



**8<sup>TH</sup>**  
**INTERNATIONAL**  
**WILDLAND FIRE**  
**CONFERENCE**

**GOVERNANCE**  
**PRINCIPLES:**  
Towards an  
International  
Framework

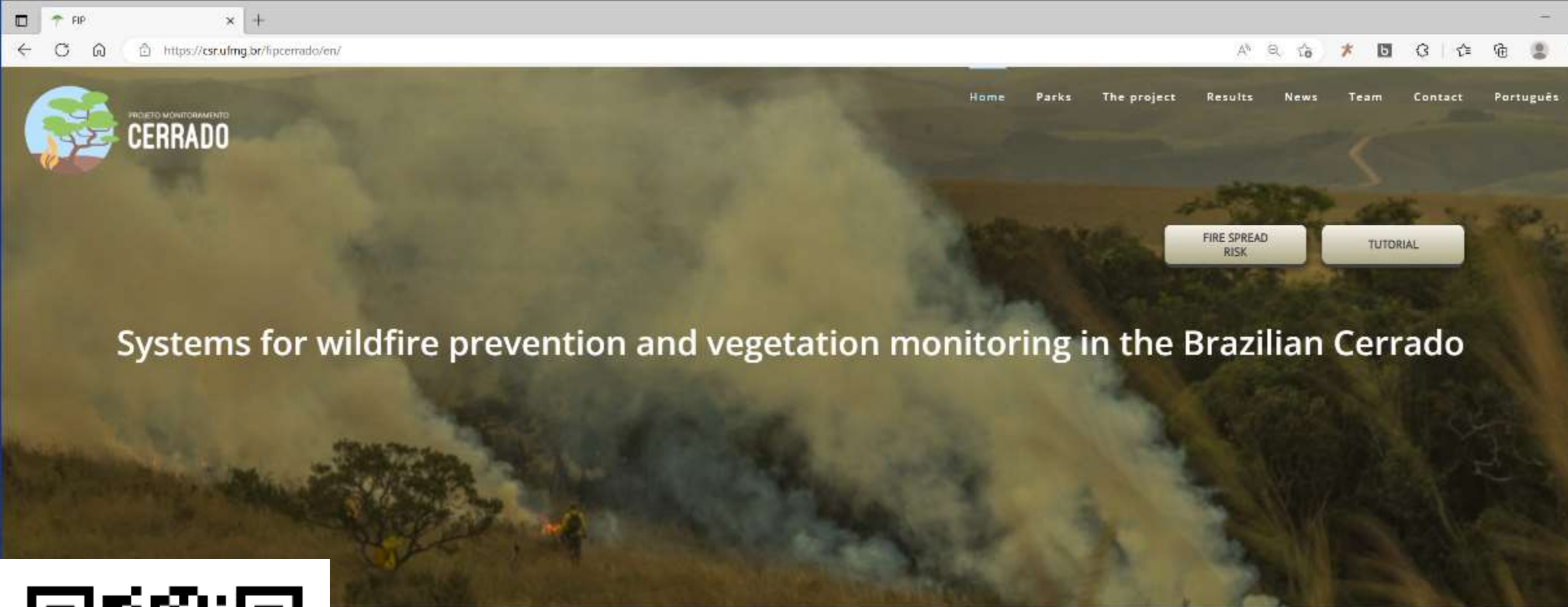
# The FISC-Cerrado near-real time web-system for predicting fire spread

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**UNIVERSIDADE FEDERAL DE**  
**MINAS GERAIS**





### Simulations

Check the daily simulations for fire spread risk in the Brazilian Cerrado

OPEN THE MAP



### Report

Read the report on the progress and activities of the project

OPEN THE REPORT



### Schedule

Check the activities' schedule and keep up to date on the progress of the project

OPEN THE SCHEDULE

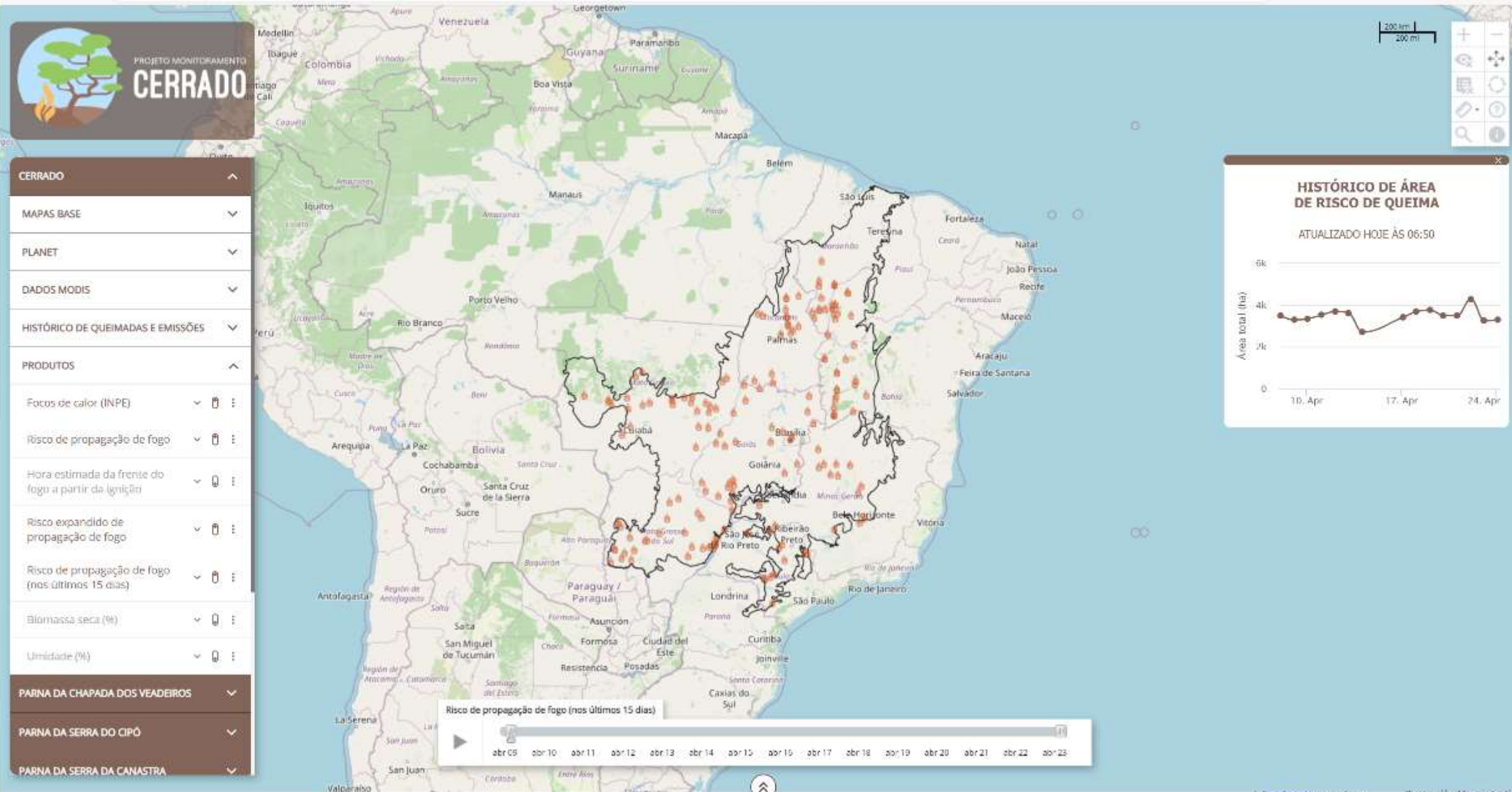


OPEN

## A near real-time web-system for predicting fire spread across the Cerrado biome

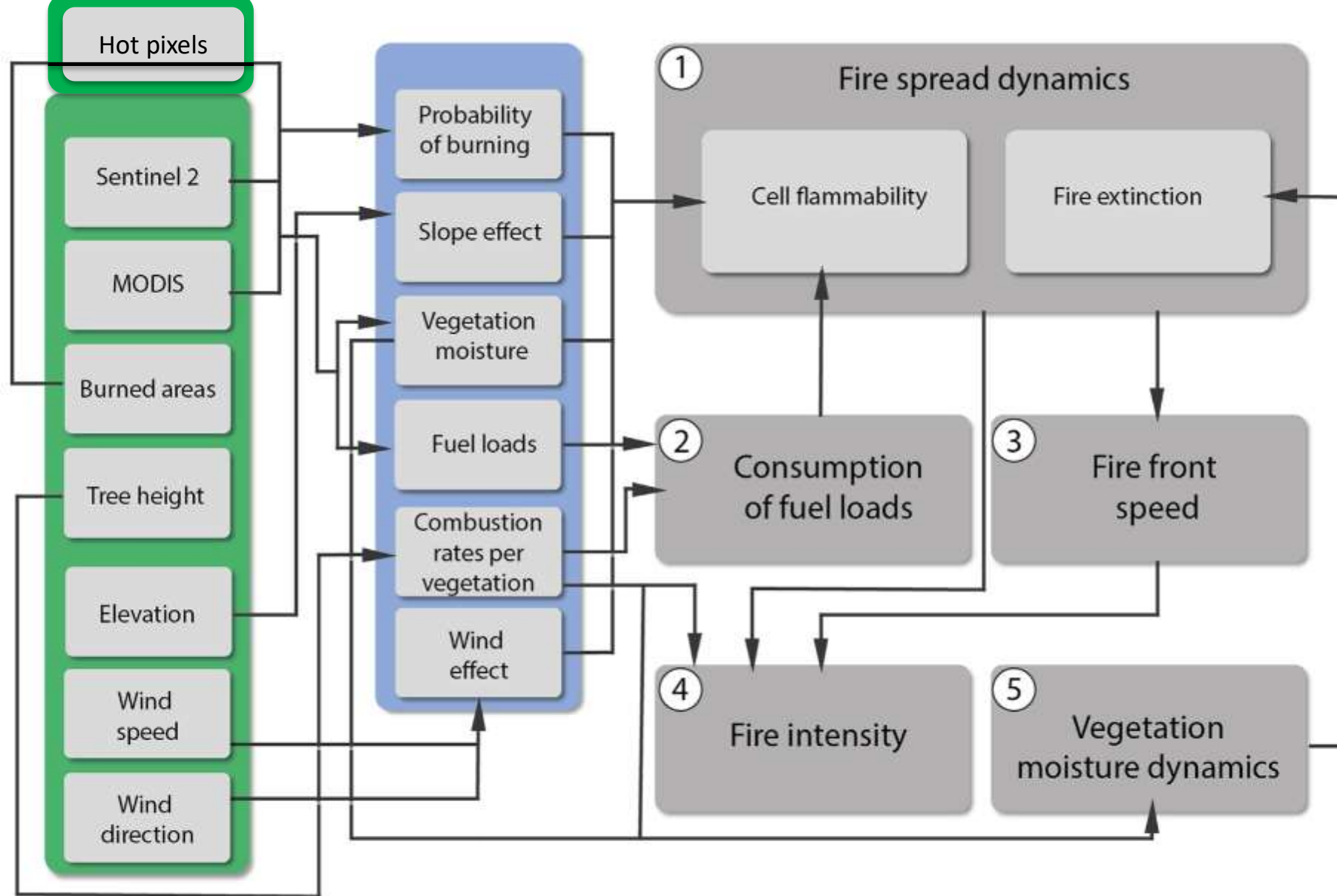
Ubirajara Oliveira<sup>1✉</sup>, Britaldo Soares-Filho<sup>1</sup>, Hermann Rodrigues<sup>1</sup>, Danilo Figueira<sup>1</sup>, Leticia Gomes<sup>2</sup>, William Leles<sup>1</sup>, Christian Berlinck<sup>3</sup>, Fabiano Morelli<sup>4</sup>, Mercedes Bustamante<sup>2</sup>, Jean Ometto<sup>4</sup> & Heloísa Miranda<sup>2</sup>

Wildfires are aggravating due to climate change. Public policies need territorial intelligence to prevent and promptly fight fires, especially in vast regions like Brazil. To this end, we have developed a fire-spread prediction system for the Brazilian Cerrado, the biome most affected by wildfires in South America. The system automatically uploads hot pixels and satellite data to calculate maps of fuels loads, vegetation moisture, and probability of burning for simulating fire spread thrice a day for the entire Cerrado at 25 ha and for nine conservation units at 0.04 ha spatial resolution. In both versions, the model attains 65–89% of spatial match. Model results together with ancillary data, e.g., historical burned areas and annual CO<sub>2</sub> emissions from fires, are available on an interactive web-platform that serves as a tool for fire prevention and fight, particularly in the selected conservation units where the platform is being used for daily operations.

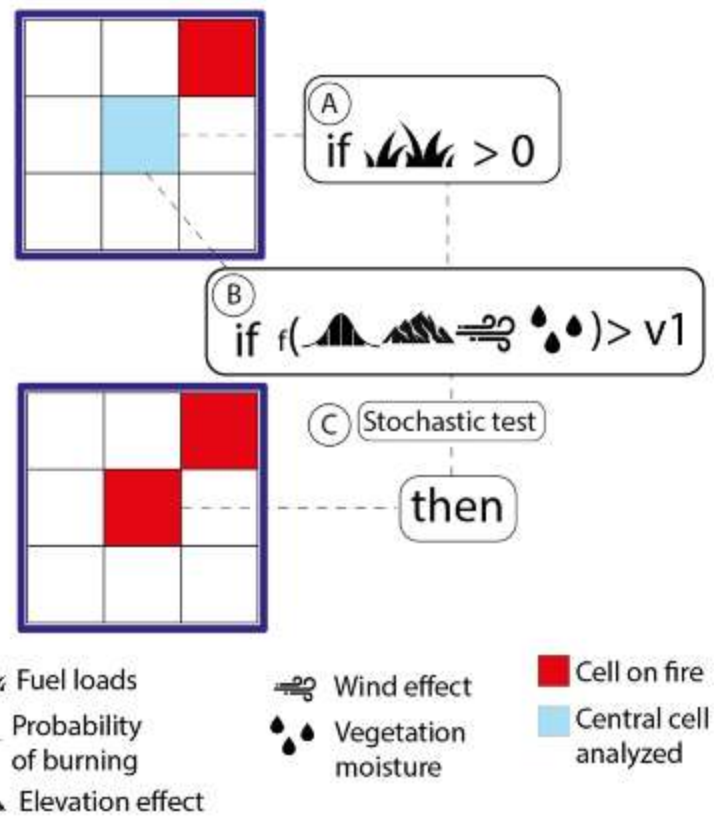


- CERRADO
- MAPAS BASE
- PLANET
- DADOS MODIS
- HISTÓRICO DE QUEIMADAS E EMISSÕES
- PRODUTOS
  - Focos de calor (INPE)
  - Risco de propagação de fogo
  - Hora estimada da frente do fogo a partir da ignição
  - Risco expandido de propagação de fogo
  - Risco de propagação de fogo (nos últimos 15 dias)
  - Biomassa seca (%)
  - Umidade (%)
- PARNA DA CHAPADA DOS VEADUIROS
- PARNA DA SERRA DO CIPÓ
- PARNA DA SERRA DA CANASTRA





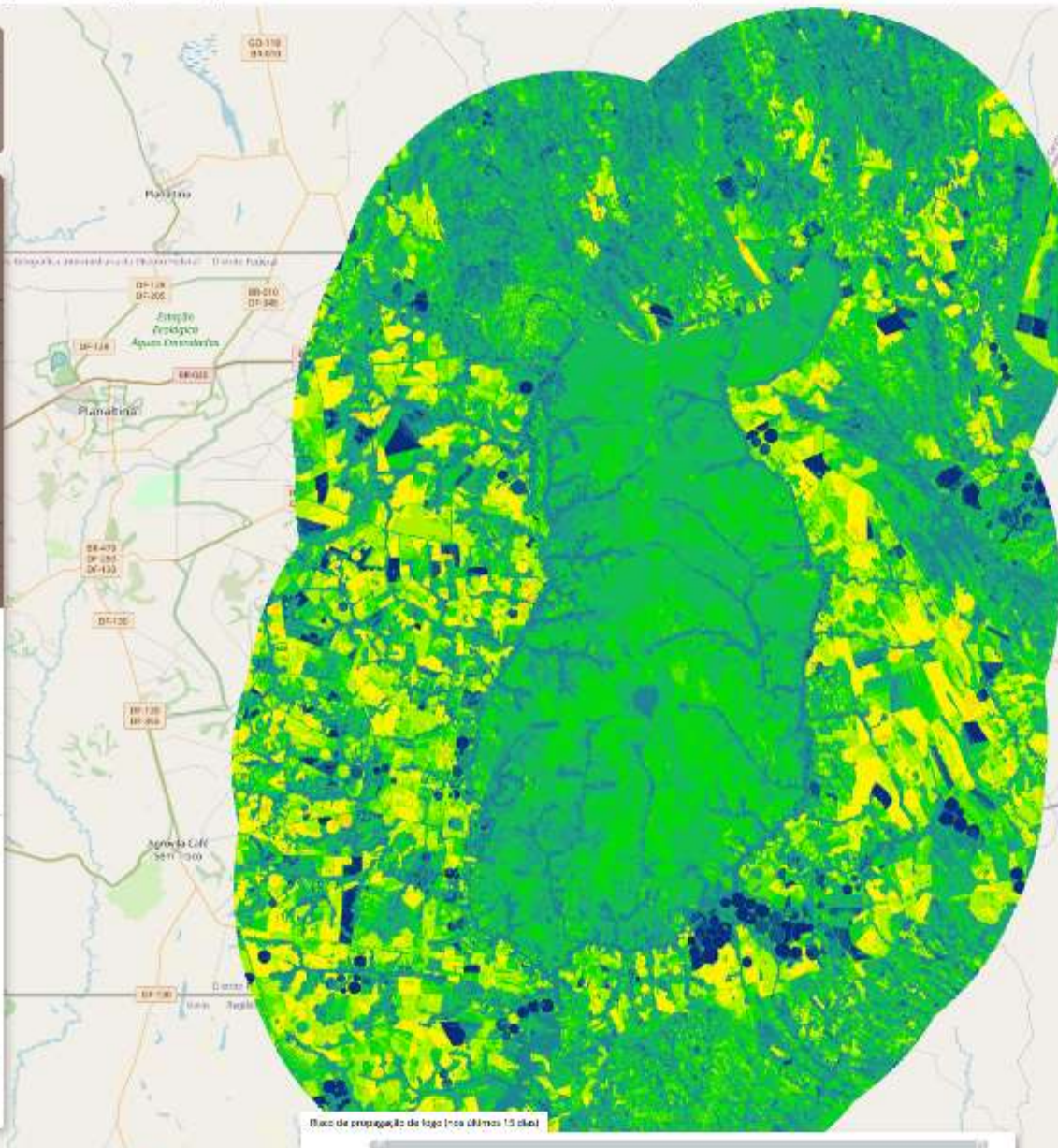
**Figure 3.** FISC-Cerrado main components. Input data (green), preprocessing of input data (blue) for feeding the cellular automata modules (gray).

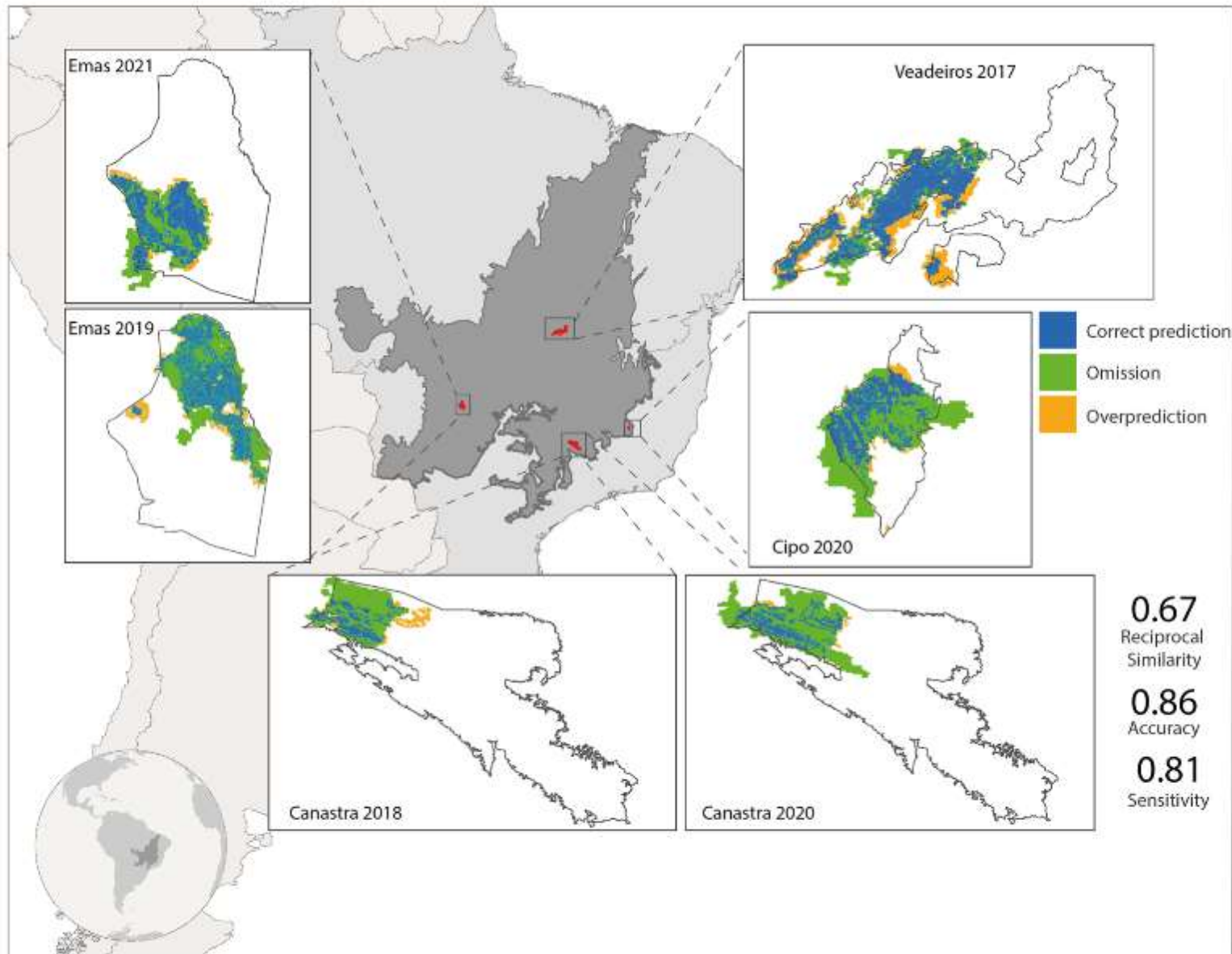


**Figure 4.** The flammability module. (A) test for the presence of fuel loads; (B) flammability test combining probability of burning, topographic and wind effects and vegetation moisture; (C) stochastic test to produce radial fire fronts.



- CERRADO
- PARNA DA CHAPADA DOS VEADINHOS
- PARNA DA SERRA DO CIPÓ
- PARNA DA SERRA DA CAMASTRA
- PARNA DAS EMAS
- PARNA DA CHAPADA DOS GUMARÃES
- PARNA DO JALAPÃO E SEEC SERRA GERAL DO TOCANTINS
- PE DA SERRA DO ROLA-MOÇA
- PARNA DAS SEMPRE VIVAS
- AM DE FORMOSA
- MAVO BALE
- PLANET
- DADOS SENTINEL
- HISTÓRICO DE QUEIMADAS E EMISSÕES
- PRODUTOS
- Risco de propagação de fogo (últimos 13 dias)
- Risco de propagação de fogo (últimos 15 dias)
- Biomassa seca (%)
- Umidade (%)





**Figure 8.** Validation of FISC-Cerrado. Simulated fire scars (20 m) laid over burned areas from MODIS<sup>64</sup>. Average validation values depicted on the right bottom. Map created in ArcGIS 10.1 (<http://www.esri.com>).





# II Capacitação Modelo online de espalhamento de fogo para o bioma Cerrado

Data: 02 de dezembro de 2020  
Horário: 14h  
Evento virtual e gratuito

**INSCREVA-SE:**  
<https://csr.ufmg.br/fipcerrado/?p=666>

**NOVO LINK DE TRANSMISSÃO:**  
<https://youtu.be/Ck10lpv7Hzo>



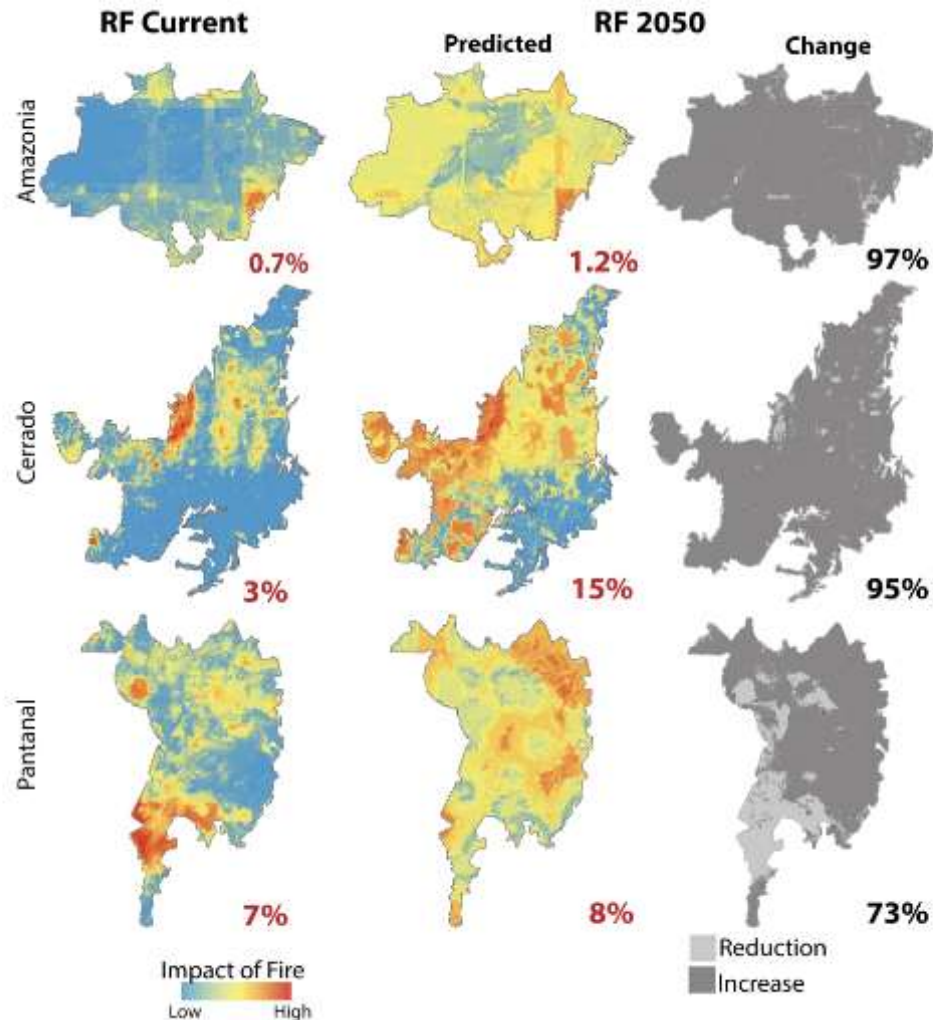
Conheça a ferramenta,  
aprenda a utilizá-la e fique  
por dentro das atualizações



Ubirajara Oliveira



# Expansion to other Brazilian biomes



## Modeling fuel loads dynamics and fire spread probability in the Brazilian Cerrado

Ubirajara Oliveira<sup>a, 4</sup>, Britaldo Soares-Filho<sup>a</sup>, William Leles de Souza Costa<sup>a</sup>, Leticia Gomes<sup>b</sup>, Mercedes Bustamante<sup>b</sup>, Heloisa Miranda<sup>b</sup>

## Determinants of Fire Impact in the Brazilian Biomes

Ubirajara Oliveira<sup>1\*</sup>, Britaldo Soares-Filho<sup>1</sup>, Mercedes Bustamante<sup>2</sup>, Leticia Gomes<sup>2</sup>, Jean P. Ometto<sup>3</sup> and Raoni Rajão<sup>1,4</sup>

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### ENVIRONMENTAL STUDIES

## The gathering firestorm in southern Amazonia

P. M. Brando<sup>1,2,3\*</sup>, B. Soares-Filho<sup>4</sup>, L. Rodrigues<sup>4</sup>, A. Assunção<sup>4</sup>, D. Morton<sup>5</sup>, D. Tuchsneider<sup>6</sup>, E. C. M. Fernandes<sup>6</sup>, M. N. Macedo<sup>2,3</sup>, U. Oliveira<sup>4</sup>, M. T. Coe<sup>2,3</sup>

# Muito Obrigado/ Thank you

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Publications of FIP Cerrado



Science in support of sound policies