

Prepared by the U.S. Dept. of Commerce, NOAA, Space Weather Prediction Center

Please send comments and suggestions to SWPC.Webmaster@noaa.gov

2007 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 |
|---------|---------|---------|
| 5 | 0 | 0 |

Mean observation

| Mevents | Xevents | Pevents |
|---------|---------|---------|
| 0.014 | 0 | 0 |

Mean, Median, and Standard Deviation of all forecasts

| | Mpred1 | Mpred2 | Mpred3 | Xpred1 | Xpred2 | Xpred3 | Ppred1 | Ppred2 | Ppred3 |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| mean | 0.039 | 0.040 | 0.039 | 0.014 | 0.014 | 0.014 | 0.012 | 0.012 | 0.012 |
| median | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 |
| sd | 0.090 | 0.091 | 0.091 | 0.020 | 0.021 | 0.021 | 0.013 | 0.014 | 0.014 |

Mean, Median and Standard Deviation of forecast given the non-occurrence ($f|x=0$) of an event

| | Mpred1 | Mpred2 | Mpred3 | Xpred1 | Xpred2 | Xpred3 | Ppred1 | Ppred2 | Ppred3 |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| mean | 0.034 | 0.036 | 0.037 | 0.014 | 0.014 | 0.014 | 0.012 | 0.012 | 0.012 |
| median | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 |
| sd | 0.071 | 0.080 | 0.084 | 0.020 | 0.021 | 0.021 | 0.013 | 0.014 | 0.014 |

Mean, Median and Standard Deviation of forecast given the occurrence ($f|x=1$) of an event

| | Mpred1 | Mpred2 | Mpred3 | Xpred1 | Xpred2 | Xpred3 | Ppred1 | Ppred2 | Ppred3 |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| mean | 0.46 | 0.34 | 0.24 | NA | NA | NA | NA | NA | NA |
| median | 0.60 | 0.30 | 0.10 | NA | NA | NA | NA | NA | NA |
| sd | 0.25 | 0.25 | 0.25 | NA | NA | NA | NA | NA | NA |

Discrimination: The difference between [Mean (f|x=1)] and [Mean (f|x=0)]

| Mpred1 | Mpred2 | Mpred3 | Xpred1 | Xpred2 | Xpred3 | Ppred1 | Ppred2 | Ppred3 |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0.43 | 0.30 | 0.21 | NA | NA | NA | NA | NA | NA |

Linear correlation (r) between forecasts and observations

| Mpred1 | Mpred2 | Mpred3 | Xpred1 | Xpred2 | Xpred3 | Ppred1 | Ppred2 | Ppred3 |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0.55 | 0.39 | 0.26 | NA | NA | NA | NA | NA | NA |

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 | 0.026 | 0.044 | 0.017 | 0.014 | 0.014 | 0.001 | 0.012 | 0.012 | 0.000 |
| MAE | 0.026 | 0.047 | 0.104 | 0.014 | 0.014 | 0.024 | 0.012 | 0.012 | 0.017 |
| MSE | 0.026 | 0.011 | 0.119 | 0.014 | 0.001 | 0.025 | 0.012 | 0.000 | 0.019 |
| RMSE | 0.040 | 0.014 | 0.130 | 0.014 | 0.001 | 0.026 | 0.012 | 0.000 | 0.019 |

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

| Mpred1 | Mpred2 | Mpred3 | Xpred1 | Xpred2 | Xpred3 | Ppred1 | Ppred2 | Ppred3 |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0.203 | -0.053 | -0.243 | -Inf | -Inf | -Inf | -Inf | -Inf | -Inf |