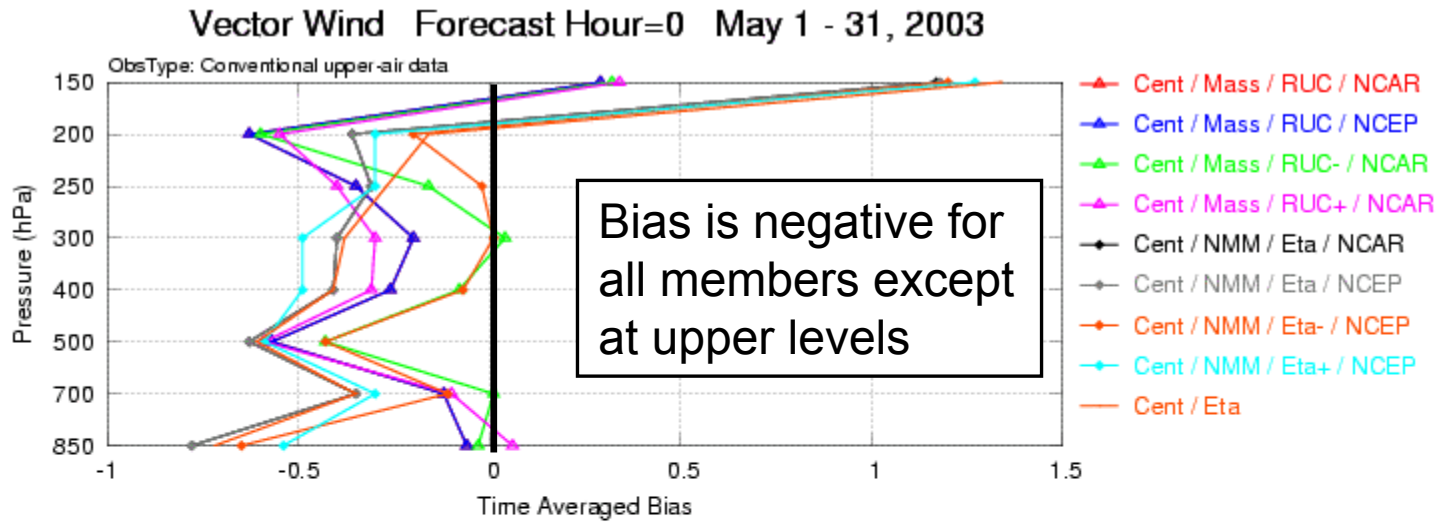
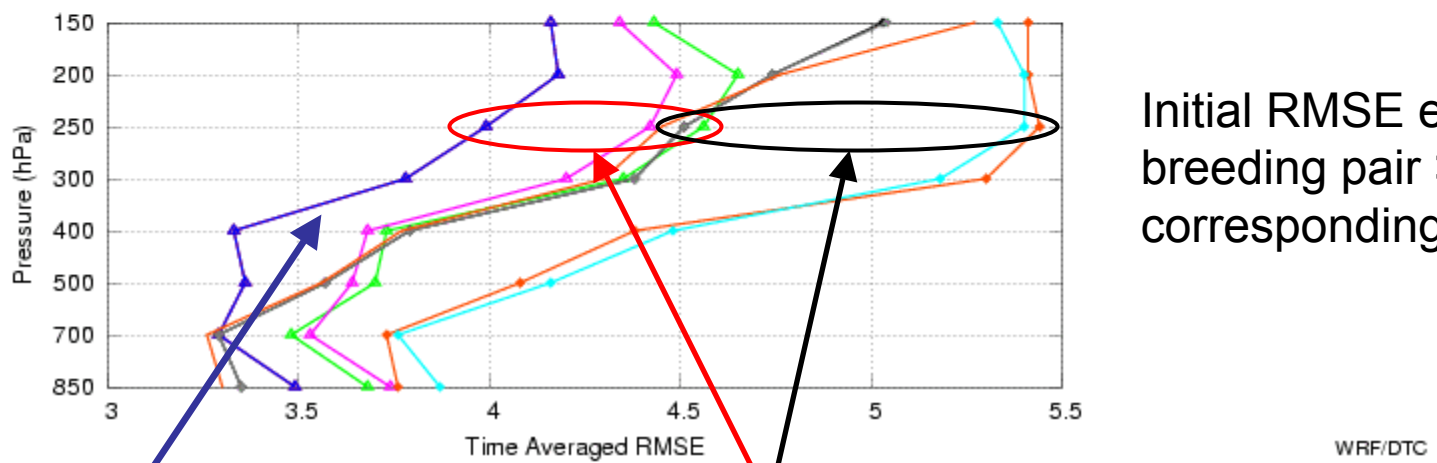
Vector Wind Field

Summary for all seasons and domains (except Alaska)

Initial Wind Errors for Central Domain



Bias is negative for all members except at upper levels



Initial RMSE errors of breeding pair > corresponding control

WRF-EM control has lowest RMSE except @ 850 & 700 mb

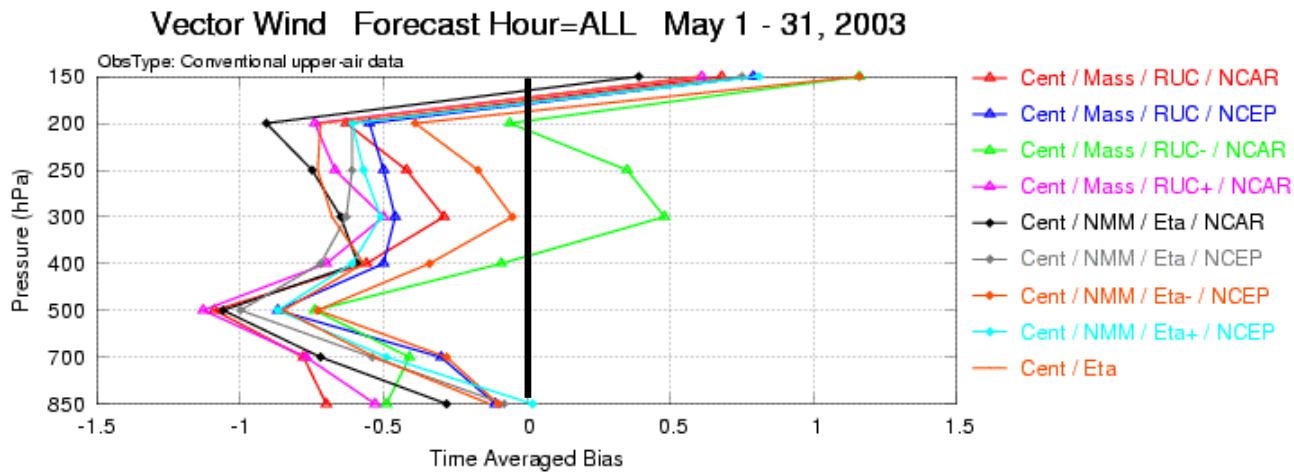
(WRF-NMM breed – WRF-NMM control) > (WRF-EM breed – WRF-EM control)

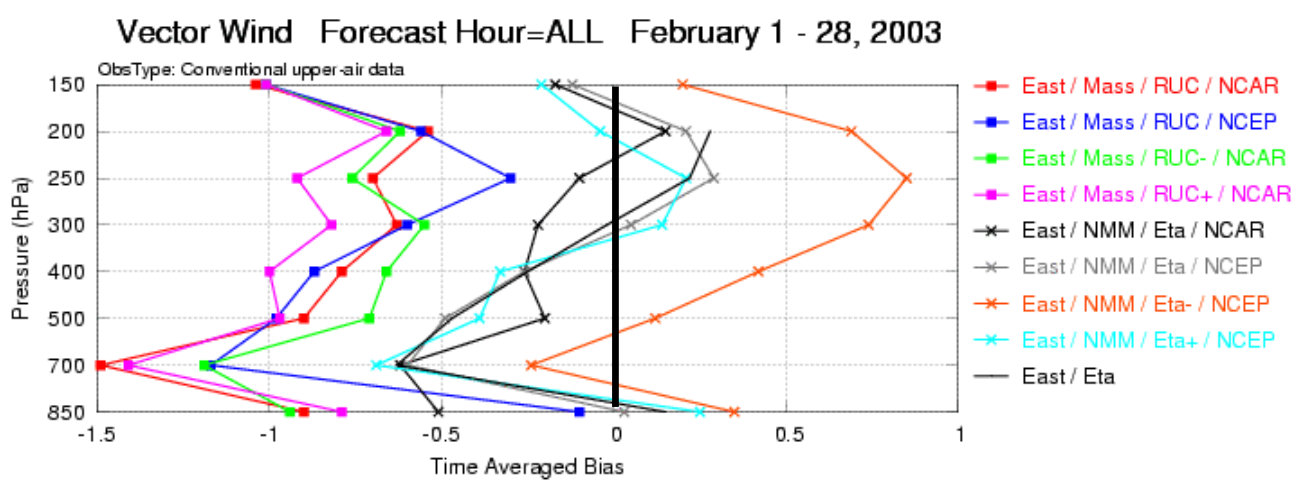
Wind Forecast Bias

All seasons/domains: Predominately negative except at upper levels

All seasons except February: No distinct grouping by dynamic core or physics package

February - East & West: Members tend to group by dynamic core





Wind Forecast Errors

All seasons/domains:
Eta & unperturbed WRF-NMM have lowest errors

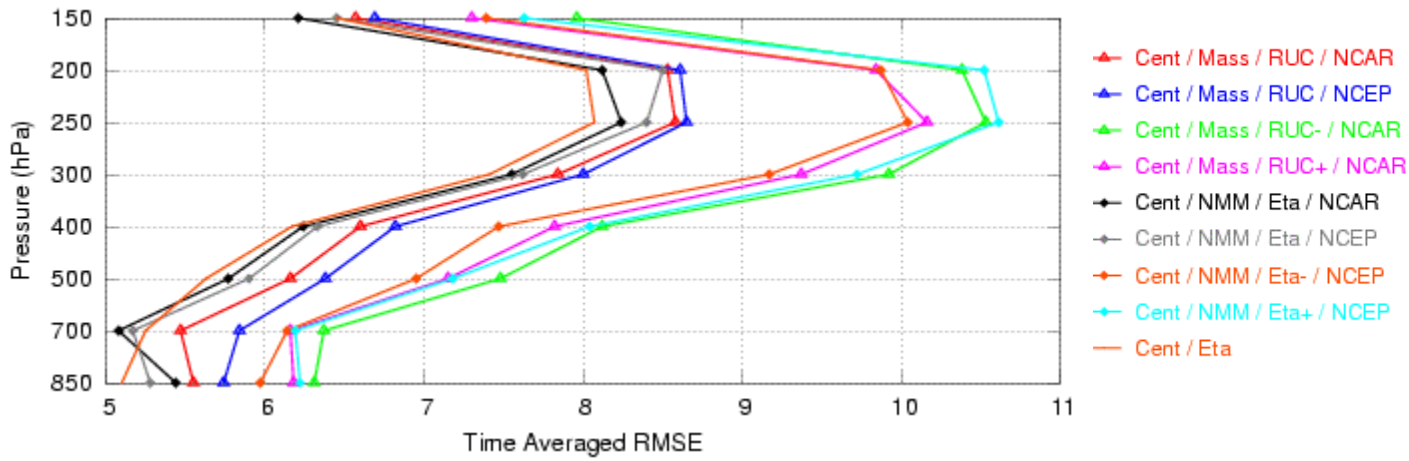
Largest errors @ upper levels (jet level)

Breeding RMSE > corresponding control / swapped physics

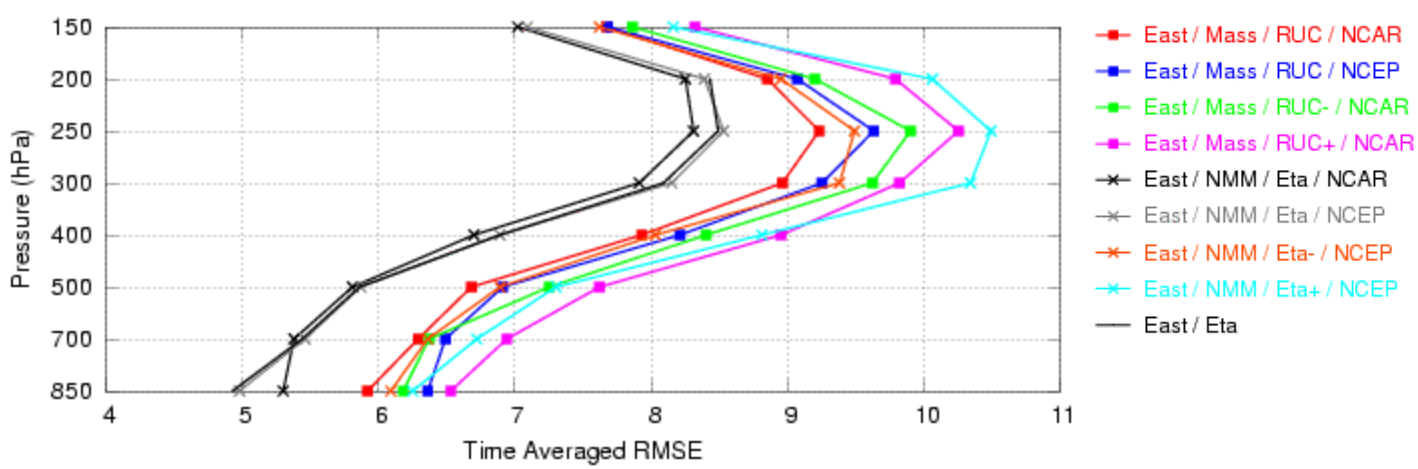
Domain dependence:
Central domain – Errors for unperturbed WRF-EM only slightly > Eta & unperturbed WRF-NMM

Other domains – Distinct separation between unperturbed WRF-EM & Eta / unperturbed WRF-NMM

1-31 May 2003 Central Domain



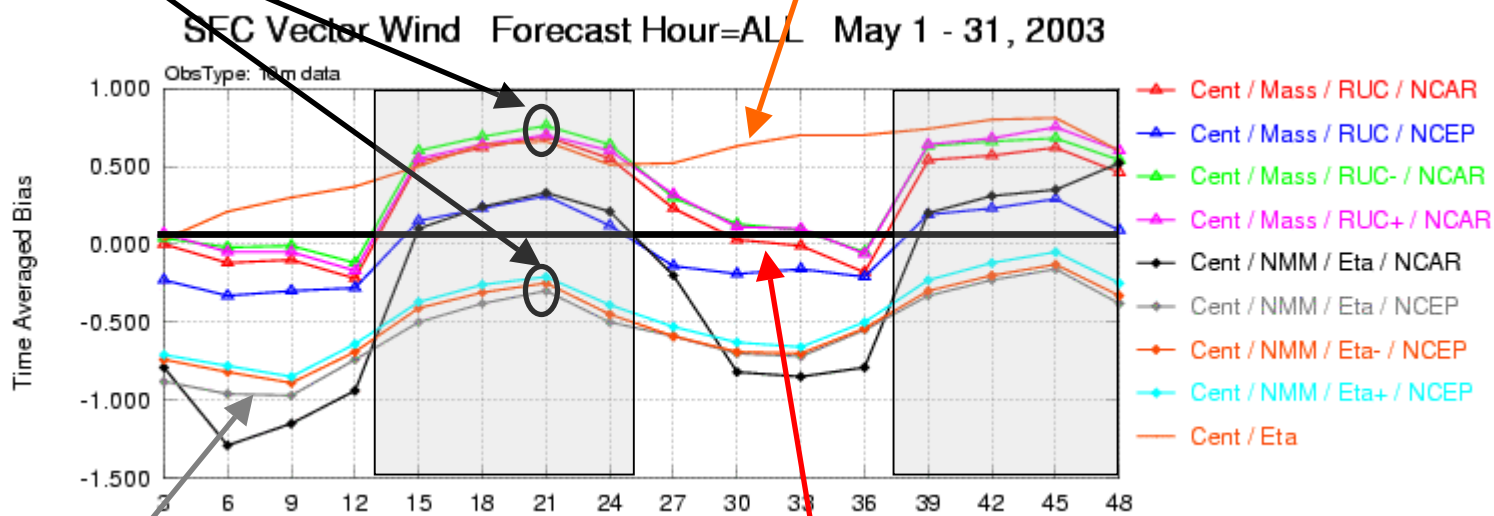
1-28 February 2003 East Domain



Surface Wind Bias - Only surface

Grouping of control & breeding members by dynamic core

Eta (Central & East) –
Weak to no diurnal signal
Always positive



WRF-NMM/NCEP –
Weak diurnal signal
Always negative (West & Central)

WRF-NMM/NCAR –
Stronger diurnal signal (May, Aug & Oct)
In phase w/ control or slight phase lag/lead

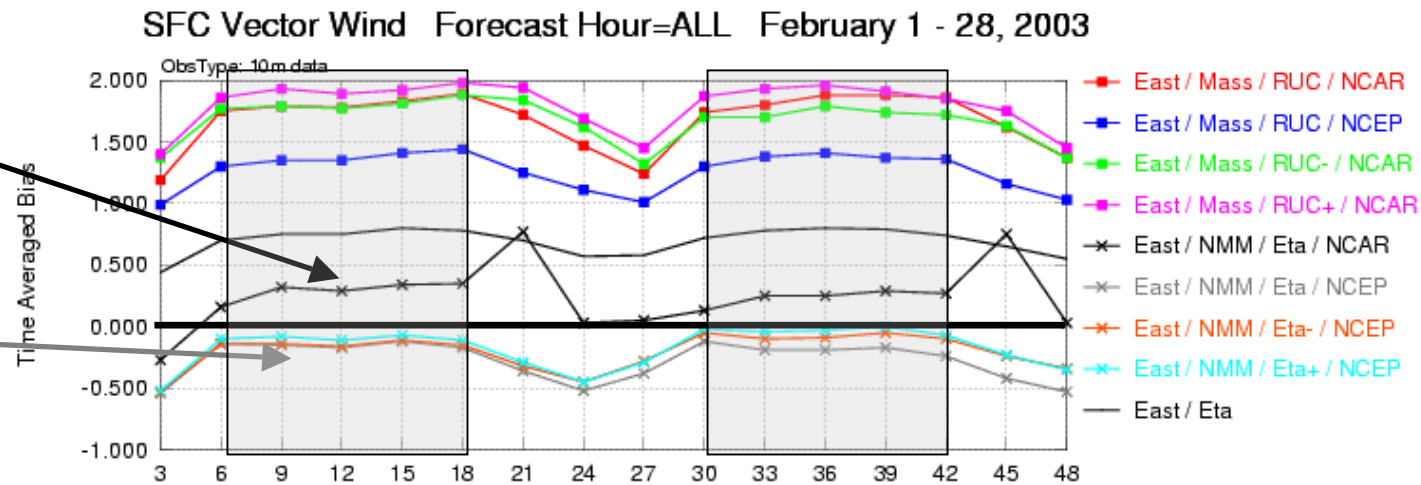
WRF-EM/NCAR –
Diurnal signal
Generally positive (except Aug/West)

WRF-EM/NCEP –
Temporal tendency similar to control w/ larger offset during max phase then min

Surface Wind Bias - Only surface

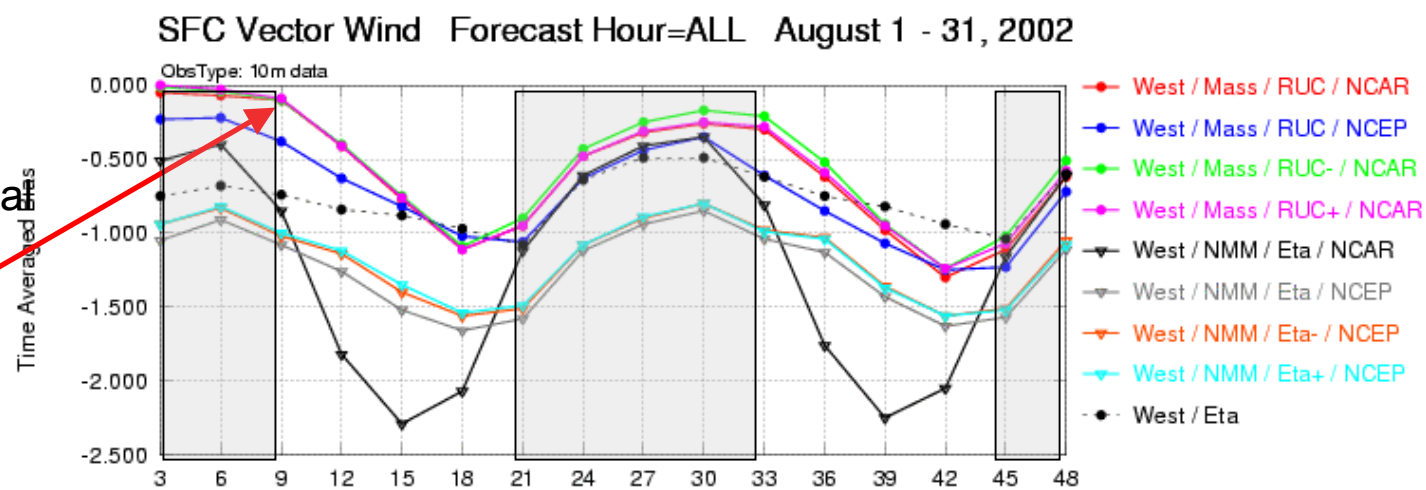
WRF-NMM/NCAR – Unique temporal behavior (Feb)

WRF-NMM/NCEP – Oscillates near zero (East)

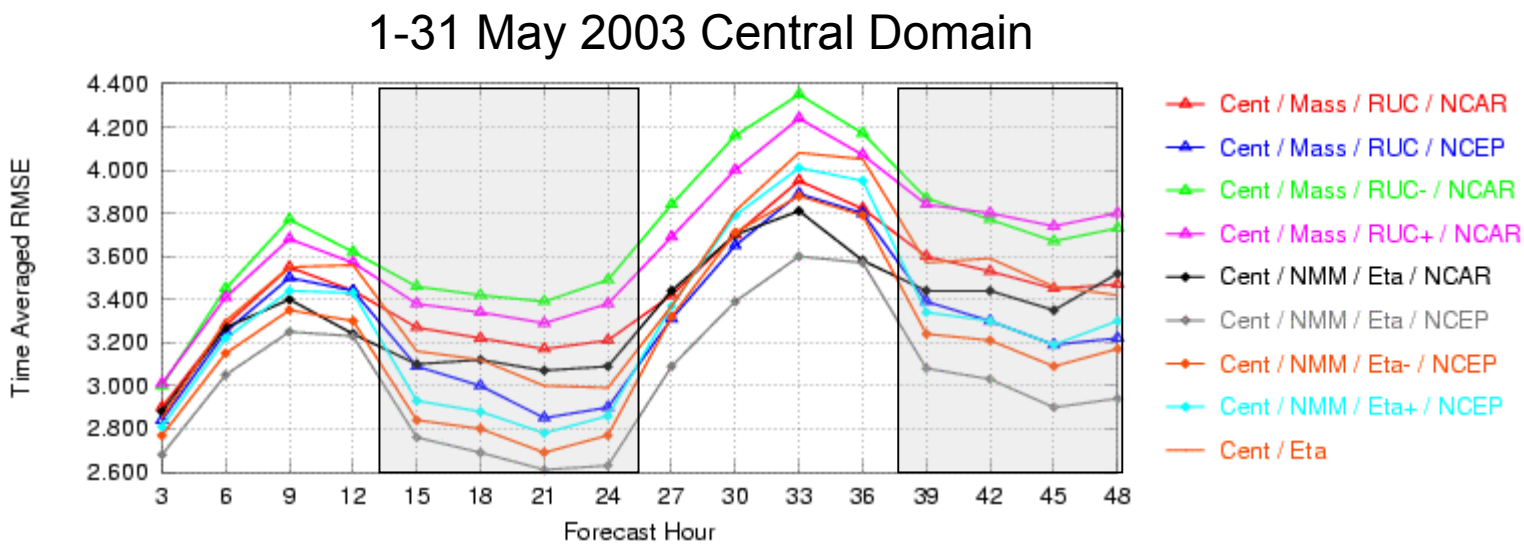


Eta (West) – Stronger diurnal signal Always negative

WRF-EM – Always negative (Aug / West)



Surface Wind Error - Only surface

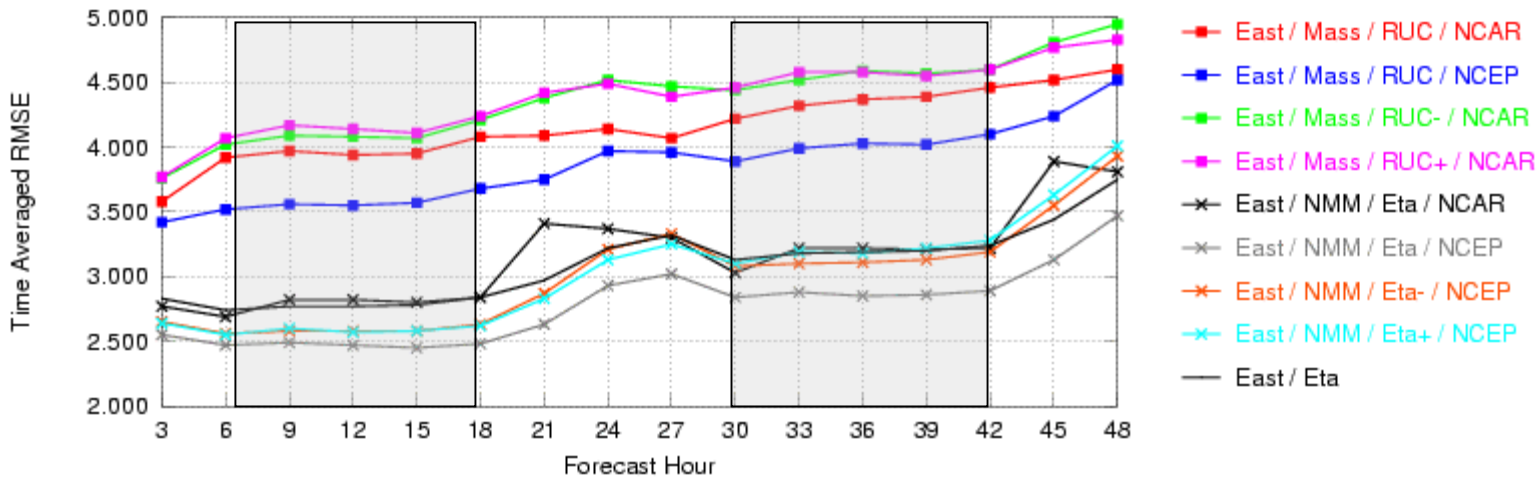


All Seasons / Domains:
Slight upward trend in errors with time
NMM/NCEP member has smallest errors

Central / West Domains:
Diurnal signal with peak @ ~ 21 Z

Surface Wind Error - Only surface

1-28 February 2003 East Domain



East Domain –
Weak to no diurnal signal

February –
More distinct separation in errors by dynamic core