Using Analogs as Medium Range Guidance for a Heavy Snow Event
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Introduction
• A blend of knowledge and experience is critical for effective interpretation of model output. Yet even seasoned forecasters sometimes fail to recognize significant weather events due to (over)reliance on model Quantitative Precipitation Forecast (QPF) values and less attention paid to the causative factors.

Methodology
• Search the 28-yr North American Regional Reanalysis (NARR) dataset against the model forecast (GFS212) for potential analogs.
  1. 20% anomaly from the date of the forecast
  2. Large angular similarity
  3. SST/soil moisture
  4. 24 h temperature normal

• Once the 20,160 potential analogs are reduced, “duplicate” times are removed. “Duplicate” times occur due to the variability in system speed (e.g., a nine historical system may exhibit similar patterns to the forecast over a longer period of time).

• To reduce the 20,160 potential analogs, threshold values were determined based on the control run for the following fields:
  1. 850 HGT COR MEZO: 0.60
  2. 850 TMPC COR MEZO: 0.85
  3. PMSL COR MEZO: 0.35
  4. 850 HGHT COR MEZO: 0.60

• The values of the thresholds were determined by utilizing a heavy snow climatology (14°F) that was developed in the LSCEMA (at this conference, see Gosselin et al. 2008).

• The best analog is determined by averaging all three results scores (e.g., F080, F060, F08).

Samples of Measures of Center and Spread Guidance

Samples of Probabilistic Guidance

Conclusions
• The goal of our analog system is NOT to make a forecast; but to provide medium-range guidance for heavy snow events by using a historical dataset.

• In addition, a forecast can quickly gain historical experience and become familiar with the meteorological patterns associated with past similar events.

• The current approach is independent of QPF yet can still provide precipitation amounts (i.e., we already have the answers).

• Initially (~1 November 2008), the analog system will be run twice a day using the 00z and 12z GFS212 runs. Early in 2009, the goal is to expand this to also use the GFS Ensemble product. Presented here is only a sample of potential products, familiar with the meteorological patterns associated with past events.

• The analog forecast approach can be applied to any meteorological event as long as a control run is found.

• The “perfect prog” approach, which is utilized in this research, has two weaknesses: the uncertainty that is considerable run-to-run consistency.

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• Finally, in order to catch possible system direction, statistics are computed for a 12 h from the time of the best analog using the matching forecast. The final analog run is determined by averaging all three results scores (e.g., F080, F060, F080).

• If certain thresholds are exceeded, the date/time is considered a potential analog.

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