



C⁴MIP in CMIP5

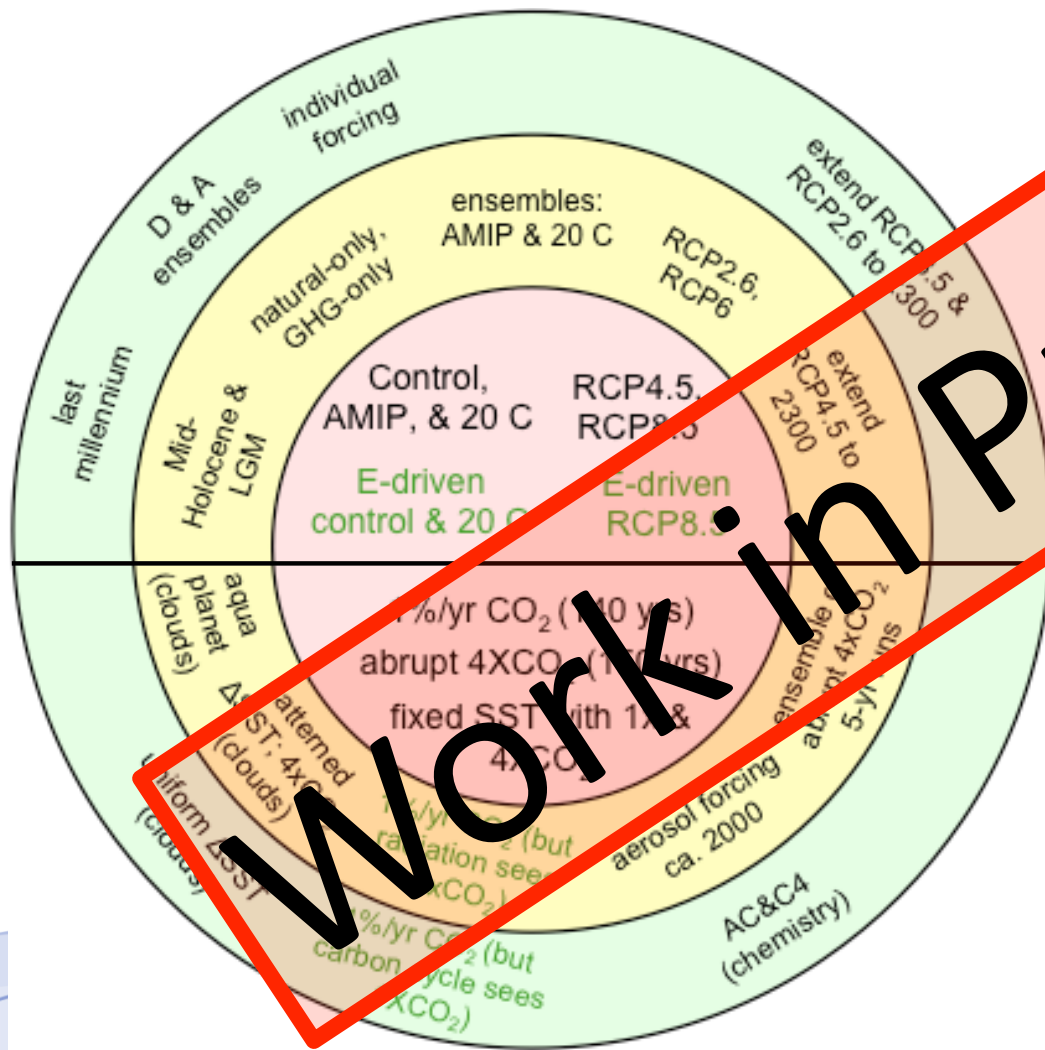
Pierre Friedlingstein,

Alessandro Anav (UExeter),

Chris Jones and Ben Booth (MetOffice)



CMIP5 Protocol

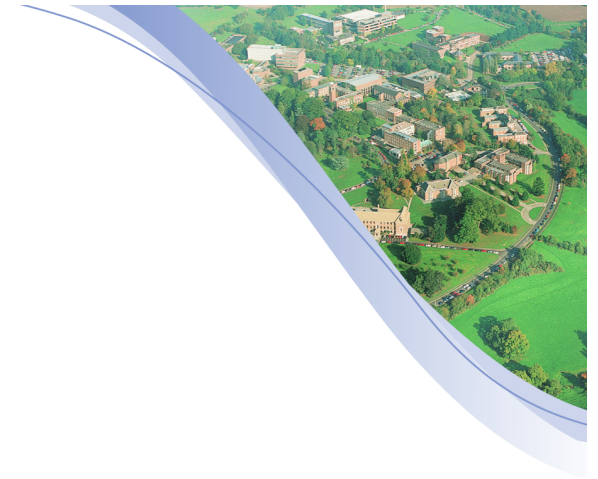


- Historical runs (C-driven)
- RCPs (C-driven)
- CMIP1% runs
- Hist+RCP8.5 (E-driven)



ESMs* involved

- CanESM2
- HadGEM2-ES
- IPSL-CM5
- BCC
- INMCM4
- NorESM-1
- + MIROC ?

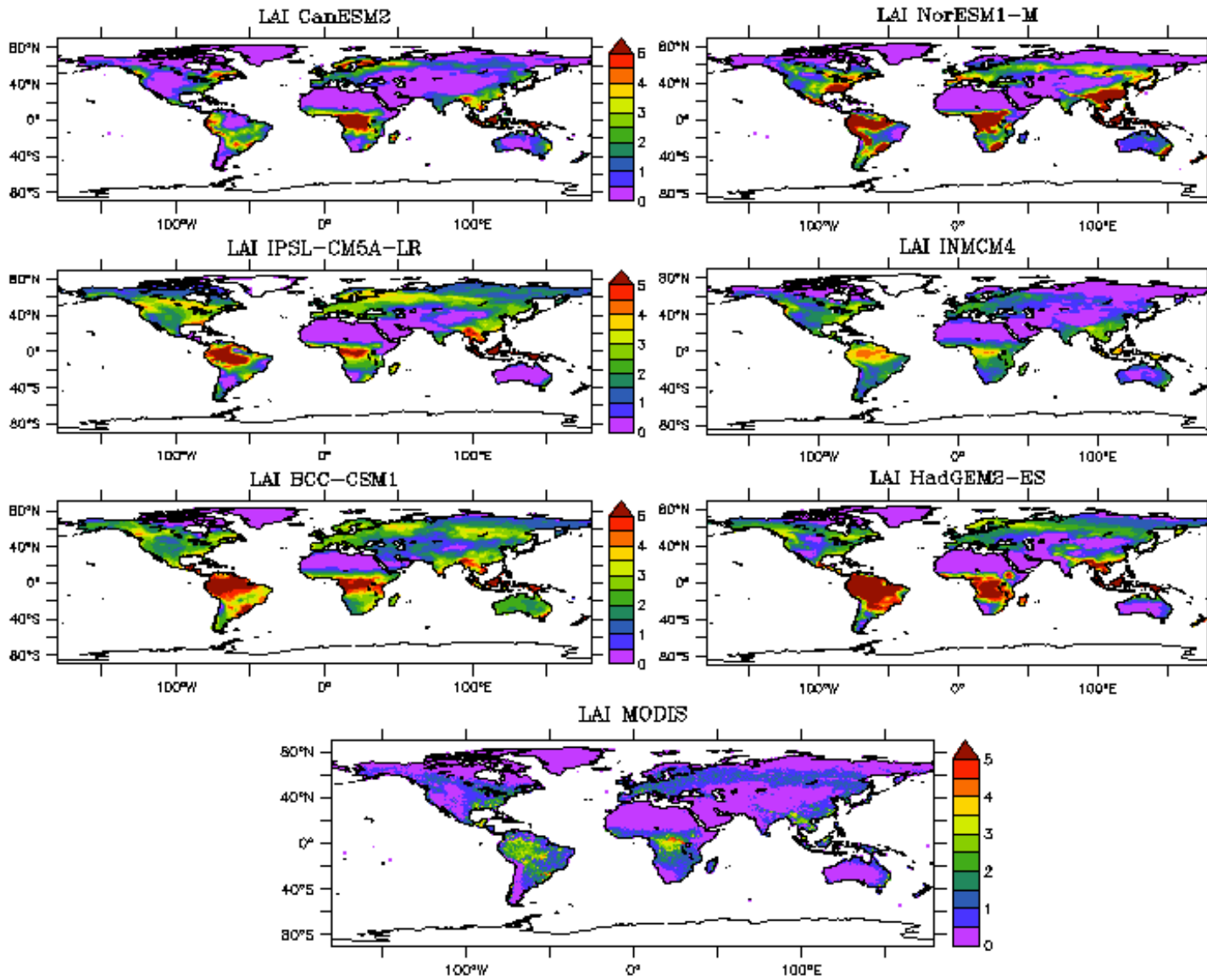
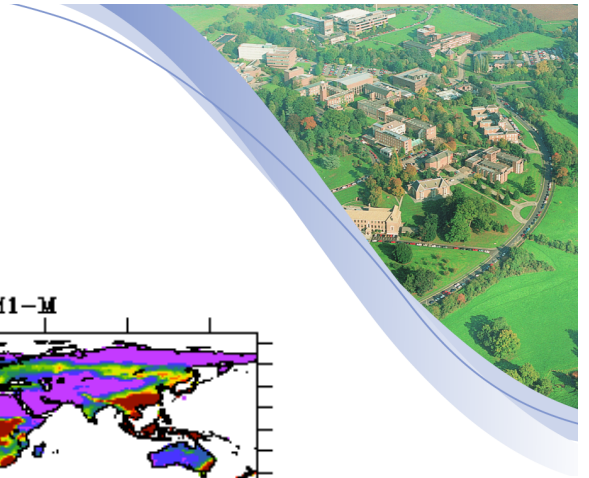


Historical runs evaluation

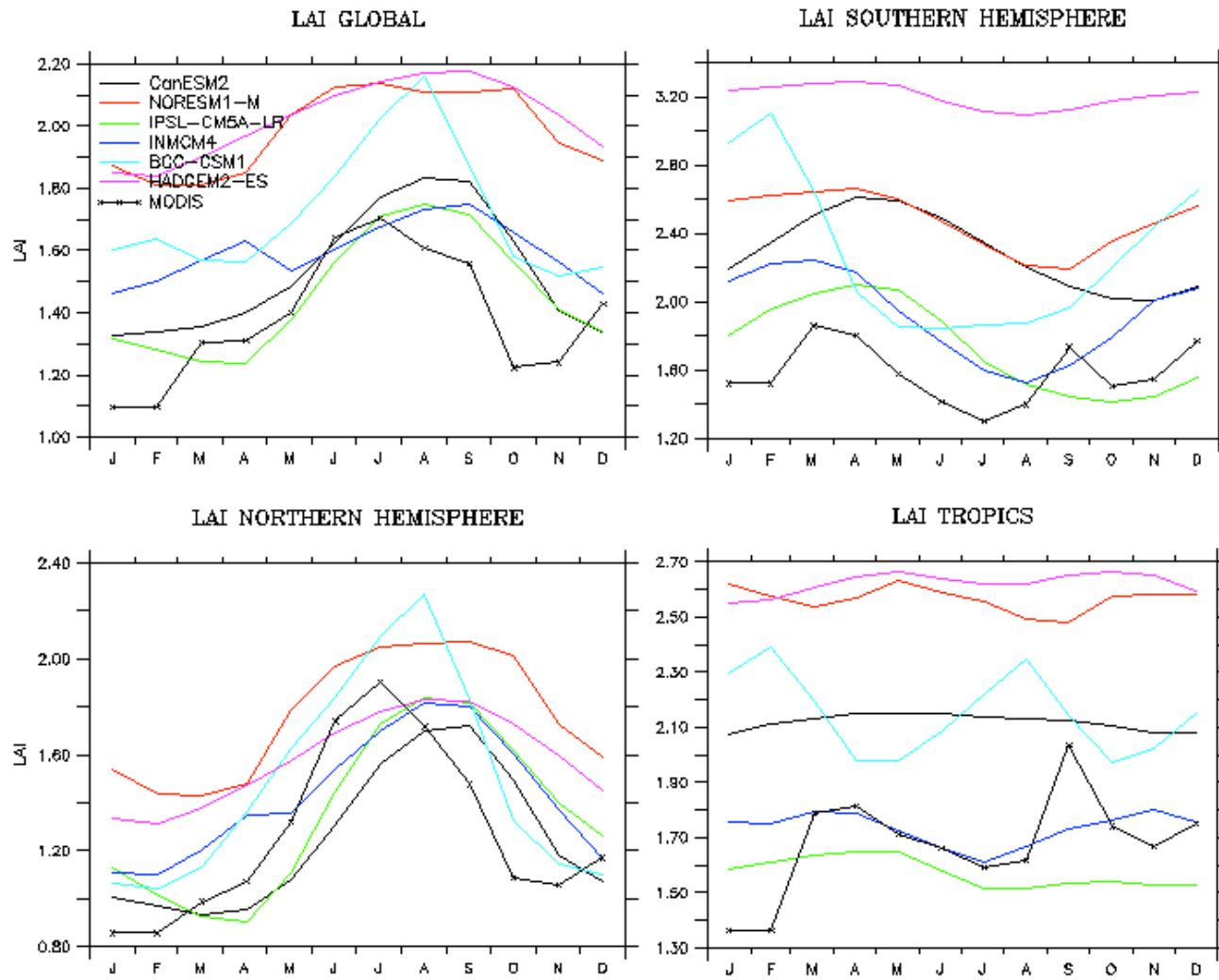


- LAI
 - annual mean and seasonal cycle
 - evaluated against MODIS LAI
- GPP
 - annual mean and seasonal cycle
 - “evaluated” against gridded FluxNET product
- C uptake
 - decadal mean and IAV
 - Evaluated against atmospheric inversions

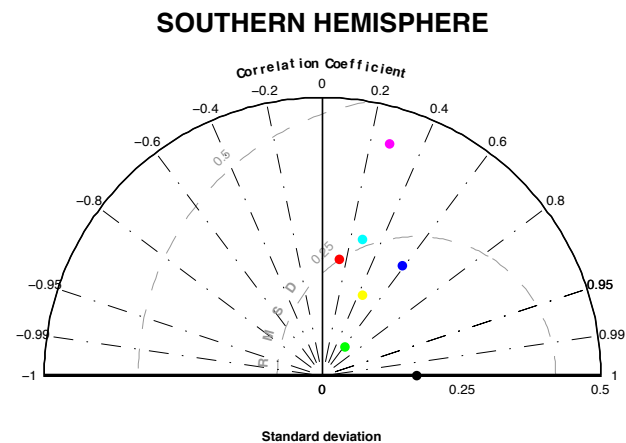
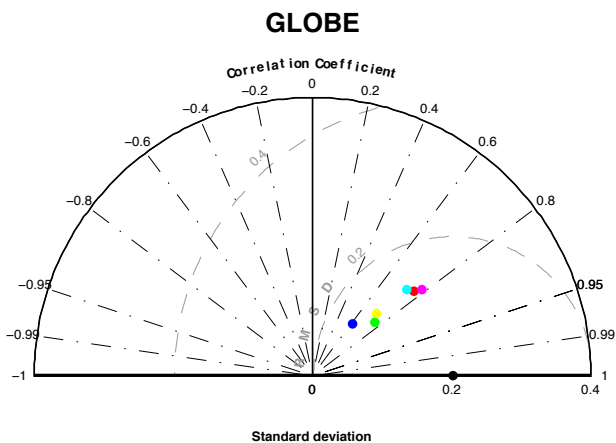
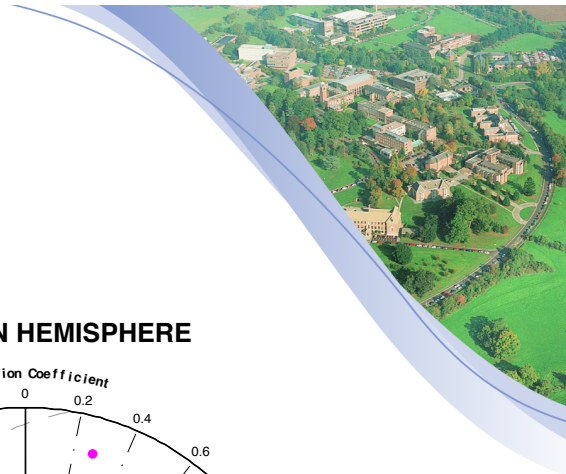
Leaf Area Index



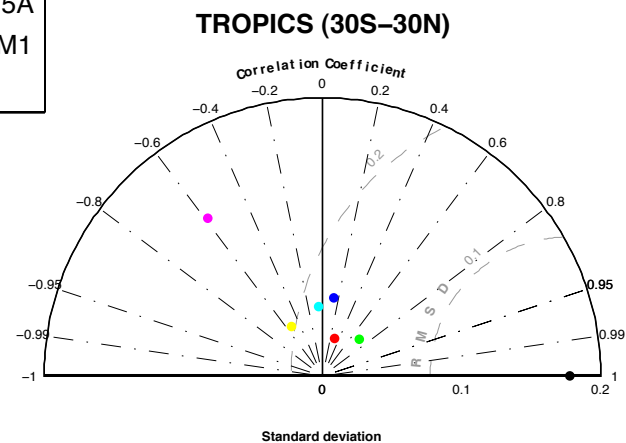
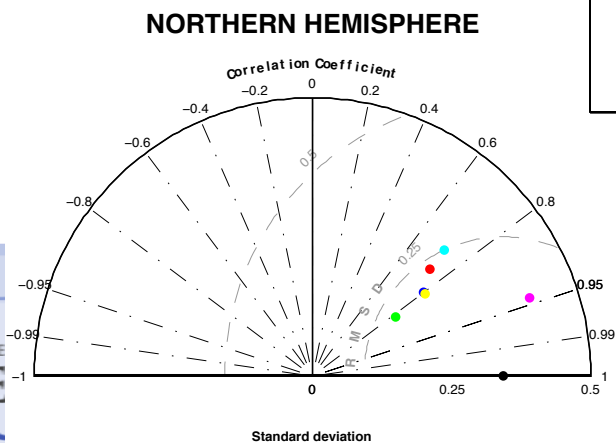
LAI seasonal cycle



Leaf Area Index

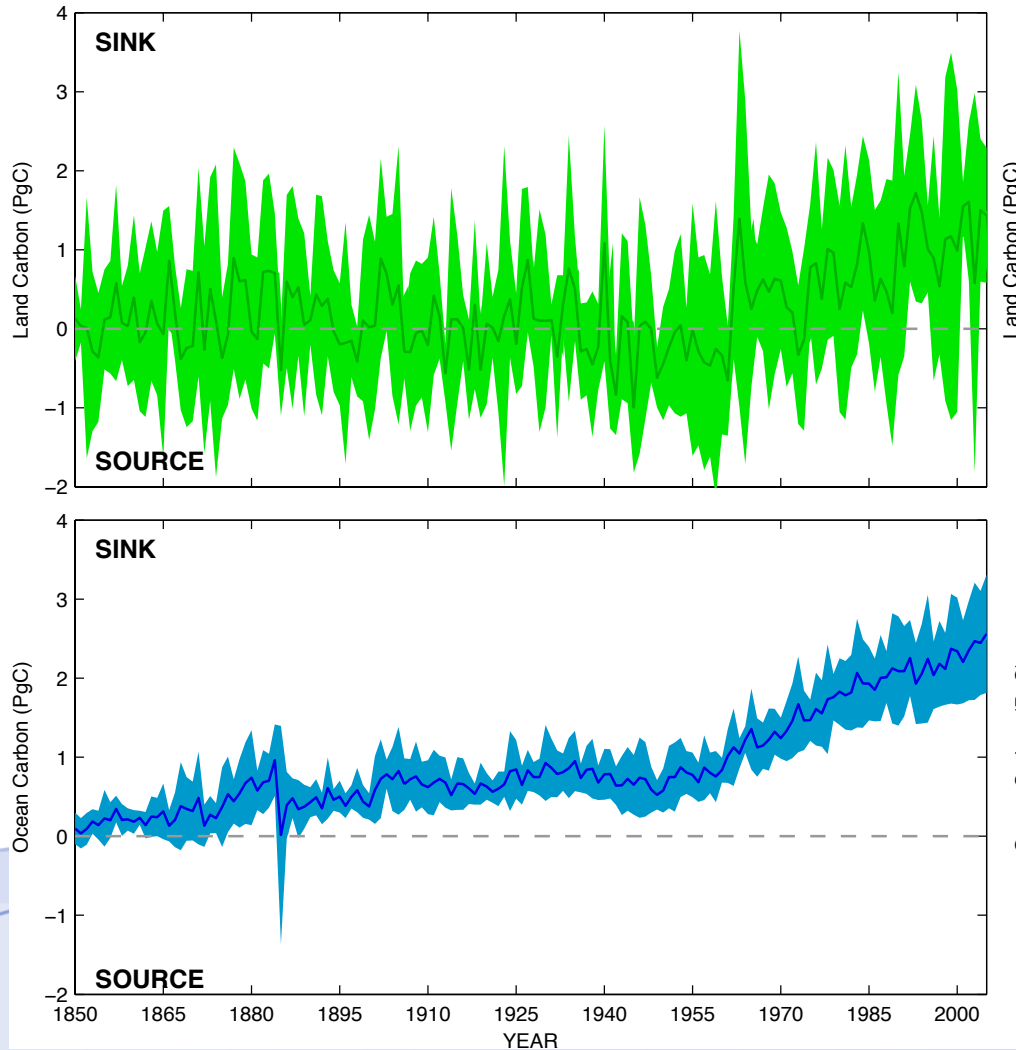


- MODIS
- CanESM2
- HadGEM2
- INMCM4
- IPSL-CM5A
- BCC-CSM1
- NorESM1



Historical runs

Global land and ocean sink

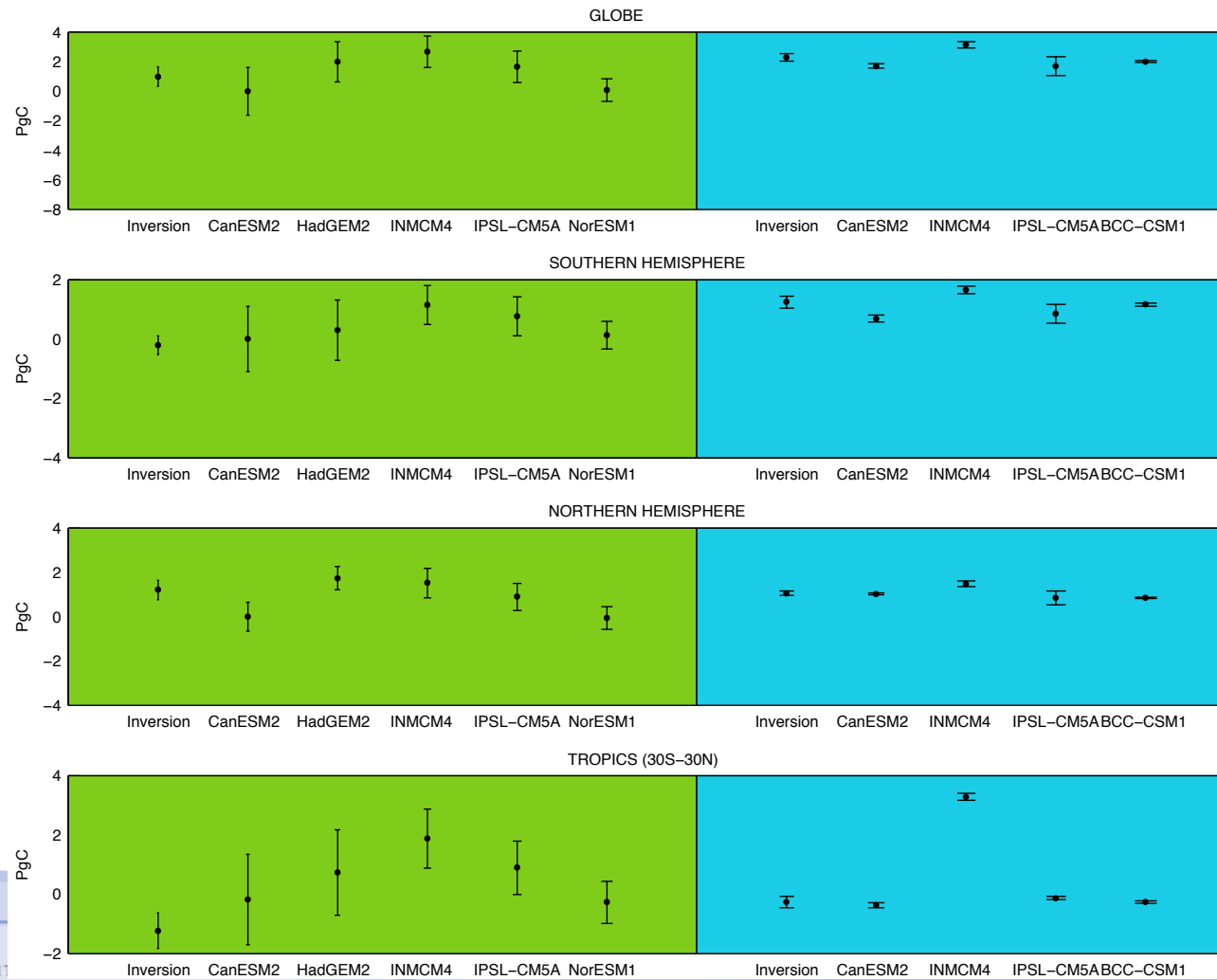


IPCC AR4
1990's average

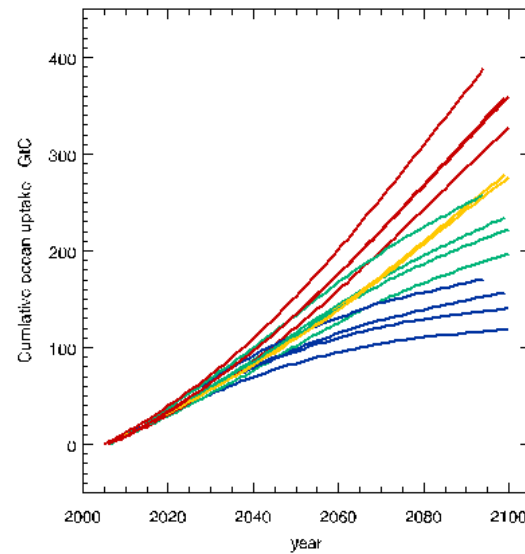
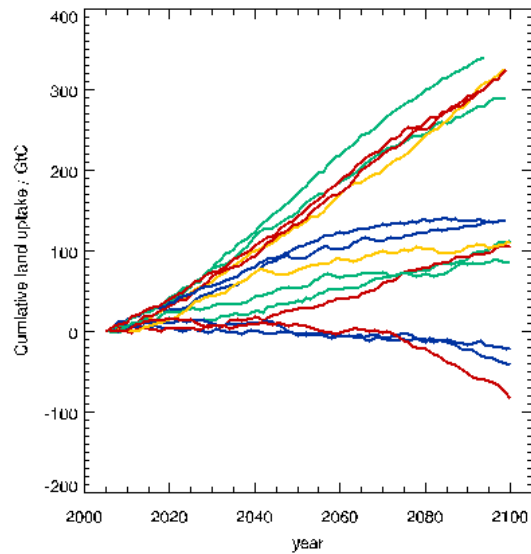
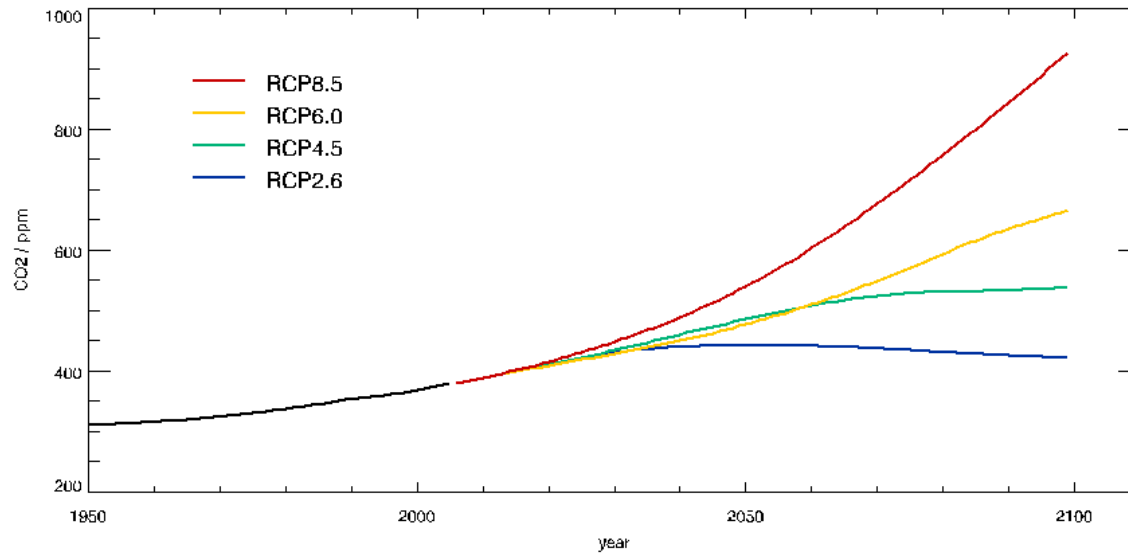
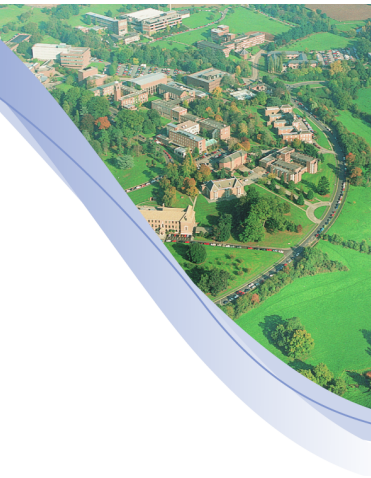
0.9 to 4.3

2.2 ± 0.4

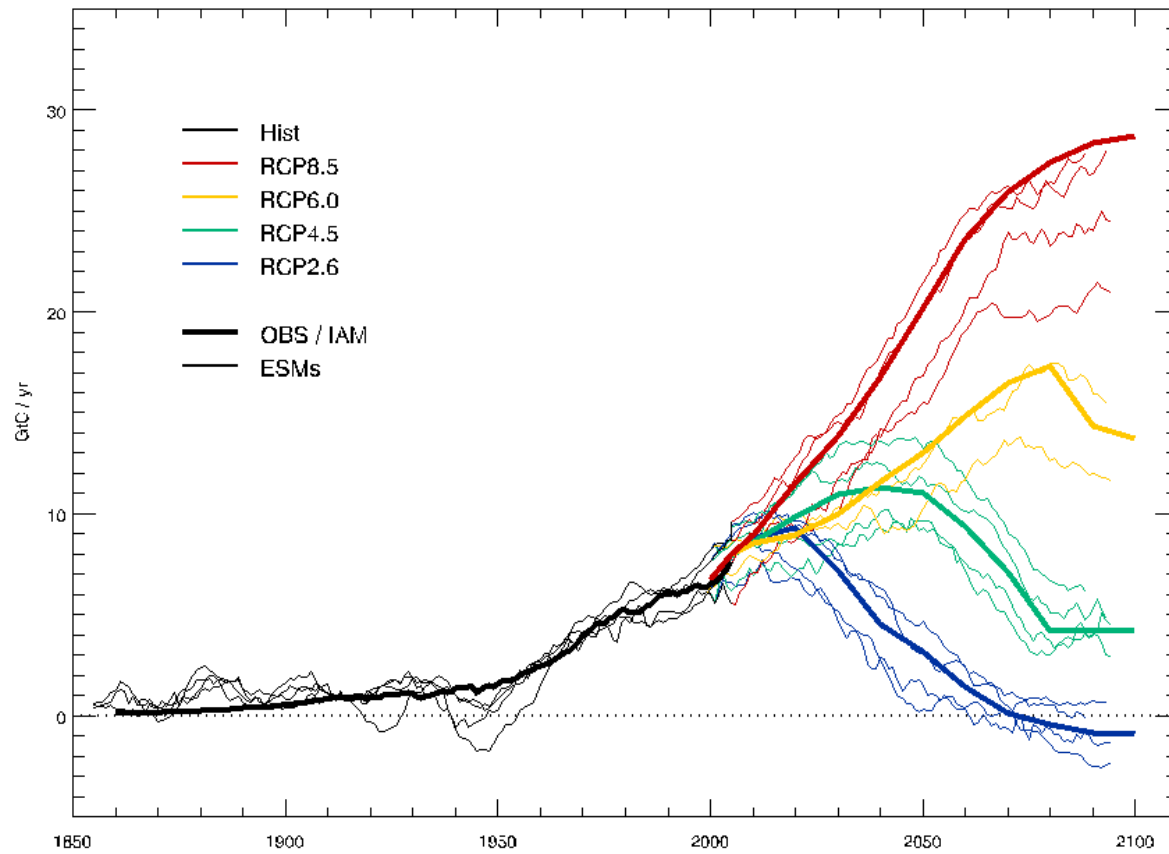
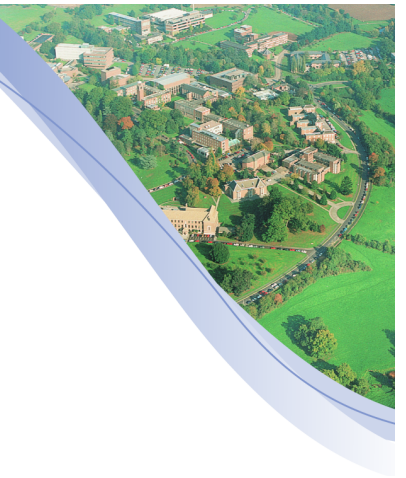
Partitioning of C sinks



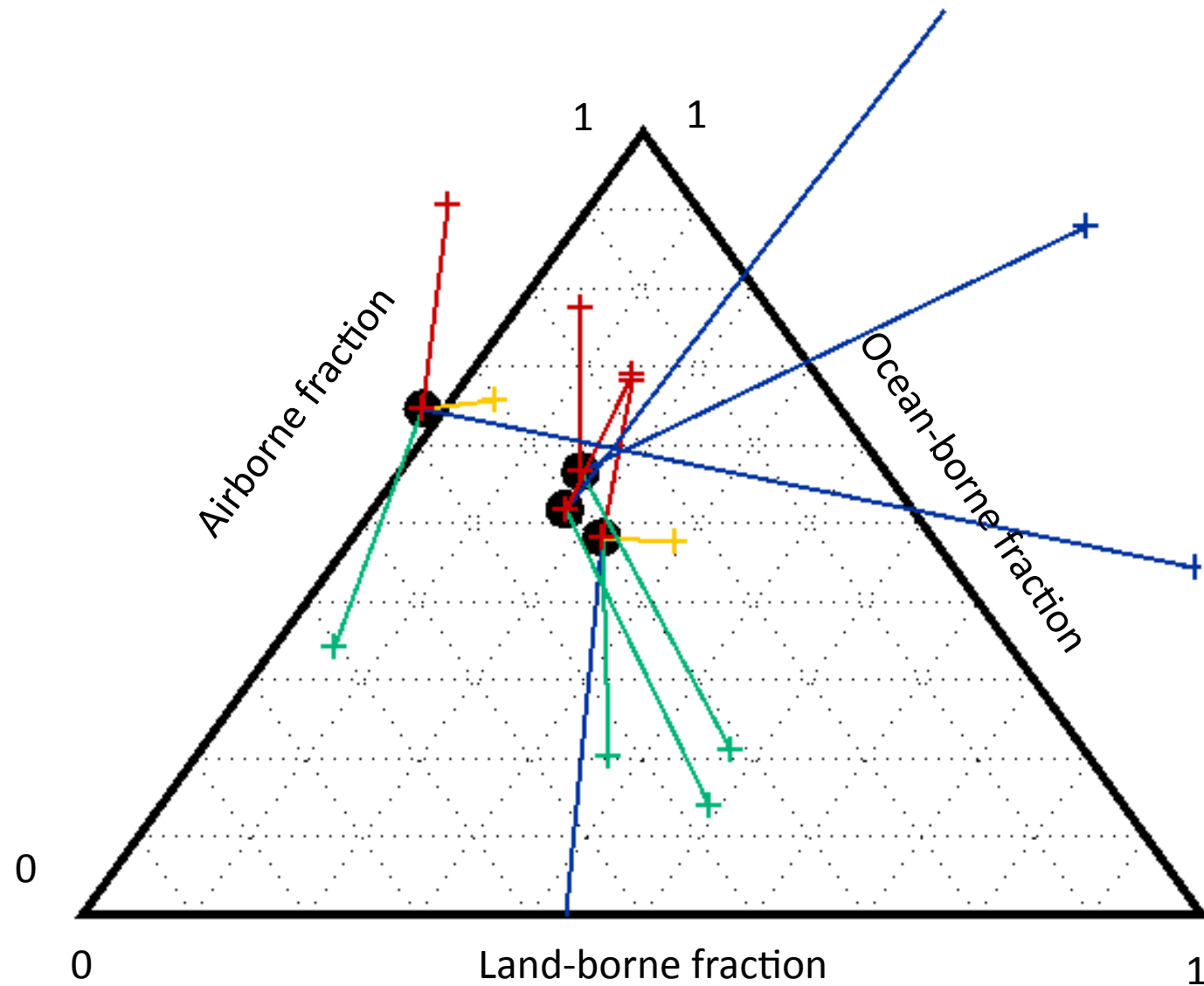
RCPs



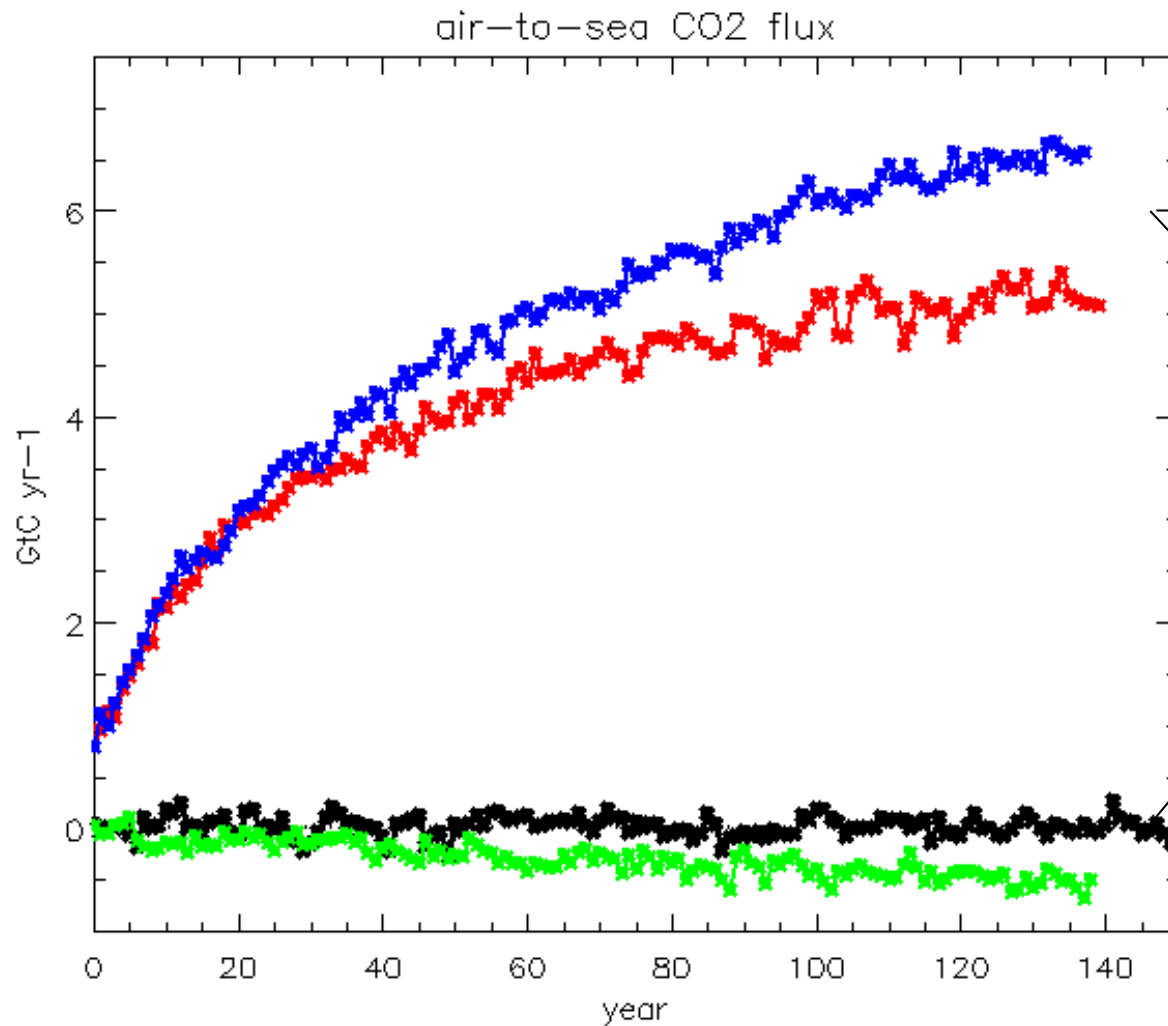
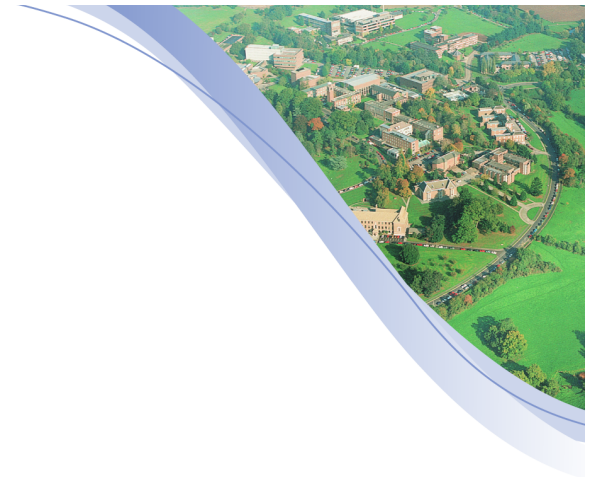
RCPs



Change in airborne fraction



CMIP 1% feedback analysis



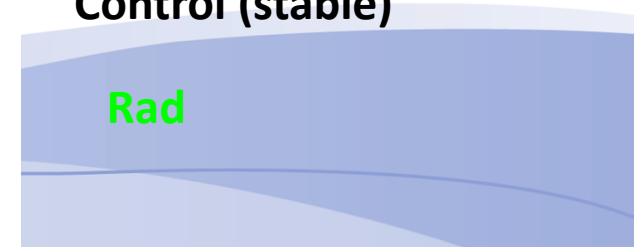
Full

BGC

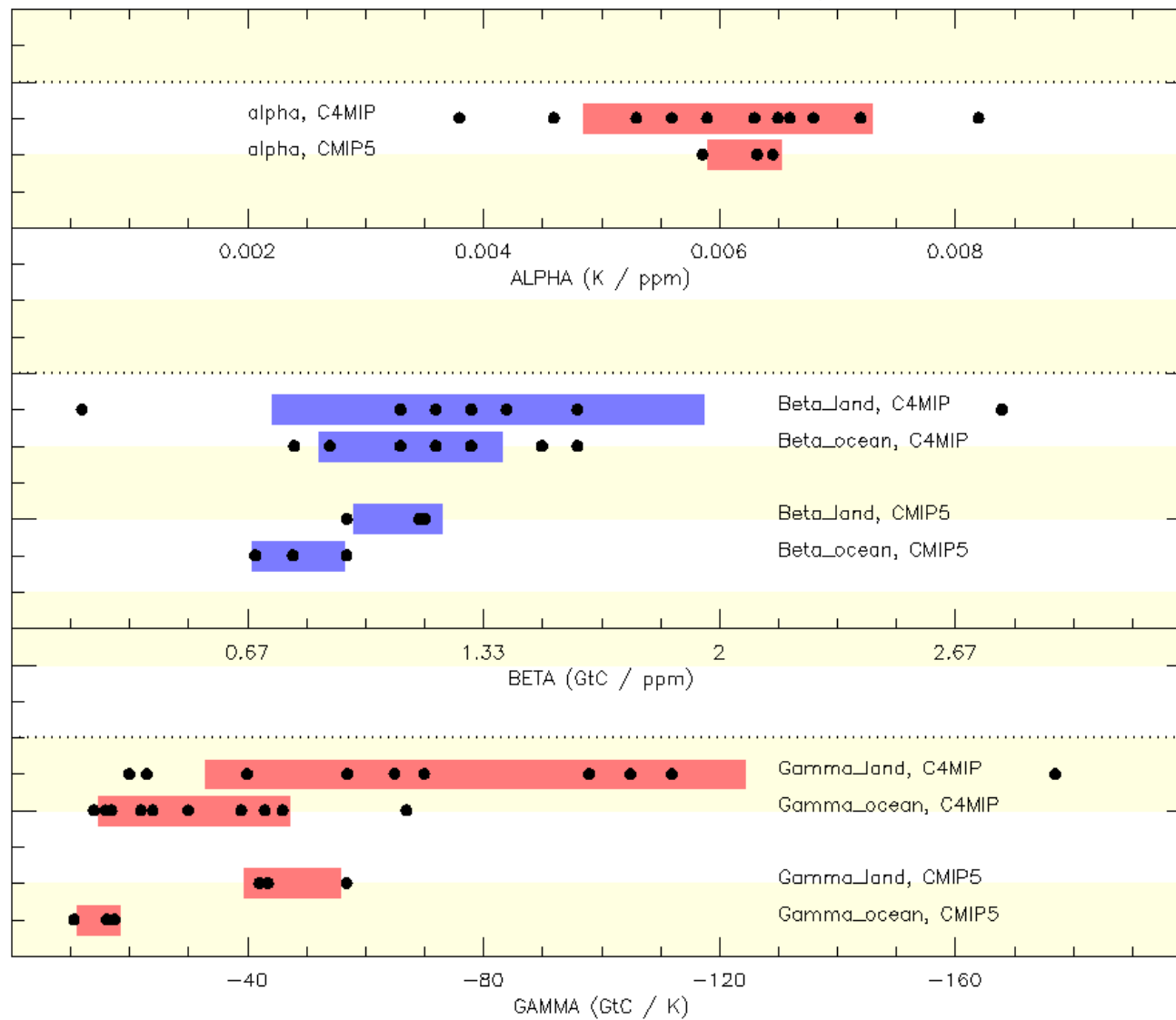
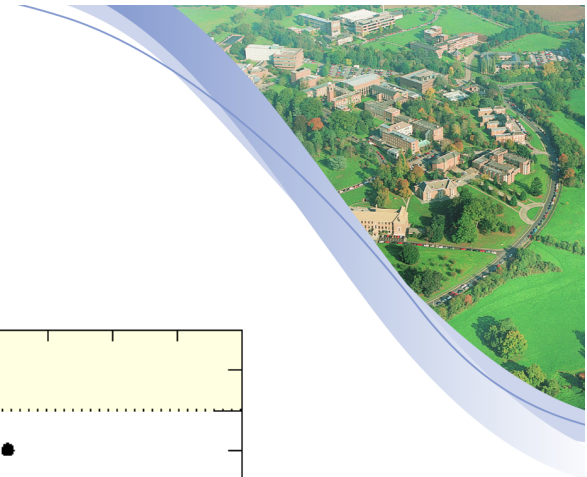
impact of climate change

Control (stable)

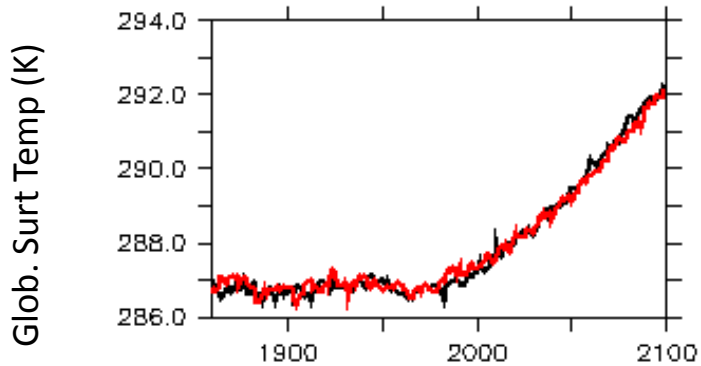
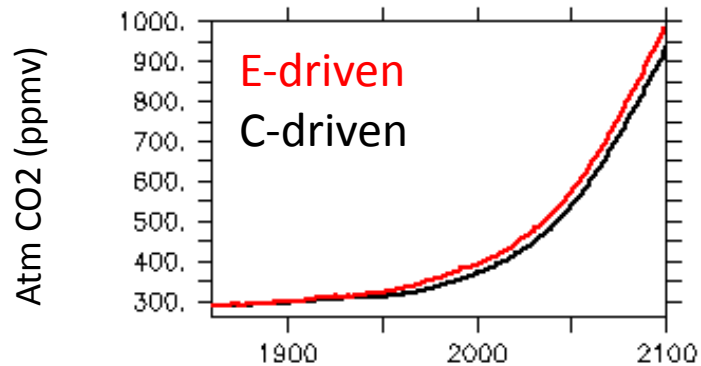
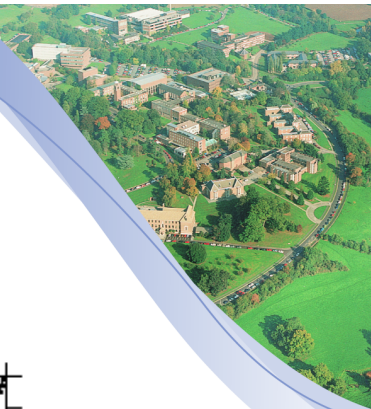
Rad



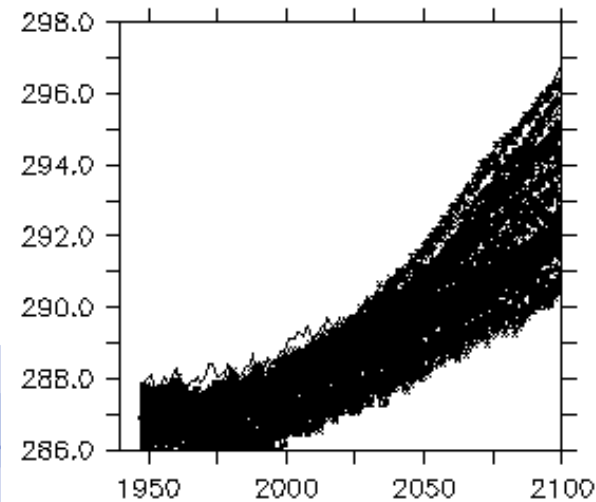
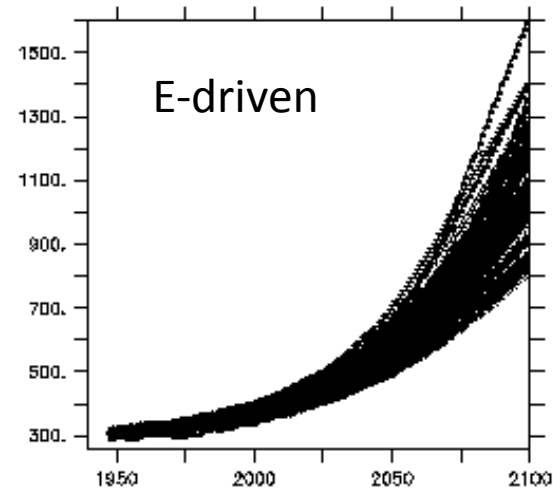
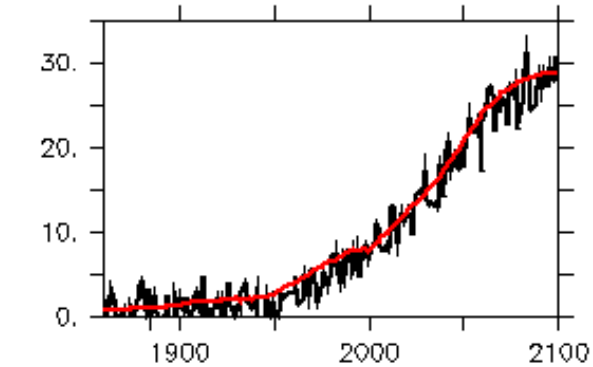
CMIP 1% feedback analysis

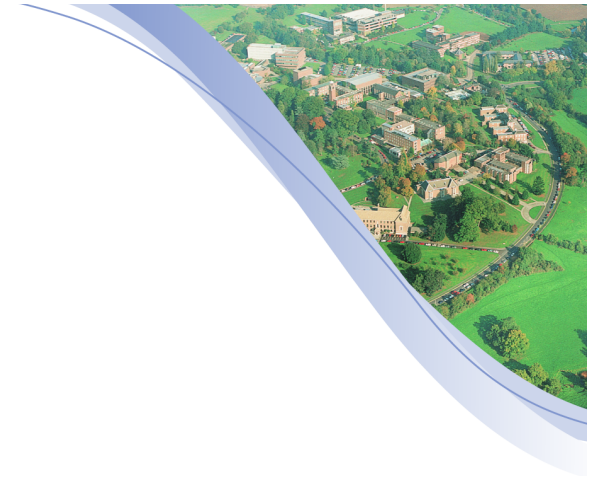


E-driven simulations Historical and RCP8.5



Anthrop. CO2
Emissions (PgC/yr)





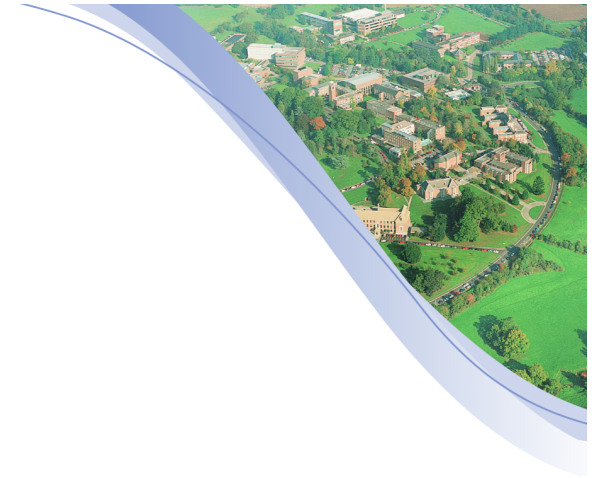
Status of the MIP;

What science have we learned so far?

Need for cross-MIPs analyses?

Plans for an introduction paper;

Plans for workshops and articulation with the
CMIP5 workshop



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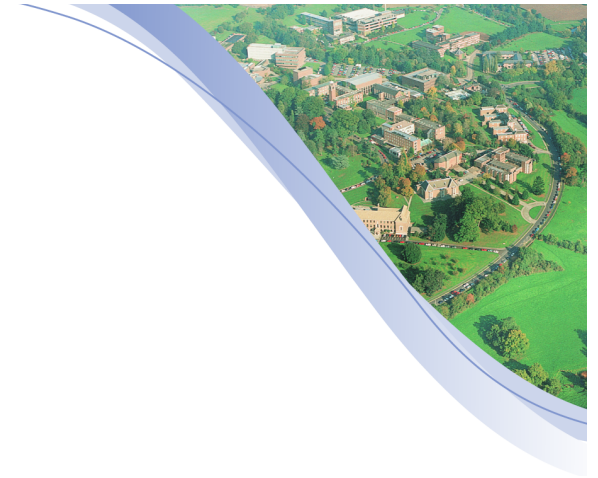
see above

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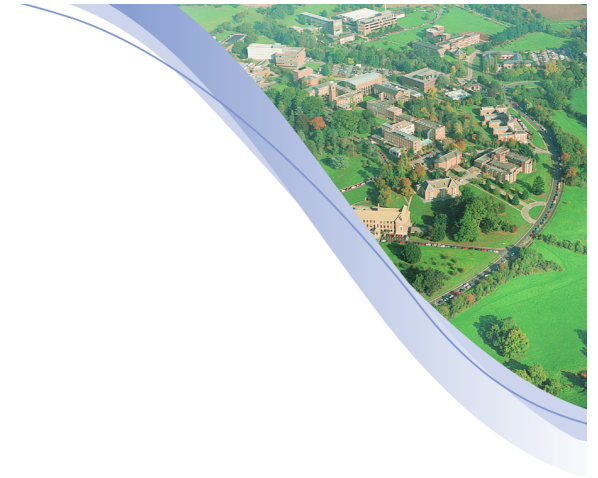
What science have we learned so far?

To be honest, not much, but I'm still optimistic

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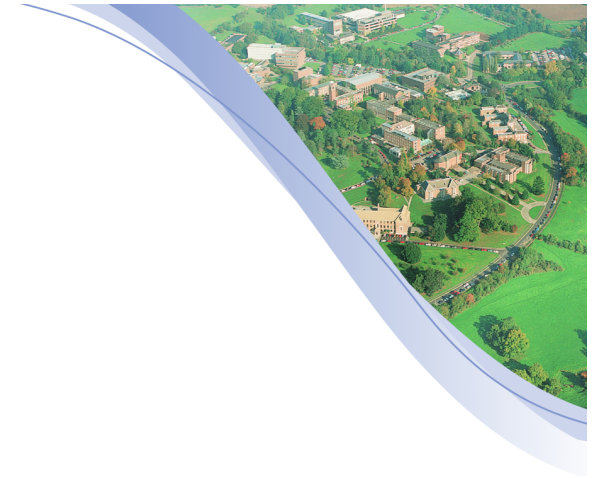
Need for cross-MIPs analyses?

Yes:

- cross feedback analysis (as in Gregory et al. 2009)
- cross uncertainty analysis
- cross evaluation
- PMIP + C4MIP = PCMIP

Plans for an introduction paper;

Plans for workshops and articulation with the CMIP5 workshop



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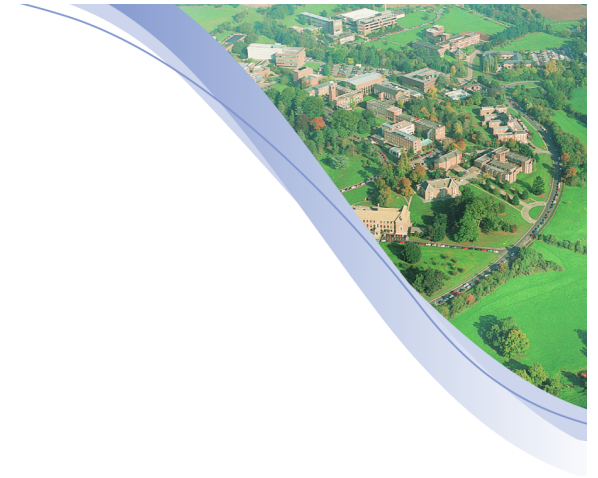
Plans for an introduction paper;

Yes, special issue planned in Jclim

(see <http://ar5carbon.wikispaces.com/>)

Introduction paper had been discussed

Plans for workshops and articulation with the CMIP5 workshop



Status of the MIP;

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No plans for a C4MIP only workshop, but clear
intention to contribute to the CMIP5 workshop