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WIND ENERGY SCIENCE DISCUSSIONS

Interactive comment on "Generating wind power scenarios for probabilistic ramp event prediction using multivariate statistical post-processing" *by* Rochelle P. Worsnop et al.

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The research work utilizes operational HRRRv2 NWP data, along with four methods of statistical post processing to transform deterministic wind speed forecasts into hourly probabilistic up and down-ramp predictions over sliding windows for two sites with complex terrain. The article is well written and is presented clearly and concisely. Ramp forecasting is a very important field which can lead to significant reductions in wind power balancing costs, and I believe that this original research work makes a valuable contribution to the topic. Therefore I recommend to the editor that this article is accepted for publication. The scientific approach is clear and well thought out, and the

methods are presented in a reproducible and logical manner.

I have a few points that I ask the authors to consider for the final manuscript:

- The observations themselves also have underlying uncertainties. Has the instrumentation been recently calibrated? You can likely disregard this (but still good to mention) since the time averaging will reduce the statistical uncertainty (type A)
- How far are both sites from the HRRR model grid point? If the resolution is 3km, the closest point may not be representative (especially in complex terrain). Including a map with the mast locations and grid points would be a good addition.
- A comparison of these methods with a baseline (e.g. persistence or climatology) would strengthen the results
- Is there a reason to not first evaluate at a site with less complex flow, where the local observations are better correlated with model predictions? Especially since these methods have not been demonstrated before
- It isn't entirely clear, since you say that M5 obs are averaged to 10 minutes, while PWN are averaged to 1 minute. Is that only raw data and then they are both averaged again later to 1-hour?
- Do you expect any improvements with the HRRRv3 model changes?
- A note about processing time and ability to run these forecasts operationally would be useful information to provide
- Skill scores for the M5 site using synthetic data are not shown (Figure 11 only for PNW). Are the results similar?

- The caption on pg. 26 should be on the same page as the figure. Same with pg. 27 to reduce whitespace
- I agree that a continuation of the work should include wind direction and atmospheric stability. Especially since you have observations to properly classify these regimes. I look forward to reading future work from your group!

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