NATIONAL WEATHER SERVICE
SERVICE DESCRIPTION DOCUMENT (SDD)
TYPE: Experimental Product
DATE: November 01, 2010

National Digital Forecast Database
Recently Updated Grids Service

Part 1 – Mission Connection

1. **Service Description**: National Digital Forecast Database (NDFD) Recently Updated Grids Service (RUGS) lets the public, government agencies, and commercial enterprises know which NDFD General Regularly-distributed Information in Binary form (GRIB2) files have recently been updated. Using RUGS information, NDFD users can avoid needlessly retrieving files that haven't been modified since the user last downloaded them. More information about RUGS is available at the following URL:

   http://www.weather.gov/forecasts/xml/rugs/

   While the service is principally for use in a machine-to-machine process, users can explore the service using the following web page interface:

   https://bestpractices.nws.noaa.gov/mdl/RUGS/recently UpdatedGrids.htm

   The Rugs response document returned by the web page above or returned to a user's client application is encoded using the Atom Syndication Format (Atom). Atom is an eXtensible Markup Language (XML) dialect used by client programs to check on updated information on the worldwide web. The Atom-encoded RUGS response document contains the URL of one or more updated NDFD GRIB2 files. Users can use the URL to download the modified file.

   For machine-to-machine retrievals, NWS customer's can direct their client application to RUGS using the following web address:

   https://bestpractices.nws.noaa.gov/mdl/RUGS/recently UpdatedGrids.php

   The client program will need to provide RUGS with the required inputs described in Part II of this document.

2. **Purpose/Intended Use**: RUGS enables NDFD users to download GRIB2 files only when they have been updated. Only retrieving recently modified GRIB2 files should save users communication and processing resources when compared to a strategy that downloads needed GRIB2 files on a regular basis such as hourly. This service is envisioned to be used primarily by computer applications performing retrieval of GRIB2 files.

3. **Audience**: RUGS is intended for NDFD users who download GRIB2 files from the NWS via File Transfer Protocol or Hypertext Markup Language (HTTP). These users represent members of the public, government agencies, and private sector entities.

4. **Presentation Format**: The service provides the URLs to updated NDFD GRIB2 files formatted in an Atom document. A sample RUGS Atom-based document is contained in Appendix A.

5. **Feedback Method**: RUGS users are encouraged to provide feedback using the Customer Survey for Experimental Products/Services (http://www.weather.gov/survey/nws-survey.php?code=RUGS). In addition to completing the survey online, it can be emailed to nwx.xml@noaa.gov or mailed to the following address:

   Meteorological Development Laboratory
   Attn: Carl McCalla, Sr., W/OST24
   1325 East-West Highway, SSMC2
   Silver Spring, MD 20910

   Comments and feedback on RUGS will be accepted through September 30, 2011.

Part 2 – Technical

1. **Format and Science Basis**: Strictly speaking, the RUGS Atom-encoded document has no format. This is one of the un underlying principles of XML that formatting information has been removed from a document leaving only content. However, the elements and attributes that can appear in a RUGS Atom-based document and their order are restricted. These constraints, which constitute Atom's vocabulary and grammar, are defined in its schema which is available online at http://tools.ietf.org/html/rfc4287#appendix-B.

   The RUGS response document contains one or more <content> elements which each hold the URL to the updated GRIB2 file. The URL follows the format described on the NDFD Access Data page http://www.nws.noaa.gov/ndfd/access_http.htm.

   RUGS monitors GRIB2 files for the elements found on the NDFD Access Data page http://www.nws.noaa.gov/ndfd/technical.htm#elements.

   To submit a RUGS request, a user sends an HTTP GET method request to the service's URL. The request contains six inputs. A sample request, which has been formatted on separate lines for ease of viewing follows:

```
https://bestpractices.nws.noaa.gov/mdl/RUGS/recentlyUpdatedGrids.php?
locationType=WFO&
locations=BOX&
elements=maxt&
issuanceSearchTime=2004-01-01T00:00:00&
searchStartTime=2004-01-01T00:00:00&
```

searchEndTime=2012-11-25T00:00:00&
showChangedTimes=yes

RUGS Inputs:

locationType: One of four types of location input supported by RUGS.

WFO – Used to monitor updates for one or more Weather Forecast Offices (WFO).
Sector – Used to track updates for one of more NDFD sectors.
State – Used to watch for changes to NDFD data in one or more U.S. States.
Point – Used to determine if data has changed at one or more NDFD grid points.

locations: A comma delimited list of locations appropriate to the selected location type. For example location input for a location type of WFO would look like the following:

LWX,BOX,RLX

elements: A comma delimited list of NDFD elements. For example, a user would include the following list to receive URLs for updated maximum and minimum temperature GRIBs files.

Maxt,mint

issuanceSearchTime: A time string indicating when the user wants RUGS to begin searching for updated files (e.g., 2004-01-01T00:00:00). This is typically when the user last refreached their NDFD data files (e.g., 6 hours ago).

searchStartTime: A time string indicating when the user wants RUGS to begin searching for updated valid times within an updated file (e.g., 2004-01-01T00:00:00).

searchEndTime: A time string indicating when the user wants RUGS to stop searching for updated valid times within an updated file (e.g., 2012-01-01T00:00:00).

showChangedTimes: Tells RUGS that the user wants the response document to contain the valid times that have changed in a given updated GRIB2 file.

For more information on RUGS input, see the RUGS home page at the following link:

http://www.weather.gov/forecasts/sml/rugs

2. **Availability**: RUGS is continuously available from the NWS web site at the following URLs:

   Human Interface:

   https://bestpractices.nws.noaa.gov/mdl/RUGS/recentlyUpdated Grids.htm

   Machine-to-machine Interface:

   https://bestpractices.nws.noaa.gov/mdl/RUGS/recentlyUpdatedGrids.php

3. **Additional Information**: The following references are provided to assist developers wishing to make use of RUGS:

   Atom Syndication Format
   http://toos.ieft.org/html/rfc4287

   W3C XML Recommendation:
   http://www.w3.org/XML/

Appendix A

Sample RUGS Response Document

This sample RUGS document was generated by submitting the following request:


```
https://bestpractices.nws.noaa.gov/mdl/RUGS/recentlyUpdatedGrids.php?
locationType=WFO&
locations=BOX&
elements=maxt&
issuanceSearchTime=2004-01-01T00:00:00&
searchStartTime=2004-01-01T00:00:00&
searchEndTime=2012-11-25T00:00:00&
showChangedTimes=yes

<?xml version="1.0" encoding="utf-8"?>
<feed xmlns="http//www.w3.org/2005/Atom"
Xmlns:rugs="htp"//www.weather.gov/forecasts/">
   <author>
      <name>National Oceanic and Atmospheric Administration's (NOAA) National
Weather Service (NWS)</name>
   </author>
   <id>http://weather.gov/forecasts/recentlyUpdatedGrids.php</id>
   <logo>http://weather.gov/images/xml_logo.giv</logo>
   <rights>http://weather.gov/disclaimer.html</rights>
   <title>Recently Updated Grids</title>
   <updated>2008-11-25T14:1100Z</updated>
   <rugs:timePeriodSearched>
   <entry>
      <content type="application/x-grib"
Src=http://weather.noaa.gov/pub/SL.us008001/ST.opnl/DF.gr2/DC.ndfd/AR.neast/VP.001-
003/ds.maxt.bin />

<id>http://weather.noaa.gov/pub/SL.us008001/ST.opnl/DF.gr2/DC.ndfd/AR.neast/VP.001-
003/ds.maxt.in</id>
   <summary type="text">This feed provides a link to an updated NDFD maxt grid for
the neast sector and days 001-003.</summary>
   <title>Updated maxt Grid (Location = neast, Days = 001-003)</title>
   <updated>2008-11-25T14:11:00Z</updated>
   <rugs:location>neast</rugs:location>
   <rugs:updatedValidTimes>
      <rugs:time>2008-11-26T00:00:00Z</rugs:time>
      <rugs:time>2008-11-27T00:00:00Z<rugs:time>
   <rugs:updatedValidTimes>
  </entry>
</feed>
```