CPSC 547
Final Presentation 2020

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the seasons have seemed to shift to become fall, winter, spring, and fire...

CNN

Tens of thousands of fires are pushing the Amazon to a tipping point

"Most of (the fires) are illegal," said Tasso Azevedo, a former head of Brazil's forest service and coordinator of MapBiomas. Read More.

3 weeks ago

ENVIRONMENT

B.C. wildfire map 2020: Current location of wildfires burning around the province

By Amy Judd · Global News
Posted September 18, 2020 1:00 pm · Updated September 18, 2020 1:09 pm

Global News Morning BC
Air quality concerns continue as U.S. wildfire smoke blankets much of B.C.

Record-breaking California wildfires scorch 8,000 sq. km, prompting closure of state forests

A gender-reveal event gone wrong is blamed for the El Dorado fire that has now scorched 30 square km

The Associated Press · Posted: Sep 07, 2020 9:38 AM ET | Last Updated: September 7

NS New Statesman

Are Australia's bushfires our future?

From December 2019 and into 2020, fires burned in Australia like never before. By their end, they had affected more than one billion animals, ...
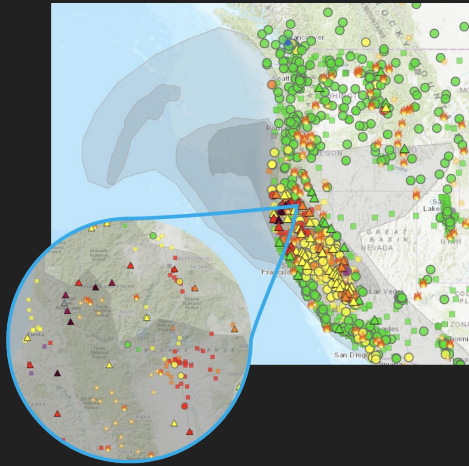
3 weeks ago

3

Tasks and Requirements (the why)

- wildfire overview (general)
  - one-stop shop for all the information related to wildfire (explore)
  - centralized view of active fires, air quality, smoke plumes, and historical data (consume)

- user centric information (specific use-case)
  - local residents: updates on fire perimeters (look-up)
  - campers: high risk wildfire zones, warnings, smoke coverage (browse)
  - climate activists: changes in trends, historical wildfire (present)
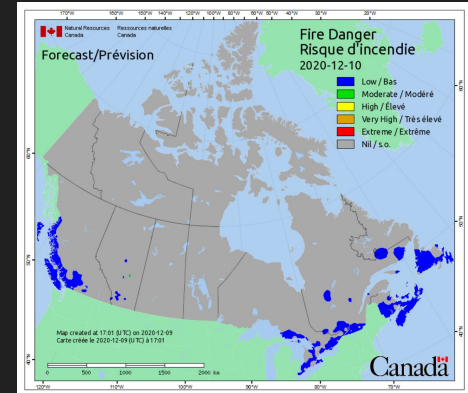
Current Approaches
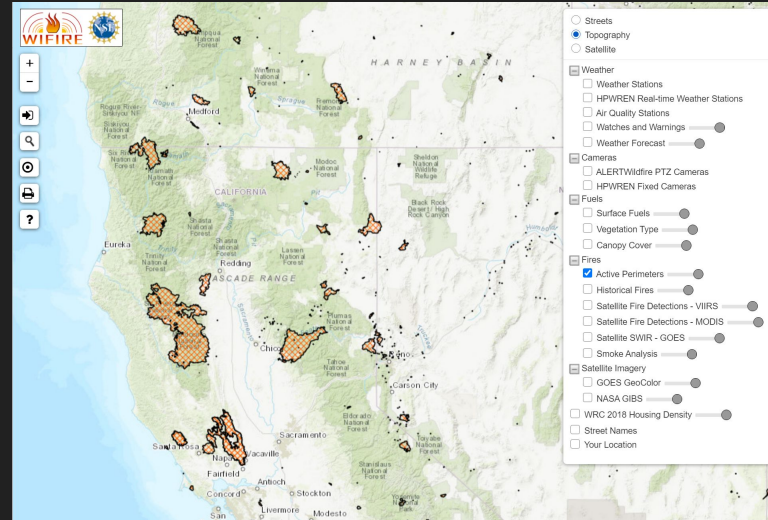
AirNow

Fire.ca.gov
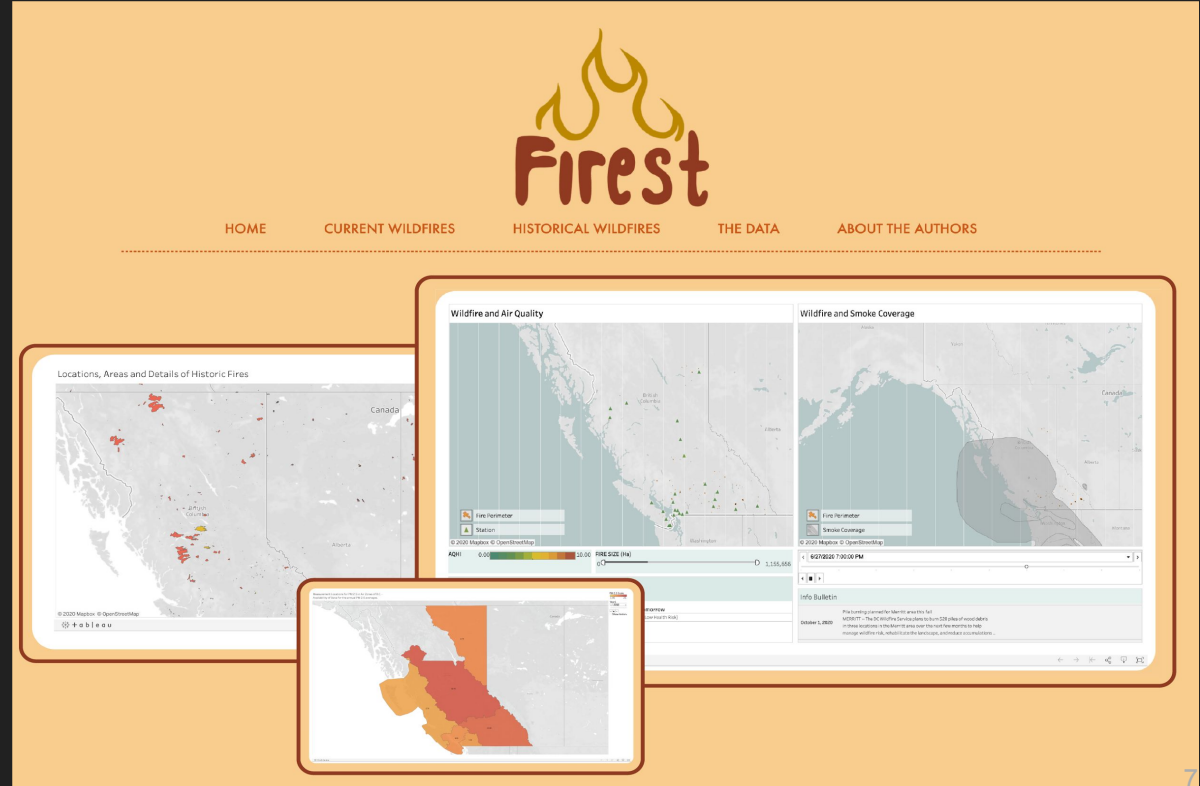
CWFIS

Current Approaches

FireSmoke

Wifire, UCSD

Our Solution (the how)

We created a web-based interface that houses all of the current wildfire updates, historical analysis, and an overview of our data.
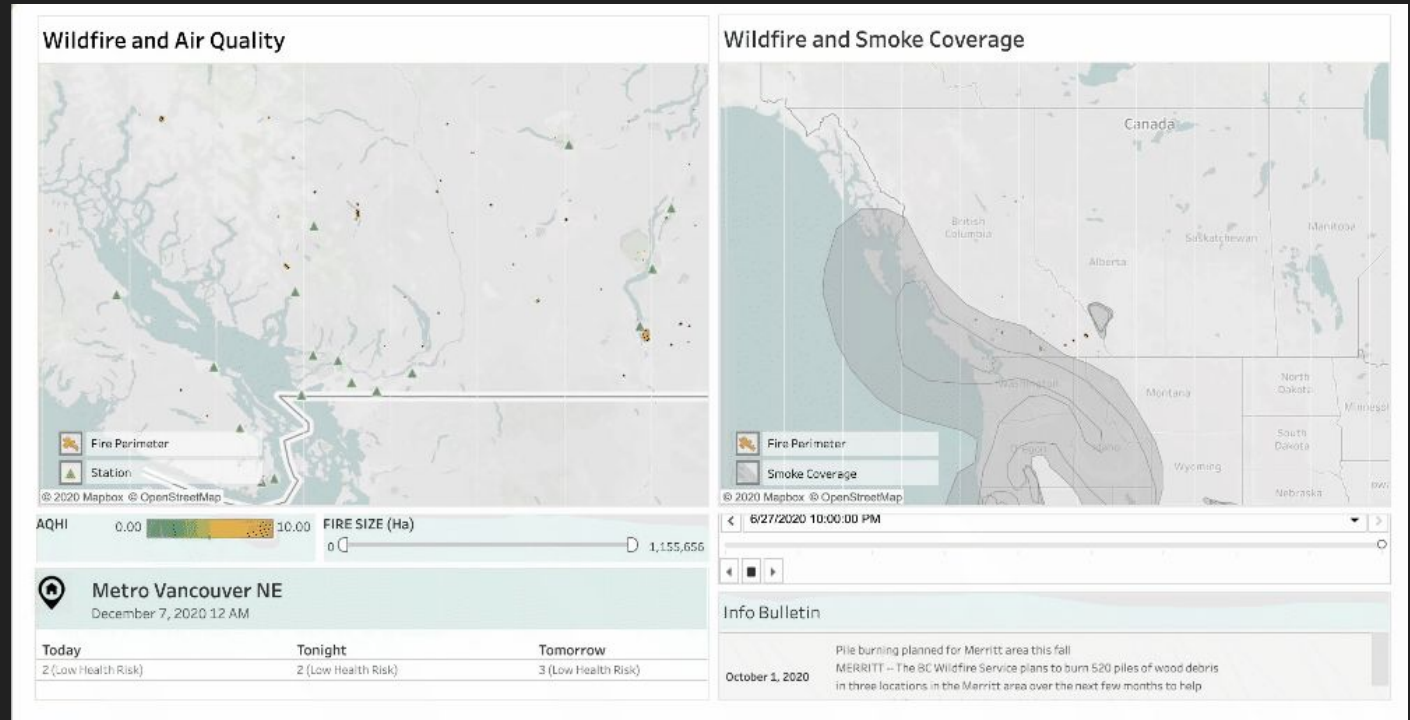
Available at:

https://firest547.github.io/

Data Sources (the what)

- **BC Data Catalogue**
  - open data sources for BC's government data holdings, applications, and web services
- **Smartfire 2.0**
  - combined data sources of fire info in unified GIS database
- **National Fire Database - Canadian Forest Service**
  - data from Government of Canada's Natural Resources
- **National Air Pollution Surveillance Program, Canadian Climate Data**
  - data from Government of Canada's Environment and Climate Change
- **National Forestry Database**
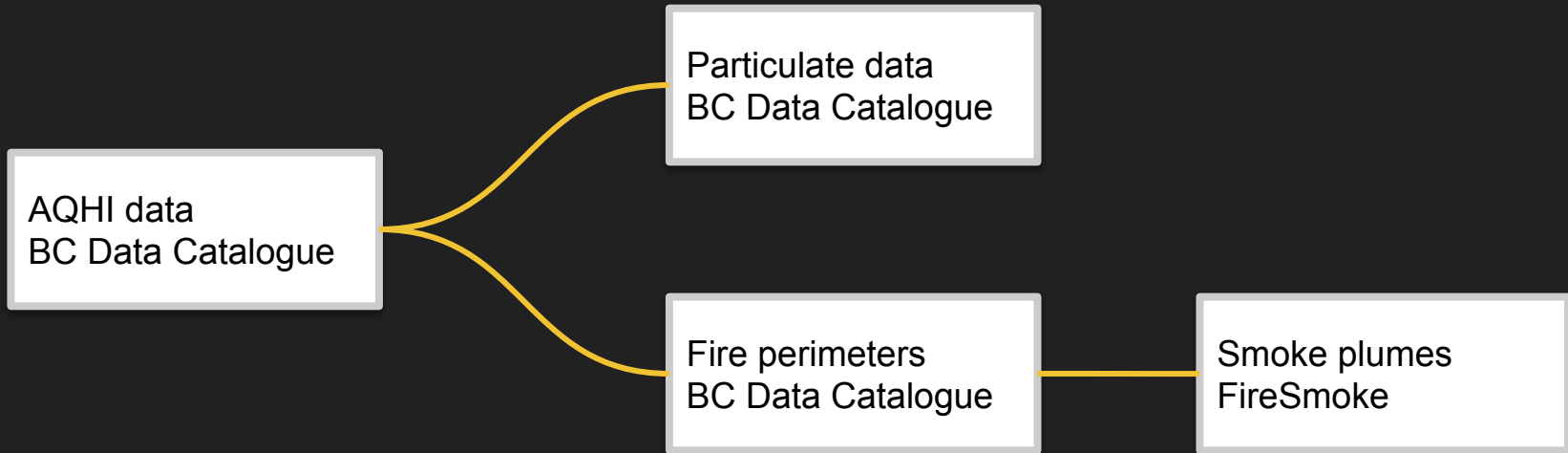 - data on forest fires from the Canadian Council of Forest Ministers
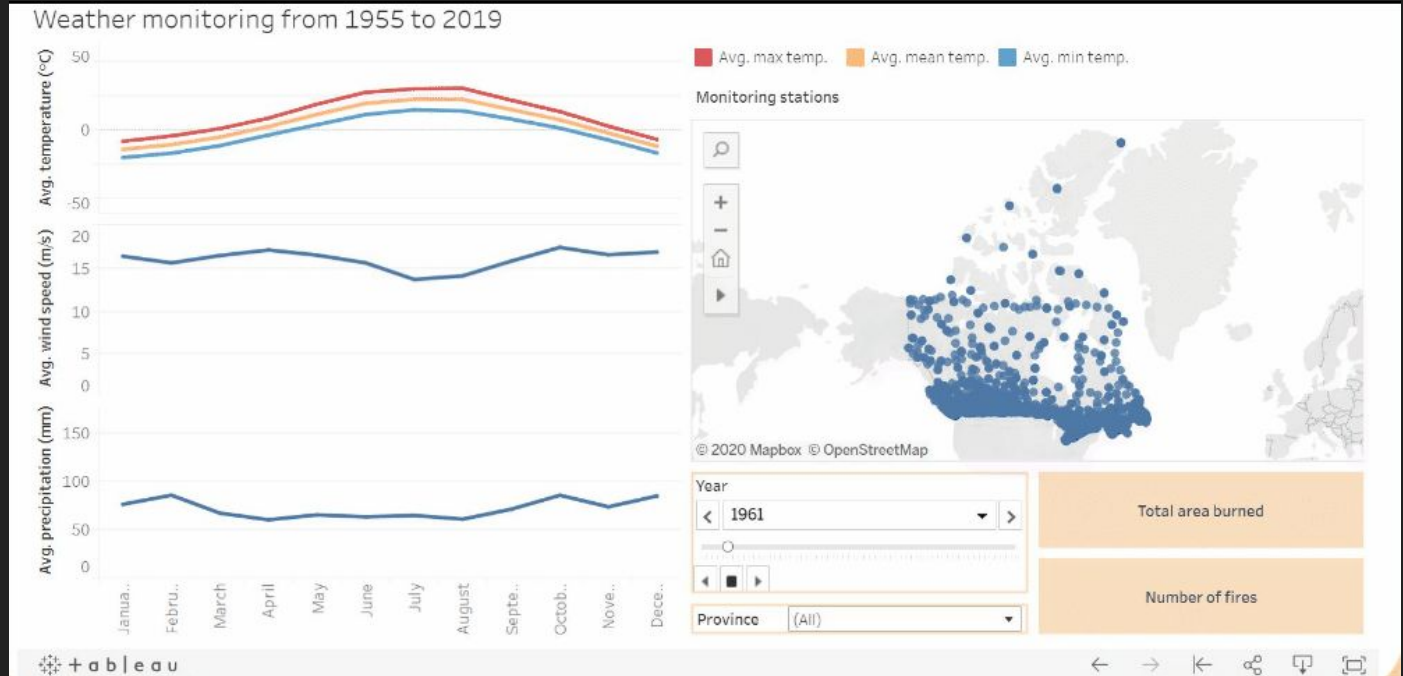
Visualizations

Current tab

Data Relationships (current tab)

```
                          ┌─────────────────────────┐
                          │ Particulate data        │
                     ┌────│ BC Data Catalogue        │
                     │    └─────────────────────────┘
┌──────────────────┐ │
│ AQHI data         │─┤
│ BC Data Catalogue │ │    ┌─────────────────────────┐      ┌──────────────────┐
└──────────────────┘ └────│ Fire perimeters         │──────│ Smoke plumes      │
                          │ BC Data Catalogue        │      │ FireSmoke         │
                          └─────────────────────────┘      └──────────────────┘
```
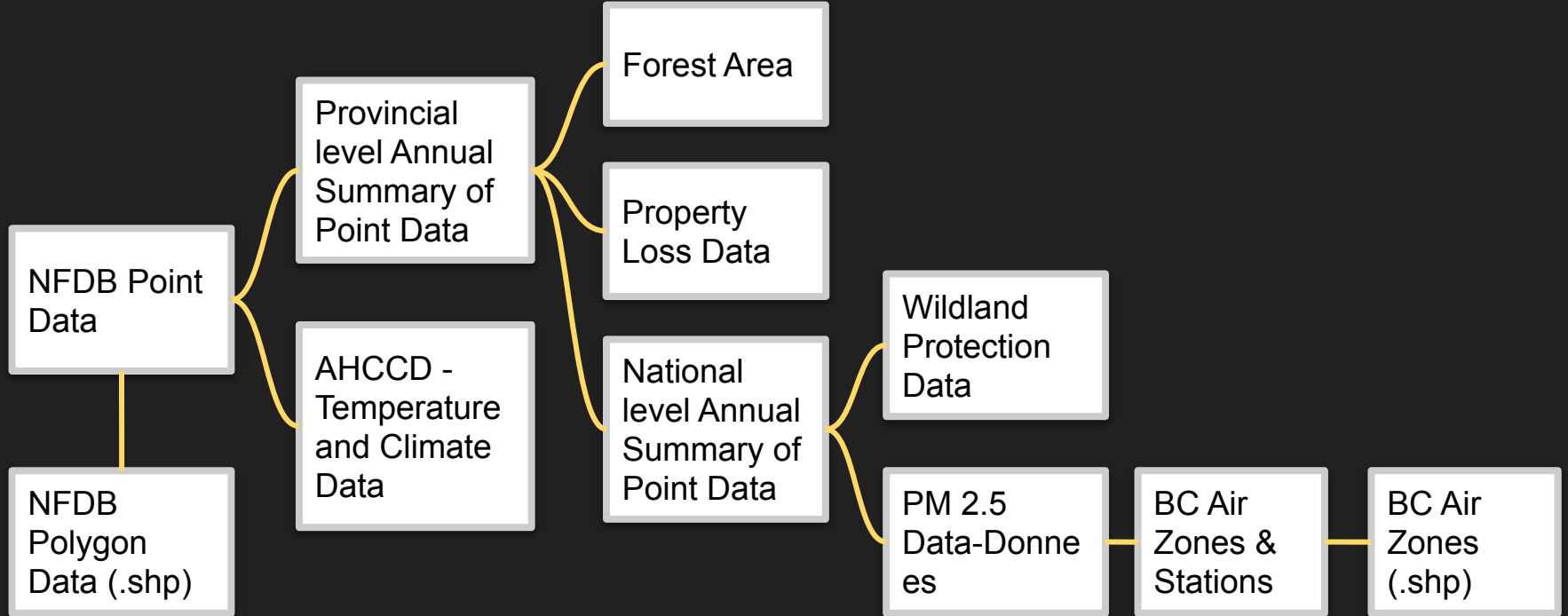
Visualizations

Historical tab
example:
*Analysis of
Effects of
Temperature*
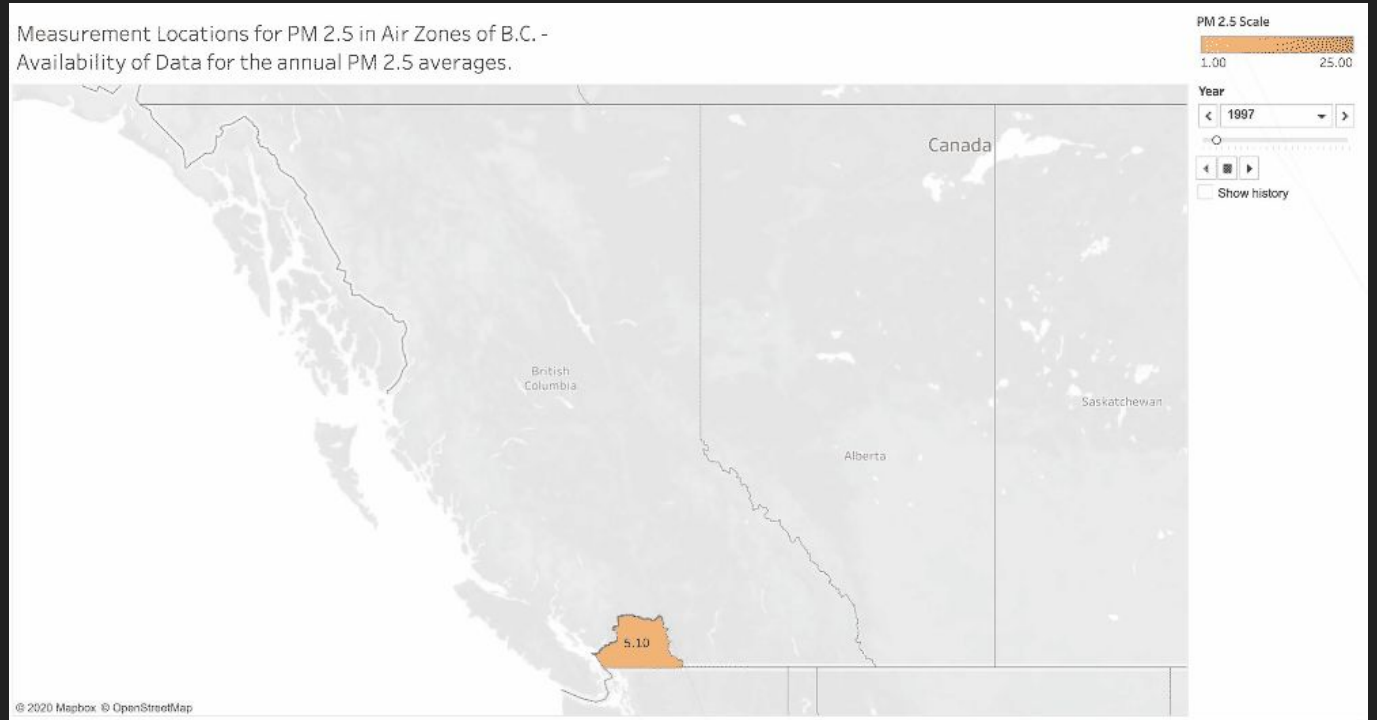

(many more on this page, more to come in demo, please visit the website)
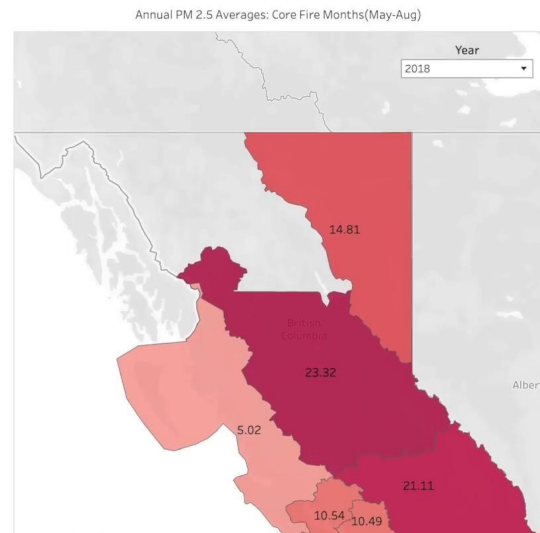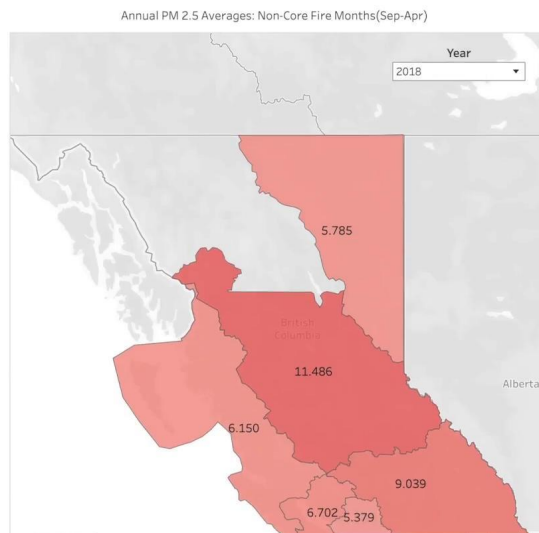
Data Relationships (historical tab)

Visualizing the availability of our data (& more) on "The Data" tab

Measurement Locations for PM 2.5 in Air Zones of B.C. -
Availability of Data for the annual PM 2.5 averages.

Demo

- [Video link](#)
- [Website link](#)

Strengths and Lessons Learned

- Firest combines current wildfire status and historical analysis in one place
  - Website has been made publically available

- Dashboard is relatively intuitive in the website
  - intended to be exploratory, so no learning or training of users is required
  - Integrating datasets brings out relations more intuitively

- Tableau is a powerful tool for data processing and visualizations
  - Even though drag and drop, specific learning of the tool required, not obvious
  - Limitations in terms of number of views it can merge at a time

Limitations and Critiques

- Data sources are not consistent
- Dependence on Tableau

- Historical tab:
  - Climate data vis are mostly exploratory
  - Limited range of analyses: 1955 - 2019

- Current tab:
  - Disjointed views of air quality and smoke
  - Manual update

Future Work

Extending the current tab

- Include more regions
- Include more parameters:
    - Real-time evacuated sites
    - Property loss index
    - Real-time weather data
    - Fire area forecast

Extending the historical tab

- In-depth analysis of climate trends
- Extend coverage:
    - Years
    - Air quality
- Include more parameters:
    - Pollution trends

Migrate the implementation to an open source tool

Thank You!