FV3GFS Input and Output

Cold RESTART

gfs_ctrl.nc sfc_ctrl.nc
gfs_data.tile$n.nc
sfc_data.tile$n.nc
Where n=1,2,…6

Created by CHGRES using operational GFS IC as input

Warm RESTART

coupler.res fv_core.res.nc
fv_core.res.tile$.nc
fv_srf_wnd.res.tile$n.nc
fv_tracer.res.tile$n.nc
sfc_data.tile$n.nc

Written out at the end of forecast

Forecast HISTORY

$cdate.nggps2d.tile$n.nc
$cdate.nggps3d_4xdaily.tile$n.n

Written out at $fdiag interval

Forecast DIAG and misc

$cdate.atmos_4xdaily.tile$n.nc
atmos_static grid_spec

Written out at $fdiag interval

Data Assimilation Steps W/O ENKF

1. Use Cold RESTART (first time) or thereafter analyses in Warm-RESTART file style to run 9-hour forecast.
2. Convert hourly or 3-hourly **Forecast HISTORY** netCDF files to nemsio global Gaussian grid files (aka "first guess" ?)
3. Feed "first guess" into GSI for data assimilation. GSI writes out analyses in nemsio format on global Gaussian grid.
4. Gaussian grid analysis increments are read in by the model, interpolated to the cubed sphere mesh, and added to the hour-6 Warm RESTART fields from step 1) on the fly during the next cycle GDAS forecast step.

A **tool** is needed to change resolution of Warm RESTART files for

1) Running forecasts at a different resolution
2) Running multiple segments of GFS forecasts at different resolution for different forecast-leading time

Alternative approach: analyses in nemsio format on global Gaussian grid made from step 3) in the left box can be fed into CHGRES, converted to Cold RESTART initial conditions at any desired resolution to run forecasts.