

14 February 2005

Eastern Region IFPS Science Steering Team (ISST) Focus Group input Regarding How NCEP Centers Should Support WFOs in the Digital Forecast Process

Task: A short-term focus group of National Weather Service (NWS) Eastern Region (ER) Science & Operations Officers (SOOs) and senior forecasters was to respond to the following question: *"How should each NCEP center support WFOs contribution to the digital forecast process?"*

The solicited response will be sent to the NWS ER and eventually the National ISST Representatives for review.

Response:

A) Medium & Extended Range Guidance Grids (HPC)

- A uniform starting point for all day 4-7 grids is necessary, with HPC being the logical source for initial grids. This is required for office to office consistency of all gridded elements at all forecast times.
- NCEP should provide synoptic **extended-range background grids (days 4-7)**, but at spatial and temporal resolutions at NDFD standards. These would be used as the starting point for WFOs regarding the day 4-7 forecast. Only in cases of locally known biases and/or effects (local knowledge and/or mesoscale expertise), persistence, or situational climatology under a particular weather regime, should a WFO forecaster spend a disproportionate amount of valuable time adding great detail in the extended grids. In other words, it should be of lower operational priority to the WFO grid editor to forecast extreme events in the extended range, since NCEP should already be taking the lead.
- Gridded QPF is necessary for days 1 -3 and all offices should be required to use these grids for initialization.
- Grids must be available in a timely fashion for WFOs to use. HPC should make initial grids available by 1200Z to 1230Z. WFOs can collaborate with HPC and other WFOs through 1500Z, and HPC should then send the final set of grids shortly after 1500Z.
- For winter storms - all grids including snow grids should be provided by HPC, if required in extended periods in the future. Gridded WWE snow amounts would be a useful starting point in days 1-3.
- An example of when the WFO forecaster could add value to the NCEP day 4-7 forecast: Consider the region from the Chesapeake Bay to the Virginia Piedmont in the winter, with a mixed precipitation event forecast, local knowledge could be applied to the position of precipitation transition zones based on climatology. Under these circumstances the WFO can add details to the extended grids beyond the basic NCEP guidance by providing temporal detail in the temperature and precipitation

grids based on known local tendencies.

- Questions to be resolved
 - What about grids over water?
 - How far offshore should HPC grids be?
- Requirements
 - HPC and OPC need to communicate and collaborate internally, so wind and wave grids are consistent from land to water and conform to NDFD standards.
 - Tools are needed for localization and conversion to NDFD spatial and temporal resolutions, if HPC grids do not conform to NDFD standards initially.

B) Gridded Format & Probabilistic Guidance (NCEP) - "Focusing on the short term (days 1-3) is not a form of *relinquishing* our duties, it is a *redistribution of duties*: the same workload, just more concentration on the short term. – John Distefano, WFO Wilmington, OH

- NCEP should provide **all forecast/guidance information in gridded format** for potential ingest into the WFO's GFE. This would support many forecast functions, development functions, smart tools, etc., and improve WFO efficiency by giving forecasters more time to incorporate their value-added contribution.
- NCEP should support the evolving probabilistic forecast processes that are taking place at WFOs. This would include value added information based on ensemble-based MOS guidance. This would be a great complement to the deterministic forecasts. As with impact weather and extreme events, it is becoming obvious that deterministic-only information is insufficient for decision-makers.

C) Model Guidance (EMC)

- NCEP should provide **all model guidance in its native resolution. High resolution mesoscale model data should be provided in a subset of a domain, such as regional tile.** Although WFOs are closest to local customers and charged with delivering the highest resolution forecasts, valuable resources (e.g. time, expertise, etc.) are wasted putting back information that was simply removed due to limited bandwidth considerations. Providing model guidance of degraded resolution decreases the potential effectiveness of the WFO forecaster who must perform redundant work just to get started; from a business-sense, this is an unwise long-term condition.
- NCEP should provide access to gridded guidance from other Numerical Weather Centers such as ECMWF, CMC, and UKMET. Access to the full suite of guidance products will assist forecasters in modifying the initial grids provided by NCEP in days 4-7.
- EMC should continue to support local and collaborative mesoscale modeling efforts by providing timely access to initialization and boundary grid fields as needed. The emphasis here is to have a high-resolution data for the best initialization possible. The intent is to make the short-term forecast the best that it can possibly be and to keep it well-maintained (especially for impact weather or extreme event situations).

D) Libraries of Climatology & Standard Deviation Grids (CPC)

- NCEP should facilitate the creation of a library of **climatology grids** (at the highest possible temporal and spatial resolution nationally).
- Climatology grids for each verification element should become part of the baseline

GFE software, with a periodic update strategy established.

- Development should also include supporting the WFOs in the growth and maturation of additional local/regional libraries of **climatology grids**. As gridded databases accumulate with past events and local mesonets improve the quality of gridded analyses, the local production of situational climatologies (e.g. for El Nino years, La Nina years, dryer/wetter than normal situations, hotter/colder than normal situations, varying wind flow regimes, etc.) for respective forecast areas should be pursued.

E) Marine/Tropical Cyclone (OPC)

- Wind (over water) and wave grids should be required for days 4 through 7, to NDFD specifications. If OPC cannot produce wave grids in a timely manner, then support should be provided to have a model run locally at respective WFOs. NCEP's role in this case would be to provide the needed data to make this a success (see section B. for discussion on local modeling).
- An ensemble or multiple model method to produce wave grids would be useful.
- **Requirements**
 - HPC, OPC and TPC need to communicate and collaborate internally for a wind gust grid.
 - Swell, periods and wave direction grids should be produced, when required.

F) Marine/Tropical Cyclone (TPC)

- Time of issuance of TCM grids is important - Some offices update the grids immediately after TCM grids are sent, others wait, can cause considerable discontinuities.
- OPC and TPC could work together to produce wind field and separate wind gust field - Current method employed by TPC in producing TCM grids, uses maximum wind fields, which are rather coarse and not always meteorologically consistent from eyewall to periphery.
- Separating the wind and wind gust fields would result in more meteorologically consistent wind and wind gust fields during tropical situations.
- NCEP should provide **a full 7-day forecast of tropical cyclone positions** with 34kt wind radii supplied throughout the forecast period. Efforts should be made for a 100kt wind radii through 36 hours, a 64kt wind radii through 72 hours, and a 50kt wind radii through 5 days.
- Again, NCEP should provide **probabilistic forecast guidance** (in gridded form) of exceeding critical thresholds with respect to **wind, wave height, and surge**. WFOs would be able to fine-tune local forecasts based on this knowledge.
- **Requirements**
 - OPC and TPC could work together to produce wind and wind gust grids, perhaps also allowing TCM grids to be sent sooner.
 - TPC could ship initial grids to OPC, OPC could refine, and then make available to the field.
 - All coastal offices must update wind and wind gust grids immediately after TCM grids are available to the field.

G) Severe Convection and Fire Weather (SPC)

- Produce gridded hazardous weather threat graphics that could be shipped to local WFO internet pages for hazardous weather pages, similar to what Florida WFOs and Morehead City, NC do.

- A CAPE field could be ingested into GFE which shows the potential for severe weather.
- Fire weather grids such as Haines Index and others could be used to initialize a database.

H) Aviation Weather Center (AWC)

- Provide gridded guidance on Ceiling and Visibility.
- Provide the CCFP and other aviation fields in gridded format for use by WFOs and CWSUs.