UEF feedback session

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ECMWF

Structure of the User Voice Corner

UK time

- 15:50   Summary of Responses to the Online Feedback Survey (11 questions)

- 16:15   Virtual Breakout Groups (set of 5)

- 17:15   Ends

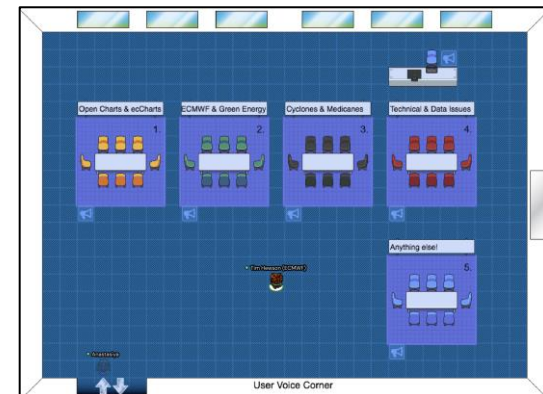- We hope to post Breakout Group summary bullet points later tomorrow

ECMWF   EUROPEAN CENTRE FOR MEDIUM-RANGE WEATHER FORECASTS   2

Breakout Groups - within Gather.Town - 16:15 UK time

A chance to quiz ECMWF experts directly, or deliver requests, feedback etc...

1. Open Charts and ecCharts   (Cihan Sahin, Sylvie Lamy-Thepaut)

2. ECMWF and the Renewable Energy sector   (Thomas Haiden, Robin Hogan)

3. Tropical Cyclones and Medicanes   (Fernando Prates, Linus Magnusson)

4. Technical/Data issues   (Emma Pidduck, Manuel Fuentes, Xavi Abellan)

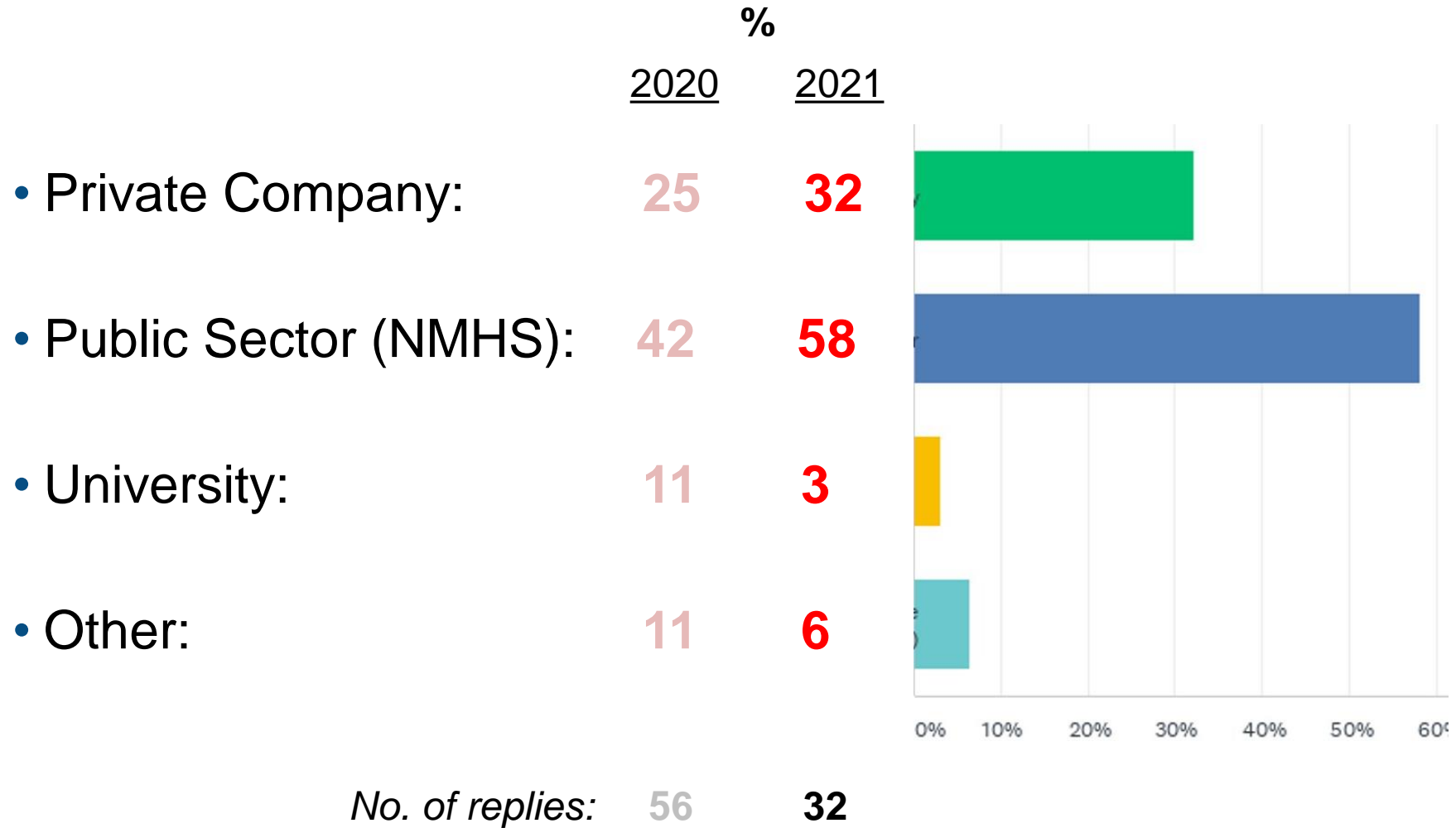5. Anything else!   (Tim Hewson, Ivan Tsonevsky, Umberto Modigliani)

<u>Please move around the virtual ECMWF and "drop by" any desks that interest you – you can go to more than one!</u>

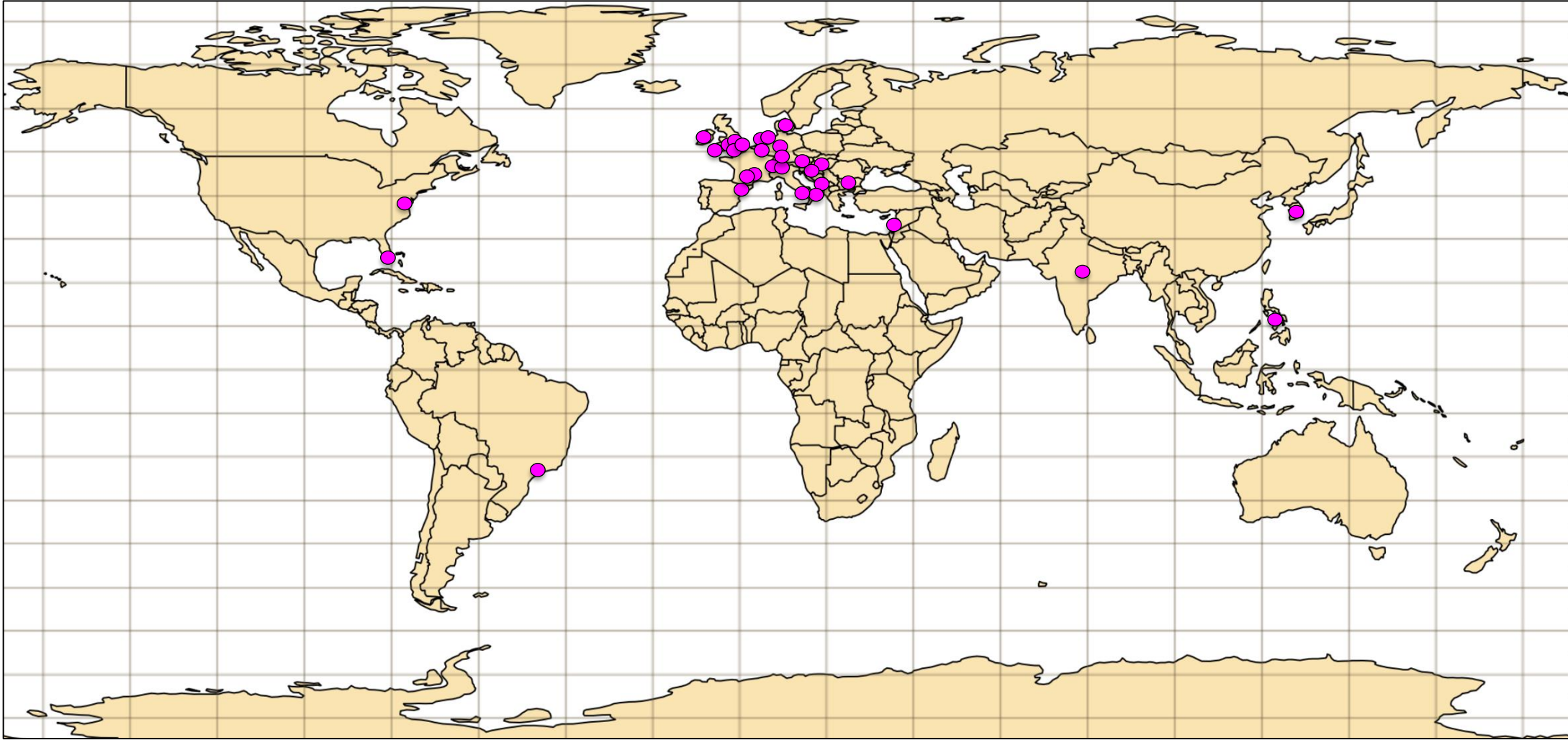**ECMWF** EUROPEAN CENTRE FOR MEDIUM-RANGE WEATHER FORECASTS

Survey Results

- Will include some illustrative plots provided by respondents

**Q1: Which of the following categories best describes your employer?**

	%	
	2020	2021
• Private Company:	25	**32**
• Public Sector (NMHS):	42	**58**
• University:	11	**3**
• Other:	11	**6**
No. of replies:	56	**32**

Q2: …Name and Affiliation… :   Where are survey responders based?

General remarks on your online survey responses:

1. Some users have **requested products, or raised issues**, that **ECMWF has already partly or fully addressed**

2. Some users highlight **issues that are known about** and that have been documented / discussed on the **known forecast issues page** and/or in the **online ECMWF Forecast User Guide**.

3. Some **key topics** will be covered in **breakout groups**

4. Other **related topics** will be covered, on Fri, in the **Extended Range section** or **Speakers Corner**

5. Feel free to contact me, or other ECMWF staff, for **anything else** that needs addressing!

ECMWF's online Forecast User Guide
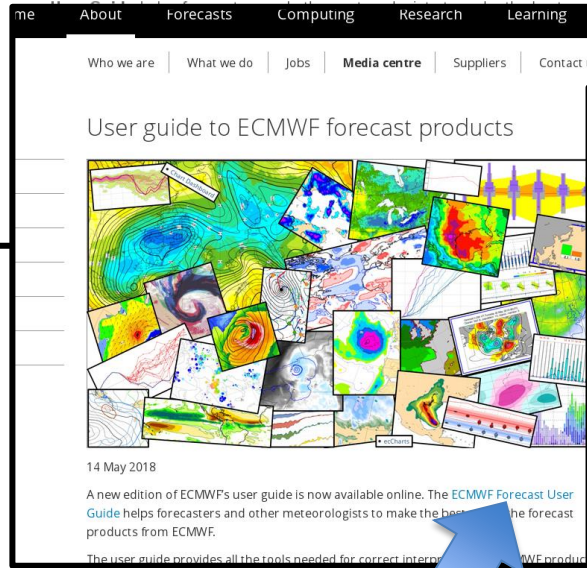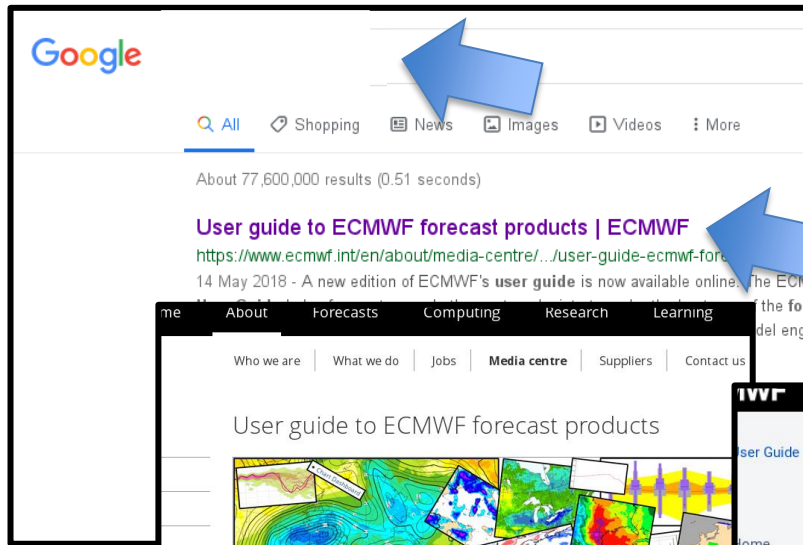
Q3: **What forecasting aspects** that relate to ECMWF model outputs are of particular concern to you and your organisation? (1 of 4)

- **<u>Short Range</u>** 8
- Medium Range (ENS) 18
- **<u>Extended (=Monthly)</u>** 11   *Range*
- Seasonal 9
- ERA5

- Rainfall/Precipitation 5
- Temperature 5
- Geopotential 4
- **<u>Low level Winds (10m, 100m, gusts, …)</u>** 6
- **<u>Solar Radiation</u>** 2   *Parameter*
- Humidity 4
- Visibility
- Snow
- Waves
- SST

Q3: What forecasting aspects that relate to ECMWF model outputs are of particular concern to you and your organisation? (2 of 4)

IMPORTANT

- Extremes / **High Impact Weather** 5
- CAPE / Convective Indices 2
- Aviation forecasting / Aviation hazards (e.g. turbulence / icing) 2   *Hazards*
- Tropical Cyclones / Tropical Weather 2
- Hydrological Extremes 3

- Plumes 2
- Meteograms 3
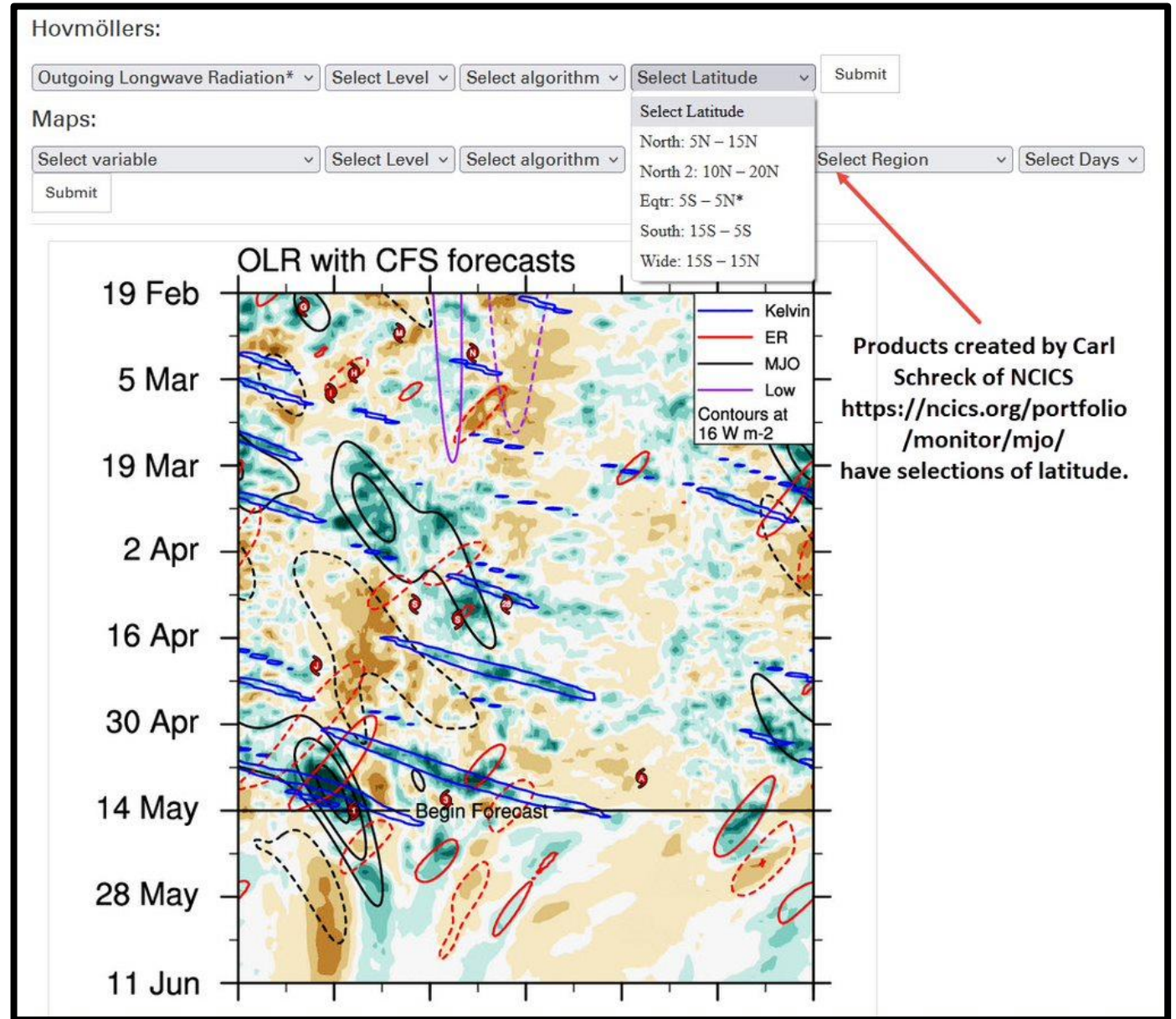- EFI 2   *Products*
- Tephigrams
- **Hovmoeller**

- Timeliness
- Simplicity of access   *Access*

External example of interactive selection of latitude bands for Hovmoeller plots

See Ivan Tsonevsky's talk in Speaker's Corner on Friday: for related ongoing work at ECMWF !

Q4: Have you experienced any particular problems with ECMWF forecasts in the last 18 months (e.g. systematic errors/biases, one off bad forecasts)? (1 of 2)

- No/no entry: **39%**

Precipitation
- 7 dates with ppn overestimates by HRES in Campania, Italy, in Dec 2020
- Convective ppn issue - diurnal cycle timing
- Region-specific biases (NW Andes, African lakes, tropical areas generally)
- Overestimated in S America
- UK shower coverage too extensive when showers small scale
- HRES fails to show pre-existing convection suppressing adjacent over-land convective initiation (Florida)
- Precipitation peaks for leads >D6 too great in winter (Austria)
- Ppn event Bulgaria 9-10 Oct 2020 – big changes in IFS forecasts D4-6 range
- Can be overly extreme in medium ranges
- Snow can occur with unrealistically high 2m temperatures **2**
- Light ppn forecast for Alpine areas (<0.5mm/6h) usually means dry (just cumulus instead)
- Forecast bust for late April 2021 Switzerland (too wet when rain needed!)
- Rainfall under-prediction in coarse grid models
- Marine convective precipitation does not penetrate inland enough

2m Temperature
- Extreme heat/cold too extreme in Florida
- E Florida near-coast values too low
- Maxs too low (1-2C) in hot, dry spells
- Mins too high (3-5C) over fresh snow **2**
- IFS has cold bias over snow (USA)

10m/100m Wind
- 100m wind too light generally
- Extreme mean speeds underestimated in severe weather (though gusts good)

Cloud
- Stratus / low cloud under-forecast; high cloud over-forecast
- Stratus base too low in summer
- Visibility poor in fog
- Coastal fog missing (Israel)
- Saharan Dust outbreak correlated with underprediction of upper cloud in Spain

Miscellaneous
- TC Surigae
- TC strike probs don't tally with mslp
- NH TCs - left-of-track bias?
- Extended (to D46) – several one-off bad forecasts
- Seasonal for winter 2020/21 disappointing (previous year better)
- Seasonal rainfall forecasts poor
- Surface pressure noisy around islands
- Unrealistic CAPE values

Misleading ENS mean signal for Extended Ranges – many examples provided

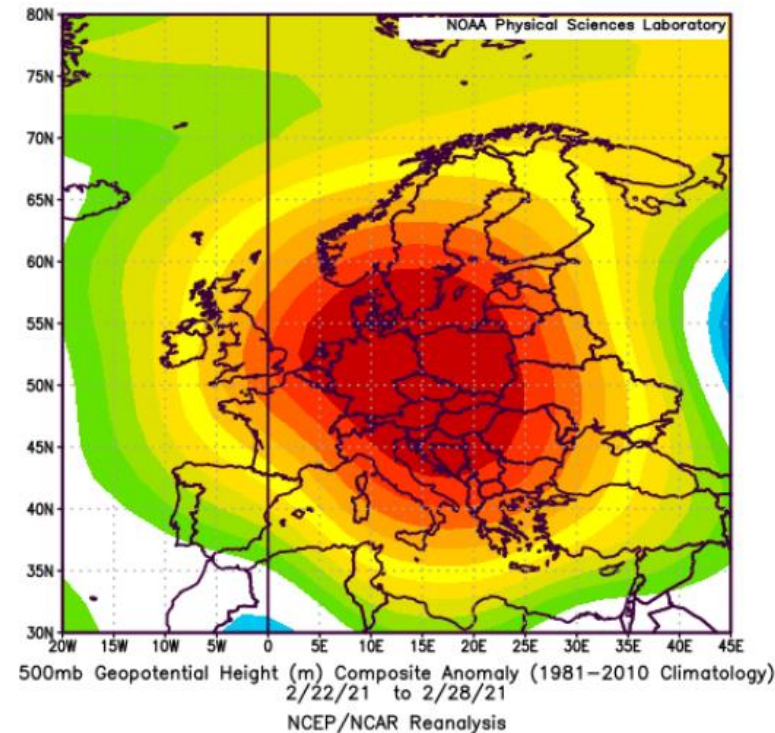Init date/s: 28/01/21, 01/02/21, 04/02/21, 08/02/21
Fcast date: Week 8 2021 (22/02/21-28/02/21)
Model: EC46 ensemble average
Comment: Model was continually indicating strong, cold Continental troughing up till 2 weeks out.
Outturn was high pressure dominated and warm

Outturn

500mb Geopotential Height (m) Composite Anomaly (1981–2010 Climatology)
2/22/21 to 2/28/21
NCEP/NCAR Reanalysis

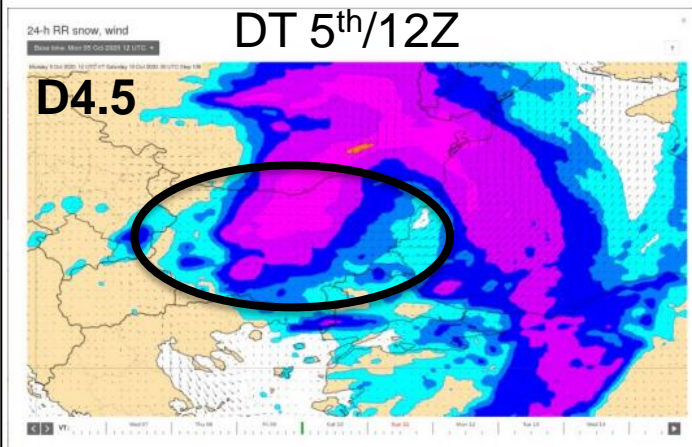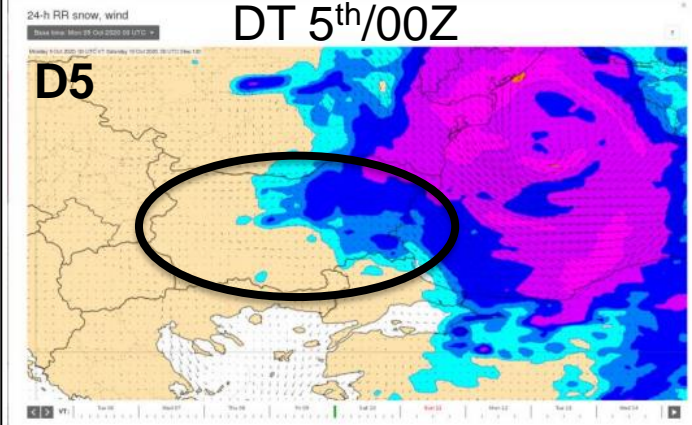Remember that sometimes outlier solutions happen – if the ensemble is reliable they should do!
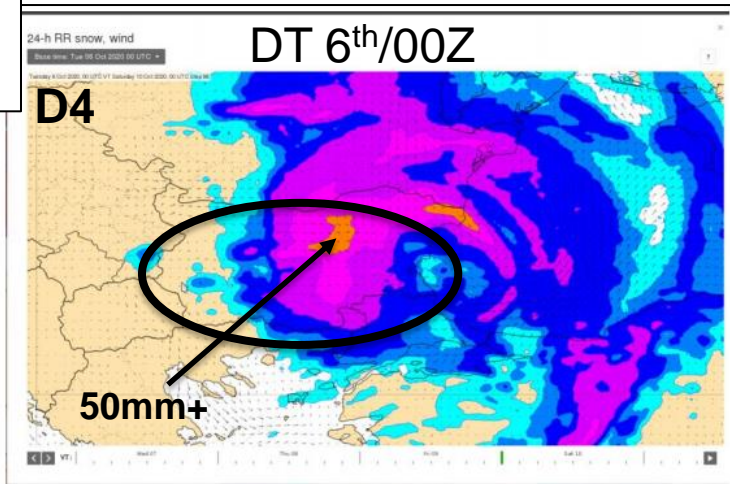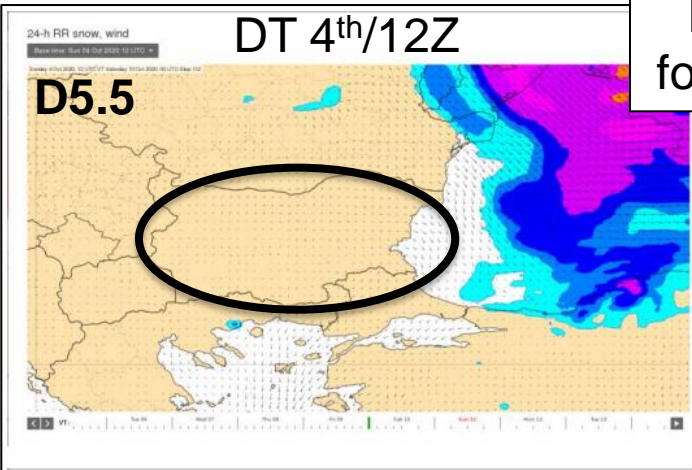
Though the existence or otherwise of "correct" outliers has not been checked for the cases provided.

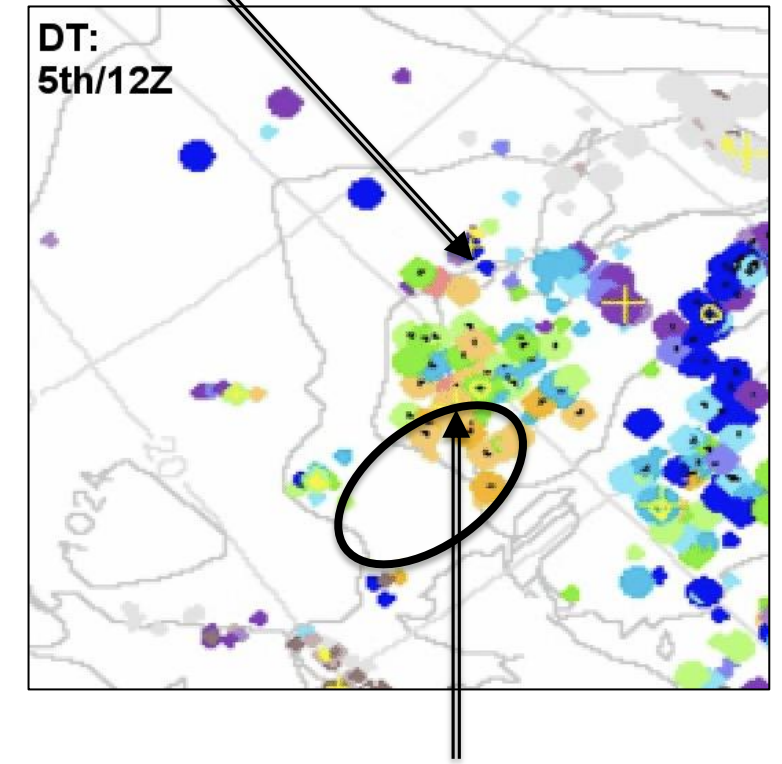And we know extended range forecasts have some reliability problems.

Please always use the reliability diagrams, that ECMWF provides online, in conjunction with our extended range forecasts.

DT 4th/12Z

HRES forecasts

DT 6th/00Z

D5.5

D4

50mm+

DT 5th/00Z

D5

Verifying ppn totals

75mm

DT 5th/12Z

D4.5

Ppn totals next day

Poor Ppn forecasts for Bulgaria – Oct 2020

HRES low DT 4th/12Z
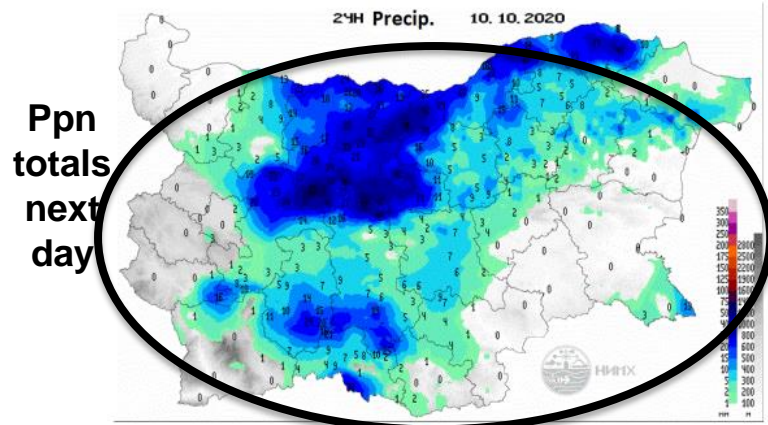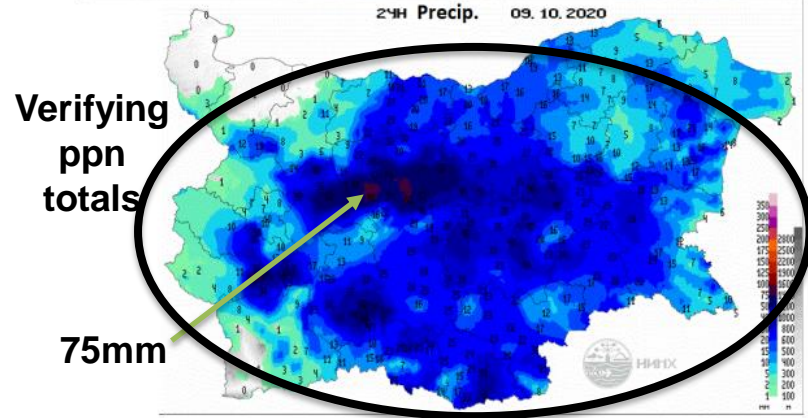
DT: 5th/12Z
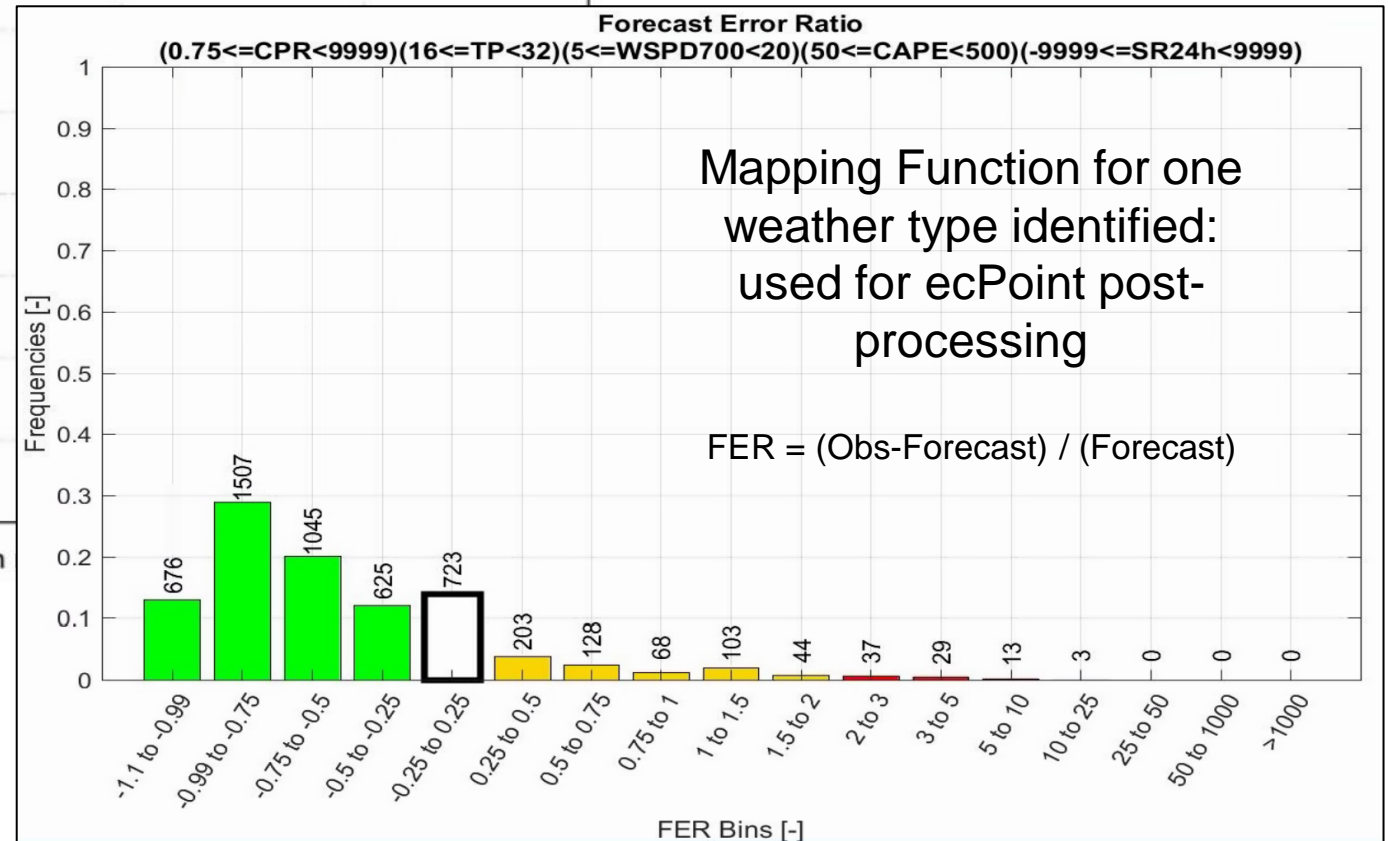
HRES low DT 5th/12Z

Cyclone Database Product segments

15
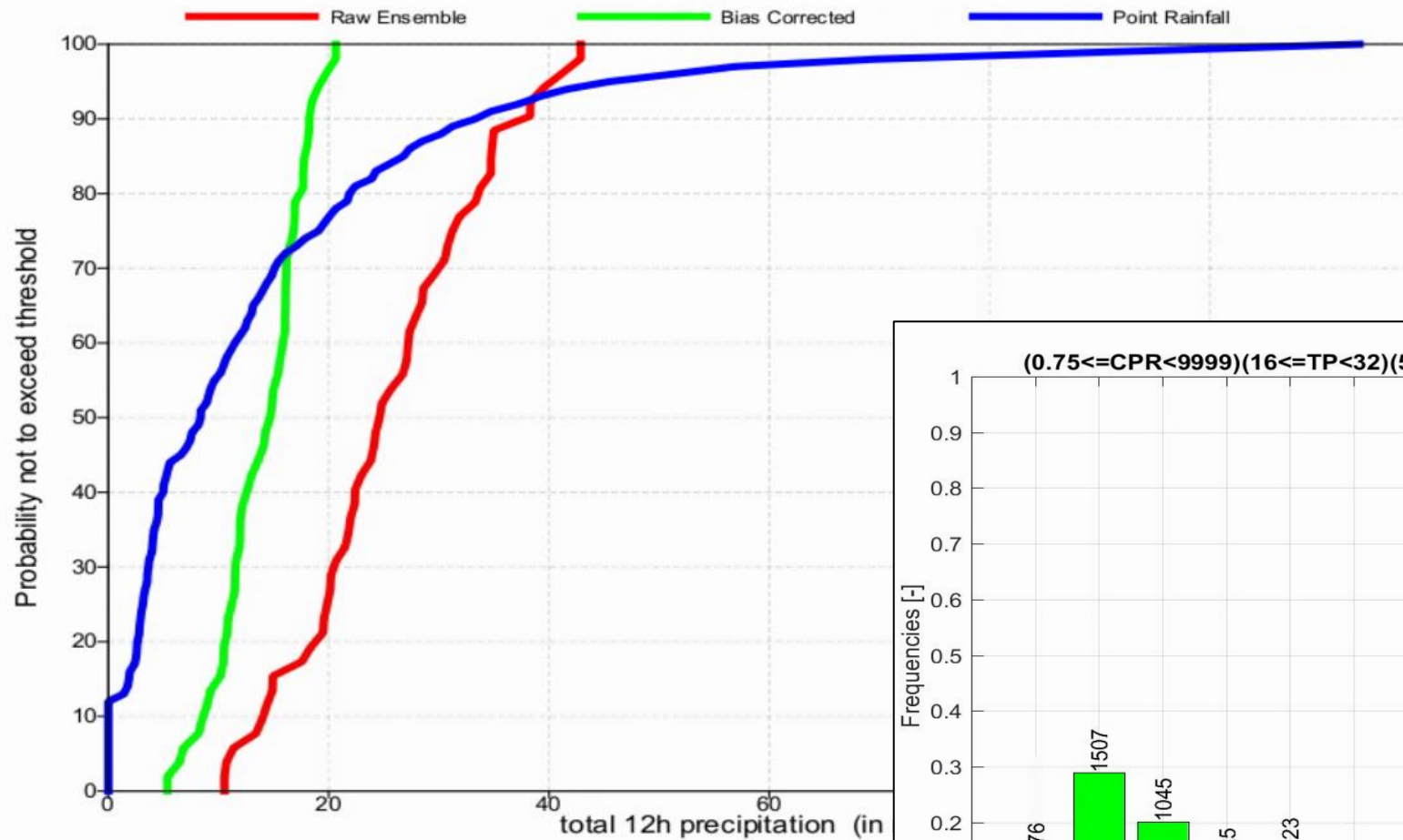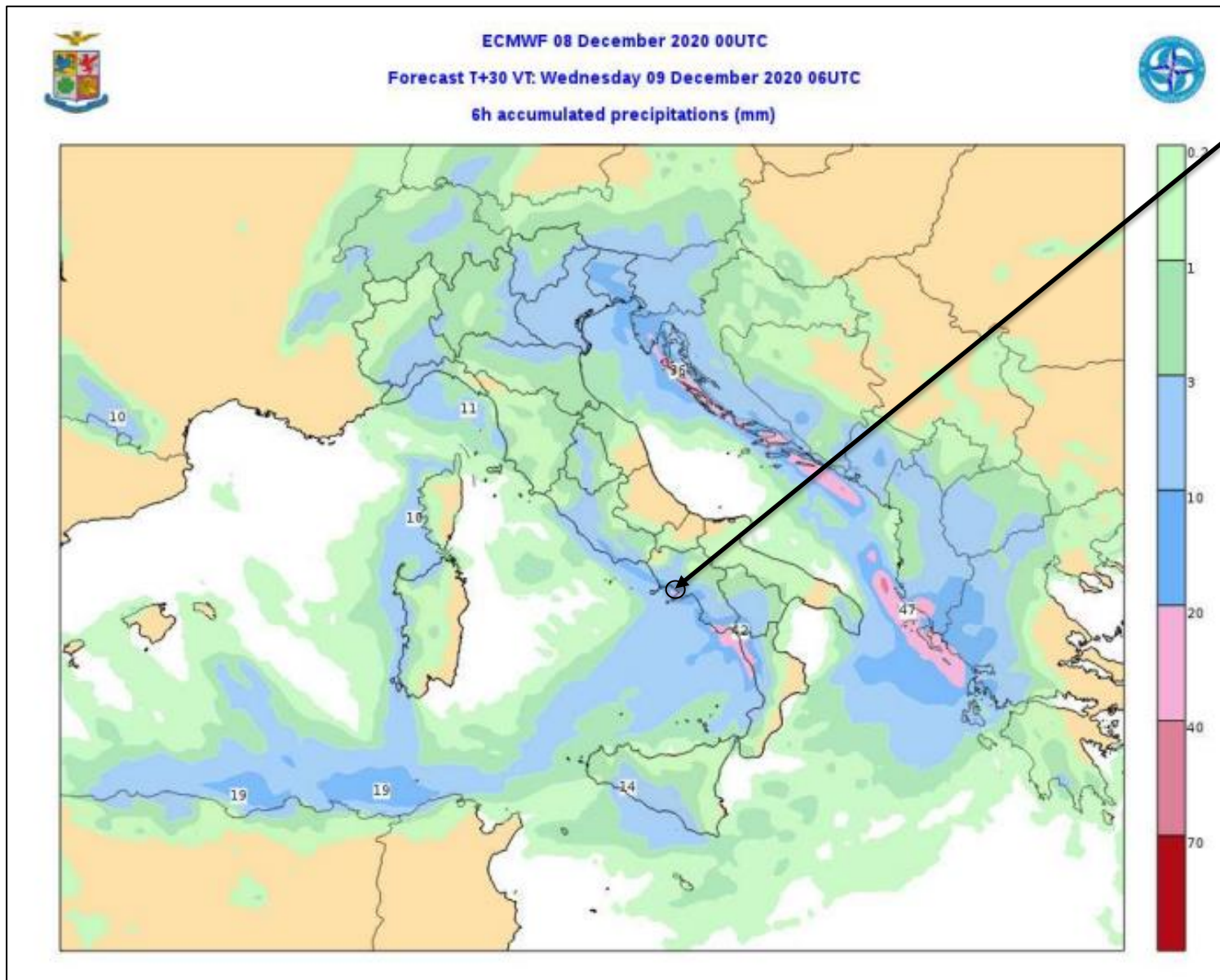
Mount Vesuvius area

Campania

Regular over-prediction of rainfall reported in this area in Dec 2020

This is one such example

Data time: Tue 08-12-2020 0Z   Lead time: T+18-30
expver = 1; CDFs for total 12h precipitation at 40.79,14.37 (= lat,lon)

ecPoint CDFs near mount Vesuvius

Forecast Error Ratio
(0.75<=CPR<9999)(16<=TP<32)(5<=WSPD700<20)(50<=CAPE<500)(-9999<=SR24h<9999)

Mapping Function for one weather type identified: used for ecPoint post-processing

FER = (Obs-Forecast) / (Forecast)

ECMWF 08 December 2020 00UTC

Forecast T+30 VT: Wednesday 09 December 2020 06UTC

6h accumulated precipitations (mm)

- ecPoint "point rainfall" forecasts for this site at short range (18-30h) suggested that IFS ENS 12h forecast rainfall was likely to be an over-estimate (and therefore probably HRES too)

- In the calibration period, for 5000+ cases which had a comparable gridbox weather situation, it would have typically been necessary to multiply the rainfall by 0.5 to 0.6, to get an unbiased forecast (at gridbox scale)

- This relates mainly to convective parametrisation, and the implied zero growth time for convective cells

- Users could thus use ecPoint output in ecCharts, or (for Italy) online MISTRAL products (which use the same ecPoint principles but blending with a post-processed 2.2km COSMO ensemble): https://meteohub.mistralportal.it/app/maps/flashflood

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Q5: Have you experienced any notably good forecasts in the last 18 months (e.g. well forecast events, variables/products performing well)? (2 of 2)

- No/no entry: **39%** (same as "particular problem" question!)

Precipitation
- 'Code red' snow event 7 Feb - Netherlands
- Great guidance for showery spell over Ireland (ppn and convective indices)
- 2 heavy rainfall events
- HRES ppn has improved
- Ppn type is reliable
- Very good for 2020/21 winter warnings (rain/snow) **2**
- Snow event over high ground in Israel 17 Feb 2021

Temperature
- Cold spring generally
- Heatwave Aug 2020

Q5: Have you experienced any notably good forecasts in the last 18 months (e.g. well forecast events, variables/products performing well)? (2 of 2)

Other
- RMM index
- Sudden stratospheric warming (e.g. Dec 2020) **2**

- TC handling generally
- Early lead warning for formative TC Bertha & its rainfall (Florida) – beat other models

- IVT, especially D6-10

- Cloud and wind gust forecasts are improving!
- LMH clouds good

- Lightning reliable
- CIN better

- Vertical profiles well-liked
- Extended Range meteograms well-liked

- EFI/CDF for medium range

- IFS generally beats other models

Heavy Rain / Flooding / Sig Snowfall in Montenegro – End Dec 2020
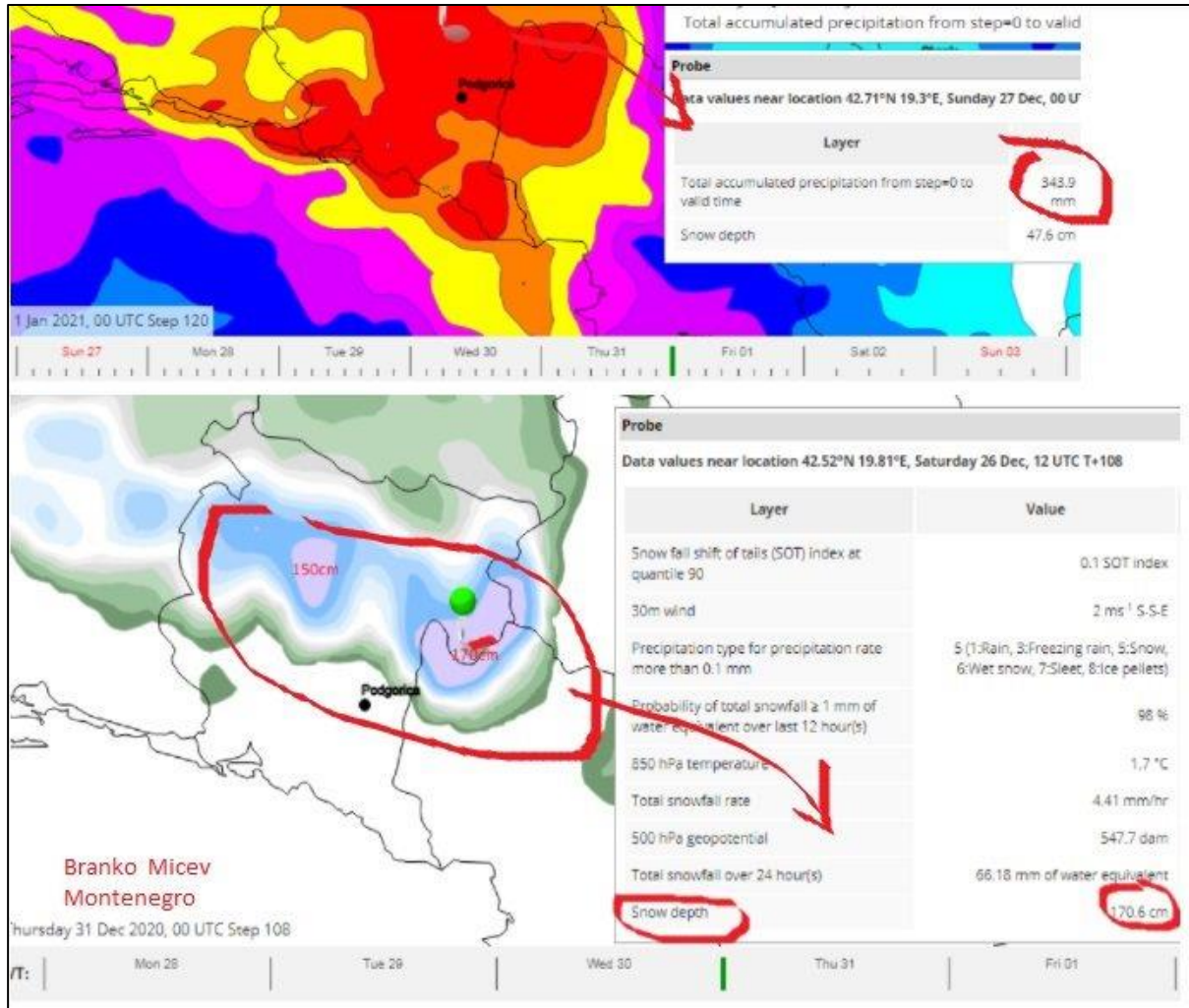
- Forecasts described as "very very good" !

WE CAN DO
BETTER

<mark>Strategy</mark>
- Open access to data
- Want all data for intermediate runs
- Cloud services for private companies
- Earlier delivery! **2**
- Abandon release schedule: deliver once available

Technical / Data Services
- High resolution wanted (details unclear)
- <mark>Login process has deterioriated, for many Met Office staff (e.g. 5 logins needed to get to ecCharts</mark>)
- Timely status updates regarding data issues (customers know before ECMWF reports)
- <mark>Single-file download for Model Climate (recently went from 1 to 40 files needed)</mark>
- Two-word city names disallowed in new meteogram window
- Animation button for vertical profiles in ecCharts needs to be bigger and relocated to top of screen

Product Changes
- Height of wet bulb temperature = 0/1C parameter may contain a bug (height above msl better?)
- Climagrams: add E. Mediterraneam region
- Hourly and instantaneous radiation values for all 10 days of HRES

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New Products
- Aviation-related (turbulence / icing) – e.g. -10C altitude **2**
- Tabulated data for convection and aviation-related parameters, at 1 or 3h intervals rather than 6h
- Rainfall mapped onto river catchments
- Most severe / frequent precip type in prev 1/3h
- Layer-average fields (e.g. mean wind for TC steering, moisture)
- Wind Shear over different layers
- "Convective gust" (thunderstorm issues)
- TC phase space diagrams (ref Bob Hart, FSU)
- Renewables-specific forecasts at all lead times (short to seasonal)
- Pre-computed Model Climate data
- Clickable charts for ERA5 climatology
- User-defined Cross-sections
- Want trajectory tool (like "HYSPLIT")
- Want CDB features in ecCharts

New Initiatives
- Do not like new-format web pages ("open charts") - MANY technical issues listed
- Meteogram window: "previous locations" no longer available **2**
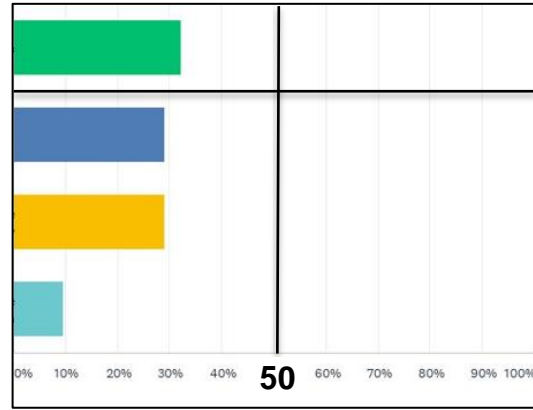- Better smartphone access to check latest forecasts

Q7. Have you experienced any issues with ECMWF products or services as a result of working from home or flexible working?
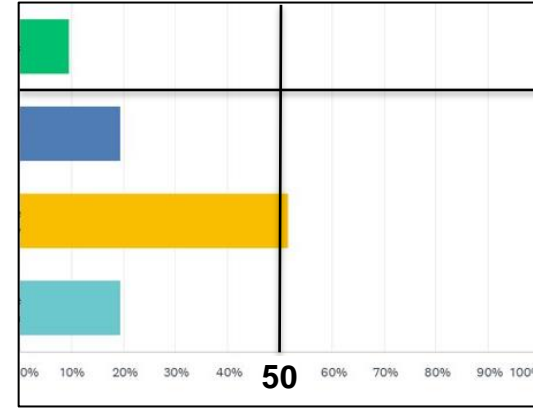
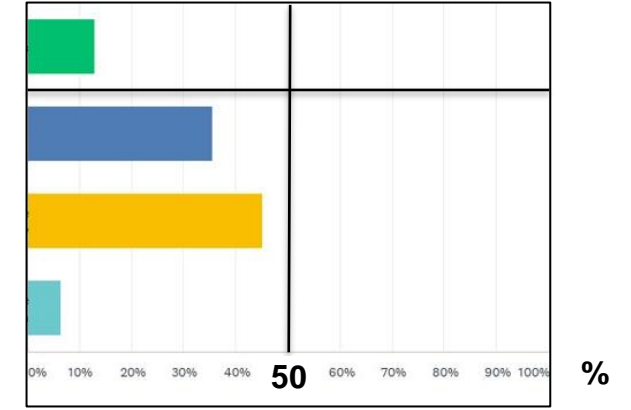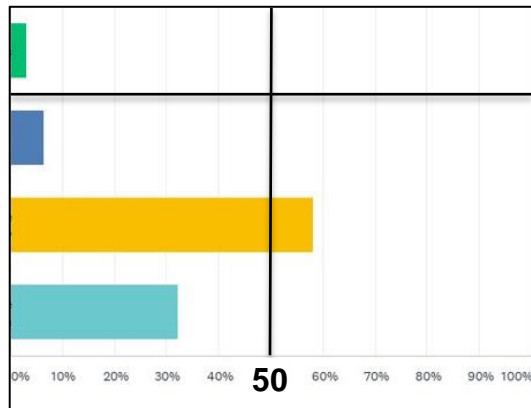**ECMWF** EUROPEAN CENTRE FOR MEDIUM-RANGE WEATHER FORECASTS
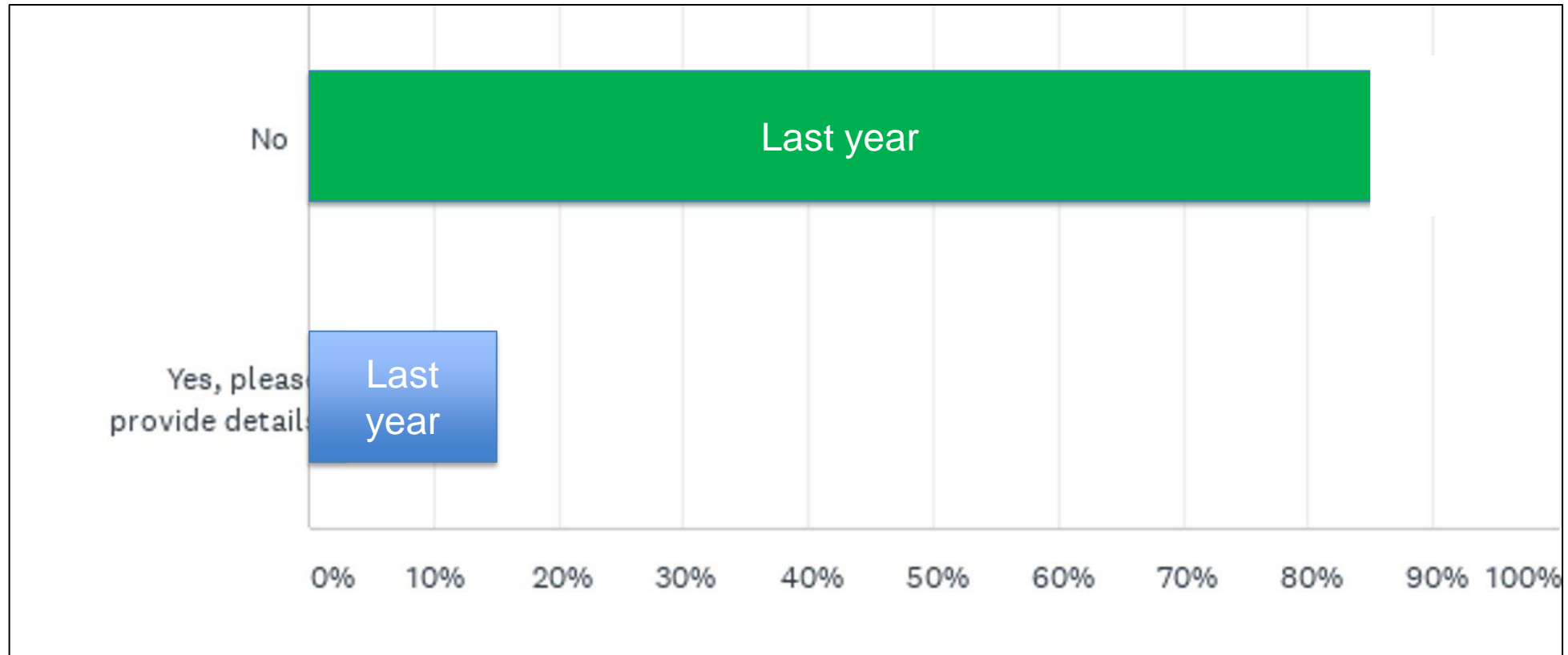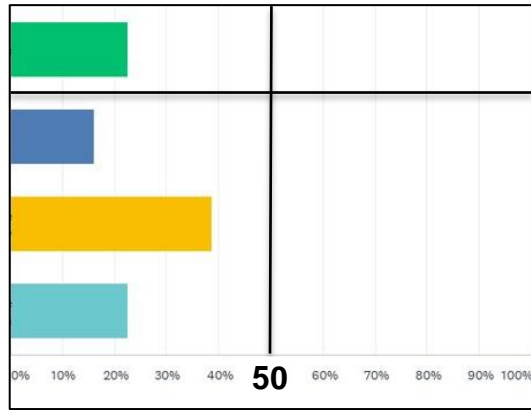
Known IFS forecasting issues page
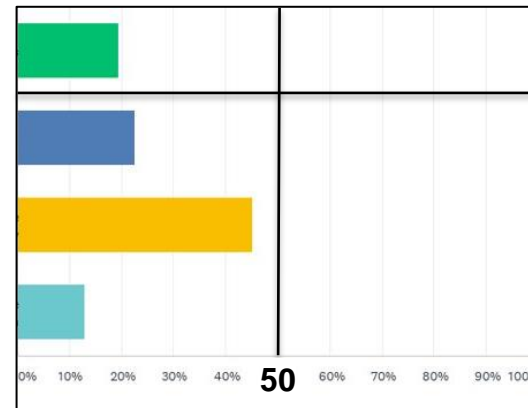
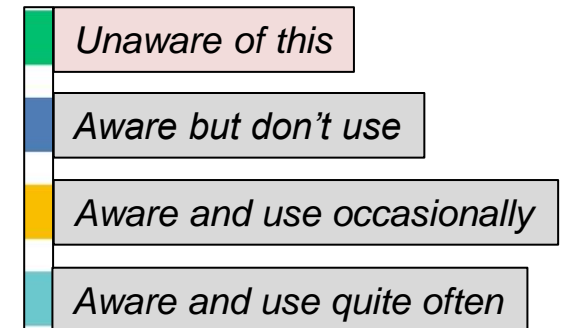Severe Event Catalogue

Forecast User Guide

Service Desk

ECMWF Newsletter

ECMWF technical memoranda
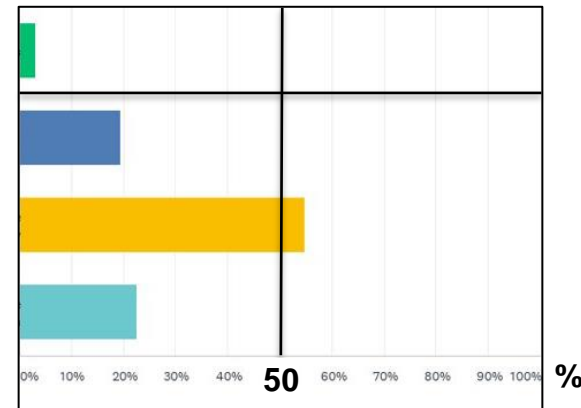
Web page on changes to the forecasting system

Unaware of this

Aware but don't use

Aware and use occasionally

Aware and use quite often

For links to all these see

Q9. In October 2020 ECMWF upgraded the look and feel of its graphical web products, as well as making them free to access. Do you have any feedback on these initiatives? Are there any aspects that you particularly like or dislike?

"Votes"

ECMWF's
Open Charts
initiative

Overall Impressions

Great!	**5**
Happy	**6**
Neutral	**1**
Dislike	**2**
Not used	**2**
Specific issues mentioned	**2**
Want more domains	**2**

Specific Comments

"Fancy-looking but less user-friendly"
"Locations history (for meteograms) is a big loss" **2**
"Want more flexibility"
"Please add point rainfall"
"This is devaluing Max Charge Customers' competitive advantage"

Q10. Another part of ECMWF's long-term move to open data will be to make some ENS and HRES forecast datasets (as distinct from graphical output) freely available in real time, but at lower resolution (e.g. 0.4 degrees). On a scale from 0 to 10 how interested are you in this initiative (10 = very interested indeed).
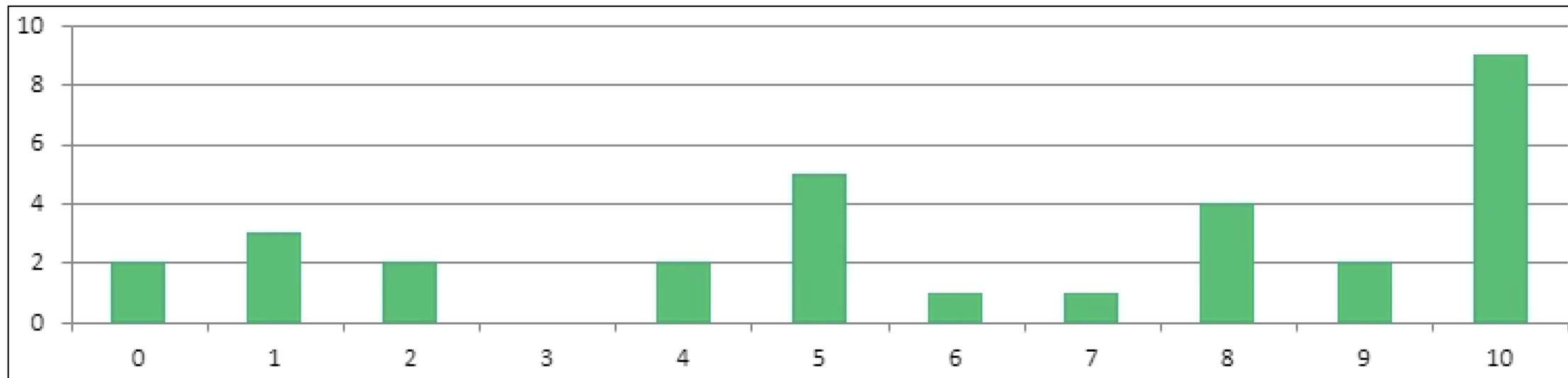
Not interested

Very interested

**Q11. ECMWF currently makes tropical cyclone track forecasts, from 00 and 12UTC runs, freely available in BUFR format. From 11 May 2021 equivalent track forecasts were made available from the intermediate 06 and 18UTC runs. How useful do you find these initiatives?**
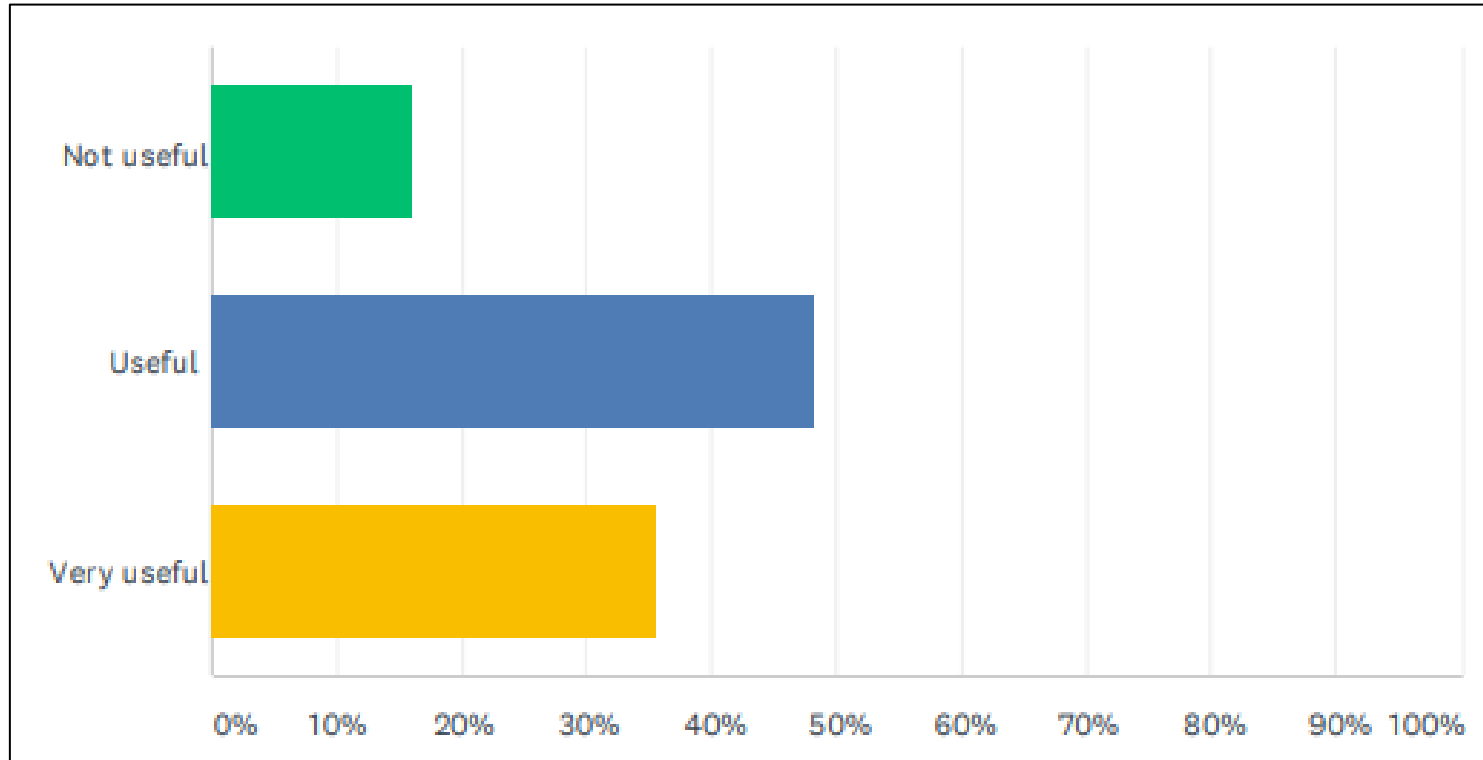
"Will be useful in many situations"

"Lack of accessibility of BUFR format is limiting – can we have web products / ecCharts products?"

06 and 18UTC run output stops at T+144
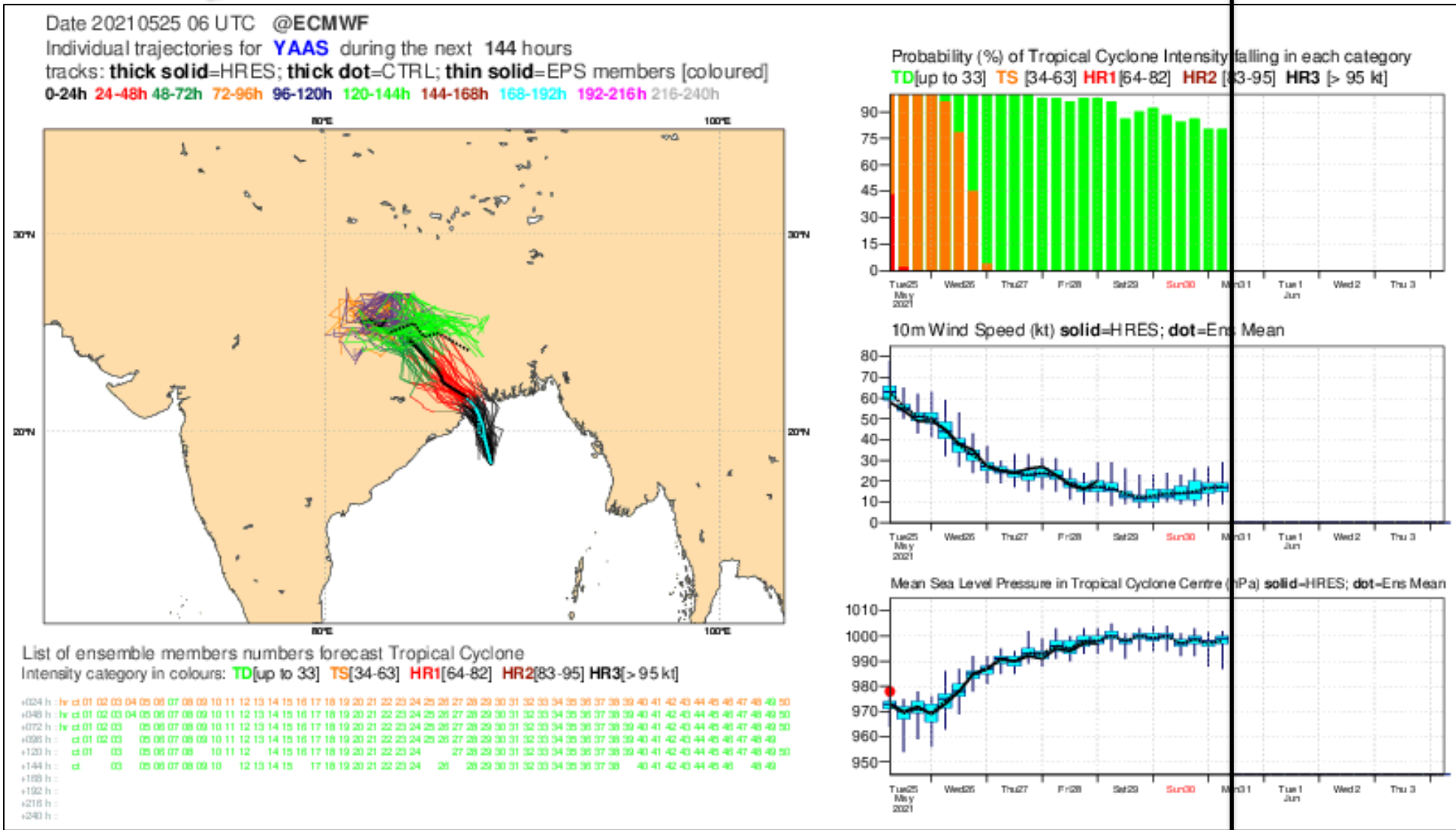
Summary of Main Messages

- Satisfaction with ECMWF forecasts and products is generally very high

- Expectations continue to grow !

- Users tend to pick up more on longer range forecasts that 'go wrong' (monthly / seasonal)

- ECMWF needs to investigate / work on some 'details' related to products / output

- Views on Open Charts and Open Data are very mixed, but on average positive

- Technical Issues of various types continue to crop up

- COVID-induced homeworking seems to have gone pretty smoothly

- Familiarity with and uptake of ECMWF's user-oriented initiatives is pretty high

- The drop in response rate is a bit concerning…

"Does ECMWF really want more feedback?"

Breakout Groups - within Gather.Town - 16:15 UK time

A chance to quiz ECMWF experts directly, or deliver requests, feedback etc…

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2. ECMWF and the Renewable Energy sector   (Thomas Haiden, Robin Hogan)

3. Tropical Cyclones and Medicanes   (Fernando Prates, Linus Magnusson)

4. Technical/Data issues   (Emma Pidduck, Manuel Fuentes, Xavi Abellan)

5. Anything else!   (Tim Hewson, Ivan Tsonevsky, Umberto Modigliani)

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