DTC WRF-RR Vertical Level Sensitivity Test - Archive Overview

The WRF-RR Vertical Level (WRFRR-VL) Sensitivity Test focused on a one month-long retrospective time period corresponding to the spring season from 25 March – 25 April 2006.

Forecasts initialized at 00 and 12 UTC every day and run out to 24 hours were generated on a 13-km grid for two configurations of the WRF-ARW model with output files every three hours. The WRFRR-VL archive resides on the NCAR MSS. The dates within each season for which forecasts were generated are listed below.

Spring 2006	Mar 00 UTC	26,27,28,29,30,31
	Mar 12 UTC	25,26,27,28,29,30,31
	Apr 00 UTC	1,3,4,5,6,7,8,9,10,11,12,14,15,16,17,19,20,21,22,23,24,25
	Apr 12 UTC	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,18,19,20,21,22,23,24,25

The following paragraph describes the <u>overall directory structure</u> of this archive.

/DTCRT/RETRO: Root directory for all data used to generate the initial and lateral boundary conditions for the retrospective forecasts. The input files are grouped into subdirectories corresponding to the retrospective season (winter, spring, summer, or fall) and under the seasonal subdirectories the files are grouped in subdirectories named **yyyymmddhh**, where yyyy corresponds to the year of the forecast cycle, mm corresponds to the month, dd corresponds to the day and hh corresponds to the hour. The following type of file is archived under the **RETRO** subdirectory:

> **ETA212.tgz**: contains NAM forecast grids with the file naming convention yyjjjhh00000ff, where yyyy corresponds to the year, jjj corresponds to the julian day, hh corresponds to the hour of the forecast cycle and ff corresponds to the forecast hour.
> **yyjjjhh000000.grib**: RUC analysis grids where yy corresponds to the year, jjj corresponds to the julian day and hh corresponds to the hour of the forecast cycle.
> **yyjjjhh00.sstgrb**: SST analysis grids where yy corresponds to the year, jjj corresponds to the julian day and hh corresponds to the hour of the forecast cycle.

/DTCRT/WRFRR_VL: Root directory for all WRF-RR Vertical Level Senstivity Test output files, code, scripts, and static files.

> **static:** Subdirectory containing all time-independent namelists used to run the forecast system. Subdirectory **DOMAINS** has files **verifparm.tar.gz**, containing the namelists to run the NCEP Verification System, and **static_arw1.tar.gz** and **static_arw2.tar.gz**, containing the namelists to run the WRF Pre-Processor, the WRF model, and the WRF Post-Processor for the two configurations of the ARW dynamic core. Subdirectory **EXTDATA** has file **static.tar.gz**, containing the Variable Table used to run the ungrib program of the WRF Pre-Processor.
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> **code:** Subdirectory containing all source codes and scripts for end-to-end system. Scripts, workflow manager and log files are also located in this subdirectory.
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> **ARW_VL1, ARW_VL2, ARW_VL1-VL2:** Subdirectories containing the output files of the forecasting system. ARW_VL1 contains the high resolution namelist runs, while ARW_VL2 contains the low resolution namelist runs. Subdirectory **yyyymmddhh** contains output files for each forecast cycle, where yyyy corresponds to the year of the forecast cycle or initial time of the forecast, mm corresponds to the month, dd corresponds to the day, and hh corresponds to the hour. The subdirectories under these headings are as follows:
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> > **nclprd:** contains **images.tar** file, which has all the image files generated for the forecast cycle.
> >
> > **postprd:** contains post-processed output files. All of these files were produced by the WRF Post-Processor and are in GRIB format. The "**WRFPRS**" files contain 3D grids on pressure surfaces and 2D grids (files used by DTC for verification and image generation), the "**WRFTWO**" files contain 2D grids, and the "**WRFNAT**" files contain the 3D grids on

the model native vertical coordinates. Each of these files contains a single forecast time. The "**WRFPCP**" files contain the GRIB files with 3-hour precipitation accumulation.
  Caveats for post-processed files:
wpsprd: contains final output from WPS process metgrid (**met*** files).
qpfprd: contains the 24-h and 3-h Quantitative Precipitation Forecast (QPF) verification statistics obtained using NCEP's QPF verification package.
verifprd: contains surface and upper air verification files obtained using NCEP's verification package, both as area averages **(*.vsdb** files) and as pairs of observation and forecast (**prepfits*** files).
wrfprd: contains the raw WRF output files on the native grid (**wrfout***). Output was generated every 3 hours over the 24 hour forecast with each forecast time (or valid time) written to a separate file. Additionally, this directory contains output files from real (**wrfinput_d01** and **wrfbdy_d01**).
  Besides the **ARW_VL1** and **ARW_VL2**, a third subdirectory (**ARW_VL1-VL2**) contains file **nclprd/images.tar** with the images of the difference fields between ARW_VL1 and ARW_VL2.

/DTCRT/OBS: Root directory for all the observation files used for the forecast verification. The observation files are collected into subdirectories named **yyyymmdd**, where yyyy corresponds to the year, mm corresponds to the month, and dd corresponds to the day for which the observations are valid. The following types of files are archived under the observation subdirectory:
  precip_yyyymmdd.tgz: contains Stage-II national multi-sensor hourly precipitation analysis data and NCEP/CPC's 1/8 degree daily precipitation analysis.
  RUC_prepbufr_yyyymmddhhhh.tar.gz, where hh is 00 or 12, contains RUC prepbufr files used for the surface and upper air verification.

The following describes the <u>data with problems</u>:
- Spring
  - RUC input data
    - 20060325 00 corrupt
    - 20060402 00 corrupt
    - 20060417 12 missing
    - 20060418 00 missing
  - Eta input data
    - 20060413 00 missing
  - RFC 2006033012 missing
  - RUC Prepbufr
    - 2006042316 through 2006042323 missing

Missing forecasts:

Affected Cycle	Missing data	Reason
2006032500	WRF output	Corrupt RUC input data
2006040200	WRF output	Corrupt RUC input data
2006041300	WRF output	Missing Eta input data
2006041712	WRF output	Missing RUC input data
2006041800	WRF output	Missing RUC input data

Missing verification:

Affected Cycle	Missing data	Reason
2006032912	Incomplete 24-h QPF verification	Missing RFC analysis
2006042300	Incomplete sfc/upa verification	Missing RUC Prepbufr files
2006042312	Incomplete 24-h QPF and sfc/upa verification	Missing RFC analysis and RUC Prepbufr files