Technical Implementation Notice 14-02
Amended National Weather Service Headquarters Washington DC
815 AM EDT Wed Mar 19 2014

To: Subscribers:
           -Family of Services
           -NOAA Weather Wire Service
           -Emergency Managers Weather Information Network
           -NOAAPort
           Other NWS Partners, Users and Employees

From: Timothy McClung
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           Office of Science and Technology

Subject: Amended: Short Range Ensemble Forecast (SREF) System Upgrade:
Effective March 26, 2014

Amended to reflect that in Improvement b, the reduction of the surface wet
and cold biases only applies to the initial time.

Effective on or about Wednesday, March 26, 2014, beginning with the 1500
Coordinated Universal Time (UTC) run, the National Centers for
Environmental Prediction (NCEP) will implement an upgrade including
improvements and new products to the Short Range Ensemble Forecast System
(SREF). The changes to the system are outlined below.

Improvements:

a. Correct/improve initial conditions:
- Replace Global Forecast System (GFS) land states (too moist) with North
American Model (NAM) Data Assimilation System (NDAS) land states in the
Nonhydrostatic Mesoscale Model (NMM) and Advanced Research WRF (ARW)
members.

b. Replace inadvertent use of global initial conditions (too moist) with
use of Rapid Refresh (RAP) for ARW members to reduce the surface wet and
cold biases at initial time; and Rewrite NDAS land states in NMMB members
to have a more representative sea ice field over the Great Lakes during
cold winter seasons.

c. Fix bugs in NOAH Land Surface Model (LSM): Eliminate negative soil
moisture fractions for NMM and ARW members and eliminate "urban swamp"
(causing too cold surface temperature over urban regions during heat wave
periods) for NMMB members.

d. Correct GFS physics in 2 NMMB members to produce compatible cloud &
ceiling guidance with the rest of SREF members.

e. Fix post-processor to remove use of snow in diagnosing cloud base
height.

f. Correct a mapping bug (eastward shift) in NMM member's pressure-GRIB output files.

g. Use the model lowest-level values for the 2m T, Td q, RH and 10m u and v fields for the 7 NMMB members at initial time f00; these fields do not have correct values in the current operational SREF.

h. Switch the hypsometric option in the ARW model back to the version in the original wrf3.3 version from option 2 (height is derived from log pressure) to option 1 (derived from pressure); this will make the model more reliable.

New output products:

Add new winter weather variables:
- Rime Factor at the lowest model level above the surface
- Snow depth
- Percent of frozen precipitation to the output for all 21 members
- Water equivalent of accumulated snow to the output for the seven ARW members.
- Hybrid level cloud mixing ration, cloud ice, and rime factor for all 21 members
- Ice cover proportion as a fixes sea ice mask for all 21 members.

Begin disseminating 2m temperature and 3-hourly accumulated precipitation for all 21 SREF members on the 32km North American domain (grid 221) via NOAAPort. More details about these products, including World Meteorological Organization (WMO) headers, can be found in NWS Technical Implementation Notice (TIN) 13-44.

Modify the clustering algorithm to preserve time-continuity within a cluster over each of the three pre-selected forecast periods (00-39 hours, 42-63 hours, 66-87 hours). This change will make available a larger number of cluster files. Also, some of the spacing in the sref_cluster_info text file will change.

Modify the list of stations for which SREF BUFR output is generated. The details of the additions, replacements and eliminations of stations are listed below. There were 68 sites added.

Key to Tables:

First column: numerical station identifier
Second/third columns: latitude/longitude
Fourth column: Character station identifier
Fifth/sixth columns: station name/state.

000228 47.08N 122.36W SWY,   SPANAWAY, WA
000229 46.91N 124.11W WPT,   WESTPORT, WA
000230 47.66N 090.91W LUT,   NEAR LUSTEN, MN
000231 46.77N 091.25W PWN,   NEAR PORT WING, WI
000232 55.31N 160.52W SDP,   NEAR SAND POINT, AK
000233 35.33N 077.60W KISO, KINSTON, NC
000234 44.53N 072.61W KMVL, MORRISVILLE-STOWE AIRPORT, VT

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000235 41.63N 080.21W KGKL,  MEADVILLE, PA
000236 38.69N 080.65W K48I,  SUTTON, WV
000237 34.34N 117.40W KGXA,  GRAY BUTTE FIELD, CA
000238 34.37N 117.36W EMF,   EL MIRAGE FIELD, CA
000239 45.97N 086.17W ISQ,   MANISTIQUE, MI
000240 46.42N 086.65W P53,   MUNISING, MI
000241 39.16N 089.67W K3LF,  LITCHFIELD, IL
000270 39.08N 120.94W CFC,   COLFAX WATER, CA
000271 37.51N 120.04W MPI,   MARIPOSA, CA
000273 37.58N 120.27W NXD,   NEW EXCHEQUER DAM, CA
000274 36.83N 119.33W PFD,   PINE FLAT DAM, CA
000275 35.85N 121.31W TPK,   THREE PEAKS, CA
000276 47.31N 121.85W RVD,   RAVENSDALE, WA
000277 38.49N 121.22W SHS,   SACRAMENTO ARO SITE, CA
000278 39.13N 120.80W TNF,   TAHOE NATIONAL FOREST, CA
000279 40.72N 122.43W STA,   SHASTA DAM, CA
000293 39.99N 122.06W CCR,   CONCORD, CA
000345 42.80N 109.81W KPNA,  PINEDALE, WY
000346 39.15N 122.15W WLM,   WILLIAM, CA
000347 40.88N 121.66W BNY,   BURNEY, CA
000348 37.99N 120.38W SON,   SONORA, CA
000349 37.74N 118.49W YSV,   YOSEMITE VALLEY, CA
000350 36.20N 119.10W LSY,   LINDSAY, CA
000351 35.97N 118.54W JHN,   JOHNSONDALE, CA
000352 34.83N 118.95W FZP,   FRAZIER PARK, CA
000353 36.14N 120.35W COA,   COALINGA, CA
000354 36.65N 118.48W TBM,   TABLE MOUNTAIN, CA
000355 42.47N 073.29W KPSF,  PITTSFIELD, MA
000356 39.21N 082.23W KUNI,  ATHENS/ALBANY, OH
000357 40.48N 111.43W K36U,  HEBER VALLEY MUNICIPAL AIRPORT, UT
000358 33.02N 114.24W B40,   YUMA, AZ
000359 31.49N 110.30W B41,   FORT HUACHUCA, AZ
000360 32.02N 107.87W B42,   DEMING, NM
000361 30.43N 104.33W B43,   MARFA, TX
000362 28.39N 110.29W B44,   EAGLE PASS, TX
000363 26.57N 098.82W B45,   RIO GRANDE CITY, TX
000364 28.71N 095.96W B46,   MATGORDA, TX
000365 29.81N 091.66W B47,   MORGAN CITY, LA
000366 24.70N 080.51W B48,   CUDJOE KEY, FL
000367 17.98N 067.08W B49,   LAJAS, PR
098009 38.33N 096.19W KEMP,  EMPORIA, KS
722593 35.07N 118.15W KMHV,  MOJAVE, CA
723065 35.64N 077.39W KPGV,  GREENVILLE, NC
723066 35.33N 077.97W KGSB,  SEYMOUR-JOHNSON_AIR FORCE BASE, NC
723069 34.82N 077.61W KOAJ,  JACKSONVILLE, NC
724397 40.48N 088.92W KBMI,  BLOOMINGTON/NORMAL, IL
724456 38.13N 091.77W VIH,   ROLLA/VICHY_AIRPORT, MO
724580 39.55N 097.65W KCNK,  CONCORDIA/BLOSSER, KS
725116 40.12N 076.29W KLNS,  LANCASTER, PA
725490 42.55N 094.20W KFOD,  FORT DODGE, IA
725635 42.05N 102.80W KAIA,  ALLIANCE, NE
726134 44.36N 071.55W KHIE,  WHITEFIELD, NH
726385 44.28N 086.25W KMBL,  MANISTEE, MI
726710 42.58N 110.11W KBPI,  BIG PINEY, WY
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727883 47.03N 120.53W KELN,  ELLENSBURG/BOWERS, WA
747900 33.97N 080.47W KSSC,  SHAW_AFB/SUMTER, SC
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3 sites removed

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000620 49.50N 108.00W C20,   CANADA/GREAT LAKES
000621 49.00N 104.00W C21,   CANADA/GREAT LAKES
072434 38.62N 090.18W STL,   ST. LOUIS, MO
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7 sites replaced by a nearby site

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Old: 000020 44.80N 096.70W WTT, NR. WATERTOWN, SD
New: 000020 45.80N 097.45W RAWS, MARSHALL COUNTY RAWS, SD

Old: 000037 42.00N 095.00W CRL, NR. CARROLL, IA
New: 000037 42.04N 094.79W CRL, CARROLL, IA

Old: 000050 40.90N 092.80W AIA, NR. ALBIA, IA
New: 000050 42.11N 092.92W MAR, MARSHALLTOWN, IA

Old: 000057 48.00N 113.00W LRR, LEWIS RANGE OF ROCKIES, MT
New: 000057 48.32N 113.35W MRP, MARIAS PASS, MT

Old: 000080 40.69N 094.47W RDD, REDDING, IA
New: 000080 41.02N 094.36W CSQ, CRESTON, IA

Old: 000617 46.00N 114.00W C17, NORTHERN ROCKIES
New: 000617 46.25N 114.15W HMM, HAMILTON, MT

Old: 724754 37.08N 113.60W KSGU, SAINT_GEORGE_(AWOS), UT
New: 724754 37.04N 113.50W KSGU, SAINT_GEORGE_(AWOS), UT.
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Data delivery timing/volume/content changes:

With this upgrade, users will see some increase in the size of the individual ensemble members due to the addition of the four variables listed above. Users will also see additional cluster output files available. No significant difference in delivery time is expected.

Output from the SREF is available via NOAAPort and on the NWS and NCEP ftp servers at the locations listed below. SREF output is also available on the NOAA Operational Model Archive and Distribution System (NOMADS) at: http://nomads.ncep.noaa.gov.

NWS ftp server, where the hh refers to the cycle:
03...09...15...21 where the yyyymmdd refers to the current date:

ftp://tgftp.nws.noaa.gov/SL.us008001/ST.opnl/MT.sref_CY.hh/RD.yyyymmdd

NCEP ftp server:
ftp://ftp.ncep.noaa.gov/pub/data/nccf/com/sref/prod

A consistent parallel feed of data is available on the NCEP server at this time, via the following URLs:

http://www.ftp.ncep.noaa.gov/data/nccf/com/sref/para
ftp://ftp.ncep.noaa.gov/pub/data/nccf/com/sref/para

The Environmental Modeling Center (EMC) Mesoscale Modeling Branch (MMB) has a publicly available website which can provide users more information concerning the SREF modeling system as well as other NCEP regional modeling systems:

http://www.emc.ncep.noaa.gov/mmb/mesoscale.html

NCEP urges all users to ensure their decoders can handle changes in content order, changes in the scaling factor component within the product definition section (PDS) of the GRIB files, changes to the GRIB Bit Map Section (BMS), and volume changes. These elements may change with future NCEP model implementations. NCEP will make every attempt to alert users to these changes before implementation.

For questions regarding the scientific content of the modeling system, please contact:

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National Technical Implementation Notices are online at:

https://www.weather.gov/notification/archive

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