



The Africa Climate Science Research Partnership (CSRP): results and experience

Richard Graham (Met Office Hadley Centre)

Acknowledgements:

Met Office Hadley Centre CSRP Team, CSRP Fellows, DFID

Second annual conference on Climate Change and Development in Africa, UNECA, Addis Ababa, 19-20 October 2012



CSRP: climate and modelling research, applications, capacity building – Africa

For more details:

Side event this evening: Conference Room 2
18:30 to 20:00

Details, questions, answers, feedback

Discussion of future research priorities



- Please also visit the CSRP posters and...
- CSRP website <http://www.metoffice.gov.uk/csrp>



CSRP: climate and modelling research, applications, capacity building – Africa

3-year programme, started January 2010

Initial consultation with African users of climate predictions; also...

- Fellowships, workshops, African RCOFs (ICPAC, ACMAD, SADC-CSC)
- In spirit of collaboration urged by Global Framework (GFCS)

Science component:

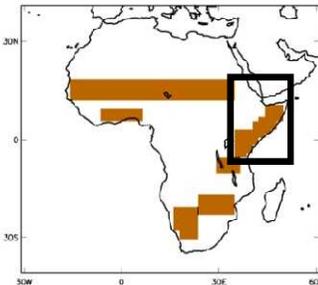
1. Improved understanding and modelling of drivers of African climate – HadGEM3 model development with an ‘Africa lens’
2. New ‘user-driven’ products: predictions (monthly-to-decadal), monitoring and ‘attribution’
3. Increasing forecast detail - downscaling seasonal forecasts

Capacity development:

4. **CSRP Fellowship scheme:** 11 associate fellows (see the posters)
5. **Workshops:** 2 climate science workshops with ICPAC (2011 & 2012)

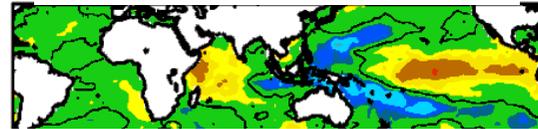
1. Understanding/modelling:

Influence of global sea-surface temperature on African rainfall



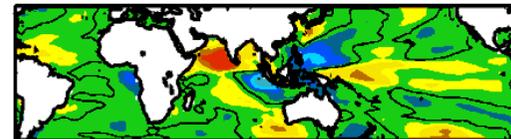
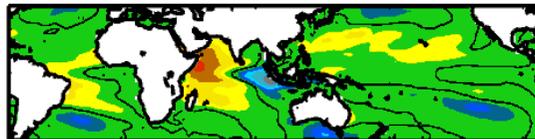
**Example: Greater Horn of Africa
'short-rains' season
'Teleconnections'**

Correlation: observed



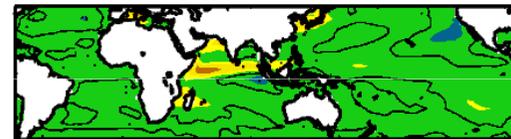
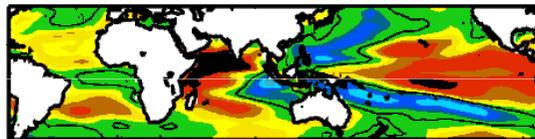
CNRM_CM3

CSIRO_MK3_0



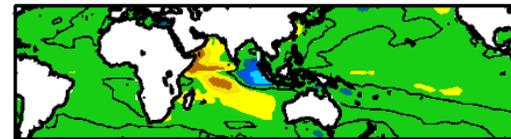
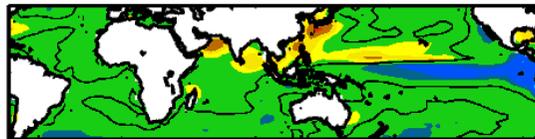
GFDL_CM2_1

GISS_AOM



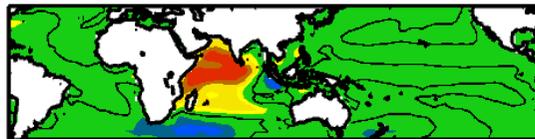
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**Correlation:
in models**

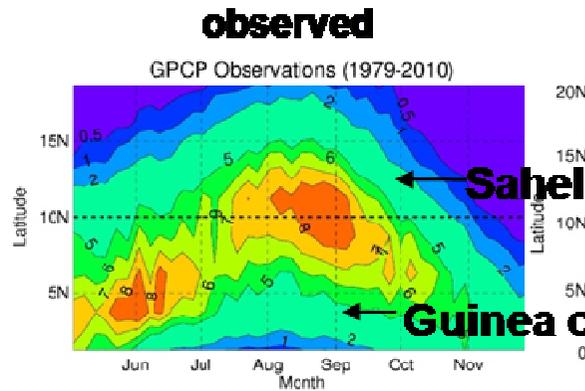
- Processes important for African rainfall are 'missing' in models
- Research is pointing the way for model improvement



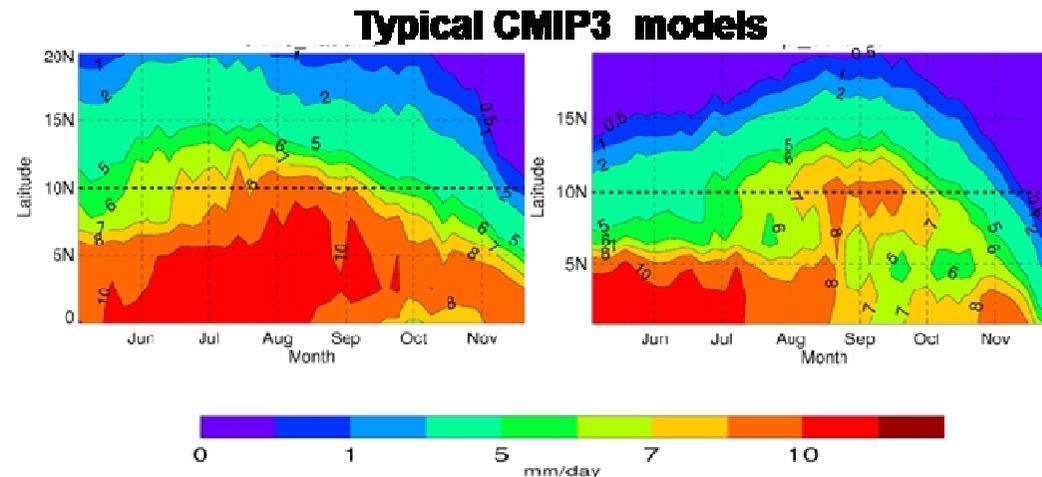
1. Understanding/Modelling:

Major climate systems of Africa

West African Monsoon
(latitude Vs time)



Red indicates latitude of
main rains



- Some African 'rain-bringing' systems not well represented in models
- HadGEM3: helping to identify factors important to monsoon onset

Michael Vellinga / Ousmane Ndiaye / Ismaila Diallo / Dominic Pokperlaar

2. Predictions and Products:

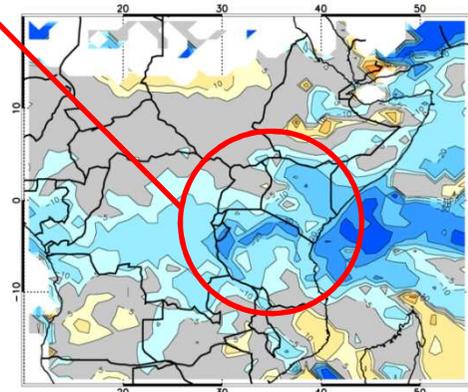
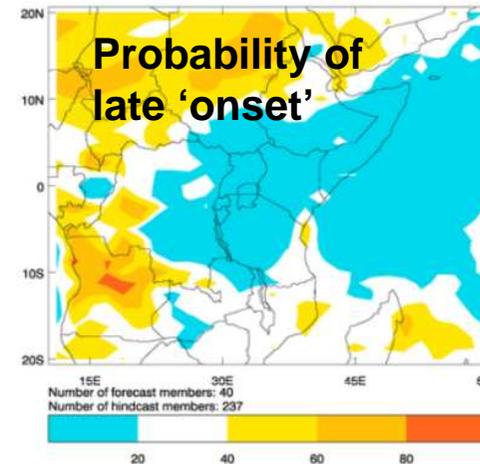
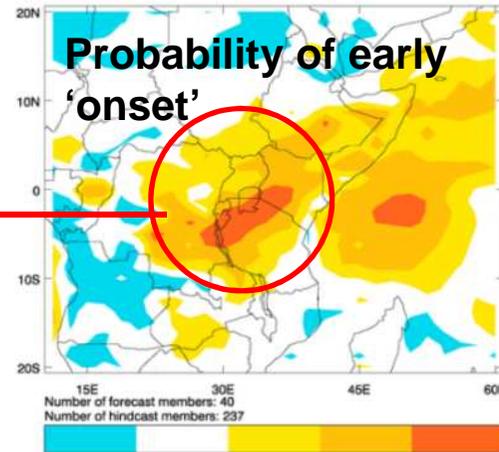
predicting the onset of the rainy season



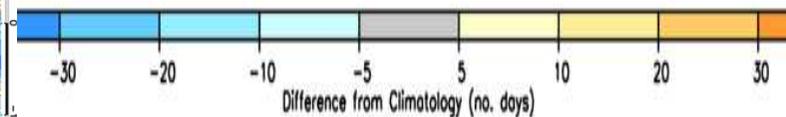
Example: Greater Horn of Africa, short-rains season (Oct-Dec)
2011– predicted from August

Early onset
predicted
most likely

Early onset
occurred



Observed 'onset' (days from normal)



- Useful predictions of onset timing are feasible
- Forecasts now being trialled in East, West and southern Africa

Michael Vellinga

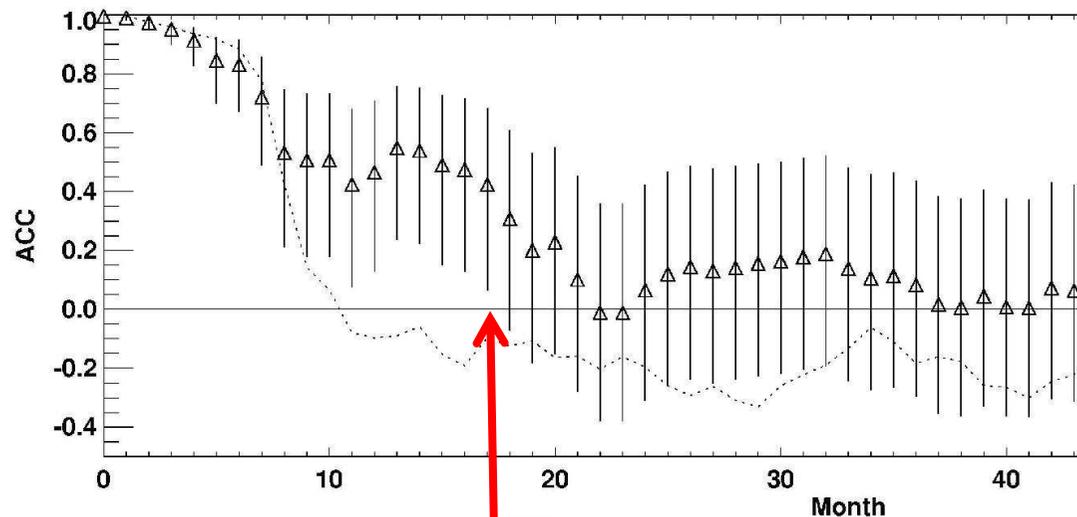


2. Predictions and products

new multi-annual to decadal prediction

Skill for El Nino/La Nina prediction to 18 months ahead

correlation skill for monthly Niño3.4 index and 95% confidence limits



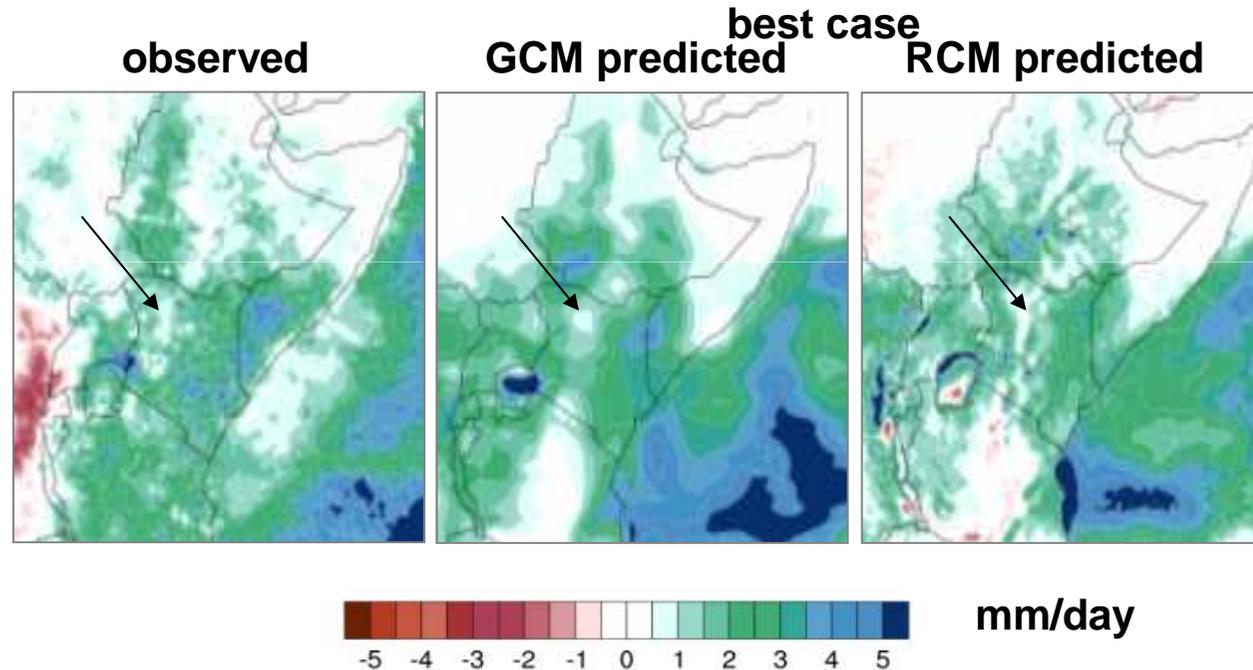
- El Nino/La Nina: predictability to ~18 months (i.e. beyond seasonal)
- Also regional skill over Africa for average rainfall next 5-years
- Paves the way for longer lead climate early warning

(Jeff Knight) / Philip Omondi Aming'o

3. Increasing forecast detail - PRECIS

Regional Climate Model (RCM) downscaling of seasonal forecasts – 2nd CSRP climate science workshop (ICPAC)

Difference (mm/day) between short rains rainfall
2006 and 2005 (2006-2005)



Green/blue shading = 2006 wetter than 2005

- New HadGEM3 RCM evaluated for Africa and installed at ICPAC
- Workshop: benefits / challenges of downscaling and its use at RCOFs

Richard Jones / (Wilfran Moufouma-Okia) / *Geoffrey Sabiiti*

4&5. Capacity development:

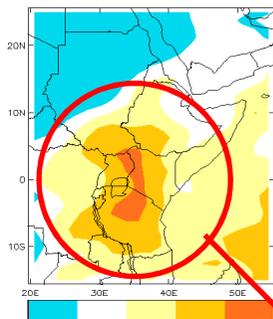
support to African Regional Climate Outlook Forums (RCOFs)



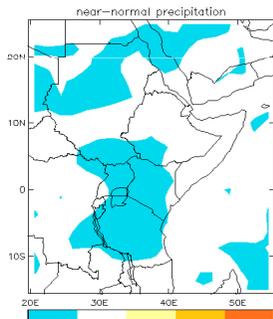
**Met Office prediction
(+other GPCs)**

Greater Horn of Africa (GHACOF29)
consensus forecast for Sept-Dec 2011 –
forecast made at peak of drought crisis

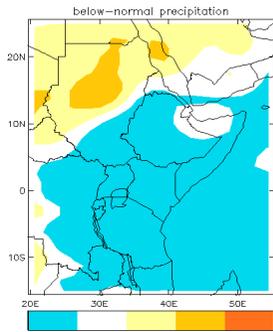
P(abv)



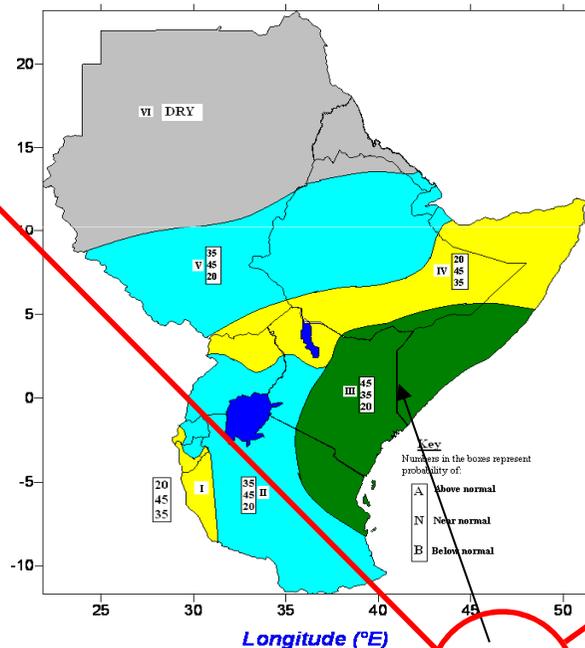
P(avg)



P(blw)

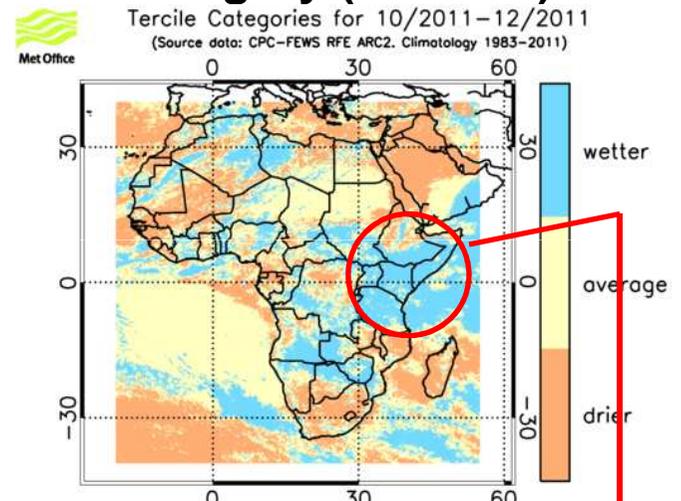


GHACOF consensus forecast



P(abv) **45**
P(avg) **35**
P(blw) **20**

**Observed rainfall
category (Oct-Dec)**



- Above average rainfall predicted most likely
- Above average occurred
- Some alleviation from drought



CSRP-Africa summary highlights

- Giving Africa the priority it 'deserves' (ack: AMMA and others)
 - Africa: prominent place in HadGEM3 model development
 - Comprehensive assessment of model strengths and weaknesses
- Progress made towards better climate models, leading to better forecasts for users
- User-relevant products jointly developed (season onset forecasts in trial at Regional Climate Outlook Forums)
- Collaboration initiated on 'Africa in-house' RCM downscaling of seasonal forecasts (ref GFCS: enhanced GPC-RCC links)
- Relevance of research focused through associate fellows, workshops and RCOF participation
- Still much to do...(via African Climate Conference, GFCS...,...)



Thank you.

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