PRESERVING EARLY 20TH CENTURY MULTI-FAMILY HOUSING ON PORTLAND'S EASTSIDE:

USING DENSITY ANALYSIS AND SPATIAL AUTOCORRELATION IN ARCGIS FOR HISTORIC PRESERVATION

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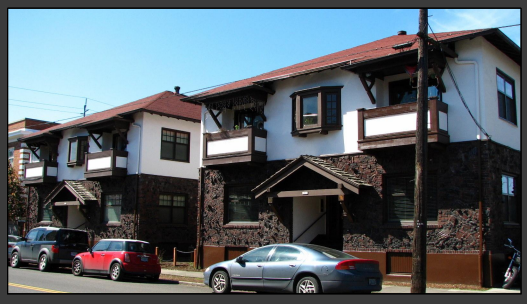
GIS II
Spring 2010



Portland's eastside neighborhoods contain a significant amount of historic early 20th century apartment buildings.

Most of the inner ring neighborhoods that contain these buildings lack any formal historic designation or conservation district protections.

The purpose of this study is to determine if the distribution of these buildings in northeast and southeast Portland could allow for new historic conservation districts.

This required searching for areas with high concentrations of historic multi-family buildings.

DATA

Metro RLIS Data
- -Tax Lot Shapefiles
- -City Boundary Shapefiles
- -Neighborhood Shapefiles
- -Census Block Shapefiles
- -Streets Shapefiles

Bureau of Planning and Sustainability Website
- -Historic and Conservation District Boundaries
  (Digitized in ArcMap using Editor)

METHODOLOGY

Isolate Eastside Metro RLIS Data

⇩

Create Point Data for Historic Multi-Family Buildings

⇩

Run Kernel and Point Density Analyses for Point Data

⇩

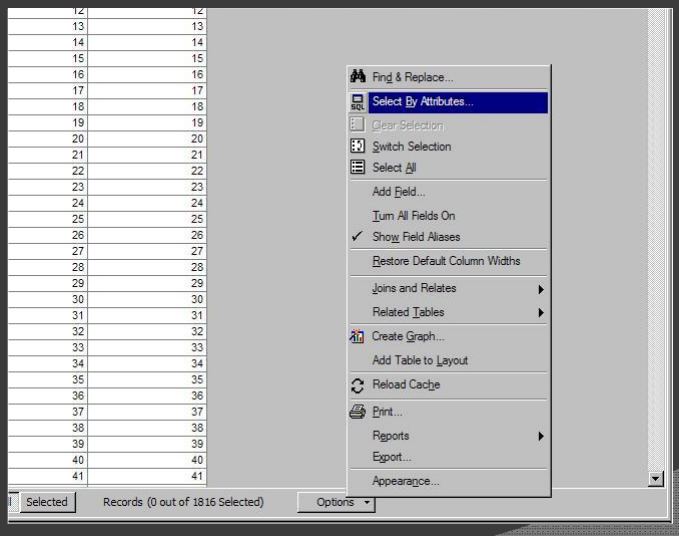
Run Spatial Autocorrelation tests based on point data at neighborhood and census block levels

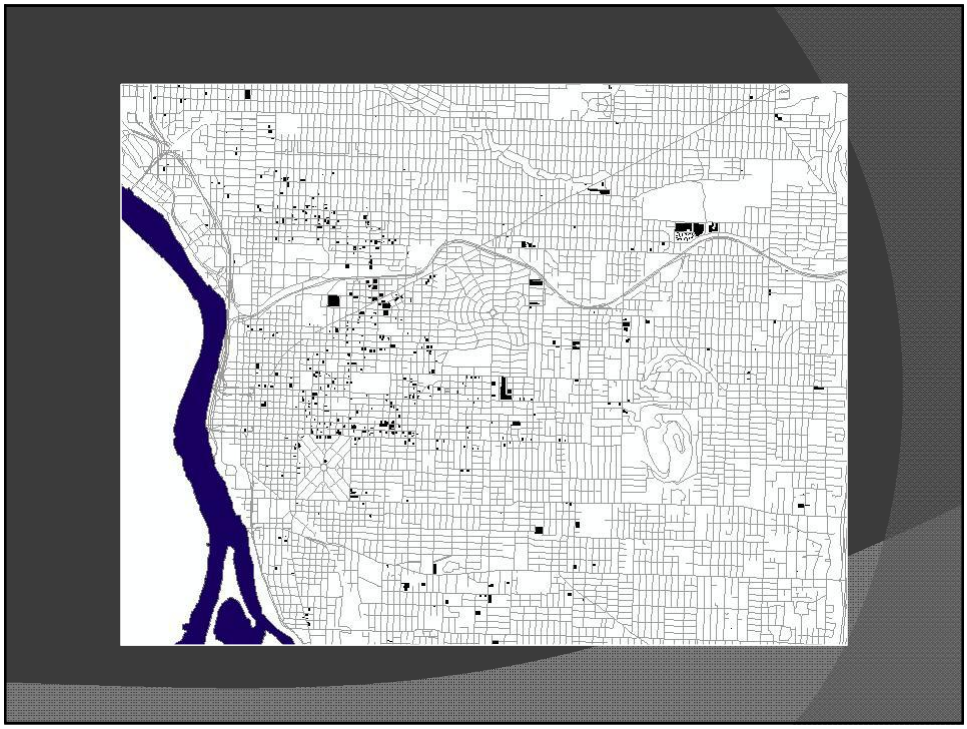
⇩

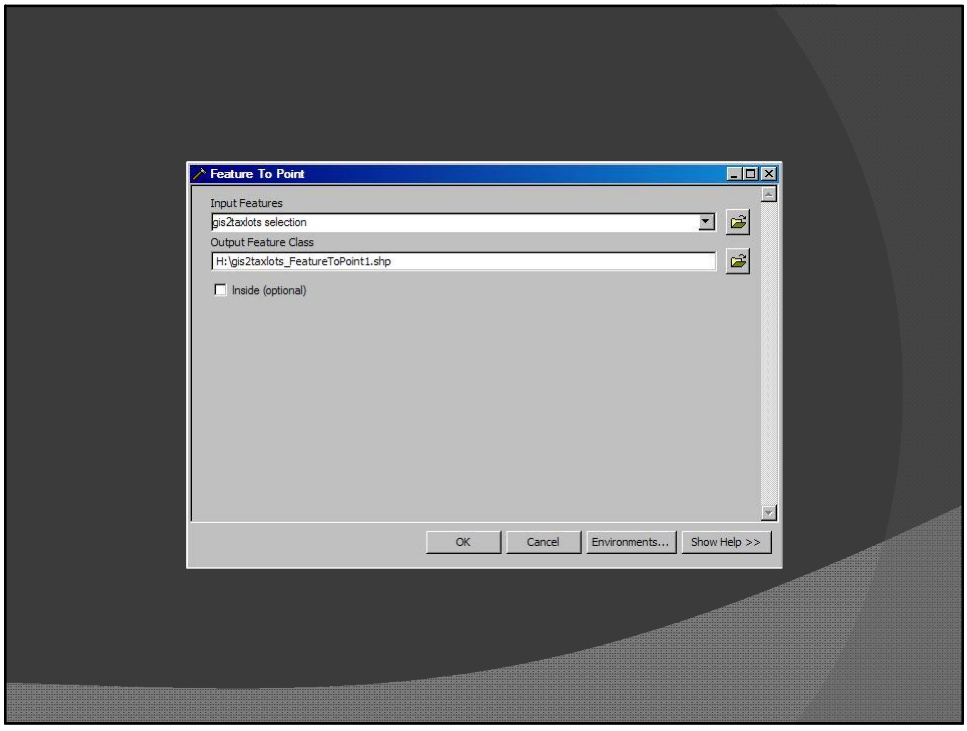
Produce Maps showing Distributions, Densities and Spatial Autocorrelation of Historic Multi-Family Buildings

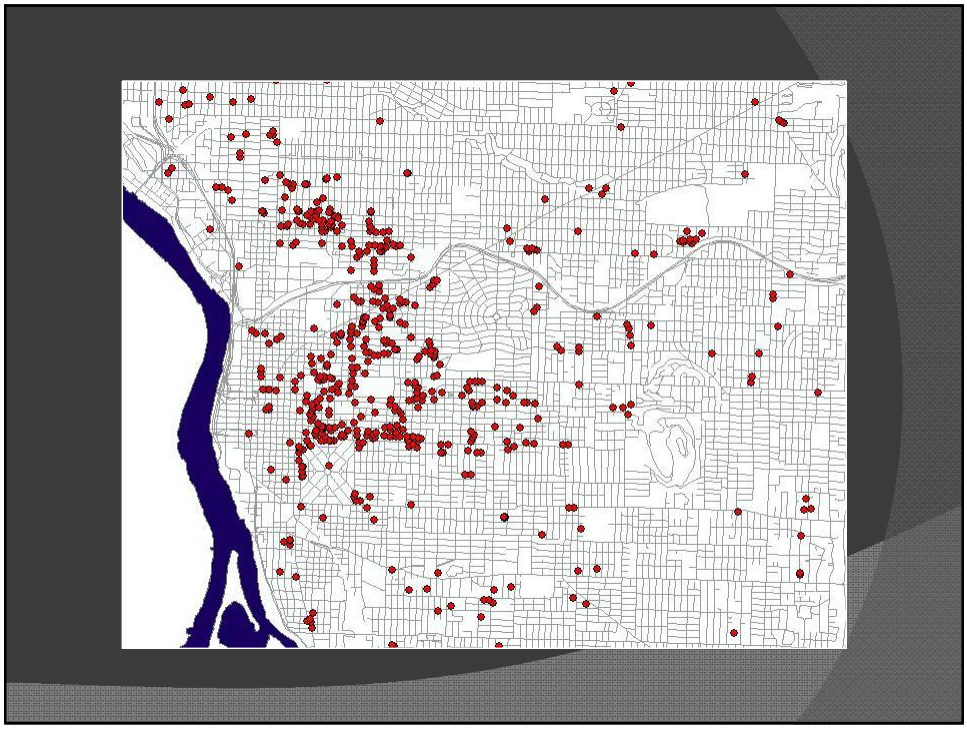
⇩

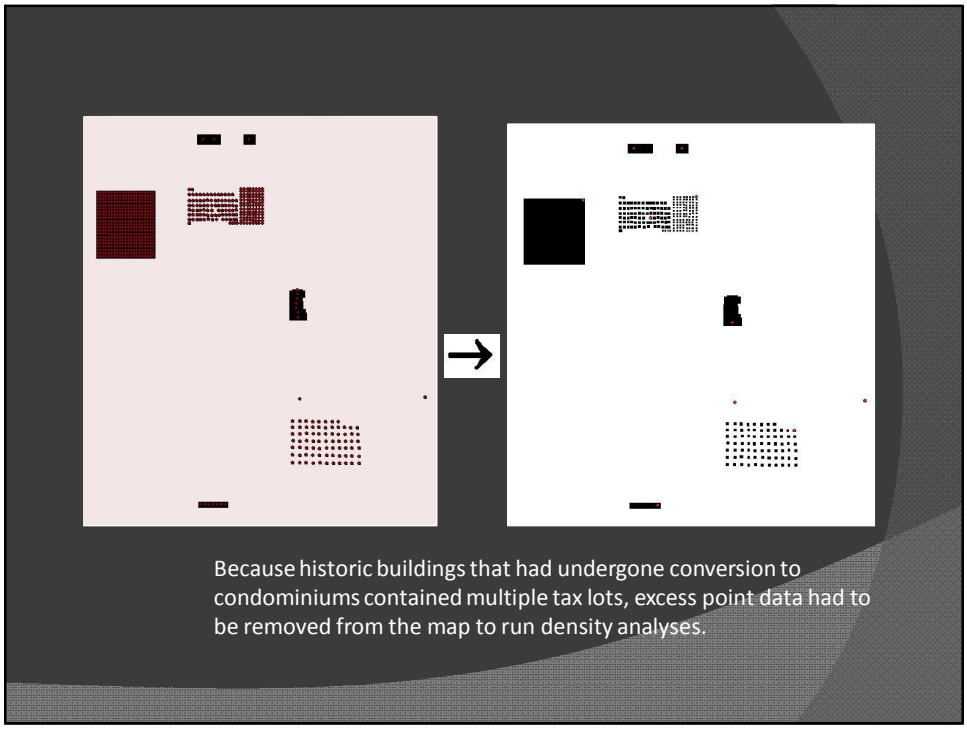
Recommend Areas that would be suitable for historic designation based on density and clustering of historic multi-family buildings



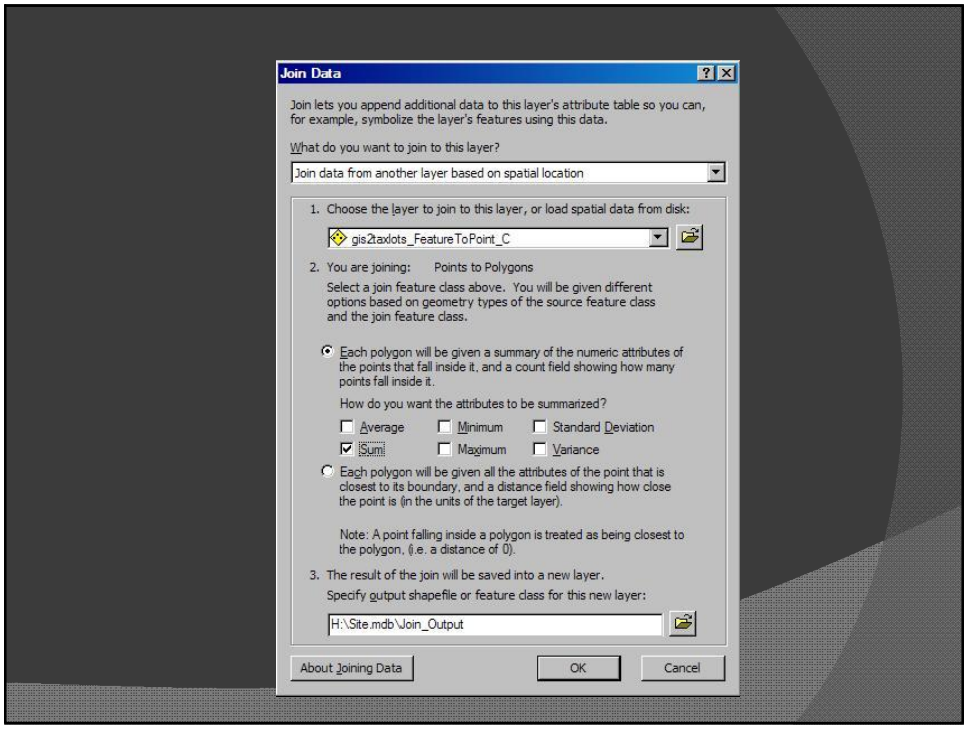


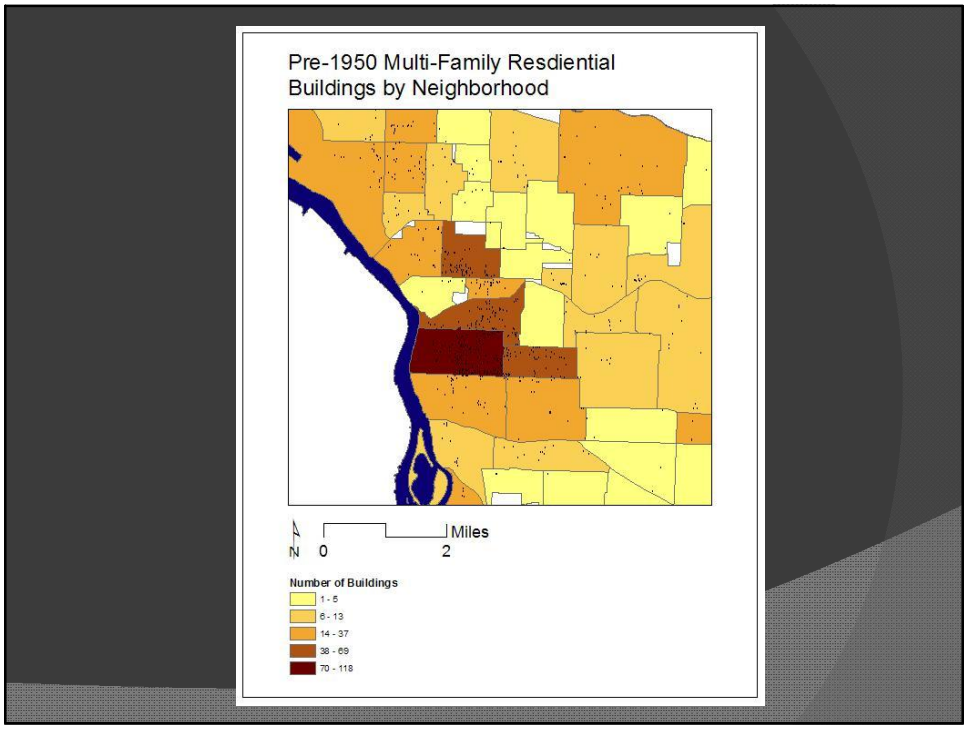

Feature To Point
Input Features
gis2taxlots selection
Output Feature Class
H:\gis2taxlots_FeatureToPoint1.shp
Inside (optional)
OK
Cancel
Environments...
Show Help >>

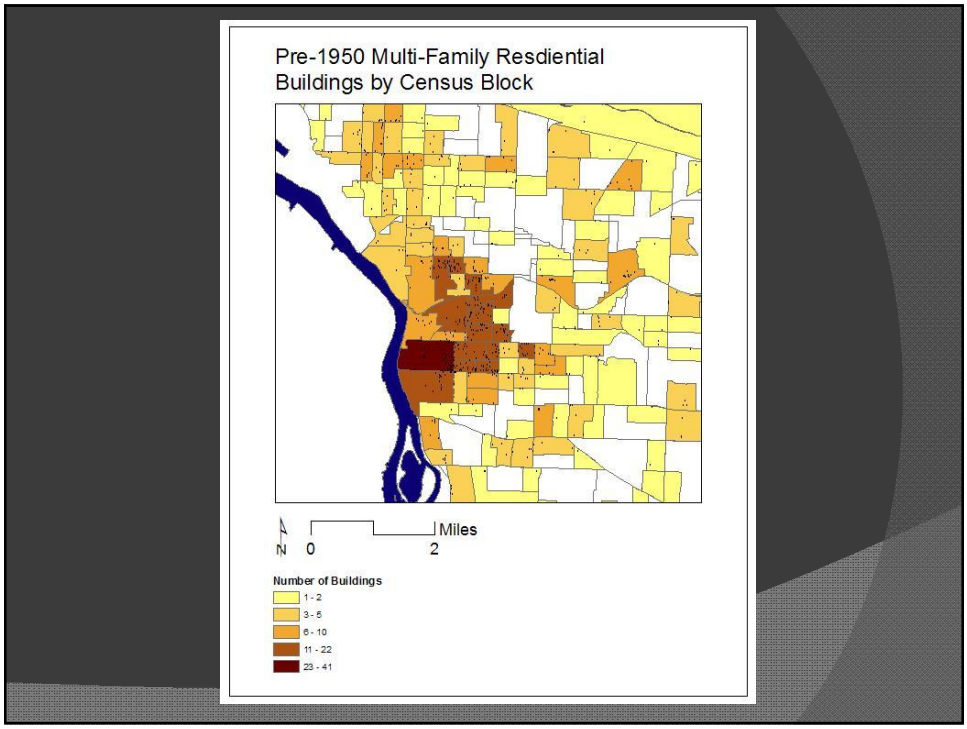


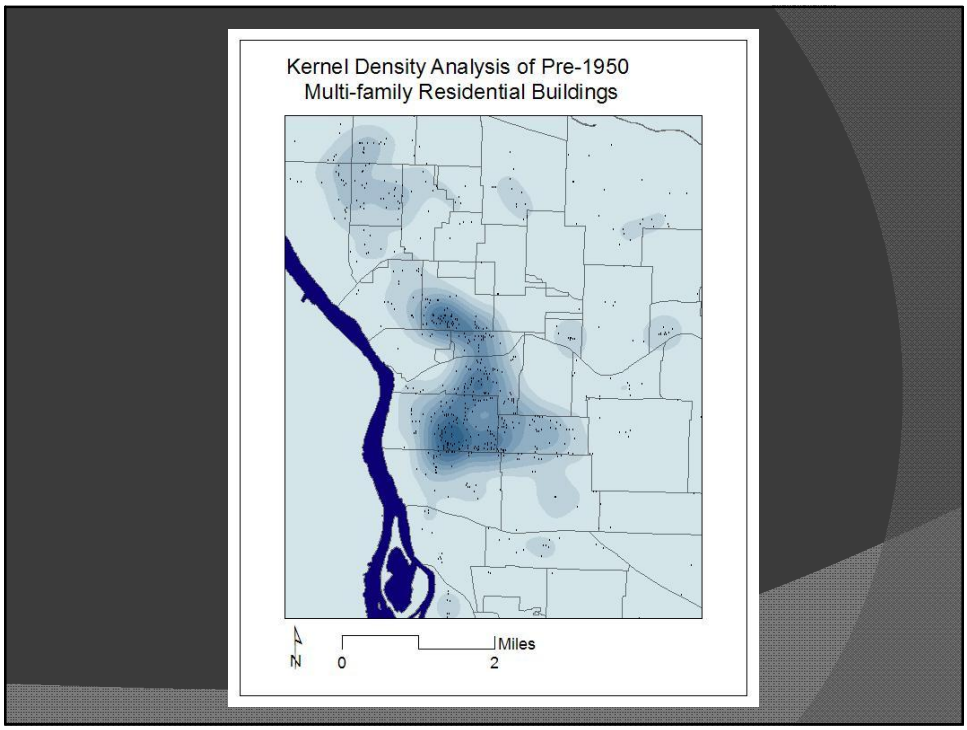


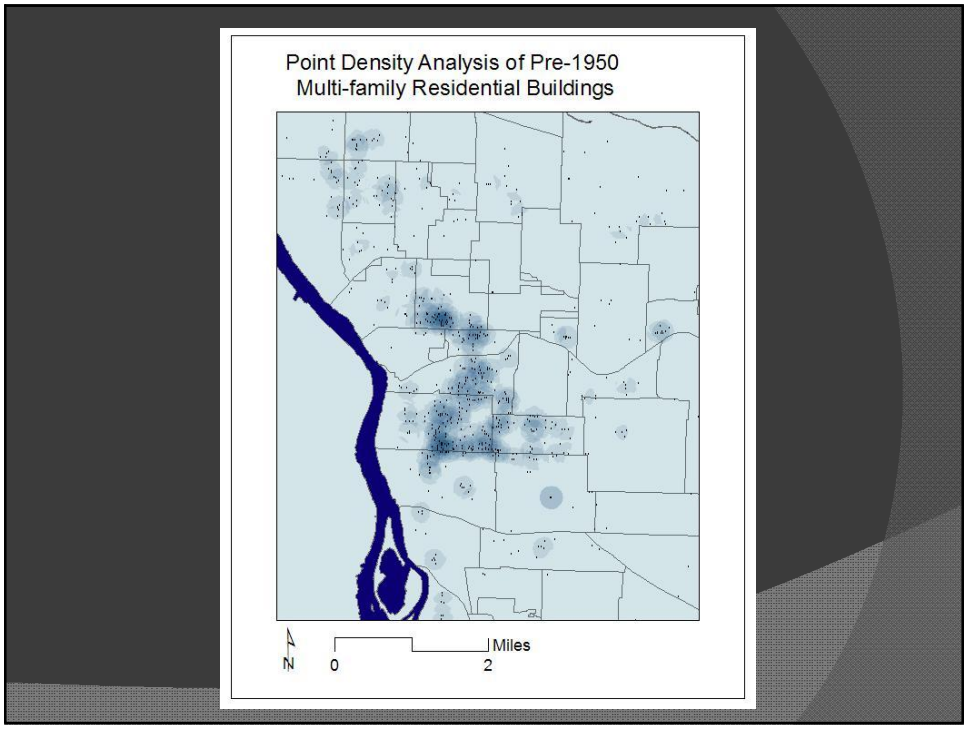
Because historic buildings that had undergone conversion to condominiums contained multiple tax lots, excess point data had to be removed from the map to run density analyses.

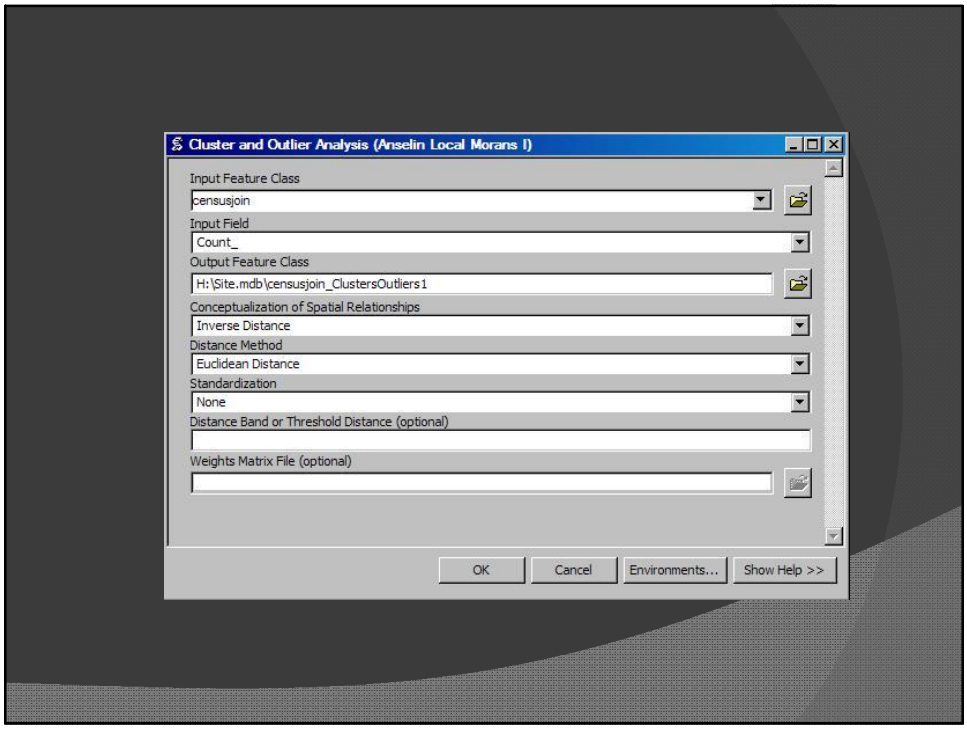

Join Data
Join lets you append additional data to this layer's attribute table so you can, for example, symbolize the layer's features using this data.
What do you want to join to this layer?
Join data from another layer based on spatial location
1. Choose the layer to join to this layer, or load spatial data from disk:
gis2taxlots_FeatureToPoint_C
2. You are joining: Points to Polygons
Select a join feature class above. You will be given different options based on geometry types of the source feature class and the join feature class.
Each polygon will be given a summary of the numeric attributes of the points that fall inside it, and a count field showing how many points fall inside it.
How do you want the attributes to be summarized?
Average
Minimum
Standard Deviation
Sum
Maximum
Variance
Each polygon will be given all the attributes of the point that is closest to its boundary, and a distance field showing how close the point is (in the units of the target layer).
Note: A point falling inside a polygon is treated as being closest to the polygon, (i.e. a distance of 0).
3. The result of the join will be saved into a new layer.
Specify output shapefile or feature class for this new layer:
H:\Site.mdb\Join_Output
About Joining Data
OK
Cancel

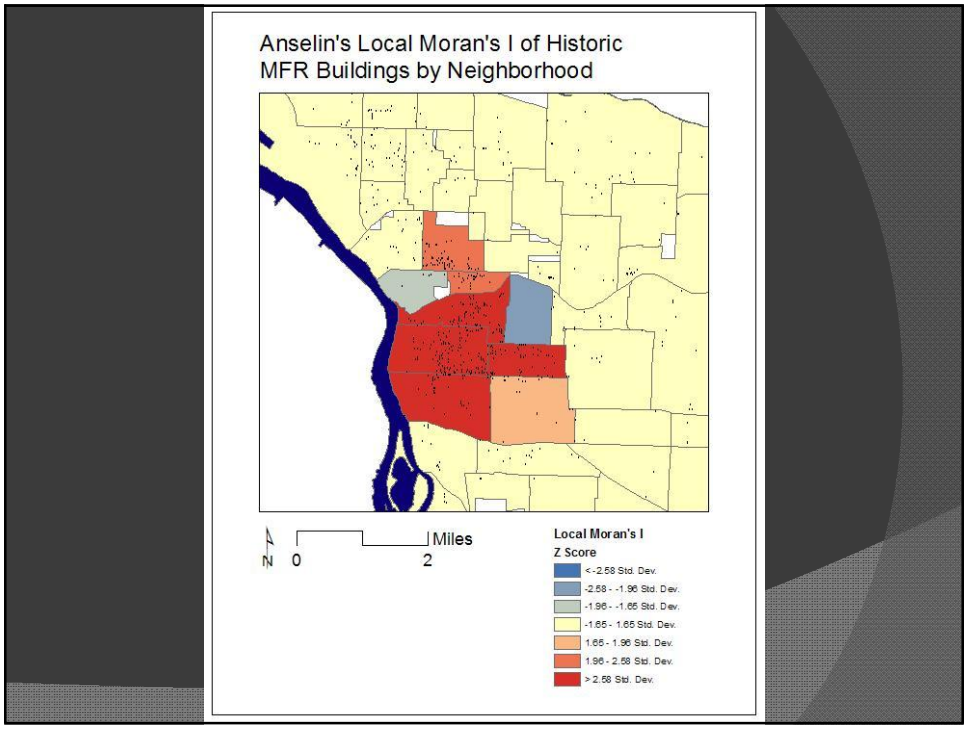

Pre-1950 Multi-Family Resdiential Buildings by Neighborhood
N
Miles
0
2
Number of Buildings
1 - 5
6 - 13
14 - 37
38 - 69
70 - 118

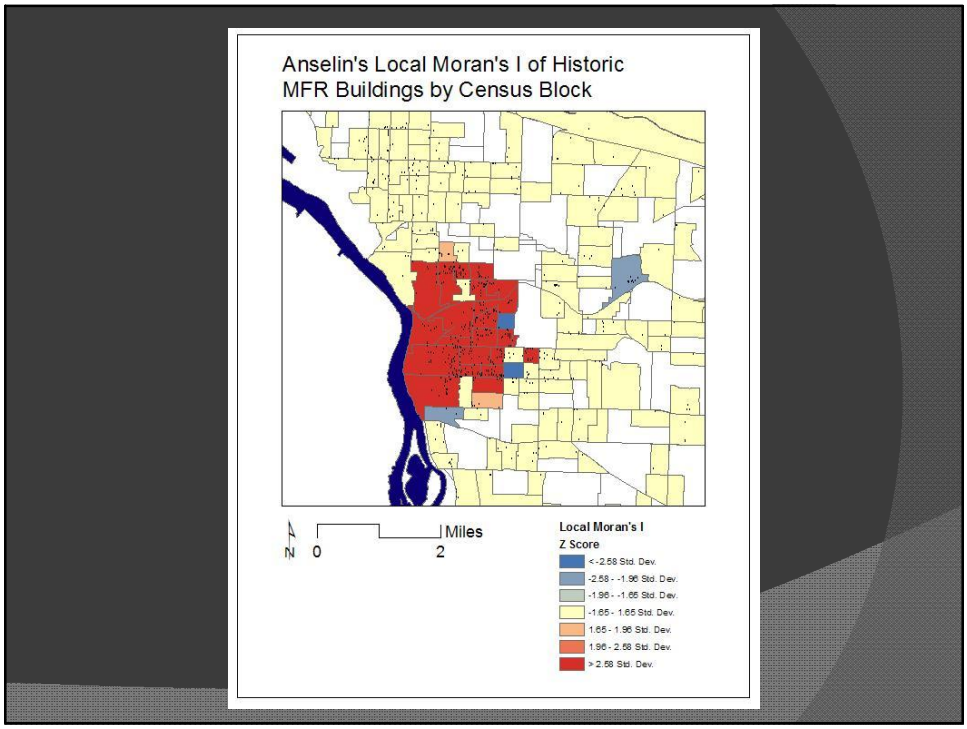

Pre-1950 Multi-Family Resdiential Buildings by Census Block
N
0
2
Miles
Number of Buildings
1 - 2
3 - 5
6 - 10
11 - 22
23 - 41

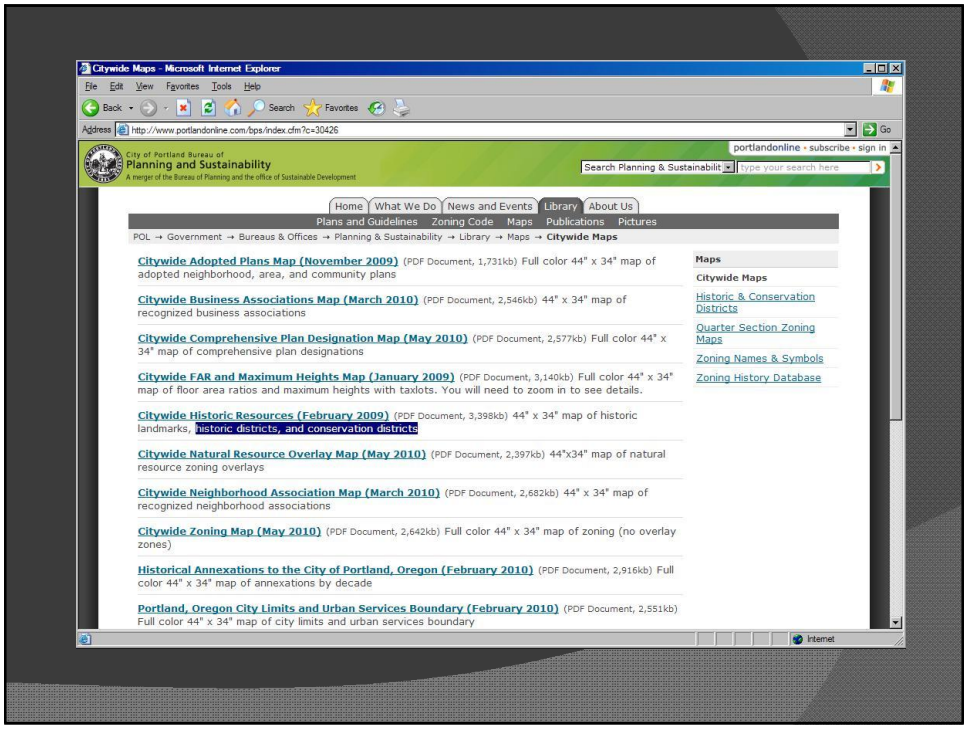

Kernel Density Analysis of Pre-1950 Multi-family Residential Buildings
N
0
2
Miles

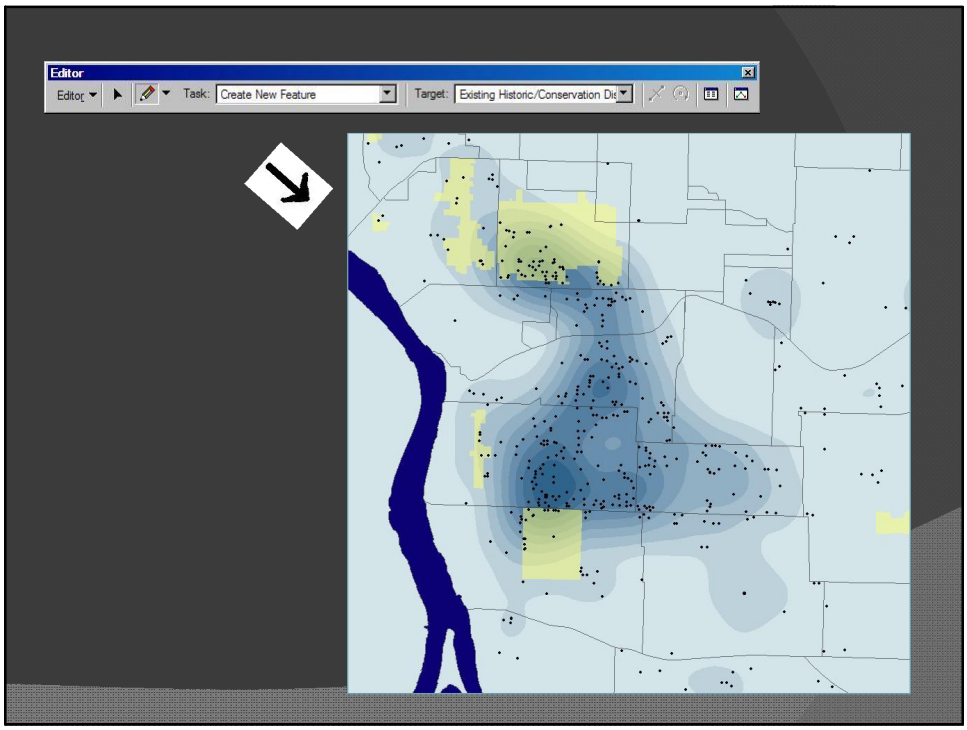

Point Density Analysis of Pre-1950
Multi-family Residential Buildings
N
0
2
Miles

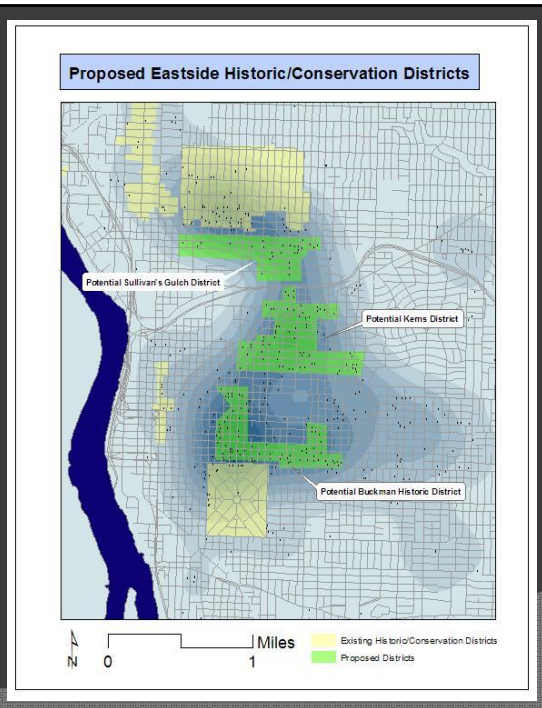

Cluster and Outlier Analysis (Anselin Local Morans I)
Input Feature Class
censusjoin
Input Field
Count_
Output Feature Class
H:\Site.mdb\censusjoin_ClustersOutliers1
Conceptualization of Spatial Relationships
Inverse Distance
Distance Method
Euclidean Distance
Standardization
None
Distance Band or Threshold Distance (optional)
Weights Matrix File (optional)
OK
Cancel
Environments...
Show Help >>


Anselin's Local Moran's I of Historic MFR Buildings by Neighborhood
N
0
Miles
2
Local Moran's I
Z Score
< -2.58 Std. Dev.
-2.58 - -1.96 Std. Dev.
-1.96 - -1.65 Std. Dev.
-1.65 - 1.65 Std. Dev.
1.65 - 1.96 Std. Dev.
1.96 - 2.58 Std. Dev.
> 2.58 Std. Dev.


Anselin's Local Moran's I of Historic MFR Buildings by Census Block
N
0
Miles
2
Local Moran's I
Z Score
< -2.58 Std. Dev.
-2.58 - -1.96 Std. Dev.
-1.96 - -1.65 Std. Dev.
-1.65 - 1.65 Std. Dev.
1.65 - 1.96 Std. Dev.
1.96 - 2.58 Std. Dev.
> 2.58 Std. Dev.


Citywide Maps - Microsoft Internet Explorer
http://www.portlandonline.com/bps/index.cfm?c=30426
City of Portland Bureau of
Planning and Sustainability
Home
What We Do
News and Events
Library
About Us
Plans and Guidelines
Zoning Code
Maps
Publications
Pictures
POL → Government → Bureaus & Offices → Planning & Sustainability → Library → Maps → Citywide Maps
Citywide Adopted Plans Map (November 2009) (PDF Document, 1,731kb) Full color 44" x 34" map of adopted neighborhood, area, and community plans
Citywide Business Associations Map (March 2010) (PDF Document, 2,546kb) 44" x 34" map of recognized business associations
Citywide Comprehensive Plan Designation Map (May 2010) (PDF Document, 2,577kb) Full color 44" x 34" map of comprehensive plan designations
Citywide FAR and Maximum Heights Map (January 2009) (PDF Document, 3,140kb) Full color 44" x 34" map of floor area ratios and maximum heights with taxlots. You will need to zoom in to see details.
Citywide Historic Resources (February 2009) (PDF Document, 3,398kb) 44" x 34" map of historic landmarks, historic districts, and conservation districts
Citywide Natural Resource Overlay Map (May 2010) (PDF Document, 2,397kb) 44"x34" map of natural resource zoning overlays
Citywide Neighborhood Association Map (March 2010) (PDF Document, 2,682kb) 44" x 34" map of recognized neighborhood associations
Citywide Zoning Map (May 2010) (PDF Document, 2,642kb) Full color 44" x 34" map of zoning (no overlay zones)
Historical Annexations to the City of Portland, Oregon (February 2010) (PDF Document, 2,916kb) Full color 44" x 34" map of annexations by decade
Portland, Oregon City Limits and Urban Services Boundary (February 2010) (PDF Document, 2,551kb) Full color 44" x 34" map of city limits and urban services boundary
Maps
Citywide Maps
Historic & Conservation Districts
Quarter Section Zoning Maps
Zoning Names & Symbols
Zoning History Database


Editor
Task: Create New Feature
Target: Existing Historic/Conservation Di



CONCLUSIONS

-Buckman, Kerns, and Sullivan's Gulch had the highest neighborhood concentrations of Pre-1950 Multi-Family Residential buildings.

-Pre-1950 MFR buildings on Portland's Eastside exhibit positive spatial autocorrelation in specific neighborhoods, which reduces the amount of area required to contain them in a single historic/conservation district.

CHALLENGES

-Limited Availability of shapefiles on buildings themselves or on historic districts.

-Digitizing data in Editor.

-Choosing scale for Spatial Analysis (census blocks vs neighborhoods, etc.)

-Choosing boundaries for proposed districts.

TOOLS USED

Clip Metro Datasets
(to Eastside Portland boundaries)
Search Tax Lots **by Attribute**
('YEARBUILT' > 1851 AND 'YEARBUILT' <= 1950 AND 'LANDUSE' = MFR)
Create New Layer from selected attributes
Feature to Point tool
(Tax Lots Selection)
Editor tool
(Erase excess points and Digitize Historic District outlines)
Spatial Join
(Census Blocks and Neighborhoods to Tax Lot points)
Kernel Density tool
(Historic MFR Point Data)
Point Density tool
(Historic MFR Point Data)
Anselin's Local Moran's I
(Measure Spatial Autocorrelation of point data in census blocks and neighborhoods)

QUESTIONS/COMMENTS?