

## Supplementary Material

# Green Space Optimization Strategy to Prevent Urban Flood Risk in the City Centre of Wuhan

Table S1. Procedure of passive submergence experiment based on SCS-CN model.

Operation Procedure	Input Data	Analytical Tool	Calculation Result
Homography	Landuse (1)	Data management-projection and transformation- create custom geographic (coordinate) transformations	WGS1984TOBEIJING1954
	Dem (2)	Data management- projection and transformation- raster-projection raster	Demtouying
	Demtouying	Spatial Analyst-hydrological analysis-land filling	Fill in the hole (4)
	Fill in the hole (4)	Spatial Analyst-hydrological analysis-flow direction	Flow to (5)
Watershed Division	Flow to (5)	Spatial Analyst-hydrological analysis-flow	Flow (6)
	Flow (6)	Spatial Analyst-map algebra-raster calculator	The main stream
	The main stream	Spatial Analyst-hydrological analysis-river link	Trunk Link (8)
	Trunk Link (8)	Spatial Analyst-hydrological analysis-watershed	Watershed (9)
Adding surface runoff coefficient CN to land use data	Watershed (9)	Conversion tool- raster out-raster face	Watershed SL (10)
	Land use Vector Data: Landuse (1)		
	Watershed Division vector data: Watershed SL (10)	Analysis tools-stack analysis-union	Union (11)
	Union (11)	Property sheet-add field (CN)	Union (11)

Calculating the area of land blocks with different land use properties	Union (11)	Property sheet-add field (LUs) floating-point-compute geometry- compute area (m <sup>2</sup> )	Union (11)
Calculation of extreme daily submergence volume (SCS model) in each watershed	DBF file of the Union File (11-1)	The submerging volume of each watershed was calculated by Excel-Lus and SCS model	The inundated volume of each watershed under different heavy rainfall recurrence periods (12)
	Watershed SL (10)	Select by property (gridcode = 1-6 in watershed SL)-right-click the "Watershed SL"layer-data-export data-export selected elements	Area factor data for each watershed: ly1- 6(13)
	Area factor data for each watershed: ly1-6(13)	Spatial Analyst- extraction and analysis-extraction according to curing membrane	Basin surface raster data: DEM1-6(14)
The submergence height of each basin is calculated	Demtouting	3D Analyst- functional surface-surface volume- search for the most approximate submergence height H between the calculated surface volume and the submergence volume (12) of each basin	Submergence height H (15) in each basin
	Basin surface raster data: DEM1-6(14)		
	Basin surface raster data: DEM1-6(14)		
Visual representation	Submergence height H (15) in each basin	Spatial analyzer-re-classification	Dem1-6 CFL
	Dem1-6 CFL	Data management tool-raster-raster data set-inlay to new raster	DEMCF 1,5,10,20... (17)

**Table S2.** Steps of water collection simulation experiment in small depression.

Operation Procedure	Input Data	Analytical Tool	As a Result
Projection coordinate system	Landuse (1)	Data management tools-projection and transformation-create custom geographic transformations	WGS1984 TO BEIJING1954
	Dem (2)	Data management tools-projection and transformation-raster-projection raster	Dem to uying
Identify the drain point	Dem to uying	Spatial Analyst-hydrological analysis-fill and cut	Fill in the hole (4)
	Fill in the hole (4)	Spatial Analyst-hydrological analysis-flow direction	Flow to (5)
	Flow to (5)	Spatial Analyst-hydrological analysis-sink	Sink
Divide the watershed (approximately active)	Sink	Spatial Analyst-hydrological analysis-watershed	A small depression
	Flow to (5)		
Identify the lowest point of each watershed	A small depression	Spatial Analyst-regional analysis-regional statistics	Area statistics (8)
	Dem to uying		
Identify tipping points for each watershed	A small depression	Spatial Analyst-zone analysis-zone filling	Area filling (9)
Calculate the height difference between the dip point and the lowest point	Area statistics (8)	Spatial Analyst-map algebra-grid calculator-"Area filling"(9)-"Area statistics"(8)	In a small depression
	Area filling (9)		
Visual representation	In a small depression	Spatial analyzer-re-classification	Small Hollow H --CFL (11)