The Fourth International Workshop on GIS Technology and Application

## GIS Technology for Land Use Evaluation

Mengyi Zhang SuperMap Software Co., Ltd.











PART 1PART 2PART 3PART 4CaseEvaluationApplicationGeoProcessingIntroductionFrameworkAutomation

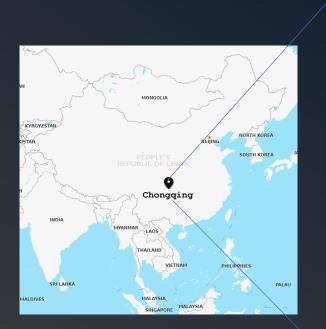


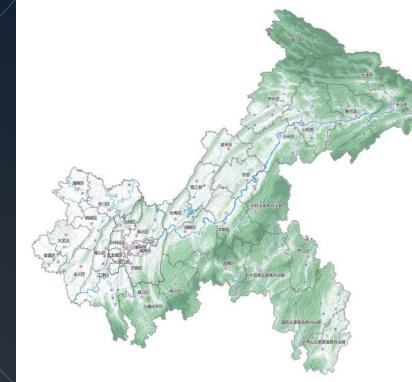
## PART 1 Case Introduction



#### PART 1 Case Introduction

## Study Area





• Chongqing is an economically important municipality in West China and is the biggest inland municipality of the country with plans for even more massive growth.

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#### PART 1 Case Introduction

## Problems in Land Use

- Poor quality of agricultural land
- Decrease in agricultural area
- Unbalanced expansion of urban land





Aims for Agricultural Land Use Evaluation

Protect Agricultural Land

Planning Based on Suitability

Sustainable Development

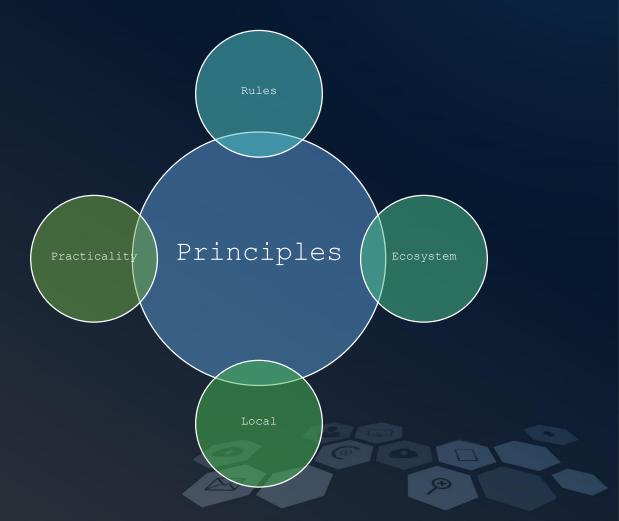






## Two-criteria Land Use Evaluation

• According to Evaluation Guide on Environmental Resource Capability and Spatial Planning Suitability, land evaluation at town and larger scale will based on a two-criteria system considering resource capability and spatial suitability equivalently.



#### Environmental Resource Capability



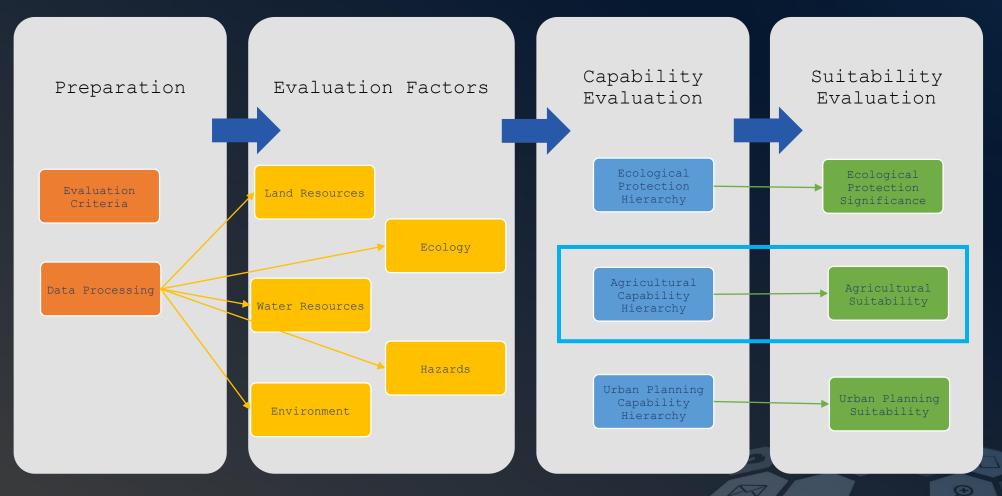
• It refers to the capability of certain land space to support human activities, based on its natural, environmental and ecological resources comprehensively.

## Spatial Planning Suitability

• It is the suitability of certain land space for varied land use types, including ecosystem protection, agriculture and urban planning.



## Evaluation Framework



## Evaluation Factors

Land Use Type	Land Resources	Water Resources	Ocean Resources	Environment	Ecosystem	Hazards
Natural Reserve					Water Quality Biodiversity Erosion	
Agriculture	Slope Height Soil Composition	Precipitation Amount of Water	Productivity	Temperature Energy Soil Capability	Salinization	Drought Flood Wildfire
Urban Planning	Slope Height Terrain	Precipitation Amount of Water	Coastal Line Depth Wind Speed Flow Velocity	Air Quality Water Capability		Earthquake Landslide Tsunami

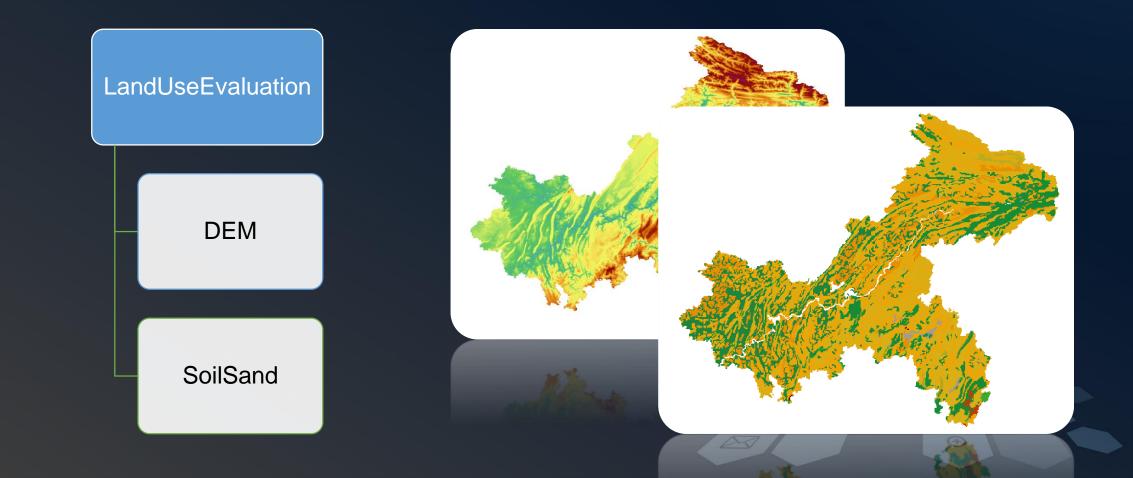


## PART 3 Application



#### PART 3 Application

#### Data



#### PART 3 Application

## Evaluation Criteria

• Agricultural land resource evaluation is based on the value of slope

Slope (degree)	<3	3-8	8-15	15-25	>=25
Hierarchy	1	2	3	4	5

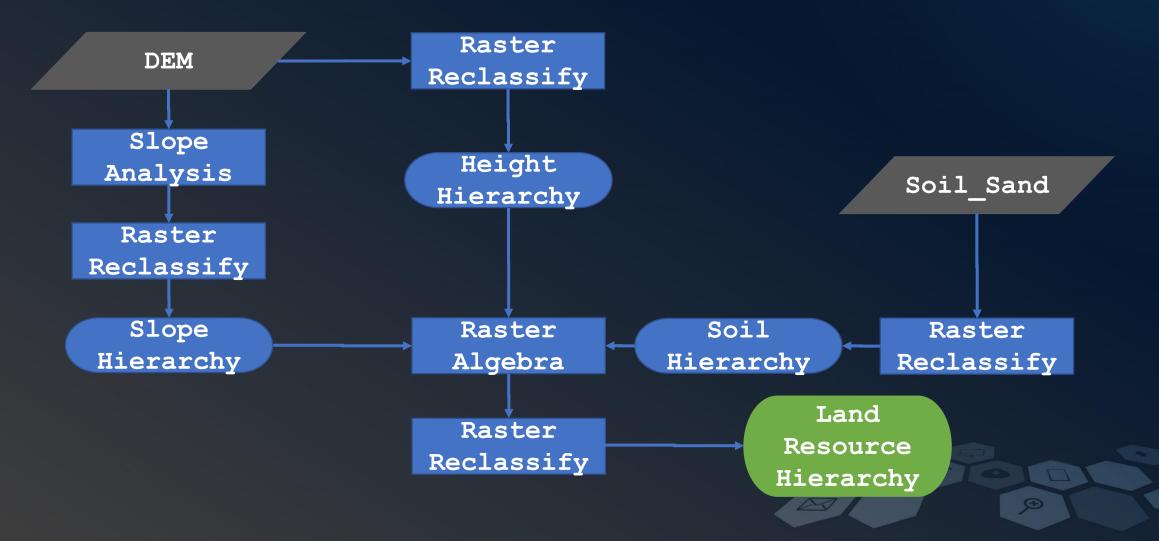
• Hierarchy of the region will be degraded based on the height and percentage of sand in soil

Height(m)	<2000	2000-3000	3000-4900	>=4900	% Sand	<45	>=45	>=60
Hierarchy	0	+1	+2	+5	Hierarchy	0	+1	+2

• Hierarchy larger than 5 should be regarded as 5, 1 is the highest hierarchy in evaluation



## Workflow



## Slope Analysis

• Spatial Analysis -> Raster Analysis -> Surface Analysis -> Slope Analysis

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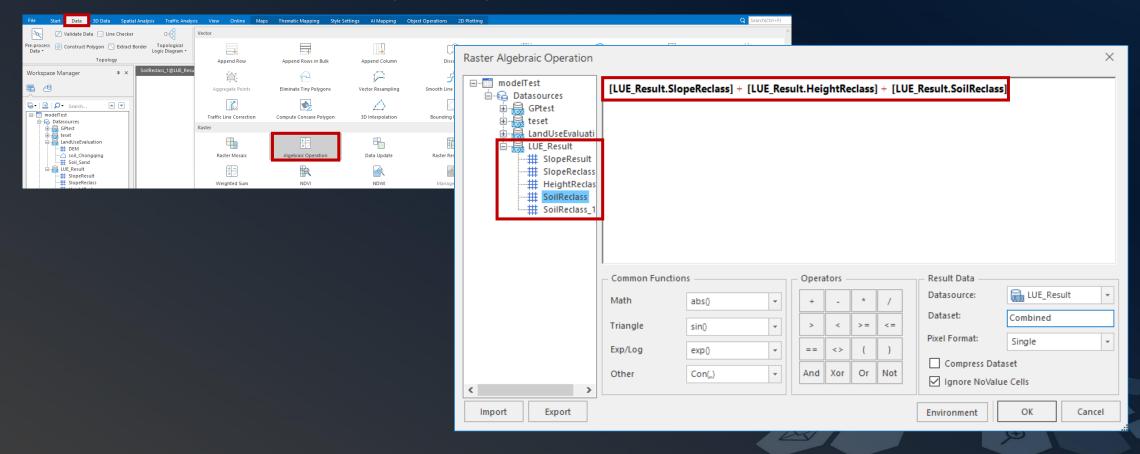
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## Factor Calculation Results



## Combine Factors

Data -> Data Processing -> Algebraic Operation

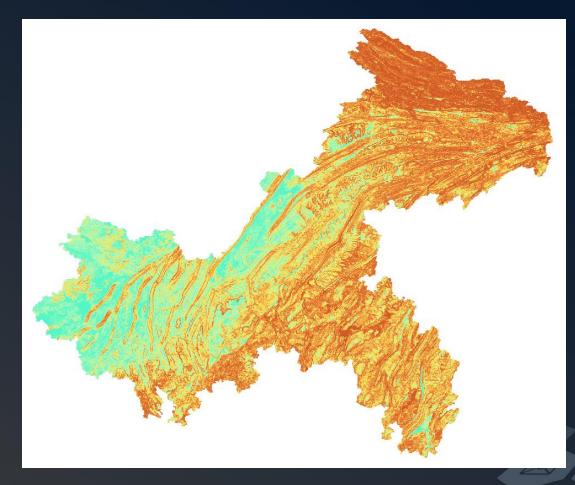


## Hierarchy Reclassify

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# PART 3 Evaluation Case Agricultural Land Resources Evaluation Result

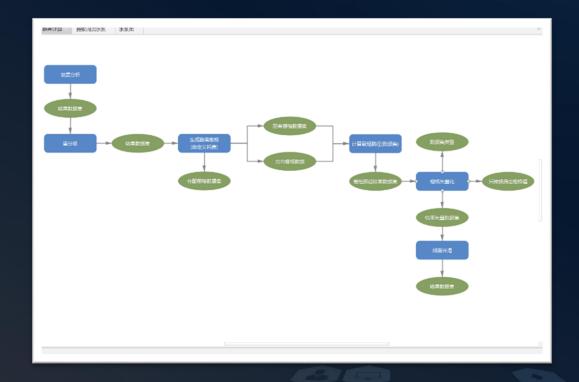


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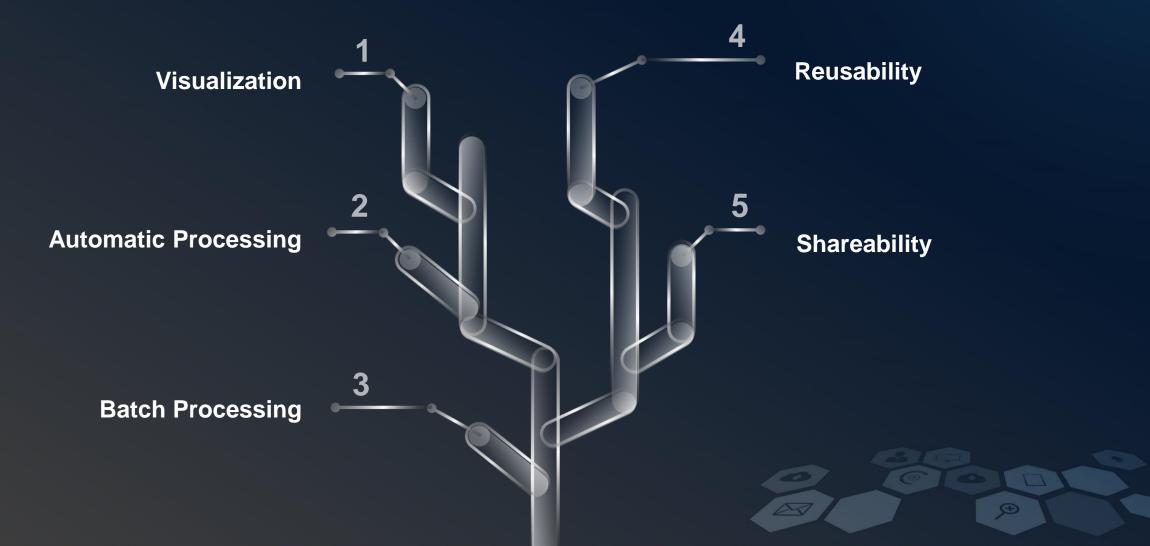


## GeoProcessing Automation

- A model connects GIS processing and analysis tools based on logic, which can automatically work as the workflow designed.
- When two (or more) tools are connected in the model, the later could take the output of the former as input.



#### GPA Features

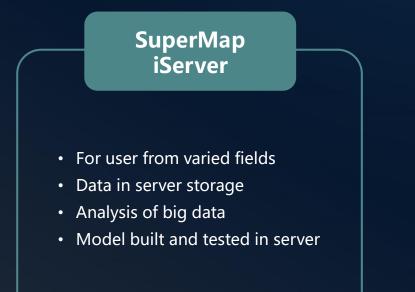


## GPA in SuperMap Products

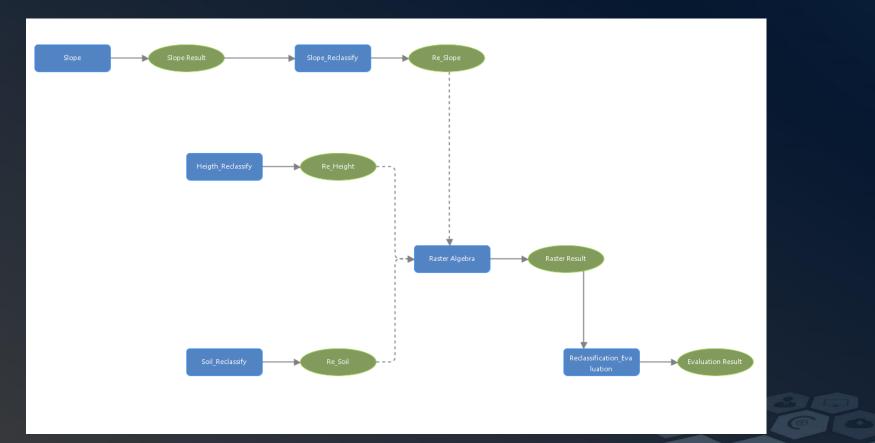
#### SuperMap iDesktopX

- For data scientists and researchers
- Data in local storage
- Model built and tested at local
- Analysis of relatively small-size data
- C/S, complicated processing





## GPA Model for Chongqing Case



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# THANK YOU.