Application and verification of ECMWF products 2015

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1. Summary of major highlights

No significant changes. Medium and long term weather forecasts at LHMS are based on ECMWF models output. Boundary conditions from ECMWF are used for local limited area NWP models – Lithuania tailored HIRLAM and HARMONIE-AROME. ECMWF EPS and ECMWF WAM model data are now also being received through the dissemination system (only used via ECMWF's web services previously).

2. Use and application of products

Include medium-range deterministic (HRES) and ensemble (ENS) forecasts, monthly forecast, seasonal forecast.

2.1 Post-processing of ECMWF model output

2.1.1 Statistical adaptation

2.1.2 Physical adaptation.

Boundary conditions from ECMWF deterministic suite (via optional BC project) are used in: Hirlam HL4; 0.036 degree resolution, +54 hours forecast. HARMONIE-AROME 2.5 km resolution +54 hours forecast. 1 hourly ECMWF BC coupling in both models. Product delivery: 4 times daily, based on 00, 06, 12 and 18 UTC data.

Include limited-area models, hydrological models, dispersion models etc. that use ECMWF model data (HRES and/or ENS) as input (e.g. for initial conditions / boundary conditions / etc.)

2.1.3 Derived fields

2.2 Use of ECMWF products

There is no significant changes in usage of deterministic and EPS forecasts products. All 3–10 day weather forecasts are based on ECMWF model output. Monthly and seasonal forecasts of mean temperature and amount of precipitation (based on ECMWF forecast) and to comparision with standart climatological normal (1961–1990) is provided in the website of LHMS (www.meteo.lt).

3. Verification of products

ECMWF deterministic model output is used in our general verification system, together with HIRLAM and HARMONIE-AROME models, but only covering a short-range period.

3.1 Objective verification

3.1.1 Direct ECMWF model output (both HRES and ENS)

3.1.2 ECMWF model output compared to other NWP models

3.1.3 Post-processed products

3.1.4 End products delivered to users

3.2 Subjective verification

3.2.1 Scores of verification of monthly mean and seasonal mean temperatures forecasts are provided in figure 1 and figure 2.

3.2.2 Case studies

In the case of strong wind on the 11th of January 2015 (up to 31 m/s on the sea shore and in the southwestern part of Lithuania) the formation of the low (cyclone) and its trajectory was predicted well 180 h in advance, however the right position of its centre well predicted was only 36 h in advance.

Situation favourable for **ground frost** on the 30th of April 2015 was predicted 132 h in advance. Another case of ground frost on the 4th of May was predicted well 156 h in advance, however 132 h in advance ECMWF forecast was wrong and model return to the previous scenario 120 h in advance.

The situation favourable for **extreme high temperature** (Tmax up to 35,2 ºC) on the 3–6 of July of 2015 by ECMWF was predicted 216 h in advance. Another heat wave on the 3–12 of August (Tmax up to 37,4 ºC, near to the highest temperature ever observed in Lithuania) was predicted 84 h in advance. In this case was very good forecast of the duration of the heat wave and run of temperature (well predicted slightly lower temperature on the 9–10 of August).

4. References to relevant publications

No publications.

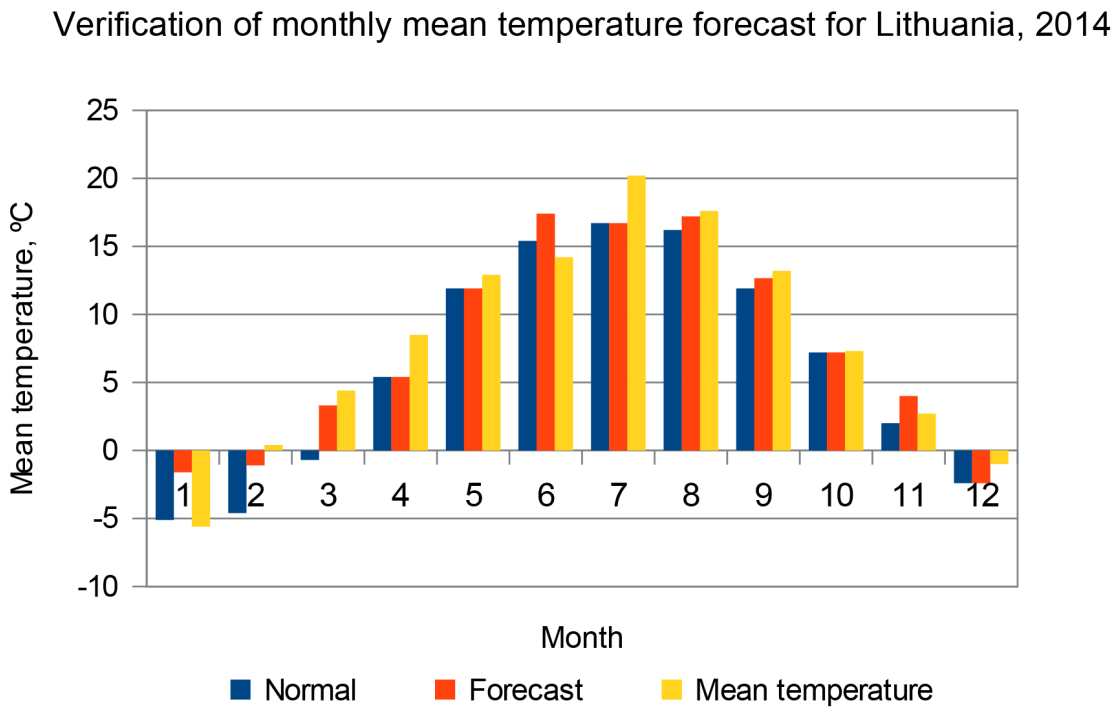

Figure. 1. Monthly mean temperature, monthly mean temperature forecast and normal (1961–1990) for Lithuania

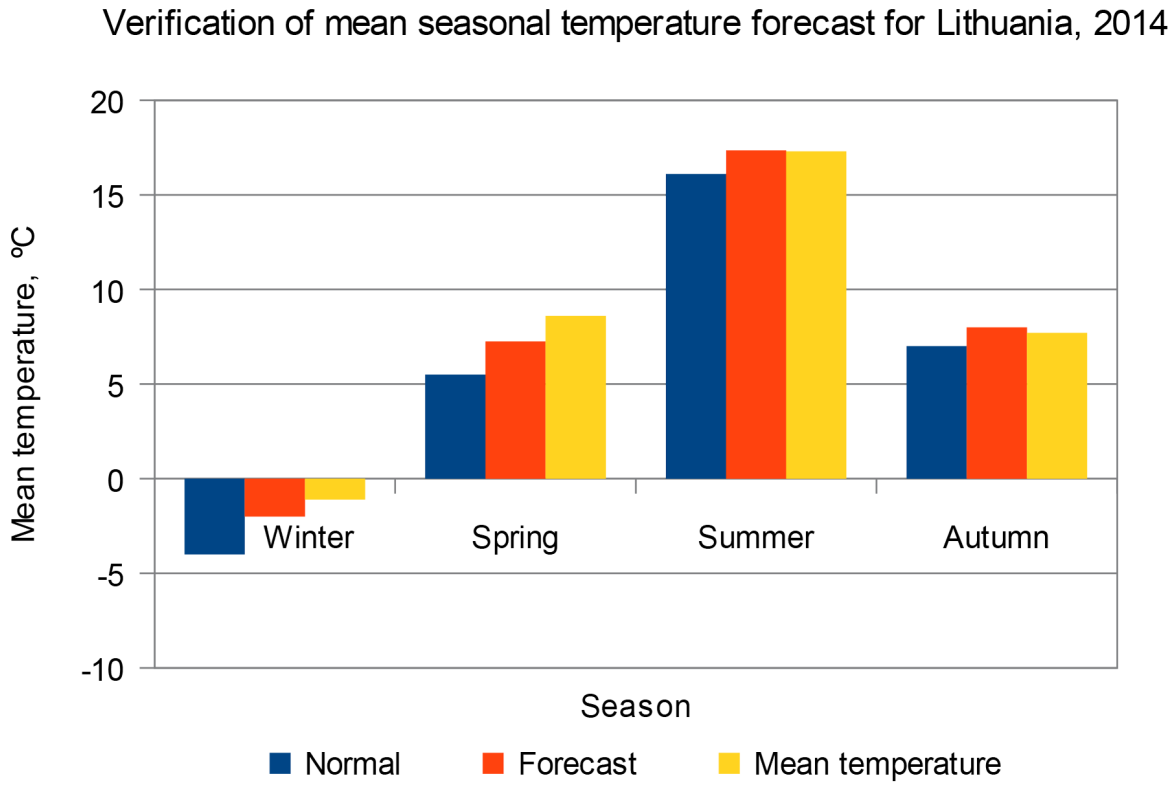

Figure. 2. Seasonal mean temperature, seasonal mean temperature forecast and normal (1961–1990) for Lithuania