

PART 2 - PROJECT EXTENSION PLAN

Aditi Kharkwal

Motivation/Problem Statement:

Project 1 - led us to do a thorough analysis of Wildfires through the years around the city of Caldwell, Idaho. The analysis conducted on Caldwell's wildfires holds paramount importance due to its potential impact on both the scientific and practical aspects of the community around it. The motivation behind this analysis stems from the pressing need to understand and mitigate the escalating threat posed by wildfires in and around the city of Caldwell.

From a scientific perspective, this analysis aims to unravel the complexities of wildfires, exploring the underlying factors that contribute to their occurrence, spread, and intensity in the specific geographical context of Caldwell in Canyon County. By delving into the patterns and trends of these wildfires, scientists and researchers can gain valuable insights into the local ecosystem, climate conditions, and human activities that may act as catalysts for such incidents. On a practical level, the analysis serves a crucial role in informing and guiding wildfire management strategies. By comprehensively understanding the spatial and temporal dynamics of wildfires in Caldwell, authorities can develop more effective and targeted prevention and response measures. This, in turn, has the potential to safeguard lives, protect property, and preserve the ecological balance of the region.

Through this analysis, we aim to uncover significant insights spanning several domains. These include identifying trends and correlations between wildfire smoke exposure and economic outcomes over the 60-year period, understanding how local climate patterns influenced by wildfires have changed, assessing the effectiveness of past air quality management interventions, contributing to the development of strategies that enhance community resilience, informing policies to mitigate the impact of wildfires on air quality and public health, and evaluating the impact of public awareness campaigns and education initiatives on community understanding and response to wildfire risks.

This analysis holds paramount importance for the community of Caldwell, Idaho, as it directly addresses critical aspects of public well-being, environmental resilience, and community planning. By understanding the health impacts of wildfire smoke, the community can implement measures to protect vulnerable populations. Insights into changing climate patterns contribute to community resilience by informing adaptive strategies especially in making decisions regarding economic policies. Data-driven policy decisions enhance the community's ability to cope with and mitigate the impact of wildfires, safeguarding public health. Furthermore, the analysis empowers the community through increased awareness and understanding of the challenges posed by wildfire smoke, fostering a sense of shared responsibility in wildfire prevention and response efforts.

Impact Focus:

As part of this new extension plan, I plan to specifically explore the economic impacts of the wildfires, from around the city, in the city of Cladwell. I will be relating this to the smoke estimates in the city. This can be used to identify if the increasing AQI and the smoke estimates from the first project have any economic impacts, specifically the following:

- 1) Impact on employment - Wildfires can disrupt local businesses and infrastructure, potentially leading to job losses and changes in employment dynamics.
- 2) Employment by industries - Certain industries, such as agriculture, forestry, and tourism, may be more directly affected by wildfires, influencing the overall employment landscape.
- 3) Employment by industry sector - Examining employment changes within specific sectors, such as manufacturing or service industries, provides insights into how different parts of the economy respond to wildfires.
- 4) Domestic Trade and Growth - Wildfires can affect domestic trade patterns by disrupting supply chains and influencing consumer behaviour, impacting the overall economic growth of the region.
- 5) Interstate Trade - The economic repercussions extend beyond local borders, with wildfires potentially influencing interstate trade relationships, affecting commerce and economic ties with neighbouring regions.

This analysis of the impact of smoke estimates and wildfires on employment and economic sectors in the city of Caldwell is driven by the profound significance of understanding the economic fallout of these events. The interconnectedness between wildfires and employment is a primary concern, as disruptions can jeopardise livelihoods and economic stability across various industries.

By dissecting employment by industry and sector, this analysis aims to provide actionable insights for policymakers and businesses to craft targeted strategies for economic recovery. Additionally, assessing the repercussions on domestic and interstate trade offers a comprehensive view, enabling the community to identify vulnerabilities and implement measures to fortify economic resilience.

Data or model to be used:

To conduct the extension analysis I looked up meticulously for a dataset which will resonate perfectly with my needs. The city of Cladwell has a very interesting website available online which is free for public access and has data and visualizations for all the various sectors in the city. The sectors are primarily human centered and aim to provide an analysis of these human centered aspects of the city for up to 50 years back.

For this particular analysis however I plan to only utilize the economic data present for the city Cladwell. I have mentioned the various subfields within this that I will be using and here I will provide the data links.

Data Links:

- 1) <https://datausa.io/profile/geo/caldwell-id#economy>

The .csv files of datasets can be directly downloaded from the website and individual visualizations. I plan to utilize some of the visualization provided on the website for analysis purposes.

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The License of the website says:

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Unknowns and dependencies:

Several factors outside of my control may impact the ability to address supplementary research questions within the given time frame:

Data Availability and Quality: The availability and quality of relevant datasets, especially those related to economic impacts, employment, and wildfire details, may vary. Delays or limitations in accessing comprehensive and accurate data could impede the timely completion of the analysis.

External Events and Policies: Unforeseen external events, such as changes in government policies, economic fluctuations, or new wildfire prevention measures, can influence the accuracy and relevance of the analysis. Adapting to real-time changes may require adjustments to the research approach.

Technical Limitations: Depending on the complexity of the analysis and the computational resources available, technical limitations such as processing power, model training time, or software constraints could affect the speed of completing the research.

Model Training and Validation: If leveraging machine learning models, the time required for model training and validation can vary based on the dataset size and complexity. Ensuring the model's accuracy and reliability may demand additional time.

Collaboration and Stakeholder Involvement: Collaborating with relevant stakeholders, such as local authorities or economic experts, is essential for obtaining insights and validating findings. Scheduling constraints or unavailability of key stakeholders could impact the pace of the research.

Regulatory and Ethical Considerations: Adhering to ethical guidelines and navigating regulatory processes, especially when dealing with sensitive economic and environmental data, may introduce delays in data acquisition, analysis, or publication.

Unforeseen Events: External factors such as natural disasters, global events, or public health emergencies can disrupt normal research operations and impact the ability to allocate resources to the supplementary questions.

Timeline to completion:

Milestones and significant tasks:

Data Collection: The data is available in a .csv format directly on the provided link for each economic domain next to the visualizations provided.

Timeline - Since the data is clean and available in a perfect format, this step would not require any time.

Model Selection: Decide on the appropriate statistical model to correlate smoke estimates with other predictor variables from the economic topics I have selected. Develop and implement the chosen model on the compiled dataset to establish relationships between smoke estimates and health indicators.

Timeline - November 21st - November 23rd

Forecasting and Visualization: Test the model to assess its accuracy and generate graphical representations illustrating trends in cancer cases, mortality rates, and tuberculosis cases over time. Compare these trends with smoke estimates. Utilize the entire dataset (population + smoke estimates) for forecasting future trends, such as predicting the effect of smoke on economics and trade factors.

Timeline - November 24th - November 25th (this will include the result analysis part too)

Generate Insights: Conduct a semantic check to ensure the logical coherence of the analysis. Present the findings in a format that is easily comprehensible for local government authorities, providing clear reasoning and actionable insights that can be readily utilized as a reference for decision-making in the future.

Timeline - November 26th - November 30th

Project Presentation (PechaKucha) - November 30th

Project Report Presentation - till December 8th