ECAS-7 2025 Conference

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04–06 June 2025 | Online

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A SPATIOTEMPORAL ANALYSIS OF THE OCCURRENCE OF FIRES IN THE CAATINGA BIOME: A CLIMATOLOGICAL APPROACH USING MACHINE LEARNING

Katyelle Ferreira da Silva Bezerra[1,2]; Helber Barros Gomes[1,2]; Janaína Mayara Pinto do Nascimento[3,4]; Marisol Osman[5,6]; Maria Cristina Lemos da Silva[1,2]; Daniel Milano Costa de Lima[7];

[1]Federal University of Alagoas; [2]Institute of Atmospheric Sciences - ICAT; [3]Cooperative Institute for Research in Environmental Sciences, University of Colorado, Boulder, CO 80309, USA; [4]NOAA OAR Global Systems Laboratory (GSL); [5]Universidad de Buenos Aires, Facultad de Ciencias Exactas y Naturales, Departamento de Ciencias de la Atmósfera y los Océanos; [6]CONICET – Universidad de Buenos Aires, Centro de Investigaciones del Mar y la Atmósfera (CIMA); CNRS – IRD – CONICET – UBA, Instituto Franco-Argentino para el Estudio del Clima y sus Impactos (IRL 3351 IFAECI), Buenos Aires, Argentina; [7]Federal University of Campina Grande

INTRODUCTION & AIM

The Caatinga is a semi-arid forest biome characterized by a climate marked by severe droughts and recurring wildfires, resulting in biodiversity loss. In recent years, the Caatinga has been undergoing a growing process of degradation driven by the inadequate and intensive use of its natural resources. Various human activities, such as the excessive exploitation of native vegetation and the recurrent use of fire in agricultural practices, have contributed to the vulnerability of this ecosystem. These actions not only compromise the environmental integrity of the biome but also intensify its exposure to the effects of climate change, increasing the negative impacts on biodiversity and the ecosystem services of the region (Melo & Cirne, 2019).

METHOD

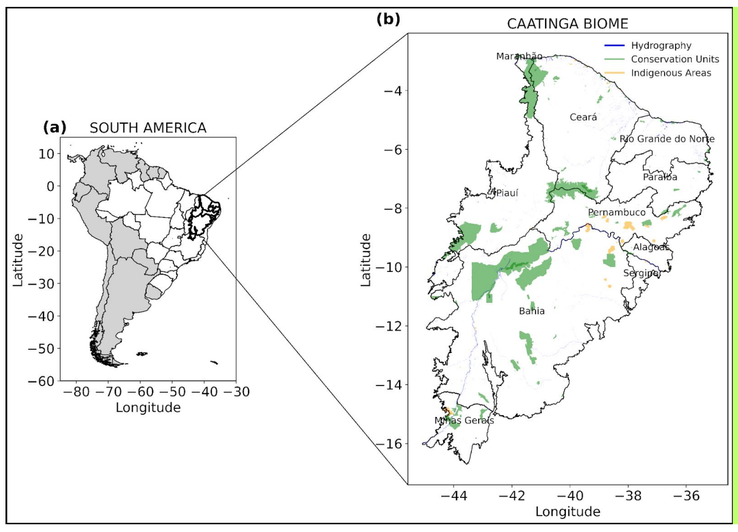


Figure 1. Study area: (a) South America with a highlight on the Caatinga Biome; (b) Caatinga Biome located in Northeastern Brazil.

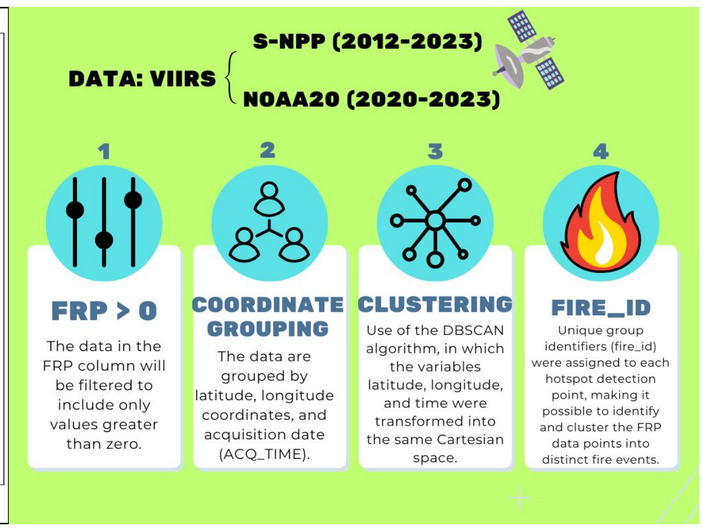


Figure 2. Methodological steps employed for the identification, clustering, and characterization of fires in the Caatinga Biome during the 2012–2023 period.

RESULTS & DISCUSSION

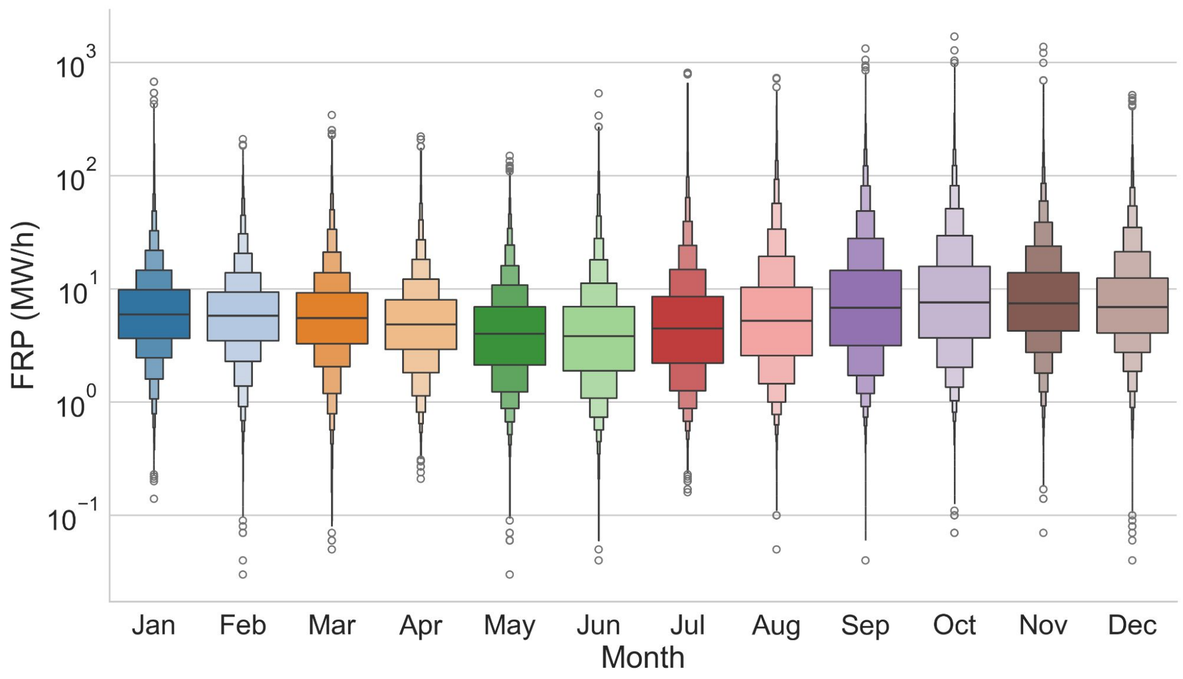


Figure 3. FRP Climatology in the Caatinga Biome during the 2012–2023 period.

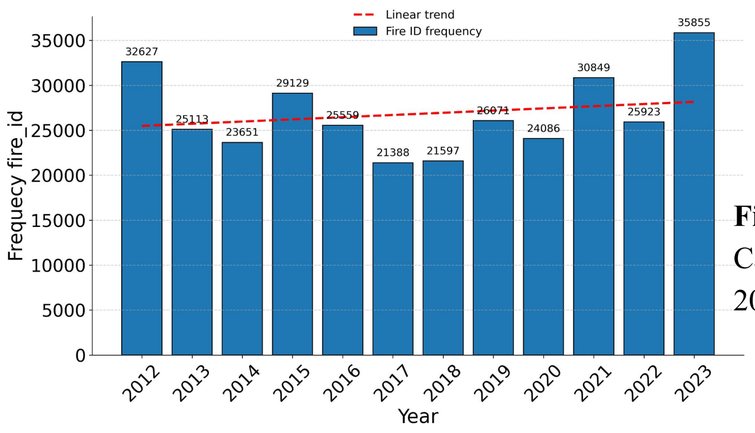


Figure 4. Frequency of fires in the Caatinga biome during the period from 2012 to 2023.

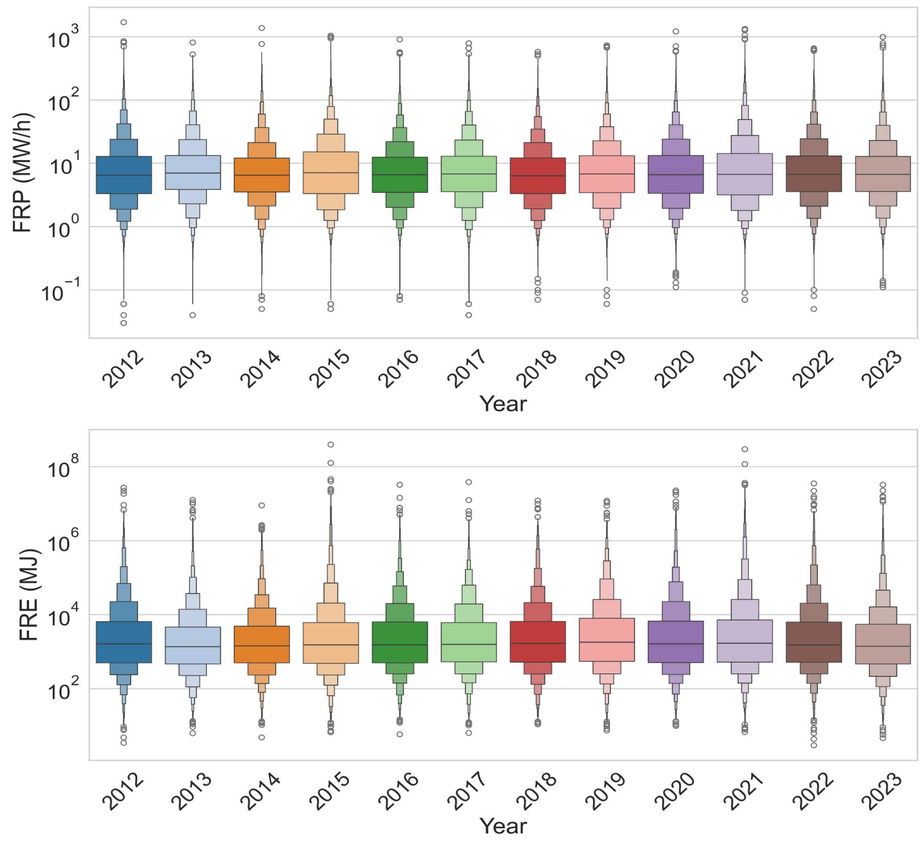


Figure 5. Annual distribution of FRP (MW/h) and FRE (MJ) in the Caatinga Biome during the period 2012–2023.

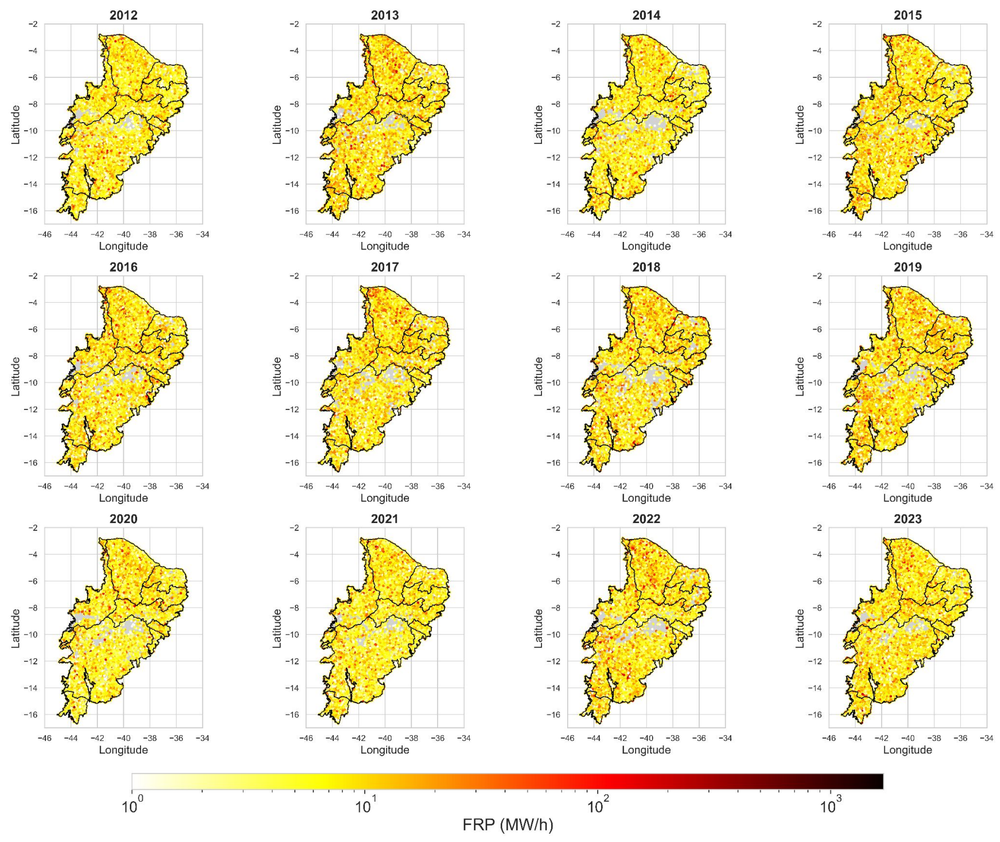
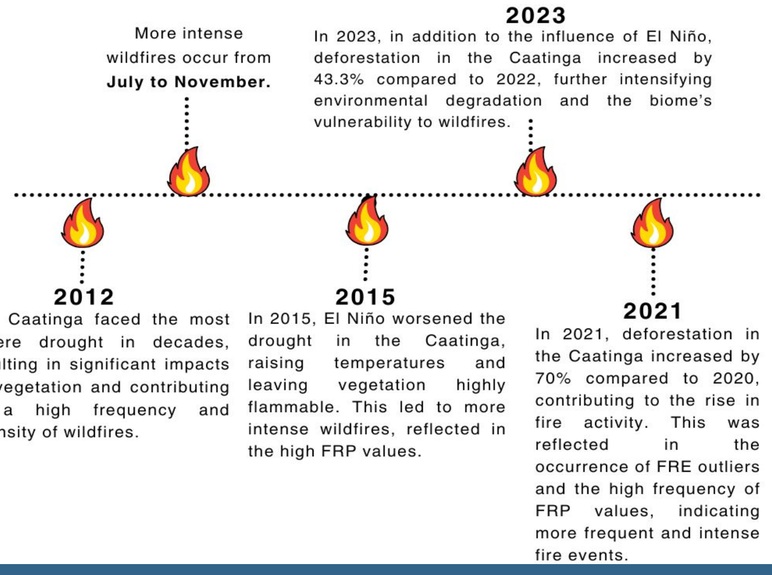


Figure 6. Annual spatial distribution of FRP (MW/h) in the Caatinga Biome during the period 2012–2023.

CONCLUSION



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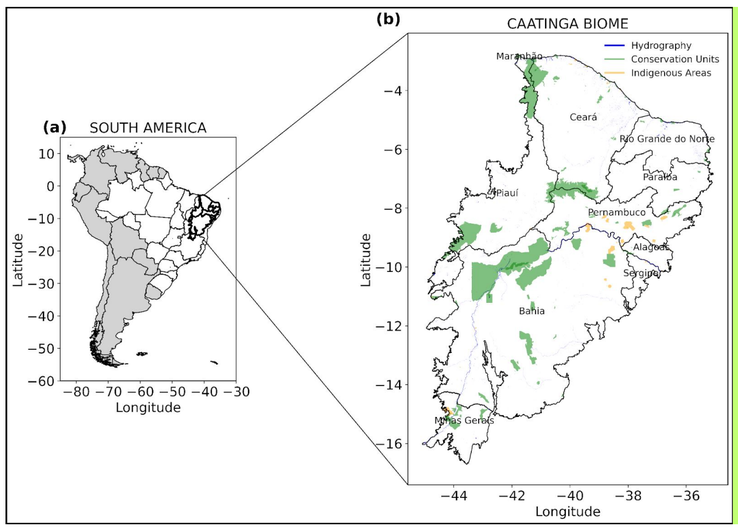

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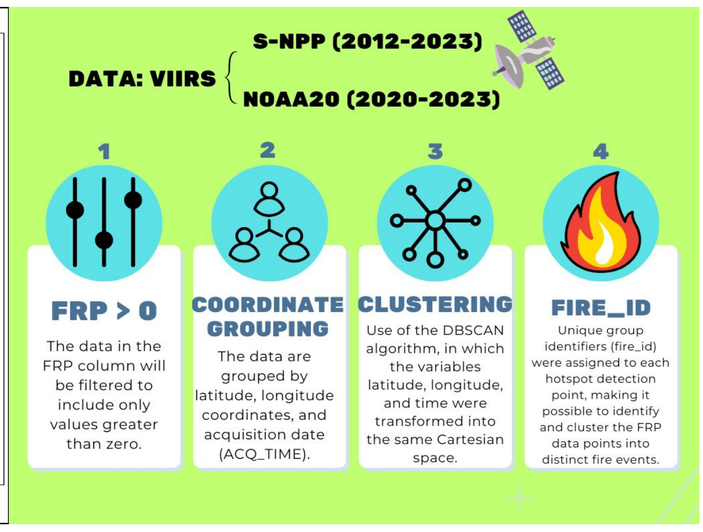

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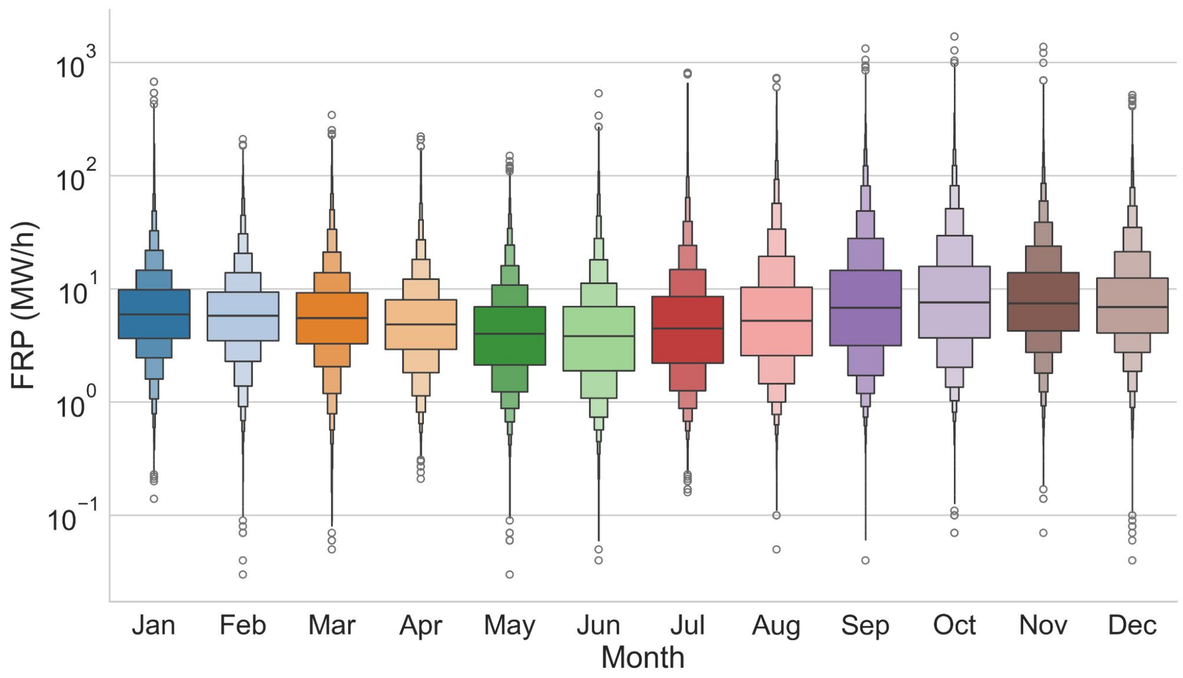

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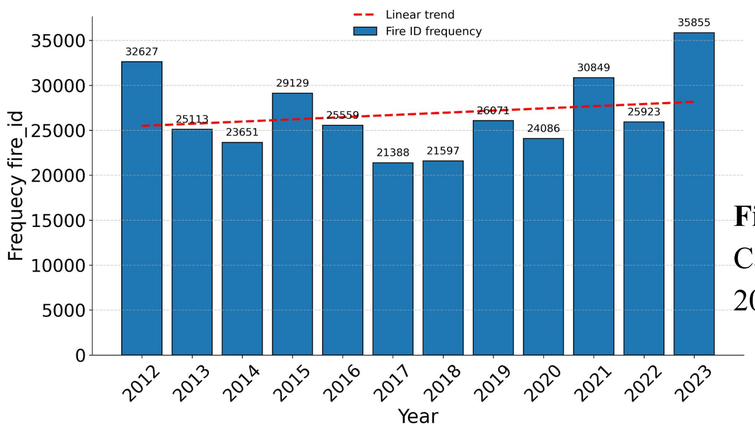

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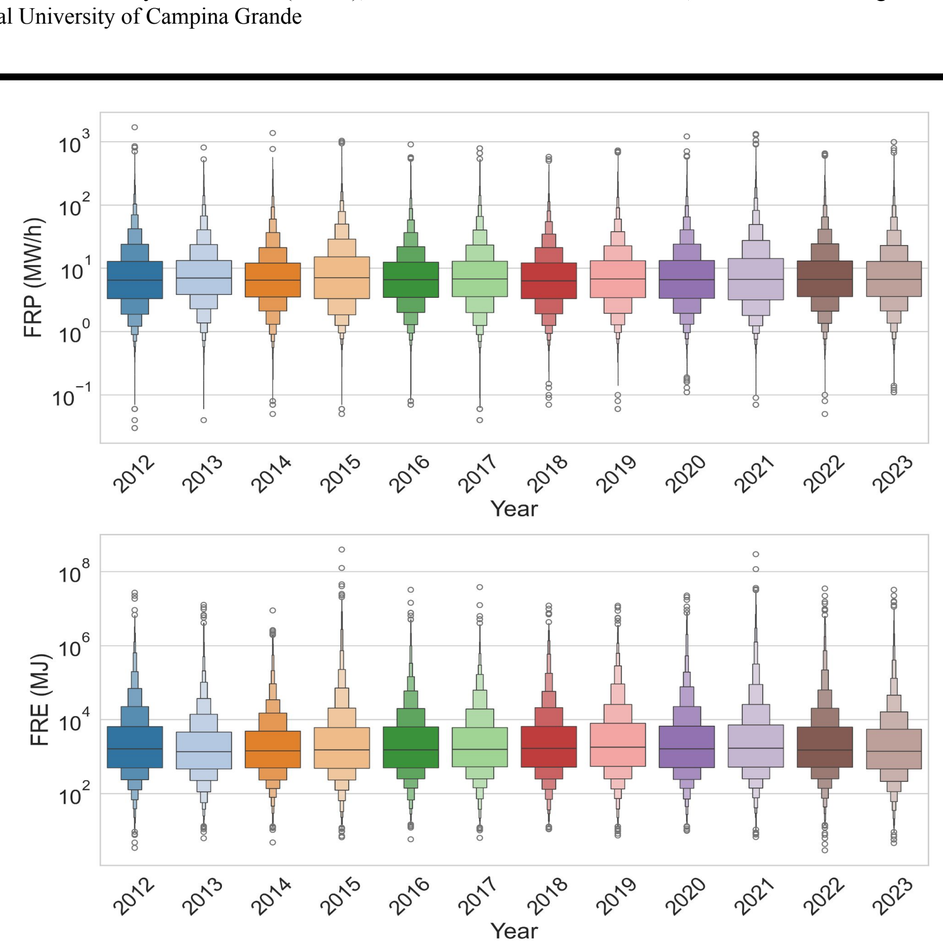

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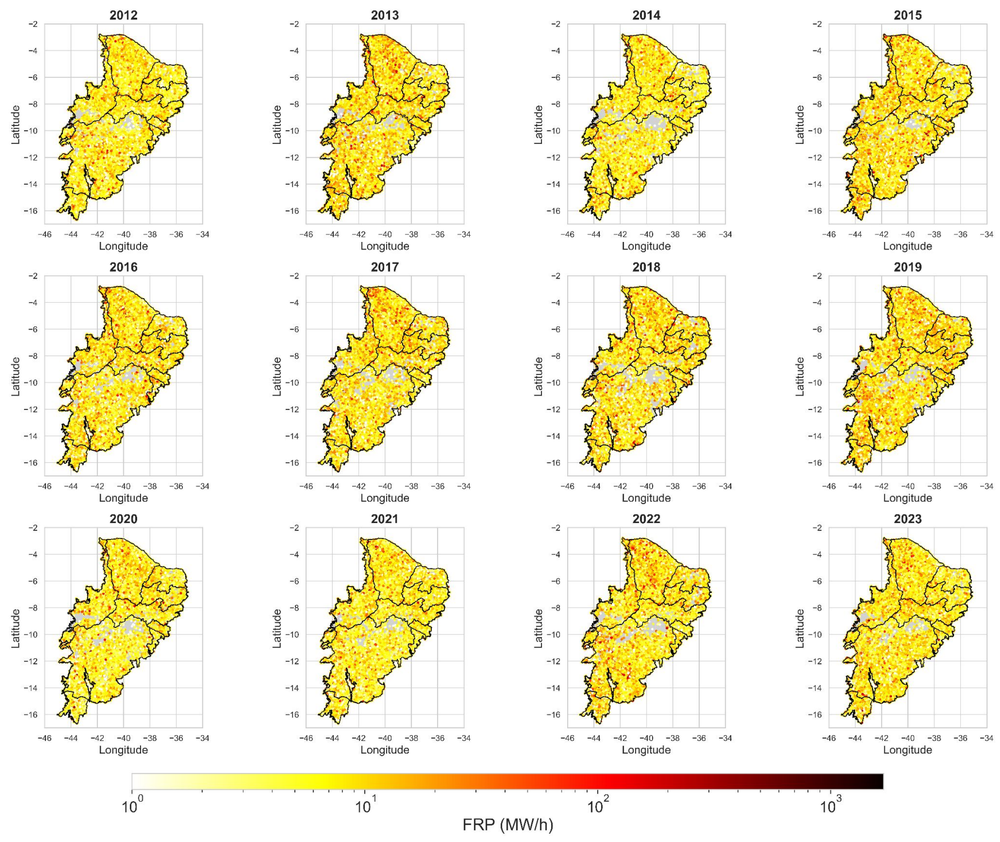

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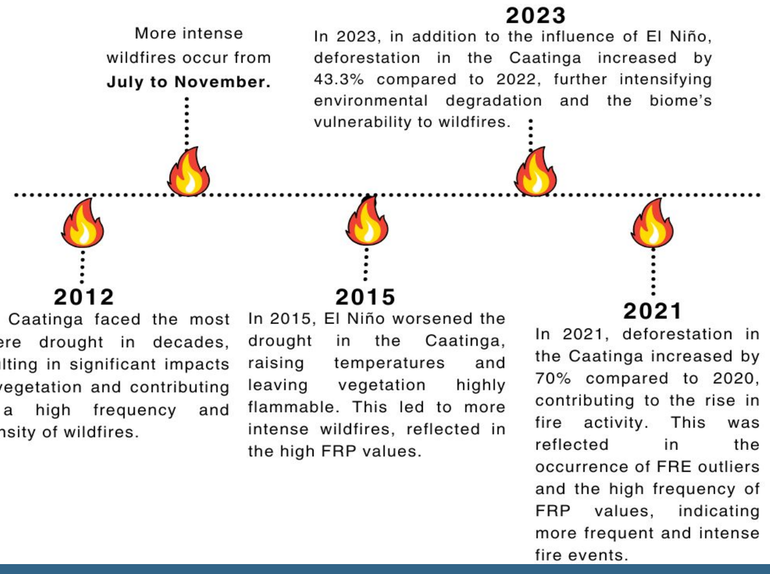

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