

HyDEF meeting

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HyDEF Meeting

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University of Reading

OUTLINE

- DATA ISSUES
- WG IMPLEMENTATION
- PRESSURE MODELLING
- CLIMATE DRIVERS

DATA

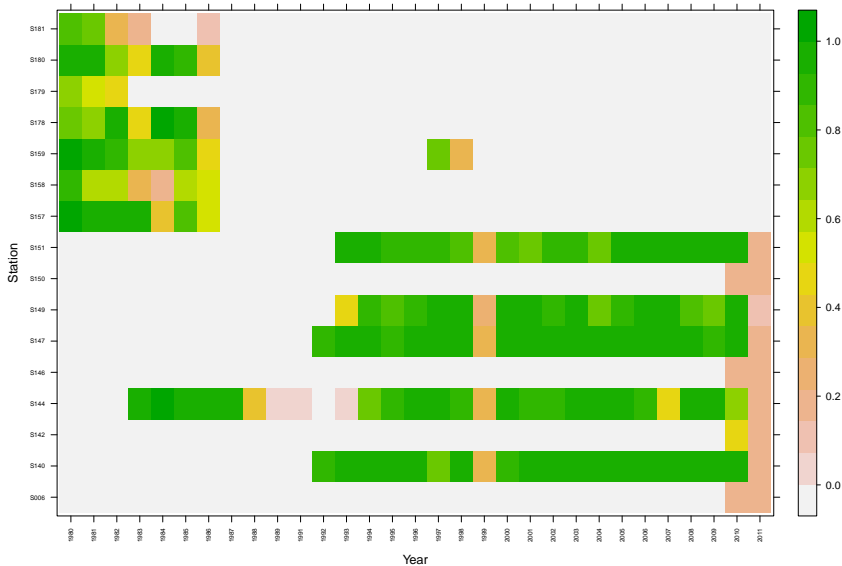
- Hourly data from the British Atmospheric Data Centre (BADC), MIDAS Met Office dataset
- PERIOD: 1950.01.01 - 2011.03.01
- AVAILABLE VARIABLES: precipitation, air pressure, air temperature, wind speed, downward SW radiation, cloud cover, wet bulb temperature
- THAMES catchment: 157 stations
- EDEN catchment: 35 stations

NUMBER OF STATIONS PER VARIABLE

	THAMES	EDEN
wind speed	135	28
pressure	52	7
temperature	140	28
precip	71	16
swr	22	2
cloud cover	131	27
wet bulb temp	140	28

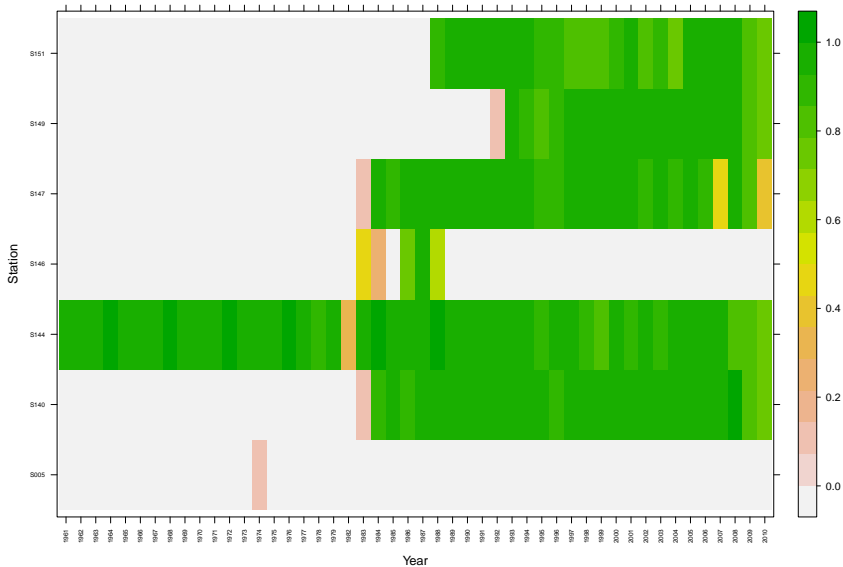
EDEN

Proportions of available observations – Rainfall



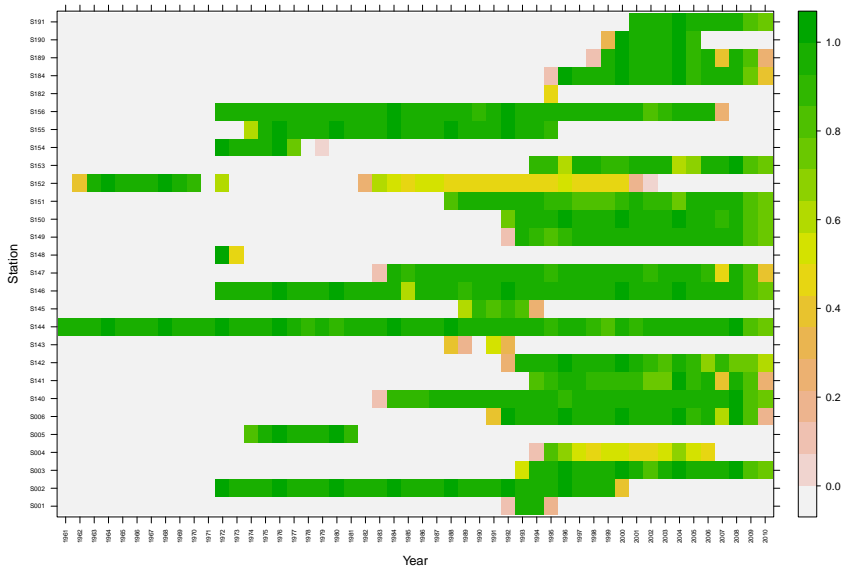
EDEN

Proportions of available observations – Pressure



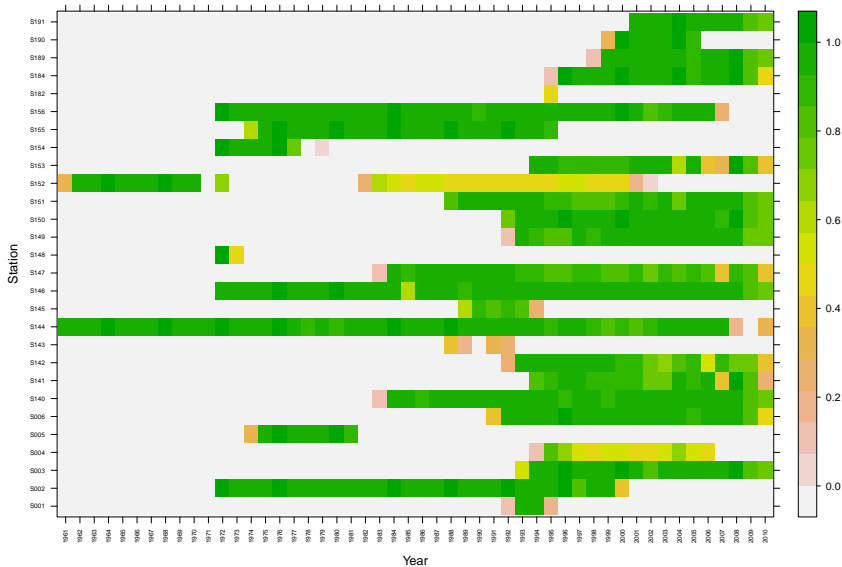
EDEN

Proportions of available observations – Temperature



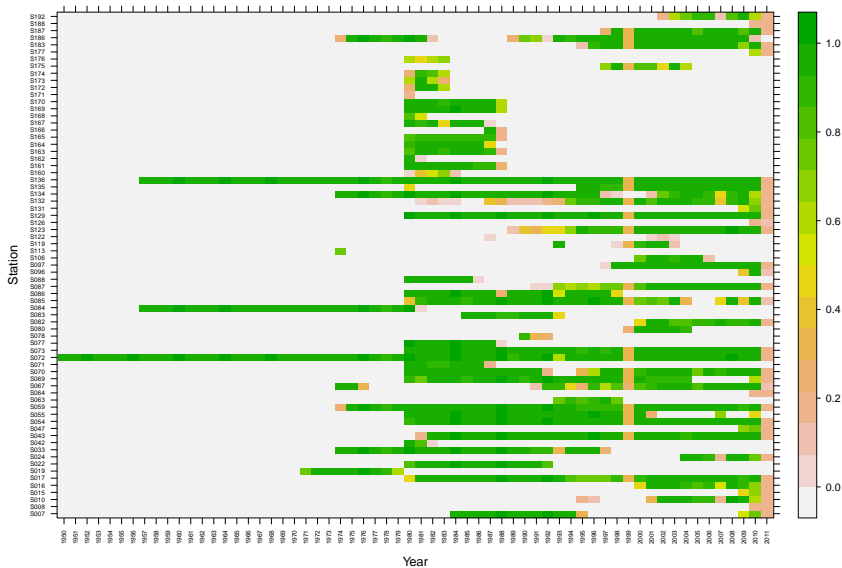
EDEN

Proportions of available observations – Wind



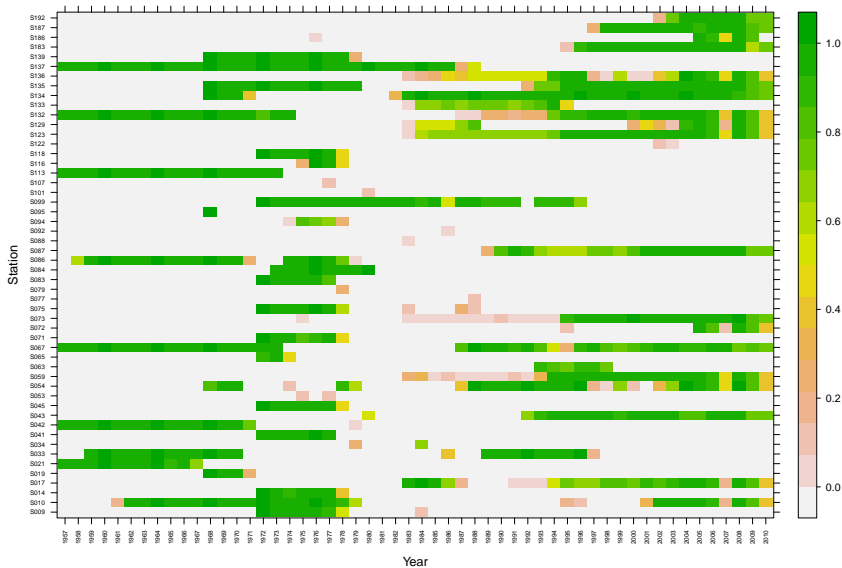
THAMES

Proportions of available observations – Rainfall



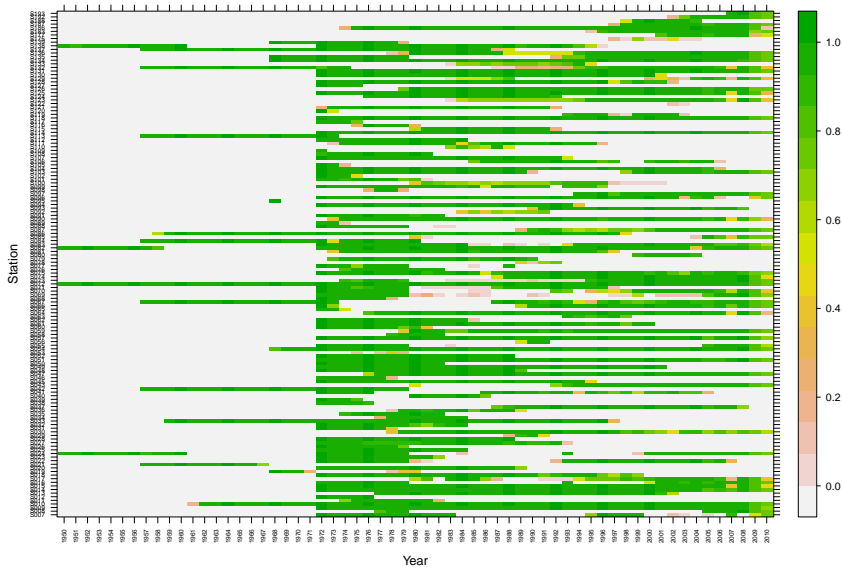
THAMES

Proportions of available observations – Pressure



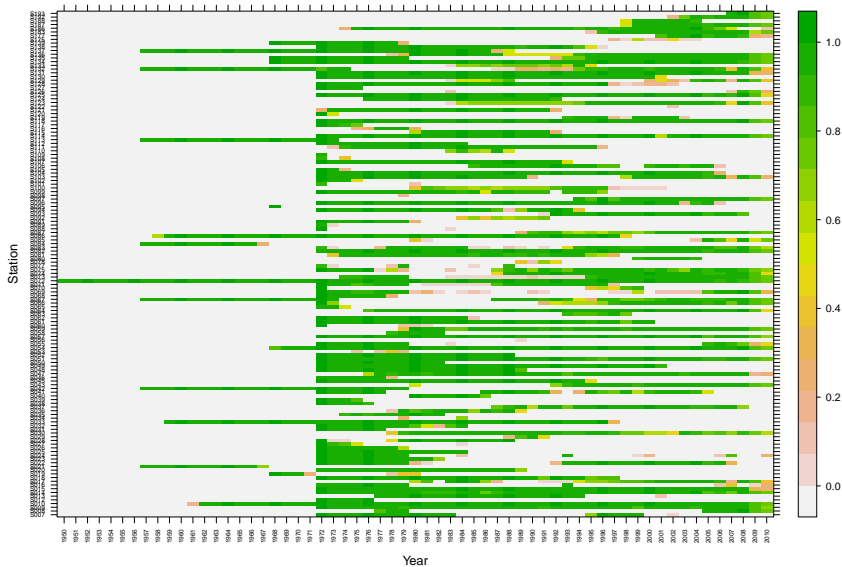
THAMES

Proportions of available observations – Temperature



THAMES

Proportions of available observations – Wind



WG METHODOLOGY

GLIMCLIM

- Software package for the generation of multi-site daily precipitation

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 - Logistic regression to model rainfall occurrence
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 - Gamma distribution to model rainfall amounts
- Implemented in Fortran

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Rglimclim

- R package free and easy to install
- Available fitting distributions: normal, logistic & gamma
- Object oriented approach to defying site, model type, time varying covariates, etc.
- It allows a full WG modelling in R

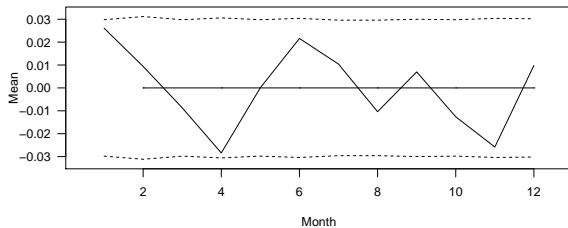
PRESSURE MODELLING (THAMES)

Significant covariates influencing pressure over the Thames domain:

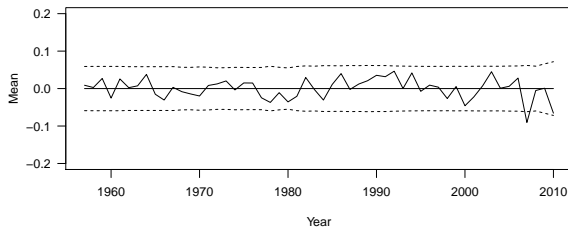
- GEOGRAPHICAL EFFECT: latitude, longitude and altitude
- SEASONAL CYCLE: 1-year cycle
- AUTOCORRELATION: 1 and 2-previous day pressure
- EXTERNAL FACTOR: large-scale pressure above the domain
- INTERACTIONS: autocorrelation and seasonal cycle

PRESSURE MODELLING (THAMES)

Monthly residual means

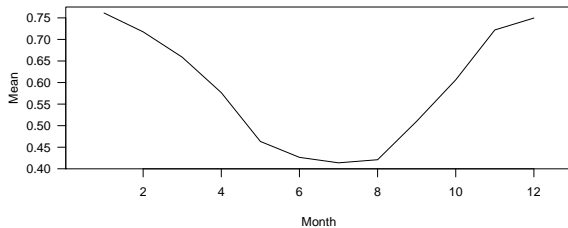


Annual residual means

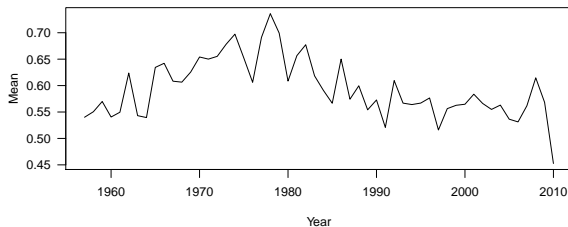


PRESSURE MODELLING (THAMES)

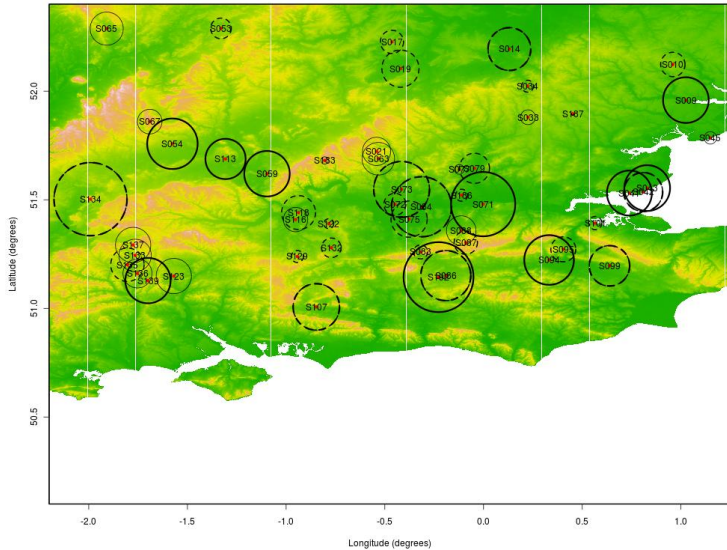
Monthly residual SD



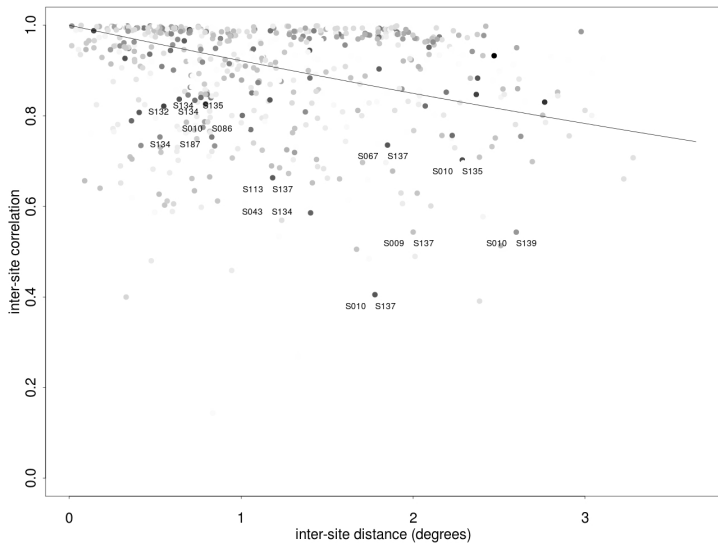
Annual residual SD



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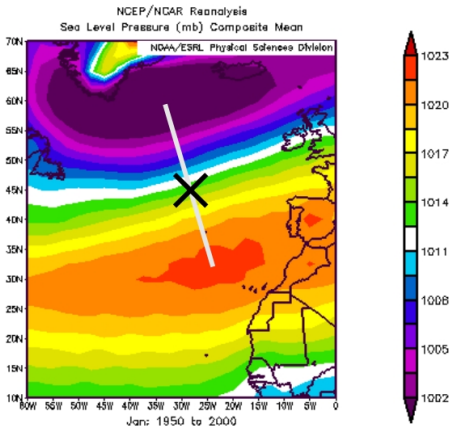


CLIMATE INDICES

PRECIPITATION MODELLING

Incorporation of climate mechanisms physically related to variables to be generated.

- pressure gradient
- orientation of the pressure gradient
- location of the halfway point
- moisture value of the halfway point



THANK YOU FOR YOUR TIME!