Fire in recent deforestation at Gleba Abelhas
A public forest in the Canutama city, in southern
Source: Marizilda Cruppe / Greenpeace
03/August/2023

Article on the Brazilian Amazon Region

Sick children!
Where does all this smoke come from?

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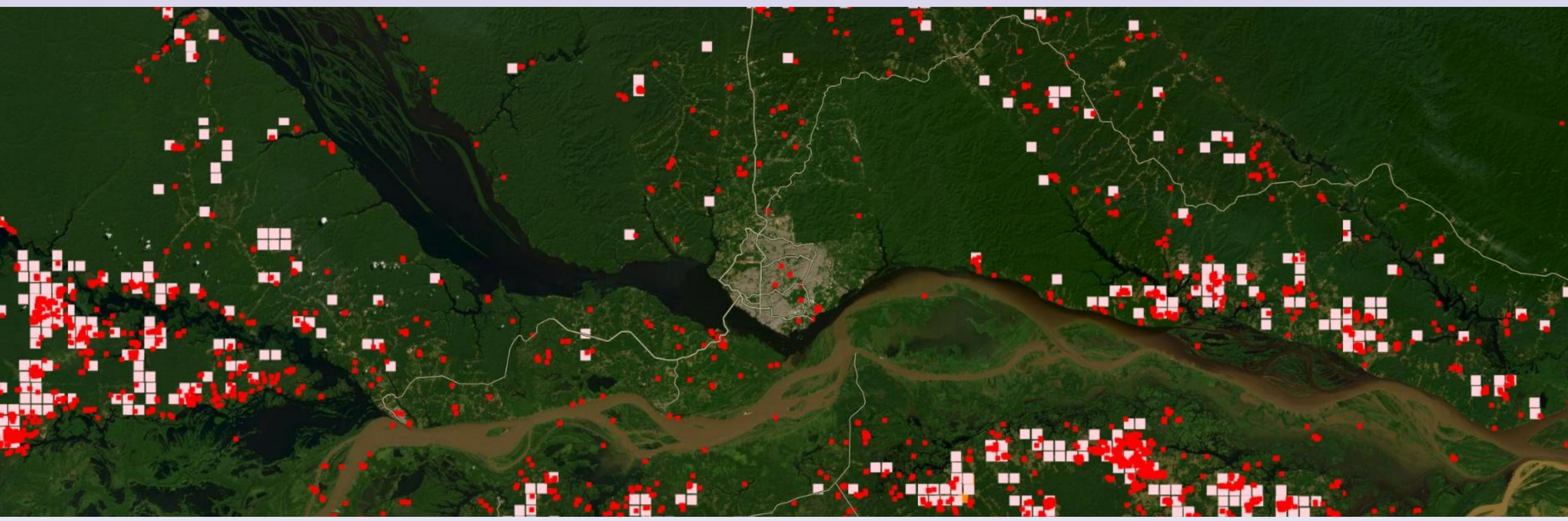


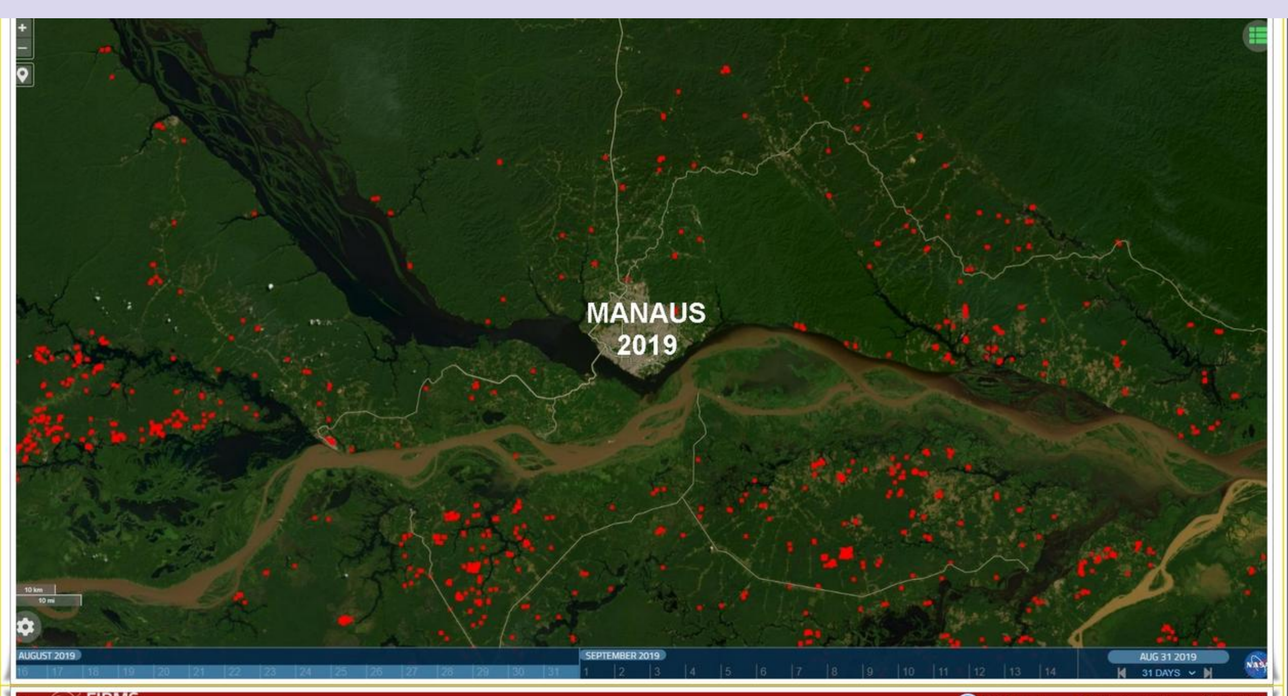
Burning Areas Surrounding Manaus on August 2023
Source: NASA FIRMS

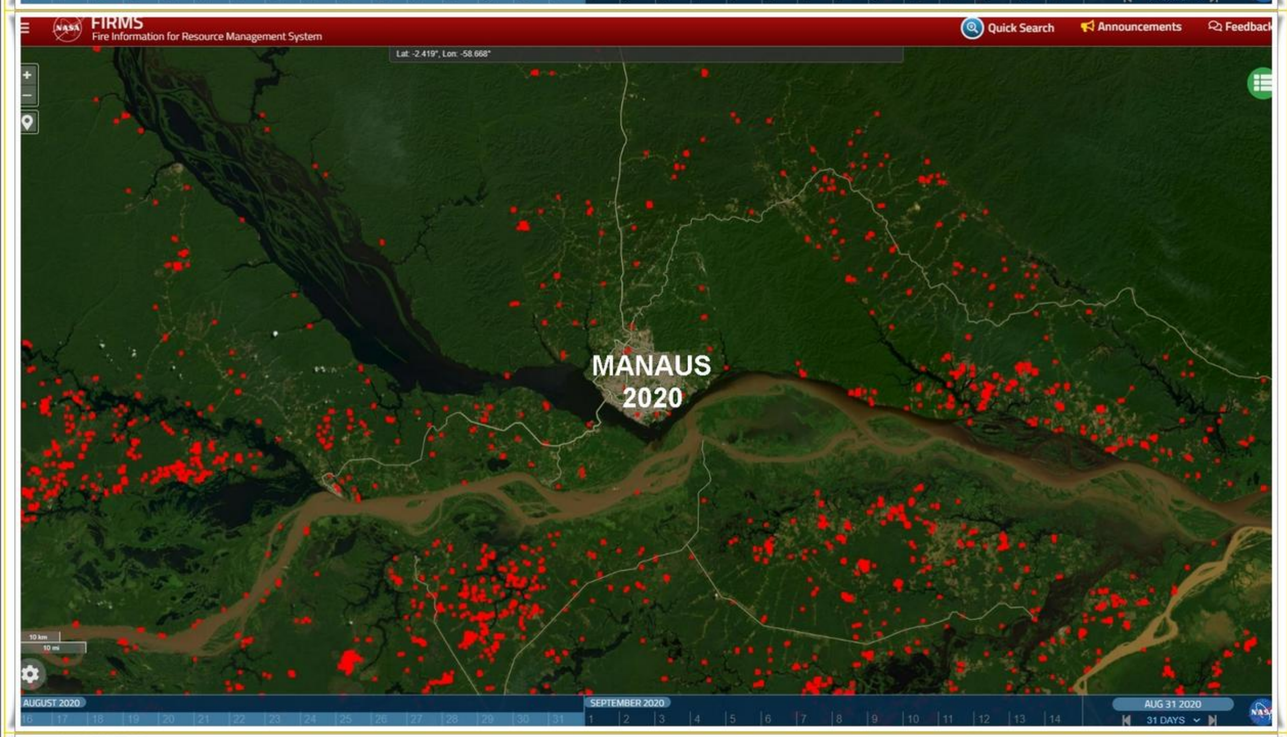
In 2016, the UN revealed that 600,000 deaths of children and teens under 15 were due to air pollution. Every hour, 800 people die of cancer and cardiorespiratory diseases from inhaling polluted air. In the brazilian Amazon, heat and pollution are becoming increasing threats. This article, aiming to provide transparency and improve the fight against environmental crimes, presents statistics and begins revealing the profile of the locations of active fire sources and thermal anomalies in Manaus city and surroundings between 15 september and 31 october, 2023.

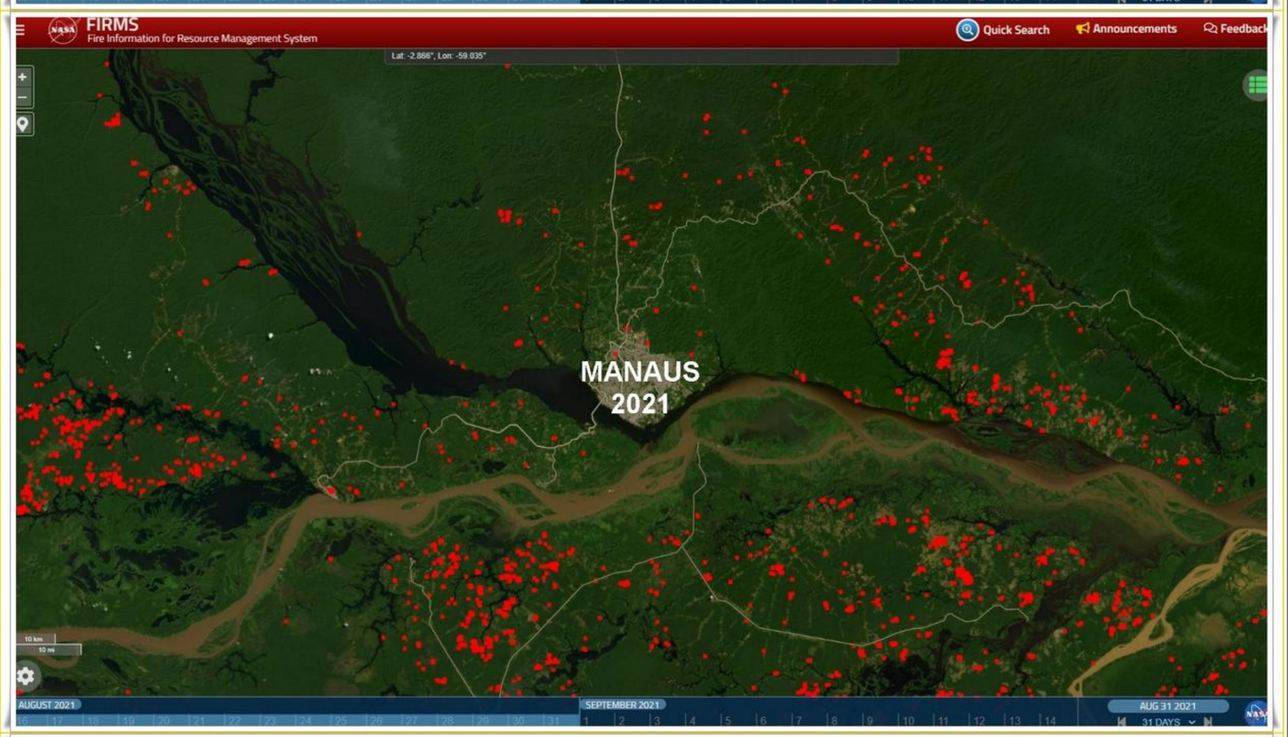
The number of fires in the State of Amazonas has been increasing in recent years. Statistical data on the evolution of fire outbreaks, as well as the high levels of air pollution recorded in the city of Manaus, in September and October 2023, reveal that the situation is out of control.

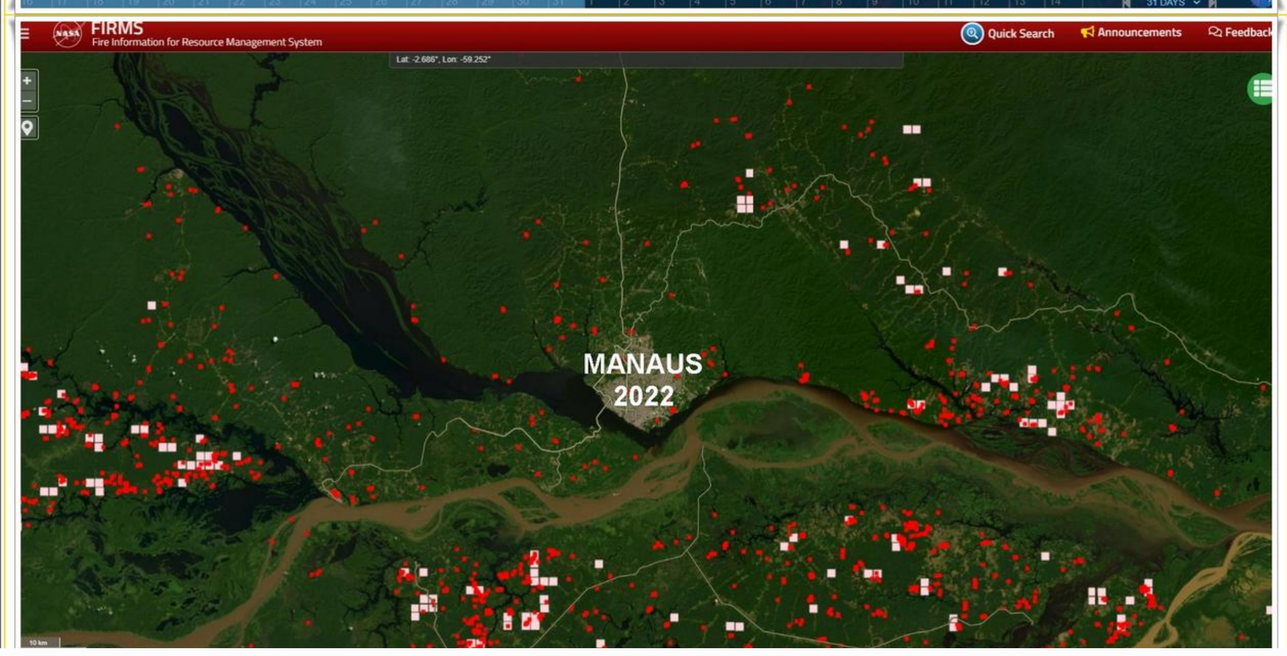
For example, according to statistics revealed by INPE through the Burn Program<**https://tinyurl.com/247wttds**>, monitored by the Aqua Tarde satellite, in the State of Amazonas the number of fire outbreaks between 2018 and 2022 (five consolidated years) evolved as follows: 2018=11204; 2019=12152; 2020=16464; 2021=14696 and 2022=20883. That is, between 2018 and 2022 there was an upward trend in the number of wildfires, with an increase of 86% when comparing the values between 2022 and 2018.

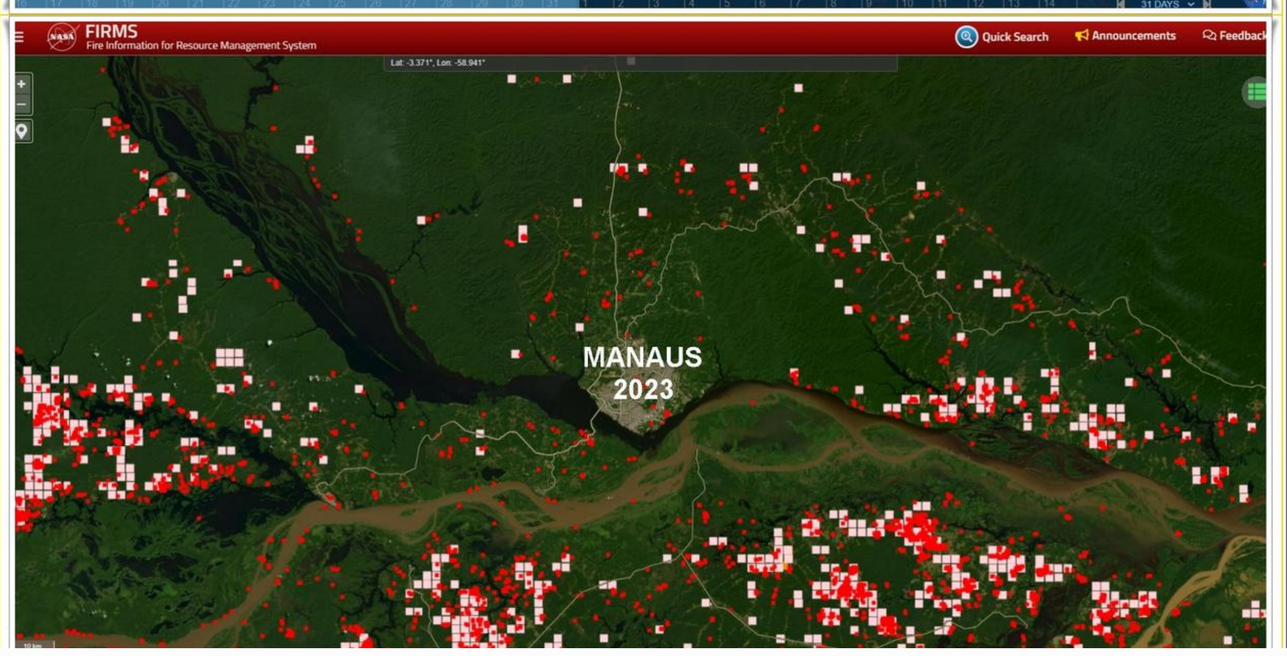
If we study the statistics from the fire dashboard <**https://tinyurl.com/y4n7x7zp**> on the Climate Panel website of the State Government of Amazonas, referring to the period when the Amazon summer is most intense, between August and October, taking into account again the years 2018, 2019, 2020, 2021 and 2022, it is observed the following total number of fire sources in Amazonas state:2018=9442; 2019=10242; 2020=13565; 2021=13160; 2022=18278. In this case, there was also an upward trend in the phenomenon in the region, with an increase of 98% between 2022 and 2018. In addition, there were about 64,487 outbreaks registered in these five years, with August being the highest with 33,991 registered outbreaks (53%), followed by September (23,682; 37%) and October (6,814; 10%).











Figures 1, 2, 3, 4, 5 and 6: active fires and thermal anormalies surrounding Manaus city - August 2018 to 2023

Source: NASA FIRMS

If we consider what has been happening in 2023, using records from other monitoring platforms that use several advanced satellites, the situation is much more alarming than what has been revealed.

For example, if we use NASA's FIRMS system, a more comprehensive platform that records active fire and thermal anomalies through twelve satellites, taking into account the entire month of August 2018, 2019, 2020, 2021, 2022 and 2023, a visual worsening of the situation around Manaus over time can be seen through figures 1, 2, 3, 4, 5 and 6, with August 2023 being the most critical. This explains, in part, the air pollution records in the city of Manaus and its surroundings in September and October 2023.

To answer the question in the title of this article, several assumptions were made, explained in last week's article, published in Portuguese <**https://tinyurl.com/5xxpk4db**> and translated into English <**https://tinyurl.com/4jc3thvy**>, so that society can gain awareness.

Based on the analysis of a sample with 2,750 images obtained from NASA's FIRMS system, referring to the outbreaks of active fires and thermal anomalies in areas within a 300 km radius of Manaus, from 15 September to 31 October 2023, it was found the following results:

1) the municipality of Careiro was the highest with 664 (24.1%) fire and thermal anomaly outbreaks, followed by Autazes (650; 23.6%), Itacoatiara (340; 12.36%), Manaquiri (256; 9.3%), Careiro da Várzea (175; 6.36%), Manacapuru (129; 4.7%), Rio Preto da Eva (126; 4.5%), Nova Olinda do Norte (95; 3.4%), Borba (94; 3.4%), Iranduba (71; 2.58%), Manaus (69; 2.5%), São Sebastião do Uatumã (27; 0.98%), Maués (17; 0.62%), Novo Airão (17; 0.62%), Caapiranga (12; 0.43%), Presidente Figueiredo (5; 0.18%) and Silves (3; 0.10%).

2) In terms of location where the events are happening, it was observed that the majority (80.4%) occurred in green areas near rivers (1189; 43%) or in green areas near already deforested areas (1022; 37%), followed by deforested areas (257; 9%), soil near river (104; 4%), deforested area near river (101; 4%), green areas (72; 2.6%) and on bare soil (5; 0.18%). Here the word river is also used to denote streams and lagoons.

To find the most critical cities, where the fires or thermal anomalies were most intense, records with confidence level above 30%, average brightness temperature well above 300 Kelvin, as well as the highest values of Fire Radiative Power (FRP) were analyzed, a variable widely used in several studies on energy emitted by fire in radiative processes in a given area.

After registering all 2750 records and organizing them in descending order by FRP, it was possible to arrive at the average values of the one hundred worst results:

First) the city of Nova Olinda do Norte.
Despite representing 9% (9 cases) of the one hundred worst records, this city had an average FRP value of around 698.6 MW, with maximum value reached in Prazeres (FRP=989.5 MW).

Second) the city of Autazes.
It could be said, based on other simulations, that it was one of the cities that most destroyed and emitted air pollution to its region and surroundings of Manaus city. There were about 56 records (56%) with average FRP of 526.46 MW, with maximum value of 1331.9 MW in a green area near Lake Piratinga.

Third) the city of Itacoatiara.
There were 22 records (22%) with average FRP of 525.96 MW, with maximum value of 965.1 MW recorded in a green area near the Urubu River, in Lindóia.

Fourth) the city of Careiro.
With eight records (8%), with average FRP value of 457.4 MW, with maximum value reaching 841.9 MW in a green area near deforested area in the Purupuru region.
The other cities were Manaquiri (3 records; average FRP of 379 MW; MaxFRP=454.1MW), São Sebastião do Uatumã (FRP=334.9 MW) and Rio Preto da Eva (FRP=304.8MW).

Finally, it is concluded that: a) the number of fires in Amazonas grew 86% between 2018 and 2022, that is, it is out of control; b) the month of August 2023 presented a historical record of heat sources when compared to the same period in the last six years; c) in the surroundings of Manaus, the municipalities of Autazes, Itacoatiara and Careiro were the most critical, which is why the next articles will detail the profile and geolocations of events in these cities, in order to support inspection and combat these environmental crimes, which have caused so much harm to our children and the environment.