

NMS news from the September 2023 meeting in Tallinn, Estonia.

AEMET (Spain – Jesus Barroso)

Provision of services: Since last year forecasters are allowed to work from home for up to 60 % of their shifts. This organisational change has had preapproved by the aeronautical supervision authority and is expected to become permanent with minor changes.

Integration of new ECMWF cycle: The new ECMWF cycle has been implemented in the internal production, initially with 18 km with a higher resolution following in late 2023. There is also a project to define new ensemble derived products.

Verification of post-processing of temperature: In spring 2023 the verification of statistical post-processing of maximum and minimum temperature was implemented daily and the scores show a much better behaviour of the post-processing respect to the direct model output (ECMWF or HARMONIE-AROME). As the post-processing is strictly statistical, it shows worse behaviour the first and second day after strong changes in the meteorological situation.

Products oriented to forest fires: Development of a viewer of the main variables for the management of forest fires (model output of temperature, humidity and wind intensity and direction), with thresholds chosen by the users in order to detect severe conditions. There is also a temporal meteorogram in the forest fire coordinate available on request and precharged imagery for reporting the meteorological situation.

CHMI (Czech Republic – Marjan Sandev)

New organizational structure

From 1st of January 2023, a new Forecasting Service Division was established, separated from the Meteorology and Climatology Division. This division incorporates the Meteorological Forecasting

Section, the Hydrological Forecasting Department and the Forecasting Service Development Department. The aim of this change is to focus on the expertise of forecasting offices and communication both between departments and sections, as well as towards the public and customers.

Warning System updates:

Changes of display alerts on the CHMI websites. Approved version of two maps: the first map displays information about all severe phenomena, and second map inform about observed severe phenomena, which require extraordinary attention and possibly quick response to protect property and health of the population; From 1st of May 2022 a support expert team, the Convective Group, started to work to help operational forecasters in decision-making process with severe convective storm forecasting and nowcasting. In the convective season (from May to September), forecasters from the Convective Group have shifts every day, when storms are expected. They prepare alert proposals and summary reports for media and social networks, explain forecast uncertainty, prepare case studies, and train the forecasters. The working group for new (Impact based/oriented) warning system has been working since the summer of 2022. A group consists of sub-groups with different tasks. I. group - Limits, Impact, II. group – Hydrology, III. group - CAP, Alert Editor – meteorological workstation, distribution, IV. group: Education, V. group: Communication;

ČHMÚ developed a mobile application: SMS alert for mayors – access to the application only for mayors and external employees of the regions, and also participates in distribution of alerts for state and local government organizations through many other applications operated by partners; Ambulance, Municipality, etc.

International and national cooperation with organizations and customers:

Preparation of interdepartmental cooperation in the rental of drones for terrain/damage survey

activities, the purchase and training of pilots is planned

Cooperation with an Amateur Meteorological Society, who prepare an application - browser and database for reporting severe weather phenomena from the field (similar to ESWD of ESSL). Preparation of a cooperation with the Mountain Rescue Service on sharing warnings (avalanches probably will be a part of the NMS warning system, assumes distribution to Metealarm)

HAMR (Hydrology – Agronomy – Meteorology - Retention) – as part of the PERUN project (Prediction, Evaluation and Research for Understanding National sensitivity and impacts of drought and climate change for Czechia) was developed. The goal of HAMR is drought status information with a resolution of the region level on surface and underground waters with a prediction for 1 week, not currently part of the warning system.

FROST – a part of TAČR grant project cooperated with Institute of Atmospheric Physics. The aim is to better predict the surface temperature and condition of the Czech motorway network (linear forecasting). The project supposes the use of new data sources, especially satellite measurements, which will be used for a cloud extrapolation;

In cooperation with the organization CzechGlobe, the FIRERISK model was innovated. FIRERISK is a forecast model for predicting the risk of occurrence and spread of fires. Based on the experience of the fire in the Czech Switzerland National Park, the model was updated. It uses the outputs of the ALADIN model (from 00 UTC). The overall risk is a combination of the Haines index, drought conditions, and the FWI Fire Danger Index itself.

Automatic creation and distribution of products at the request of customers from the energy suppliers (ČEZ, ČEPS) , transport (road – ŘSD, railway – SŽ) and public services segments (WOLT). Data, text, graphic forecasts of severe weather phenomena with a large impact - e.g. wind gusts, storms, snowfall, icing, rime.

Education and Training

Coordination of preparation, creation of online meteorological courses in MOODLE (mandatory, optional) for newcomers as well as operational fore-

casters. Examples of courses: Convective storms (mandatory), Road meteorology (mandatory), Integrated warning system and meteorological workstation Visual Weather – Alert Editor (mandatory), other optional courses: Basics of synoptic meteorology, Satellite and radar meteorology, numerical weather forecast etc.

Final note

Due to the recent economic crisis, CHMI was forced to reduce the number of employees by 3% (23 employees) from 1st October 2023. Unfortunately, the reduction mainly fell on forecasters from the meteorological and hydrological section (10 forecasters in total).

DMI (Denmark - Janne Rydhof Thor Hansen)

HQ is moving - Operation department on October 4th, rest of DMI will follow November 6th. New organization unit of the Operation department with focus on projects. We are now issuing warnings to the Greenlandic public. Lastly, we have started a new team of seven to become forecasters with two of them to be posted in Jutland.

DWD (Germany – Robert Hausen)

Forecasters more involved in project work and education which has led to the cancellation of zoomed in 3 hourly analysis charts over central Europe. Forecaster staffing at regional offices has become limited as it has been hard to hire suitable candidates (shift work not attractive enough anymore despite home office and dislocated work has been established in recent years for some shifts). Finally some significant rainfall during winter and spring with slow recovery of the groundwater table, but drought returned since mid of May 2023 with short interruption in July.

A new warning project called „RainBow“ has started. It will automate the warning process for some events with individualization of warning information for key customers and expert users. This will give harmonization of thresholds between general, aviation as well as maritime warnings and include consideration of impacts. It is hoped it will bring improved communication.

FMI (Finland – Juha Sihvonen)

No big changes but a focus on a goal of continuous improvement including monthly 1-page verification reports for the whole Weather and Safety Centre unit since April 2021 and Short (3 pages?) verification reports for aviation weather since Sep 19, 2023.

GeoWeb development: Together with KNMI/ Netherlands and MET Norway. Mainly used for viewing satellite and radar imagery but also some use with surface observations. Some forecasters use it for viewing model information too. KNMI is further with developing & implementing weather warning and TAF tools, not yet confirmed but probably going to adopt the TAF tool as only a backup system initially.

International projects. Training projects in various countries, often jointly financed with foreign aid funding from the Ministry for Foreign Affairs of Finland, EU, World Bank loans etc and also as commercial projects where target country buys training with no outside funding. Currently projects in Central Asia (Tajikistan, Uzbekistan, Kyrgyzstan), eastern Africa (Rwanda, Tanzania, Kenya, Ethiopia) and Nepal.

ILM (Estonia – Taimi Paljak)

Three new forecasters started work in the spring and general forecasters are working from home for about 65% of their hours. The HQ building is quite old so work has started on renovation in forecasters rooms, requiring a move to the temporary place. There is also a plan for a new building near the sea to be called Environment House.

A very dry spring in April and May and again at the beginning of Summer followed by rain at times in July which helped to mitigate a catastrophic situation for agriculture. September brought very heavy rain, that was forecasted by MetCoop and also ECMWF, Extreme forecast Index was with high values.

Two VAISALA radars with IRIS software scanning every 5 minutes are working quite fluently, perhaps thanks our radar specialists. They have developed nowcasting product for 2 hours ahead based on radar observation (the main parameter is wind vector). We have a project for renewing the forest fire charts and other production. Our

warning system needs more personal approach to the clients and after active discussions with our IT company we have decided to start with development project for warnings. ILM is participating in modelling development in group MetCoop. Our mobile application ILM+ (weather +) is now quite widely used although it needed many corrections at first, there is still a issue with warnings.

IMGW (Poland – Szymon Ogórek)

Further steps of the reorganisation: Improvement of measurement network, further automatization of SYNOP stations, working on new products (nowcasting for example), new layout of website.

Change in operational structure: Current structure is 6 regional forecasters, 1 forecaster responsible for warnings (extended team) in summer (mid May until mid September) for 8 hours 12-20, 1 forecaster responsible for Poland and coordination, 1 media forecaster (8 hours in Warsaw) and 3 short commercial shifts (4-6 hours). From 2024 there will be 4 regional forecasters, 1 forecaster responsible for warnings (extended team), 1 forecaster responsible for Poland and coordination, 1 media forecaster (8 hours in Warsaw) and 4 commercial shifts (8 hours).

The trend is for a shrinking team (recently few people went on retirement) so few will do more with no option for replacing missing workers

Quite calm storm season, warm August and September

IMS (Israel – Shai Katz)

- Establishing the Israeli Radars Network in collaboration with the Airforce, Israeli Government Water and Sewage Authority and Cyprus, maybe the Jordanian Radar will also be added.

- Strengthening the new Floods forecasting centre.

- Now a High-resolution fire danger model and a new wildfire model.

- A lot of new features for the website: models, new marine and aviation pages, climate changes, portal for the National Fire and rescue authority and a new page especially for the municipal authorities.

- New HPC with 1344 processors and 112 TFlops. 20 million NIS (€ 5 million) are allocated for this project by the government. Adoption of the German model – will be used by all the Israeli meteorological community.

- Storm naming project - cooperation with Greece and Cyprus.

- Cooperation with the Jordanian and Palestinian meteorological services under European auspices, including flash floods courses and warnings for the various emergency authorities.

- South-East Europe Meteorological International Training Workshop – SEEMET.

- Collaboration effort between the Israeli government, academy and IMS to rise a National Climate Calculation Centre.

IPMA (Portugal - Paula Leitao)

In 2023:

One new forecaster at the Aeronautical Weather Centre - now operational under supervision, soon to be certified. 3 new forecasters at the General Forecast Centre - now fully operational.

Ongoing project of collaboration with local authorities for improving the weather station network is allowing for an increase in the quantity and quality of surface data. New HPC (high performance computer) is pre-operational now. Several operational problems with VAISALA / Iris Focus radar software update. Updating radar network on the Portuguese Mainland: 2 single-polarization radars will be completely replaced by dual-polarization doppler radars.

Looking forward to 2024:

The implementation of 2 new dual-polarization doppler radar systems in São Miguel island and in Flores island of the Azores archipelago. Implementation of a lightning network in Azores.

Hiring new technicians including: 15 meteorological observers for aeronautic proposes, 15 weather meteorologists and 3 climatologists. This is a longstanding project to fill in existing gaps in development and forecasting teams as well as filling gaps left by soon retiring forecasters.

Thresholds established at the beginning of the METEOALARM project, based on impact and/ or climatology, are now under study:

- Snow – impact-based thresholds recently reviewed

- Wind – impact-based threshold

- High/ Low Temperature – climatology-based threshold – under study change into impact-based

- Costal Event – impact-based thresholds – under study to better include wave energy and damage

- Fog - seriously difficult to assess impacts and set thresholds

- Thunderstorm – seriously difficult to assess impacts and set thresholds

- Rain – impact-based thresholds – under study

KNMI (Netherlands – Jos Diepeveen)

Last 4 years of KNMI program Early Warning Center, funding will stop next year 2024. This included Renewal warning system, My KNMI, extranets, New KNMI app, Verification.

Redesign of IT system, which is a spaghetti of software. Often including tools made by forecasters under pressure. Most crucial software now running in AWS (Amazon).

Ongoing development web based Meteo Work Station Geoweb with FMI Met Norway etc.

Operational forecasters took part in the Cycle 4 Climate 250 KM bike ride up the length of the Netherlands to bring attention to the impacts of climate change.

LVGMC (Latvia – Valerija Kostevica)

New developments include: MODES data from airplanes are being visualized for operational work use, giving opportunity to have more often vertical observation data for temperature and wind. A now-casting radar product has been developed. Post processing data of HAR/ECMWF now available for editing wind speed/RH/temperature/pressure. A heat record and precipitation monitoring system.

During last year improved collaboration with Radiation Safety Centre where we prepare additional information about potential spread of nuclear pollution because of war in Ukraine.

Four new employees hired in the forecast division: two forecasters completed training as aviation forecaster, one in progress and a further trainee completed their training as general forecaster.

In 2021 we started work on a project with the main goals of improved joint LEGMC and SFRS impact-oriented early warning system of dangerous hydrometeorological conditions.

Met Éireann (Ireland – Liz Coleman)

Met Éireann switched to DINI and DINI-EPS for operational purposes; with Harmonie and IREPS disabled. Moving from a new model run every 3hrs to a new model every 1hr. Also moving from 15 ensemble members to 30 ensemble members. A huge increase in the volume of data for forecasters to analyse.

High-resolution model of horizontal grid resolution of 750m is continuing to be developed, mainly for Aviation forecasting services.

A lot of IT overall with finalisation of design of new text-based forecasting system. Tenders for visualisation model, Web Services and Weather Warning System are being prepared.

A new team called Collaborative Re-engineering in AI For Transformation (CRAFT) has been created in Met Éireann which will act as a bridge between Met Éireann and the forthcoming University College Dublin (UCD) professorship in Data Science for Weather and Climate. It will also interlink with other local, national, and international organisations to help progress AI/ML service and research projects.

Flood Forecasting Division became operational, providing daily guidance to local authorities and issuing High Tide and Flood advisories.

Forecasters have been taking part in ESSL training course and testbeds on severe convection and MTG products.

Recruitment ongoing for operational forecasters.

Met Eireann has been liaising with Health Service

Executive to develop guidance for public during Heatwaves.

MET Norway (Leonidas Tsopouridis)

GeoWeb:

A new meteorological workstation: An application used by the forecasters to visualize meteorological data and produce weather forecasts is under development. So far it has been presented in workshops/ training courses and is on display in our forecasting room in Bergen.

New staff have been hired mainly in Bardufoss, Orland. KraK (deep convection) group is looking into methodology, tools, database and new criteria. Strom Hans: was an extreme storm to remember causing difficulty between “a lot of rain” and “torrential” rain warnings so will develop tools to aid prediction of intense convective rain in.

Met Office (UK – Nick Roe)

Exploiting ensemble strategic action will see the UKMO moving to ensemble only NWP rather than a deterministic model in 2024/2025. This will be based on the 18 member MOGREPs 10 KM out to 14 days with the global model deterministic control and MOGREPs 1.5 KM to 7 days with the UKV as the control. Visual Weather forecasting tool will be replaced by the fully online Vortex, all meteorologists are engaging with development via sandbox versions and surveys. Until this goes live ~800 new parameters have been added to Visual Weather via cloud based servers which can be viewed as images overlaid on the ingested data. LEELA has now replaced ADT as a new lightning detection system. 1.5KM UKV data is now freely available on Windy.com as it is so widely used by the public as part of the “stay safe and thrive” value.

Civil and Defence forecasting branches have now been merged with a joint management team. Product streamlining is ongoing to reduce duplication and identify automation potential. Operational Meteorologist staffing level has dropped to a challenging low, PDev (UKMO College) are running surge courses to get more people qualified and Op Met Technicians have become Foundation Meteorologists with a faster route from joining the office

being fully operational. UKMO is now a Category 2 emergency responder, elements of the national security risk register that it is responsible for include heat, storms, snow and ice as well as space weather.

Proposal to create a database of national records, starting with Europe. This is following recent increased number s of requests from the media it has been found to be difficult to get reliable data on other nations national extremes. It would be available to all but only editable by the NMS who owns the data so that each NMS can be responsible for updating as records are broken. Challenges are differences in what data each nation retains, how to judge what is a usable extreme record (e.g. should an alpine mountain top site hold a record low temperature etc) and where the database should be hosted.

Météo-France (France - Bruno Gillet-Chaulet)

Weather Events:

"Ciaran" windstorm with exceptional winds in north-west France (sometimes exceeding the values of the 1999 storms Lothar and Martin). Read the article about this system in this Newsletter, with the interest of AI model forecasts.

Major flooding in northern France (Pas-de-Calais) with unprecedented rainfall sequences in autumn and winter. At the same time, exceptional drought continued in the south of the country (Pyrénées-Orientales): climate change is amplifying extremes! Several cyclones in overseas territories.

Observations:

Deployment of an 'Ajaccio' buoy (off Corsica) to better observe conditions following the devastating storms of summer 2022 on the island. Additional buoys to come. New station in the Mont Blanc massif to monitor avalanche risk.

Production:

Changeover to a new production chain at the end of 2023, called ALPHA. The database, initialized automatically, contains observed and forecast meteorological data from hour H to D+14 over France. ALPHA is supervised at a national level (creation of a dedicated forecaster position) and can be

corrected "manually", if necessary, with proposals from forecasters at a regional level. ALPHA then feeds all Météo France productions. Adjustments have been (and will continue to be) made.

NWP:

New chain under test, with modifications in the assimilation of observations in AROME and awaiting observations from MTG-I1 satellite! AROME at 500m resolution deployed for the Paris Olympics (See previous Newsletter).

A great deal of work in progress on the use of artificial intelligence (AI). In particular, the aim is to develop a fine-scale AI emulator based on 'deep-learning' from AROME analyses.

Weather Warnings:

Production of bulletins at a 'departmental' level (administrative division), until now these have been national and regional. 73% of the 2023 warnings were anticipated with more than 6 hours' notice, against a target of 60% (see article on "Vigilance" in previous issue of the Newsletter). Enhanced meteorological support for forest fire fighting.

Climate:

Météo France provides a '*Reference Trajectory for Adaptation to Climate Change*' (TRACC in French). This is a 'framework' to which society must adapt. By the end of the century, France should be +4°C warmer than in the pre-industrial era!

Trade and Services:

Availability of public data (European 'directives') on the meteo.data.gouv.fr portal. Very strong mobilization for assistance (institutional and commercial) to the Paris Olympic and Paralympic Games.

Staff and Corporate Responsibility:

Another increase in the workforce, with 25 additional jobs planned for 2024!

Energy-efficient renovation of buildings. Tree planting on the 'Météopole' site in Toulouse. Development of a gender equality plan for the coming years.

MeteoSwiss (Switzerland - Andre-Charles Letestu)

Autometar : AutoMetar LSGG 24/24 from June 2024 (already in use during the night) with TRENDS, lightning and wind warnings issued from the office In WMO's building. Autometar LSZH 24/24 in 2026 and regional airports after that. Future of the SYNOP : not decided yet.

www.drought.ch: A project between MeteoSwiss and BAFU (hydrological institute) showing measurements and forecasts.

Weather 4 UN: Prototype of a Global HydroMet Scanning Capability providing hydromet information and expert advice to the Humanitarian Actors (HA). Data from different sources are collected, analyzed and compiled, providing added-value advice. This part of the project is developed in close collaboration with the WMO Secretariat in Geneva. Development of a tool to estimate the combined risks and impacts of forecasted natural hazards. Based on a globally consistent probabilistic risk model ([CLIMADA](#)) coupled with probabilistic weather forecasts from WMO Member countries and territories, the estimation of multi-hazard impacts will enable humanitarian actors to plan and anticipate the best responses to protect the most vulnerable populations.

Severe events 24.7 : Storm in La Chaux-de-Fonds (Jura) 217 km/h recorded with heavy damage. Heat wave mid-august record of 0°C height at 5298 m on the 21 August, the snow limit dropped to 1800 m on the 28th. Flooding in Ticino, 358 mm in Biasca between 26 and 27 august.

The ICON ensemble model will replace COSMO : operational: 9.4.2024 and from 14.9.2024 MeteoSwiss has been on Instagram.

RMI (Belgium – Thomas Vanhamel)

Climate centre: new (sort of spin-off) institute at the site in Uccle with separate funding; 8 full time meteorologists covering climate services, climate communication and scientific liaison between other scientific centres and stakeholders (e.g. media, private sector, public sector).

New pollen forecasts together with the health agency.

Implementation of a “mini EPS” in the road model for forecasting slippery roads

Migration of models from our HPC to ECMWF infrastructure (ALARO-14, ALARO-40, AROME-BE). BC from IFS instead of arpege.

Implementing a flash flood nowcast warning derived from radar products.