Global Wastewater Treatment Plant Visualization

Towards Better Public Health and Environment

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Motivations

- Water is important!
- Health concerns: Covid-19 waste awareness
- Impacts on environment and ecosystems
- Waterfront properties Protections

Problem Statement

- **Goal:** an interactive vis tool for wastewater treatment plants (WWTPs) on a global scale
  - Level of treatment
  - Locations
  - Status
  - Served population size and more…
- **Current:** little visualization available except some work done for WWTPs in the U.S.

Target End Users: Everyone!

- Water users
  - personal and industrial
- Government
- NGOs
- Geographers
- Engineers…

The HydroWaste Datasets

- **Most up-to-date data**
  - developed by McGill, published in 2022
- **Spatially explicit global database**
  - combines all national and regional data
- **Comprehensive characteristics:**
  - auxiliary information to derive or complete missing WWTP characteristics, including the number of people served
- **A single csv file:** easy to explore and manipulate!

A closer look: flat table

58502 items, 5 categorical and 20 ordered attributes

```
1 import pandas as pd
2 df = pd.read_csv('HydroWASTE_v10.csv', encoding = 'unicode_escape', engine ='python')
3 df.shape
```

```
(58502, 25)
```

```
1 df.head(3)
```

	WASTE_ID	SOURCE	ORG_ID	WWTP_NAME	COUNTRY	CNTRY_ISO	LAT_WWTP	LON_WWTP	QUAL_LOC	LAT_OUT	...
0	1	1	1140441	Akmenes aglomeracija	Lithuania	LTU	56.247	22.726	2	56.223	...
1	2	1	1140443	Alytaus m aglomeracija	Lithuania	LTU	54.432	24.056	2	54.519	...
2	3	1	1140445	Anyksciu aglomeracija	Lithuania	LTU	55.509	25.073	2	55.452	...

3 rows × 25 columns

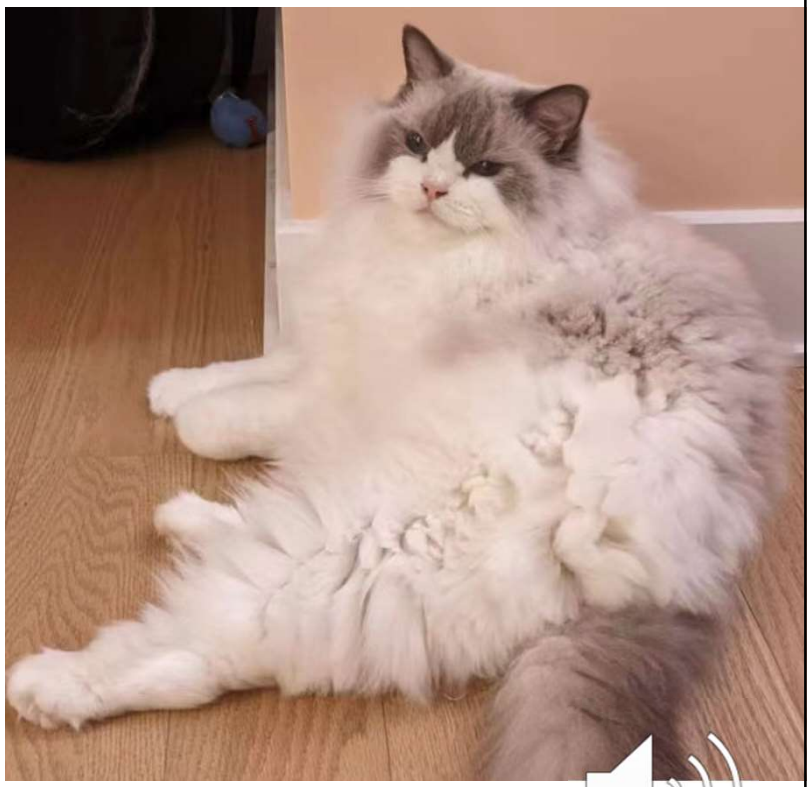
Potential Approach

- Global map for WWTPs
- Interactive filtering zooming
- Parallel layout allowed for diverse visual encodings
- Additional information panels to help decide the sufficiency of wastewater treatment
- Python, HTML, D3

Teammates wanted and open to other proposals!

Who am I?

- A CS grad student at UBC; Computer Sci & Statistics Undergrad at McGill
- Experience with **Python, Tableau, HTML, JAVA**
- Related past projects
  - Data preprocessing (python, R)
  - log statistics dashboards (splunk)
  - investment portfolio (tableau)



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Reference

1. Ehalt Macedo, H., Lehner, B., Nicell, J. A., Grill, G., Li, J., Limtong, A., Shakya, R.: Distribution and characteristics of wastewater treatment plants within the global river network. Earth System Science Data. 2022.
2. Dataset link: https://figshare.com/articles/dataset/HydroWASTE_version_1_0/14847786/1