

N-AWIPS 5.9.2 Release Notes

February 23, 2006

Version 5.9.2 covers development from November 16, 2005 to February 23, 2006

I. NMAP Product Generation Improvements

A. 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.

1. Added TURB-LO and TURB-HI hazards to the GFA

The hazards TURB-LO and TURB-HI have been added to the GFA processing layers. They are defined in the table \$GEMTBL/pgen/gfa.tbl. Hazard areas of TURB-LO and TURB-HI appear as simply TURB in the final AIRMET text product. The TURB hazard remains available and unchanged.

2. Added Freezing Level Processing

The freezing level (FZLVL) hazard can now be drawn either as an open or closed line. FZLVL hazards always display as arrowed lines, even when they are drawn as closed lines. The arrow indicates the end of the line. Left of the arrow is assumed to be a lower freezing level, and right of the line is assumed to be a higher freezing level. This is true for open as well as closed FZLVLs.

When the user draws an open FZLVL hazard, the text box is placed in the same way as is done for other GFA hazards. If text box does not intersect the FZLVL line, then an arrowed line is drawn from the text box to the nearest point on the FZLVL line. If the user exits the draw (using MB2) before placing the text box, then the last point on the FZLVL line is used for the text box location. The user may change the text box location using the "Move Text" button on the GFA GUI.

The FZLVL has five associated contour values "SFC", "040", "080", "120", and "160". The From line for FZLVL is grayed out.

Information from FRZLVL contours are included in the freezing paragraph of the

Zulu AIRMET. All FZLVLS that are at least partially within a given FA are included as a line entry in the freezing paragraph. Note that a FZLVL contour can create more than one line entry in the freezing paragraph if it intersects the FA area at more than 2 points. Additionally, if a FRZLVL contour stops short of an FA area bound it will be extended from the last two points to the FA bound.

The FRZLVLS undergo a point reduction before they are formatted in the freezing paragraph. The point limit is set by the FZLVL_REDUCE_THRESHOLD found in the \$GEMTBL/config/prefs.tbl file. At present this value is set to 5.

The points at which FZLVL hazards are clipped against the FA Area bounds are snapped. The snapping algorithm is simply to select the nearest snap point without regard to whether this point is inside or outside of the FA. In this way adjacent areas should get the same snap point results for any given FZLVL contour.

Note that if the freezing level contours are not in the forecast area, no freezing level AIRMET is generated. The capability to properly handle the case where freezing levels are outside the forecast area will be added in a future release.

3. Added Multiple Freezing Level Processing

The GFA GUI and formatter now handle multiple freezing level hazards. Top and bottom flight levels have been added to the multiple freezing level hazards. This information, as well as the bounded by line is extracted from multiple freezing level smears and is formatted in the AIRMET Zulu text bulletin.

The format for the freezing level header and multiple freezing level line of the Zulu AIRMET is thus:

```
FRZLVL...RANGING FROM SFC-130 ACRS FA.  
    ...MULT FRZLVLS BLW 130 BOUNDED BY 60SSW YOW-30E MPV-  
        50WSW HNK-50NW CSN-60NNE BUF-60SSW YOW
```

The "RANGING FROM" bounds is taken from the lowest base and the highest top of all multiple freezing level hazards and FZLVL levels in the specified FA area.

One "...MULT FRZLVLS" line will be produced for each multiple freezing level smear. The "...MULT FRZLVLS" line(s) will be positioned before any freezing level contour lines.

4. Added Outlooks

The AIRMET formatter and style sheets are now capable of producing outlooks in the three AIRMET text bulletins. When outlooks (GFAs with a forecast time of "6-12", "9-12", "6-9", "6-6", "9-9", or "12-12") are drawn, the AIRMET for the corresponding FA area and hazard type includes an outlook paragraph for the hazard. When the outlook is generated from snapshots by the Smear All tool, the 6hr snapshot is now included in the outlook.

There are two possible formats for AIRMETs. If there is only one outlook in an AIRMET bulletin then it will be formatted as follows:

```
OTLK VALID 0800-1400Z...IFR IA MO LM IL IN
BOUNDED BY 60SE MCW-30WNW GIJ-30W TTH-30SW IRK-60SE MCW
OCNL CIG BLW 010/VIS BLW 3SM CLDS/PCPN/BR/FG.
```

The format for more than one outlook within the same bulletin as follows:

```
OTLK VALID 0800-1400Z
```

```
AREA 1...IFR IA MO LM IL IN
BOUNDED BY 60SE MCW-30WNW GIJ-30W TTH-30SW IRK-60SE MCW
OCNL CIG BLW 010/VIS BLW 3SM CLDS/PCPN/BR/FG.
```

```
AREA 2...IFR SD NE KS IA MO
BOUNDED BY 50SSE FSD-50ESE FOD-50SSE PWE-20SSW OBH-50SSE FSD
OCNL CIG BLW 010.
```

All outlook paragraphs are located at the end of the AIRMET bulletin, after all the hazard paragraphs (which describe the 0-6 hour smears).

5. Set Default Issuance to Normal in GFA GUI

The issuance type menu defaults to NRML when the GFA window pops up for drawing new GFAs. In earlier versions, this menu started as the last selected item. Now it always returns to NRML at start, regardless of what was previously selected.

6. Set the Apply Button to Yellow

The Apply button turns yellow when unsaved changes exist. In previous versions, the button became active when unsaved changes were made, but it didn't change

colors or otherwise call attention to itself. Now the background turns yellow as a visual clue that changes must be applied in order to be saved.

7. Added GFA Line Widths Specification

GFA object line widths are no longer hard-coded. The line widths are specified by editing the 'GFA_ELEM' entries in the \$GEMTBL/pgen/setting.tbl. The line widths may be specified for snap shots, user drawn smears, smear-all smears, user-drawn outlooks and smear all outlooks. Note that entries for the five GFA sub-types have been added to the setting.tbl. Therefore, the site setting.tbl must be updated to operate properly. Also note that color specification for the five sub-types is not implemented.

8. Corrected State Ordering for Smears Entirely Over Water

The state order list has been corrected in the AIRMET bulletins when GFA smears are drawn entirely over water. This bug was reported in the 5.9.1 release.

9. Corrected AIRMET Issuance Time

The issue time of an AIRMET text bulletin is overridden if a NEW AIRMET is included in the list of hazards. In earlier versions, the standard issue time was overridden in the cases of canceled, amended, or corrected AIRMETS. NEW has been added to this list. If a NEW AIRMET is found within a given FA Area and the standard issue time has already passed, then the standard issue time plus one minute is used for the bulletin's issue time.

10. Eliminated Coastal Waters and Great Lakes from MT_OBSC hazards

MT_OBSC hazards no longer reference either CSTL WTRS or any of the Great Lakes in the state list.

11. Corrected Header for Tango AIRMETS

The Tango style sheet has been corrected to ensure "TURB" is always included in the header of the Tango AIRMET bulletin. This was a bug found in 5.9.1.

12. Allow a Blank Entry in the Turbulence Hazard "Due To" Selection

For TURB hazards, the DUE_TO menu starts as a blank menu entry. The first table entry for the DUE_TO menu in the \$GEMTBL/pgen/gfa.tbl must be set to "NULL_STRING" to make this happen. The GUI code then substitutes an empty

string for the menu item, and sets the DUE_TO menu to this menu item every time the GFA GUI is started for the purposes of drawing a new TURB hazard. TURB hazards with a blank DUE_TO selection are considered valid, and are not flagged as an error in any way.

13. Corrected several AIRMET Formatter Problems

Several AWC reported problems with the AIRMET text formatter detected with test 5.9.2 executables have been addressed. They include:

- a. Corrected outlook format to change the location of the "..." in the first line of the outlook.
- b. MT_OBSC outlooks now correctly include a state list.
- c. The 3rd line (conditions, frequency, etc) is not included in canceled AIRMETS.
- d. LLWS is no longer permitted to generate an outlook.
- e. The first line of the freezing level statement reads "ACRS AREA" not "ACRS FA."
- f. The AIRMET header line includes hazards that only reside in the outlook.

14. Incorporated AWC Corrections to Build Snap Program

Modifications made by the AWC to the program that creates the snap locations table, build_snap, have been incorporated into the N-AWIPS baseline.

15. Corrected Smear and Snap Algorithms

Changes were made to the smear snap algorithm which result in snapped smears fully containing all component snapshots. The effective result is that all snapped smears are incrementally larger than the original snapshot areas.

16. Added Snapshot Merging

The GFA "Smear ALL" action now accounts for snapshot merging. If users draw multiple GFA snapshots at any single forecast hour or at any discrete hours, the Smear All action will first merge (rubberband smear) the snapshots with the same forecast hour into single intermediate GFAs and then smear (time smear) these intermediate GFAs to create final smears and outlooks.

Rubber band smear means that all figures are smeared using the "convex hull" algorithm. Time smear means that figures with adjacent forecast hours are first rubber band smeared and then those intermediate smears are combined by union to generate a final smear.

Note that manual smear action has not been changed and still works in the way of time smear.

17. Improved clipping, snapping and point reduction algorithms for hazard smears.

The clipping algorithm has been improved to more accurately reflect the FA area clipping rules. New points resulting from clipping are snapped outward and are consistent from region to region. The new point reduction algorithm removes only non-FA border points. Points are removed in such a way as to minimize the overall increase in smear size. "On" and "Off" control of the clipping and point reduction remains in prefs.tbl table (GFA_AF_CLIPPING and GFA_AF_REDUCEPTS) as does the point reduction threshold (SMEAR_REDUCE_THRESHOLD).

There are three cases where problems occur that have not been addressed in this release. First, the algorithms do not include clipping against the large FA regional border, e.g., Canada. Second, the algorithms have not been modified to properly account for snapping in sparse snap point regions, e.g., coastal waters. Third, the snapping algorithm sometimes produces a kink in the resultant smear.

B. Incorporated VAA Text Product Changes (NESDIS)

Changes were made to the VAA text product creation for upcoming ICAO adopted standards. The requested wording changes may be enabled by changing the prefs.tbl table entry "USE_NEW_VAA_WORDING" to TRUE. Until that time, the current wording will prevail.

C. Added County Watch Area (CWA) Toggling for Watch Generation (SPC)

The capability to toggle entire CWAs on/off in the "Watch Specifications and County List" GUI has been added to NMAP2 PGEN for the SPC. After the watch counties are created, the CWAs included in the watch appear in the GUI. In/Out widgets are initially unset. If the In or Out widget is clicked, counties for the entire CWA are included or excluded, respectively. CWAs that appear in the GUI are updated appropriately each time the watch is modified.

The default has been changed from the "QC Counties" to the "Specifications" button for the "Watch Specifications and County List" GUI.

D. Added Fill Patterns for Watch Generation (SPC)

Fill patterns can now be specified for the watch counties in product generation. A new tag, COUNTY_FILL_PATTERN has been added to \$GEMTBL/config/prefs.tbl. The value of the tag is the pattern number to use for the county fill in PGEN. Valid values are 1 (solid) through 7 which is the default.

E. Modified Text Wrapping for Select Watch Products (SPC)

The WCC, WCL, and WOU text products created from NMAP were modified so that the attention line containing the string of WFO ID's follows the wrapping rules requested by the SPC.

F. Watch Status Corrections (SPC)

Corrected a problem where marine zones were erroneously turned off when using the option of updating the status counties with the latest WCNs. This problem occurred in the following watches: #895-897 and #17 and #18.

A bug was reported by the SPC for watch 897 in which there was a discrepancy in the Final Watch Status product's UGC expiration time in the "county section" of the product. The UGC expiration time is now the same as the UGZ time which is the watch expiration time.

G. Intermediate Storm Advisories Added (TPC)

The TCA product generation in NMAP2 has been enhanced to process intermediate storm advisory numbers. Breakpoint information can be modified and saved for an intermediate advisory, and a corresponding Tropical Cyclone VTEC (TCV) message can be created.

Program GPTCWW has been modified to create the Hurricane Watch/Warning graphic for an intermediate advisory. Updated storm information is obtained from the intermediate Public Advisory, and the breakpoint information is read from a corresponding VG file, if available.

H. Improved Watch/Warning Prioritization in TCV Message (TPC)

The code which creates the tropical cyclone VTEC message (TCV) was modified so that if a county or zone has more than one event associated with it, and the events conflict, the correct event is chosen. Generally, this is the higher priority event. If, however, a special geography type "water" watch/warning has a higher priority than the adjoining "land" watch/warning, the higher priority applies only to the marine zones, not the land.

I. TCA Cancel Added to NMAP GUI (TPC)

A new button, labeled "Cancel All", has been added to the bottom of the TCA Attributes GUI. This button is used to generate a Tropical Cyclone VTEC (TCV) message that cancels all current tropical cyclone watches and warnings for a given storm. Users must first increment the storm Advisory number of the selected storm before pressing the "Cancel All" button.

J. Modified TCV to Use Land Zone Codes Instead of County Codes (TPC)

The Tropical Cyclone VTEC (TCV) message has been changed to specify land zone UGC codes instead of the previously used county FIPS codes. In addition, the marine zones are being removed from the product to address product changes requested for the 2006 season. A new tag, TCV_ZONE, in \$GEMTBL/config/prefs.tbl is used to specify whether land zones or county FIPS/marine zone codes are used in the TCV. The new breakpoint file with corresponding land zone codes is \$GEMTBL/stns/tcabkptlz.tbl.

K. Added Storm Advisory Number to TCV (TPC)

The tropical storm advisory number has been added to the storm name line in the header of the Tropical Cyclone VTEC (TCV) message created by NMAP2.

II. Product Generation Pre/Post Processing Improvements

A. WOUPDT Corrections (SPC)

The following corrections were made to the woupdt program.

The SPC reported that a WOU update for watch #841 was generated in which a blank was in the text area where "Tazewell" County should have been. This problem occurred for any county with a "z" in the third character position because WOUPDT erroneously decoded it as a marine zone. This bug has been corrected.

Problems were reported by the SPC in which some WCNs canceled counties that were not reflected in the MISC/WCN display or WOU update. The MISC/WCN display problem had already been fixed in release 5.9.1. The problem with the WOU update has been corrected in this release. This resolves the problems that occurred with the following watches: #851, 11/7; #875, 11/27; #883, 11/28; #888, 12/4; #889, 12/4. In addition, the problem that also occurred when issuing status reports for watch #875 has been corrected in NMAP2.

Problems where WOUs were not issued for watch #865-867 were also corrected.

B. Enhanced GRPHGD Program to Read VG Files Directly (SPC, ALL)

VG files may now be imported directly into the GEMPAK graph-to-grid program (GRPHGD) using a new parameter named GGVGF. This new capability eliminates the need to create a '.info' file via NMAP for subsequent insertion into GRPHGD. See the help files for GRPHGD and GGVGF for more information.

C. Added Points Product for Fire Outlooks (SPC)

The program dat2pts has been enhanced to create the lat/lon points product for Day 1 and Day 2 Fire Weather Outlooks. The format of this new text product is similar to the existing Convective Outlook Areal Points product. A third command line argument 'T' has been added to the dat2pts program. Set the parameter to F or C to specify a fire weather or convective outlook, respectively.

Type 'dat2pts -h' for additional information on this program. The tables \$GEMTBL/pgen/grptyp.tbl and outlook.tbl have been updated accordingly.

This development has been done by the SPC in collaboration with the N-AWIPS team.

III. NMAP2 Display Improvements

A. Added Capability to Save Specific Cycle Time for SPFs (HPC, ALL)

The capability to save the loaded cycle time to the NMAP2 Stored Procedure File (SPF) has been added. This capability allows the user to restore a particular cycle time from a SPF instead of current cycle time. This feature only applies to data sets that have a cycle time. Datasets that have cycle times are included under the model grids, surface forecast and upper air forecast data categories. These data sets must be set as the dominant data set for the save SPF to work properly. If other data sets are included, they will be time matched with the saved cycle time.

A new panel has been added to the "Save To SPF File" GUI titled "Save Source Timestamp As:". To save the loaded cycle time to the SPF, click the "Constant" radio button. The "Latest" radio button which is the default saves the cycle time as a template as in previous releases. Thus, if this button is selected, the current cycle is selected upon restoring the SPF.

This development was done by the HPC in collaboration with the N-AWIPS team.

B. Added Wind Speed Color Coding to Ensemble Cyclone Display (OPC, ALL)

The plotting of ensemble cyclone tracks in NMAP2 and GPMAP has been enhanced to allow the user to color-code the tracks according to the maximum surface wind in knots at each forecast point. The wind criteria and corresponding color are specified in the first three lines in the \$GEMTBL/config/miscset.tbl table under ENS_CYC alias. By default, the color-coding by wind speed is turned off and the tracks are color-coded according to the model as in previous releases.

For NMAP2, turn wind speed color coding on by clicking the "ColorCode" button in the "ENS_CYC Attributes" GUI. The markers are also color-coded according to the wind speed. The values of wind criteria and colors are editable in the GUI. If the color-coding is turned on, the model names as well as time stamp and pressures at each forecast point are plotted in white.

A new parameter color code flag has been added to the GPMAP parameter ENCY to allow wind speed color code plotting for GPMAP. See the help on ENCY for additional details.

IV. General Improvements

A. Increased the Maximum Number of File Name Template Characters (ALL)

The number of characters in FILE TEMPLATE field of the table \$GEMTBL/config/datatype.tbl was increased from 25 to 48 in order to allow the ability to read data files with long names (for example, grid files from the high resolution WRF sectors).

B. Enhanced Gaussian Weighted Filter Diagnostic (HPC, ALL)

The GWFS (Gaussian weighted filter) diagnostic function has been changed to specify a larger footprint for the weighted averaging, allowing for reductions at wavelengths up to 200 delta grid units. A bug in the GWFS was fixed so that missing values are assigned on the output grid where appropriate.

This development was done by the HPC in collaboration with the N-AWIPS team.

C. GDGRIB Enhancement (HPC, ALL)

The program gdgrib, used to convert GEMPAK grids to GRIB1 messages, has been modified to handle forecast hours greater than 255.

This development was done by the HPC in collaboration with the N-AWIPS team.

D. Added GDLOT3 Program (NCO)

A new program, GDLOT3, has been added to incorporate the functionality from GPTEXT, GPBOX, GPANOT into GDLOT2. The program is linked with various drivers including TIFF. This program was developed to support efficient WAFS graphics generation on the CCS.

Twelve new parameters, BOXLIN, REGION, TXTCOL, TXTYPE, TXTFIL, TXTLOC, COLUMN, SHAPE, INFO, LOCI, ANOTLN, and ANOTYP are added to GDLOT3. LOCI specifies the location where the text or object to be placed just like GPANOT. Normalized and Map coordinates can be used, while Grid coordinates are not implemented. If the new parameters are left blank, GDLOT3 produces identical plots as GDLOT2.

E. Improved Visibility Plotting (NCO, ALL)

Fractional visibilities plotting has been improved for the parameter SFPARM = VSBC. The visibility is now displayed as $2\frac{3}{4}$ (for example) as opposed to 2-3/4. The improved fractional plotting works at all 25 plot positions about the station location. Visibility in whole miles is still plotted in the usual way.

F. Add Stand-alone Program Capability for AODT Version 6.4 (TPC, PR)

The stand-alone program AODT has been modified to run either version 6.3 or 6.4. The version number is specified using the "-v" option, as "-v 6.3" or "-v 6.4". If no version number is specified, the default version number is obtained from the first entry in table \$GEMTBL/nmap/aodtvers.tbl. No changes have been made to the way in which version 6.3 is run. Most options are unchanged from version 6.3, and apply to both versions. The default history file name is now AODTDUMP.AODTv6n, where n is 3 or 4. For version 6.4 only, the user can now specify the addition of a comment to an entry in the history file by using the "-n" option. This option must be used in conjunction with the "-d" and "-y" options. See the program help for aodt for more information.

A new program TESTAODTV64 has also been written to allow the testing of individual version 6.4 subroutines.

V. Bug Corrections

A. Corrected BUFR Encoding for Jets Crossing the Equator (AWC)

The significant weather chart BUFR production was not properly handling jets that cross the equator. This problem has been corrected.

B. BUFR Front Encoding Problem Crossing International Dateline (AWC)

Corrected a problem in the Significant Weather Chart BUFR encoding when fronts cross the international dateline.

C. Graph-to-Grid Problem (HPC, SPC)

Corrected a problem where if a line label could not be decoded into a valid value, random holes in the resultant grids occurred.

D. Correct TCA Graphic Generation for Tropical Cyclone Watch/Warning and Track Error Graphic (TPC)

Fixed GPTCWW to handle the year changeover when creating forecast track point labels.

E. Corrected RADMAP Problem (Unidata)

A problem reported by Unidata regarding the RADMAP program has been corrected.

F. Corrected Drifting Buoys Decoder for Year Problem (Unidata, ALL)

Corrected a problem where the year was not interpreted properly for drifting buoy data. The year is encoded as a single digit in the data and the code originally had a window of 1996-2005 for interpreting the value. This correction removes the window and will work for data from any year.

VI. Map and Table Updates

A. Surface Station Table Updates To Fix Plotting Problem (ALL)

The AWC noticed a mis-plotted surface station, that was traced to a missing state designator in the station table \$GEMTBL/stns/sfstns.tbl (blank instead of '--'). Blank state designators have been replaced with '--', and missing elevations ('-9999') have been replaced with elevations gotten from an NCDC web site. In addition, 12 new stations

identified by the AWC have been added. (A few location and elevation values for the new stations were modified from the AWC-supplied values to be consistent with NWSTG station information. All the new stations are in or bordering on the Gulf of Mexico.)

B. Updates to the GFA Table (AWC)

Several additions were made to the table \$GEMTBL/pgen/gfa.tbl to support enhancements to the GFA. Therefore this table must be reconciled with any site changes.

C. Updated the Combined County/Marine Zone Bounds and Tables (SPC)

Made changes to several map, bounds and station files in accordance to changes of county (c_10fe06), marine zones (mz10ja06), public forecast zones (z_14fe06), fire zones (fz10fe06) and combined county/marine zone files.

The combined county/marine zones used for watch generation were updated.

VII. Calling Sequence Changes

- A. \$GEMPAK/source/gemlib/gh/ghwwld.f
- B. \$GEMPAK/source/cgemlib/ces/cesrtbl.c, cesgetflag.c
- C. \$GEMPAK/source/source/textlib/airmet/afcreate.c
- D. \$GEMPAK/source/programs/gd/grphgd/ggcrinfo.c, grginp.f
- E. \$GEMPAK/source/cgemlib/cds/cdsgfa.c
- F. \$GEMPAK/source/nmaplib/pgen/nmap_pggfaw.c
- G. \$GEMPAK/source/nmaplib/pgen/nmap_pgtca.c
- H. \$GEMPAK/source/cgemlib/cst/cstwrap.c
- I. \$GEMPAK/source/contrib/tdl/radmap/imcbar2.f
- J. \$GEMPAK/source/programs/util/dat2pts/dat2pts.f, d2phdr.f, d2pday.f, d2pfil.f
- K. \$GEMPAK/source/nmaplib/pgen/nmap_pgwlst.c, nmap_pgwatch.c
- L. \$GEMPAK/source/gemlib/gg/ggagency.f, ggnatc.f

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

VIII. Developers Information

A. New XML Library Routines (ALL)

Three new public library routines have been added to the cgemlib/xml library. These provide some basic query functionality that can be applied generically to xml

documents. A brief description of the new routines follows. More information can be found in a programmer's guide located at \$NAWIPS/doc/Prog_guide/xml. The file is cgemlib_xml.sxw.

xml_count – returns the number of specified elements within an xml file or within a given parent element in the xml file.

xml_value – returns the value (content) of a specified element within an xml file.

xml_getsubdoc – returns a new xml document with a specified element as the root node.

IX. Compiling and Linking Instructions

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

```
release_build_5.9.2
```

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

```
cd $GEMPAK/build
```

```
release_build_5.9.2 >&! RELEASE_${NA_OS} & ; tail -f RELEASE_${NA_OS}
```

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