1st Suomi NPP EDR Product Provisional Readiness Review

Session 4: VIIRS Cloud Mask

NCEP User Feedback

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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, %)

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

- **NAM**
  - Higher RMSE
  - Small cloud bias

**0.5° CLAVR-x**

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1/18/2013
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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° lat-lon grid, preferably in GRIB
  – 3-h intervals at high latitudes poleward of 70° N & S
    • A merged geostationary product up to 70° 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?