

Appendix B: Interpreting the Area/Point Forecasts

INTRODUCTION

The National Weather Service in Paducah is now providing detailed digital forecast data via two products, the *Area Forecast Matrices* (AFM) and *Point Forecast Matrices* (PFM). The AFM/PFM are routinely issued around 4:00 a.m. and 3:30 p.m. local time, with updates as needed. This guide explains how to read and interpret the AFM/PFM with a complete example included.

WHAT IS THE AREA/POINT FORECAST?

The Area/Point Forecast Matrices (AFM/PFM) display forecast weather parameters in 3, 6, and 12-hour intervals. These intervals, incorporated into a matrix format, create a highly detailed forecast, allowing for rapid visual scanning of a large number of forecast parameters. Currently, the AFM/PFM provide forecasts in 3-hourly intervals through 60 hours into the future, then in 6-hourly intervals through 7 days. The AFM contains forecasts for each county within the WFO Paducah forecast area, while the PFM shows forecasts for specific cities. The AFM/PFM are available via disseminators of National Weather Service products and are also available on the internet.

HOW TO READ AND INTERPRET THE AFM/PFM PRODUCTS

An example of a typical AFM/PFM forecast is displayed in Table 2, using a PFM for Paducah as an example. Below is a description of how to interpret this forecast.

- (1) The product **WMO Identification Code**, **issuing office identifier**, **issuance date and time** in UTC, and **AWIPS Identification Code**.
- (2) The **product name**, **issuing office information**, and **issuance date and time** in local time.
- (3) The **area or point location** of the forecast, product **expiration date and time** in UTC, and **issuance date and time** in local time.
- (4) **Forecast Dates and Times** - The forecast dates and times are listed in 3-hour increments, both in UTC and local time, for the forecast period through 60 hours.
- (5) **MAX/MIN** (Alternatively **MIN/MAX**) - A forecast of maximum or minimum temperatures in degrees Fahrenheit (°F), displayed as single integer (e.g., -2, 8, 53, 102). MAX/MIN is forecast out through Day 7.
- (6) **TEMP** - The expected temperature in degrees Fahrenheit (°F) valid at the indicated hour. TEMP is forecast at 3-hour intervals through 60 hours, then 6-hour intervals through Day 7.

(7) DEWPT - The expected dew-point temperature in degrees Fahrenheit (°F) valid at the indicated hour. DEWPT is forecast at 3-hour intervals through 60 hours, then 6-hour intervals through Day 7.

(8) RH - The forecast relative humidity based on the expected temperature and dew point at the indicated hour. RH is available in 3-hour increments through 60 hours.

(9) WIND DIR - A forecast of the direction from which the wind will be blowing at the indicated hour, using the 8 points of a compass (i.e., N, NE, E, SE, S, SW, W, NW). If a calm wind is forecast, double zeros (00) are listed in place of a wind direction. WIND DIR is available in 3-hour increments out to 60 hours.

(10) WIND SPD and WIND GUST - A forecast of the sustained wind speed in miles per hour (mph) at the indicated hour. If a calm wind is forecast, double zeros (00) are listed in place of a wind speed. WIND SPD is valid in 3-hour increments out to 60 hours. A WIND GUST row appears beneath WIND SPD whenever forecasted wind gusts exceed sustained wind speeds by at least 10 mph and sustained winds are at least 15 mph.

(11) CLOUDS - The amount of sky coverage at the indicated hour. The CLOUDS parameter is divided into five category codes ranging from clear to overcast. Each code represents an equivalent percentage of sky cover in percent. CLOUDS are forecast in 3-hour intervals out to 60 hours. (See Table 1.)

(12) POP 12HR - Probability of Precipitation (POP), is defined as the likelihood, expressed as a percent, of a measurable precipitation event (0.01" or greater) at any given point within the forecast area. The forecast is valid for each 12-hour period ending at 6:00 a.m. or 6:00 p.m. local time. It is listed underneath the ending time of each period through Day 7.

(13) QPF 12HR - This parameter, quantitative precipitation forecast (QPF), represents the total amount of liquid precipitation, in inches, expected during a 12-hour period ending at 6:00 a.m. or 6:00 p.m. local time, at any point within the forecast area.

(14) SNOW 12HR - The expected range of total snowfall accumulation (in whole inches) forecast to occur within the specified forecast area during a 12-hour period ending at 6:00 a.m. or 6:00 p.m. local time. SNOW 12HR only appears during the locally defined winter period. SNOW 12HR may appear as a one or two-digit number (1, 4, 10), or as a specified range (2-4, 8-12). When no snowfall is forecast, double zeros (00-00) appear in the row. Snowfall that is not measurable (less than 0.1 inch of frozen precipitation) is referred to as a trace, and is depicted by "T". SNOW 12HR is forecast out to 36 hours.

(15) PRECIPITATION - Precipitation types only appear if they are forecast to occur within the given forecast area. For each type of precipitation that is forecast, probability or areal coverage is specified in 3-hour intervals through 60 hours, then 6-hour intervals through Day 7. If no precipitation is forecast, no contractions are listed. (See Table 1.)

(16) OBVIS - If an obstruction to visibility (OBVIS) is forecast for the area, a row labeled OBVIS is listed. OBVIS is forecast at 3-hour intervals through 60 hours. (See Table 1.)

(17) WIND CHILL / HEAT INDEX - These indexes are included seasonally based upon locally defined criteria. WIND CHILL appears for values below 40°, while HEAT INDEX appears for values above 80°. WIND CHILL / HEAT INDEX is forecast out to 60 hours.

(18) MIN CHILL / MAX HEAT - When WIND CHILL or HEAT INDEX is included in the forecast, a 6-hour extreme may follow on the next row. This value indicates the minimum wind chill or maximum heat index forecast to occur during the 6-hour period ending at the specified time. MIN CHILL / MAX HEAT is forecast out to 60 hours.

(19) Forecast Dates and Times - The forecast dates and times are listed in 6-hour increments, both in UTC and local time, for the period from 60 hours through Day 7.

(20) PWIND DIR - The *predominant* wind direction during the 12-hour period ending at 6:00 a.m. or 6:00 p.m. local time. PWIND DIR is valid beyond 60 hours through Day 7.

(21) WIND CHAR - Denotes the character of the wind for the 12-hour period ending at 6:00 a.m. or 6:00 p.m. local time. WIND CHAR is comprised of descriptive wind terms defined by range categories to best describe the *maximum* sustained wind speed during the period. WIND CHAR is valid beyond 60 hours through Day 7. (See Table 1.)

(22) AVG CLOUDS – Indicates the average amount of all clouds during the 6-hour period ending on the indicated hour. The AVG CLOUDS parameter is valid for 6-hour increments beyond 60 hours through Day 7.

| Clouds / Sky Cover | Precipitation Type | Obstructions to Visibility |
|---|--|--|
| CL – Clear / Sunny (0-6%) FW – Mostly Clear / Mostly Sunny (7-31%) SC – Partly Cloudy / Partly Sunny (32-69%) BK – Mostly Cloudy (70-94%) OV – Cloudy (95-100%) | RAIN – Rain RAIN SHWRS – Rain Showers SPRINKLES – Sprinkles TSTMS – Thunderstorms DRIZZLE – Drizzle SNOW – Snow SNOWSHWRS – Snow Showers FLURRIES – Snow Flurries SLEET – Ice Pellets FRZNG RAIN – Freezing Rain FRZNG DRZL – Freezing Drizzle | F – Fog PF – Patchy Fog F+ – Dense Fog PF+ – Patchy Dense Fog H – Haze K – Smoke BS – Blowing Snow BD – Blowing Dust VA – Volcanic Ash |
| Wind Character | POP Codes (Probability) | POP Codes (Areal Coverage) |
| LT – Light (0-7 mph) GN – Gentle (8-14 mph) BZ – Breezy (15-22 mph) WY – Windy (23-30 mph) VW – Very Windy (31-39 mph) SD – Strong/Damaging (40 mph+) | S – Slight Chance (20%) C – Chance (30-50%) L – Likely (60-70%) O – Occasional (80-100%) D – Definite (80-100%) | IS – Isolated (20%) SC – Scattered (30-50%) NM – Numerous (60-70%) WP – Widespread (80-100%) |

Table 1. Codes found within the Area/Point Forecast Matrices.

FOUS53 KPAH 161733 (1)
PFMPAH

POINT FORECAST MATRICES (2)
NATIONAL WEATHER SERVICE PADUCAH, KY
1133 AM CDT TUE SEP 16 2003

KYZ005-170000- (3)
PADUCAH-MCCRACKEN KY
37.06N 88.77W
1133 AM CDT TUE SEP 16 2003

| DATE (4) | TUE 09/16/03 | | | | | | | WED 09/17/03 | | | | | | | THU 09/18/03 | | | | | | | | | | | | | |
|-----------------|--------------|----|----|----|----|----|-----|-----------------|----|----|----|----|----|----|-------------------------|----|----|----|----|----|----|--------------|----|--|--|--|--|--|
| UTC 3HRLY | 09 | 12 | 15 | 18 | 21 | 00 | 03 | 06 | 09 | 12 | 15 | 18 | 21 | 00 | 03 | 06 | 09 | 12 | 15 | 18 | 21 | 00 | | | | | | |
| CDT 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(5) | 59 | | | | | | | 36 | | | | | | | 46 | | | | | | | | | | | | | |
| TEMP (6) | 57 | 59 | 56 | 50 | 43 | 38 | 36 | 39 | 44 | 46 | 44 | 40 | 35 | 32 | 31 | 41 | 55 | 60 | 57 | | | | | | | | | |
| DEWPT (7) | 39 | 39 | 39 | 38 | 38 | 37 | 36 | 36 | 35 | 35 | 34 | 32 | 30 | 28 | 28 | 29 | 30 | 31 | 31 | | | | | | | | | |
| RH (8) | 51 | 47 | 53 | 63 | 82 | 96 | 100 | 89 | 70 | 65 | 68 | 73 | 82 | 85 | 88 | 62 | 38 | 33 | 37 | | | | | | | | | |
| WIND DIR (9) | NE | NE | NE | N | NW | NW | NW | NW | NW | NW | NW | NW | NW | W | W | W | W | W | W | | | | | | | | | |
| WIND SPD (10) | 10 | 10 | 10 | 11 | 14 | 14 | 14 | 14 | 21 | 21 | 17 | 17 | 17 | 11 | 11 | 10 | 10 | 10 | 10 | | | | | | | | | |
| CLOUDS (11) | BK | BK | OV | OV | OV | OV | BK | BK | BK | BK | BK | BK | BK | BK | SC | SC | FW | FW | FW | | | | | | | | | |
| POP 12HR (12) | 60 | | | | | | | 80 | | | | | | | 50 | | | | | | | | | | | | | |
| OPF 12HR (13) | 0.03 | | | | | | | 0.21 | | | | | | | 0.04 | | | | | | | | | | | | | |
| SNOW 12HR (14) | 00-00 | | | | | | | 00-00 | | | | | | | 00-00 | | | | | | | | | | | | | |
| SNOW (15) | | | | | | | | D D C C C C C C | | | | | | | | | | | | | | | | | | | | |
| RAIN (15) | L L D D | | | | | | | D D C C C C C C | | | | | | | | | | | | | | | | | | | | |
| OBVIS (16) | | | | | | | | F F PF | | | | | | | | | | | | | | | | | | | | |
| WIND CHILL(17) | | | | | | | | 36 29 27 31 | | | | | | | 36 38 36 31 25 23 22 34 | | | | | | | | | | | | | |
| MIN CHILL (18) | 37 | | | | | | | 36 27 27 36 | | | | | | | 25 22 24 | | | | | | | | | | | | | |
| DATE (19) | FRI 09/19/03 | | | | | | | SAT 09/20/03 | | | | | | | SUN 09/21/03 | | | | | | | MON 09/22/03 | | | | | | |
| UTC 6HRLY | 06 | 12 | 18 | 00 | 06 | 12 | 18 | 00 | 06 | 12 | 18 | 00 | 06 | 12 | 18 | 00 | 06 | 12 | 18 | 00 | 06 | 12 | | | | | | |
| CDT 6HRLY | 00 | 06 | 12 | 18 | 00 | 06 | 12 | 18 | 00 | 06 | 12 | 18 | 00 | 06 | 12 | 18 | 00 | 06 | 12 | 18 | 00 | 06 | 12 | | | | | |
| MIN/MAX | 40 | 66 | | | 42 | 62 | | | 38 | 68 | | | 40 | 70 | | | | | | | | | | | | | | |
| TEMP | 46 | 40 | 61 | 63 | 49 | 42 | 59 | 59 | 45 | 38 | 63 | 64 | 48 | 40 | 65 | 66 | | | | | | | | | | | | |
| DEWPT | 33 | 34 | 40 | 41 | 43 | 42 | 43 | 45 | 43 | 37 | 39 | 41 | 40 | 40 | 42 | 45 | | | | | | | | | | | | |
| PWIND DIR (20) | W | W | | | NW | NW | | | NW | W | | | W | W | | | | | | | | | | | | | | |
| WIND CHAR (21) | GN | GN | | | BZ | BZ | | | GN | GN | | | BZ | GN | | | | | | | | | | | | | | |
| AVG CLOUDS (22) | SC | BK | BK | BK | BK | BK | BK | BK | BK | BK | FW | FW | FW | FW | FW | FW | | | | | | | | | | | | |
| POP 12HR | 0 | 0 | | | 0 | 30 | | | 30 | 0 | | | 0 | 0 | | | | | | | | | | | | | | |
| RAIN SHWRS | | | | | | | | C C C C | | | | | | | | | | | | | | | | | | | | |

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Table 2. A sample forecast for Paducah from the Point Forecast Matrices.