



**Thank you for joining
FIRES IN THE AMAZON:**

What You Need to Know in 2021

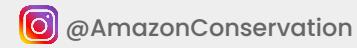
We will start promptly at 12:00 pm EST.

Did you know?

Amazon Conservation's Monitoring of the Andean Project (MAAP) performs real-time, satellite-based forest loss and fire monitoring across 83% of the Amazon, covering 5 countries – Brazil, Bolivia, Colombia, Ecuador, and Peru. *Learn more at: maaproject.org*

Support fire prevention and response:
Visit bit.ly/fires-response

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WITH SUPPORT FROM



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FIRE IN THE AMAZON:

What You Need to Know in 2021



August 4, 2021



12:00 p.m. EST / 11 am Peru

ORGANIZED BY



SERVIR AMAZONIA

WITH SUPPORT FROM



Alliance



CONSERVACIÓN
AMAZÓNICA

AND PARTICIPATION BY



WAKE FOREST
UNIVERSITY

UNIVERSITY OF
ARKANSAS



General Welcome and Event Introduction



John Beavers

Executive Director of Amazon Conservation



Carlos Gasco

SERVIR-Amazonía Program Director



*Base Map. "Major Amazon Fires 2021" layer, as visualized in the app.
Data: MAAP, Amazon Conservation.*



*Major fire burning recently deforested area in the Brazilian Amazon (#17, Mato Grosso).
Data: MAAP, Planet.*

Overview of Fires in the Amazon, Climate Change, and What to Expect



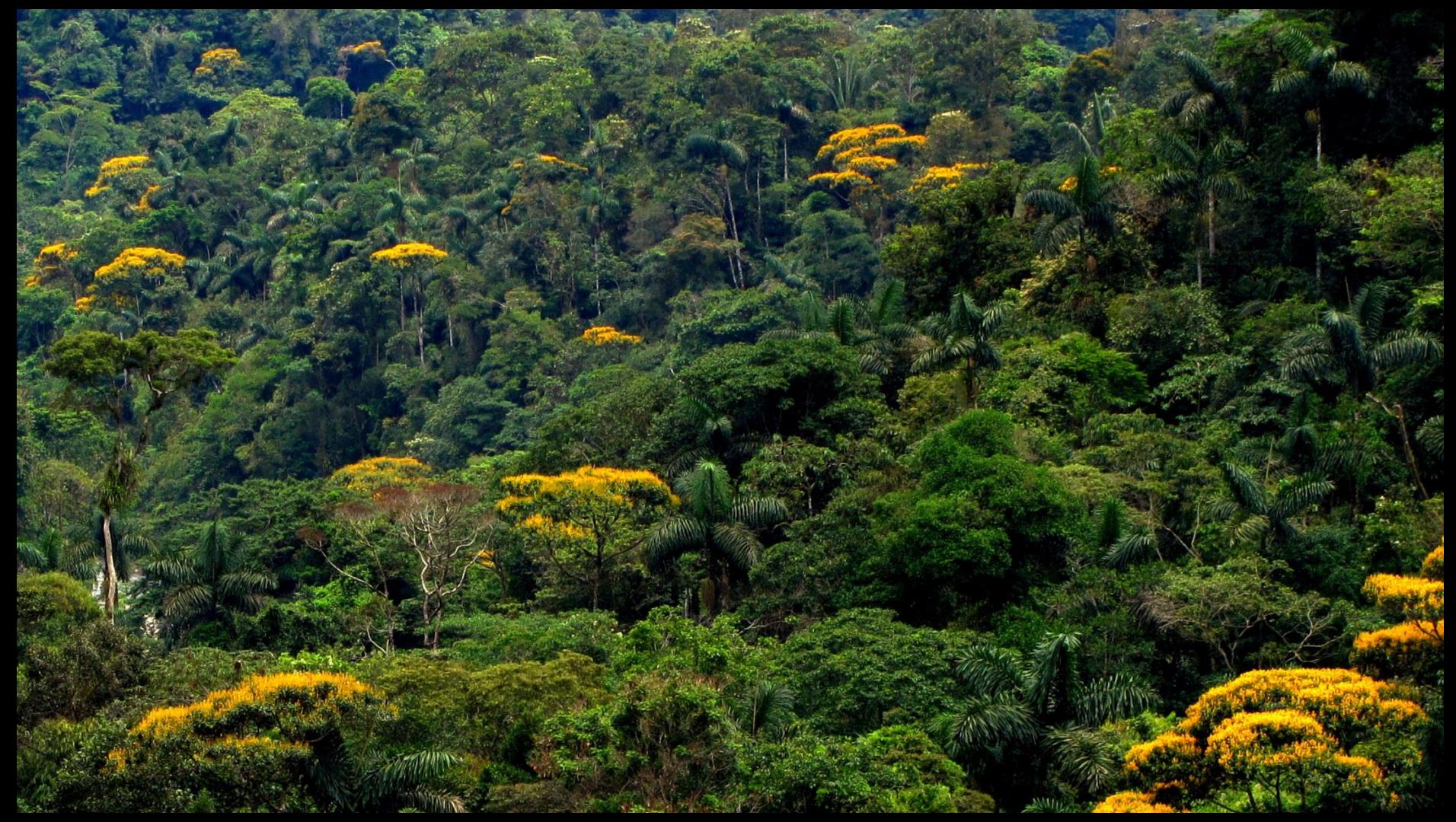
Miles Silman
Wake Forest University



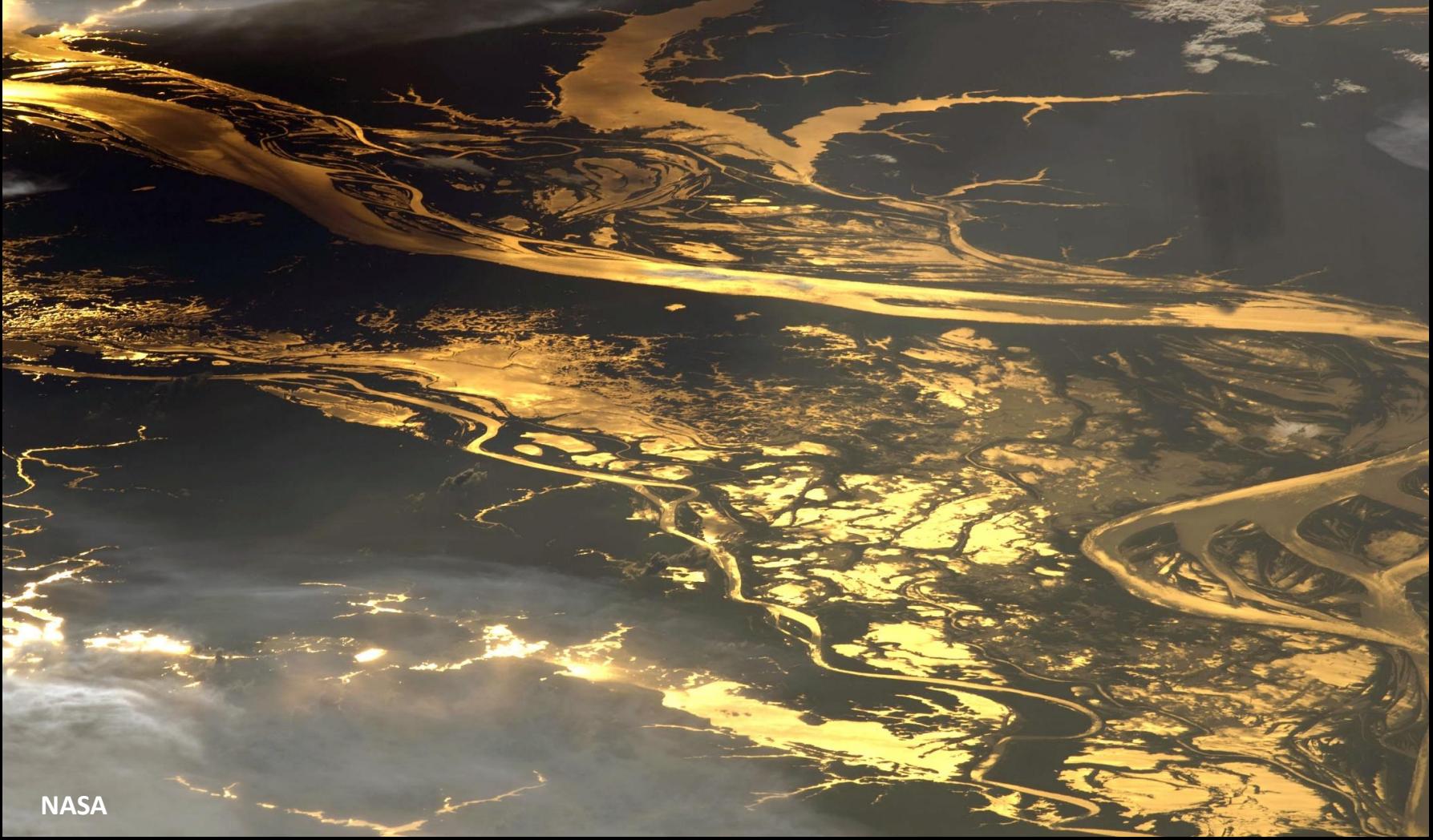
Photo: Jason Houston



Adrian Tejedor, Amazon Conservation Association

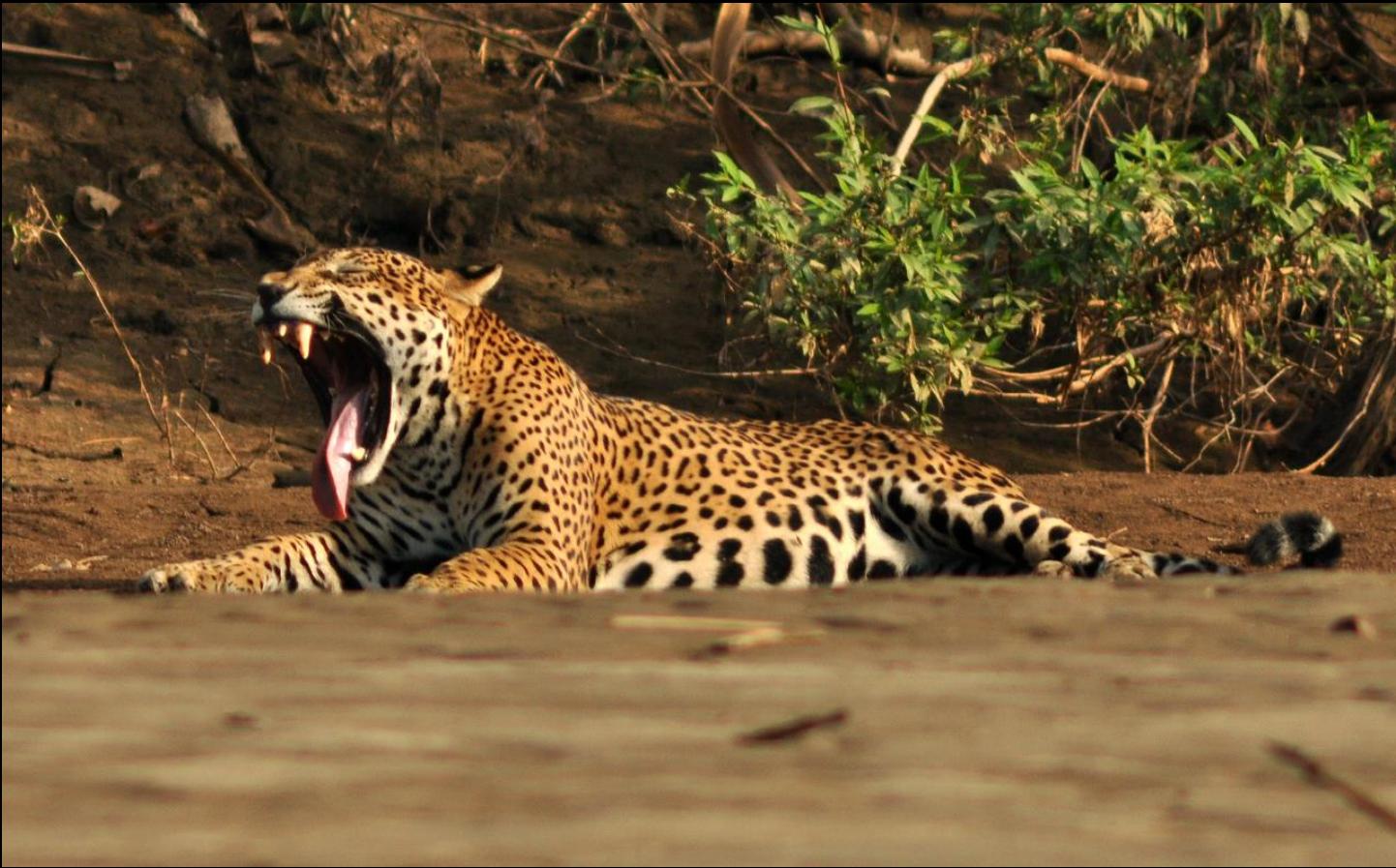






NASA











THE FINDINGS

What We Know About the First Fires in the Amazon in 2021 and the Patterns We Are Identifying



Matt Finer

Director of the Monitoring of the Andean Amazon Project (MAAP) at Amazon Conservation



Major fire burning recently deforested area in the Brazilian Amazon. Data: MAAP, Planet.



Amazon Fires 2021: What we Know So Far

Dr. Matt Finer
Amazon Conservation, Senior Research Specialist
MAAP, Director



AMAZON REAL-TIME FIRE MONITORING



--- MAAP Initiative ---

Updated: Jul 27 2021

Legend:

Aerosol Index (Sentinel-5P)

Min: ≤ -1 Max: ≥ 3

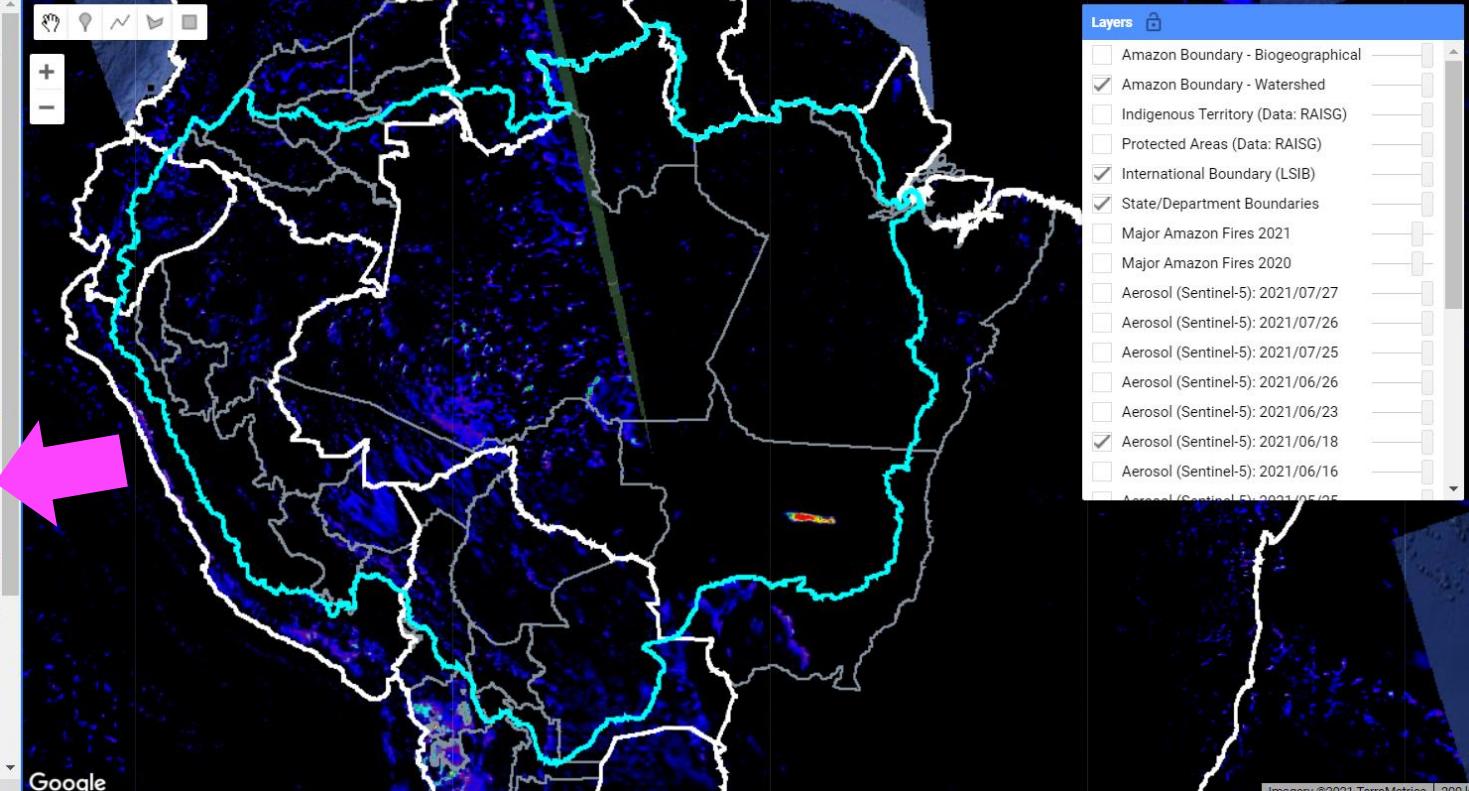
Instructions:

- Scan map for aerosol emissions of major fires (yellow, orange, red) across Amazon

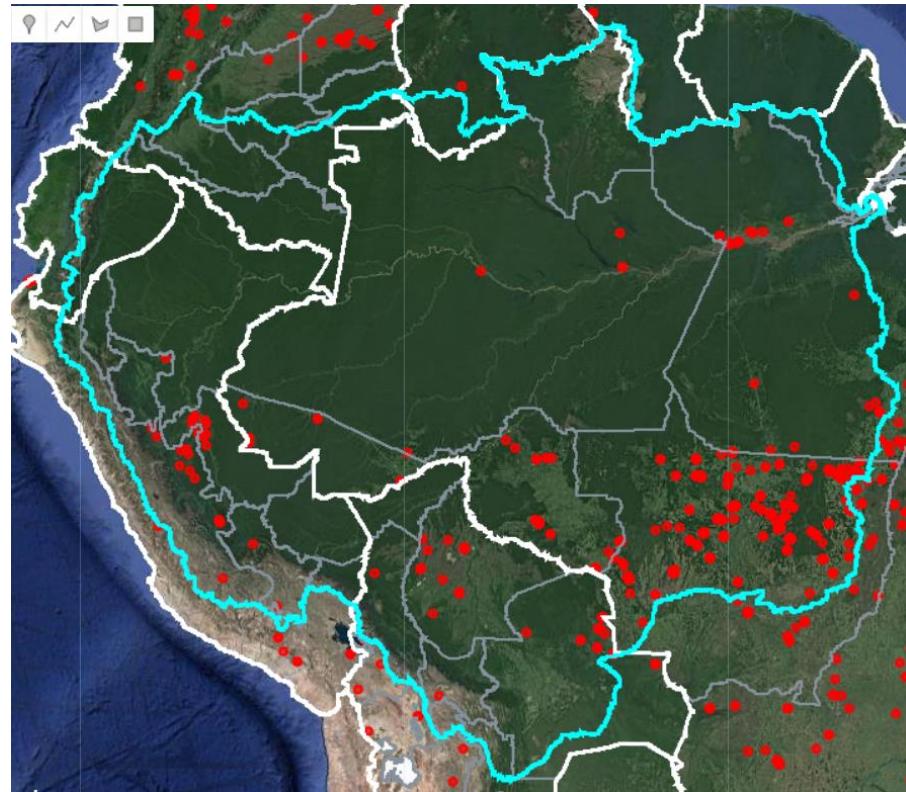
- Click "Layers" to see date of image (Sentinel 5)

- Click "Layers" to compare with temperature anomaly alerts to

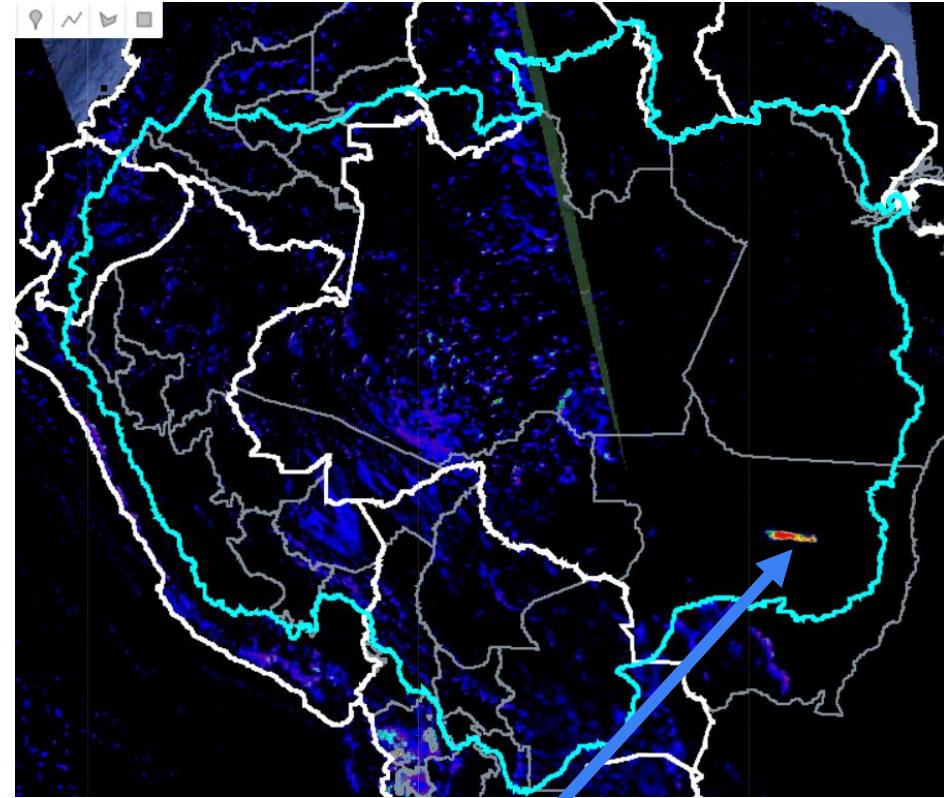
Google

bit.ly/firesapp

Heat-based Alerts



Aerosol-based Alerts



"Major Fire"

Amazon Major Fires 2021 (as of Aug 1)

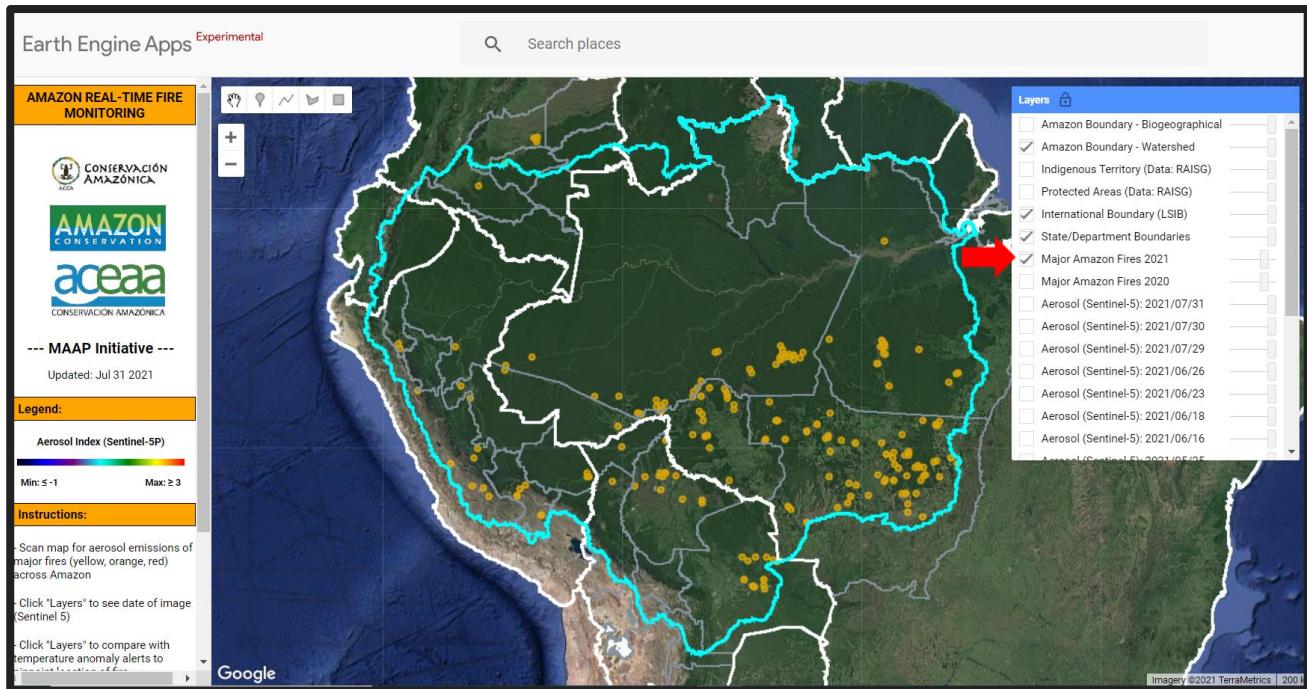
Total: 216

Brazil: 150 (73%)

Bolivia: 32 (15%)

Peru: 21 (10%)

Colombia: 6 (3%)



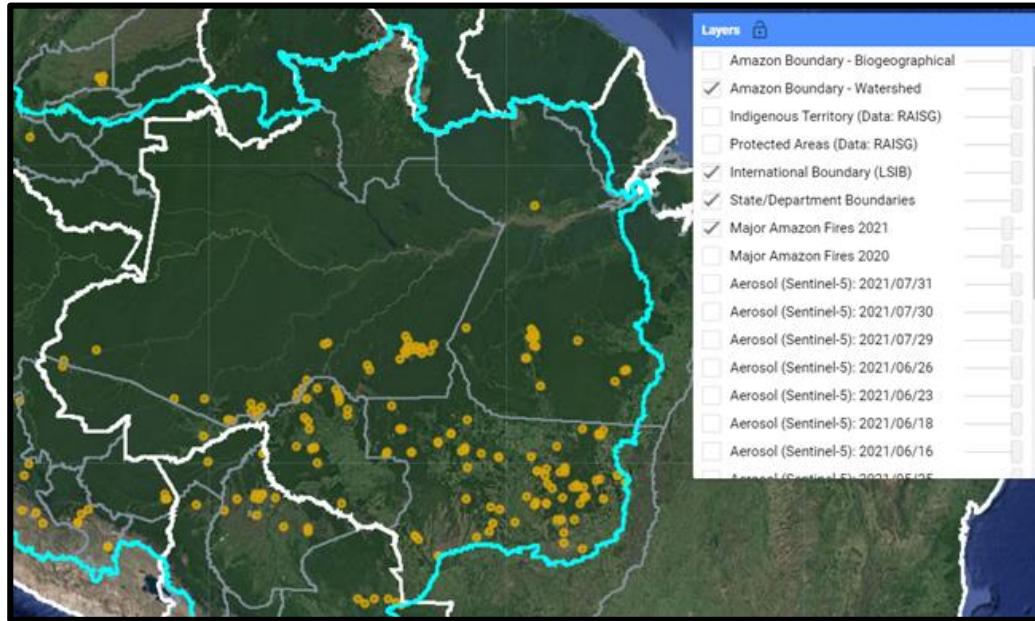
bit.ly/firesapp



Brazilian Amazon: Key Findings

By Year

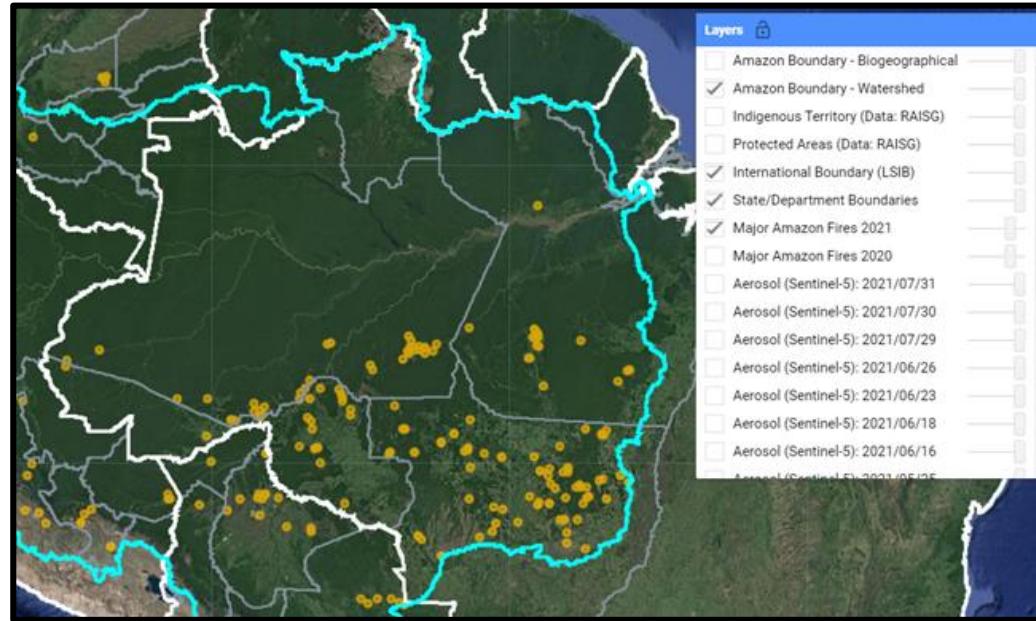
- August 1, **2021**: 150 major fires
- August 1, **2020**: 87 major fires
- Total 2020: 2,250 major fires



Brazilian Amazon: Key Findings

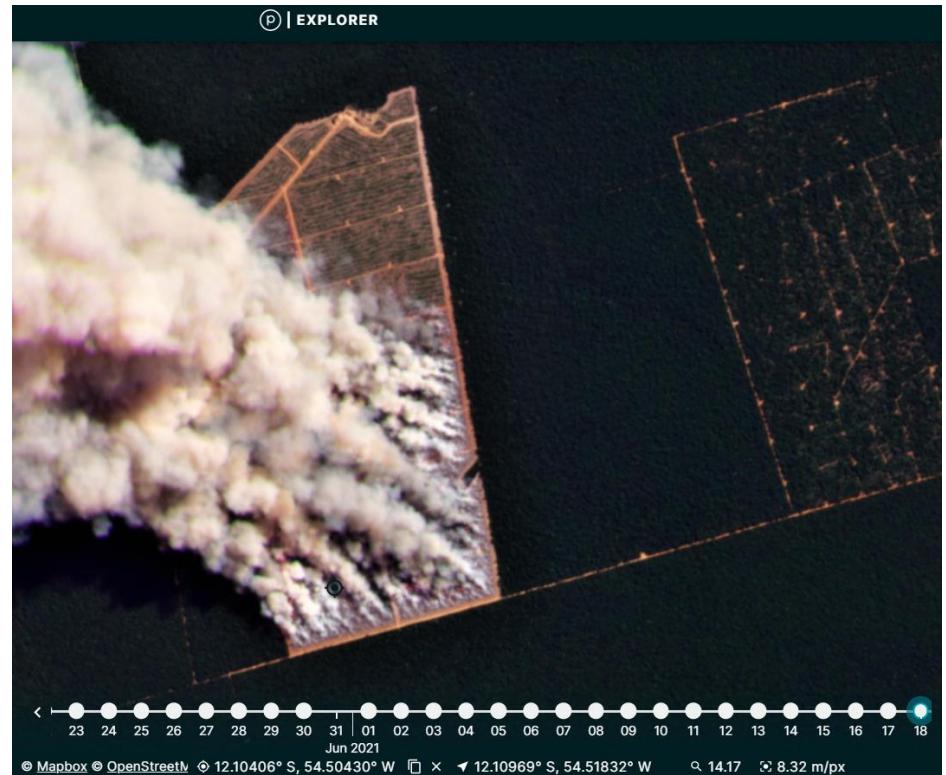
By State

- Mato Grosso: 43%
- Amazonas: 29%
- Pará: 14%
- Rondônia: 12%
- Acre



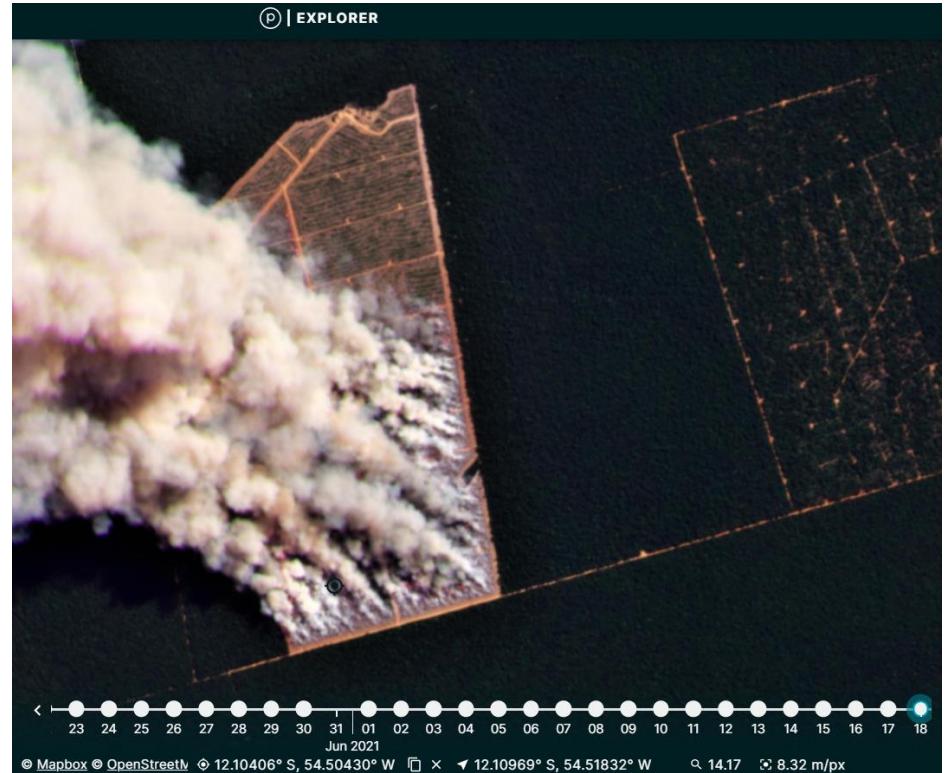
Brazilian Amazon: Key Findings

- Majority (63%) of major fires have burned **recently deforested areas**.



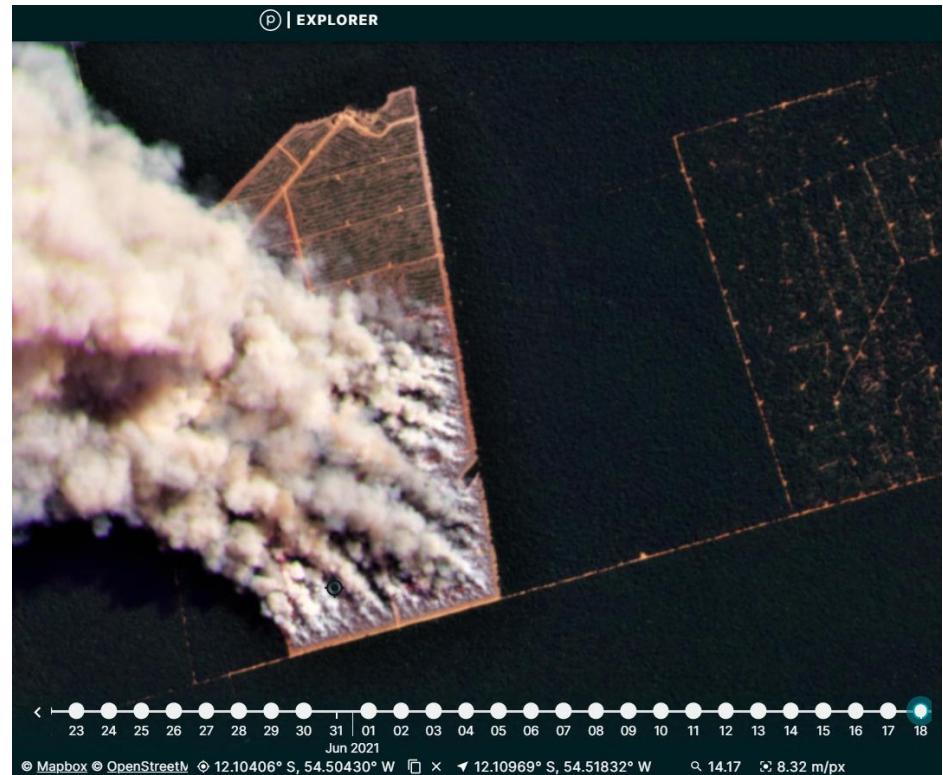
Brazilian Amazon: Key Findings

- Majority (61%) of major fires have burned **recently deforested areas**.
- Fires actually burning remains of freshly cut forest. **Deforestation > Fire**



Brazilian Amazon: Key Findings

- Majority (61%) of major fires have burned **recently deforested areas**.
- Fires actually burning remains of freshly cut forest. **Deforestation > Fire**
- **36,000 hectares** (90,000 acres)
- Highlights current high deforestation



Brazilian Amazon, Key Pattern: Deforestation > Fire

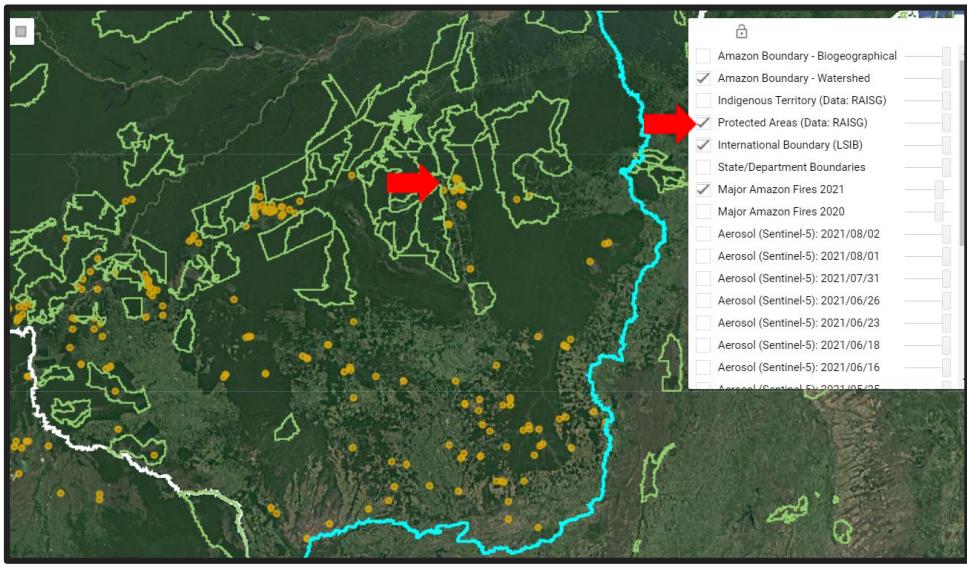


Brazilian Amazon: Key Findings

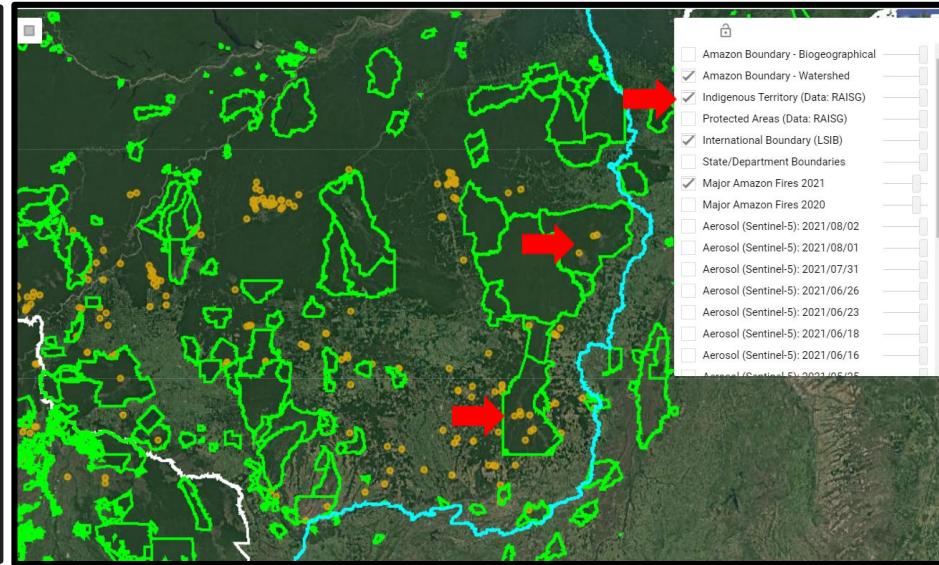
- **Forest Fires:** first several small ones



Brazilian Amazon: Key Findings



Protected Areas: Altamira National Forest



Indigenous Territories: Xingu, Kayapó

Brazilian Amazon: Key Findings

- Natural **grasslands**: 16%; 30,000 ha
- **Indigenous Territories**: Xingu, Kayapó
- Better understand context?



Brazilian Amazon: Key Findings

- **Illegal:** 100 major fires post June 27 ban

June 29, 2021
11:28 AM EDT
Last Updated a month ago

Environment

Brazil bans fires, redeploys military to protect Amazon rainforest

3 minute read Jake Spring, Ricardo Brito



Thank you

amazonconservation.org
maaproject.org

Contact Information:

Matt Finer

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MAAP)

mfiner@amazonconservation.org

→ Twitter: [@MattFiner](https://twitter.com/MattFiner)



2021 Brazilian Amazon Fire #1. Mato Grosso. Data: MAAP, Planet.

THE FINDINGS

The Expectation for the Rest of the Fire Season and the Climate Variability



Kátia Fernandes

University of Arkansas,
SERVIR-Amazonía



Seasonal Forecast July-September 2021

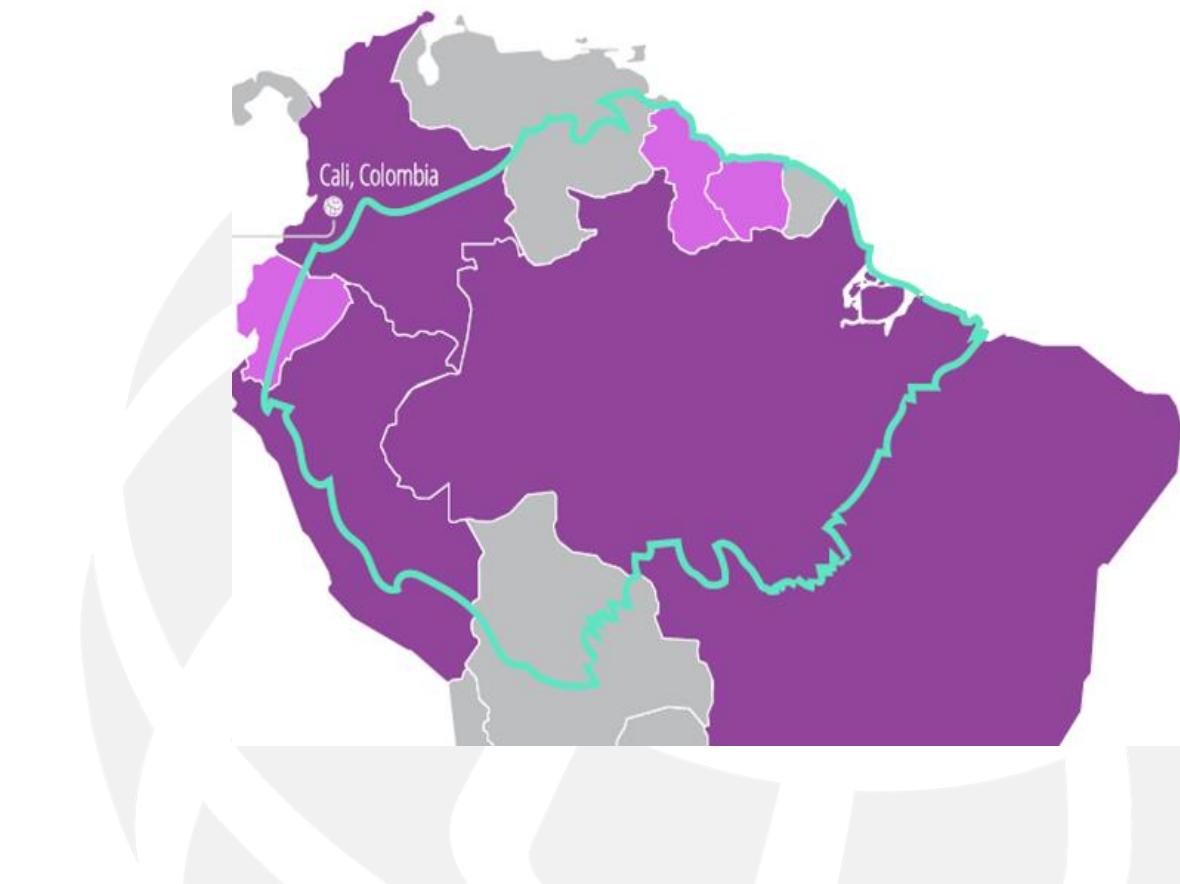
Kátia Fernandes
Assistant Professor of Geosciences
University of Arkansas

SERVIR-Amazonia
Drought and Fires Theme Lead
August 4th 2021.

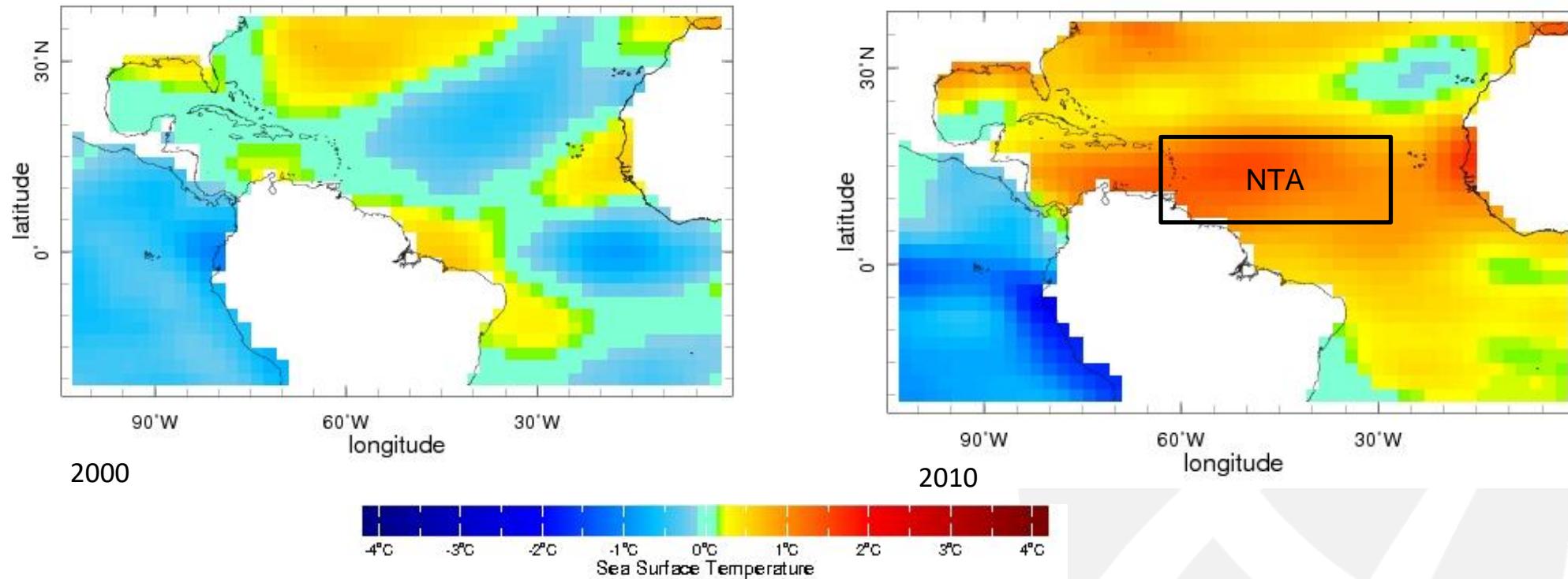


Drought and Fire Risk

- Fire ignition in the Amazon results from human activities
- Interannual variability is mostly determined by climate conditions.



Fires and Sea Surface Temperature



NTA- North Tropical Atlantic

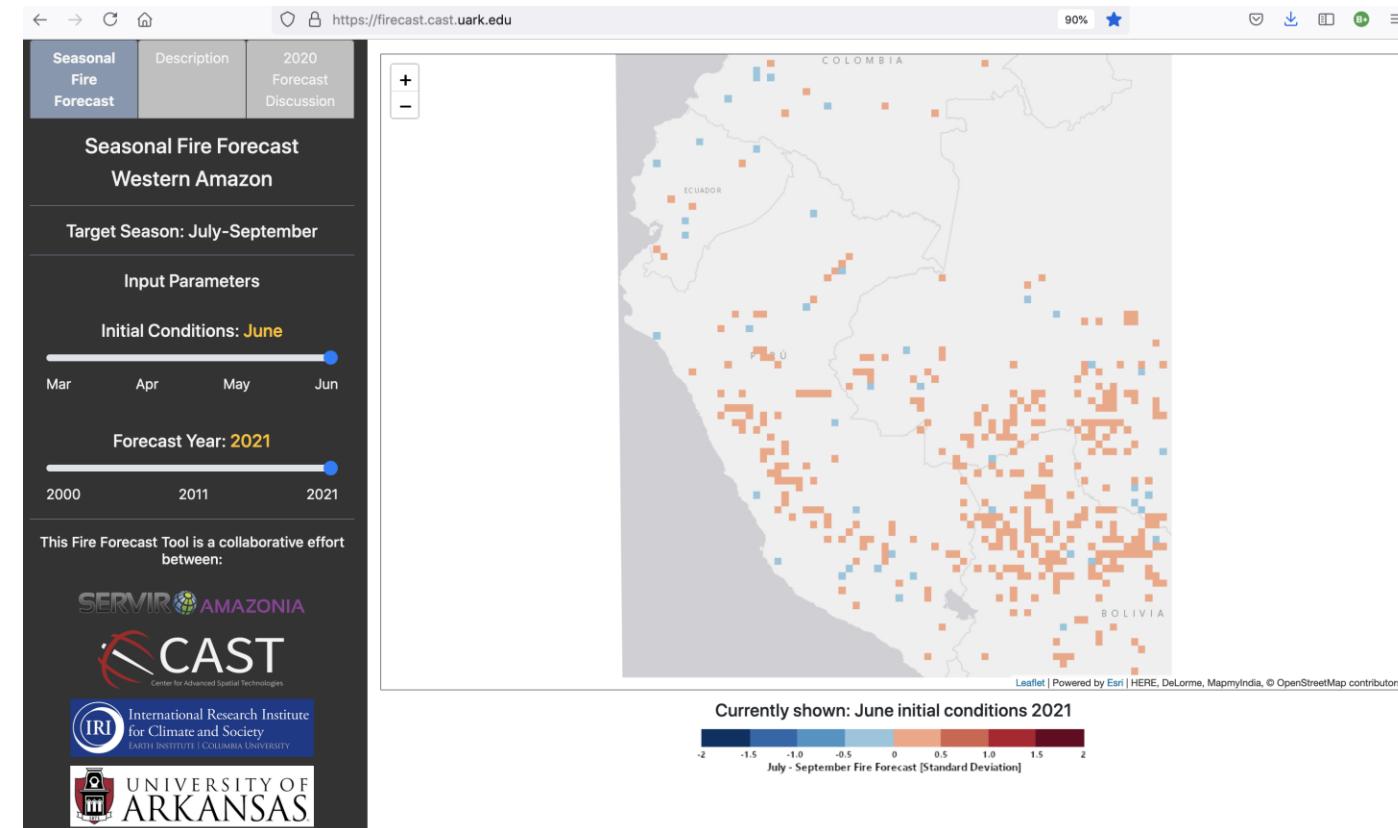
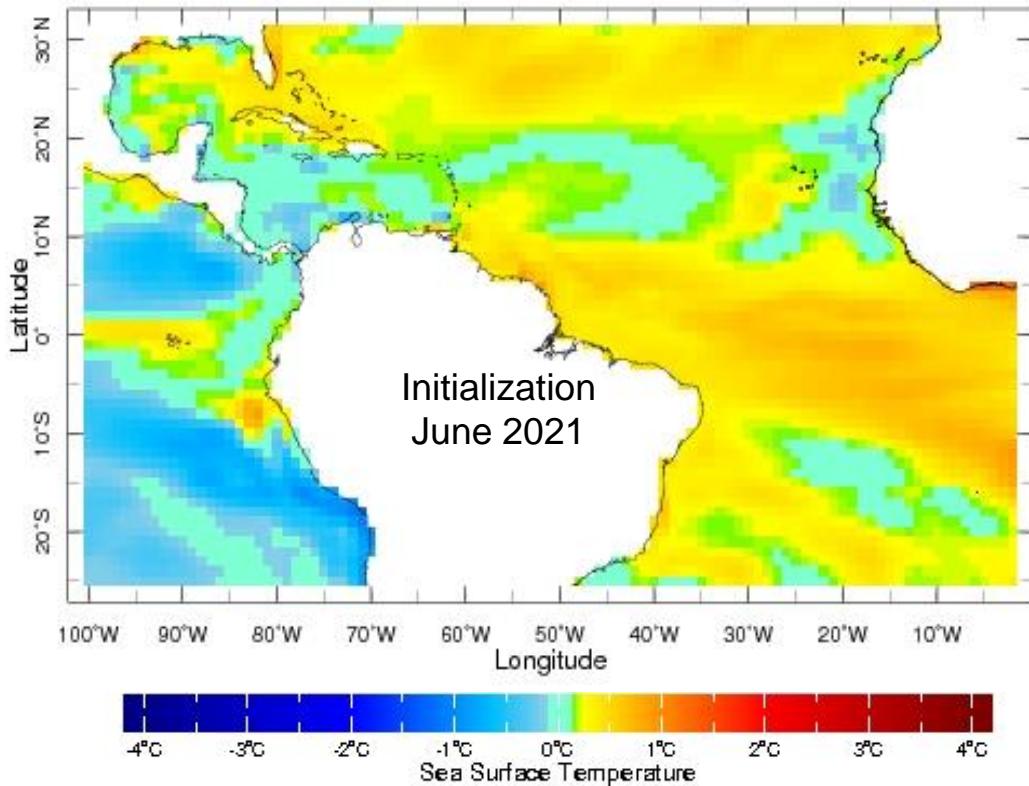
Fernandes, Katia, et al. "North Tropical Atlantic influence on western Amazon fire season variability." *Geophysical Research Letters* 38.12 (2011).

Fires and Sea Surface Temperature

Statistical Models Forecast

<https://firecast.cast.uark.edu/>

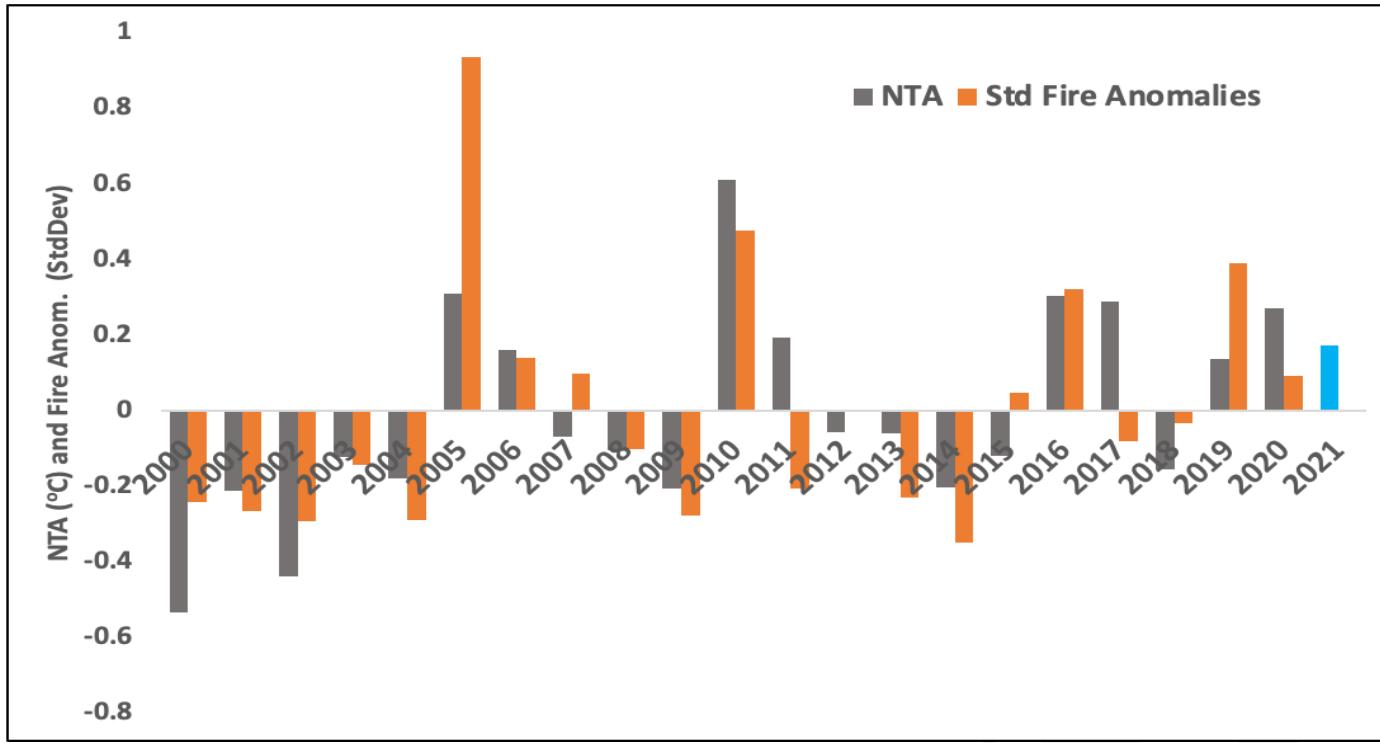
JAS SST Forecast



Fernandes, Katia, et al. "North Tropical Atlantic influence on western Amazon fire season variability." *Geophysical Research Letters* 38.12 (2011).

Fires and Sea Surface Temperature (SST)

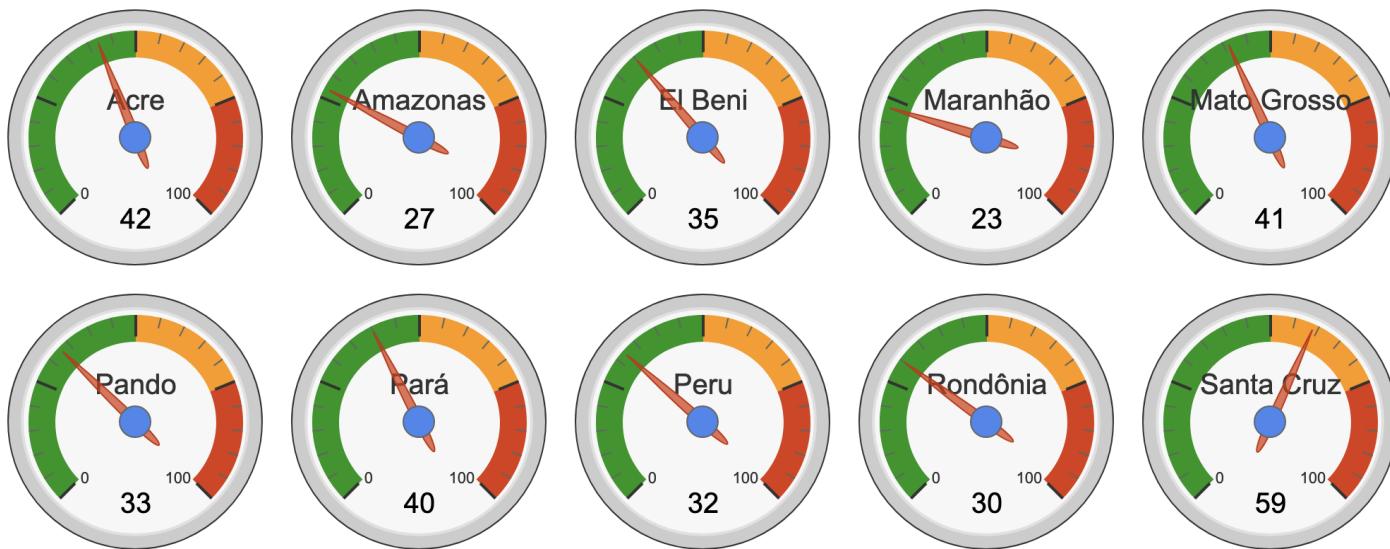
Statistical Models Forecast



Jul-Sep (JAS). SST anomalies in the North Tropical Atlantic active fires versus normalized anomalies in an area representative of the state of Acre in Brazil and Departament of Ucayali-Peru. Previous years NTA forecast in dark grey and active fires in orange. The blue bar represents the NTA forecast in JAS with June initialization.

Fires and Sea Surface Temperature

Statistical Models Forecast



Fire Severity Index Forecast (2021)

<https://www.ess.uci.edu/~amazonfirerisk/ForecastWeb/SAMFSS2021.html>

Chen, Yang, et al. "Forecasting fire season severity in South America using sea surface temperature anomalies." *Science* 334.6057 (2011): 787-791.

Current Climate Conditions

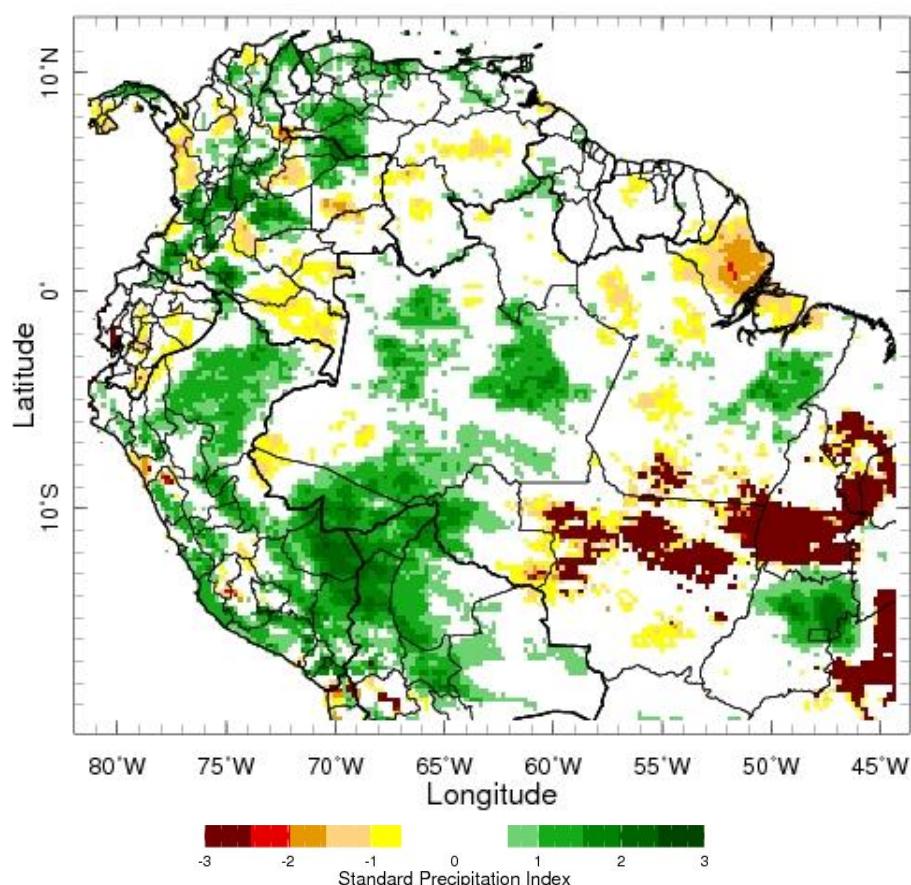
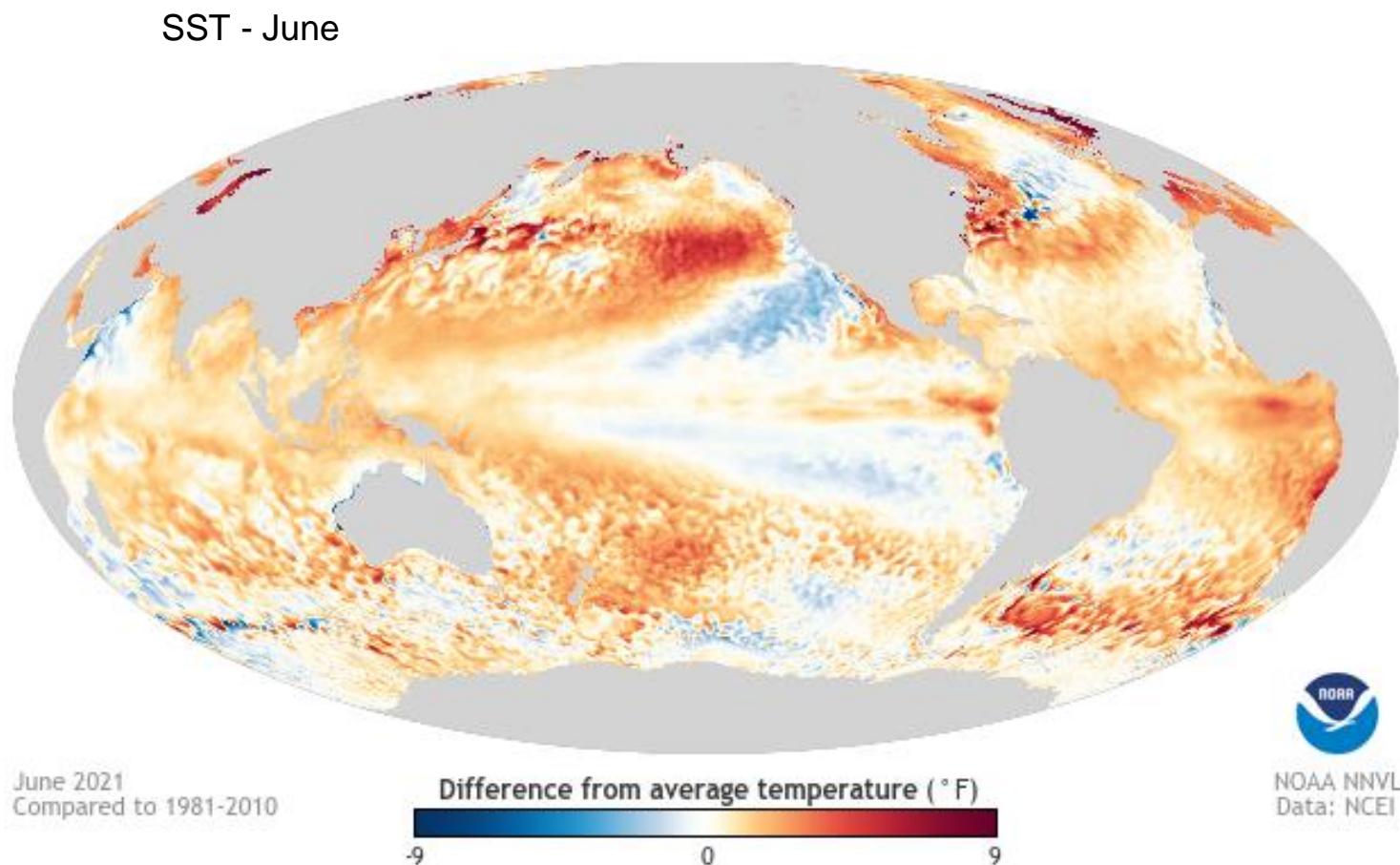


Fig. 5. Standardized Precipitation Index June 2021
(1-mo SPI).



SERVIR AMAZONIA



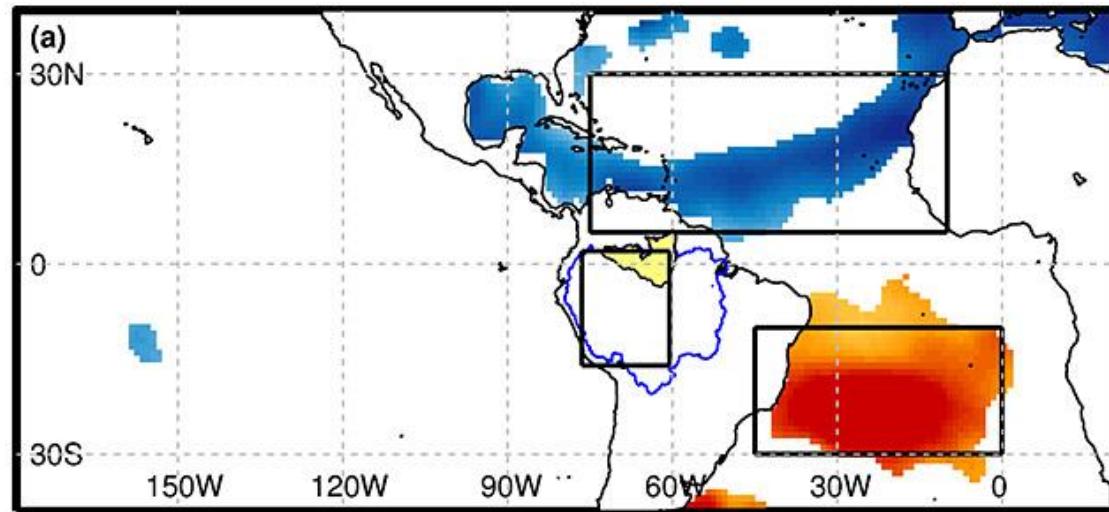
USAID
FROM THE AMERICAN PEOPLE



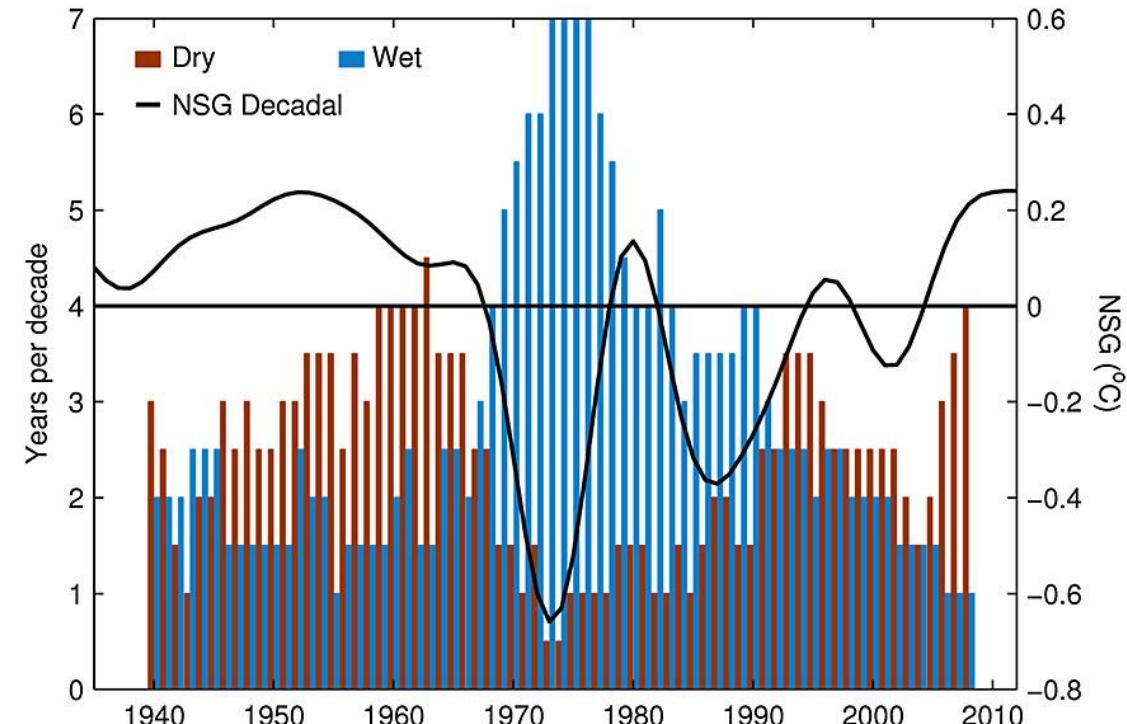
www.servir.ciat.cgiar.org

#SERVIRamazonia

Secas e variabilidade de long prazo (décadas)

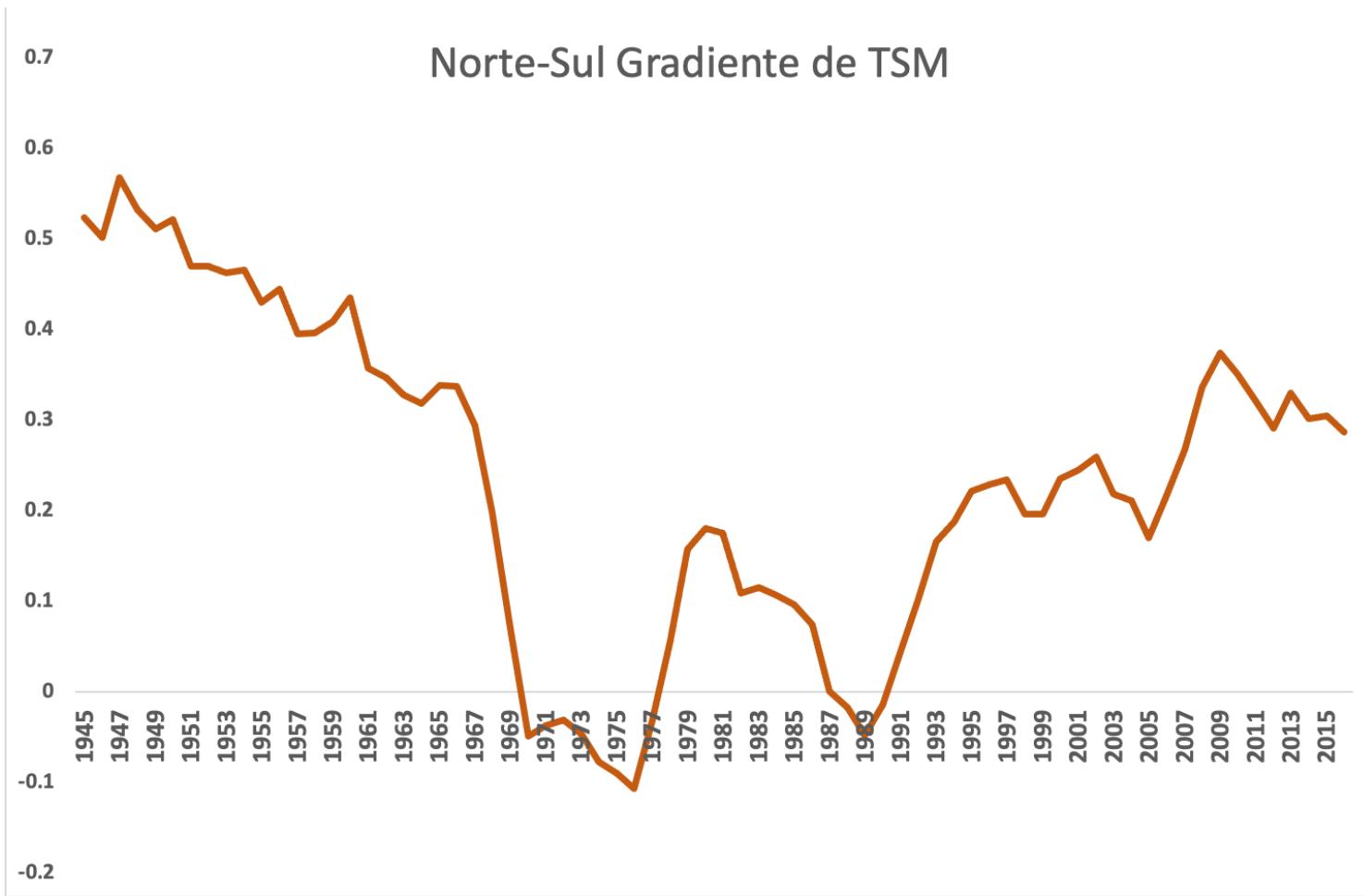


Relação entre a variabilidade decadal de precipitação em JAS no oeste da Amazônia e TSM



Relação entre a variabilidade decadal de precipitação em JAS no oeste da Amazônia e o gradiente norte-sul de TSM do Atlântico

Fernandes, Katia, et al. "Decadal covariability of Atlantic SSTs and western Amazon dry-season hydroclimate in observations and CMIP5 simulations." *Geophysical Research Letters* 42.16 (2015): 6793-6801.



Gradiente norte-sul de TSM no Atlântico. Média para Abril-Setembro entre 1940-2020

Fernandes, Katia, et al. "Decadal covariability of Atlantic SSTs and western Amazon dry-season hydroclimate in observations and CMIP5 simulations." *Geophysical Research Letters* 42.16 (2015): 6793-6801.

THE TECH

Fire Tracker App



Lucio Villa

Conservación Amazónica –
ACCA



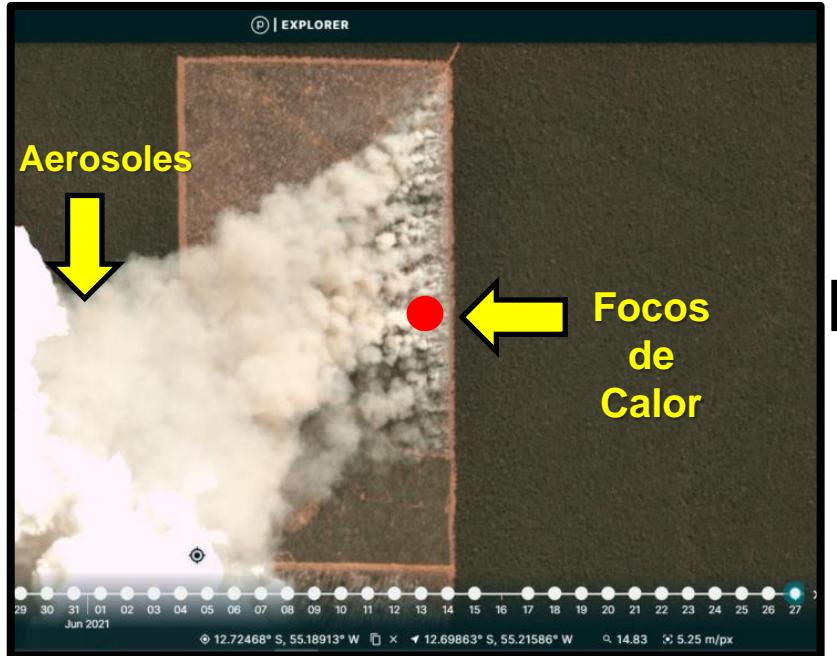
Base Map. "Major Amazon Fires 2021" layer, as visualized in the app.
Data: MAAP, Amazon Conservation.



Fire Tracker App

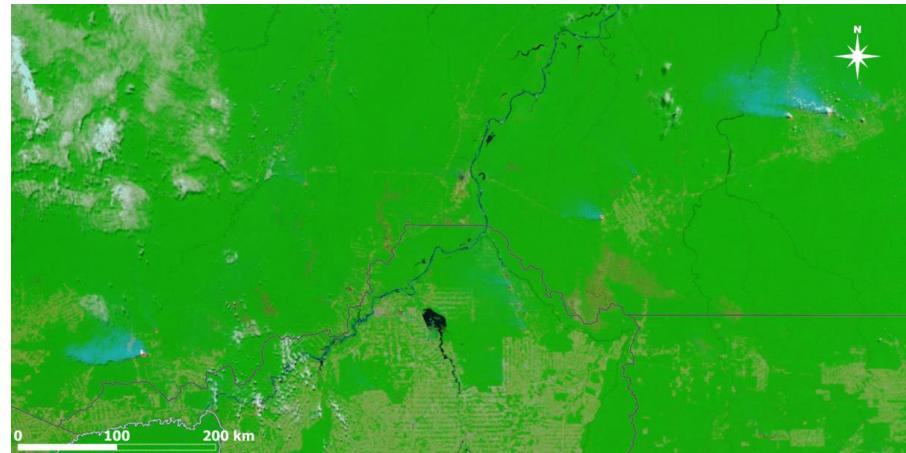
Lucio Villa - Senior GIS/RS Specialist

1. Introducción



Aerosoles

Focos de Calor



bit.ly/fire_app



CONSERVACIÓN
AMAZÓNICA
ACCA

1. Introducción

MODIS/ VIIRS

(Aqua/Terra + Suomi NPP/NOAA-20)

EARTH DATA
OPEN ACCESS FOR OPEN SCIENCE



Earth Observation Data • LANCE: NASA Near Real-Time Data and Imagery • Fire Information for Resource Management System (FIRMS)

Data
Disciplines:
Land

Data from FIRMS
Fire Map
Fire Alerts
Active Fire Data: SHP / TXT / KML
Web Services
Archive Download

FIRMS
FIRMS US/Canada
FIRMS Blog
Active Fire User Guides

Search datasets, news, articles, and information

ABOUT DATA COLLABORATE LEARN

Fire Information for Resource Management System (FIRMS)

Announcing FIRMS US/Canada: A Fire Map focused on the US and Canada. [Read more.](#)



Fires in Etosha National Park, Namibia - detected using imagery from VIIRS aboard the joint NASA/NOAA Suomi NPP satellite on October, 18, 2020.

TROPOMI

(Sentinel-5P)

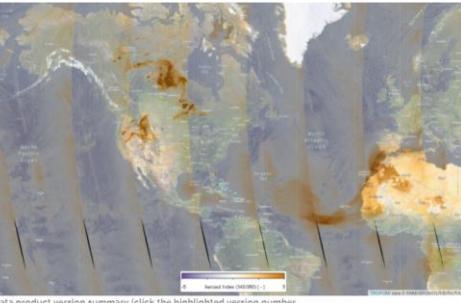
HOME MISSION STATUS DATA PRODUCTS MORE FEATURED RESULTS ABOUT

HOME > DATA PRODUCTS > LEVEL 2 > UV AEROSOL INDEX

DATA PRODUCTS
UV Aerosol Index

DESCRIPTION

The Aerosol Index (AI) is a well-established data product that has been calculated for several different satellite instruments spanning a period of more than 40 years. The SSP/TROPOMI aerosol index is referred to as the Ultraviolet Aerosol Index (UAI). The relatively simple calculation of the Aerosol Index is based on wavelength dependent changes in Rayleigh scattering in the UV spectral range where ozone absorption is very small. UAI can also be calculated in the presence of clouds so that daily, global coverage is possible. AI is ideal for tracking the evolution of episodic aerosol plumes from dust outbreaks, volcanic ash, and biomass burning. The figure below shows the SSP/TROPOMI UVAI (NRTI) on 10 July 2021. Saharan dust as well as biomass burning smoke plumes over the United States and Canada are most visible.



TOGGLE COLUMNS

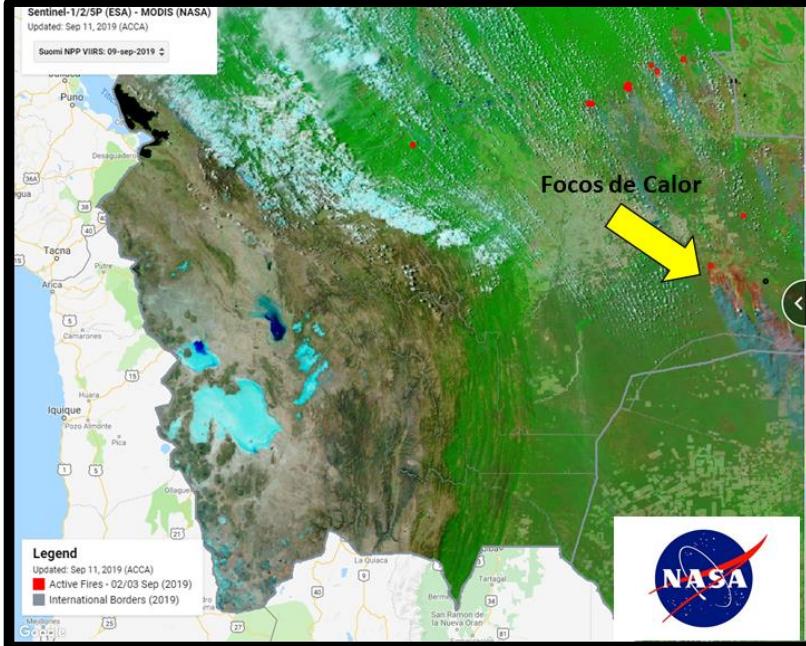
Data product version summary (click the highlighted version number for latest PRF).



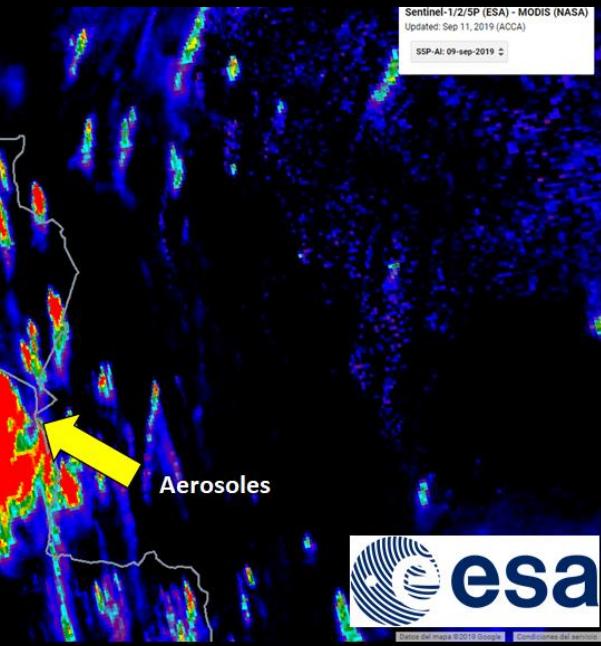
CONSERVACIÓN
AMAZÓNICA

1. Introducción

MODIS/VIIRS



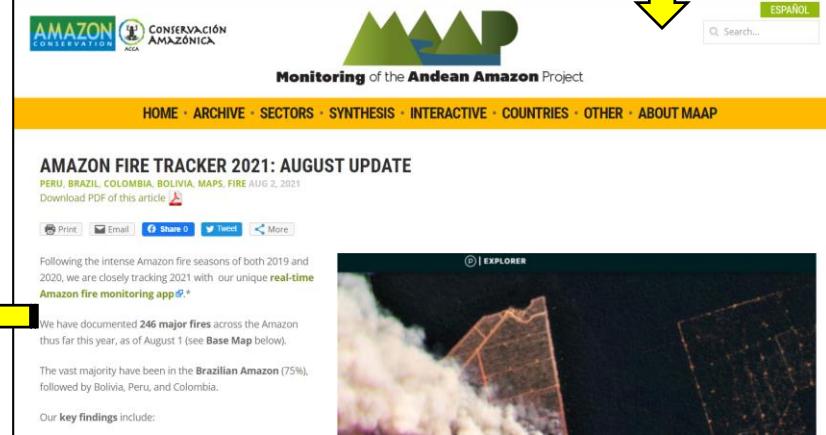
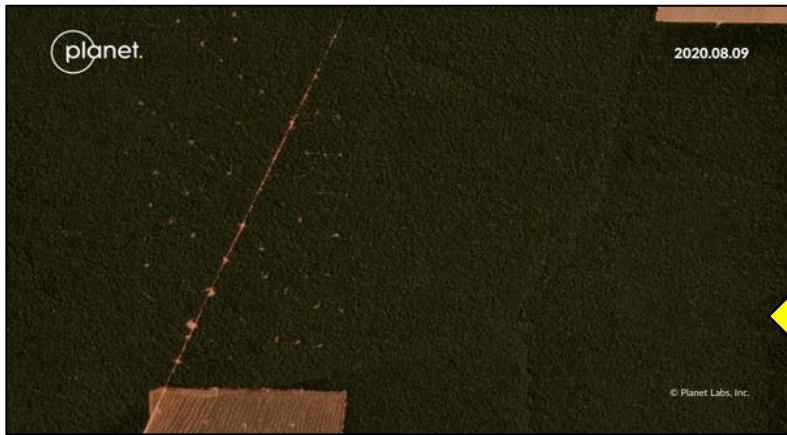
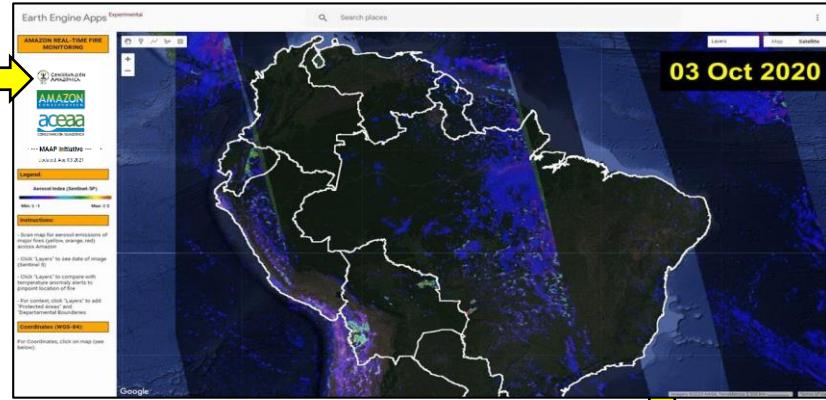
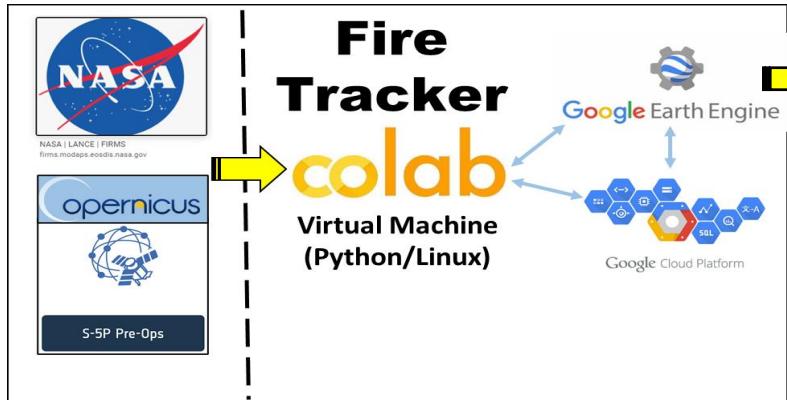
TROPOMI



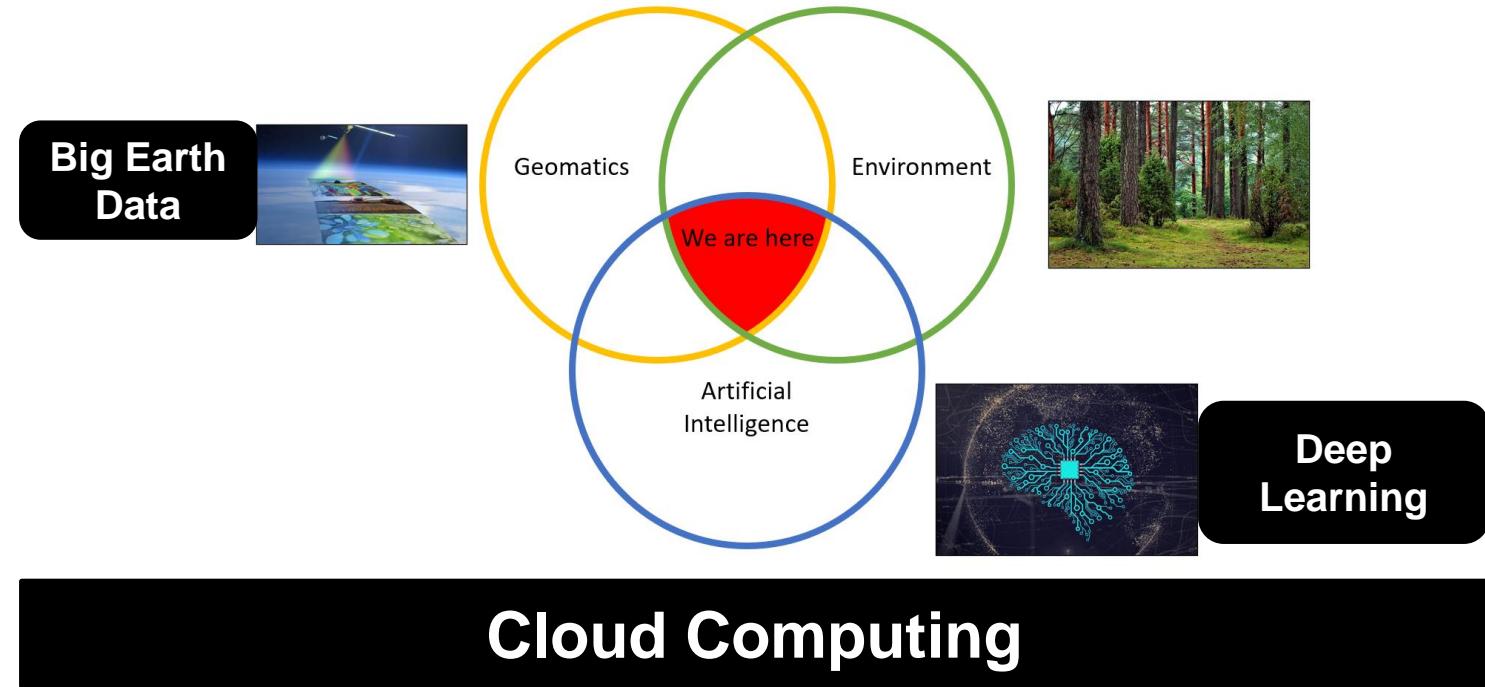
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AMAZÓNICA

ACCA

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2. Próximos Pasos





Conoce más en:



@ConservacionAmazonica



@amazonacca



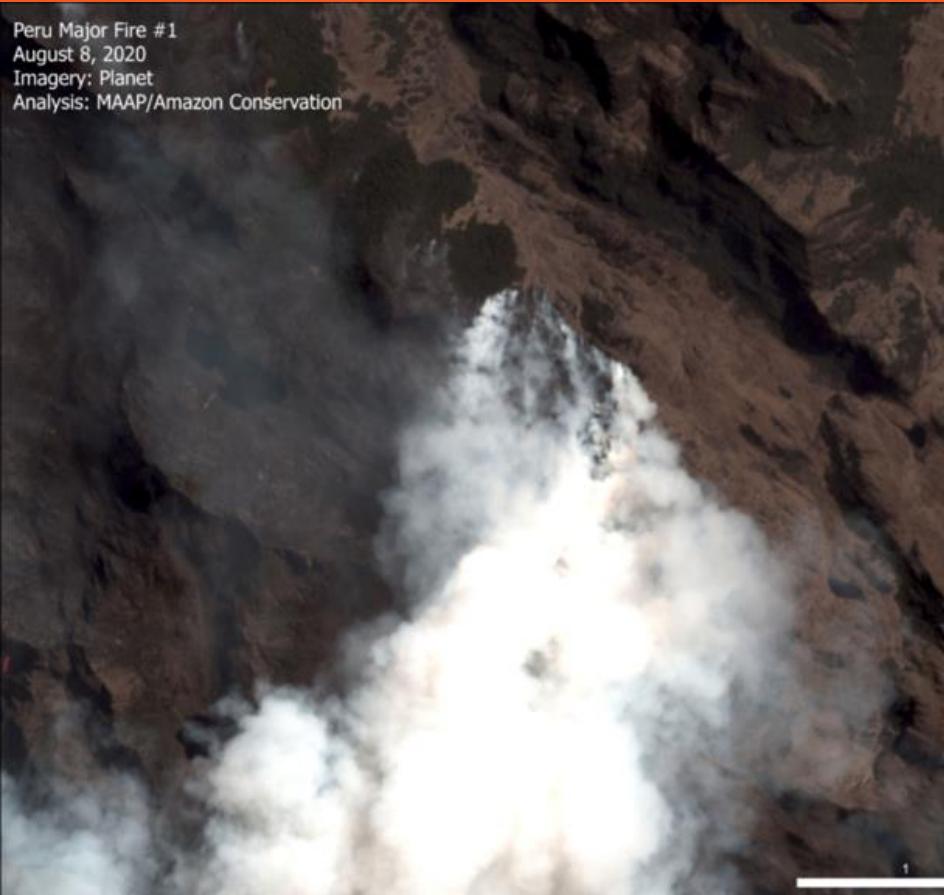
@conservacionamazonica

www.acca.org.pe

FIRE IN THE AMAZON:

What You Need to Know in 2021

Peru Major Fire #1
August 8, 2020
Imagery: Planet
Analysis: MAAP/Amazon Conservation



THE TECH

Amazon Dashboard



Brian Zutta

SERVIR-Amazonía Data
and Science Lead

WHAT IT ALL MEANS

Fighting Fires in the Amazon: What Can Be Done



**Dolors
Armenteras**
Universidad Nacional de
Colombia



Firefighter during the 2019 Amazon fires



Combatir incendios en la Amazonía: ¿Qué se puede hacer?

Dolors Armenteras

ECOLMOD - **Ecología del Paisaje y Modelación de Ecosistemas**

Profesora Titular, Departamento de Biología, Facultad de Ciencias

Universidad Nacional de Colombia

Incendios en la amazonía: Lo que necesita saber en 2021



An aerial photograph showing a patchwork of agricultural fields. The fields are organized into long, narrow rectangles of varying colors, likely representing different crops or stages of cultivation. The colors range from deep green to brown and tan. The fields are separated by thin, dark green strips of vegetation or paths. The overall pattern is a dense grid of agricultural land stretching towards the horizon.

DRIVERS

An aerial photograph showing a vast, uniform field of palm trees. The trees are planted in perfect, straight rows that stretch across the entire frame. The canopy of the palms is a dense green, with some yellowing or brown edges visible, particularly along the outer margins of the rows. A few small, thin red irrigation canals are visible, running parallel to the tree lines. The overall pattern is one of high agricultural organization and environmental homogeneity.

Monocultures



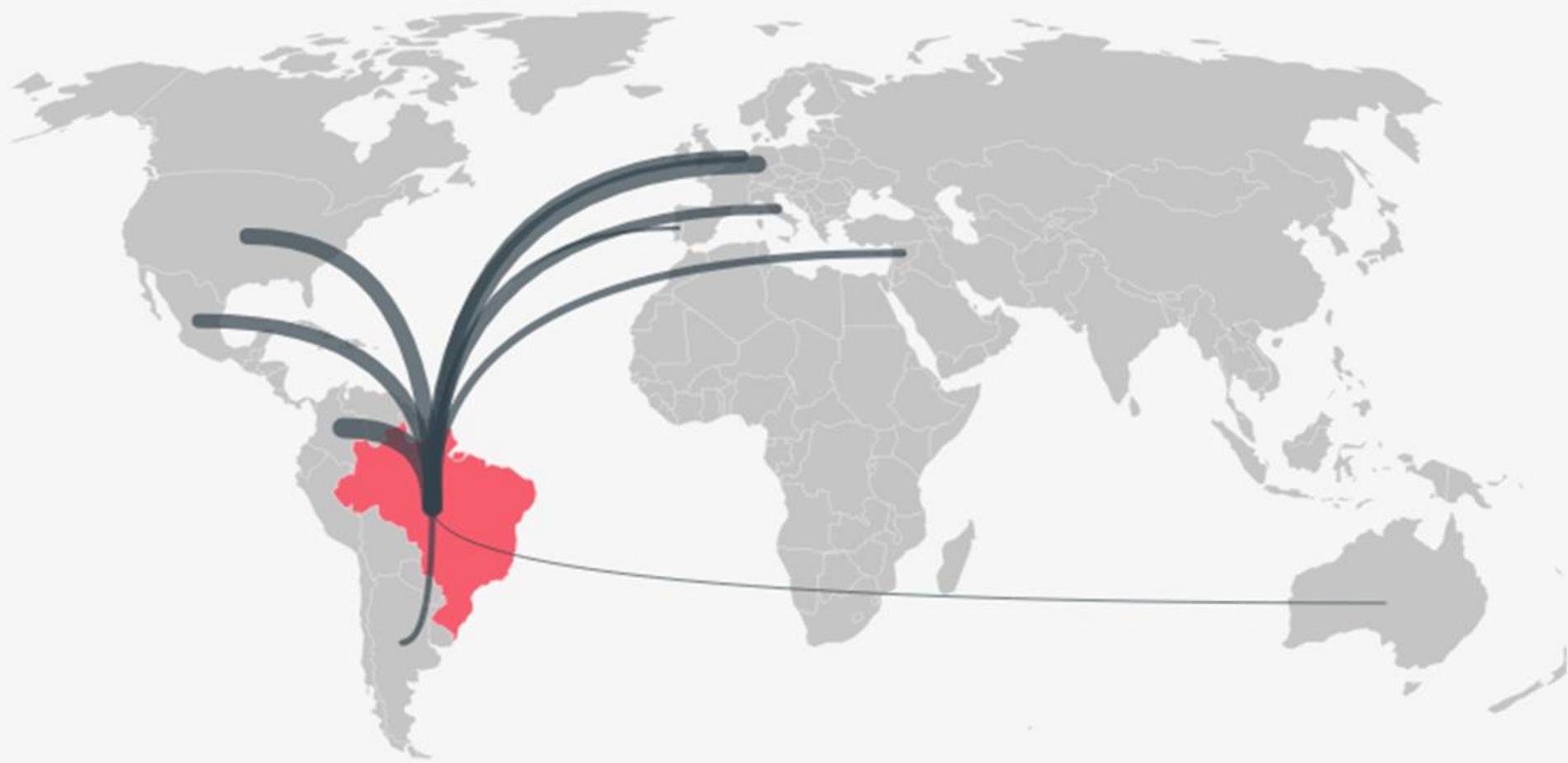
Featured **Beef** supply chains

<https://trase.earth/explore>

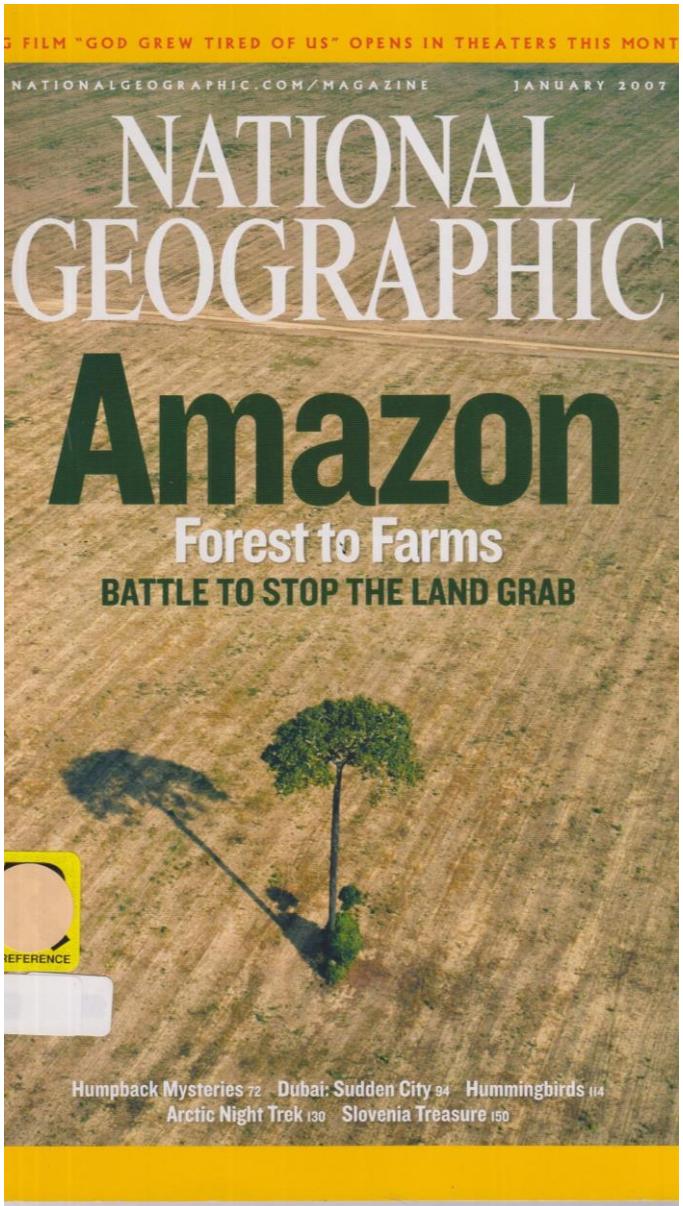


VOLUME 2018

1,412,813 t

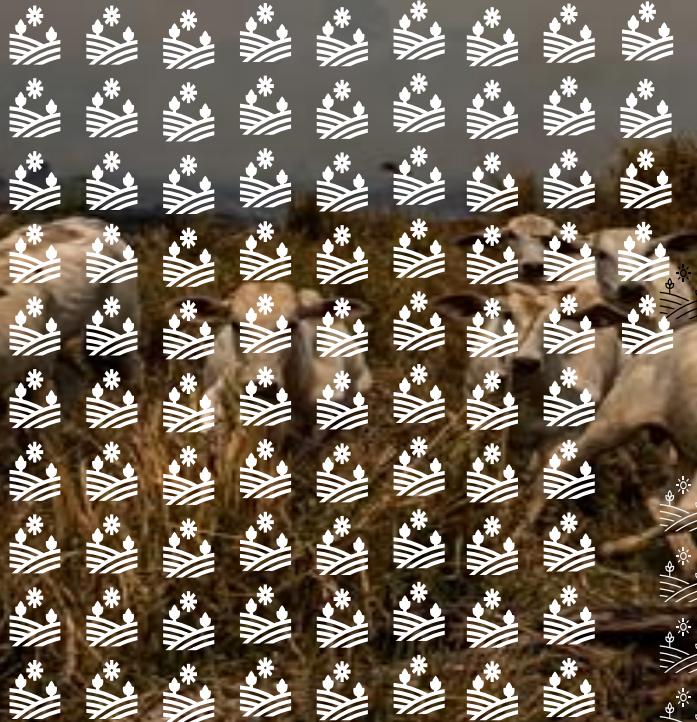


VOLUME 2017
89,980 t



LAND vs OWNERS

85%



1%



SEASONALITY and REGIONAL DIFFERENCES

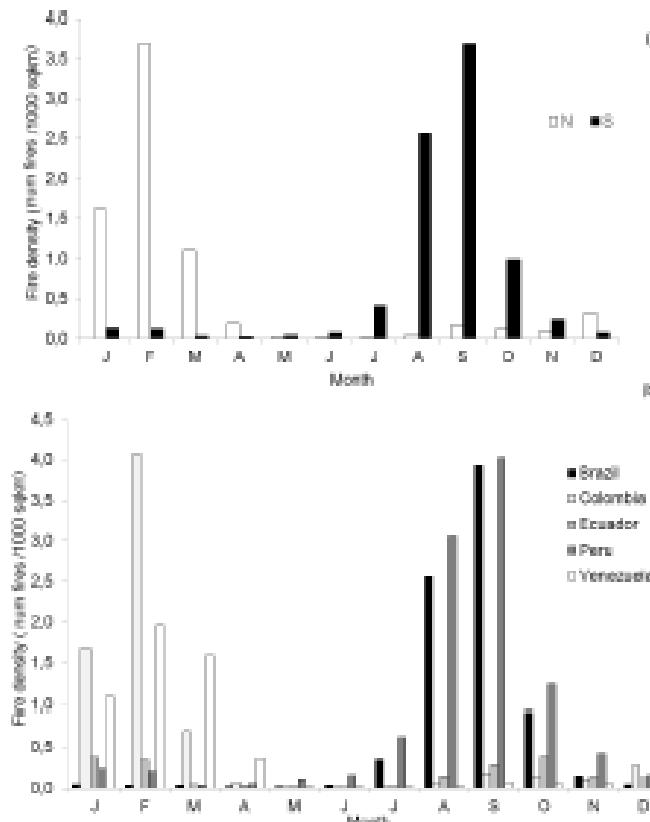
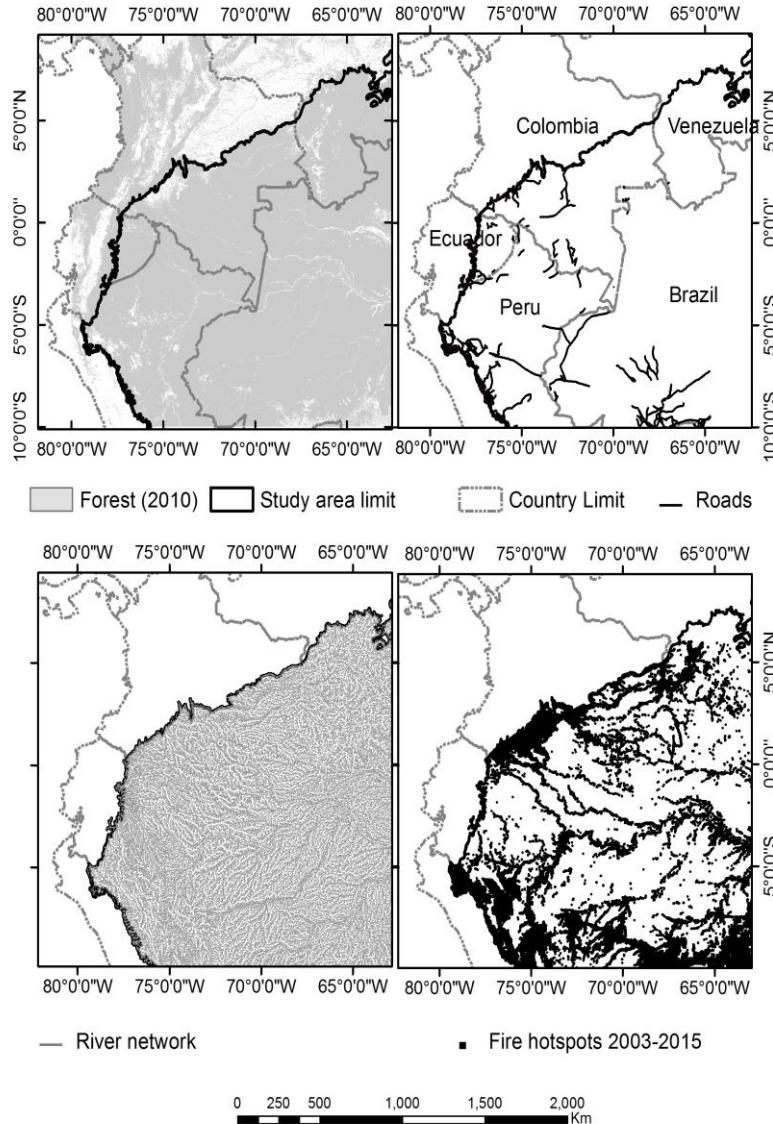


Figure 3. Monthly average satellite-detected active-fire density (number/1000 sq km) per latitudinal position (north, south) (a) and country (b).

- Roads increase deforestation ✓
- Rivers ✓
- Ecuador and Peru oil infrastructure
- Colombia pasture
- Venezuela agriculture

Colombia most fires closest to the forest edge and less agricultural development

Country particularities

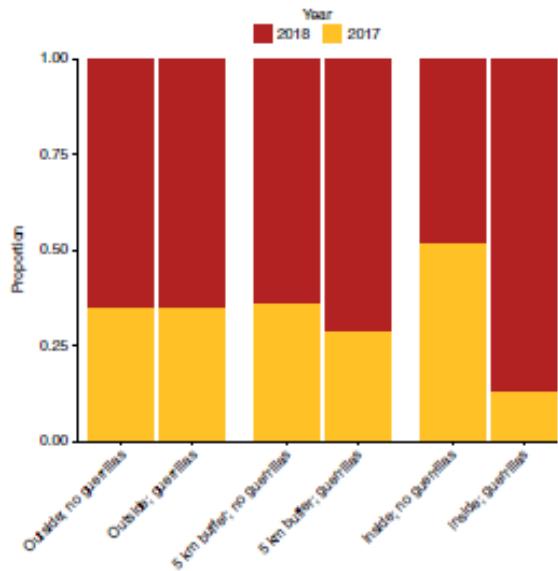
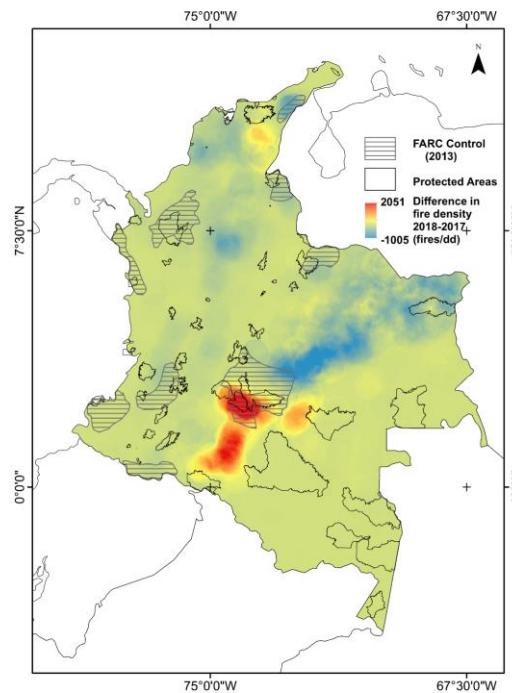
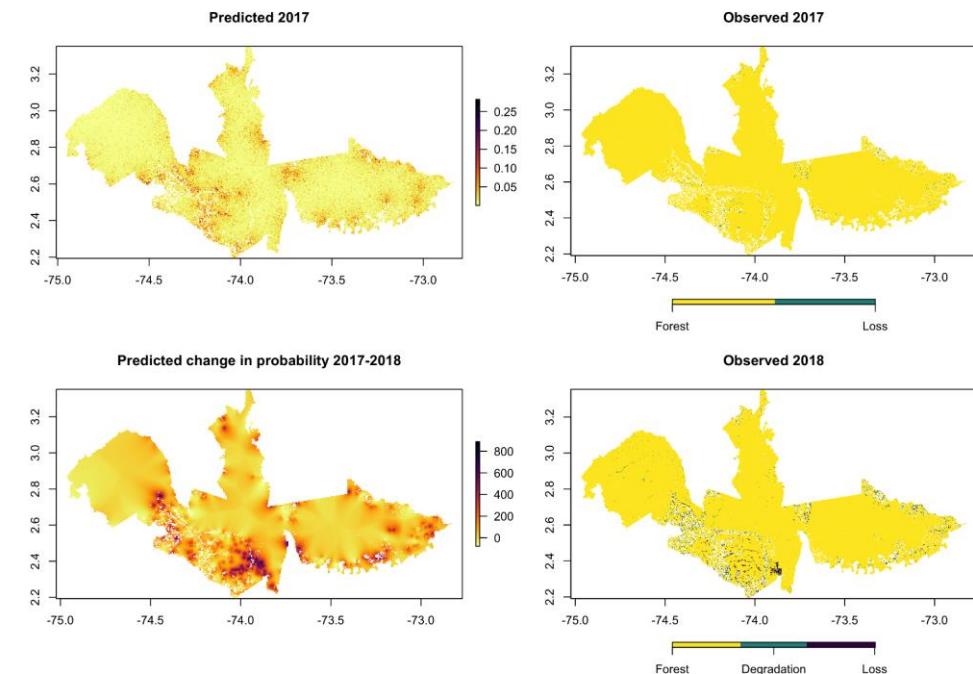


Fig. 1 | Fire occurrence in Colombia. Fires were detected over January and February of each year by the Moderate Resolution Imaging Spectroradiometer (see Methods).



Fires in protected areas reveal unforeseen costs of Colombian peace

Jólores Armenteras^{1*}, Laura Schneider² and Liliana María Dávalos^{3,4}

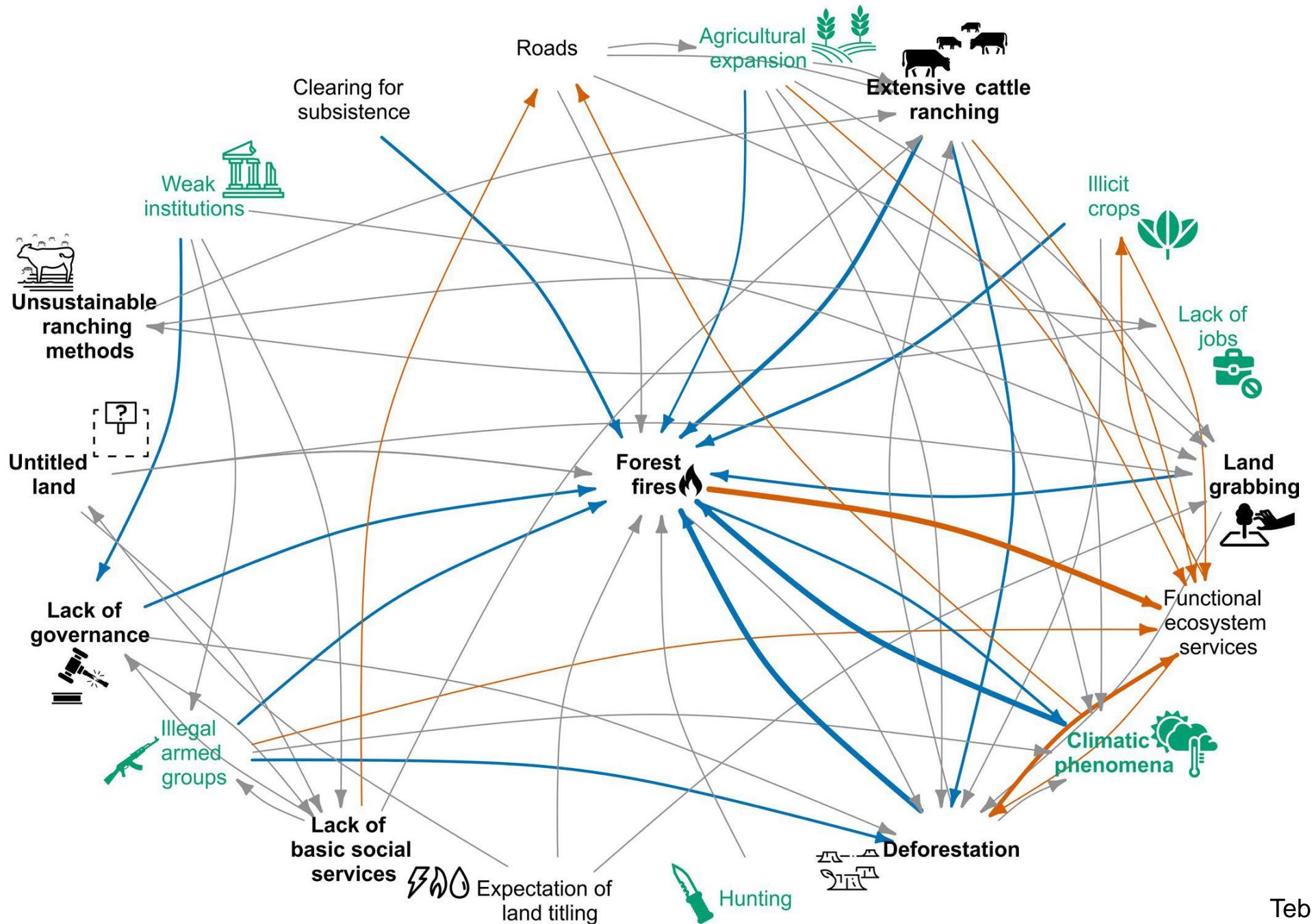


132km² deforestation 2018

LOCAL COMMUNITIES AND STAKEHOLDERS



Challenge: participatory approaches



SOLUTIONS?





Land distribution



Land distribution



**Rights indigenous and
traditional communities**



Land distribution



Rights indigenous and
traditional communities



**Traditional Knowledge and
practices**



Land distribution



Traditional Knowledge and practices



Rights indigenous and traditional communities

≡ EL PAÍS  EN FUTURO.  HO LA 

EN COLABORACIÓN CON 

PLANETA FUTURO. 

EN PRIMERA LÍNEA · RED DE EXPERTOS · QUÉ MUEVE A... · DESARROLLO EN ÁFRICA · BLOGS · CIUDADES SOSTENIBLES



Indígenas que participan en las misiones de vigilancia forestal comunitaria encuentran áreas deforestadas próximas al territorio Copal Uco. PEDRO SIFUENTES VIGAY



**Sustainable activities amd
Innovative bioeconomy**



Sustainable activities and
Innovative bioeconomy



**Consumers acces to
certification measures**



**Sustainable activities and
Innovative bioeconomy**



**Consumers acces to
certification measures**



Sustainable infrastructure



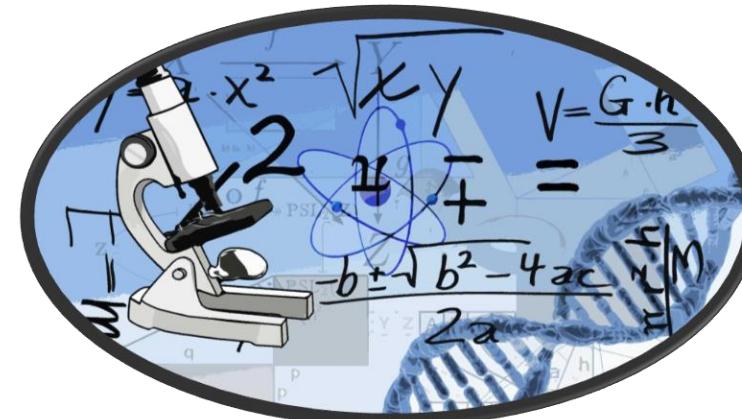
Sustainable activities amd
Innovative bioeconomy



Consumers acces to
certification measures



Sustainable infrastructure



Sound scientific principles

Experiencia en Colombia: Manejo Integral del Fuego 2016- hoy



Filing Forest FIRES BILL

3 SEPT 2019

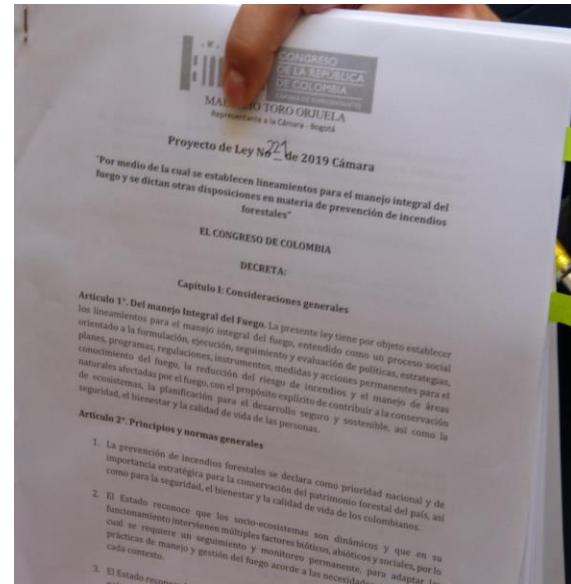
The screenshot shows the official website of the Colombian Chamber of Representatives. At the top, there are links for 'Mapa Del Sitio', 'Preguntas Frecuentes', 'Versión Anterior Página Web', and social media icons. The header includes the 'CONGRESO DE LA REPÚBLICA DE COLOMBIA' logo and 'CÁMARA DE REPRESENTANTES'. Below the header, there's a search bar labeled 'SEÑALE EN VIVO' and a magnifying glass icon. A navigation menu at the bottom of the header includes 'Inicio', 'La Cámara', 'Proceso Y Trámite Legislativo', 'Comisiones', 'Representantes', 'Prensa', 'Directores', 'Contratación', 'Servicios Al Ciudadano', and 'Transparencia'. The main content area has a green banner with the title 'Propuesta para el manejo integral del fuego en Colombia' and its English translation 'Proposal for an integrated fire management in Colombia'. Below the banner, there are names and contact information for the proposal's authors: María Constanza Meza Elizalde, Tania Marisol González Delgado, and Dolores Armenteras Pasqual. Logos for USAID, The National Academies of Sciences, Engineering, and Medicine, University of Colorado Boulder, and the National University of Colombia are displayed. The page also features sections for 'Senado', 'Origen: Cámara', 'Contenido', 'Observaciones', and 'Objeto de proyecto'. At the bottom, there are logos for various government entities like 'Gobierno en línea', 'Presidencia de la República', 'Ministerio de Comercio', 'Ministerio de Hacienda y Crédito Público', 'CongresoVisible.org', 'Hora Legal Colombiana', and 'URNA DE CRISTAL'.



Propuesta para el manejo integral del fuego en Colombia

Proposal for an integrated fire management in Colombia

Financian:
USAID | The National Academies of Sciences, Engineering, and Medicine | University of Colorado Boulder | FINANCIADA POR EL ESTADO NACIONAL DE COLOMBIA



Government-Political leadership
Private sector (responsability and innovation)
Financial organizations (investments)
Civil society organizations
Indigenous groups
Community leaders, researchers, activists, conservation and development organization

Proyecto de Ley 221 del 2019



Comprenden la función del fuego
en los ecosistemas

Desarrollar conocimientos,
capacidades y tecnología para
aplicar el fuego de forma segura
donde sea necesario.

Reducir las
igniciones de
origen humano

Vincular
programas a
nivel
comunitario

Incorporar
información
científica en el
manejo del
fuego

Educación
Ambiental
/Incentivos

Introduzca su logotipo o su
nombre aquí



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 kütös dankie
 dhanyavad
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 bayarlaata
 gracie
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YouTube ECOLMOD UNAL



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Ecolmod_UN



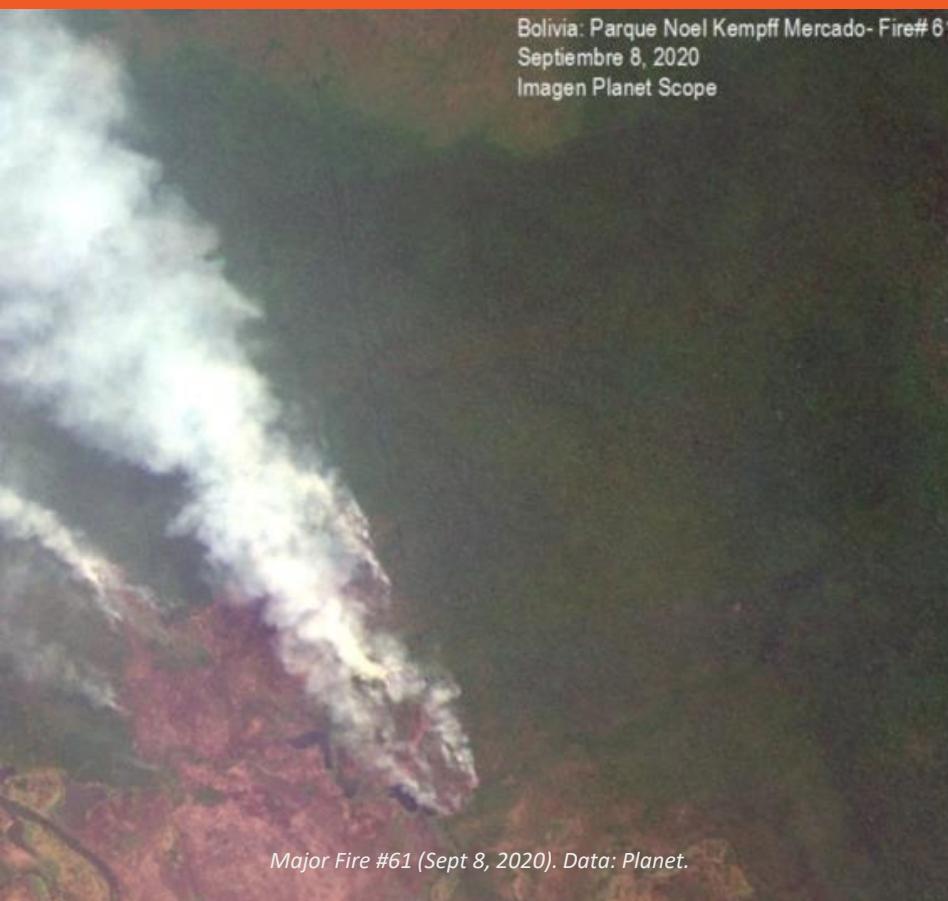
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ecolmod



darmenterasp@unal.edu.co
ecolmod_fcbog@unal.edu.co



WHAT IT ALL MEANS

Applying Technology to Fight Forest Fires: How Real-Time Monitoring in Bolivia Can Be Used to Help Make Decisions on Firefighting Efforts



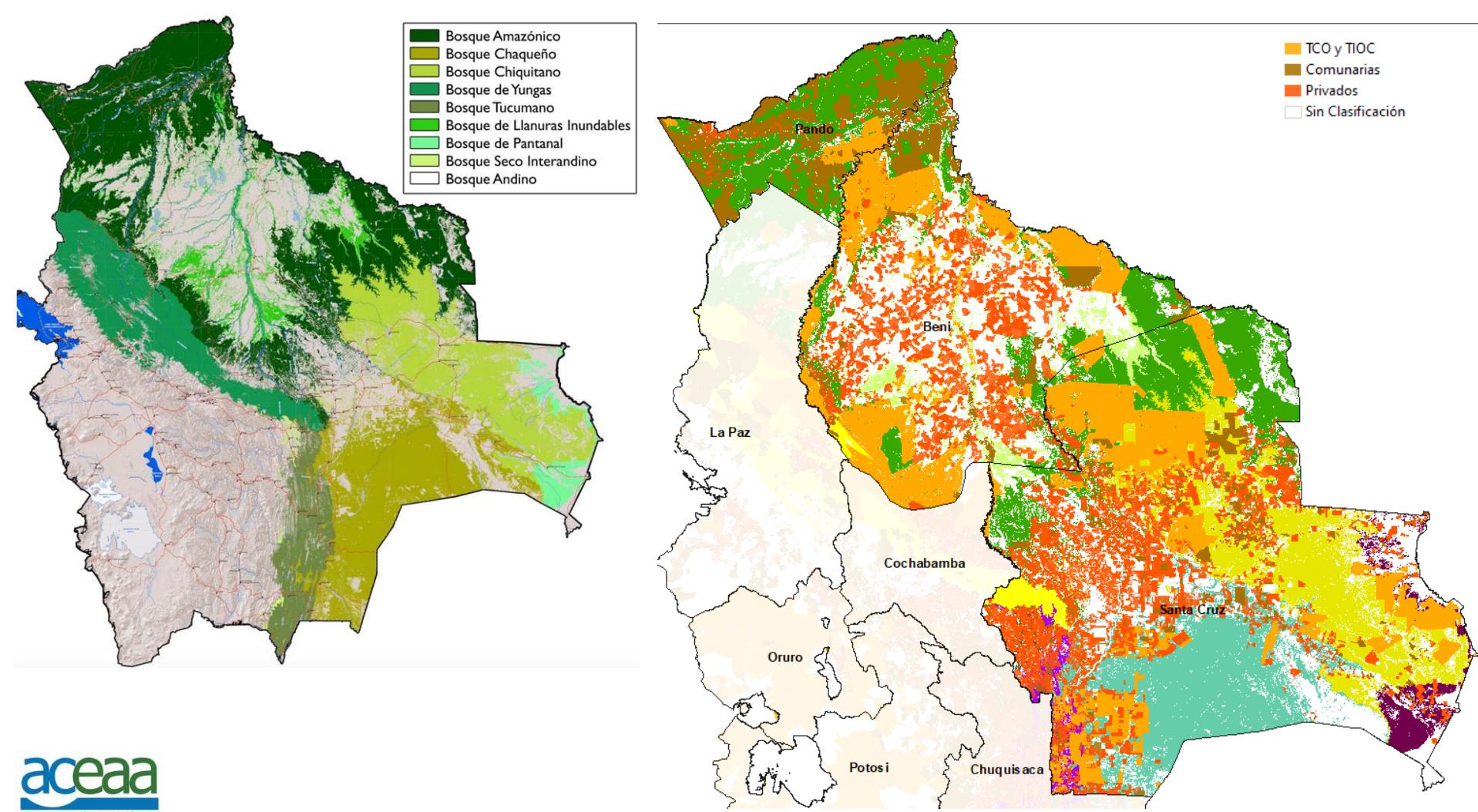
Marcos Terán

Conservación Amazónica – ACEAA

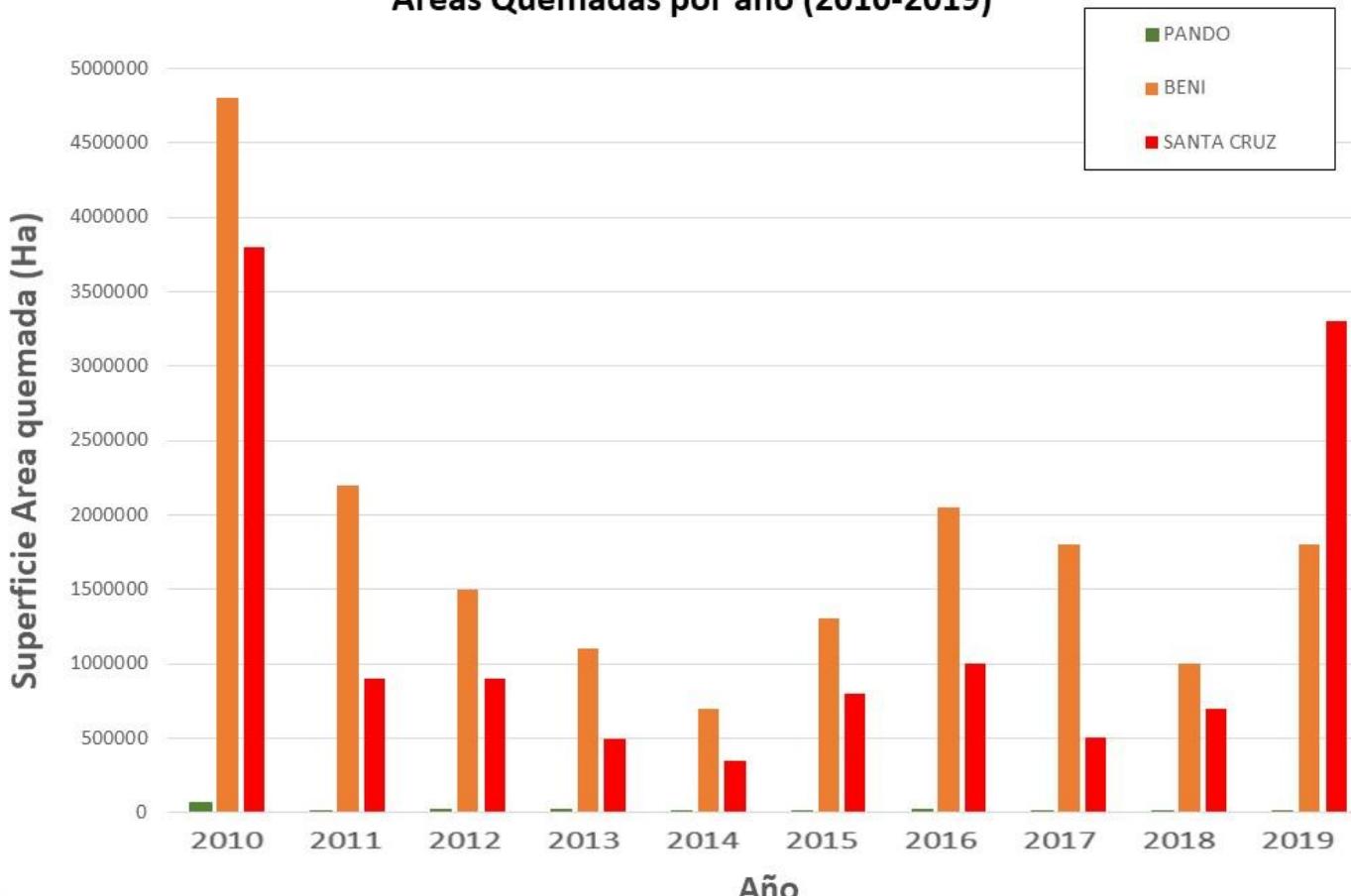
Applying Technology to Fight Forest Fires: How Real-Time Monitoring in Bolivia Can Be Used to Help Make Decisions on Firefighting Efforts

M.F. Terán, A. Ariñez

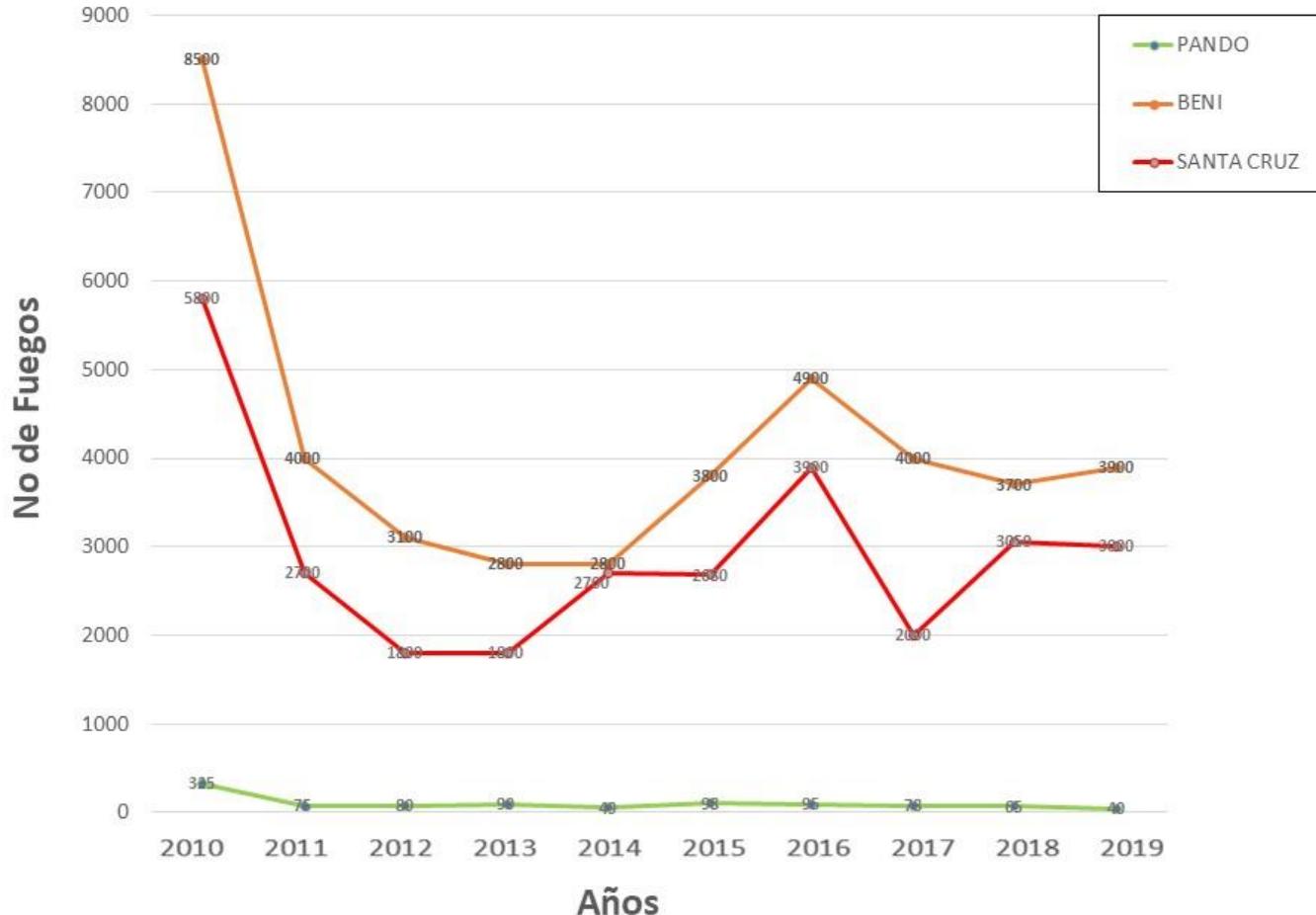


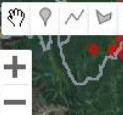


Areas Quemadas por año (2010-2019)



Número de fuegos identificados (2010-2019)





--- MAAP Initiative ---

Updated: Aug 02 2021

Legend:

Aerosol Index (Sentinel-5P)

Min: ≤ -1 Max: ≥ 3

Instructions:

- Scan map for aerosol emissions of major fires (yellow, orange, red) across Amazon.

- Click "Layers" to see date of image (Sentinel 5)

- Click "Layers" to compare with temperature anomaly alerts to pinpoint location of fire

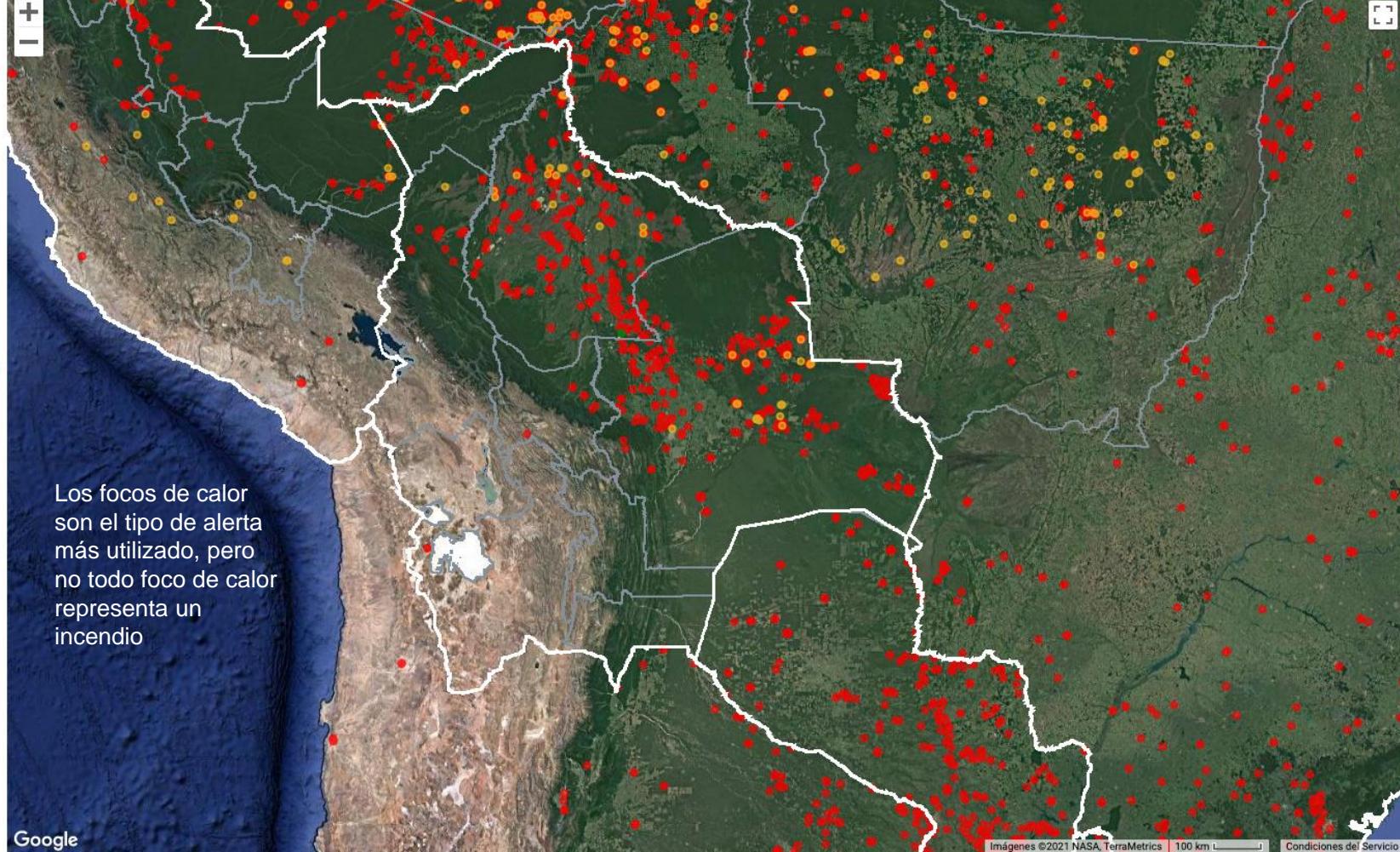
- For context, click "Layers" to add "Protected Areas" and "Departmental Boundaries"

Coordinates (WGS-84):

For Coordinates, click on map (see below):

lon: -64.22 lat: -15.71

Google





--- MAAP Initiative ---

Updated: Aug 02 2021

Legend:

Aerosol Index (Sentinel-5P)



Instructions:

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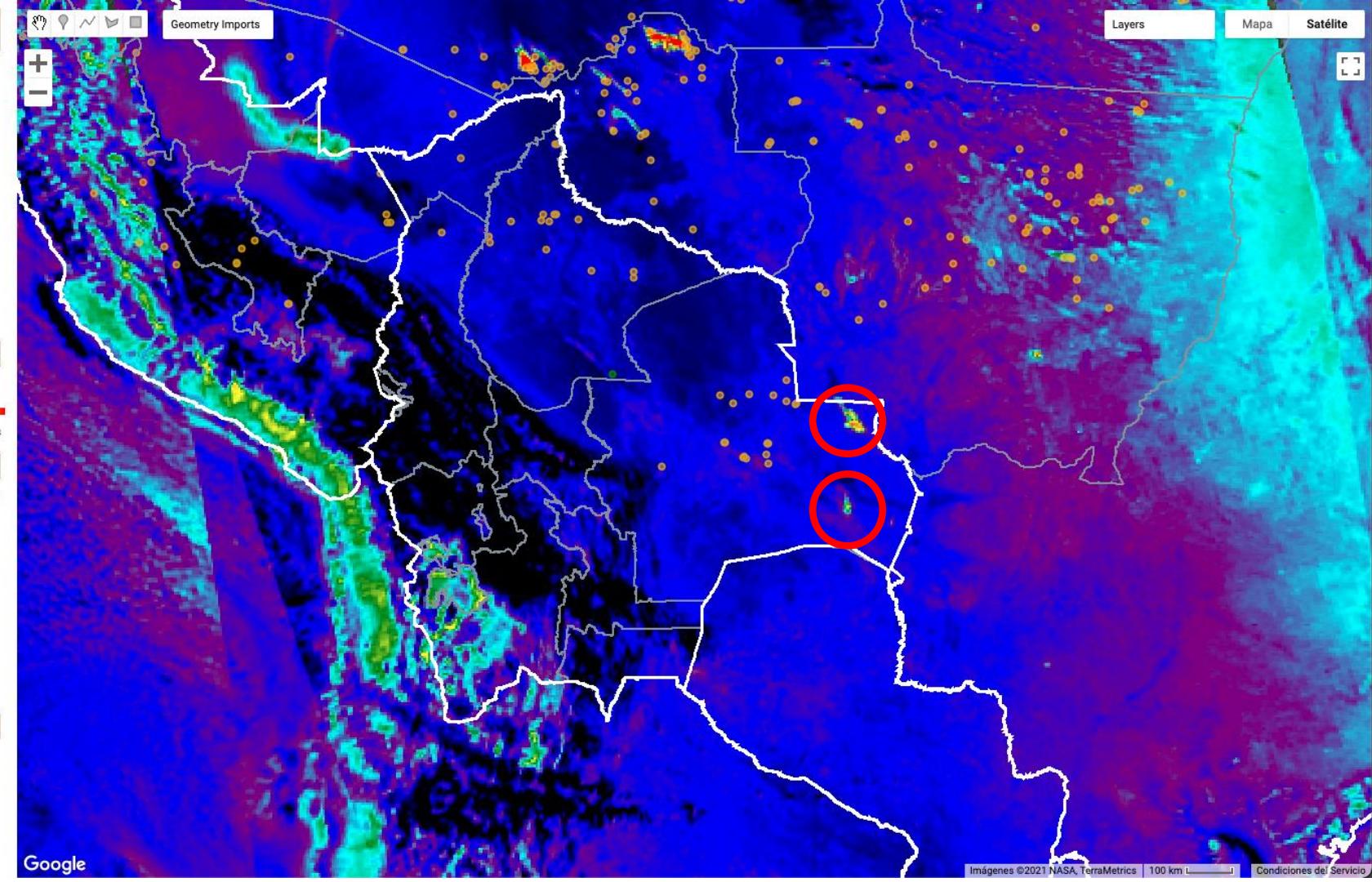
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Coordinates (WGS-84):

For Coordinates, click on map (see below):

lon: -64.22 lat: -15.71



Google

Imágenes ©2021 NASA, TerraMetrics

100 km

Condiciones del Servicio

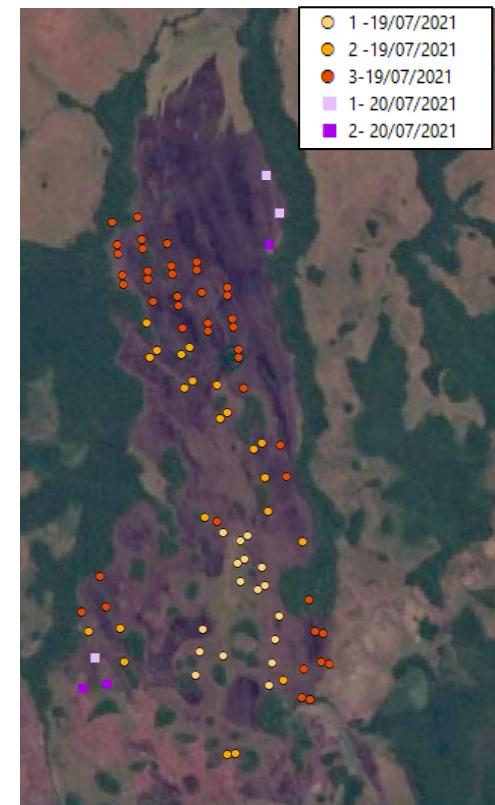
SEGUIMIENTO FUEGO EN UN AREA DE SABANA DEL DEPARTAMENTO DEL BENI



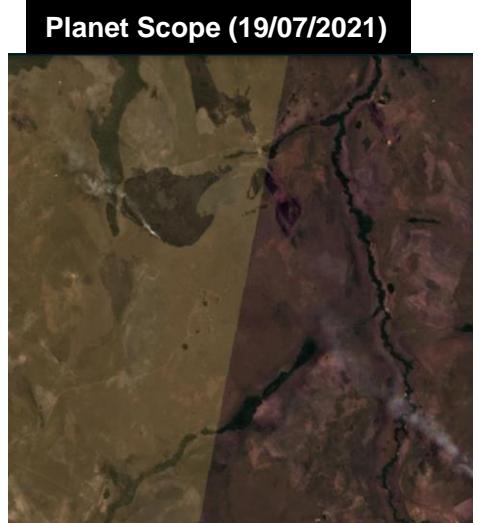
Fuego activo detectado



Área quemada : 4540 Ha



Alertas de fuego en 2 fechas (19 y 20 de julio), con mayor intensidad el primer día



El uso de tecnología e información en tiempo real permite:

- Generar información para acciones de prevención y combate a incendios.
- Contar con los insumos necesarios para establecer estrategias diferenciadas a corto, mediano y largo plazo.

La cooperación entre los diferentes niveles de gobierno y los sistemas de monitoreo operados por Sociedad Civil es fundamental para el desarrollo de acciones de prevención y combate efectivas, dentro de la normativa nacional vigente





QUESTION AND ANSWER SESSION



Matt Finer

Amazon Conservation



Brian Zutta

SERVIR-Amazonía



Kátia Fernandes

University of Arkansas,
SERVIR-Amazonía



Dolors Armenteras

Universidad Nacional de
Colombia



Lucio Villa

Conservación Amazónica –
ACCA



Marcos Terán

Conservación Amazónica –
ACEAA

Closing Remarks



Manuel Pulgar Vidal

Leader of the Climate & Energy
Global Practice at the World Wild
Fund for Nature International



2021 Brazilian Amazon Fire #2. Mato Grosso. Data: MAAP, Planet.



FIRES IN THE AMAZON:

What You Need to Know in 2021



August 4, 2021



12:00 p.m. EST / 11 am Peru

Thank you for attending!

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AMAZÓNICA**

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**UNIVERSITY OF
ARKANSAS**

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NACIONAL
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