

# Dynamically Downscaling Precipitation from Extra- Tropical Cyclones

**Adrian Champion**, Kevin Hodges, Lennart Bengtsson

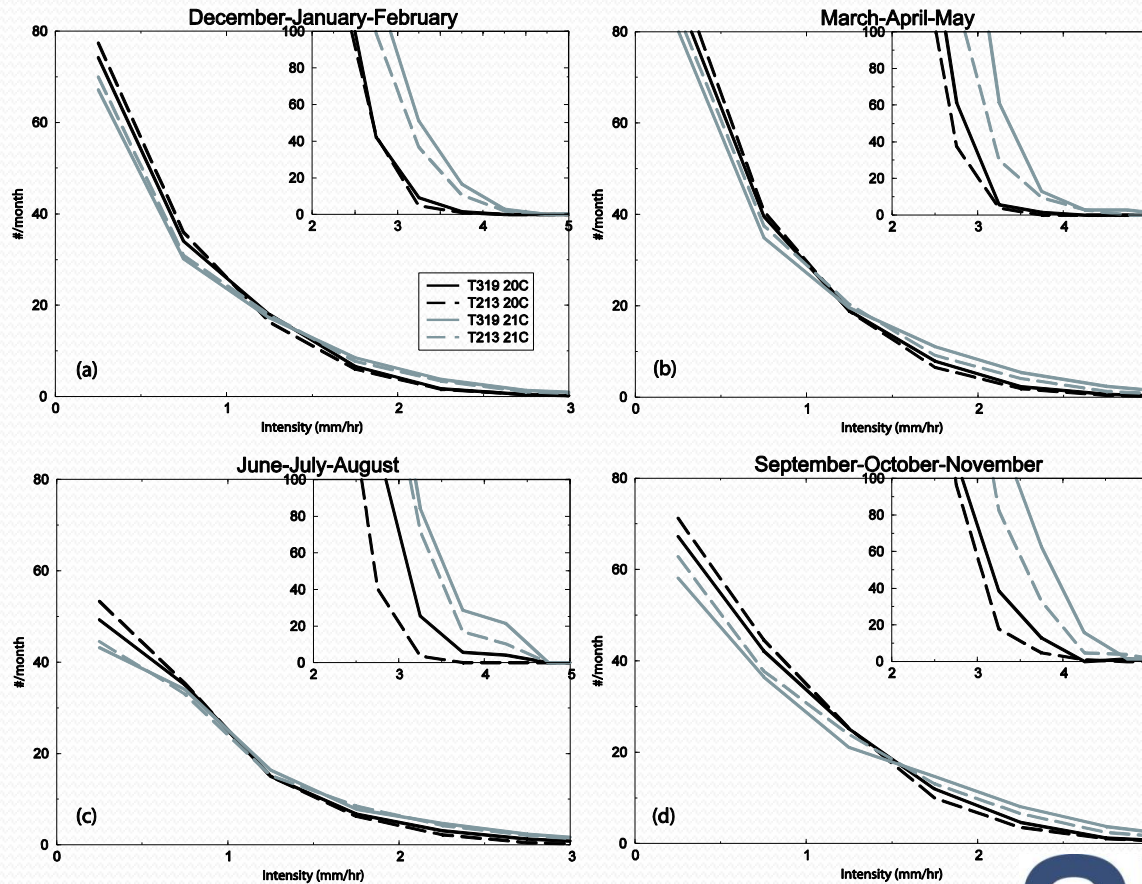
National Centre for Earth Observation

University of Reading

[a.j.champion@reading.ac.uk](mailto:a.j.champion@reading.ac.uk)

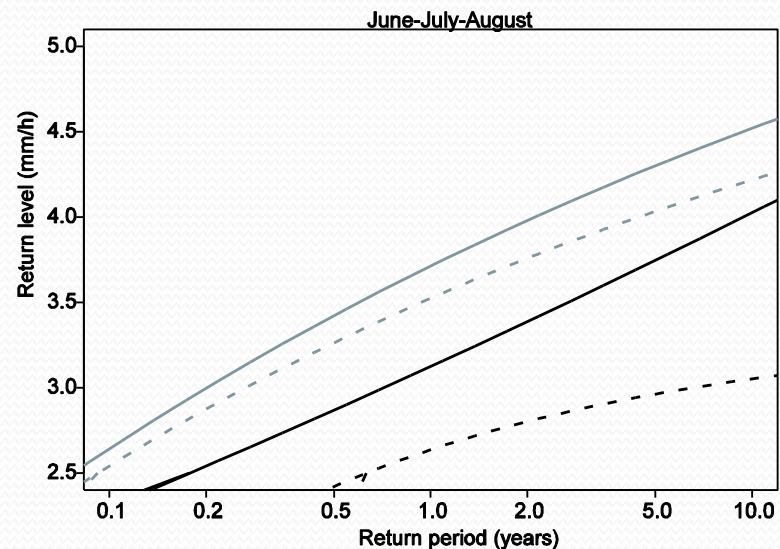
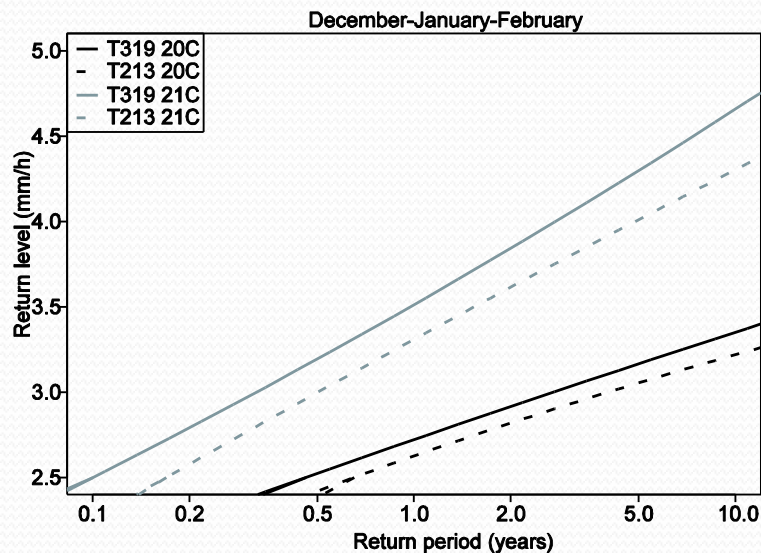
# Extra-Tropical Cyclones

Area Average Precipitation



# Extra-Tropical Cyclones

Precipitation Return Level Plots, threshold = 2.5 mm/hr



# Dynamical Downscaling

## Global Model

- ECMWF Operational Analysis
  - 25km resolution
  - June and July 2007
- ECHAM 5 GCM
  - 60km resolution
  - 4 events from each climate

## Nested Model

- Met Office Unified Model
  - vn6.1, non-hydrostatic
  - UK and Western Europe
  - 12km, 4km and 1.5 km resolutions
  - 48 hour forecasts
  - 12, 24, 36 and 48 hour lead times

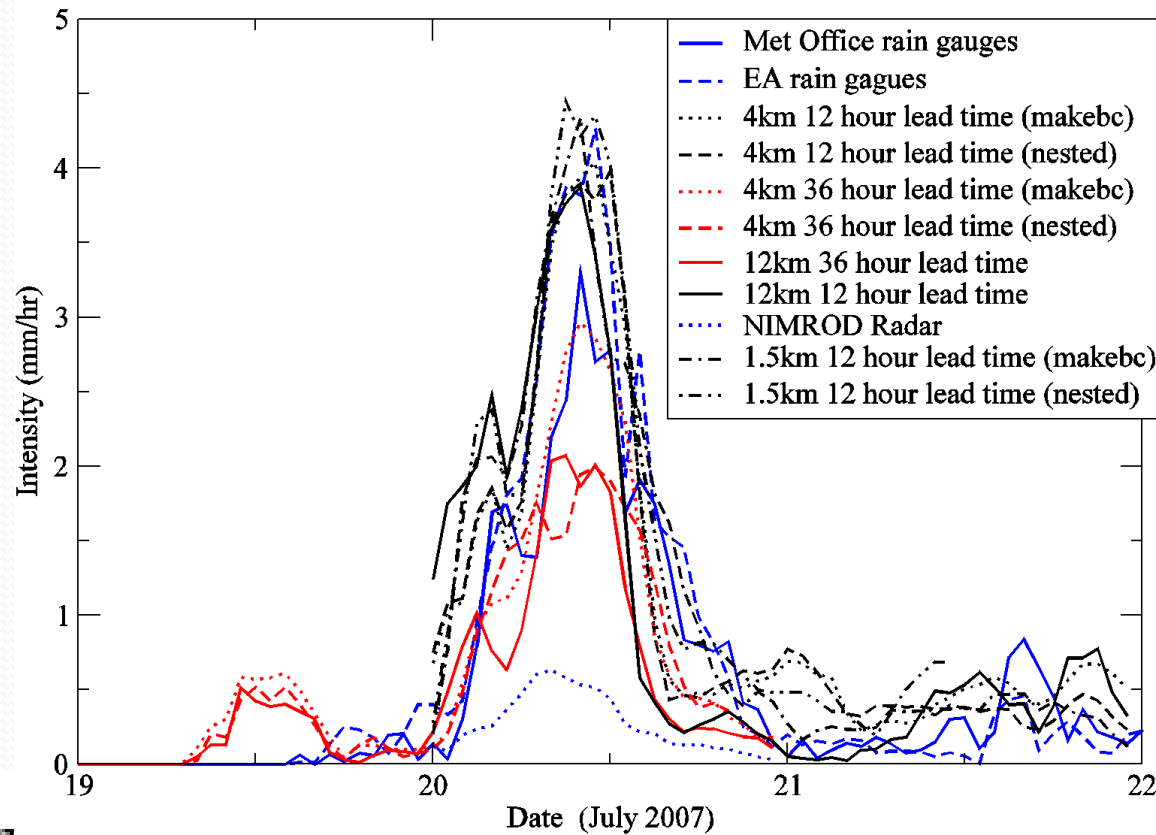
# Observational Datasets

- MIDAS Raingauge Data
  - ~140 raingauges UK wide
  - Hourly data
  - Non-gridded
- Environment Agency Raingauges
  - Regional data
  - Time-of-tip
  - Non-gridded
- NIMROD Radar Data

# July 2007

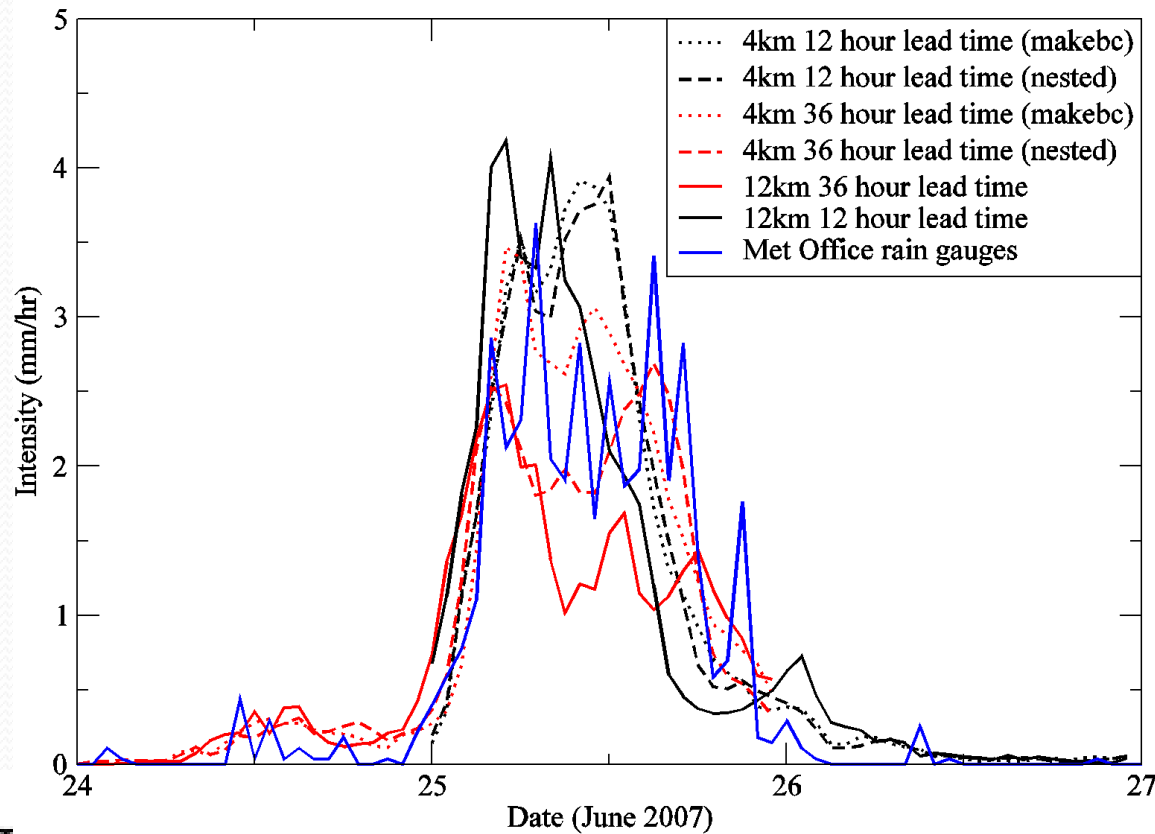
## Area Averaged Total Precipitation Rate

West Midlands Area



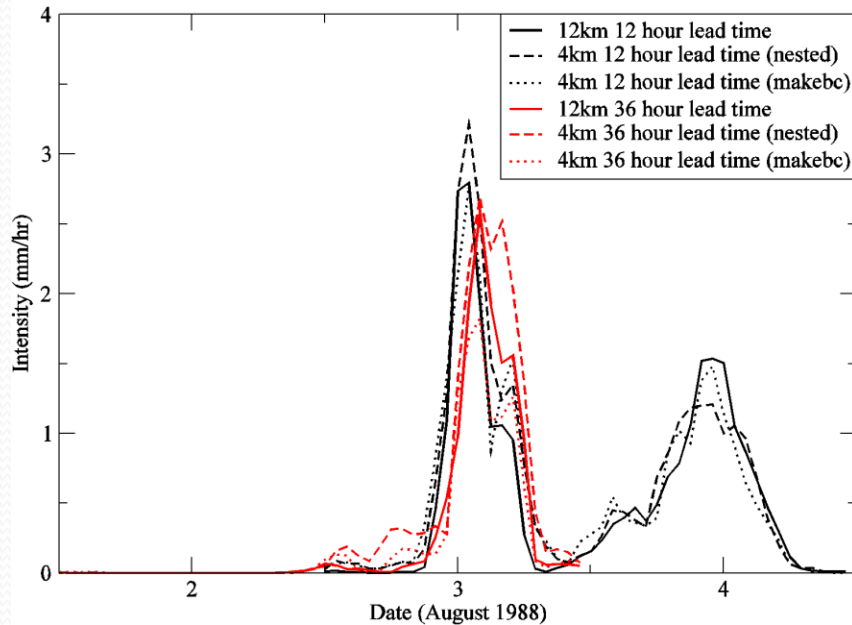
# June 2007

Area Averaged Total Precipitation Rate  
North East England Area

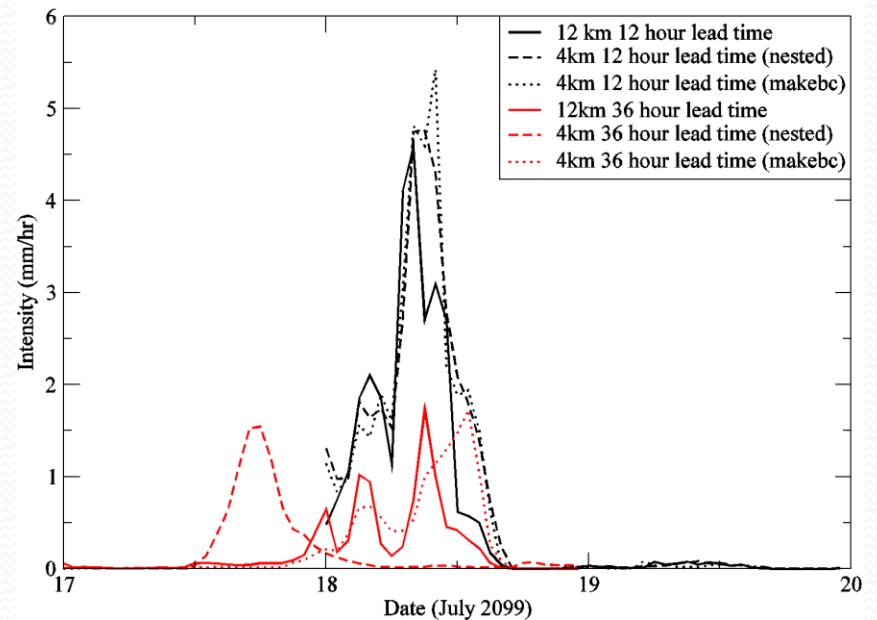


# GCM Downscaling

Area Averaged Total Precipitation Rate



Area Averaged Total Precipitation Rate





# Further Work

- Using ECMWF Ensemble System to drive LAM
  - June and July 2007 events
  - 12km, 4km and 1.5km
- Expand sample size of GCM events
- Use WRF as nested model
  - Compare to UM results