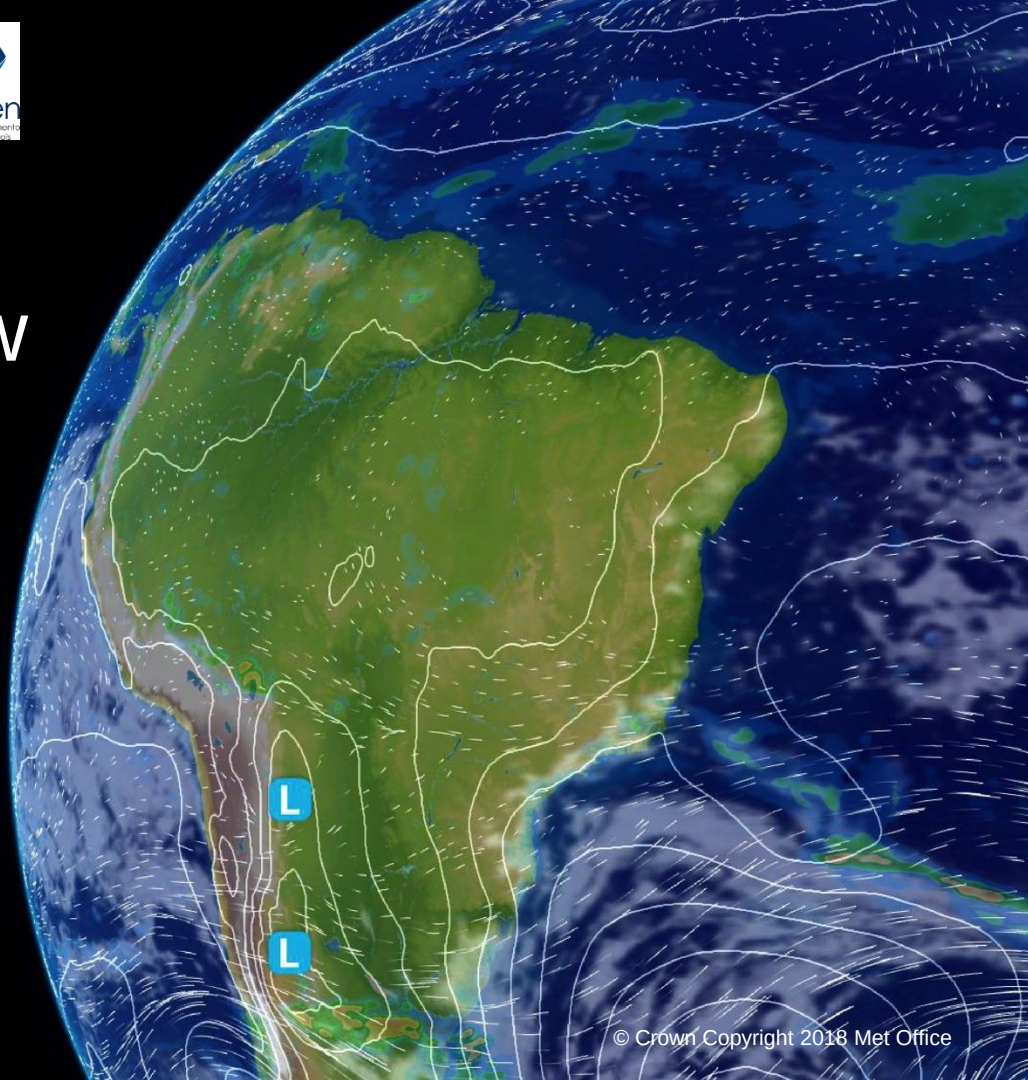
CSSP Brazil Overview



www.metoffice.gov.uk

Project Summary

CSSP Brazil aims to develop capability to inform decision makers in climate mitigation and adaptation strategy and to underpin services to support climate and weather resilient economic development and social welfare.

The overarching aims of CSSP Brazil are to:

- Underpin capability in climate modelling in Brazil;
- Gain understanding of recent climate changes and Brazil's role in mitigation activities and greenhouse gas budgets to inform international negotiations;
- Understand the risks and causes of climate-related extremes and impacts, and provide projections of changes in risk from seasonal to centennial timescales, to inform decision making and contribute to disaster risk reduction in Brazil.

+UK partners

CSSP Brazil partners

Centre for Ecology & Hydrology
NATURAL ENVIRONMENT RESEARCH COUNCIL

Newton Fund

UNIVERSITY OF EXETER

THE UNIVERSITY of EDINBURGH

UNIVERSITY OF LEEDS

Met Office

University of BRISTOL

Cemaden
Centro Nacional de Monitoramento e Alertas de Desastres Naturais

UNIVERSITY OF OXFORD

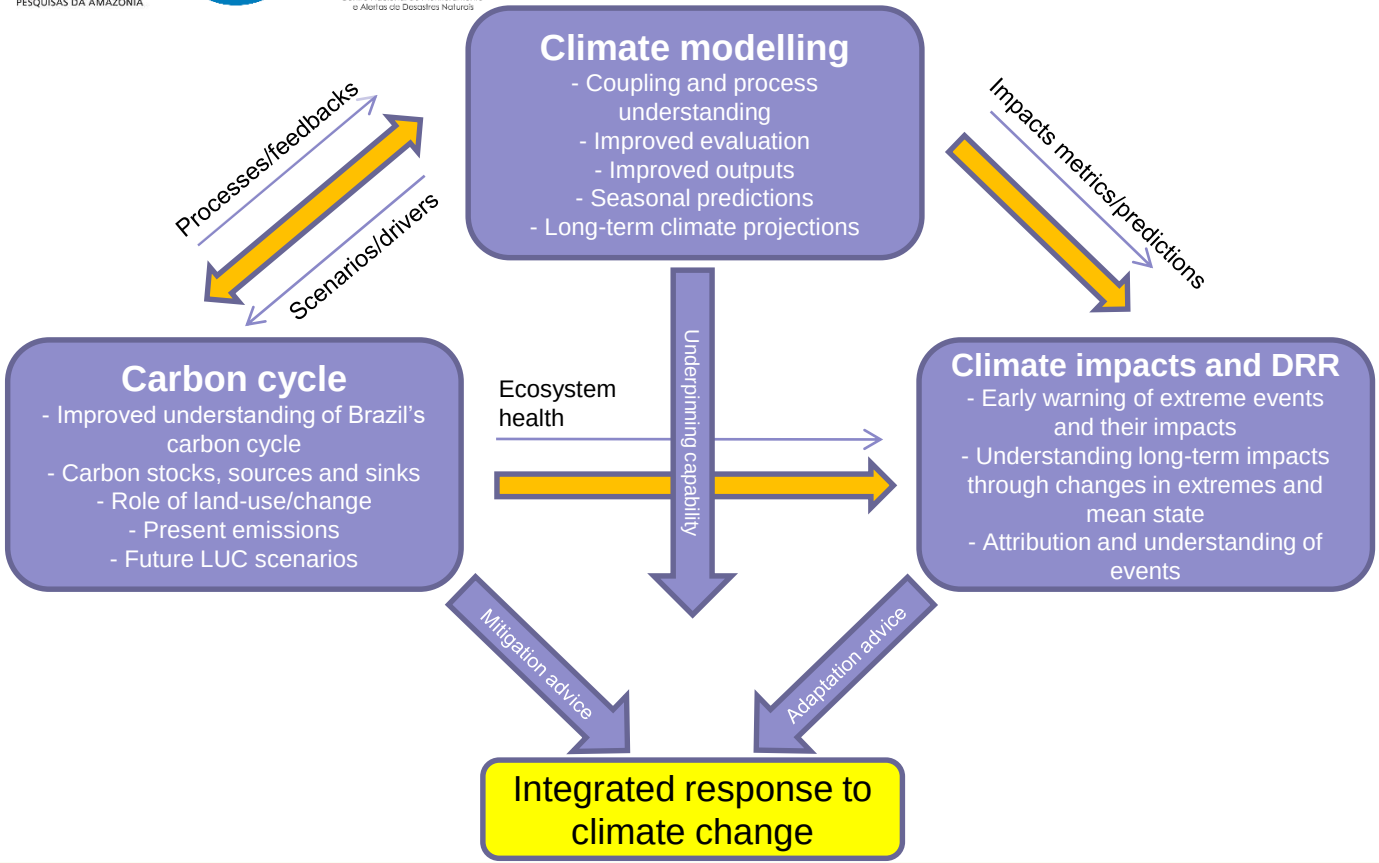
University of Reading

INPE

INPA
INSTITUTO NACIONAL DE PESQUISAS DA AMAZÔNIA

National Centre for Atmospheric Science
NATURAL ENVIRONMENT RESEARCH COUNCIL

Three Work Packages

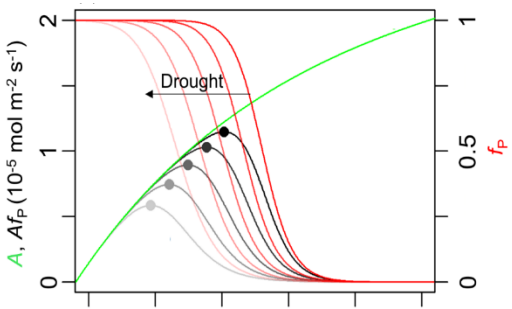


Work Package 1: Carbon Cycle

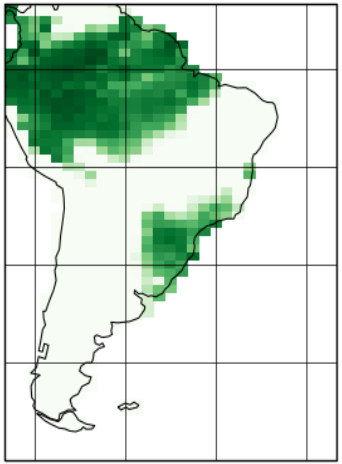
(Andy Wiltshire)

High level goals

- Quantification of carbon budgets of Brazil
- Present day – inform national reporting
- Future – inform mitigation policy, role of LUC
- Now looking also at CH_4



As the soil (or the atmosphere) dies out, the cavitation costs (f_P) associated with a given A increases.
<courtesy, Cleiton Eller, Uni .Exeter>



New fire model is able to capture Tropical Forest - Savanah – Tropical Forest transition

Objectives

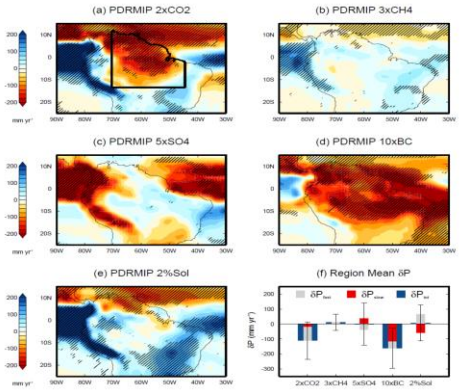
- Better quantify CO_2 and CH_4 budgets for Brazil
- Gain an understanding of natural and anthropogenic carbon and methane fluxes to aid national reporting and mitigation planning
- Improved assessment of the role of land-use and land-use change, rising atmospheric CO_2 and fires in present and future scenarios to guide mitigation and land-use planning and enable contributions to international climate negotiations
- A better understanding of Ecosystem resilience to multiple drivers of change

Work Package 2: Carbon Modelling

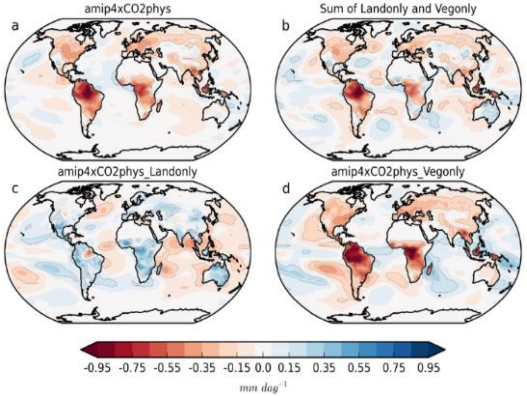
(Chris Jones)

High level goals

- Rainfall with focus on seasonal scales
- Seasonal forecasting and predictability
- Drivers of future changes



Brazilian rainfall response to different drivers



Water-cycle response to different land coupling mechanisms

Objectives

- Improve understanding of (sub)seasonal rainfall processes and their predictability
- Develop and apply evaluation techniques to help improve models, with a focus on land-atmosphere coupling and the use of remote sensed/satellite products
- Develop and apply new experimental techniques to quantify and understand the relative importance of mechanisms driving future rainfall changes
- High-resolution (convective permitting) regional modelling

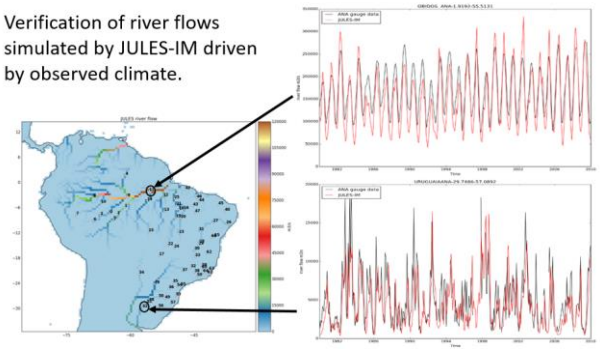
Work Package 3: Climate Impacts and DRR

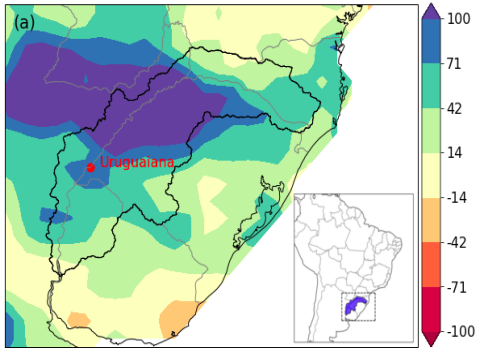
(Richard Betts)

High level goals

- Understanding and attribution of extremes, impact attribution
- Quantify present day risks
- Future risk changes and trends

Verification of river flows simulated by JULES-IM driven by observed climate.





Precipitation in the Uruguay basin as percentage difference from 1980-2013 climatology

Objectives

- Develop climate impacts modelling capability, including crops, fire and river flow
- To attribute recent observed extreme events to climate change and to quantify the risks of extreme rainfall under current climate conditions, to understand the risk of not-yet-seen record extremes and to try to understand drivers of how these risks change in the future
- To apply climate impacts modelling to inform risks, and changing risks, of climate impacts including contributions to international activities such as ISIMIP, AgMIP and IPCC WG2