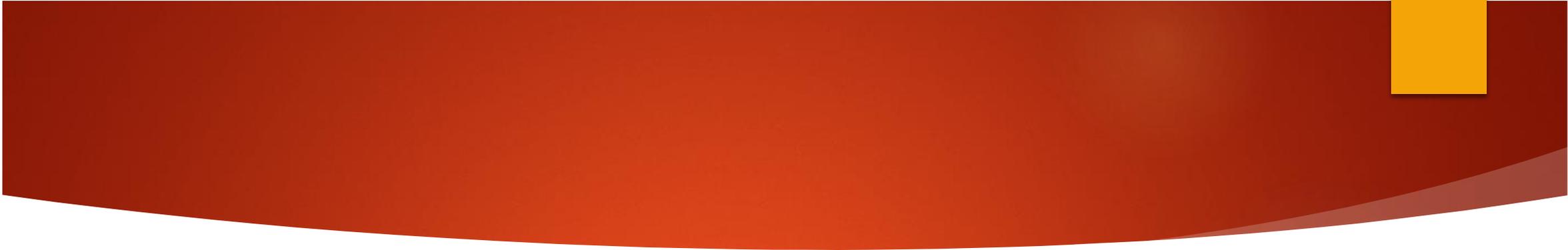




Future Work for the Mexican Fire Danger System

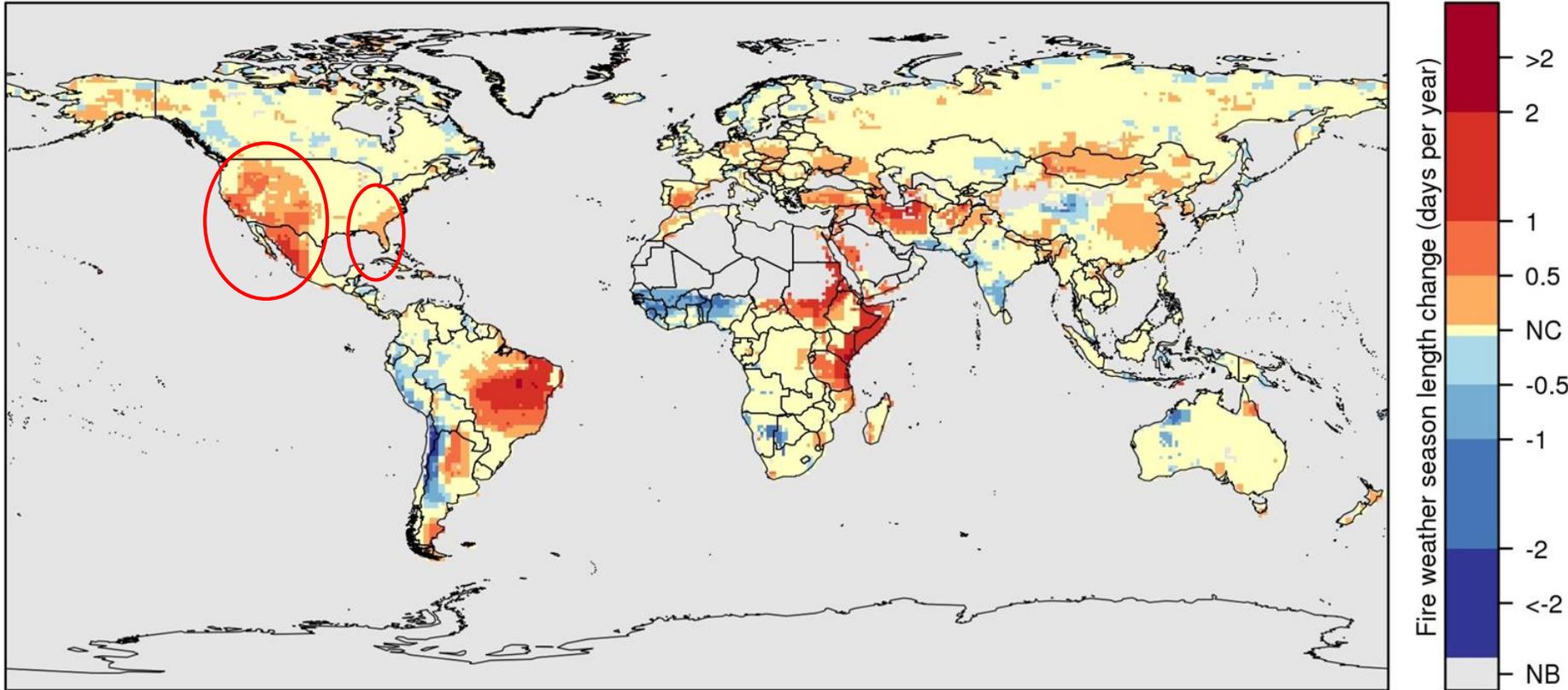
DANIEL VEGA, UJED, FACULTAD DE CIENCIAS FORESTALES

W. MATT JOLLY , USFS, RMRS, MISSOULA FIRE SCIENCES LABORATORY

- 
- ▶ Si cometo muchos errores, perdónenme y cúlpelo a «Google Translate»

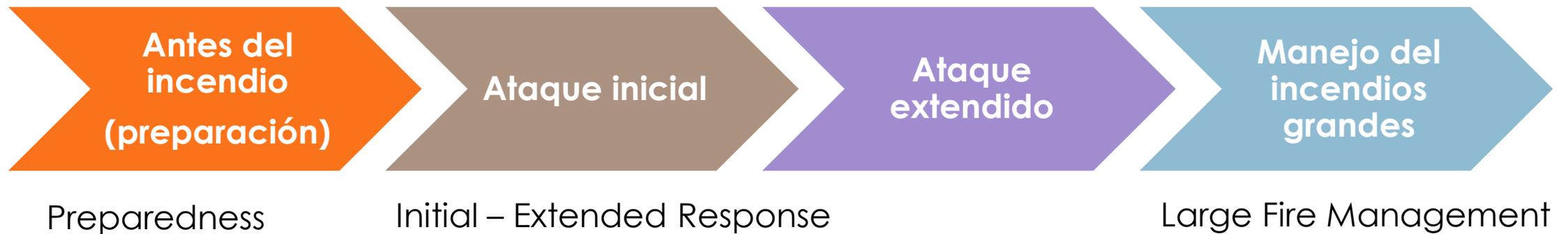
Fire weather conditions are changing

A



Fire weather seasons have lengthened across 29.6M km² (25.3%) of the Earth's vegetated surface. (Jolly et al 2015, Nature Communications)

Toma de decisiones en incendios



Sistemas para toma de decisiones

- ▶ Antes del incendio (preparación) y Ataque inicial
 - ▶ El peligro de incendios (el Riesgo de ignición)
 1. National Fire Danger Rating System (NFDRS) (ERC)
 - ▶ Varía semana a semana
- ▶ Ataque extendido y manejo del incendios grandes
 - ▶ La sistema para pronosticar el comportamiento de fuegos (crecimiento del incendios)
 1. National Fire Danger Rating System (NFDRS) (ERC)
 2. Fire Behavior Prediction System

Trabajo futuro juntos

- ▶ Tecnología
- ▶ Ciencia
 - ▶ Mejorando las predicciones de las características del fuego
 - ▶ Añadir el viento a los productos pronósticos

- ▶ Tecnología
 - ▶ Conglomerados de los puntos de calor
 - ▶ Animaciones de los mapas
 - ▶ Mapas móviles

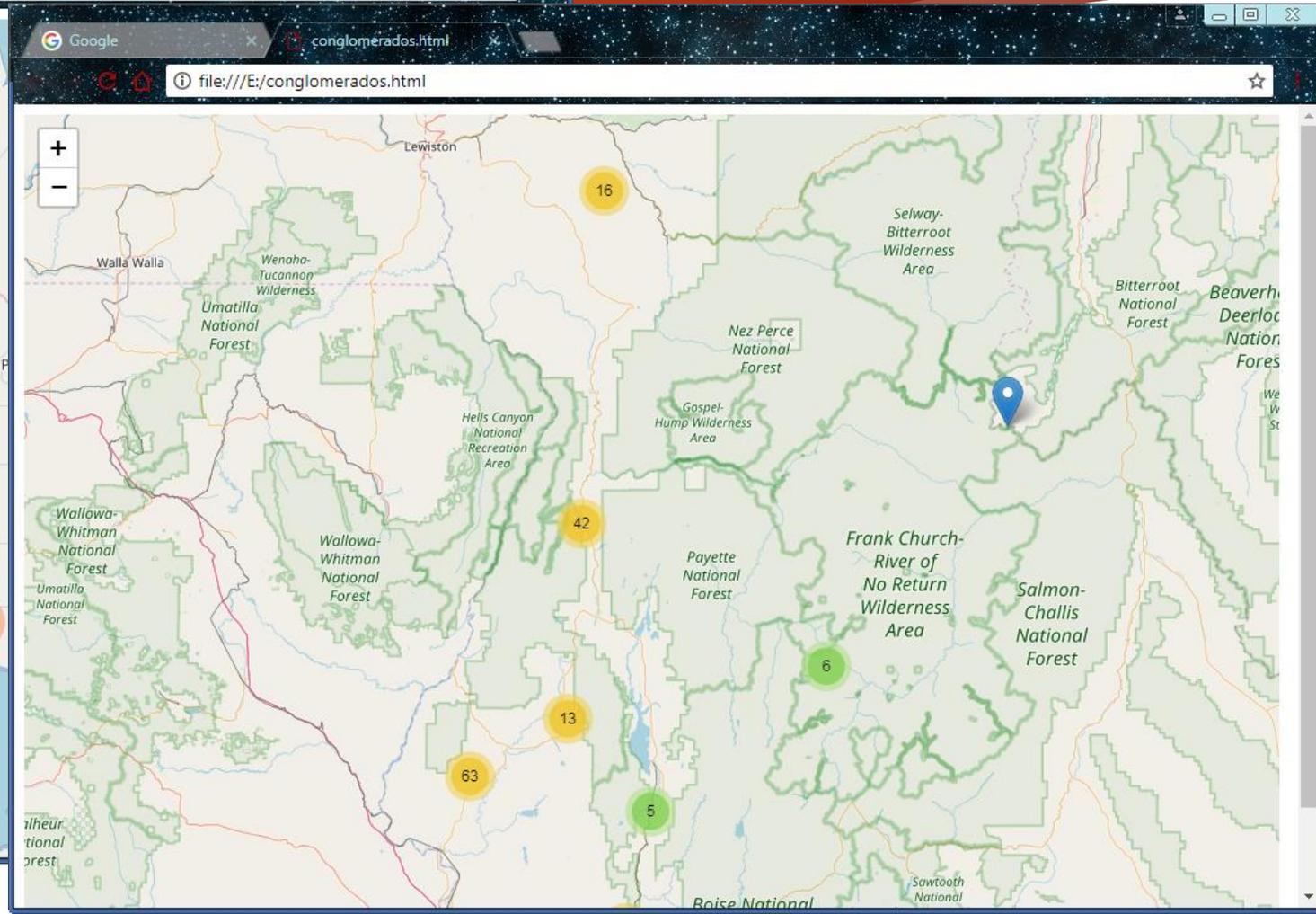
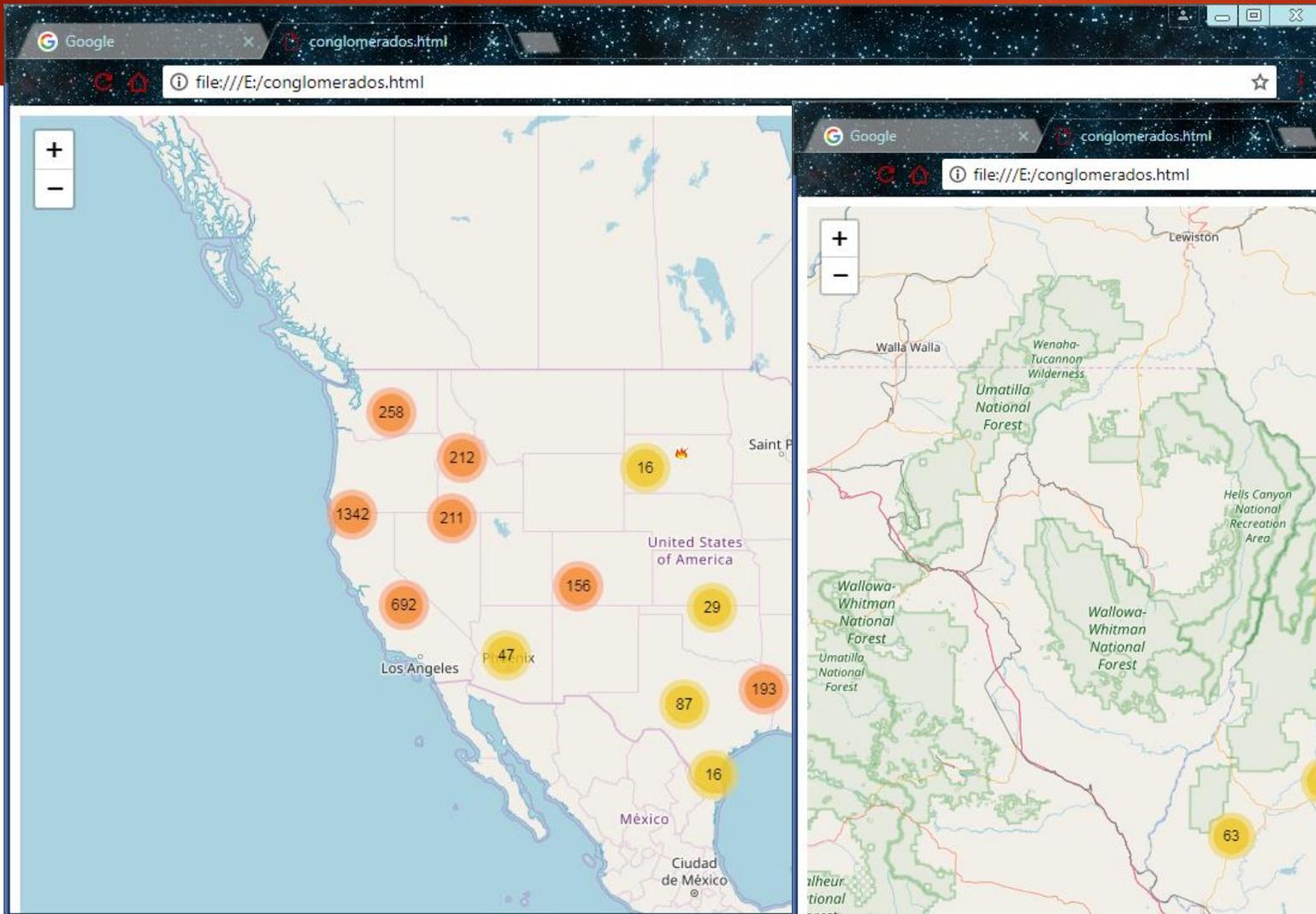
- ▶ LEAFLET



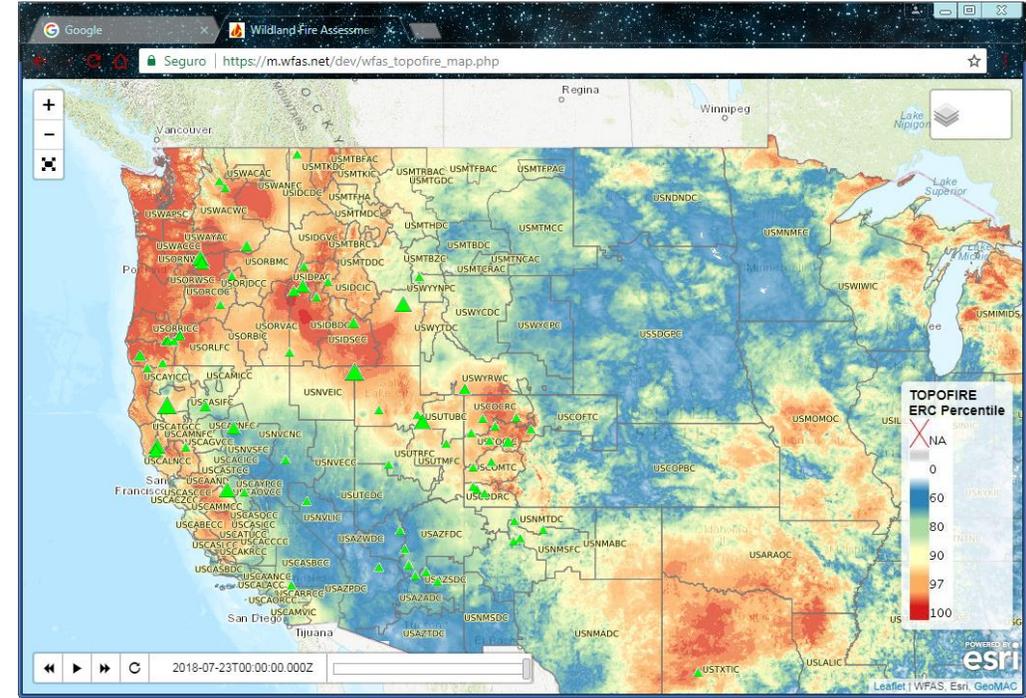
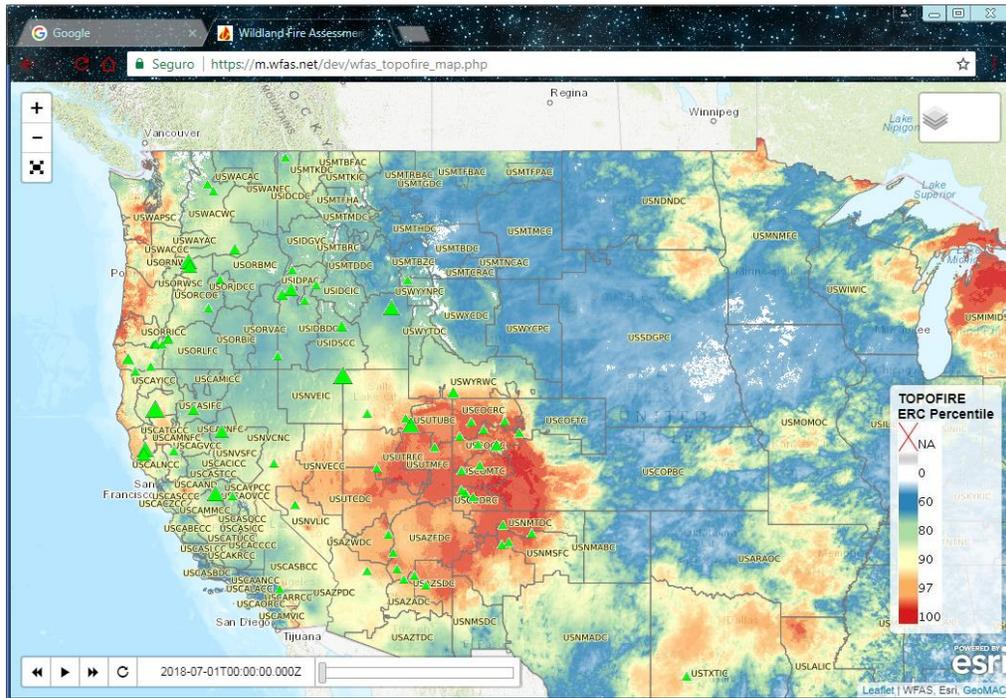
an open-source JavaScript library
for mobile-friendly interactive maps

[Overview](#) [Tutorials](#) [Docs](#) [Download](#) [Plugins](#) [Blog](#)

Conglomerados de puntos del calor



Animaciones y historicos

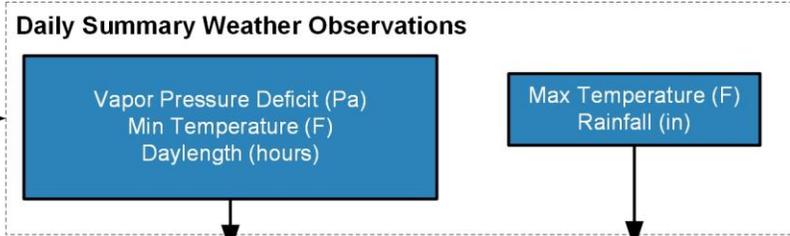
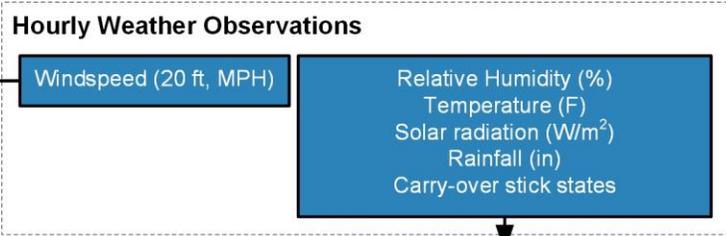


Desarrollo de un índice de peligro

- ▶ Desarrollo de pronósticos de **número de conglomerados** y **área quemada** por estado
- ▶ Añadir el viento a los productos pronósticos
- ▶ Desarrollar un modelo para pronosticar **dificultad de supresión**.

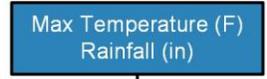
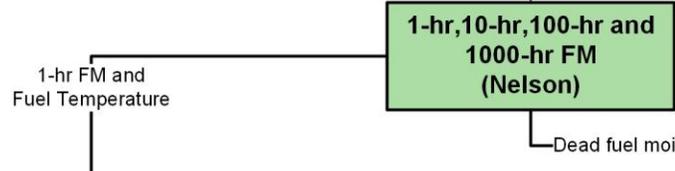


Inputs



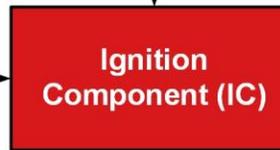
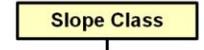
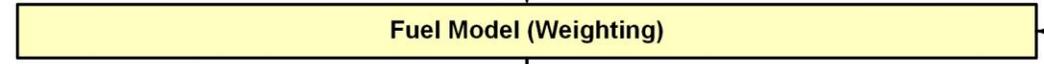
Meteorología

Fuel Moistures



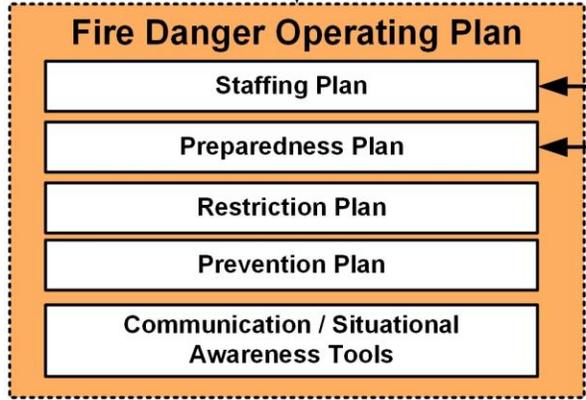
El combustible

Outputs



Índices

Applications



Los aplicaciones

Windspeed

1-hr FM and Fuel Temperature

Dead fuel moistures

Live fuel moistures

Herb Curing

Drought Fuel Load

Preparedness

Wildland Fire Response

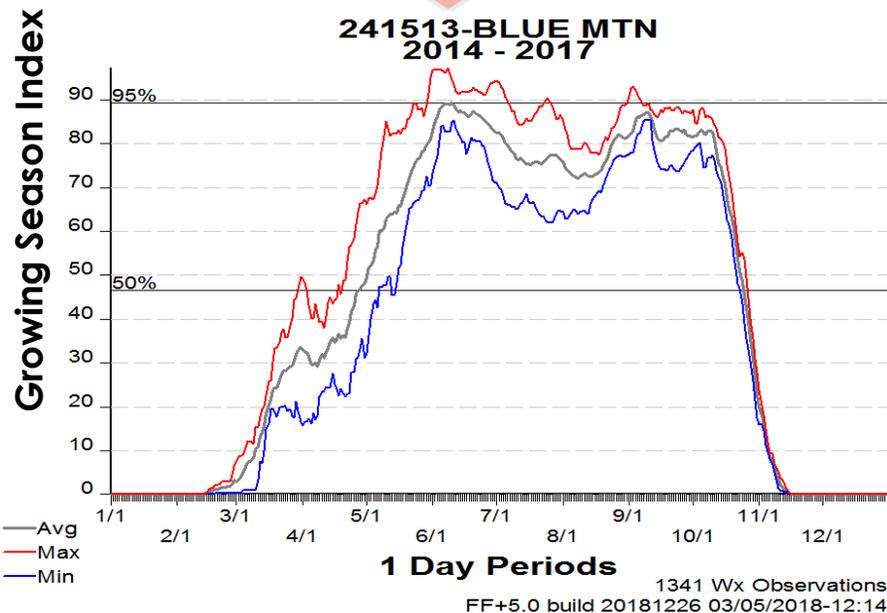
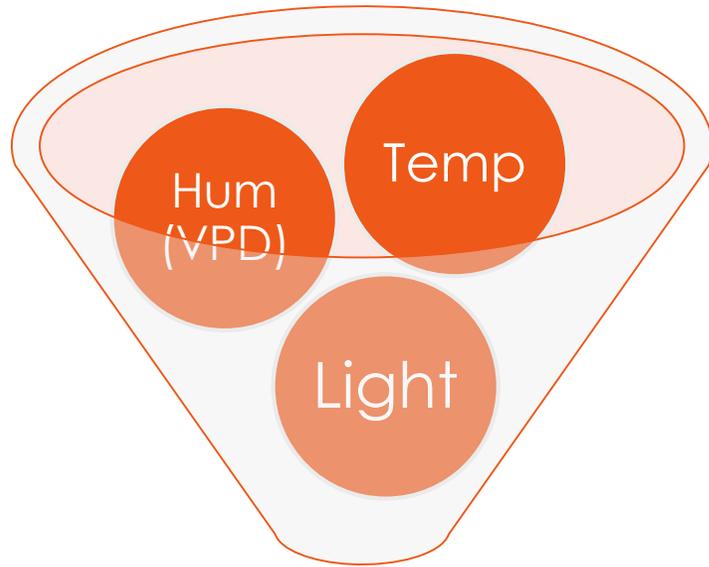
“

Better representation of live fuels

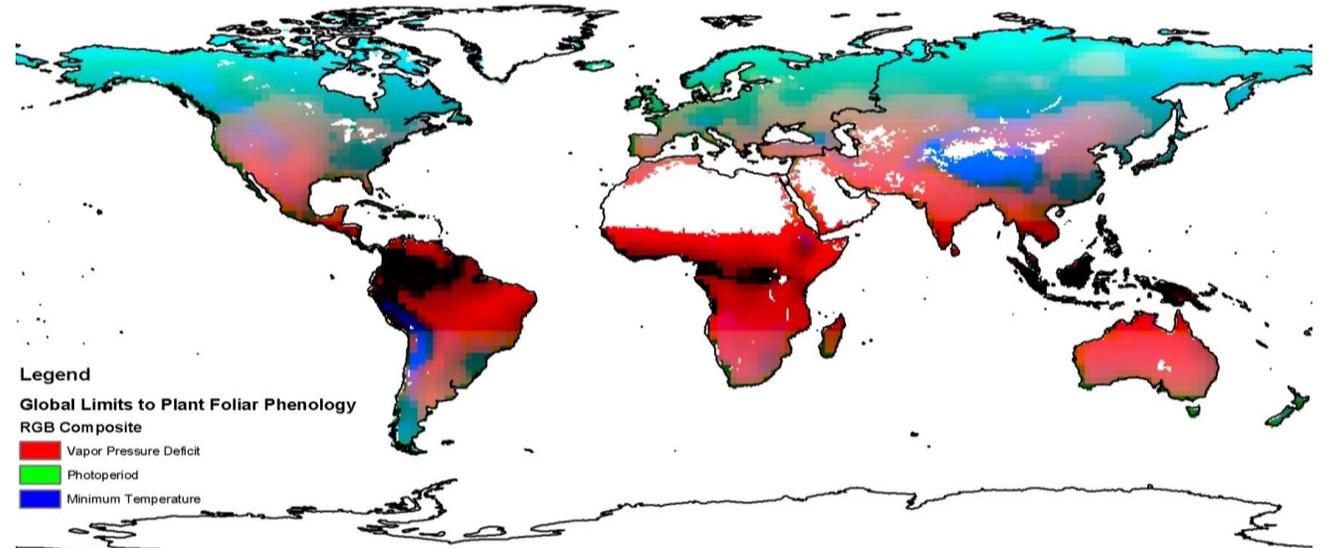
Mejor representación de
combustibles vivos

”

Daily Growing Season Index



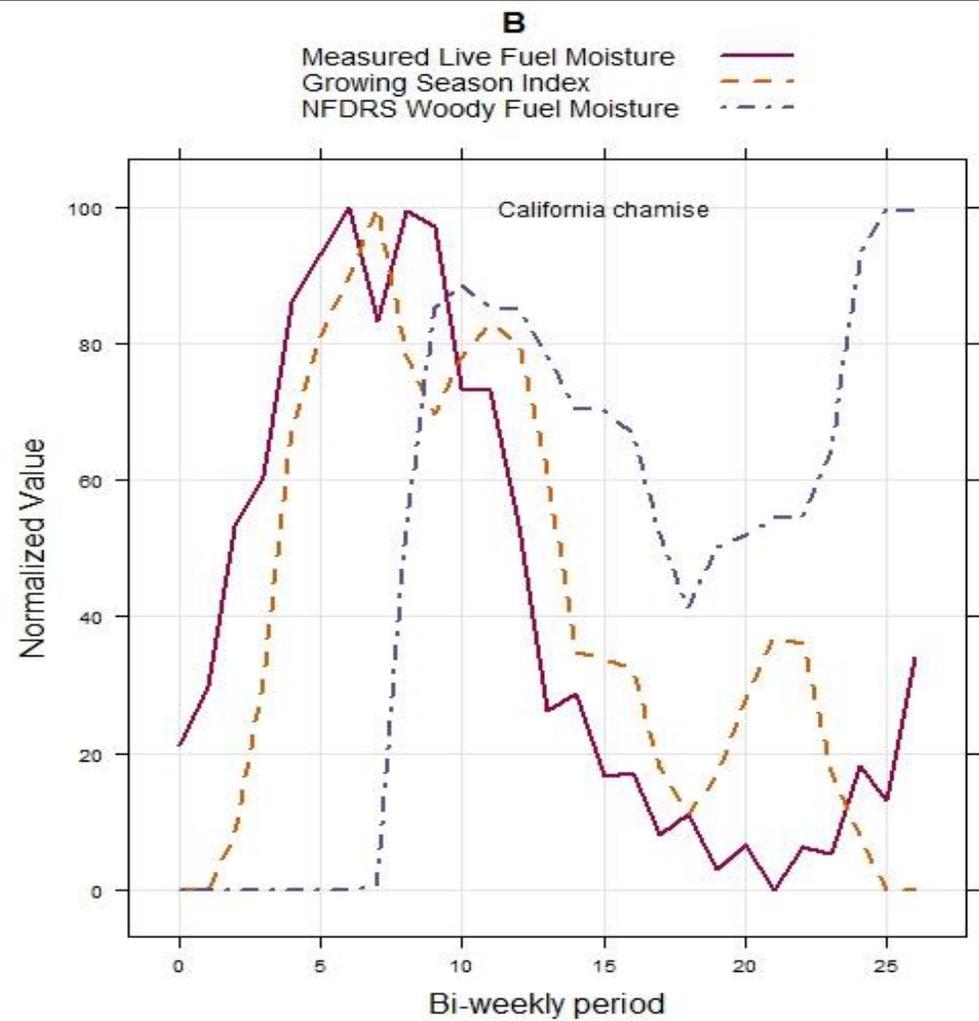
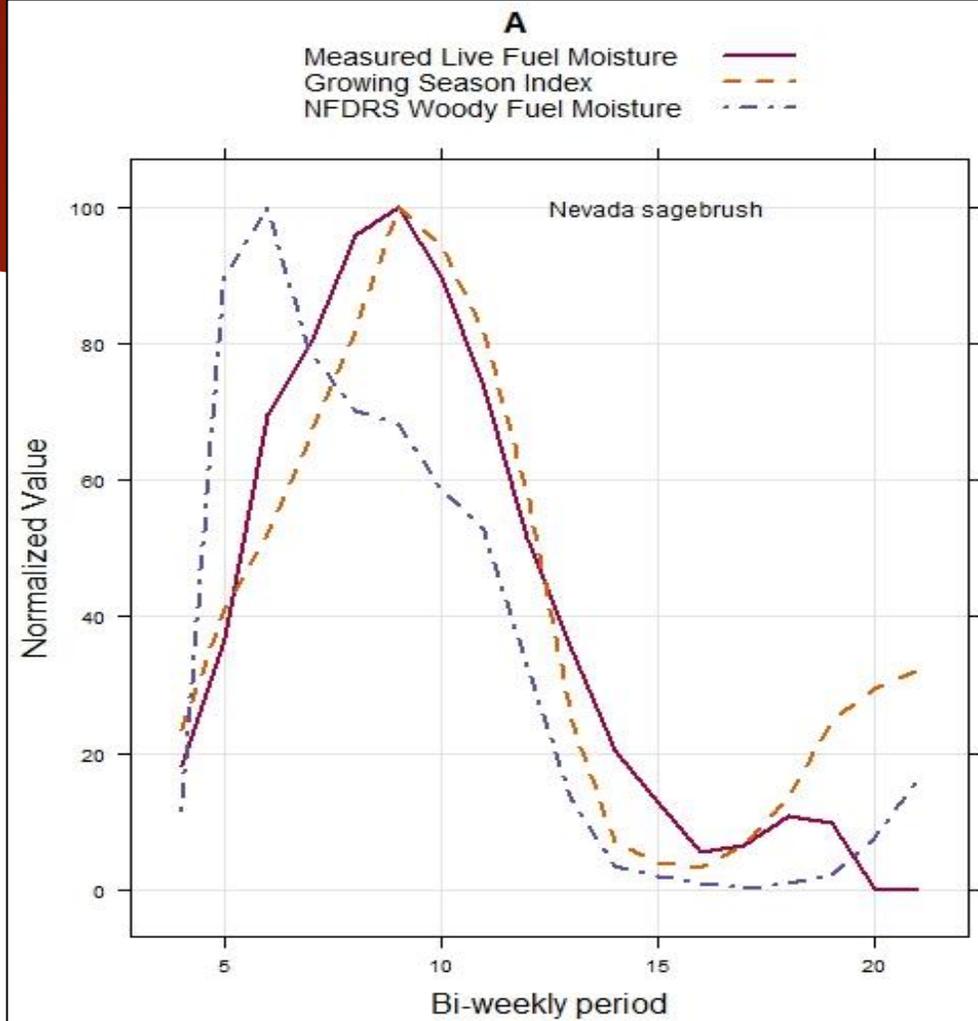
Generalized across all climates



Calculate GSI

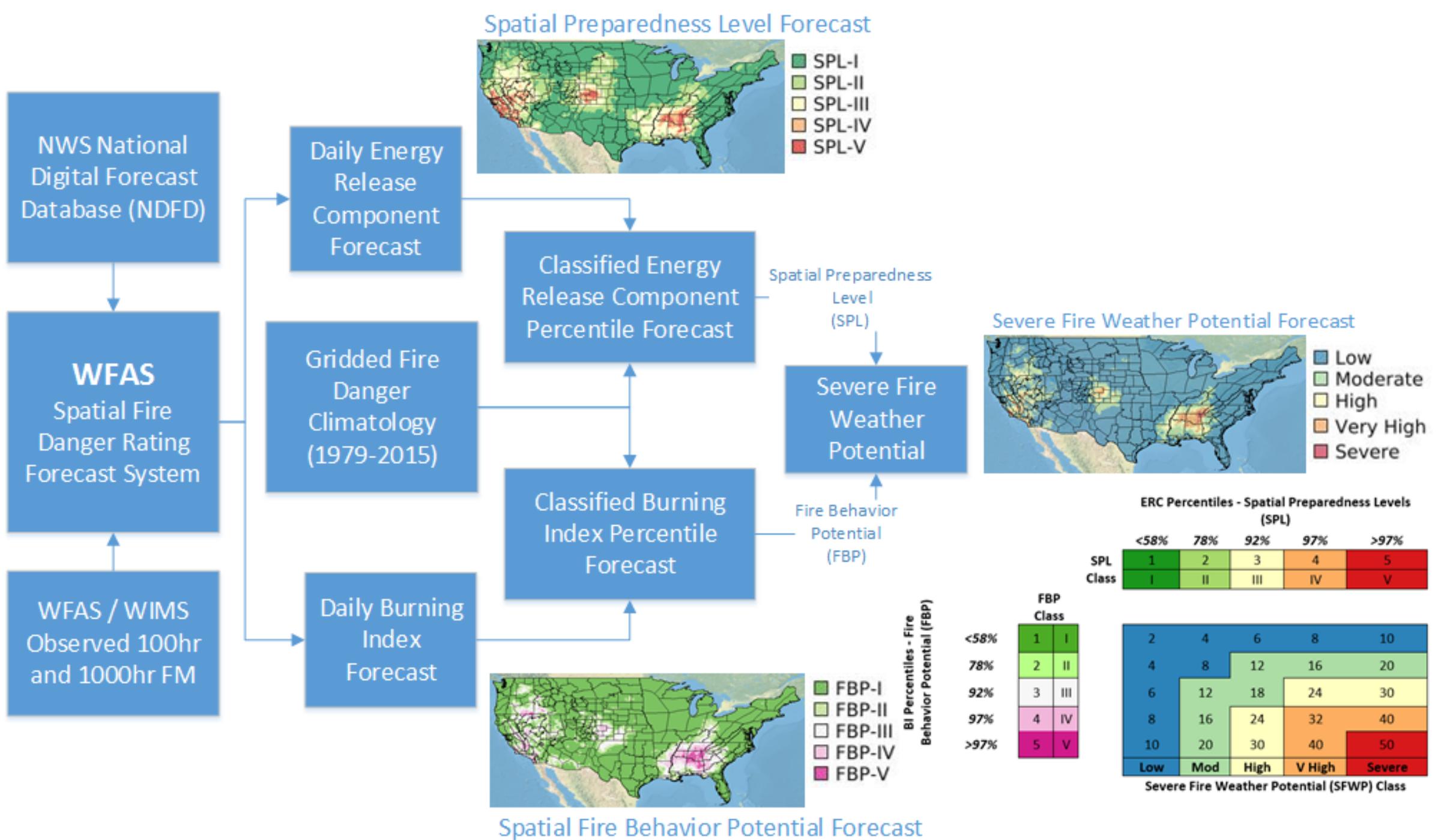
Rescale GSI

Calculated LFM
from GSI



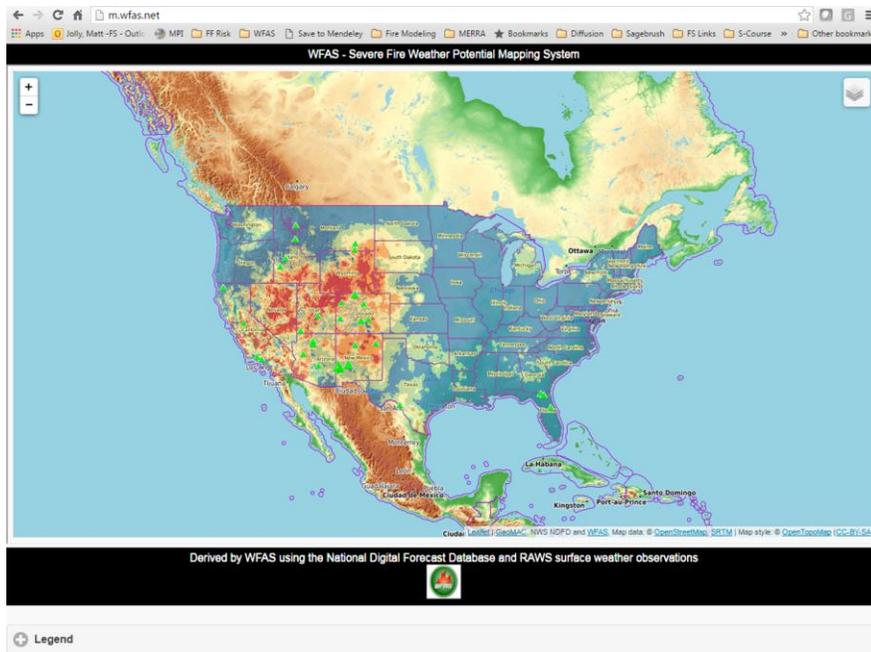
Componentes importantes de NFDRS

- ▶ Energy Release Component
 - ▶ La sequedad del combustible
 - ▶ Para decisiones que no cambian rápidamente
 - ▶ **(el riesgo de ignición)**
- ▶ Burning Index
 - ▶ Incluye la velocidad del **viento**
 - ▶ Mejor para ataque extendido y decisiones de supresión que cambian rápido
 - ▶ **Dificultad de supresión (velocidad y longitud de flama)**

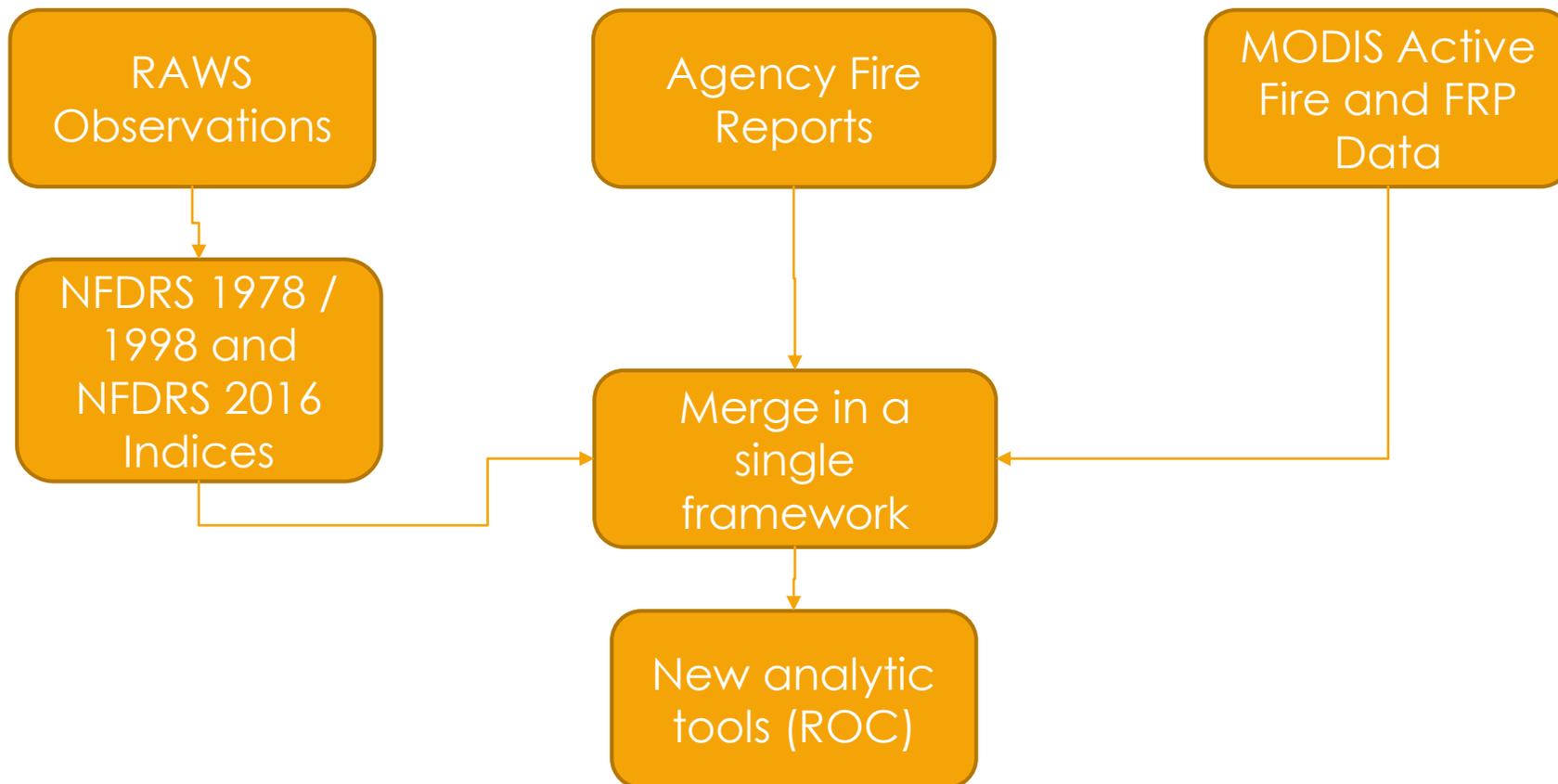


Severe Fire Weather Potential Mapping

<https://m.wfas.net>

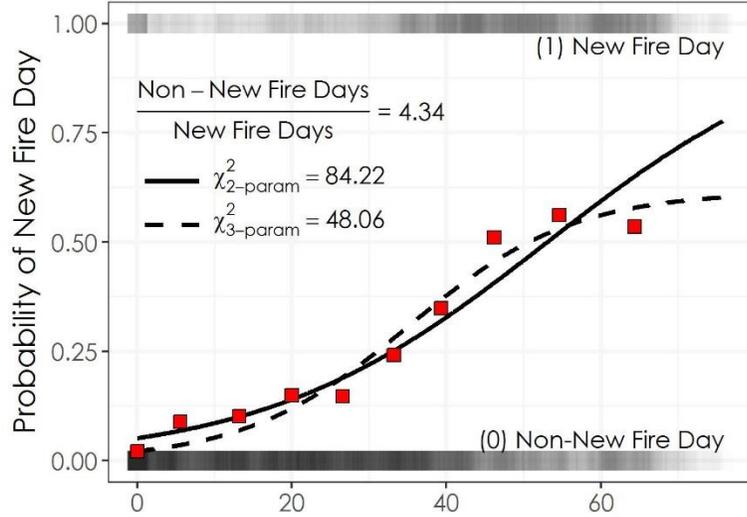


- ▶ Mobile-enabled but works on everything
- ▶ Geo-located in the future
- ▶ Incorporates GeoMAC fire locations and perimeters, MODIS and VIIRS active fire products from RSAC Active Fire Mapping Program, fuels and slope maps
- ▶ Operational and available daily @ ~0630MT
- ▶ Currently provides forecast for next three days



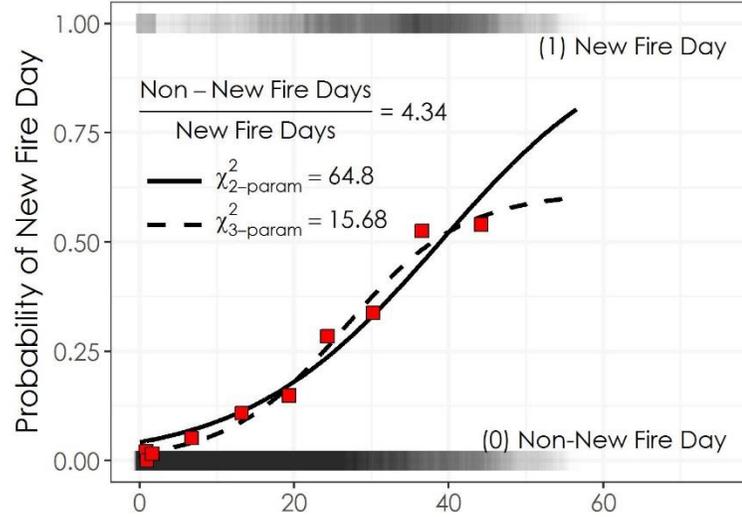
NFDRS 1978

SIG-LDW, 2003-2016

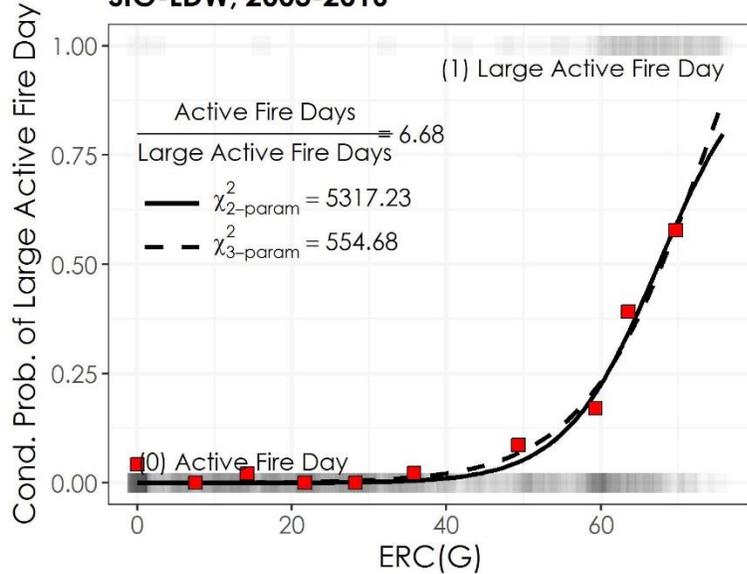


NFDRS 2016

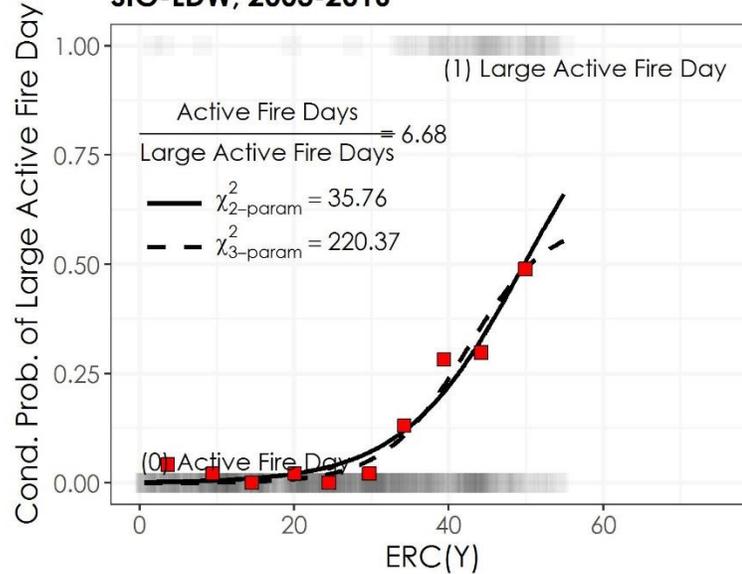
SIG-LDW, 2003-2016



SIG-LDW, 2003-2016



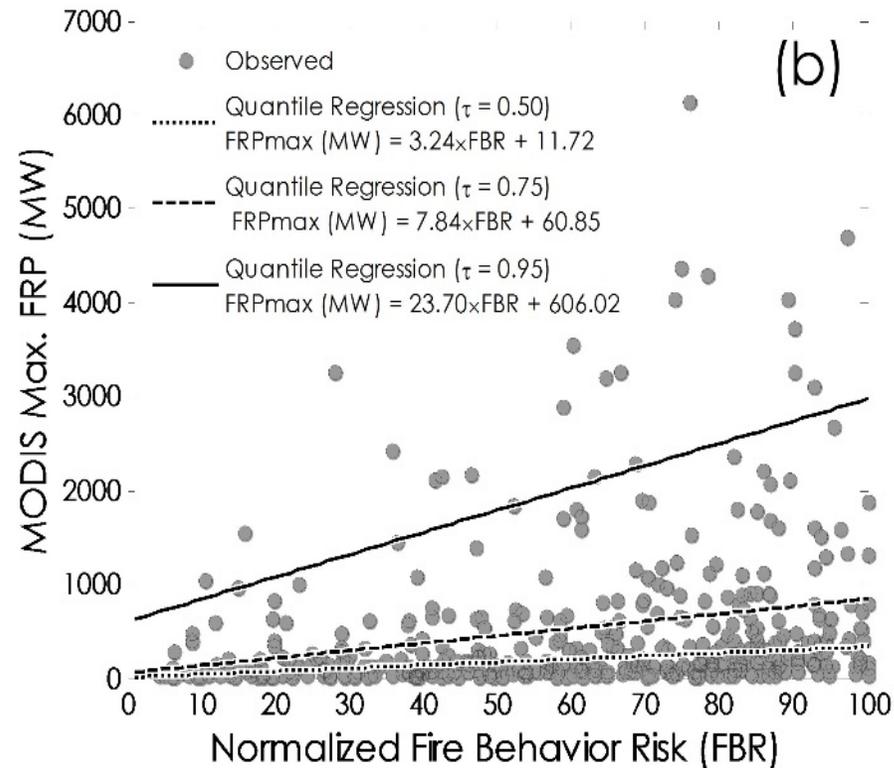
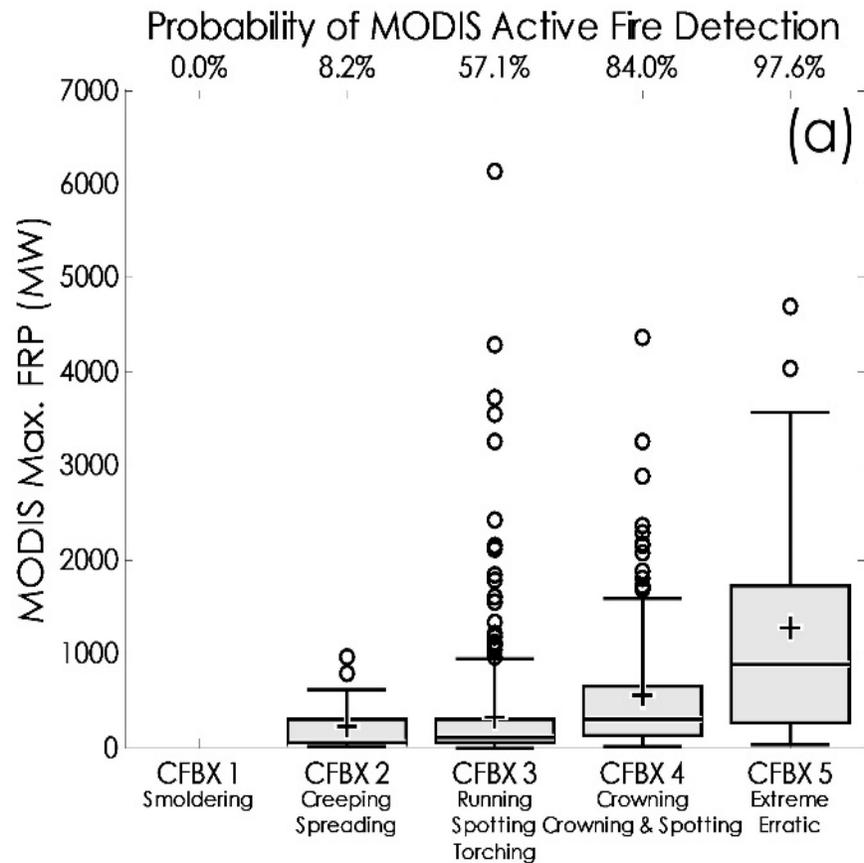
SIG-LDW, 2003-2016

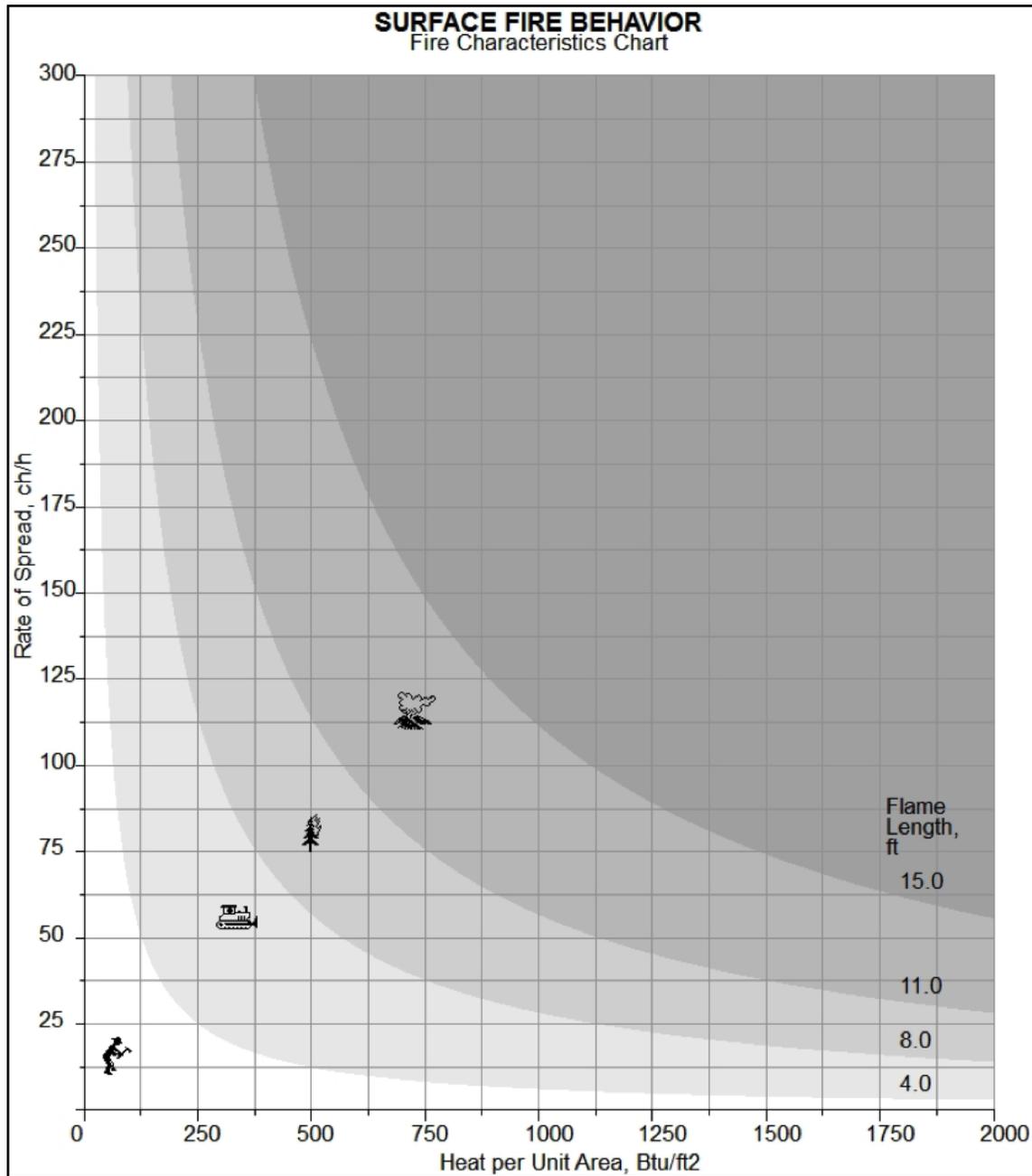


Probabilidad
diaria de
incendio por día

Probabilidad de
un incendio
duradero por dia

La relación entre el FRP y el comportamiento del fuego

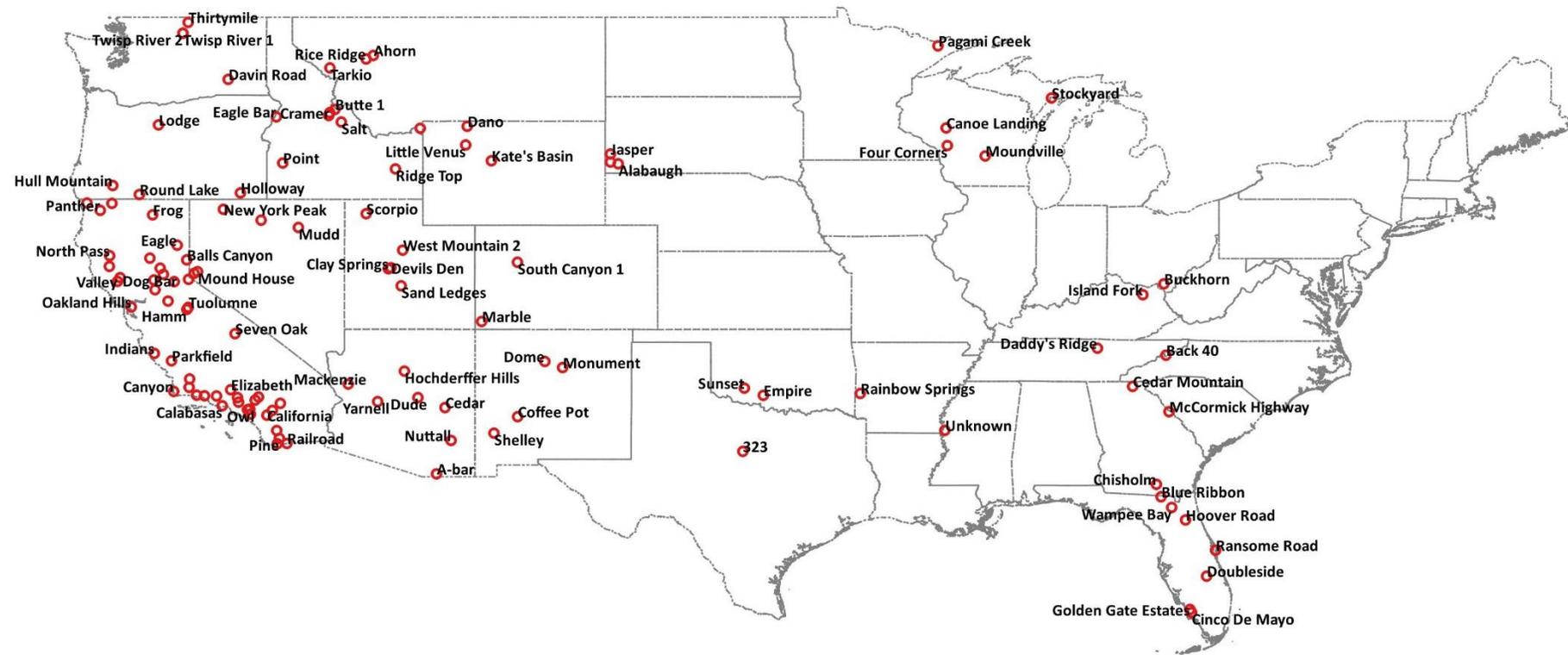




Fire Behavior Class	Rate of Spread (ch/hr)	Flame Length (ft)	Tactical Interpretation
Very Low	0-2	0-1	Direct, Hand
Low	2-5	1-4	Direct, Hand
Moderate	5-20	4-8	Direct, Equip
High	20-50	8-12	Indirect
Very High	50-150	12-25	Indirect
Extreme	150+	25+	Indirect

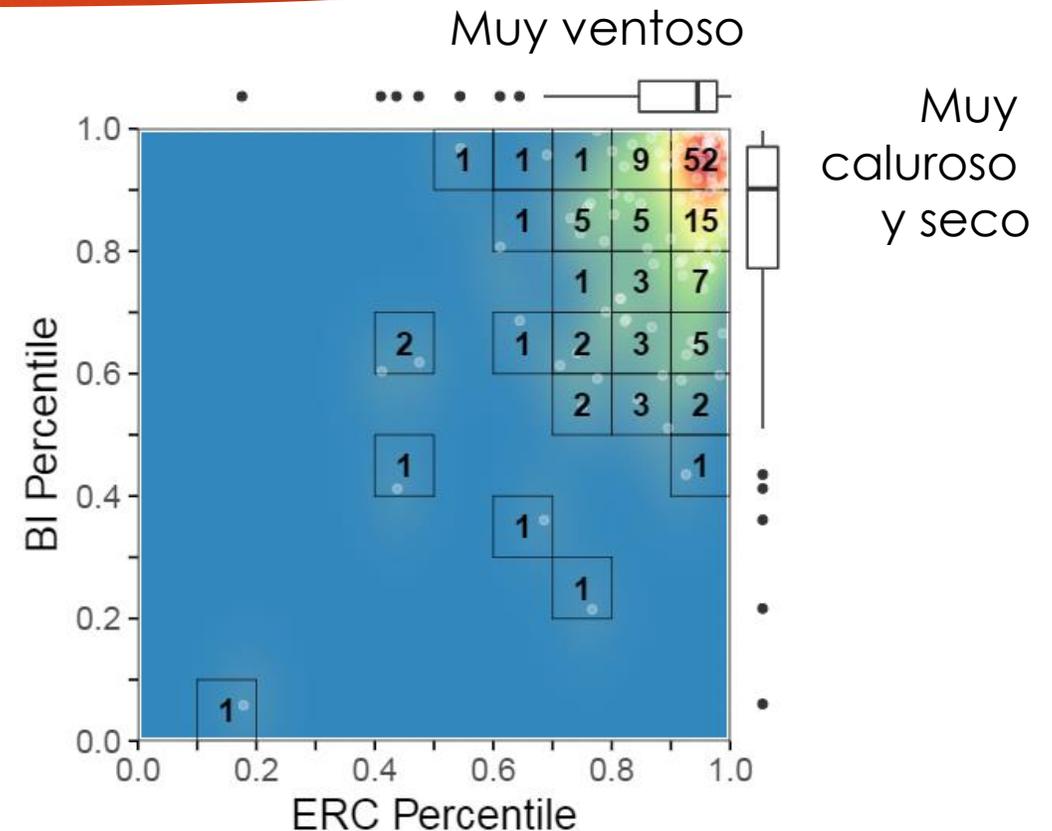
Relacion de poder calorifico del incendio

118 atrapamientos (1979-2017)



La relación entre los acorralamiento / fatalidades y los índices del peligro de fuego

- ▶ 118 firefighter entrapments and fatalities from 1979 to 2017
 - ▶ **94 happened under extreme weather conditions**
 - ▶ **94 ocurrieron bajo condiciones climáticas extremas**
 - ▶ Fire weather is a major common factor in firefighter deaths



Thomas Fire, 2017

Preliminary Summary Report of Serious or Near Serious
CAL FIRE Injuries, Illnesses and Accidents



GREEN SHEET

Fatality Firefighter Entrapment

12/14/2017

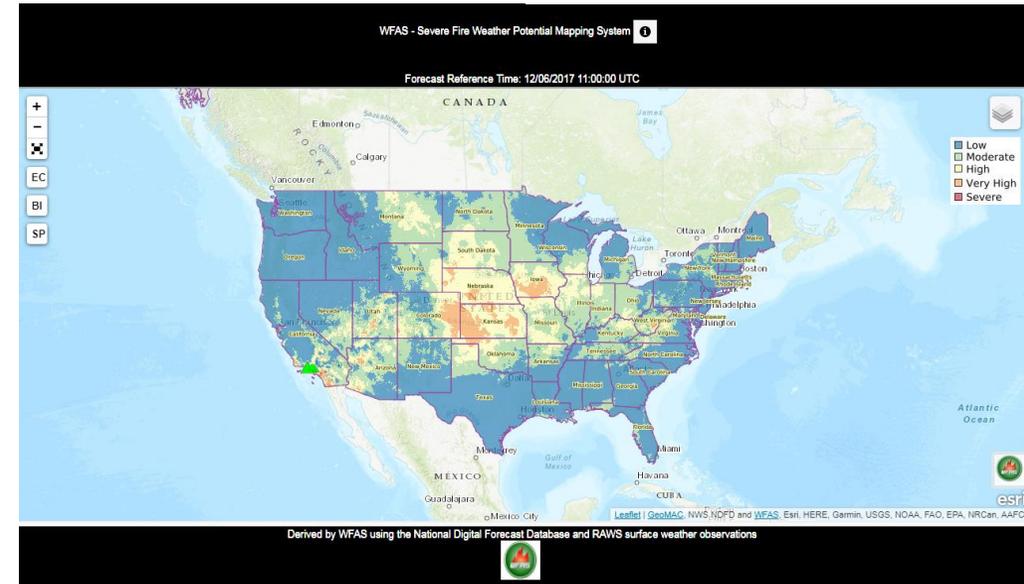
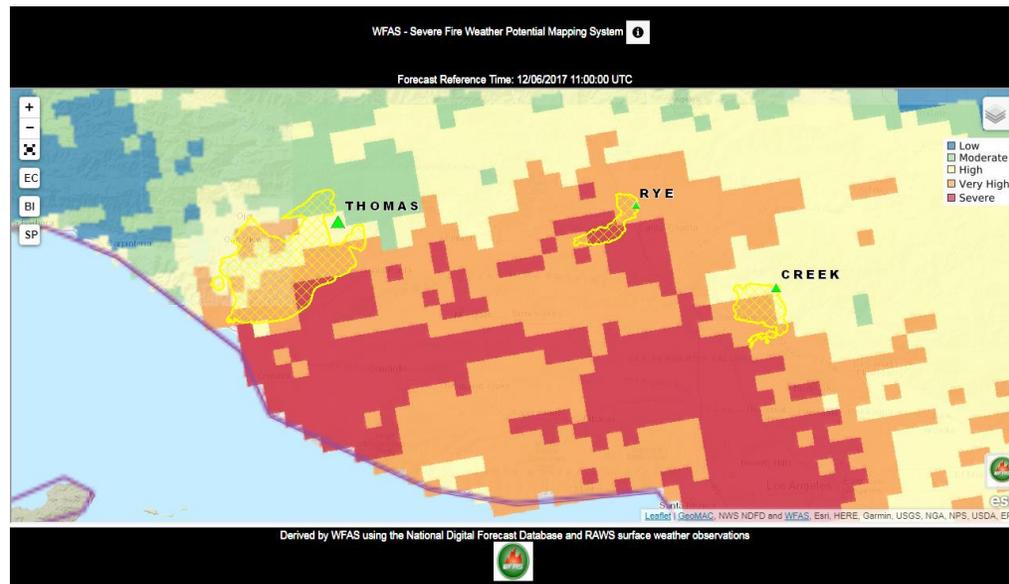
Thomas Fire

17-CA-VNC-103156

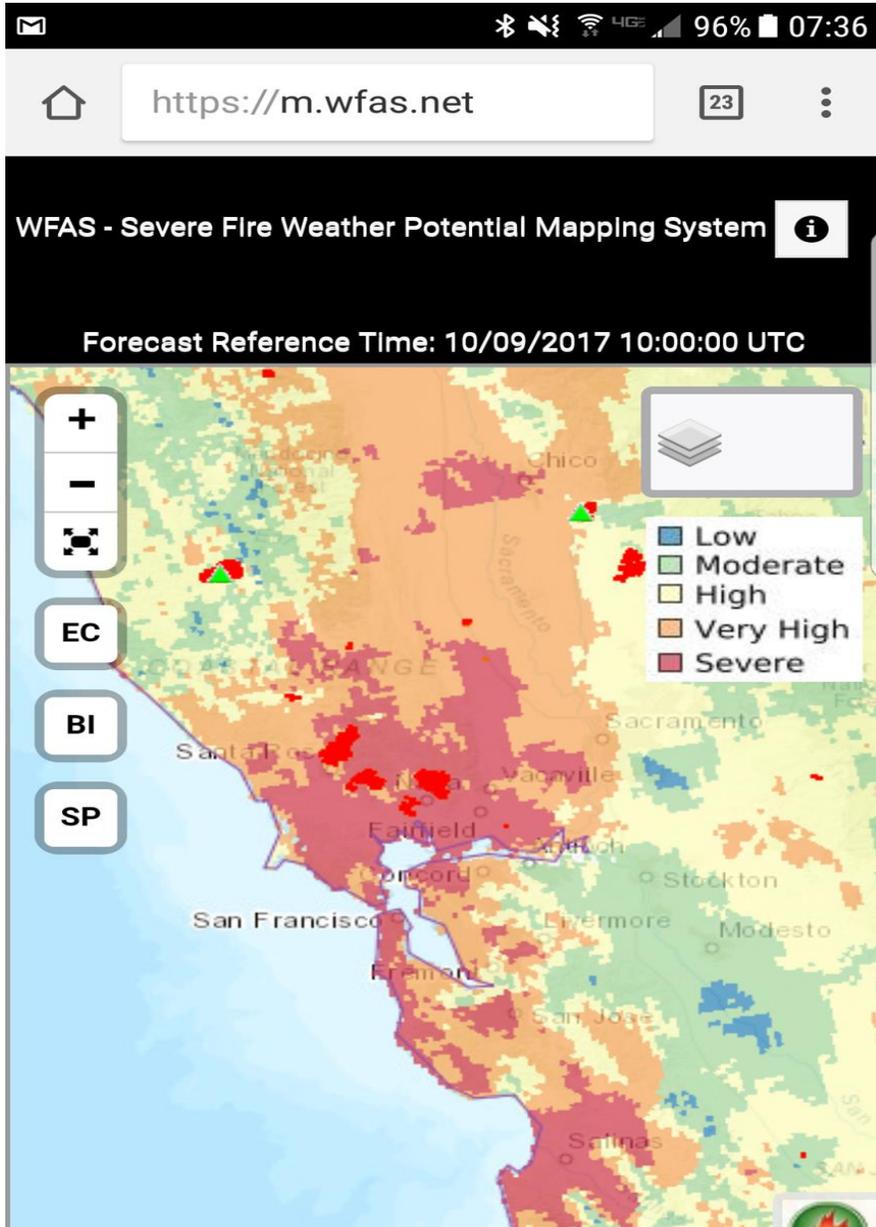
California Southern Region

SUMMARY

On December 13, 2017, a CAL FIRE Engine Strike Team (STEN1), with a leader (STL1) from the San Diego Unit (MVU) was assigned to Branch III, Division X of the Thomas Fire above the community of Fillmore in Ventura County, California. On the morning of December 14, 2017, a Fire Apparatus Engineer (FAE1) and four Fire Fighter I's (FF1, FF2, FF3 and FF4) from STEN1 were engaged in the placement of a hoseline in support of a dozer line with fire established above the line. At approximately 9:27 AM, while attempting to suppress spot fires below the dozer line, FAE1 became entrapped and suffered fatal injuries. The four firefighters on the dozer line retreated up their escape route without injury.



Fires in Sonoma County leave at least nine dead and about 180 more missing



Phil Willon ✓
@philwillon



Sonoma County Sheriff Rib Giardano confirms nine fire-related death in the wildfires. Still many people missing,he said

3:19 PM - Oct 10, 2017

♥ 3 👤 See Phil Willon's other Tweets

Componente de liberación de energía (Energy Release Component)

ISC

ISC + Viento

Índice de combustión / quemando (Burning Index)

Conglomerados (clusters) de puntos calores

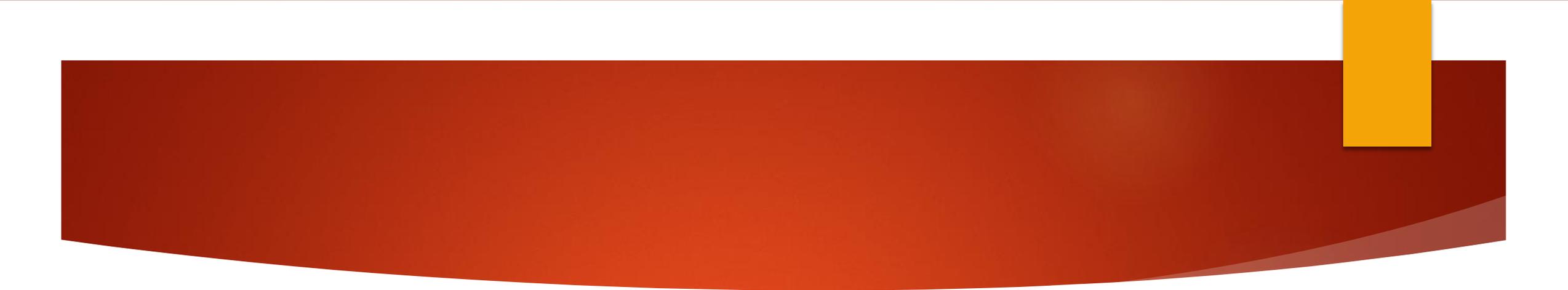
Área quemada

Dificultad de supresión (FRP)

Por Espacio Y Estado

Por Estado

- Para apoyar decisiones de:
1. Antes del incendio (preparación)
 2. Ataque inicial
 3. Ataque extendido
 4. Manejo del incendios grandes



- ▶ Tecnología

- ▶ 1. “Clustered” o conglomerados del puntos de calor en el mapa del web
- ▶ 2. Animaciones de los mapas
- ▶ 3. Mapas que estan disponible en los dispositivos moviles

- ▶ Ciencia (Pronosticos mejoras)

- ▶ 4. Pronosticos del numero de los conglomerados por espacio y por estado
- ▶ 5. Pronosticos de áreas quemadas y dificultad de suppression por estados
- ▶ 6. Mapa del riesgo de incendios agriculturas

Gracias a todos! Preguntas