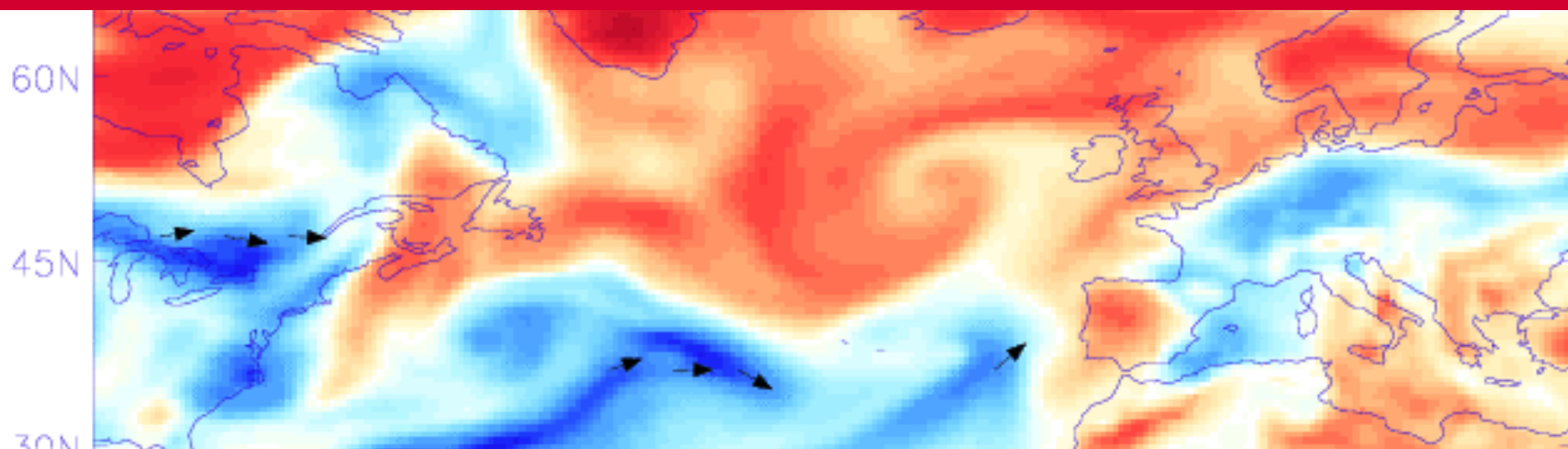


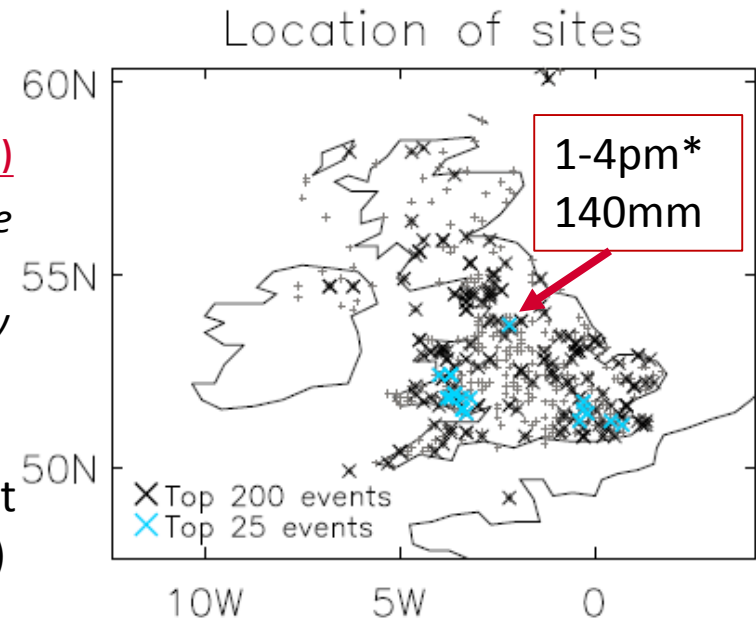
## ST2.2 ATMOSPHERIC PRECURSORS



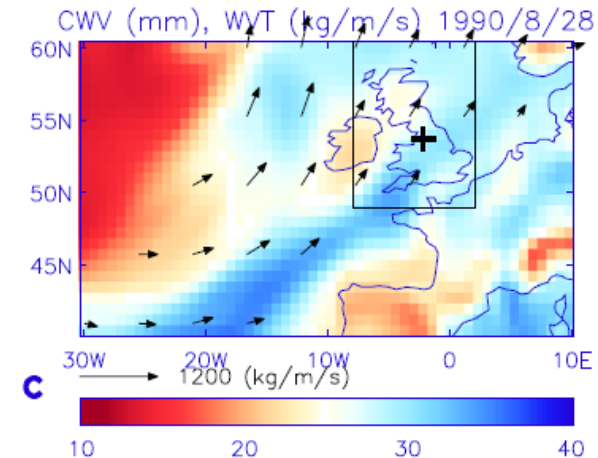
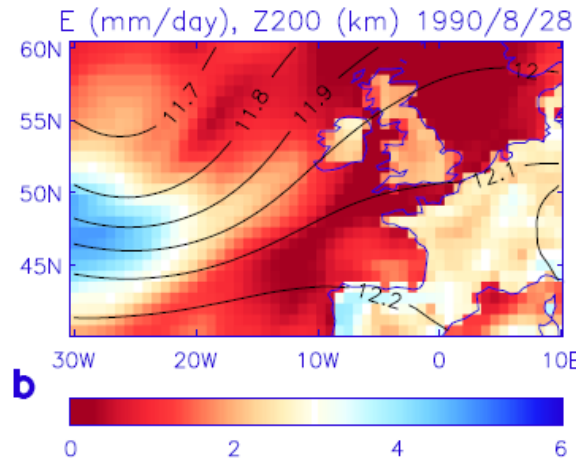
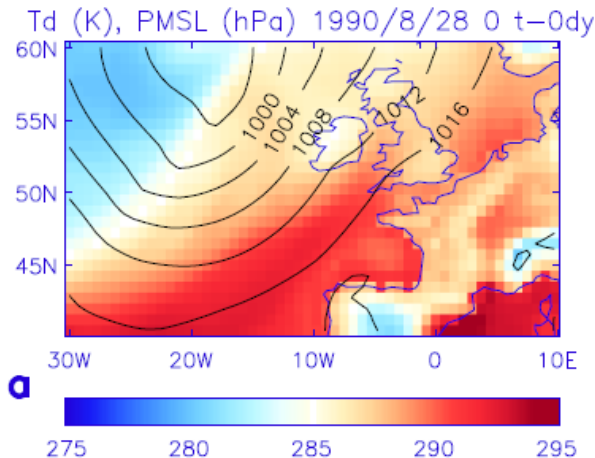
Richard Allan, Adrian Champion (University of Reading)  
Stephen Blenkinsop, Hayley Fowler (Newcastle University)

# ST1.3/ST2.2 ATMOSPHERIC PRECURSORS

- Atmospheric precursors to heavy 3hr summer rainfall events ([Blenkinsop et al. 2016](#)); extends daily analysis ([Allan et al. 2015](#); [Champion et al. 2015](#))
- e.g. August 1990 [Monthly Weather Reports](#): “During the 28<sup>th</sup> and 29<sup>th</sup> part of a trailing cold front crossed most areas... Thundery outbreaks occurred... more extensively in Eastern parts on 29<sup>th</sup>...” [[+British Rainfall](#)] →
- Composite analysis of anomalous atmospheric conditions prior to heavy rainfall events as context for end to end system (see also [Lavers et al. 2014](#))



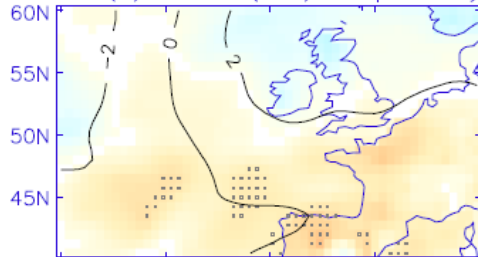
\*this is on “Hailstone Hill” near Bacup!



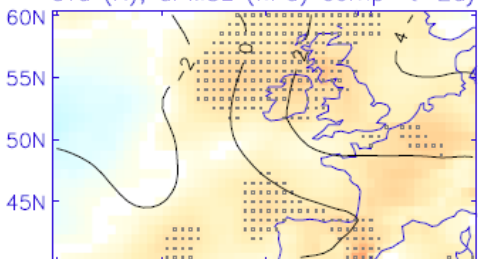
# EXAMPLE COMPOSITES (TOP 25 EVENTS NW)

Td' (K), PMSL' (hPa)

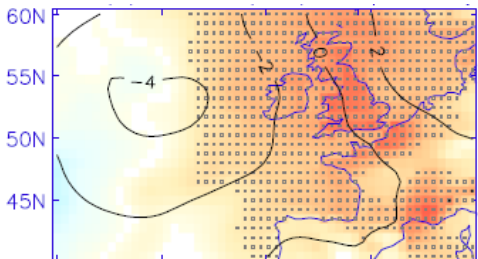
Day -4



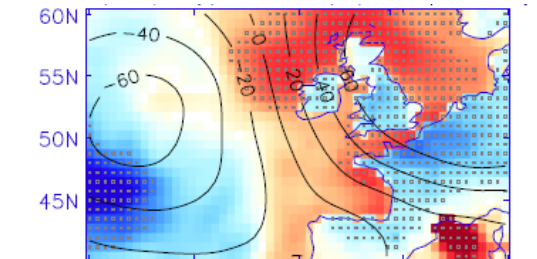
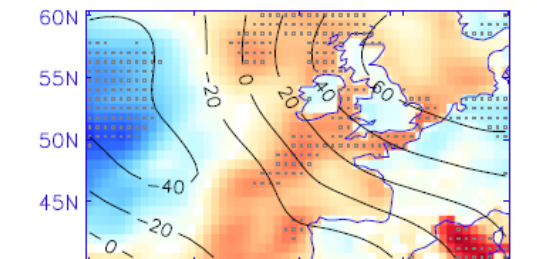
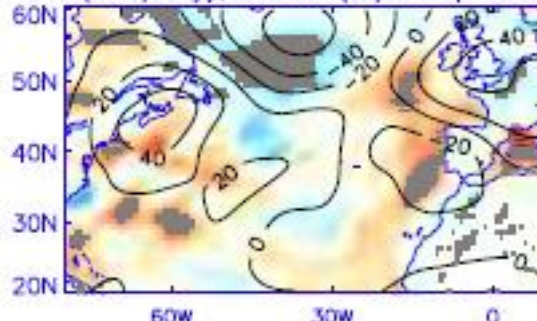
Day -2



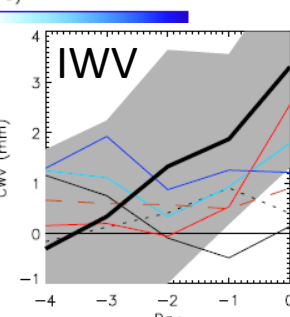
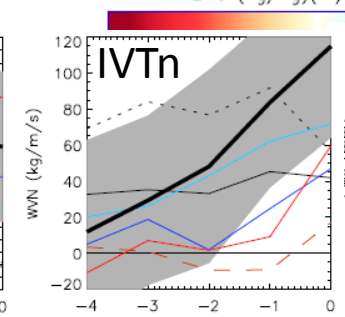
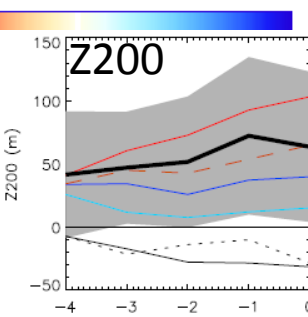
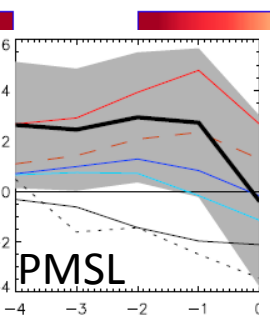
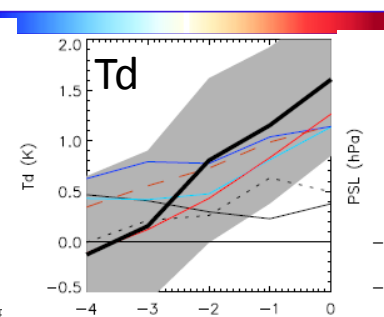
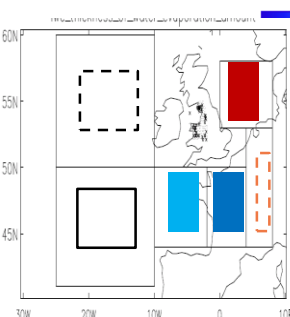
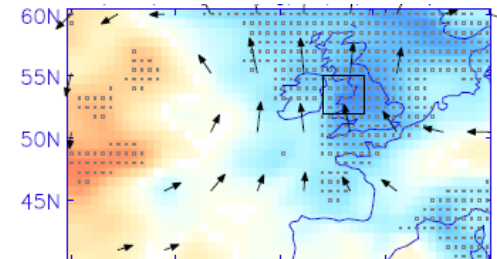
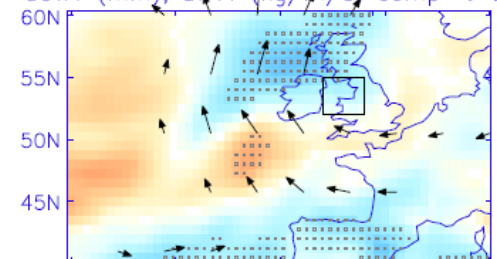
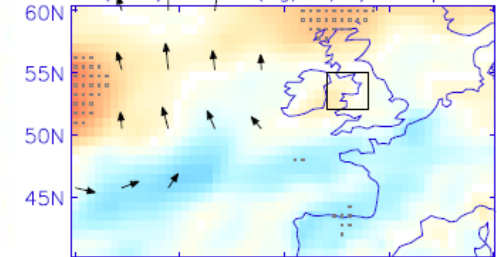
Day 0



dE (mm/day), dZ200 (m) comp t-4dy



V' (mm), IVT' (kg/m/s)



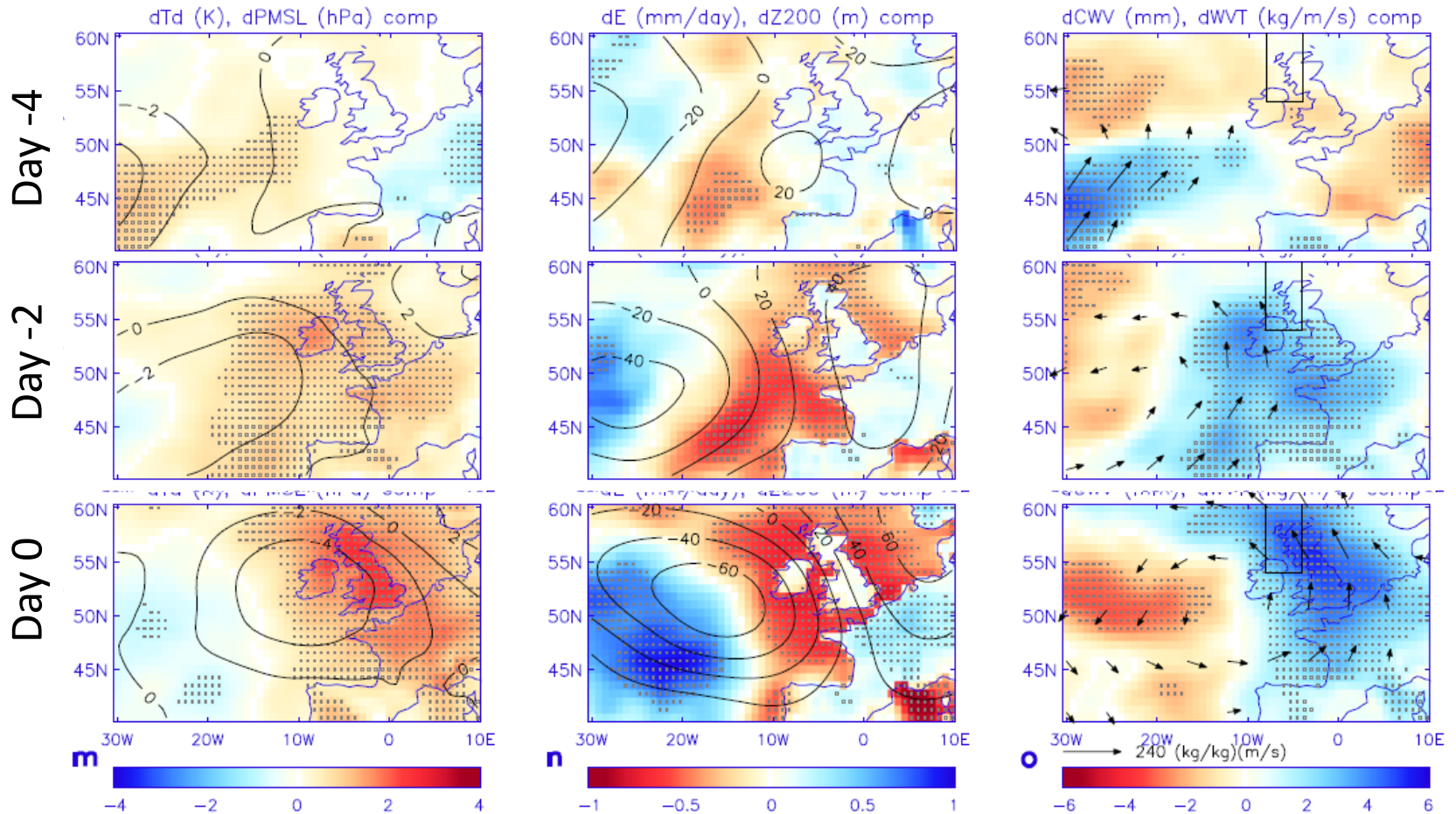
240 (kg/kg)(m/s)

# NW UK COMPOSITES (TOP 25 EVENTS)

$Td'$  (K), PMSL' (hPa)

$E'$  (mm),  $Z200'$  (m)

$WV'$  (mm),  $IVT'$  (kg/m/s)

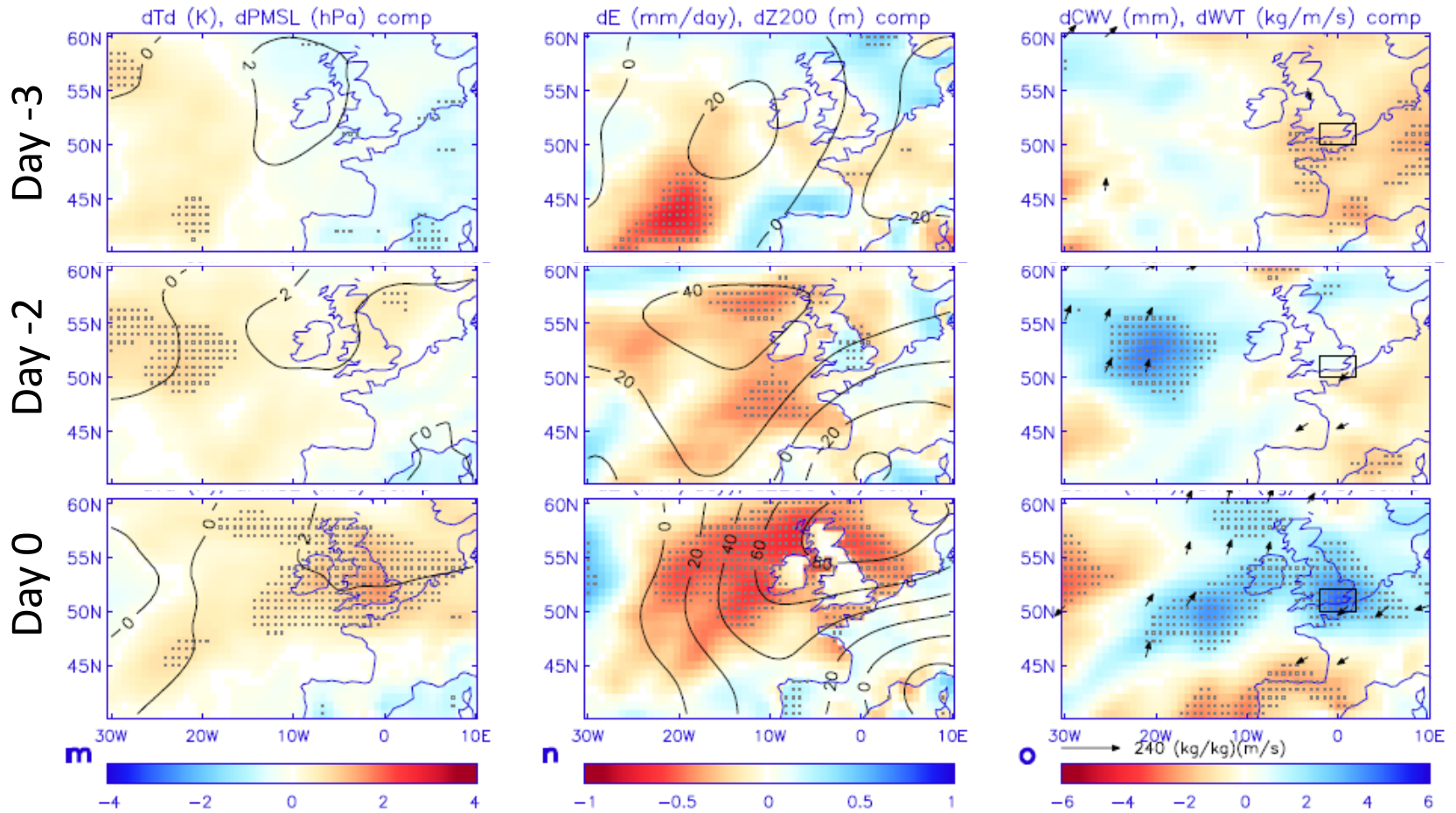


# SE ENGLAND COMPOSITES (TOP 25 EVENTS)

Td' (K), PMSL' (hPa)

E' (mm), Z200' (m)

WV' (mm), IVT' (kg/m/s)



# OUTPUTS/DELIVERABLES

- **Dissemination:** Various talks on SINATRA work (e.g. EMS conference)
- **Outreach:** schools events, talks to general public, development of online courses, twitter, media interviews
- **Additional Activities:**
  - Meetings with FFC, Nigel Roberts and Newcastle to discuss diagnostics
  - 2 MSc projects: daily/hourly rain gauge datasets (inc. link to XL Catlin)

## Publications/Reports:

- Champion, A.J., R.P. Allan and D.A. Lavers, (2015) Atmospheric Rivers don't explain UK Summer Extreme Rainfall, Journal of Geophysical Research, 120, 6731-6741, [doi: 10.1002/2014JD022863](https://doi.org/10.1002/2014JD022863)
- Allan, R. P., D. A. Lavers and A. J. Champion (2015), Diagnosing links between atmospheric moisture and extreme daily precipitation over the UK, Int. J. Climatol., in press, [doi: 10.1002/joc.4547](https://doi.org/10.1002/joc.4547).
- Allan R.P. (2015) Scientific Knowledge of Meteorological Drivers of Widespread Flooding, report to JBA/Environment Agency