

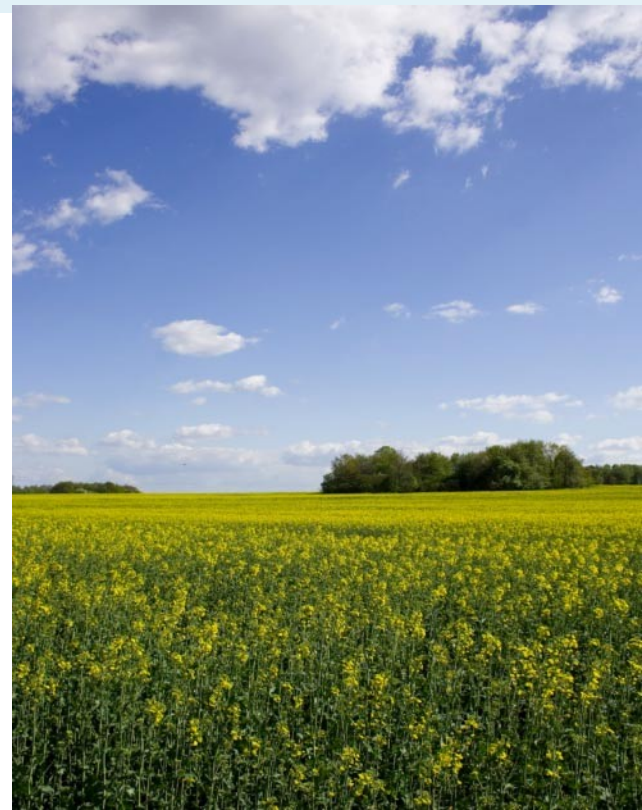


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Improved Seasonal Forecast System

Debbie Hudson, Oscar Alves, Harry Hendon



Background



- BoM's seasonal forecasts have become more skilful with recent versions of the system, but user expectations and performance is still inhibiting uptake by users
- Increasing demand for multi-week and seasonal forecasts
- Present system (POAMA-2) is low resolution (250 km) and based on no longer supported models
- Prior to April this year development focussed on POAMA-3 ---150 km resolution with same model configuration as for climate change studies (UM atmosphere, MOM ocean)
- POAMA-3 already lower resolution than systems operating at other leading centres and the current approach means that we will always be at least two to four years behind the latest developments available from the UKMO



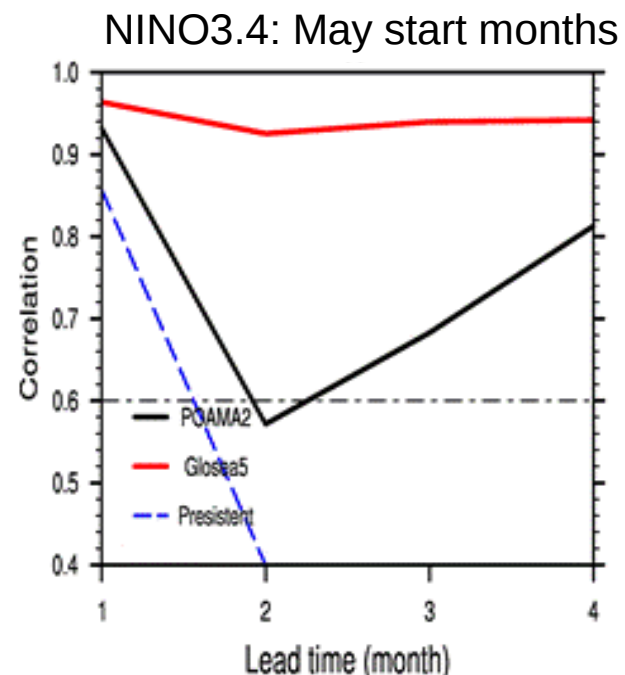
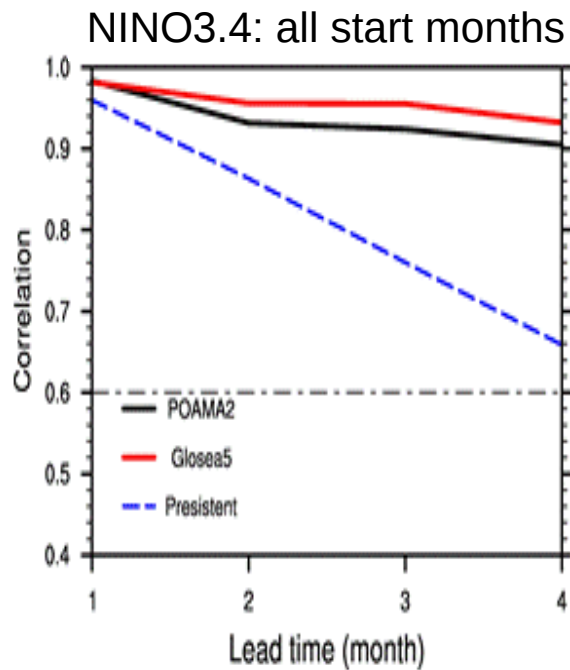
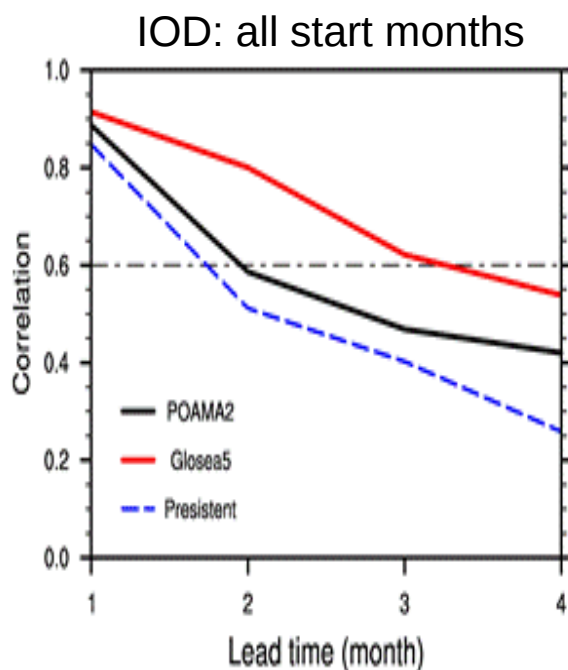
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What has changed?



- Forecast performance of UKMO GLOSEA5 (their previous system) indicated that their system would lead to a step improvement in forecasts compared to POAMA-2 and POAMA-3 due to higher resolution and improved physics.

Example 1:





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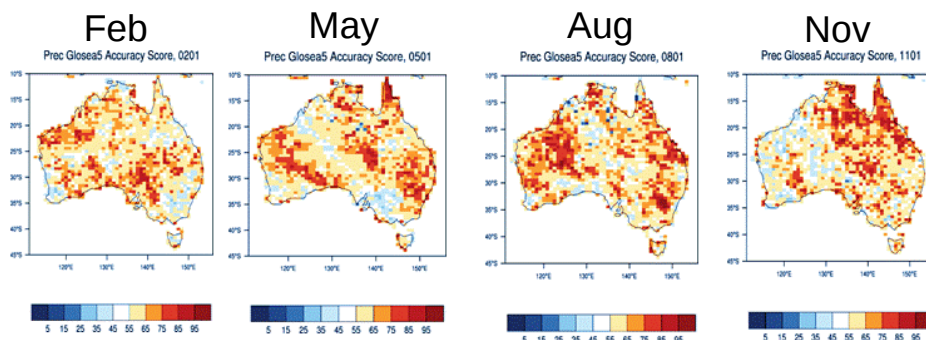
What has changed?



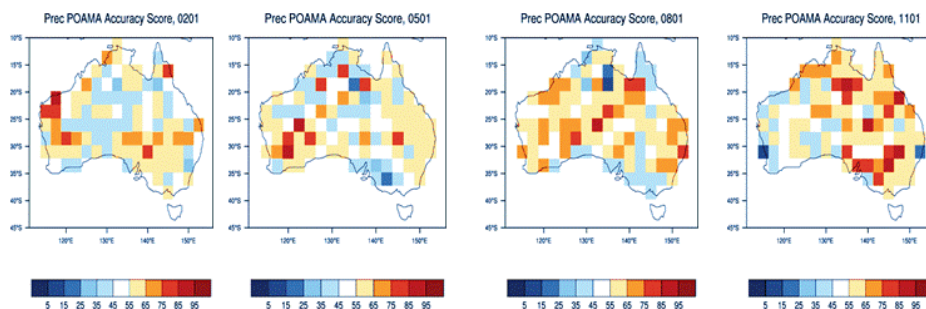
- Example 2:

Hit Rate for above median rainfall Month 1

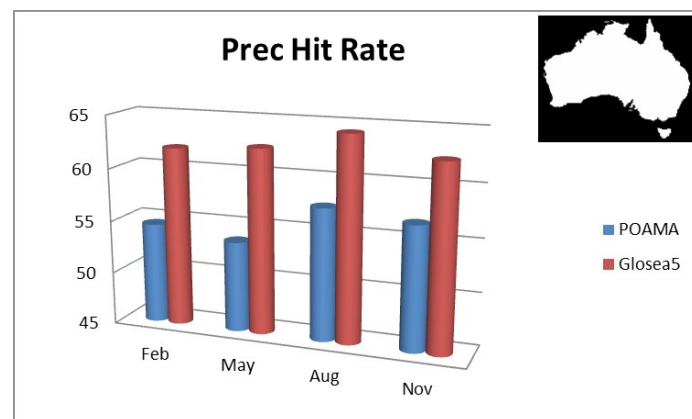
GLOSEA5



POAMA2



- New



a higher resolution system

Plan



New the system: ACCESS-S

- Deliver a high resolution seasonal prediction system at reduced cost, reduced forecast risk and on a significantly shorter time frame compared with the past approach
- Use latest version of the UKMO coupled model: UM atmos N216 (~60km in midlats) L85; NEMO ocean 0.25° L75
- Implement local data assimilation and ensemble generation
- Option for joint hindcasts and forecasts with UKMO
- Play significant role in contributing to UKMO development



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Plan



Note: We are not importing the UKMO seasonal prediction system

- The strategy is no different from the past
- We are taking the UKMO coupled model and entering into a joint partnership to develop it under ACCESS framework
- Forecast system is more than just the model...local DA and ensemble generation, size of hindcast set, size of ensemble ...

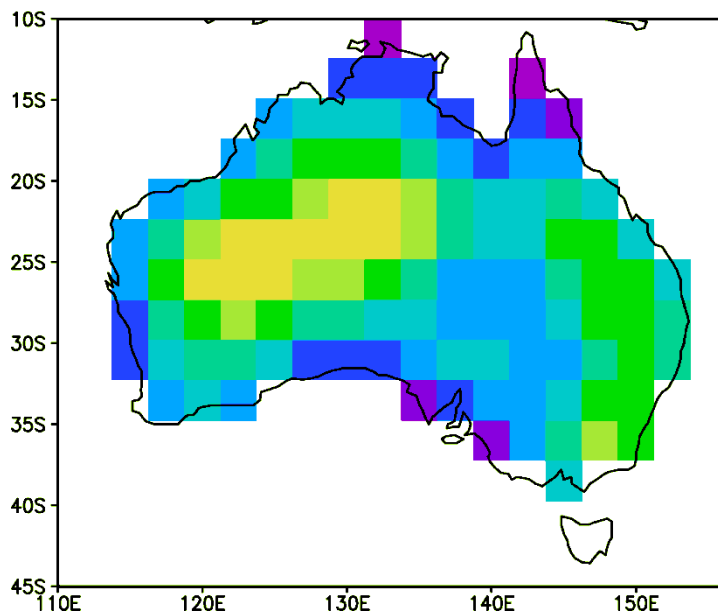
Enhanced resolution



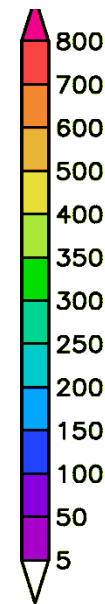
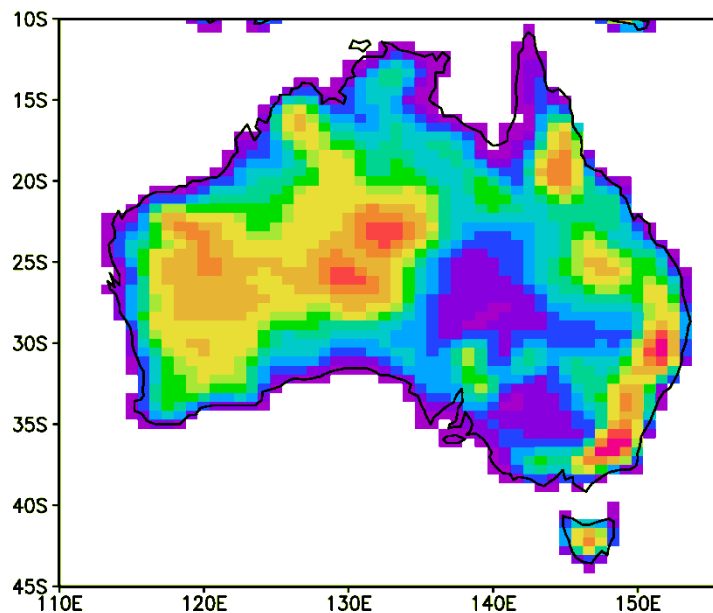
Topography

Resolution increase from 250km to 60km
Able to resolve Dividing Range, Tasmania, coastal zone

POAMA-2



ACCESS-S

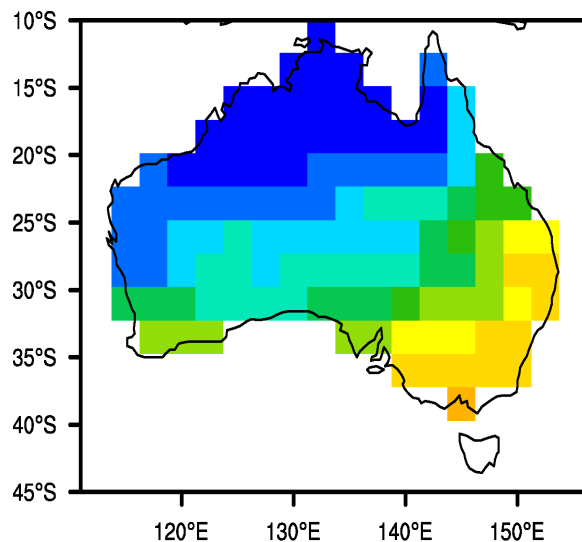


Enhanced resolution

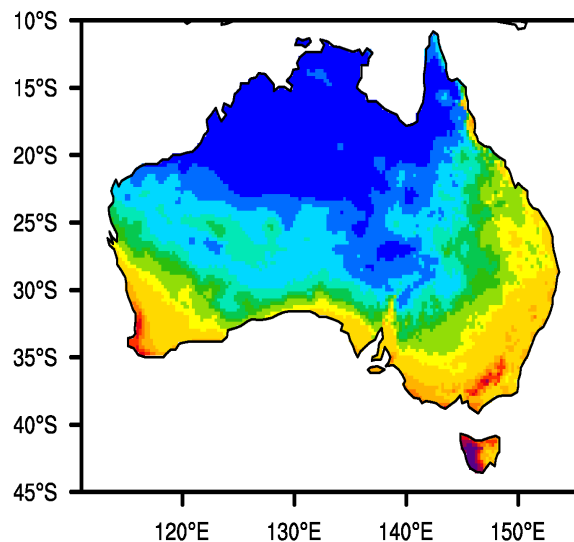


August Mean Rainfall

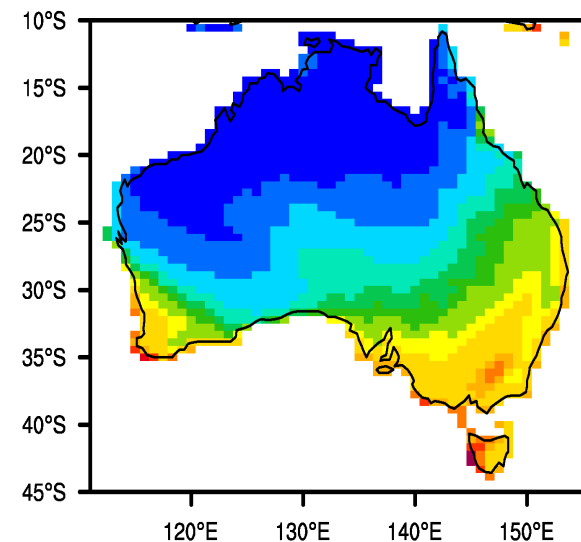
POAMA-2



Obs



ACCESS-S



Plan: Phase 1



Fast track phase : transfer to operations for trial mid-2016*

- UKMO GC3 (stochastic phys, greenhouse gases, etc)
- UKMO initial conditions + local ensemble generation
- Hindcasts increased from 15 to 25 years
- Hindcasts members increased from 3 to 10
- Real-time forecasts 2 per day from UKMO + at least 3 per day from BoM
- 6 months lead (could do longer using local forecasts only)

*Note: exact timelines for delivery depend on funding and supercomputer

Plan: Phase 2



Full suite phase: transfer to operations for trial mid-2018*

- UKMO GC4/5 (reduced tropical biases e.g. Indian Ocean)
- Local Coupled EnKF for assimilation and ensemble generation
- Hindcasts locally 35+ years (joint with UKMO?)
- Hindcasts members at least 10 (joint with UKMO?)
- Real-time forecasts at least 5 per day (+UKMO ones?)
- 1 year lead (?)

*Note: exact timelines for delivery depend on funding and supercomputer



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Thank you...

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