

A study on lake temperatures in HIRLAM

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Abstract: Sensitivity of the mesoscale High Resolution Limited Area Model (HIRLAM, <http://hirlam.org>) forecasts to lake temperatures is studied over a Nordic domain. Three series of experiments are run for the period 1 Nov - 31 Dec, 2006, when the lakes of Finland kept unfrozen unusually late in the winter. A version of HIRLAM with improved soil and surface parametrizations (so called “newsnow” scheme, Samuelsson et al. (2006)) was applied a) as such, i.e. with utilization of some climatological information of lake temperatures over Finland; b) with assimilated lake temperature observations over Finland; c) with lake parametrizations based on FLake (Mironov, 2006), that were started from observed temperatures at the end of October.

The results will be analysed and compared with observations in terms of the screen-level temperature and surface energy balance at selected representative sites. Standard verification scores over the experiment domain and period will be shown and discussed. Conclusions concerning the further strategy of handling lake temperatures in the HIRLAM data-assimilation system and forecast model will be drawn.

Keywords: *HIRLAM, lake surface temperature, surface data assimilation, FLake model*

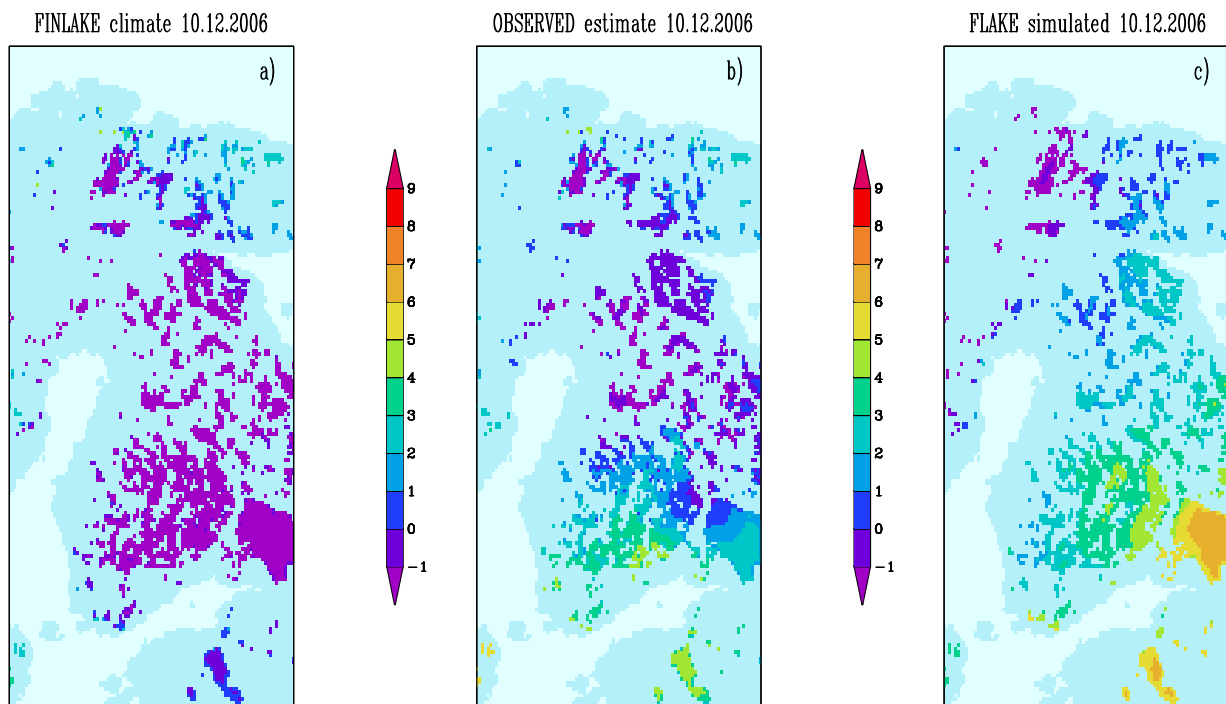


Figure 1: Estimated by HIRLAM lake surface temperatures (in Celsius) 10 December 2006 over the lakes of Finland and Russian Carelia. Temperatures below -1 C indicate that lake is considered frozen in the model. Climatological lake temperatures were used in the experiment series a), while LST observations were assimilated in the series b) and the experiments c) created simulated LST by FLAKE, see the text for details.

REFERENCES

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