

# Student Research Update

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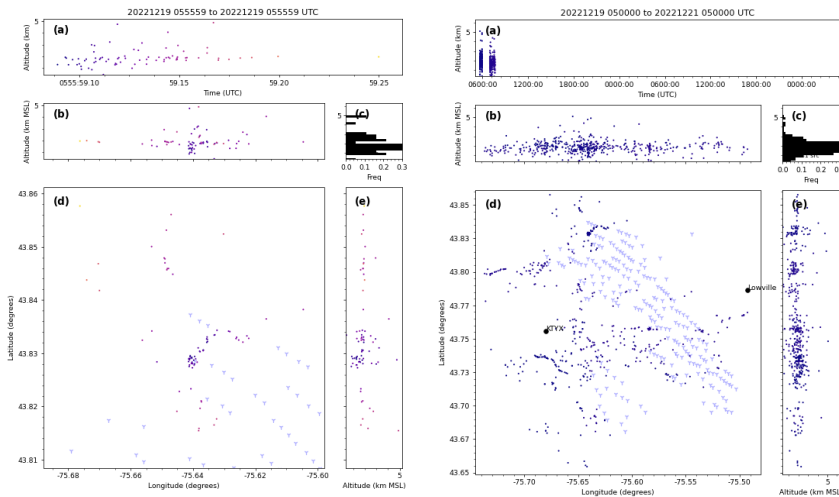
# LEE\_FLASHCOUNTS

- Combined Vanna Chmielewski's LEE\_flashcounts\_6 (station min of 6) and LEE\_flashcounts (station min of 5) into one document
- Color key at the top

Identifier	Time Searched	Agree	Slightly Agree	Disagree	
		Station Min 5	Station Min 6	Station Min 7	
Time	FlashCount-SM 5	FlashCount-SM 6	Manual LMA	NLDN	IOP/SM
2022-11-30 23:00:00	0	0			
2022-12-01 0:00:00	0	0			
2022-12-01 1:00:00	0	0		0	
2022-12-01 2:00:00	1	0		1	
2022-12-01 3:00:00	12	9		15	
2022-12-01 4:00:00	6	3		5	
2022-12-01 5:00:00	8	7		9	
2022-12-01 6:00:00	10	8		8	
2022-12-01 7:00:00	5	4		5	
2022-12-01 8:00:00	1	0		0	
2022-12-01 9:00:00	0	0		0	
2022-12-01 10:00:00	0	0			

# LMA PLOTS FOR EACH LIGHTNING STRIKE

- Lightning flashes based on times in the IOP Lightning Data document
- General overview of IOP (right) and individual flashes (left)



# Other Obstacles

```
obstacles = "https://aeronav.faa.gov/Obst_Data/DOF_230319.zip"  
urllib.request.urlretrieve(obstacles, "DOF_230319.zip")
```

## 1) Retrieve the data file

```
data = zipfile.ZipFile('DOF_230319.zip')  
infos = data.infolist()
```

```
for info in infos:  
    if '36-NY' in info.filename:  
        print(info.filename)  
        info.filename = 'NewYork_Obstacles.Dat'  
        data.extract(info)
```

## 2) Unzip and find the correct file for New York

```
obs_colour = (0.0,1.0,0.2,0.3)  
art = self.lma_plot.ax_plan.scatter(NYObs.xlong, NYObs.ylat, color = obs_colour, marker = '1', zorder=-10)  
new_artists.append(art)
```

```
specs = [(35, 46), (49, 60), (82, 88), (62, 74)]  
NYObs = pd.read_fwf('NewYork_Obstacles.Dat', colspecs = specs, skiprows=9209, skipfooter =1,  
                  #test row  
                  #skiprows=10980, skipfooter=1735,  
                  names=('ylat', 'xlong', 'Elevation', 'Obstacle'))  
NYObs.to_csv(r'/Users/BenLa/lmaworkshop/LEE-2023/NewYork_Obstacles.csv')  
  
#There are going to be a lot of errors and this will take a long time to run  
#recommended to only use if you are looking at all objects and not just turbines  
od = pd.read_csv('NewYork_obstacles.csv')  
o = 0  
p = 0  
m = 0  
n = 0  
  
while o < od.shape[0]:  
    row = od.loc[o, "ylat"]  
    x = row.split()  
    for r in range(len(x)):  
        x[r] = float(x[r])  
    x[1] = x[1]/60  
    x[2] = x[2]/3600  
    m = x[0]+x[1]+x[2]  
    od.at[o, "ylat"] = m  
    o += 1  
  
while p < od.shape[0]:  
    row2 = od.loc[p, "xlong"]  
    x = row2.split()  
    for r in range(len(x)):  
        x[r] = float(x[r])  
    x[1] = x[1]/60  
    x[2] = x[2]/3600  
    n = 0-x[0]-x[1]-x[2]  
    od.at[p, "xlong"] = n  
    od.to_csv(r'/Users/BenLa/lmaworkshop/LEE-2023/NewYork_Obstacles.csv')  
    p += 1  
NYObs = od
```

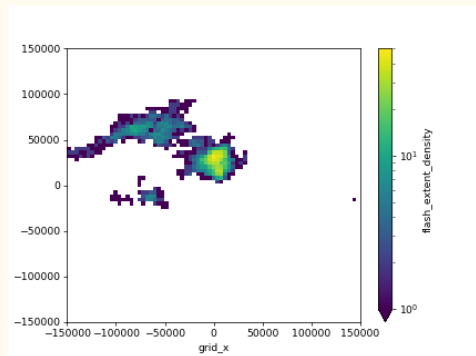
3) Format the columns, remove unneeded data, set the latitude and longitude from minute-second format to decimal

The original code processes latitude and longitude in decimal format

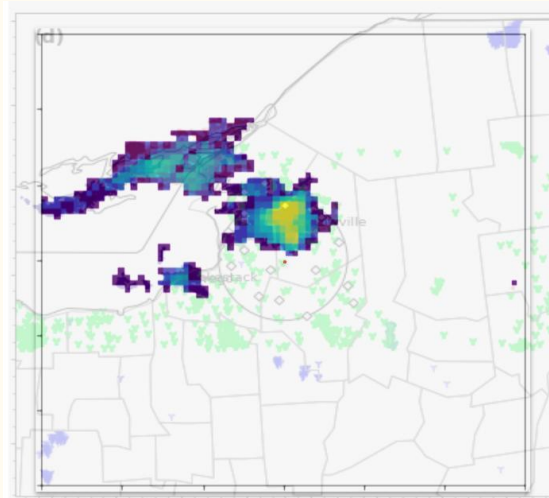
4) Add the obstacles to the plot

# Other Obstacles Plot/Grid Map

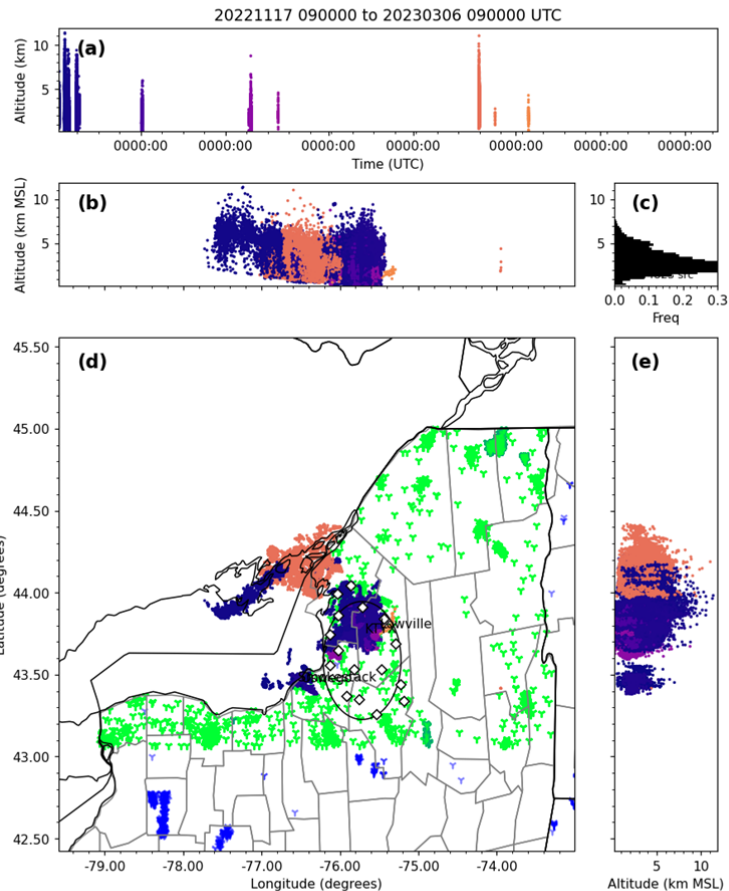
- Dark Green for where turbines file and obstacles file agrees
- Light Blue for where turbines file marks a turbine that isn't in the obstacles file
- Light Green for other obstacles (Towers, Smokestacks, ect.)



Original grid plot



Overlaid on top of map



# Non-tower correlated flashes

- Began looking for flashes that were  $>700\text{m}$  away from a tower
- Closest was  $0.71\text{km}$  from a tower with an initial point at an altitude of  $1.95\text{km}$

Tower	Flash ID	Description
Not @	LOP2a - 09514745	Lightning
	LOP2a - 09514754	Lightning
	LOP2a - 09514754	Lightning
	LOP2a - 09514761	Lightning
	LOP2a - 09514761	Lightning
	LOP2a - 12255987	Lightning
	LOP2a - 12255989	Lightning
	LOP2a - 12255999	Lightning
	LOP2a - 12255998	Lightning
	LOP2 - 0922043	Lightning
	LOP2 - 0922740	Lightning
	LOP2 - 1029599	Lightning
	LOP2 - 1034444	Lightning
	LOP2 - 10344500	Lightning
	LOP2 - 10344529	Lightning
	LOP2 - 10344536	Lightning
	LOP2 - 10344541	Lightning
	LOP2 - 23242500	Lightning
	LOP2 - 23242542	Lightning
Atmosphere	LOP2 - 02343068	Lightning
	LOP2 - 02343083	Lightning
A	LOP2 - 043925	Lightning
	LOP4 - 203521	Lightning
	LOP4 - 220261	Lightning
	LOP4 - 043946	Lightning
	LOP4 - 043943	Lightning

Skipped any originating in Canada

Flash ID	Description	Misc ID	Description
LOP5 - 072028	Lightning	Misc2 - 053118	Lightning
LOP5 - 140237	Lightning	Misc1 - 052741	Lightning
LOP5 - 140408	Lightning	Misc1 - 070237	Lightning
LOP11 - 022633	Lightning	Misc1 - 070400	Lightning
LOP11 - 022917	Lightning	Misc2 - 171411	Lightning
LOP11 - 023020	Lightning		
LOPET - 2118285	Lightning		
LOPET - 2118733	Lightning		
LOPET - 2118757	Lightning		
LOPET - 212437	Lightning		
LOPET - 213655	Lightning		
LOPET - 213286	Lightning		
LOPET - 281287	Lightning		
LOPET - 281240	Lightning		
LOPET - 282426	Lightning		
LOPET - 282437	Lightning		
Misc1 - 023572	Lightning		
Misc1 - 03303688	Lightning		
Misc1 - 033246	Lightning		
Misc1 - 033503	Lightning		
Misc1 - 03394195	Lightning		
Misc1 - 0344021	Lightning		
Misc1 - 03543552	Lightning		
Misc1 - 03563582	Lightning		
Misc1 - 03563588	Lightning		
Misc1 - 035827	Lightning		