

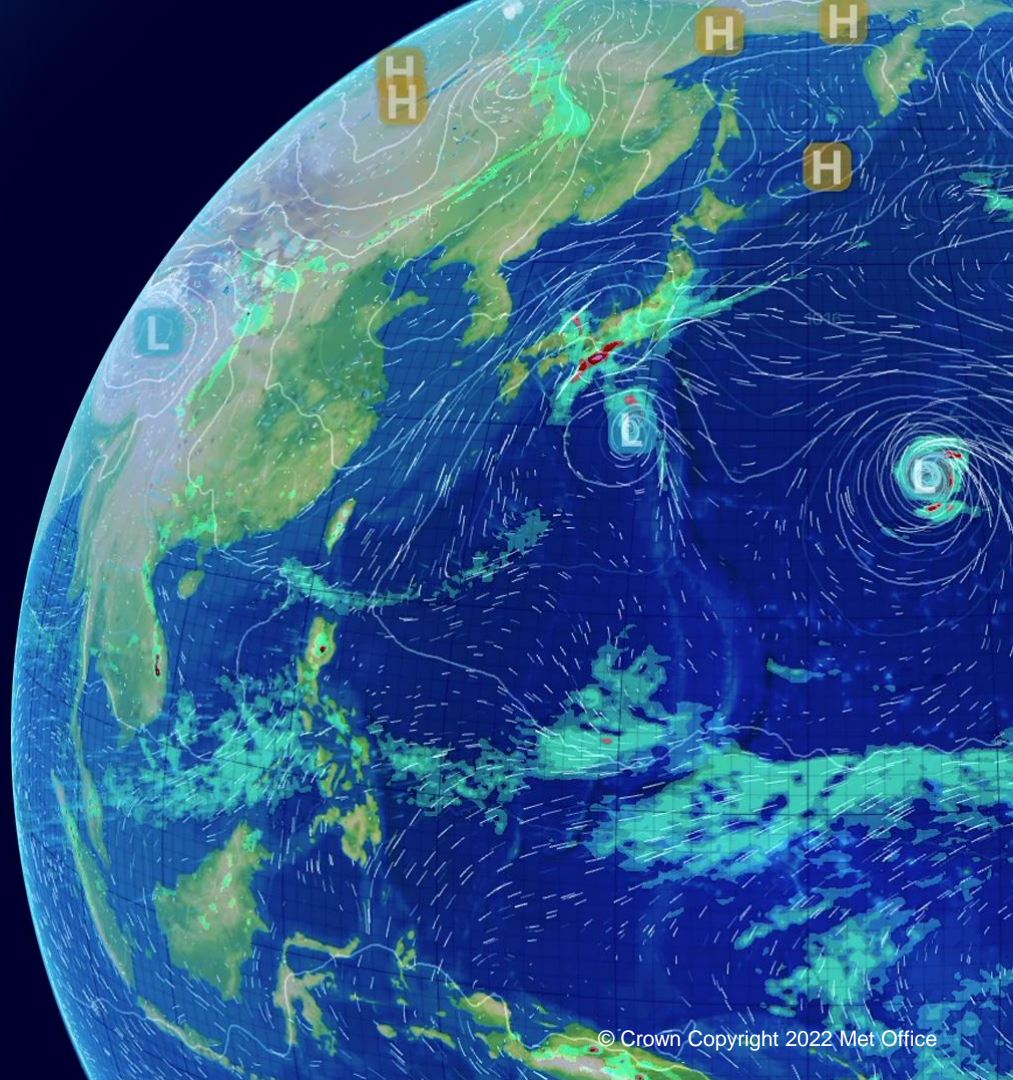
UK Met Office Hadley Centre Seasonal Predictions

Dr Philip Bett

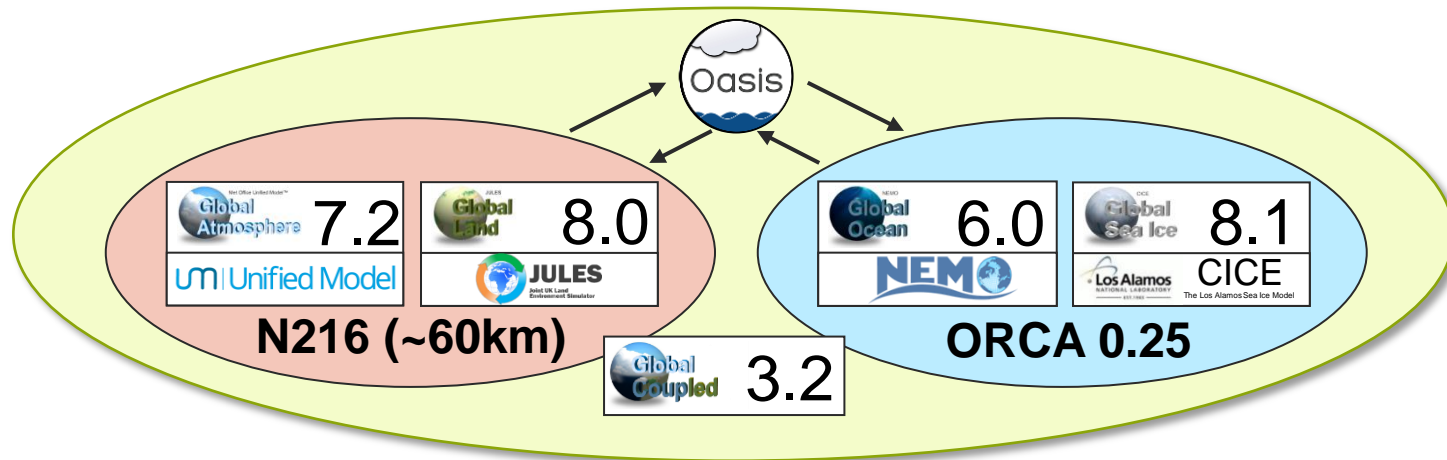
With thanks to Prof. Adam Scaife,
Dr Tim Mitchell and Dr Nick Dunstone

FOCRA-II

9th May 2022



Met Office Seasonal Forecasting System: **GloSea6**



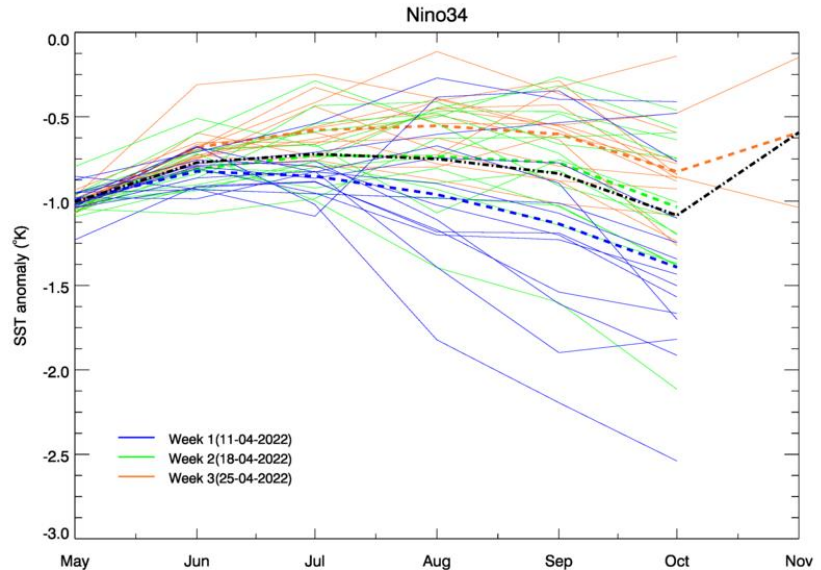
Fully coupled climate model (Atmosphere–Land–Ocean–Sea Ice)

High resolution ocean and atmosphere, including stratosphere

Used across timescales: Monthly → Seasonal

ENSO: Niño3.4 Forecasts

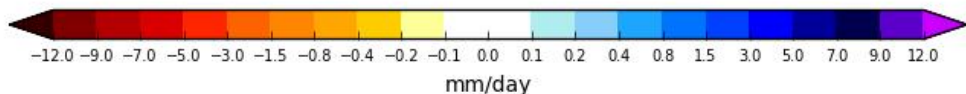
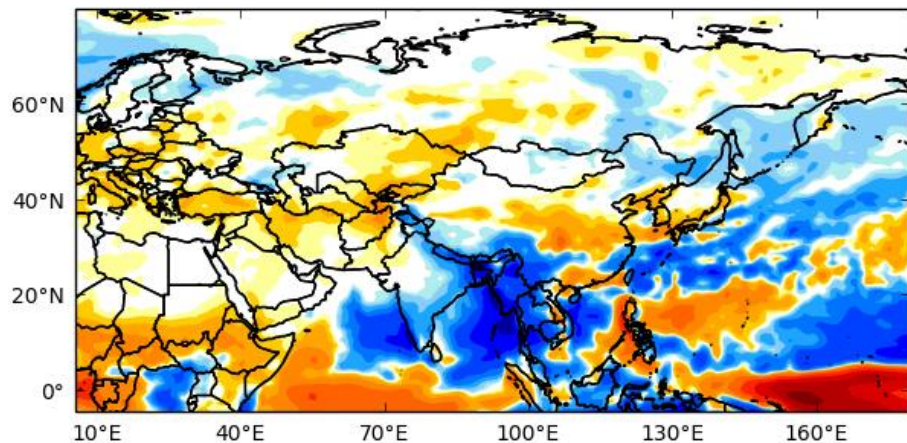
ENSO close to neutral,
but still in La Niña.



Forecast produced 2nd May

GloSea6 rainfall forecasts for May

Met Office: Ensemble mean anomaly : precipitation : May



Forecast produced 24th April

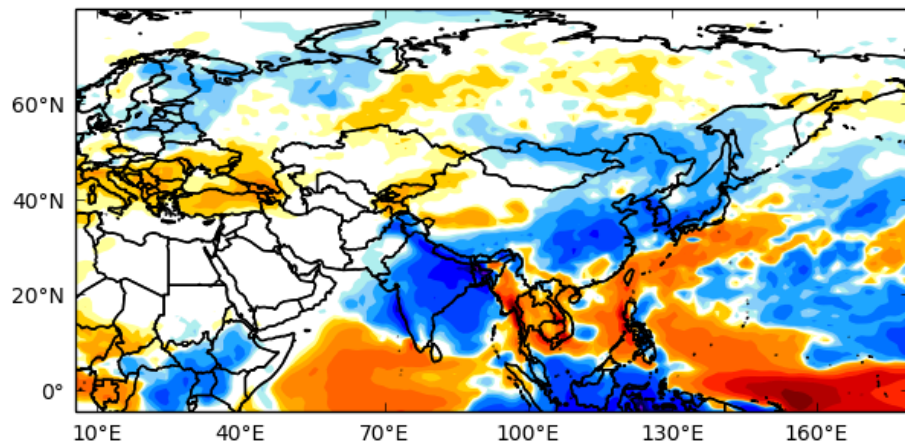
Mixture of signals.

Less rainfall than normal
across much of Yangtze basin

Enhanced rainfall over much of
South and South-East Asia

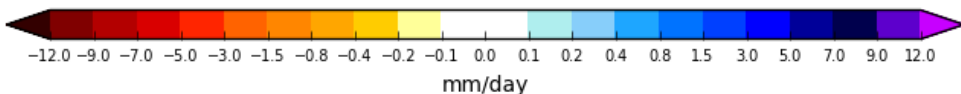
GloSea6 rainfall forecasts for June

Met Office: Ensemble mean anomaly : precipitation : Jun



Clear signal for enhanced rainfall across much of Asia

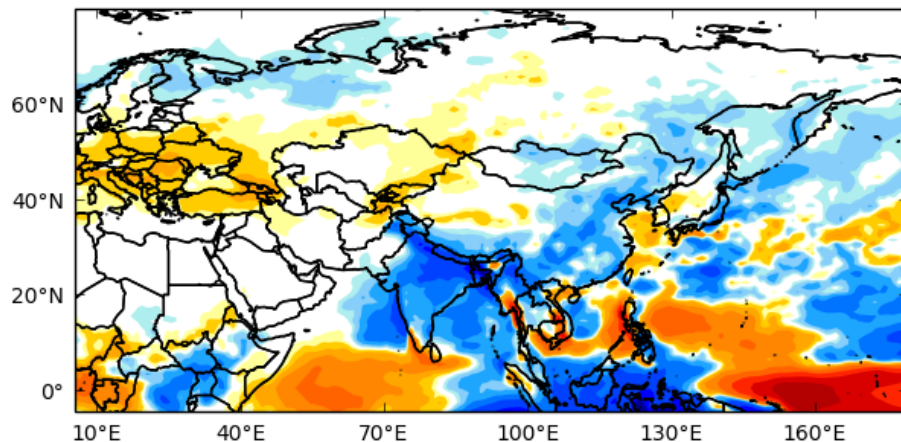
Areas of reduced rainfall in southern China, Myanmar, Thailand, Laos, Vietnam, Cambodia.



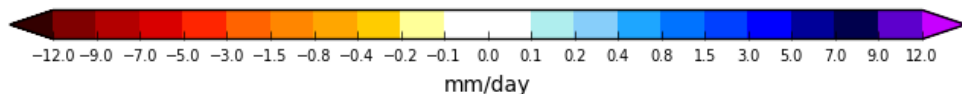
Forecast produced 2nd May

GloSea6 rainfall forecasts for MJJ

Met Office: Ensemble mean anomaly : precipitation : May/Jun/Jul



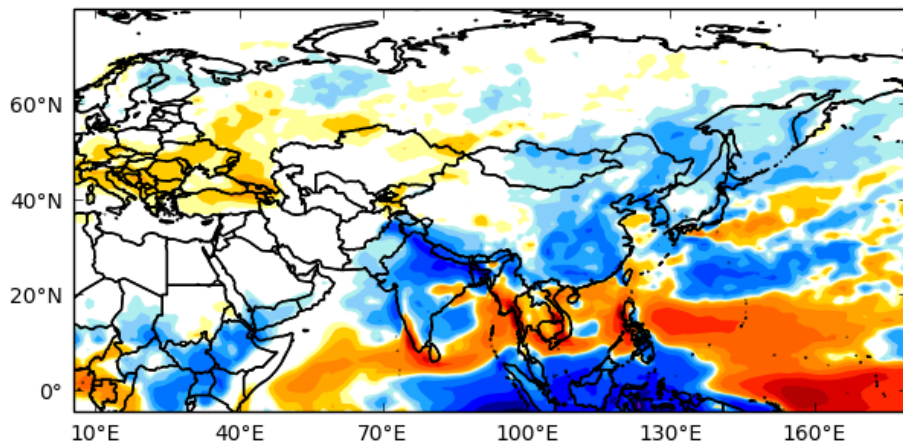
Clear signal for enhanced rainfall across much of Asia



Forecast produced 24th April

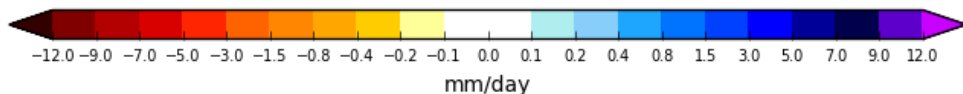
GloSea6 rainfall forecasts for JJA

Met Office: Ensemble mean anomaly : precipitation : Jun/Jul/Aug



Clear signal for enhanced rainfall across much of Asia

Areas of reduced rainfall in Myanmar, Thailand, Laos, Vietnam, Cambodia.



Forecast produced 2nd May

East Asian Summer Monsoon (EASM) forecasts

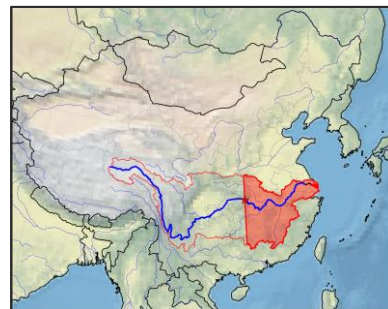
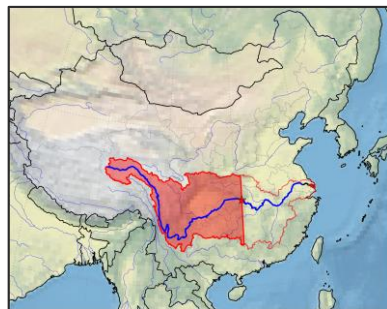
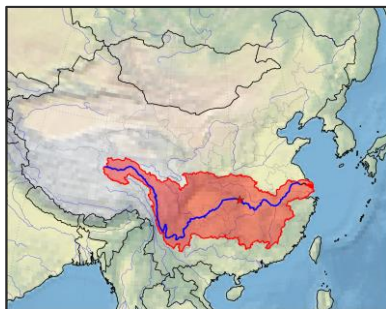
Early forecasts showed no strong signals in the EASM index for MJJ, although consistent $\frac{1}{2}\sigma - 1\sigma$ anomalies for JJA

Forecast signals have increased over time

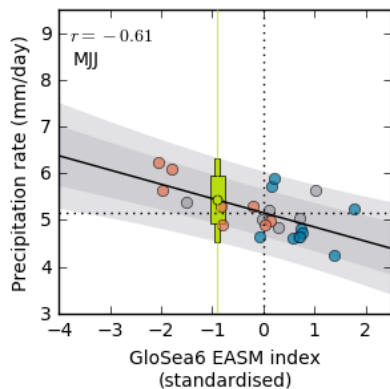
Current forecasts show a stronger anomaly in MJJ ($\frac{1}{2}\sigma - 1\sigma$) and even stronger signals for JJA (about 1.5σ)

Corresponds to a strengthened WPSH+ anomaly

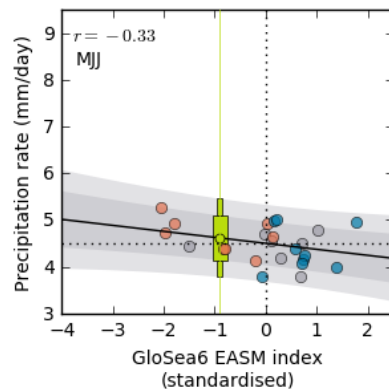
Yangtze Basin forecasts for MJJ from May



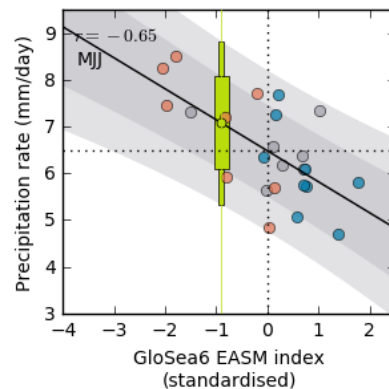
Forecasts are produced for the whole basin, Upper Reaches, and Middle/Lower Reaches



Probability of
above-average rainfall: **75%**



60%



75%

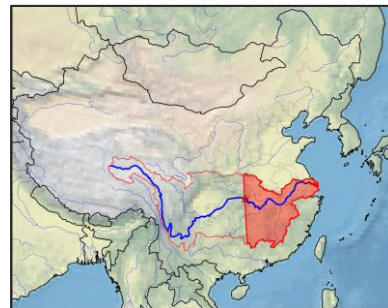
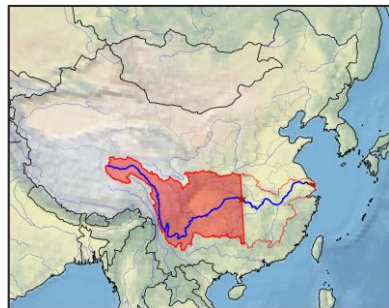
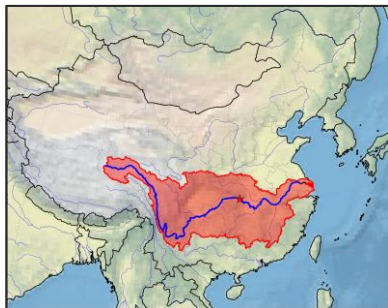
Increased probability of
above-average rainfall,
based on enhanced
EASM signal ($\sim 1\sigma$)



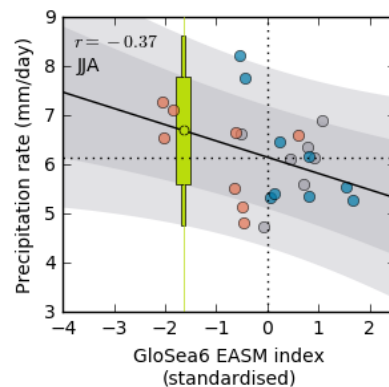
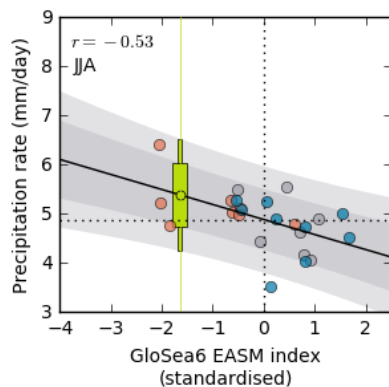
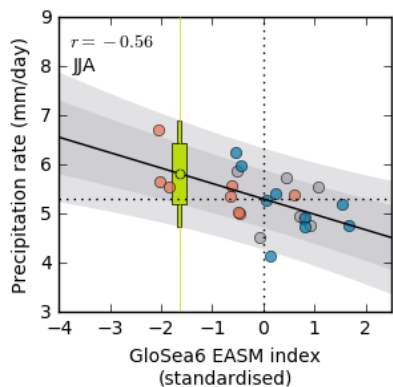
Forecast
probability
distribution

Historical years
(1993–2016)

Yangtze Basin forecasts for JJA from May



Forecasts are produced for the whole basin, Upper Reaches, and Middle/Lower Reaches



Increased probability of above-average rainfall, based on enhanced EASM signal ($\sim 1.5\sigma$)



Forecast probability distribution

Historical years (1993–2016)

Probability of above-average rainfall:

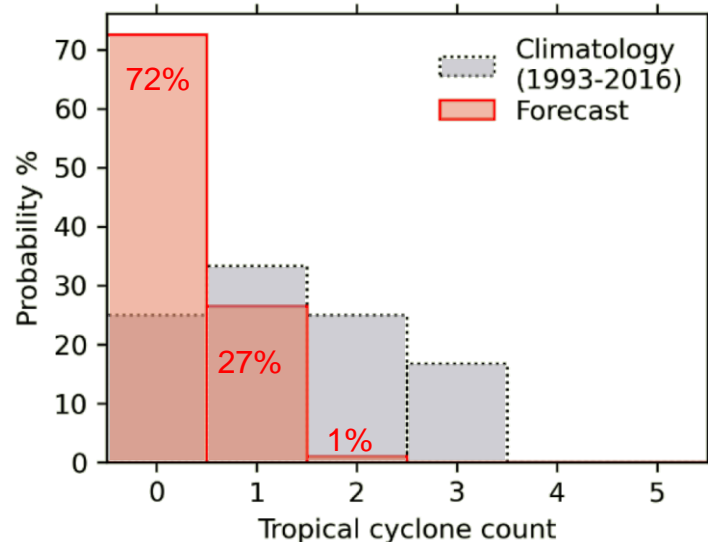
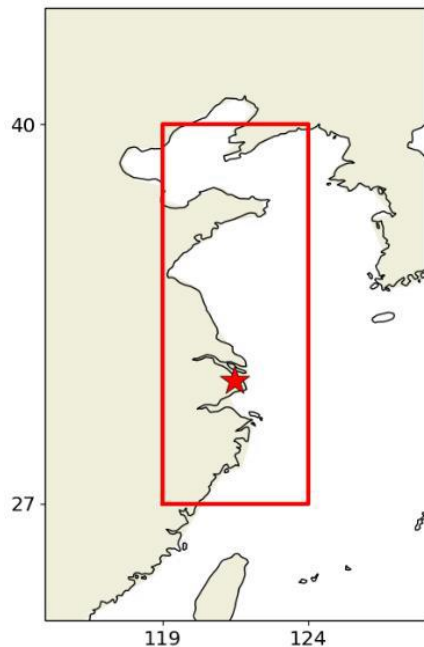
85%

80%

70%

Method: Bett et al. (2020), <https://doi.org/10.1007/s13351-020-0049-z>

East Asia Tropical Cyclone Landfall JJA forecast



Increased probability of fewer tropical cyclone landfalls, based on enhanced WPSH signal

Conclusions

- Forecasting enhanced rainfall across Asia in MJJ
- Different signals in JJA:
 - Enhanced rainfall in much of Asia
 - Reduced rainfall in Myanmar, Thailand, Laos, Vietnam, Cambodia.
- Strong EASM / WPSH anomalies, particularly in JJA
- High probability of above-average rainfall in the Yangtze River Basin and fewer tropical cyclone landfalls in East China