

Climate ObjectiVes and Feedback Effects on Future Emissions - COVFEFE

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- Evidence for the UK Committee on Climate Change, with regard to their statutory advice on national carbon budgets.
- Input to the International Panel on Climate
 Change (IPCC) special report, which is expected
 to have a publication submission deadline in late
 2017 or early 2018.

Three projects with common methods (JULES-IMOGEN) formed an "Intra-Consortia"

CLIFFTOP

Climate feedbacks from wetlands and permafrost thaw in a warming world

Garry Hayman, Sarah Chadburn, Eddy Comyn-Platt, Toby Marthews, Eleanor Burke, Nic Gedney, Eleanor Blyth and Hanna Lee

CLUES

Climate, Land-Use, and Ecosystem Services at 1.5°C

Anna Harper, Peter Cox, Chris Huntingford, Tom Powell

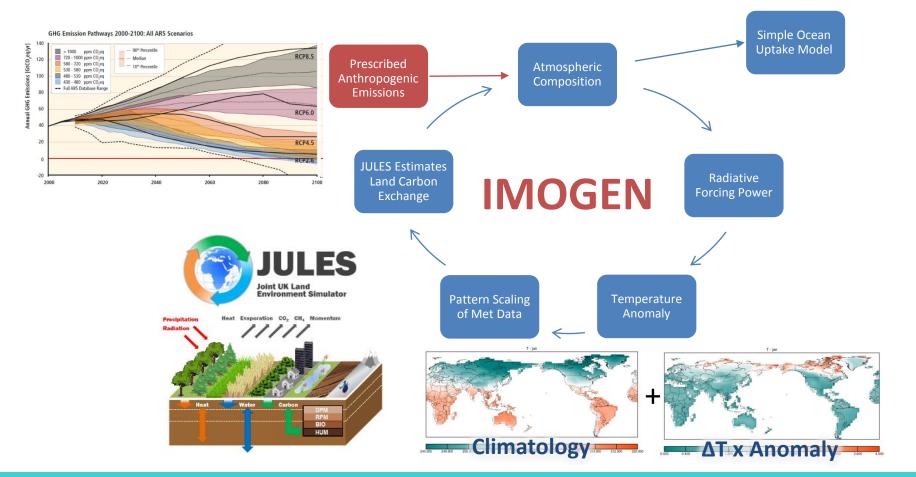
MOC1.5

Methane, Ozone and the Carbon Budget for 1.5°C

Bill Collins, Steven Sitch, Jason Lowe, Chris Webber

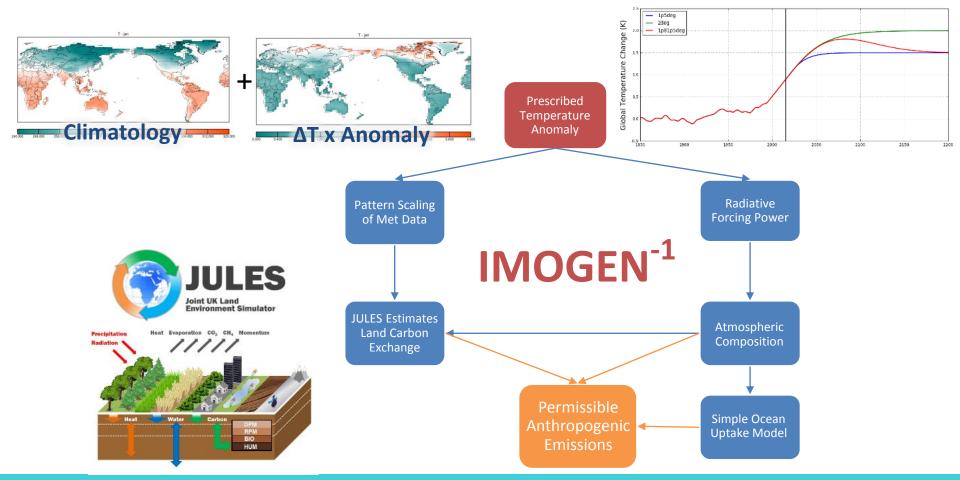












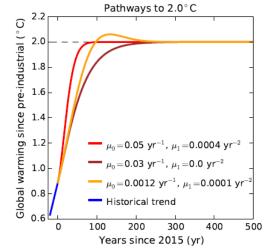


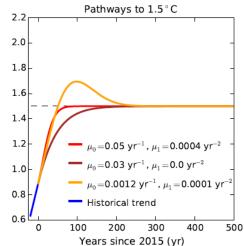
ingford, C., et al. (2010). IMOGEN: an intermediate complexity model to evaluate terrestrial impacts of a changing climate, Geosci. Model Dev., 3, 679–687, doi: 10.5194, gmd-3-679-2010.



Intra-Consortia Baseline Scenario

- Temperature profiles
 - Huntingford et al. (2017) formulation
- Non-CO2 Radiative Forcing Contributions
 - SSP2-RCP2.6-IMAGE

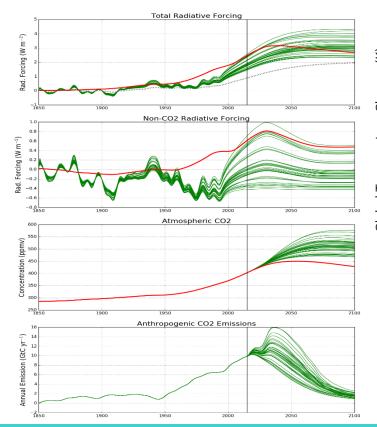


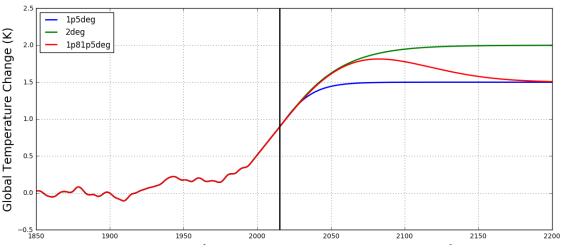






Intra-Consortia Baseline Scenario





$$\Delta Q_{non\ CO_2} = m\Delta Q_{non\ CO_2}^{SSP} + c$$

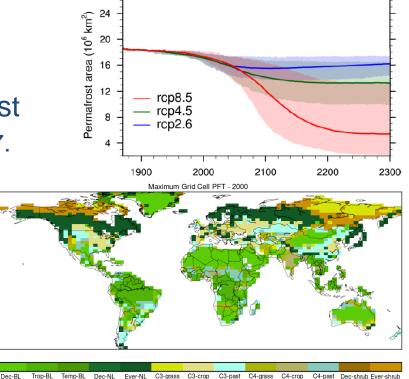




Intra-Consortia Baseline Scenario

JULES Key Features:

- 14 Soil Layers
- Layered Soil Carbon and Permafrost
 - Chadburn et al., 2015; Burke et al., 2017.
- 13 PFTs and LULUC projections
 - Anna Harper et al., 2016.
- Ozone damage
 - Scaled to CH4
- TOPMODEL (Gedney et al., 2004)
- 3 Snow Layers



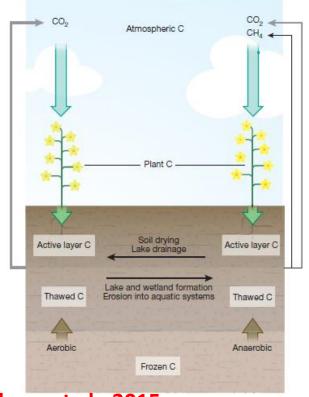




CLIFFTOP Methane Feedback

- Permafrost Thaw
 - Burke et al., 2017
- Methane Feedback
 - Gedney et al, 2017 in preparation





Schuur et al., 2015



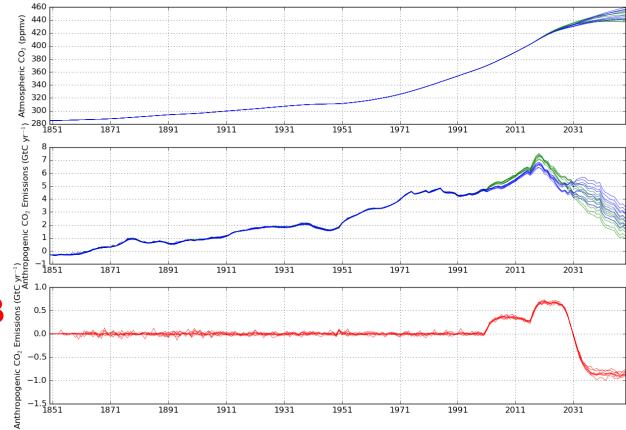


Results

Baseline Scenario

CH4 Feedback

Baseline - CH4-FB







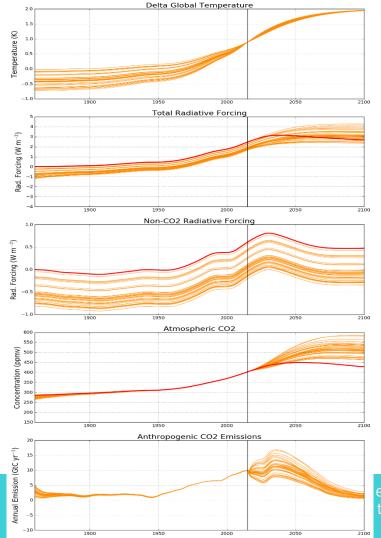
Summary and Future work

- We have a state of the art JULES-IMOGEN configuration setup and available as a ROSE suite, available for distribution
- We need to finalise our decision on Temperature and Radiative forcing approach so we can set our finalised simulations going
- First lot of publications will be on their way out later in the year
- There will be a wealth of data to mine to study the impacts of these targets after we get our initial results out.
- This will form a new IMOGEN configuration available on the jules_doc trac.

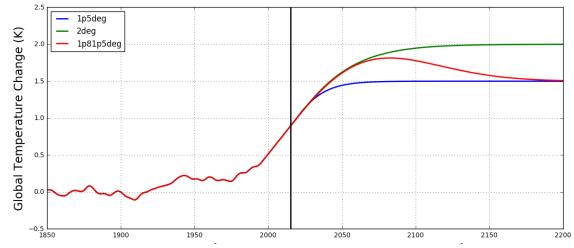




Projec		Comment/Interaction
2	Climate feedbacks from wetlands and permafrost thaw in a warming world (CLIFFTOP) Climate, Land-Use, and Ecosystem Services at 1.5C P Cox (PI), <u>A Harper</u> , S Sitch, T Lenton (U. Exeter), J House (U. Bristol), Chris Huntingford (CEH)	 All using JULES-IMOGEN Agree/use common 'baseline' scenario Hold joint project meeting(s)
3	Methane, Ozone and the Carbon Budget for 1.5 degrees (MOC1.5) <u>Bill Collins</u> (PI), S Sitch, P Cox (Exeter) Also involves: Chris Huntingford (CEH) and <u>Jason Lowe</u>	
4	Quantifying the cumulative carbon emissions consistent with a 1.5C global warming (TCRE1.5) <u>Pierre Friedlingstein</u> (PI, Exeter), <u>Richard Millar</u> , D Wallom (Oxford).	Use common 'baseline' scenarioHold joint project meeting(s)
5	Plausible policy pathways to Paris <u>Neil Edwards</u> (PI, OU), <u>Hector Pollitt</u> (Cambridge)	 Econometric modelling with Climate Emulator. ENTS DVGM (with 1 pft, 1 crop, 1 soil reservoir and water bucket) Focus on
6	CURB CO2: Carbon Uptake Revisited - Biases Corrected using Ocean Observations P Halloran (PI), A Watson, Alice Lebehot (U. Exeter)	Explore bias in air-sea exchange of CO2Any link through scenarios
7	ADJUST1.5: Defining ADJUSTable (emission) pathways to 1.5 degrees C warming, and assessing their feasibility, physical consequences and impacts Philip Goodwin (PI), I Haigh, J Matter, R Nicholls, Sally Brown (U. Southampton)	Simple terrestrial C cycleAny link through scenarios
8	Sea level rise trajectories by 2200 with warmings of 1.5 to 2 degree C Svetlana Jevrejeva (PI), F Mir Calafat (NOC), DF Hendry, <u>Luke Jackson</u> (Oxford),	Any link through scenarios
9	Thresholds for the future of the Greenland ice-sheet <u>Jonathan Gregory</u> (PI), R Smith, <u>Steve George</u> (Reading), AJ Payne (U. Bristol)	Any link through scenarios
10 CI	Implications of the Paris Agreement for Biodiversity and Conservation Planning (IMPALA) Rachel Warren (PI), Jeff Price (UEA)	BiodiversityAny link through scenariosInvolved in AVOID programme



Baseline Scenario



et al. (2017). "Flexible parameter-sparse global time-profiles that stabilise at 1.5°C and 2.0°C.", Earth Syst. Dynam. Discuss.

