

# Application of Forest Fire Danger Prediction System of Mexico in decision making

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# Forest situation in Mexico



**MEDIO AMBIENTE**

SECRETARÍA DE MEDIO AMBIENTE Y RECURSOS NATURALES



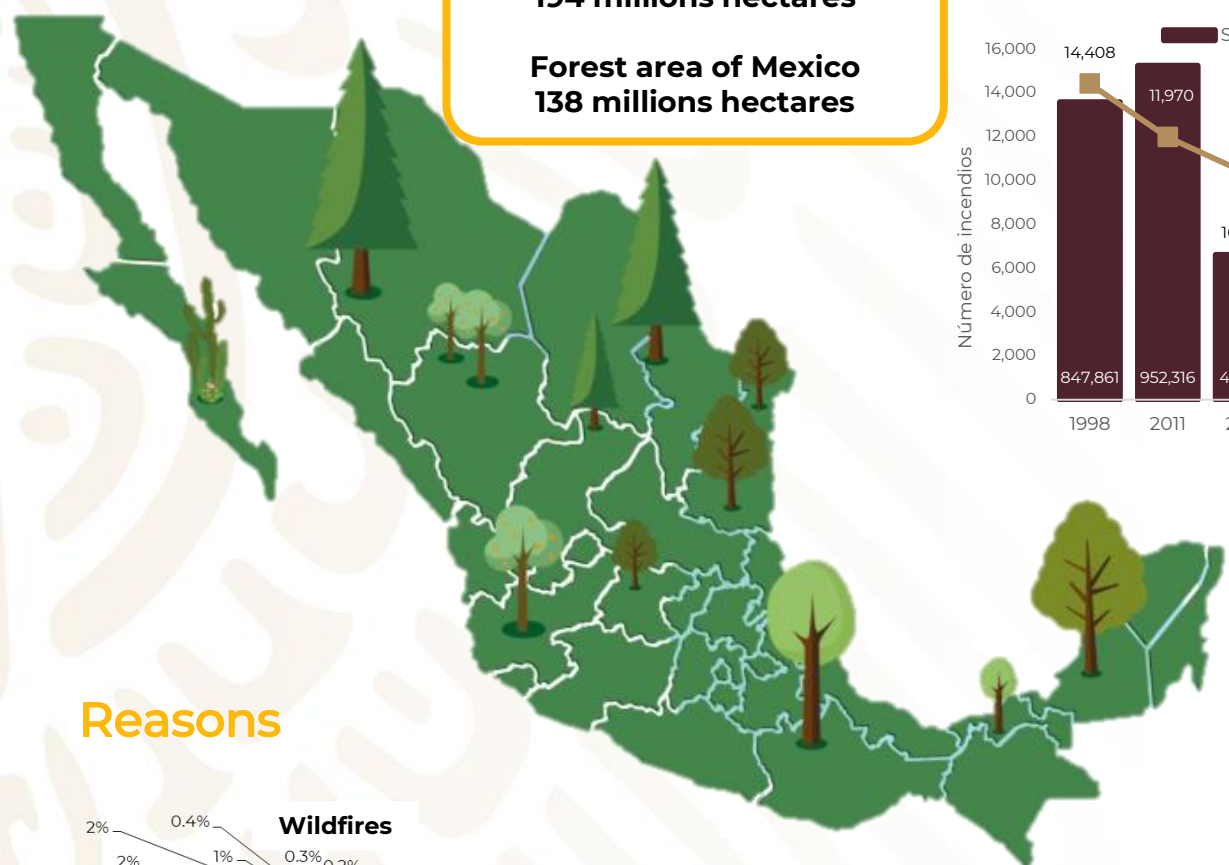
**CONAFOR**

COMISIÓN NACIONAL FORESTAL

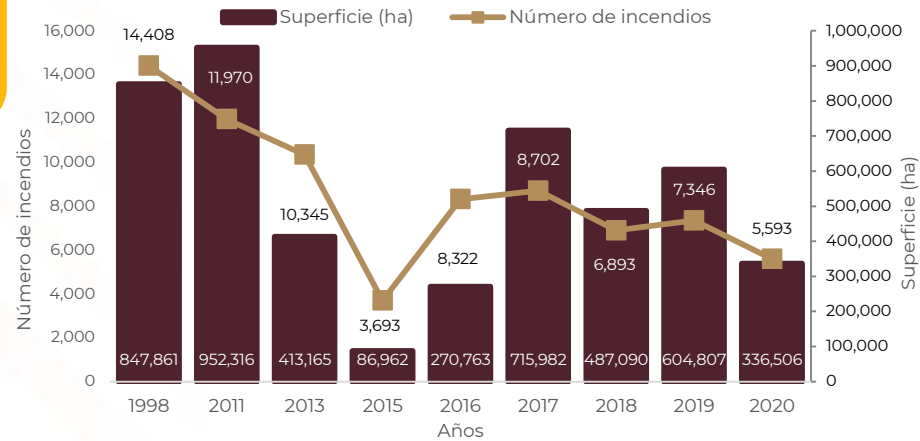


**Area of Mexico**  
194 millones hectares

**Forest area of Mexico**  
138 millones hectares



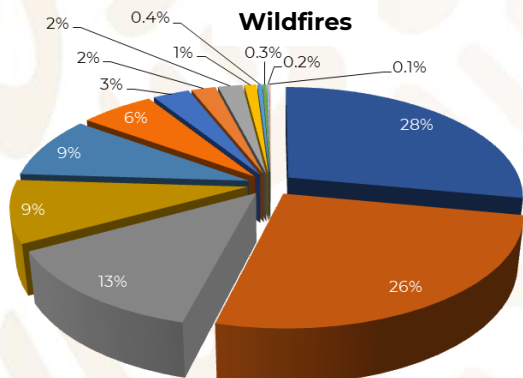
## Historical wildfires statistics



In the period from **1970 to 2019** there have been registred an average of **7,095 wildfires** with a surface of **261,012 ha** per year in Mexico .

The years **1998, 2011** and **2017** stand out as they are the years with the largest affected area by wildfires, with **849,632, 956,405** and **726,361** hectar, respectively.

## Reasons



- Agricultural activities
- Unknown
- Livestock activities
- Hunters
- Natural
- Forest harvesting residues
- Festivities and rituals
- Illegal activities
- Bonfire
- Smokers
- Burn a dump
- Other productive activities
- Clean away
- Tansport

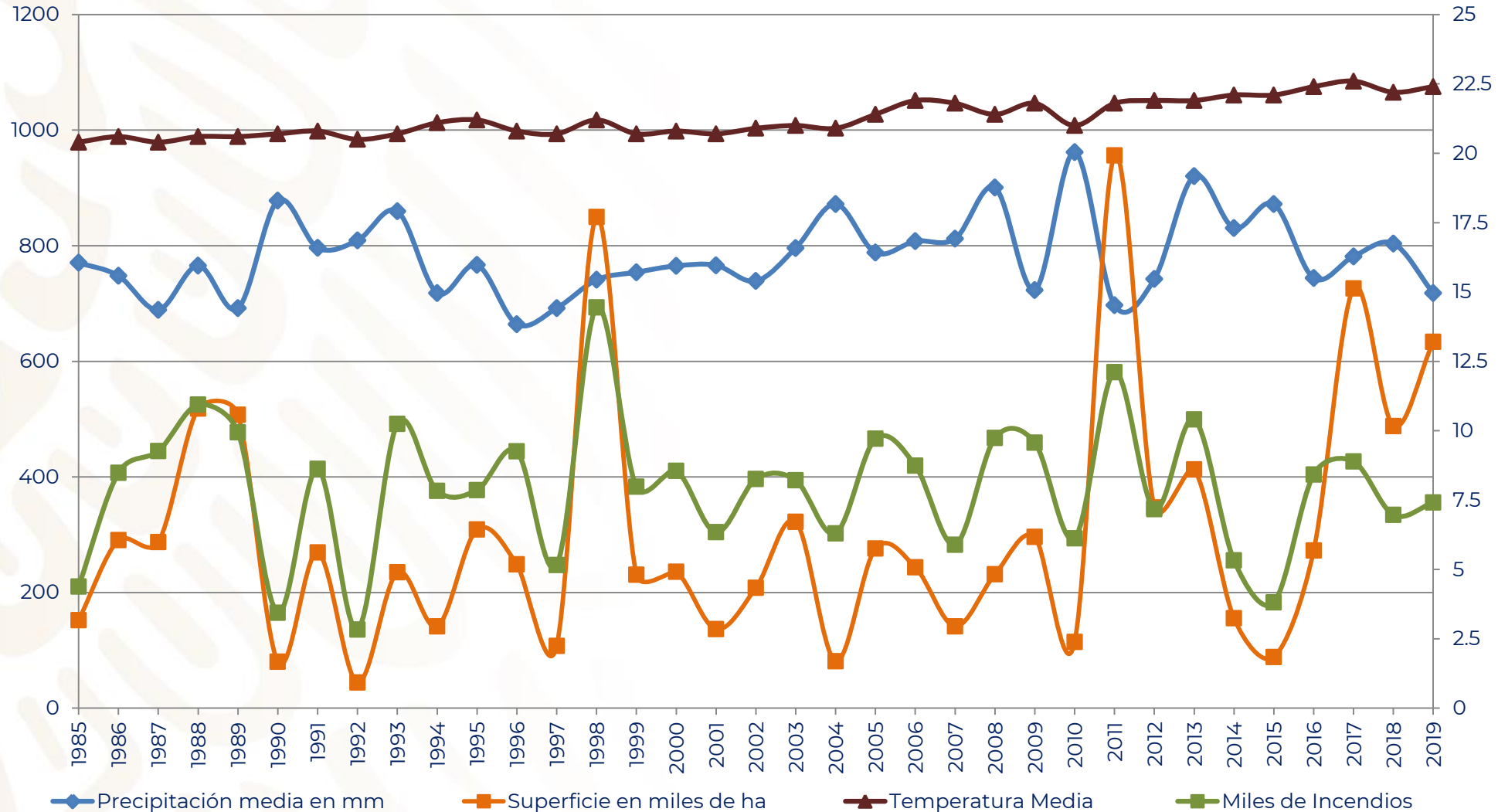


Ecosystems examples: a) sensitive, b) dependent, c) independent.

Of the total wildfires **4,565 (81%)** occurred in ecosystems adapted to fire, while only **710 (12%)** affected ecosystems sensitive to fire.



# Effect of temperature and precipitation on the number of wildfires and affected area





# The political and social vision of fire



Political-social problem



Bad management (Suppression)

Changes in fire regimes



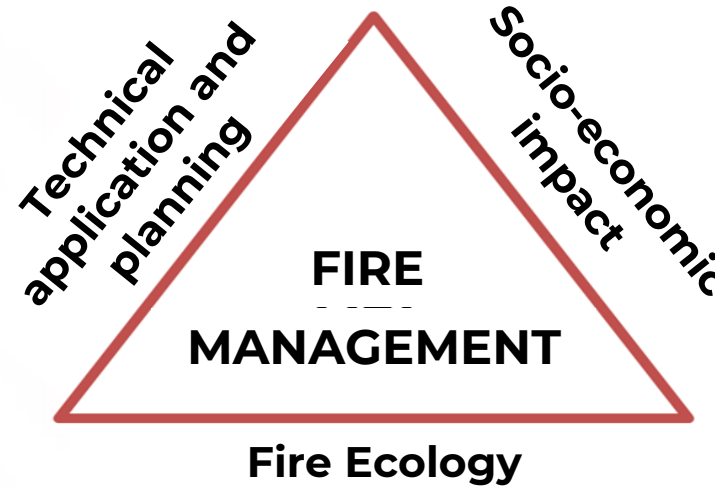


# The new vision of CONAFOR: FIRE MANAGEMENT

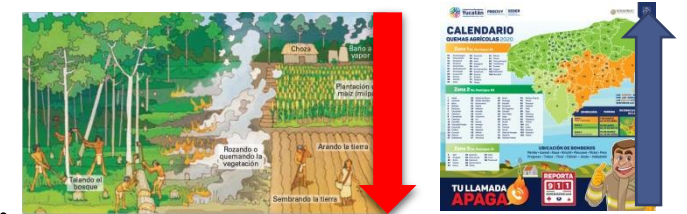
Fire is a **natural process** that frequently operates as an **integral part of the** ecosystem where it occurs.



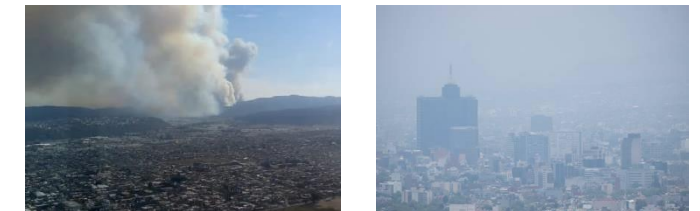
Nacional PMF 2019 workshop



Rural environment



Urban environment



Types of ecosystems

Adapted



Independent



Sensitive

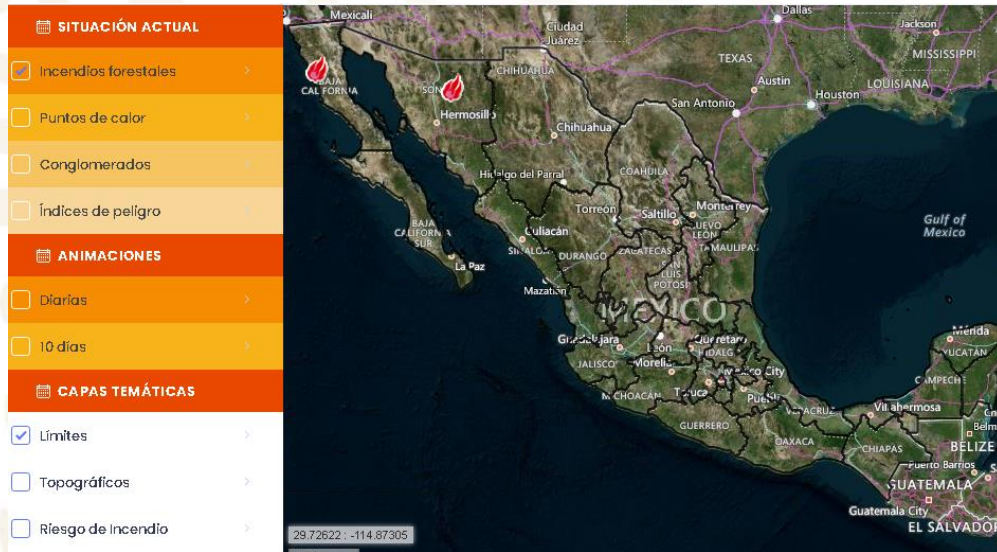


Influenced





# Forest Fire Danger Prediction System of Mexico (SPPIF)



The SPPIF of the Mexico is the fifth system of its kind worldwide and the first to consider human causality as a factor within its prediction models.

Is an operational decision-support tool to aid in decision making in fire management from near-real time information about fuel dryness, active fire, fire suppression, and forecasted number and location of forest ignitions.

The system is available online for supporting fire management decisions by CONAFOR and other fire management agents in Mexico.

<http://forestaes.ujed.mx/incendios2/#>



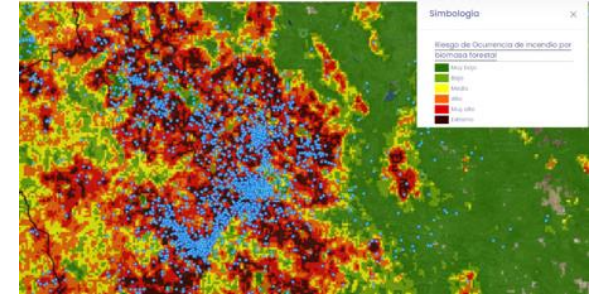
Fondo  
CONACYT  
CONAFOR





1. Forest fire
2. Hot spots
3. Perimeters and number of hot spots clusters
4. Danger indexes

Animations

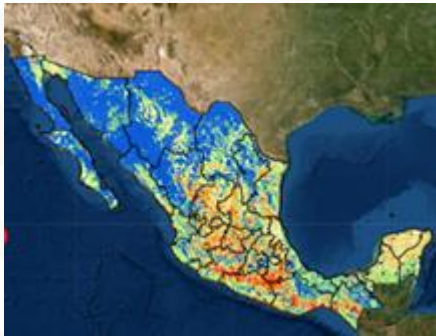
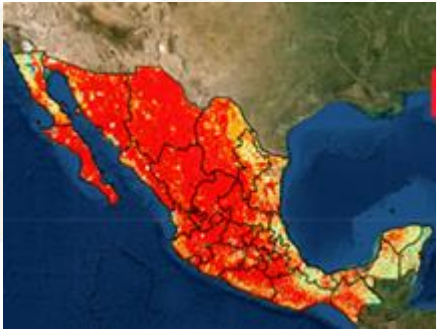


Actual situation

Theme Layers

Structure

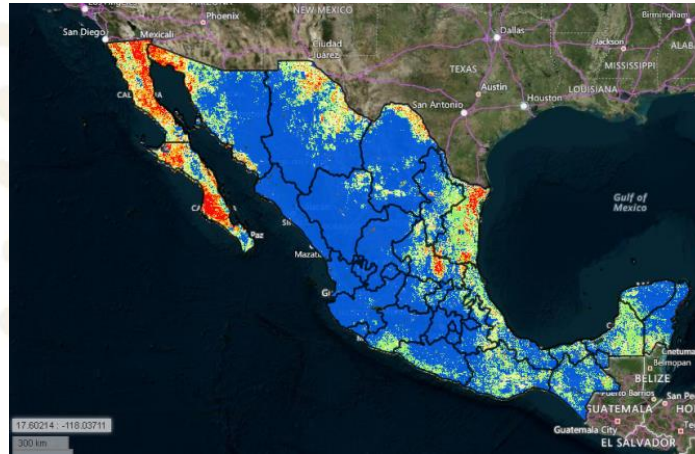
1. Limits
2. Topography
3. Risk of fire
4. Fuels and vegetation
5. Base layers





# Danger indexes

## Fuel Dryness Index



Temperature, RH,  
Precipitation  
(MODIS, GPM  
(CONABIO)  
& WRF (CONAGUA-  
SMN)  
+  
100 h Fuel humidity  
+  
Vegetation Greenery  
Standard Index  
(NDVI)  
(MODIS-CONABIO)

## Ignition Danger Index



Fuel Dryness Index  
+  
Fuel Type  
+  
Region  
+  
Hot Spots (previous days)

## Forest Fire Danger Index



Ignition Danger  
Index  
+  
Forest Fire Risk  
(Urban areas + Roads  
+ Agricultural  
interface + Forestal  
Biomass)

## Number of expected fires by state



Forest Fire Danger Index  
+  
States  
+  
Fires (CONAFOR)



# Animations



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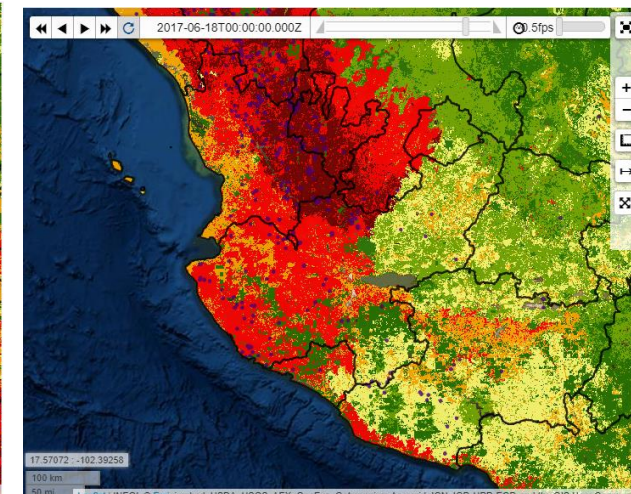
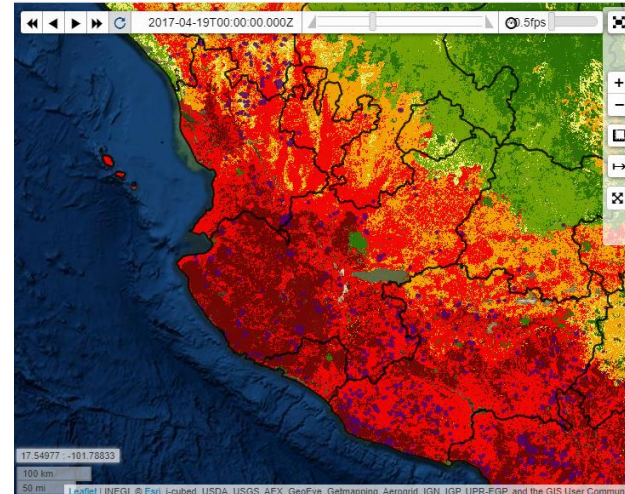
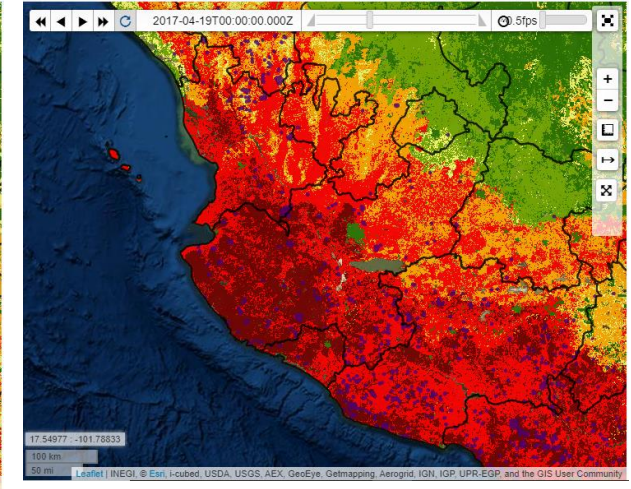
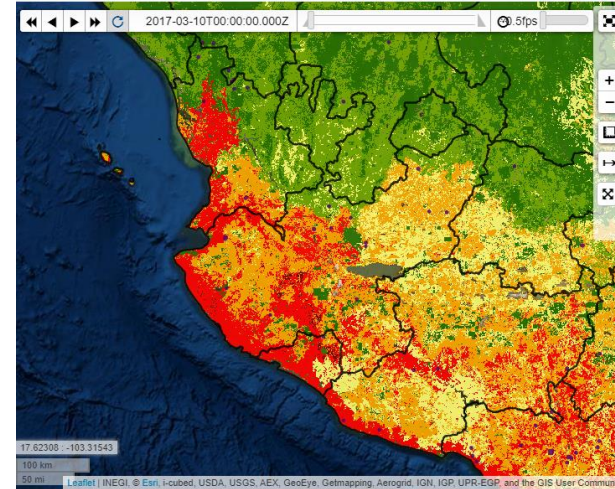


## Daily Animations

Allows simultaneous visualization of fires, hot spots and danger indexes, in intervals of specific periods between two dates.

## 10 days Animations

Allows also visualization of fires, danger indexes, hot spot's clusters perimeters within 10 days.



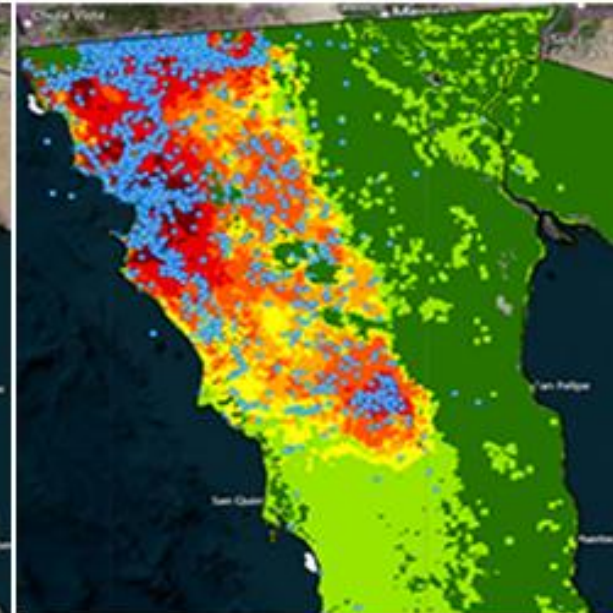
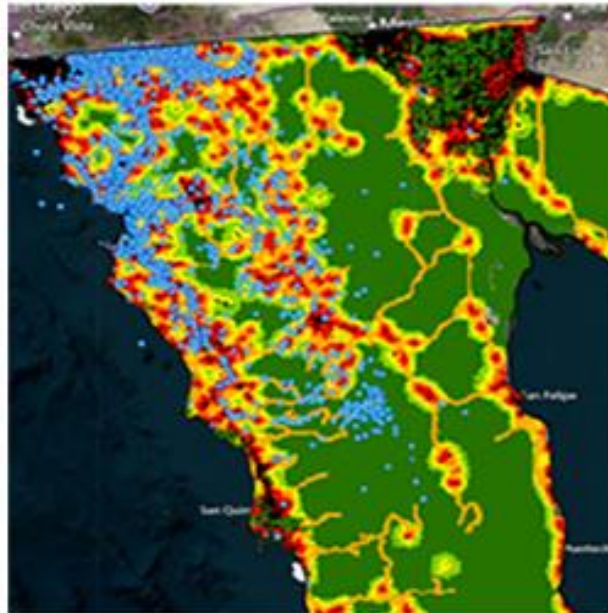
# Theme Layers



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# Prevention actions



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## Physical Prevention

Construction and Rehabilitation of Firebreak

Fire-use fuel management actions:  
Controlled burning Prescribed burning  
Black Lines

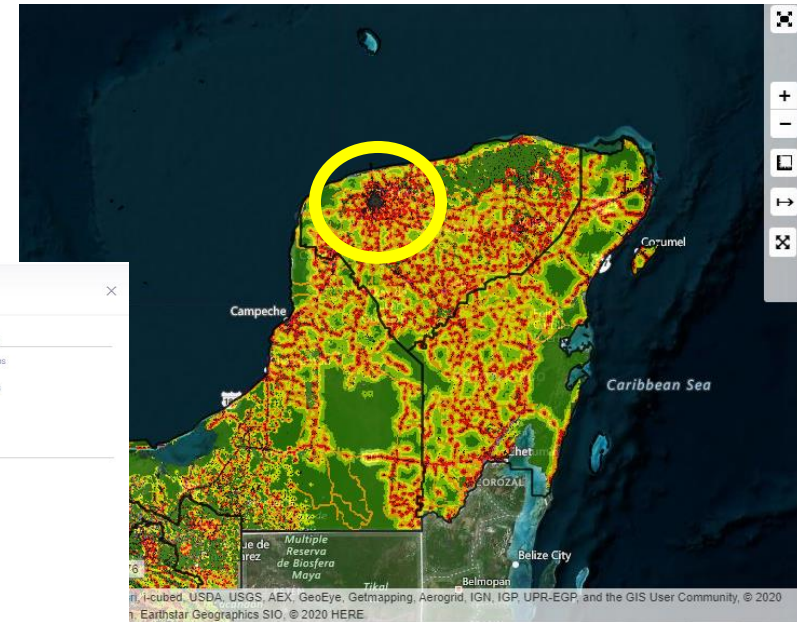
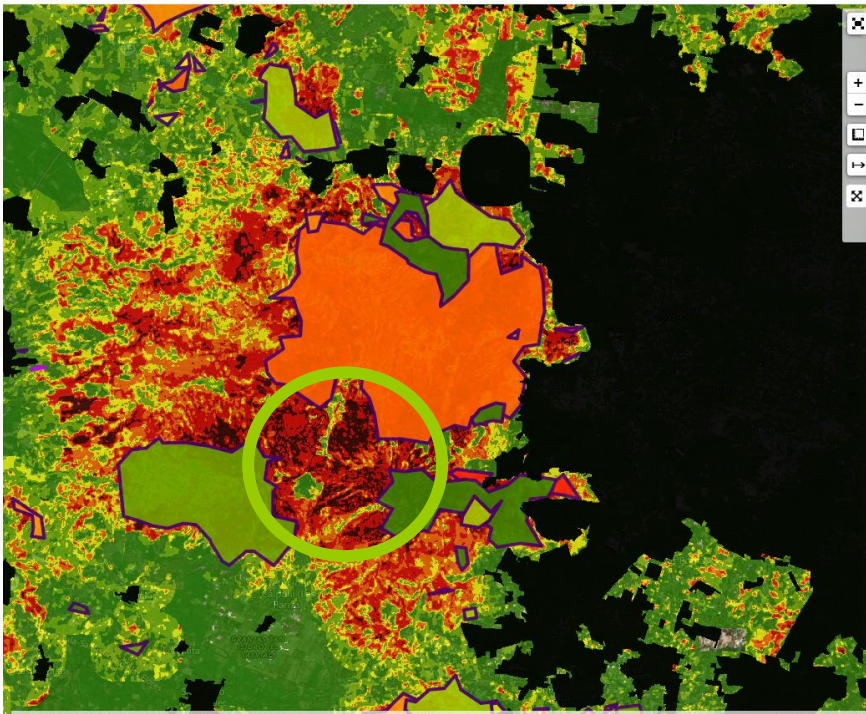
Mechanical Handling and Removal Fuel



## Cultural Prevention

Speech NOM 015 SEMARNAT/SAGARPA-2007

Cultural events



# Guerrero from May 14th to 28th 2019



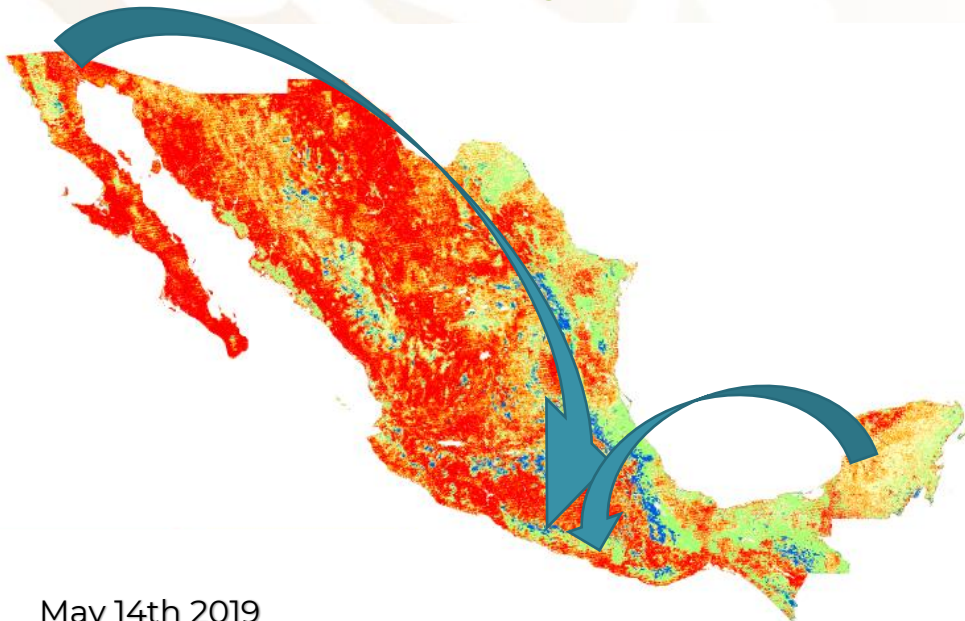
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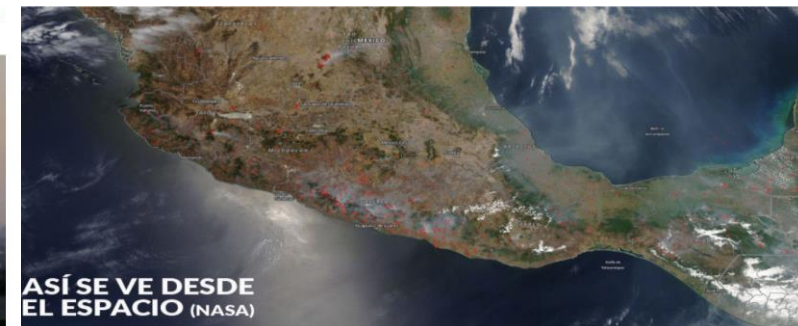
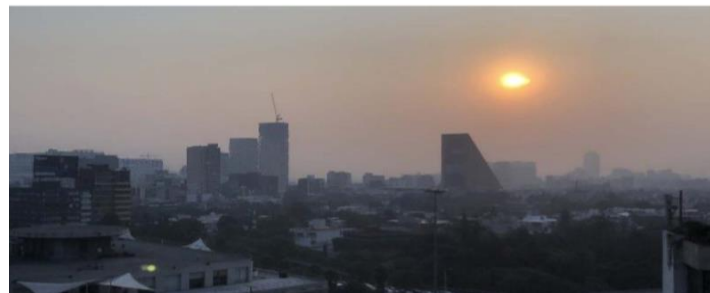


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ÚLTIMAS NOTICIAS SECCIONES LIFE FORBES CA BRAND VOICE

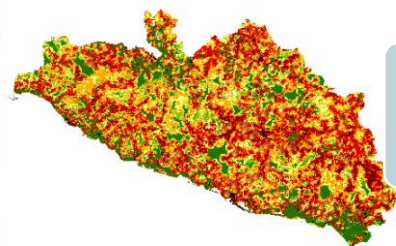
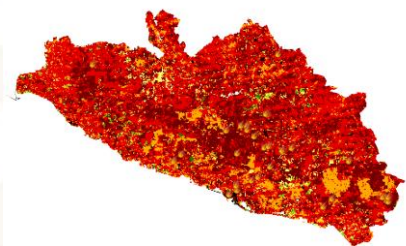
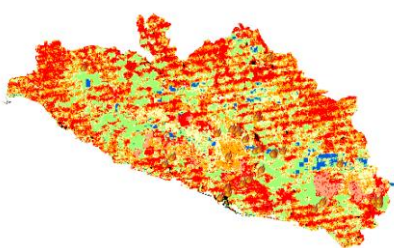
## Se declara contingencia extraordinaria por contaminación; persisten incendios en CDMX

autoridades pidieron a la población permanecer en interiores y de ser posible, realizar trabajo en casa.

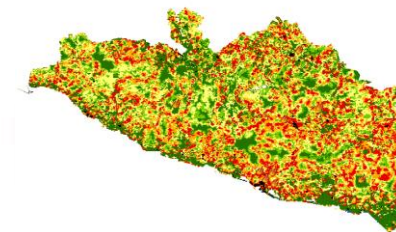
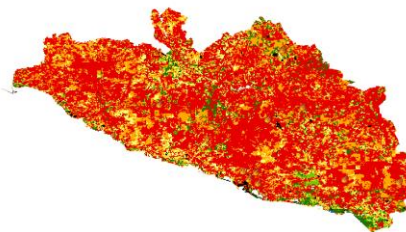
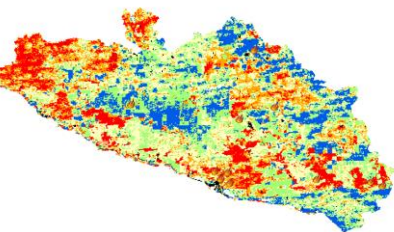


ASÍ SE VE DESDE EL ESPACIO (NASA)

May 14th 2019



May 28th 2019



Fuel Dryness Index

Danger Meteorological

Danger Index

**Oficial CONAFOR and rurals firefighters**

186 (56 CONAFOR)

**Other instances firefighters**

204

28 Wildfire

1,752 days/men

2,890.67 hectares affected areas

**State origen**

**Mobilized people**

Hidalgo	2
Baja California	10
Campeche	10
Morelos	17
<b>Total</b>	<b>37</b>

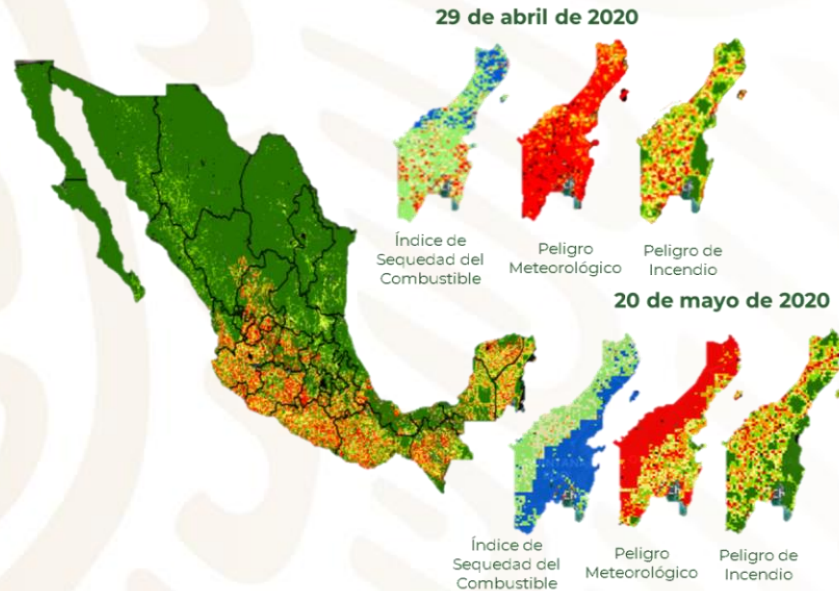
# Extended Attack - Operation Baalam



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During the Báalam mobilization in Quintana Roo state, there were 21 wildfire active, affecting a surface of **22,694** hectar and there were mobilized **59 people** (firefighter and specialized technicians), from **April 29 to May 20, 2020.**

NO NEW STAFF INFECTED BY COVID-19

State origen	Mobilized people	Start operation	End operation
Chiapas	10	29/04/2020	14/05/2020
Campeche	1	29/04/2020	15/05/2020
CRMF Sureste	4	29/04/2020	15/05/2020
Durango	20	29/04/2020	20/05/2020
Guanajuato	1	01/05/2020	15/05/2020
Hidalgo	3	01/05/2020	14/05/2020
Jalisco	20	01/05/2020	14/05/2020
<b>Total</b>	<b>59</b>		



Thanks



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