Florida Fire Weather FOR DUMMIES

1 Find a **location that is representative of the fuels** that the fire is burning in. **Record the time in military time.**

2 ***Stand up in a shady spot,*** so that radiant heat from the sun does not affect the thermometers. Use your body (back to the sun) to shade the instruments and create shade if necessary.

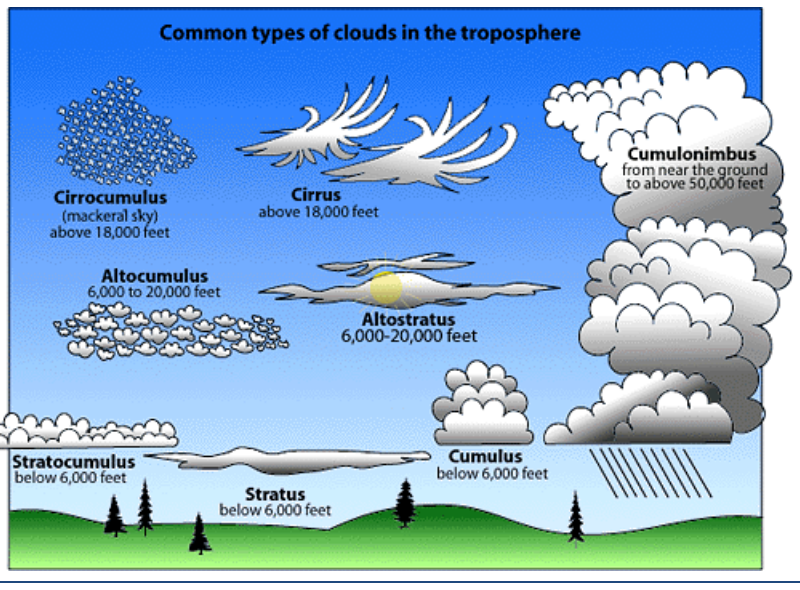
3 Using your compass and a piece of flagging tape, determine which **direction the wind is coming from.**

This is your *wind direction* for your report.

4 Using the Kestrel in your fire kit, **determine the average and maximum wind speeds**. Do this by turning the unit on and holding it **into the wind** for about one minute.

Press the button on the front to scroll through the various speeds.

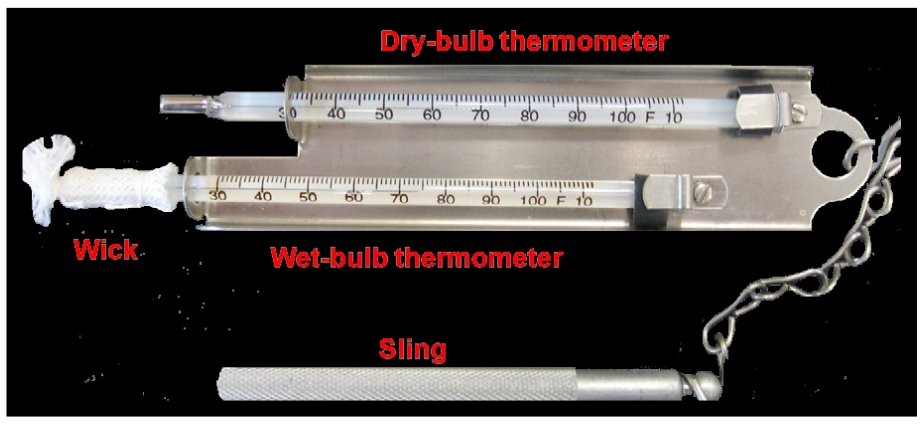
Record the average wind speed and the maximum wind speed (gusts) on your weather chart in miles per hour.



5 **Look at the sky and record what you see.**

How much of the sky is covered in clouds?
(Ex: 5%, 25%, 50%....)
What type of clouds do you see?
What part of the sky are they in?
(Ex: Cumulus in SW)
Do you see any storm cells or lightning?

6 Take out the sling psychrometer (see right) and **wet the wick** with distilled water from your kit.



7 Being careful not to hit it on anything, spin the psychrometer at a pace of **one rotation per second**. Do this **for one minute**.

8

Take note of the temperatures in Fahrenheit on the wet bulb *first*, and then the dry bulb.

Repeat the process again for one minute.

If there was a change, repeat again **until the readings level out**.

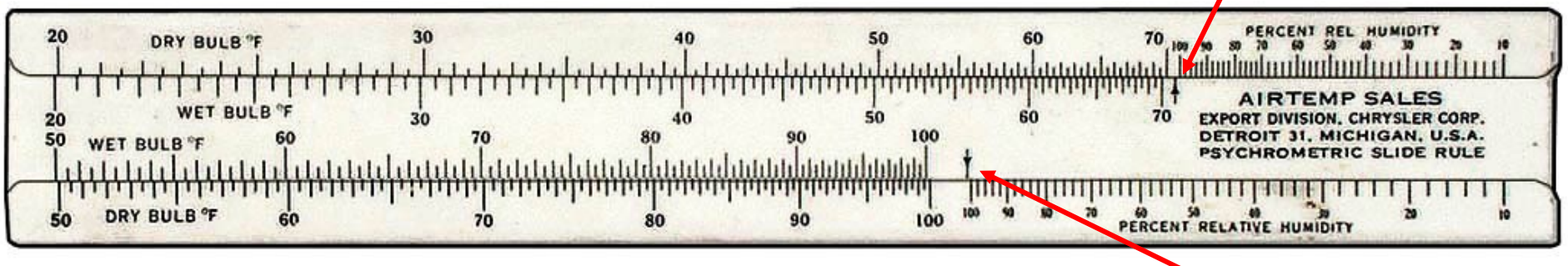
Record both temperatures.

9

Calculate the **percent of relative humidity (RH)** using the slide rule.

Match the wet bulb temperature (the part inside that moves) with the dry bulb temperature.

The small black arrow will tell you the relative humidity.



If the wet bulb is above 70 degrees, use the bottom half of the ruler.

10 FINE FUEL MOISTURE TABLE

(Day Time 0800-1959)

Determine the fine fuel moisture using the chart below.

This a term expressing the moisture level (in percentage) found in fine fuels (such as grass).

	Relative Humidity (Percent %)																			
Dry Bulb Temp - F	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90-94	95-99	100
10 to 29	1	2	2	3	4	5	5	6	7	8	8	8	9	9	10	11	12	12	13	13	14
30 to 49	1	2	2	3	4	5	5	6	7	7	7	8	9	9	10	10	11	12	13	13	13
50 to 69	1	2	2	3	4	5	5	6	6	7	7	8	8	9	9	10	11	12	12	12	13
70 to 89	1	1	2	2	3	4	5	5	6	7	7	8	8	8	9	10	10	11	12	12	13
90 to 109	1	1	2	2	3	4	4	5	6	7	7	8	8	8	9	10	10	11	12	12	13
109 +	1	1	2	2	3	4	4	5	6	7	7	8	8	8	9	10	10	11	12	12	12

11

Using the tables on the next card, find the **correction factors for moisture content**.

1) Find the month.
2) Determine the time of day.
   (Ex: at 1130, you would choose 1000>)
1) This will give you a correction for exposed (unshaded) and shaded factors.

Make note of these correction factors.
You will need them again.

12

Write the shaded and unshaded fuel moisture content using the correction values.

Here's an example.
Your Fine Fuel Moisture was 7.
Unshaded (exposed) correction value was 1.
Shaded correction value was 4.

Your corrected moisture % will be
8 (7+1) unshaded and
11 (7 + 4) shaded.

You will use these corrected values on the next step.

11 See Below Tables for Fine Fuel Moisture Correction Values (Daytime 0800-1959 hrs)

	May, June, July					
Time:	0800	1000	1200	1400	1600	1800
Aspect:	Clear and/or No Canopy (Less than 50% Shaded)					
South	3	1	0	0	1	3
	Cloudy and/or Canopy (more than 50% Shaded)					
South	4	4	3	3	4	5

	Feb, March, April, August, Sept, Oct					
Time:	0800	1000	1200	1400	1600	1800
Aspect:	Clear and/or No Canopy (Less than 50% Shaded)					
South	4	2	1	1	2	4
	Cloudy and/or Canopy (more than 50% Shaded)					
South	5	4	4	4	4	5

	Nov, Dec, Jan					
Time:	0800	1000	1200	1400	1600	1800
Aspect:	Clear and/or No Canopy (Less than 50% Shaded)					
South	5	4	3	2	4	5
	Cloudy and/or Canopy (more than 50% Shaded)					
South	5	5	5	5	5	5

13 Calculate the Probability of Ignition (The PIG) with this table and record results.

UNSHADED <50% FINE DEAD FUEL MOISTURE (PERCENT %) (Use the corrected value from step 12)

Dry Bulb Temp	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
110 +	100	100	80	70	60	60	50	40	40	30	30	20	20	20	20	10
100-109	100	90	80	70	60	60	50	40	40	30	30	20	20	20	10	10
90-99	100	90	80	70	60	50	40	40	30	30	30	20	20	20	10	10
80-89	100	90	80	70	60	50	40	40	30	30	20	20	20	10	10	10
70-79	100	80	70	60	60	50	40	40	30	30	20	20	20	10	10	10
60-69	90	80	70	60	50	50	40	30	30	20	20	20	20	10	10	10
50-59	90	80	70	60	50	40	40	30	30	20	20	20	10	10	10	10
40-49	90	80	70	60	50	40	40	30	30	20	20	20	10	10	10	10
30-39	80	70	60	50	50	40	30	30	20	20	20	10	10	10	10	10

SHADED >50% FINE DEAD FUEL MOISTURE (PERCENT %) (Use the corrected value from step 12)

Dry Bulb Temp	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
110 +	100	90	80	70	60	50	50	40	40	30	30	20	20	20	10	10
100-109	100	90	80	70	60	50	50	40	30	30	30	20	20	20	10	10
90-99	100	90	80	70	60	50	40	40	30	30	20	20	20	10	10	10
80-89	100	80	70	60	60	50	40	40	30	30	20	20	20	10	10	10
70-79	90	80	70	60	50	50	40	30	30	30	20	20	20	10	10	10
60-69	90	80	70	60	50	40	40	30	30	20	20	20	10	10	10	10
50-59	90	80	70	60	50	40	40	30	30	20	20	20	10	10	10	10
40-49	90	80	60	50	50	40	30	30	30	20	20	20	10	10	10	10
30-39	80	80	60	50	50	40	30	30	20	20	20	10	10	10	10	10

14 Calling Out the Weather

You should call out the weather at least once an hour.
If conditions are changing often, call out the weather every 30 minutes.

Say it like this, and then wait for them to say 'copy':

"All units stand by for the _____[time] weather, taken from _____ [location]."
(Wait a five seconds for them to get ready to write it.)

"At _____[time], temperature was ___ degrees [dry bulb], up/down _____degrees from the last hour."
(Always let the crew know how the reading changed from the last time you called it out.)

"RH is ____%, down from ____%. Winds are ___ mph with gusts up to _____ mph from the _____[wind direction]."

"The fine fuel moisture is _____ unshaded and _____ in the shade with a PIG of _____ unshaded and _____ in the shade."

"The rate of spread is _____ chains per hour with a flame length of ___ feet ." *(This part isn't always read, check 1st. If so, see step 15))*

! Good Stuff to Know !

Fire Type H– Heading F– Flanking B– Backing	**ROS** means Rate of Spread
FFM means 1 hr. Fine Fuel Moisture	**PIG** means Probability of Ignition
66' Feet in 1 Chain; 80 chains per hour = 1 MPH; 40 Chains per hour = 1/2 MPH.	
Tonnage rule of thumb: 10 ton @ knee's, 20 T @ waist, 30 T @ chest & 40 T is over head	

15 Determine Fuel Model, you'll need this for the next steps.

Fuel Model Descriptions: Grass group = 1-3; Shrub group = 4-7; Timber Litter group = 8-10; Logging Slash Group 11-12.

Model 1	1.0 ft deep fuels, primarily grass very little other fuels make up less than 1/3 of area. Surface fires in cured fuels for rapid spread.	Grass lands, Pastures and Savannas
Model 2	1.0 ft deep fuels, Primarily Grass and shrub debris and pine over story. 1/3 to 2/3rd of Oaky stands and scattered pines and scrubs.	Open shrub lands, Pine/shrub stands
Model 3	2.5 ft deep, primarily taller stands around 3 feet, most intense of grass groups, fire may carry through upper grass stands.	Marsh grasses, 1/3 + dead fuels
Model 4	6.0 ft deep, Mature shrub stands of approx 6 feet tall; fire can be carried in continuous secondary over story	
Model 5	2.0 ft deep, fire burns surface fuels from litter cast of shrubs, pines; light fuels, young shrubs not tall but continuous coverage.	
Model 6	2.5 ft deep, fires carry through shrub more intense than model 5 shrubs are older, but less tall than model 4.	
Model 7	2.5 ft deep, continues coverage of green flammable fuels 2 to 6 feet tall; palmetto Gallberry understory, with pine over-story	Palmetto/Gallberry w/ pine over story
Model 8	0.2 ft deep, slow burning ground fires, Primarily surface fires carried by short pine needles and litter; very little under canopy growth.	
Model 9	0.2 ft deep, fires run through surface litter faster than Model 8 w/higher flame height	Pine plantations, oak-hickory
Model 10	1.0 ft deep fuels, fires burn in surface and ground fuels more intense than other timber litter, large load of dead material on forest floor	Partial-cut slash, over mature &/or diseased stands
Model 11	Dominated by slash and much of it is less than 3 inches in diameter. Fuel bed depth 1 ft	
Model 12	Dominated by slash and much of it is less than 3 inches in diameter. Fuel bed depth of 2.3 ft	

16 Calculate Rate of Spread and Flame Length (0% Slope)

This isn't always read as part of the weather report. Check with your supervisor to see if these readings are necessary.

Fuel Model 1

Fuel Moisture (1-Hour)	Midflame Wind (mph)						
	0	2	4	6	8	10	12
	Rate of Spread (Chains per Hour)						
3.0	5	22	77	172	307	*446	*446
6.0	4	18	61	135	242	*270	*270
9.0	3	13	45	101	*136	*136	*136
12.0+	0	0	0	0	0	0	0
	Flame Length (Feet)						
3.0	1.3	2.5	4.5	6.4	8.4	*10.0	*10.0
6.0	1.1	2.1	3.8	5.4	7.1	*7.5	*7.5
9.0	0.9	1.7	3.0	4.3	*5.0	*5.0	*5.0
12.0+	0	0	0	0	0	0	0

*** Means you hit the wind limit.**

Fuel Model 2

Fuel Moisture (1-Hour)	Midflame Wind (mph)						
	0	2	4	6	8	10	12
	Rate of Spread (Chains per Hour)						
3.0	3	11	28-31	56-62	92-102	138-152	191-211
6.0	2	9	23-25	45-50	75-83	112-124	156-172
9.0	2	8	20-22	40-44	66-73	99-109	137-151
12.0+	2	6	16	30-33	49-54	73-81	102-112
	Flame Length (Feet)						
3.0	2.1	3.8	6.2	8.4	10.7	12.8	14.9
6.0	1.8	3.2	5.3	7.2	9.1	11.0	12.8
9.0	1.7	3.0	4.8	6.6	8.4	10.0	11.6
12.0+	1.3	2.3	3.7	5.2	6.5	7.8	9.1

*** Means you hit the wind limit.**

Fuel Model 3

Fuel Moisture (1-Hour)	Midflame Wind (mph)						
	0	2	4	6	8	10	12
	Rate of Spread (Chains per Hour)						
3.0	6	52	121	201	290	387	490
6.0	5	39	89	148	214	286	361
9.0	4	32	73	122	176	234	296
12.0	3	28	64	107	154	206	260
15.0	3	25	57	95	137	182	213
18.0	2	20	47	79	114	151	191
21.0	2	14	32	53	77	103	130
	Flame Length (Feet)						
3.0	3.8	10.1	14.8	18.7	22.2	25.3	28.2
6.0	3.0	8.0	11.8	14.9	17.7	20.2	22.5
9.0	2.6	7.0	10.3	13.0	15.4	17.6	19.6
12.0	2.4	6.5	9.5	12.1	14.3	16.3	18.2
15.0	2.2	6.0	8.9	11.2	13.3	15.2	16.9
18.0	2.0	5.3	7.7	7.19.8	11.6	13.2	14.7
21.0	1.4	3.8	5.6	7.1	8.4	9.6	10.7

Fuel Model 4

Fuel Moisture (1-Hour)	Midflame Wind (mph)						
	0	2	4	6	8	10	12
	Rate of Spread (Chains per Hour)						
3.0	5	24-29	56-70	97-120	143-179	195-243	252-313
6.0	4	24-25	49-61	85-104	126-155	171-211	221-272
9.0	4	19-23	46-56	79-96	117-143	160-194	206-250
12.0	4	18-22	43-53	74-90	110-134	149-183	192-235
15.0	3	12-19	28-46	47-78	70-116	96-158	124-204
18.0	1	6	11-13	19-23	29-34	39-46	51-60
21.0	0	0	0	0	0	0	0
	Flame Length (Feet)						
3.0	5.7	12-13	18-20	23-25	27-31	32-35	35-40
6.0	5.1	11-12	16-18	20-23	25-27	28-32	32-35
9.0	4.8	10-1	15-17	19-21	23-26	27-30	30-33
12.0	4.6	10-11	14-16	18-20	22-24	25-28	28-32
15.0	3-4	6-10	10-14	12-18	15-22	17-25	19-28
18.0	1	3	4-5	6	7	8	9
21.0	0	0	0	0	0	0	0

Fuel Model 5

Fuel Moisture (1-Hour)	Midflame Wind (mph) *Means you hit the wind limit.						
	0	2	4	6	8	10	12
	Rate of Spread (Chains per Hour)						
3.0	1	7-10	16-23	28-39	42-58	56-78	72-100
6.0	1	4-8	9-20	16-34	24-50	32-67	42-87
9.0	1	2-5	6-13	10-22	14-32	19-44	*20-56
12.0	0	2-3	5-6	9-11	13-16	*18-22	*18-22
15.0	0	2	4-5	8-9	11-14	*12-15	*12-15
18.0	0	1	3	*4	*4	*4	*4
21.0	0	0	0	0	0	0	0
	Flame Length (Feet)						
3.0	1-2	3-4	5-6	7-8	8-10	9-11	10-12
6.0	1	2-4	3-6	4-7	5-8	6-10	6-11
9.0	1	1-2	2-4	2-5	3-6	3-7	*3-7
12.0	1	1	2	2	3	*3	*3-4
15.0	1	1	2	2	3	*3	*3
18.0	<1	1	1	*1	*1	*1	*1
21.0	0	0	0	0	0	0	0

Fuel Model 6

Fuel Moisture (1-Hour)	Midflame Wind (mph)						
	0	2	4	6	8	10	12
	Rate of Spread (Chains per Hour)						
3.0	2	15	33	56	81	109	138
6.0	2	11	25	43	62	83	105
9.0	1	9	21	35	52	69	88
12.0	1	8	19	31	45	61	77
15.0	1	7	17	28	41	55	69
18.0	1	6	15	24	35	47	60
21.0	1	6	11	19	28	37	47
	Flame Length (Feet)						
3.0	1.9	4.5	6.5	8.3	9.8	11.3	12.6
6.0	1.6	3.7	5.4	6.8	8.1	9.2	10.3
9.0	1.4	3.2	4.7	6.0	7.1	8.2	9.1
12.0	1.3	3.0	4.4	5.6	6.6	7.6	8.5
15.0	1.2	2.8	4.1	5.2	6.2	7.1	7.9
18.0	1.1	2.6	3.8	4.8	5.7	6.5	7.2
21.0	0.9	2.1	3.1	3.9	4.7	5.3	6.0

Fuel Model 7

Fuel Moisture (1-Hour)	Midflame Wind (mph)						
	0	2	4	6	8	10	12
	Rate of Spread (Chains per Hour)						
3.0	1-2	10-11	23-26	38-44	55-64	74-85	94-109
6.0	1	9-10	20-23	33-38	48-55	64-73	81-93
9.0	1	8-9	17-20	29-33	42-48	56-65	72-82
12.0	1	7-8	16-18	26-30	38-44	51-59	65-74
15.0	1	6-7	15-17	24-28	35-40	47-54	60-69
18.0	1	6-7	14-16	23-26	33-38	45-51	57-64
21.0	1	6	13-15	22-25	32-36	42-48	54-61
	Flame Length (Feet)						
3.0	2	4	6	7-8	8-9	10	11-12
6.0	1	3-4	5	6-7	8	9	10
9.0	1	3	5	6	7	8	9
12.0	1	3	4-5	5-6	6-7	7-8	8-9
15.0	1	3	4	5-6	6-7	7	8
18.0	1	3	4	5	6	7	8
21.0	1	3	4	5	6	7	7-8

Fuel Model 8

Fuel Moisture (1-Hour)	Midflame Wind (mph) *Means you hit the wind limit.						
	0	2	4	6	8	10	12
	Rate of Spread (Chains per Hour)						
3.0	0	1	2	3	5	7	8
6.0	0	1	2	3	*4	*5	*5
9.0	0	1	1	2	*3	*3	*3
12.0	0	0	1	2	*3	*3	*3
15.0	0	0	1	2	*2	*2	*2
18.0	0	0	1	1	*2	*2	*2
21.0	0	0	1	1	*2	*2	*2
	Flame Length (Feet)						
3.0	0.5	0.8	1.2	1.5	1.8	2.1	*2.2
6.0	0.4	0.7	1.0	1.2	1.5	*1.6	*1.6
9.0	0.4	0.6	0.8	1.1	*1.3	*1.3	*1.3
12.0	0.3	0.5	0.8	1.0	*1.2	*1.2	*1.2
15.0	0.3	0.5	0.7	0.9	*1.1	*1.1	*1.1
18.0	0.3	0.5	0.7	0.9	*1.0	*1.0	*1.0
21.0	0.3	0.4	0.6	0.8	*0.9	*0.9	*0.9

Fuel Model 9

Fuel Moisture (1-Hour)	Midflame Wind (mph)						
	0	2	4	6	8	10	12
	Rate of Spread (Chains per Hour)						
3.0	1	3	8	16	25	36	49
6.0	1	2	6	12	19	27	37
9.0	1	2	5	10	15	22	30
12.0	1	2	4	8	13	19	26
15.0	1	2	4	7	12	17	23
18.0	0	1	3	6	10	14	19
21.0	0	1	2	4	7	10	13
	Flame Length (Feet)						
3.0	1.3	2.1	3.2	4.2	5.2	6.2	7.1
6.0	1.0	1.6	2.5	3.4	4.2	4.9	5.7
9.0	0.9	1.4	2.2	2.9	3.6	4.3	5.0
12.0	0.8	1.3	2.0	2.7	3.4	4.0	4.6
15.0	0.8	1.2	1.9	2.5	3.1	3.7	4.3
18.0	0.7	1.1	1.7	2.2	2.7	3.3	3.7
21.0	0.5	0.8	1.2	1.6	2.0	2.4	2.7

Fuel Model 10

Fuel Moisture (1-Hour)	Midflame Wind (mph)						
	0	2	4	6	8	10	12
	Rate of Spread (Chains per Hour)						
3.0	1	4	8	11-13	16-20	22-27	28-35
6.0	1	3	7	9-12	14-17	19-23	24-30
9.0	1	3	6	9-10	13-15	17-21	22-27
12.0	1	3	6	8-10	12-14	16-19	21-25
15.0	1	2	5	9	11-13	15-18	19-23
18.0	1	2	5	8	10-12	14-16	18-21
21.0	0	2	4	6	8-10	11-13	14-17
	Flame Length (Feet)						
3.0	2.0	3.5	5.0	6.4	7.7	8.9	10.0
6.0	1.7	3.1	4.5	5.6	6.8	7.8	8.9
9.0	1.6	2.9	4.2	5.3	6.2	7.2	8.2
12.0	1.5	2.7	4.0	5.1	6.0	6.9	7.8
15.0	1.5	2.6	3.8	4.8	5.7	6.6	7.5
18.0	1.4	2.4	3.5	4.4	5.3	6.0	6.8
21.0	1.2	2.0	2.9	3.7	4.4	5.1	5.8

Fuel Model 11

Fuel Moisture (1-Hour)	Midflame Wind (mph) *Means you hit the wind limit.						
	0	2	4	6	8	10	12
	Rate of Spread (Chains per Hour)						
3.0	1	3	6	9	12	16	19
6.0	1	2	5	7	10	13	16
9.0	0	2	4	6	9	11	14
12.0	0	2	3	5	7	9	11
15.0	0	1	2	3	4	*5	*5
18.0	0	0	0	0	0	0	0
	Flame Length (Feet)						
3.0	1.3	2.6	3.6	4.3	5.0	5.6	6.1
6.0	1.2	2.3	3.1	3.8	4.4	4.9	5.4
9.0	1.1	2.1	2.9	3.5	4.0	4.5	5.0
12.0	0.9	1.8	2.4	2.9	3.4	3.8	4.2
15.0	0.5	1.0	1.4	1.7	1.9	2.2	*2.3
18.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Fuel Model 12

Fuel Moisture (1-Hour)	Midflame Wind (mph)						
	0	2	4	6	8	10	12
	Rate of Spread (Chains per Hour)						
3.0	2	7	13	20	27	34	42
6.0	1	6	11	16	22	27	33
9.0	1	5	9	14	19	24	29
12.0	1	4	8	12	17	21	26
15.0	1	4	7	11	15	19	23
18.0	1	3	6	8	11	15	18
21.0	0	2	3	5	7	9	11
	Flame Length (Feet)						
3.0	3.3	6.3	8.5	10.3	11.8	13.2	14.4
6.0	2.8	5.4	7.3	8.8	10.1	11.3	12.4
9.0	2.6	5.0	6.7	8.1	9.3	10.3	11.3
12.0	2.4	4.7	6.3	7.6	8.7	9.7	10.6
15.0	2.2	4.3	5.7	6.9	7.9	8.9	9.7
18.0	1.9	3.5	4.7	5.7	6.6	7.4	8.1
21.0	1.2	2.3	3.1	3.7	4.2	4.7	5.2