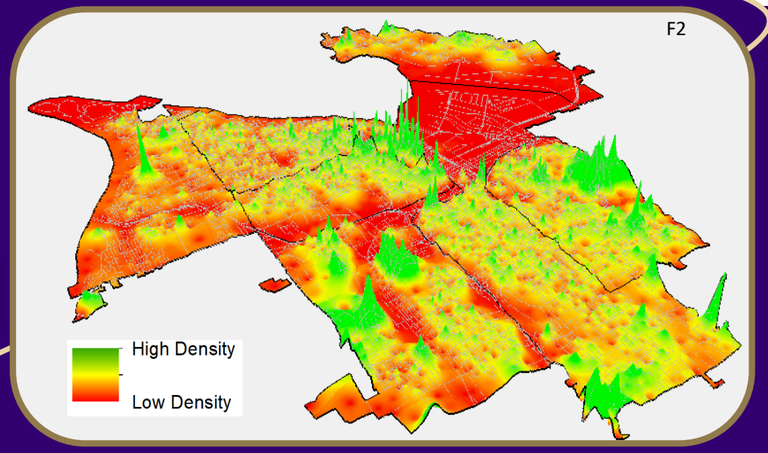
3D Mapping Population Density and Median Income of Tacoma WA



Introduction

ArcScene is an ArcGIS Desktop program which edits and visualizes geospatial data. It can display 2D and 3D visuals. A topographical model was created to visualize peaks and valleys of population density (for children ten years old and under) and median household income data for "neighborhoods" in Tacoma Washington.

Methods

To perform the analysis, Pierce Blocks, which contained data for population density was processed to create a new feature class of just Tacoma. Then the Tacoma Block feature class was interpolated using Inverse distance weighted (IDW) interpolation, which determines cell values using a linearly weighted combination of a set of sample points. The weight is a function of inverse distance. (F1) is the raster file showing different values for population density of children ages ten and under. Using ArcScene, (F2) the layers were displayed using a red-to-green ramp, then the Z units exaggeration was adjusted on scene properties so the peaks of population density per area is less exaggerated.

Median household income per block group and Pierce County block groups (F3) was collected from U.S. Census. That information was processed, (F4) spatial joined to Pierce County Block Groups shapefile,(F5) clipped to show the extent of Tacoma, then (F6) interpolated again using IDW to show a raster of different values for median household income per neighborhood. (F7) Using ArcScene again, the layers were displayed using the same setting as that for (F2).

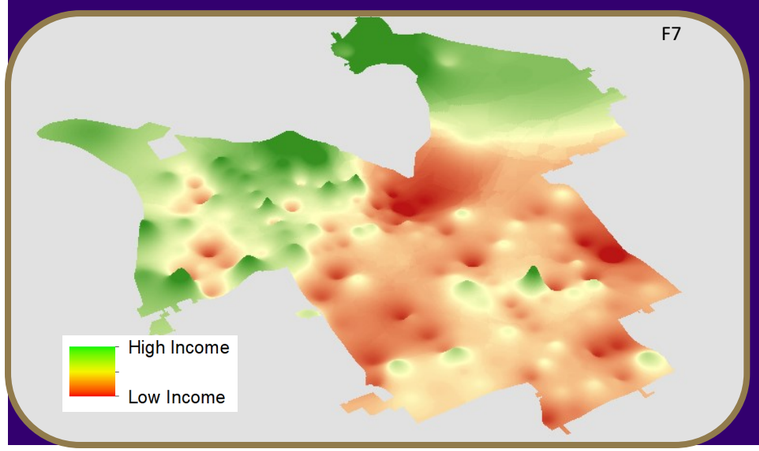
Results

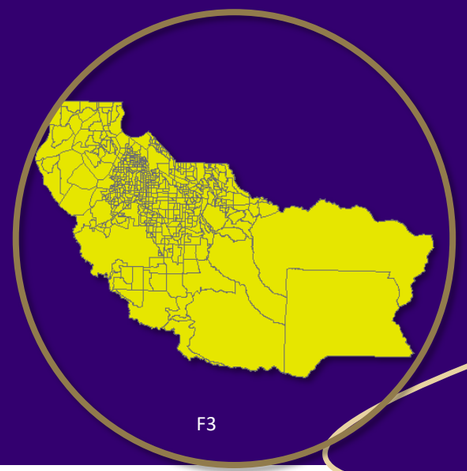
T1 Neighborhood	Median household income per neighborhood	Number of kids per neighborhood.
North East	$ 87,162.67	2,451
North End	$ 73,085.19	3,103
West End	$ 60,774.86	3,336
Central	$ 47,776.91	2,861
South End	$ 47,596.29	6,279
South Tacoma	$ 45,843.00	4,262
Eastside	$ 43,181.87	5,367
New Tacoma	$ 33,739.00	858

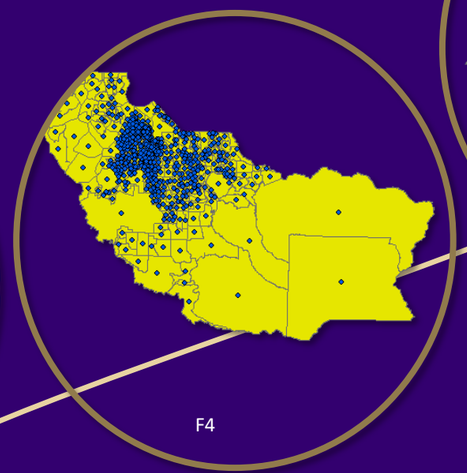
Discussion and Conclusion

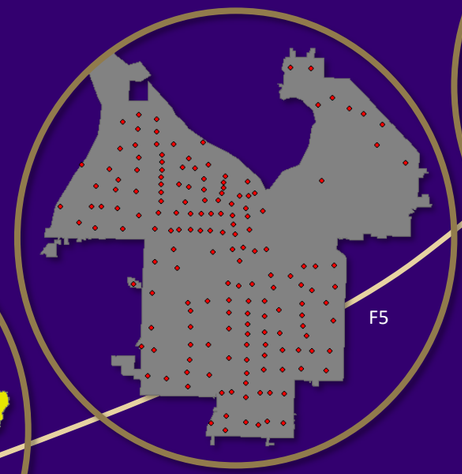
(T1) Median household income and kid count are illustrated for each neighborhood. New Tacoma has the lowest mean income and also the lowest number of children. Eastside has a lower mean income in comparison to the other neighborhoods, but has 5, 367 kids, which is on the higher end of children. South End has the highest number of children with 6,279, but it is the lower half on income. North East has the highest mean income at $87,162.67 but has a moderate number of 2,451 kids.

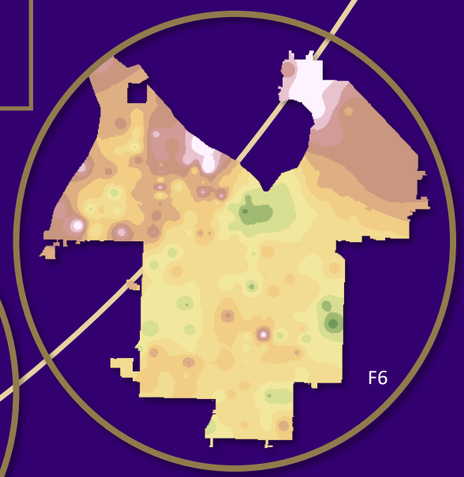
Although there is no clear correlation between median income and total children within the neighborhoods there are still conclusions that can be drawn. Neighborhoods that have a high number of children, like South End, may need to have more funding for social programs or activities for the children to partake in. The North portions of Tacoma have a higher median income and as you move South the median income decreases.











Resources/ References

GIS Skills: ArcScene, 3D Analyst, 3D Modelling of Elevation Data, 3D Modelling of Demographic Data, Downloading Census Data

Name: Kevin Tran, Cassidy Sawyer (University of Washington Tacoma)

Date Created: 4/17/2019

Software Used: ArcMap 10.6.1, ArcScene, and Publisher

Geographic Coordinate System: GCS North American 1983 HARN

Projected Coordinate System: NAD 1983 HARN StatePlane Washington South FIPS 4602 Feet

Data References: US Census, City of Tacoma, and Lab 6 Data

Data: Tac Neighborhoods (2009), Pierce Block Groups (2016, U.S. Census), Streets (2019, City of Tacoma), Block Group Income (2016, U.S. Census), and Pierce Block Centroids (2015)