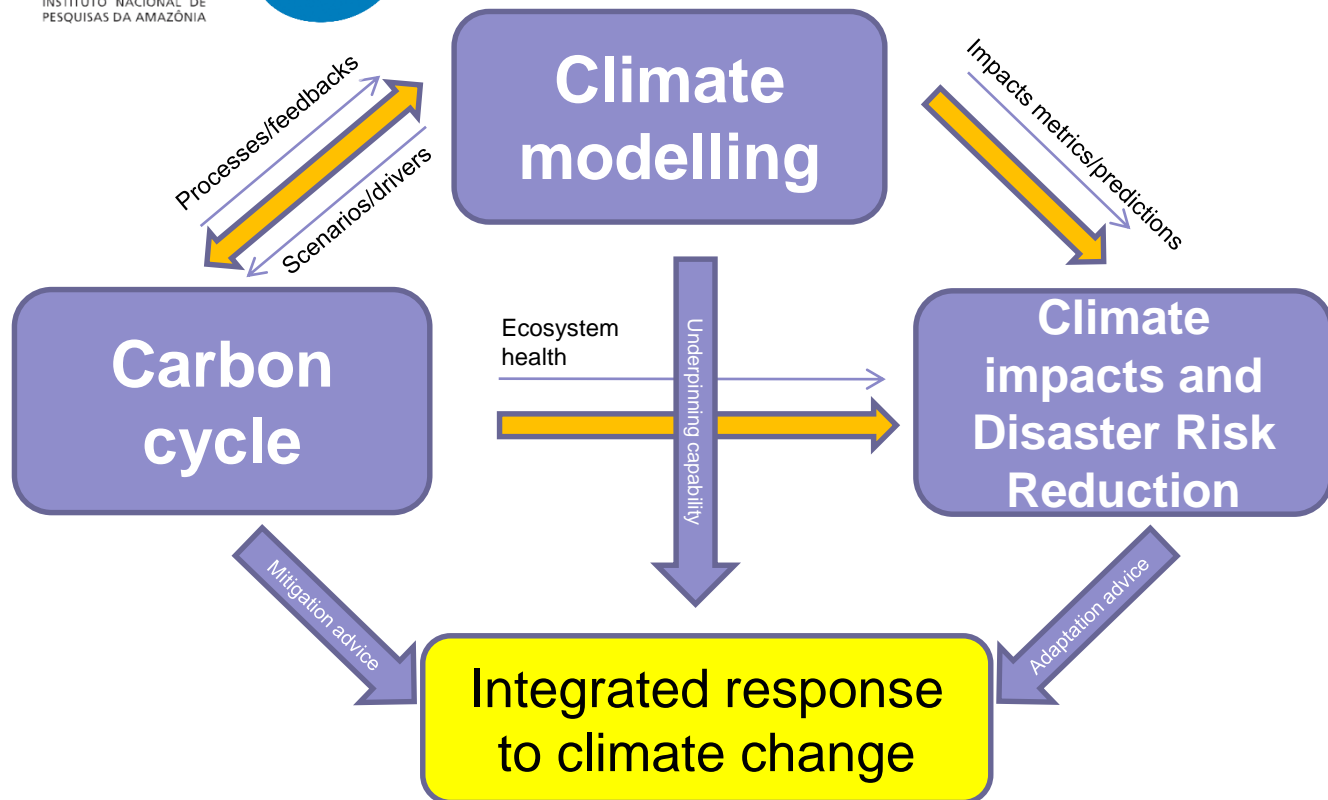


CSSP Brazil

Dr Chris Jones, Met Office

Dr Gilvan Sampaio, INPE

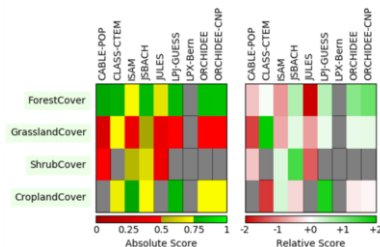
CSSP Brazil



CSSP Brazil has brought
together modelling expertise on
land-use change and fire



ILAMB overview



Geosci. Model Dev., 12, 179–193, 2019
<https://doi.org/10.5194/gmd-12-179-2019>
© Author(s) 2019. This work is distributed under
the Creative Commons Attribution 4.0 License.

Geoscientific
Model Development
EGU
Open Access

Representation of fire, land-use change and vegetation dynamics in the Joint UK Land Environment Simulator vn4.9 (JULES)

Chantelle Burton^{1,2}, Richard Betts^{1,2}, Manoel Cardoso³, Ted R. Feldpausch², Anna Harper², Chris D. Jones¹,
Douglas I. Kelley⁴, Eddy Robertson¹, and Andy Wiltshire¹

¹Met Office Hadley Centre, Exeter, EX1 3PB, UK

²College of Life and Environmental Science, University of Exeter, Exeter, EX4 4SB, UK

³Brazilian Institute for Space Research (INPE), Earth System Science Center (CCST), São José dos Campos, Brazil

⁴Centre for Ecology and Hydrology, Wallingford, OX10 8BB, UK

Together with data and model evaluation
expertise

To enhance land-surface and carbon cycle
modelling over Brazil

CSSP Brazil output contributes to the Global Carbon Project annual carbon budget

Met Office and U. Exeter are supporting INPE to lead South America chapter of the Global Carbon Project RECCAP2 analysis



Assessing changing likelihood of extreme events in Brazil



2017 heavy rainfall over Uruguay river basin (\$102m damage, 3,500 people displaced) now **5 times more likely** due to climate change



2018 flood in Parnaíba river (5,000 displaced) now **70% more likely** due to climate change



Long-term warming trend in SE Brazil due to human-induced climate change

Dedicated attribution workshops, building capacity of early career researchers and growing a WCSSP attribution community



Convective scale modelling

- We are developing 4km scale climate modelling capability over Brazil
- Drawing on expertise and experience across other WCSSP partnerships

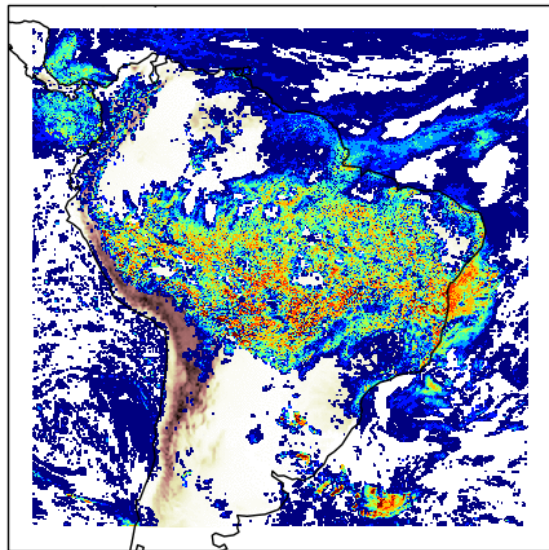
Applications for Brazil :

- improved river flow, flood and landslide projections, which could better inform infrastructure projects and reduce risk to life in vulnerable areas.
- a better understanding of the impact of land cover change, e.g. deforestation, on precipitation patterns.
- improved understanding of the interactions between aerosols (e.g. from biomass burning) with clouds and rainfall.

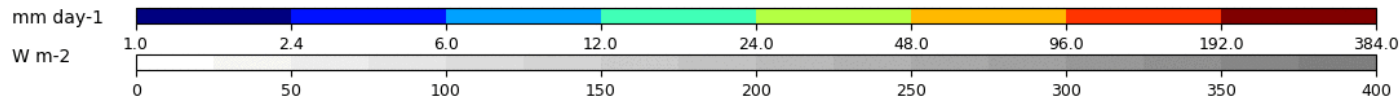
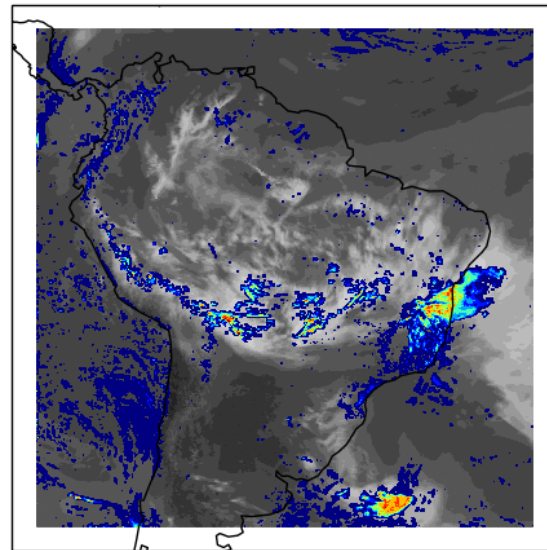


Precip and orography(left), OLR(right) 2002-01-01T00:30:00

RCM: 12km



CPM: 4.4km



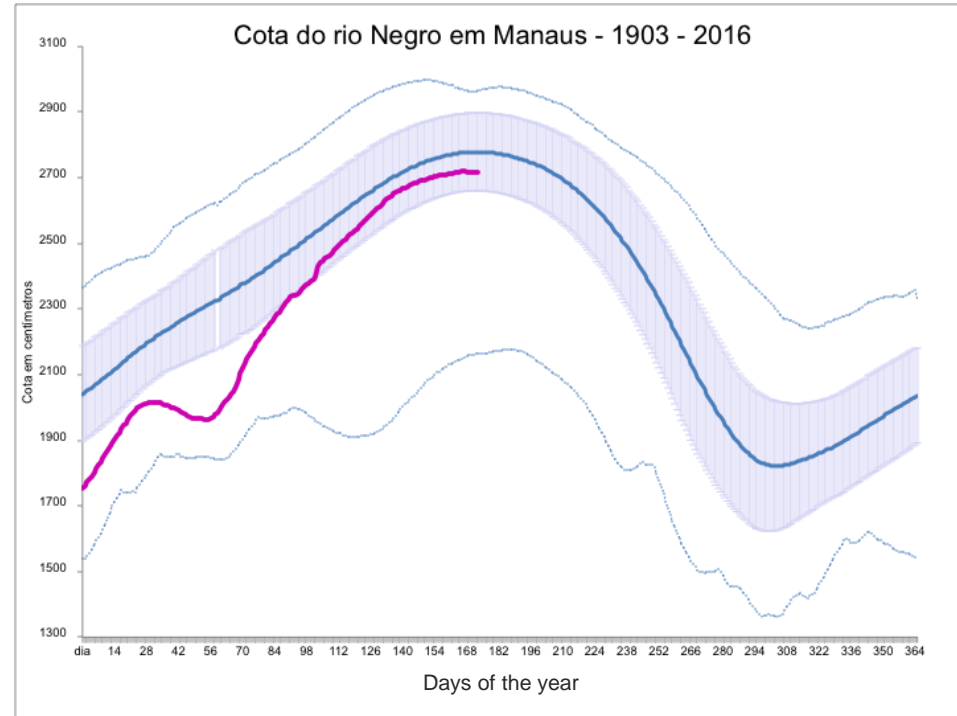
River forecasting for Manaus

CSSP Brazil pilot project to develop and evaluate Manaus River level forecast

What would be required for a minimum level forecast?

INPE, INPA, CEMADEN and Met Office: collaborative work

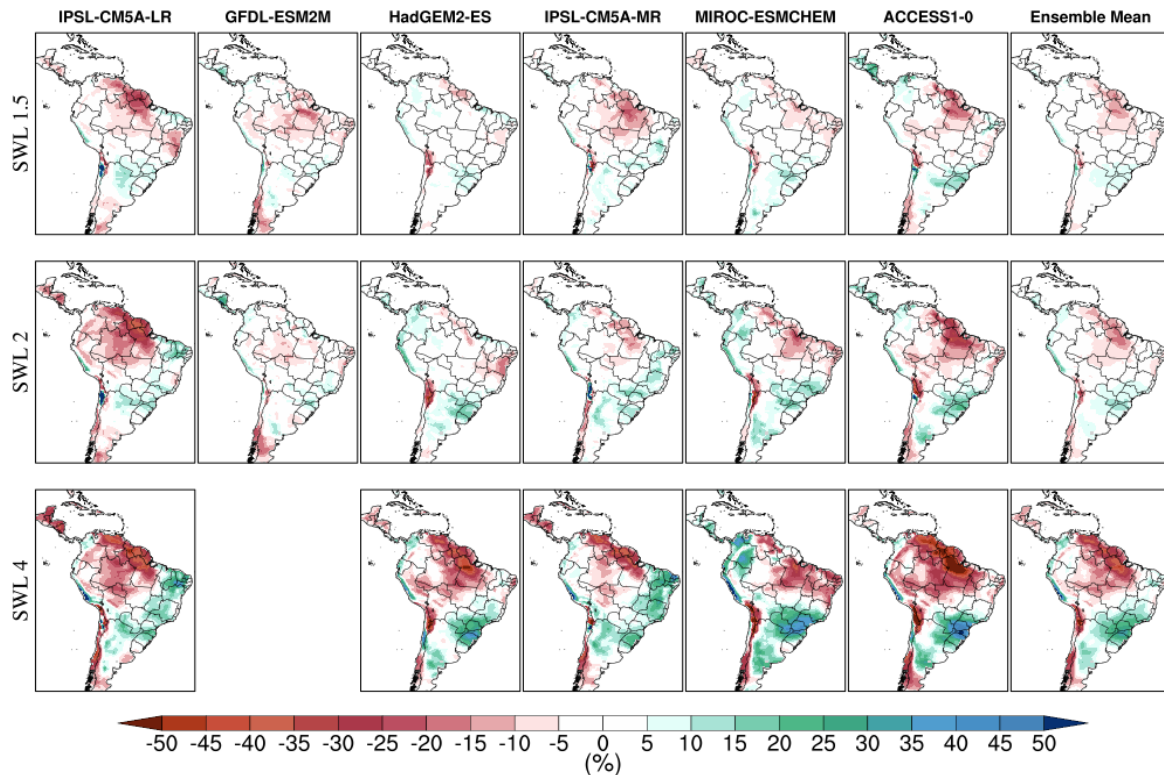
Initial results by summer 2020



Fourth National Communication – Brazil

Climate projections: HELIX
project results

*Change in annual mean precipitation
precipitation at 1.5°C, 2°C and 4°C global
warming – HadGEM3 results*



Fourth National Communication – Brazil

Climate projections: HELIX
project results

*Summer maximum 5-day precipitation
(rx5day) at 1.5°C, 2°C and 4°C global
warming – HadGEM3 results*

