Turbine and Tower Interactions

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What I have been working on:

- Turbine/towers interactions with LE lightning
- Determining likely turbine/tower initiated lightning flashes
- Recording the distance between strokes/isolated low altitude events and turbines/towers
- All work so far has been done on IOP3 with about 100 flashes around the turbine region

Methods

IOP_Flash #	osest tower source	Distance (m)	Distance (km)	Turbine ID	Altitude (km)	True Distance (km)
3_51	Maple Ridge WF	336	0.336	3015604		0.336

Above, example of data collected for average of first 10 events in flash.

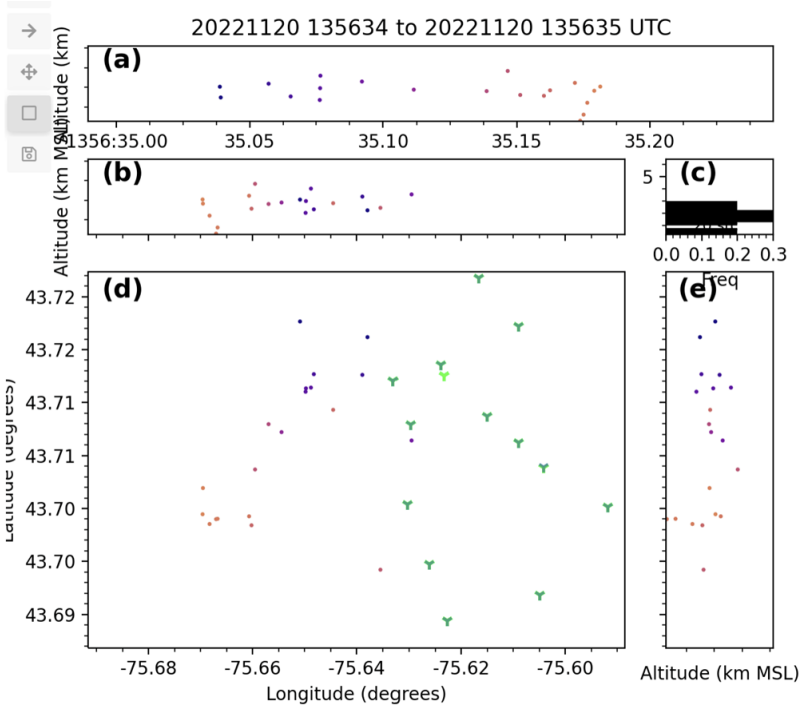
- Also recorded are data for the closest event to a tower source, the lowest altitude event, and the first event of the flash

To the right

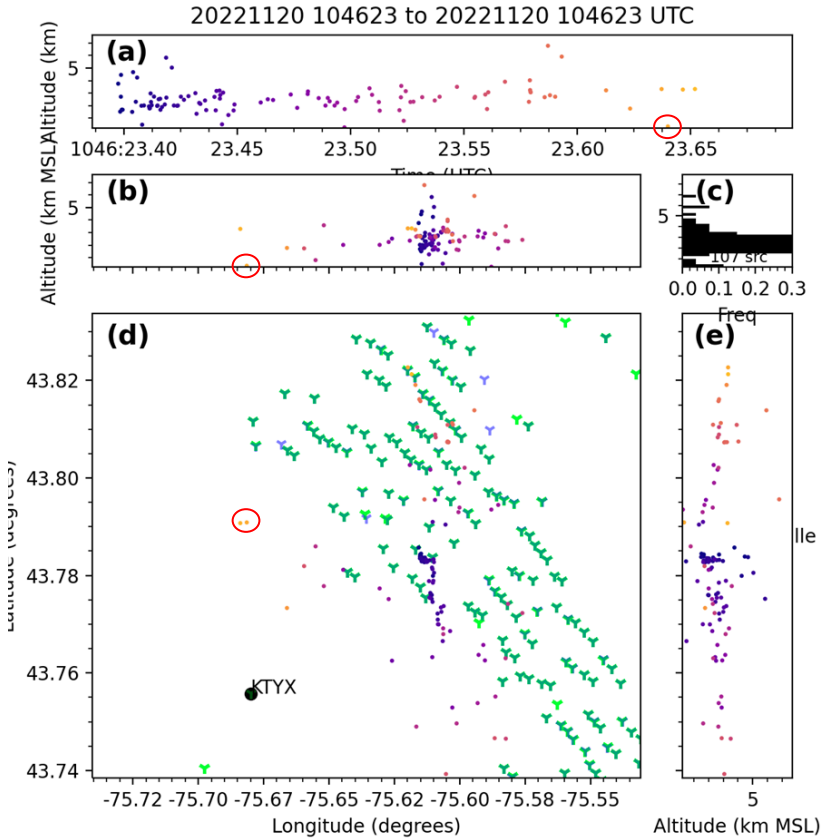
- Data for events at lowest altitude for
  - The beginning of the flash
  - Strokes
  - Isolated low altitude events

IOP_Flash #	Distance (m)	Distance (km)	Turbine ID	Altitude (km)	True Distance (km)
	Flash				
3_51	513	0.513	3015604	0.890	1.027
Stroke 1	142	0.142	3015604	0.334	0.363
Isolated event 1	443	0.443	3017649	0.473	0.648
Isolated event 2	358	0.358	3017654	0.530	0.640

Stroke vs Isolated low altitude



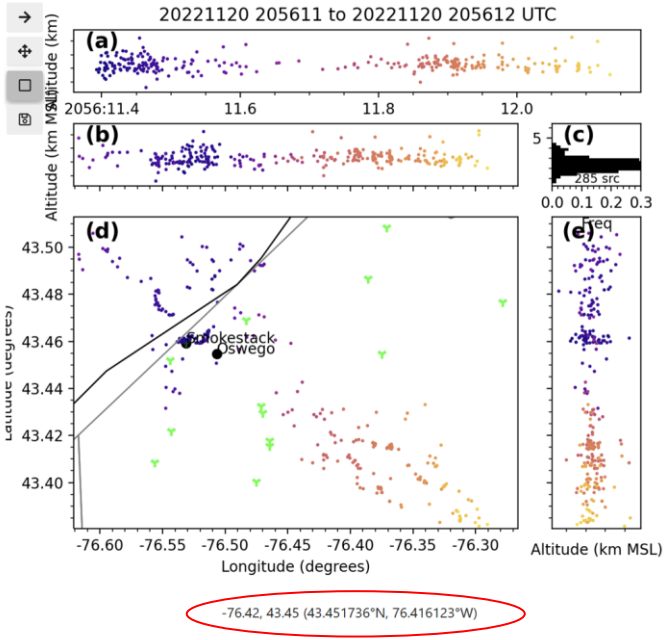
Stroke



Isolated low altitude event

Methods

- Distances measured using a GPS coordinate distance calculator with coordinates from toggling over map area
- Turbine IDs from the U.S. Wind Turbine Database
  - Not as updated as the Digital Obstacle File from the Federal Aviation administration
    - When turbine IDs are not available or dealing with towers, GPS coordinates were recorded instead
    - Working on incorporating elevation data into this work



Next Steps

- Incorporating elevation data into analysis

- Update the first half of the flashes for correlations with updated turbine/tower list (completed before that data was ready)