Transition to ICON in RHM

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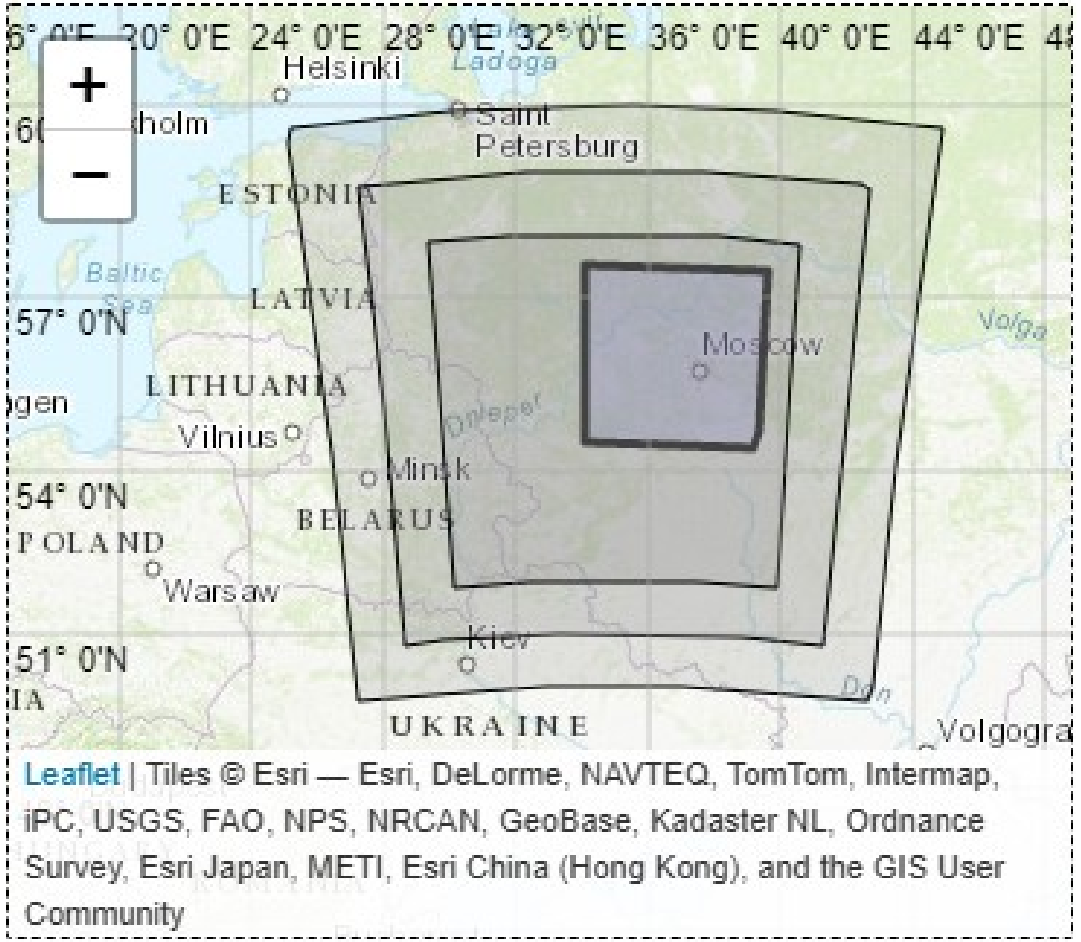
Forecast setup of ICON-LAM Nested

	D1	D2	D3	D4
Initial data	ICON-LAM ENA	D1	D2	D3
Boundary data	ICON-LAM ENA	D1	D2	D3
Time step, s	20	10	5	2.5
Horizontal grid	R5B09 ~2.0 km	R5B10 ~1.0 km	R5B11 ~0.5 km	R5B12 ~0.25 km
Number of cells	318013	814485	1833243	1833592
Vertical levels	65	65	65	65
Leadtime, h	24	24	24	24
Cluster	CRAY XC40			
Number of nodes	720			
Computing time for launch 24 hours, min	12			



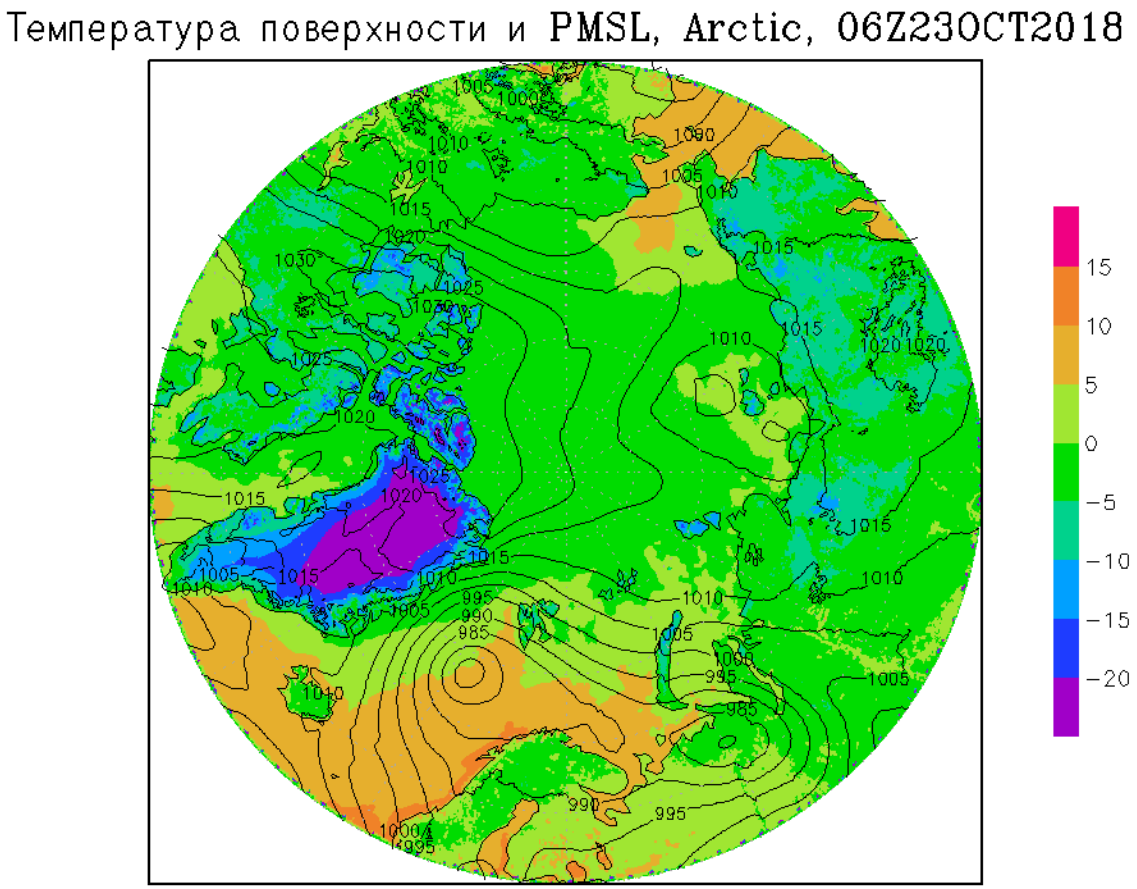
ICON global

RHM has plan to launch ICON Global. It is useful for opportunity to launch ICON-LAM for arbitrary areas.
At August 2019 DWD started to provide operative initial data for this task.

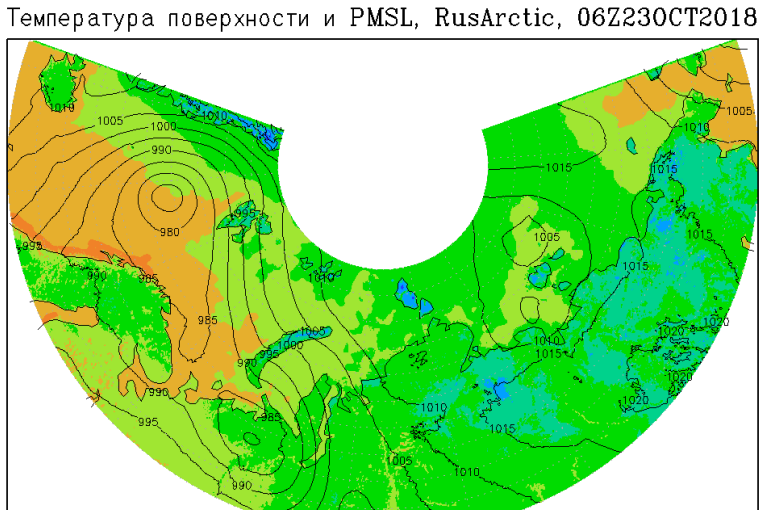
Initial data	First guess and incremental analyses from DWD
Time step	120 seconds
Horizontal grid	R3B07 ~13.0 km
Number of cells	2949120
Vertical levels	90
Leadtime	24 hours
Computer cluster	CRAY XC40
Number of cores	900 Problem with speedup for no. proc. greater 900
Computing time for launch 24 hours	23 mins

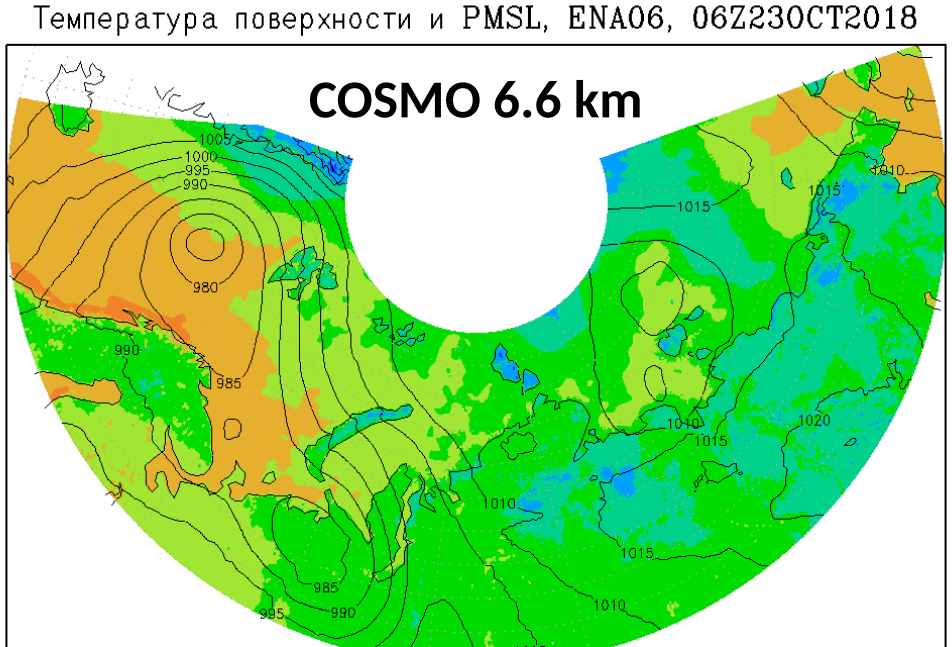
ICON-LAM for Arctic

ICON-LAM Arctic 6.6 km



ICON-LAM Arctic – Ru 3.3 km

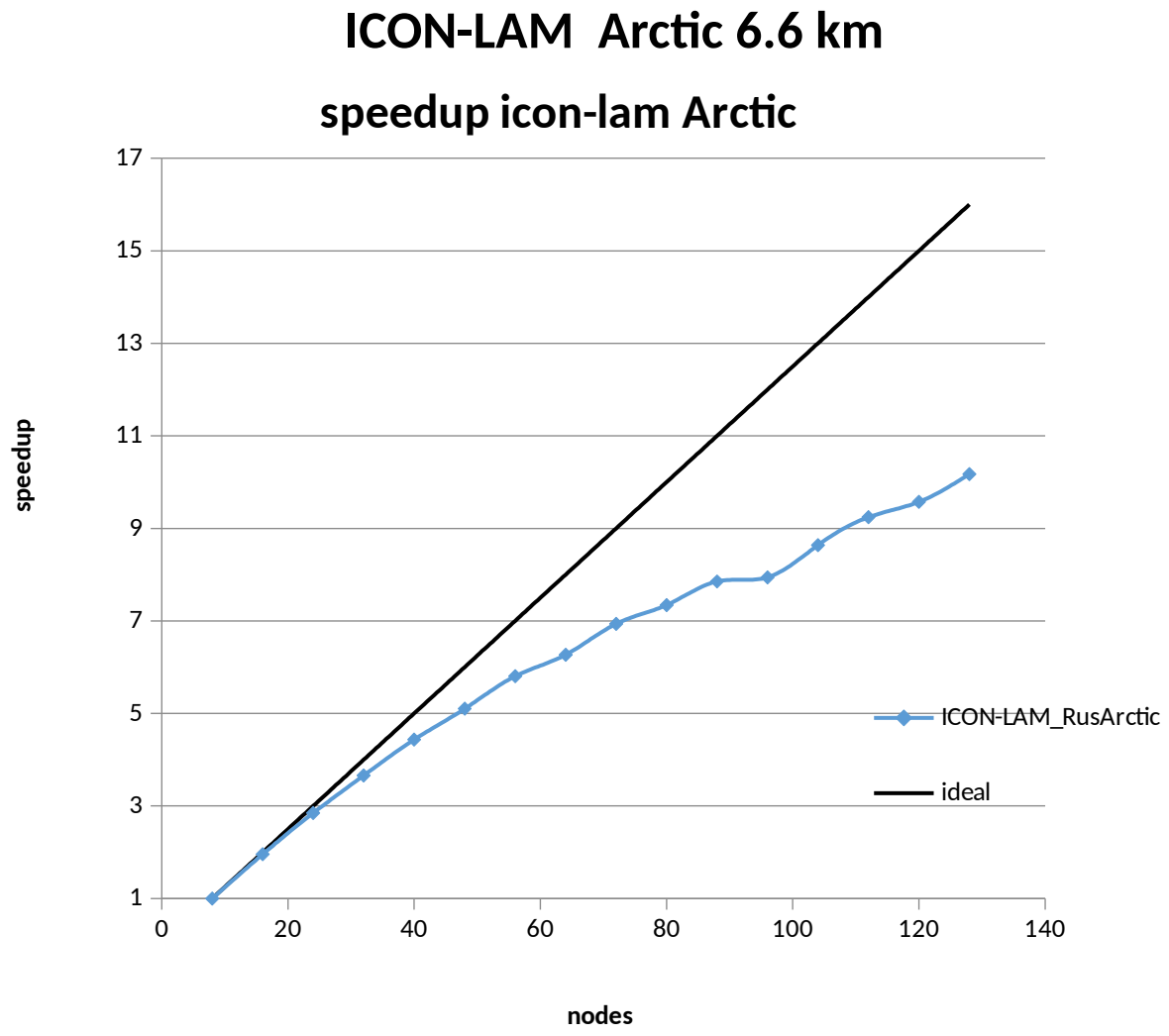




Computational issues

- Lower speedup above 900 cores (50 nodes). This is especially true for the global model.

- Hybrid mode with openMP threads and MPI-mode have the same runtime

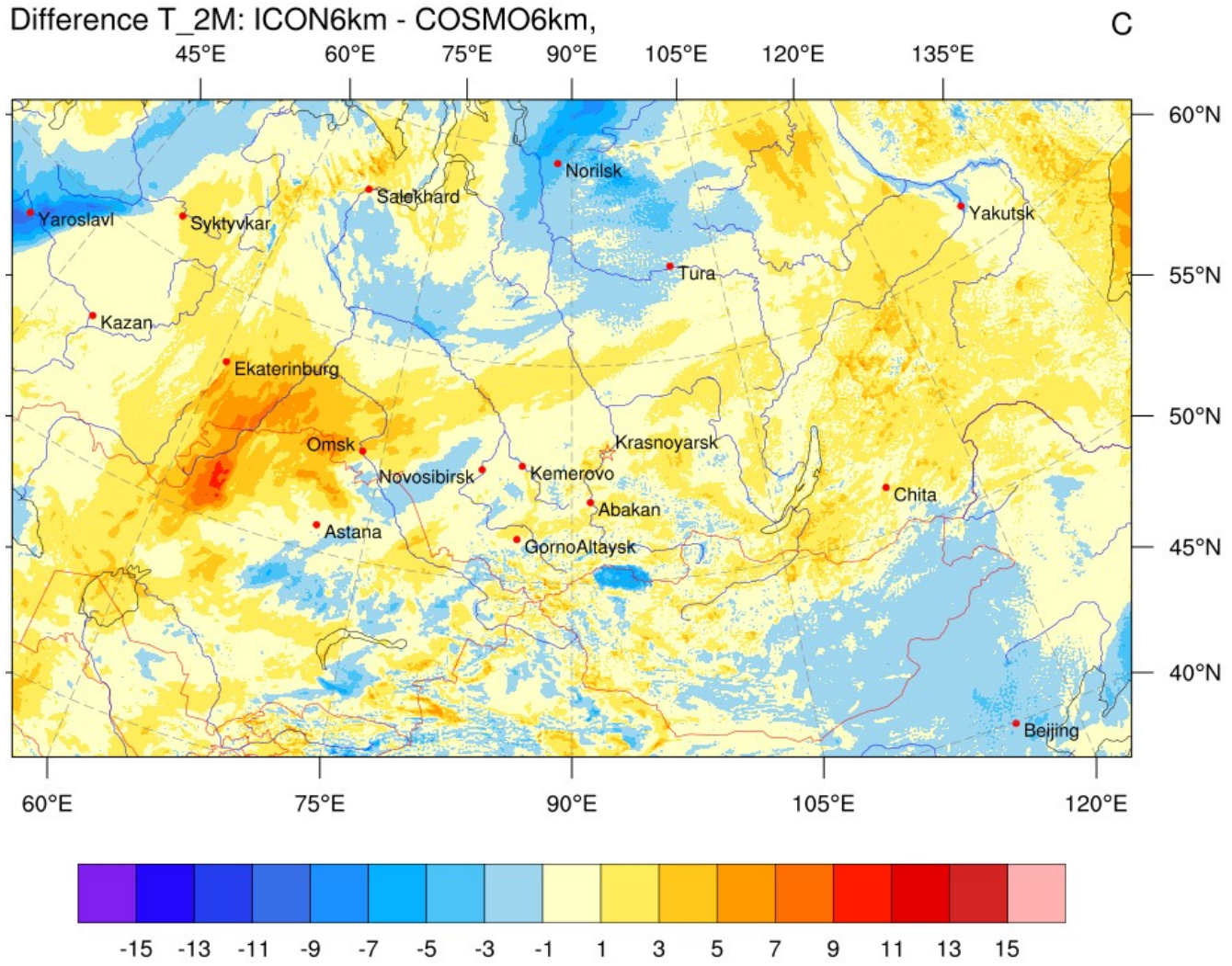


First experiments:
Daytime temperature at spring time

ICON-LAM06 vs COSMO-06

Comparison of temperature at 2m
for 3 March 2019,
78 hours lead-time.

Preliminary results.
Spring daytime T_2M better for ICON!



Adaptation of postprocessing

Used tools:

- NCL
- Fieldextra
- Python
- etc

Problems/challenges:

- Reading and handling triangulation grid for lots of software
- Nonstandard fields for GRIB2 on triangulation grid
- Experiments with ICON-L before September 2018

Summary:
Status of ICON at RHM on 15 August 2019

- Installation – done
- Forecast setup – done
- Adaptation for postproccessing and users – in progress
- Case study – in progress
- Verification – in progress

Outlook for ICON-LAM

- ICON-LAM with nested domains for grid 2, 1, 0.5 km
- Operative routine ICON-LAM6.5 after neutral or positive results of verification