

Prepared by the U.S. Dept. of Commerce, NOAA, Space Weather Prediction Center
Please send comments and suggestions to SWPC.Webmaster@noaa.gov

2010 Verification Statistics for Daily M flare, X flare, and Proton Event Probability Forecasts

Forecast Type: Likelihood (probability) of the occurrence of an M flare, X flare, or Proton Event

Note: Mpred1 = M flare PREDiction day 1
 Mpred2 = M flare PREDiction day 2
 Mevents = Observed number of M flares,
 etc.

Missing data: NA

Total Records: Total number of daily forecast/observation records used to generate statistics
365

Event Days: Total number of days in the sample on which at least one (M, X, Proton event)
occurred

| Mevents | Xevents | Pevents |
|---------|---------|---------|
| 14 | 0 | 1 |

Mean observation

| Mevents | Xevents | Pevents |
|---------|---------|---------|
| 0.038 | 0 | 0.0027 |

Mean, Median, and Standard Deviation of all forecasts

| | Mpred1 | Mpred2 | Mpred3 | Xpred1 | Xpred2 | Xpred3 | Ppred1 | Ppred2 | Ppred3 |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| mean | 0.065 | 0.064 | 0.062 | 0.014 | 0.014 | 0.014 | 0.0109 | 0.0109 | 0.0109 |
| median | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 0.0100 | 0.0100 | 0.0100 |
| sd | 0.128 | 0.126 | 0.125 | 0.023 | 0.023 | 0.023 | 0.0069 | 0.0069 | 0.0069 |

Mean, Median and Standard Deviation of forecast given the non-occurrence (flx=0) of an event

| | Mpred1 | Mpred2 | Mpred3 | Xpred1 | Xpred2 | Xpred3 | Ppred1 | Ppred2 | Ppred3 |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| mean | 0.059 | 0.063 | 0.062 | 0.014 | 0.014 | 0.014 | 0.0109 | 0.0109 | 0.0109 |
| median | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 0.0100 | 0.0100 | 0.0100 |
| sd | 0.119 | 0.127 | 0.127 | 0.023 | 0.023 | 0.023 | 0.0069 | 0.0069 | 0.0069 |

Mean, Median and Standard Deviation of forecast given the occurrence (flx=1) of an event

| | Mpred1 | Mpred2 | Mpred3 | Xpred1 | Xpred2 | Xpred3 | Ppred1 | Ppred2 | Ppred3 |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| mean | 0.22 | 0.084 | 0.062 | NA | NA | NA | 0.01 | 0.01 | 0.01 |
| median | 0.12 | 0.030 | 0.030 | NA | NA | NA | 0.01 | 0.01 | 0.01 |
| sd | 0.23 | 0.093 | 0.066 | NA | NA | NA | NA | NA | NA |

Discrimination: The difference between [Mean (flx=1)] and [Mean (flx=0)]

| | Mpred1 | Mpred2 | Mpred3 | Xpred1 | Xpred2 | Xpred3 | Ppred1 | Ppred2 | Ppred3 |
|--|---------|---------|---------|--------|--------|--------|----------|----------|----------|
| | 0.15723 | 0.02072 | 0.00029 | NA | NA | NA | -0.00091 | -0.00091 | -0.00091 |

Linear correlation (r) between forecasts and observations

| Mpred1 | Mpred2 | Mpred3 | Xpred1 | Xpred2 | Xpred3 | Ppred1 | Ppred2 | Ppred3 |
|---------|---------|---------|--------|--------|--------|----------|----------|----------|
| 0.23651 | 0.03164 | 0.00045 | NA | NA | NA | -0.00686 | -0.00686 | -0.00686 |

Mean Error, Mean Absolute Error, Mean Square Error, and Root Mean Square Errors of forecasts.

| | Mpred1 | Mpred2 | Mpred3 | Xpred1 | Xpred2 | Xpred3 | Ppred1 | Ppred2 | Ppred3 |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| ME | 0.027 | 0.096 | 0.053 | 0.014 | 0.014 | 0.001 | 0.008 | 0.014 | 0.003 |
| MAE | 0.025 | 0.095 | 0.206 | 0.014 | 0.014 | 0.027 | 0.008 | 0.014 | 0.053 |
| MSE | 0.024 | 0.042 | 0.228 | 0.014 | 0.001 | 0.027 | 0.008 | 0.003 | 0.053 |
| RMSE | 0.087 | 0.052 | 0.230 | 0.014 | 0.001 | 0.027 | 0.014 | 0.003 | 0.053 |

Forecast skill with respect to observed climatology (same as prediction efficiency)

| Mpred1 | Mpred2 | Mpred3 | Xpred1 | Xpred2 | Xpred3 | Ppred1 | Ppred2 | Ppred3 |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| -0.144 | -0.401 | -0.435 | -Inf | -Inf | -Inf | -0.041 | -0.041 | -0.041 |