

# **GEOG 491/891: Special Topics - Spatial Analysis in R**

## **Week 05.01: R as a GIS**

**Dr. Bitterman**

# Today's schedule

- Open discussion
- Some basic spatial operations
- Activity

**Anything to discuss? Questions?**

**This week is SUPPOSED to be "point pattern analysis", but we're going to be flexible**

**(Chapters 5 & 6 are extensive)**

**This week's focus: simple geospatial operations and getting comfortable with them**

# today's setup

- there's new data in the `./data/` directory of the repository

```
library(tidyverse)
library(sf)
library(GISTools)
library(tmap)
```

# Let's start with some simple data

## Break it down first

```
# let's start with some data

streams <- sf::read_sf("./data/Streams_303_d_.shp")
tm_shape(streams) + tm_lines()
```

what happened?

## More data...

```
counties <- sf::read_sf("./data/County_Boundaries-Census.shp")  
counties_areas <- sf::st_area(counties)
```

**what happened?**

**How would you add the areas back to the sf data.frame?**

**How would you use your data to "get" ONLY Lancaster County?**



## Something like this:

which function are we using, and how does it work?

```
lc <- counties %>% dplyr::filter(., NAME10 == "Lancaster")
```

**How would we find only those 303d streams in Lancaster County?**

**Something like this:**

```
lc_303ds <- sf::st_intersection(streams, lc)
```

## Plot them:

let's break them down - how are these different?

```
tm_shape(lc_303ds) + tm_lines()  
tm_shape(lc_303ds) + tm_lines(col = "blue")  
  
tm_shape(lc_303ds) + tm_lines(col = "Waterbody_")
```

What happened?

# Buffers

- What's a buffer?

# Let's try one

## Break down the code...

```
buffs <- sf::st_buffer(lc_303ds, dist = 1000)  
tm_shape(buffs) + tm_polygons(col = "Waterbody_")
```

## What does it look like?

# Point data

```
# read the state parks shapefile
parks <- sf::read_sf("./data/State_Park_Locations.shp")

# subset to lancaster county
lc_parks <- sf::st_intersection(parks, lc)

# plot them
tm_shape(lc_parks) + tm_dots(col = "AreaName", size = 1)
```

## Plotting multiple layers using `tm`

```
tm_shape(lc_303ds) + tm_lines(col = "Waterbody_") +  
  tm_shape(lc_parks) + tm_dots(col = "AreaName", size = 1)
```

What happened?



## Your final task

- find all of the state parks within 0.5 miles of a 303d stream
- plot just those points WITH the corresponding stream segment
- use color to distinguish the points and stream segments

**GO!**

## For this week

- Chapters 5 & 6
- Practice, practice, practice
- Lab 01 due