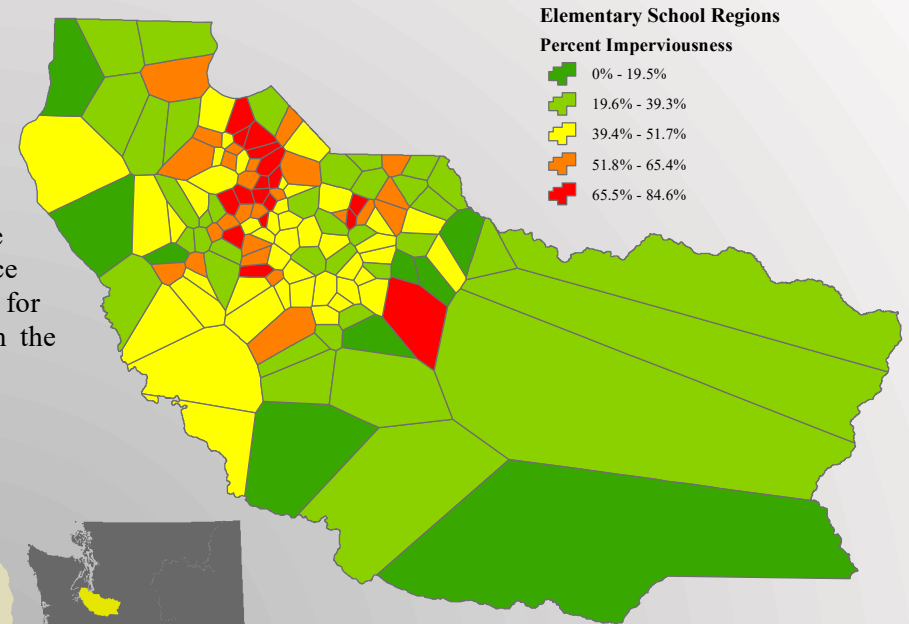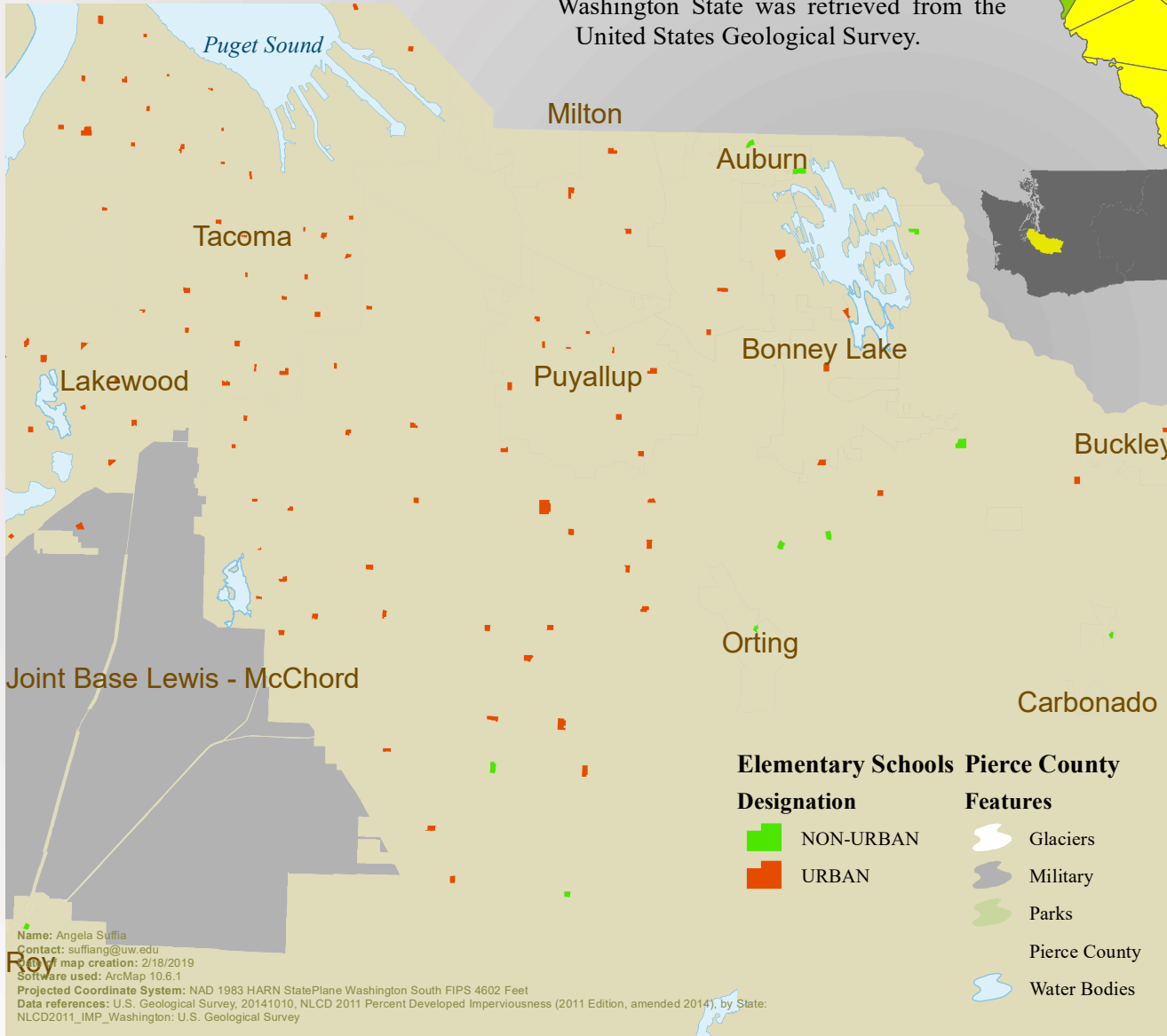# Pierce County Penetrability

This analysis was performed to visualize the variance in surface imperviousness among Pierce County Elementary schools. Imperviousness, in this scenario, is defined as the ability for water to penetrate a surface. Data collected from the Census provided the Urban Area Urban Cluster (UAUC) layer. The Pierce County Data portal provided a Pierce County basemap and the School Grounds shapefile. Percent Imperviousness data for Washington State was retrieved from the United States Geological Survey.

Elementary School Regions
Percent Imperviousness

- 0% - 19.5%
- 19.6% - 39.3%
- 39.4% - 51.7%
- 51.8% - 65.4%
- 65.5% - 84.6%

Puget Sound

Milton

Auburn

Tacoma

Bonney Lake

Lakewood

Puyallup

Buckley

Joint Base Lewis - McChord

Orting

Carbonado

Roy

Since this analysis focused on only elementary schools, a new layer containing only the elementary schools in Pierce County was exported from the School Grounds polygon. To manage the impervious surface data easier the 'Extract by Mask' tool was used to extract only the portion of the the Washington State impervious surface raster that intersects the Pierce County basemap boundaries. Next, each school was classified as "Urban" or "Non-Urban" depending on if the school lies within an Urban Cluster defined by the Census data. The analysis continued by using the 'Zonal Statistics' tool to calculate the mean imperviousness for school grounds. The new raster was classified using the 'Standard Deviation' method then converted to point data using the 'Raster to Point' tool. The next operation was to complete a spatial join between the School Grounds layer, containing all the previous analyses, and the new points created in the previous step. The Elementary School Grounds polygons were converted to points that would be used as inputs for the 'Create Thiessen Polygons' tool.

Elementary Schools
Designation

- NON-URBAN
- URBAN

Pierce County
Features

- Glaciers
- Military
- Parks
- Pierce County
- Water Bodies

Name: Angela Suffia
Contact: suffiang@uw.edu
Date of map creation: 2/18/2019
Software used: ArcMap 10.6.1
Projected Coordinate System: NAD 1983 HARN StatePlane Washington South FIPS 4602 Feet
Data references: U.S. Geological Survey, 20141010, NLCD 2011 Percent Developed Imperviousness (2011 Edition, amended 2014), by State: NLCD2011_IMP_Washington: U.S. Geological Survey