

Changes in Land cover over Time in the Clackamas and Johnson Creek Watersheds

Junjie Chen and Becky Talbot
GEOG 593



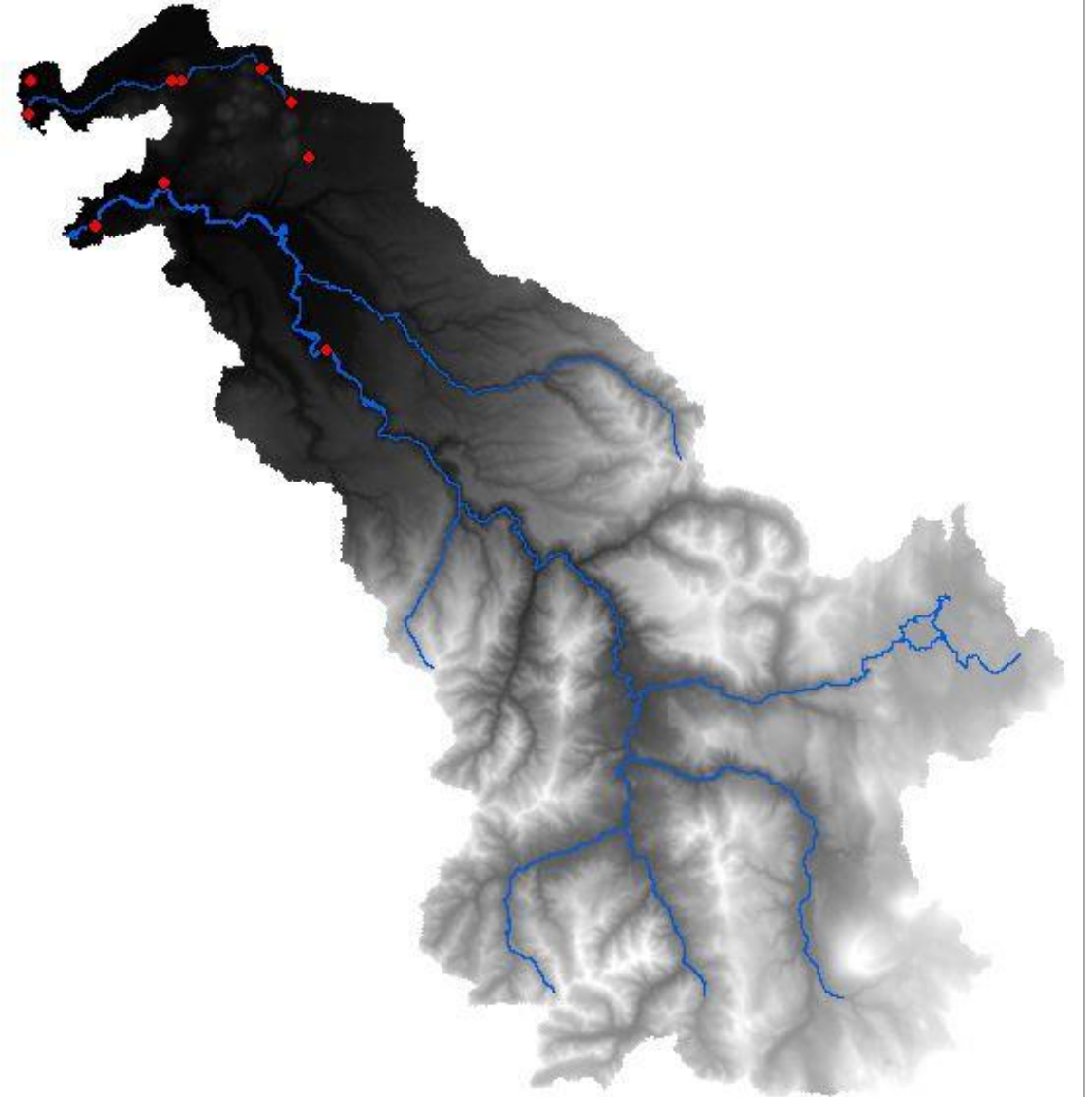


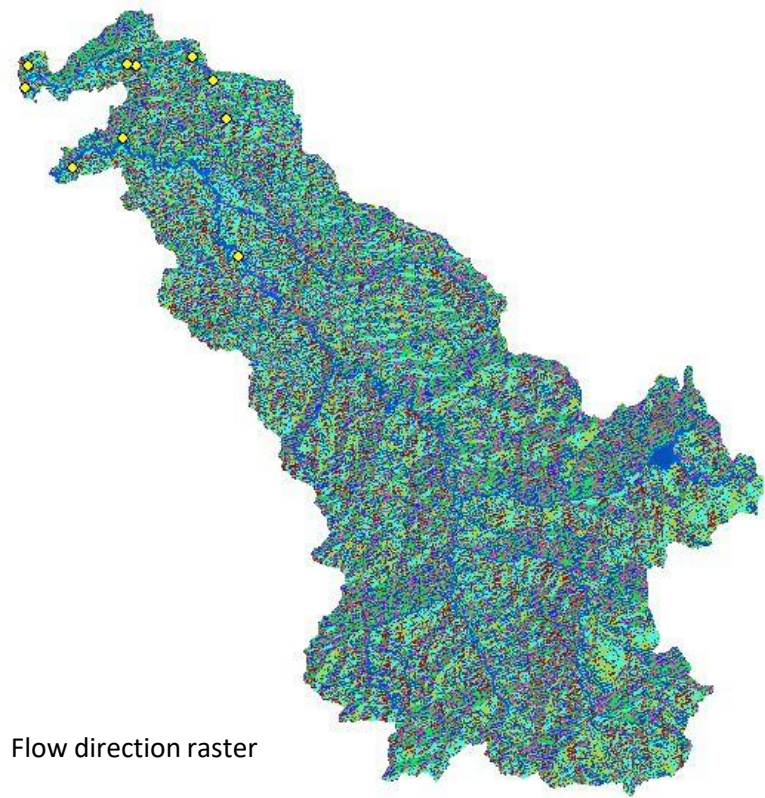
Project Objectives

- Delineate subwatersheds for 10 sites located in the Clackamas and Johnson Creek watersheds
- Evaluate how land use has changed over time in these subwatersheds
 - NLCD 2011 vs. NLCD 2016

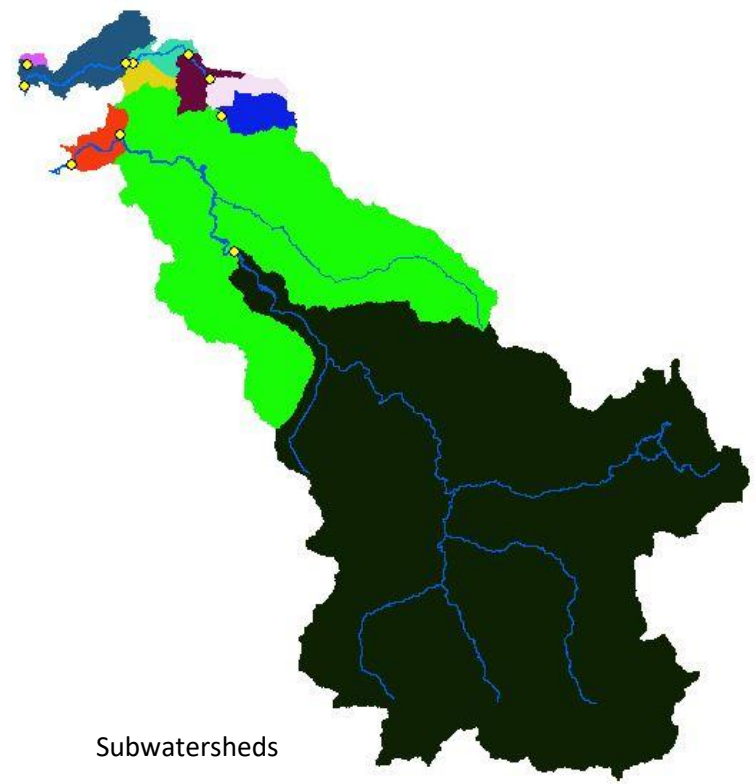
Data

- Point data for the 10 study sites
- 30m DEM
- NLCD 2011, 2016





Flow direction raster

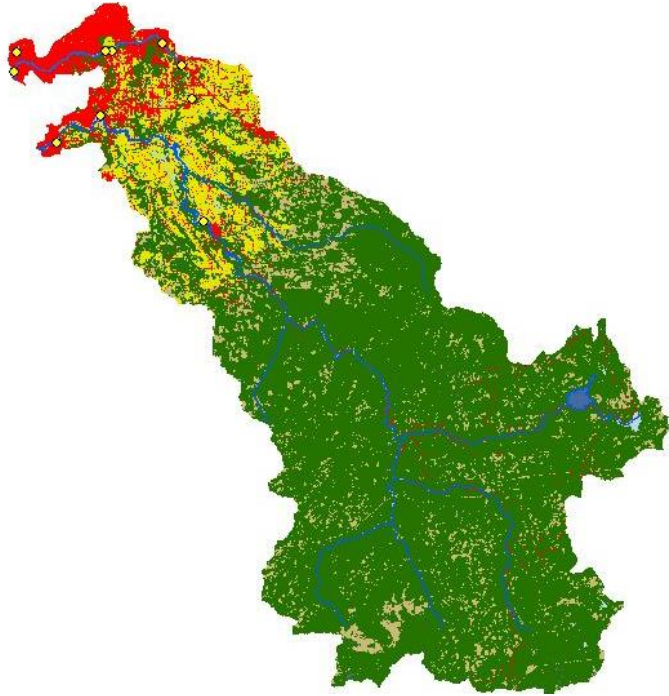


Subwatersheds

Methods

Delineate Subwatersheds

- Fill sinks
- Create flow direction raster
- Create flow accumulation raster
- Snap pour point tool
- Delineate watersheds



Table

zonalhist_test2

Rowid	LABEL	OPEN_WATER	DEVELOPED_OPEN	DEVELOPED_LOW_I	DEVELOPED_MEDIU	DEVELOPED_HIGH_	BARREN_LAND	DECIDUOUS_FOREST	EVERGREEN_FOREST
1	1	12202	17139	1599	633	206	1165	585	1711010
2	2	405	1585	1913	862	317	56	728	1865
3	3	2739	28178	19735	5114	1197	285	6785	324689
4	4	611	3435	5056	4594	3020	134	353	2706
5	5	34	2068	2597	491	92	12	419	1466
6	6	1	3694	4254	1354	221	0	795	2011
7	7	0	2450	2551	838	47	0	474	1310
8	8	0	1803	4760	4373	614	0	267	2228
9	9	24	4868	22206	23991	5115	1	297	2872
10	10	25	362	1437	842	176	2	0	76

(0 out of 10 Selected)

Methods

NLCD

- NLCD datasets
 - Extract by Mask tool
 - Group into 7 overarching land use categories
- Zonal histogram tool
 - Determine breakdown of land use within each delineated subwatershed
 - Performed on both 2011 and 2016 NLCD datasets

Methods

- Created new fields in the zonal histogram attribute tables
 - Total cell count per subwatershed
 - Total cell count of 7 land use categories per subwatershed
 - Derived the proportion of each land use category per subwatershed as a function of total cell count
- Exported to Excel for final analysis

Results

Watershed Name	Forest_2011	Forest_2016	Dev_2011	Dev_2016	Crops_2011	Crops_2016	Wetlands_2011	Wetlands_2016	Shrub_2011	Shrub_2016	Barren_2011	Barren_2016	Openwater_2011	Openwater_2016
Estacada	89.16	88.10	1.00	1.00	0.40	0.40	0.26	0.26	8.49	9.56	0.06	0.06	0.63	0.63
Deep Creek	10.54	10.22	15.44	15.73	68.44	68.01	1.91	1.91	1.92	2.58	0.07	0.19	1.68	1.36
Rock Creek	54.20	54.45	7.75	7.84	24.41	24.26	1.47	1.49	11.66	11.51	0.04	0.04	0.47	0.40
Oregon City	18.88	18.59	57.47	57.71	15.38	15.26	3.94	3.99	1.58	1.78	0.46	0.48	2.29	2.19
Near headwaters	15.58	15.42	25.53	25.53	55.60	55.37	1.50	1.51	1.50	1.94	0.03	0.06	0.26	0.17
Regner	27.96	27.86	39.91	40.15	28.92	28.59	2.24	2.24	0.97	1.15	0	0	0	0
Kelley Creek	27.73	27.31	41.10	43.81	28.79	26.36	0.65	0.65	1.73	1.87	0	0	0	0
Sycamore	23.32	23.34	67.32	67.33	6.27	6.26	2.84	2.84	0.25	0.23	0	0	0	0
Milwaukie	7.84	7.89	89.42	89.45	2.13	2.10	0.34	0.35	0.21	0.16	0	0	0.06	0.04
Crystal Springs	2.98	2.98	91.16	91.16	0.87	0.87	3.27	3.27	0.84	0.84	0.06	0.06	0.81	0.81