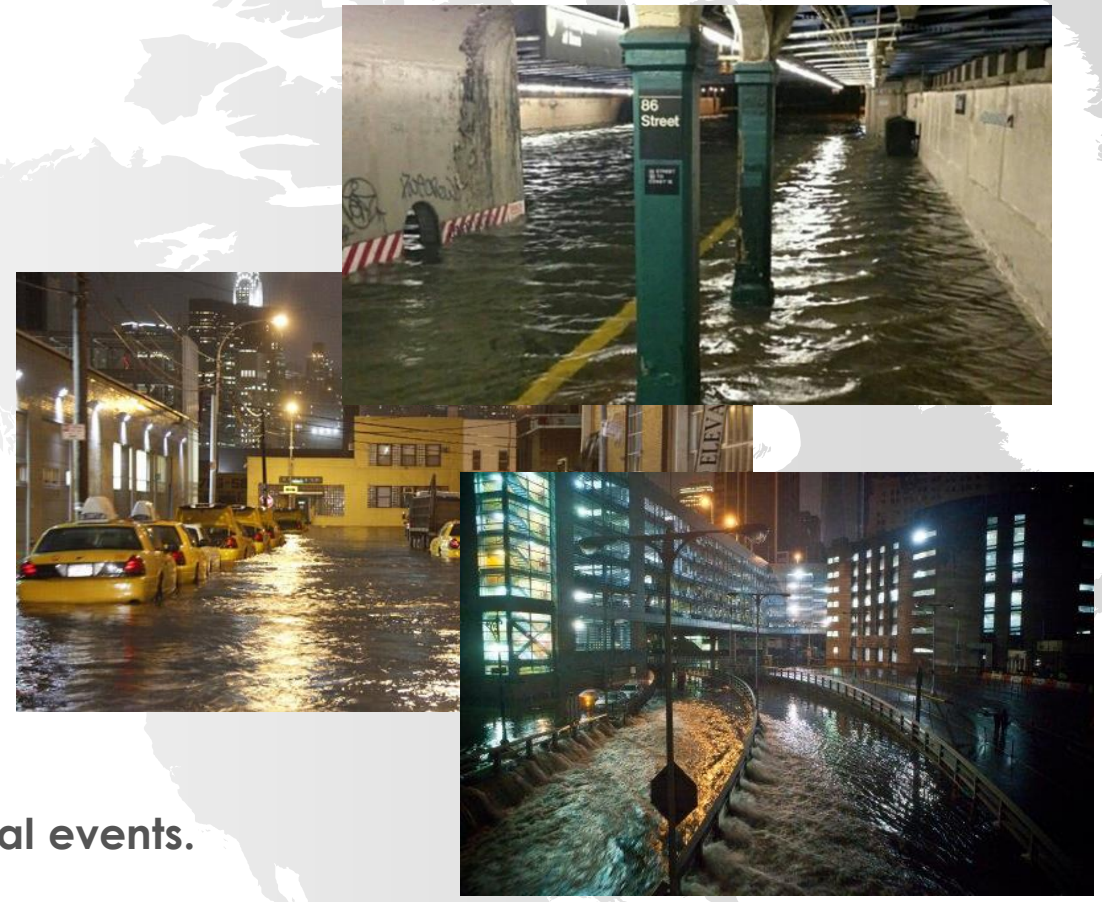
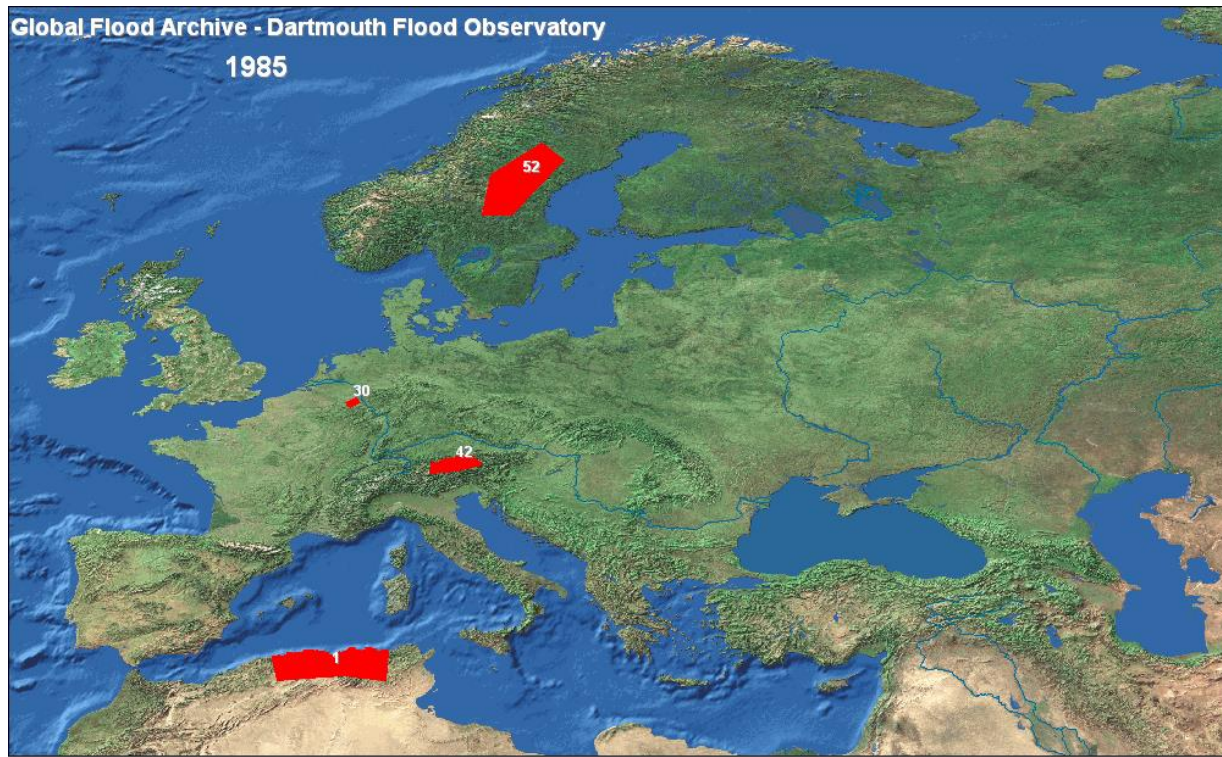


FREQUENCY ANALYSIS IN EXTREME RAINFALL EVENTS

Saman Armal

PhD Student of Civil Engineering – Water Resources

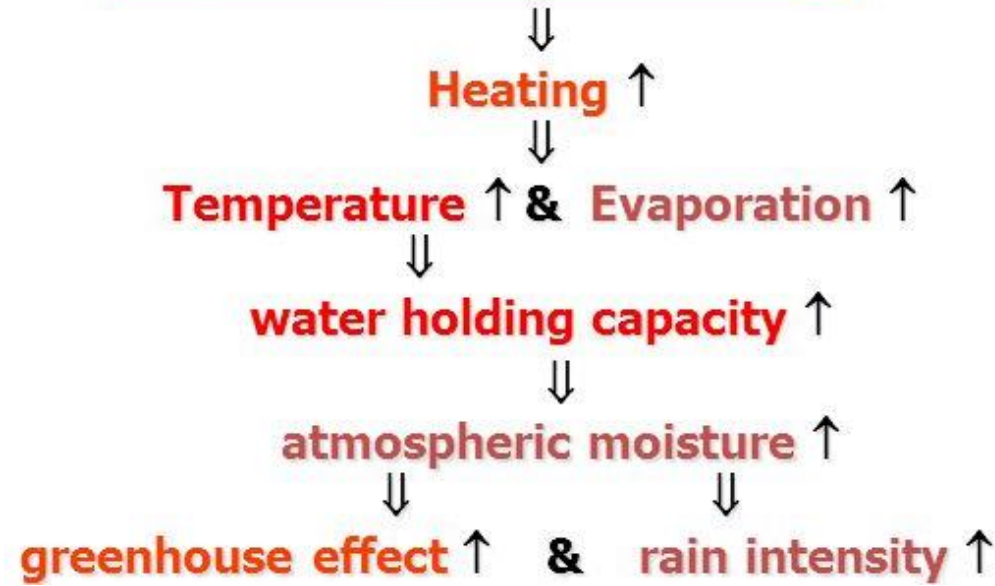
June 2017



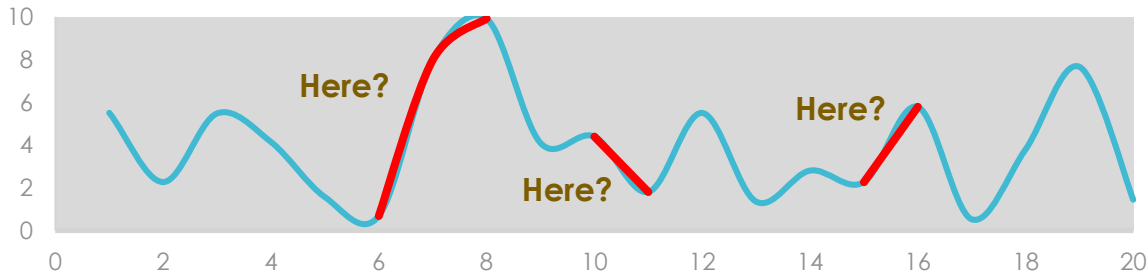
- 80% of natural disasters' economic losses : hydro-meteorological events.
- Flooding damage in central Europe : 11.4-13.5 billion Euro.
- NYC, the estimated flood damage to buildings : \$59 -129 million/year.
- Super storm Sandy in NYC and NJ : USD \$60 billion.



Global warming

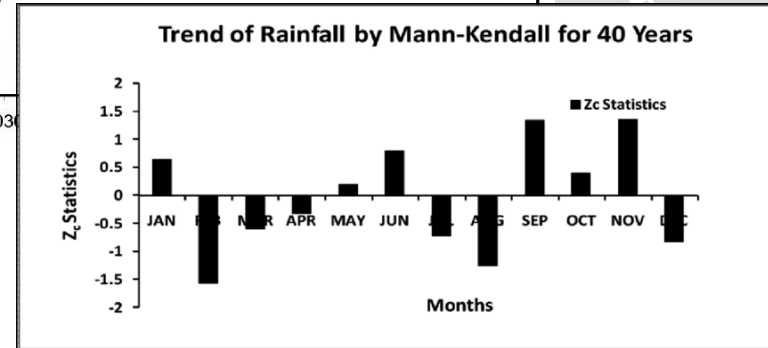
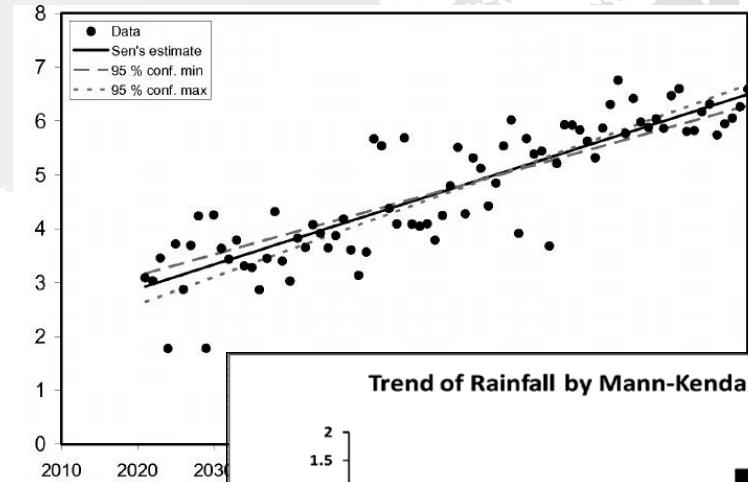


OR

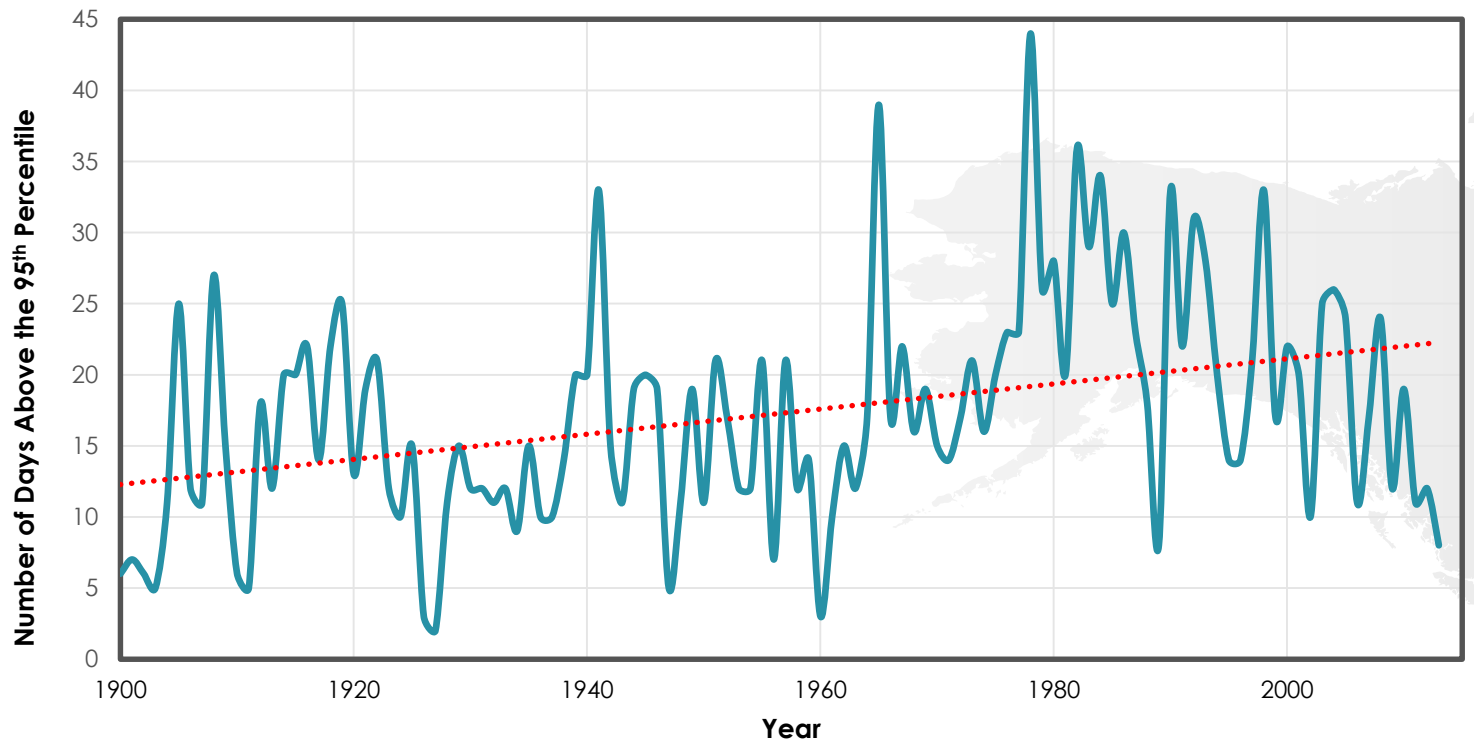


Trend Analysis

Mann-Kendall or Simple Regression



The Attribution of Climate Variability and Climate Change?



The Upward Trend in Data

Part of a larger Cycle

or Forced by Climate Change?

