

Mortality/Veg distribution JPEG

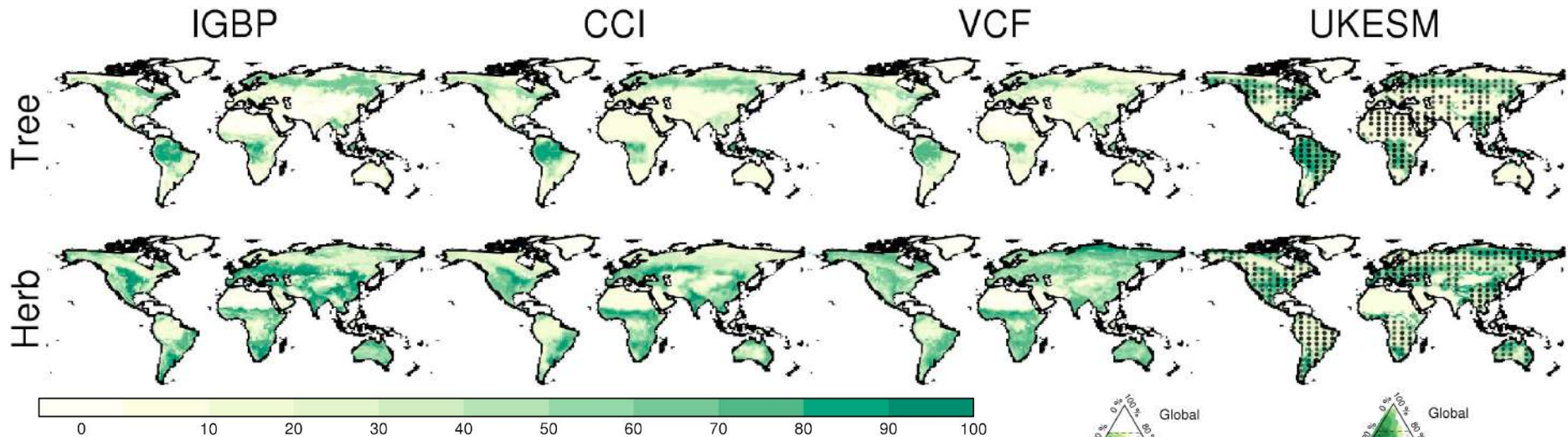
Douglas Kelley, Chantelle Burton,
Karina Williams, Camilla
Mathison, Arthur Argles, Rachael
Turton, France Gerard, Rahayu
Adzhar, Rhys Whitley, Andrew
Hartley, Rich Ellis, Dong Ning,
Carolina Duran Rojas, Graham
Weedon, Anna Harper, Simon
Jones, Eddy Robertson.



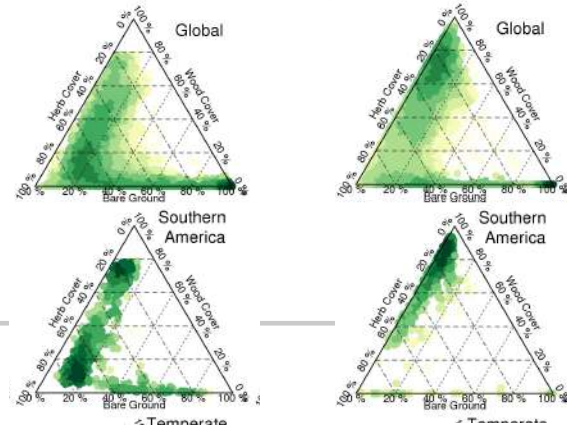
- JULES-ES, UKESM etc simulate vegetation fractions
- Uses “TRIFFID” dynamic veg model with PFTS competing and dying, changing “flat” veg fractions.

UKESM veg distribution

(UKESM-land eval group)

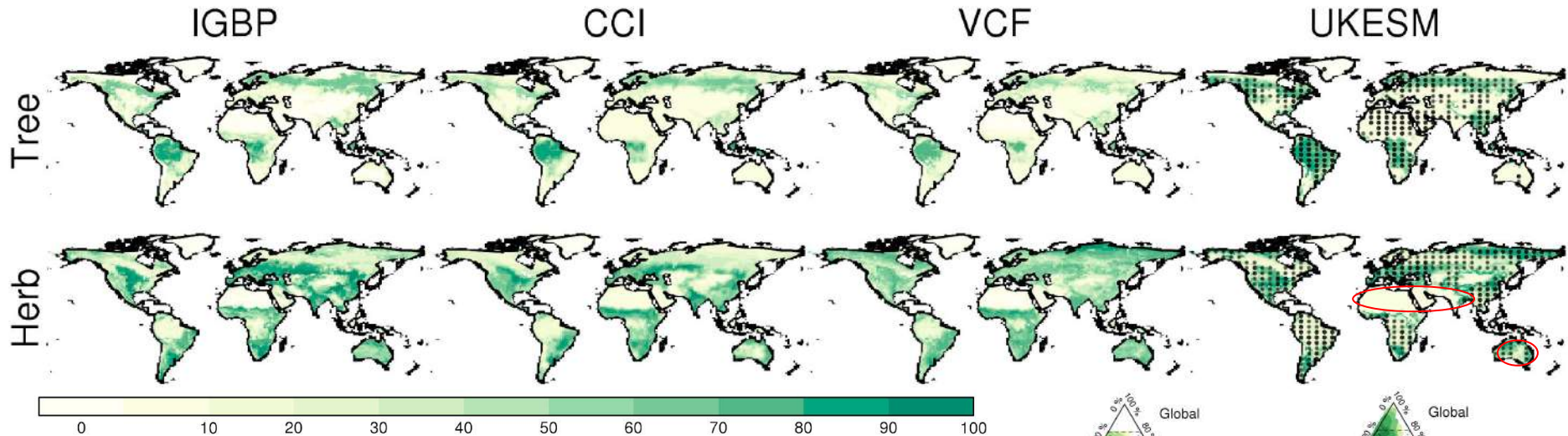


- Too much tree cover and tree extent
- Too much bare ground
- Tree cover in offline runs as well

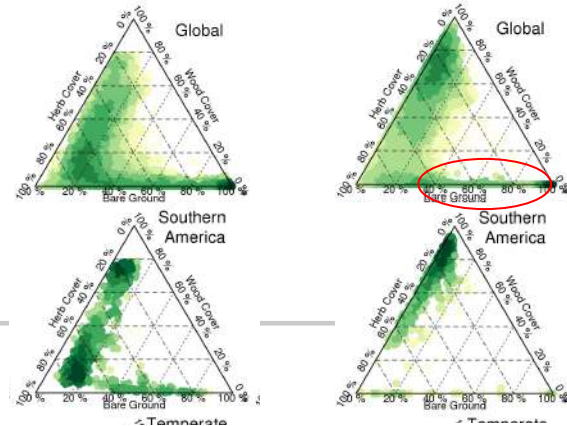


UKESM veg distribution

(UKESM-land eval group)

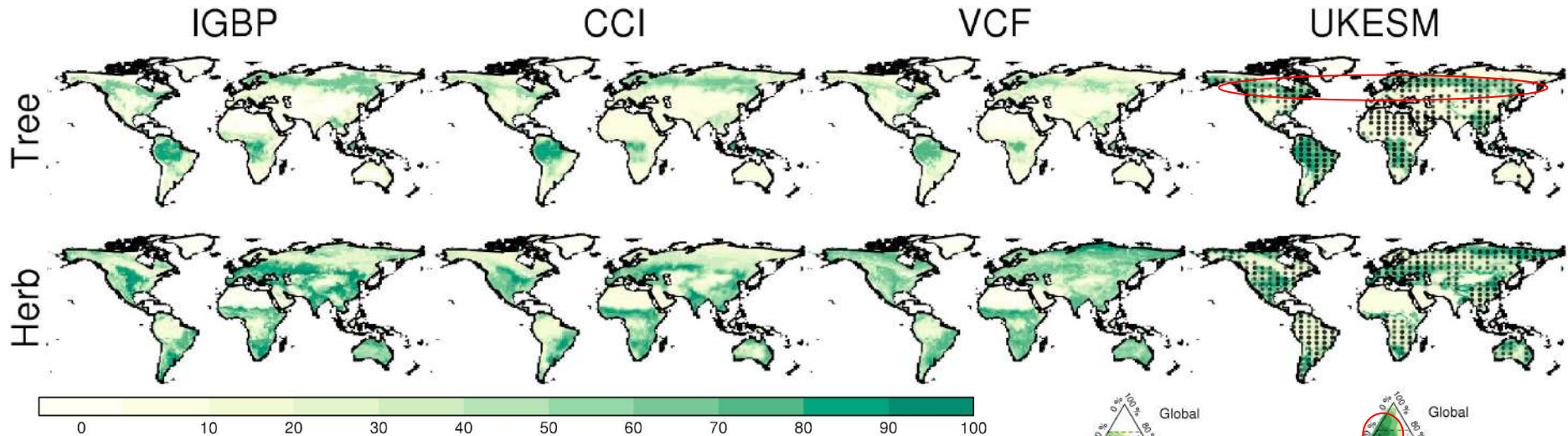


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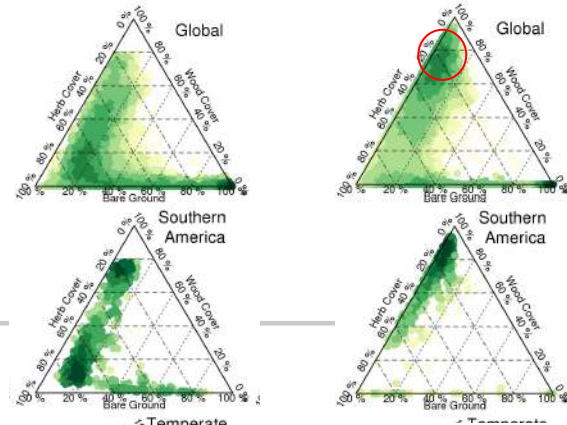


UKESM veg distribution

(UKESM-land eval group)

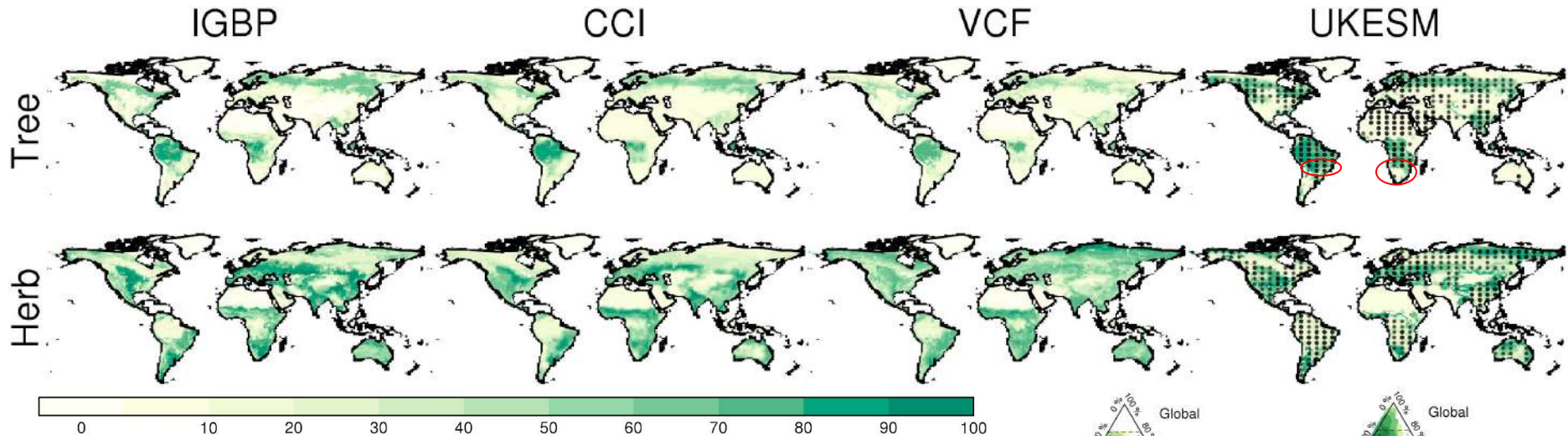


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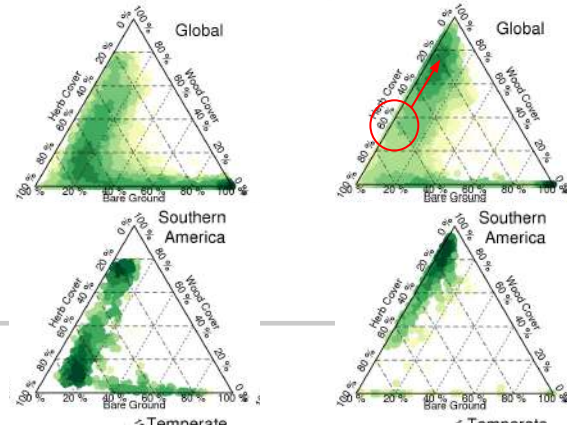


UKESM veg distribution

(UKESM-land eval group)

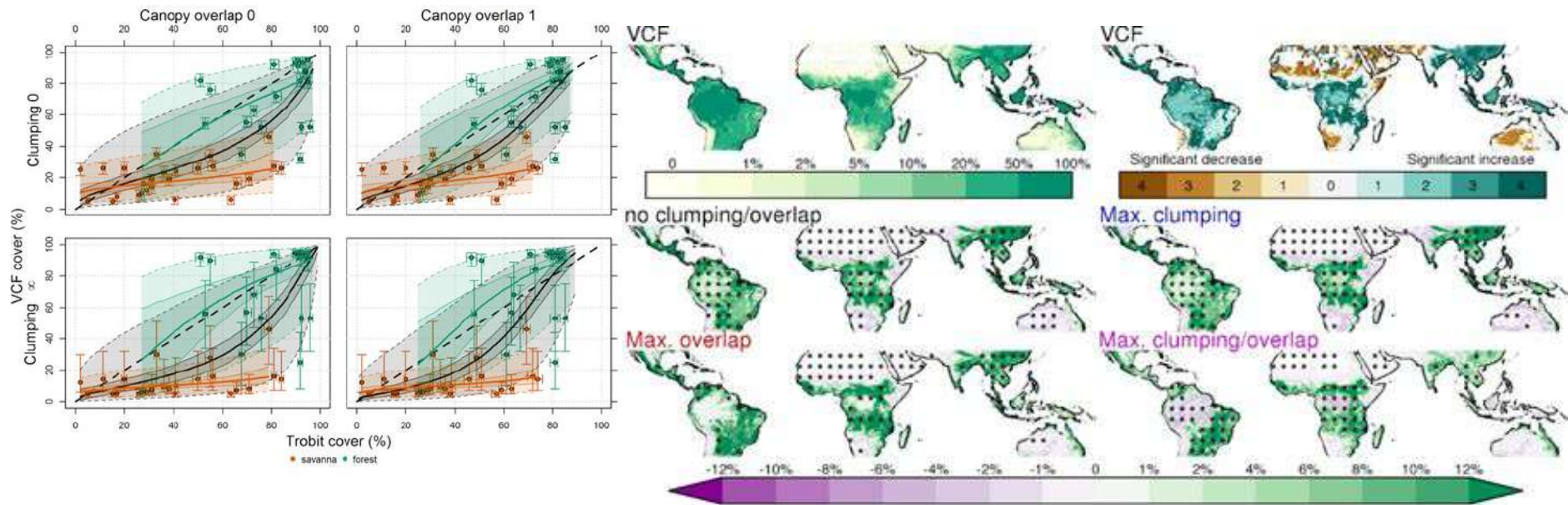


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Are the observations right? - testing VCF tree cover

(Rahayu Adzhar, Douglas Kelley, France Gerard, Dong Ning)



Missing process - fire - Thursday 3pm

(Chantelle Burton, João Teixeira, Andy Wiltshire, Doug Kelley)

 **Met Office**
Hadley Centre
JULES-ES
CRU-JRA



JULES
with
UKESM
forcing

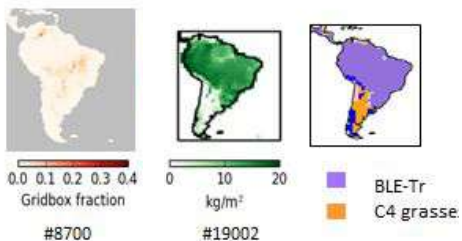


UKESM
with fire



UKESM
without fire

Burned
area =
GFED



Historical 1930-1960 mean

- Putting fire mortality in JULES-ES improves veg carbon/distribution
- Improvement smaller but still good with UKESM climate
- Fire-climate feedbacks amplify fires impact (maybe a bit too much atm)

Missing dimension - RED

(Arthur Argles, Jonathan Moore,
Chris Huntingford, Andrew Wiltshire,
Anna Harper, Chris Jones, Peter Cox)

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Robust Ecosystem Demography (RED version 1.0): a parsimonious approach to modelling vegetation dynamics in Earth system models

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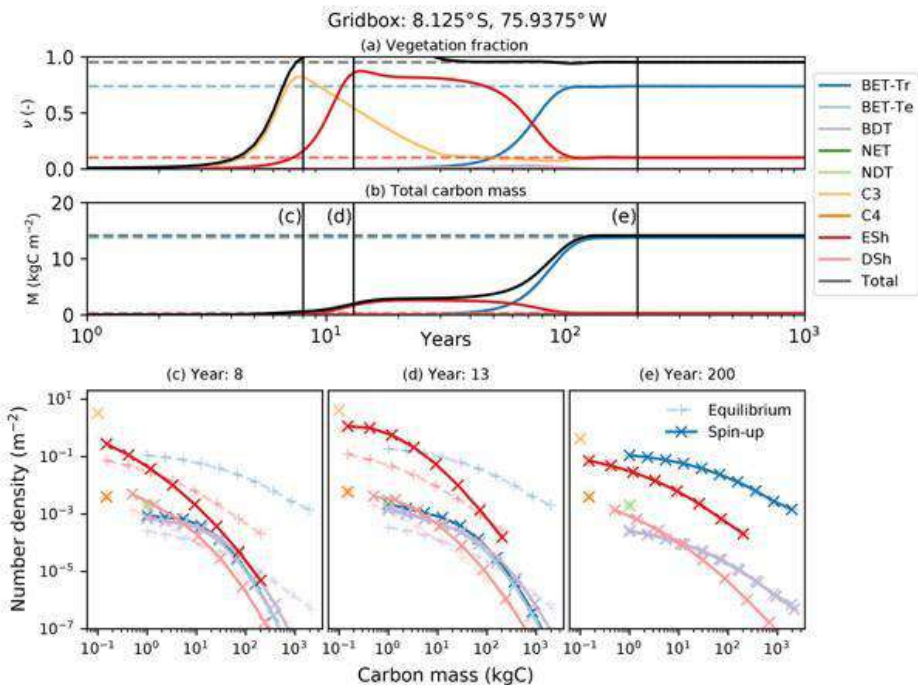
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From Arthur: “You might want to mention in the talk about how we can have size-dependent relationships like mortality from disturbance on PFTs.”

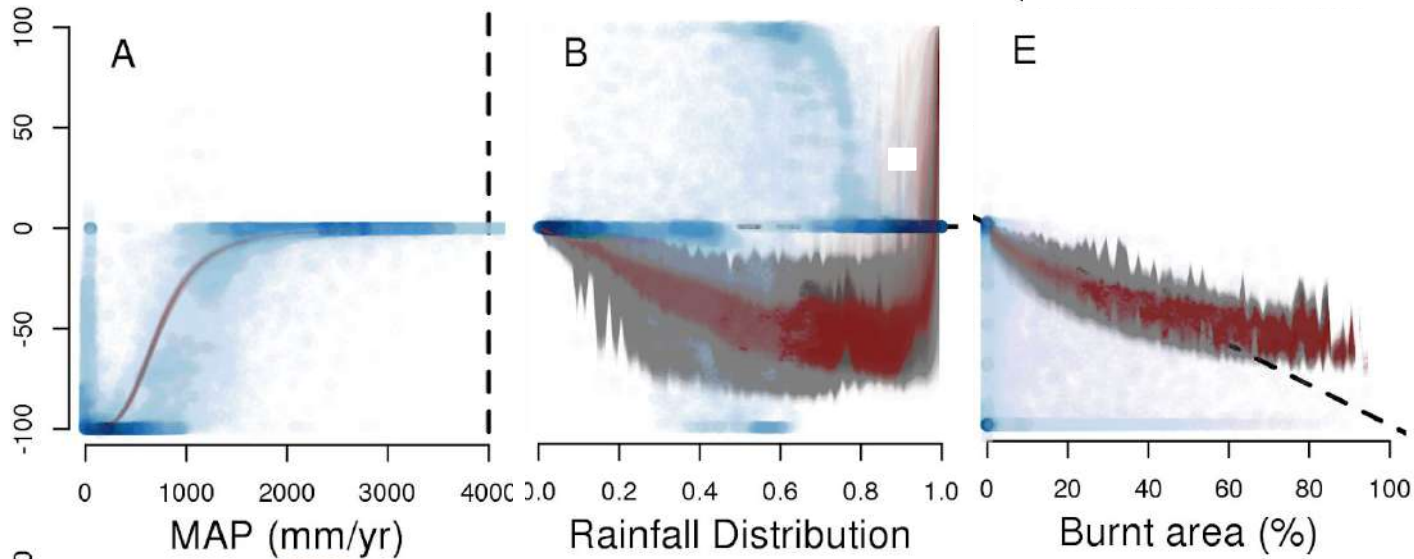


Misrepresentation of processes

(Doug Kelley, France Gerard, Rhys Whitley, Chantelle Burton, Dong Ning, Graham Weedon, Rich Ellis)

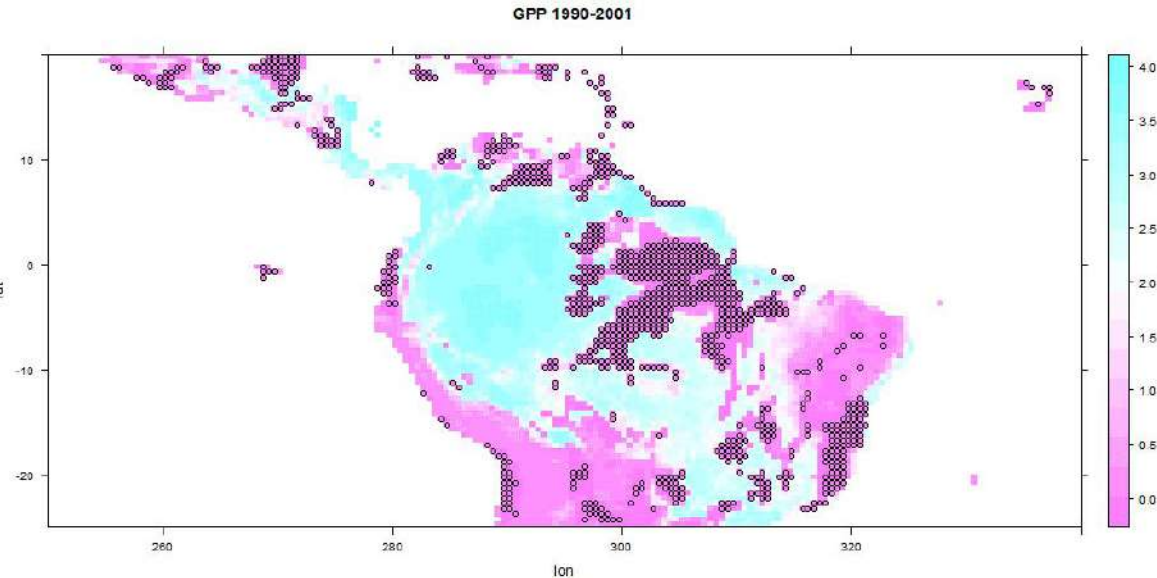
Red = Inferred
Blue = JULES

- Impacts from burnt area might be a bit much
- Cos Rainfall distribution impacts mis-represented...?



Misrepresentation of processes - aka How to kill the Amazon again - Camilla's ISIMP on Friday, 1:45

(Karina Williams, Barbara Orellana, Carolina Duran Rojas, Camilla Mathison)



Investigating what did it using gauge data:

- Disaggregation of daily driving data
- Convective rainfall fraction.
- Infiltration enhancement factors preventing recovery

Orellana, 2017: Annual GPP 1990-2001 in JULES ISIMP2a runs. Black circles = bare soil

Plans to bring this together - (+ing in time)

- A lot to write up already
- Reassess model performance including observational uncertainty
- Explore how sub-seasonal and sub-daily processes impact veg cover
- Split assessment of veg cover impact between initial vegetation loss and vegetation recovery and test:
 - What Obs do?
 - How bad is TRIFFID at recovery?
 - How much better is RED?
 - Would NSC help?



Sub-JPEGS

Observations JPEG

- Veg frac with uncertainty estimates to help JULES evaluation/calibration
- Reduce uncertainty with CCI based on high resolution original data
- Collate LAI datasets

“Mortality” JPEG

- Productive vegetation competition and distribution
- Representation and magnitude of disturbance
- Post-disturbance recovery rate

Arid-veg JPEG

- Too high bare soil in arid regions
- Vegetation can be over-sensitive to moisture availability
- Test response to variability at different timescales (seasonal, annual, decadal etc)

Phenology JPEG

- Lack of cold deciduousness in grasses
- Drought phenology untested
- Assessment of veg-frac “shrinkage” from seasonal carbon starvation

No dinosaurs were made extinct in the making of this presentation

Wanna come along to our meetups? 3rd Thursday of the month.

doukel@ceh.ac.uk

:D