

**OKLAHOMA
FORESTRY SERVICES**



MANAGE ♦ PROTECT

Partnered Power: Connecting Science and Operations in Real Time

CIWRO Workshop on Fire Weather & Forecasting

Drew Daily

Deputy Fire Management Chief – Operations/Preparedness

Oklahoma Forestry Services



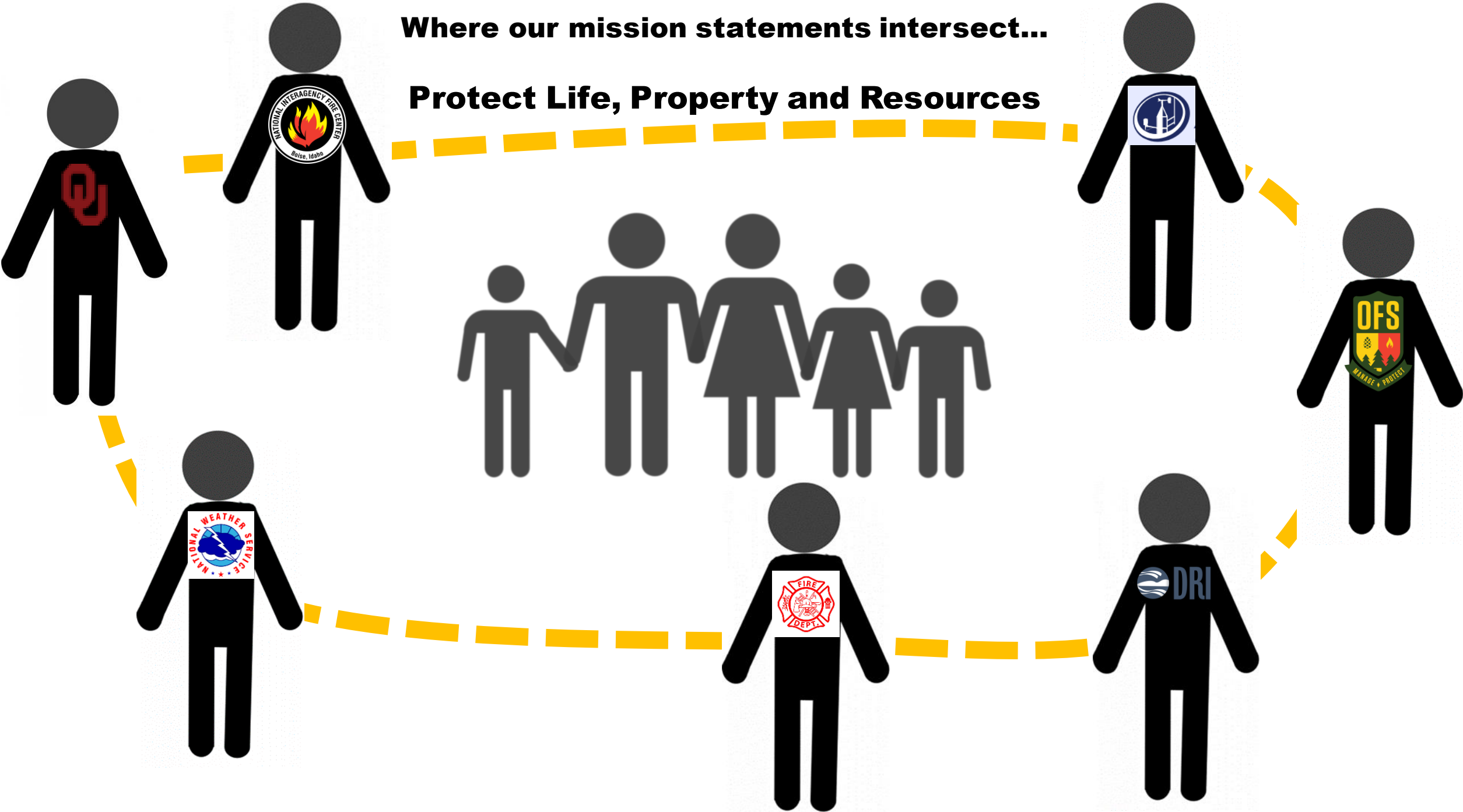
“If an agency stays only within its jurisdictional boundaries, it will fail...[we must] address how fire really exists, and not how select sciences can handle it”

-Dr. Stephen J. Pyne

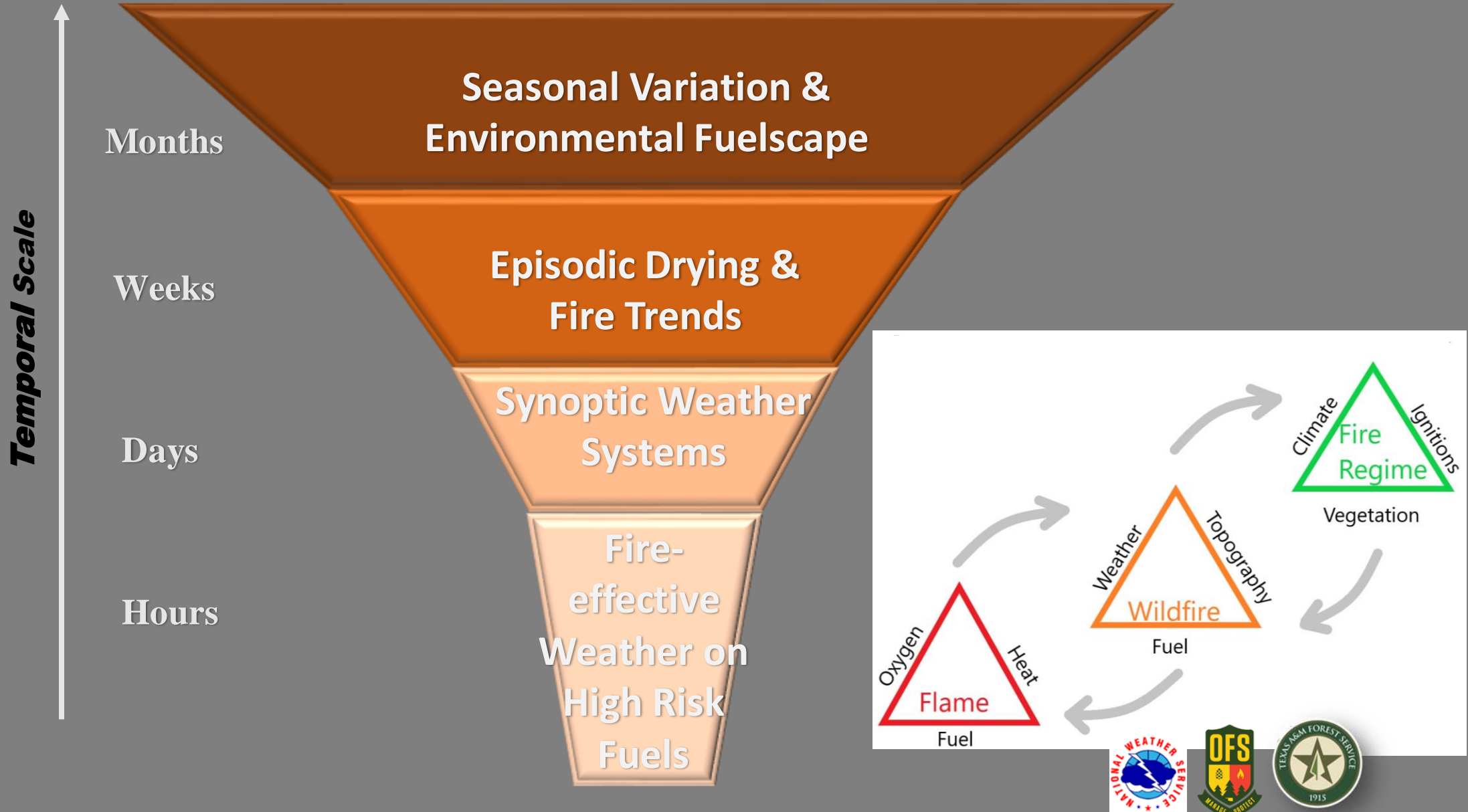


Where our mission statements intersect...

Protect Life, Property and Resources



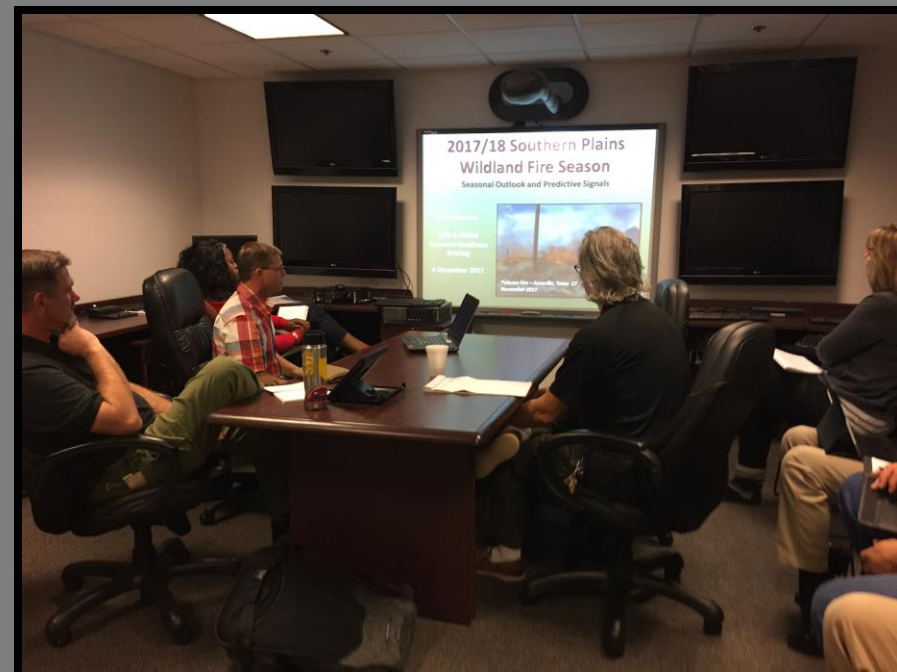
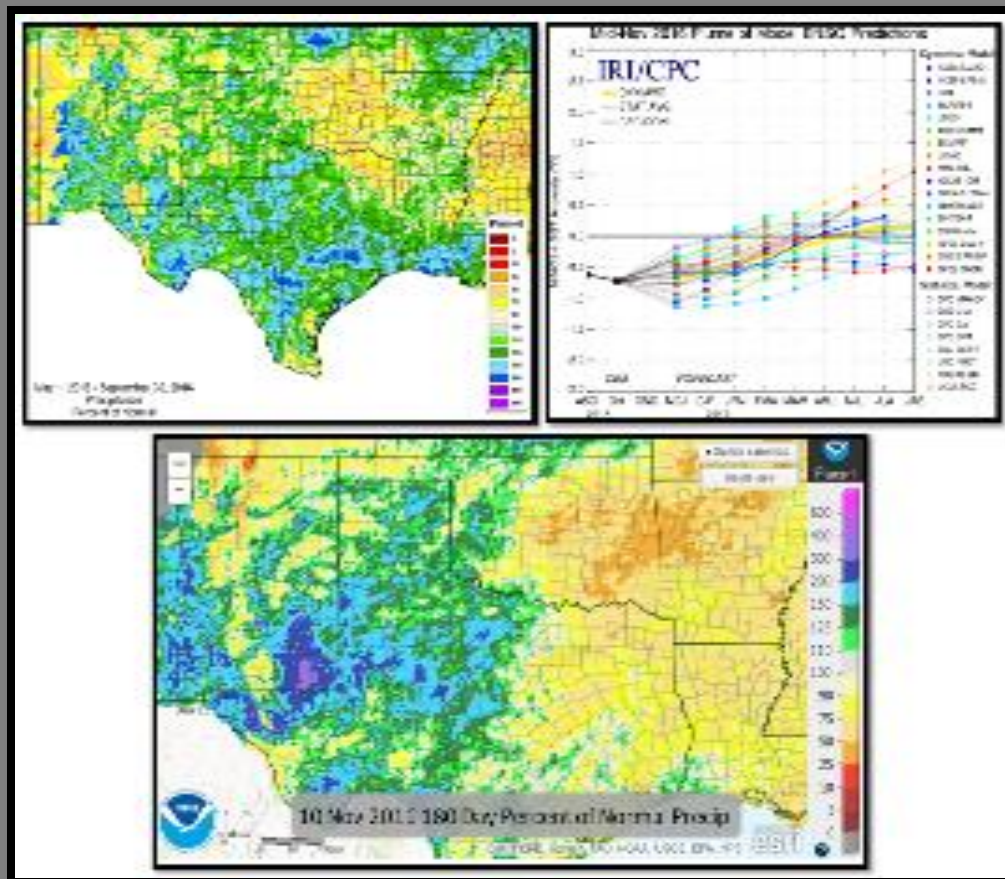
Interdisciplinary Forecast Funnel



Example 12-13 April 2018 Firestorm

Seasonal Variation & Environmental Fuelscape

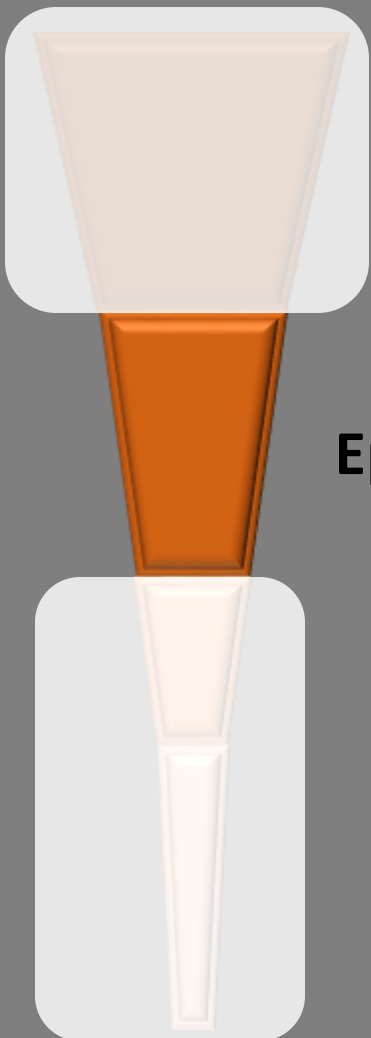
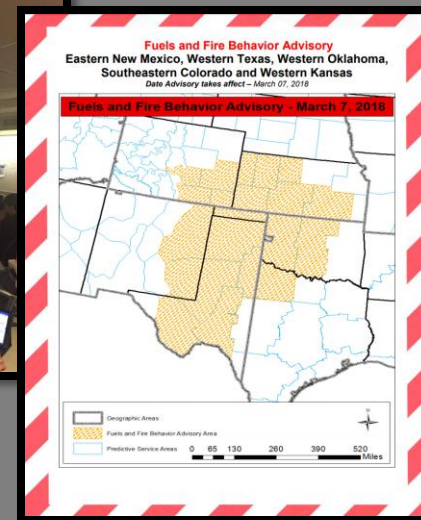
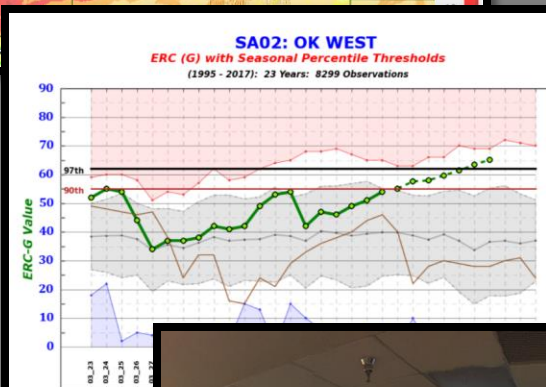
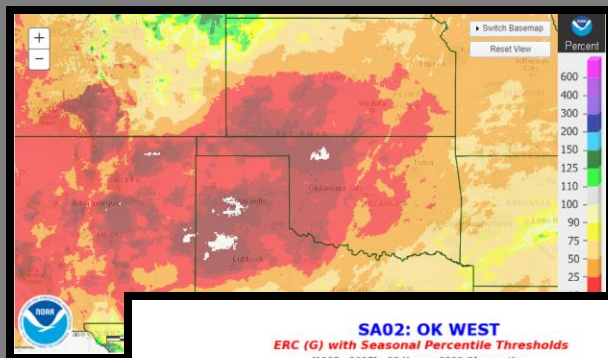
- Warm season rains
- Herbaceous response
- Developing La Niña
- State Forestry/EM leadership briefing – 14 December 2017



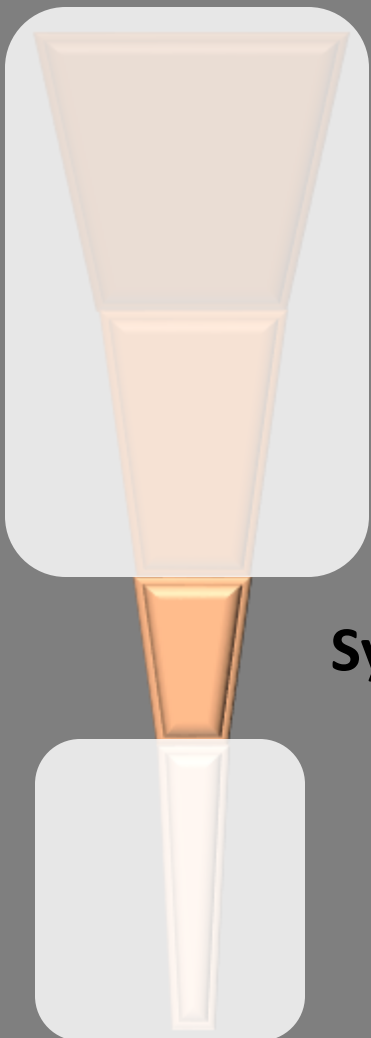
Example 12-13 April 2018 Firestorm

- 30-day precipitation deficits
- ERC trends toward 'crisis'
- Observed fire trends
- Multi-agency Fuels & Fire Behavior Advisory – 7 March
- OFS/NWS joint EM briefing – 15 March 2018

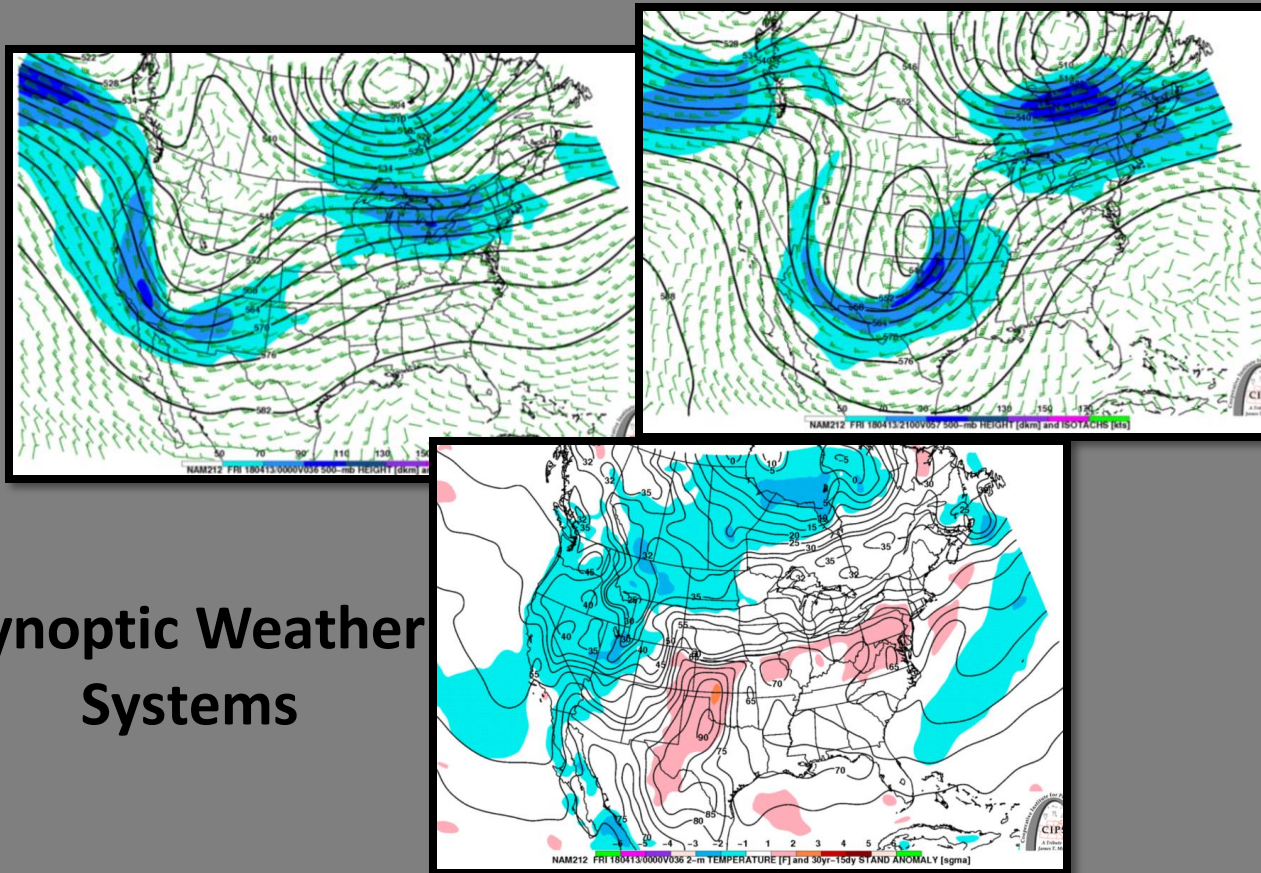
Episodic Drying & Fire Trends



Example 12-13 April 2018 Firestorm



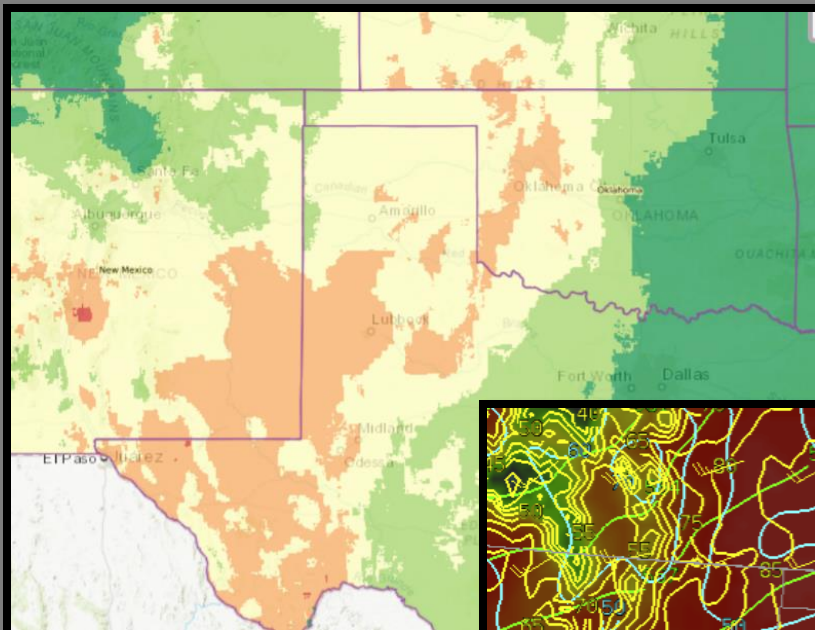
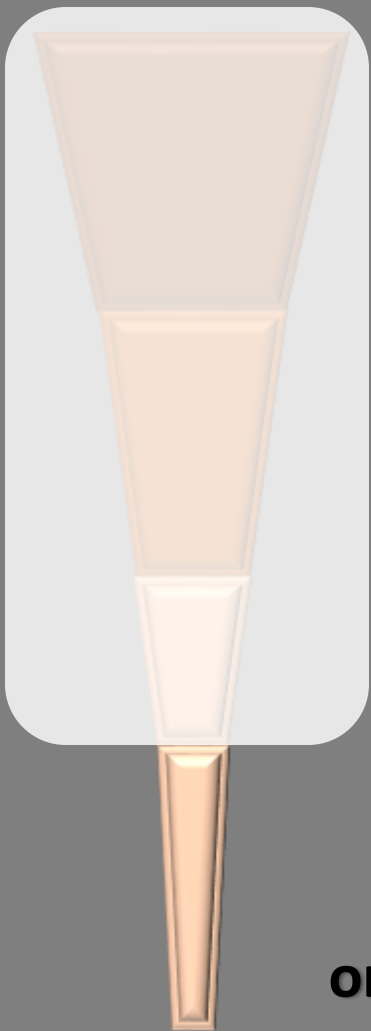
Synoptic Weather
Systems



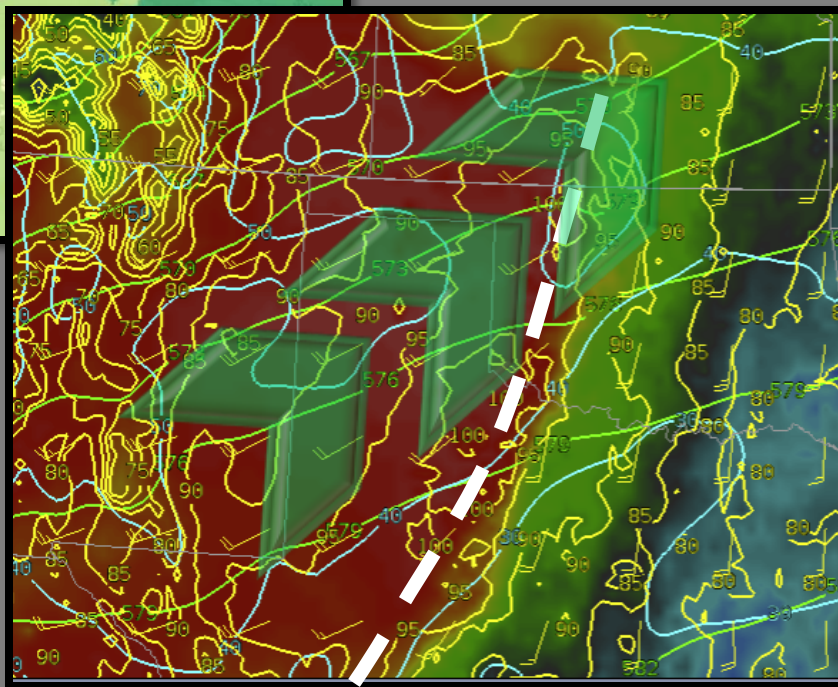
- 7 Apr – “Wed-Fri next week could be interesting with an escalating trend each day.”
- 8 Apr – “Strong fire wx possible Thur & Fri. High end critical/extreme conditions Fri with some similarities to SGPWO patterns.”
- 9 Apr – “Potentially very active period of wildland fire on the Southern Plains.”
- 10 Apr – “Extreme conditions over a small area lending toward potential predictable fire episode [and] dangerous fire situation Friday.”



Example 12-13 April 2018 Firestorm



- 11 Apr – “Dangerous fire episode on the Southern Plains Thu-Fri. Greatest concern is for ignition of significant fire Thursday afternoon in vicinity of the Panhandles/nw OK which will be hit by strong wind shift during peak burning period Friday.”



- 12 Apr – “**Dangerous – potentially life threatening – wildfire episode expected to begin today.** Most favored area for dangerous wildfires is taking shape from the Flint Hills southwestward to central/western-central OK.”

Fire-effective
Weather
on High Risk Fuels



Example 12-13 April 2018 Firestorm

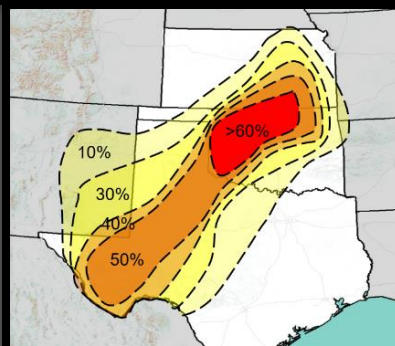
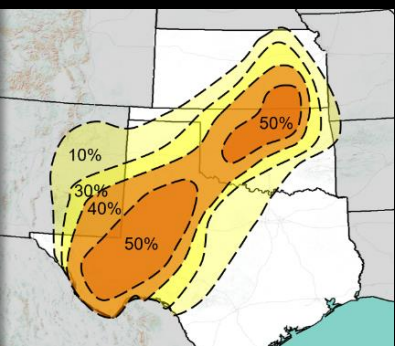
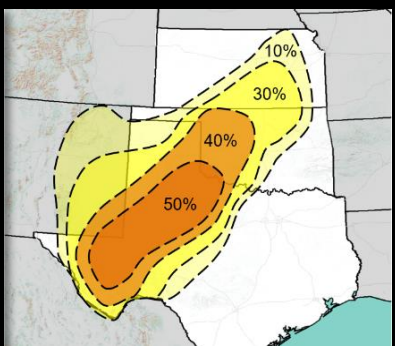
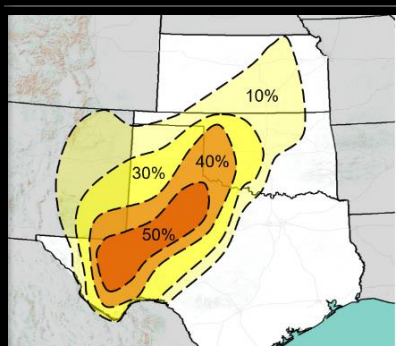
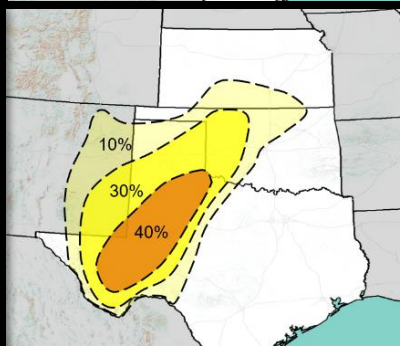
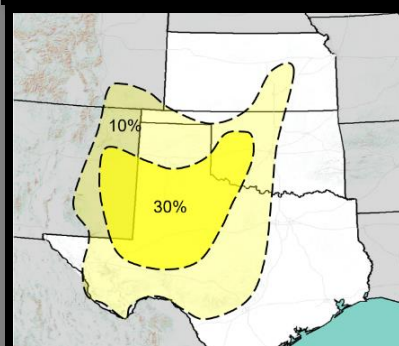
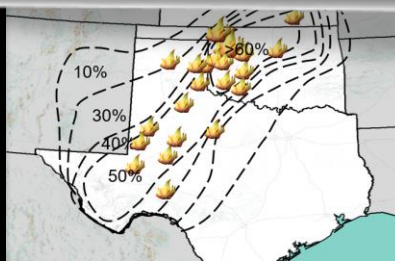
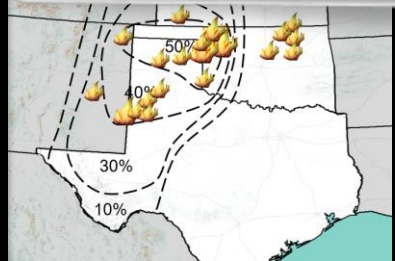
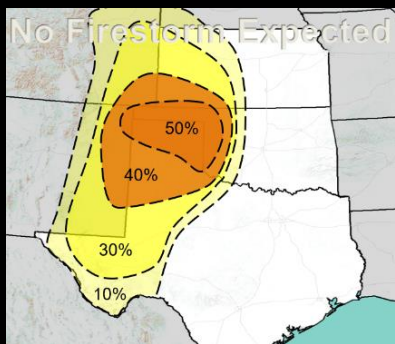
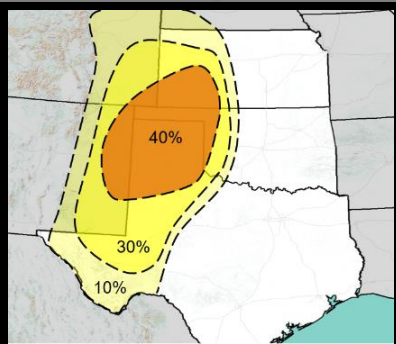
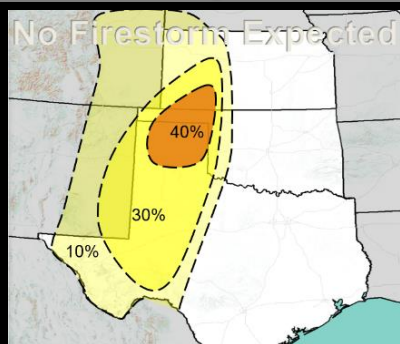
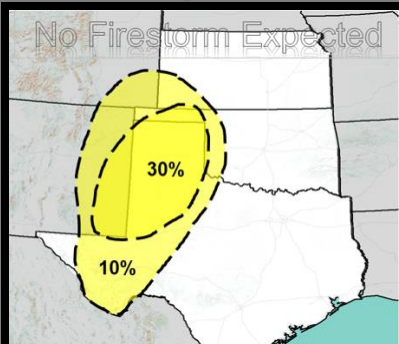
"That fire behavior forecast should scare the hell out of you"

4/9 Day 4

4/10 Day 3

4/11 Day 2

4/12 Day 1



4/9 Day 5

4/10 Day 4

4/11 Day 3

4/11 Day 3

4/12 Day 2

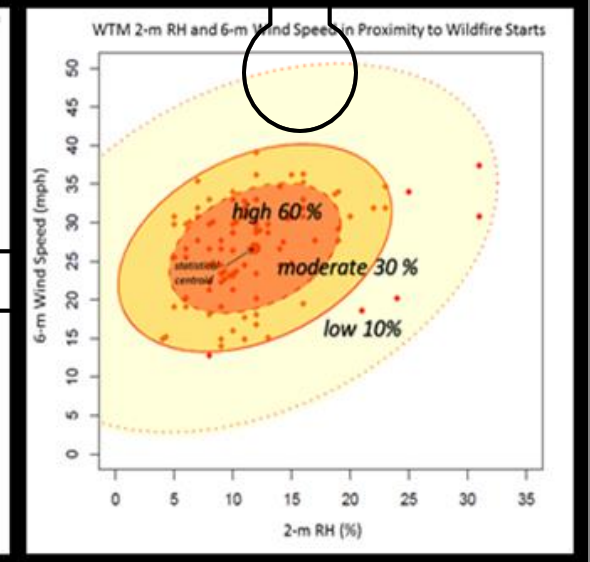
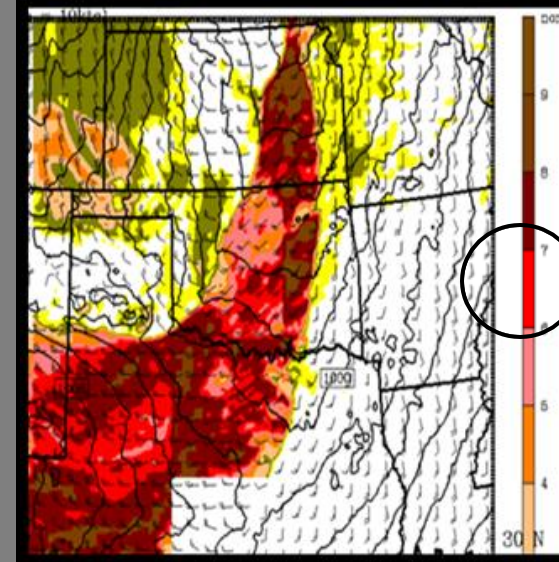
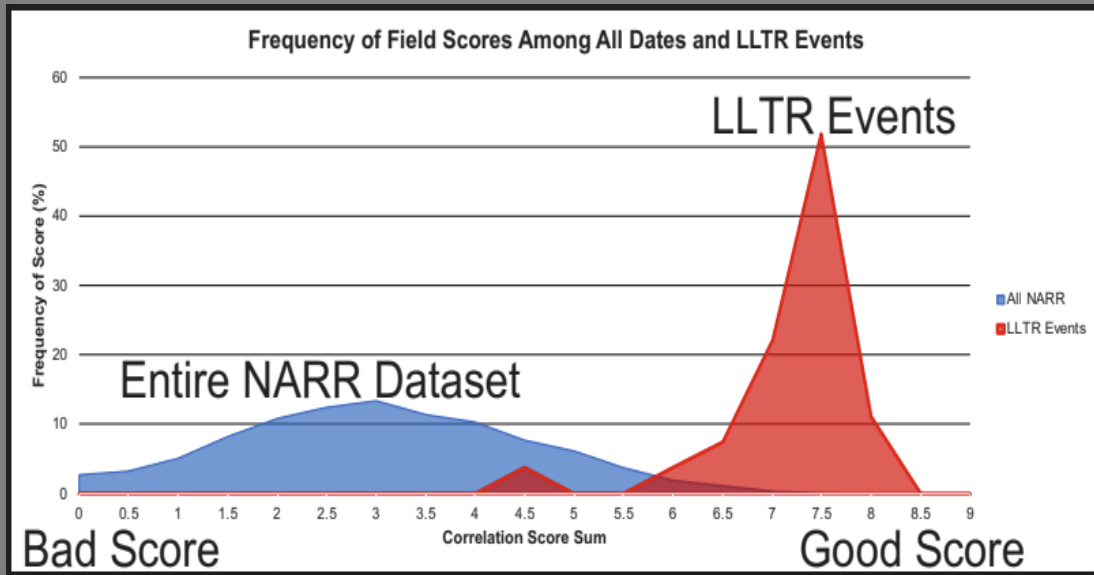
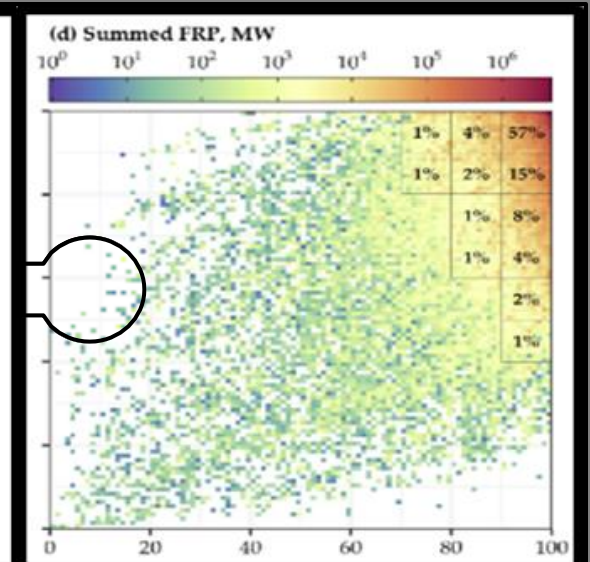
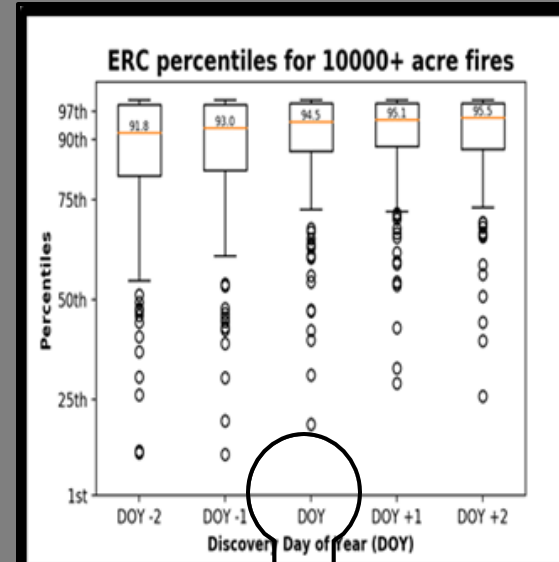
4/13 Day 1



- 40 fires
- 425,408 acres
- 2 killed, 11 injured
- 50 homes lost

Pieces of a Probabilistic Puzzle

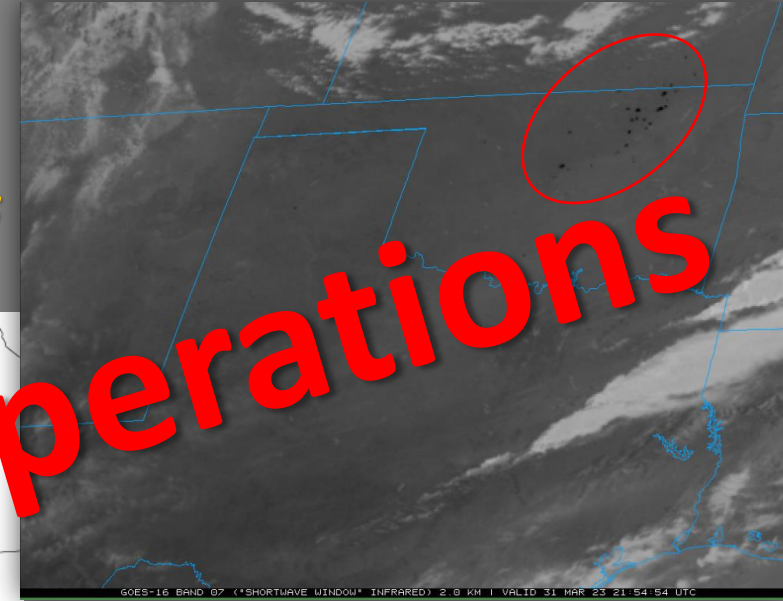
- Energy Release Component
- Red Flag Threat Index
- Burning Index
- CIPS Analog Guidance
- Weather+Fuel Parameter Space



The Probabilistic Puzzle

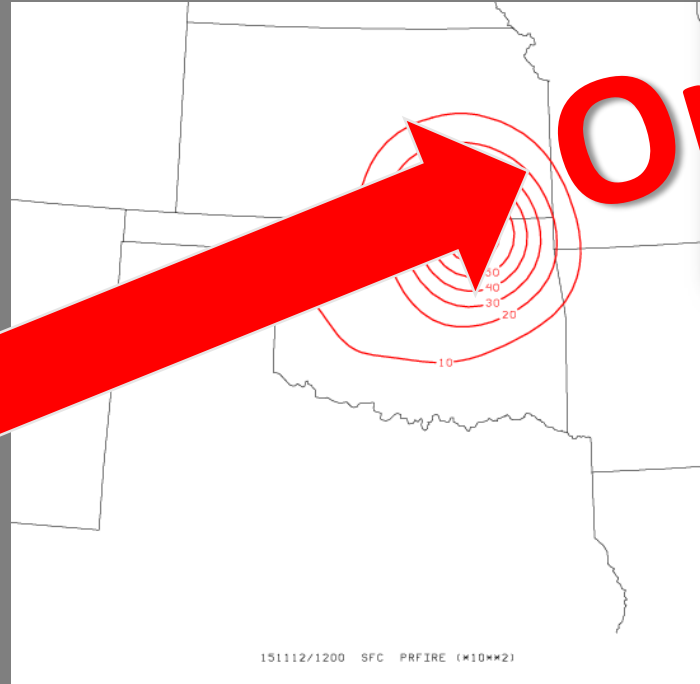
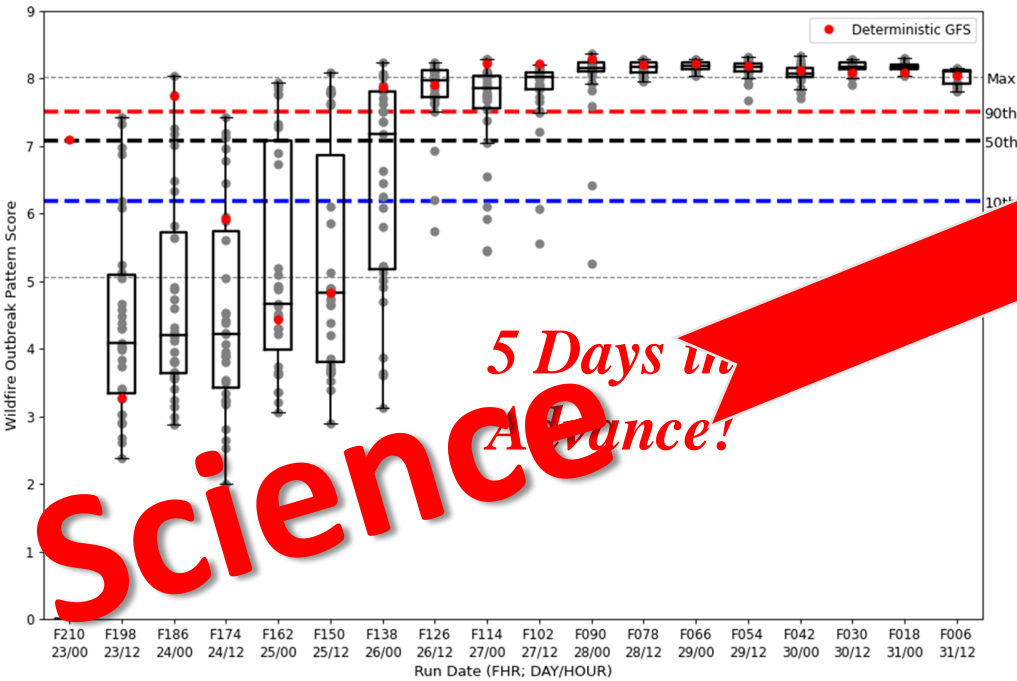
- Energy Release Component
- Red Flag Threat Index
- Wildland Fire Assessment System

Prototype probability of $\geq 5,000$ acre fire 1st guess



Operations

Southern Great Plains Wildfire Outbreak Guidance
GEFS Forecasts All Valid at: 20230331/1800



Science



Science to Operations

- Cooperation - Collaboration – Partnership
- Direct Connection to Operations
 - To the Incident Responder
 - To the Public

(Fuels) + (Weather) + (Topography) = Fire Behavior
Values at Risk

- Duty, Respect & Integrity





Drew Daily
Deputy Fire Management Chief

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...Fire is not listening to our whining, rhetorical windiness, and data presentations. It speaks a language of wind, fuel, drought, and terrain, and it will ignore anything that does not translate its conceptions into such media.

Dr. Stephen J. Pyne – Pyromancy (2004)

