

WPC Challenges

- Diverse product suite requiring use of multiple aspects of the NCEP modeling environment across CONUS and OCONUS domains
- Greater focus on IDSS → improving forecast of high-impact events at sufficient lead times

Focus Areas

Winter weather

- Providing calibrated probabilistic guidance to support greater winter storm watch collaboration with WFOs
- Main challenges – lake effect, precipitation transition zones, membership performance (primarily the SREF) in our PWWF suite

QPF

- Providing greater lead time for high impact heavy rainfall events in the Day 0-3 time frame, Collaborative Forecast Process
- Main challenges – NWP QPF has only marginally improved over the last decade – especially at day 3, Lack of CAM through day 3 (Agency Priority Goal – Day 3 ERO High Risk Issuance).

Medium Range

- Day 3-7 Hazards, Collaborative Forecast Process
- Main challenges – Develop better objective inputs for Day 3-7 Hazards Product. Under-dispersive ensemble guidance.

Testbed R2O

- Evaluating new data sets, products and forecast methodologies through HMT-WPC (Flash Flood, Winter Weather, and Extended Range Forecast Experiments) for potential transition to operations
- Main challenge – Obtaining new data sets in time for experiments and consistently during the duration of experiments

WPC's UFS Involvement

How do you see your involvement in the development of the Unified Forecast System (UFS) now, and how do you see it evolving?

- WPC Involvement in the UFS
 - Subjective and Objective Verification
 - Emphasis is on QPF and Winter Weather Elements and Medium Range Forecasts
 - Evaluation of Model Output (direct and post-processed) by WPC Forecasters
 - Evaluation of Model Output (direct and post-processed) by WPC HMT Experiments
- WPC Future Involvement in UFS
 - Increase activity with Strategic Implementation Plans (SIPs) for UFS
 - Subjective and Objective Evaluation will continue with improved evaluation methods (MET and Refined Subjective Evaluations)
 - Develop evaluations focused on impacts (e.g. Winter Storm Severity Index)

WPC's UFS Needs

What do you see as the greatest needs going forward in the construction of the UFS? (in terms of applications or specific targets for model improvement)

- Needs of UFS
 - Coupling of Air/Sea/Ice Modeling
 - CAM output to 84 hrs (Day 3)
 - Continued Focus on QPF (Year Round)
 - Allow for additional output parameters from microphysic schemes to enhance PTYPE machine learning techniques (e.g. snow mixing ratio, depositional snow growth, vertical snow flux)
 - Add post-processing to incorporate hydrologic (e.g. QPF with respect to flash flood guidance , ARIs, etc...) and climate (e.g. how do max/min temperature forecasts or QPFs compare to record events?, etc...) context

WPC's UFS Needs

What do you see as the greatest needs going forward in the construction of the UFS? (in terms of applications or specific targets for model improvement)

- Needs of UFS
 - Development of impacts based post-processed products
 - Develop explicit microphysics-based precipitation type algorithm and variable snow ratio calculated at every model time step for snowfall accumulations.
 - Unified Suite of Verification Metrics across NWS/NOAA/Partners
 - Social Science Engagement of Forecaster and Customer Use of UFS output
 - Improved Soil Moisture output from Land Surface Model - aid in Flash Flood Forecasting
 - Incorporate Dynamic (Movable) Nesting for High Impact events
 - Improve ability to run and evaluate retro-case studies.