

Economy of Terrain and the Trajectory of Urban Renewal in Portland, OR

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Abstract

Urban Landscapes change at a rapid pace, we can see it happening every day from trees being cut to building new structures. These changes are often more evident in some areas than others. What is the nature of these changes and can they be reliably tracked on a city wide scale using public data? How are these changes being implemented with respect to neighborhood demographics? I studied a series of two aerial photograph mosaics for the Multnomah county area; 2009 Geoeye and 2016 NAIP images. The Normalized Differential Vegetation Index(NDVI) was calculated for each image set, as well a differential surface of the two years. The results are symbolized to show areas of potential vegetation loss or gain as well as new buildings and land use changes. QC of the NDVI change model is needed to assess the reliability of the output values, and this is undertaken somewhat by visual inspection of the 2009 and 2016 images against the NDVI layer. A number of issues arise at this point to create erroneous values in the NDVI change layer, such as perspective tilt directions of very tall buildings, areas that change from bare earth to building, dry vs wet years, and overly sensitive vegetation increases in non vegetated areas. A TIGER census tract layer and an Urban Renewal Area(URA) layer are overlayed onto the NDVI differential layer to delineate study areas and zonal statistics of slope and NDVI change are calculated within them. Census tracts that intersect the URAs are selected as the main study areas. Selection of tracts whose centroid falls within the URAs further refines the study areas. Census tract household income and race demographics as CSV were obtained and modified to show group proportions within each tract population and joined to the TIGER layer. Income group frequency within study areas are plotted against the NDVI differential mean in each tract. Frequency distributions of the mean slope and vegetation change statistics within each census tract and URA are also compared with the those of the county average. In lieu of advanced statistical analysis, urban renewal areas seem to be accumulating vegetation more slowly than other areas. Slope and vegetation statistics within census tracts do not seem to correlate with demographic variables.

Keywords: *NDVI, URA, urban, renewal, geoeye, NAIP, census, demographic, TIGER, CSV*

