

N-AWIPS 5.10.1 Release Notes

October 27, 2006

Version 5.10.1 covers development from August 3, 2006 until October 31, 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. Item 1 through item 5 pertain to Step 3 requirements. Item 6 through item 14 pertain to Step 4 requirements.

1. Freezing Level Line Issues

Several issues found during GAIRMET evaluations have been addressed.

The point reduction for closed freezing level contours has been corrected. In 5.9.4 the point reduction value for closed freezing level contours was incorrectly using the same value as that used by the open freezing level contours. The point reduction value for closed freezing level contours is now the `SMEAR_REDUCE_THRESHOLD` (in `prefs.tbl`), while the reduction value for open freezing level contours remains `FZLVL_REDUCE_THRESHOLD`.

Under certain circumstances closed freezing level contours which intersected an FA Area bound, but which should have been left closed (because the length of the clipped segment was less than the `FZLVL_MAXIMUM_GAP_LENGTH`), were not formatted correctly. Internally it was not consistently identified as a closed contour. This problem has been corrected.

More consistent results needed for freezing level point reduction are now produced. An error in the implementation of the `KevLinDev` point reduction algorithm was found. This error manifested itself by providing inconsistent results for the point reduction of open freezing level contours. The reduction results are now consistent run to run and regardless of selected geographic area.

A problem with formatted FZLVL contours occurred when a vertex of the FZLVL

contour was very close to an FA bound. The clip point most often, but not always, snapped to the same location as the nearby vertex. When it did not snap to the same point, the result was often a sharp kink at the end of a FZLV contour. The implemented correction eliminates any vertex that is very close (within 5nm) to an FA bound.

The AIRMET Zulu formatter now picks up a FZLV contour with a level of "000" and formats a corresponding ALG or BOUNDED BY line in the Zulu bulletin with a level of "SFC". This correction was a change to the airmet_zulu.xsl stylesheet and did not require any code change.

2. AIRMET Bulletin Precedence Rule Handling

When AIRMET and OUTLOOK are of differing status types, the AIRMET will always take the precedence over the OUTLOOK for the bulletin. The exception is that non-NRML OUTLOOKS take precedence over NRML AIRMETS.

3. Outlook Cancellation Wording Correction

The wording for a canceled outlook has been changed, per AWC guidance. Instead of "CANCEL OUTLOOK. CONDS HV ENDED." a canceled outlook now states: "CANCEL OUTLOOK." Also the last line of the AIRMET/outlook, "...UPDT TO CANCEL...", is no longer indented with a space, but is fully left justified like the rest of the AIRMET/outlook.

4. Added Warning Popup for Incomplete CIG/VIS/IFR Entry

If a user draws a GFA IFR without selecting the CIG/VIS types, a warning popup is invoked to warn the user that the IFR is incomplete. The popup allows the user to select the desired CIG/VIS types.

5. Smear Action Modified to Remove User and System Drawn Smears

The Smear tool now removes all previous smears, both user drawn and system generated, before creating new smears. If the selected action is "Smear All" then all existing smears on the current layer are removed. If the selected action is "Smear Tag" then all smears of the selected tag sequence are removed.

6. Improved Tagging

In the GFA GUI, if the zero forecast hour is selected, the default tag number is set to 'NEW'. If a forecast hour other than zero is selected, the default tag number is

set to the last used tag number. Before this release, the default tag number was set to the last tag number in the available tag array.

7. X-O-X rules for AIRMET and OUTLOOK Conditional Wording

Changes were made to the AIRMET formatter to generate appropriate wording for for AIRMETS and OUTLOOKS for X-O-X cases according to rules supplied by AWC.

8. Apply flight levels and other attributes from snapshots to clipped FROM and BOUNDED BY lines

Changes were made in the AIRMET formatter according to the rules provided by AWC to apply flight levels and other attributes from selected snapshots to clipped FROM and BOUNDED BY lines, other than use those attributes from the original unclipped ones. The affected attributes are top/base of the flight level, top/base of the freezing level, frequency, severity, IFR combined type, and issue status.

9. Added Canceled Snapshot Handling

The canceled snapshots are ignored when smearing or formatting GFAs. There is one exception. If all snapshots of an AIRMET or OUTLOOK are canceled, they will be accepted for smearing or formatting.

10. Removed FL Text String From the GFA Text Box

For hazards with flight levels, the “FL” string has been removed from the GFA text box. The previous releases had “FL” in the text box for flight levels higher than 180.

11. Corrected NMAP Crash Problems

Two fatal errors were corrected. The first occurred after formatting smears whose attributes were edited. The second fatal error occurred when a specific projection was selected.

12. Updated Snap And Coordination Tables and Bounds Files

Changes made by the AWC to the tables \$GEMTBL/stns/snap.tbl and coordPts.tbl have been incorporated into the baseline.

The latest versions of the GFA bounds files have also been incorporated into the

baseline.

13. Updated Support Library Routine to Support Elevation Bounds Files

The routine `clo_tqbnd` was modified to eliminate the restriction on bounds parts. This modification was needed to support elevation bounds file requirements.

14. Modified Point Reduction Algorithm

The point reduction algorithm has been significantly modified to account for text character limit in the AIRMET message. Two major phases of point reduction are conducted.

Phase 1 is described as follows. If the polygon cannot be represented on three 66-character lines of text, then remove allowable points (non-FA regional and non-international boundaries), one at a time, based on the impact their individual removal would have on the overall size of the polygon. Specifically, remove points that increase the size of the polygon the least, while not increasing the overall size of the polygon by `SMEAR_INCR_PCT` (`prefs.tbl`) AND not allowing any new point to be `SMEAR_INCR_DST` distance from the original polygon. The parameter `SMEAR_INCREASE_PCT` refers to the areal percentage increase when a single point is removed from the polygon. Continue to remove points until the polygon can be represented on three 66-character lines of text, or no more points can be removed under the above criteria.

Phase 2 of the algorithm is invoked if the resultant polygon still exceeds the character limit then the following steps are conducted. First, attempt to divide the polygon along the FA Area boundary. If this can be accomplished, check the overall size of each part. If either resultant part is less than 3K sq nm or still exceeds the character limit then by use simple bisection as follows. Choose as a dividing segment the two closest opposite points in the polygon array which also does not intersect any part of the polygon. Determine the midpoint of this segment and snap to the closest snap point. Bisect the polygon using this three-point segment into two new AIRMET polygons. Again, check to make sure these two polygons can be formatted. If not, re-divide again except without a midpoint. Two bisections should be sufficient to format correctly.

B. Enhance Surface Frontal Positions for CODSUS and CODSRP Products (HPC)

The "SFC Prog" action now creates a new formatted text product in addition to the existing text product. The new formatted product has latitude and longitude points encoded to the nearest tenth of a degree. In addition, the designator after front types is

eliminated. The name of the new formatted text file created by NMAP2 includes the string hires.dat after the file name to distinguish it from the old formatted file. Note that the old format text messages still appears in the "Surface Prog Message" window.

C. Add ability to Interpolate Line Objects Across Layers (HPC, ALL)

The interpolate action (INTERP) now can interpolate line objects across layers. This capability allows multiple VG files to be used for interpolation. For example, the fronts from two different forecast periods may be stored in two VG files. The resultant interpolated fronts can now be stored in a third VGF by using layers. For instance, the user can select a front from 12-hour fronts file and another front from 24-hour fronts file and interpolate them. The result goes into an 18-hour fronts file.

Layering must be active to take advantage of this new feature. After the "Interpolation" GUI has been invoked select the "Multiple Layers" option. Select the desired layer where the resultant interpolated objects are drawn. Then using the layer GUI, select the desired layer for first object to be interpolated. Select the object. After the object is verified, the vertices turn into red boxes. Then select the second layer. Select and verify the second object to be used in the interpolation. Click the "Interpolate" button in the GUI and the interpolated object is drawn in the resultant layer. Repeat this process if additional objects require interpolation. The "Interpolation" GUI remains active when switching layers. Click the "Close" button to terminate the interpolation action.

The selection of "This Layer Only" causes interpolation to function on one layer only as it did in previous versions. A new parameter in the \$GEMTBL/config/prefs.tbl called DEF_INTERP_MODE specifies whether "This Layer Only" or "Multiple Layers" is the default setting.

D. Enhanced Editing of Vector Values (OPC, ALL)

A new option has been added to allow the speed and direction of vector objects to be incrementally modified. This option is especially useful when using the multi-select feature to modify groups of vectors. A pair of radio buttons labeled "Value" and "Increment" located above the Direction and Wind Speed sliders have been added to the vector attributes GUIs that are invoked when editing vectors. Click the "Increment" button to allow incremental changes to the speed and direction for selected vectors. Click the "Value" radio button to apply absolute speed and direction values as was available in previous N-AWIPS versions.

E. Create New Group Types for Extended Fire and Severe Outlooks (SPC)

Two new group types EXT_FIRE for Day 3-8 Fire and EXT_SVR for Day 4-8 Severe

outlooks have been created with corresponding labels to facilitate extended range outlook creation. The labels for EXT_FIRE are: D3, D4, D5, D6, D7, D8, D3-4, D3-5, D3-6, D3-7, D3-8, D4-5, D4-6, D4-7, D4-8, D5-6, D5-7, D5-8, D 6-7, D6-8, D7-8. The labels for EXT_SVR are: D4, D5, D6, D7, D8, D4-5, D4-6, D4-7, D4-8, D5-6, D5-7, D5-8, D 6-7, D6-8, D7-8. The table \$GEMTBL/pgen/grptyp.tbl has been modified to include these new group types.

F. Add Cursor Distance Display to Product Generation (TPC, ALL)

A new feature has been added to NMAP2 product generation that allows the current distance and direction to be displayed while users are drawing objects in the LINES, FRONTS and CIRCLE classes. When invoked, the distance and direction will be displayed in a little text box very similar to the way the “seek” function displays distance. If the user is drawing a LINE or FRONT object, the distance displayed represents the distance from the cursor to the first point in the line or front. For CIRCLES, the distance indicated is calculated from the cursor position to the center of the circle.

A new button was added to the “Actions:” section of PGEN's pgpalette window. When pressed, a distance display GUI window is displayed allowing users to turn the feature on and off, and also to select the desired units in which the distance will be displayed. Note that the tables \$GEMTBL/pgen funcbtn_4.tbl and funcbtn.tbl have been updated to include this new action.

II. Product Generation Pre/Post Processing Improvements

A. Improve Handling of Invalid WOUs (SPC)

WOU Decoder DCWOU has been made more robust by adding checks for the validity of data being decoded to protect against garbled WOU products which had caused (1) WOUPTD to issue multiple WOU products to cancel a watch due to a long WFO list in the decoded header line and (2) DCWOU to falsely identify a WOU to be a test. When invalid data is identified by DCWOU, a log message is written and no decoded WOU is generated.

III. NMAP2 Display Improvements

A. Added Proper Navigation Handling for Meteosat-8 Native Projection (TPC)

N-AWIPS satellite navigation routines have been updated to properly handle the Meteosat-8 satellite navigation. Therefore, NMAP and GEMPAK display programs now properly display earth location information, e.g., maps on Meteosat-8 imagery in

its native projection.

IV. General Improvements

A. Updated N-AWIPS for New Daylight Saving Time Rules in 2007 (ALL)

The N-AWIPS library routine for determining whether Daylight Saving Time is in effect was modified to account for new rules effective in 2007.

B. Increased Maximum Grid Size to One Million (ALL)

The maximum grid size supported by N-AWIPS grid programs has been increased from 750,000 to 1,000,000 points. In addition, the grid size limit has been completely eliminated in the following programs: NAGRIB, NAGRIB2, GDGRIB and GDGRIB2. The programs NAGRIB and GDGRIB were converted from FORTRAN to C to eliminate the restriction. In addition, in preparation for completely eliminating the grid size restriction, the programs GDDIAG and GDLIST were converted to C.

C. Added Two New Ensemble Probability Functions (EMC, ALL)

This release includes two new ensemble functions, ENS_CPRB and ENS_CVAL, based on a univariate cumulative probability under a piecewise linear probability density function (PDF). The first computes the probability of the value of a parameter occurring less than or equal to a given value. The second is the inverse, computing the value to which the parameter is less than or equal for the given cumulative probability. These functions assume an ensemble of N members dividing the number line of possible values for a parameter into N+1 bins. The statistical properties of the ensemble are idealized by assuming that there is a 1/(N+1) chance of an observation falling below the ensemble range in the first bin, and there is a 1/(N+1) chance of an observation falling above the ensemble range in the N+1st bin. The PDF is assumed to trail off linearly to zero in the two outlying bins, forming the tails of the PDF. See the `gparm.hl2` (ph `gparm`) help file for more information.

D. GEMPAK Contour Labeling Enhanced to Support Text Strings (HPC, ALL)

The user can now specify a text string of up to 24 characters to label a contour using the CINT parameter. Text strings are specified by associating them with contour numerical values in the following fashion:

```
CINT = value1=label1;value2=label2;...;valueN=labelN
```

See the GEMPAK help on CINT for additional details.

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

E. Added Option to Suppress Drawing Contours Too Small to Label (HPC, ALL)

An additional flag has been added to the GEMPAK LINE parameter that allows the user to suppress the drawing of contours too small (seven points or less) to label. Setting the flag to True will suppress the drawing of these contours. The flag defaults to False. See the GEMPAK help on the LINE parameter for additional details.

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

F. Reverse Video Option Added to Text Plotting (NCO, ALL)

Users now have the capability to plot text or data in “reverse video” mode. This rendering is similar to a photographic negative where the text color and the background color are switched. To invoke this feature, set the first digit of the border flag in the TEXT parameter to “2” and set the second digit to “3”. The third digit (box type) can be 1, 2, 3, or 4. NOTE: This feature does not work with box types 5 and 6 – underline and overline. See the GEMPAK help on the TEXT parameter for additional details.

G. Added New Dew Point Depression Parameter (NCO, ALL)

A new SNPARM data type parameter, DPDX, allows users the ability to plot dew point depressions greater than or equal to 30 degrees C with an “X”. The tables \$GEMTBL/parms/pconv.tbl and prmflg.tbl have been updated, accordingly.

H. Updated Satellite Access Routines to Properly Support Two-Byte Data on Different Platforms (Unidata, ALL)

N-AWIPS satellite access routines were updated to properly handle two-byte image data sets that are created on one type of ENDIAN platform, e.g., big ENDIAN and displayed on another, e.g., small ENDIAN.

This development was done in collaboration with Unidata.

V. Bug Corrections

A. Corrected Ensemble Percentile Computation (ALL)

The ENS_PRCNTL function's computational algorithm has been modified to compute percentile values correctly for both uniformly and non-uniformly weighted ensemble

members. This correction eliminates the low bias of the calculation in previous versions.

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

B. VGF Create Problem (AWC)

A problem was discovered when a user attempted to view another user's VGF in data display. If the VGF did not exist, NMAP would create an empty VGF. This problem has been corrected.

C. Corrected Problems With Display on the Rotated ICAO B Projection

In some cases, JETS, FRONTS, and other special lines were not displayed properly on the ICAO B rotated cylindrical map projection. This problem has been corrected.

D. NMAP2 Frame Navigation Problem (HPC)

Corrected a rarely occurring problem where the loop's navigation (geographic area, zooming, etc.) was not properly applied to some frames. This problem occurred after auto-update.

E. Nsharp Model Grid Data Access Problem (OPC, ALL)

Corrected a problem where in order to display soundings derived from model grid files, the user was required to click the Load button twice.

VI. Map and Table Updates

A. Reconcile Canadian and Mexican Surface Station Information (HPC)

Updates were made to surface station entries for Canadian and Mexican stations. These updates were made by the HPC in collaboration with the N-AWIPS team.

Added 257 Canadian stations sending synoptic message data that were not in the synoptic station file. Also corrected the locations of eleven Canadian stations. Several Canadian stations were removed that have closed. Also added several Canadian METAR stations and corrected some station locations.

Several Mexican stations were also updated.

B. Change priority values for KFGN and KBDE in GFS MOS station table (HPC)

The HPC received a request from a WFO to use Baudette, MN (KBDE) instead of Flag Island, MN (KFGN) in their medium range products. In order for the replacement to take effect, the GFS MOS station table needed to be modified to change the priority values of the stations. The medium range processing uses the priority value to select the stations used in the products.

C. Added New Map and Bounds Files for Basic Weather (HPC)

New Basic Weather Desk map and bounds files were added at the request of the HPC. The new bounds file is `$GEMTBL/bounds/bwus_label.tbl` and the new map file is `$GEMMAPS/bwuslabel.ncp`

D. Updated AWDEF Table to Support Graphics Generation (NCO)

Added 14 new air pollution products to the AWIPS Redbook table, `awdef.tbl`, for creating graphics on the CCS. Also, replaced a zero with a capital O in the Redbook graphic for 120-hour pressure (U17). The header ID should be PPZO50.

VII. Calling Sequence Changes

- A. `$GEMPAK/source/programs/gui/nmap2/nmap_pgpalw.c`, `nmap_mainw.c`
- B. `$GEMPAK/source/gplt/contour/ccboxt.f`, `ccdraw.f`, `ccdrw2.f`, `ccplot.f`, `cldriv.f`, `cldrv2.f`, `gclgrn.f`, `gcntln.f`
- C. `$GEMPAK/source/nmaplib/pgen/nmap_pgsfp.c`, `nmap_pgprd.c`
- D. `$GEMPAK/source/cgemlib/clo/closnap.c`
- E. `$GEMPAK/source/cgemlib/ctb/ctbgfa.c`
- F. `$GEMPAK/source/cgemlib/cgr/cgrlinepoly.c`
- G. `$GEMPAK/source/nmaplib/pgen/nmap_pgwndw.c`
- H. `$GEMPAK/source/textlib/airmet/affzlvl.c`
- I. `$GEMPAK/source/cgemlib/cgr/cgrreducepts.c`
- J. `$GEMPAK/source/nmaplib/pgen/nmap_pginterp.c`
- K. `$GEMPAK/source/textlib/airmet/afutils.c`

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

VIII. Configuration Management Changes

A. Unused Environment Variables Removed (ALL)

The unused environment variables `$AC`, `$ANSI_CFLAGS` and `$GEM_OS` have been removed from the `.cshrc` and `.profile` files. The latest versions of these files,

.cshrc_v5.10.1 and .profiel_v5.10.1 are provided with the release.

B. GPC Library Updated (ALL)

The external GPC library has been updated to the latest version.

C. GDGRIB Source Code Moved (ALL)

The gdgrib source code has been moved from the contrib/hpc directory to \$GEMPAK/programs/gd/gdgrib. This move is taken into account in the build script.

IX. Compiling and Linking Instructions

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

```
release_build_5.10.1
```

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

```
cd $GEMPAK/build
```

```
release_build_5.10.1>&! RELEASE_${NA}_OS & ; tail -f RELEASE_${NA}_OS
```

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