Changes in cover over time in the Clackamas and Johnson Creek Watersheds

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Abstract

Land use land cover (LULC) changes in highly urbanized watersheds are often key drivers of water quality degradation. However, water quality parameters response to LULC changes differently across multiple spatial and temporal scale. In this study, we attempt to analyze ten sampling sites in a microplastic research by identifying the LULC changes over time from 2011 to 2016. Subwatersheds were delineated from the Clackamas and Johnson Creek watersheds using 30 meters digital elevation models in ArcMap using the Spatial Analyst Toolbox. LULC data were derived and extracted from the National Land Cover Dataset and zonal histogram tool was used to determine the breakdown of LULC change within each subwatershed. Preliminary results indicate no significant changes to all land cover types with the exceptions of the deep creek site, near headwater site, and Milwaukie site, where there are more than 10% loss of open water land cover (-19% ~ -30%). Furthermore, barren land has increased significantly near headwaters (+100%) and in deep creek (+170%) from 2011 to 2016. Our results indicated that these two subwatershed may be in more vulnerable state than other sites and future analysis to compare water quality data is needed to draw more conclusion on the relation between LULC changes to water quality. This research was intended to practice our newly skills on DEM processing and watershed delineation, we approached the LULC change analysis by using zonal histograms but we also plan to explore other methods as well.