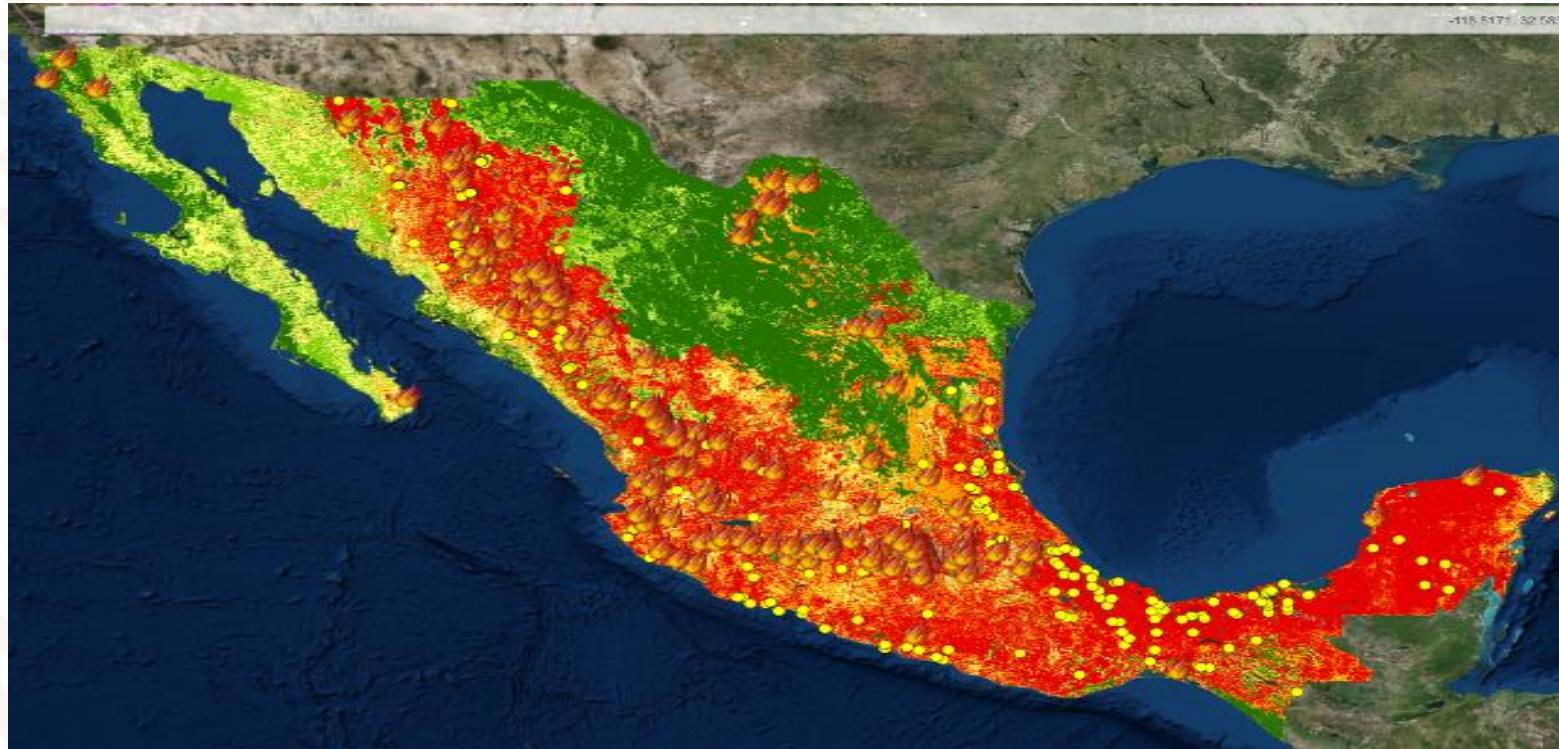


Fire Management and the Prediction System of wildfires Hazard



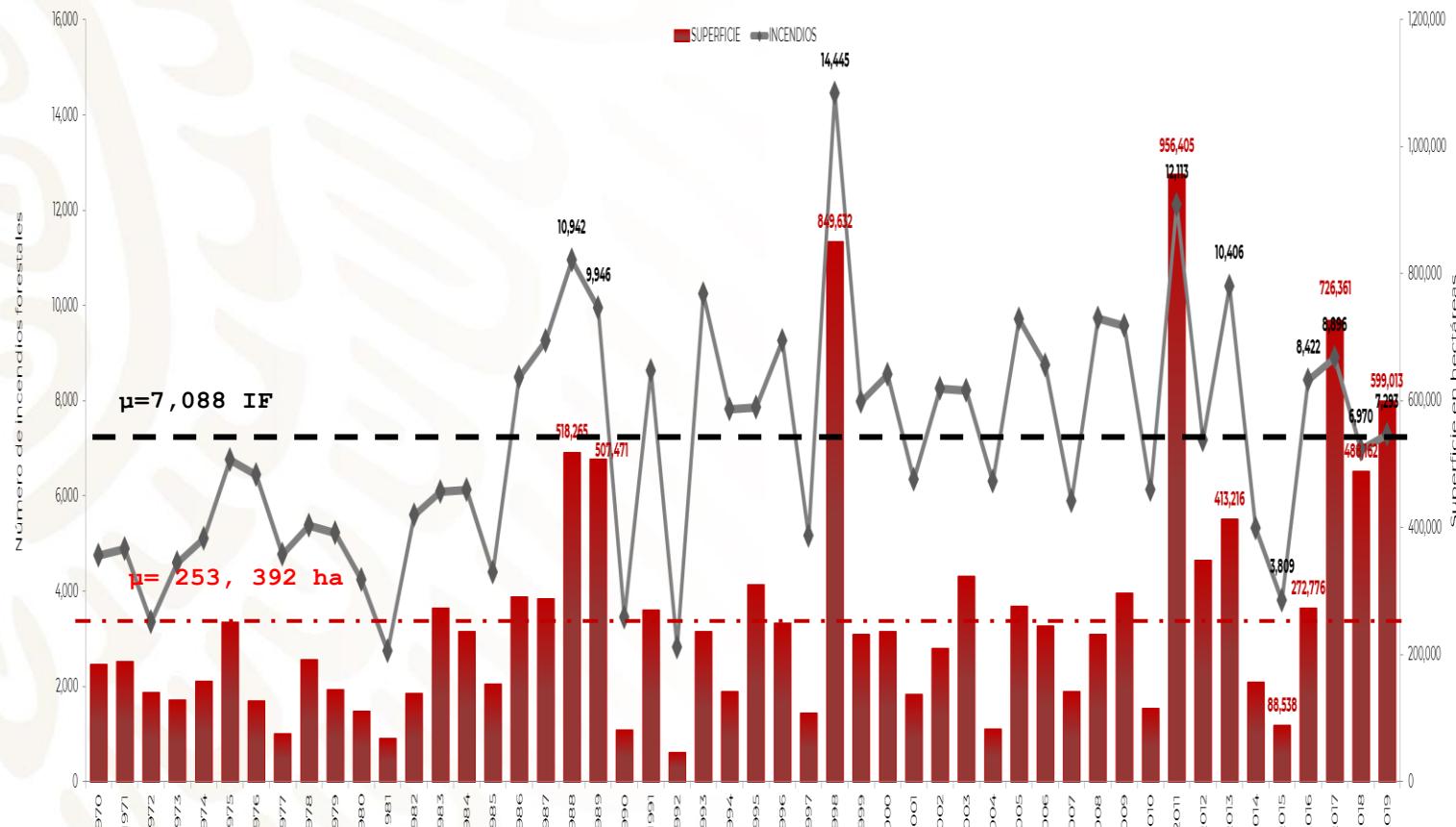
Presenta: César Alberto Robles Gutiérrez
Subgerente del Centro Nacional de Manejo del Fuego
Gerencia del Manejo del Fuego

Forest Situation in Mexico



Situation of Wildfires in Mexico

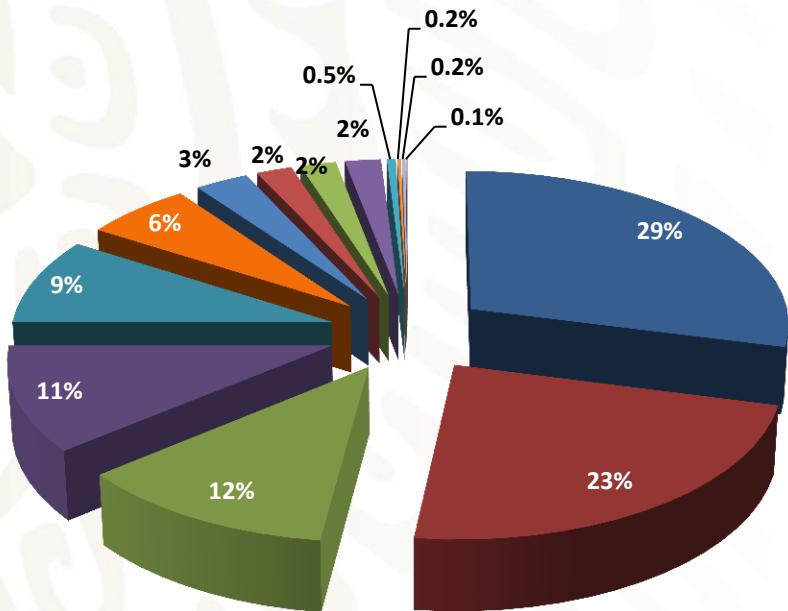
Comparative number of Wildfires and affected area 1970-2019 *



1970-2018 data at the close of January 1 to December 31.
2019 * with data from January 1 to September 19 (7,293
IF, 599,013 ha)

Situation of Wildfires in Mexico

Causes of wildfires 2019

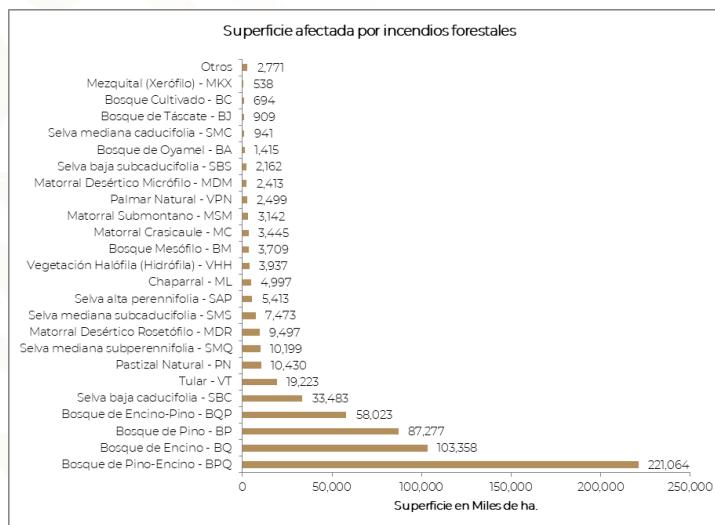
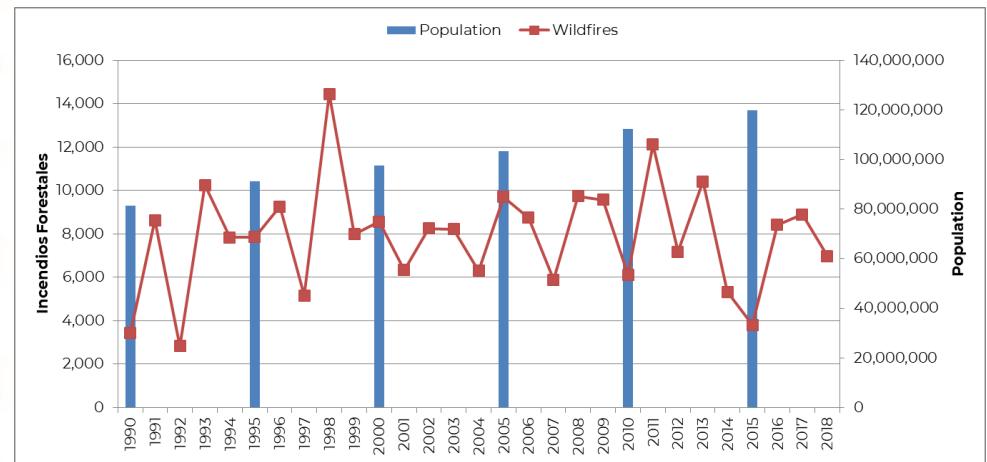
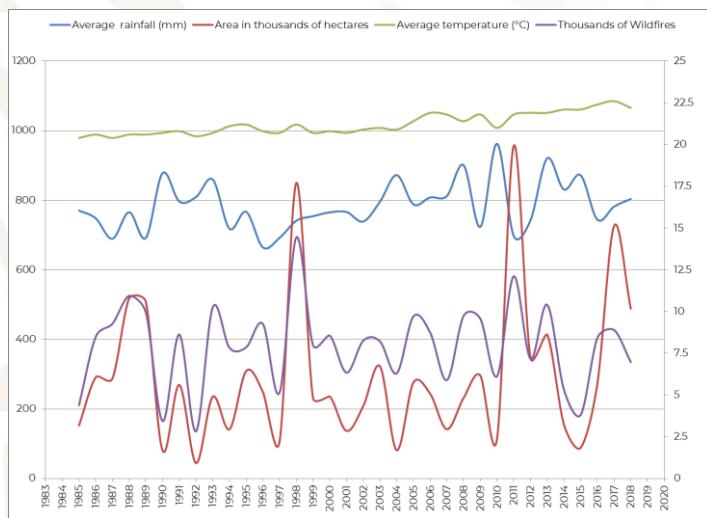


No.	Tipo de Causa	Porcentaje
1	Intencional	29%
2	Actividades Agrícolas	23%
3	Fogatas	12%
4	Desconocidas	11%
5	Actividades Pecuarias	9%
6	Fumadores	6%
7	Cazadores	3%
8	Otras actividades productivas	2%
9	Naturales	2%
10	Quema de basureros	2%
11	Residuos de aprovechamiento forestal	0.5%
12	Transportes	0.2%
13	Limpias de derecho de vía	0.2%
14	Festividades y rituales	0.1%

98% of forest fires in Mexico are caused by humans

Situation of Wildfires in Mexico

But . . . how bad are we?

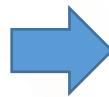


Situation of Wildfires in Mexico

The political and social vision of fire



Political-social problem



Bad management in fire management (Suppression)

Changes in fire regimes



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Y RECURSOS NATURALES

 **CONAFOR**
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Fire Management

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



Ecología del fuego:
Atributos ecológicos clave del fuego

Dependent



Sensitive



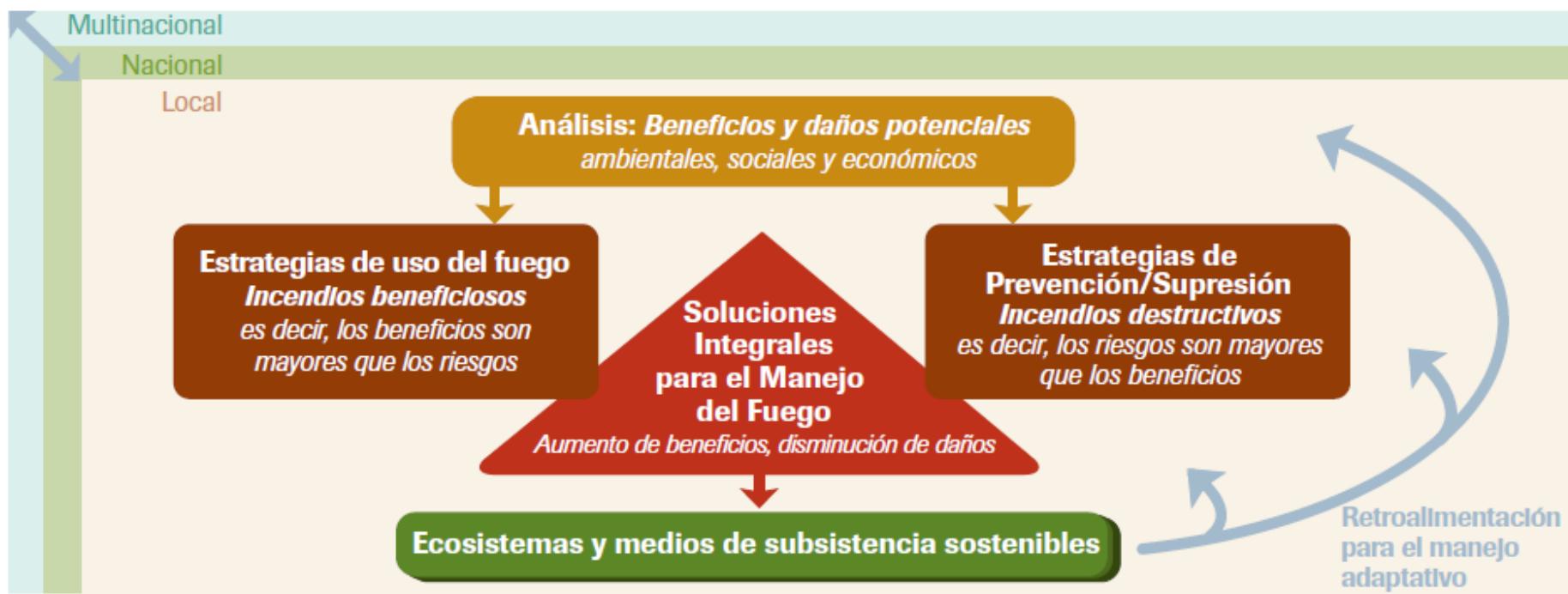
Independent



Influenced

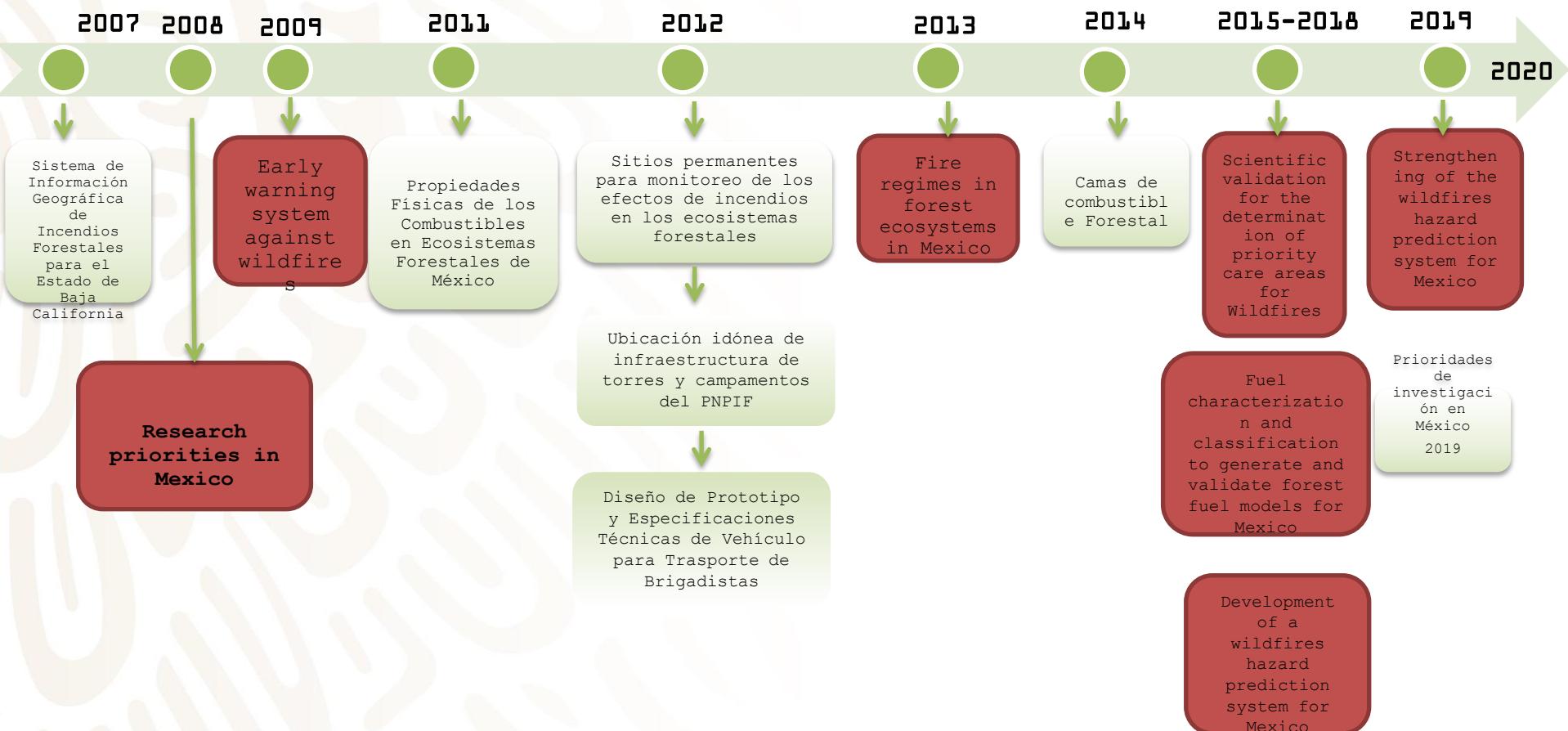


Fire Management

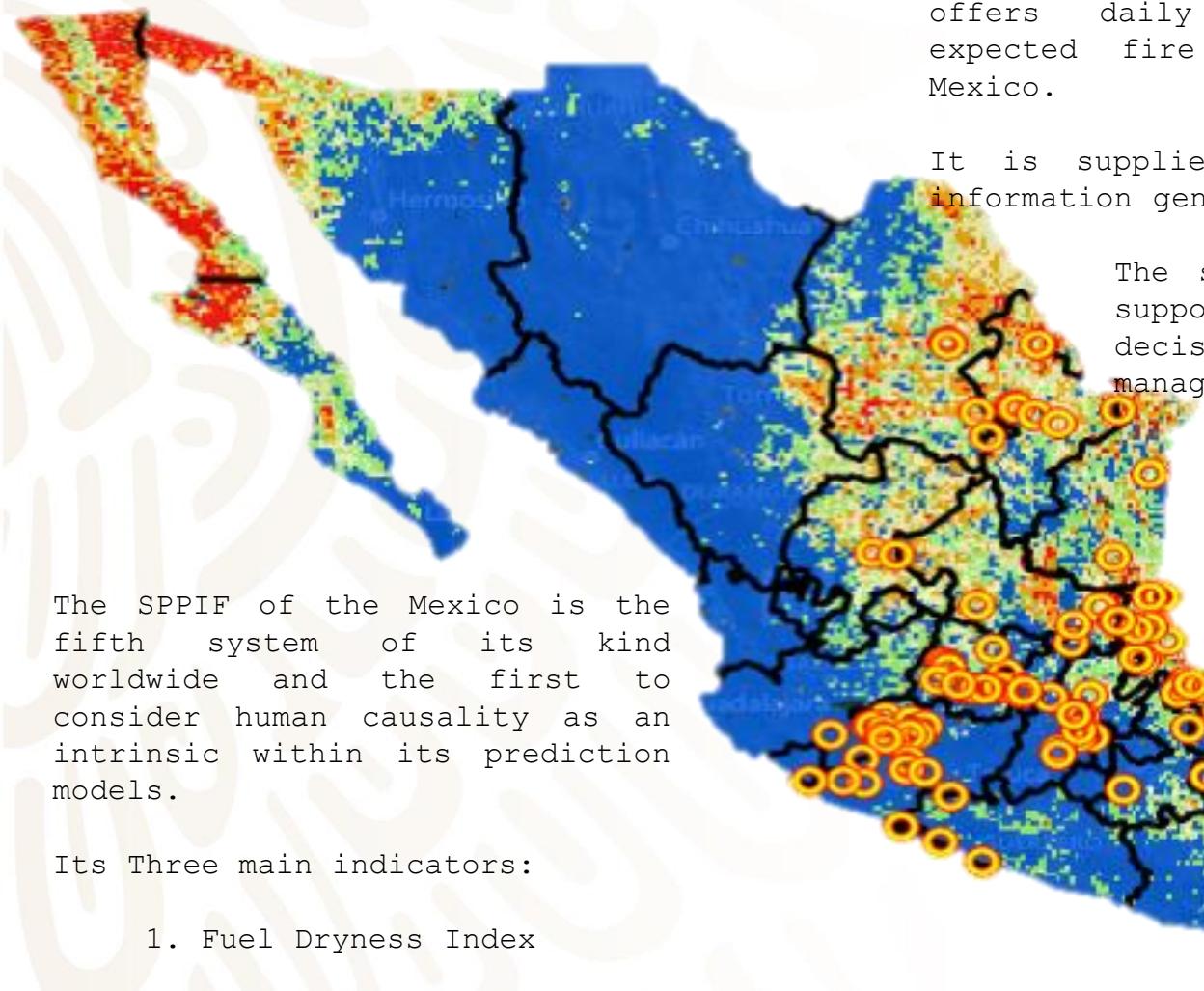


Boost research for Fire Management

Building applied research in Fire Management in Mexico



Wildfire Hazard Prediction System (SPPIF)



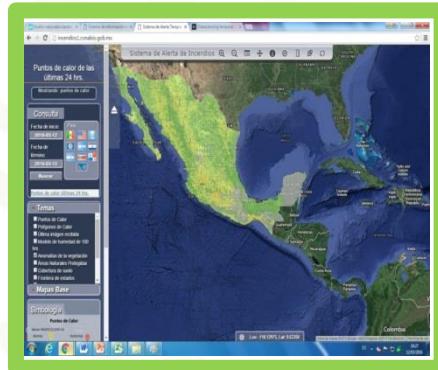
The SPPIF of the Mexico is the fifth system of its kind worldwide and the first to consider human causality as an intrinsic within its prediction models.

Its Three main indicators:

1. Fuel Dryness Index
2. Meteorológico hazard index
3. Fire Hazard

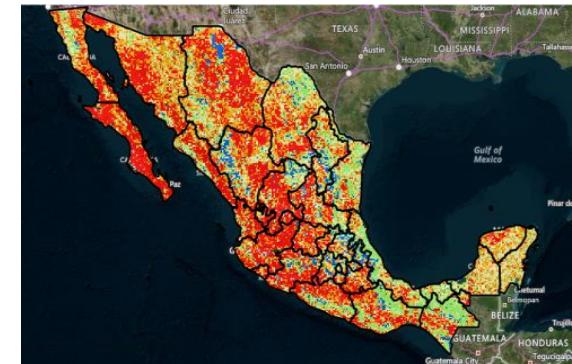
Fuel Dryness Index

**Temperature, RH,
Precipitation**
(MODIS, GPM
(CONABIO)
& WRF (CONAGUA-SMN)



Vegetation index of standarized
difference (NDVI)
(MODIS-CONABIO)

More information at:
<http://forestales.ujed.mx/incendios/incendios/pdf/forests-09-00190.pdf>



Fuel Dryness Index

**Compatibility of fuel dryness indices
from fire danger systems of USA &
Mexico**

Animation Fuel Dryness Index

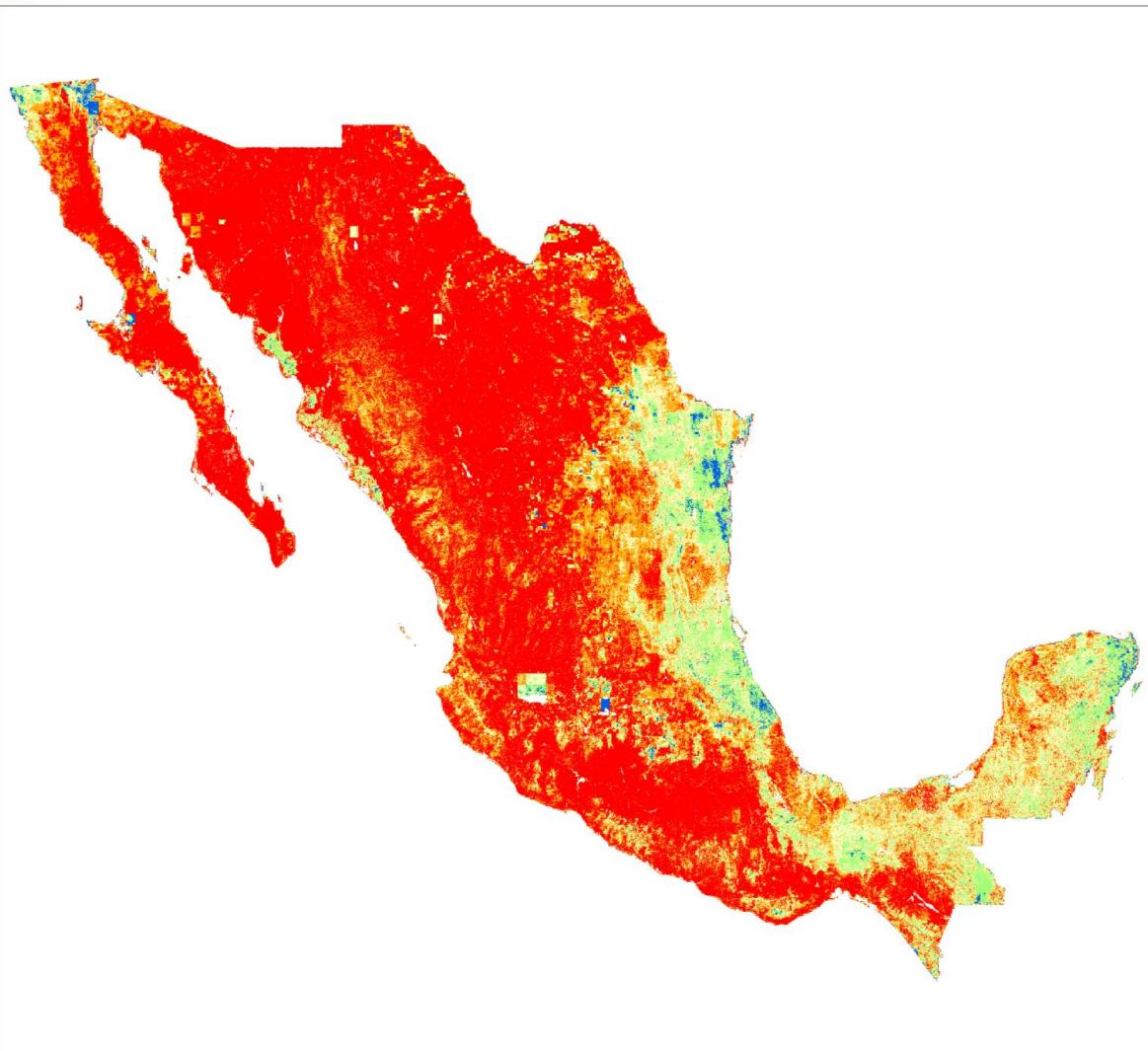
(01/april/2014)

Índice de Sequedad del Combustible (ISC)

- Muy bajo
- Bajo
- Medio
- Alto
- Muy alto
- Extremo

Densidad de Puntos de Calor Observada

- 1 punto
- 2-5 puntos
- >5 puntos
- Puntos de Calor/100 km²



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Animation Fuel Dryness Index

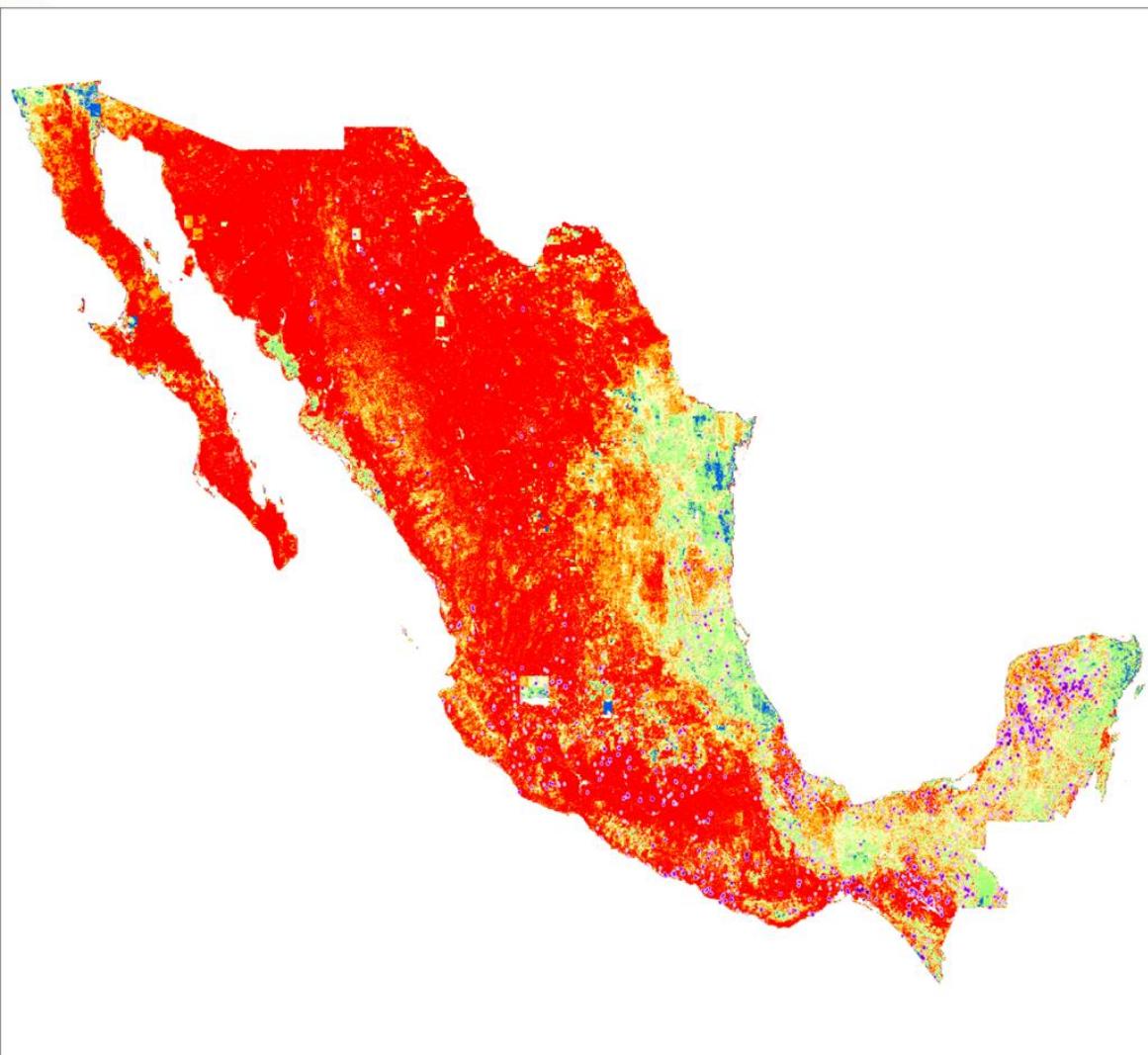
(01/april/2014)

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Animation Fuel Dryness Index

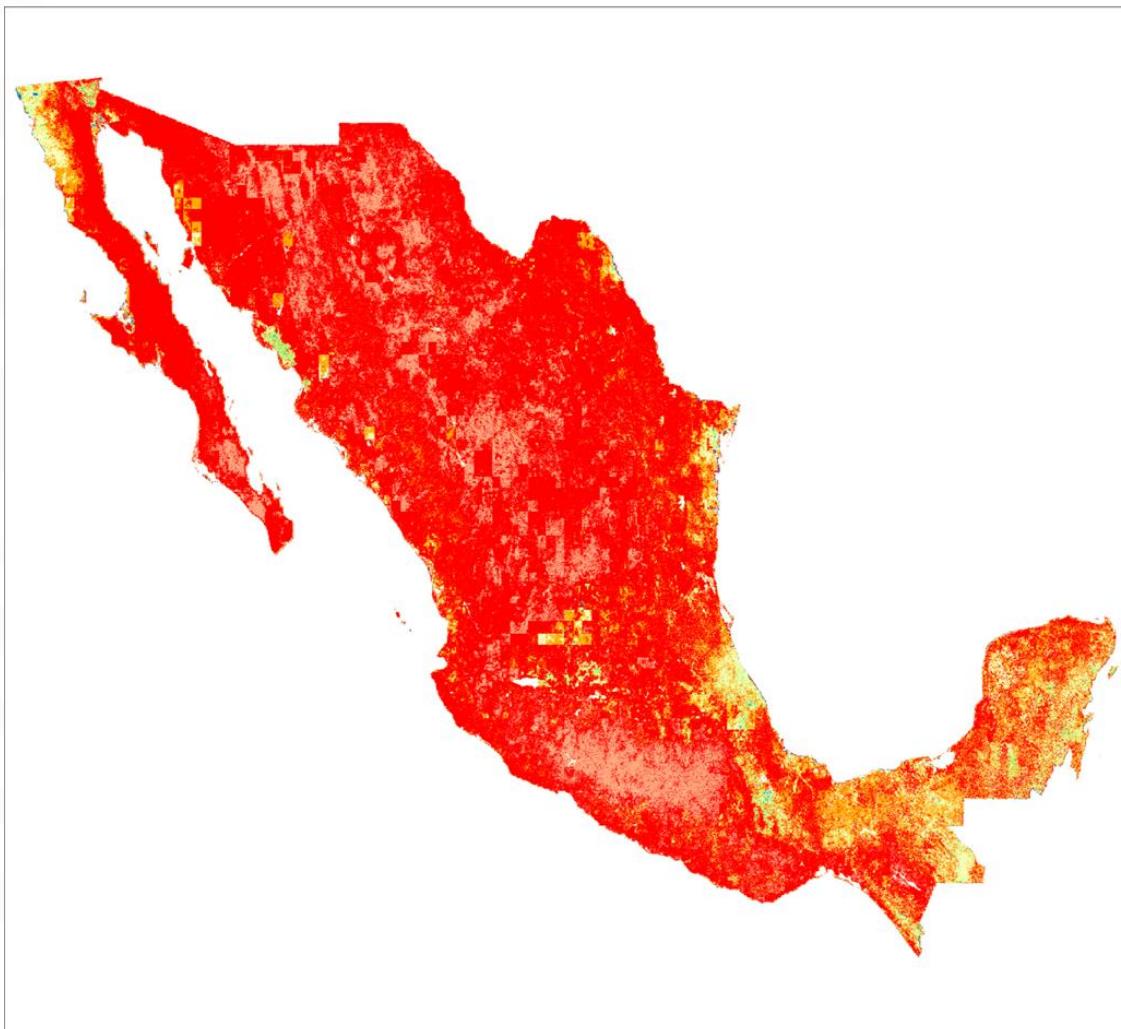
(01/april/2011)

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Animation Fuel Dryness Index

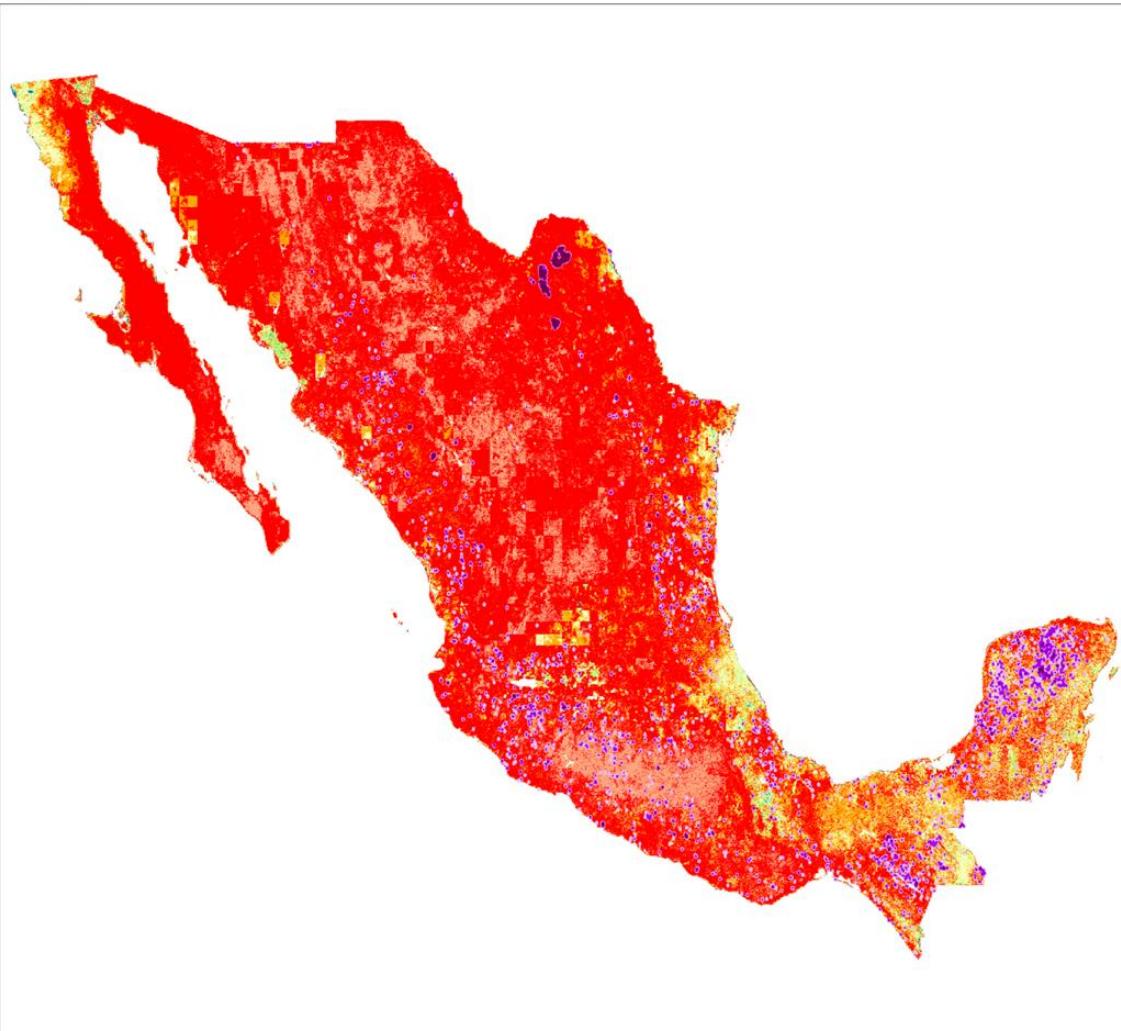
(01/april/2011)

Índice de Sequedad del Combustible (ISC)

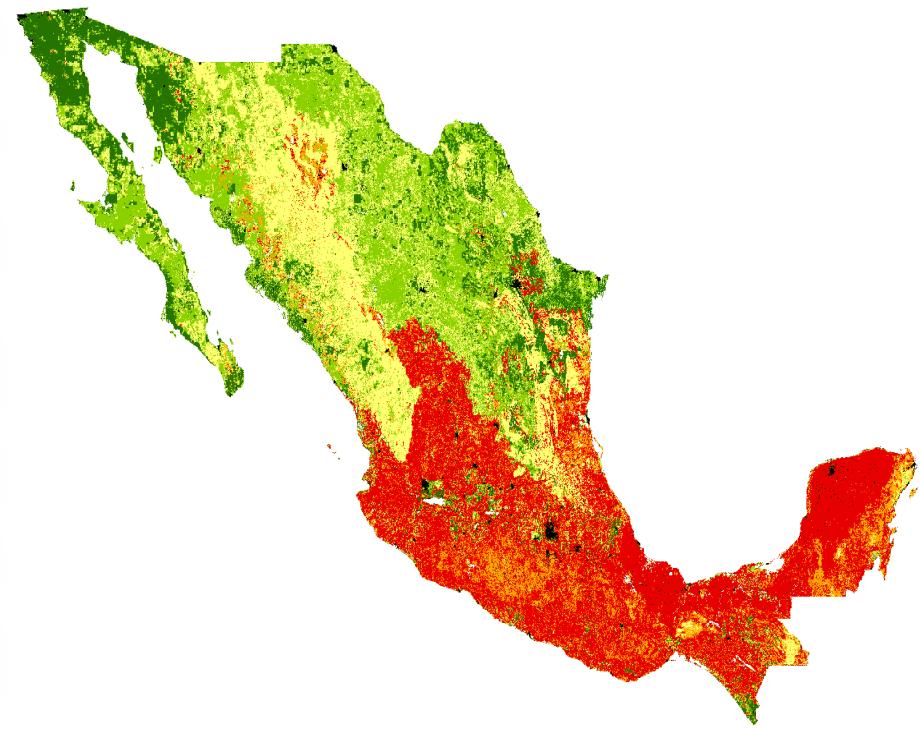
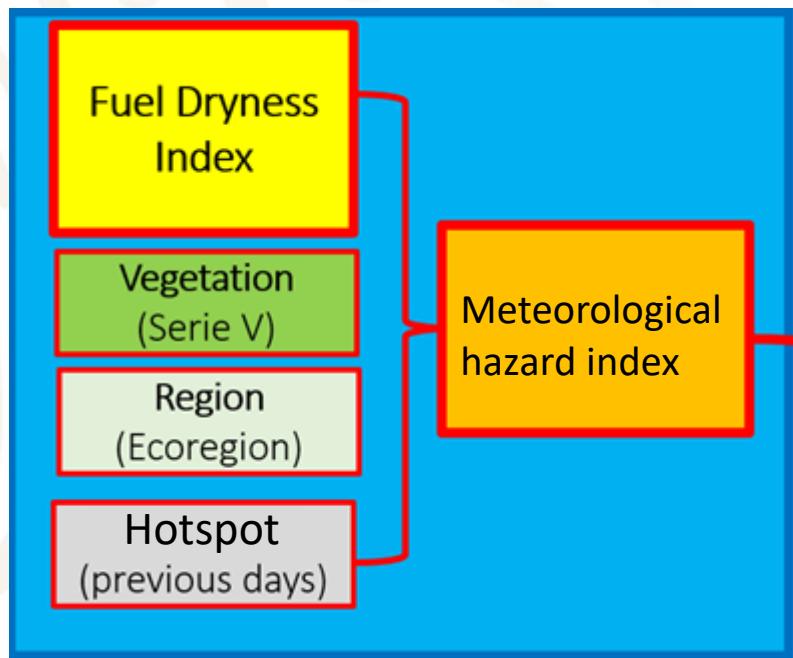
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- >5 puntos
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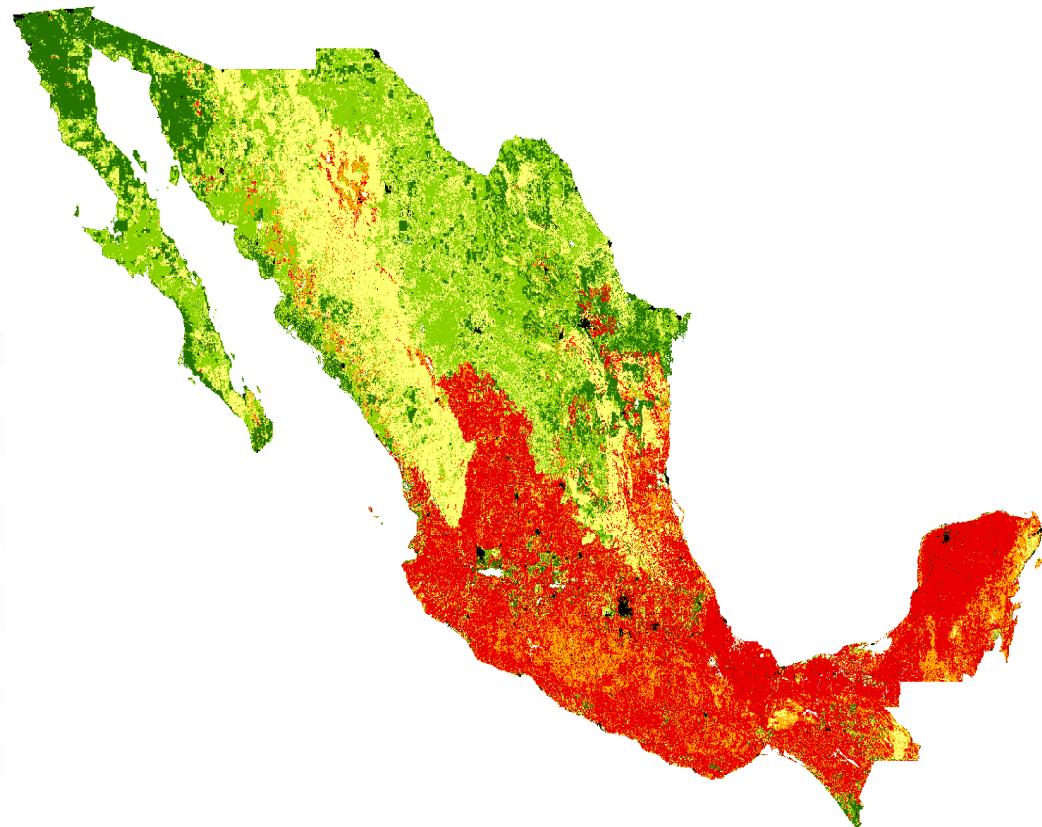
Meteorological hazard index



Animation Meteorological hazard index

(01/april/2014)

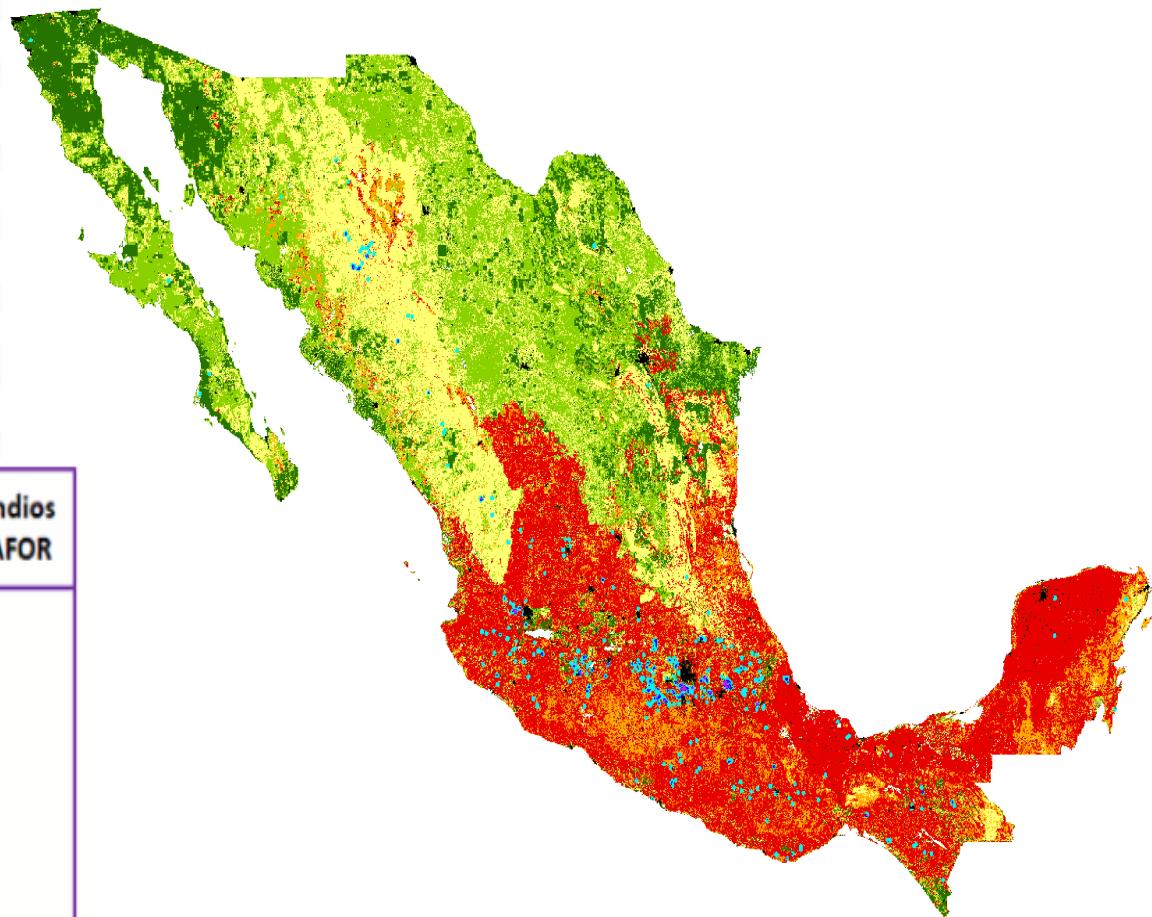
Peligro Meteorológico	Densidad de Incendios combatidos CONAFOR
Muy bajo	■ 1 Incendio
Bajo	■ 2-5 Incendios
Medio	■ >5 Incendios
Alto	• Incendios/100 km ²
Muy alto	
Extremo	



Animation Meteorological hazard index

(01/april/2014)

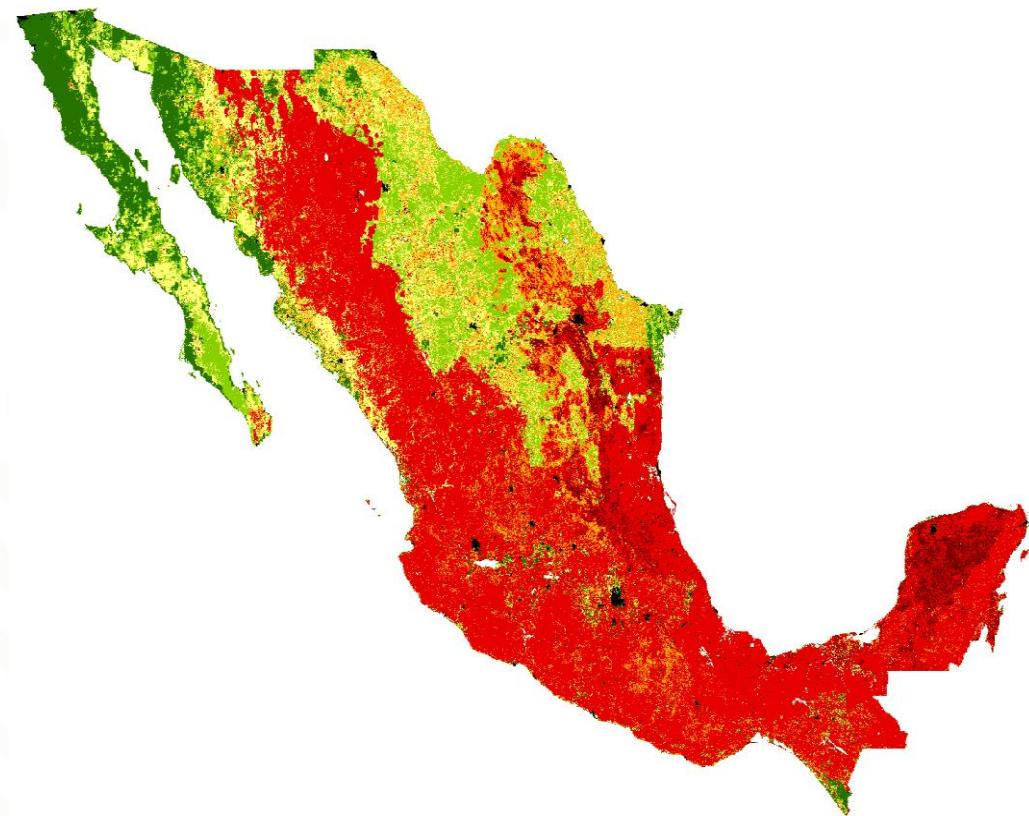
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Muy bajo	1 Incendio
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Extremo	



Animation Meteorological hazard index

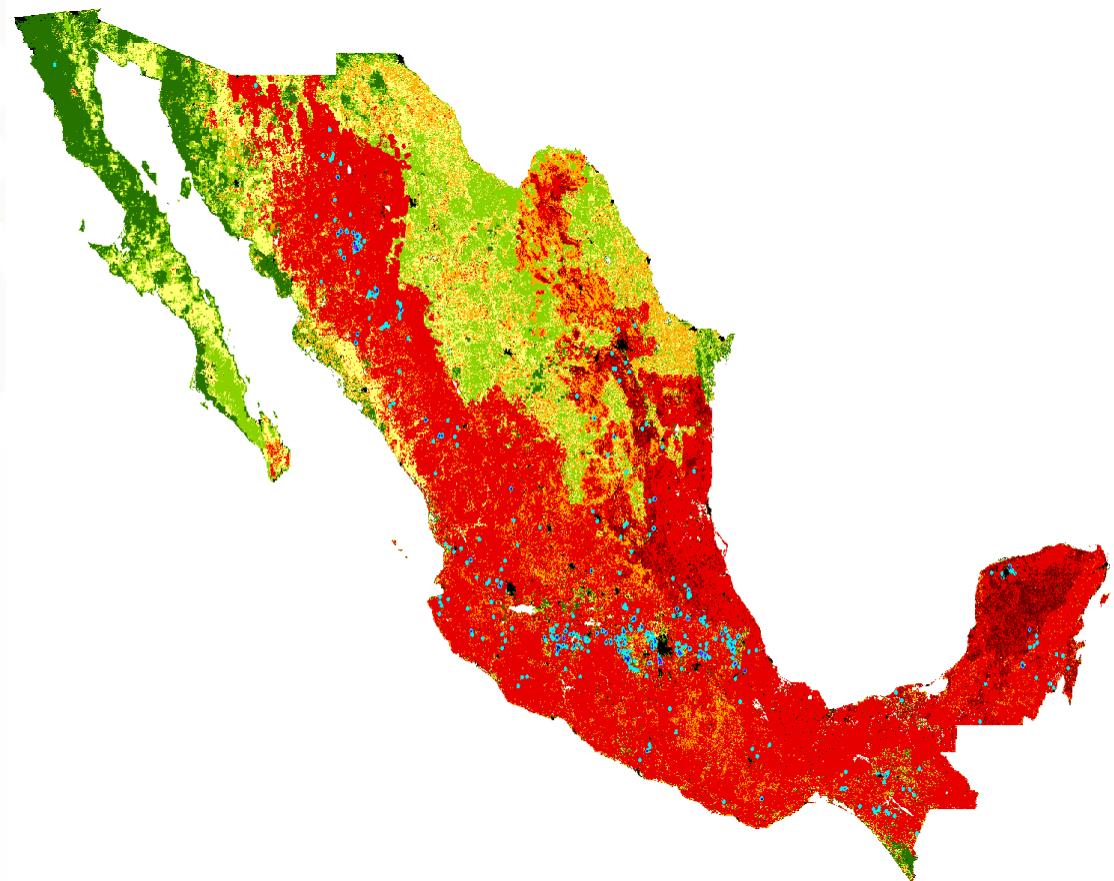
(01/april/2011)

Peligro Meteorológico	Densidad de Incendios combatidos CONAFOR
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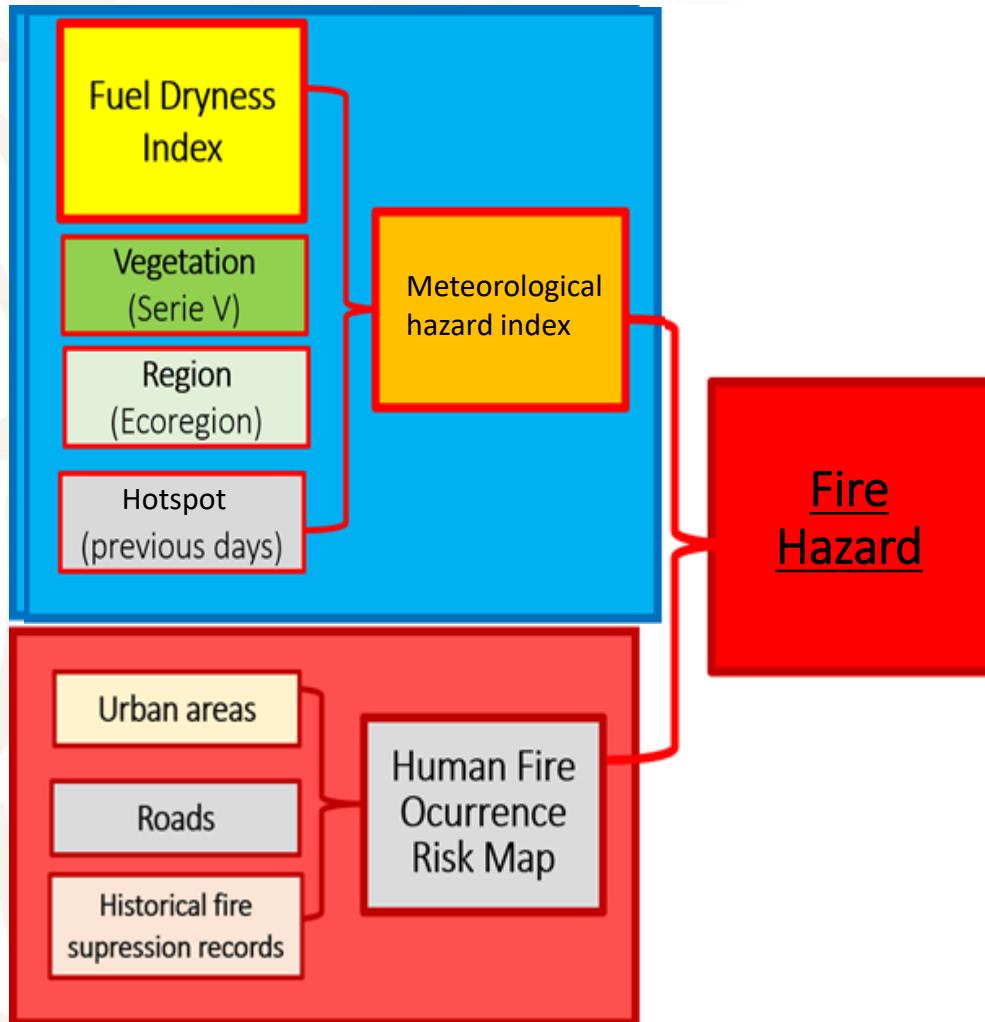


Animation Meteorological hazard index

(01/april/2011)

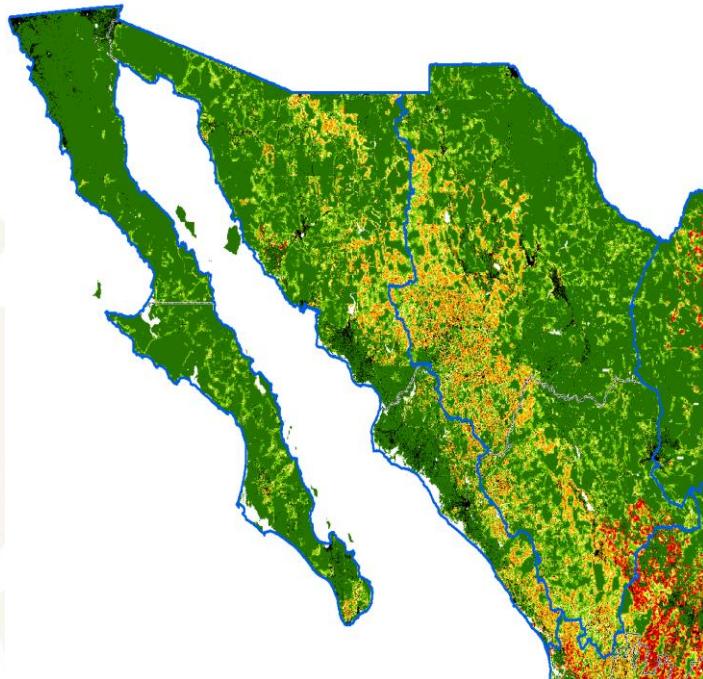


Fire Hazard

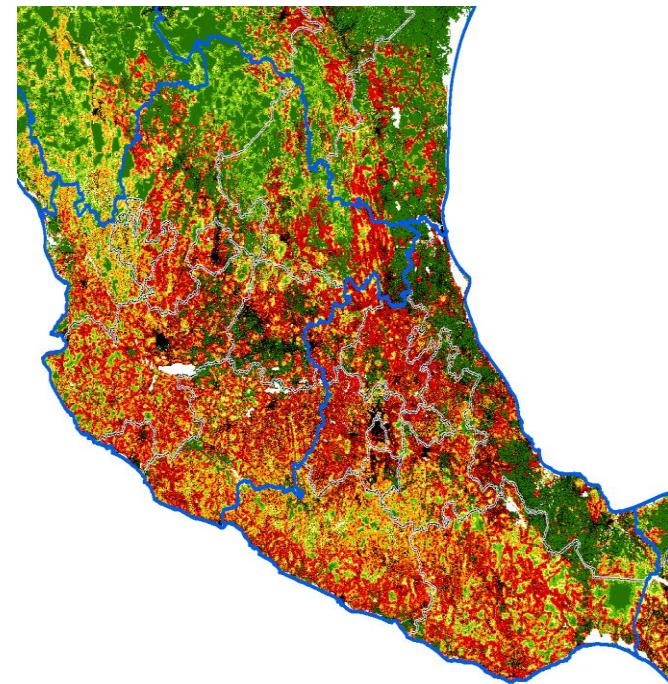


Animation of Fire Hazard

(21/03/2011)



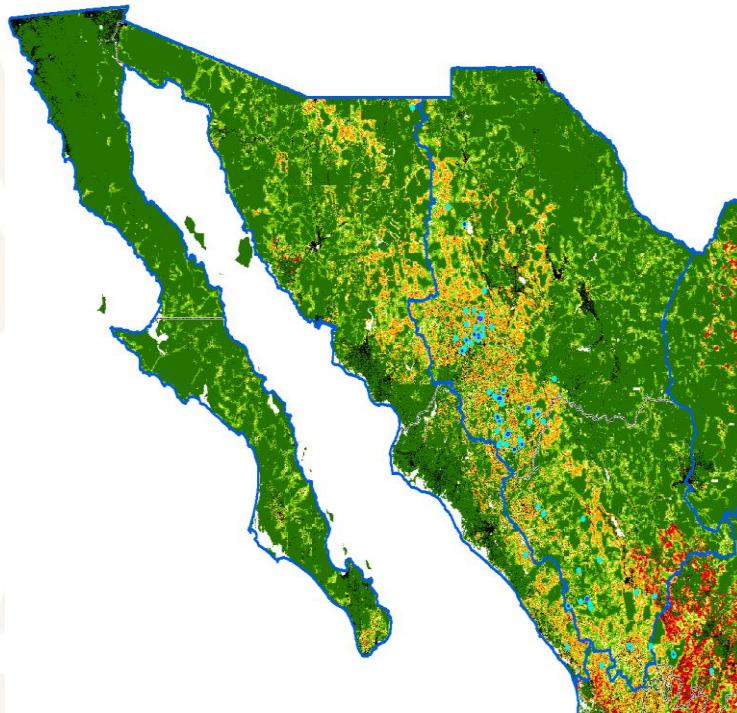
North and
northwest regions



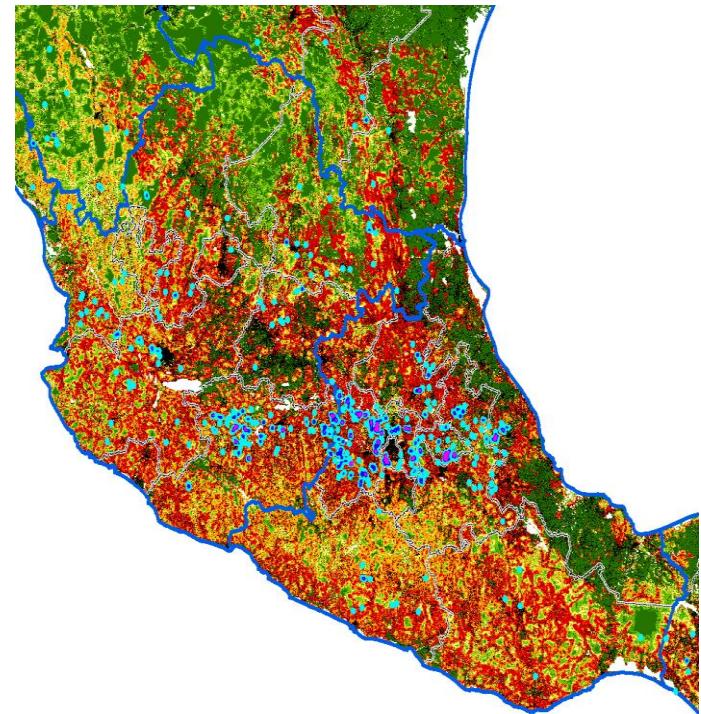
western and
central regions

Animation of Fire Hazard

(21/03/2011)



North and
northwest regions



Western and
central regions

Main uses in Mexico



Early warning of forest fires to the 32 State Fire Management Centers (9:00 am)

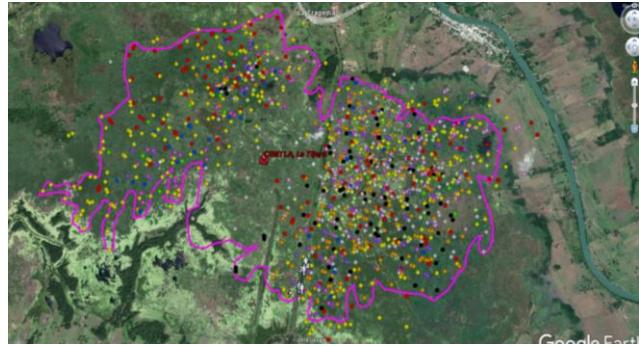


Priority areas for forest fire protection + Wildfire Hazard Prediction System =
Decisions of resource predisposition

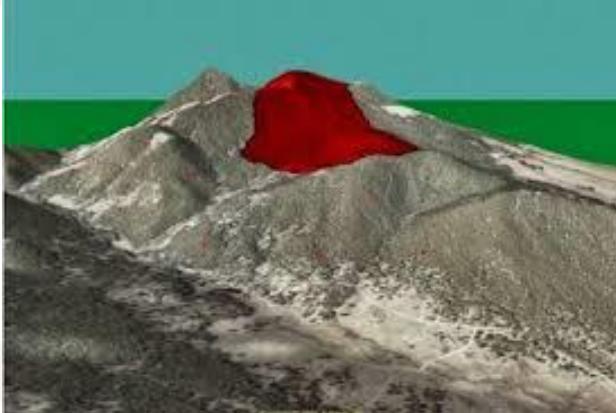


Support for making combat decisions under the incident command system

Future work



- Refine the current hazard prediction system



- Burned area mapping with the inclusion of high resolution satellites and validated in the field.

- Fire behavior predictions (including topographically corrected wind & forest fuel models)

- Tool for automated delimitation of clusters
- Forecast index of the number of clusters of hotspots expected by state.



- Prediction of future scenarios by ecoregion for fire management planning

Thank You

