

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

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

### 2003 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
79	17	24

Mean observation

Mevents	Xevents	Pevents
0.22	0.047	0.066

Mean, Median, and Standard Deviation of all forecasts

	Mpred1	Mpred2	Mpred3	Xpred1	Xpred2	Xpred3	Ppred1	Ppred2	Ppred3
mean	0.30	0.29	0.28	0.065	0.061	0.056	0.064	0.051	0.042
median	0.25	0.25	0.25	0.050	0.050	0.050	0.010	0.010	0.010
sd	0.23	0.22	0.21	0.104	0.100	0.090	0.170	0.127	0.091

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	0.24	0.24	0.24	0.055	0.053	0.050	0.030	0.028	0.027
median	0.20	0.20	0.20	0.050	0.050	0.010	0.010	0.010	0.010
sd	0.18	0.18	0.18	0.079	0.083	0.077	0.046	0.047	0.040

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	0.45	0.41	0.28	0.21	0.18	0.55	0.38	0.26
median	0.50	0.40	0.35	0.25	0.15	0.10	0.50	0.25	0.20
sd	0.27	0.28	0.26	0.24	0.23	0.19	0.40	0.32	0.23

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

Mpred1	Mpred2	Mpred3	Xpred1	Xpred2	Xpred3	Ppred1	Ppred2	Ppred3
0.26	0.20	0.16	0.23	0.16	0.13	0.52	0.35	0.23

Linear correlation (r) between forecasts and observations

Mpred1	Mpred2	Mpred3	Xpred1	Xpred2	Xpred3	Ppred1	Ppred2	Ppred3
0.47	0.38	0.32	0.46	0.34	0.30	0.76	0.69	0.63

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	0.082	0.31	0.16	0.019	0.087	0.041	-0.002	0.067	0.042
MAE	0.072	0.32	0.37	0.014	0.086	0.188	-0.015	0.074	0.163
MSE	0.062	0.14	0.39	0.010	0.036	0.201	-0.023	0.027	0.186
RMSE	0.297	0.15	0.40	0.086	0.040	0.203	0.058	0.035	0.204

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

Mpred1	Mpred2	Mpred3	Xpred1	Xpred2	Xpred3	Ppred1	Ppred2	Ppred3
0.179	0.091	0.037	0.203	0.095	0.078	0.569	0.439	0.321