Fire Weather
Area Forecast Matrices
User's Guide to Decoding the AFW

What are the Area Forecast Matrices?

The Area Forecast Matrices (AFW) is a table that displays the forecasted weather parameters in 3, 6 and 12 hour intervals out to 7 days in the future. Below is a sample AFW, along with a description of each parameter's code (***blue*** *colored numbers*).

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(1)  NCZ510-082100-
     EASTERN POLK-
     INCLUDING THE CITIES OF...COLUMBUS
     939 AM EST THU DEC 8 2011

(2)  DATE            THU 12/08/11             FRI 12/09/11             SAT 12/10/11
     UTC 3HRLY     09 12 15 18 21 00 03 06 09 12 15 18 21 00 03 06 09 12 15 18 21 00
     EST 3HRLY     04 07 10 13 16 19 22 01 04 07 10 13 16 19 22 01 04 07 10 13 16 19

(3)  MAX/MIN                  51          30          54          32          52
(4)  TEMP                39 49 51 41 36 33 32 31 42 51 52 44 39 36 33 32 41 49 50 41
(5)  DEWPT               24 21 20 23 26 28 28 26 26 25 25 28 28 26 26 26 26 26 25 25
(6)  MIN/MAX RH               29          93          34          78          37
(7)  RH                  55 32 29 47 67 82 86 79 52 36 35 52 65 68 73 78 53 40 37 51
(8)  WIND DIR            NW  S  S SE NE NW NW  N NW  S  S  W NW NW NW NW  N  N  N  N
(9)  WIND DIR DEG        33 16 18 12 02 33 31 33 32 19 20 25 33 32 32 32 34 35 35 35
(10) WIND SPD             5  4  5  2  3  0  0  1  2  4  3  2  3  5  5  6  8  8  6  5
(11) CLOUDS              CL CL CL FW FW SC SC SC SC SC SC SC SC SC SC SC FW FW FW FW
(12) CLOUDS(%)            0  2  1 10 25 34 35 35 33 31 34 37 40 43 37 33 24 15 12  9
(13) VSBY                10 10 10 10 10 10 10 10
(14) POP 12HR                 0           0           5          10          10
(15) QPF 12HR                 0           0           0           0           0
(16) LAL                      1     1     1     1     1     1     1     1     1
(17) HAINES                   5     4     4     5     5     5     4     4     5
(18) DSI                      1                       2                       2
(19) MIX HGT               2900  1500   300  3000  2900   400   600  4200  4100
(20) T WIND DIR               S    NE     N    SW    SW    NW    NW    NW     N
(21) T WIND SPD               5     3     2     6     9     3     8    13    14
(22) ADI                     27     2     5    44    51     5    17    57    55
(23) MAX LVORI                4    10    10     4     3     4     5     4     2
(24) STABILITY                C     G     F     B     B     F     E     C     C
(25) CEILING              25000 25000 17800 23100 19700 18600 21300 26200 27600
(26) PRESSURE             28.82 28.84 28.84 28.80 28.78 28.79 28.83 28.87 28.90


(27) DATE          SUN 12/11/11 MON 12/12/11 TUE 12/13/11 WED 12/14/11
     UTC 6HRLY     06 12 18 00 06 12 18 00 06 12 18 00 06 12 18 00
     EST 6HRLY     01 07 13 19 01 07 13 19 01 07 13 19 01 07 13 19

     MIN/MAX          27    49    29    52    33    56    34    57
     TEMP          32 27 46 40 33 29 48 44 36 33 53 47 39 34 53 49
     DEWPT         22 19 20 22 21 20 25 27 28 28 32 34 33 31 33 35
     MAX/MIN RH       72    33    70    37    81    42    87    43
     RH            67 72 36 47 63 70 39 52 71 81 45 59 80 87 46 56
     WIND DIR      NE NE  E  E  E NE NE NE NE  N NW  W NW  N NE  S
     WIND SPD       4  4  6  5  4  4  5  4  3  3  5  3  3  3  1  3
(28) AVG CLOUDS    FW FW FW FW FW SC SC SC SC SC SC SC B1 SC SC SC
     POP 12HR         5     5    10    10    10    10    10    20
     RAIN SHWRS                                                S  S

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Key to Decoding the AFW:

(1) **Area Location** The zone for which this AFW has been issued and the date/UTC time the forecast expires.

(2) **DATE** The forecast date and time groups. Forecast times/dates listed, both in UTC and local time in 3 hour increments.

(3) **MAX/MIN** Maximum and minimum temperatures. The afternoon issuances will be labeled MIN/MAX. Forecast of maximum and minimum temperatures in degrees F. This is forecast out 7 days. Will be an integer (31 or -5).

(4) **TEMP** The temperature (degrees F) valid at the indicated hour. TEMP is forecast at 3-hour intervals out to 60 hours, then at 6-hour intervals on to day 7.

(5) **DEWPT** The dew point temperature (deg F) for the same time periods corresponding to TEMP.

(6) **MIN/MAX RH** The maximum and minimum relative humidity in the 12 hour time periods in percentages ranging from 0-100%. This is forecast for 7 days.

(7) **RH** The relative humidity for the same time period as its corresponding TEMP and DEWPT. It is available out to 60 hours.

(8) **WIND DIR** The forecast wind direction (*from which the wind blows*) at the indicated hour, using the 8 compass Areas (N, NE, E, SE, S, SW, W, NW). Calm wind will be listed as zeroes (00) in place of a direction. Available in 3-hour intervals out to day 7.

(9) **WIND DIR DEG** The forecast wind direction (*from which the wind blows*) at the indicated hour, using 2-digit degrees in multiples of ten. (i.e.…05 = 50 degrees; 13 = 130 degrees). Calm wind will be listed as zeroes (00) in place of a direction. Available in 3-hour intervals out to 60 hours.

(10) **WIND SPD** and **WIND GUST** The forecast wind speeds in miles per hour (mph) as the indicated hour. If calm winds are forecast, then zeroes (00) will be listed in place of a speed. Wind Speed is available in 3-hour intervals out to day 7. A WIND GUST row will appear whenever the forecasted wind gusts exceed the sustained wind speed (WIND SPD) by at least 10 mph.

(11) **CLOUDS**. This is the sky coverage at the indicated hour. Clouds are available in 3-hour intervals out 60 hours. Clouds are divided into 5 categories:

AFW Cloud Code	Commonly Called	% Sky in Cloud Cover
CL	Clear or Sunny	0%-6%
FW	Few	7%-31%
SC	Scattered	32%-69%
B1	Mostly Cloudy	70%-75%
B2	Considerable Clouds	76%-94%
OV	Overcast	95%-100%

(12) **CLOUDS (%)**, This is the sky coverage expressed in percentage of the sky covered during the indicated hour. Cloud percentage is available in 3-hour intervals out 60 hours.

(13) **VSBY** The minimum surface visibility, and if restricted below 7 miles, the obstruction causing the restriction. The value reported is the minimum value for the zone grouping, in order to capture the lowest values. Visibility values of 7 to 10 miles are considered unrestricted.

(14) **POP 12HR** The probability of precipitation, and is defined as the likelihood (in percent) of a measurable precipitation event (*0.01 inch or more*) at the given Area. The 12HR refers to the 12 hour valid time ending at indicated hour. Forecast out to day 7.

(15) **QPF 12HR** The total amount of liquid precipitation (*in inches*) expected during the 12 hour period ending at the indicated hour.

(16) **LAL** Lightning Activity Level. This parameter describes the amount of lightning expected. LAL is forecast at 3-hour intervals out to 60 hours.

LAL Number	Clouds, Precipitation and Lightning Activity
1	No thunderstorms.
2	Cumulus clouds are common, but only a few reach the towering cumulus stage. A single thunderstorm must be confirmed in the rating area. The clouds mostly produce virga, but light rain will occasionally reach the ground.
3	Swelling and towering cumulus cover less than 2/10 of the sky. Light to moderate rain will reach the ground, and lightning is infrequent.
4	Swelling cumulus and towering cumulus cover 2-3/10 of the sky. Thunder-storms are scattered, but more than three must occur within the observation area. Moderate rain is commonly produced, and lightning is frequent.
5	Towering cumulus and thunderstorms are numerous. Rain is moderate to heavy, and lightning is frequent and intense.
6	Same as #3 but dry (little or no rain reaching the ground).

(17) **HAINES** Haines Index. Describes the instability and dryness of the atmosphere and addresses the potential for rapid forest fire growth. HAINES INDEX is forecast at 3-hour intervals out to 60 hours.

HAINES INDEX	Rapid Fire Growth
Less than 4	Very Low Potential
4	Low Potential
5	Medium Potential
6	High Potential

(18) **DSI** Davis Stability Index. This is an index of afternoon stability based on the surface to 850 mb temperature lapse rate and categorized from 1 to 4. DSI is included at 24-hr intervals out to 60 hours.

DSI	SFC to 850 mb Lapse Rate	Stability
1	Less than 10	Stable
2	10-14	Conditionally Unstable
3	15-17	Unstable
4	Greater than 17	Absolutely Unstable

(19) **MIX HGT** Mixing Height. The height to which the atmosphere mixes vertically, in feet above ground level. MIX HGT is forecast at 3-hour intervals out to 60 hours.

(20) **T WIND DIR** Transport Wind Direction. The average direction of the wind from the surface to the mixing height using the 8 compass Areas (N, NE, E, SE, S, SW, W, NW). T WIND DIR is forecast at 3-hour intervals out to 60 hours.

(21) **T WIND SPD** Transport Wind Speed. The average speed of the wind from the surface to the mixing height, using 2-digit degrees in multiples of ten. (i.e.…05 = 50 degrees; 13 = 130 degrees). T WIND SPD is forecast at 3-hour intervals out to 60 hours.

(22) **ADI** Atmospheric Dispersion Index. A measure of dispersions based on mixing height, stability, and wind. ADI is forecast at 3-hour intervals out to 60 hours.

ADI	Character of Dispersion
Greater than 100	Very Good: but may indirectly indicate hazardous conditions.
61-100	Good: typical case burning weather values are in this range.
41-60	Generally Good: climatological afternoon values in most inland forested areas of the US fall within this range.
21-40	Fair: stagnation may be indicated if accompanied by persistent low wind speeds.
13-20	Generally Poor: stagnation, if persistent, although better than average for a night value.
7-12	Poor: stagnant at day, but near or above average at night.
1-6	Very poor: very frequent at night; represents the majority of nights in many locations.

(23) **MAX LVORI** Low Visibility Occurrence Risk Index. A measure of the potential for thick fog based on, dispersion and relative humidity. LVORI is forecast at 3-hour intervals out to 60 hours.

LVORI	Accidents with Fog or Smoke Reported
1	Lowest proportion of accidents with smoke and/or fog reported
2	Physical or statistical reasons for not including in category 1
3	Higher proportion of accidents than category 1, by about 30% to 50%
4	Significantly higher than category 1, by a factor of 2.
5	Significantly higher than category 1, by a factor of 3 to 10.
6	Significantly higher than category 1, by a factor of 10 to 20.
7	Significantly higher than category 1, by a factor of 20 to 40.
8	Significantly higher than category 1, by a factor of 40 to 75.
9	Significantly higher than category 1, by a factor of 75 to 125.
10	Significantly higher than category 1, by a factor of 150.

(24) **STABILITY** Turner-Pasquil Stability Class. Stability as a function of mixing height, wind, and solar radiation. Essential for thick fog based on dispersion and relative humidity. STABILITY is forecast at 3-hour intervals out to 60 hours.

CLASS	Stability
A	Very Unstable.
B	Moderately Unstable.
C	Slightly Unstable.
D	Near Neutral.
E	Slightly Stable.
F	Moderately Stable.

(25) **CEILING** The height of the lowest layer of clouds causing the sky to be broken or overcast, in feet above the ground. CEILING is forecast at 3-hour intervals out to 60 hours.

(26) **PRESSURE** The station pressure in inches of mercury. PRESSURE is forecast at 3-hour intervals out to 60 hours.

(27) **DATE** Forecast date and time groups. Forecast times/dates listed from 60 hours out to day 7, both in UTC and local time in 6 hour increments.

(28) **AVG CLOUDS** This is the average amount of all clouds during the 6 hour interval ending at the indicated hour from 60 hours to day 7. AVG CLOUDS are divided into 6 categories the same as CLOUDS **(13)**.

Updates and Corrections: The AFW will be updated and corrected when the on-duty forecast team believes the current forecast is not representative, or when format or content errors are detected. When the AFW is updated, all forecast parameters prior to the update time (to the nearest 3-hour period) are removed from the product. Occasionally, a forecast may need a correction. In these instances, the automated AFW product is replaced with the corrected version.

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