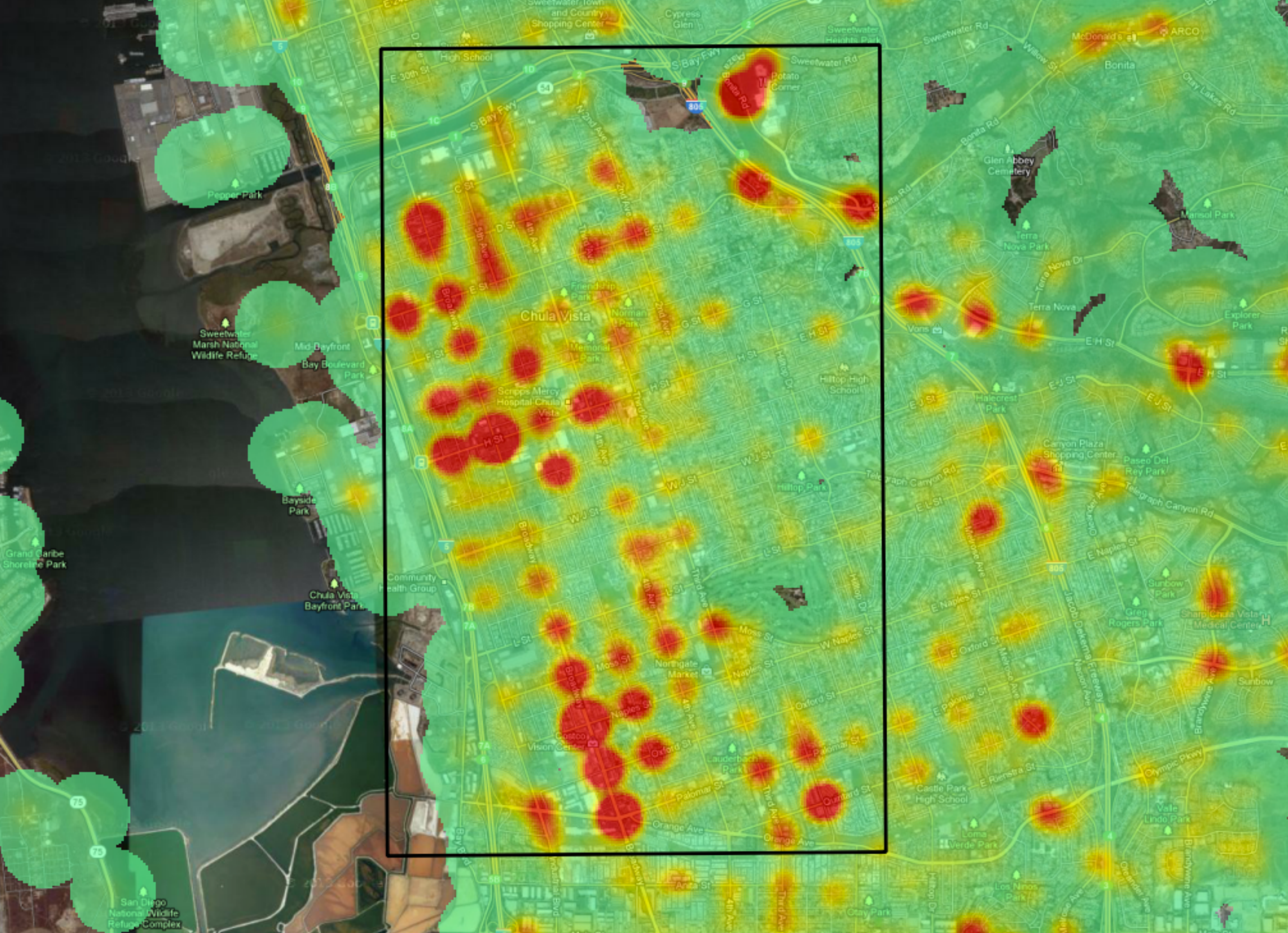


Crime Analysis With Rhythm Maps

The San Diego Regional Data Library

Eric Busboom, eric@sandiegodata.org

<http://sandiegodata.org>



Six Weeks of Aggregate Average Response Time Data (in ms), By Day of Week and Hour of Day							
	SUN	MON	TUE	WED	THU	FRI	SAT
Midnight							
01:00 AM PT							
02:00 AM PT							
03:00 AM PT							
04:00 AM PT							
05:00 AM PT							
06:00 AM PT							
07:00 AM PT							
08:00 AM PT							
09:00 AM PT							
10:00 AM PT							
11:00 AM PT							
Noon							
01:00 PM PT							
02:00 PM PT							
03:00 PM PT							
04:00 PM PT							
05:00 PM PT							
06:00 PM PT							
07:00 PM PT							
08:00 PM PT							
09:00 PM PT							
10:00 PM PT							
11:00 PM PT							

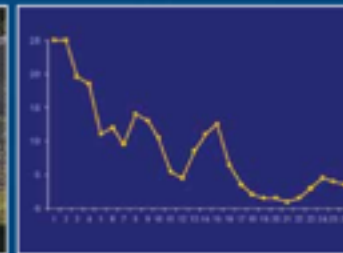
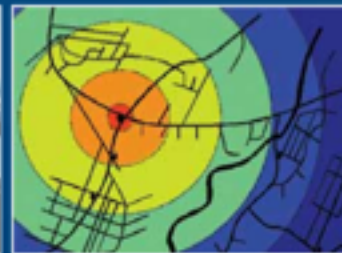


U.S. Department of Justice
Office of Community Oriented Policing Services



COPS

COMMUNITY ORIENTED POLICING SERVICES
U.S. DEPARTMENT OF JUSTICE

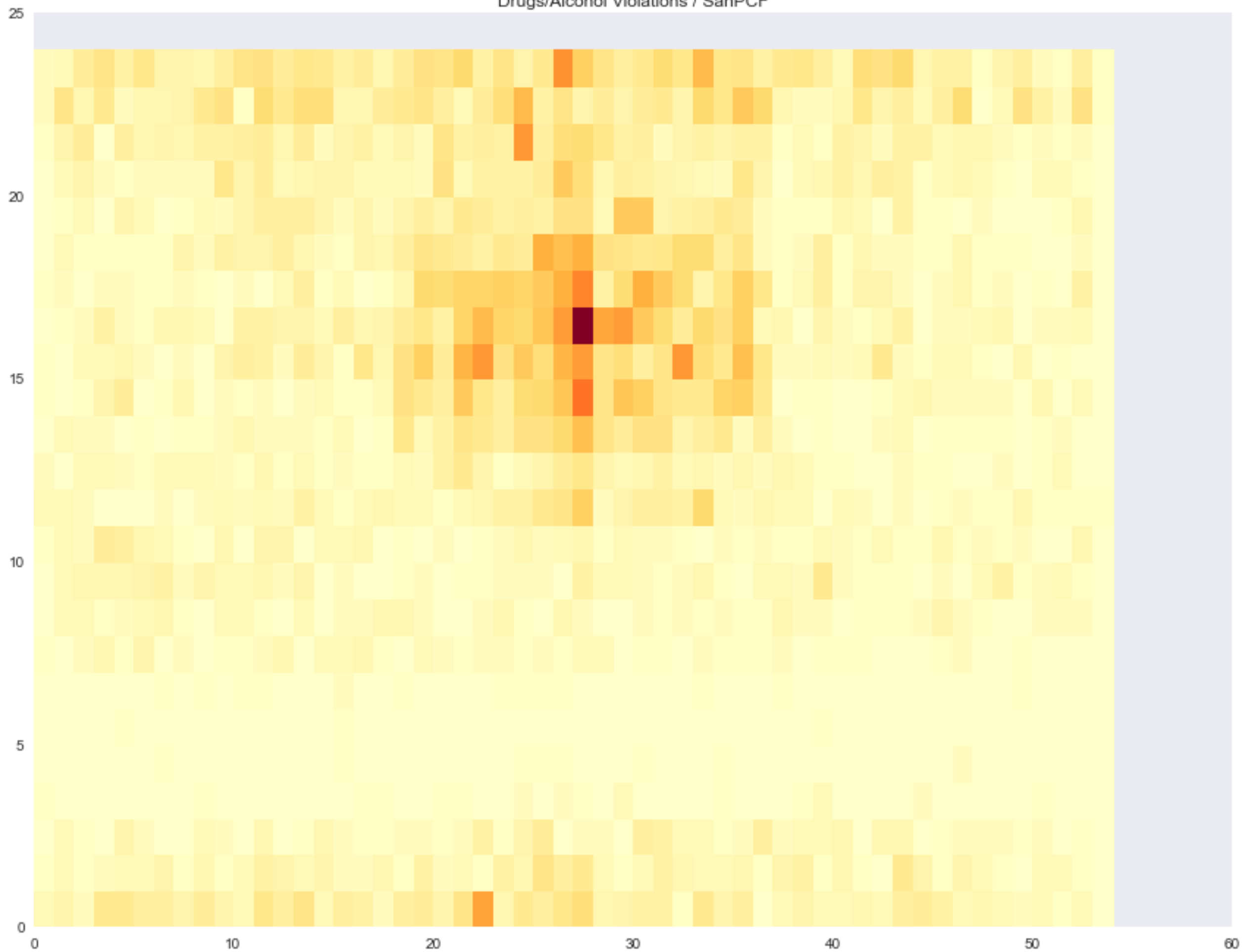


CRIME ANALYSIS FOR PROBLEM SOLVERS

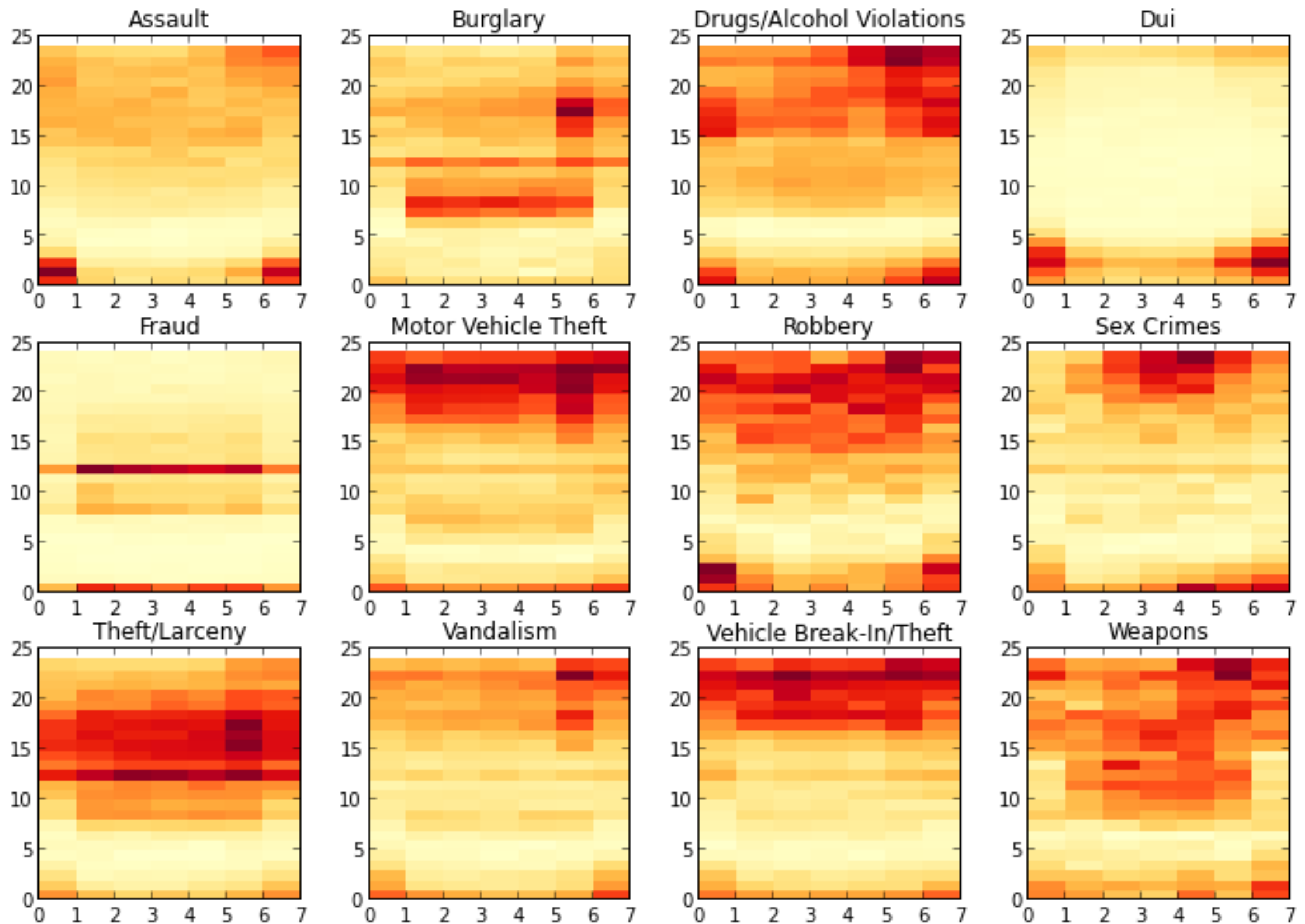
In 60 Small Steps

Ronald V. Clarke & John E. Eck

Drugs/Alcohol Violations / SanPCF

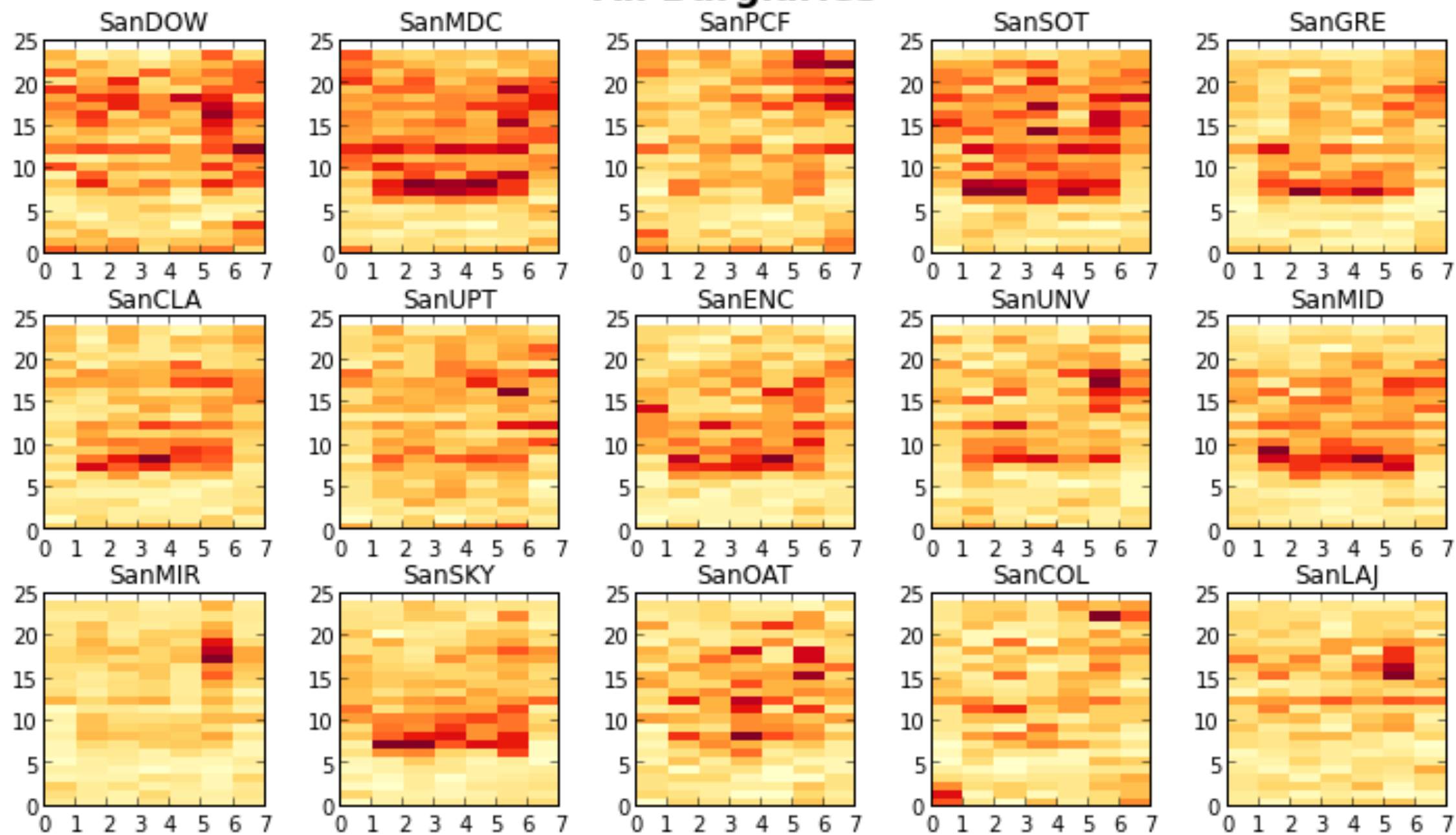


All Crime

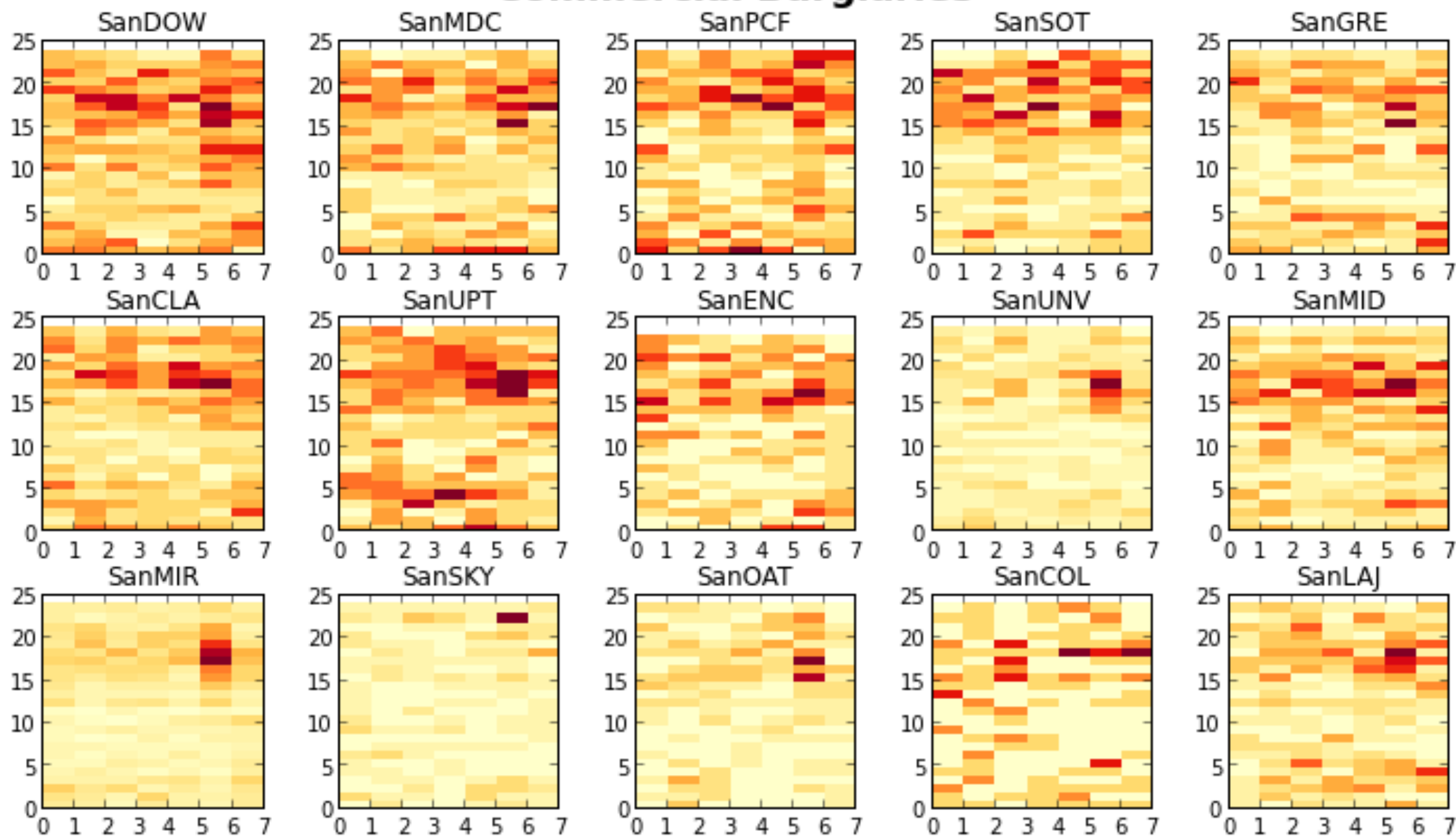


Burglary

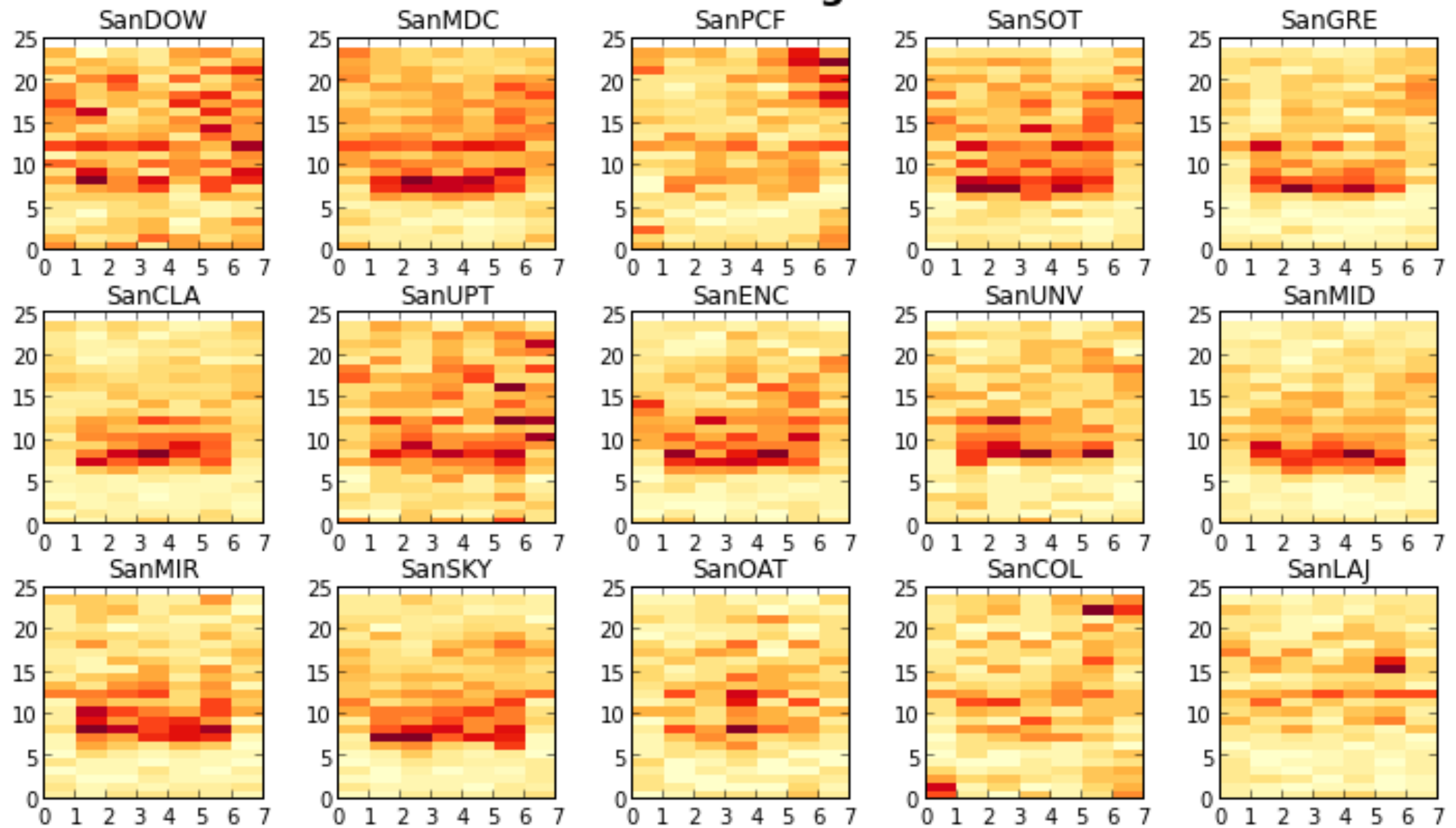
All Burglaries



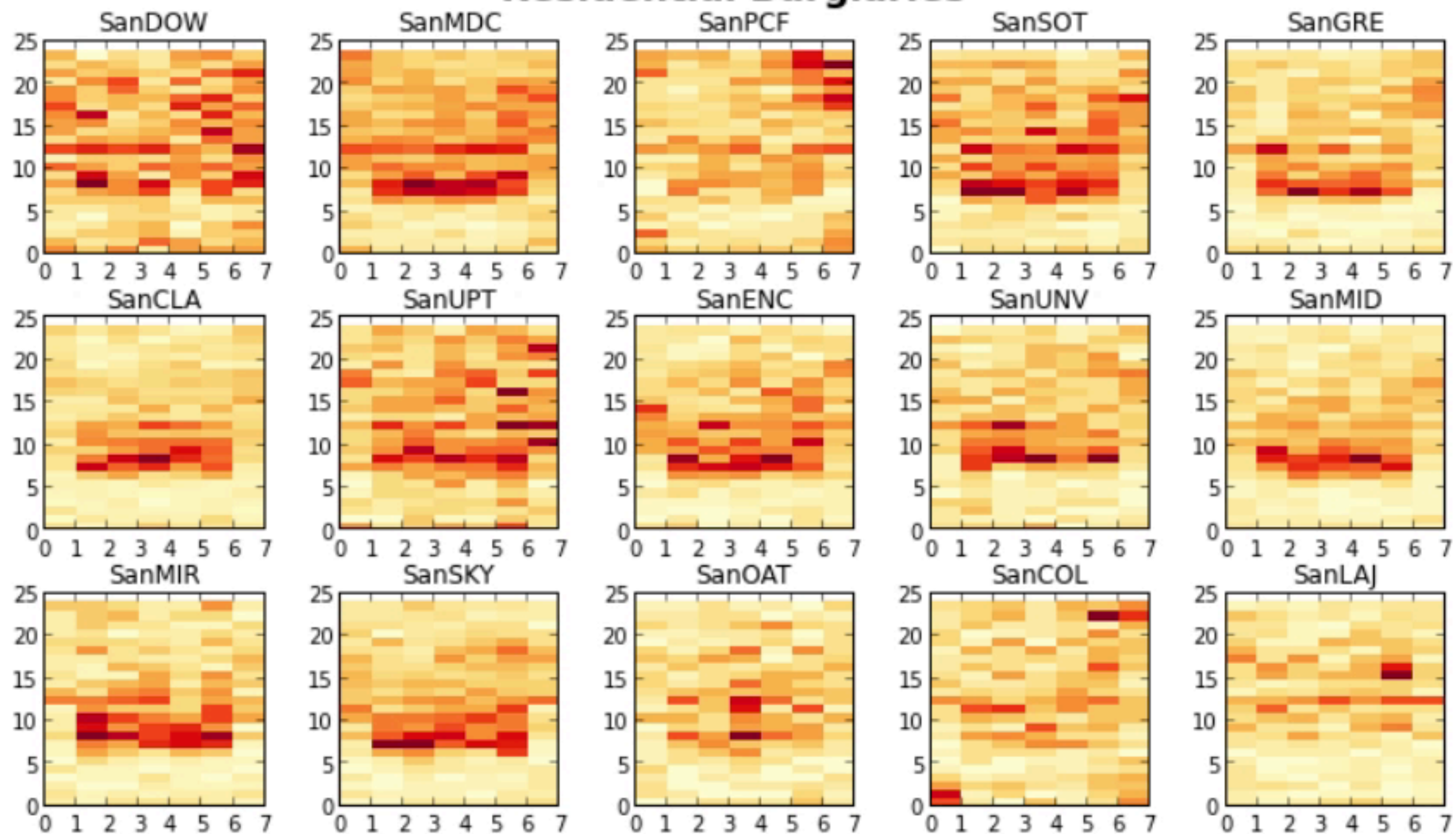
Commercial Burglaries



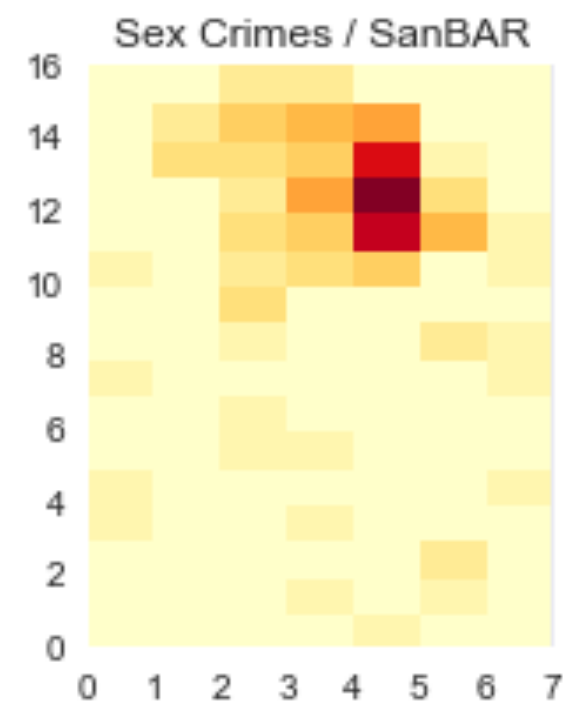
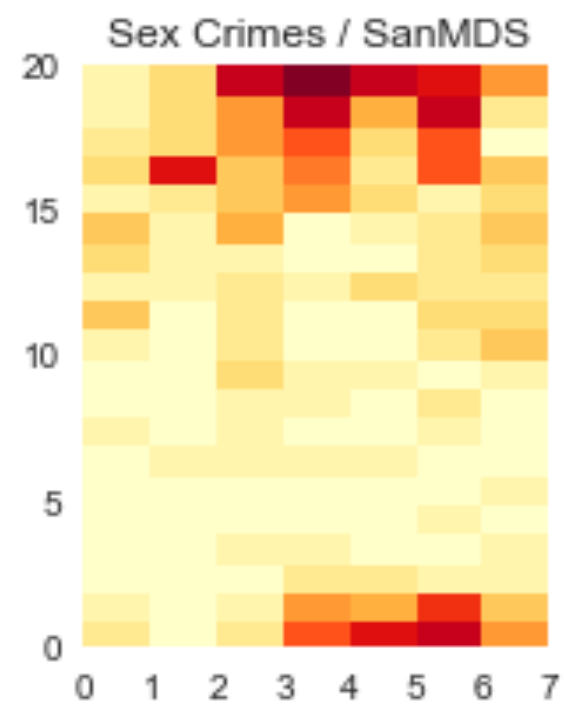
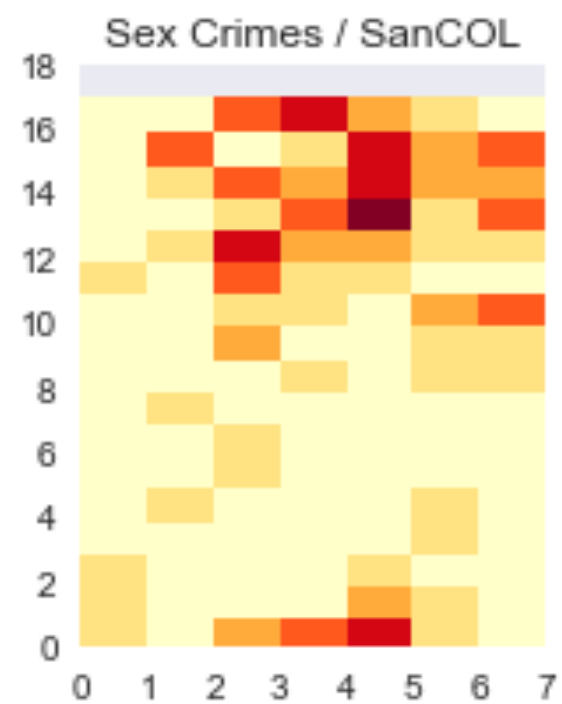
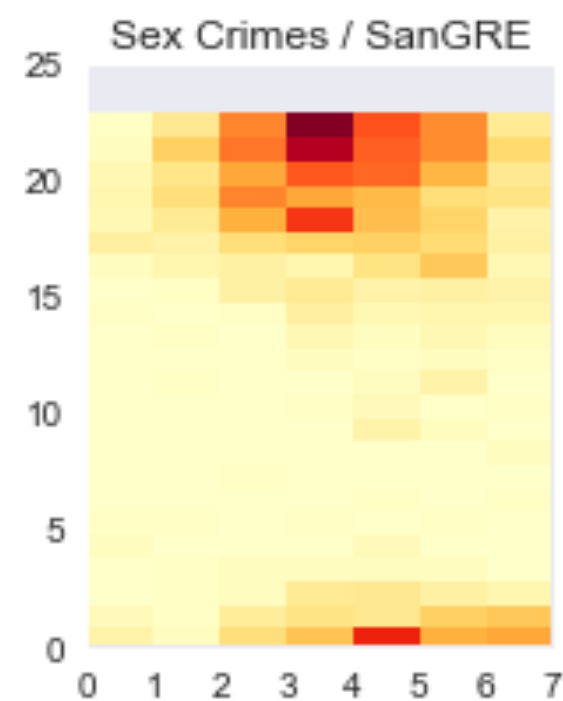
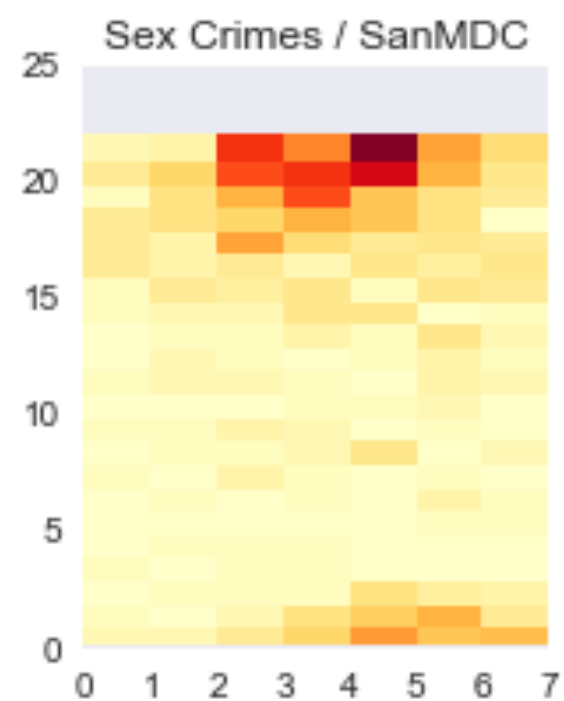
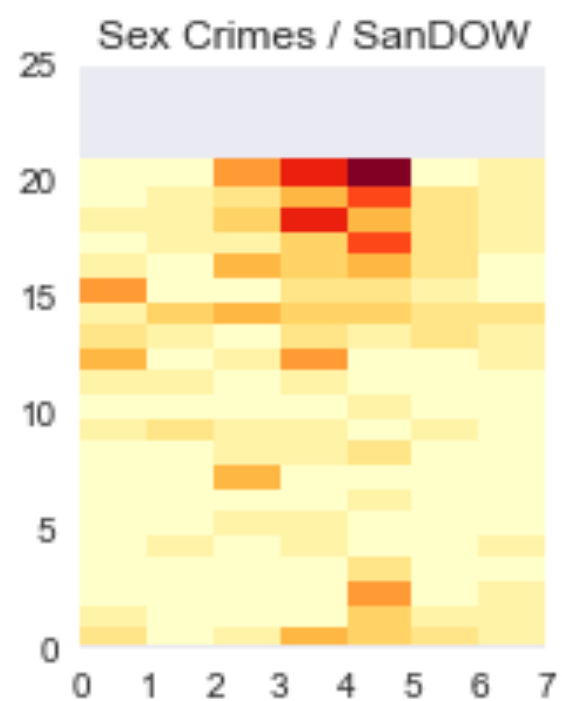
Residential Burglaries



Residential Burglaries

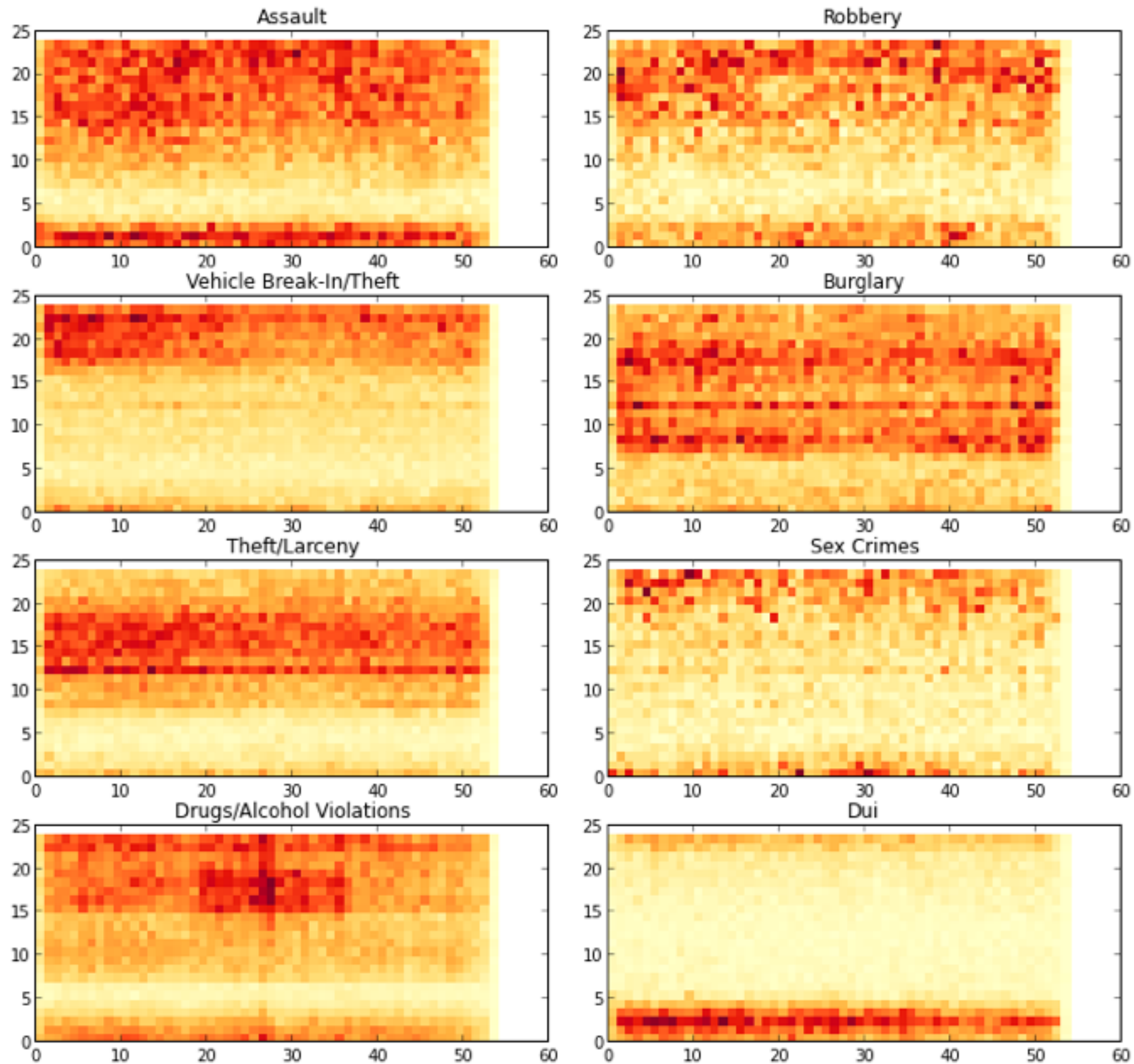


Prostitution

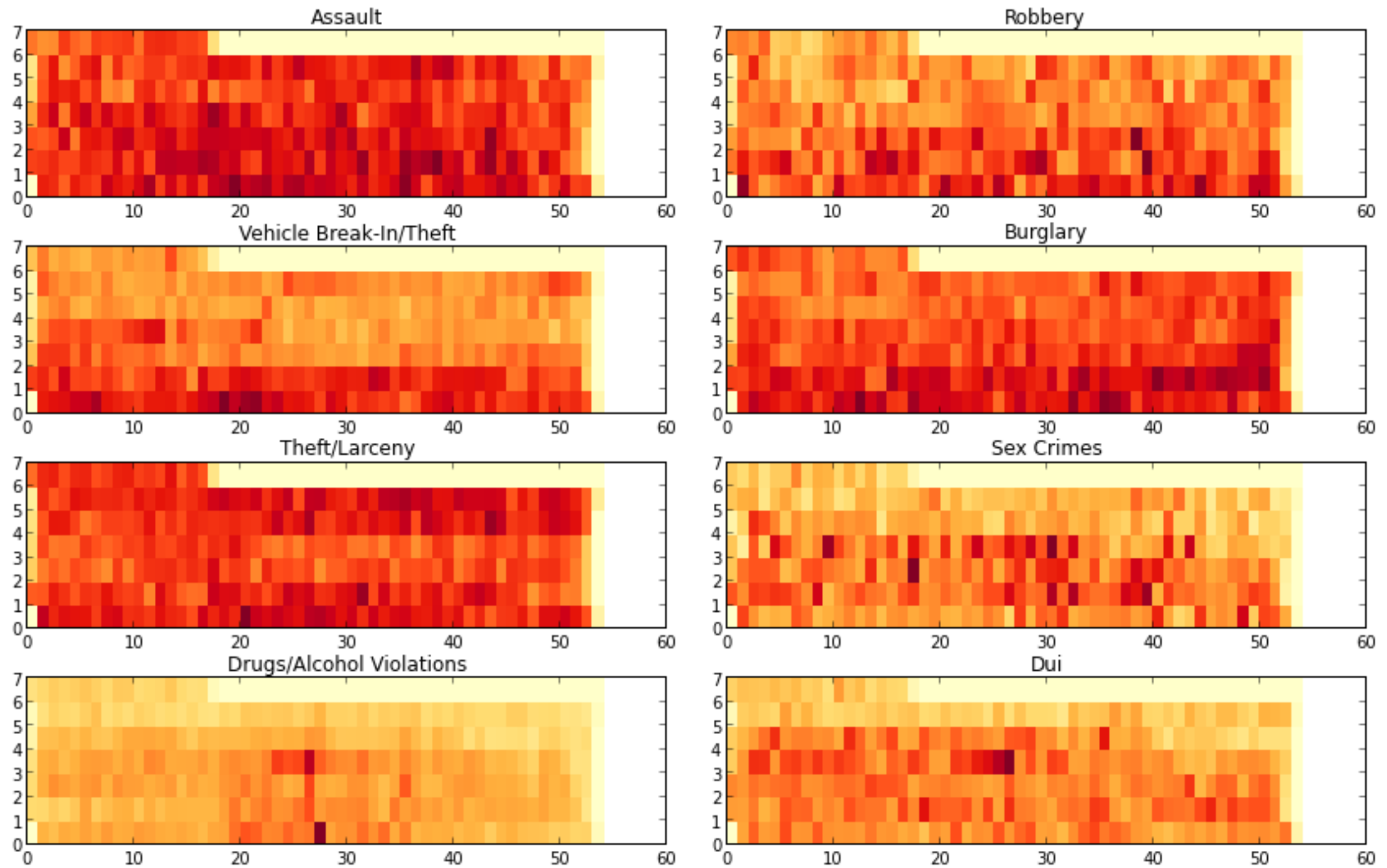


Long Term Rhythm

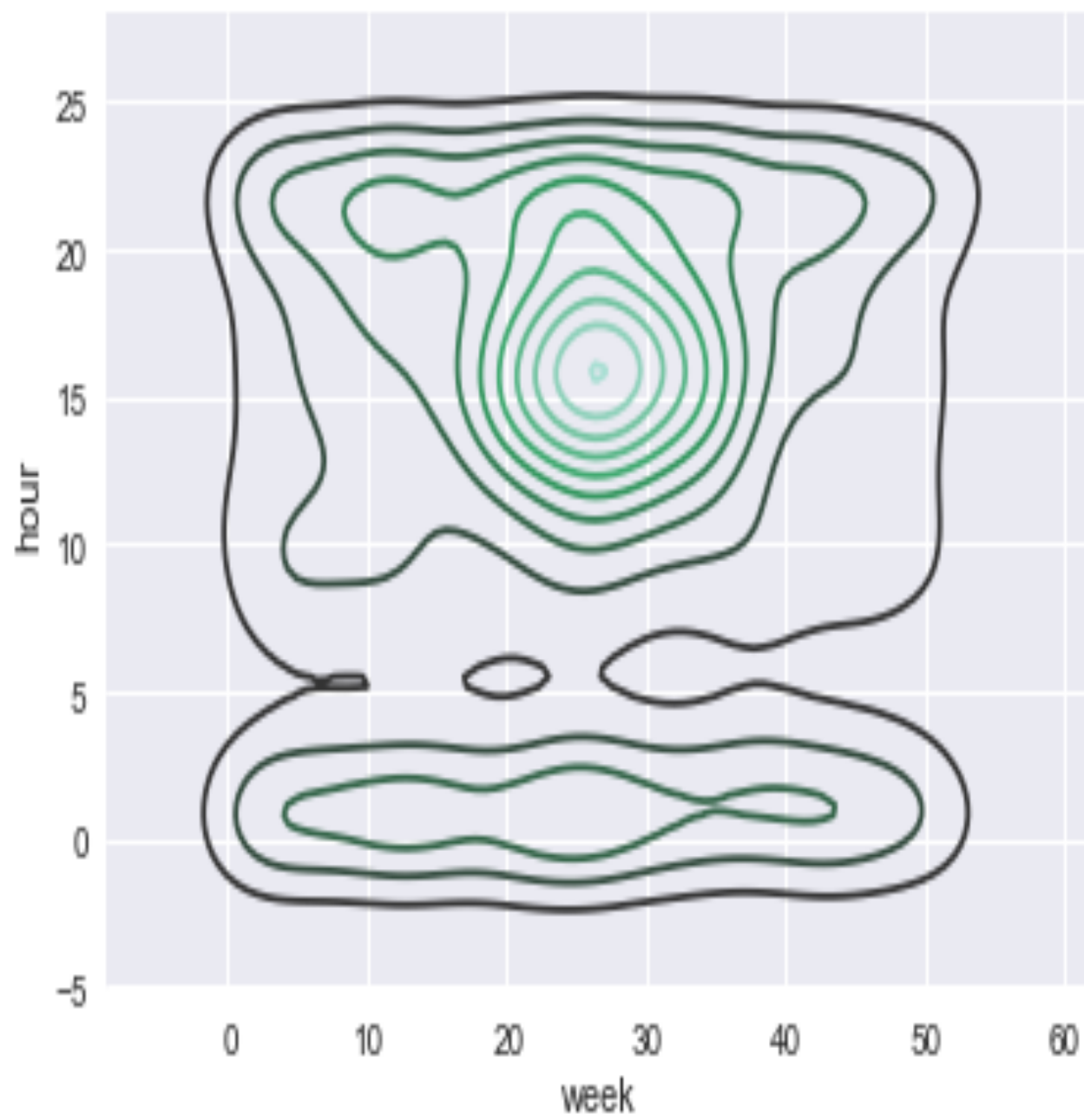
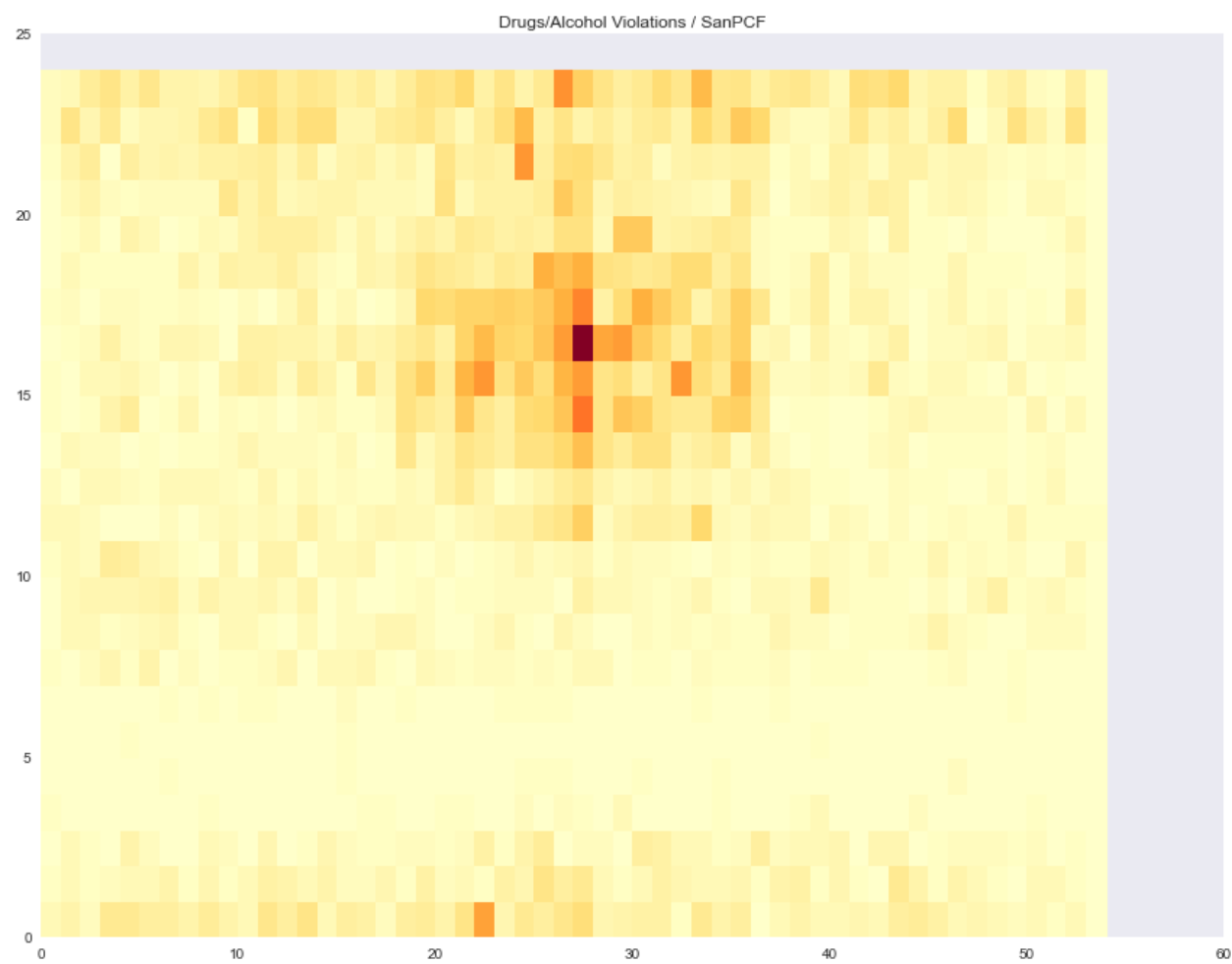
Hour / Week



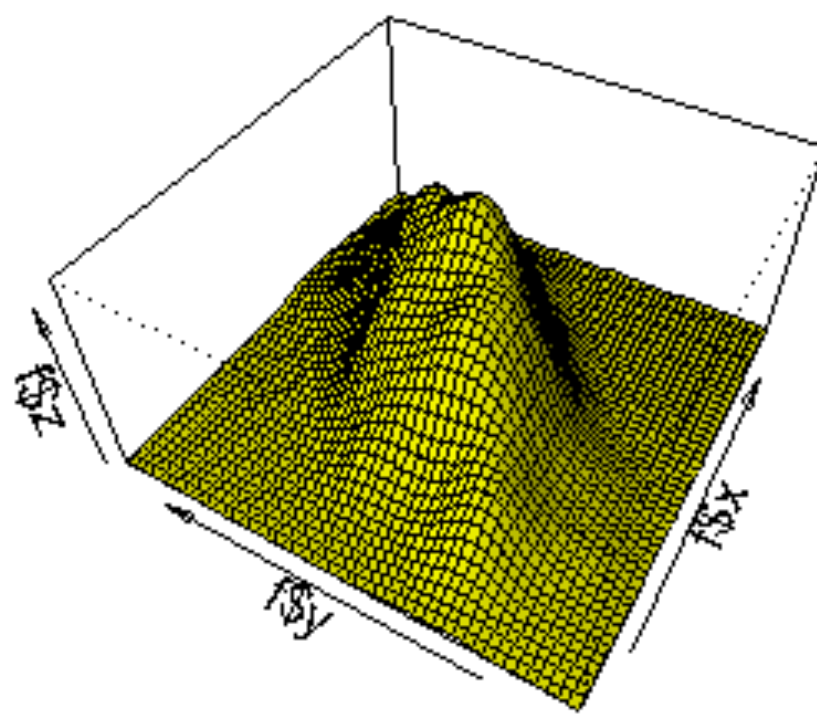
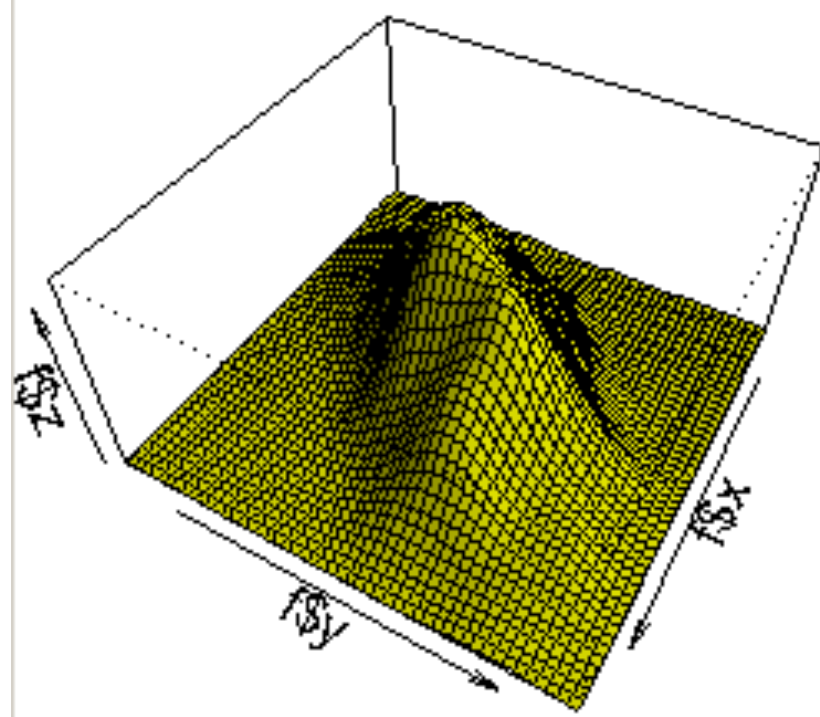
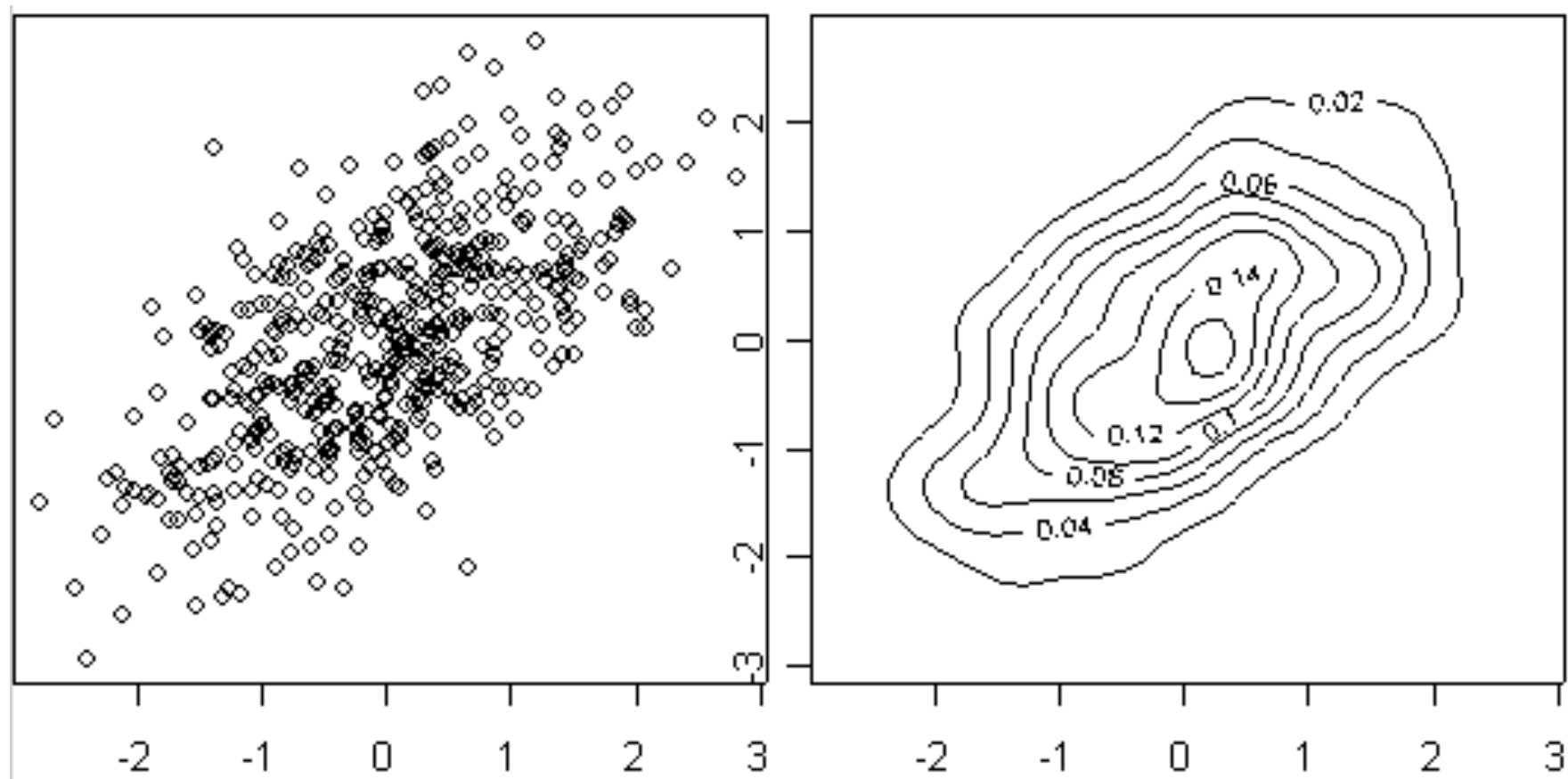
Year / Week

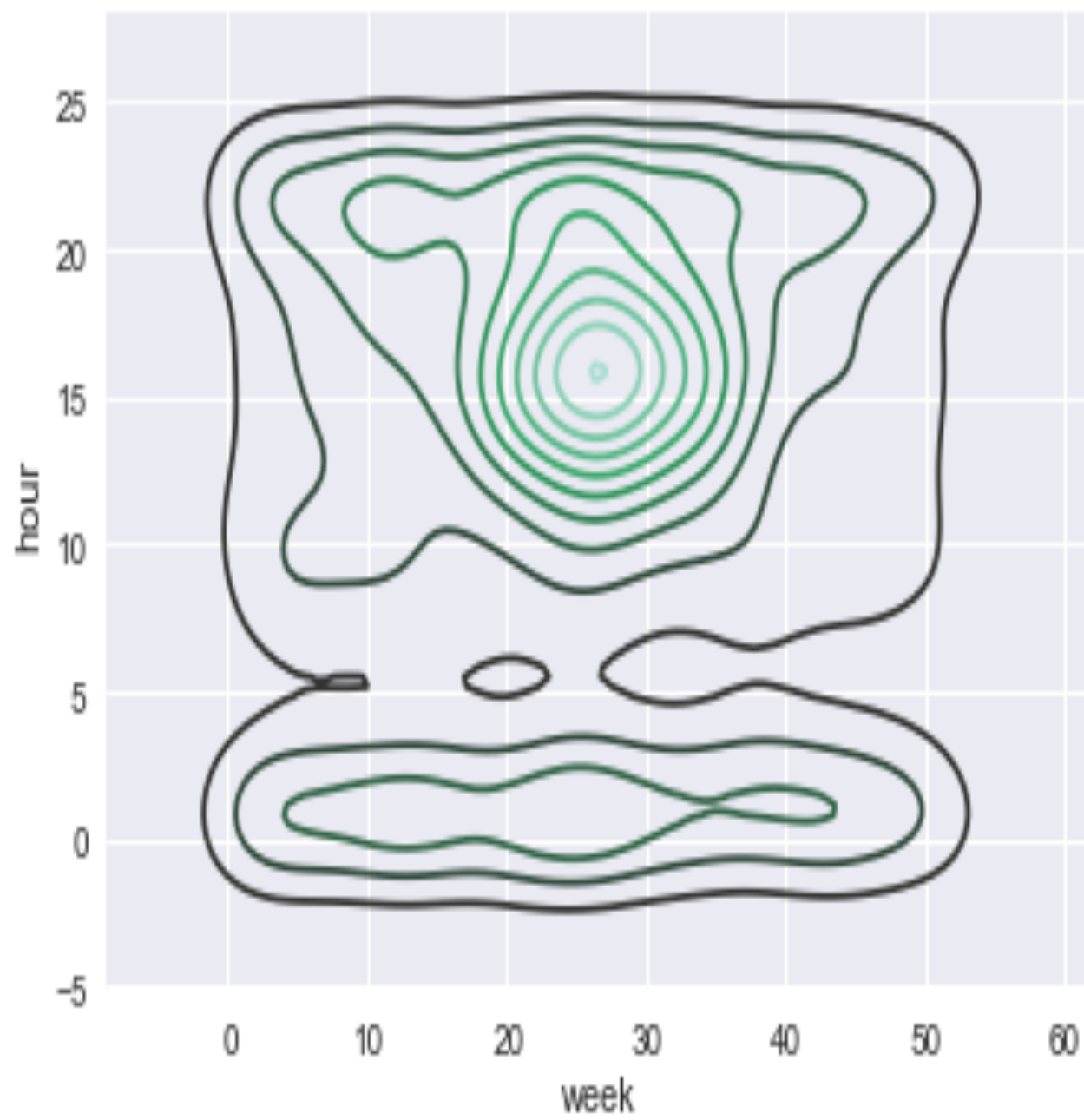
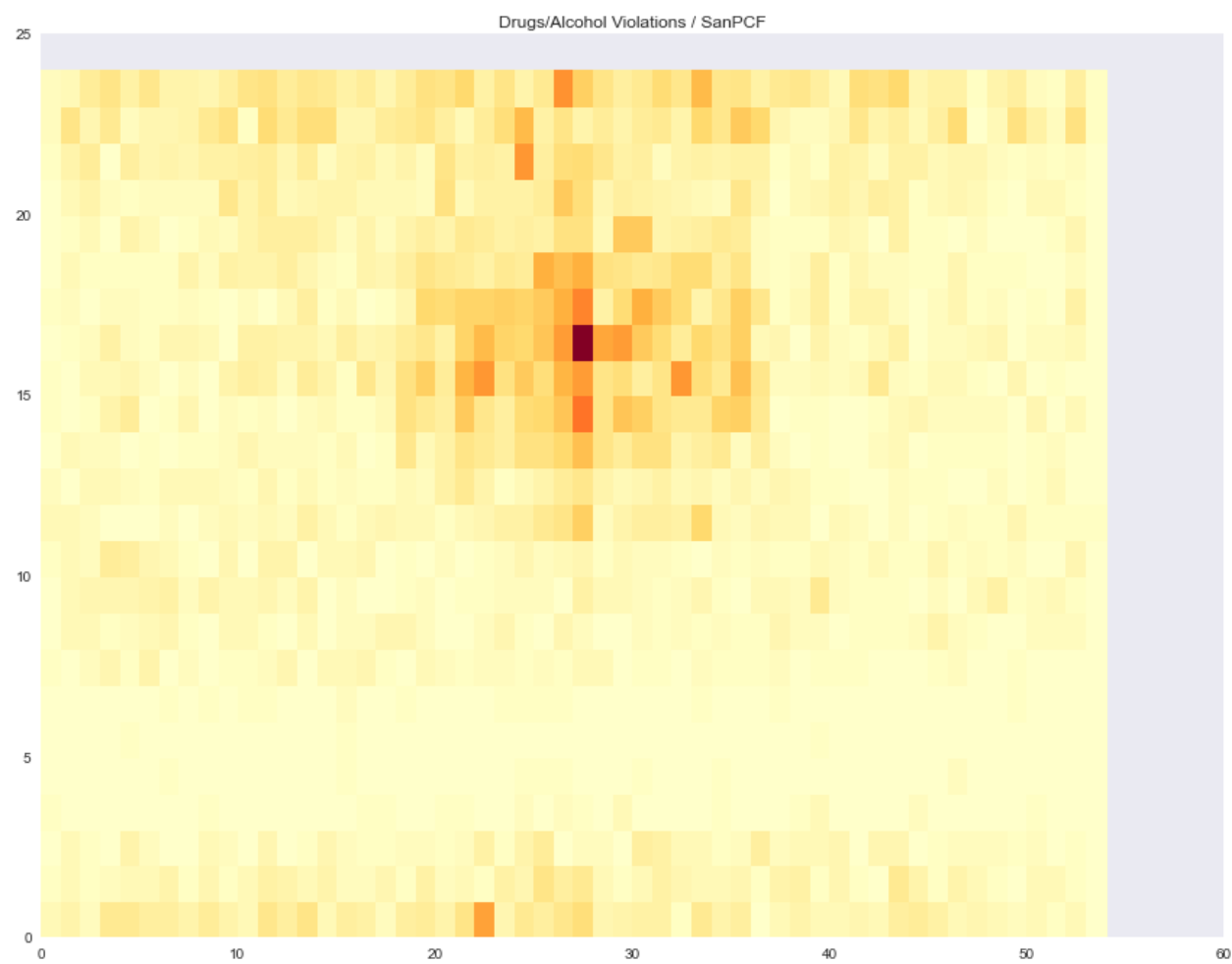


Kernel Density Estimation









25

20

15

10

5

0

-5

25

20

15

10

5

0

0

10

20

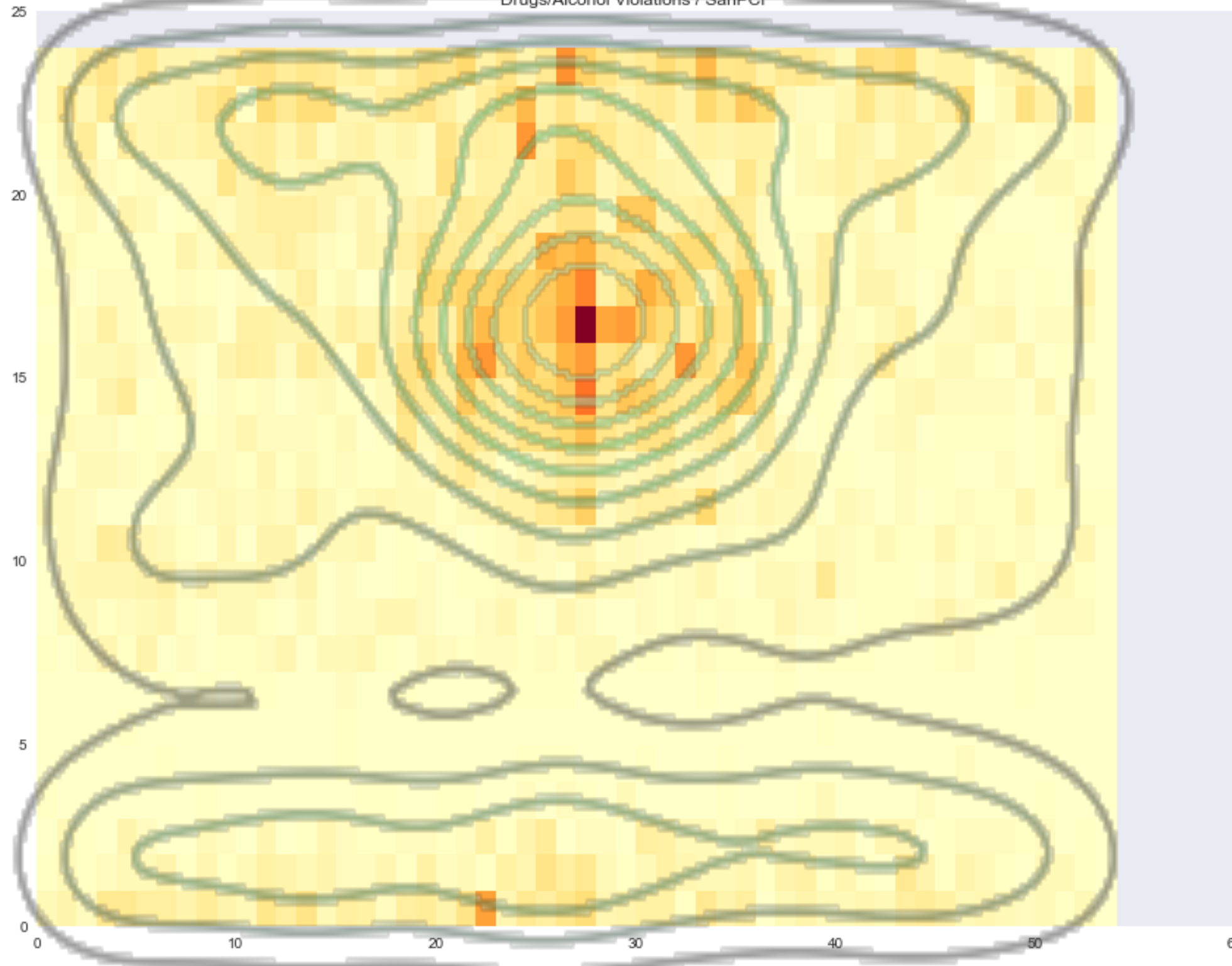
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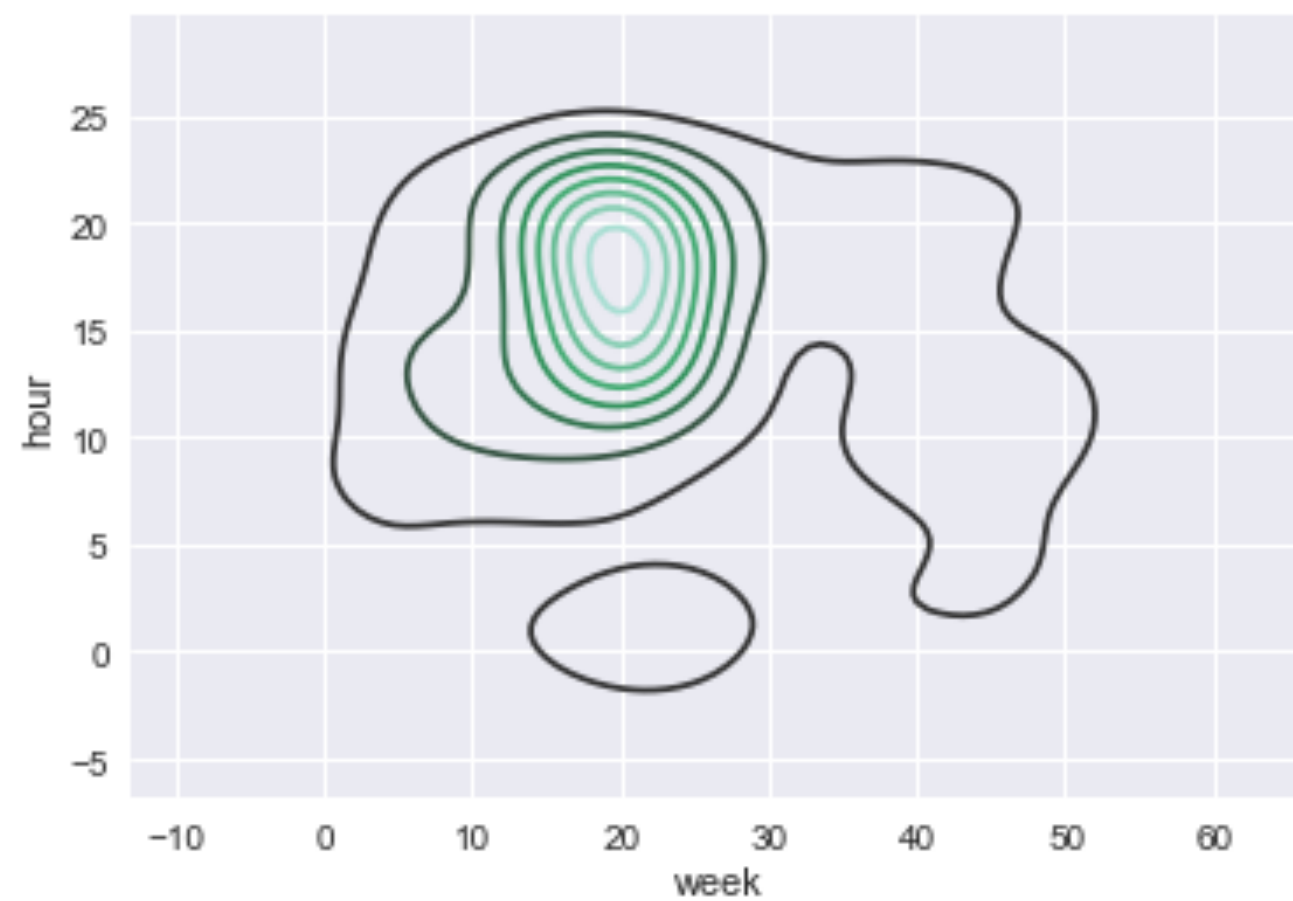
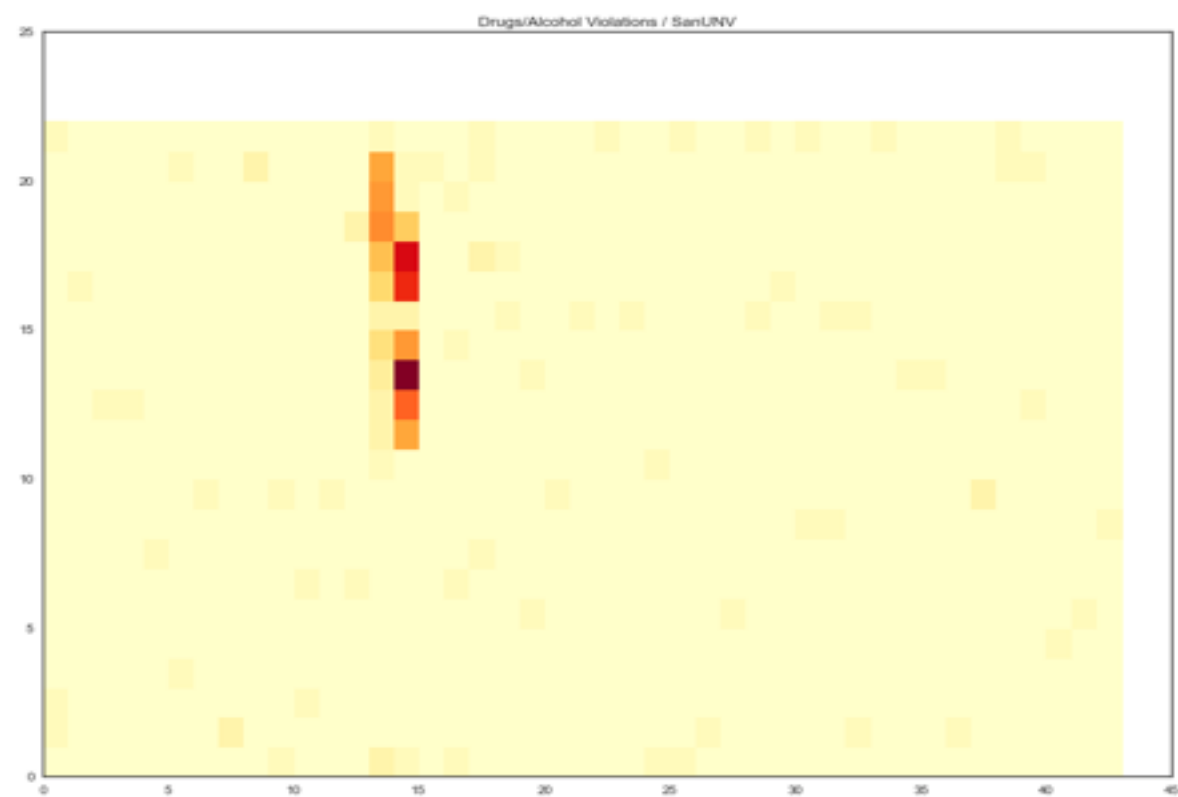
40

50

60

Drugs/Alcohol Violations / SanPCF





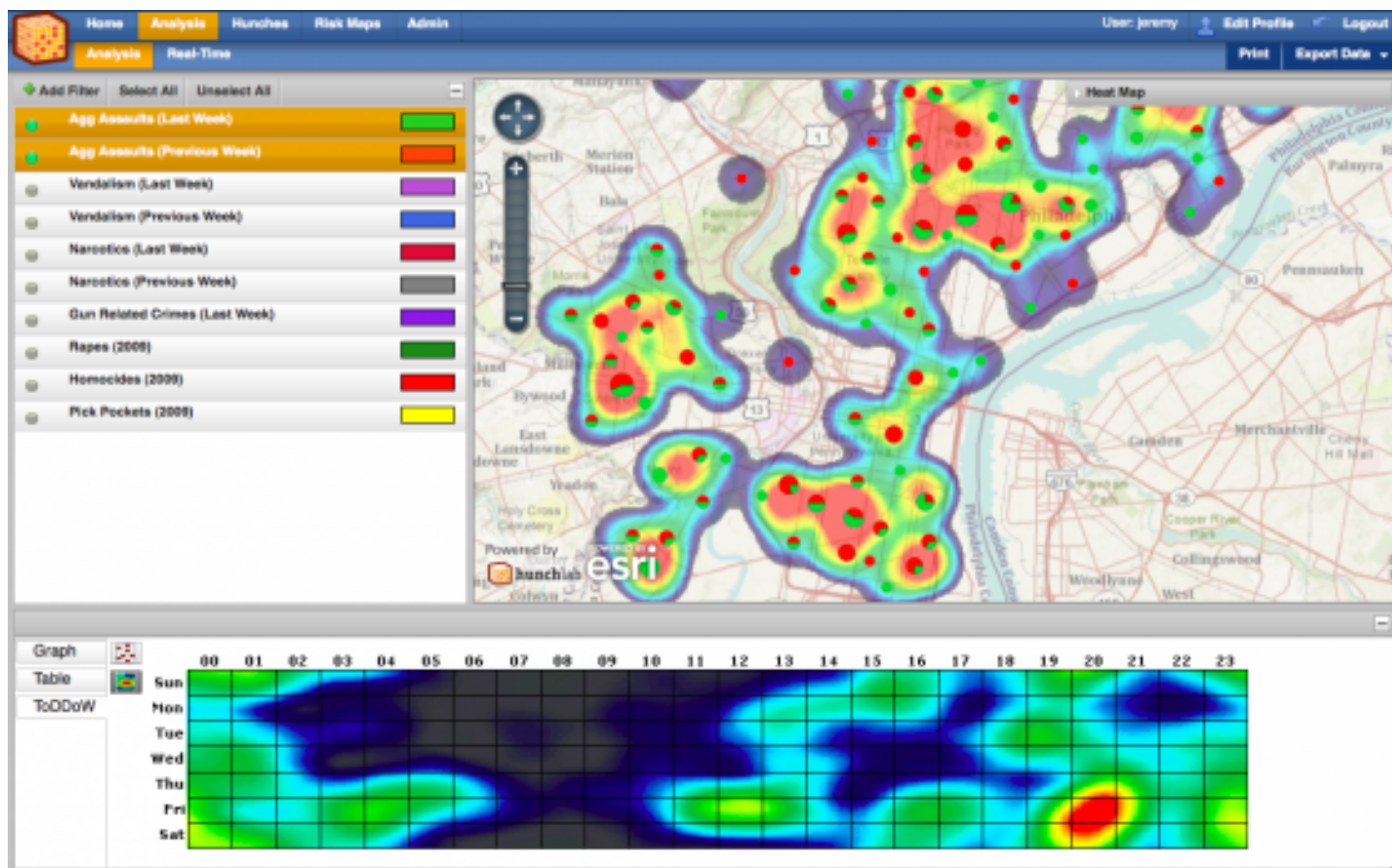
Heat Maps

- Not just for maps
- Explore different time dimensions
- KDEs can smooth out the data to reveal new patterns
- ... but can also destroy patterns.

Making Heat Maps

	C	D	E	F	G	H	I	J	K
	Sun	Mon	Tue	Wed	Thu	Fri	Sat		
0000	2.59	0.66	0.68	1.35	1.35	2.03	1.6		
0100	1.39	0.7	0.95	1.22	1.08	1	2.12		
0200	2.87	0.59	1.02	1.22	0.57	1.08	3		
0300	0.99	0.25	0.5	0.48	0.5	0.99	1.7		
0400	1.06	0.42	0.17	0.56	0.24	0.3	0.48		
0500	0.32	0.23	0.39	0.22	0.47	0.47	0.44		
0600	0.42	0.41	0.57	0.6	0.64	0.5	0.49		
0700	0.38	1.29	0.77	0.86	1.42	1.14	1.22		
0800	0.53	1.05	1.77	1.56	1.32	1.58	1.67		
0900	0.62	2.04	2.97	1.45	2.96	1.92	2.32		
1000	1.37	2.09	3.67	1.87	2.52	1.47	2.29		
1100	0.98	3.27	1.6	3.32	2.89	2.09	1.27		
1200	1.81	3.41	2.66	2.7	3.24	2.84	1.35		
1300	2.38	1.79	2.15	1.91	1.64	1.43	2.49		
1400	2.31	2.69	3.19	2.98	2.85	3.69	1.17		
1500	1.44	1.46	1.44	3.46	1.55	3.55	2.35		
1600	1.18	2.61	3.74	3.21	2.76	1.98	1.84		
1700	1.52	3.45	1.4	1.99	1.79	3.33	2.1		
1800	2.09	2.53	1.64	1.37	3.15	3.1	1.21		
1900	2.67	1.2	1.44	2.04	2.58	1.16	2.34		
2000	1.5	2.31	2.58	1.89	2.76	1.96	1.75		
2100	0.81	1.7	1.97	1.76	0.99	3.16	1.92		
2200	1.24	1.91	1.97	1.48	2.22	2.93	1.63		
2300	1.69	1.55	1.74	1.29	2.01	1.97	3.87		

- The screenshot shows the Philadelphia Police Department's 'Heat Map' application. The main map area displays a color-coded density of crimes across the city. The sidebar on the left contains filters for 'Crime Type' (Burglary, Theft, Robbery, etc.), 'Created' (Wed Aug 19 2009 06:14:26 AM EDT), 'View' (Eastern Daylight Time), 'Status' (Incident), 'Class' (Burglary (500 Series), Commercial Burglary (500 Series), Robbery (500 Series), Theft (500 Series)), 'Recent' (20 Days), 'Time' (None), 'Boundary' (Block Face 365 Days), 'Shape' (None), 'Color' (None), 'Style' (None), and 'Color' (None). The legend on the right indicates the color scale for crime density. The 'Graph & Table' section at the bottom shows a grid of data points, with columns representing different crime types and rows representing different geographic areas.



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