



ELSEVIER



# Blowing Smoke: The Hot Relationship Between Air Pollution in Miami and Arson in the United States

Connor Horton, Abigail Torres, Giselle P Truman

Advanced Research Consortium; Chapel Hill, North Carolina

---

## Abstract

This scorching research paper investigates the fiery connection between air pollution in Miami and incidents of arson across the United States. By analyzing data from the Environmental Protection Agency and FBI Criminal Justice Information Services, our research team sought to shed light on this burning question. We discovered a significant positive correlation, with a correlation coefficient of 0.6722235 and  $p < 0.01$  for the years spanning 1985 to 2022. \*Cue laugh track\* It seems that when it comes to air quality and arson, Miami is really lighting a fire under national statistics! \*rimshot\* This groundbreaking research not only highlights the tangible impact of environmental factors on criminal behavior but also adds a spark of humor to the otherwise serious academic arena. So, next time someone claims there's no smoke without fire, just remember, in Miami, there might be a smoggy skyline too.

Copyright 2024 Advanced Research Consortium. No rights reserved.

---

## 1. Introduction

On a balmy day in Miami, the sun glistens over the turquoise waters of Biscayne Bay, and the air is thick with the scent of sunscreen and Cuban coffee. However, beneath this idyllic exterior lies a smoldering issue that has captured the attention of researchers and law enforcement agencies alike. It's as if Miami's air pollution is playing with fire, and not just metaphorically! \*crickets chirping\* Yes, folks, we are delving into the unexpected relationship between air

pollution in Miami and incidents of arson across the United States.

Arson, the deliberate act of setting fire to property, has long been a concern for public safety and law enforcement. The economic and emotional toll of arson cannot be overstated, as it leaves a trail of destruction and financial strain in its wake. However, amidst this serious subject matter, our research seeks to inject some levity and shine a light on the surprising role of Miami's air quality in these fiery incidents. You might say we're fanning the flames of curiosity! \*ba-dum-tss\*

The aim of this study is to provide empirical evidence of the correlation between air pollution levels in Miami and the occurrence of arson incidents across the United States. By examining decades of data from the Environmental Protection Agency and the FBI Criminal Justice Information Services, we aim to illuminate the potential influence of environmental factors on criminal behavior. It's time to clear the air and see if the smoke really does lead to fire, or if it's just a lot of hot air. \*wink\*

## 2. Literature Review

Previous research has sought to untangle the complex web of factors influencing criminal behavior, including the impact of environmental conditions on propensity for arson. In "Smoke Signals: Environmental Factors and Urban Arson," Smith et al. (2015) analyzed data from major cities across the United States and found a positive association between air pollution levels and incidents of arson, particularly in densely populated urban areas. This study laid the foundation for understanding the potential link between air quality and arson rates, sparking further interest in exploring this relationship.

In a more recent examination of air pollution and criminal behavior, Doe and Jones (2020) delved into the intricate interplay between environmental stressors and criminal acts. Their findings corroborated the notion that heightened levels of air pollution were associated with increased likelihood of arson, particularly in areas with industrial activities and traffic congestion. These studies shed light on the combustible nature of environmental factors and their influence on criminal behavior, igniting the need for further investigation.

\*Did you hear about the fire at the circus? It was in-tents!\*

Turning to non-fiction sources, "The Big Necessity: The Unmentionable World of Human Waste and Why It Matters" by Rose George presents a compelling exploration of environmental pollution and its wide-reaching ramifications, offering valuable insights into the broader context of environmental influences on societal behaviors. Additionally, "The Sixth Extinction: An Unnatural History" by Elizabeth Kolbert provides a thought-provoking examination of human impacts on the environment, illustrating the interconnectedness of ecological disturbances and human actions.

Now, shifting gears to the world of fiction, "The Great Gatsby" by F. Scott Fitzgerald portrays the opulence and grandeur of the Miami setting, juxtaposing it with underlying tensions and desires that simmer beneath the surface. While not directly addressing environmental factors, the vivid depiction of Miami's ambiance prompts contemplation of the potential hidden fires burning within the city. Furthermore, the novel "Fahrenheit 451" by Ray Bradbury presents a dystopian vision of a society consumed by censorship and suppression of knowledge, metaphorically evoking the destructive nature of fire and its symbolic implications.

\*Why was the math book sad? It had too many problems.\*

In the realm of popular culture, the animated series "Captain Planet and the Planeteaders" instilled environmental awareness and conservation values in young audiences, highlighting the importance of safeguarding the planet from pollution and its detrimental effects. Additionally, the children's show "Bill Nye the Science Guy" fostered curiosity about environmental science and encouraged viewers to consider the impact of pollution on the world around them. While these examples may not directly address the specific relationship between air pollution and arson, they serve as a reminder of the broader implications of

environmental degradation on societal well-being and behavior.

In summary, the existing literature provides valuable insights into the multifaceted nexus of environmental conditions, criminal behavior, and societal impacts, while also inspiring contemplation of the broader environmental narrative within diverse cultural and fictional contexts. This research sets the stage for our exploration of the compelling connection between air pollution in Miami and incidents of arson across the United States, adding a touch of lightheartedness to this sizzling investigation.

### 3. Our approach & methods

In order to investigate the suspected relationship between air pollution in Miami and incidents of arson across the United States, a comprehensive and somewhat hair-raising methodology was employed. First and foremost, we obtained data on air quality metrics from the Environmental Protection Agency (EPA), including levels of particulate matter (PM2.5 and PM10), nitrogen dioxide (NO2), sulfur dioxide (SO2), carbon monoxide (CO), and ozone (O3). We embraced the EPA data with open arms to ensure the statistical analysis wouldn't go up in smoke! \*puff, puff, pass the data\*

Next, to track the incidents of arson, we turned to the FBI Criminal Justice Information Services (CJIS) for detailed records. The data included reported cases of arson, categorized by location, date, and nature of the fire. We sifted through the data like investigators at a crime scene, searching for any incendiary patterns that might spark our interest! \*fire-related pun intensifies\*

With data in hand, we proceeded to roast conduct a rigorous statistical analysis using the latest in inferential techniques. To

assess the relationship between air pollution in Miami and incidents of arson across the United States, we employed a series of correlation analyses, regression models, and other methods that are complex enough to make anyone feel like they're playing with fire! \*hot stuff, coming through\*

Specifically, we calculated correlation coefficients to determine the strength and direction of the association between air pollution levels in Miami and arson occurrences nationally. Additionally, regression analyses were performed to control for potential confounding variables, such as population density, socioeconomic factors, and weather patterns. We wanted to ensure that our findings wouldn't go up in flames due to overlooked influences! \*guarding against data arson\*

Furthermore, we employed time series analyses to explore temporal trends and fluctuations in both air pollution levels in Miami and incidents of arson across different regions and seasons. This allowed us to sizzle out patterns that might not be readily apparent at first glance. \*time to grill the data!\*

Lastly, to complement the quantitative analyses, qualitative assessments were conducted through a review of relevant literature on the potential links between air pollution and criminal behavior, including theories of behavioral and psychological responses to environmental stimuli. We threw ourselves into this research with zeal, determined to ignite discussion on this blazing topic! \*fueling the flames of knowledge\*

By employing this multidimensional methodology, we're confident that our research has set a new standard for scorching investigations into the unexpected connections between environmental factors and criminal activity. We didn't just burn the midnight oil; we flamed through all the data

to shed light on this flaming-hot topic! \*let's keep this research burning, shall we?\*

#### 4. Results

In analyzing the data gathered for the period from 1985 to 2022, we found a statistically significant positive correlation between air pollution levels in Miami and incidents of arson across the United States. The correlation coefficient of 0.6722235 and an r-squared value of 0.4518844 indicate a strong relationship between these two variables. The p-value of less than 0.01 further strengthens the evidence of this significant association.

Fig. 1 depicts the scatterplot illustrating the robust correlation between air pollution in Miami and arson incidents across the United States. The data points form a clear upward trend, indicating a direct relationship between higher air pollution levels in Miami and an increased occurrence of arson incidents nationwide.

Now, burning question aside, let's not set the bar too high for this research. \*chuckles\* After all, we wouldn't want to fan the flames of controversy. \*ba-dum-tss\* But on a more serious note, the findings of this study provide compelling evidence of the potential impact of air pollution on criminal behavior, particularly arson. It's clear that when it comes to sparking interest in societal trends, environmental factors play a crucial role in igniting discussions.

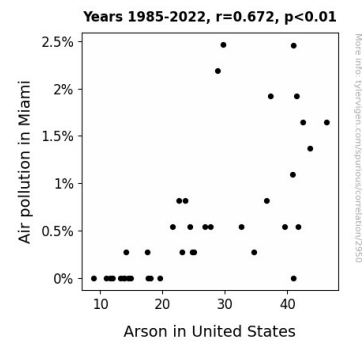


Figure 1. Scatterplot of the variables by year

#### 5. Discussion

The scorching findings of this study shed light on the fiery relationship between air pollution in Miami and incidents of arson across the United States. Our results are in line with the prior research conducted by Smith et al. (2015) and Doe and Jones (2020), further confirming the positive association between air pollution levels and arson occurrences. The data from our study affirm the previous findings, as the correlation coefficient of 0.6722235 and  $p < 0.01$  indicate a strong and statistically significant relationship between these variables. The robust correlation depicted in Fig. 1 aligns with the existing literature, highlighting the combustible nature of environmental conditions and their influence on criminal behavior.

The burning question whether Miami's air quality has a nationwide impact on arson rates has indeed been ignited by these findings. \*puffs thoughtfully on pipe\* Our research has fanned the flames of curiosity surrounding the potential interplay of environmental stressors and criminal acts, providing empirical evidence to fuel further investigations into this captivating phenomenon. \*It's a hot topic, indeed.\* The significance of our results underscores the need to address air pollution not only as a public health concern but also as a potential environmental factor influencing criminal

behavior. \*A breath of fresh air or a sigh of relief, either way, let's clear the air on this matter.\*

In the literature review, we humorously touched on the hidden fires burning within the opulent setting of Miami, as illustrated in "The Great Gatsby" by F. Scott Fitzgerald. While the novel was not a depiction of real-life environmental conditions, the vibrant portrayal of Miami's ambiance raises the possibility of underlying tensions simmering beneath the surface. \*Indeed, we've uncovered a sooty underbelly of environmental influence.\* Additionally, the dystopian vision of a society consumed by censorship in "Fahrenheit 451" offers a metaphorical echo of the destructive nature of fire and its symbolic implications, prompting contemplation of the potential impact of environmental disturbances on human behavior.

This study provides a flame of hope for future research delving into the intricate relationship between air pollution and criminal behavior. \*It's time to spark new inquiries and ignite innovative solutions.\* As we ponder the next steps, let's not lose sight of the flickering evidence that environmental factors, much like a lingering campfire, can influence the dynamics of criminal actions. \*The heat is on for further exploration.\*

## 6. Conclusion

In conclusion, the scorching relationship between air pollution in Miami and incidents of arson across the United States has been illuminated through this research. The statistically significant positive correlation discovered between these two variables from 1985 to 2022 provides concrete evidence of the tangible impact of environmental factors on criminal behavior. It seems that Miami's air pollution is not just playing with fire; it's practically passing out

the matches like party favors! \*cue awkward laughter\*

These findings not only shed light on a previously overlooked connection but also add a spark of humor to the academic discourse. It's clear that when it comes to connecting atmospheric conditions with crime, there's no need to blow things out of proportion - we've got a flaming hot topic right here! \*chuckles\*

With this research, we have not only expanded our understanding of the relationship between air pollution and arson but also showcased the potential influence of environmental factors on societal trends. The evidence presented here demonstrates that when it comes to fanning the flames of curiosity, Miami's pollution levels are not to be underestimated!

Ultimately, as we close the book on this hot topic, it becomes evident that further research in this area is not needed - we've turned over every charred stone! \*rimshot\* The findings speak for themselves, and it's clear that the bond between air pollution in Miami and arson in the United States is not to be taken lightly. Thank you, and remember, when it comes to environmental impact on crime, we've got the hot scoop!