High Resolution Re-analysis for Baltic Sea Region During 1965-2005 Period

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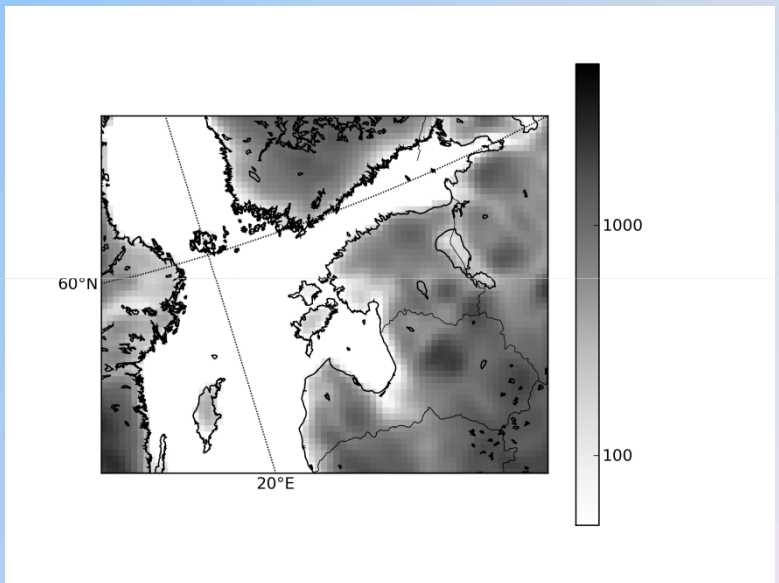
BaltAn65+

- ongoing regional atmospheric re-anlysis project at University of Tartu
- data assimilation model - HIRLAM 7.1.4
- observational data - WMO standard surface meteorological observations and soundings from ECMWF operational archive.
- boundary fields - ERA 40 global re-analysis

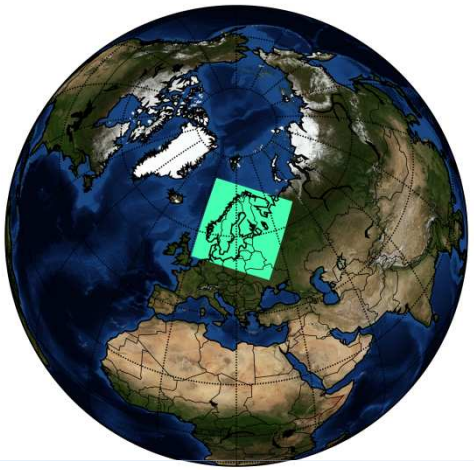
Motivation.

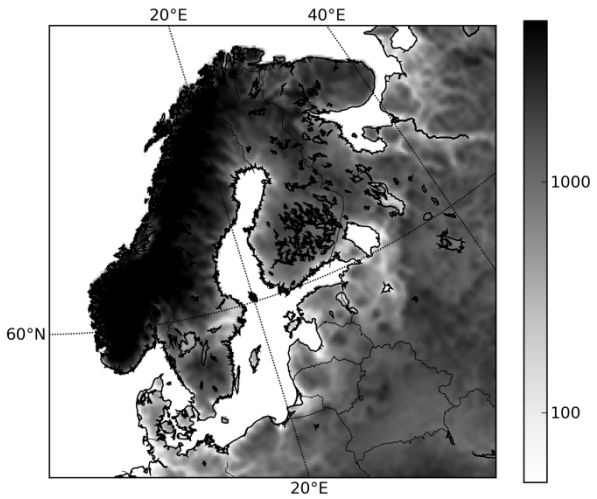
- The BaltAn65+ can be considered as a regional refinement of ERA-40 for Baltic Sea region, providing the historical weather and climate data with enhanced spatial resolution, which is main motivation for creation of this novel reanalysis database.



Model domain.

- Horizontal grid step 0.1 degrees (about 11 km)
- 206x206 points in horizontal
- 60 levels in vertical





Hirlam 7.1.4 as used in BaltAn65+

- Integration time-step 360 s. Semi-implicit semi-Lagrangean scheme.
- 6-hour forecasts are made at each analysis cycle

- HIRLAM 3DVAR

- Initialization - digital filtering (DFI)

- Savijärvi radiation scheme is applied for both long and short wave radiation
- Planetary boundary layer parametrization is based on a prognostic turbulent kinetic energy equation with diagnostic length scale (TKE-l)
- For clouds and condensation - STRACO
- surface scheme - ISBA

- Standard HIRLAM physics modules are used with one exception. In HIRLAM 7 wintertime temperatures over the sea ice are sometimes un-physically low and to override the problem, the routine for calculation of that temperature (surtend_sea.F) is taken from the earlier HIRLAM 6.4 model

Database

- The period of the reanalysis is 01.01.1965-31.12.2005 (41 full years).

- Interval of saving model states is 6 hours, four times a day in standard meteorological hours 00, 06, 12, 18 UTC.

- Estimated size of reanalysis database - 4TB