

Application and verification of ECMWF products 2011

Lithuanian Hydrometeorological Service (LHMS) – Martynas Kazlauskas, Vida Ralienė (Ms)

1. Summary of major highlights

ECMWF models output is a milestone for medium- and long-range weather forecasts at LHMS. Boundary conditions from ECMWF via BC project are used for local limited area NWP model (Lithuanian-tailored HIRLAM).

2. Use and application of products

2.1 Post-processing of 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 HL7; 0.071 degree resolution, +54 hours forecast.
- Hirlam HL4; 0.036 degree resolution; +54 hours forecast.
- Harmonie-Arome 2.5 km resolution +24 hours forecast.

Boundary delivery: 4 times daily, 00, 06, 12 and 18 UTC data.

2.1.3 Derived fields

2.2 Use of products

The ECMWF products are the base of most of the forecasts. There are no significant changes in usage of deterministic forecasting products. EPS products are used intensively for extreme weather events prediction (Extreme Forecast Index).

EPS-based probability products, monthly- and seasonal-range forecasts output are available via password-protected webpage only. Deterministic forecast products are available in two ways: via webpage or model output received in GRIB format and visualised on Messir-Vision forecaster workstation. Alternatively, the fields are visualised with GrADS (COLA/IGES) software package for internal web pages of LHMS.

Magics++ (ECMWF) visualisation for external web users is used and is expected to replace GrADS in internal production in the future. Grib_API (ECMWF) is used for pre-processing (decoding) of ECMWF fields before parsing into Mysql & Oracle databases (used at local warning system & other).

Monthly- and seasonal-range forecasts output is used to compile 4-week (issued every Friday), monthly (issued on the last day of every month) and seasonal (issued on the last day of every season) forecasts of mean temperature and amount of precipitation tailored to Lithuania. Those forecast are available for public via LHMS website. Format of monthly and seasonal forecasts is a text message, 4-week forecast – a diagram.

3. Verification of products

3.1 Objective verification

3.1.1 Direct ECMWF model output (both deterministic and EPS)

A system for verification of the ECMWF products has not been implemented.

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 Subjective scores (including evaluation of confidence indices when available)

3.2.2 Synoptic studies

The summer of 2010 in Lithuania was rich with extreme weather events: heavy rain (>50 mm in ≤ 12 h) locally occurred 12 times; hail ≥ 20 mm – 3 events; 2 events of squall or tornado with wind speed ≥ 28 m/s.

The situation favourable for a heavy rain on the 17th of May locally in Southern part of Lithuania (54–60 mm in 4–6 hours); on the 4th of June in Central and Eastern part of Lithuania (50–84 mm in ≤ 12 h); on the 20–21st of June locally in Southern and Eastern part of Lithuania (52–73 mm in 7–9 hours); on the 13–14th of July locally in Central and Southern part of Lithuania (50–60 mm in ≤ 12 h); on the 18th of July locally in Western and Southern part of Lithuania (56–75 mm in ≤ 12 h); on the 23–4th of July locally in Western part of Lithuania (52–80 mm in ≤ 12 h and hail 30 mm); on the 28th of July locally in Central and Western part of Lithuania (50–52 mm in ≤ 12 h and tornado 28 m/s in Akmenė); on the 8th of August locally in the Western part (69 mm in 8 h and squalls or tornado in Southern and Central part of Lithuania) by ECMWF was predicted 48–120 h in advance.

Heavy rain on the 19th of August (53–56 mm in ≤ 12 h) was not predicted, but this event was very local.

4. References to relevant publications

None