Thesis Plan

# What do I want to do

I want the ability to semi realistically generate actual events which would cause power grid substations/lines to go out of service. This could be done via hail storms, tornadoes, hurricanes or just simply high winds

I want to follow Panteli’s method for tornadoes for this as it’s something semi proven from literature

# Why is this important?

I get actual scenarios to run my simulation instead of just dumb storm travel lines which don’t even work properly

# Steps in Strader

3 Steps for me

Study region and model parameter definition

* Should be larger than 80 km^2
* Edge effects occur with key points that fall outside domain
  + Tornadoes move southwest to northeast so an under sampling occurs on the south and west sides
    - Add a buffer zone to mitigate this

Tornado footprint creation

* I don’t care at all about tornado counts
* They used the SPCC SVRGIS database to get the number of tornadoes
  + <https://www.spc.noaa.gov/gis/svrgis/>
    - This has tornadoes hail and wind
      * Paths and initial points for everything
  + <https://www.spc.noaa.gov/wcm/>
    - Has heatmaps
      * All heatmap data is within 25 miles (40km) of a point
        + So I guess it’s 6400 km^2 of area?
    - Also wind data with points on a map
      * Given a bunch of points I can create a grid and take out buses
        + Same with hail
      * For wind and hail, since I don’t want to just run through previous events, I can use the heatmaps to pick a spot and select a specific severe weather event day from the time series, center it on that point and run the grid
* You can choose to only select angles of a certain magnitude or above
  + I.e for me just select a random magnitude from the dataset, probably above a certain threshold
    - For the azimuth, they select a tornado with the same magnitude and use its azimuth
    - Same thing for length
  + Then get a width using a Weibull distribution
    - Need to figure out how to do this
  + Then simply select a random spot in the area
    - Or just use my heatmaps lol
    - Make sure it’s skewed properly and isn’t pole skewed as it would be if one chooses a random latitude and longitude

Tornado cost assessment

* How will I determine if a bus is hit?