

ponto de vista

VIEWpoint

29/03/2022

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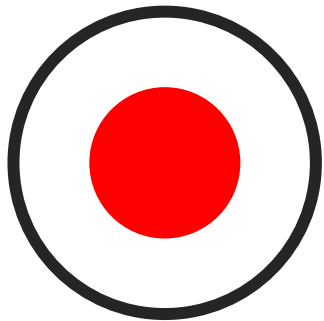


Met Office

Climate Science for Service Partnership (CSSP) Brazil
Parceria Ciência para Serviços Climáticos (CSSP) Brasil



HOUSEKEEPING



Please note this session will
be recorded

HOUSEKEEPING




Please pose questions in the Q&A and
we will address them at the end

HOUSEKEEPING




To listen in English

Under  **Interpretation**
(found at the bottom right corner of
the Zoom window)
Choose **English channel**

You will hear the English presenters
You will hear the interpretation of
those speaking Portuguese




To listen in Portuguese

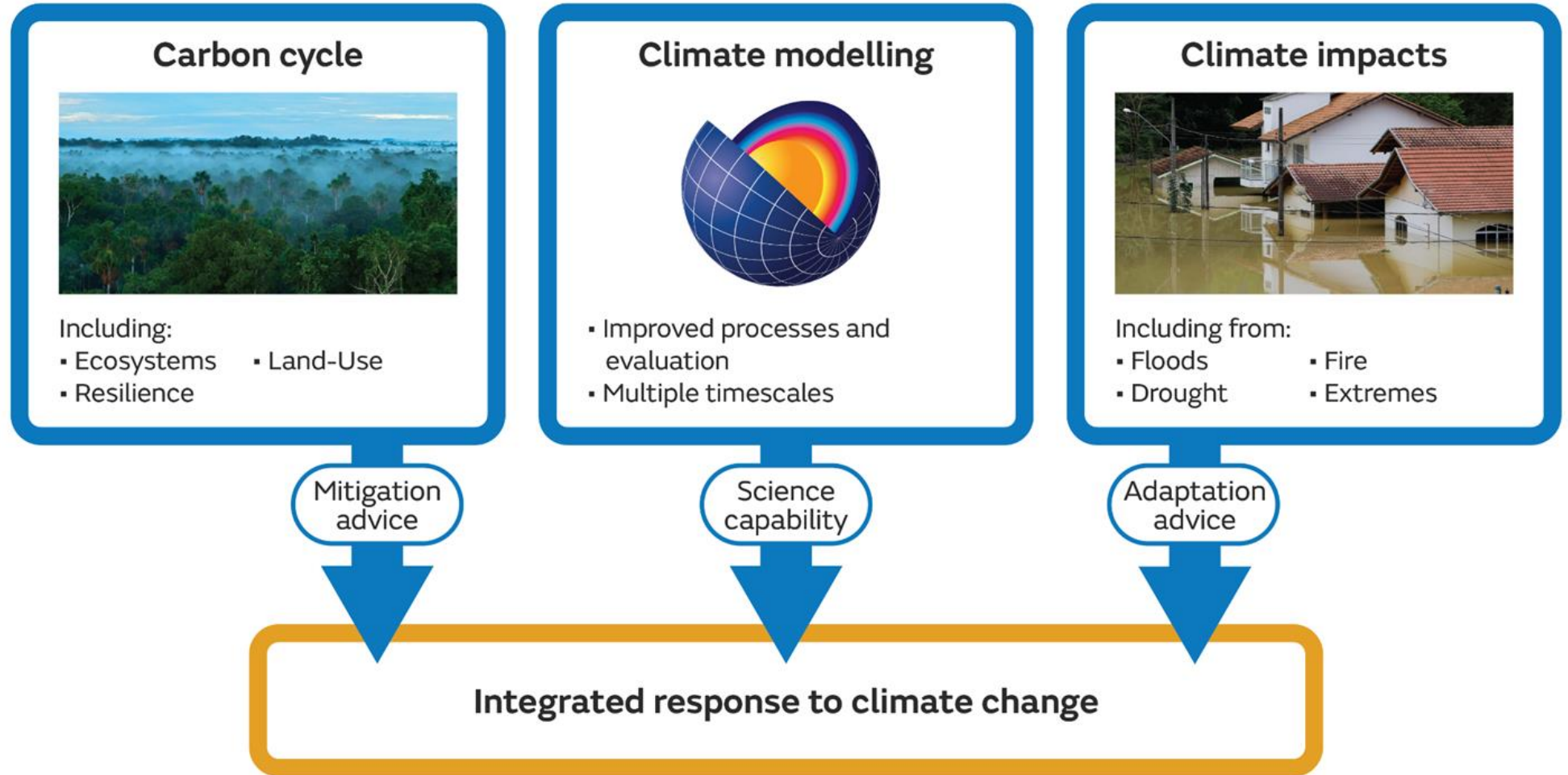
Under  **Interpretation**
(found at the bottom right corner of
the Zoom window)
Choose **Portuguese channel**

You will hear the Portuguese
presenters
You will hear the interpretation of
those speaking English

To listen in either,
depending on the speaker

Under  **Interpretation**
(found at the bottom right corner of
the Zoom window)
Choose **Off mode**

You will hear both the English
presenters and the Portuguese
presenters in their original language



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A showcase for the Climate Science for Service
Partnership between Brazil and the UK

INSTITUTE FOR ENVIRONMENTAL ANALYTICS



- Weather and climate analytics
- Data insight and visualisation
- Consultancy, communication & exploitation

Consultancy	Data science	Software Development	
<i>Simulate your business transformation</i>	<i>Unlocking the power of data</i>	<i>Bespoke software and data visualisation</i>	
6 Years in operation	25 Dedicated experts	60 Successful projects	2 Commercial SaaS products

Putting CSSP Brazil's climate research into the hands of decision-makers in Brazil

- Explainers, Briefing Notes, Infographics, Videos
- Interviews with scientists
- Handbook
- Data visualisation demonstrators
- Searchable catalogue of scientific papers
- In Portuguese and English



<https://www.viewpoint-brazil.org>

RESOURCES

EXPLAINERS, BRIEFING NOTES, INFOGRAPHICS, VIDEOS



Explainer

A plain language explainer for decision-makers about research from the Climate Science for Service Partnership (CSSP) Brazil

ForestPlots.net – global collaboration provides new insight on Amazon forests

Tropical forests – Earth's most precious ecosystems – are changing as never before. Meanwhile, careful, long-term measurements are essential to know how, where and why. What if we could unite researchers across the world to understand the ecology of forests, their sensitivity to climate change and how they may help to slow it? ForestPlots.net's mission is to support and connect researchers measuring tropical forests, and to create a shared, scientific picture of their health. This worldwide collaboration is transforming our understanding of tropical forests and their shifting dynamics.

Importance

Ground measurements of tree species, carbon and soils are hard to monitor from space, so fieldwork is essential for validating estimates obtained from satellite images (Chave et al. 2019). Accurate forest measurements are essential to know what species grow where, how much carbon they store and sequester and how this changes over time. ForestPlots.net brings together ground measurements of tropical forests from over 2,500 colleagues across 62 countries. They use standardised protocols and data management procedures. This ensures that measurements from all the teams can be fairly compared, creating a unique global record of forest characteristics. This huge collaboration has revolutionised our understanding of tropical forests, and how they respond to and affect climate change. The database they have created provides a permanent record and a treasure-trove of information about many of Earth's most precious ecosystems.

Nota Informativa

Informações sobre pesquisas do Climate Science for Service Partnership (CSSP) Brasil para tomadores de decisão No. X

Apoio à previsão de alagamentos para melhor gestão de riscos de desastres

A planície amazônica tem servido como sustento para comunidades tradicionais e indígenas no Brasil por séculos, mantendo atividades como a agricultura, pecuária, piscicultura e silvicultura – todas intimamente relacionadas ao ciclo da água (Junk et al., 2014). De que maneira esse modo de vida está ameaçado pelas mudanças no ciclo da água provocadas pelo aquecimento global? A Parceria Ciência para Serviços Climáticos (CSSP no inglês) entre Brasil e Reino Unido está desenvolvendo um novo método de previsões de inundações que protege áreas, como a Amazônia, dos impactos de eventos climáticos severos – o PEACFLOW. O estudo piloto produz previsões com capacidades semelhantes aos modelos operacionais, mas com maior tempo de execução. Isso beneficiará o preparo e a gestão de desastres em futuras enchentes.

A necessidade de planos de manejo de risco a inundações com maior tempo de execução

A frequência e magnitude crescentes de eventos de inundações nas duas últimas décadas já causou perdas ambientais e socioeconômicas consideráveis em várias regiões da bacia Amazônica (Marengo e Espinoza, 2016). Embora alguns estudos tenham estimado um aumento de risco de inundações nesta bacia hidrográfica (de Andrade et al., 2017), a maioria das cidades da região ainda carecem de sistemas operacionais de previsão de enchente e planos integrais de gestão de risco à inundação. Nos últimos dez anos, a região central da Amazônia foi afetada por sete eventos severos de inundação (2012, 2013, 2014, 2015, 2017, 2019 e 2021) atingindo a marca crítica de declaração de estado de emergência. Sistemas de previsão de enchentes severas, com maior tempo de execução, são necessários para prevenir e mitigar impactos graves sobre populações urbanas e rurais e sobre setores socioeconômicos, de maneira a fornecer ferramentas de tomada de decisão confiáveis para formuladores de política.

Research by CSSP Brazil enables an integrated response to climate change

The Climate Science for Service Partnership Brazil (CSSP Brazil) brings together the expertise of scientists in the UK and Brazil to deliver cutting-edge research into science that underpins climate-resilient economic development and social welfare

The flowchart illustrates the research process: Scenarios/drivers (Processes/feedbacks, Ecosystem health) lead to CLIMATE MODELLING (Coupling and process understanding, improved outputs, Seasonal predictions, Long-term climate projections). This leads to CLIMATE IMPACTS AND DISASTER RISK REDUCTION (DRR) (Early warning of extreme events and their impacts, Understanding long-term impacts through changes in extremes and mean state, Attribution and understanding of events). This leads to INTEGRATED RESPONSE TO CLIMATE CHANGE (Underpinning capability). A feedback loop exists from Integrated Response back to Scenarios/drivers.

Briefing Note

A briefing on research from the Climate Science for Service Partnership (CSSP) Brazil for decision-makers No.01

Supporting flood forecasting for better disaster risk management

PEACFLOW – Predicting the Evolution of the Amazon Catchment to Forecast the Level Of water

The Amazonian floodplains have been the lifeline for indigenous and traditional populations in Brazil for centuries, supporting activities such as agriculture, livestock production, fisheries and forestry – all heavily reliant on the water cycle (Junk et al., 2014). The way of life being threatened by changes in the water cycle due to global warming? The Climate Science for Service Partnership (CSSP) between Brazil and the UK is developing a new method to forecast floods to protect areas such as the Amazon region from the impacts of severe climate events. PEACFLOW. This pilot study produces forecasts with similar skill to operational ones but with a longer lead time, which will benefit the preparedness and disaster management of future floods.

Need for flood risk management plans with a longer lead time

The increasing frequency and magnitude of floods in the last few decades have caused considerable environmental and socio-economic losses in many regions of the Amazon basin (Marengo and Espinoza, 2016). Although some studies have identified an increase in flood risk, operational flood forecasts and integrated flood risk management plans. During the last ten years, the Central Amazon region has been affected by seven severe flood events (2012, 2013, 2014, 2015, 2017, 2019 and 2021) reaching the critical threshold to declare an emergency. To prevent and mitigate severe impacts on the urban and rural populations and on socio-economic sectors, seasonal forecasts of severe flood events with a longer lead time are required, to provide a reliable decision-making tool for authorities.

New method for seasonal forecasts of flood events

CSSP is developing a new method to forecast floods to protect areas such as the Amazon region from the impacts of severe climate events. PEACFLOW. This pilot study produces forecasts with similar skill to operational ones but with a longer lead time, which will benefit the preparedness and disaster management of future floods.

The year always reaches its annual maximum water level at the end of June. This system is designed to support the official flood forecasts issued by the Brazilian Geological Survey (CGE) in Manaus at the end of March each year, providing essential information for effective implementation of disaster risk management actions.



HANDBOOK

Institute for Environmental Analytics

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Plain language resources for decision-makers in Brazil

Information you need to take effective climate action

Climate Science for Service Partnership (CSSP) Brazil

Met Office INPA Cemaden Newton Fund

A challenge shared ... is a huge success

Advance in seasonal forecasting is a model example of Brazil-UK partnership

With people having more access to information, it is up to the scientific community to further strengthen this relationship with society



By Dr Chris Jones
UK science leader of Climate Science for Service Partnership (CSSP) Brazil, Research Fellow, Earth System and Integration Science Team at the Met Office Hadley Centre

The Met Office pays tribute to true partnership

The Climate Science for Service Partnership Brazil (CSSP Brazil) brings together the expertise of scientists in the UK and Brazil to deliver cutting-edge research into science that underpins climate-resilient economic development and social welfare.

The climate challenge is large and our contribution is only a small component of a much bigger goal: to reduce the risk of a substantial loss of climate resilience for the world's most vulnerable populations. In Brazil, particularly in rural farming for coffee and food crops and implications for the security of the food supply chain.

Brazil is a vast and fascinating landscape that plays a 'huge' role in the health of the planet - from the Amazon rainforest. The climate goal is to improve climate resilience and sustainability, with a focus not only on Brazil but to the benefit of South America and global science and society.

The collaboration is financed by the Newton Fund in the UK, which funds research and innovation partnerships across Latin America, Africa and Asia. Other CSSP Brazil started in 2016, partners from both countries set out three priority themes:

1. Carbon cycle/budgets ecosystems and land-use
2. Climate modelling, especially of rainfall predictability and processes
3. Climate impacts modelling for disaster risk reduction

Since then, researchers across many universities and organisations in Brazil and the UK have joined the Met Office and Brazilian research partners INPA, INPE and Cemaden in providing the world's best climate science services. The work has led to many 10-authored scientific research papers, including a cutting-edge special issue of the open access Climate, Resilience and Sustainability, journal. Papers better represent real world climate systems. And where it does not, we can more confidently say how our climate is likely to change in the future.

Key to the research effort - which has resulted in three CSSP Brazil scientific papers being published with impact in the peer-review literature - is the interaction between the surface and atmosphere to better understand the connections between different aspects of climate.

Both models cover the whole globe but scientific papers published from the research focus on South America, in particular understanding climate in the Amazon in Brazil now and in the future.

The models rely on a supply of long-term accurate data on ground temperature and precipitation information comes from ground weather stations across South America and goes back 20 years. In remote areas that are difficult to access, including the Amazon, there are only a few ground weather stations and meteorological data on Earth Observation data, but what this can be a challenge because of the inhomogeneous canopy in forests.

They are now looking to help satellite and data applied to any region worldwide, building on the success of running climate prediction models and evaluating the results.

Another, more recent source of data is the Amazon Tall Tower Observatory - the tallest tower in the world at 323m and only accessible by a marathon climb up metal stairs, which was recently used on during the first Brazil-UK meeting instruments at various heights capturing meteorological, biological and chemical data, including a concentration of greenhouse gases. Because it is so tall, it has a large footprint reaching from the undergrowth up through the rainforest canopy and far higher.

Completed in 2015, scientists are eagerly awaiting the long-term datasets to be processed. Measuring changes over time in a way that satellites are not able to because of the dense canopy of forest - at least until the Collins satellite is operational - scheduled for launch in 2023, it will be the first satellite to study the world's forest in 3D. Researchers are particularly interested in the water cycle in the rainforest and how this is changing over time.

CATALOGUE OF PUBLISHED PAPERS

Filter on:

- Author
- Year
- Theme

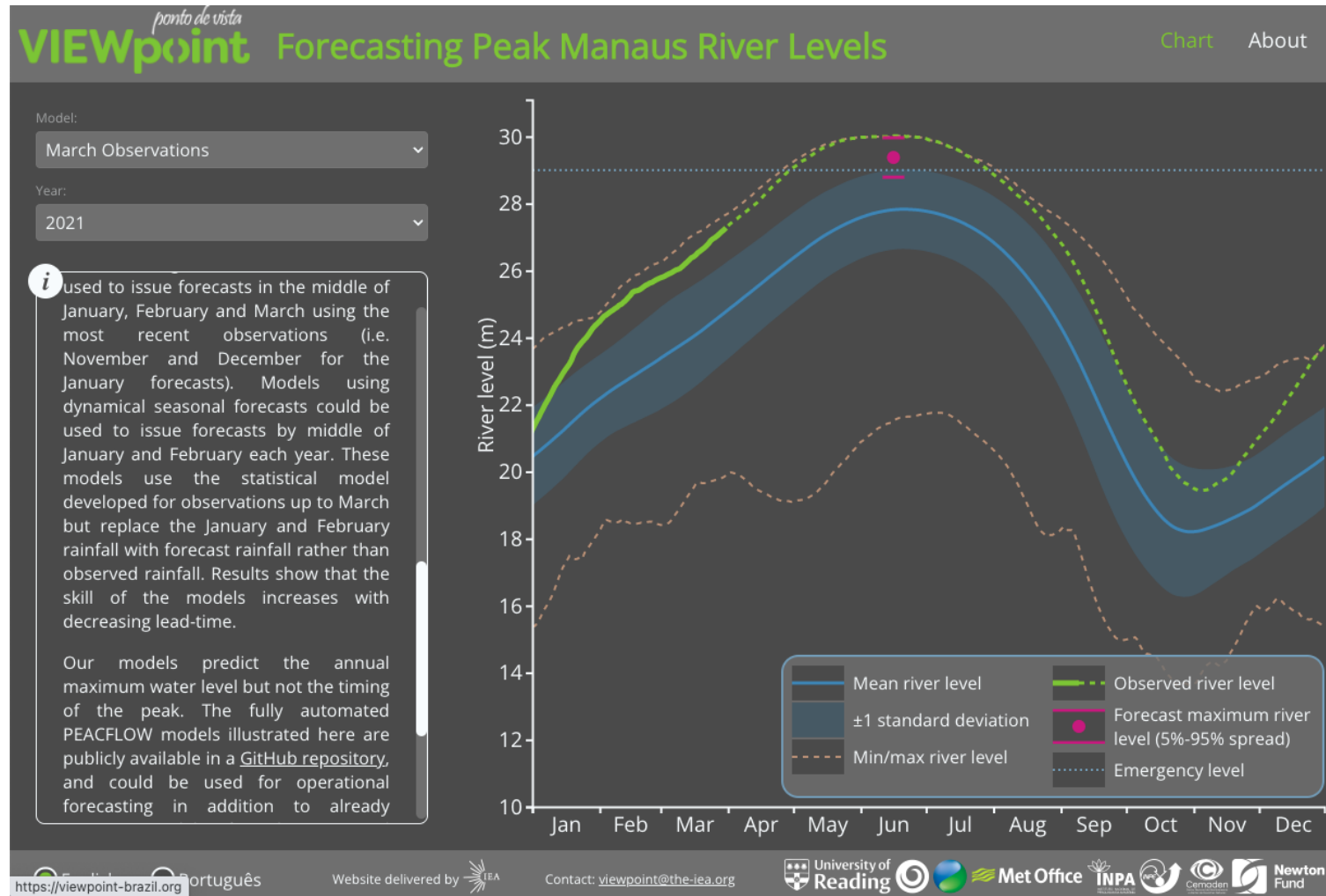
Free text search

The screenshot shows the 'Catalogue of published papers' page on the VIEWpoint website. The page features a navigation menu at the top with links for Home, About, Resources, Demonstrators, Catalogue, Glossary, and their respective Portuguese equivalents. The main content area displays a table of papers with columns for Title, Authors, and Year. A filter sidebar is open on the right, allowing users to filter papers by themes (e.g., Amazon, Climate change, Drought) and publication years (2017-2021). The table lists several papers, with one highlighted in pink: 'An Assessment of Land-Atmosphere Interactions over South America Using Satellites, Reanalysis, and Two Global Climate Models' by Baker, Jessica C. A. et al. (2021).

Title	Authors	Year
A multi-data assessment of land use and land cover emissions from Brazil during 2000–2019	Kosari, Travis W. <i>et al</i>	2021
An Assessment of Land-Atmosphere Interactions over South America Using Satellites, Reanalysis, and Two Global Climate Models	Baker, Jessica C. A. <i>et al</i>	2021
An inter-comparison performance assessment of a Brazilian global sub-seasonal prediction model against four sub-seasonal to seasonal (S2S) prediction project models	Guimarães, Bruno dos Santos <i>et al</i>	2021
Assessment of rainfall variability and future change in Brazil across multiple timescales	Alves, Lincoln M. <i>et al</i>	2021
Carbon loss from forest degradation exceeds that from deforestation in the Brazilian Amazon	Qin, Yuanwei <i>et al</i>	2021
Evaluation of climate simulations produced with the Brazilian global atmospheric model version 1.2	Coelho, Caio A. S. <i>et al</i>	2021
Evapotranspiration in the Amazon: spatial patterns, seasonality, and recent trends in observations, reanalysis, and climate models	Baker, Jessica C. A. <i>et al</i>	2021
Exploring uncertainties in global crop yield projections in a large ensemble of crop models and CMIP5 and CMIP6 climate scenarios	Müller, Christoph <i>et al</i>	2021
Extreme Rainfall and Hydro-Geo-Meteorological Disaster Risk in 1.5, 2.0, and 4.0°C Global Warming Scenarios: An Analysis for Brazil	Marengo, Jose A. <i>et al</i>	2021
High sensitivity of tropical precipitation to local sea surface temperature	Good, Peter <i>et al</i>	2021

VIEWPOINT DEMONSTRATOR 1

FORECASTING PEAK MANAUS RIVER LEVELS



Led by University of Reading and UK Centre for Ecology and Hydrology

VIEWPOINT DEMONSTRATOR 2

CLOUD BAND EXPLORER



VIEWpoint Cloud band explorer

Cloud Band Climatology | All Cloud Band Events | Events per season | Selected Cloud Band

Selected Cloud Band

The rainy season across large parts of Brazil and neighbouring countries occurs during spring (September to November) and summer (December to February) months. A substantial fraction of the rain events are caused by extensive tropical-extratropical cloud bands that stretch from the Amazon to the South Atlantic Ocean. These cloud bands are responsible for the majority of rainfall over central and eastern Brazil to South America South, the eastern of...

In this view, you can explore the selected cloud-band event in more detail. The shape of the identified cloud band on the chosen day is plotted on the map. The dashed rhombus-shaped region represents the area over which rainfall is averaged for the season timeline plot.

Select natural disasters to show

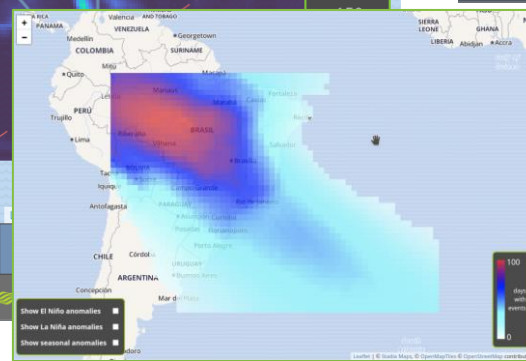
- Floods
- Flash floods
- Hail
- Storms
- Erosion
- Drought
- Landslides

6 Feb 2013

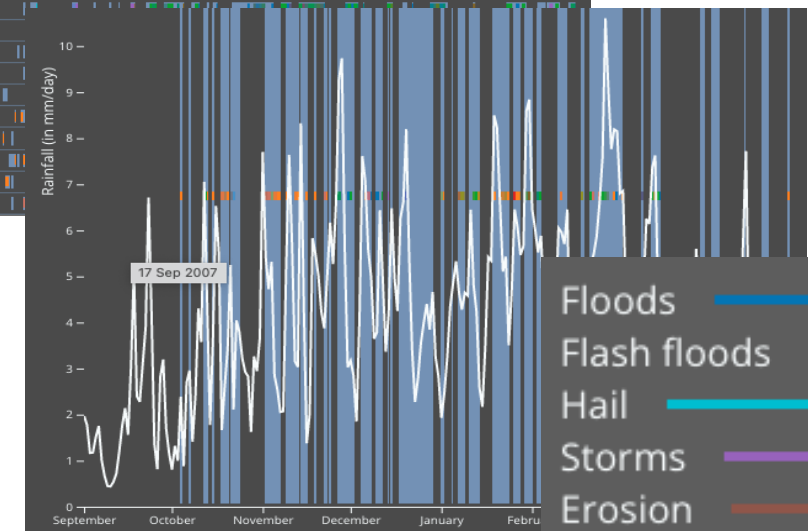
English Portuguese Website delivered by IEA Contact: viewpoint@the-iaea.org



All cloud band events



Cloud band climatology



Season detail

Led by University of Oxford

Thank you!
Obrigado!

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You can download and share these resources with your contacts

<https://www.viewpoint-brazil.org/>

For more information, please contact: Maria Nogueir (m.nogueir@the-iea.org)

CARBONO

CONTABILIDADE PARA ARMAZENAMENTO E EMISSÕES DE CARBONO

CARBON

ACCOUNTING FOR CARBON STORAGE AND EMISSIONS

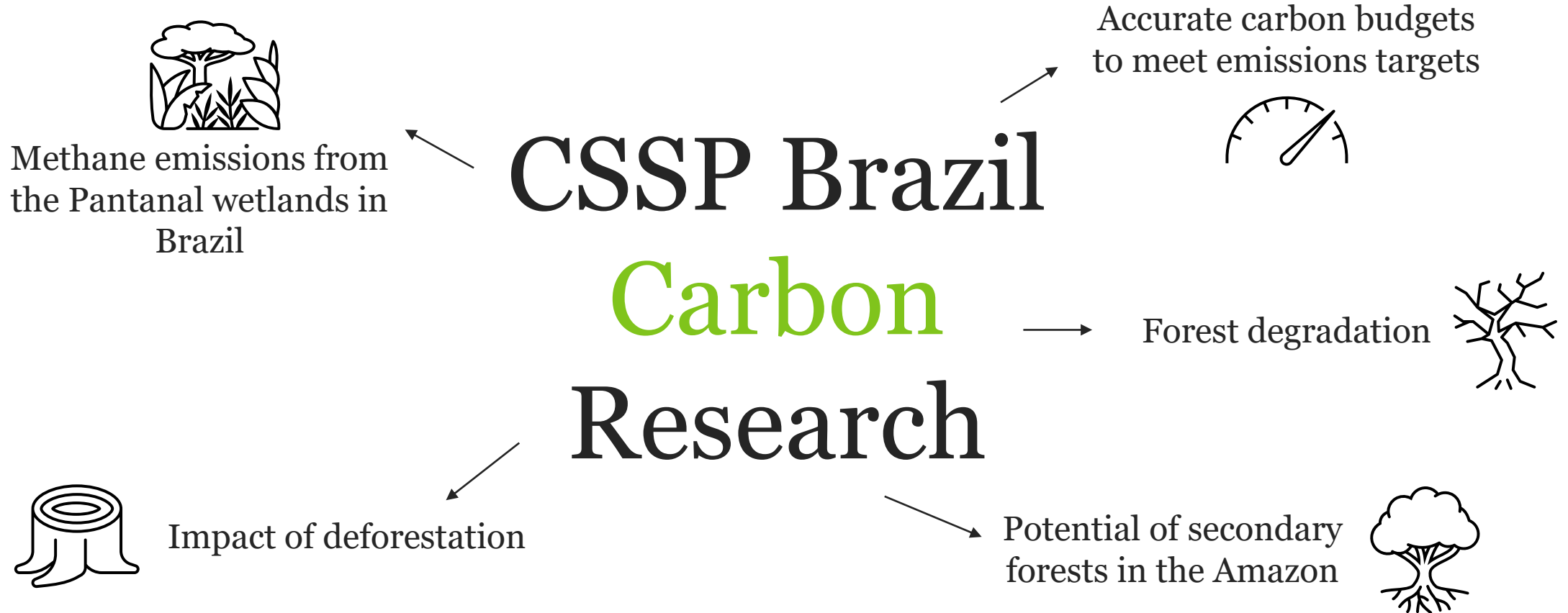
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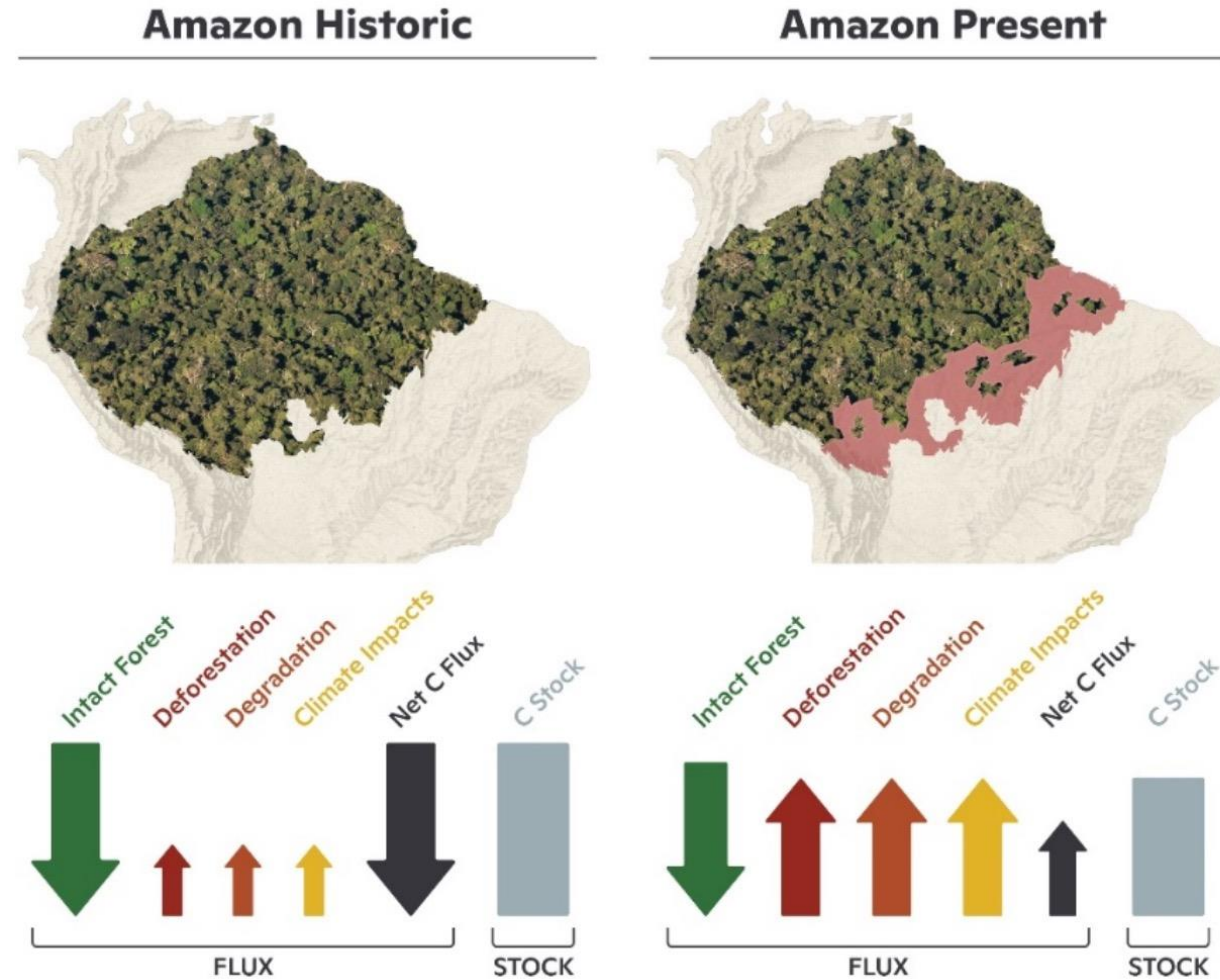
Celso von Randow

celso.vonrandow@inpe.br





CARBON CARBONO

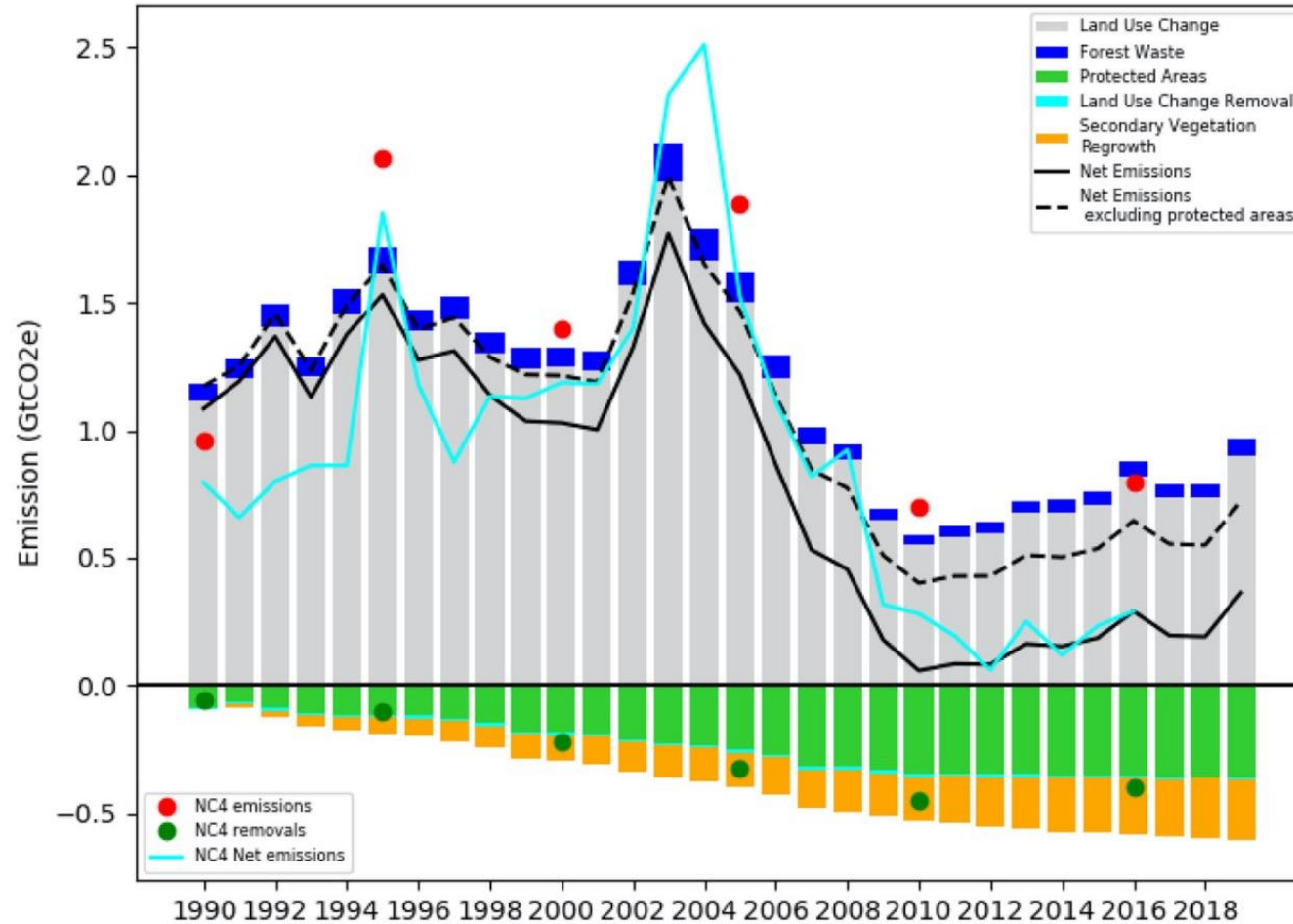


CARBON CARBONO

Emissions



Removal



Wiltshire et al.
(2022)



The potential of secondary forests



Disturbances
reduce regrowth
rates by 8-55%

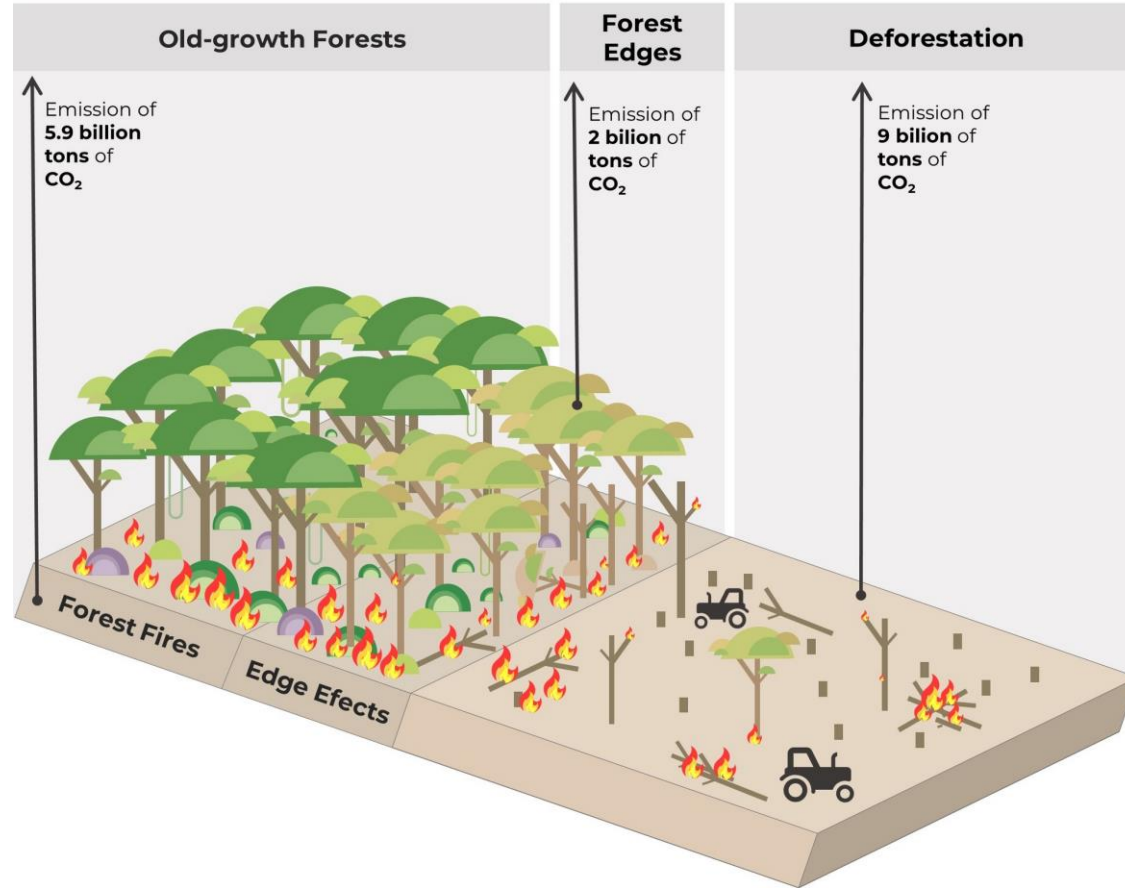
Maintaining
secondary forests:
+ absorbs carbon
+ contributes to
Brazil's emissions
targets



Heinrich et al. (2021)

CARBON CARBONO

CO₂ emissions due to deforestation and forest degradation between 2001 and 2015 in the Brazilian Amazon



“It is vital that forest degradation is considered in upcoming discussions.”

- Silva Junior et al. (2021)

MODELAGEM

PROJEÇÕES CLIMÁTICAS E PREVISÃO DE INUNDAÇÕES

MODELLING

CLIMATE PROJECTIONS AND FLOOD FORECASTING

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Lincoln Alves

lincoln.alves@inpe.br



Climate Science for Service Partnership (CSSP) Brazil
Parceria Ciência para Serviços Climáticos (CSSP) Brasil



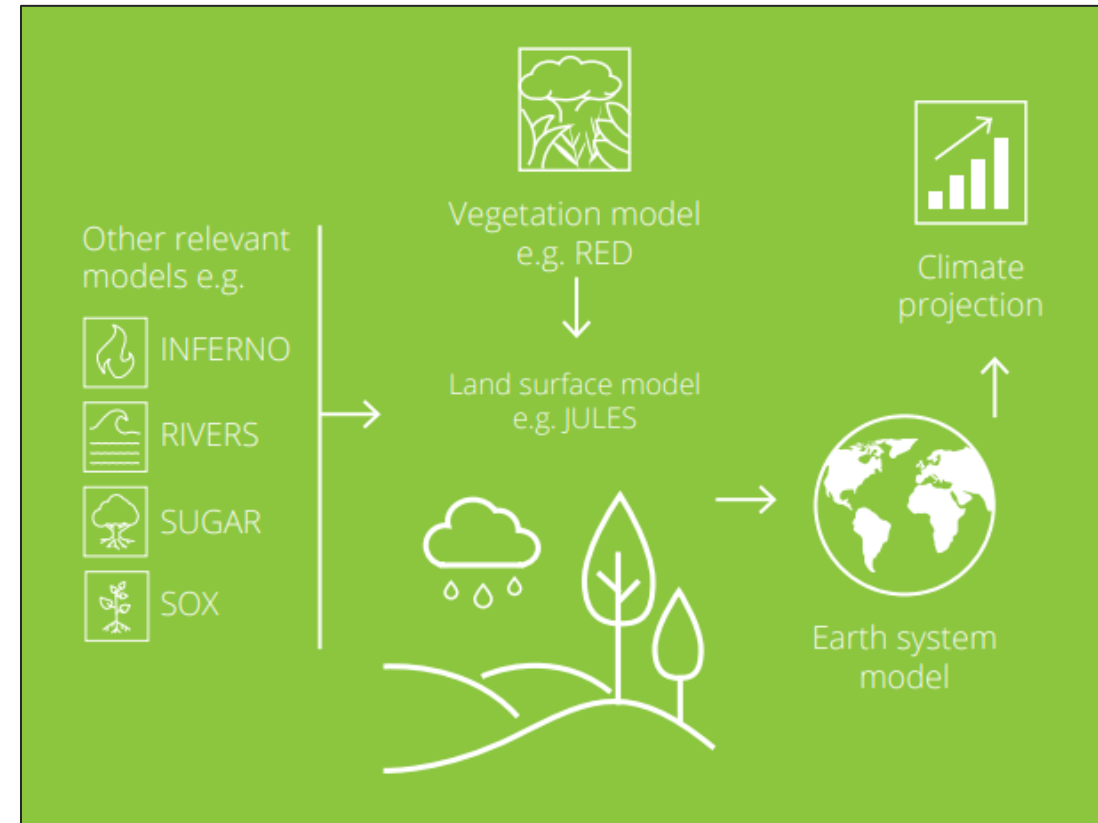


What are climate projections?



The Brazil Climate Portal: an easy-to-use data visualisation tool

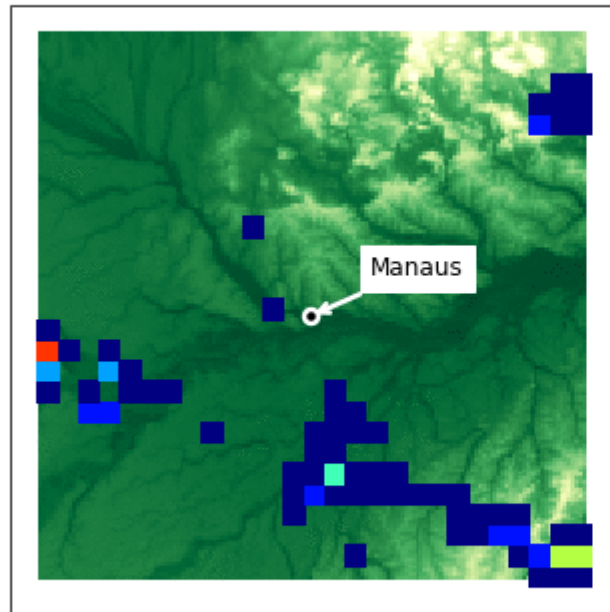
<http://pclima.inpe.br/>



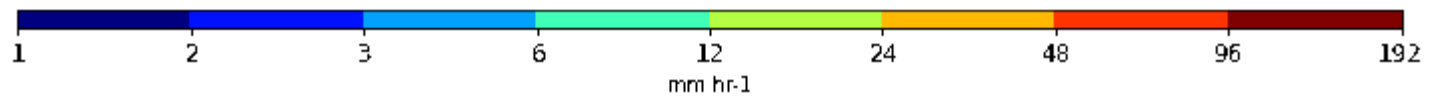
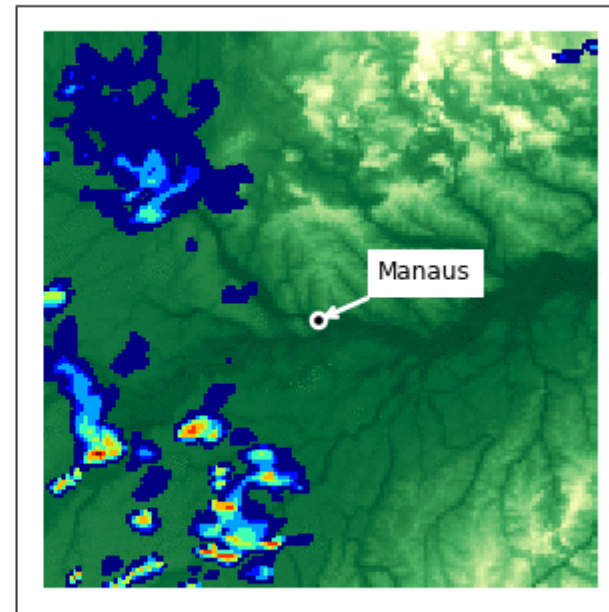
MODELLING *MODELAGEM*

Hourly rainfall in RCM (left) and CPM (right)

Regional Model (25km)
2002-03-16 00:30:00



Convective Permmiting Model (4.4km)
2002-03-16 00:30:00



ATRIBUIÇÃO

OS IMPACTOS QUE O AQUECIMENTO GLOBAL JÁ CAUSOU

ATTRIBUTION

THE IMPACTS GLOBAL WARMING HAS ALREADY CAUSED

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Sarah Sparrow

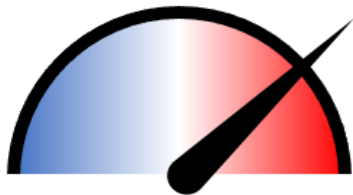
sarah.sparrow@oerc.ox.ac.uk



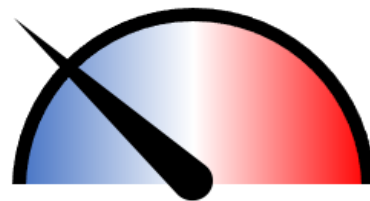
Ricardo Dalagnol

ricds@hotmail.com

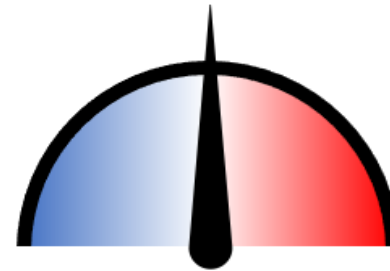
What is the effect of climate change on extreme weather?



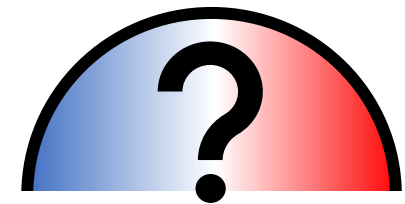
More likely.



Less likely



No change.



We can't tell.



ATTRIBUTION *ATRIBUIÇÃO*



Flood of the Piracicaba River in Prainha, a slum of Coronel Fabriciano, Minas Gerais, Brazil.



Climate Science for Service Partnership (CSSP) Brazil



AGRICULTURA

MONITORAMENTO DE EVENTOS EXTREMOS E IMPACTOS CLIMÁTICOS



AGRICULTURE

MONITORING DROUGHT AND CLIMATE CHANGE IMPACTS

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UNIVERSITY OF LEEDS

Marcelo Galdos

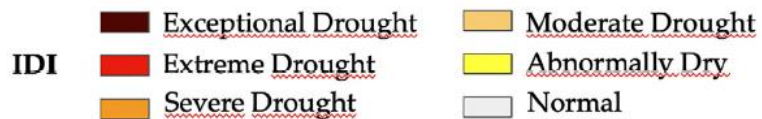
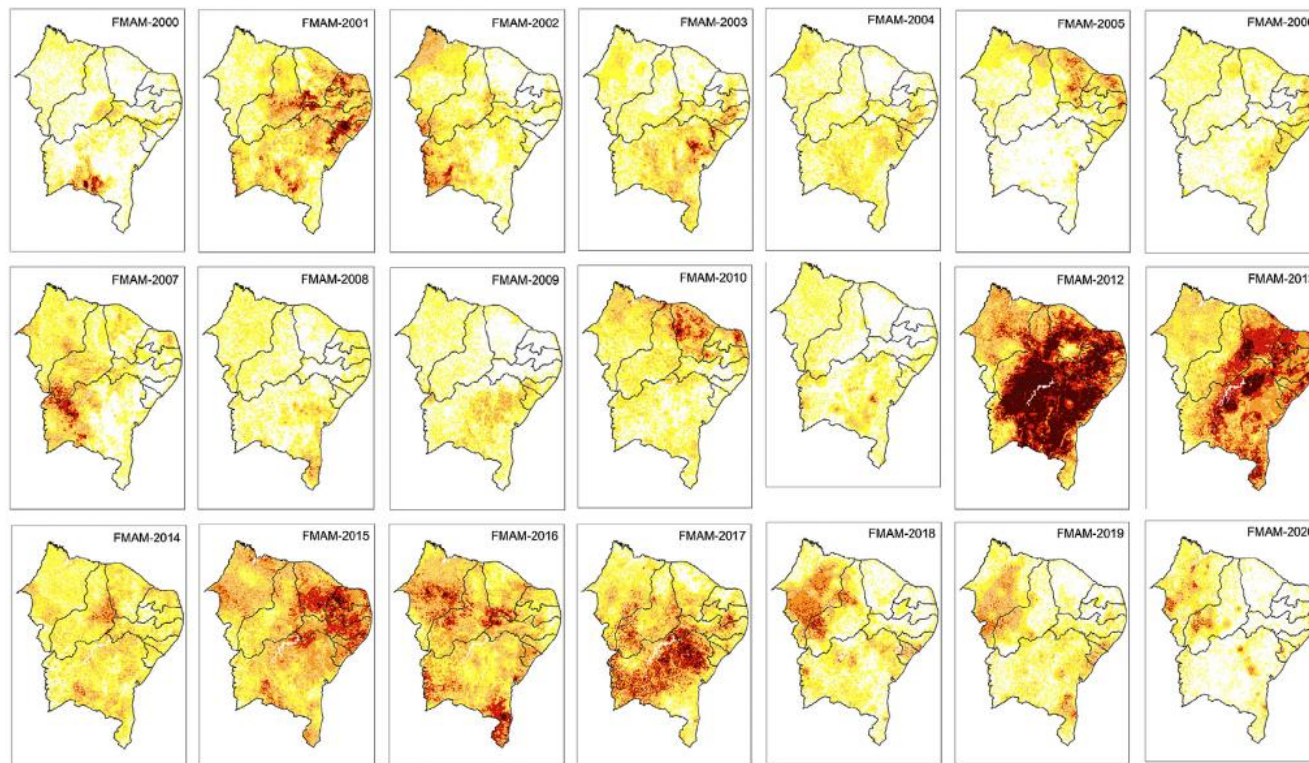
m.galdos@leeds.ac.uk



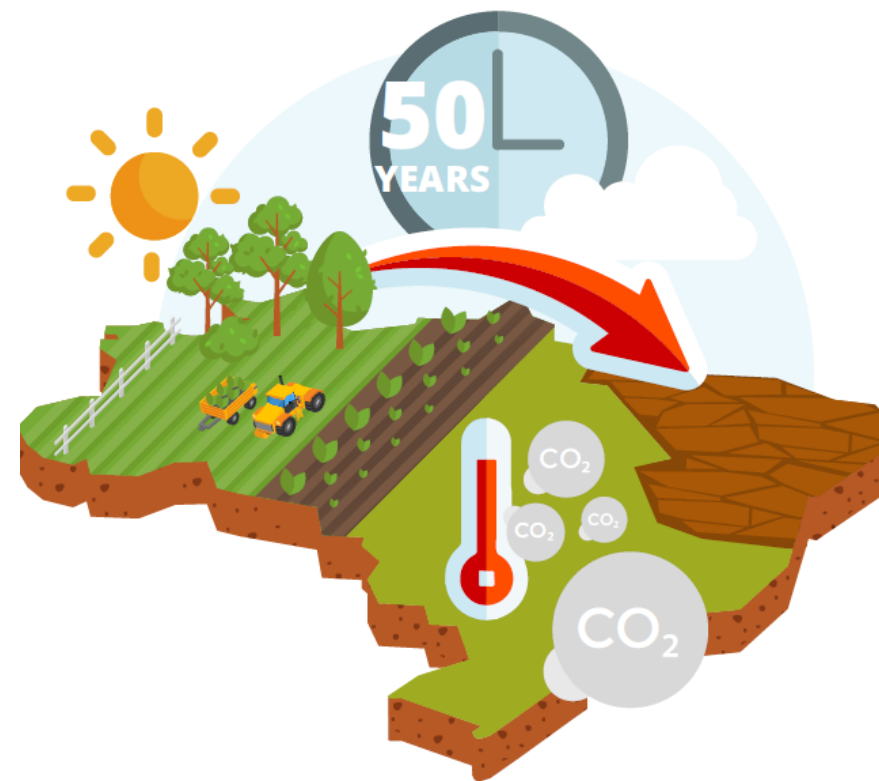
Marcelo Zeri

marcelo.zeri@cemaden.gov.br

AGRICULTURE AGRICULTURA

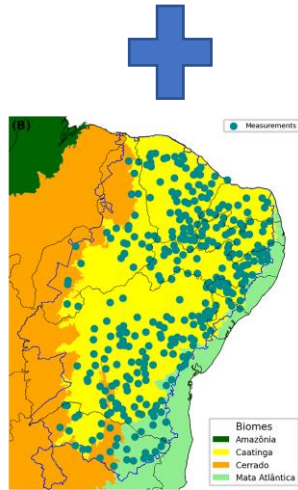
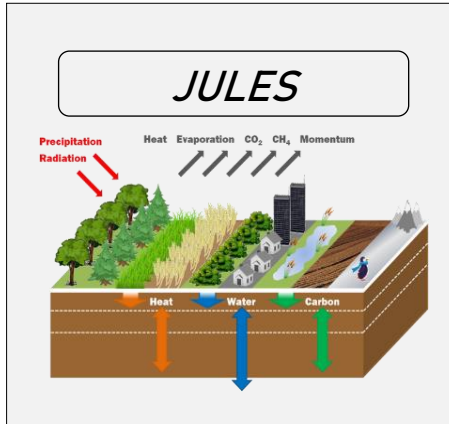


Marengo et al. (2021)

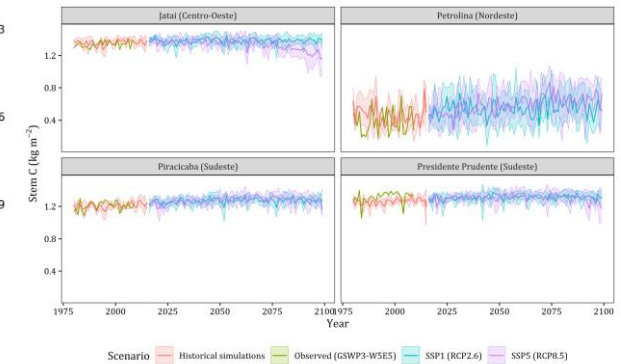
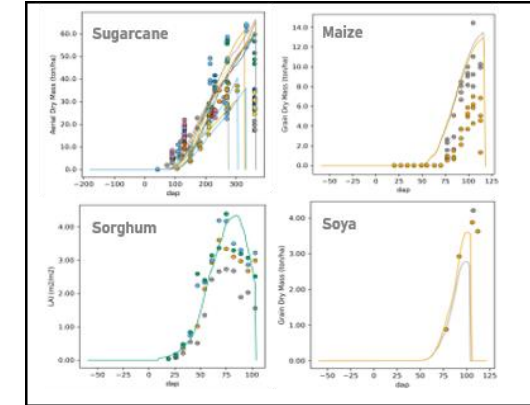
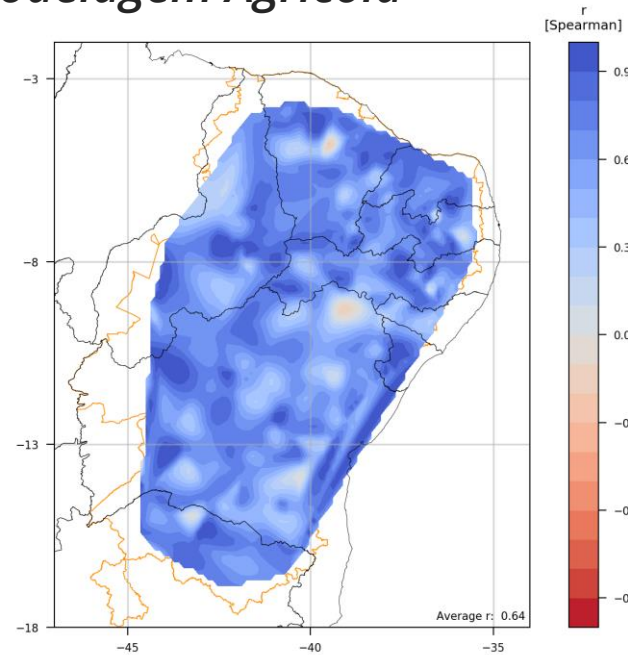




AGRICULTURE AGRICULTURA



Agricultural Modelling Modelagem Agrícola



Prudente Junior et al. (2022) & Zeri et al. (2021)

Adaptation strategies for drought *Estratégias de Adaptação*



Practices to preserve soil moisture

Práticas de conservação da umidade do solo



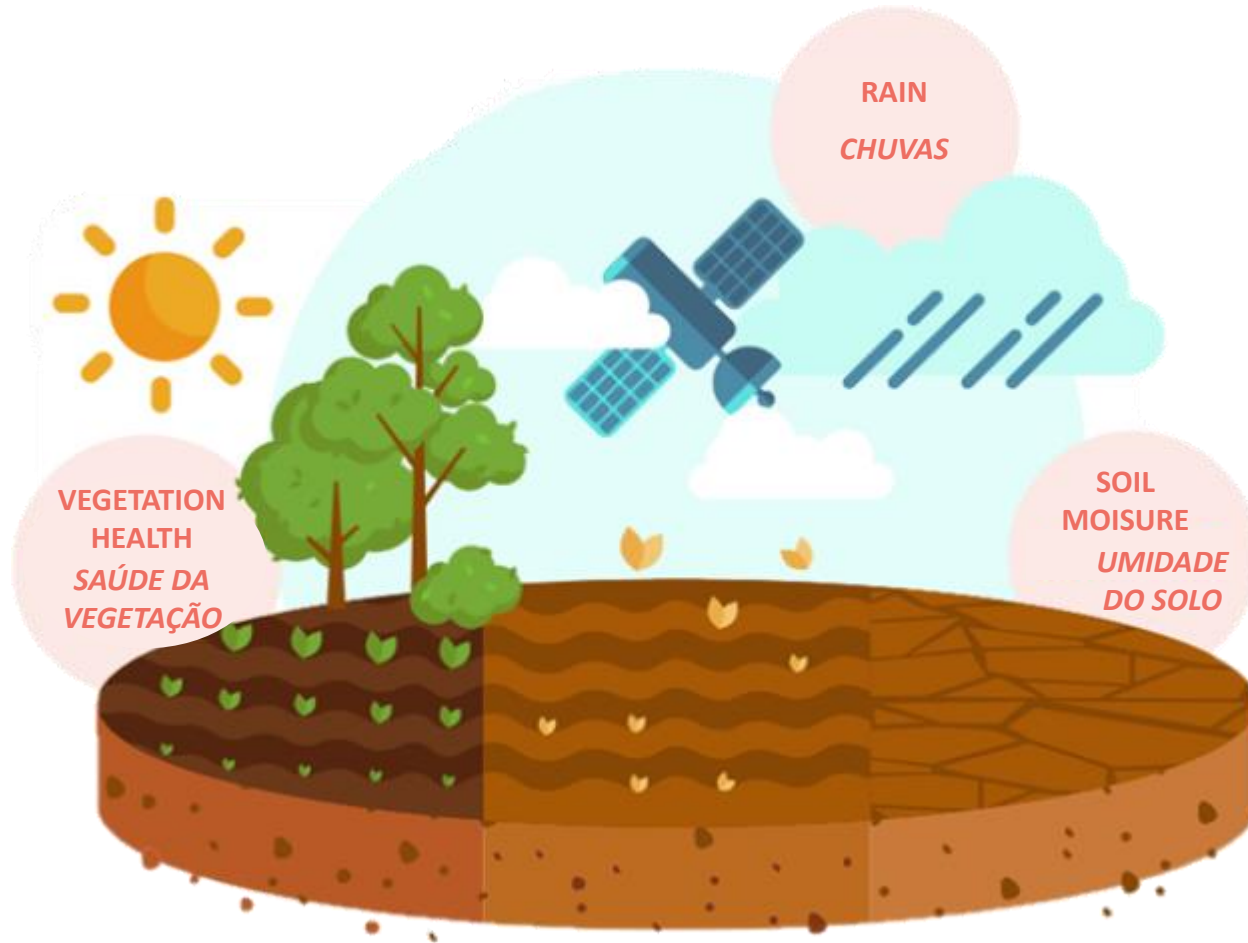
Uso de culturas mais tolerantes à seca

Use of crops that are more tolerant to drought



Diversifying crops and adjusting the crop calendar

Diversificação de culturas e ajustes no calendário de operações agrícolas



The AgroClimatic Monitor App

O Monitor AgroClimático

AGRICULTURE AGRICULTURA



AGROCLIMATIC MONITOR

EM FORMAÇÃO
[Sobre nós](#)
[Usando a ferramenta](#)
DATA
[Navegador de Dados](#)
[Mapas de Índice](#)
[Município](#)
[Isenção de responsabilidade](#)
ALTERAR O IDIOMA
[Inglês](#) | [Português](#)

Bem vindo!



Monitor Agroclimático

"Uma ferramenta de monitoramento de secas para a agricultura brasileira"

O Brasil é um dos maiores produtores de commodities agrícolas do mundo. Todos os anos, os agricultores brasileiros são atingidos por secas ou eventos climáticos extremos, levando a perdas econômicas e de recursos. Espera-se que esses eventos sejam mais recorrentes no futuro e a compreensão dos riscos e possíveis adaptações são fundamentais para alcançar a segurança alimentar. Monitorar as condições de seca é o primeiro passo para entender seus impactos e estratégias de mitigação no setor agrícola. Essa é uma tarefa desafiadora em países continentais como o Brasil, onde uma grande variedade de ecossistemas e culturas é encontrada em todo o país.

Esta ferramenta tem como objetivo auxiliar na tomada de decisões em nível municipal (por exemplo, Defesa Civil) e produtores que podem monitorar as condições de seca mensal para suas localidades por meio de índices de seca, derivados de dados de sensoriamento remoto e rede de estações meteorológicas. Uma equipe de cientistas e programadores da University of Leeds e Cemaden regularmente atualiza e mantém esta ferramenta da web, que foi financiada pelo programa Met Office CSSP-Brazil. Para obter mais informações, consulte nossa página "Sobre nós".

Navegador de dados

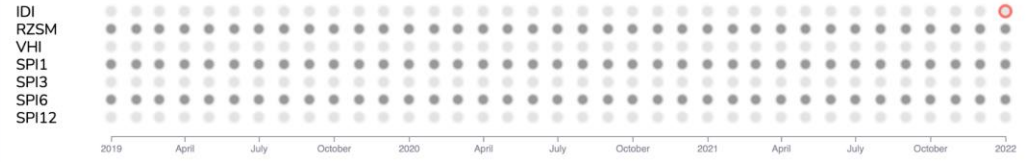
Instruções

Instruções:

O mapa a seguir mostra todos os conjuntos de dados disponíveis para cada índice em todo o Brasil. Para ver os mapas para um determinado índice e mês, clique no círculo correspondente.

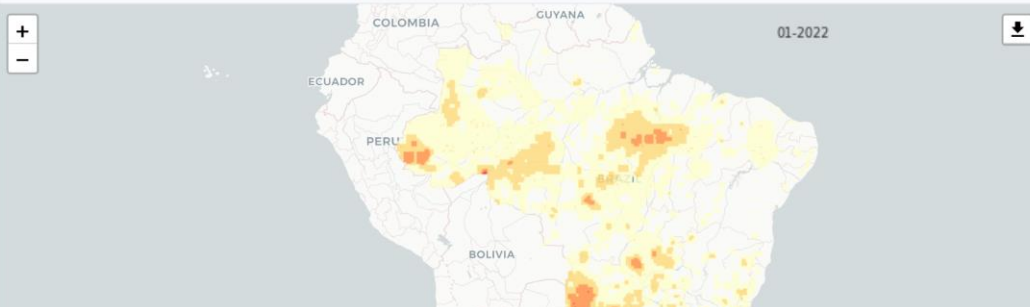
Clique duas vezes nos limites do município para abrir o painel do município selecionado. Uma série temporal também pode ser baixada para qualquer índice e município clicando sobre o município.

2022-01 IIS3



Índice	2019	April	July	October	2020	April	July	October	2021	April	July	October	2022
IDI													
RZSM													
VHI													
SPI1													
SPI3													
SPI6													
SPI12													

Mapa



Access the platform here

Acesse a plataforma aqui

<https://agclimatebr.leeds.ac.uk/br/>

INCÊNDIOS FLORESTAIS

INCÊNDIOS PASSADOS, PRESENTES E FUTUROS NO BRASIL



WILDFIRES

PAST, PRESENT AND FUTURE WILDFIRES IN BRAZIL

ponto de vista
VIEWpoint



Met Office

Chantelle Burton

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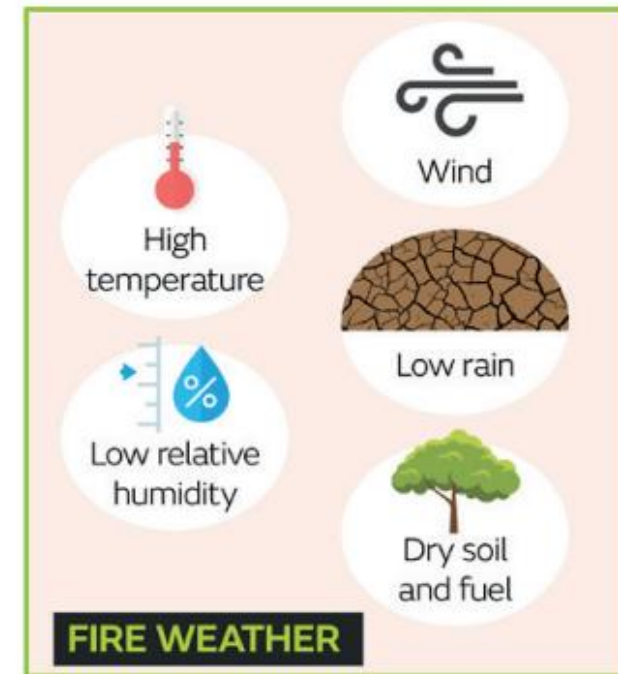
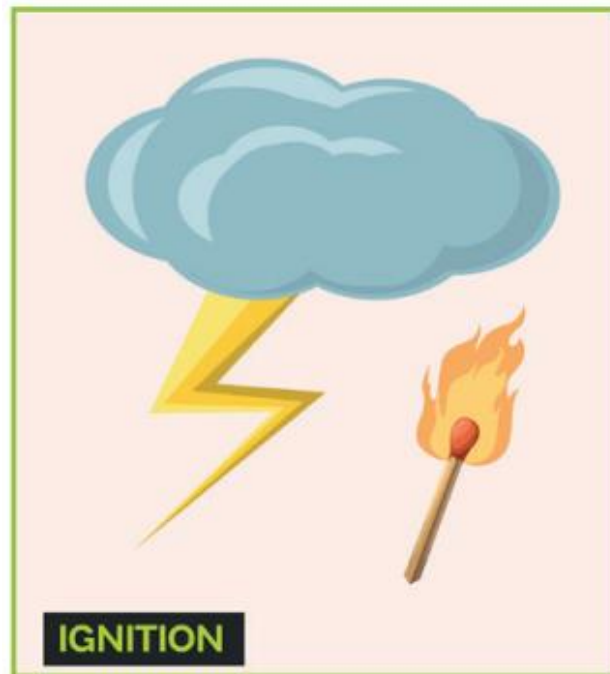
Cemaden
Centro Nacional de Monitoramento
e Alertas de Desastres Naturais



Liana Anderson

liana.anderson@cemaden.gov.br

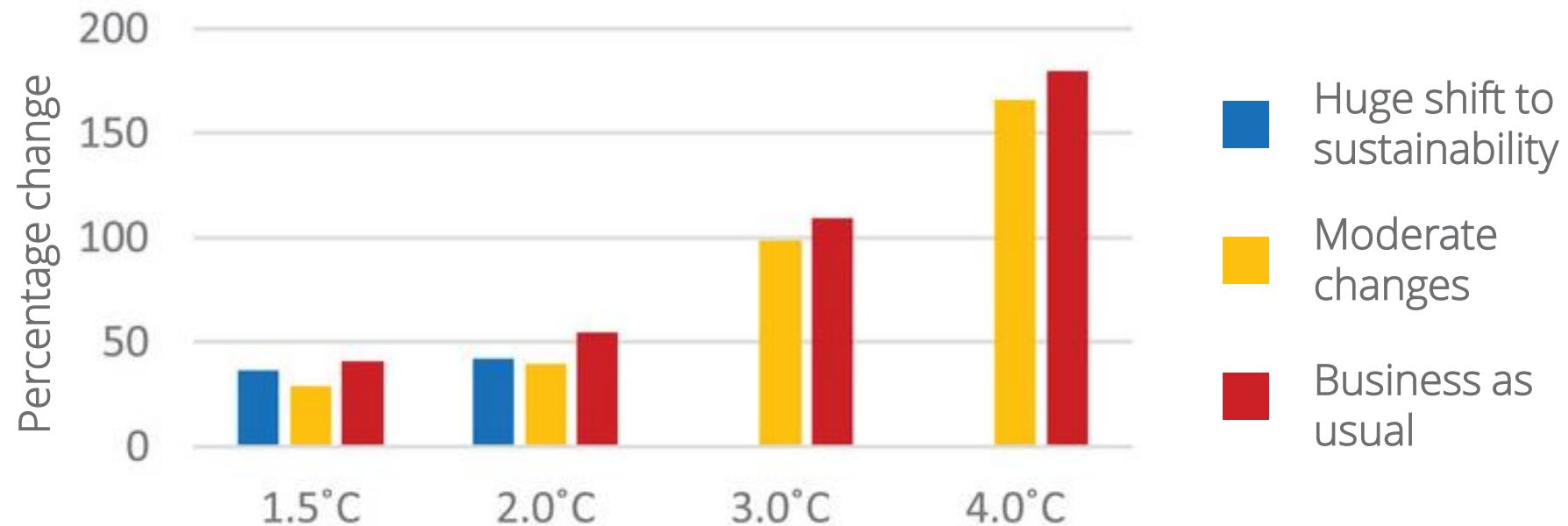
What causes wildfires?



Taylor et al. (submitted)

Wildfire occurrence in South America will change under global warming

Projected changes to yearly burned area under various future scenarios



Burton et al. (2021)

New predictions of wildfire risk in South America's protected areas



<http://terrama.cemaden.gov.br/griif/mapfire/monitor>

Anderson et al. (2021)

WILDFIRES *INCÊNDIOS FLORESTAIS*

These predictions are part of a new action plan to protect the Pantanal wetlands from wildfires



Guerra et al. (2021)

FUTURO

IMPACTOS PREVISTOS DO AQUECIMENTO GLOBAL NO BRASIL

FUTURE

PREDICTED IMPACTS OF GLOBAL WARMING ON BRAZIL

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FUTURE

PREDICTED IMPACTS OF GLOBAL WARMING ON BRAZIL

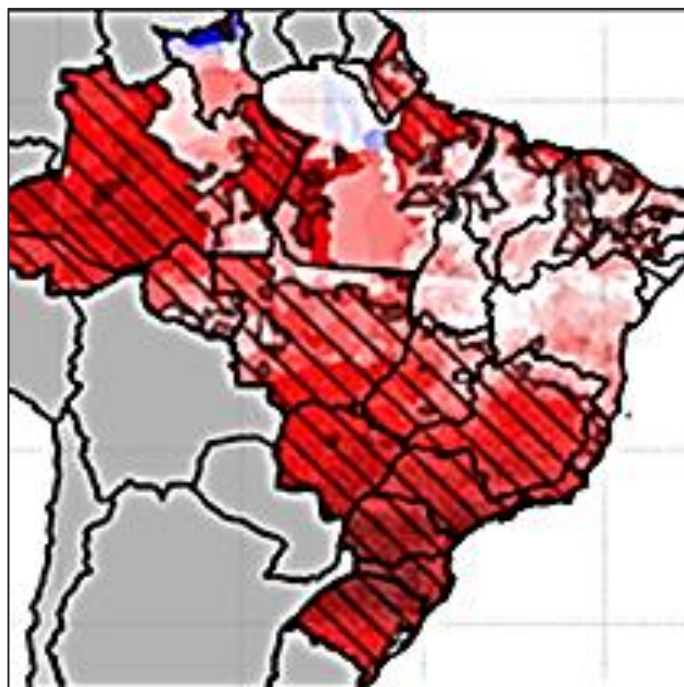


Research is helping policy-makers deal with extreme events across Brazil.

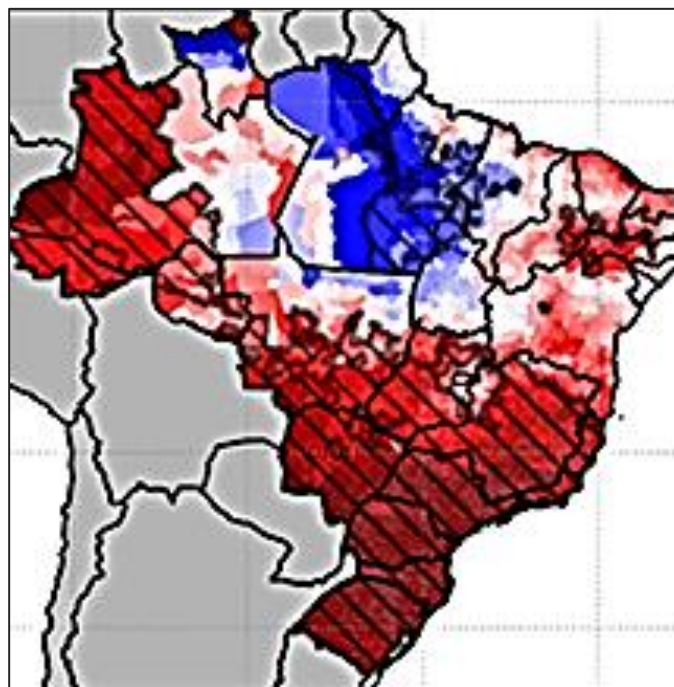
FUTURE

PREDICTED IMPACTS OF GLOBAL WARMING ON BRAZIL

- This maps show relative changes in the potential impacts of landslides and flashfloods across Brazil, should global temperatures increase by 4.0°C. Higher risk in Southeastern and Southern Brazil
 - This is already the situation in the present



Landslides



Flash floods



Potential impacts will be worse

Potential impacts will lessen

FUTURE

PREDICTED IMPACTS OF GLOBAL WARMING ON BRAZIL



February 15 2022: The heaviest rainfall in Petrópolis since at least 1932



“Rain is the
triggering agent.”

- Geologist Marcelo Fischer Gramani

On that afternoon of February 15 2022, the rain gauge in the São Sebastião neighborhood, located just over 2 km from Morro da Oficina, recorded 259.8 mm of rain in just six hours. The amount of water that fell exceeds by 28% the historical average expected for the entire month of February – 202.2 mm – and is the heaviest rainfall in Petrópolis since at least 1932 - INMET

<https://www.viewpoint-brazil.org>

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29/03/2022



Climate Science for Service Partnership (CSSP) Brazil
Parceria Ciência para Serviços Climáticos (CSSP) Brasil

