

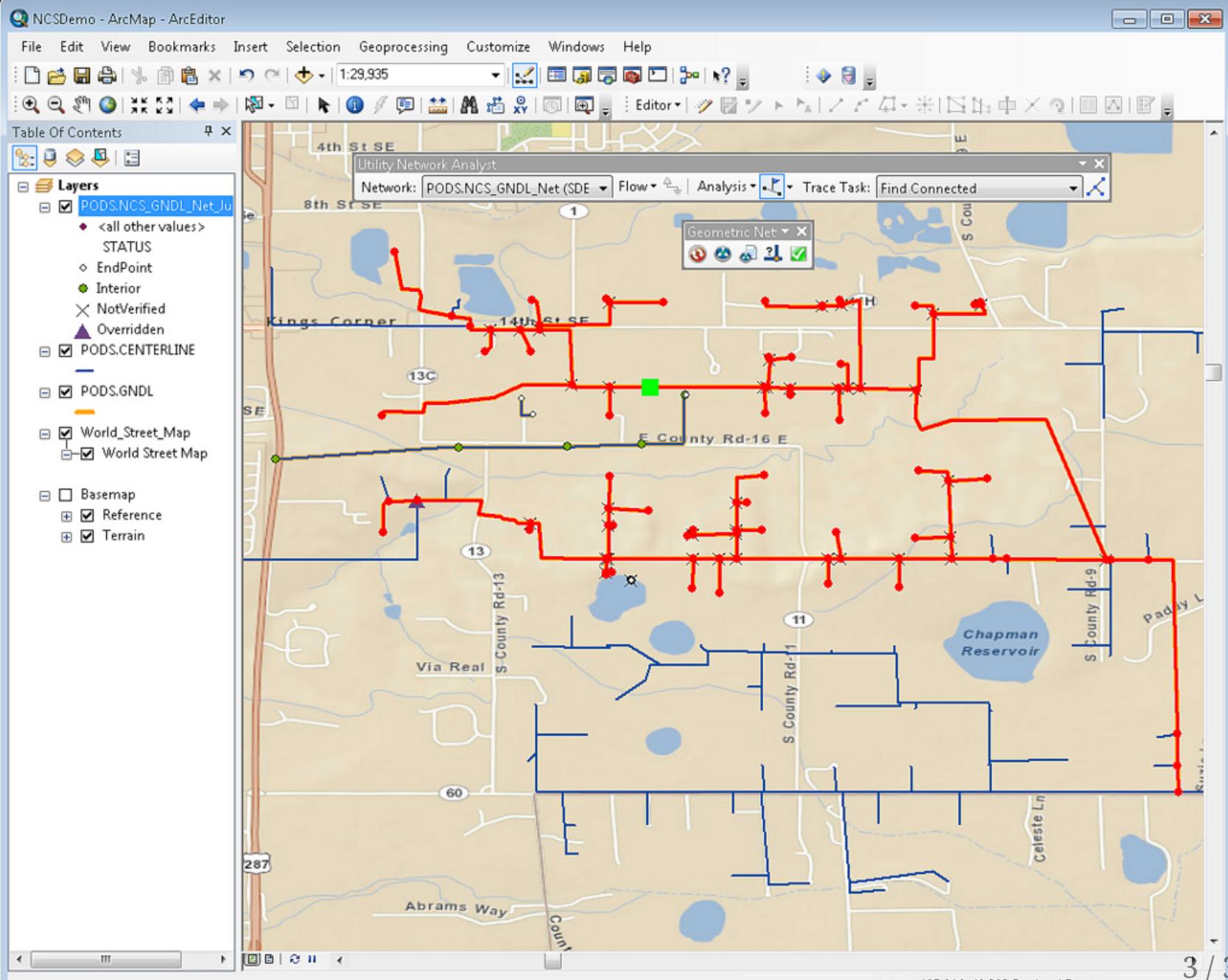
R for Geospatial Data Science

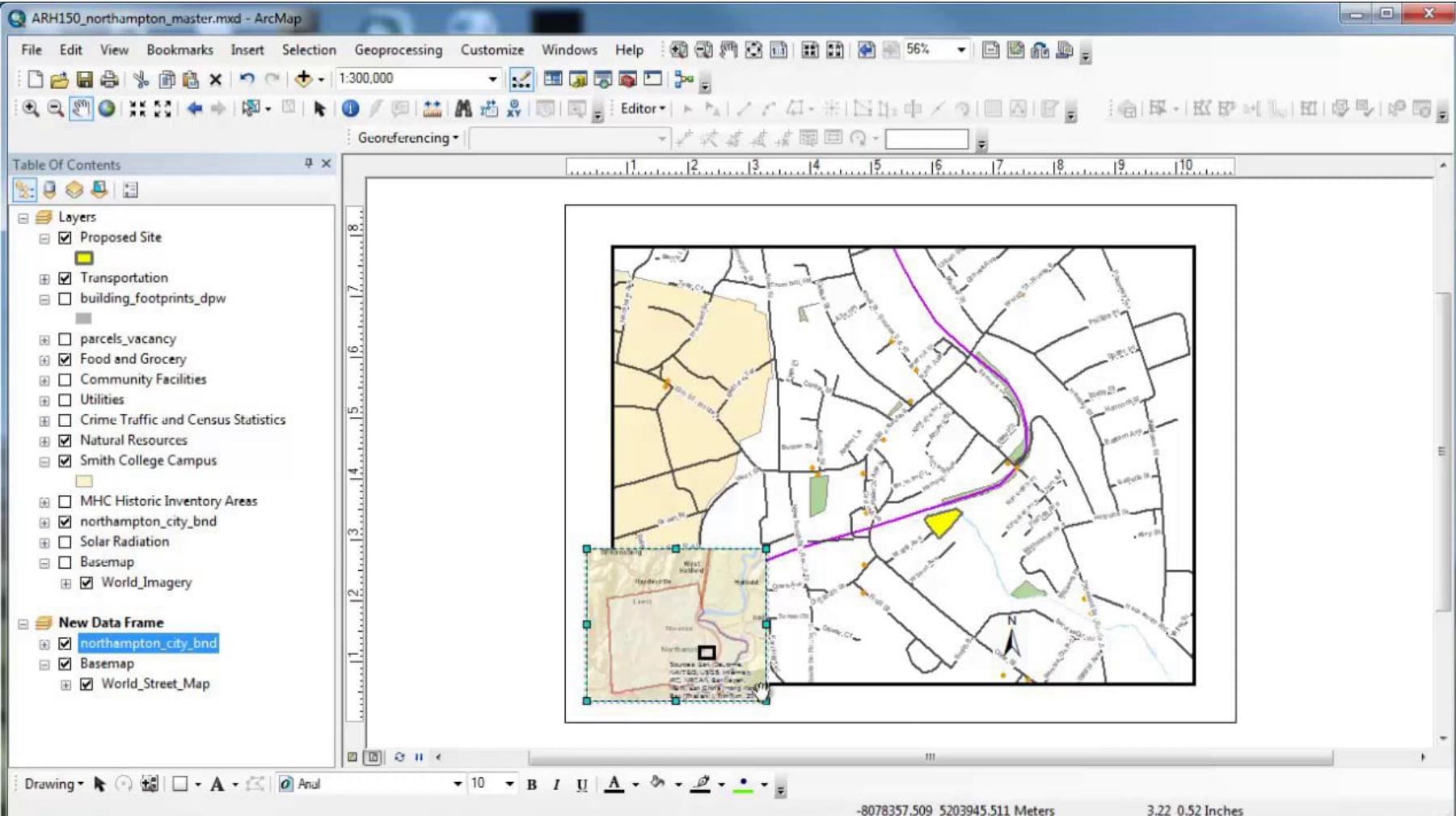
Victoria GeoGeeks Meetup

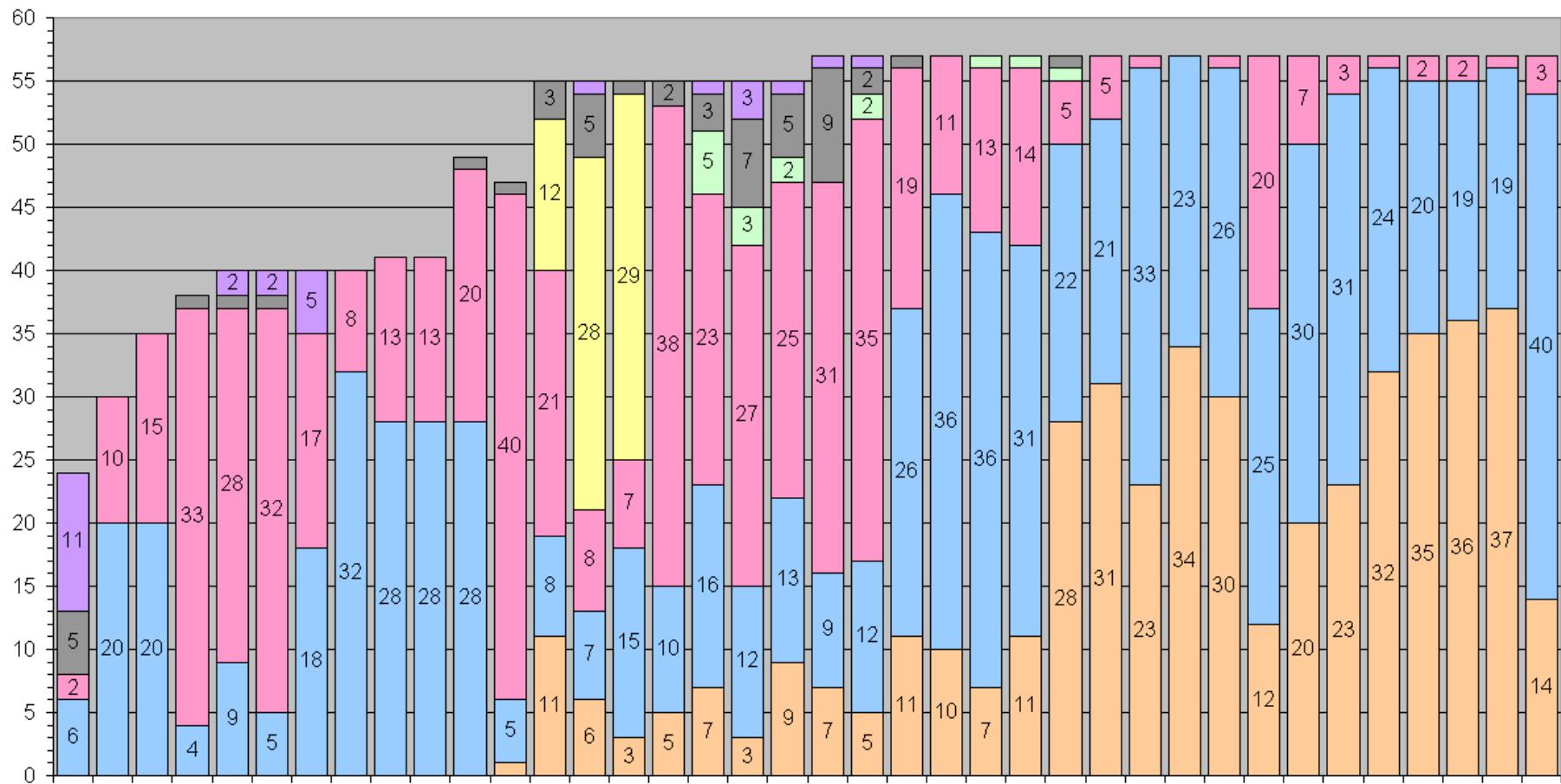
Andy Teucher

2018/01/30

	A	B	C	D	E	F	G
1	path	name	photographer	title	description	depicted_people	depicted_place
2	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-Álvaro-Enrique-2.jpg	hayfestival-2016-Álvaro-Enrique-2.jpg	Andrew Lih (User:Fuzheado)	Hay Festival 2016 - Álvaro Enrique			Hay Festival
3	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-band.jpg	hayfestival-2016-band.jpg	Andrew Lih (User:Fuzheado)	Hay Festival 2016 - Band			Hay Festival
4	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-beatrix-potter-1.jpg	hayfestival-2016-beatrix-potter-1.jpg	Andrew Lih (User:Fuzheado)	Hay Festival 2016 - Beatrix Potter posing			Hay Festival
5	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-beatrix-potter-book.jpg	hayfestival-2016-beatrix-potter-book.jpg	Andrew Lih (User:Fuzheado)	Hay Festival 2016 - Beatrix Potter with book			Hay Festival
6	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-beatrix-potter-gesture.jpg	hayfestival-2016-beatrix-potter-gesture.jpg	Andrew Lih (User:Fuzheado)	Hay Festival 2016 - Beatrix Potter gesturing			Hay Festival
7	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-beatrix-potter-reading.jpg	hayfestival-2016-beatrix-potter-reading.jpg	Andrew Lih (User:Fuzheado)	Hay Festival 2016 - Beatrix Potter reading			Hay Festival
8	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-bookcase.jpg	hayfestival-2016-bookcase.jpg	Andrew Lih (User:Fuzheado)	Hay Festival 2016 - Beatrix Potter reading			Hay Festival
9	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-booktable-shadow.jpg	hayfestival-2016-booktable-shadow.jpg	Andrew Lih (User:Fuzheado)				Hay Festival
10	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-brotton-essiedu-peake.jpg	hayfestival-2016-brotton-essiedu-peake.jpg	Andrew Lih (User:Fuzheado)				Hay Festival
11	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-Bruce-Robinson-portrait-2.jpg	hayfestival-2016-Bruce-Robinson-portrait-2.jpg	Andrew Lih (User:Fuzheado)				Hay Festival
12	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-Bruce-Robinson-portrait.jpg	hayfestival-2016-Bruce-Robinson-portrait.jpg	Andrew Lih (User:Fuzheado)				Hay Festival
13	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-bus.jpg	hayfestival-2016-bus.jpg	Andrew Lih (User:Fuzheado)				Hay Festival
14	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-Caitlin-Moran-crowd.jpg	hayfestival-2016-Caitlin-Moran-crowd.jpg	Andrew Lih (User:Fuzheado)				Hay Festival
15	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-Caitlin-Moran-cu-face.jpg	hayfestival-2016-Caitlin-Moran-cu-face.jpg	Andrew Lih (User:Fuzheado)				Hay Festival
16	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-Caitlin-Moran-cu-hand-2.jpg	hayfestival-2016-Caitlin-Moran-cu-hand-2.jpg	Andrew Lih (User:Fuzheado)				Hay Festival
17	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-Caitlin-Moran-cu-hand.jpg	hayfestival-2016-Caitlin-Moran-cu-hand.jpg	Andrew Lih (User:Fuzheado)				Hay Festival
18	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-Caitlin-Moran-cu-profile.jpg	hayfestival-2016-Caitlin-Moran-cu-profile.jpg	Andrew Lih (User:Fuzheado)				Hay Festival
19	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-Caitlin-Moran-signboard.jpg	hayfestival-2016-Caitlin-Moran-signboard.jpg	Andrew Lih (User:Fuzheado)				Hay Festival
20	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-Caitlin-Moran-signing-1.jpg	hayfestival-2016-Caitlin-Moran-signing-1.jpg	Andrew Lih (User:Fuzheado)				Hay Festival
21	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-Caitlin-Moran-signing-2.jpg	hayfestival-2016-Caitlin-Moran-signing-2.jpg	Andrew Lih (User:Fuzheado)				Hay Festival
22	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-Caitlin-Moran-signing-3.jpg	hayfestival-2016-Caitlin-Moran-signing-3.jpg	Andrew Lih (User:Fuzheado)				Hay Festival
23	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-Caitlin-Moran-signing-4.jpg	hayfestival-2016-Caitlin-Moran-signing-4.jpg	Andrew Lih (User:Fuzheado)				Hay Festival
24	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-Caitlin-Moran-signing-5.jpg	hayfestival-2016-Caitlin-Moran-signing-5.jpg	Andrew Lih (User:Fuzheado)				Hay Festival
25	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-Caitlin-Moran-signing-6.jpg	hayfestival-2016-Caitlin-Moran-signing-6.jpg	Andrew Lih (User:Fuzheado)				Hay Festival
26	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-Caitlin-Moran-wide.jpg	hayfestival-2016-Caitlin-Moran-wide.jpg	Andrew Lih (User:Fuzheado)				Hay Festival
27	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-Caitlin-Moran-widestage.jpg	hayfestival-2016-Caitlin-Moran-widestage.jpg	Andrew Lih (User:Fuzheado)				Hay Festival
28	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-carpark.jpg	hayfestival-2016-carpark.jpg	Andrew Lih (User:Fuzheado)				Hay Festival
29	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-Claire-Vaye-Watkins.jpg	hayfestival-2016-Claire-Vaye-Watkins.jpg	Andrew Lih (User:Fuzheado)				Hay Festival
30	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-crowd-reading.jpg	hayfestival-2016-crowd-reading.jpg	Andrew Lih (User:Fuzheado)				Hay Festival
31	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-crowd.jpg	hayfestival-2016-crowd.jpg	Andrew Lih (User:Fuzheado)				Hay Festival
32	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-Daniel-Hahn.jpg	hayfestival-2016-Daniel-Hahn.jpg	Andrew Lih (User:Fuzheado)				Hay Festival
33	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-Edna-O'Brien-1.jpg	hayfestival-2016-Edna-O'Brien-1.jpg	Andrew Lih (User:Fuzheado)				Hay Festival
34	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-Edna-O'Brien-2.jpg	hayfestival-2016-Edna-O'Brien-2.jpg	Andrew Lih (User:Fuzheado)				Hay Festival
35	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-Edna-O'Brien-3.jpg	hayfestival-2016-Edna-O'Brien-3.jpg	Andrew Lih (User:Fuzheado)				Hay Festival
36	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-Edna-O'Brien-4.jpg	hayfestival-2016-Edna-O'Brien-4.jpg	Andrew Lih (User:Fuzheado)				Hay Festival
37	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-Enrique-Vasquez.jpg	hayfestival-2016-Enrique-Vasquez.jpg	Andrew Lih (User:Fuzheado)				Hay Festival
38	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-flag1.jpg	hayfestival-2016-flag1.jpg	Andrew Lih (User:Fuzheado)				Hay Festival
39	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-flag2.jpg	hayfestival-2016-flag2.jpg	Andrew Lih (User:Fuzheado)				Hay Festival
40	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-Fleur-Alexander-1.jpg	hayfestival-2016-Fleur-Alexander-1.jpg	Andrew Lih (User:Fuzheado)				Hay Festival
41	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-Fleur-Alexander-2.jpg	hayfestival-2016-Fleur-Alexander-2.jpg	Andrew Lih (User:Fuzheado)				Hay Festival
42	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-Fleur-Alexander-3.jpg	hayfestival-2016-Fleur-Alexander-3.jpg	Andrew Lih (User:Fuzheado)				Hay Festival
43	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-Fong-Xin-wide.jpg	hayfestival-2016-Fong-Xin-wide.jpg	Andrew Lih (User:Fuzheado)				Hay Festival
44	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-Fong-Xin.jpg	hayfestival-2016-Fong-Xin.jpg	Andrew Lih (User:Fuzheado)				Hay Festival
45	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-Goldsmit-Enrique-Vasquez.jpg	hayfestival-2016-Goldsmit-Enrique-Vasquez.jpg	Andrew Lih (User:Fuzheado)				Hay Festival
46	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-halfway.jpg	hayfestival-2016-halfway.jpg	Andrew Lih (User:Fuzheado)				Hay Festival
47	/Users/allh/Documents/Wikipedia/Hay Festival/photos/hayfestival-2016-haysign-day.jpg	hayfestival-2016-haysign-day.jpg	Andrew Lih (User:Fuzheado)				Hay Festival







DEMOGRAPHICS BY GENDER

Platform	Men (%)	Women (%)
20% of users	20%	10%
30% of mobile users	30%	30%
35% of females	35%	35%
40% of Facebook Likes	40%	40%
50% of Pinterest Pins	50%	50%

MEN - 40%

WOMEN - 60%

FOUR STEP PROCESS CHART

- Define Objective
- Plan
- Launch
- Follow Up

Each step includes a brief description: Plan (Write down what you want to achieve. Put it in writing and make sure everyone involved is informed), Launch (Put it out there and let people know what you want to achieve. Put it in writing and make sure everyone involved is informed), Follow Up (Check back and see what people can understand its relevance).

Green Chalkboard

SOCIAL MEDIA FLOW CHART

TWITTER CONVERSATIONS
Write a little bit here about the information you want people to understand its relevance.

FACEBOOK CONVERSATIONS
Write a little bit here about the information you want people to understand its relevance.

LINKEDIN CONVERSATIONS
Write a little bit here about the information you want people to understand its relevance.

REGIONAL DEMOGRAPHICS

10% USA
10% UK
10% France
10% Australia
10% India
10% Brazil
10% Russia

Dusty Chalkboard

TWO KEY IDEAS PRESENTED TOGETHER

KEY IDEA NUMBER ONE
Go ahead and place your text about one of your ideas in this lovely box right here. Once the people are engaged with the first idea, they will be more open to the second idea. Be careful how much text you add to this area when you are preparing a presentation that you will be giving live. People will not be able to read your text and listen to you simultaneously.

KEY IDEA NUMBER TWO
Put your text about the second of your ideas in this lovely box right here. Once the people are engaged with the first idea, they will be more open to the second idea. Be careful how much text you add to this area when you are preparing a presentation that you will be giving live. People will not be able to read your text and listen to you simultaneously.

A VIDEO CASE STUDY

VIDEO TITLE...2012
DIRECTOR AND PRODUCER
SYNOPSIS
We are confident that you will find this video to be of great value and educational value. This video will be priceless for the education and training in this video once you have cut through all 2 hours of its unscripted comedy. It is a must see for anyone who is interested in being their best. Get some popcorn and get ready!

Black Chalkboard

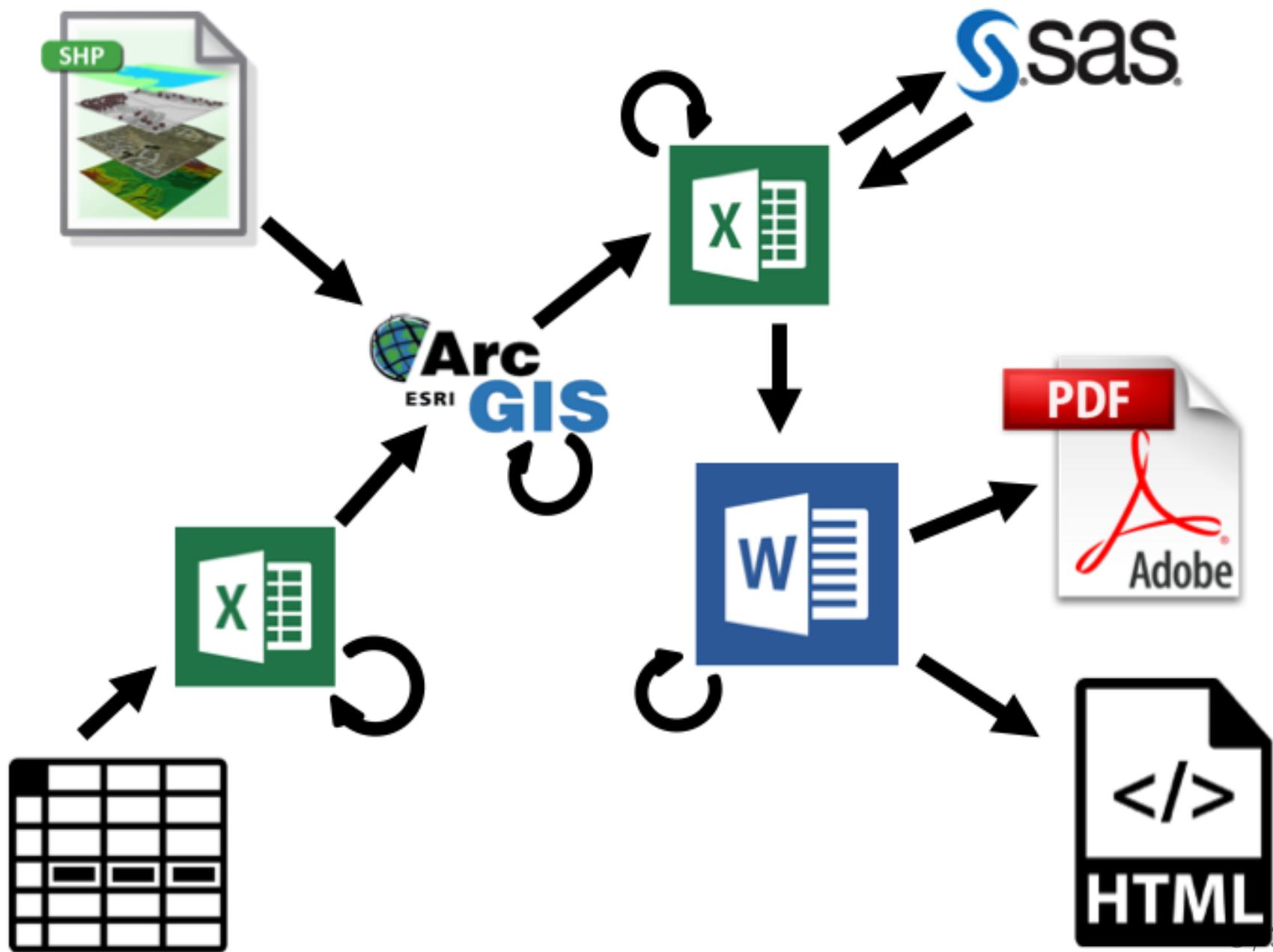


"Thank you for your hard work, this is exactly what we were looking for!"

"But, I think I gave you the wrong version of shapefile #2. Oh, and that Excel spreadsheet has been updated."

"But, I think I gave you the wrong version of shapefile
#2. Oh, and that Excel spreadsheet has been
updated."





Open source programming language

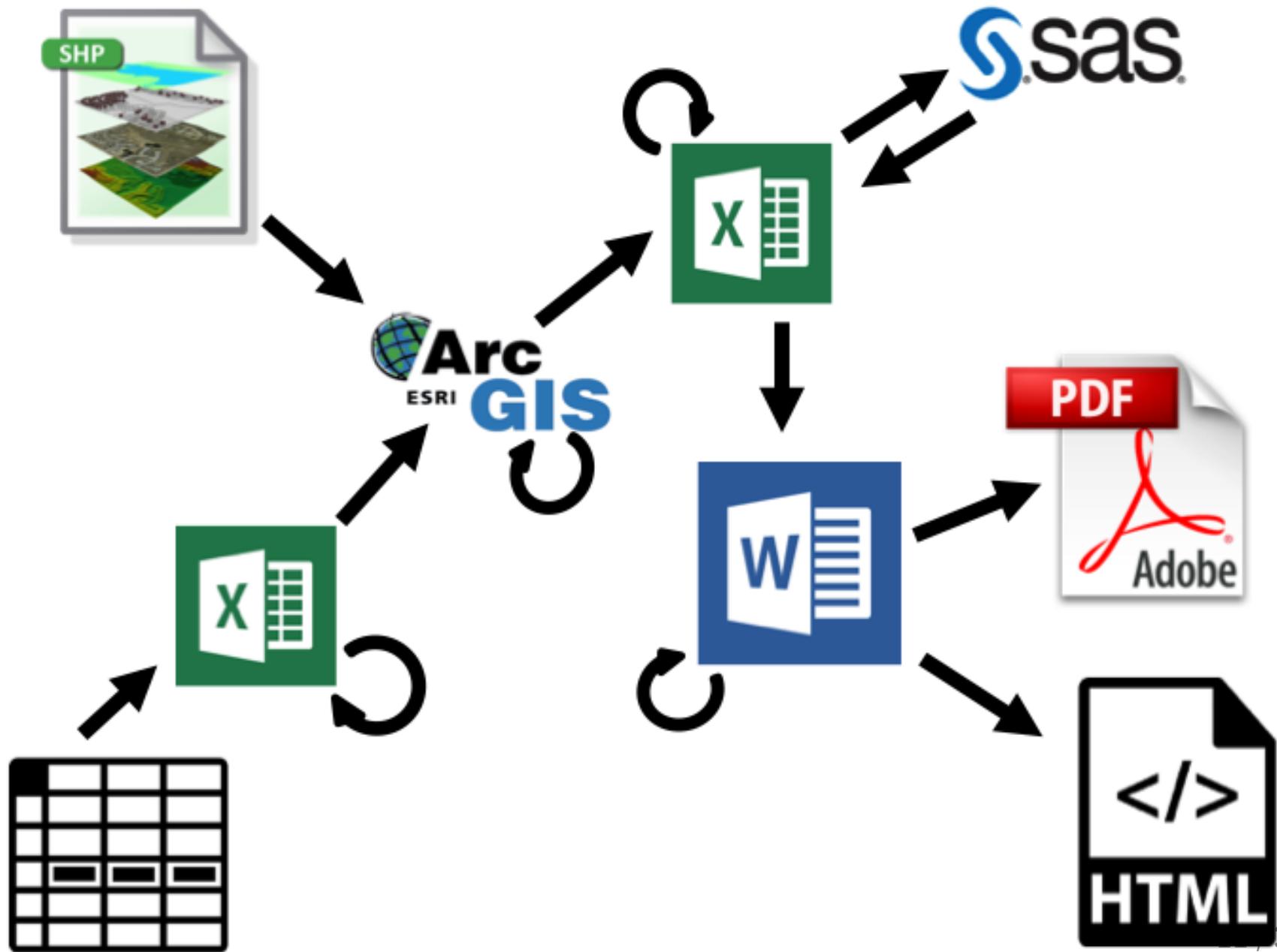
Data analysis focus

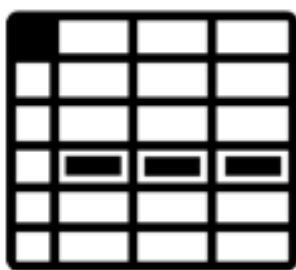
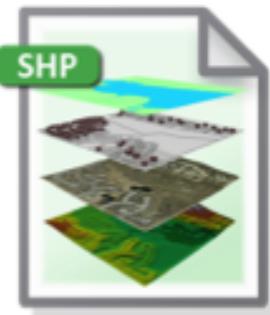
Cross-platform



Efficiency







Reproducibility



Reliability



Versatility

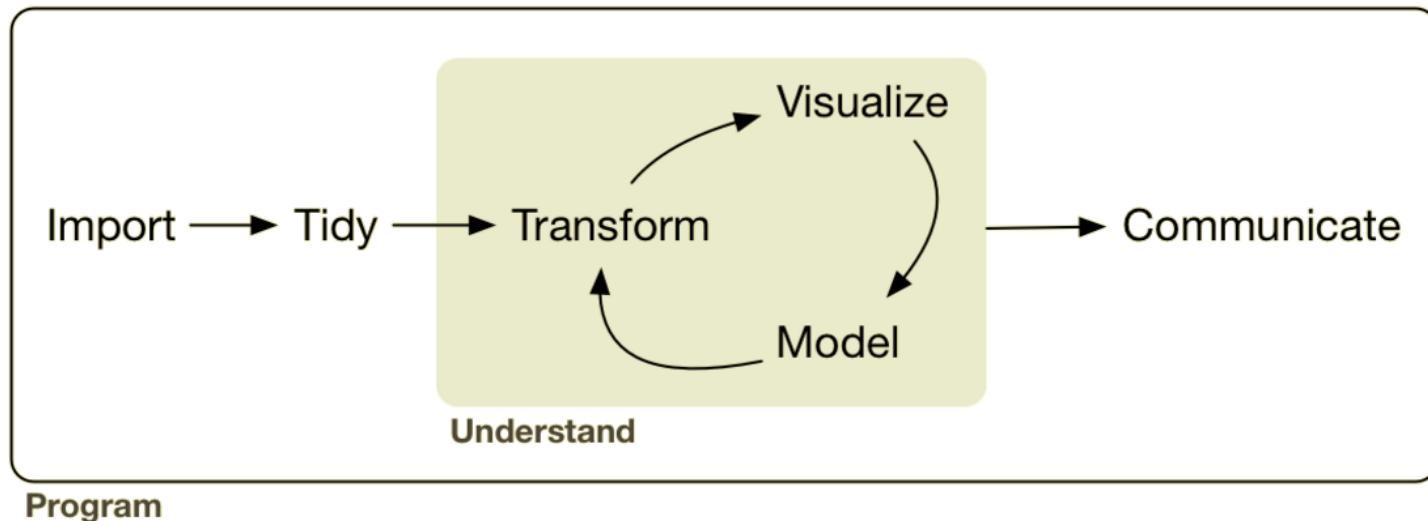


Community

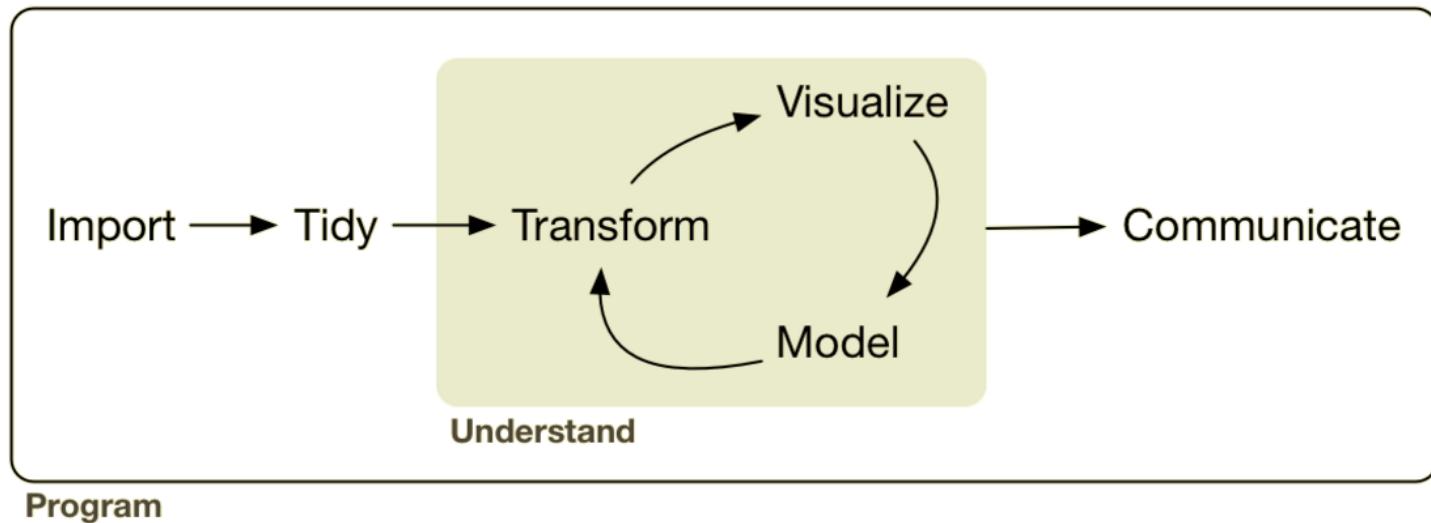
'Faces of R' by Maelle Salmon



Data Science



Geographical Data Science



Geographic Information Systems (GIS)

VS

Geographic Data Science (GDS)¹

Attribute	GIS	GDS
Home disciplines	Geography	Geography, Computing, Statistics
Software focus	Graphical User Interface	Code
Reproducibility	Minimal	Maximal

[1] Lovelace, Nowosad, and Muenchow: Geocomputation with R ([Table 1.1](#))



Home | What's New | Events | Blog | Contact Us

Select Language ▾



SEARCH

Residents

Business

City Hall

Online Services

I Want To...

Home

Online Services

Open Data

Text size



Share page



Online Services

Apply for Jobs

Bid Opportunities

BizPal

ConnectVictoria App

Council Webcasting

Development Tracker

Document Library

Garbage Collection Reminders

MyCity Online

Online Transactions

Open Data

Open Data Licence

ParkVictoria App

Recreation Registration

Open Data

Welcome to the City of Victoria's Open Data Catalogue.

We will continue to add data to this page as it becomes available. Please review the City's [Open Data Licence](#).

Mapping data can also be downloaded from [VicMap](#), an interactive, multi-layered map.

Financial Data

Data Set	CSV	KML	SHP	Other	Date Added or Updated
Statement of Council remuneration and expenses paid - 2016	CSV				June 2017
Statement of employee remuneration and expenses paid - 2016	CSV				June 2017
Statement of grants paid - 2016	CSV				June 2017

Contact Info

Email us to request data or report a problem

Related Links

» [DataBC](#)

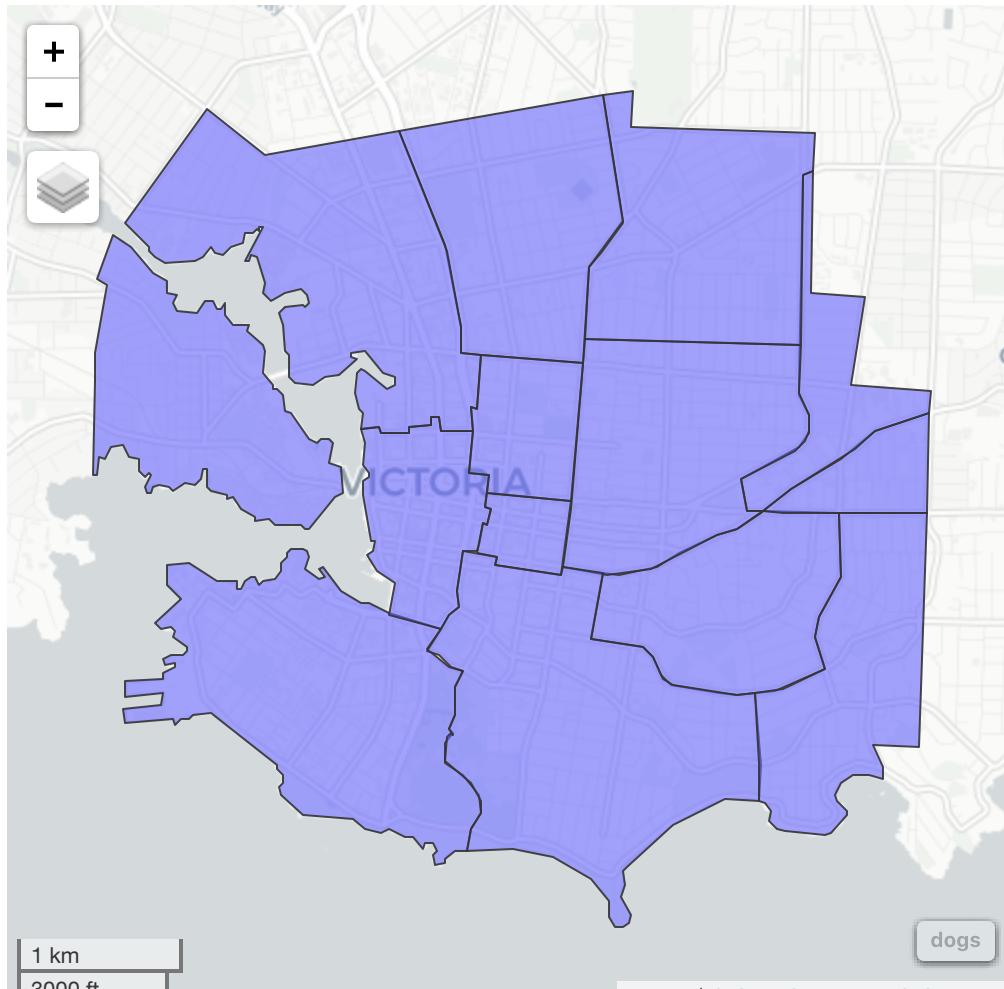
» [Government of Canada Open Data Portal](#)

» [VicMap](#)



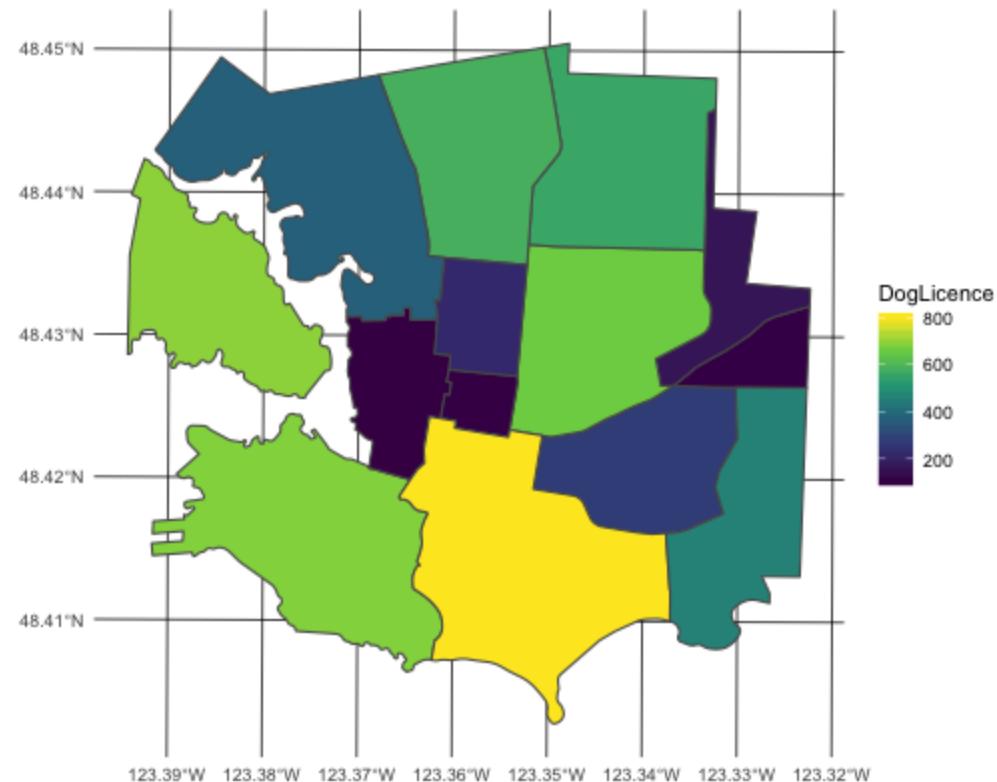


```
library(sf)
library(mapview)
dogs <- read_sf("data/dogs/DogsByNeighbourhood.shp")
mapview(dogs)
```



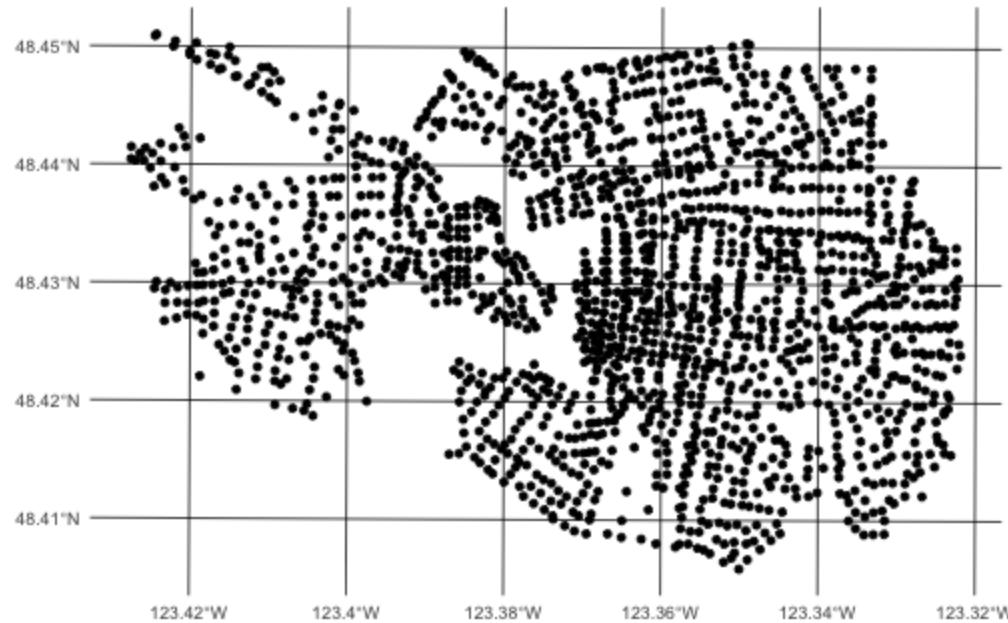
```
library(ggplot2)

ggplot() +
  geom_sf(data = dogs, aes(fill = DogLicence)) +
  scale_fill_viridis_c() + theme_minimal()
```

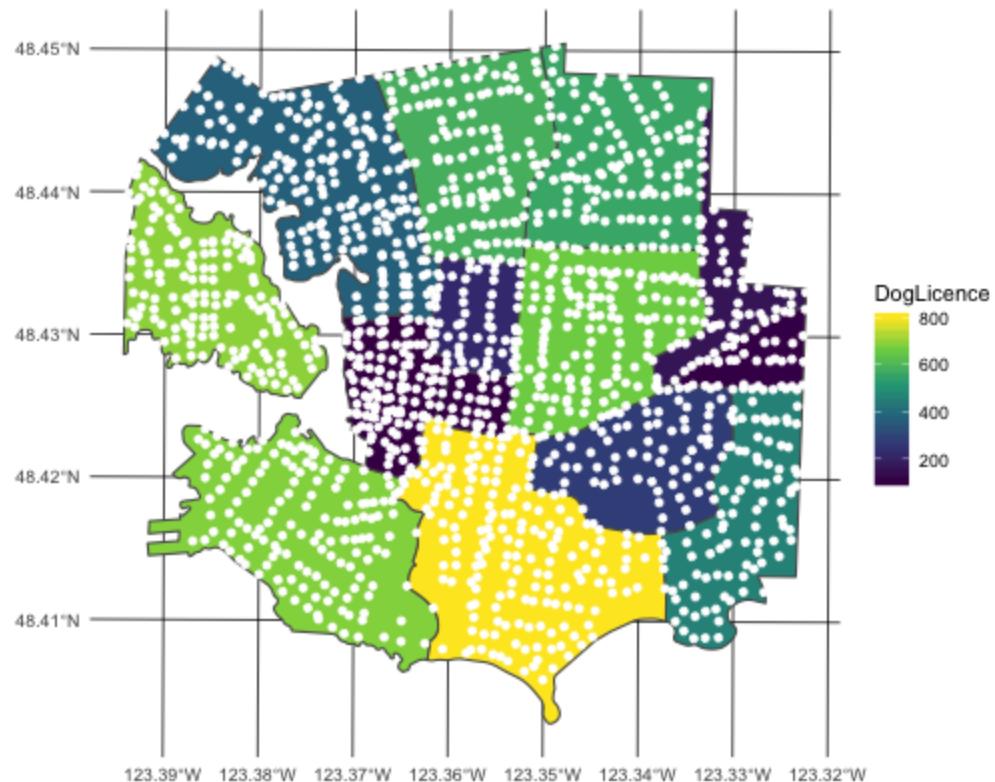




```
hydrants <- read_sf("data/hydrants/Hydrants.shp")  
  
ggplot() +  
  geom_sf(data = hydrants) +  
  theme_minimal()
```



```
hydrants <- st_intersection(hydrants, st_geometry(dogs))  
ggplot() +  
  geom_sf(data = dogs, aes(fill = DogLicence)) +  
  geom_sf(data = hydrants, colour = "white") +  
  scale_fill_viridis_c() + theme_minimal()
```



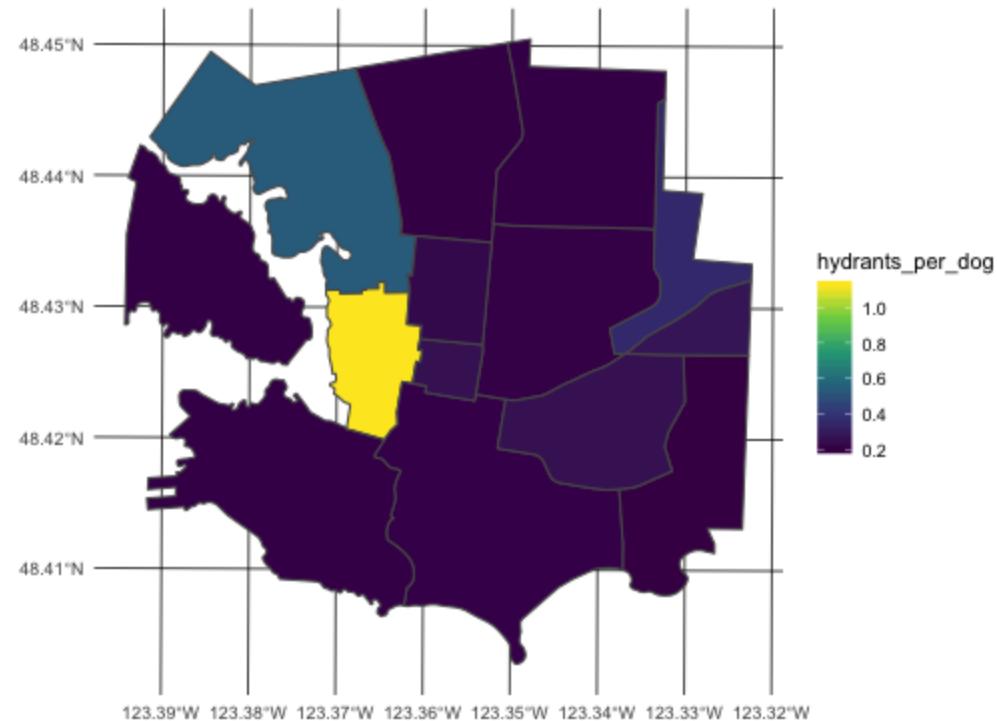
```

dogs_and_hydrants <- st_join(dogs, hydrants) %>%
  group_by(Neighbour) %>%
  summarize(licences = max(DogLicence),
            n_hydrants = length(unique(ID)),
            hydrants_per_dog = n_hydrants / licences)

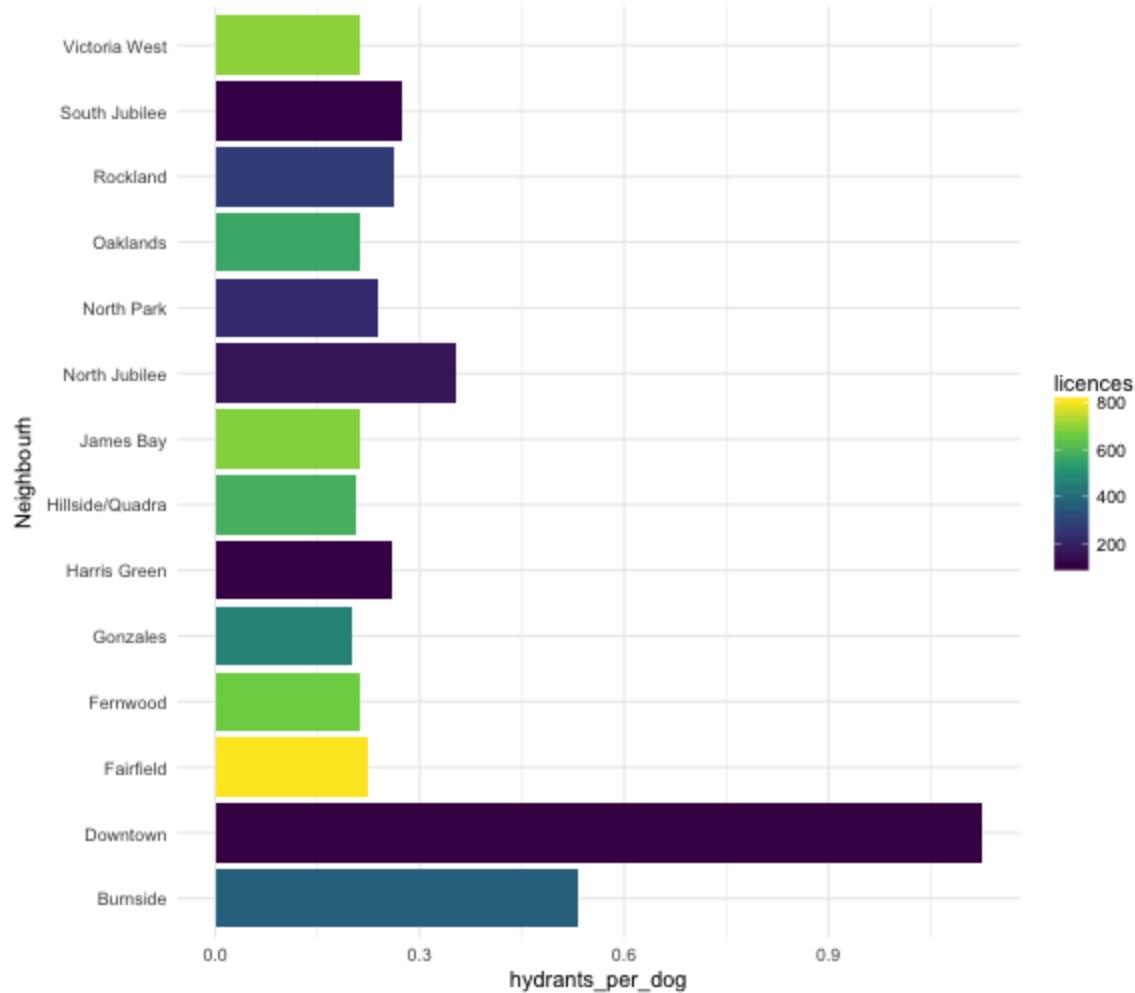
```

Neighbour	licences	n_hydrants	hydrants_per_dog
Burnside	366	195	0.5327869
Downtown	104	117	1.1250000
Fairfield	802	180	0.2244389
Fernwood	664	142	0.2138554
Gonzales	460	92	0.2000000
Harris Green	108	28	0.2592593
Hillside/Quadra	582	121	0.2079038
James Bay	684	145	0.2119883
North Jubilee	159	56	0.3522013
North Park	219	52	0.2374429
Oaklands	559	119	0.2128801
Rockland	276	72	0.2608696
South Jubilee	112	31	0.3743363

```
ggplot() +  
  geom_sf(data = dogs_and_hydrants, aes(fill = hydrants_per_dog)) +  
  scale_fill_viridis_c() + theme_minimal()
```



```
ggplot(dogs_and_hydrants, aes(x = Neighbour, y = hydrants_per_dog))  
  geom_col(aes(fill = licences)) + scale_fill_viridis_c() +  
  coord_flip() + theme_minimal()
```



Me:

Twitter: @andyteucher

GitHub: @ateucher

Resources:

<http://fg2re.sellorm.com/>

<http://r4ds.had.co.nz/>

<https://geocompr.robinlovelace.net/>

<http://r-spatial.org/>

Source code for this presentation available [here](#)

Made with [xaringan](#)

```
leaflet() %>%  
  addProviderTiles("Stamen.TonerLite") %>%  
  addAwesomeMarkers(lng = -123.369407, lat = 48.428881,  
    label = paste0("<h3>", emoji("beer"), "</h3>"),  
    labelOptions = labelOptions(noHide = TRUE))
```

