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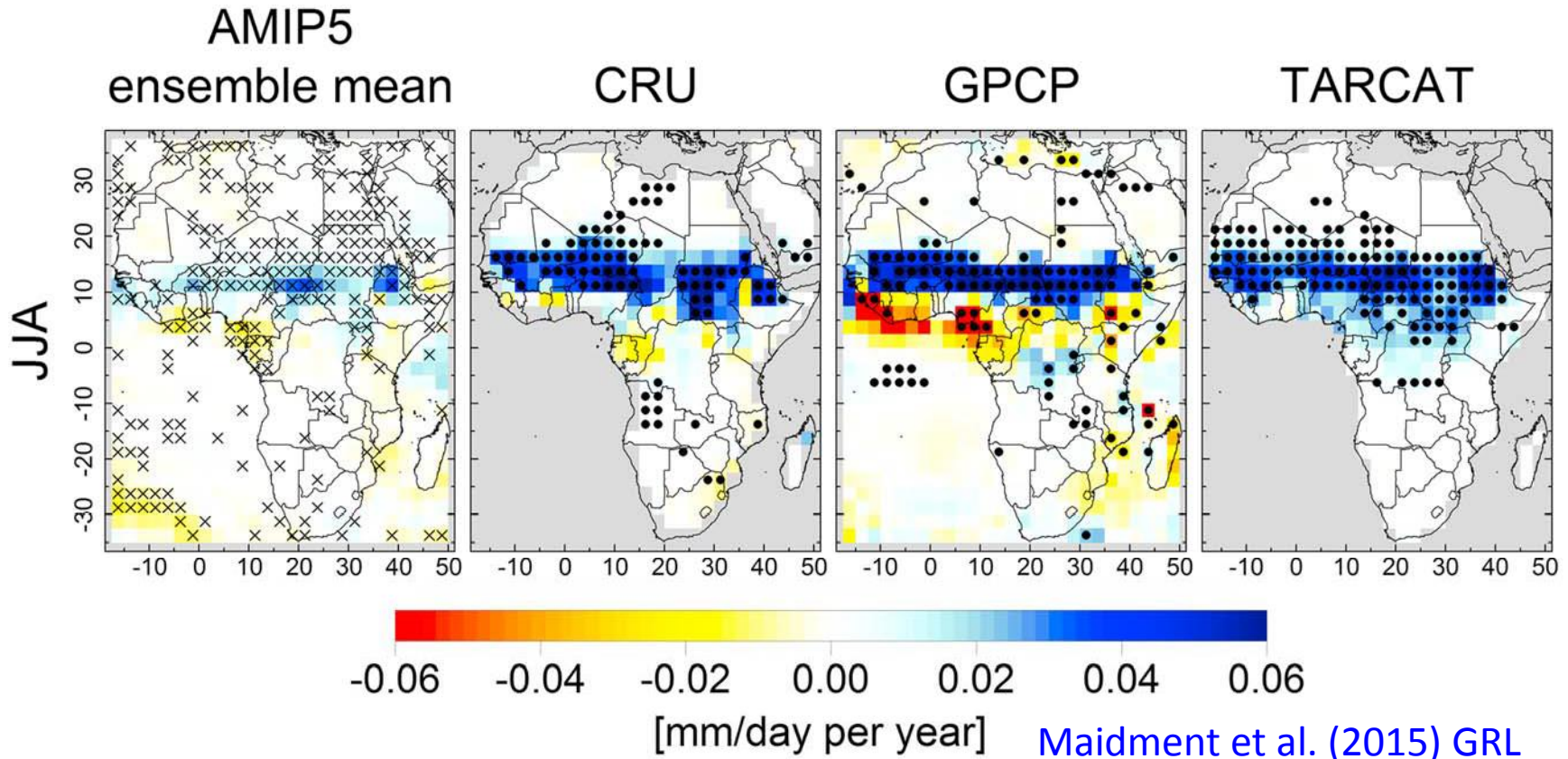
Dynamics-aerosol-chemistry-cloud interactions in West Africa

Diagnosing onset/cessation of the rainy seasons over West Africa

Richard Allan | University of Reading | Leeds Oct 16

Thanks to Caroline Dunning, Ross Maidment and Emily Black

Trends in JJA rainfall 1983-2008



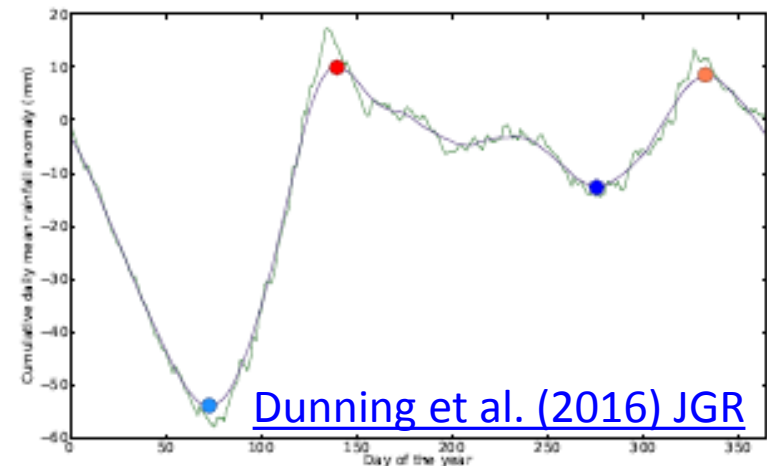
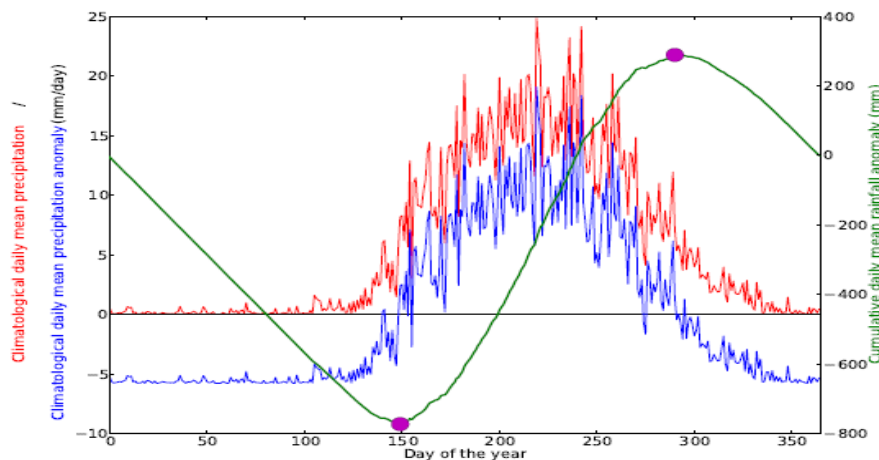
- **Contrasting rainfall trends in coastal/inland W Africa**
- **What about timing of wet season(s)?**

Diagnosing wet season onset/cessation



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- **Timing/duration characteristics of wet/dry seasons over Africa of importance for agriculture and impacts**
- **Develop methodology to diagnose onset & cessation dates of wet seasons over Africa**
 - Harmonic analysis to diagnose single/double rainy season regimes
 - Cumulative rainfall to estimate onset/cessation (modified based on [Liebmann et al. 2012](#))

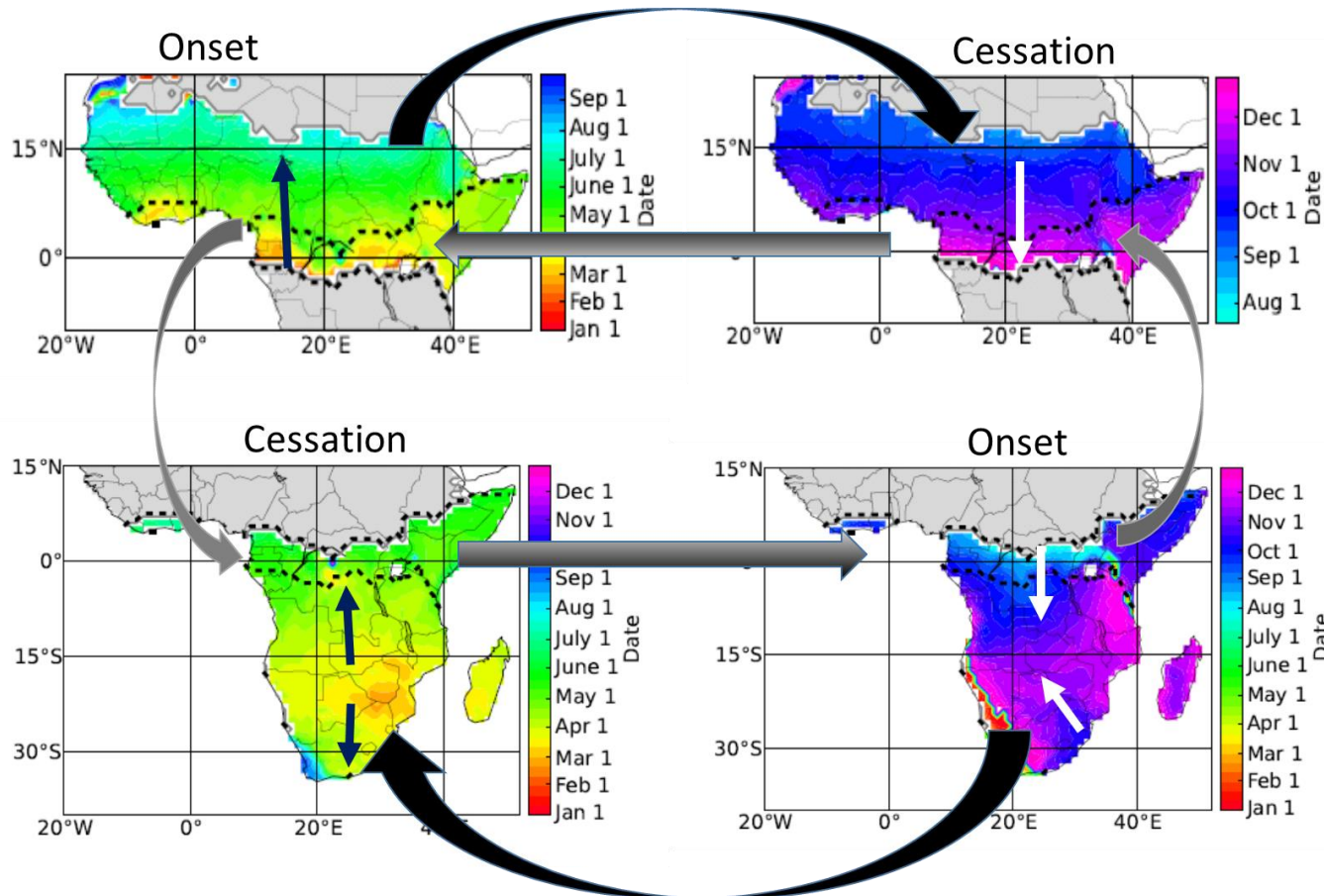


[Dunning et al. \(2016\) JGR](#)

Example progression of onset/cessation of wet season(s) - GPCP



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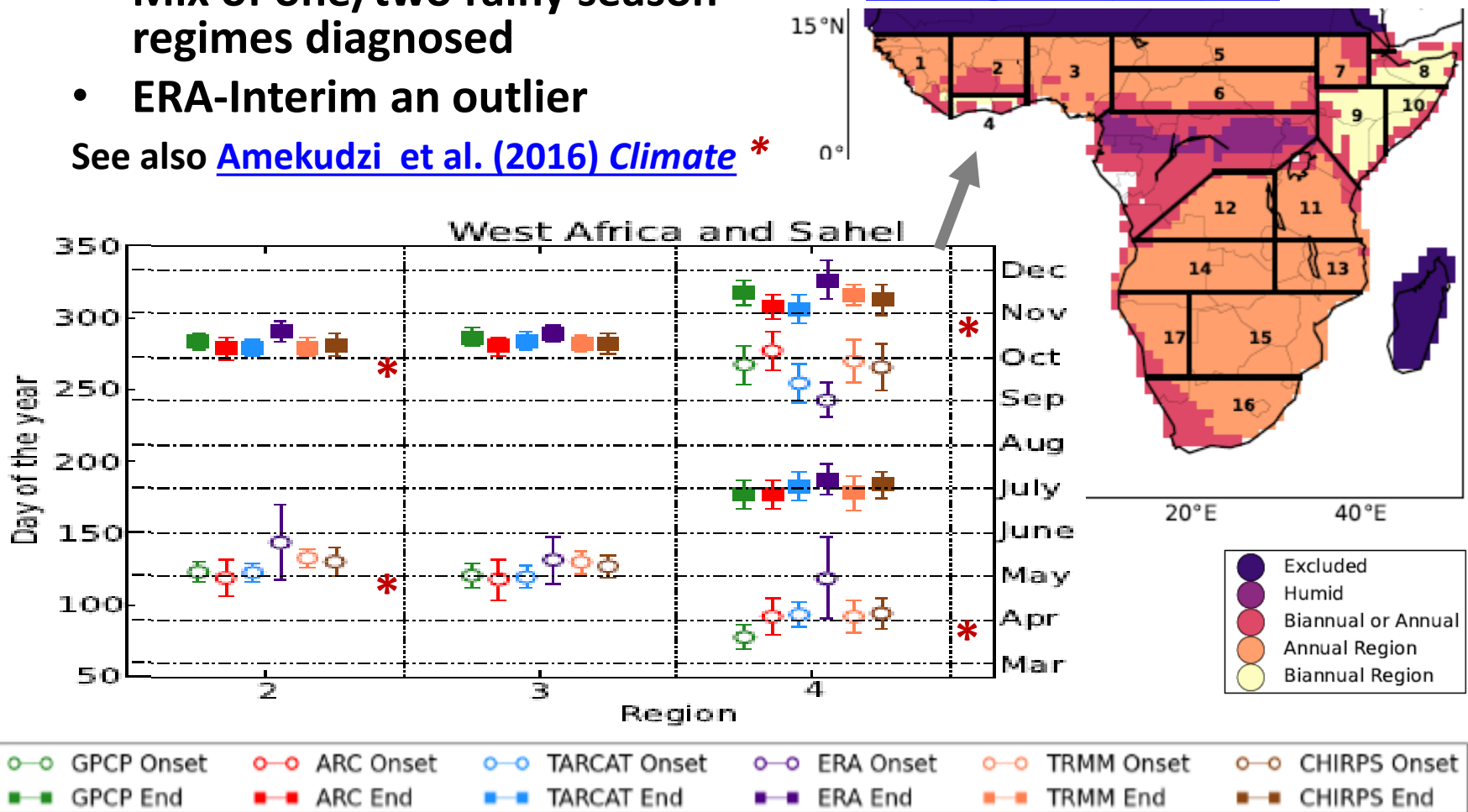
Considered GPCP 1DD, TRMM 3B42, ARCV2, TARCATv2, CHIRPS, ERA Interim in subsequent analysis ([Dunning et al. \(2016\) JGR](#))

Onset/cessation across products

- Mix of one/two rainy season regimes diagnosed
- ERA-Interim an outlier

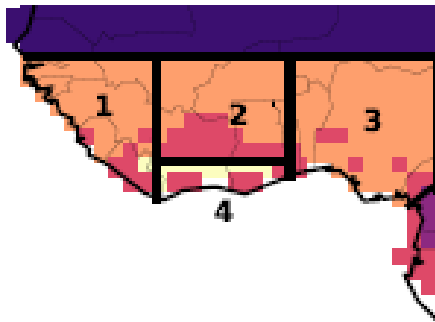
See also [Amekudzi et al. \(2016\) Climate](#) *

[Dunning et al. \(2016\) JGR](#)

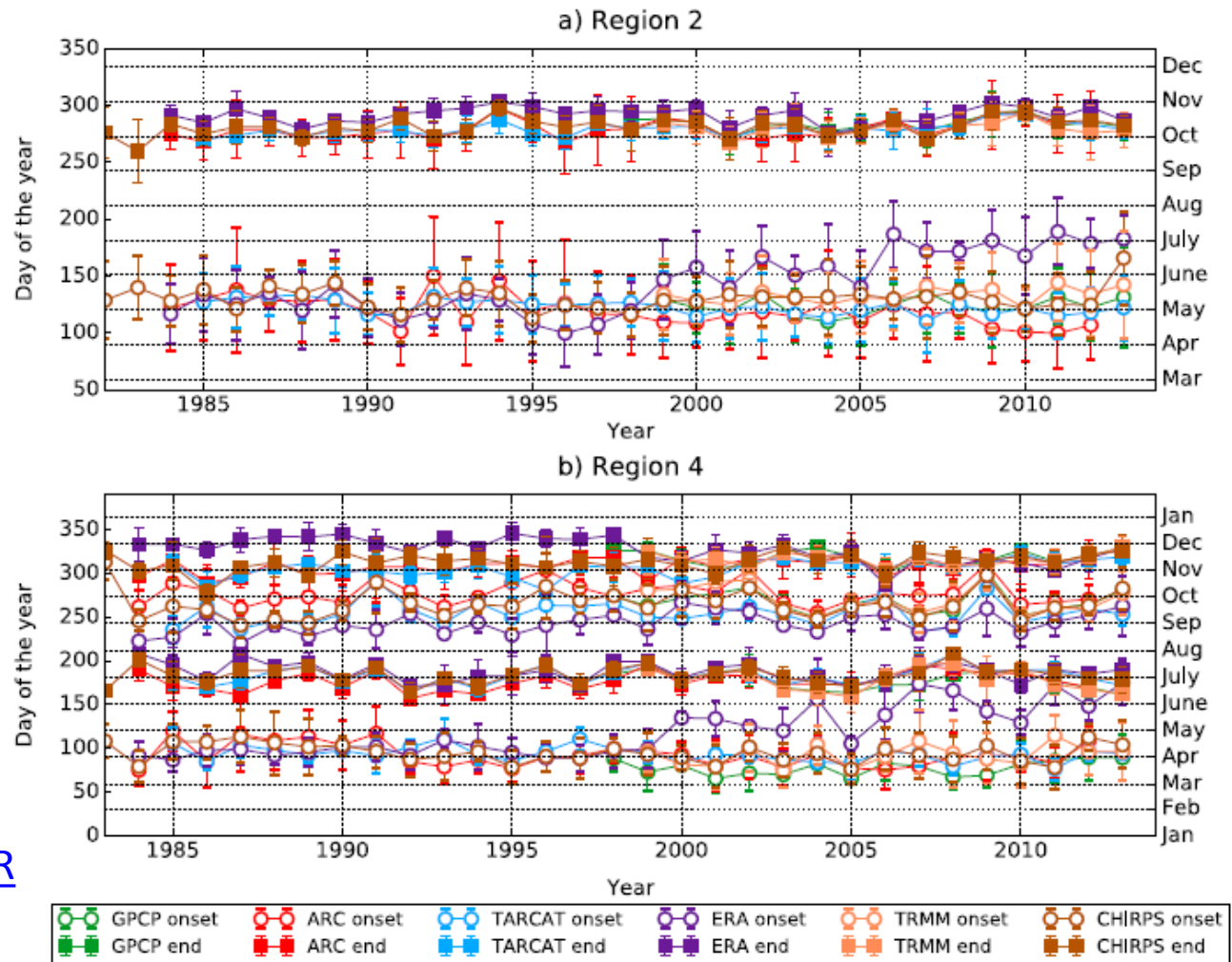


Variability in onset/cessation dates DACCIIWA

- Some coherent variability in onset and cessation date
- Spurious trend in ERA Interim onset dates



[Dunning et al. \(2016\) JGR](#)



Conclusions

- Trends & variability in African rainfall strongly linked to internal climate variability ([Maidment et al. \(2015\) GRL](#))
- Methodology to diagnose the onset and cessation dates of wet seasons over Africa: [Dunning et al. \(2016\) JGR](#)
- Spurious variability in ERA Interim & some satellite products
- Future work: apply methodology to climate model simulations, investigate mechanisms and develop impact relevant metrics

