NCEP Global Ensemble Forecast System

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Global Ensemble Group
Environmental Modeling Center

http://wwwt.emc.ncep.noaa.gov/gmb/yzhu/html/imp/201109_imp.html

Acknowledgements

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MDL: Kathryn Gilbert

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contents

- Next GEFS configuration
- GFS version 9.01
- Initialization
- Stochastic perturbation (STTP)
- Retrospective experiments
- Future plan

Proposal Changes

- Model and initialization
  - Using GFS V9.01 instead of GFS V8.00
  - Improved Ensemble Transform with Rescaling (ETR) initialization
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  - T190 (70km horizontal resolution for 192-384 hours (same as current opr)
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- Unchanged:
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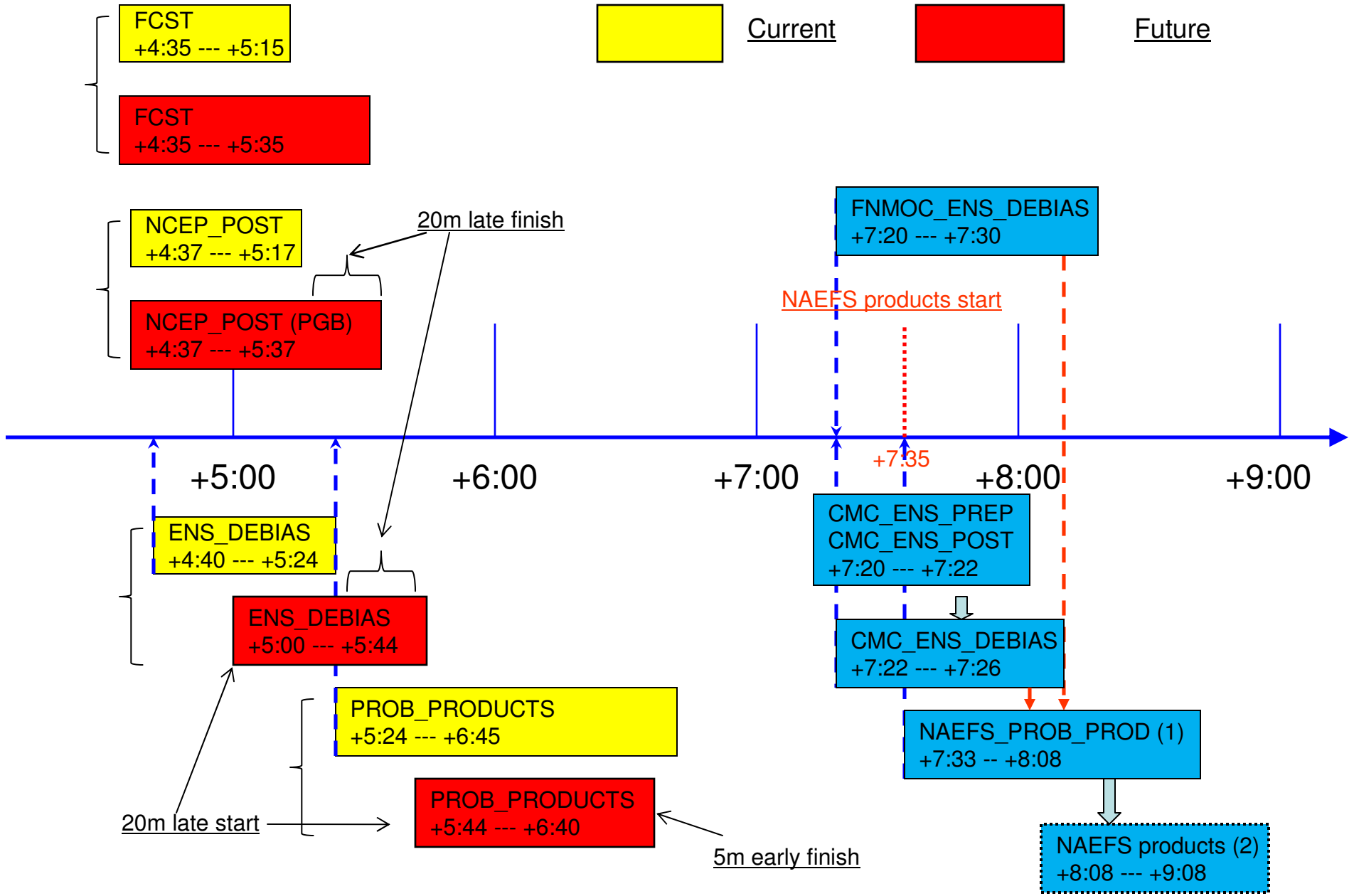
  - pgrb file output at 1*1 degree every 6 hours
  - GEFS and NAEFS post process output data format
- Why do we make this configurations?
  - Considering the limited resources
  - Resolution makes difference (example of T126 .vs T190)
- What do we expect from this implementation?
  - Preliminary results (NH 500hPa and SH 500hPa height and tracks)

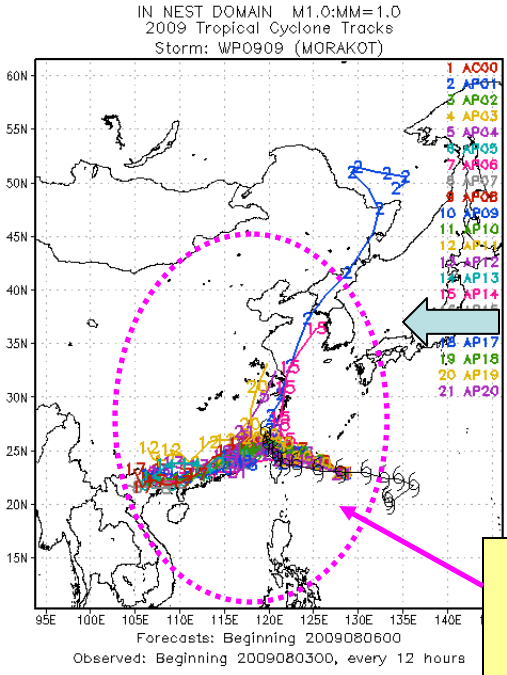
GSI/GFS Changes (Fall 2010)

- **Assimilation Changes**
  - Assimilate tropical storm pseudo sea-level pressure obs
  - GPSRO changes - improved QC, re-tuned obs errors.
  - Give more weight to profile data in upper troposphere / lower stratosphere
  - Change evaporation efficiency parameter in SASCNV forward model to be consistent with current global_fcst model
  - Extend satinfo to include N19 hirs/4, amsua, mhs (no N19 assimilation)
  - Extend ozinfo and update code to recognize and read in N19 sbuv/2, GOME, and OMI ozone (no assimilation)
  - Ability to process RARS (currently only EARS) 1b data
  - Extensions to allow global_gsi to run from T878L91 spectral coefficient files
  - Code optimization
- **Model Changes:**
  - Restructure the Global Model code
  - Code unification between GFS & GEFS
  - Consolidate Global Post codes used in GFS & GDAS
  - Upgrade to ESMF 3.1.02p
  - Modify low cloud definition
  - Output additional parameters for TIGGE & ICAO
  - Introduce more accurate algorithm for several diagnostic variables



GEFS/NAEFS 6-hr window flow chart

Resolution makes difference for Typhoon Morakot



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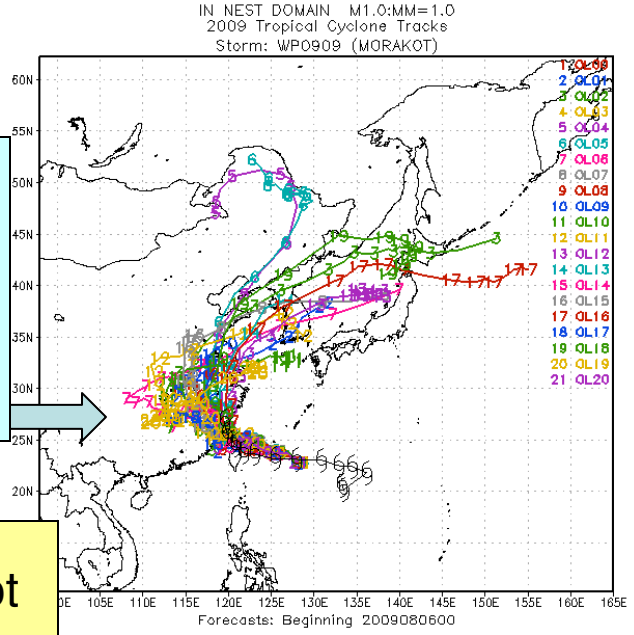
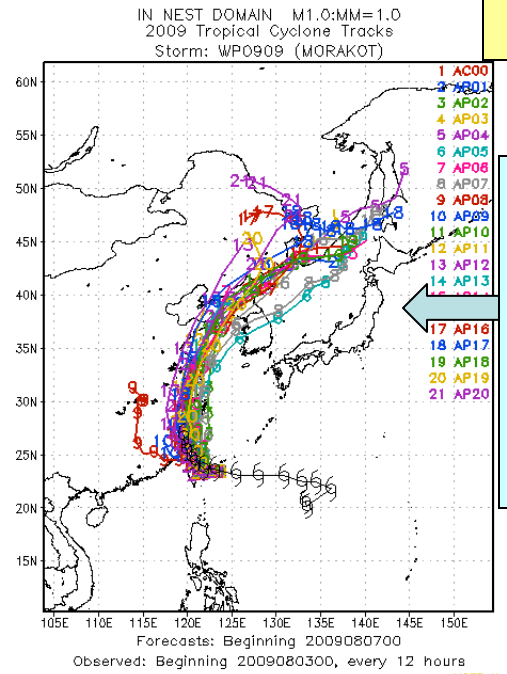
T126 ensemble

T190 ensemble



Most models do not make right forecasts



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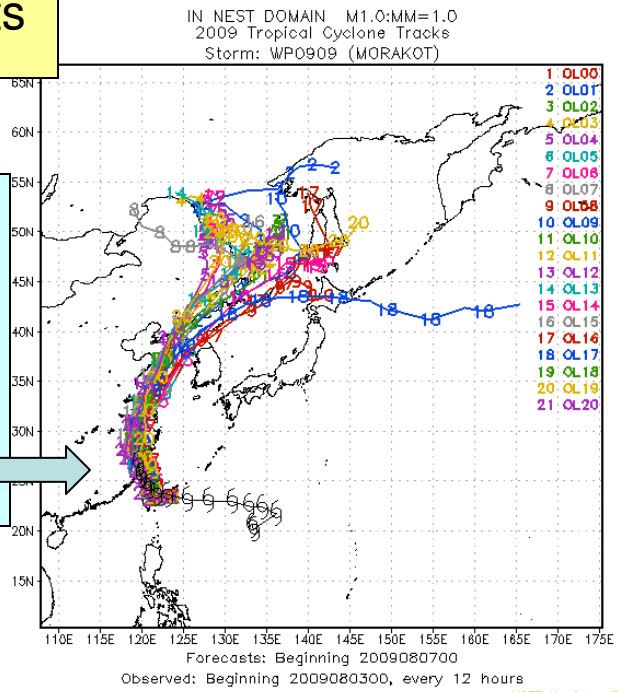
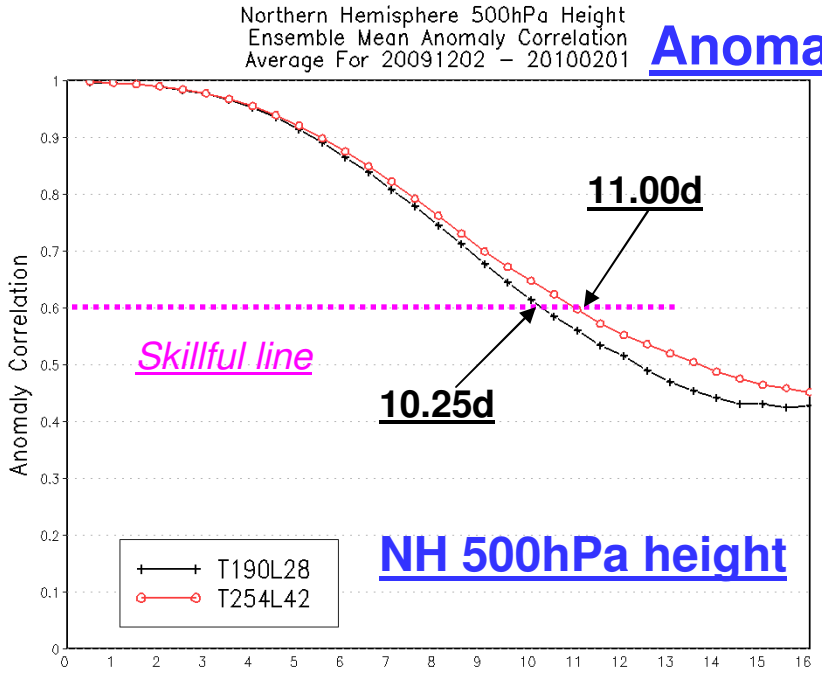
T126 ensemble

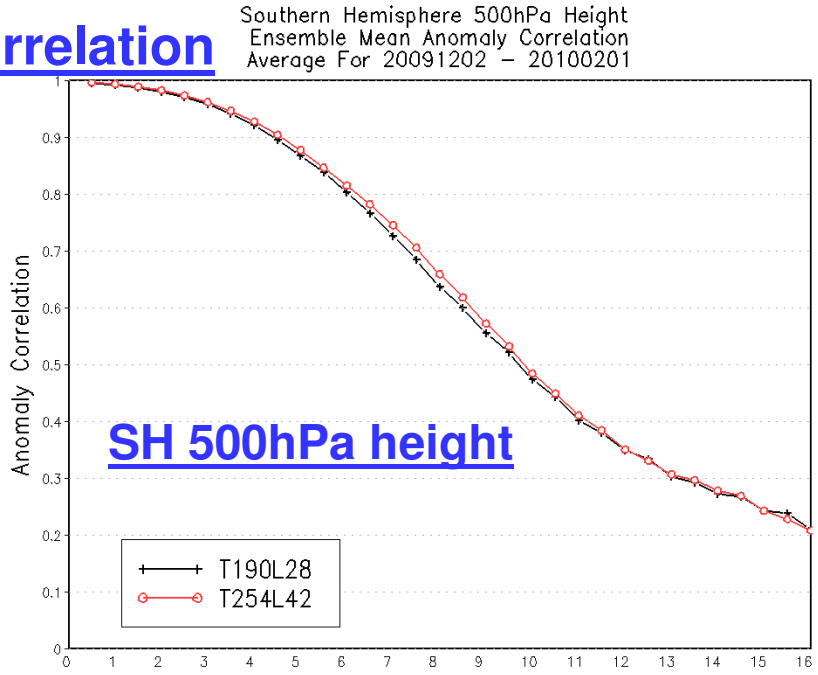
T190 ensemble



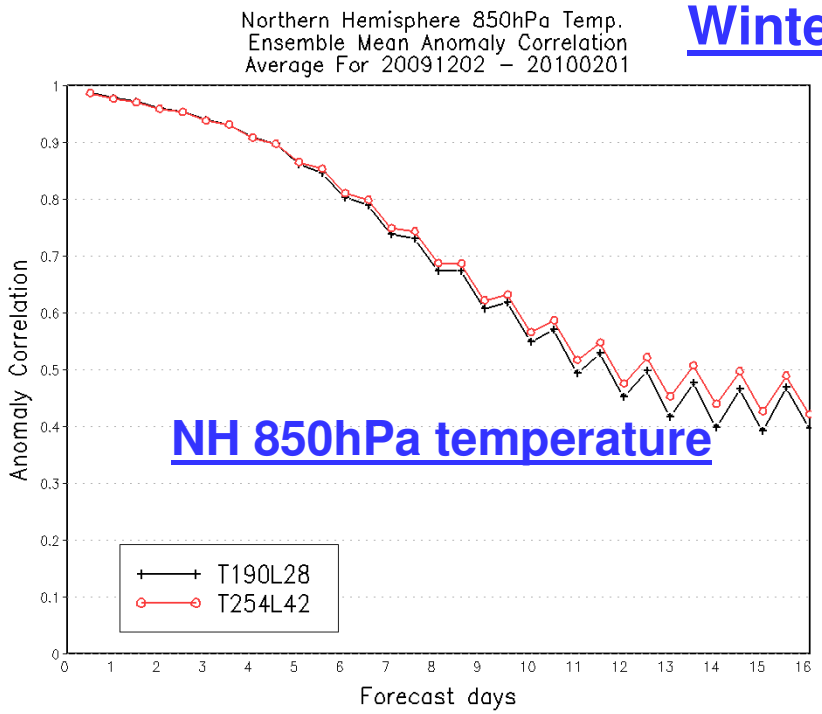
NCEP Hurricane Forecast Project

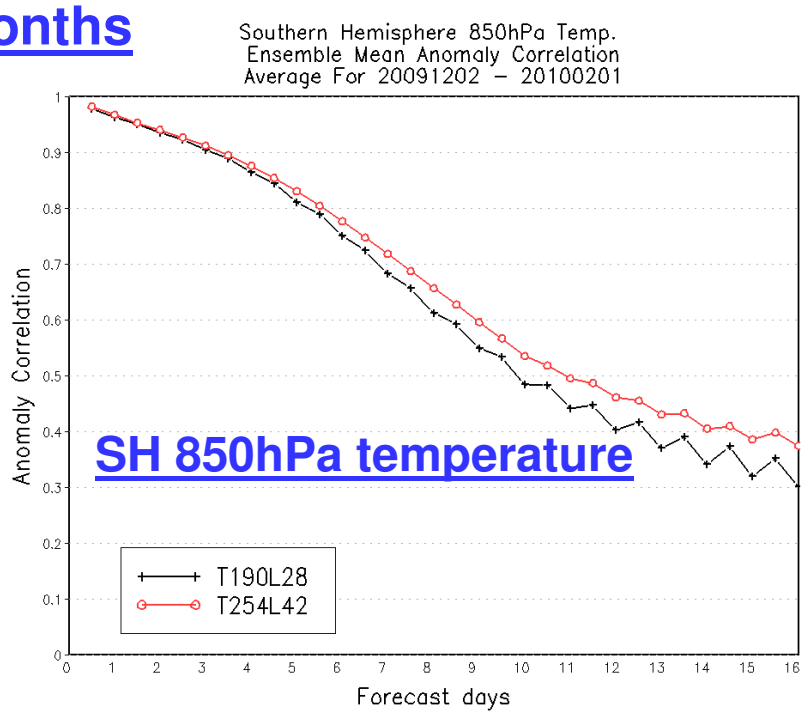
Anomaly Correlation



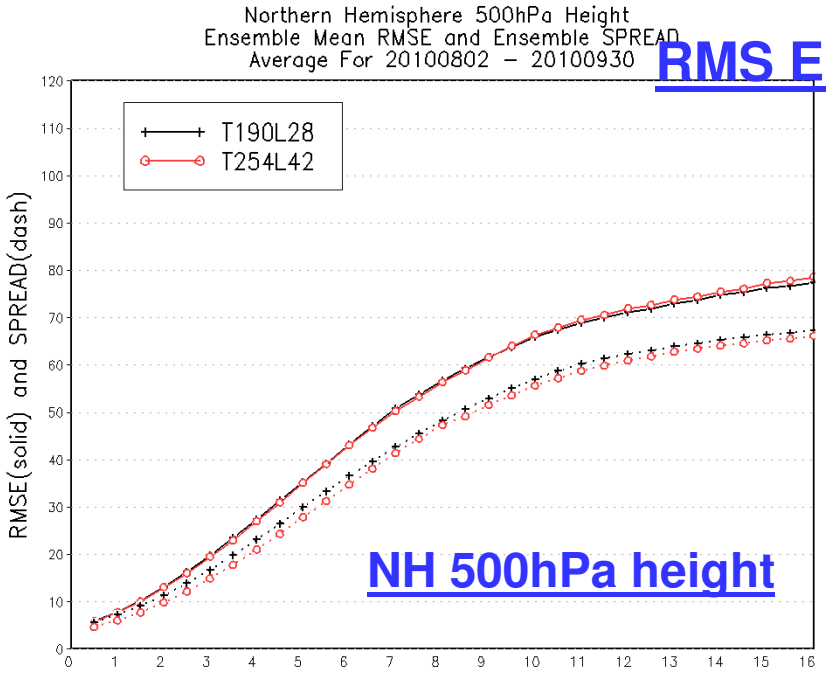


Winter 2 months

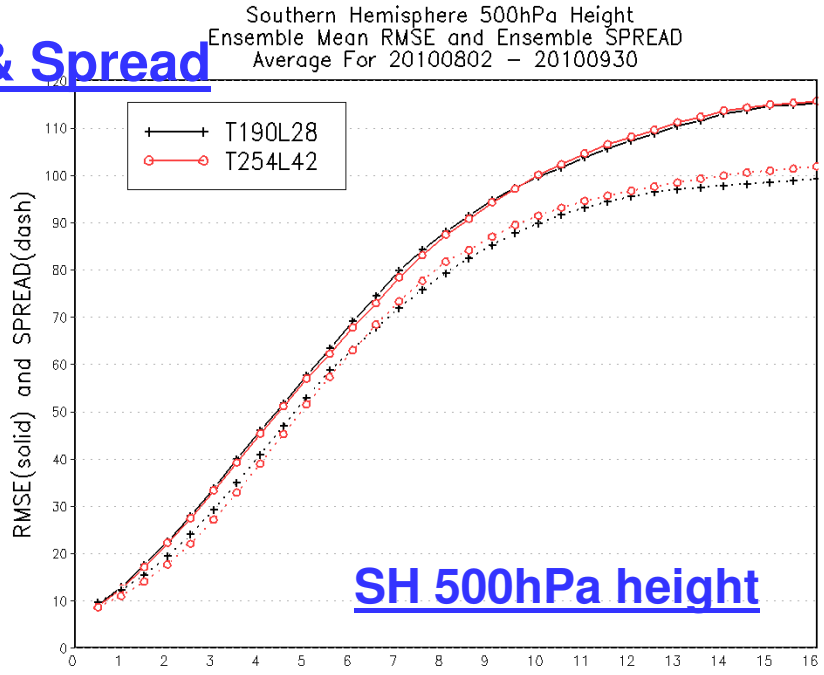




RMS Error & Spread

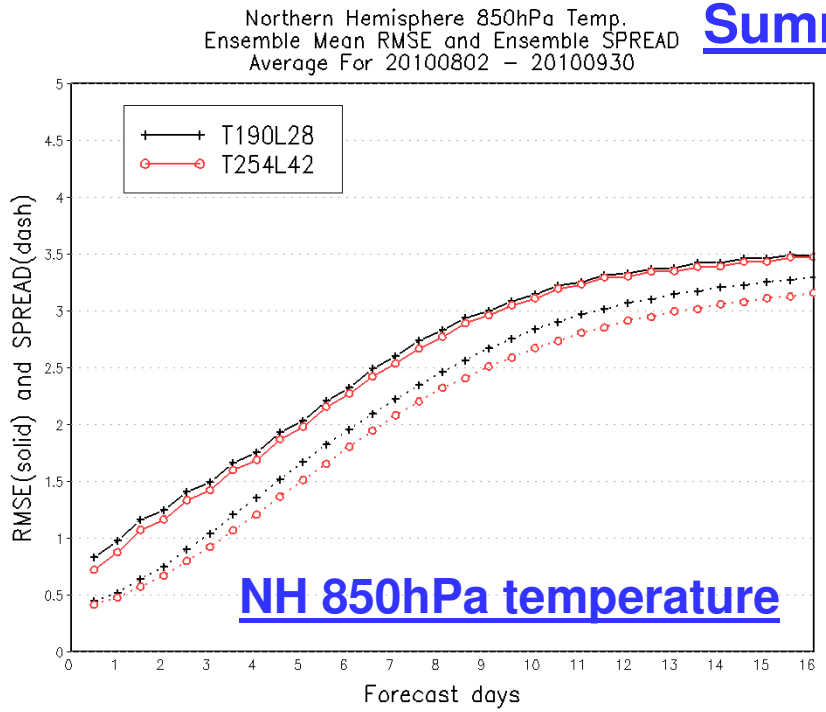


NH 500hPa height

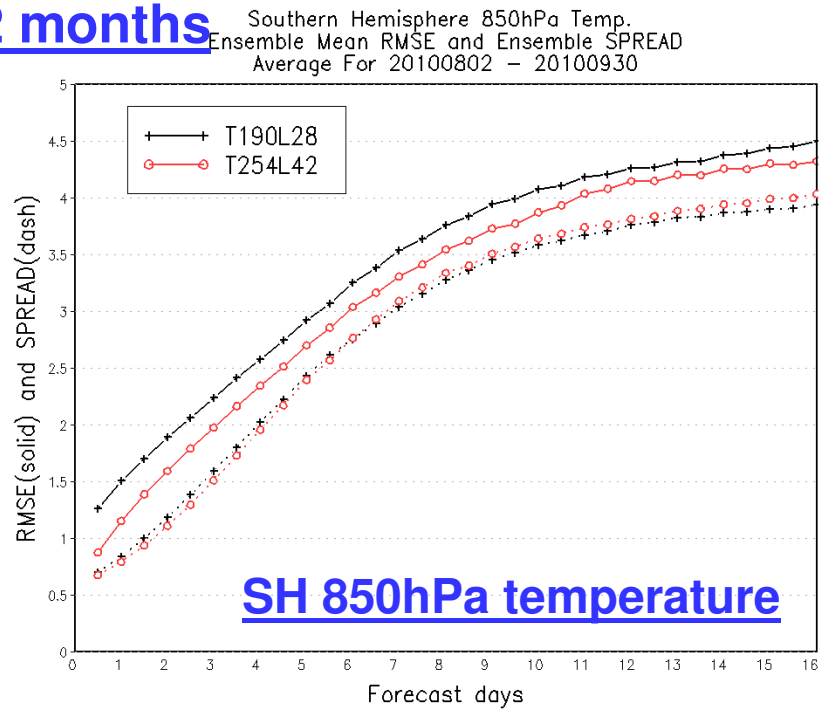


SH 500hPa height

Summer 2 months

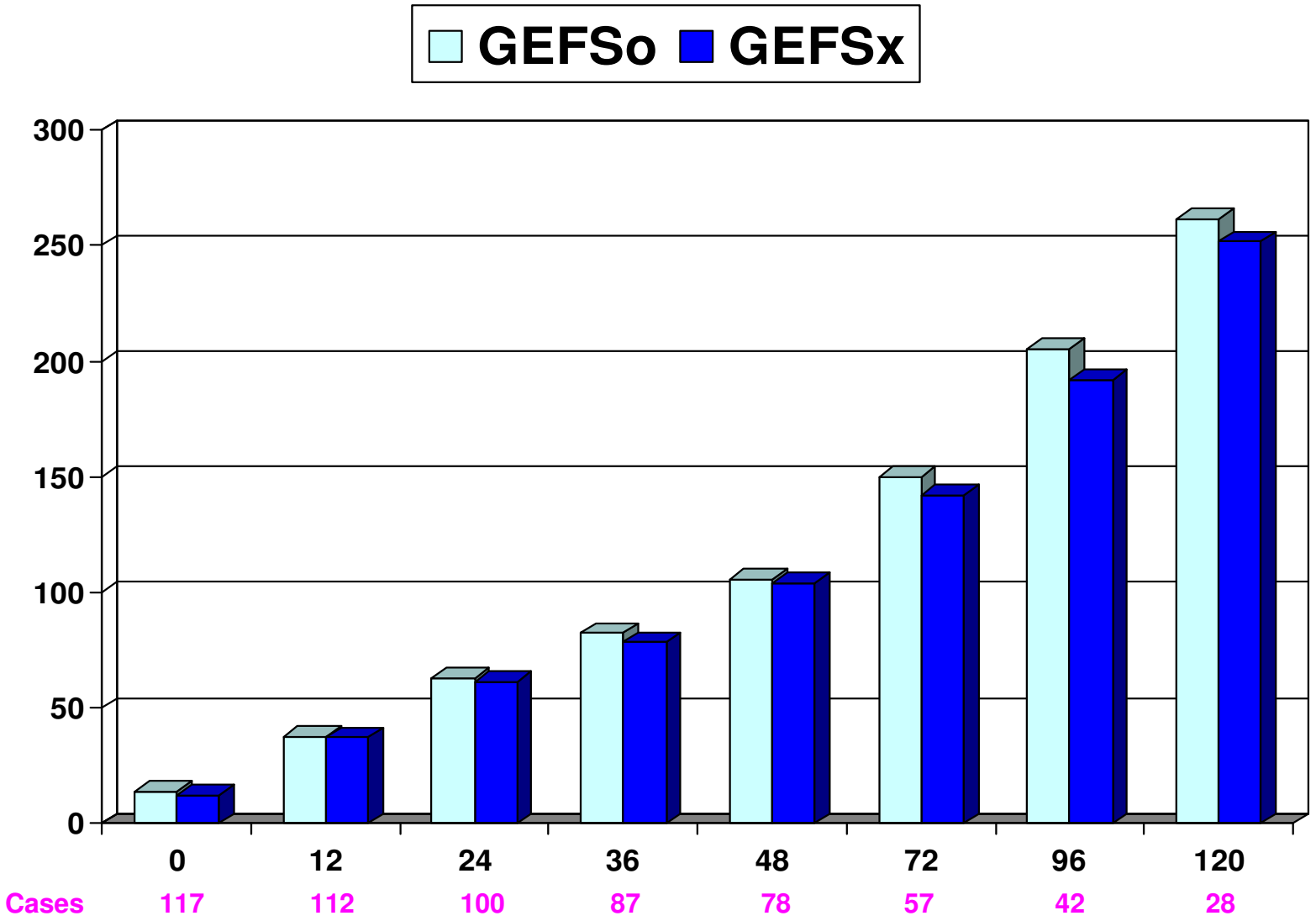


NH 850hPa temperature



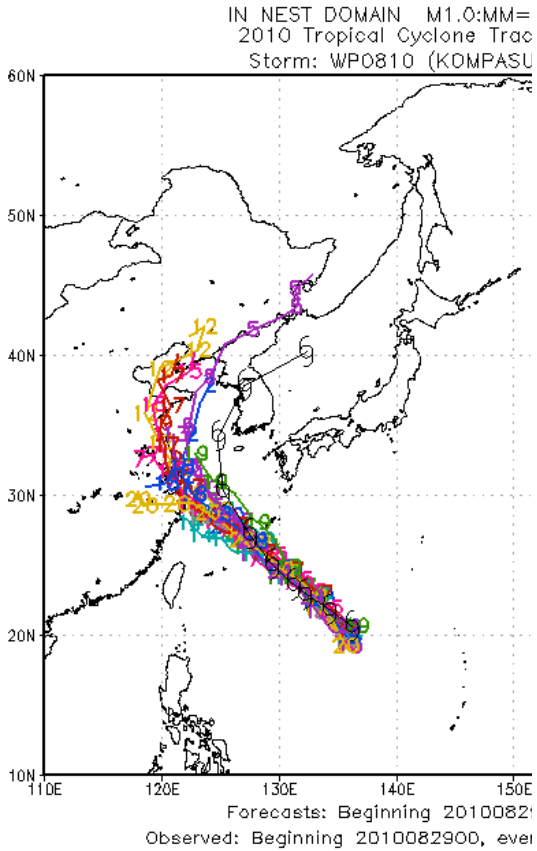
SH 850hPa temperature

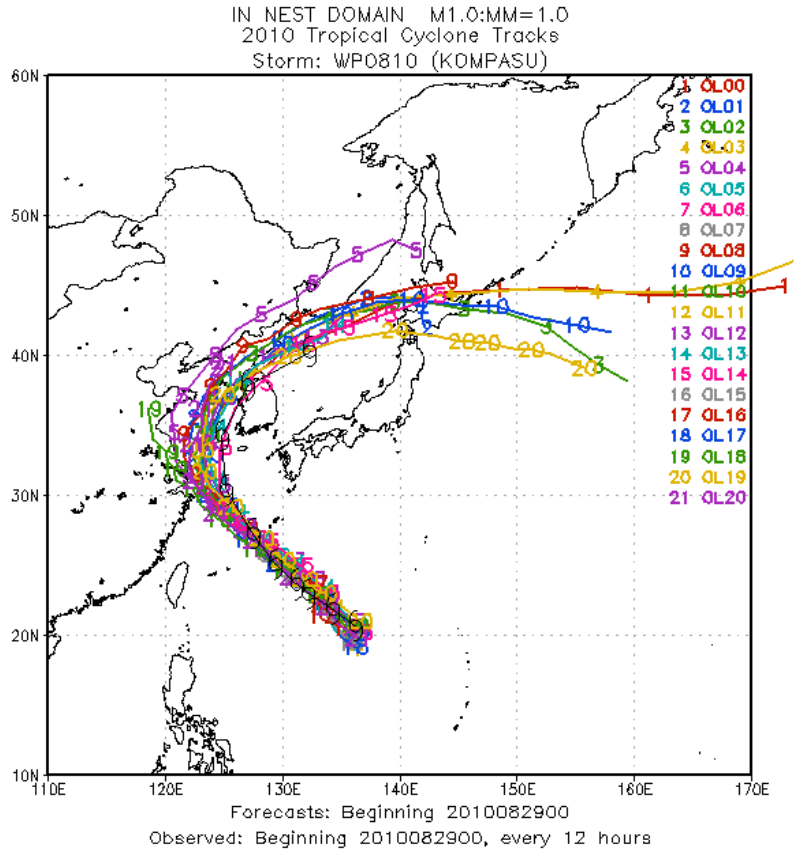
Track forecast error for 2010 season (AL+EP+WP)



Period: 08/02 – 09/25/2010

Contributed by Dr. Jiayi Peng (EMC/NCEP)





Ensemble track forecast for hurricane Kompasu

Left: Current GEFS operation

T190L28 (GFS V8.0)

Right: Future GEFS

T254L42 (0-192 hours)

T190L42 (192-384 hours)

GFS V9.0

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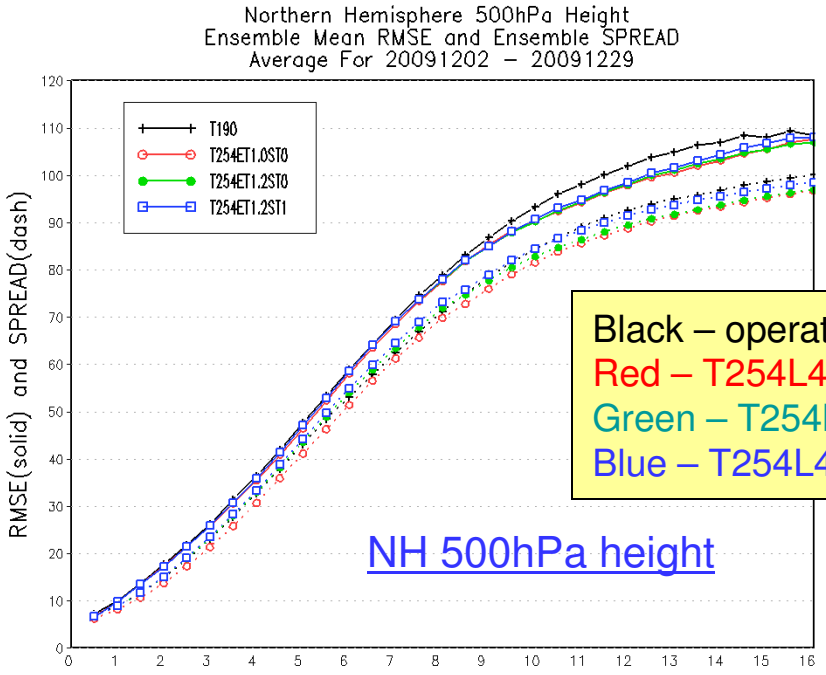
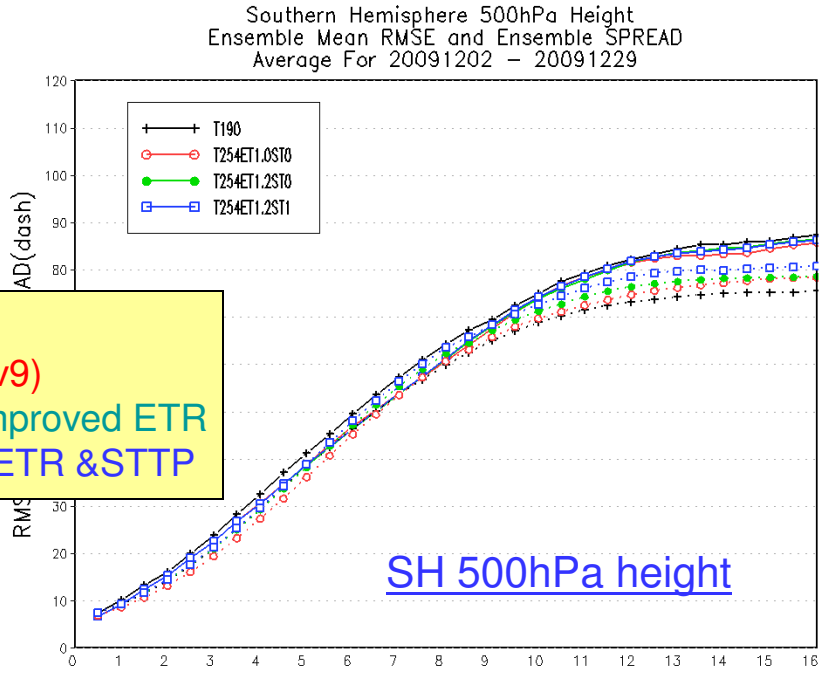
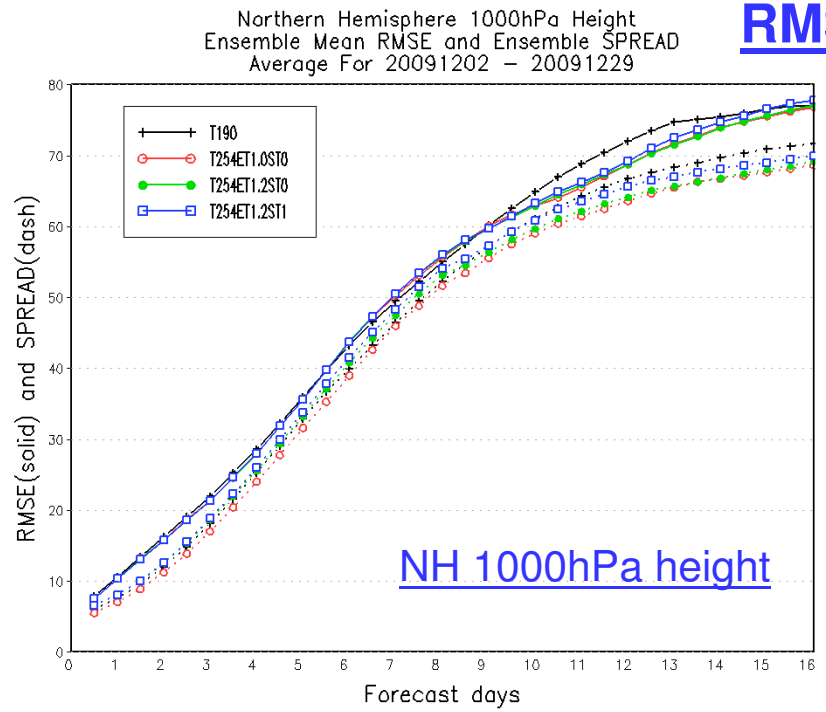
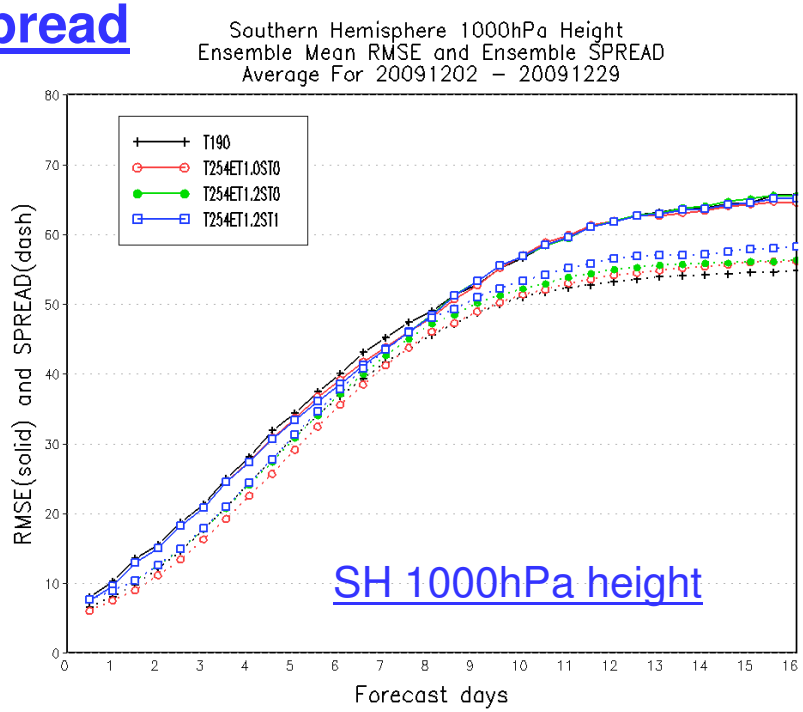




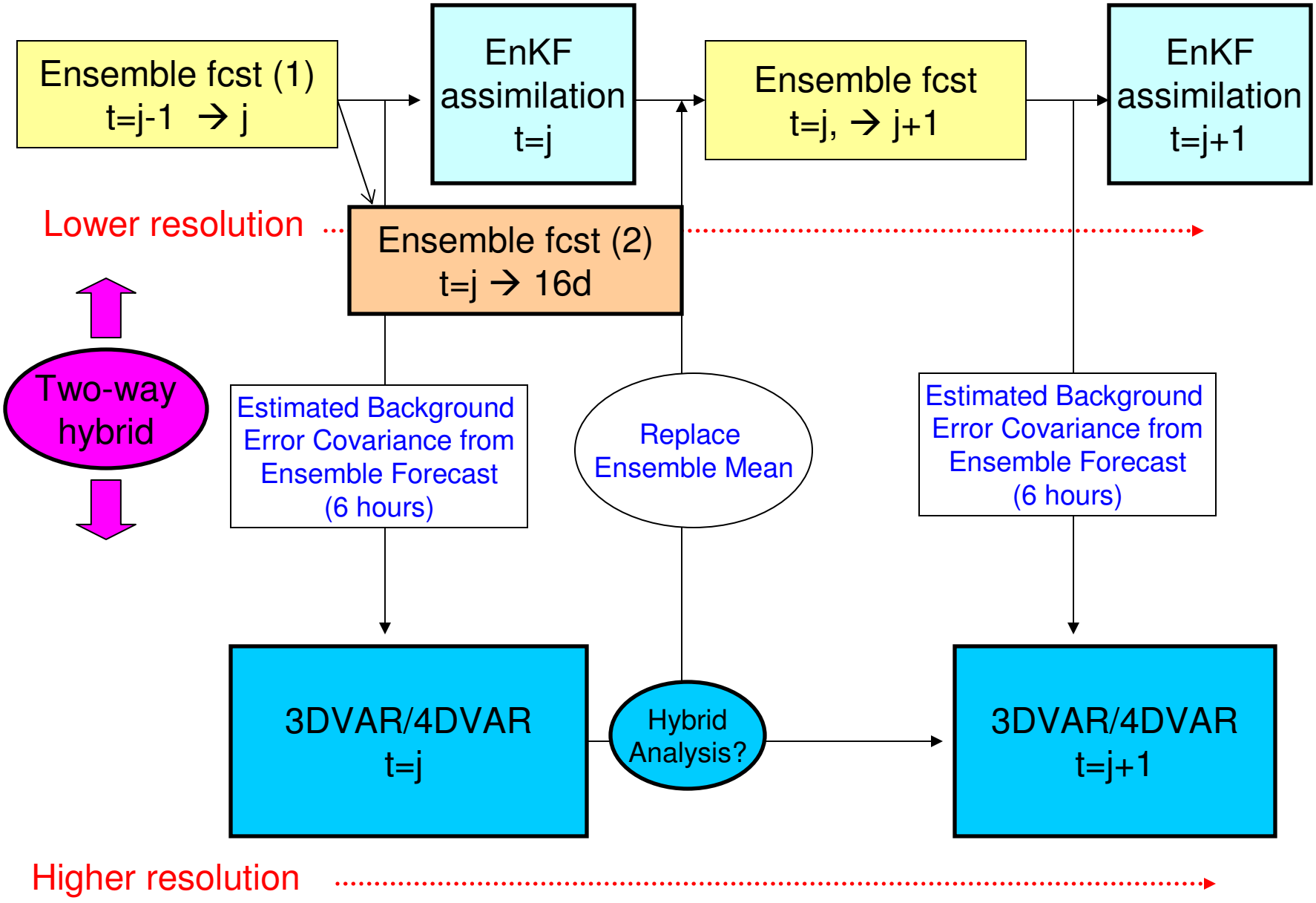
Black – operation
Red – T254L42 (GFSv9)
Green – T254L42 + improved ETR
Blue – T254L42+imp ETR &STTP





Future GEFS initialization plan

Flow Chart for Hybrid Variation and Ensemble Data Assimilation System (HVEDAS) - concept



5th NCEP/NWS Ensemble User Workshop

- Time: May 10-12 or May 17-19 2011 (2.5-3 days)
- Location: Maryland
- Topics:
  - Opening remarks
  - NCEP ensemble systems
  - NCEP ensemble products
  - Other ensemble based products (MDL, OHD and etc…)
  - International user reviews (include TIGGE program)
  - NCEP service center reviews and requests.
  - NWS regional office, WFO/RFC reviews and requests
  - Other users/developers (review)
  - Data distribution/access
  - Working group discussion
- Organized by EMC and DTC (co-organizer)
- Expect to have 80-100 attendances