Manitoba Wildfire Prediction Dashboard

Features Trends

Fire Weather Conditions

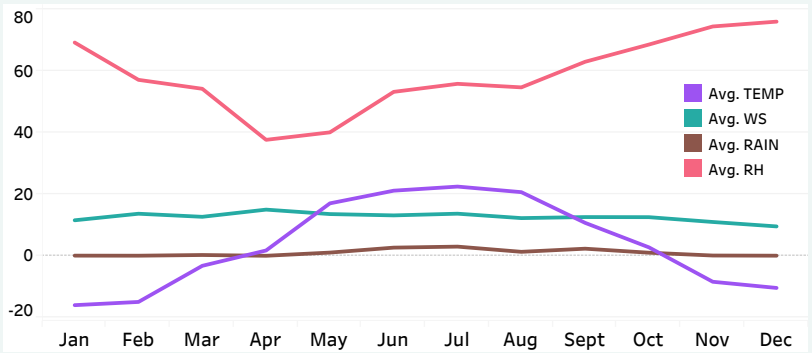
AVG Temperature (TEMP): 4.487

AVG Rain: 1.173

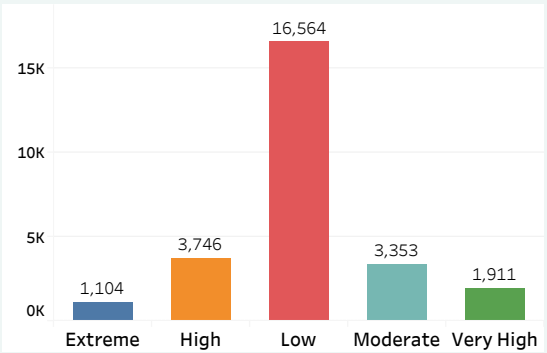
AVG Relative Humidity (RH): 58.92

AVG Wind Speed (WS): 12.68

AVG Fire Weather Trends by Month



FWI Levels By Date

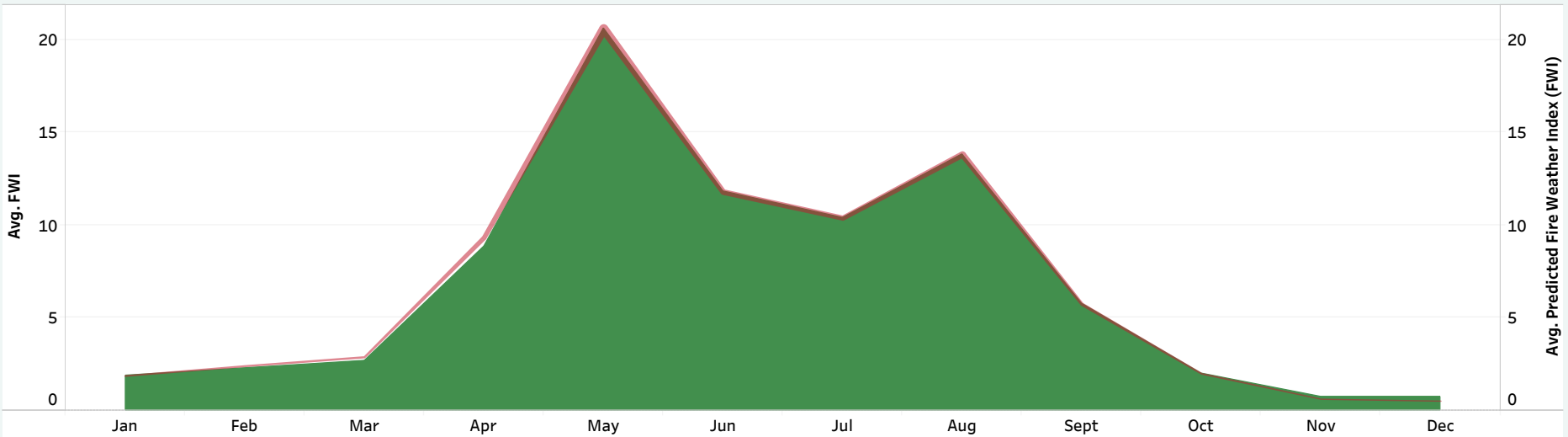


Select Year
2018

Select Quarter
All

Select Day
All

FWI vs Predicted FWI by Month

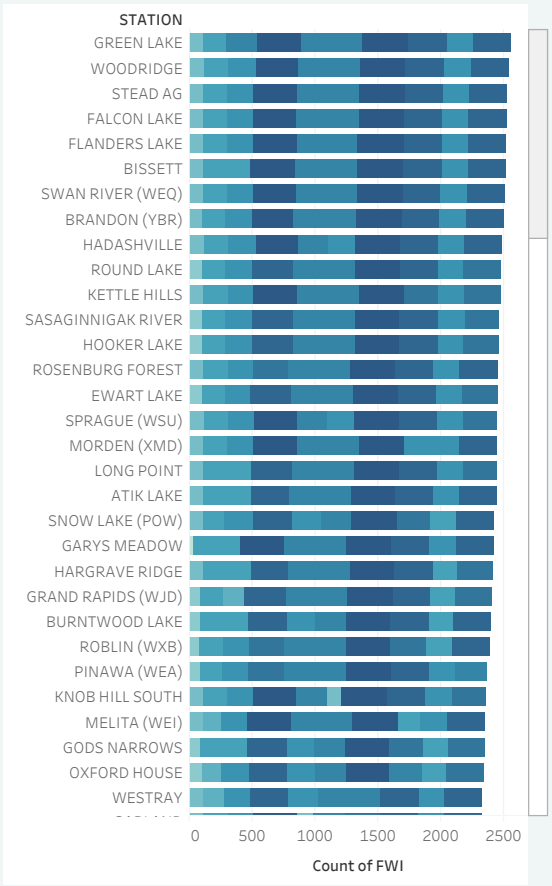


Manitoba Wildfire Dashboard

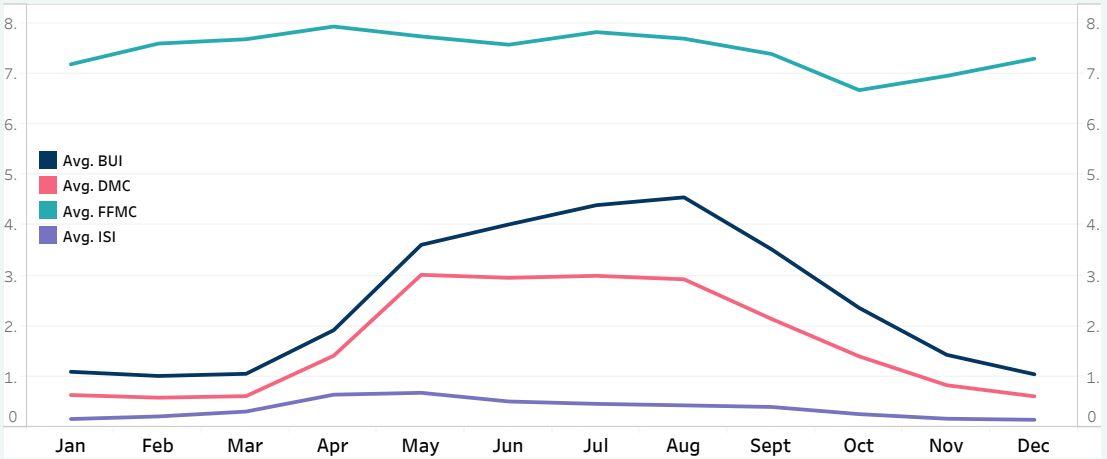
Wildfire Historical Trends

Features Trends

Fire Weather Observation Count by Station



AVG Fuel Moisture Codes and Indexes Trends by Month



Select Year
All

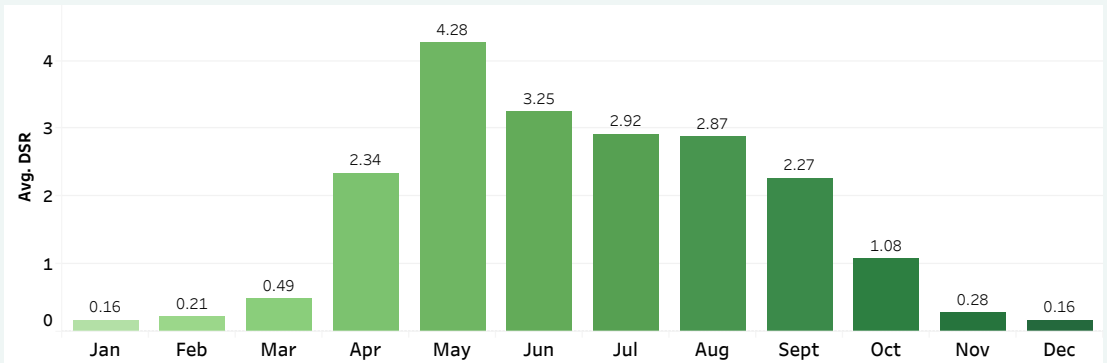
Select Quarter
All

Select Day
All

Select Station
All

BUI: Buildup Index
DMC: Duff Moisture Code
FFMC: Fine Fuel Moisture Code
ISI: Initial Spread Index

DSR - (Daily Severity Ranting Average) by Month

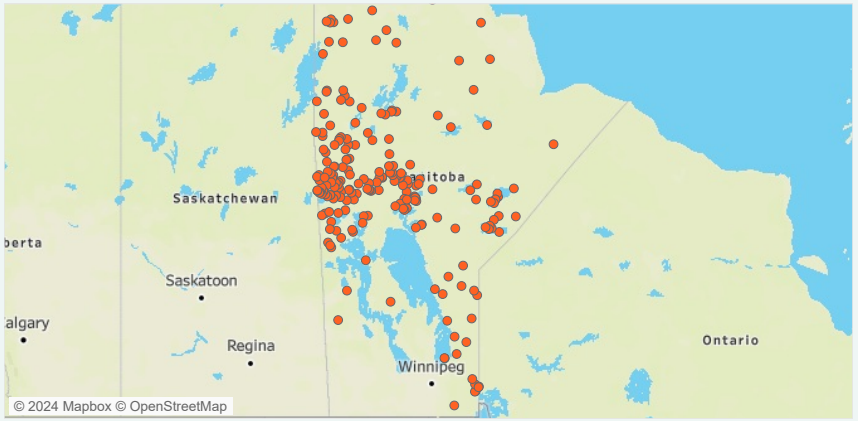


Manitoba Wildfire Dashboard

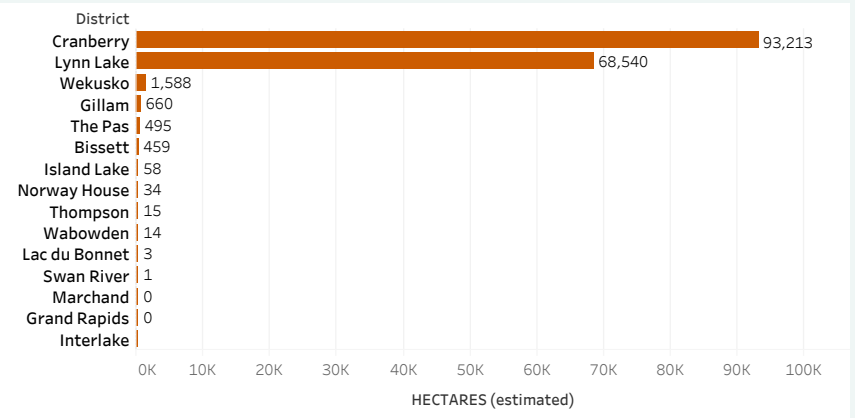
Dashboard Background Information

Historical Trends

Wildfire by District Map



Hectareas Wildfires by MB District

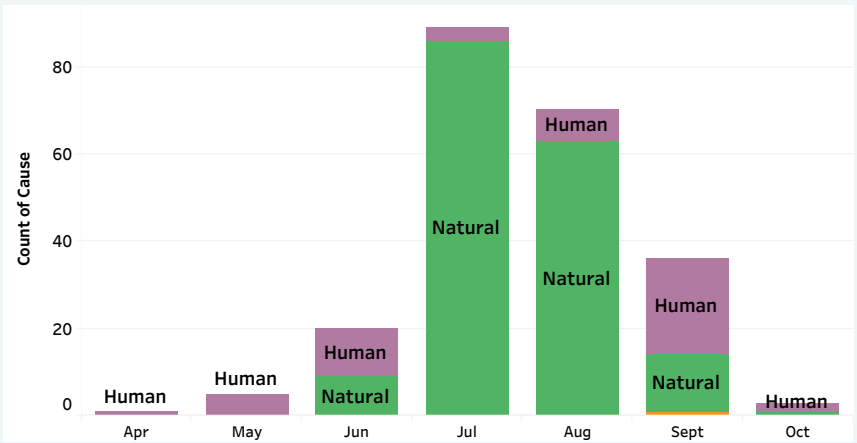


Select Year
2022

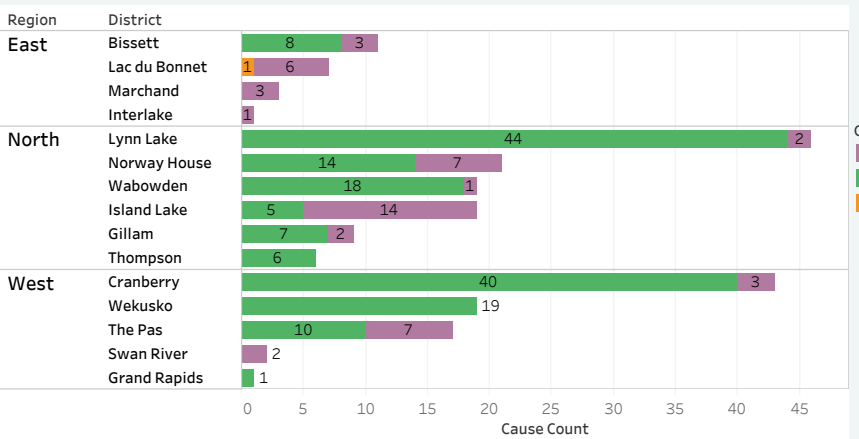
Select Quarter
All

Select Month
All

Wildfire Causes by Month (Apr 2021- Aug 2024)



Wildfire Count by District and Causes (Apr 2021 - Aug 2024)



Manitoba Wildfire Dashboard

FWI Prediction & Fire Weather Trends

Background Information

Dashboard Description:

This dashboard shows several factors of Wildfire Weather used to predict the Canadian Forest Fire Index (FWI) System which is the main feature of Wildfires in Canada, specifically for Manitoba province.

A prediction model was developed and evaluated using Python with historical data from Jan 2015 to Jul 2024. The dataset with actual FWI and predicted FWI resulting from the model is used in this dashboard.

The dashboard' aim objective: Show the results of the deployment of the predicted model for FWI with historical data, complementing with statistical metrics about the features used in the model, specifically the following Weather Observations:

TEMP: Temperature (°C)
RH: Relative Humidity
WS: Wind Speed
Rain: (24-hour-precipitation)
FFMC: Fine Fuel Moisture Code
DMC: Duff Moisture Code
ISI: Initial Spread Index
FWI: (Target Feature) Fire Weather Index.

About Dashboard Pages:

First Page - Manitoba Prediction Wildfire Dashboard: it contains three graphs with important prediction report information, and the bottom graph is the most important information, containing the comparison between the Actual FWI and the Predicted FWI average per month, showing close results, demonstrating a good prediction.

Second Page - Manitoba Wildfire Dashboard (Feature Trends): shows the stations where the weather observations were taken, the trends through the time for these other main weather features, and the trend of DSR - Daily Severity Ranting, which is an additional range that is not included to calculate the FWI but helps to understand the Severity of Wildfire.

Third Page - Manitoba Wildfire Dashboard (Historical Trends): this page shows the trend of wildfire causes by date, region, and district, and a map with the location of the wildifire using another dataset recollected for this analysis to understand the original behavior of this wildfires.

Definitions, Column Meanings, and Assumptions:

The datasets used in this dashboard are:
1. mb_data_FWI_vs_Predicted_Polynomial_Regression
2. Fire Status Report Apr 2021-Aug 2024

The first dataset contains the most important features resulting from the data recollection in the Manitoba Government Website and results from the Polynomial Regression Prediction Model. The following are the column/feature names: (not all used in this report)

STATION, TEMP, RH, WD, WS, RAIN, FFMC, DMC, DC, ISI, BUI, FWI, DSR, Date, Predicted Fire Weather Index (FWI), FWI Levels.
Rows:190557

The second dataset contains the extra important information resulting from research and data recollection from the Manitoba Government Website. The following are the column names: (not all used in this reports)

REPORTED, REGION, FIRE, DISTRICT, CAUSE, LATITUDE, LONGITUDE, STATUS, HECTARES (estimated).
Rows:1245

References:

Canada, N. R. (n.d.). National wildland fire situation report . Canadian Wildland Fire Information System. https://cwfis.cfs.nrcan.gc.ca/report
https://cwfis.cfs.nrcan.gc.ca/background/summary/fwi

Government of Manitoba Website, Weather Stations Referenced by the Manitoba Fire Program (n.d.). https://www.gov.mb.ca/conservation_fire/station-location-map.html

Government of Manitoba Website, Natural Resources and Northern Development - Wildfire Service(n.d.). Historical Database - Fire Weather Reports from 2015 to 2024. https://www.gov.mb.ca/conservation_fire/Wx-Report/index.html

Government of Manitoba Website, Natural Resources and Northern Development - Wildfire Service(n.d.). Historical Database - Fire Status Reports from 2021 to 2024. https://www.gov.mb.ca/conservation_fire/Fire-Status/index.html

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