Nat. Hazards Earth Syst. Sci. Discuss., 2, C1071–C1075, 2014
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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "The XWS open access catalogue of extreme European windstorms from 1979–2012" *by* J. F. Roberts et al.

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Received and published: 12 June 2014

Dear Joaquim,

Thank you for bringing this point to our attention. Because sub-grid scale processes like convection should be covered by the parameterisation scheme, we can incorporate your comments in the discussion of the parameterisation scheme on page 2025:

The 2nd paragraph on page 2025 can be changed to:

"Regarding point (i), the gust parameterisation scheme should take into account the sub-grid scale and sub-timestep processes that lead to gusts. The parametrisation scheme used for this work is classed as non-convective (Sheridan et al. 2011), yet for

some of the storms strong convective activity has been identified: the storm Kyrill featured strong convection along the cold front, which lead to heavy precipitation, strong convective gusts, and even tornadoes (Fink et al, 2009). It is therefore possible that failure to represent convective gusts is one of the reasons for the model gust underestimation, and in order to correct for this either convective gusts should be included in the parameterisation scheme, or a highly resolution model which explicitly resolves convection should be used. "

(We will move the reference to Born et al 2012 to section 2.2.2, which will include a fuller discussion of gust parameterisation schemes - see 'Reply to review', AC C579)

We can replace the example of a storm with underestimated pressure gradients to Anatol. The 3rd paragraph on page 2025 will be changed to:

"However, for many storms it appears that the underestimation of gusts stems from an underlying problem with the 10m winds. Figure 9 shows a scatter plot of ..." Then keep text the same as page 2025, lines 13-20, but replacing Kyrill with Anatol. The value of the correlation coefficient between the gust error and wind error for stations which recorded gusts > 25m/s for Anatol is coincidentally also 0.57 (when removing outliers with gust/wind errors greater than 30 m/s). The new figure 9 using Anatol instead of Kyrill is attached.

Line 20 on page 2025 will be modified to say "This strong relationship indicates that **for this case** the underlying problem is with the 10m winds rather than the gust parameterisation itself".

On page 2026, the first paragraph will be changed to:

"To investigate whether the underprediction of the 10m winds (leading to the underprediction of gusts) is due to the underestimation of strong pressure gradients (point (ii)), the observed and modelled minimum MSLP for the storm Anatol were compared...". The rest of the text can remain almost the same because it also appears that Anatol

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also deepened earlier (further west) than the model predicted, and the depth of the low is underestimated over Denmark, and just south of these areas are where the highest gusts were. The updated Figure 10 is attached (also including the observed and model footprints for Anatol (e and f), with scatter plot of model against observed gusts (g), as these aren't shown in Figure 8 in the paper).

The final statement of Section 4.1 will be weakened to: "We conclude that the underestimation of strong gusts apparent in some storms can be due to several mechanisms, including the underestimation of convective effects and strong pressure gradients. It would not make sense...". The abstract and conclusions will also be appropriately modified.

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 2, 2011, 2014.

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Interactive Comment

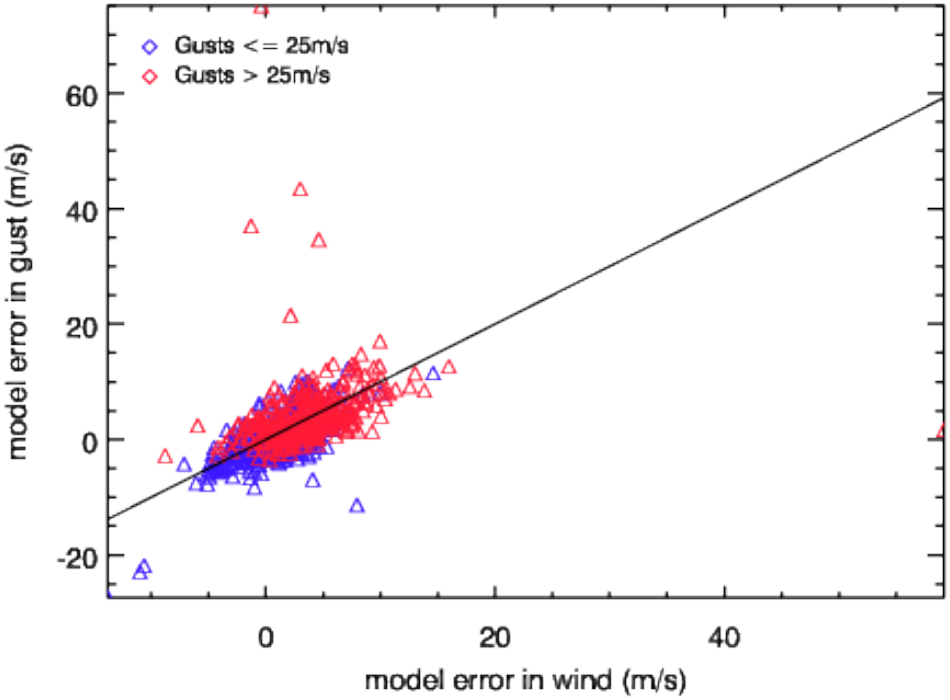

Fig. 1.

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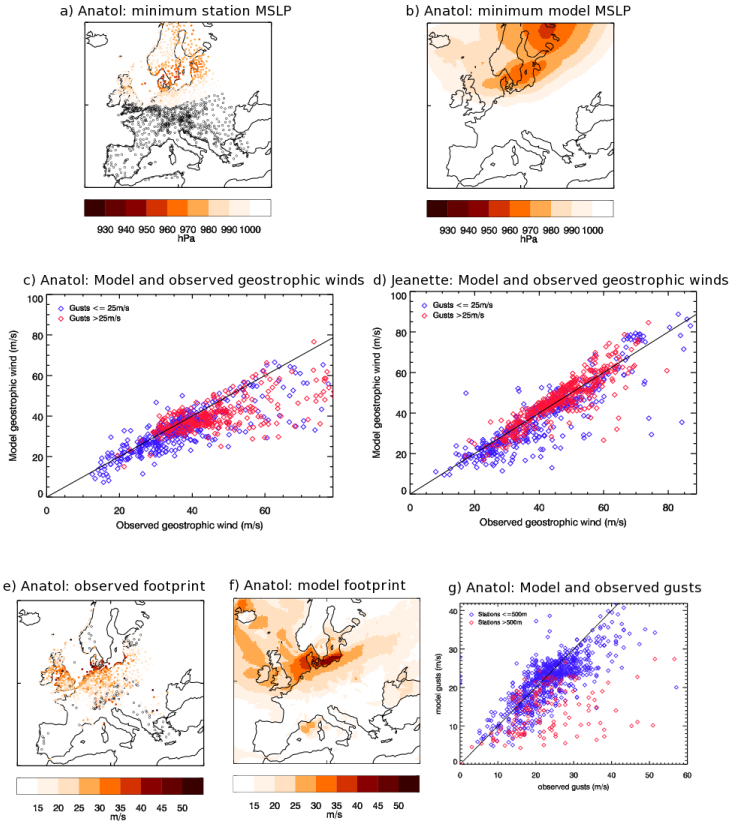

Fig. 2.

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