

Weather's Effect on Crime in Los Angeles

By:

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Questions:

- Is Crime impacted by weather in Los Angeles?
 - Does crime happen most in high precipitation or low precipitation?
 - Does crime happen most in high temperatures or low temperatures?
 - What type of weather is ideal for crime?
- We thought of these questions because of the relatively commonly held theme that crime is increased in warmer temperatures.

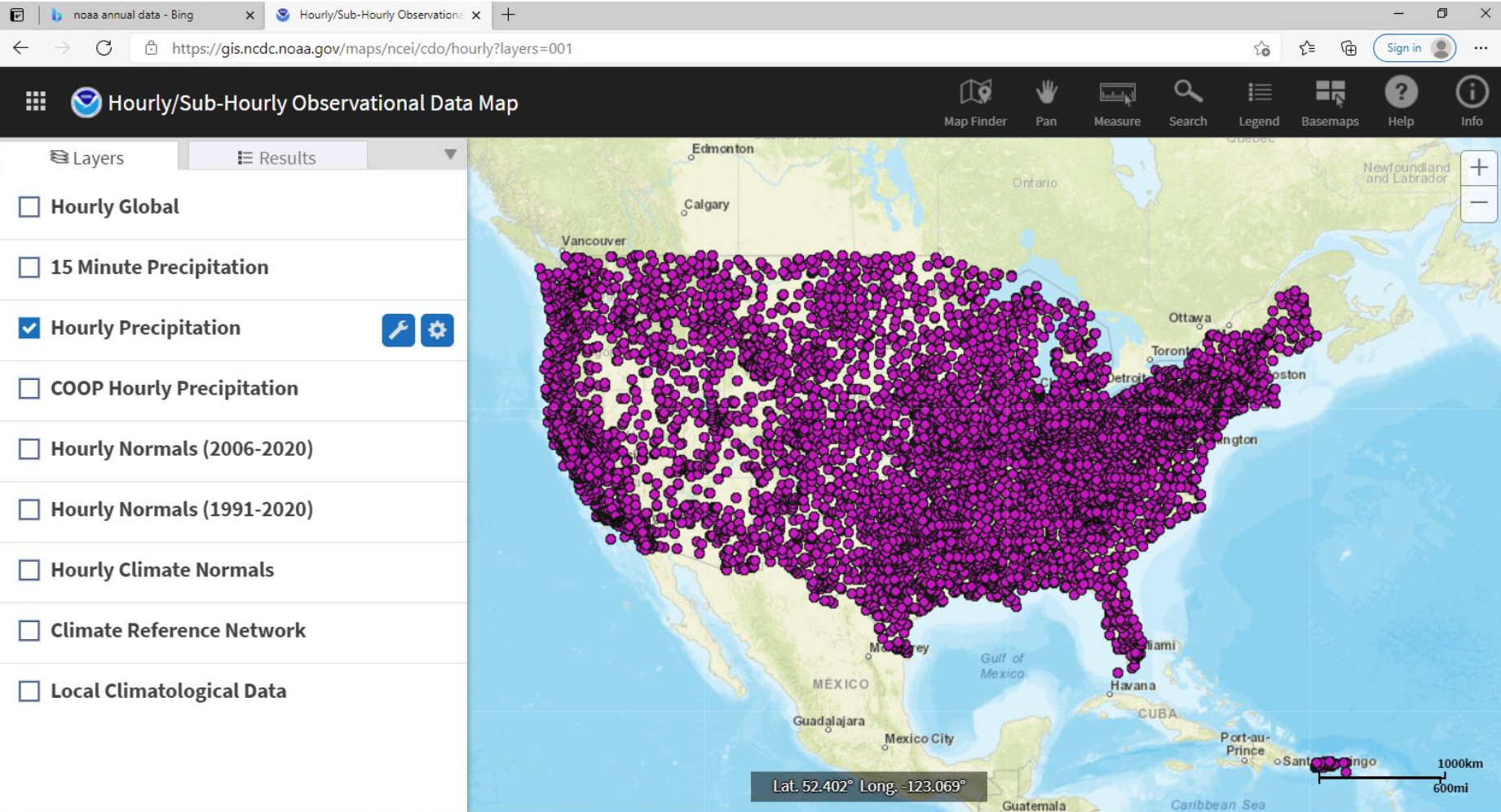


Hypotheses/Core Message

- Null Hypothesis:
 - High temperature has no effect on crime count.
- Alternative Hypothesis
 - High temperature has a positive effect on crime count.

NOAA Weather Data

- **Available at:**
 - Climate Data Online (CDO) - The National Climatic Data Center's (NCDC) Climate Data Online (CDO) provides free access to NCDC's archive of historical weather and climate data in addition to station history information. | National Climatic Data Center (NCDC) (noaa.gov)
- **Available by:**
 - Daily Summaries
 - Global Marine Data
 - Global Summary of Month, Year
 - Local Climatological Data
 - Normal(s) are available for Annual/Seasonal, Daily, Hourly, Monthly
 - Precipitation 15 minute
 - Precipitation Hourly
 - Weather Radar II/III
 - More...
- **Highlights:**
 - Available by PDF/CSV/Text file
 - 4 Character codes in the files fairly well documented
 - Metrics are available for number of days with max, min temperatures, days with a snowfall, days with a minimal snow depth.
 - No costs
 - Files are sent via email links with a respectable turnaround time.
- **Cleansing tasks:**
 - Rename columns to documented names
 - Setting Null values to 0
- **Discoveries:**
 - Ordering the same CSV report does not mean report files will be identical for all cities. JFK file had more column information due to the seasonal weather types.
- **Selection Criteria:**
 - Chose International airports with the assumption that weather for the airports would be fairly consistent (uniform) with the surrounding city area.



U.S. Department of Commerce
 National Oceanic & Atmospheric Administration
 National Environmental Satellite, Data, and Information Service
 Current Location: Elev: 11 ft. Lat: 40.6392° N Lon: -73.7640° W
 Station: **JFK INTERNATIONAL AIRPORT, NY US USW00094789**

Global Summary of the Year
2012 - 2021
 Generated on 04/29/2021

National Centers for Environmental Information
 151 Patton Avenue
 Asheville, North Carolina 28801

Date	Liquid Precipitation (Inches)			Frozen Precipitation (Inches)					Number of Days				
Elem->	PRCP	EMXP		SNOW	EMSN		EMSD		DP01	DP10	DP1X	DYHF	DYTS
Year	Total Liquid Content	Extreme Max Precip	Date of Occurrence	Snowfall	Extreme Max Snowfall	Date of Occurrence	Extreme Max Snow Depth	Date of Occurrence	Precip >= 0.01"	Precip >= 0.10"	Precip >= 1.00"	FG+	TS
2012	39.86	2.14	Apr-22	7.0	4.0	Nov-07	4	Nov-08	124	78	8	22	30
2013	35.54	4.01	Jun-07	19.9	3.5	Feb-09	6	Feb-09	114	62	6	5	2
2014	50.78	4.68	Apr-30	39.3	6.8	Jan-21	10+	Feb-18	122	75	16	4	6
2015	38.33	2.48	Aug-21	43.9	5.8	Mar-05	10	Jan-28	110	63	12	31	18
2016	36.04	2.90	Jan-23	44.7	30.3	Jan-23	28	Jan-24	111	65	7	20	23
2017	43.16	2.84	Oct-29	34.3	8.3	Feb-09	8+	Feb-10	122	72	11	24	26
2018	57.43	2.16	Mar-02	33.7	8.4	Mar-21	9	Mar-22	156	96	18	40	29
2019	52.03	2.07	Jul-23	11.8	3.2	Mar-02	3	Mar-02	140	89	15	24	34
2020	40.91	2.33	Jul-10	9.1	3.8	Dec-16	7+	Dec-19	133	80	12	28	36
2021												14	

Notes

(Blank) Data element not reported or missing.

X Monthly means or totals based on incomplete time series.

+ Occurred on one or more previous dates during the month. The date in the Date field is the last day of occurrence.

A Accumulated amount.

T Trace Amount.

FG+ Heavy Fog

TS Thunderstorms



Crime Data info for LA

- Available at:
 - <https://data.lacity.org/Public-Safety/Arrest-Data-from-2010-to-2019/yru6-6re4> from Data.gov
- Available by:
 - Report ID
 - Arrest Date
 - Time
 - Age
 - Sex Code
 - Charge Group Code
 - Charge Group Description
 - Arrest Type
 - Charge
 - Charge Description
 - Disposition Description
 - LAT
 - LON
- Cleansing tasks:
 - Drop most columns, leave Report ID, Arrest Date, Age, Sex Code, Charge Description, LAT, LON
 - Convert Arrest Date to datetime and separate by month, day, and year
 - Drop 'Arrest Date','day','month','LAT','LON'
 - Drop NaN from Charge Description
- Selection Criteria:
 - Date and crime type
 - Crime description count

Arrest Data from 2010 to 2019

This dataset reflects arrest incidents in the City of Los Angeles from 2010 to 2019. This data is transcribed from original arrest reports that



More Views

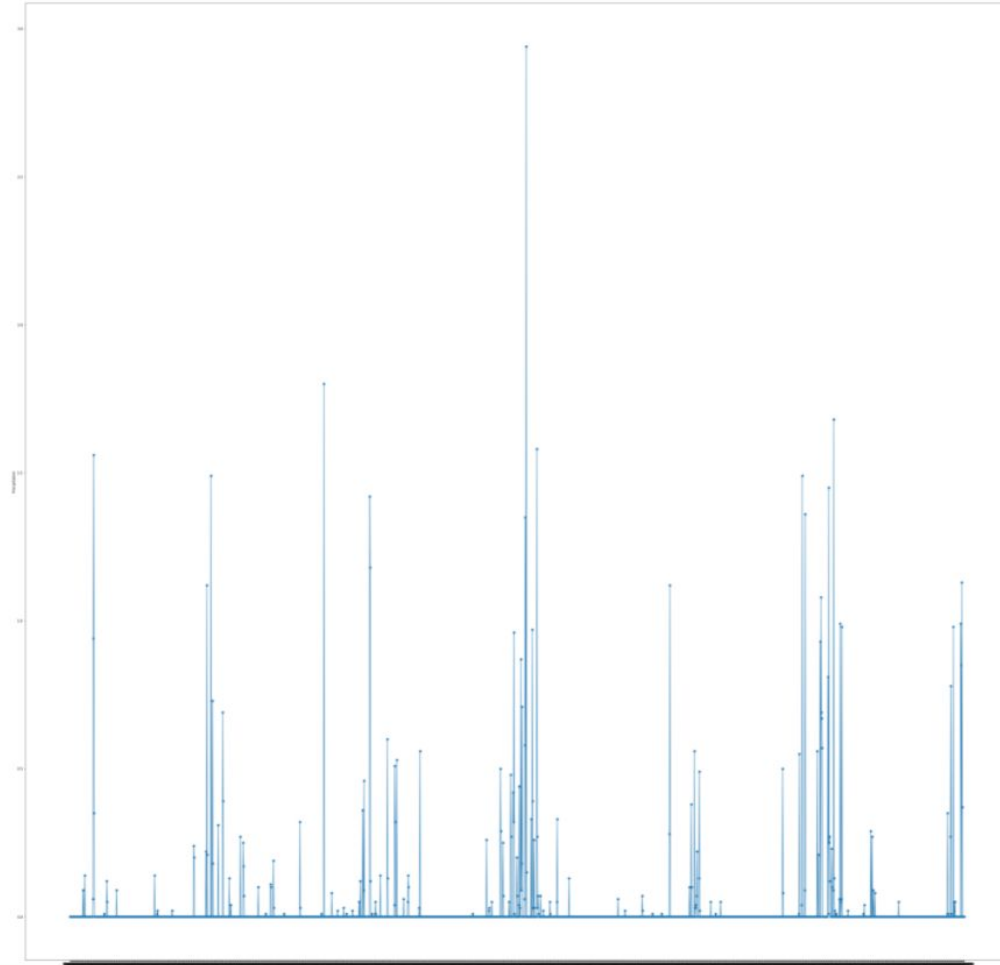
Report ID	Report T...	Arrest Date	Time	Area ID	Area Name	Reporting District	Age	Sex Code	Descent Code	Charge Group Code
121920046	RFC	09/28/2012	0930	19	Mission	1998	60	M	H	
0000000	BOOKING	02/18/2019	1115	01	Central	0132	32	M	H	
090712341	RFC	03/10/2011	0940	07	Wilshire	0776	45	M	B	
121909585	RFC	04/01/2012	1715	19	Mission	1993	37	M	H	
100109543	RFC	04/14/2010	1510	01	Central	0158	38	F	W	
100208368	RFC	03/18/2010	2110	02	Rampart	0275	40	F	W	
100218913	RFC	10/07/2010	1835	02	Rampart	0217	32	F	O	
100321755	RFC	09/11/2010	1840	03	Southwest	0359	43	M	B	
100321757	RFC	09/11/2010	1730	03	Southwest	0359	36	M	B	
100321798	RFC	09/11/2010	1750	03	Southwest	0359	24	M	O	
100321800	RFC	09/11/2010	1750	03	Southwest	0359	19	F	H	
100325586	RFC	11/06/2010	1920	03	Southwest	0377	51	M	H	
100404077	RFC	01/03/2010	0015	04	Hollenbeck	0456	43	F	H	
100406558	RFC	02/26/2010	2040	04	Hollenbeck	0463	22	M	H	
100409711	RFC	05/08/2010	2135	04	Hollenbeck	0412	20	M	H	
100409797	RFC	05/07/2010	2125	04	Hollenbeck	0453	27	M	H	
100409813	RFC	05/08/2010	0130	04	Hollenbeck	0499	15	M	H	
100409814	RFC	05/08/2010	0100	04	Hollenbeck	0499	14	M	H	
121920272	RFC	09/15/2012	0040	19	Mission	1913	34	M	H	
100409815	RFC	05/08/2010	0145	04	Hollenbeck	0499	16	F	W	
100409816	RFC	05/08/2010	0100	04	Hollenbeck	0499	14	M	H	

Crime Count

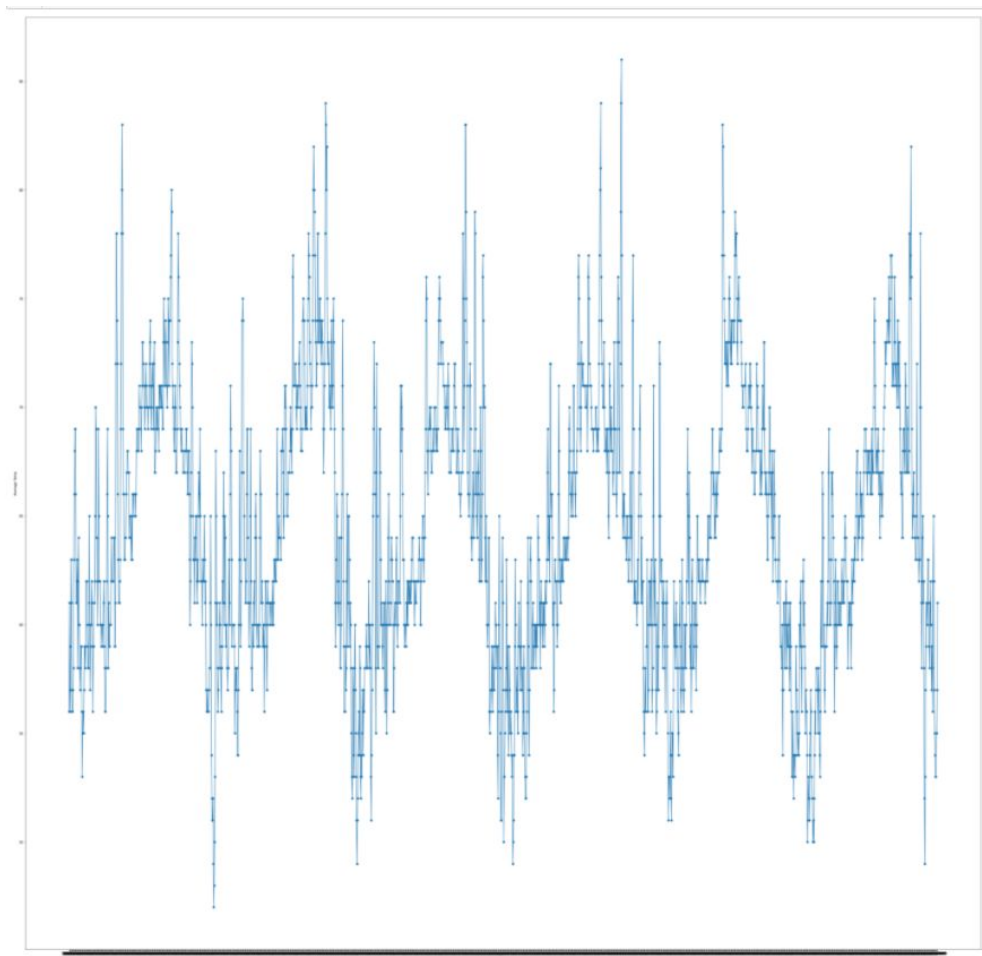


```
Out[52]: Miscellaneous Other Violations    114811
         Narcotic Drug Laws                77778
         Driving Under Influence           63179
         Aggravated Assault               52727
         Other Assaults                   41613
         Drunkenness                      38553
         Larceny                          36724
         Liquor Laws                      31613
         Moving Traffic Violations         26072
         Disorderly Conduct                23034
         Prostitution/Allied               22154
         Weapon (carry/poss)              18791
         Vehicle Theft                    16866
         Robbery                          15288
         Burglary                         12362
         Sex (except rape/prst)            7579
         Fraud/Embezzlement               5903
         Against Family/Child              5217
         Receive Stolen Property           3194
         Forgery/Counterfeit               3187
         Pre-Delinquency                   1955
         Non-Criminal Detention            1875
         Rape                             1775
         Homicide                         1427
         Gambling                          1189
         Disturbing the Peace              1062
         Federal Offenses                  145
```

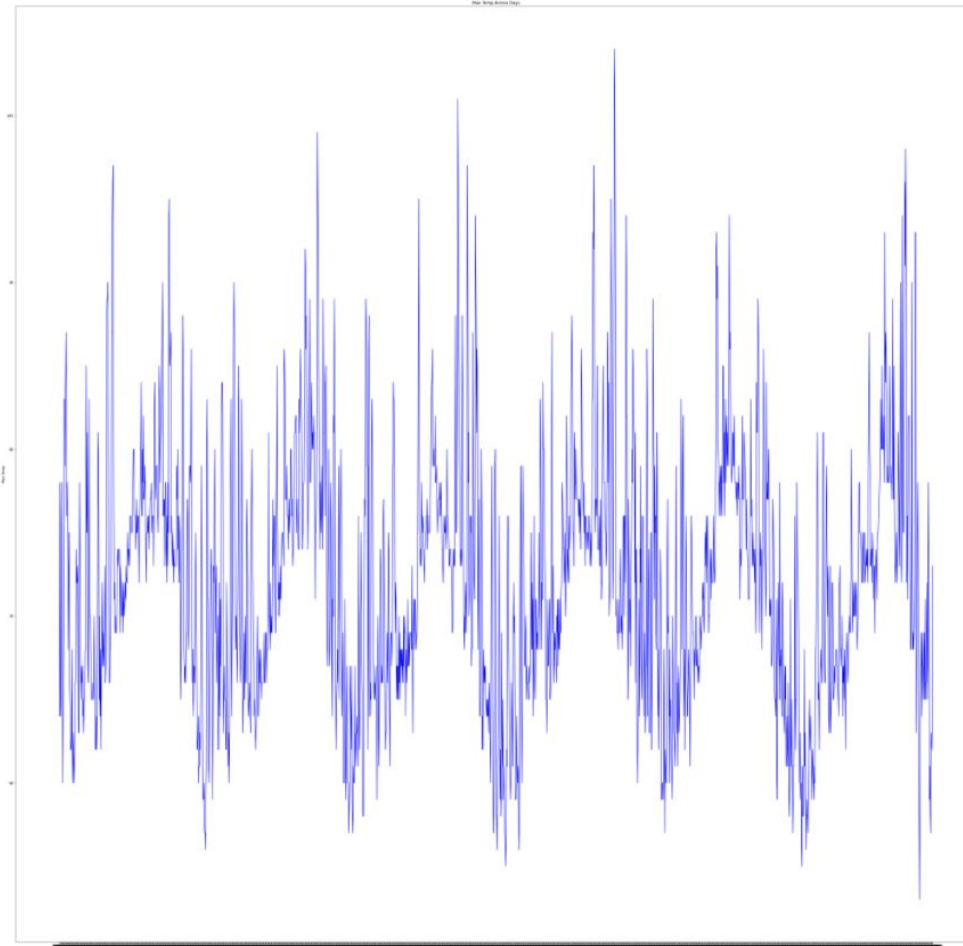
Daily precipitation over dataset

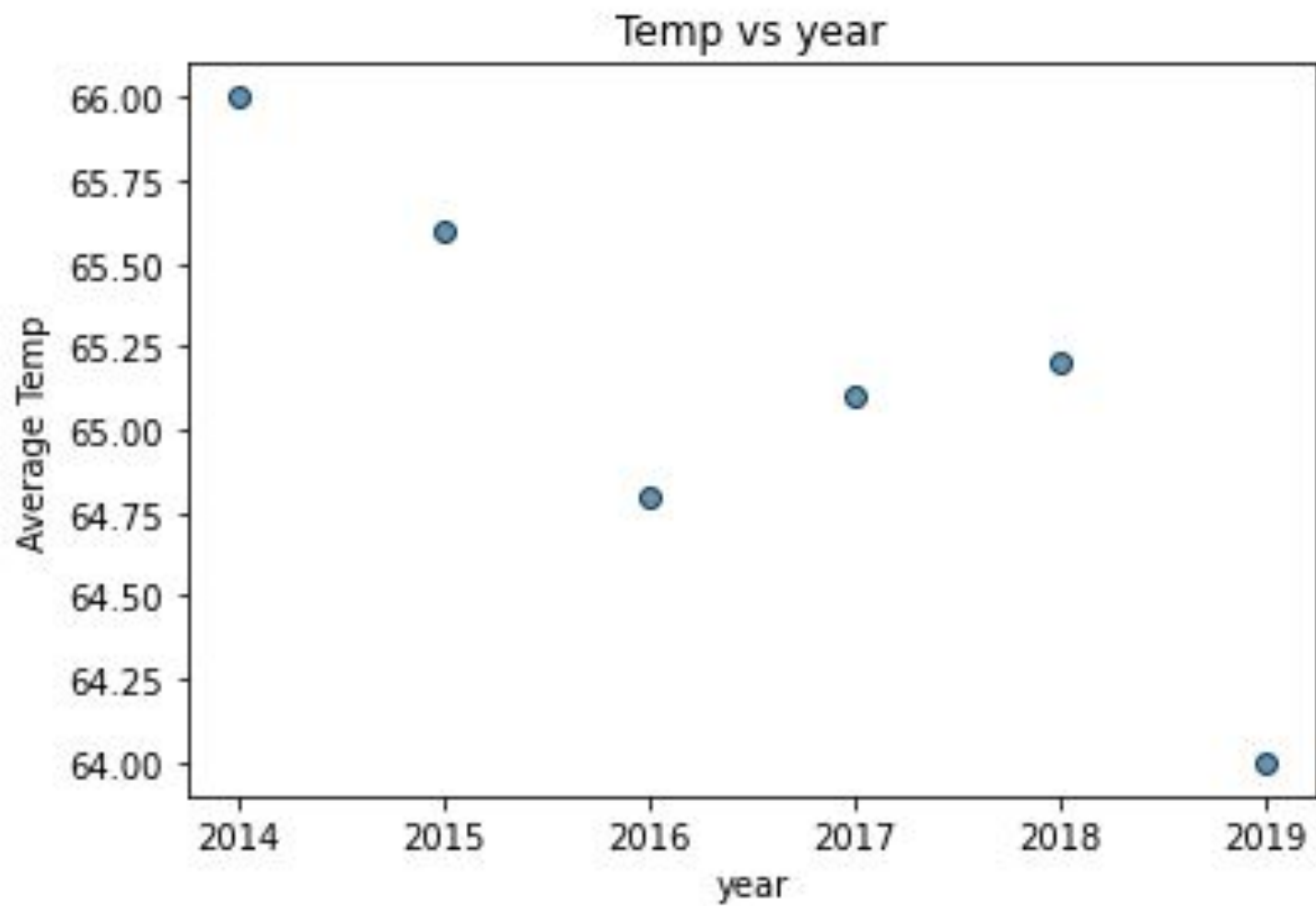


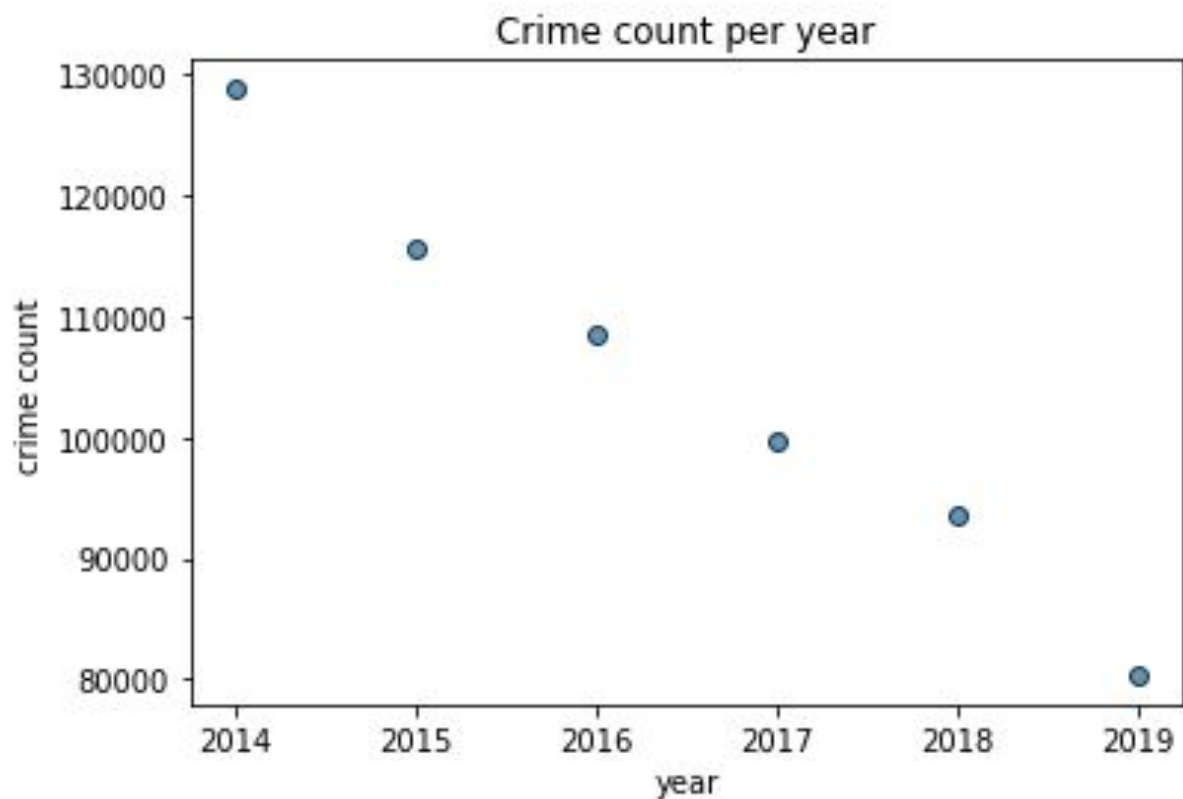
Avg Temp over dataset



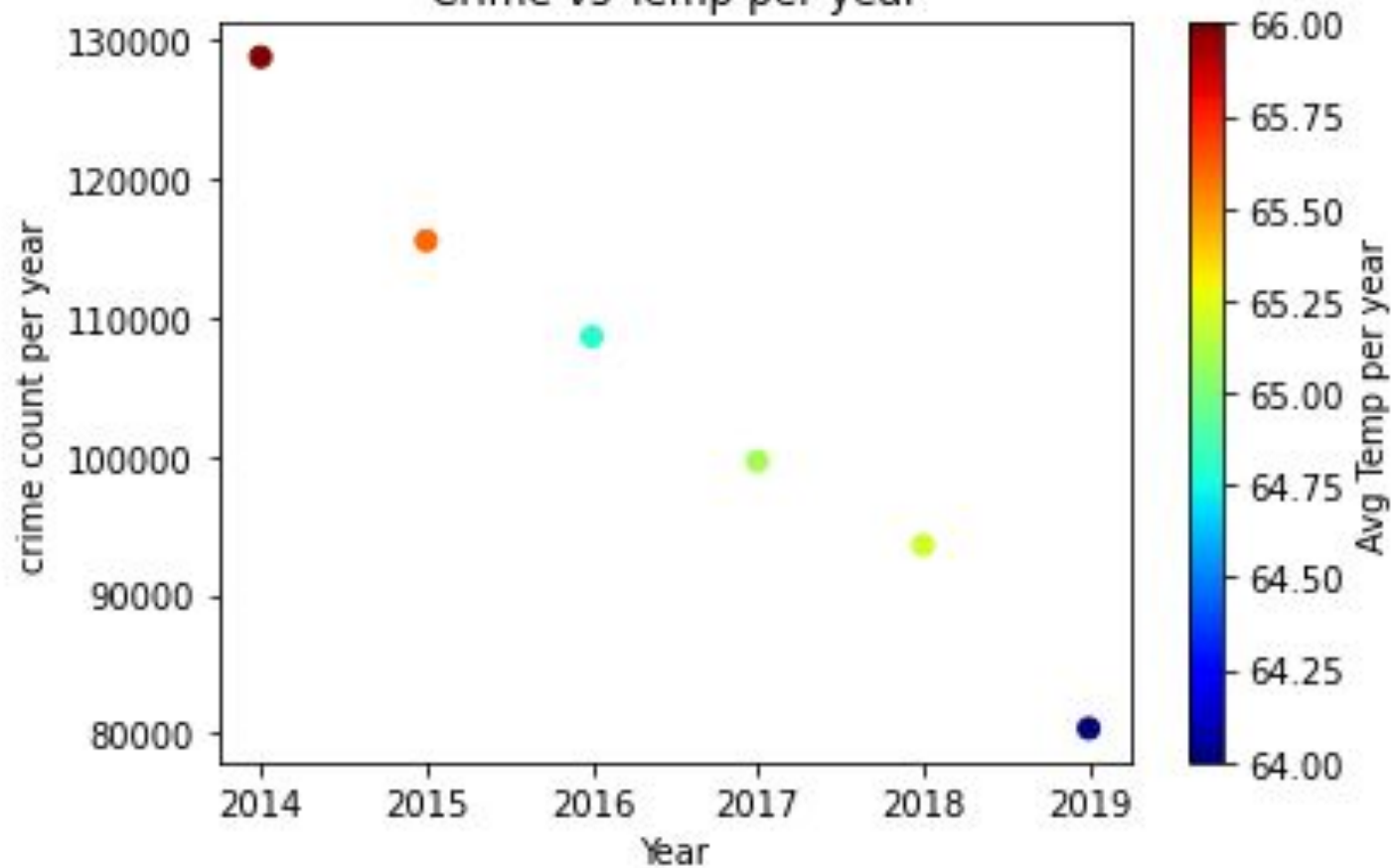
Max Temp over dataset

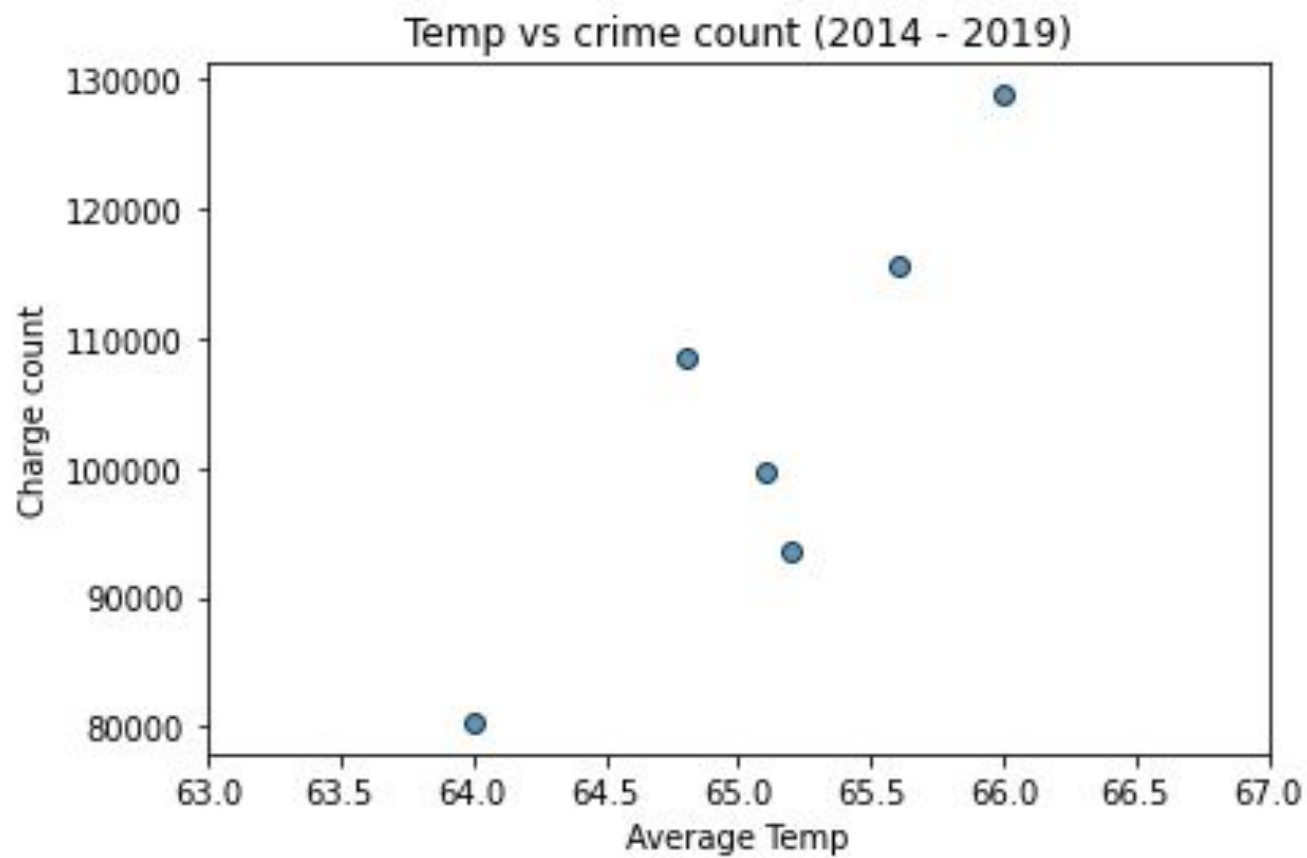






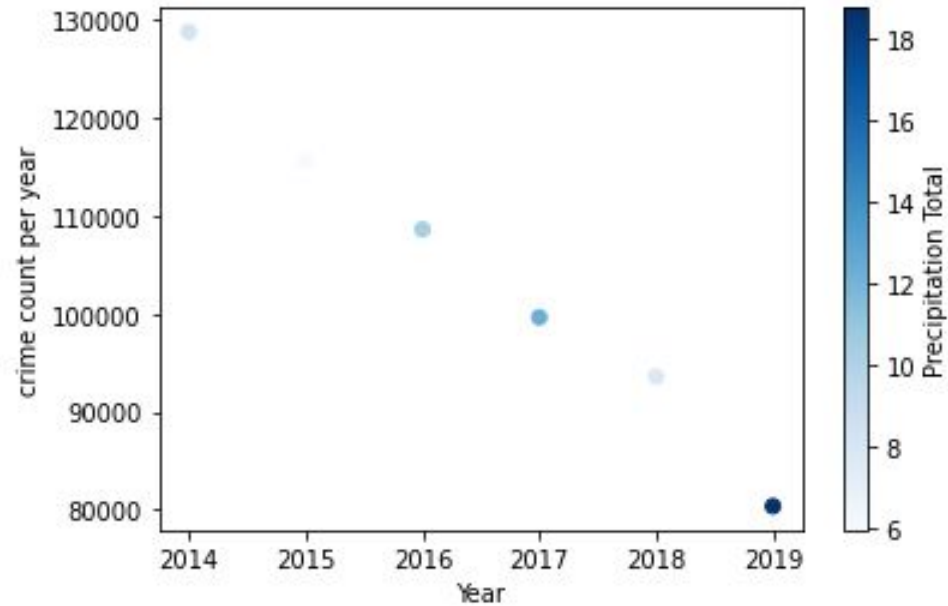
Crime vs Temp per year



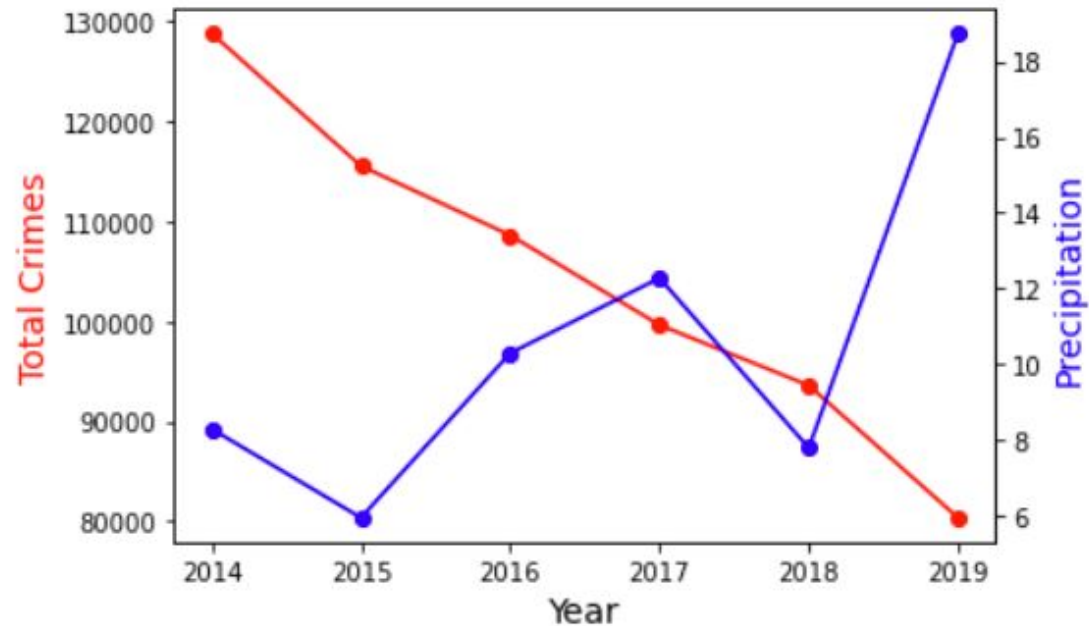




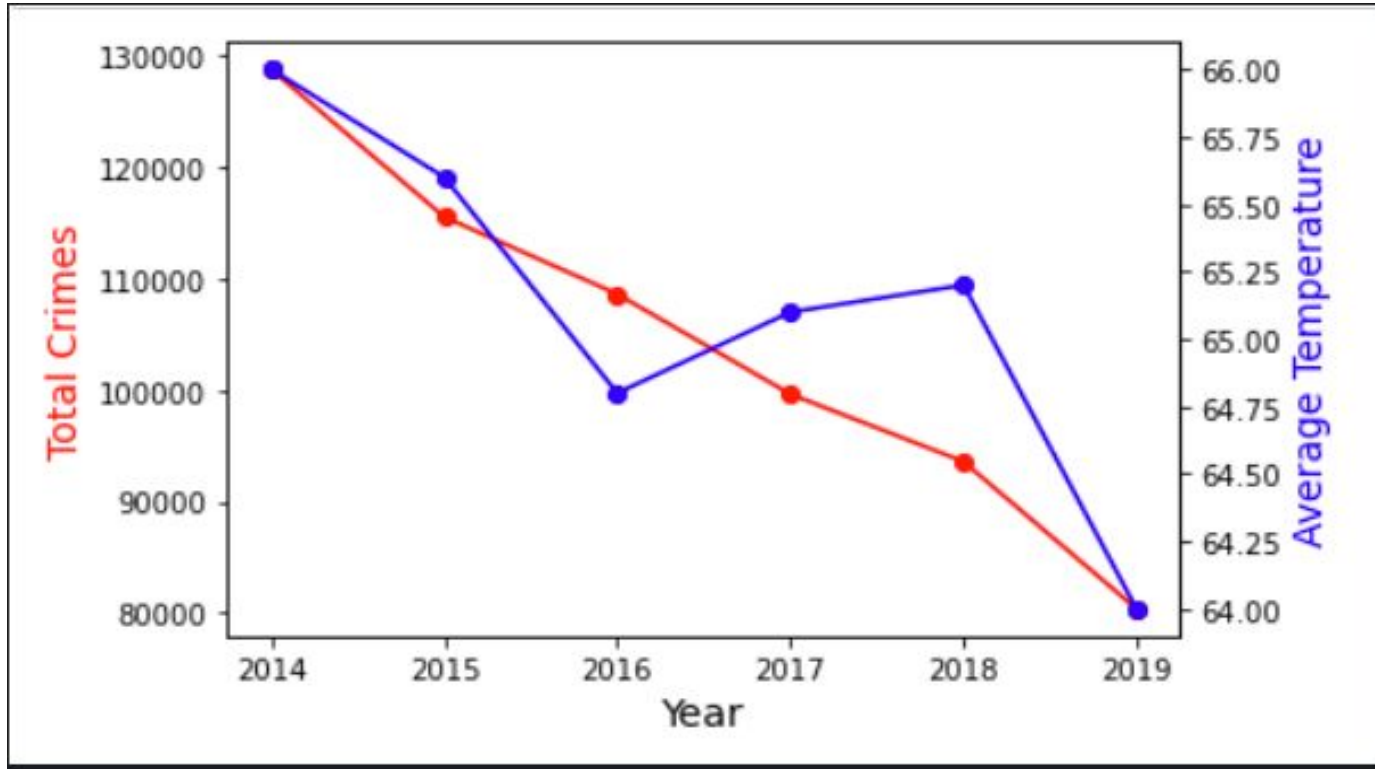
Crime count per year vs Precipitation Total



Crime vs Precipitation



Total Crime vs Average Temperature





Challenges

- Annual graphs do not show a significant amount of data, resulting in not a lot of data points.
- Finding a good and relative crime csv to use.
- Trying to display large sets of data.
- As we were analyzing, we realized how important it is to recognize how many different factors would impact crime besides temperature.
- The climate of Los Angeles is relatively stable
- Tried to use census data for demographic but it did not line up with the year data type to merge
- Timeliness is a major factor



Conclusions

Regardless of the temperature, we found it interesting that the crime has seemed to go down significantly.

In addition, it is rather interesting that the temperature has seemed to decrease from a year average standpoint. This could be due to the decrease in drug use. After quick research, there seems to also be thought that the increase in incarceration rate could lead to less crime. Lastly, and from a positive outlook, hopefully the type of policing would try to create better relationships with communities that would lead to less unnecessary policing.

Despite the lack of perfect data, the graphs show that there is the possibility of a relationship between crime and temperature.

While there seems to be a possible relationship between crime and temperature it would be incomplete to not acknowledge all of the other factors involved. Other possible contributing factors to this relationship could be average income, population disbursement, and policies/politics etc.

Without further analysis we cannot conclude that there is a direct relationship or correlation.



Conclusions Continued

Based on our limited results, it seems relatively safe to say that there is not a relationship between crime and precipitation. While we would need further statistical analysis, the graphs seem to indicate this.

If we had additional time to research we would like to investigate more cities. One issue we found was that Los Angeles was a relatively stable climate and may not be able to draw the most significant conclusions. With more time, we could look into cities with a more changing climate (Midwest, East Coast). Additionally, if we had more time we would like to attempt to incorporate the other factors we have mentioned. We thought that maybe pulling more data from other sources.



Q&A or Discussion