Assessment of New Hampshire Red Flag Criteria

Joe Kennedy and Timothy Brown

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Existing red flag criteria for New Hampshire

When in Vegetative Stage I & II (pre-greenup and cured) - Spring and Fall:
Winds sustained or frequent gusts above 25 mph
Relative humidity at or below 30%
Rainfall amounts for the previous 5 days of less than 0.25 inches

When in Vegetative Stage III (green) - Summer:
Winds sustained or with frequent gusts above 25 mph
Relative humidity at or below 30%
Rainfall amounts for the previous 8 days of less than 0.25 inches
Keetch-Byram Drought Index values of 300 or greater

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So what is Problem Fire Behavior?

Its when normal, "expected" fire behavior……..

Becomes erratic, exhibits higher than normal rates of spread, flame length, and intensity, and generally presents a challenge to control forces

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But how do we know what weather parameters will cause these challenges?

Up to now, we have relied on historic parameters….

But do they actually portray reality? Hazards, risk, values, even fire climate, changes over time.

Are we missing Red Flag opportunities creating safety concerns?

Or are we producing false alarms?

To help answer these questions, the Fire Science Working Team of the Northeast Compact sponsored a project to attempt to corroborate existing Red Flag Criteria with the behavior of historic fires

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Project Objectives:

1. Corroborate historic Red Flag days with actual fire occurrence

2. Identify “problem fire behavior” for a particular area utilizing fire analysis tools

3. If indicated, make recommendations for more applicable criteria

4. Create a methodology of the Project for local use by Compact members.

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Expected Outcome:

Utilize the correct local criteria for Red Flag warnings in a given area.

Improve the confidence value of fire management decision making and increase firefighter safety awareness when utilizing Red Flag Watches and Warnings

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Data:

- 1300 hour fire weather variables including state of the weather, temperature, relative humidity, 20 ft. wind speed and direction, and precipitation occurrence for the Manchester area for 1980-2005.
- 24-hour fire weather variables including maximum/minimum dry bulb temperatures, maximum/minimum relative humidity values, and precipitation amounts and duration.
- 15-year record of historic wildfire occurrence.

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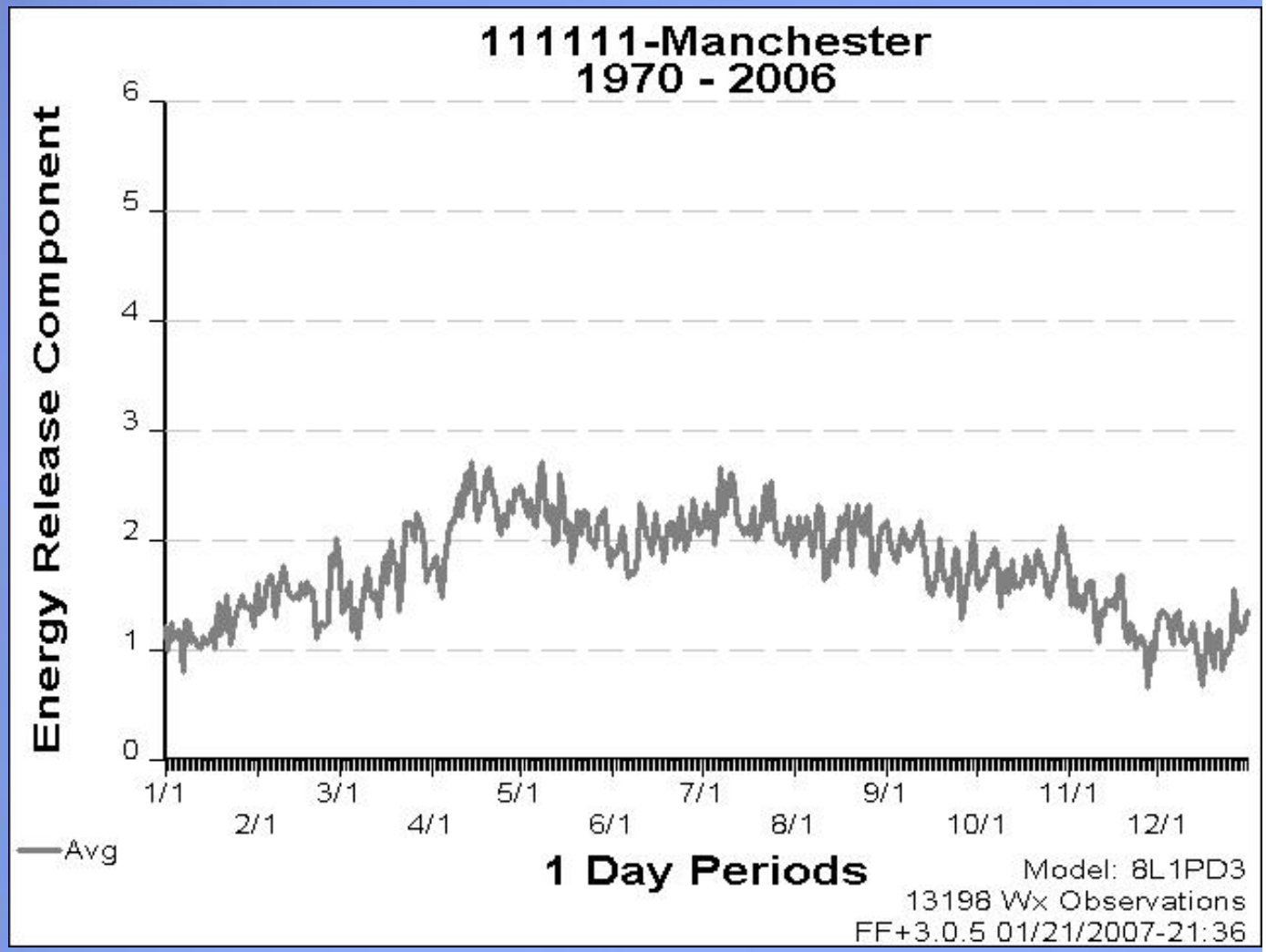

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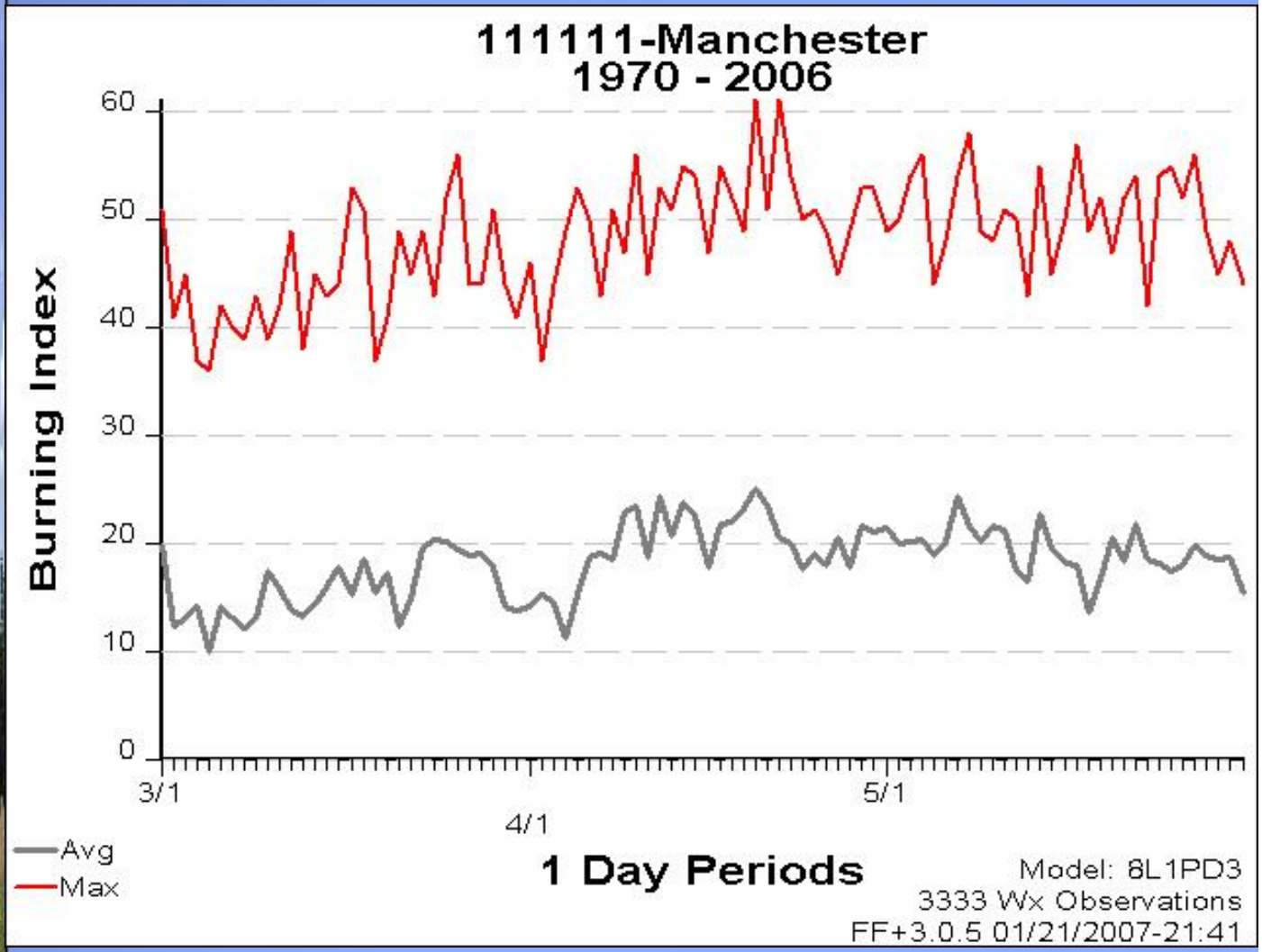

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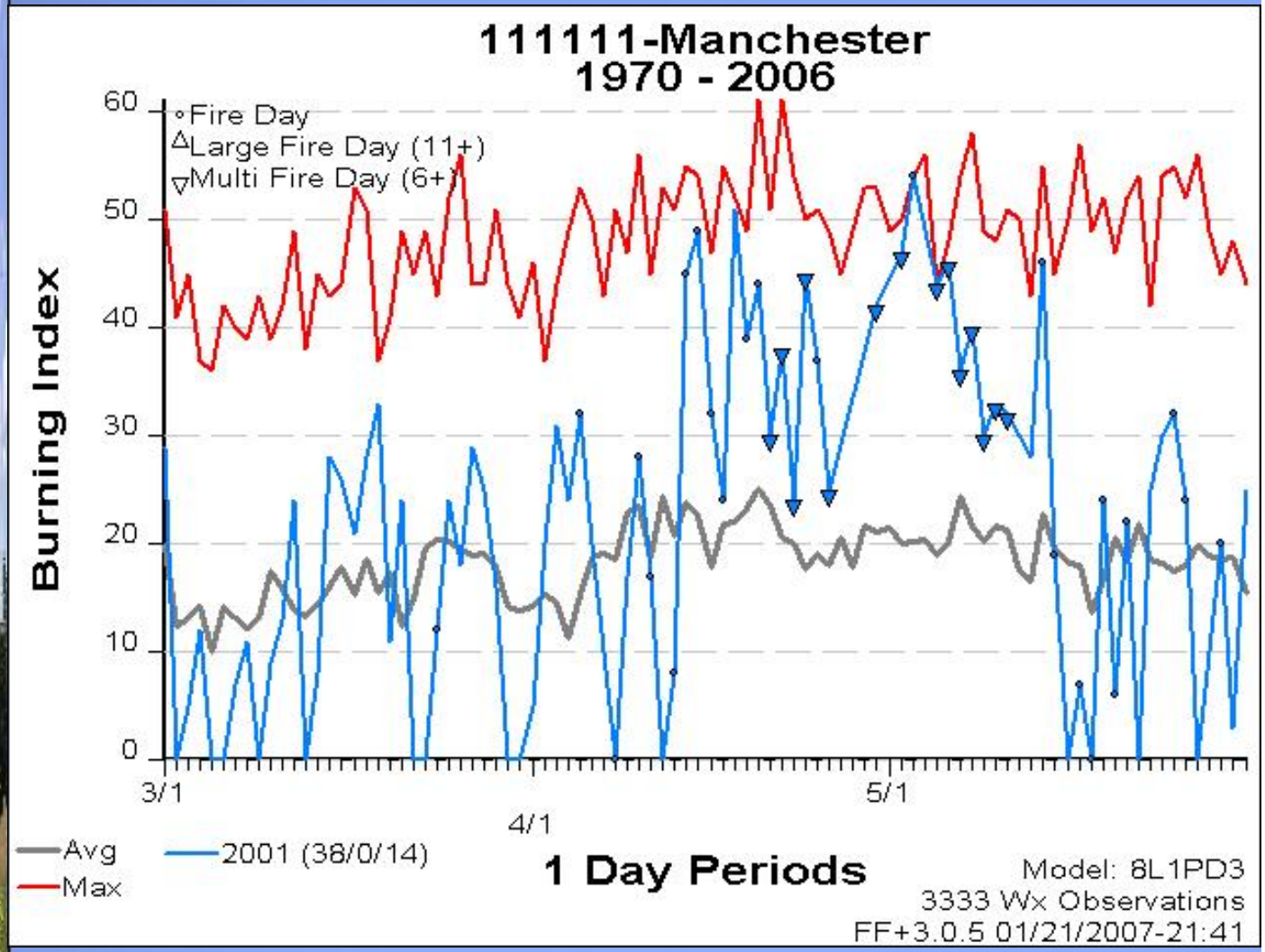

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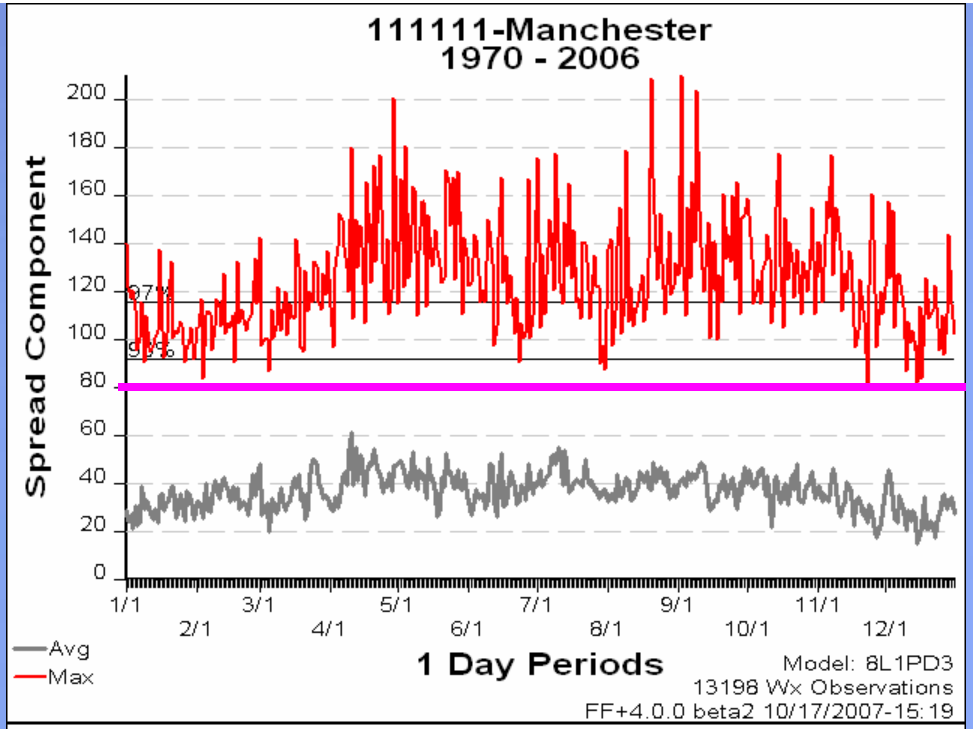

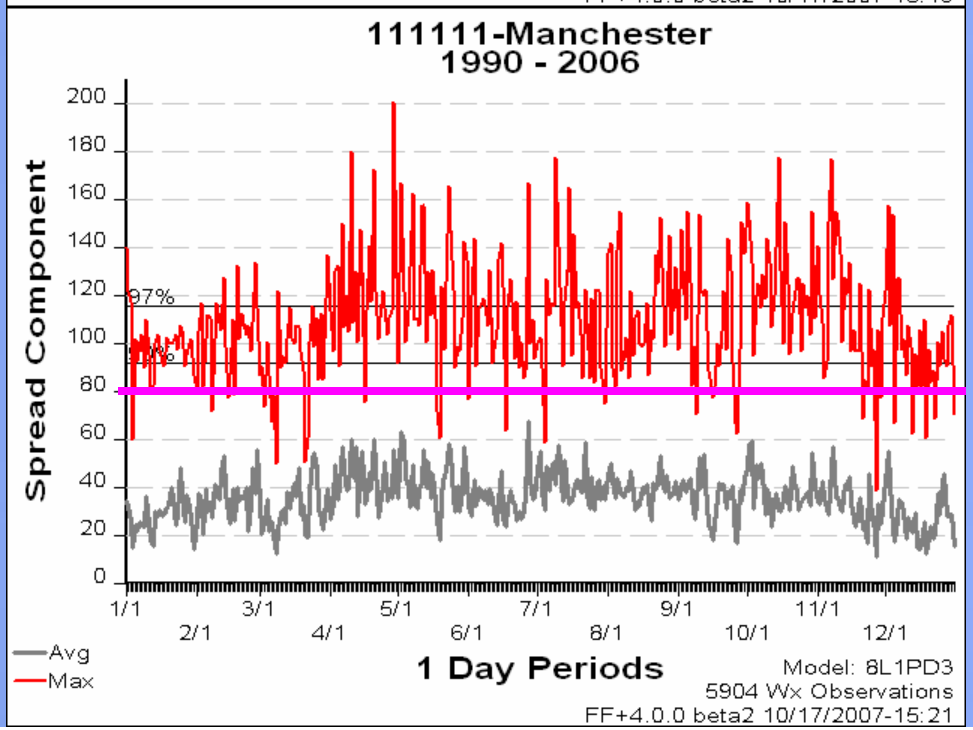

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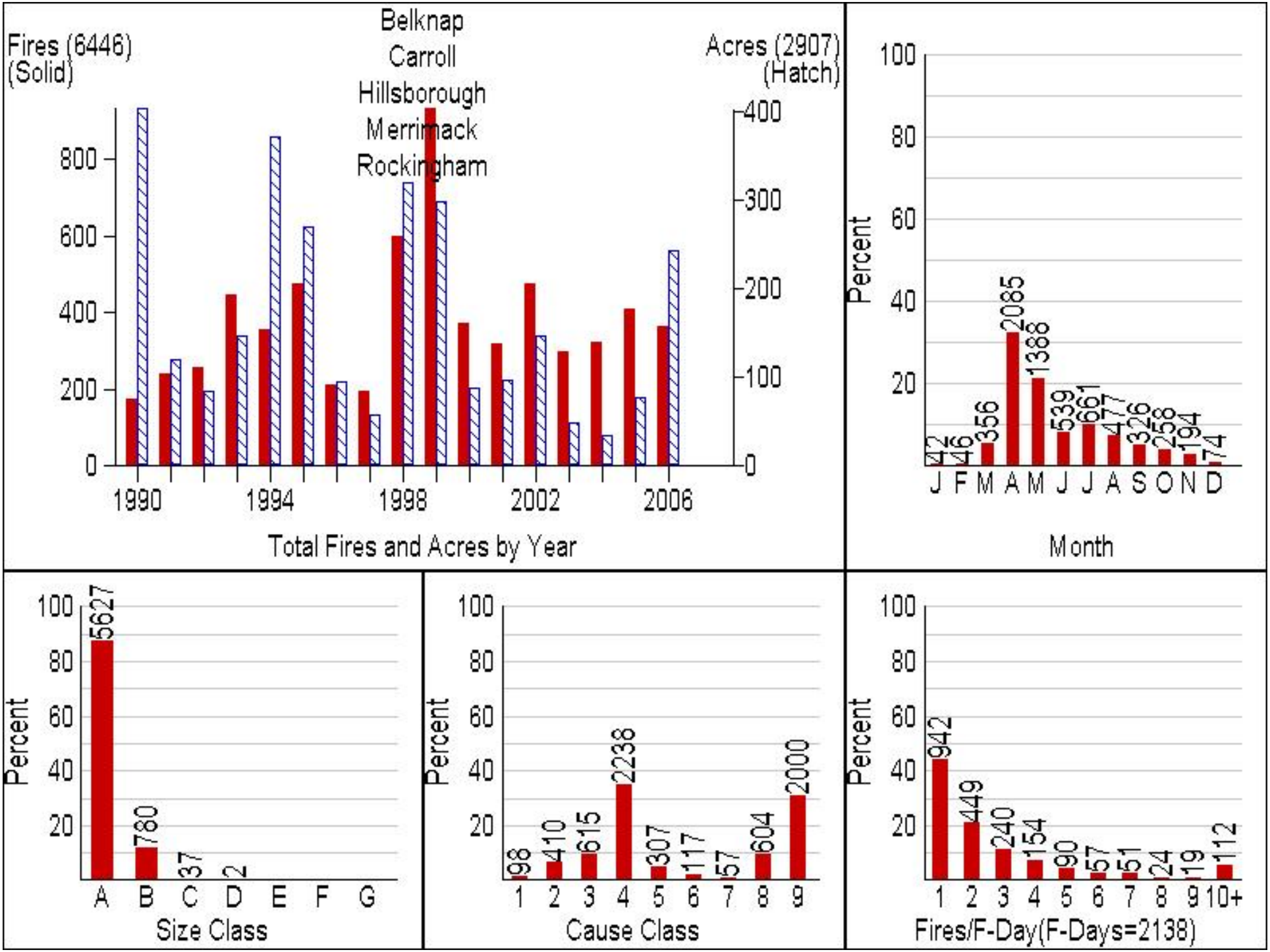

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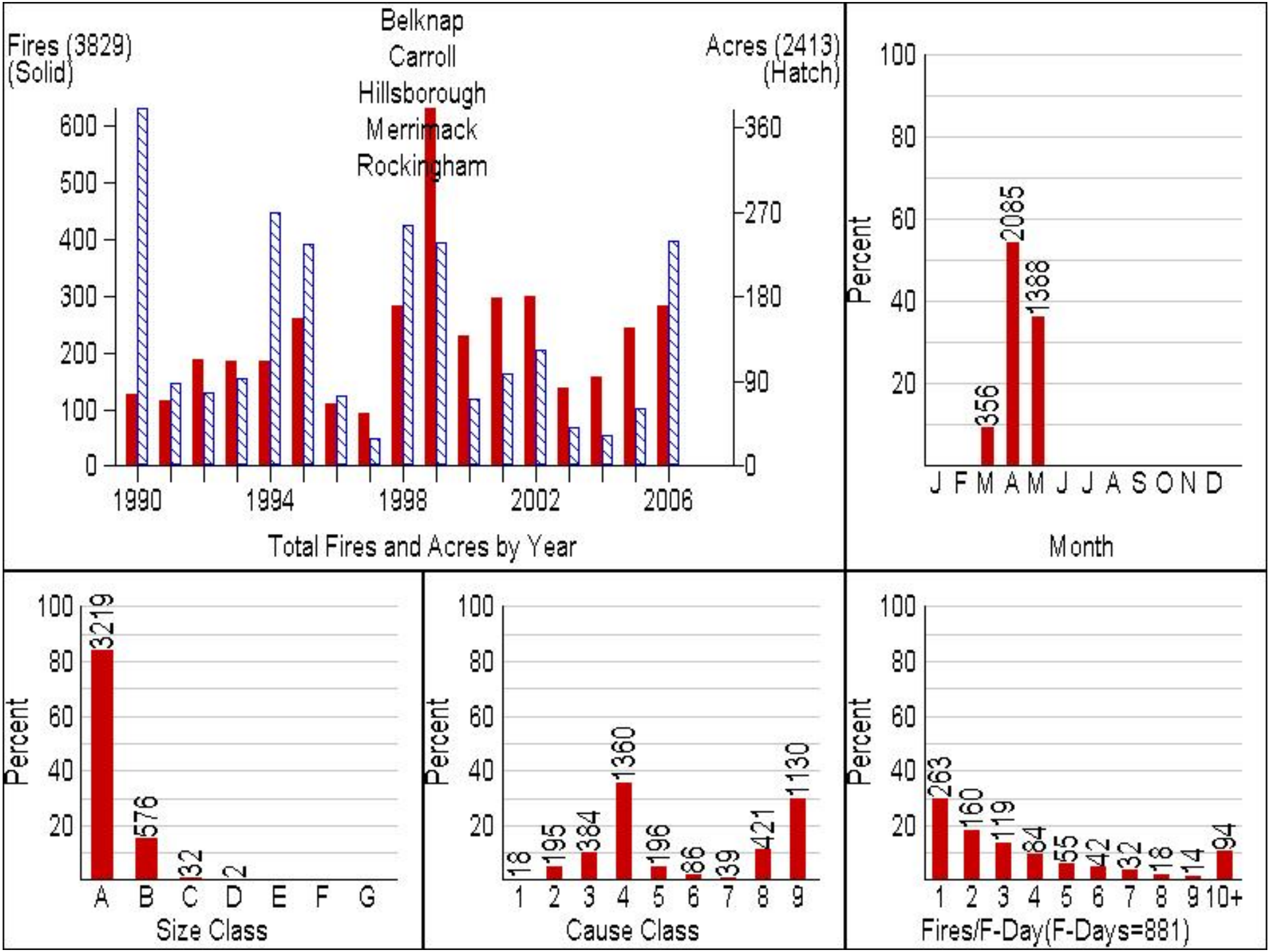

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FireFamily Plus Event Locator Report
Listing of Selected Events
Station: llllll - Manchester
March 1 - May 31, 1970 - 2006

Event Definition:
Avg(Wind Speed) >= 25.00
AND Avg(Min RH) <= 30.00

1-Day Periods

DATE	Wind	MnRH
05/13/1977	25.00	28.00

1 hits out of 3404
564 rejects for no/missing observations

FF+3.0.5 01/21/2007-22:01

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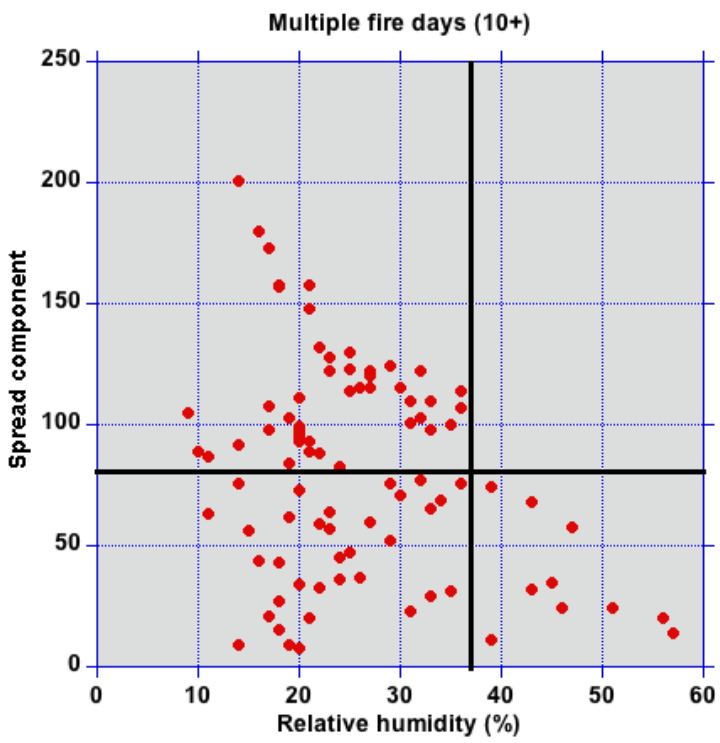

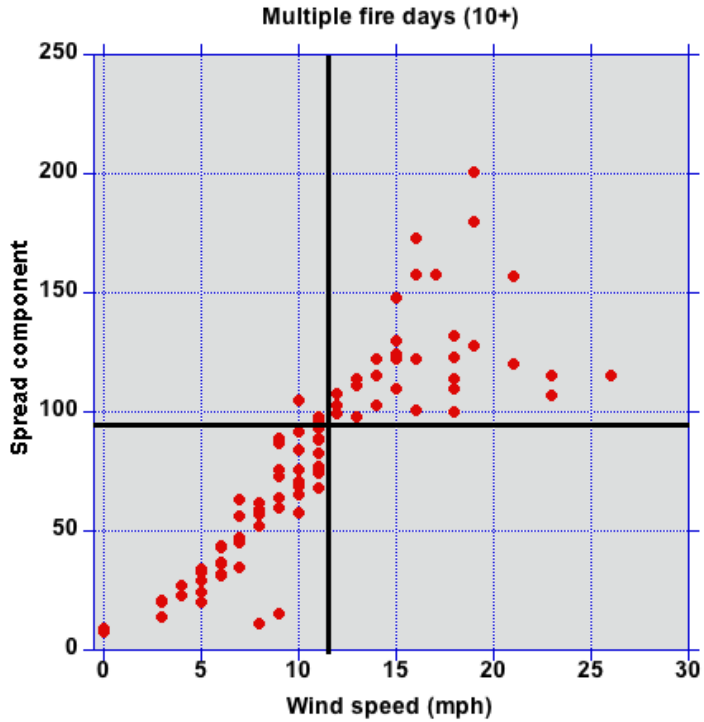

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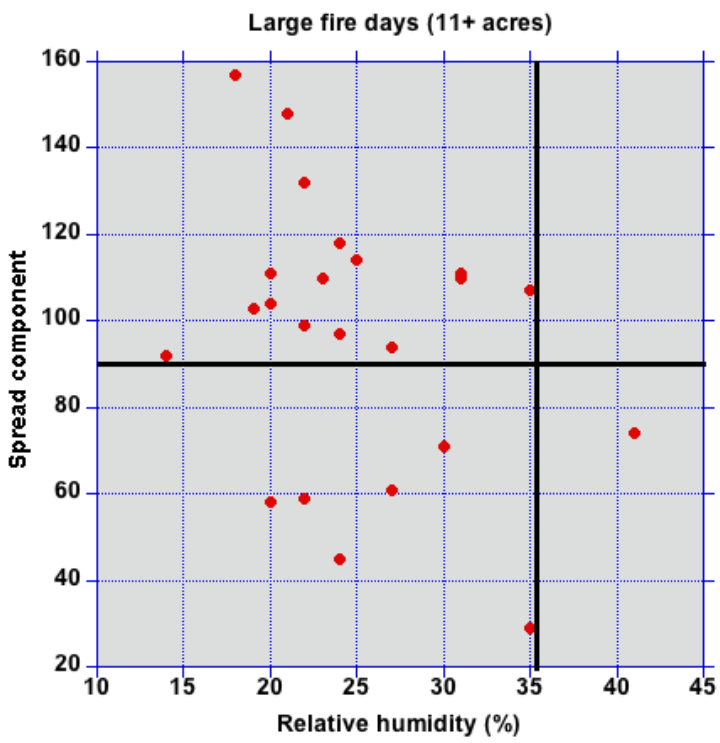

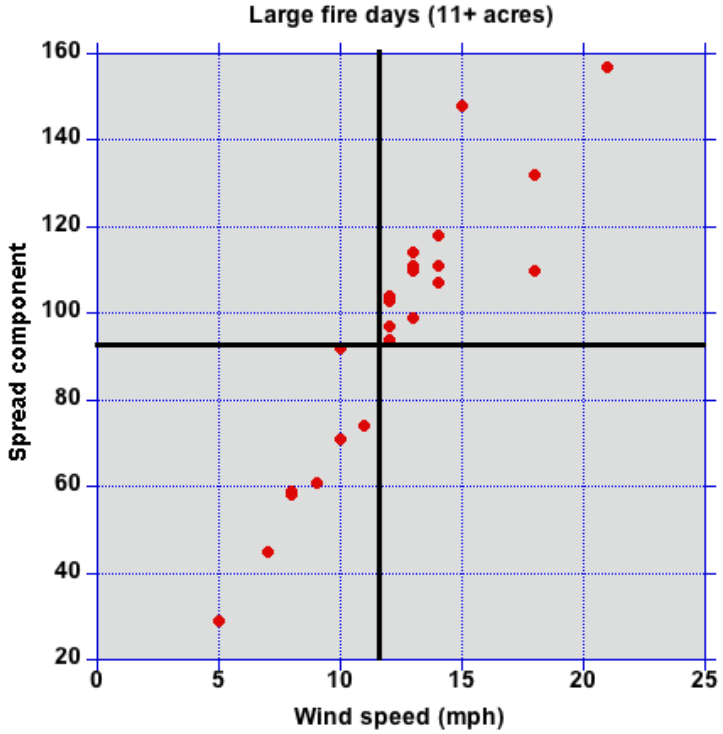

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	RH	WS	BI	%
Large	23	13	40	4
Multiple	37	7	40	10
Large	23	13	>0	5
Multiple	37	7	>0	38

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	RH	WS	SC	% occurrence
Large	35	12	80-100	1
Multiple	35	12	80-100	2
Large	35	12	>0	1
Multiple	35	12	>0	2

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Discussion points

- BI > 40 is potentially a good indicator of problem fire, but does not have consistent RH or WS thresholds for large and multiple fires
- SC > 80 is potentially a good indicator of problem fire, and does have consistent RH and WS thresholds for large and multiple fires
- Is grass an appropriate fuel type for March-May?
- How many multiple fires for a fire day is a problem?
- Are large fires >11 acres a problem?
- If so, suggested values:
  - RH 35% (same as original threshold)
  - WS 12 mph (half of original threshold)

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