

# Group 2

# Precipitation Forecast Issues

User Voice Corner

- **Dan:**

- Point rainfall is very useful. E.g. gave good indication on how thunderstorms could develop just recently in one a UK case.
- Tim (EC): An example was a recent event in South Wales where the point rainfall gave a good guidance 4-5 days in advance! There will be a seminar on 18 June 10:30 about the point rainfall (see <https://www.ecmwf.int/en/learning/seminars>)

- **Alexandre:**

- There is a lack of definition of precipitation related to low-level orography in eastern France with too low maxima over hills compared to the observations. The Arpege model at a similar resolution was better. This was confirmed by a German colleagues who saw the same problem in Germany. It is mostly a problem when it is windy, which suggests orographic enhancement and/or rain shadowing may play a role
- Tim (EC): It was strange to see the difference of precipitation coverage in the example that was presented earlier in the survey feedback presentation, as they should have been for the same time period. Also notably that HRES showed much less detail than Arpege, which has slightly lower resolution.
- Richard (EC): The different precipitation coverage in Tim's and the users' map can not be just interpolation, the period must be also different. Mentioned also that a future cycle (possibly 48R1) may deliver different orographic rainfall modulation, with e.g. better enhancement and rain shadows due to higher order interpolation of precipitation, but this is still being assessed.

- **Alexandre:**

- Too many light rain ( $< 0.5$  mm/hr) events in the model. The FBI (frequency bias index) is too high for light rain, but too low for heavier rain ( $> 10$  mm/hr).

- Tim (EC): Probably relates to (i) systematic gridscale error, and (ii) to the grid box forecast vs. point observation problem where the point observation can not represent the whole grid box. The point rainfall product is there to help correct for both these biases in the output (notably the latter one). A paper was recently submitted about this.

- Richard (EC): The FBI problem is common in global models in general. It is an issue that is being actively worked on and will hopefully be improved in a future model cycle (possibly 48r1) to reduce the light rain over-prediction on the grid box scale ( (i) above ).

- **Jens:**

- Discussed some of the complexities of orographic effects, parametrisation and vertical velocity, in the context of the DWD modelling systems. Resulting new parametrisations are now leading to improved handling of precipitation near orography.

- Richard (EC): We are interested to hear about this, could be very interesting for ECMWF too, and we are in contact with the DWD developers.

- **Kristian:**
  - They have been using the point rainfall very happily. It is a great product! He asked about which percentile should be used from the point rainfall for extreme precipitation event forecasting. Colleagues use the 95<sup>th</sup> percentile as this is the default one in ecCharts.
  - Tim: 98-99<sup>th</sup> percentiles should be reasonable to use for this and could very well show the most intense potential localised events. Especially useful in convective situations. This value (e.g. 98<sup>th</sup> percentile) will mean that, at a chosen location, there is a 1 in 20 chance to have at least this value.

- **Steffen:**

- He had general interest in precipitation. Users are interested mainly in precipitation and clouds. He also reiterated the FBI problem with the too frequent light rain events in the model. Their area of interest is mainly Central Europe, plus North America and also India.

- Tim (EC): He recommended to use the point rainfall. It is worth trying it.

- Richard (EC): He also mentioned again that improving the FBI issue was being worked on and hoped to see an improvement in a future model cycle.

- Steffen was also concerned with using the ENS as this causes data download issues as they already at the maximum of their data allocation. To download the ENS would be very expensive, so not done, even though they would like to have it.

- Tim (EC): He mentioned that the point rainfall currently is not in MARS or dissemination (Grib headers need to be sorted out), so it is available only in ecCharts, which is free for this maximum charge private company. He also mentioned that it would be good if users would indicate the need for the point rainfall which could speed up the process of getting the archival sorted.

- **Johanna:**
  - She joined the group as a general observer from Columbia, from a private energy company working with short- to long-range forecasts.
  - Tim (EC): Asked if she was interested in floods at all.
  - Johanna: They have only used ECMWF forecasts for about 8 months. They have noticed the usual difficulty and problems of tropical precipitation predictions.
  - Tim (EC): added that in that northwestern parts of South America the forecast fields can be particularly wavy due to the impact of the high orography of the Andes.
  - Peter Bechtold (EC): added that the anomalies (like the monthly forecast, etc.) are OK, however, to predict the local, absolute values is very difficult as it depends on the flow and the waves that the high orography creates.