UNDERSTANDING THE DYNAMIC NATURE OF TIME TO PEAK (T_P) IN UK STREAMS

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- Compilation of data set including 1413 storms, catchment characteristics, Tp values in UK
- Address research gap: current methods of prediction are based upon constant catchment descriptors
  - Provide a single value for a given catchment, with no variability based upon storm size, or antecedent conditions
- Application of machine learning and artificial neural networks
- This is the first study that has employed ANN to build a robust, dynamic prediction model for predicting Tp.
- Key results: identify input variables with greatest predictive capabilities and hydrologic significance

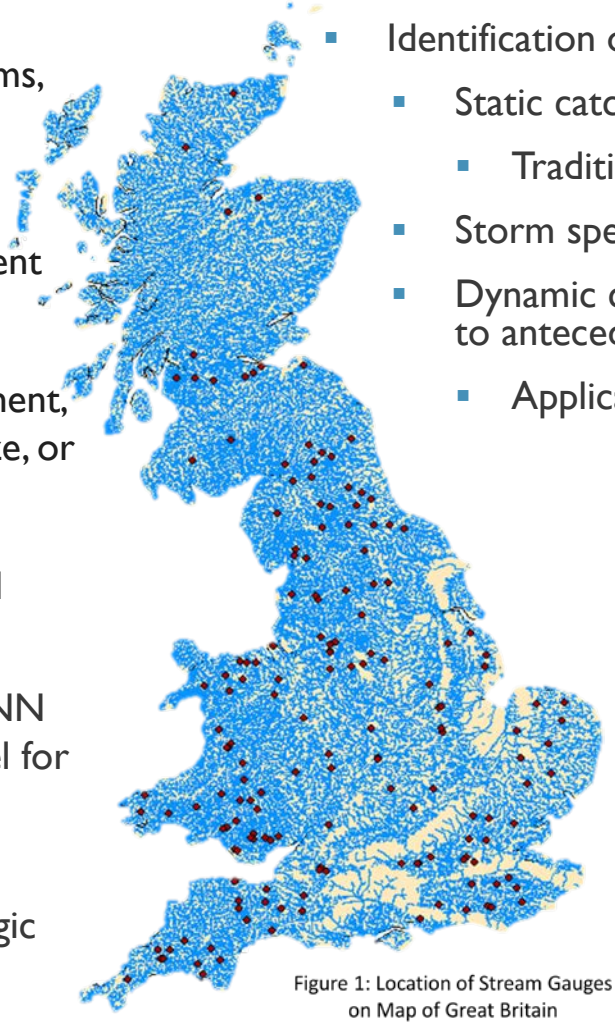

Figure 1: Location of Stream Gauges on Map of Great Britain

- Identification of three key input types, to encompass dynamic nature of Tp:
  - Static catchment- encompassing the variability between each catchment
    - Traditionally used in empirical Tp, Tc equations
  - Storm specific- encompassing the magnitude of the storm
  - Dynamic catchment- encompassing the variability within a catchment due to antecedent conditions
    - Application of seasonal trends in soil moisture (LCM Factor)

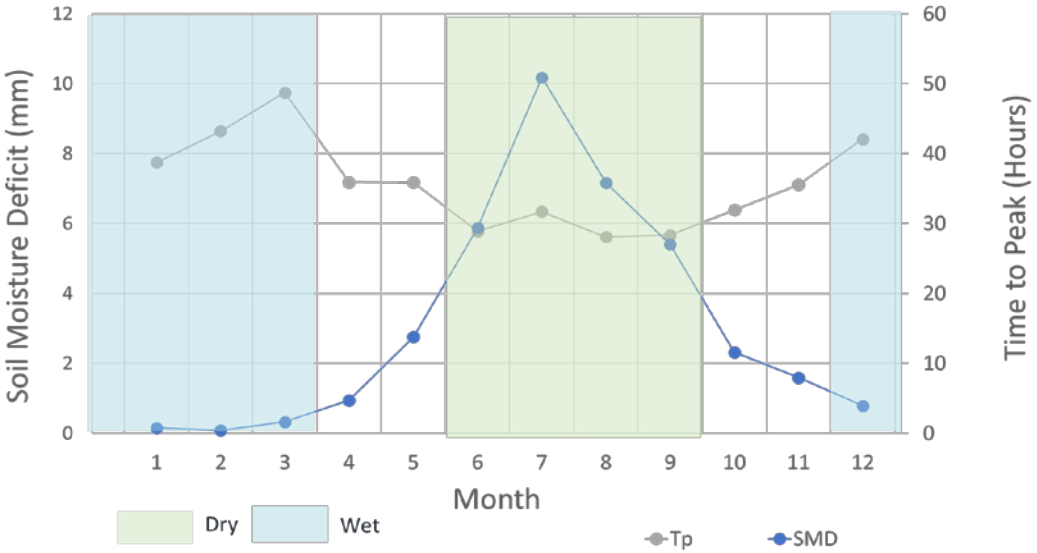

Figure 2: Mean monthly Soil Moisture Deficit (mm) and Time to Peak (hours)