Ice data from Sveg compared to Hirlam forecasts

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Ice data from Sveg compared to Hirlam forecasts

Outline:

- **Hirlam setup**
- **Measurements**
- **Results**
- **Summary**

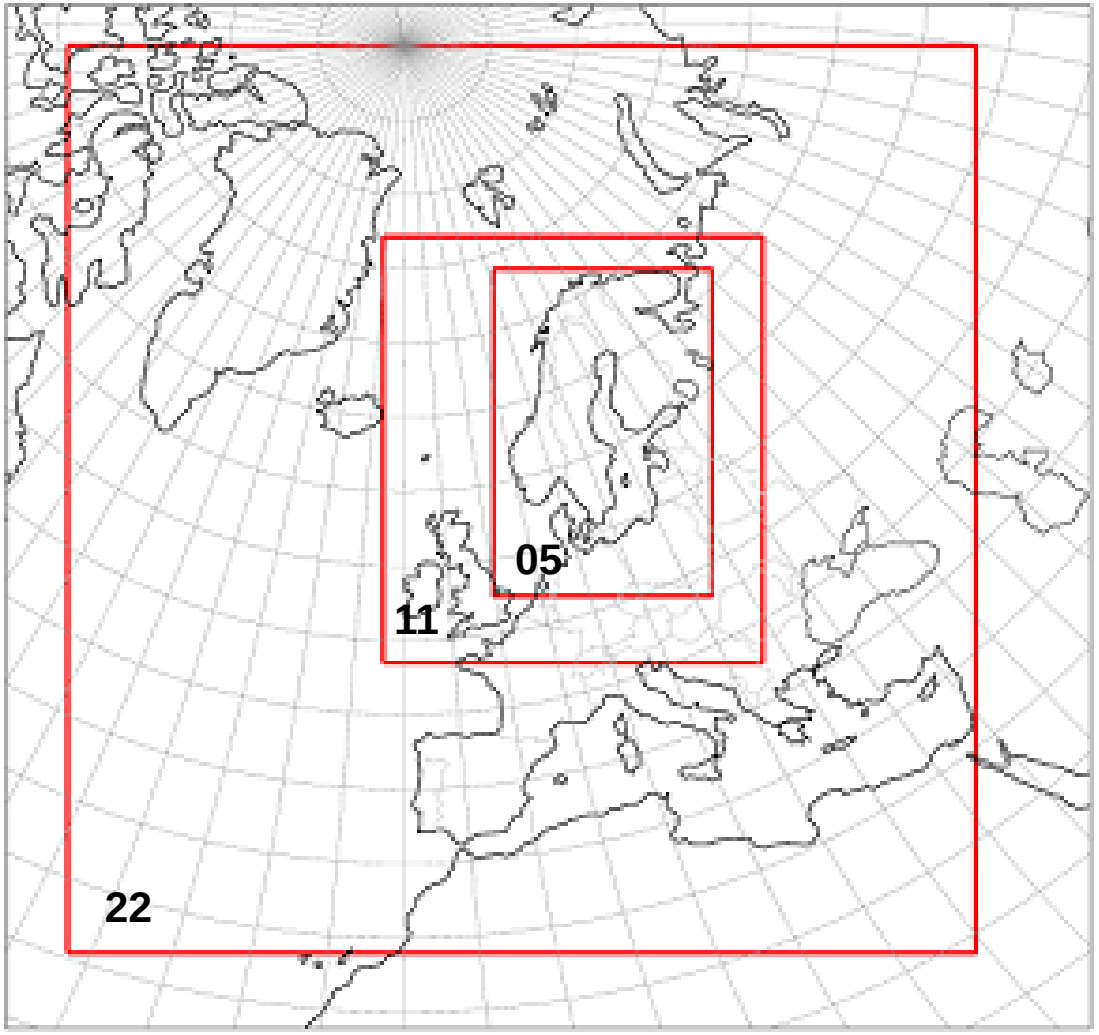
Ice data from Sveg compared to Hirlam forecasts
Hirlam setup

SMHI runs three versions of the Hirlam model

5, 11 and 22 kms horizontal resolution, with 60, 60 and 40 vertical levels.

All hydrostatic.

Rather ”simple” cloud physics.



Ice data from Sveg compared to Hirlam forecasts
Hirlam setup

Profiles of temperature, wind and cloud water (5 and 11 km) has been used to calculate model ice load using:

$$\frac{Dm}{dt} = \alpha_1 \alpha_2 \alpha_3 \cdot w \cdot A \cdot V$$

α_1 = collision efficiency.

α_2 = sticking efficiency.

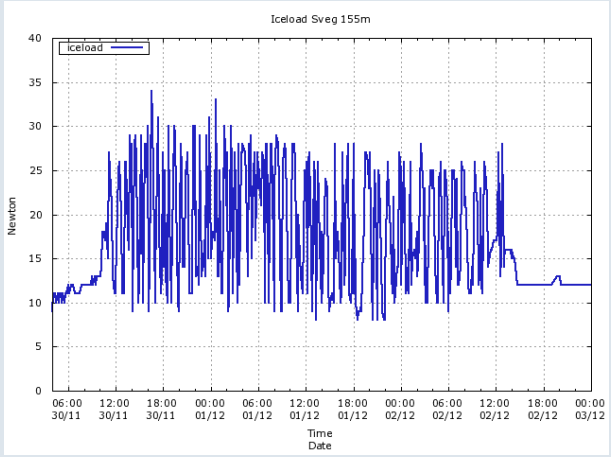
α_3 = run off/melt water.

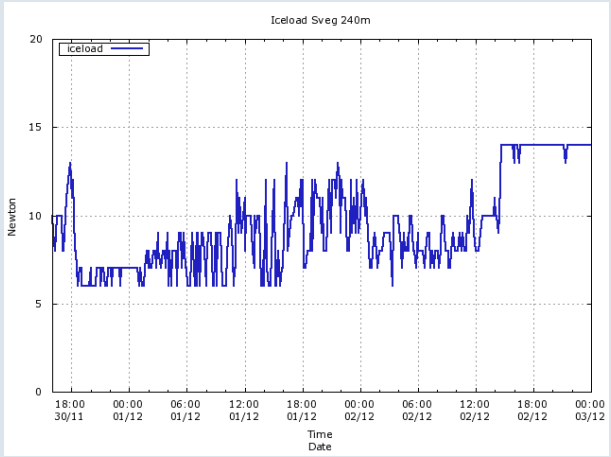
$w*A*V$ = Flux of water/snow/rain

Ice data from Sveg compared to Hirlam forecasts Measurements

Data from the TV-tower in Sveg has been used to validate model results:

- **Temperature, humidity, wind and ice load.**
- **Levels 70, 155 and 240 meter.**
- **Ice load classified (light, moderate, severe)**





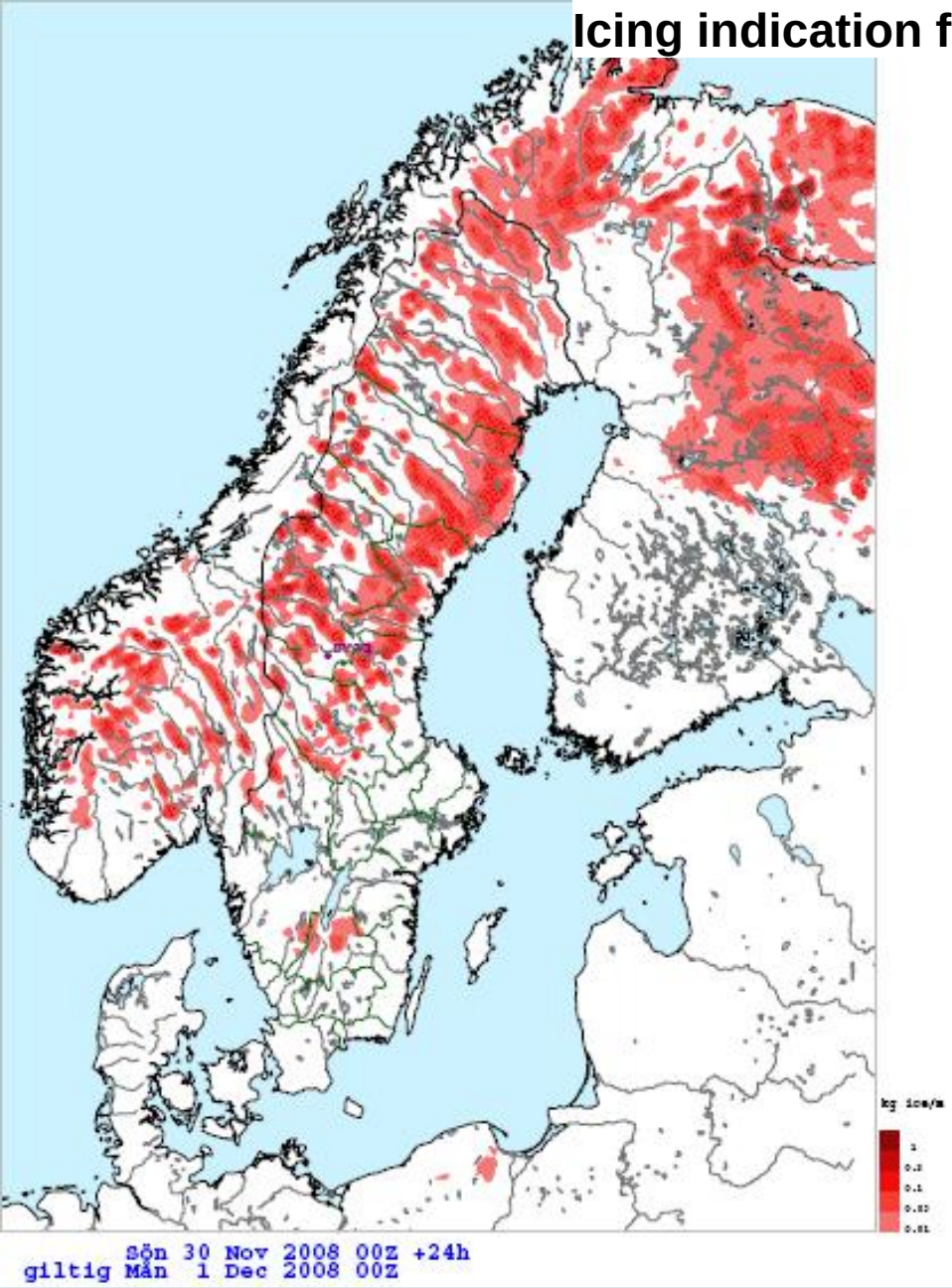
Ice data from Sveg compared to Hirlam forecasts
Results

- 5 icing episodes has been analyzed.
- Rather good agreement for atmospheric variables temp, humidity and wind.
- Only light ice accumulation in the models (in the order 5-50g/m during 6-12 hours).
- The models, in most cases, underestimates the ice loads.
- A little bit better with higher resolution.
- Not enough cloud water.

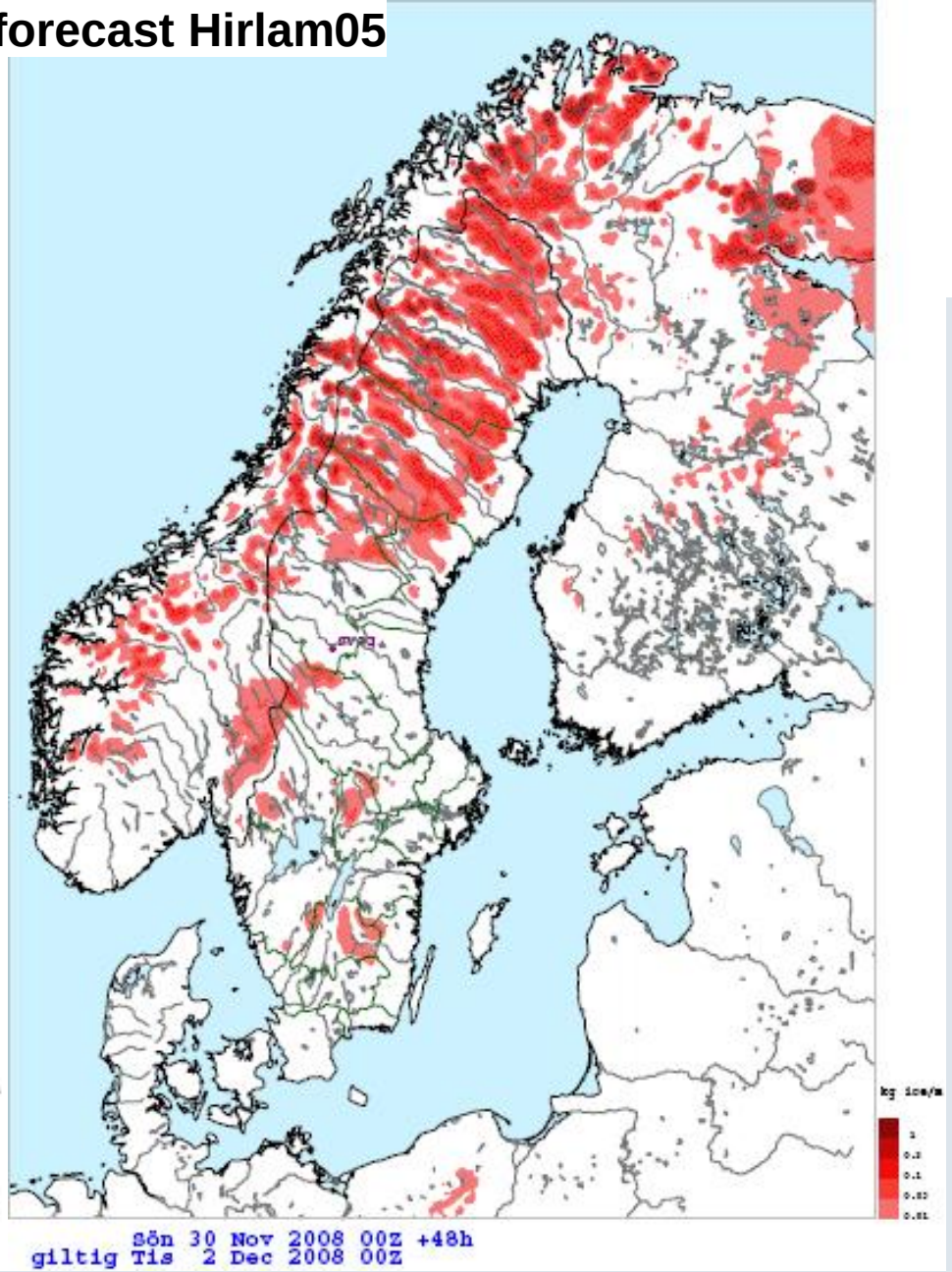
Ice data from Sveg compared to Hirlam forecasts
Summary

- **Present Hirlam models are not able to produce accurate ice load forecasts.**
- **They can indicate occurrence of icing.**
- **Higher resolution (non-hydrostatic model) and better physics needed.**

Icing indication forecast Hirlam05



”Today”



”Tomorrow”