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1999 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 |
|---------|---------|---------|
| 101 | 4 | 0 |

Mean observation

| Mevents | Xevents | Pevents |
|---------|---------|---------|
| 0.28 | 0.011 | 0 |

Mean, Median, and Standard Deviation of all forecasts

| | Mpred1 | Mpred2 | Mpred3 | Xpred1 | Xpred2 | Xpred3 | Ppred1 | Ppred2 | Ppred3 |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| mean | 0.35 | 0.34 | 0.33 | 0.065 | 0.063 | 0.061 | 0.048 | 0.047 | 0.046 |
| median | 0.30 | 0.30 | 0.30 | 0.050 | 0.050 | 0.050 | 0.010 | 0.010 | 0.010 |
| sd | 0.24 | 0.24 | 0.24 | 0.075 | 0.075 | 0.075 | 0.055 | 0.057 | 0.058 |

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 | 0.29 | 0.29 | 0.28 | 0.064 | 0.063 | 0.061 | 0.048 | 0.047 | 0.046 |
| median | 0.25 | 0.20 | 0.20 | 0.050 | 0.050 | 0.050 | 0.010 | 0.010 | 0.010 |
| sd | 0.22 | 0.22 | 0.21 | 0.074 | 0.075 | 0.075 | 0.055 | 0.057 | 0.058 |

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 | 0.50 | 0.47 | 0.45 | 0.18 | 0.087 | 0.087 | NA | NA | NA |
| median | 0.50 | 0.50 | 0.50 | 0.12 | 0.075 | 0.075 | NA | NA | NA |
| sd | 0.24 | 0.25 | 0.26 | 0.16 | 0.048 | 0.048 | 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 |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0.215 | 0.177 | 0.170 | 0.111 | 0.025 | 0.027 | NA | NA | NA |

Linear correlation (r) between forecasts and observations

| Mpred1 | Mpred2 | Mpred3 | Xpred1 | Xpred2 | Xpred3 | Ppred1 | Ppred2 | Ppred3 |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0.397 | 0.331 | 0.319 | 0.154 | 0.035 | 0.037 | 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 | 0.070 | 0.36 | 0.19 | 0.054 | 0.072 | 0.018 | 0.048 | 0.047 | 0.005 |
| MAE | 0.061 | 0.36 | 0.42 | 0.052 | 0.070 | 0.130 | 0.047 | 0.046 | 0.073 |
| MSE | 0.053 | 0.18 | 0.44 | 0.050 | 0.017 | 0.136 | 0.046 | 0.005 | 0.073 |
| RMSE | 0.345 | 0.19 | 0.44 | 0.072 | 0.019 | 0.136 | 0.048 | 0.005 | 0.074 |

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

| Mpred1 | Mpred2 | Mpred3 | Xpred1 | Xpred2 | Xpred3 | Ppred1 | Ppred2 | Ppred3 |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0.114 | 0.052 | 0.044 | -0.563 | -0.712 | -0.692 | -Inf | -Inf | -Inf |