

Buffer & Overlay Analysis

SuperMap Software Co., Ltd.



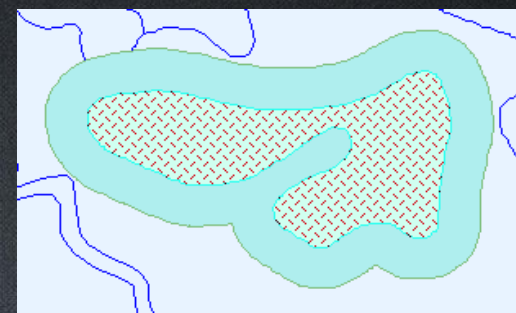
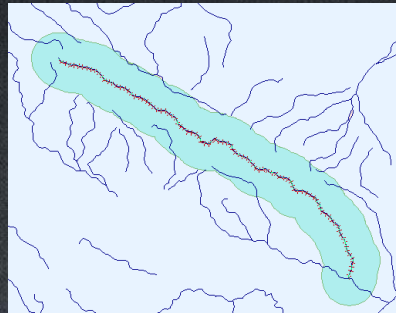
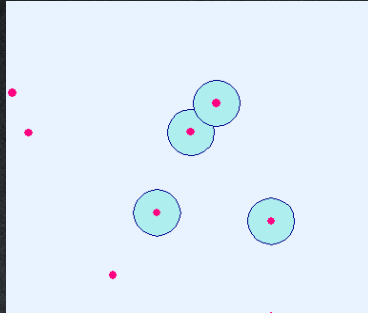
TO BE THE GLOBAL LEADING GIS

Course Overview

- Buffer Analysis
 - Create Buffer for Selections/ Dataset
 - Create Multiple Ring Buffer
- Overlay Analysis
 - Clip
 - Erase
 - Intersect
 - Union
 - Identity
 - XOR
 - Update

Buffer Analysis

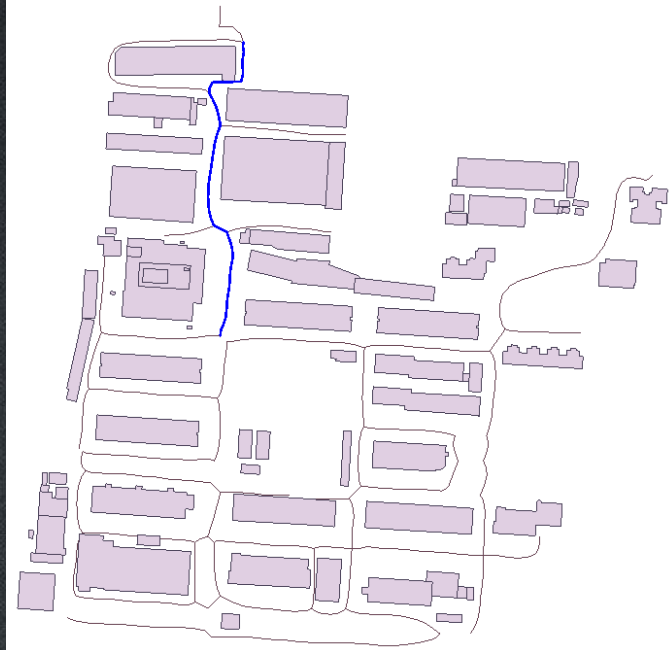
- What is buffer ?
 - The extension space created around a given object, such as a point, a line, or a polygon.



- Application Examples:
 - Create buffer for the selected road line and then use the buffer result to query residential buildings intersect with the buffer region.
 - Get affected region around some dangerous spots.
 - What neighborhoods will be affected by the flood?

Create Buffer for Selection

- Create buffer for point, line, or region.
- The left and right buffer radius can be different for lines.
- Union Buffer can dissolve the left and the right buffer space.
- The buffer end type for lines can be round or flat.



Create Buffer

Data Type: ☐ Point and Region ☒ Line

Buffer

Datasource: RoadExpand

Dataset: Road

☒ Selected Objects Only

Result Settings

☒ Union Buffer ☐ Keep Attributes

☒ Display In Map ☐ Display On Scene

Semicircle Segments: 100

Result Data

Datasource: RoadExpand

Dataset: Buffer

Buffer Type

☐ Round ☒ Left ☒ Right

☒ Flat

Buffer Radius

Unit: m

☒ Numeric

Left Radius: 8

Right Radius: 8

☐ Field

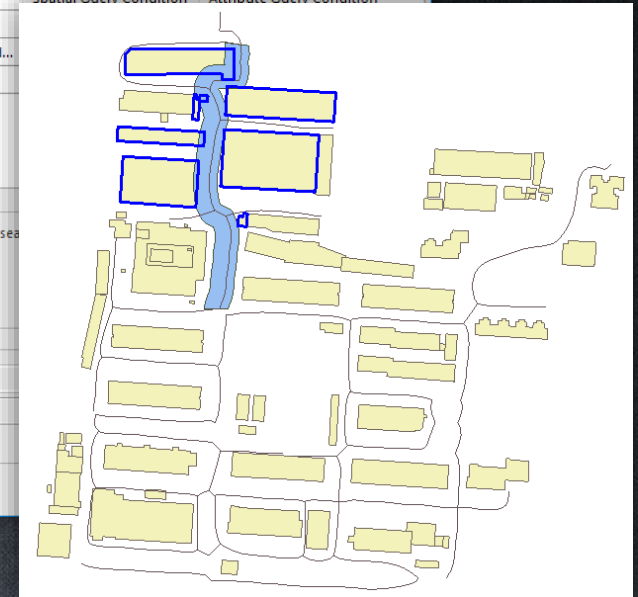
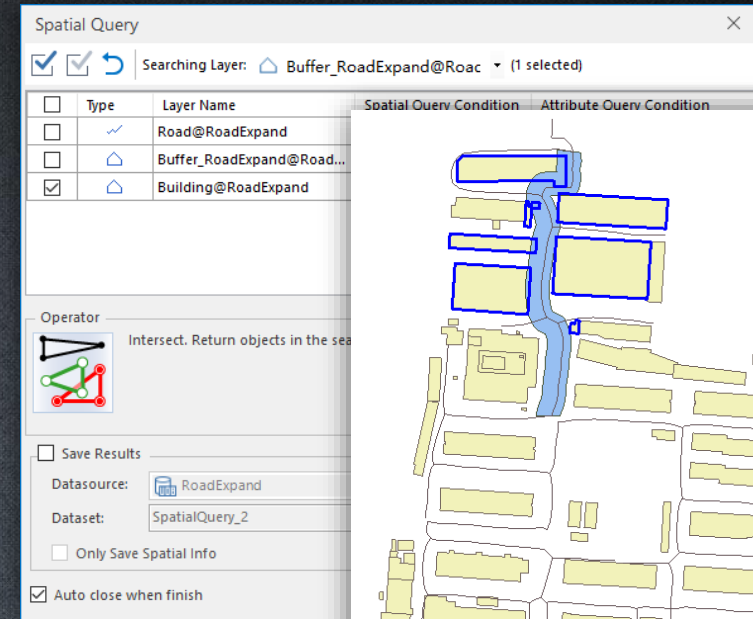
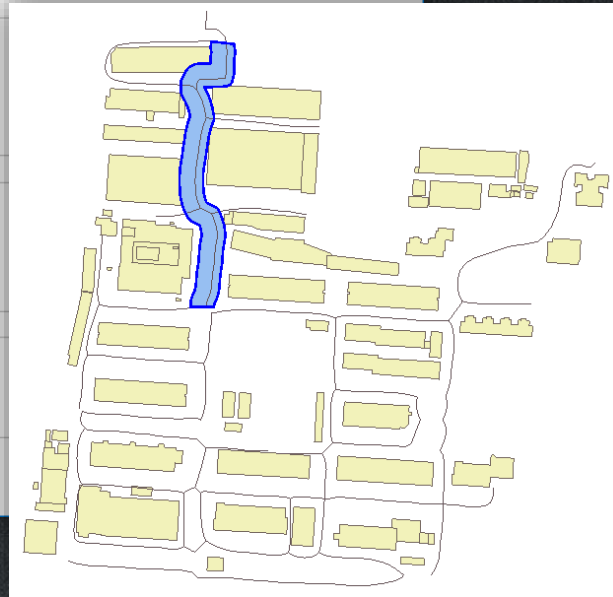
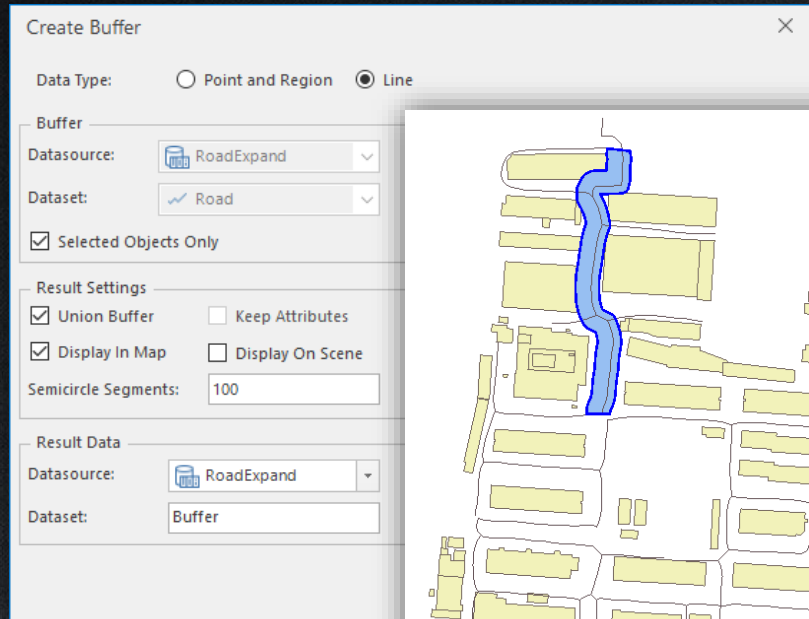
Left Radius: SmUserID

Right Radius: SmUserID

OK Cancel

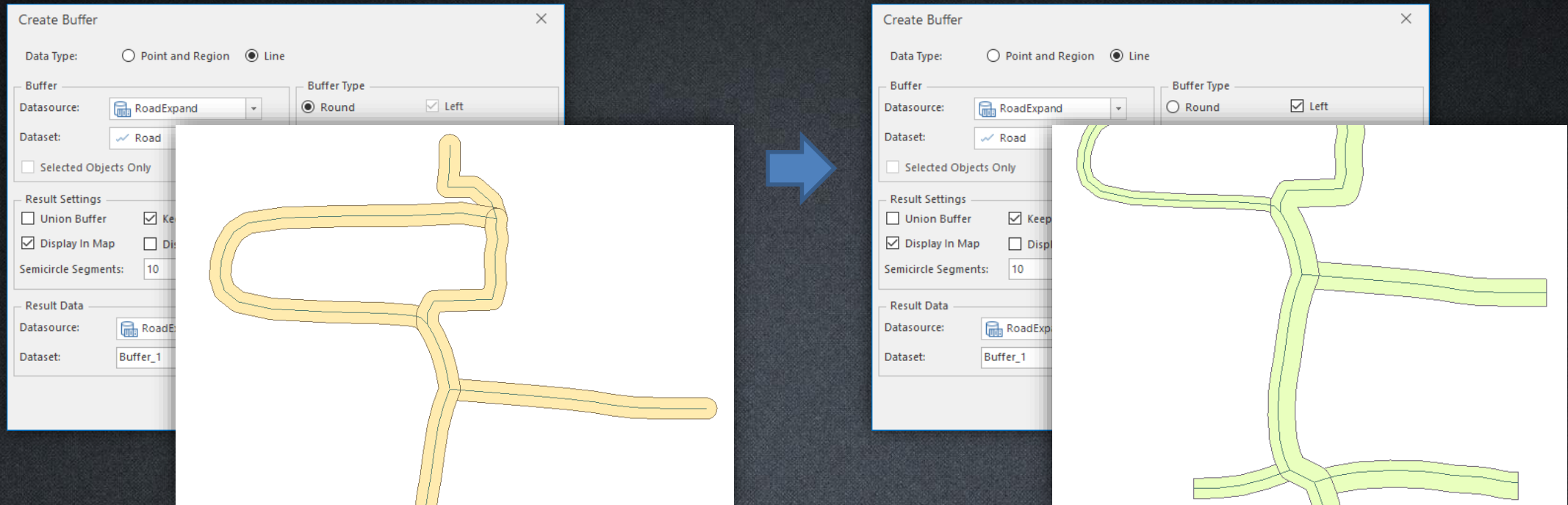
Exercise:

- Find buildings that will need to be demolished due to the expansion of a road.
- Use spatial query to get the affected buildings.



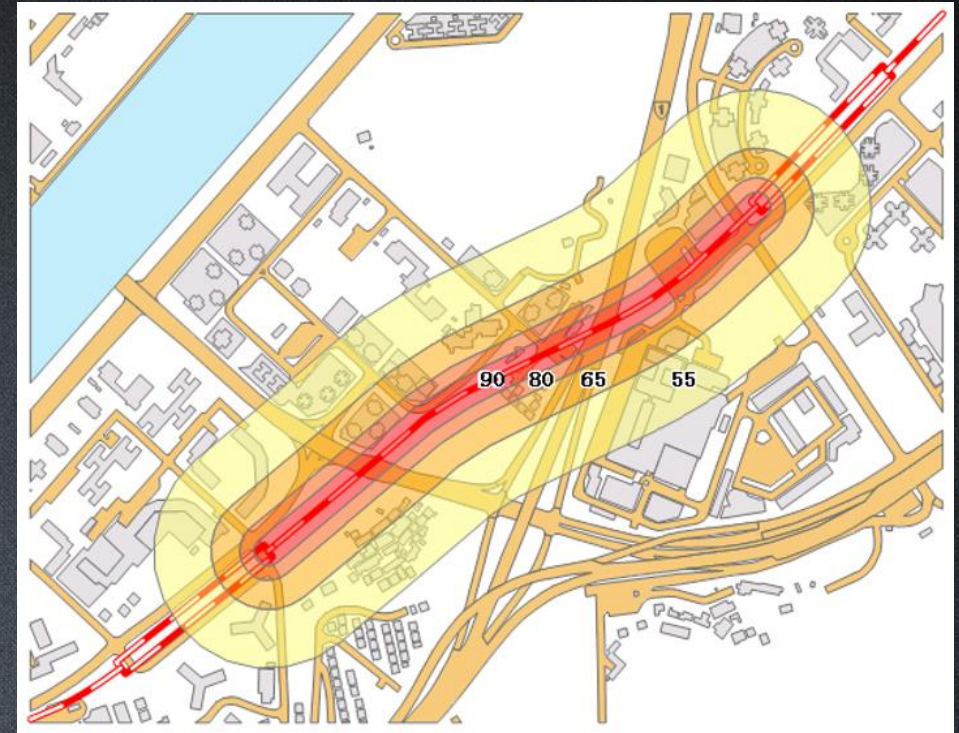
Create Buffer for Dataset

- Generate buffer region dataset for a road dataset.
- Compare Round & Flat buffet type, Numeric & Field buffer radius.



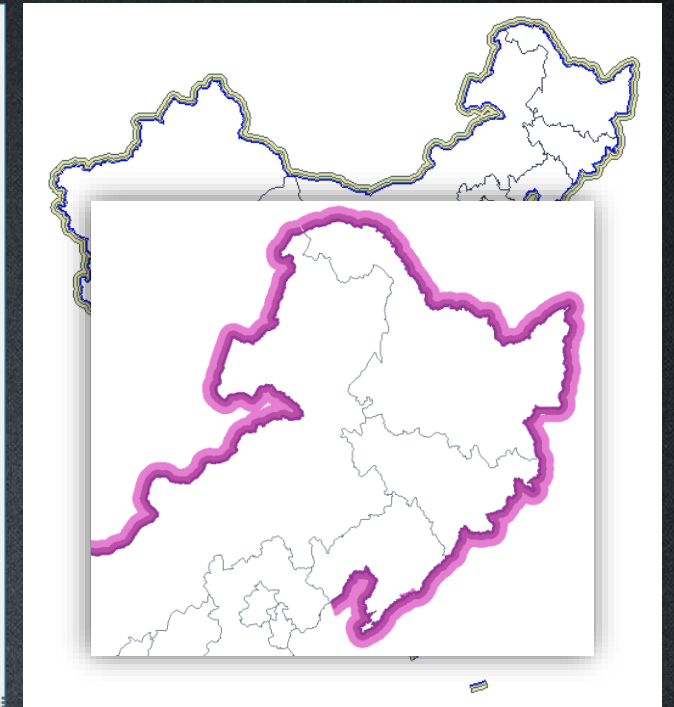
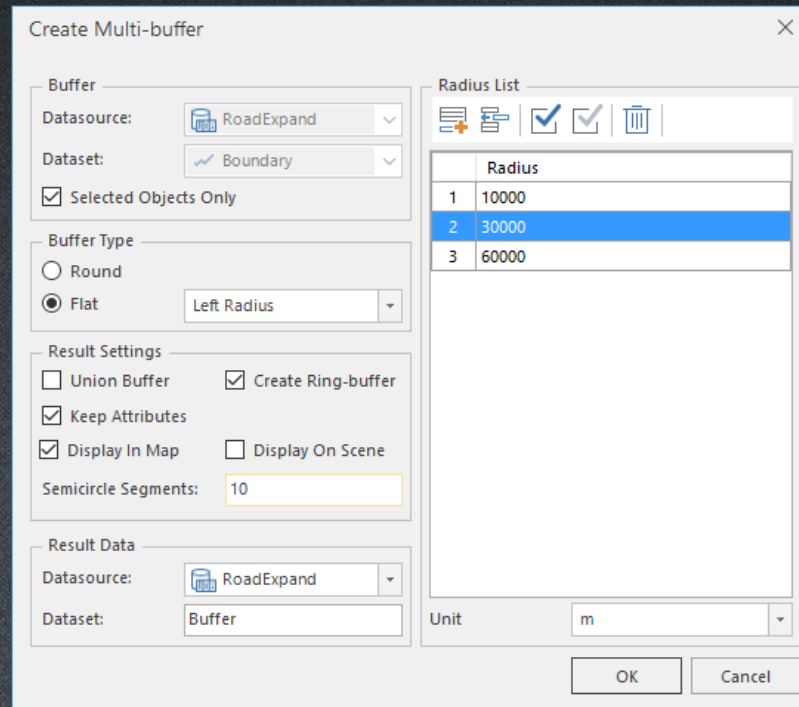
Create Multi-Buffer Zone

- Create multi-buffer zone for a railway line to analyze different levels of noise affection to the residential areas nearby.
- Create multi-buffer zone
 - Point, line, or region dataset
 - Several buffer radius



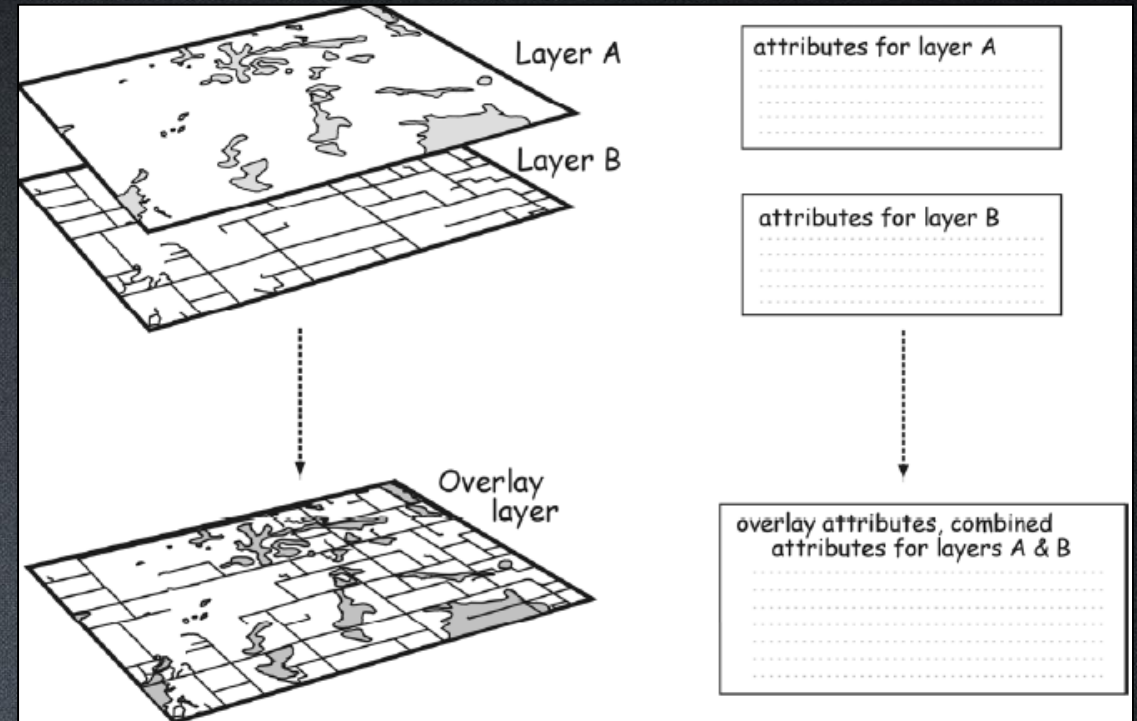
Exercise:

- Create gradient effects for country boundary(id=10), and make a unique map for the buffer result dataset.



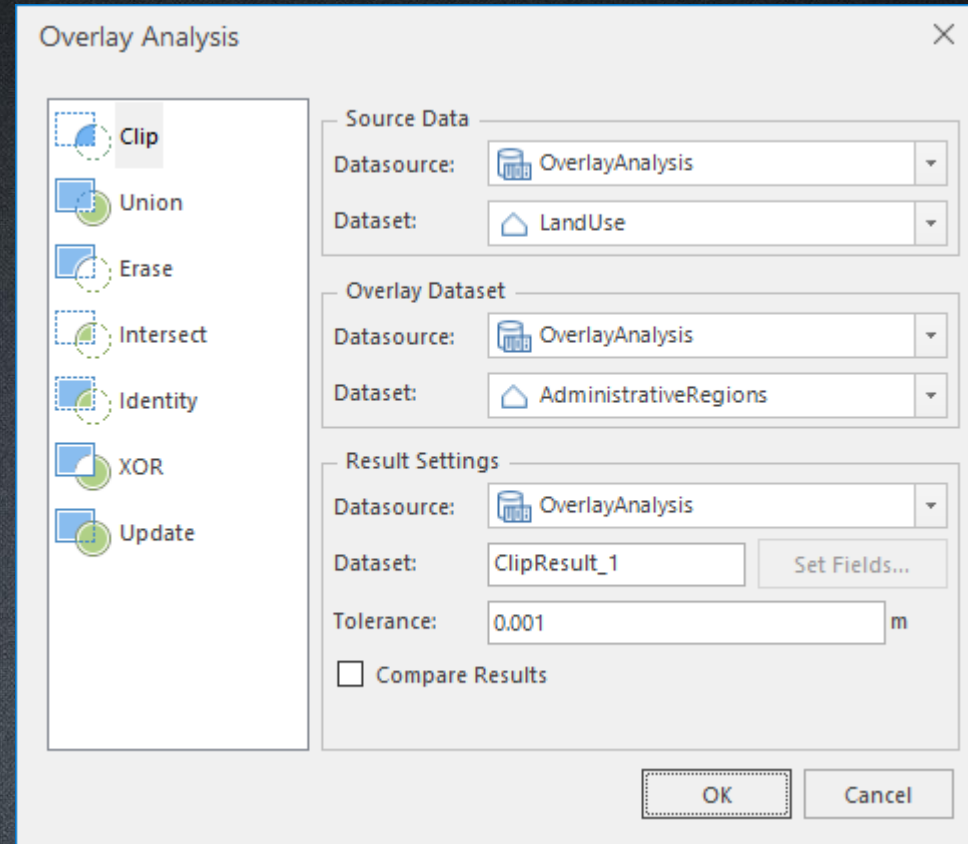
Overlay Analysis

- What's Overlay?
 - The operation of comparing variables between two datasets.
- Application Examples
 - Find out the lake distribution of a certain province.
 - With the land use data in two years, we can get the land use changed areas in these two years using Symmetrize.
 - With land use data and recovering forest distribution data, we can get the new land use data after recovering using Update.



Overlay Analysis

- Overlay mode
 - Clip
 - Erase
 - Intersect
 - Union
 - Identity
 - XOR
 - Update



Clip

- Exercise: get land use data of Liuzhuang Village.

The diagram illustrates the 'Clip' operation in a GIS software. It shows a 'Clipped Dataset' (a network of lines) and a 'Clip Dataset' (an irregular polygon shape). An arrow points from these two datasets to a 'Result' box, which contains the clipped network. To the right, the 'Overlay Analysis' dialog box is shown. It has a left sidebar with icons for 'Clip', 'Union', 'Erase', 'Intersect', and 'Identity'. The 'Clip' option is selected. The 'Source Data' section has 'Datasource' set to 'OverlayAnalysis' and 'Dataset' set to 'LandUse'. The 'Overlay Dataset' section has 'Datasource' set to 'OverlayAnalysis' and 'Dataset' set to 'LiuzhuangVillage'. The 'Settings' section has 'Source' set to 'OverlayAnalysis', 'ClipResult_1' selected, and a 'Set Fields...' button. The 'Tolerance' is set to '0.001 m'. There are 'OK' and 'Cancel' buttons at the bottom. To the right of the dialog box is a map showing the result of the clip operation: a network of lines (roads or rivers) overlaid on a land use map (colored in shades of green and yellow). The 'SuperMap' logo is visible in the bottom right corner of the map area.

Overlay Analysis

Clip

Union

Erase

Intersect

Identity

Source Data

Datasource: OverlayAnalysis

Dataset: LandUse

Overlay Dataset

Datasource: OverlayAnalysis

Dataset: LiuzhuangVillage

Settings

Source: OverlayAnalysis

ClipResult_1

Set Fields...

Tolerance: 0.001 m

Compare Results

OK

Cancel

Clipped Dataset

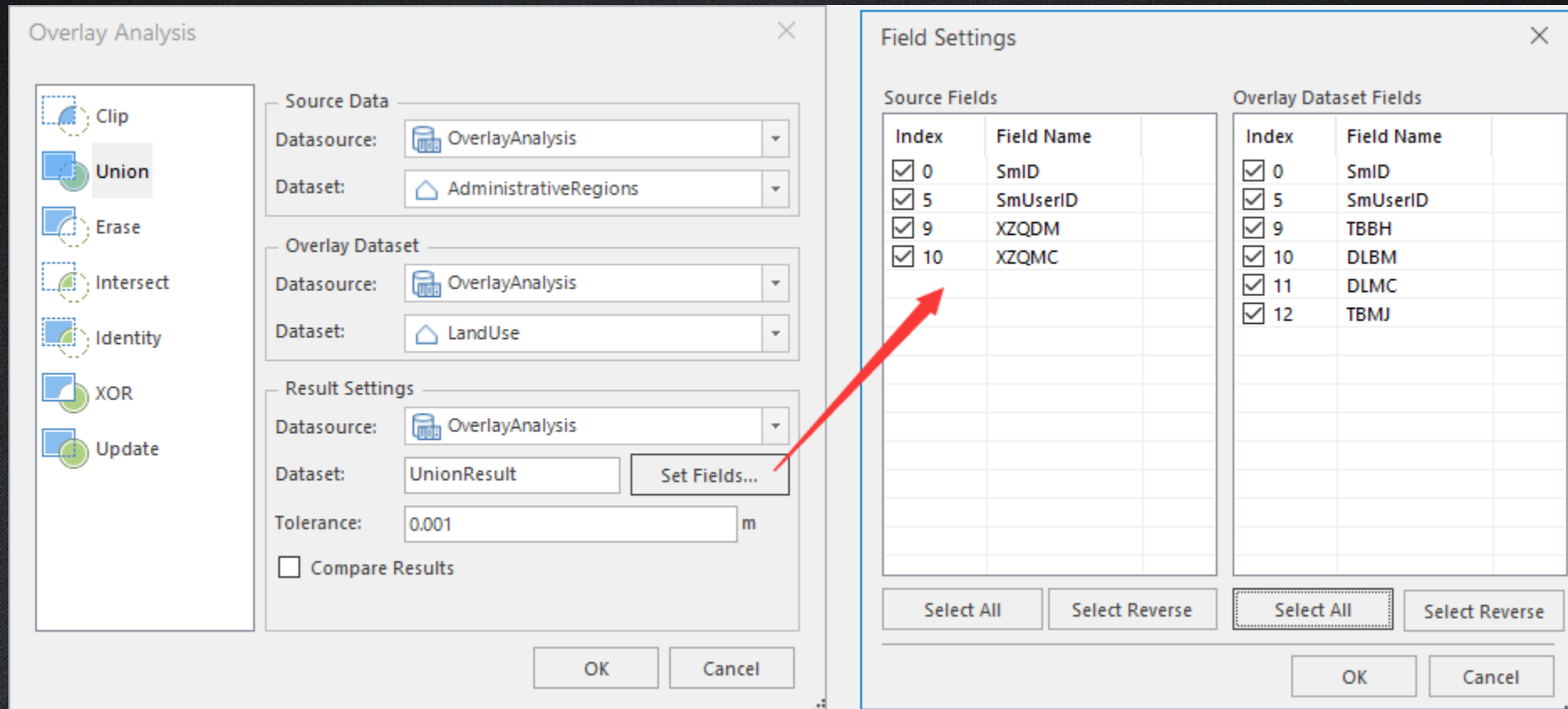
Clip Dataset

Result

SuperMap

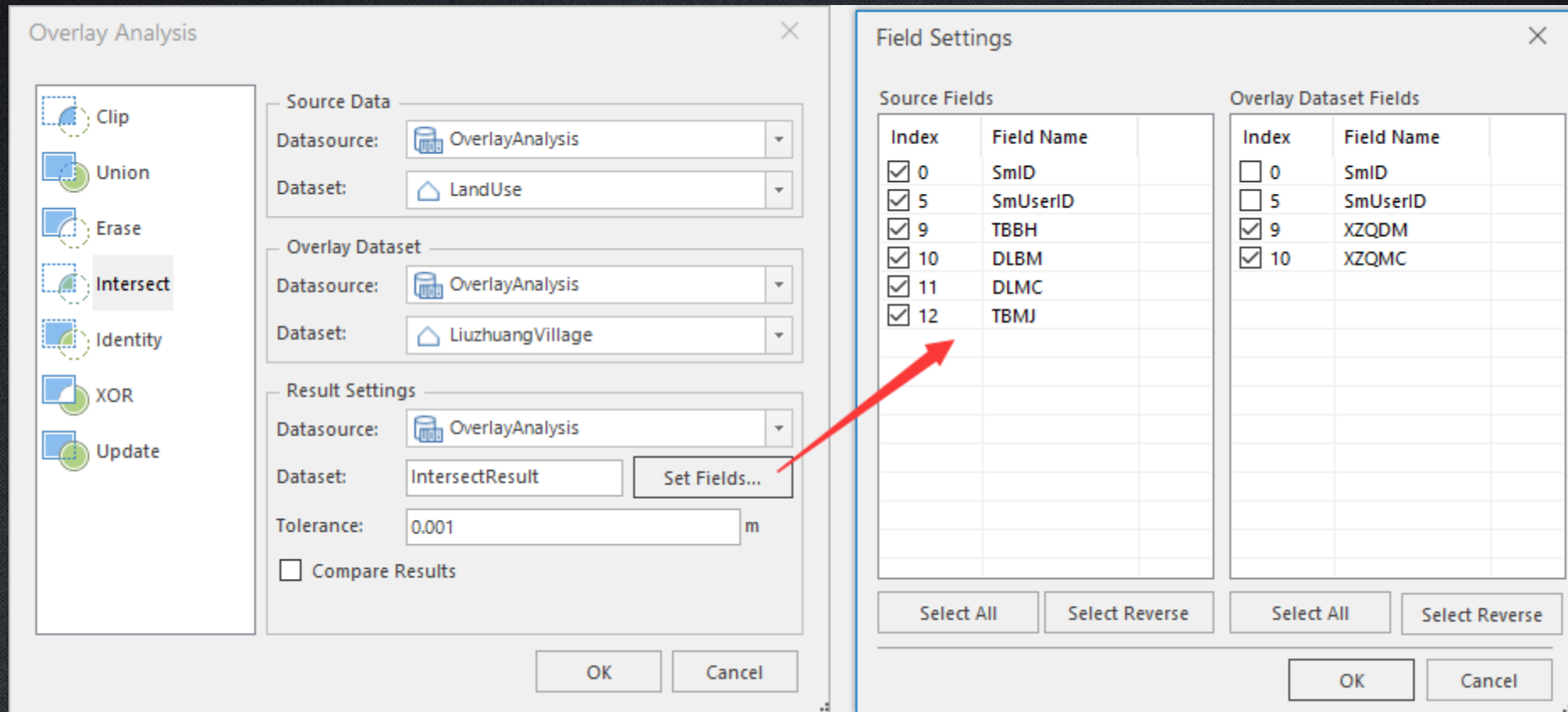
Union

- Get land use data with Administrative information



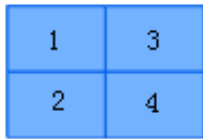
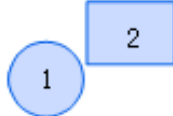
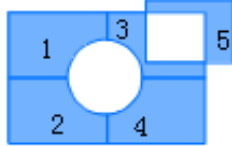
Intersect

- Get land use data with Administrative information for Liuzhuang village.



XOR (Symmetric Difference)

- Example:
 - Source dataset: land use of Beijing in 2000
 - Overlay dataset: land use of Beijing in 2005
 - Result: Land use change from 2000 to 2005.

																																																								
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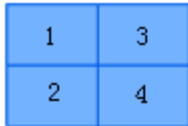
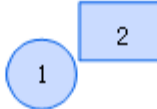
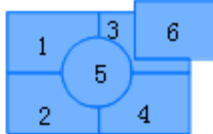
Identity

- Example:
 - Source dataset: Land use data of Beijing
 - Overlay dataset: Slope data of China
 - Result: Data of Beijing with land use and slope information

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Update

- Example:
 - Source dataset: land use data of China
 - Overlay dataset: farmland areas need to be converted to forestry
 - Result: land use after conversion

																																								
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Thank You!

Website: www.supermap.com

Email: globalsupport@supermap.com

Skype: [supermapsupport](https://www.skype.com/people/supermapsupport)

MSN: globalsupport@supermap.com



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