Regional Model METplus Use Case

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Regional Model Verification

- EMC's gridtobs verification system was created to calculate many statistics to see how models performed
- Made up of several components but can be clunky to use and distribute
- MET was written to emulate many of the functions of EMC's verification and more
- Presented here is METplus use case to demonstrate surface verification of the regional models
- Tested on the current operational North American Model (NAM), but what is demonstrated here can be used on any of EMC's regional models (RAP and HRRR)
- Standard variables, plus ceiling and visibility

Model files

- In the operational directory /com2/nam/prod/nam.YYYYMMDD
- Model files (for 12-km parent) nam.t${cyc}z.awphys${fhr}.tm00.grib2
- Output files are hourly for 36 hours into the forecast, 3-hourly after that up to 84 hrs
- For 3-km nest, use nam.t${cyc}z.conusnest.hiresf${fhr}.tm00.grib2 (hourly to 60 hrs)
- Grib file contains a vast array of variables - for this example we'll be using some of the standard variables, (2-m T, DPT, total cloud, sea-level pressure), though many more can be added

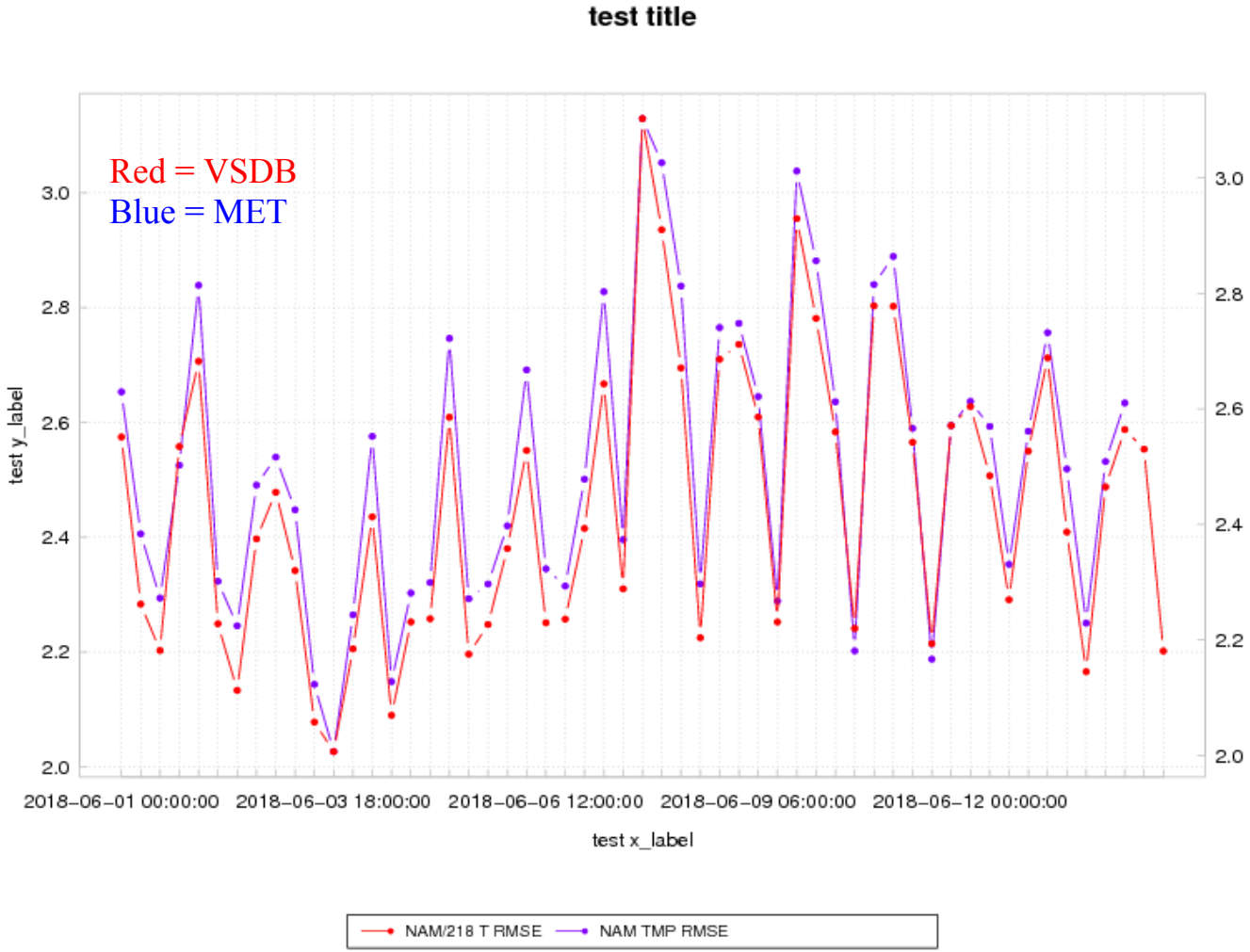
Observed BUFR files

- We use the NDAS prepbufr files located in /com2/nam/prod/nam.YYYYMMDD
- File structure: nam.t${cyc}z.prepbufr.tm${hrs before cycle time}
  - For example: nam.t18z.prepbufr.tm06 = 12Z
  - nam.t18z.prepbufr.tm05 = 13Z
  - nam.t18z.prepbufr.tm04 = 14Z
  - etc
- Many variables present in these files - we focus here on ADPSFC (the surface METARs and other observations in this data type)
- Also existing: ADPUPA (upper-air observations, radiosondes, available only at 00Z and 12Z)
- To use aircraft profilers (additional sounding information using aircraft), use files nam.t${cyc}.prepbufr.acft_profiles_sfc.tm${hrs before cycle time}

MET codes used

pb2nc prepda.2018100100 prepda.nc.2018100100
/meso/save/Perry.Shafran/verif/nwtest/parm/PB2NCConfig -v 3

point_stat AWIP3D00.tm00 prepda.nc.2018100100
/meso/save/Perry.Shafran/verif/nwtest/parm/PointStatConfig_cv -v 2


test title
Red = VSDB
Blue = MET
test y_label
3.0
2.8
2.6
2.4
2.2
2.0
2018–06–01 00:00:00
2018–06–03 18:00:00
2018–06–06 12:00:00
2018–06–09 06:00:00
2018–06–12 00:00:00
test x_label
NAM/218 T RMSE
NAM TMP RMSE

METplus scripts for the NAM use case

```
41 (t14a1) /meso/save/Perry.Shafran/METplus.dev > ls -l
total 896
drwxr-sr-x 4 Perry.Shafran meso 131072 Sep 21 13:04 doc
drwxr-sr-x 7 Perry.Shafran meso 131072 Sep 21 13:04 internal_tests
drwxr-sr-x 2 Perry.Shafran meso    512 Sep 21 13:05 logs
drwxr-sr-x 5 Perry.Shafran meso    512 Sep 21 13:04 parm
-rw-r--r-- 1 Perry.Shafran meso   1910 Sep 21 13:04 README.md
drwxr-sr-x 3 Perry.Shafran meso    512 Sep 21 13:04 sorc
drwxr-sr-x 5 Perry.Shafran meso 131072 Sep 21 18:20 ush
42 (t14a1) /meso/save/Perry.Shafran/METplus.dev >
```

METplus scripts

- METplus scripts were developed to wrap around calls to MET codes to create .stat files
- Replace the scripts that were used in the original EMC gridtobs VSDB verification
- Early tests of MET for mesoscale verification used these same scripts, but with calls to MET codes rather than VSDB codes
- Goal is to create daily verification using the new METplus scripts wrapped around the MET codes and get away from the VSDB scripting framework entirely

METplus scripts

47 (t14a1) /meso/save/Perry.Shafran/METplus.dev/parm/use_cases/perry > ls -l
total 640
-rw-r--r-- 1 Perry.Shafran meso 1120 Sep 21 13:04 jpresto.system.conf.gyre
-rw-r--r-- 1 Perry.Shafran meso 1781 Sep 21 13:04 pb2nc.conf
-rw-r--r-- 1 Perry.Shafran meso 1084 Sep 21 17:02 perry.system.conf.tide
-rw-r--r-- 1 Perry.Shafran meso 2819 Oct 1 18:59 point_stat.conf
-rw-r--r-- 1 Perry.Shafran meso 821 Oct 1 17:05 shared.conf
48 (t14a1) /meso/save/Perry.Shafran/METplus.dev/parm/use_cases/perry >

Standard files:

parm/use_cases/grid_to_obs/grid_to_obs.conf
parm/use_cases/grid_to_obs/examples/conus_surface.conf

METplus command

ush/master_metplus.py -c /

parm/use_cases/grid_to_obs/grid_to_obs.conf -c /

parm/use_cases/grid_to_obs/examples/conus_surface.conf -c /

parm/use_cases/perry/pb2nc.conf -c /

parm/use_cases/perry/point_stat.conf -c /

parm/use_cases/perry/shared.conf -c /

parm/use_cases/perry/perry.system.conf.tide