UEF feedback session

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ECMWF

Structure of the User Voice Corner

- 13:50 UTC: Summary of Responses to the Online Feedback Survey (10 questions)
- 14:20 UTC: Virtual Breakout Groups (set of 6)
- 15:00 UTC: Ends
- Breakout group summary bullet points will be posted later tomorrow

Breakout Groups

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

1. Extended Range (Monthly) forecast products	(Linus Magnusson, Ivan Tsonevsky, Umberto Modigliani, +..)
2. Issues with Precipitation Forecasts	(Richard Forbes, Ervin Zsoter, Tim Hewson)
3. Tropical & Sub-tropical Weather (including Tropical Cyclones)	(Fernando Prates, Peter Bechtold)
4. Technical issues – e.g. data services / downloading / MARS	(Emma Pidduck, Manuel Fuentes, Xavi Abellan)
5. ecCharts and meteograms	(Cihan Sahin, Sylvie Lamy-Thepaut)
6. Anything else!	(David Richardson, Irina Sandu, +..)

You will need to decide which group to join later, but you can change

General remarks on your online survey responses:

1. Some users have **requested products, or raised issues**, that **ECMWF has (partly) addressed**, or is about to address (e.g. alongside cycle 47r1 that goes live on 30th June). For these there is a smiley on the following slides: 

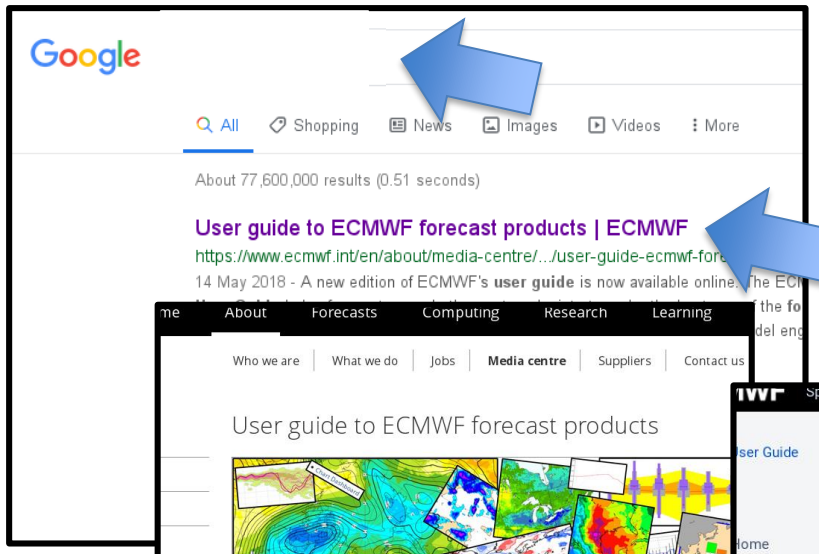
2. Some users highlight **issues that are known about** and that have been documented / discussed on the known forecast issues page and/or in the **online ECMWF Forecast User Guide**. These are highlighted as follows: 

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

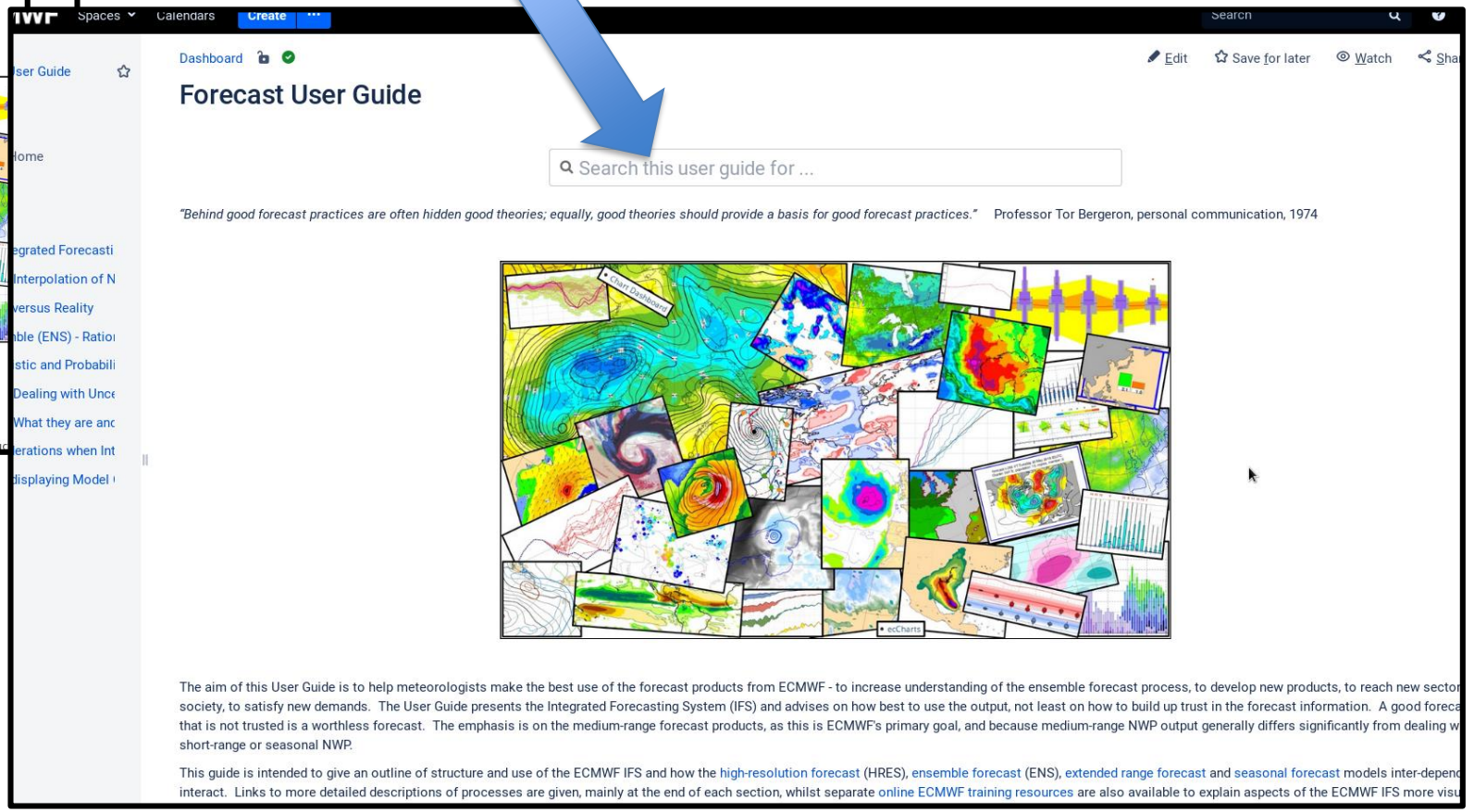
4. Other **key topics** will also be covered in the **Speakers Corner and coffee break on Wed:** 

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

ECMWF's online Forecast User Guide

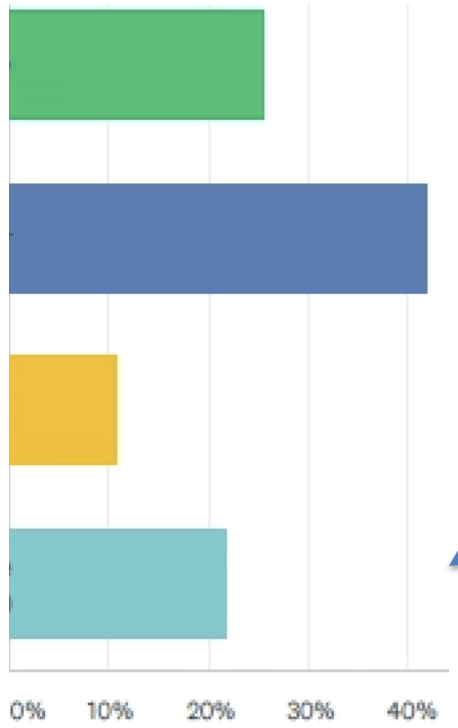


Means issue discussed in Forecast user guide / known model issues



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

	2019 (%)	2020 (%)
• Private Company:	29	**25**
• Public Sector (NMHS):	64	**42**
• University:	4	**11**
• Other:	4	**22**
No. of replies:	56	**55**



Mainly:
- Research institution
- Mixture of other 3 categories
- NGO

Q3: What forecasting aspects that relate to ECMWF model outputs are of particular concern to you and your organisation? (1 of 4)

- Medium Range (ENS) **11**
- Seasonal **10**
- Extended (=Monthly) **7**
- HRES **5**

Group 1

- Rainfall/Precipitation **13**
- Extreme Precipitation **5**
- Hydrological Extremes **4**
- Point Rainfall
- Drought

Group 2

- Temperature **11**
- Low level Winds (10m, 100m, gusts, …) **11**
- Cloud **5**
- Solar Radiation **4**
- Humidity **3**
- Visibility **2**
- Renewables **2**
- Snow/ice

Means aspect discussed in Forecast user guide / known model issues

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

- Extremes **7**
- CAPE / Convective Indices **5**
- Aviation forecasting / Aviation hazards (e.g. turbulence / icing) **4**
- Tropical Cyclones / Tropical Weather **3**
- Forest fires
- Landslides

Group 3

- Weather scenarios / clusters **2**
- Plumes **2**
- Meteograms **2**
- EFI **2**
- Uncertainty indicators
- Tephigrams
- Geopotential

Group 5

- Air quality / composition **4**
- Agricultural applications **3**
- Disease (dengue fever)

- Accuracy **3**
- Timeliness **2**
- LAM runs (ECMWF boundary conditions) **2**
- Machine Learning techniques
- GPU usage

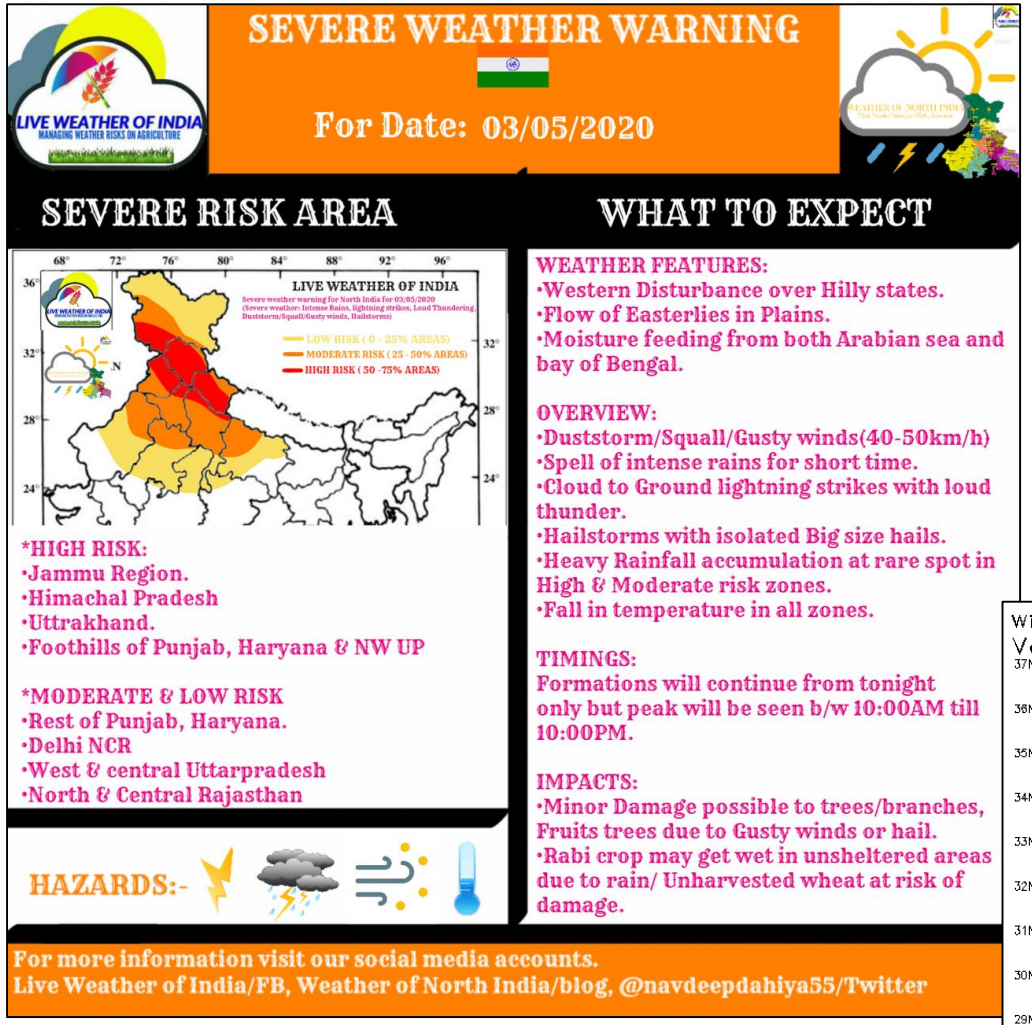
Group 4

Q3: What forecasting aspects that relate to ECMWF model outputs are of particular concern to you and your organisation? (3 of 4)

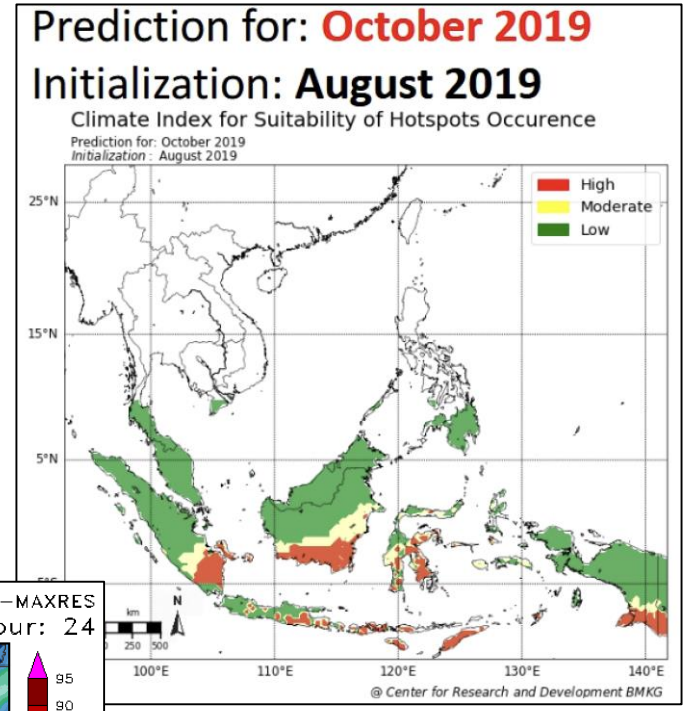
IMPORTANT

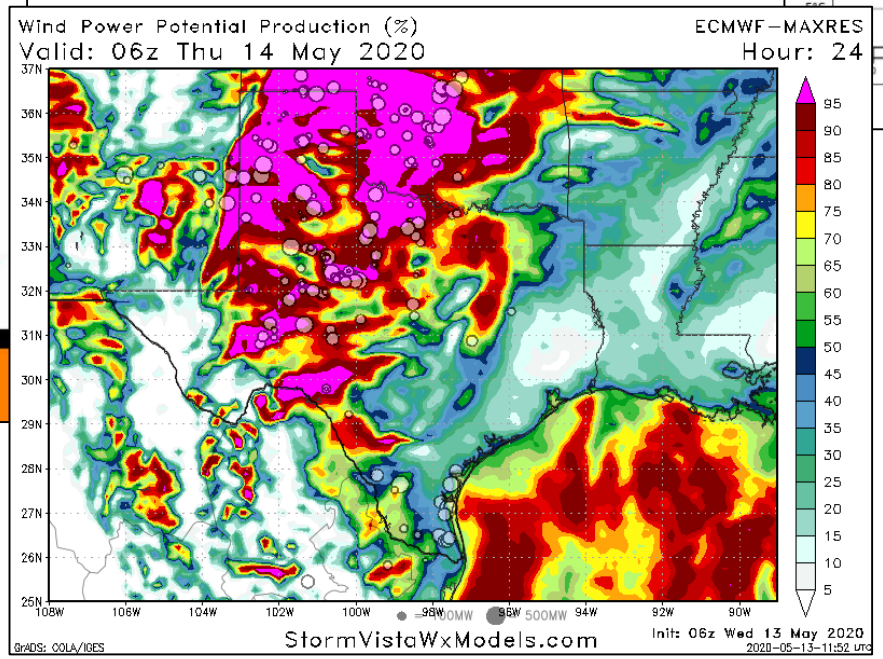
- ERA5 **3**
- Post-processing **2**
- Simplicity of access
- Model Issues

Group 4


LIVE WEATHER OF INDIA
MANAGING WEATHER RISKS ON AGRICULTURE
SEVERE WEATHER WARNING
For Date: 03/05/2020
SEVERE RISK AREA
WHAT TO EXPECT
LIVE WEATHER OF INDIA
LOW RISK (0 - 25% AREAS)
MODERATE RISK (25 - 50% AREAS)
HIGH RISK (50 -75% AREAS)
*HIGH RISK:
•Jammu Region.
•Himachal Pradesh
•Uttrakhand.
•Foothills of Punjab, Haryana & NW UP
*MODERATE & LOW RISK
•Rest of Punjab, Haryana.
•Delhi NCR
•West & central Uttarpradesh
•North & Central Rajasthan
HAZARDS:-
WEATHER FEATURES:
•Western Disturbance over Hilly states.
•Flow of Easterlies in Plains.
•Moisture feeding from both Arabian sea and bay of Bengal.
OVERVIEW:
•Duststorm/Squall/Gusty winds(40-50km/h)
•Spell of intense rains for short time.
•Cloud to Ground lightning strikes with loud thunder.
•Hailstorms with isolated Big size hails.
•Heavy Rainfall accumulation at rare spot in High & Moderate risk zones.
•Fall in temperature in all zones.
TIMINGS:
Formations will continue from tonight only but peak will be seen b/w 10:00AM till 10:00PM.
IMPACTS:
•Minor Damage possible to trees/branches, Fruits trees due to Gusty winds or hail.
•Rabi crop may get wet in unsheltered areas due to rain/ Unharvested wheat at risk of damage.
For more information visit our social media accounts.
Live Weather of India/FB, Weather of North India/blog, @navdeepdahiya55/Twitter

Examples


Prediction for: October 2019
Initialization: August 2019
Climate Index for Suitability of Hotspots Occurence
Prediction for: October 2019
Initialization : August 2019
High
Moderate
Low
25°N
15°N
5°N
100°E
110°E
120°E
130°E
140°E
@ Center for Research and Development BMKG


Wind Power Potential Production (%)
Valid: 06z Thu 14 May 2020
ECMWF-MAXRES
Hour: 24
StormVistaWxModels.com
Init: 06z Wed 13 May 2020

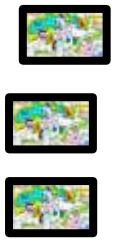
Q4: Have you experienced any particular problems with ECMWF forecasts in the last 18 months (e.g. systematic errors/biases, one off bad forecasts)? (1 of 2)

- No/no entry: **35%**

Group 2

Precipitation **(14)**

- Convective ppn issues (lacks skill; limited by resolution; too widespread by day in Sweden; ends too early; night-time MCS missed) **5**
- Region-specific general issues- e.g. E Spain for Mediterranean lows; S Florida: “Sig degradation in skill came with 46r1”; Australia biases **3**
- Orography-related errors – S France; Germany **2**
- Extremes underestimated – Italy*2 **2**
- Underestimation of dynamically-triggered convection (PV-forcing)
- Precipitation peaks for leads >D6 too great in winter (Austria)



2m Temperature **(7)**

- Minima too high: valleys in Spain, generally over Sweden **2**
- Strong cold bias over snow cover (US/Pennsylvania?)
- Cool daytime bias NW Europe of late
- Frontal warm air incursion over topography too rapid (700m freezing level error in Spain)
- HRES-ENS temperature differences on meteograms (in winter, and with inversions)
- Contaminated by systematic biases

Group 6

10m Wind **(6)**

- Gusts too strong (for cyclonic storm Ciara; for deep lows generally; over land generally; e.g. for Adriatic/Croatia) **4**
- Extremes underestimated (Italy)
- Contaminated by systematic biases

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

Cloud **(3)**

- Low cloud (stratus) problematic generally
- Too much low cloud near the Alps
- Contaminated by systematic biases

Technical **(4)**

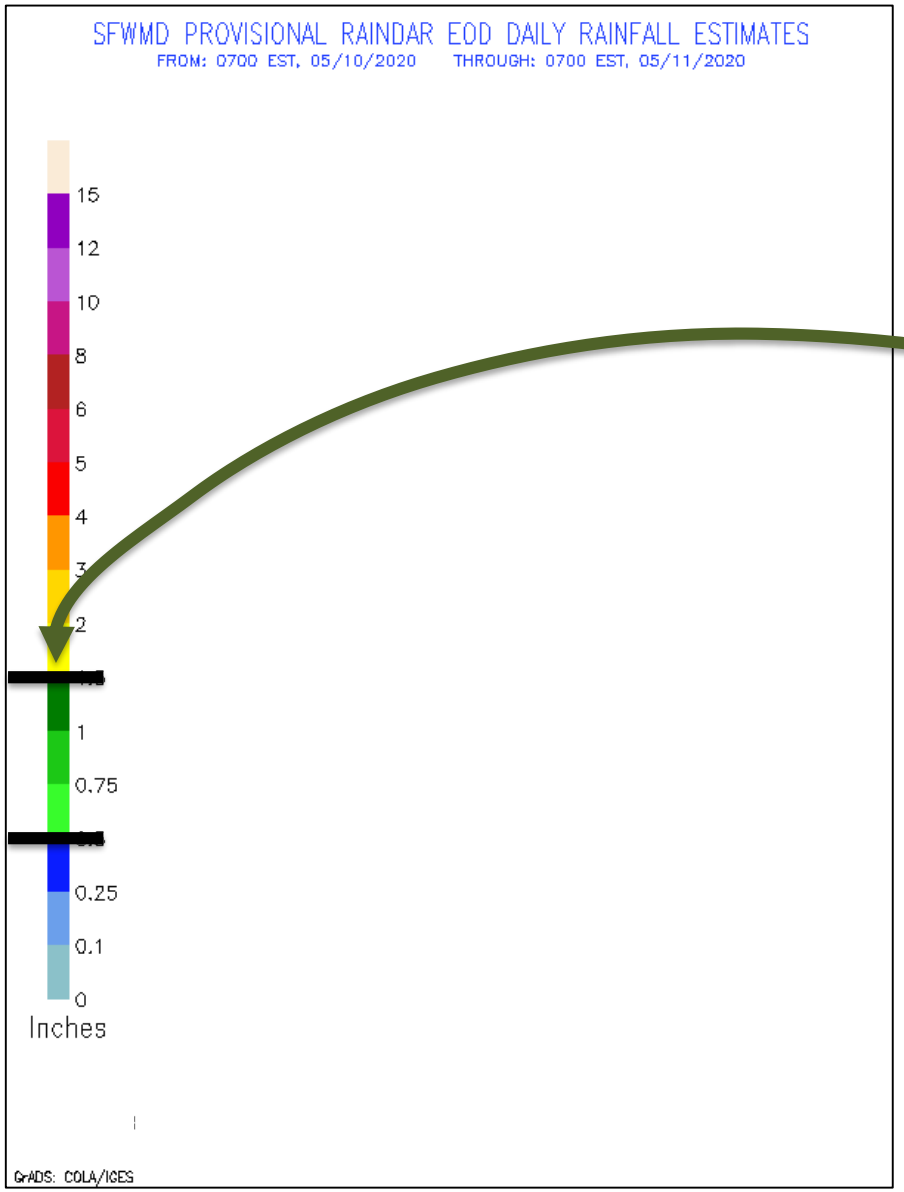
- Licensing procedure is complex
- Downloading is very slow
- File size download limit for the CDS is too small
- Products cost too much

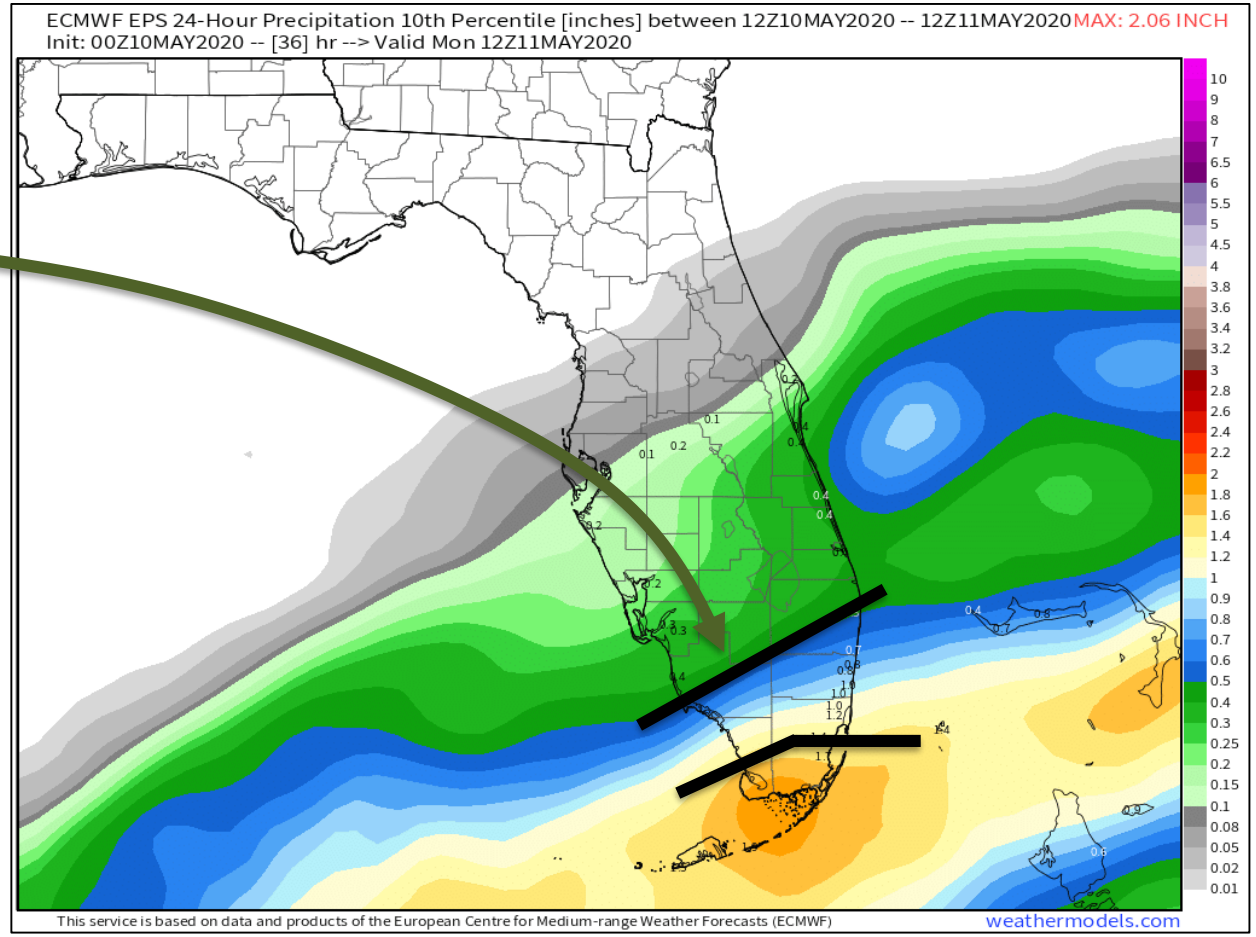
Group 4

Miscellaneous **(8)**

- Jumpiness still a problem
- Ensemble lacks spread
- Convective inhibition is systematically too high
- Visibilities are too low (Austria)
- Wave heights for extreme events are too low (Spain)
- First attempt at estimating insurance losses from SEAS5 not successful
- Skill seems to have degraded due to lack of aircraft data during the pandemic
- Forecast issues in certain parts of Ecuador

Example





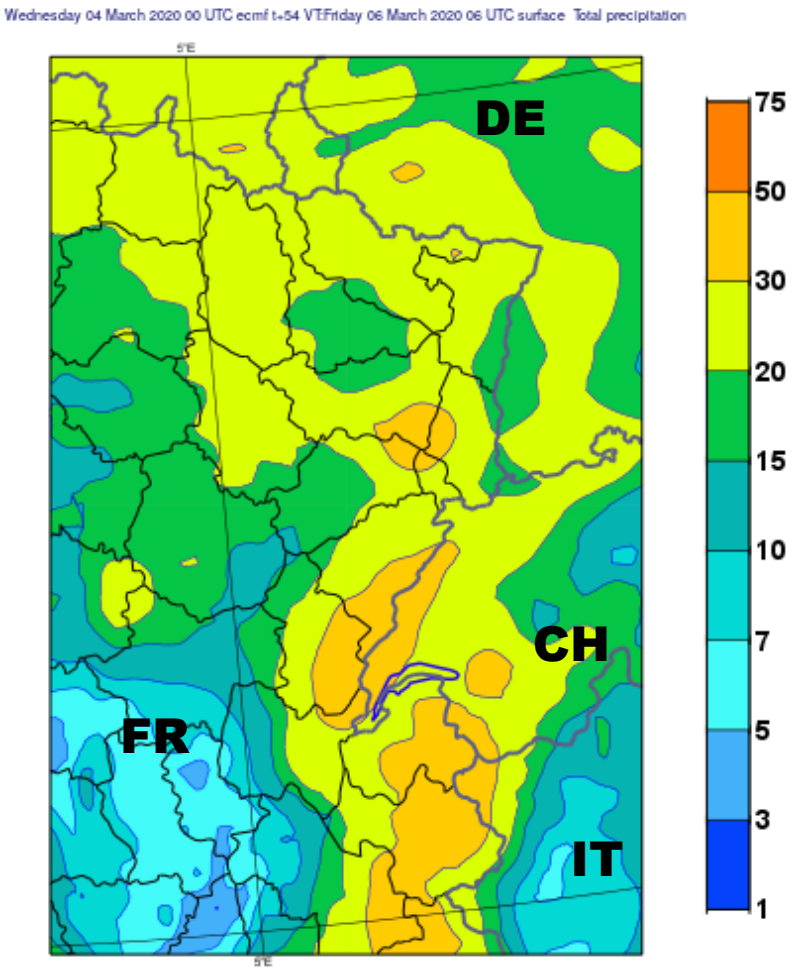
ENS 10th Percentile (towards dry end of range)
12-36h forecast

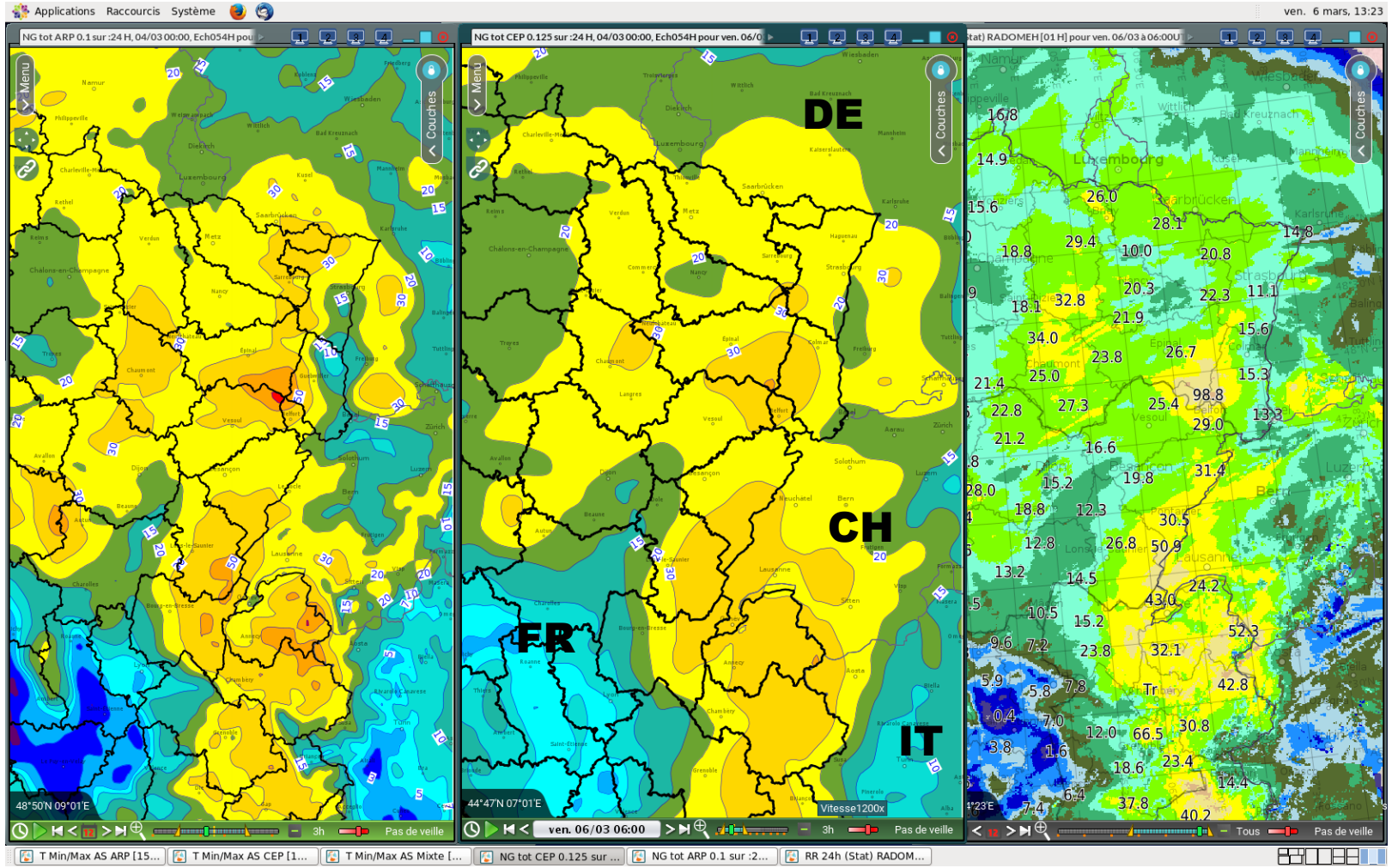
HRES 0.8 deg (native)

ARPEGE 0.1 deg

HRES 0.125 deg

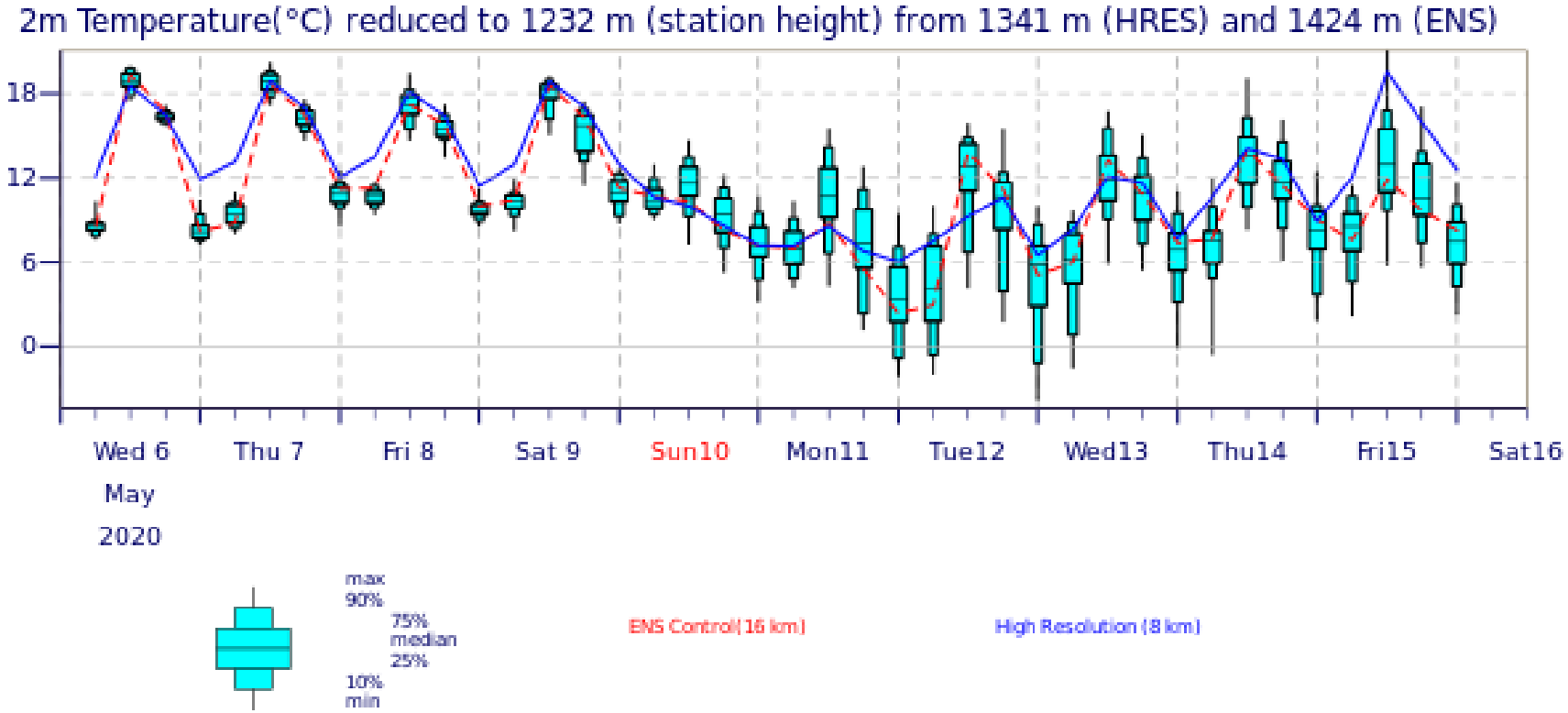
Obs



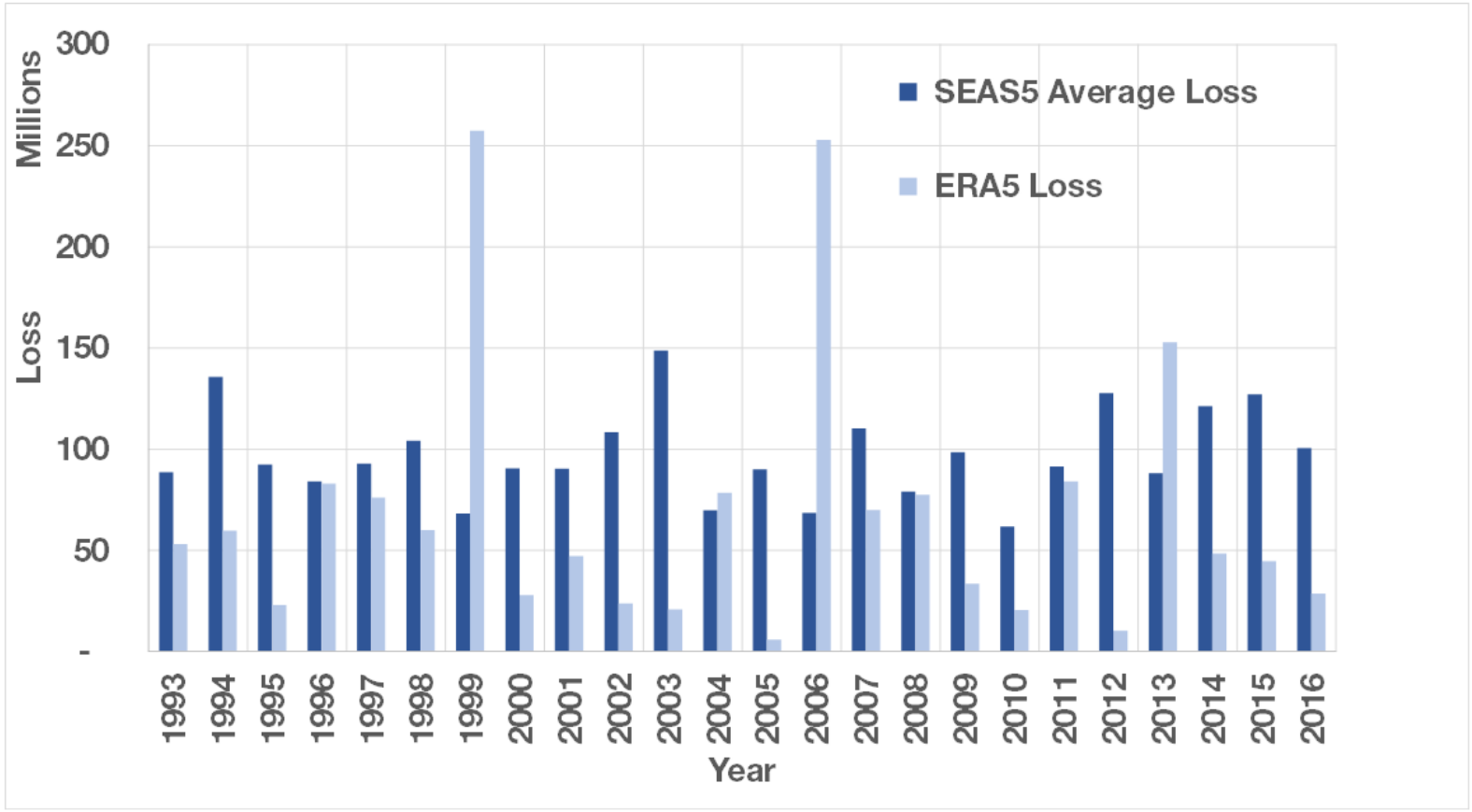


24h ppn
to 06Z 6 Mar 2020
T+30 to 54h

ENS Meteogram
Canfranc, Spain 42.66°N 0.53°W (ENS land point) 1232 m
High Resolution Forecast and ENS Distribution Wednesday 6 May 2020 00 UTC



ERA5 Loss versus Mean Ensemble Loss



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: **51%**

Precipitation **(7)**
- Excellent rainfall forecasts for Spain 21 April (short-range) – extremes in NE
- Precipitation in SE Spain related to cut-off lows
- Extreme snowfall event between Valencia and Zaragoza 19-21 Jan
- Numerous ‘laser sharp’ rainfall forecasts for S Florida (prior to 46r1!)
- Winter-time Western Disturbance rains in N India
- Point rainfall good for thunderstorms
- Warm front precipitation generally well-handled (N Italy)

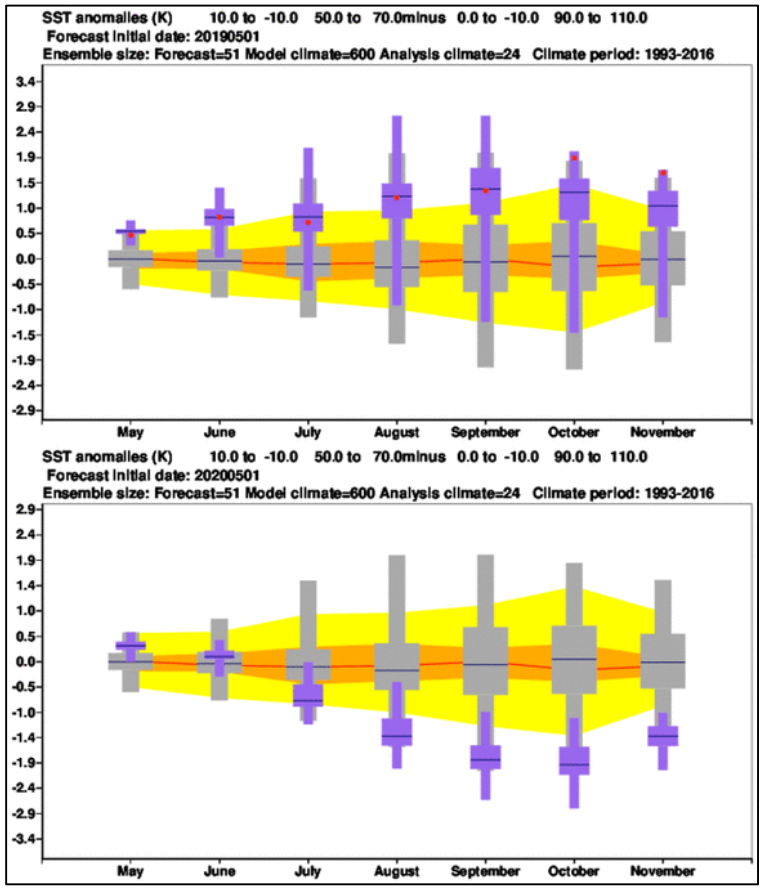
Group 2

Lightning **(2)**
- Lightning density product ‘works well’
- Lightning density guidance v good for Adriatic MCS

Monthly/Seasonal **(4)**
- Seasonal drought prediction for Indonesia
- S2S last winter “extraordinarily consistent”
- Very good JJA seasonal irrigation forecast for N Italy
- UK week 4 forecasts have been very good

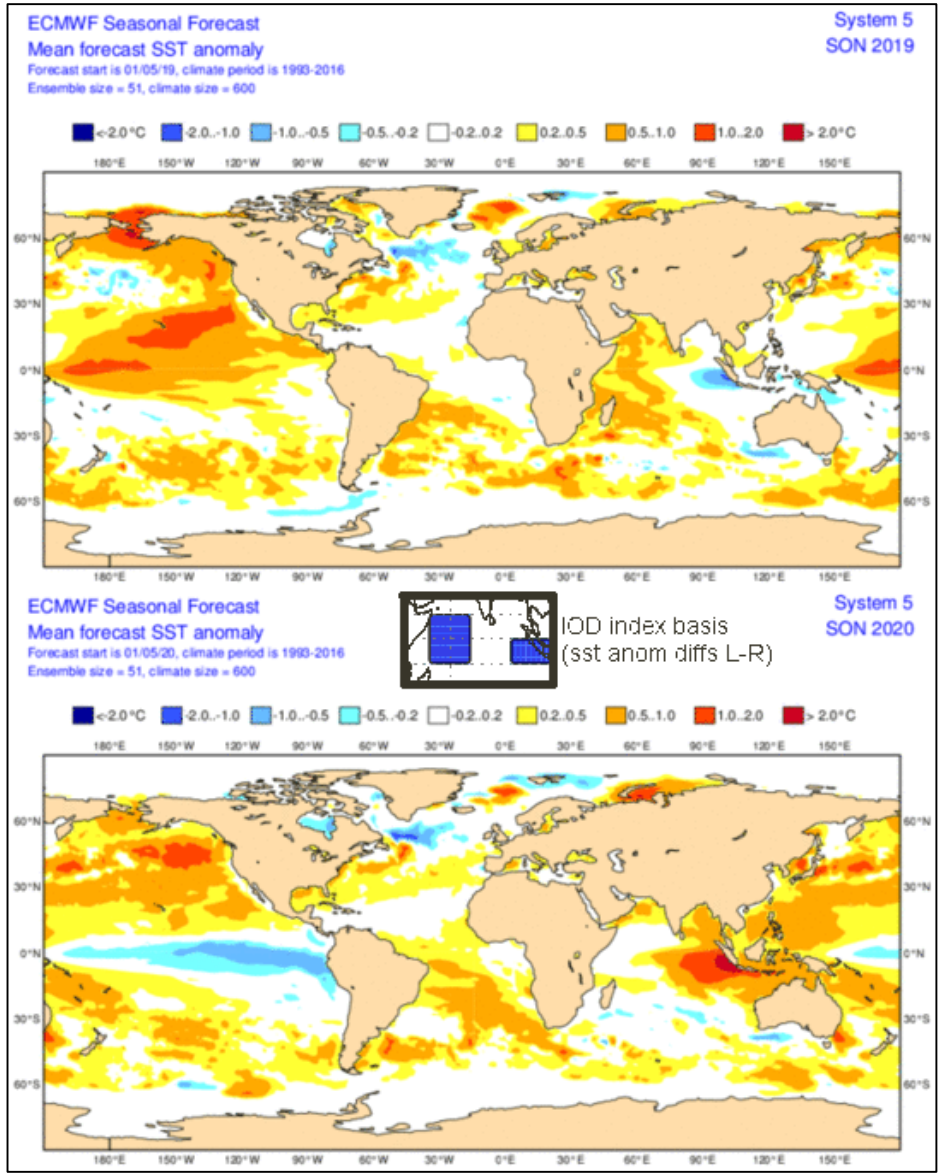
Other **(6)**
- Advection fog case in Galicia / Storm Ciara (Sweden) / Stratospheric forecasts at start of Feb (strengthening vortex when other models weakened) / N Italy dust episode in Mar / Some extreme weather events in Andes (Ecuador) / Cluster probs make sense

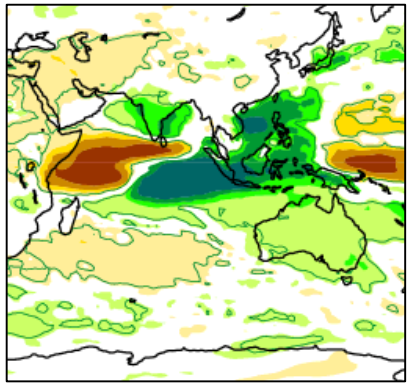
Indian Ocean Dipole:
Source of SEAS5 predictability last year.
And this?



May 2019 FCs

May 2020 FCs

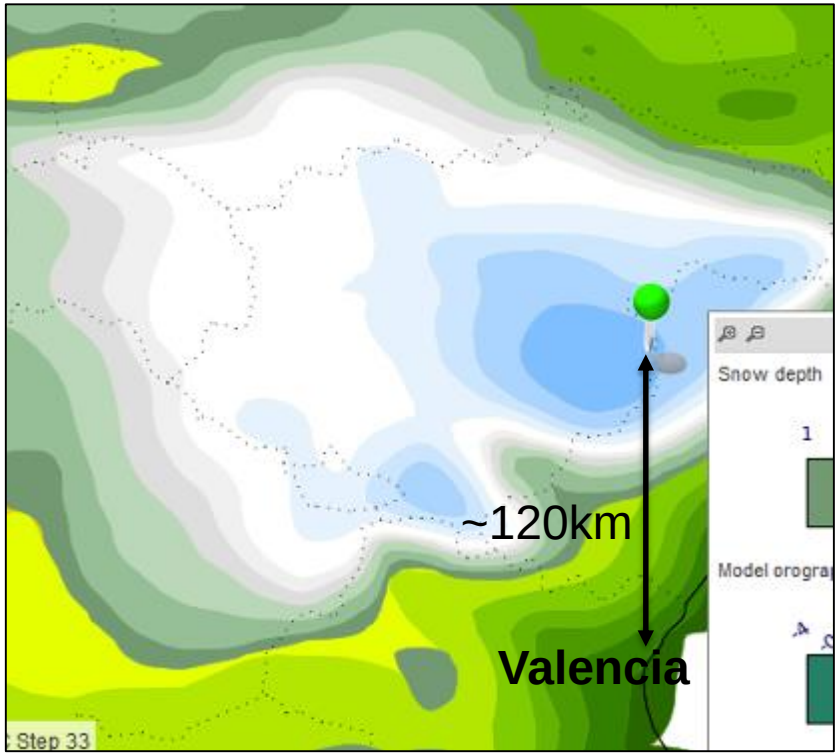


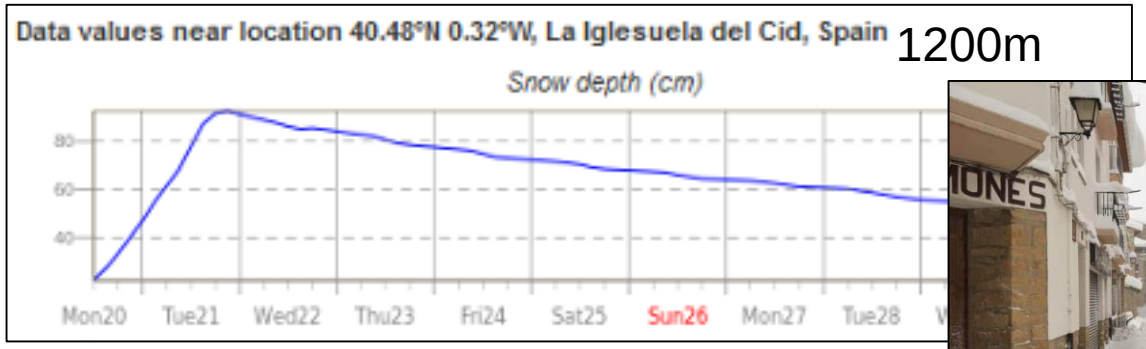


Ppn forecast

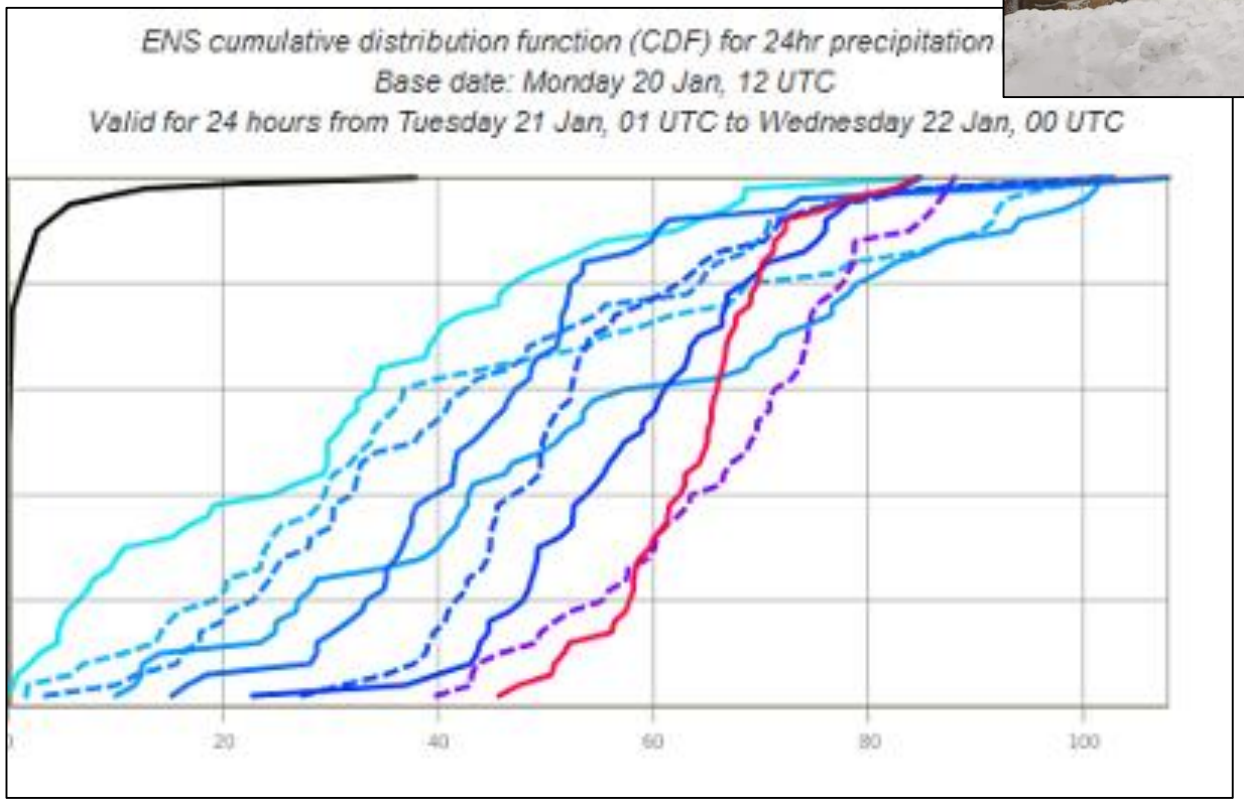
Massive Change – one extreme to the other

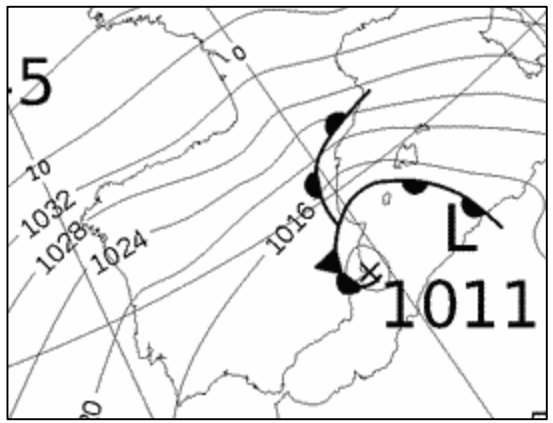
Example





1200m





12UTC 21st Jan 2020

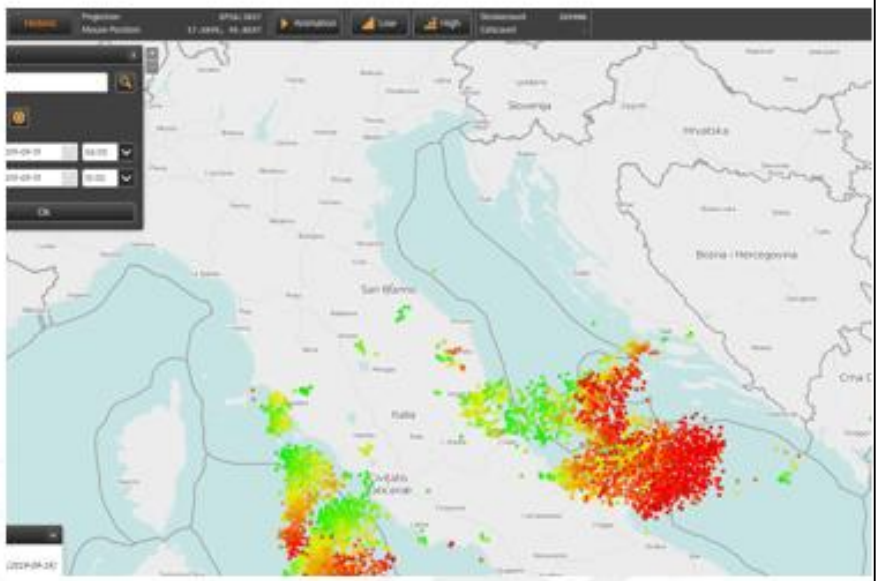
Lightning Density forecasts

Example

RUN 1812

RUN 1900

MCS over Adriatic sea
September 19., 2019.



Q6: How could ECMWF improve the way it provides forecast data to users (e.g. new products / parameters, output to support warning issue and impact forecasting, technical issues, timeliness, cloud services)? (1 of 3?)

Strategy **(7)**

- Earlier availability of products
- More members (e.g. 100)
- Better resolution
- More data for same price (>100Gb limit for max charge customers)
- Post-processed forecasts for surface variables

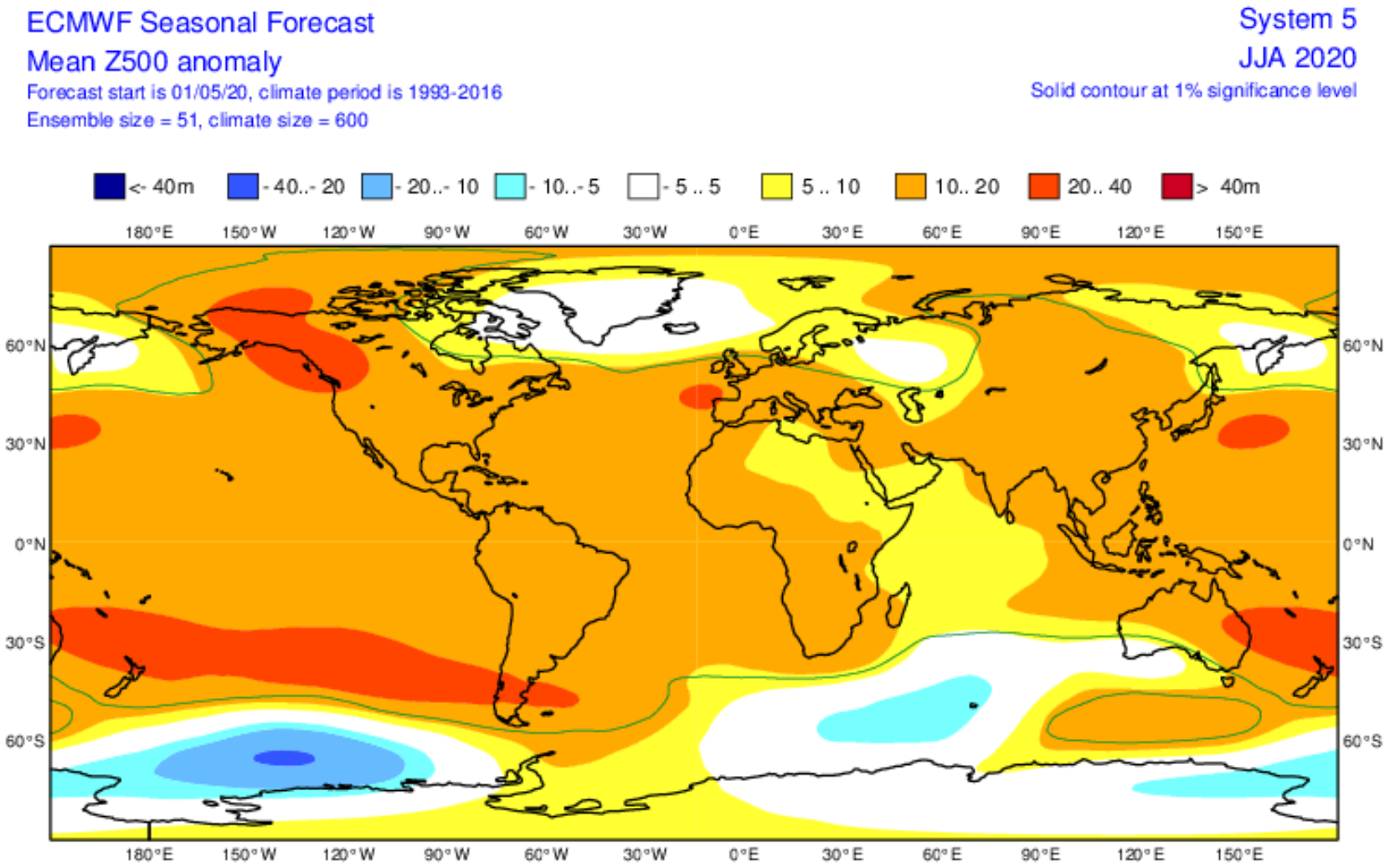
Technical / Data Services **(13)**

- Cloud services wanted **3**
- MARS queues painfully slow (e.g. if user wants vast amounts of data needed for calibration or machine learning) **3**
- Open data (and a date for this) **2**
- ecCharts / Dashboard faster, more reliable, bug-free (e.g. problem of disappearing timeline) **2**
- One-off parameter downloads for real-time usage (e.g. demanded by forecast situation)
- API for retrieving site forecasts with simple lat/long input
- Ecuador want more basic data for their SmartMet workstation
- Improve meteogram reliability (recent issues with metview and event triggers – e.g. “ef00h240metgram”)

Group 4

Seasonal forecast **(3)**

- Anomalies are contaminated by climate change – notably T2m, Z500 – so create trend-adjusted forecasts (= fn(x,y,month))
- Want seasonal forecast for month 1, made available from day 1
- Can we provide metrics of SEAS5 and multimodel skill ?



Example of the impact of global warming on a SEAS5 product

(but could be worse: we have used a shorter recent reference period than is in the hindcasts (1981-92 omitted))

Q6: How could ECMWF improve the way it provides forecast data to users (e.g. new products / parameters, output to support warning issue and impact forecasting, technical issues, timeliness, cloud services)? (3 of 3)

Product Changes **(6)**

- Improve vertical profiles (e.g. add Model Climate data background, to highlight extremes, anomalies) **2**
- Mean sea level pressure on plume diagrams
- Probability of threshold exceedance (e.g. for QPF)
- Inclusion of orography in point rainfall product
- More (and better) cloud / radiation parameters (for renewables business)

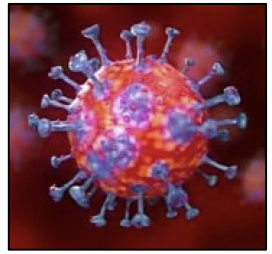
New Products **(8)**

- Specifically for aviation (icing, turbulence, mountain waves) **3**
- More convective indices **2**
- More hydrological parameters
- More products for intense / extreme events
- Simulated radar reflectivity

New Initiatives **(3)**

- Real-time interactive public verification tool, with user settings (e.g. user defines country of interest) **2**
- Insurance loss forecasts (collaborative project suggested)

Q7: Have you experienced any issues with ECMWF products or services as a result of working from home or flexible working? (1 of 1)



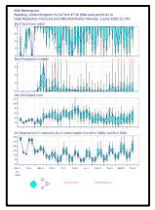
No: 85%

Yes: 15%

- ecCharts slow or unreliable **3**
- ftp / data downloads slow **2**
- ECMWF website slow
- No token available!

Group 4

Q8: ECMWF is planning to upgrade the database that feeds into its meteogram-style products. Therefore, would you like to propose improvements and additions to meteograms (e.g. variables included, time ranges, plot formats, methods for selecting gridpoint/s)? Feel free to be creative!



Responded: 31%

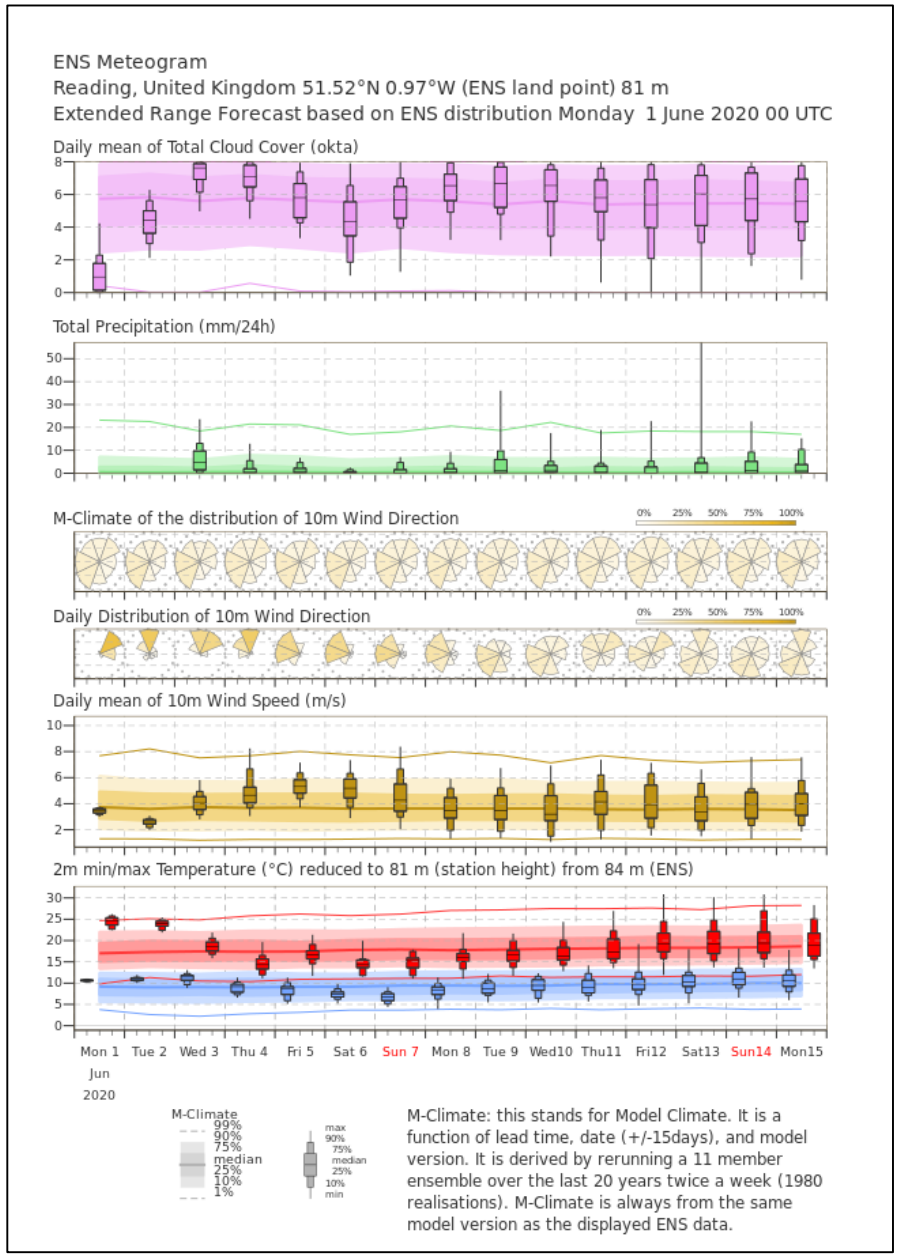
General Structure **(7)**

- Time interval > 6h (e.g. 3-hourly to day 5) **2**
- Develop monthly meteograms (daily averages of rain, T2m, wind speed/dirn)
- Include reference points for extremes (from M-Climate)
- Airport-specific option (e.g. in “city selector?”)
- Add Jupyter Notebooks
- “Rainfall should be accurate”

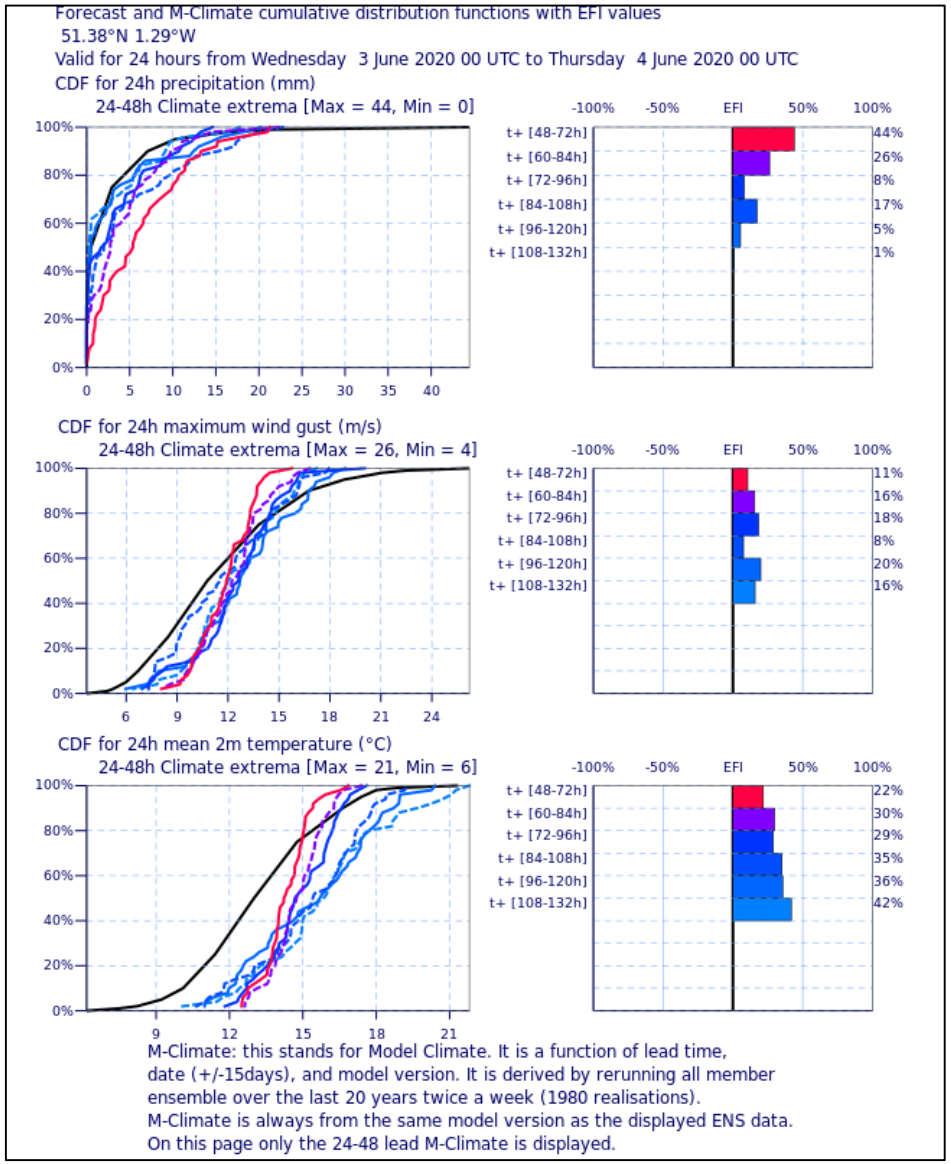
Variables to add **(13)**

- Convection-related parameters (not necessarily new ones) **3**
- Mean sea level pressure **2**
- Variables for aviation forecasting
- Visibility
- Snowfall
- Thermal Comfort indices
- Soil moisture
- Drought index
- Stratospheric variables
- Cloud at low, medium, high levels (separated)

Group 5



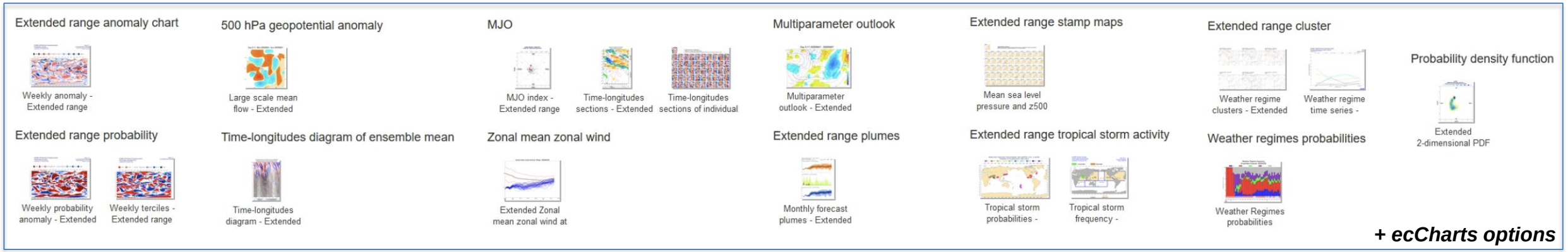
Reference points for extremes…



Q9a. We are also reviewing the extended-range forecast products and welcome your feedback. Which extended range products currently available from ECMWF do you find most important (please specify up to 3)?

- Many responders found the reference to “extended-range forecast products” confusing it seems, and provided some strange answers !
- We were referring to monthly forecast charts - i.e. the ones issued by ECMWF twice per week, that go out 4-6 weeks, so probably need to retain that term in future.
- There is little merit in summarizing the responses here.
- But please express your views in the breakout group, especially if this class of forecast charts are of interest to you !

Group 1



Q9b: Do you have any suggestions for new extended range products you would find useful? How would you use them?

Responded: 25%

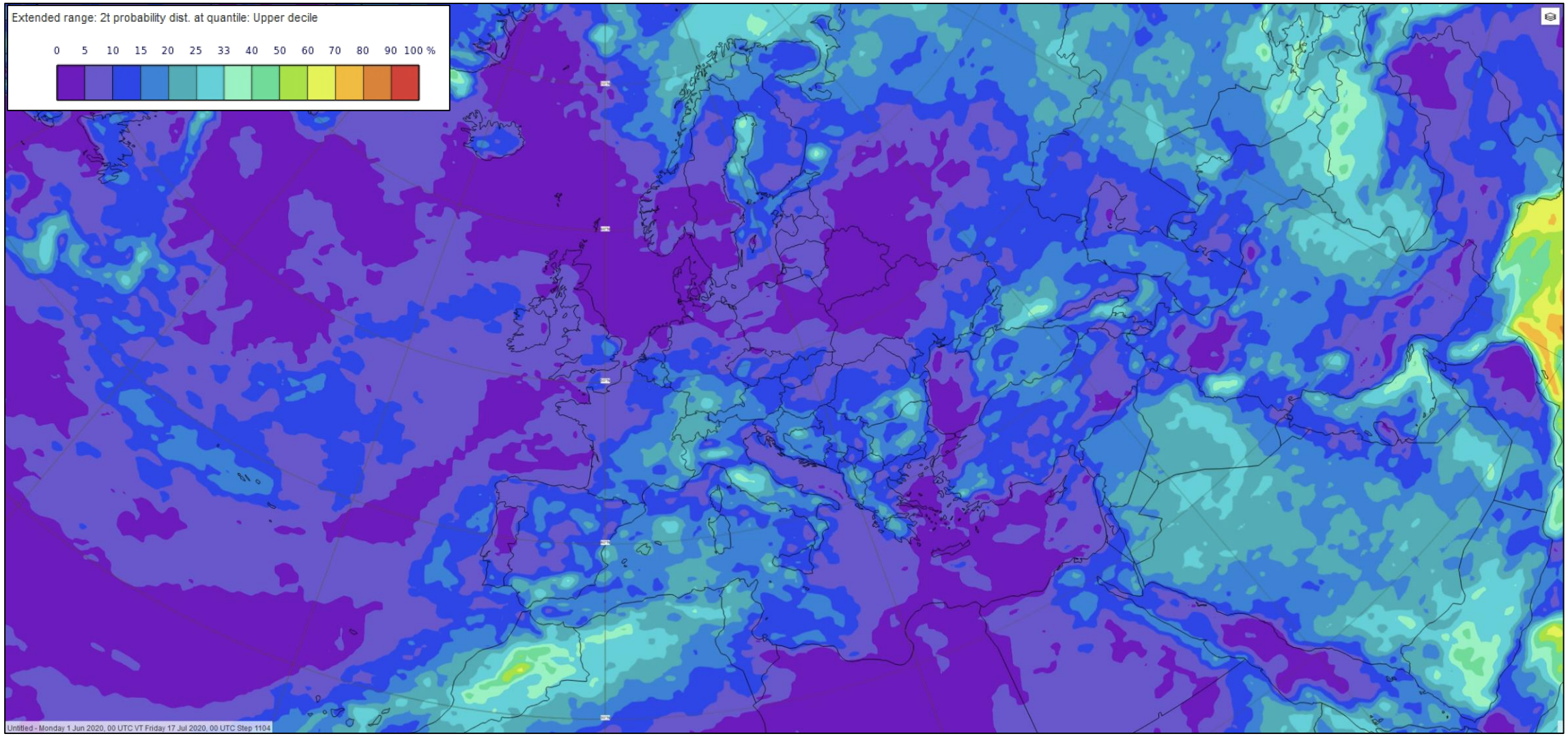
New parameters **(7)**
- Soil moisture
- Dust
- Plumes for 2m temperature
- Mean anomalies for 200mb velocity potential
- Mean anomalies for precipitable water
- Mean anomalies for 500mb height
- More stratospheric parameters (related to teleconnections)

Visualisations **(8)**
- More regimes (defining "what broadscale weather systems might dominate") **2**
- Climatology on plumes (e.g. mean)
- More cluster products (e.g. by weeks)
- Probabilities at different thresholds
- All ENS output should be available as mean/spread/min/max
- Probabilities of extremes
- TC genesis forecasts

New concepts **(4)**
- Interactive extended range member deselection, day by day, based on current trends
- For regimes, attendant plots of climatological temp/ppn anomalies
- Explanations of forecast outcomes (e.g. why a high over France in week 3?)
- 3D virtual reality experience


Group 1

Week 6 probs (mid July) of 2m temperature in upper decile (warm extreme)



Q10: Additional comments…

- “Excellent Service” / “IFS is wonderful” / … **(5)**
- ecCharts speed has improved
- ecCharts often logs users out since last upgrade

Group 4

- “Thanks for the opportunity to participate”
- Would like an index to show how close we are to the “limits of predictability”
- Would like an easy way to create ERA5 analogs
- Would like more HRES evaluation

~ 1500 plots

https://sites.ecmwf.int/ifs/scorecards/scorecards-47r1HRES.html

Breakout Groups

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

1. Extended Range (Monthly) forecast products	(Linus Magnusson, Ivan Tsonevsky, Umberto Modigliani, +..)
2. Issues with Precipitation Forecasts	(Richard Forbes, Ervin Zsoter, Tim Hewson)
3. Tropical & Sub-tropical Weather (including Tropical Cyclones)	(Fernando Prates, Peter Bechtold)
4. Technical issues – e.g. data services / downloading / MARS	(Emma Pidduck, Manuel Fuentes, Xavi Abellan)
5. ecCharts and meteograms	(Cihan Sahin, Sylvie Lamy-Thepaut)
6. Anything else!	(David Richardson, Irina Sandu, +..)

You need to decide which group to join, but you can change

How to join the breakout groups