Supplement 2 to: Spatial consistency and bias in avalanche forecasts - a case study in the European Alps

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1 Sensitivity analysis - removing individual years from the data set

Danger level D≥4:

Using $D_{morning}$ instead of D_{max} decreased $P_{v.crit}$ (median change from 2.5% to 2.1%), but resulted in more or less the same order of the warning regions (ρ = 0.94), and the same regions with the highest values ($P_{v.crit} \geq 7\%$, max = 12.2%). For the warning region with the highest values of $P_{v.crit}$, using $D_{morning}$ rather than D_{max}, resulted sometimes in markedly lower values ($\Delta P_{v.crit}$ 1 to 3%), with especially large differences observed in Piemonte (PIE, $\Delta P_{v.crit} = 4.7\%$).

Removing the winter 2013/2014 from the data set had the greatest impact on both the absolute values of $P_{v.crit}$ as well as the rank order. The largest changes in $P_{v.crit}$ were noted when comparing a data set excluding 2013/2014 and one excluding 2011/2012 (ρ= 0.59). However, six of the ten regions with the highest values of $P_{v.crit}$ remained the same even for those subsets (all belonging to Briançon (BRI)).

Danger level D=1:

Using $D_{morning}$ instead of D_{max} resulted in a reduction of the number of forecasts with D = 1, but the rank order of the warning regions changed only marginally (ρ = 0.90). The rank order correlation was most sensitive to removing the 2011/2012 winter, and was lowest when comparing subsets of the data either excluding the 2011/2012 or the 2013/2014 winter. However, even then the correlation was strong (ρ = 0.80).

Danger level D=3:

The rank order correlations were most sensitive to removing the 2013/2014 winter. However, even then the correlations were generally strong or very strong ($P_{D=3}$: $\rho = 0.84$, $L_{D=3}$: $\rho = 0.71$).