위성 영상 처리 SW 개요

Overview of remote sensing image processing SW

위성 영상 처리 SW 종류

10 Open Source Remote Sensing Software Packages

1 SAGA GIS: System for Automated Geoscientific Analyses

SAGA GIS is on the top of the list and for good reason. The main reason being: SAGA GIS is ideal for most GIS and remote sensing needs.

A rich library of modules gives SAGA GIS a big advantage. These modules c ome in the form of raster analyses and manipulation.

What gives SAGA GIS a kick is its quick and reliable raster processing.

http://www.saga-gis.org/

https://opticks.org/maintenance/

2 Opticks

Opticks might be that magic bullet that you're looking for in open source remote sensing software.

The neat part about this software is the long list of extensions you can add. There are plugins for raster math, radar pro cessing and hyper/multispectral. Now, that is a lot functionality for open source remote sensing software.

Make sure to check the compatibility before downloading an extension though. You might have to scale bac k your Opticks version in order for the extension to work properly.

위성 영상 처리 SW 종류

3 GRASS: Geographic Resources Analysis Support System

GRASS may be the most popular software package on this list. And for good reason.

GRASS is full of functionality: image classification, PCA, edge detection, radiometric cor rections, 3D, geostatistics analysis and filtering options.

Another key feature of GRASS is the LiDAR processing and analysis. You can filter LiDAR points, create contours and generate DEMs. Next time you see a LAS file, see what GRASS can do with it.

4 PolSARPro

For synthetic aperture radar, you may want to take a nice, long look at PolSARP ro.

This software can handle dual and full polarization SAR data. The SAR data can come from ENVISAT-ASAR, ALOS-PALSAR, RADARSAT-2 and TerraSAR-X. There's a wide range of to ols like importing, conversion, filtering, decompositions, inSAR processing and calibration.

Another neat part of this software is the graph processing framework where users can automate workflow. This funct ionality is similar to ArcGIS model builder and easy to set up.

Overall, PolSARPro is a very sophisticated piece of open source remote sensing software. You need to take a look at P olSARPro if you're working with full or dual polarization SAR data.

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5 ORFEO: Optical and Radar Federated Earth Observation

The ORFEO toolbox was a cooperative project developed by France and Italy.

It is a library of remote sensing image processing **specifically aimed at high**

spatial resolution. ORFEO provides a wide range of remote sensing functions: radiometry, PCA, change detection, pan sharpening, image segmentation, classification and filtering.

One really interesting aspect of this software is the capability to do object based image analysis. This is a rar e feature seen in software nowadays.

https://www.orfeo-toolbox.org

https://trac.osgeo.org/ossim/

6 OSSIM: Open Source Software Image Map

OSSIM is a high performance open source remote sensing software app lication. It has been actively developed for almost two decades. Interesti ng enough, it's being funded through US departments such as in intellig ence and defense.

Some of the key features is compatibility with **more than 100 raster and vector formats** and over **4000 differ ent projections and datums**. It supports a long list of sensors but some may require additional plug-ins.

If you need some remote sensing direction for high spatial resolution imagery, OSSIM might be the answer you have been searching for.

위성 영상 처리 SW 종류

7 InterImage

InterImage is a bit different from the other open source remote sensing software on this list. It **specializes in automatic image interpretation**, which is pretty neat.

The core theme of automatic image interpretation is object-based classification (OBIA). This involve s segmentation, exploring attributes and supervised classification.

Although developed in Brazil, documentation is available in English.

https://www.youtube.com/watch?reload=9&v=pyhSDp8AxaY

https://www.youtube.com/watch?v=rz75uiRNrpI

8 E-foto

E-foto is concerned with mainly one thing: **digital photogrammetry**.

The core functionality of this open source remote sensing software is photo triangulation, stereoscopic modeling, digital elevation model extraction an d terrain correction.

This software provides a fully functional photogrammetry tool set to use at no cost. E-foto has loads of tutorial s and examples to get you well on your way to being a photogrammetry expert.

위성 영상 처리 SW 종류

9 ILWIS: Integrated Land and Water Information System

ILWIS has been around for more than 25 years. It has had **over 27,000 do wnloads** since its first release. It wasn't until recently that it has become a vailable for public use.

ILWIS was originally built for researchers and students. For this reason, effort was concentrated on developing a user-friendly environment. The other main focus was compatibility with raster and vector formats. This has been done by full integration with the GDAL library.

The practical uses of ILWIS makes it a prime choice for remote sensing activities.

https://www.itc.nl/ilwis/

10 gvSIG

gvSIG is known for its **wide variety of rich features**. But there's more to it than just that. gvSIG is full of incredible capabilities: supervised classificati on, defining ROIs, band algebra and decision trees.

gvSIG stands for Generalitat Valenciana Geographic Information System. Generalitat Valenciana is the Spanish regional authority the system was designed for.

I bet you didn't know that.

위성 영상 처리 SW 종류

BONUS: QGIS

Quantum GIS (QGIS) is one of the **most powerful open source GIS software packages** available for free. This software package allows users to visualize, a nalyze, interpret and understand spatial data.

Plugins are the key to QGIS success. Raster manipulation includes neighborhood analysis, map algebra, surfac e interpolation, hydrologic modelling and terrain analysis like slope and aspect. There are plugins for semi- aut omated classification, BEAM and NEST framework, multitemporal raster analysis, viewshed analysis.

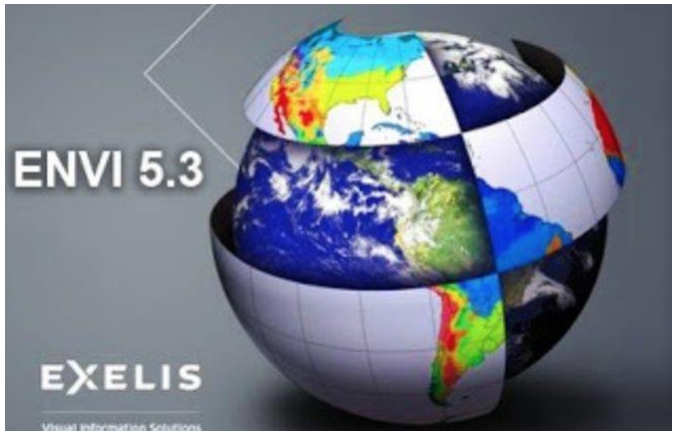
상용 소프트웨어

ArcGIS

ESRI

https://www.esrikr.com/products/arcgis/
https://www.youtube.com/watch?v=FRcv9xmmojE

Harris Geospatial



Hexagon Geospatial

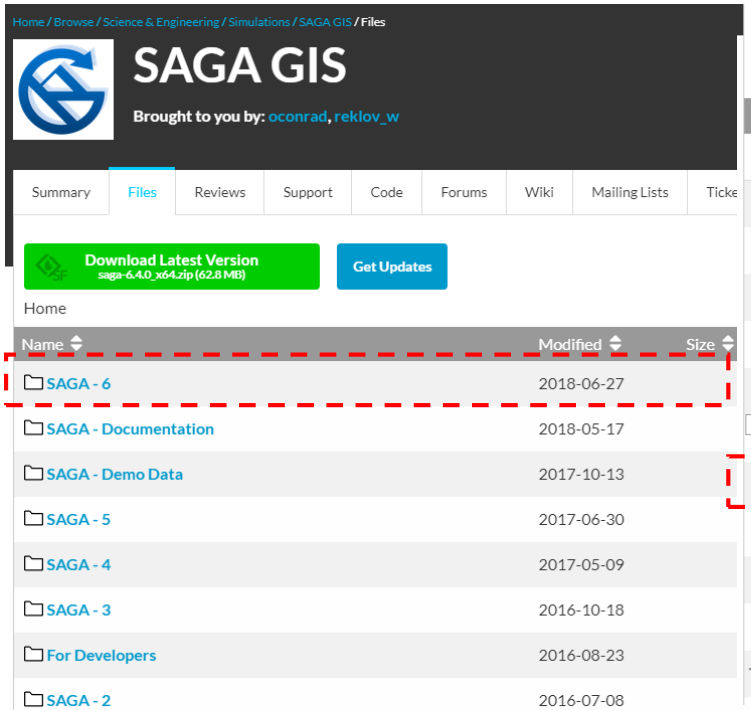
erdas
The Earth to Business Company

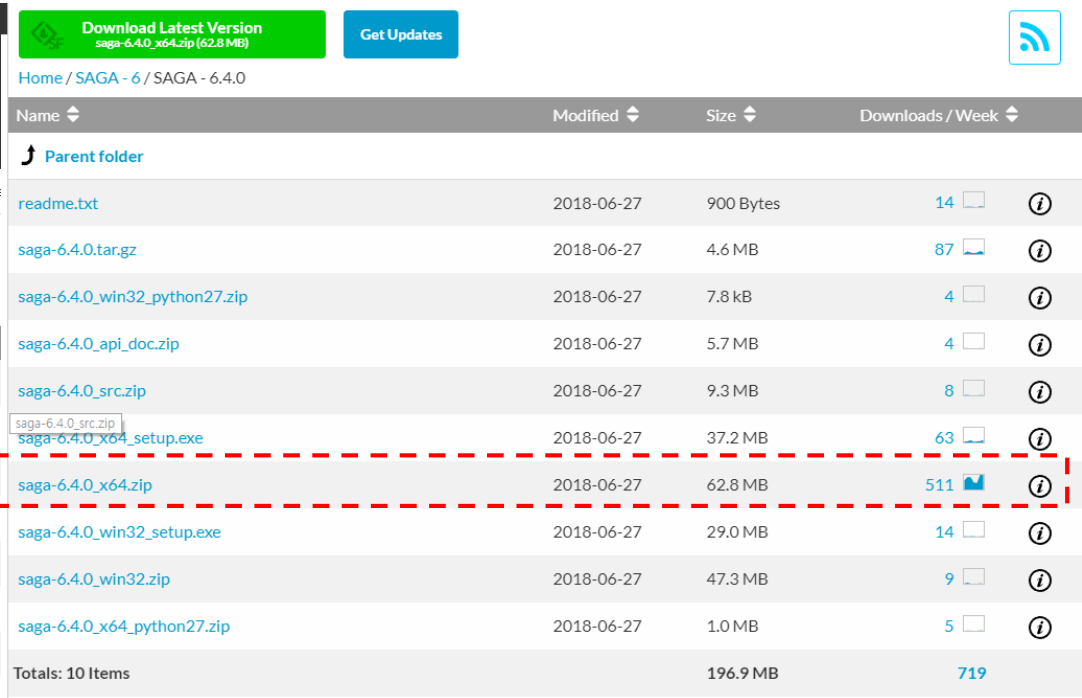
https://www.youtube.com/watch?v=0tNlNs9DFyo

Introduction to SAGA

SAGA 설치

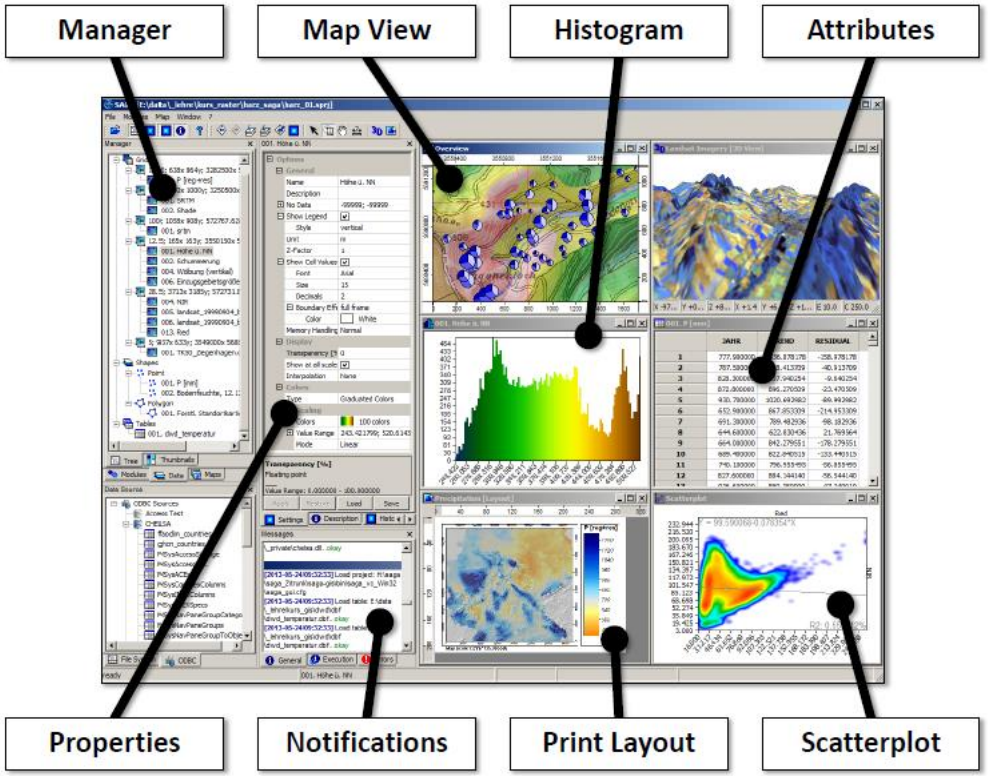
- System for Automated Geoscientific Analyses
- http://www.saga-gis.org/en/index.html





Introduction to SAGA

SAGA 시스템 / GUI 구성



Front Ends

- Graphical User Interface
- Command Line Interpreter — *Shell, RSAGA, Sextante*
- Script Languages — *Python, Java*

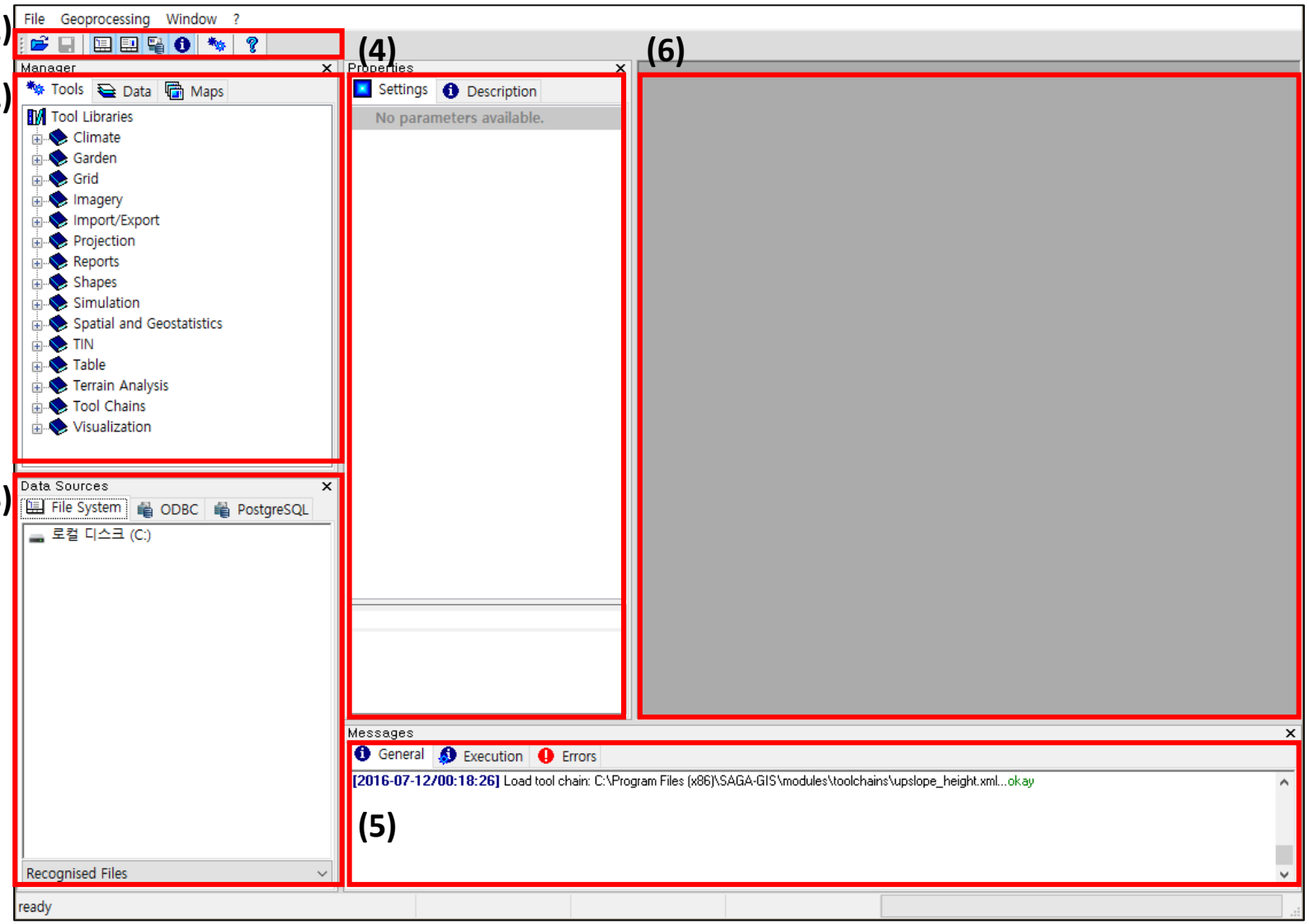
Tool Libraries

- Library A
- Library B
- Library C
- Library D

Application Programming Interface

- Data Management
- Tool Management
- Data Structures — *Tables, Vector and Raster Data*
- Helpers — *Memory Handling, Files, Strings, Numerics, Statistics*
- Tools — *Library Interface, Parameter Lists, User Interaction*

Introduction to SAGA



(1) 아이콘 툴바

(2) 툴바, 데이터, 시각화 지도 탭

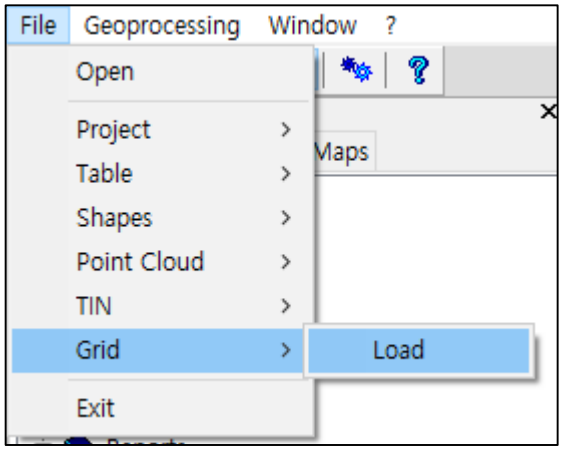
(3) 데이터 위치(소스)

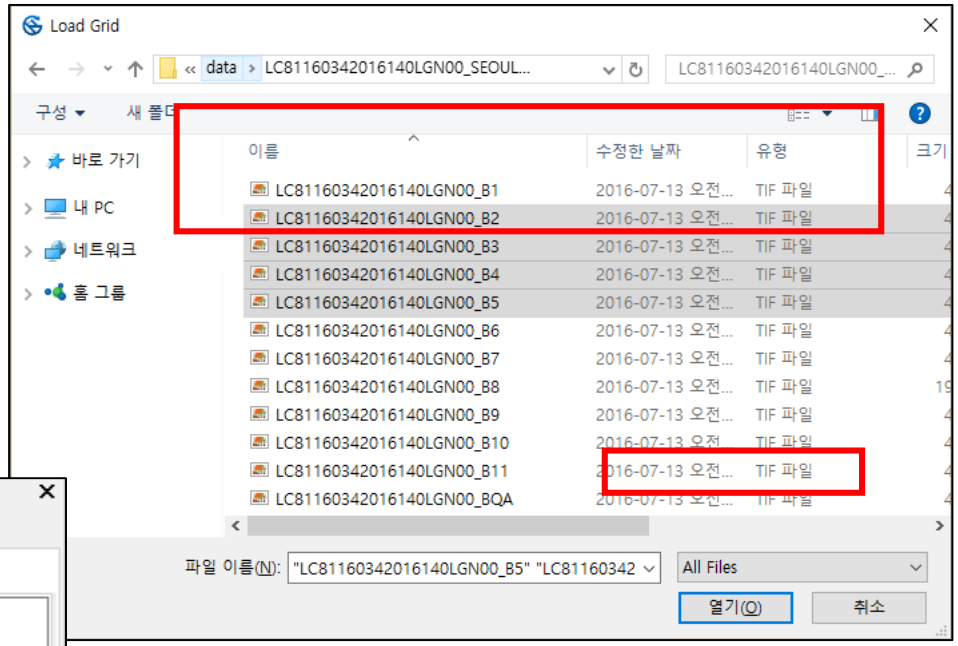
(4) 객체 정보

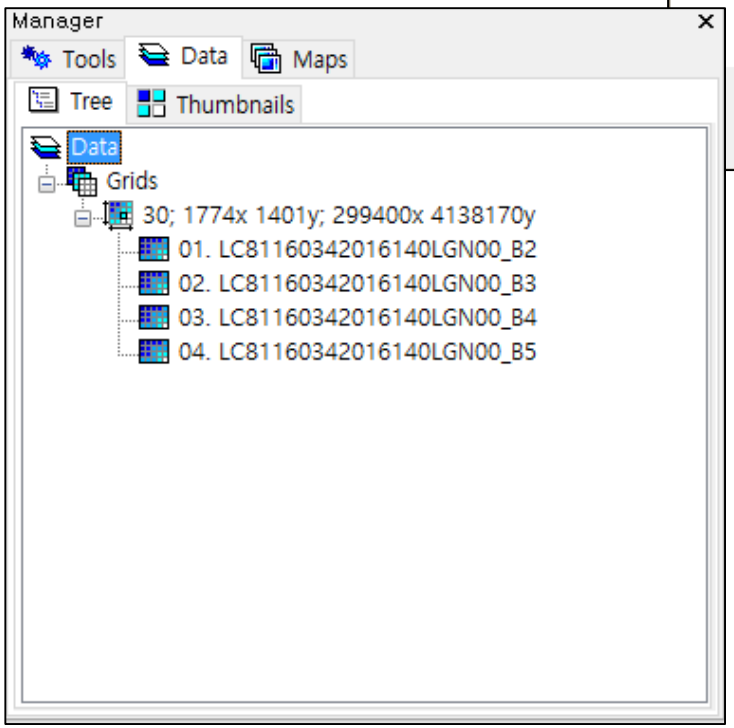
(5) 실행 로그

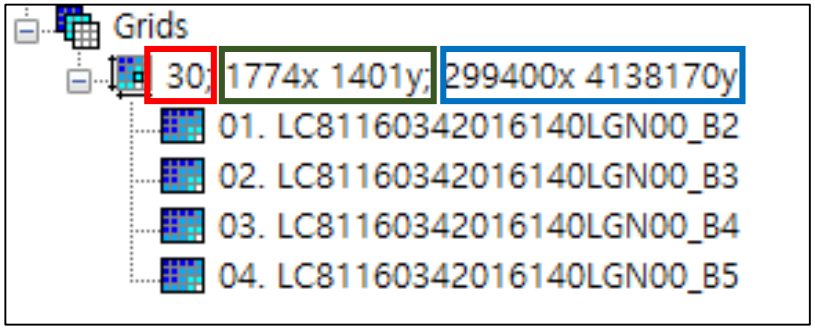
(6) 작업 영역

Introduction to SAGA







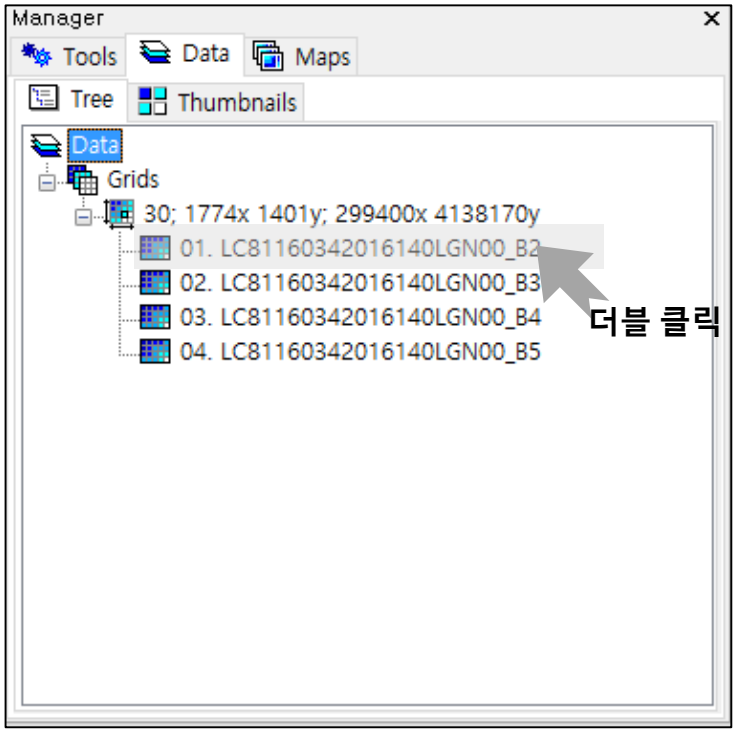


픽셀 사이즈 행 & 열 개수 왼쪽 상단 좌표

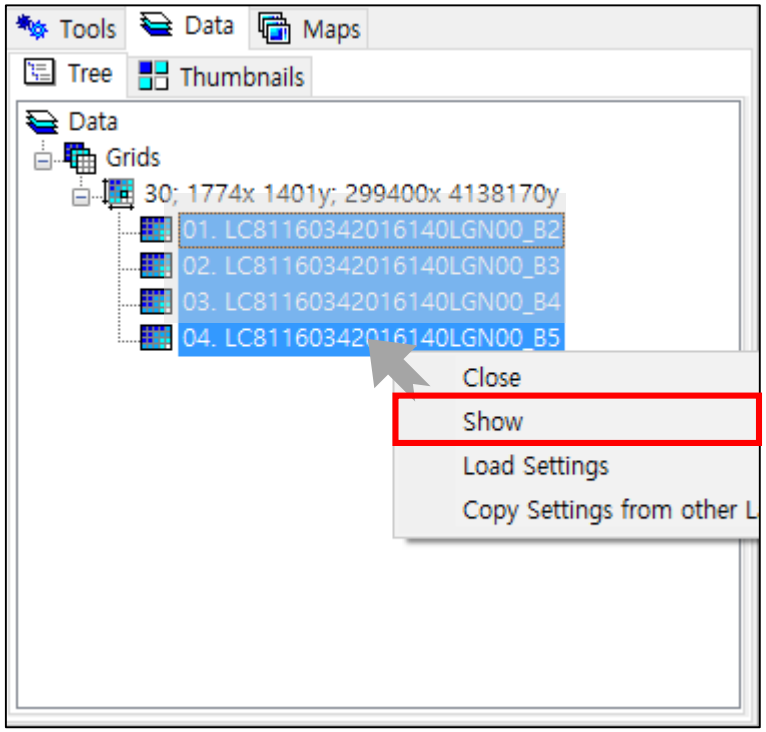
Introduction to SAGA

- ❖ 시각화 방법: 더블 클릭 또는 오른쪽 클릭 show 메뉴 버튼
- ❖ 1개 또는 여러 개 시각화 가능

단일 영상 시각화

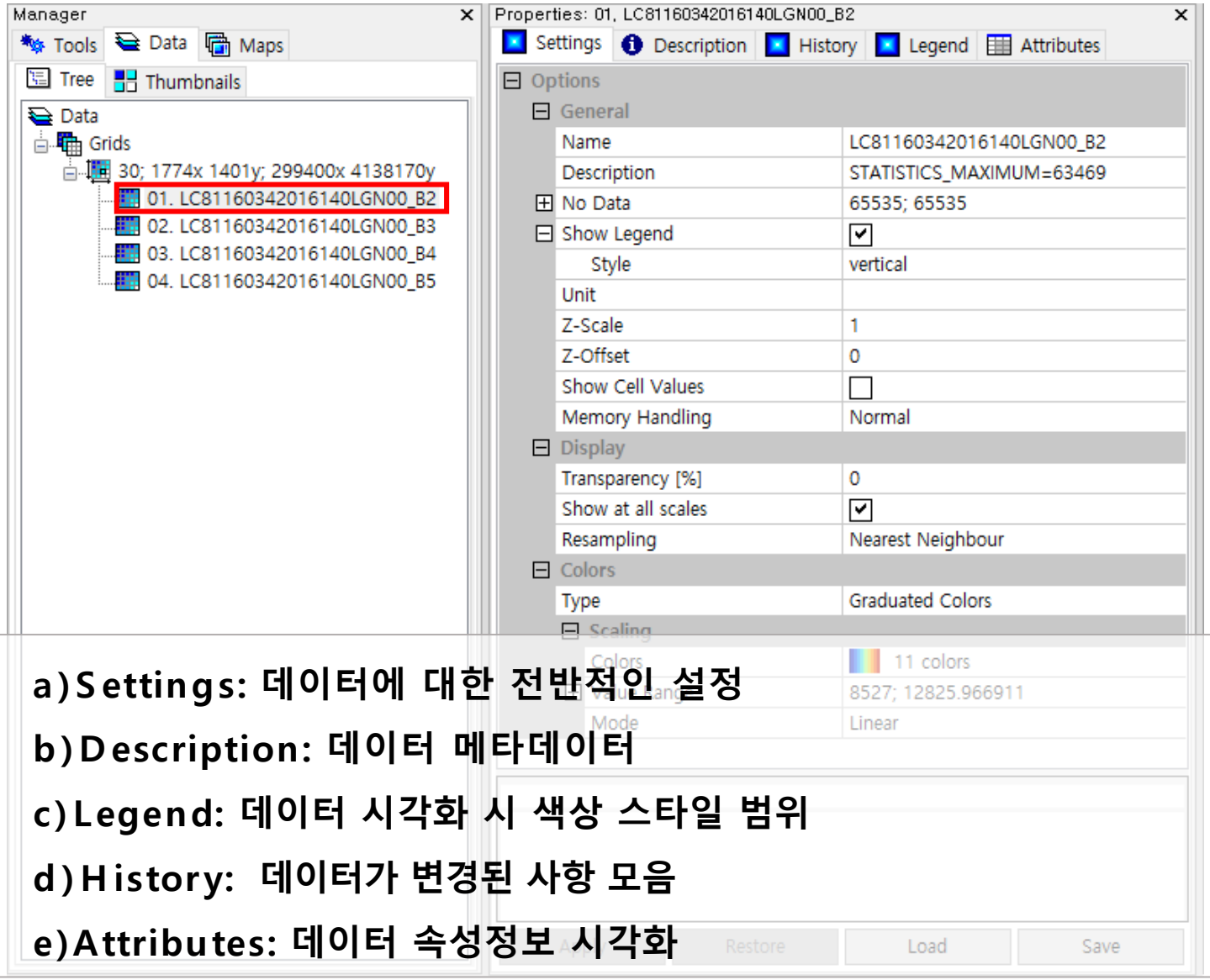


다수 영상 시각화



Introduction to SAGA

❖ **Object Properties 창 영상 정보 출력**



a) Settings: 데이터에 대한 전반적인 설정

b) Description: 데이터 메타데이터

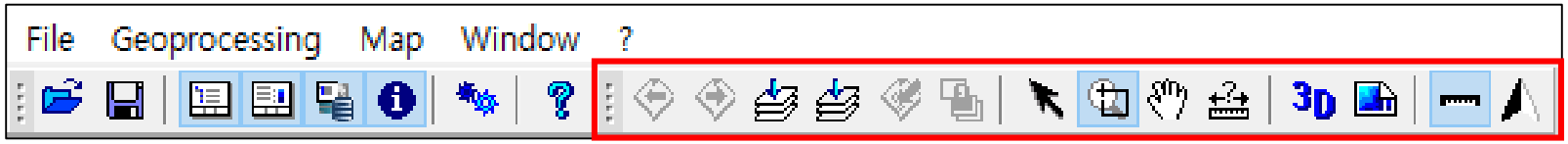
c) Legend: 데이터 시각화 시 색상 스타일 범위

d) History: 데이터가 변경된 사항 모음

e) Attributes: 데이터 속성정보 시각화

Introduction to SAGA

❖ 영상 컨트롤 툴 박스



Action : 영상 영역 선택

3D View : 3D 시각화

Zoom : 지도 확대

Show Print Layout : 출력 미리보기

Pan : 지도 이동

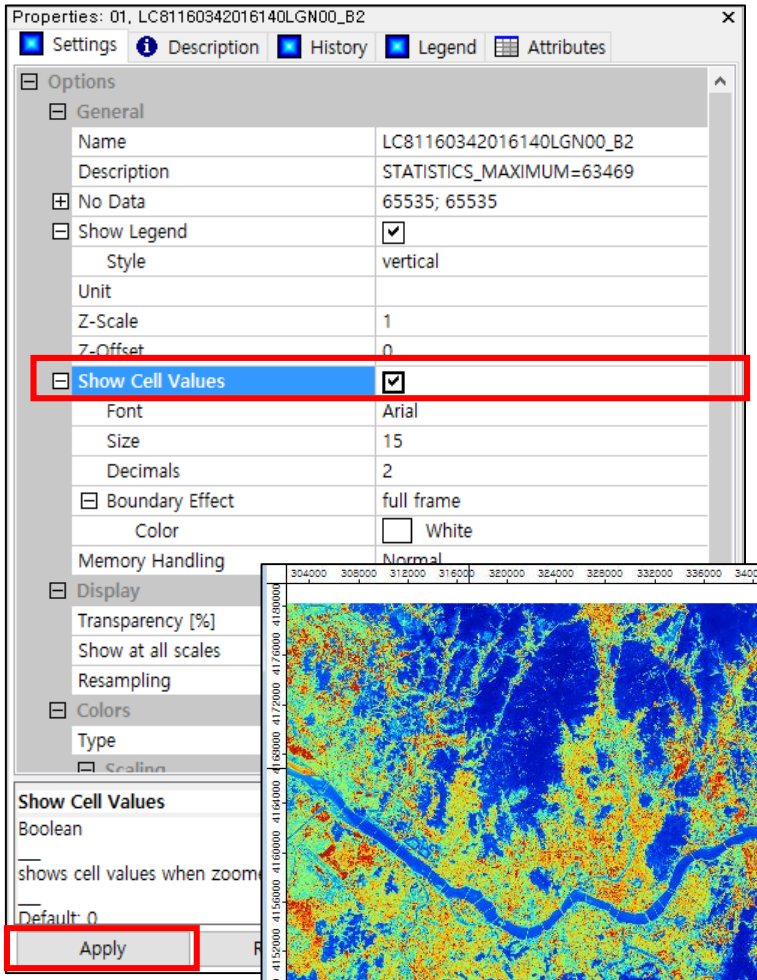
Scale Bar : 축척

Measure Distance : 거리 측정

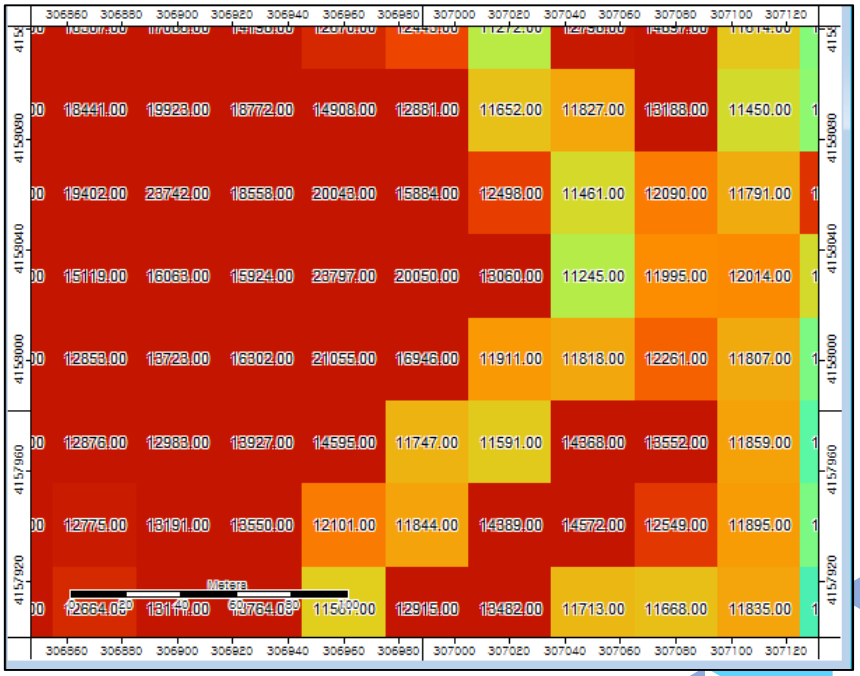
North Arrow: 방위각

Introduction to SAGA

❖ **Object Properties 픽셀 값 출력[화면 확대 시] (Properties -> Settings)**



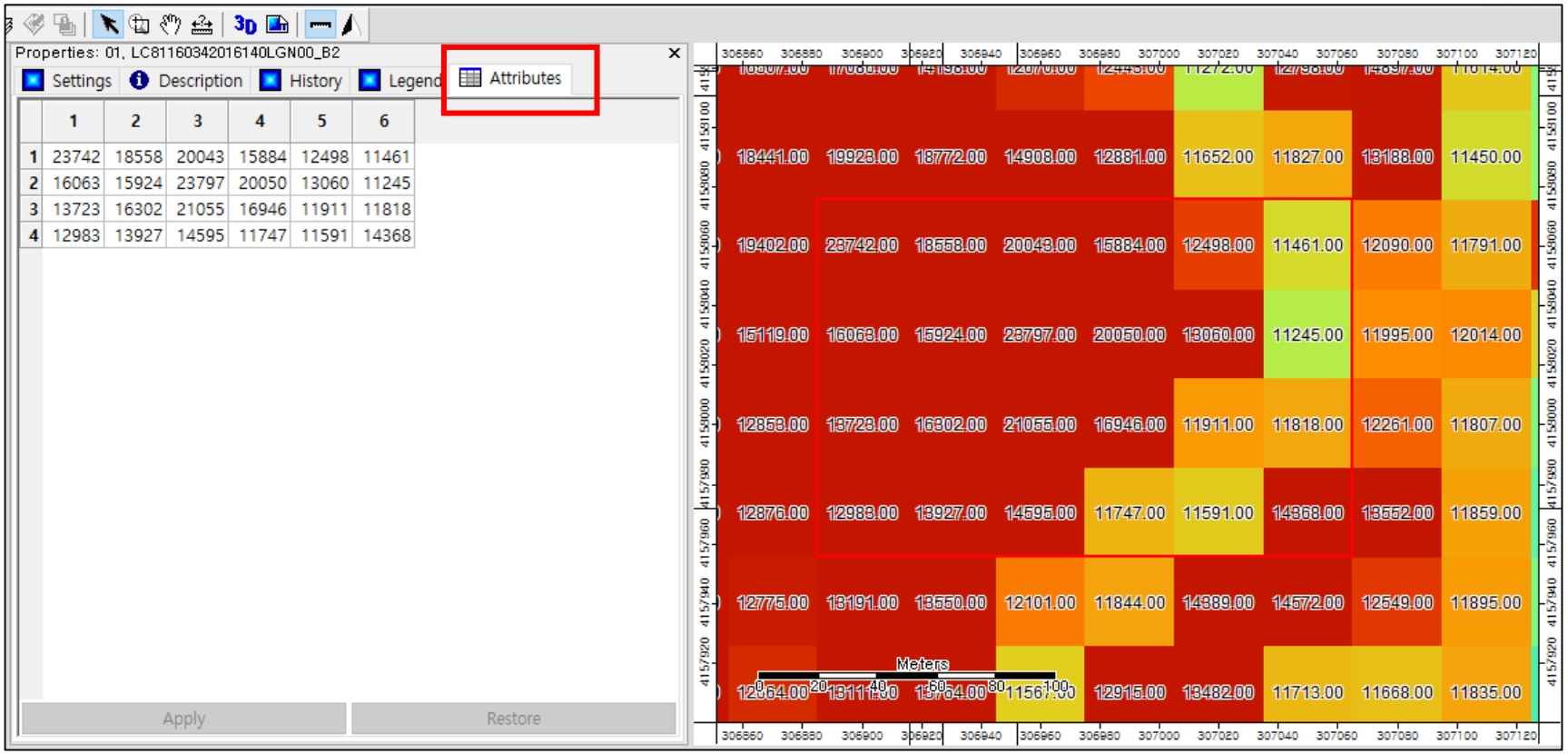
- Show cell Values 클릭
- Apply 클릭
- 확대 시 픽셀 값 출력



사용 데이터 (data/LC81160342016140LGN00_SEOUL_20160524/LC81160342016140LGN00_B2.tif)

Introduction to SAGA

❖ 액션(Action) 활용 속성 값 테이블 출력

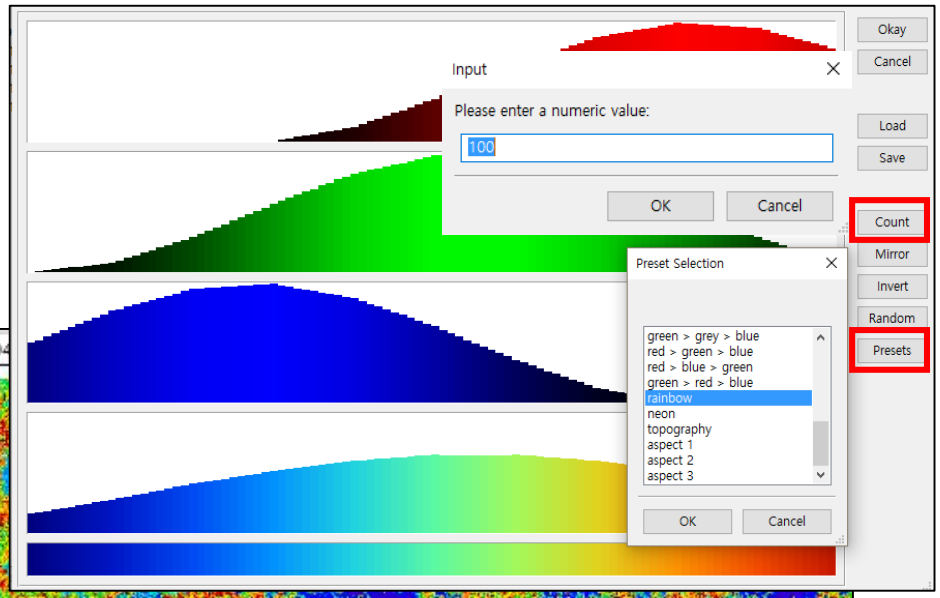


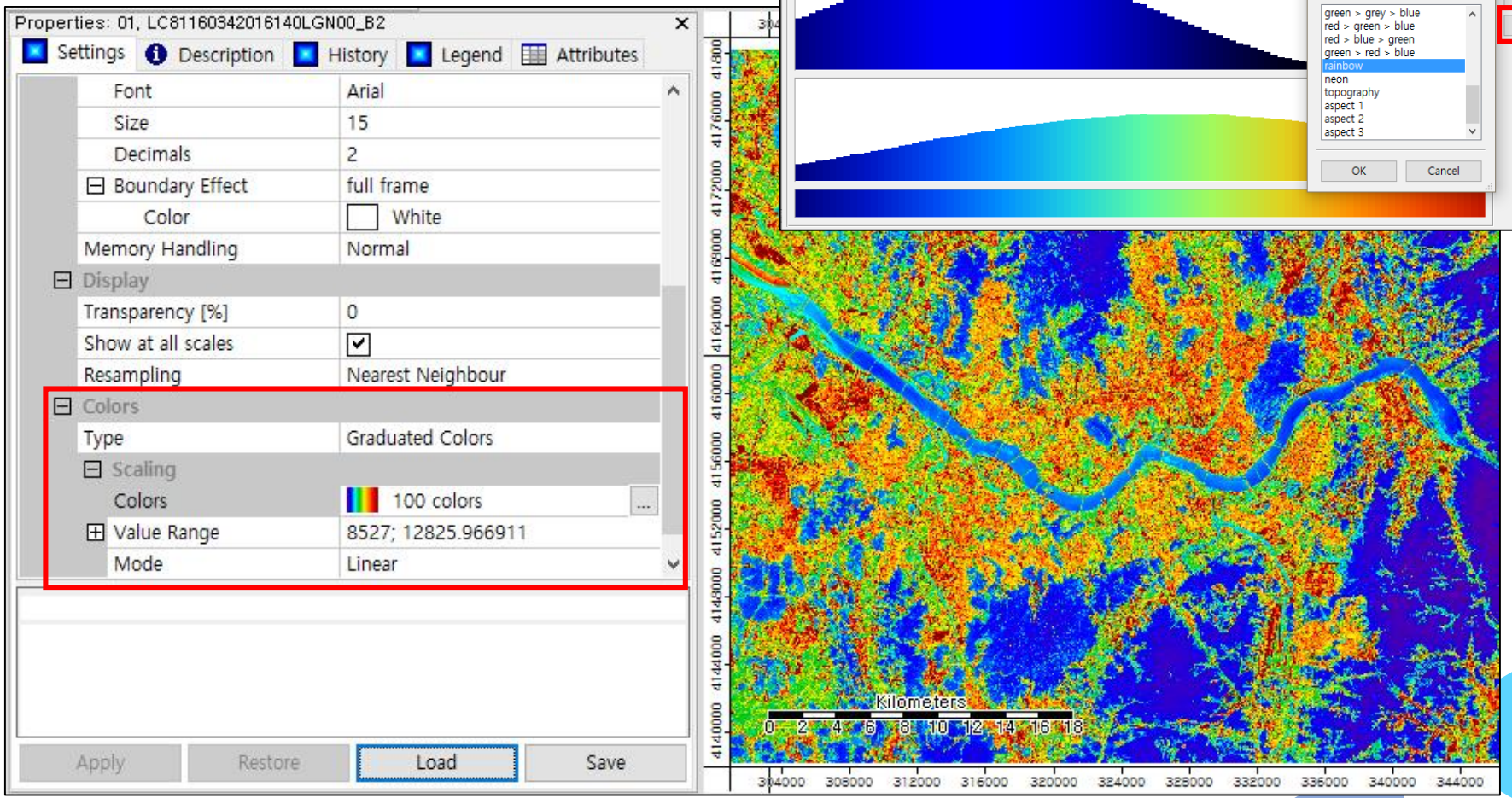
	1	2	3	4	5	6
1	23742	18558	20043	15884	12498	11461
2	16063	15924	23797	20050	13060	11245
3	13723	16302	21055	16946	11911	11818
4	12983	13927	14595	11747	11591	14368

Introduction to SAGA

❖ 영상 출력 색상 변경 (Settings -> Colors)

- Graduated Color 색상 개수 및 프리셋 변경





Introduction to SAGA

❖ 영상 출력 색상 변경 (Properties -> Setting -> Colors)

- Graduated Color 에서 Shade 변경

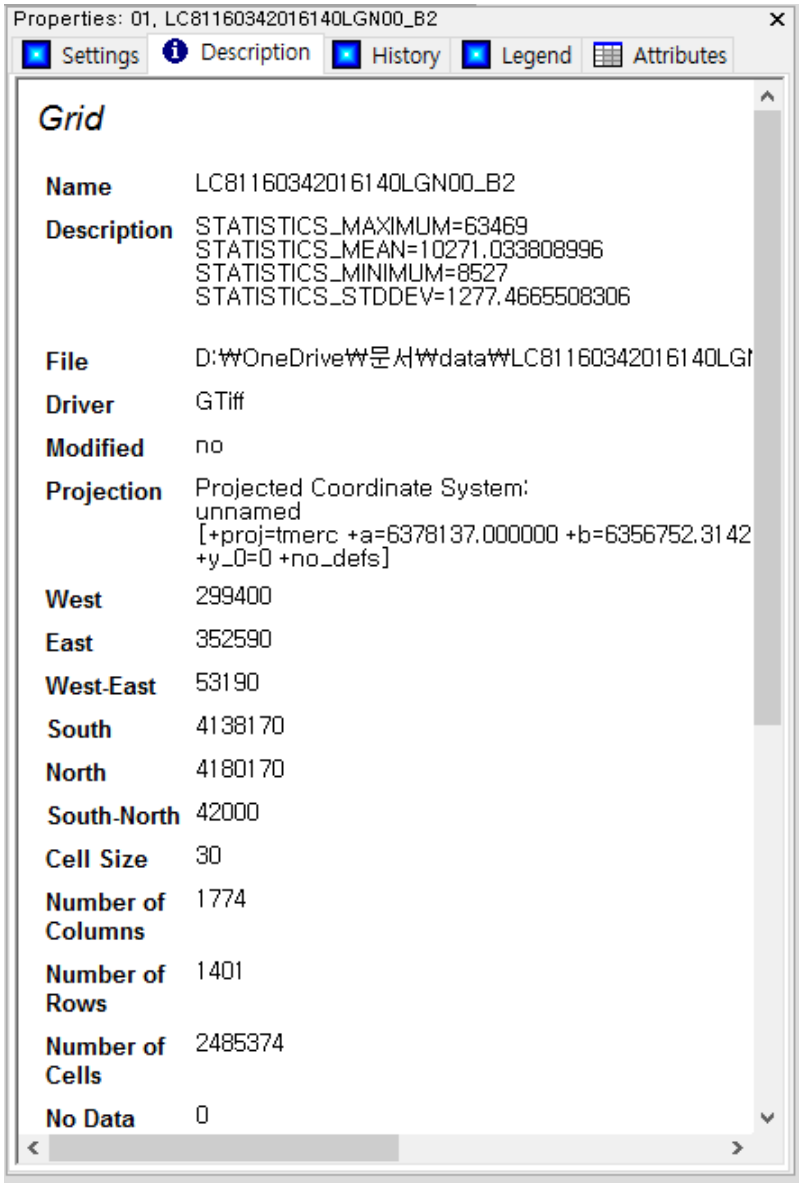
Introduction to SAGA

❖ 영상 출력 색상 변경 (Properties -> Setting -> Colors)

- Graduated Color 에서 Shade 변경

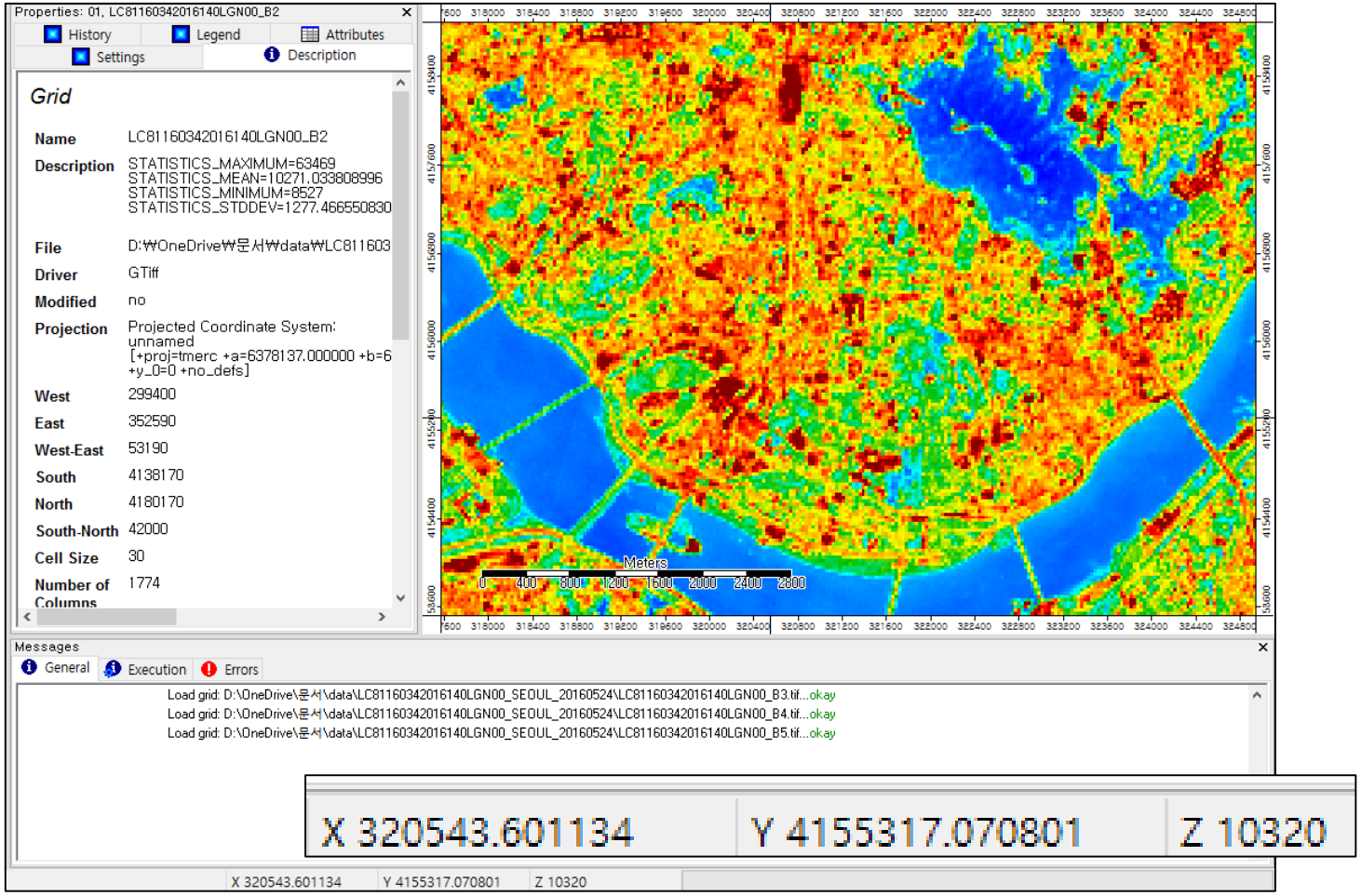
Introduction to SAGA

❖ 영상 메타데이터 정보 (Properties -> Description)



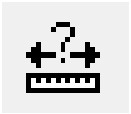
Introduction to SAGA

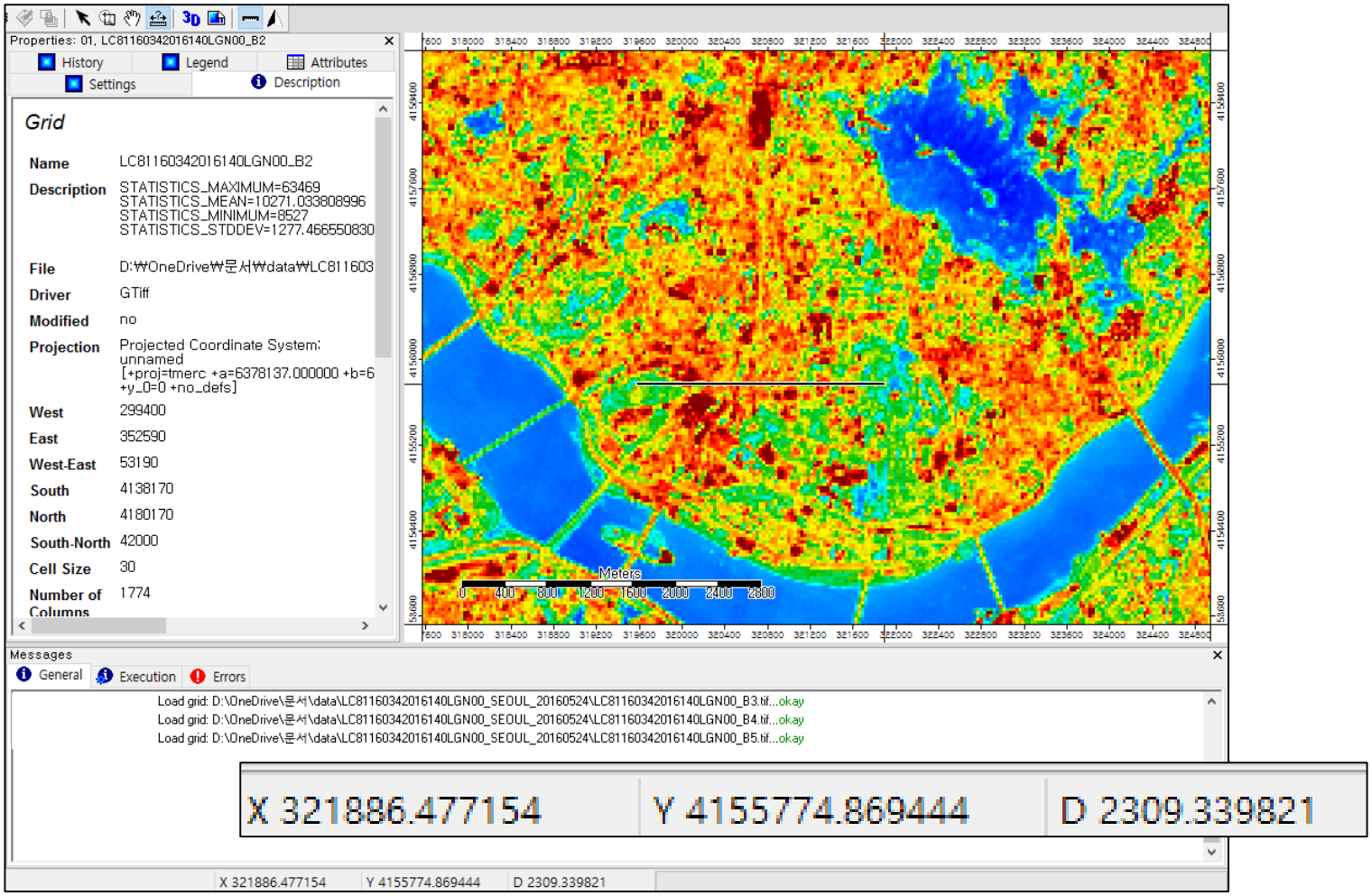
❖ 커서 위치 시각화



Introduction to SAGA

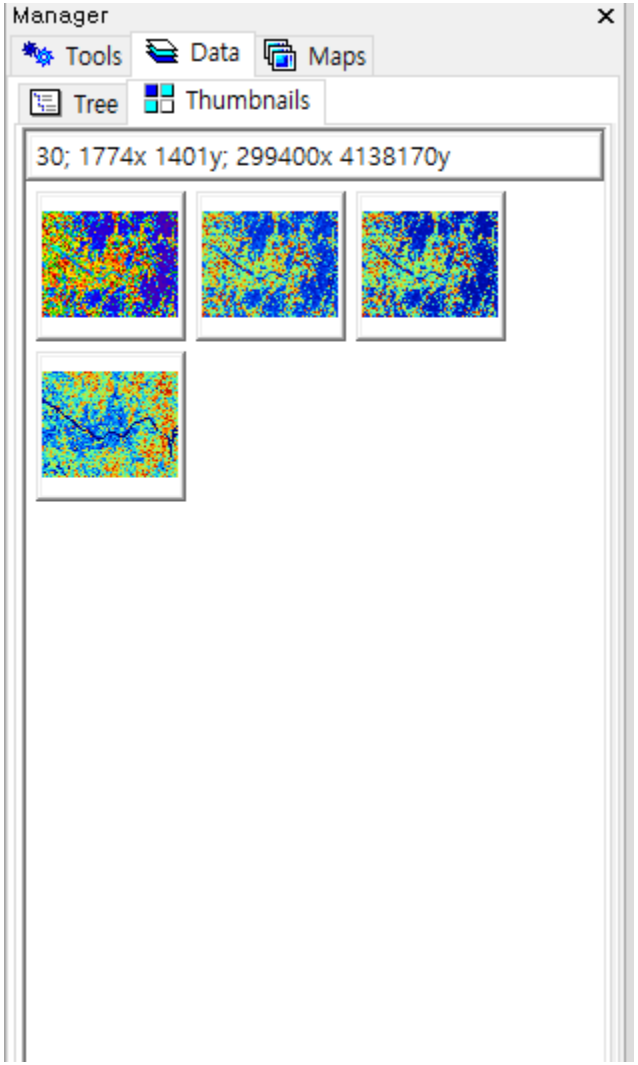
❖ 커서 위치 시각화 (거리 측정 툴 박스 아이콘 클릭)





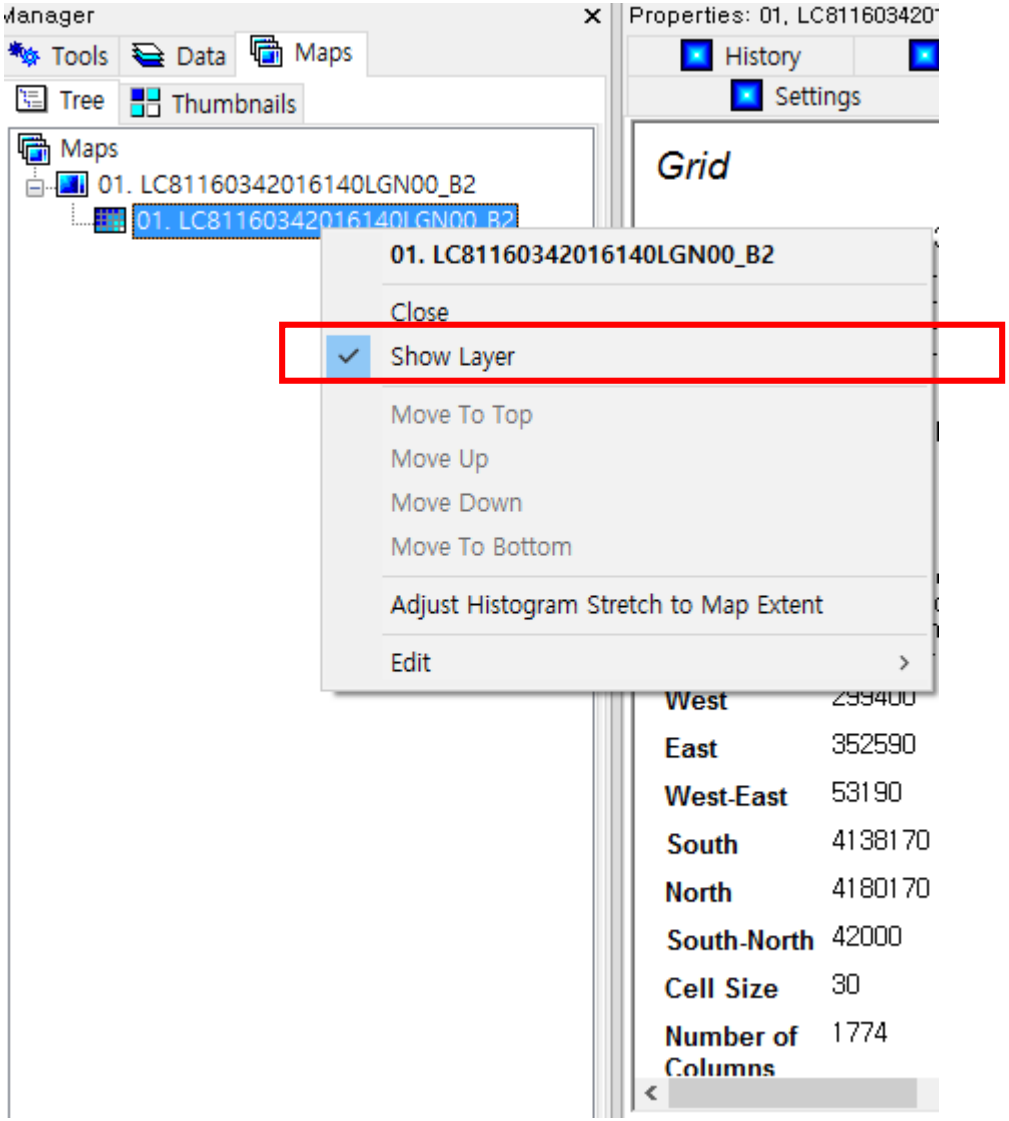
Introduction to SAGA

❖ 현재 시각화 되고 있는 영상 확인 (Manager -> 모든 탭 아래 -> Thumbnails 탭)



Introduction to SAGA

❖ 현재 시각화 되고 있는 영상 확인 (Manager -> Maps)



Introduction to SAGA

❖ 투명도 조절 (Properties ->Settings)