1st Suomi NPP EDR Product Provisional Readiness Review

Session 4: VIIRS Cloud Mask

NCEP User Feedback

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*Thanks to Hui-ya Chuang[1], Yali Mao[2], Binbin Zhou[2], Fanglin Yang, John Derber[1], & Geoff DiMego[1]

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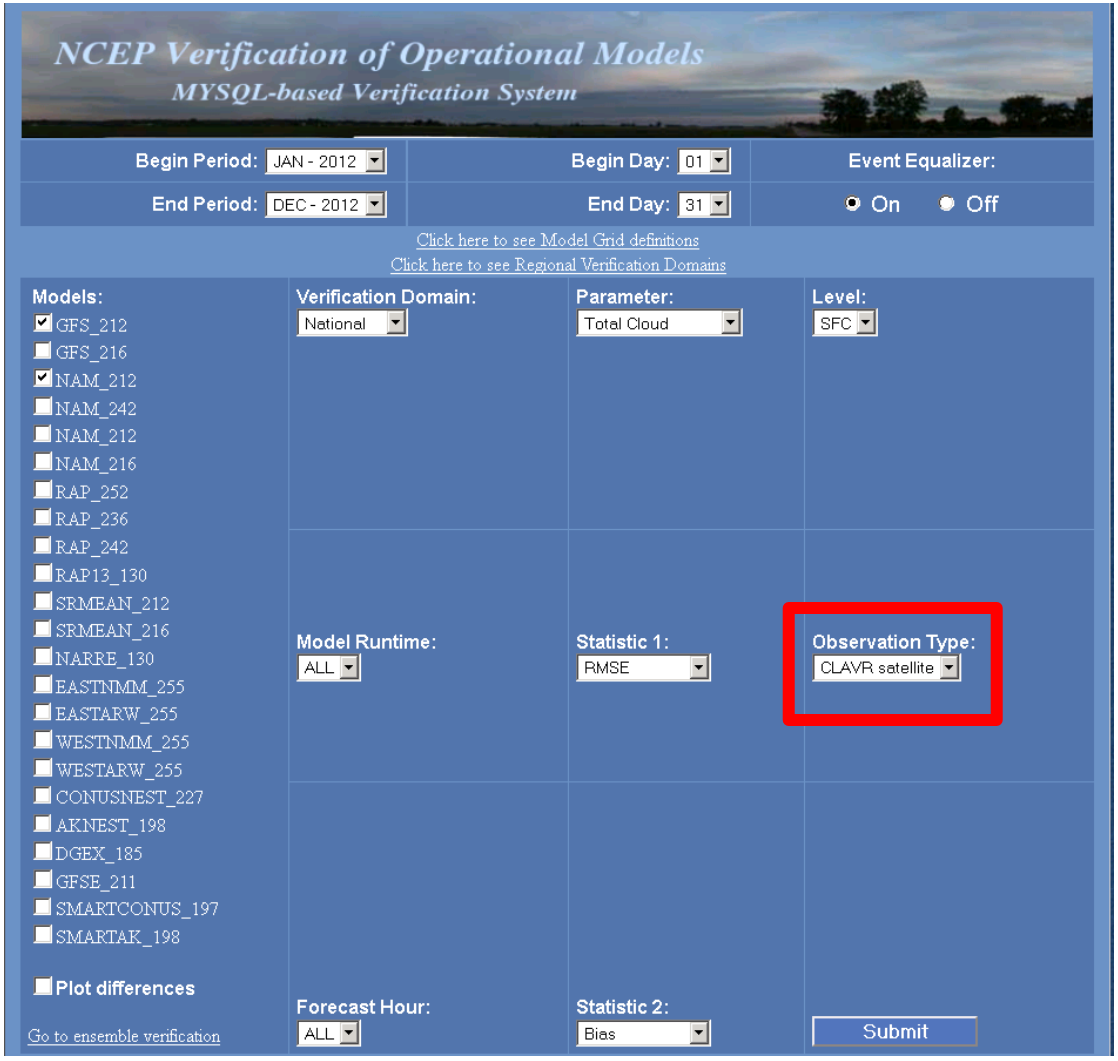
VIIRS on NPP

- Currently no direct use within EMC; indirect use through VIIRS?
- Future plans to assimilate VIIRS radiances for:
  - Use of cloud information
  - Deriving near-surface sea temperature
- Unfortunately no one available to work on this within EMC

Indirect use through CLAVR-x

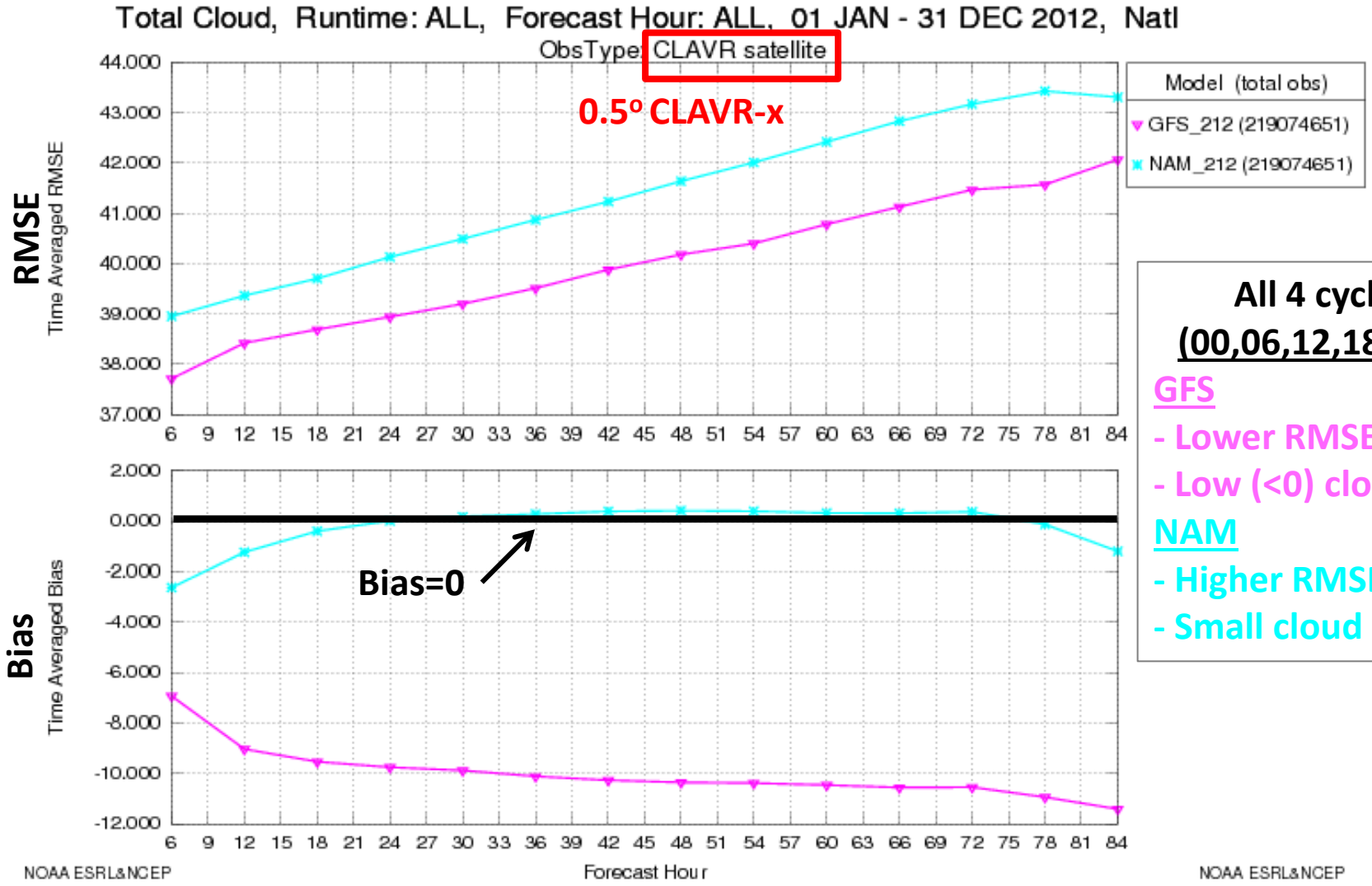
- Objective grid-to-grid (g2g) verification of cloud forecasts from EMC models:
  - N. American Mesoscale Model (NAM)
  - Global Forecast System (GFS)
- Accessed through an internal EMC web page from a MYSQL data base
  - Total cloud fractions from CLAVR-x & from the Air Force Weather Agency (AFWA)

Objective (g2g) Cloud Verification



(Binbin Zhou, Perry Shafran)

Average Statistics for 2012 (Total Cloud Fractions, %)

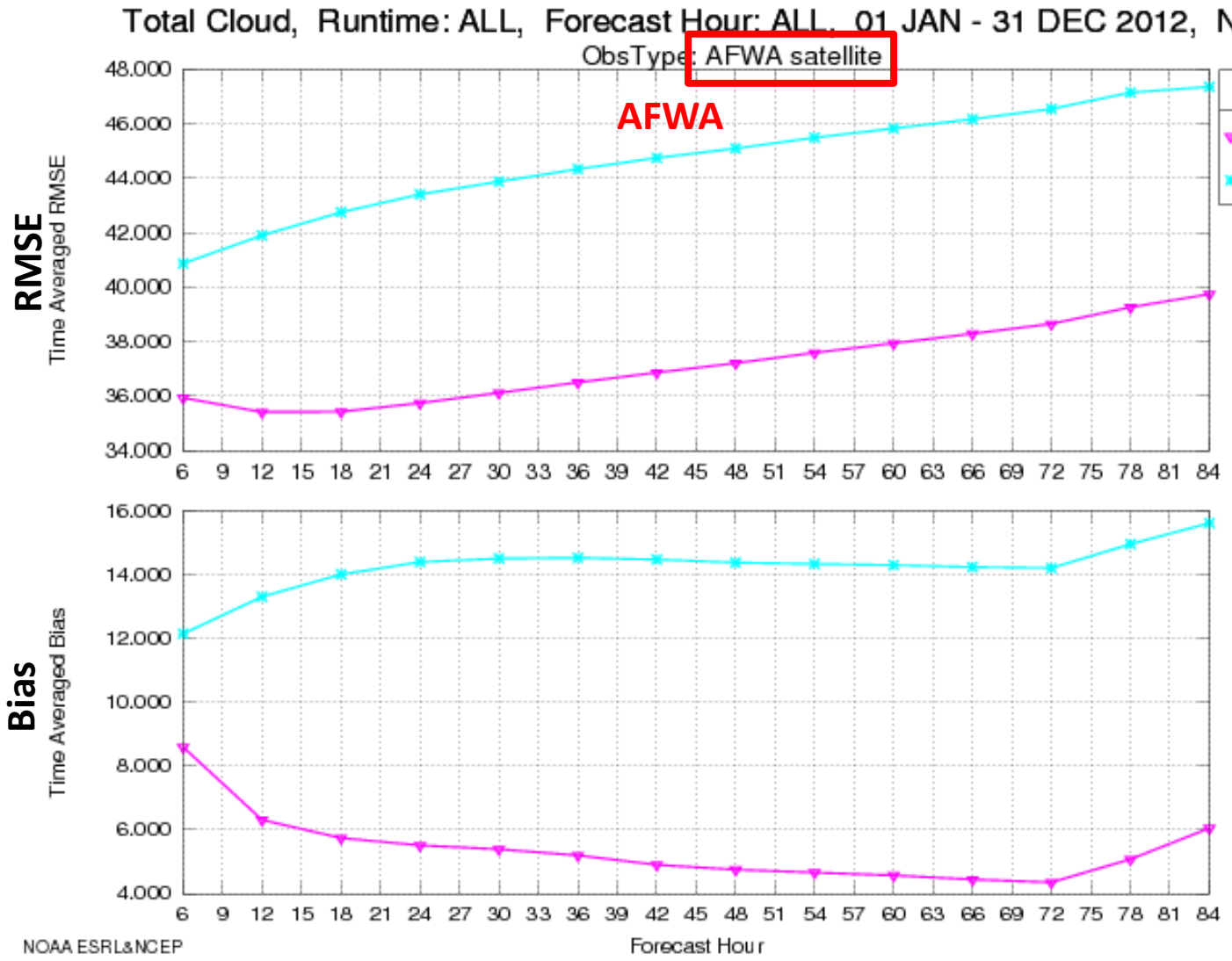


All 4 cycles (00,06,12,18 UTC)

GFS
- Lower RMSE
- Low (<0) cloud bias

NAM
- Higher RMSE
- Small cloud bias

Average Statistics for 2012 (Total Cloud Fractions, %)



All 4 cycles (00,06,12,18 UTC)

GFS

- Lower RMSE
- Slight high bias in total cloudiness

NAM

- Higher RMSE
- Large, high bias In total cloudiness

Summary of g2g Cloud Verification

- Large differences between CLAVR-x & AFWA
- NAM more consistent with CLAVR-x
- GFS more consistent with AFWA
- More cloudiness in CLAVR-x (& NAM) than in AFWA (& GFS)

Future Plans (1 of 4)

- Data assimilation (John Derber)
  - Need funding to hire someone
- Expand objective g2g verification?
- Daily & monthly global maps (Fanglin Yang)
  - Regular lat-lon grid
  - Standard isobaric layers
  - 6-h mean fields
  - Preferably in **GRIB format**

Future Plans (2 of 4)

- Global Current Icing Potential, GCIP
  (Hui-ya Chuang, Yali Mao, Binbin Zhou)
  - Global analysis of probability & severity of icing
  - Used in *validating* World Area Forecast System (WAFS) icing forecasts from GFS & UKMO
  - Combines data from satellites, radars, lightning obs, METAR, & pilot reports (NCAR algorithm)

Future Plans (3 of 4)

- Requests in support of GCIP
  - 0.25^{o} lat-lon grid, preferably in GRIB
  - 3-h intervals at high latitudes poleward of 70^{o} N & S
    - A merged geostationary product up to 70^{o} N & S will be provided later this year (K. Pryor, STAR/SMCD)
  - For icing probability:
    - Cloud coverage (fractions) & cloud-top temperatures
  - For icing severity:
    - Normalized albedos from visible channel
    - T_b diffs between 'shortwave IR' ch 2 (~3.9 μm) & 'window' ch 4 (~10.7 μm)

Future Plans (4 of 4)

- Regional & global validation?
  - Evaluate strengths & weaknesses between treatment of clouds between regional & global modeling systems?
  - Tie in with geostationary estimates?
    - Incoming surface insolation (useful for land surface)
    - Total cloud and/or aerosol optical depths
  - A joint effort between NESDIS & NCEP?