

Carla Freeman
NC Forest Service District 5
Management Ranger

Handheld Weather Meters

Kestrel- Fire Weather Pro with LINK

- **Cost: \$420.00-500.00**
- Provides MORE data
- SUPER easy to share dashboard but only one device can connect at a time
- During test dropped connection 1 time in two hours
- Continuous reading and updating
- Can be stored on device and retrieved for printing on PC



Shared/Downloaded Data Views

Ignore Delete Archive Reply Reply Forward Forward All Respond

Fri 6/15/2018 4:49 PM

Freeman, Carla

Weather Report

To Griffin, Kenny

fire2018-06-15.jpeg 58 KB

Current Readings :
6/15/18, 16:47:33 PM
WB: 60.6°F
CrW: -0.0mph
D.A.: 1,894ft
R.H.: 42.1%
Deg: 75.8°F
S.P.: 29.36inHg
MDir: -1°
Vel: 0.0mph
TDir: -1°
HdW: -18,764.8mph
PIG: 50%
D.P.: 51.1°F
WC: 75.7°F
Baro: 29.36inHg
Alt: 519ft
H.I: 73.8°F

Get [Outlook for Android](#)

75.8°F

Temperature

0.0mph

Wind Speed

42.1%

Relative Humidity

Kestrel_Conversion_Template.xlsx - Excel Carla Freeman

File Home Insert Page Layout Formulas Data Review View Add-ins Tell me what you want to do

Normal Page Break Preview Page Layout Custom Views Ruler Formula Bar Gridlines Headings Zoom 100% Zoom to Selection New Window Arrange All Freeze Panes Split Hide View Side by Side Synchronous Scrolling Reset Window Position Switch Windows Macros

AD6

	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH
9																		
10		Time	Temp	Wet Bulb	Rel. Hum.	Baro.	Altitude	Station P.	Wind Spe	Heat Inde	Dew Point	Dens. Alt.	Crosswind	Headwind	Mag. Dir.	True Dir.	Wind Chill	
11		yyyy-MM-dd hh:mm:ss	Deg F	Deg F		inHg	Feet	inHg	mph	Deg F	Deg F	feet	mph	mph	Degrees	Degrees	Deg. F	
12		6/15/2018 17:00	74.12	60.08	44	29.36	515	29.36	0.00	72.5	50.72	1785	#VALUE!	#VALUE!	***	***	74.48	
13		6/15/2018 18:00	73.94	59.9	44.2	29.36	515	29.36	0.00	72.14	50.72	1772	#VALUE!	#VALUE!	***	***	69.44	
14		6/15/2018 19:00	78.08	63.14	44	29.60	289	29.60	0.00	76.46	54.5	1785	#VALUE!	#VALUE!	***	***	67.28	
15		6/15/2018 20:00	83.12	69.98	52.5	29.65	240	29.65	0.00	84.92	64.04	2110	#VALUE!	#VALUE!	***	***	66.74	
16		6/15/2018 21:00	83.66	68.9	48.1	29.67	226	29.67	0.00	84.38	61.88	2100	#VALUE!	#VALUE!	***	***	66.38	
17		6/15/2018 22:00	82.76	67.64	46.5	29.80	112	29.80	0.00	82.76	60.26	1893	#VALUE!	#VALUE!	***	***	66.02	
18		6/15/2018 23:00	80.96	65.84	45.5	29.81	95	29.81	0.00	80.24	57.92	1745	#VALUE!	#VALUE!	***	***	65.84	
19		6/16/2018 0:00	78.8	64.04	45.1	29.82	92	29.82	0.00	77.36	55.76	1585	#VALUE!	#VALUE!	***	***	65.48	
20		6/16/2018 1:00	76.46	62.06	44.5	29.83	79	29.83	0.00	74.48	53.24	1401	#VALUE!	#VALUE!	***	***	65.3	
21		6/16/2018 2:00	74.12	60.08	44.2	29.83	79	29.83	0.00	72.32	50.9	1237	#VALUE!	#VALUE!	***	***	65.66	
22		6/16/2018 3:00	71.78	58.28	44.1	29.83	79	29.83	0.00	70.52	48.92	1086	#VALUE!	#VALUE!	***	***	69.26	
23		6/16/2018 4:00	69.98	56.66	44	29.83	75	29.83	0.00	68.18	47.12	948	#VALUE!	#VALUE!	***	***	69.26	
24		6/16/2018 5:00	68.18	55.4	44.1	29.84	66	29.84	0.00	65.48	45.5	814	#VALUE!	#VALUE!	***	***	68.9	
25		6/16/2018 6:00	66.56	54.14	44.1	29.84	66	29.84	0.00	63.5	44.06	712	#VALUE!	#VALUE!	***	***	69.44	
26		6/16/2018 7:00	65.3	53.06	44.2	29.87	39	29.87	0.00	61.34	42.98	587	#VALUE!	#VALUE!	***	***	68.9	
27		6/16/2018 8:00	64.94	52.88	44.5	29.88	36	29.88	0.00	60.98	42.8	554	#VALUE!	#VALUE!	***	***	68.9	
28		6/16/2018 9:00	66.2	54.32	45.8	29.89	20	29.89	0.00	62.78	44.6	633	#VALUE!	#VALUE!	***	***	69.26	
29		6/16/2018 10:00	70.88	58.64	48.6	29.90	13	29.90	0.00	69.98	50.54	961	#VALUE!	#VALUE!	***	***	69.26	
30		6/16/2018 11:00	78.44	65.66	51.1	29.90	13	29.90	0.00	77.9	59	1493	#VALUE!	#VALUE!	***	***	71.06	

- Cost: \$100.00-150.00
- **No wind readings**
- Stays connected well
- Easy to use, dashboard easy to share
- One user access at a time
- Continuous Reading and updating

Kestrel DROP D3



Dashboard Shared: Emailed

87.9°F



Temperature

51.8%



Relative Humidity

93.0°F



Heat Stress Index



Thu 6/14/2018 2:09 PM

Freeman, Carla

Weather Report from drop

To



You replied to this message on 6/14/2018 2:56 PM.

87.9°F

Temperature

d5_59_drop2018-06-14.jpeg

59 KB

Current Readings :

6/14/18, 14:08:19 PM

Deg: 87.9°F

R.H.: 51.8%

H.I.: 93.0°F

D.P.: 68.0°F

S.P.: 29.76inHg

WB: 73.8°F

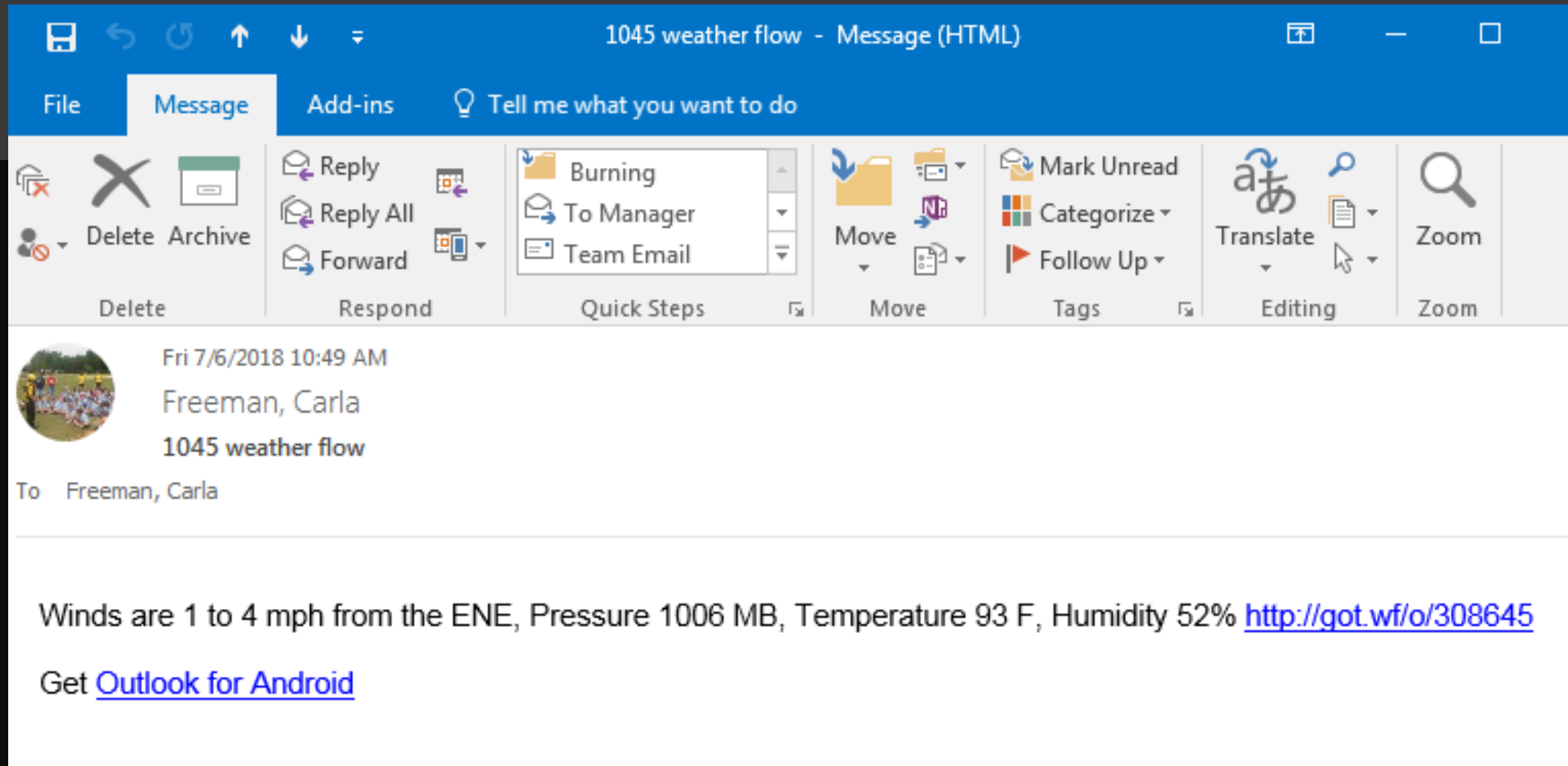
Get [Outlook for Android](#)

- Cost: \$72.00-79.00
- Averages 1 minute of readings each time. Not a continuous reading device
- Can be stored on device and retrieve for printing on PC.
- Can be shared directly off your phone as a text/email
- During test this meter seemed to disconnected more often than the kestrel links
- Provides wind data as well

Weatherflow Meter



Emailed Dashboard Information



Belt Weather Kit

- Cost: \$110.00-130.00
- General wind speeds
- Wet and Dry bulb temps
- Calculate RH from included tables
- If used correctly it is accurate. Operator Error!



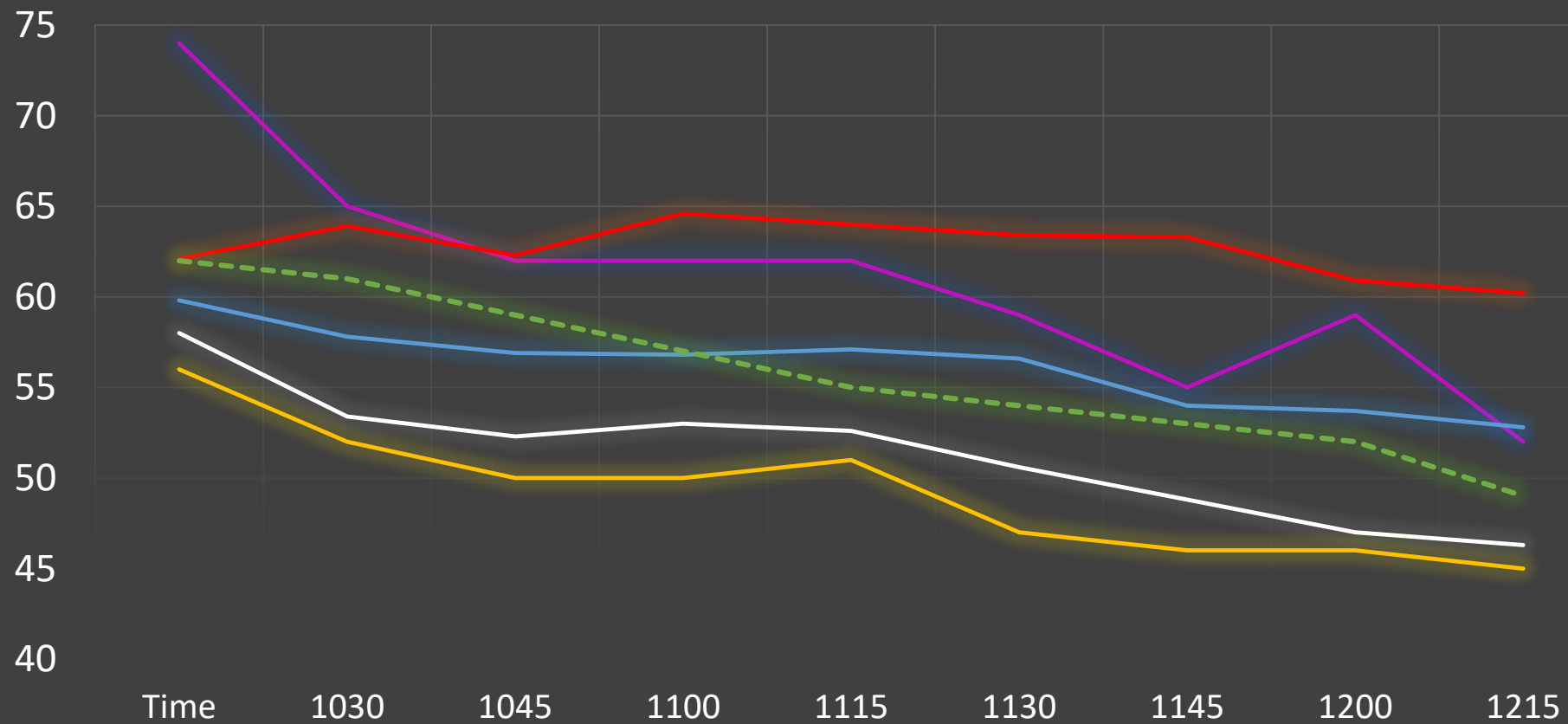
RH Results from Field Test

Relative Humidity Comparison RAWS Warrenton -7/06/2018																		
Time	1030	% Diff.	1045	% Diff.	1100	% Diff.	1115	% Diff.	1130	% Diff.	1145	% Diff.	1200	% Diff.	1215	% Diff.	1230	% Diff.
Belt Weather Kit	74	-16.2	65	-6.2	62	-4.8	62	-8.1	62	-11.3	59	-8.5	55	-3.6	59	-11.9	52	-5.8
Kestrel 3000	62.1	-0.2	63.9	-4.5	62.3	-5.3	64.6	-11.8	64	-14.1	63.4	-14.8	63.3	-16.3	60.9	-14.6	60.2	-18.6
Kestrel Drop	58	6.9	53.4	14.2	52.3	12.8	53	7.5	52.6	4.6	50.6	6.7	48.8	8.6	47	10.6	46.3	5.8
Weatherflow	56	10.7	52	17.3	50	18.0	50	14.0	51	7.8	47	14.9	46	15.2	46	13.0	45	8.9
Kestrel 5500 Fire Pro	59.8	3.7	57.8	5.5	56.9	3.7	56.8	0.4	57.1	3.7	56.6	-4.6	54	-1.9	53.7	-3.2	52.8	-7.2
RAWS Warrenton	62		61		59		57		55		54		53		52		49	

Device	Avg. % Difference
Belt Weather Kit	8.49
Kestrel 3000	11.13
Kestrel Drop	8.65
Weatherflow	13.32
Kestrel 5500 Fire Pro	3.76

Relative Humidity Comparison 7/06/2018

Belt Weather Kit Kestrel 3000 Kestrel Drop
Weatherflow Kestrel 5500 Warrenton RAWS



Temperature Results from Field Test

Temperature Comparison RAWS Warrenton -7/06/2018																		
Time	1030	% Diff.	1045	% Diff.	1100	% Diff.	1115	% Diff.	1130	% Diff.	1145	% Diff.	1200	% Diff.	1215	% Diff.	1230	% Diff.
Belt Weather Kit	88	1.1	90	-0.1	91	-0.3	91	0.2	91	0.7	92	0.5	94	-0.6	92	1.3	94	-0.3
Kestrel 3000	89.4	-0.4	90.6	-0.8	91	-0.3	89.3	2.1	90.2	1.6	90.4	2.3	89.1	4.8	92.6	0.6	92.3	1.5
Kestrel Drop	90	-1.1	88.4	1.7	89.3	1.6	90.2	1.1	90	1.8	91.8	0.8	92.4	1.1	90.9	2.5	90.4	3.7
Weatherflow	90.8	-2.0	92.8	-3.1	94.2	-3.7	93.8	-2.8	93.4	-1.9	95.6	-3.2	97.2	-3.9	96.2	-3.1	96.3	-2.7
Kestrel 5500 Fire Pro	89.7	-0.8	90.2	-0.3	92	-1.4	90.2	1.1	89.8	-2.0	92.7	-0.2	91.1	2.5	91.5	1.9	92	1.8
RAWS Warrenton	89		89.9		90.7		91.2		91.6		92.5		93.4		93.2		93.7	

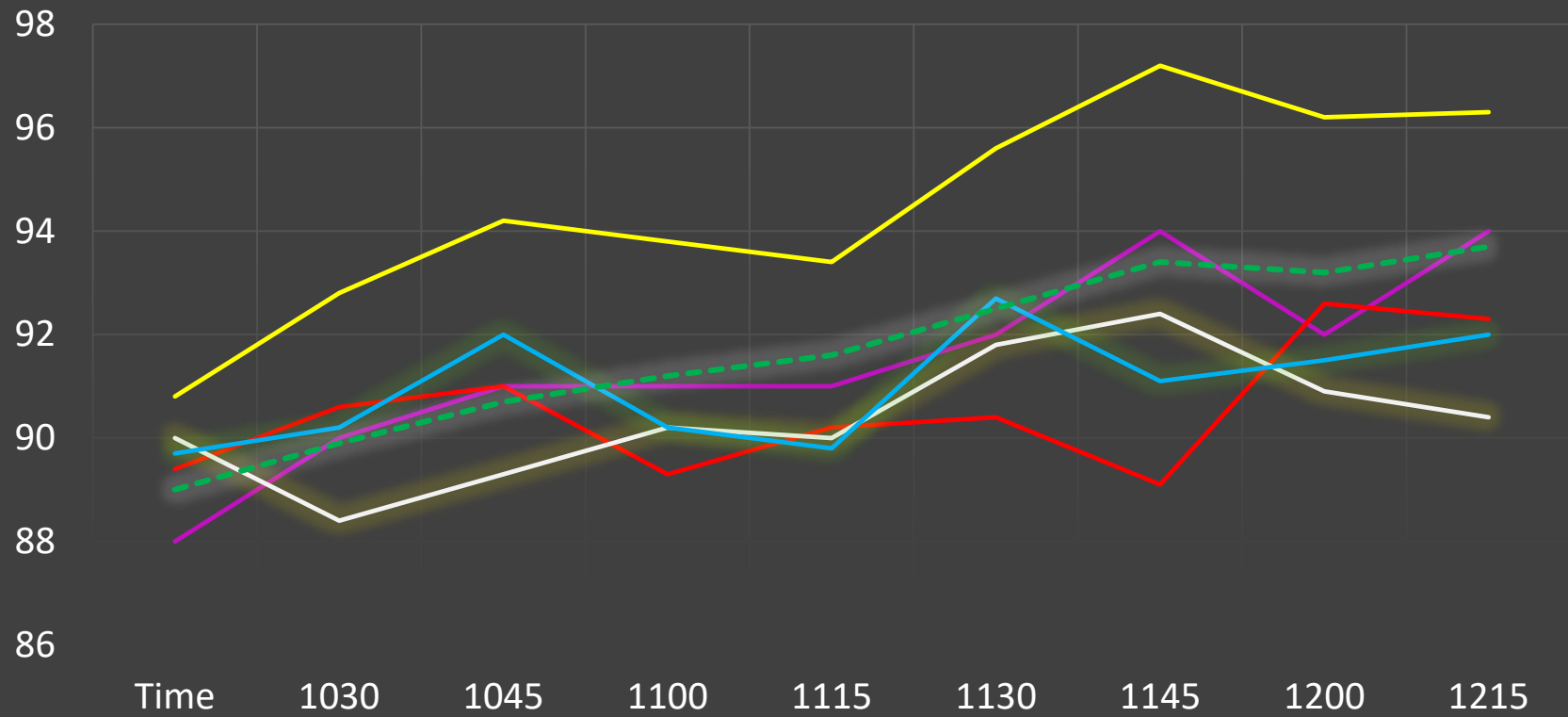
Device	Avg. % Difference
Belt Weather Kit	0.57
Kestrel 3000	1.61
Kestrel Drop	1.51
Weatherflow	2.93
Kestrel 5500 Fire Pro	1.34

% Diff. = Percentage Difference from RAWS Warrenton

Comparison conducted at the Warrenton RAWS station by Carla Freeman (NCFS-D5) and Kenny Griffin (NCFS-D11) 7/6/2018

Temperature Comparison 7/06/2018

Belt Weather Kit Kestrel 3000 Kestrel Drop
Weatherflow Kestrel 5500 Warrenton RAWS





Carla Freeman
District 5 Management Ranger

DEPENDS.....Amount you are willing to spend, how often you will use it, and what you are comfortable using.

Free Online Precipitation Tool


SC

Fri 7/6/2018 9:38 PM

State Climate Office of North Carolina <scos@climate.ncsu.edu>

[External] Precipitation ALERT for Griffin Home - 0.23 inches within 24 hours

To: Freeman, Carla

 You forwarded this message on 7/6/2018 9:57 PM.

This is an automatically generated precipitation alert message from the State Climate Office of North Carolina.

PROJECT: Testing

SITE:

LOCATION: 36.388213893171, -78.856997452125

THRESHOLD: 0.1 inches within 24 hours

ALERT: estimated 0.23 inches during the previous 24 hours ending at 7pm EST, Jul 6.

MPE webpage

<http://climate.ncsu.edu/dot>

Site Details:

<http://climate.ncsu.edu/dot/projects.php#5805>

Site Forecast

<http://forecast.weather.gov/MapClick.php?site=slc&textField1=36.388213893171&textField2=-78.856997452125>

There are possible errors associated with these radar-based precipitation estimates. The calculations in this alert



Sent: Saturday, July 7, 2018 3:37:52 AM

To: Freeman, Carla

Subject: [External] Precipitation ALERT for Finch - 0.84 inches within 6 hours

CAUTION: External email. Do not click links or open attachments unless verified. Send all suspicious email as an attachment to Report Spam.<<mailto:report.spam@nc.gov>>

This is an automatically generated precipitation alert message from the State Climate Office of North Carolina. This alert is for...

PROJECT: RAW5 STATIONS

SITE: Finch

LOCATION: 35.431051891532, -78.030493640493

THRESHOLD: 0.1 inches within 6 hours

ALERT: estimated 0.84 inches during the previous 6 hours ending at 1am EST, Jul 7.

Ver. 5.0 FastPath EOBS Weather Information Management System Show [Navigation Tree](#)

[Edit Observations EOBS](#) [Back to Menu](#)

on ID: or D5

Station ID	Obs Tm	Obs Type	W	Dry Tmp	RH	M L	HC Rsk	Wind		10 Hr	Temp		RH%		Dur	Amt	Y L
								Dir	SP		Max	Min	Max	Min			
311001	13	<input type="button" value="O"/>	<input type="button" value="3"/>	76	66		0	36	7		94	70	97	47	9	1.39	
312940	13	<input type="button" value="O"/>	<input type="button" value="6"/>	71	90		0	22	7		95	71	95	43	8	0.82	
317501	13	<input type="button" value="O"/>	<input type="button" value="3"/>	73	89		0	41	12		98	72	100	40	8	0.9	

Info: Observation successfully saved.[317501/07-Jul-18/13/0]

Free Online Precipitation Tool

83° 33% 6:24 PM

sco@climate.ncsu.edu

Park
ALERT: 0.16 in 6 hrs ending at 7pm, Jul 4

S: M:PROJECT: Testing
SITE: Freeman Home
ALERT: 0.14 in 24 hrs ending at 7pm, Jul 4
9:37 PM

Saturday, July 7, 2018

S: M:PROJECT: Testing
SITE: Medoc Mountain State Park
ALERT: 0.1 in 6 hrs ending at 7am, Jul 7

S: M:PROJECT: Testing
SITE: Medoc Mountain State Park
ALERT: 0.1 in 6 hrs ending at 7am, Jul 7
9:38 PM

S: M:PROJECT: Testing
SITE: Freeman Home
ALERT: 0.26 in 24 hrs ending at 1pm, Jul 7
3:38 PM

Enter message

SEND

to help determine your specific latitude/longitude

RAWS STATIONS or [create a new project](#)

More Data

Sent: Saturday, July 7, 2018 3:37:52 AM
To: Freeman, Carla
Subject: [External] Precipitation ALERT for Finch - 0.84 inches within 6 hours

CAUTION: External email. Do not click links or open attachments unless verified. Send all suspicious email as an attachment to Report Spam. <<mailto:report.spam@nc.gov>>

This is an automatically generated precipitation alert message from the State Climate Office of North Carolina. This alert is for...

PROJECT: RAWS STATIONS
SITE: Finch
LOCATION: 35.431051891532, -78.030493640493
THRESHOLD: 0.1 inches within 6 hours

ALERT: estimated 0.84 inches during the previous 6 hours ending at 1am EST, Jul 7.

Submit and add another



- Sign In: Request a login required
- Setup Project Files

<https://climate.ncsu.edu/dot/>