Research Plan and Questions for Case Study of Precipitation in New Brunswick

*Work in Progress (like most research…)*

Two “sets” of data for NB precipitation:

* POI to 1968
* 1968 to present

Why? 1968 was the year when observation time changed from 6pm to 8am.

**PART I**

For each “set” of data, we can look at precipitation distribution and see how events have been happening, and how the magnitude of events has changed over time

* Possibly use a rolling average

Steps:

* Acquire daily data of precipitation from 1968 – now (start with this range)
  + I’ve also acquired monthly means, in case they come in handy
* Designate “bins” to separate this data into:

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | Trace | 0.01 – 0.10 | 0.10 – 0.25 | 0.25 – 0.50 | 0.50 – 0.75 | 0.75 –1.0 | 1.0 –  1.5 | 1.5 – 2.0 | 2.5 – 3.0 | 3.0 – 4.0 | >4.0 |

This was based off of AHPS but maybe there is a better way to separate the bins?

Possibly a frequency distribution graph for each year and how much of each event occurred

A 3-D plot?

* X axis: time
* Y axis: precipitation bins
* Z axis: frequency

Not sure if this is a good idea but this is what I was thinking

**PART II**

An interesting question: can the difference in observation time be seen through only the precipitation data? Possibly look at winter vs. summer. Storms seem to happen more often in the evening in the summer, so a storm could be “split” in two days if it is raining

Idea: Compare a “rolling total” of about three days for NB POI-Present to some sort of daily statistical measure (maybe a regular average)

UPDATE 4/6: Methods analyzed in the Kunkel et al. paper that I will attempt to replicate

Start with New Brunswick, then look at other stations

The Recurrence Interval Method:

* Combine data and get 2-day precip totals (Monday/Tuesday, Tuesday/Wednesday,…)
* Analyze the temporal variation in the number of extreme precipitation totals of 2-day duration exceeding a recurrence interval of five years (this data can be found at https://hdsc.nws.noaa.gov/hdsc/pfds/pfds\_map\_cont.html?bkmrk=nj) for NB

The 1% Method (Possibility 1):

* Find the 99th percentile (the top 1% for daily amounts) of all days for NB
* See where these events fall on the timeline of all days
  + Do more fall near the end?

~~The 1% Method (Possibility 2):~~

* ~~Find the 99~~~~th~~ ~~percentile (the top 1% of daily amounts) for each year in NB~~
* ~~See how the amount in the top 1% each year changes throughout the POR~~