Application and verification of ECMWF products 2016

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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 model – Lithuania tailored HIRLAM and HARMONIE-AROME.

2. Use and application of products

Include medium-range deterministic and ensemble forecasts, monthly forecast, seasonal forecast

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 HL4; 0.036 degree resolution, +60 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.

2.1.3 Derived fields

2.2 ECMWF products

There is no significant changes in usage of deterministic and EPS forecasts products. All medium and long-term weather forecasts are based on ECMWF models output. All deterministic, EPS and WAM products are being used both via ECMWF's web interface and ingested in GRIB format into the local production systems.

3. Verification of products

Include medium-range deterministic and ensemble forecasts, monthly forecast, seasonal forecast. ECMWF does extensive verification of its products in the free atmosphere. However, verification of surface parameters is in general limited to using synoptic observations.

More detailed verification of weather parameters by national Services is particularly valuable.

3.1 Objective verification

A system for verification of the ECMWF products has been implemented, including a performance comparison against local deterministic LAM setups.

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

Year **2016** in Lithuania was poor with extreme weather events – only 6. ECMWF predicted situation favourable for those events in advance 108–240 h:

The situation favourable for a **severe convection** on 11th July (in the Southern part and in some northern regions of Lithuania thunderstorms, squalls up to 19 m/s, 22 mm/12 h of rain and hail**)** was well predicted by ECMWF model in advance 156 h and very well – in 108 h. Another case of active convection in the Southern part of Lithuania on the 28th July (thunderstorms, squalls up to 19 m/s, 35 mm/12 h of rain, hail) was well predicted in advance 108 h.

The situation favourable for **local heavy rain** on 6th July (in the SW of Lithuania thunderstorm, 53,4 mm/12 h) was predicted in advance 168 h, on 1st August (thunderstorm, 55,5 mm/6 h of rain) was predicted in advance 180 h, but has been changed to wrong side later and again returned to the previous scenario and predicted situation favourable for extreme event in advance 108 h.

The situation favourable for **extreme high temperature** (Tmax 30–35,4 °C) on 24 th – 26th of June was predicted in advance 156 h.

Situation favourable for **ground frosts** (T min. -0,1...-3 °C) on the 10th of June was predicted very early – in advance 10 days.

4. Feedback on ECMWF “forecast user” initiatives

5. References to relevant publications

No publications.