Minutes from CHPS Forcing Team Call
Wednesday December 17, 2008
Mark Glaudemans, OHD

Participants:
ABRFC – not present
CNRFC – Art Henkel, Alan Haynes
NERFC – Ron Horwood
NWRFC – not present, but on-site discussions with Harold Opitz, Joe Intermill preceded call
OHD – Mark Glaudemans, Jon Roe, Jingtao Deng, Paul Tilles, David Miller, David Kitzmiller
OCWWS – Mary Mullusky

Next Call:
Wednesday 12/31/2008 12:00 Eastern **(note: no call 12/24)**
number: 866-614-2988
participant passcode: 7565560

This week was a bit different as CHPS Testing is taking place at HQ, with Ron Horwood, Harold Opitz, Joe Intermill, and (3) Deltares employees on-site. Face-to-face discussions regarding CHPS forcings took place and are reflected in some of the topics discussed during the call. The call agenda roughly followed the topics presented in the 12/3 call minutes. I am interspersing some of my thoughts with the minutes below.

1. Forcing-Application Matrix

The spreadsheet/matrix posted with the 12/3 minutes shows the application(s) currently planned for each gridded forcing for each CAT RFC. Mark reminded folks that this matrix is serving as the official record of RFC forcings BOC plans. Please inform Mark of any changed approaches for your RFC and the team can discuss them to ensure that the overall goals are still met.

In the near future, with your input, this matrix will be expanded to include the grid form expected for each of the forcings (more on this below).

A separate matrix will be developed in the future to document the applications and grid forms for post-BOC. [Reminder: BOC-1 is the CHPS delivery for the (4) CAT RFCs. BOC-2 is the CHPS delivery to the remaining (9) RFCs.]

2. Forcings Grid Forms

The early December email exchanges (posted on listserver) between NWRFC/Joel and Deltares/Micha discussed the abilities of FEWS to handle different grid forms. Deltares has stated that FEWS can already handle GRIB1, and to some degree, netCDF and HDF5. Deltares stated that they are prepared to modify software if needed to handle these or other grid forms. [Reminders: grid form is defined by projection, resolution, and format; forcing defined by time domain and element.]

2.1 Grid Resolution/Projection

Despite these accommodating statements from Deltares, Mark stated the OHD belief that it is in the NWS's collective best interests to deliver forcings grids to CHPS which use consistent grid forms as much as possible. The desire for consistent grid forms will not always be practical or meaningful, but that should be the starting point.

Ideally, all RFCs will use the same grid form for a given forcing for the following reasons: a) more unified grids will make RFC operations more efficient for providing grids to destinations other than CHPS; b) it will avoid having to spend limited Deltares resources on accommodating divergent, inconsistent approaches

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from not just 4, but 13 RFCs; c) having unified grid forms will allow improved long-term flexibility with grid generation in the post-BOC era, when new tools and/or methods may be adopted;

For discussion purposes, maybe (?) it is helpful to visualize the different grid form possibilities via a table.

Grid Resolution (R) and Projection (P) for a given forcing		RFC	
		RFC-1	**RFC-n**
Weather Element Time Domain	**Observed (O)**	R-1Obs P-1Obs	R-nObs P-nObs
	Forecast (F)	R-1Fcst P-1Fcst	R-nFcst P-nFcst

For certain factors, it is preferable that for each forcing element (i.e. temperature), the resolution and projection for both observed and forecast elements would be the same. Verification needs would especially benefit from this.

This consistent grid form will probably not be attainable for BOC for software reasons, and possibly beyond for science reasons too. The software reasons include the use of different applications (e.g. GFE, MPE/DQC) or different spatial domains (e.g. GFE at larger MBRFC vs. GFE at smaller NERFC). An example of the effect of different applications may be in precipitation, where the initial proposal is to have observed data follow the MPE 4-km HRAP polar stereographic and forecast data follow the GFE 2.5-km Lambert conformal.

Even if the resolution and projection differ between the observed and forecast element, it is expected that the different RFCs use the same projection for the given forcing. However, the resolution may differ, in which case it is hoped to have the resolution be numeric multiples of each other. An example of this may be the forecast data - for larger RFCs this may be 5 km, or double the 2.5 km used at smaller RFCs.

2.2 Grid Format

Regardless of the projection and resolution for a given element, there are benefits in using the same data format to transfer the data into CHPS. Discussion at the call was about some current and proposed formats in AWIPS.

For AWIPS-1, GFE uses netCDF locally and transfers data among offices via ISC (Inter-Site Coordination) using netCDF format files transferred on the WAN. Model data is passed on the SBN using GRIB1 and GRIB2. For AWIPS-2, the model data will continue to use GRIB. However, netCDF will be replaced by HDF5 at least for local purposes. It is presumed that HDF5 will also be used for ISC in AWIPS-2, but this is not certain. There are no plans to use HDF5 for SBN transmission formats currently used by GRIB.

Also, MPE is being migrated for AWIPS-2. Raytheon has given us indications that they will continue to use "xmrg" for the MPE file storage.

2.3. Related Grid Teams:

Mary Mullusky/OCWWS-HSD discussed her recent visit to NERFC with Tom Lefebvre/GSD and Tish Soulliard/OCWWS-Verification to discuss transmission format for precipitation data in support of NPVU. It has been decided that NPVU will purchase a workstation and install GFE. They plan to begin parallel operations in Spring 2009, with operational conversion in Summer 2009. Grids from RFC GFE use can be distributed to NPVU using ISC methods. This change is part of an overall strategy to reduce the grid generation/conversion burden

Discussion also included the proposal from the Southern Region to form a national team to look at the "end-to-end QPE transmission/archive" process. This proposal is still pending. Regardless, we

discussed the need for strong definition of grid forms to use to better serve not just the internal AWIPS/CHPS needs but also the external needs such as NPVU/NCEP/NCDC/web pages, etc. Some level of unified grid forms is needed even if the applications generating the grids vary among RFCs.

2.4 Summary

Defining each RFC's desired grid forms is the next step. It was discussed that RFCs must think about their desired resolution and projection. In late January 2009, a workshop at OHD will include deciding on a consensus approach and this will be coordinated with Deltares. Sample grids will be needed for basic testing, even before the full end-to-end test is performed.

3. Software Support Role Of OHD/HSEB And RFC Tasks

Some more discussion took place on the roles of the OHD and RFCs. OHD and the NERFC and NWRFC will actively work together to implement MPE/DailyQC. After-call discussion with these offices included ideas about a new method for handling temperature data (more on this below). OHD is also prepared to write grid converter programs to transform grid forms from one format, projection, resolution to another. There may be a need to write an application to transform netCDF to GRIB.

Other RFC activities include configuring and getting operational with GFE, and any chosen applications for creating gridded forcings.

CNRFC expressed their desire for more/better tools for grid transformations and stated that they currently have no needs for OHD assistance.

4. Temperature Data:

There was some discussion during the call and after the call about the observed and forecast temperature handling. With the retirement of the MAT preprocessor, it is necessary for other apps to fill the void. There are a lot of reported complaints about the MAT preprocessor with respect to how it determines the 6-hour mean values based in part on the daily min and max.

As I understand the situation, together we should consider the idea of passing grids of 6 hour means into CHPS, rather than one- or six-hour grids of instantaneous data. Furthermore, the idea of passing any sort of min or max temp may not make sense any more, although the model calibrations may be affected by the changes being mentioned here.

There were also suggestions that OHD modify MPE/DQC to handle hourly temperature data. Currently it only handles 6/24 hour temperature data and hourly precipitation. Mark stated that OHD is very reluctant to embark on adding one hour observed temperature processing into MPE. Possibly instead the DQC preprocessor could be changed to use the hourly instantaneous values to determine a 6-hour mean and the mean values would be what DQC operates upon.

Mark still needs to determine what the FEWS operations require in terms of the form of temperature data. More discussion of this topic is necessary.

4.1. RUC Model Usage

Some information from after the call…as initiated by Dave Miller here in OHD…The RUC80 is currently used for DailyQC for freezing level data. The RUC13 is available and has much better resolution. Also, it provides surface temperature analysis and forecast grids. Consideration should be given to using the RUC13 instead of the RUC80 for at least the observed freezing level info. Furthermore the use of RUC13 for observed temperature to supplement temperature gages should be considered…

Other Notes/Actions:

1) <u>ESP Forcings:</u> This is still an area that needs more investigation and discussion.

2) <u>PET Information:</u> As stated before, I am not sure that we will need to provide any grids for PET, as the current info embedded within the calibration is expected to be available. I need to confirm that this info is indeed preserved within the migrated SAC-SMA calibration data migrated into CHPS.