

## N-AWIPS 5.9.1 Release Notes

November 21, 2005

Version 5.9.1 covers development from August 18, 2005 to November 16, 2005

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### I. NMAP Product Generation Improvements

#### A. Display Jet Depth Information as Either Deltas or Flight Levels (AWC)

Both high-level significant weather charts (SWH) and mid-level significant weather charts (SWM) can include optional "jet depth" information as part of the jet stream label. Currently, this information is displayed underneath the flight level (e.g., "FL420", meaning 42,000 feet) as "+40/-60", indicating that the height of the 80 knot isotach extends from 36,000 feet (6000 feet below 42,000) to 46,000 feet (4000 feet above 42,000). The format for displaying the jet depth information is scheduled to change in March 2006. The new format will display the actual heights (in hundreds of feet), instead of the +/- delta values, with the lower value first. In the above example, the values would be shown as "360/460".

A new entry, "SIGWX\_FLIGHT\_LEVELS", has been added to \$GEMTBL/config/prefs.tbl to control the display format for the jet depth information, both in product generation and in VG files created by program SIGAVGF. Its value is TRUE if the new format is to be used, and FALSE if the old format is to be used. The current value is FALSE. The prefs.tbl entry controls both the "Barb Info" GUI format and the display format for the jet label. Currently, the "Barb Info" GUI has three entry lines: "SPEED", "LEVEL" and "DELTAS". If the prefs.tbl entry is TRUE, the third entry line becomes "TOP/BOT", allowing the user to enter the top and bottom jet depth information values in 100's of feet. The jet label is displayed in one of the two formats described above (e.g., either "+40/-60" for FALSE or "360/460" for TRUE). Note that if an input vg file is used, its format does **not** have to conform to the prefs.tbl entry.

The values in the intermediate ASCII file, and also in the BUFR file, are not being changed. These values have always been the flight levels above and below, never the flight deltas.

## B. 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 (GAIRMET) and the derived text AIRMET product. Please note that several enhancements and corrections to the GAIRMET were included in the 5.8.4a and 5.8.4b patches provided to the AWC. Those changes are described in the respective patch release notes.

### 1. Coastal Waters Handling

The process by which CSTL WTRS is determined within the AIRMET state list has been modified according to the latest set of rules provided by the AWC. The process now uses a new bounds file named `$GEMTBL/bounds/airmetcstlbnds.tbl` in order to determine which state(s) coastal waters are included within an AIRMET. If the AIRMET is entirely over water, then the state list includes those states whose coastal waters are included in the AIRMET followed by "CSTL WTRS" (e.g. "NC SC CSTL WTRS"). If the AIRMET includes both land and water, the state list is unchanged, listing the actual states covered with "AND CSTL WTRS" appended to the end of the list.

### 2. IFR CIG and VIS Handling Added

For the GFA, two new hazards are now included in the table `$GEMTBL/pgen/gfa.tbl`, - IFR\_CIG and IFR\_VIS. These new IFR areas of CIG and VIS are automatically combined into a single area of IFR whenever combination criteria are met (overlap area of the two hazards must exceed 50% of the area of the smaller hazard). Appropriate wording which reflects the combination is produced by the AIRMET formatter.

### 3. GFA GUI Changes

The GFA GUI modifications made by the AWC to improve its appearance have been incorporated into the N-AWIPS baseline.

Also, the file name for saved airmet bulletins has been changed. Saved files are now in the format of "AIRMET\_{type}\_{FA\_Area}\_{CC}.txt". All date information in the file name has been removed.

#### 4. FROM Line Display Added

The FROM line as generated by the AIRMET formatter is now displayable by specifying options in the table \$GEMTBL/config/prefs.tbl. These options control the FROM line display as follows:

The tag GFA\_AF\_DISPLAY, TRUE or FALSE, controls whether the FROM line gets displayed. The tags GFA\_LINE\_COLOR, GFA\_LINE\_TYPE, GFA\_LINE\_WIDTH specify the line color, line type and line width, respectively. These attributes use GEMPAK line attribute conventions.

#### 5. Miscellaneous Formatter Corrections

The following formatter corrections have been incorporated into the N-AWIPS baseline.

Selections in the day popup menu in the AIRMET formatter are now passed into the formatted AIRMET bulletins. The default selection in the menu is still the current day. This correction was made by the AWC.

The maximum line length within the AIRMET bulletin has been reduced to 65. This correction was made by the AWC.

Corrected the problem where the string "BTN" was erroneously repeated in the Zulu AIRMET when numeric flight levels were entered for multiple AIRMETs.

Corrected a problem where the formatter occasionally crashed due to a memory error.

#### 6. SNAP Algorithm Problem Corrected

A drawn point outside of 10nm from the coordination point now properly snaps to the coordination point.

#### 7. Update to Stand Alone AIRMET Format Programmer

A new command line argument of day of the month (2 digits) has been added to the airmet\_format program. This argument is required. (The airmet\_format program formats an AIRMET bulletin from a saved vg file.)

#### C. Reduce Layer GUI size (AWC, ALL)

The Layer GUI has been made smaller to reduce the need for forecasters to move the GUI out of the NMAP data display area. The "Edit Name" button and the color edit buttons in the layer control GUI are hidden by default so that the layer control GUI becomes smaller. An arrow button that displays/hides those hidden buttons has been added into the layer control GUI.

#### D. Graph-to-Grid Handling Unlabeled Lines (SPC)

Unlabeled contour lines may now be processed in graph-to-grid by using the CATMAP parameter. By setting "CATMAP=UNLABELED=v", contour lines that are unlabeled are assigned the value of 'v'. This specification in CATMAP may be combined with other values in CATMAP such as "CATMAP=UNLABELED=1;SLGT=2;MDT=3".

#### E. Updated SEL and SAW Product Formats (SPC)

The lat/lon points have been removed in the current SPC SEL watch product (i.e. Public watch) formerly located at the bottom of the product and lat/lon points with more precision have been added to the SAW watch product (i.e. aviation watch). The lat/lon at the bottom of the SEL is a carry over from the AFOS-era alarm/alert feature and was never intended to be used by the public to plot SPC watches. This change was done in coordination with SPC partners and product users.

A new TAG entry, LATLON\_SAW\_FORMAT has been added to the table \$GEMTBL/config/prefs.tbl to specify whether the new product formats are used. If FALSE, then lat/lon remains in the SEL and is not included in the SAW.

If TRUE, then lat/lon is removed from the SEL and is included in the SAW.

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

#### F. Set QC Counties to Default for Watch GUI (SPC)

The "QC Counties" toggle button has been set "on" as default instead of the "Specifications" button when the "Watch Specifications and County List" GUI is popped up for the first time.

#### G. Added Ability to Add Nearby WFO to WCC Product (SPC)

A test and evaluation version of the ability to add nearby WFOs to the watch WCC alert line and to the KNCFNIMNAT.launch file has been added to NMAP2 . A new tag, NEARBY\_WFO\_DIST with value 60 has been added to \$GEMTBL/config/prefs.tbl. To not have any nearby WFOs listed or if problems are encountered, the NEARBY\_WFO\_DIST tag can be set to 0. If an invalid value is found for that tag, it will be set to 0. A list of nearby WFOs that are within a certain distance specified by NEARBY\_WFO\_DIST, in statute miles, from the watch box boundary is displayed in the "Watch Coordination" GUI. To include a nearby WFO in the WCC alert line, click the WFO check box to turn it on. Proposed WFOs and replaced WFOs are also listed in the "Watch Coordination" GUI. This test and evaluation version uses the prior release's format for the WCC text, so wrap rules have not been implemented yet.

## II. Product Generation Pre/Post Processing Improvements

### A. WOUPDT Enhancements (SPC)

A correction to WOUPDT has been implemented to correct the problem in which a WOU was issued for continuing watch 9041 (10/12/05 test) after a WOU had been issued to cancel it.

### B. Modifications to TCV Message (TPC)

At the request of the TPC, counties and marine zones in the Tropical Cyclone

VTEC (TCV) message are now written as separate segments. A message segment is created for the Dry Tortugas when it is selected as an island in product generation. Bug fixes have been made to eliminate conflict and redundancy among UGCs across segments. Segments which are geographically adjacent and have identical VTEC strings, or which have identical UGC and breakpoint strings, are now combined. Finally, the breakpoint table has been modified at TPC's request by changing some UGCs.

### C. Removed Obsolete Program GPKGRF (TPC, HPC)

GEMPAK program GPKGRF created a tropical cyclone watch/warning and track error graphic by using a text-based interface to allow the user to enter breakpoint numbers via the keyboard in response to prompts. Beginning with the 2005 hurricane season, this program was replaced by GEMPAK program GPTCWW, which creates the same graphic using a VG file of breakpoint information created in product generation. Since GPTCWW has been used successfully for the 2005 season, program GPKGRF and associated ancillary files have been removed.

## III. NMAP2 Display Improvements

### A. Removed Restrictions on Model Selections (ALL)

Previously, NMAP had restrictions on the number of models, groups and products that could be accessed by the "Data Source" GUI. These limits have been removed.

### B. Implement version 6.4 of AODT (TPC, PR)

The latest version of the AODT code from the University of Wisconsin – CIMSS, version 6.4.2, is now available in NMAP2. Both version 6.3 and version 6.4.2 (referred to here as version 6.4) are available. The choice of which version to run as the default is configurable through a table, \$GEMTBL/nmap/aodtvers.tbl . The first line in the table is always the default version, while second and possibly subsequent lines refer to other versions. If the user clicks the AODT button in NMAP2, the default version in column two of the first line of the table is loaded. If the user clicks and holds the AODT button, a drop-down menu appears with the column one entries from the table (currently "Operational" and "Experimental", although this text is also user configurable). Currently, clicking on "Operational" loads version 6.3, and clicking on "Experimental" loads version 6.4. To make version 6.4 the default, the table could be modified to be, for example,

Operational 6.4  
Previous 6.3

Once a version is selected, the version number appears in the title bar of the "AODT" GUI. The file naming convention for the history files has been modified to make it easier to distinguish version 6.3 files from version 6.4, since the files have different formats. For version 6.4, the file extension is always assumed to be ".hst\_64", although the cascade menu which pops up only shows the extension ".hst". If the user does not include the extension when typing in a new or existing file name, the extension is added automatically. For version 6.3, the program first looks for an existing file name exactly as the user types it in. If one is not found, it looks for one with an extension of ".hst\_63". If neither of these is found, it creates a new file with an extension of ".hst\_63". As with version 6.4, the history file name cascade menu which pops up only shows the extension ".hst". Note that all new history files created in this release now have an extension of either ".hst\_63" or "hst\_64".

The cascade menu of history file names is now updated after each run of AODT, rather than waiting until the program exits. For version 6.3, any local file with an extension of ".hst" or ".hst\_63" is included in the cascade menu. For version 6.4, any local file with an extension of ".hst\_64" is included in the cascade menu.

AODT version 6.4 allows comments to be added to the history file entries. A comment may be up to 50 characters long. To add a comment, go to the "History File Management" GUI and select a single line in the history file display window. The "Comment" frame at the lower right becomes sensitized. Left click in the text box, enter a comment in the text box and click "Apply". The comment is appended to the selected history file entry in the display window, which now has a horizontal scroll bar. A comment may be deleted or edited by first selecting the comment, left clicking in the text box, deleting or editing the comment as it appears in the text box, and then clicking "Apply". If no comment is selected, or if more than one comment is selected, the "Comment" frame is de-sensitized.

#### IV. Decoder Improvements

##### A. Upgrades to METAR Decoder for WMO Code Form Changes (ALL)

Modifications were made to the DCMETR decoder to handle changes to the

WMO code form effective Nov. 2, 2005: allow "NDV" (no directional variation) to be appended to the 4-digit visibility value; allow "NCD" (no clouds detected) to be used for sky cover for automated systems; allow "COR" immediately preceding the station id to denote a correction.

#### B. Added Validity Check for Bulletin Time (AWC, ALL)

A validity check on the bulletin date/time has been added to the METAR decoder DCMETR. Only bulletins with a day between 1 and 31 and a time between 0000 and 2359 are decoded. AWC had noted problems on several occasions in the display of METAR data in NMAP2. These problems were traced to bulletins from Argentina which had a time of 2400 following a valid day (e.g., 182400).

#### C. Overwrite Option Added to GRIB decoders (ALL)

A new parameter, OVERWR, has been added to programs NAGRIB, NAGRIB2, and NDFDG2 to allow users the option of overwriting existing grids in the output GEMPAK file. If OVERWR is set to 'YES', existing grids in the GEMPAK file are replaced. If OVERWR is blank or set to 'NO', existing grids are not overwritten. The default value for OVERWR is 'NO'. Thus existing scripts do not need to add this parameter to continue to operate as in previous releases.

#### D. Increase Number of METAR Specials Saved per Hour (SPC, ALL)

The number of METAR special reports which can be stored per hour (as text strings) in the GEMPAK file created by DCMETR has been increased from a maximum of 6 to a maximum of 30. Anywhere from 15 specials (at between 81 and 160 characters each) to 30 specials (at less than or equal to 80 characters each) can now be stored for a station for a given hour. The actual number stored depends on the aggregate report length of all the specials for the station at the time. The specials may be viewed with SFLIST (SFARM=SPCL) or NWX (Observed Data/Surface Hourlies).

### V. General Improvements

#### A. New GRIB2 Program Available (ALL)

A new program, GDGRIB2, is available that converts GEMPAK grids to GRIB



edition 2 format. GDGRIB2 converts an existing GEMPAK grid or writes out any grid diagnostic to the GRIB2 file. In addition, a horizontal interpolation is invoked, when necessary, to store the GRIB2 formatted data points on any user specified grid. For information on available parameters and example usage, type "help gdgrib2" in any GEMPAK program.

## B. New Logical Grid Diagnostics (ALL)

A new set of logical grid diagnostics have been developed to support the new ensemble probability function (ENS\_PROB).

A set of arithmetic logical functions has been added to provide for multivariate relative frequency (probability) estimations from ensembles. One-sided inequalities LT, LE, GT, and GE have two arguments, S1 and S2, and evaluate, respectively,  $S1 < S2$ ,  $S1 \leq S2$ ,  $S1 > S2$ , and  $S1 \geq S2$ . A true evaluation is assigned the value 1.0, a false evaluation is assigned 0. Two-sided inequalities GTLT, GELT, GTLE, and GELE have three arguments, S1, S2, and S3, and evaluate, respectively,  $S2 < S1 < S3$ ,  $S2 \leq S1 < S3$ ,  $S2 < S1 \leq S3$ , and  $S2 \leq S1 \leq S3$ .

A new set of functions (AND, OR, EOR) allows for logical combinations of arithmetic logical evaluations. These functions take two or more operators. The AND evaluates to 1 (true) if all of its arguments are nonzero; OR evaluates to 1 (true) if at least one of its arguments is nonzero; and EOR evaluates to 1 (true) if exactly one of its arguments is nonzero and all the others are zero. These functions return 0 if the evaluation is false.

Three additional logical functions are added: EQ (S1,S2,S3) evaluates  $|S1-S2| \leq S3$ , NE (S1,S2,S3) evaluates  $|S1-S2| > S3$ , and NOT (S) evaluates  $S \neq 0$ . If the evaluation is true the function assigns 1; otherwise 0.

This development was done in collaboration with the HPC. See help on GPARM for additional details.

## C. Multi-variate Ensemble Probability (ALL)

A new ensemble function, ENS\_PROB, is provided to perform weighted relative frequency of occurrence calculations using the new suite of logical functions (AND, OR, EOR, NOT, LT, LE, GT, GE, GTLT, GELT, GTLE, GELE, EQ, NE). This function performs a weighted average of the 1 or 0 valued outputs of the logical evaluation for each ensemble member. The resulting value lies on the interval [0,1] and can be taken as an estimate of probability. For example to compute the ensemble probability of the wind speed exceeding 10 m/s AND the

temperature less than 0 C enter the following:

```
ENS_PROB(AND(GT(MAG(WND),10),LT(TMPC,0))).
```

This development was done in collaboration with the HPC. See help on GPARM for additional details.

#### D. New Grid Diagnostic Utility Functions (ALL)

Four new grid diagnostic functions have been added: 1) IGPT – computes I grid index values with respect to the reference grid (determined by the first GDFILE entry or GDOUTF); 2) JGPT – computes the J grid index values with respect to the reference grid; 3) SGMX (S) – computes the maximum of scalar argument S and returns a grid with this value at every point; 4) SGMN (S) – like SGMX, except that it computes the minimum.

This development was done in collaboration with the HPC.

#### E. Add Saved Procedures to NTRANS (HPC, ALL)

HPC forecasters requested the ability to save procedures in NTRANS similar to NMAP2. This functionality allows the user to save settings for models, groups and panel location for multi panel display. A new drop down menu (Procedures) has been added to the NTRANS top menu bar with the options to restore or save a procedure file.

The NTRANS Procedure File (NPF) stores the number of rows and columns that are displayed for a multi-panel display. It also contains information about each panel. This information includes the metafile source name with the model cycle date and time replaced with a [cycle\_date] and [cycle\_hour], respectively. The column and row location of the panel, the group name, and whether the source was used to set the valid time for the animation are also saved within the file.

When a user loads a .npf file, the text strings [cycle\_date] and [cycle\_hour] within the source name are replaced with the latest available cycle date and hour for that model source. The model used to set the valid time (if done at all) is loaded first with the remaining models loading at the matching times and time intervals.

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

## VI. Bug Corrections

### A. NMAP2 Display Problem with Roam Factor of Twenty (AWC, ALL)

An error was found when displaying a large image with a roam factor of 20X was displayed to a 1600x1200 display where the NMAP2 window filled the screen. This problem has been corrected.

### B. International SIGMET Display Problem (AWC, PR)

Corrected the problem where identically named international SIGMETs from the Pacific (KKCI/KZOA), and the Atlantic (KKCI/KZNY) with the same times were not being properly displayed in NMAP2.

### C. Add Overline to the Text in VG Files (OPC)

The OPC reported that the text in a VG file could not use the overline. The overline was added as a text outline for display in NMAP product generation. However, the ability to save the overline in a VG file from the GEMPAK programs was missing. This capability has now been added.

### D. Watch Status Generation Problem (SPC)

A fatal error occasionally occurred when generating a watch status message if the option to incorporate current WCNs was used. This error occurred with watches with more than one hundred counties. This problem has been corrected.

### E. WCN Display Problems (SPC)

The SPC reported a problem where canceled counties were still being displayed. This problem occurred for watches 841 and 843. The problem was corrected by modifying the check for a valid report. The WCN display problems reported by the SPC for watch numbers 855 and 856 have also been corrected.

### F. WOUPDT Problem With Test String (SPC)

Prior releases of DCWOU decoded a WOU as a test if it had two occurrences of "TEST". An additional check was added to DCWOU to search for only one occurrence of "TEST...", which could happen when the second "...TEST" is replaced by "RESENT" or "CORRECTION". This corrects a problem in which a test was resent and WOUPDT issued a WOU that did not flag it as a test.

#### G. Fix a Bug with Printing NWX Output (TPC)

The TPC reported a problem when printing Mexican METAR observations from NWX. This problem was traced to the print filters on Linux workstations. Mexican observations start with the letters MM. This is a flag to the print filters that indicates the file is a TIFF image. However, since the following data was ASCII text, the filter failed and the file would not print. This problem was corrected by inserting a blank line as the first line of output in the NWX output.

### VII. Map and Table Updates

#### A. METAR Station Table Updates (ALL)

Added 23 new METAR stations in Alaska to the METAR station table. The additional stations were announced by the NWS.

#### B. Fixed elevation for Varennes, Quebec (ALL)

The elevation of Varennes, Quebec (WHM) was corrected from 192 meters to 19 meters in the tables \$GEMTBL/stns/ sfstns.tbl and xrainsort.tbl.

#### C. Updates to Upper-air Station Table (ALL)

The location for station 74002 (APG – Aberdeen Proving Grounds) was corrected. Stations 62403 (Egypt) and 76743 (Mexico) were added.

#### D. Change Kalispell, MT ID from KFCA to KGPI (ALL)

The location identifier used for Kalispell, MT (Glacier Park International Airport) in bulletins was changed from KFCA to KGPI effective Oct. 25, 2005. Station tables gfsmos.stn, lsfstns.tbl, ngmmos.stn, sfstns.tbl, tafstn.tbl, wrqpf.tbl and xrainsort.tbl, and NWX tables stations.tbl and taf.stn were changed accordingly. (Additionally, the location for station CWWU was corrected in xrainsort.tbl.)

#### E. Miscellaneous Map and Bounds Files Updates (ALL)

Several map changes were made in this release. Updates were made to the FA Region and Area maps & bounds files for the AWC. Also, changes were made to several map, bounds, and station files in accordance with AWIPS changes of county (c\_08au05), coastal marine zones (mz12jl05), and public forecast zones (z\_06oc05) shapefiles. In addition, new to this release are an SPC outlook map, spcout.ncp, and a Mexican states map, histmx.nws.

#### F. Updates to TIFF Product Table (OPC, NCO)

Two changes were made to the TIFF Product Table \$GEMTBL/pgen/tiffprod.tbl.

1. At the request of the OPC, the Y-dimension of select OPC products was reduced to 1106.
2. The NCO will be creating WAFS charts using NAWIPS and these new products were added to the table.

#### G. Added New Satellite Id Number 84 (OPC,NESDIS)

A new set of images are being stored with a satellite ID of 84. The table \$GEMTBL/sat/imgtyp.tbl was updated to accommodate the new ID.

#### H. Update Watch Corner Points Table (SPC)

Numerous changes and additions were made to the table \$GEMTBL/stns/spcwatch.tbl containing the watch corner points. The location information is used in the creation of the watch text products and when decoding these products for display in NMAP.

### VIII. Calling Sequence Changes

- A. \$GEMPAK/source/programs/gd/grphgd/ggapsm.f
- B. \$GEMPAK/source/nmaplib/pgen/nmap\_pggfaw.c
- C. \$GEMPAK/source/cgemlib/clo/clostngall.c
- D. \$GEMPAK/source/nmaplib/pgen/nmap\_pgtca.c
- E. \$GEMPAK/source/textlib/airmet/afcreate.c
- F. \$GEMPAK/source/bridge/mt/mtgrpt.f

- G. \$GEMPAK/source/nmaplib/pgen/nmap\_pgairmet.c
- H. \$GEMPAK/source/programs/na/nagrib/naginp.f
- I. \$GEMPAK/source/programs/na/ndfdg2/ndginp.f
- J. \$GEMPAK/source/programs/util/sigavgf/sigajet.c
- K. \$GEMPAK/source/gemlib/gh/ghwwtx.f
- L. \$GEMPAK/source/cgemlib/ctb/ctbgfa.c

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

## IX. Documentation Changes

### A. NMAP2 Hot Key Help Updated (ALL)

The NMAP2 hot key help was updated to document all the current hot keys used by NMAP2. Click on "Hot Keys" in the "Help" GUI to display this help. Users are encouraged to review the use of hot keys to aid in accessing NMAP2 functions.

## X. Configuration Management Changes

### A. Support for New Forecaster 64 bit Linux Platform (ALL)

The new 64 bit Linux platform for the next generation forecaster workstations is now supported. The version of Linux used is RedHat Enterprise 4.0.

The .cshrc and .profile files have changed to accommodate 64-bit architecture. As usual, the files are named with the release name as an extension. The .cshrc can be found at \$NAWIPS/.cshrc\_v5.9.1 and .profile can be found at \$NAWIPS/.profile\_v5.9.1.

## XI. Compiling and Linking Instructions

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

release\_build\_5.9.1

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

```
cd $GEMPAK/build
```

```
release_build_5.9.1 >&! RELEASE_${NA}_OS & ; tail -f RELEASE_${NA}_OS
```

The output of the script will be written to RELEASE\_\${NA}\_OS.