



„Detective“ Miss Marple
in
„Murder at the Gallop“

m1

Now, this is how we verify the forecasters at DWD: we watch them intently and when they get it wrong, they'll get a bang over their head. OK, I'm slightly exaggerating and I will explain later what Detective Miss Marple has to do with warning verification.

mgoeber, 03/01/2007

Comparing peaches and apples

On the accuracy of **gust** warnings issued by forecasters and the accuracy of the model guidance

Martin Göber

Department Weather Forecasting
Deutscher Wetterdienst

Acknowledgements: R. Kirchner, T. Kratzsch, D. Richardson, G. Schweigert, S. Tremmel



Warnungen

[UV-Warnungen](#)
[Hitzealarm](#)
[Warnlagebericht](#)

[Faxabruf](#)

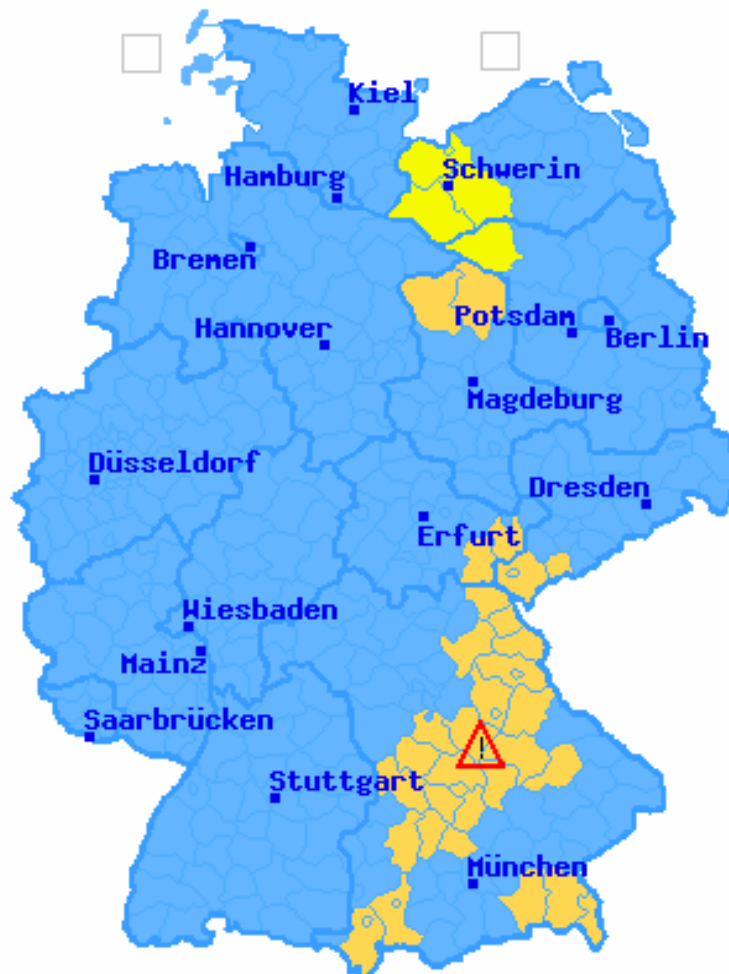
[Erläuterungen und Kriterien](#)

[Auswirkungen von Wetterereignissen](#)

[Wetterbedingte Gefährdungen Deutschland](#)
[Wetterbedingte Gefährdungen weltweit](#)

KONRAD

Warnsituation - Alle Warnungen



Aktuelle Warnungen:

- Alle Warnungen
- Gewitter inkl. Begleiterscheinungen

[Warnlagebericht Deutschland](#)
[Wochenvorhersage Wettergefahren](#)

[Wetter aktuell](#)
(Wettermeldungen, Satellitenbilder)
[Deutschland - Kurzfristvorhersage](#)
[Deutschland - Mittelfristvorhersage](#)
[Europawetterkarte](#)

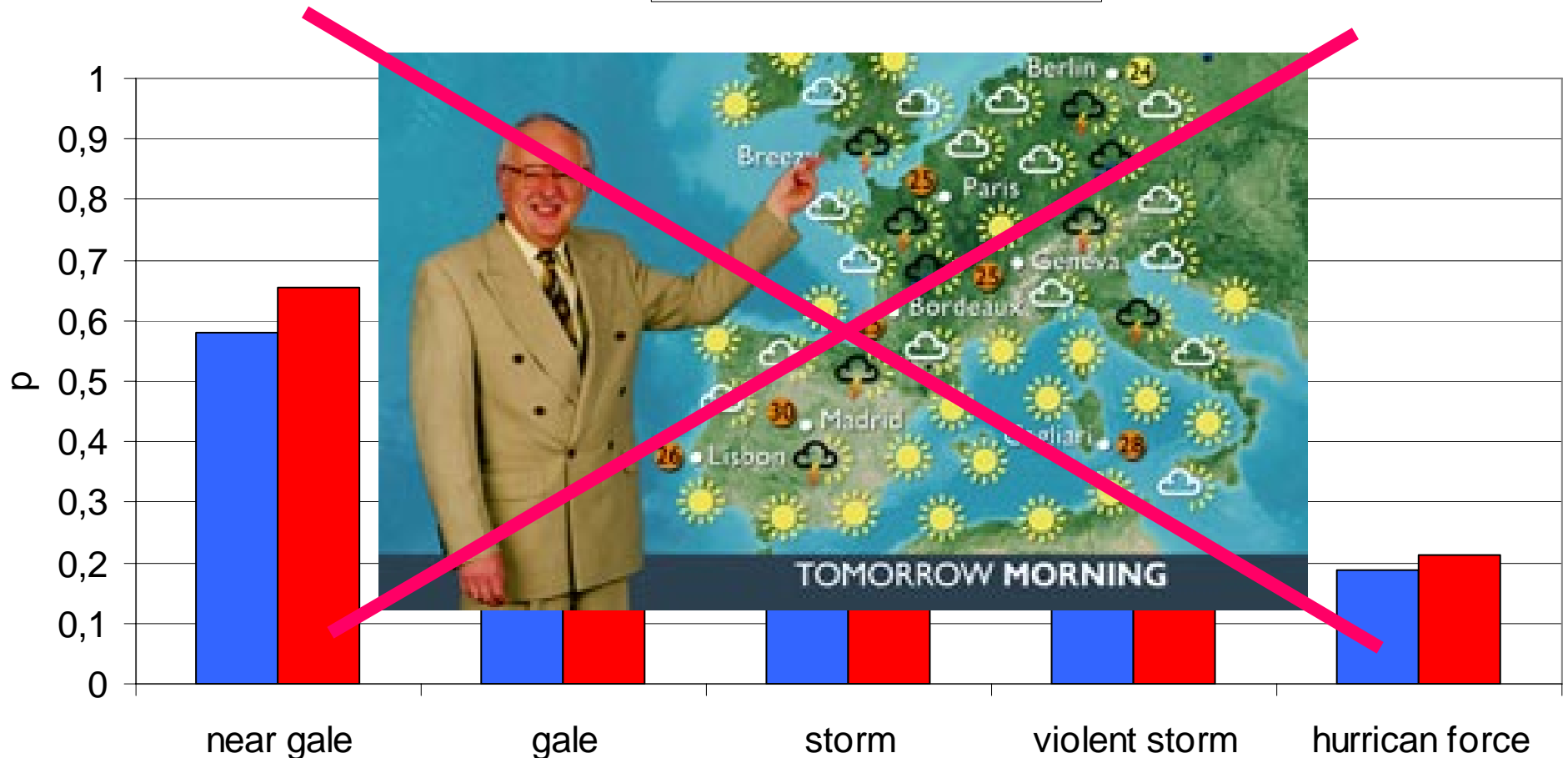
- Warnung vor extremem Unwetter
- Unwetterwarnung
- Vorwarnung zur Unwetterwarnung
- Warnung vor markantem Wetter
- Wetterwarnung
- Seewetterwarnung
- keine Warnung

Stand: 02.09.05 10:30 Uhr

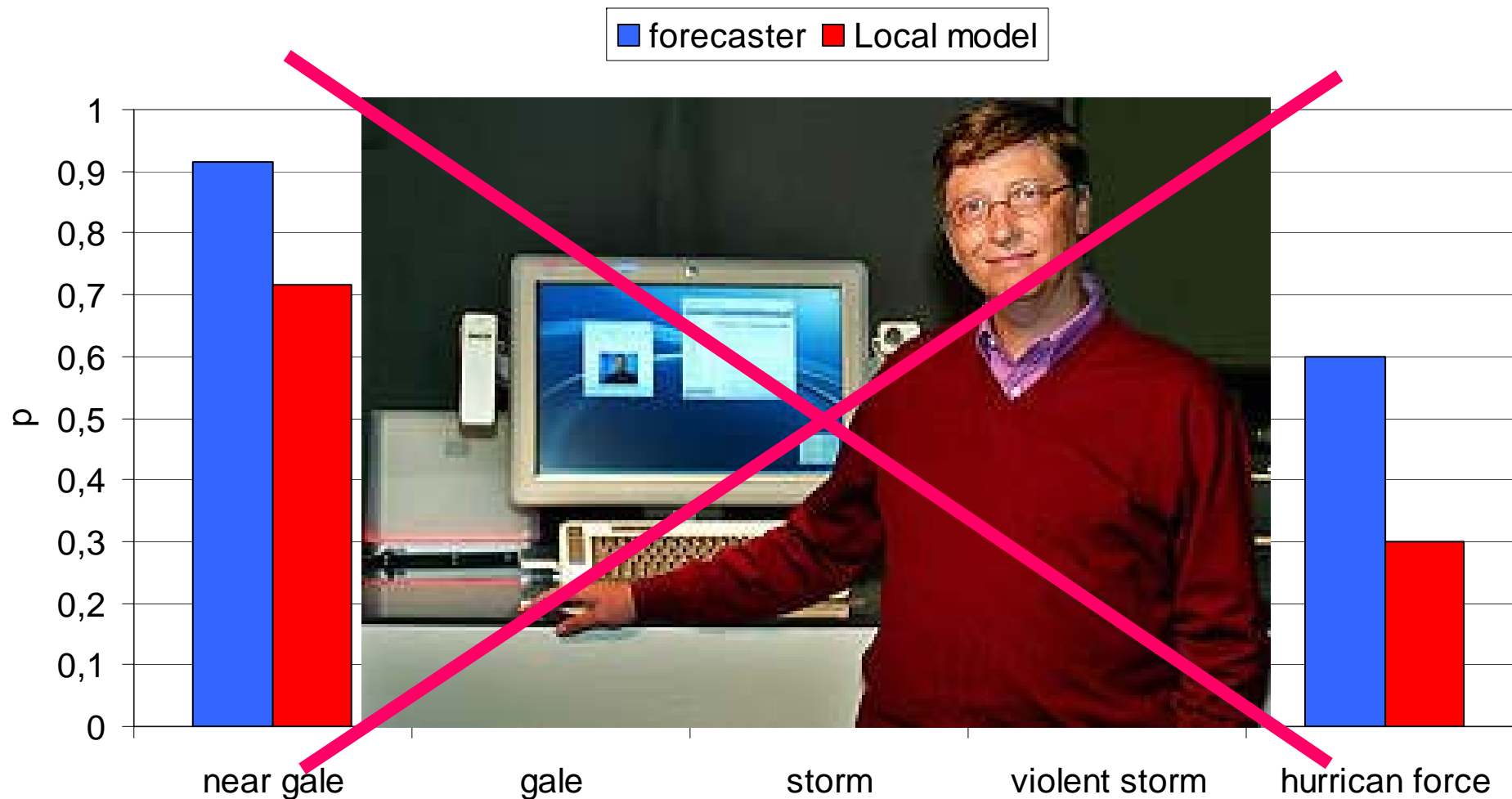
Warnlage: Vor allem im Süden teils starke Gewitter.

Heidke skill score

■ forecaster ■ Local model

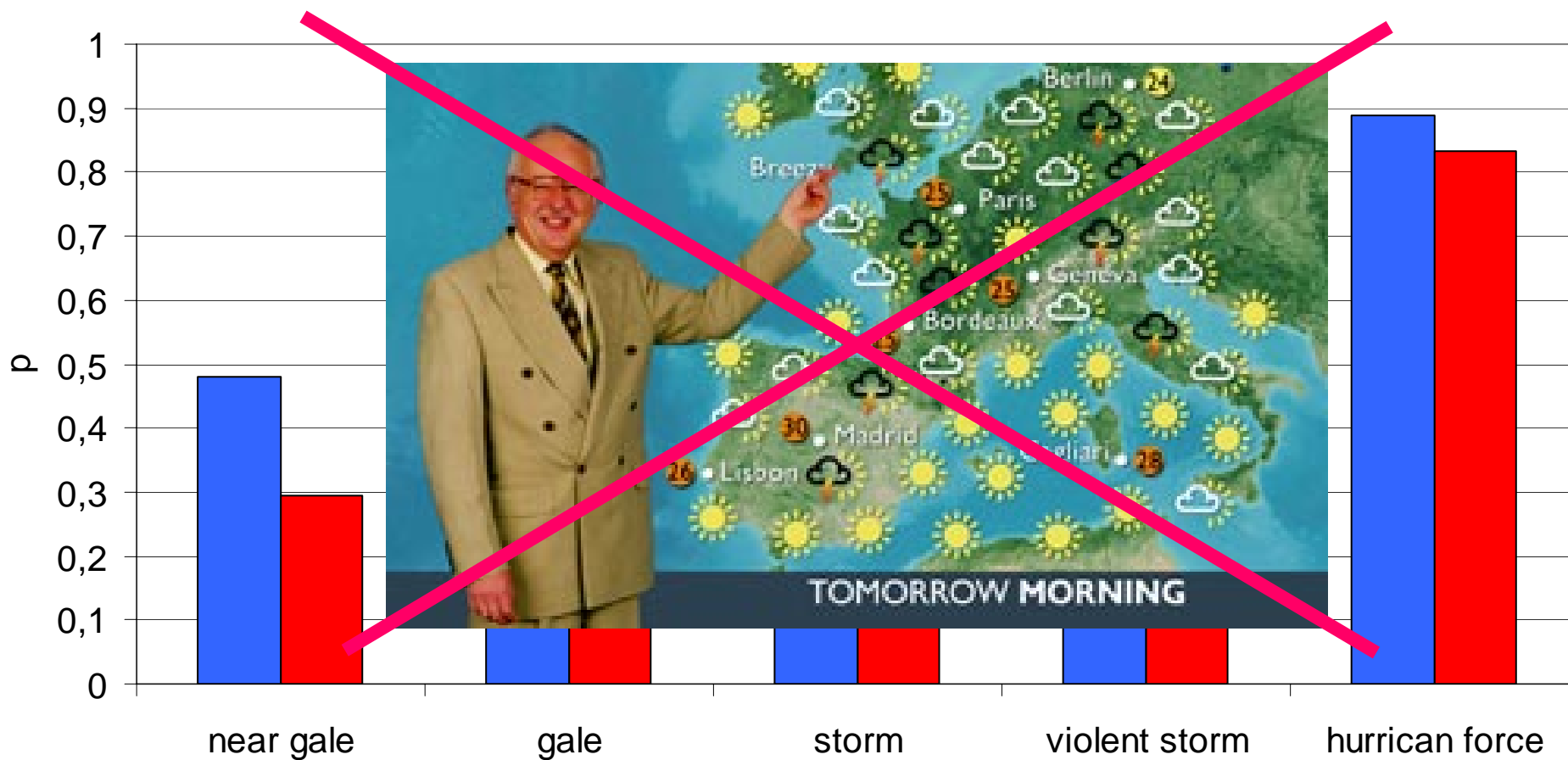


hit rate

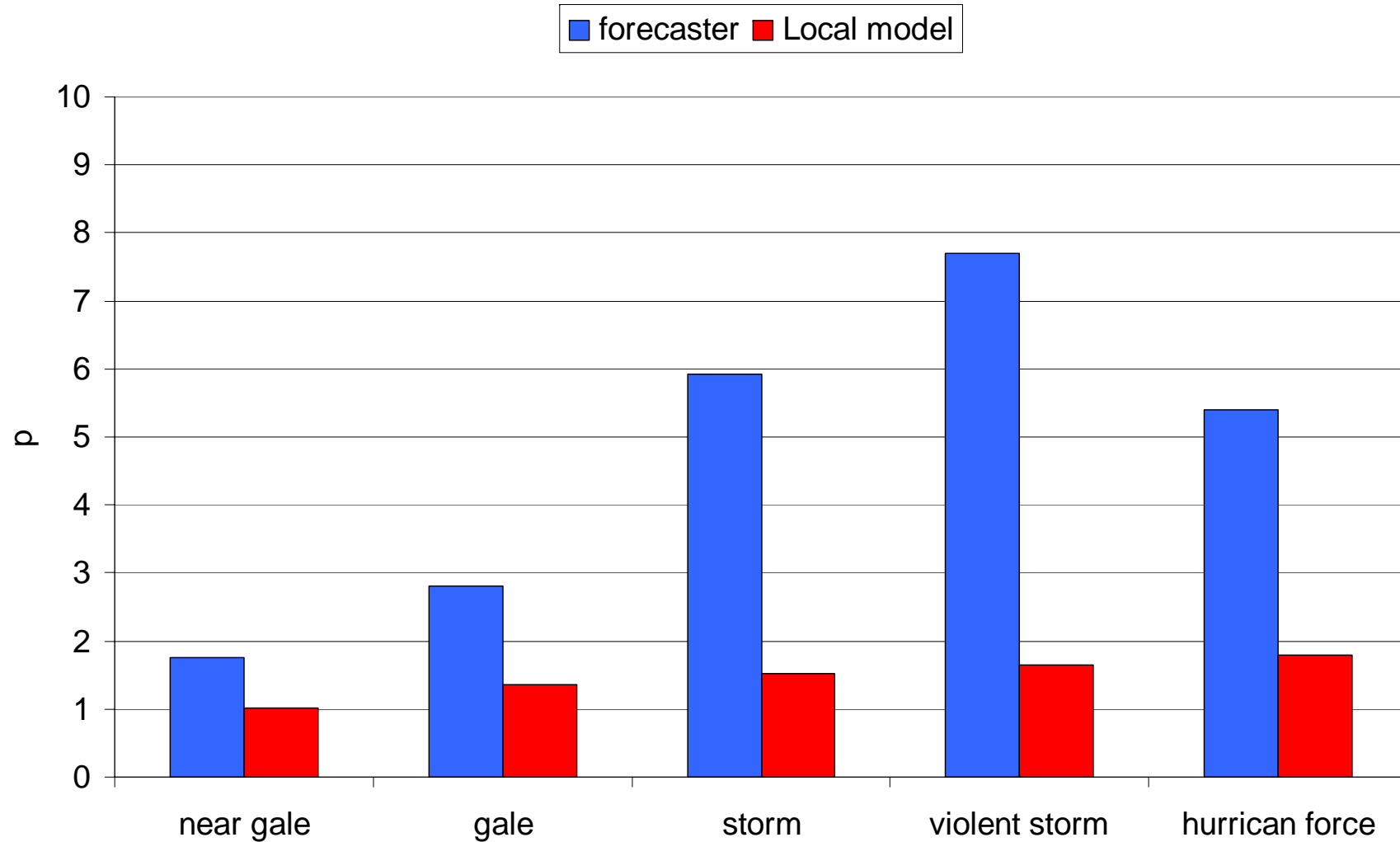


false alarm ratio

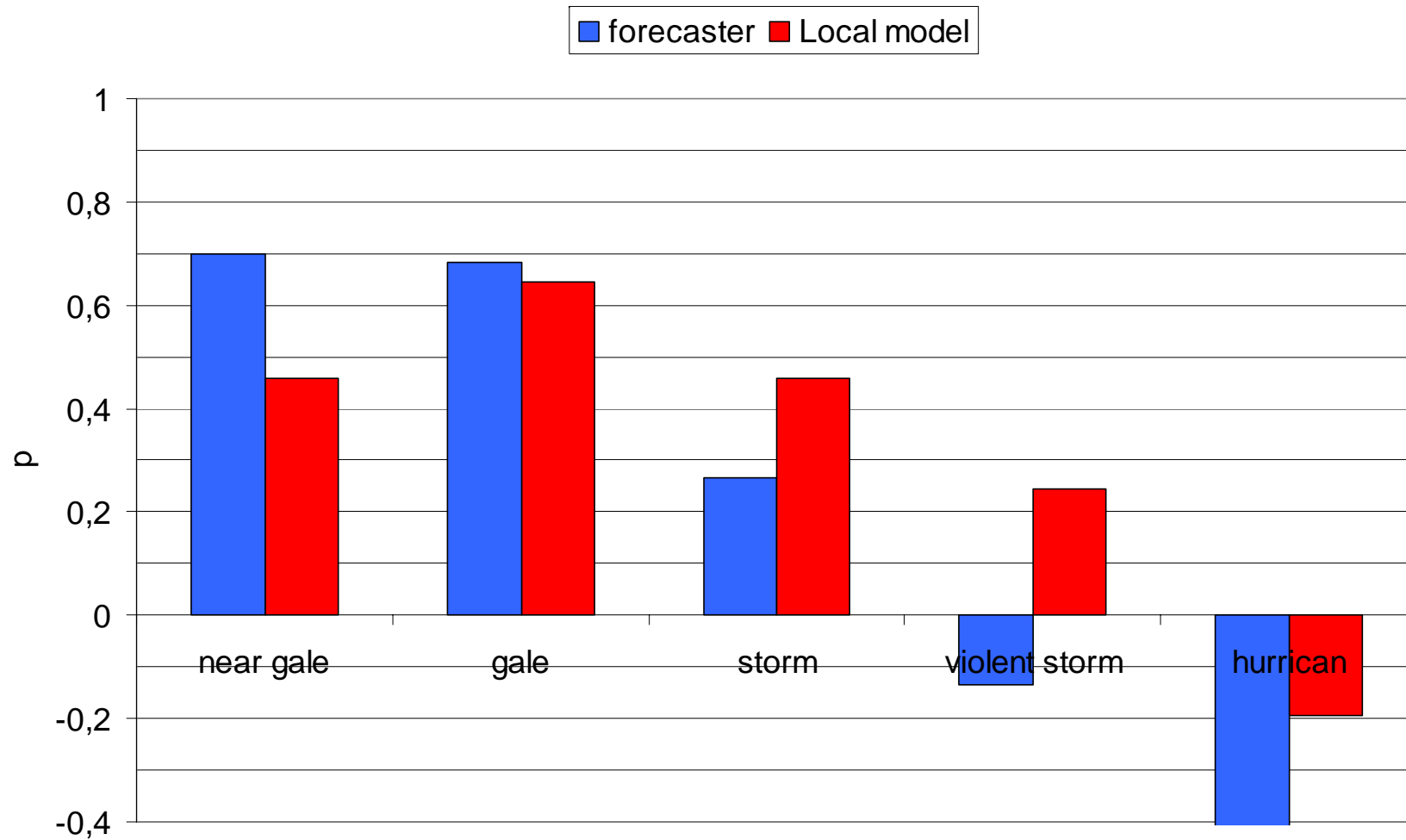
■ forecaster ■ Local model



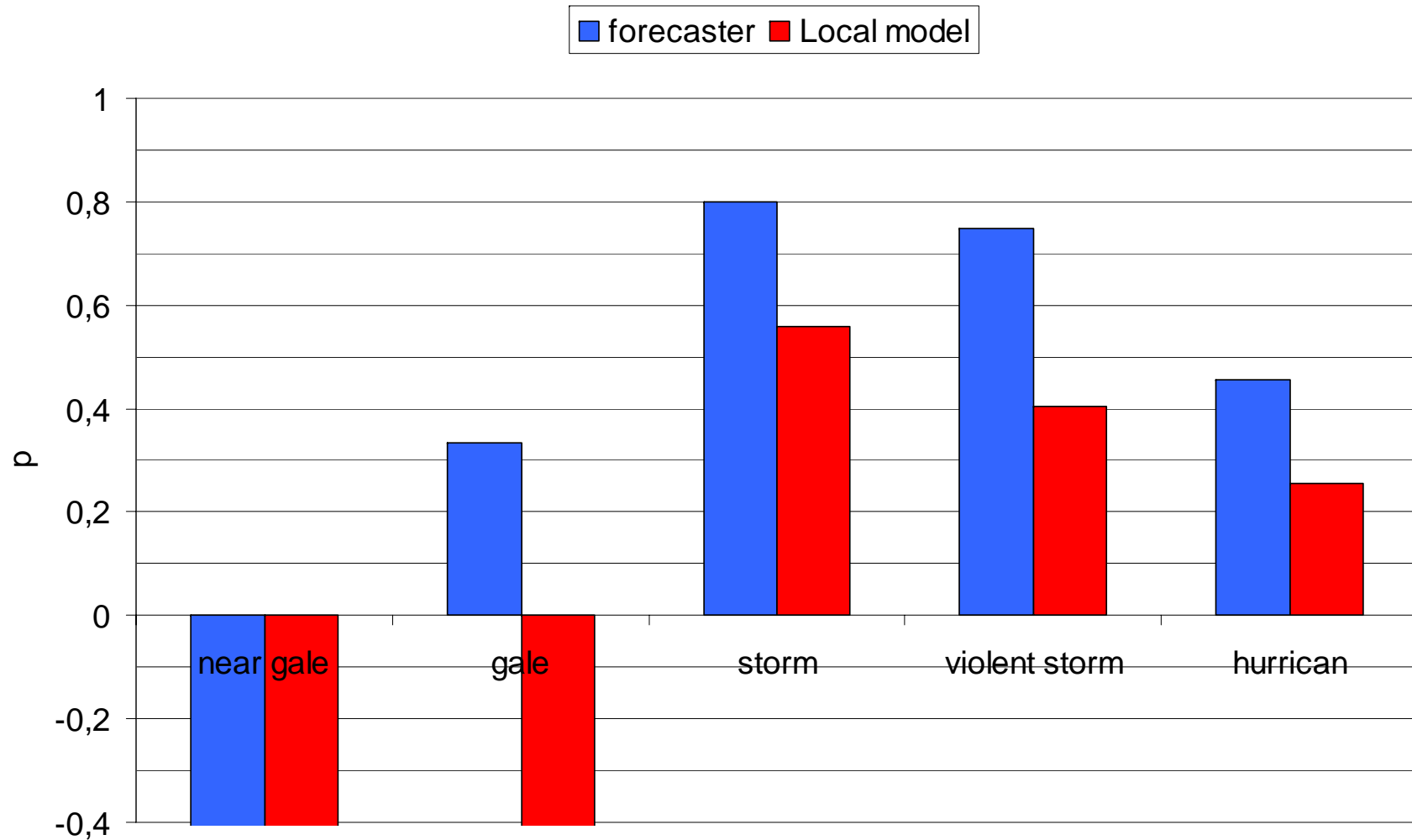
Frequency bias



relative value for $C/L=0,1$

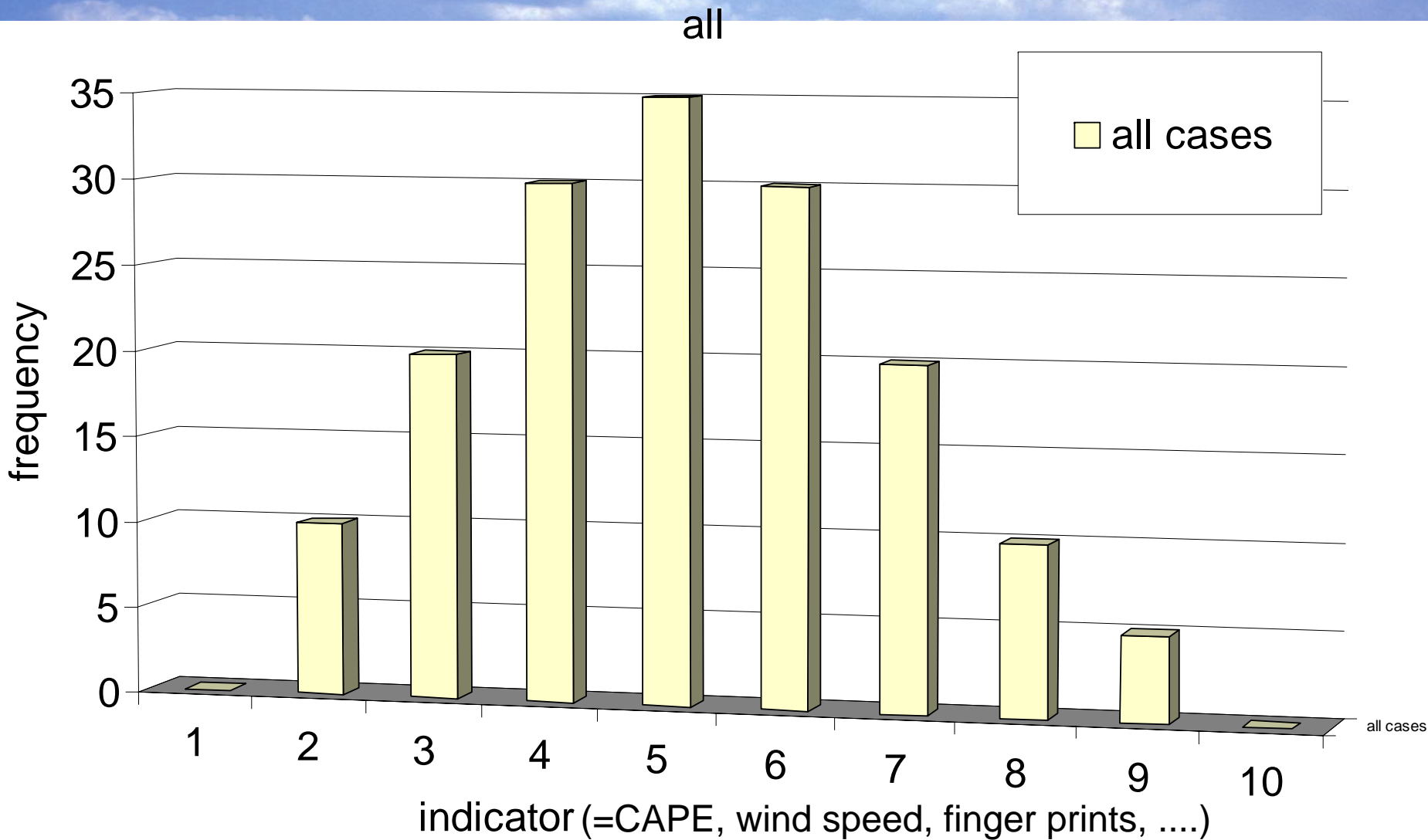


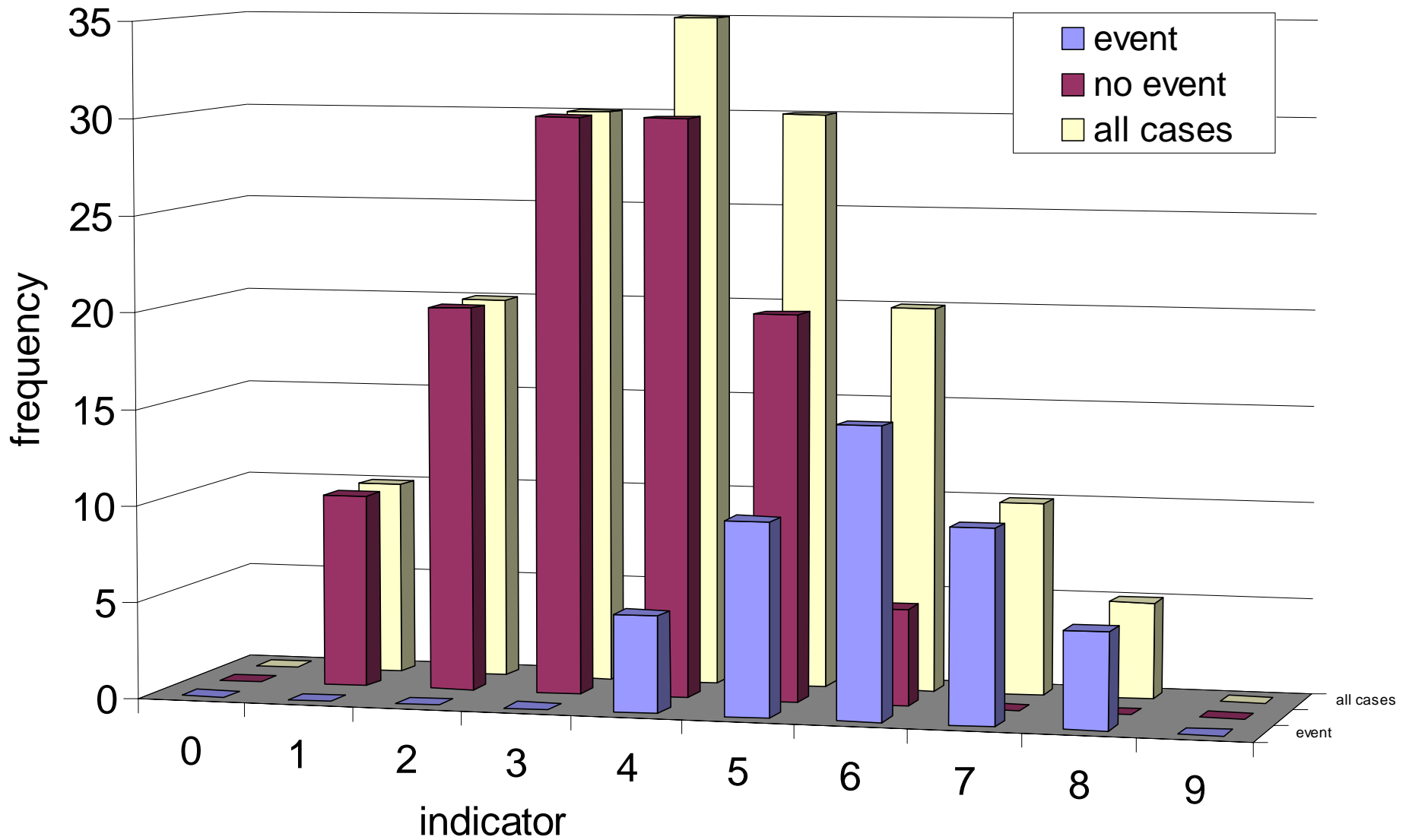
relative value for $C/L=0,01$

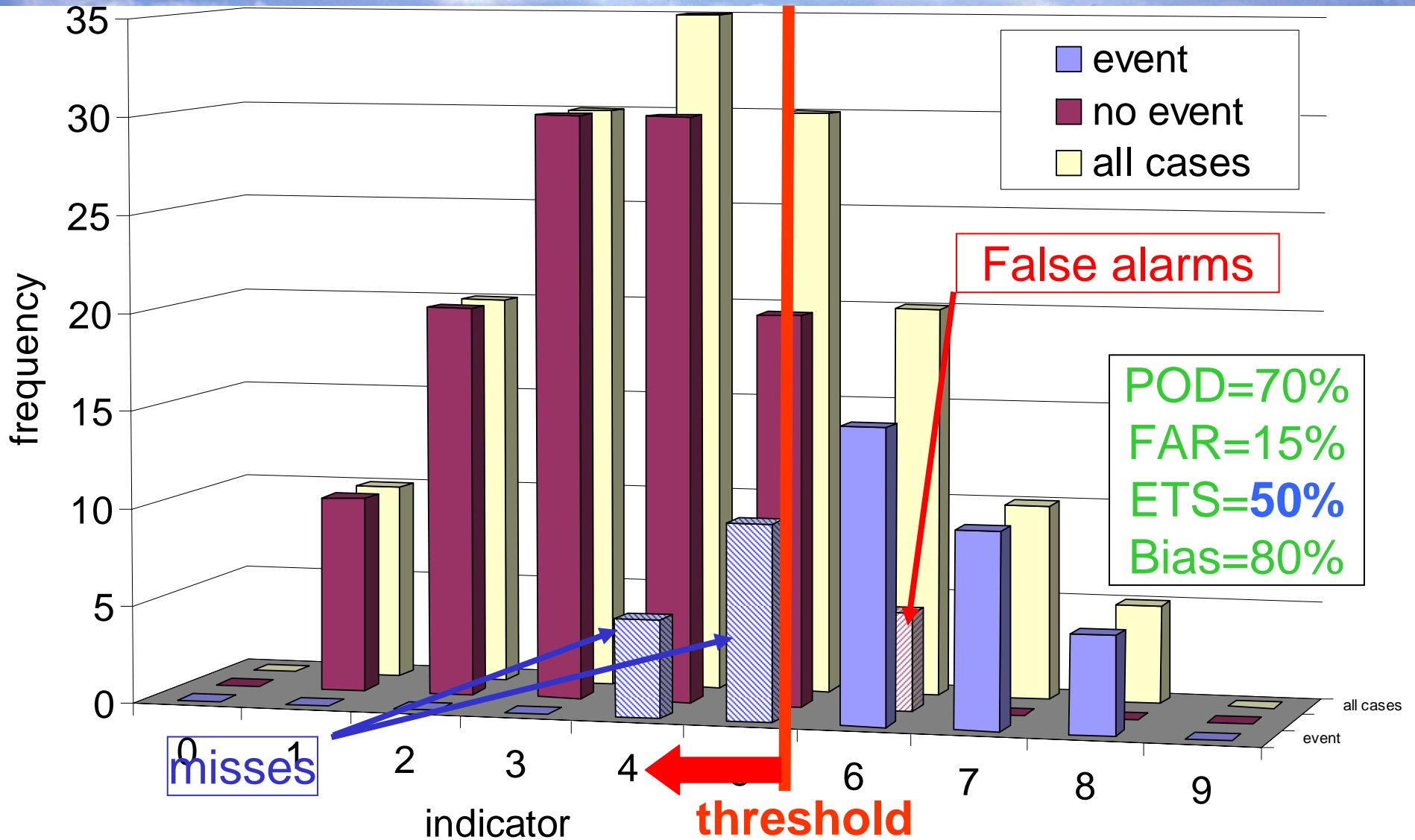


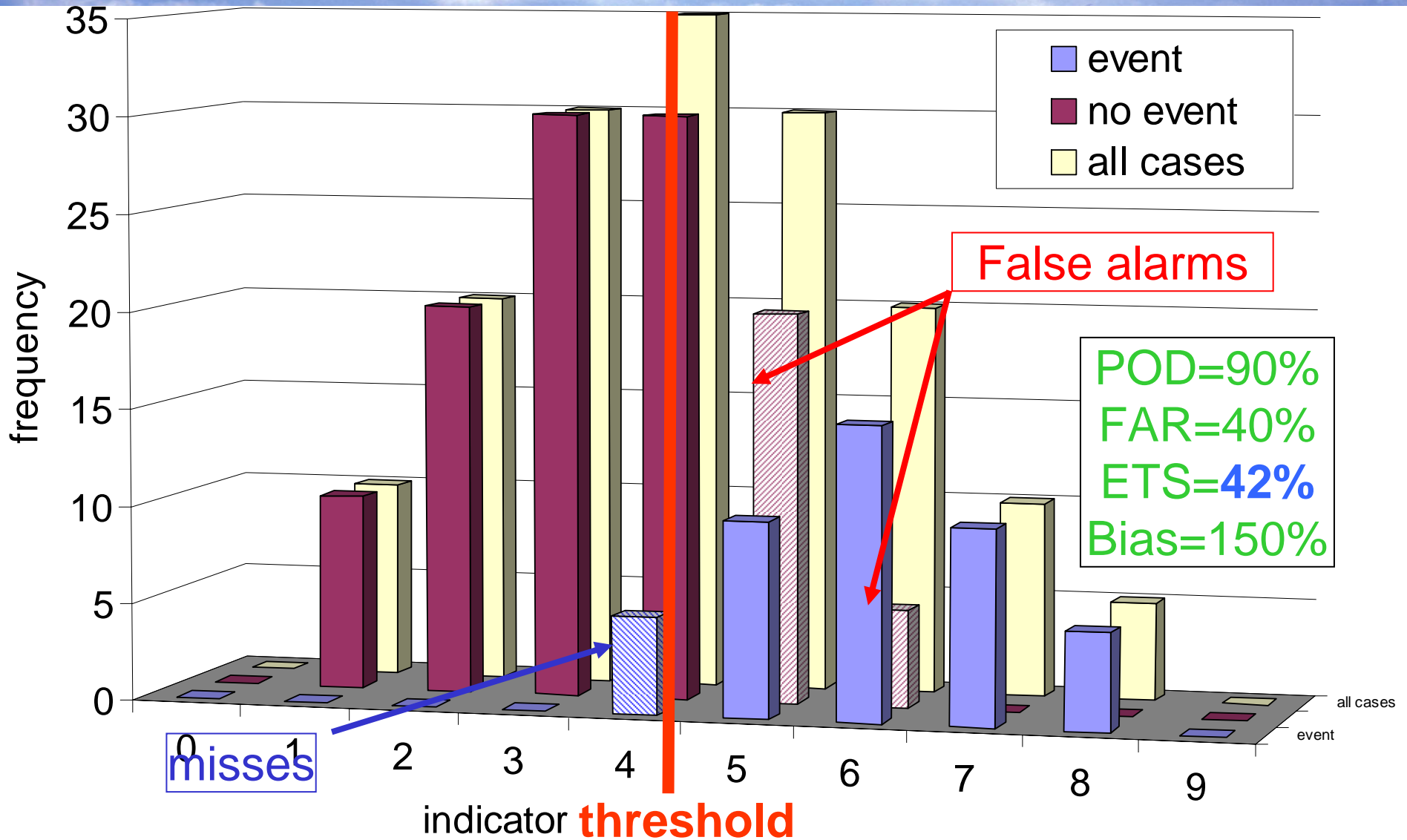


Signal Detection Theory











„Detective“ Miss Marple
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m2

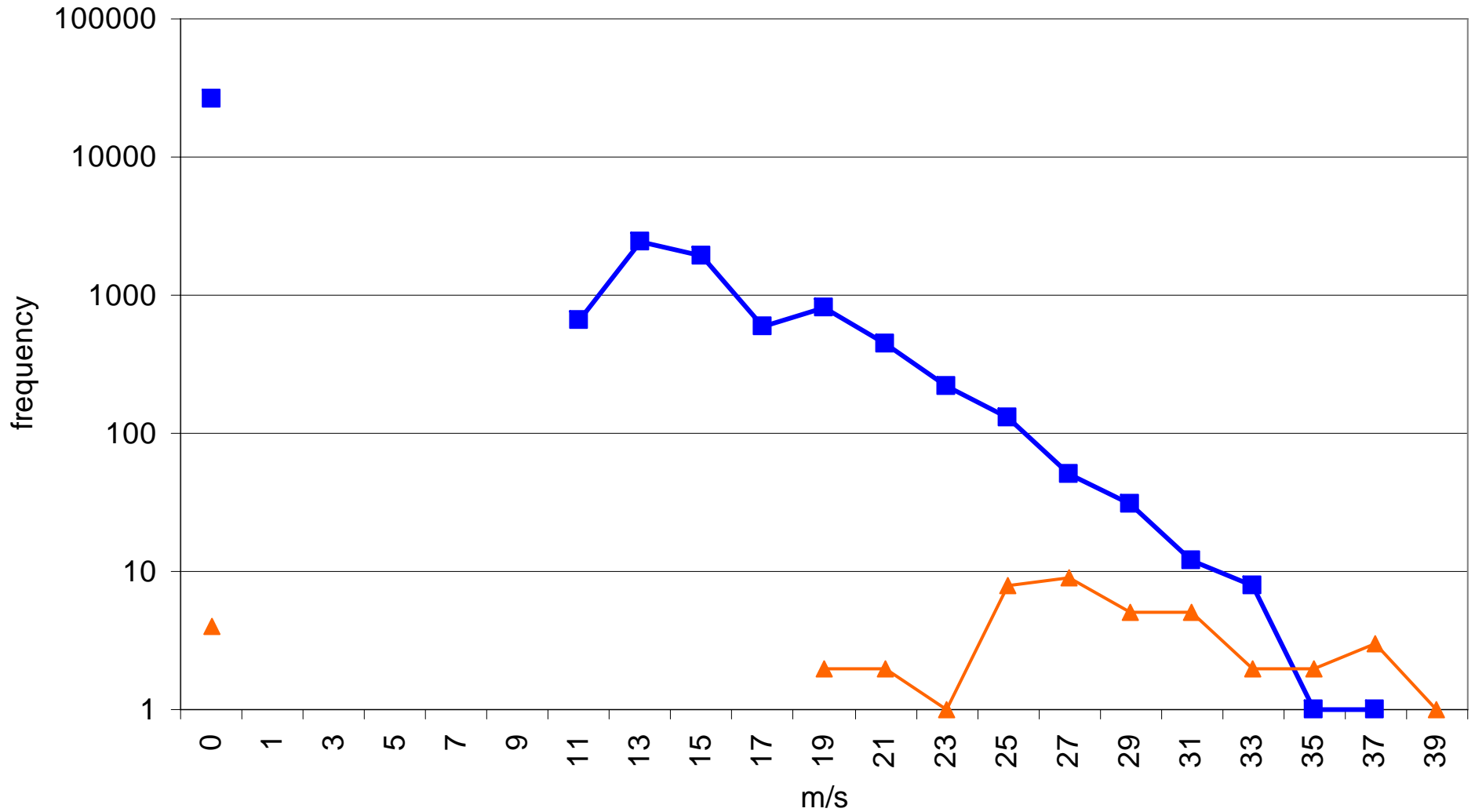
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mgoeber, 03/01/2007

Violent storm warning: gusts ≥ 29 m/s

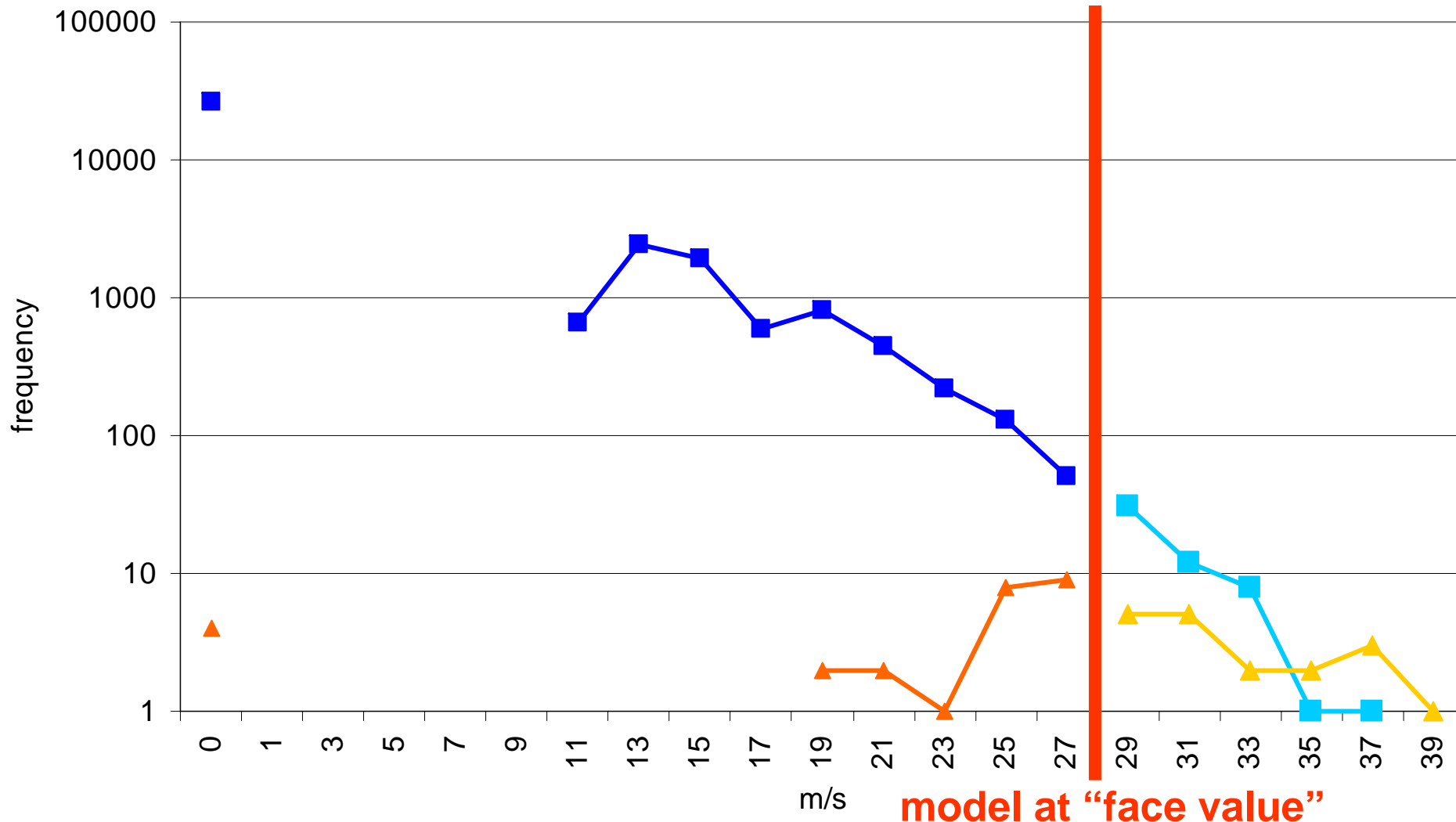


■ $n(F|O < 29)$ ▲ $n(F|O \geq 29)$



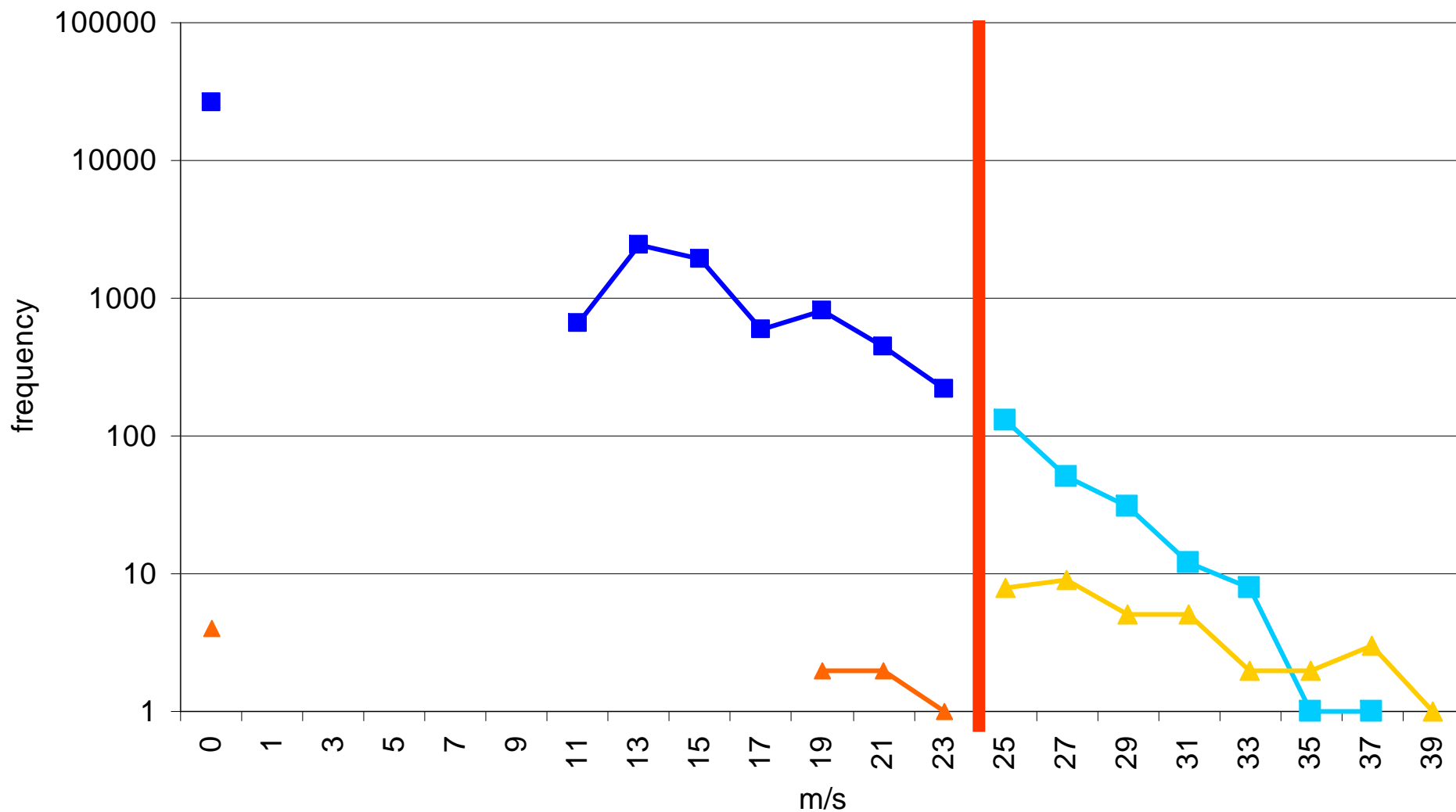
Violent storm warning: gusts ≥ 29 m/s

■ correct NO
 ▲ missed
 ■ false alarm
 ▲ hit



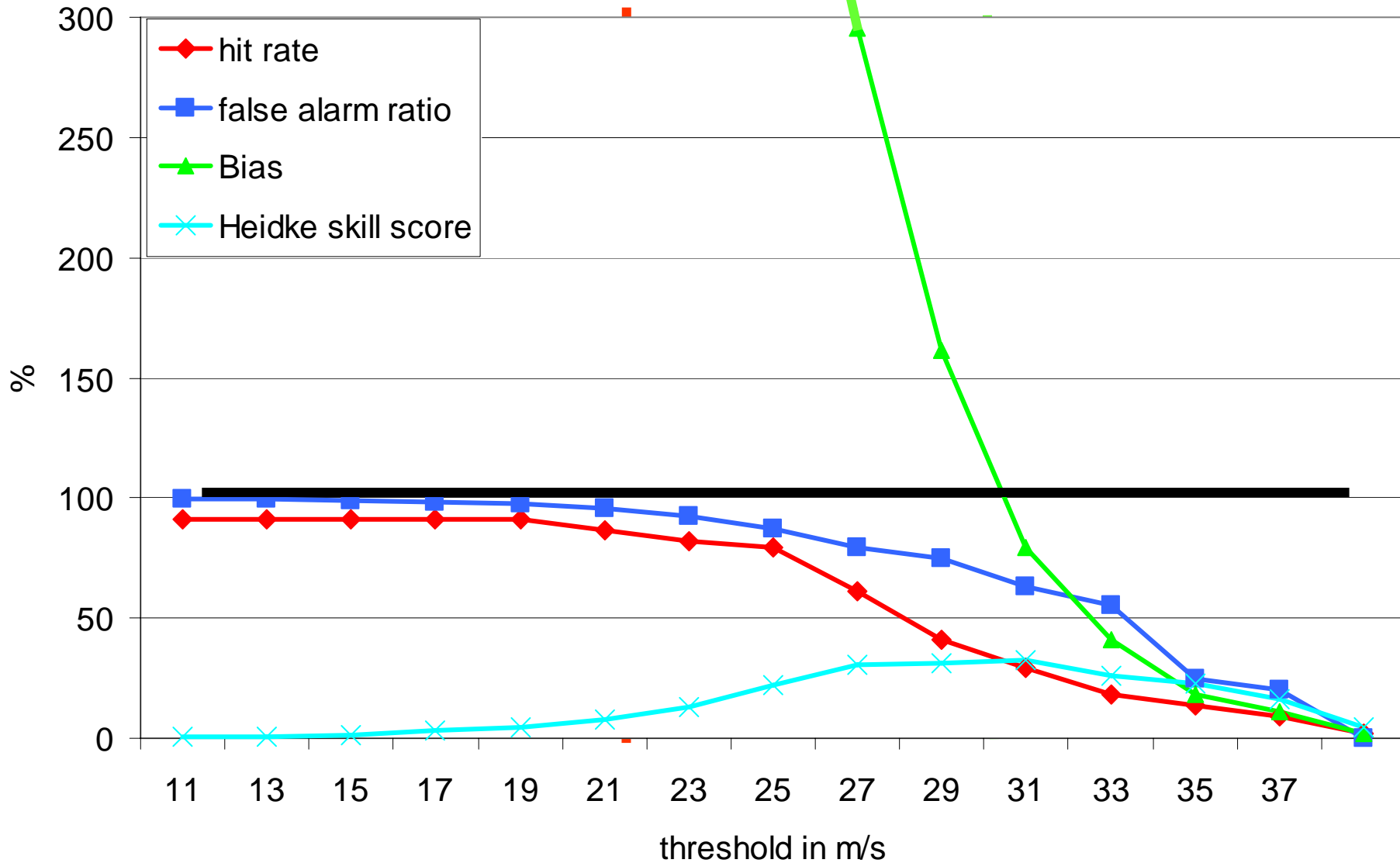
Violent storm warning: gusts ≥ 29 m/s

■ correct NO
 ▲ missed
 ■ false alarm
 ▲ hit



Violent storm warning: gusts ≥ 29 m/s

Deutscher Wetterdienst



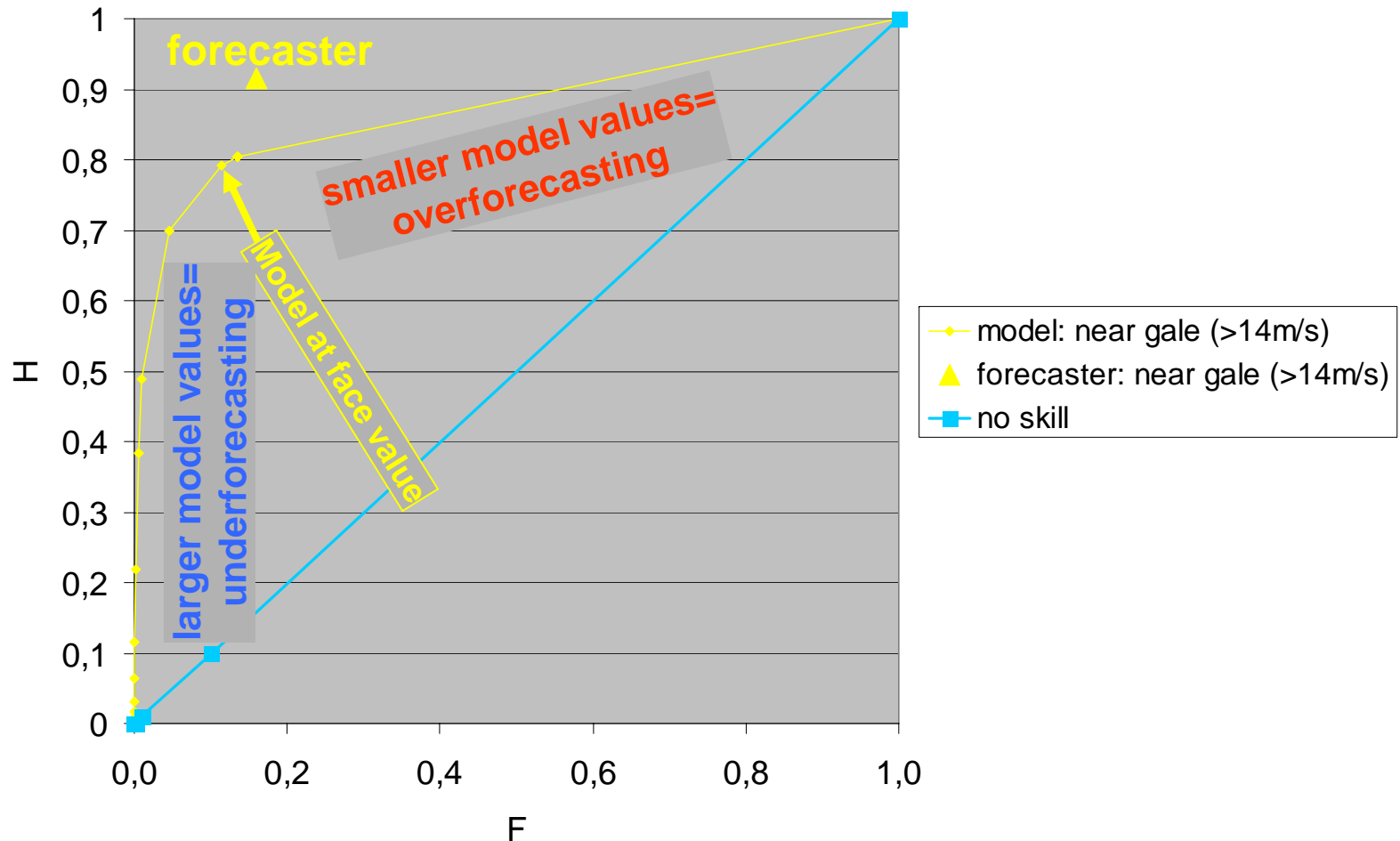
Re-labeling
„model bias = forecaster bias“

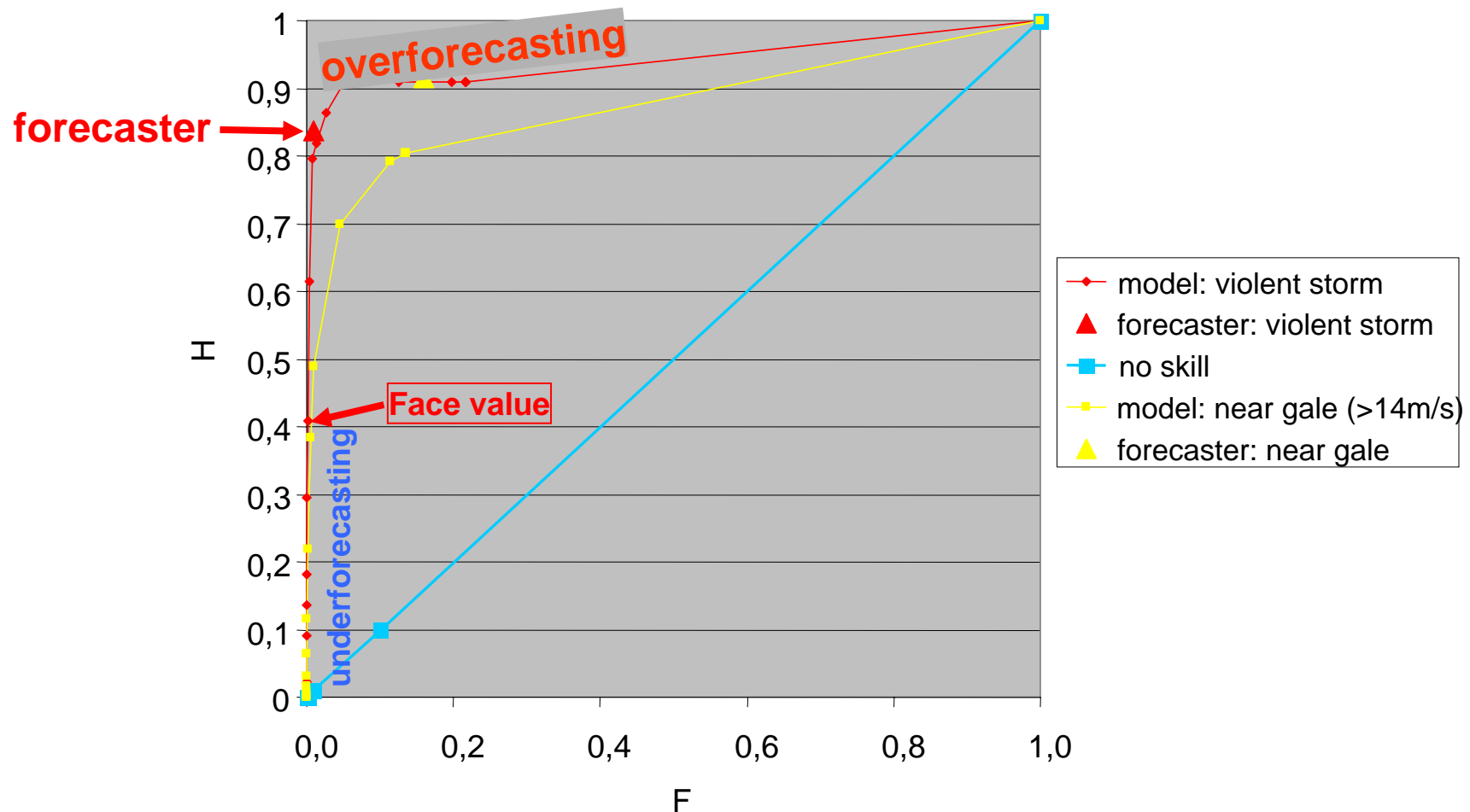
model in m/s ----> „model gust interpretation
for warnings “

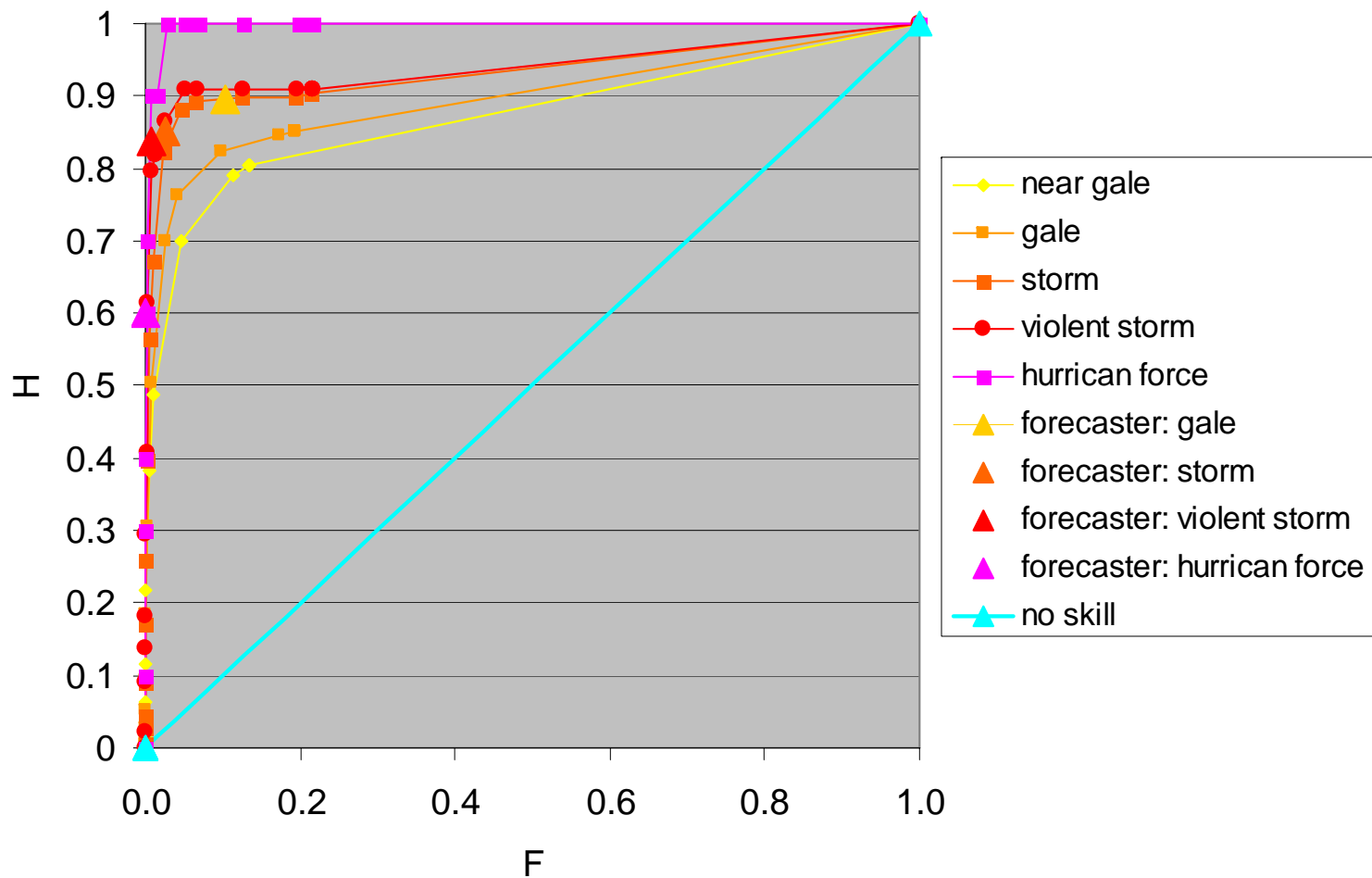
13	---->	14	(near gale)
16	---->	18	(gale)
22	---->	25	(storm)
25	---->	29	(violent storm)
30	---->	33	(hurricane force)

Verification of heavily biased model ? **Quite similar to forecaster !**

Relative Operating Characteristics (ROC)







My conclusions

End user forecast verification: face value (incl. space-time point)

Guidance verification: measure **potential of the guidance** using
Fuzzy, Object,, Signal detection Theory (ROC)