



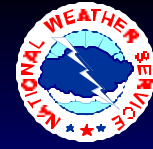
Vision for Fire and Public Weather Services Digital Products

Douglas C. Young
Fire and Public Weather Services Branch
Office of Climate, Water, and Weather Services
February 9, 2003



Session Outline

- **Public and Fire Weather Vision for Digital Products**
- **General Sensible Weather Elements in NDFD**
- **Fire Weather Elements in NDFD**
- **Derived Public and Fire Weather Elements**
- **Graphical Representations of Public and Fire Weather Digital Data**
- **Area/Point Forecast Matrices**
- **Experimental Web-based Interactive Forecasts**
- **Present and Future Examples of Public and Fire Weather digitally-based Products**



Public and Fire Weather Services

Digital Data Vision

- **Standardized and meteorologically consistent suite of products derived from the National Digital Forecast Database**
- **Comprehensive, current, and high resolution digital datasets provided so that private sector can build upon our services**
- **Probabilistic products primarily for long duration outlooks, watches, warnings**
- **Data allowing integration of forecast information with existing GIS datasets**



General Sensible Weather Elements in NDFD



- **Maximum/Minimum Temperature**
- **Temperature**
- **Dewpoint**
- **12-hour Probability of Precipitation**
- **Sky Cover**
- **Wind Speed and Direction**
- **Weather (type, intensity, coverage)**
- **Quantitative Precipitation Forecast**



Fire Weather Elements in NDFD



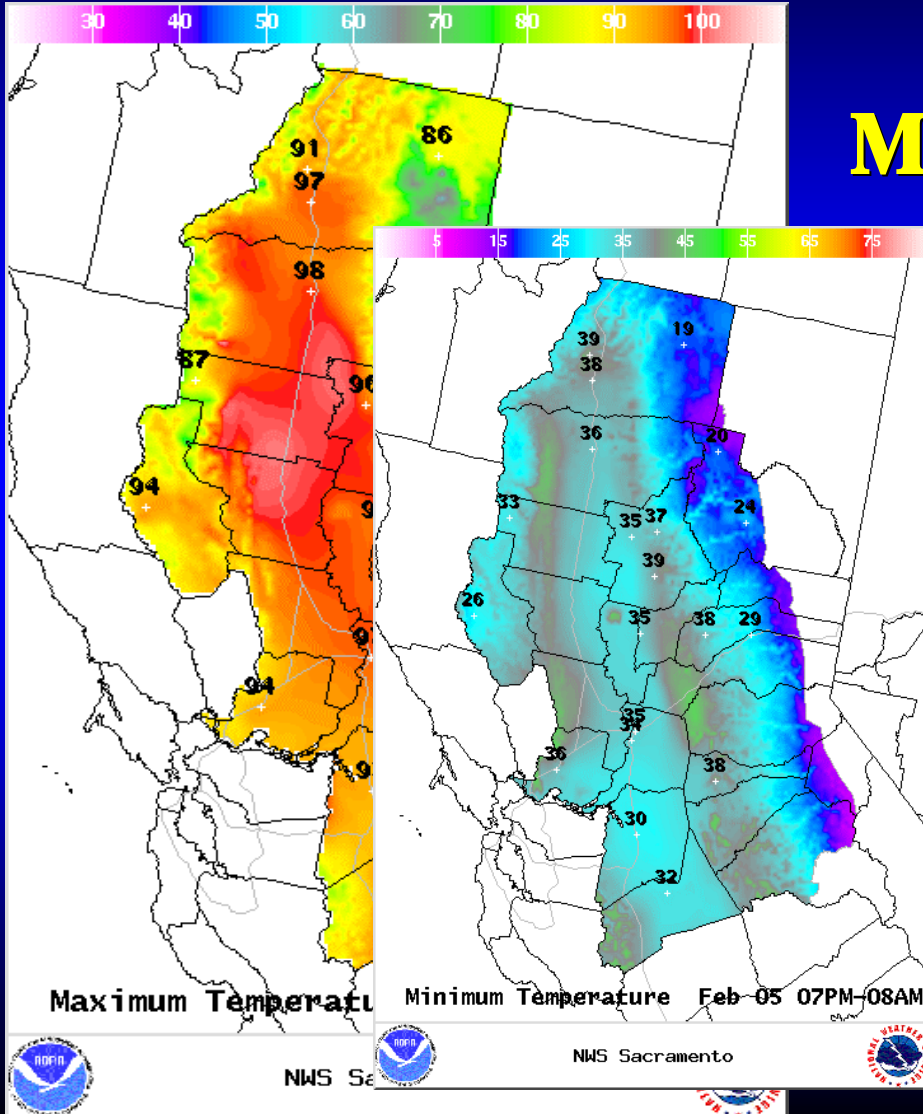
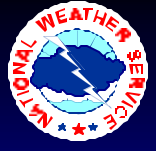
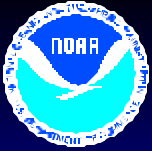
- **Max/Min Relative Humidity**
- **Free Air Wind (i.e, ridgetop wind)**
Proposed
- **Lightning Activity Level**
- **Mixing Height or Stability**
- **Transport Wind**
- **Haines Index**



Public and Fire Weather Derived Elements in NDFD



- **Heat Index**
- **Wind Chill**
- **Relative Humidity**
- **24-hr Temperature Trends**
- **24-hr Relative Humidity Trends**



Maximum/Minimum Temperature °F

Daytime maximum and Nighttime minimum temperature in °F during the valid period



NWS Sacramento

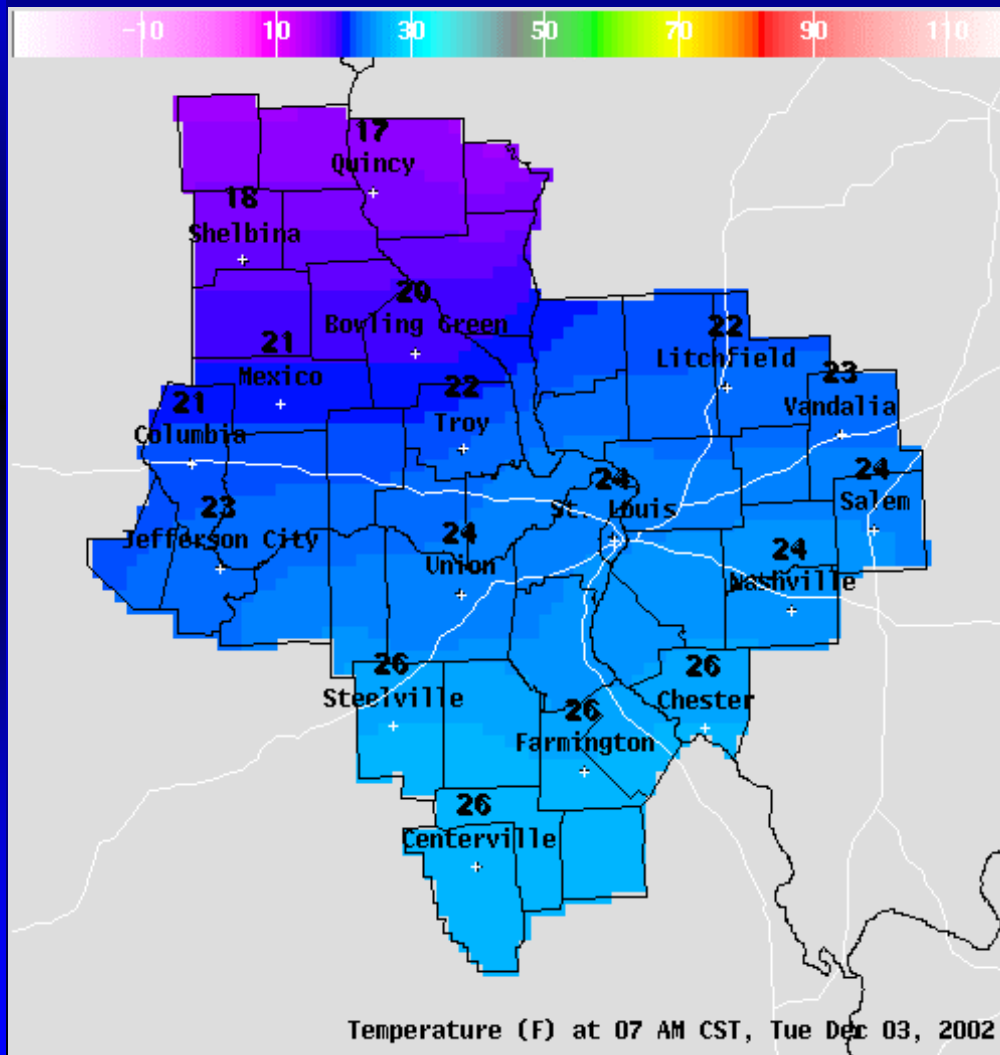


NWS Sacramento





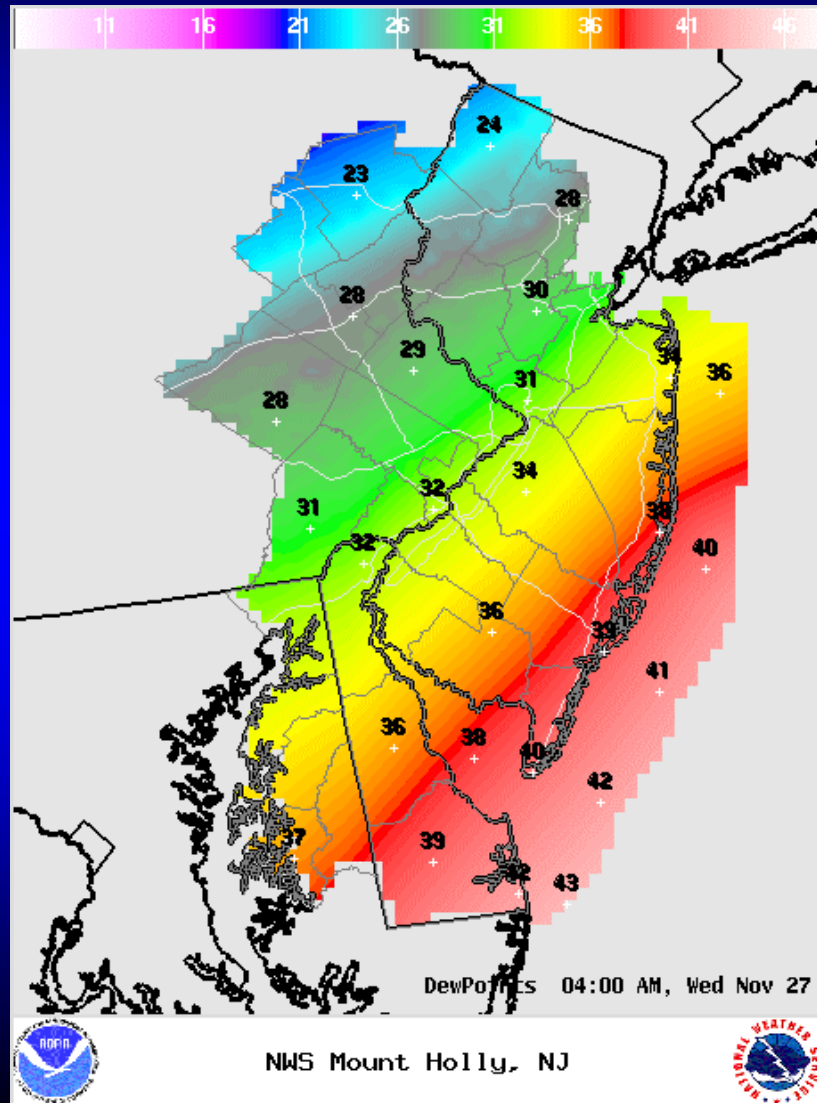
Temperature °F



- Snapshots of the forecasted temperature in °F at the indicated hour



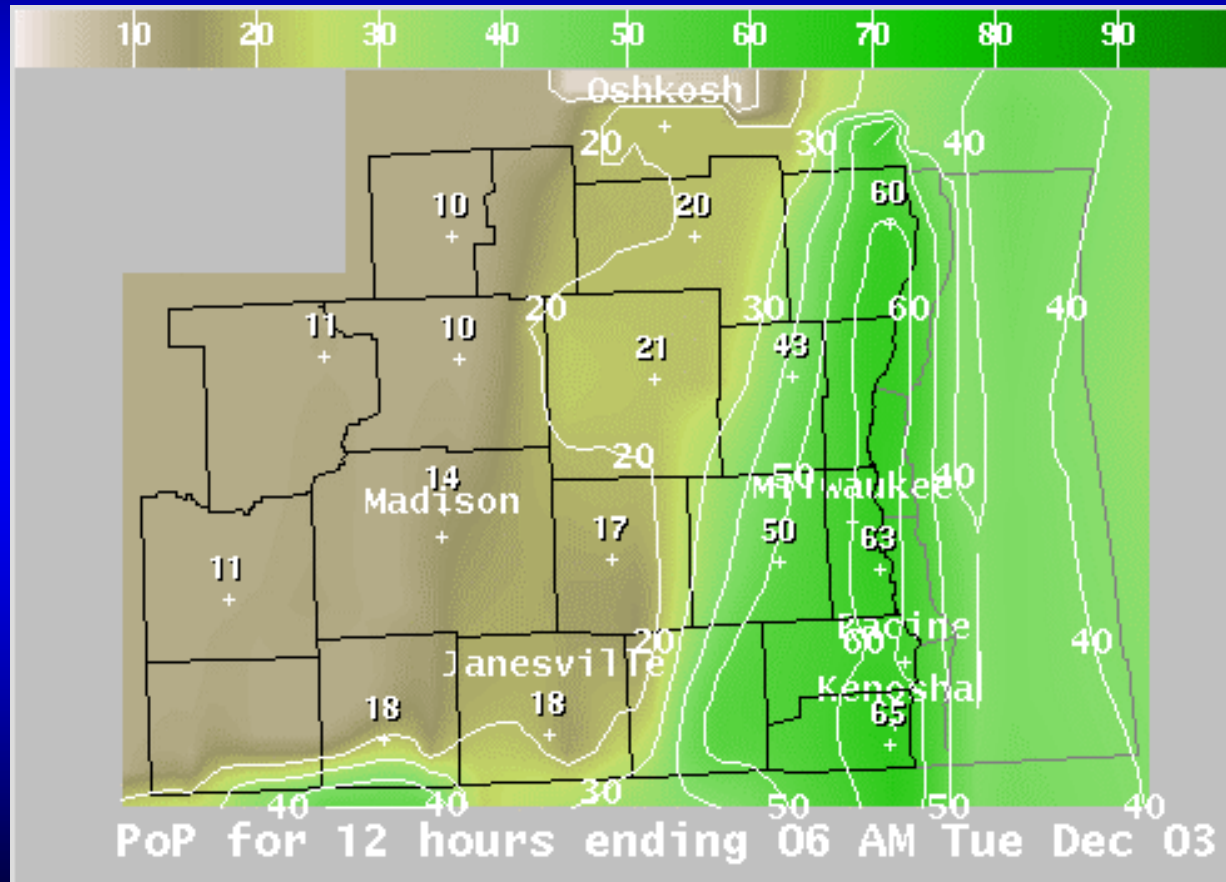
Dewpoint °F



- Snapshots of the forecasted dewpoint (°F) valid at the indicated hour
- Dewpoint – a more “absolute” measurement of atmospheric moisture than relative humidity



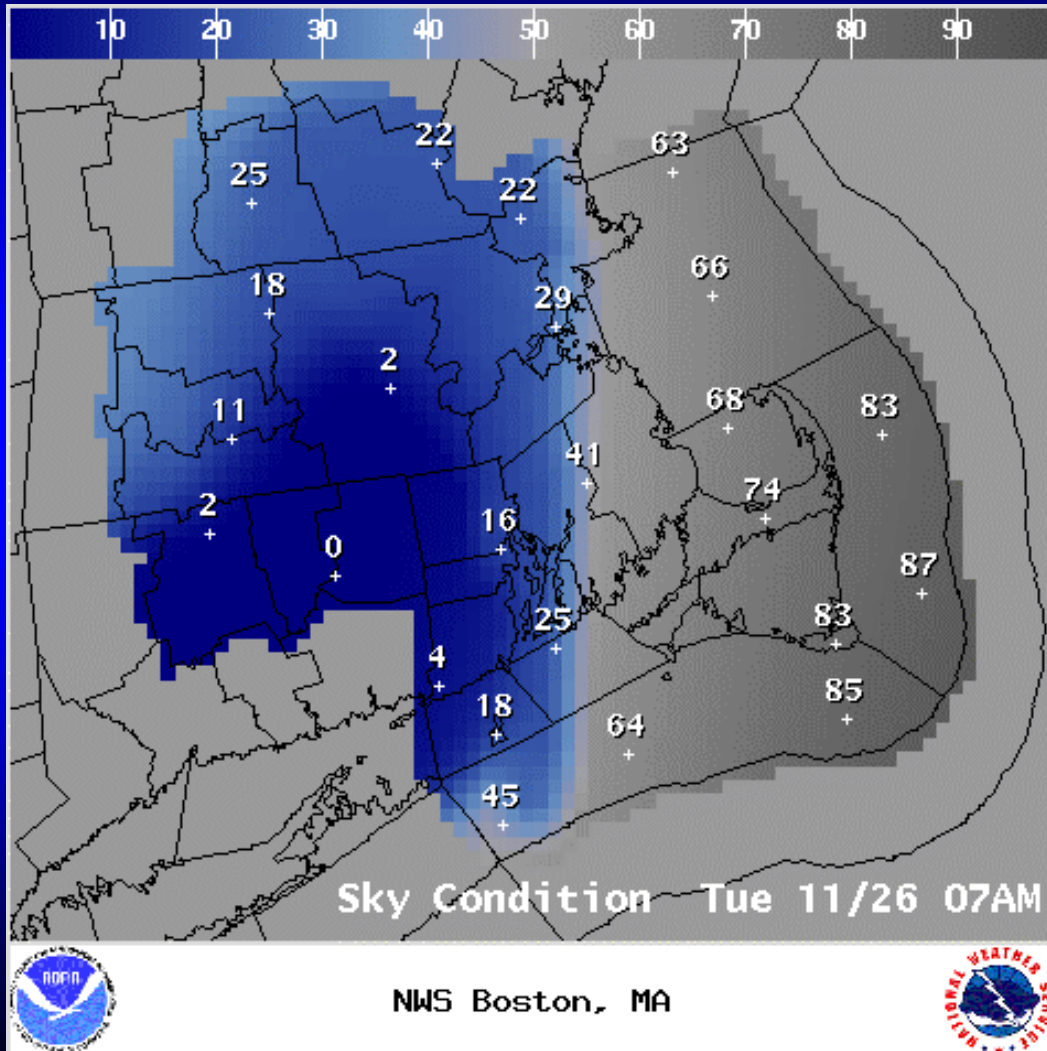
12-hr Probability of Precipitation (PoP 12)



- **The likelihood, expressed as a percent (%), of a measurable precipitation event during the indicated 12-hr period**
- **Measurable = 1/100th of an inch at a grid point**



Sky Cover

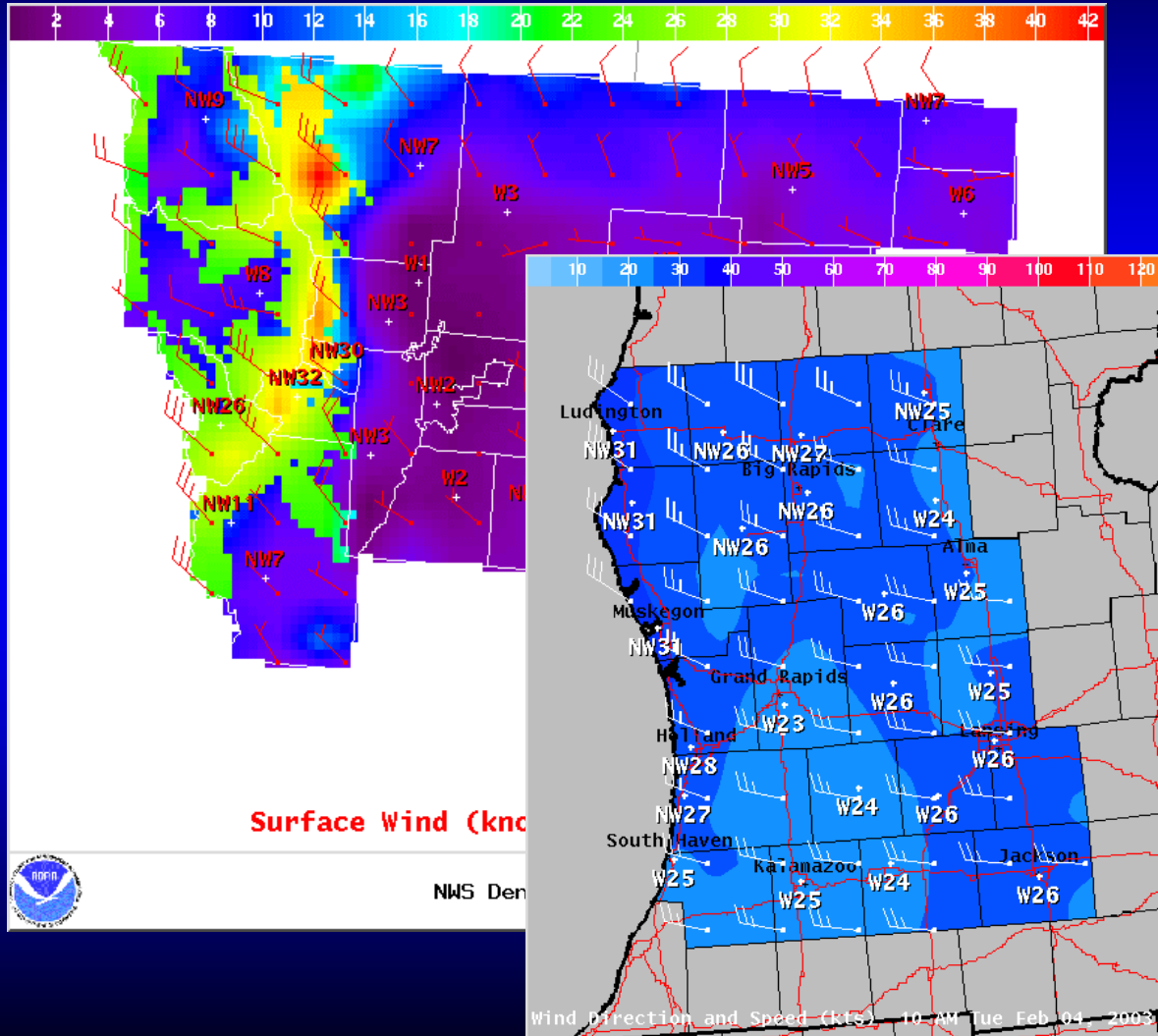


- Snapshots of the percentage (%) of opaque sky cover valid at the indicated hour

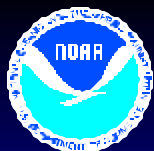




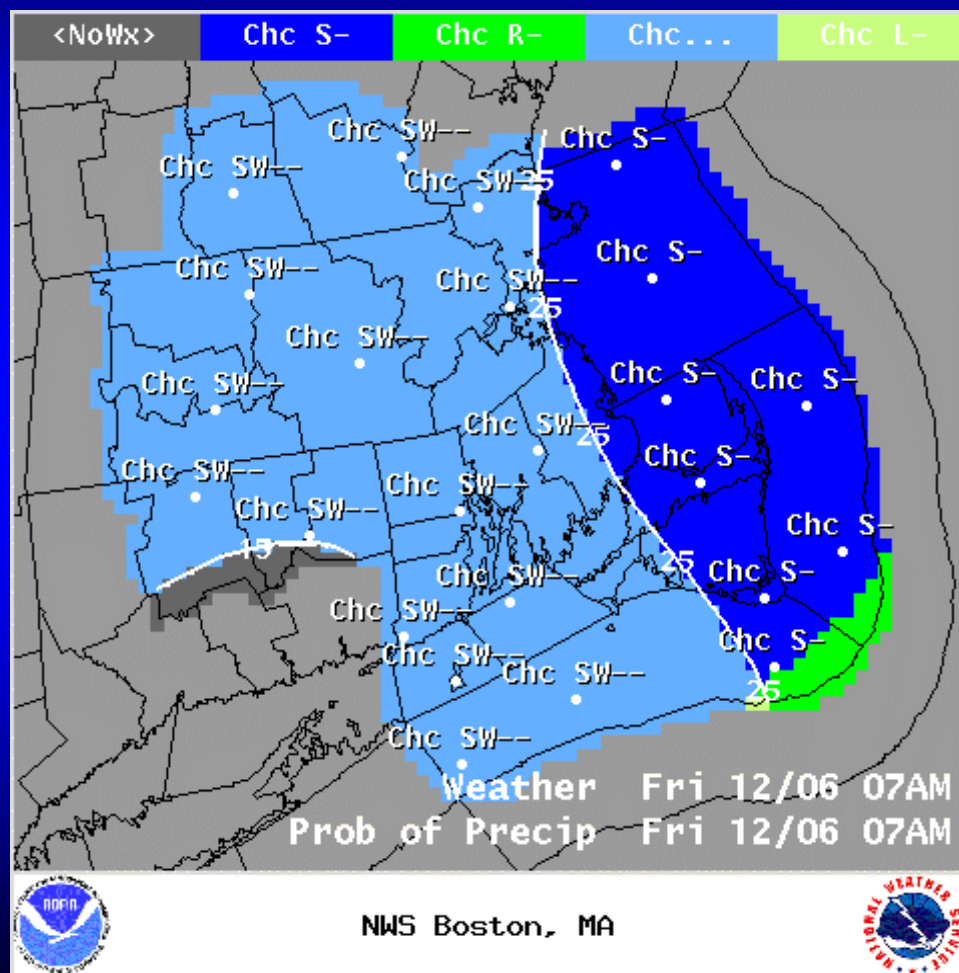
Surface Wind (knots)



- Snapshots of the sustained wind speed (kts)
- Direction using 36 pts. of compass



Weather

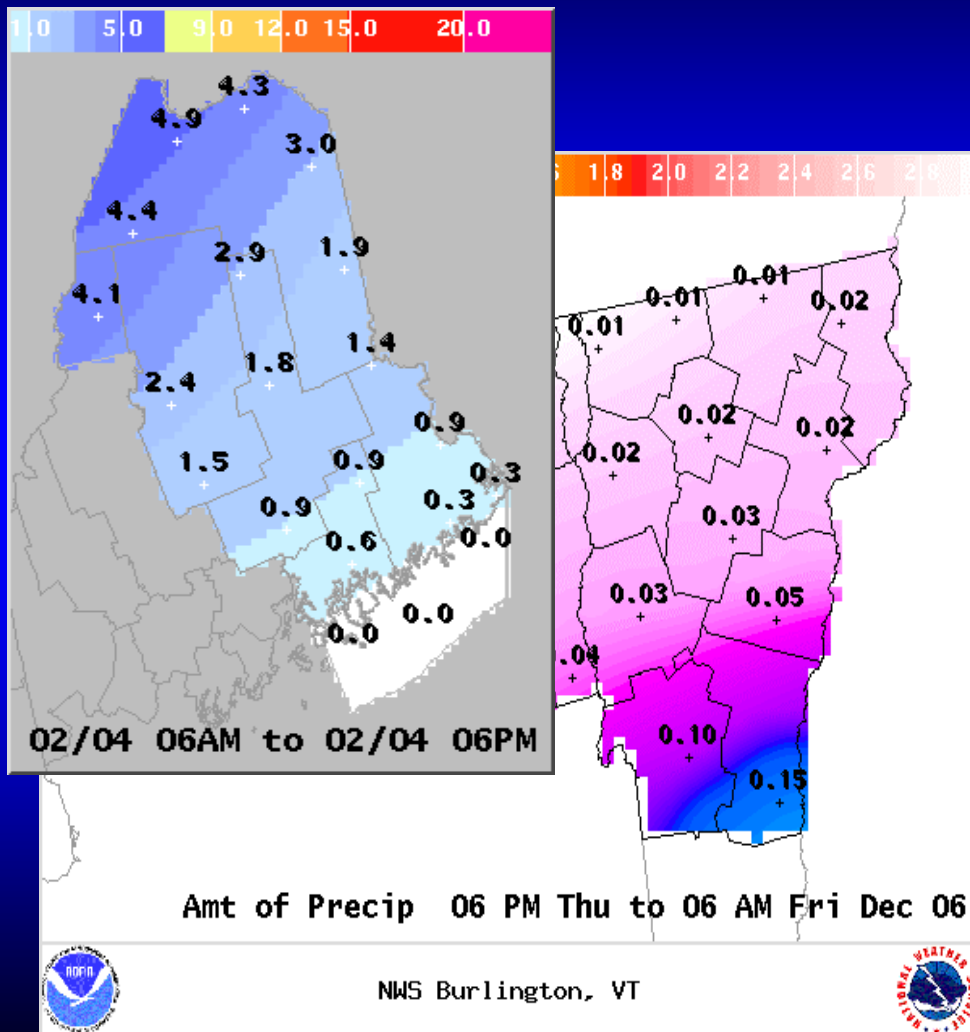


- Snapshots of expected weather conditions
- 16 weather type and visibility restriction codes
- Probability/Coverage category
- 5 intensity levels



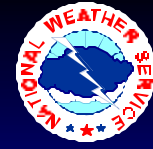


Quantitative Precipitation and Snowfall



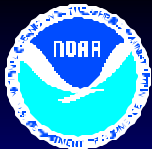
- Total amount of liquid (in hundredths of an inch) during the indicated period
- Total snowfall (in tenths of an inch) during the indicated period





Point/Area Forecast Matrices

- **Tabular displays of various forecasted weather parameters for defined areas (e.g., NWS zones), points, selected cities, climatologically significant locations**
- **Forecasted parameters available at 3-hour, 6-hour, and/or 12 hour intervals through Day 7**
- **Useful for visual scanning or automated retrieval of data**



POINT FORECAST MATRICES
 NATIONAL WEATHER SERVICE city state
 400 AM EST MON FEB 3 2003

(MND - NWS Product Name)
 (Issuing Office)
 (Issuance Time/Date)



stZ###-ddhhmm-
 point location-county st
 ll.lll ll1.lll
 400 AM EST MON FEB 3 2003

(UGC Type: Zone)-(Exp. Time)
 (Loc. in plain language-Cty/Zone State)
 (Point latitude & longitude)
 (Issuance Time/Date)

Point Forecast Matrices (PFM)

DATE	MON 02/03/03								TUE 02/04/03								WED 02/05/03							
UTC 3HRLY	08	11	14	17	20	23	02	05	08	11	14	17	20	23	02	05	08	11	14	17	20	23		
EST 3HRLY	03	06	09	12	15	18	21	00	03	06	09	12	15	18	21	00	03	06	09	12	15	18		
MAX/MIN						48			38					53			45					52		
TEMP	33	39	45	46	45	43	41	39	41	45	49	50	49	49	50	48	46	47	47	49	47			
DEWPT	15	17	20	22	25	29	33	34	36	38	40	42	42	43	44	44	44	46	46	43	39			
RH	47	40	36	38	45	57	72	82	76	70	73	76	79	79	85	92	96	96	79	73				
WIND DIR	NW	NW	W	W	SW	SW	W	W	S	S	S	S	S	S	SW	SW	S	SE	SE	SE	SE			
WIND SPD	5	8	8	8	8	8	5	2	10	14	28	36	26	22	10	8	5	2	2	5	8			
WIND GUST									22	25	42	56	52	34	20									
CLOUDS	OV	OV	OV	OV	BK	BK	SC	BK	BK	BK	BK	BK	BK	OV	OV	OV	OV	OV	OV	OV	BK	BK	BK	
POP 12HR						10			10					20			70					50		
QPF 12HR						0			0					0		.25	.49				.10	.24		
SNOW 12HR						00-00			00-00					00-00										
RAIN														S	S	C	L	L	L	C	C			
OBVIS							K	K								F	F	F	F	F				
WIND CHILL							30	30																
MIN CHILL								24																
HIGH WIND														A	A									

DATE	THU 02/06/03				FRI 02/07/03				SAT 02/08/03				SUN 02/09/03			
UTC 6HRLY	05	11	17	23	05	11	17	23	05	11	17	23	05	11	17	23
EST 6HRLY	00	06	12	18	00	06	12	18	00	06	12	18	00	06	12	18
MAX/MIN		35		46	34		41	24		33	18		30			
TEMP	41	39	44	43	40	36	39	34	29	24	29	26	22	19	28	24
DEWPT	38	36	36	38	37	34	34	32	26	22	21	18	16	16	20	21
PWIND DIR		SE		S	SW		NW	N		N	SE		SE			
WIND CHAR		LT		LT	LT		LT	BZ		WY	LT		LT			
AVG CLOUDS		BK	BK	OV	OV	BK	BK	BK	SC	FW	CL	CL	CL	FW	SC	SC
POP 12HR		10		40	40		20	10		10	40		60			
RAIN				C	C									C	L	L
RAIN SHWRS						SC	SC	SC								

\$\$



Experimental Graphical Forecast Tables



- Graphical representations of the forecast matrices

Your NATIONAL WEATHER SERVICE forecast for

NORTHWESTERN BURLINGTON NJ

... Including Mount Holly

ISSUED 315 PM EST SUN JAN 26 2003

Experimental

[GO TO 3 HOURLY GRAPHICAL FORECAST](#)

	Min Temp	Max Temp	Midnight Sky	Midday Sky	Weather	Day PoP	Night PoP	Wind (mph)	Wind Dir	Max RH	Min RH
MONDAY	14F	28F				0%	0%	10 to 22	SE	74%	41%
TUESDAY	1F	38F				10%	30%	2 to 10	SE	76%	40%
						40%	0%				
						0%	10%				
						10%	10%				
						40%	40%				

Your NATIONAL WEATHER SERVICE forecast for

SUFFOLK ... INCLUDING THE CITY OF BOSTON

ISSUED 431 AM EST FRI JAN 10 2003

Experimental

Click on column header for description.

WEEKLY QUICKCAST

TODAY

HIGH	PROB OF PRECIP
37F	
12 HR PRECIP AMOUNT (in.) 01-10	
MAX 12 HOUR PRECIP AMOUNT (in.) 01-10	
12 HR SNOW AMOUNT (in.) 00-1	

TIME	Temp	Dew Point	Rel Hum	Sky	Wind Dir	Wind Spd	Snow	Snow Slows	Rain	Wind Chill
7AM	37F	29F	73%		N	10	CLEAR		0.00	31F
10AM	33F	26F	76%		N	10			0.00	25F
1PM	33F	22F	64%		NE	15			0.00	23F
4PM	30F	15F	54%		NE	15			0.00	19F

TODAY's variable forecast

Described by customers as:

- “A vivid picture of expected weather”
- “Quick read with good detail”
- “Easy to understand format” 17



Experimental Interactive Navigation Forecast Maps



www.nws.noaa.gov

National Weather Service Forecast Office
Kansas City/Pleasant Hill

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Select the type of forecast and the forecast elements/pcpn type probability. Then, select the location on the map, or enter the latitude and longitude and select Submit. The forecast for the nearest gridpoint should appear momentarily. (Note: if the 7-day text forecast option is selected, the forecast will include temperature, sky cover, wind, and probability of precipitation regardless of what is selected in the elements and probability sections.)

7-day Text
Narrative text forecast describing the weather for the next 7 days.

Element Meteogram
Hourly 48-hour plot of selected forecast elements.

Digital Text
Hourly 120-hour digital tabular/text forecast for selected elements.

Forecast Elements

- Temperature (°F)
- Dewpoint (°F)
- Wind (mph)
- Wind Chill (°F)
- Relative Humidity (%)
- Sky Cover (%)

Pcpn Type Probability

- Rain (%)
- Thunder (%)
- Snow (%)
- Freezing Rain (%)
- Sleet (%)

Click on map or enter latitude/longitude pair in decimal degrees.
 (i.e. 38.75 -94.23)

Latitude Longitude



Experimental 7-Day Text Forecasts



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Experimental Gridpoint forecast for 39.15 -94.6
 Locations within 5 miles of this gridpoint include...Avondale MO...Gladstone MO...Houston Lake MO...Kansas City MO...North Kansas City MO...Northmoor MO...Oaks MO...Oakview MO...Oakwood MO...Oakwood Park MO...Parkville MO...Riverside MO

Forecast at a Glance

Today	Tonight	Saturday	Saturday Night	Sunday	Sunday Night	Monday	Monday Night	Tuesday
								
Sunny	Clear	Mostly Sunny	Mostly Cloudy	Cloudy	Mostly Cloudy	Mostly Cloudy	Partly Cloudy	Mostly Sunny
Hi 26°F	Lo 15°F	Hi 35°F	Lo 20°F	Hi 35°F	Lo 21°F	Hi 36°F	Lo 22°F	Hi 39°F

Detailed 7-day Forecast

Today (2/7): Sunny skies, with a high around 26. West wind between 6 and 12 mph.

Tonight (2/7-2/8): Clear skies, with a low around 15. West Southwest wind between 8 and 12 mph.

Saturday (2/8): Mostly sunny skies, with a high around 35. West wind between 6 and 10 mph.

Saturday Night (2/8-2/9): Mostly cloudy skies, with a low around 20. West wind between 6 and 9 mph.

Sunday (2/9): Cloudy skies, with a high near 35. West wind between 6 and 10 mph.

Sunday Night (2/9-2/10): Mostly cloudy skies, with a low near 21.

Monday (2/10): Mostly cloudy skies, with a high around 36.

Monday Night (2/10-2/11): Partly cloudy skies, with a low around 22.

Tuesday (2/11): Mostly sunny skies, with a high around 39.

Radar and Satellite Images



Additional Forecasts & Information

Element Meteogram	Digital/Tabular Forecast
Hazardous Weather	Forecast Discussion



Experimental Detailed Hourly Forecast Information



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Experimental Gridpoint forecast for 39.15 -94.66
 Locations within 5 miles of this gridpoint include...Kansas City Ks KS...Houston Lake MO...Northmoor MO...Parkville MO...Riverside MO

Digital Forecast

	2/7										2/8													
	11	12	13	14	15	16	17	18	19	20	21	22	23	00	01	02	03	04	05	06	07	08	09	10
Temp	16	20	23	25	26	26	25	21	22	20	19	19	18	18	17	17	16	16	16	15	15	15	19	23
Dewp	12	14	14	15	15	15	16	16	16	16	16	16	16	15	16	16	16	16	15	15	15	15	19	21
RH(%)	84	77	68	65	63	63	68	81	77	84	88	88	92	88	96	96	100	100	96	100	100	100	100	92
Dir	WSW	W	W	W	W	W	WSW	WSW	WSW	SW	SW	SW	SW	SW	SW	WSW	WSW	WSW	WSW	WSW	WSW	W	W	W
Spd	8	10	10	11	12	12	11	9	8	8	9	10	11	12	12	13	12	12	11	10	9	9	9	8
Sky(%)	0	0	0	0	0	0	0	0	0	0	0	1	1	3	5	6	8	9	12	12	10	27	31	
WC	5	9	13	14	15	15	14	11	13	10	8	8	6	5	4	3	3	3	3	3	3	8	14	
Snow	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

	2/9																							
	11	12	13	14	15	16	17	18	19	20	21	22	23	00	01	02	03	04	05	06	07	08	09	10
Temp	27	30	32	34	35	35	34	31	29	27	26	25	24	24	23	22	21	21	20	19	19	20	23	26
Dewp	22	24	25	25	25	25	24	23	23	23	23	23	23	22	21	20	19	18	17	16	18	20	23	25
RH(%)	81	78	75	69	67	67	66	72	78	85	88	92	96	92	92	92	92	88	88	88	96	100	100	96
Dir	W	W	WNW	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W
Spd	7	7	6	6	7	8	7	7	6	6	7	7	8	9	9	9	9	9	9	10	10	10	10	10
Sky(%)	40	47	47	48	53	53	53	55	55	55	55	55	55	73	73	73	73	73	73	93	93	93	93	93
WC	19	23	26	29	29	28	28	24	23	20	18	17	15	14	13	12	11	11	10	8	8	9	13	16
Snow	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

2/10



Experimental Meteograms

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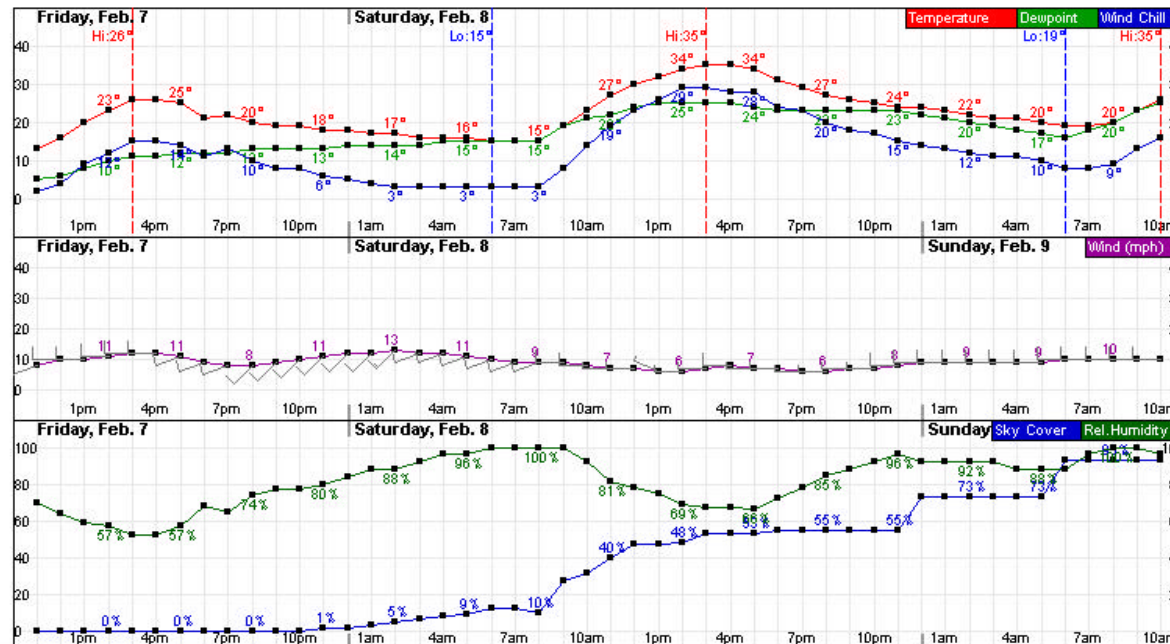
Experimental Gridpoint forecast for 39.15 -94.66

Locations within 5 miles of this gridpoint include...Kansas City Ks KS...Houston Lake MO...Northmoor MO...Parkville MO...Riverside MO

Element Meteogram

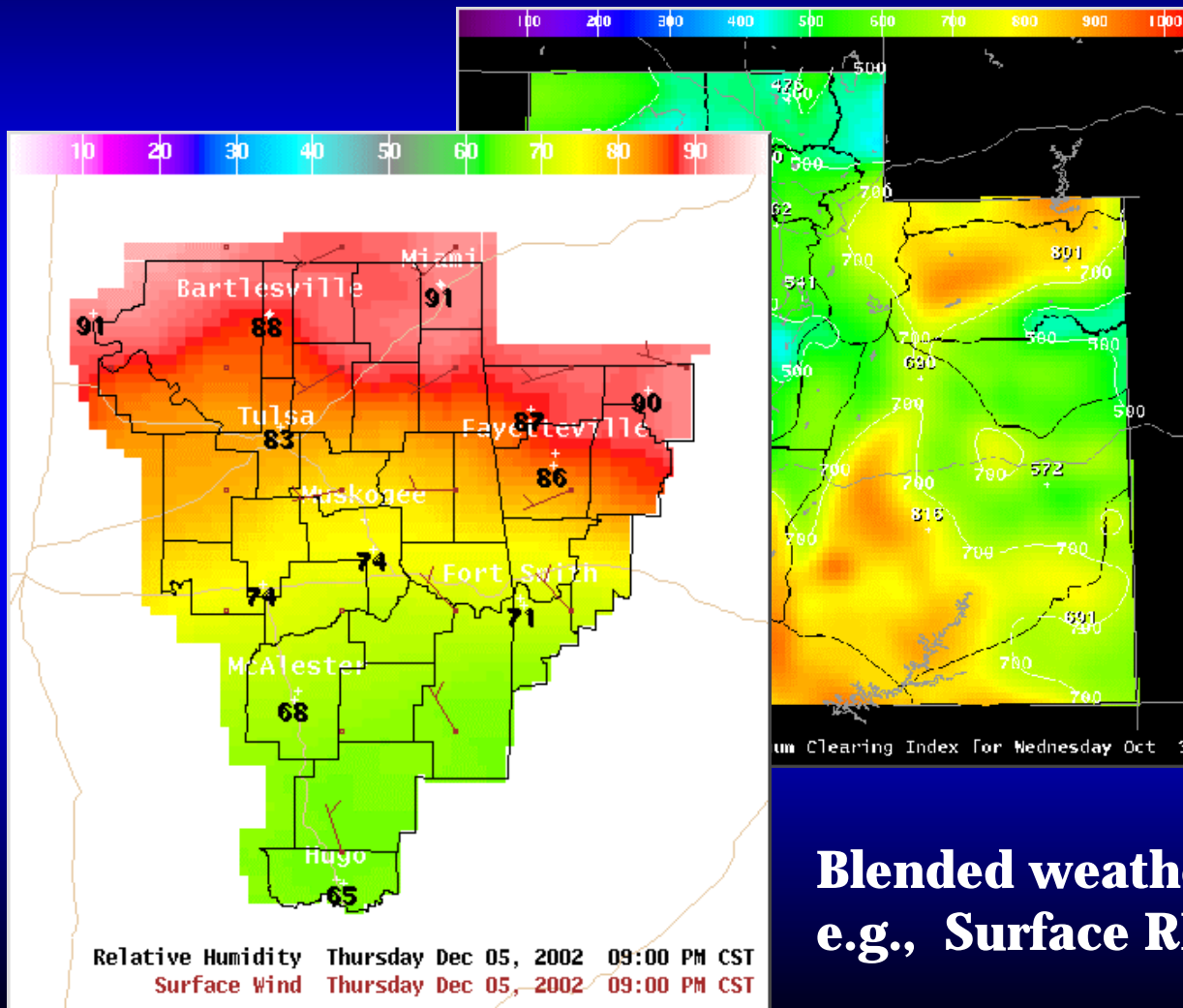
- Temperature
- Wind Chill
- Rel.Humidity
- Rain
- Snow
- Pcpn.Probability
- Dewpoint
- Wind
- Sky Cover
- Thunder
- Freezing Rain

Submit





Current and Proposed Fire Weather Graphics



- **Tools for smoke management**
 - *Mixing Heights*
 - *Transport Winds*
 - *Dispersion Index*
- **Wildfire Spread Index**
- **Haines Index**

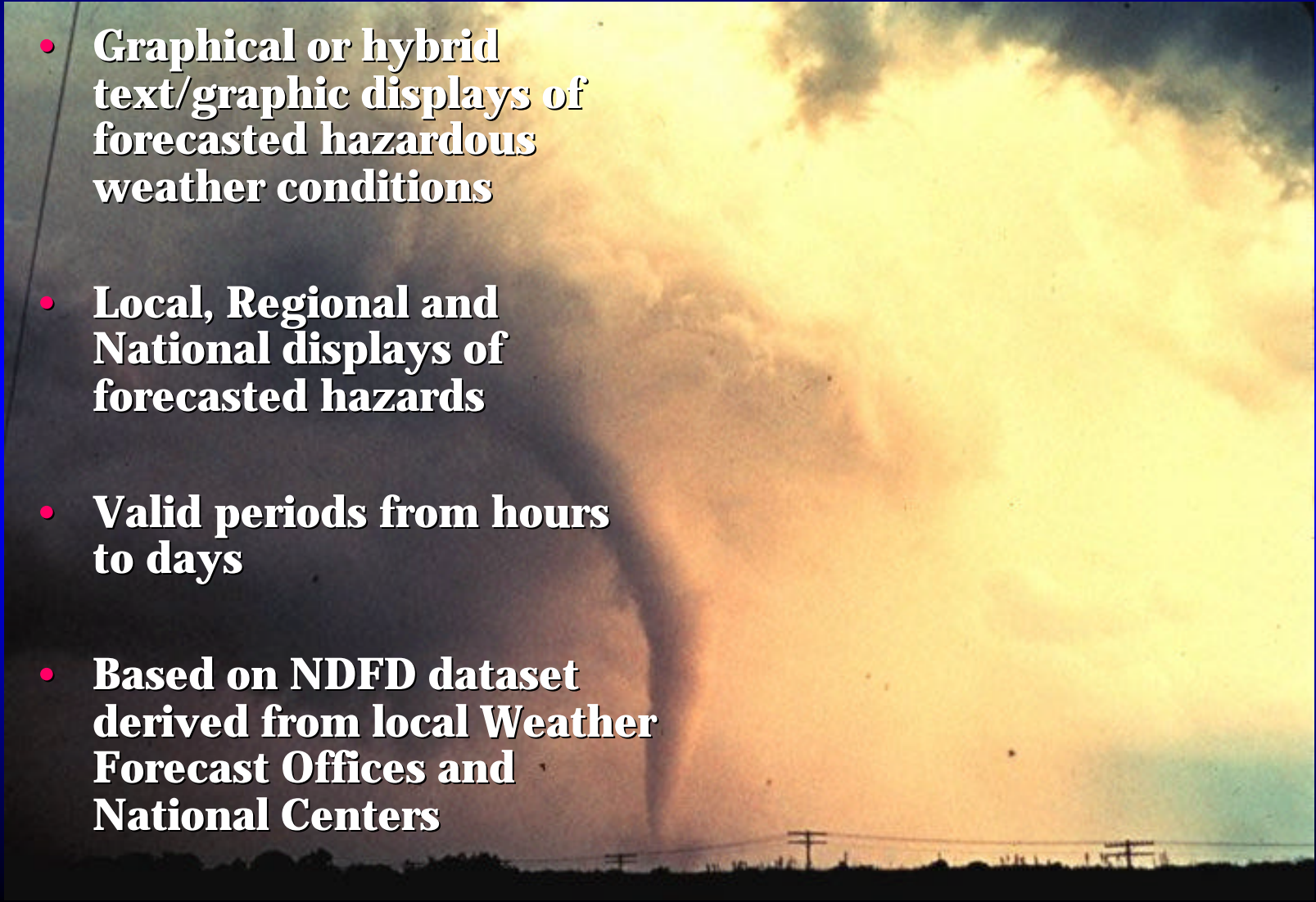
**Blended weather element fields,
e.g., Surface RH and Wind**



Future Graphical Hazardous Weather Outlooks



- Graphical or hybrid text/graphic displays of forecasted hazardous weather conditions
- Local, Regional and National displays of forecasted hazards
- Valid periods from hours to days
- Based on NDFD dataset derived from local Weather Forecast Offices and National Centers

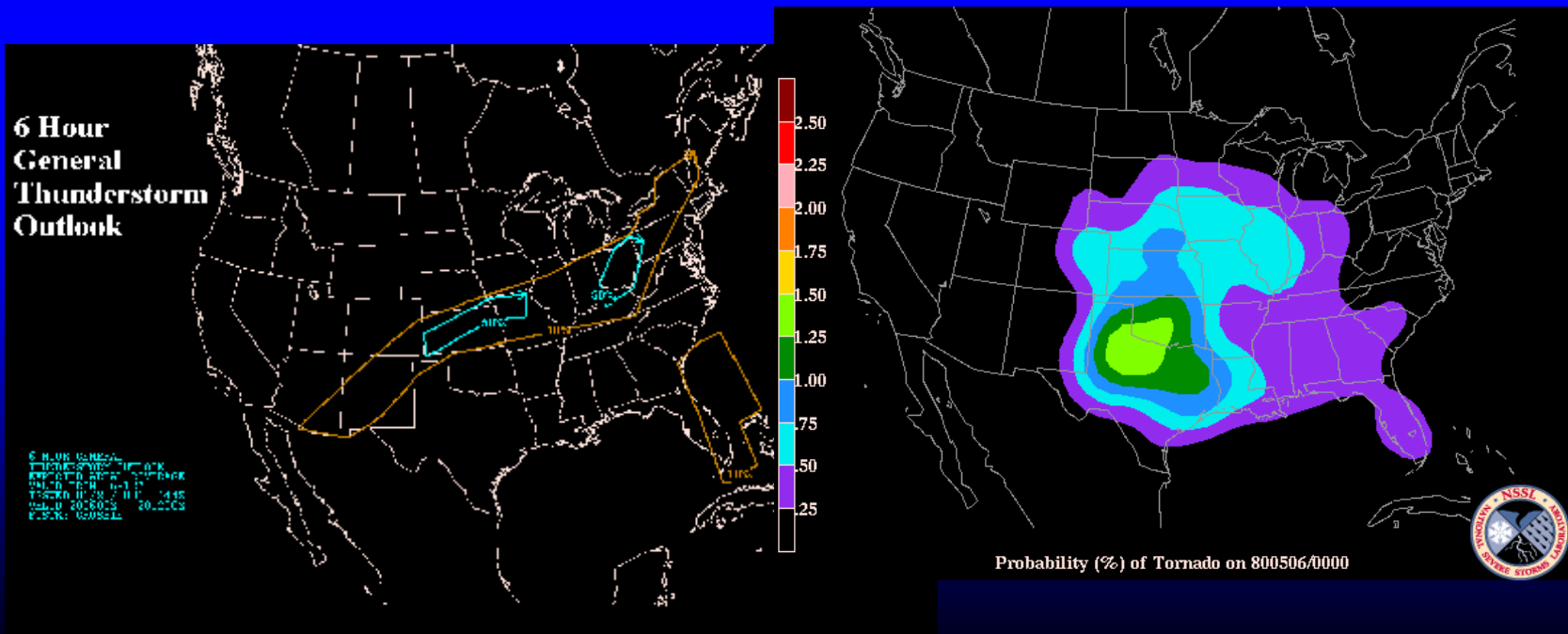


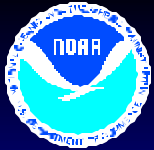


Digitally-based Probabilistic Forecasts



- **Thunderstorms and Severe Weather**
- **Critical Fire Weather Patterns**
- **Long Duration Outlooks/Watches/Warnings**
- **Public and Fire Weather Elements (e.g., precipitation type/intensity, QPF/coverage of weather, clouds, visibility, lightning, volcanic ash)**



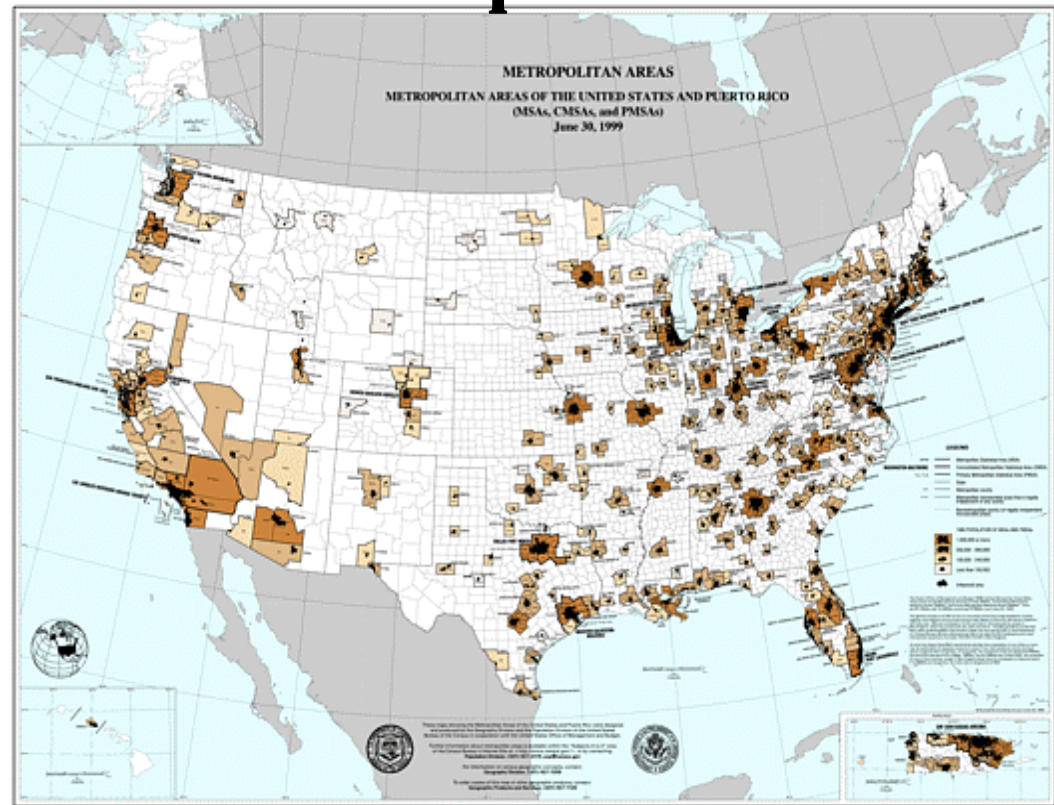


Grid-based Forecasts Derived for Geographic Areas



- Digital data generated in tailored formats (e.g., graphical, text, tabular, or hybrid products)
- User-defined areal forecasts (e.g., radio broadcast and metropolitan areas)

U.S. Metropolitan Areas





Summary



- **Public and Fire Weather Digital Data derived from singular source—meteorologically consistent and current**
- **Variety of formats (Gridded, Tabular, Text Graphical, Graphic/Text Hybrids) to meet customer and partner needs**
- **Probabilistic and GIS-compatible formats**
- **NWS will work with the private sector and academia to translate public and fire weather digital data into improved products and services for America.**
- **Questions, Comments, Suggestions?**



For Further Information on NWS Public and Fire Weather Digital Products...



...Please Contact:

Douglas Young

Natl. Public Weather Services Program Manager

Phone #: 301-713-1867 x113

Email: Douglas.Young@noaa.gov