

Business Intelligence
20/21

Forest Fire Prevention and Management

Partes 1-5 do Projeto

Professoras
Catarina Helena Branco Simões da Silva
Bernardete Martins Ribeiro

Filipe Miguel Fonseca Dos Santos - 2017271196
Ricardo David da Silva Briceño - 2020173503



UNIVERSIDADE D
COIMBRA



Tópicos



01 Objetivos

02 Requisitos

03 Design Data Warehouse

04 Software

05 ETL

06 Apresentação dos Dados aos Utilizadores
e Análise



Objetivos

Causas



Causas



Empresas e instituições



Serviço Nacional de
Bombeiros



Instituto da Conservação da
Natureza e das Florestas



Proteção Civil



GOVERNO DE
PORTUGAL
Governo



Direção Geral de Recursos
Florestais



GNR

Soluções





Requisitos

Dataset

Kaggle

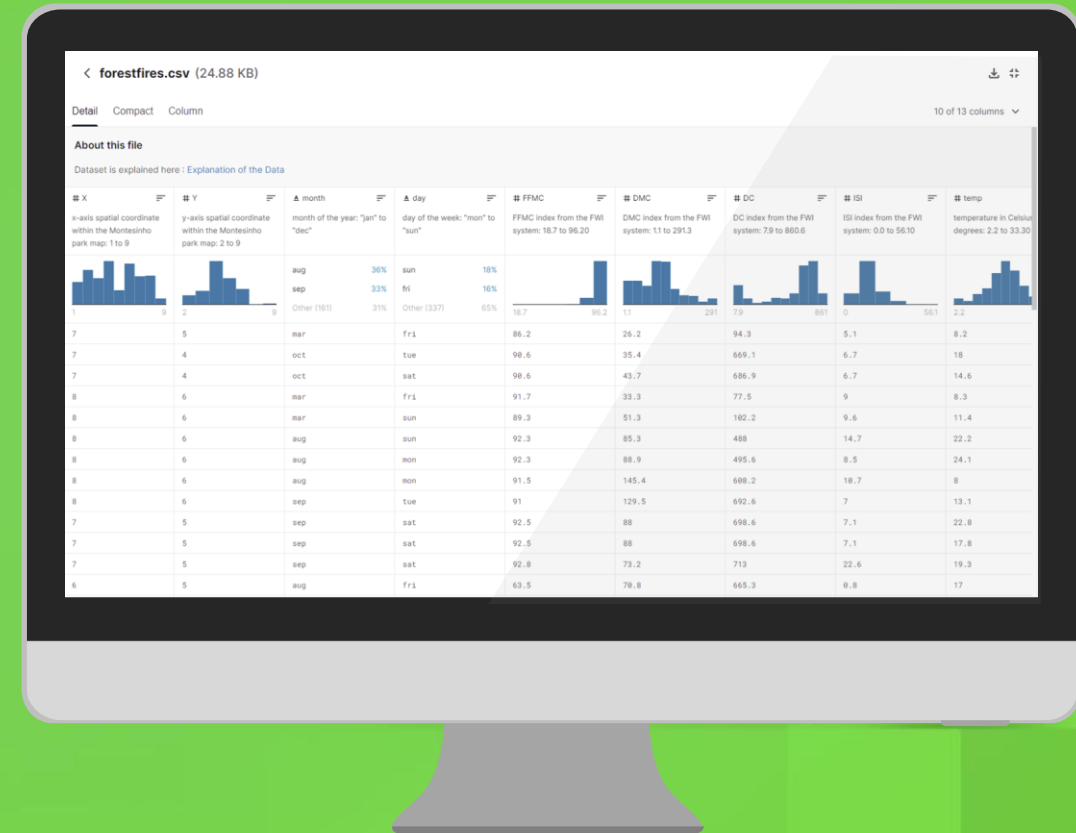
<https://www.kaggle.com/sumitm004/forest-fire-area>

517 Incêndios

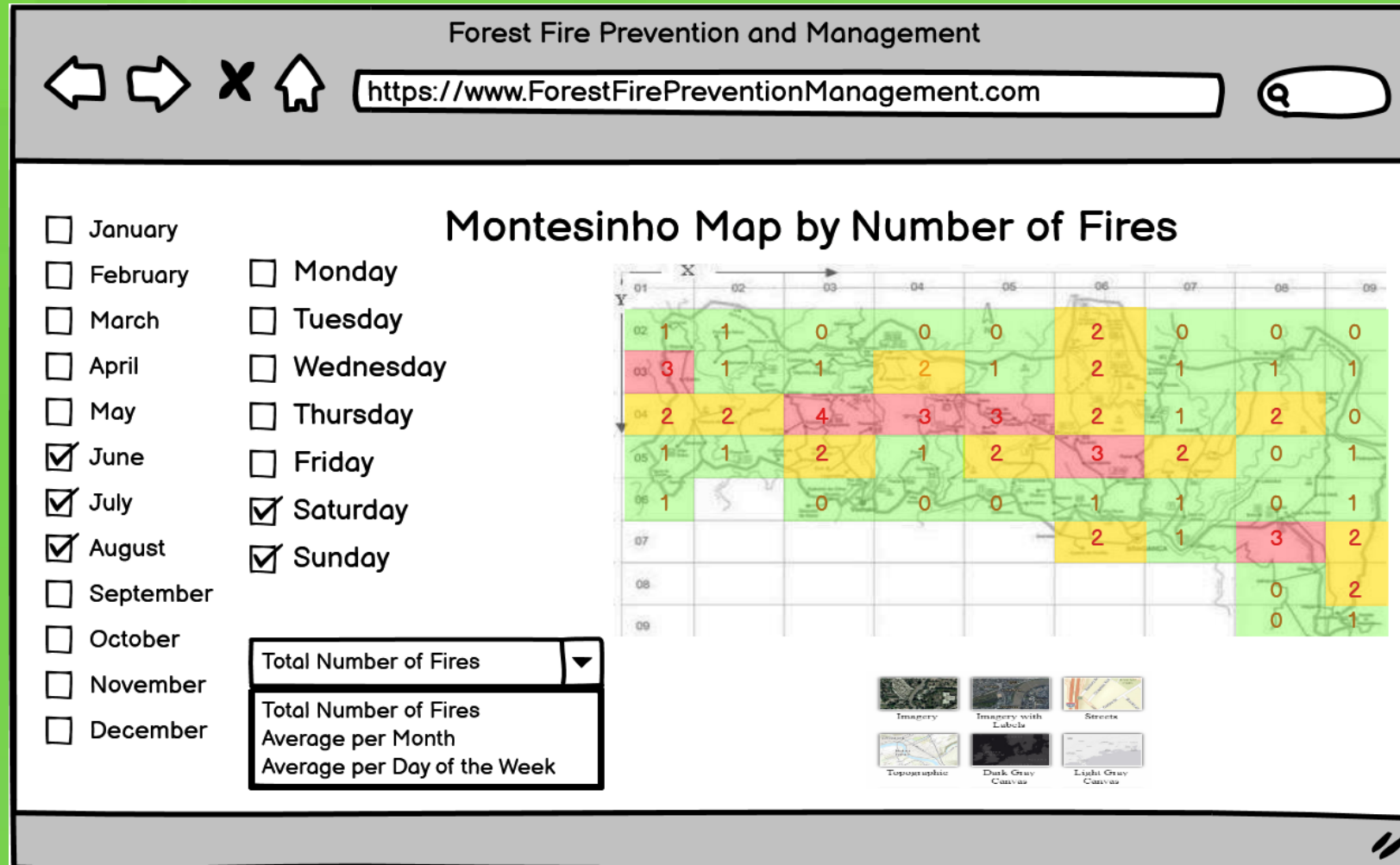
Janeiro 2000 -
Dezembro 2003

Parque
Natural de
Montesinho

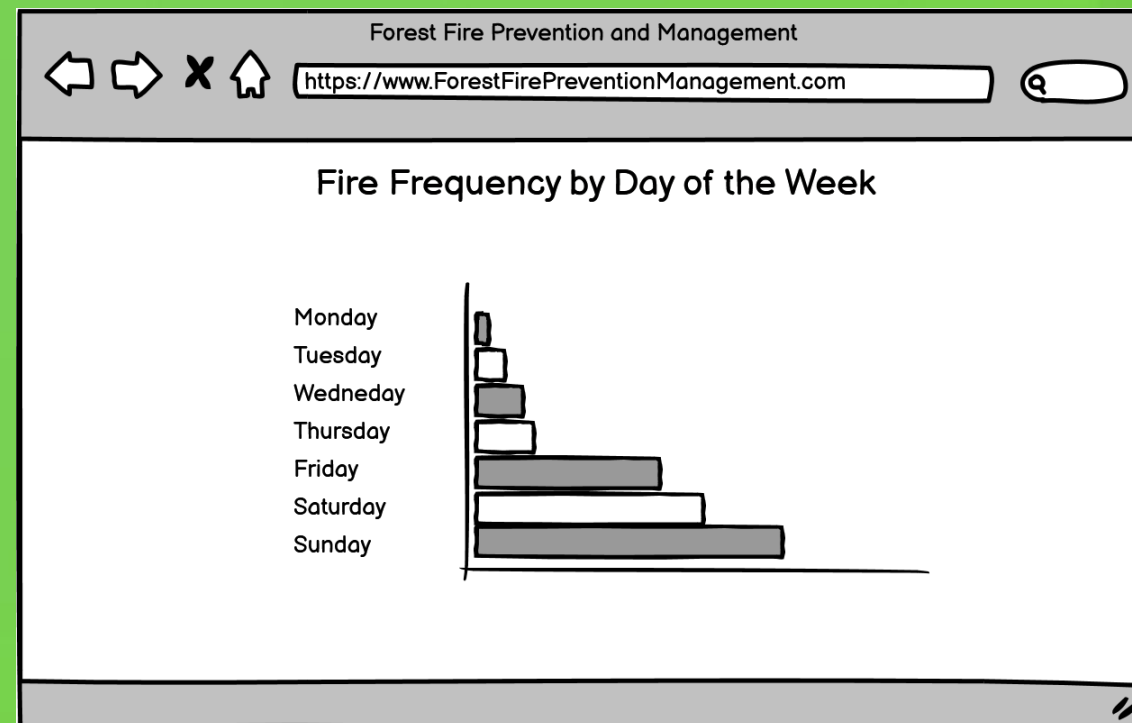
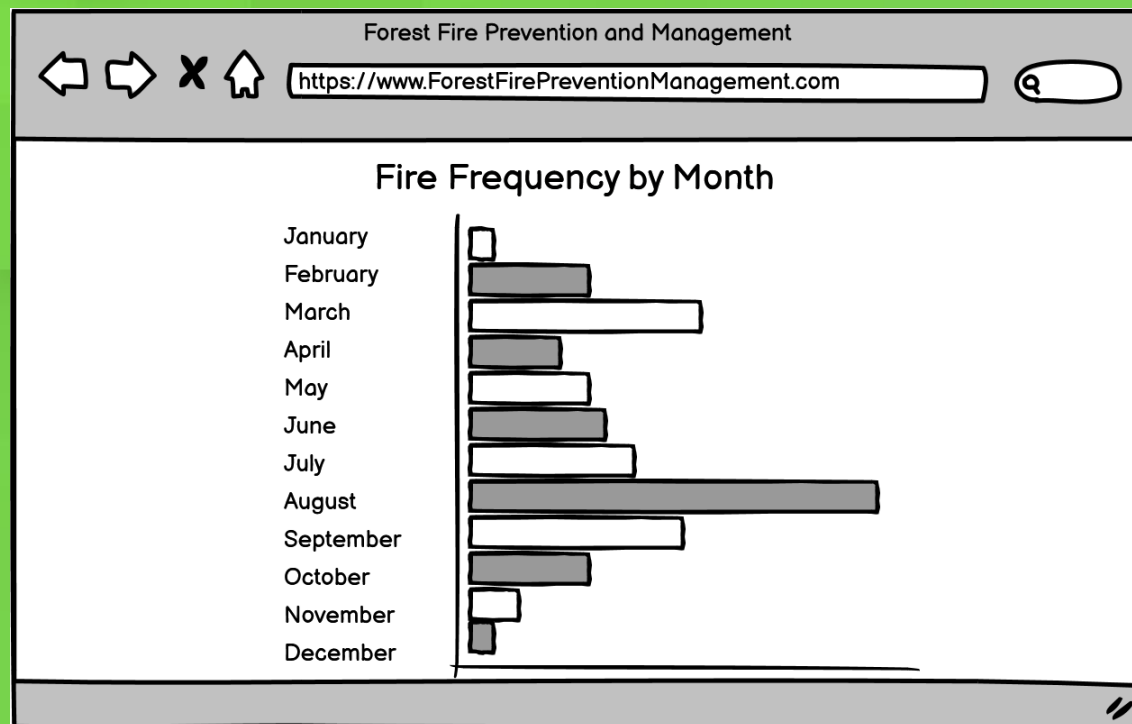
- Coordenadas (X,Y)
- Meses
- Dias da semana
- Índices Canadianos
- Condições Meteorológicas
- Área Queimada



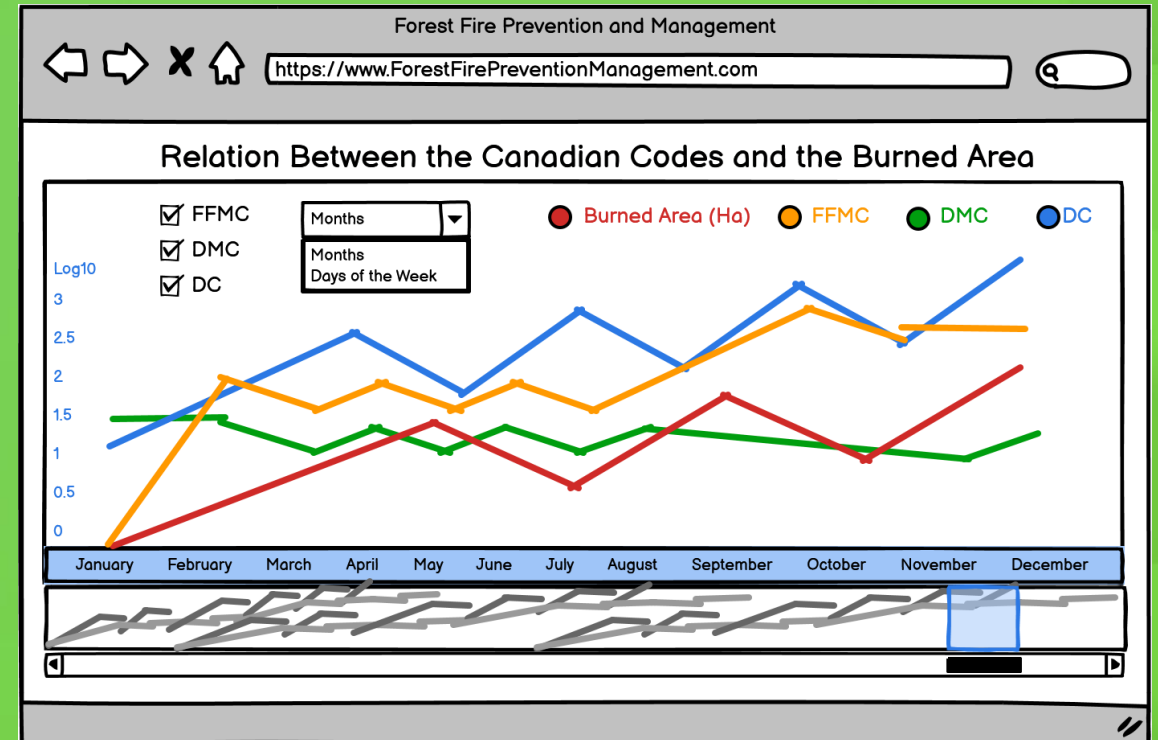
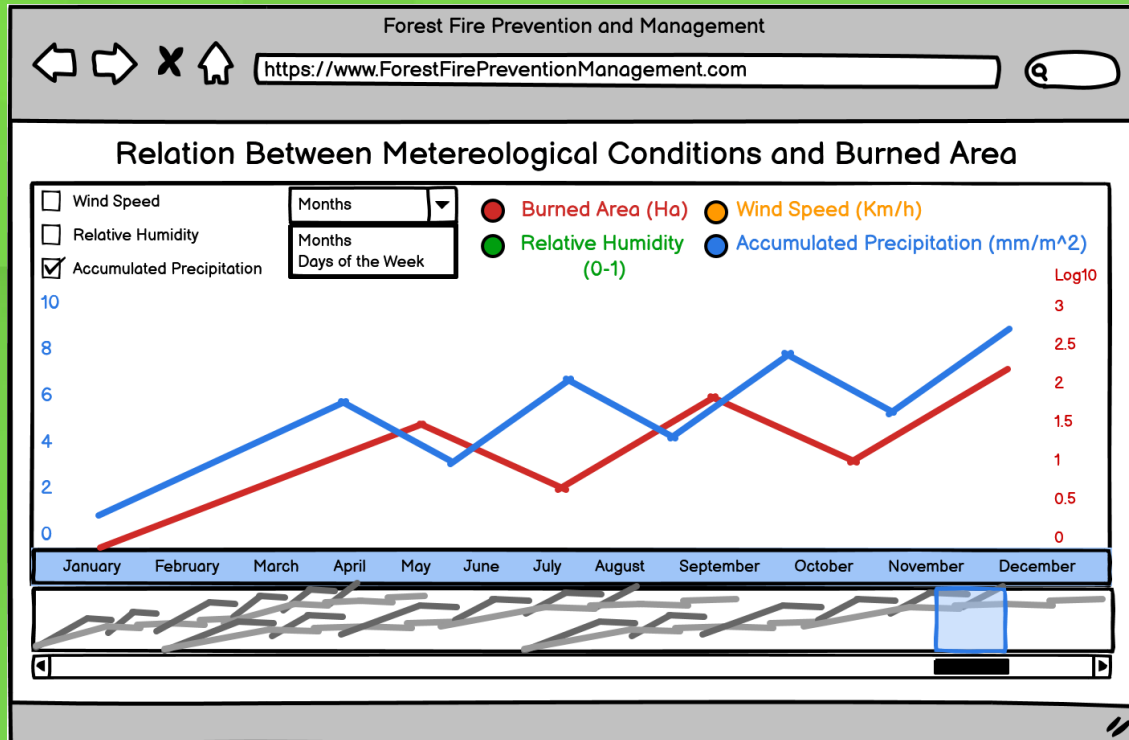
Relação entre o incêndio e a localização (por mês / dia da semana)



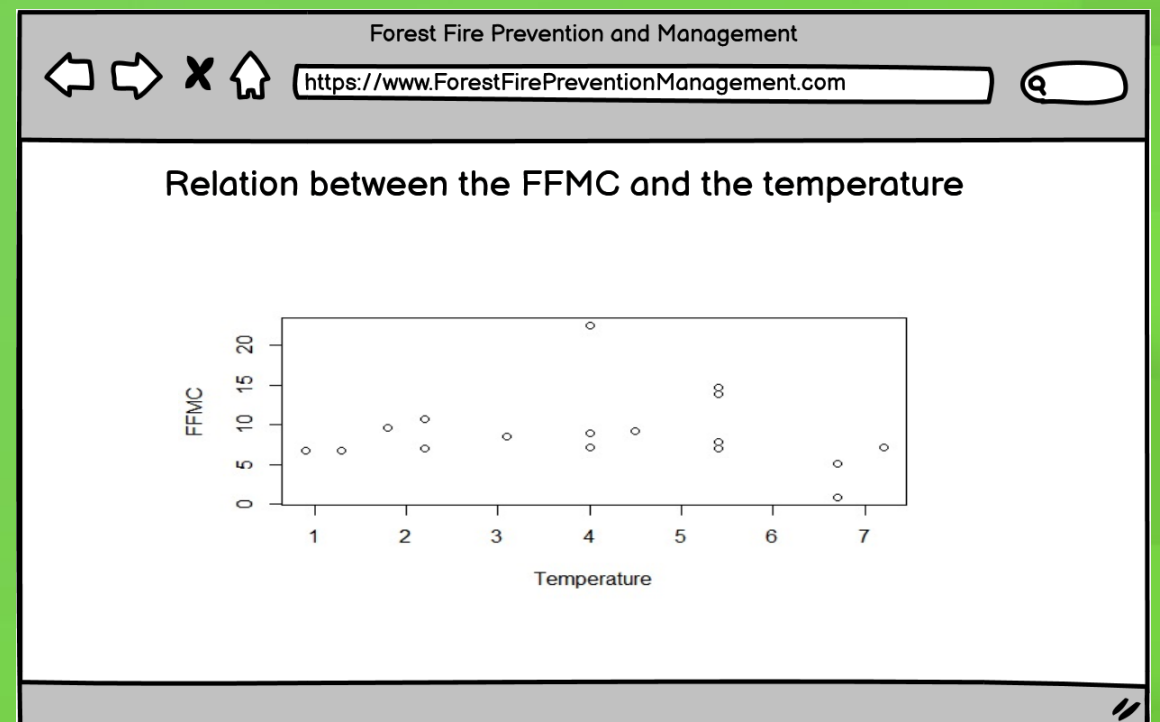
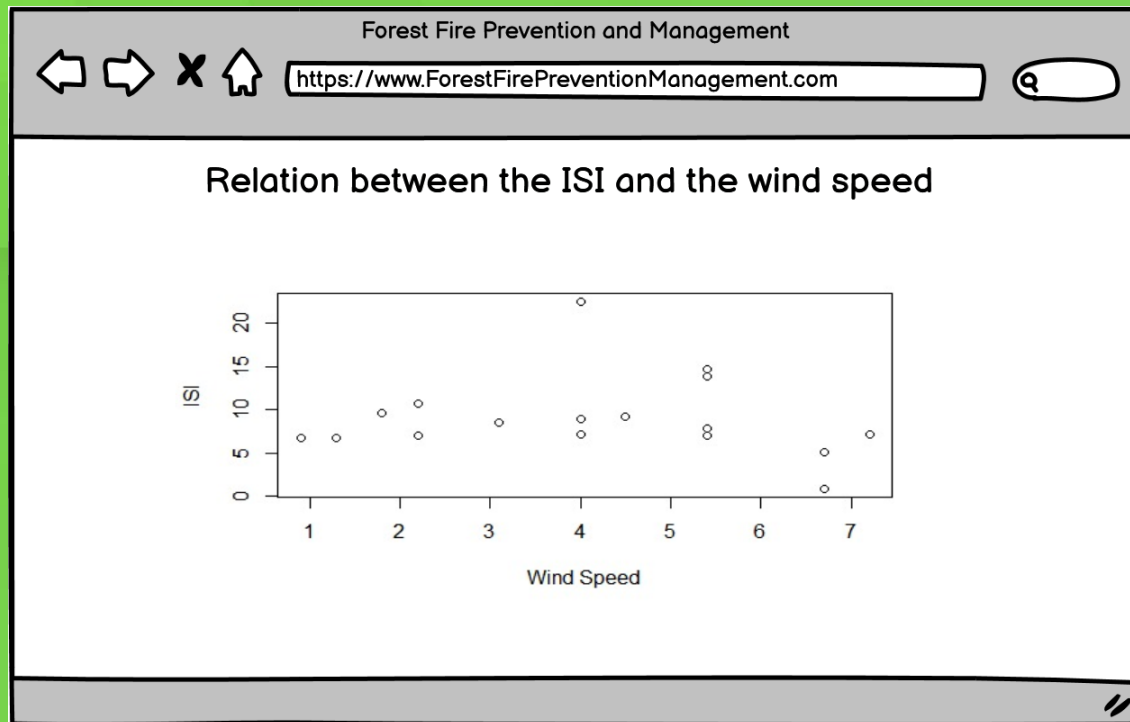
Meses / Dias da semana com a maior frequência de incêndio

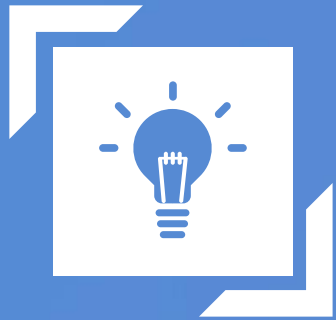


Relação entre área queimada e Condições Meteorológicas/Índices Canadianos por meses/dias da semana



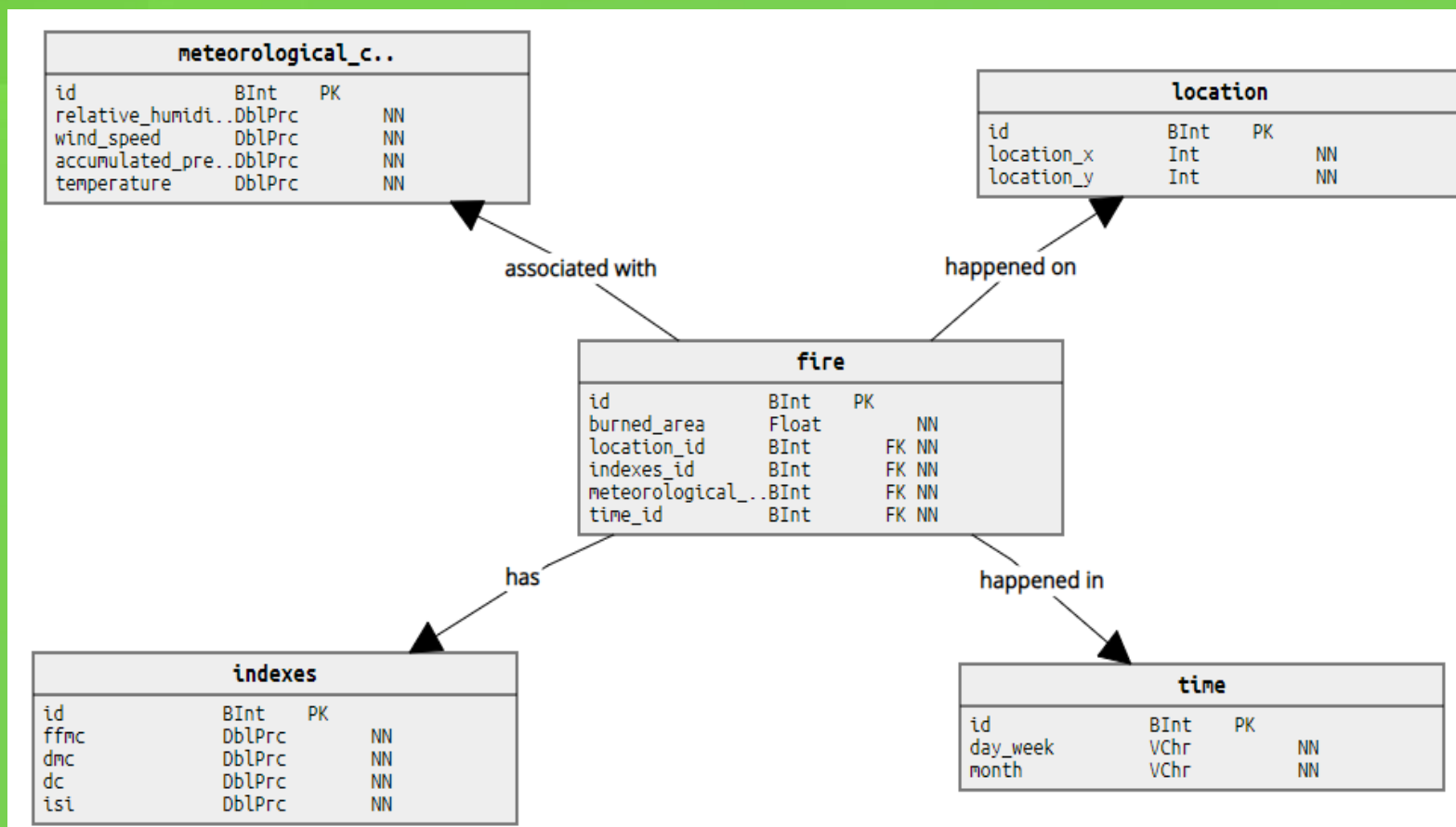
Relação entre área queimada e Condições Meteorológicas/Índices Canadianos por meses/dias da semana





Design Data Warehouse

Diagrama Físico do Esquema de Estrela

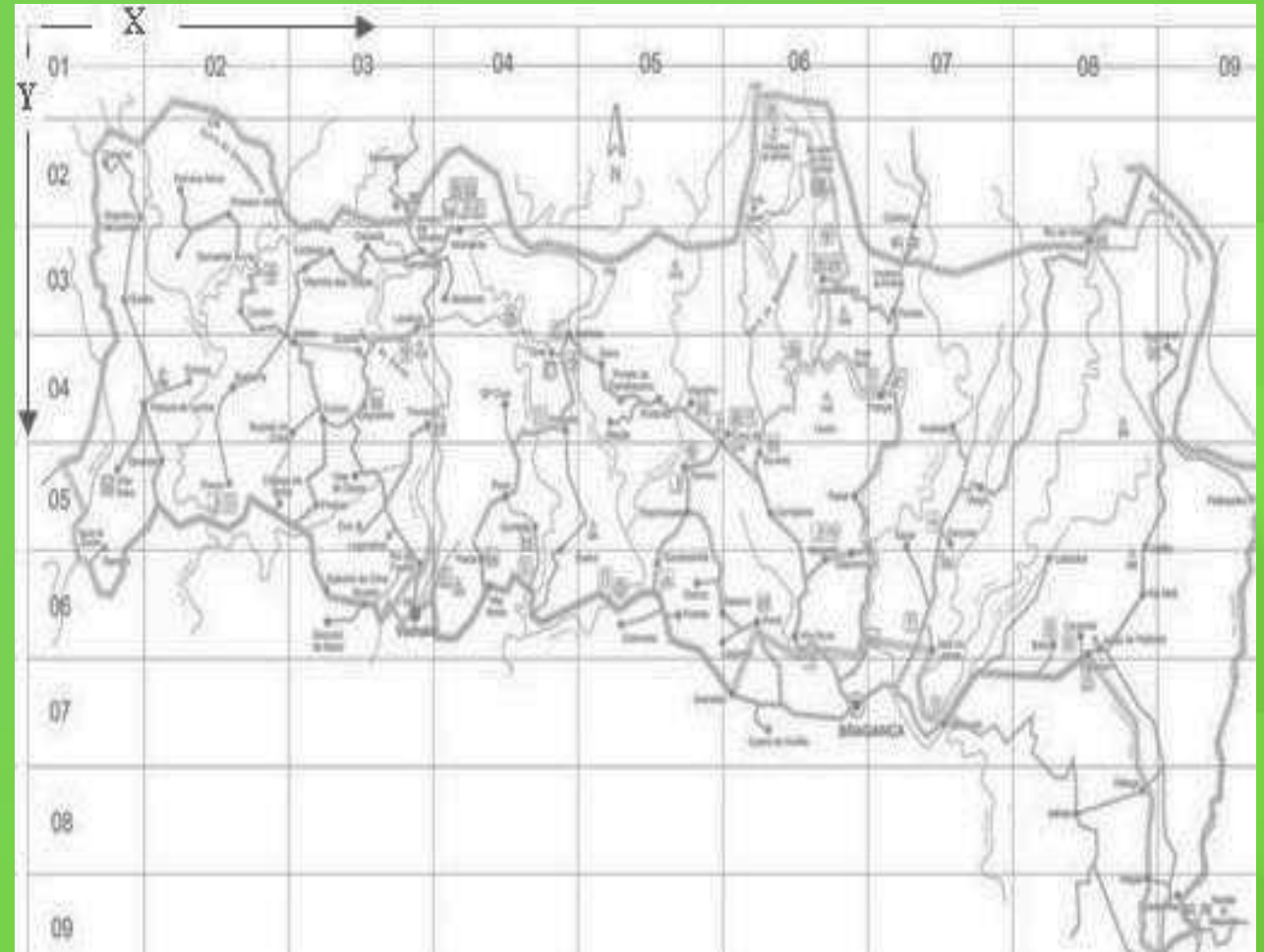


Dimensões e seus atributos

- Meteorological Conditions
- Location
- Time
- Indexes

Dimensões e seus atributos

- Meteorological Conditions
- Location
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Dimensões e seus atributos

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- Location
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- Indexes

Dimensões e seus atributos

- Meteorological Conditions
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- Indexes



Software

Software - Database Server

Software	Type of License	Database Type	Familiarity
PostgreSQL	Free and Open-Source	Relational	Yes
MySQL	General Public License and Proprietary License	Relational	Yes
Oracle	Proprietary	Relational	No
MongoDB	Free Limited Version	NoSQL	So, so

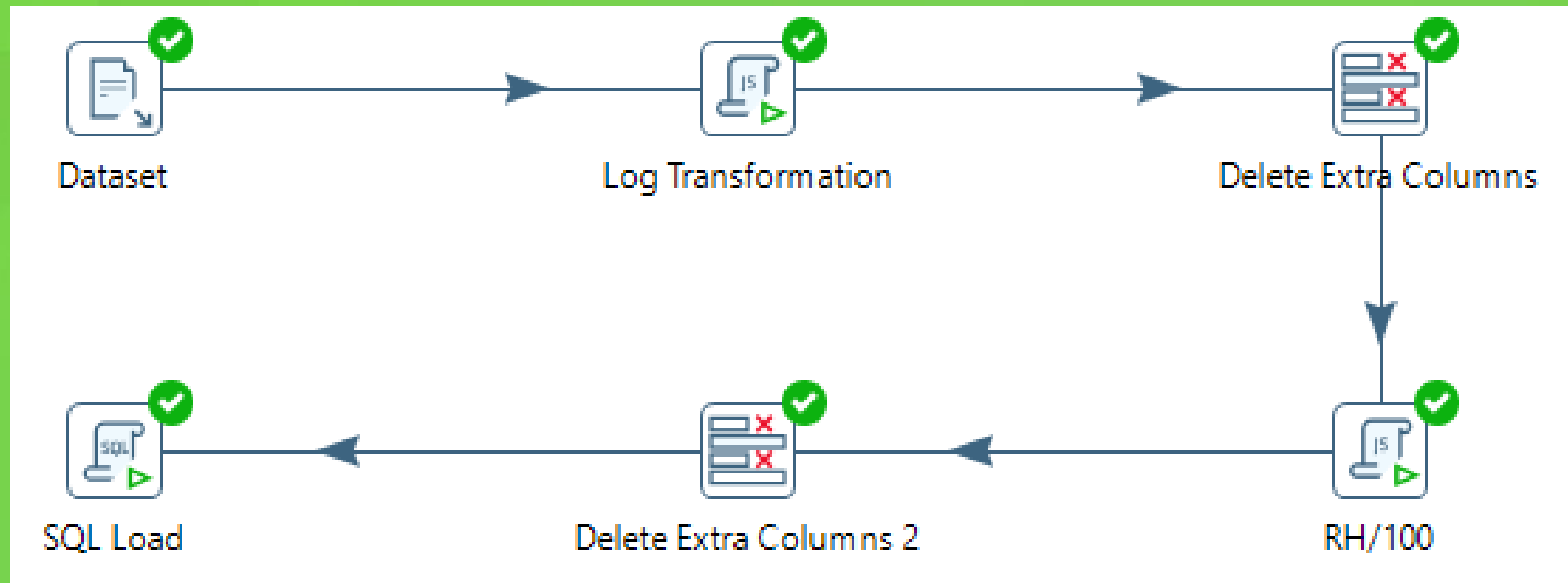
Software - ETL e OLAP

Software	Type of License	ETL	Reporting/ Dashboards	Data Mining	Machine Learning	Familiarity
Pentaho	Community (Open Source)	Yes	Yes	Yes	Yes	Yes
Talend Open Studio	Free (Open Source), Premium	Yes	Yes	Yes	Yes	Yes
Domo	Trial, Premium	Yes	Yes	No	Yes	No
Tableau	Public Version	No	Yes	No	Yes	Yes

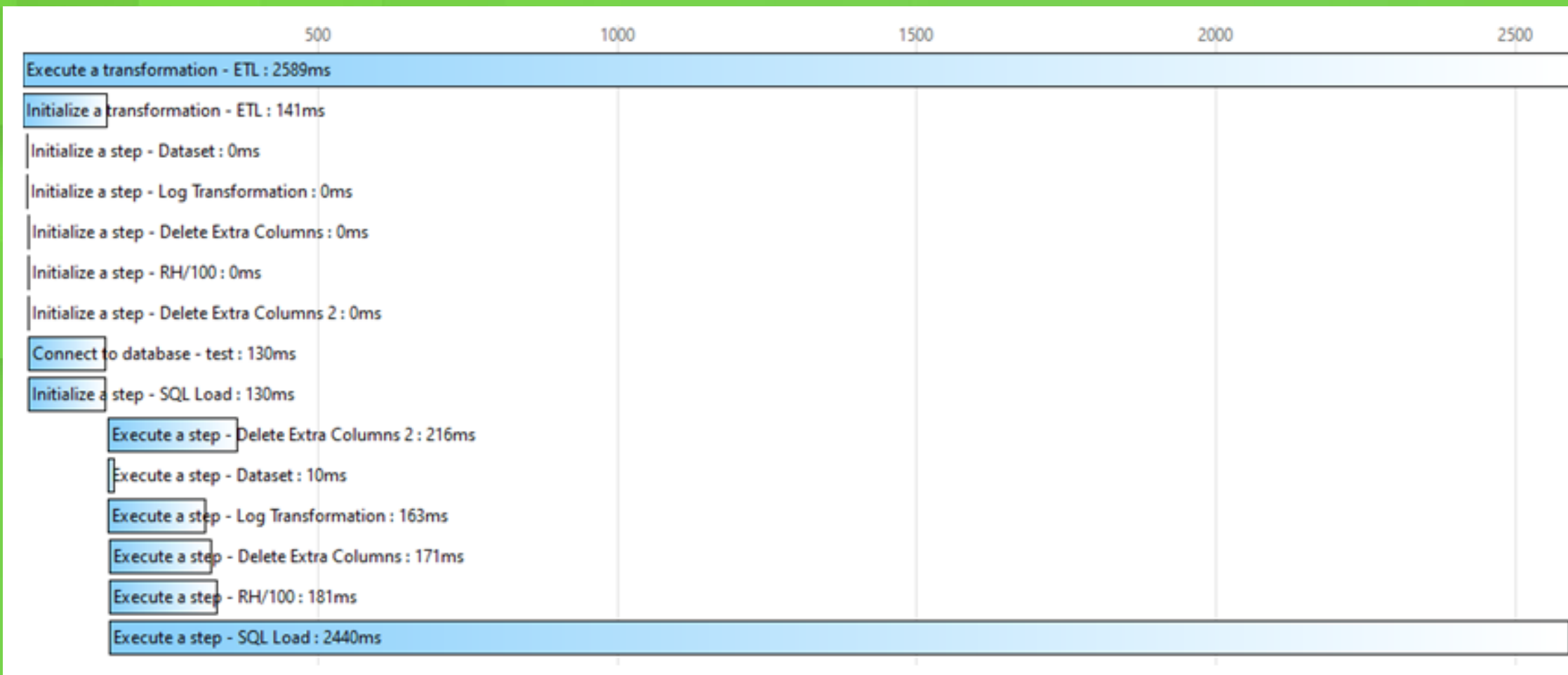


ETL
Extract Transform Load

ETL



ETL - Tempo do Carregamento





ETL

Potenciais Updates Futuros

Kafka

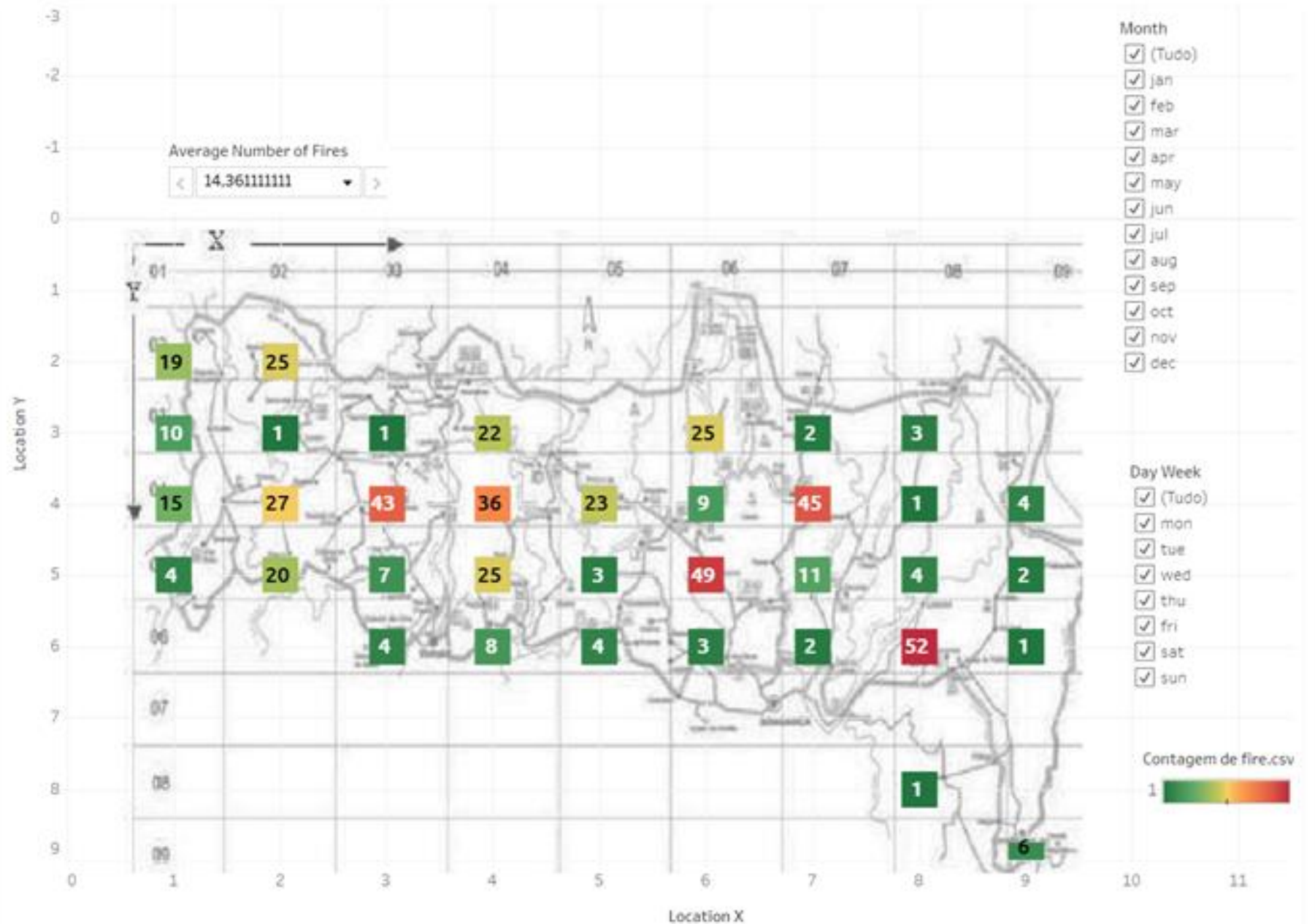
Hora a Hora

Estudo
Semelhante

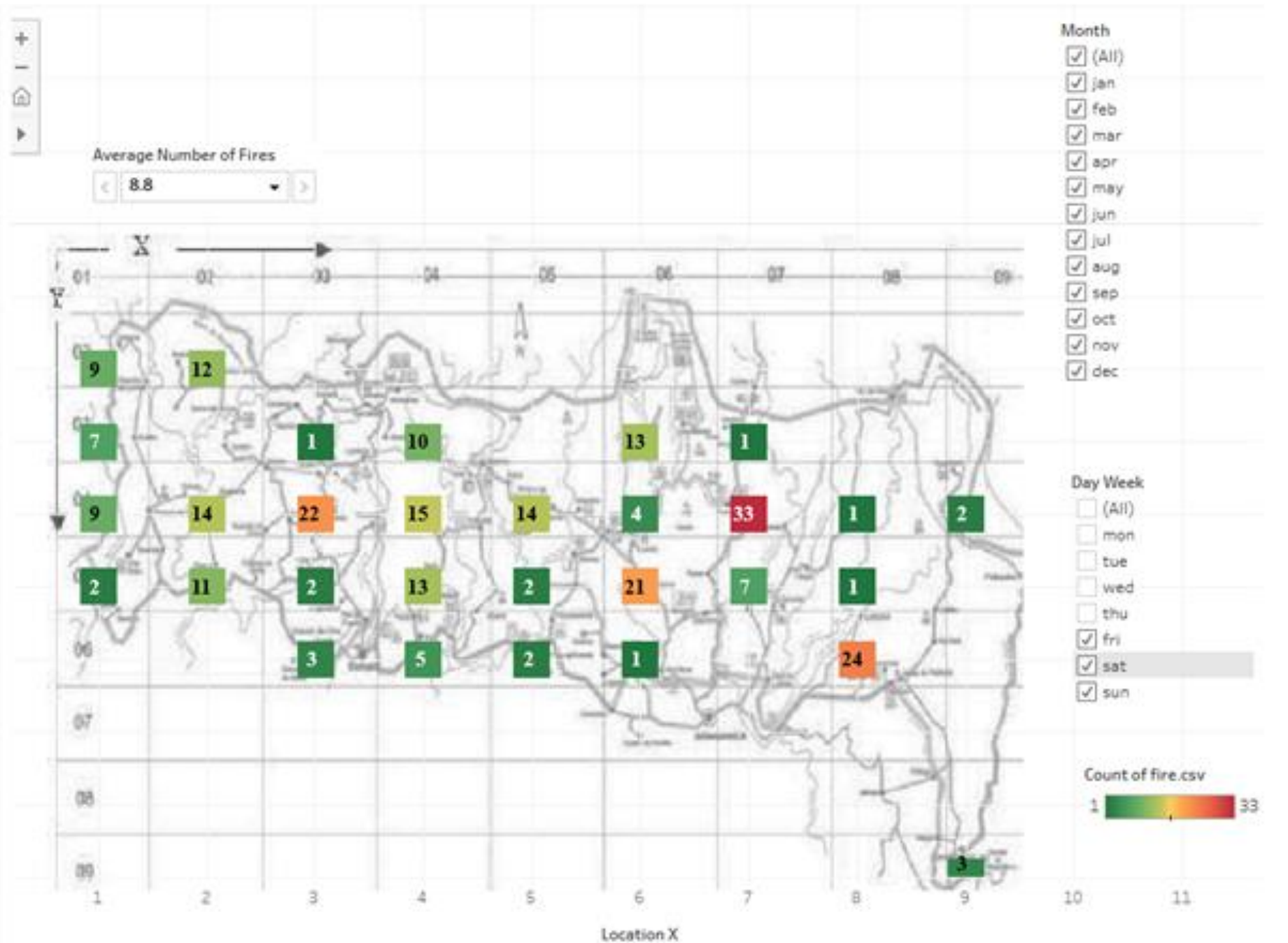


Apresentação dos Dados aos Utilizadores e Análise

Montesinho Map by Number of Fires



The screenshot displays a web-based map application for fire data analysis. The map shows a geographical area with a grid overlay. The horizontal axis is labeled 'Location X' and ranges from 01 to 09. The vertical axis is labeled 'Y' and ranges from 06 to 09. A sidebar on the left contains navigation controls (plus, minus, home, expand) and a filter for 'Average Number of Fires' set to 8.8. A sidebar on the right contains filters for 'Month' (all months selected) and 'Day Week' (all days selected). A legend on the right shows a color scale for 'Count of fire.csv' ranging from 1 (green) to 33 (red). The map displays a grid of locations with numbers indicating the average number of fires. The numbers are color-coded according to the legend: green for 1-10, yellow for 11-15, orange for 16-25, and red for 26-33. The highest value is 33, located at grid position (7, 7). Other high values include 24 at (8, 8) and 22 at (3, 7). The map also shows a network of roads and a north arrow.



Forest Fire Prevention and Management

Montesinho Map by Number of Fires

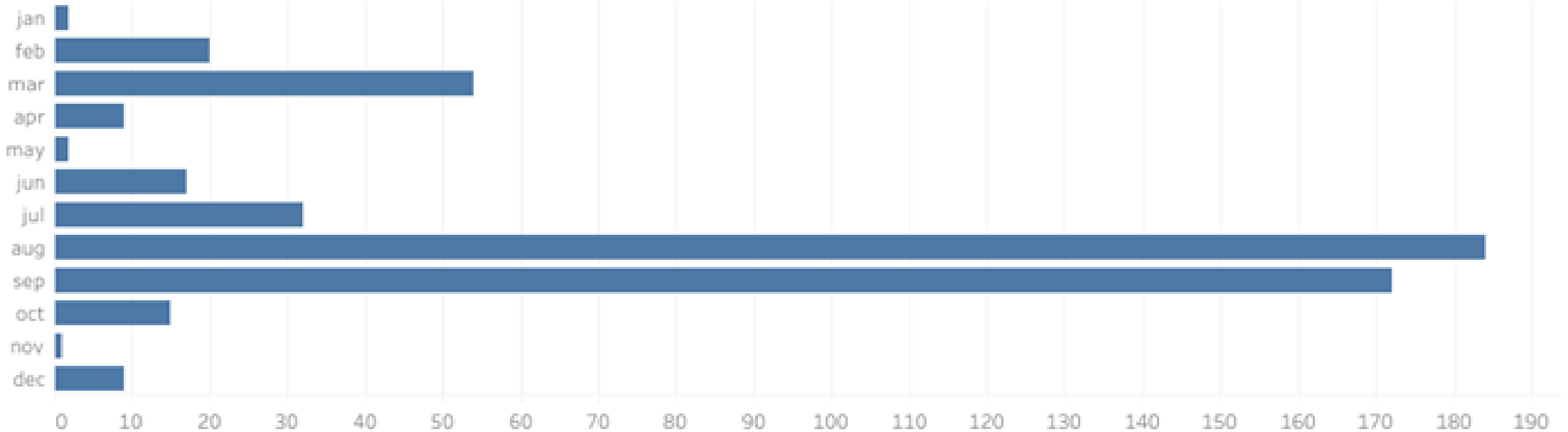
Fire Frequency by Month

Fire Frequency by Day of the Week

Relation Between Meteorological Conditions and Burned Area

Relation Between the C
anadia..

Month



Number of Fires

Forest Fire Prevention and Management

Montesinho Map by
Number of Fires

Fire Frequency by Month

Fire Frequency by Day of the Week

Relation Between Meteorological
Conditions and Burned Area

Relation Between the
Canadian Codes and
Burned Area

Day Week

mon

tue

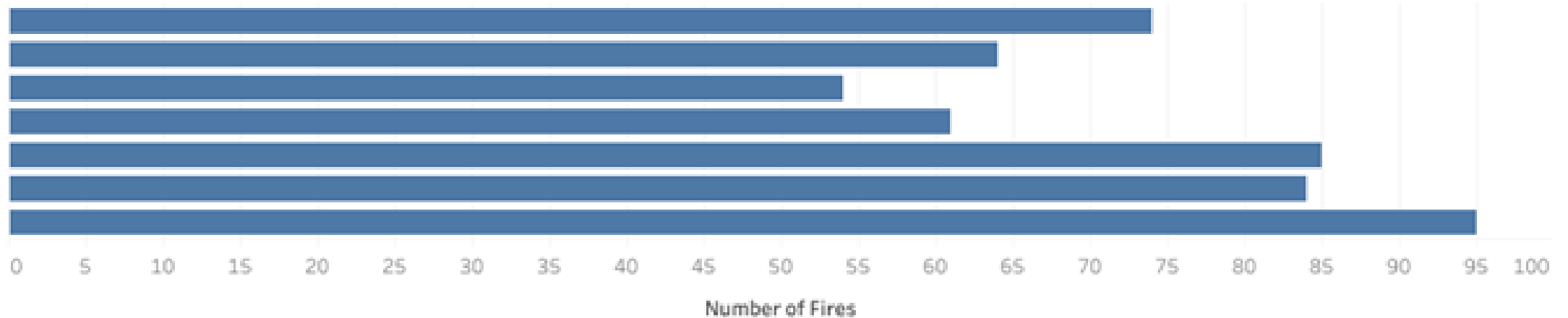
wed

thu

fri

sat

sun



Forest Fire Prevention and Management

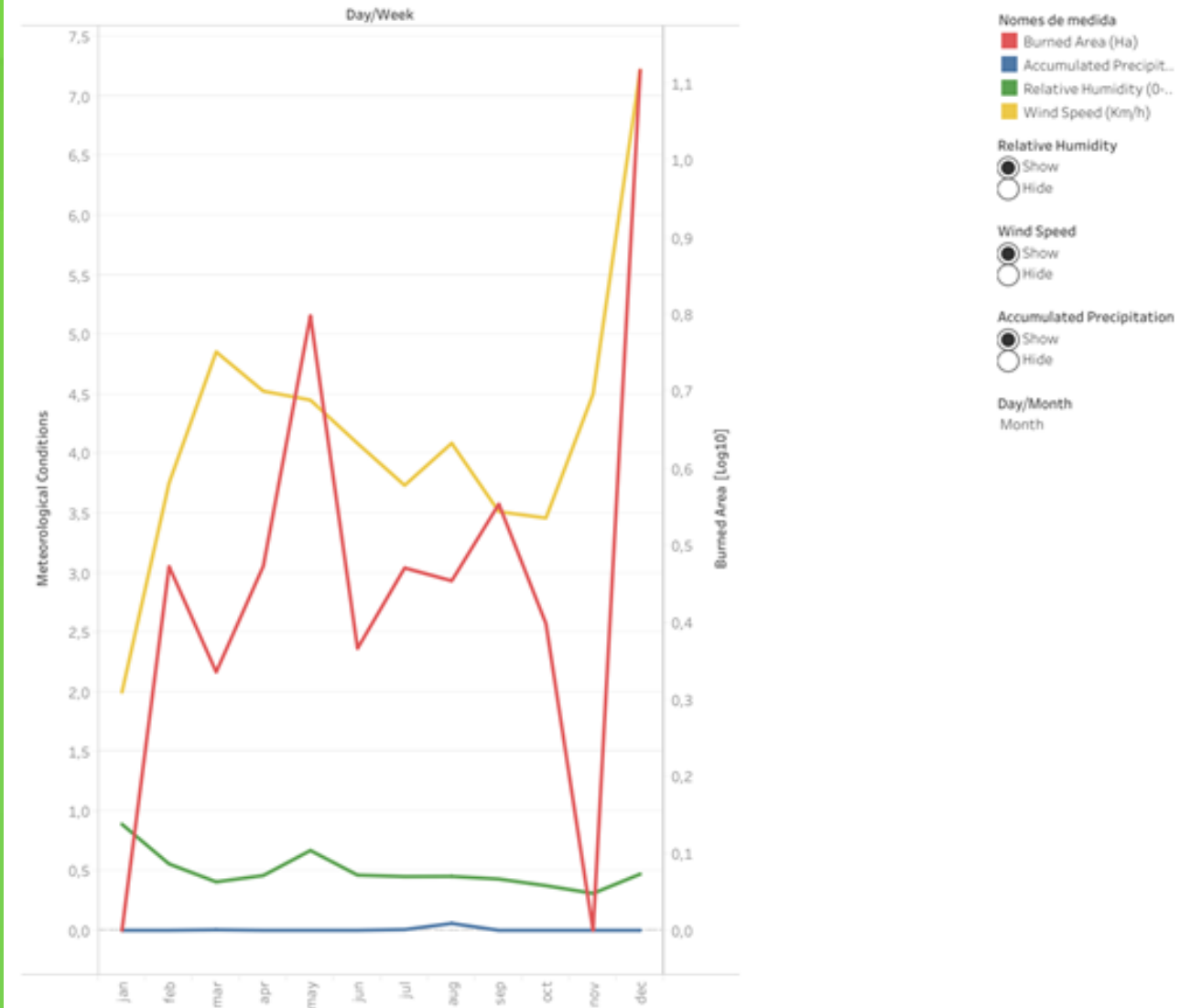
Fire Frequency by Month

Fire Frequency by Day of the Week

Relation Between Meteorological Conditions and Burned Area

Relation Between the Canadian Codes and Burned Area

Relation Between the ISI and the Wind Speed



Forest Fire Prevention and Management

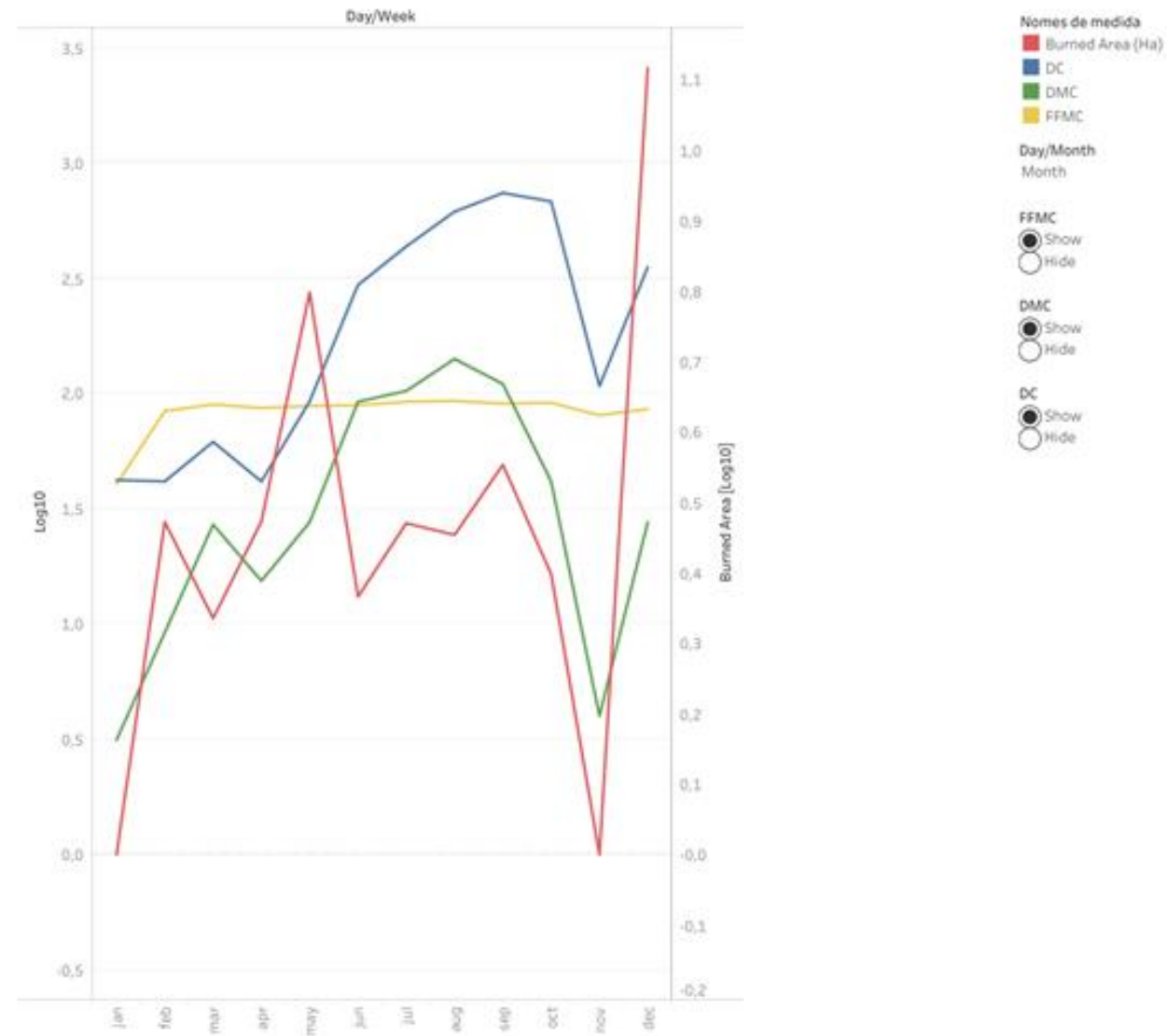
Fire Frequency by Day of the Week

Relation Between Meteorological Conditions and Burned Area

Relation Between the Canadian Codes and Burned Area

Relation Between the ISI and the Wind Speed

Relation Between the FFMCI and the Temperature



Forest Fire Prevention and Management

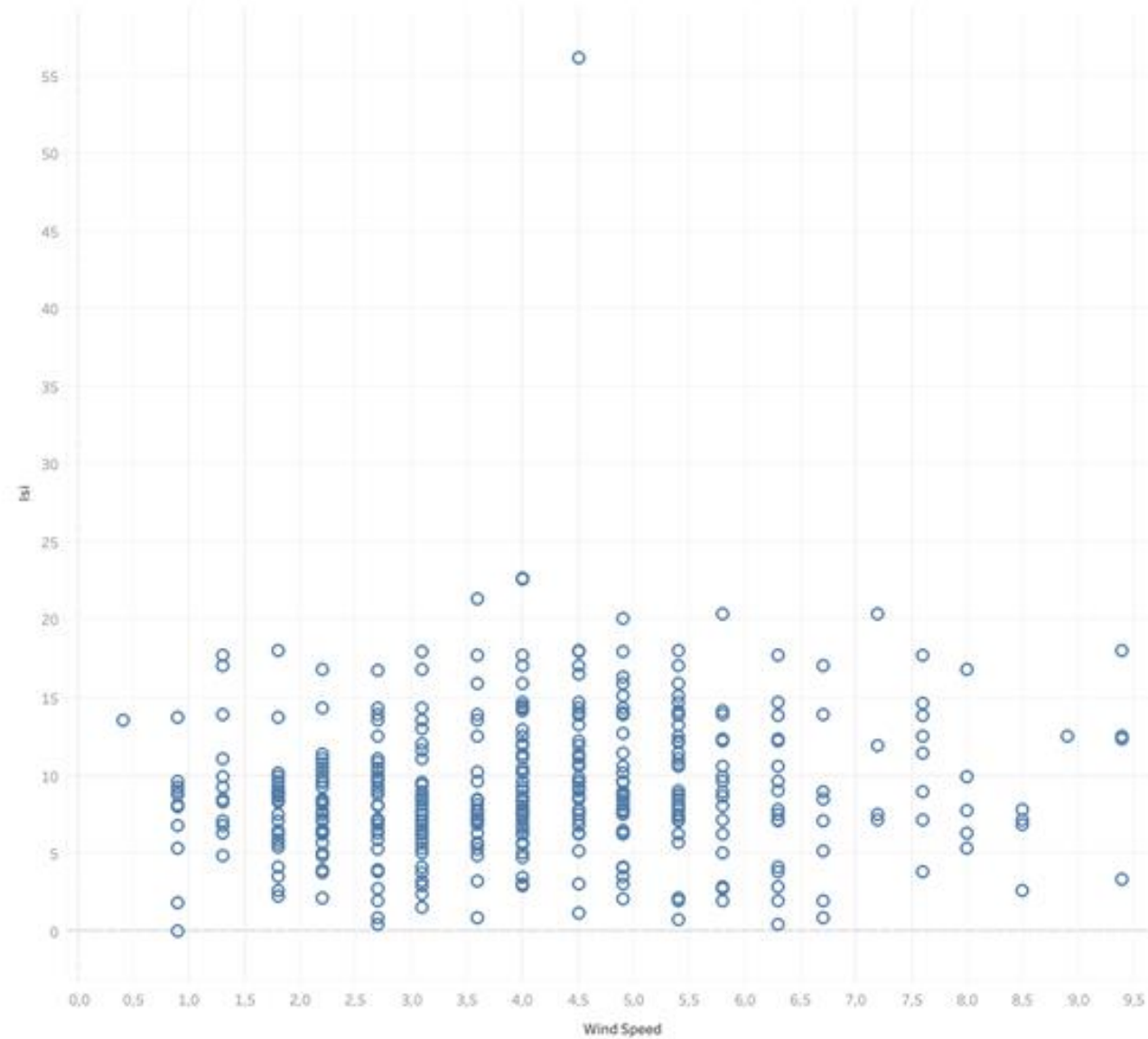
Fire Frequency
by Day of
the...

Relation Between Meteorological
Conditions and Burned Area

Relation Between the Canadian
Codes and Burned Area

Relation Between the ISI and the
Wind Speed

Relation Between the FIMC and the
Temperature



Forest Fire Prevention and Management

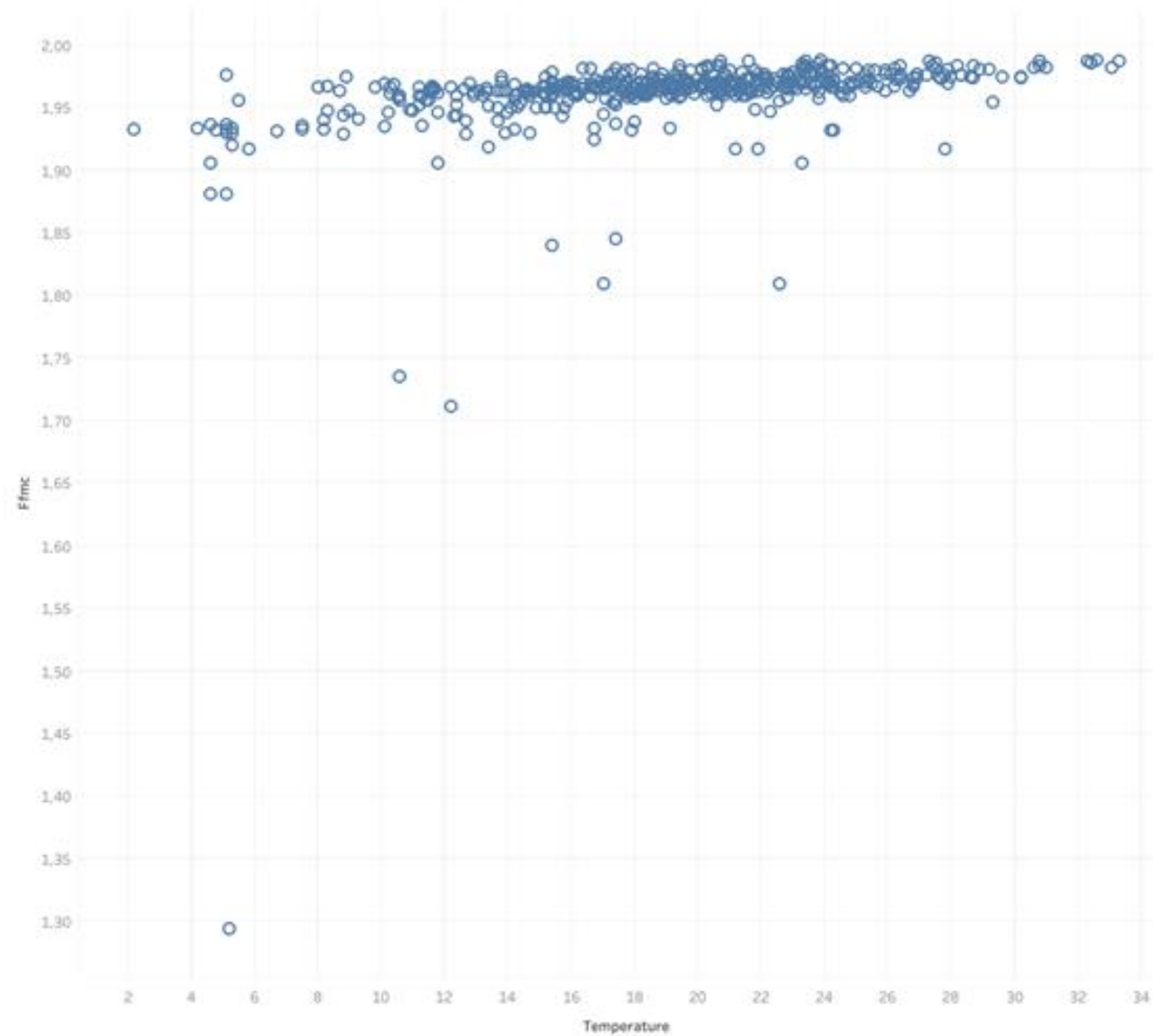
Fire Frequency
by Day of
the...

Relation Between Meteorological
Conditions and Burned Area

Relation Between the Canadian
Codes and Burned Area

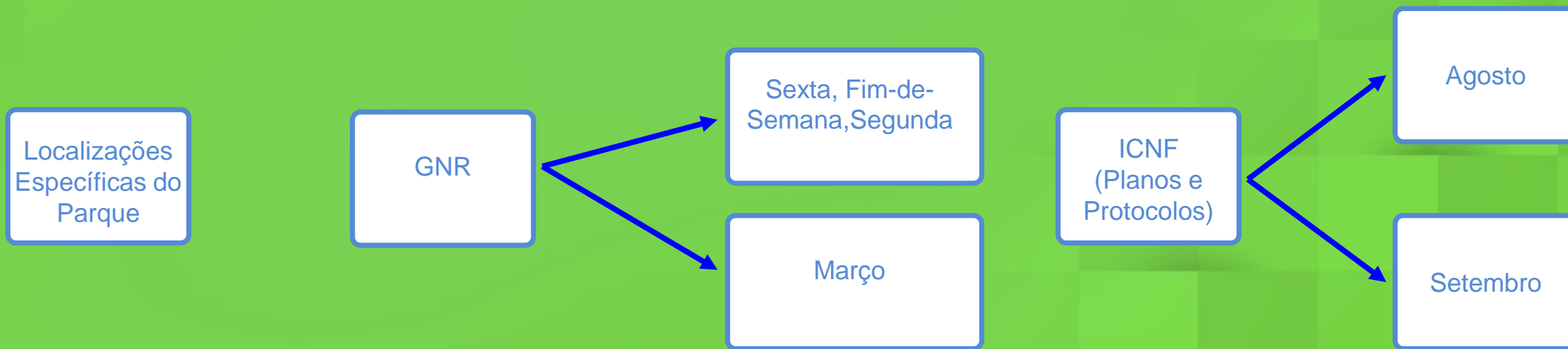
Relation Between the ISI and the
Wind Speed

Relation Between the FFMC and the
Temperature





Perspetiva de Negócio





Fim