

**Product and Service Description Document
(PDD)**

Real-Time Mesoscale Analysis

Approved //David Caldwell// **Date** 4/30/2010

Disapproved _____ **Date** _____

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National Digital Forecast Database (NDFD) Real-Time Mesoscale Analysis (RTMA) Product Description Document

April 7, 2010

Part I - Mission Connection

- a. **Product Description.** The National Weather Service (NWS) weather forecast offices (WFO) produce and send digital forecasts to various users. These forecasts of hydrometeorological variables, such as temperature and precipitation, contribute to the generation of the NWS National Digital Forecast Database (NDFD). The Real-Time Mesoscale Analysis (RTMA) is a gridded analysis of the hydrometeorological variables that matches the NDFD spatial resolution. Products from this analysis are generated hourly, disseminated to NWS field offices and National Centers, and available for external users. The RTMA is the first component of the NWS Analysis of Record (AOR) project.

RTMA product generation for the CONUS region includes the following products: surface temperature, surface dew point, wind speed and direction, and cloud and precipitation amount products, and u and v wind components. The product set generated for RTMA Alaska, Hawaii and Puerto Rico contain the same parameters as CONUS regions except for the cloud amount and precipitation products. An analysis uncertainty product is generated for all RTMA products except the cloud and precipitation products, and u and v wind components.

- b. **Purpose.** The primary purpose of the RTMA is to provide an NDFD matching-resolution analysis to verify NWS digital forecasts.
- c. **Intended Audience.** The primary intended audience of RTMA products includes users of hydrometeorological analyses including groups applying gridded products for operational applications such as NWS forecast offices. Other possible users include other government meteorologists, private operational meteorologists, research and media meteorologists, and climatologists.
- d. **Presentation Format.** The hourly RTMA products are provided in two formats, graphical and digital. The National Centers for Environmental Prediction's (NCEP) Environmental Modeling Center (EMC) generates all RTMA products except the effective cloud amount (ECA) product, which is created by the National Environmental Satellite, Data and Information Service (NESDIS). Other NWS groups contribute to the development of the RTMA, as well as NOAA's Office Oceanic and Atmospheric Research (OAR) Environmental Research Laboratory (ESRL). All RTMA products are available on the National Digital Guidance Database (NDGD) in GRIB 2 data format except the u and v wind components. These wind components are available for NOAAPort users.

These RTMA products are available on the National Digital Guidance Database (NDGD) in GRIB 2 data.

CONUS:

The CONUS GRIB 2 products are available from the NDGD at the following URL:

<ftp://tgftp.nws.noaa.gov/SL.us008001/ST.expr/DF.gr2/DC.ndgd/GT.rtma/AR.conus/>

Graphical images of selected RTMA CONUS products are available at the following URL:

<http://www.nco.ncep.noaa.gov/pmb/nwprod/analysis/>

Comparisons between the operational and parallel versions of the analyses for the CONUS are found at the following URL:

<http://www.emc.ncep.noaa.gov/mmb/rtma/para/>

ALASKA:

The Alaska GRIB 2 products are available from the NDGD at the following URL:

<ftp://tgftp.nws.noaa.gov/SL.us008001/ST.expr/DF.gr2/DC.ndgd/GT.rtma/AR.alaska/>

Graphical images of Alaska RTMA products can be found at the following URL:

<http://www.emc.ncep.noaa.gov/mmb/rtma/alaska/>

HAWAII:

The Hawaii GRIB 2 products are available from the NDGD at the following URL:

<ftp://tgftp.nws.noaa.gov/SL.us008001/ST.expr/DF.gr2/DC.ndgd/GT.rtma/AR.hawaii>

Graphical images of Hawaii RTMA products can be found at the following URL:

<http://www.emc.ncep.noaa.gov/mmb/rtma/hawaii/>

PUERTO RICO:

The Puerto Rico GRIB 2 products are available from the NDGD at the following URL:

<ftp://tgftp.nws.noaa.gov/SL.us008001/ST.expr/DF.gr2/DC.ndgd/GT.rtma/AR.puertori>

Graphical images of Puerto Rico RTMA products can be found at the following URL:

<http://www.emc.ncep.noaa.gov/mmb/rtma/pr/>

- e. Feedback Mechanism. Comments are welcomed from users of RTMA information. The following URLs provide links to the surveys for CONUS, Alaska, Hawaii and Puerto Rico RTMA feedback.

<http://www.weather.gov/survey/nws-survey.php?code=rtma>

<http://www.weather.gov/survey/nws-survey.php?code=RTMA-AK>

<http://www.weather.gov/survey/nws-survey.php?code=RTMA-HI>

<http://www.weather.gov/survey/nws-survey.php?code=RTMA-PR>

Technical questions regarding NCEP's RTMA products may be addressed to:

NCEP
Attention: Geoff DiMego
5200 Auth Road, WWBG
Camp Springs, MD 20746-4304
301-763-8000 x 7221
Geoff.DiMego@noaa.gov

Technical questions about NESDIS' ECA product may be addressed to:

NESDIS
Attention: John Paquette
5200 Auth Road
Camp Springs, MD 20746-4304
301-763-8051 x 110
John.Paquette@noaa.gov

Technical questions about the NWS' NDFD and NDGD may be addressed to:

NWS Meteorological Laboratory (MDL)
Attention: David Ruth, W/OST21
1325 East-West Highway
SSMC 2
Silver Spring, MD 20910
301-713-1768 x 157
David.Ruth@noaa.gov

Part II - Technical Description

- a. **Format and Scientific Basis.** RTMA product availability for users includes both digital and graphic formats, and accessibility through the World Wide Web. Source links to obtain this information is provided in the previous section of this document. These products are displayable in the Advanced Weather Interactive Processing System (AWIPS) in the NWS. The initial set of RTMA products includes the two-meter (2-m) ambient temperature and 2-m dew point temperature, the ten-meter (10-m) wind speed and wind direction, the effective cloud amount (ECA) and a precipitation product.

The RTMA production involves various types of hydrometeorological data (e.g., surface weather, radar, and satellite) and a background field, which is a one-hour forecast from a numerical weather model. Rain gauge and Doppler radar reflectivity data contribute to the generation of the one-hour precipitation product. The ECA is created using satellite data.

Production of the analysis uncertainty products occurs hourly for each product in the initial set of RTMA products except for the ECA and precipitation products. The analysis uncertainty values depend primarily on observation density, observation quality, and the background field. The analysis uncertainty products' units are the same as the corresponding product (e.g., temperature uncertainty units are in degrees F). The RTMA creates an hourly product for each of the u and v wind components that are provided through NOAAPort. The complete RTMA OCONUS product set contains the same RTMA variables as the CONUS with the exception of the precipitation and cloud products.

- b. **Product Availability.** The RTMA generates gridded products that are available in the last half of each hour. Part I of this document contains Internet links for the RTMA.