

무감독/감독 분류

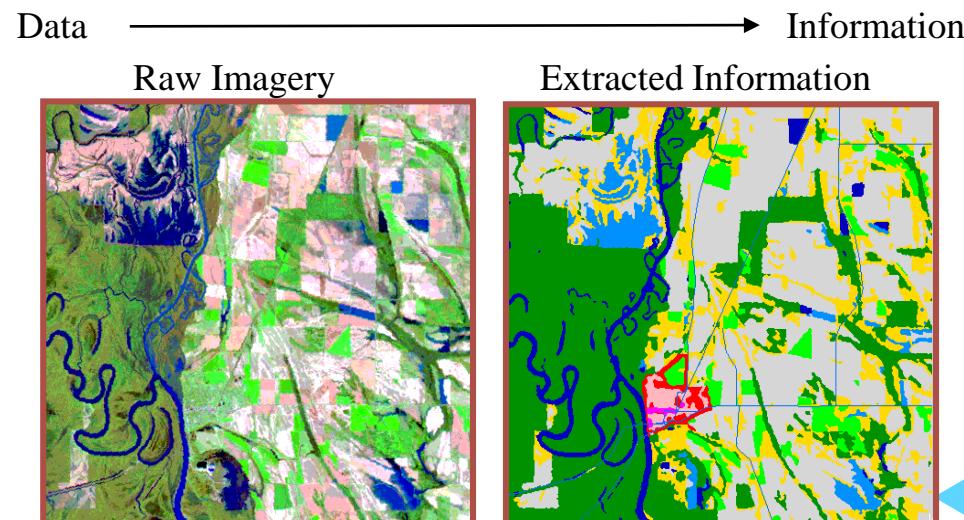
Unsupervised/ supervised classification

Classification



영상 분류 정의

- 원격탐사 자료를 이용하여 사용자가 정의한 기준(분류하고자 하는 클래스의 개수 및 종류)에 맞춰 영상 화소들을 자동으로 분류하고, 동일 특성을 가진 화소들을 각 클래스로 할당하여 주제도와 같은 지도 형태로 표현하는 기법
- 유사한 분광특성을 가지는 화소들의 집단에 대응되는 범주를 클래스로 정의하며, 지형에 존재하는 물, 농작물, 산림 등의 토지 피복이나 농경지, 상업지 등 토지 이용 특성을 기준으로 클래스를 설정
- 기법의 특성에 따라 감독 분류(supervised classification) / 무감독 분류(unsupervised classification) 구분



Classification



클래스

- 정보 클래스(information classes) / 스펙트럼 클래스(spectral classes)
- 정보 클래스
 - > 작물의 종류, 숲의 종류나 수종, 지질학적 단위 또는 암석 종류 등과 같이 실제 이미지에서 식별하고자 하는 관심의 범주
- 스펙트럼 클래스
 - > 데이터의 각각 스펙트럼 채널 안에서 밝기 값이 균일한(또는 거의 유사한) 픽셀 그룹



분류의 목적

- 데이터의 스펙트럼 클래스를 관심이 있는 정보 클래스에 매치

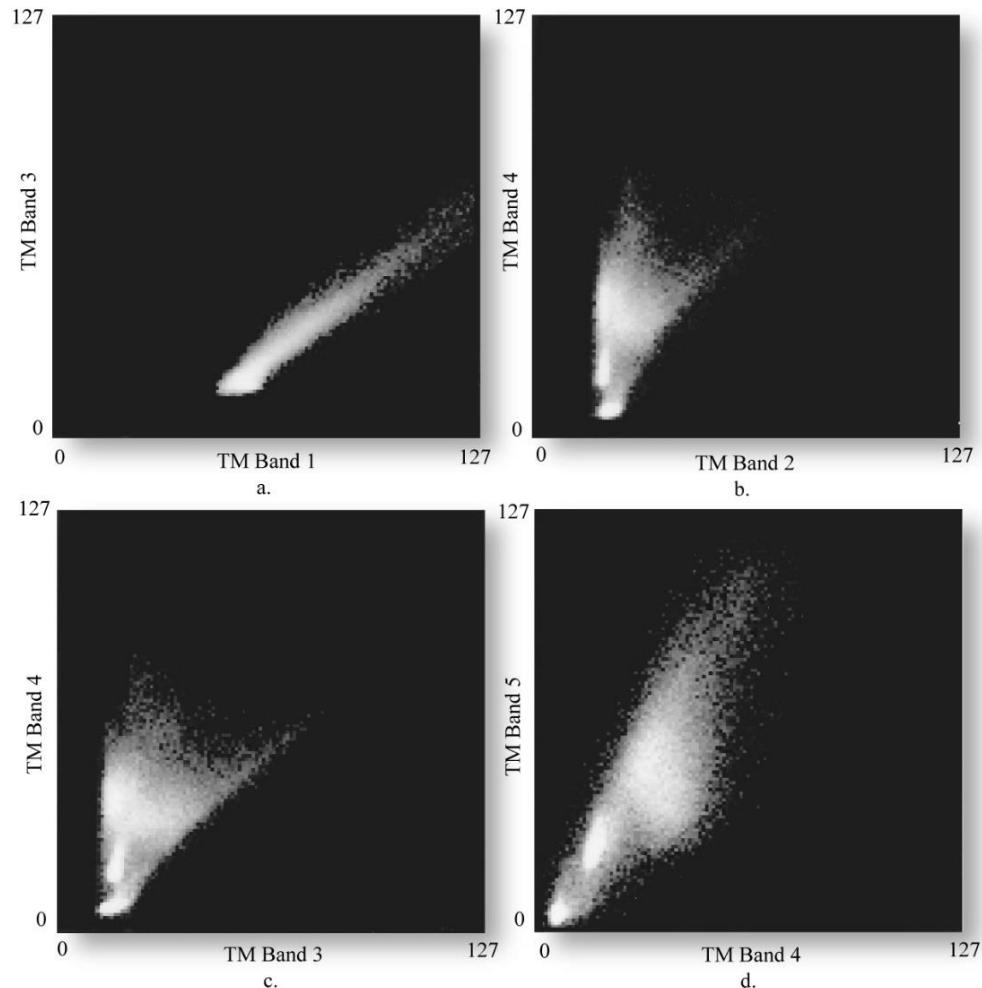
Classification



Feature Space Scatter plots

- Feature space 안에 2 이미지 랜드 비교
- 2개의 수직 축에 2개의 히스토그램 표시
- 특정 지점이 밝아 질수록 더 많은 픽셀 랜드 값의 고유한 조합

Two-dimensional Feature Space Plots

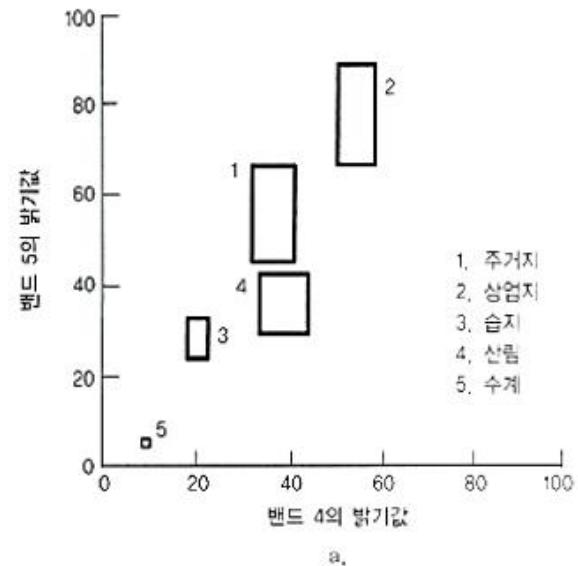
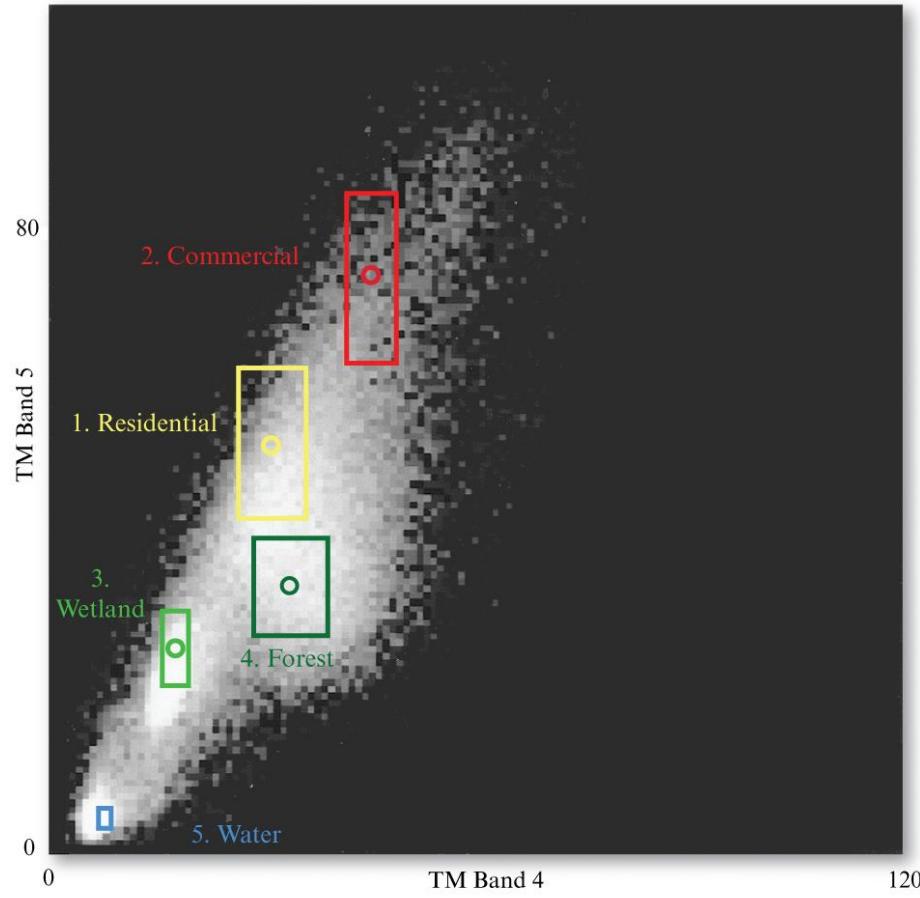


Classification

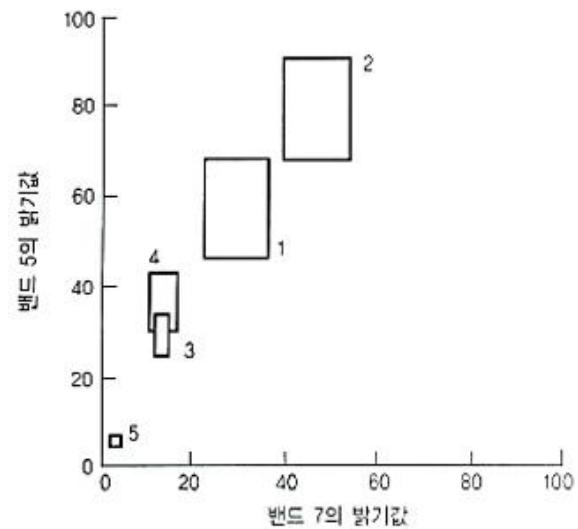


Feature Space Scatter plots

Two-dimensional Feature Space Plot of Five Training Classes



a.



Classification



무감독 분류 특징

- 훈련자료 사용하지 않으며, 영상에서 화소 값들 사이에 존재하는 특성을 이용하여 영상의 모든 화소를 분석가가 정의한 개수의 클래스로 배정하는 기법
- 군집화(clustering) 기법으로도 불리며, 무감독분류의 결과를 주제도로 사용하기 위해 분석가가 분류 결과의 각 클래스에 명칭 부여
- 감독 분류를 위한 참고자료로 많이 활용
- K-means, ISODATA(Iterative Self-Organizing Data Analysis Technique)



감독 분류 특징

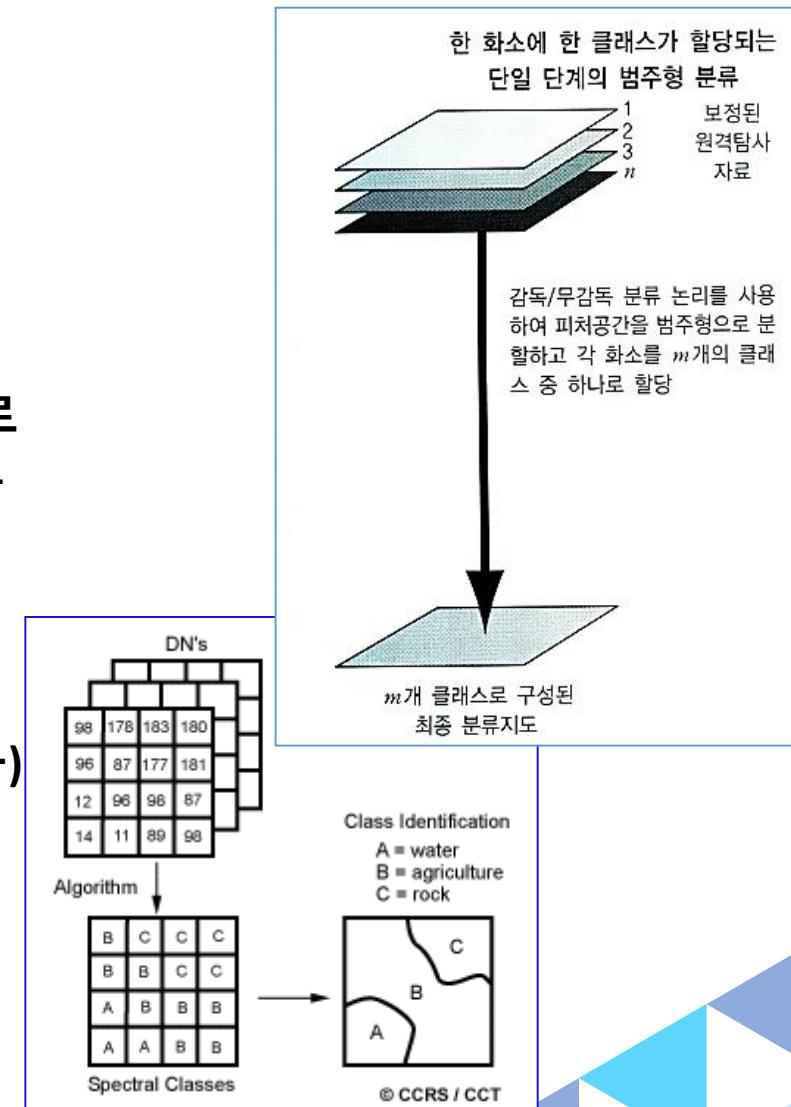
- 영상 내 모든 화소들을 각 클래스의 훈련자료들과 비교하여 가장 유사한 특성을 가지는 클래스로 할당하는 기법
- 훈련자료(training data): 영상 내 토지피복의 속성 및 위치로부터 각 클래스에 대한 화소값들의 고유의 통계정보를 의미
- 원격탐사 분야의 가장 대표적인 분석 기법, 분석가 신뢰도 있는 훈련자료를 생성할 수록 감독 분류 결과의 품질 향상

Classification



무감독 분류

- 지상 참조 정보가 부족하거나 영상의 표면 구조물들이 제대로 정의되어 있지 않아 클래스별 토지 피복 형태를 선험적으로 알 수 없음
- 통계적으로 정의된 기준에 따라 컴퓨터가 비슷한 분광특성을 가진 화소들을 군집으로 분류, 그 다음 분석가가 각 군집마다 이름을 붙여 통합
- 유사한 스펙트럼 특성을 (평균, 표준 편차, 공분산 행렬, 상관 행렬 등) 갖는 픽셀을 고유한 클러스터로 자동 분류



Classification



무감독 분류

- 컴퓨터가 알고리즘을 통해 별도 분석가 지시 없이 클래스 구분
- 알고리즘을 통한 분류 작업 완료 후 이미지 해석, 지상 진실 정보, 지도, 현장 보고서 등을 기반으로 토지 표지 유형 결정

Data

Raw Imagery (6 bands)
256 Grey Level Values Each

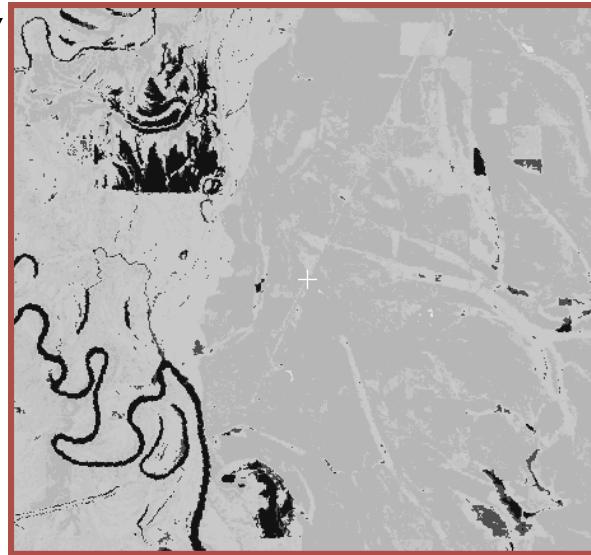
Classification

Classified Image
80 Classes (Clusters)

Aggregation

Extracted Information
11 Categories

Information



Classification



무감독 분류 스텝

1. Define Classification Scheme
2. Configure and Run Classifier
3. Aggregate Classification
4. Label Classes
5. Check Accuracy



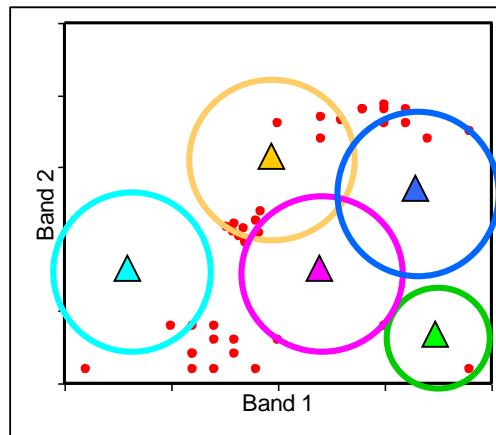
무감독 분류 – K-means

- 영상에서 후보 클래스의 중심 값으로 사용될 n개의 클래스 선정
- 각 화소 값과 클래스 중심 값을 비교하여 가장 가까이에 위치한 클래스로 화소값 속성 배정
- 클래스 선정에 따른 화소 값 군집의 평균으로 새로운 클래스 중심 할당
- 각 화소들의 클래스 변동이 수렴할 때까지 위 과정 반복 수행

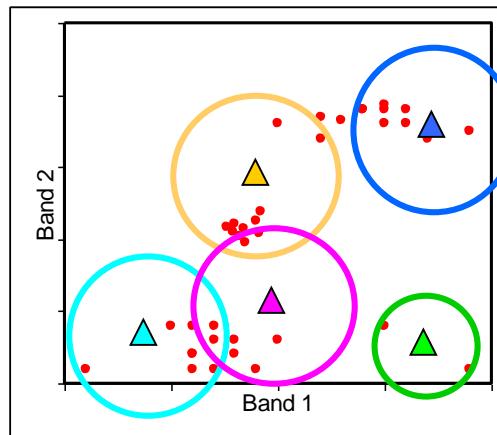
Classification



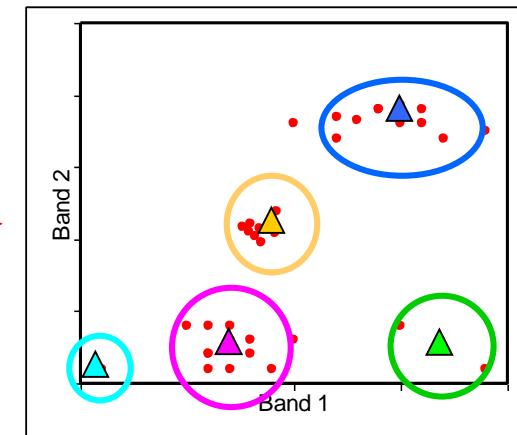
무감독 분류 – K-means



1. First iteration.
The cluster centers
are set at random.
Pixels will be
assigned to the
nearest center.



2. Second iteration.
The centers move
to the mean-center
of all pixels in this
cluster.

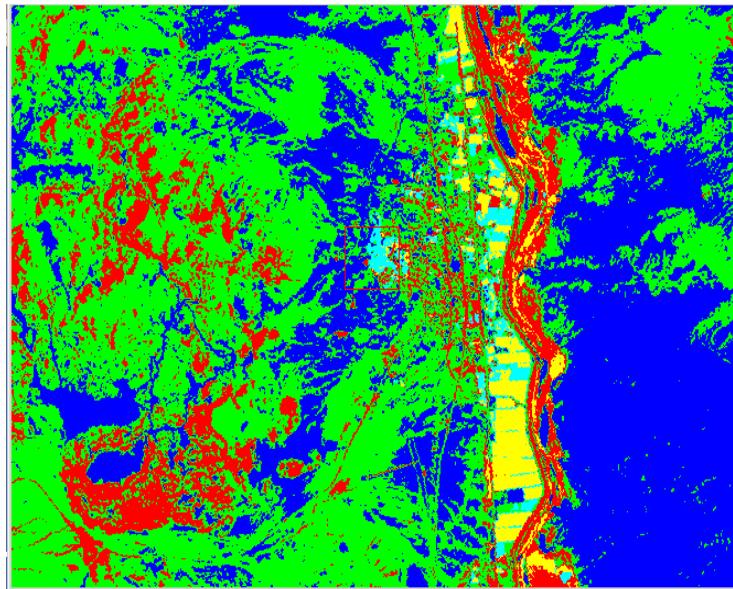


3. N-th iteration.
The centers have
stabilized.

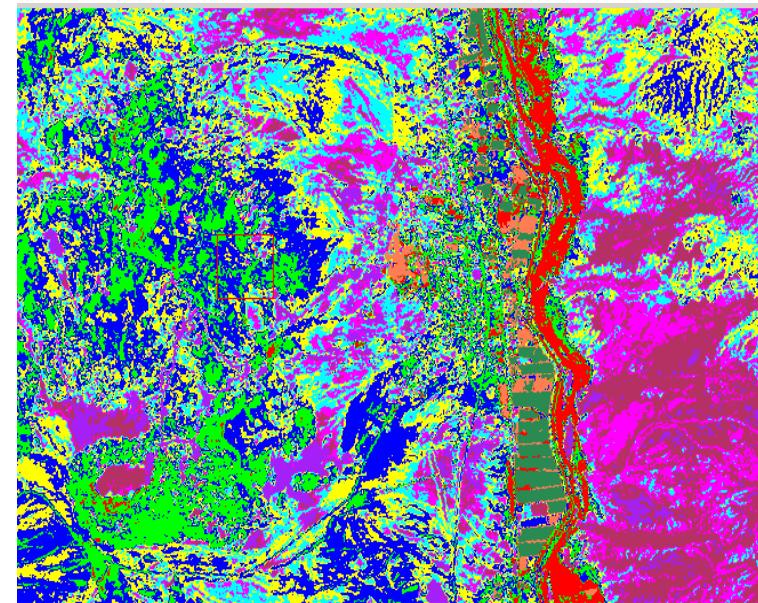
Classification



무감독 분류 – K-means



5 classes



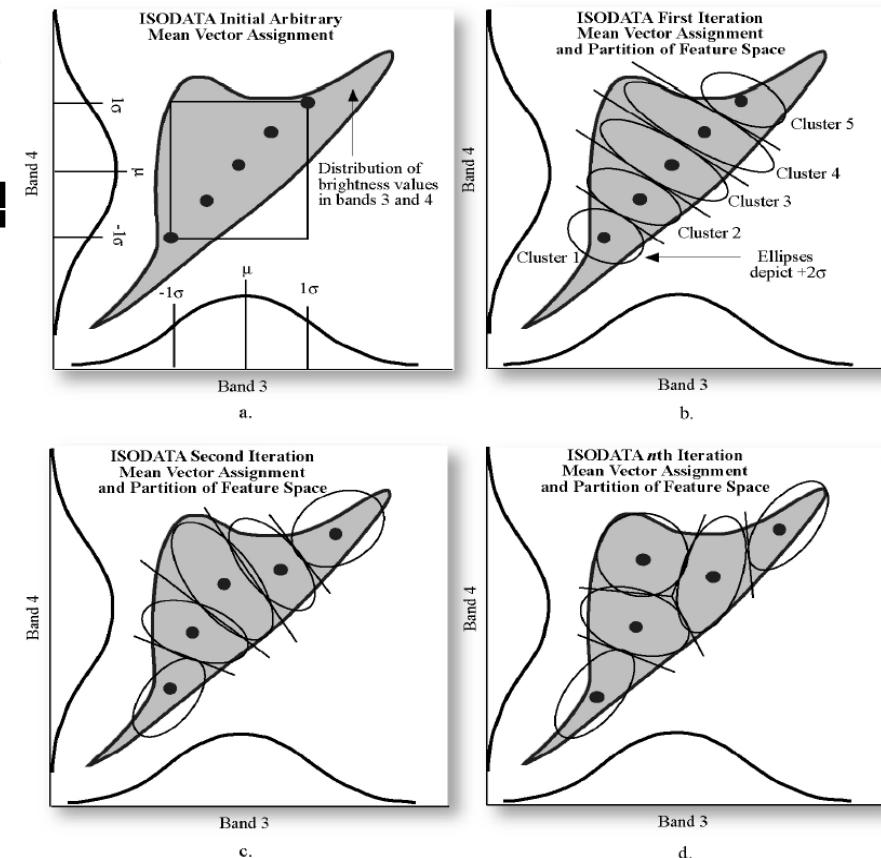
10 classes

Classification



무감독 분류 - ISODATA

- 반복적 자기-조직화 자료분석 기술 (Iterative Self-Organizing Data Analysis Technique)
- 군집들 간의 거리가 사용자가 명시한 임계 값 보다 작으면 병합
- 하나의 군집을 둘로 나누기 위한 규칙



Classification



무감독 분류

Manager

The screenshot shows the QGIS Manager interface with the 'Tools' tab selected. A red box highlights the 'Classification' section under the 'Tool Libraries' category. The 'Classification' section contains the following tools:

- Confusion Matrix (Polygons / Grid)
- Confusion Matrix (Two Grids)
- Decision Tree
- ISODATA Clustering for Grids
- K-Means Clustering for Grids
- Supervised Classification for Grids
- Supervised Classification for Shapes
- Supervised Classification for Tables

Below this section, other tool categories are listed:

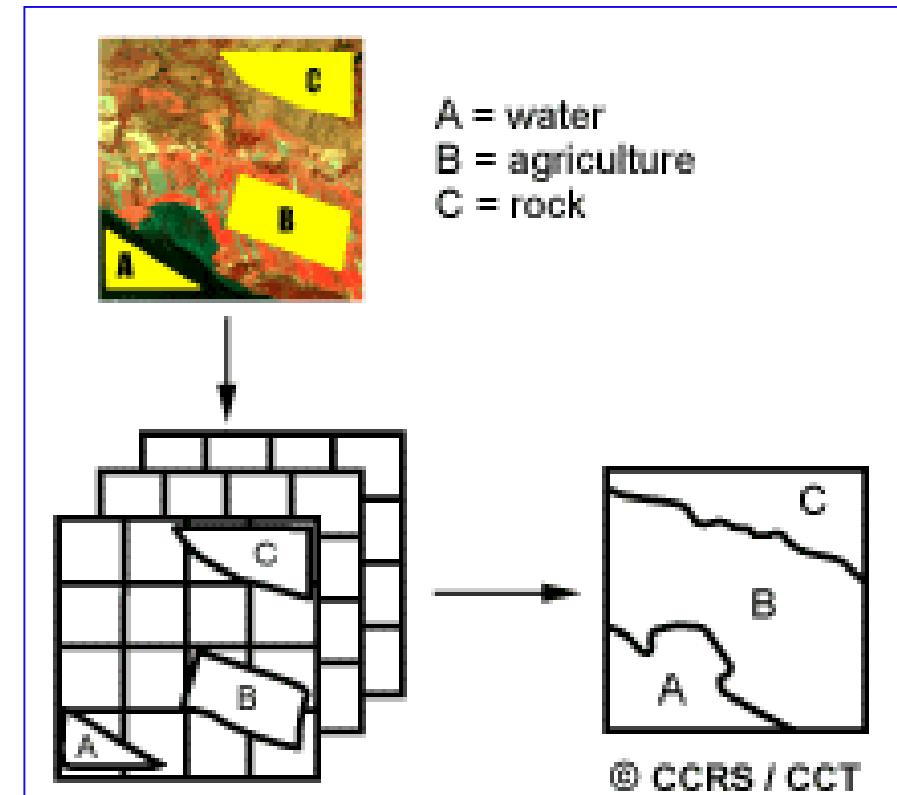
- Maximum Entropy
- OpenCV
- Photogrammetry
- SVM
- Segmentation
- Tools

Classification



감독 분류

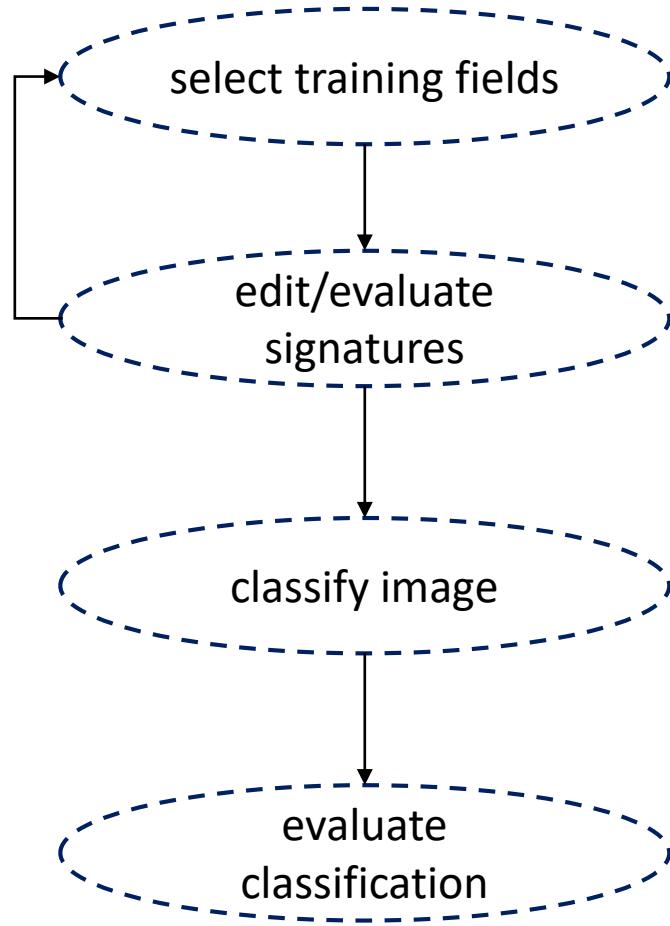
- 현장 조사, 지도 분석 및 훈련 현장으로 개인 경험의 결합을 통해 선형적으로 알려진 내용을 식별
(훈련 데이터)
- 정보 클래스 식별 ->
스펙트럼 클래스 결정



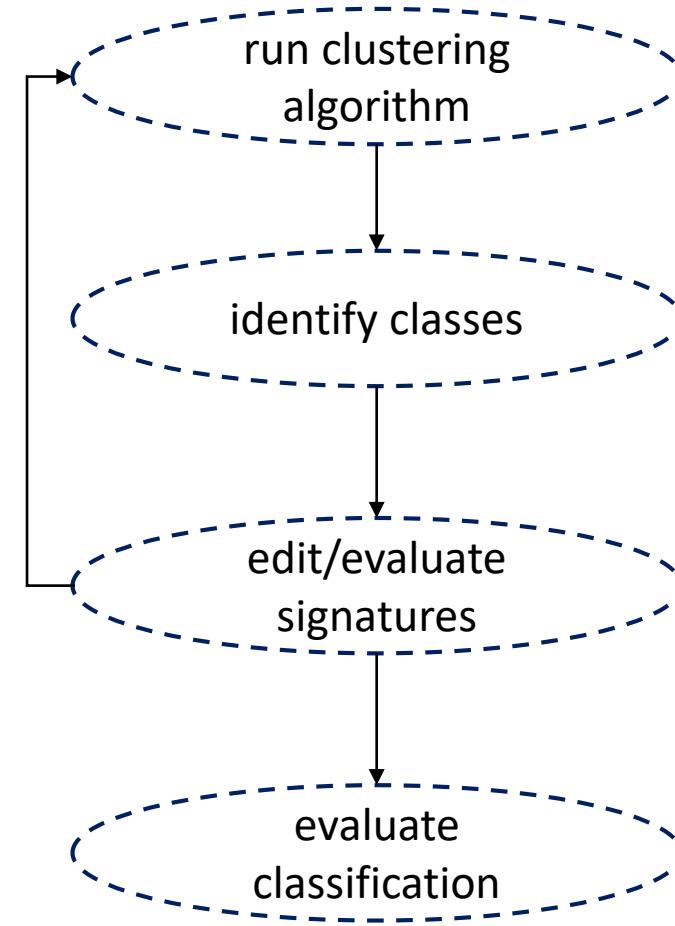
Classification



무감독 / 감독 분류



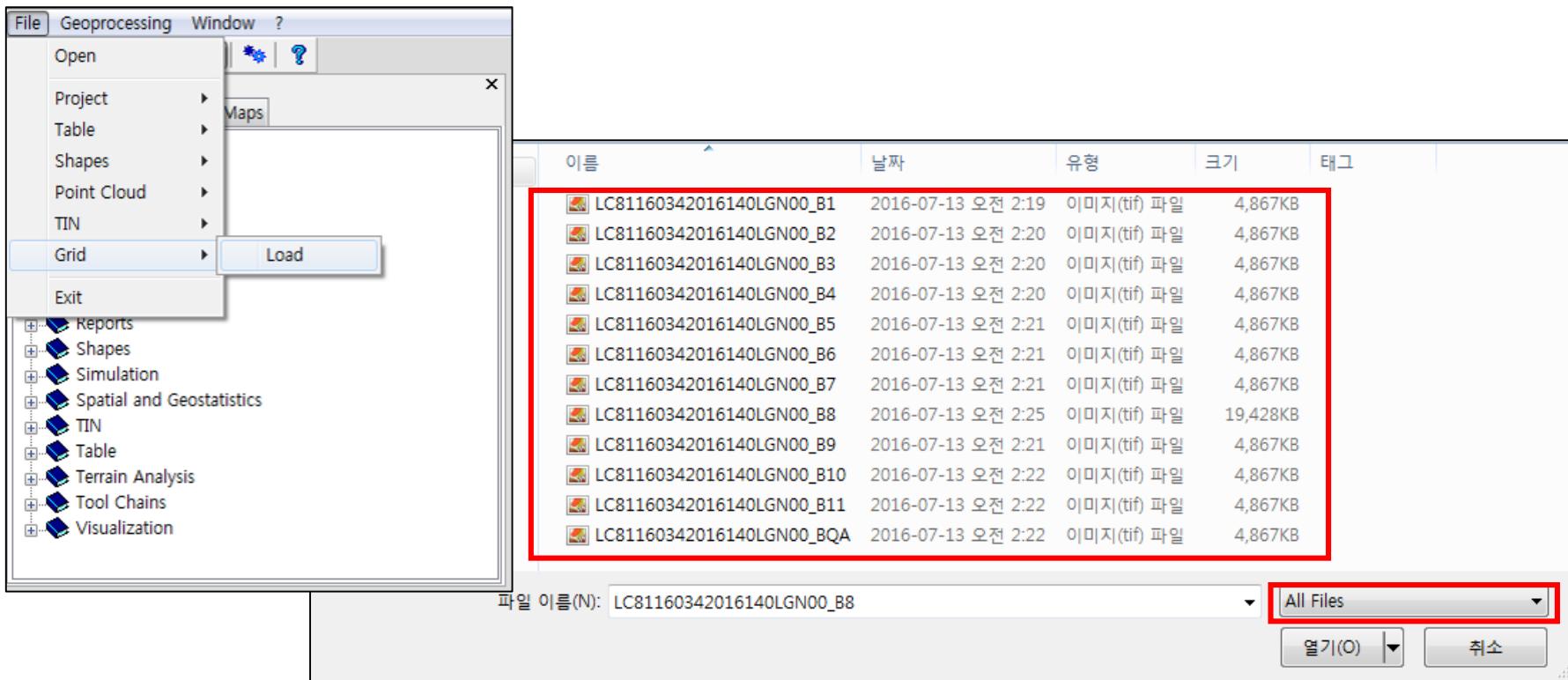
Supervised



Unsupervised

무감독 분류 실습

❖ 데이터 불러오기(File -> Grid -> Load)



무감독 분류 실습

❖ 영상 융합(Tool -> Visualization -> Grids -> RGB Composite)

The screenshot displays the QGIS Manager interface with the 'Tools' tab selected. In the 'Grids' section, the 'RGB Composite' tool is highlighted with a red box. The 'Data Objects' pane shows a 'Grid system' entry with three sub-items: 'Red', 'Green', and 'Blue', each with its own configuration options like 'Value Preparation' and 'Standard Deviation'. The 'RGB Composite' dialog is open, showing the same three items. Below it, the 'True Colour Composite' settings dialog is open, with the 'Name' field set to 'True Colour Composite'. The 'Description' field contains the value 'Red: LC81150352016133LGN00_B4'. The 'No Data' field contains '-2147483647; -2147483647'. The 'Show Legend' checkbox is checked. The 'Unit' field is empty. The 'Z-Scale' field is set to '1'. The 'Z-Offset' field is set to '0'. The 'Show Cell Values' checkbox is unchecked. The 'Memory Handling' field is set to 'Normal'.

Manager

Tools Data Maps

Tool Libraries

- Climate
- Garden
- Grid
- Imagery
- Import/Export
- Projection
- Reports
- Shapes
- Simulation
- Spatial and Geostatistics
- TIN
- Table
- Terrain Analysis
- Tool Chains
- Visualization
- 3D Viewer
- Grids
 - Aspect-Slope Grid
 - Color Blending
 - Color Palette Rotation
 - Color Triangle Composite
 - Create 3D Image
 - Fit Color Palette to Grid Values
 - Histogram Surface
 - RGB Composite**
 - Select Look-up Table for Grid Visualization
 - Split RGB Composite
 - Terrain Map View
- Point Clouds Viewer

RGB Composite

Data Objects

Grid system

- >> Red
- >> Green
- >> Blue

Value Preparation
Standard Deviation
Value Preparation
Standard Deviation
Value Preparation
Standard Deviation
> Alpha
<< Composite

Okay Cancel Load Save Defaults

RGB Composite

True Colour Composite

Name: True Colour Composite

Description: Red: LC81150352016133LGN00_B4

No Data: -2147483647; -2147483647

Show Legend:

Unit:

Z-Scale: 1

Z-Offset: 0

Show Cell Values:

Memory Handling: Normal

Settings Description History Legend Attributes

General

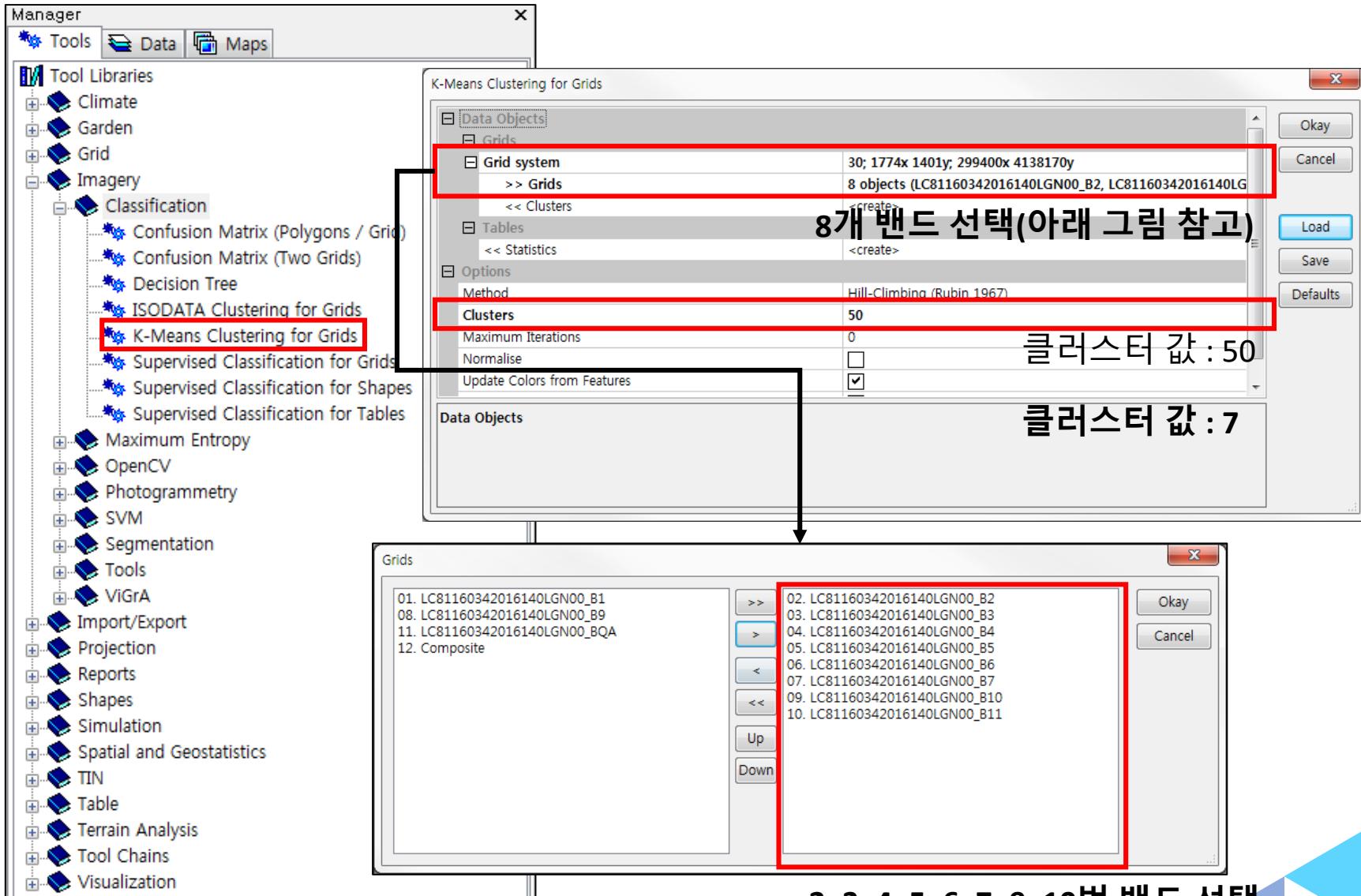
Options

생성된 영상 이름 True Colour Composite 로 지정

17

무감독 분류 실습

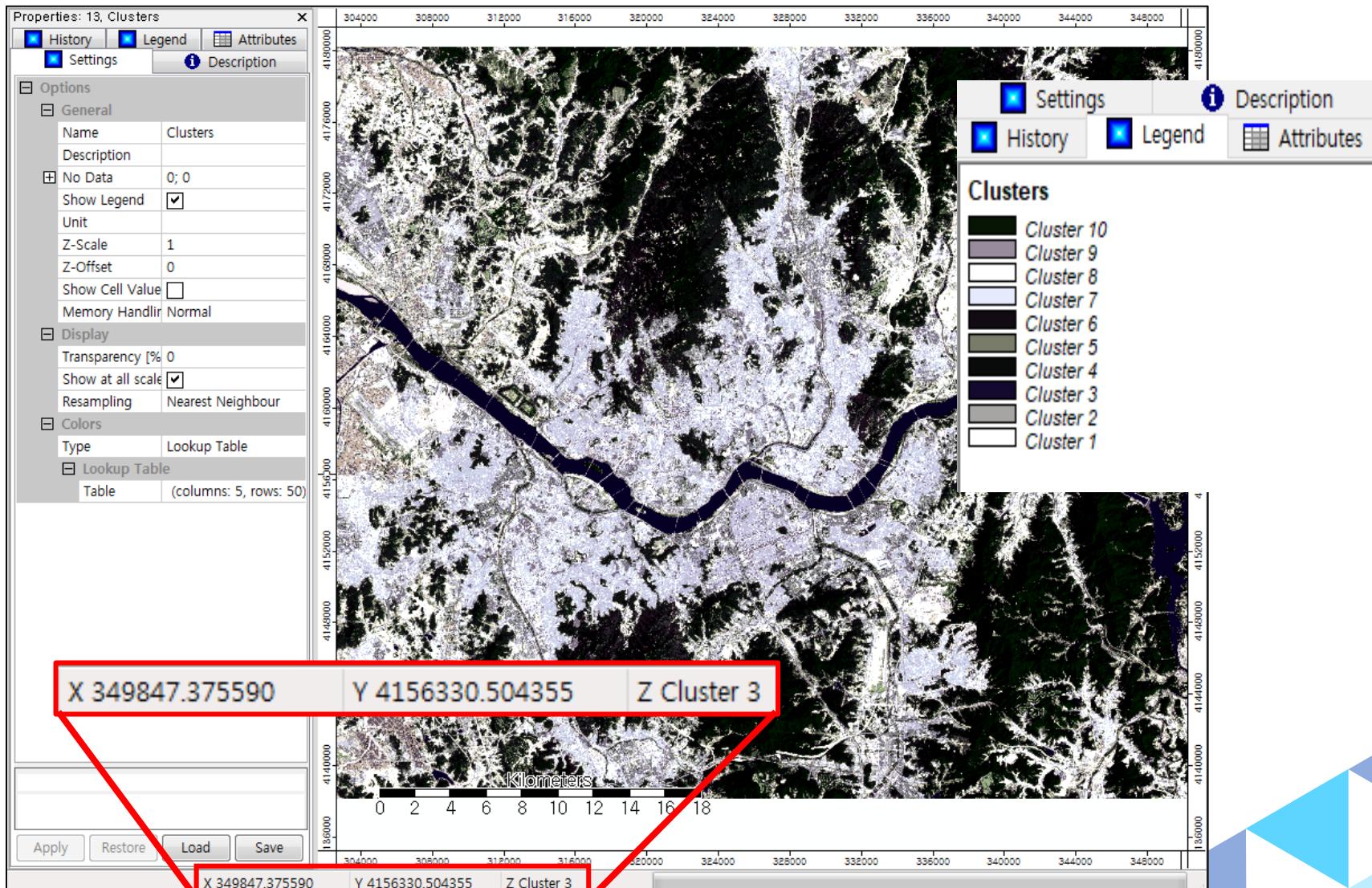
❖ 클러스터 실행(Tool -> Imagery -> K-Means Clustering for Grids)



2, 3, 4, 5, 6, 7, 9, 10번 밴드 선택

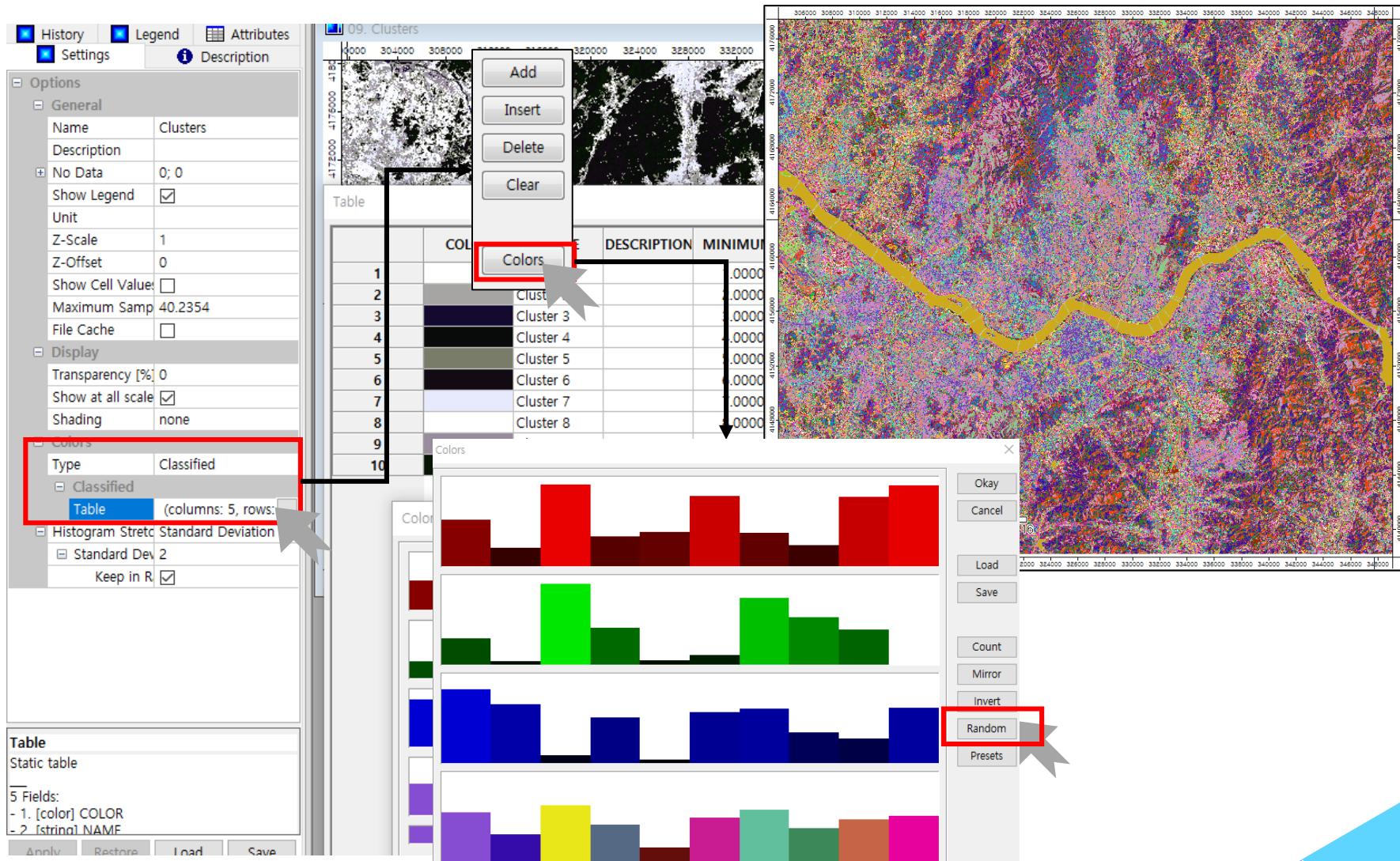
무감독 분류 실습

- ❖ 생성된 영상 이름은 Clusters
- ❖ 작업 표시줄에서 마우스 커서에 해당되는 분류되어진 클러스터 값 확인 가능



무감독 분류 실습

❖ Lookup Table 색상 변경 (Settings -> Colors -> Lookup Table Table -> Colors -> Random)



무감독 분류 실습

- ❖ Legend 탭에서 분류된 클러스터 속성 확인 가능
- ❖ Lookup Table 속성에서 클러스터 값 및 색상 확인 가능

Properties: 13, Clusters

Cluster	Name	Description	Min	Max
Cluster 50	Cluster 1		1.000000	1.000000
Cluster 49	Cluster 2		2.000000	2.000000
Cluster 48	Cluster 3		3.000000	3.000000
Cluster 47	Cluster 4		4.000000	4.000000
Cluster 46	Cluster 5		5.000000	5.000000
Cluster 45	Cluster 6		6.000000	6.000000
Cluster 44	Cluster 7		7.000000	7.000000
Cluster 43	Cluster 8		8.000000	8.000000
Cluster 42	Cluster 9		9.000000	9.000000
Cluster 41	Cluster 10		10.000000	10.000000
Cluster 40	Cluster 11		11.000000	11.000000
Cluster 39	Cluster 12		12.000000	12.000000
Cluster 38	Cluster 13		13.000000	13.000000
Cluster 37	Cluster 14		14.000000	14.000000
Cluster 36	Cluster 15		15.000000	15.000000
Cluster 35	Cluster 16		16.000000	16.000000
Cluster 34	Cluster 17		17.000000	17.000000
Cluster 33	Cluster 18		18.000000	18.000000
Cluster 32	Cluster 19		19.000000	19.000000
Cluster 31	Cluster 20		20.000000	20.000000
Cluster 30	Cluster 21		21.000000	21.000000
Cluster 29			22.000000	22.000000
Cluster 28			23.000000	23.000000
Cluster 27			24.000000	24.000000
Cluster 26			25.000000	25.000000
Cluster 25			26.000000	26.000000
Cluster 24			27.000000	27.000000
Cluster 23			28.000000	28.000000
Cluster 22			29.000000	29.000000
Cluster 21			30.000000	30.000000
Cluster 20			31.000000	31.000000
Cluster 19			32.000000	32.000000
Cluster 18			33.000000	33.000000
Cluster 17			34.000000	34.000000
Cluster 16			35.000000	35.000000
Cluster 15			36.000000	36.000000
Cluster 14			37.000000	37.000000
Cluster 13			38.000000	38.000000
Cluster 12			39.000000	39.000000
Cluster 11			40.000000	40.000000
Cluster 10			41.000000	41.000000
Cluster 9			42.000000	42.000000

Legend

History

Settings

Description

Clusters

Properties: 13, Clusters

History

Legend

Attributes

Settings

Description

Options

General

Name: Clusters

Description:

No Data: 0; 0

Show Legend:

Unit:

Z-Scale: 1

Z-Offset: 0

Show Cell Values:

Memory Handling: Normal

Display

Transparency [%]: 0

Show at all scales:

Resampling: Nearest Neighbour

Colors

Type: Classified

Lookup Table

Table (columns: 5, rows: 50)

Table

	COLOR	NAME	DESCRIPTION	MINIMUM	MAXIMUM
1	Cluster 1			1.000000	1.000000
2	Cluster 2			2.000000	2.000000
3	Cluster 3			3.000000	3.000000
4	Cluster 4			4.000000	4.000000
5	Cluster 5			5.000000	5.000000
6	Cluster 6			6.000000	6.000000
7	Cluster 7			7.000000	7.000000
8	Cluster 8			8.000000	8.000000
9	Cluster 9			9.000000	9.000000
10	Cluster 10			10.000000	10.000000
11	Cluster 11			11.000000	11.000000
12	Cluster 12			12.000000	12.000000
13	Cluster 13			13.000000	13.000000
14	Cluster 14			14.000000	14.000000
15	Cluster 15			15.000000	15.000000
16	Cluster 16			16.000000	16.000000
17	Cluster 17			17.000000	17.000000
18	Cluster 18			18.000000	18.000000
19	Cluster 19			19.000000	19.000000
20	Cluster 20			20.000000	20.000000
21	Cluster 21			21.000000	21.000000
22	Cluster 22			22.000000	22.000000
23	Cluster 23			23.000000	23.000000
24	Cluster 24			24.000000	24.000000
25	Cluster 25			25.000000	25.000000
26	Cluster 26			26.000000	26.000000
27	Cluster 27			27.000000	27.000000
28	Cluster 28			28.000000	28.000000
29	Cluster 29			29.000000	29.000000
30	Cluster 30			30.000000	30.000000
31	Cluster 31			31.000000	31.000000
32	Cluster 32			32.000000	32.000000
33	Cluster 33			33.000000	33.000000
34	Cluster 34			34.000000	34.000000
35	Cluster 35			35.000000	35.000000
36	Cluster 36			36.000000	36.000000
37	Cluster 37			37.000000	37.000000
38	Cluster 38			38.000000	38.000000
39	Cluster 39			39.000000	39.000000
40	Cluster 40			40.000000	40.000000
41	Cluster 41			41.000000	41.000000
42	Cluster 42			42.000000	42.000000
43	Cluster 43			43.000000	43.000000
44	Cluster 44			44.000000	44.000000
45	Cluster 45			45.000000	45.000000
46	Cluster 46			46.000000	46.000000
47	Cluster 47			47.000000	47.000000
48	Cluster 48			48.000000	48.000000
49	Cluster 49			49.000000	49.000000
50	Cluster 50			50.000000	50.000000

Okay

Cancel

Load

Workspace

Save

Workspace

Add

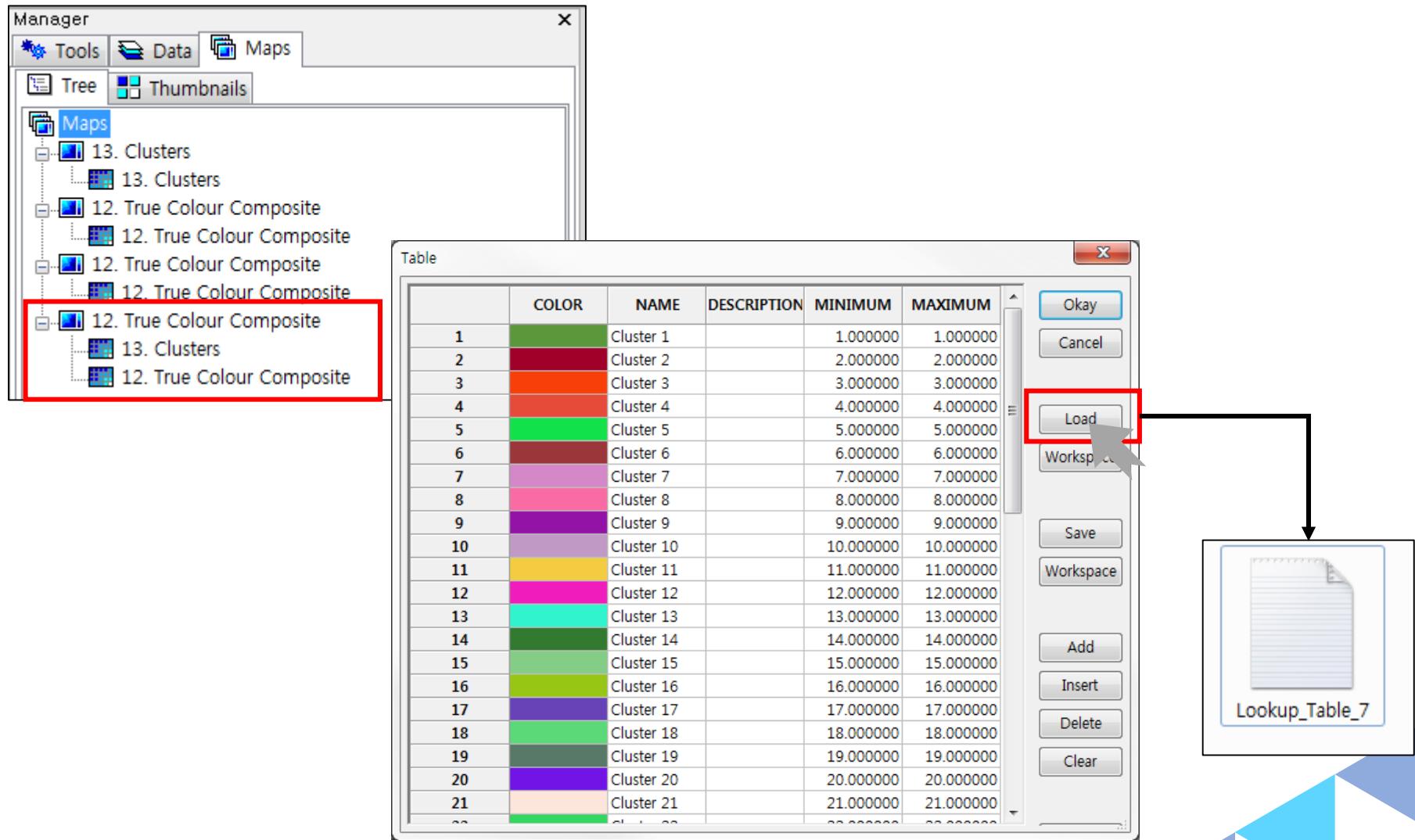
Insert

Delete

Clear

무감독 분류 실습

- ❖ True Colour Composite & Clusters 중첩 시각화
- ❖ Clusters 영상 Lookup Table 속성에서 Lookup_Table_7.txt 적용



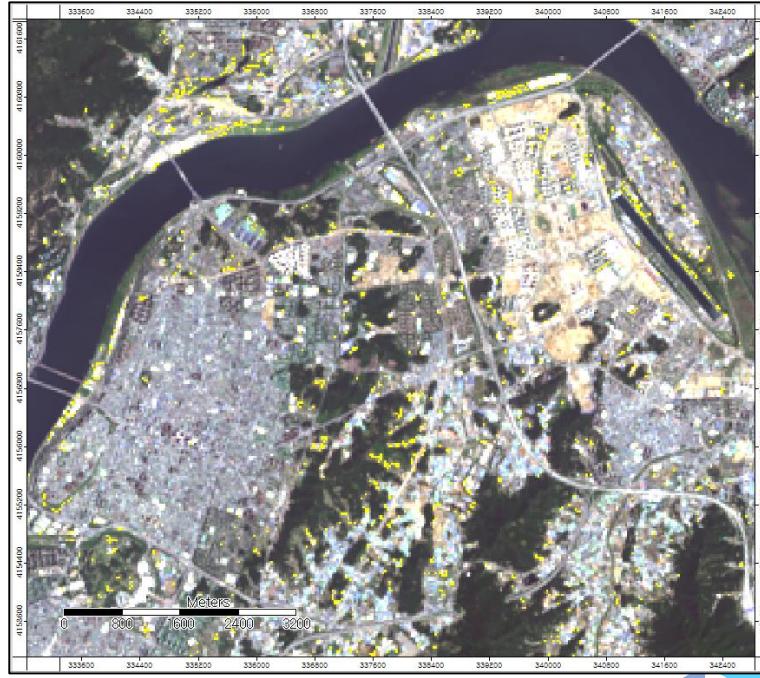
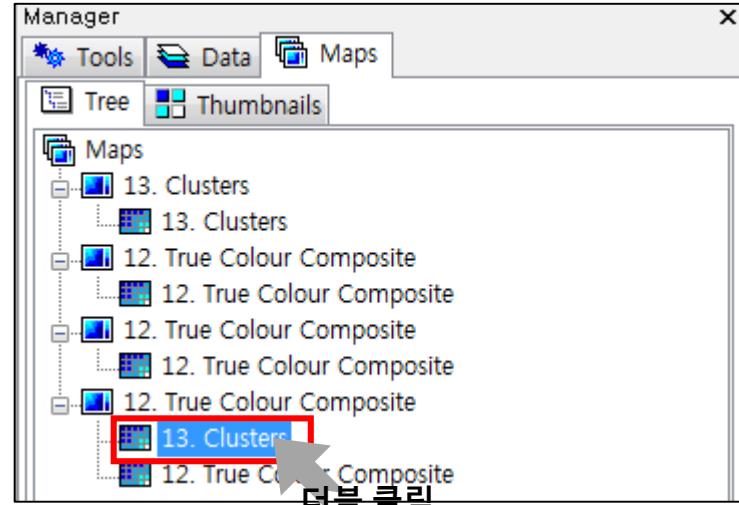
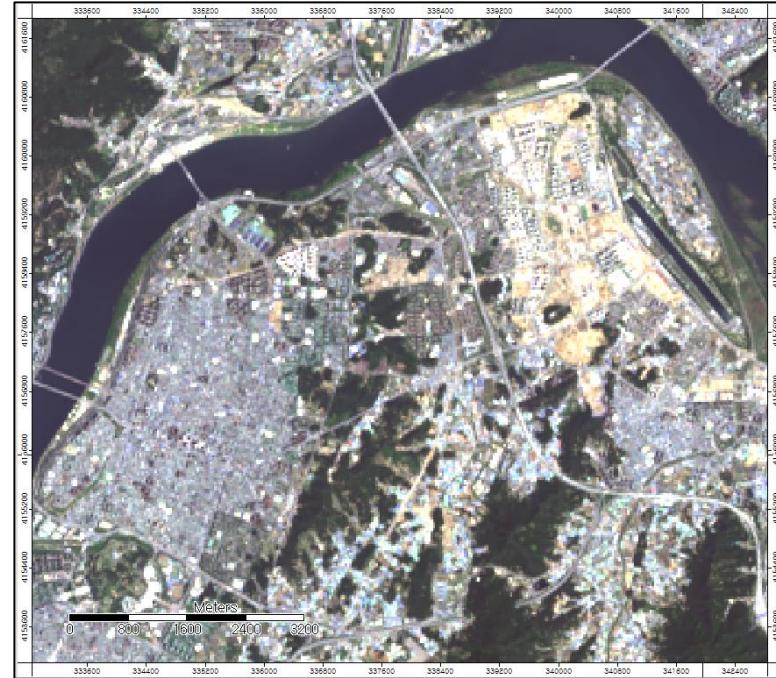
무감독 분류 실습

- ❖ 변경된 Lookup Table 속성 확인(-1 : 시각화 X)
- ❖ Maps 탭에서 Clusters 더블 클릭하여 영상 비교

Table

	COLOR	NAME	DESCRIPTION	MINIMUM	MAXIMUM	
1	Yellow	Cluster 1		1.000000	1.000000	
2	Maroon	Cluster 2		-1.000000	-1.000000	
3	Orange	Cluster 3		-1.000000	-1.000000	
4	Red	Cluster 4		-1.000000	-1.000000	
5	Green	Cluster 5		-1.000000	-1.000000	
6	Dark Maroon	Cluster 6		-1.000000	-1.000000	
7	Purple	Cluster 7		-1.000000	-1.000000	

Okay Cancel Load Workspace



무감독 분류 실습

❖ 영상 융합(Tool -> Visualization -> Grids -> RGB Composite)

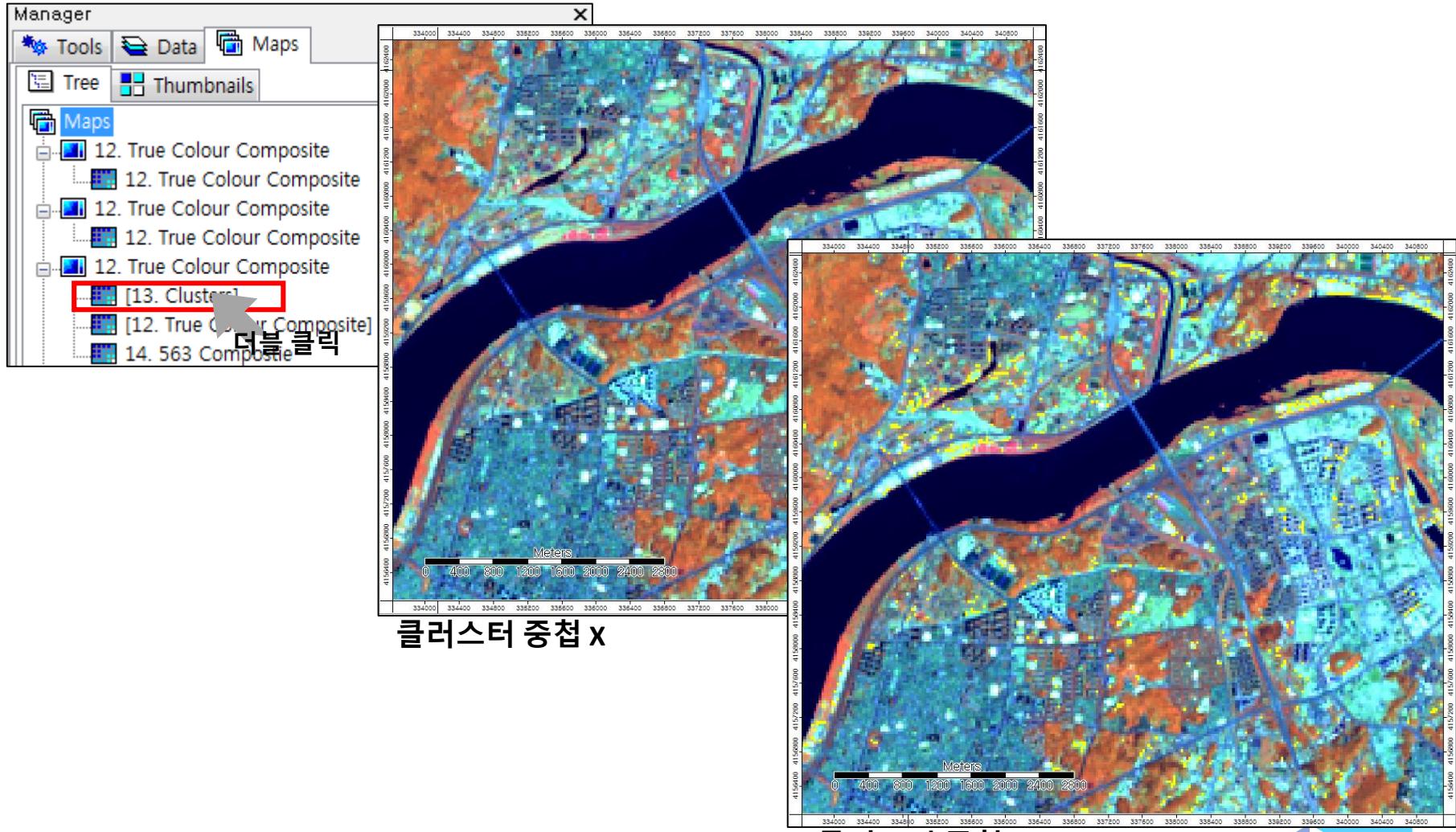
The screenshot shows the QGIS software interface with the following details:

- Manager** window (Tools tab selected):
 - Tool Libraries: Climate, Garden, Grid, Imagery, Import/Export, Projection, Reports, Shapes, Simulation, Spatial and Geostatistics, TIN, Table, Terrain Analysis, Tool Chains, Visualization, 3D Viewer.
 - Grids section:
 - Aspect-Slope Grid, Color Blending, Color Palette Rotation, Color Triangle Composite, Create 3D Image, Fit Color Palette to Grid Values, Histogram Surface, **RGB Composite** (highlighted with a red box), Select Look-up Table for Grid Visualization, Split RGB Composite, Terrain Map View, Point Clouds Viewer.
- RGB Composite** dialog:
 - Data Objects:
 - Grid system
 - >> Red (Value Preparation: standard deviation 2, File: 05. LC81160342016140LGN00_B5)
 - >> Green (Value Preparation: standard deviation 2, File: 06. LC81160342016140LGN00_B6)
 - >> Blue (Value Preparation: standard deviation 2, File: 03. LC81160342016140LGN00_B3)
 - > Alpha (<not set>)
 - << Composite (<create>)
 - Buttons: Okay, Cancel, Load, Save, Defaults.
- Properties: 14, Composite** dialog:
 - General tab:
 - Name: 563 Compostie (highlighted with a red box)
 - Description: Red: LC81150352016133L00
 - No Data: -2147483647; -2147483648
 - Show Legend: checked

생성된 영상 이름 563 Compostie로 지정

무감독 분류 실습

- ❖ 563 Composite & True Colour Composite & Cluster 중첩 시각화
- ❖ True Colour Composite 비활성화 후 Clusters & 563 Composite 영상 비교

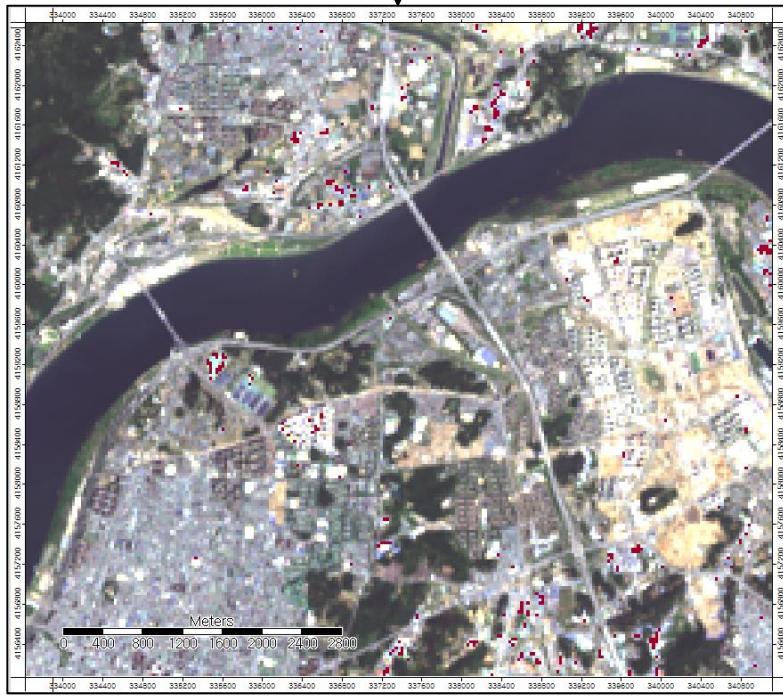


무감독 분류 실습

- ❖ Lookup Table 속성 각 50개 클러스터 True Colour Composite과 비교해 분류
- ❖ 분류하려는 클러스터 외에 나머지는 -1로 지정하여 영상에 표시되는 색상 확인

Table

	COLOR	NAME	DESCRIPTION	MINIMUM	MAXIMUM	X
1	Yellow	3	OpenScrub	-1.000000	-1.000000	<input type="button" value="Okay"/>
2	Dark Red	1	BuiltUp	2.000000	2.000000	<input type="button" value="Cancel"/>
3	Orange	Cluster 3		-1.000000	-1.000000	
4	Red	Cluster 4		-1.000000	-1.000000	



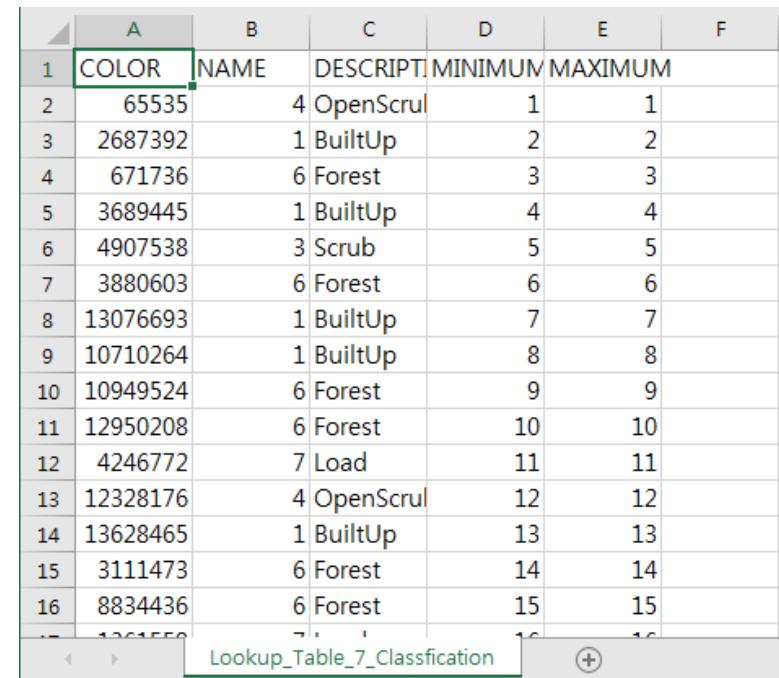
Builtup(건물)	1
Agriculture(농지)	2
Scrub(덤불)	3
Open Scrub(평지 덤불)	4
Water(물)	5
Forest(숲)	6
Load(도로)	7

무감독 분류 실습

- ❖ 분류 완료 시 Lookup_Table_7_Classification.txt로 저장
- ❖ Lookup_Table_7_Classification.txt 파일 엑셀에서 불러오기

Table

	COLOR	NAME	DESCRIPTION	MINIMUM	MAXIMUM
1	4	OpenScrub	1.000000	1.000000	
2	1	BuiltUp	2.000000	2.000000	
3	6	Forest	3.000000	3.000000	
4	1	BuiltUp	4.000000	4.000000	
5	3	Scrub	5.000000	5.000000	
6	6	Forest	6.000000	6.000000	
7	1	BuiltUp	7.000000	7.000000	
8	1	BuiltUp	8.000000	8.000000	
9	6	Forest	9.000000	9.000000	
10	6	Forest	10.000000	10.000000	
11	7	Load	11.000000	11.000000	
12	4	OpenScrub	12.000000	12.000000	
13	1	BuiltUp	13.000000	13.000000	
14	6	Forest	14.000000	14.000000	
15	6	Forest	15.000000	15.000000	
16	7	Load	16.000000	16.000000	
17	1	BuiltUp	17.000000	17.000000	
18	7	Load	18.000000	18.000000	
19	4	OpenScrub	19.000000	19.000000	
20	7	Load	20.000000	20.000000	



	A	B	C	D	E	F
1	COLOR	NAME	DESCRIPTION	MINIMUM	MAXIMUM	
2	65535		OpenScrub	1	1	
3	2687392		BuiltUp	2	2	
4	671736		Forest	3	3	
5	3689445		BuiltUp	4	4	
6	4907538		Scrub	5	5	
7	3880603		Forest	6	6	
8	13076693		BuiltUp	7	7	
9	10710264		BuiltUp	8	8	
10	10949524		Forest	9	9	
11	12950208		Forest	10	10	
12	4246772		Load	11	11	
13	12328176		OpenScrub	12	12	
14	13628465		BuiltUp	13	13	
15	3111473		Forest	14	14	
16	8834436		Forest	15	15	

무감독 분류 실습

- ❖ NAME행 자료 복사하여 새로운 행을 만들고 좌측 3개(COLOR, NAME, DESCRIPTION)행 삭제
- ❖ 새로운 행(NEW)의 셀 서식을 '숫자'로 변경
- ❖ Lookup_Table_7_Classification_New.txt로 저장

The image shows two Excel spreadsheets and a '셀 서식' (Cell Format) dialog box.

Left Spreadsheet: Contains data from row 1 to 10. Columns A through E are visible. Row 1 contains headers: COLOR, NAME, DESCRIPT, MINIMUM, MAXIMUM. Row 2 contains values: 65535, OpenScrub, 1, 1, 4. Rows 3 through 10 show various entries like BuiltUp, Forest, Scrub, etc., with values ranging from 1 to 9. The range B2:F10 is highlighted with a red border. An arrow points from the MAXIMUM column to the NEW column in the right spreadsheet.

Right Spreadsheet: Contains data from row 1 to 9. Columns A through D are visible. Row 1 contains headers: MINIMUM, MAXIMUM, NEW. Rows 2 through 9 show values: 1, 1, 4; 2, 2, 1; 3, 3, 6; 4, 4, 1; 5, 5, 3; 6, 6, 6; 7, 7, 1; 8, 8, 1; 9, 9, 6. The range C2:D9 is highlighted with a red border.

Cell Format Dialog: A '셀 서식' dialog box is open over the left spreadsheet. The '형식' tab is selected. In the '범주' list, '수자' is selected. The '보기' field shows 'NEW'. Under '소수 자릿수(D):', the value '0' is selected. The '음수(N):' section shows '(1234)', '(1234)', '1234', and '-1234', with '1234' highlighted in blue. At the bottom, a note states: '숫자 서식은 일반적인 숫자를 나타내는 데 사용됩니다. 통화 및 회계 표시 형식에는 화폐 가치에 대한 틀수 서식이 있습니다.' (Number format is used for general numbers. For currency and accounting formats, there are formats for monetary values.)

Page Number: 28

무감독 분류 실습

❖ 클러스터에 분류된 값 적용(Tools -> Grid -> Tools -> Change Grid Values)

The screenshot shows the 'Manager' interface with the 'Tools' tab selected. In the 'Tool Libraries' tree, the 'Grid' library is expanded, and the 'Change Grid Values' tool is highlighted.

The main window displays the 'Change Grid Values' dialog. The 'Data Objects' section shows a 'Grid system' node with a red box around it. The 'Options' section contains a 'Replace Condition' field set to 'Grid value equals low value' and a 'Lookup Table' field which is also highlighted with a red box. A large red box encloses both the 'Grid system' and 'Lookup Table' sections. To the right of the 'Lookup Table' field is a button labeled 'Clusters 지정' with a grey arrow pointing to it.

A callout box points from the 'Clusters 지정' button to a smaller 'Lookup Table' dialog window titled 'Static table'. It lists '3 Fields:' with entries: '1. [8 byte floating point number] Low Value' and '2. [8 byte floating point number] High Value'.

Below the 'Change Grid Values' dialog is a detailed view of the 'Lookup Table' contents. The table has columns: 'Low Value', 'High Value', and 'Replace with'. The rows are numbered 1 to 12:

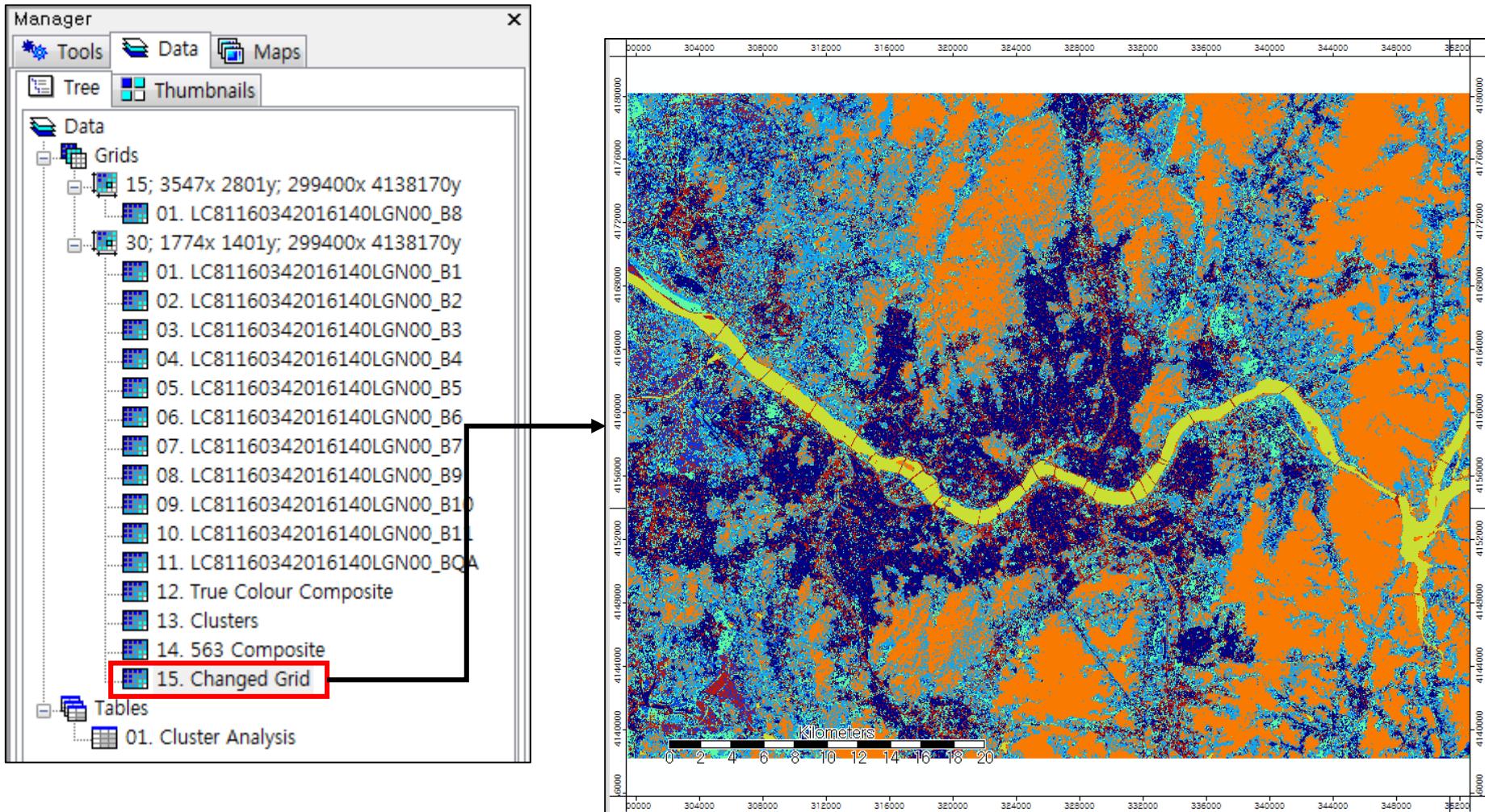
	Low Value	High Value	Replace with
1	1.000000	1.000000	4.000000
2	2.000000	2.000000	1.000000
3	3.000000	3.000000	6.000000
4	4.000000	4.000000	1.000000
5	5.000000	5.000000	3.000000
6	6.000000	6.000000	6.000000
7	7.000000	7.000000	1.000000
8	8.000000	8.000000	1.000000
9	9.000000	9.000000	6.000000
10	10.000000	10.000000	6.000000
11	11.000000	11.000000	7.000000
12	12.000000	12.000000	4.000000

To the right of the table are 'Okay', 'Cancel', and 'Load' buttons. The 'Load' button is highlighted with a red box. Below the table are 'Save' and 'Workspace' buttons.

A large callout box at the bottom right points to the 'Load' button with the text 'Lookup_Table_7_Classification_New.txt 불러오기'.

무감독 분류 실습

❖ Data 탭에서 새로 분류된 클러스터 영상 확인



무감독 분류 실습

❖ 7개 분류 값 아래와 같이 Lookup Table 적용 (15. Changed Grid -> Properties -> Settings -> Colors)

Properties: 15, Changed Grid

History Legend Attributes
Settings Description

Options General

- Name: Changed Grid
- Description:
- No Data: -99999; -99999
- Show Legend:
- Unit:
- Z-Scale: 1
- Z-Offset: 0
- Show Cell Values:
- Memory Handling: Normal

Display

- Transparency [%]: 0
- Show at all scales:
- Resampling: Nearest Neighbour

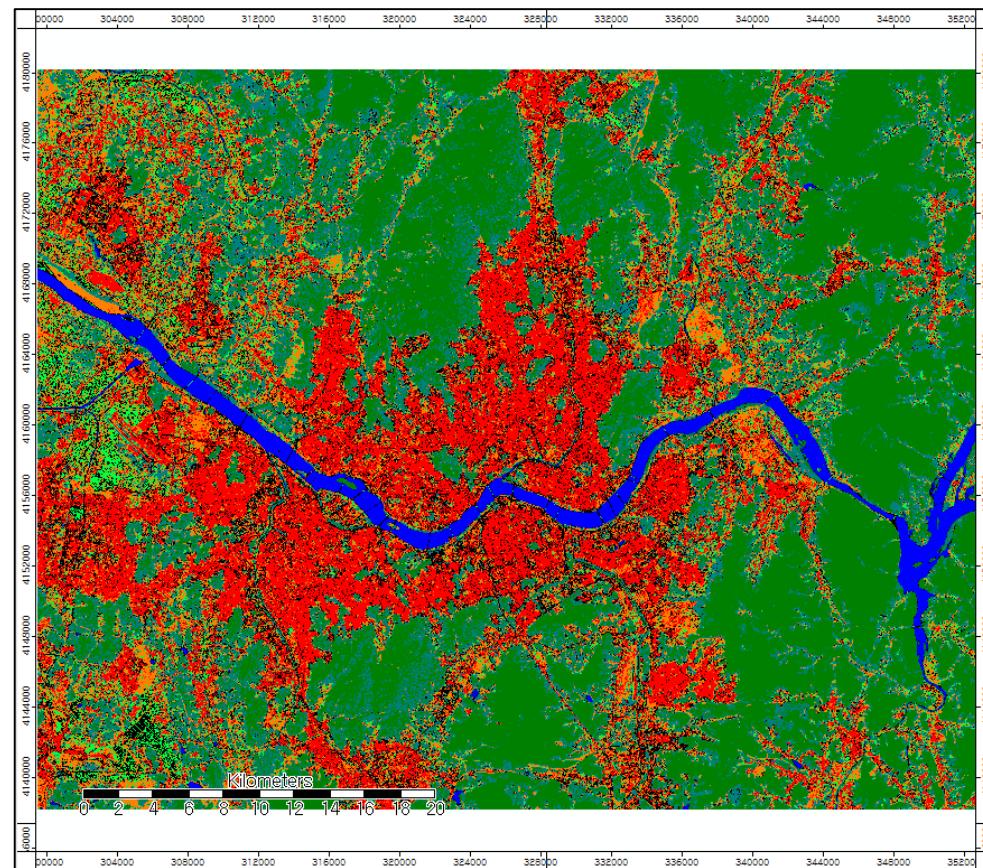
Colors

- Type: Lookup Table
- Lookup Table
- Table: (columns: 5, rows: 7)

Table

	COLOR	NAME
1	Red	BuiltUp
2	Green	Agriculture
3	Teal	Scrub
4	Orange	OpenScrub
5	Blue	Water
6	Dark Green	Forest
7	Black	Load

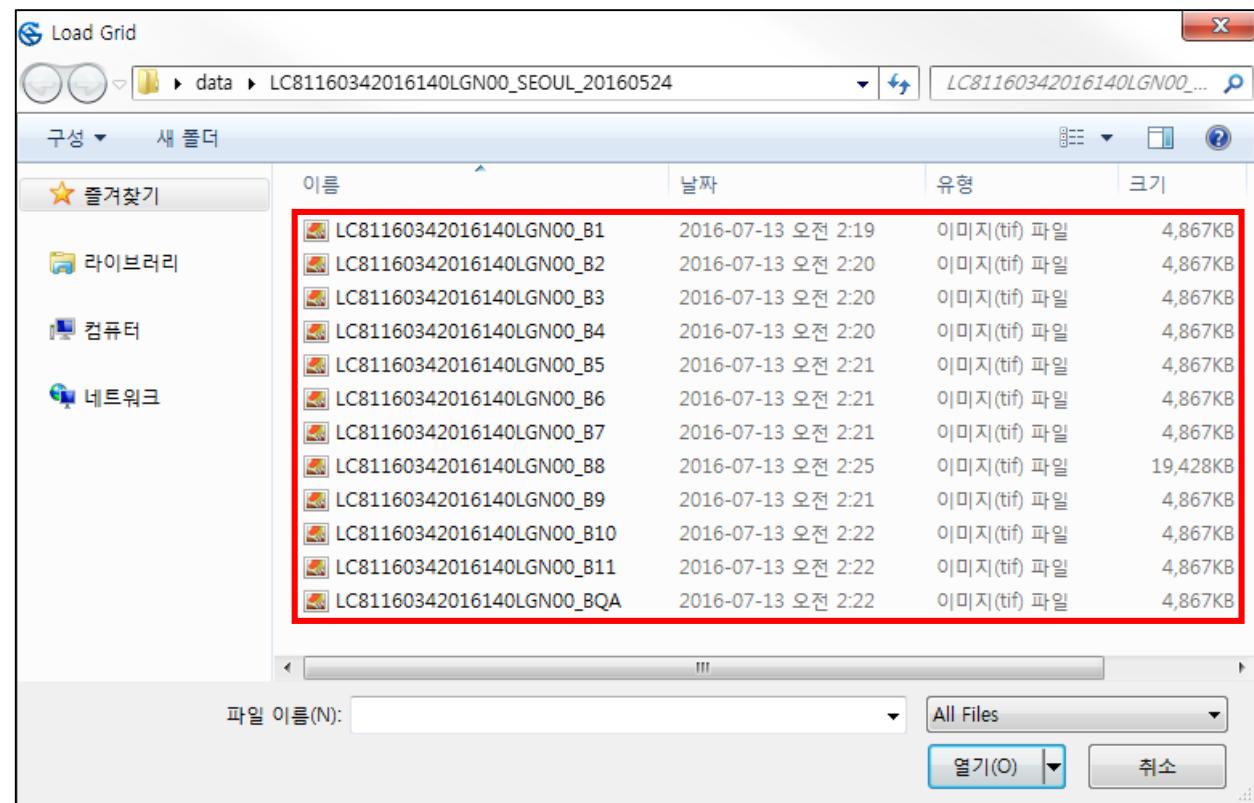
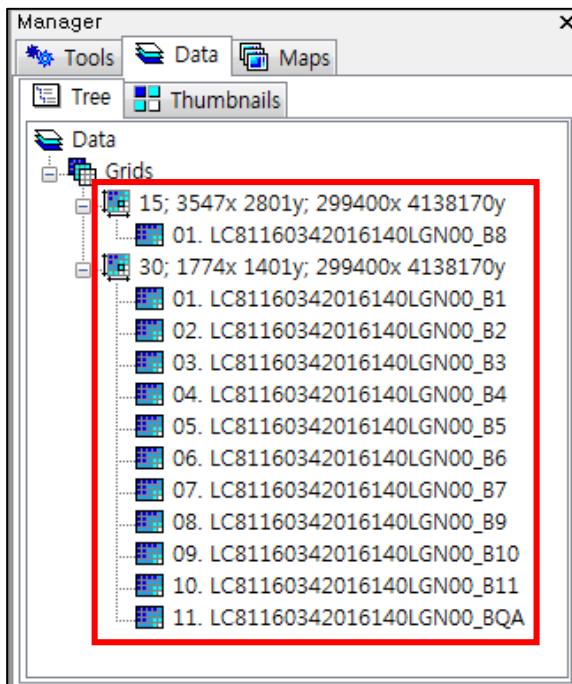
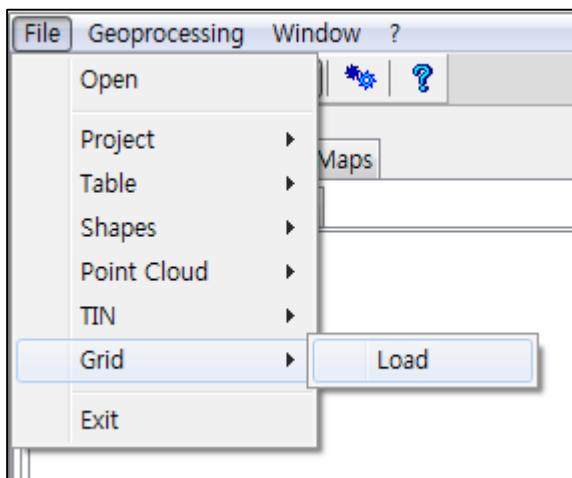
Buttons: Apply, Restore, Load, Save, Load, Workspace, Save, Workspace, Add



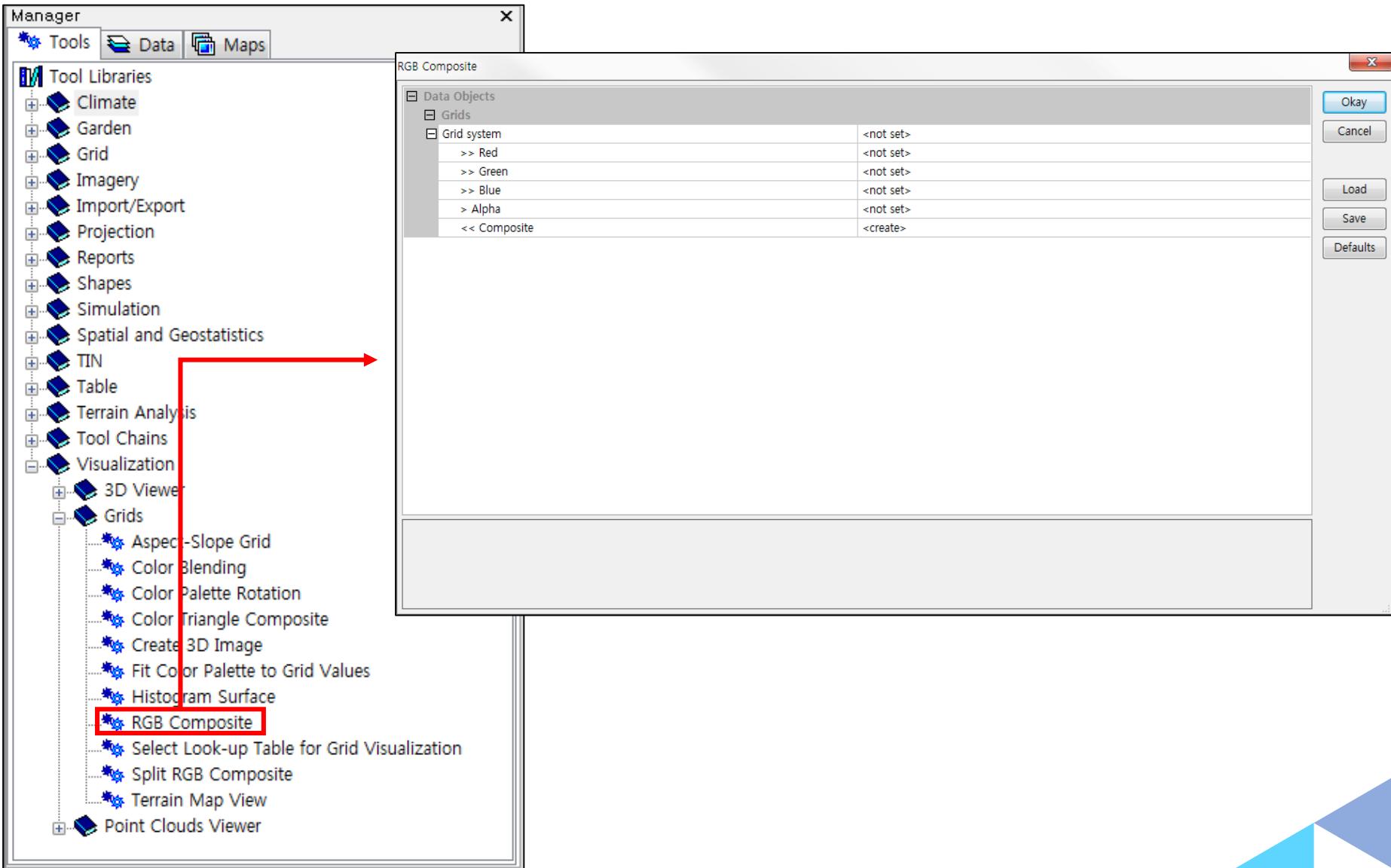
감독 분류 실습

감독 분류 실습

EX 07과 같은 데이터 이용



감독 분류 실습



감독 분류 실습

☰ Data Objects

☰ Grids

☰ Grid system

- ☒ >> Red
 - ☒ Value Preparation
 - Standard Deviation
- ☒ >> Green
 - ☒ Value Preparation
 - Standard Deviation
- ☒ >> Blue
 - ☒ Value Preparation
 - Standard Deviation
- > Alpha
- << Composite

30; 1774x 1401y; 299400x 4138170y
05. LC81160342016140LGN00_B5 **밴드 5**
standard deviation
2

06. LC81160342016140LGN00_B6 **밴드 6**
standard deviation
2

03. LC81160342016140LGN00_B3 **밴드 3**
standard deviation
2

<not set>
<create>

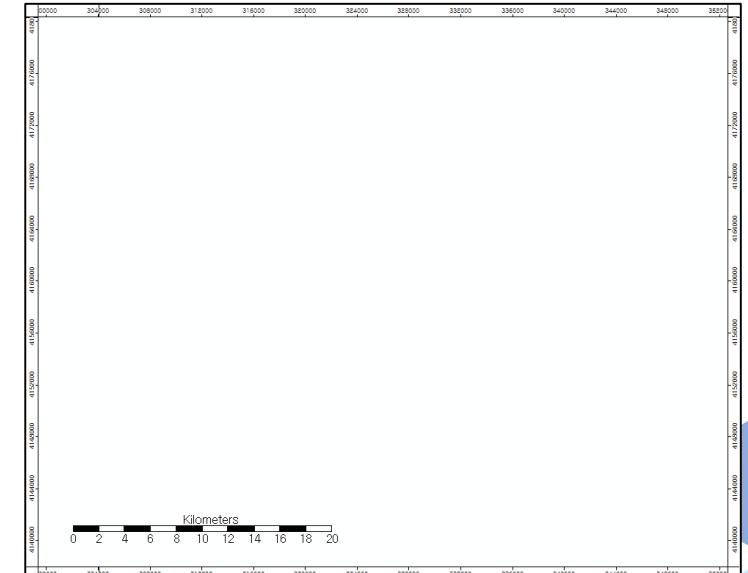
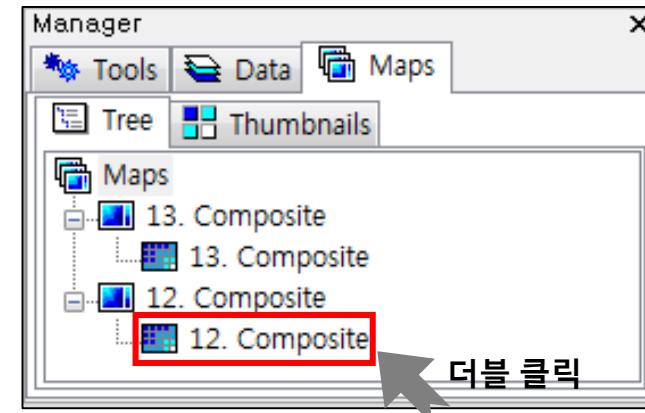
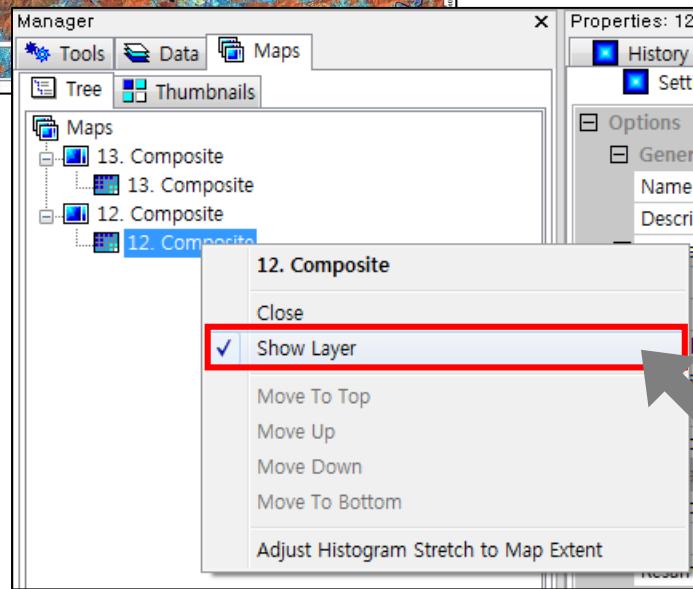
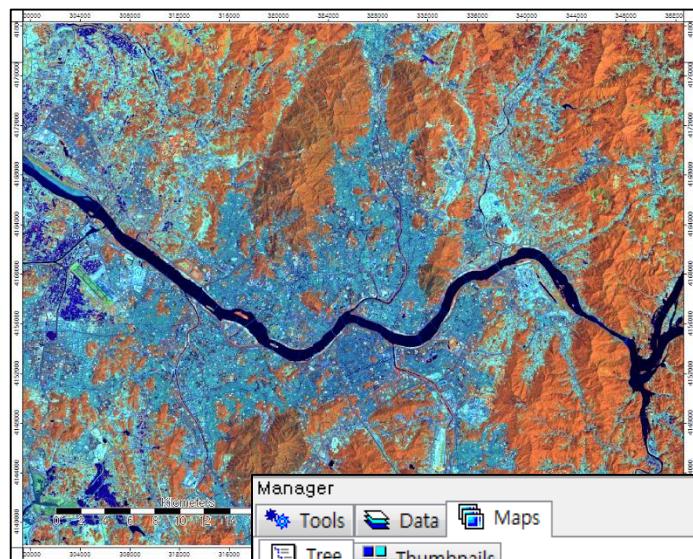
☰ Data Objects

Okay Cancel Load Save Defaults

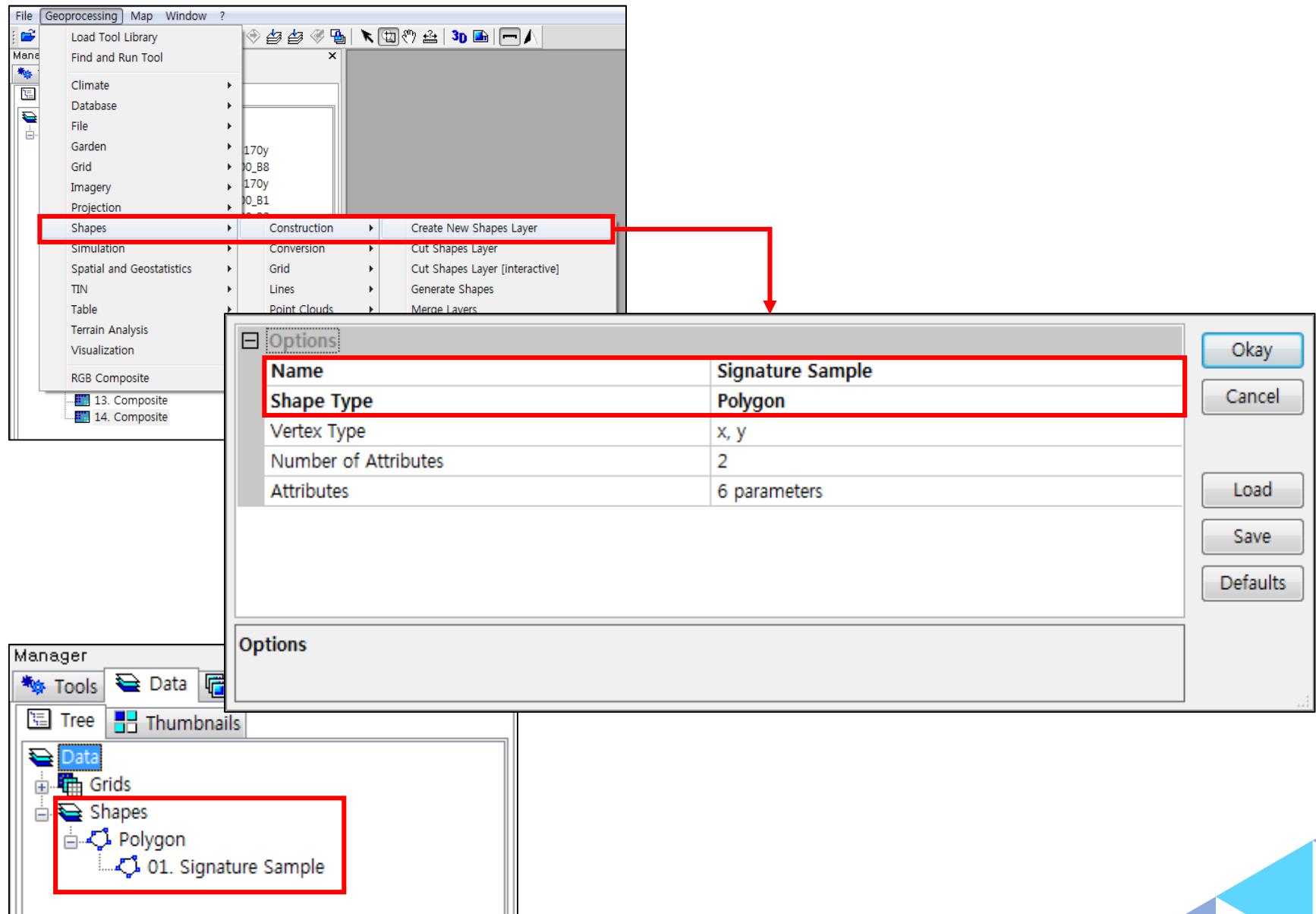
Kilometers

0 2 4 6 8 10 12 14 16 18 20

감독 분류 실습

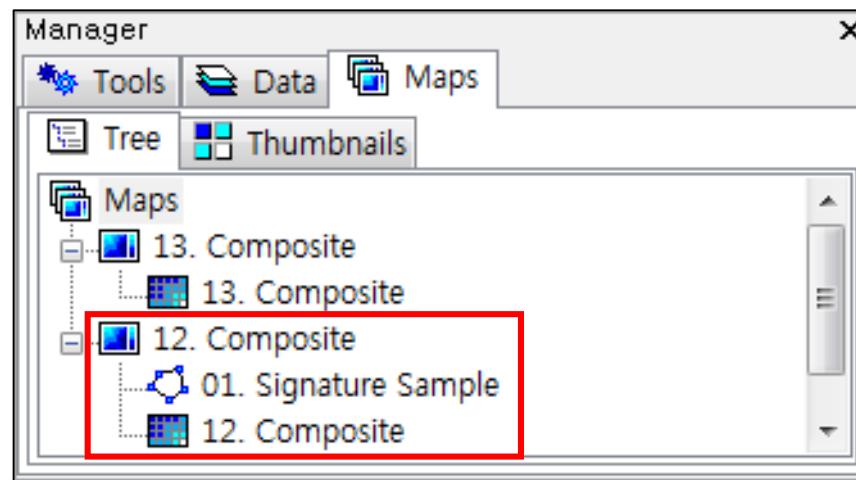
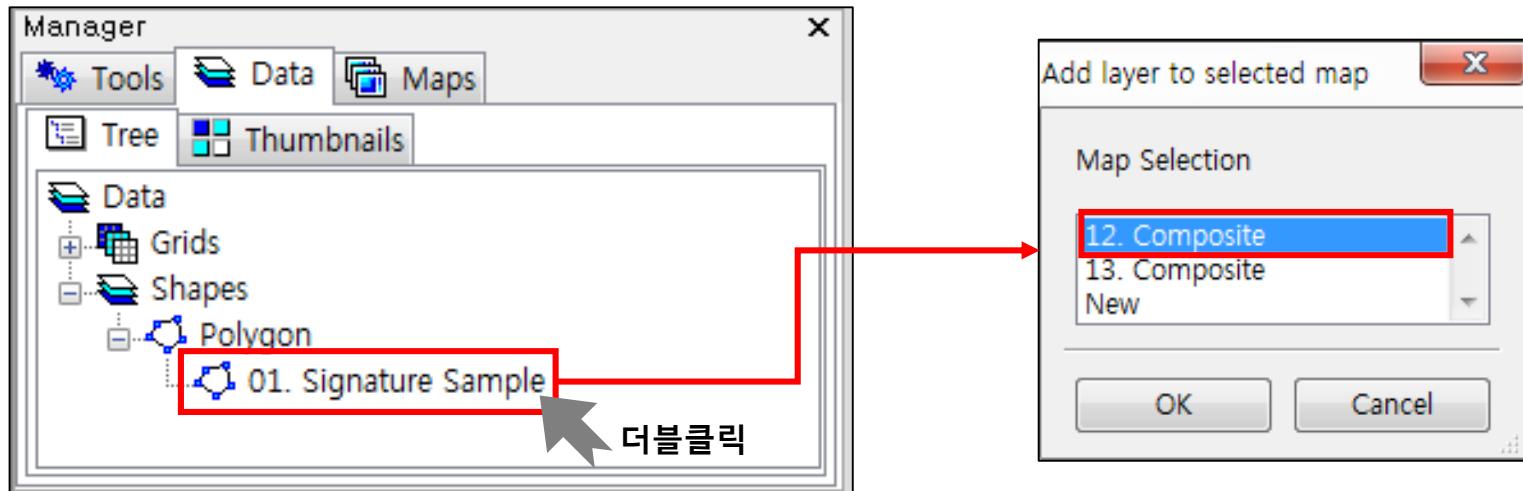


감독 분류 실습

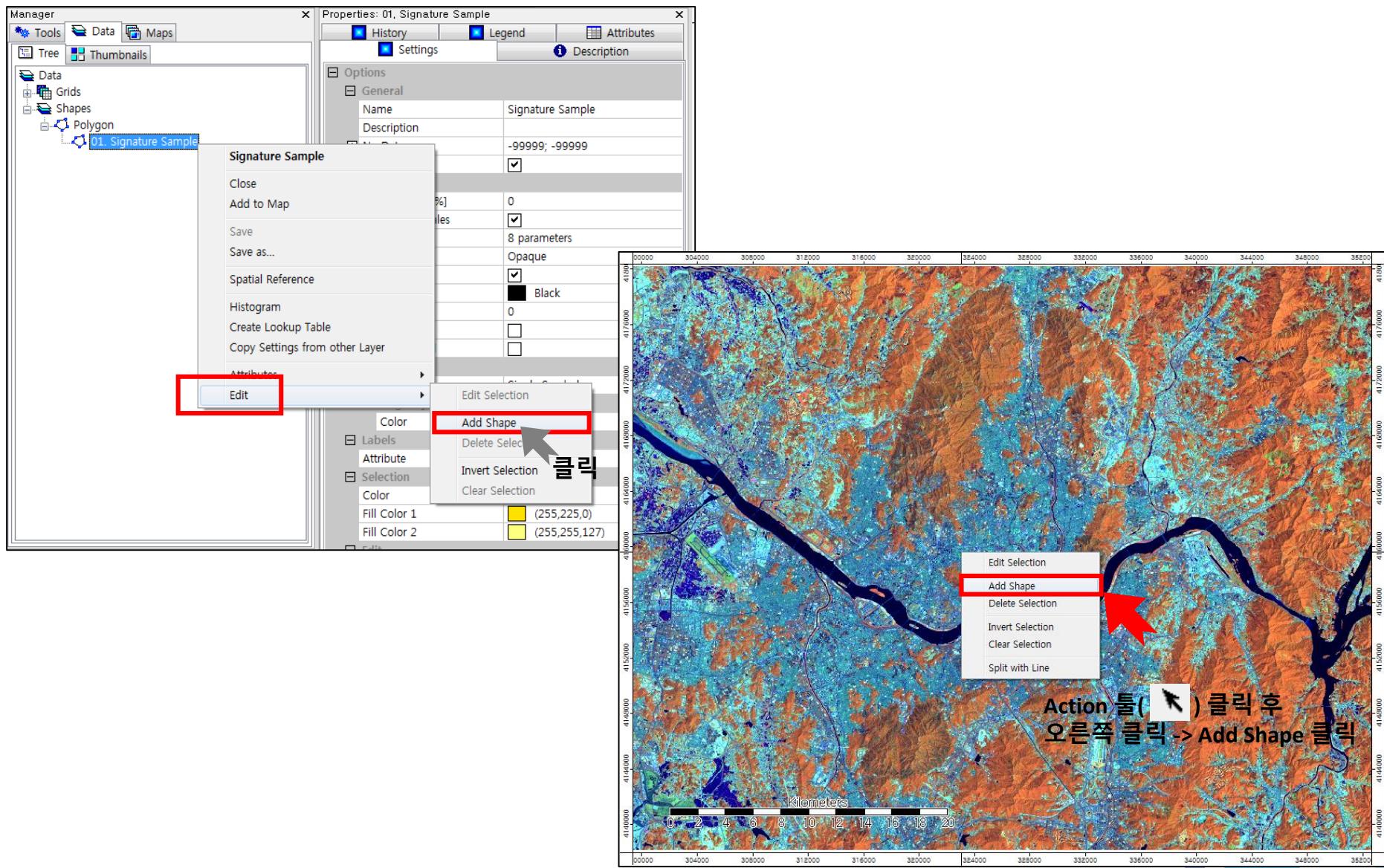


감독 분류 실습

- ❖ Shapes Layer 추가 (Signature Sample -> Composite)
- ❖ 추가된 Shapes Layer 확인 (Manager -> Maps)

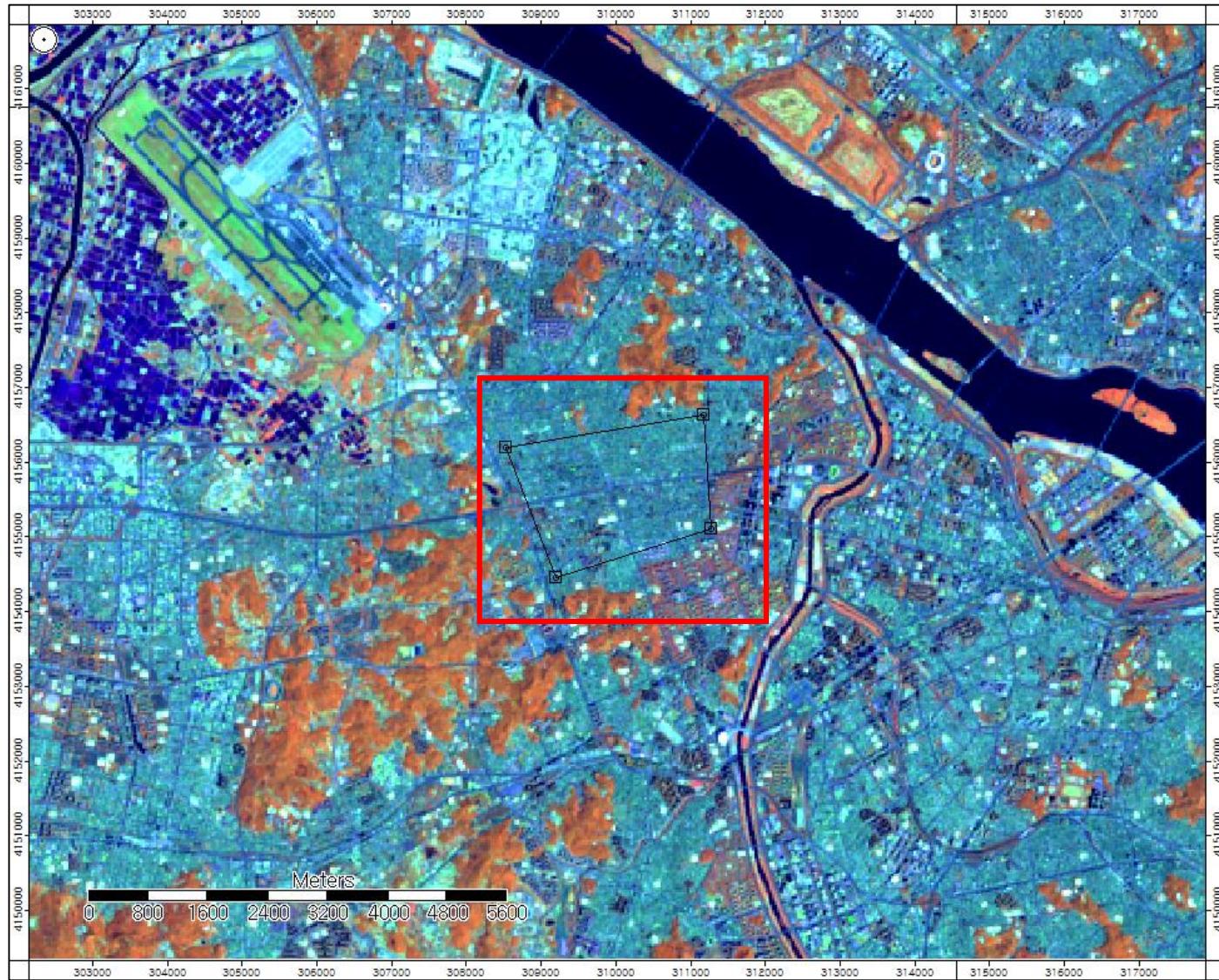


감독 분류 실습



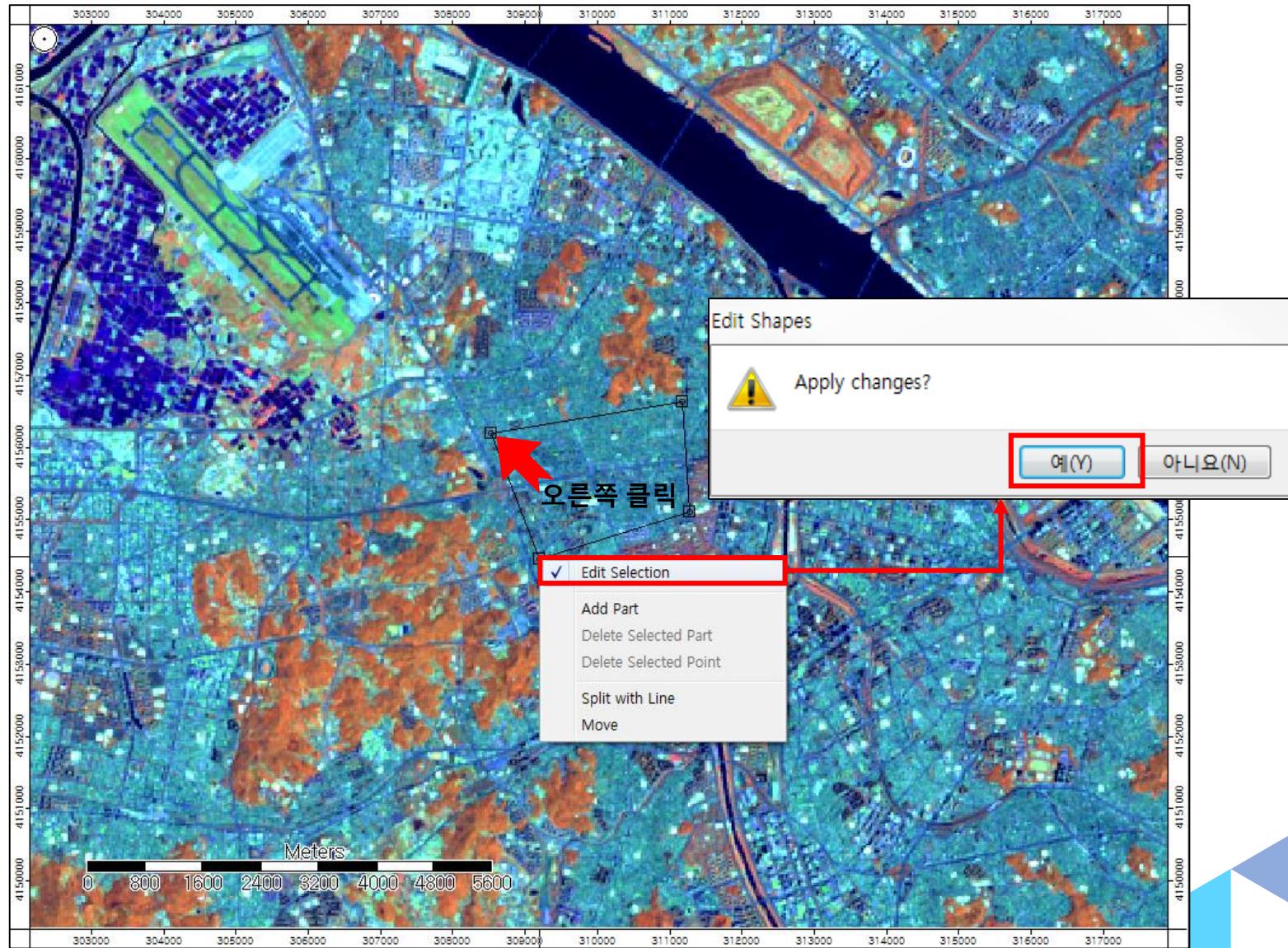
감독 분류 실습

❖ 원하는 범위 선택



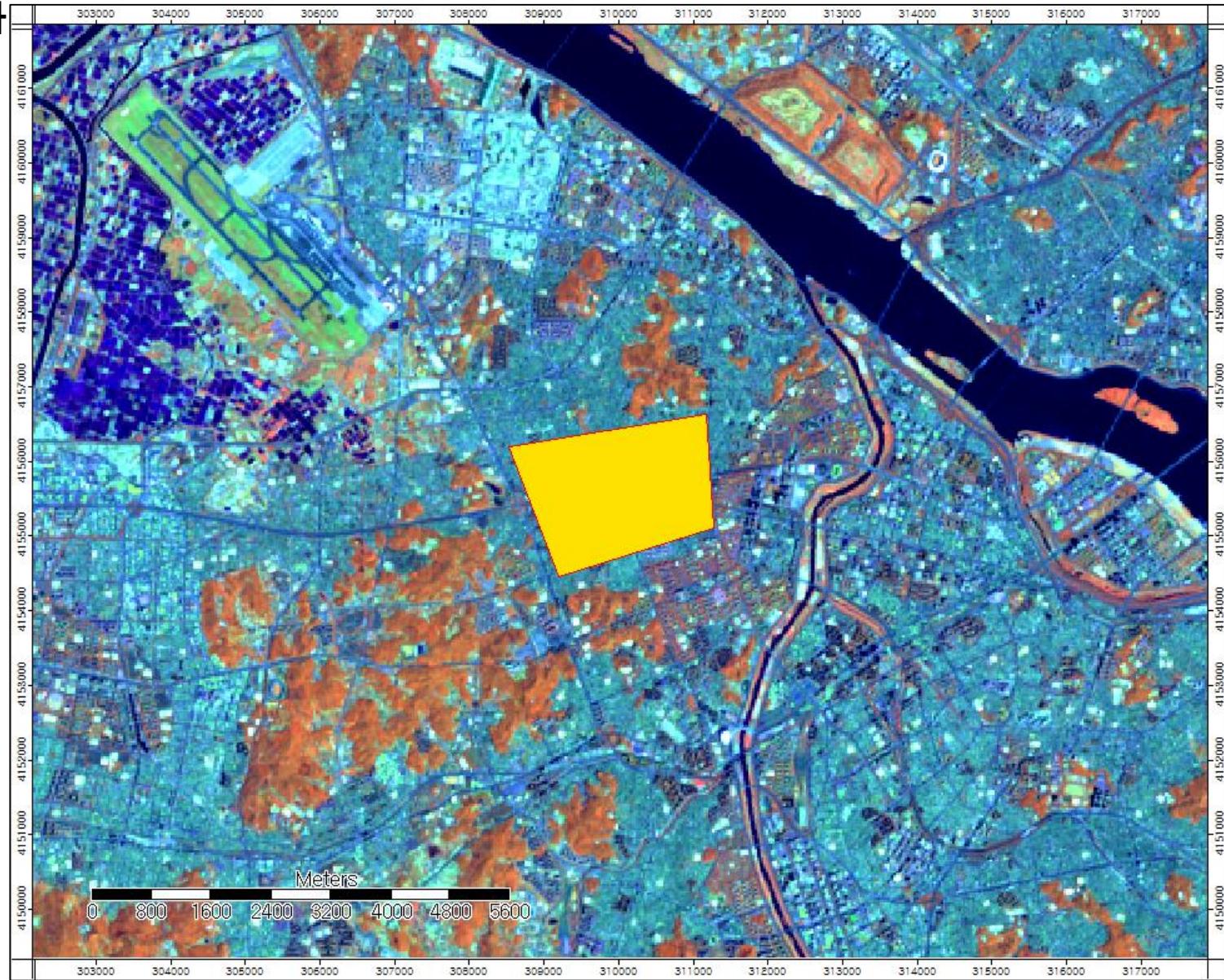
감독 분류 실습

❖ Edit Selection 체크 해제

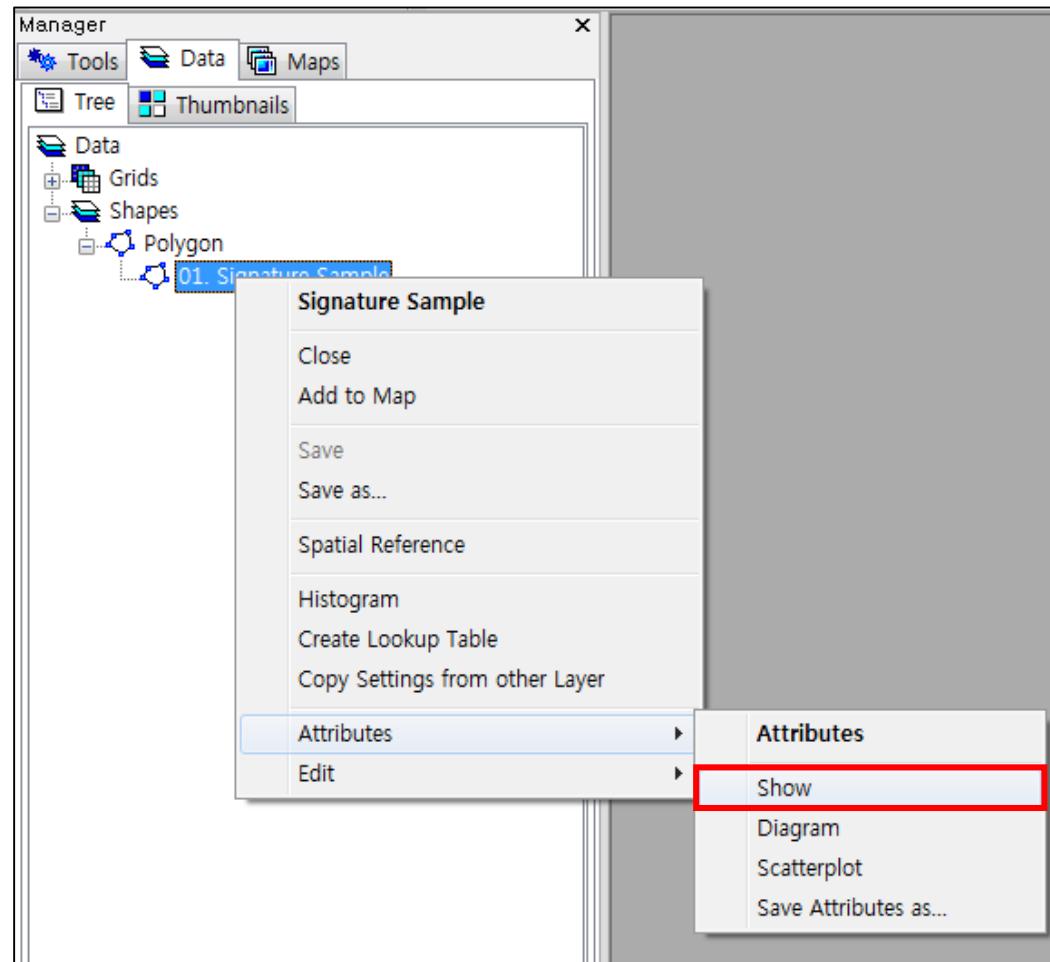


감독 분류 실습

❖ 결과



감독 분류 실습



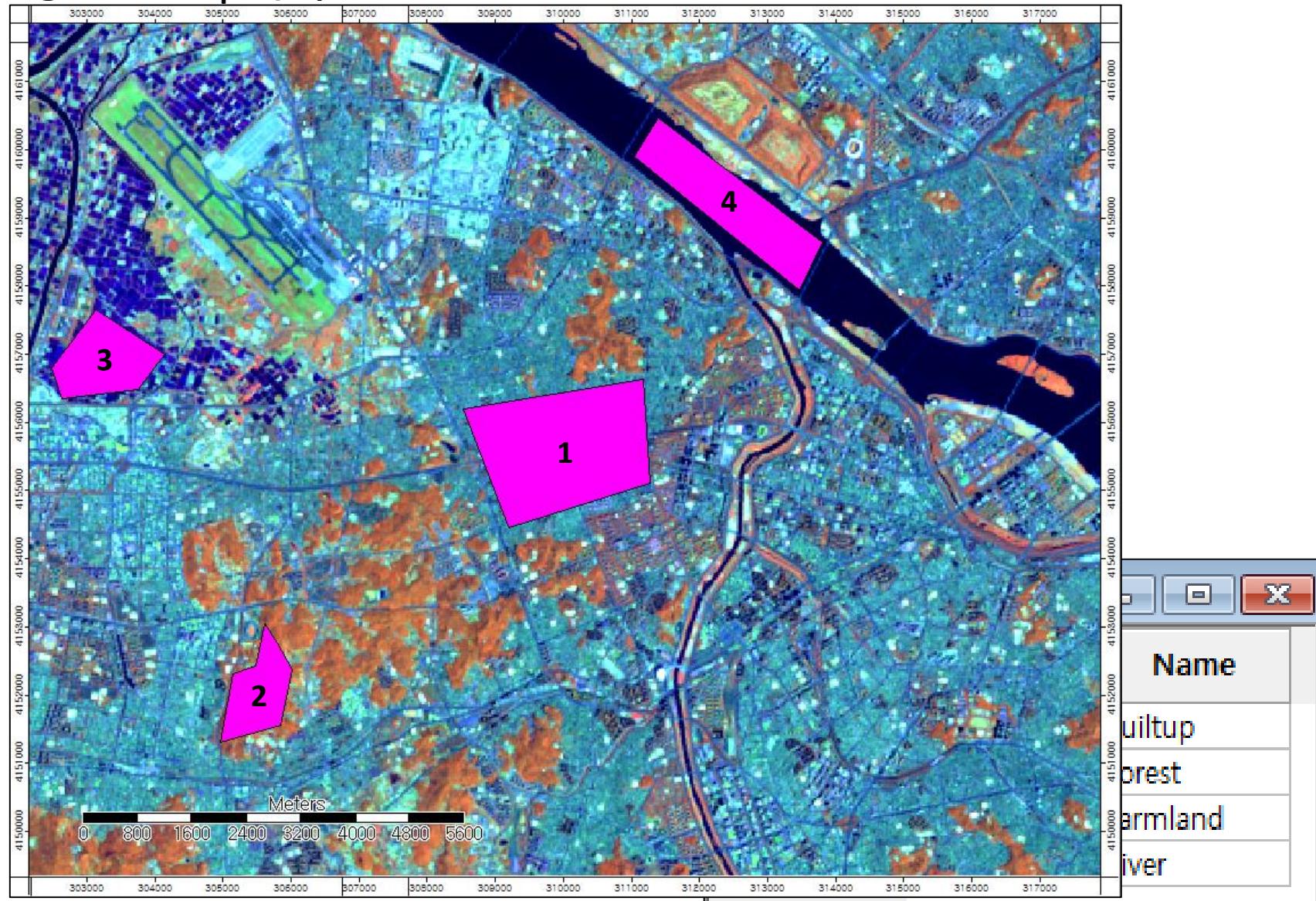
	ID	Name
	1 0	

속성값 입력

	ID	Name
	1 1	Builtup

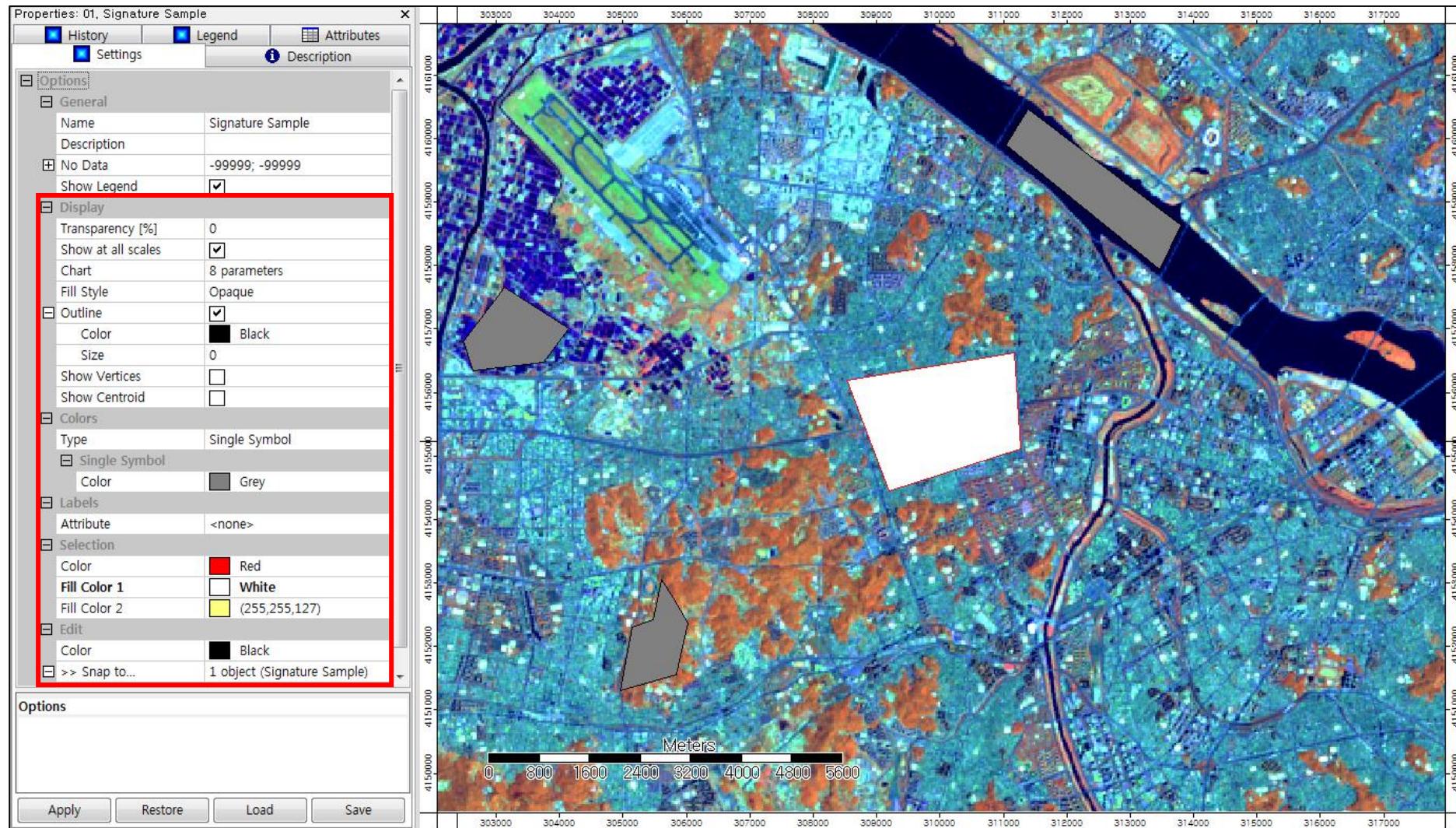
감독 분류 실습

❖ 같은 방법으로 Shape 추가



감독 분류 실습

❖ Shapes 색 변경 가능



감독 분류 실습

Manager

Tools Data Maps

Tool Libraries

- Climate
- Garden
- Grid
- Imagery
 - Classification
 - Confusion Matrix (Polygons / Grid)
 - Confusion Matrix (Two Grids)
 - Decision Tree
 - ISODATA Clustering for Grids
 - K-Means Clustering for Grids
 - Supervised Classification for Grids**
 - Supervised Classification for Shapes
 - Supervised Classification for Tables
 - Maximum Entropy
 - OpenCV
 - Photogrammetry
 - SVM
 - Segmentation
 - Tools
 - ViGrA

Import/Export

Projection

Reports

Shapes

Simulation

Spatial and Geostatistics

TIN

Table

Terrain Analysis

Tool Chains

Visualization

Data Objects

Grids

Grid system

 - >> Features 30; 1774x 1401y; 299400x 4138170y
 - Normalise
 - << Classification <create>
 - < Quality <not set>

Shapes

> Training Areas 01. Signature Sample

 - Class Identifier ID

Options

 - Save Statistics to File...
 - Method Maximum Likelihood
 - Probability Threshold 0
 - Probability Reference absolute
 - Update Colors from Features

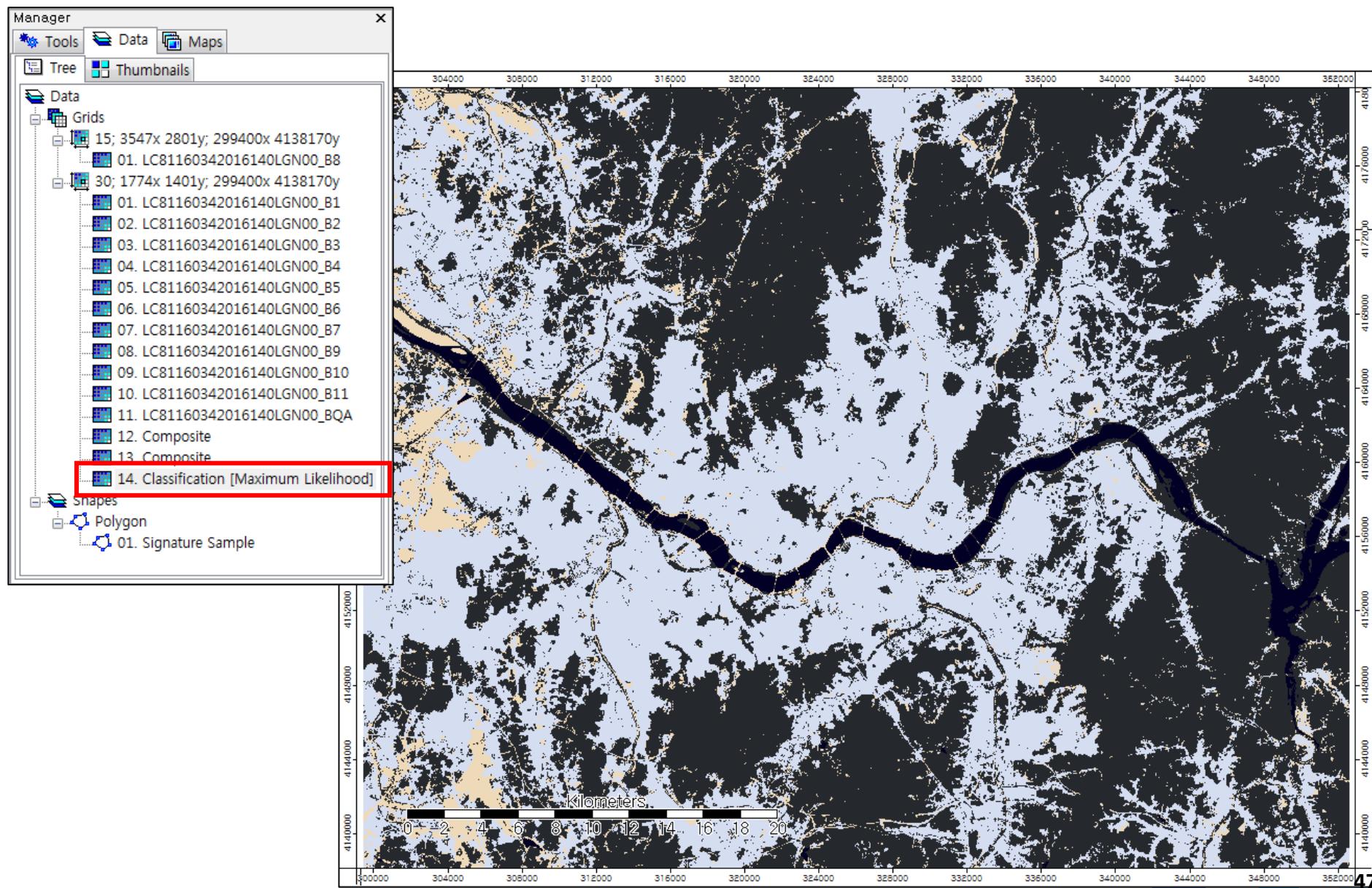
Data Objects

Features

 - 01. LC81160342016140LGN00_B1
 - 08. LC81160342016140LGN00_B9
 - 11. LC81160342016140LGN00_BQA
 - 12. Composite
 - 13. Composite
 - 02. LC81160342016140LGN00_B2
 - 03. LC81160342016140LGN00_B3
 - 04. LC81160342016140LGN00_B4
 - 05. LC81160342016140LGN00_B5
 - 06. LC81160342016140LGN00_B6
 - 07. LC81160342016140LGN00_B7
 - 09. LC81160342016140LGN00_B10
 - 10. LC81160342016140LGN00_B11

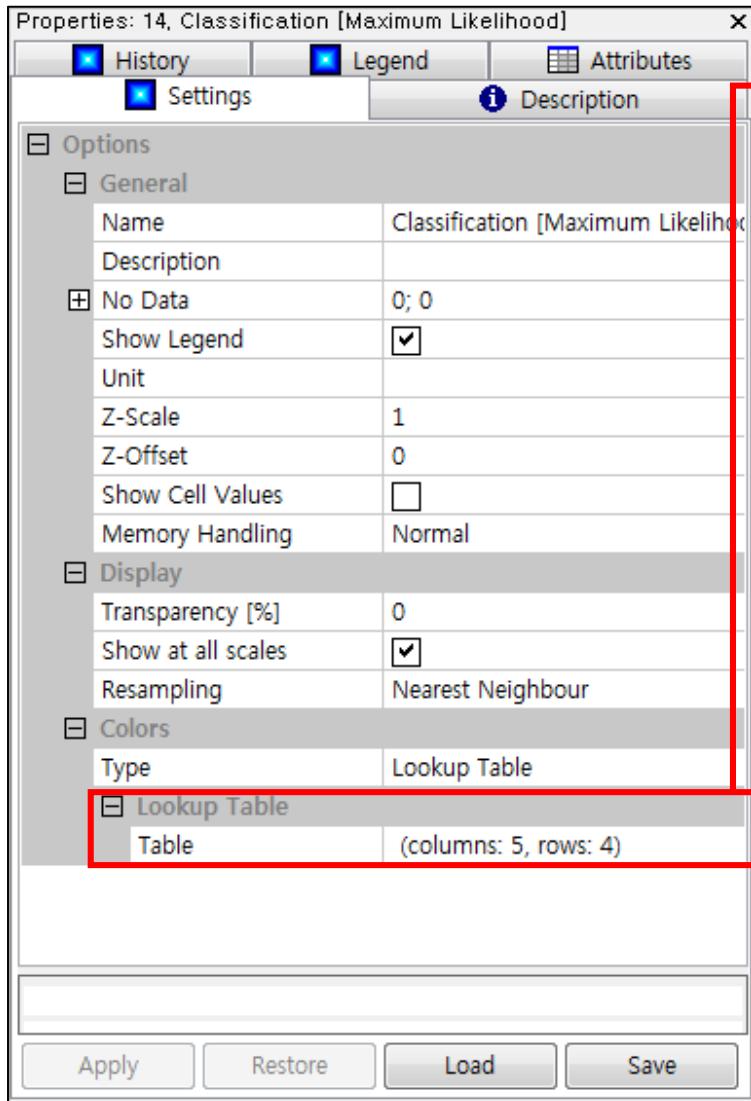
Okay Cancel Load Save Defaults

감독 분류 실습



감독 분류 실습

❖ 색 변경 가능



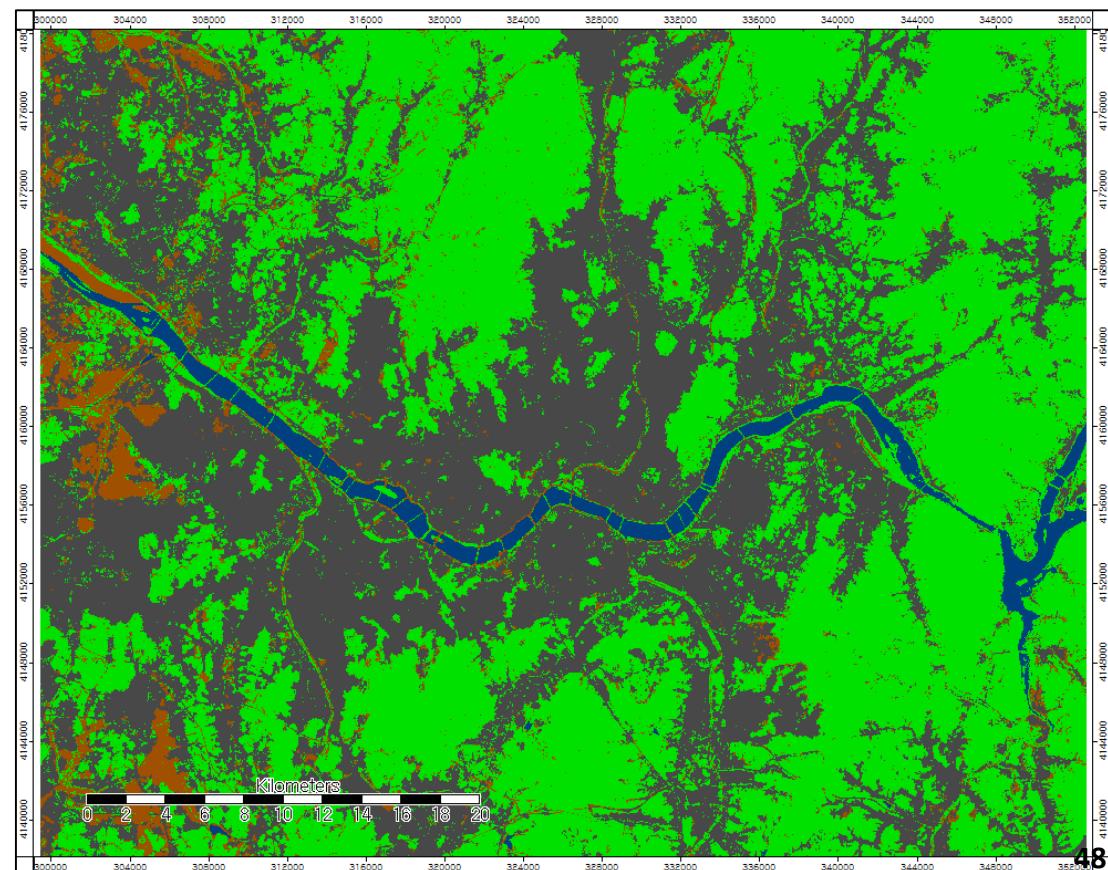
	COLOR	NAME	DESCRIPTION	MINIMUM	MAXIMUM	
1		2		1.000000	1.000000	
2		1		2.000000	2.000000	
3		3		3.000000	3.000000	
4		4		4.000000	4.000000	

1: Forest
2: Builtup
3: Farmland
4: River

Okay Cancel

Load Workspace

Save Workspace



감독 분류 실습

❖ Show Print Layout : 출력 미리 보기() 통해 새로운 창에서 각주 포함 된 이미지 보기 가능

