G1 (K5) Short Term Warning Verification

The Short-Term G1 Warning is a "high-confidence" notification of geomagnetic activity expected to reach the G1 alert threshold (Kp=5).

G1 (K5) Short Term Warning Statistics Table

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# Prepared by the U.S. Dept. of Commerce, NOAA, Space Weather Prediction
Center.
# Please send comments and suggestions to SWPC.Webmaster@noaa.gov
#
#                      Annual Verification Statistics for K5 Short-Term
Warnings
#
# Missing data: -99999
#

Year                         2013
Hits                         21
Misses                       4
False Alarms                 22
Correct Rejections          2873
Climatology                  0.01
Probability of Detection     0.84
False Alarm Ratio           0.51
Success Ratio                0.49
Critical Success Index      0.45
Bias                         1.72
Gilbert Score                0.44
Heidke Skill Score          0.61
True Skill Statistic        0.83

Year                         2012
Hits                         34
Misses                       0
False Alarms                 18
Correct Rejections          2876
Climatology                  0.01
Probability of Detection     1.00
False Alarm Ratio           0.35
Success Ratio                0.65
Critical Success Index      0.65
Bias                         1.53
Gilbert Score                0.65
Heidke Skill Score          0.79
True Skill Statistic        0.99
```

Year	2011
Hits	20
Misses	0
False Alarms	23
Correct Rejections	2877
Climatology	0.01
Probability of Detection	1.00
False Alarm Ratio	0.53
Success Ratio	0.46
Critical Success Index	0.46
Bias	2.15
Gilbert Score	0.46
Heidke Skill Score	0.63
True Skill Statistic	0.99

Year	2010
Hits	14
Misses	4
False Alarms	7
Correct Rejections	2895
Climatology	0.01
Probability of Detection	0.78
False Alarm Ratio	0.33
Success Ratio	0.67
Critical Success Index	0.56
Bias	1.17
Gilbert Score	0.56
Heidke Skill Score	0.72
True Skill Statistic	0.78

Year	2009
Hits	4
Misses	5
False Alarms	1
Correct Rejections	2910
Climatology	0.00
Probability of Detection	0.44
False Alarm Ratio	0.20
Success Ratio	0.80
Critical Success Index	0.40
Bias	0.56
Gilbert Score	0.40
Heidke Skill Score	0.57
True Skill Statistic	0.44

Year	2008
Hits	17
Misses	7
False Alarms	8
Correct Rejections	2896
Climatology	0.01
Probability of Detection	0.71
False Alarm Ratio	0.32
Success Ratio	0.68
Critical Success Index	0.53
Bias	1.04
Gilbert Score	0.53
Heidke Skill Score	0.69
True Skill Statistic	0.71

Year	2007
Hits	19
Misses	19
False Alarms	9
Correct Rejections	2873
Climatology	0.01
Probability of Detection	0.50
False Alarm Ratio	0.32
Success Ratio	0.68
Critical Success Index	0.40
Bias	0.74
Gilbert Score	0.40
Heidke Skill Score	0.57
True Skill Statistic	0.50

Year	2006
Hits	28
Misses	15
False Alarms	18
Correct Rejections	2877
Climatology	0.01
Probability of Detection	0.65
False Alarm Ratio	0.39
Success Ratio	0.61
Critical Success Index	0.46
Bias	1.07
Gilbert Score	0.45
Heidke Skill Score	0.71
True Skill Statistic	0.64

Year	2005
Hits	47
Misses	22
False Alarms	32
Correct Rejections	2851
Climatology	0.02
Probability of Detection	0.68
False Alarm Ratio	0.40
Success Ratio	0.59
Critical Success Index	0.46
Bias	1.14
Gilbert Score	0.46
Heidke Skill Score	0.73
True Skill Statistic	0.67

Year	2004
Hits	31
Misses	27
False Alarms	17
Correct Rejections	2845
Climatology	0.02
Probability of Detection	0.53
False Alarm Ratio	0.35
Success Ratio	0.65
Critical Success Index	0.41
Bias	0.83
Gilbert Score	0.41
Heidke Skill Score	0.58
True Skill Statistic	0.53

Year	2003
Hits	58
Misses	63
False Alarms	65
Correct Rejections	2734
Climatology	0.04
Probability of Detection	0.48
False Alarm Ratio	0.53
Success Ratio	0.47
Critical Success Index	0.31
Bias	1.02
Gilbert Score	0.29
Heidke Skill Score	0.45
True Skill Statistic	0.46

Year	2002
Hits	22
Misses	26
False Alarms	22
Correct Rejections	2858
Climatology	0.02
Probability of Detection	0.46
False Alarm Ratio	0.50
Success Ratio	0.50
Critical Success Index	0.31
Bias	0.92
Gilbert Score	0.31
Heidke Skill Score	0.47
True Skill Statistic	0.45

Year	2001
Hits	30
Misses	20
False Alarms	16
Correct Rejections	2854
Climatology	0.02
Probability of Detection	0.60
False Alarm Ratio	0.35
Success Ratio	0.65
Critical Success Index	0.40
Bias	0.92
Gilbert Score	0.45
Heidke Skill Score	0.62
True Skill Statistic	0.59

Year	2000
Hits	29
Misses	25
False Alarms	29
Correct Rejections	2845
Climatology	0.02
Probability of Detection	0.54
False Alarm Ratio	0.50
Success Ratio	0.50
Critical Success Index	0.35
Bias	1.07
Gilbert Score	0.34
Heidke Skill Score	0.51
True Skill Statistic	0.53

Year	1999
Hits	9
Misses	49
False Alarms	23
Correct Rejections	2840
Climatology	0.02
Probability of Detection	0.16
False Alarm Ratio	0.72
Success Ratio	0.28
Critical Success Index	0.11
Bias	0.55
Gilbert Score	0.10
Heidke Skill Score	0.19
True Skill Statistic	0.15

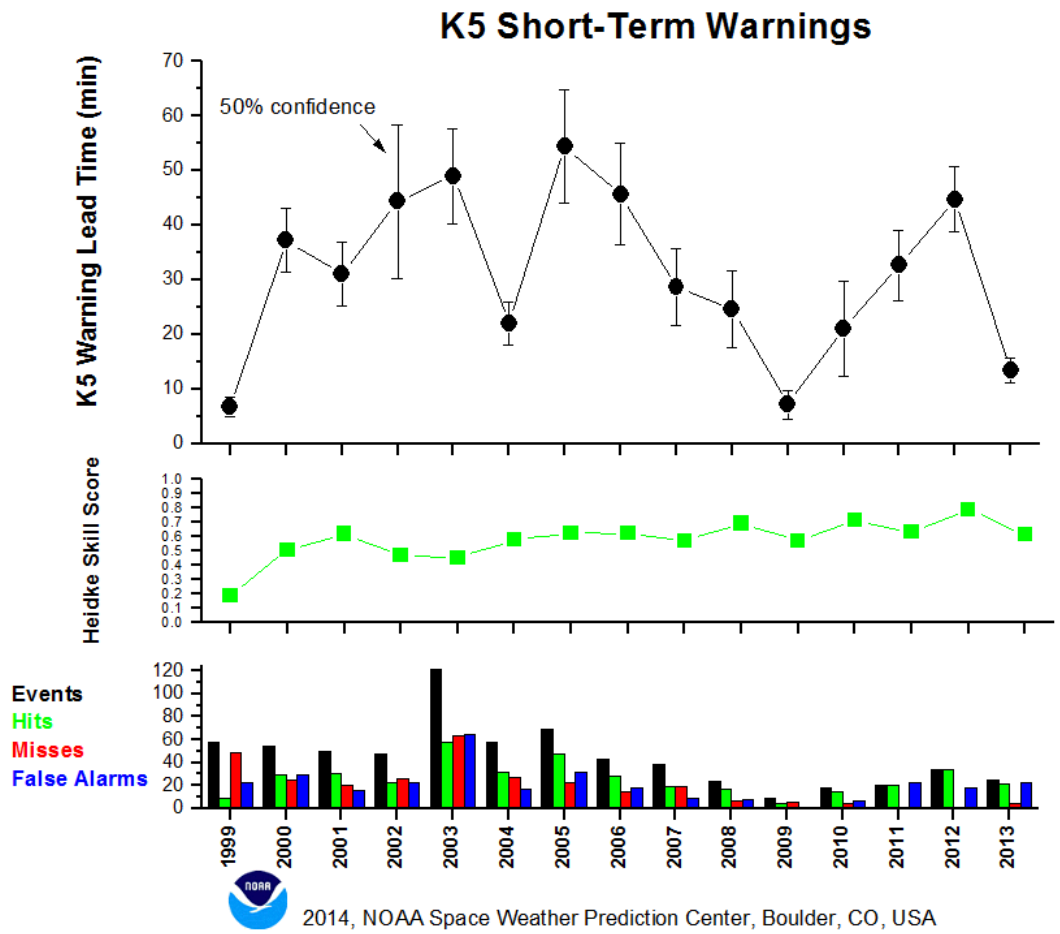
K5 Short-Term Warnings (1999-2013)
Contingency Table

K5 Warning Issued	K5 Observed: YES	K5 Observed: NO
YES	HIT 383	FALSE ALARM 310
NO	MISS 286	Correct Null 42,853

	Statistic	Value
1	Hits	383
2	Misses	286
3	False Alarms	310
4	Bias	1.04
5	Heidke Skill Score	0.61
6	Critical Success Index	0.39
7	Probability of Detection	0.57
8	False Alarm Ratio	0.45
9		
10		
11		
12		
13		

Note: Please see verification glossary for statistics definitions

This 2x2 contingency table summarizes the joint distribution of K5 short-term warnings during years 1999-2013. The "Correct Null" value in the table represents the number of 3-hour geomagnetic intervals in the period for which no warning was issued and no K5 activity occurred. The summary statistics derived from the contingency table include the Bias (values less than 1 indicate fewer warnings issued than events observed), Heidke skill score (a corrected skill score that accounts for hits due to chance), Critical Success Index (also called the Threat Score), Probability of Detection (POD), and the False Alarm Ratio (FAR). Detailed definitions of these metrics are in the Verification Glossary.



The top graph plots the annual average lead time of K5 Short-Term Warnings. Lead time is defined as the time between the warning being issued and when a K5 is measured at the Boulder magnetometer. A missed warning, where a K5 is observed but no warning was issued, is counted as a lead time of 0 minutes. The middle plot shows the annual average of the Heidke skill score. This score ranges from -1 to +1, where all correct warnings give a score of +1, no correct warnings give a score of -1, and no K5 observed or no warnings issued give a score of 0. The bottom histogram plots the annual frequency of K5 observed, warning hits, warning misses, and warning false alarms. Boulder, Colorado observations were used for K5 warnings prior to 2012 and NOAA estimated Kp was used thereafter.