

# Unveiling Minot's Wildfire Smoke Impact: Data & Ethical Insights

Empowering Policy Through Analytical & Ethical Perspectives

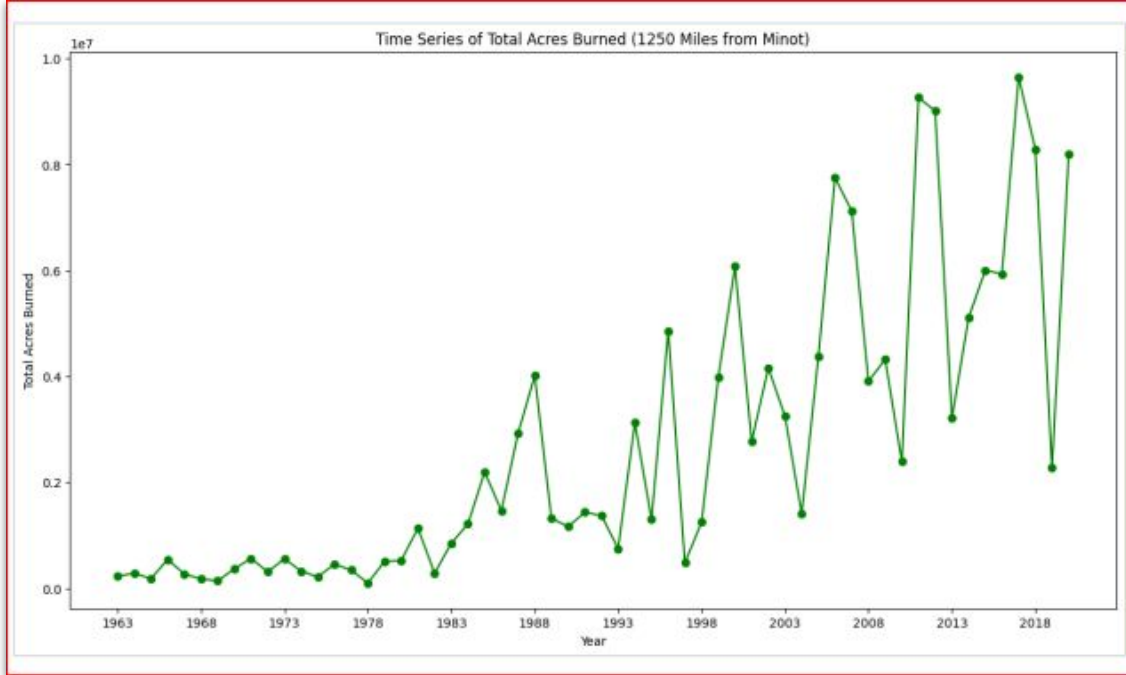
*AKSHIT MIGLANI*

# LOCATION CONSIDERATION



The location assigned is Minot, North Dakota. The state's landscape, with its mix of grasslands, forests, and agriculture, is susceptible to fires, especially during dry and hot periods. As highlighted in black, it's close to the border of US-CANADA and the 1250 miles radius covers a major portion of Canada

# TOTAL ACRES BURNED



The smoke from these fires can have far-reaching effects, causing respiratory problems, reducing visibility on roads, and affecting overall air quality. In recent years, with the increase in wildfires globally (almost grew  $10^3$ X) due to climate change, there's been heightened awareness of the impact of wildfire smoke in North Dakota.

# IMPACT

## Health Impact

Wildfire smoke contains particulate matter and other pollutants that can lead to respiratory issues. Increased instances of asthma, bronchitis, and other respiratory problems can occur during periods of intense wildfire activity.

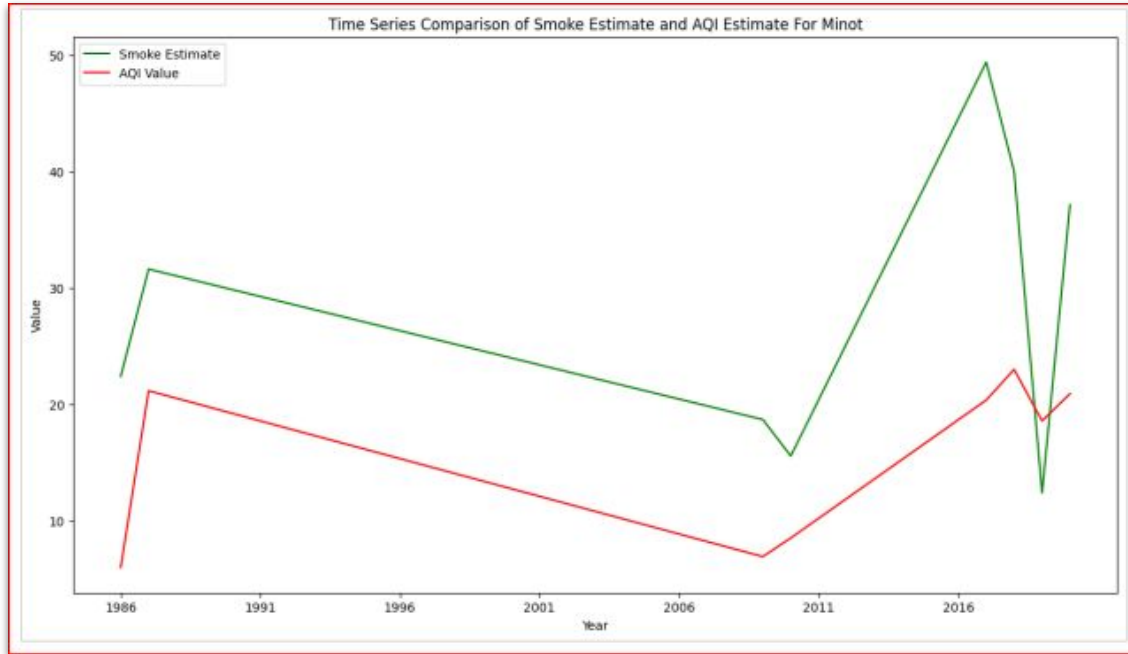
## Economic Impact

Wildfires have economic consequences, including firefighting costs, damage to property and infrastructure, healthcare expenses due to smoke-related illnesses, and impacts on agriculture and tourism industries.

## AQI Impact

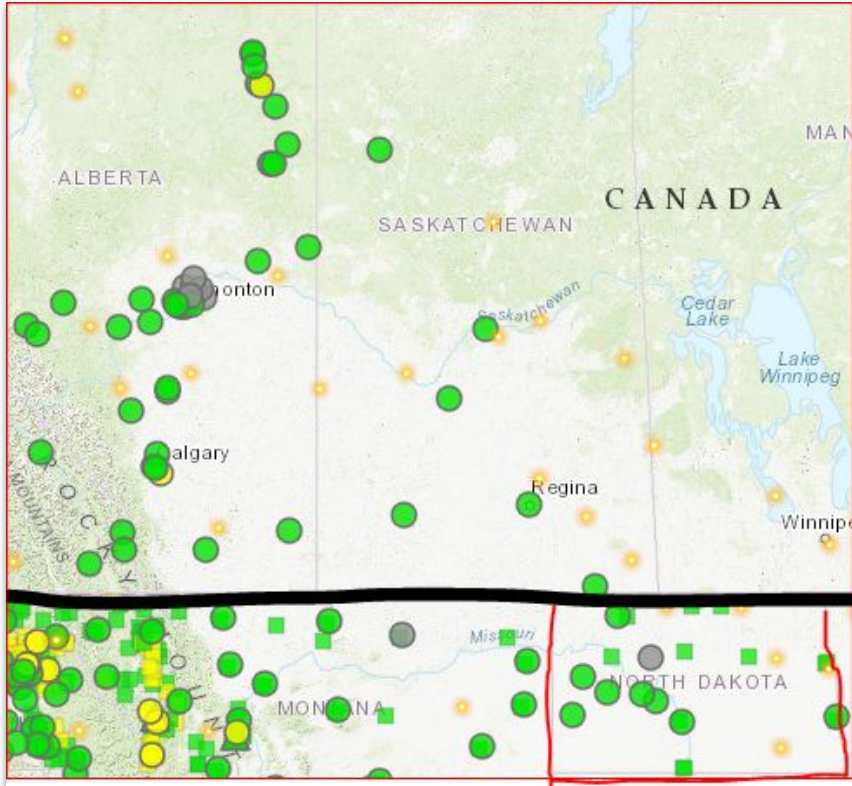
Wildfire smoke significantly impacts the AQI. When smoke drifts from neighboring states or provinces, the AQI in North Dakota can reach unhealthy or hazardous levels, affecting respiratory health and visibility.

# COMPARISON OF SMOKE AND AQI ESTIMATE



There is a temporal interplay between the smoke estimate, derived from an ARIMA model within a 1250-mile radius of Minot and the government provided AQI. The correlation coefficient of 0.65 suggests a moderately positive link between the two variables, indicating a discernible alignment in their trends

# Ethical Implications: Responsible Interpretation



There is a disparity in wildfire occurrence between North Dakota and neighboring regions. Understanding these differences is pivotal in shaping policy decisions regarding wildfire smoke impact. North Dakota's comparatively fewer wildfires provide a nuanced lens for policymakers, guiding tailored strategies to address potential smoke repercussions while considering the region's distinct fire landscape.

# Policy Guidance: Community Experience/Response

Farmers burn ditches and cattails slews because they are difficult or impossible to mow. The farmers want them as low as possible or else when the snow flies it will accumulate and cause bad snow drifts.

↑ 6 ↓ Share ...

Farmers burning their field to kill everything and getting the soiled prepped for winter. This happens every October/November

How I feel about all this smoke in the air



Im so dizzy & I almost had an accident.

What...In The World ?! 🤖

## Community Health Protection

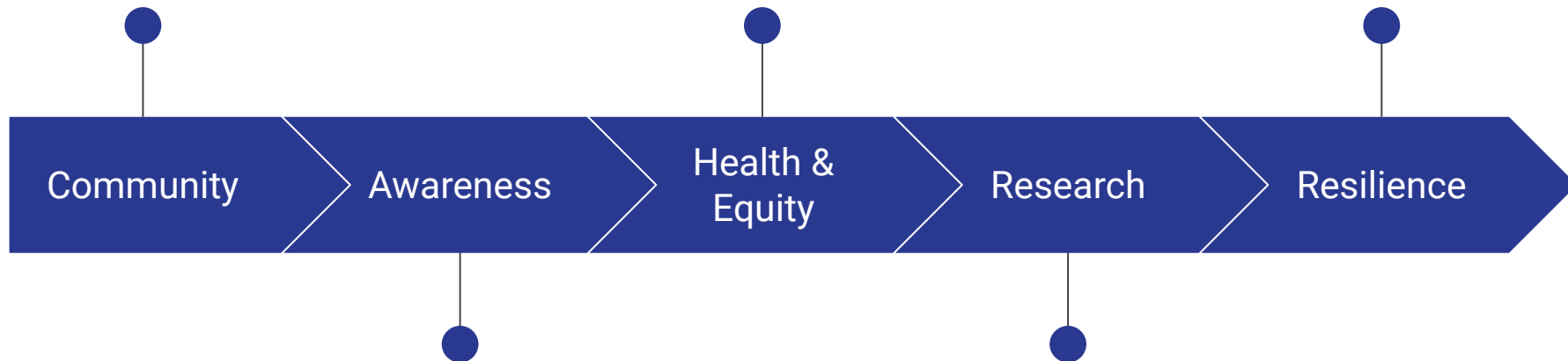
**Policies:** smoke exposure monitoring system that provides real-time data and alerts to residents

## Equity-Centric Initiatives:

Provide free respiratory protection equipment to low-income households, ensuring equitable access to safety measures

## Long-term Resilience Strategies:

Invest in green infrastructure and urban planning, integrating fire-resistant building materials or creating defensible spaces.



**Public Awareness Campaigns:** Engage in community outreach programs & public education campaigns to ensure that residents are well-informed about smoke-related health risks and empower them to take protective actions.

## Research and Data Collaboration:

Illustrate how ethical considerations, such as community engagement and informed consent, will be integrated into data collection processes to respect residents' rights and perspectives



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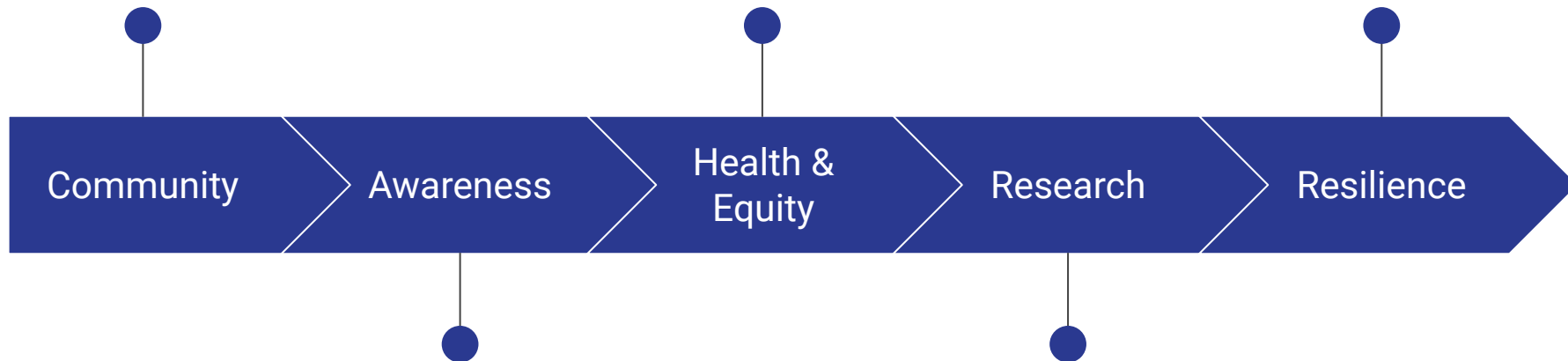
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# Extension Plan

1. Classify Fires:
  - Prairie Fires: fires were often ignited by lightning strikes and helped maintain the health of the ecosystem by clearing dead vegetation and allowing new growth
  - Fires originating outside North Dakota within 1250 miles
  - Fires originating within North Dakota within 1250 miles
  - Unclassified/Others
2. How does fire smoke relate to the chronic respiratory disease rate in Ward County, Minot across different years?

# Impact

Understanding these ethical impacts and enlightening policymakers and residents about potential future scenarios arising from smoke exposure in their community is critical. Forecasting and classifying the potential trends in hospitalizations or fatalities in upcoming years can aid in devising strategies to mitigate these effects.

