NBM Webinar Notes	
Date / Time	Apr 15, 20261:00 - 2:00 PM

Notes	• **Question: Has there been any consideration of developing a reforecast dataset to build a longer-term historical record for variability?**
	  ○ The team acknowledged the value of a long-term archive for calibration purposes. The primary challenge is data retention, as the NBM integrates many inputs and storing all historical data at the necessary scale is currently not feasible. There are ongoing efforts to expand data storage capacity, which could enable this in the future.
	  ○ Reforecast data from sources like GEFS or the European ensemble may be leveraged, but limitations exist since not all inputs support reforecasting. There is also no existing reforecast dataset from a hi-res input.
	• **Question: How does the overall performance of version 5.0 compare to the current production version?**
	  ○ Version 5.0 has been more vetted than any other previous version - many months of objective and subjective review and verification. The most substantial mprovements have been noted in deterministic wind and gust fields, especially in the medium range, where biases at higher wind speeds were reduced.
	  ○ There is a slight high bias at lower wind thresholds, resulting in somewhat worse RMSE, but this was an intentional tradeoff to better capture higher-impact events.
	  ○ There are other improvements to winter fields, precipitation, and significant wave height. Results for temperature and dew point were somewhat mixed.
	• **Question: What role will AI or other technologies play in future development, particularly for improving blending and bias correction?**
	  ○ AI is seen as an important future component, though it will be implemented cautiously. It may help leverage reforecast and reanalysis datasets for improved bias correction. The team is already exploring AI applications, and it is expected to be incorporated in some capacity moving forward.
	• **Question: Has the team considered replicating extreme cases in the training data to help improve prediction of rare events, given that those extremes don't occur often enough for models to fully train on them?**
	  ○ The team is beginning to explore this approach, including initial work related to maximum temperature. However, there is a risk of overfitting if too many non-representative extreme cases are added, which could skew the model in the wrong direction.
	  ○ The team noted that extreme events are inherently difficult to model, especially since the system relies on existing model

output. If extreme events are not well represented in the input models, they are unlikely to be captured in the output. It's also worth noting that a blended system mutes signals of major events from individual inputs, by design.
    - Addressing extreme events requires a large number of cases, which are rare and require long historical datasets that are not currently available at the needed scale. Reforecast data could help, but limitations in data availability and storage remain.
- **Question: How does the NBM support different NOAA organizational units, and how is it used by external partners outside of NOAA?**
    - The NBM is designed to serve as the starting point for the National Weather Service's gridded forecasts within the National Digital Forecast Database. Forecasters use it as a baseline and make edits as needed. The long-term goal is for the NBM to function as the primary gridded forecast, allowing forecasters to spend less time on routine forecast adjustments and more time on impact-based decision support services and high-impact events.
    - The approach to generation of the gridded forecasts is still in a transition phase, where some manual adjustments are made, particularly in the medium range, but these are relatively limited.
    - For external partners, the team noted that they have limited visibility into how the NBM is used. They receive occasional feedback, but are actively seeking more input from users and partners to better understand use cases.
- **Question: How can I use the NBM, particularly for something like thunderstorms, to better look ahead and understand what the weather might do beyond the standard forecast?**
    - The NBM provides a probabilistic thunderstorm product that extends out to approximately day 8. There is also a more specific thunderstorm probability product that goes out to just beyond day 3.
    - For severe weather, the NBM relies on and repackages products from the Storm Prediction Center, which cover the short range through Day 7.
    - The usefulness of these products depends on the quality of the input models. Data can be accessed through the public NBM viewer, downloadable datasets, or text products available on the NBM web page, depending on the user's level of technical access.
- **Question: : How should deterministic and probabilistic forecasts be interpreted now that they are more consistent in version 5.0? Previously, deterministic was seen as the most likely outcome and probabilistic as a range of possibilities.**
    - That is still a reasonable way to interpret the deterministic and probabilistic output. The key, though, is that now the deterministic and probabilistic outputs are derived from the same underlying data and weighting, rather than being developed

separately. This means that the deterministic value falls within the distribution, and we avoid situations in which the deterministic value is completely inconsistent with the probabilistic output (i.e. in previous versions of the NBM, it was possible to have a deterministic QPF value of 9.84", while the probability of QPF > 5" was 4%).
    - **Question: Is the NBM deterministic snow depth parameter similar to snowfall or snow depth outputs from models like the NAM 3km or HRRR, especially in terms of what a user would expect to see on the ground?**
    - The NBM does not directly use any direct winter accumulation fields from input models. Instead, it uses QPF and precipitation type information, along with a computed snow-to-liquid ratio (SLR), to derive snowfall and freezing rain accumulations. Downscaling of the wet-bulb temperature is used to map the precipitation type information to the higher-resolution grid. Since the SLR computations are variable and at least partially account for compacting and melting, the NBM accumulations do fairly effectively represent what should be on the ground.
    - The NBM has a new instantaneous snow depth field which represents how much snow will be on the ground, but it is not intended to be used as an accumulation parameter.
- **Question: With the timing differences mentioned in the Service Change Notice, should users expect differences in when files are available from AWS compared to the current version?**
    - Yes, some timing differences are expected. Some fields will be available faster and others slower. Any timing changes noted in the Service Change Notice will apply across all platforms, including NOMADS, AWS, and others.