

N-AWIPS 5.11.1 Release Notes

November 2, 2007

Version 5.11.1 covers development from July 20, 2007 to October 19, 2007

I. NMAP Product Generation Improvements

A. Jet Tool Enhancement (AWC)

The "Barb Info" GUI that is used by the Jet drawing tool has been modified so that it remains in the same position each time it is invoked. This work was done by the AWC in collaboration with the NAWIPS team.

B. Updated International SIGMET formatter (AWC, PR)

The international SIGMET formatter in NMAP2 has been modified to comply with the latest ICAO standard for the text product. The following changes were made:

1. Change 12-hour outlook to 6-hour forecast
2. Remove date from current position and forecast time strings
3. For an isolated tropical cyclone SIGMET, use the lat/lon from the GUI as the location, not the from line location
4. Append a "Z" to the current position time
5. Add a "." (period) after the name of the volcano
6. Add "VA CLD" to the beginning of the "bounded by" line for volcanic ash SIGMETs
7. Append a "Z" to the forecast time
8. Add "VA CLD APRX" to VA SIGMET forecast section
9. Add "TC CENTER" to TC SIGMET forecast section

This work was done by the AWC in collaboration with the NAWIPS team.

C. GFA/AIRMET (AWC)

Several new features and enhancements have been added to NMAP GFA GUIs and formatting functions in support of creating the Graphical AIRMET. In addition, several problems have been corrected that were found during AWC evaluations of version 5.10.4.

1. Implemented Cycle Time Selection, From Line Editing and Formatting

Several changes have been made to support the editable F/BB/A element and creation of the AIRMET text product from the F/BB/A element.

Cycle Time Selection GUI. A new Action, named “Cycle”, is available in the pgen palette. This action opens the day/cycle selection GUI, which provides the user a means to change the selected Day, Cycle, and status. Any changes the user makes are immediately displayed in the NMAP2 window title. The cycle time should be set before the F/BB/A element is drawn or edited.

Cycle Time display. A new prefs.tbl setting, USE_DAY_CYCLE, has been added. When this flag is set to TRUE, a default day, cycle, and status (Routine or Update) will be selected and displayed in the title of the NMAP2 window (right end). The starting value uses the same logic that the current Airmet GUI uses in selecting the day/cycle/status.

F/BB/A Editing. The implementation to generate the fully user editable FROM lines from the GFA snapshots has been completed. Click the "FROM" icon action to invoke the "Generate FROM Lines" GUI. Select “Format All”, “Format Layer”, or “Format Tag” to generate F/BB/A elements for specified snapshots for all layers, the active layer, or a selected hazard that has the same hazard type and tag on the active layer, respectively. F/BB/A elements are created by applying all the required rules, e.g., clipping, point reduction, and snapping.

Available actions can be applied to the resultant F/BB/A objects. For example, the resultant F/BB/A objects can be edited by clicking the select action and dragging the object's selected vertex with the mouse. Note that if the F/BB/A is edited, only snapping is applied. No other algorithms or checks are done.

Please note that the "Undo" and "Redo" actions only work on the active layer. These actions do not work if the "Format All" option was selected.

Airmet' (Airmet prime) GUI. The Airmet' GUI now properly generates the Airmet text based on the created F/BB/A elements. The GUI is similar to the original Airmet GUI except that the “Generate/Save” has replaced the "Format/Save" button and the "Day" and "Cycle" widgets have been removed.

2. Corrected GFA' Desk Setting Problems

The GFA' desk menu problem has been corrected. When editing a GFA element

in the previous NMAP2 release, the desk value in the GFA' Edit GUI did not match the one in the element.

3. Improved Cancel Action in GFA GUI

The GFA warning window behavior has been modified to fully cancel out of the "GFA Create/Edit" GUI when clicking on the "Cancel" button in the warning window. The GFA warning window pops up if a GFA is not complete, for instance, ICE top/bottom values are not typed in or IFR types are not selected. In the previous release, the GFA points remained after clicking on the "Cancel" button in the warning window and if user drew another GFA, those points were included in the new polygon. In this release, clicking on the "Cancel" button in the warning window closes the "GFA Create/Edit" GUI and deletes all the points of the GFA.

4. Updated Algorithm in Connect for GFA

The GFA "Join" algorithm in the "Connect" tool has been modified based on AWC's request. Originally, "Join" GFAs used the same algorithm as "smear" GFAs, which uses a "convex hull" algorithm. Now, if two GFAs to be joined intersect, a union is performed instead of "convex hull" to keep the concavity shape as much as possible. If GFA polygons do not touch each other, "shrink-wrap" is applied. Note that "Smear" tool behavior remains unchanged and should behave the same as before.

Also, the problem where, in some cases, the Connect tool was deleting one of the polygons has been corrected.

5. Text Box Plotting Enhancements

Two enhancements have been made to GFA text box plotting. These changes were made primarily to support Web display requirements.

Text boxes now support display of special forecast hour times. In addition, the arrow size from the text attribute box to the object to which it is pointing can now be adjusted by modifying arrow size value in the \$GEMTBL/pgen/setting.tbl for NMAP2 or in the \$GEMTBL/pgen/uattribd.tbl for GPMAP post-processing requirements.

This work was done by the AWC in collaboration with the NAWIPS team.

6. Auto Placement Enhancement

The auto placement has been enhanced to find a better location for the label when the optimal position cannot be found. The algorithm now determines whether the interior of adjacent objects can be used for the label with a pointing arrow to the referenced object. This work was done by the AWC in collaboration with the NAWIPS team.

7. Added Mountain Obscuration Cause to Text Box Display

Added the cause of mountain obscuration to the text box for that hazard.

8. Use Actual Values for Flight Levels Above 160 for Freezing Levels

At the request of the AWC, the actual top levels are now used in the AIRMET bulletins for freezing levels or multiple freezing levels. In previous releases, if the top level was above 160, 'ABV 160' was used in the bulletin.

C. Updates to VAA Generation (NESDIS/VAAC)

The text "ASH NOT IDENTIFIABLE FROM SATELLITE DATA" was removed for "NOT SEEN" type of ash cloud at forecast hours other than F00. Also, all items set in the "VAA" GUI are now retained if the "VAA Save" GUI is canceled.

D. Enhance Vector Attribute Editing (OPC, TPC)

The vector attribute editing capability for multi-selection has been improved. When multi-selection is active, a check box is created next to each vector attribute. Only the selected attributes are updated when the "Apply" button is clicked.

E. TCV Modifications for California Storms (TPC)

The TCA breakpoint table, \$GEMTBL/stns/tcabkptlz.tbl, and product generation GUI have been modified so that NMAP2 can properly generate VTEC TCV bulletins for tropical storm watches and warnings along the southern coast of California that cross into Mexico. In addition, the TCV file name for eastern Pacific storms is now different from the name used for Atlantic storms. The file includes the string EP instead of AT in its name.

II. Product Generation Pre/Post Processing Improvements

A. New G-AIRMET BUFR Encoding/Decoding Software (AWC)

AIRMET_VGFBUFR and AIRMET_BUFRVGF are two new programs created to process G-AIRMET related VGF files, BUFR messages and XML documents.

Airmet_vgfbufr is the BUFR encoder and requires VGF files containing GFA objects depicting aviation hazards forecast at a specific time or range of times. It can also produce XML documents descriptive of the hazards that are to be encoded into the BUFR message. The program will produce up to three BUFR messages under the designation as SIERRA, TANGO, or ZULU hazards.

The program can be run from a command line or embedded in a script. A simplified usage statement is:

```
airmet_vgfbufr -i <VGF file name> -refDate YYYYMMDD -cycle DD -issDateTime  
YYYYMMDDHHMM
```

```
-bulletin <SIERRA/TANGO/ZULU> -obufr <BUFR file name> -fxyPath $GEMTBL/bufr
```

For example, to process a VGF file containing IFR GFA Objects for October 2, 2007 with the 09Z package and encode them to BUFR, issue the following command:

```
airmet_vgfbufr -i merged_09Z_IFR.vgf -refDate 20071002 -cycle 09 -issDateTime  
200710020845 -bulletin SIERRA -obufr testSIERRA.bufr -fxyPath $GEMTBL/bufr
```

This command reads the merged_09Z_IFR.vgf file as input and produces a testSIERRA.bufr message as output. The software internally references the MEL BUFR Tables under \$GEMTBL/melbufr, but must be given an explicit reference to the FXY Tables via the -fxyPath switch. Because the issue dates and absolute forecast times are not encoded in the VGF files, a reference date and an issue time must be passed to the encoder as arguments (e.g. -refDate, -issDateTime). The reference date is always based off the original standard issuance time of the package.

Airmet_bufrvgf is the BUFR decoder and requires G-AIRMET SIERRA, TANGO, or ZULU BUFR messages for input. It produces VGF files containing GFA Objects depicting aviation hazards forecast at a specific time or range of times. It also can produce XML documents descriptive of the hazards encoded into the BUFR message.

Like the airmet_vgfbufr program, it can be run from a command line or embedded in a script. A simplified usage statement is the following:

```
airmet_bufrvgf -i <BUFR File name> -ovgf <VGF File name>
```

For example, to process a SIERRA BUFR message as input and create a testout.vgf file as output, issue the following command:

```
airmet_bufrvgf -i testSIERRA.bufr -ovgf testout.vgf
```

Further documentation on available options can be found by running the applications without arguments.

This development was done by the AWC in collaboration with the NAWIPS team.

B. New Software Fonts Created (NCO, ALL)

New software fonts were added to alleviate a problem on the CCS, where the virtual X server is not running properly. The virtual X server, which is used to create GIF files on the CCS, allows the user to display any text using the hardware fonts, Helvetica or Times-Roman. One reason that the hardware fonts are used is that the GEMPAK software fonts are very primitive. Tables containing an implementation of the Hershey Fonts were added, along with the functions needed to read and query the table information. (Hershey Fonts were initially developed in the 1960's. A history of the fonts can be found at <http://www.efg2.com/Lab/OtherProjects/Hershey.htm>.)

Two of the Hershey Fonts were implemented which emulate the hardware fonts already available in the GEMPAK device drivers. If a particular device driver does not support hardware fonts, the requested font is emulated using the appropriate software font. For example, if the GIF driver is selected and a hardware font of 23 (Times-Bold) is specified, the software emulated font for Times-Bold (24) is automatically used.

See the help for the TEXT parameter for more information.

C. Offshore Text Formatter Added (OPC, TPC)

GOFTXT is an Offshore Text Formatter (OTF) which creates five-day offshore forecast text from gridded data. Currently only the wind and significant wave height text is created by the program. Refinements to the wind and height parameter algorithms and additional parameters will be added in future releases. GOFTXT is controlled by user inputs in the following format:

```
GOFTXT
alias for a grid file[cycle]
grid times
alias for a boundary info file
```

The alias name for the grid file is defined in \$GEMTBL/config/datatype.tbl. To run the program properly, grid times have to be in specific time fields for different cycles as follows:

	Pacific Zones	Atlantic Zones

00Z	f15-f57-6;f63-f147-12	f12-f54-6;f60-f144-12
06Z	f15;f18;f21-f57-6;f69-f141-12	f12;f15;f18-f54-6;f66-f138-12

12Z f15-f75-6;f87-f159-12 f12-f72-6;f84-f156-12
18Z f15;f18;f21-f69-6;f81-f153-12 f12;f15;f18-f66-6;f78-f150-12

The alias name for the boundary info file is defined in \$GEMTBL/config/clo.tbl. The name of the output file is composed of the last three letters of the info file appended with a "_" and a numerical value, i.e., pac_1, pac_2, etc.. The numbers correspond to the order of the offshore zones in g2t_zone.tbl. For example, pac_1 is the output for the Washington zone and pac_2 is the output for the Oregon zone.

D. Add a UGC state list to the SPENES product (NESDIS)

At the request of NESDIS, the Satellite Precipitation Estimates (SPENES) creation application was modified to output a UGC line listing the states involved. This line was added to the header section of the product.

E. Updated Graph-to-Grid to Recognize Wave Height Group (OPC, TPC)

The Graph-to-Grid algorithm was modified to recognize the wave height in feet (WHFT) group to support the creation of grids for that parameter. This development was done by the OPC in collaboration with the NAWIPS team.

F. Create PTS Product For Day 4-8 Severe Wx and Day 3-8 Fire Wx Outlooks (SPC)

The creation of the text product for Day 3-8 Fire Weather Outlooks when clicking PROD;OUTLOOK in NMAP2 PGEN has been enhanced to identify the dry thunderstorm areas. Dry thunderstorm areas now have the text string "DRYTSTM" following the day(s) of threat label (such as D3, D4-5, D5-8) and a blank space. They are grouped together last in the output .dat file.

The creation of Points (PTS) Products for the Day 3-8 Fire Weather Outlook and the Day 4-8 Severe Weather Outlook with day(s) of threat as the line label has been added to program DAT2PTS. The file name of the PTS product for the Day 3-8 Fire Weather Outlook is KWNSPFWFD38 and the file name of the PTS product for the Day 4-8 Severe Weather Outlook is KWNSPTSDY48. To create the PTS products for these two extended outlooks, the day field in the command line for Day 3-8 is 38 and for Day 4-8 is 48. Thus, the command to create the PTS product for the Day 3-8 Fire Weather Outlook would be: dat2pts 38 DDHHNN F, where DDHHNN is the day, hour, and minute of the product.

G. Updates and Corrections to TPC2SHP Program (TPC)

The program TPC2SHP that generates shape files for the Tropical Cyclone graphics has

been modified to address several issues found by the TPC as a result of their evaluation and testing. The following items have been addressed:

1. The initial gust field encoding has been corrected to properly encode 3 digit winds.
2. The spelling of "Tropical Storm" has been corrected in the points file.
3. The maximum wind speed in knots is now rounded to follow the nearest-five knot convention for intermediate advisories.
4. Latitude/Longitude points are now rounded to the 10th of a degree as requested by the TPC.
5. The Latitude/Longitude attributes are now properly set. Previously, they were incorrectly swapped.

III. NMAP2 Display Improvements

A. Changed Pane Orientation in NMAP2 "Data Source" GUI (ALL)

The data selection panes have been changed to expand horizontally instead of vertically. This change was done to accommodate gridded data sets using the feature that allows models to be grouped under user-defined categories. In some cases the number of panes was too large to be visible on the screen. This change addresses that problem. Also, the number of rows in each pane has been set to twenty five reducing the amount of scrolling necessary for selection.

B. Added Display of ASCAT Ambiguities (OPC, TPC)

The capability to decode and display ASCAT MGDR-Lite ambiguity data in NMAP2 and GPMAP has been added. The ASCAT data includes two ambiguities for the wind data. These ambiguities are used as an aid in determining the confidence in the quality of the data especially for the location of tropical cyclones.

In NMAP2, four new data types have been added to under the "MISC" category in the "Data Selection Window" GUI. They are AAMBG1, AAMBG2, AAMBG1_HI, or AAMBG2_HI which specify the ambiguities for the regular and high resolution ambiguities, respectively. Clicking the "Edit Source" GUI invokes the ASCT Attributes window that allows the following display attributes to be specified:

- Time range/Interval of ambiguities
- Skip value
- Time stamp interval, line width and color
- Directional arrow, Regular arrow, or Wind barb, and select Width/Size/Head size
- Wind Speed intervals with available color coding of wind vectors
- Display/Hide High Wind Speed, Low Wind Speed, Quality Control (QC) Fail

Flagged data, Redundant Data, Circles for QC Fail

- Use 2nd color for QC Fail

To display these data sets in GPMAP, set the ASCT parameter to the desired ambiguity dataset, for the data type sub-string i.e., AAMBG1, AAMBG2, AAMBG1_HI, or AAMBG2_HI. All other attributes remain unchanged.

Default entries for these attributes for the four categories of ASCAT attributes have been added to the table \$GEMTBL/config/miscset.tbl. Data source template for these ambiguity data have been added to \$GEMTBL/config/datatype.tbl. Note that a new environment variable \$MSCDT has been defined in the file .cshrc_data. This variable is used instead \$MISC_DATA for the AAMBG1_HI and AAMBG2_HI entries in the datatype.tbl in order to not exceed the maximum string length allowed.

This development was done by the OPC in collaboration with the NAWIPS team.

IV. General Improvements

A. Grid size limitation removal (ALL)

Many GEMPAK programs impose a limit on the size of grids that can be processed successfully. This limit is currently set for a maximum of 1 million grid points for those grid programs. In this release, the grid size limitation has been removed from programs GDCROSS, GDPROF, GDTHGT, and GDTSER.

B. Increased Maximum Number of Stations In GEMPAK Surface/Upper Air Files (ALL)

The maximum number of stations was increased from 4000 to 30,000 in GEMPAK surface and upper-air files.

C. Maximum Limit for Number of Image Files Removed in NMAP2 (ALL)

The limit on the number of image files permitted in any one directory that NMAP2 accesses has been removed.

D. New Program to Plot probability density at select point and time (EMC, ALL)

A new GEMPAK program GDPTPDF has been written to plot probability density or cumulative probability at a selected point, time and level. The probability is computed from ensemble data at each grid point. Grid values specified in gfunc are plotted on the vertical axis and probability associated with gfunc is plotted along the horizontal axis. The probability is displayed as a line or markers. For details, run the program and

use the standard GEMPAK help commands or view the help file
\$GEMHLP/hlp/gdptpdf.hlp.

E. Add ability to use Data Set Provided Ensemble Weights (HPC)

The ability to use a weight grid in the calculation of the ensemble average has been added to the ensemble scalar average function, ENS_SAVG. It is assumed that a weight grid exists in the data file for each ensemble member. The function will take the name of the weight grid, which follows the ampersand in the input parameter string to the function, and apply the specified weight in the scalar averaging. For example,

ENS_SAVG (HGT&WT)

would calculate the weighted average for height using the weight grid named WT. Future releases will add this capability to other ensemble functions.

F. Modified Centroid Location Algorithm for Select Marine/Counties (SPC)

When bounds files are generated for a few irregularly shaped counties/zones, the mathematical centroid falls outside the polygon. This problem has been corrected by adding a new table \$GEMTBL/stns/shpexception.tbl that lists those counties/zones. The table is used to specify the centroids for the irregularly shaped counties/zones.

G. Added Capability to Display More Radar Products (SPC, ALL)

The capability to display more mosaic radar products, e.g., CAPPI levels, in GEMPAK programs and NMAP2 has been added. Previously the number of radar product identifiers was limited to 149. This limit has been increased to 999. New products entries have been added to the tables \$GEMTBL/sat/imgtyp.tbl and \$GEMTBL/rad/nidprd.tbl, accordingly. This work was done by the SPC in collaboration with the NAWIPS team.

V. Bug Corrections

A. Convective SIGMET Decoder (AWC)

An error occurred in the convective SIGMET decoder when a line SIGMET included the contraction "INTSF". This problem has been corrected. This work was done by the AWC in collaboration with the NAWIPS team.

B. AIRMET Decode and Display (AWC)

The AIRMET decoder was corrected to distinguish between the strings “LLWS POTENTIAL” and “LLWS EXP”, both of which occur (in that order) in the formatted low-level wind shear section of a turbulence AIRMET.

The position of the low and high filter value AIRMET parameters has been corrected. This bug was introduced when the low-level wind shear enhancement was added in a previous release.

This work was done by the AWC in collaboration with the NAWIPS team.

C. International SIGMET Decoder and GPMAP Display (AWC, PR)

The international SIGMET decoder, DCISIG, has been modified to properly decode updated/corrected SIGMETs from KKCI, PAWU and PHFO.

GPMAP has been modified to correctly display updated/corrected SIGMETs from KKCI, PAWU and PHFO.

This work was done by the AWC in collaboration with the NAWIPS team.

D. Fix DCWOU To Handle ATTN String Longer Than One Line

DCWOU was modified to decode ATTN strings longer than one line. This fixed a problem the SPC reported with watch #724 on October 18, 2007.

VI. Map and Table Updates

A. Updated Marine Zone and County Map and Bounds Files (SPC)

The marine zone and county map and bounds files have been updated to reflect the latest changes for the marine zones especially those surrounding the Great Lakes.

B. Updated Fire Weather Map and Bounds Files (SPC)

The fire weather map and bounds files have been updated based on the latest Shapefiles generated by the National Weather Service.

C. Updated SPC Related Settings in Tables (SPC)

Several SPC related settings have been updated by the SPC to be included in the baseline tables. The following changes have been made:

1. Changes to the GRIB2 tables to support SPC NDFD products.
2. Changes to GRIB tables for SPC CCS processing.
3. Changes to the watch cluster tables.
4. Updates for the pgen tables for drawing and creating SPC products.
5. Update prefs.tbl for SPC Watch Status Message flags.
6. Update misc settings and map file tables for SPC entries.

VII. Calling Sequence Changes

- A. \$GEMPAK/source/programs/gui/nmap2/nmap_dslw.c
- B. \$GEMPAK/source/textlib/airmet/afbounds.c, afgetairmetxml.
- C. \$GEMPAK/source/programs/gui/nmap2/nmap_pgsmear.
- E. \$GEMPAK/source/programs/gui/nmap2/nmap_pgundo.c
- F. \$GEMPAK/source/programs/gui/nmap2/nmap_pgwndw.c
- G. \$GEMPAK/source/gemlib/gh/ghtctx.c
- H. \$GEMPAK/source/textlib/airmet/affmtxml.c, afutils.c

See the nawips.log and changes.log for additional details concerning these routines.

VIII. Configuration Changes

A. Build Scripts Updated for CCS (NCO)

Build scripts have been updated so that NAWIPS can properly compile and link on the NCEP Central Computing System (CCS).

Minor changes were made to \$GEMPAK/build/gettext_build, \$NAWIPS/extlibs/GNU/gettext/v0.16.1/Makefile.in, and the configuration files \$NAWIPS/.cshrc and \$NAWIPS/.profile.

In \$GEMPAK/build/gettext_build the -k option was added to 'make' calls. Also, the environmental variable GMSGFMT was added so that the gettext 'make' could find the msgfmt program prior to it being installed.

In \$NAWIPS/extlibs/GNU/gettext/v0.16.1/Makefile the order of SUBDIRS was changed so that gettext-tools is built before gettext-runtime so that the msgfmt program is available for use during the rest of the build.

In the configuration files \$NAWIPS/.cshrc and \$NAWIPS/.profile the AIX 'C' compiler was changed to 'cc -qlanglvl=extc99' so that the configure tests worked properly.

IMPORTANT NOTE: Other changes were made to the configuration files

\$NAWIPS/.cshrc and \$NAWIPS/.profile. The most noteworthy is the re-definition of the path variable. See the log entries in the files for a complete listing.

B. Dot File Deliveries (ALL)

**** Site Administrators Please Note ****

Configuration file changes are no longer delivered with the version number as a suffix. Instead, the modified configuration files are in the directory \$NAWIPS/dotfiles without the dot (.) so they are visible. These files must be copied or merged with site configuration files in \$NAWIPS when updates are made to the baseline.

IX. Compiling and Linking Instructions

The necessary compiling and linking instructions are contained in the following file:

```
release_build_5.11.1
```

To execute the script and save its output in a file type:

```
cd $GEMPAK/build
```

```
release_build_5.11.1>&! RELEASE_${NA_OS} & ; tail -f RELEASE_${NA_OS}
```

The output of the script will be written to RELEASE_\${NA_OS}.