De Olho no Fogo

Beyond hotspots, an integrated view of fire.

Challenge: Harmonization of MODIS and VIIRS Hot Spots

Team Space Uai · Ouro Preto, Brazil

Wedny Lucas Fernandes
João Pedro N. H. Ribeiro
Mila Cristian de Paiva Martins
Kevilin Brites
Maria Heduarda Rosa Morais
Wander Marcos Fernandes



Who pays for the fire?

How much does the smoke weigh on your health?

+23%

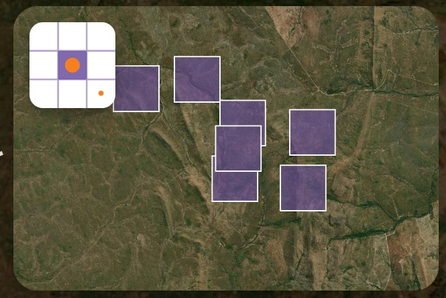
higher chance of respiratory illness

How many animals did the fire kill?

17 million

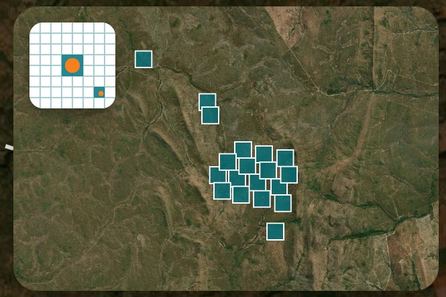
animals in the Pantanal, in 2020





Older 7 alerts

1 km: sees the big fire, the small one slips through



Newer 19 alerts

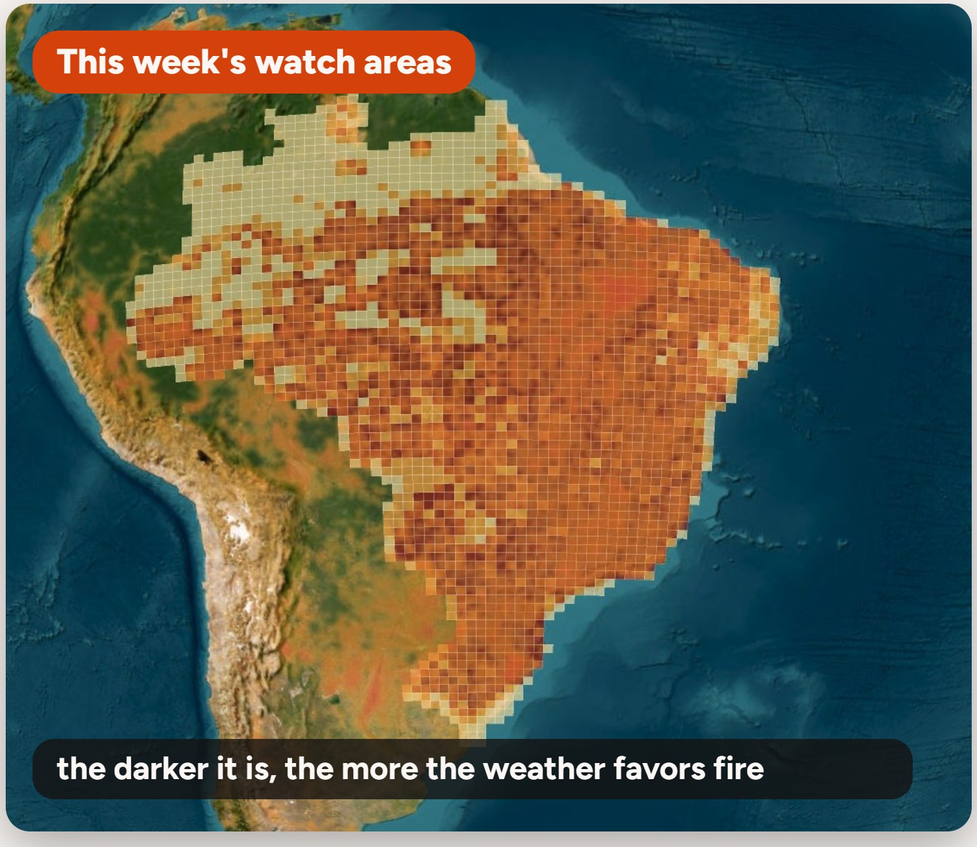
375 m: catches even small fires. In 2025, **3 out of 4 fires** only it saw

Like 2 calls to the fire department at 193: one says “there's a fire in the neighborhood”, the other calls from every block. **It's one fire. Which count is right?**

Health: FGV EPPG (INPE × DataSUS, 2008–2018) · Wildlife: Tomas et al., 2021 · Image: Esri · Boundary: IBGE

The solution: De Olho no Fogo

an open globe that brings the 2 satellites together, explains what it sees and points to where fire may come next



919,972 hotspots worldwide in August 2025.

challenge · NASA FIRMS

16% of hotspots were seen by both satellites at once; the rest by only one. That's why we merge MODIS and VIIRS without counting the same fire twice.

challenge · NASA FIRMS

One single count

the 2 satellites together, and the app explains the number in plain sentences

49% of Brazil's area is at **very high risk** of fire in the week of 30/07 to 05/08/2025.

extra · outside the challenge

team estimate · FIRMS + NASA POWER

Main drivers: fire is common in this week of the year, there was a fire hotspot in the last week, and fire is common at this time of year.

extra · outside the challenge

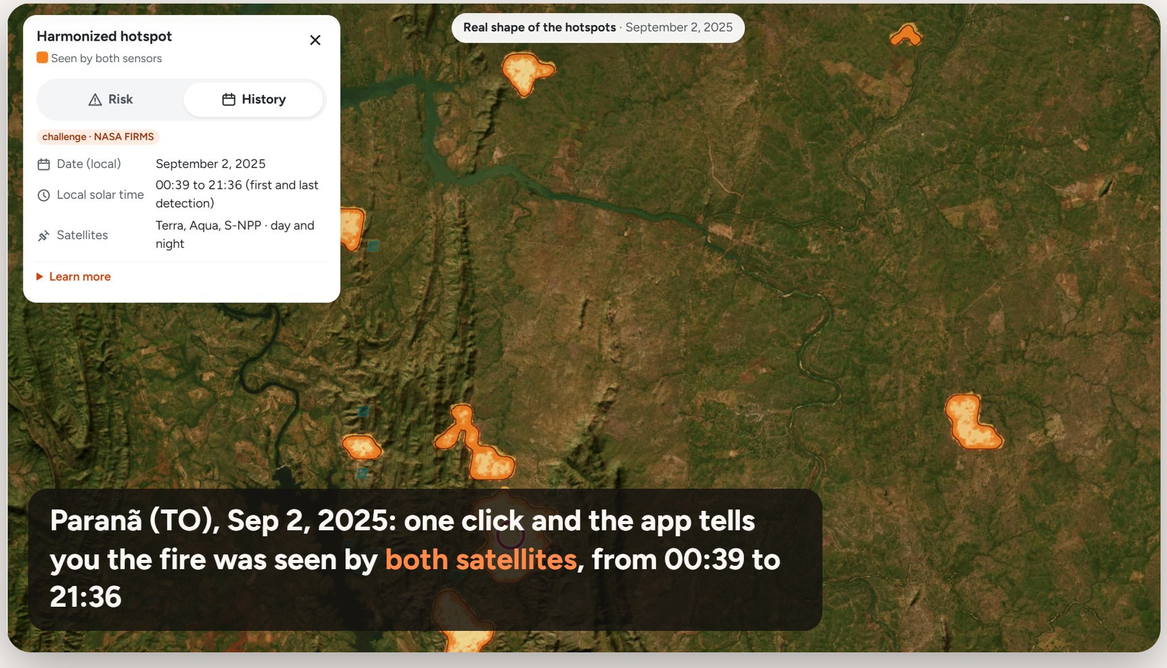
team estimate · FIRMS + NASA POWER

This week's outlook

heat, dry air, recent fire and the time of year tell you where to keep watch

Real captures from the globe, August 2025 · watch areas: team estimate using FIRMS + NASA POWER (extra, in progress)

Demo: who uses it and why



IT'S ALREADY LIVE

deolhonofogo.estudiocrivy.com.br

free, in the browser, on phone or computer

Fire brigades and Civil Defense

Now mode: hotspots from the last 24 h, to decide where to send the crew today

City hall

search for the city, mark the region and download the hotspot table for the report

Protected area

check this week's watch area and step up patrols before the fire

Schools, newsrooms, researchers

click a hotspot: when, how big and who saw it; compare the years since 2000

The data and how we combine it

CHALLENGE

NASA FIRMS

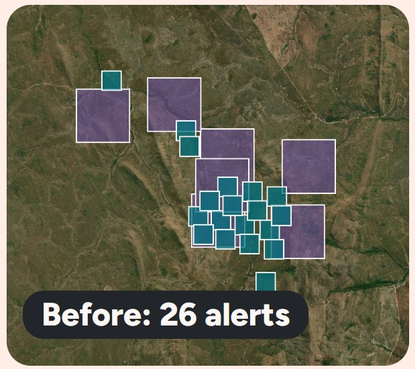
the hot spots from the 2 satellites: one sees 1 km, the other 375 m

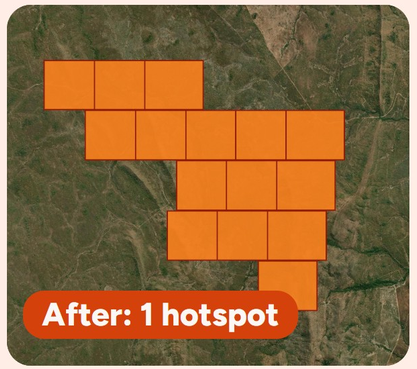
20,516,943
alerts in 2025

26 years
of Brazil, since 2000

EXTRAS

- **NASA POWER** · the weather each day
- **NASA imagery** · burned area and clouds
- **INPE** · the marks fire leaves on the ground
- **IBGE** · the maps of Brazil





THE SAME FIRE, NOTED 3 TIMES

- old, 10:30
- new, 13:30
- new, again

= 1 fire, counted once

1 Download → 2 1 km grid → 3 Day by the sun → 4 Neighbors become 1

Matches NASA's burned area (0.84). Limit: hotspots less than 1 km apart on the same day become one.

But doesn't NASA already show both?

Side by side. We merge them: 20.5 million alerts become 7.26 million hotspots.

But how do we know it's right?

The count matches the burned area NASA measures: 0.84.

What about Civil Defense?

We add to their work: open, free data.

Impact: getting there before the fire grows

See it sooner
the right hotspot, in the right place

→

Get there first
the brigade goes where it's needed

→

Smaller fires
put out while still small

Less money

a small fire needs fewer planes, trucks and people in the field

Less smoke

+23%

that's how much burning raises the chance of respiratory illness

More animals alive

17 million

animals died in the Pantanal in 2020

Less forest lost

less burned area and less carbon going into the air

EVIDENCE

- The count matches NASA's burned area (0.84)
- 7,260,823 hotspots counted once in 2025

LIMITS

- Not every hotspot is a fire
- The time saved in the field hasn't been measured yet

Health: FGV EPPG (INPE × DataSUS, 2008–2018) · Wildlife: Tomas et al., Scientific Reports, 2021 · Burned area: NASA MCD64A1

Next steps

NOT THERE YET

- The whole world only for 2025 (Brazil since 2000)
- Watch areas not yet tested against real fires
- Hotspots less than 1 km apart on the same day become one
- Before 2012, the Brazil count is estimated

COMING UP

- **Count the whole world, every year**
- **Test the watch areas against real fires**
- **See the effect on climate and wildlife**
- **Show air quality at the time of the fire**

Fire doesn't wait. With De Olho no Fogo, we see clearly so we can get there first.

deolhonofogo.estudiocrivy.com.br · Air quality: SISAM, from INPE · NOAA-20 continues the newer satellite's series