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Representativeness and observation uncertainty

Representativeness issues in verification practices (Barbara Casati)

Dominique Brunet: Why not interpolate the observations to the model instead of interpolating the model to the observations?

Barbara: For historical reasons – more fair comparison amongst models

Pavel Khain: Re. looking at model lapse rate, suggest that there may be other model grid points in the vicinity which are below and above. Consider "lapse rate of 2-m temperature", rather than lapse rate of model in atmospheric column.

Jonathan Day: Is it common to aggregate?

Barbara: Some modelling centres use model outputs directly, others use land surface model.

Morten Køltzow: MetNo went from 10-km to 1-km grid spacing, and got larger errors along the coast. Were using proportional in old model; in the new model, tiles were either ocean or land. Constructed weighting to place more emphasis on land component of surface scheme output. Additional post-processing performed before presenting outputs to public.

Barbara: At what point does the treatment become post-processing?

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Representativeness of Coastal Stations for Verifying Open-Water 10 Metre Wind Forecasts (Nelson Shum)

Marion Mittermaier: Scatterometer winds are "stress equivalent winds"; not the same characteristics as a wind generated from an anemometer.  Model doesn't output "stress equivalent winds" on its own.

Manfred Dorninger: Future steps will include wind direction. Expect that will give different results on the scatterplots, particularly when coastal zones are complex.

Nelson: Samples are filtered to focus on on-shore winds at the moment. Will be able to do more with additional data.

Elyakom Vadislavsky: Once you correct the wind (bias correction), you change the physics (mass conservation).  Any other adjustments made to compensate?  Might not need for a single station, but if using for verification of gridded fields using multiple stations, need to consider.

Nelson: Didn't take this into account.  Using available algorithm.

Representativeness and observation uncertainty

Accounting for representativeness in the verification of ensemble forecasts (Zied Ben Bouallegue)

Pavel Khain: Did you consider constructing a map of the correction?  Does the correction depend on location?

Zied: The model does incorporate some information about location: the difference in elevation.  This is a general model which can be used anywhere in the world.  The lapse rate is incorporated in the standard deviation term.

Barbara Casati: Results for temperature and precipitation could be quite different.  Precipitation has a strong seasonal signal (convective vs. stratiform).

Zied: This is a first step.  Hope people will build on it to account for seasonal variations.

Barbara: Another group (unable to catch the name) analysed seasonal precipitation using wavelets. Could be another group of studies to consider for refining analysis.

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Taking the wind-induced undercatch of solid precipitation into account in the verification process
(Morten Køltzow)

Chiara Marsigli: Have you considered a probabilistic verification, given the uncertainty in the observations?

Morten: It is a possibility.  Experimented with the approach, but didn't include it in the paper.  A number of other papers have also presented this approach.  Not clear if the coefficients for the transfer functions span the probability space.

Barbara Casati: All the correction functions increase the estimated precipitation. After correcting, we have an uncertainty (spread), which is not the same as the error in the measurement.  Need to consider separately.

Morten: Adjustment has substantial impact on biases; less impact on other measures, such as skill scores.

Jonathan Day: How many stations are co-located with automated SWE observations or a snow course? Could observations of the snowpack provide a complementary check of the adjustment factors?

Morten: It is recommended to complement solid precipitation measurements with other types of precipitation measurements when available. (Point 6 on summary slide)  Has investigated a bit: other types of measurement also demonstrate considerable noise, and must be handled accordingly.  Not many examples in Norway, so didn't include that analysis in this paper.

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Are gridded datasets reliable for extreme rainfall events assessment over West African Sahel-Sudan?
(Not available)

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Representativeness and observation uncertainty

General Discussion

Barbara Casati: Notes will be shared after on the drive, along with the presentation. Please verify that the notes are an accurate representation of what was discussed. (I agree!) Yesterday, we had a presentation on data assimilation. Tom Auligne showed how data assimilation is handling observation uncertainty. Is anyone considering such techniques for handling observational uncertainty?

Chiara Marsigli: Comment made by (Beth) re. calculating forecast increments. (Wasn't able to keep up...sorry!)

Marion Mittermaier: Trying to estimate observational uncertainty by comparing results using different observing platforms (e.g. gauge vs. radar). Using data assimilation techniques to get a handle on that. Need a large dataset to get meaningful results. Done some experimentation, but need more data...

Roger Harbord: Barbara and Zied use methods involving post-processing. We are using neighbourhood methods also. To what degree can we separate verification of model data and post-processing?

Barbara Casati: WMO CBS has published guidance on how to exchange scores, precisely because of the issues raised. Simple methodology which can be applied by all centres (e.g. lapse rate adjustment). For work within a modelling centre, need to tailor outputs from individual stations.

Manfred Dorninger: If we imagine a perfect measurement without any uncertainty, we still have a representativeness issue based on scale, either because scale is not represented or phenomena not represented. Have not seen analysis of this.

Zied Ben Bouallegue: Comment re. post-processing. Might have a different answer depending on perspective. Post-processing at ECMWF based on observation only; not based on model. Allows to answer questions re. reliability of ensemble. If only correct based on observation, can apply bias correction.

Barbara Casati: For coarse resolution models, would also look at gridded observations; if similar results from point observations, good. Otherwise, have a problem. There are a number of gridded products (e.g. from satellite). Looking for consensus, based on different observing platforms, is a valuable exercise. Applies also to process errors (e.g. radiative fluxes).

Marion Mittermaier: Do we expect results to agree, irrespective of observation type? If so, do we continue to develop until we get agreement? If so, which observation type do we favour?

Barbara Casati: If no discrepancy between different observing platforms, gain more confidence. Another option to compare against analysis to see if one observing type is out.

Marion: Need to take into account the operating characteristics of each observing platform.

Barbara: Sometimes differences in observations are greater than differences between observations and models.

Chiara: Representativeness particularly important because of the differences in the operating characteristics.

S K Sagar: Refer to talk by Hotta on twin analysis. How to generate independent analysis?

Barbara: Presentation is on One Drive.  All participants have access.  Can also use Chat function to contact the participant directly, or contact presenter by e-mail.  Please remember that the IT support people are available to resolve technical issues.

Chiara: Thanks for participation.  Next session will be tomorrow at 1500 UTC.

Barbara: Opening keynote had to bow out.  Will start with a very brief introduction, and proceed with presentations.