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Forecasting benefits of increased horizontal resolution in complex terrain

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The MM5 numerical weather prediction model is run operationally as a part of the HRAS weather forecasting system for the complex terrain of Iceland (www.belgingur.is). Results from the simulations at different horizontal resolutions during 2006 are compared to point observations.

For all resolutions, the wind speed is systematically underestimated in strong winds and there is a cold bias in the model in cold weather conditions. Increasing resolution stepwise from 27 to 3 km improves the wind forecasts substantially. There is a moderate improvement in the temperature forecasts, even if corrected for the different elevation of the weather stations at different resolutions. In the mountains, improved horizontal resolution gives much more correct precipitation quantities, while away from mountains, the improvement is not quite clear when moving from 9 km to 3 km.