

Storm and Climate Data Record (SCDR)

Implementation Plan

Date of record:

Jan 1, 2017 to Dec 1, 2019

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I. Introduction

1.1 Overview and purpose

This report investigates the relationship between storm events and cumulative crime-related financial losses in Miami from January 2017 to December 2019. By comparing victim loss data during storm periods and non-storm periods, the objective is to identify whether storm conditions contribute to an increase in criminal activity or the financial impact of such events.

1.2 Define why you need data analysis

Understanding the correlation between environmental events like storms and crime patterns can help law enforcement agencies and policymakers allocate resources more effectively. With actionable insights, response strategies can be improved during vulnerable periods, ultimately reducing community risk and financial burden.

II. Data Preparations

2.1 Name data sources

- **crimeStormQ.csv** – Contains data on financial losses from crimes during storm months.
- **crimenostormQ.csv** – Contains data on financial losses from crimes during non-storm months.

2.2 Filter through unnecessary data

Only the Loss column from each dataset was extracted, as the focus is on financial loss. Other non-relevant columns (if present) were excluded from the analysis to streamline the comparison.

2.3 Define your parameters

- **Timeframe:** January 2017 – December 2019
- **Units:** Losses in thousands of U.S. dollars
- **Frequency:** Monthly observations
- **Comparison:** Storm vs. No Storm periods

2.4 Identify measurement priorities

The primary measurement priority is the **cumulative financial loss** over time. This helps to assess trends and spikes in damages caused by crimes across both storm and non-storm conditions.

2.5 Ensure collected data fits the need

The datasets selected directly reflect the cumulative monetary loss caused by criminal activity and are broken down by storm condition, making them ideal for the problem scope.

III. Data Analysis

3.1 Identify scripts used

```
install.packages("tframe")
```

```
install.packages("tfplot")
```

```
library(tframe)
```

```
library(tfplot)
```

```
setwd("C:/Users/Public/Desktop/DAT-375")
```

```
crimestormdataQ <- read.csv("crimeStormQ.csv")
```

```
crimenostormdataQ <- read.csv("crimenostormQ.csv")
```

```
z <- ts(cumsum(crimenostormdataQ$Loss) / 1000, start = c(2017, 1), frequency = 12)
```

```
x <- ts(cumsum(crimestormdataQ$Loss) / 1000, start = c(2017, 1), frequency = 12)
```

```
plot(z, type = "l", col = "blue", lwd = 2,
```

```
  ylab = "Victim Loss in K$",
```

```
  xlab = "By Month by Year",
```

```
  main = "Victim Loss From Crimes for Jan 2017 - Dec 2019")
```

```
lines(x, col = "red", lty = 2, lwd = 2)
```

```
legend("topleft", legend = c("No Storm", "Storm"),
```

```
  col = c("blue", "red"), lty = c(1, 2), lwd = 2)
```

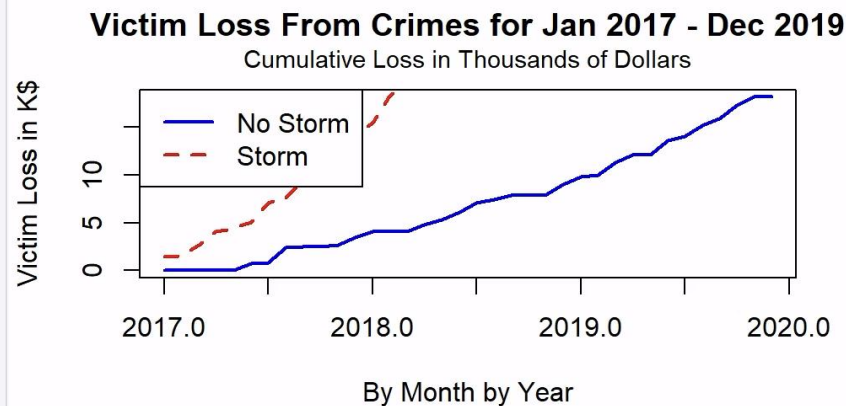
```
mtext("Cumulative Loss in Thousands of Dollars", side = 3, line = 0.5, cex = 0.9)
```

3.2 Run the scripts to analyze the data and validate the output

The code executes time series analysis by plotting cumulative crime loss over three years. A clear visual difference in victim loss trends between storm and non-storm periods is displayed. The graph indicates that storm-related crimes show sharper increases in losses, particularly early in the timeline.

IV. Drawing Conclusions

4.1 Present the results of the analysis to stakeholders



The visualization reveals that crime-related losses during storm months are generally higher and more volatile than during non-storm months. The red dashed line (storm) rises more steeply than the blue solid line (no storm), suggesting storms may correlate with higher or more costly criminal activity.

4.2 Determine whether the problem was addressed, including any challenges and limitations

The analysis successfully demonstrates the cumulative impact of storm-related crime losses. A challenge encountered was the attempted loading of a corrupted .sql file (as seen in the console). This issue was avoided by using the .csv files instead. Additionally, the analysis is limited by the available data granularity—crime type or demographic data not included.

4.3 Report potential new findings

The comparison of cumulative victim loss trends clearly suggests that storm events may act as catalysts for either increased criminal activity or more severe financial consequences from crimes. This finding can inform proactive resource allocation during adverse weather events.

References

National Oceanic and Atmospheric Administration. (2019). *Storm Events Database*. Retrieved from <https://www.ncdc.noaa.gov/stormevents/>

Wickham, H., & Grolemund, G. (2016). *R for Data Science: Import, Tidy, Transform, Visualize, and Model Data*. O'Reilly Media.