

# MIDLATITUDE CYCLONE FEATURES ASSOCIATED WITH EXTREME WINDS IN THE SEAS SURROUNDING THE UK

**MOTIVATION**

**CYCLONE FEATURES  
ASSOCIATION**

**CONCLUSIONS**

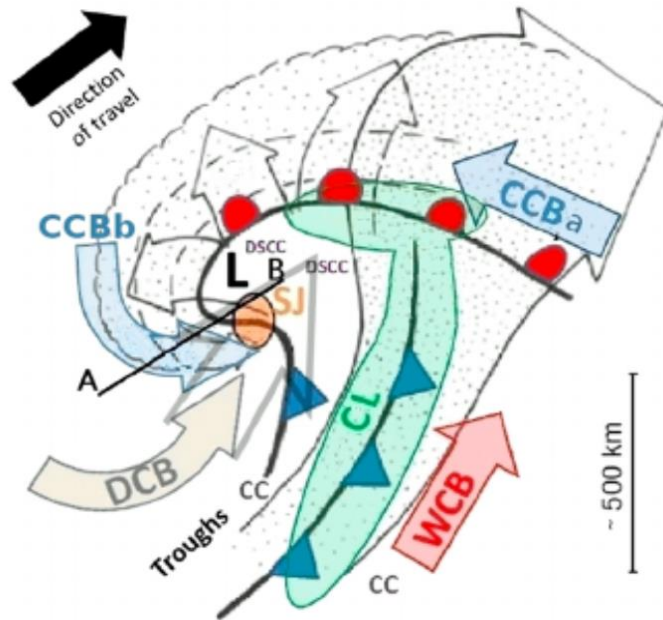
**UK SEAS EXTREME  
WIND CLIMATE**

**FEATURES FLOW  
CHARACTERISTICS AND BIAS**

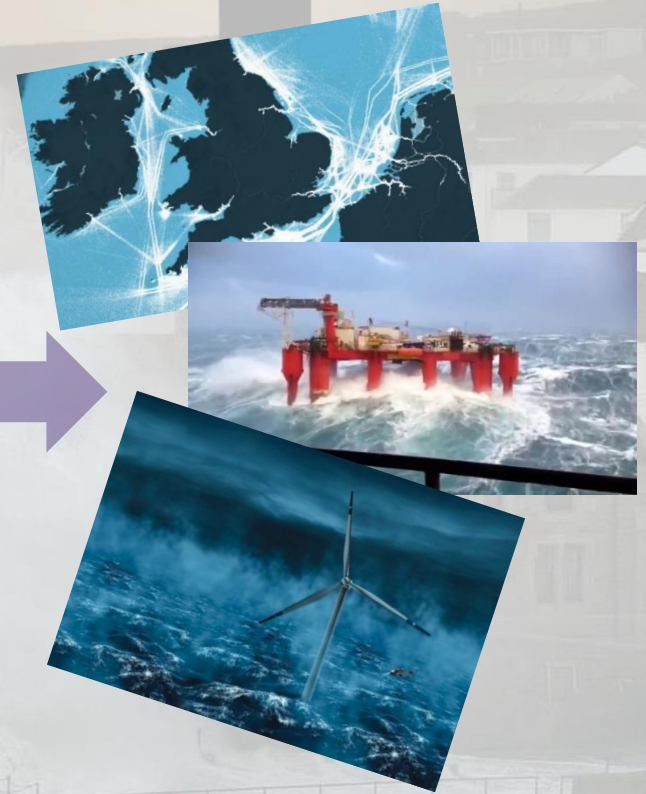
Emanuele Silvio Gentile, Suzanne Louise Gray

## Midlatitude cyclone features based on Earth-relative winds

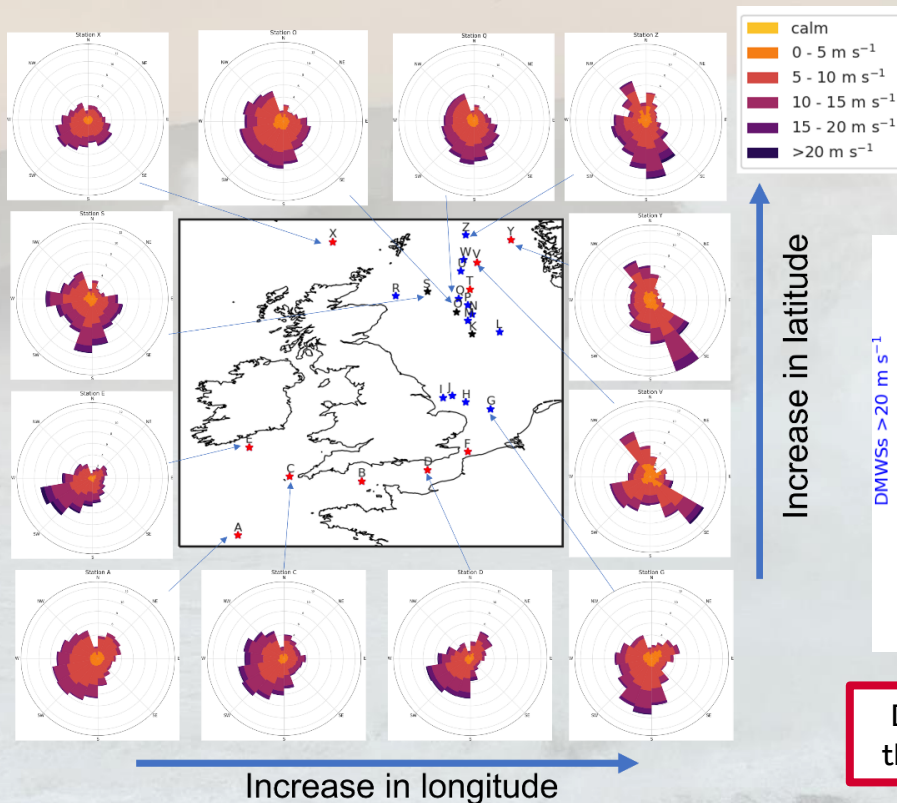
Browning (2004)



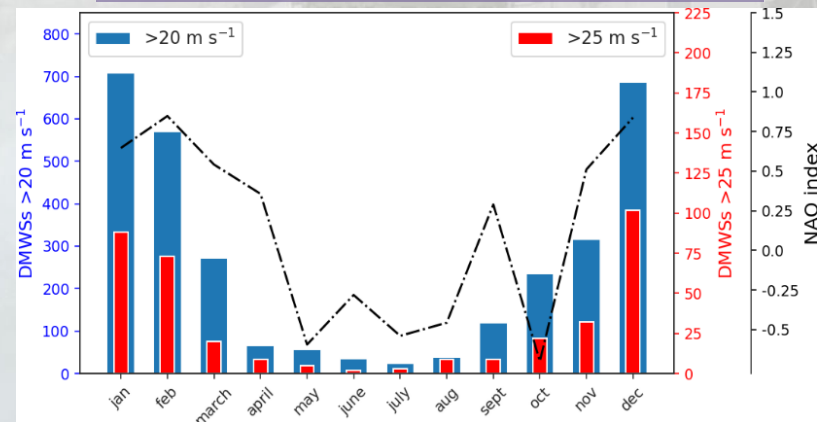
Hazard



# Distribution of observed 10-m wind speeds across the seas surrounding the UK – 2012-2020 climatology

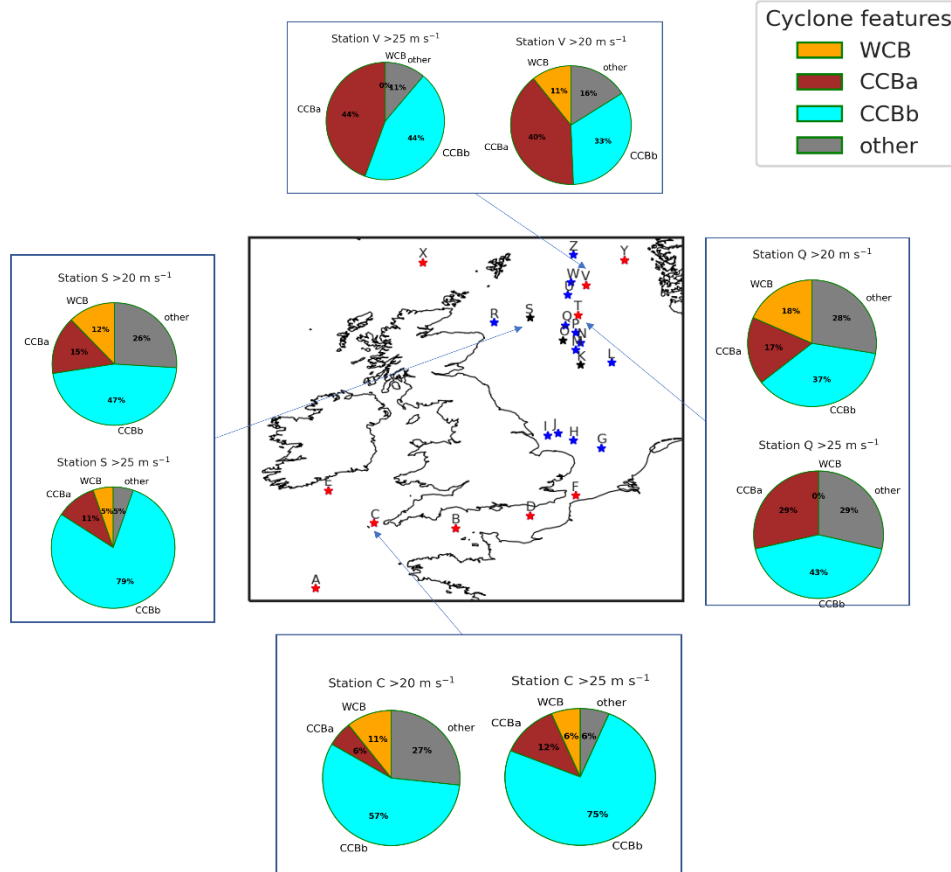


## Seasonal variability of observed extreme Daily Maximum Wind Speeds (DMWSs)

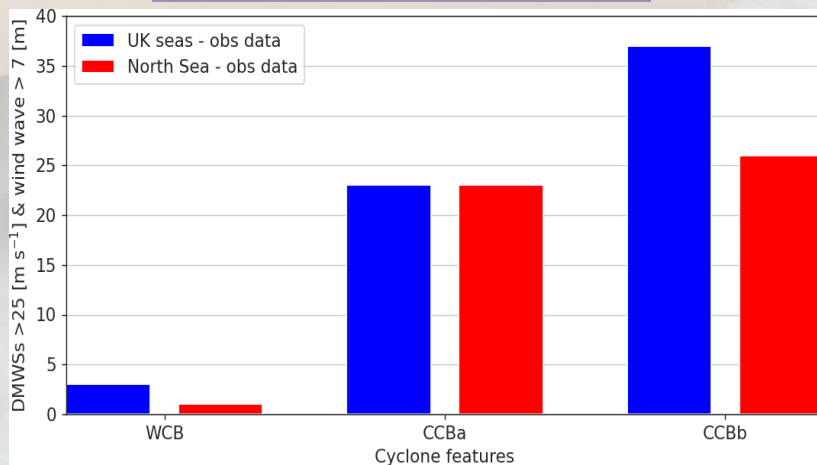
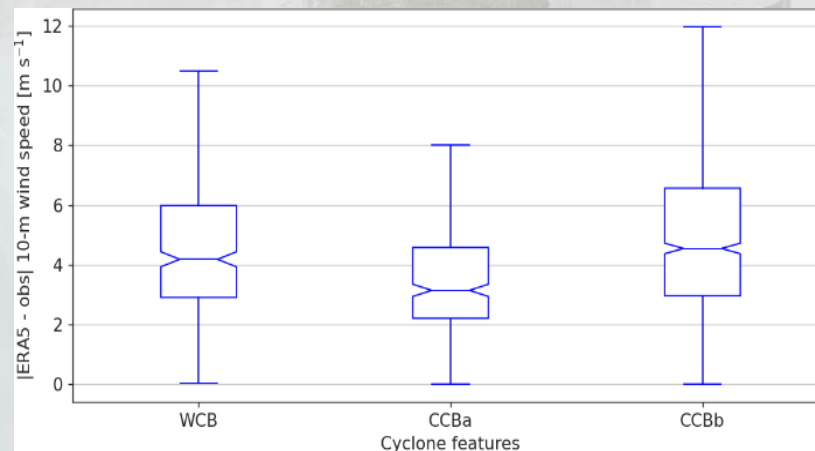


Data sourced from the MetDB database

# Distribution of observed daily maximum wind speeds (DMWSs) cyclone features across selected network sites

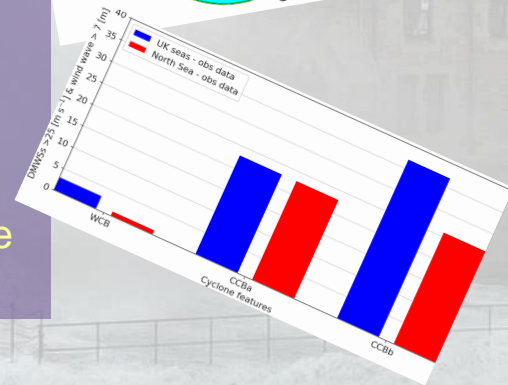
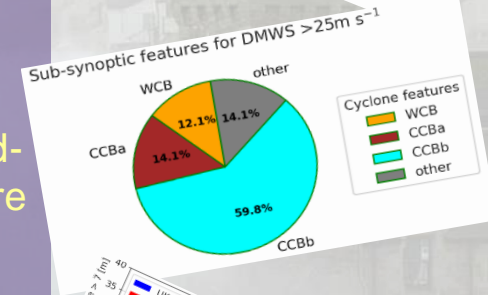
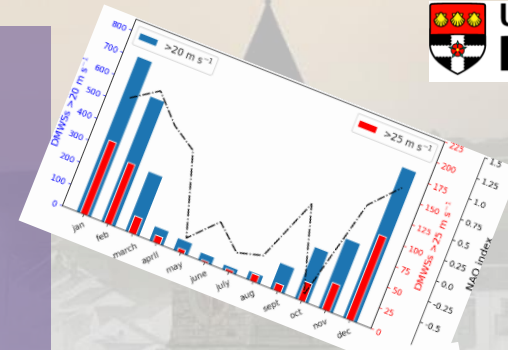


Automatic cyclone  
feature labelling  
based on ERA5  $\theta_e$  field  
and observed wind  
direction

Compound wind wave risk for  
WCB, CCBa, and CCBbExtreme 10-m wind ERA5 bias associated with  
WCB, CCBa, and CCBb



- Midlatitude cyclones responsible for the vast majority of extreme wind speeds observed over the UK seas
- CCBb responsible for the highest proportion of observed extreme winds above the 20 m/s threshold, and more so above the 25 m/s threshold
- CCBb responsible for the largest compound wind-wave hazard, followed by the CCBa, 5 times more dangerous than the WCB.
- Finest and most intense feature, CCB, characterised by ERA5 largest bias
- Need of observation-based studies to capture the variability of extremes





**THANKS!**