

EUMETSAT Study Status Update: Enhancing the MTG LI User Readiness

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Introduction

- The purpose of the study is to
 - Chart the readiness and expectations of the main data users (i.e., National Meteorological and Hydrological Services in Europe),
 - Generate LI-proxy data available for all of the main data users,
 - Test the LI-proxy data in data assimilation
 - The study was launched in Nov 2014 and ends in July 2015

Introduction

- The study has the following outcomes:
 - Evaluation of the relevant user readiness and expectations before exposure to space-borne lightning data on an operational basis
 - Enhancing the readiness and awareness of the main future LI product data users
 - Collection and analysis of the feedback and input regarding the proxy data, its use in the case studies, and the LI products (flashes, accumulated products).

Introduction

WP1 User readiness and expectations
(RMI, FMI)

WP2 Proxy data experiments
(IMGW, RMI, DWD, FMI)

WP3 Generation of proxy data
(FMI, RMI, IMGW)

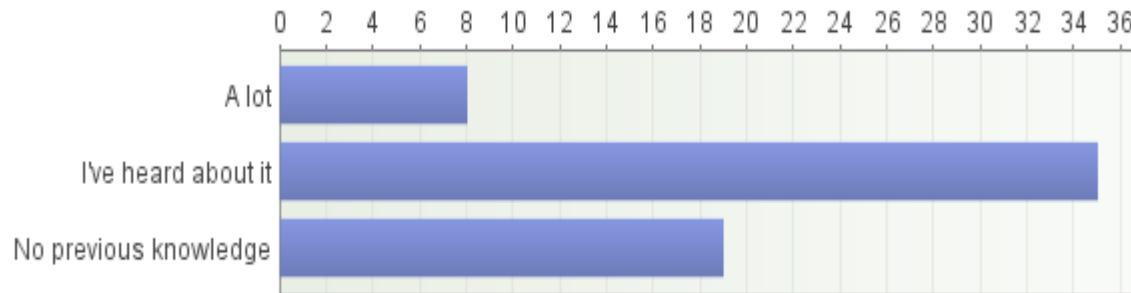
WP4 Data assimilation for nowcasting
applications
(FMI)

WP1: User readiness and expectations

- An electronic questionnaire was prepared and distributed to the NMHS's of EUMETSAT member states
- The questionnaire was delivered to those parties whose contact person was identified related to operating a lightning network and/or with links to operational NWC using any lightning information currently available
- The tool used for the survey and the feedback analysis was the www-based Webropol-survey tool
 - The survey was sent to a total of 35 persons
 - A total of 62 responses from 17 different countries

Some results of WP 1

- Plenty material/statistics available



Above: summary of answers related to question "Prior to this survey, how would you rate your knowledge of MTG LI in general and its capabilities?"



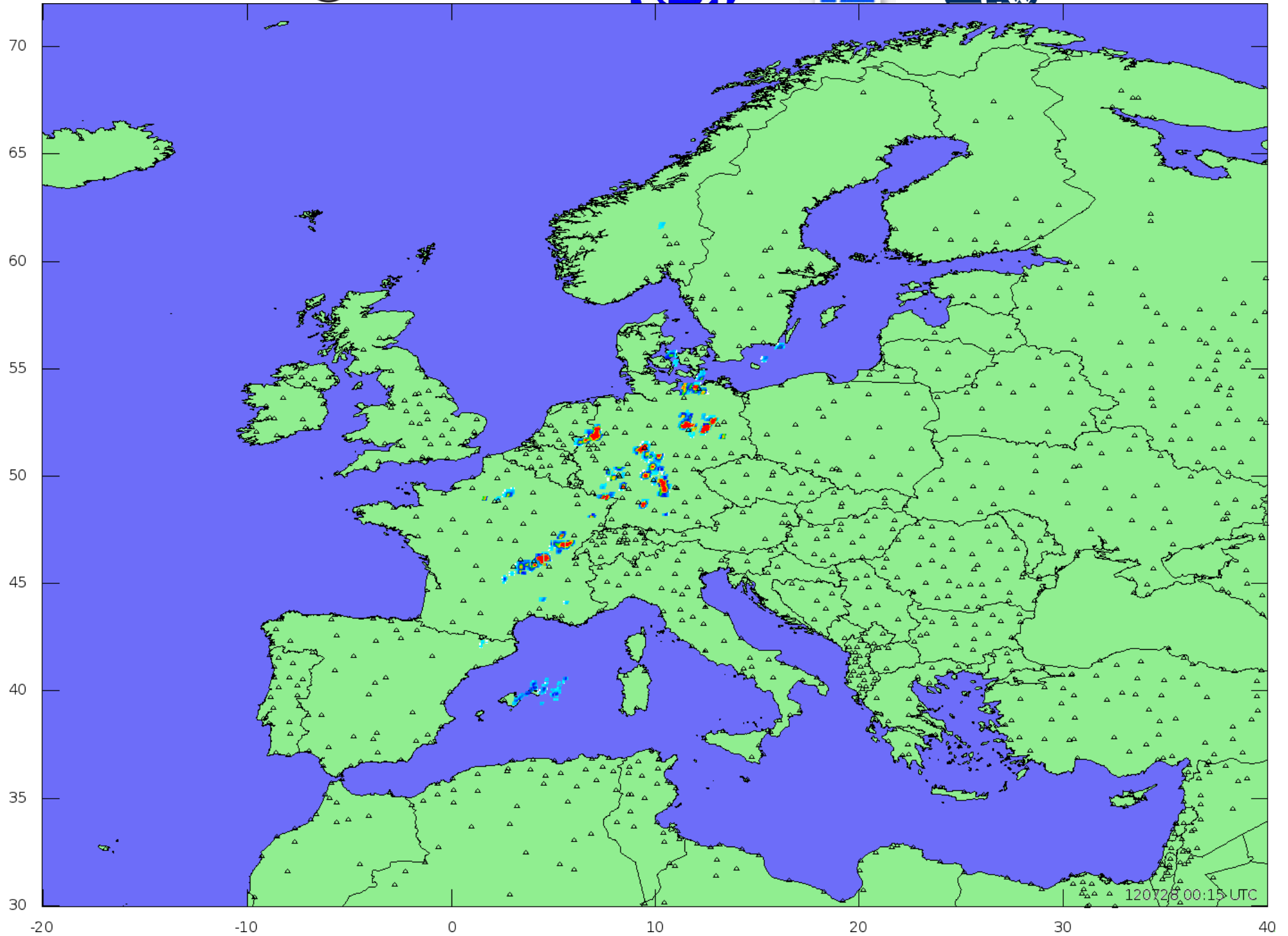
Above: Countries providing answers to the questionnaire.



Above: "Does your organization already make use of lightning location data in any form?"

WP2: Proxy data experiments (**IMGW**, RMI, DWD, FMI)

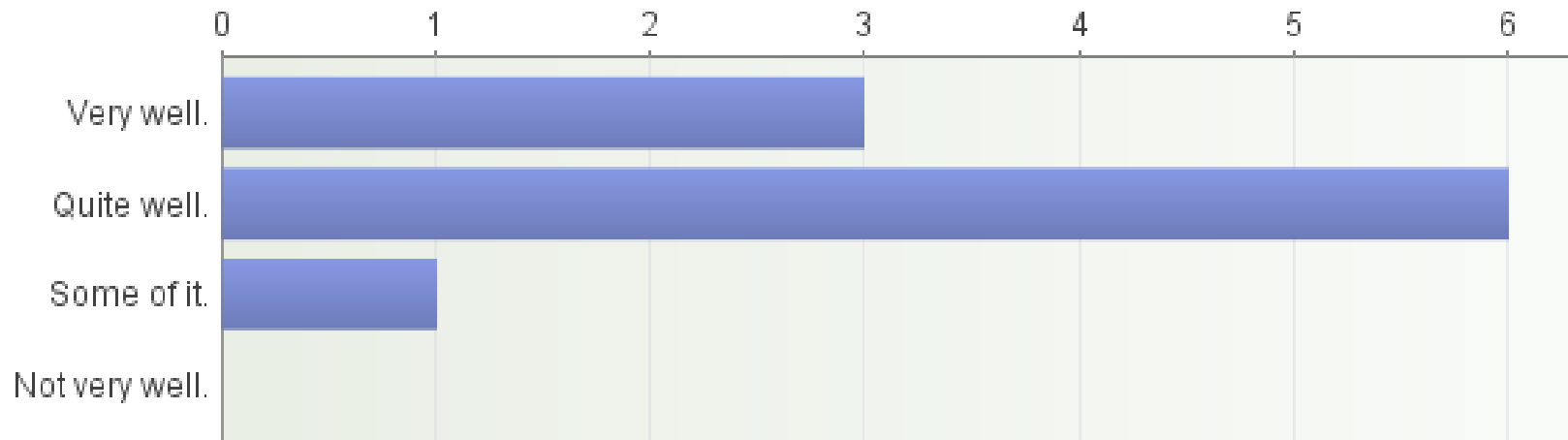
- Proxy data experiments with NMHS's and their operational users of lightning data with historical case studies
- An internal study team with operational forecasters and researchers has been set up (FMI, RMI, IMGW, DWD)
 - Data visualisation and reporting tools for the case studies
 - Two visualisation tools: one covering the whole Europe (common tool for all), another for a zoomed/specific region for each country



Status of WP 2: proxy data experiments (cont.)

- Results based on the forecaster comments:**

- According to the forecasters, the greatest benefit is to observe lightning in real time way outside the national borders
- With optical data it is possible see the intracloud lightning
- The accumulated product looks useful for estimating the storm intensity



How well you feel you understood the purpose of the demonstration tool?

WP3: Generation and assimilation of proxy data

- Extending the proxy data methodology to Vaisala LF and VHF data
- A proxy data generator based on Vaisala LF and VHF ground-based data has been developed
- The transformation functions are based on statistical properties between the optical (TRMM) and ground-based data sets
- At present, the proxy data can be generated and used as an input to WP2

WP4: Data assimilation for nowcasting applications

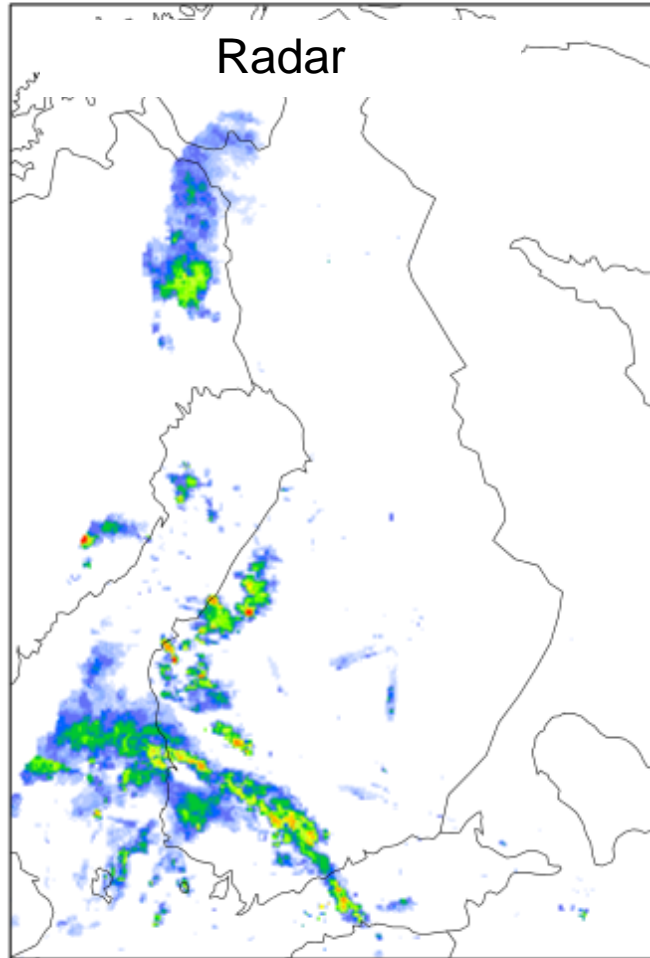
- Local Analysis and Prediction System (LAPS) is a tool that provides a 3D-analysis of atmosphere based on the high resolution observations and *a-priori* background information
- Assimilation of lightning data into LAPS has the potential to generate a better precipitation and cloud analysis, which would have impact on the nowcast and short-term high resolution forecast
- LAPS code has been further developed together with NOAA and Vaisala (Dr. Antti Pessi)
- Currently
 - the ingest and process of lightning location data has been accomplished successfully, i.e., data can be ingested into LAPS
 - Radar profiles based on lightning data have been calculated, i.e., lightning data can be used to estimate and make more accurate the precipitation rates within LAPS

the EUM reference processor proxy data ingestion and

Examples of reflectivity, 30 July 2014, 16UTC

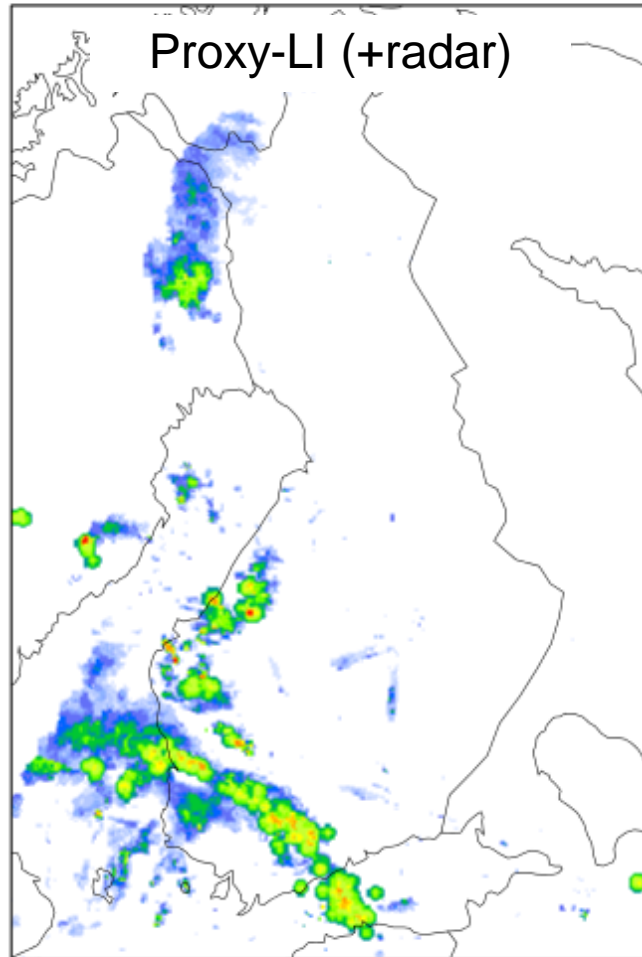
Reflectivity (dBZ)

Radar



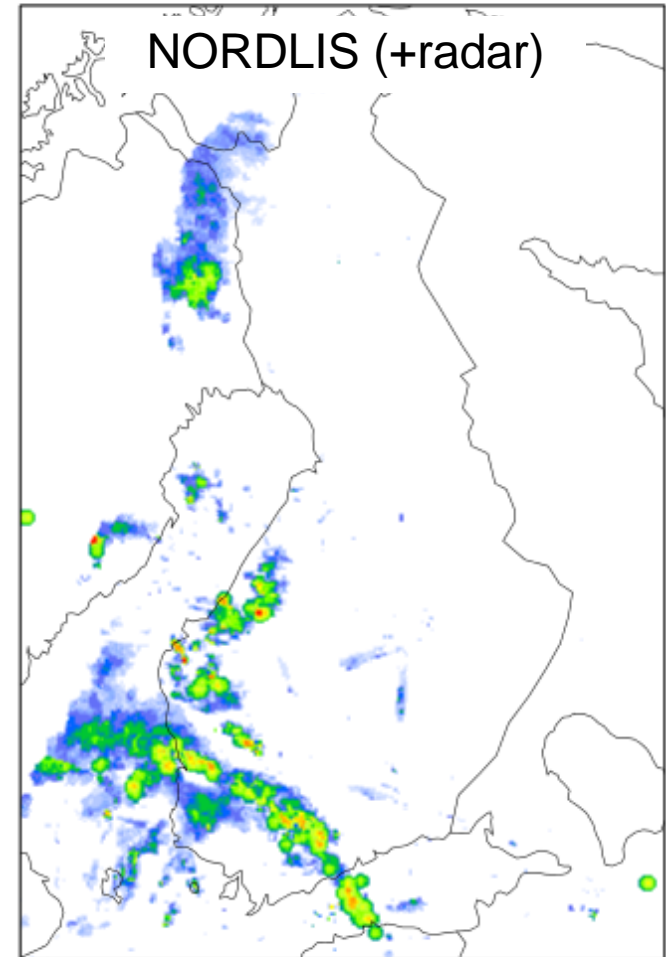
Reflectivity (dBZ)

Proxy-LI (+radar)



Reflectivity (dBZ)

NORDLIS (+radar)



0 5 10 15 20 25 30 35 40 45 50



0 5 10 15 20 25 30 35 40 45 50



0 5 10 15 20 25 30 35 40 45 50

Proxy data visualisation - examples

<https://virpo.fmi.fi/finpac/LIMAG/index.html>

Summary

- Feedback from the operational users of lightning data in Europe has been collected regarding the Lightning Imager and its (proxy) data
- At present, the proxy data can be visualised and animated for case studies
- A possible extension in the future is to test the LI-proxy data in operational **real-time usage** in a subset of European NMHS's → this requires the reference processor to work fast (this is not the case at present)

Grazie!

Thank you!