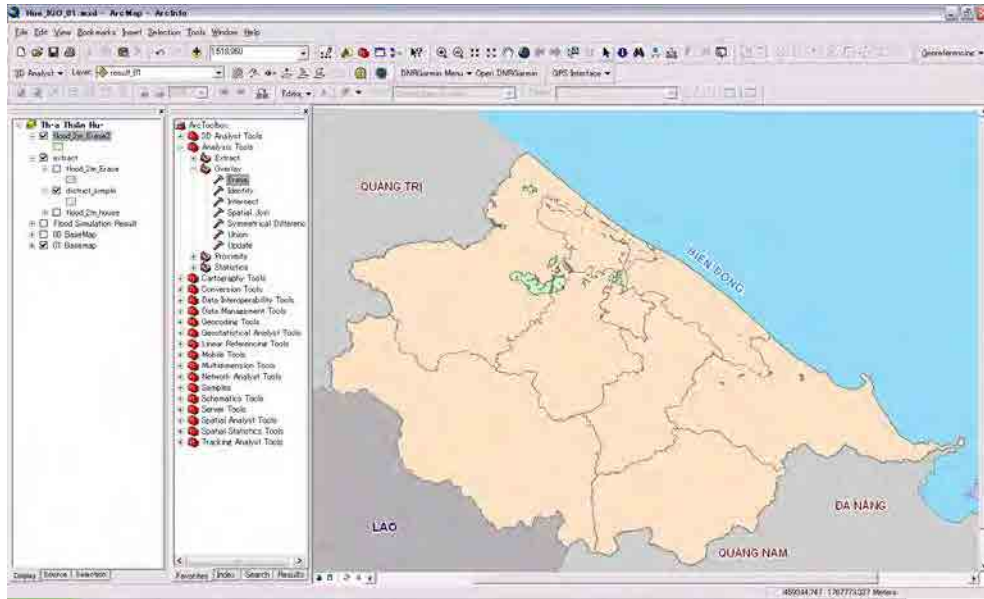
### [6-1] Erase

[Set 2 shape files “flood\_2m\_erase” and “district\_simple”]



Erase by water surface.

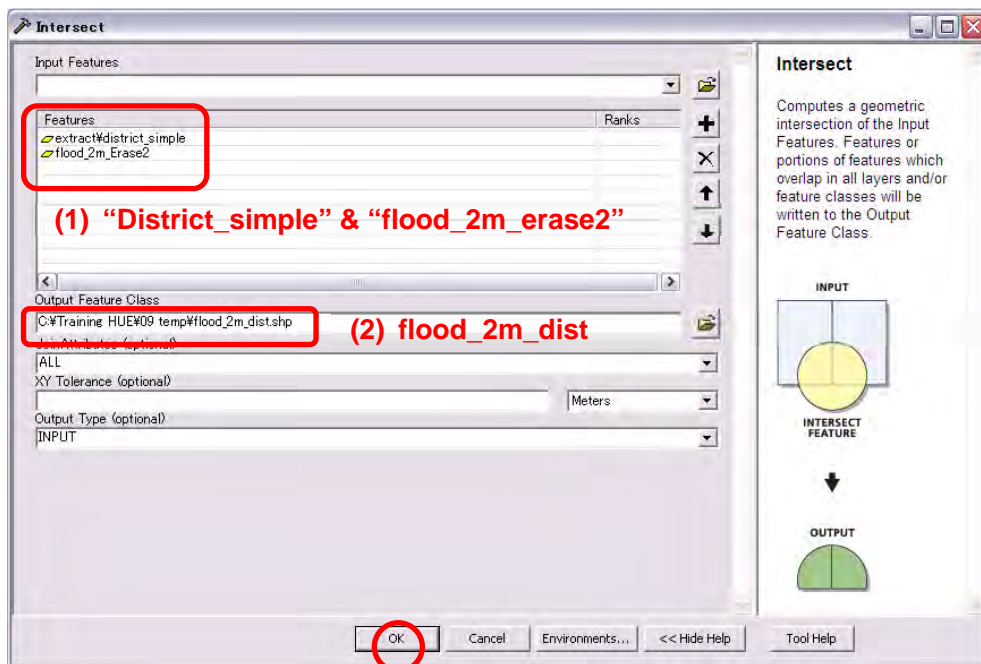




[6-2] Intersect

Let us extract flood areas district-by-district.

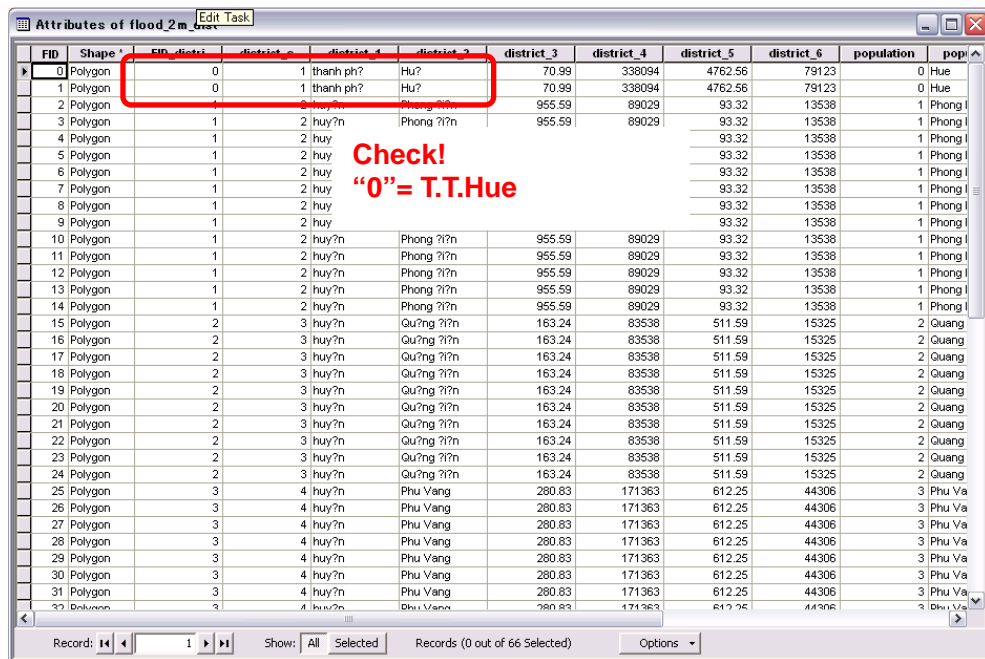
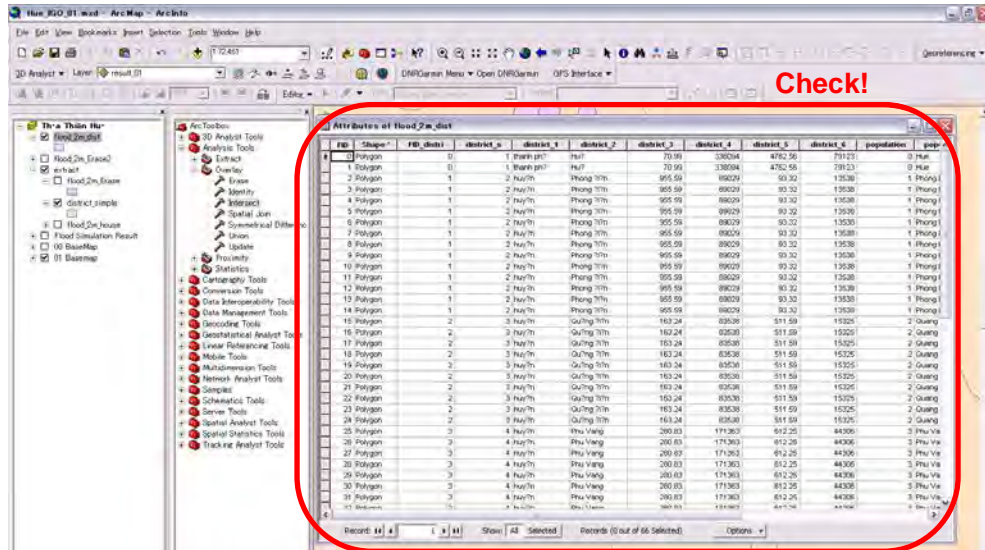
[Open the “Intersect” tool]



*Let us look at the map.*

### [6-3] Merge of Polygon

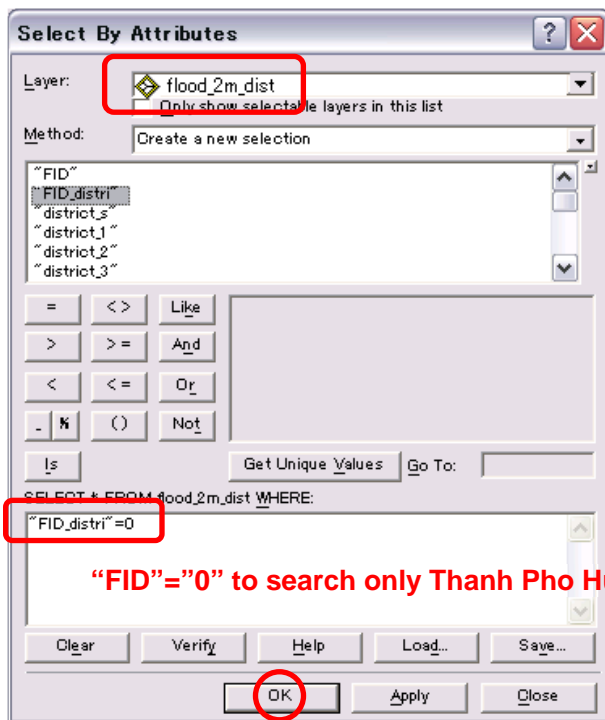
[Open the attribute table of “flood\_2m\_dist”]



[Select by Attributes...]

Selection>Select by attributes...





"FID"="0" to search only Thanh Pho Hue

Attributes of flood\_2m\_dist

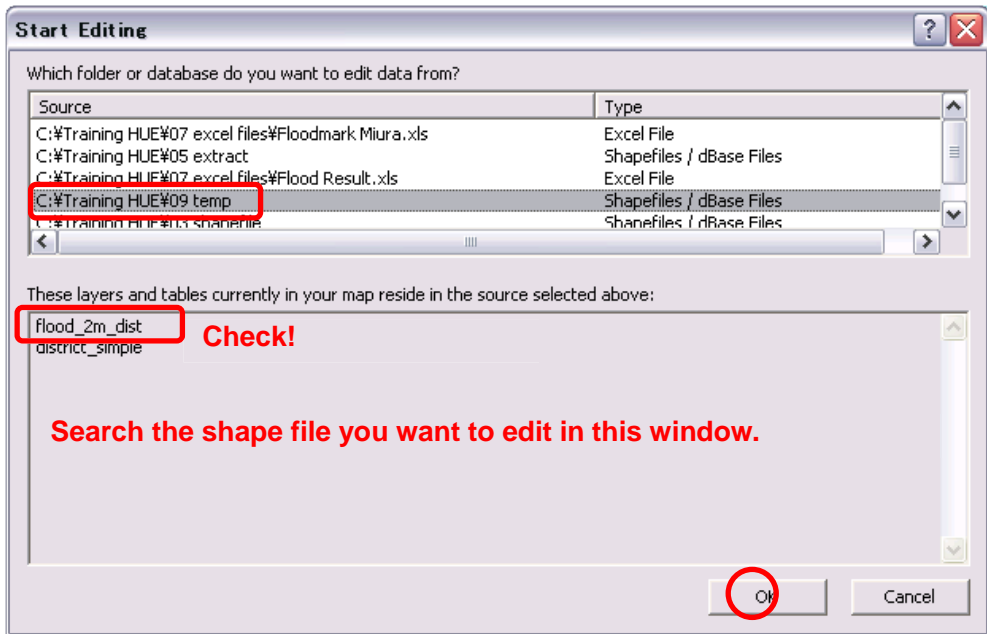
FID	Shape	FID_distri	district_s	district_1	district_2	district_3	district_4	district_5	district_6	population	popu
0	Polygon	0	1	thanh ph?	Hu?	70.99	338094	4762.56	79123	0	Hue
1	Polygon	0	1	thanh ph?	Hu?	70.99	338094	4762.56	79123	0	Hue
2	Polygon	1	2	huy?n	Phong ?i?	955.59	89029	93.32	13538	1	Phong
3	Polygon	1	2	huy?n	Phong ?i?	955.59	89029	93.32	13538	1	Phong
4	Polygon	1	2	huy?n	Phong ?i?	955.59	89029	93.32	13538	1	Phong
5	Polygon	1	2	huy?n	Phong ?i?	955.59	89029	93.32	13538	1	Phong
6	Polygon	1	2	huy?n	Phong ?i?	955.59	89029	93.32	13538	1	Phong
7	Polygon	1	2	huy?n	Phong ?i?	955.59	89029	93.32	13538	1	Phong
8	Polygon	1	2	huy?n	Phong ?i?	955.59	89029	93.32	13538	1	Phong
9	Polygon	1	2	huy?n	Phong ?i?	955.59	89029	93.32	13538	1	Phong
10	Polygon	1	2	huy?n	Phong ?i?	955.59	89029	93.32	13538	1	Phong
11	Polygon	1	2	huy?n	Phong ?i?	955.59	89029	93.32	13538	1	Phong
12	Polygon	1	2	huy?n	Phong ?i?	955.59	89029	93.32	13538	1	Phong
13	Polygon	1	2	huy?n	Phong ?i?	955.59	89029	93.32	13538	1	Phong
14	Polygon	1	2	huy?n	Phong ?i?	955.59	89029	93.32	13538	1	Phong
15	Polygon	2	3	huy?n	Qu?ng ?i?	163.24	83538	511.59	15325	2	Quang
16	Polygon	2	3	huy?n	Qu?ng ?i?	163.24	83538	511.59	15325	2	Quang
17	Polygon	2	3	huy?n	Qu?ng ?i?	163.24	83538	511.59	15325	2	Quang
18	Polygon	2	3	huy?n	Qu?ng ?i?	163.24	83538	511.59	15325	2	Quang
19	Polygon	2	3	huy?n	Qu?ng ?i?	163.24	83538	511.59	15325	2	Quang
20	Polygon	2	3	huy?n	Qu?ng ?i?	163.24	83538	511.59	15325	2	Quang
21	Polygon	2	3	huy?n	Qu?ng ?i?	163.24	83538	511.59	15325	2	Quang
22	Polygon	2	3	huy?n	Qu?ng ?i?	163.24	83538	511.59	15325	2	Quang
23	Polygon	2	3	huy?n	Qu?ng ?i?	163.24	83538	511.59	15325	2	Quang
24	Polygon	2	3	huy?n	Qu?ng ?i?	163.24	83538	511.59	15325	2	Quang
25	Polygon	3	4	huy?n	Phu Vang	280.83	171363	612.25	44306	3	Phu Va
26	Polygon	3	4	huy?n	Phu Vang	280.83	171363	612.25	44306	3	Phu Va
27	Polygon	3	4	huy?n	Phu Vang	280.83	171363	612.25	44306	3	Phu Va
28	Polygon	3	4	huy?n	Phu Vang	280.83	171363	612.25	44306	3	Phu Va
29	Polygon	3	4	huy?n	Phu Vang	280.83	171363	612.25	44306	3	Phu Va
30	Polygon	3	4	huy?n	Phu Vang	280.83	171363	612.25	44306	3	Phu Va
31	Polygon	3	4	huy?n	Phu Vang	280.83	171363	612.25	44306	3	Phu Va
32	Polygon	3	4	huy?n	Phu Vang	280.83	171363	612.25	44306	3	Phu Va

Record: 1 | Show: All Selected | Records (2 out of 66 Selected) | Options

[Start Editing....]

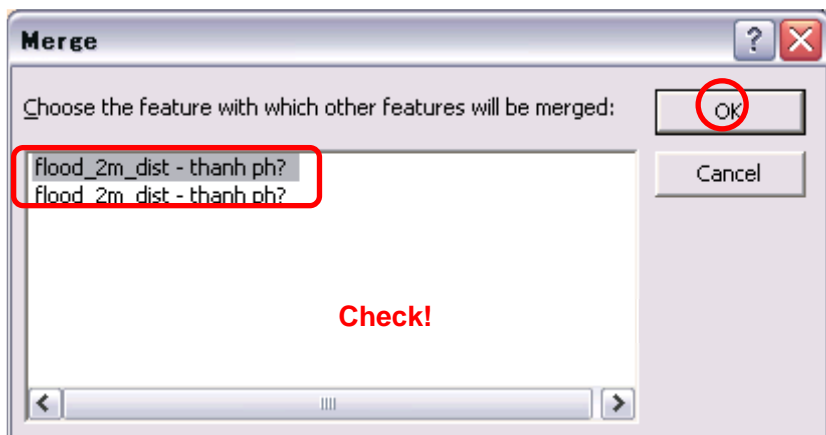
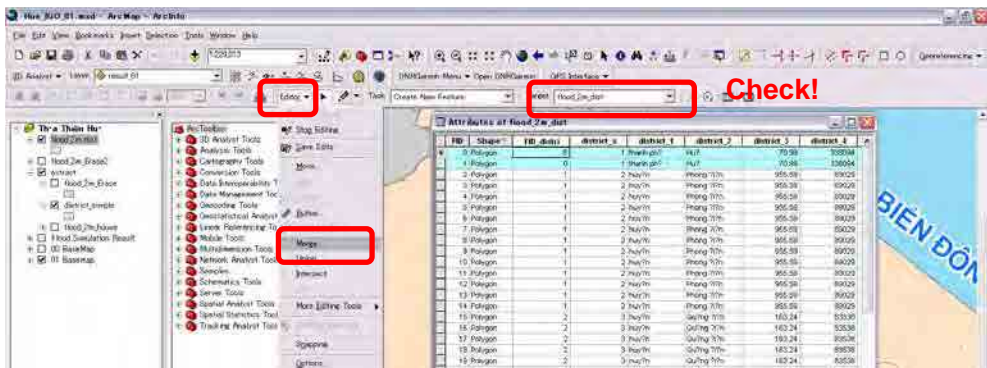
Editor>Start Editing





[Merge]

Editor>Merge



Attributes of flood\_2\_m\_dist

FID	Shape	FID_distri	district_s	district_1	district_2	district_3	district_4
0	Polygon	0	1	thanh ph?	Hu?	70.99	338094
2	Polygon	1	2	huy?n	Phong ?i?n	955.59	89029
3	Polygon	1	2	huy?n	Phong ?i?n	955.59	89029
4	Polygon	1	2	huy?n	Phong ?i?n	955.59	89029
5	Polygon	1	2	huy?n	Phong ?i?n	955.59	89029
6	Polygon	1	2	huy?n	Phong ?i?n	955.59	89029
7	Polygon	1	2	huy?n	Phong ?i?n	955.59	89029
8	Polygon	1	2	huy?n	Phong ?i?n	955.59	89029
9	Polygon	1	2	huy?n	Phong ?i?n	955.59	89029
10	Polygon	1	2	huy?n	Phong ?i?n	955.59	89029
11	Polygon	1	2	huy?n	Phong ?i?n	955.59	89029
12	Polygon	1	2	huy?n	Phong ?i?n	955.59	89029
13	Polygon	1	2	huy?n	Phong ?i?n	955.59	89029

Check!

Please repeat this activity.

[“1”=Phuong Dien], [“2”=Quang Dien], [“3”=Phu Vang], [“5”=Phuong Tra], [“9”=Phu Loc]

Attributes of flood\_2\_m\_dist

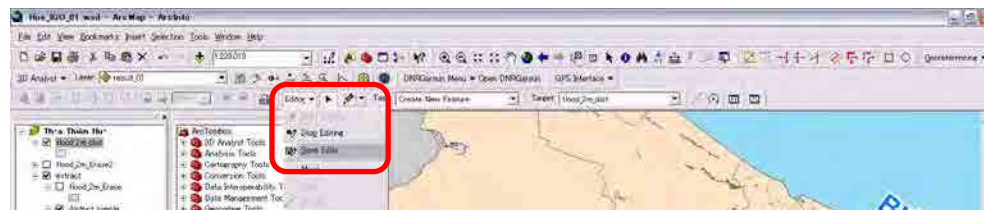
FID	Shape	FID_distri	district_s	district_1	district_2	district_3	district_4	district_5	district_6	population
0	Polygon	0	1	thanh ph?	Hu?	70.99	338094	4762.56	79123	0
2	Polygon	1	2	huy?n	Phong ?i?n	955.59	89029	93.32	13538	1
15	Polygon	2	3	huy?n	Qu?ng ?i?n	163.24	83538	511.59	15325	2
25	Polygon	3	4	huy?n	Phu Vang	280.83	171363	612.25	44306	3
34	Polygon	5	6	huy?n	H?ng Tra	522.2	112327	215.17	25561	5
61	Polygon	9	17	huy?n	Phu L?c	729.31	135225	185.35	31657	9

Record: 14 | Show: All Selected | Records (1 out of 6 Selected) | Options

Check!

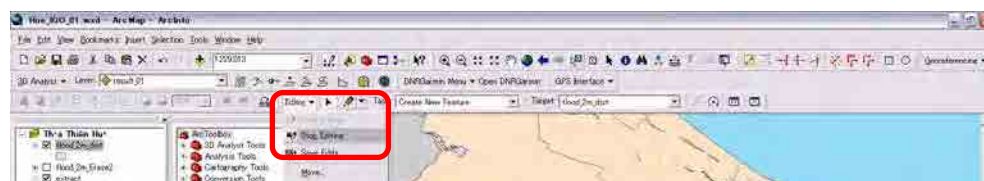
[Save Editing]

Editor>Save Editing

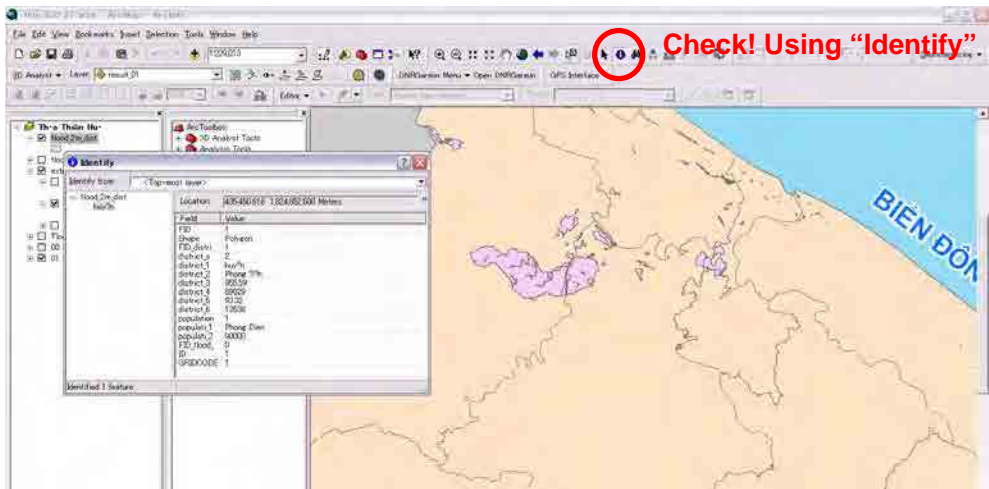


[Stop Editing]

Editor>Stop Editing



*Let us look at the map.*

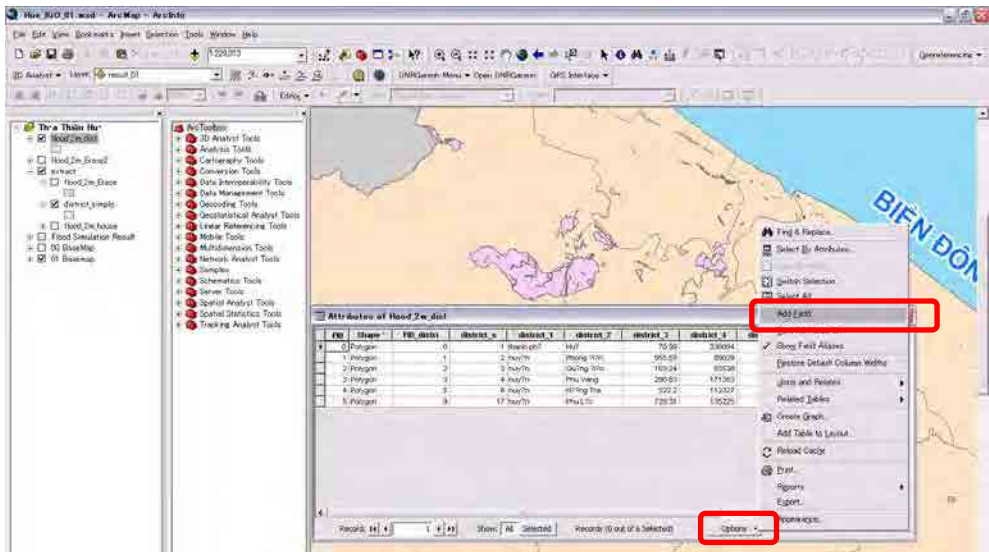


#### [6-4] Calculate Geometry

Open the "Attribute Table" of the flood\_2m\_dist layer.

[Add Field]

Options>Add Field

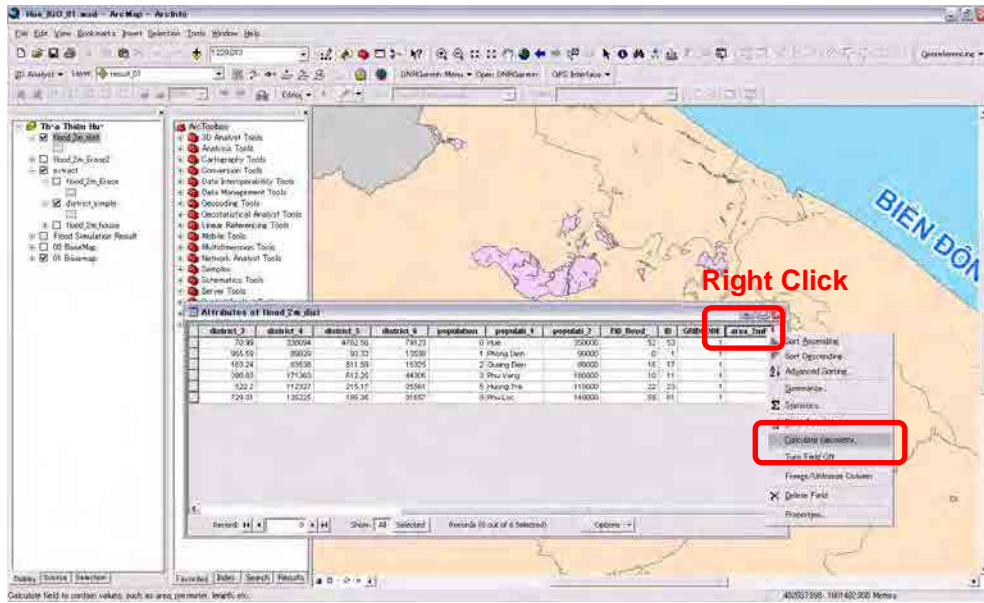






[Calculate Geometry]

Right Click on the Field > Calculate Geometry



**Calculate Geometry**

Property: **Area**

Coordinate System

Use coordinate system of the data source:  
PCS: dh10000

Use coordinate system of the data frame:  
PCS: dh10000

Units: **Square Meters [sq m]**

Calculate selected records only

Help OK Cancel

Attributes of flood\_2m\_dist

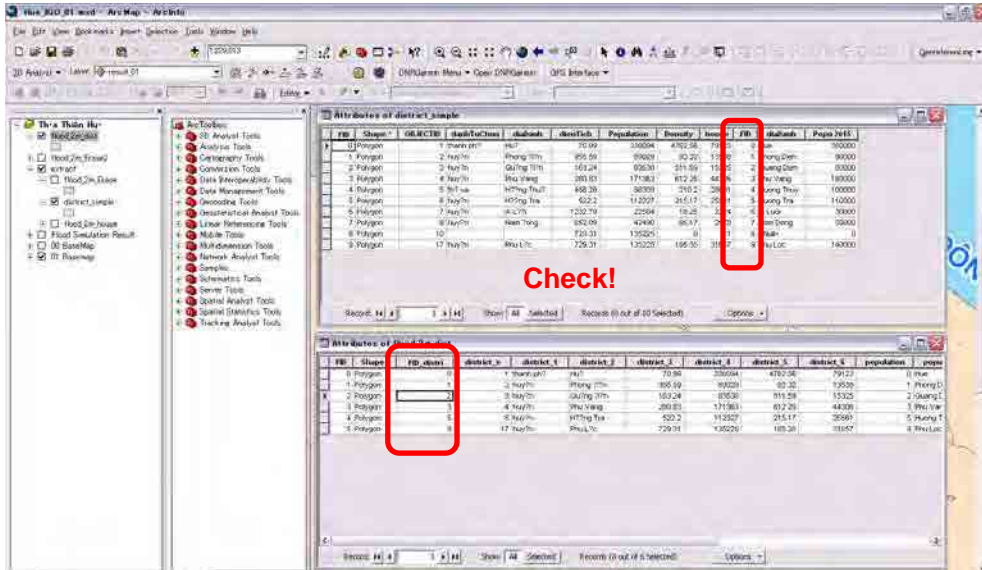
district_3	district_4	district_5	district_6	population	populati_1	populati_2	FID_flood_	ID	GRIDCODE	Area_2mE
70.99	338094	4762.56	79123	0	Hue	350000	52	53	1	362753
955.59	89029	93.32	13538	1	Phong Dien	90000	0	1	1	25156187
183.24	83538	511.59	15325	2	Guang Dien	80000	16	17	1	993776
280.83	171363	612.25	44306	3	Phu Vang	180000	10	11	1	103544
522.2	112327	215.17	25561	5	Huong Tra	110000	22	23	1	11442047
729.31	135225	185.35	31657	9	Phu Loc	140000	59	61	1	816846

Record: 14 | 0 | Show: All Selected | Records (0 out of 6 Selected) | Options

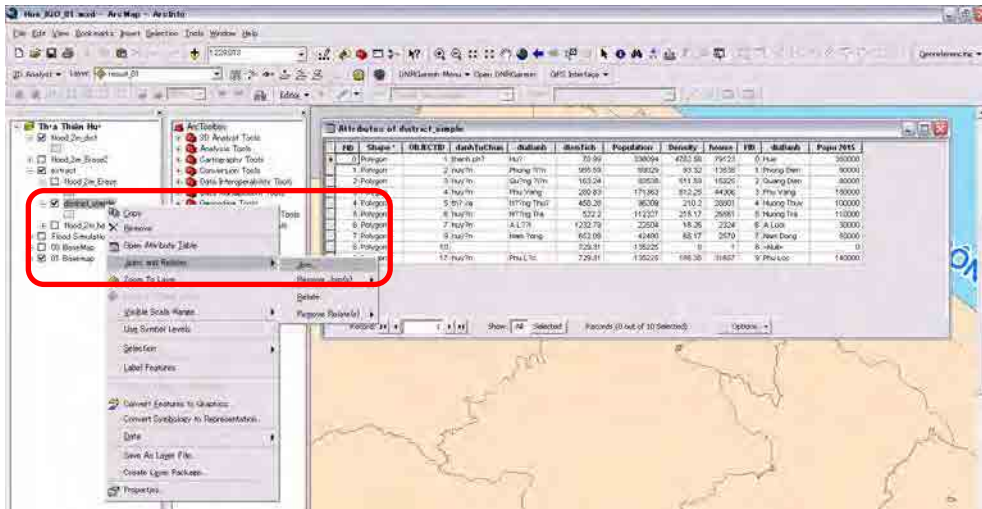
**Check!**

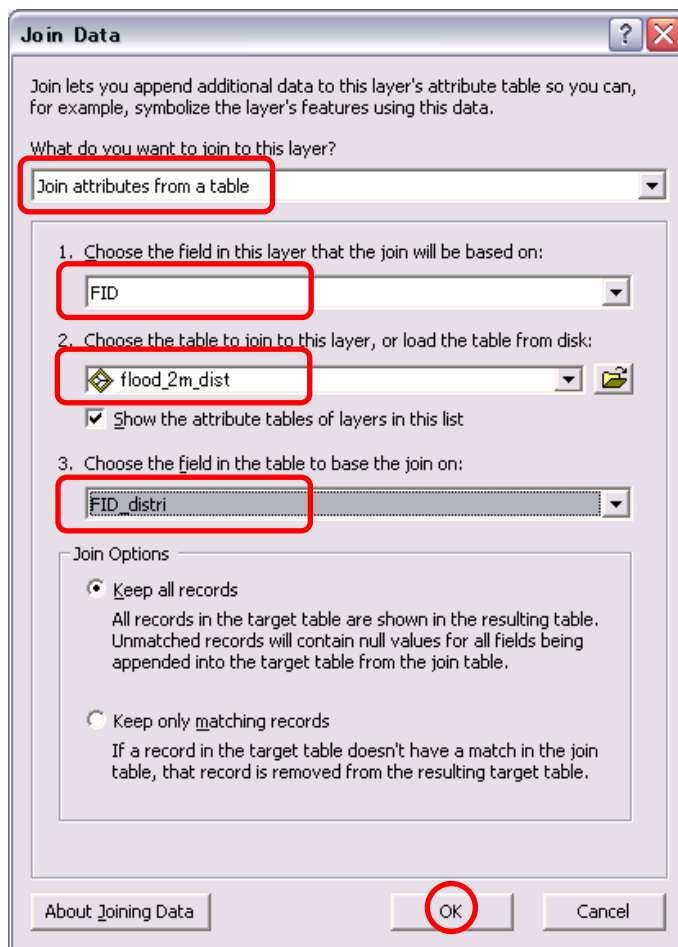
**[6-5] Finalize**

Open the attribute table of “flood\_2m\_dist” and “district\_simple” layer.



[Open “Join” on “district\_simple” layer]





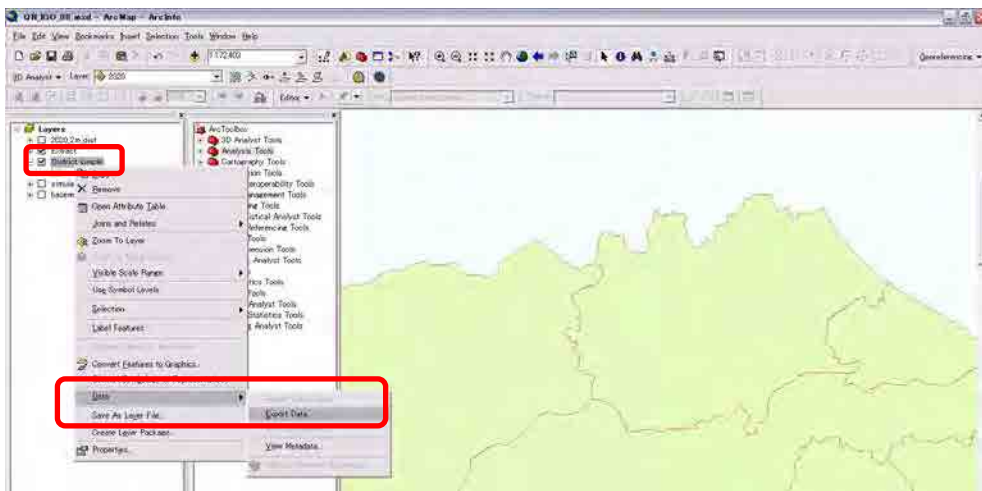
Attributes of district\_simple

district_6	population	populati_1	populati_2	FID_flood	ID	GRIDCODE	area_2mF
79123	0	Hue	350000	52	53		362753
13538	1	Phong Dien	90000	0	1		25156187
15325	2	Quang Dien	80000	16	17		993776
44306	3	Phu Yang	180000	10	11		103544
<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>
25561	5	Huong Tra	110000	22	23		11442047
<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>
<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>
<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>
31657	9	Phu Loc	140000	59	61		816846

Record: 1 | Show: All Selected | Records (0 out of 10 Selected) | Options

**Check!**

[Export Data from "district\_simple"]



**Export Data**

Export: All features

Use the same coordinate system as:

- this layer's source data
- the data frame
- the feature dataset you export the data into (only applies if you export to a feature dataset in a geodatabase)

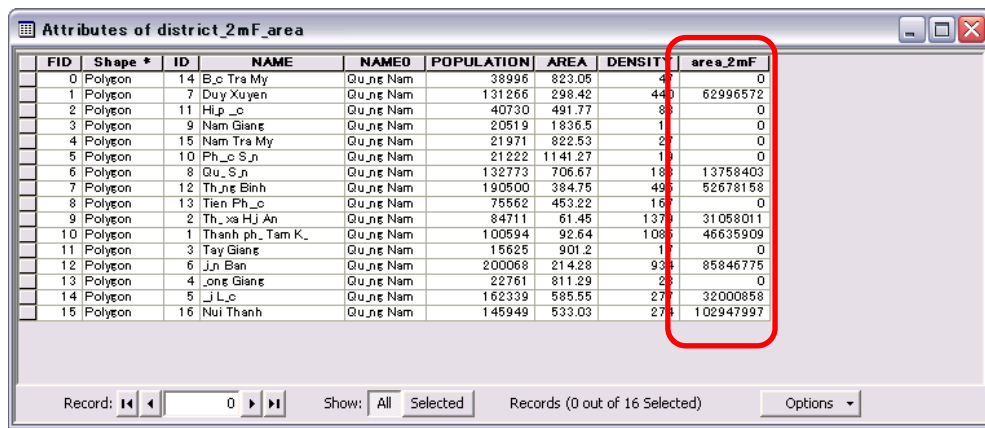
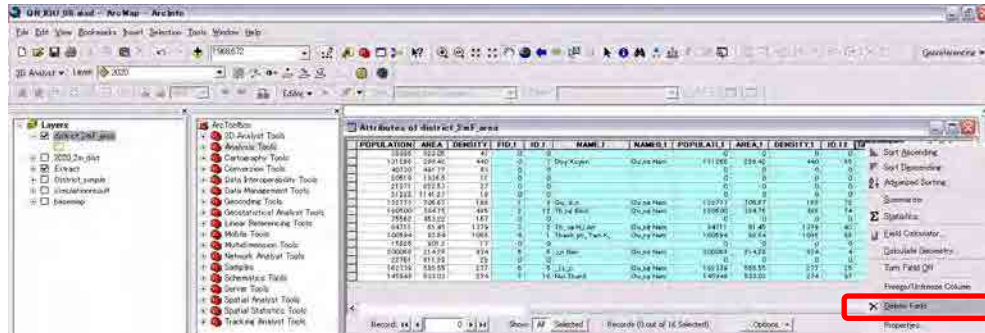
Output shapefile or feature class:

C:\Training\05 Extracted\#district\_2mF\_area.shp

**district\_2mF\_area**

OK Cancel

[Delete fields]



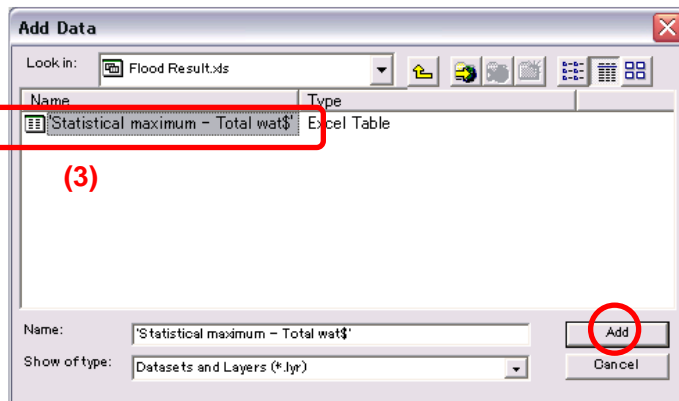
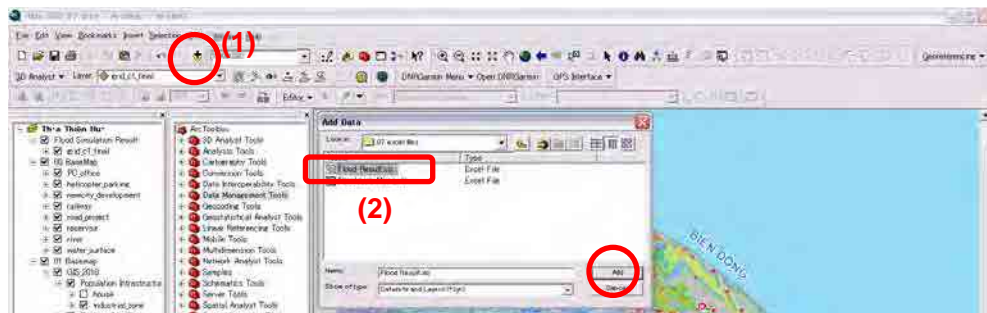
**Course 7 Conversion from Simulation Results of MIKE**

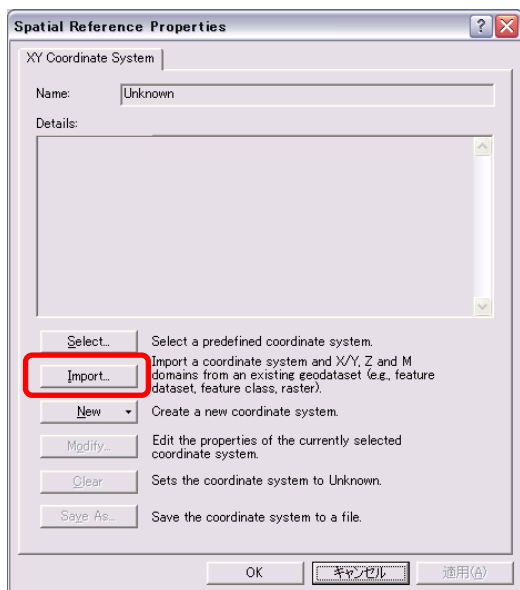
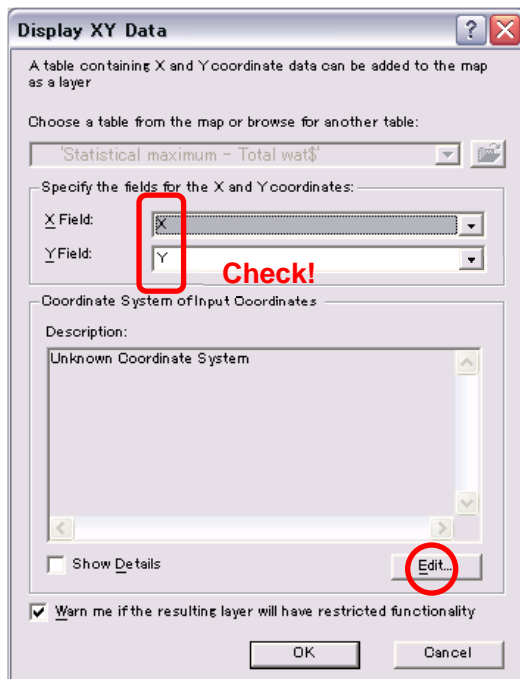
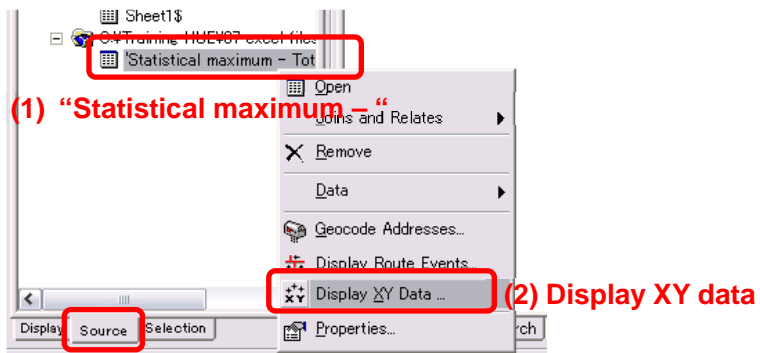
**[7-1] Add Excel Data**

Open the “Flood result.xlsx”.

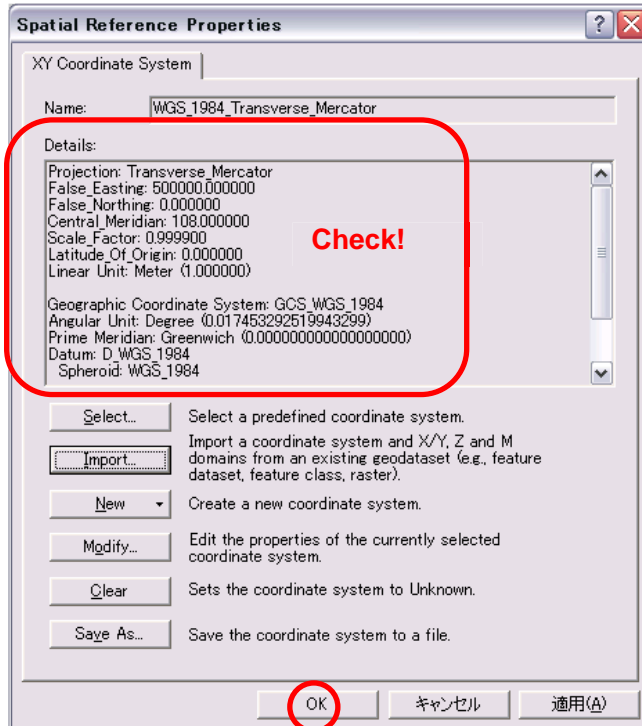
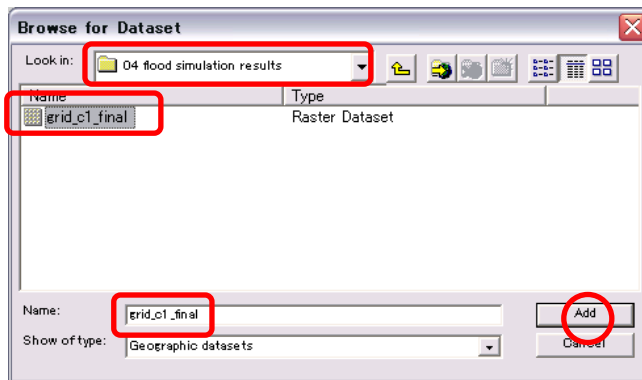
X	Y	Z	Depth	Check!
444005.9	1826142	6.298789	0.015756	
444100.1	1826111	5.99089	0.015756	
444021.7	1826160	7.107442	0.015756	
444333.8	1826002	5.557705	0.015756	
444283.6	1826037	5.821074	0.015756	
443668.1	1828252	2.377605	1.303079	
443462.5	1827619	4.040099	0.623622	
444198.6	1826086	5.799091	0.0173	
443979.1	1826182	7.769981	0.015756	
444115.3	1826129	6.520854	0.015756	
444072.4	1826153	7.204498	0.015756	
443883.2	1826246	8.864258	0.015756	
448650.5	1823471	2.601635	0.456396	
448854.5	1823988	2.07561	0.970245	
450408.6	1827645	0.911355	1.415193	
450491.3	1827700	0.700056	1.626304	

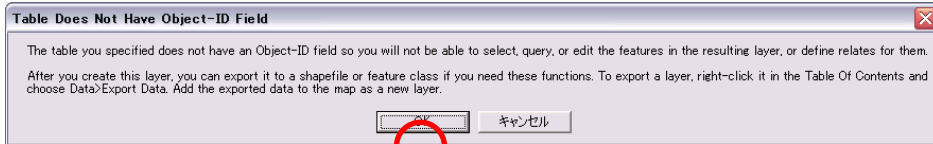
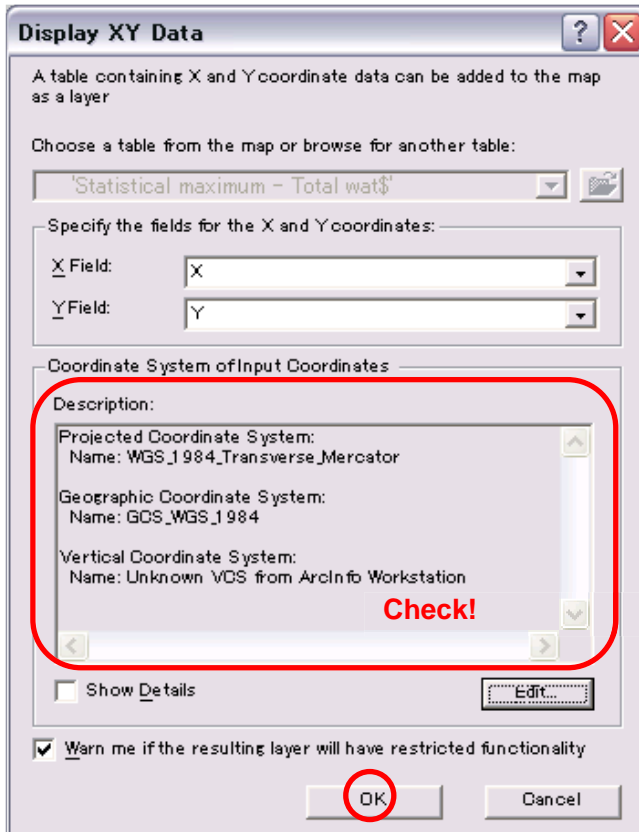
Add Data



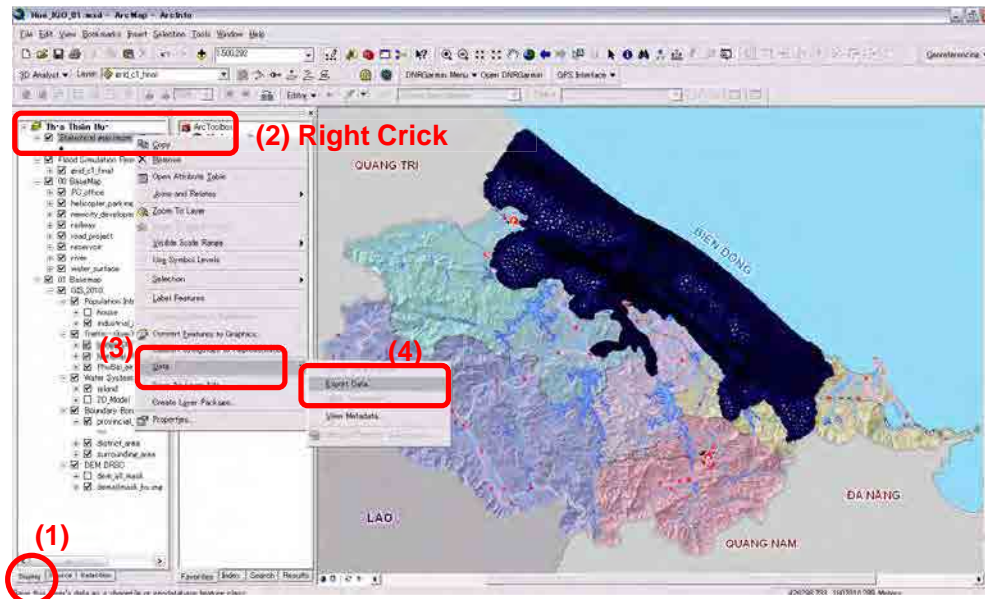


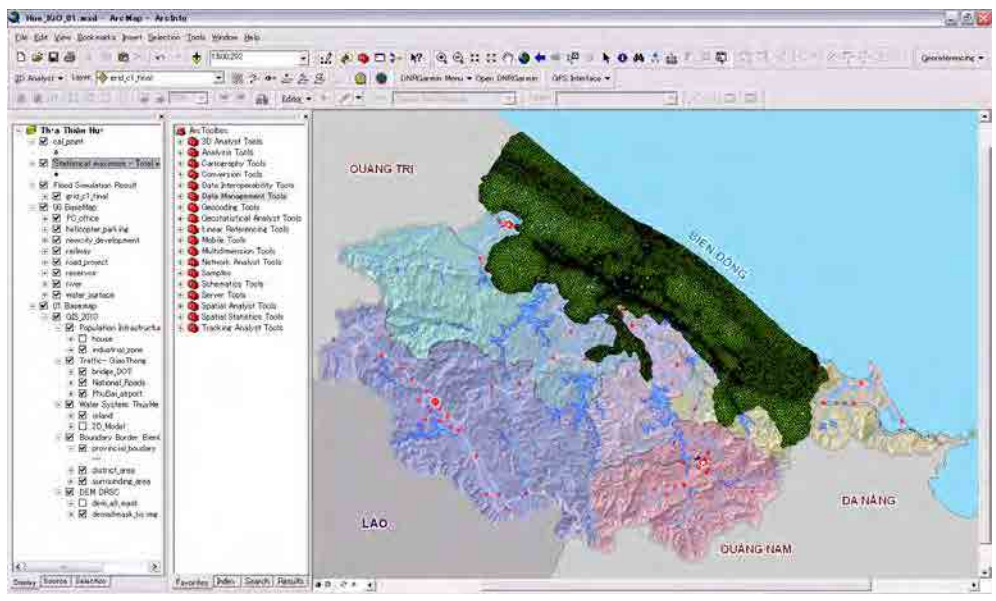
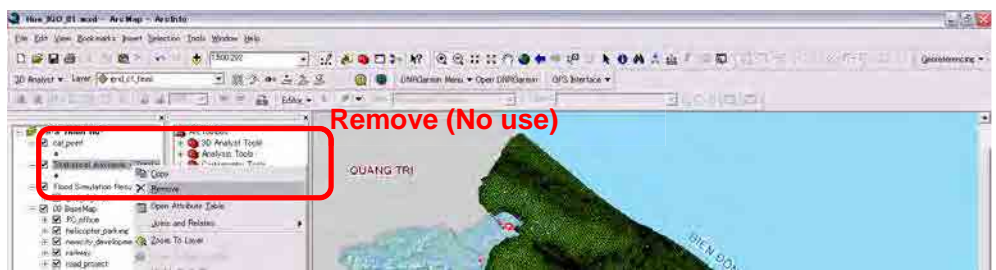
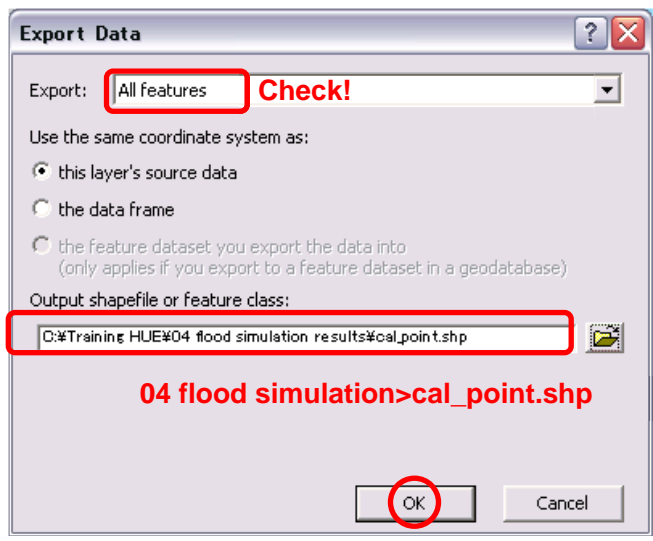






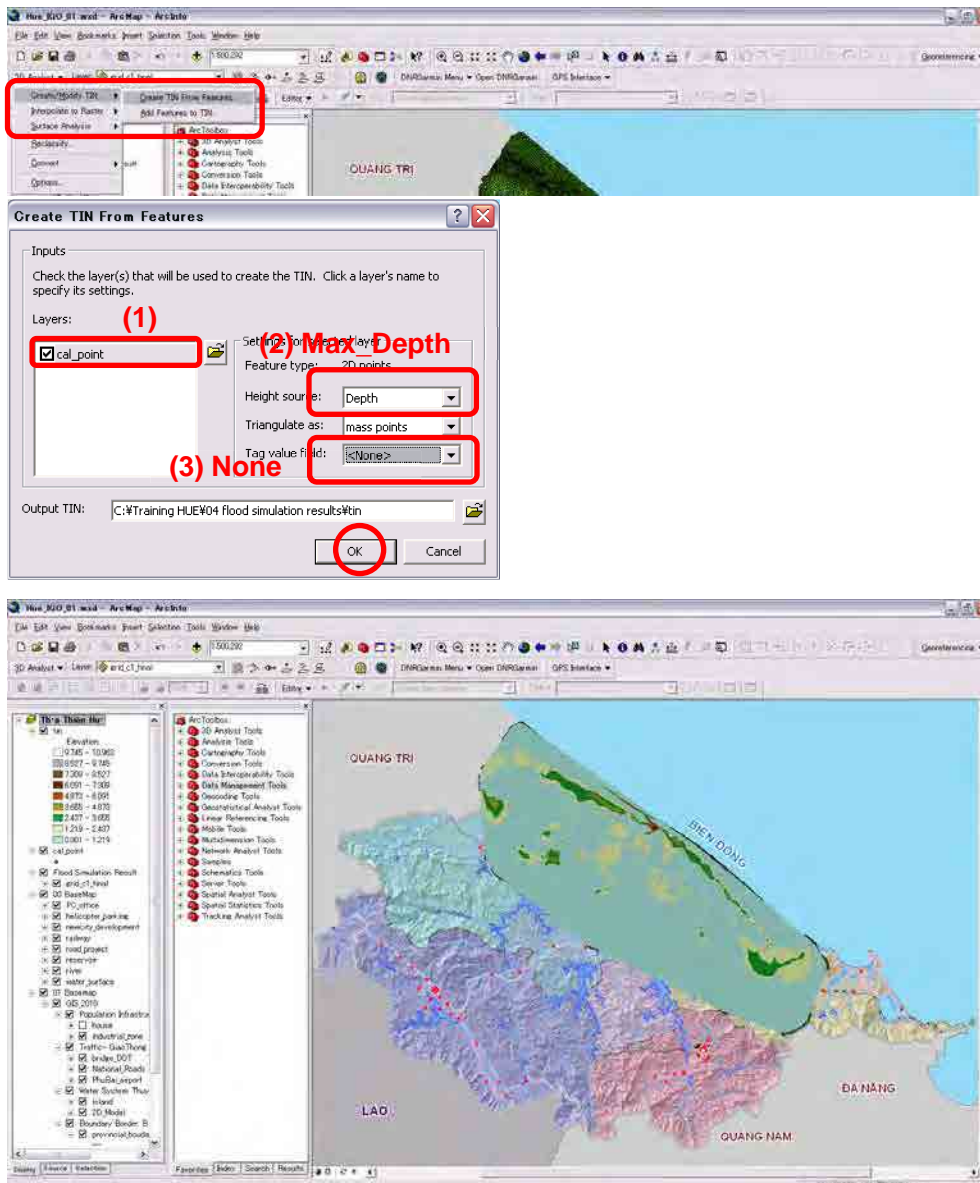
**[7-2] Export Data**





### [7-3] Point Data to TIN

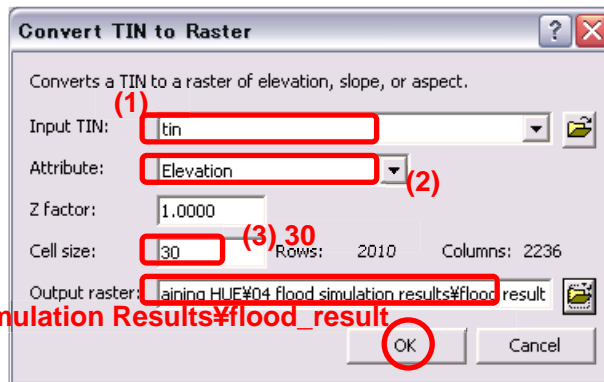
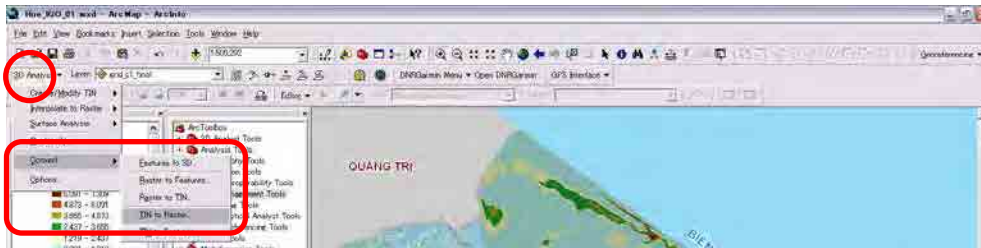
[Create TIN from Feature by using 3D Analyst]



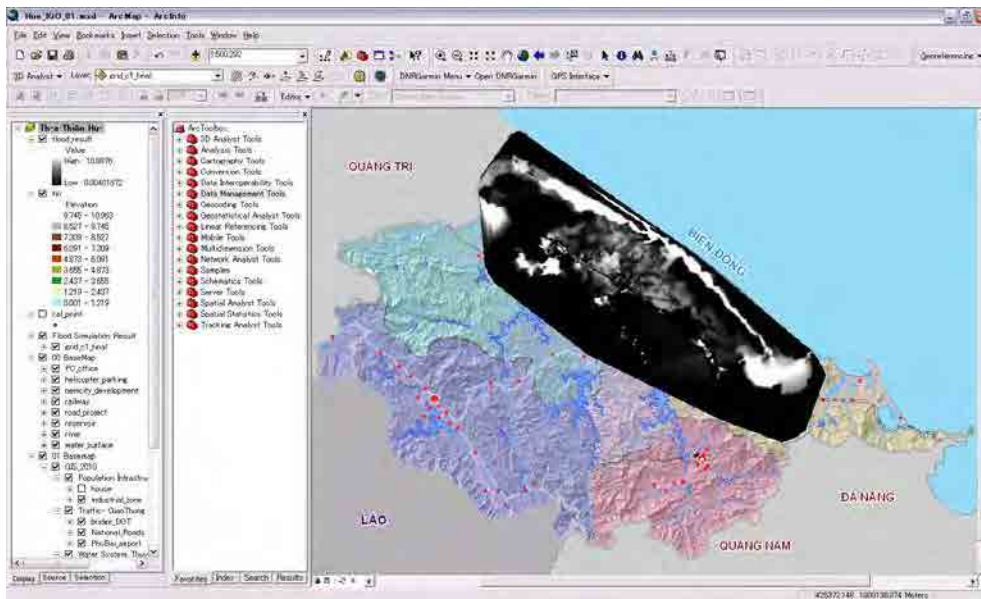
**[7-4] TIN to Raster**

[Click off the “cal\_point”]

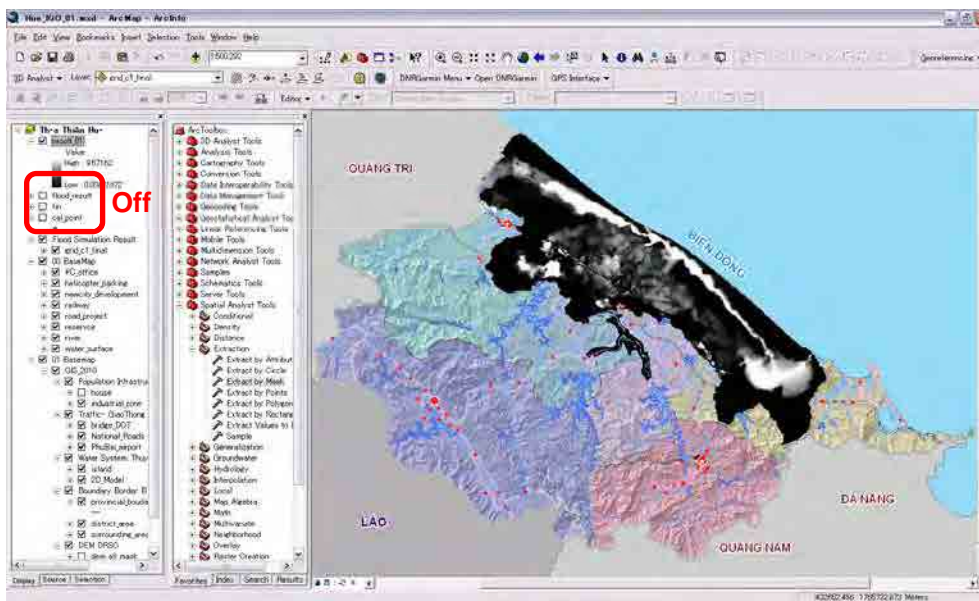
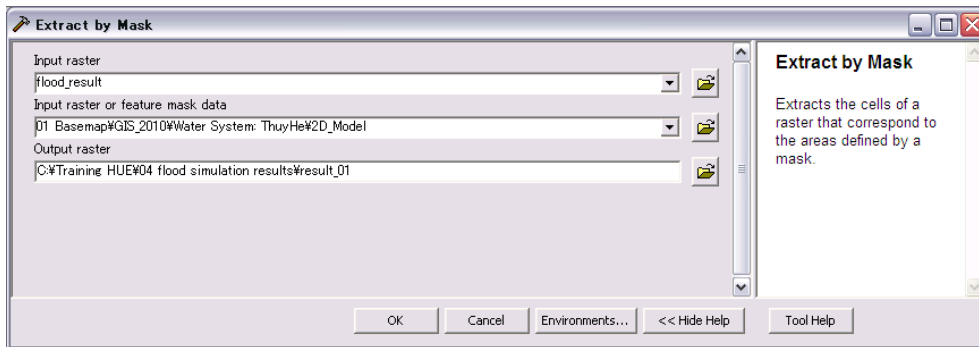
3D Analyst>Convert>Tin to Raster



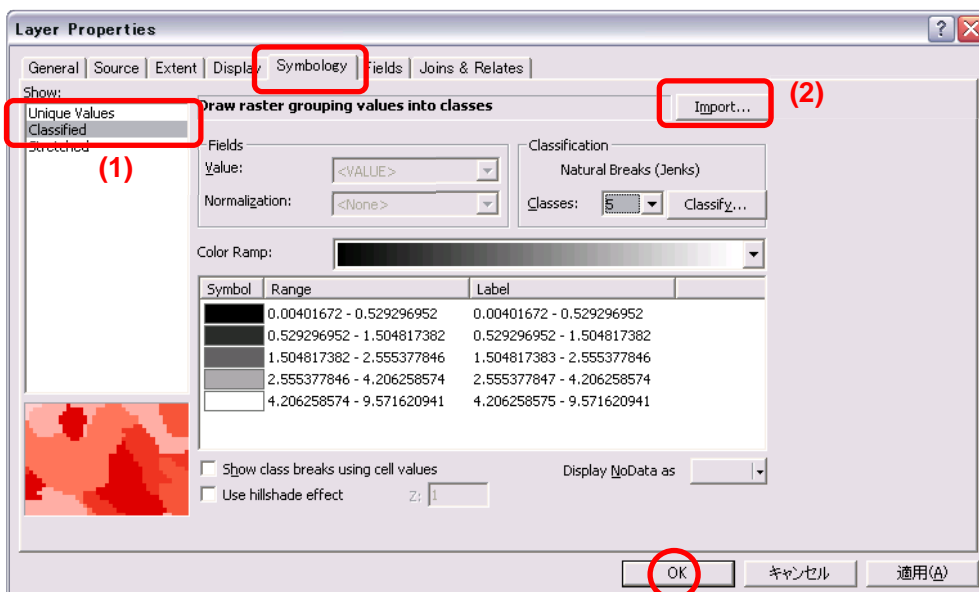
(4) 04 Flood Simulation Results#flood\_result

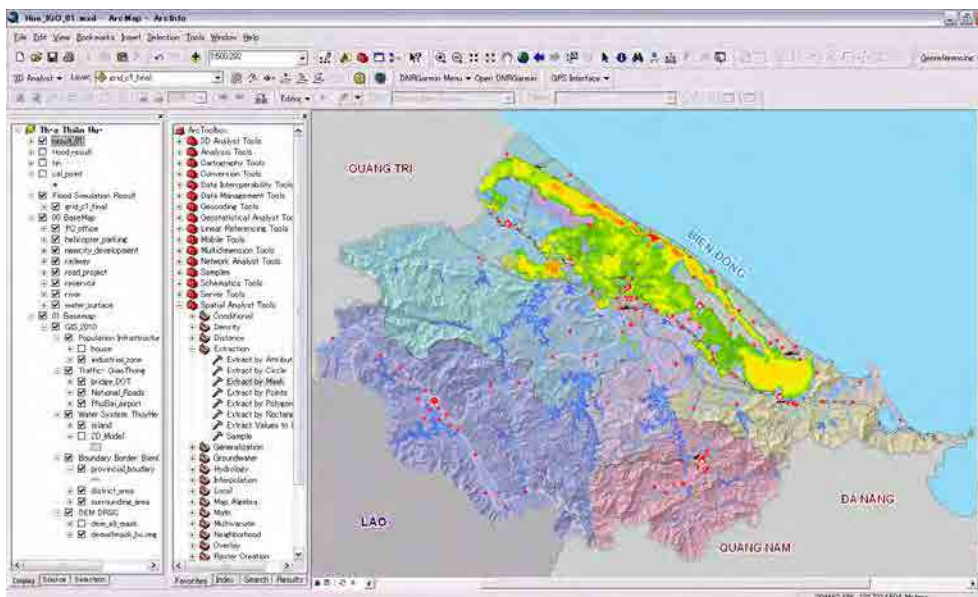
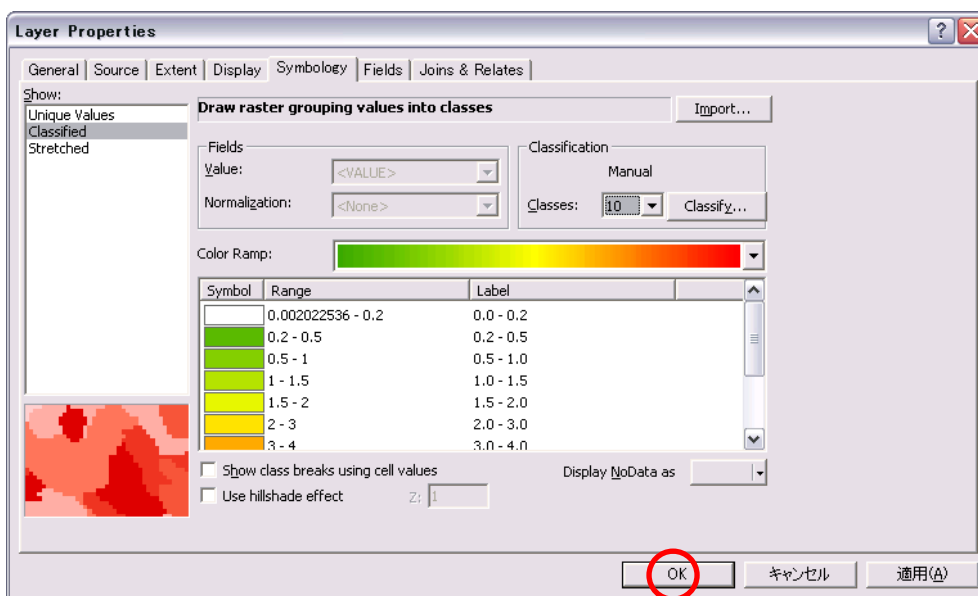
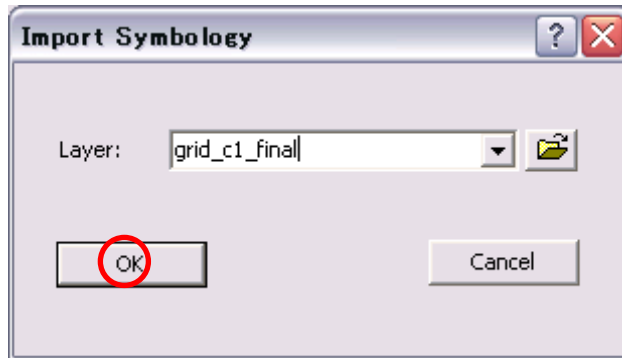


[Clip the 2D area] by Using “**Extract by Mask**” Tool.



### [7-5] Import Layer File





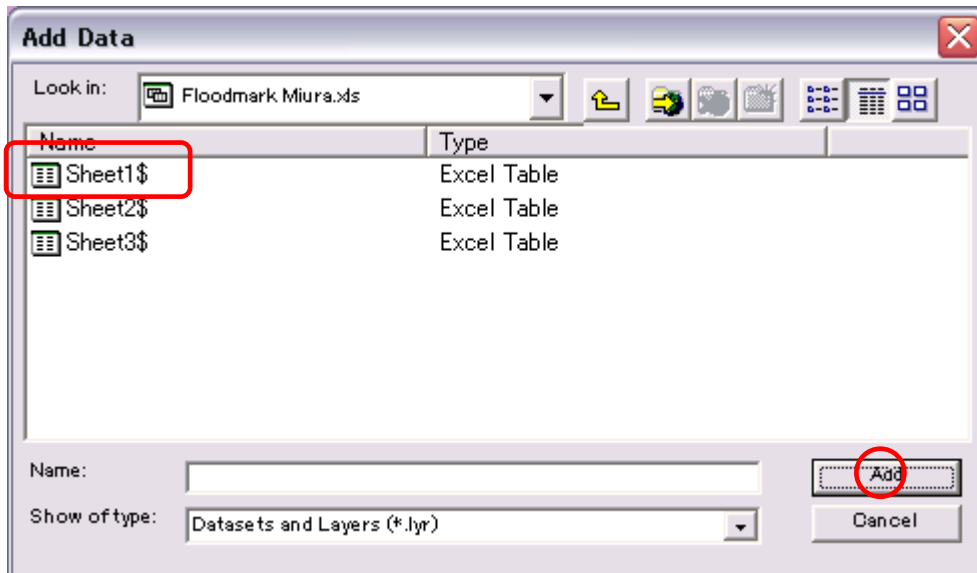
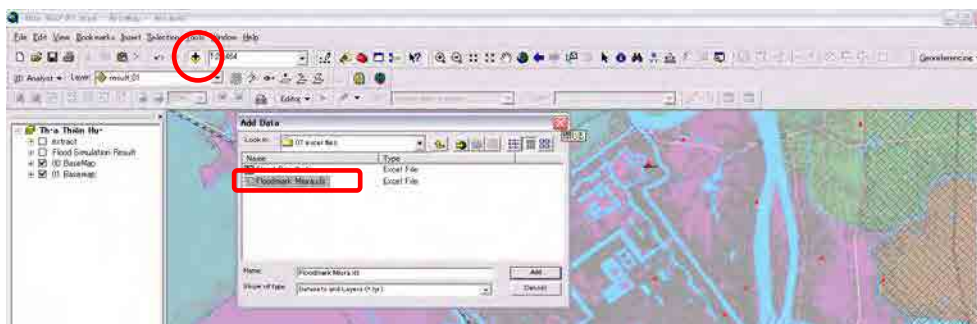
## Course Add-1 Add Point Shapefile from GPS

### [A1-1] Add point data from Excel Table

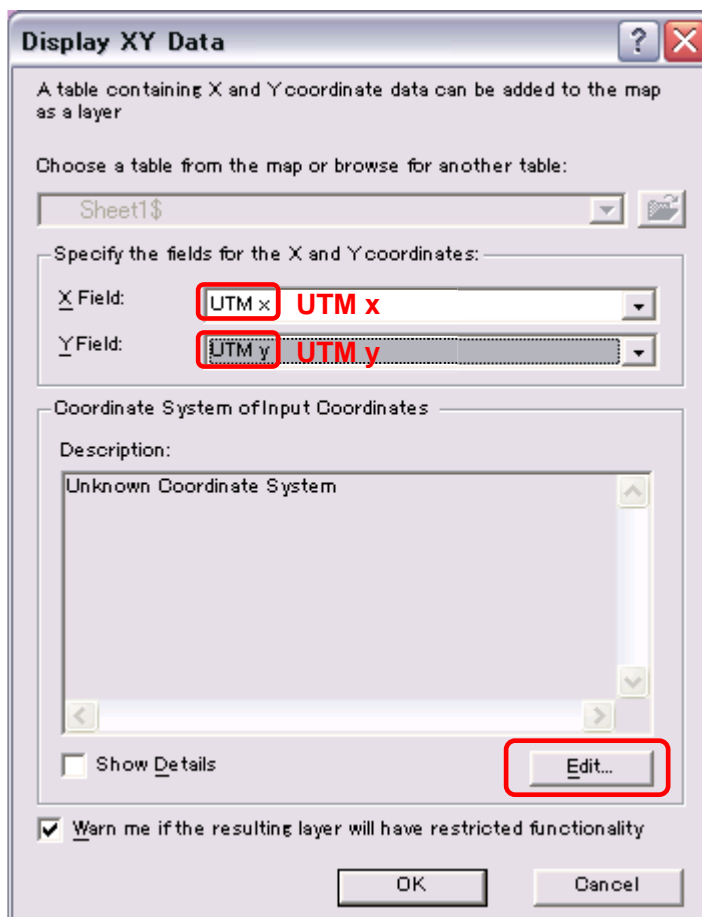
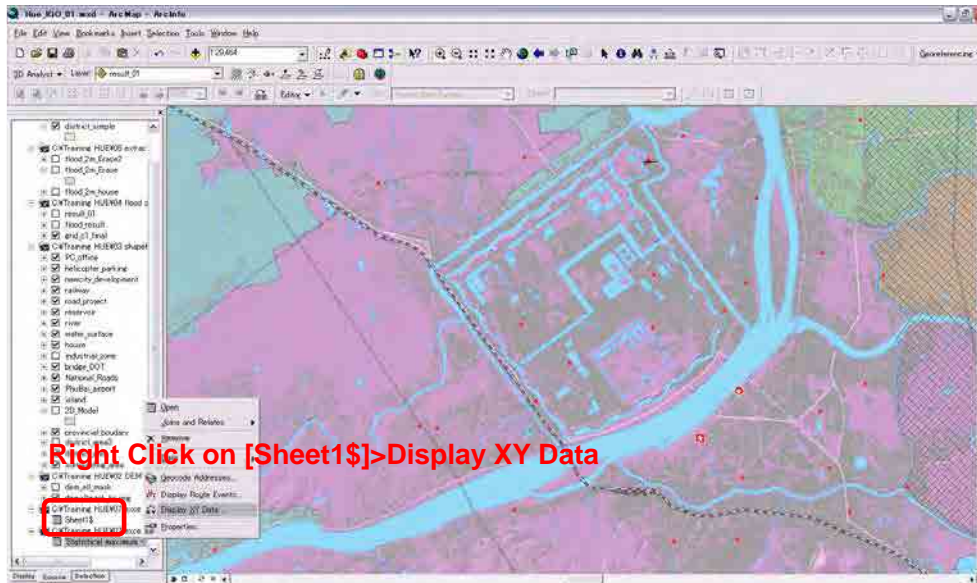
Open the excel file of “Floodmark Miura.xlsx”.

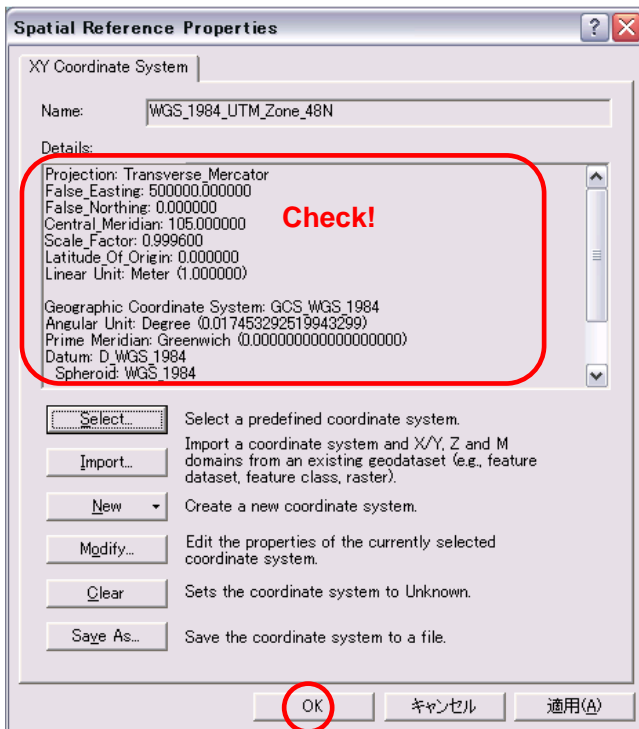
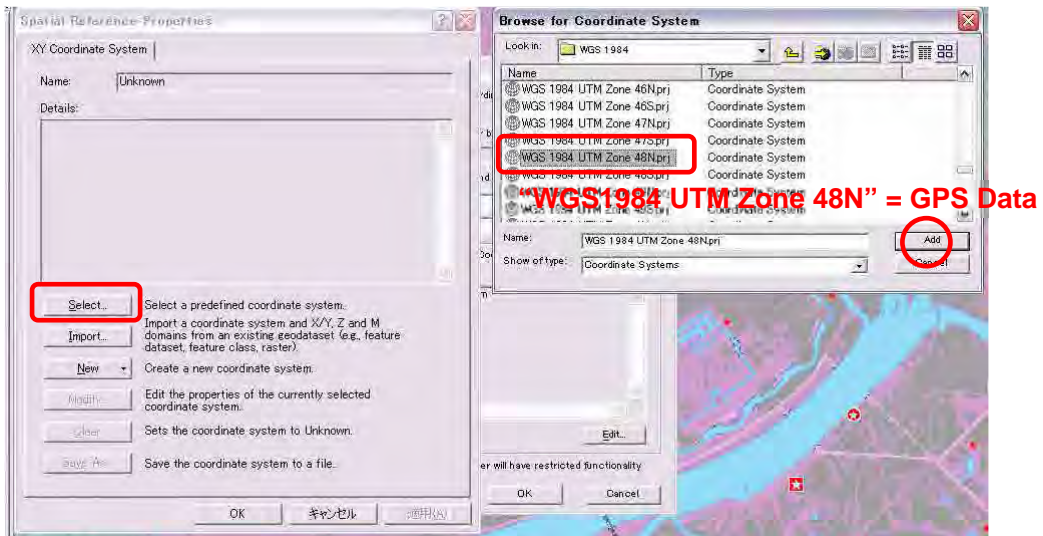
No	Name	Commune	Address	1983 (m)	2004 (m)	Elevation (m)	Longitude (UTM x)	UTM y	Latitude	UTM y	Plot code
1	12	Siemreap house - Nguyen Tai	Hung So Ward	Group 4 area II	2.60	1.42	107.502303	77128.8524	15.462712	152485.45	218
2	12	Siemreap house - Nguyen Van Dung	Hung So Ward	Group 7 area B	2.42	1.20	107.566479	77020.8113	15.495231	152638.00	219
3	12	Hung So Elementary School, M. Luu	Hung So Ward	Group 7 area II	3.10	1.01	107.598309	77020.8114	15.495231	152638.00	219
4	12	Phap's Commune of Siemreap Ward	Siemreap Ward		1.95	0.26	107.555643	77024.8747	15.507872	152422.16	247
5	12	Siemreap Commune of Siemreap Ward	Siemreap Ward		2.73	1.15	107.557790	77024.8748	15.507872	152422.16	247
6	12	Siemreap house - Lu Minh	Hung Long Commune	11 Su Luu Nam	3.12	1.22	107.542628	77141.2156	15.452534	152570.56	220
7	12	Nguyen Thi A Pharmacy	Hung Long Commune	82 Ly Nam De	3.32	1.20	107.541142	77141.2156	15.452534	152570.56	218
8	12	Siemreap house - Nguyen Thi Huu	Kim Long Ward	17 Pham Tu cam	2.25	1.32	107.591033	77241.3111	15.464541	152199.97	200
9	12	Siemreap house - Ho Dang Binh	Kim Long Ward	13416 Kim Long	1.62	0.22	107.562234	77123.4205	15.462161	152138.71	221
10	12	Kim Long Elementary School (M. Luu)	Kim Long Ward	12 Nguyen Phuc Tam	3.20	1.10	107.541770	77041.1881	15.473569	152171.93	223
11	12	Siemreap house - Nguyen Thi Dao	Phu Thuan Ward	385 Le Thanh	1.12	0.22	107.585820	77041.1881	15.474210	152142.54	251
12	12	Phu Thuan Kindergarten	Phu Thuan Ward	25 Tay Binh	1.82	0.22	107.604402	77041.1881	15.474210	152142.54	251
13	12	Siemreap house - Nguyen Thi Hoa	Tay Lac Ward	41 Ho My	2.28	1.25	107.51264	77141.2156	15.474210	152142.54	251
14	12	Siemreap house - Lu Quang Binh	Tay Lac Ward	114 Thanh Giang	2.65	1.18	107.542736	77041.1881	15.473569	152142.54	251
15	12	Siemreap house - Lu Quang Binh	Tay Lac Ward	17 Le Son Phu Tu	3.45	1.35	107.567524	77141.2156	15.473569	152142.54	251
16	12	People's Committee of Thanh Hoa Ward	Thanh Hoa Ward	107 Nguyen Trai	2.18	1.04	107.671034	77451.2545	15.493205	152294.22	229
17	12	Thanh Hoa Elementary School	Thanh Hoa Ward	14 Tran Nguyen Dan	2.14	1.12	107.5714	77451.2545	15.493205	152294.22	229
18	12	Siemreap house - Pham Van Minh	Thanh Hoa Ward	12 Nguyen Lu Thanh	1.15	0.43	107.567571	77451.2545	15.493205	152294.22	229
19	12	People's Committee of Thanh Lac Ward	Thanh Lac Ward	124 La Thanh Tin	2.42	1.30	107.511629	77041.1881	15.452534	152142.54	218
20	12	Phu An High Temple	Thanh Lac Ward	140 Bui Thi Xuan Tam 15 area 1	2.38	1.30	107.494423	77021.8276	15.473569	152142.54	218
21	12	Siemreap house - Nguyen Thi Hoa	Thanh Lac Ward	21 Minh Ca	1.80	1.10	107.472389	77021.8276	15.473569	152142.54	218
22	12	People's Committee of Thanh Thuan	Thanh Thuan Ward	12 Giang Thi Thanh	1.88	0.72	107.572385	77021.8276	15.473569	152142.54	218
23	12	Siemreap house - Tran Van Binh	Thanh Thuan Ward	14 Lu Van Hoa	1.80	0.72	107.472385	77021.8276	15.473569	152142.54	218
24	12	Elementary Department of Hiep Hoa Ca	Thanh Lac Ward	110 Dien Tin Hoang	2.90	1.32	107.511629	77041.1881	15.473569	152142.54	218
25	12	Siemreap house - Nguyen Thi Hoa	Phu Hoa Ward	124 Huynh Thuc Khang	2.12	1.12	107.487428	77041.1881	15.473569	152142.54	218
26	12	Siemreap house - Lu Minh	Phu Hoa Ward	15 Tran Nguyen Dan	1.62	1.10	107.487428	77041.1881	15.473569	152142.54	218
27	12	Siemreap house - Tran Van Binh	Phu Hoa Ward	107 Tran Chu Lam	1.80	1.30	107.511629	77041.1881	15.473569	152142.54	218
28	12	Siemreap house - Tran Van Binh	Phu Hoa Ward	104 Tran Chu Lam	1.00	1.30	107.511629	77041.1881	15.473569	152142.54	218
29	12	High school - Phu Hoa	Phu Hoa Ward	140 Vinh	1.92	1.30	107.487428	77041.1881	15.473569	152142.54	218
30	12	High school - Phu Hoa	Phu Hoa Ward	140 Vinh	1.92	1.30	107.487428	77041.1881	15.473569	152142.54	218
31	12	High school - Phu Hoa	Phu Hoa Ward	140 Vinh	1.92	1.30	107.487428	77041.1881	15.473569	152142.54	218
32	12	High school - Phu Hoa	Phu Hoa Ward	140 Vinh	1.92	1.30	107.487428	77041.1881	15.473569	152142.54	218
33	12	Medical house of Phu Hoa	Phu Hoa Ward	100 Nguyen Thi Thanh	1.80	1.30	107.487428	77041.1881	15.473569	152142.54	218
34	12	Siemreap house - Lu Minh	Phu Hoa Ward	100 Bao Egan	1.80	1.30	107.487428	77041.1881	15.473569	152142.54	218

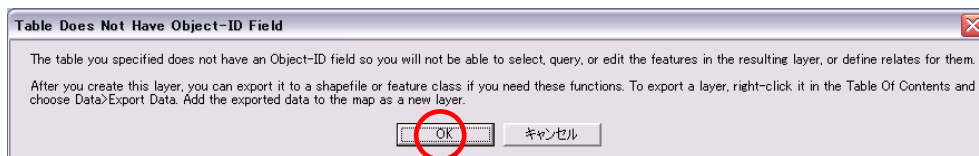
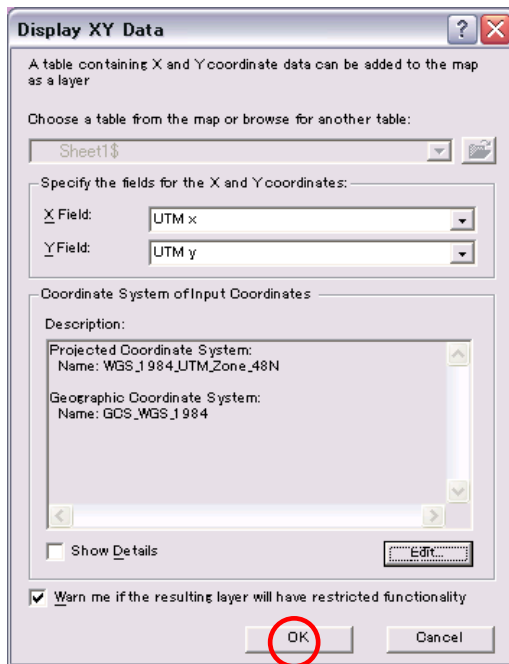
Check!



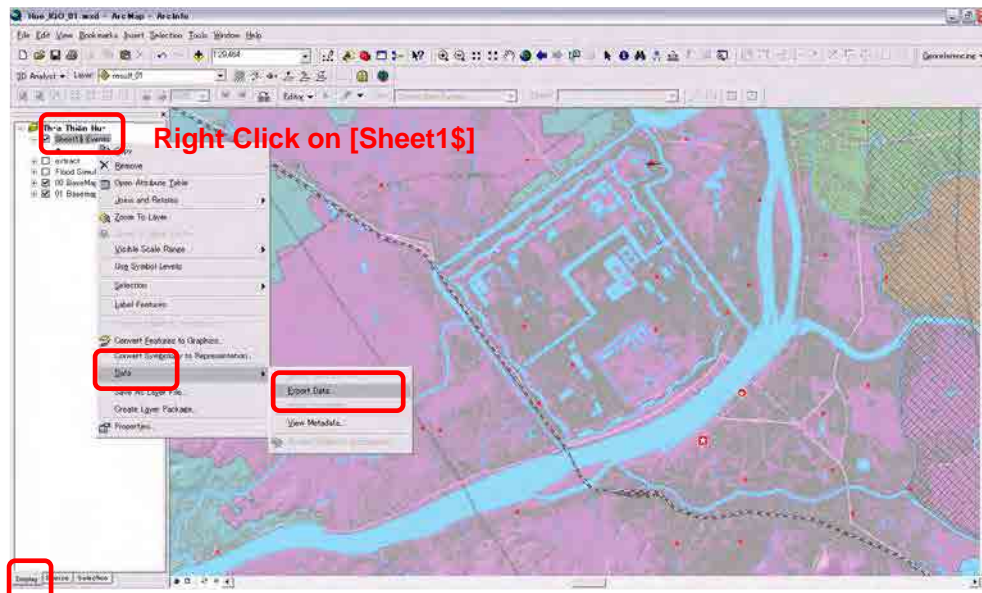


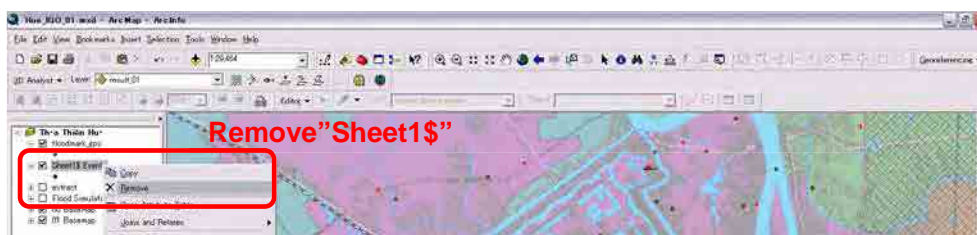
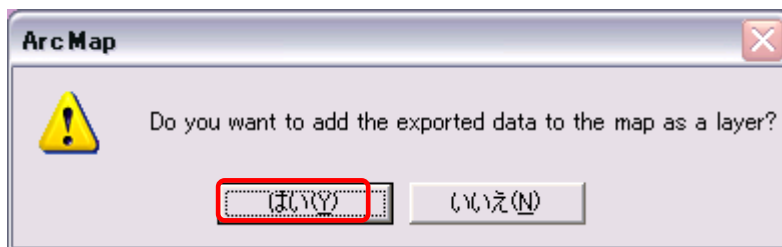
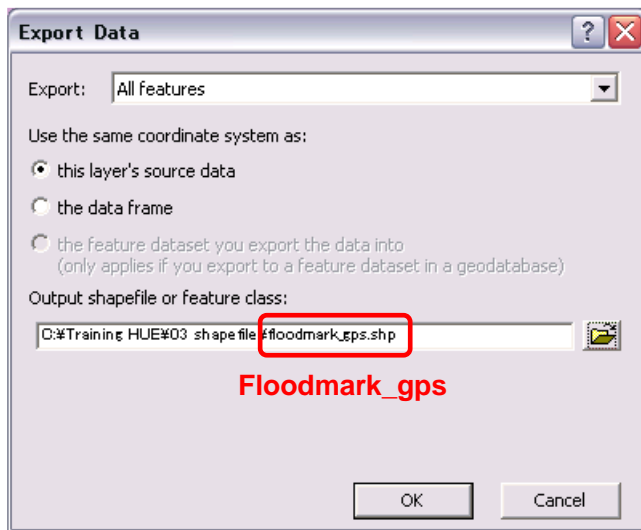






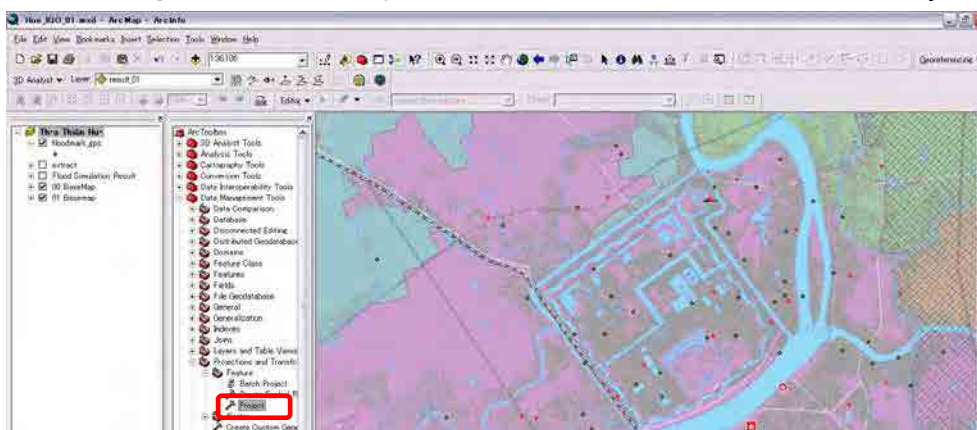
### Export Data of “Sheet1\$”

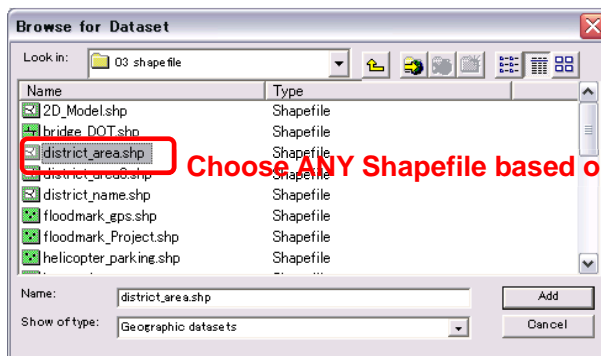
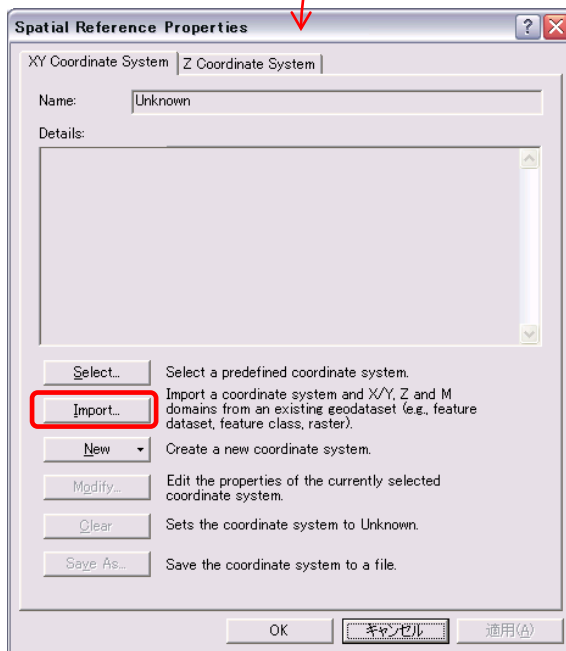
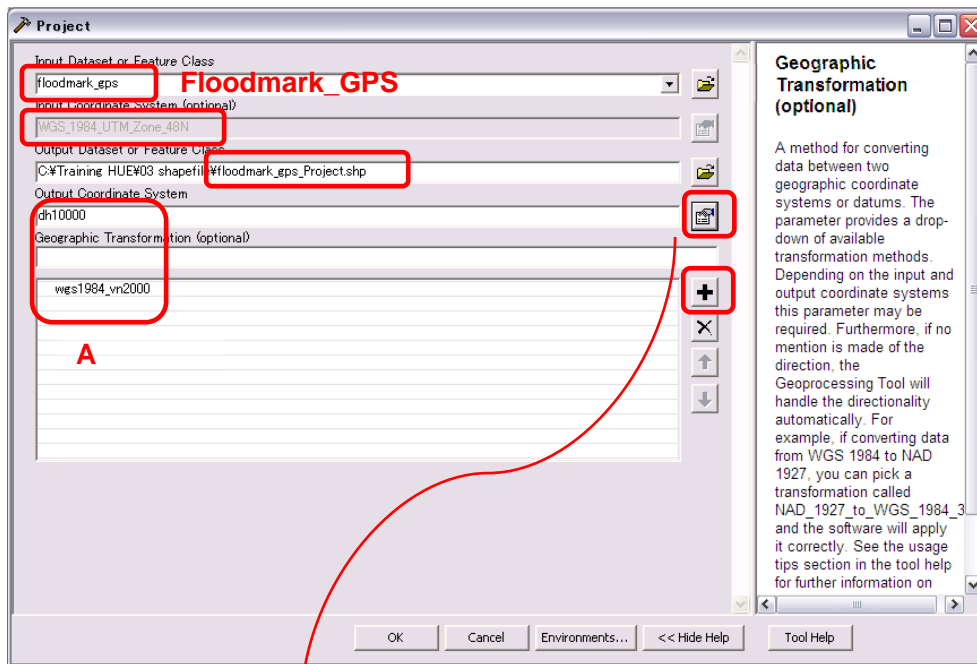


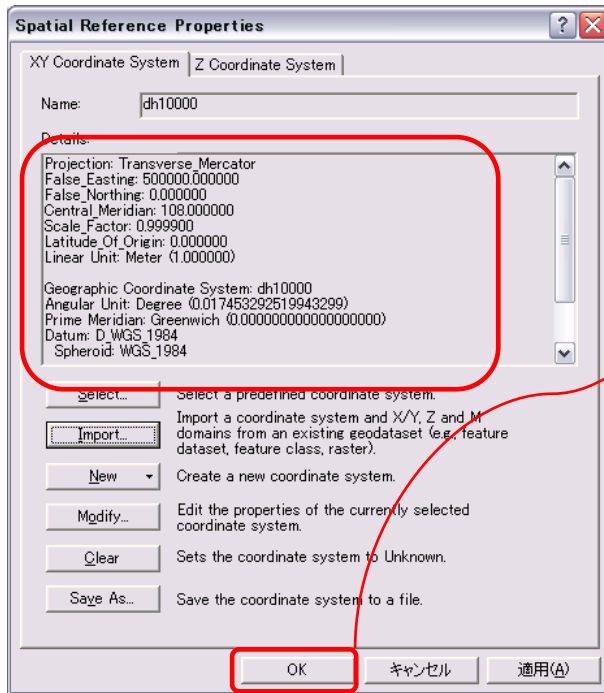


[A1-2] Change coordinate system from WGS84 to VN2000

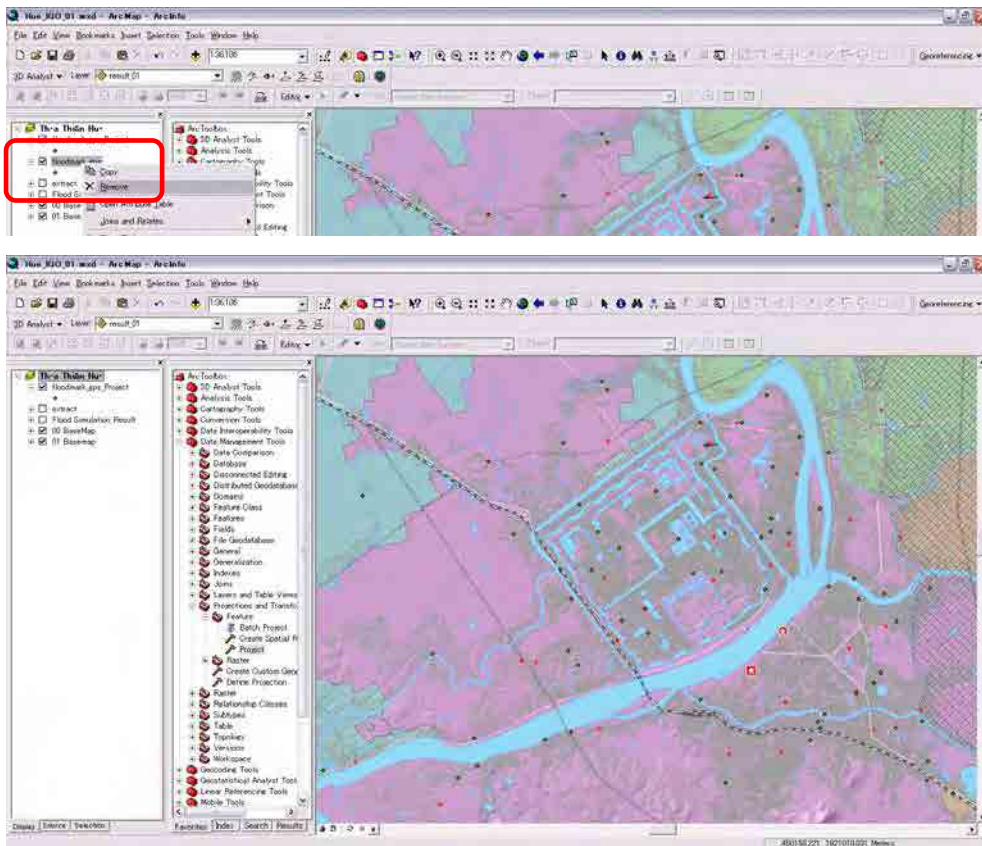
Data Management Tools>Projections and Transformation>Feature>***Project***







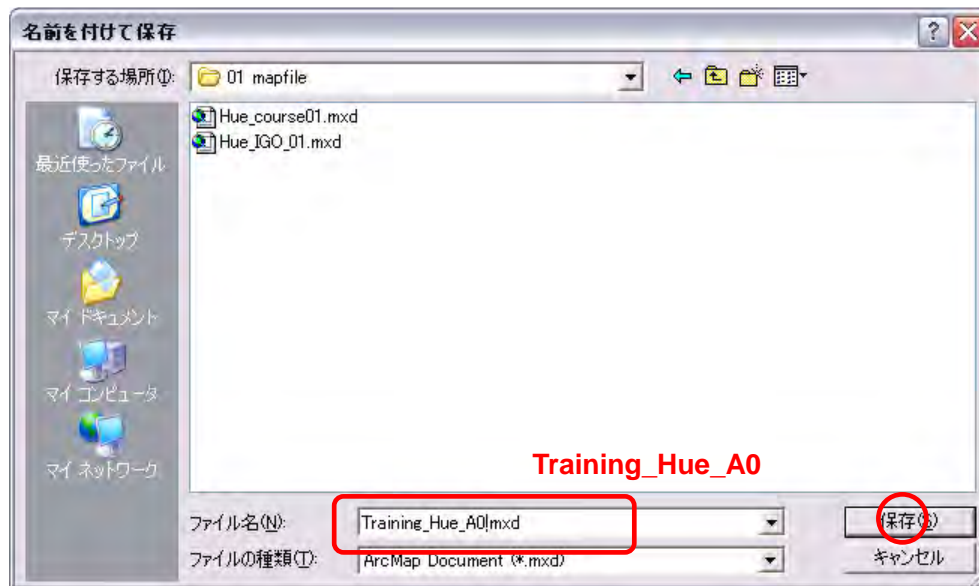
### Remove "Floodmark\_GPS"



## Course Add-2 Layout and Printing

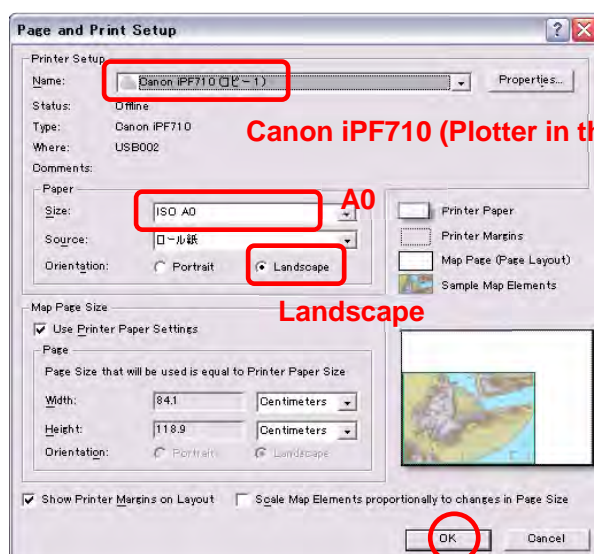
### 【1】 Mapfile

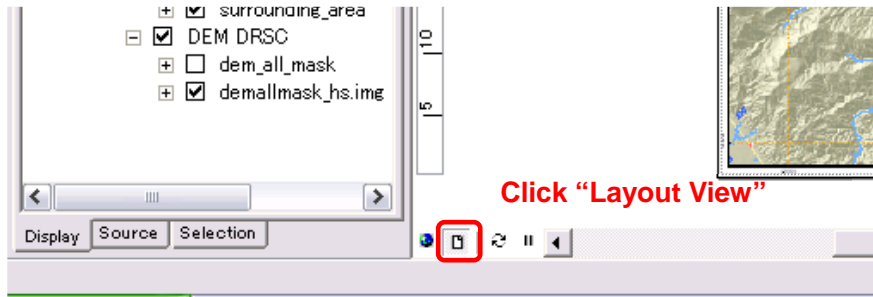
Save as “new mapfile” to layout this training case.



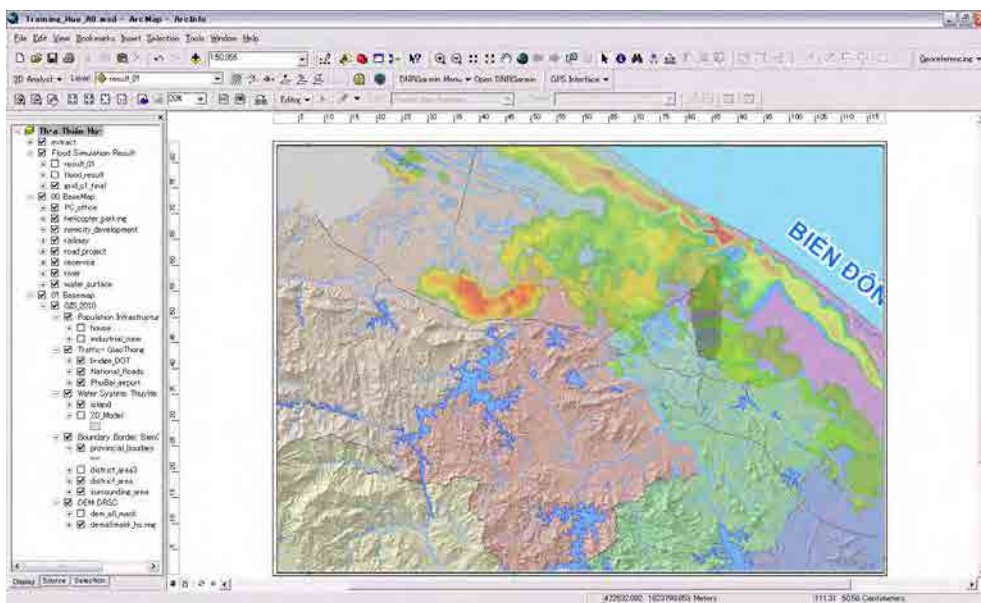
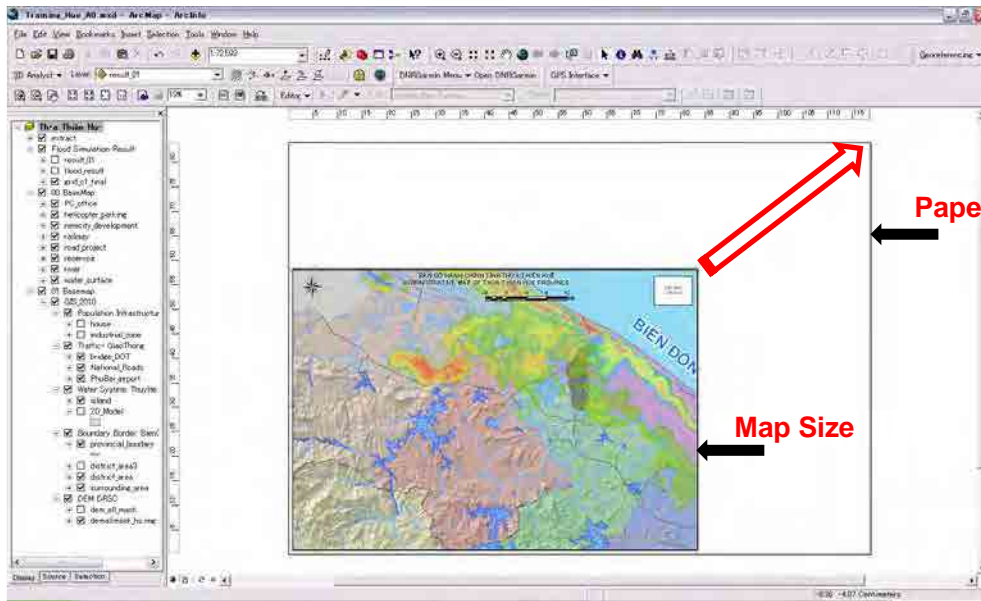
### 【2】 Page and Print Setup

File>Page and Print Setup





Adjust the map size to paper size.

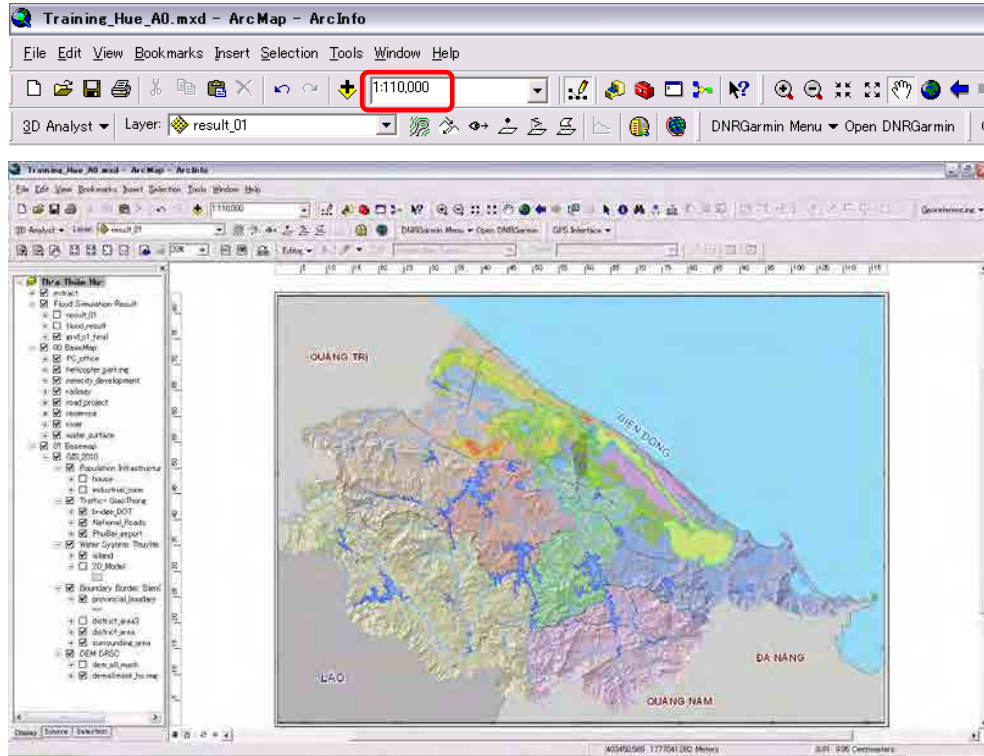




### [3] Scale

You can choose any scale on this command.

In this training you choose **“1:110,000”**.



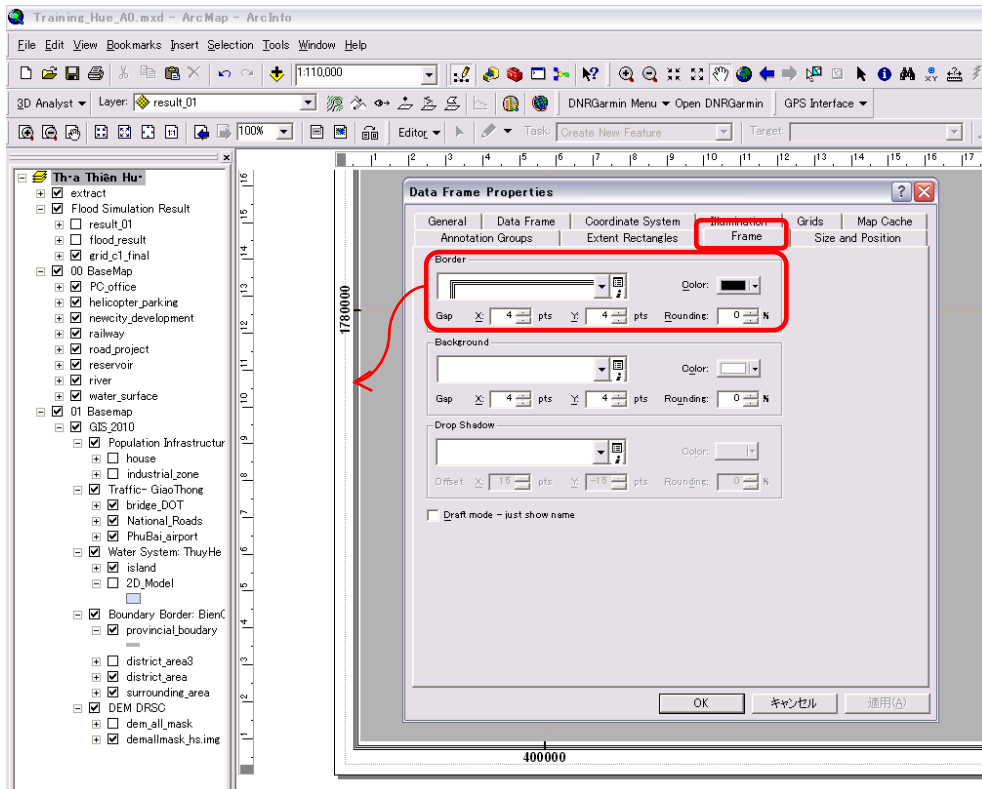
### [4] Data Frame Setting

Right click on the “Thua Thien Hue” data frame.

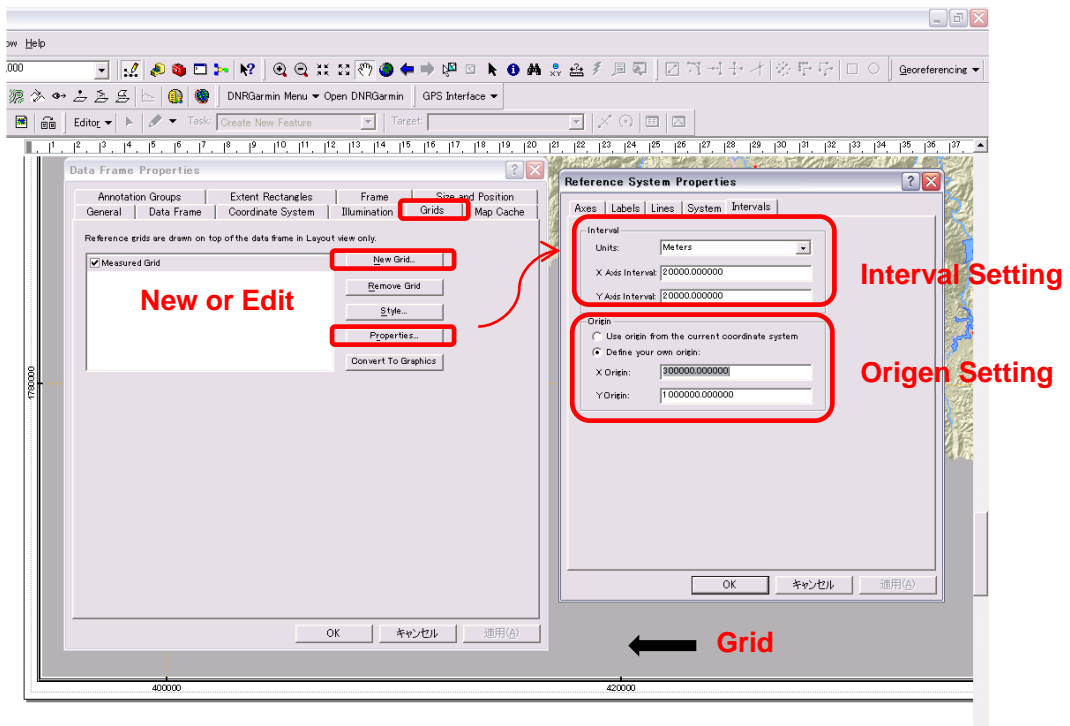
Right Click>Properties



## [Frame]

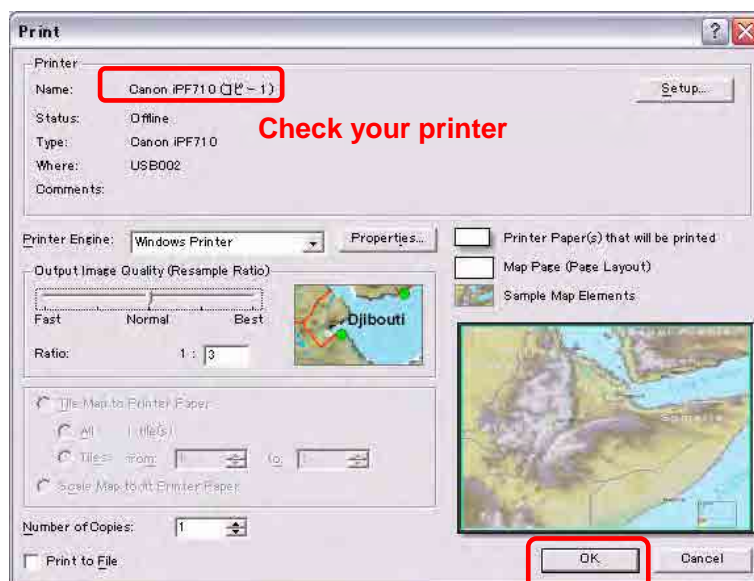
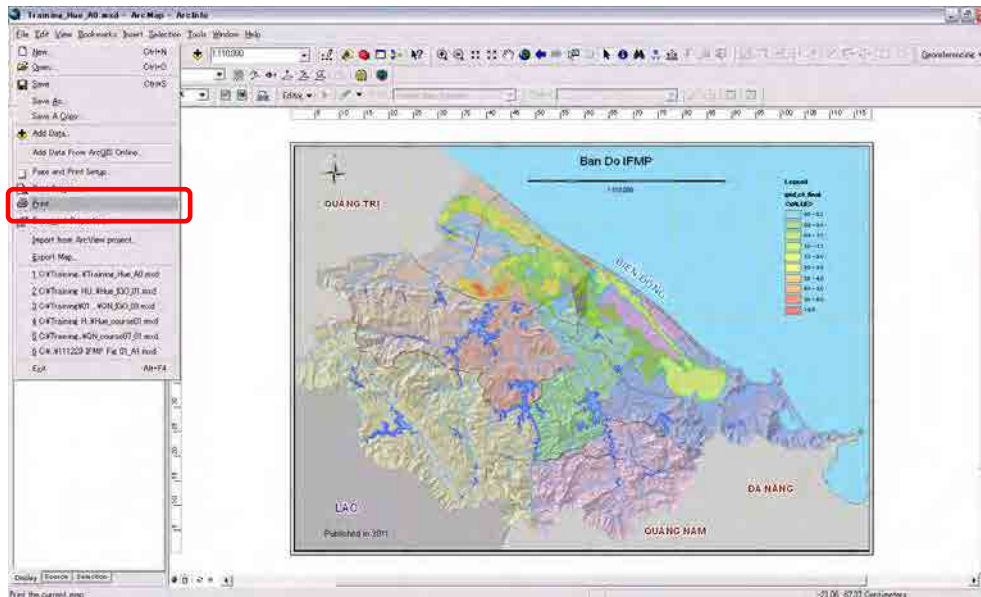


## [Grids]





[6] Printing  
File>Print

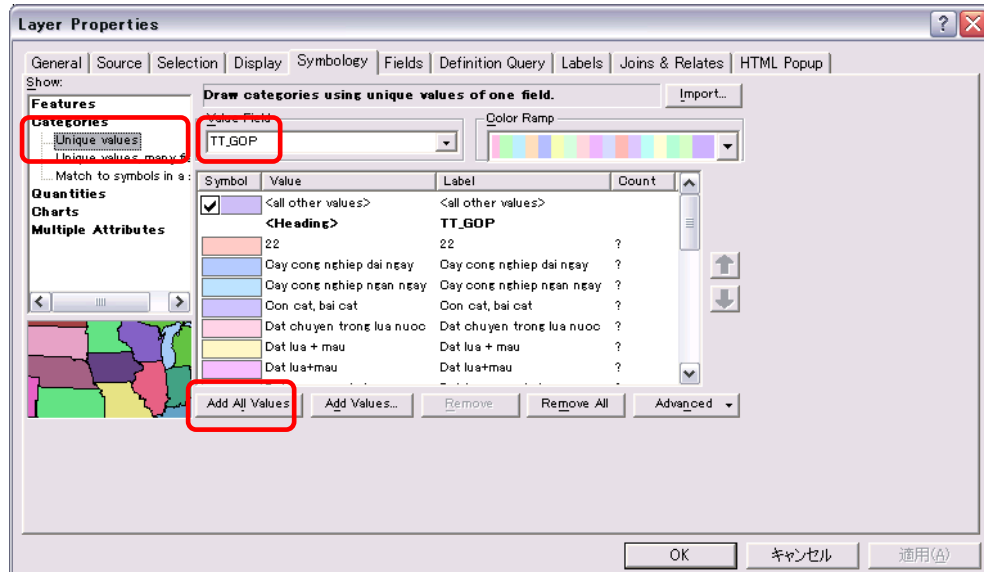
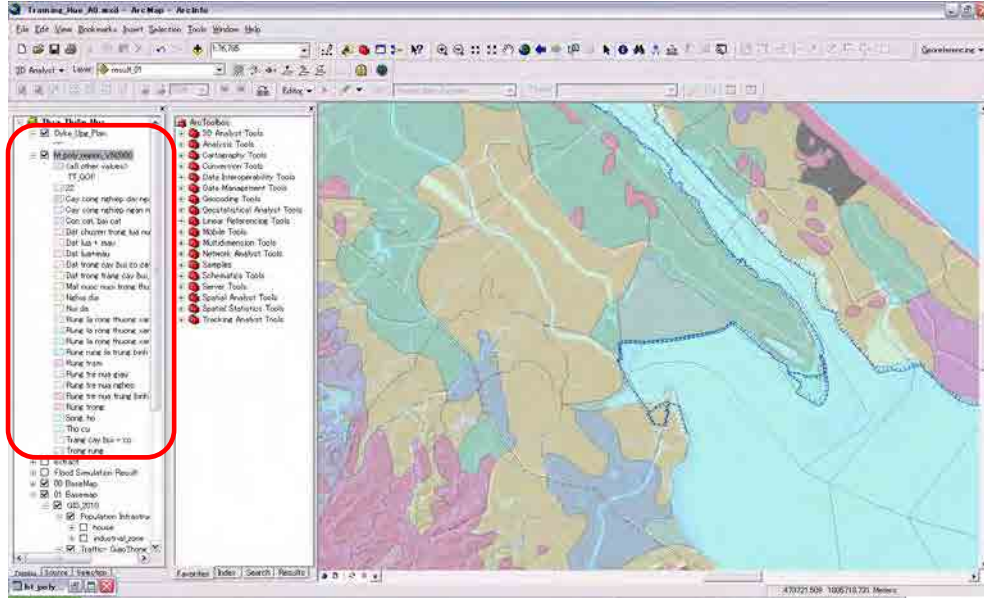


## Course Add-3 Dyke and Land Use

### [1] Preparation

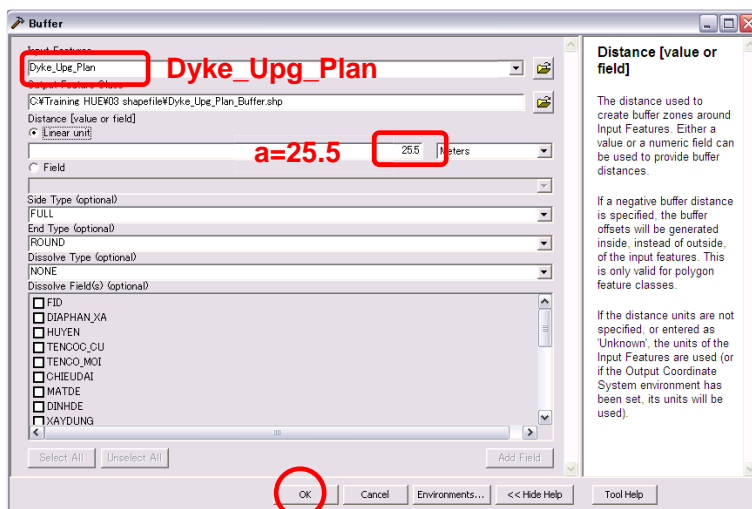
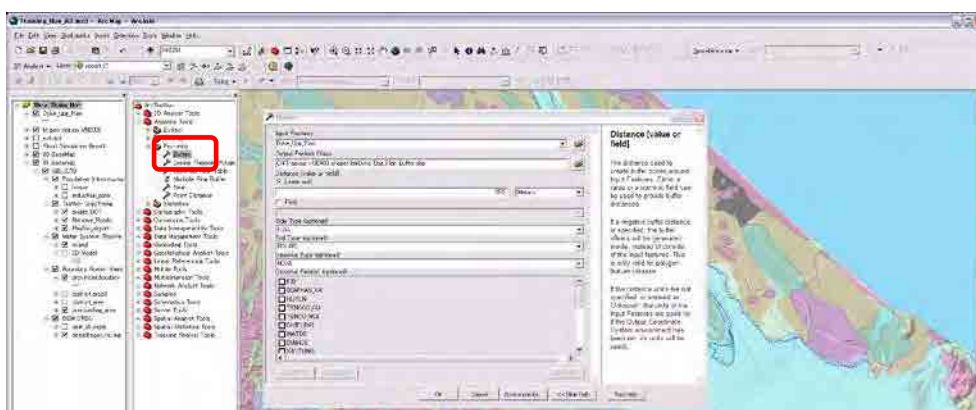
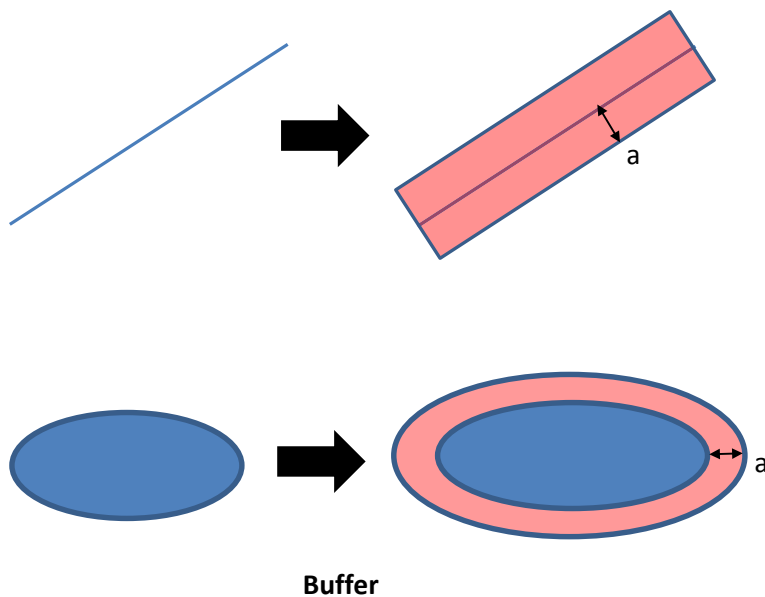
Add “Dyke\_Upg\_Plan” line data.

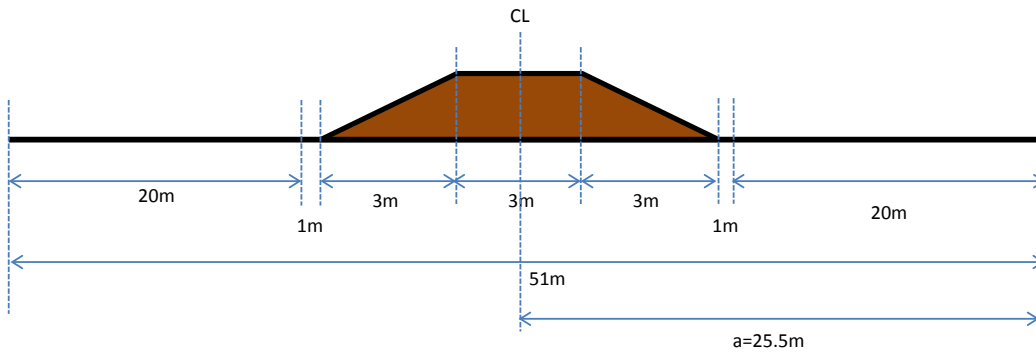
Add “ht\_poly\_region\_VN2000” polygon data.



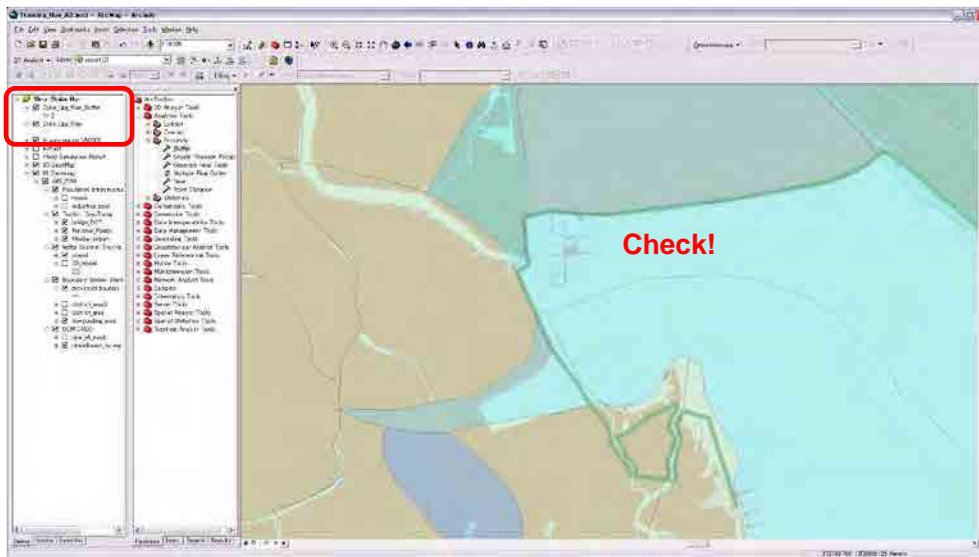
## [2] Buffer

Arc Toolbox>Analysis Tools>Proximity>Buffer

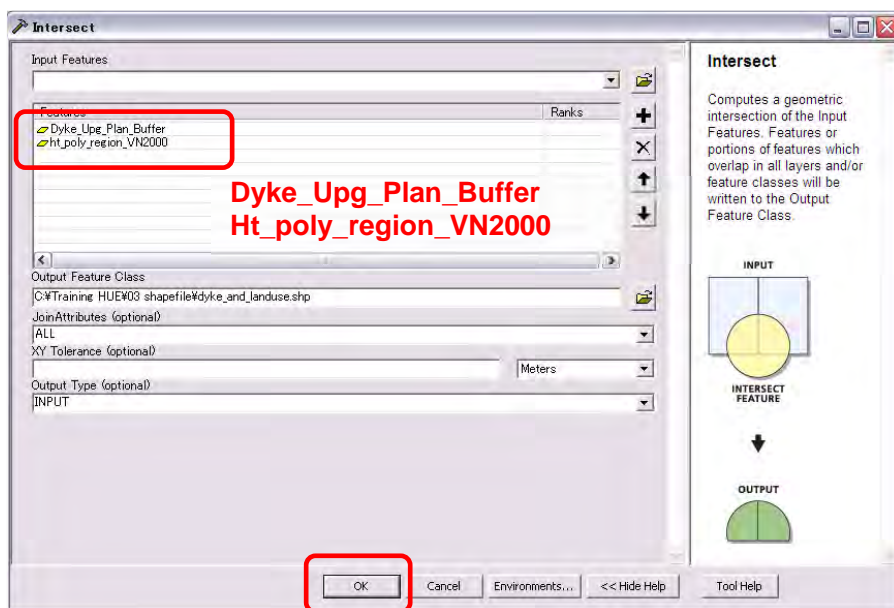




Change Color and Line of “Dyke\_Upg\_Plan” and “Dyke\_Upg\_Plan\_Buffer”  
And Zoom in.



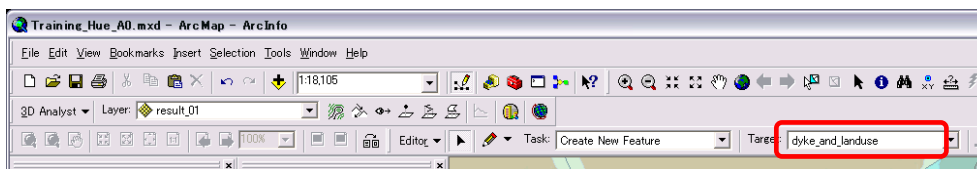
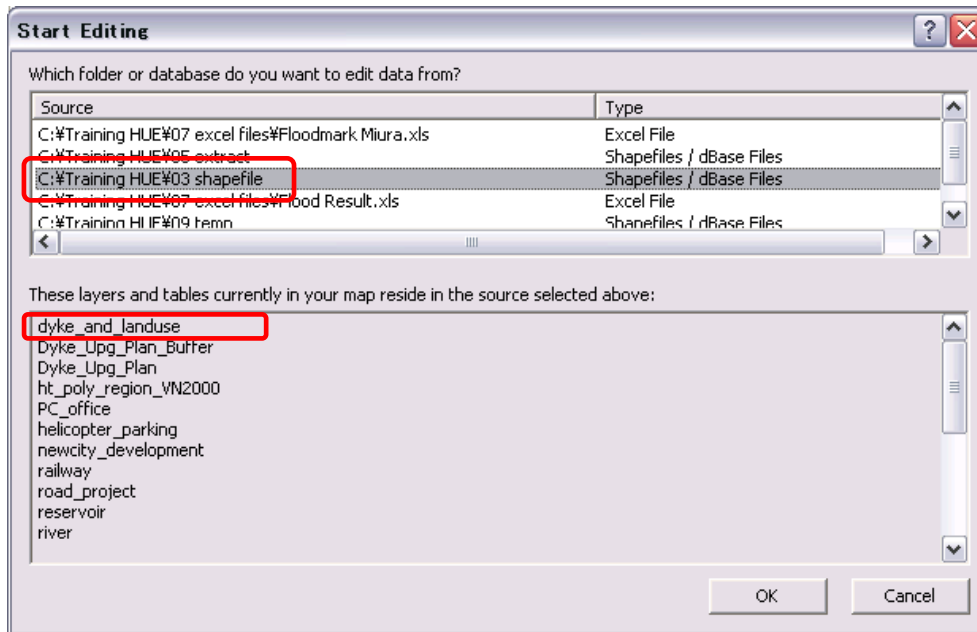
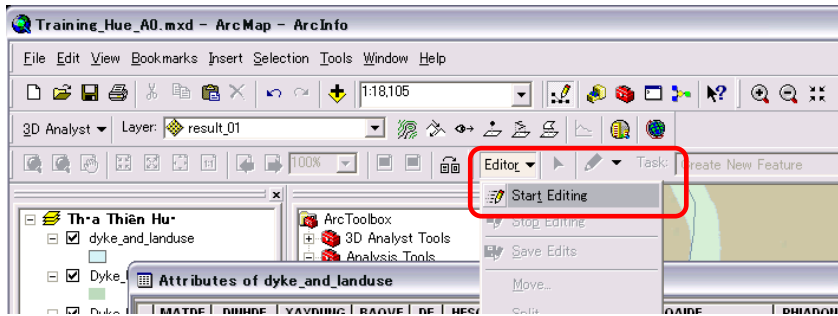
### [3] Intersect



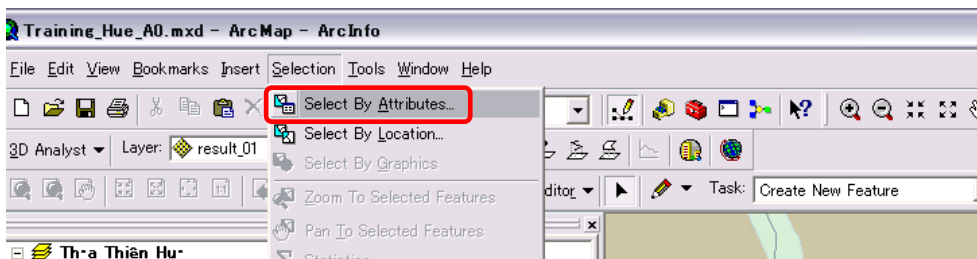


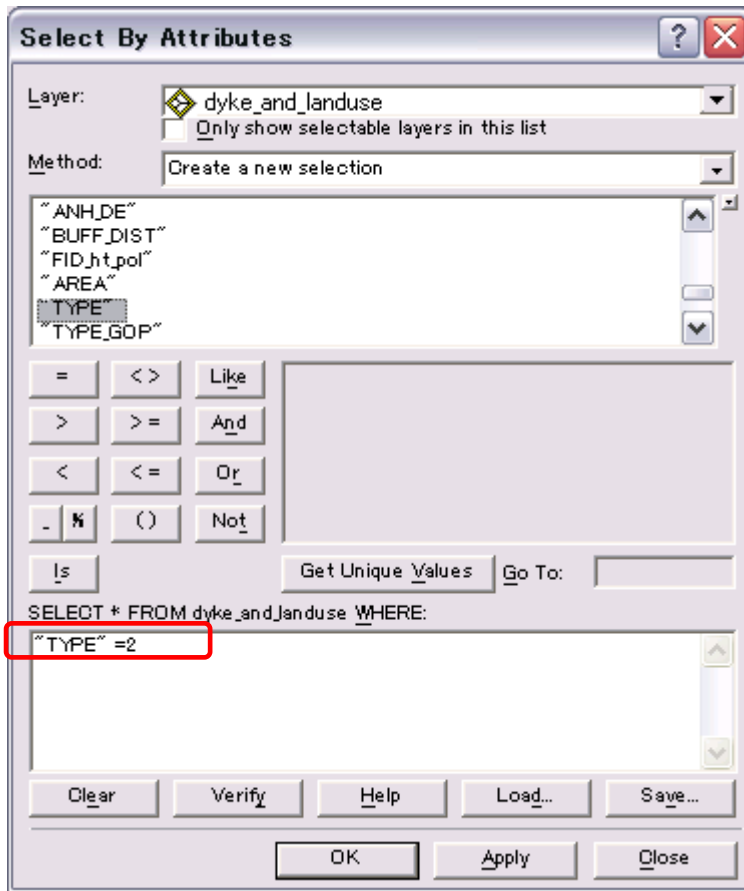


## Start Editing

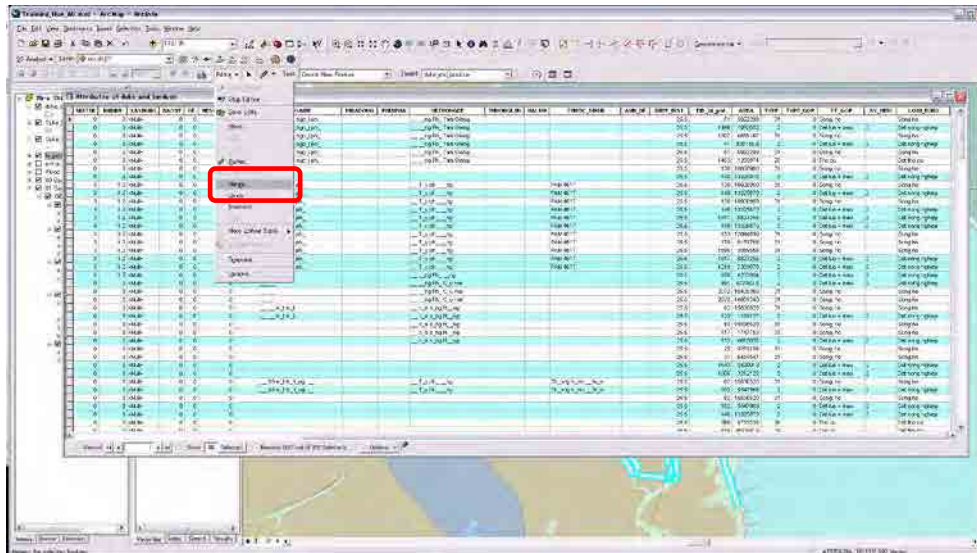


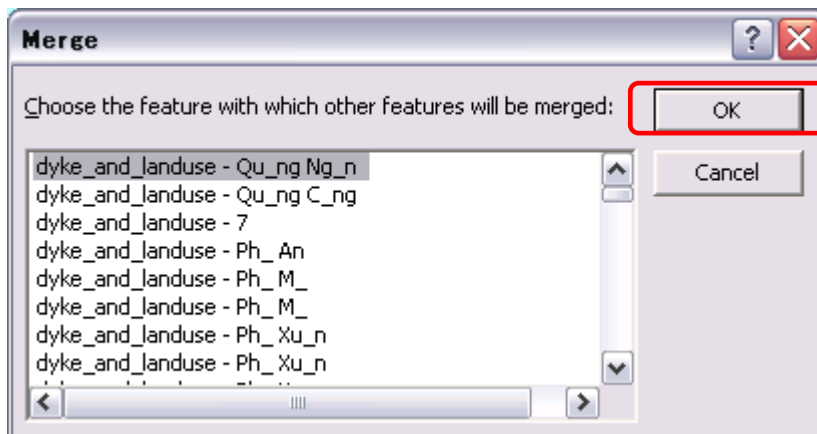
## Select By Attribute





## Merge





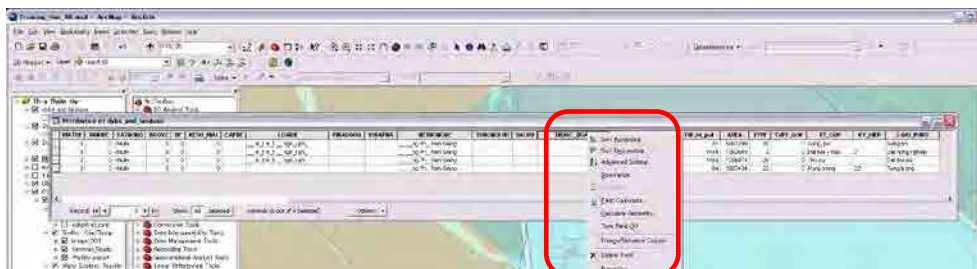
Continue merging by using the columns “22”, “28”, “31”.



**Save Edits and Stop Editing.**

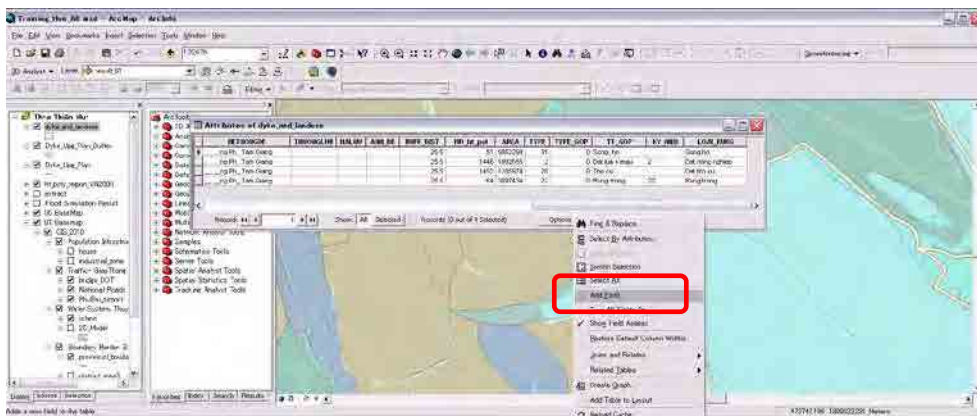


**Delete Unnecessary Fields.**



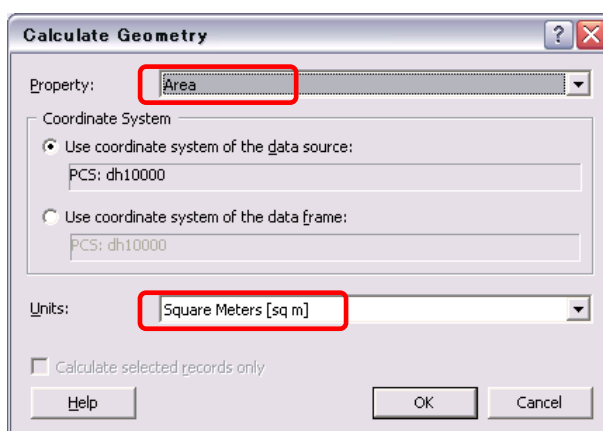
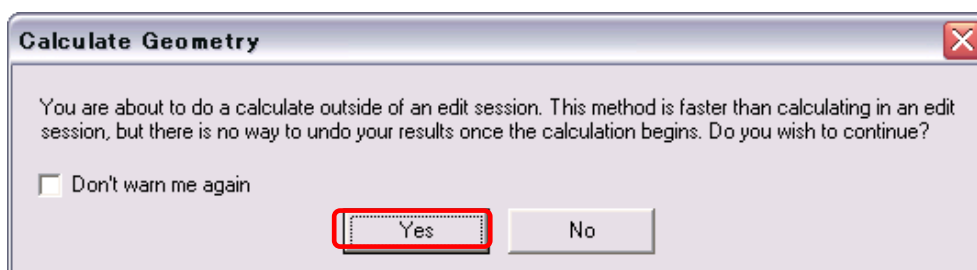
[6] Calculate Geometry

**Add Field.**





### Calculate Geometry



Attributes of dyke\_and\_landuse

THUONGLUU	HALUU	AHH_DE	BUFF_DIST	FID_ft_pol	AREA	TYPE	TYPE_GOP	TT_GOP	KY_HIEU	LOAI_RUOI	dyke_land
			25.5	51	5853299	31	0	Song, ho		Song ho	3754778
			25.5	1446	1092655	2	0	Dat lua + mau	2	Dat nong nghiep	3026680
			25.5	1453	1285974	28	0	Tho cu		Dat tho cu	619601
			25.5	64	3897434	22	0	Rung trong	22	Rung trong	71429

Record: 14 | 0 | Show: All Selected | Records (0 out of 4 Selected) | Options

