Geographic Information System

Spatial Interpolation Lab Practice

Dr. Chan, Chun-Hsiang
Department of Geography
National Taiwan Normal University

Photo credit: ChatGPT

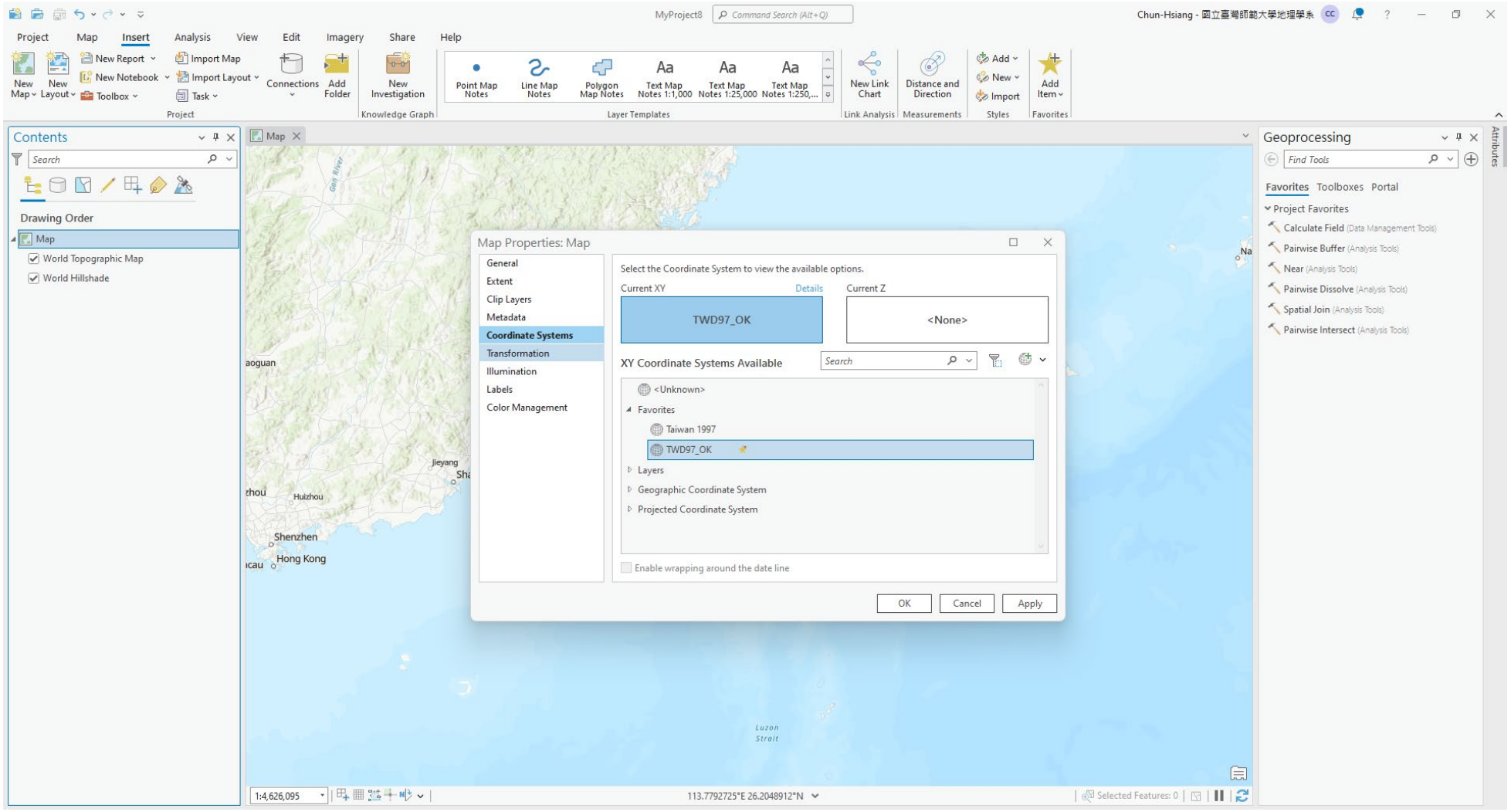
Outline

- Objectives
- Set PCS and Feature Dataset
- XY Table To Point
- Set Symbology for Airbnb Listings
- IDW
- Kriging
- Nearest Neighbor
- Spline
- Create 250m/1500m/2500m Fishnet
- Spatial Join for Counting Number of Airbnb Listings
- Symbology – Grid 250m/1500m/2500m
- MAUP Observation

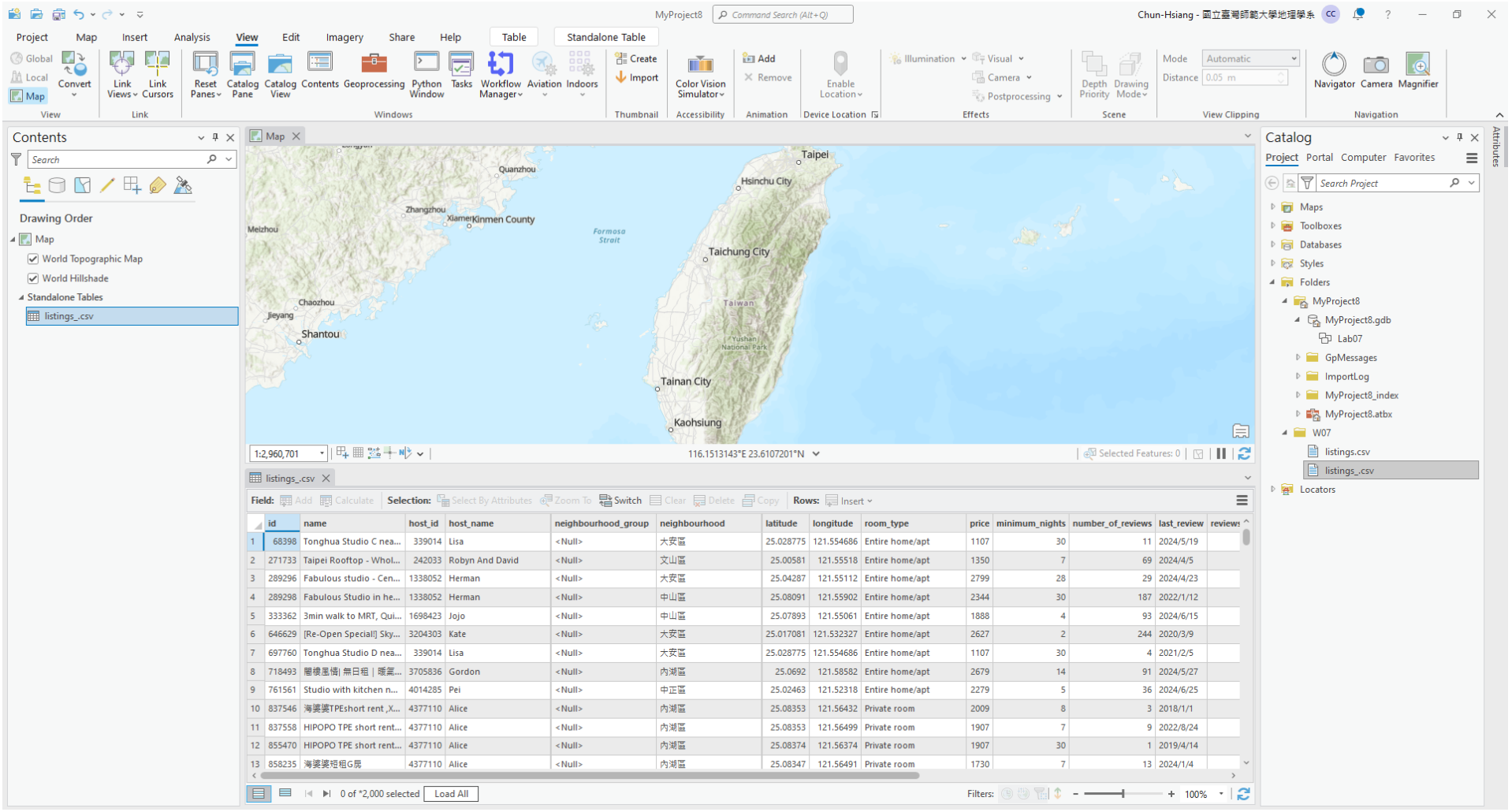
Objectives

- Use four different spatial interpolation method to understand the spatial distribution of Airbnb listing price.
- Use create fishnet to generate 250m, 1500m, and 2500m of grid to observe the MAUP effect by the number of Airbnb listing.

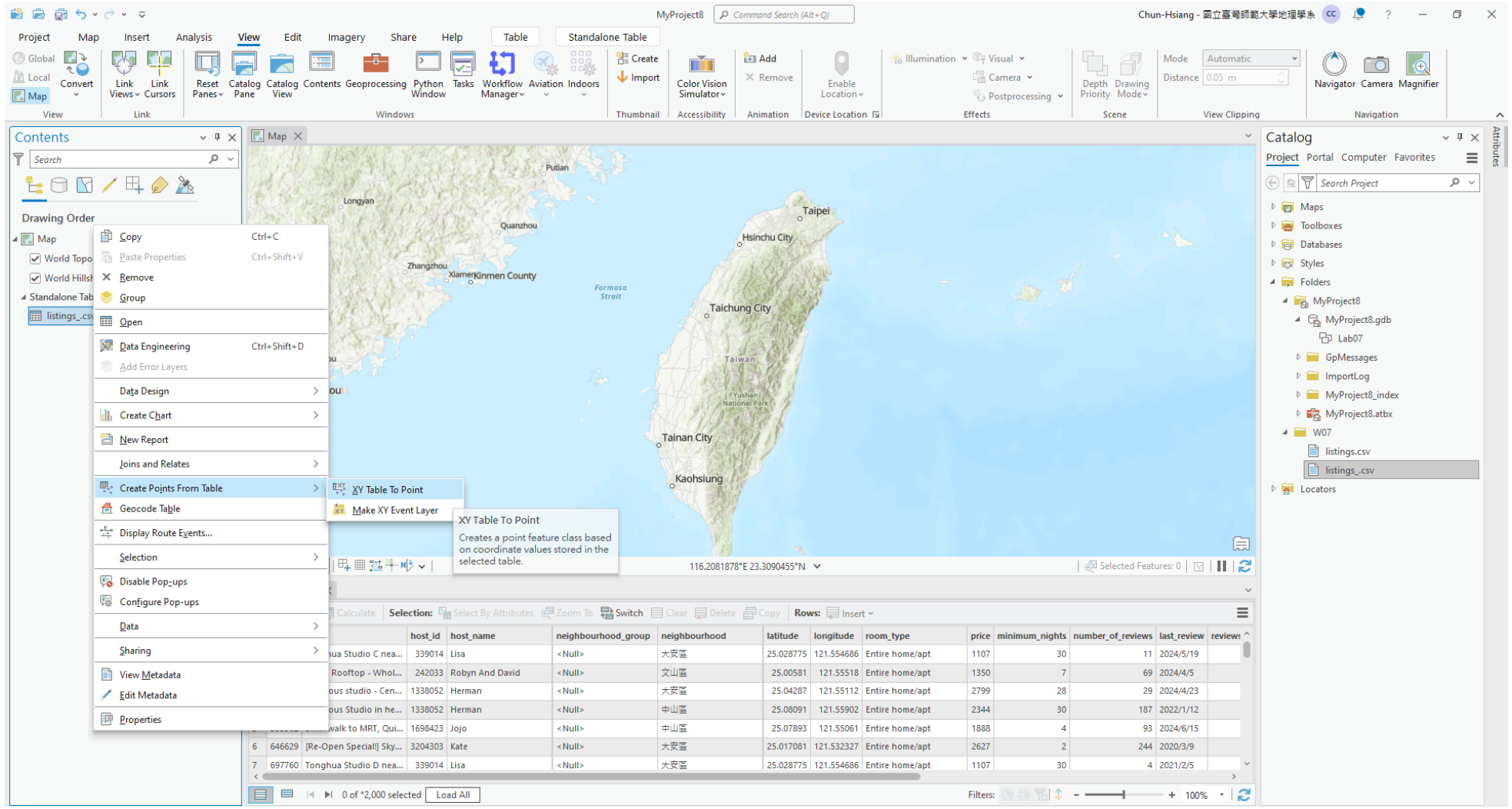
Set PCS and Feature Dataset



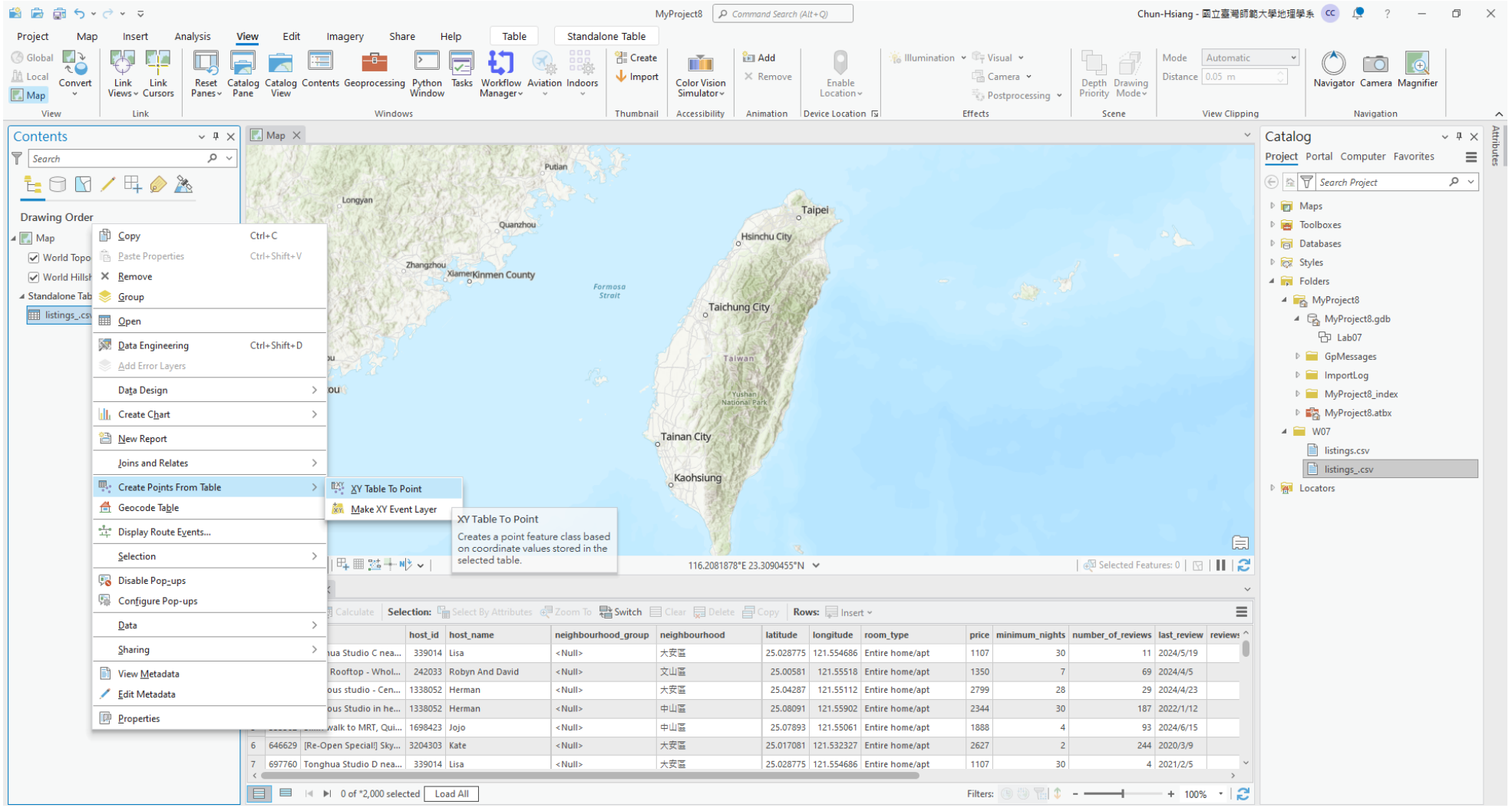
Add Airbnb Listing Data



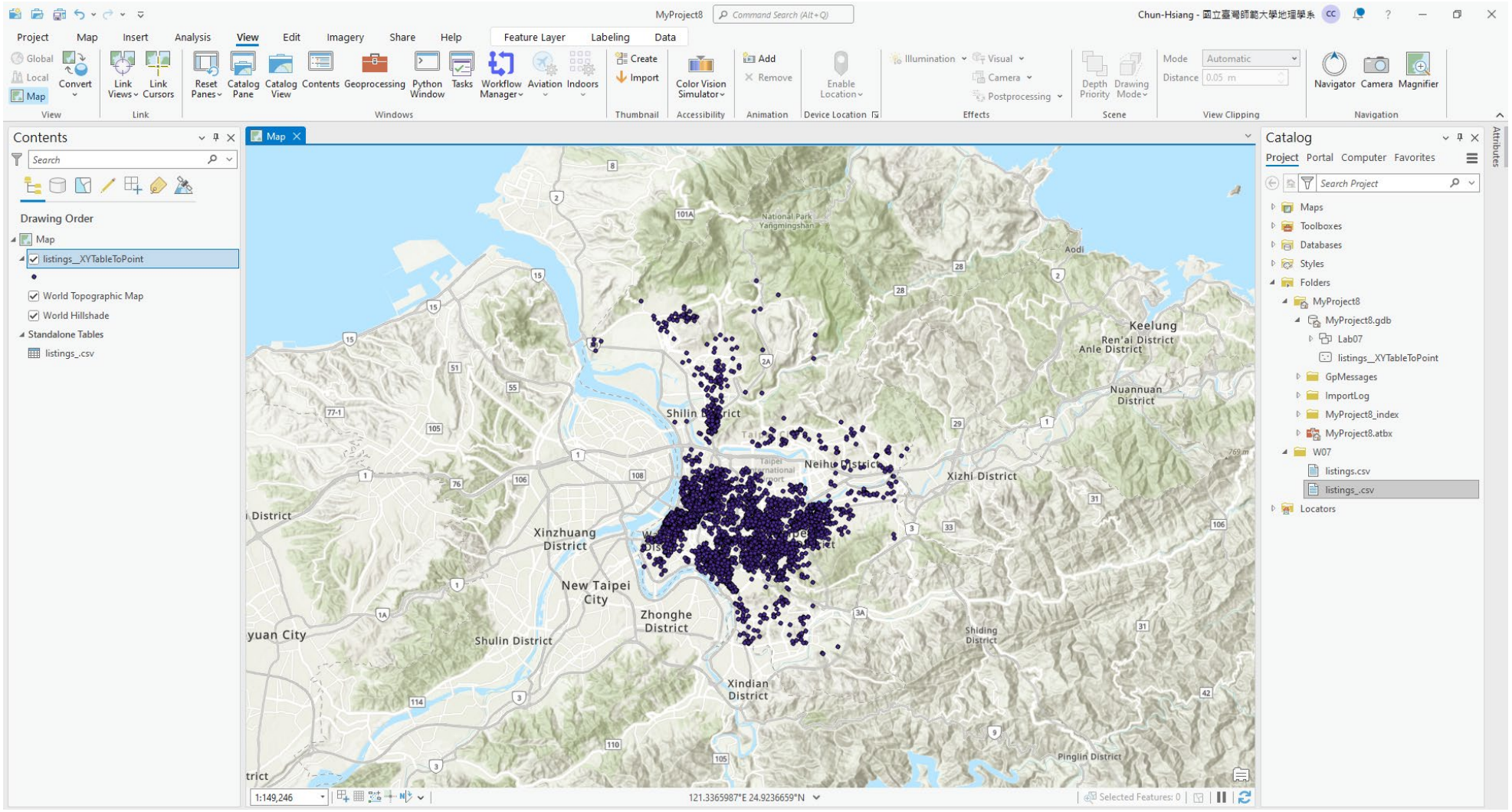
XY Table To Point for Airbnb Listing Data



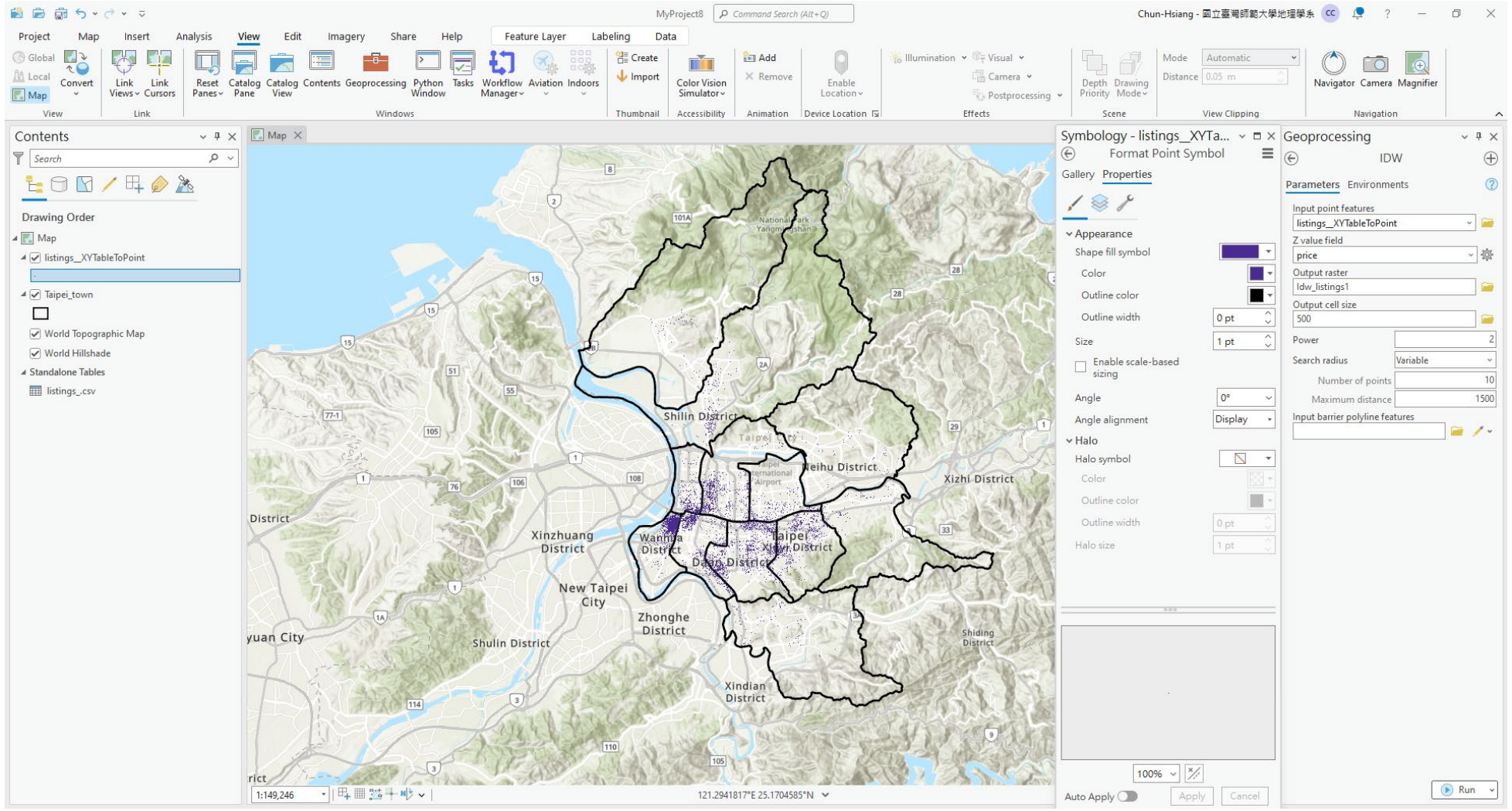
XY Table To Point for Airbnb Listing Data



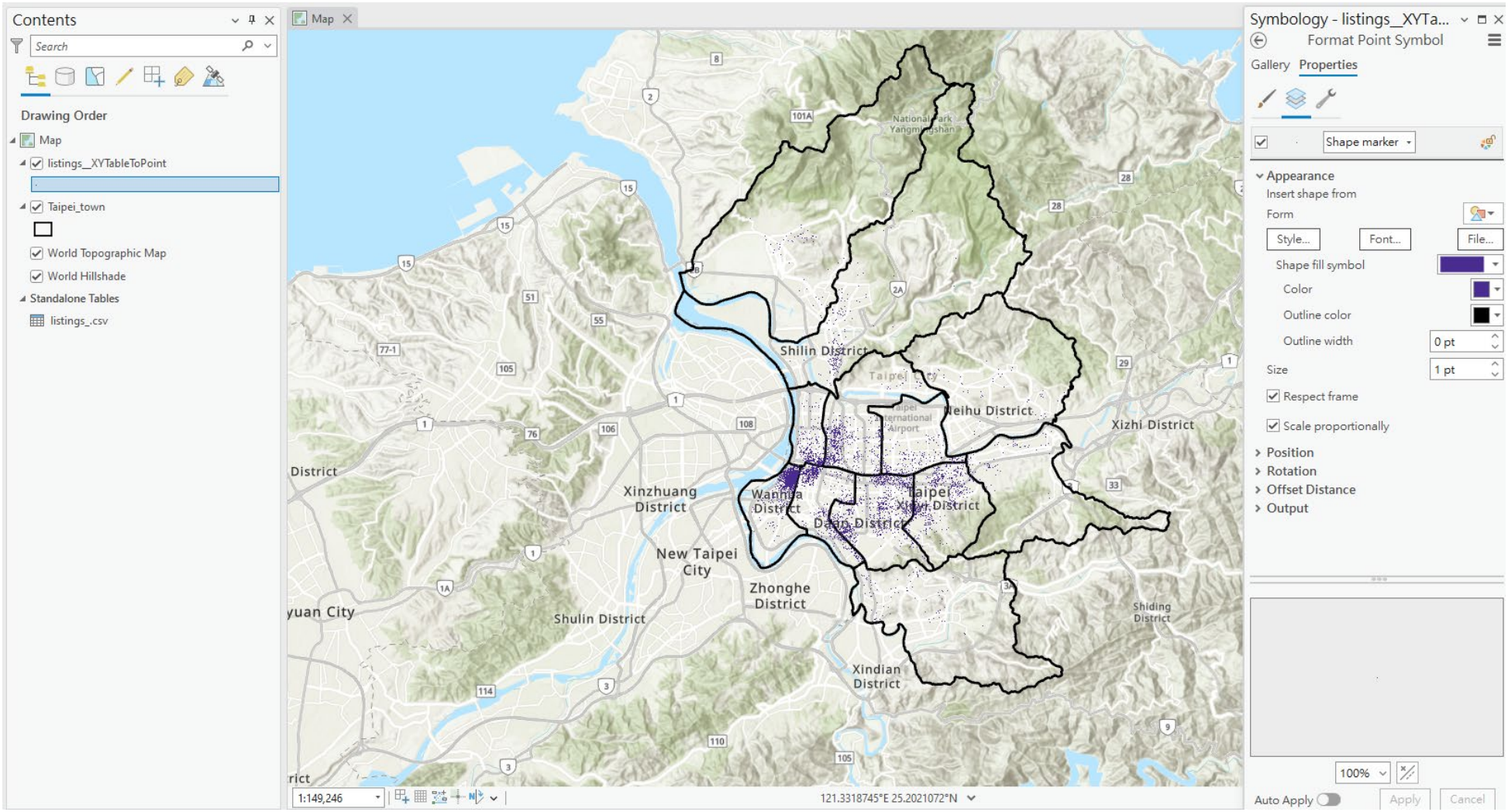
XY Table To Point for Airbnb Listing Data



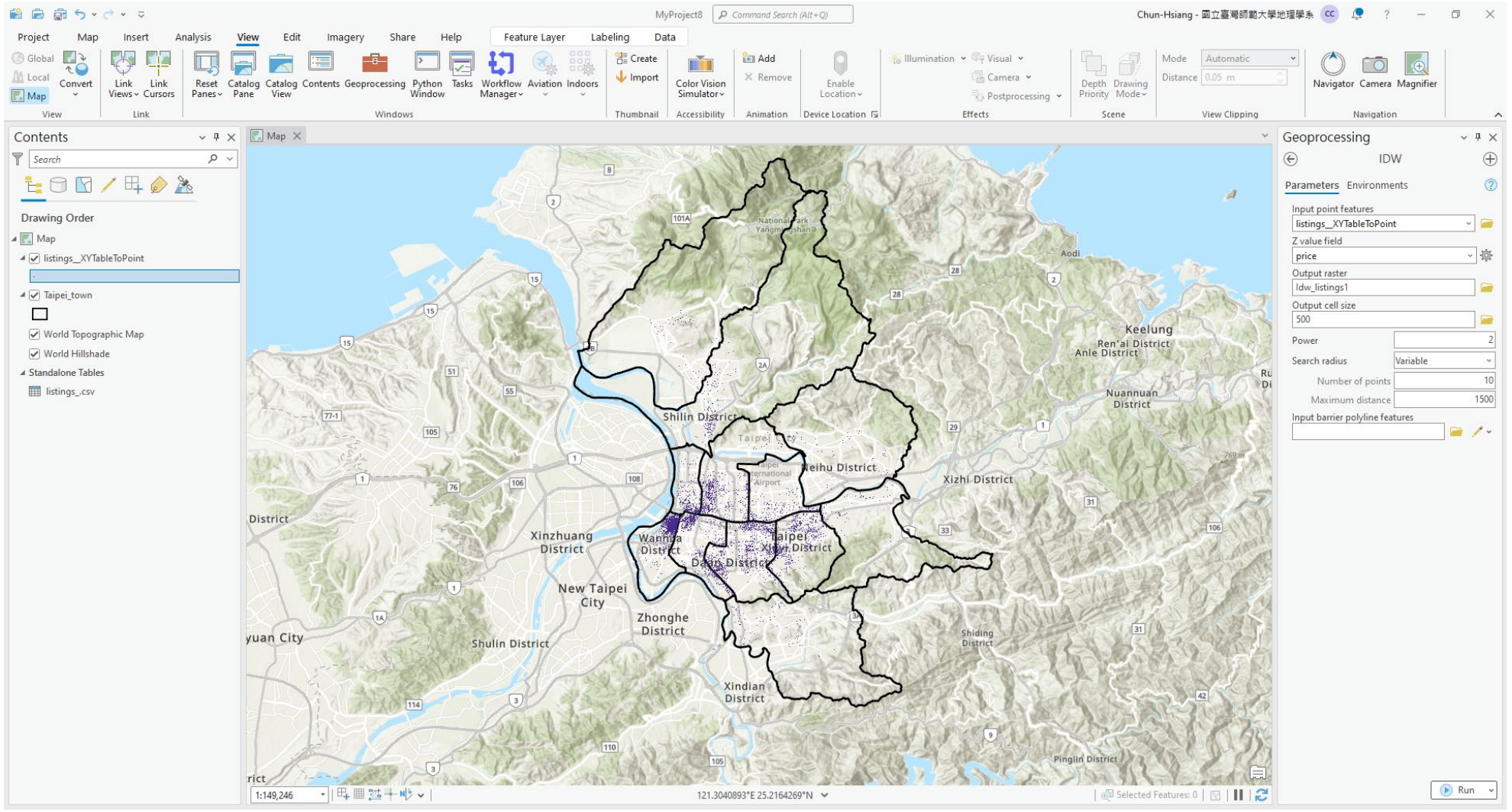
Set Symbology for Airbnb Listings



Set Symbology for Airbnb Listings



IDW


Contents
Drawing Order
Map
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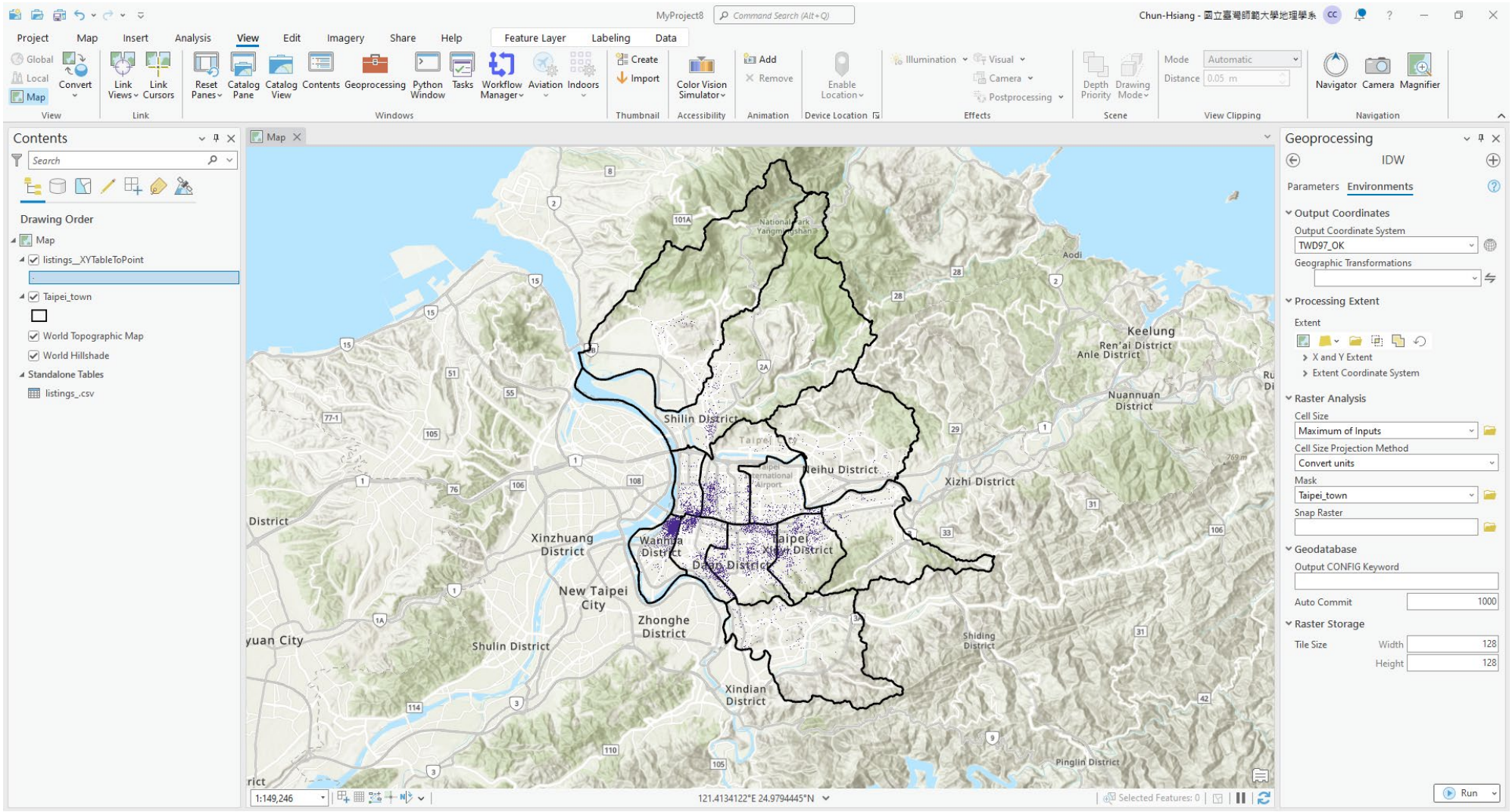
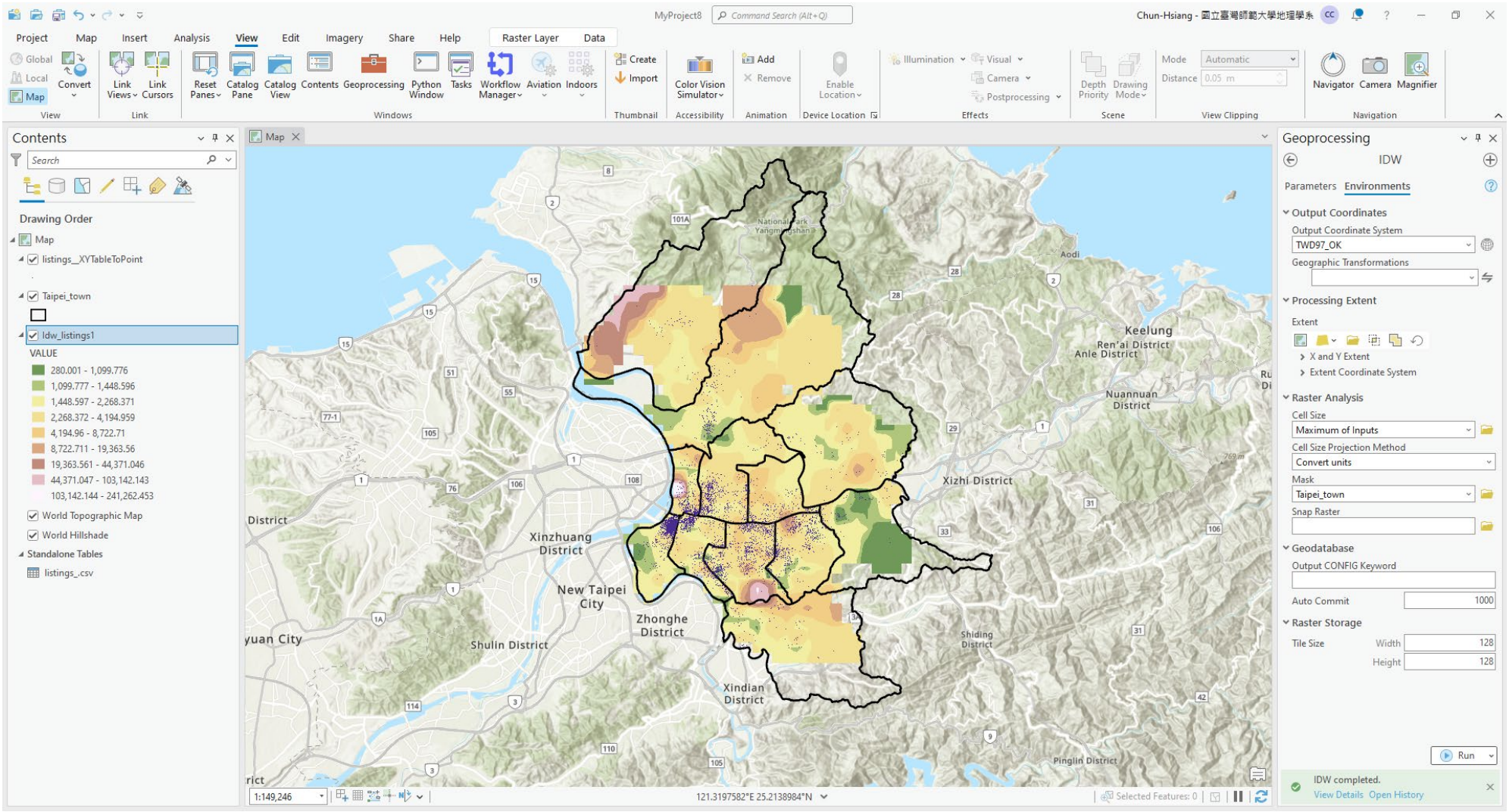
Taipei_town
World Topographic Map
World Hillshade
Standalone Tables
listings_.csv
Geoprocessing
IDW
Parameters
Environments
Input point features
listings__XYTableToPoint
Z value field
price
Output raster
Idw_listings1
Output cell size
500
Power
2
Search radius
Variable
Number of points
10
Maximum distance
1500
Input barrier polyline features
Run
Shilin District
Neihu District
Xizhi District
Keelung
Ren'ai District
Anle District
Nuannuan District
Xinzhuang District
New Taipei City
Zhonghe District
Shulin District
Xindian District
Shiding District
Pinglin District
Aodi

IDW


Contents
Drawing Order
Map
listings_.XYTableToPoint
Taipei_town
World Topographic Map
World Hillshade
Standalone Tables
listings_.csv
Geoprocessing
IDW
Parameters
Environments
Output Coordinates
Output Coordinate System
TWD97_OK
Geographic Transformations
Processing Extent
Extent
X and Y Extent
Extent Coordinate System
Raster Analysis
Cell Size
Maximum of Inputs
Cell Size Projection Method
Convert units
Mask
Taipei_town
Snap Raster
Geodatabase
Output CONFIG Keyword
Auto Commit
1000
Raster Storage
Tile Size
Width
128
Height
128
Run
Shilin District
Neihu District
Xizhi District
Keelung
Ren'ai District
Anle District
Nuannuan District
Xinzhuang District
Wanhua District
Taipei City
Xinyi District
Da'an District
New Taipei City
Zhonghe District
Shulin District
Xindian District
Shiding District
Pinglin District
Aodi
1:149,246
121.4134122°E 24.9794445°N
Selected Features: 0

IDW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Idw_listings1
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1,099.777 - 1,448.596
1,448.597 - 2,268.371
2,268.372 - 4,194.959
4,194.96 - 8,722.71
8,722.711 - 19,363.56
19,363.561 - 44,371.046
44,371.047 - 103,142.143
103,142.144 - 241,262.453
World Topographic Map
World Hillshade
Standalone Tables
listings_.csv
Geoprocessing
IDW
Parameters
Environments
Output Coordinates
Output Coordinate System
TWD97_OK
Geographic Transformations
Processing Extent
Extent
X and Y Extent
Extent Coordinate System
Raster Analysis
Cell Size
Maximum of Inputs
Cell Size Projection Method
Convert units
Mask
Taipei_town
Snap Raster
Geodatabase
Output CONFIG Keyword
Auto Commit
1000
Raster Storage
Tile Size
Width
128
Height
128
Run
IDW completed.
View Details
Open History
Xinzhuang District
New Taipei City
Zhonghe District
Shulin District
Xindian District
Xizhi District
Keelung
Ren'ai District
Anle District
Nuannuan District
Shiding District
Pinglin District
Aodi
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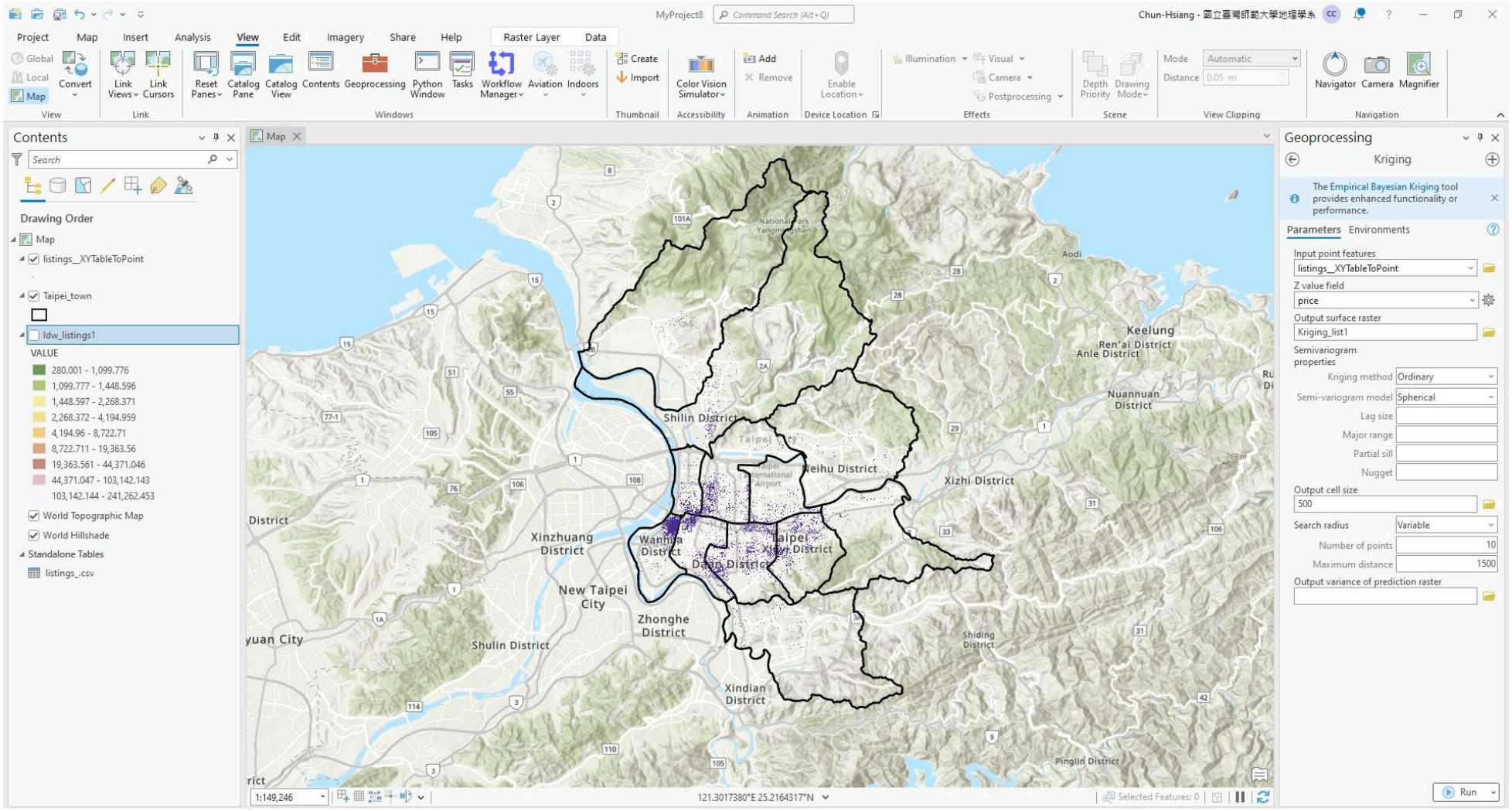
121.3197582°E 25.2138984°N

Kriging


Contents
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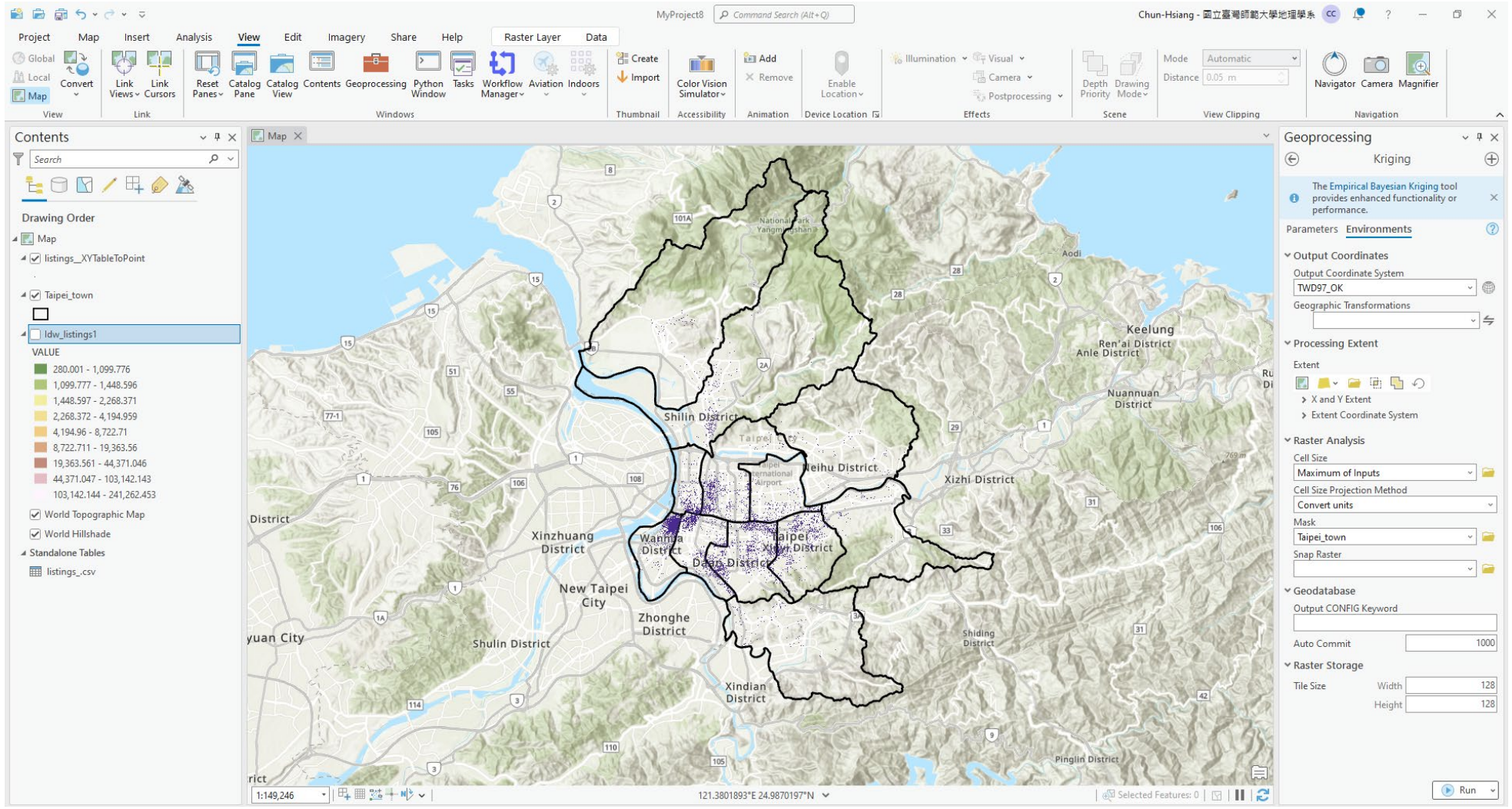
Taipei_town
Idw_listings1
VALUE
280.001 - 1,099.776
1,099.777 - 1,448.596
1,448.597 - 2,268.371
2,268.372 - 4,194.959
4,194.96 - 8,722.71
8,722.711 - 19,363.56
19,363.561 - 44,371.046
44,371.047 - 103,142.143
103,142.144 - 241,262.453
World Topographic Map
World Hillshade
Standalone Tables
listings_.csv
Geoprocessing
Kriging
The Empirical Bayesian Kriging tool provides enhanced functionality or performance.
Parameters
Environments
Input point features
listings__XYTableToPoint
Z value field
price
Output surface raster
Kriging_list1
Semivariogram properties
Kriging method
Ordinary
Semi-variogram model
Spherical
Lag size
Major range
Partial sill
Nugget
Output cell size
500
Search radius
Variable
Number of points
10
Maximum distance
1500
Output variance of prediction raster
Run
Shilin District
Beitou District
Xizhi District
Nuannuan District
Keelung
Ren'ai District
Anle District
Xinzhuang District
Wanhua District
Da'an District
New Taipei City
Zhonghe District
Shulin District
Xindian District
Shiding District
Pinglin District
Aodi
1:149,246
121.3017380°E 25.2164317°N
Selected Features: 0

Kriging


Contents
Drawing Order
Map
listings_XYTableToPoint
Taipei_town
Idw_listings1
VALUE
280.001 - 1,099.776
1,099.777 - 1,448.596
1,448.597 - 2,268.371
2,268.372 - 4,194.959
4,194.96 - 8,722.71
8,722.711 - 19,363.56
19,363.561 - 44,371.046
44,371.047 - 103,142.143
103,142.144 - 241,262.453
World Topographic Map
World Hillshade
Standalone Tables
listings_.csv
Geoprocessing
Kriging
The Empirical Bayesian Kriging tool provides enhanced functionality or performance.
Parameters
Environments
Output Coordinates
Output Coordinate System
TWD97_OK
Geographic Transformations
Processing Extent
Extent
X and Y Extent
Extent Coordinate System
Raster Analysis
Cell Size
Maximum of Inputs
Cell Size Projection Method
Convert units
Mask
Taipei_town
Snap Raster
Geodatabase
Output CONFIG Keyword
Auto Commit
1000
Raster Storage
Tile Size
Width
128
Height
128
Run
Shilin District
Beitou District
Xizhi District
Keelung
Ren'ai District
Anle District
Nuannuan District
Aodi
Xinzhuang District
Wanhua District
Da'an District
New Taipei City
Zhonghe District
Shulin District
Xindian District
Shiding District
Pinglin District
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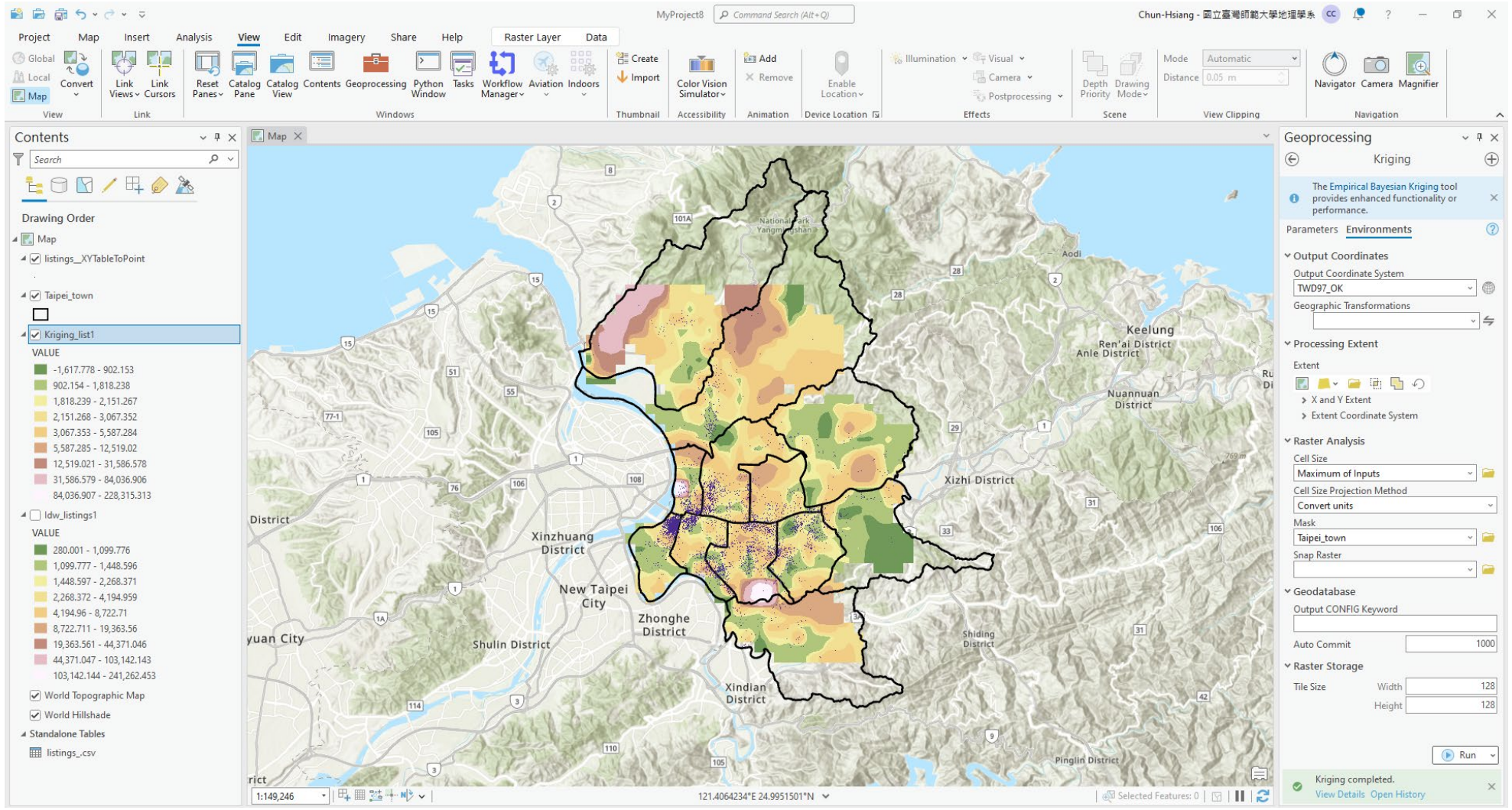
121.3801893°E 24.9870197°N
Selected Features: 0

Kriging


Contents
Drawing Order
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listings__XYTableToPoint
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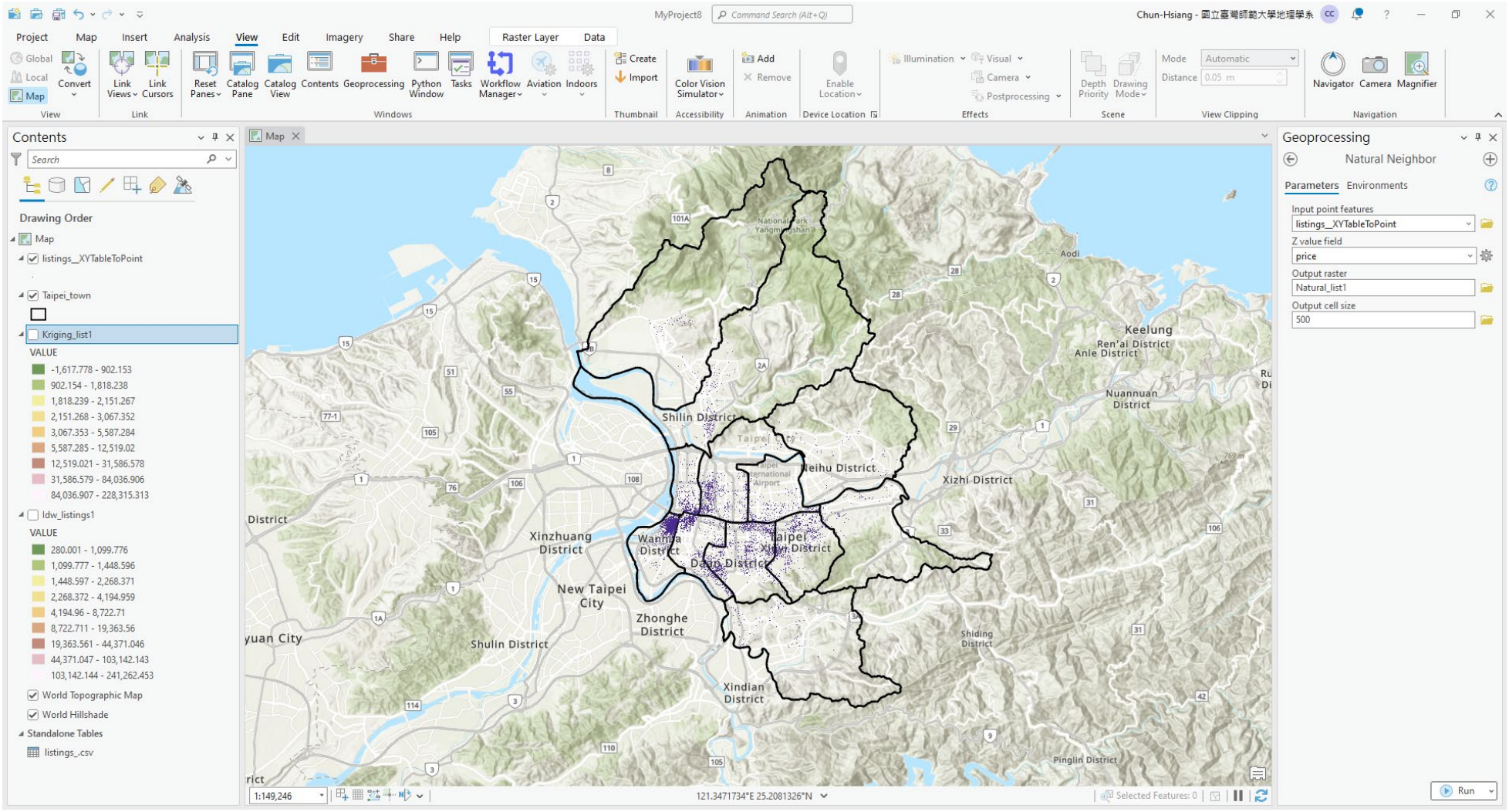
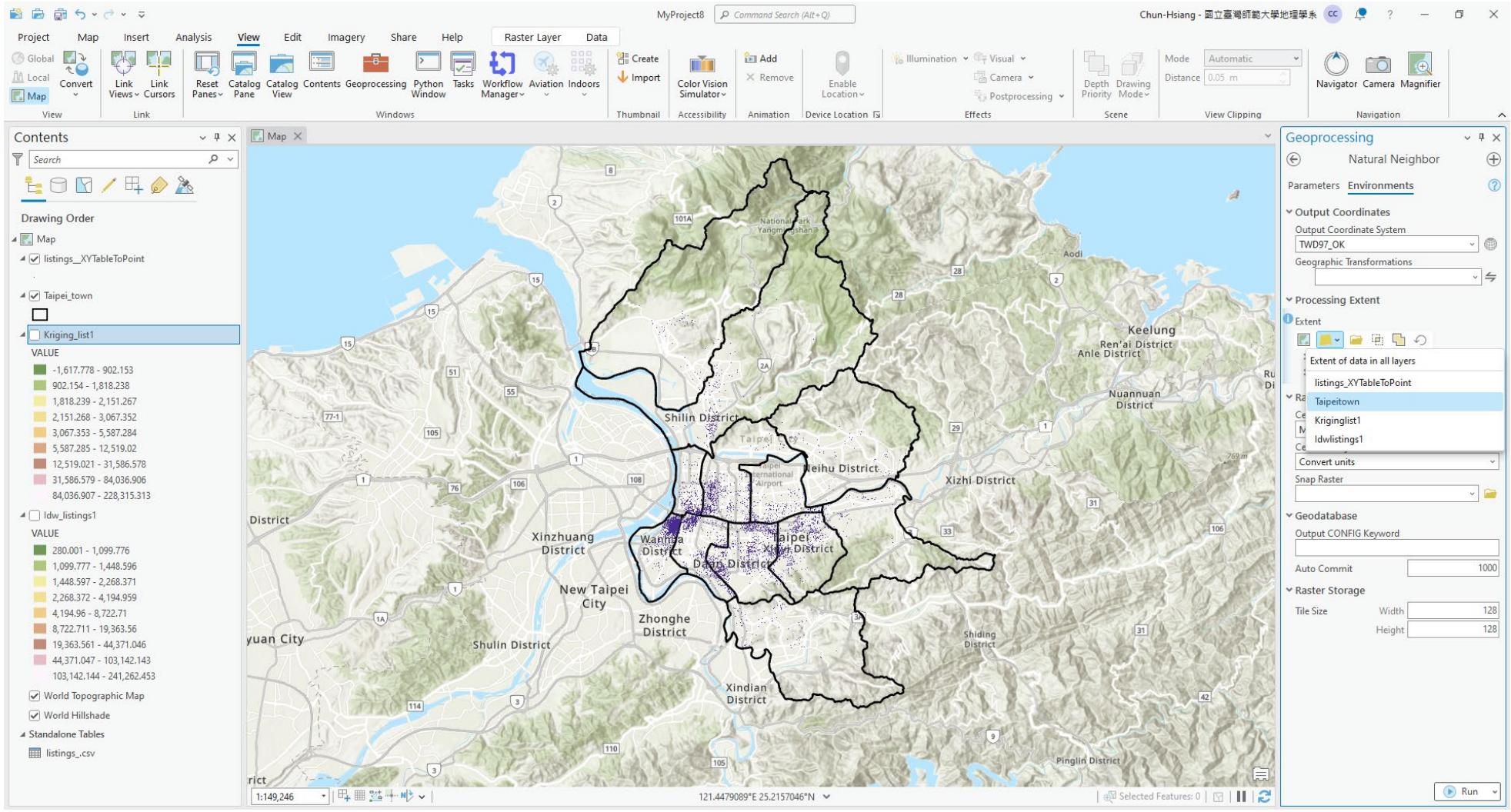
Kriging_list1
VALUE
-1,617.778 - 902.153
902.154 - 1,818.238
1,818.239 - 2,151.267
2,151.268 - 3,067.352
3,067.353 - 5,587.284
5,587.285 - 12,519.02
12,519.021 - 31,586.578
31,586.579 - 84,036.906
84,036.907 - 228,315.313
Idw_listings1
VALUE
280.001 - 1,099.776
1,099.777 - 1,448.596
1,448.597 - 2,268.371
2,268.372 - 4,194.959
4,194.96 - 8,722.71
8,722.711 - 19,363.56
19,363.561 - 44,371.046
44,371.047 - 103,142.143
103,142.144 - 241,262.453
World Topographic Map
World Hillshade
Standalone Tables
listings_.csv
Geoprocessing
Kriging
The Empirical Bayesian Kriging tool provides enhanced functionality or performance.
Parameters
Environments
Output Coordinates
Output Coordinate System
TWD97_OK
Geographic Transformations
Processing Extent
Extent
X and Y Extent
Extent Coordinate System
Raster Analysis
Cell Size
Maximum of Inputs
Cell Size Projection Method
Convert units
Mask
Taipei_town
Snap Raster
Geodatabase
Output CONFIG Keyword
Auto Commit
1000
Raster Storage
Tile Size
Width
128
Height
128
Run
Kriging completed.
View Details
Open History
Keelung
Ren'ai District
Anle District
Nuannuan District
Xizhi District
Xinzhuang District
New Taipei City
Zhonghe District
Shulin District
Xindian District
Shiding District
Pinglin District
Aodi
1:149,246
121.4064234°E 24.9951501°N
Selected Features: 0

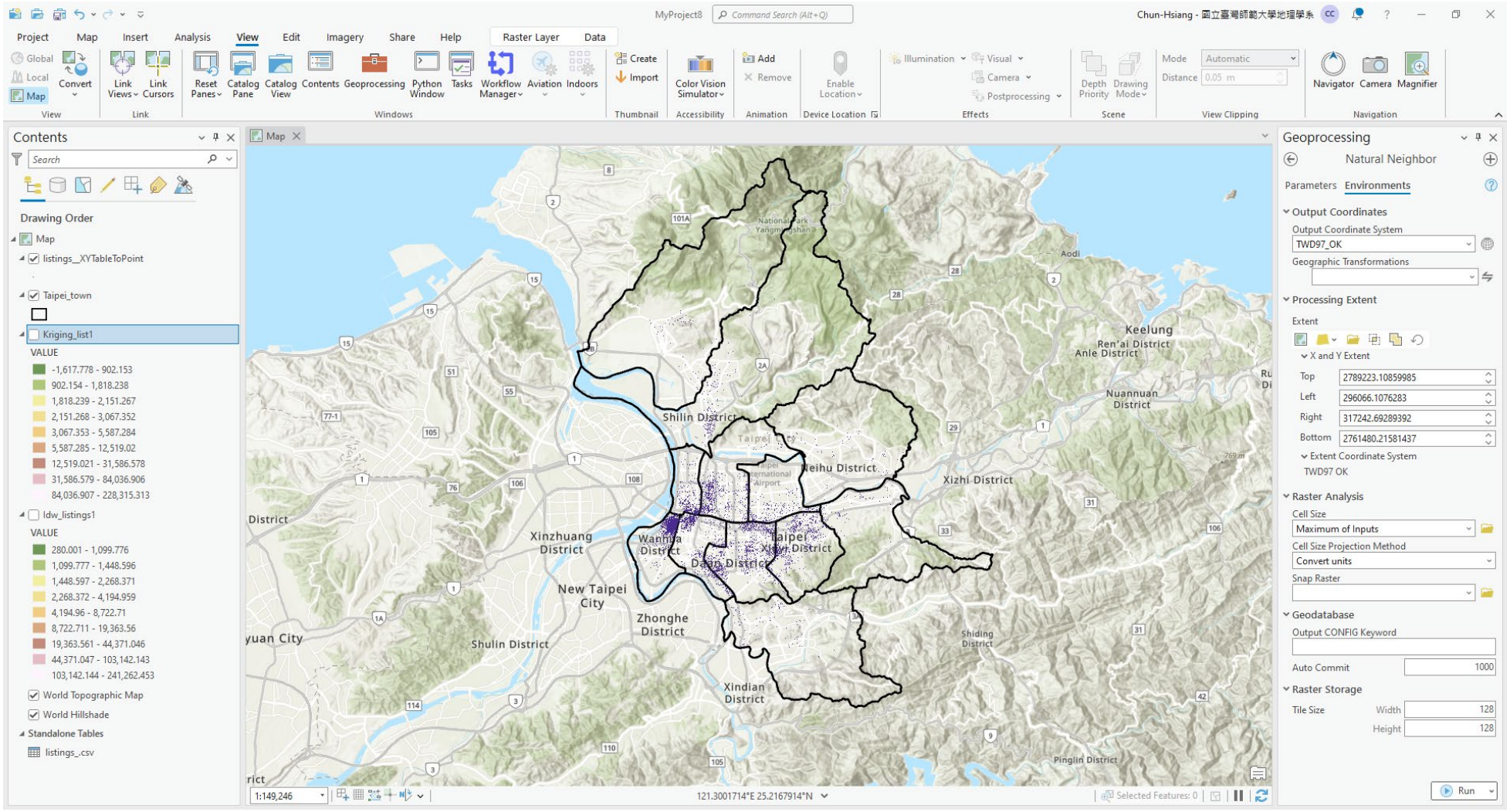
Nearest Neighbor



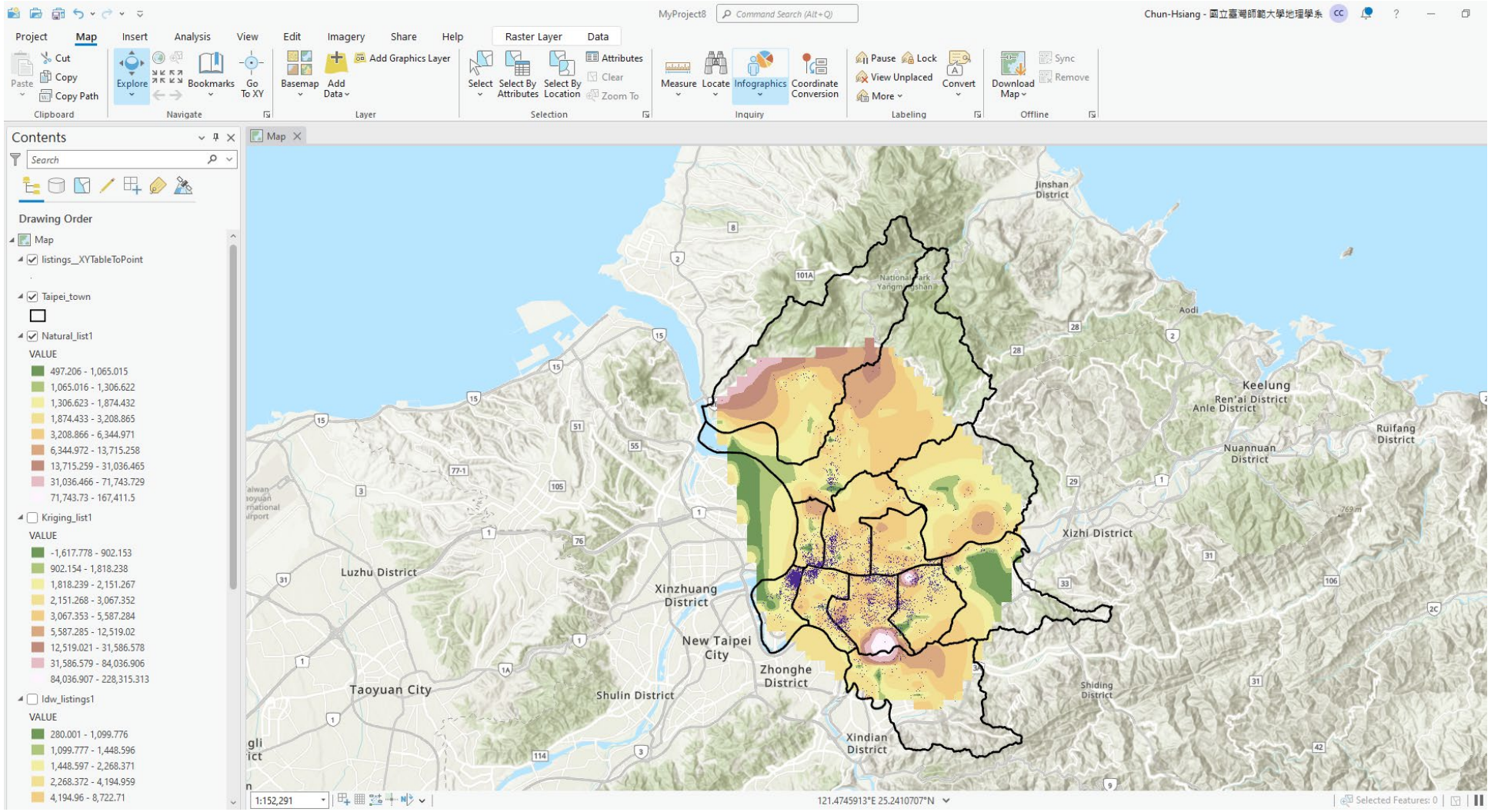
Nearest Neighbor



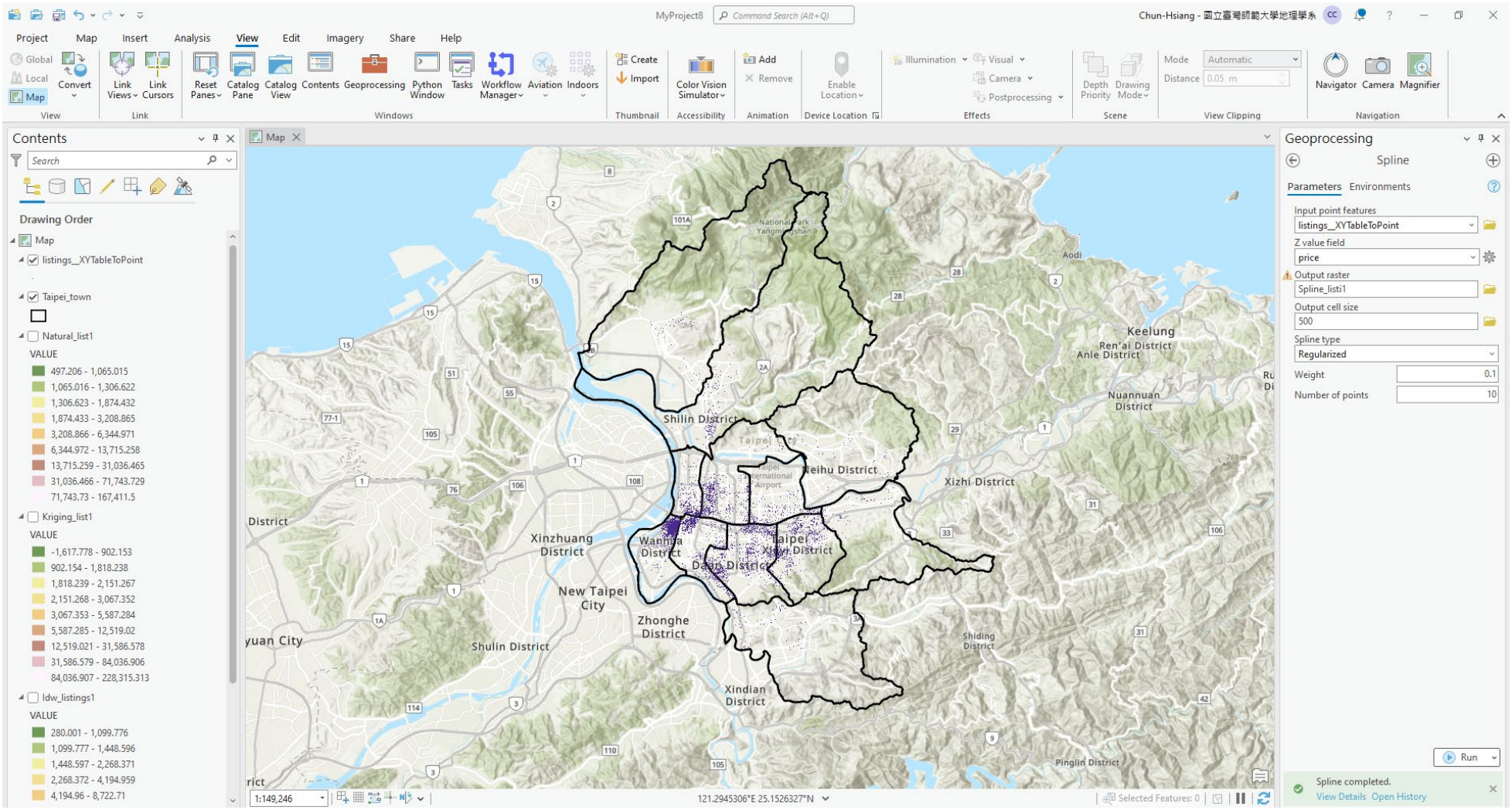
Nearest Neighbor



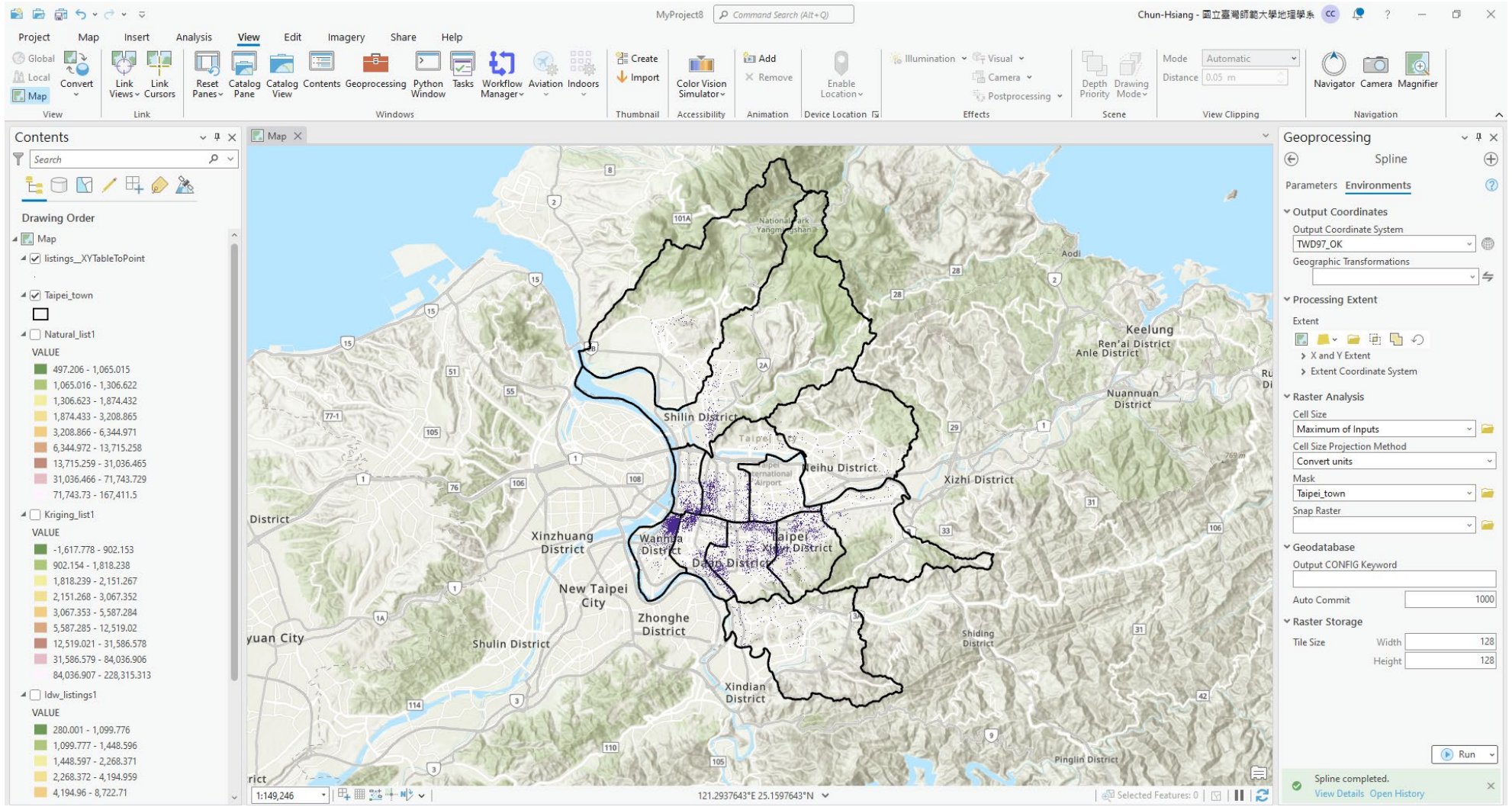
Nearest Neighbor



Spline


Project
Map
Insert
Analysis
View
Edit
Imagery
Share
Help
Contents
Drawing Order
Map
listings__XYTableToPoint
Taipei_town
Natural_list1
VALUE
497.206 - 1,065.015
1,065.016 - 1,306.622
1,306.623 - 1,874.432
1,874.433 - 3,208.865
3,208.866 - 6,344.971
6,344.972 - 13,715.258
13,715.259 - 31,036.465
31,036.466 - 71,743.729
71,743.73 - 167,411.5
Kriging_list1
VALUE
-1,617.778 - 902.153
902.154 - 1,818.238
1,818.239 - 2,151.267
2,151.268 - 3,067.352
3,067.353 - 5,587.284
5,587.285 - 12,519.02
12,519.021 - 31,586.578
31,586.579 - 84,036.906
84,036.907 - 228,315.313
Idw_listings1
VALUE
280.001 - 1,099.776
1,099.777 - 1,448.596
1,448.597 - 2,268.371
2,268.372 - 4,194.959
4,194.96 - 8,722.71
Geoprocessing
Spline
Parameters
Environments
Input point features
listings__XYTableToPoint
Z value field
price
Output raster
Spline_listi1
Output cell size
500
Spline type
Regularized
Weight
0.1
Number of points
10
Run
Spline completed.
View Details
Open History
Shilin District
Neihu District
Xizhi District
Keelung
Ren'ai District
Anle District
Nuannuan District
Xinzhuang District
Wanhua District
Xinyi District
Da'an District
New Taipei City
Zhonghe District
Shulin District
Xindian District
Shiding District
Pinglin District
Aodi
Taipei
1:149,246
121.2945306°E 25.1526327°N
Selected Features: 0

Spline


Contents
Drawing Order
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VALUE
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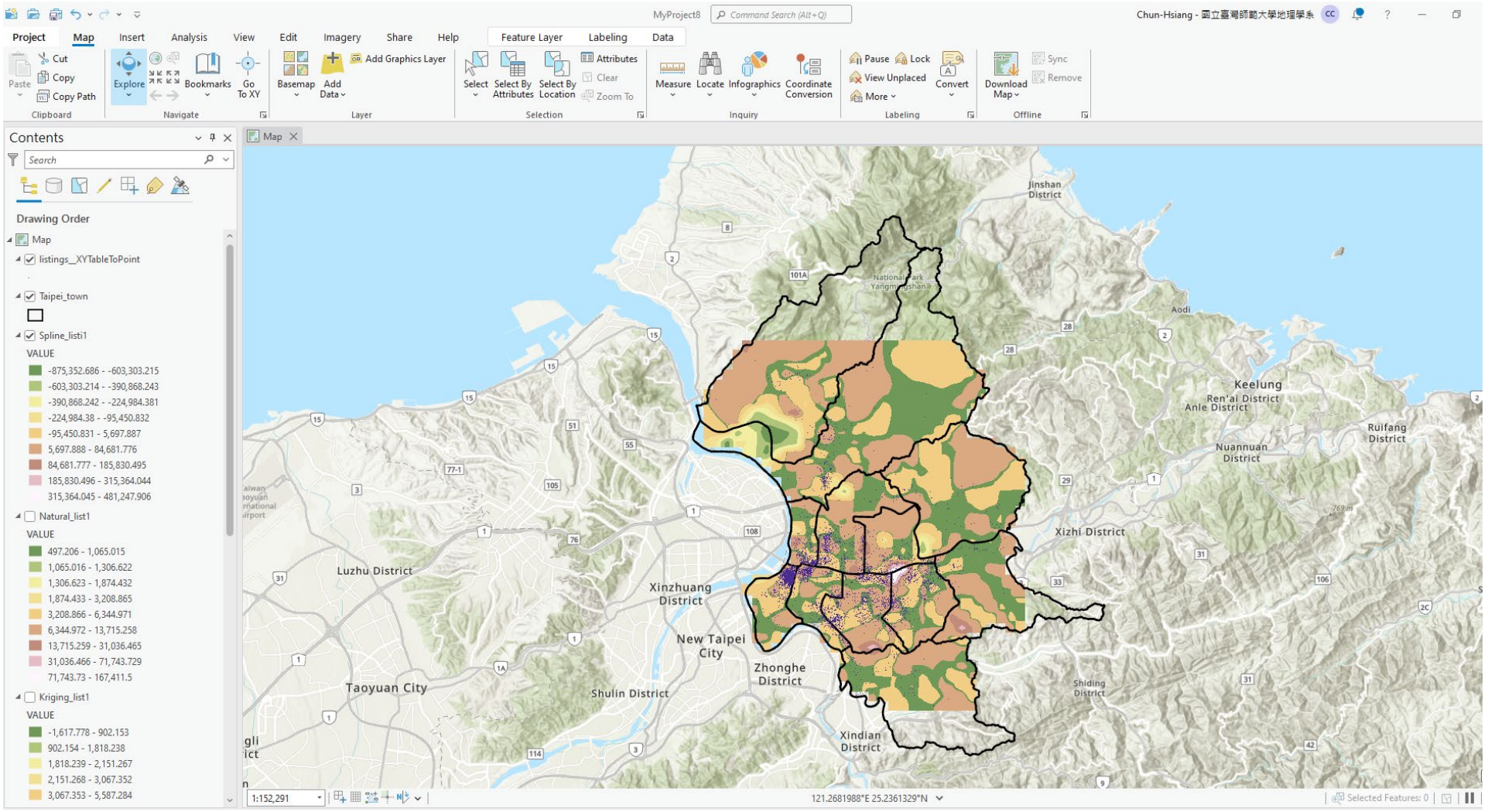
1,065.016 - 1,306.622
1,306.623 - 1,874.432
1,874.433 - 3,208.865
3,208.866 - 6,344.971
6,344.972 - 13,715.258
13,715.259 - 31,036.465
31,036.466 - 71,743.729
71,743.73 - 167,411.5
Kriging_list1
VALUE
-1,617.778 - 902.153
902.154 - 1,818.238
1,818.239 - 2,151.267
2,151.268 - 3,067.352
3,067.353 - 5,587.284
5,587.285 - 12,519.02
12,519.021 - 31,586.578
31,586.579 - 84,036.906
84,036.907 - 228,315.313
ldw_listings1
VALUE
280.001 - 1,099.776
1,099.777 - 1,448.596
1,448.597 - 2,268.371
2,268.372 - 4,194.959
4,194.96 - 8,722.71
Geoprocessing
Spline
Parameters
Environments
Output Coordinates
Output Coordinate System
TWD97_OK
Geographic Transformations
Processing Extent
Extent
X and Y Extent
Extent Coordinate System
Raster Analysis
Cell Size
Maximum of Inputs
Cell Size Projection Method
Convert units
Mask
Taipei_town
Snap Raster
Geodatabase
Output CONFIG Keyword
Auto Commit
1000
Raster Storage
Tile Size
Width
128
Height
128
Run
Spline completed.
View Details
Open History
Shilin District
Neihu District
Xizhi District
Nuannuan District
Keelung
Ren'ai District
Anle District
Aodi
Xinzhuang District
New Taipei City
Zhonghe District
Shulin District
Xindian District
Shiding District
Pinglin District
Wanhua District
Taipei
1:149,246
121.2937643°E 25.1597643°N
Selected Features: 0

Spline


Contents
Drawing Order
Map
listings__XYTableToPoint
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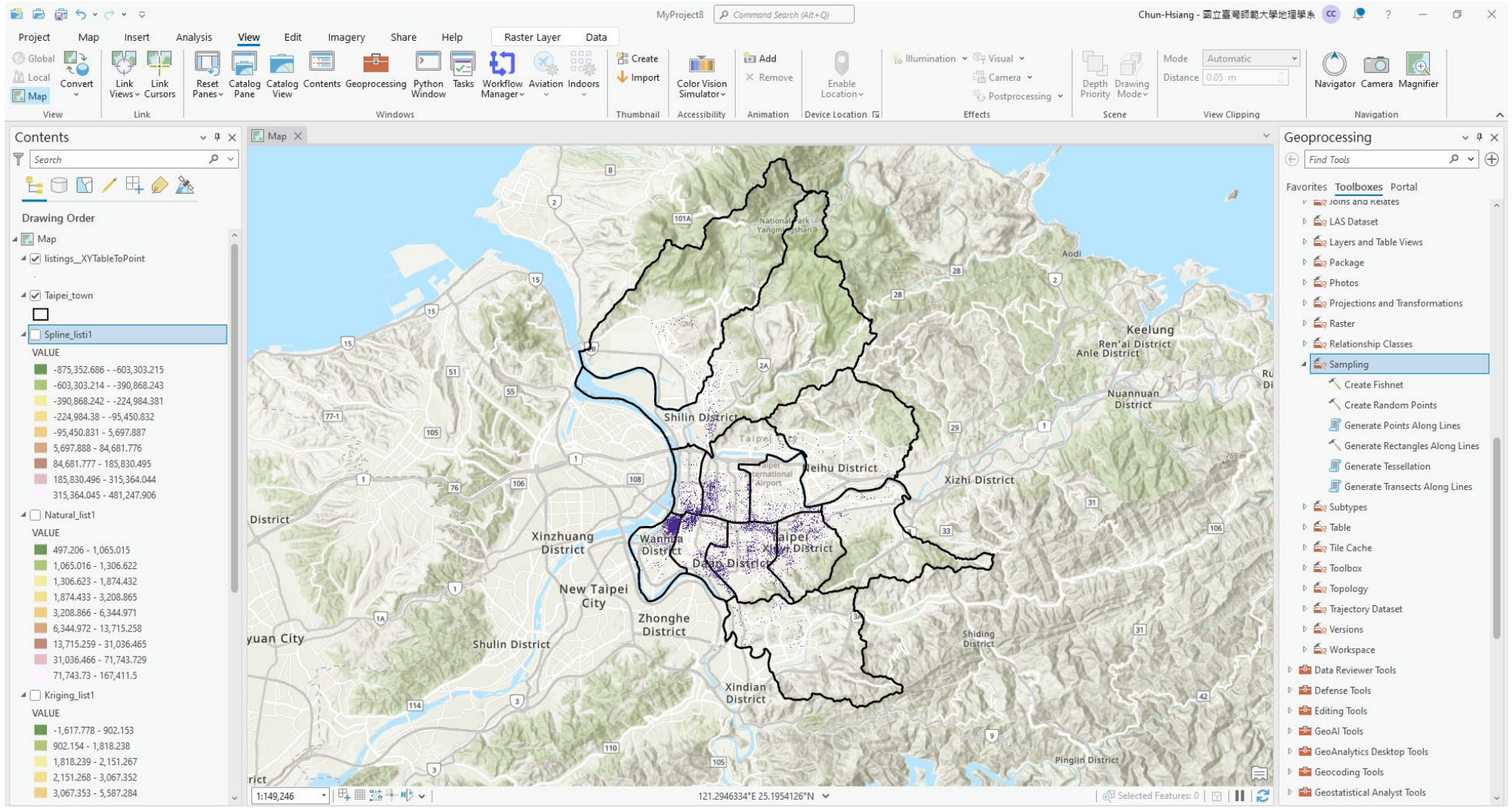
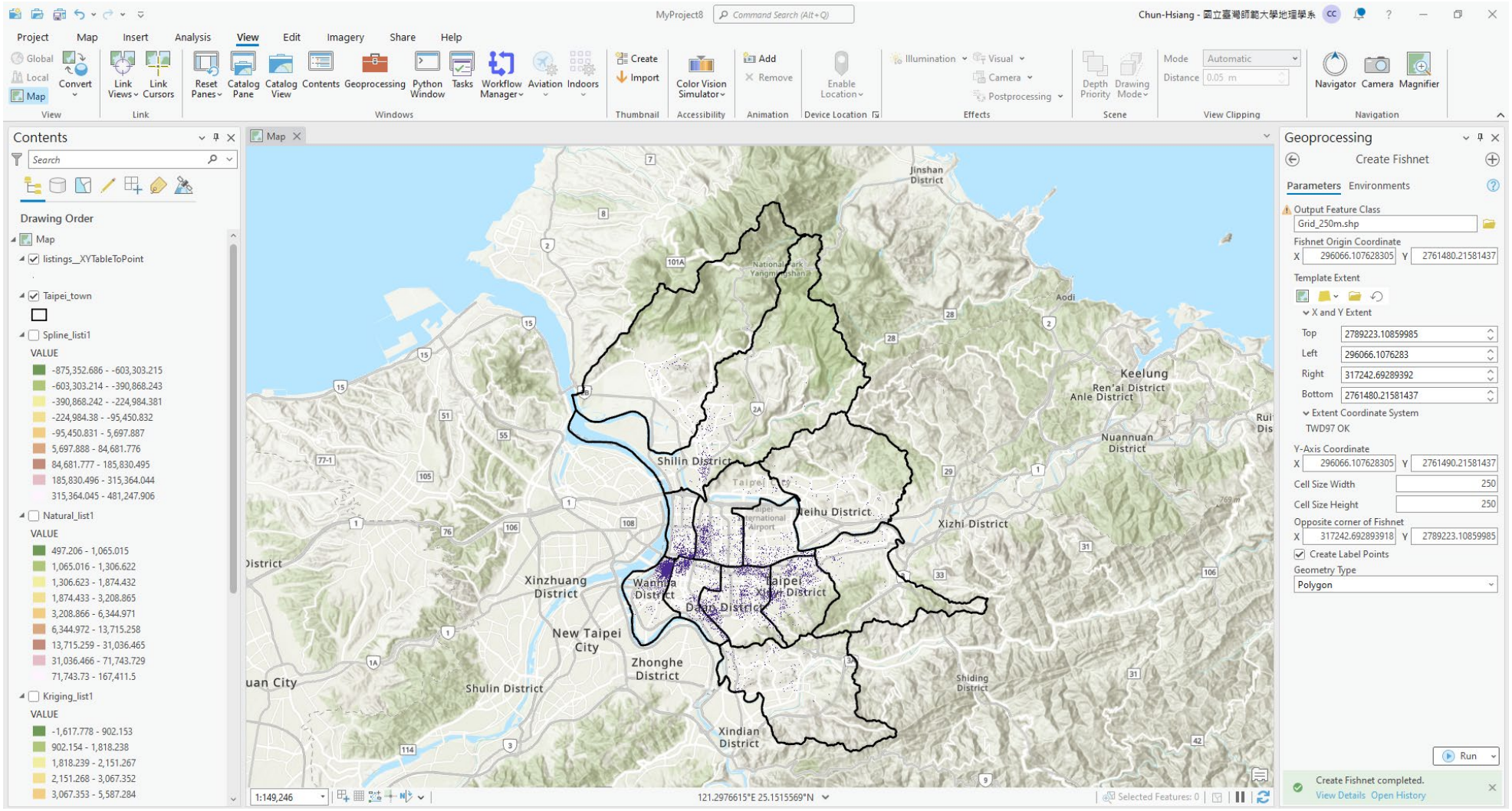
Spline_listi1
VALUE
-875,352.686 - -603,303.215
-603,303.214 - -390,868.243
-390,868.242 - -224,984.381
-224,984.38 - -95,450.832
-95,450.831 - 5,697.887
5,697.888 - 84,681.776
84,681.777 - 185,830.495
185,830.496 - 315,364.044
315,364.045 - 481,247.906
Natural_list1
VALUE
497.206 - 1,065.015
1,065.016 - 1,306.622
1,306.623 - 1,874.432
1,874.433 - 3,208.865
3,208.866 - 6,344.971
6,344.972 - 13,715.258
13,715.259 - 31,036.465
31,036.466 - 71,743.729
71,743.73 - 167,411.5
Kriging_list1
VALUE
-1,617.778 - 902.153
902.154 - 1,818.238
1,818.239 - 2,151.267
2,151.268 - 3,067.352
3,067.353 - 5,587.284
Jinshan District
Aodi
Keelung
Ren'ai District
Anle District
Ruifang District
Nuannuan District
Xizhi District
Luzhu District
Xinzhuang District
New Taipei City
Zhonghe District
Taoyuan City
Shulin District
Shiding District
Xindian District
1:152,291
121.2681988°E 25.2361329°N

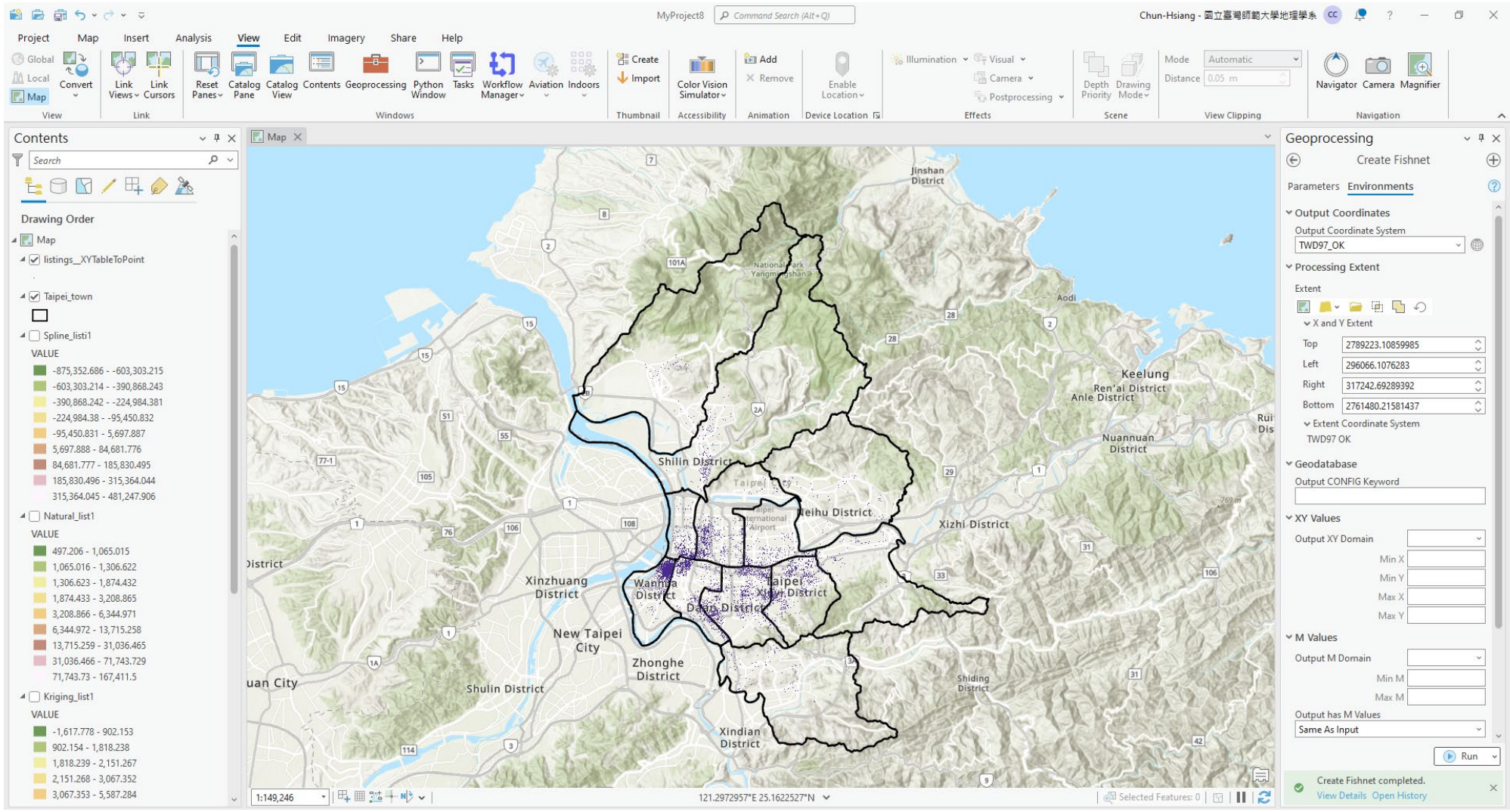
Create Fishnet for Sampling



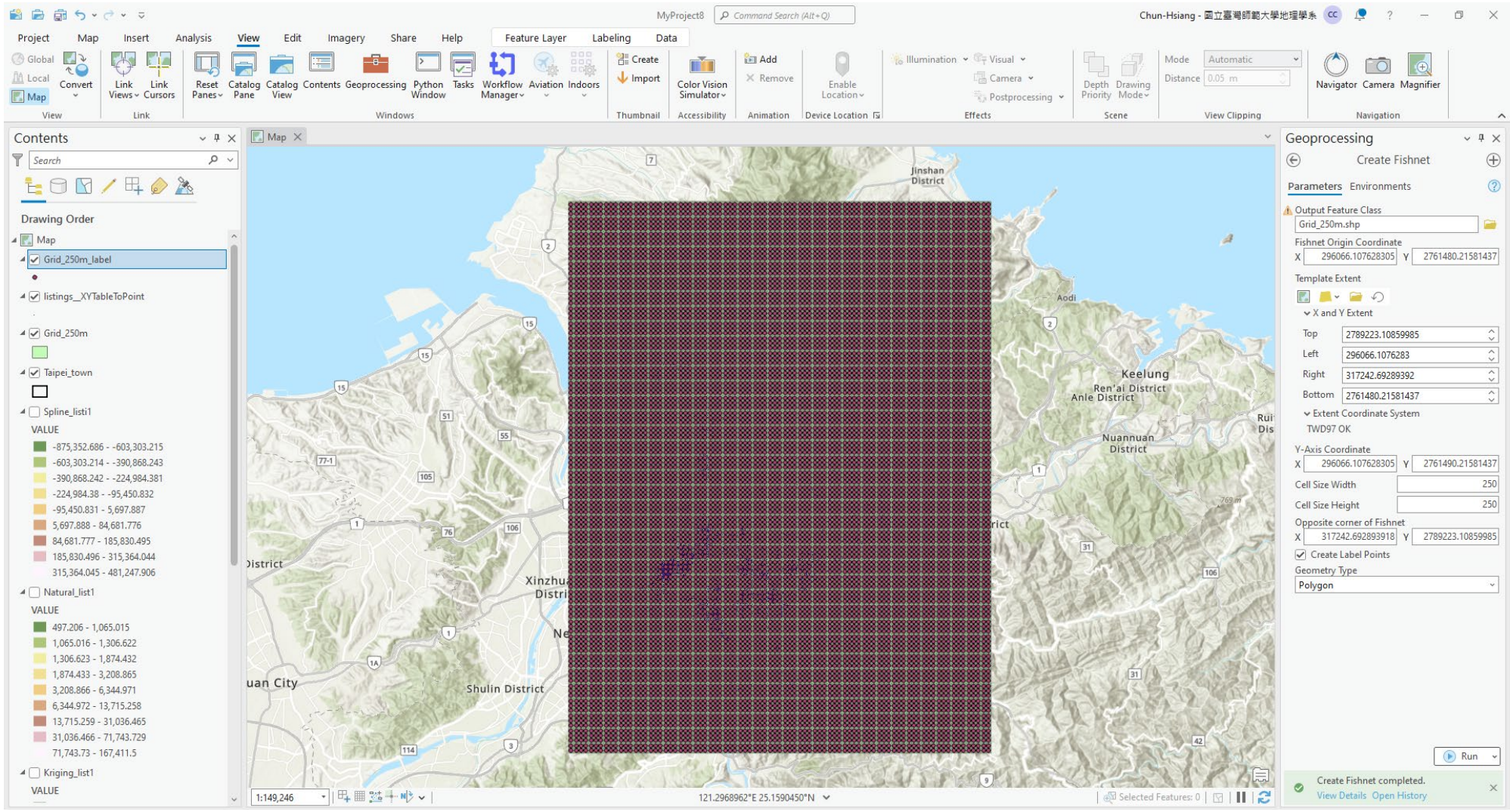
Create 250m x 250m Fishnet



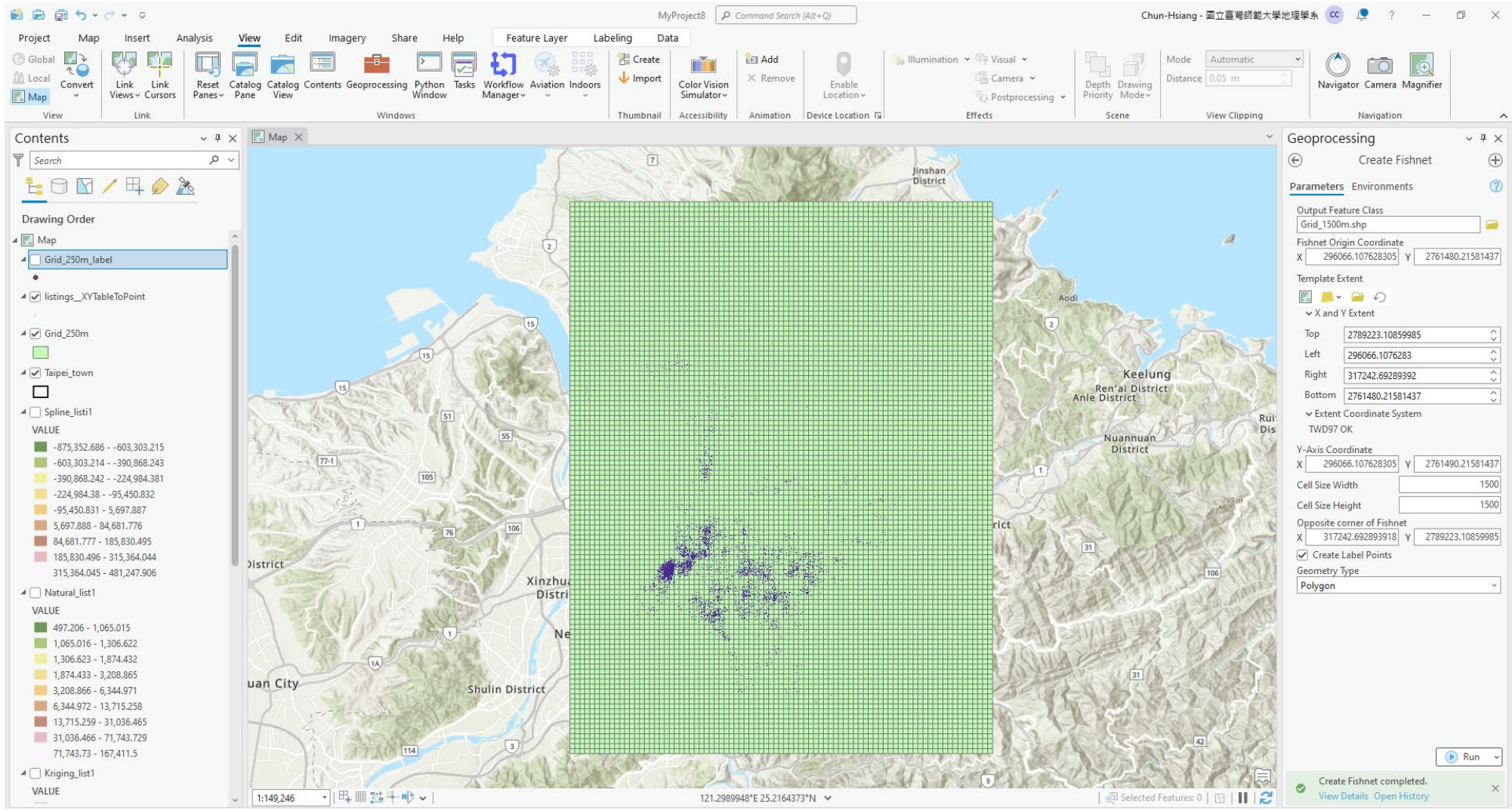
Create 250m x 250m Fishnet



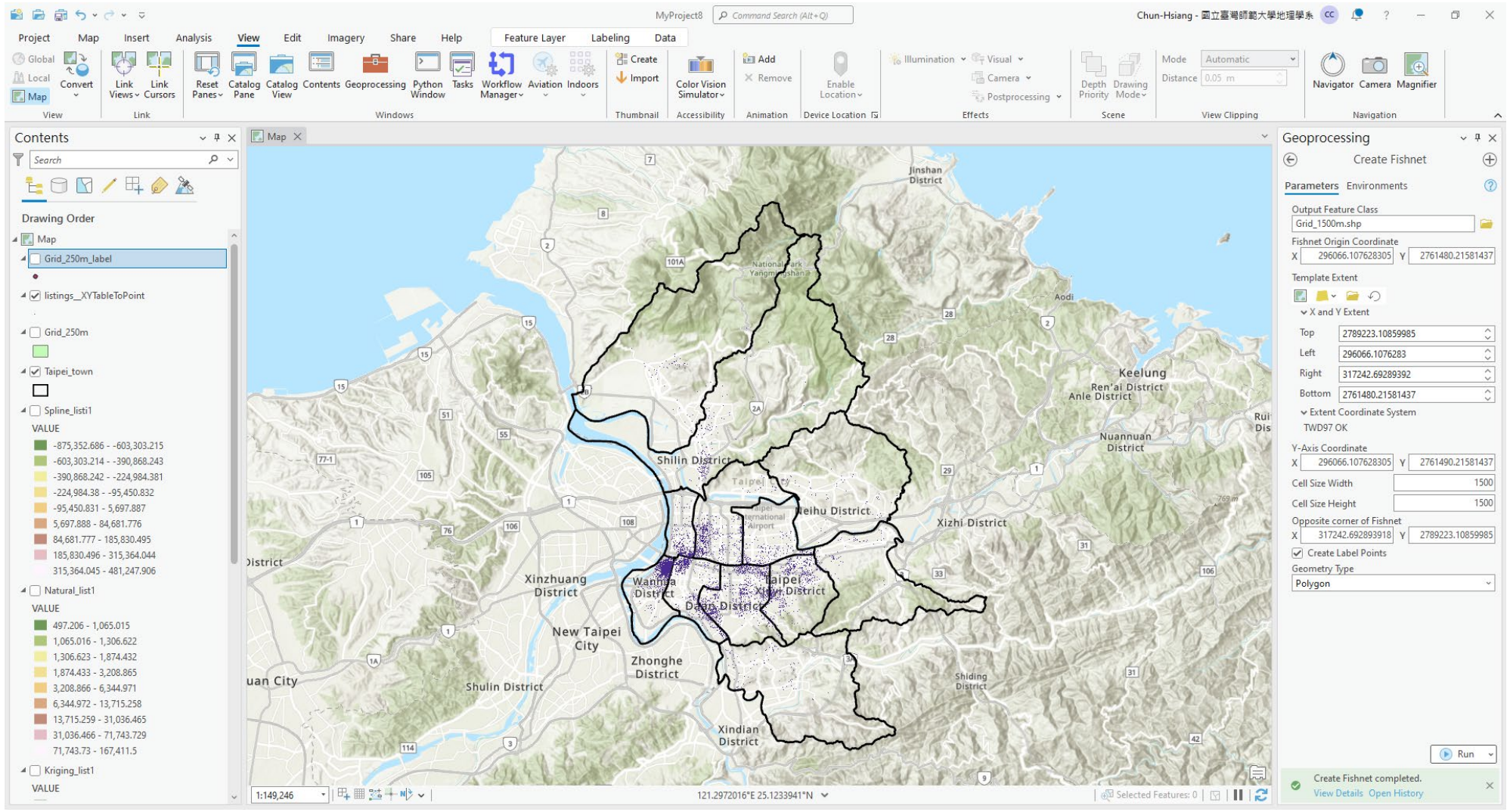
Create 250m x 250m Fishnet



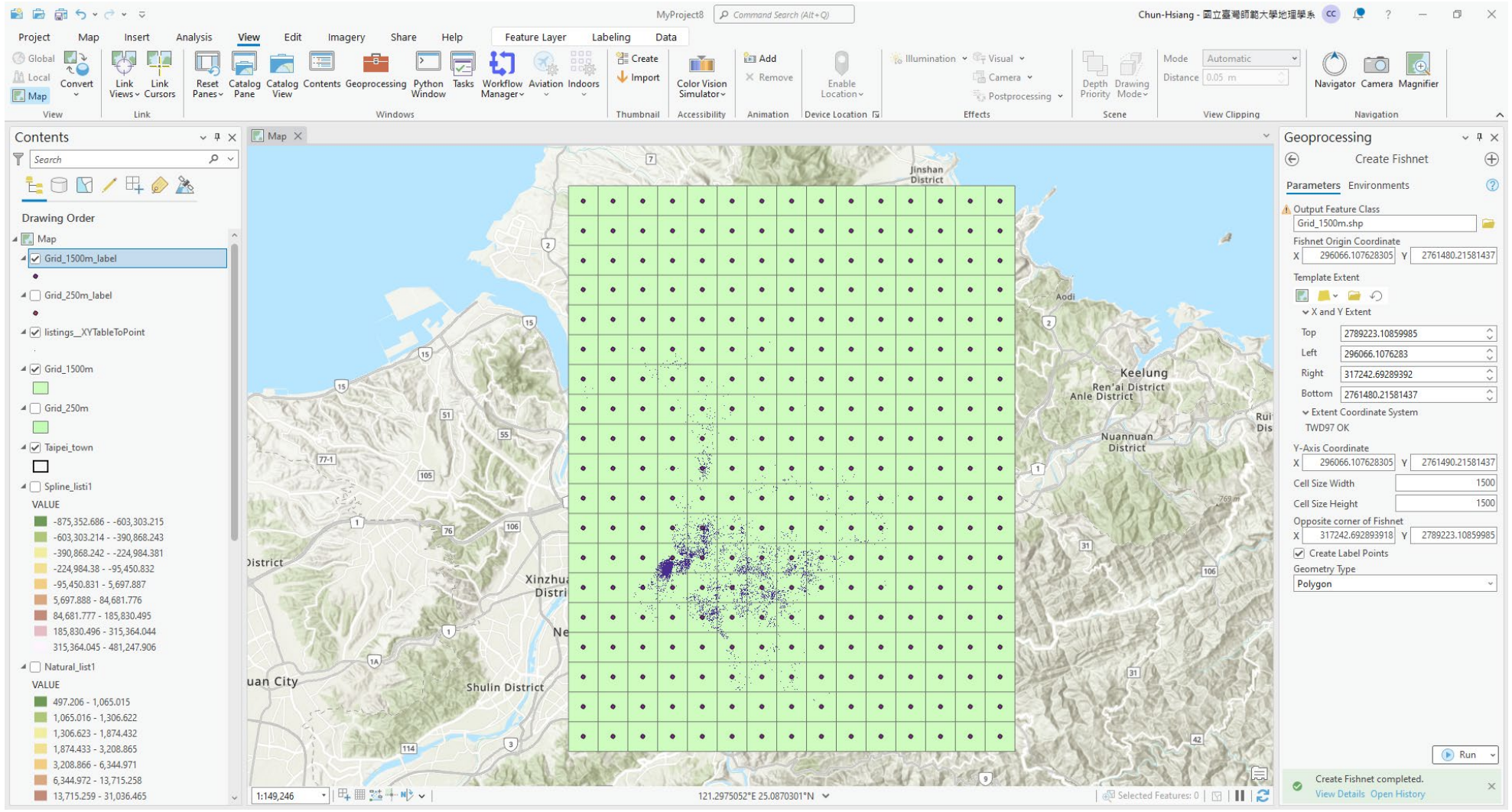
Create 1500m x 1500m Fishnet



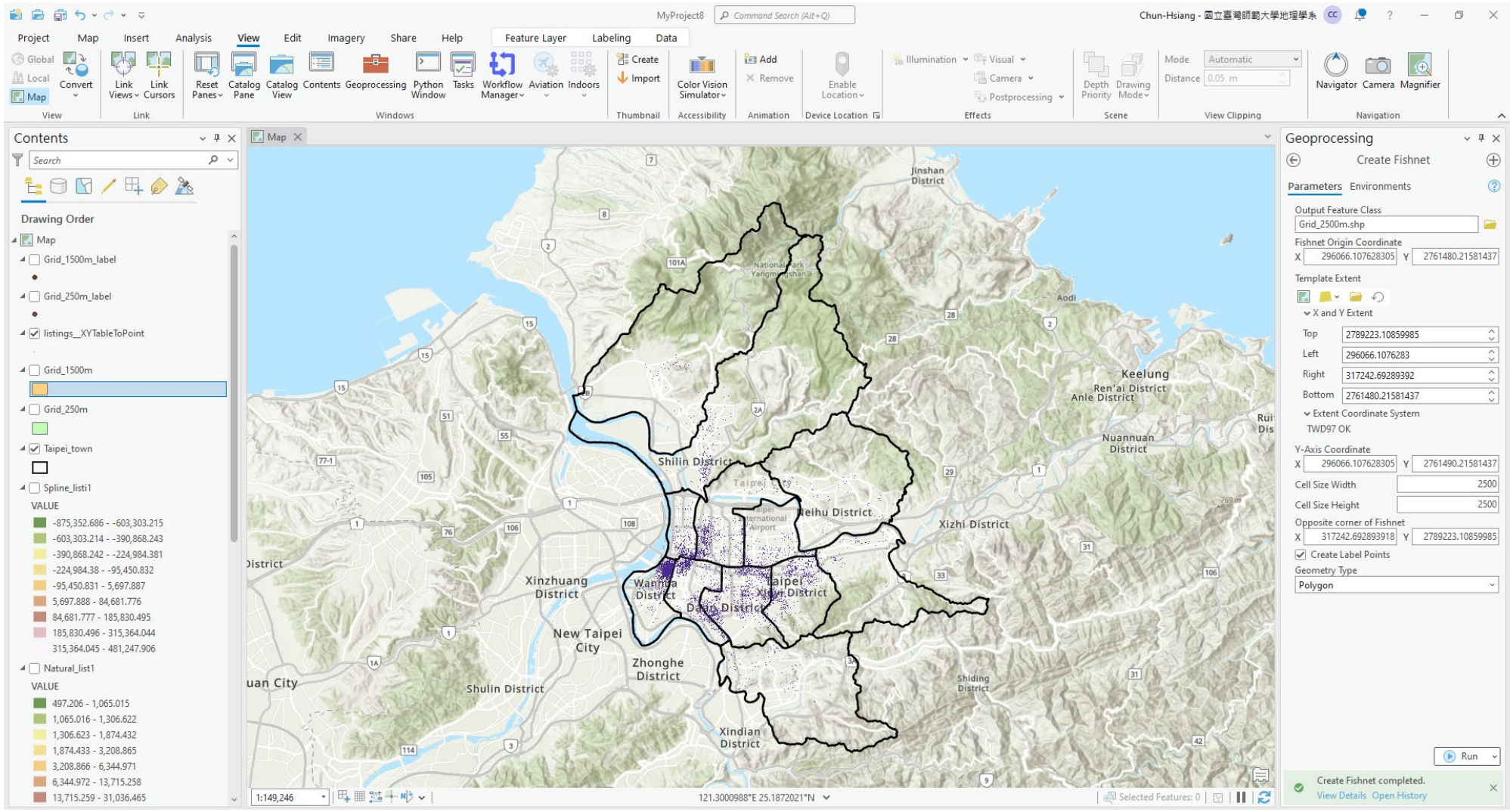
Create 1500m x 1500m Fishnet



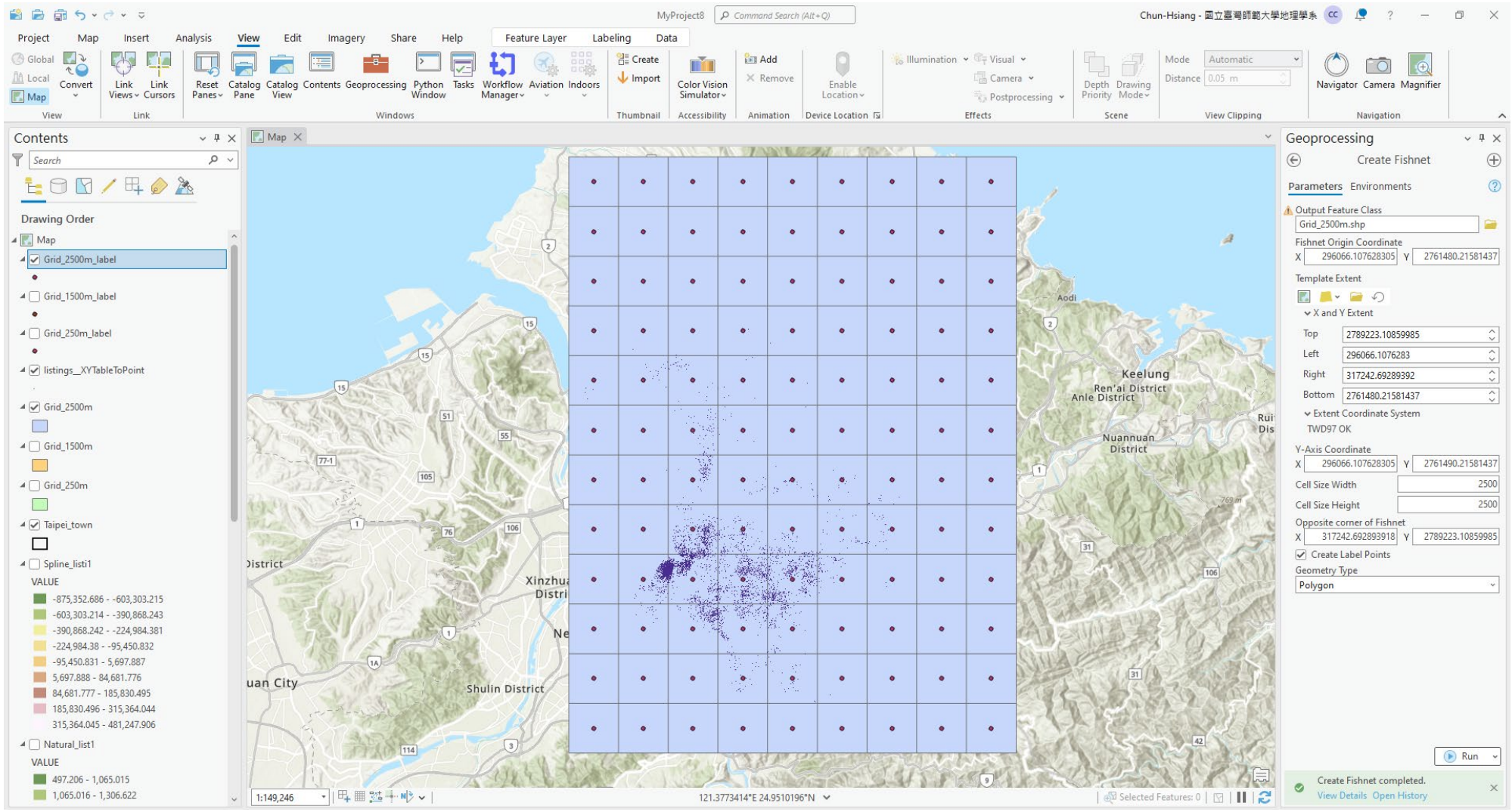
Create 1500m x 1500m Fishnet



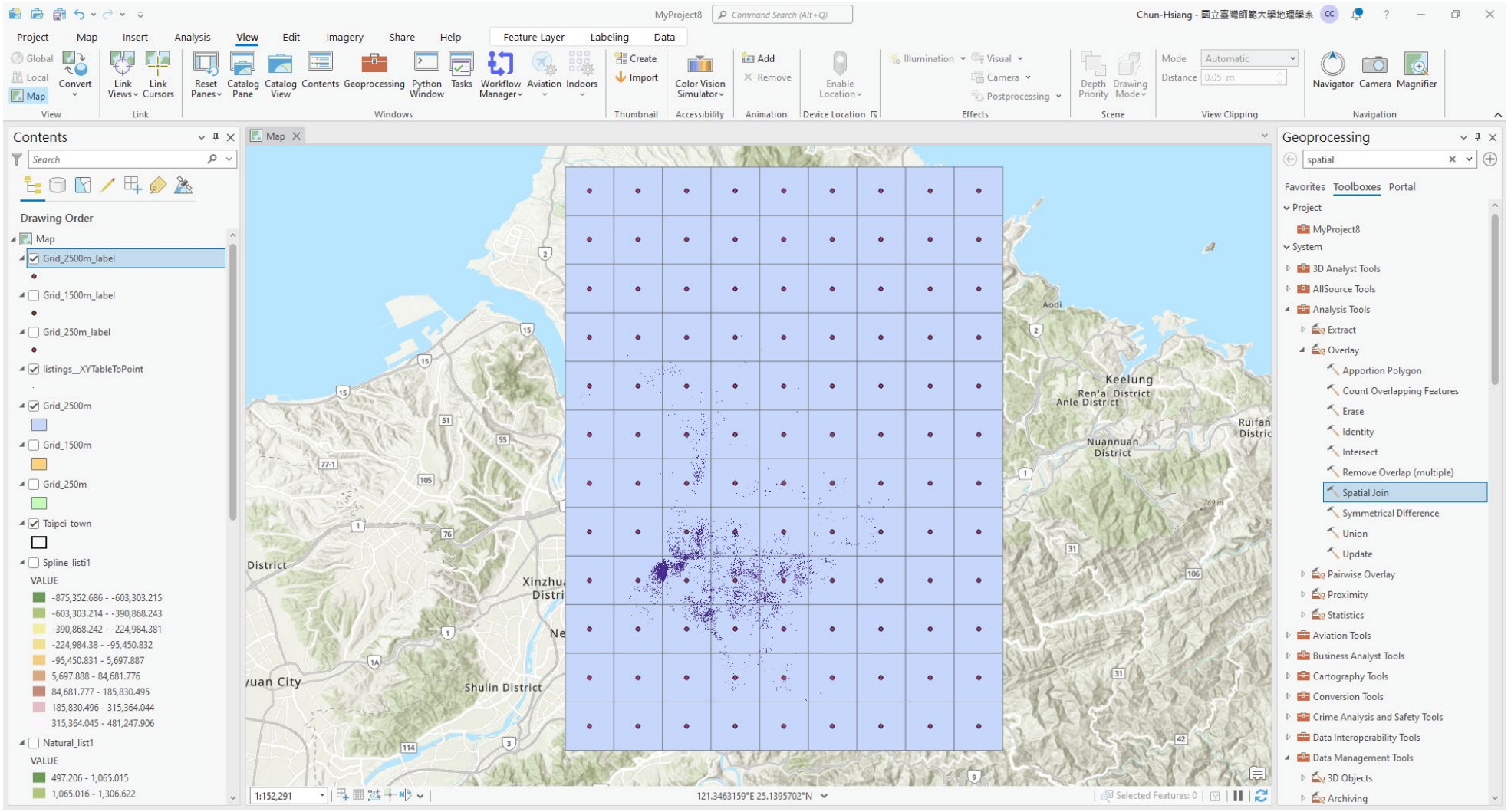
Create 2500m x 2500m Fishnet



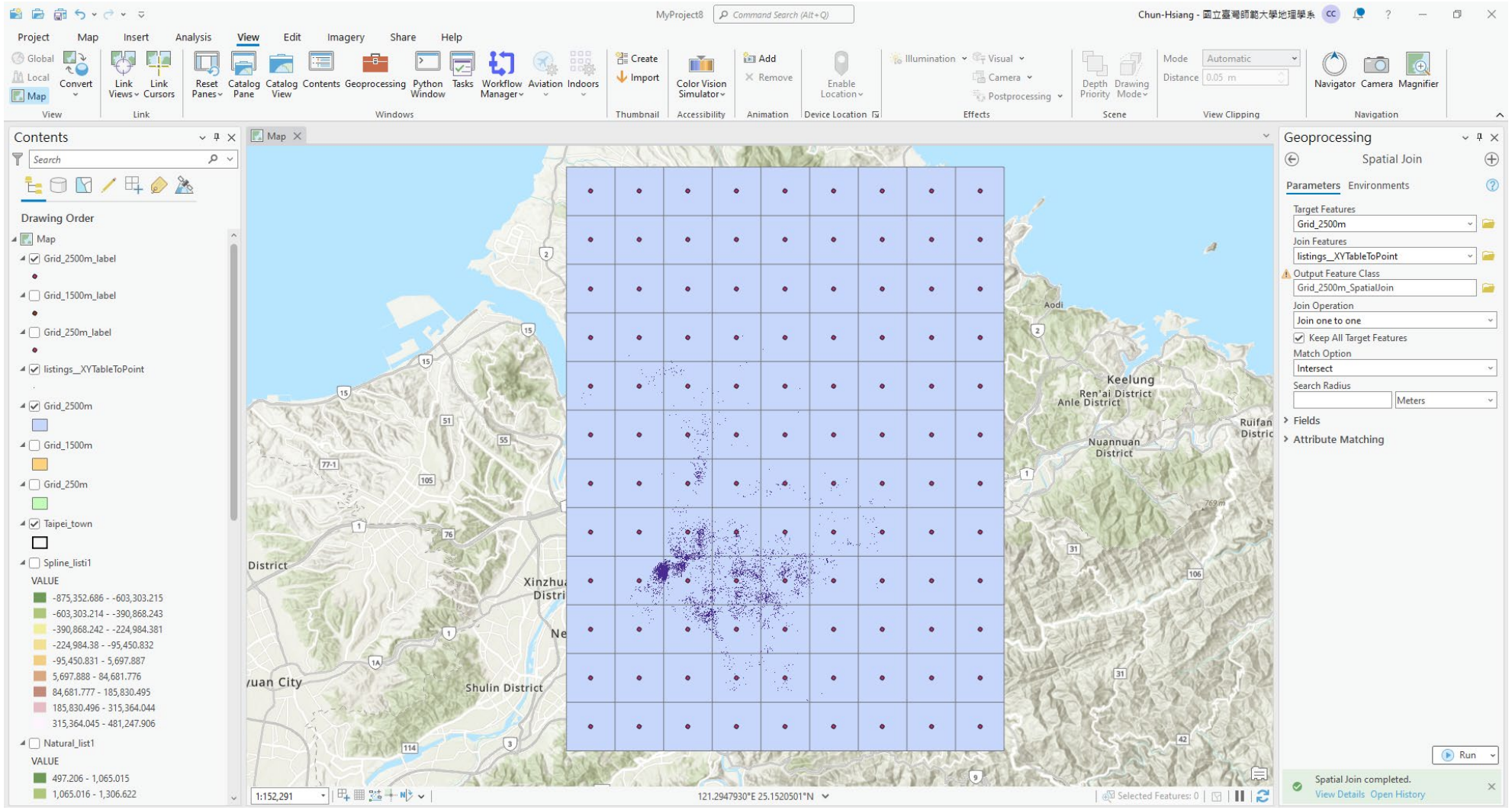
Create 2500m x 2500m Fishnet



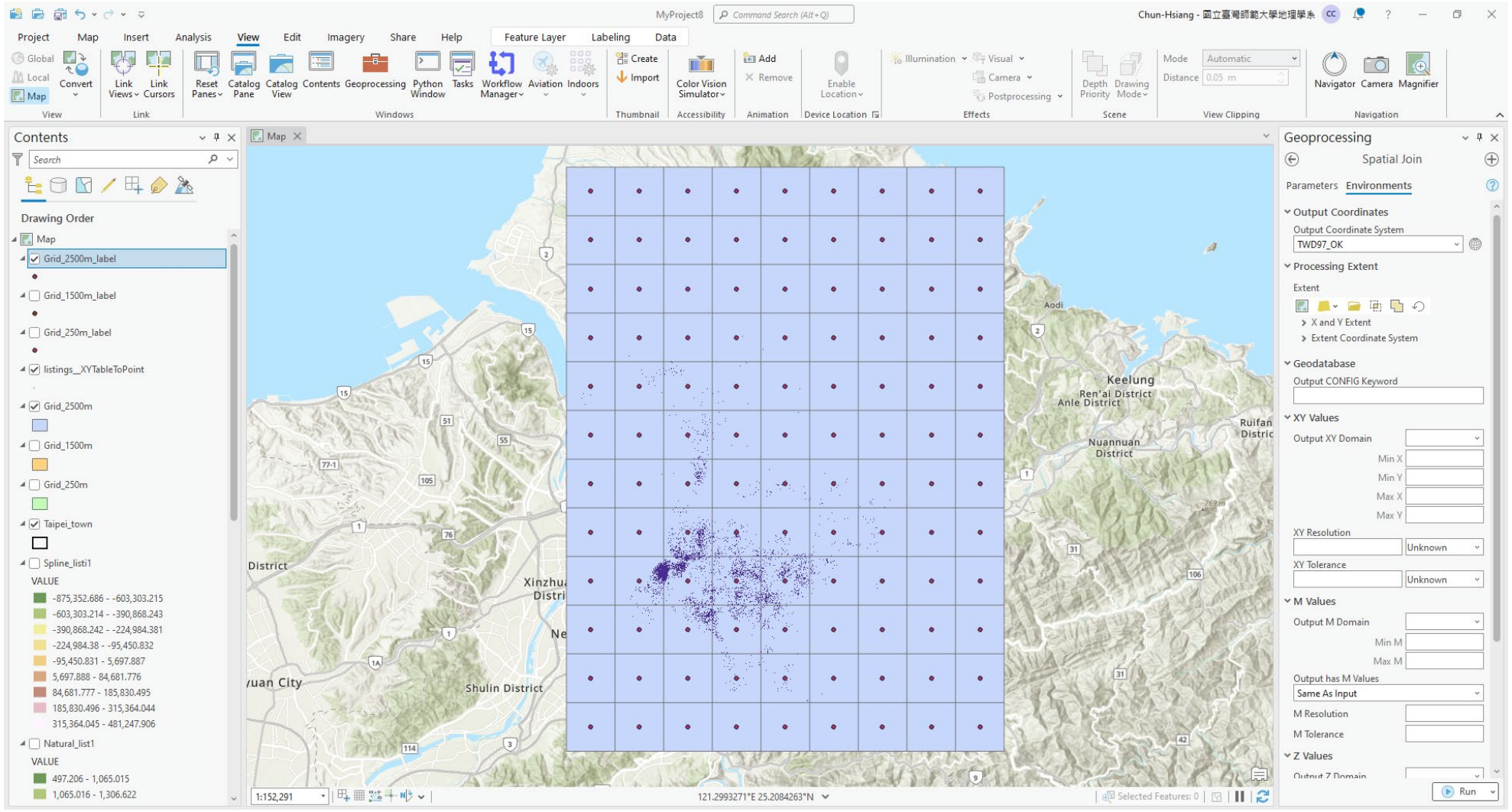
Spatial Join for Counting Number of Airbnb Listings



Spatial Join for Counting Number of Airbnb Listings



Spatial Join for Counting Number of Airbnb Listings



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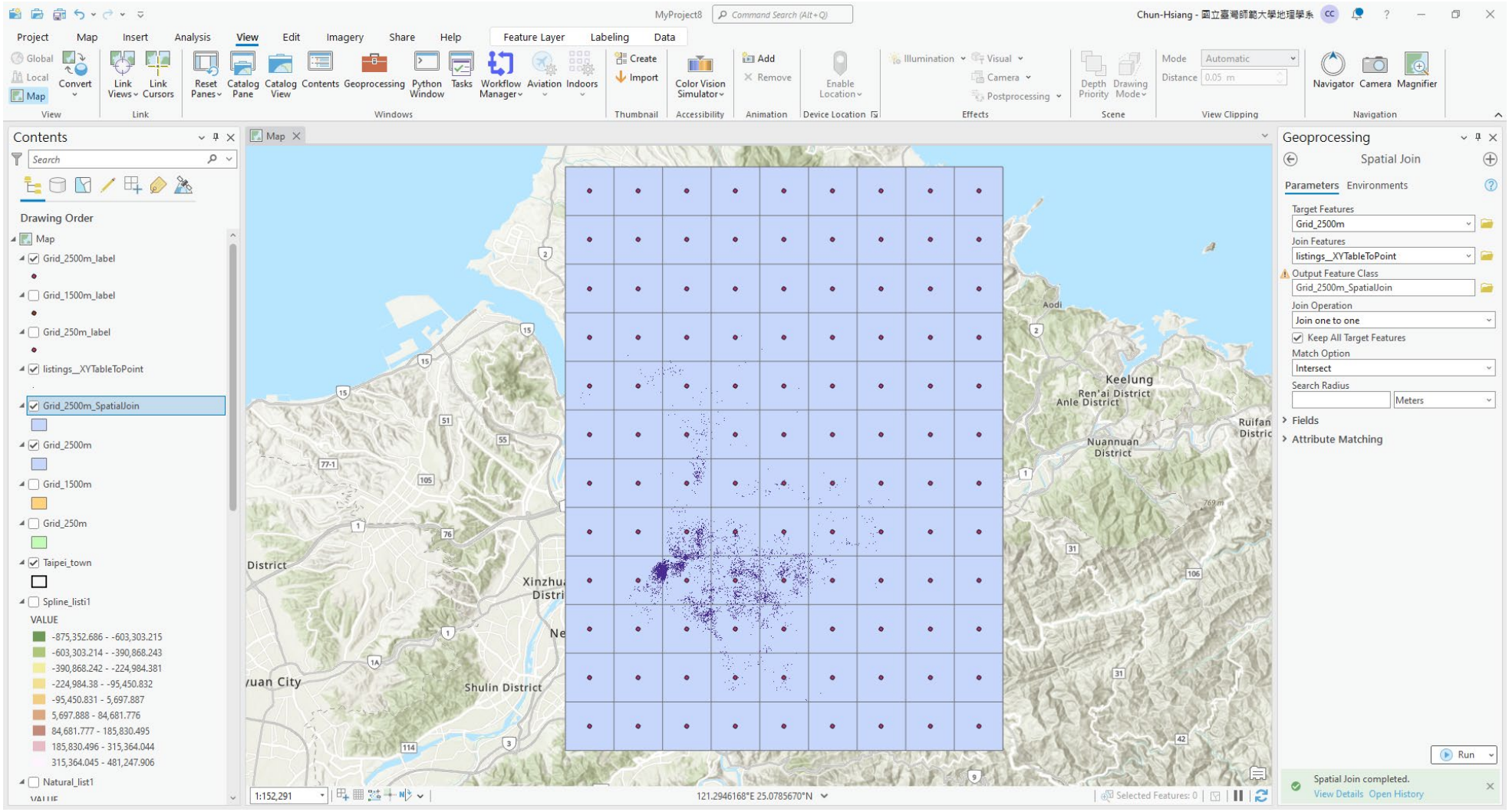

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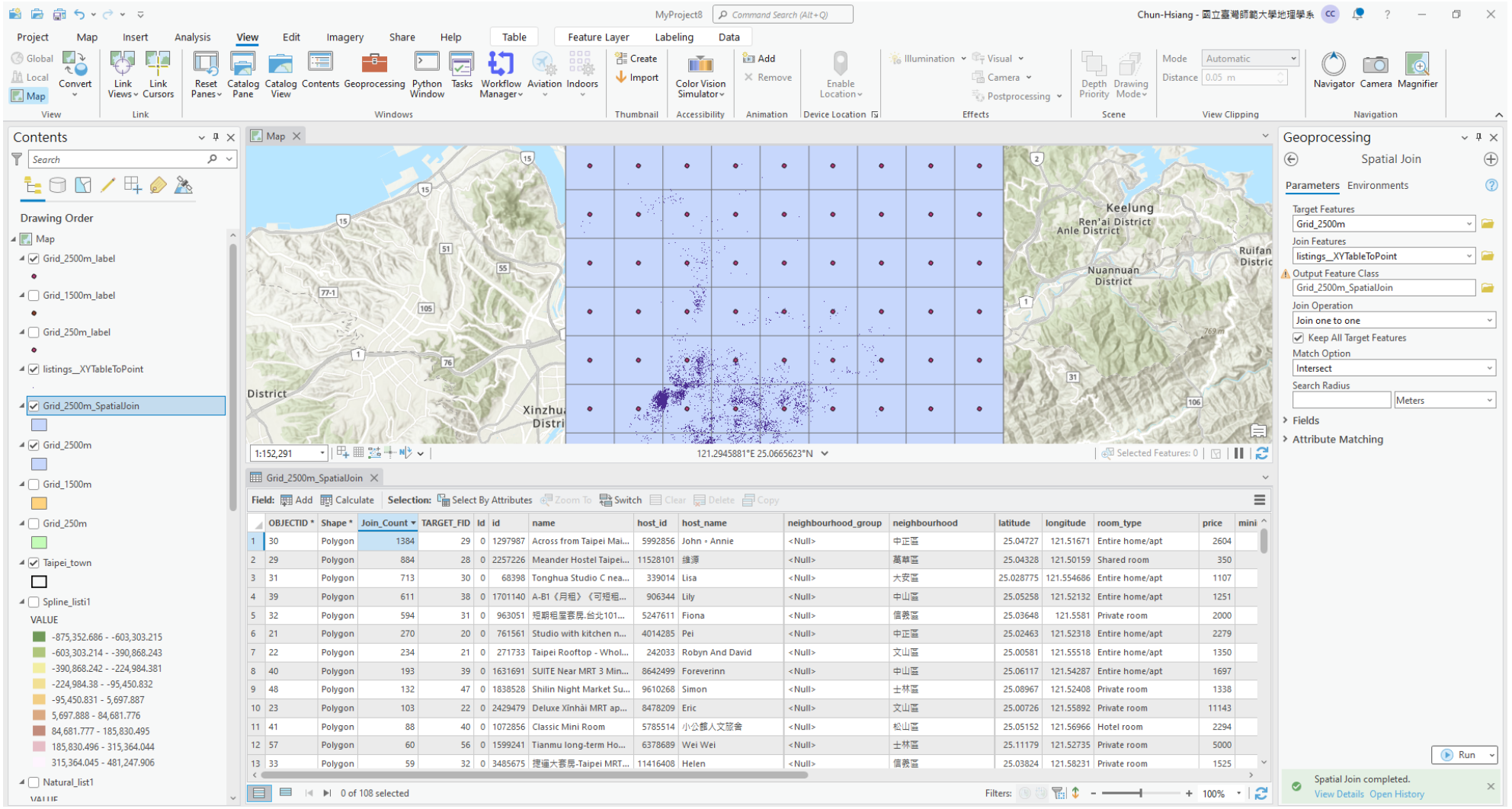

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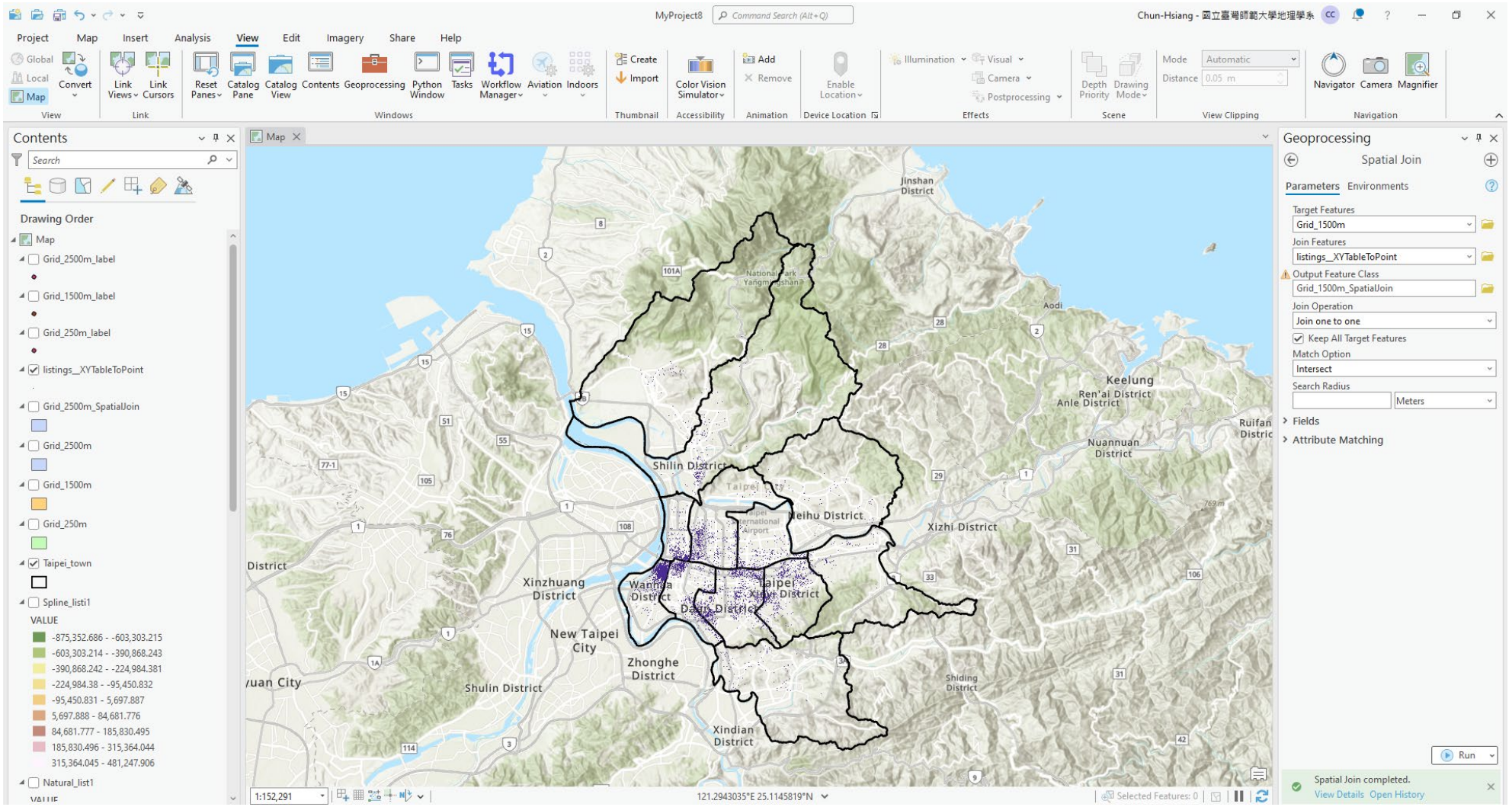

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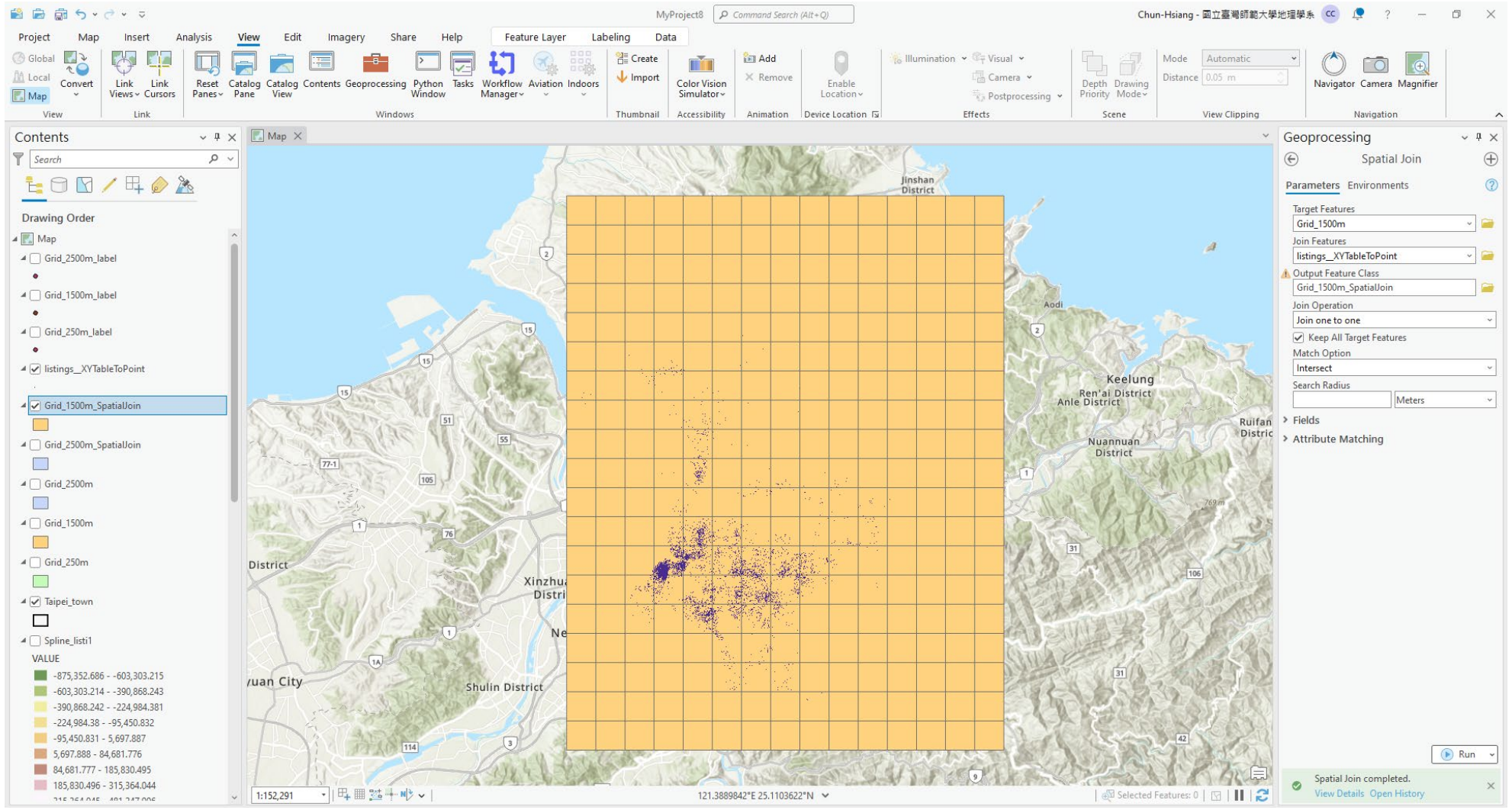

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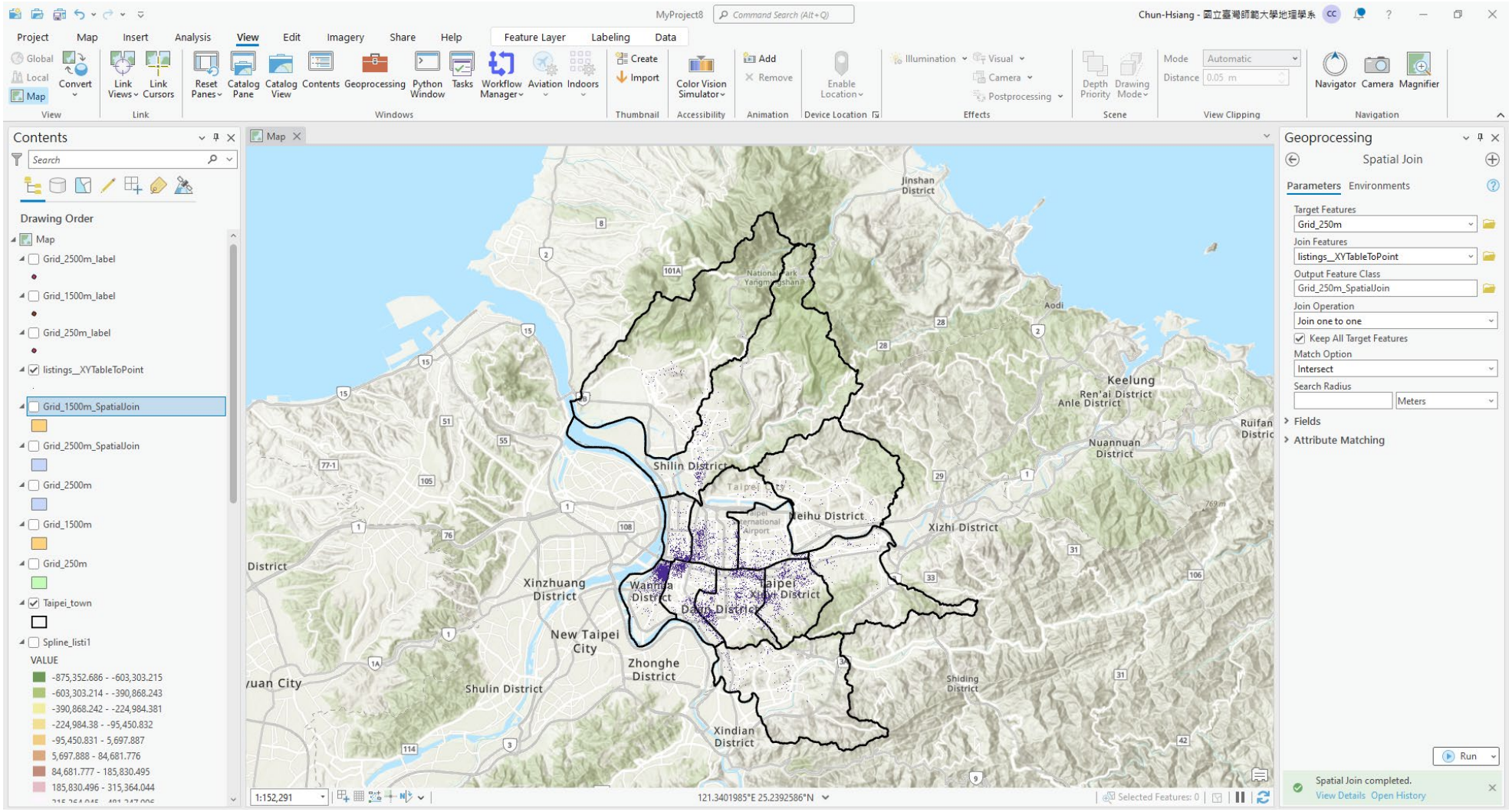

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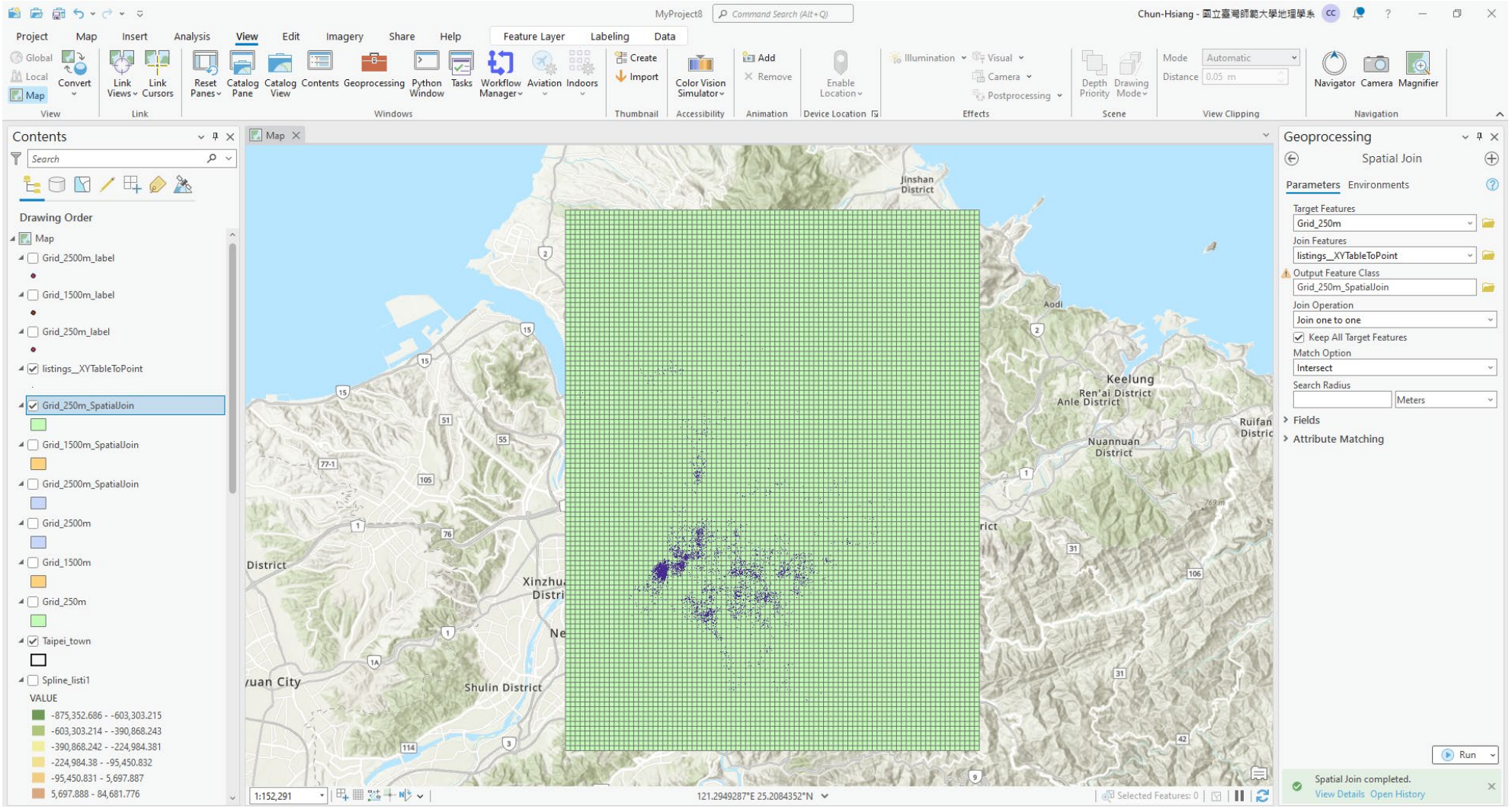
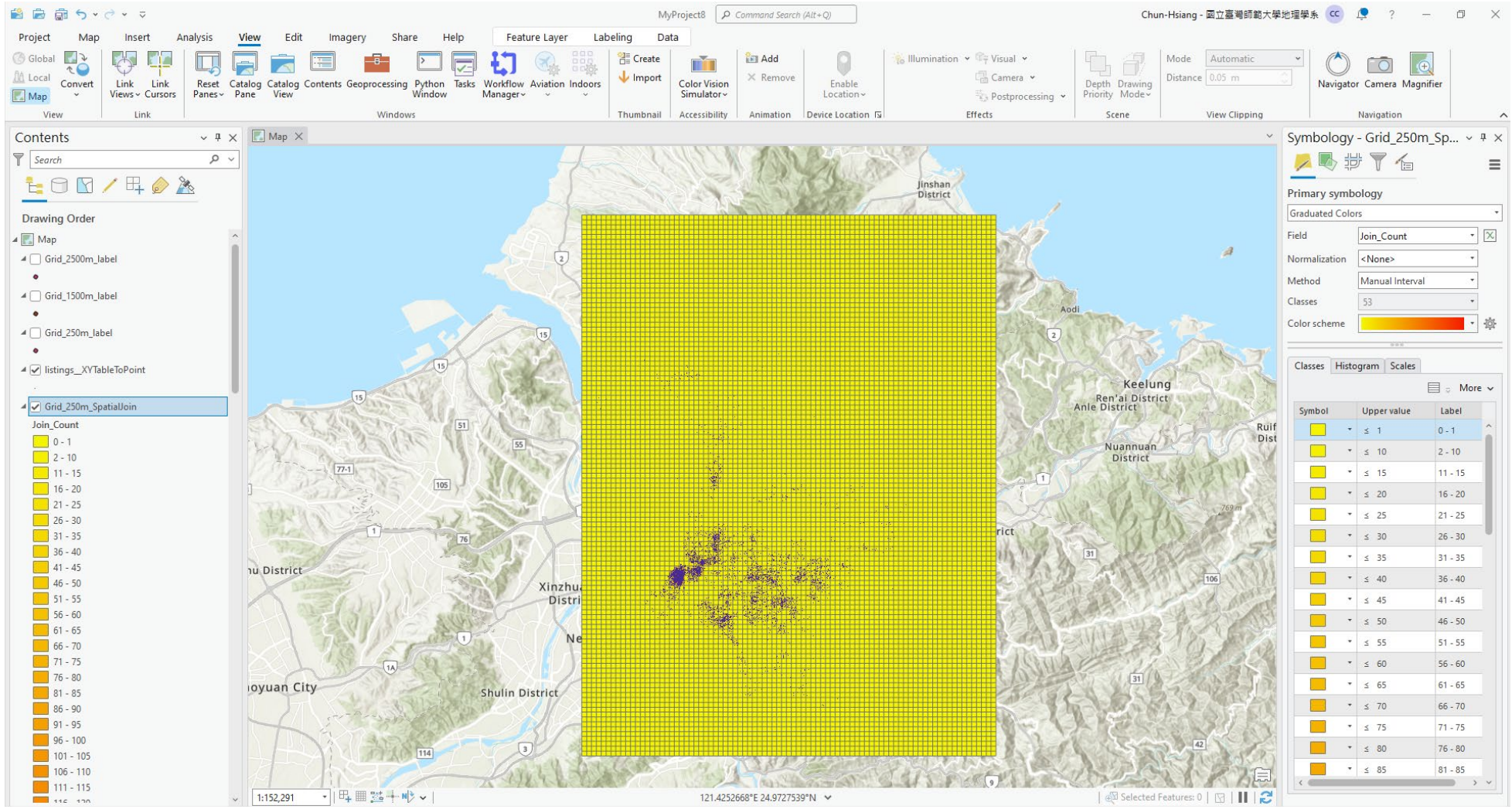
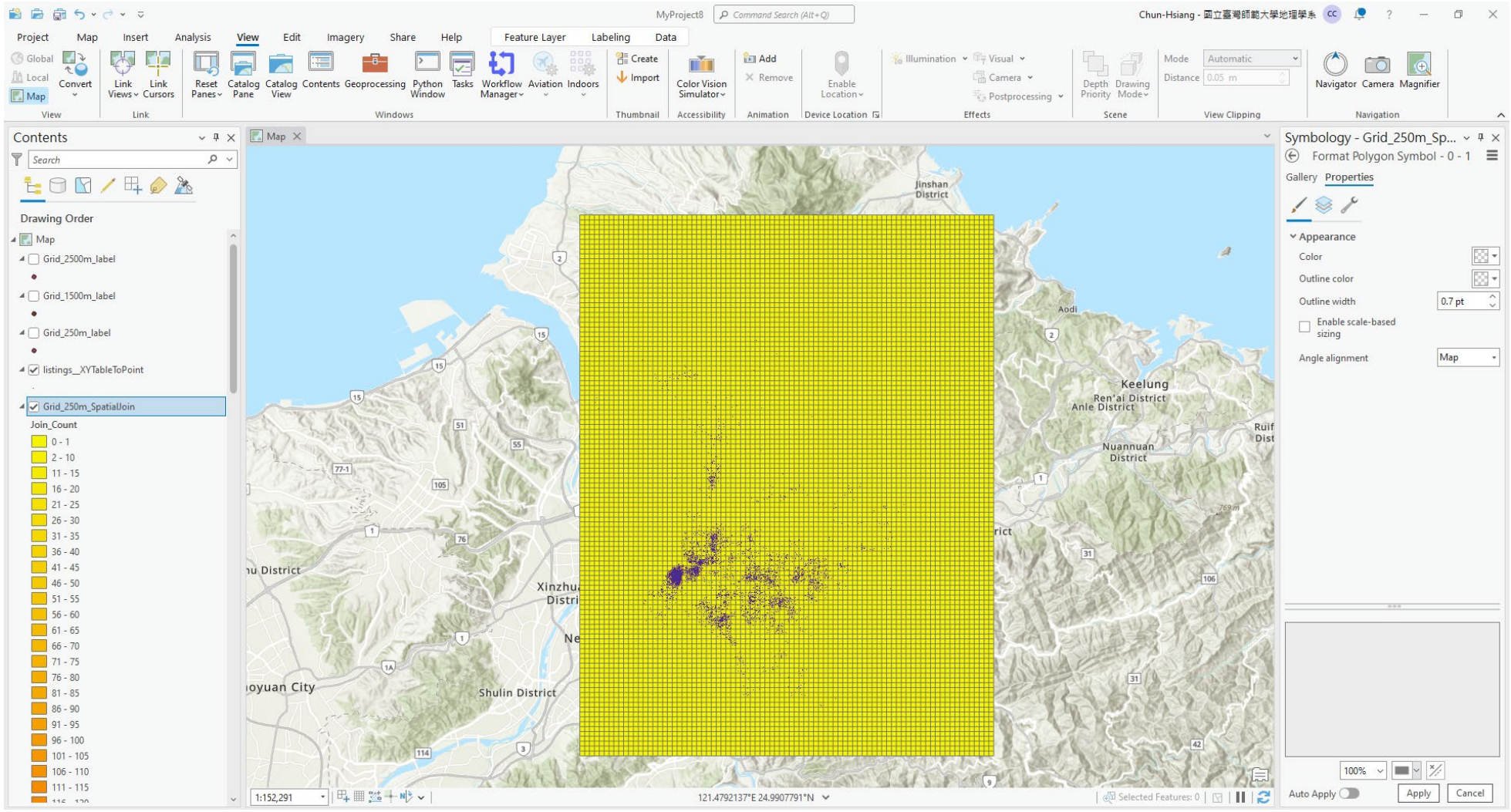


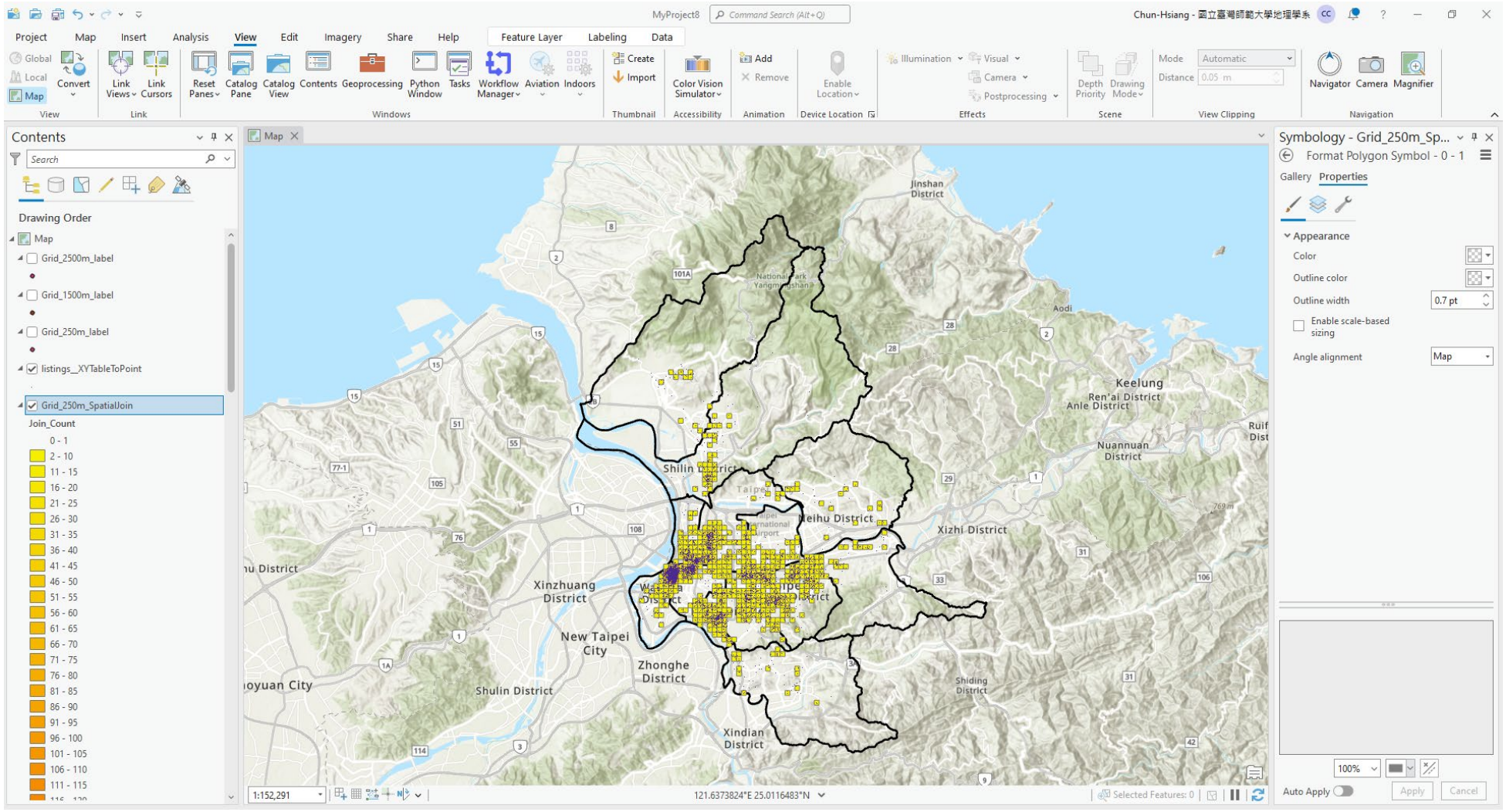
Symbology – Grid 250m



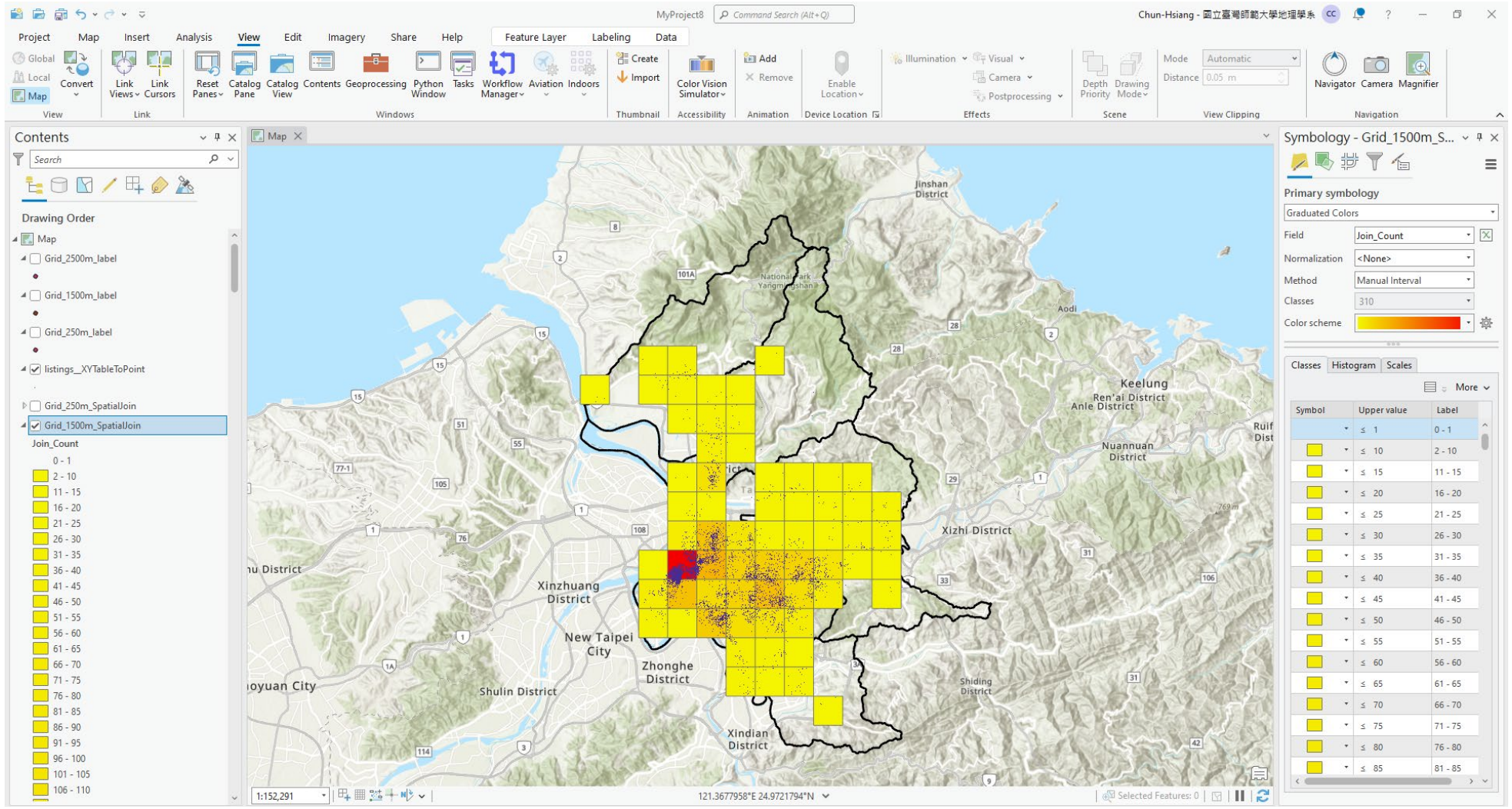
Symbology – Grid 250m



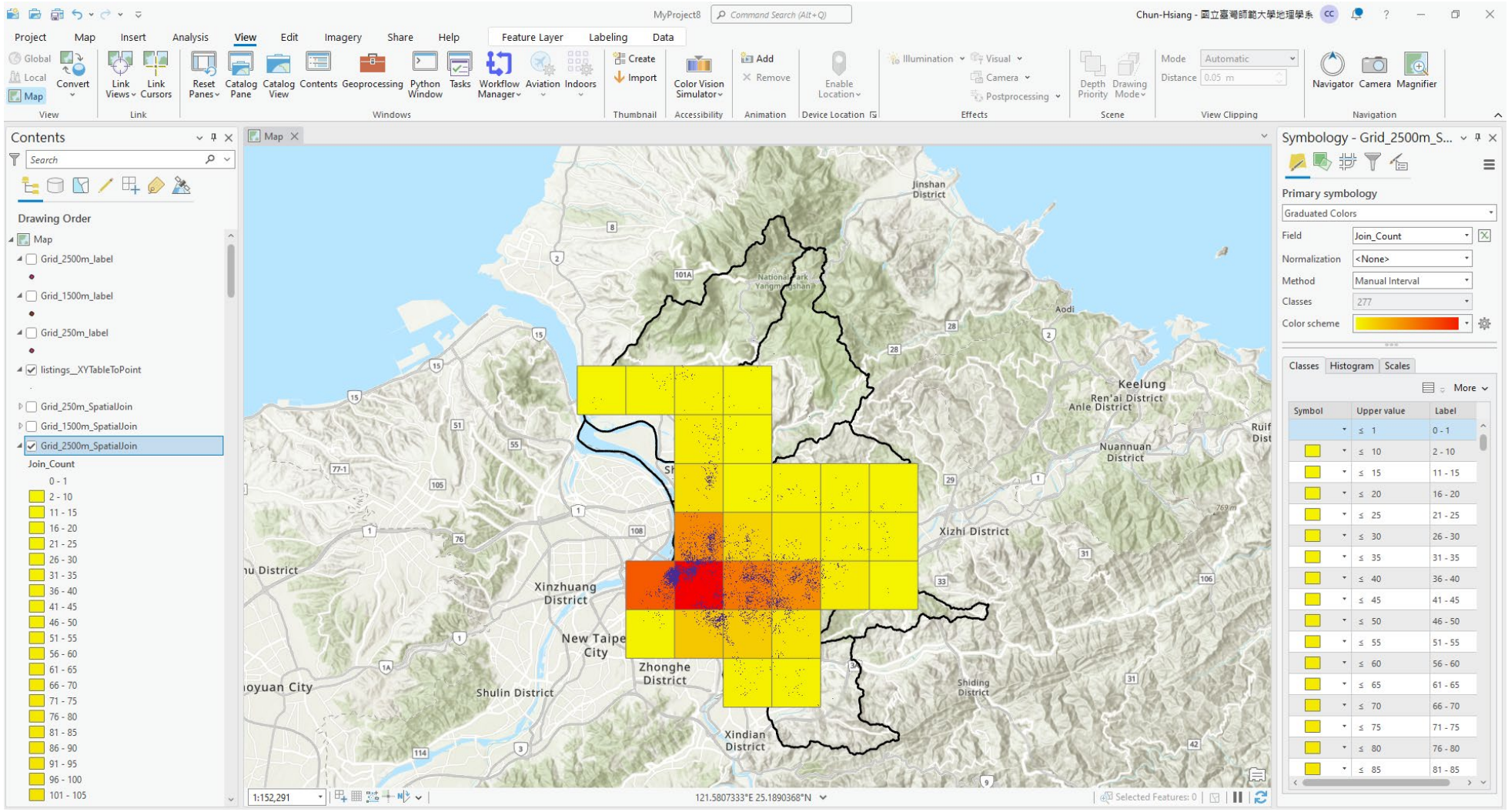
Symbology – Grid 250m



Symbology – Grid 1500m



Symbology – Grid 2500m



MAUP Observation

- What do you found the spatial distribution differences in the three gridding sizes?
- …
- …
- …
- …

The End

Thank you for your attention!

Email: chchan@ntnu.edu.tw
Web: toodou.github.io