SuperMap

GIS Contest Training

Get started with SuperMap iDesktop

Content

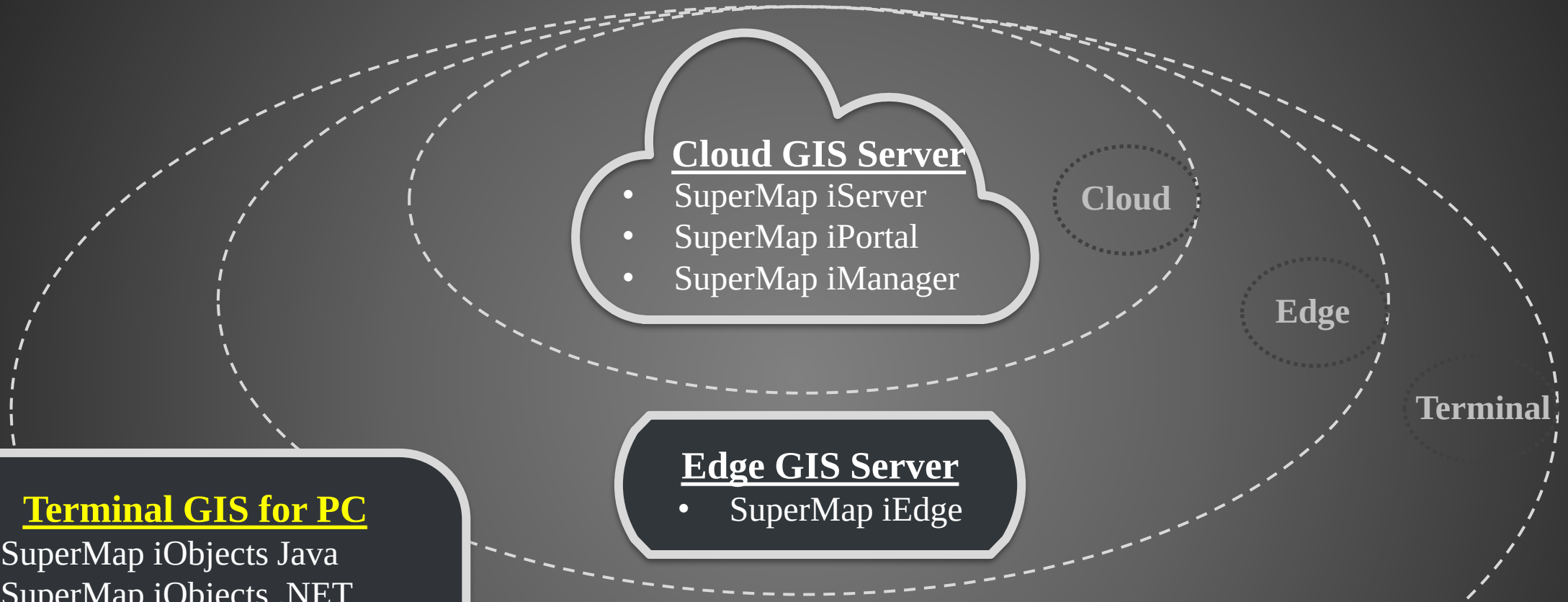
- Product Introduction
- Product installation and license configuration
- SuperMap iDesktop .NET
- Q & A

SuperMap

PART 01

Product Introduction

SuperMap GIS 10i Product System



Terminal GIS for PC

- SuperMap iObjects Java
- SuperMap iObjects .NET
- SuperMap iObjects C++
- SuperMap iObjects Python
- SuperMap iObjects for Spark
- SuperMap iDesktopX
- SuperMap iDesktop .NET

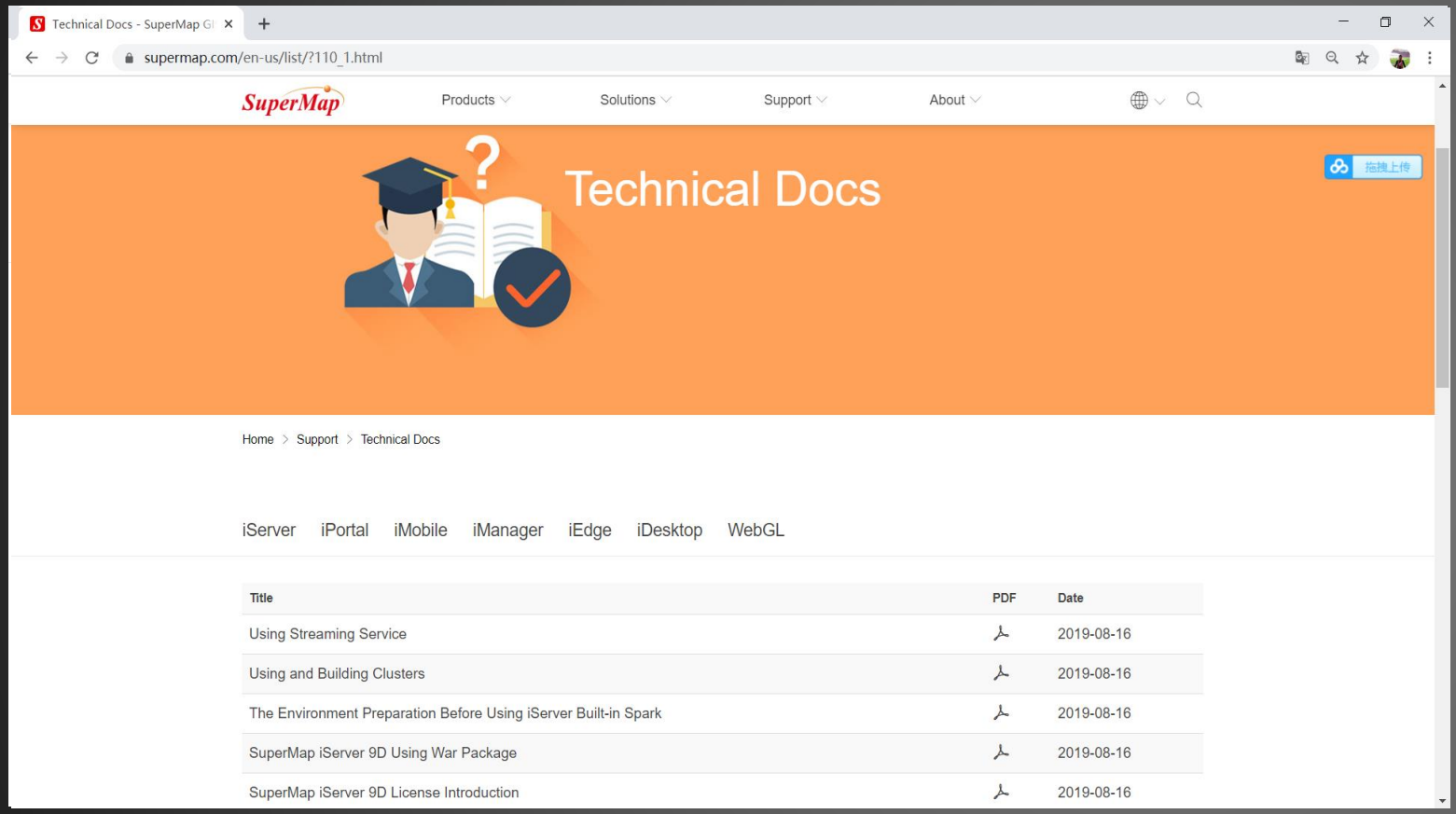
Terminal GIS for Browser

- SuperMap iClient JavaScript
- SuperMap iClient Python
- SuperMap iClient3D for WebGL

Terminal GIS for Mobile

- SuperMap iMobile
- SuperMap iTablet
- SuperMap iMobile Lite

Software Download



Product Packages
- Software
- Sample Data

Support → Online Documents

https://supermap.com/en

Software Package

SuperMap

iDesktop

- 10i
- 10i SP1

Name	Type	Size	Download
SuperMap iDesktopX	win64	1.68G	
SuperMap iDesktopX	win64-bin	1.37G	
SuperMap iDesktopX	linux-bin	1.52G	
SuperMap iDesktop SampleData		1.36G	
SuperMap iDesktop	win32	1.79G	
SuperMap iDesktop	win32-bin	696M	
SuperMap iDesktop	win64	1.96G	
SuperMap iDesktop	win64-bin	847M	

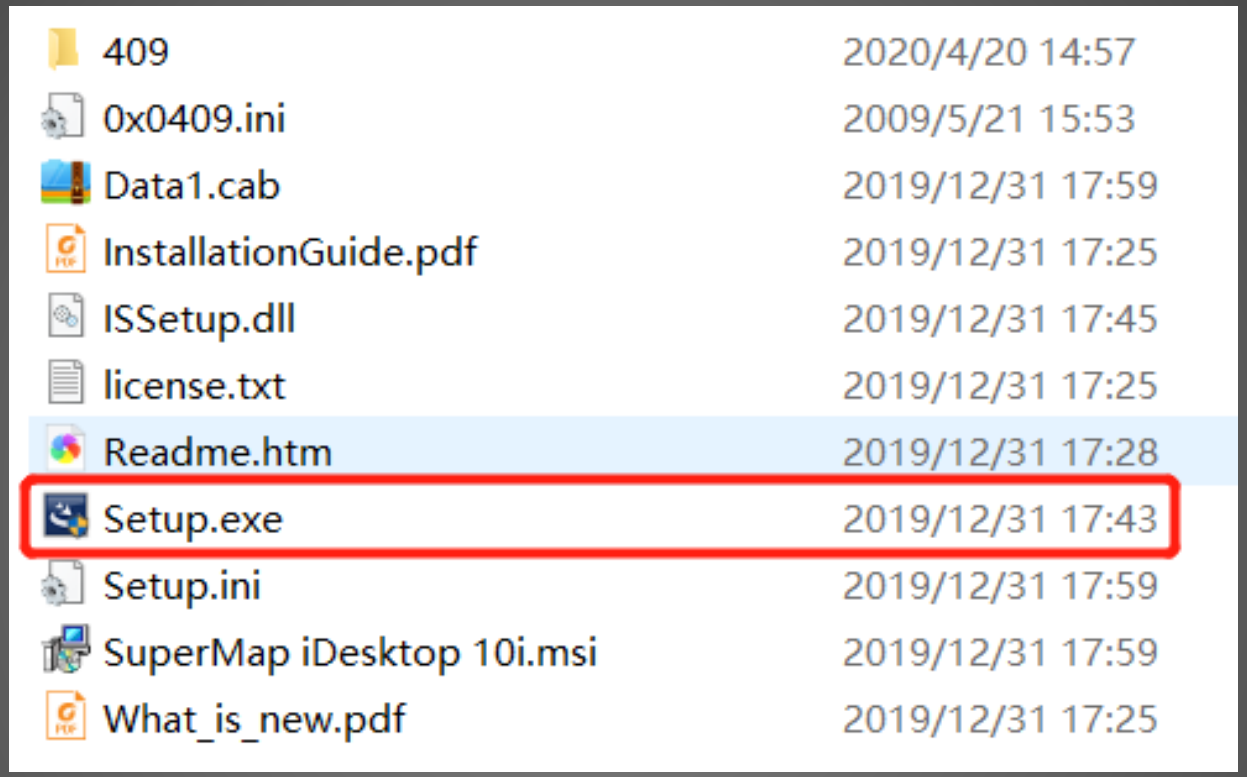
PART 02

Product installation and license configuration

SuperMap

SuperMap iDesktop

Software installation

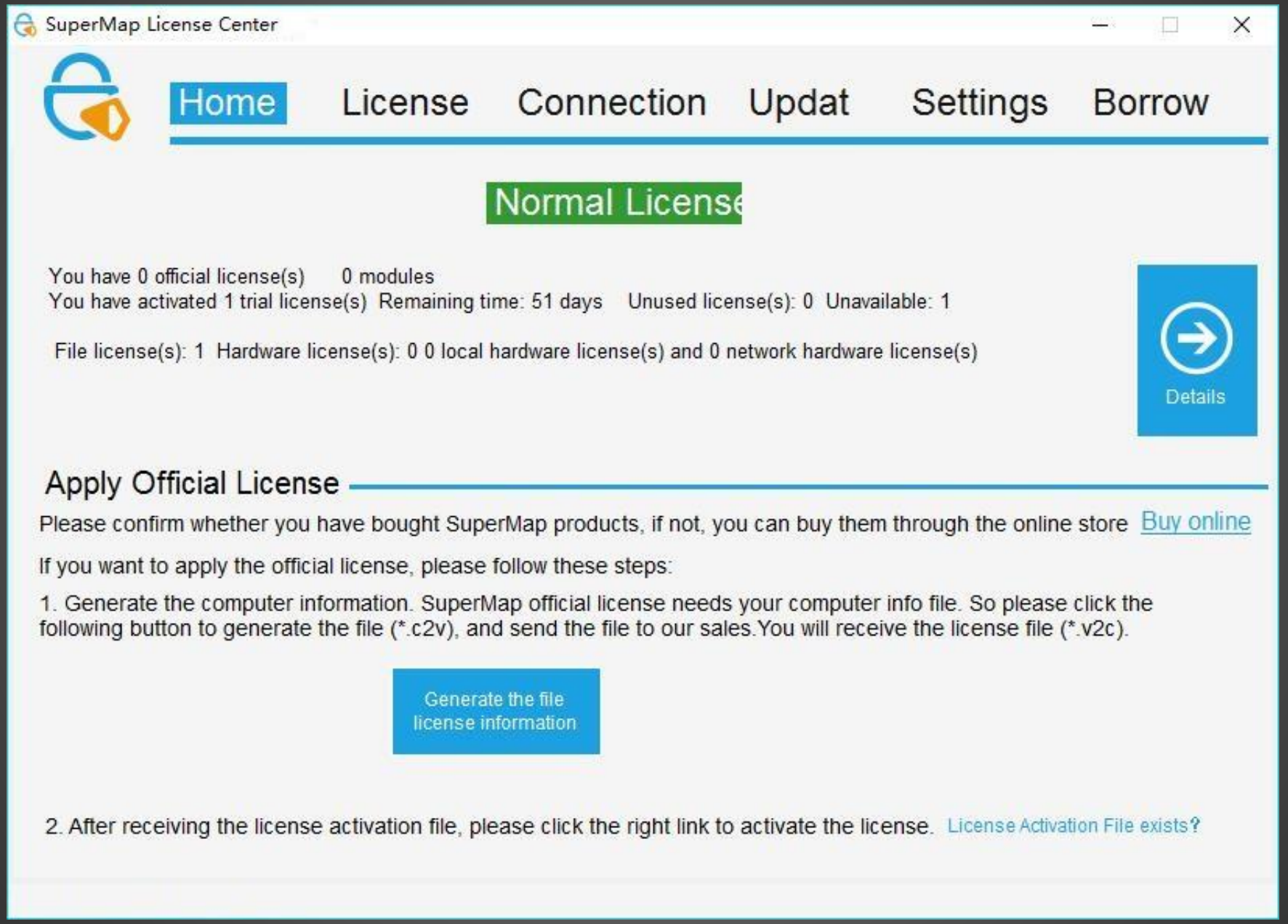


Step:

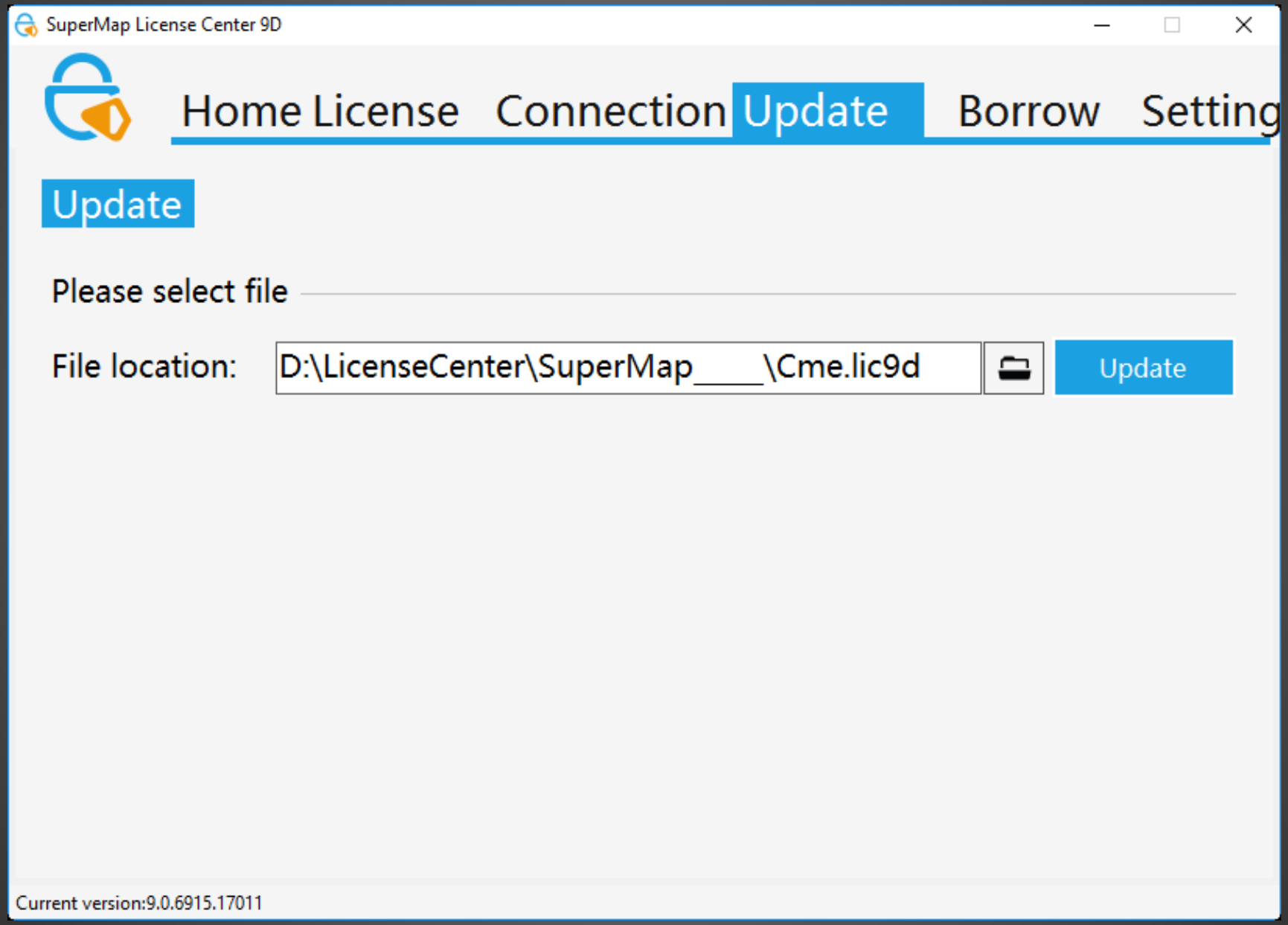
1、Unzip the package.

2、Right click on the Setup.exe and use adminstator to run it.

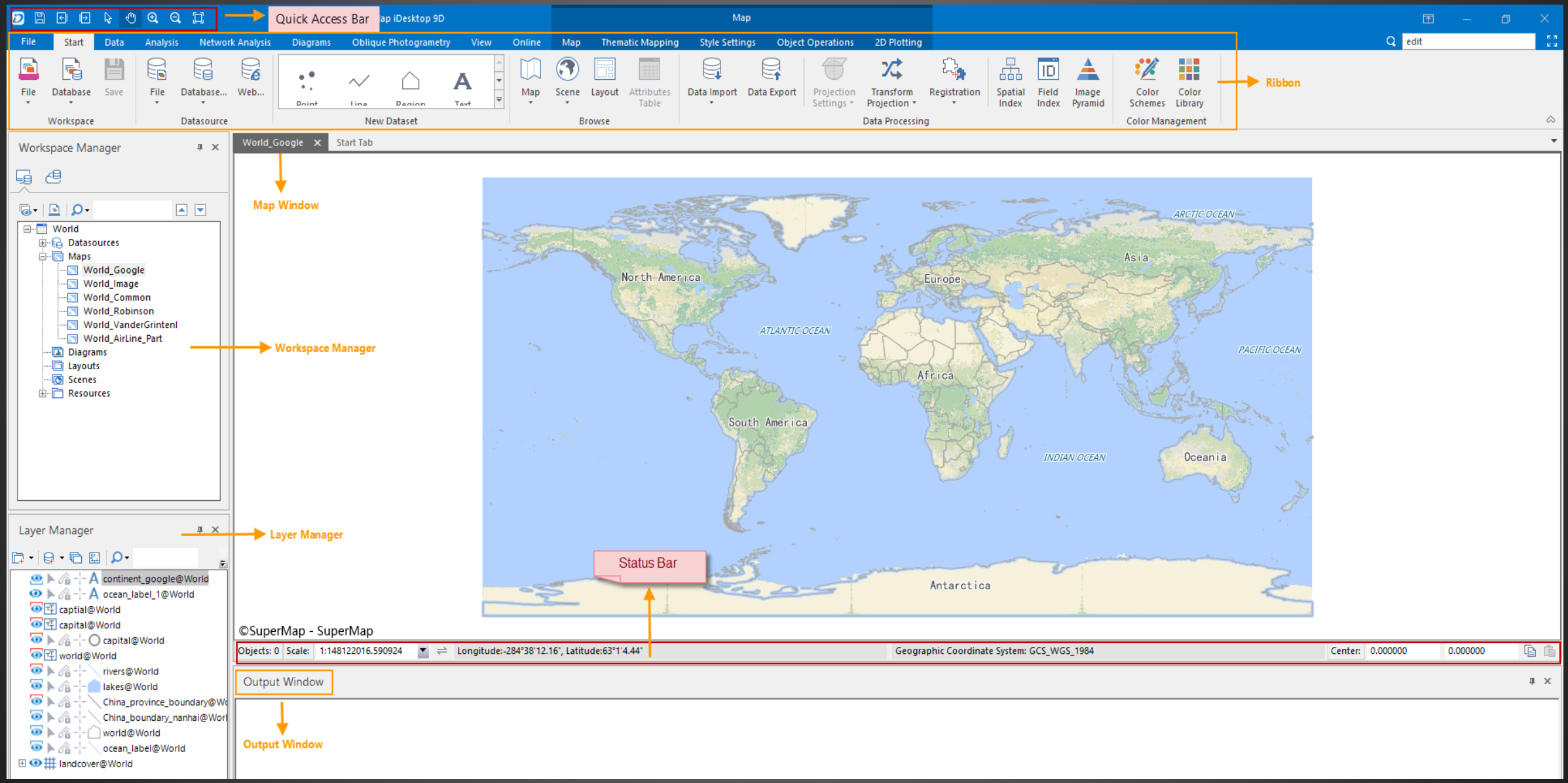
SuperMap License Center



Update the license



SuperMap iDesktop Interface



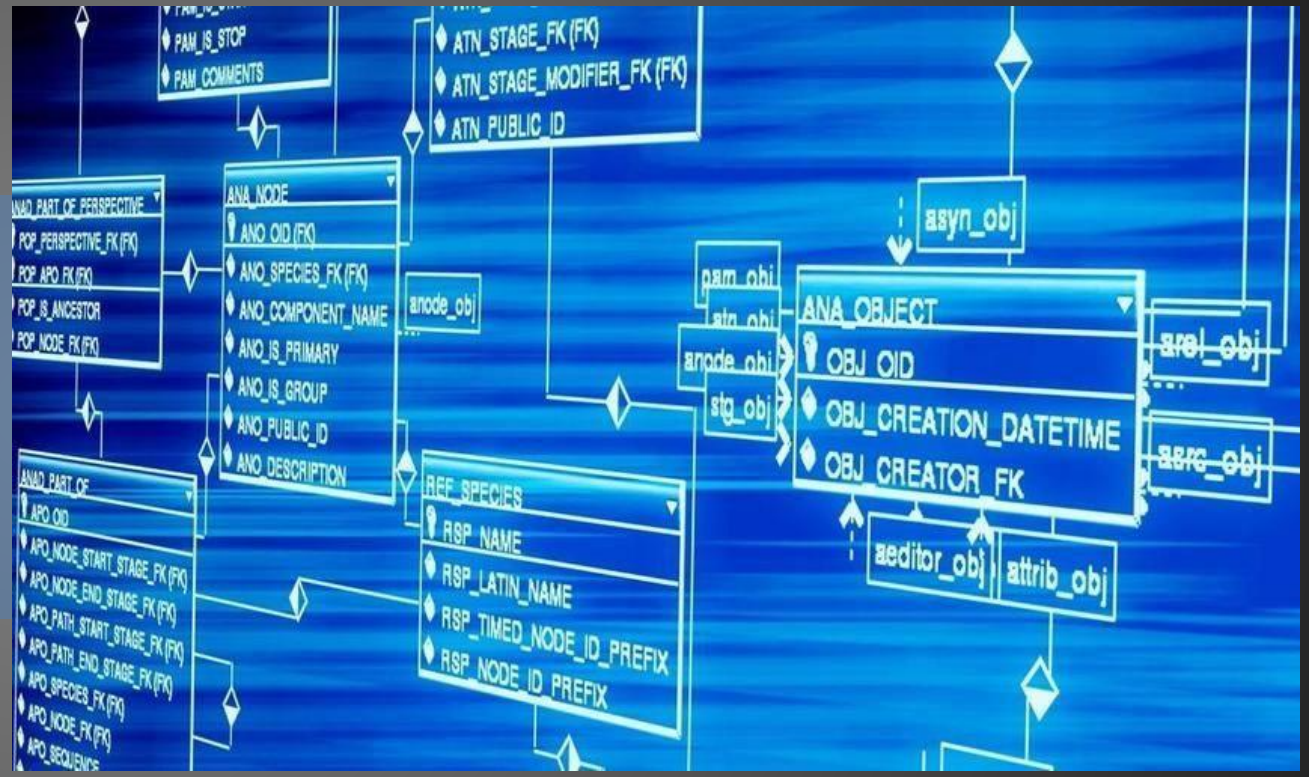
SuperMap

PART 03

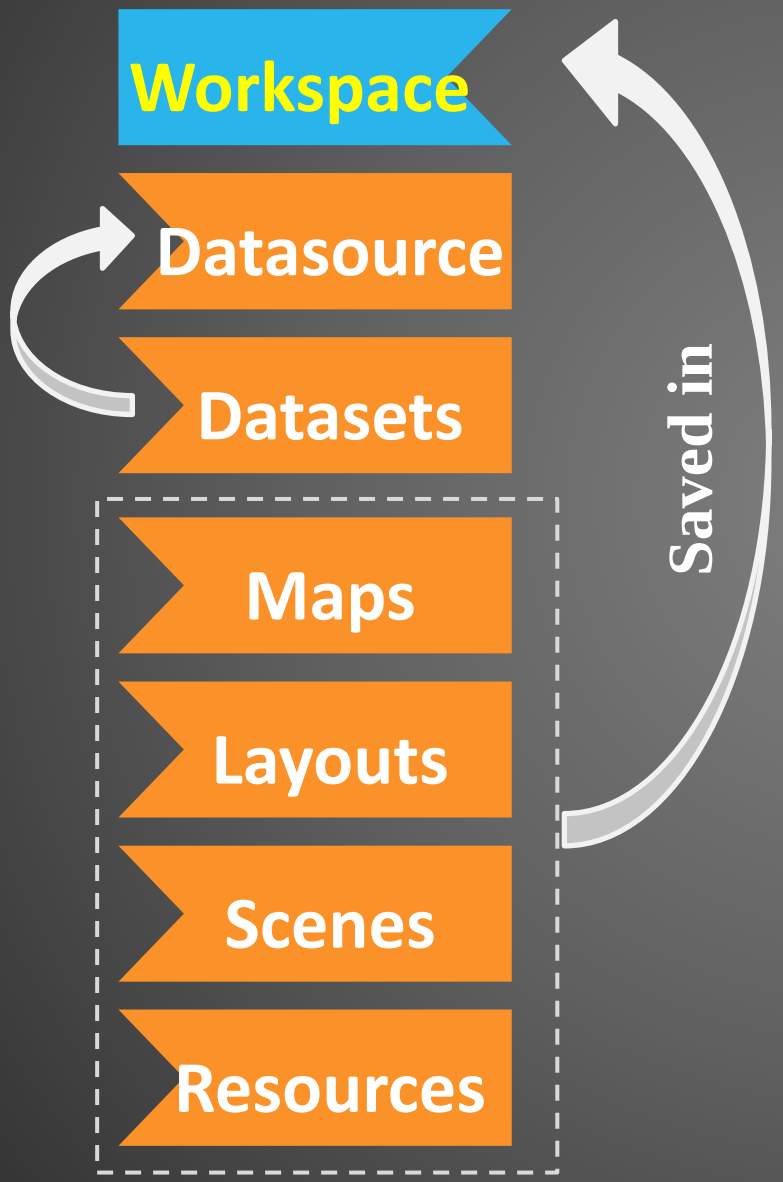
Concept and Operation

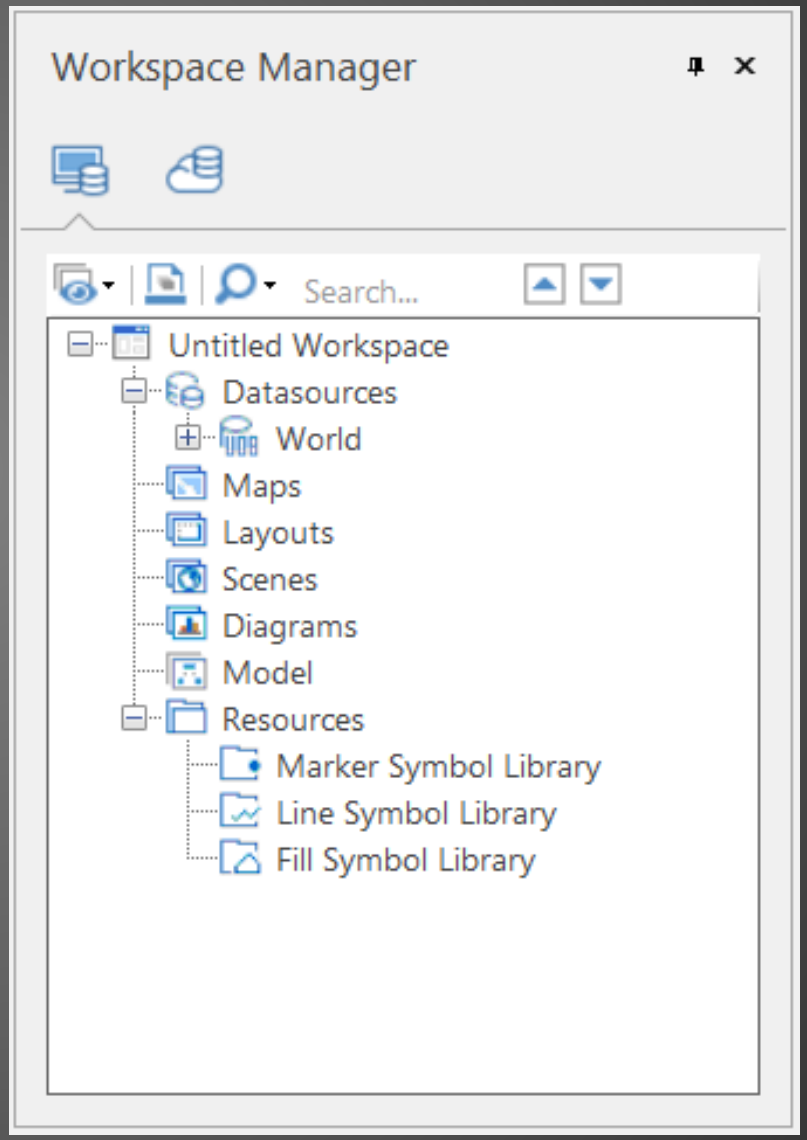
Data Structure and Basic Concept

Data Structure



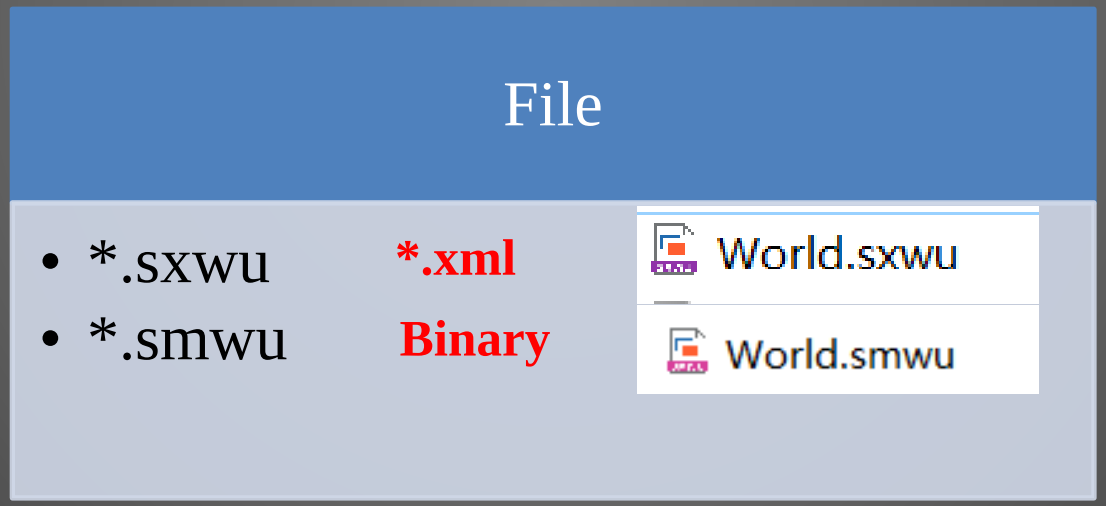
Data Structure





Workspace

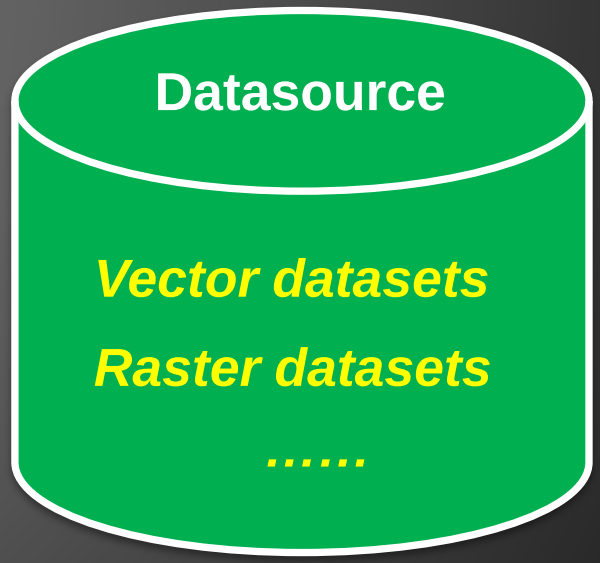
- Definition
  - The workspace is used to save the work environment, including the opened datasources (locations, aliases, opening modes), saved maps, layouts, resources (marker symbol libraries, line symbol libraries, fill symbol libraries) and 3D scenes.



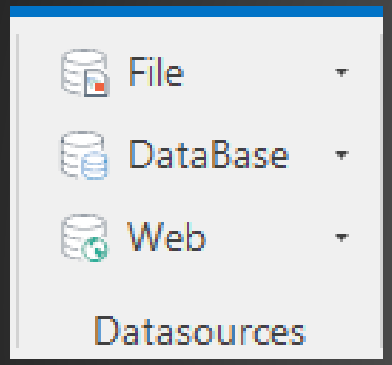
Datasource

- Definition
  - A datasource is composed of multiple types of datasets and it is the physical storage for the spatial data (datasets).
- Types
  - File Datasourse
  - Database Datasourse (SuperMap SDX+ Engine)
  - Web Datasourse

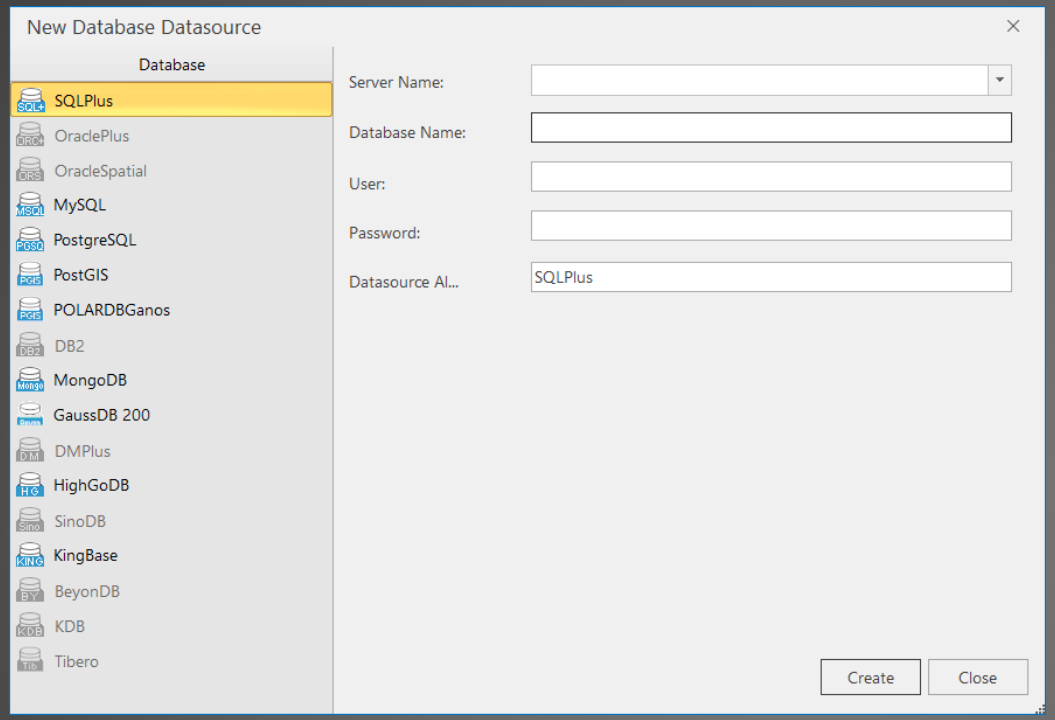
File Type	• *.udb & *.udd double files • *.udbx single files
Database Type	• PostgreSQL, Oracle, MySQL, etc.



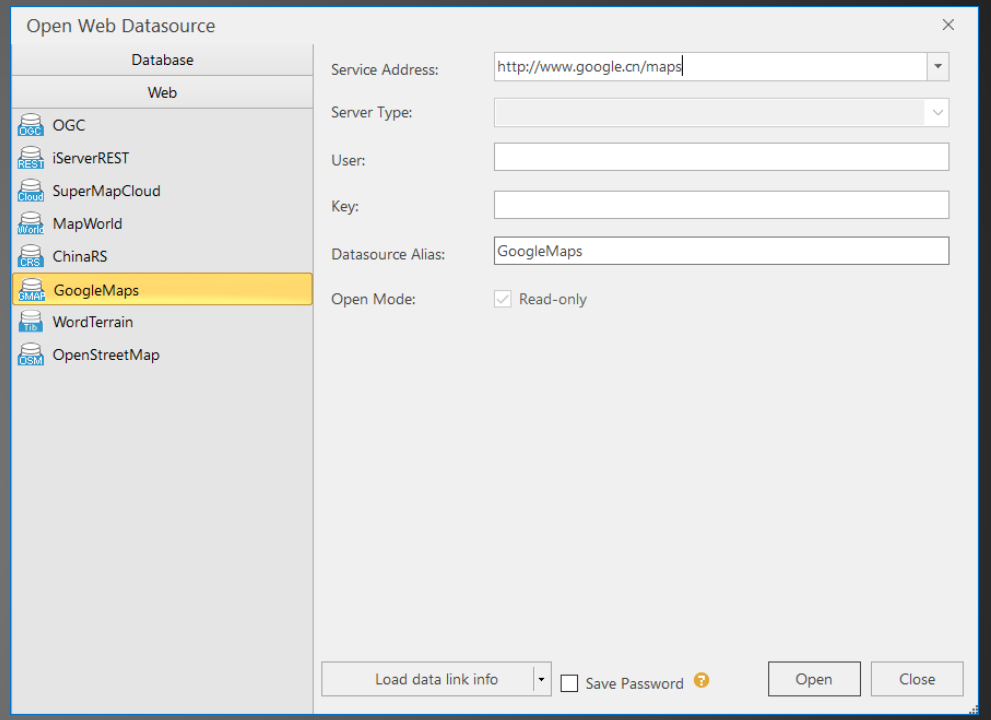
Datasources Types



Types



Database Datasourse



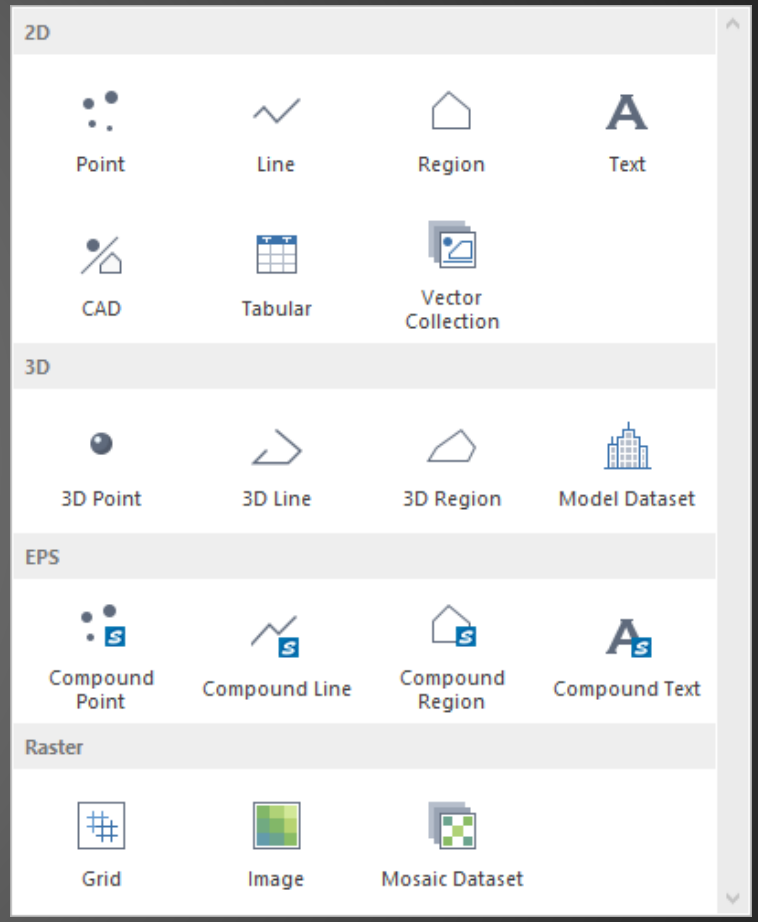
Web Datasourse

Types

- File Datasourse: *udb, *.udbx
- Database Datasourse: Oracle/Oracle Spatial, PostgreSQL, MySQL, ArcSDE
- Web Datasourse: OGC standard, iServerREST, GoogleMaps, OpenStreet Maps

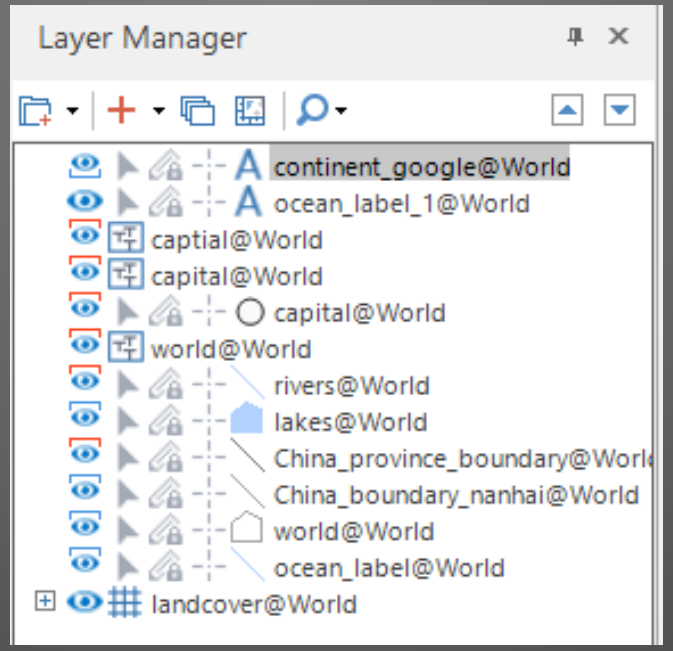
Datasets

- Definition
  - A dataset is a collection of data of the same type.
  - Types
    - Point dataset, line dataset, region Dataset,
    - Text dataset, tabular dataset,
    - Network dataset, CAD dataset,
    - Route dataset, image dataset,
    - Grid dataset……
- Storage
  - Datasets are stored in the datasource/database.



Layers

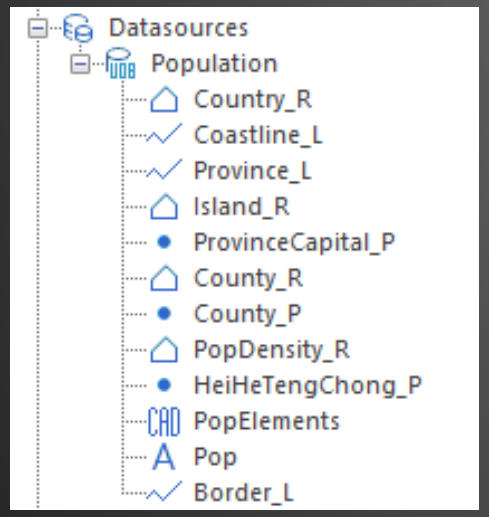
- Definition
  - A layer is the display media of a dataset.
  - A layer helps display the objects in a dataset with appropriate styles in the map window.
  - A map consists one or more layers.



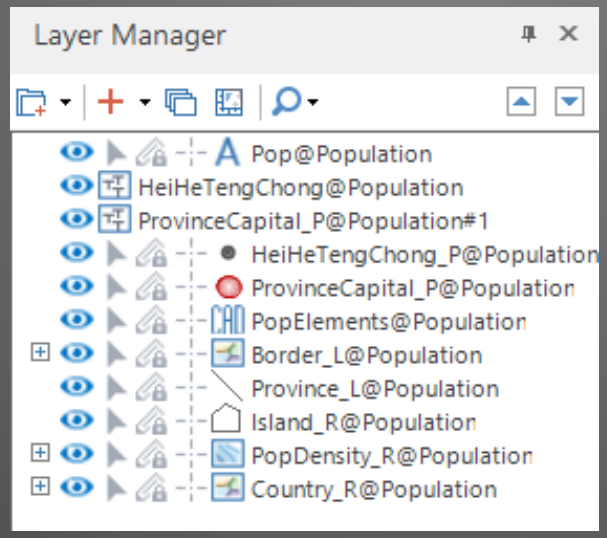
Maps

- Definition
  - A map is composed of one or multiple 2D datasets with specified display styles.

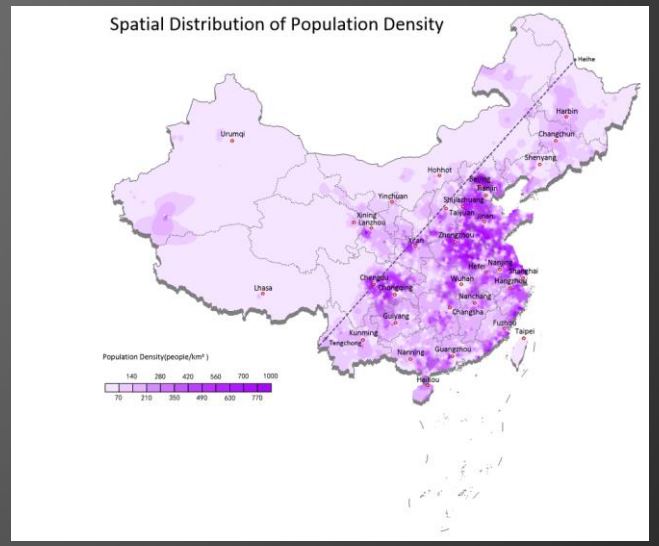
Datasets



Layers

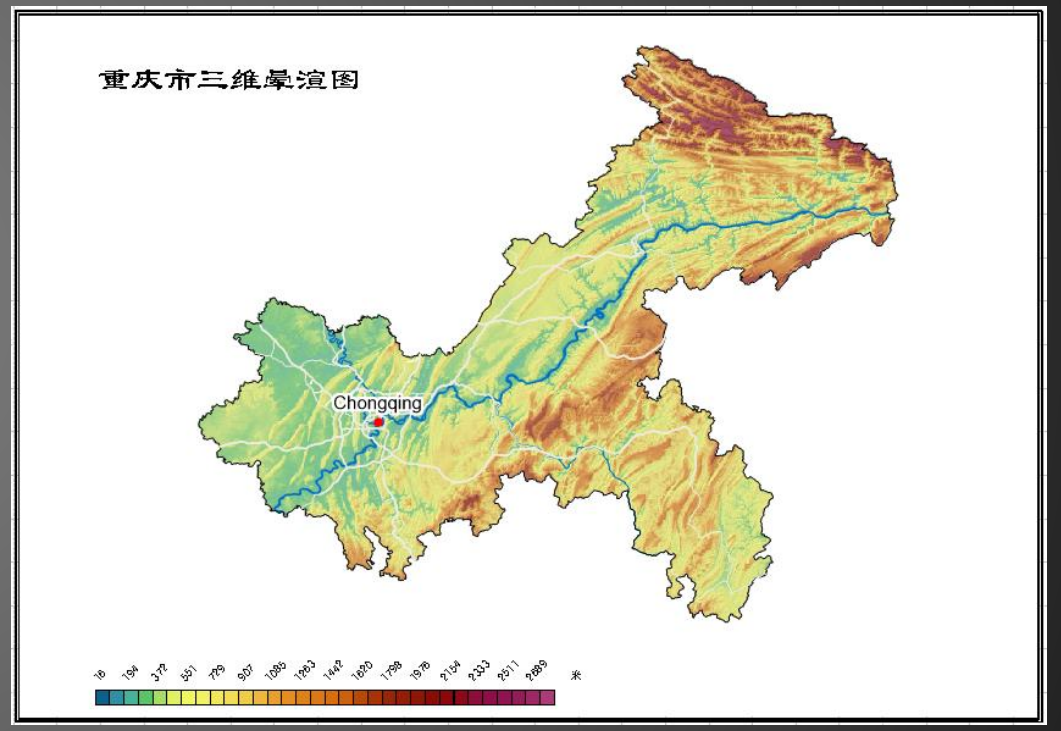


Maps



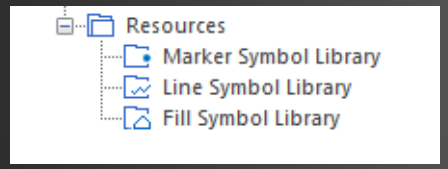
Layouts

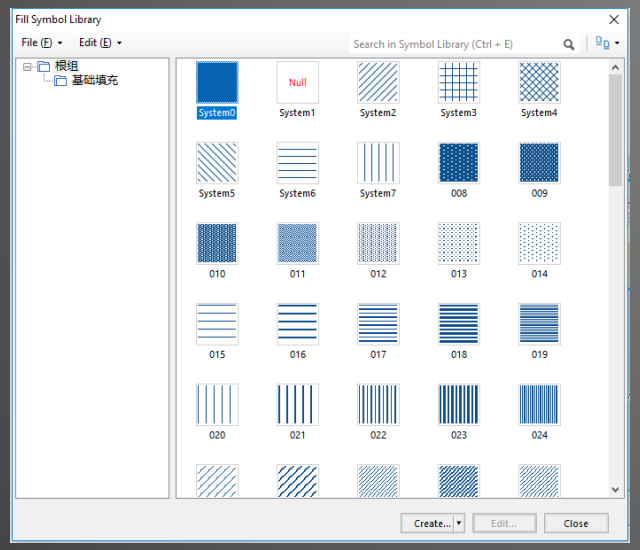
- Definition
  - A layout is composed of one or multiple configured maps, as well as some mapping elements such as the map name, legend, map scale, etc.
- Storage Type
  - A layout is physically stored in a file or database via the workspace.

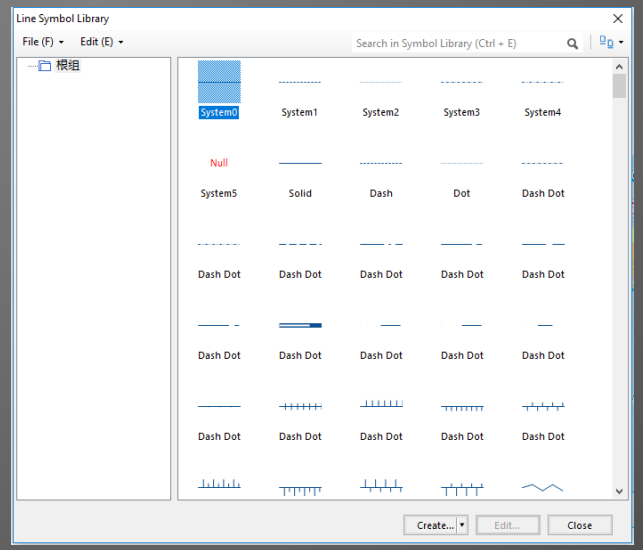


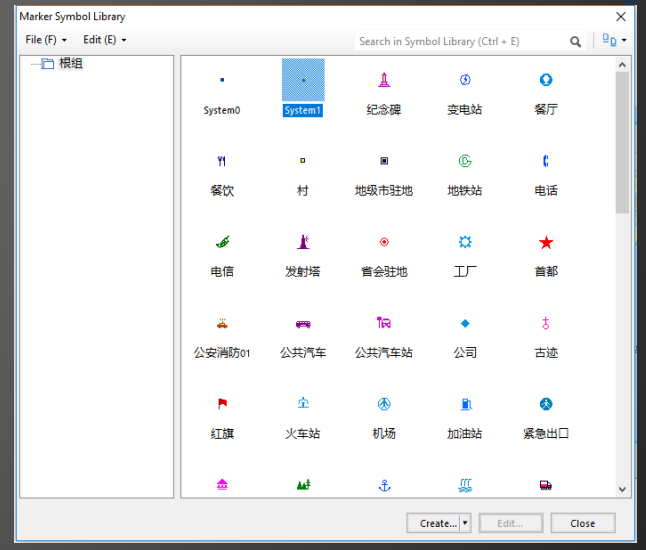
Resources

- Definition
  - Resources are collections of symbol libraries used in the maps and scenes. Resource libraries contain marker, line, and fill symbol libraries.



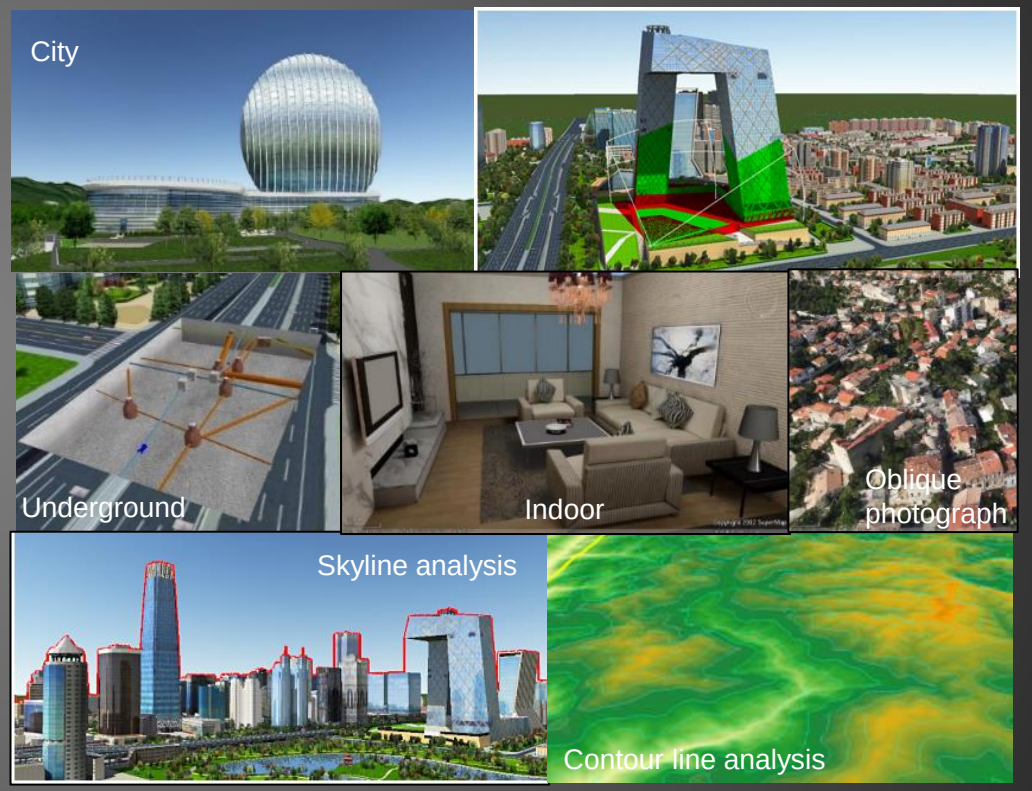




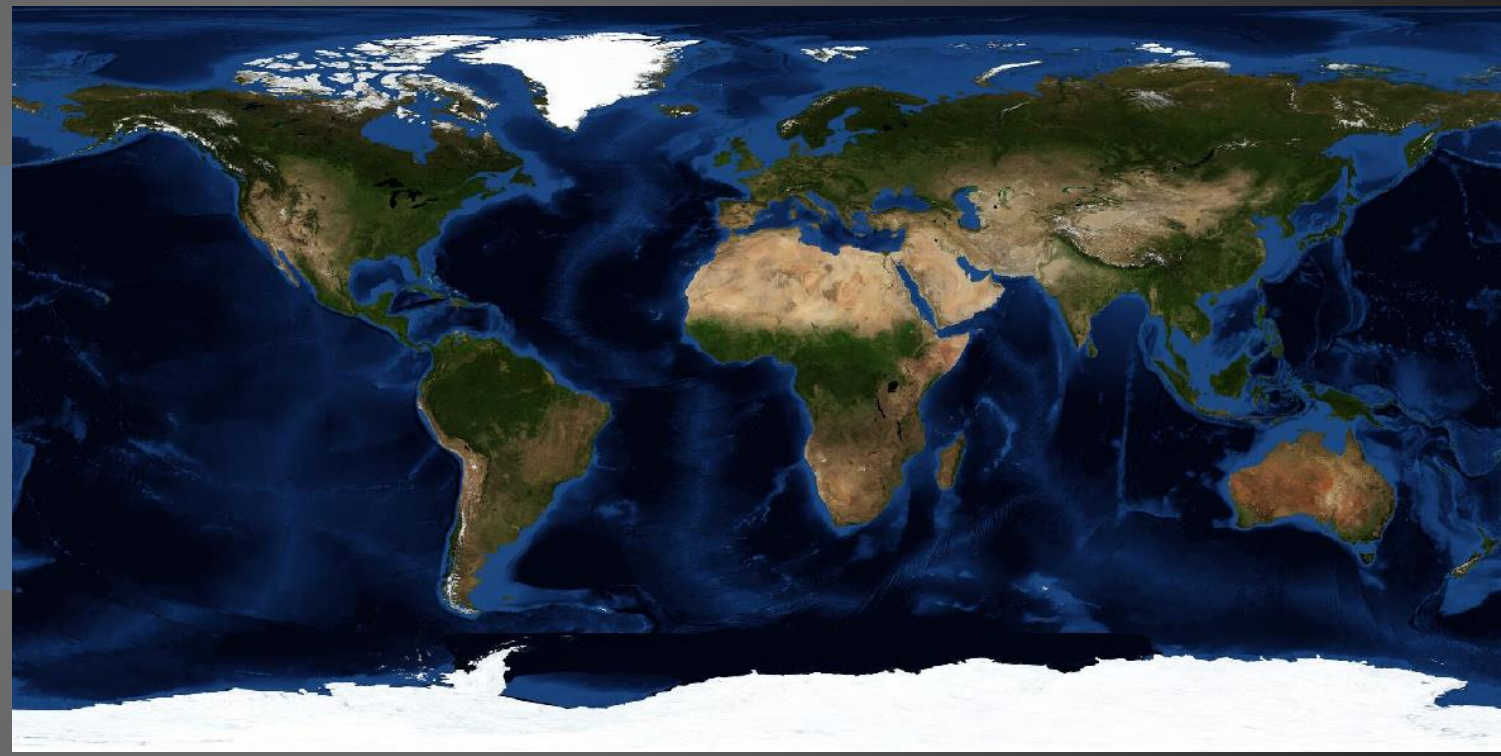


3D Scenes

- Definition
  - A 3D scene enables the loading of 2D and 3D point, line, region, text, image, grid, model (*.3ds、 *.sgm) data and so on. 3D scenes realize the 2D and 3D integrated display and management
- Storage Type
  - A 3D scene is also physically stored in a file or database via the workspace.



Datasets

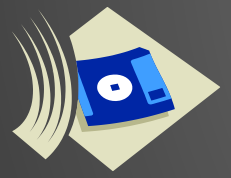


GIS Data

Map data (e.g. paper map and electronic map)

Remote sensing image data

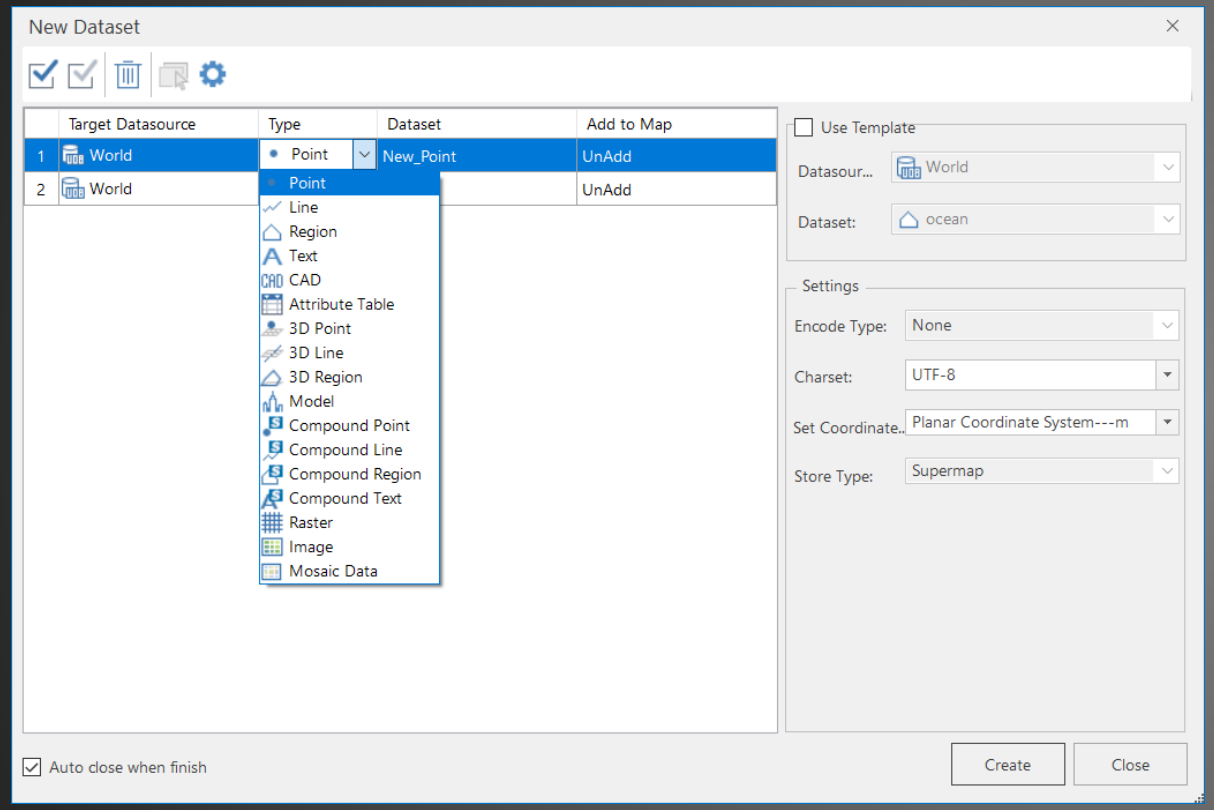
Field surveying data (e.g. GPS data)



Digital data (e.g. the data from statistical yearbook)

Text reports

New Dataset



Database – New dataset

No	SmID	SmSdriW	SmSdriN	SmSdriE	SmSdriS	SmUserID	SmArea
1	1	-180	90	-150	60	1	28678607...
2	2	-150	90	-120	60	2	2,867,860,...
3	3	-120	90	-90	60	3	2,867,860,...
4	4	-90	90	-60	60	4	2,867,860,...
5	5	-60	90	-30	60	5	2,867,860,...
6	6	-30	90	0	60	6	2,867,860,...
7	7	0	90	30	60	7	2,867,860,...
8	8	30	90	60	60	8	2,867,860,...
9	9	60	90	90	60	9	2,867,860,...
10	10	90	90	120	60	10	2,867,860,...
11	11	120	90	150	60	11	2,867,860,...
12	12	150	90	180	60	12	2,867,860,...
13	13	-180	60	-150	30	13	7,793,872,...
14	14	-150	60	-120	30	14	7,793,872,...
15	15	-120	60	-90	30	15	7,793,872,...
16	16	-90	60	-60	30	16	7,793,872,...
17	17	-60	60	-30	30	17	7,793,872,...
18	18	-30	60	0	30	18	7,793,872,...

Attribute Table

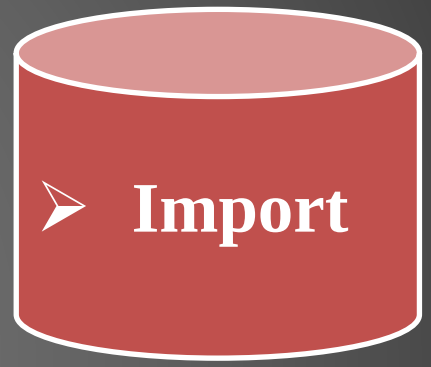
Demo - Datasets

1. Build a new database: *.udb, *.udbx
2. Build a new a dataset: Point, Line, Polygon
3. Open Attributes Table: Add a new field

Import

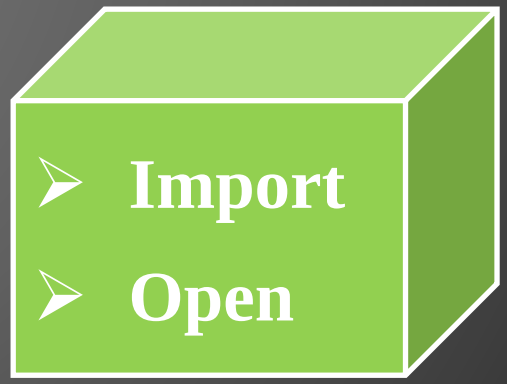
Vector data

- CAD General Format (*.dxf/*.dwg)
- GIS General Format (*.mif/*.shp/…)
- Tabular data (*.csv)
- ……



Raster data

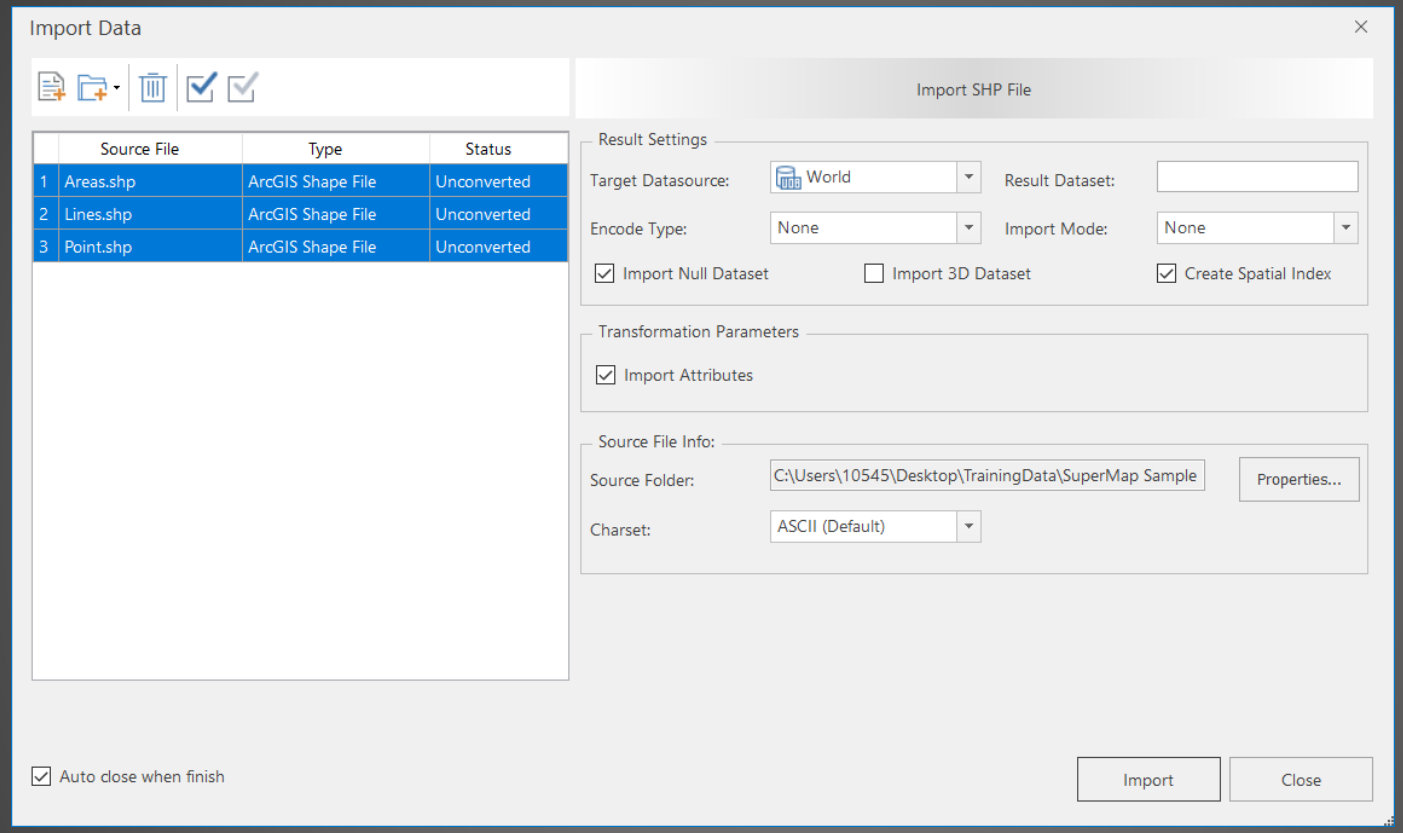
- General Image Format (*.bmp/*.jpg/*.tiff/…)
- Compression Format (*.sit)
- ……



Supported Formats

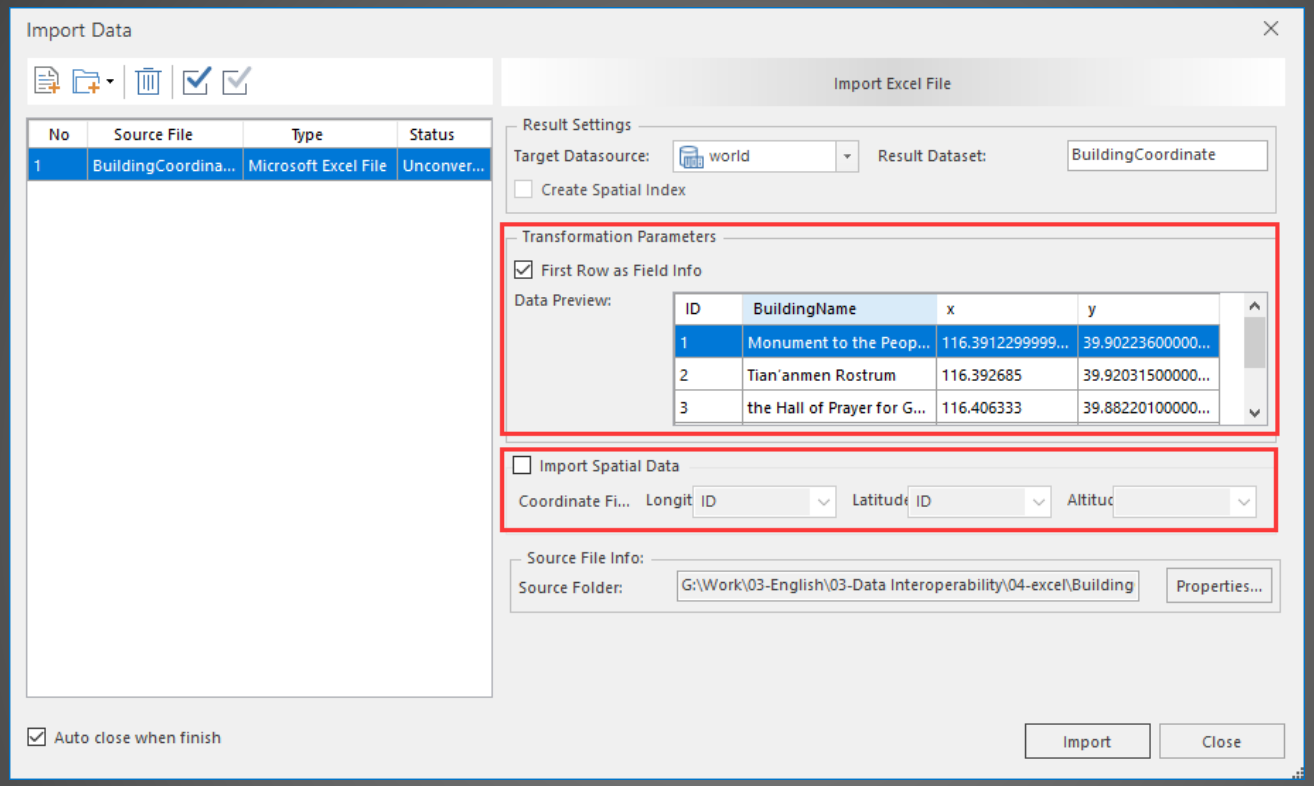
AutoCAD(*.dxf;*.dwg;*.dgn)
ArcGIS(*.grd;*.txt;*.dem;*.asc;*.shp;*.E00;*.dbf;*.mdb)
MapInfo(*.tab;*.mif;*.wor)
Google KML(*.kml;*.kmz)
MapGIS(*.wat;*.wal;*.wap;*.wan)
Micosoft(*.csv;*.txt;*.xlsx)
Image Bitmap File(*.bmp;*.jpg;*.jpeg;*.png;*.gif;*.img;*.sit;*.tif;*.tiff;*.sid;*.ecw;*.jp2;*.jpk)
Raster File(*.raw;*.b;*.bin;*.bil;*.bsq;*.dem;*.bip;*.vrt;*.egc)
3D Model File(*.osgb;*.osg;*.s3m;*.s3mb;*.s3mbz;*.3ds;*.x;*.dxf;*.obj;*.fbx;*.dae;*.stl;*.off;*.sgm;*.skp)
LIDAR File(*.txt)
TIN(*.tinz;*.sct)
Vector File(*.vct;*.json;*.geojson;*.gpx;*.osm)
GRIB2 File(*.grib2)
Geo3DML(*.xml)
Oblique Photograph(*.scp)

Vector Data Import — GIS Format



- CAD format (*.dwg)
- ArcGIS format (*.shp, *.gdb, *.mdb)

Vector Data Import — Attribute Table



- Attribute Files (*.csv;*.xlsx)
- Functions of Attribute Files
  - Convert it into point dataset
  - Associate it with other spatial dataset

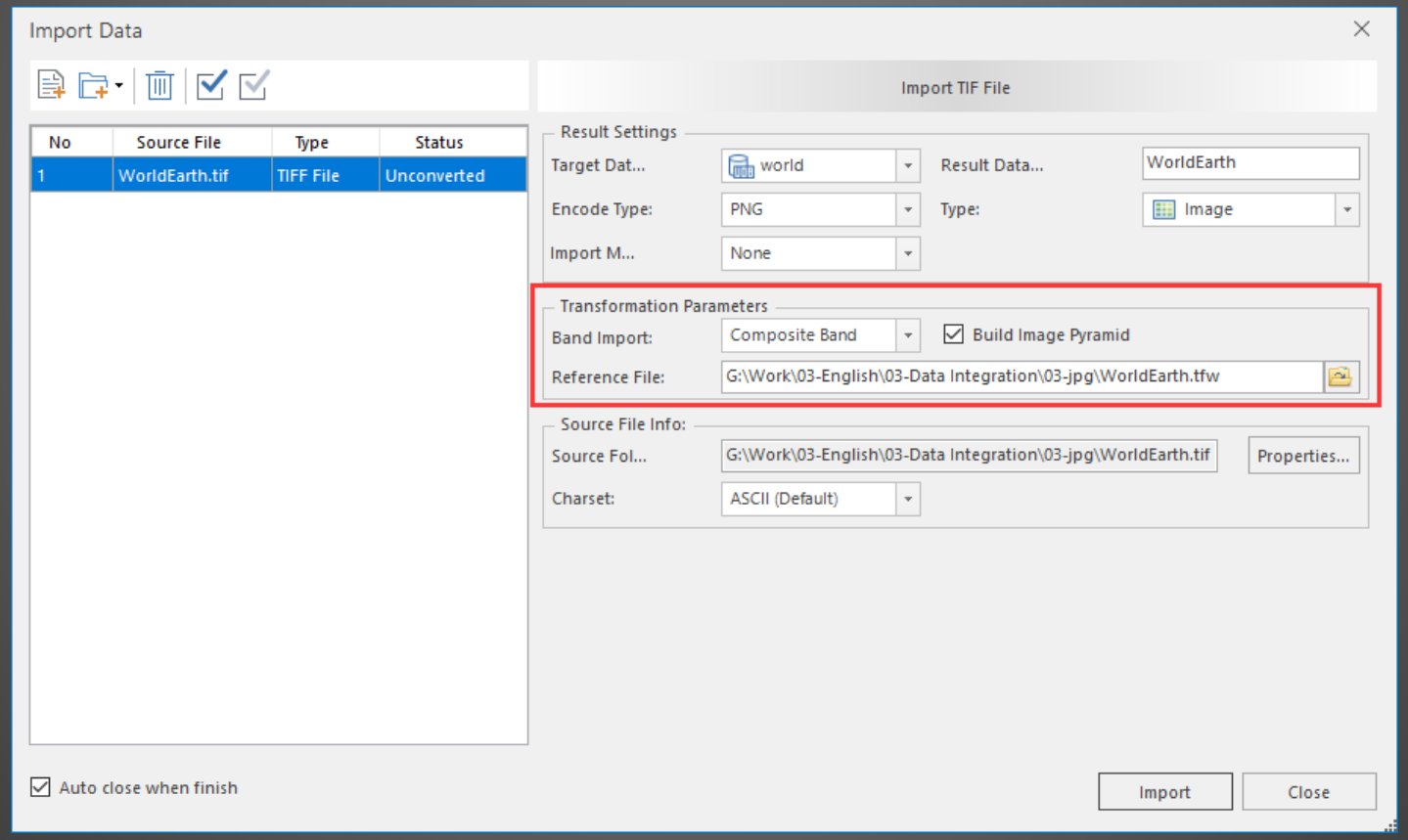
Attention:

✓ First Row as Field info

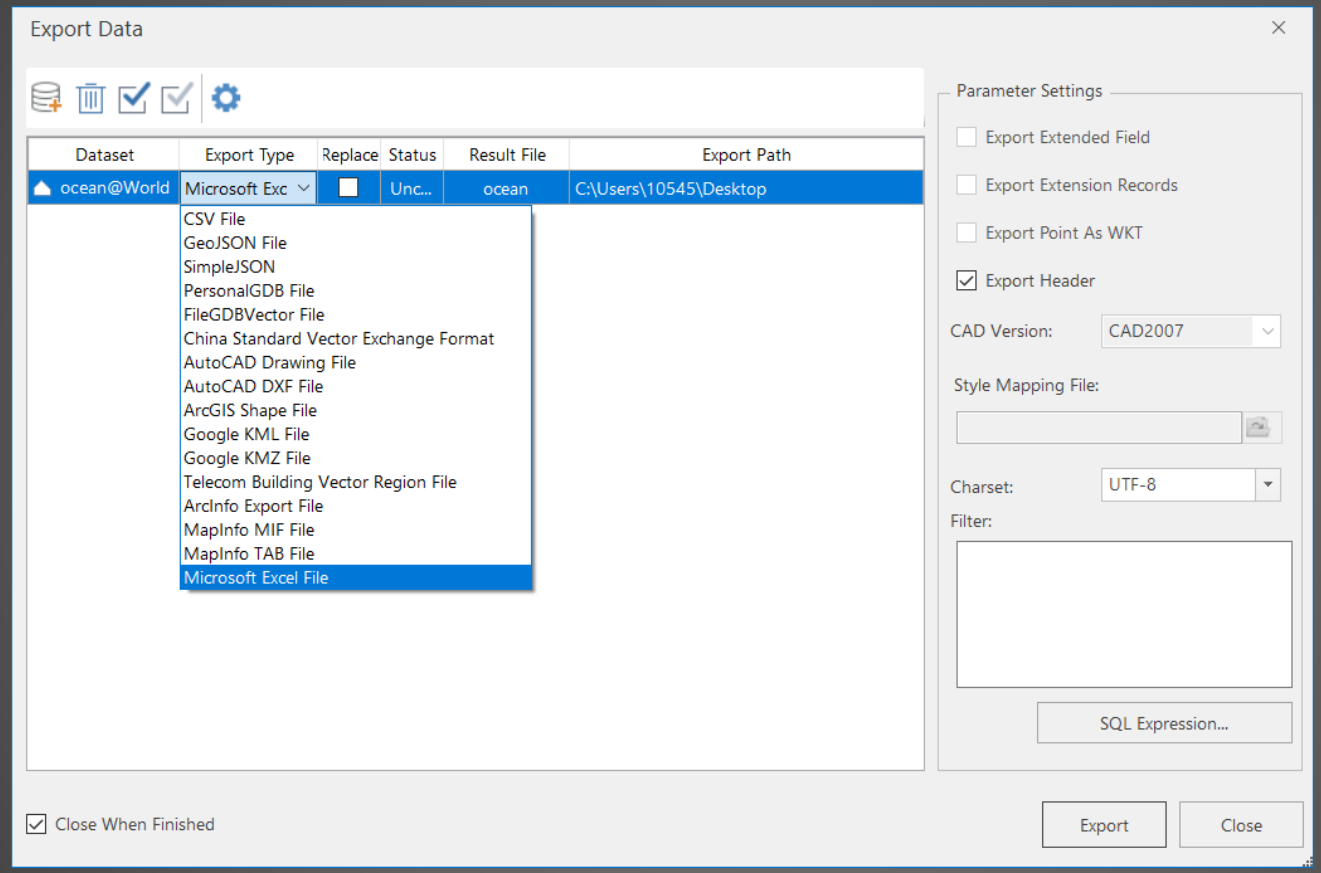
✓ Import Spatial Data

Raster Data Import

- General image files (*.bmp;*.jpg;*.png;*.tiff;etc.)
- Compression image files (*.sit)



Export SuperMap Data to Other Formats

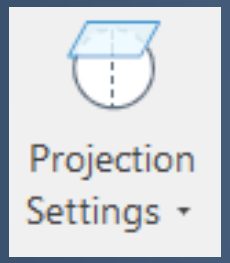


- Export a vector dataset into .shp format file
- Export a vector dataset into .csv format file
- …

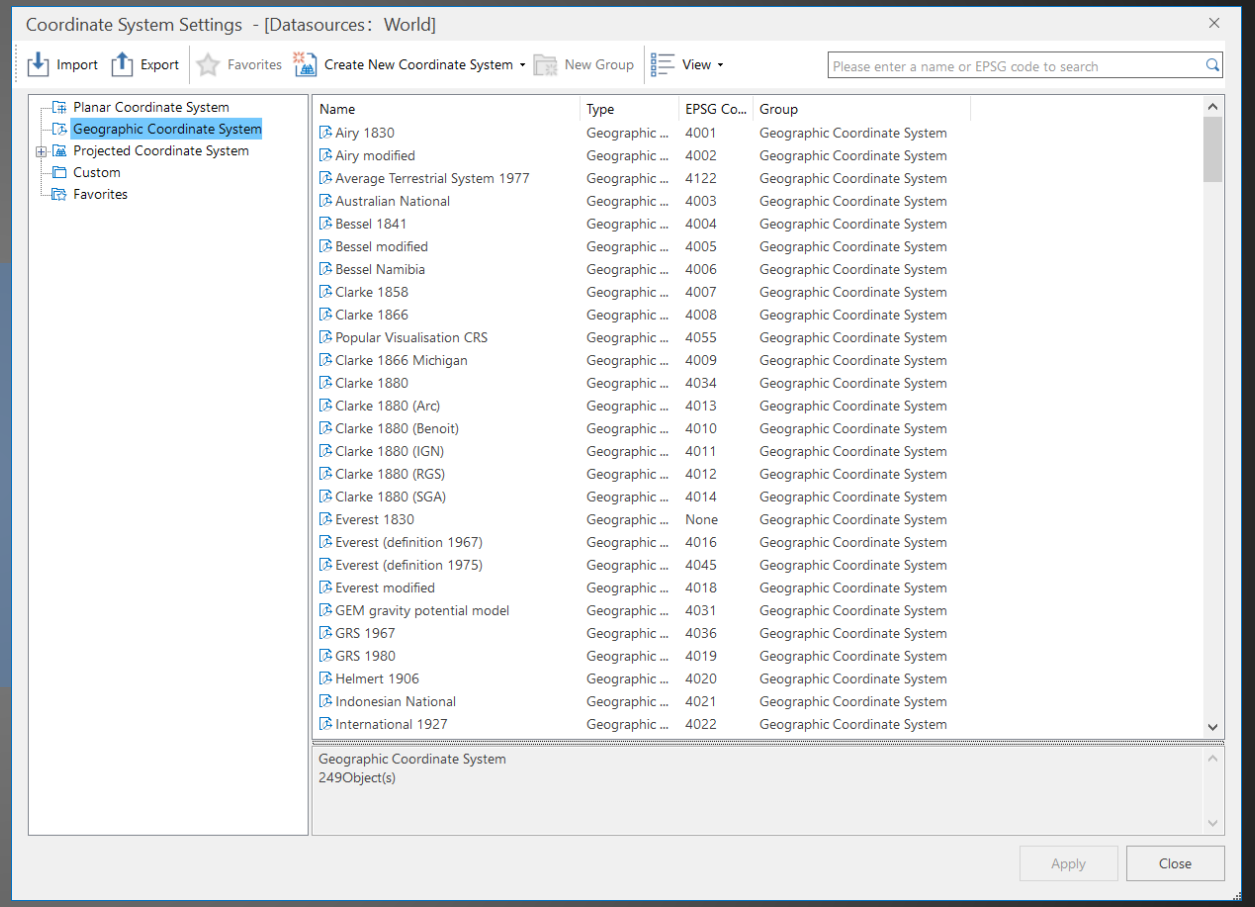
Demo - Data Importing

1. CAD: Building.dwg
2. ArcGIS format: Point.shp, Lines.shp, Area.shp
3. Attribute Files: Meteorological Data.xlsx
4. Import TIFF: WorldEarth.tif
5. Export Data

SuperMap



Coordinate System and Registration

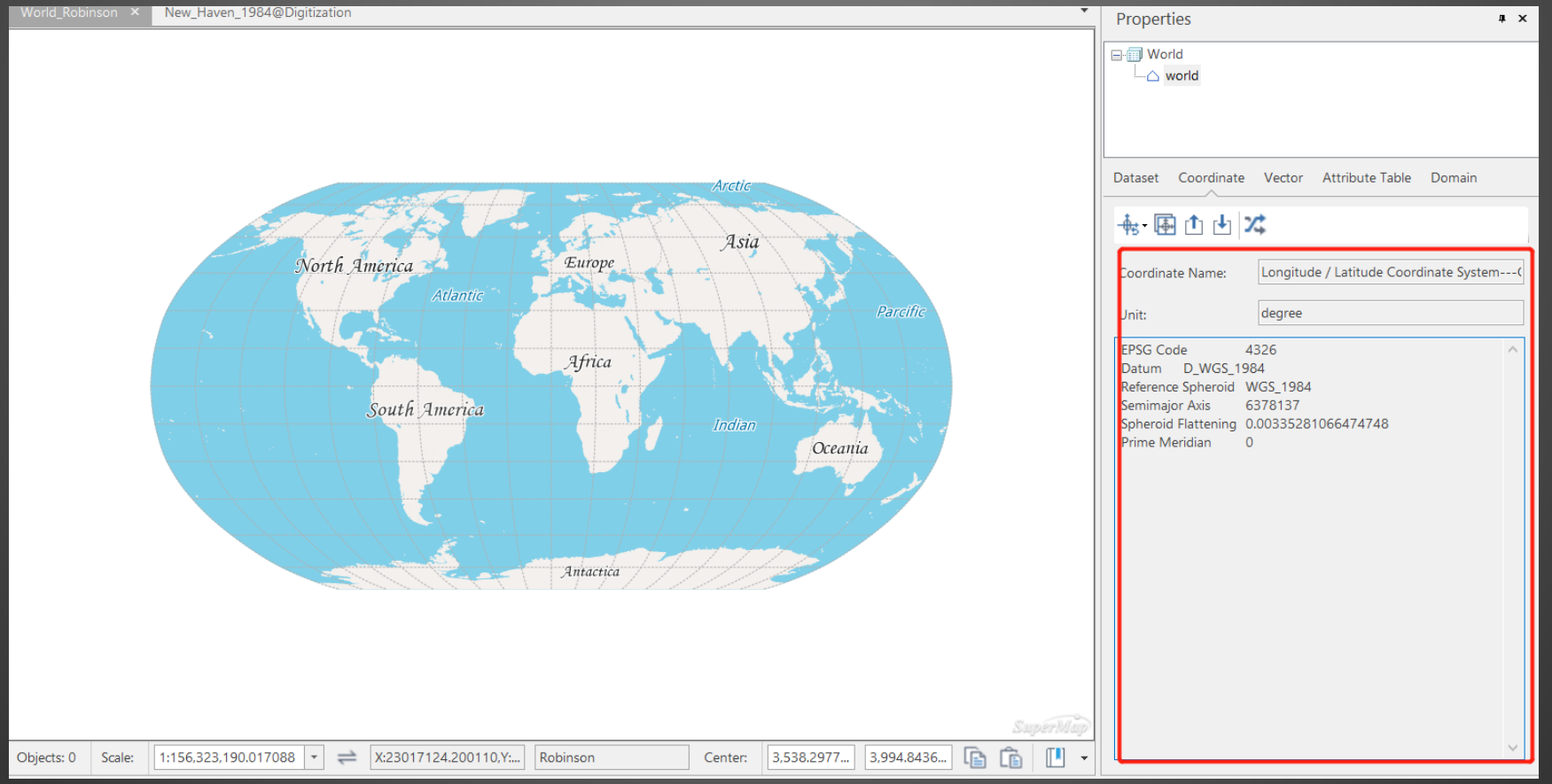


Coordinate System Settings

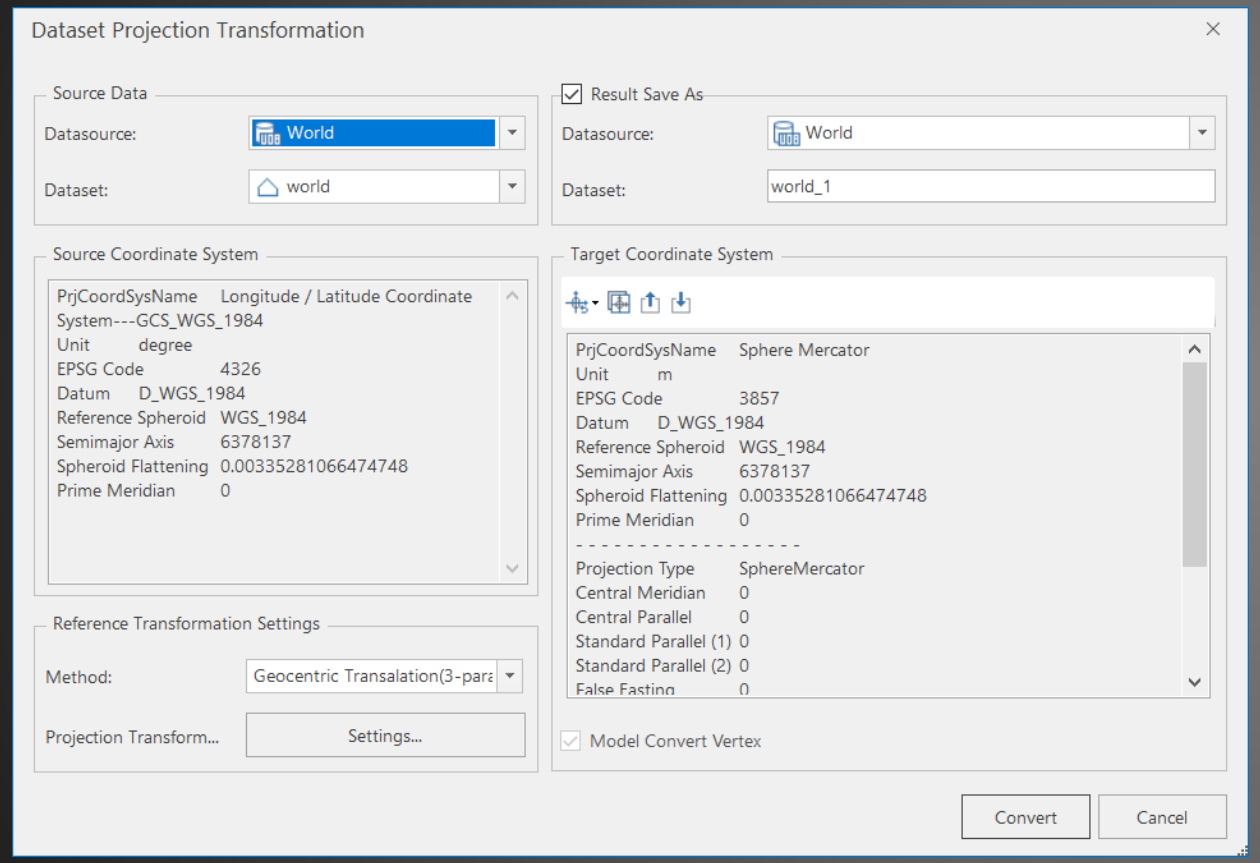
More than 1000 predefined coordinate systems. Extensible

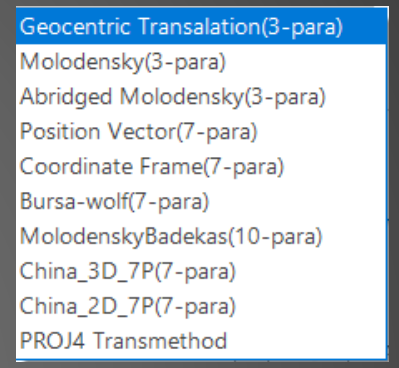
Coordinate system type:

- Planar coordinate system,
- Geographical coordinate system
- Projected coordinate system



Coordinate System Conversion





Conversion parameters

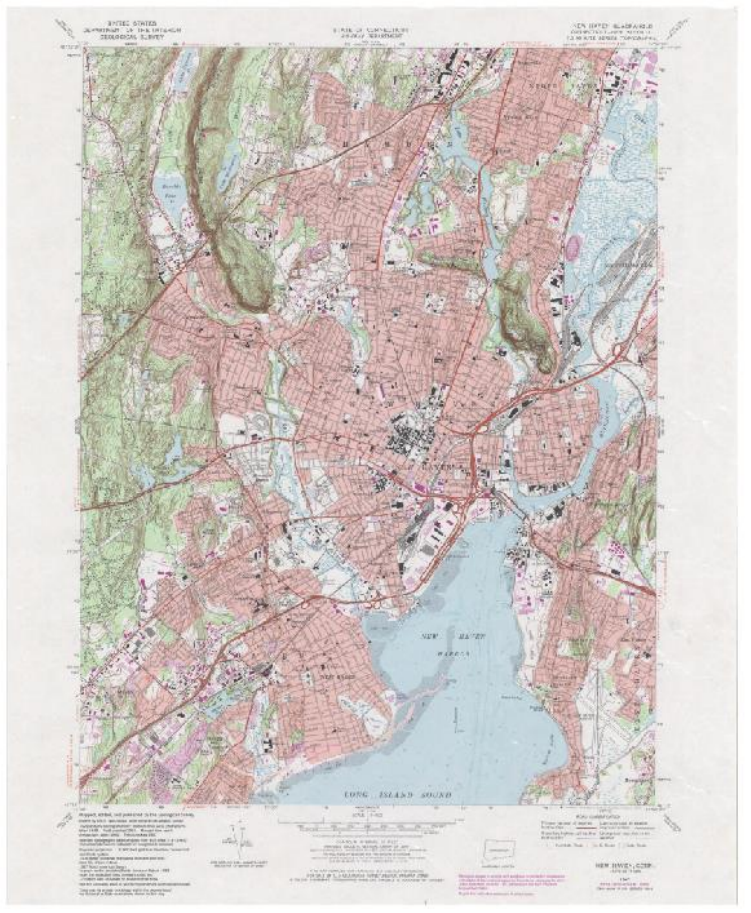
Coordinate transformation

- Single transformation
- Batch transformation

Calculation of transformation parameters

- Support five common model approaches
- Import/Export conversion parameter file

Demo – Registration and Vectorization

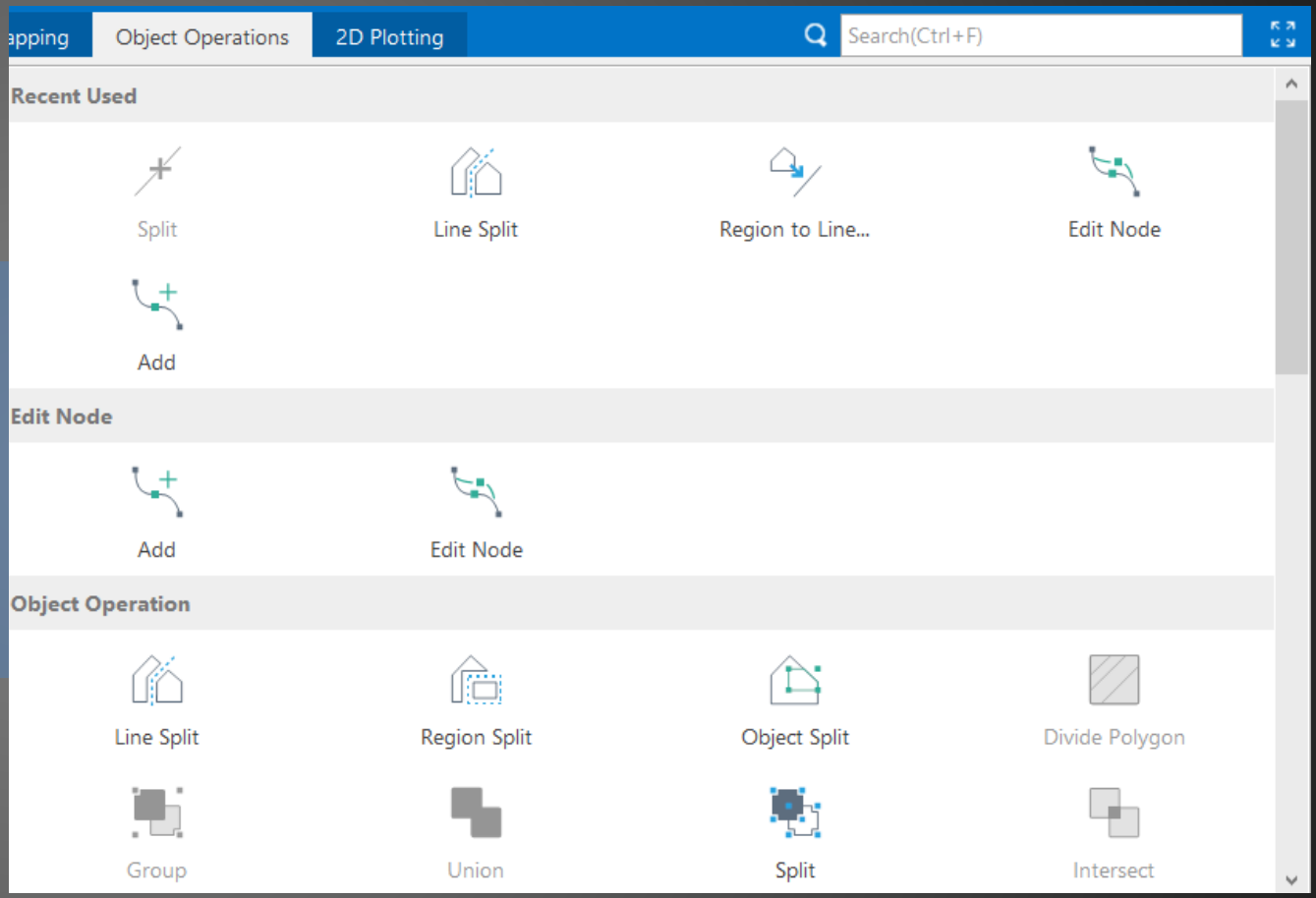


1. Import: New_Haven_1984.jpg
2. Open reference points
3. Select matching points
4. Calculate Error: Remove the error
5. Click Registration button
6. Build new dataset and set Coordinate System
7. Draw polygon

Have a rest (10mins)

Data Operation and Processing

Data Operation



Draw Objects

The application provides the feature of drawing and editing objects. Draw objects function includes point, line, Region, and text object drawing. Different methods are available for drawing different objects.

Point

- Point

Line

- Polyline
- Straight line
- Parallel lines
- Curve
- Arc

Region

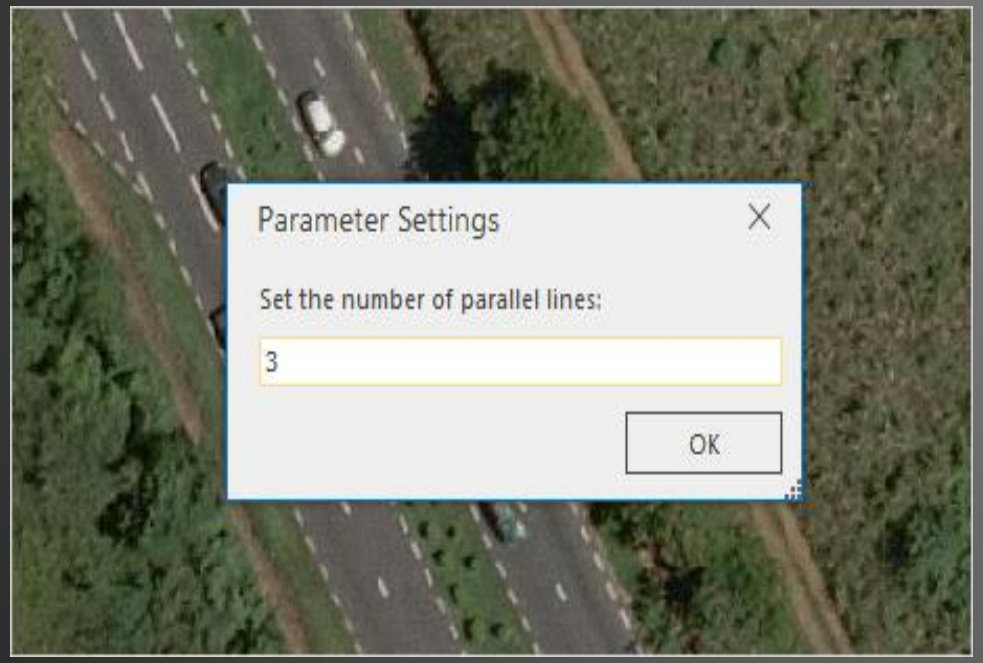
- Polygon
- Parallelogram
- Rectangle
- Circle
- Sector

Text

- Text
- Alongline Text

Draw Objects

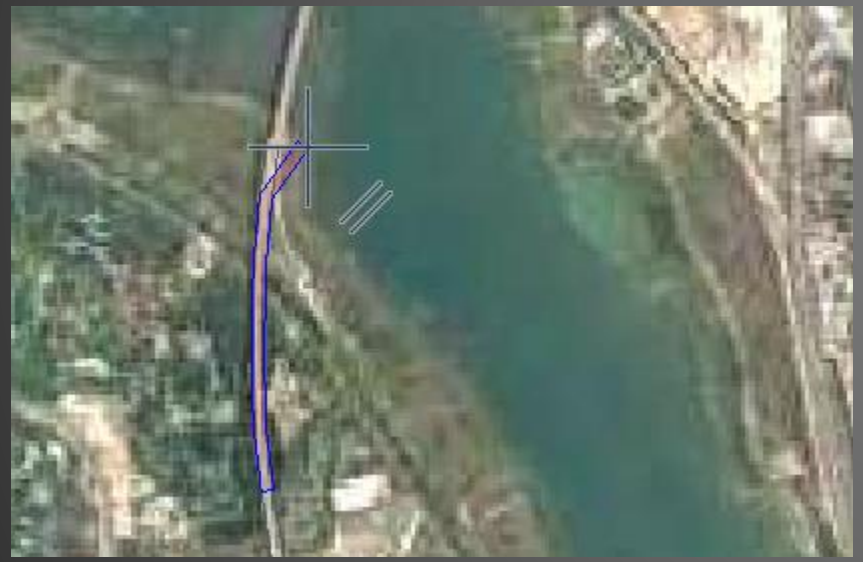
Multiple Parallel Lines



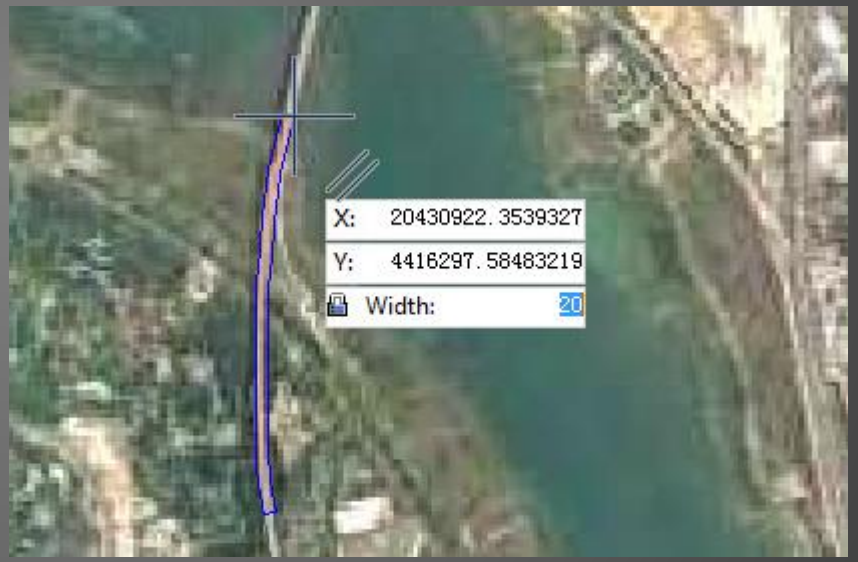
Alongline Text

Parametric Drawing

Objects can be drawn using the input parameters such as coordinates, length, and angle. Tab key can be used to switch between input parameters.



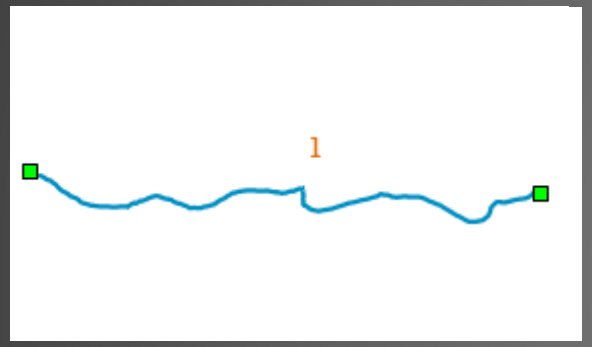
Without parametric drawing



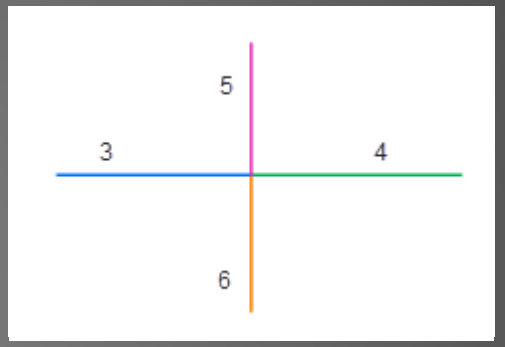
With parametric drawing

Drawing Settings

Support auto-connect line, auto-close line, auto-split line, and auto-split region.

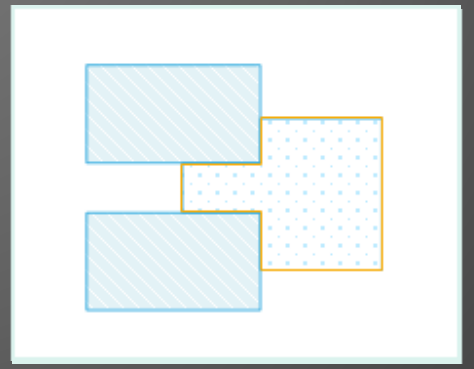


Auto-connect line



Auto-split line

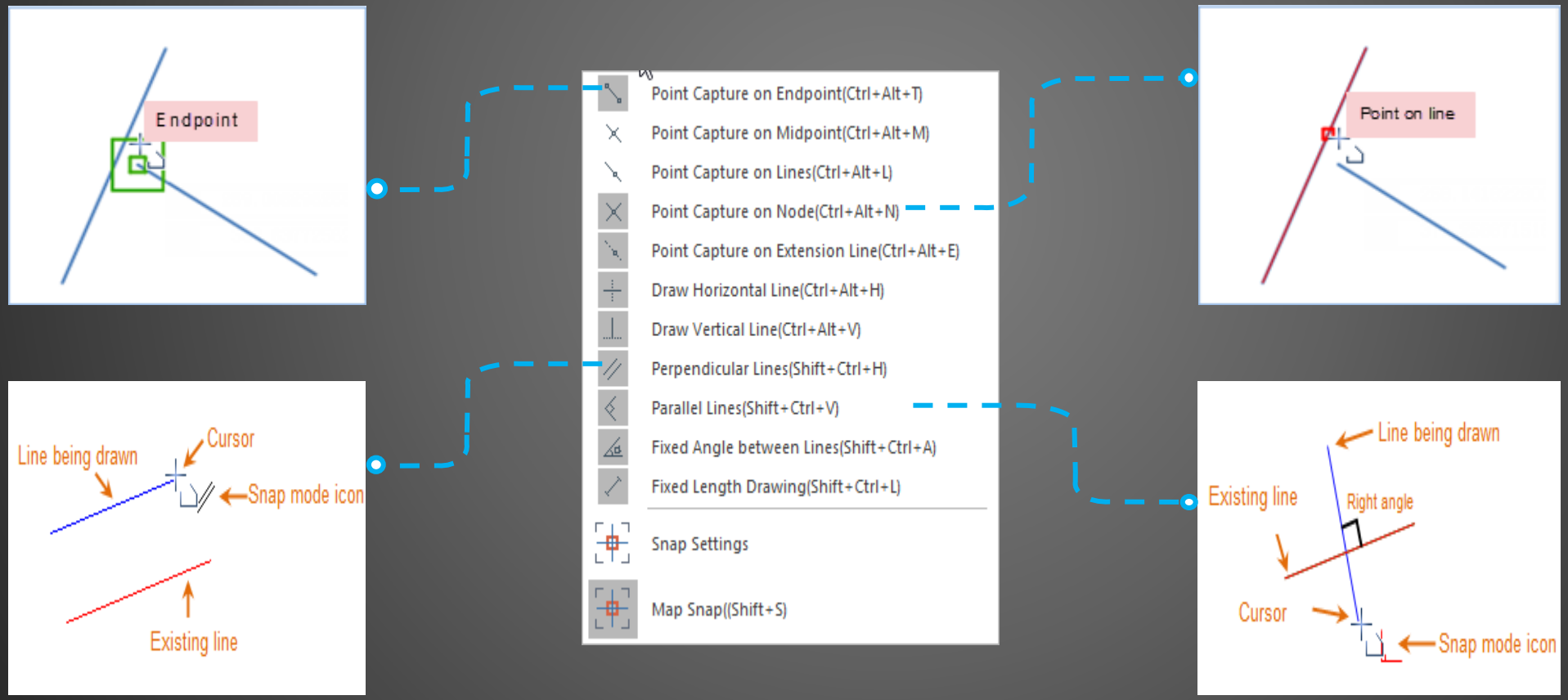
Auto-close line



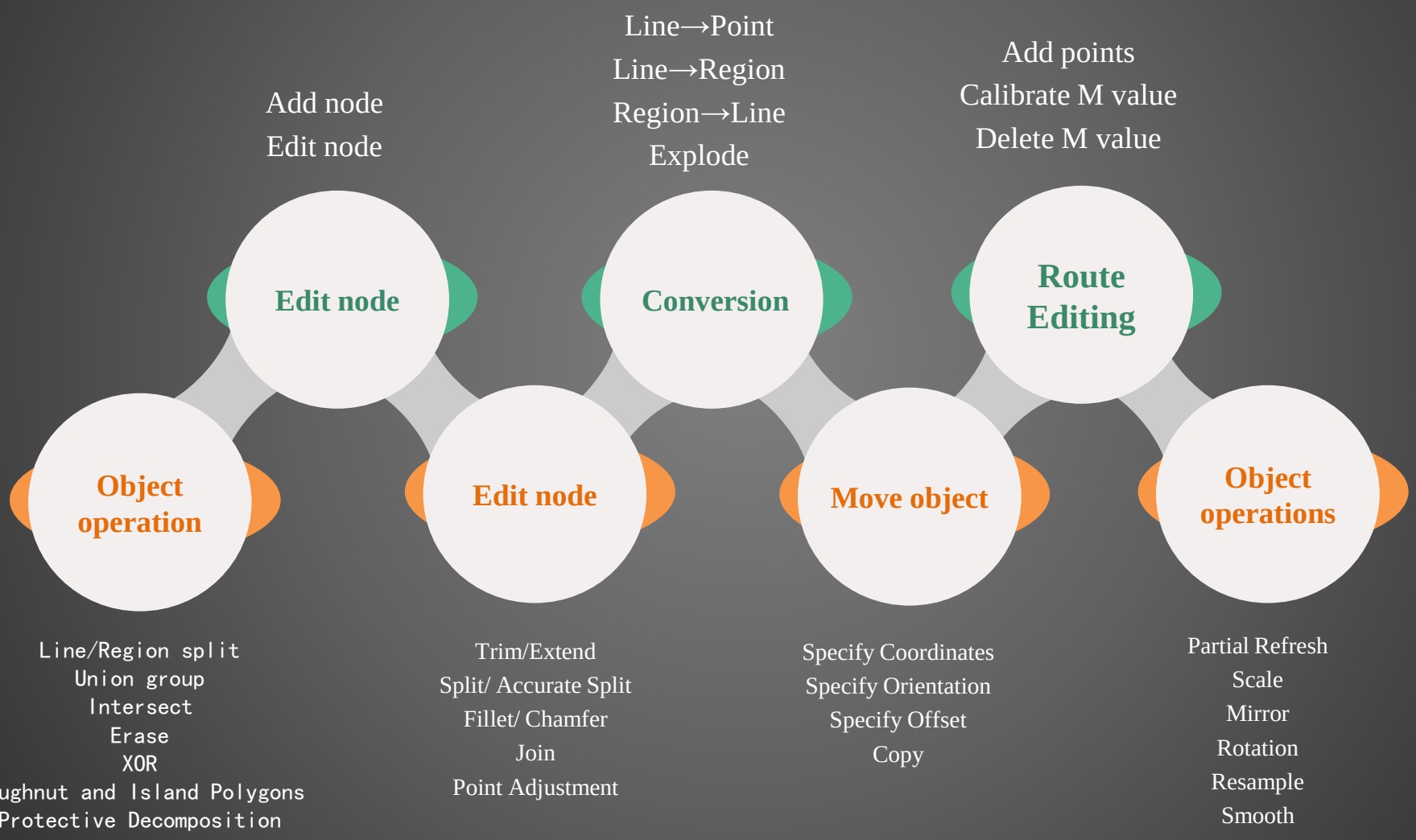
Auto-split Region

Snap

The application provides powerful graphics snapping function to help the user easily and accurately locate specific locations in a map. Enabling Snap Settings functions lets currently drawn nodes to automatically capture edges, nodes, geometric objects, and so on within the tolerance range.

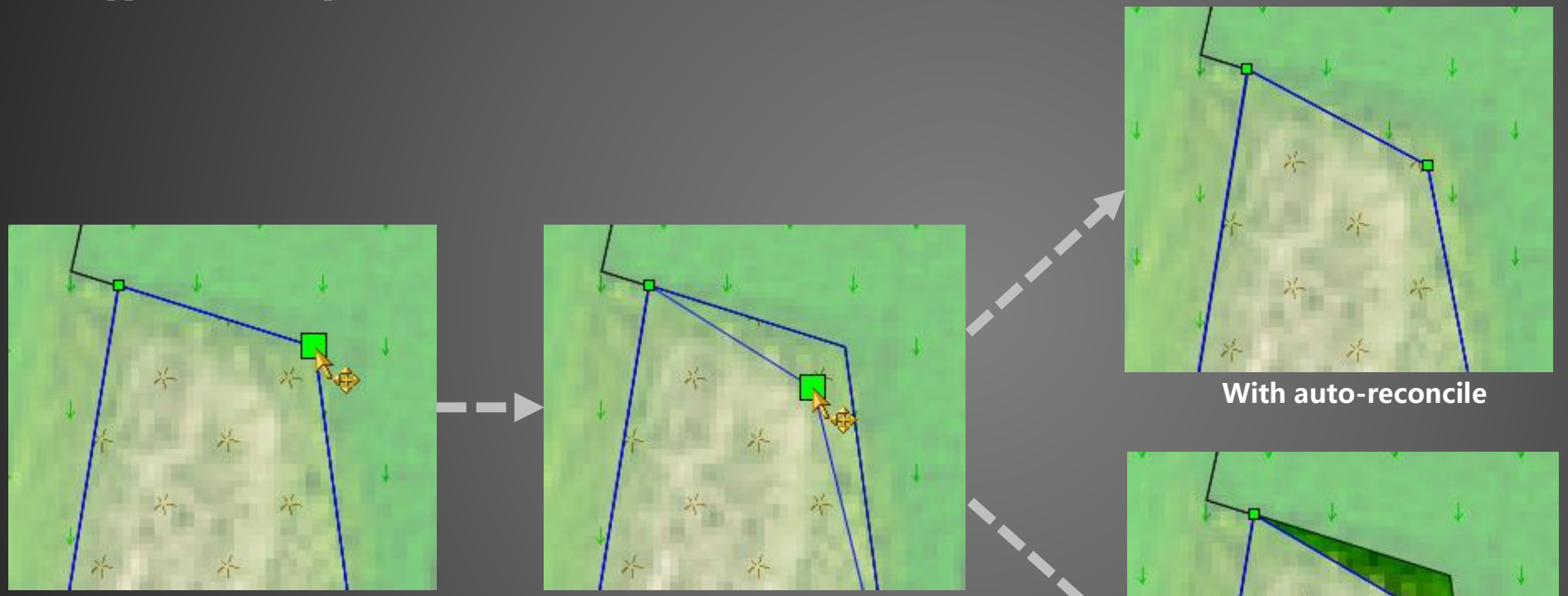


Editing Tools



Edit node

It provides the function of adding and editing nodes to change the spatial position and shape of the objects. The application also provides the Auto-reconcile feature.

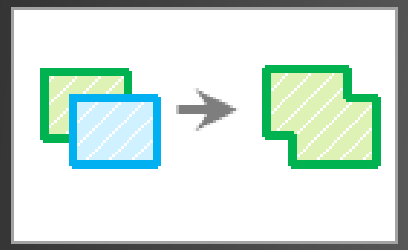


With auto-reconcile

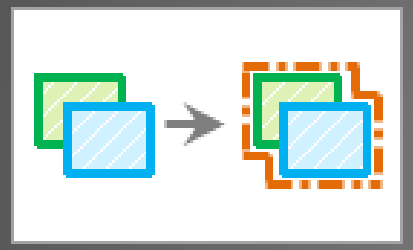
Without auto-reconcile

Object Operation

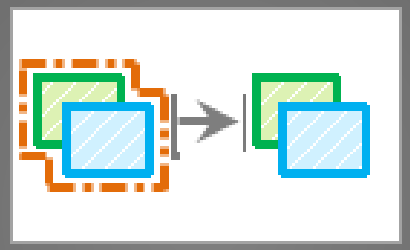
The Object Operation group provides 14 editing operations for geometric objects, such as Line Split, Region Split, Object Split, Union, Group, Split, Intersect, Erase, Erase External, XOR, Protective Decomposition, etc.



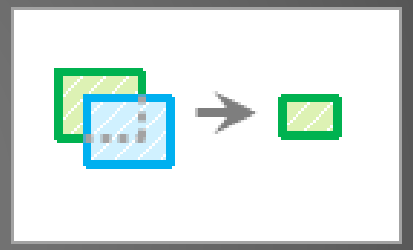
Union



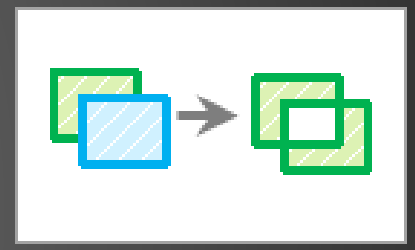
Group



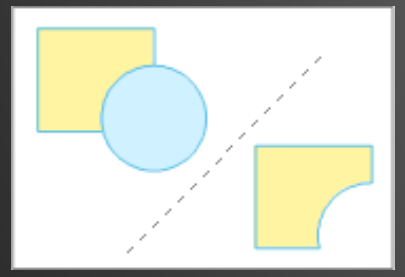
Split



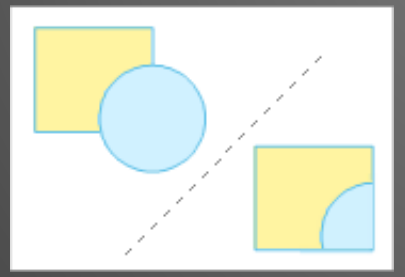
Intersect



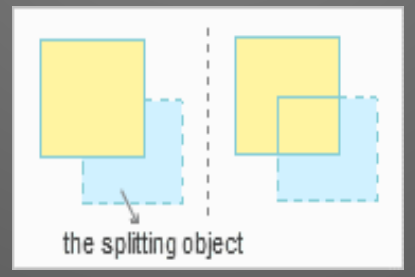
XOR



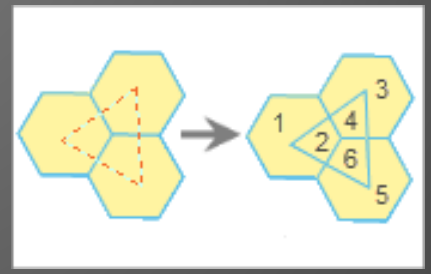
Erase



Erase external



Object Split

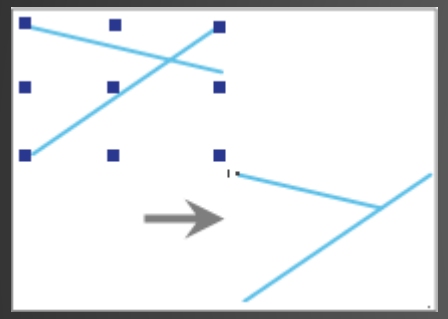


Region Split

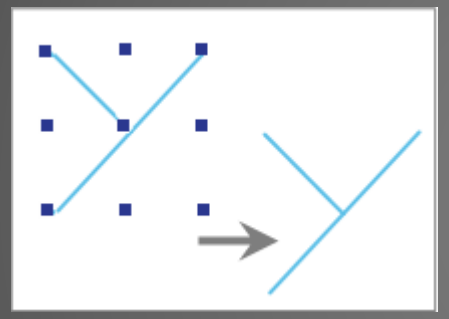
Doughnut and Island Polygons

Edit Node

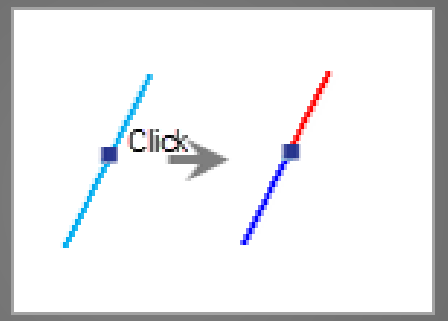
The application provides 8 kinds of editing nodes features, such as Trim, Extend, Split, Accurate Split, Join, Fillet, Chamfer, etc.



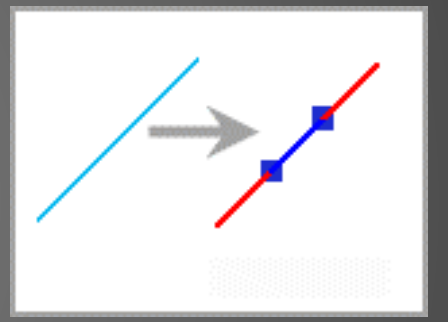
Trim



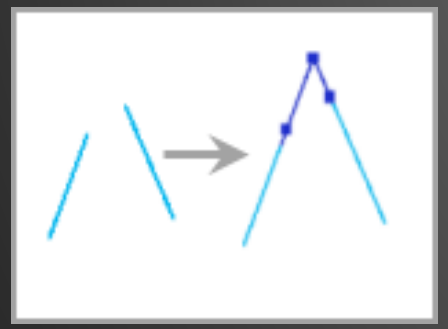
Extend



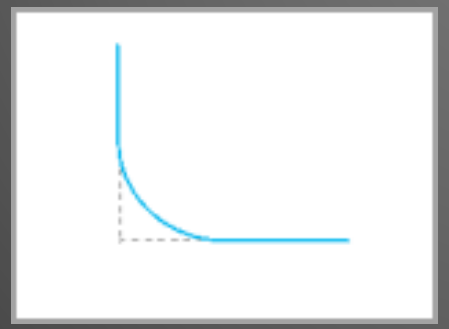
Split



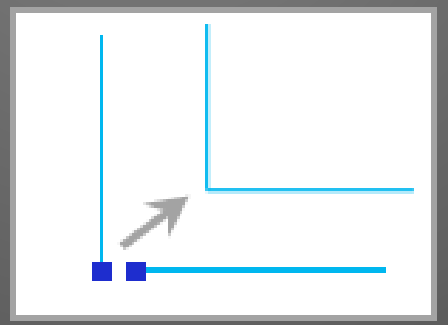
Accurate Split



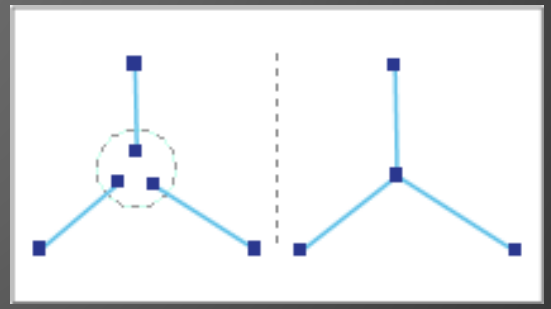
Chamfer



Fillet

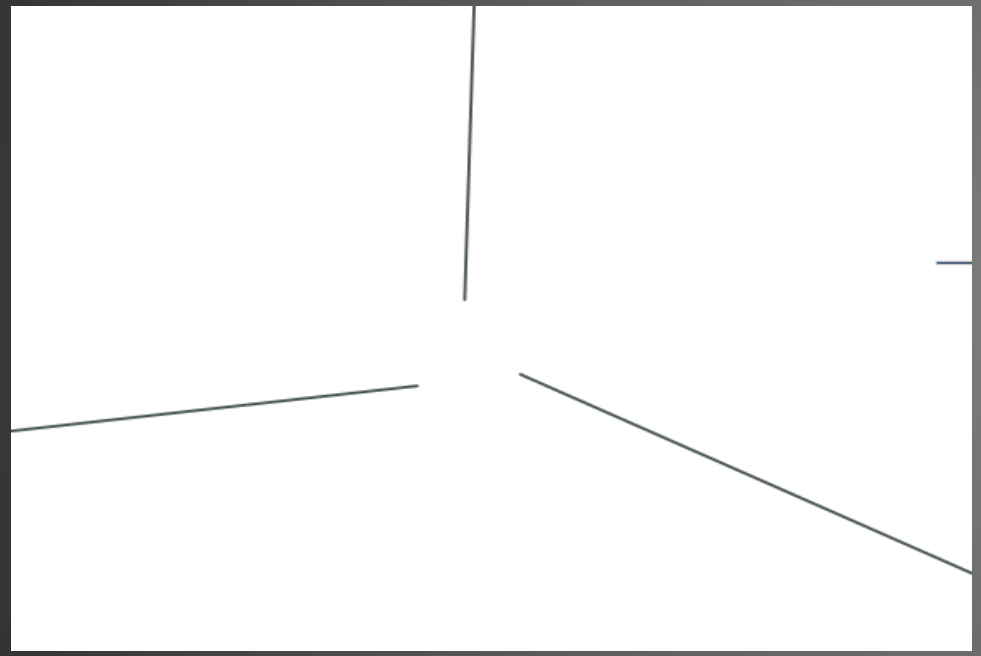


Join

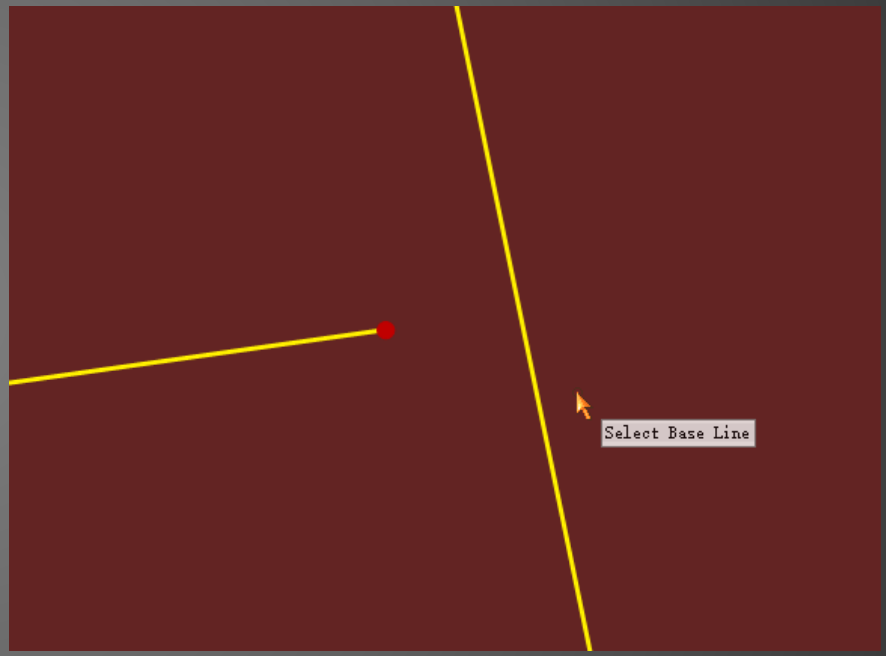


Point Adjustment

Edit Node



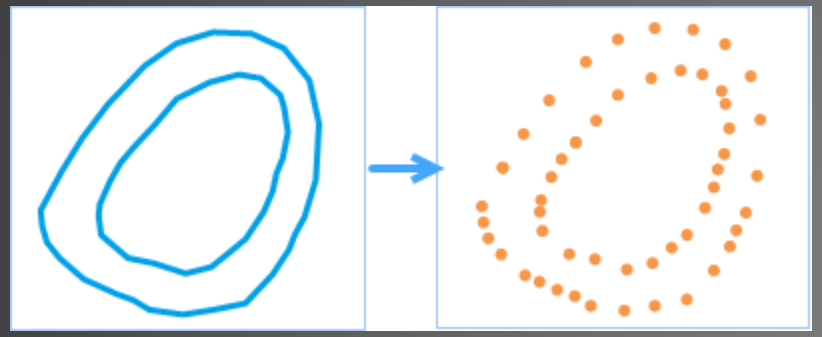
Point Adjustment



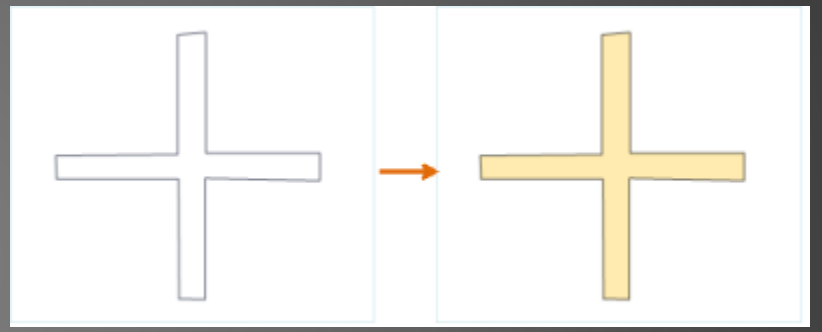
Extend

Conversion

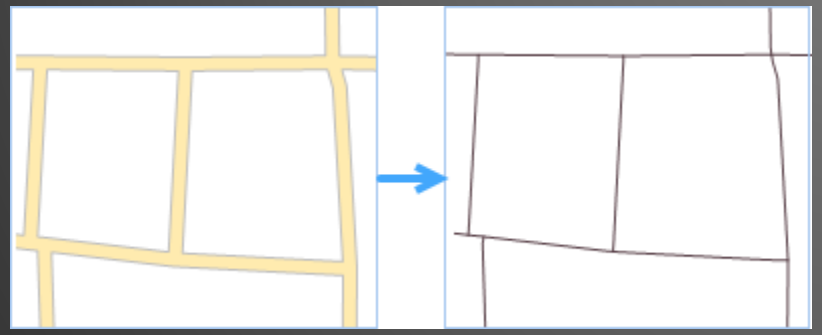
The application provides Line to Point, Region to Line, Line to Region and Explode conversions.



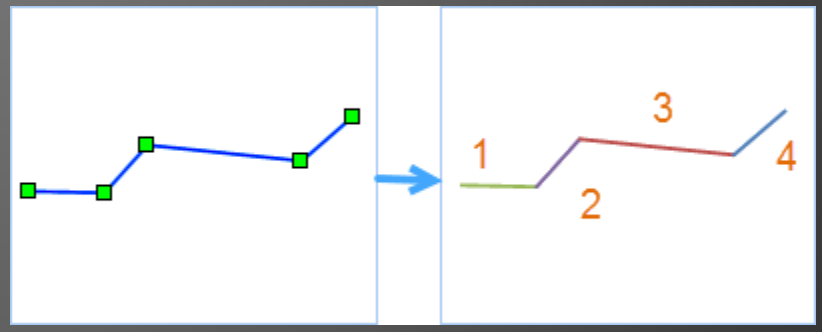
Line to Point



Line to Region



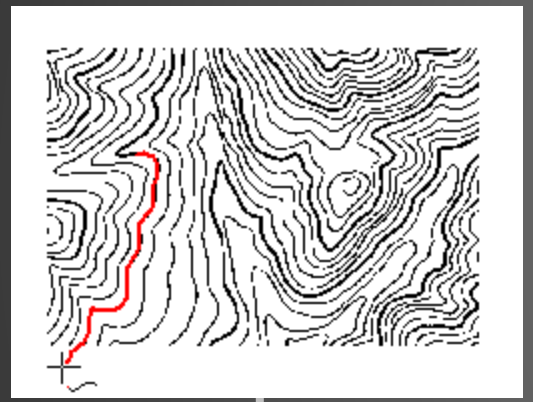
Region to Line



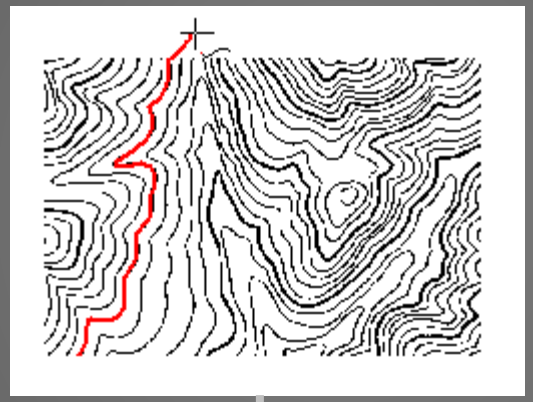
Explode

Semi-automatic Vectorization

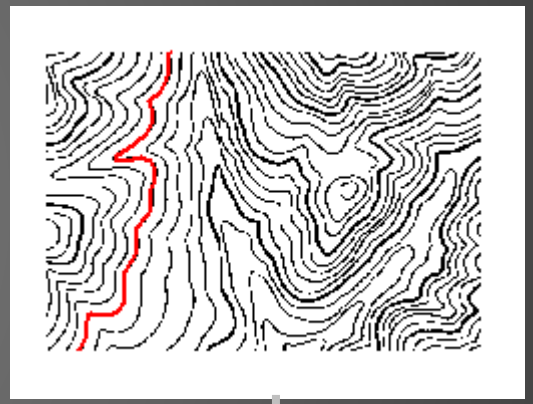
The semi-automatic vectorization steps are as follows:



1. Click the left mouse button on the line to track automatically. The tracing will stop when the line meets a breakpoint or a crossing. Double-click on the next point in forwarding direction to continue tracing till next breakpoint or crossing.

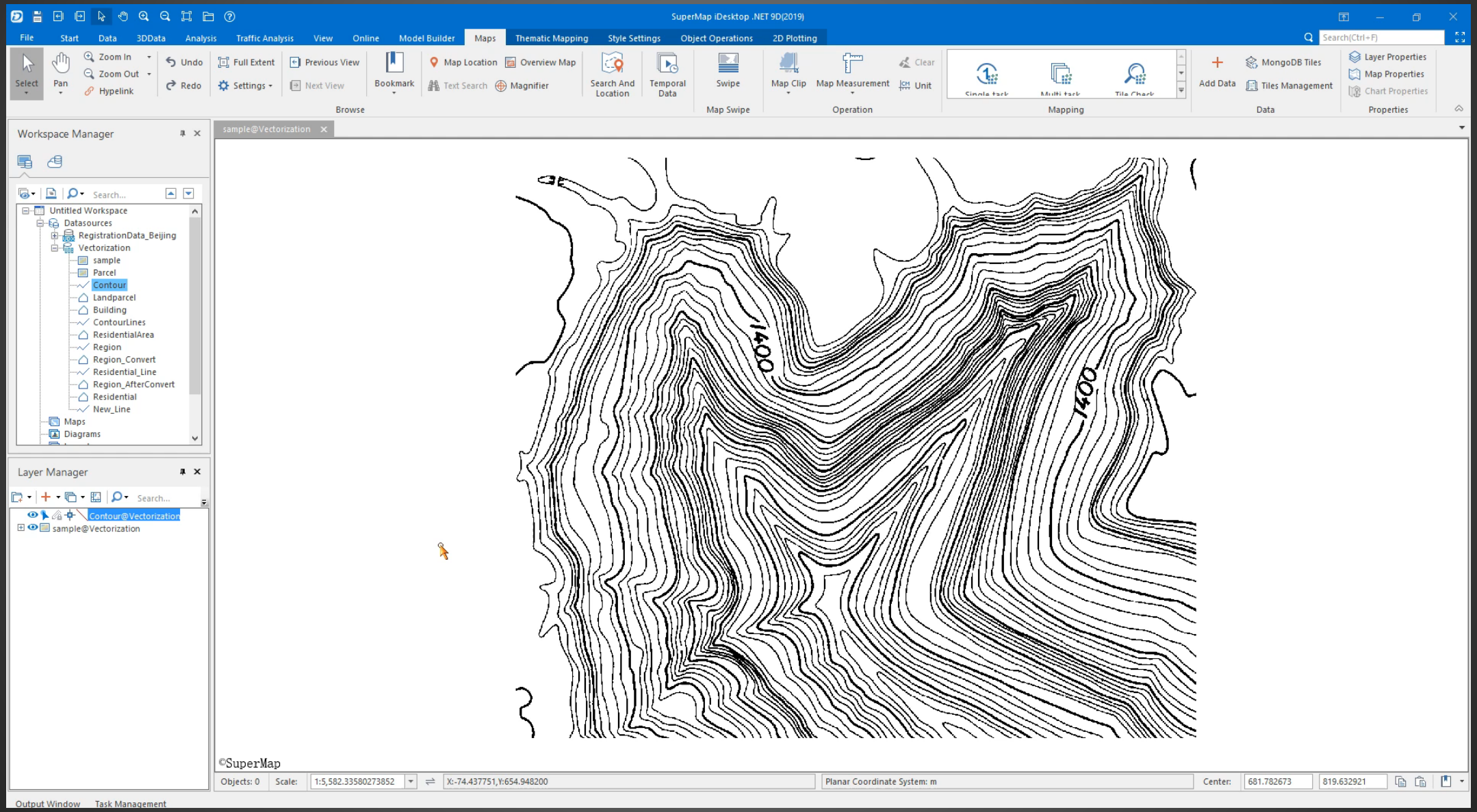


2. Right-click to reverse the direction of the tracing from the start point.



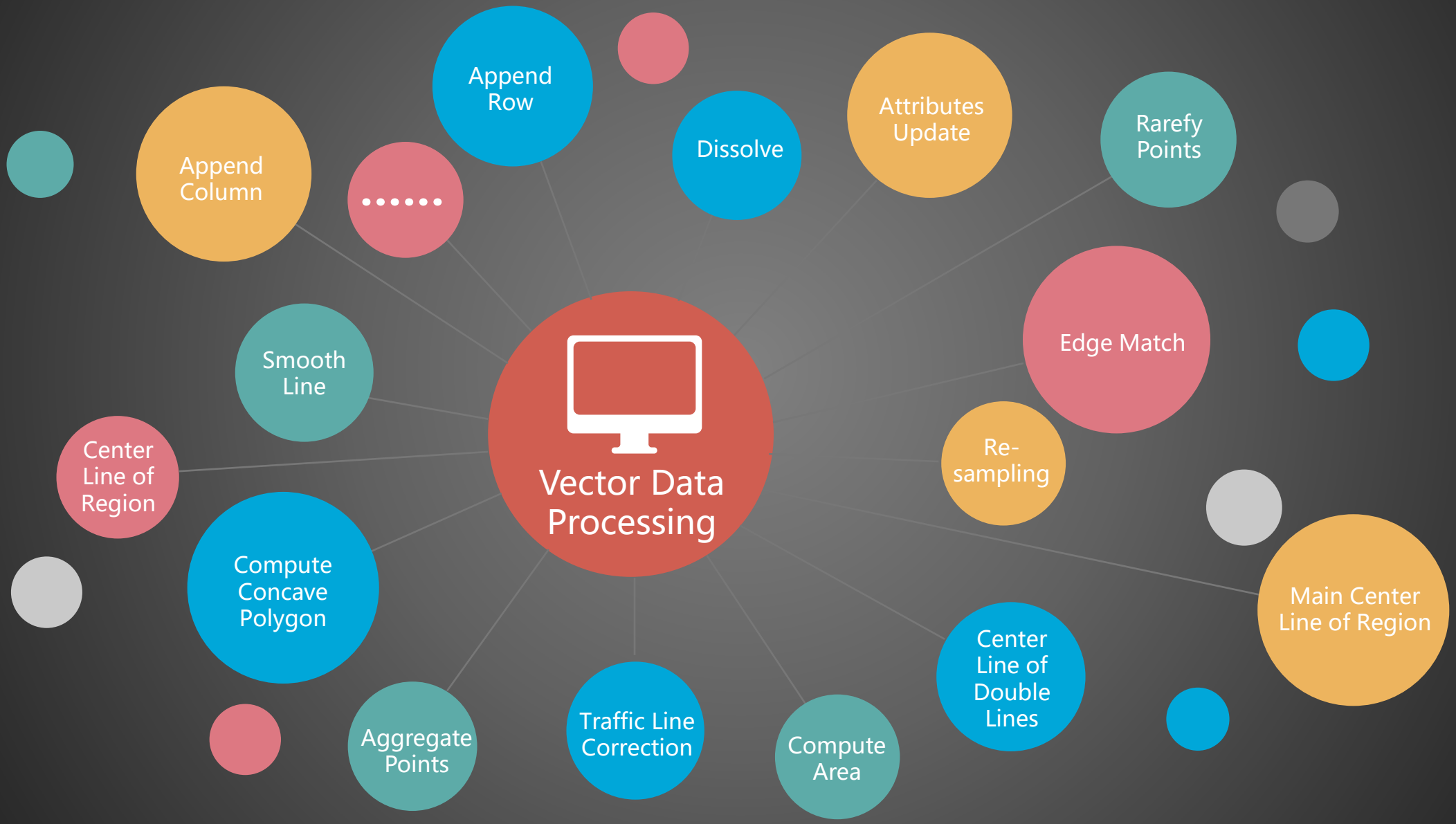
3. Right-click again to end the Vectorize Line operation.

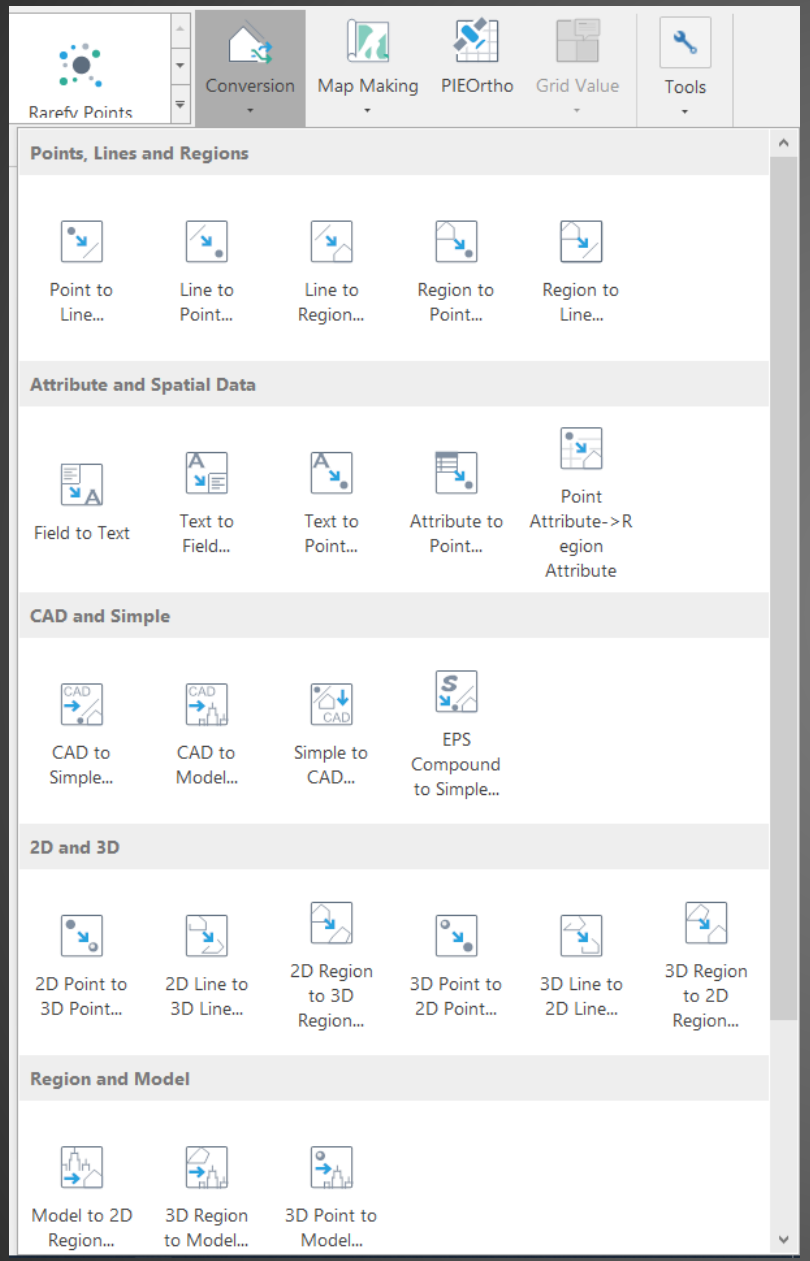
Vectorization Example



Data Processing

Vector Data Processing



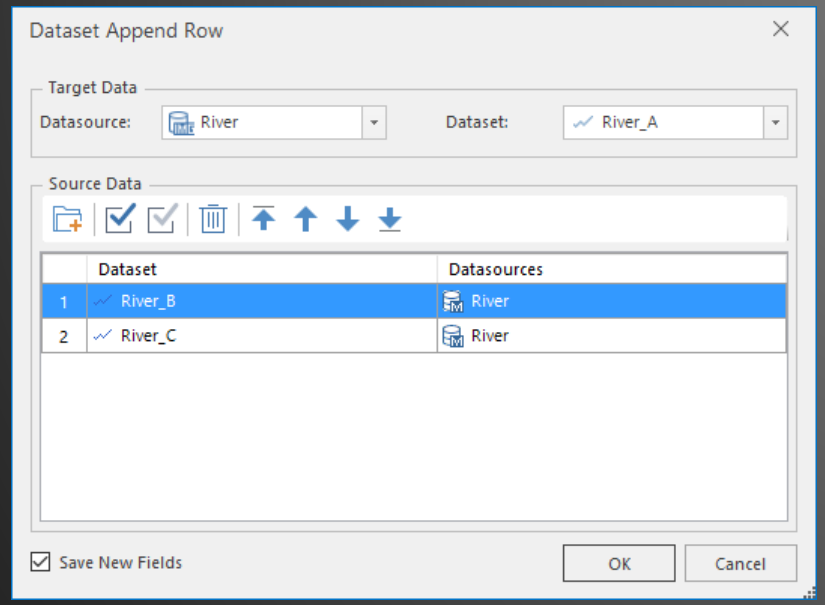


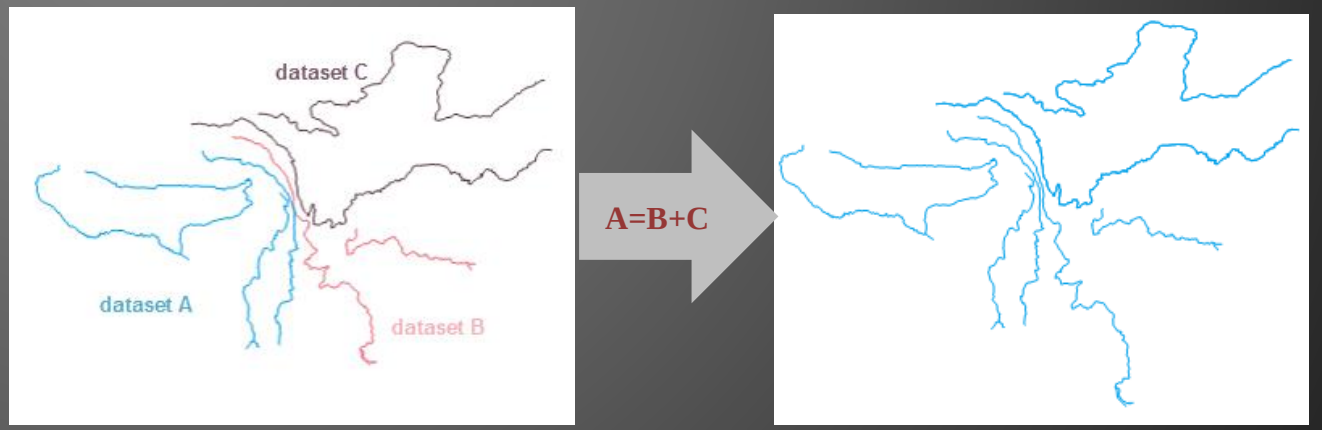
Data Conversion

Append Rows/Columns

- **Append Rows**: Appends data from one or more data sets to the target data set. The field name and field type of the source data set and the target data set should be the same.

- **Append Columns:** Adds new fields in the attribute table of the target dataset from the attribute table of the source data set. The user needs to set connection fields of the same type, from the source data set and the target data set respectively. The connection field type cannot be a binary type and should have the same values.



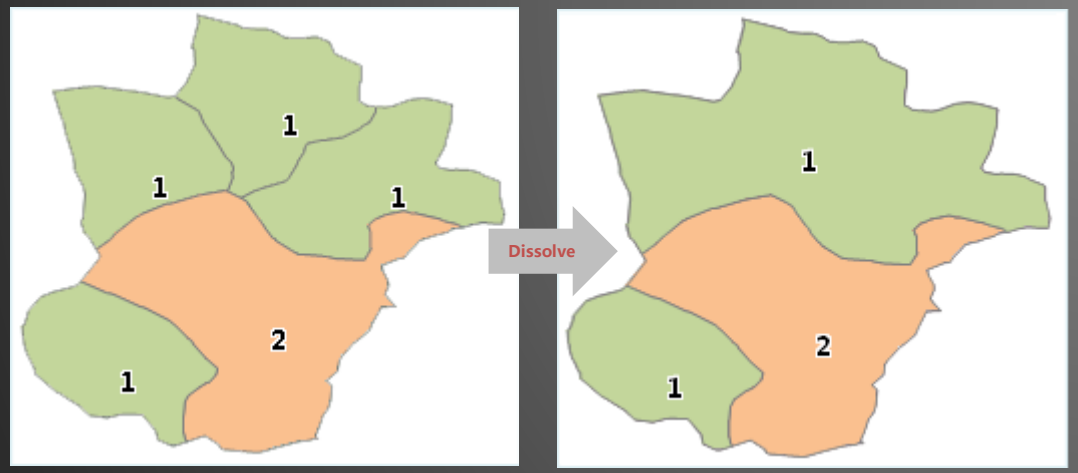


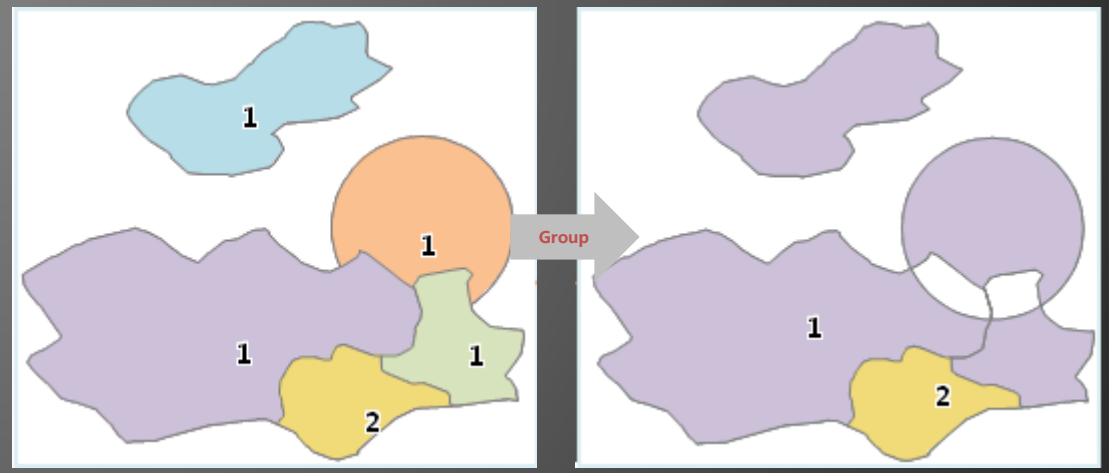
Dissolve

Dissolve feature combines objects having the same attribute values in one or more fields of a dataset.

Dissolve mode: Dissolve, Group, and Group after dissolving.

- Dissolve: Dissolve the intersecting objects which have the same attribute fields (or the distance between them are within the tolerance) into one object.
- Group: Group the objects with the same attribute fields into one object, and delete the overlapping parts.





Topology

Topological Relationship reflects the relationship between geographical objects in spatial location. They are the rules that maintain data integrity. It is the basis of spatial query and analysis, and helpful to the simulation and analysis of the real world.

Topology Processing

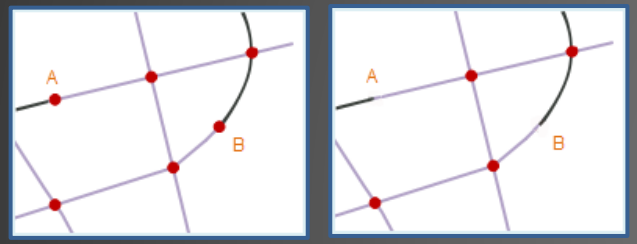
After checking the line data set (or network data set), the system will correct the wrong topological relationship in the data set automatically.

Topology Checking

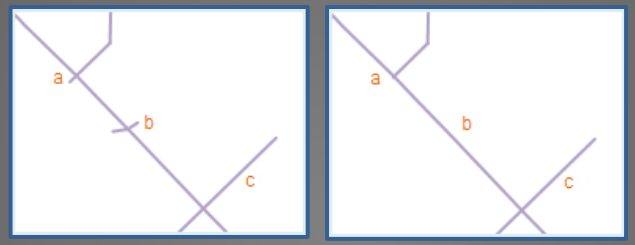
Detailed rules are provided to check point, line, and surface datasets more carefully. The system will save the topological errors to the new result dataset to be modified by the user manually.

Topology Processing

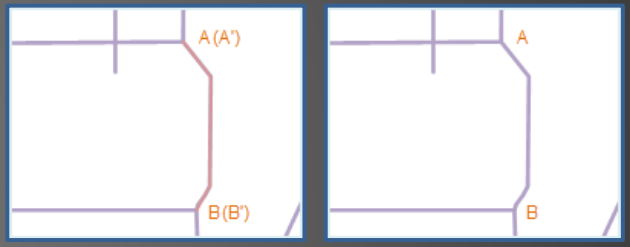
Topology processing is a process of repairing or avoiding the occurrence of topology errors. Topology processing includes seven kinds of rules. When dealing with topology, it is necessary to set corresponding tolerance for different rules in order to achieve the best result.



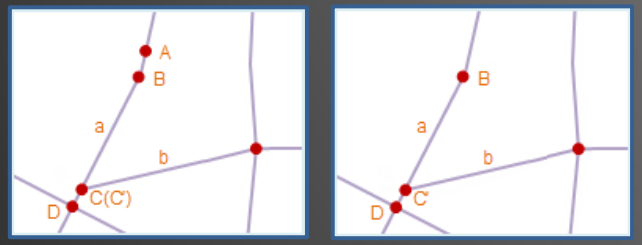
Clean pseudo nodes



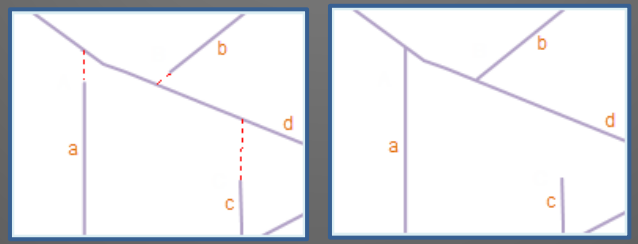
Clean overshoots



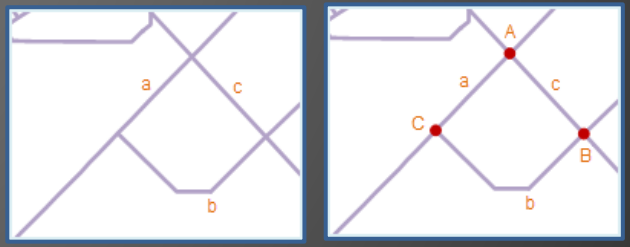
Clean duplicate lines



Clean redundant vertices



Extend undershoots

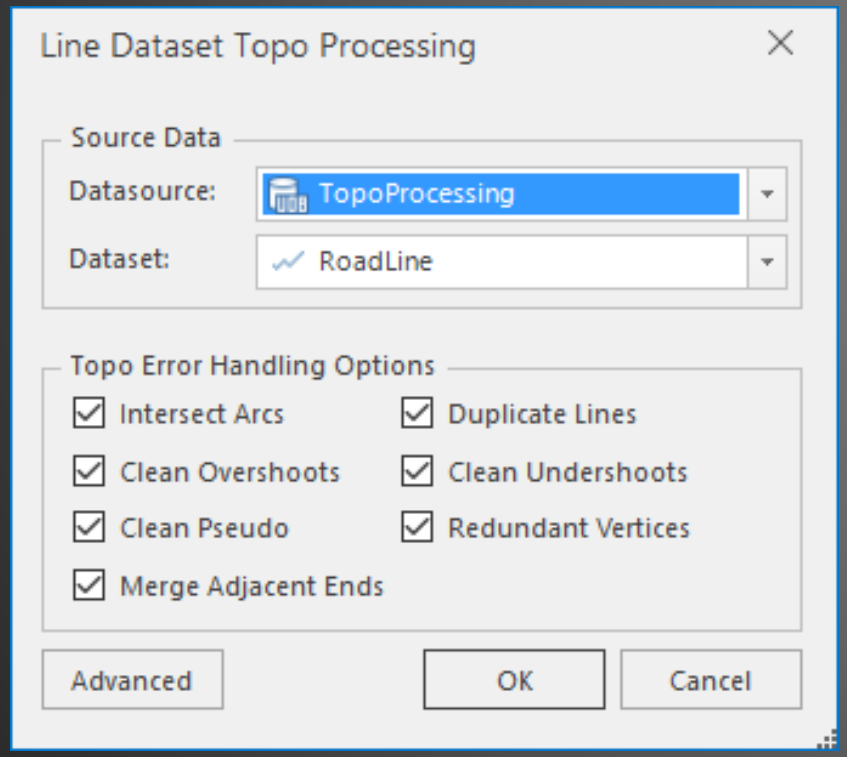


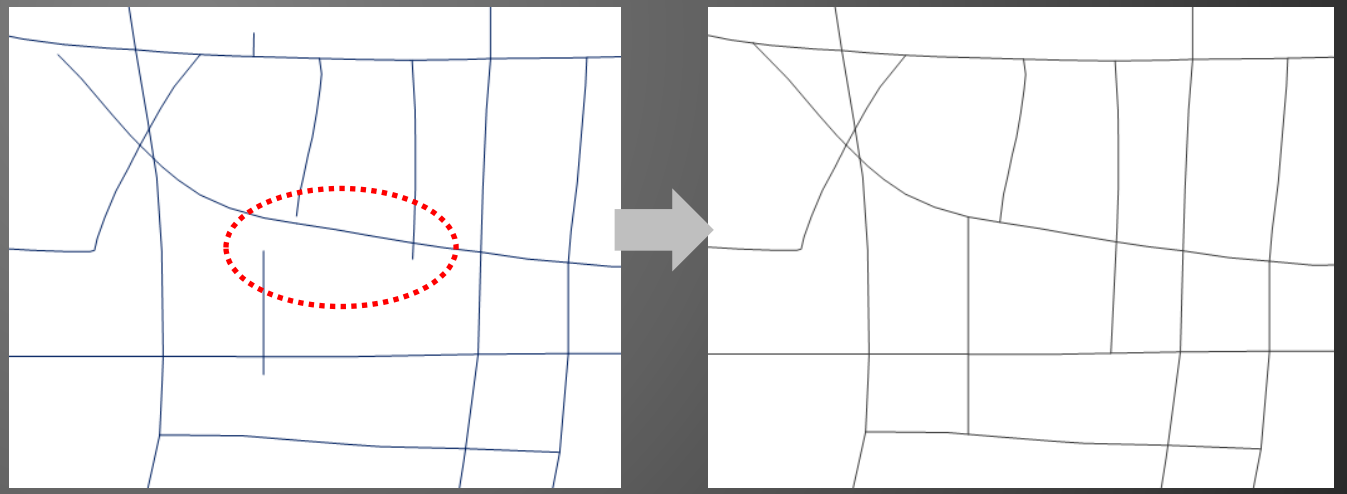
Intersect Arcs

Line Topology Processing

Topology checking and repairing for a line or network data sets.

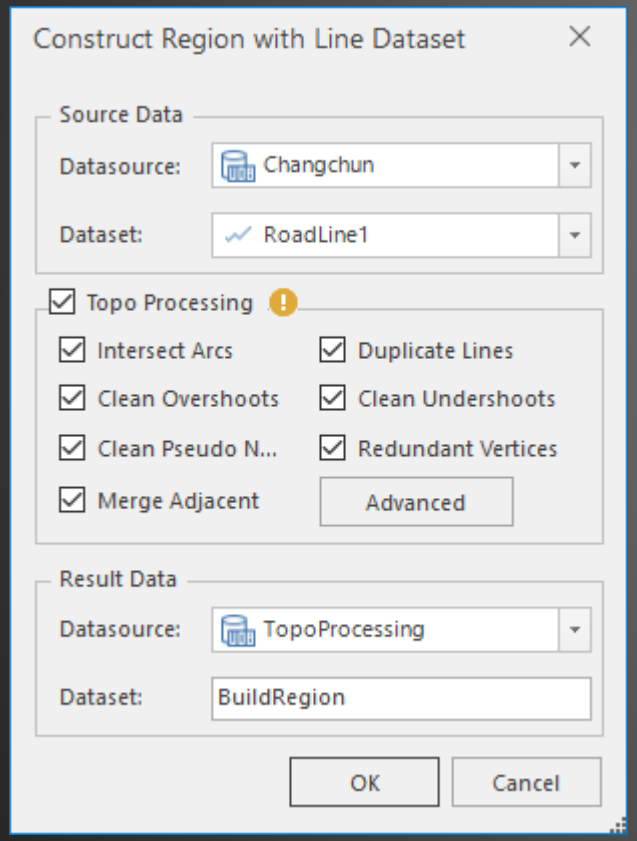
The system will check the topology of the line data set according to the selected topology rules, and correct the detected topology errors.

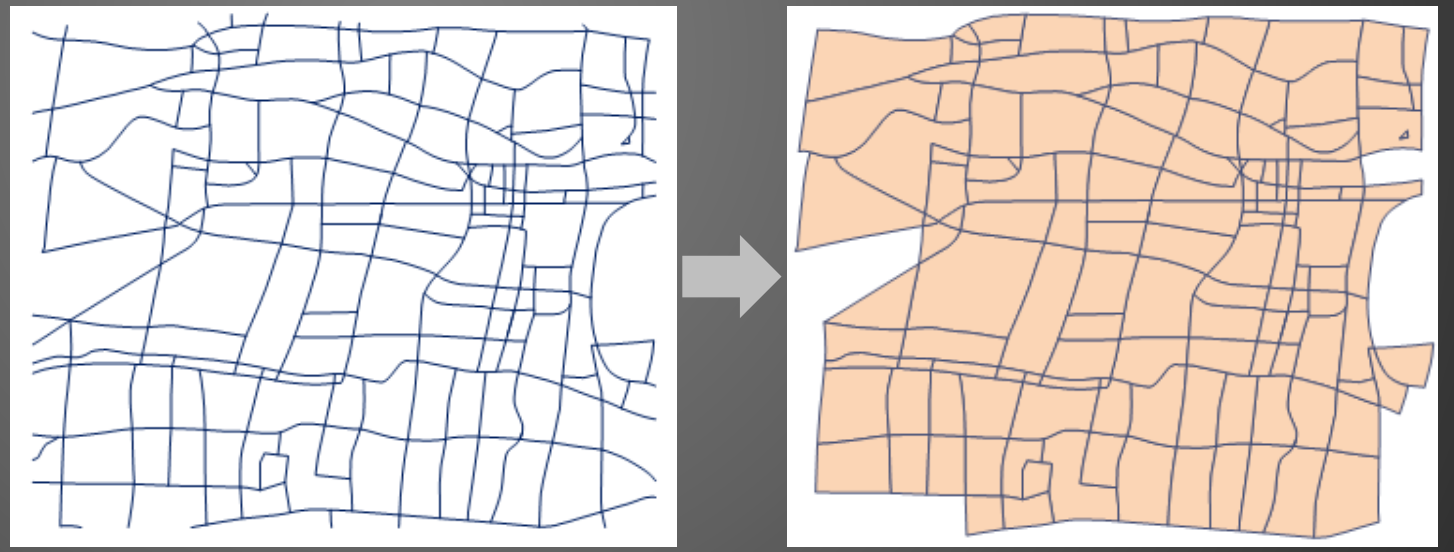




Region by Topology

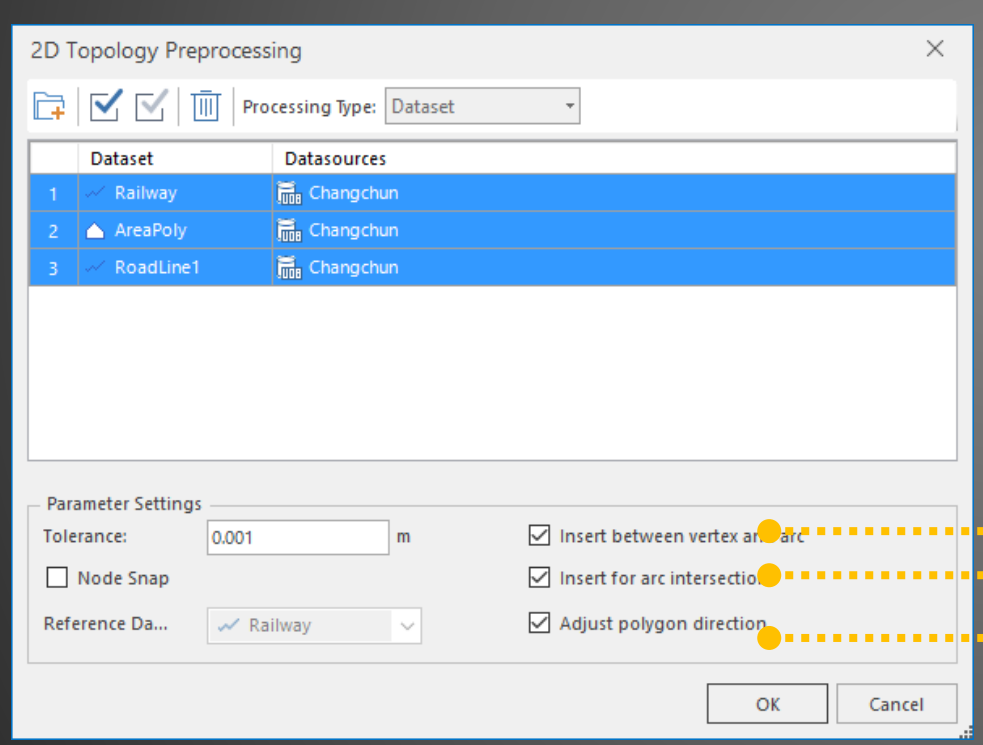
Construct a region dataset from a line dataset or a network dataset through topological processing.

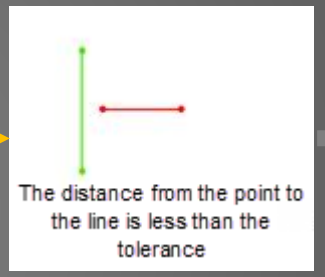


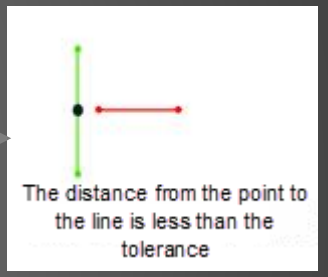


Topology Preprocessing

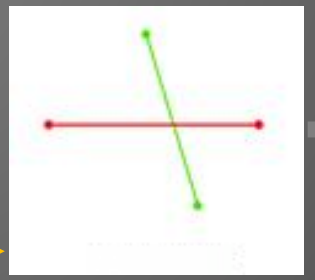
Before carrying out the topology check, it is necessary to carry on the topology preprocessing operation to adjust the problem data in the tolerance range. 2D topology preprocessing includes nodes insertion, nodes snapping, and the adjustment of the polygon direction.

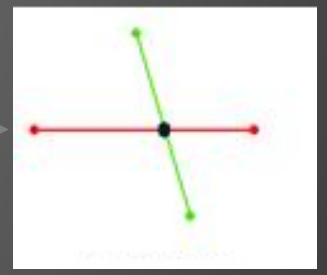




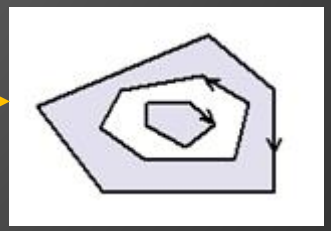


Nodes insertion





Nodes snapping



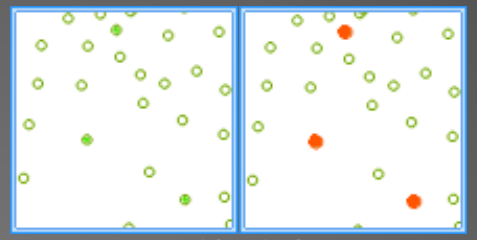
Adjustment of polygon direction

Topology Checking

SuperMap

Point 6

Must be covered by line

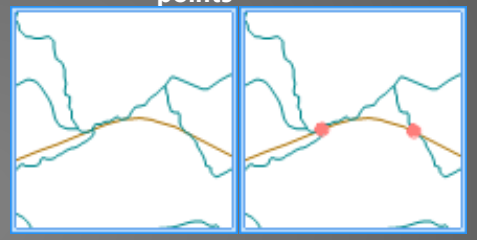


No identical points

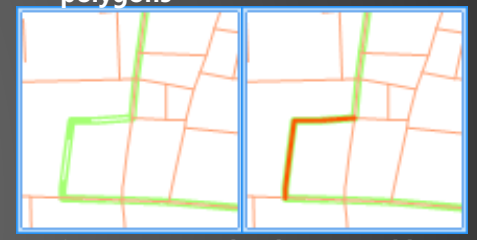
Must be properly inside polygons

Line 14

Must not intersect with the line itself

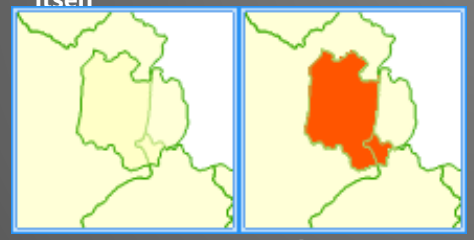


Must not intersect with each other

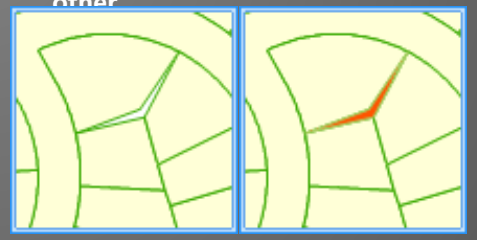


Lines are completely covered by multiple lines

Region 10



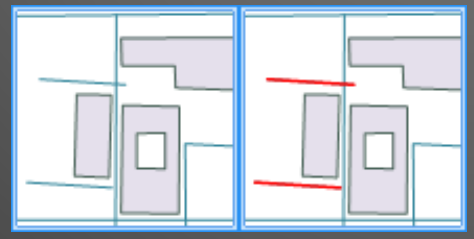
Must not overlap



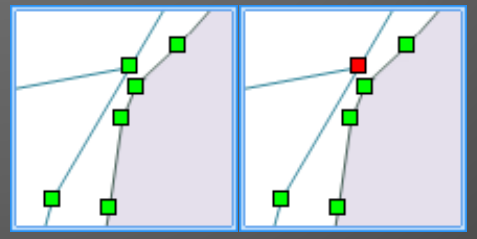
Must not have gaps

A region is covered by multiple regions

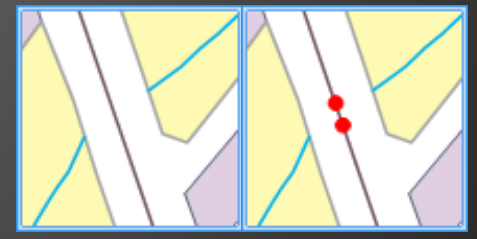
Others 5



Line or region must be single object



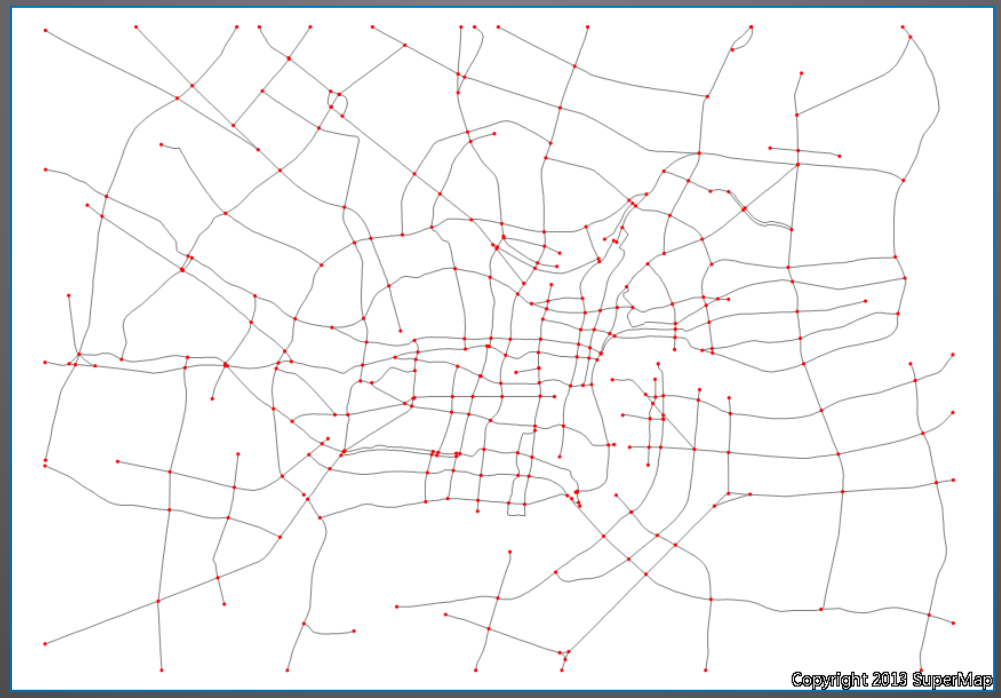
The Vertex Distance must be greater than the tolerance



Nodes must match with each other

Demo: Network by Topology

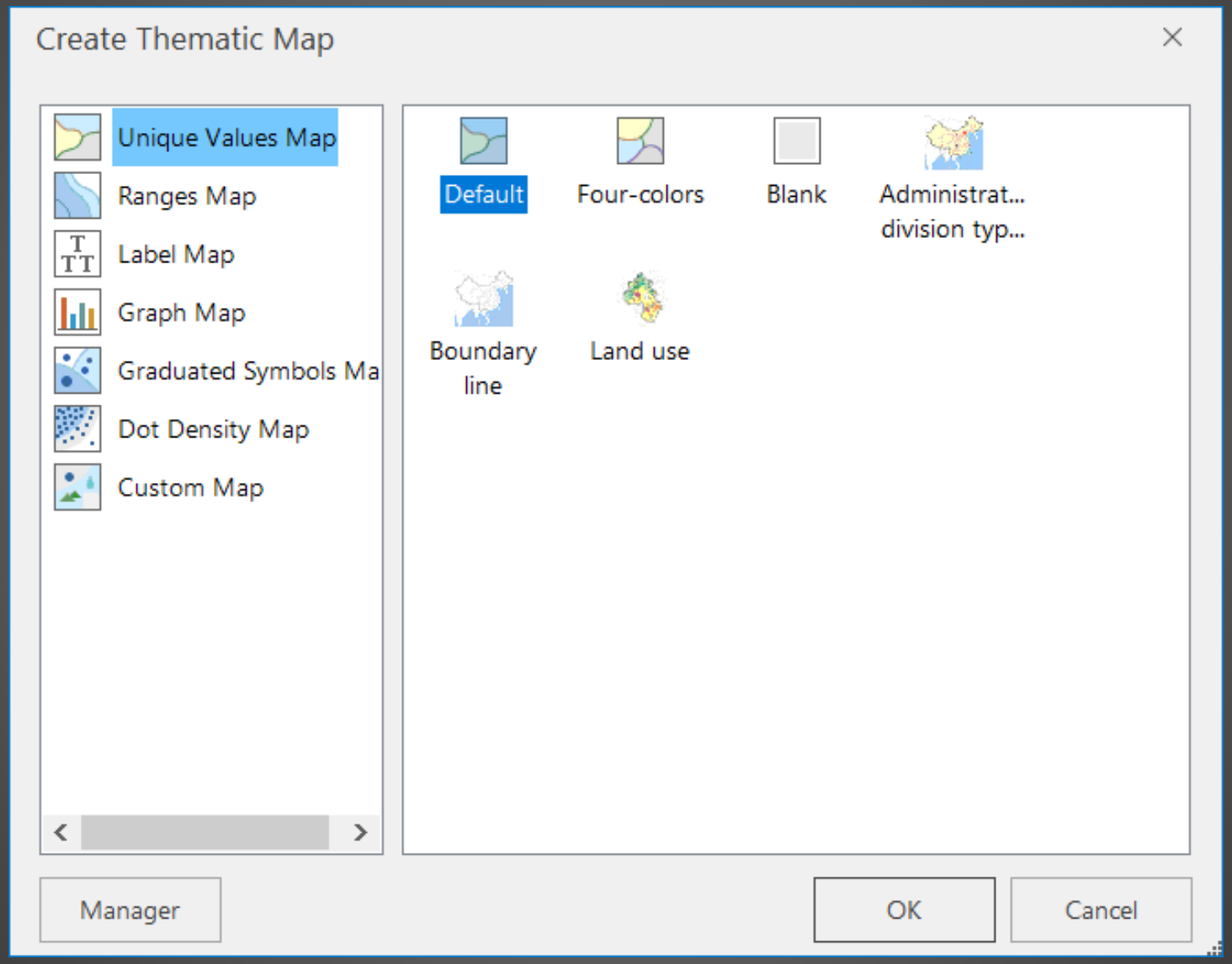
- What's network model?
  - A dataset contains not only arcs but also nodes, and topologic relationship exists between node-node, node-arc and arc-arc.
  - Network examples: The Traffic network, power transmission network, pipeline network.
  - Network dataset is used in Network Analysis



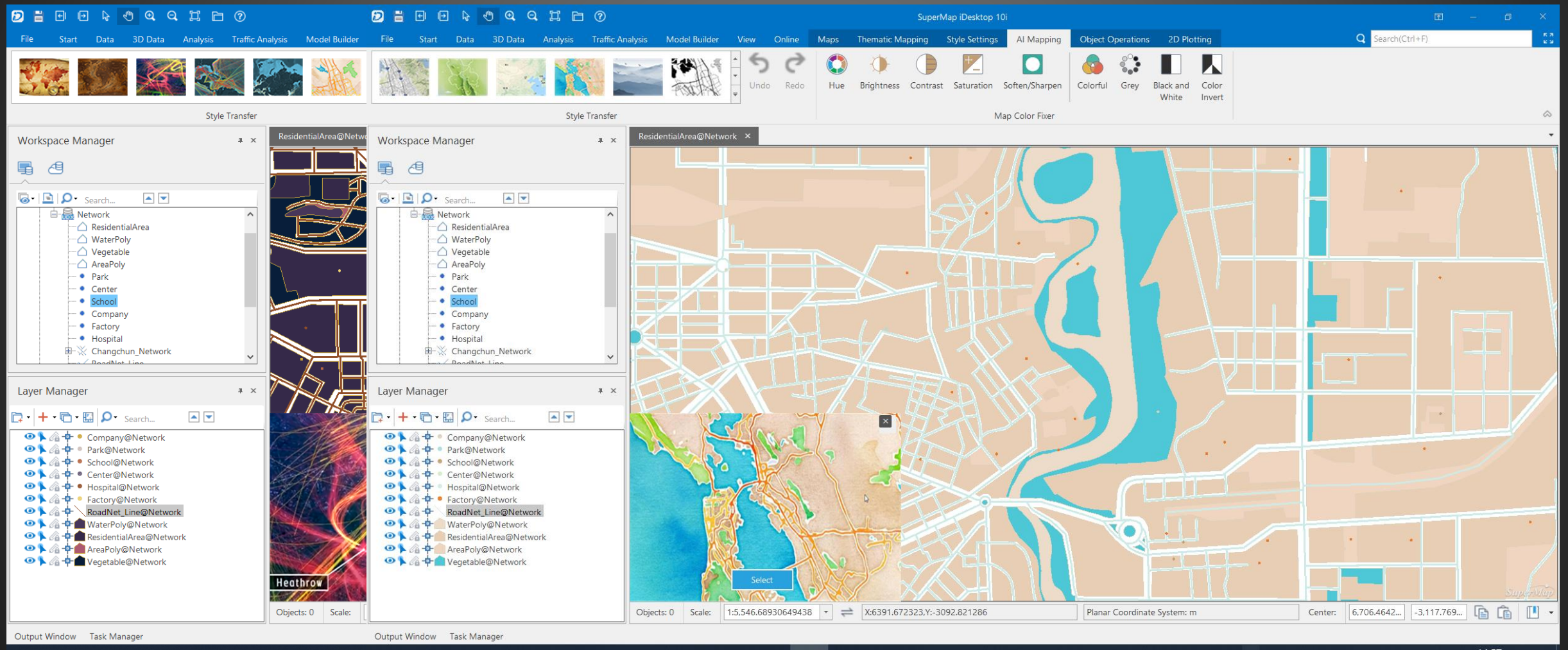
Mapping and Layout

Thematic map and symbolization

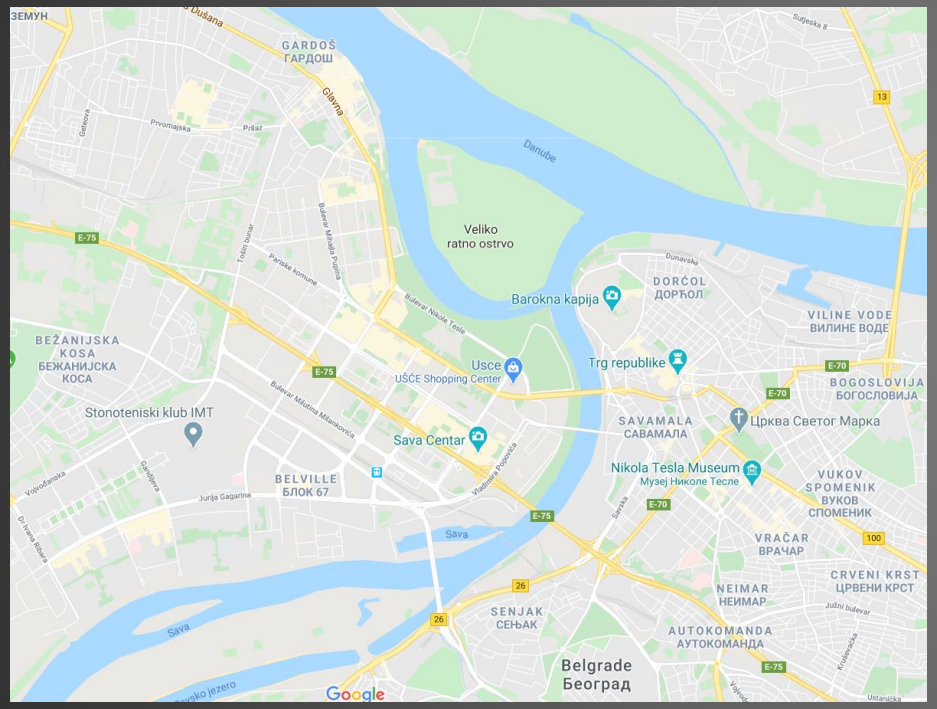
Demo: Creat Thematic Map

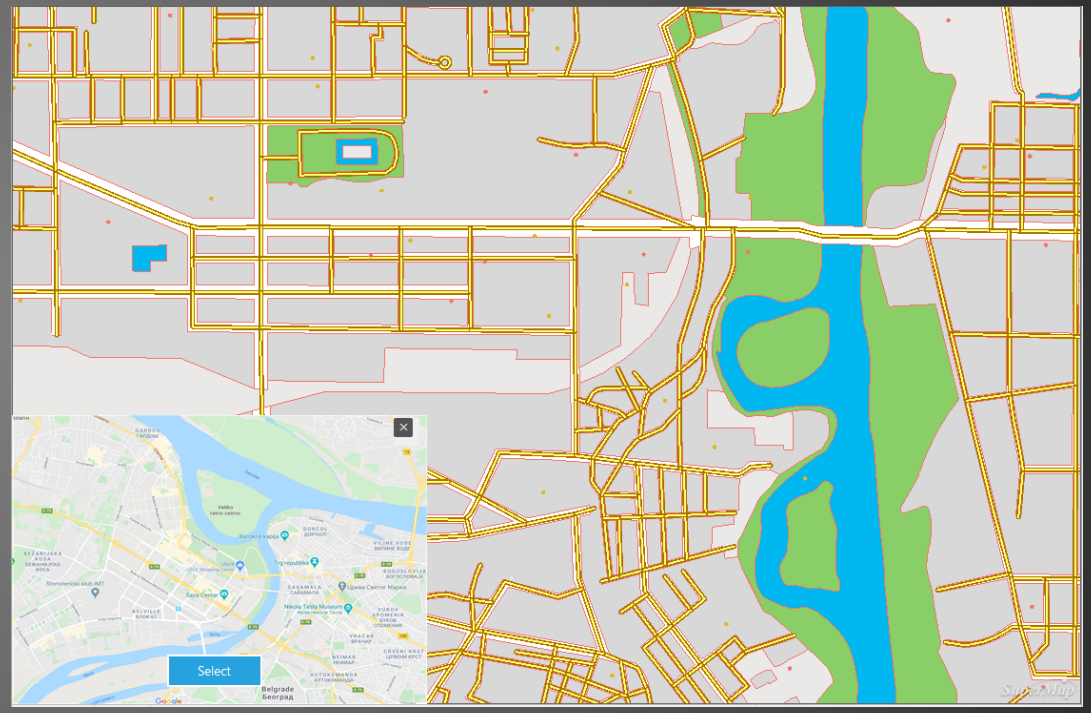


AI Mapping: Set colors Automatically



Demo: AI Mapping

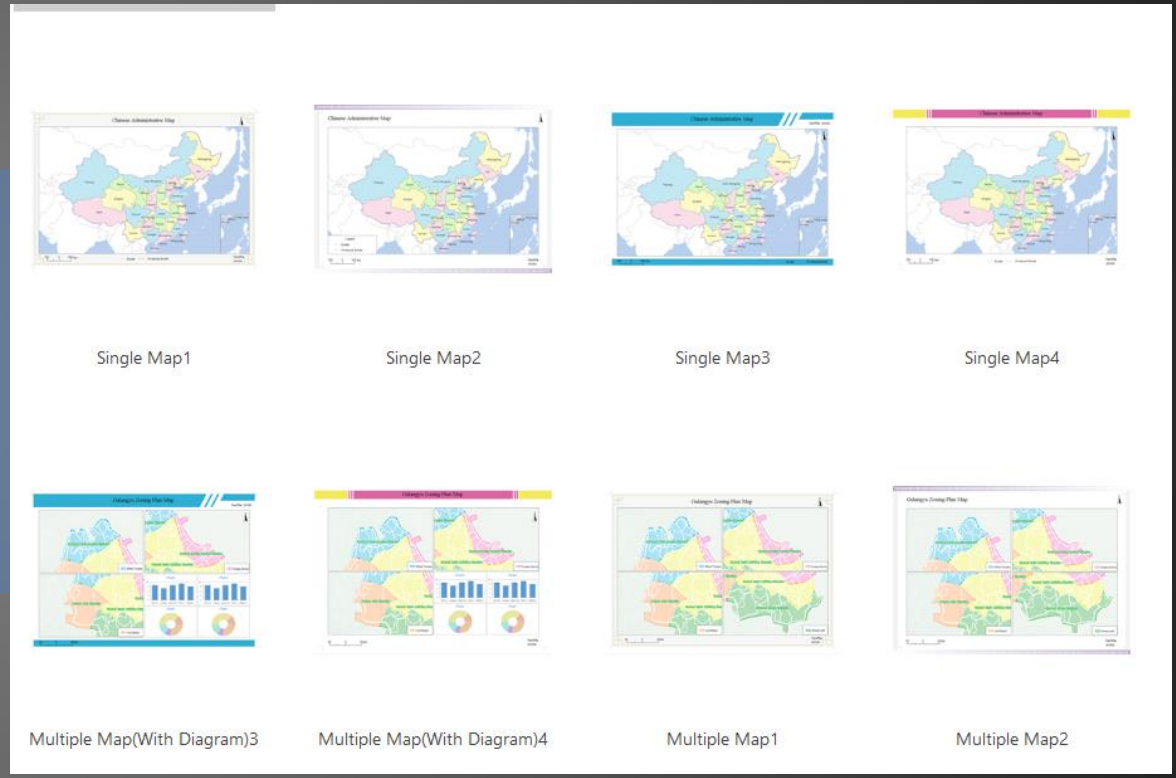




Google Maps

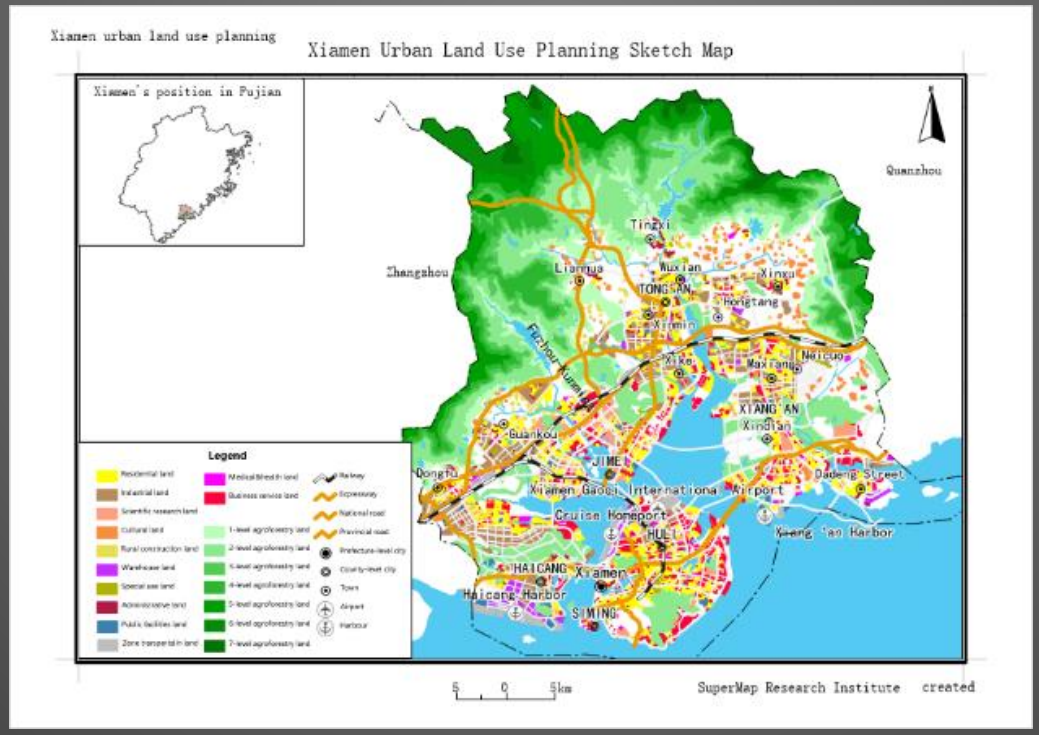
SuperMap

Map Layout and Printing



01 Map Layout and Printing

- **Map Layout** — to make our map more beautiful, professional, and readable, we can adopt different map layouts and add various elements according to the map type.
- **Printing**— For further use, a map can be exported as an image or a PDF file or printed out directly.



02 Map Layout

Based on the layout window, we can edit any element visually in a layout. Assign and place various contents such as maps, legends, scales, text and so on.

Page settings

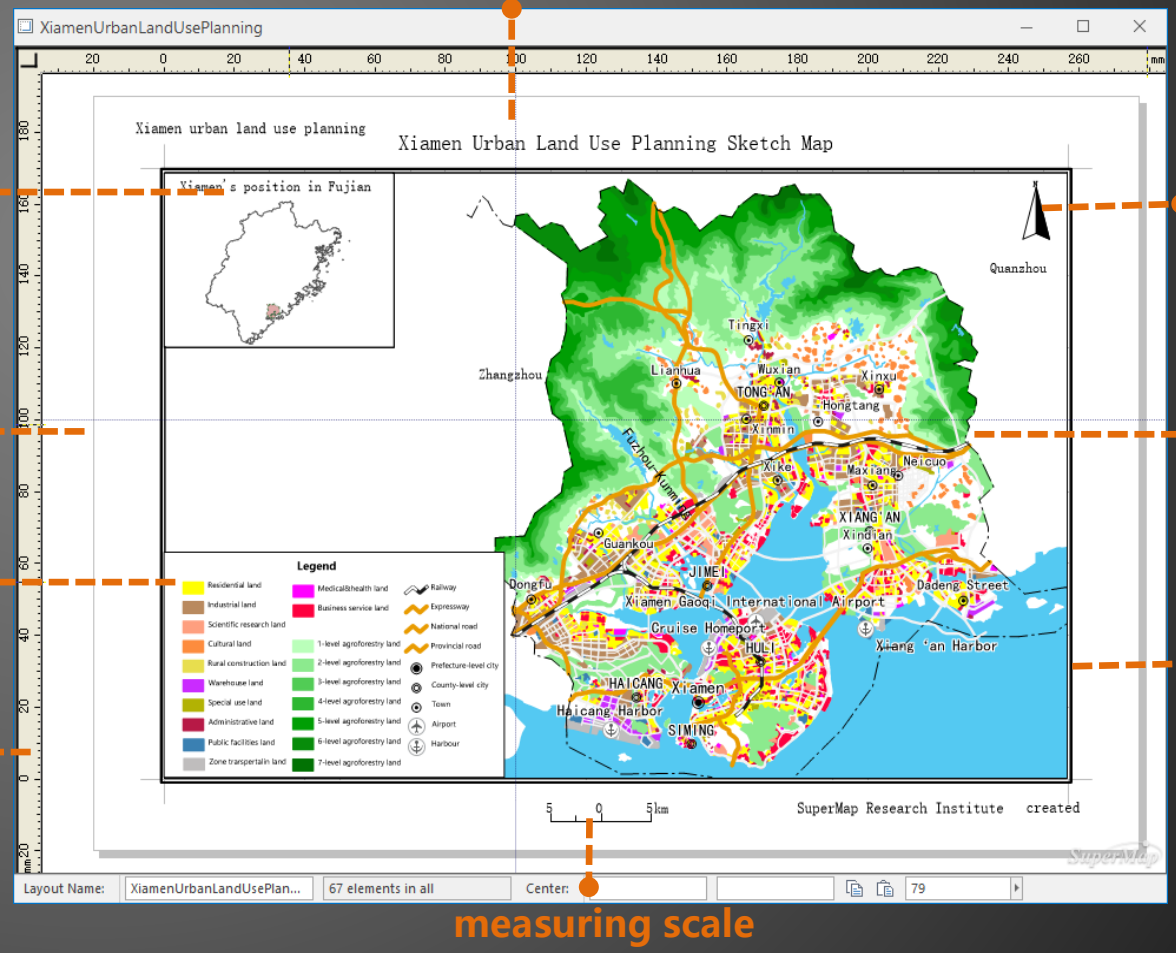
Vertical/horizontal page, page size, and margin

Layout properties

Scroll bar, grid, ruler line, and scale

Geometrical object drawing

The adding of image, table, diagram

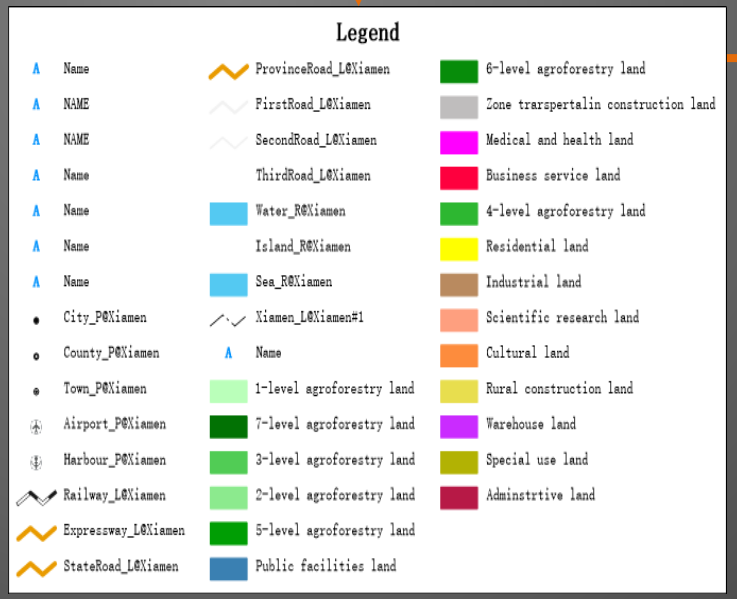


03 Legend

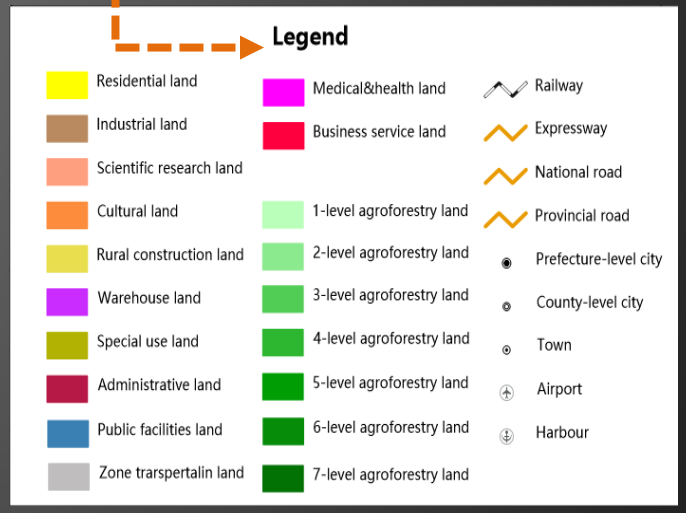
- Generate a legend base on a map to help us understand the meaning of each map feature.
- Modify the properties of a legend to make it fit the map theme information much better.

Legend properties:

- width/height
- position
- font
- visibilities of items/sub items



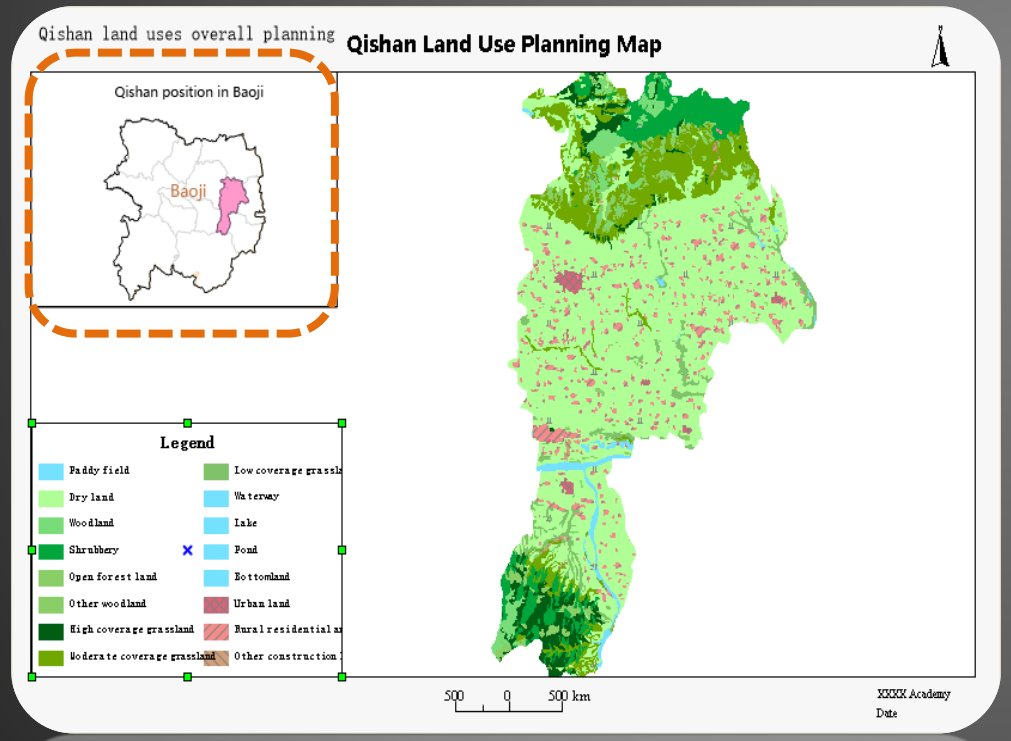
The default legend based on the map



The result legend after adjusting its properties

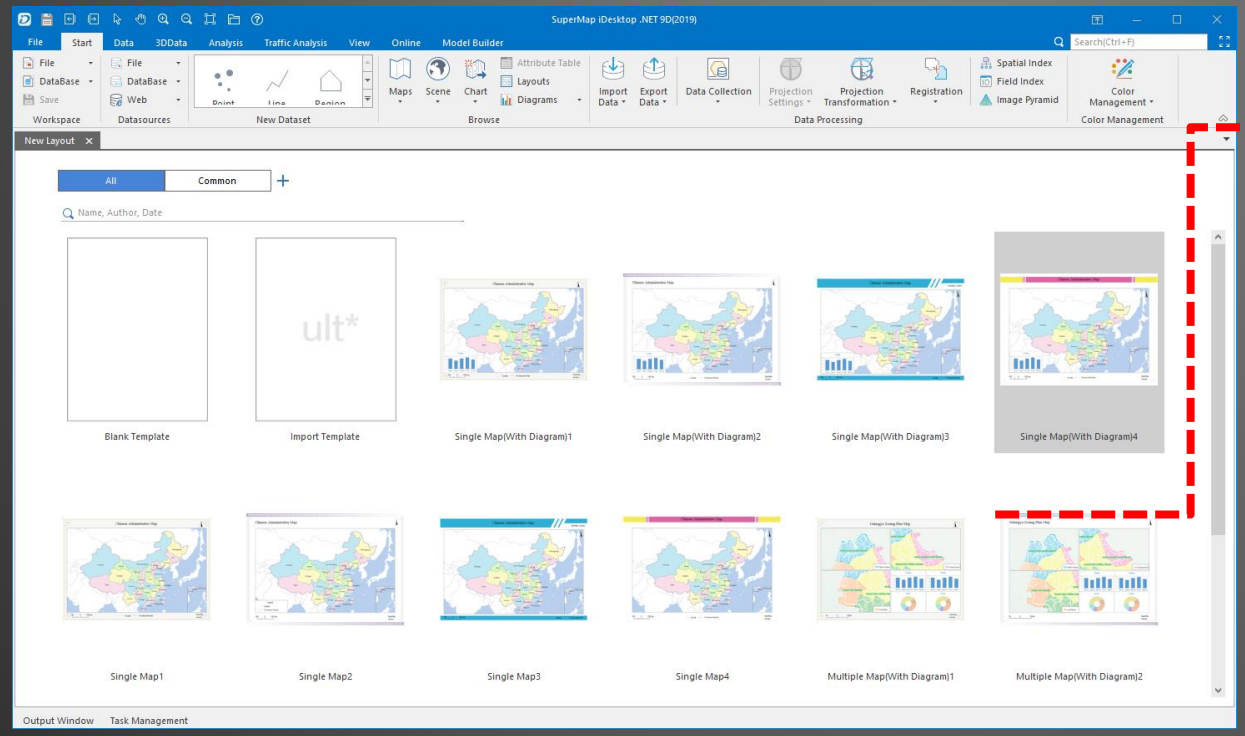
04 Layout——Overview Map

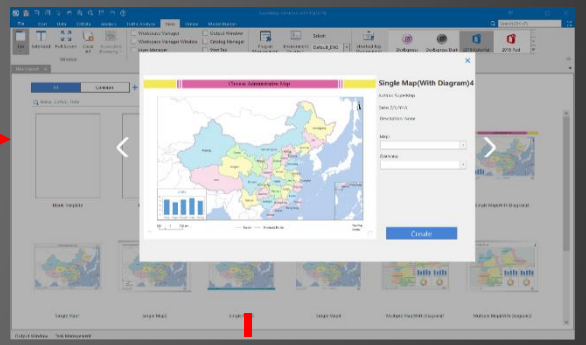
- Add an overview map in a layout to view the position of a map in a larger area.
- Add a map illustration to rich the contents of a map layout contents and to make a map layout more resonable.

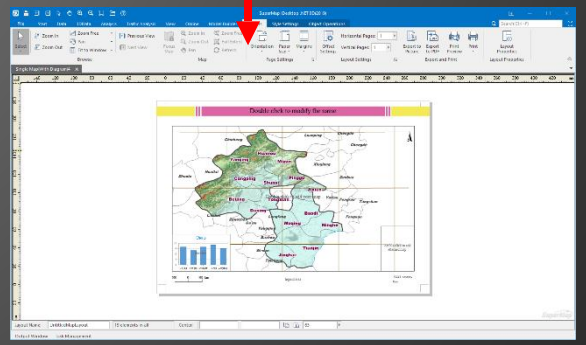


05 Quickly Making a Map Layout

- Up to 27 abundant layout templates including universal and land-use planning templates are provided.
- The predefined formats are saved in layout templates, which is convenient for the creation and reusing of standardized layouts.







06 Template Management

Fully featured tools makes the using and management of layout templates more easily.

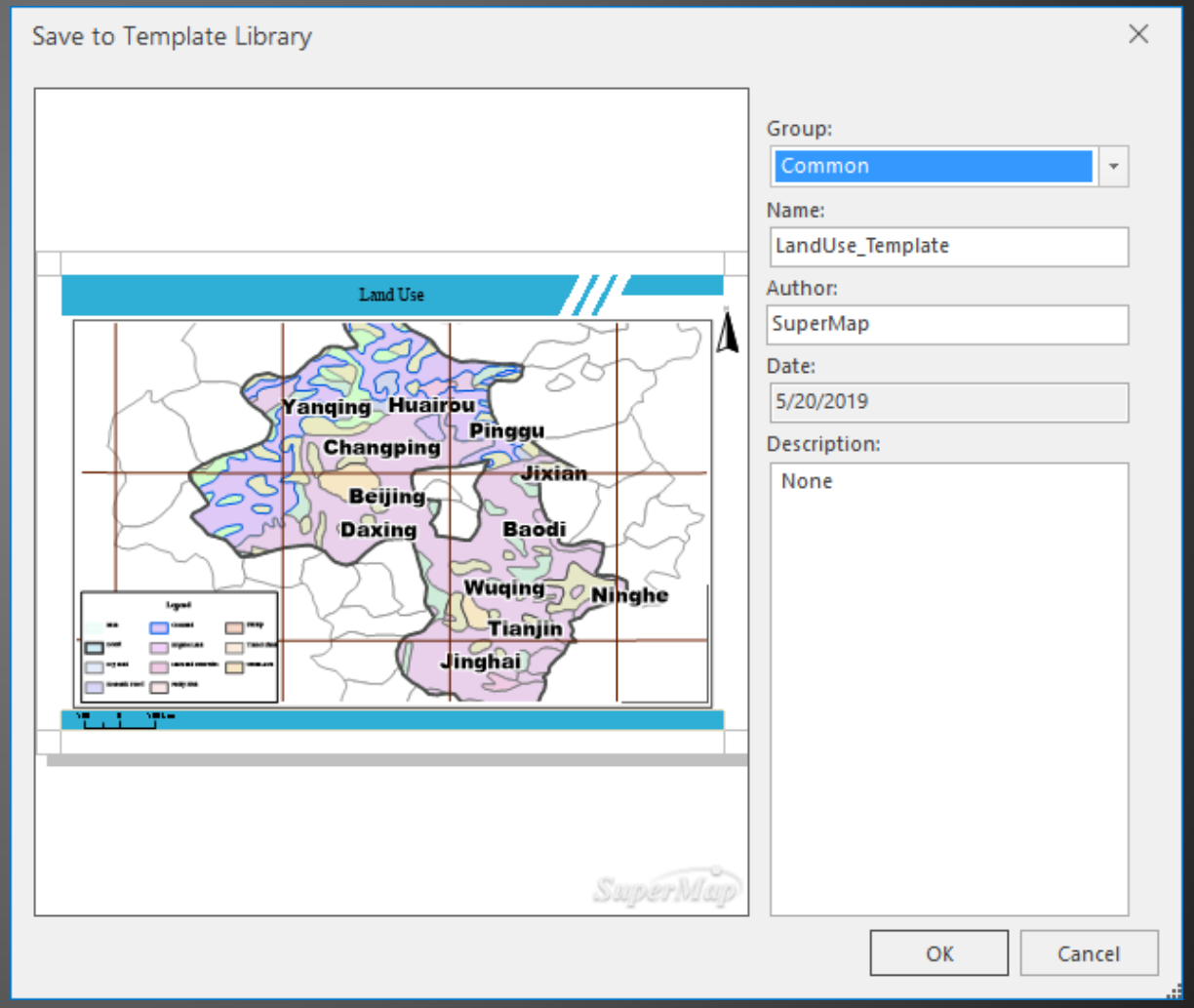
1 **Edit a layout template**

Modify its name, author, and description

2 **Import/export a layout template**

Import an existing template to create a layout quickly.
Export a template for further use.

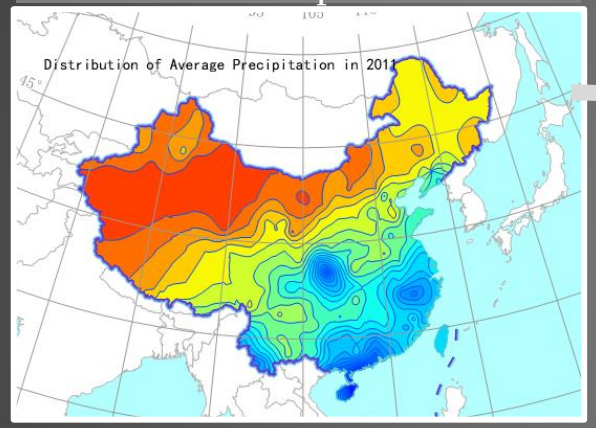
3 **Group layouts**



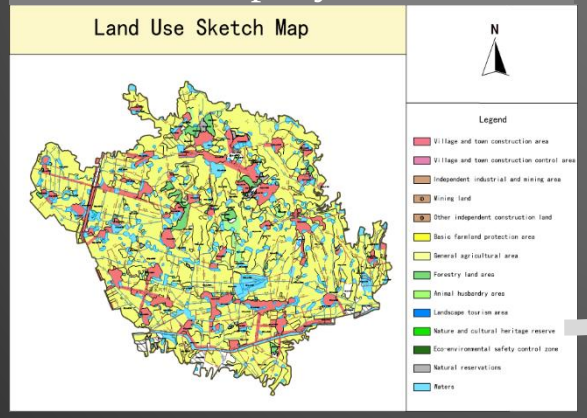
07 Output and Printing

Output a map layout as an image (JPG, PNG, bit map, or tiff and so on) or a PDF file.

Map



Map layout



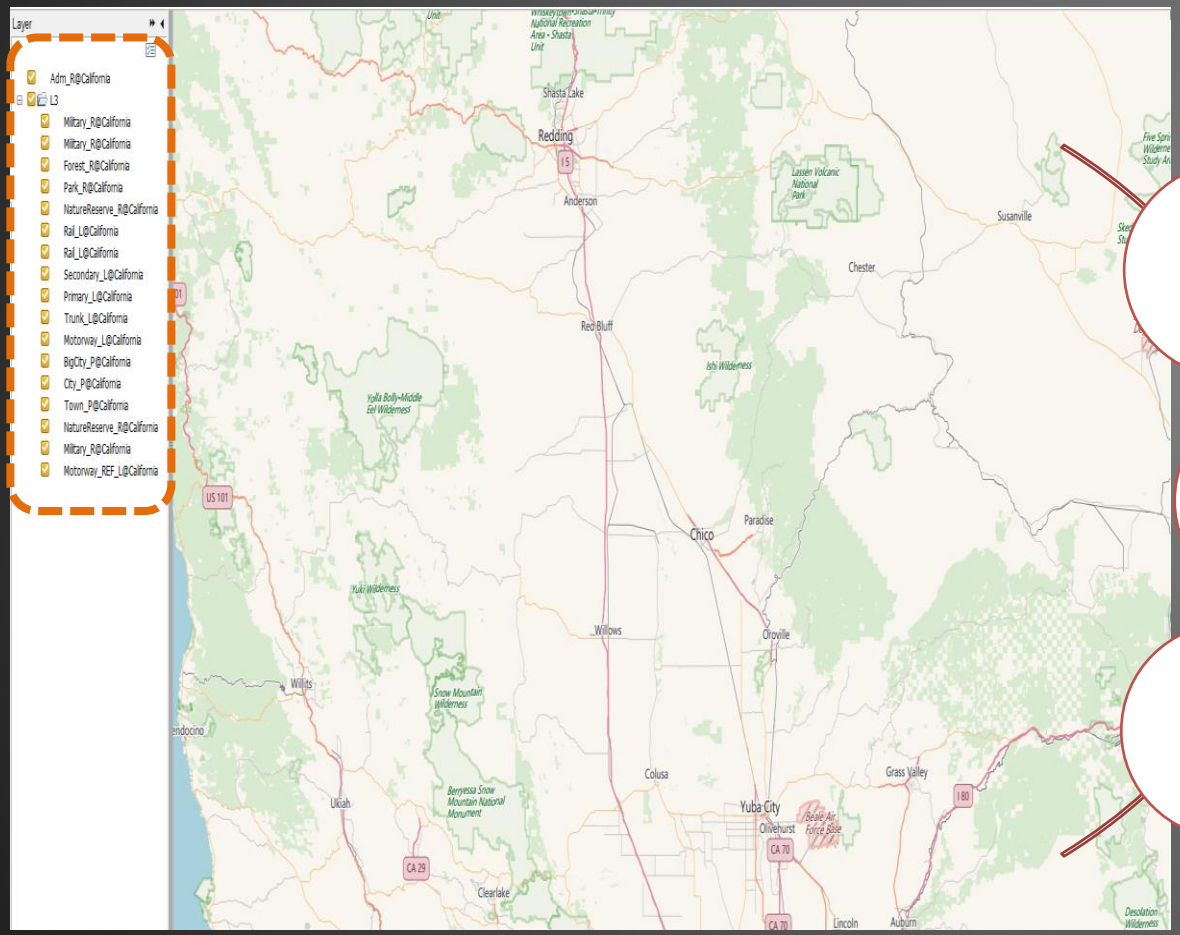
1 Image

- Format: PNG, JPG, BMP, TIFF.....
- Output resolution (DPI) setting
- Paging setting

2 PDF

0 8 Output a layout as a PDF file

Both a map and a layout can be output as a PDF file, thereby sharing them to a non-GIS user more conveniently.



1. Retained the layer tree structure, layers' names, and the visibility control of layers
2. Kept the vector graphs and text. We can edit some vector elements and words using a PDF editor.
3. Supported setting the output DPI to obtain a high-quality map material.

SuperMap

PART 03

Q & A Part

Homework – Make a Map

Requirements:

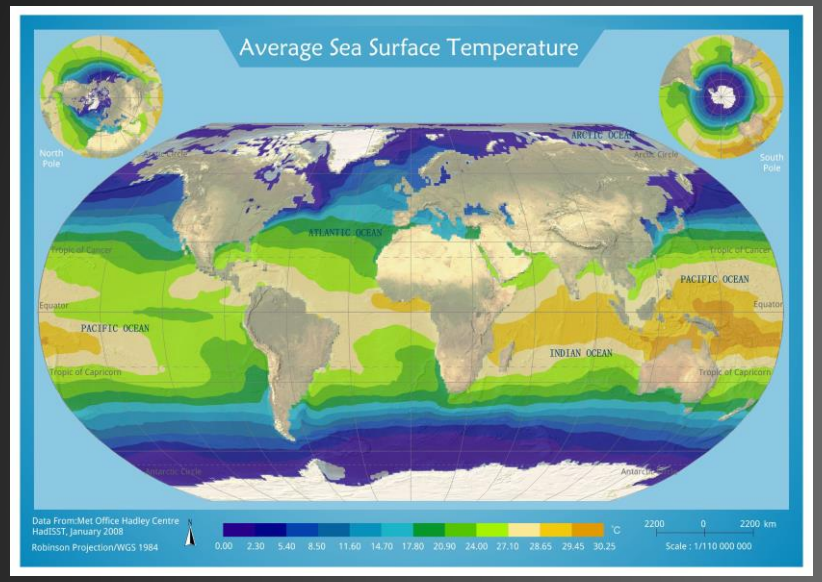
1、Use data from your country.

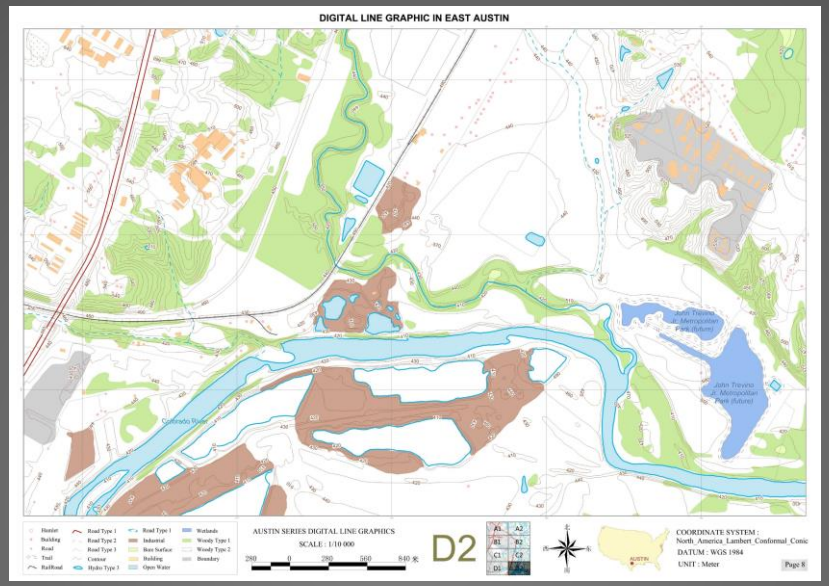
2、Contain at least point, line and area features.

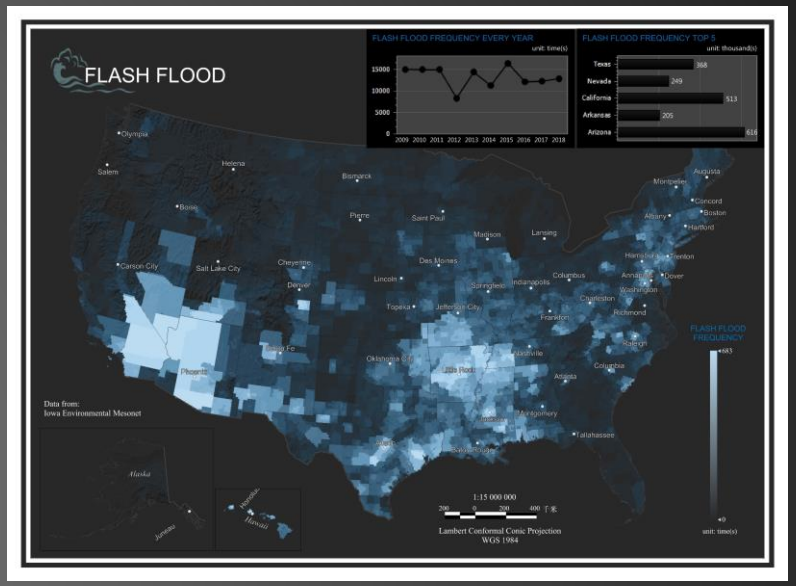
3、Symbolized and with beautiful colors.

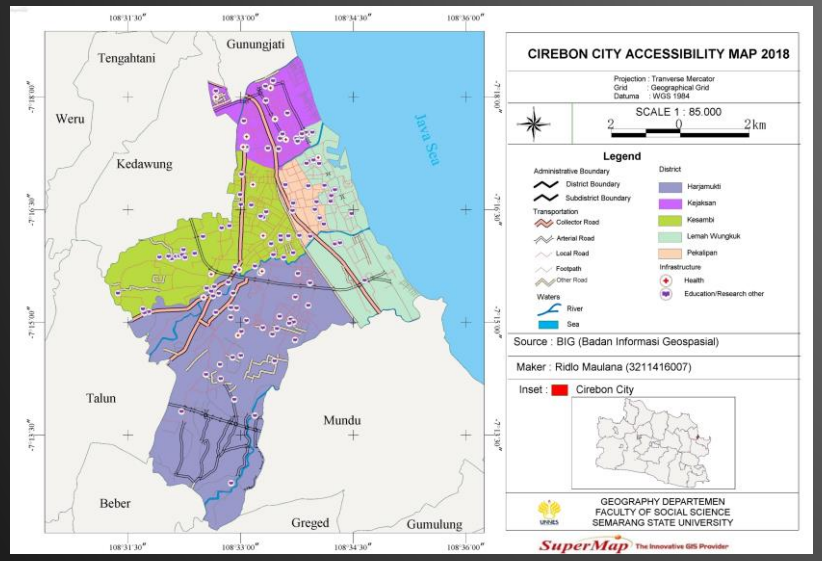
4、Contains basic elements of cartography: Title, Legend, Scale, Compass

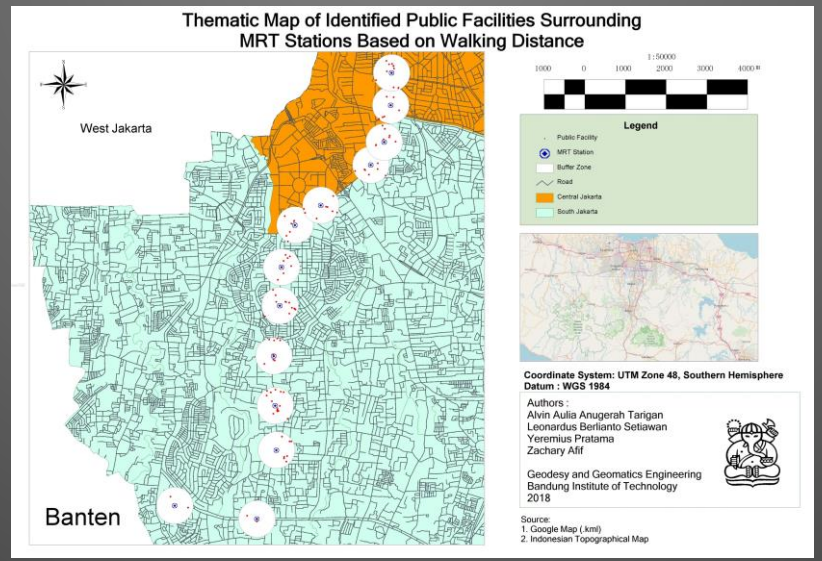
Come and create your work

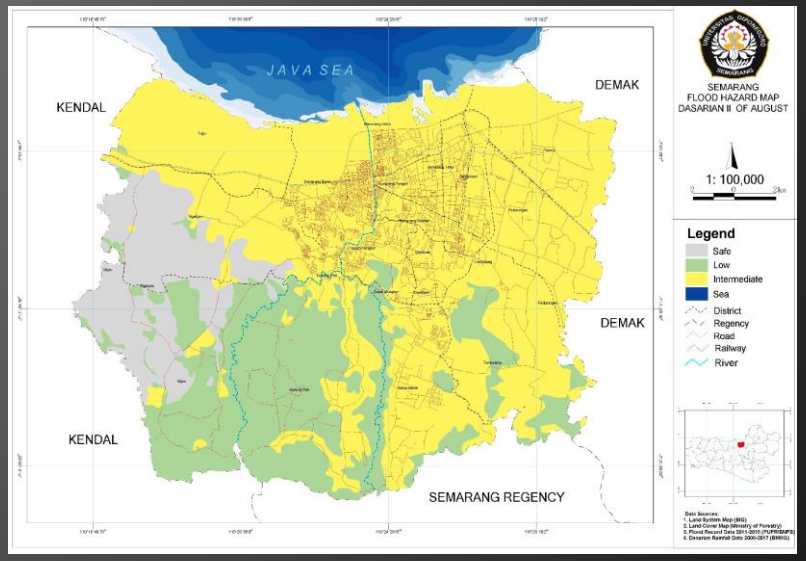













SuperMap
Thank You !