Why we should verify seasonal forecasts

Willem A. Landman

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tinyurl.com/ForecastProf

Alliance for Collaboration on Climate & Earth Systems Science

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Protea Hotel Breakwater Lodge, Cape Town, South Africa

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DOI: 10.1002/joc.6157

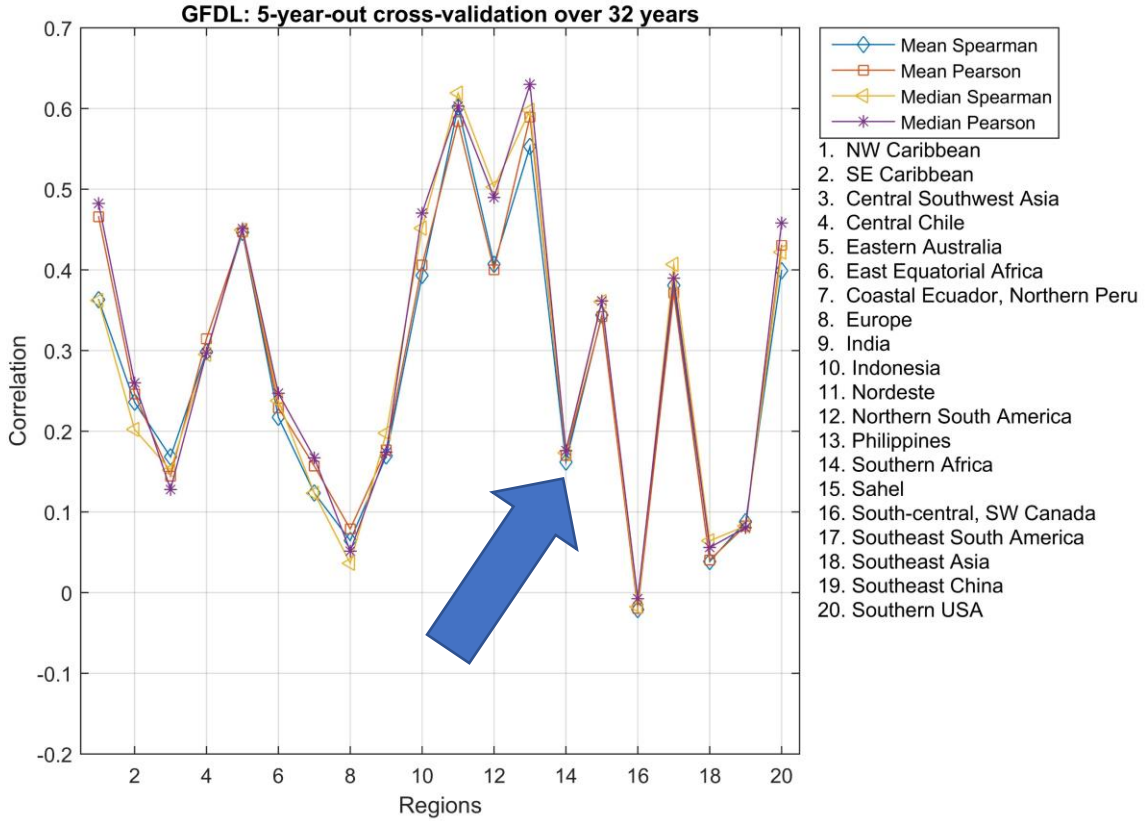
RESEARCH ARTICLE

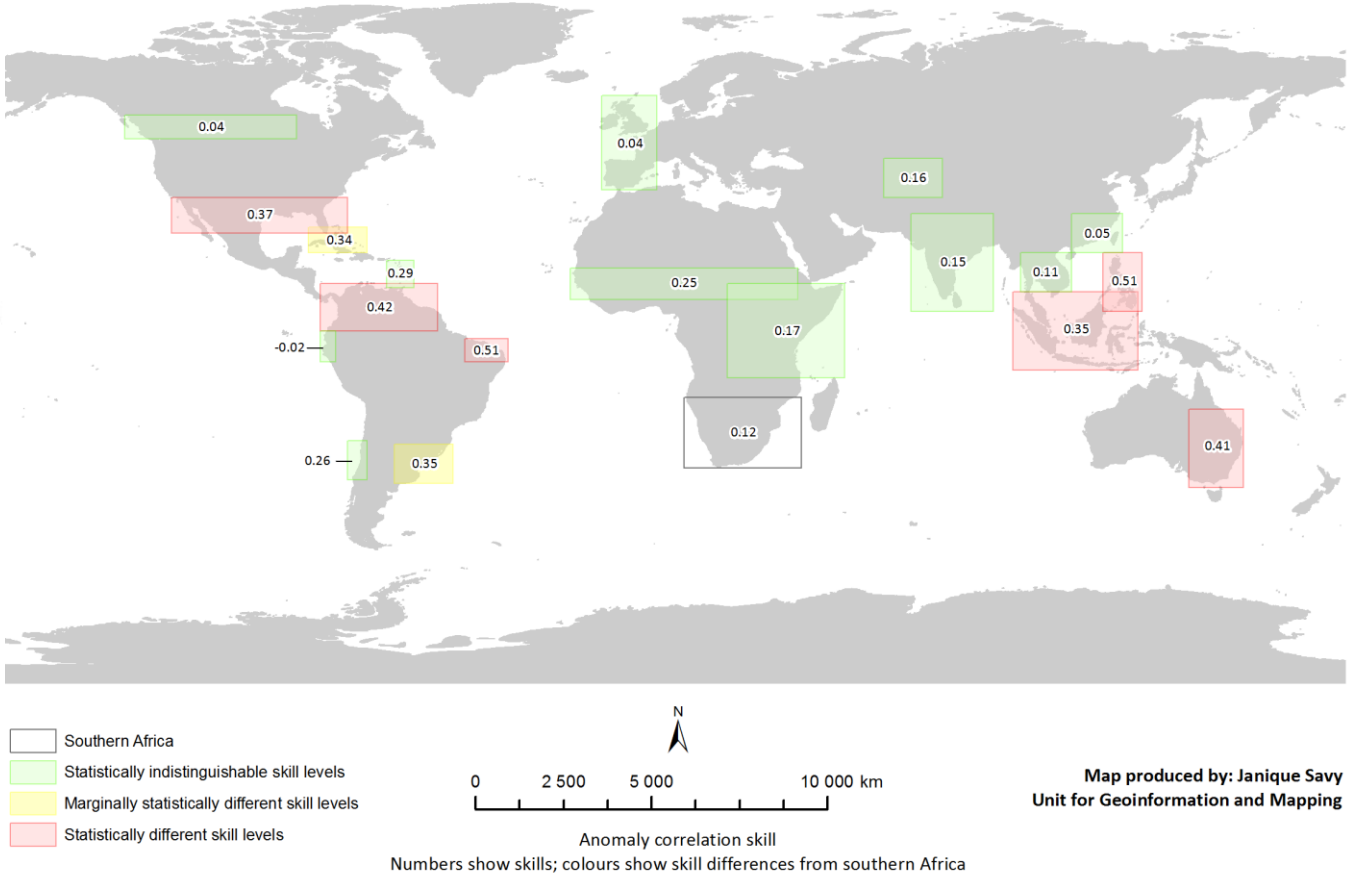
International Journal of Climatology | RMetS

Use of El Niño–Southern Oscillation related seasonal precipitation predictability in developing regions for potential societal benefit

Willem A. Landman[1] | Anthony G. Barnston[2] | Coleen Vogel[3] | Janique Savy[1]

Ranking seasonal rainfall forecast skill





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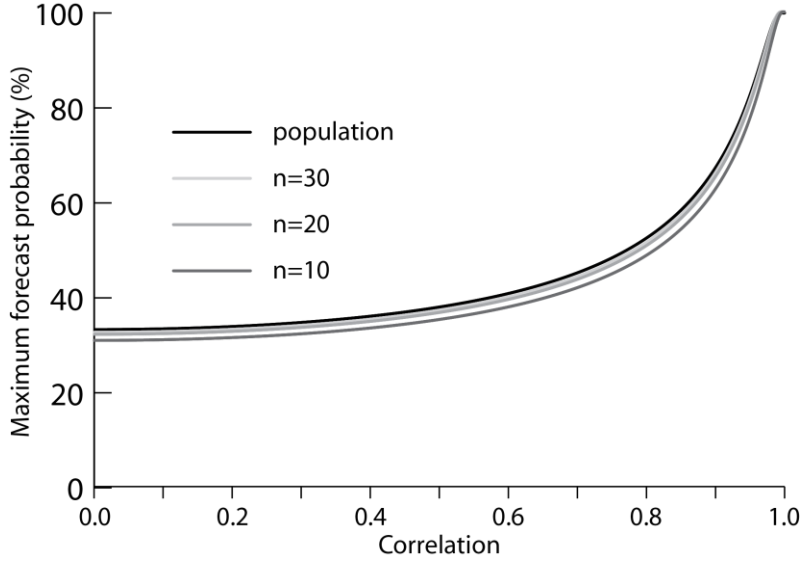
Quarterly Journal of the Royal Meteorological Society RMetS

RESEARCH ARTICLE

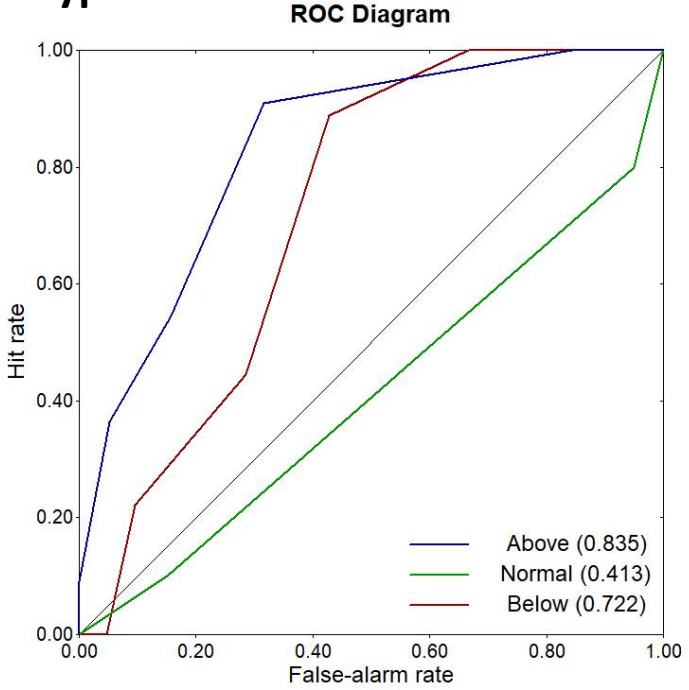
Lessons regarding "normal" forecasts

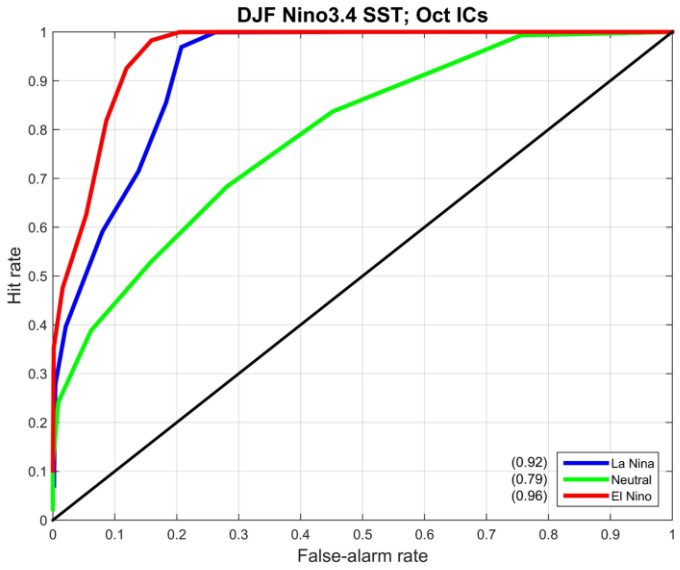
Forecasts of "normal"

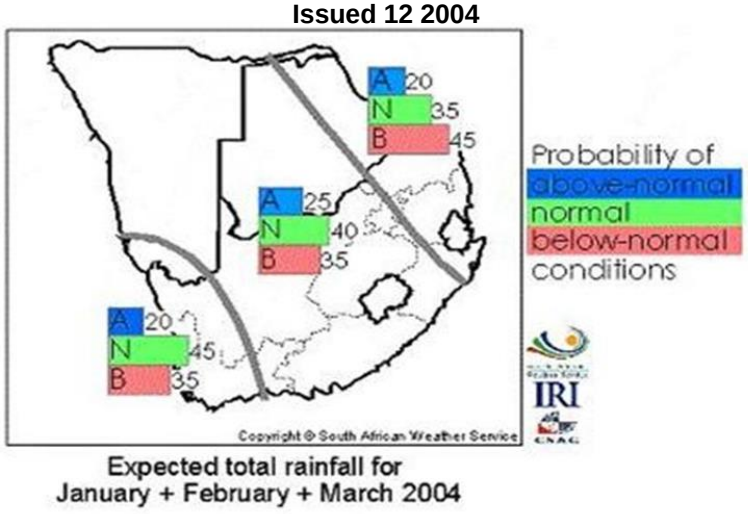
Simon J. Mason[1] | Christopher A. T. Ferro[2] | Willem A. Landman[3]

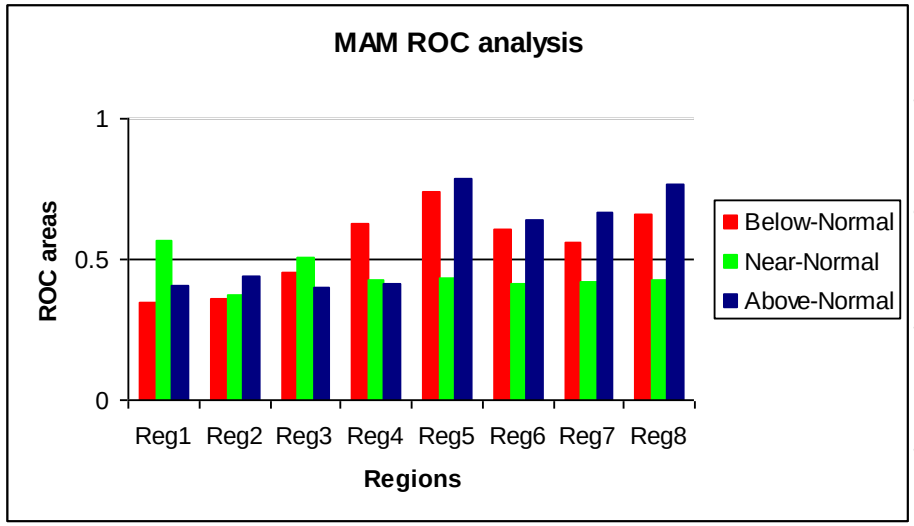


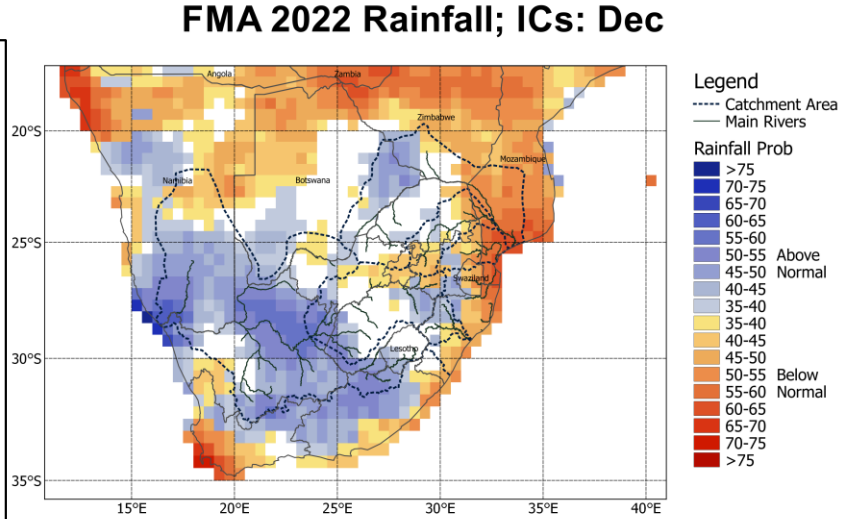
Typical of mid-summer SA rainfall











Seasonal Rainfall Prediction Skill over South Africa: One- versus Two-Tiered Forecasting Systems

WILLEM A. LANDMAN

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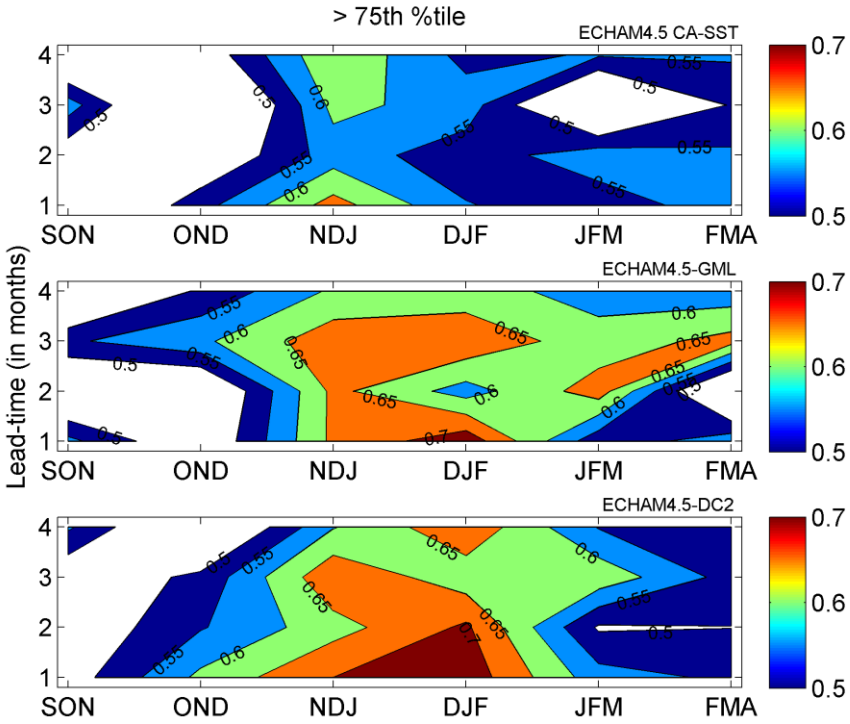
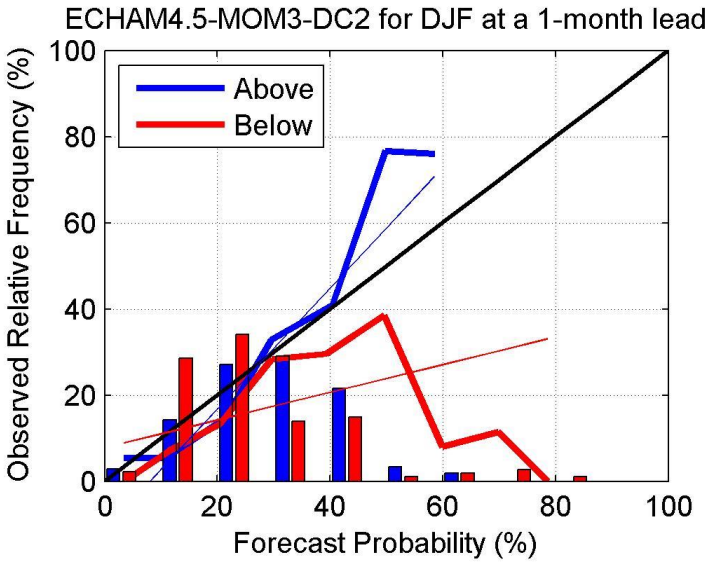
South African Weather Service, Pretoria, South Africa

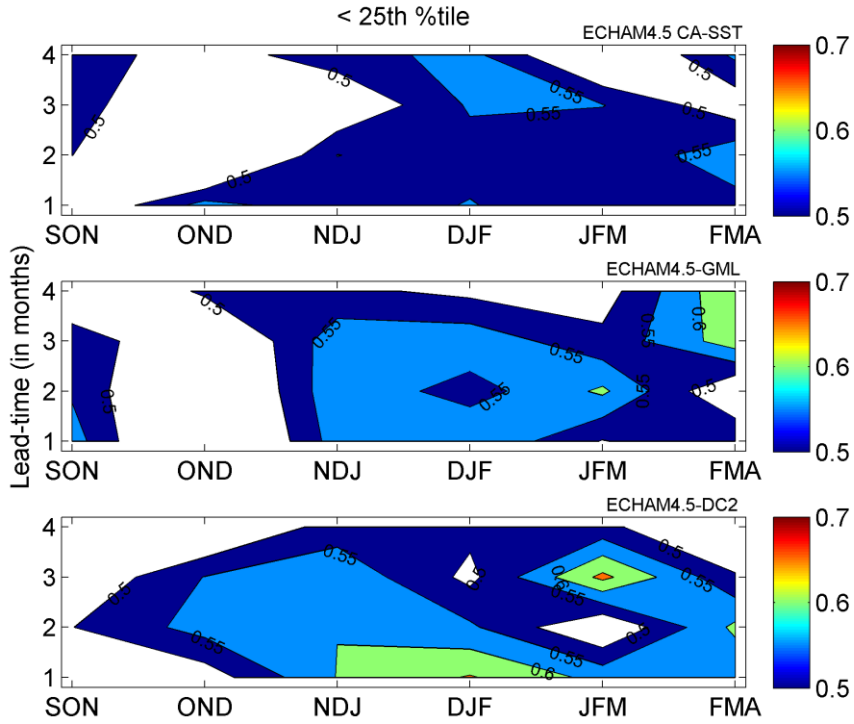
DALEEN LÖTTER

Council for Scientific and Industrial Research, Natural Resources and the Environment, Pretoria, South Africa



What about "above" and "below"?





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Seasonal Forecast Worx

https://tinyurl.com/ForecastProf

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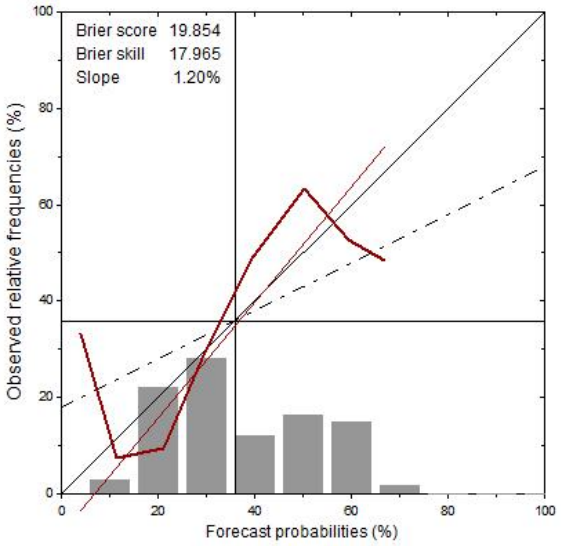
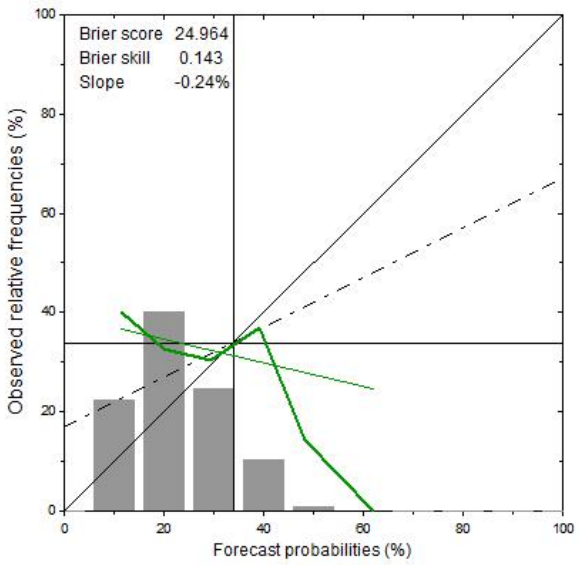
Seasonal Climate Forecasts

Verification of *real-time* seasonal forecasts: 2018/19 – 2022/23

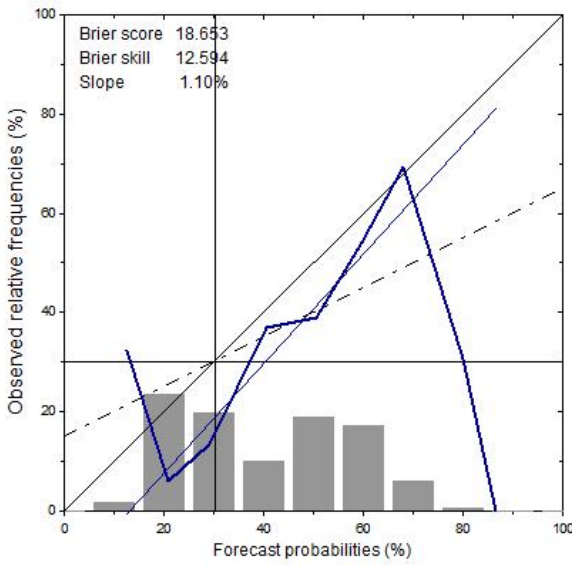
Attributes Diagram: BELOW (NDJ precip, ICs Aug)



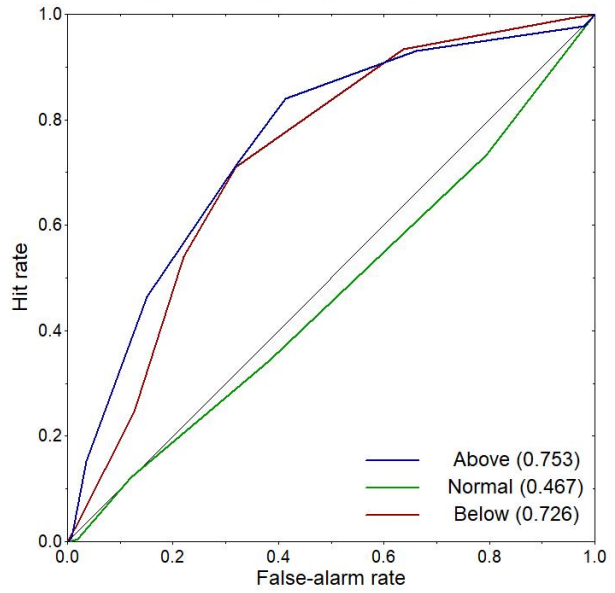
Attributes Diagram: NORMAL (NDJ precip; ICs Aug)



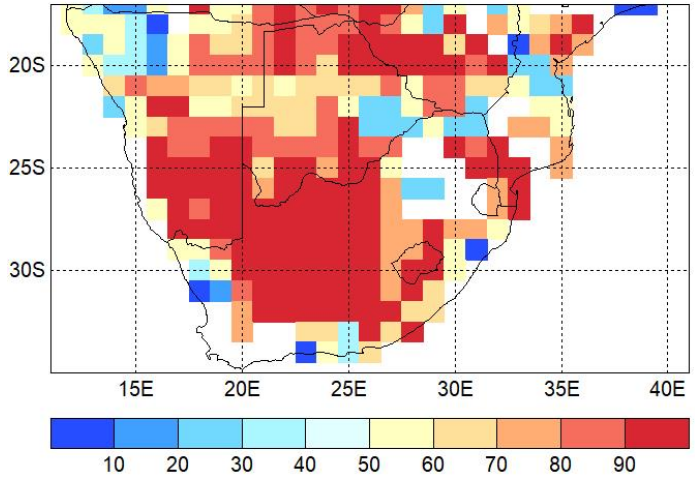
Attributes Diagram: ABOVE (NDJ precip, ICs Aug)



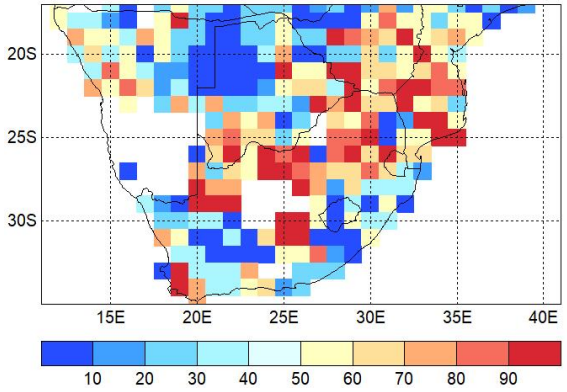
ROC Diagram: NDJ precip; ICs Aug



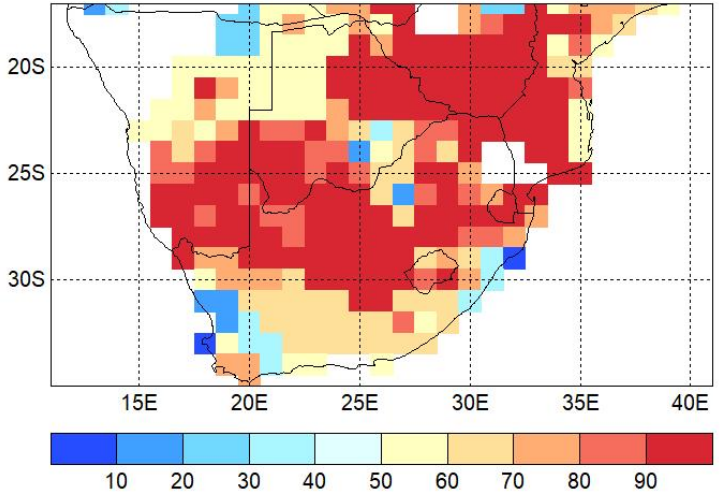
ROC area (Below): NDJ precip; ICs Aug



ROC area (Normal): NDJ precip; ICS Aug



ROC area (Above): NDJ precip; ICs Aug



Can users understand verification statistics?

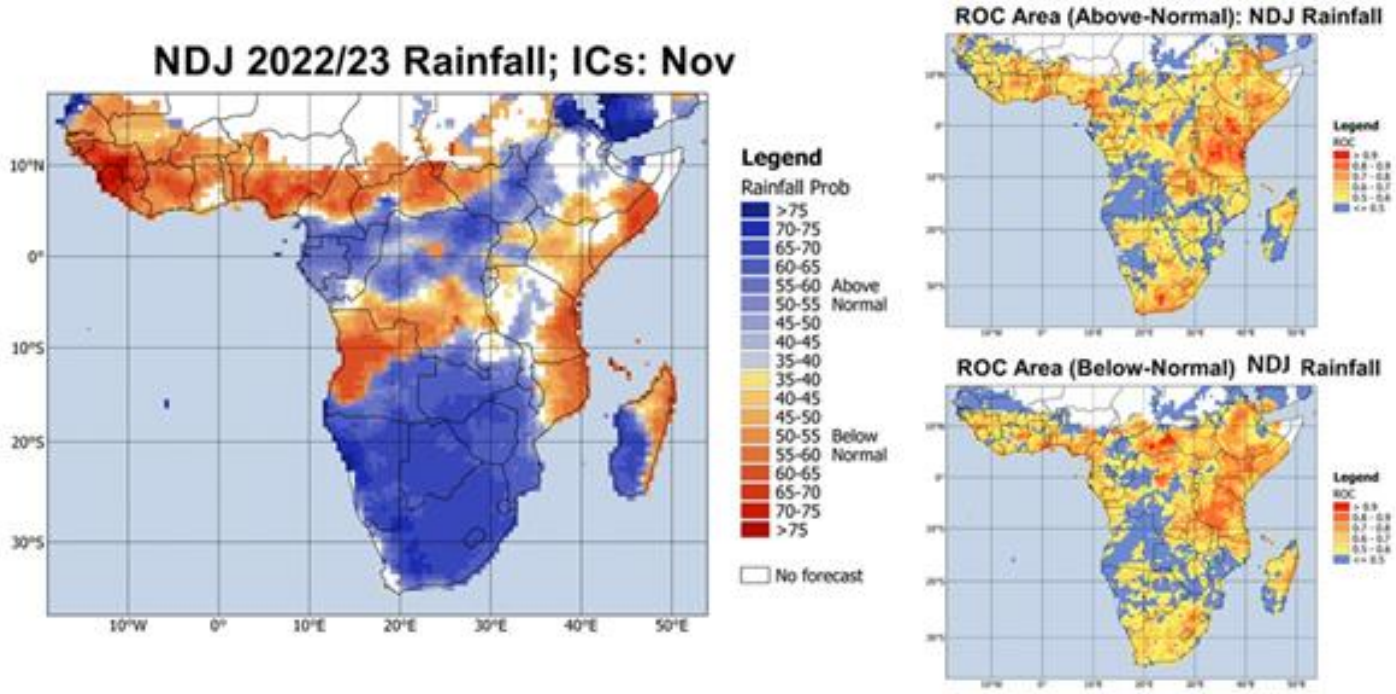
Water SA 49(3) 192–198 / Jul 2023
https://doi.org/10.17159/wsa/2023.v49.i3.4058

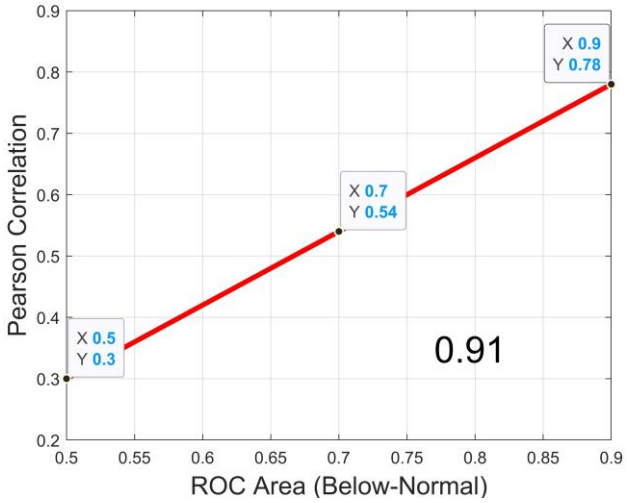
Research paper

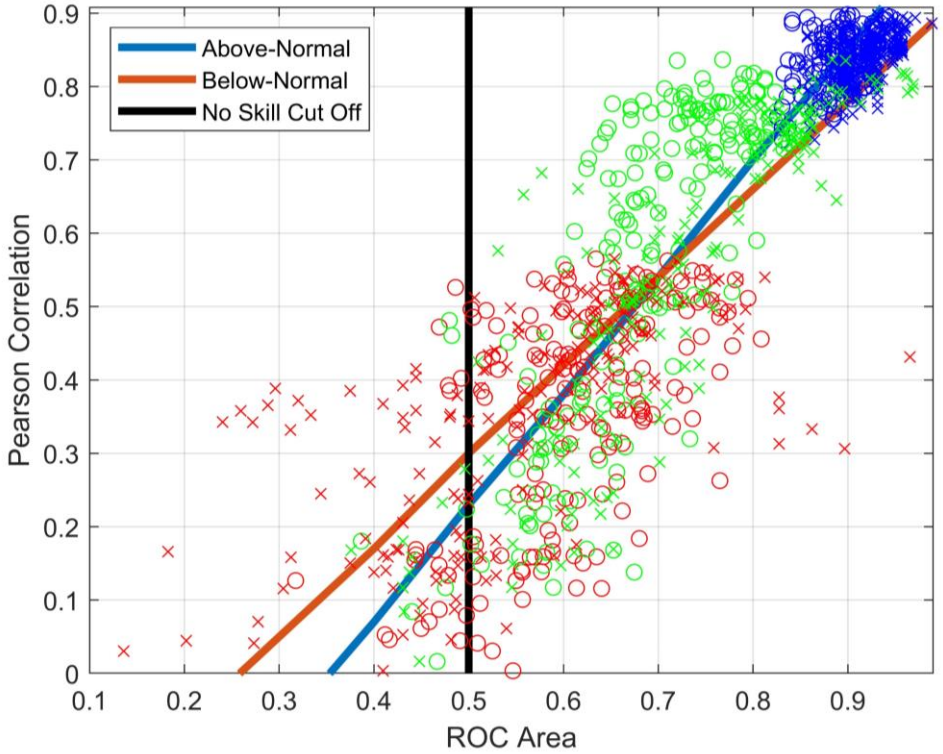
Probabilistic vs deterministic forecasts – interpreting skill statistics for the benefit of users

Willem A Landman[1], Mark Tadross[2], Emma Archer[1] and Peter Johnston[2]

[1]Department of Geography, Geoinformatics and Meteorology, University of Pretoria, Pretoria, South Africa
[2]Climate System Analysis Group, University of Cape Town, Cape Town, South Africa







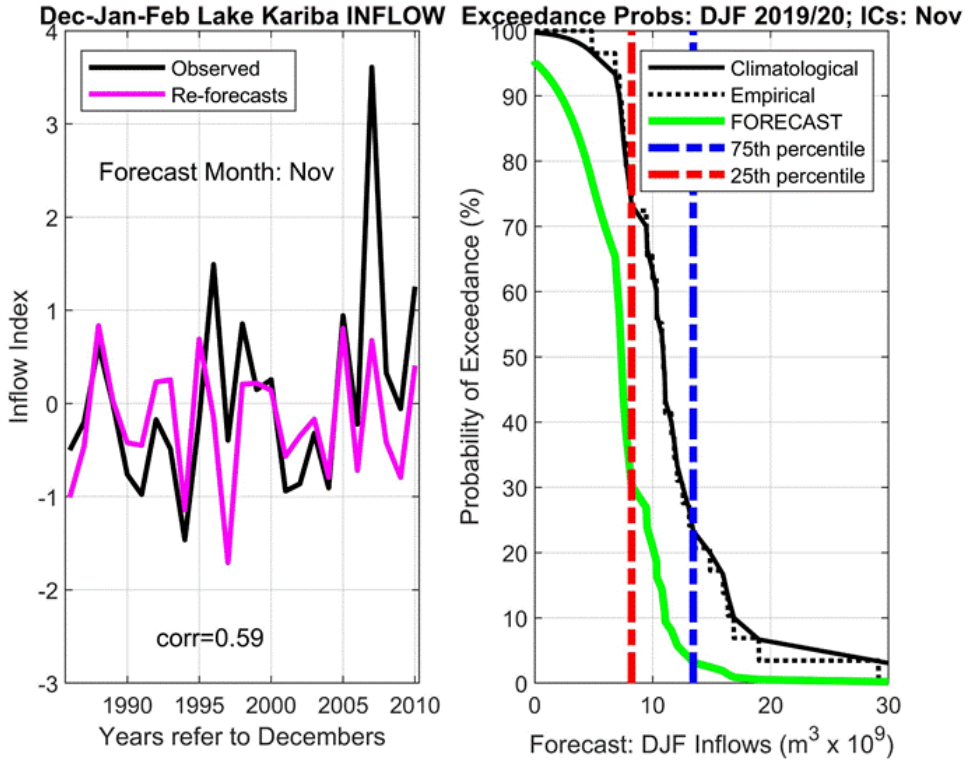
Tailored forecasting

INTERNATIONAL JOURNAL OF CLIMATOLOGY
Int. J. Climatol. **36**: 2570–2581 (2016)
Published online 7 October 2015 in Wiley Online Library
(wileyonlinelibrary.com) DOI: 10.1002/joc.4513

RMetS
Royal Meteorological Society

Prediction of inflows into Lake Kariba using a combination of physical and empirical models

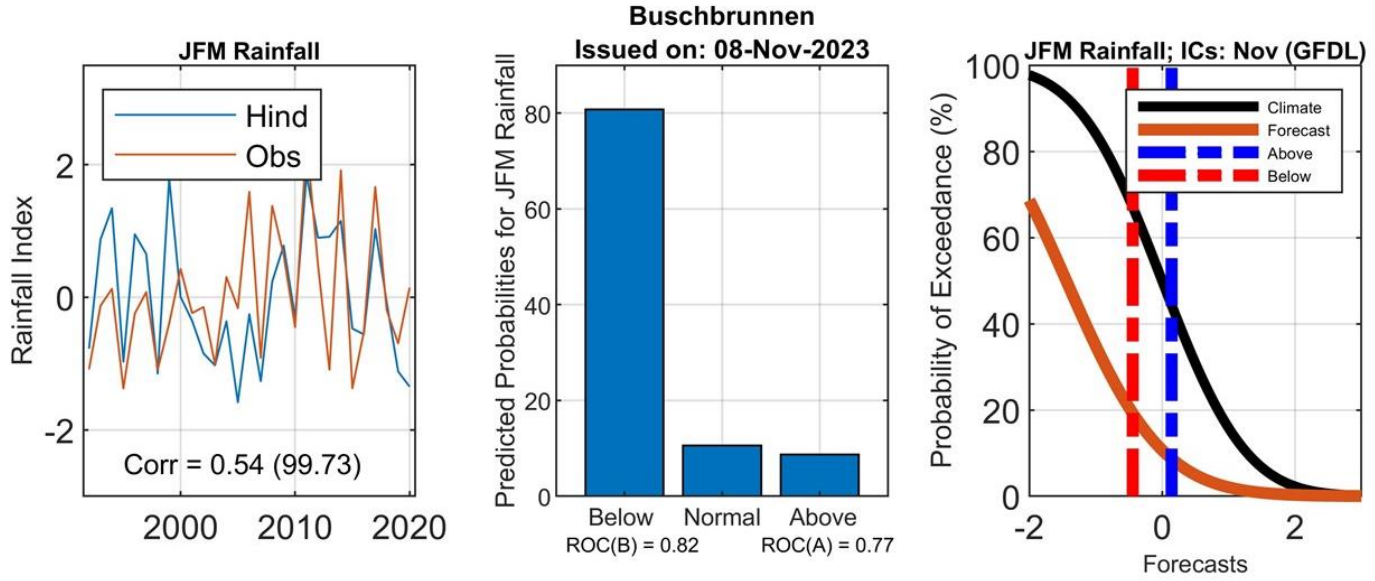
Shepherd Muchuru,[a]* Willem A. Landman[a,b] and David G. DeWitt[c]
[a] *Department of Geography, Geoinformatics and Meteorology, University of Pretoria, South Africa*
[b] *Council for Scientific and Industrial Research, Natural Resources and the Environment, South Africa*
[c] *International Research Institute for Climate and Society, Lamont-Doherty Earth Observatory of Columbia University, Palisades, NY, USA*



frontiers in Climate
ORIGINAL RESEARCH
published: 08 September 2020
doi: 10.3389/fclim.2020.00005

Citizen Science for the Prediction of Climate Extremes in South Africa and Namibia

Willem A. Landman[1,2], Emma R. M. Archer[1] and Mark A. Tadross[3]*



Environmental Development 35 (2020) 100522

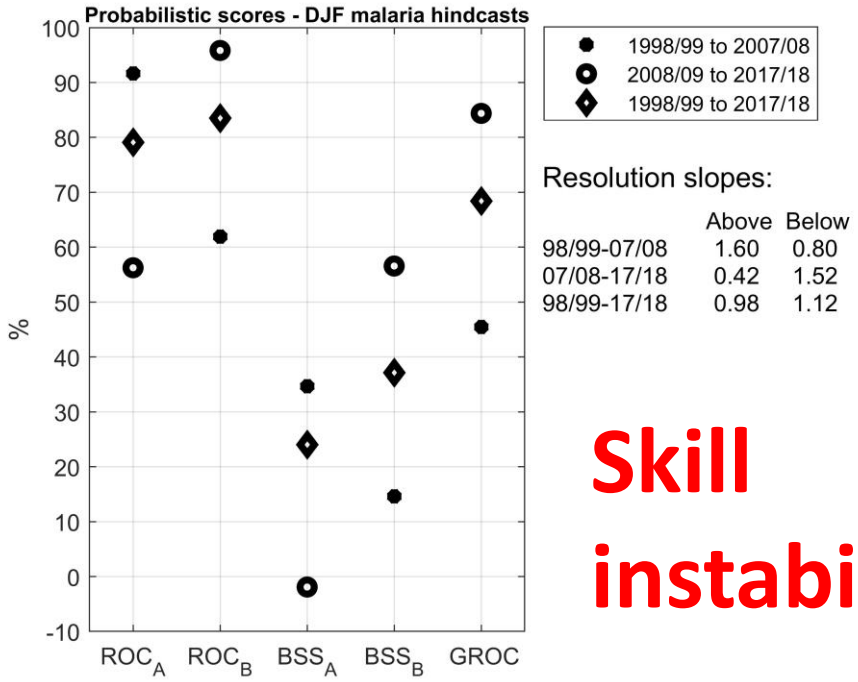
Contents lists available at ScienceDirect

Environmental Development

journal homepage: www.elsevier.com/locate/envdev

The development and prudent application of climate-based forecasts of seasonal malaria in the Limpopo province in South Africa

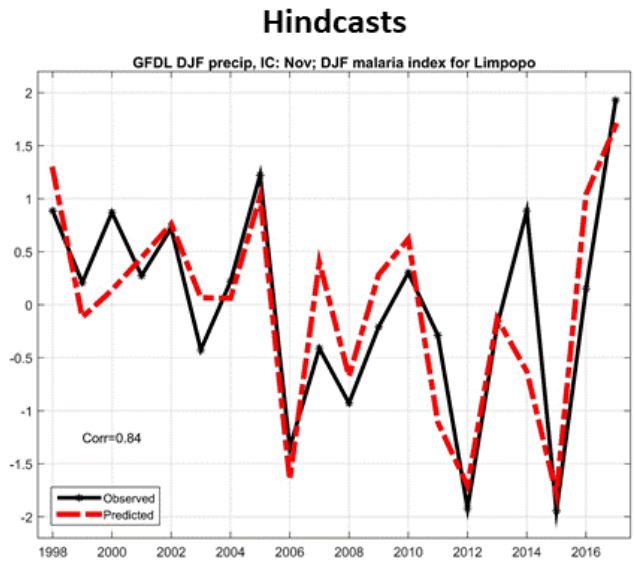
Willem A. Landman[a,*], Neville Sweijd[b], Nyakallo Masedi[c], Noboru Minakawa[d]

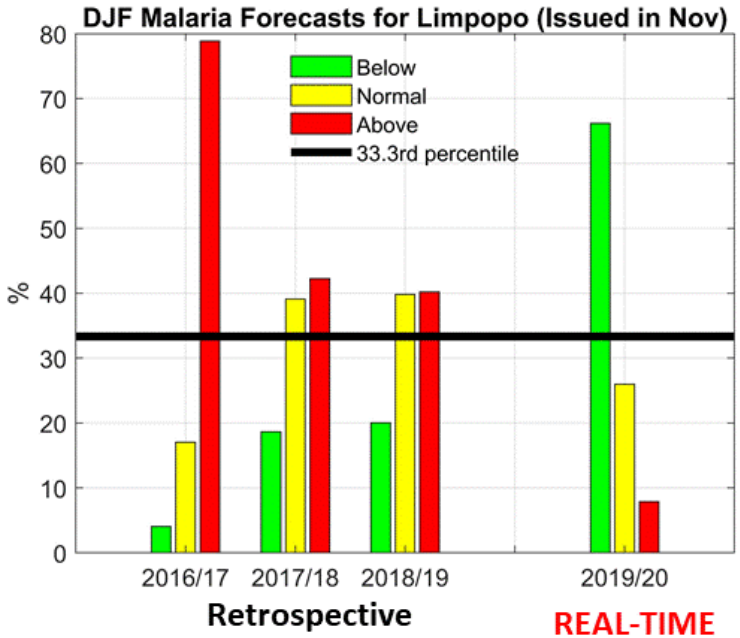


Resolution slopes:

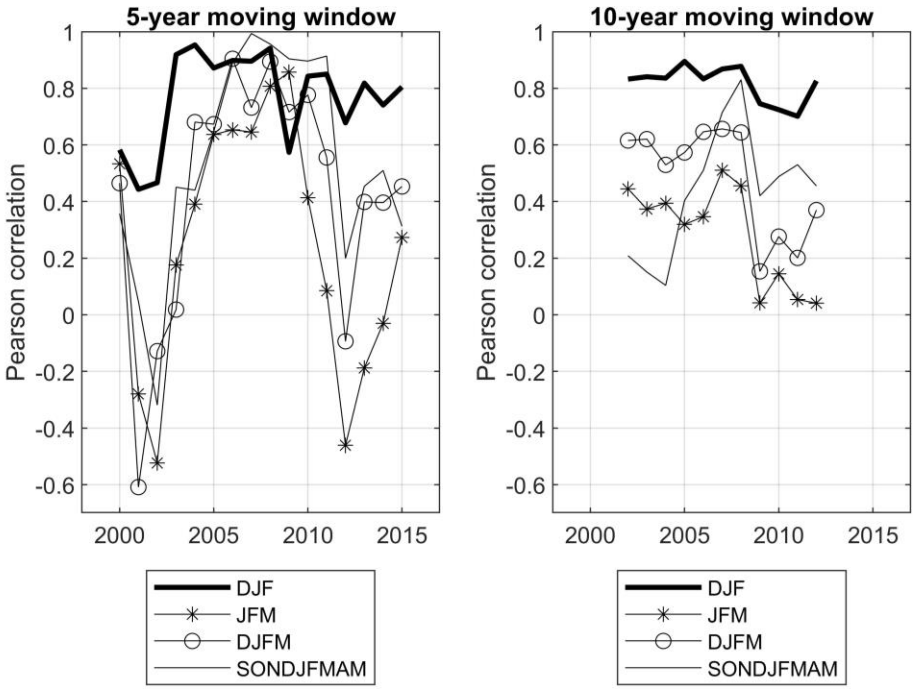
	Above	Below
98/99-07/08	1.60	0.80
07/08-17/18	0.42	1.52
98/99-17/18	0.98	1.12

Skill instability



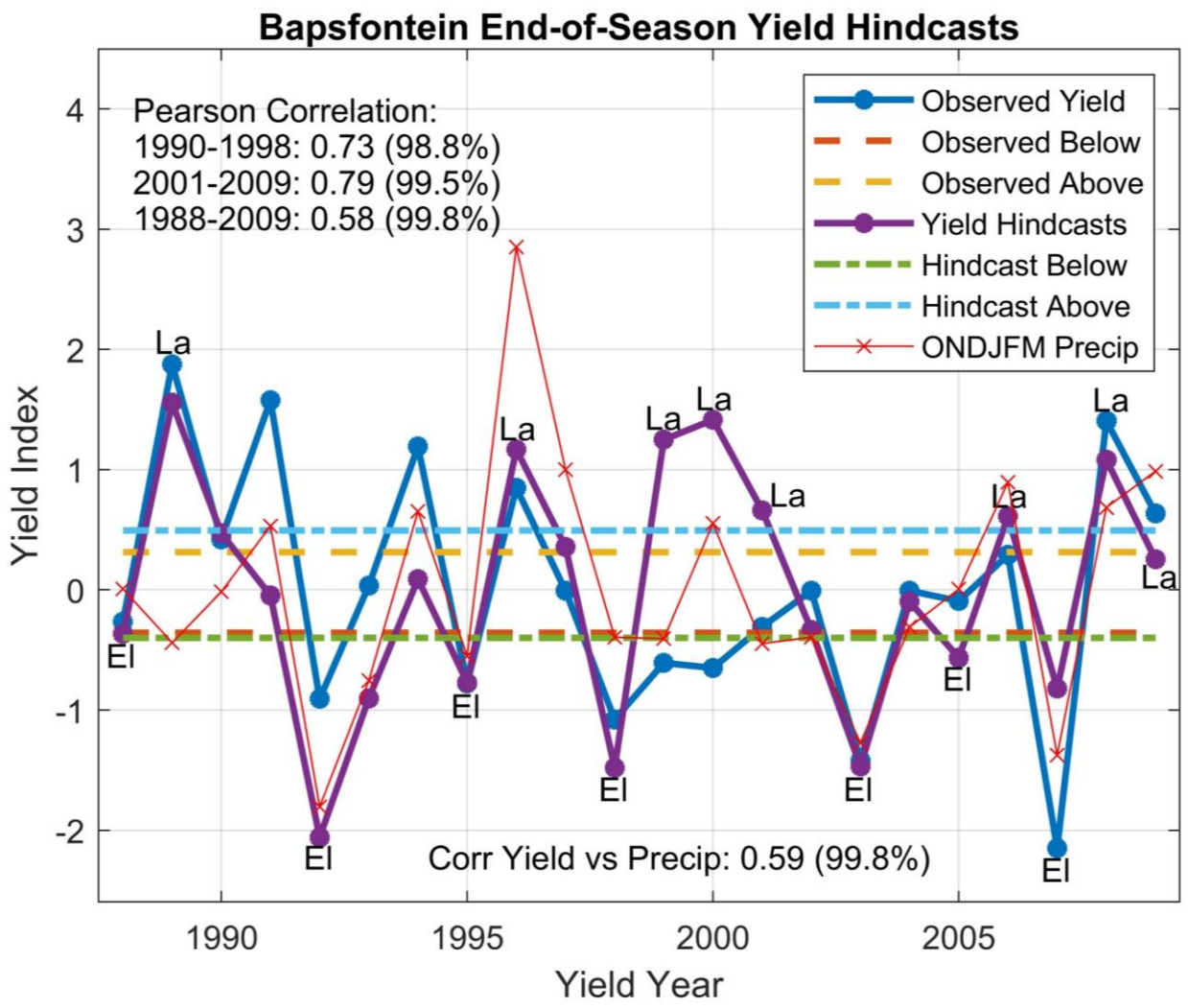


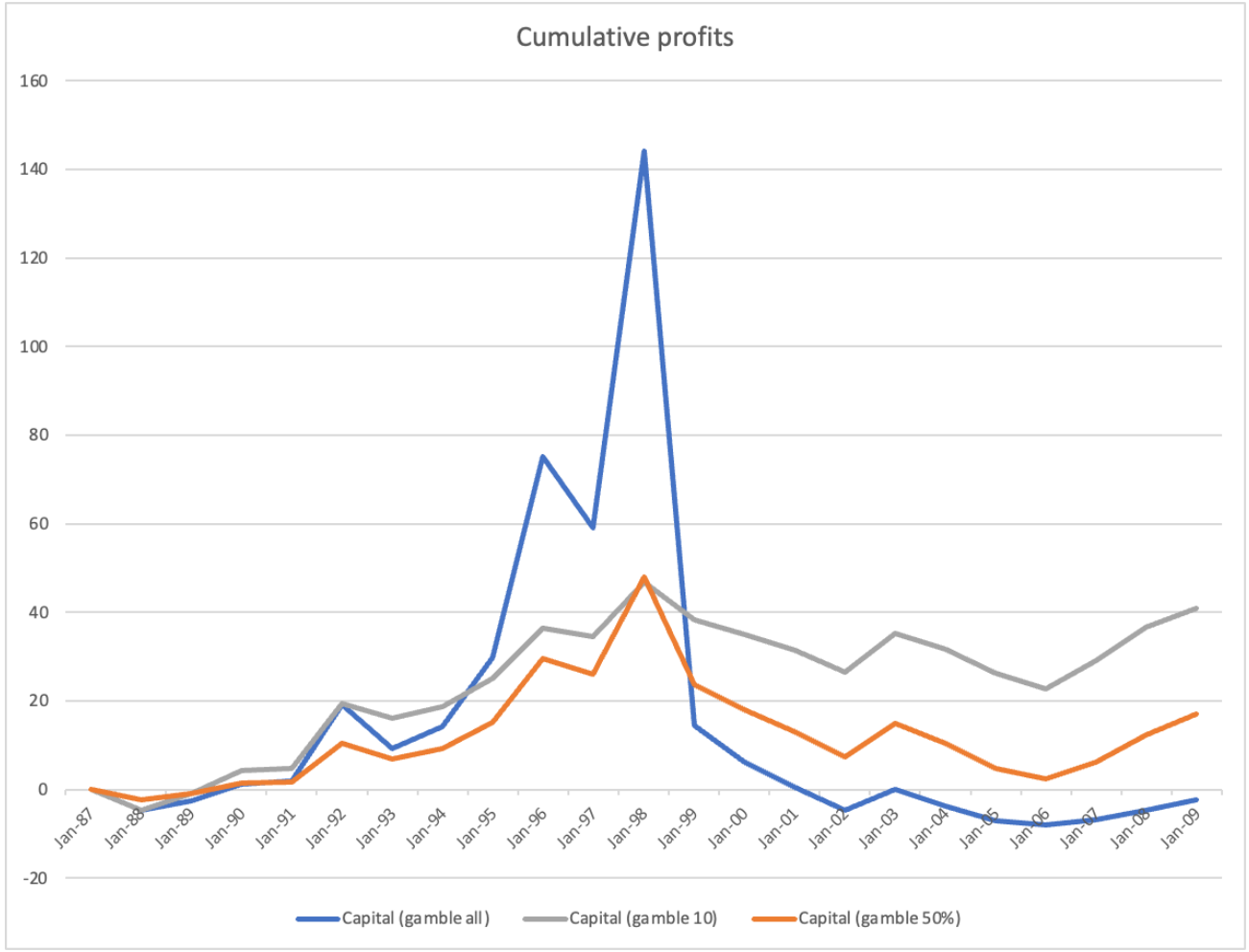
REAL-TIME



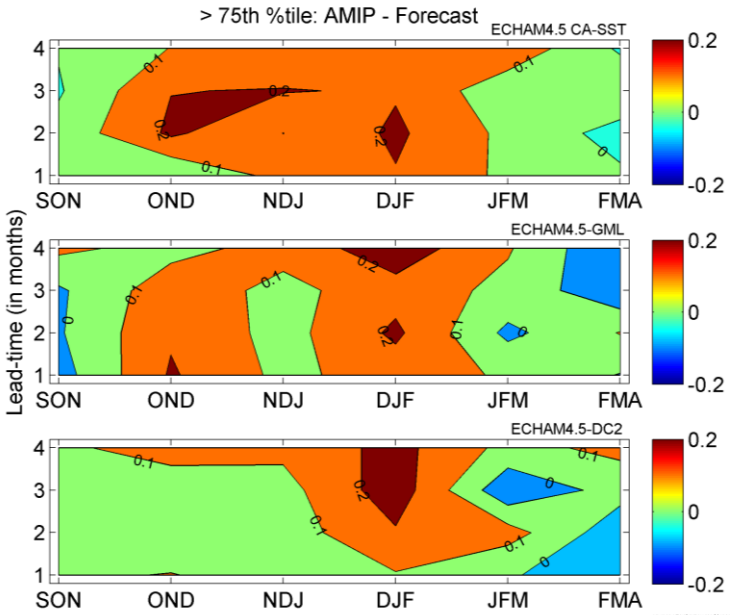
Seasonal forecast characteristics influence the financial success of farming strategies

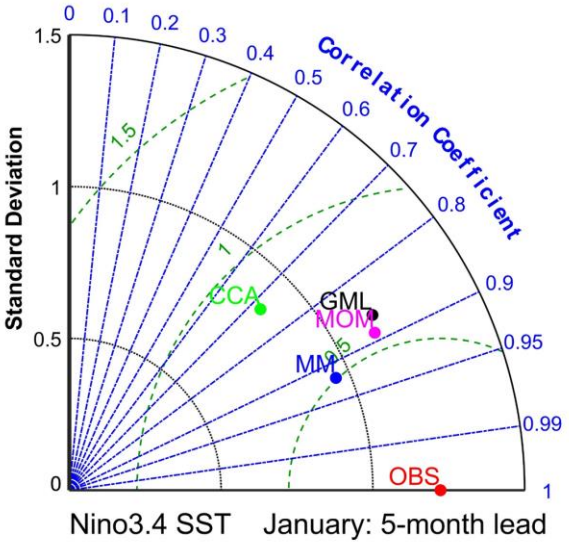
Willem A. Landman, Mark Tadross, Peter Johnston, Olivier Crespo, Emma Archer

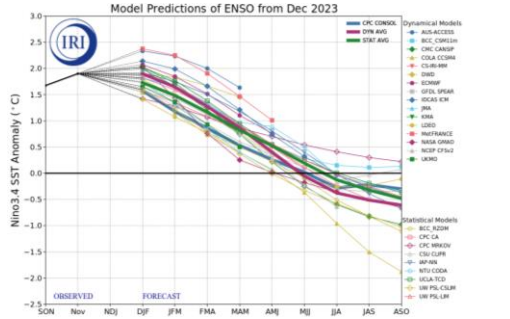


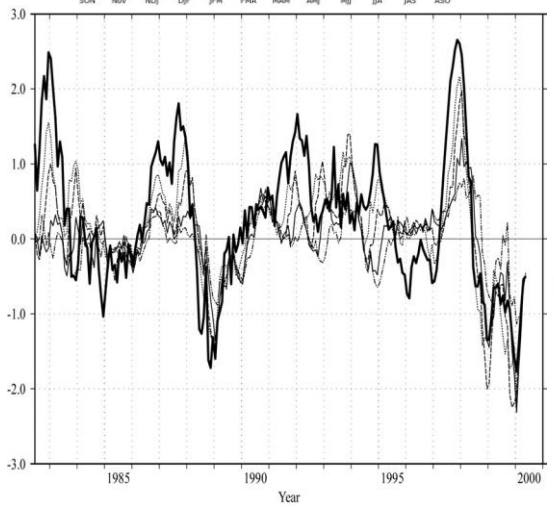


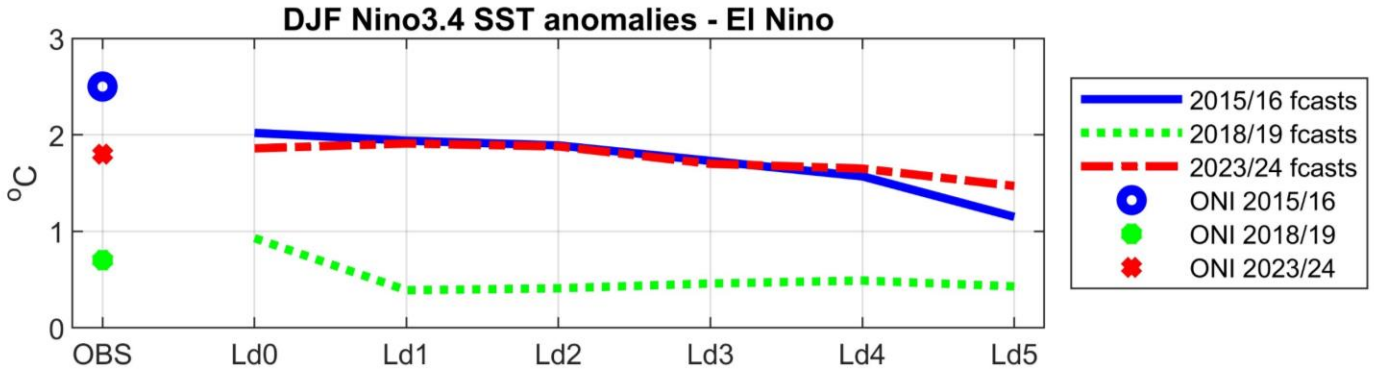
ENSO prediction capability in SA

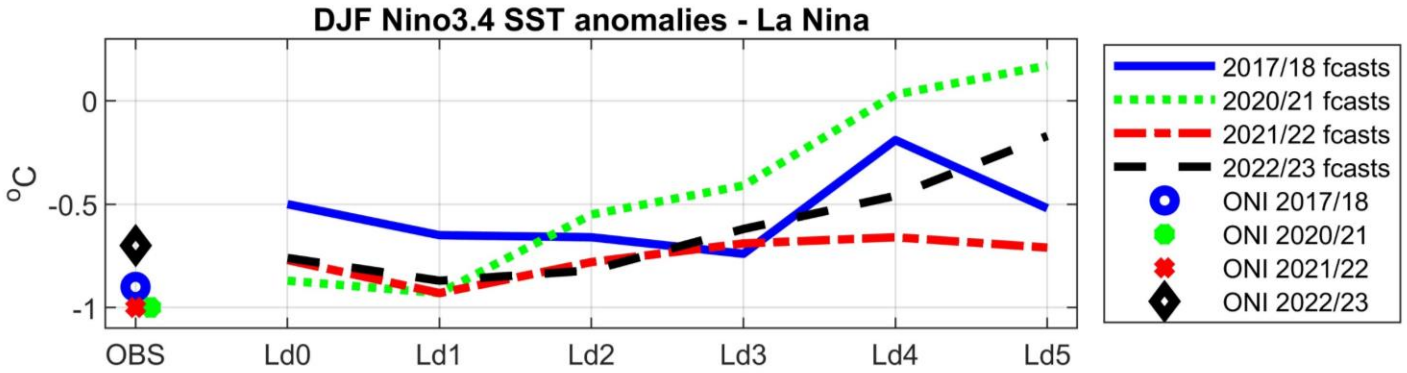


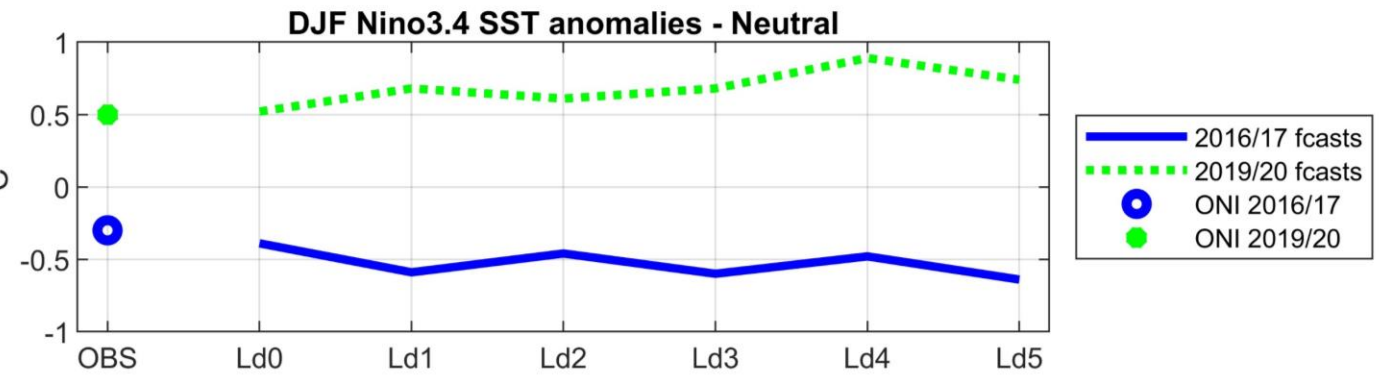












Lessons learnt from seasonal forecast verification

- Southern Africa ranks low against other ENSO-related areas
- Do not predict for the normal category
- Wet-season forecasts work best
- Operational forecasts over recent 5 years have skill
- Operational forecasts should be accompanied by verification statistics
- Financial benefits can be obtained when using forecasts
- ENSO forecasting skilful, but sometime lacks the ability to capture extreme ENSO events