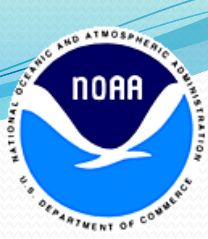




Red Flag Threat Index Experiment

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NWS Amarillo Fire Weather Customer's Meeting
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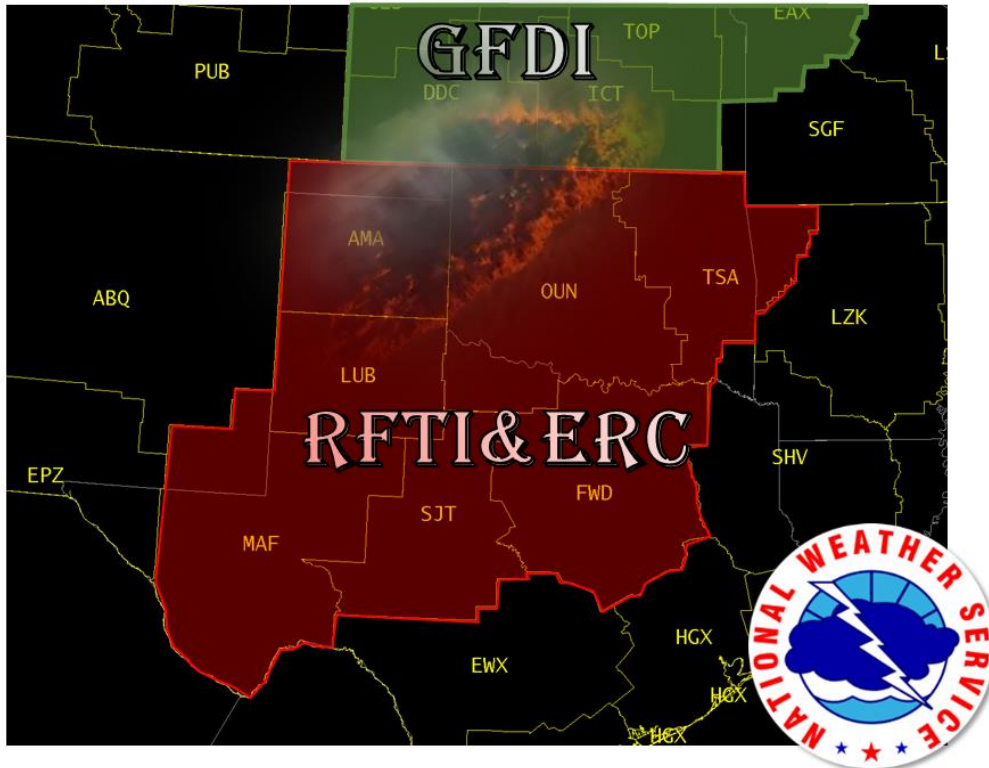


Outline

- Purpose of Experiment
- Background about RFTI
- Questions for you, our fire customers



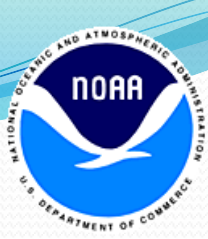
Purpose



- Summary: To improve impact-based National Weather Service fire forecasts and warnings in 2018
- Improved scientific logic and reasoning into Red Flag Warning and Fire Danger Statement products
- Allow consideration for state of grass fuels for or against fire headline issuance
- This experiment will last from Feb 1st to May 1st

Figure 1: Participating National Weather Service offices in experiment.

Note: GFDI (Grassland Fire Danger Index) participating offices will only be Dodge City this season.



Background: What is RFTI?

$$\text{RFTI} = \text{RFTI(A)} + \text{RFTI(B)}$$

- The acronym stands for Red Flag Threat Index (RFTI), and values range from 0 to 10.
 - Each component, A & B, range from 0 to 5.
 - Component A is 2 meter relative humidity based upon quartile rankings from a 10 year climate database.
 - Component B is 6 meter wind speeds based upon quartile rankings from a 10 year climate database.
- Values summed yield the following:
 - 0 = "Non-Critical"
 - 1-2 = "Elevated"
 - 3-4 = "Critical-Low"
 - 7-8 = "Extremely Critical"
 - 9-10 = "Historically Critical"



Background: RFTI Climate Calculations

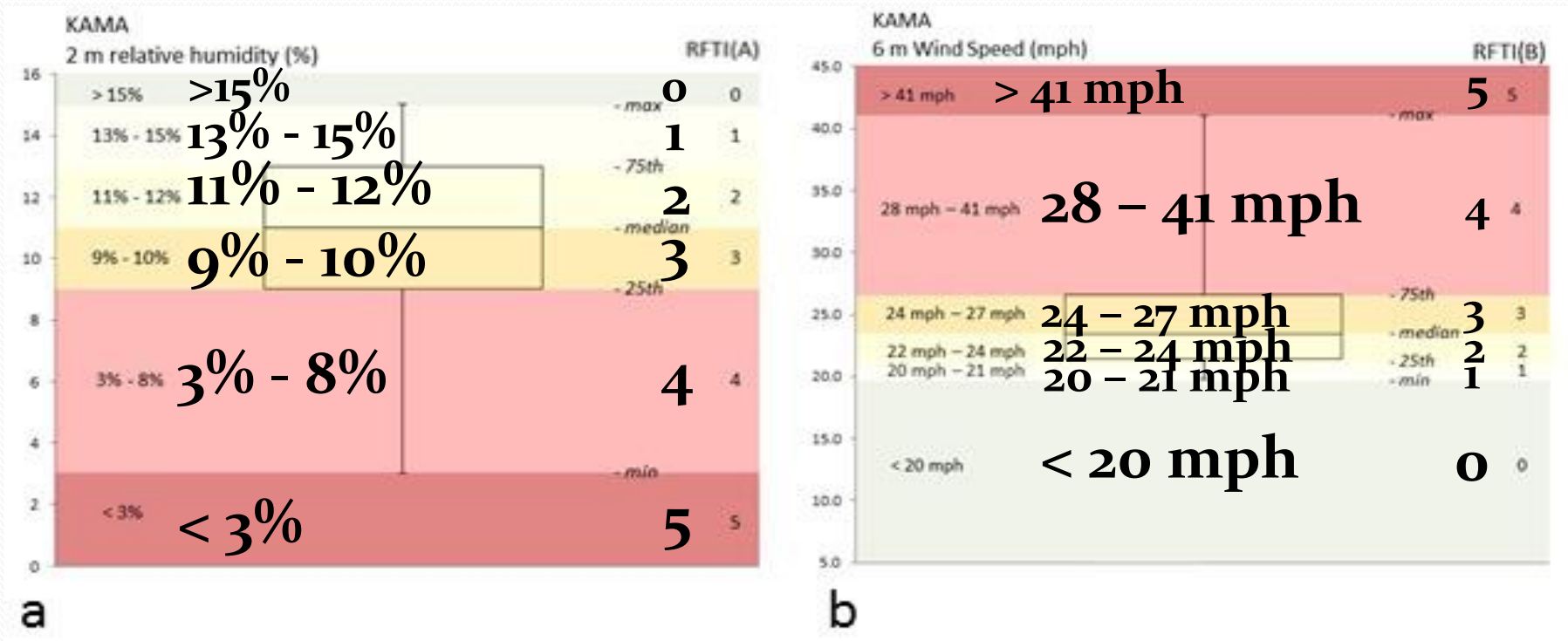
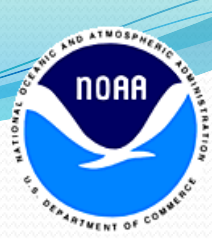


Figure 2: Each RFTI climatological quartiles calculated for Rick Husband International Airport from Murdoch et al. (2012).

Source: Murdoch, G.P., R.R. Barnes, C.M. Gitro, T.T. Lindley, and J.D. Vitale, 2012: Assessing critical fire weather conditions using a red flag threat index. *Electronic J. Operational Meteor.*, 13 (4), 46-56.



Background: RFTI Research Data

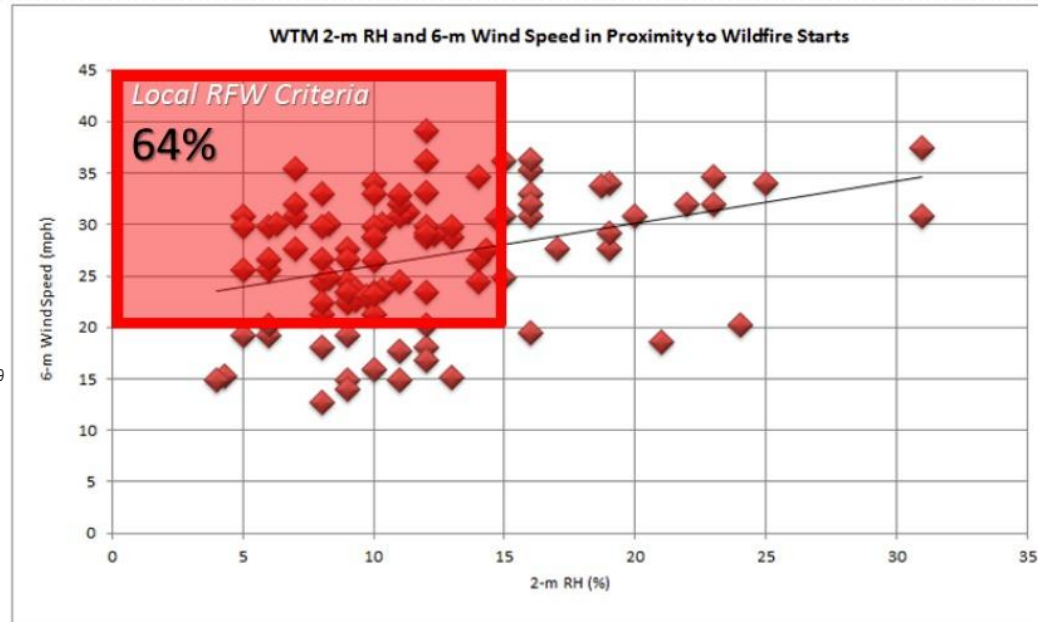
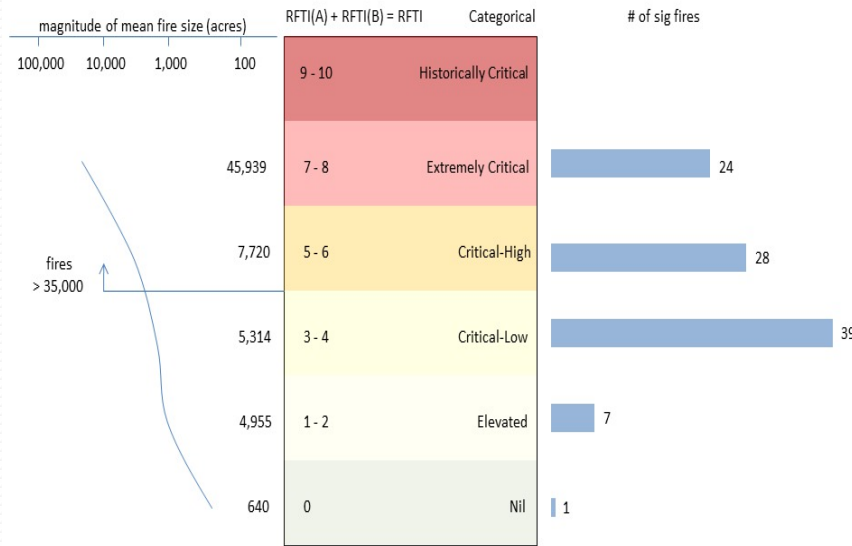
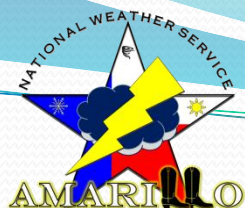


Figure 3: (Left) Magnitude of mean fire size vs RFTI for NWS Amarillo, Lubbock and Midland's Area of Responsibility. (Right) Significant wildfire starts compared against RH and winds. Red box represents current Red Flag Warning criteria.

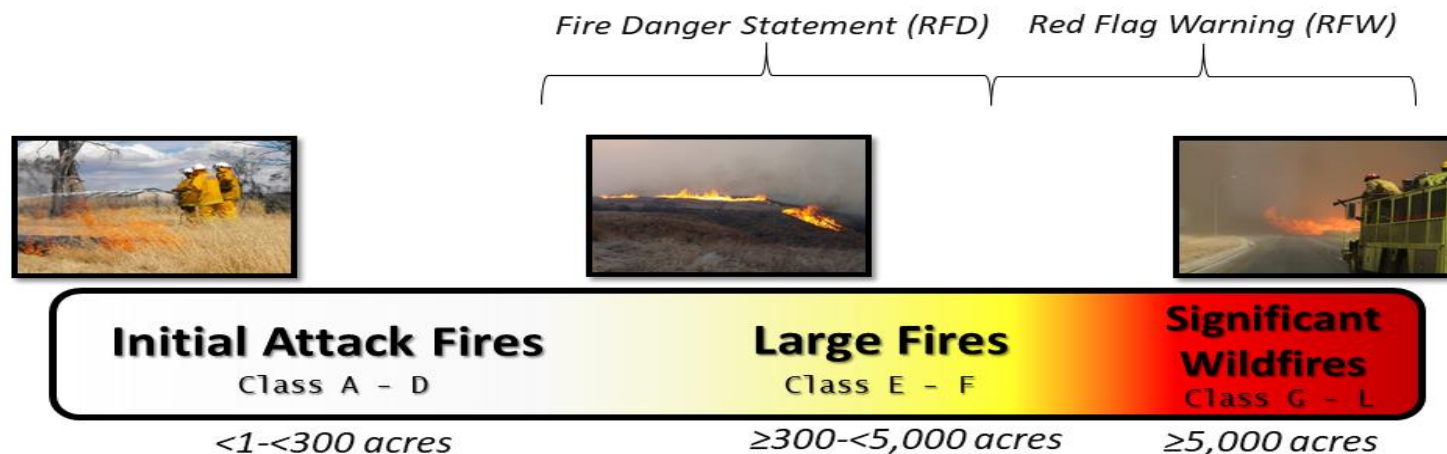


Background: RFTI Decisional Nomogram

Weather (RFTI) + Fuels (ERC-G %ile)	NIL 0	Elevated 1-2	Near Critical 3-4	Critical 5-6	Extreme 7-8	Historic 9-10
0-25 th %ile	--	--	--	--/RFD	RFD/RFW	RFW
25 th -50 th %ile	--	--	--/RFD	RFD/RFW	RFW	RFW
50 th -70 th %ile	--	--/RFD	RFD/RFW	RFW	RFW	RFW
70 th -90 th %ile	--	RFD/RFW	RFW	RFW	RFW	RFW
>90 th %ile	--/RFD	RFW	RFW	RFW	RFW	RFW

Warning Guidance Considering ERC-G

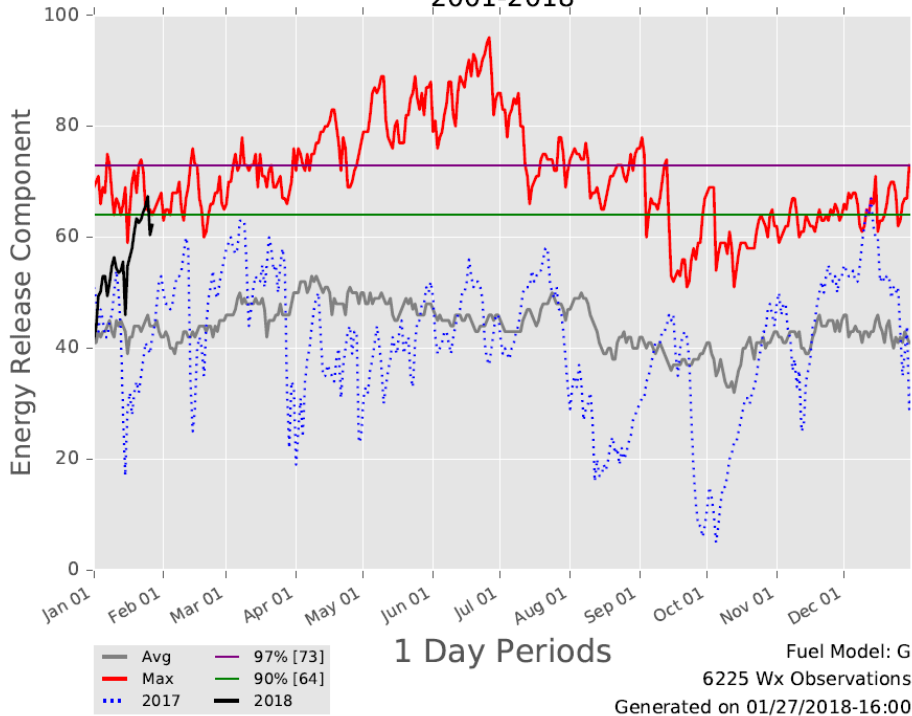
- <25th percentile, err against warning in absence of extreme/historic weather
- <50th percentile, err against warning even in low-end critical weather
- 50th-70th percentiles, increasing Initial Attack warn on critical weather
- 70th-90th percentiles, err toward warning in marginal weather
- >90th percentile, very pro-active RFWs



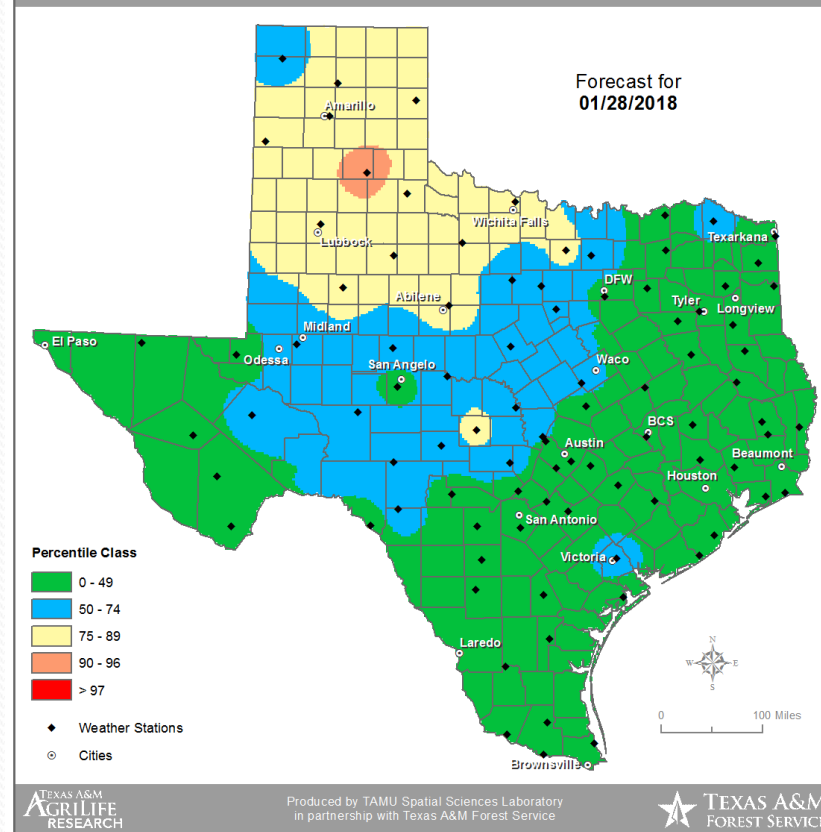


Background: RFTI ERC information

PSA - High Plains
2001-2018



Forecast ERC Percentile



- We will be heavily utilizing fuels information from the Texas A&M Forest Service and the Oklahoma Forestry Services (for OK Panhandle).



Questions for You

- With us switching to this paradigm, at what levels do the following not concern you (or do you wish not to have a Red Flag Warning for)?
 - Relative Humidity: We currently are capping our values at 35% minimum RH.
 - Winds: We currently are capping values of winds below 15 MPH to ensure no RFWs are out during good prescribe burn days.
 - Temperatures: Probability of Ignition in fuel sources with 3-4% dryness remain as high as 80% down to 30°F, but we are capping RFTI values starting at 50°F.
- Note: GACC Region 3 (Chuck Maxwell) is open to changes in Red Flag Warning criteria, and this experiment is our first run at trying slightly different criteria.

THANK YOU!

