Sewer_Attachments_Walksheds

2025-03-19

```r
setwd("C:/Users/MaxBo/OneDrive/Documents/Class MQE/Capstone/Data Files/Filtered Park Data Finalized")
library(sf)
```

```
## Linking to GEOS 3.9.3, GDAL 3.5.2, PROJ 8.2.1; sf_use_s2() is TRUE
```

```r
walksheds <- st_read("Walkshed differences.geojson")
```

```
## Reading layer ‘Walkshed differences’ from data source
##   ‘C:\Users\MaxBo\OneDrive\Documents\Class MQE\Capstone\Data Files\Filtered Park Data Finalized\Walks
##   using driver ‘GeoJSON’
## Simple feature collection with 168 features and 67 fields
## Geometry type: MULTIPOLYGON
## Dimension:     XY
## Bounding box:  xmin: 1318214 ymin: 383116.4 xmax: 1379567 ymax: 431866.1
## Projected CRS: NAD83 / Pennsylvania South (ftUS)
```

```r
sewer <- st_read("Sewershed.geojson")
```

```
## Reading layer ‘Sewershed’ from data source
##   ‘C:\Users\MaxBo\OneDrive\Documents\Class MQE\Capstone\Data Files\Filtered Park Data Finalized\Sewe
##   using driver ‘GeoJSON’
## Simple feature collection with 182 features and 8 fields
## Geometry type: MULTIPOLYGON
## Dimension:     XY
## Bounding box:  xmin: -80.0918 ymin: 40.37011 xmax: -79.87144 ymax: 40.50073
## Geodetic CRS:  WGS 84
```

```r
#Convert nulls to zero priority

sewer$PRIORITYSS[is.na(sewer$PRIORITYSS)] <- 0
```

```r
#Convert priority 1 and 2 to numeric, and deal with problematic obs.

sewer$PRIORITYSS[sewer$PRIORITYSS == "Y - Ph1"] <- 1
sewer$PRIORITYSS[sewer$PRIORITYSS == "Y - Ph2"] <- 2

sewer$PRIORITYSS[sewer$PRIORITYSS == "<Null>"] <- 0
```

```r
#Check class
class(sewer$PRIORITYSS)
```

```
## [1] "character"
```

```r
#Convert characters to numeric
sewer$PRIORITYSS <- as.numeric(sewer$PRIORITYSS)
```

```r
#Disable s2 processing
sf_use_s2(FALSE)
```

```
## Spherical geometry (s2) switched off
```

```r
#Change to same coordinate reference system (CRS)

sewer <- st_transform(sewer, st_crs(walksheds))
```

```r
#Create geopatial overlaps between sewershed and walkshed polygons
overlaps <- st_intersection(walksheds, sewer)
```

```
## Warning: attribute variables are assumed to be spatially constant throughout
## all geometries
```

```r
#Compute area of overlaps
library(dplyr)
```

```
##
## Attaching package: 'dplyr'

## The following objects are masked from 'package:stats':
##
##     filter, lag

## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

```r
overlaps <- overlaps %>%
  mutate(overlap_area = st_area(.))
```

```r
#Covnert to Acreage from feet squared
overlaps$overlaps_acre <- overlaps$overlap_area / 43560
```

```r
#Areal Interpolation: Assigns weight to sewershed score based on the amount
#of area the sewershed polygon takes up in the park polygon

walkshed_scores <- overlaps %>%
  mutate(weighted_sewer = (overlaps_acre / Acreage.Difference) * PRIORITYSS) %>%
  group_by(SiteID) %>%  # Replace with actual unique park ID column
  summarise(avg_sewershed_score_walkshed = sum(weighted_sewer, na.rm = TRUE))
```

```r
#Convert from sf
walkshed_scores2 <- st_drop_geometry(walkshed_scores)
walksheds <- st_drop_geometry(walksheds)
```

```
#Merge
walkshed_scores3 <- walksheds %>%
  left_join(walkshed_scores2, by = "SiteID")
```

```
#Convert null scores to zero since they don't have PWSA rating
walkshed_scores3$avg_sewershed_score_walkshed[is.na(walkshed_scores3$avg_sewershed_score_walkshed)] <-
```

```
#Covnert to Numeric
walkshed_scores3$avg_sewershed_score_walkshed <- as.numeric(walkshed_scores3$avg_sewershed_score_walksh
```

```
#Write to csv

write.csv(walkshed_scores3, "walkshed_sewer_scores.csv", row.names = FALSE)
```