UEF2018 - User Voice Corner

Tim Hewson

- Resumé from last year, with actions that resulted

- Summary of new feedback, from this year's breakout groups (**interactive**)

ECMWF

Q1: What forecasting aspects are of particular concern to you and your organisation?

➢ **IFS widely used around world, together with other LAMs (+beyond Europe), for BCs too…**

➢ **Most very happy with output**, some with long range skill (e.g. Cholera outbreak/ Peruvian floods /TC Mora)!

➢ **Some focus on medium range and beyond, but others use IFS for short range** and even nowcasting

➢ **High Impact Weather – all leads!**

➢ Tropical cyclones (1-7 days) / Long period swells / **Aviation parameters**

➢ **Renewables in energy sector** (**wind power, solar power**)

➢ Stratospheric winds (directional shear); QBO/MJO

➢ ENS for driving storm surge model

➢ Marine activities generally

➢ Increasing use of monthly (some)

➢ Lightning (45r1 index awaited, MetNorway developing index for triggering by helicopters in winter time)

New lightning diagnostic implemented in 45r1 on Tuesday

Q2: Have you experienced any particular problems with ECMWF forecasts in the last 18 months (e.g. systematic errors/biases, one-off bad forecasts)?

➢ Biases:
  ➢ Temperature in summer (**maxT too low on hot days** – superadiabats?) – **starting to understand, task team formed**
  ➢ Wind speeds too high or too low depending on location/geography (LAMs can be better) – **resolution limitation**
  ➢ Under-dispersion in ENS winds – **need to compare with analysis not obs**
  ➢ **Underestimation of extreme point rain** (convective and orographic) – **Point Rainfall product addresses, imminent**
  ➢ Overestimation of the snow accumulation in sleet and wet snow situation – **one related bug removed, but much more still to do**
  ➢ CAPE too high over sea – **unresolved, using virtual temperature would help but very costly, anyone have efficient code for this?**
  ➢ **General under-forecasting of low cloud cover** (but over-forecasting in UK in spring)
  ➢ "Drizzle problem" (?) – **Point Rainfall product should address, imminent (but need also to work on model physics!)**

➢ Freezing rain/drizzle from supercooled water, in absence of "warm nose", is not represented – **new formulation devised**

➢ Very light showers forecast when not believed physically possible – **evidence elusive**

➢ ENS slave to HRES in some cases, so can be jumpy (but other models thought more jumpy overall!) – **new user guide / e-learning module**

➢ Fog and visibility: either very dense or nothing at all, & underprediction in Swiss valleys (aerosol?) – **ongoing, long term may use CAMS aerosol**

➢ Over-abundance of meso lows forecast for the Med

➢ Noisy surface pressure round islands (Gibbs phenomena) - **ongoing**

➢ Denmark/Iceland spurious sea ice – **probably resolved, HRES coupling should help**

➢ Lake Constance frozen all winter – never happens? – **not yet understood**

➢ SST along Norwegian coast too low year round – **HRES coupling may help**

➢ Seasonal forecast SST over gulf of Guinea jumped recently => jump in Sahel rainfall – **not understood**
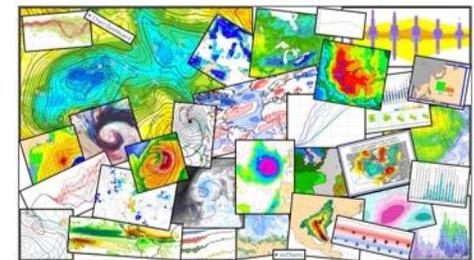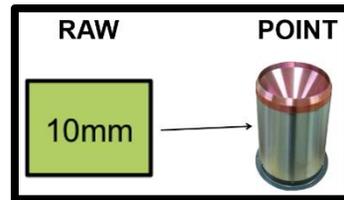
RAW | POINT
10mm

- Urban heat island effects missing – **in long term plans + ecPoint opportunity to assess impact on rainfall etc**

- BL too dry in winter A/C situations (Hungary esp), cloud and 2m temp very poor as a result - **ongoing**

- M-Climate jumps in CAPE & Snowfall, on Tue & Fri, can adversely affect the EFI – **ongoing**

- Monthly forecast worse this winter (over-confident?). Weeks 3&4 lack skill. Spring heatwave problem too. – **maybe better in 2017/18 winter, some evidence now of predictability of extremes to week 4**

- Seasonal forecasts lack skill – **System 5 small step in right direction for some aspects**

➢ Frontal zones sometimes contaminated by isolated spot values of high ppn rate – **evidence elusive**

➢ Isol 600mm/day some tropical grid points – too much?! – **not necessarily (new Hawaii record of >1000mm/24h)**

- Rainfall over-prediction bias specifically at longer leads (e.g. D6), south Africa and Sweden – **not yet examined**

- Westward bias in ppn in SW China – **focus on this region in diagnostics group; symptomatic of wider implications**

- IFS diurnal cycle in W Africa rainfall doesn't match reality – **Point rainfall could help, especially if we include 6-hourly totals (but need also to work on model)**

- Cloud ceiling too low in IFS (Ireland) – **more cloud verification being undertaken, may help understand**

- TC intensification, from tropical depression, occurs a bit too far west (off NW Australia) in ENS D5-10 – **lack of cases**

- TC false alarms in southern Indian Ocean (but v good cases too) – **not so apparent this season?**

- IFS has difficulties with TC genesis in monsoon trough situations – **not understood**
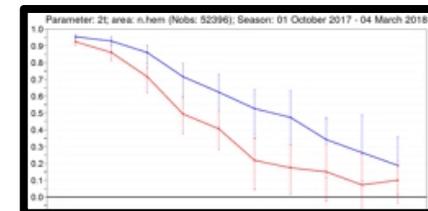
Q3: How could ECMWF improve the way it provides forecast data to users (e.g. new products/parameters, technical issues, timeliness, ..)?

- Thanks for recent additions
- Better links on web - Earlier delivery - Cloud service / ftp access to real-time forecasts – **web + links revamped, cloud services to come**
- Additional convection indices (long list!) – **not yet**
- More aviation parameters (e.g. Icing/Turbulence indices ("Elrod")) – **not yet**
- Consider time-lagged ENS – **under consideration, along with "dual resolution" ENS configuration options**
- More time steps in M-climate, and higher temporal resolution for EFI/SOT (details needed for both?) - **possible future development**
- More frequent time steps ie: 3 hourly in meteograms – **possible future development**
- **Improve MARS re-forecast archive, reducing load, e.g. save all quantiles (10,25,50,75,90) for EFI/SOT**
- **Hourly data for everyone**
- **06/18Z BC runs delivered to everyone**

  agenda item at council meeting next week

- **Re-forecasts 1 year in advance for major model upgrades** (with TC tracks) – **far too costly at present, cycles can last <1y**
- ENS wind level between 10m and 100m for offshore wind power – **not yet**
- Extend range of EFI (longer lead) – **undergoing thorough investigation, monthly timescales**
- Monthly – different time periods – more params – **weeks 5 and 6 added, no more params as yet**
- Z500 ENS mean included on Monthly FC anomaly charts – **not yet**
- Tropical waves (MJO, Kelvin…) and TC genesis; TC phase space – **not yet**
- ERA5 progress updates needed (Copernicus web site?) – **can use catalogue**
- Stratospheric levels from ENS + monthly (200mb limit in catalogue!) – **in catalogue for ENS to D15**
- Aerosol optical depth – **not yet**
- Altitude-corrected precipitation type – **very complex**
- Seasonal forecasts extended up to 12 months? – **skill levels provide no justification**

Q4: How good do you think ECMWF is at forecasting storms - windstorms, rainstorms, convective storms, thunderstorms, snowstorms, icestorms, etc. - and where would you particularly like to see improvements (e.g. timing, intensity, location)?

- **Generally good** – even convection for some!

- Poor rapid cyclogenesis for small systems – Doris/Egon/Zeus/… - **cases regularly studied, mainly a resolution issue?**

- Convection kicks in too quickly – **some convection modifications in 45r1**

- Convective storms: improvement required over the Alps – **under investigation - slope radiation?**

- Convective gusts a sig problem – **ongoing, use CAPE and CAPE-shear, "max" vars in 45r1 help**

- Post-processing can help for problem areas – **agreed, ecPoint and dual res ENS work relates**

- Resolution issues (e.g. for Bora / TCs) - **ongoing**

- EFI requested for other convective indices – **not yet**

- Verification of cyclone locations requested – **not yet**
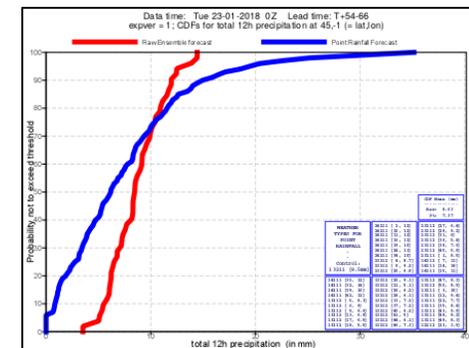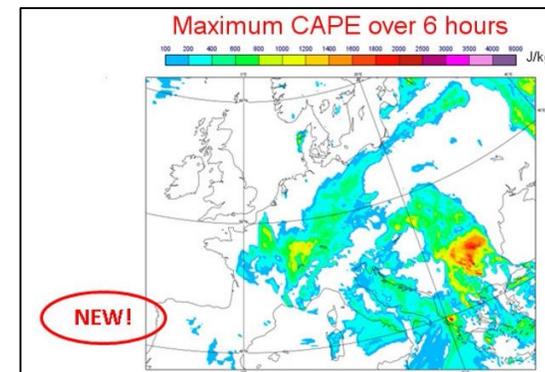
Q5: Are you a user of the main products web page (not ecCharts), which was recently updated, providing larger plots, clickability and many more domain options. Do you like these? Anything we could improve here?

- Default location for meteogram : could it be customized in profile ? – **not yet**

- Familiarisation still under way! **Stepping back needs to be easier.** **done**

- Meteograms / extra-tropical cyclones to move from the bottom. – **done, organisation improved**

- More precip/wind speed thresholds for probs – **not done, recommend using ecCharts**

- Infrared simulated low clouds colour-scaling issue – post-process using e.g. SST? – **not yet**

- Provide weather window guidance (colour coded meteograms where 90% of ens waves are below 2.2m) – **not yet**

- Clearer meteograms (aspect ratio) – **not yet, big issue for product layout**

- New domain for Australia that goes further W – **not yet**

- Better login authentication – **miscellaneous web changes may have improved situation here**
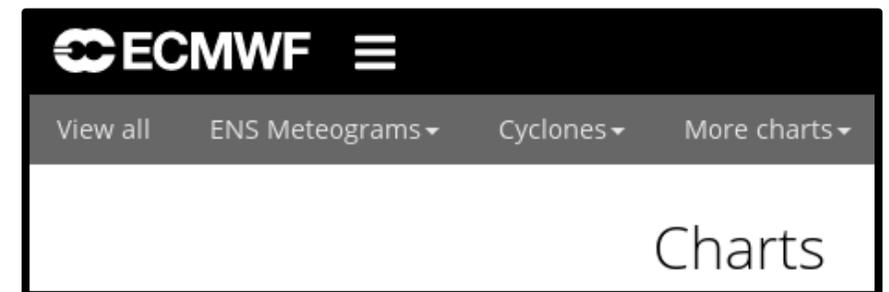
Q6: Regarding ecCharts, where would you like ECMWF to focus improvements in the coming 1-2 years?

- **Used a lot!**
- **Speed is an issue to use as an operational tool** – **ongoing (?), but remember WMS facility**
- More ENS parameters – **new parameters being continually added**
- **Clickable vertical soundings** – **about to be implemented, major undertaking!**
- Cross-sections – **not yet**
- Extension of meteograms in ecCharts (wind direction, 3 hourly steps), min/max temps – **not yet**
- Spaghetti plots crashing – **fixed?**
- 24 hr granularity on TC risk estimates – **not yet improved**
- WFS capability to be added (WMS is used heavily) - **?**
- Mercator projection bug - **?**
- Vorticity advection (500mb +) – **not yet**
- Sunshine duration probability (tunable threshold for new direct solar radiation variable) – **not yet**
- More probabilities (e.g. CAPE) – **not yet**
- **Compare/combine multiple recent runs – not yet**
- Save Meteograms as PDFs – **implemented, via print-save**
- More conditional probability options (e.g. to help fog forecasting, combine EFI with M-Climate quantile) – **not yet**
- TC tadpoles for systems developing during forecast – **not yet**
- Precipitation type meteograms - **implemented**
- Aviation parameters in feet – **not yet**
- Dashboard: sharing, tab re-ordering, include "Views" menu to make legend visible – **some improvements, more can be done**
- Update a saved product – **not yet**
- CDB products – **work ongoing to implement Python coding (from Met Office) which will provide importable objects**
- Options to make wind barbs legible – **not yet**
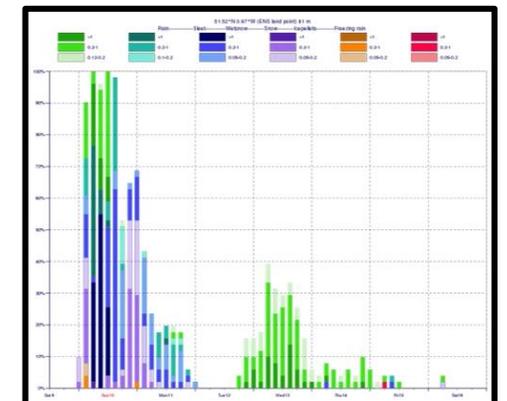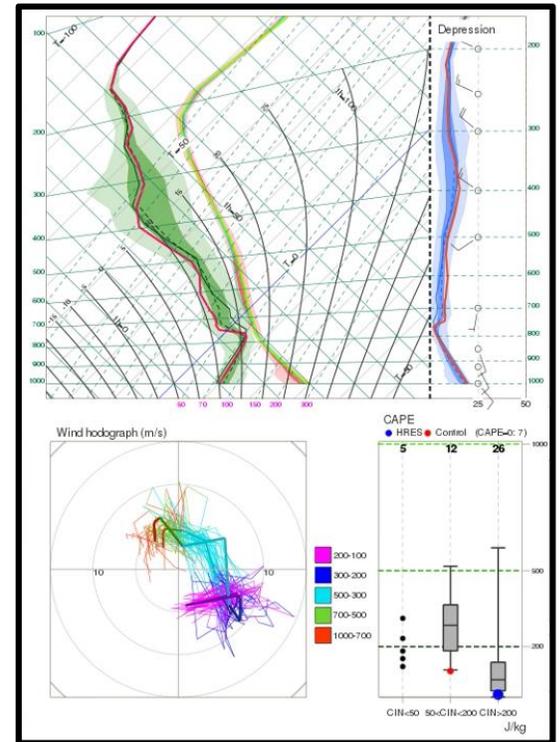
Q7: Would you like to see ECMWF issue monthly forecast products for weeks 5 and 6 even if there is minimal evidence of any skill over Europe?

➢ Mixed views:

➢ Not high priority

➢ **If no skill, should not be there**

➢ Strong interest even with no reliability!

➢ Better to focus on weeks 3 and 4 first

➢ Post-processing can enhance/uncover skill

Week 5 and 6 product options are now in ecCharts – no complaints about making these available!

Miscellaneous Feedback

➢ Great customer service

➢ Stratospheric wind data from project Loon – could you use for data assimilation? – **not yet**

➢ Suggest workshop on tropical meteorology – short range to seasonal (or topic for next UEF)

➢ ECPDS v useful

➢ ECMWF should not provide "added value services"

➢ Official dissemination should deliver full 9km resolution (not 11km from 14km mesh) – need better BCs!

➢ Would like to use our "high density observations" – **use restricted by providers**

➢ Re-forecasts in dissemination – sub optimal – want:

    ➢ Resolution overlap included – **implemented?**

    ➢ Longer leads ahead in time - **?**

Additional Question: ECMWF is planning to archive more **ocean data** in MARS. This will probably not begin until 2019 at the earliest, but we are now canvassing users in order to plan the content. So what would you/your organisation like ECMWF to archive in the way of ocean data (it would of course need to be part of model runs)?

➢ Currents (for e.g. oil slick movement) – **ocean currents now available in HRES output (45r1)**

➢ Temperature & salinity below surface, focus on levels near surface

➢ Users need to learn how they could use such data (test datasets?)