

## ***Interactive comment on “pSNOWPACK: a forecasting tool for avalanche warning services” by S. Bellaire et al.***

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Thanks for reviewing our manuscript entitled “pSNOWPACK: a forecasting tool for avalanche warning services”. You will see that we changed the title to “Forcing the snow-cover model SNOWPACK with forecasted weather data”, which should now better reflect the content of the paper. We see this paper as an initial attempt or the first step to a potential forecasting tool for data sparse areas. We agree that one profile is not enough to assess the overall performance of the model chain and it did not show the model chains ability as a forecasting tool. However, we still think it shows promising potential as a forecasting tool and the profile looks encouraging given the source of the input data.

Numerical weather prediction over complex terrain is challenging. We therefore in-  
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cluded an additional figure, which shows a comparison of forecasted and observed meteorological parameter as suggested (Figure 6). The comparison includes the air temperature, relative humidity as well as incoming short and long wave radiation. The comparison revealed the same trends and biases as already documented by Mailhot et al. (2005). The model GEM tends to be too cold and too dry and overestimates the solar radiation. The long wave radiation seems to be in good agreement with the observations. We did not show a comparison of wind direction and speed between the model and the observation. We feel that a comparison of wind direction is not meaningful since the study plot is located in a wind-sheltered location and therefore not meaningful for comparison with the forecast. A comparison with a more exposed ridge top wind station showed that the wind is in reasonable agreement with the observation in terms of wind direction and speed. However, the given model resolution of 15 km will only allow a qualitative analysis of snow redistribution due to wind in the future.

We further include three new graphs (Figure 9), which illustrate the problem of the early season over-estimation of the new snow amounts resulting into an over-estimation of the snow heights. These graphs show that it is a problem of precipitation treated as snow instead of rain or a mixture of rain and snow. The fact that GEM15 is too cold and precipitation amounts tend to be overestimated clearly contributed to the over-estimation of the new snow amounts.

We have no evidence that the snow height at Fidelity is representative for Rogers Pass. However, the experienced avalanche professionals at Rogers Pass consider the snow height at Mt. Fidelity as representative for the region and even for the mountain range. Unfortunately there are no other study plots with continuous observations available to prove this statement.

Throughout the new manuscript (attached) we tried to make clear that this study should be seen as an initial study and more work and further analysis is needed to make it a valuable tool for avalanche warning services.

Typing errors: - page 2265 line 15: replace “can assumed” with “can be assumed”  
Changed as requested.

Please also note the supplement to this comment:  
<http://www.the-cryosphere-discuss.net/5/C1334/2011/tcd-5-C1334-2011-supplement.pdf>

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Interactive comment on The Cryosphere Discuss., 5, 2253, 2011.

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