

Ernst & Young

Predicting the impact and severity of Wildfires in Alberta using AI

# Background

In the heart of Alberta, the menace of wildfires poses a significant challenge. These fires, with their unpredictable impact and severity, not only threaten the natural landscapes but also the communities, wildlife, and the economy. In response to this pressing issue, the Alberta Fire Department has decided to employ the brightest minds in AI and machine learning (that’s you!). Your primary objective is to develop innovative strategies for predicting the size class of wildfires across different regions of Alberta, based on data regarding their initial conditions.

# Objectives

To help the province of Alberta to understand better about the risk profile so as to take the effective strategy and decision to mitigate the wildfire risk and help to save life, property and protect indigenous areas you are assigned the Data Scientist role to help with the below questions using statistical analysis together with AI/ML.

1. Which top FSA regions are more vulnerable with Wildfires?
2. What are the main reasons that usually cause the wildfires near each vulnerable FSA region? And especially analyze the main reasons for the wildfires with large burn areas and much bigger impact on environment and residents close by?
3. Assess the vulnerability of the population in each of the vulnerable FSA region and identify the wildfires' impact on indigenous population. (For the demographic information, you can go to Statistics Canada for more information).
4. Create the AI/ML models to predict the severity and the final size burned of the wildfires?

**Tips for success:** We encourage conducting additional research to find the third-party data that you think is useful to resolve the problems. In the final submission, you need to clearly explain the thought process of the methodologies being used in a logical way, and combine the data visualization tools with AI/ML models to extract the key insights and interpret the results in business plain language.

# Submission

The EY challenge will consist of **two rounds.** The first includes a submission of your analysis with a report by the submission deadline. 8 Finalists from the first round will be selected for the in-person second round after the submission deadline, where you will get a chance to pitch directly to representatives from the **EY AI & Data team** and get a unique chance of networking with them directly.

## **First Round** - Project Report

The project report should describe the business use case in an easy-to-understand manner appropriate for the business audience. It should aim to motivate your potential clients to invest in your project to facilitate their business development.

Please follow these guidelines when writing the report:

* Maximum 10-pages (excluding references), minimum font size 11. (Not following this formatting standard will receive score deduction)
* Your report should include these sections:
  + **Abstract (10 marks):** Briefly summarize the paper, highlighting the value of the topic, methodology, key findings in a paragraph.
  + **Introduction (15 marks):** Introduce the background, previous research and applications of this topic, its value proposition (i.e., project objective as to why this use case is relevant or important to some specific sectors), and the structure of the rest of the paper to tackle the use case.
    - You should also clearly mention and interpret the assumptions and hypothesis if there is any.
  + **Methodology (30 marks):** This section describes how you are planning to tackle this use case in detail.
    - Break this section into logical sub-sections that present your methodologies in a clear and concise manner. (e.g., how the data is integrated, criteria to define the most vulnerable FSA, criteria to derive the vulnerable population profile, models used for prediction, etc.)
    - Flow charts, figures and tables can be added to help with interpretation.
    - You do not need to show all the mathematical details or proofs, but to convey the key concepts of the data science methodologies being used in plain language.
    - Do not include code samples in the report but attach them in the final submission package.
  + **Experiments & Results (30 marks):** This section demonstrates the experimentation design & results to showcase the capabilities (and limitations) of this use case through exploring the provided datasets, and the methodologies being considered.
    - Describe the experiments and relate them to the objective of this use case.
    - Highlight the key findings to extract the business insights through the experimentation results with benchmarking/comparison (e.g., selected features, hyper-parameter tunings, different machine learning models, etc.)
  + **Conclusion (10 marks):** Provide a summary of the report and restate the relevance of the project. Demonstrate the areas of future enhancement.
  + **References (5 marks):** List all the references that you used and other sources that the reader may follow (if applicable).

### How to submit?

* Compile all files included of your project (including project report and code samples) into a **ZIP file** and include it as part of your submission on [our Devpost platform](https://cxc-powered-by-ey.devpost.com/).
  + If the ZIP file exceeds Devpost size limit (>35 MB), upload it to a Google Drive or Github repository and include a link in your submission.
* One submission per team is needed, but include all team member info in the submission.

(Optional) If you’d like to be eligible for the $500 Interac Most Innovative Solution Award, check out the details in our [participant guide](https://docs.google.com/document/d/1TrUlcToyEzFcHDB8dyXYGxyXRe3BdE_VBlhf-V5zfps/edit#heading=h.gfvxp7dgpqm2)!

## **Second Round** - In Person Presentation

The in-person presentation will be graded by the EY team, which gives you the chance to better convery and tell the story of your insights to an audience with a non-technical background.

The presentation will be maximum 30 mins long for each team including 3-5 mins for questions. Here are some additional guidelines:

* All members of your group should have dedicated speaking time
* The section/title of the slides are not necessary to be the same as your project report. You have the flexibility to restructure your presentation to flow better with the storylines
* If your team has the live demo to show, you can also include it as one of the sections in the presentation

The presentation will be graded based on the average scores from the EY judging panel for a total of 100 marks. Each judger will grade the presentation based on the below criteria:

* Presentation organization (e.g., all team members have reasonable speaking time, smooth transition, etc.) **(10 marks)**
* Logicality, Reasonability, and Clarity of the storyline **(25 marks)**
* Innovative ideas, methodologies & state-of-the-art technologies being used **(25 marks)**
* Clearly demonstrate the value of the use case, interpret the technical details and key insights in business plain language to ensure audience with non-technical background can digest **(25 marks)**
* Presenter engagement, confidence, fluency **(15 marks)**

## **Prizes**

* 1st Place Team: $1000
* 2nd Place Team: $500
* 3rd Place Team: $200