HIRLAM-A: some highlights and challenges

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- 3D-VAR: inclusion of various “local” RS data streams, derivation of structure functions, etc etc
- Basic HARMONIE 4D-VAR set up, to increase in sophistication.
- Impact assessment of remote sensing obs: EUCOS, trans-Atlantic and convective CIS
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- Development of ETKF, start study of hybrid ensemble ass techniques.
  Challenge: prove added value / best form of hybrid approaches for interpretation of high-resolution models

Highlights and challenges (2): Upper air physics and dynamics

- HARMONIE:
  - Case studies on (too strong) convective behaviour
  - Norrkjöping workshop June 2008: common challenge requiring better understanding of basic processes?
  - Challenge: process studies and detailed model behaviour validation of e.g. cloud microphysics, detailed BL behaviour, precipitating structures, using non-standard RS observations
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- HIRLAM:
  - UA physics developments mostly focussed on tuning
  - HARMONIE beginning to appear competitive at 5km scale
  - ENVIRO-HIRLAM branch ready, start made with studies of impact chemistry/aerosols on atmosphere, (more) mass-conserving SL schemes.

Highlights and challenges (3): Surface

HIRLAM:

- Newsnow optimization struggle
- Challenge: a better surface model may require much retuning of (many) other aspects of the model. This likely to get only worse at higher resolutions
- Surface wave coupling

HARMONIE:

- FLake: Extended lake database (global coverage, more European lakes, additional depth information, error corrections, …) soon available
- Start made with snow analysis

Surface nesting:
pairing off the right model couples isn't easy…

- SURFEX fine for 2km HARMONIE but cannot be used for larger-scale configurations yet. Surface DA (OI/CANARI): works on larger scales, but not yet with SURFEX
- Experience SMHI, met.no: Inconsistent surface nesting leading to significant, long-persistant errors
- Interoperability kick-off meeting: "Surface coupling inconsistencies likely to be biggest problem."
- Oslo workshop March 2008: surface data assimilation and/or (SWI) scaling of nesting/nested surface models likely best solutions
- Challenge to ET-Surface: provide recommendations on what (not) to do, and demonstrate impact.

Highlights and challenges (4): GLAMEPS

- Configuration experiments 12km/40L, 40-50 members, EUROTEPS+HIRLAM EPS+ALADEPS, with/without stoch. physics
- Outcome:
  - Significant added value over ECMWF EPS for all parameters, scores
  - All GLAMEPS components contribute (but not yet clean comparison)
  - Stochastic physics impact significant only for heavy precipitation
- Extended experiments to answer questions:
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- Coming period:
  - Real-time operation: TCF status for EUROTEPS and GLAMEPS, possibility of using common domain with LAEF?
  - Yet to be answered (challenge to ET-EPS):
    - What is better: convection-permitting ensemble within European-scale ensemble, or use larger, coarser overlapping ensembles?

Organizational aspects

- No changes in member institutes or management team
- Prolongation status of acceding member for Lithuania until end 2010
- Next year December: end of HIRLAM-A programme. Activities in coming year:
  - $\Rightarrow$ External review
  - $\Rightarrow$ Start preparations of MoU
  - $\Rightarrow$ Start preparations for update of 10-year strategy (2011-2020) and formulation of scientific objectives for new programme

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- Hardware developments: move toward massively parallel systems => major code consequences for NWP
- NWP models becoming a main basic tool in both global and regional climate modelling
- Gradual shift from atmospheric to environmental (earth system) modelling

=> What implications does this have for SR NWP?

=> How do we plan to deal with these issues (threats and opportunities)?

In any case: in 10 years time, life will be different in SR NWP space!

So, in the coming years…

Quo vadis, SR NWP?