Canadian Forest Fires: A Quick Look at the Problem and Data

Forest fires have far-reaching consequences, impacting both human lives and the environment by causing widespread destruction and depleting natural resources. These devastating events have gained global attention due to their significant impact. Having resided in Canada for the past 15 years, I have personally witnessed how forest fires affect various aspects of life, regardless of proximity to the fire zone. While forest fires are not a new phenomenon, their severity appears to have escalated in the past decade. Exploring avenues to minimize the severity and repercussions of these events presents a potential opportunity.

Accurate prediction of forest fire risk holds immense value for residents living within affected areas letting them to proactively assess their vulnerability. Government entities can leverage such data to make informed decisions on resource allocation, risk mitigation strategies, and comprehensive planning, ensuring efficient and effective response efforts. Insurance corporations can utilize predictive insights to analyze the risk landscape in specific regions. Health organizations can anticipate and address potential health concerns arising from the fires themselves or from associated factors like smoke pollution. The transportation sector can strategize by considering possible route closures, devising alternative routes, and planning supply chain adjustments. Despite the collaborative efforts of multiple government entities in combating these immense fires, the scale of the challenge often surpasses the available resources, emphasizing the critical need for proactive measures and advanced predictive capabilities.

Machine learning is currently employed in monitoring vast land areas, analyzing emission data to gather information about potential new fires. A promising opportunity lies in leveraging machine learning to forecast the location and intensity of forest fires, facilitating efficient resource allocation and strategic planning for future events. This approach would enable government entities to proactively initiate early mitigation strategies, particularly in crucial areas identified as high-risk zones.

Historical data from National Resources Canada and Government of Canada for wildfires and weather are publicly available. The wildfire data is classified by location, date, cause, and severity. There is a separate file that maps out the affected area for each wildfire. The dataset contains 400k instances spanning 1930 to 2021. The climate data provides information based on location for temperature and precipitation broken down into different classifications. Merging both datasets should provide enough features to do a thorough analysis. There are also 400,000 instances in the wildfire data. Below are the links to both datasets.

https://cwfis.cfs.nrcan.gc.ca/datamart/download/nfdbpnt

https://climate.weather.gc.ca/historical_data/search_historic_data_e.html

As an alternative, there is also an opportunity to look at global renewable energy output across the world. Renewable energy is becoming increasingly critical as we face climate change. Focusing on energy production that produces a smaller carbon footprint has a massive impact on our future. We can look at possible trends into renewable energy production across different countries compared to their total energy generation and usage. Possible sources for renewable energy can be found at: https://pxweb.irena.org/pxweb/en/IRENASTAT?_gl=1*n5ishk*_ga*OTUwMDc1NjU2LjE2ODg1OTY5OTU.*_ga_7W6ZEF19K4*MTY4ODY1NjcwNS4yLjEuMTY4ODY1NjcyNy4zOC4wLjA.

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