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AWIPS CAVE-D2D User's Manual: AWIPS II Operational Build 12.2.1

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AWIPS CAVE-D2D User's Manual:

AWIPS II Operational Build 12.2.1

01 March 2012

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WHAT'S NEW IN THE AWIPS CAVE-D2D USER'S MANUAL



OB 12.2.1

FEATURES, FUNCTIONALITIES, ENHANCEMENTS, AND/OR MODIFICATIONS

AWIPS II Software

Interactive NsharpSkewt:

- The **Interactive NsharpSkewt** or SHARP (Skew-T Hodograph Analysis and Research Program), formerly the Interactive Skew-T (IST) program, was introduced in AWIPS software OB 12.1.1. Its functionality, compared to the IST is essentially unchanged. However, its operational interface has changed significantly, with an increase in the number of rawinsonde-derived upper air parameters and indices used to evaluate severe weather and flash flood potential. Refer to [Chapter 7: The Interactive NsharpSkewt \(NSHARP\) Application](#).

AWIPS CAVE-D2D User's Manual

We Want to Hear from You:

- New to this release of the User's Manual is **We Want to Hear from You**. As the user of this manual, you are our most important critic. We welcome your freeback. If you find errors in the manual or would like to make a comment or suggestion, please write to the AWIPS Documentation Team at nws.hq.awips.doc.team@noaa.gov.

The "Comments" button on the Online Navigation Page provides the information you need to provide your feedback to the authors of this document.

1.0 The AWIPS CAVE-D2D User's Manual

The AWIPS CAVE-D2D User's Manual provides the information needed to utilize the user interface of AWIPS (Advanced Weather Interactive Processing System) for the retrieval and display of weather data. This introduction provides an overview of the manual's scope, intended audience, and structure.

The "Online Navigation Page" enables you to navigate easily throughout the online document. Using the navigation page makes it easy to find information, and provides you with quick access to tutorials for practicing many AWIPS functionalities. From this page you can open the NOAA Web site, or look up a term in one of the glossaries. You can return to the "Online Navigation Page" from any page in the manual by clicking the  button.

When you see the  symbol, it indicates a separate manual is available for the system being discussed. For more information about the system click on the book symbol to open the manual.

When you see the  symbol, it indicates a practice module is available for the function being discussed. To access the practice module click on the tutorial symbol.

Note: The AWIPS CAVE-D2D User's Manual is an online document that can be opened using any Internet browser. However, no two browsers support online documents in exactly the same way, and no browser totally supports a document's intended structure. Therefore, the appearance of pages within this manual may differ from browser to browser. Mozilla Firefox best supports the structure of this manual and is the recommended browser for viewing it.

This chapter includes the following sections:

- [Section 1.1: Scope](#)
- [Section 1.2: Intended Audience and Assumed User Skills](#)
- [Section 1.3: Organization of the Manual](#)

1.1 Scope

This edition of the AWIPS CAVE-D2D User's Manual describes the AWIPS II implementation of the D2D (Display 2-Dimensions) Perspective within the CAVE (Common AWIPS Visualization Environment), and the user interface components (text and graphic displays) that comprise the AWIPS II workspace. The other perspectives — GFE, Hydro, MPE, and Python (all of which are accessible from the CAVE main display) — are outside the scope of this manual and are therefore not discussed in any detail.

AWIPS accommodates two complete desktops (graphical environments where you do your work): KDE (K Desktop Environment); and GNOME (GNU Network Object Model Environment). The differences are mainly cosmetic, with the choice of desktops being simply a matter of preference. The KDE desktop is more Windows-like than GNOME. You would choose your preferred desktop from the Session menu on the login screen before you log on. The system defaults to whichever desktop was active when the user logged off. This version of the manual is configured to the more commonly used KDE.

AWIPS II is being implemented in a series of releases. This version of the AWIPS CAVE-D2D User's Manual (01 March 2012) supports AWIPS II Software Operational Build 12.2.1. As subsequent major releases of the software are implemented, the AWIPS CAVE-D2D User's Manual will be updated to reflect the changes associated with the respective release. When the manual is reissued, a "What's New in the AWIPS CAVE-D2D User's Manual" page will follow the manual's Table of Contents describing any new and/or changed features, functionalities, enhancements, and modifications associated with the newly implemented release, as well as any changes made to the document's format to improve usability. If no significant changes occurred in the new release, a "What's New" page will not be included in the manual.

1.2 Intended Audience and Assumed User Skills

This online document is intended for users of the AWIPS workstation. It is assumed that users of this manual have a basic understanding of how to use a mouse to navigate a graphical user interface (GUI). This includes such operations as opening, resizing, moving, and closing windows, and selecting items from menus.

1.3 Organization of the Manual

The AWIPS CAVE-D2D User's Manual is organized as follows:

- [The Online Navigation Page](#) enables you to access needed information more quickly, navigate throughout the online version of the manual more efficiently, and execute Acrobat's search function in the PDF version of the manual. It also allows you to access two separate glossaries and provides information for searching general information about NOAA and AWIPS. Every page in the online version has a  button that links you back to the Navigation Page.
- [Chapter 1 - The AWIPS CAVE-D2D User's Manual](#) provides an overview of the scope, intended user, and organization of this manual.
- [Chapter 2 - The AWIPS Workstation and Graphical User Interface](#) provides an overview of the AWIPS workspace and graphical interface; it includes descriptions of all the CAVE menus and functions for setting up your display.
- [Chapter 3 - Getting Started Using AWIPS Graphical User Interface](#) describes the menus used in CAVE to work with graphic and image products and data; it also includes a series of practice modules (tutorials) designed to step you easily and quickly through the basics of using CAVE. Chapter 3 concludes with tutorials that provide practice working with the AWIPS graphical interface.
- [Chapter 4 - The AWIPS Workstation and Textual User Interface](#) provides an overview of the AWIPS workspace and text interface, covering viewing, creating, editing, and transmitting text products.
- [Chapter 5 - Getting Started Using AWIPS Textual User Interface](#) describes how to retrieve and edit text products, and how to work with text scripts and the alarm/alert feature. The chapter also includes a series of practice modules (tutorials) designed to familiarize you with the basics of using the Text Workstation and AWIPS textual interface.
- [Chapter 6 - WarnGen](#) covers the AWIPS Warning Generation (WarnGen) program.
- [Chapter 7 - The Interactive NsharpSkewt \(NSHARP\) Application](#) covers the Interactive NsharpSkewt application, including sampling and editing the skew-T and hodograph.
- [Chapter 8 - Radar Applications](#) covers the radar applications, including the System for Convection Analysis and Nowcasting (SCAN) application.
- [Chapter 9 - Background Applications](#) covers the background applications (the Hourly Weather Roundup, and the NOAA Climatological Reports Formatter).
- [Chapter 10 - Local Data Acquisition and Dissemination](#) covers the Local Data Acquisition and Dissemination (LDAD) system.
- [Chapter 11 - AWIPS Quality Control and Monitoring System](#) introduces the AWIPS Quality Control and Monitoring System (QCMS).
- [Chapter 12 - System Monitoring and Alert Visualization](#) provides information on the tool used to monitor AWIPS systems and the tool used to alert the user to malfunctions and to signal and data loss.

This chapter also includes access to online documents and links to important forecaster information.

- [Chapter 13 - Applications Developed by the NWS Office of Hydrology](#) introduces the NWS-developed applications that are accessible from both the CAVE interface and the AWIPS Start-up menu.
- [Appendix A - Glossary](#) provides a glossary of relevant terms.
- [Appendix B - AWIPS Acronyms and Abbreviations](#) provides a listing of AWIPS acronyms and abbreviations.
- [Appendix C - Reserved](#)
- [Appendix D - Managing Your AWIPS User Account](#) provides information on managing your AWIPS user account.
- [Appendix E - AWIPS Applications / Interfaces](#) provides a list of AWIPS applications.

2.0 The AWIPS Workstation and Graphical User Interface

Each AWIPS Workstation is comprised of three graphic displays (Graphic Workstation) and one text display (Text Workstation), as shown in **Exhibit 2.0-1**. The three graphic displays share a common keyboard, mouse, and central processing unit (CPU - LX). The text display has a dedicated keyboard, mouse, and CPU - XT.



Exhibit 2.0-1. The AWIPS Workstation

This chapter includes the following sections:

- [Section 2.1: The AWIPS Graphic Workstation](#)
- [Section 2.2: The AWIPS Graphical User Interface](#)

2.1 The AWIPS Graphic Workstation

The AWIPS Graphic Workstation is located on the right side of the AWIPS Workstation, as shown in **Exhibit 2.1-1**. It includes the three graphic displays, all controlled by a single dedicated keyboard, mouse, and its own CPU (LX).



Exhibit 2.1-1. The AWIPS Graphic Workstation

Input Devices

Each AWIPS Workstation has two input devices: a three-button mouse and a keyboard. Both the Graphic Workstation (LX), used to interact with CAVE via the Graphical User Interface (GUI), and the Text Workstation (XT), used to interface with the Textual User Interface (TUI) include a set of the same input devices.

This section describes the hardware components (input devices) that comprise the AWIPS Workstation.

- **Mouse:** The three-button mouse, as shown in **Exhibit 2.1-2**, performs a number of actions in CAVE, depending on where the mouse cursor (left-pointing arrow) is located. In this manual, each mouse button is referred to by number: Button 1 (B1), Button 2 (B2), and Button 3 (B3), as illustrated below.

Note 1: A two-button mouse with a clickable scroll wheel is also referred to as a three-button mouse. The clickable scroll wheel is the second button (B2).



Exhibit 2.1-2. Right-Handed Mouse (3-button and 2-button with clickable scroll-wheel)

Most mouse actions are invoked with mouse Button 1. It is the primary activator button for opening and closing menus and making most menu selections. In this manual, subsequent references to a mouse click refer to Button 1 unless otherwise noted.

For a right-handed mouse (default), Button 1 is on the left. You can change the left-hand and right-hand orientation of the mouse through the K Desktop Environment (KDE) Control Center.

- **To change the left-hand and right-hand orientation of the mouse:**

1. From the panel on the desktop, click the Red Hat button and select **Control Center**.
2. In the Control Center window, on the Index tab, select **Peripherals ▶ Mouse**.
3. On the General tab, in the Button Order section, select **Right handed**.
4. Click **Apply** to accept the change and close the window.

On the GUI the mouse button functions are configurable from the Preferences dialog window under the CAVE menu, as shown in **Exhibit 2.1-3**. Additional mouse button functions are described in [Section 3.3.4-Objective 2.5](#).

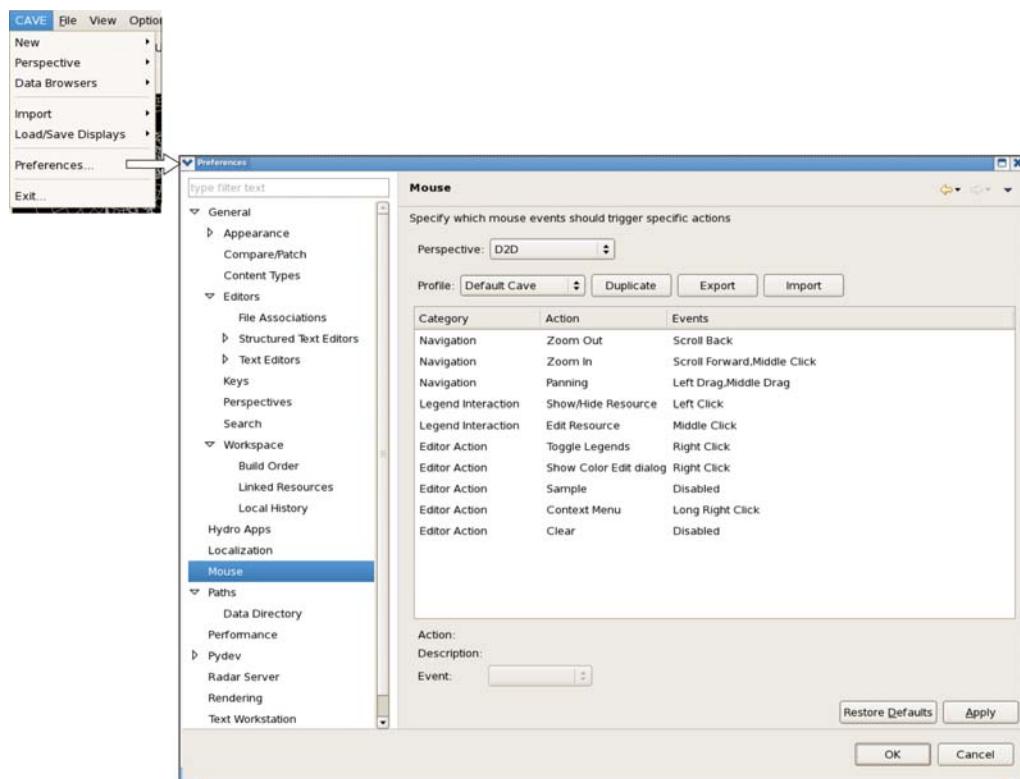


Exhibit 2.1-3. CAVE Preferences Dialog Box for Mouse Button Configuration

Table 2.1-1 lists the legacy mouse button functions and user interface locations of each mouse button action for all three mouse buttons (B1 through B3). Most of the mouse actions described are related to features that are covered in detail in upcoming chapters.

Table 2.1-1. Legacy Mouse Button Functions for the CAVE Workspace (B1 through B3)

Function	Mouse Action	Cursor Location
Button 1 (B1)		
Open Pull-Down Menus	Click B1	In Menu Bar
Activate Menu Buttons	Click B1	In Toolbar
Make Menu Selection	Click B1	In Menu
Iconify Dialog Box	Click B1	In Little Square in Title Bar of Dialog Boxes
Zoom Out	Click B1	In Large and Small Display Panes
Zoom Out 1:1	Shift + Click B1	In Large and Small Display Panes
Toggle Product Legend	Click B1	On Legend in Large Display Pane
Sample Data	Press and Hold B1	In Large and Small Display Panes with Image Data, METAR, Ceiling/Vis Plots, or Wind Vector Grids
Drag Slider to Desired Setting	Press and Hold B1	On Slider Bar in Dialog Box
Move Point, Baseline, Distance Speed, WarnGen Vertex; Select Alert Area	Press and Hold B1	In Large and Small Display Panes
Pop (bring window to front)	Click B1	In Title Bar or frame of Any Window or Dialog Box
Move	Press and Hold B1	In Title Bar of Any Window or Dialog Box
Shade (roll up/unroll)	Double-click B1	In Title Bar of Any Window or Dialog Box
Button 2 (B2)		
Zoom In	Click B2	In Large and Small Display Panes
Pan Across Zoomed Product	Press and Hold B2, Drag Mouse	In Large and Small Display Panes
Toggle Product Between Contour and Image (or Barbs, Arrows, and Streamlines for Wind Data)	Click B2	On Product Name in Volume Browser

Toggle Tools' Editability	Click B2	On Tool Legend in Large Pane
Insert/Delete Vertices When Editing Warning Box	Click B2	On Lines/Vertices of Warning Box in Large and Small Display Panes
Expand or Compress Section of Color Bar	Press and Hold B2, Drag Mouse, Release to see change	On Color Bar in Image Colors Editor
Move Window or Dialog Box Without Popping	Press and Hold B2, Drag Mouse	In Title Bar of Any Window or Dialog Box That Is Partially Covered by CAVE Display
Button 3 (B3)		
Swap Small Display Pane with Large Display Pane	Click B3	In Small Display Panes
Pop/Push Dialog Boxes	Click B3	In Title Bar of CAVE Display or Dialog Box
Toggle All Product Legends	Click B3	Over Displayed Product in Large Display Pane
Bring Up Color Table	Click B3	On Legend in Large Display Pane
Open Respective Pop-up Menu	Press and Hold B3	On Legends or Over Displayed Products in Large and Small Display Panes and in 4-Panel
Open Pop-Up Menu in Volume Browser	Press and Hold B3	On Product Name in Volume Browser
Toggle Alert Cells	Click B3	In Radar Alert Area

- **Keyboard:** Exhibit 2.1-4 shows a typical AWIPS workstation keyboard.



Exhibit 2.1-4. AWIPS Workstation Keyboard

- **Keyboard Shortcuts:** Instead of using the mouse pointer for every workstation display manipulation, some functions can be activated by pressing a combination of keyboard keys, called Keyboard Shortcuts.

Note 2: Keyboard shortcuts are not case sensitive, even though they appear in uppercase on the menus; you can use upper or lowercase letters.

- **Keyboard shortcuts for menu functions:** Keyboard shortcuts can be found to the right of some menu options listed on the CAVE menus. A list of available keyboard shortcuts for menu functions is provided in Table 2.1-2.

Table 2.1-2. Keyboard Shortcuts for Menu Functions

Menu Function	Keys or Key Combinations
File Menu Functions	
New Procedure	Ctrl + n
Open Procedure	Ctrl + o
Delete Procedure - requires acknowledgment	Ctrl + d
Copy Display to Procedure(s)	Ctrl + b
Open History List	Ctrl + h
Open Print Dialog Box	Ctrl + p
Exit CAVE - requires acknowledgment	Alt + F4
View Menu Function	

Clear Large Display Pane	Ctrl + c
Options Menu Functions	
Turn on Time Options	Ctrl + t
Turn on Data Scale	Ctrl + s
Open Loop Properties Dialog Box	Ctrl + l
Open Image Properties Dialog Box	Ctrl + i
Miscellaneous Functions	
Open first pull-down menu. Use arrows to scroll through every menu option of each menu. Press Enter key on keyboard to make a menu selection.	F10
Cursor Location	F12

- **Keyboard shortcuts for large display pane:** For functions that manipulate the main D2D display (the large display pane), the keyboard shortcuts are entered using the arrow keys and numeric keypad, as shown in **Exhibit 2.1-5**.

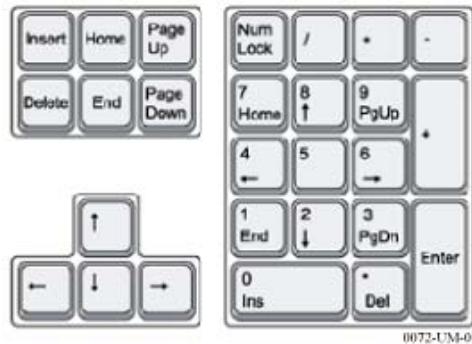


Exhibit 2.1-5. Arrow Keys and Numeric Keypad

Table 2.1-3 identifies the keyboard shortcuts for the main D2D display functions. You should become familiar with using these keys, because they provide convenient shortcuts to perform routine display manipulations.

Table 2.1-3. Keyboard Shortcuts for Large Display Functions

Functions	Key or Key Combinations
Navigation Functions	
Step Back, Step Forward (at Current Tilt for All-Tilts Display)	Left Arrow, Right Arrow
Step Back, Step Forward Through All Frames Ignoring Any Tilt Considerations	Shift + Left Arrow, Shift + Right Arrow
First Frame, Last Frame in the Collection	Ctrl + Left Arrow, Ctrl + Right Arrow
Step Up, Step Down Through All-Tilts for the Currently Displayed Time	Up Arrow, Down Arrow
Increase, Decrease Loop Speed (Turns on Looping)	Page Up, Page Down
Zoom Out 1:1	Shift + Mouse Button 1
Toggle/Fade Functions	
Toggle Image	Keypad 0
Toggle Overlays 1-9	Keypad 1- 9
Toggle Overlays 10-19	Shift + Keypad 0-9
Image 1/Image 2 Toggle	Keypad . (Decimal)
- Single Image: Reduce Brightness, Increase Brightness - Combined Image: Fade to Image 1, Fade to Image 2	Keypad -, Keypad +
Legend Functions	

Legend Cycle: 1. Show Product Legends 2. Show Map Legends 3. Show Valid Time	Keypad Enter
Panel/Combo Rotate Functions	
Enter panel/combo rotate mode, showing upper left product with most 'fade'; step to next panel if already in rotate mode.	Delete
Enter panel/combo rotate mode, showing upper left product with most 'fade'; step to previous panel if already in rotate mode.	Backspace
Enter panel/combo rotate mode (also true for 2..8); show left-hand image of upper left panel	1
Show left-hand image of upper right panel	2
Show left-hand image of lower right panel	3
Show left-hand image of lower left panel	4
Show right-hand image of upper left panel	5
Show right-hand image of upper right panel	6
Show right-hand image of lower right panel	7
Show right-hand image of lower left panel	8
Return to 4-panel display	End

- **Keyboard shortcuts for loop and step functions:** Table 2.1-4 lists the loop and step arrow keys and keypad functions. For more information about looping and stepping through a display, see the All-Tilts section in [Section 2.2.6.12](#), or see the All-Tilts practice module in [Section 3.3.4-Objective 3.6](#).

Table 2.1-4. Loop and Step Keypad Shortcuts

Button	Function
Left Arrow	Step Backward in Time at a Fixed Tilt (Single-Tilt Mode)
Right Arrow	Step Forward in Time at a Fixed Tilt (Single-Tilt Mode)
Shift + Left Arrow	Step Backward Through All Frames Ignoring Any Tilt Considerations (All-Tilts Mode)
Shift + Right Arrow	Step Forward Through All Frames Ignoring Any Tilt Considerations (All-Tilts Mode)
Ctrl + Left Arrow	Displays First Frame and Returns to the Default Navigation Mode
Ctrl + Right Arrow	Displays Last Frame and Returns to the Default Navigation Mode
Ctrl + Down Arrow	Displays First Frame of a Tilt or Volume Scan (Single-Tilt and Single-Volume Display Mode)
Ctrl + Up Arrow	Displays Last Frame of a Tilt or Volume Scan (Single-Tilt and Single-Volume Mode)
Page Up	Start/Speed Up Loop
Page Down	Start/Slow Down Loop
Up Arrow	Step Upward at the Currently Displayed Time (Single-Volume Mode)
Down Arrow	Step Downward at the Currently Displayed Time (Single-Volume Mode)
Shift + Up Arrow	No Function
Shift + Down Arrow	No Function
Notes:	If you hit the up or down arrow after a standard load, then hit Page Up or Page Down to start looping, you'll find that you have an 'uninteresting' loop - that is, a loop of one frame - until you hit one of the step forward/backward keys. The reason is that using up/down puts you in loop-within-a-volume (Single Volume) mode, and there's no vertical component to your data.
	The default looping behavior immediately after loading is to loop ignoring any tilt considerations until one of the arrow keys is used. Otherwise, the form of looping depends on whether you most recently used the left/right or up/down arrows prior to starting the loop. For All-Tilts, the meaning of first and last frame is bottom and top if you have been using the up/down motion; oldest and newest if stepping by time, and oldest/lowest and newest/highest if navigating all frames.

2.2 The AWIPS Graphical User Interface

This section describes the AWIPS Graphical User Interface (GUI) that is displayed on the AWIPS Graphic Workstation. The three graphic displays that comprise the Graphic Workstation share a common keyboard, three button mouse, and central processing unit (CPU - LX), as shown in **Exhibit 2.1-1**. The GUI enables forecasters to view many different types of meteorological data on one system.

This section discusses the following topics:

- [Layout of CAVE's Graphical User Interface \(GUI\) - Section 2.2.3](#)
- [Windows, Tooltips, Menus, and Dialog Boxes - Section 2.2.4](#)
- [Other CAVE Operational Displays - Section 2.2.5](#)
- [The Menu Bar - Section 2.2.6](#)

<

2.2.1 Reserved

2.2.2 Reserved

2.2.3 Layout of CAVE's Graphical User Interface (GUI)

CAVE Display Components

This is an overview of CAVE's graphical user interface (GUI). From the system point of view, the entire CAVE interface is a window. As such, it can be moved, minimized (iconified), restored, etc., in the same way as any other window displayed by the system. It is also resizable. The display features introduced here are covered more thoroughly in [Section 2.2.4](#). **Exhibit 2.2.3-1** illustrates the layout of the CAVE graphics screen. All the perspectives have been selected, as indicated by the iconified tabs appearing on the CAVE Perspectives Tab Bar. However, only the D2D 5-pane perspective is currently showing, as indicated by the display, as well as by the highlighted tab.

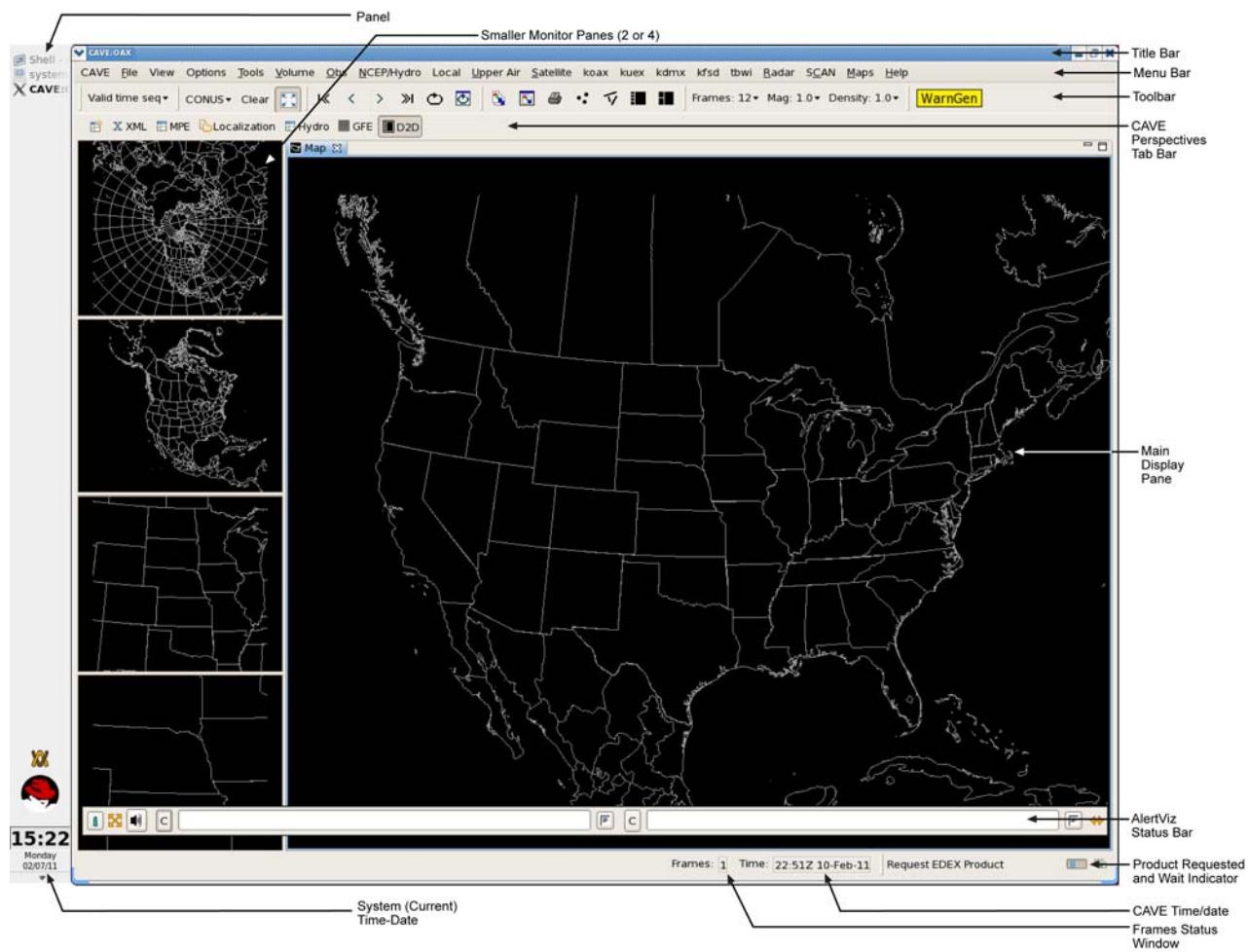


Exhibit 2.2.3-1. CAVE Graphical User Interface (GUI)

The various sections of the graphics screen are described below.

- **CAVE Screen Layout:**

- **Title Bar:** The Title Bar is the top border of the CAVE Window. CAVE: followed by "ID", either current site, as shown in **Exhibit 2.1.3-1**, or the username of the user that is currently logged on.
- **Menu Bar:** The first row of labels (menu buttons) is the Menu Bar. These menu buttons open pull-down menus that contain a large number of graphic or image products from various data

sources. The menus that display along the Menu Bar are determined by the perspective that is selected.

- **Toolbar:** The second row of labels is the Toolbar, which contains buttons and option menus for manipulating displayed data. The Toolbar can be hidden if desired. The button for WarnGen, the Warning Generation application, is also located on the Toolbar.
- **CAVE Perspectives Tab Bar:** The third row is the CAVE Perspectives Tab Bar. It always contains the **Open Perspective**  iconified button and at least one iconified tab for the currently selected perspective. Selecting the Open Perspective icon drops down a list of perspectives, as shown in **Exhibit 2.2.3-2**. When a perspective is selected from the list, an iconified tab for the selected perspective is added to the tab bar to indicate the perspective is opened, and the tab remains on the tab bar until the perspective is closed. The highlighted tab indicates the perspective that is displayed on the Main Display Window. The tabs enable the user to move quickly between the different open perspectives by selecting the tab for the respective perspective.



Exhibit 2.2.3-2. Open Perspective Drop-down Box

- **Main Display Pane:** The large display pane (also known as the Main Display Pane) is where all data selections are initially displayed and where Toolbar manipulations take place. Products that you select for display always appear in the large display pane.
- **Monitor Panes:** Monitor panes are located along the left side of the Main Display Pane. They are only displayed with the D2D perspective (D2D 5-pane has 4 monitor panes and D2D 3-pane has 2). They are used for both displaying and monitoring data.
- **AlertViz Status Bar:** Floating along the bottom of the CAVE window is the AlertViz Status Bar. Remember, AlertViz must be active to open CAVE, and therefore the AlertViz Status Bar is always present. The AlertViz Status Bar contains two message windows for displaying an alert when it occurs.
- **Frames Status Window:** The Frames Status Window displays the number of frames that are open, which may or may not be the same number of frames that are selected from the Frames button on the Toolbar. The window expands to accommodate the number of digits (1 - 64).
- **System and CAVE Time and Date Status:** The System Time and Date is located at the bottom of the Panel on the left-side of the CAVE window. The CAVE Time and Date is at the bottom of the CAVE window. System time is the current date and time of day, with the CAVE usually reading the same. However, the forecaster can change the CAVE time and date in order to look at

past data and grid information.

- **Product Requested and Wait Indicator:** When a product is selected, the name of the product that is requested appears at the bottom of the screen with oscillating wait indicator. Once the product appears on the display, the product name and wait indicator disappear.

Notes:

1. **Swapping Pane Contents:** Clicking mouse Button 3 opens a menu with an option for swapping the contents of the large display pane into the small pane. Data are automatically updated in these small panes, and looping, zooming, and panning are also possible.
2. **Pane Size:** The size of all panes is adjustable. Click and hold down mouse Button 1 on the pane's border and drag either horizontally or vertically to resize the pane. The size of the map background adjusts accordingly. Two icons in the Toolbar configure the display with pre-defined pane settings.

CAVE Display Perspectives

CAVE incorporates a collection of applications that are separate from the legacy AWIPS system. Each application is contained in its own perspective, a user interface that contains different graphical layouts, tool bars, and menu items unique to the application. The applications incorporated in CAVE consist of applications from the legacy AWIPS system (D2D, GFE, Hydro, and MPE). Also included are Localization and Other (XML), as shown in **Exhibit 2.2.3-1 and 2.2.3-2** above.

- **D2D (Display 2-Dimensions):** This perspective is used to derive gridded forecasts for various meteorological variables and forecast products. **Exhibit 2.2.3-1** shows D2D 5-pane perspective, which consists of a large main display pane and 4 smaller monitor panes.
- **GFE (Graphical Forecast Editor):** This perspective is used to derive gridded forecasts for various meteorological variables and forecast products. The GFE perspective displays a large main pane (Spatial Editor), without monitor panes. Above the Spatial Editor is a GFE Toolbar and a Weather Element block (Grid Manager), as shown in **Exhibit 2.2.3-3**.

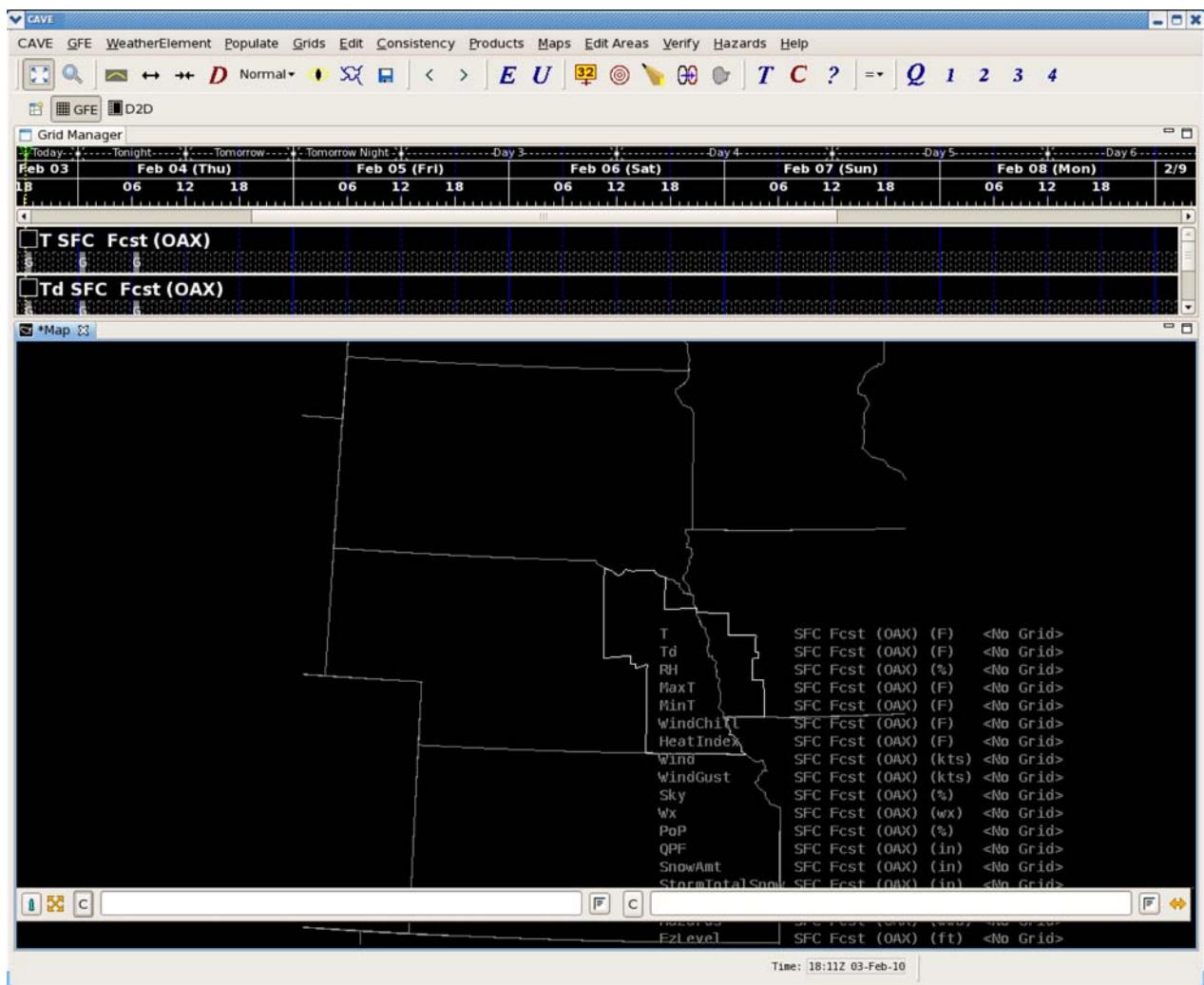


Exhibit 2.2.3-3. GFE Perspective

- **Hydro:** This perspective displays hydrological data. The Hydro perspective displays a large main pane, without monitor panes, as shown in **Exhibit 2.2.3-4**.

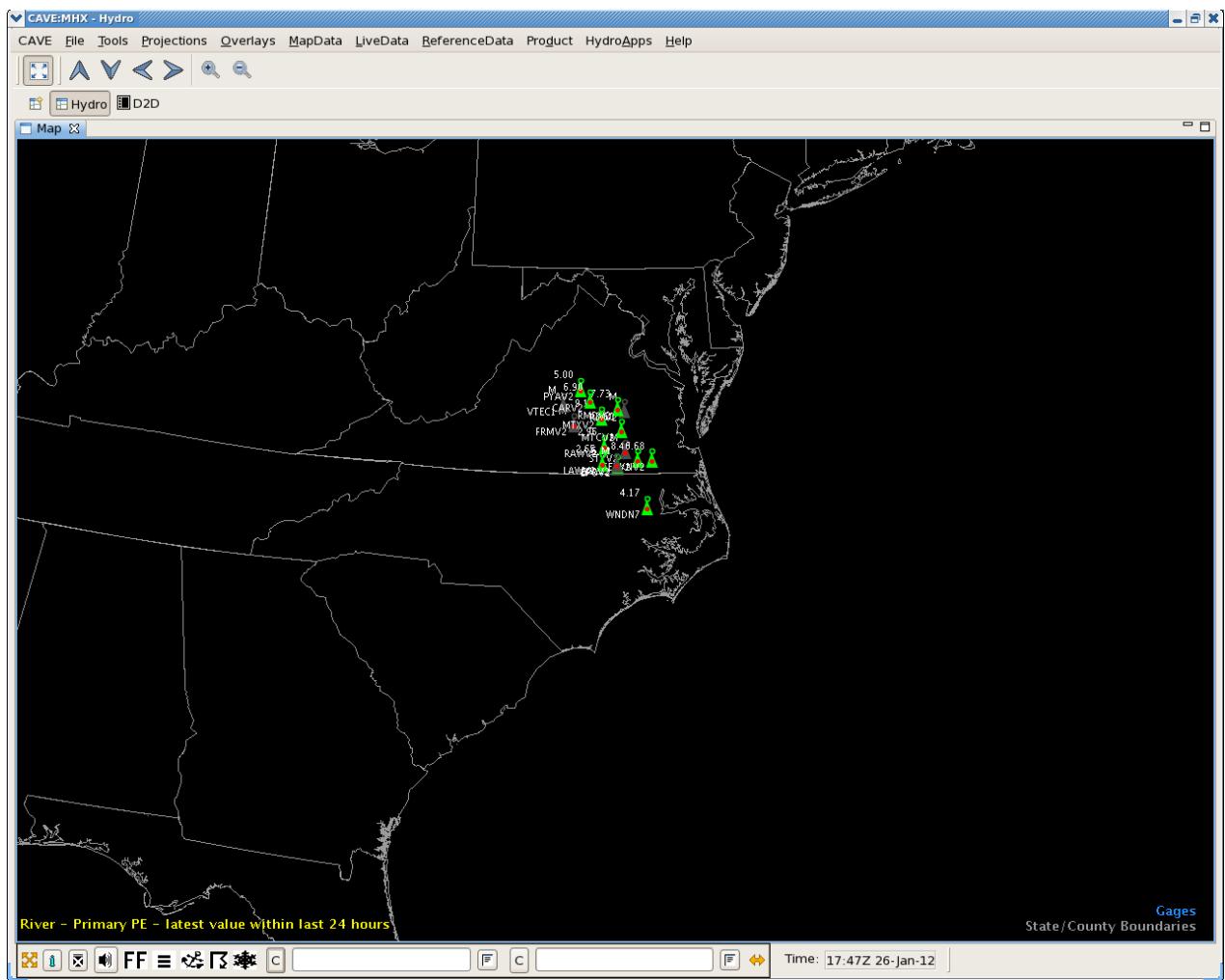


Exhibit 2.2.3-4. Hydro Perspective

- **Localization:** This perspective displays localization data for the other perspectives and CAVE. The Localization perspective displays a large main pane in the middle of the screen to display mapping, an area on the left side of the main pane for selecting specific files, and an area on the right side of the main pane for localization script outlines, as shown in **Exhibit 2.2.3-5**.

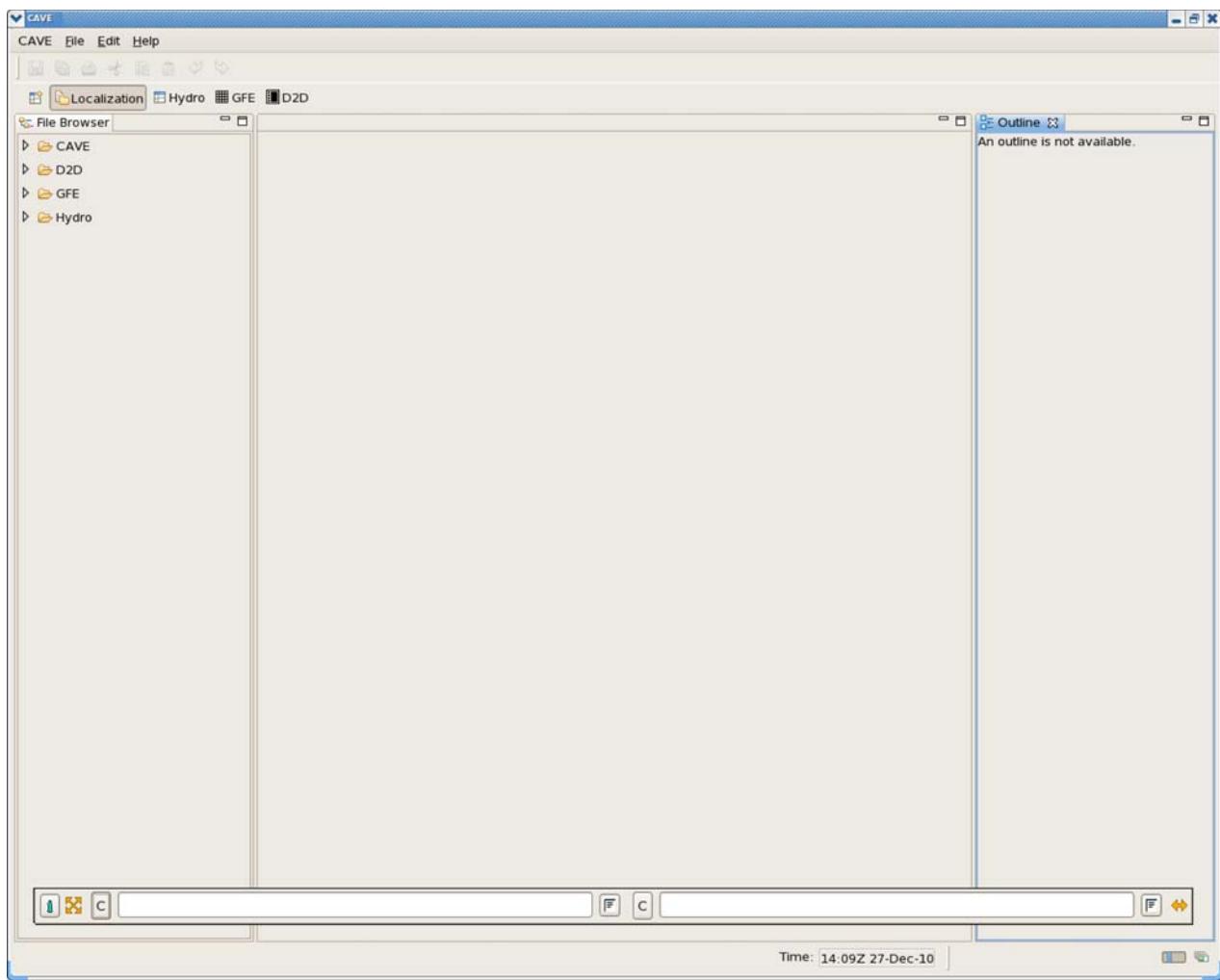


Exhibit 2.2.3-5. Localization Perspective

- **MPE:** This perspective displays hydrological data within the WHFS MPE Data Viewer. The Choose Data Period dialog window enables filtering the information displayed. The MPE perspective displays a large main pane, without monitor panes, as shown in **Exhibit 2.2.3-6**.

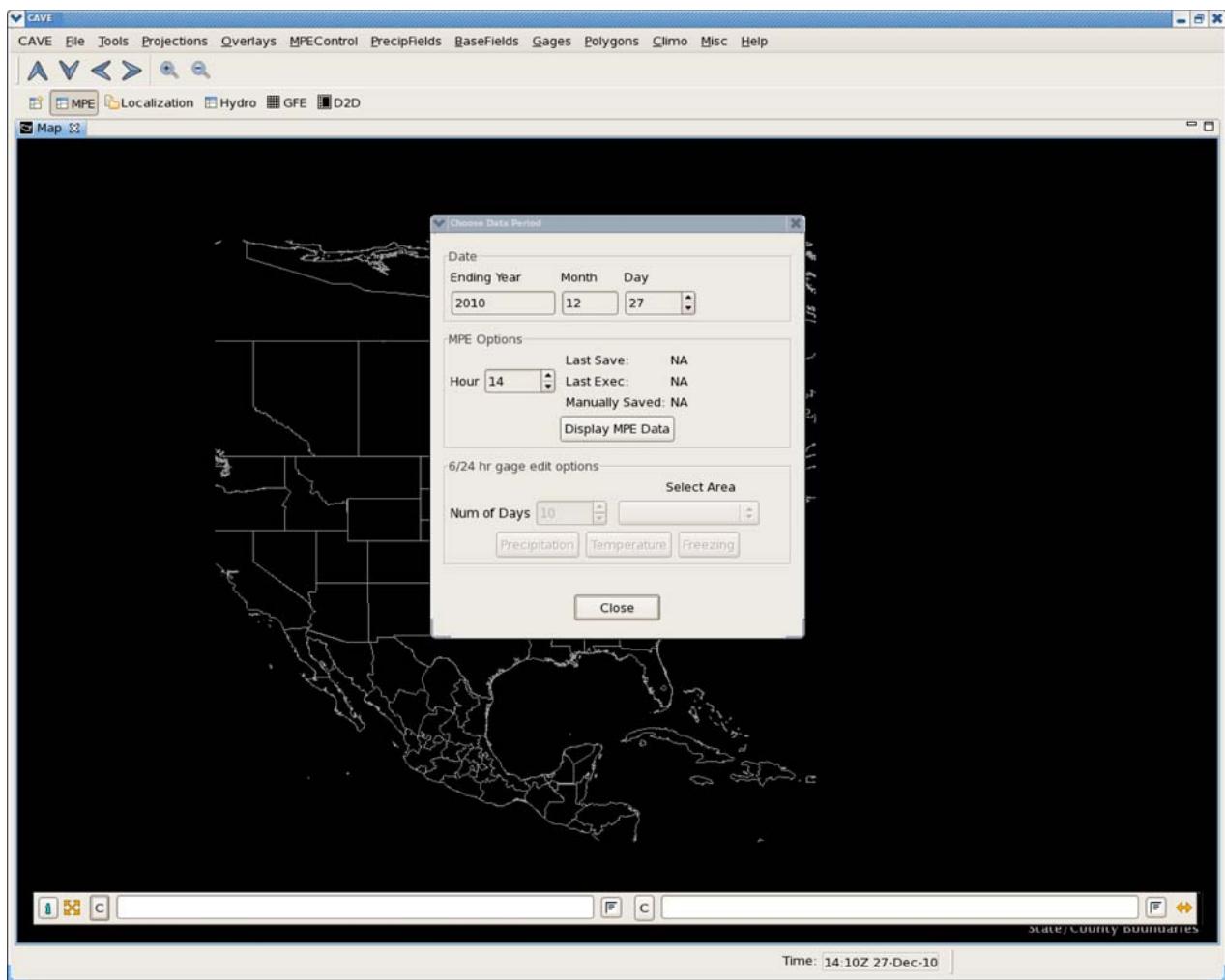


Exhibit 2.2.3-6. MPE Perspective

- **Other:** This option undocks the CAVE Open Perspective dropdown box and displays it as a floating pallet, as shown in **Exhibit 2.2.3-7** that can be manually relocated to any desired location within the area of the display screen. This option is provided to allow for better viewing of the display without closing the dropdown box.

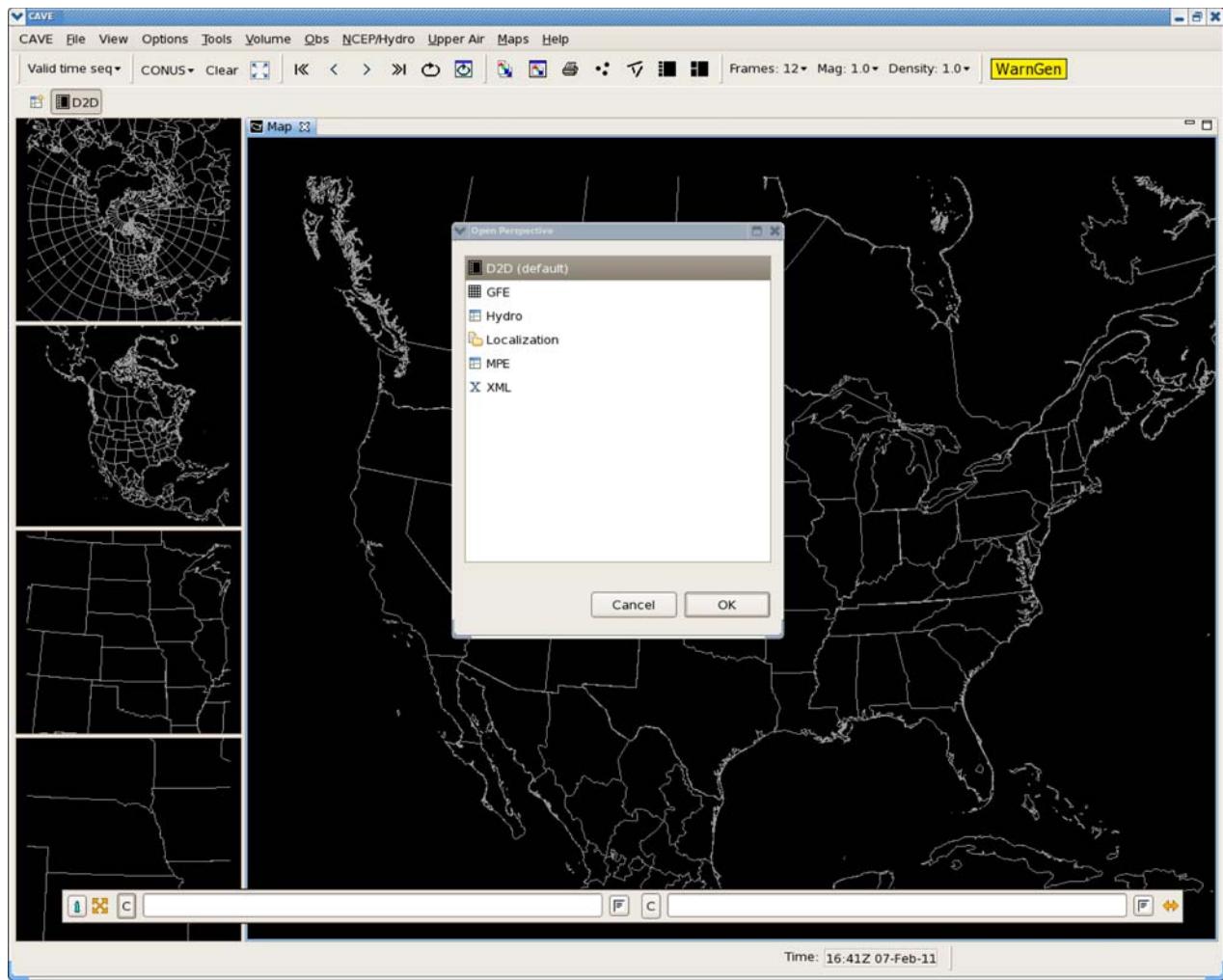


Exhibit 2.2.3-7. Floating Open Perspective Pallet

- **XML:** Listed on the floating Open Perspective pallet is the XML perspective, as shown in **Exhibit 2.2.3-8.**

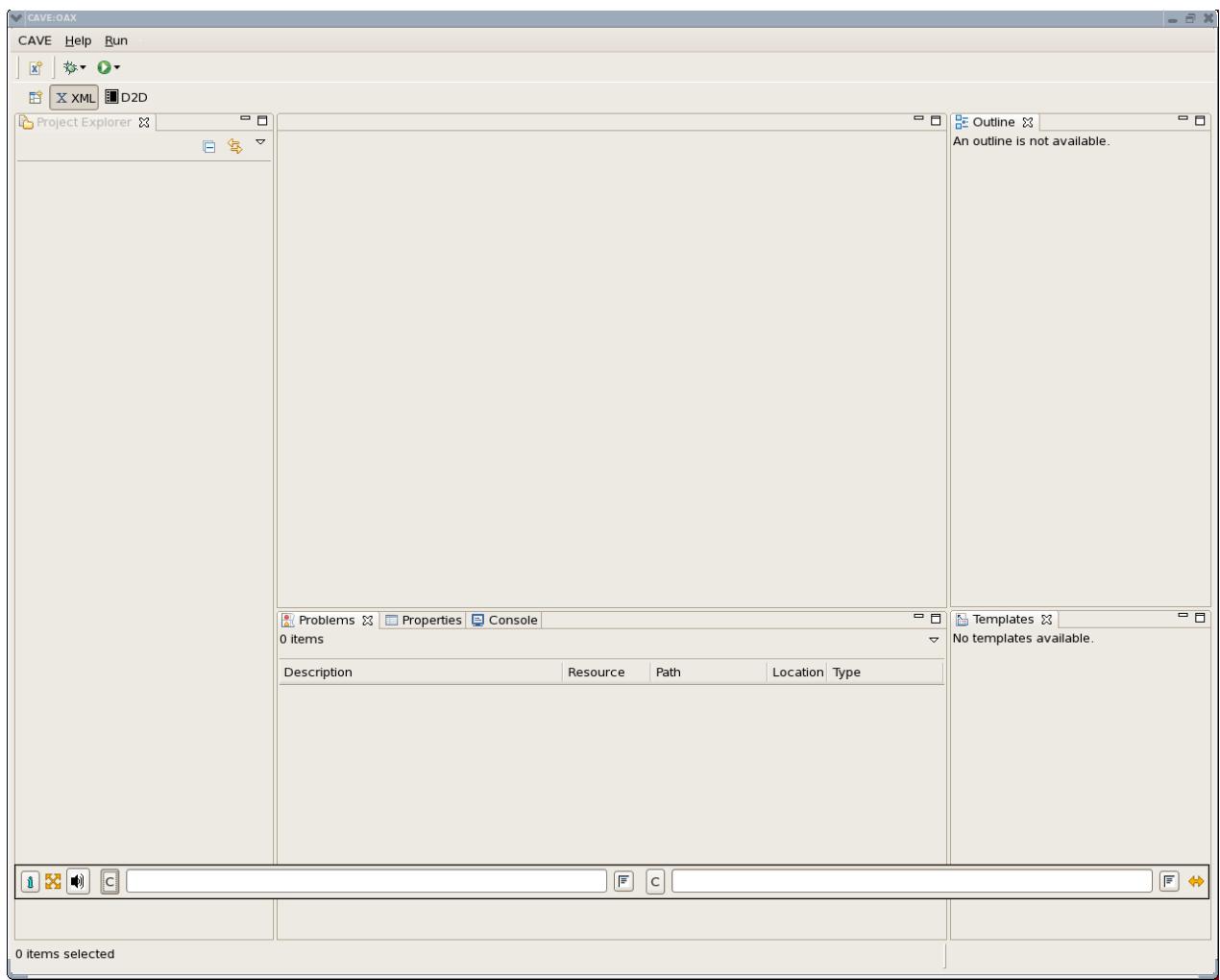


Exhibit 2.2.3-8. XML Perspective

2.2.4 Windows, Tooltips, Menus, and Dialog Boxes in CAVE

This section describes some distinctions among CAVE's windows, menus, and dialog boxes. Understanding these distinctions can help you become more comfortable navigating the CAVE interface. Remember that the menus, tools, and other components that are displayed depend on the selected perspective.

- **CAVE Navigating Devices:**

- **Pull-down Menus:** The primary means of navigating CAVE is via the menus, with the majority of those menus being pull-down type, as shown in **Exhibit 2.2.4-1**.

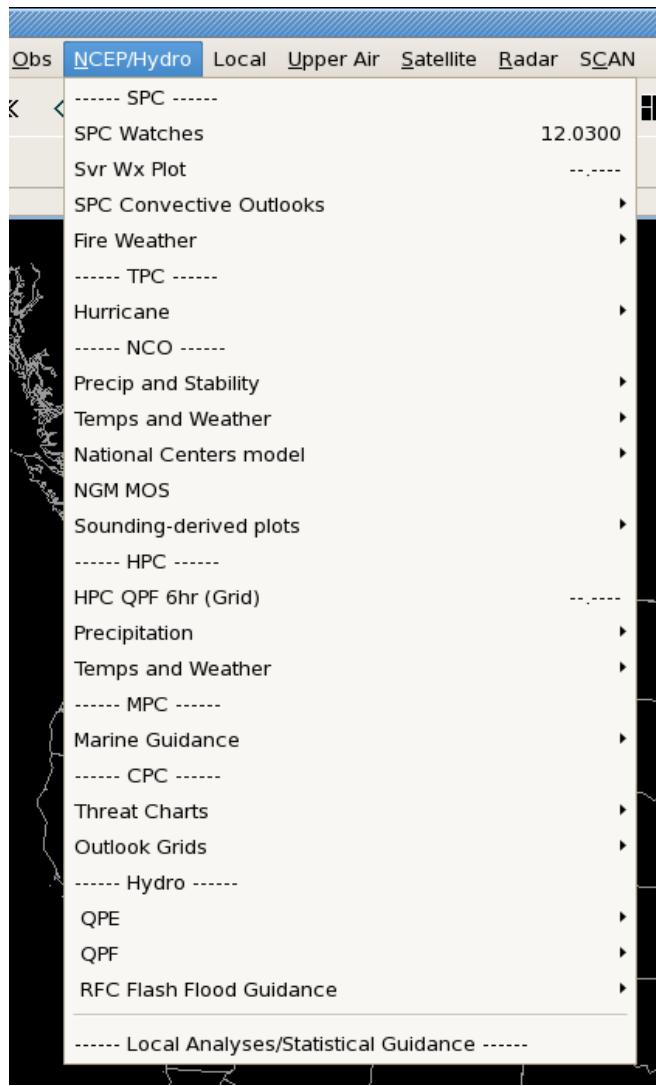


Exhibit 2.2.4-1. A Pull-down Menu

- **Options Menus:** Options menus, located on the CAVE screen's Toolbar, behave like pull-down menus but display the selected option's label in the menu button. Option menus are denoted with a small down arrow, as shown in **Exhibit 2.2.4-2** for "Valid time seq" and "CONUS."



Exhibit 2.2.4-2. An Option Menu

- **Cascading Options Menus:** Some menus lead to other menus, and in turn these menus can then lead to additional menus, etc. This forms a cascading pattern. These subsequent menus are called submenus, or pull-right second stage submenus. They are indicated by a solid black right-pointing arrowhead located to the right of a parent menu option.

To access the next stage of a submenu, move the mouse cursor over the option that includes a right-pointing arrowhead; then press and hold mouse Button 1, pausing long enough for the menu option to highlight, and for the second menu to appear. An example of a cascading menu pattern is shown in **Exhibit 2.2.4-3**.

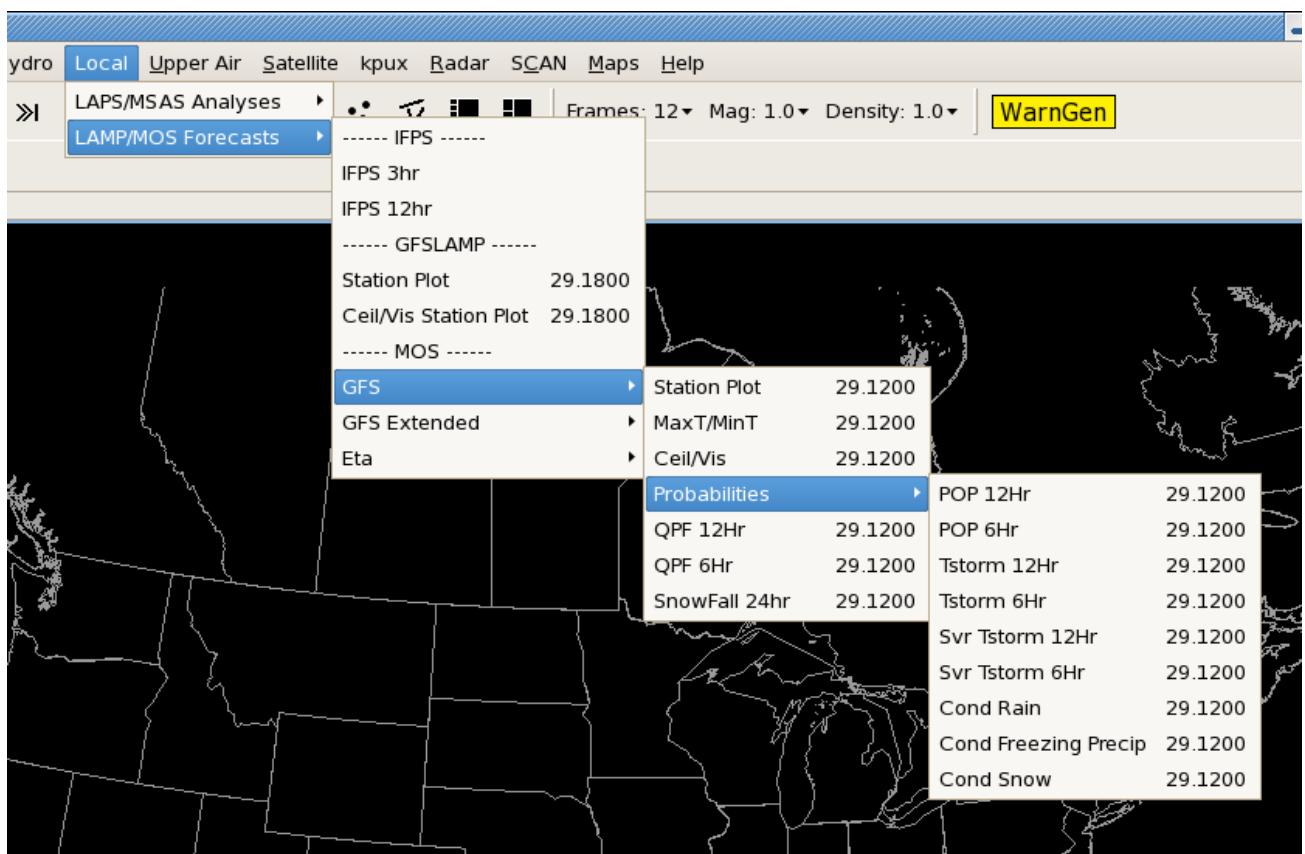


Exhibit 2.2.4-3. Cascading Options - Pull-right Second Stage Submenu

- **Dialog Boxes:** Dialog boxes are windows that are independent of the main CAVE window. They are typically opened from a menu item containing an ellipsis (three dots after the menu item), as shown in **Exhibit 2.2.4-4**. The Preferences option and all the options listed for the pull-right Load/Save Displays option have the three dots following the item.

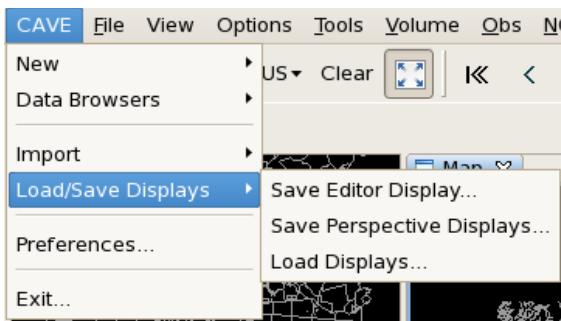


Exhibit 2.2.4-4. Example of an Ellipsis for Opening a Dialog Box

An example of a dialog box is shown in **Exhibit 2.2.4-5**. Dialog boxes enable you to interact with the interface in a specialized way.

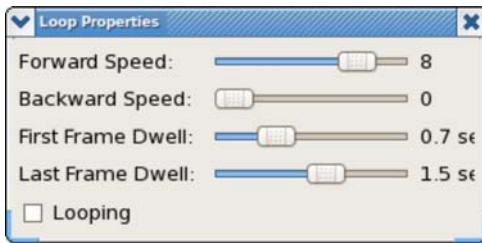


Exhibit 2.2.4-5. A Dialog Box

- **Moving dialog boxes:** Dialog boxes can be moved in the same way as other windows are moved; by pressing and holding mouse Button 1 over the window's Title Bar, then dragging the window to the new location.

Dialog boxes can also be moved in front of other windows (popped) or behind other windows (pushed). This means that it is possible (either intentionally or accidentally) to pop or push a dialog box relative to the CAVE window. In the latter case, the dialog box will seem to have disappeared. Should this happen, simply go to the parent menu and reselect the item that has "disappeared", click on its icon on the Panel, or click with mouse Button 3 on the CAVE Title Bar to push CAVE back, revealing the dialog box.

Minimizing or resizing dialog boxes: Dialog boxes can be minimized or resized in the same way as other windows are minimized or resized, that is, by clicking the appropriate iconified minimize or resize button (if available) in the upper right corner of the window. When minimized, the dialog box "vanishes" from the screen. The dialog box can be restored by clicking on its icon listed on the top portion of the Panel on the left side of the screen. Refer to [Exhibit 2.2.3-1](#).

- **Closing dialog boxes:** Dialog boxes can be closed in the same way as other windows are closed, that is, by clicking the iconified close button in the upper right corner of the window. If a Close, Exit, or Cancel button is present on the window, it should always be used to close the dialog box. Some dialog boxes have a menu bar. When a menu bar is present, the "close" or "exit" option is under the File menu. In this case, the dialog box should always be closed from the File menu option.

• Navigation Tools and Rules:

- **Tooltips:** Moving the mouse cursor over the items on the Toolbar displays "Tooltips", as shown in **Exhibit 2.2.4.6**. Tooltips are helpful identifiers of the iconified buttons on the Toolbar. If you do not want "Tooltips" to appear, they can be toggled off by going to the Help pull-down menu and unchecking the Show tooltips option.

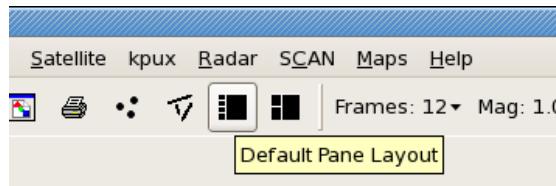


Exhibit 2.2.4-6. Example of a Tooltip

- **Pop-up Menus:** Pop-up menus contain options that are specific to a certain area of the CAVE workspace (main display pane, smaller monitor panes, four-panel layout, or legends); and specific to the type of product being displayed (graphic plot, contoured graphic, or image). Pop-up menus are built into the CAVE user interface, providing no visual cue of their presence; they simply pop up when you perform a particular action. All pop-up menus in CAVE are opened by pressing and holding mouse Button 3 in a specific area on the screen, such as the window's title bar, a dialog box, or on a product legend. For a detailed description of

CAVE pop-up menus, refer to [Section 2.1.8](#).

- **General CAVE Menu Navigating Rules:** Understanding the following general rules will help you to become more comfortable navigating the CAVE menus:
 - **Menu option selection:** To choose a menu option, click the desired option. To close the menu without selecting an option, click anywhere outside the menu. You can save mouse clicks by pressing and holding mouse Button 3 over the menu button, dragging the mouse cursor through the menu until the desired option is highlighted, and then releasing the button. The requested action is initiated and the menu closes immediately.
 - **Hovering mouse cursor (left-pointing arrow):** When the mouse cursor hovers over the display window or a dialog box, the window's title bar is highlighted, and the window is said to have *focus*. Sometimes, when traversing the mouse cursor from screen to screen, the display window fails to get focus; in this case, keyboard shortcuts will not work. You may need to move the mouse cursor out of and back into the window, or even click on its title bar, to regain focus.
 - **Raised menu item text:** If the text of a menu item appears raised from the plane of the menu, that item is highlighted. A highlighted menu item is surrounded by a light gray or purple box. An item can be highlighted, but it still needs to be selected, by clicking on it, to initiate the action or to display the product.
 - **Menu on-off check boxes:** Some menus have small square-shaped boxes to the left of the items on the menu. These are on-off checkboxes; that is, they start or stop the indicated action. If an action is on, the box is checked. To turn the action off, click the checkbox. The checkmark is removed from the checkbox and the action is stopped.
 - **Product data availability:** The availability of data is not dependent on scale or projection. All data-selection menus have a valid date and time adjacent to the product name. It means the item is available and indicates the most currently available version of the product. Whenever the notificationServer is updated, the "time" automatically updates. The format is **(dd.hhmm)**. When data are not available or are not updating, or the system has not been notified that new data are available, dashes (---) appear in place of the date and time. Refer to [Section 2.2.6](#), The Menu Bar, or [Section 3.3.4](#) Practice Modules: Working With Graphic and Image Products, Module 2: Working With a Single Graphic Product, for more information about product availability.

2.2.5 Other CAVE Operational Displays

This section contains additional notes about the operational behavior of the CAVE workspace.

- **Auto Update**

As new versions of currently loaded products become available to the system, they are automatically displayed. Auto Update functions in all five display panes. For example, if you are displaying Meteorological Aviation Report (METAR) station plots and new data are received in the database, the new METARs are plotted on the screen.

- **Time Matching**

By default, when you add overlays to a displayed product, the system matches the valid times to those of the initially displayed product. This feature can be overridden by the load mode called Forced Load (refer to [Section 3.3.6 Practice Modules: Using the Volume Browser, Module 13: Load Modes](#), for more information). Time Options (see [Section 2.2.6.4](#)) also allows you to override standard time matching.

- **CAVE Status Messages**

When data are missing or incomplete, or there are other problems with the workstation, the Alert Visualization Popup Message Dialog appears, announcing an alert, as shown in **Exhibit 2.2.5-1**. (Refer to [Section 11.3 Alert Visualization](#), for more information.)



Exhibit 2.2.5-1. Alert Visualization Popup Message Dialog

Note: There are three alert message priority levels: Routine, Significant, and Urgent. Routine and Significant Radar status messages may include announcements from the Radar Product Generator (RPG) and are often related to the radar applications (refer to [Chapter 8 Radar Applications](#)).

2.2.6 The Menu Bar

This section briefly describes the options available from the CAVE menu bar. The Menu Bar shown in **Exhibit 2.2.6-1** is that of the D2D Perspective. The D2D Perspective tab is highlighted, indicating the selected Perspective. The menu bar consists of menu buttons that open pull-down menus applicable to the D2D Perspective.

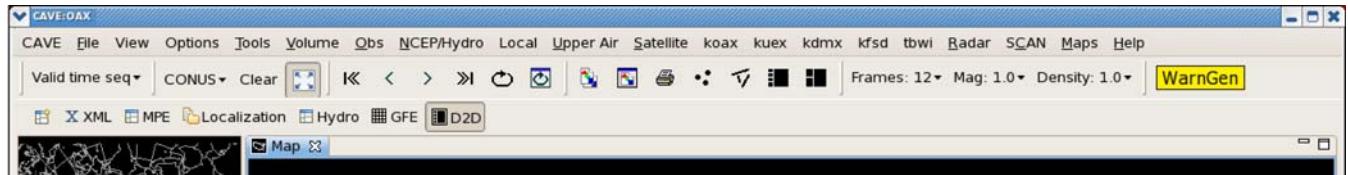


Exhibit 2.2.6-1. D2D Perspective Menu Bar Options

Notes:

1. The actions "Display" and "Load" are used interchangeably in this manual. Both refer to the action(s) the system takes once you have selected one or more products. With the exception of the Volume Browser, a product is loaded to the large display pane immediately after you have selected it. In the Volume Browser, you must explicitly select **Load** to have your product(s) displayed. Refer to [Section 3.2](#) for more information.
2. The descriptions of the D2D Perspective Menu Bar options are presented in the order in which their buttons are displayed along the menu bar, moving from left to right. Keep in mind that some menu button options require more detailed explanations, which you will find in subsequent sections of this manual.
3. Some pull-down menu options (i.e., kxxx, txxx, etc.) vary from site to site.

2.2.6.1 CAVE

Refer to **Exhibit 2.2.6.1-1** for a display of the CAVE menu.



Exhibit 2.2.6.1-1. CAVE Pull-down Menu

The CAVE menu includes the following options:

- **New:** The "New" option opens a submenu, as shown in **Exhibit 2.2.6.1-2**, that includes additional options: It allows the user to create a new Map Projection; opens a new Map Editor (tab); opens a blank 4-panel display; starts the Text Workstation application; and initiates and configures the GUI of the AvnFPS application via the Aviation submenu option.

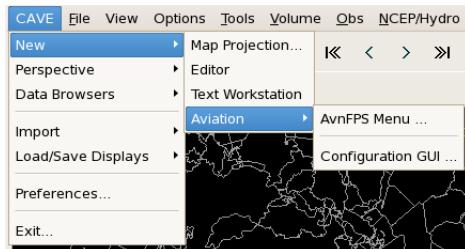


Exhibit 2.2.6.1-2. CAVE New Option Submenu

- **Perspective:** The "Perspective" option opens a submenu, as shown in **Exhibit 2.2.6.1-3**, that lists the CAVE Perspectives. A new Perspective can be opened from here, or from the iconic Perspectives button.

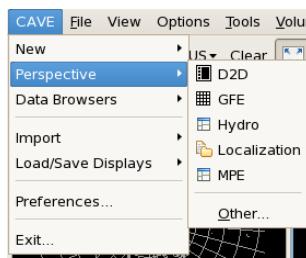


Exhibit 2.2.6.1-3. CAVE Perspective Option Submenu

- **Data Browsers:** The "Data Browsers" option opens a submenu, as shown in **Exhibit 2.2.6.1-4**, that includes two options: The "Browser Classic..." option opens a Volume Browser dialog box for requests to display multiple data types in CAVE (satellite, radar, observations (ASCII), and gridded data); and the "Product Browser" that displays an explorer-type tree structure, listing products by category (Grid, Lightning, Maps, QPF, Radar, Redbook, and Satellite).

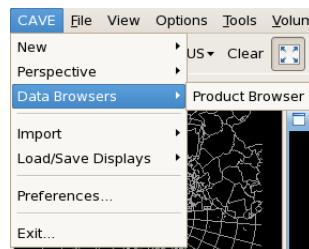


Exhibit 2.2.6.1-4. Data Browsers Option Submenu

Note 1: The data browsers can be used to view data that might be ingested but CAVE is not localized for. For example, it is possible for EDEX to ingest and store radar data that do not appear on the normal CAVE menus, but can be accessed by either of the data browsers.

- **Import:** The "Import" option opens a submenu, as shown in **Exhibit 2.2.6.1-5**, that allows the user to import various file types: BCD File, GeoTIFF, LPI File, Shapefile, or SPI File.

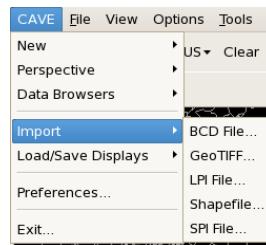


Exhibit 2.2.6.1-5. CAVE Import Option Submenu

- **Load/Save Displays:** The "Load/Save Displays" option opens a cascading submenu, as shown in **Exhibit 2.1.6.1-6**, that provides the user with the ability to save or load displays to or from a given path within the file directory of the workstation.

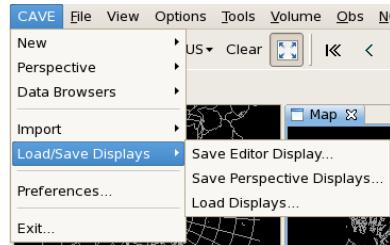


Exhibit 2.2.6.1-6. CAVE Load/Save Displays Option Submenu

Note 2: The Editor Display references the main display pane, while the Perspective Displays reference all the display panes (3 or 5).

- **Preferences...:** The "Preferences" option opens the Preferences dialog box, which allows the user to set the Base Maps and Server Data directories; set the Database Connection String, Config Directory and Log Directory for the Hydro applications; set the Localization Site and/or Server for the workstation; configure the Mouse operations; change the Performance Levels; set the Radar Server; set the Font Magnification; and set the Text Workstation hostname.
- **Exit...(Alt + F4):** The "Exit" option allows the user to shut down the CAVE workspace. (You can also use the "Alt + F4" keyboard shortcut to exit.) When you choose this option, a dialog box appears in the

center of the display screen and asks you to confirm that you really want to quit.

2.2.6.2 File

- **File Menu Options:** The File menu, as shown in **Exhibit 2.2.6.2-1**, includes of the following options:

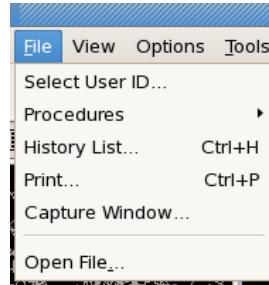


Exhibit 2.2.6.2-1. File Pull-down Menu

- **Select User ID...:** The User ID identifies you as the current user of the AWIPS workstation, giving you access to your personal procedures and color tables. Selecting this File option brings up a dialog box that allows this identification. Each site has its own list of User IDs.
- **Procedures:** The Procedures pull-right submenu, as shown in **Exhibit 2.2.6.2-2** enables you to define and customize a sequence of routinely used products or products used for a particular forecast problem. Refer to [Section 3.1.1](#) for more information.

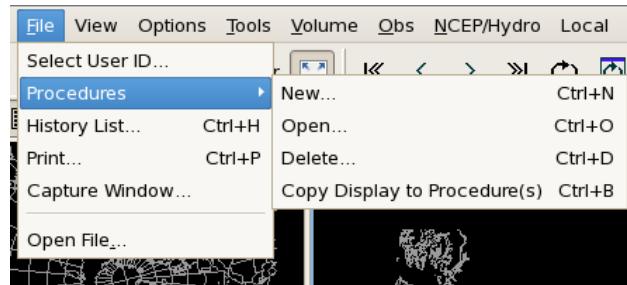


Exhibit 2.2.6.2-2. Procedures Pull-right Menu

Note: The Procedures that are under the File menu differ from the Procedures that are under the CAVE menu.

- **History List (Ctrl + h):** A History List is a recall list of all the products loaded to the large display pane since the last restart of the workstation. Products in the history list are used to build procedures. The History List can also be opened with the "Ctrl + h" keyboard shortcut. Refer to [Section 3.1.1](#) for more information.
- **Print... (Ctrl + p):** This option does not send anything to the printer, but rather allows you to do so. The Print Dialog Box, as shown in **Exhibit 2.2.6.2-3**, can be opened with the "Ctrl + p" keyboard shortcut.
 - To change the destination printer from the default (lp1), type the desired printer name in the Printer data entry field. Use lp2 for the color printer.

Note: The Print Icon button on the Toolbar can also be used for default printing.
Refer to [Section 2.2.7](#)

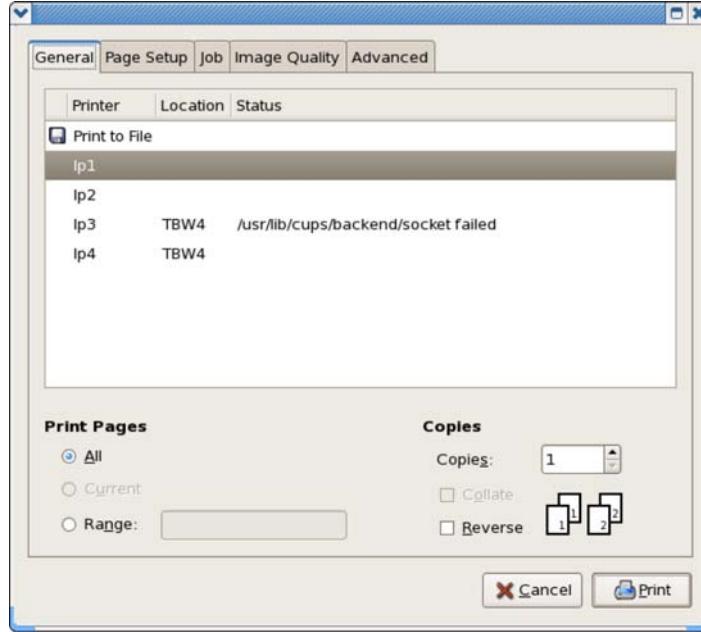


Exhibit 2.2.6.2-3. Print Options Dialog Box

- **Capture Window... :** This menu option allows you to create screen shots (in PNG format) of objects contained in a framed window. When you choose this option, the Window Capture dialog box, as shown in **Exhibit 2.2.6.2-4**, appears and requires you to enter a filename.

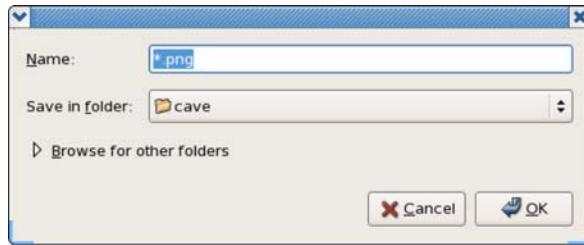


Exhibit 2.2.6.2-4. Window Capture Dialog Box

Once you type in a unique file name, press the OK menu button and the mouse cursor becomes a crosshair cursor. Simply click on the desired window and wait a moment for the Window Capture message box to appear, confirming that the screen capture is complete, and indicating where your file can be found.

2.2.6.3 View

The View pull-down menu, shown in **Exhibit 2.2.6.3-1**, contains nine options that control the display layout and product animation. All, except the Toolbar option, have corresponding Icon buttons in the second row of menu options called the Toolbar. Refer to [Section 2.2.7](#) for additional information on toolbar options.

- **Clear (Ctrl + C):** This option clears the large display pane but retains the map background. You can also use the **Ctrl + C** keyboard shortcut to clear the large display pane, or the **Clear** button in the Toolbar.
- **Step Back (Left):** This menu option reverses the displayed data by one frame. You can also use the **LEFT ARROW** keyboard shortcut to step back, or the  button on the Toolbar.
- **Step Forward (Right):** This menu option advances the displayed data by one frame. You can also use the **RIGHT ARROW** keyboard shortcut to step forward, or the  button on the Toolbar.

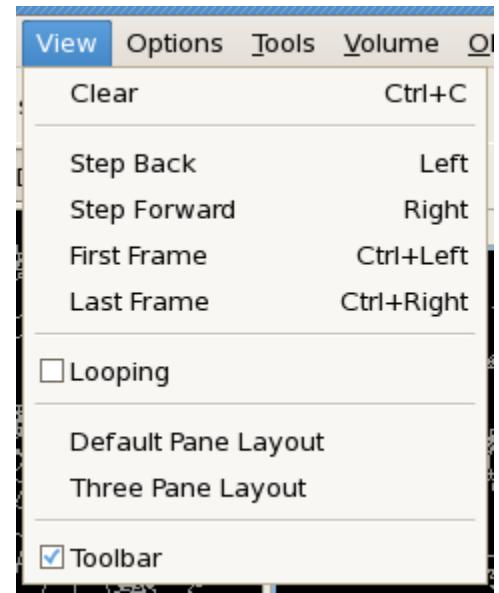


Exhibit 2.2.6.3-1. View Pull-down Menu

- **First Frame (Ctrl + Left):** This option displays the first frame of available data. You can also use the **Ctrl + LEFT ARROW** keyboard shortcut or the  button on the Toolbar.
- **Last Frame (Ctrl + Right):** This option displays the last frame of available data. You can also use the **Ctrl + RIGHT ARROW** keyboard shortcut or the  button on the Toolbar.
- **Looping (Up/Dn;L/R):** Check this box to enable animation (**Page Up/Page Down** buttons turn looping on, **LEFT/RIGHT ARROWS** turn looping off). You can also use the Loop Properties Dialog Box or the  button on the Toolbar.

Note 1: If you hit the **UP** or **DOWN ARROW** keys in a standard (not All-Tilts) display, looping and stepping are disabled until you hit either the left or the right arrow key.

- **Default Pane Layout:** This menu option arranges the display in the D2D 5-pane layout, with one large display pane on the right side of the workstation display and four small (monitor) panes of equal size along the left side of the display. You can also set the display to the default (5-pane) layout by clicking the  button on the Toolbar. Refer to **Exhibit 2.2.6.3-2** for an example of the D2D 5-pane layout.

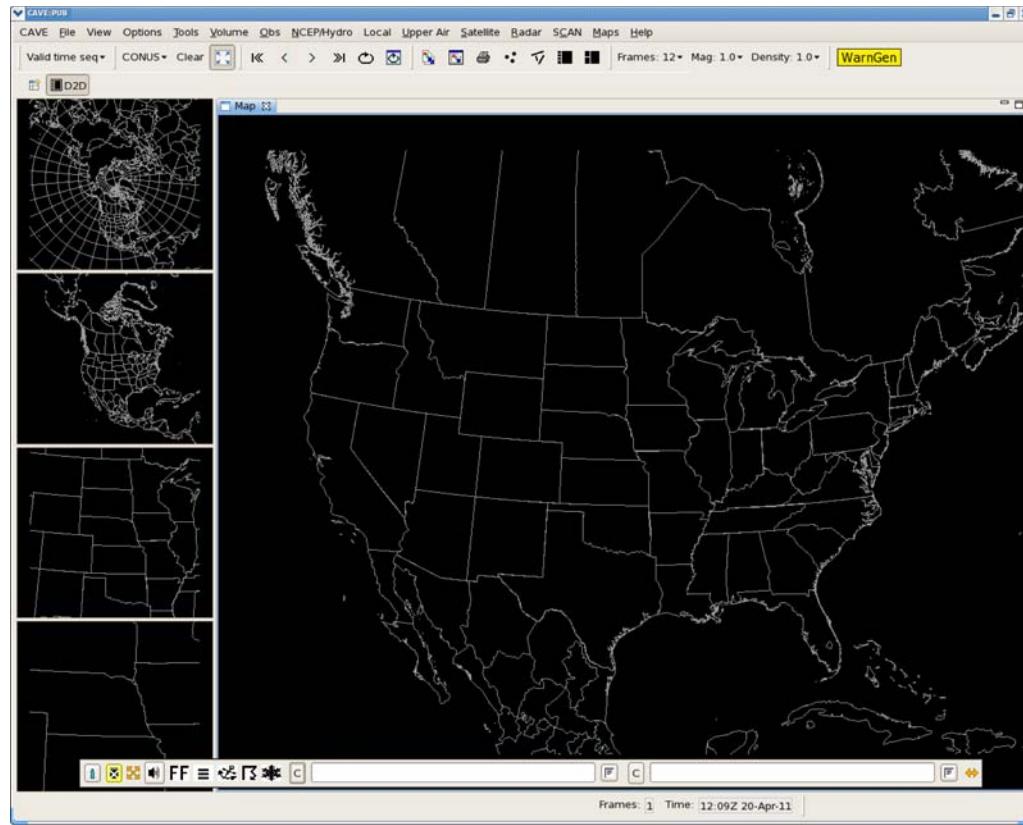


Exhibit 2.2.6.3-2. Default D2D 5-Pane Layout

Note 2: It is possible to **resize** each CAVE window pane. The white pane borders are adjusted by pressing on them with mouse Button 1 and dragging them to the desired new size. There are size limitations for the large display and small panes.

- **Three Pane Layout:** Refer to **Exhibit 2.2.6.3-3**. This option arranges the display to have one large display pane and two medium-sized panes along the left side of the display. You can also set the display to the 3-pane layout by clicking the  button on the Toolbar. Notice that two of the four original monitor panes are greatly reduced in size but can still display data.

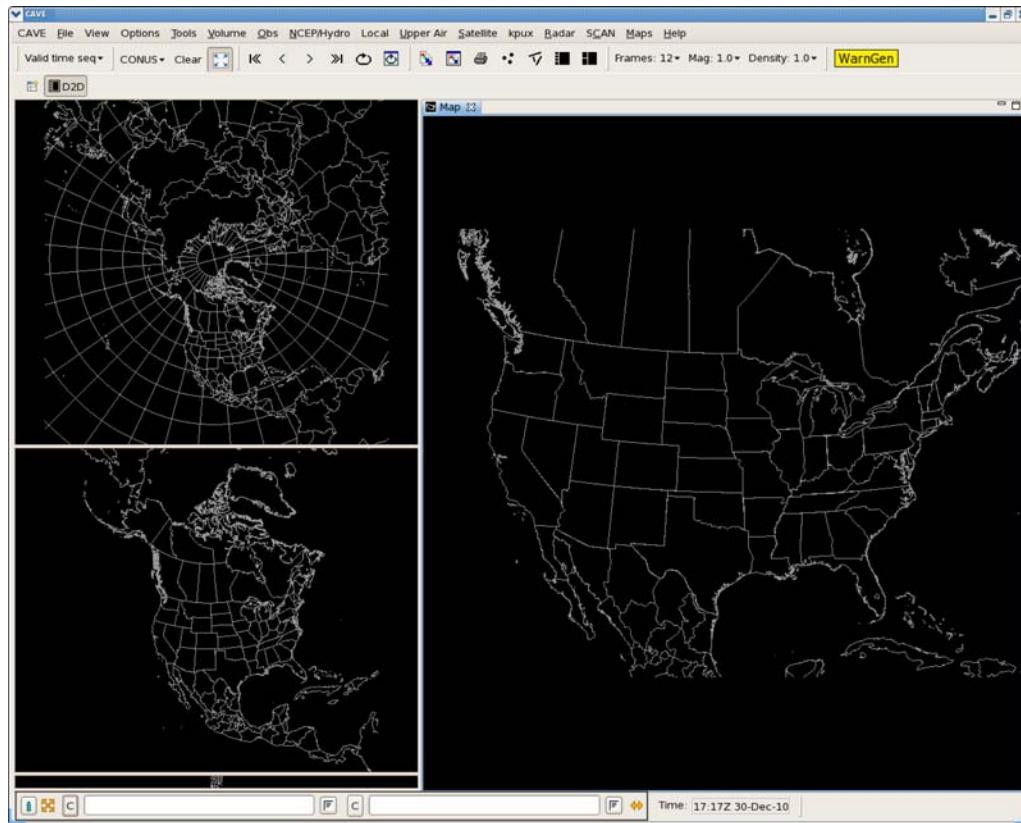


Exhibit 2.2.6.3-3. D2D 3-Pane Layout

- **Toolbar:** Check this box to show the Toolbar, namely, the second row of options along the top of the display. You can hide the Toolbar if you need more viewing space by unchecking this checkbox.

2.2.6.4 Options

The **Options** menu, as shown in **Exhibit 2.2.6.4-1**, contains options that enable you to set display preferences such as magnification (graphic font size), density (amount of data displayed), looping speed, color tables, and time resolution.

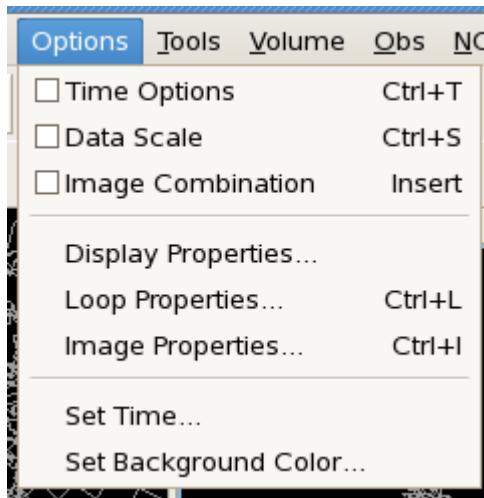


Exhibit 2.2.6.4-1. Options Pull-down Menu

Most of these options are available on the Toolbar or in other areas of the user interface, but are redundantly placed in this pull-down menu in case you want to hide the Toolbar. Refer to [Section 2.2.7](#) for more information on Toolbar options.

- **Time Options (Ctrl + T):** This check button enables/disables the ability to select the time interval between frames of real-time or model data. This feature has the added benefit of allowing you to view extended amounts of data (temporally) but stay within the limits of 64 frames. For example, METAR surface plots, which typically display every hour, can be set to display every three hours via the Select Valid Time and Time Resolution Dialog Box.

When the Time Options check button is selected, the next product you choose to display in the Large Display Pane launches either the Select Valid Time and Time Resolution dialog box or the Select Offset and Tolerance dialog box.

- When you are loading data to an empty display and the Time Options check button is enabled, the Select Valid Time and Time Resolution dialog box opens.
 - **Valid Time:** In this column of dates/times, you may choose the one that will be the first frame loaded onto the Large Display Pane. The Default option is the most recent data.
 - **Time Resolution:** This column contains various time increments in which the data can be displayed. Once you make a selection, the Valid Time Column indents the exact times that will be displayed. The Default resolution displays the most recent frames available.
- With the Time Options check button enabled for a display that already contains data, when you choose the data to be overlaid in the Large Display Pane, the Select Offset and Tolerance dialog box appears, providing the following options:

- **Offset:** This column contains various time increments at intervals before, at, or after the time you selected for the first product that is displayed in the Large Display Pane.
- **Tolerance:** The options in this column refer to how strict the time matching is. "None" means an exact match, while "Infinite" will put the closest match in each frame, regardless of how far off it is.
- **Data Scale (Ctrl + S):** This check button enables/disables the ability to display data on its native scale. For example, if you enable Data Scaling and select a product from an alternate radar, the data will be displayed with that radar in the center of the screen. Other data can be overlaid on this "dynamic" scale until the Large Display Pane is cleared or a non-plan-view product is loaded. Refer to [Section 3.3.4](#).
- **Image Combination (Insert):** This check button enables/disables the ability to display two images at once. You can also enable/disable the ability to combine images by using the Toggle Image Combination iconified button on the Toolbar.

Combined-image displays have been improved by removing the valid time for non-forecast products and removing the date string (time is kept) from the left side of the legend. In particular, this makes [All-Tilts](#) radar legends more usable.

Note 1: If the time of both images is the same, the day-month-year string is shown only for the right-side image (unless it's not loaded, in which case the day-month-year is included on the left).

- **Display Properties...:** This menu option opens the Display Properties dialog box. All the options available in this dialog box are also available on the Toolbar.
 - **Scale:** The Scale menu, which defaults to CONUS scale when CAVE is first started is shown in **Exhibit 2.2.6.4-2**. From this menu you can choose any of the scales defined for your location: N. Hemisphere, North American, CONUS (Conterminous United States), Regional, State(s), and WFO (Weather Forecast Office).



Exhibit 2.2.6.4-2. Scale Menu with Default CONUS Scale Selected

Note 2: The Scale menu options vary based on local needs and requirements. Data is not Scale dependent; it can be displayed on any scale.

The CONUS Scale is displayed in the large display pane, and other map backgrounds with

different scales are loaded into the four monitor panes. The Scale option menu affects only the main pane. A swap is required to change the scale on a monitor pane.

Once data have been loaded, changing the scale will alter the map background. The data displayed will remain displayed. You can also swap the monitor pane showing the desired scale with the large display pane to change scales (refer to [Section 3.3.4](#) Module 2 for more information).

- Load Mode: Also under the **Display Properties** option is Load Mode, which provides different ways to display model or real-time data by manipulating previous model runs and inventories of data sets.

The Load Modes are defined here, and an example of their use is found in [Section 3.3.6](#) Module 13.

- **Latest:** Displays forecast data only from the latest model run, but also backfills at the beginning of the loop with available frames from previous runs to satisfy the requested number of frames.
- **Valid time seq:** Displays the most recent data and fills empty frames with previous data. For models, it provides the product from the latest possible run for every available valid time.
- **No Backfill:** Displays model data only from the most recent model run time with no backfilling to fill out a loop. Using this Load Mode prevents the mixing of old and new data.
- **Previous run:** Displays the previous model run, backfilling with frames from previous runs at the beginning of the loop to satisfy the requested number of frames.
- **Prev valid time seq:** Displays the previous model run and fills empty frames with previous model data or analyses.
- **Prognosis loop:** Shows a sequence of n-hour forecasts from successive model runs.
- **Analysis loop:** Loads a sequence of model analyses but no forecasts.
- **dProg/dt:** Selects forecasts from different model runs that all have the same valid times. This load mode is available only when there are no other products loaded in the large display pane.
- **Forced:** Puts the latest version of a selected product in all frames without time-matching.
- **Forecast match:** Overlays a model product only when its forecast times match those of an initially loaded product. This load mode is available only when another product is already loaded in the large display pane.
- **Inventory:** Selecting a product when the load mode is set to Inventory brings up a Dialog Box with the available forecast and inventory times from which you can select the product you want. Inventory loads into the currently displayed frame.
- **Slot:** Puts the latest version of a selected product in the currently displayed frame.

Note 3: Default Load Modes -- Latest Run and Valid Time Sequence are "sticky" default load modes. This means that the current load mode setting automatically defaults back to either Latest Run or Valid Time Sequence, whichever you used before switching to another load mode.

- **Frames:** Frames is used to select the number of frames of a product you want loaded. The startup default is 12 frames, but whatever number you choose is used until you change it. The maximum frame count has been increased to 64.
Exception: Family graphics (see [Section 2.2.6.5](#)) come with a preset frame count, to allow you to see the entire model run.

Note 4: If no frames of data are available, the system sends a message to the General Status Area of the Status Bar. You can also use the Frames Option menu in the Toolbar.

- **Magnification:** You can enlarge or reduce the size of text and symbols on a graphic product using the **Mag:** option. As you increase magnification, the density of the data presented automatically decreases. The purpose of this feature is to make text and symbols more visible. Selecting **Mag: 0** displays all the site locations without any visible data.
- **Density:** The display features an automatic declutter function, which adjusts the density of station plots and contours for clarity of view. You can override the default setting to adjust the amount of data presented on the large display pane by using the **Density:** option. You can also change the density setting from the Toolbar. Lower-density settings decrease the amount of data displayed; higher settings increase the amount of data. The "Max" density setting displays all available data and therefore disables declutter.
- **Loop Properties... (Ctrl + L):** Loop Properties is another dialog box that can be opened from the Options menu or from the Loop Properties  icon on the D2D Toolbar, or by using the **Ctrl + L** keyboard shortcut. The dialog allows you to adjust the forward and backward speeds, with 0 = off and 10 = maximum speed. You can set the duration of the first and last frame dwell times to between zero and 2.5 seconds.

You can turn looping on or off by checking the Looping check button. There is also a Looping button located on the Toolbar that enables/disables the animation in the large display pane. Finally, you can turn looping on and increase/decrease forward speed by pressing **Page Up/Page Down** on your keyboard, and turn looping off with the **Left or Right Arrow keys**. On the toolbar, you can use the button to start/stop looping.

- **Image Properties... (Ctrl + I):** The Image Properties dialog box can be opened here or by using the Image Properties  iconified button on the D2D Toolbar, or using using the **Ctrl + I** keyboard shortcut. This dialog box provides options that allow you to change the color table; adjust the brightness, contrast, and alpha of either a single image or combined images; fade between combined images; and/or interpolate the displayed data.

From this dialog box, you can also access the Image Colors Editor, which enables you to edit and save Image Color Tables. This option is selectable if an image or combined image product is displayed. If a single image is loaded, the second color table selector and edit button are dimmed. Refer to [Section 2.2.9](#) for more information on the Image Colors Editor.

- **Change Color Table of Image:** The Color Table option menus are annotated with a color table name and a small rectangle. These menus provide a list of predefined or default color tables (enhancement curves) available for use with displayed images.

While any color table can be used with any image, some are specifically designed for use with satellite imagery, some for use with radar imagery, and others for use with gridded data displayed in image format. (Displaying gridded data as an image is covered in [Section 3.2.4](#).)

- **Brightness Control Slider:** The Brightness control slider changes the brightness of the display. Drag the slider (using mouse Button 1) to the desired level of brightness, and then release the mouse to save and view the change in the display. To adjust the brightness one increment at a time, click adjacent to the slider using mouse Button 1 (this is called a "single step" change). To adjust brightness to a specific level on the slider bar, place the pointer at the desired location along the slider bar and click mouse Button 2 (this is called a "snap to" change). Brightness can also be adjusted using the "+" and "-" keyboard shortcuts on the keyboard after the Brightness slider bar has been selected (note the box that appears around the slider bar).

Note 5: All images have default brightness settings, but you may need to adjust them to make overlaid graphics and map backgrounds easier to see against the image.

- **Contrast Control Slider:** The Contrast control slider changes the contrast of the display. Drag the slider (using mouse Button 1) to the desired contrast level, and then release the mouse to save and view the change in the display. To adjust the contrast one increment at a time, click adjacent to the slider using mouse Button 1 (this is called a "single step" change). To adjust contrast to a specific level on the slider bar, place the pointer at the desired location along the slider bar and click mouse Button 2 (this is called a "snap to" change). Contrast can also be adjusted using the "+" and "-" keyboard shortcuts on the keyboard after the Contrast slider bar has been selected (note the box that appears around the slider bar).
- **Alpha Control Slider:** The Alpha control slider changes the alpha level of the display. Drag the slider (using mouse Button 1) to the desired level, and then release the mouse to save and view the change in the display. To adjust the alpha level one increment at a time, click adjacent to the slider using mouse Button 1 (this is called a "single step" change). To adjust alpha level to a specific level on the slider bar, place the pointer at the desired location along the slider bar and click mouse Button 2 (this is called a "snap to" change). The alpha level can also be adjusted using the "+" and "-" keyboard shortcuts on the keyboard after the Alpha slider bar has been selected (note the box that appears around the slider bar).

Note 6: All images have default alpha level settings, but you may need to adjust them to make overlaid graphics and map backgrounds easier to see against the image.

- **Interpolate:** The Interpolate checkbox is located at the bottom of the Image Properties dialog box. To interpolate the displayed data, place the mouse cursor in the checkbox and click mouse Button 1 to place a checkmark in the box. Then observe the change in the display. To revert the display so that the data is not interpolated, click the Interpolate checkbox to remove the checkmark. Again, observe the change in the display.
- **Combine a Second Image:** The check button in the lower right corner of the Image Properties dialog box allows you to combine a second image with an image already loaded. (Refer also to

[Section 3.3.4](#), Module 4: Combining Image Products.)

- **Edit <product>**: A click on the Edit <product> menu button brings up the Image Colors Editor dialog box. The Image Colors Editor allows you to make changes to a default color table for a displayed image and to save your edits into a new color table. (Default color tables cannot be permanently changed.) Refer to [Section 2.2.9](#) for details on how to use the Image Colors Editor.
- **Combined Images**: If combined images are loaded, the name of one product is displayed above the Fade Slider Bar, and the other name is displayed below the Fade Slider Bar.
 - **Fade Slider Bar**: The Fade Slider Bar in the middle of the dialog box lets you adjust how much of each image is visible on the screen. The Fade Slider Bar works the same way as the Brightness Control Slider.

Note 7: You can fade an image using the "+" or "-" keyboard shortcuts. You can also toggle between the images using the "period" on the keyboard. Refer to Table 2.1-3 in [Section 2.1](#).

- **Brightness**: This control works in the same manner for combined images as for single images. Refer to the Brightness Control Slider paragraph above.
- **Contrast**: This control works in the same manner for combined images as for single images. Refer to the Contrast Control Slider paragraph above.
- **Alpha**: This control works in the same manner for combined images as for single images. Refer to the Alpha Control Slider paragraph above.
- **Change Color Table**: Both Color Table option menus are selectable. The top Color Table option menu corresponds to the product name displayed above the Fade Slider Bar. Similarly, the bottom Color Table option menu corresponds to the product listed below the Fade Slider Bar.
- **Set Time... :** This option allows you to set the CAVE clock, located on the bottom of the screen, to an earlier time for reviewing archived data. Selecting this option opens the Set Time dialog box. The Set Time dialog box, as shown in **Exhibit 2.2.6.4-3**, includes several options.

Note 8: All times are in Coordinated Universal Time (UTC), also known as Greenwich Mean Time (GMT) or "Z" time.

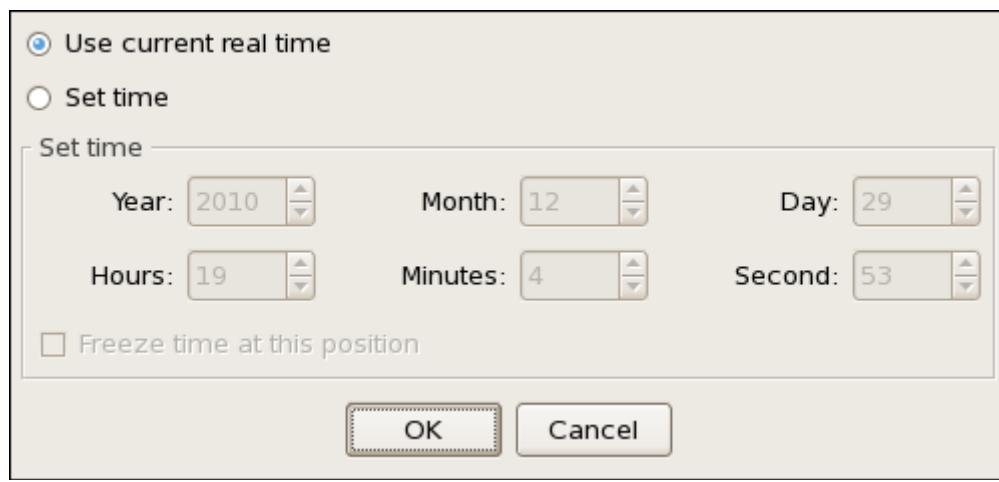


Exhibit 2.2.6.4-3. Set Time Dialog Box

- **Use current real time:** This radio button switches the CAVE clock to the current System time. The System clock, or current real time, is located on the bottom of the Panel, left side of the screen. In this mode the Set time parameter windows on the Set Time dialog box are dimmed.
- **Set time:** This option allows you to set the CAVE clock to a different year, month, day, hour, minute, and/or second. For each element, a pair of "step buttons" allows you to set the option. You can also click on the entry box and use the keyboard to enter a new value.
 - **Freeze time at this position:** This checkbox is only available when **Set time** is selected. **Freeze time at this position** stops the clock from ticking and is selected by default. If it is unchecked, the clock will be set to the specified time and then advance normally.
- **OK:** Applies the newly-selected time to the CAVE clock. If Freeze time is selected, the clock will display yellow text on a black background. If Freeze time is unselected, it will be white on black.
- **Cancel:** This menu button enables you to close the Set Time dialog box without applying the changes.
- **Set Background Color...:** You can now set the background display color on your workstation. You can also set the background display color for a single pane via mouse Button 3. The "Set Background Color for all Panes" dialog box is shown in **Exhibit 2.2.6.4-4**.

Note 9: The background color is affected by the image brightness setting. Also, the sample color and color bar annotation are always white, so samples may be difficult or impossible to read if you pick a very light background color.

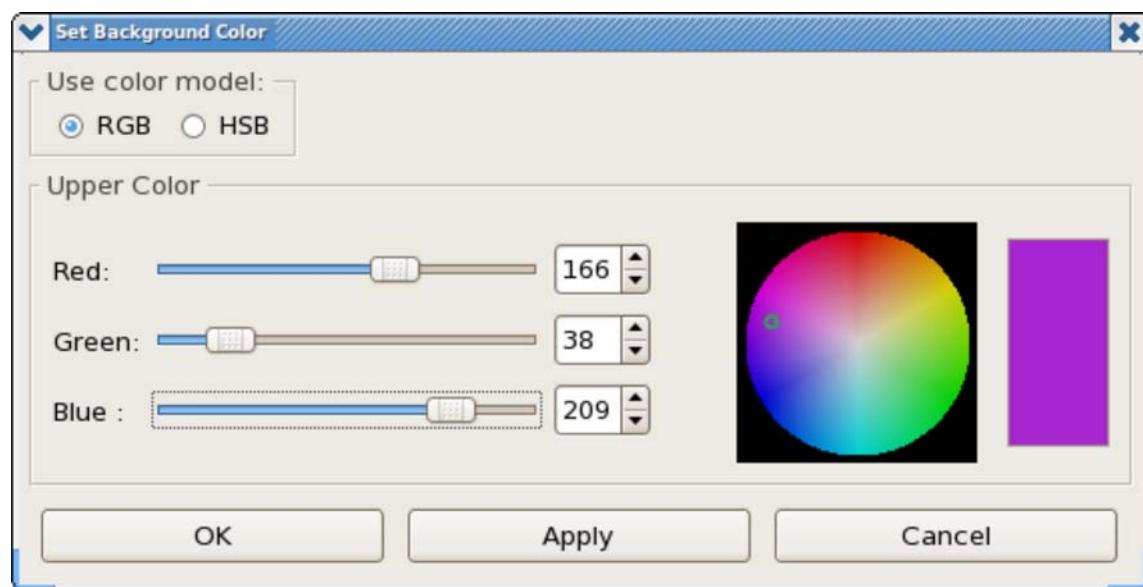


Exhibit 2.2.6.4-4. Set Background Color for All Panes Dialog Box

2.2.6.5 Tools

Refer to **Exhibit 2.2.6.5-1** for a display of the Tools menu.

Note 1: The tools are ordered alphabetically, except for Feature Following Zoom and Time Of Arrival / Lead Time, which are logically associated with Distance Speed.

Note 2: Many of the tools can be in editable or non-editable state. "Hide Legends" cannot be enabled if you want to toggle editability of any of the Tools, because you toggle using mouse Button 2 over the tool's legend.

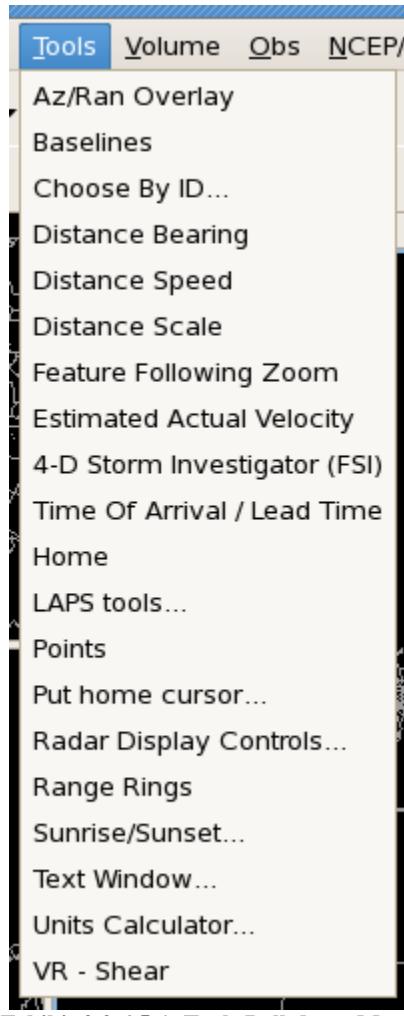


Exhibit 2.2.6.5-1. Tools Pull-down Menu

- **Az/Ran Overlay**

The Az/Ran Overlay Tool displays a movable azimuth/range radar map overlay. The overlay is in the "editable" state when displayed, and can be relocated by positioning the mouse cursor to the center of the overlay and pressing mouse Button 1 to drag the map to the desired location.

- **Baselines**

Selecting Baselines displays 10 lines, labeled A-A' to J-J', along which cross-sections can be constructed from within the Volume Browser (refer to [Section 3.2.2](#) for more information). Baselines come up editable.

Note 3: "Snapping" an Interactive Baseline: If you are zoomed in over an area when you load Interactive Baselines and no Baselines appear, press mouse Button 3 to "snap" a Baseline to where the mouse cursor is. The system chooses a Baseline that has not been recently used. If you are working with a Baseline, a second click with mouse Button 3 will return you to the original Baseline, even if you modified another Baseline in the meantime.

- **Choose By ID...**

Choose By ID, which is a function of DMD (Digital Mesocyclone Display), is a method of selecting feature locations. The tool is used to monitor the same feature at a certain location. Without the Choose By ID tool, a monitored feature (over a period of time) could move away from its monitored location and another feature could move in its place. You can use Choose By ID to set points, baselines, and "Home" for conventional locations like METARs and RAOBs (Radiosonde Observations), but its primary use is for the WSR-88D-identified mesocyclone locations. Refer to [Section 3.3.6](#) for practice modules. You can also access the Choose By ID tool from the **Tools** Menu on the Volume Browser (refer to [Section 3.2.2](#)).

- **Distance Bearing**

Selecting this tool displays six editable lines, each of which shows the azimuth and range of the labeled end of the line relative to the unlabeled end of the line. You can make the lines editable by clicking mouse Button 2 over the legend at the lower right of the display. Once in edit mode, a line can be moved as a unit and/or either of its end points can be adjusted.

- **Distance Speed**

This tool can be used to determine the speed and direction of a storm or any other meteorological feature of interest. Selecting Distance Speed displays a Centroid Marker to move to the location of the storm or feature of interest in any two or more frames of displayed imagery (e.g., a satellite or radar loop). The system then displays a storm track with the direction (degrees) and speed (knots) of movement.

When you select the Distance Speed option, the Distance Speed dialog box (not shown) opens. It contains the following options.

- **Mode:** You have the following selections from this option.
 - **Point:** A radio button that allows you to set the Centroid Marker as a single point.
 - **Polyline:** A radio button that allows you to set the Centroid Marker as a polyline.
- **Legend:** You have the following selections from this option.
 - **Time:** A radio button that allows you to display time with the Centroid Marker.

- **Speed:** A radio button that allows you to display speed with the Centroid Marker.

- **Distance Scale**

This tool can be used to determine the size of a storm or any other meteorological feature of interest.

- **Feature Following Zoom**

When you zoom in over a small area to be able to view a feature in detail, animation will often cause the feature to move into and then out of the field of view. This tool allows you to follow a feature of interest even when zoomed in to a small area.

First, you need to identify the location and motion of the feature, using Distance Speed or the WarnGen tracker. Once satisfied that the tracking icon is following the feature of interest, load this tool, and the center of the zoom area will track with the Distance Speed icon. Toggling the overlay off will resume the standard zooming behavior, and toggling it back on will reinvoke the feature following zoom.

- **Estimated Actual Velocity (EAV)**

A velocity (V) display from the radar shows only the radial component of the wind, so the indicated speed depends on the direction of the wind and the azimuth (direction) from the radar. Consider, for example, a north wind. Straight north of the radar, the full speed of the wind will be seen on the V product. As one moves around to the east of the radar, the radial component gets smaller, eventually reaching zero straight east of the radar. If the wind direction is known, then the actual wind speed can be computed by dividing the observed radial speed by the cosine of the angle between the radar radial and the actual direction. The EAV tool allows you to provide that angle and use the sampling function of the display to show the actual wind speed.

Note 4: The EAV is modeled on VR - Shear, but in this case, the vector you draw serves primarily to establish direction. While the data plotted at the endpoints and in the corner is valid, you'll use sampling to gather most of the information you seek.

- **4-D Storm Investigator (FSI)**

Using FSI, you can create and manipulate 3-dimensional radar displays. You'll find an overview of FSI in [Section 8.8](#).

- **Time Of Arrival / Lead Time**

Selecting the Time Of Arrival / Lead Time option displays a tracking line from a feature's initial starting point in a past frame to its final position in the current frame. Once the final position is set, an Arrival Point is displayed. You can drag this point anywhere along the line to get the Time Of Arrival / Lead Time and Distance. You can also change the Mode from Point to Circular Front or Polyline anywhere along the line to better represent the feature(s).

- **Home**

Selecting the Home option displays a marker, which is an "X" with the word "Home" next to it. Clicking on the Home Location Legend with mouse Button 2 makes the marker editable; drag the X or click with mouse Button 3 to change its location. When the Home Marker is displayed, use the Sample feature (press and hold mouse Button 1 while moving the pointer around the screen) to display the

range in miles and azimuth (in degrees) of the pointer location relative to the Home location. The Home Tool is also useful when selecting radar data that may be outside of your County Warning Area (CWA). Refer to [Section 2.2.6.14](#) for more details.

- **LAPS Tools...**

Two LAPS tools are available from the LAPS Tools dialog box. The first LAPS tool is the Data Used by Current Analysis, and the second tool is the Configure Analysis Domain.

- **Data Used by Current Analysis:** This tool allows you to select a given data type from the Select Type Options Menu. Even though Surface is displayed as the Select Type, you still must reselect it (or another item) to make it happen. After a moment, a report from the most recent LAPS model run is displayed and provides detailed log information of what data were included in that model run.
- **Configure Analysis Domain:** This tool provides information on the current map projection and grid spacing of the LAPS program, and allows the user to relocate the LAPS domain (constrained so as to contain your CWA). This tool has the following options:
 - **Projection:** Only the center latitude and longitude are configurable on AWIPS.
 - **Grid:** This area of the tool provides the horizontal and vertical LAPS grid spacing. It is not configurable on AWIPS.
 - **Settings:**
 - **Default:** This menu button resets the LAPS model domain to the coordinates that were used when the current AWIPS software was installed.
 - **Reset:** This menu button resets the coordinate settings to those associated with the current active analysis domain.
- **LAPS Relocator:** Another way to change the domain is to drag the centerpoint using the Graphical Relocator. By pressing the Load Menu button, the current LAPS grid domain is displayed on D2D.
 - **Load:** This menu button displays the graphical LAPS Relocator onto D2D. It is best displayed on the State or Local scale. You can drag the centerpoint anywhere within the dashed rectangular boundary. This boundary ensures that your CWA is still covered in the LAPS run.
 - **Apply:** When you click Apply, the display clears and the center location you have selected is entered in the lat/lon boxes.
- **Localize LAPS:** This option initiates the process of relocating the LAPS run with the newly defined domain coordinates. A message dialog box appears to warn you that the process can take about 10 minutes, and you may want to delay the localization to avoid interrupting the next LAPS model run.
- **Points:** Selecting Points displays 10 points, labeled A through J, from which model soundings, time-height cross-sections, time series, and variable vs. height plots can be generated using the Volume Browser. Points can also be loaded via the Points Icon on the Toolbar. As with the Baselines, the locations of these Points come up editable.

- **"Snapping" an Interactive Point:** If you are zoomed in over an area when you load Interactive Points and no Points appear, press mouse Button 3 to "snap" a Point to where the mouse cursor is. The system chooses a Point that has not been recently used. If you are currently working with a Point, then a second click with mouse Button 3 will position another Point to where your cursor is located.
 - **Dynamic Reference Map:** When you generate a sounding, a time height plot, a time series plot, or a variable vs. height plot, and a small reference map indicating the location(s) of the plotted sounding(s) are provided in the upper left corner of the Large Display. If you overlay another plot whose location is far from the original plot location, the reference map may not include this new location. To "refresh" the reference map, simply zoom in once over the reference map with mouse Button 2 and then zoom back out with mouse Button 1 (Legacy Mouse Button Functionality-AWIPS D2D). A new reference map will be generated to include all the data point locations.
- **Put Home Cursor...:** The Put Home Cursor Tool provides an easy way to locate a METAR observation station, a city and state, or a latitude/longitude coordinate. For Canada and Mexico, only the METAR observation stations and latitude/longitude coordinates are accessible. When you select Put Home Cursor from the Tools pull-down menu, the Home marker X is displayed and the Put Home Cursor dialog box opens.
- You can use the Home marker, as previously described in the Home Tool, and the new Home location (station, city/state, or latitude/longitude) is identified in the Put Home Cursor dialog box.
- Another way to use this tool is to type in the station, city and state, or latitude and longitude, and select **Go**, or hit **Enter** on the keypad, to move the Home marker to the specified location. The new location's nearest METAR site, city and state, and latitude and longitude appear in the Put Home Cursor dialog box. The Put Home Cursor dialog box contains the following options.
- **Location Selection:** There are three ways to find a desired location. Once you choose the Station, City/State, or Lat/Lon radio button, an Entry Box is activated next to the respective label within the Put Home Cursor dialog box. Enter the desired location information.
 - **Go:** A menu button that initiates the search for the desired station, city/state, or latitude/longitude. The Home marker jumps to the newly specified location.
- **Radar Display Controls...:** Refer to [Section 8.9](#) for more information on how to use the Radar Display Controls menu option.
- **Range Rings:** The Range Rings Tool displays adjustable range rings around locations of interest to your local office. When you select Range Rings from the Tools pull-down menu, the Range Rings legend appears in the Large Display Pane. The tool comes up editable, and the rangeRing dialog box (**Exhibit 2.2.6.5-2**) opens. (Clicking mouse Button 2 over the legend toggles tool editability and closes/opens the rangeRing dialog box.) Within this dialog box, you can toggle on/off any of the target locations using the square selectors. Adjust the size of the radii (in nautical miles) by typing a new value in the entry boxes associated with each location and pressing the **Apply** menu button. You can also add labels at the center of the range ring and/or at any of the radial distances using the Labels Options Menu associated with each location. Using the Movable Rings, you can add a new location at a specific point by using the Interactive Points Tool, or by typing in latitude/longitude coordinates. There is no practical limit on the number of new locations you can add to the display. The list of locations are pre-set but can be customized at a field site. In **Exhibit 2.2.6.5-2** below, Colorado Springs and Pueblo Colorado were chosen as the sample locations.

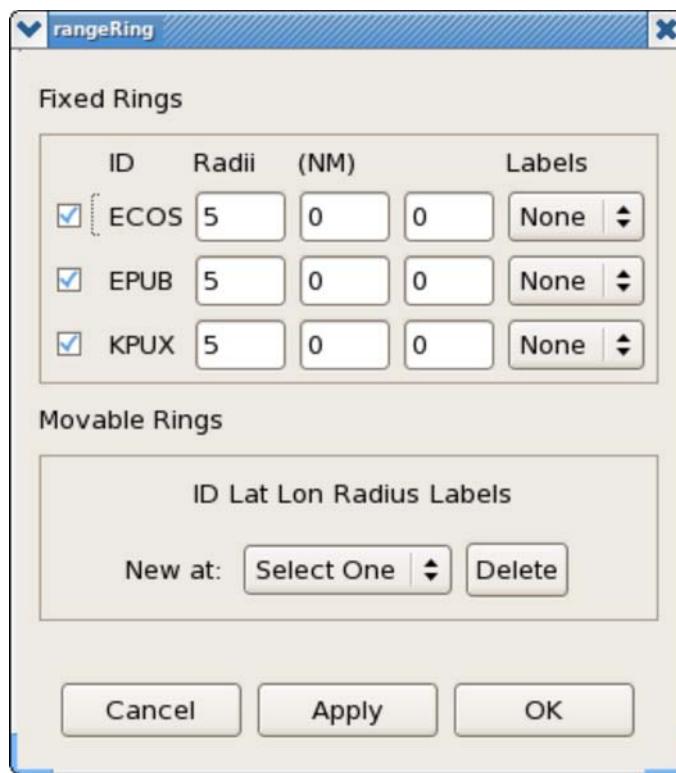


Exhibit 2.2.6.5-2. rangeRing Dialog Box

- **Sunrise/Sunset...:** By typing a date, as well as the latitude and longitude of a location into the Sunrise/Sunset Tool dialog box, you can obtain the time (for any time zone) of sunrise and sunset, as well as the total length of daylight for that date. Refer to **Exhibit 2.2.6.5-3**. Additional features include the ability to calculate the sunrise/sunset in a different hemisphere, and the azimuthal angles, relative to true north, of the sunrise and sunset.

Note 5: For an alternate method of entering latitude/longitude, you can set the location using Home, then click Set at Home location.

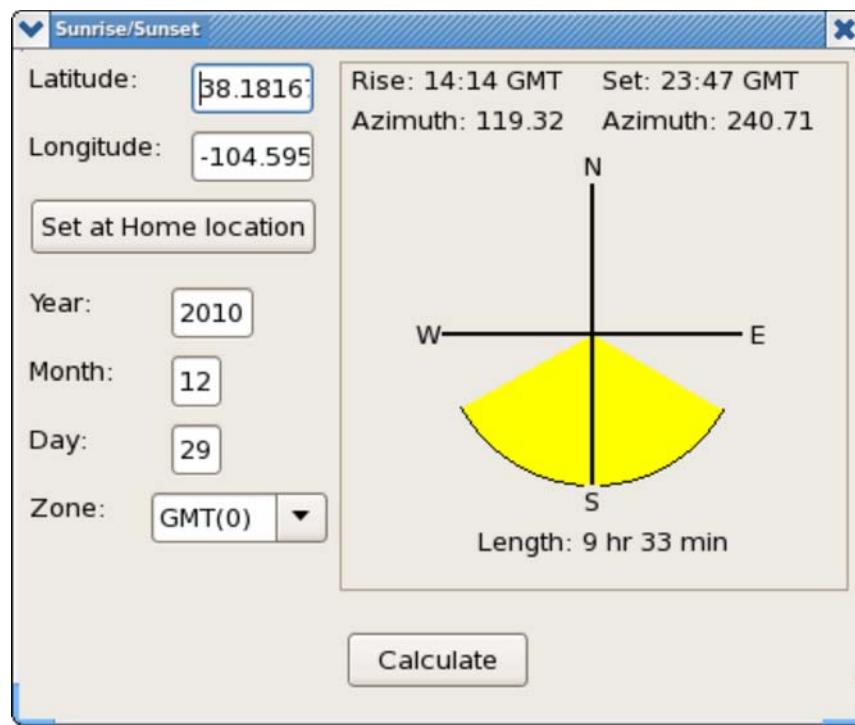


Exhibit 2.2.6.5-3. Sunrise/Sunset Tool

- **Text Window...:** Selecting this option brings up a Text Display Window that behaves in the same way, except for scripts, as a window on the Text Workstation. Refer to Text Display [Section 4](#).
- **Unit Calculator...:** This handy tool, shown in **Exhibit 2.2.6.5-4**, converts the units of the first column into differing units of the second column. The units are grouped into temperature, velocity, distance, time, and atmospheric pressure. First, simply type the number and select the units of the value you wish to convert in the first-column entry box. Then in the second column, select the desired units to which you want the original value converted. The new value will appear in the second column entry box.

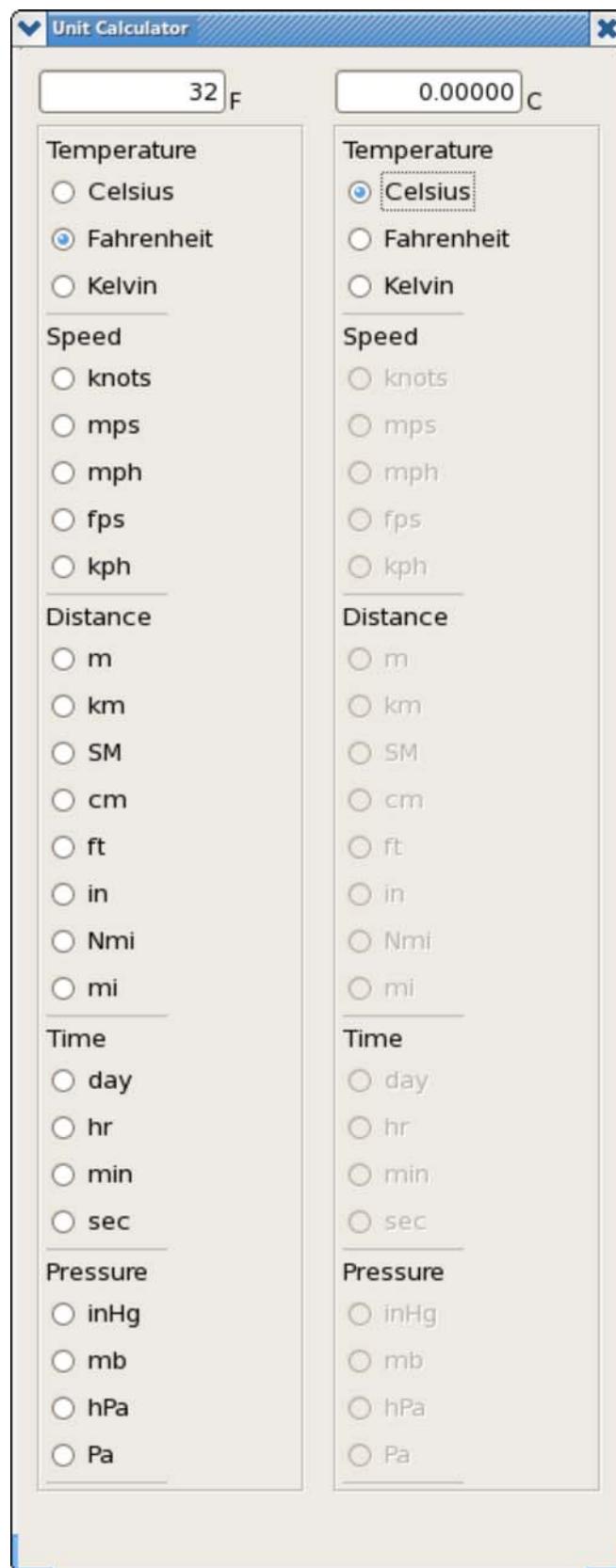


Exhibit 2.2.6.5-4. Unit Calculator

- **VR - Shear:** This tool is used in conjunction with Doppler velocity data to calculate the velocity difference (or "shear") of the data directly under the end points. As with the Baselines, this feature comes up editable and the end points can be dragged to specific gates of velocity data. When in place, the speed difference (kts), distance between end points (nautical miles), shear (s^{-1}), and distance from

radar (Nmi) are automatically plotted next to the end points and in the upper left corner of the large display pane. A positive shear value indicates cyclonic shear, while a negative value indicates anticyclonic shear. If either end point is not directly over velocity data, the phrase "no data" is reported for the shear value. This tool is also useful in determining gate-to-gate shear. Simply place the two end points directly over adjacent gates of velocity data.

- **"Snapping" VR Shear:** If you are zoomed in over an area when you load VR - Shear, and the VR - Shear Baseline does not appear, press mouse Button 3 to "snap" the Baseline to where the mouse cursor is located.
 - **VR - Shear in 4-Panel:** You can use the VR - Shear Tool when the large display is in 4-panel mode. The VR - Shear overlay is loaded in different colors for each panel. There are actually four copies of the program running, and each behaves independently. This means that you can get accurate readings in any one of the four panels — one VR - Shear panel is editable at a time. To activate, click mouse Button 2 on the VR - Shear legend in the desired panel and position the query line to the echoes of interest.
-

2.2.6.6 Volume

From the Volume Menu, as shown in **Exhibit 2.2.6.6-1**, you can open the Volume Browser (refer to [Section 3.2](#)). This option provides access to gridded data and allows you to create and generate products on demand. You can also access the Popup SkewT function from this menu.

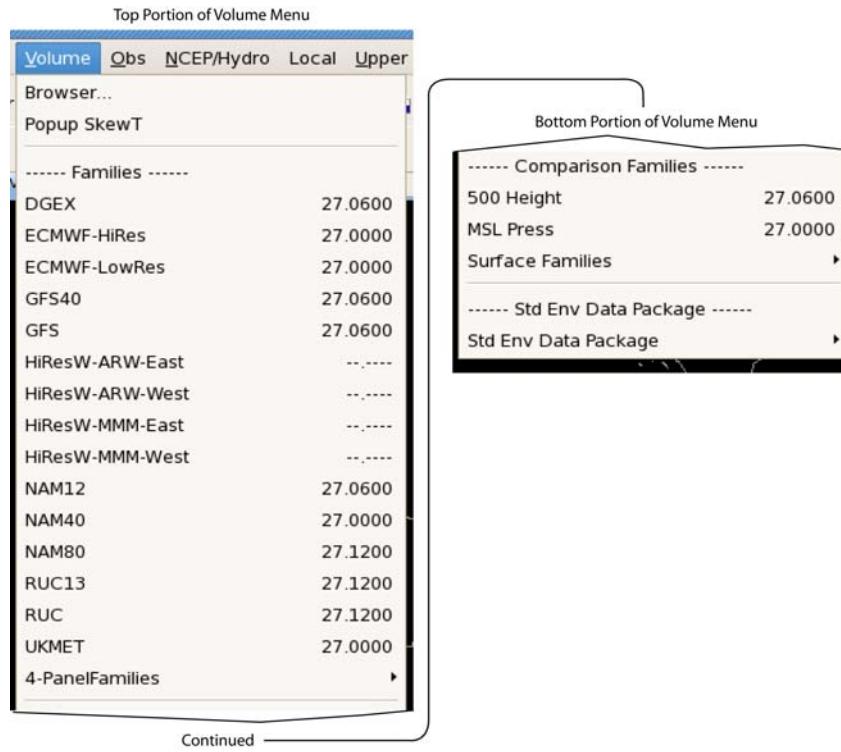


Exhibit 2.2.6.6-1. Volume Pull-down Menu

The Volume Menu is then divided into three additional sections as follows:

- **Families:** Families are preselected groups of model data that can be displayed with a single product request.

Note: Model availability is not scale dependent. ETA grids are now referred to as NAM (e.g., ETA40 would be NAM40).

- **Model Family Grids** are titled with their delivered resolution (e.g., NAM40, GFS80). In some cases, however, higher-resolution components are available, such as NAM precipitation, or different resolutions are used at different time projections, such as >168 hours on the GFS. The product label will show the actual resolution of each grid used.
- **Four-Panel Families** consist of four preselected products, or groups of products, each loaded into one of the four panels into which the large display pane is divided. In the case of Four-Panel Families, eight fields from a model family are displayed, two per panel. One field is displayed as an image, the other as a contoured graphic.

- **Comparison Families** such as Surface Families for displaying forecast surface products, which allow the user to overlay preselected models for comparison at 500 mb heights and mean sea level (MSL) pressure.
- **Std Env Data Package:** You can customize a standard set of forecast products localized to your site, as shown in **Exhibit 2.2.6.6-2**.

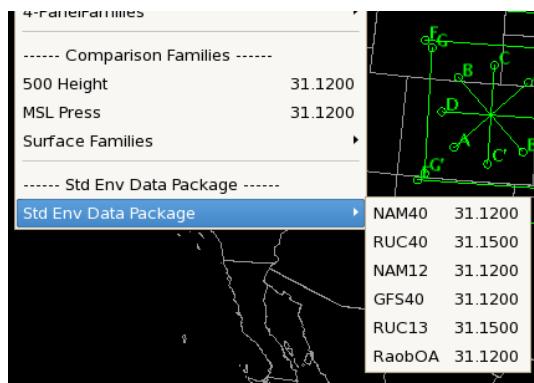


Exhibit 2.2.6.6-2. Std Env Data Package Submenu

2.2.6.7 Obs

Refer to **Exhibit 2.2.6.7-1** for a display of the Obs menu.

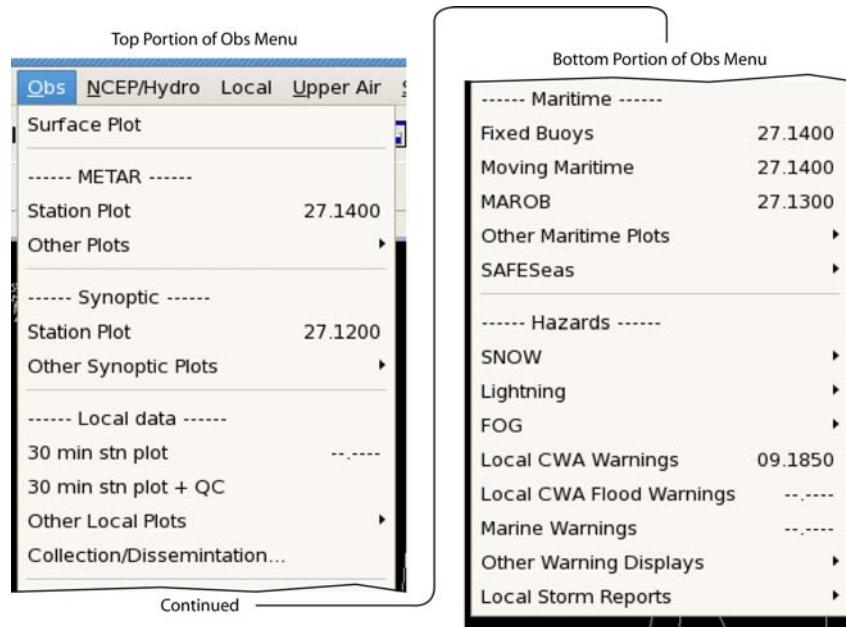


Exhibit 2.2.6.7-1. Obs Pull-down Menu

Several of the data sets in the Obs menu can be interrogated (sampled) for more detailed information by pressing mouse Button 1 over a site. These data sets include METAR, Maritime, and Local.

The Obs menu is subdivided into sections that contain related products. These sections are described below.

- **METAR:** This section contains automatically updating METAR observations, ceiling and visibility plots, wind chill and heat indices, precipitation plots at various time intervals, and quality-checked MSAS observations. The 24hr Chg METAR plot provides the difference between the observed temperature, dewpoint, pressure, and wind from those observed 24 hours earlier. The calculation of the wind difference involves vector subtraction of the u and v components.
- **Synoptic:** This section contains automatically updating Synoptic observations, and 6- and 24-hour precip plots. Note that this section of the menu is not present at most sites.
- **Local Data:** Under the Local data subheading are menu entries for local plots and precipitation plots of various time intervals, as well as the LDAD Collection/Dissemination application. The QC plot includes quality control information about LDAD-collected observations. Please refer to [Chapter 10](#) for more information on LDAD Collection/Dissemination..
- **Maritime:** This section contains buoy and ship report plots, plus SAFESEAS for the Marine WFOs.
 - **MAROB** displays include Station Plots.
 - The **Other Maritime Plots** cascading menu contains options to display the Fixed and Moving Sea State plots, MAROB Sea State and Cloud/Vis plots, Maritime Clouds/Visibility plots, as well as the Scatterometer Winds.
 - **Sea State** plots provide information on the wave period and height and swell period and height. The wave type, whether a standard wave or a wind wave, is denoted at the origin of the plot by a "+" or a "w", respectively. An "x" at the plot origin signifies that no wave type was reported. If reported, the directions of the primary and secondary swells are denoted with arrows labeled "1" and "2",

respectively. The arrows point in the direction the swell is moving. An annotated Sea State station model is shown in **Exhibit 2.2.6.7-2**.

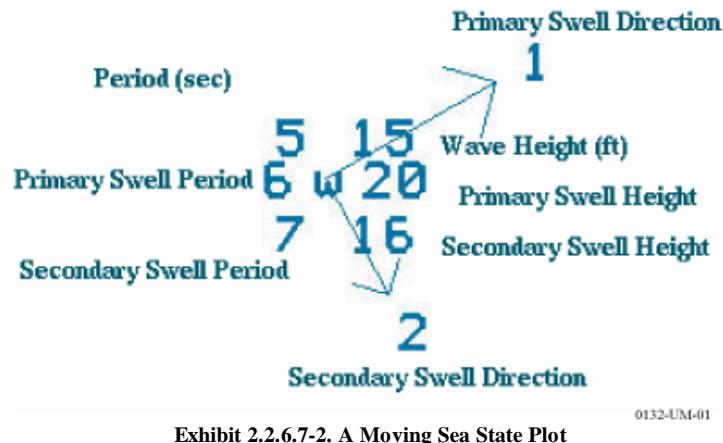


Exhibit 2.2.6.7-2. A Moving Sea State Plot

- **Maritime Clouds/Visibility** plots contain a station circle denoting sky coverage and the visibility along with standard symbols for obstructions to visibility.
- **Scatterometer Winds** are obtained from the ASCAT instrument on EUMETSAT's MetOp-A polar orbiting satellite. This instrument sends pulses of radiation to the ocean surface and measures the amount of energy, called backscatter, it receives back. When you sample these observations, the time, satellite ID, wind direction, and wind speed are provided. With the polar orbiting scanning, a given region will generally be sampled about every 12 hours.

Note 1: ASCAT Winds (25 km retrieval resolution but interpolated and displayed at 12.5 km resolution) can be launched from either the CAVE Obs menu, as shown in **Exhibit 2.2.6.7-3**, or from the Satellite menu.

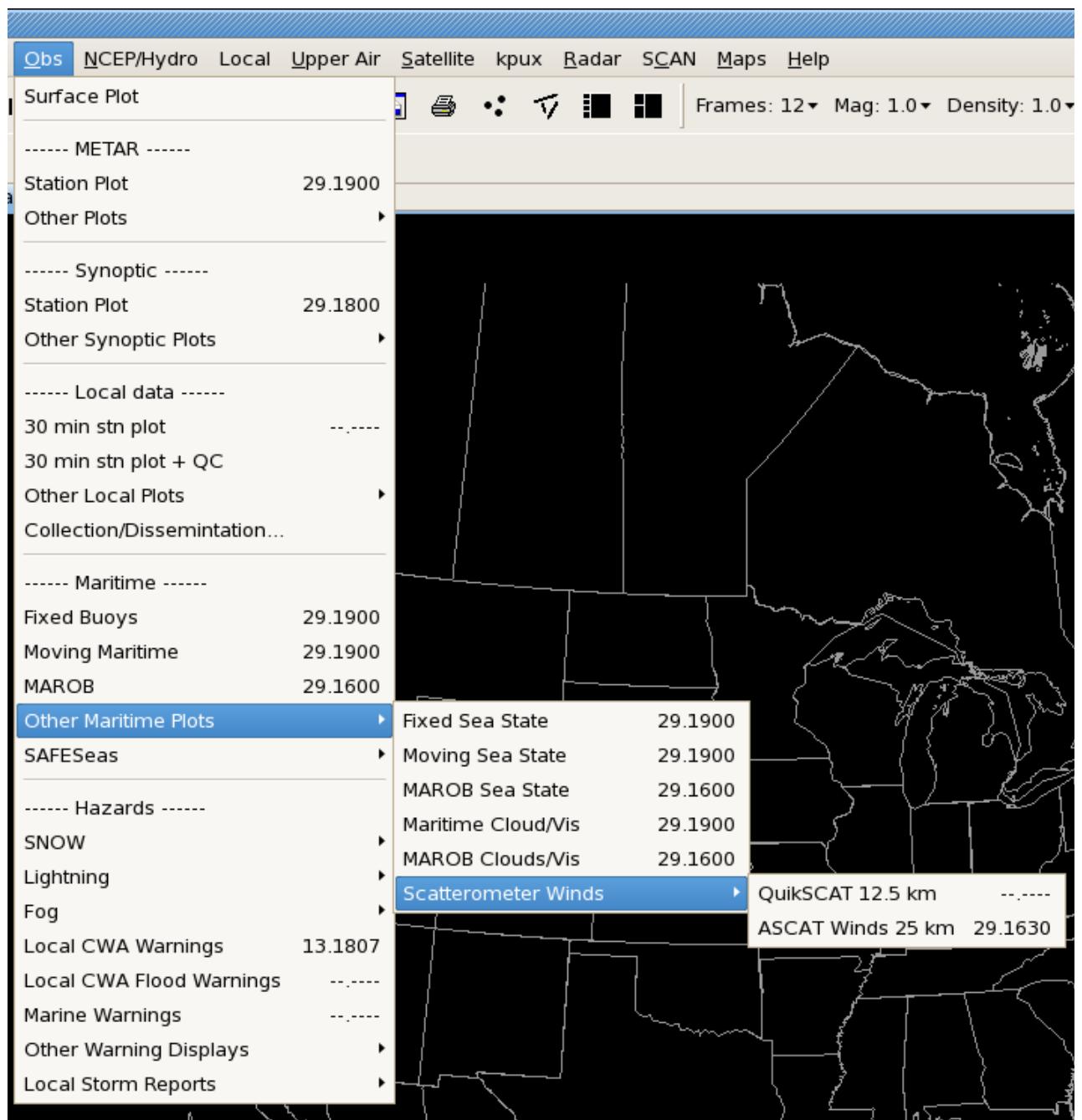


Exhibit 2.2.6.7-3. Obs Menu - Scatterometer Winds

Note 2: The QuikSCAT experimental NASA satellite ceased providing wind retrievals when it failed in November 2009. The ASCAT instrument continues to generate ocean surface wind retrievals, but from an operational satellite.

Note 3: The ASCAT Scatterometer Ocean Winds product is displayable on CAVE at all scales: N. Hemisphere, North America, CONUS, Regional, State(s), and WFO.

You can access the Scatterometer Winds menu options by selecting **Obs ▶ Other Maritime Plots ▶ Scatterometer Winds**.

- **SAFESEAS** is the System on AWIPS for Forecasting and Evaluation of Seas and Lakes. It is a set of AWIPS applications that continuously monitor marine and adjacent overland conditions for specific marine and

weather hazards. SAFESEAS helps make faster, earlier, and higher-quality decisions regarding marine watches and warnings. SAFESEAS is primarily intended to support any WFO with marine forecast responsibilities; however, non-marine WFOs also may find its monitoring capabilities to be of practical use.

The SAFESEAS menu option is available under the OBs menu's Maritime section; but only available at marine WFOs; local WFOs can be reconfigured to include this option. Refer to **Exhibit 2.2.6.7-3**, which shows the SAFESEAS menu option.

Note 4: A table of values is displayed when sampling station plots. The SAFESEAS menu has two Fog Monitoring products. These products include a Fog Monitoring Table tool and a Fog Monitor Levels color table. For more information about the Fog Monitor, refer to the [Fog Monitor User's Guide](#). You can access the Fog Monitor from the Obs menu under the Hazards section and also through the SAFESEAS monitor threat level CAVE icon on the main menu. This guide opens in Adobe® Reader®.



Refer to the separate **SAFESEAS User's Guide** for more information by clicking on the book symbol.

- **Hazards:** The Hazards section covers local and regional plots, marine warnings, local storm reports, lightning plots, and monitoring of fog and winter weather hazards.

- **SNOW:** the System for Nowcasting Of Winter weather (SNOW) is an application suite for continuously monitoring surface observations for detecting winter weather threats.



Refer to the separate **SNOW User's Guide** for more information by clicking on the book symbol.

- **Lightning:** This menu option plots cloud-to-ground (CG) lightning flashes for specified time intervals. The data is then used to determine the intensity or frequency of CG lightning accompanying a thunderstorm for a particular area.
 - **Fog:** This menu option plots the fog threat level and displays the Fog Threat Level Zone/County table. You can also access the Fog Monitor from the SAFESEAS monitor threat level CAVE icon on the main menu, only available at marine WFOs.



Refer to the separate **Fog Monitor User's Guide** for more information by clicking on the book symbol.

- **Other Warning Displays:** This section of the menu is defined locally, and may not be present at your site.
 - **Local Storm Reports:** Local Storm Report (LSR) plots are generated from spotter reports that were entered into the LSR text database and decoded into the correct point data format. The spotter reports can be displayed on CAVE on any scale, and use the symbols shown in **Exhibit 2.2.6.7-4**. Refer to the [NWS JetStream - Online School for Weather](#) for a detailed list of present weather meterological symbols.

The LSR graphical user interface (GUI) is a stand-alone AWIPS application designed to provide forecasters with an easy and quick way to create, manage, and send the LSR public text product. This text product contains noteworthy weather events for which the forecaster has either received or sought out real-time observations.

Spotter Report Symbols			
Description	Symbol	Description	Symbol
Avalanche	*	Hurricane	
Blizzard		Ice Storm	
Downburst		Lightning	
Drought	DRY	Marine Winds	Speed
Dust Storm		Microburst	
Excessive Heat	HEAT	Non-Thunderstorm Wind	
Extreme Cold	COLD	Rip Currents	RIP
Extreme Wind Chill	CHILL	Seiche	SEICHE
Flash Flood	Flood	Sleet	deep
Flood	Flood	Storm Surge	SURGE
Fog		Thunderstorm Wind	
Freeze		Tornado	
Funnel Cloud		Tropical Storm	
Hail		Waterspout	
Heavy Rain		Wildfire	FIRE
Heavy Snow	* * *	Wind Damage	+W
High Astronomical Tides	+Tide	Wind Gust	G Speed
High Wind	+W Speed		

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Exhibit 2.2.6.7-4. Spotter Report Symbols

Refer to the separate **LSR User's Guide** for more information by clicking on the book symbol.

2.2.6.8 NCEP/Hydro

Refer to **Exhibit 2.2.6.8-1** for a display of the NCEP/Hydro menu.

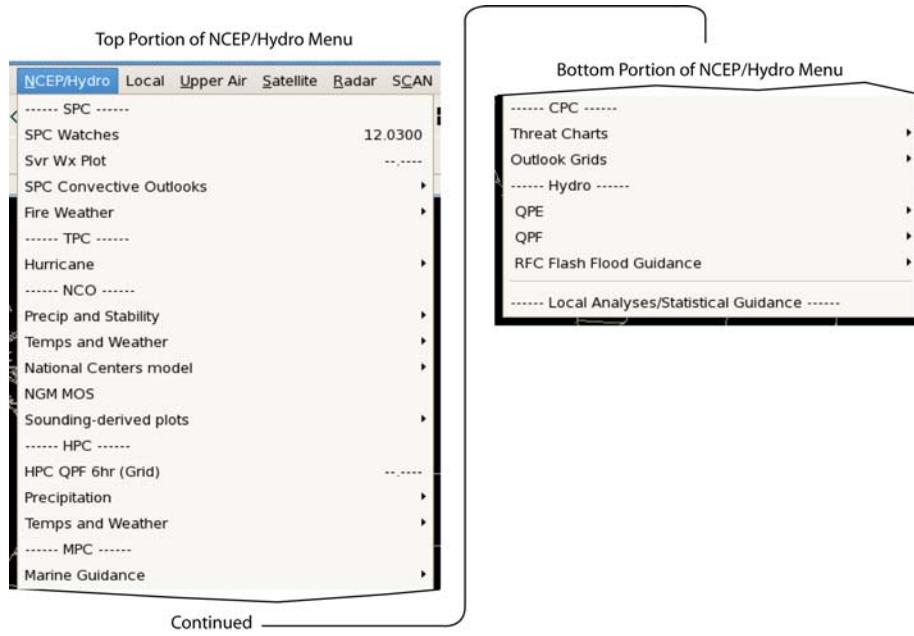


Exhibit 2.2.6.8-1. NCEP/Hydro Pull-down Menu

The NCEP/Hydro menu contains sections sections: SPC, TPC, NCO, HPC, MPC, CPC, Hydro, and Local Analyses/Statistical Guidance. Each section is further subdivided into related products, as described below.

- **SPC:** Storm Prediction Center (SPC) Watches, Severe Weather Plots, SPC Convective Outlooks, and Fire Weather information. Severe Weather Plots are extracted from the STADTS and STAHRY text products and plotted to time-match the current display. The Severe Weather Plots data set in the NCEP/Hydro Menu can be interrogated (sampled) for more detailed information by pressing mouse Button 1 over a site.
- **TPC:** Contains the hurricane submenu, which comprises graphic products that display the Marine/Tropical Cyclone Advisory (TCM), the Public Tropical Cyclone Advisory (TCP), hourly forecasts, and model guidance.
- **NCO:** Contains Precip & Stability, Temps & Weather, National Centers model, NGM MOS (NGM-based MOS system), and the following Sounding-derived plots submenus described below.
 - **Precip & Stability:** This submenu contains precipitation, radar, and stability products.
 - **Temps & Weather:** This submenu contains Max/Min temperature, freezing level, weather depiction, and surface geostrophic wind and relative vorticity plots.
 - **National Centers Models:** This submenu contains model guidance from the National Centers.
 - **Sounding-derived plots:** The Sounding-derived plots submenu contains options to display model soundings (sometimes called "BUFR soundings" because they are packaged in BUFR format for

transmission). These are soundings extracted directly from the model, including all levels not generated from the pressure-level grids used elsewhere in the system.

- **Sounding Availability:** This option displays the sounding locations (shown with asterisks) available from the latest model run; typically these locations coincide with TAF (Terminal Aerodrome Forecast) locations. The plot will update with each model run. Because the sounding data are quite voluminous, only soundings over your State(s) scale are saved.
- **Surface:** The Surface Plots, which mimic the METAR Surface Plots, are taken from the model-derived soundings and provide hourly forecast surface plots. Because you cannot see all forecast projections in a 32-frame loop (e.g., displaying the entire North American Model (NAM) or Global Forecasting System (GFS) run would require 61 frames), you will probably want to use the Time Options Tool (refer to [Section 2.2.6.4](#)) to view a subset of the forecast -- perhaps a continuous run of hours or every other hour for the whole run.
- **Ceiling/Visibility:** The "Ceil/Vis Plot" is illustrated in **Exhibit 2.2.6.8-2**. It shows weather (rain, frz rain, snow) on the right, a stack of three cloud layers above, and visibility below the METAR station. The cloud layers are defined as low (990mb-640mb), mid (640mb-350mb), and high (<350mb). Each cloud layer shows a coverage circle with clear, sct, bkn, and ovc options. Next to one of the circles may be a cloud base. The cloud base is sent as a pressure, but is plotted in hft MSL based on a Standard Atmosphere conversion. Because the cloud layers and the cloud base are generated from separate algorithms at NCEP (National Centers for Environmental Prediction), it is possible to have broken or overcast clouds indicated but no base; alternatively, the base may be shown with a high overcast, while ignoring a mid broken layer. Also, a cloud base is reported if convective precipitation is indicated, even for only 10-20% cloud cover. As a result, one can see a cloud base associated with scattered clouds.

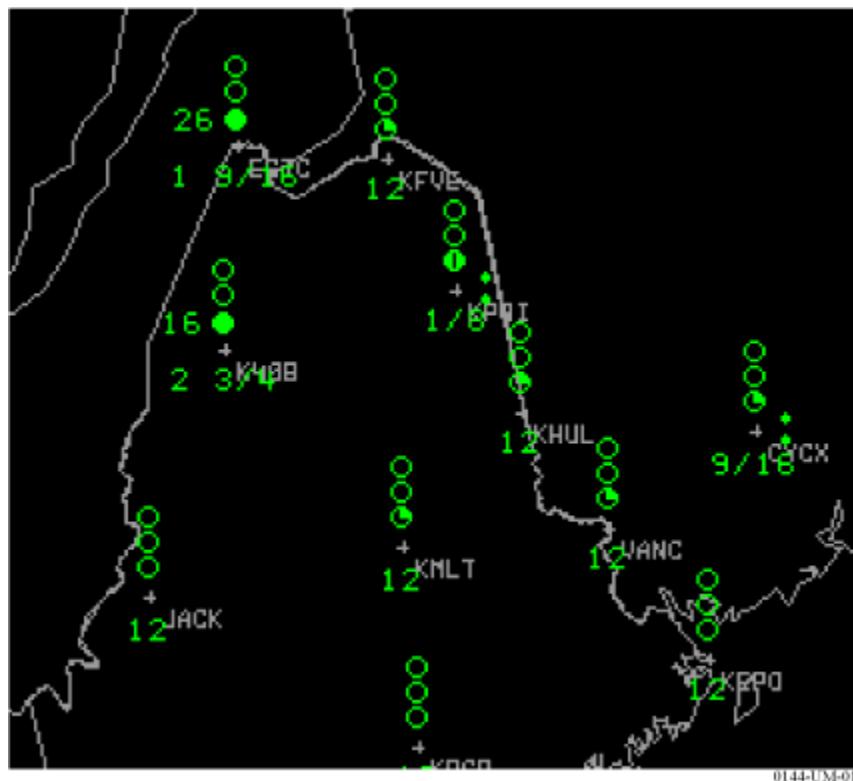


Exhibit 2.2.6.8-2. Example of a Ceil/Vis Plot

- **1-Hr and 3-Hr Precip Amt:** This option shows hourly amounts for NAM and 3-hour

intervals for GFS at each location.

- **Cloud Layers:** This option will display the amount of low, middle, and high cloud cover, each as a standard sky coverage symbol, and weather type as a weather symbol.
- **HPC:** Contains 6-hour QPF (Quantitative Precipitation Forecast) data plus the submenus, described below, for Precipitation and Temps & Weather products.
 - **Precipitation:** This submenu contains probabilities of daily precipitation, precipitation accumulation, and probabilities of daily snowfall. In addition, this submenu enables you to display QPF projections for 1 to 3 days in 6-hour increments, 4 to 5 days in 48-hour increments, and 1 to 5 days in 120-hour increments. The HPC Excessive Rainfall product consists of a contour graphic and image of the excessive rainfall for day 1 (with forecast times of 21, 24, 27, or 30 hours), and days 2 and 3 (both with forecast times of 48 and 72 hours). The HPC product will update the selected forecast cycle twice per day.
 - **Temps & Weather:** This submenu contains daily Max/Min temperature anomalies, daily heat index probabilities, and pressure and frontal analysis.
- **MPC:** The Marine Prediction Center (MPC) is now called the Ocean Prediction Center (OPC). It contains the Marine Guidance submenu, which includes marine analyses and model guidance.
- **CPC:** Contains threat charts and outlook grids derived from the submenus listed below.
 - **Threat Charts:** This submenu contains drought monitoring data, daily threats assessment, and daily heat index forecasts.
 - **Outlook Grids:** This submenu contains temperature and precipitation probabilities.
- **Hydro:** Hydro contains QPE, QPF, and RFC Flash Flood Guidance submenus. Hydro Applications, such as HydroView and MPE Editor, are loaded from the Perspectives dialog (Hydro and MPE, respectively) or from the HydroApps menu in the Hydro(View) Perspective (Hydrobase, RiverPro, XDAT, Forecast Service, River Monitor, Precip Monitor, SSHP and Dam Catalog).
 - **QPE:** Mosaic images of RFC-generated Quantitative Precipitation Estimator (QPE) and the Multisensor Precipitation Estimator (MPE) grids, which are displayed using a 'truncated' grid color table that shows zero values in gray to let you see the limits of the site-specified domain, are available from the QPE submenu. These mosaic images are generated by the RFCs in 1-, 6-, and 24-hour cycles. The MPE grids can be displayed as local contours or images.
 - NESDIS produces two types of Satellite Precipitation Estimates (SPE) based on GOES (Geostationary Operational Environmental Satellite) imagery series: Auto SPEs and Manual SPEs. Auto SPEs, which can be displayed directly from the QPE submenu, are produced hourly based on the most recent one-hour series of IR GOES imagery. This product is displayable on any AWIPS scale. The Auto SPE estimates are displayed in units of inches of precipitation that fell during the specified one-hour period.
 - Manual SPEs are accessible through the Manual SPE submenu. You can access the Manual SPE submenu from the QPE submenu. Generation of these products requires substantial manual intervention by NESDIS personnel; consequently, these products are generated and distributed to AWIPS at variable frequencies, as significant precipitation events warrant (i.e., their frequency is variable). The duration (or valid period) of the Manual SPEs is also variable. Whereas the duration of Auto SPEs is always one hour, the duration of the

Manual SPEs ranges from 1 to 12 hours. Furthermore, although each Manual SPE product is mapped to a CONUS grid, the area of analysis is usually regional (focusing on the significant precipitation event). Apart from these important differences, the Manual SPEs are very similar to the Auto SPEs.

- **QPF:** The River Forecast Centers (RFC) issue QPF, indicating how much precipitation will occur in a particular grid. They display as contours by default, but from the pop-up menu you can convert them to image form.
- **RFC Flash Flood Guidance:** County and Zone Flash Flood Guidance grids are available and can be displayed on any scale using the RFC Flash Flood Guidance (FFG) submenu. The area for which the data are displayed is limited, but the site system manager may configure a larger area. In addition, 1h, 3h, and 6h mosaic RFC-generated FFG grids can be displayed for both local and other RFC locations.

Note: Refer to documentation prepared by the NWS' Office of Hydrology for more information on hydro products.

- **Local Analyses/Statistical Guidance:** Model Output Statistical (MOS) plots derived from the MOS BUFR and Text Bulletins display forecast data for GFS MOS, GFS-Extended MOS, Eta MOS, and NGM MOS. The plots are accessed by selecting NGM or GFS-LAMP/MOS forecasts under the Local Analyses/Statistical Guidance option.
-

2.2.6.9 Local

The Local menu is shown in **Exhibit 2.2.6.9-1**. Each section is further subdivided into related products. A description of each section follows.

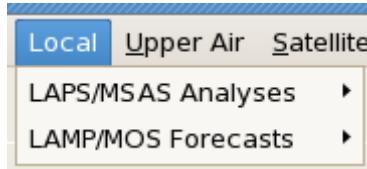


Exhibit 2.2.6.9-1. Local Pull-down Menu

- **LAPS/MSAS Analyses:** Contains the LAPS and MSAS analyses described below.
 - **LAPS:** The Local Analysis and Prediction System (LAPS) analysis component is currently included in CAVE, but the predictive component is planned for a later build. The LAPS analysis grid is 10 km and covers an area slightly larger than the WFO scale. The contour intervals are not specifiable, but you can use the Density function to increase/decrease the number of contours.

➤ To access the LAPS grids

- With any scale displayed, from the **Local** menu, select **LAPS/MSAS Analyses ▶ LAPS**.

Note 1: You can also access LAPS grids from the **Grid** menu in the **Volume Browser**.

The LAPS application runs on px1 as a cron from 20 minutes to 45 minutes after the hour. Because of its size, LAPS does not run if the application server is failed over.

The LAPS modules included in AWIPS are surface, temperature, humidity, cloud, wind, derived parameters, and soil parameters. These modules use a mixture of required and optional data to prepare their products. If a LAPS module's required data are not present, that LAPS module does not run. If a LAPS module's optional data are not present, that LAPS module will still run.

LAPS uses the following data:

- Rapid Update Cycle (RUC) forecast model data
- Satellite imagery (GOES-East or GOES-West)
- METAR observations
- Profiler data (only used by Midwest sites)
- Surface buoy/ship reports
- Radar reflectivity

If the required data are present and the optional data are not, the LAPS module runs, creating the LAPS products without the optional data. It is possible for LAPS products to vary from hour to hour, and from site to site, depending on data availability. See Table 2.2.6.9-1 for further details of required and optional data.

Table 2.2.6.9-1. LAPS Modules With Required and Optional Data

Module	Required	Optional
surface	Surface METAR Observations	Satellite imagery (WV, 11 and 12 IR) Model Background (RUC or NAM) Completion of cloud module Previous run of surface module Previous run of wind module
cloud	Surface METAR Observations Satellite imagery (WV, 11 and 12 IR) Model Background (RUC or NAM) Completion of surface module Completion of temp module	Completion of soil module
humid	Model Background (RUC or NAM) Completion of temp module	Satellite imagery (WV, 11 and 12 IR) Completion of Surface Module Completion of Cloud Module
temp	Model Background (RUC or NAM) Completion of surface module	
wind	Model Background (RUC or NAM) Surface METAR Observations	Profiler (Midwest only) Completion of surface module Completion of temp module
soil	Completion of surface module Completion of temp module	Previous run of soil module
deriv	Completion of temp module Completion of cloud module	Surface METAR Observations Completion of cloud module Completion of humid module Completion of wind module

- **MSAS (MAPS):** The Mesoscale Analysis and Prediction System (MAPS) Surface Assimilation System (MSAS) was built to exploit the spatial density and temporal frequency of surface data by providing timely and detailed surface analyses. It currently provides hourly analyses on a 40-km grid covering the 48 contiguous states and neighboring areas of Canada and Mexico and uses persistence (the previous hourly analysis) as the background for the current analysis.

One-hour persistence provides a fairly accurate forecast and allows for the incorporation of previous surface observations into the analysis. More importantly, it assures continuity between analyses, especially near stations that report less frequently than hourly. Persistence, however, cannot be used in data-void or data-sparse areas such as oceans. In these regions, gridded data from NCEP's NAM model are used as a background to ensure that the analysis does not stray far from reality. The NAM grids are linearly combined with 1-hour persistence, using weights calculated to produce a persistence forecast over data-dense areas, a model forecast over data-sparse areas, and a smooth transition between the two areas.

Because rough terrain can complicate the analysis of surface variables, MSAS attempts to obtain analyses with improved spatial continuity from mountainous observations through careful choice of analysis methods and variables. MSAS incorporates elevation and potential temperature differences in the correlation functions used to model the spatial correlation of the surface observations. The resulting functions help to take into account physical blocking by mountainous terrain and improve the representation of surface gradients. In addition, MSAS analysis variables

were chosen, whenever possible, so as to minimize the effects of varying terrain. Potential temperature, for instance, is analyzed instead of surface temperature because it varies more smoothly over mountainous terrain when the boundary layer is relatively deep and well mixed.

The major MSAS pressure variable is sea level pressure, computed at each station from altimeter setting observations. Station pressures calculated from the altimeter settings are reduced to sea level and the 700-mb NAM temperature is used to estimate an effective surface temperature. This reduction generally provides smoother regional, diurnal, and seasonal variation because it avoids the use of actual surface temperatures, which are often unrepresentative of the surrounding conditions. Moreover, additional data are available for analysis of the MSAS reduction because more stations report altimeter setting than report sea level pressure.

MSAS utilizes most surface observations contained in its domain. These include METARS, surface reports from fixed buoys, and the NOAA Profiler Network, as well as surface observations from any local mesonets ingested through the LDAD system (refer to [Section 10](#)). Observations failing the automated quality control checks implemented by the Quality Control and Monitoring System (QCMS) (refer to [Section 11](#)), or listed in the QCMS subjective reject list, are not ingested or analyzed by MSAS.

➤ To access MSAS Grids:

- From the Local menu, select **LAPS/MSAS Analyses ► MSAS (MAPS)**.

➤ To access MSAS Observations

- In addition to MSAS gridded output, AWIPS has the ability to display the observations used in each MSAS analysis. The displays consist of color-coded observation plots. Pressing mouse Button 1 on any observation gives the station ID associated with the observation. Observations ingested by MSAS, but not used due to Quality Control (QC) failures, are distinctly colored. Pressing mouse Button 1 on these observations invokes the display of a small QC table indicating which QC checks have failed. **Exhibit 2.2.6.9-2** shows an example of a MSAS QC table.

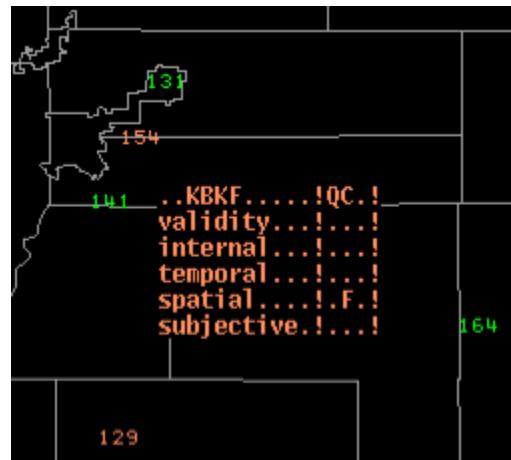


Exhibit 2.2.6.9-2. Example of a MSAS QC Table Accessible Through the CAVE NCEP/Hydro Menu

The observation either failed (F) the automated checks or was labeled bad (B) through the subjective intervention procedures. See [Section 10](#) on the AWIPS QCMS for more information on the QC procedures.

- **LAMP/MOS Forecasts:** Contains the IFPS, GFSLAMP, and MOS forecast options. Descriptions of these options follow.
 - **IFPS:** The Interactive Forecast Preparation System (IFPS) Station Plot, accessible from the **Local ▶ LAMP/MOS Forecast** submenu, allows you to view the forecast data stored in the PostGresql database by IFPS. The two available plots are for 3-hour and 12-hour forecast intervals, each of which displays slightly different data. **Exhibit 2.2.6.9-3** illustrates the attributes that are rendered on the 3-hour and 12-hour station plots.

Note 2: These data are available for those sites using IFPS.

Note 3: This station plot paradigm is not the standard METAR format.

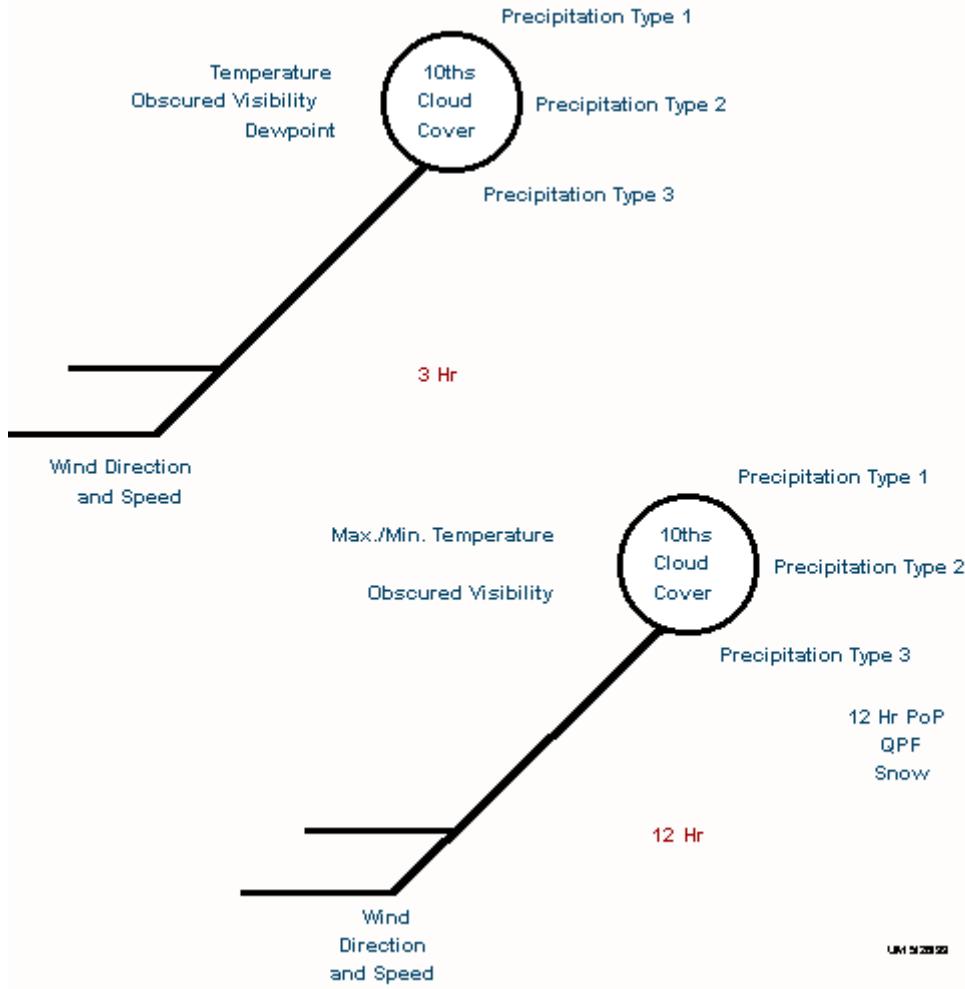


Exhibit 2.2.6.9-3. 3-Hour and 12-Hour IFPS Station Plots

- **GFSLAMP:** The Localized Aviation MOS Program (LAMP) is referred to here as GFSLAMP. GFSLAMP consists of a series of programs to analyze hourly weather data, run simple numerical models, evaluate statistical forecast equations, and display the resulting information. The statistical forecasts are produced by multiple linear regression equations that combine information from the central GFS-MOS guidance, local model output, and the most recent hourly surface observations. GFSLAMP guidance updates each hour by using the latest observational

information and also furnishes forecasts for hourly projections for over 1500 stations in the CONUS, Hawaii, Alaska, Puerto Rico, and the Virgin Islands with a record of hourly data.

GFSLAMP provides hourly forecasts for up to 25 projections at locations currently receiving GFS-MOS guidance.

The three simple numerical models used in GFSLAMP provide advective forecasts of sea level pressure, saturation deficit, and variables such as surface temperature and cloud amount. These models are driven by NCEP's GFS model.

Two types of GFSLAMP plots are available within CAVE. They are GFSLAMP Station Plot and GFSLAMP Ceiling and Visibility Station Plot. Each can be accessed by selecting a GFSLAMP option from the **Local ▶ LAMP/MOS Forecasts** submenu.

Each GFSLAMP plot displays its forecast data in station model plot format.

Note 4: You can also access GFSLAMP grids from the **Grid** menu in the **Volume Browser**. Refer to [Section 3.2](#) for more information about accessing grids in the Volume Browser.

- **Accessing the GFSLAMP Time Series:** The GFSLAMP time series can be accessed through the volume browser. See [Section 3.2.2](#) for information on displaying time series plots through the volume browser.
- **Using Various Load Modes:** All load modes are supported for the GFSLAMP station and GFSLAMP ceiling and visibility plots.
- **MOS:** Model Output Statistics. These plots are derived from the MOS BUFR Bulletins. The previous MOS plots were derived from the MOS Text Bulletins.

Note 5: The MOS Plots are accessed by selecting NGM or GFS-LAMP/MOS forecasts under the Local Analyses/Statistical Guidance heading of the NCEP/Hydro pull-down menu.

- The plots display forecast data for GFS MOS, GFS-Extended MOS, and NGM MOS. Submenus under each model reveal the element choices. These displays include:
 - Station Model Plots (Wind, T, Td, Sky Cover, Wx)
 - MaxT/MinT (°F)
 - Ceiling (agl) / Visibility (ft × 100) (Categorical)
 - Probabilities Submenu (6h/12h PoP, 6h/12h Tstorm, 6h/12h Svr-Tstorm, Conditional precipitation types; %)
 - QPF 12h (Categorical mid-points; inches)
 - QPF 6h (Categorical mid-points; inches)

- Snowfall (6h/12h/24h, Categorical; inches)

You can access the MOS forecasts from the Volume Browser. Refer to [Section 3.2](#) for more information about accessing GFSLAMP guidance through the Volume Browser.

2.2.6.10 Upper Air

The Upper Air pull-down menu, shown in **Exhibit 2.2.6.10-1**, is located on the CAVE menu bar. It provides access to upper air plots, profiler data, radar plan-view and perspective displays of winds, and aircraft and rawinsonde data. Nearby Radiosonde Observations (RAOB) are also included on the menu to provide easy viewing of upper air data.

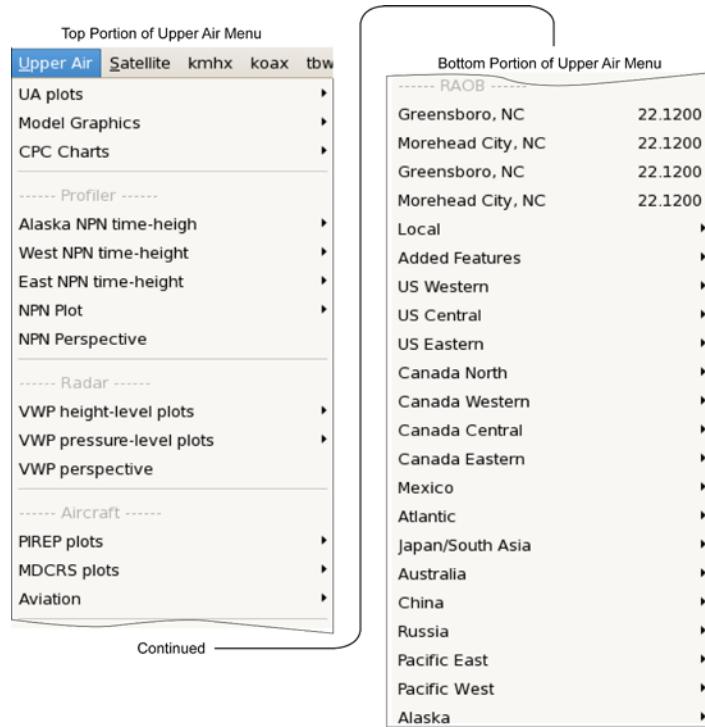


Exhibit 2.2.6.10-1. Upper Air Pull-down Menu

- **Aircraft:** The Aircraft option, as shown in **Exhibit 2.2.6.10-1**, provides access to the following products:
 - **PIREP plots:** The Aircraft data include Low-, Mid-, and High-level Pilot Weather Report (PIREP) observations. The display plots the temperature, aircraft identifier, wind speed and direction, significant weather, and the flight level (in feet). Pilot reports are critical for air safety. Pilots reporting the conditions they are experiencing show up in a matter of minutes on AWIPS. Weather conditions can change quickly, and there is nothing like having a pilot report to provide a bird's eye view of what it is really like up there. PIREPs may validate forecast conditions, or they may describe real-time weather that varies from them.
 - **MDCRS plots:** Meteorological Data Collection and Reporting System (MDCRS) data include plan-view plots for various 5kft layers and ascent/descent soundings. Using the availability plots (Upper Air menu under MDCRS plots) and ACARS Airports from the Maps menu button, as shown in **Exhibit 2.2.6.10-2**, you can locate airports that have available soundings. ACARS Airports provides an illustration of locations of airports, but it is not necessary to use it. The "+" sign means a temperature sounding and the "*" means a

temperature and dewpoint sounding. To see a sounding at a location, simply press the Points menu button. Several points from letters of the alphabet will appear on the map display. To view a sounding, drag one of the points/letters to a "+" or "*" location. From the menu bar press Volume and then Browser. From the Volume Browser select MDCRS for Source, Sounding for Fields and select the letter/point on the desired location for Points. Click on your selection in the Product Selection List and then press the Load button to view the sounding.

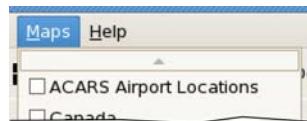


Exhibit 2.2.6.10-2. ACARS Airports Option on Maps Pull-down Menu

Note 1: A zoomable inset map (NW corner) is available to show the location of the sounding. When you zoom in (mouse Button 2), the flight track of the ascent/descent sounding is shown on the map. In addition, you can sample the flight track to see the time and elevation. To zoom out, press Button 1. This inset map (and also those on var vs. height displays, cross sections, and cell trends) can be suppressed by setting the global density (i.e., from the tool bar) at less than 1.

- **Aviation:** The Aviation pull-right menu provides access to aviation products and qualifying information:
 - **National Convective Weather Forecast (NCWF):** The NCWF is information suitable for the graphical depiction of hazardous convection. The NCWF contains both GRIB and BUFR output. The GRIB output delineates the current convection. The BUFR output includes hazardous convection area polygons, movement arrows, and storm top and speed text information.
 - **Collaborative Convective Forecast Product (CCFP):** The CCFP is alpha-numeric information suitable for the graphical depiction of forecast areas of significant thunderstorms. The CCFP message covers the CONUS area, and includes information on the location of thunderstorm areas, and associated information such as storm tops, coverage, confidence, and direction/speed of movement. The CCFP contains a 2-, 4-, and 6-hour forecast issued by the AWC between 1 March and 30 October, eleven times per day.
 - **Significant Meteorological Information (SIGMET):** The SIGMET, as shown in **Exhibit 2.2.6.10-3**, is an alpha-numeric message describing specific aviation hazard conditions between the surface and 45,000 feet (FL450). A SIGMET includes information about the location of the hazard using VOR locations. SIGMETs are produced on an as-needed basis at the AWC and are distributed on the SBN.



UM/2_1_6_9-4.png

Exhibit 2.2.6.10-3. Example of a SIGMET Message

Note 2: Plots associated with significant weather conditions include icing severity and significant weather turbulence, as shown in **Exhibits 2.2.6.10-4 and 2.2.6.10-5.**

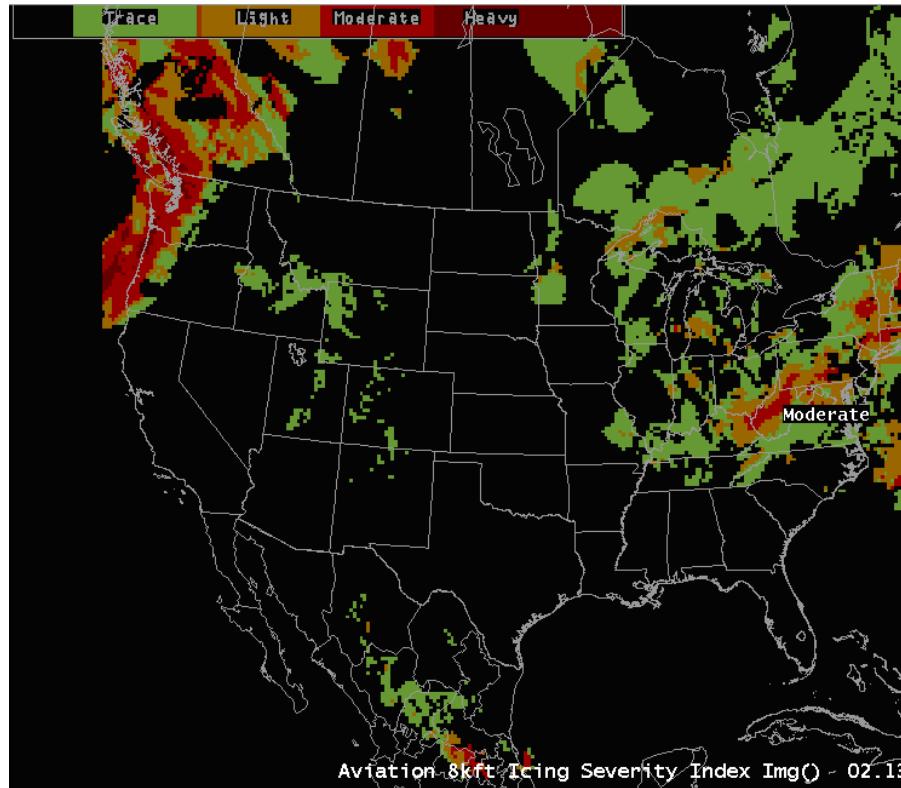


Exhibit 2.2.6.10-4. Aviation Icing Severity Plot

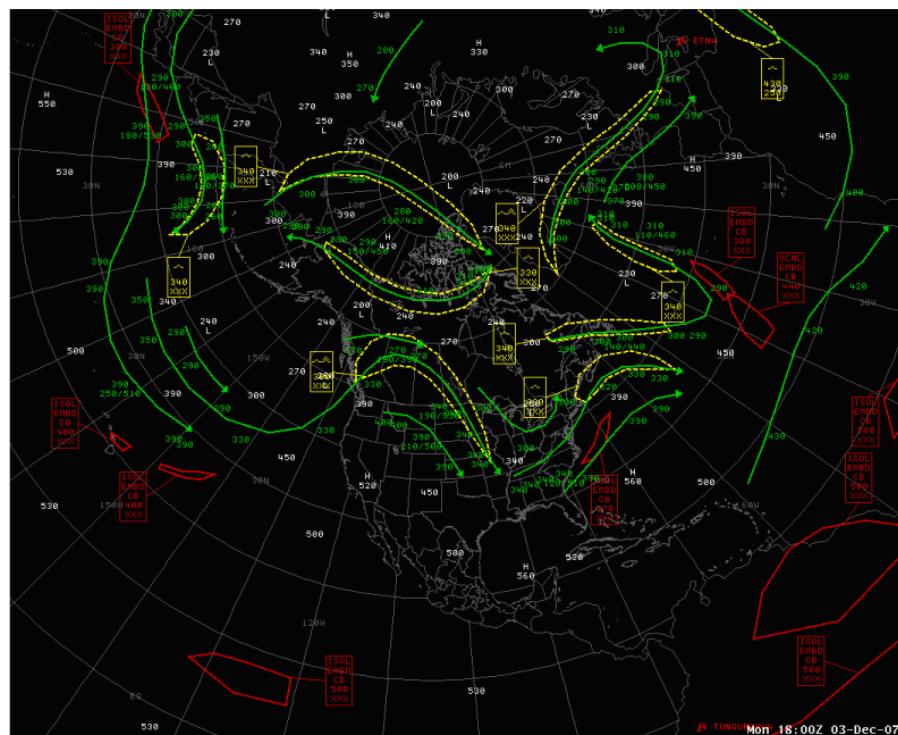


Exhibit 2.2.6.10-5. Aviation Turbulence Plot

- **Airmen's Meteorological Information (AIRMET):** An AIRMET is an alpha-numeric message, such as that shown in **Exhibit 2.2.6.10-6**. AIRMET Messages describe specific aviation hazard conditions between the surface and 45,000 feet (FL450), not requiring the issuance of a SIGMET. An AIRMET includes information about the location of the hazard using VOR locations. AIRMETs are produced every 6 hours at the AWC for the CONUS area, and are distributed on the SBN.

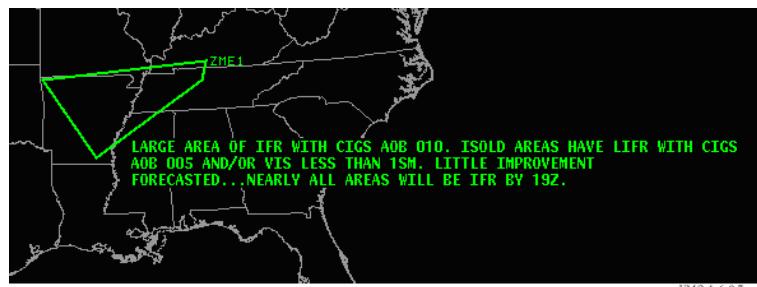


Exhibit 2.2.6.10-6. Example of an AIRMET Message

- **RAOB:** RAOB data are plotted on the standard skew-T log-p thermodynamic diagram. A small reference map indicating the location(s) of the plotted sounding(s) is provided in the upper left corner of the main display pane, as shown in **Exhibit 2.2.6.10-7**.

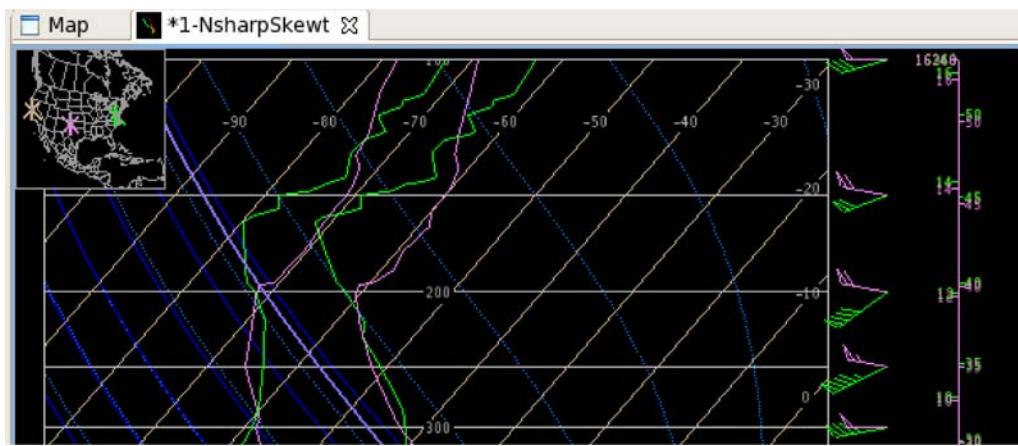


Exhibit 2.2.6.10-7. Skew-T Reference Map Indicating Locations of Plotted Soundings

Note 3: If you overlay another skew-T whose location is far from the original sounding location, the reference map updates to show both locations, as shown in **Exhibit 2.2.6.10-7.**

The Interactive NsharpSkewt Program plots and derives quantities on a skew-T log-p diagram and on a hodograph. You can edit the skew-T and hodograph data and obtain instantaneous information on the modified data. To start the Interactive NsharpSkewt Program refer to [Chapter 7](#).

Also plotted on the standard skew-T log-p thermodynamic diagram is the lifted parcel trajectory, displayed on zoom factors greater than 1. For a 12Z sounding, the parcel trajectory is computed based on a surface parcel temperature represented by the forecast maximum temperature for that sounding. At all other observation times, the surface parcel temperature is represented by an average temperature and dewpoint through the lowest 50 mb of the sounding. For the 00Z soundings, the temperature and dewpoint are represented as a low-level (50 mb) mean. For the 12Z soundings, the forecast maximum temperature is used as the "modified" parcel temperature, with the surface dewpoint temperature as the parcel dewpoint. The parameters affected by these modified values are noted with asterisks in the second column of the parameters list on the sounding plot.

The MDPI (Microburst-Day Potential Index) and the WINDEX (Wind Index) determine whether the environment is favorable for microburst development. The MDPI utilizes vertical profiles of environmental equivalent potential temperature, while the WINDEX predicts the maximum expected gust possible for a given environmental sounding. For a full description of these equations and the optimal index values, refer to the following website:

<http://www.wdtb.noaa.gov/workshop/psdp/Roeder/sec2.htm>

2.2.6.11 Satellite

The Satellite Menu provides access to various types of satellite imagery. Most AWIPS sites receive this imagery via the Satellite Broadcast Network (SBN).

All of the GOES imagery products received by AWIPS sites are now being compressed frame by frame, and certain GOES products have been reallocated among the existing carriers. All of the CONUS GOES East and GOES West imagery products are now exclusively broadcast on the former GOES East channel. All of the other (OCONUS) GOES imagery products are now broadcast on the fourth channel, formerly known as the Data Collection Platform (DCP)/nonGOES imagery channel. The product sets are GOES satellite images (either GOES East or GOES West), composite images, and non-GOES satellite images (GMS/METEOSAT). Ingest of GOES, non-GOES, and composite images all use the same process and files at all sites except the NCF.

For sites that have the GOES East or GOES West satellite configured, the Satellite menu should resemble **Exhibit 2.2.6.11-1**.

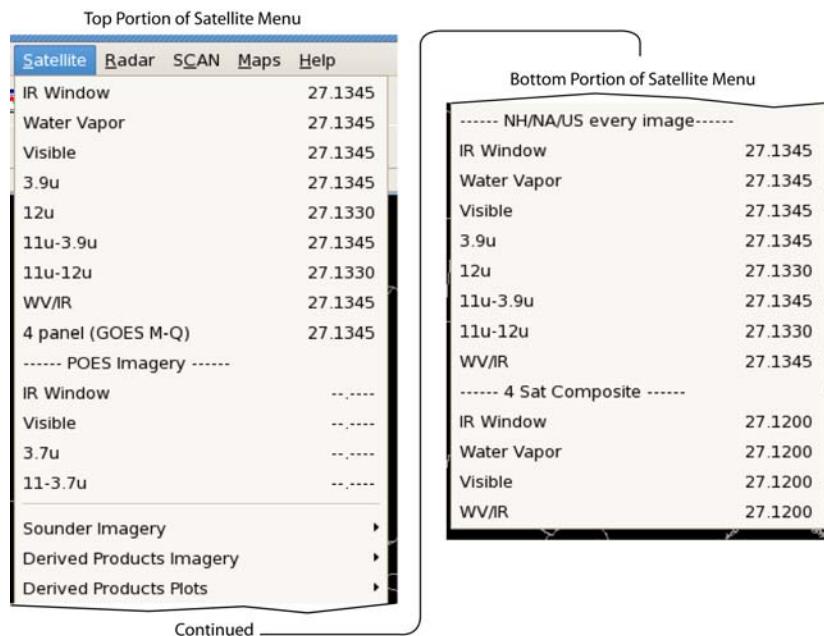


Exhibit 2.2.6.11-1. Satellite Pull-down Menu for GOES West

Additionally, the POES (Polar Operational Environmental Satellite) Imagery section is available from the Satellite menu, and contains selectors for IR Window, Visible, 3.7 μ , and 11-3.7 μ products. These are viewable on all scales.

With the following exceptions, all of the other products on the satellite menu are based purely on the imager instruments aboard GOES East and/or West:

- The **Derived Product Imagery** submenu displays the following data: Lifted Index, Total Precip Water, Cloud Amount, Cloud Top Height, Skin Temperature, and Low Cloud Base. Because this imagery is based on the GOES sounder instrument, several important differences exist between these products and the other (imager-based) imagery. The main differences are that the resolution is no finer than 10 km, the product update frequency is driven by the sounder instrument (AWIPS receives a set of GOES East/West composite derived product images once per hour), and the aerial coverage is based on that of the sounder scans, which is somewhat less than the aerial coverage provided by the imager.

The Cloud Amount option provides an hourly update of cloud amounts within a geostationary satellite field of view. You can loop through the display to identify increasing/decreasing cloud conditions and trends.

The Low Cloud Base option provides nighttime images of fog and low stratus clouds derived from a combination of two GOES IR channels. This product identifies cloud ceilings of <1000 feet and is generated hourly starting between 2042 and 2142, and ending between 1510 and 1610 GMT the next day. This product is beneficial to the warning and forecast processes specific to aviation and terminal forecasting.

Also accessed from the Derived Products Imagery submenu are Rainfall Rate and Total Precip Water products from the Special

Sensor Microwave / Imager (SSM/I) and Advanced Microwave Sounding Unit (AMSU) instruments, as well as the Blended Total Precip Water and Percent of Normal TPW multi-sensor blended products.

You can access the GOES Derived Product Imagery (DPI) products by selecting **Satellite ► Derived Products Imagery**. Select **Satellite ► Sounder Imagery** to access GOES East/West (GE & GW) sounder imagery.

- The **Derived Product Plots** submenu supplies the following options:

- The **GOES High Density Winds** submenu has options to display satellite-derived multi-layer winds plots from the IR, Visible, and three Water Vapor channels. In addition, you can display individual layers that display a composite of all the satellite channels.

You can access the GOES High Density Winds by selecting **Satellite ► Derived Products Plots ► GOES High Density Winds**.

- **MTSAT High Density Winds**, which cover the Western Pacific, can be accessed just below the GOES winds on the same submenu.
- **Scatterometer Winds** are obtained from the ASCAT instrument on EUMETSAT's MetOP-A polar orbiting satellite. This instrument sends pulses of radiation to the ocean surface and measures the amount of energy, called backscatter, it receives back. When you sample these observations, the time, satellite ID, wind direction, and wind speed are provided. With the polar orbiting scanning, a given region will generally be sampled about every 12 hours.

ASCAT winds (25 km retrieval resolution but interpolated and displayed at 12.5 km resolution) are launchable from both the CAVE Satellite menu, shown in **Exhibit 2.2.6.11-2**, and from the Obs menu, shown in **Exhibit 2.2.6.11-3**. The QuikSCAT experimental NASA satellite ceased providing wind retrievals when it failed in November 2009. The ASCAT instrument continues to generate ocean surface wind retrievals, but from an operational satellite.

Note 1: The ASCAT Scatterometer Ocean Winds product is displayable on CAVE at all scales.

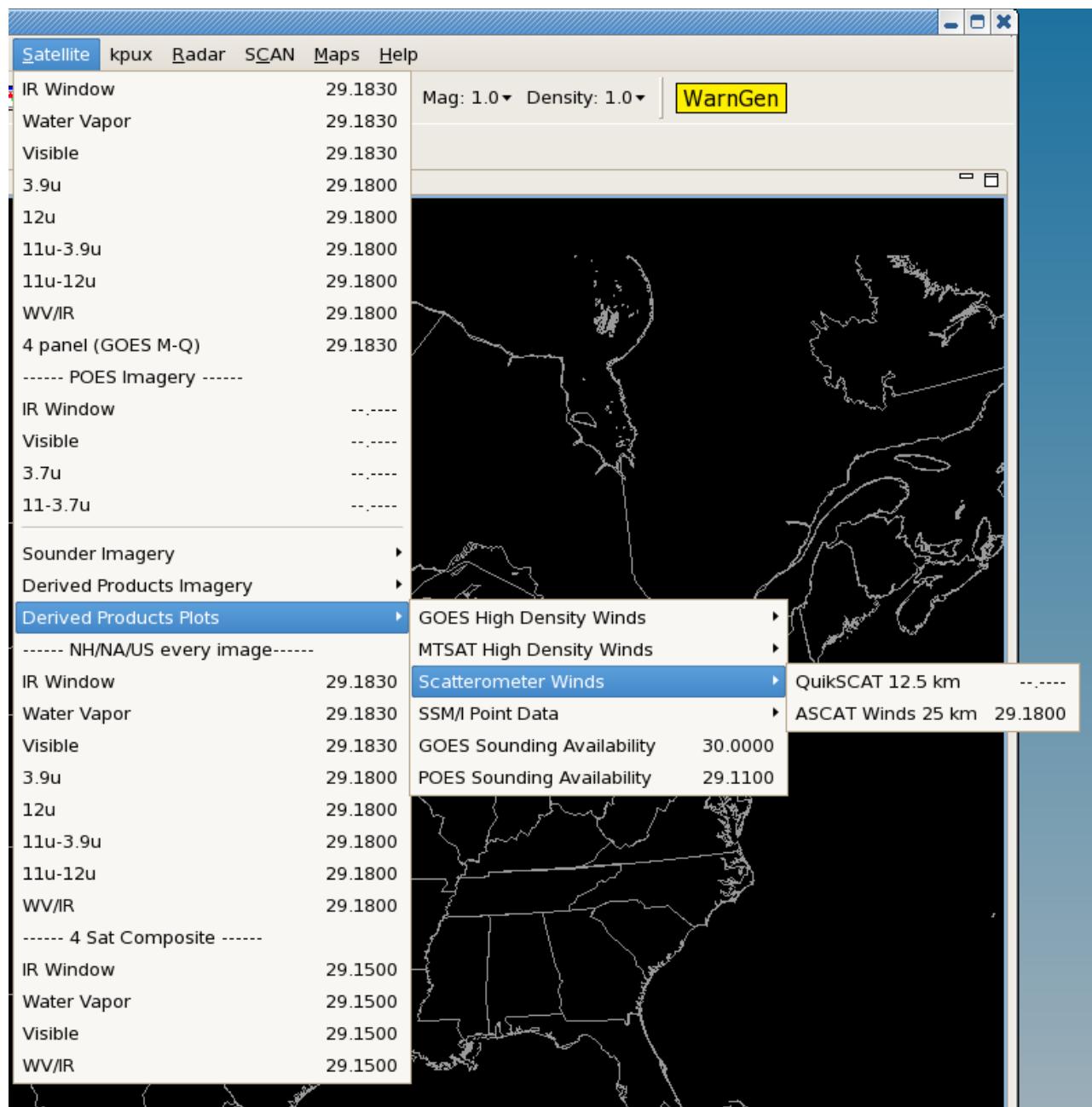


Exhibit 2.2.6.11-2. Satellite Menu - Scatterometer Winds

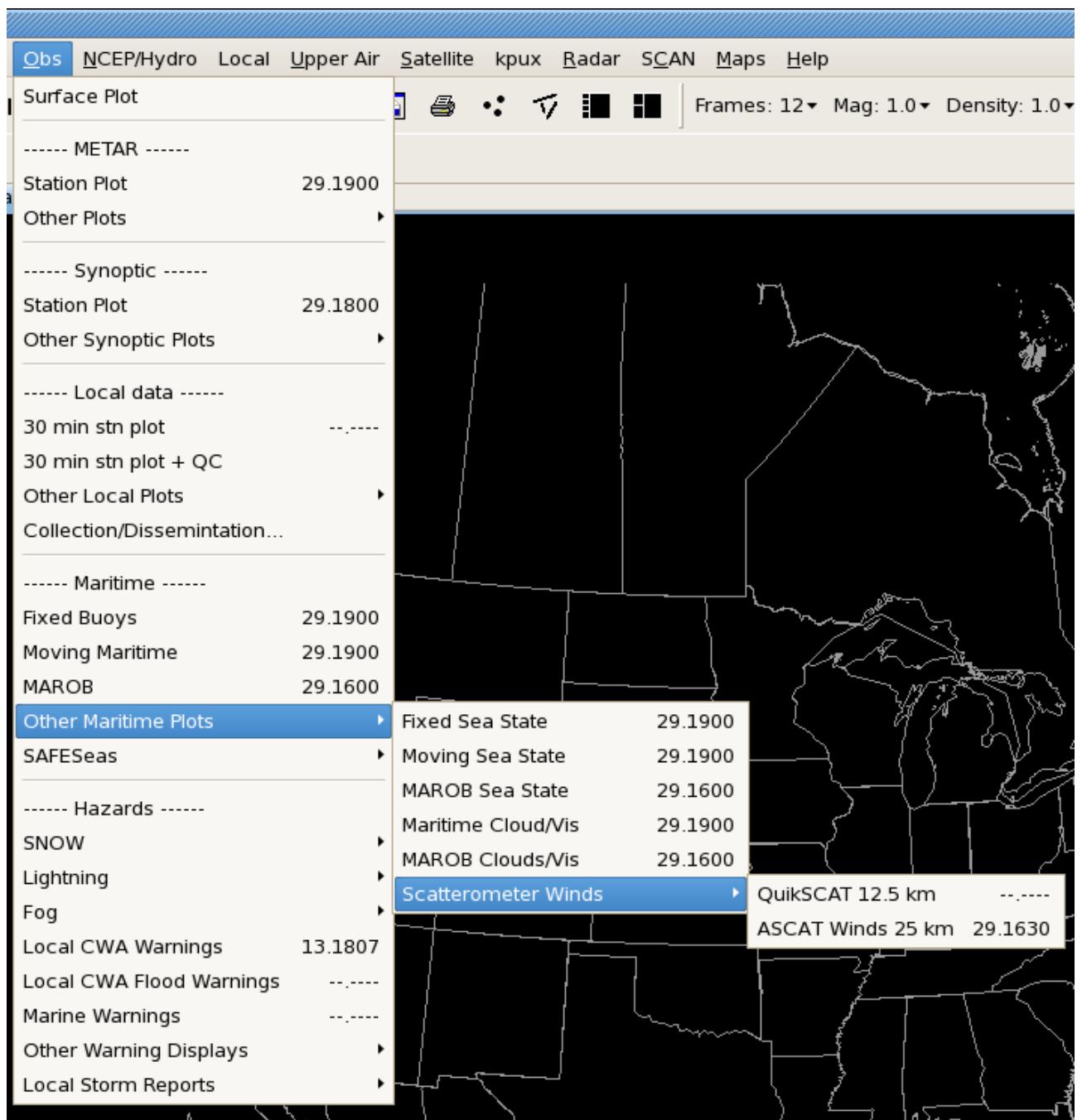


Exhibit 2.2.6.11-3. Obs Menu - Scatterometer Winds

- The **Special Sensor Microwave/Imager (SSM/I)** wind speeds, taken at 10 meters ASL, are generated by using a unified, physically based algorithm to retrieve ocean wind speed data at the same time. You can access the SSM/I submenu by selecting **Satellite ▶ Derived Products Plots ▶ SSM/I Point Data**.
- The **GOES and POES Sounding Data Availability Plot** displays the locations where GOES and POES temperature and moisture profiles are available. These soundings are displayed on a Skew-T/log P chart using the Points tool and the Volume Browser. Soundings from the GOES satellites are made only in relatively cloud-free areas, whereas POES systems produce temperature and moisture soundings in clear and cloudy atmospheres. Each hour, NESDIS provides the latest soundings from GOES East and West. Although the GOES East and West sounders yield soundings over a broad area, the default AWIPS configuration retains soundings only from within each site's Regional CAVE scale domain. POES soundings are generated approximately every 12 hours and have more global coverage. You can access the GOES and/or POES Sounding Availability menu options by selecting **Satellite ▶ Derived Products Plots**.
- The **NH/NA/US every image** products are based on imagery from the current series of GOES satellites. This menu section is oriented toward the larger scales (i.e., N. Hemisphere [NH], North American [NA], and CONUS [US]). Selecting satellite imagery from this menu section loads every available image for display. In the legacy AWIPS system, data was scale dependent. Because data is no longer scale dependent, every available satellite image is available and displays on any scale. The satellite

products under the "NH/NA/US every image" section display the same data as the satellite products at the top of the Satellite menu. Note that larger-scale imagery (i.e., from the NH and NA scales) is ultimately limited in frequency not by AWIPS but rather by the availability of scans from the GOES satellites. Large-scale northern hemispheric imager scans are produced only every 30 minutes. A complete "full disk" (i.e., most of the Western Hemisphere) image is scanned only once every 3 hours per spacecraft.

GOES East and West each feature a five-channel imager, and apart from the exceptions noted above, all imagery available on the satellite menu is based on either one or two imager channels from one or both GOES satellites. The current series of GOES satellites consists of nine spacecraft, with pre-launch designators I-Q and post-launch designators of 8-16 (the latter designator assigned when the spacecraft achieves geosynchronous orbit). At any given time, two satellites of this series will be operational, one situated over the equator at 75W longitude (called GOES East) and the other situated over the equator at 135W longitude (called GOES West).

Note 2: The imagers on this series of satellites are similar, but not identical. The primary differences involve the availability of one of two long-wave channels (12u or 13u) and the resolutions of certain channels.

The GOES imager instruments operate in various modes, which affect the frequency and coverage of some imagery provided to AWIPS. The default mode is referred to as "Routine" mode, and the imagers most often scan in this mode. The other common imager mode is "Rapid Scan" mode. NESDIS switches the GOES East and West imagers (independently), chiefly between these two modes and usually in response to NWS requests. In routine mode, the imager scans four CONUS sectors per hour; in rapid-scan mode, the imager typically scans eight CONUS sectors per hour. Satellite imagery is generally displayed at all intervals for all scales (i.e., 15-minute intervals in routine mode and generally 5-10 minute intervals in rapid-scan mode). A set of menu options is available in the "NH/NA/US every image" section of the satellite menu.

- The **4 Sat Composite** products are based on imagery from four geostationary satellites: GMS; GOES West; GOES East; and METEOSAT. These composites are disseminated via the SBN's OCONUS channel and are therefore unavailable to most CONUS sites.

A Water Vapor/Infrared (WV/IR) combination product is available in this menu. In this product, the IR Window (11 micron) data replace water vapor pixels where the cloud top temperature is below -35 C. Other menu entries display images that are differences between two channel images. For example, the selection of the 11u-3.9u menu entry will display the temperature difference between a channel 4 image and a channel 2 image (both from the same time period).

2.2.6.12 kxxx

The **kxxx** is a site-specific menu that provides access to Weather Surveillance Radar-1988 Doppler (WSR-88D) base, derived, and graphic products, four-panel displays, and all-tilts groupings, as shown in **Exhibit 2.2.6.12-1**.

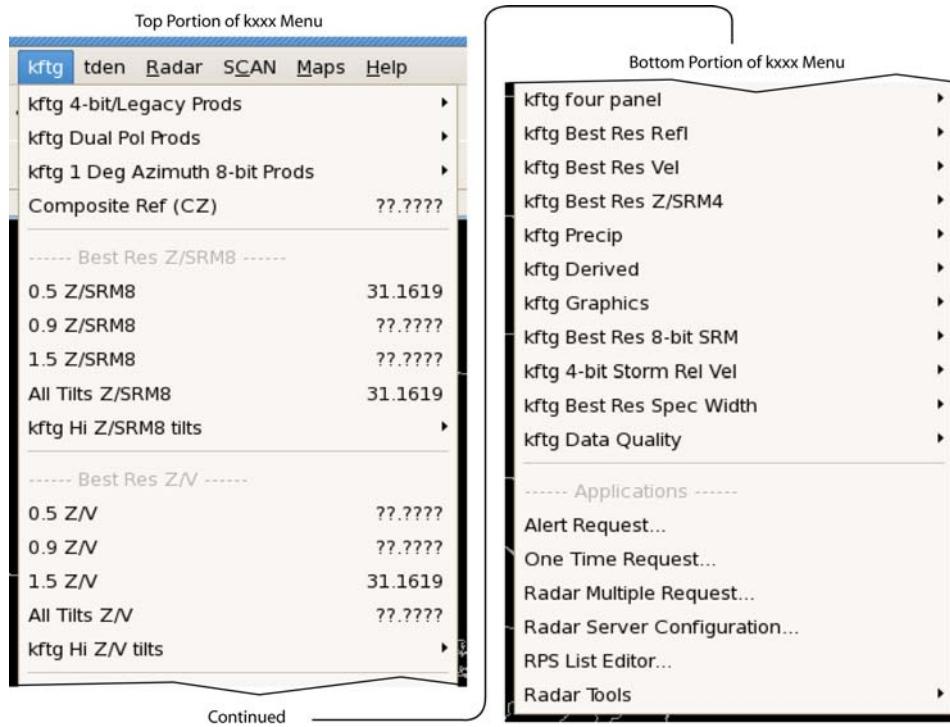


Exhibit 2.2.6.12-1. kxxx Pull-down Menu

- **kxxx products:** Variations in the menu may exist because of your site configuration, so you should spend some time exploring the vast array of radar products within this menu.
 - **kxxx 4 Bit/Legacy Prods:** The kxxx menu uses generic selectors that load 8-bit (256-level) data, with legacy 4-bit (16-level) and 3-bit (8-level) data filling in when no 8-bit data are available.
 - **Note 1:** Although 3-bit products do not appear on the menu, you can still request them, and they will display in combination with other data as appropriate. Standard storm and clear air reflectivity color tables are "ramped," to take advantage of the 8-bit data depth.
 - **kxxx Dual Pol Prods:** This option is currently not available. The upgrade to dual- polarization technology is expected to begin beta testing in early 2011. When the entire fleet of WSR-88Ds are equipped with dual-pol capability; and dual-pol radar data becomes available, your ITO will run a turnkey script to swap in a dual-pol-focused menu and re-run radar localization to make use of it.

The dual-pol-focused menu will include all the existing products, including a pull-right dual-pol

products submenu listing all the dual-pol products, including dual-pol 4-panel sets. The 4-panel sets are expected to be heavily used once dual-pol data becomes available.

- **kxxx 1 Deg Azimuth 8bit Prods:** In ORPG Build 10, some Z and V scans are in the "super resolution" format - $\frac{1}{2}^\circ$ beam width, $\frac{1}{4}$ km gate spacing. These are used preferentially when available. This means that the standard 8-bit products may not be displayed. If you wish to view them, use the **kxxx 8-bit Z**, **kxxx 8-bit V**, and **kxxx 8-bit SRM** submenus on the **kxxx 1 Deg Azimuth 8-bit Prods** pull-right in the top section of the **kxxx** menu.
- **Composite Reflectivity (CZ):** Composite Reflectivity is the maximum base reflectivity value that occurs in a given vertical column in the radar umbrella. NEXRAD scans in several pre-defined volume coverage patterns (VCP), where the radar makes a 360-degree horizontal sweep with the radar antenna tilted at a given angle above the horizontal, then changes the elevation angle, and completes another 360-degree sweep, and so on. Composite reflectivity gives a plan view of the most intense portions of thunderstorms, and can be compared with Base Reflectivity to help determine the 3-D structure of a thunderstorm.
- **Best Res Z/SRM8 and Z/V Combinations: (CZ):** The radar combination products Z/SRM and Z/V are precombined formats of the reflectivity and storm relative motion or velocity, displayed together via a single menu selection. SRM products include the storm motion vector information, which is plotted in the upper left corner of the Display Pane.
- **NEXRAD Volume Coverage Patterns (VCP):** The kxxx menu accommodates all NEXRAD Volume Coverage Patterns (VCP), encompassing many radar tilt angles. Instead of having a menu item for each tilt angle, "tilt bins" have been set up internally. Each bin includes a range of tilts, as outlined in Table 2.2.6.12-1. Menu selections result in the display of an angle within the given range, depending on which VCP is in use. For example, selecting 2.4 will display a tilt between 2.1 and 2.6 degrees. The product legend shows the actual angle.

Table 2.2.6.12-1. Tilt Bins for Radar Menus

Primary Tilt	Tilt Range	Primary Tilt	Tilt Range
0.0	0.0 - 0.3	7.5	6.7 - 8.0
0.5	0.4 - 0.7	8.7	8.1 - 9.5
0.9	0.8 - 1.1	10.0	9.6 - 11.0
1.5	1.2 - 1.6	12.0	11.1 - 13.0
1.8	1.7 - 2.0	14.0	13.1 - 15.6
2.4	2.1 - 2.6	16.7	15.7 - 17.9
3.4	2.7 - 3.6	19.5	18.0 - 22.0
4.3	3.7 - 4.6	25.0	22.1 - 27.5
5.3	4.7 - 5.6	32.0	30 - 60
6.0	5.7 - 6.6		

- **All Tilts: (CZ):** The kxxx menu includes several All Tilts options. This is a special feature in CAVE that loads all available tilts from a sequence of volume scans. All Tilts allows you to step or animate in either space or time. Selecting one of the All Tilts buttons will load all the tilts available from the latest volume scan. It will continue to load tilts from previous volume scans until it has loaded as many frames as indicated on the frame count menu. Auto updates will add higher tilts from the latest volume scan, replacing a tilt from the oldest volume.
After loading an All Tilts display, **Shift + LEFT ARROW** and **Shift + RIGHT ARROW** and looping will take you through the frames without regard to volume scan or tilt, but simply in the order in which the system loaded them. The **UP ARROW** and **DOWN ARROW** will step the

display up or down in a volume scan allowing the tilts to change for a fixed time. The **RIGHT ARROW** and **LEFT ARROW** will step the display forward or backward through time at a fixed tilt. Once you have set the mode of motion (vertical or time), the **Page Up/Page Down** keys will start and adjust loop speed. To switch from vertical to time mode or from time to vertical mode, press the desired arrow key function.

CAUTION: If you hit the up or down arrow key in a standard (not All-Tilts) display, looping and stepping are disabled until you hit either the left or right arrow key or one of the stepping buttons on the menu.

Once an arrow key (Left, Right, Up, Down) has been pressed, the stepping/animation controls on the main window toolbar and the **Page Up/Page Down** keys will function in that same mode. For example, assume the **UP ARROW** or **DOWN ARROW** key is pressed; the menu controls will now operate through the tilts at a fixed time - e.g., you can go to the lowest tilt by selecting .

Note 2: **Ctrl + LEFT ARROW** and **Ctrl + RIGHT ARROW** are still the keyboard shortcuts for  and ; however, you will be returned to the standard (not All-Tilts) display. To proceed to the first or last frame while in the All-Tilts special mode, use **Ctrl + UP ARROW** or **Ctrl + DOWN ARROW**.

Refer to [Section 3.3.4 - Module 3, Objective 3.6](#) for an All-Tilts practice module.

- **kxxx four panel:** The kxxx four panel submenu includes menu entries for Z/V, Z/SRM 8- and 4-bit, and some other combinations that are presented in 4-panel mode, with a different elevation angle or product in each panel.
- **kxxx Precip:** Precip products are accessible via the pull-right kxxx Precip submenu, which includes Storm Total, One Hour, Three Hour, and User Selectable precipitation products.

A suite of snowfall products is also available on the Precip submenu. All are available for request (OTR, RMR) and the first four can be added to an RPS (Routine Product Set) list. All of these products are available on any scale.

- **kxxx Derived:** The kxxx Derived products submenu includes Layer Reflectivity, Cross Section, and Other products displayed on any scale. Derived products include precipitation, storm (mesocyclone, hail, tornado), and wind derivations.
- **kxxx Graphics:** The kxxx Graphics products submenu, shown in **Exhibit 2.2.6.12-2**, includes Storm Track (STI), Hail Index (HI), Tornado Vortex Signature (TVS), TVS Rapid Update (TRU) products, and Mesocyclone and Digital Mesocyclone (MD and DMD). (The M and MRU products are found in the **4 Bit/Legacy Prods** menu.) The display attributes of all these products can be adjusted with the Radar Display Controls dialog. Storm attributes, Velocity Azimuth Display (VAD and VWP) Products; and Cell Trends round out this menu.

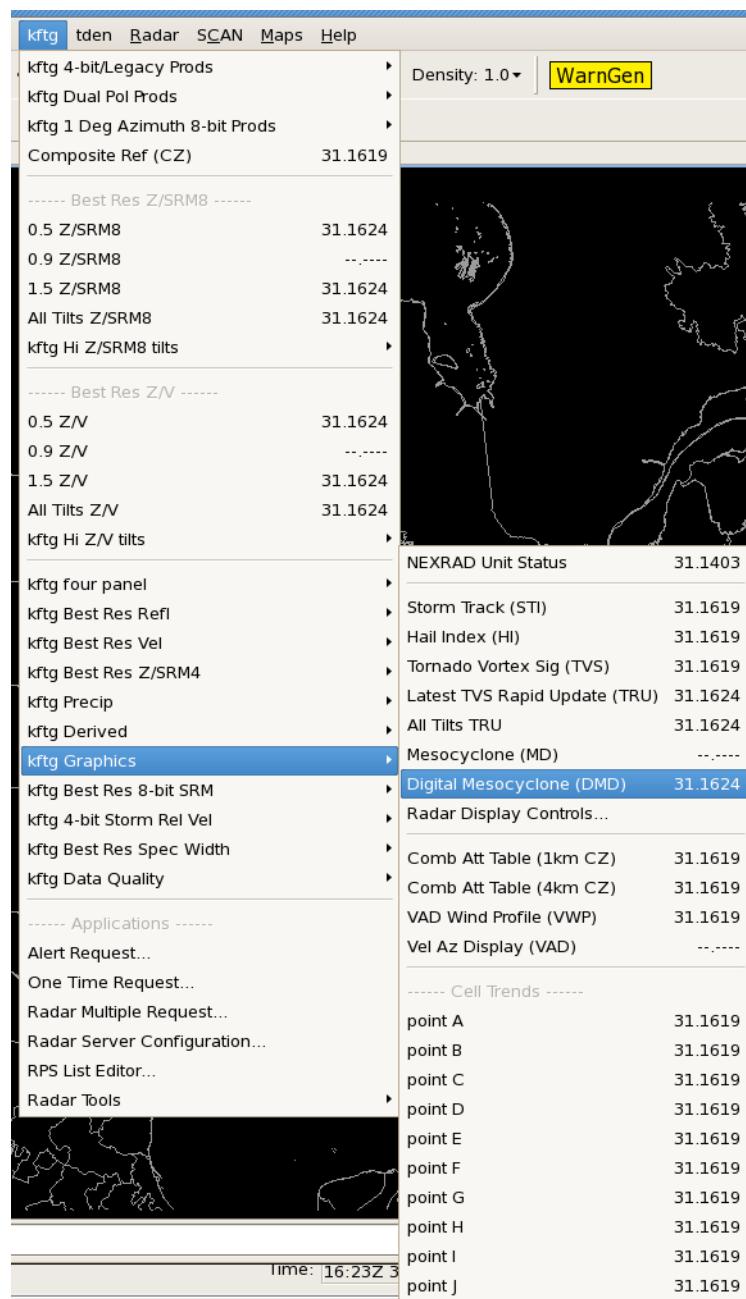


Exhibit 2.2.6.12-2. Selecting DMD Option from kxxx Graphics Products Submenu

The Rapid Update items (TVS and Mesocyclone) update after each tilt is processed. When you request these products or add them to your RPS list, you can ask for a specific tilt angle, the lowest n tilts, all up to a selected elevation angle, or all updates. See [Section 8.2](#) for details of these applications.

- **Digital Mesocyclone (DMD):** Digital Mesocyclone is a graphics product that displays a plan view of mesocyclones from the DMD algorithm, as shown in [Exhibit 2.2.6.12-3](#). It is generated from the kxxx Main menu by selecting **kxxx ▶ kxxx Graphics ▶ Digital Mesocyclone (DMD)**.

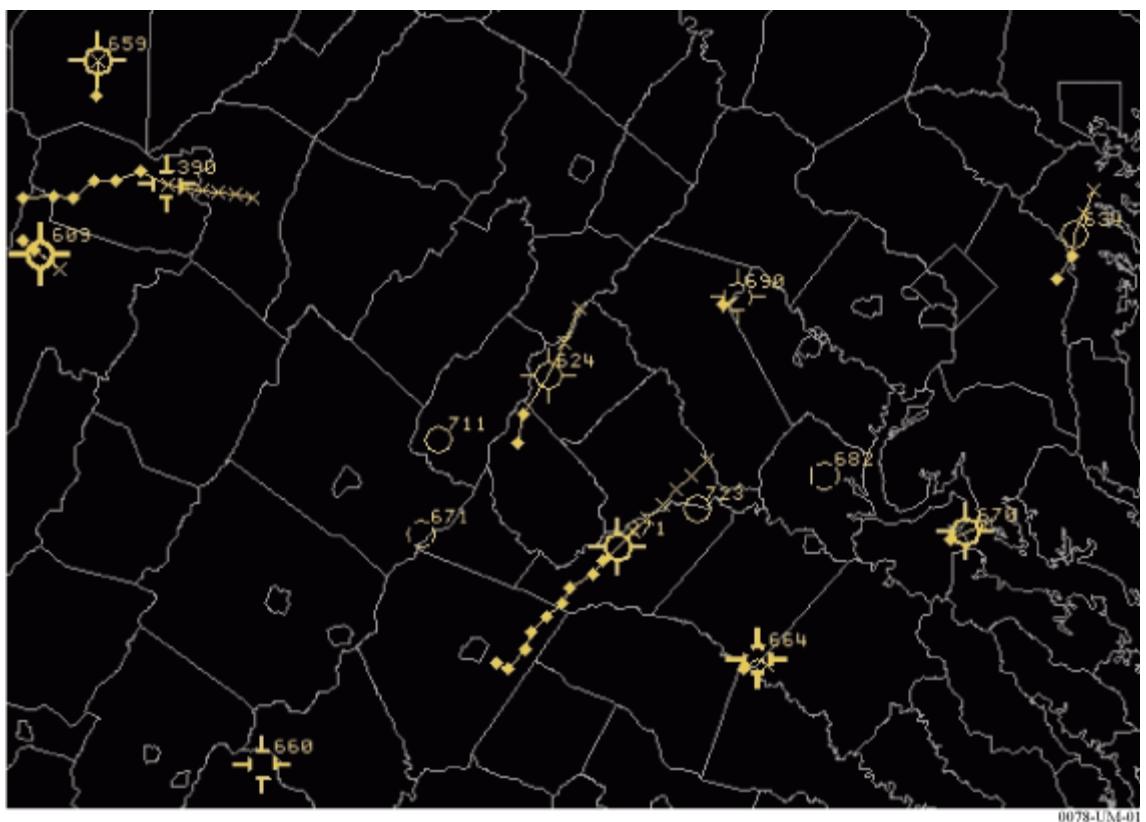


Exhibit 2.2.6.12-3. DMD Display

Note: This is similar to the "MD" display, but uses five strength categories vs. two in the latter, standard progressive disclosure (weaker features appear as you zoom or increase density), and sampling for feature characteristics. In comparison to the "MD" display, the DMD display has the following characteristics: Broken circle means an extrapolated feature; spiked circle means a low-level feature; the size of the circle corresponds to the actual geographic size of the circulation, with a lower limit in pixel space; and the thickness of the circle corresponds to the strength of the feature. You can access the DMD by selecting **kxxx ► kxxx Graphics ► Digital Mesocyclone**. Refer to [Section 3.3.6 - Module 14](#) for practice using the Choose By ID Tool, and using the Volume Browser to generate the Plan view DMD display.

- **kxxx Data Quality:** The kxxx Data Quality products, accessible by a pull-right submenu, include Clutter Filter Control and reflectivity and velocity clutter probability products.
- **Applications:** This section provides access to the Alert Request, One Time Request (OTR), Radar Multiple Request (RMR), Routine Product Set (RPS) List Editor, and other applications. These tools are discussed in [Chapter 8](#). The VR-Shear tool, however, is described below.
 - **VR-Shear:** This tool is used in conjunction with Doppler velocity data to calculate the velocity difference (or "shear") of the data directly under the end points. As with the Baselines, this feature comes up editable and the end points can be dragged to specific gates of velocity data. When in place, the speed difference (kts), distance between end points (nautical miles), shear (s^{-1}), and distance from radar (Nmi) are automatically plotted next to the end points and in the upper left corner of the large display pane. A positive shear value indicates cyclonic shear, while a negative value indicates anticyclonic shear. If either end point is not directly over velocity data, the phrase "NO DATA" is reported for the shear value. This tool is also useful in determining

gate-to-gate shear. Simply place the two end points directly over adjacent gates of velocity data.

- **"Snapping" VR-Shear:** If you are zoomed in over an area when you load VR-Shear and the VR-Shear Baseline does not appear, press mouse Button 3 to "snap" the Baseline to where the mouse cursor is located.
 - **VR-Shear in 4-Panel:** You can use the VR-Shear Tool when the large display is in 4-panel mode. The VR-Shear overlay is loaded in different colors for each panel. There are actually four copies of the program running, and each behaves independently. This means that you can get accurate readings in any one of the four panels - one VR-Shear panel is editable at a time. To activate, click mouse Button 2 on the VR-Shear legend in the desired panel and position the query line to the echoes of interest.
-

2.2.6.13 txxx

The **txxx menu**, as shown in **Exhibit 2.2.6.13-1**, is a site-specific menu that provides access to the displays for a Terminal Doppler Weather Radar (TDWR). The TDWR is a high-quality, dedicated meteorological surveillance radar that is deployed near many large airports in the United States. TDWRs, in contrast to the WSR-88Ds, provide a finer resolution, have more sweeps per scan, a maximum elevation angle up to 60 degrees, and repeated patterns and elevations within a scan. They also use multiple pulse repetition frequencies (PRF). Each TDWR has a different set of elevation angles that depend on the distance between the TDWR and associated airport. TDWRs operate on the C-band wavelength, making the signal more susceptible to beam attenuation, velocity aliasing, and range folding.

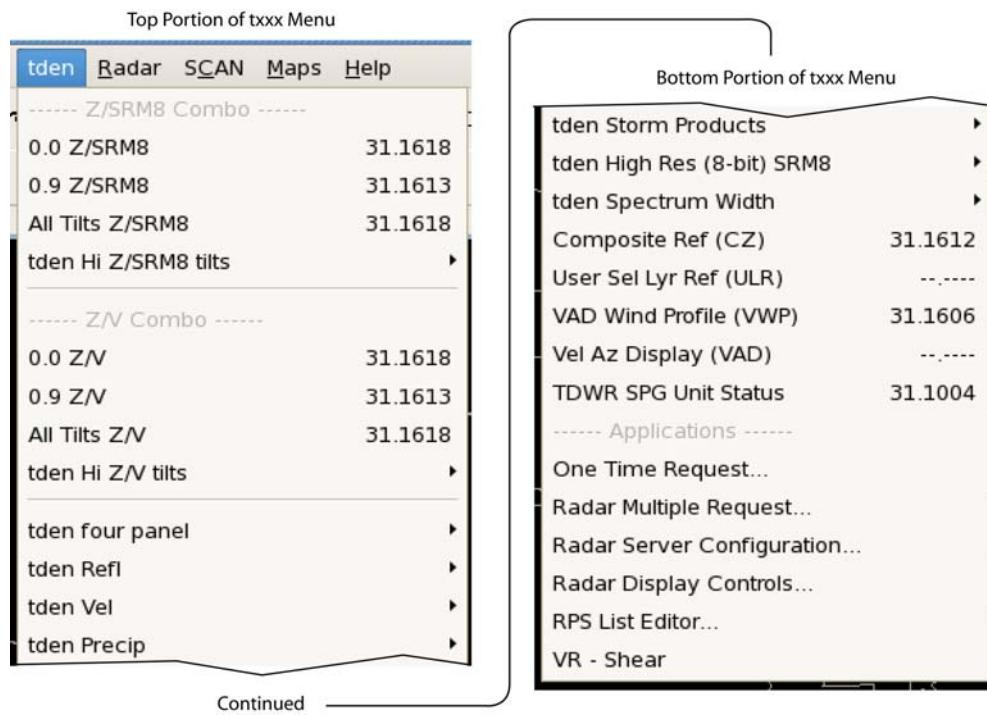


Exhibit 2.2.6.13-1. txxx Pull-down Menu

TDWRs use scan strategies for interlacing short-range scans with long-range observations. There are two types of scan strategies:

1. **Monitor mode:** In Monitor mode, the TDWR is used to survey the weather in all directions and determine if more frequent scans are needed over the airport.
 2. **Hazardous mode:** If it is determined that more frequent scans are needed, the TDWR switches to Hazardous mode.
- **txxx products:** Variations in the menu may exist because of your site configuration, so you should spend some time exploring the products within this menu. Refer to [Section 2.2.6.12](#) for a description of "All Tilts".
 - **Z/SRM8 Combinations and Z/V Combinations:** The radar combination products Z/SRM and Z/V are precombined formats of the reflectivity and storm-relative motion or velocity, displayed together via a single menu selection. Storm Relative Motion (SRM) products include the storm

motion vector information, which is plotted in the upper left corner of the Display Pane.

- **txxx four panel Submenu:** The txxx four panel submenu includes menu entries for Z/V and Z/SRM8. The four panel submenu also includes specific elevation angles (for Hazardous mode), rather than the standard bin-representing tags. Each TDWR's menu reflects the actual tilt angles in its Hazardous mode VCP. For Monitor mode, tilts are displayed from the closest Hazardous mode angle menu selector.
- **Other Products:** The TDWR menu entries now include specific elevation angles (for the Hazardous mode), rather than the standard bin-representing tags. That is, each radar's menu reflects the actual tilt angles in its Hazardous mode VCP. For Monitor mode, tilts are displayed from the closest Hazardous mode angle menu selector.

The txxx menu gives you access to the TDWR velocity, reflectivity, four-panel, storm relative motion and spectrum width products. Also included in the menu are the high-resolution 8-bit velocity, reflectivity, and storm-relative motion products and TDWR SPG Unit Status.

Additionally, users can access the Velocity Azimuth Display (VAD), VAD Wind Profile Display (VWP), and User Selectable Layer Reflectivity (ULR) from this menu.

- **Applications:** This section provides access to the alert requests; radar server configuration and display controls; RPS (Routine Product Set) List Editor, for creating or editing a list of radar products and sending the list to a WSR-88D RPG for display in the next radar Volume Scan(s); and VR-Shear. All except VR-Shear are discussed in [Chapter 8](#). VR-Shear, however, is described in this section.

- **VR-Shear:** This tool is used in conjunction with Doppler velocity data to calculate the velocity difference (or "shear") of the data directly under the end points. As with the Baselines, this feature comes up editable and the end points can be dragged to specific gates of velocity data. When in place, the speed difference (kts), distance between end points (nautical miles), shear (s^{-1}), and distance from radar (Nmi) are automatically plotted next to the end points and in the upper left corner of the large display pane. A positive shear value indicates cyclonic shear, while a negative value indicates anticyclonic shear. If either end point is not directly over velocity data, the phrase "NO DATA" is reported for the shear value. This tool is also useful in determining gate-to-gate shear. Simply place the two end points directly over adjacent gates of velocity data.

- **"Snapping" VR-Shear:** If you are zoomed in over an area when you load VR-Shear and the VR-Shear Baseline does not appear, press mouse Button 3 to "snap" the Baseline to where the mouse cursor is located.
- **VR-Shear in 4-Panel:** You can use the VR-Shear Tool when the large display is in 4-panel mode. The VR-Shear overlay is loaded in different colors for each panel. There are actually four copies of the program running, and each behaves independently. This means that you can get accurate readings in any one of the four panels - one VR-Shear panel is editable at a time. To activate, click mouse Button 2 on the VR-Shear legend in the desired panel and position the query line to the echoes of interest.

Refer to [Section 3.3.4 - Module 3, Objective 3.7](#) for a practice module on how to use the txxx menu and products.

2.2.6.14 Radar

The Radar pull-down menu, shown in **Exhibit 2.2.6.14-1**, allows users to access the national 10km Radar Coded Message product, FAA radars, Mosaic products, Dial Radars products, and radar Applications. With the exception of RCS, VCS, and SWA products, all products that can be requested from your local radar can now be requested from non-associated radars.

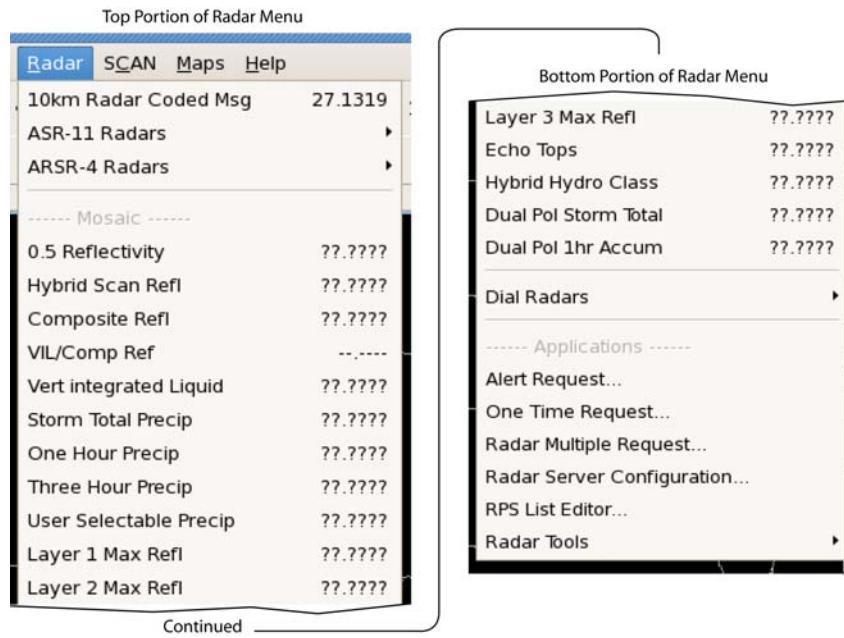


Exhibit 2.2.6.14-1. Radar Pull-down Menu

The Radar menu provides access to the following options:

- **10km Radar Coded Message:** This mosaic is derived from the reflectivity information in Radar Coded Messages (RCM). The mosaic is created centrally and disseminated via the SBN at approximately 00:10 and 00:40 each hour. The reflectivity fields have been given automated quality control to identify and remove echo features due to nonprecipitation targets, chiefly migrating birds, aircraft, and insects. However, some small nonprecipitation features may pass all quality-control checks, especially when they are located underneath cold, dense clouds or near actual precipitation. True precipitation features are only rarely removed. Boxes within the mosaic grid that are more than 230 km from the nearest reporting radar are black with no data pixels at the out-of-range spots.
- **FAA Radars:** Most field sites have access to one or more FAA radars, which can provide fill-in coverage for the WSR-88D network. These radar locations (along with 88Ds and TDWRs) appear on the '88Ds' map. There are two kinds of FAA radars: (1) The ASR-11 (IDs beginning with 'e') has a fan beam spanning 4.5 deg in elevation and 1.4 deg azimuth, making a product similar to an 88D composite reflectivity; and (2) the ARSR-4 (IDs beginning with 'f') is a phased-array radar (the product we receive is somewhat like a hybrid scan comprising the four lowest beams). These appear at the top of the Radar menu, just above the Mosaic section. As shown in **Exhibit 2.2.6.14-2**, products for each radar include a Reflectivity image and a Unit Status graphic; these generally update once per minute. The FAA radar data are also included in the Hybrid Scan Refl mosaic.

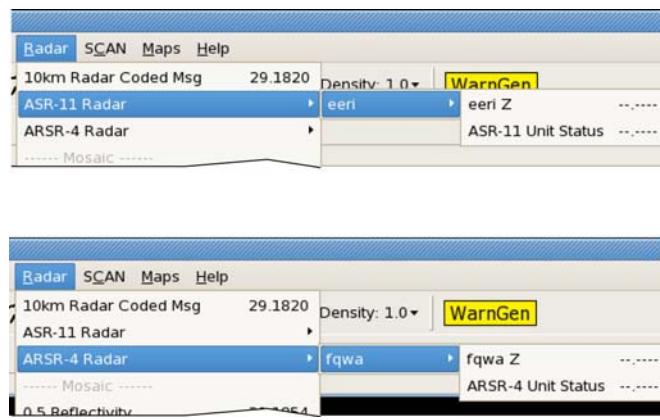
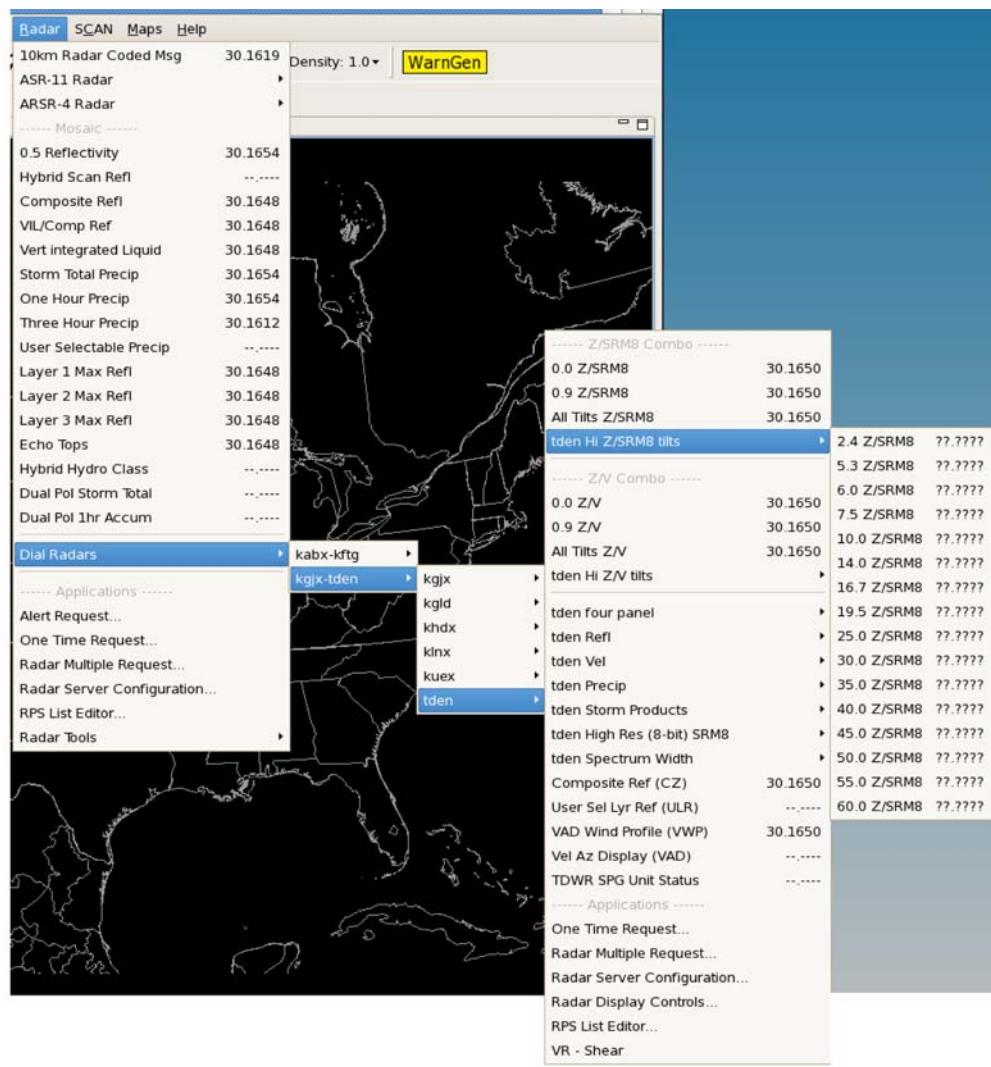


Exhibit 2.2.6.14-2. ASR-11 and ARSR-4 FAA Radars Pull-right Menus

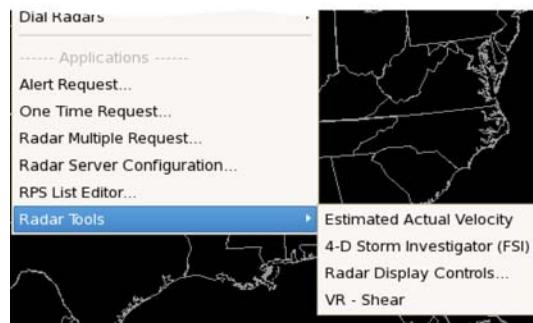
- **Mosaic:** Mosaics available via this menu use data from up to nine nearby radars. Additional optional mosaics on cascading menus provide a limited list of radar products from a predefined set of NEXRAD 88D radars within a given region. Your site administrator can set up such mosaics by: /awips2/edex/data/utility/common_static/site//radar/radarInUse.txt.

Note: A mosaicInfo.txt table will only work while logged on to an AWIPS workstation.

- **Dual Pol:** Dual-polarization radar data involves alternating between sending vertically and horizontally polarized pulses. Whereas doppler allows the radar to be sensitive to the motion of the targets, dual-polarization allows the radar to be sensitive to the shape of the targets. The greatest impacts of this technology will be improved values for accumulated precipitation, improved hail detection, and improved detection of non-meteorological targets. Refer to [Section 8.10](#) for further details.
- **Dial Radars:** The list of Dial Radars for this menu is set up as part of your localization process. A comprehensive menu of radar products is available for each Dial Radar, as shown in **Exhibit 2.2.6.14-3**.

**Exhibit 2.2.6.14-3. Dial Radars and Radar Products**

- Applications:** The Radar Applications are discussed in detail in [Chapter 8](#). The Radar Tools are identified in [Exhibit 2.2.6.14_4](#).

**Exhibit 2.2.6.14-4. Radar Tools**

2.2.6.15 SCAN, Maps, and Help Menus

SCAN

The System for Convection Analysis and Nowcasting (SCAN) pull-down menu, shown in **Exhibit 2.2.6.15-1**, is located on the CAVE-D2D menu bar. SCAN is an integrated suite of multi-sensor applications that detect, analyze, and monitor convection and generate short-term probabilistic forecast and warning guidance for severe weather automatically within AWIPS. SCAN also provides forecasters with severe weather guidance and supplements forecaster event monitoring with multi-sensor, automated event monitoring. Refer to [Section 7.5](#) for a more information on SCAN.

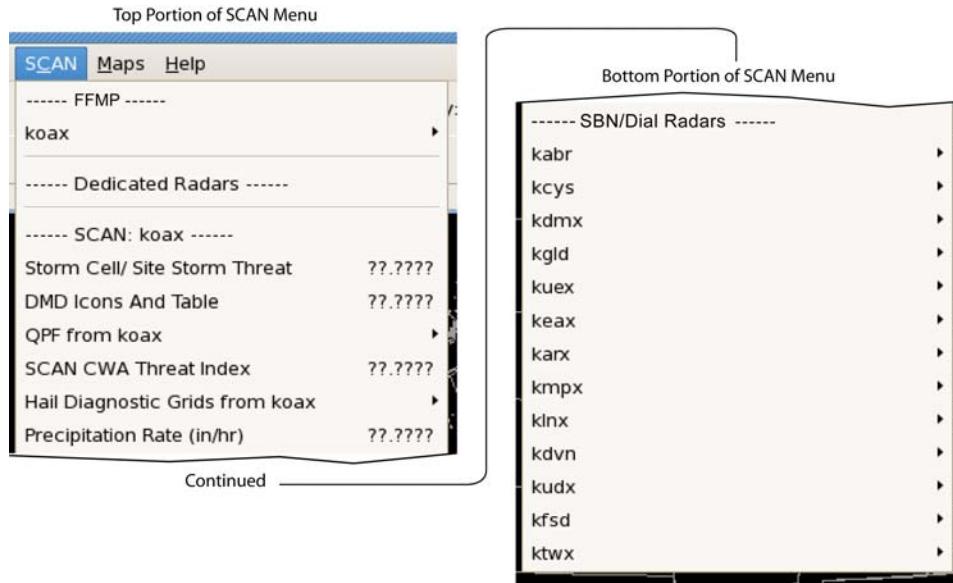


Exhibit 2.2.6.15-1. SCAN Pull-down Menu

The SCAN menu also includes the Flash Flood Monitoring and Prediction (FFMP) application, which allows forecasters to compare precipitation accumulations derived from radar and other sources with flash flood guidance. FFMP operates by accumulating precipitation over hydrologic basins on various spatial scales. Refer to [Section 8.6](#) for a more information on FFMP.

Maps

The Maps menu, shown in **Exhibit 2.2.6.15-2**, is located on the CAVE-D2D menu bar. The Maps menu lets you choose one or more map backgrounds for the displayed product. The content of this menu varies somewhat from site to site.

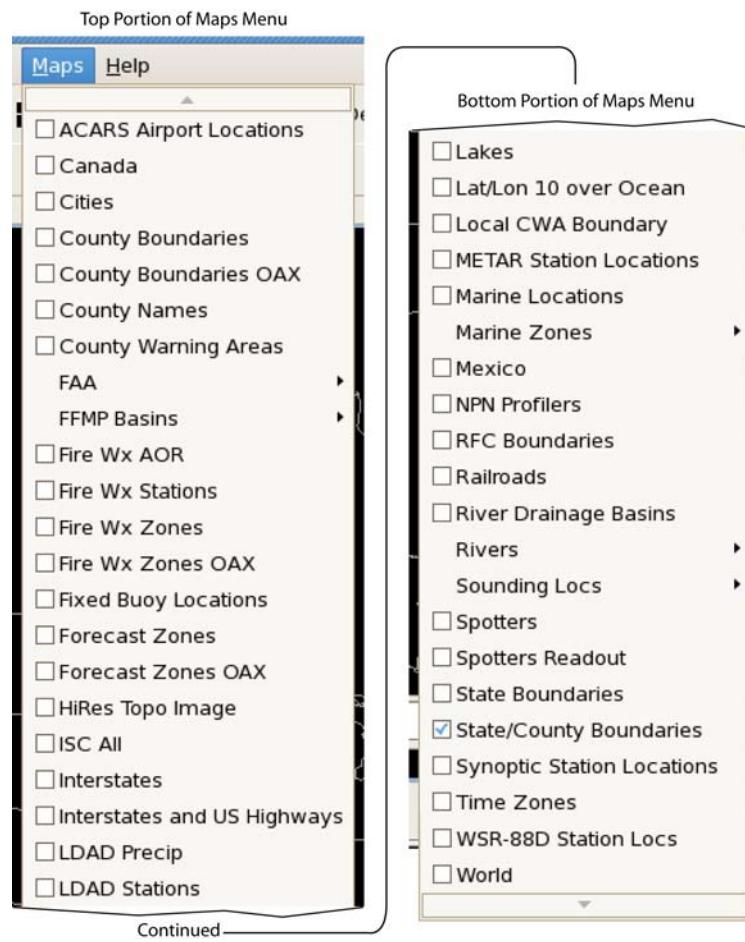


Exhibit 2.2.6.15-2. Maps Pull-down Menu

Help

The Help menu, shown in **Exhibit 2.2.6.15-3**, contains a checkbox that enables/disables the Tooltips. Information on the workstation software is also accessible from this menu.

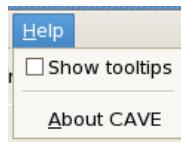


Exhibit 2.2.6.15-3. Help Pull-down Menu

2.2.7 The Toolbar and CAVE Perspectives Tab Bar

This section contains brief descriptions of each menu and iconified button displayed along the second and third row of the menu options, called the CAVE Toolbar (second row) and CAVE Perspectives Tab Bar (third row), on your workstation screen. Refer to **Exhibit 2.2.7-1**, which displays the menu and options for the selected D2D Perspective.

Note 1: Remember the menus and Toolbar iconified button options are perspective dependent.

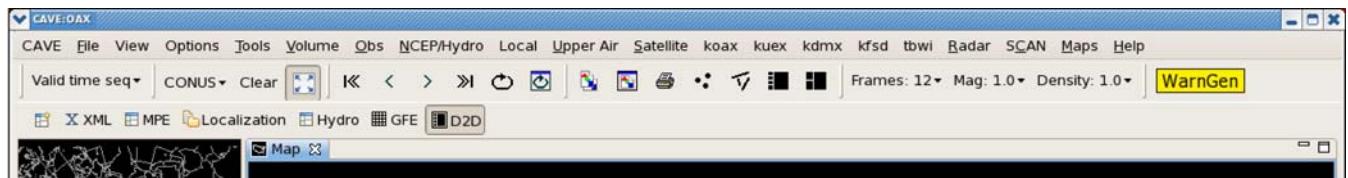


Exhibit 2.2.7-1. Toolbar for D2D Perspective

Certain iconified buttons on the toolbar are check buttons. These buttons are recessed when they are in the "on" position, as shown in **Exhibit 2.1.7-1** for the "Pan" button. If Tooltips is selected, a checkbox option under the Help menu, tooltips appear as you slowly move the mouse pointer over the iconified Toolbar button. Other buttons on the Toolbar dropdown a list of options. A description of each is supplied below.

Load Modes **Valid time seq▼**

Load Modes, as shown in **Exhibit 2.2.7-2** provide different ways to display model or real-time data by manipulating previous model runs and inventories of data sets. Load Modes are defined in [Section 2.2.6.4](#).



Exhibit 2.2.7-2. Load Modes Menu with Default Valid time seq Mode Selected

Scale CONUS▼

From this menu you can choose one of six scales: N. Hemisphere, North American, CONUS, Regional, State(s) or RFC, and WFO, as shown in **Exhibit 2.2.7-3**.



Exhibit 2.2.7-3. Scale Menu with Default CONUS Scale Selected

Notes

2. When CAVE is first started, the CONUS Scale (for CONUS sites) is displayed in the large display pane.
3. Changing the scale affects the product graphically displayed on the large display pane by rerendering the image to the new scale.

Clear Clear

This button clears the large display pane. The map background remains.

Pan

This button, which resets when selected (as shown here), allows you freely move around the map background in the main display pane. Click and hold-down mouse Button 1 to move the map.

Stepping << < > >>

This set of four menu buttons allows you to Step Backward (<) or Step Forward (>) through multiple frames of data, one frame at a time, or to move immediately to the First (<<) or Last (>>) frame in the loop.

Loop

This icon button toggles looping in the large display pane.

Toggle Image Combination

This icon button enables/disables the ability to display two images at one time, combining the two products as one in one product legend.

Loop Properties

This icon button opens the Loop Properties dialog box, as described in Section 2.2.6.4. The Loop Properties are defined in [Section 2.2.6.4](#).

Image Properties

This icon button opens the Image Properties dialog box, as described in [Section 2.2.6.4](#).

Print

This icon button prints the contents of the large display pane on the default printer. See [Section 2.2.6.2](#) for how to change printer destination.

Points

This icon button displays the Interactive Points Tool, as described in [Section 2.2.6.5](#).

Baselines

This icon button displays the Interactive Baselines Tool, described in [Section 2.1.6.5](#).

Five-Pane Default Layout

Clicking this icon button arranges the default display to have one large display pane and four small monitor panes. Refer to [Exhibit 2.2.6.3-2](#).

Three-Pane Layout

Clicking this icon button arranges the display to have one large display pane and two medium-sized monitor panes. Refer to [Exhibit 2.2.6.3-3](#).

Frames

Frames: 12 ▾

Use this option menu to select the number of frames of a product you want loaded. The default is 12 frames. The maximum is 64 frames. The actual number of frames loaded is indicated in the status bar at the bottom of the display, which may be different from the number of frames selected.

Magnification **Mag:** 1.0 ▾

Use the Magnification option menu to enlarge or reduce the size of the text and symbols on a graphic product. As you increase magnification, the density of the data automatically decreases. The purpose of this feature is to make the text and symbols more visible. Magnification 0 is a special case. For station plots, only the location of the station is shown, and stations with data are in the overlay color, while those without are gray. You can still sample the data in this mode. For grids, you can see the grid resolution by displaying wind and setting magnification to zero.

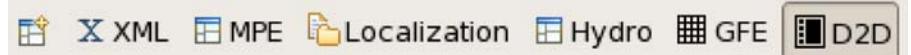
Density **Density:** 1.0 ▾

Use the Density option menu to adjust the amount of data presented on the large display pane. Higher density settings increase the amount of data.

WarnGen **WarnGen**

The yellow WarnGen button, located on the right side of the Toolbar, activates the Warning Generator function. Refer to [Chapter 6](#) for more information. The background color of the WarnGen window changes to reflect the test/practice mode setting. This setting allows you to generate warning tagged "TEST" or that will not be sent out. You can put CAVE in test or practice mode by running the Test Mode Control Program (TMCP) from the command line, then choosing the desired mode.

Note: To switch to test, practice, or operational mode using the TMCP, first close all CAVE sessions on the LX and XT workstations. Once the mode has been selected, CAVE may be restarted. CAVE then loads in the selected mode. When in test/practice mode, the background of the text window changes to black or orange, respectively. Refer to [Section 6.5](#) for more information.

Perspective Button and Tab(s)

The image above shows the Perspective button on the far left with the tabs for each perspective, in the order selected, right to left. When a tab is showing, it indicates the perspective is open. The highlighted tab (D2D in this case) indicates the active perspective, with the other perspectives, non-highlighted tabs, running in the background. The forecaster can quickly switch to another perspective by selecting the desired perspective's tab, which would then, in this case, change the D2D to non-highlighted and the selected perspective's tab to highlighted.

Use the **Open Perspective**  iconified button to drop down the list of perspectives, as shown in

Exhibit 2.2.7-4. An iconified tab for the respective perspective that is opened is listed from right to left in the order in which the perspective was opened. The iconified tab will remain displayed until the perspective is closed. You can toggle between perspectives by selecting the desired perspective's tab. The D2D tab is highlighted, indicating it is the active display, and no other perspective is open.



Exhibit 2.2.7-4. List of Perspectives with D2D Perspective Active

2.2.8 Pop-up Menus

Pop-up menus contain options that apply to a specific area or a product in CAVE. In other words, the pop-up menus are area- and context-sensitive and are used to make on-the-fly changes to displayed data.

Different options appear in the pop-up menu, depending on whether a graphic or an image is displayed and whether the product is displayed in the main display pane or smaller monitor panes or in the four-panel layout.

Pop-up menus are opened by pressing and holding mouse Button 3 in a specific area, either over a product legend or over the display area. Pop-up menus that are opened over a product legend contain options that apply only to that product and do not affect any other overlay.

Pop-up menus that are opened over the main display pane or smaller monitor panes affect all the overlays contained in the display pane. For example, when you toggle "Looping" on over a small display pane, you toggle animation for all the products contained in that pane.

2.2.8.1 Pop-up Menus From Product Legends

A pop-up menu can be opened by pressing and holding mouse Button 3 on the product legend for every product you display in the main display pane or the four-panel layout. Simply clicking on the legend performs the default pop-up action, which is the first option in the pop-up menu, as shown in **Exhibit 2.2.8.1-1**.



Exhibit 2.2.8.1-1. Example of Pop-up Menu

Keep in mind that the changes you make apply to that one overlay and not to all the overlays that are displayed. Also, the pop-up menus are designed to be dynamic; that is, they respond to any changes you have made and contain new options that pertain to the current state of the overlay.

Note 1: You can open pop-up menus on both the main and monitor display panes.

All possible pop-up menu options from the product are described below.

Note 2: Keep in mind that the options available in the pop-up menus depend on the type of product loaded in the display.

Set Color

The Set Color option allows you to change the color of a single-colored graphic overlay or map background. Once you choose one of the nine colors from the pop-up menu, the selected overlay immediately appears in the new color. If the overlay needs to be displayed in a color other than one provided in the pop-up, the Set Background Color option opens the Set Background Color dialog box.

- **Choose Color:** The Set Background Color dialog box, a pop-up that can apply to both the main and monitor panes, as shown in **Exhibit 2.2.8.1-2**, allows you to customize the background color for a

particular graphic overlay.

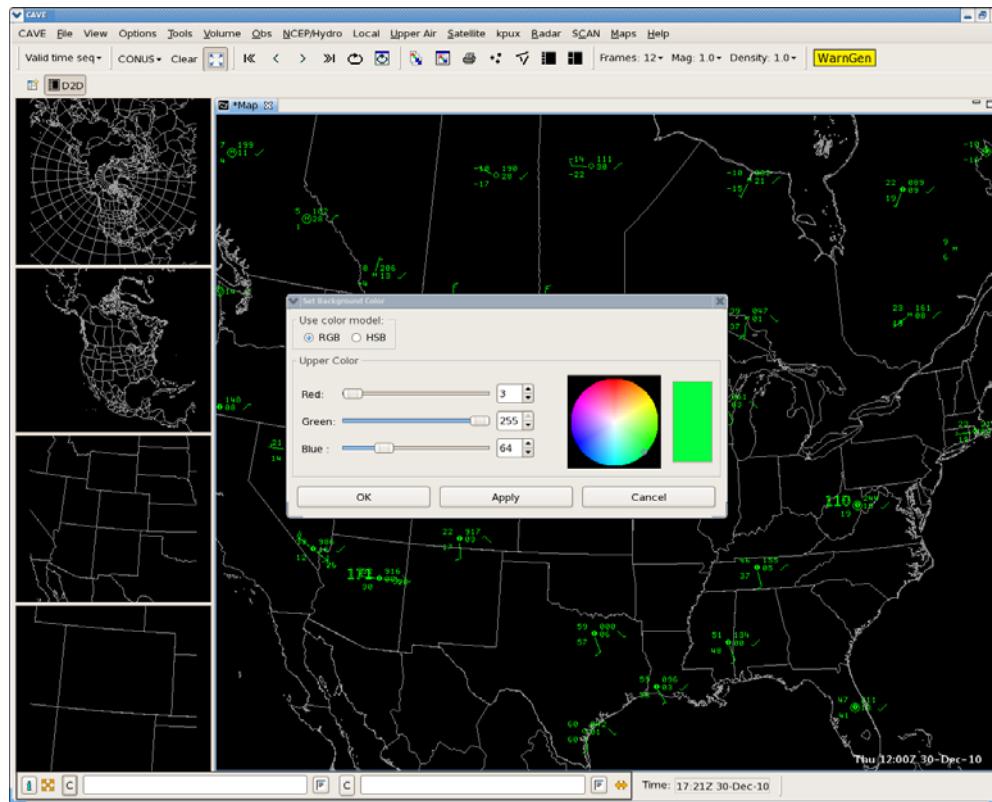


Exhibit 2.2.8.1-2. Set Background Color Dialog Box

Note 3: Like the Image Color Editor ([Section 2.2.9](#)), the Set Background Color has a Color Wheel, HSB and RGB radio buttons, RGB or HSB slider bars, and a Color Swatch.

Adjusting the Color Wheel Centroid or slider bars generates the desired color in the Color Swatch, or you can enter specific HSB or RGB values.

- **OK:** Applies the chosen color to the selected overlay and closes the Set Background Color dialog box.
- **Apply:** Applies the new color to the selected graphic overlay.
- **Cancel:** If you've applied a color, Cancel will revert to the original color.

Edit Colors...

If you press and hold mouse Button 3 over an image legend, the pop-up menu contains the Image Color Editor, discussed in [Section 2.2.9](#), from which you can change the color table. This option is made available in the pop-up menu whenever a single or combined image or multicolored graphic (e.g., time-series Profiler data) is displayed. If a combined image is displayed, the pop-up menu will include the name of each image from which you can choose to edit.

Blinking

This menu option contains a check button that toggles the blinking of a graphic. It is possible to have several graphics blink simultaneously.

Change Blinking...

This menu option opens the Image Blinking dialog box. It is used to set up the blinking parameters for a single or combined image. If a combined image is displayed, the pop-up menu will include the name of each image from which you can choose to change the blinking.

The blinking capability allows you to flash selected graphic(s), color(s), and ranges of colors. The blinking rate is adjustable and you can blink several color ranges simultaneously. Blinking features are illustrated in Module 6, [Section 3.3.2](#), under Objectives 5 through 7.

The Image Blinking dialog box contains the following options.

- **Blink Rate:** An options menu that contains blinking rates from 0.1 to 2 seconds. Also included is the option to have no blinking, or a zero blink rate. Once blinking is on, then a root (main display area) pop-up will include a 'Blink Rate (seconds)' item.
 - **Enable Range:** This menu button activates the blinking once you select the range of color values you want to blink by dragging the arrows in the color bar to the upper and lower limits of the desired range. You can enable blinking for several color ranges, which then blink simultaneously.

Note 4: Looping must be turned off for the specified range to blink.

- **Disable Range:** Disables the blinking only for the range of values within the arrows.
- **Reset:** Turns off the blinking for the entire color table.
- **OK:** Applies the settings you have made and closes the Image Blinking dialog box.
- **Cancel:** Closes the Image Blinking dialog box without applying the settings you have made.

Load as Image

This menu option overlays the selected contoured graphic overlay as an image. When you load a graphic as an image with this option, the contoured graphic is still displayed.

Load as Image and Combine

This menu option displays the selected contoured graphic overlay as an image and combines the new image with an already-displayed image. This option is available in the pop-up menu when there is at least one image displayed. To better distinguish and manipulate the combined images, use the options available in the Imaging... dialog box, which is opened from the Image Properties iconified button on the Toolbar.

Load as Arrows

This menu option displays a gridded vector product (such as wind) using arrows and is available whenever vector fields are displayed. When selected, the wind arrows product is overlaid on the display.

Load as Barbs

This menu option displays a gridded vector product (such as wind) using wind barbs. This option is made available in the pop-up menu whenever vector fields are displayed. When selected, the wind barbs product is added to the display.

Load as Streamlines

This menu option displays a gridded vector product (such as wind) using streamlines. This option is made available in the pop-up menu whenever vector fields are displayed. When selected, the wind streamlines product is added to the display.

Load as Contours

This option overlays the selected image field as a contoured graphic.

Line Style

This is a cascading menu that provides line style settings for a selected graphic overlay. The options are Default, Solid, Dashed, or Dotted. By default, data with values less than zero are automatically displayed in dashed lines. Any text or symbols contained in a graphic are not affected by the changes to line style. However, wind barbs and arrows are affected.

Line Width

This is a cascading menu that provides four line-width settings for a selected graphic overlay. Any text or symbols contained in a graphic are not affected by the changes to line style. However, wind barbs and arrows are affected.

Magnification

This is a cascading menu that provides magnification settings for selected graphic overlays. These settings are the same as those in the Magnification option menu in the Toolbar (see [Section 2.2.7](#)). However, the magnification setting chosen from the Toolbar applies to all the overlays in the main display pane, while the magnification setting chosen from the pop-up menu applies only to the one overlay on which you opened the pop-up menu. The present magnification setting of the overlay is indicated with the check button turned on (yellow).

Density

This is a cascading menu that provides data density settings for a selected graphic overlay. These settings are the same as those in the Density option menu in the Toolbar (see [Section 2.2.7](#)). However, the density setting chosen from the Toolbar applies to all the overlays in the main display pane, while the density setting chosen from the pop-up menu applies only to the one overlay on which you opened the pop-up menu. The present density setting of the overlay is indicated with the radio button turned on (yellow).

Sampling for this Product

When you press and hold mouse Button 1 (using the Legacy AWIPS mouse functionality) over an image and some plotted data, (including METARs, LDAD, marine, severe weather reports, MSAS QC information, and skew Ts), the data value or report will be displayed next to the pointer. You can disable this sampling readout by unselecting the Sampling for this Product button from the product legend.

Display Product

This menu option contains a check button that toggles the visibility of the selected graphic or image overlay. Clicking mouse Button 1 on the legend performs the same action.

Unload

This menu option permanently removes a selected graphic or image overlay from the display. The product is restored only by reloading.

Editable

This pop-up menu option applies to editing elements of WarnGen, Interactive Skew-T, and any of the tools that require editing (Baselines, Points, Home, etc.). You can also enable or disable editing of WarnGen and the tools by clicking the legend with mouse Button 2.

2.2.8.2 Pop-up Menus in the Large Display Pane

Pressing and holding mouse Button 3 over the large display pane or over the four-panel layout opens pop-up menus that contain options that affect all products in that display area. Most options that are available in these menus are shown in **Exhibit 2.2.8.2-1**. All options are discussed in the following sections.

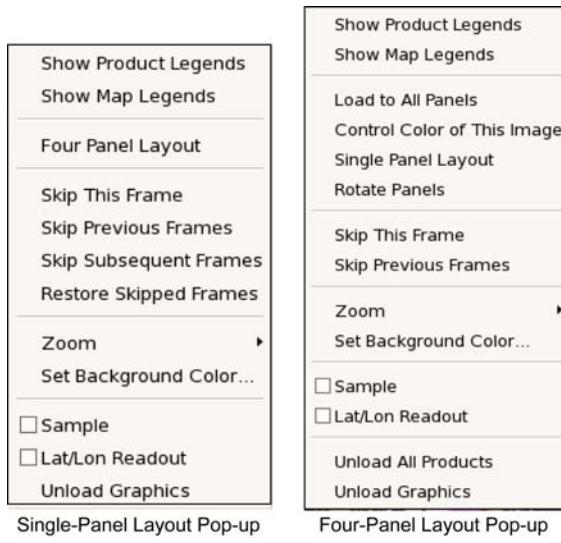


Exhibit 2.2.8.2-1. Main Display Pane Pop-up for Single- and Four-Panel Layouts

2.2.8.3 Pop-up Menus in Small Display Panes

Pressing and holding mouse Button 3 over the small display pane opens a pop-up menu, as shown in **Exhibit 2.2.8.3-1**, that contains options affecting all products in that display area. All possible options that are available in these pop-up menus are described in [Section 2.2.8.4](#).



Exhibit 2.2.8.3-1. Pop-up Menu That Affects All Products in Small Display Pane Display Area

Swap with Large Pane

The Swap with Large Pane menu option exchanges the contents of a small display pane with that of the large display pane. When the contents of the large pane are swapped to the smaller pane, the Rotate Panels and Four Panel Layout options become available, as shown above.

Zoom

This menu option opens a cascading menu that contains eight zoom factors. The position of the cursor before the pop-up menu was invoked determines the center of the display once you zoom in. When zooming on plan-view data, the zoom factors are expressed as display widths in kilometers. For non-plan-view data (skew-Ts, profiler time series, etc.), the zoom factors are given as magnification factors.

Set Background Color...

This menu option opens the **Choose Pane Background Color** dialog box, which allows you to set the background display color. Note that the background color is affected by the image brightness setting, and that the sample color is always white; therefore, samples may be difficult or impossible to read if you pick a very light background color.

Lat/Lon Readout

This is a check button that toggles the ability to sample latitude and longitude coordinates at the mouse pointer.

2.2.8.4 Pop-up Menus for Display

Show/Hide Legends

This menu option reveals and conceals both product legends and map background legends and is the default action if you click mouse Button 3 in the large display pane or one of the panels in the four-panel layout.

Once you toggle off the product legends, the valid time and date of the first loaded product remain in the lower right corner of the large display pane.

Show Map/Product Legends

This menu option toggles between making product legends or map legends visible on the large display pane or one of the panels in the four-panel layout.

Load to This Panel

This menu option, available only in the four-panel layout, allows you to choose one of the four panels for your next product selection. When this option is selected, a large yellow "L" appears in the lower left corner of the chosen panel, as shown in **Exhibit 2.2.8.4-1**, upper right panel. Any subsequent product loads overlay only in the chosen panel and not in the other three panels.

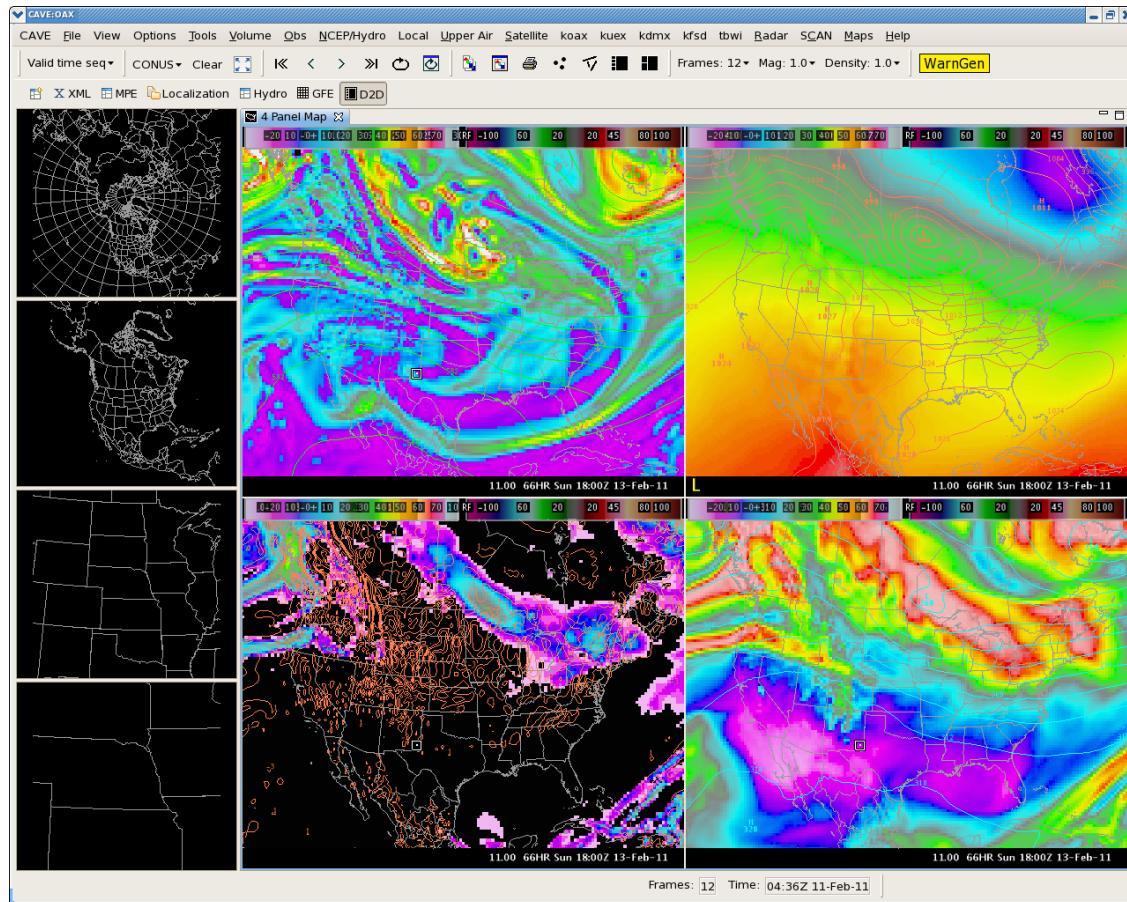
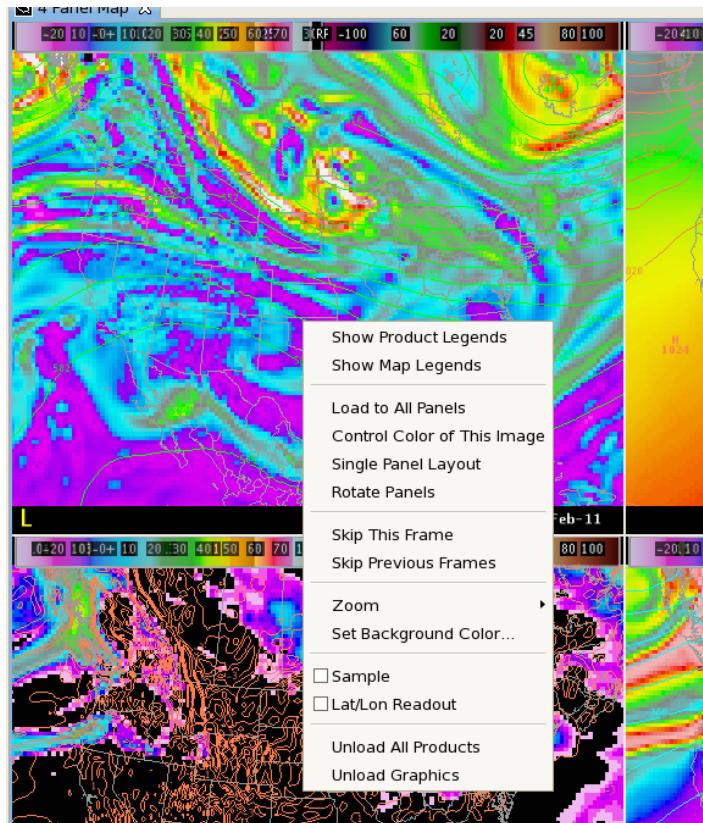


Exhibit 2.2.8.4-1. Chosen Panel (Yellow "L") of Four-Panel Layout**Load to All Panels**

This menu option is available when the four-panel layout is displayed in the large display pane and one of the panels is enabled for loading (marked with a yellow "L"), as shown in **Exhibit 2.2.8.4-2**. It allows you to load the next overlay into all four panels.

**Exhibit 2.2.8.4-2. Pop-up Menu with Load to All Panels Option**

Note 1: Observe that both product and map legends are hidden on **Exhibits 2.2.8.4-1 and 2.2.8.4-2**. For that reason, the pop-up shown in **Exhibit 2.2.8.4-2** has "Show Product Legends" and "Show Map Legends" as options.

Control Color of This Image

This option, available only in the four-panel layout, allows you to choose one of the four panels that may contain an image and make changes to that image. When this option is selected, a large green "I" appears in the lower left corner of the chosen panel, and the Image Properties dialog box appears automatically, as shown in **Exhibit 2.2.8.4-3**. Within this dialog box, you can adjust the brightness using the slider bar or edit the image by clicking on the image label within the Image Properties dialog box, which opens the Image Controls Editor. To combine an image in this panel with another image, you need to press mouse Button 3 over the panel and choose the Load to this Panel option. Then select the additional image to combine into the panel.

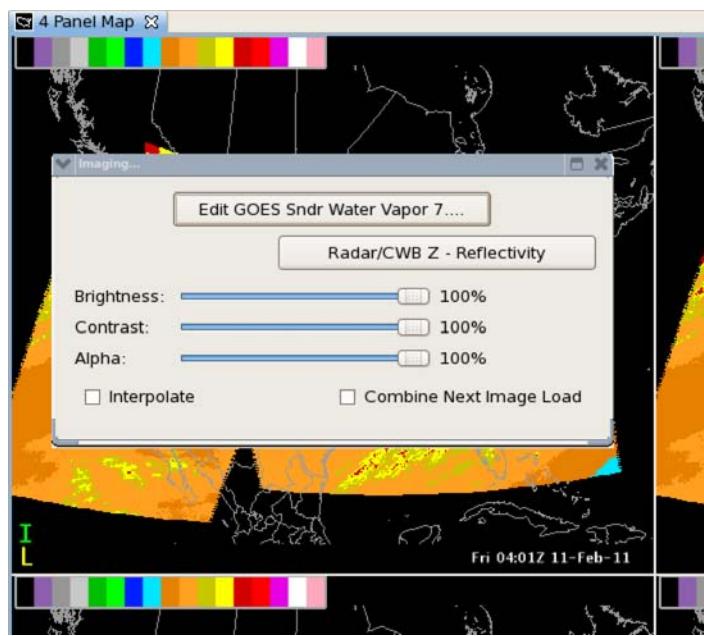


Exhibit 2.2.8.4-3. Control Color of This Image Panel Indicator (Green "I")

Control Color of All Images

This option is available when the four-panel layout is displayed in the Large Display Pane and one of the panels is enabled for controlling its image (denoted with a green "I"). This menu option allows you to make changes to the images in all four panels.

Four-Panel Layout

This menu option, available only in the large display pane, divides the large display pane into the four-panel mode, as shown in **Exhibit 2.2.8.4-1** above. If you select this option when data are displayed in the large display pane, the data are redrawn in the upper left panel.

Single-Panel Layout

This menu option, available only in the four-panel layout, reverts the four-panel layout to the single large display pane. Any products loaded in the panel where you selected this pop-up menu option are then redisplayed in the single large display pane. Products displayed in the other three panels are not redisplayed.

All-Panel Sample

This check button enables sampling of the current full-screen image (see **Rotate Panels**, below), plus up to seven hidden images.

Note 2: The hidden images' samples show a reduced amount of information, while the in-view image uses a standard sample preceded by an equals sign.

Rotate Panels

When in four-panel mode, this option brings the upper-left panel into the full main pane, with a large cyan

plus sign in the lower left corner as a cue. If you have combined images, the 'left-hand' image will be displayed. Subsequent selections of Rotate Panels cycle through the panels—UL, UR, LR, LL.

Note 3: This function is usually controlled by keyboard shortcuts. **Delete** is equivalent to **Rotate Panels**, while **End** returns you to four-panel mode. Keyboard keys **1** through **8** go directly to a component of interest. (See [Table 2.1-3](#).)

Skip This Frame

This menu option, available only over the large display pane and only when the actual number of loaded frames is greater than one, temporarily removes (skips) the currently displayed frame from the loop. You can restore this frame by selecting the Restore Skipped Frames menu option. Keep in mind that once a frame is removed from the loop, you can no longer step to it.

Note 4: Not available if looping is toggled on.

Skip Previous Frames

This menu option, available over the large display pane only, allows you to skip all previous (earlier) frames of data from a loop. If the current frame is the first frame, then this option is not available.

Note 5: Not available if looping is toggled on.

Skip Subsequent Frames

This menu option, available over the large display pane only, allows you to skip all subsequent (later) frames of data from a loop. If the current frame is the last frame, then this option is not available.

Note 6: Not available if looping is toggled on.

Restore Skipped Frames

This menu option, available over the large display pane only, recovers all frames that were temporarily removed. This option appears in the menu once you have skipped any frames from the loop.

Zoom

This menu option, available in the large display pane and the four-panel layout, opens a cascading menu that contains eight zoom factors. The position of the cursor before the pop-up menu was invoked determines the center of the display once you zoom in.

When zooming in on plan-view data, the zoom factors are expressed as display widths in kilometers. For nonplan-view data (such as skew-Ts, profiler time series, etc.), the zoom factors are given as magnification

factors. The present zoom setting is identified by the radio button turned on (yellow).

Sample

"Sample" is a menu option with a check button that toggles the capability for continuous sampling for all image data, as well as METAR and ceiling/visibility plots and the Home Tool. Sampling 'on' is equivalent to holding mouse Button 1 down all the time (using the Legacy AWIPS mouse functionality).

Sample Cloud Heights

The cloud height-sampling feature combines data from IR Satellite imagery and either model or RAOB sounding data to derive a computed cloud height. Once you have the IR imagery display in the Large Display Pane, you can access this tool from the mouse Button 3 pop-up menu over the data; choose the Sample Cloud Heights/Radar Skewt cascading menu. Refer to [Section 8.11](#) for further information and sample screen shots.

From this menu you can select from the following options:

- **No Sampling** - This radio button disables the Cloud Height Sampling Tool.
- **NAM** - This radio button toggles the use of the NAM grids in the sampling computation.
- **GFS212** - This radio button toggles the use of the GFS 212 grids in the sampling computation.
- **RUC** - This radio button toggles the use of the RUC grids in the sampling computation.
- **Laps** - This radio button toggles the use of the LAPS grids in the sampling computation.
- **From Raobs** - This radio button toggles the use of RAOB data in the sampling computation.
- **SKEW-T** - This check button gives you the option to see the actual sounding data used in the cloud height computation. A small floating window appears with the graphical sounding, which updates automatically as you move the cursor, or as you animate the satellite imagery.

As you sample the data, the output appears in the following format:

aaaaa/bbbbb feet (Source Status), where

- **aaaaa** - The estimated cloud height at the cursor in feet MSL. Values are rounded to the nearest 100 feet.
- **bbbbb** - The peak cloud top height within a 25 x 25 pixel area around the cursor.
- **Source** - The model name, or a 3-letter RAOB site identifier, or climatological data (indicated as CLIMO) used in the cloud height computation. In areas where gridded model data are not available, the system resorts to a climatological-based sounding for estimated cloud heights.
- **Status** - A one-letter indicator of the results of a cloud height computation. Status can be any of the following values:
 - **W** - Cloud Temp warmer than sounding, so the top is set to zero.
 - **C** - Cloud Temp colder than sounding, so the top is extrapolated.

- **M** - Multiple heights were found; lowest height is shown.
- **D** - Cloud Height estimated from level of dewpoint drying.
- **S** - Cloud Height derived directly from sounding.

In the case of multiple hits on the temperature due to inversions, the algorithm attempts to resolve the actual cloud deck by looking at the second derivative of the dewpoint for a drying layer above cloud top. If it cannot select a height using this criterion, it will choose the lowest candidate height. A zero cloud top indicates that the cloud top is warmer than the entire sounding, and the assumption is that it is seeing the ground.

Note 7: When using the Cloud Height Sampling Tool, expect the workstation response to decrease because the system is reading and interpolating raw model grids to obtain the computed cloud height information. Accessing higher-resolution models and RAOB data causes the greatest delays in performance.

Lat/Lon Readout

This is a check button that toggles the ability to sample latitude and longitude coordinates at the mouse pointer.

Unload All Products

This menu option removes all graphics and image products from the large display pane. To redisplay a product, it must be reloaded into the large display pane.

Unload Graphics

This menu option removes all displayed graphics from the large display pane. To redisplay a graphic, you must reload it into the large display pane. If one or two images are displayed with the graphics, they remain in the large display pane when the graphics are removed.

Unload Extra Maps

This menu option removes all user-displayed map backgrounds. To redisplay a map background, you must reload it into the large display pane.

2.2.8.5 Pop-up Menus for Editing

The following pop-up menu options apply to editing elements (baselines, points, home, etc.).

Delete Vertex

This menu option removes the vertex where the mouse pointer was located when you opened the pop-up menu. This option is available only when a tool is displayed. This same action can be performed by clicking mouse Button 2 on a vertex.

Move Vertex

This menu option lets you drag a vertex without pressing mouse Button 1. The cursor's position over a vertex before the pop-up menu was invoked marks the vertex that moves. To terminate the move and fix the location, click any mouse button.

Move Entire Element

This menu option lets you drag an entire element without pressing mouse Button 1. The cursor's position over an element before the pop-up menu was invoked marks the element that moves. To terminate the move and fix the location, click any mouse button.

Add Vertex

This menu option lets you add a vertex without pressing mouse button 2. The new vertex is added at the cursor location in the identified element segment. The cursor's position over an element before the pop-up menu was invoked identifies the element. When you add a vertex using the pop-up, it is movable until you click Button 1.

Select Location

This menu option allows you to change the location of the selected element by clicking mouse Button 3 on the desired location. This option is available only when you are using WarnGen or the Alert Area Editor.

Select Area

This menu option, available only when you are using the Alert Area Editor, allows you to delineate an alert area using a stretch box. The upper left corner of the box is located at the location of the cursor when the Select Area option is chosen. Stretch out the box to the desired size and click any mouse button to finish drawing the box.



2.2.9 Color Editors

There are two color editors: The Image Properties Color Editor, which is used to change an images color property; and the Set Background Color Editor, which is used to change the background color of the main and/or monitor panes. The Image Properties Color Editor is also used to modify existing color tables, or create new ones and save them for future use. There are four types of color tables:

1. AWIPS standard color tables, which come with the system as part of the baseline code and are read-only (they cannot be changed unless you save them with different names).
2. Site-localized color tables, which are also read-only.
3. Office-customized color tables, which are available to the entire staff and can be edited.
4. User-customized color tables, which are saved and accessible under a specific user ID.

The menu from which to access all color tables is in the Image Properties dialog box. The Image Properties dialog box labeled "**Imaging...**", is shown in **Exhibit 2.2.9-1**.

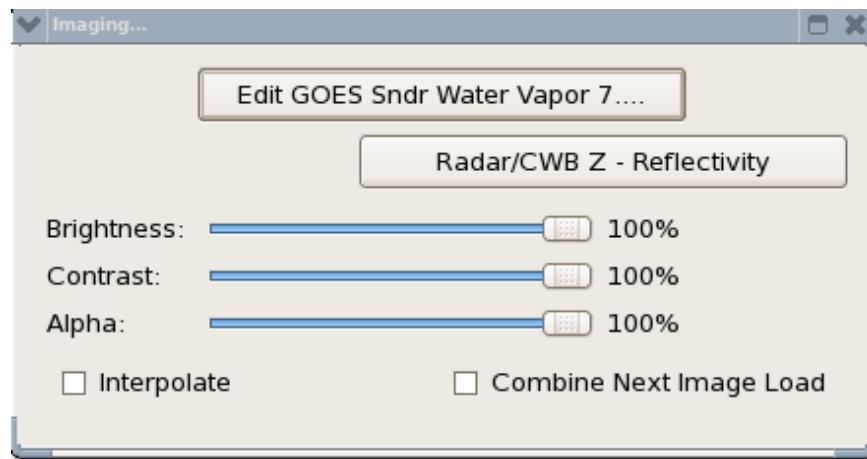


Exhibit 2.2.9-1. Image Properties Dialog Box

The Image Color Editor, as shown in **Exhibit 2.2.9-1** can be opened in three ways:

1. From the Menu bar, select **Options ▶ Image Properties**.
2. From the Toolbar, select the **Image Properties**  iconified button.
3. On a 4 Panel Map, by pressing and holding mouse Button 3 over one of the panels to pop-up menu and selecting **Control Color of This image** as shown in **Exhibit 2.2.9-2**.

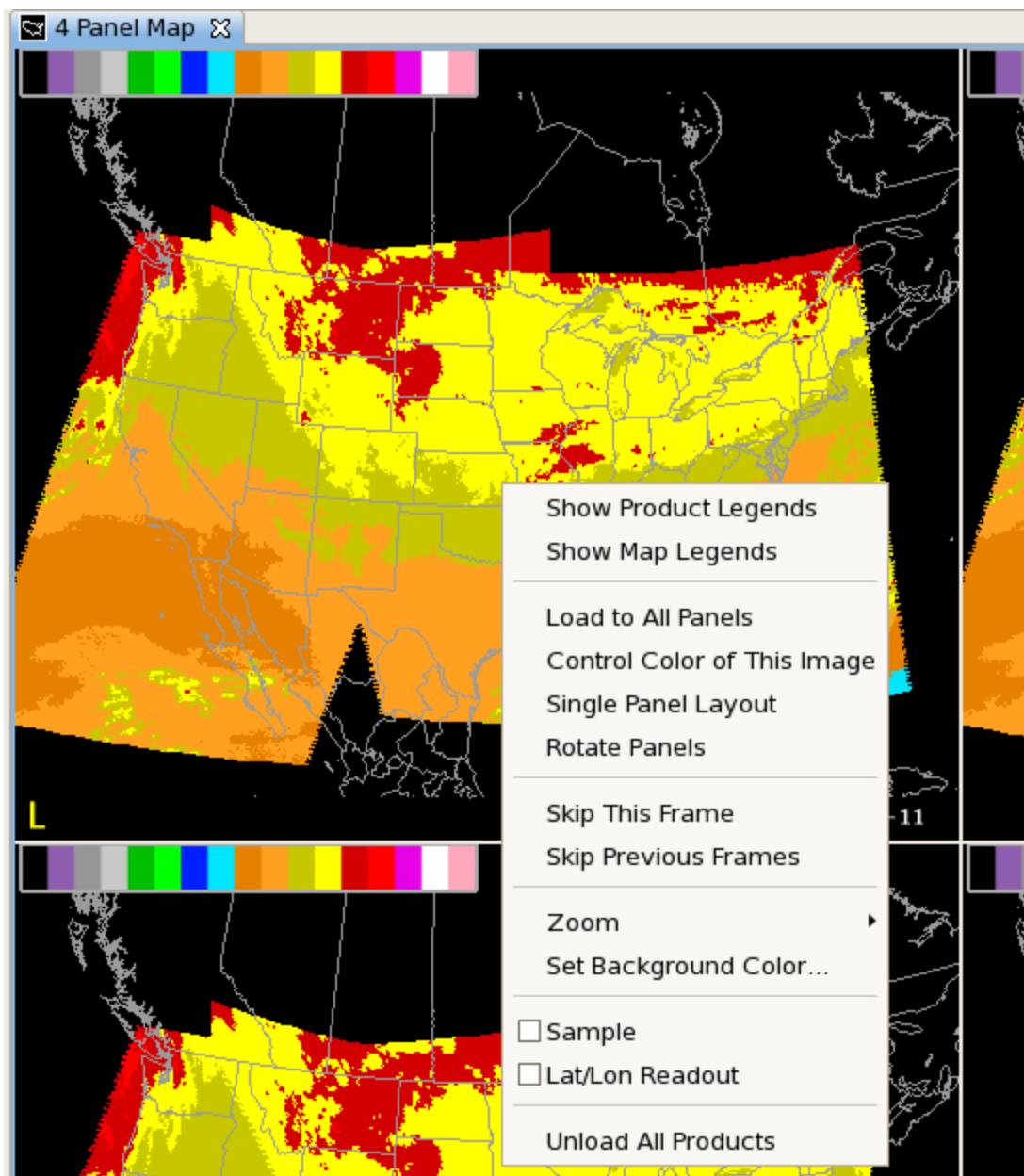


Exhibit 2.2.9-2. Control of This Image Pop-up Menu

To change the background color of the main and/or monitor panes, you would open the Set Background Color dialog box. This Image Color Editor is shown in **Exhibit 2.2.9-3**.

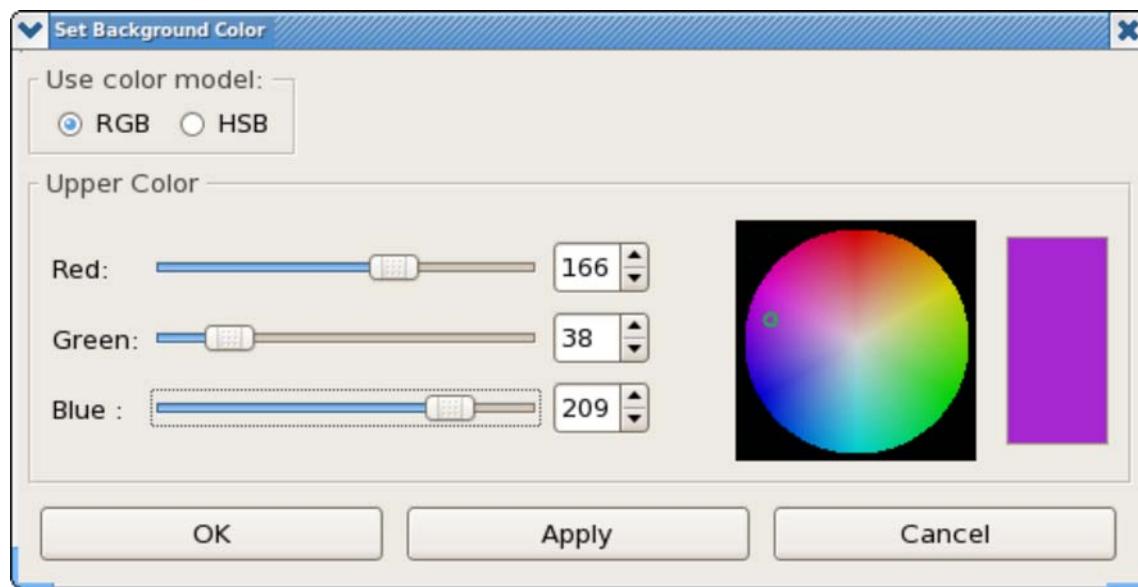


Exhibit 2.2.9-3. Set Background Color Dialog Box

The Image Color Editor, as shown in **Exhibit 2.2.9-1** is opened by:

1. Pressing and holding mouse Button 3 on the main or monitor display pane until the pop-up window, as shown in **Exhibit 2.2.9-4** appears.



Exhibit 2.2.9-4. Pop-up Window to Open Set Background Color Dialog Box

2. Select **Set Background Color** to open the dialog box shown in **Exhibit 2.1.9-3**.

For more information about the Image Color Editor, go to the next section, [Section 2.2.9.1](#).

2.2.9.1 Image Color Editing Features and Process

This section describes the image color editing feature and illustrates the image color editing process. For a Practice Module on how to use the color editor function, see [Section 3.3.3](#).

Refer to **Exhibit 2.2.9.1-1** when reading this section.

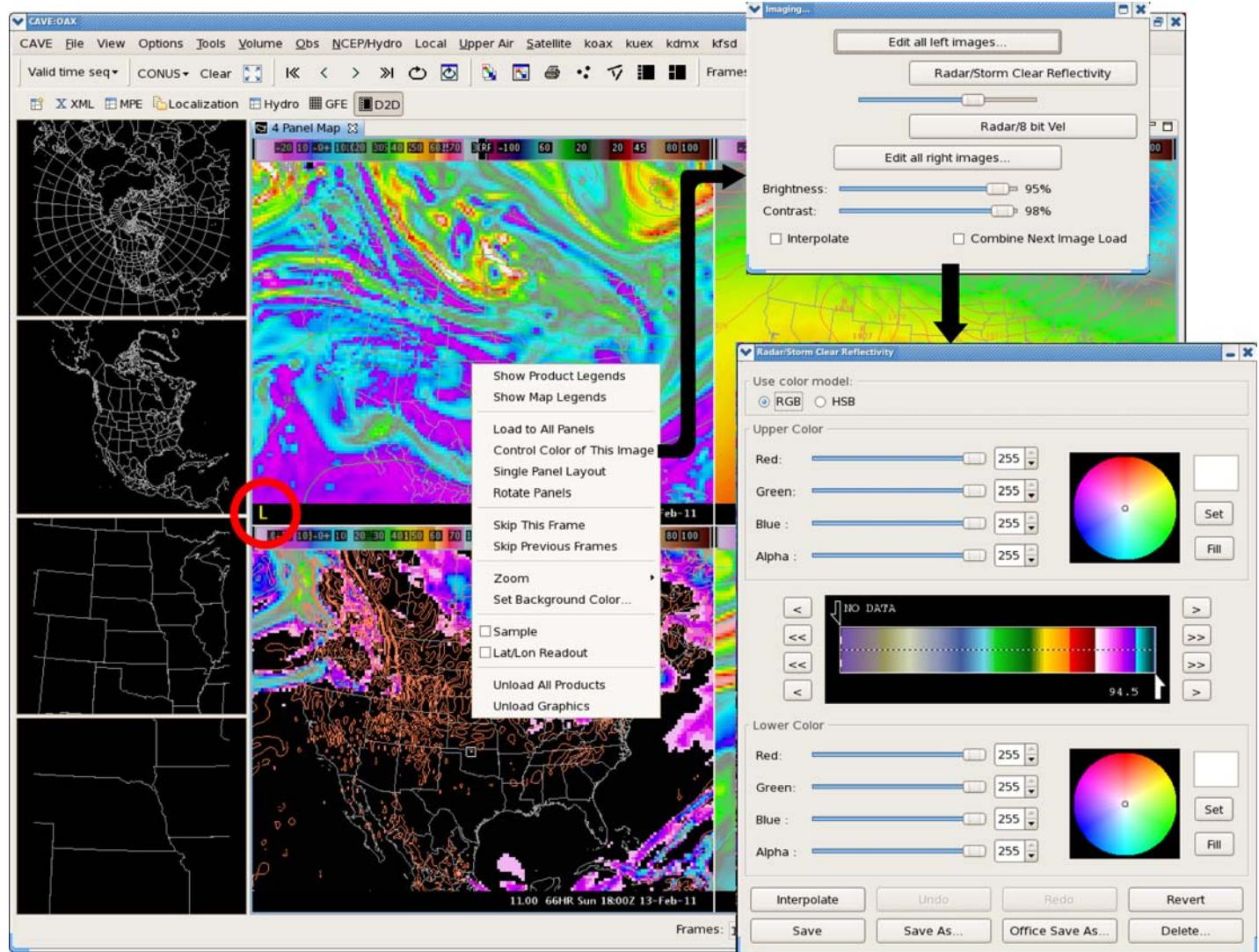


Exhibit 2.2.9.1-1. Image Color Editing Process

Note 1: The controls in the upper color portion of the dialog box are mirrored in the lower color portion. The controls in both portions behave the same way.

- **Use Color Model:** Red, Green, Blue (RGB) and Hue, Saturation, and Brightness (HSB) radio buttons allow you to choose the color model.
- **HSB/RGB Slider Bars:** These slider bars allow you to make incremental changes in the components of the color displayed in the Color Swatch. These values can be set using the slider bar, typing a value in the entry box to the right of the slider, or by using the up and down arrow keys.
- **Color Wheel:** The box on the right side of the dialog box contains the Color Wheel. The Color Wheel Centroid (a circle with a dot in the middle) can be dragged anywhere within the circle to change the color displayed in the Color Swatch (more on this later in this section). Moving the Centroid around the circle also changes the HSB or RGB values. In HSB mode, brightness cannot be changed by dragging the Centroid.
 - **Red, Green, Blue:** The red, green, and blue values in the RGB mode all range from 0-255 and reflect the amount, or intensity, of each color present in the displayed color. Changing these values moves the Color Wheel Centroid across the Color Wheel, but not necessarily along a radial.
 - **Alpha:** The Alpha values in both the RGB mode and the HSB mode range from 0-255 and reflect the amount, or intensity, of blending of the

displayed color. Changing the Alpha values does not move the Color Wheel Centroid across the Color Wheel, but it modifies the contrasting colors in the Color Swatch box.

- **Hue:** Values for hue range from 0-359 and determine the amount of color tint. Changing hue values moves the Color Wheel Centroid around the circumference of the Color Wheel. Try dragging the Hue Slider Bar (to change the hue value) and notice the movement of the Centroid.
- **Saturation:** Saturation values are given in percent (0-100) and determine the amount of white (the higher the value, the less white) present in the color. Changing saturation values moves the Color Wheel Centroid along a radial of the Color Wheel. Change the saturation values and note the movement of the Centroid.
- **Brightness:** As with saturation, brightness values are also given in percent (0-100). Brightness determines the amount of black present in the color. The higher the values, the less black present. Brightness can also be thought of as the intensity of the color.
- **Color Swatch:** To the right of the Color Wheel is the Color Swatch. Moving the Color Wheel Centroid changes the color in the swatch. Also, clicking anywhere in the top half of the Color Bar (located in the middle of the dialog box) fills the top Color Swatch with the corresponding color; clicking anywhere in the lower half of the Color Bar fills the bottom Color Swatch.
- **Set:** These buttons, located in both the upper and lower portions of the Image Colors Editor, insert a narrow line of color into the current Color Bar at the location of the Color Pointer. The color inserted is the one displayed in the corresponding (i.e., upper or lower) Color Swatch.
- **Fill:** These buttons replace the colors contained within the range specified by the Color Pointers in the Color Bar with the colors in the upper or lower Color Swatch.
- **Color Bar:** The Color Bar contains the color table of the current image and is located in the middle of the dialog box.

The arrowhead Color Pointers along the top and bottom halves of the Color Bar can be dragged to delineate a range of the color table, that is, the portion of the Color Bar contained between the top and bottom arrows. The Color Pointers move independently of one another, but they cannot move past each other. When aligned, they move in unison and delineate a single point along the Color Bar.

As the Color Pointers are dragged along the Color Bar, they display the image values corresponding to the color pointed to. For example, if an infrared satellite image is displayed, moving the Color Pointer shows the temperature values corresponding to the colors in the Color Bar.

Note 2: As the Color Pointers are moved, they are filled with the color they are pointing to.

To either side of the Color Bar are left- and right-pointing arrows. These are used to move the Color Pointers along the Color Bar an increment at a time. The > and < move one image value at a time (i.e., 256 steps through the color bar), while >> and << move one color band at a time. In the case illustrated, there is no difference in behavior between the two. For a 4-bit radar color table, the << moves to the next of the 16 colors.

- **Edit Controls:** At the bottom of the dialog box are the Edit Controls.
 - **Interpolate:** This button fills the specified range of values with intermediate colors. In both RGB and HSB modes, each component is interpolated. For RGB, the effect is more or less one of moving across the color wheel in a straight line from the upper color to the lower; in HSB, the centroid motion is along an arc or spiral. (In fact, the RGB interpolation is not necessarily a straight line across the color wheel, as one can see from the example in Objective 2 of Module 5 in the next section.)
 - **Undo:** This button allows you to successively undo changes made to the color table.
 - **Redo:** This button successively redo the last edit that was undone.
 - **Revert:** This button returns the Color Bar (and the displayed image) to its original state.
 - **Save:** This button saves changes that you have made to a color table. If you are editing a read-only color table, or one that is owned by another user, this menu button is disabled.
 - **Save As...:** This menu button opens the Save As dialog box in which you can enter a name for your color table. The color table is saved in a folder containing the customized color tables for the current user. If the new name of the color table is the same as the name of an existing color table in this folder, a dialog box opens and asks you if you want to overwrite the existing color table.
 - **Office Save As...:** With this menu button, you can save a newly edited color table so that it is accessible on every workstation in your office. A dialog box asks you to enter a name for your color table and then lets you save it or cancel the command.
 - **Delete...:** This button allows you to delete an edited color table. A confirmation dialog box opens to confirm your request. This menu button is disabled if you are editing a read-only color table or a color table that is owned by another user.

3.0 Getting Started Using AWIPS Graphical User Interface

This chapter introduces you to the CAVE workspace for working with graphic and image products. It includes practice modules for getting you familiar with the Graphics Workstation and the CAVE environment.

This chapter includes the following sections:

- [Section 3.1: Working with Graphics and Image Products](#)
- [Section 3.2: Working with Model Data Using the Volume Browser](#)
- [Section 3.3: Practice Modules \(Tutorials\) for AWIPS Graphical User Interface](#)

3.1 Working with Graphic and Image Products

Products are presented in two formats in the CAVE workspace: graphics and images. Graphic products are presented as either contoured or plotted data. Image products are presented as continuous fields. Examples of graphic products include contours of temperature or other model data, plots of METAR or local-scale observational data, or Radiosonde Observation (RAOB) soundings. Examples of image products include satellite and radar data, as well as image presentations of other (usually contoured) data fields such as temperature, heights, and vorticity.

3.1.1 The Procedures Cascading Menu

Procedures are user-generated lists of graphics and/or image products, which enable you to define, customize, and save a sequence of products. Procedures provide a convenient way to display commonly used products or products that are needed for a certain weather scenario. If, for example, you display 24 frames of IR satellite imagery overlaid with METAR plots, you can save for future use this grouping of products (a "bundle"), along with other bundles, as a Procedure.

Bundles contain not only all the products you overlaid onto the display, but also the display parameters (frame count, looping speed, color tables, and graphics control settings). You can then label your Procedure to reflect its contents or with your own name. This allows you to save your color, line width, and line style preferences. When you display the bundle, your preferences are already applied.

When you use the Points or Baselines tools to generate model soundings, cross-sections, time series, etc., and save these bundles in a Procedure for future use, you have the choice to display the data with the original position of the point or baseline that you used when you set up the bundle, or you can use the current position, which is likely to be in a different location than it was when you set up the bundle. You can also alter the model grid, radar, or point/baseline at load time.

You open the Procedures cascading menu from the File button on the Menu Bar, as shown in **Exhibit 3.1.1-1**.

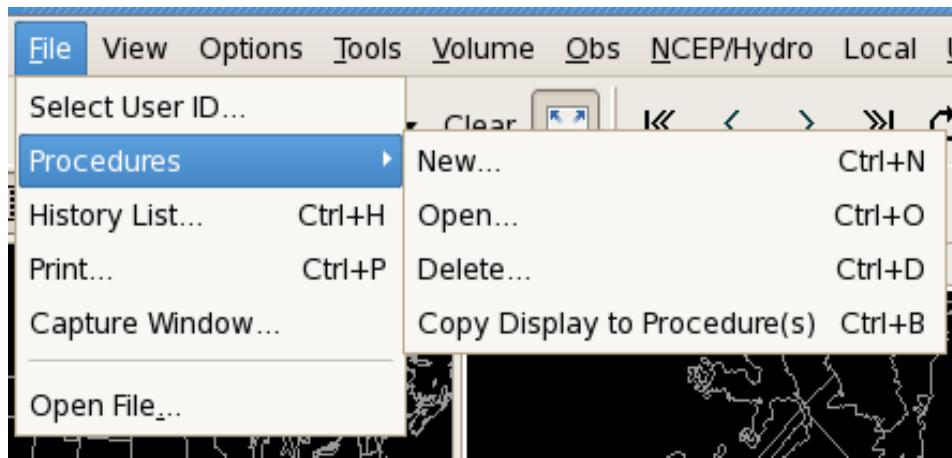


Exhibit 3.1.1-1. Procedures Cascading Menu

The New, Open, and Delete menu options each activate dialog boxes needed to open, build, edit, save, name, and delete Procedures. These dialog boxes are described in the next section. The Copy Display to Procedure(s) option copies the current bundle into any open Procedure.

3.1.2 The Procedures Dialog Box

New... (Ctrl+N)

The File ► Procedures ► New... (Ctrl+N) option opens the Procedure - (untitled) dialog box, as shown in **Exhibit 3.1.2-1**. When first opened, the dialog box's display window is empty. The buttons on the Procedure dialog box are used to control the bundles in a procedure, as described below.



Exhibit 3.1.2-1. Procedure Dialog Box

- **Up/Down:** These buttons move the selected bundle up or down within the procedure. Movement 'wraps' from top to bottom and vice versa.
- **Rename...:** Clicking this button brings up a dialog box which allows you to type a new name for the selected bundle.
- **Original:** This radio button allows you to display any cross-sections or point soundings or time-height cross-sections that you may have in your procedure using the original location of the points and baselines that you used when you initially set up your bundle.
- **Current:** This radio button allows you to display any cross-sections or point soundings or time-height cross-sections that you may have in your Procedure using the present location of the baselines or points.
- **First/Next:** This menu button loads the bundles sequentially from the top (first) bundle to the last (and will wrap back to the top). The currently displayed bundle is highlighted.
- **Load:** This menu button displays the highlighted bundle in the large display pane. You can also double-click on the bundle to load it.
- **Alter...:** This menu button opens the Alter Bundle On Loading dialog box, which contains options that allow you to modify how an existing bundle displays. In each case, choosing an item from the option menu will automatically select the associated check button. If the selection you want is already showing, you can just click on the check button to activate it. In the case where an item does not apply

(e.g., point/line for a radar PPI), it makes no difference if it is selected or not.

- **Point/Line:** These option menus allow you to modify an existing cross-section, point sounding, or time-height cross-section bundle.
 - **Last Edit (Point/Line):** This option lets you load a cross-section or point sounding or time-height cross-section using the most recently edited point or line, which is given in the label.
 - **Original Location:** Select this option to display data using the point or baseline location in effect when the bundle was stored.
 - **Current Location:** This option lets you display a cross-section or point sounding or time-height cross-section using the present location of the baseline or point.
 - **Point/Line-[x]:** You can choose to use any of the points or baselines with one of these selections.
- **Radar:** Select this check button to display data from a different radar.

Note 1: The radars available to choose are those that appear on the menus - main menu plus Radar menu.

- **Grid:** This menu allows you to select an alternate grid, for example, to display a time section or cross-section.

Notes:

2. Once you alter a bundle and display it, you override the information in the bundle with new information. The new information in the bundle can then be put into a procedure.
3. Refer to [Section 3.3.5](#) for a practice module on altering a Procedure.

- **Copy In:** This button puts the current contents of the large display pane into this procedure.
- **Copy Out:** This button copies a selected bundle in one procedure into other open procedures. At least one other Procedure Dialog Box must be open to enable this menu button.
- **Delete:** This button deletes a highlighted bundle from a procedure.
- **Save:** If this is a new, unsaved procedure, this button will open the Save Procedure As dialog box, which provides a standard interface to name your procedure and store it in your personal directory. For an existing procedure, Save will update it without any further interaction. The Save button becomes enabled any time you make a change (add, delete, move, or rename bundles). It's a good practice to save changes as you make them.
- **Save As...:** This button opens the Save Procedure As dialog box to allow you to save a copy under a different name.

- **Close:** This button closes the Procedure Dialog Box. The Close button does not automatically save changes you may have made to your procedure but will prompt you to do so if appropriate. Use the Save button to save a revised procedure.

Open... (Ctrl+O)

The Open... (Ctrl+O) option opens the Open Procedure dialog box.

The Open Procedure dialog box contains a list of the selected user ID's procedures. To open an existing procedure, double click on it or highlight it and press the **OK** button at the upper right of the dialog box. You can also type the procedure name on the line provided in this dialog box. Once you select a procedure, it appears in a dialog box labeled with the procedure's name.

Delete... (Ctrl+D)

The Delete... (Ctrl+D) option opens the Delete Procedure dialog box, which allows you to delete any procedure that you own.

- **OK:** Once you have identified the procedure you want to delete, click the **OK** button or you can double-click to delete. A confirmation dialog appears and then the Delete Procedure dialog closes.

Note 4: Once deleted, a procedure cannot be restored.

- **Cancel:** This closes the Delete Procedure Dialog Box.

Copy Display to Procedure(s) (Ctrl+B)

This Copy Display to Procedure(s) option copies the products that are currently in the large display pane into any open procedure.

The History List Dialog Box

The History List dialog box is opened from the File pull-down menu or by using the "**Ctrl+H**" keyboard shortcut. It contains the most recent bundles that were displayed in the large display pane with the most recently loaded bundle appearing at the top of the History List.

Procedures may be built from the bundles contained in the History List. If you swap panes or clear the large display pane, a blank space appears temporarily in the History List.

The buttons on the History List dialog box are described below.

- **Load:** The Load button displays the highlighted bundle in the large display pane; you can also double-click on the name to load it. A copy of this bundle is added to the top of the History List.
- **Copy Out:** This button copies the selected bundle into any open Procedure dialog boxes.
- **Alter Bundle...:** This menu button opens the Alter Bundle On Loading dialog box, which contains options that allow you to modify how an existing bundle displays. These options are as described above.
- **Close:** This button closes the History List.

3.2 Working with Model Data Using The Volume Browser

The Volume Browser provides access to numerical models, other gridded data, and selected point data sources, such as RAOB, METAR, and Profiler. Through the Browser interface, you can choose the data source(s), field(s), plane(s), and point(s), and generate a customized list of model graphics or images for display. This chapter introduces the features and functionality of the Volume Browser.

3.2.1 The Volume Browser Dialog Box

The Volume Browser Dialog Box can be accessed from the Volume menu.

The Volume Browser window is divided into four areas:

- The Menu Bar along the top
- The Data Selection Menus
- The Product Selection List
- The Load Buttons (Diff and Load) to load items from the Product Selection List

Each area is then subdivided into menu components, described in Sections 3.2.2 through 3.2.5.

The menu bar along the top of the Volume Browser window has pull-down lists that contain options for controlling all the various menu choices of the Volume Browser. Exhibit 3.2.1-1 shows the Volume Browser Dialog Box when initially opened.

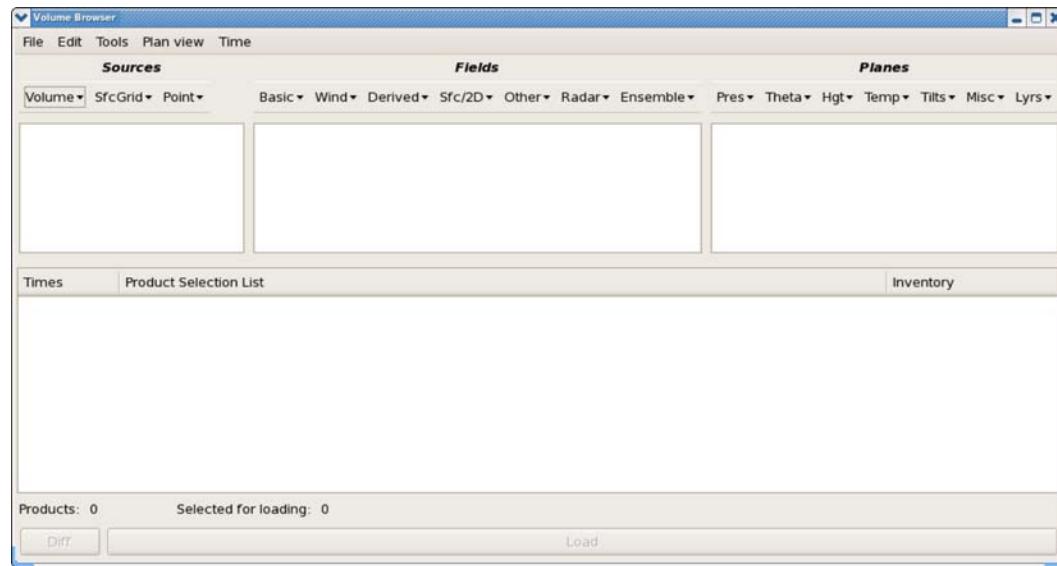


Exhibit 3.2.1-1. Standard (Default) Volume Browser Dialog Box

The Volume Browser dialog layout can be reconfigured to accommodate additional selectors that are not available on the standard (default) Volume Browser dialog box. The workstation configuration file (nationalData/ws.config) can be reconfigured to include the additional selectors, added either to the standard single-row layout or to an optional two-row layout that would include two rows of selectors under *Sources*, *Fields*, and *Planes*. This office-level setting results in a two-row layout. Users may wish to experiment with this alternate layout, which can be effected by creating a customFiles version of ws.config with #append and the single vb numRows: 2 line.

3.2.2 The Volume Browser Menu Bar

The pull-down menus in the Volume Browser menu bar contain options for controlling and manipulating the Volume Browser or the products chosen through the Volume Browser.

- **File:** The File pull-down menu, shown in **Exhibit 3.2.2-1**, contains the following options:

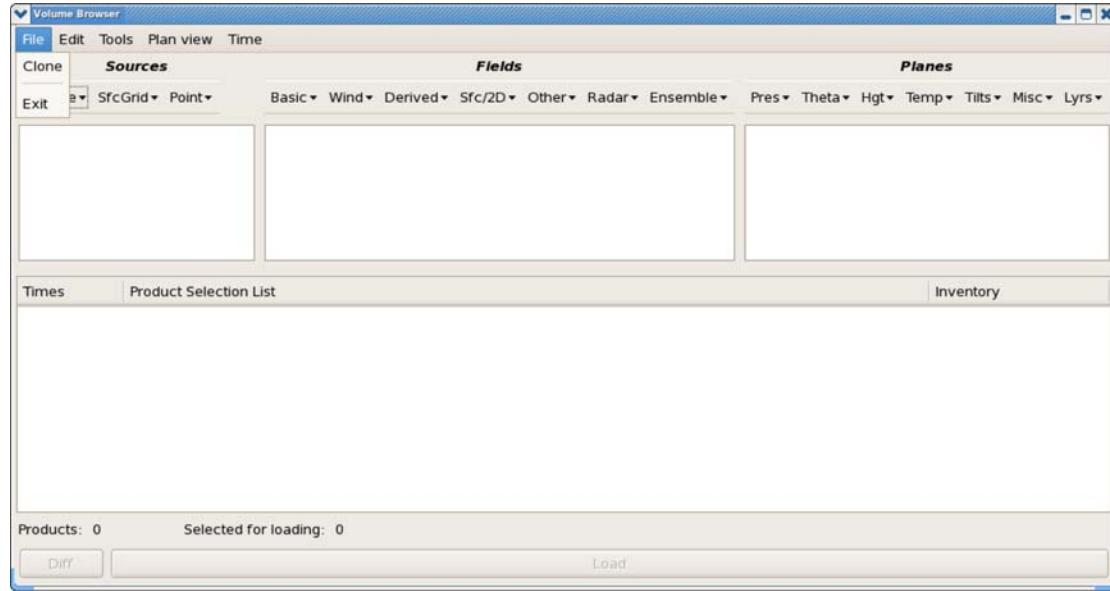


Exhibit 3.2.2-1. Volume Browser Menu Bar - File Pull-down Menu

- **Clone:** Duplicates the Product Selection List's highlighted products into a separate dialog box.
- **Exit:** Closes the Volume Browser Dialog Box. Any product selections you may have made in the Volume Browser before exiting remain when you re-open the Volume Browser.
- **Edit:** The Edit pull-down menu, shown in **Exhibit 3.2.2-2**, contains the following options:

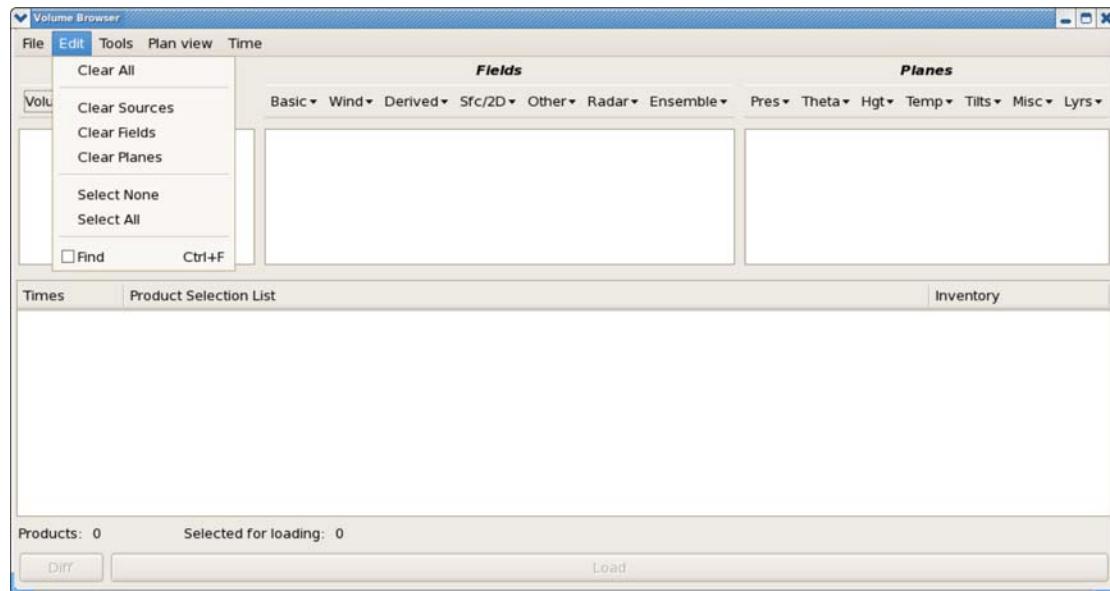


Exhibit 3.2.2-2. Volume Browser Menu Bar - Edit Pull-down Menu

- **Clear All:** Removes all list entries you have made in the Volume Browser.
- **Clear Sources:** Removes any model sources from the Sources List.
- **Clear Fields:** Removes any model fields from the Fields List.

- **Clear Planes:** Removes any model planes from the Planes List.
 - **Select None:** Deselects and empties all of the products in your Product Selection List but leaves the selections you made in the Source, Fields, and Planes Menus.
 - **Select All:** Generates a Product Selection List of all possible products based on the selections made in the Source, Fields, and Planes Menus.
 - **Find (Ctrl+F):** Checking this box activates the search function.
- **Tools:** The Tools pull-down menu, shown in **Exhibit 3.2.2-3**, contains the following options:

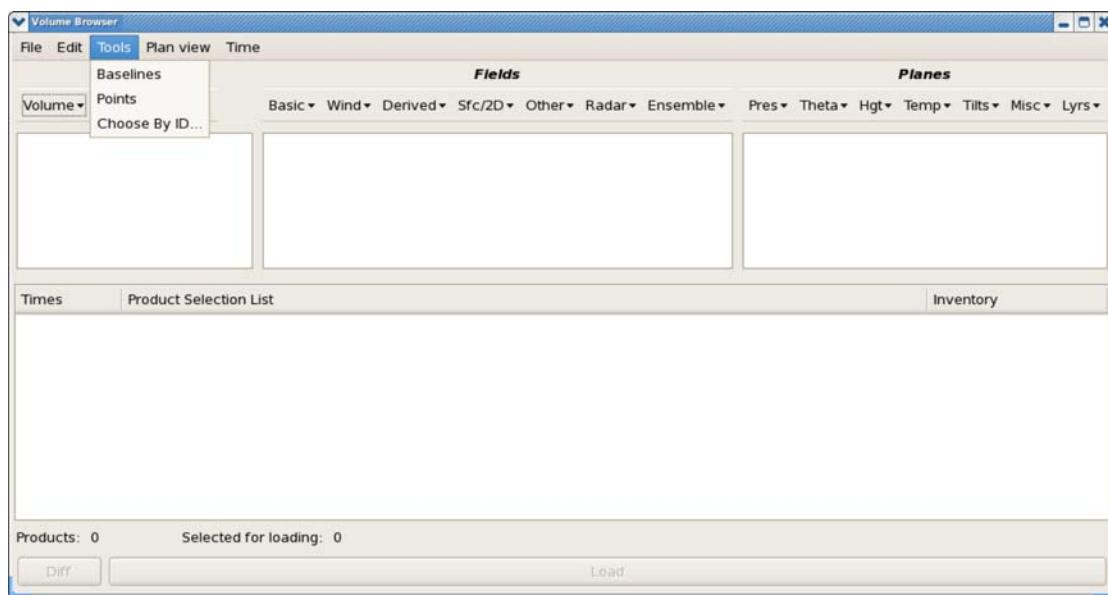


Exhibit 3.2.2-3. Volume Browser Menu Bar - Tools Pull-down Menu

- **Baselines:** Editable lines that determine the cross-section coordinates of the gridded model data. These baselines are the same as those mentioned in [Section 2.2.6.5 Tools](#) and are available in the Volume Browser for user convenience.
 - **Points:** Editable locator dots that are used to generate model soundings, time/height sections, and time series from gridded model data. These points are the same as those mentioned in [Section 2.2.6.5](#) and are available in the Volume Browser for user convenience.
 - **Choose By ID... :** A function of the Digital Mesocyclone Display (DMD) and a method of selecting feature locations. The tool is used to monitor the same feature at a certain location. Without the Choose By ID tool, a monitored feature (over a period of time) could move away from its monitored location and another feature could move in its place. You can use Choose By ID to set points, baselines, and "Home" for conventional locations like METARs and RAOBs, but its primary use is for the 88D-identified mesocyclone locations. Refer to Exhibit 3.2.2-3 and to [Section 3.3.6, Objective 14.1](#) for practice modules. You can also access the Choose By ID tool and menu from the **Tools** Menu on the Main Menu; refer to [Section 2.2.6.5](#).
- **Settings:** Settings allow you to choose whether you want the data to be presented in Plan-view (horizontal), cross-section (vertical slice), time-height, variable vs. height, sounding, or in a time series perspective. You can also choose the temporal direction of time-height cross-sections.

The Settings category consists of a one, two, or more pull-down menus, which are labeled with the selected menu option. The number of additional Volume Browser pull-down menus, if any, depend on the setting that was first selected. For example, selecting Plan view adds the Time (Animate in Time or Animate in Space) pull-down menu setting, as shown in **Exhibit 3.2.2-4**. However, selecting Sounding does not add any additional pull-down menus.

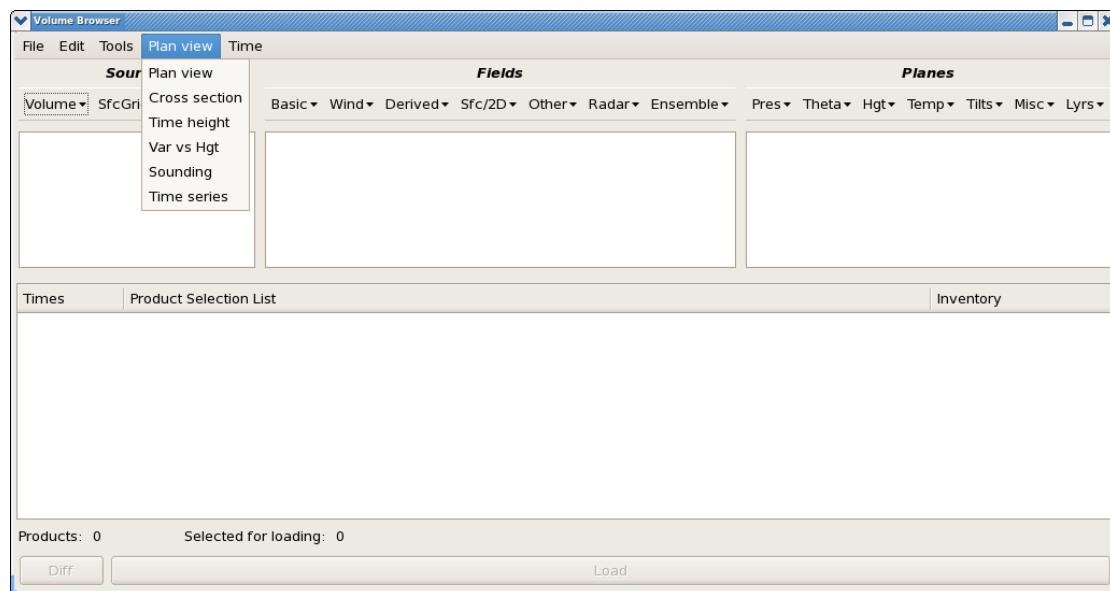


Exhibit 3.2.2-4. Volume Browser Menu Bar - Settings (Plan view & Time) Pull-down Menus

The Volume Browser is a dynamic dialog box. After you choose the first setting, additional option menus specific to that setting appear to the right on the Volume Browser menu bar. The Fields and Planes pull-down menus change with each setting as well. Because of this relationship, the additional pull-downs menus are listed here under the Settings general category.

- **Plan view:** The default option for the Volume Browser. From the Plan-view perspective, data are plotted onto horizontal surfaces. The Plan-view Planes are discussed in the planes section that follows. The additional options menu that appears in the Volume Browser menu bar allows you to choose whether you want the Plan-view data to Animate in Time or Animate in Space. **Exhibits 3.2.2-1, -2, -3, and -4** show Plan view and Time (Animate in Time) settings. **Exhibit 3.2.2-5** show Cross section and Time settings.
- **Cross section:** Allows you to view gridded data as vertical slices along specific baselines. You need to use either the Interactive Baseline Tool or the predefined latitude/longitude baselines to specify the slice you wish to see. One of the additional options menus that appear in the Volume Browser menu bar allows you to choose whether you want the cross-section data to animate in time or space, while the other options menu allows you to adjust the vertical resolution. Descriptions of these options follows. (Note that the Fields and Planes submenu labels have changed after selecting "Cross section.") **Exhibit 3.2.2-5** shows the Volume Browser menus as they appear when the Cross section setting is chosen.

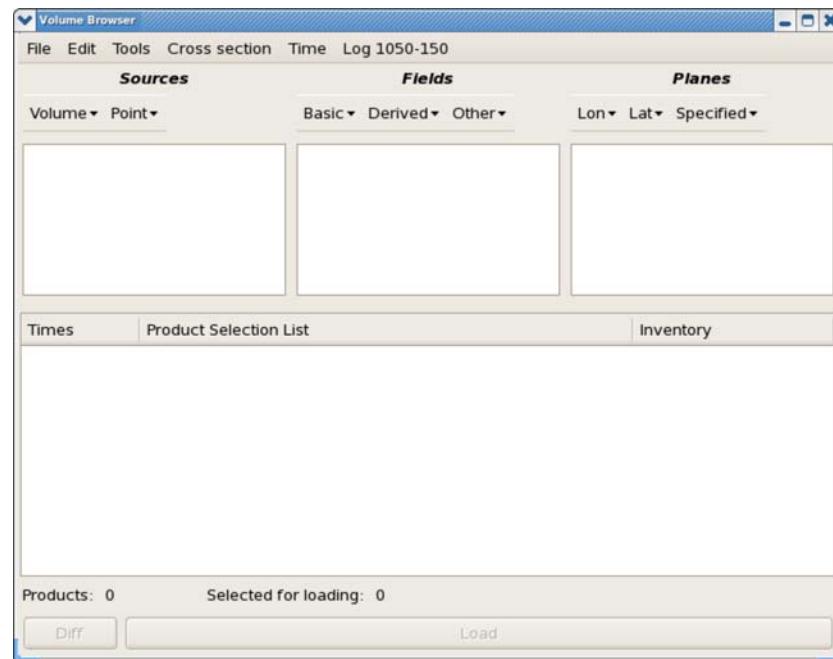


Exhibit 3.2.2-5. Volume Browser - Cross section Menu State

- **Time-height:** Used in conjunction with the Interactive Points Tool to enable you to view a time-height cross section of a full run

of gridded model data for a specific location. Additional options menus in the Volume Browser menu bar allow you to choose the direction in which you want the data to be plotted, and to adjust the vertical resolution. **Exhibit 3.2.2-6** shows the Volume Browser menus as they appear when the Time height setting is chosen. (Note that this illustrates the case of no local sources.)

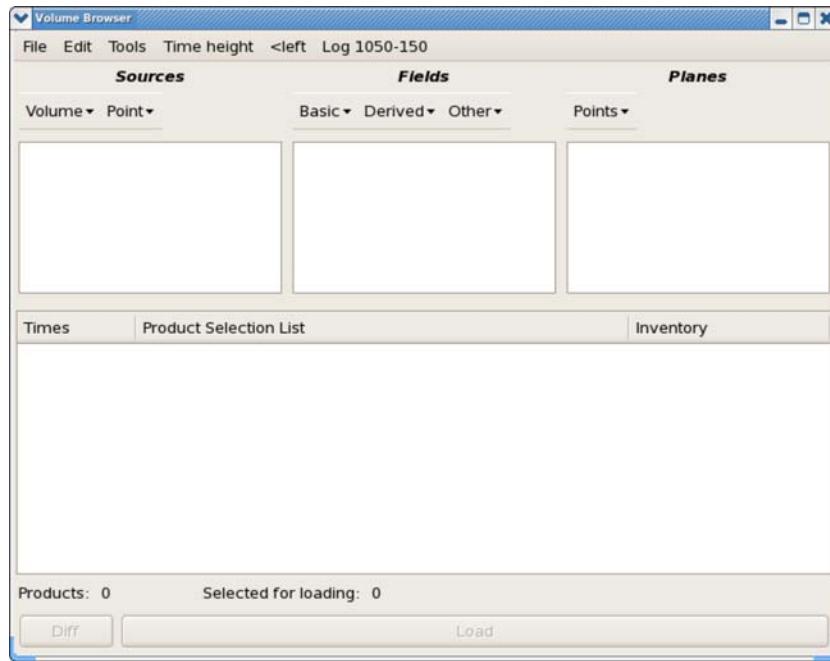


Exhibit 3.2.2-6. Volume Browser - Time height Menu State

- <**left**: Used when generating a time-height cross section. Data are plotted with the latest data on the left and the earliest data on the right.
- >**right**: Used when generating a time-height cross section. Data are plotted with the latest data on the right and the earliest data on the left.
- **Var vs Hgt**: Enables you to view a profile of a meteorological model field as it changes through height, which is displayed in millibars. By using the Interactive Points Tool, you can select one or more locations from which to plot the data. **Exhibit 3.2.2-7** shows the Volume Browser menus as they appear when the Var vs Hgt setting is chosen.

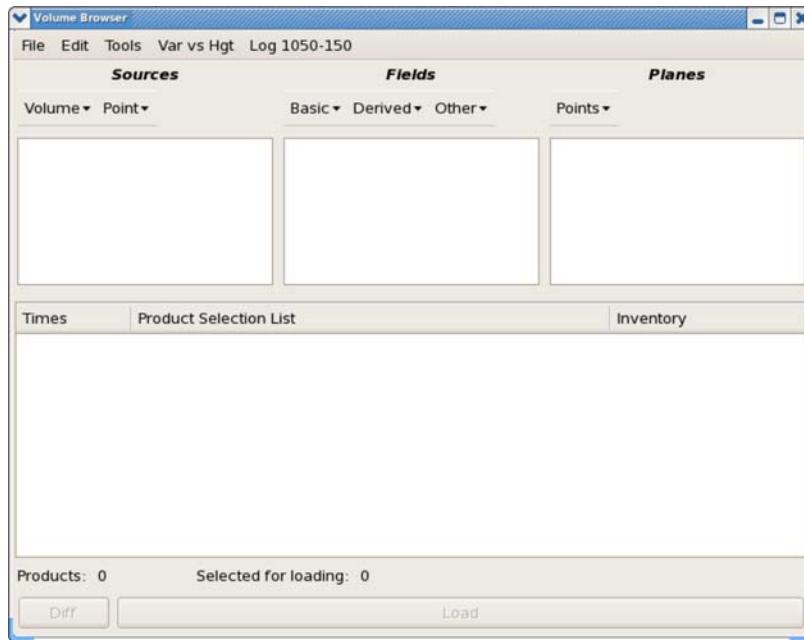


Exhibit 3.2.2-7. Volume Browser - Var vs Hgt Menu State

- **Sounding**: Works in conjunction with the Interactive Points Tool to enable you to generate a Skew-T chart for a specific location, as shown in **Exhibit 3.2.2-8**, no additional menus appear in the Volume Browser when the Soundings setting is chosen.

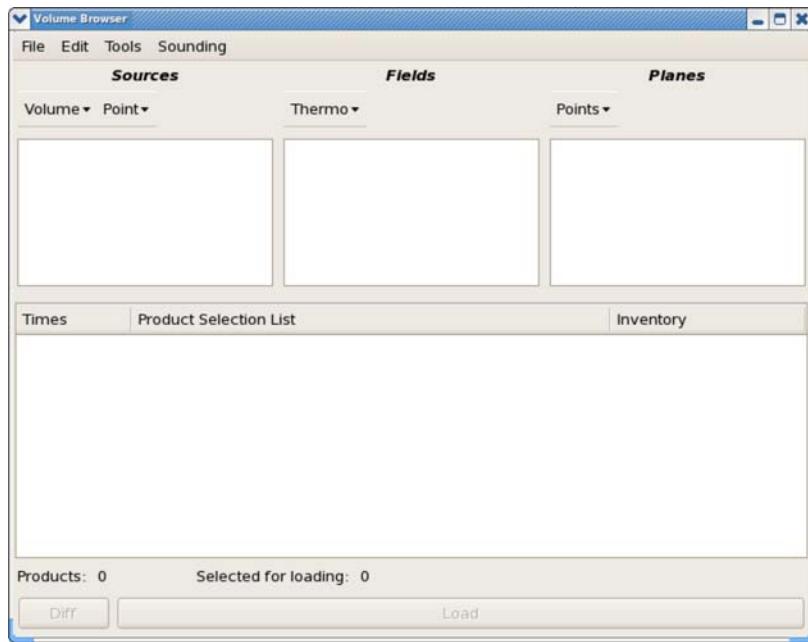


Exhibit 3.2.2-8. Volume Browser - Sounding Menu State

- **Time series:** Used in conjunction with the Interactive Points Tool to enable you to plot gridded data on a time versus data value graph for a specified point. **Exhibit 3.2.2-9** shows the Volume Browser menus as they appear when the Time series setting is chosen.



Exhibit 3.2.2-9. Volume Browser - Time series Menu State

- **Animate in Time:** The default option for the Volume Browser. It allows you to view model data through time.
- **Animate in Space:** Allows you to loop through a series of predefined latitude or longitude cross-sectional slices at a fixed time.

3.2.3 Data Selection

All the data available through the Volume Browser are stored in gridded format and generated as graphic or image presentations on the fly. The specific product you want to display graphically is defined by your selections from the Volume Browser dialog box, as shown in **Exhibit 3.2.3-1**.

Note 1: The combinations of the selected menus, submenus, and options define the available Sources, Fields, and Planes and thus define the specific product you want to graphically display. Refer to [Section 3.2.2](#) for a listing of menu options and their combinations and availability.

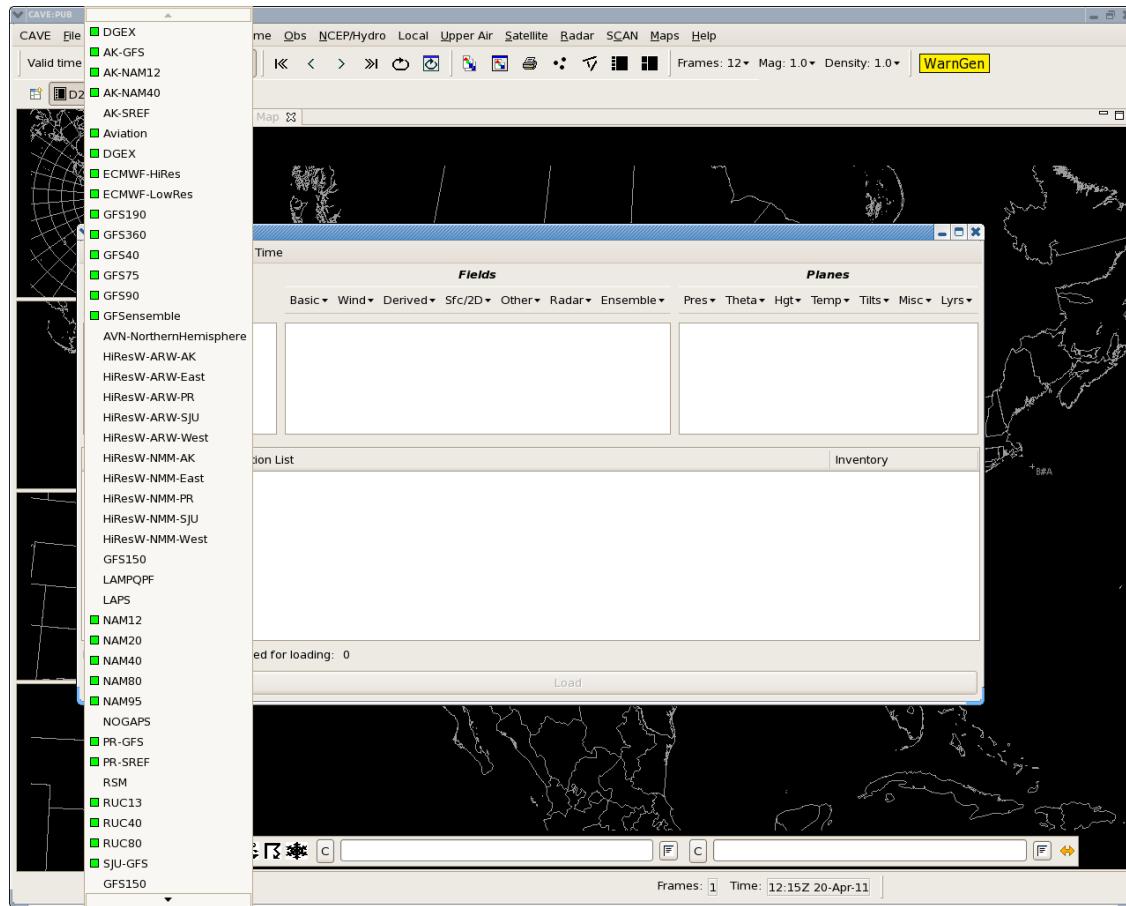


Exhibit 3.2.3-1. List of Volume Browser Product Sources

Note 2: Grids are named (titled) with their delivered resolution, such as NAM40 and GFS90. In some cases, however, higher-resolution components are available, such as GFS precipitation, or different resolutions are used at different time projections, such as >168 hours on the GFS. Once displayed, the product legend will show the actual resolution of each grid used.

The product descriptions that follow will help you understand how the combination of menu selections displays specific information.

Note 3: Menus are not scale-dependent, which means that the contents do not change with a change in the selected scale. Items listed in green font indicate that the items are available in the database. Once a Source is selected the database is sorted and the available items in the Fields and Planes menus are shown in green. Unavailable items have no green indicator. Once an available product is selected, it appears in a dimmed gray color in the menu.

Sources submenus: The Sources section consists of three, and sometimes four submenus.

Note 4: The links provide a generic view of the type of items available for the selected combination. The available options, defined by the green box, may vary depending on the specific Volume Browser menu/submenu combination. Note that Volume and SfcGrid are only partial lists of the total options available, denoted by the down-pointing arrow at the bottom of the list.

- **Volume:** The Volume menu encompasses everything traditionally thought of as grids, including model output and ensembles, plus radar. Click here for [Volume](#).
- **SfcGrid:** The SfcGrid submenu comprises surface or near-surface data, such as MSAS, winds and waves, and sea surface temperature. Click here for [SfcGrid](#).
 - **North American Mesoscale (NAM) Grids:** The NAM model is a regional mesoscale model using enhanced terrain and improved parameterization of surface and precipitation processes. It produces forecasts out to 84 hours at 00, 06, 12 and 18UTC. The NAM Downscaled NWP (Numerical Weather Prediction) Grid (DNG) products (NamDNG5) are available from the Volume Browser. These NAM grid fields include T, Td, Tmin, Tmax, wind, precip, categorical rain, cloud, snow water equiv, visibility, and geometric height for 3-hour to 84-hour incremental projections.
 - **Multisensor Precipitation Estimator (MPE) Grids:** Grids produced by the MPE algorithm are available for display from the Grid menu on the State(s) and WFO scales. MPE grids are displayed using a 'truncated' grid color table that shows zero values in gray to let you see the limits of the site-specified domain.
 - **Ocean Prediction Center and Tropical Analysis Branch (OPC-TAFB) Grids:** On any scale you can access the OPC grids from the Grid menu in the Volume Browser. The grids are generated twice daily and cover the Northeast-Pacific (grid OPCWave-NE-PAC), the tropical Pacific (OPCWAVE-TE-PAC), and the Western Atlantic/Caribbean (OPCWAVE-W-ATL). The grids consist of analysis, 24-hr, and 48-hr forecasts of significant wave heights.
 - **TPC Tropical Cyclone Gridded Probabilistic Wind (TPCWindProb) Grids:** On any scale you can access cumulative and incremental TPCWindProb grids from the Grid menu. These fields include cumulative and incremental probabilities of 34kt, 50kt, and 64kt surface winds. Selectors for these probabilities are found in a TPC Guidance submenu on the **Sfc/2D** menu in the Fields column. Also from the Grid menu, you can access GFS fields, which include Low, Middle, and High Cloud Base pressure; 0.5, 1.0, 1.5, and 2.0 PV Surfaces; and ICEG (ice accretion). A GFS Ice Accretion and Visibility Guidance NH lat-lon grid (232) dataset with 3h intervals from 3-24h, 6h from 30-72h, and 12h from 84-168h, is available from the GFSGuide, located in the Grid menu.
 - **Graphical Forecast Editor (GFE) Grids:** MakeD-2DFile is a feature offered by the GFE that allows you to generate a file, which then can be viewed by D2D. To view GFE-generated grids in D-2D, select **Products ▶ Scripts...** from the GFE's main menu bar. Once the dialog appears, select **MakeD-2DFile** and click **Run/Dismiss**. After about 20 seconds, the file is available for

display in D2D via the Volume Browser. To view it, select **GFE** as the model from the Sources menu on the Volume Browser, any one of the scalar weather elements listed below as the Field, and **Surface** as the Level followed by **Load**.

The program stores the first 24 hours of the gridded forecast by default. Currently, the set of GFE weather elements stored in the file is limited to the following scalars:

- Temperature (T)
- Dew Point (Td)
- Relative Humidity (RH)
- Probability of Precipitation (PoP)
- Minimum Temperature (MinT)
- Maximum Temperature (MaxT)
- Quantitative Precipitation Forecast (QPF)
- **Rapid Update Cycle (RUC) Grids:** On any scale level, you can access RUC13 and RUC40 grids from the Grids menu on the Volume Browser. RUC80 grids are accessible on the North America and CONUS scale levels. RUC13 grids are available on the Volume Browser, and integrated with GFE. The grids (source RUC13, grid 130) are clipped to your Regional scale.
- **Real-time Global Sea Surface Temperature Analyses (RTG_SST and RTG_SST_HR) Grids:** On any scale, you can access the RTG_SST analysis grid. On all displayable scales, you can also access the Real-time Global RTG_SST_HR analysis grid found on the Grid menu of the Volume Browser.

The RTG_SST analysis grid displays a 1/2-degree resolution temperature grid. The RTG_SST_HR analysis grid displays a 1/12-degree resolution temperature grid. The grids are transmitted via the SBN. The high-resolution SST will make the grid an invaluable tool used to aid and improve the digital marine forecasts.

- **High-resolution Precipitation Estimator (HPE/BiasHPE):** The High-resolution Precipitation Estimator (HPE) provides approximately 1km x 1km rain rate and 1-hour rainfall amount mosaics every 5 minutes over part of a 1/4 Hydrologic Rainfall Analysis Project (HRAP) grid covering a WFO's (or an RFC's) area of responsibility in standard AWIPS format. These gridded datasets can be viewed in D2D and used by the Flash Flood Monitoring and Prediction Advanced (FFMPA) system. In the Volume Browser, HPE/BiasHPE data are accessible from the **SfcGrid ▶ HPE/BiasHPE ▶ Precip** submenu.

Note 5: Applicable fields include Temperature, Model Terrain (RTG_SST only), Convective Available Potential Energy (CAPE), and Convective Inhibition (CIN); the only applicable plane is Surface. Although the Surface plane is automatically selected after clicking the desired RTG grid, you can select **Temperature** or **Model Terrain** from the **Basic** menu in the **Fields** column, and **CAPE (Pos Buoy En)**, or **CIN (Neg Buoy En)** from the **Sfc/2D ▶ Convective** submenu.

- **Real Time Mesoscale Analysts (RTMA) Grids:** The RTMA grids are available from the Grids menu of the Volume Browser for all scales. The National Centers for Environmental Prediction/Environmental Modeling Center (NCEP/EMC) produces hourly RTMA grids of T, Td,

u, v, sky cover, and precip. These are displayed via the Grid menu on the Volume Browser, and also are integrated with GFE.

- **WAVEWATCH III (WW3) Grids:** Enhancements to WW3 are designed to significantly improve guidance near the shore. Specifically, the enhanced WW3 brings 5 to 10 km resolution wave guidance to within 4 km (or less) of the shore, and includes shallow-water wave physics. WCwave10, WCwave4, WNAwave, WNAwave10, and WNAwave4 are displayed via the SfcGrid menu on the Volume Browser.

Note 6: WC (West Coast), WNA (Western North Atlantic)

- **Short Range Ensemble Forecast (SREF) Products:** The SREF product suite is available from the Grids menu of the Volume Browser for all scales. NCEP will generate SREF products on three grids — CONUS 212 (40 km), Alaska 216 (45 km), and Hawaii 243 (0.4 deg lat/lon) — four times daily (0300, 0900, 1500, and 2100 UTC model cycles). Guidance is available for three-hour projections of 3 to 84 hours after model run time. This implementation consists of guidance for the means, spreads, and probabilities of several parameters.
- **Point:** Both surface, such as Metar, and Column (soundings, profiler, VWP) data populate the Point menu. Click here for [Point](#).

Fields submenus: The Volume Browser Fields submenus contain all available data fields and are divided into several pull-down submenus. Related fields are grouped together within these submenus. Remember that as you change a selection in the Settings options submenu, the options in the Fields pull-down submenus change as well. Each possible Setting/Fields combination follows.

Fields submenus with Plan view - Time: When you choose Plan view and Time Settings, the data are presented on a Plan-view surface and animate in time. The Plan view - Time submenus appear in the following order:

- **Basic:** Basic fields are fields that can be calculated directly from state variables without finite differencing. Click here for [Basic](#).
- **Wind:** Wind-related fields are grouped here. Click here for [Wind](#).
- **Derived:** Derived fields are atmospheric measures that require horizontal finite differencing calculations before plots are made. Click here for [Derived](#).
- **Sfc/2D:** The fields on this menu cannot be defined in three dimensions; they are mostly valid for the earth's surface. Click here for [Sfc/2D](#).

- **European Centre for Medium-Range Forecasts (ECMWF) Grids:** You can access the ECMWF-HiRes grid or ECMWF-LowRes grid from any scale. In addition to standard heights, winds, temperatures, etc., you can display 3-hour and 6-hour maximum and minimum temperatures from the **Sfc/2D ▶ ECMWF-HiRes** submenu.

Notes:

7. The max/min temperature menu items are mislabeled. Currently, the 3-h max/min temps are available at 12h projections from 12 to 144 hours, with 6-h data for 12h projections from 156 to 240 hours.

8. Redistribution of one-degree (high-resolution) ECMWF grids from AWIPS is prohibited. This limitation is formalized in a 2007 NOAA/ECMF interagency agreement. The one degree (i.e., "Hi-Res") ECMWF grids in AWIPS are intended for use only in the conduct of official duties within NWS offices and at designated AWIPS test and support sites. ECMWF products — and products directly and exclusively derived from them — may not be accessed from AWIPS for provision to third parties.
9. The ECMWF grids should be considered "data of opportunity," which means that the availability and timeliness of the ECMWF grids could, at times, be somewhat inconsistent or inferior (i.e., relative to other scheduled NOAA operational products). The potential for somewhat-degraded availability and timeliness is related to the external nature of the data source (i.e., the European Center) and the characteristics of some of the intermediate product dissemination legs.

- **Gridded MOS Grids:** You can access the Gridded MOS (GMOS) grids from any scale, though the grids are clipped to your region. GMOS is a synoptic-scale guidance package available on a meso-scale (i.e., 5 km NDFD) grid. The available fields found on the **Sfc/2D ► MDL MOS** menu consist of guidance for maximum and minimum temperature; 6- and 12-hr probability of precipitation (POP); 3-, 6- and 12-hr probability of thunderstorms; and 24-hr snowfall amount. Additional MOS fields include temperatures, winds, cloud cover, and QPF. GMOS coverage for Alaska is shown in **Exhibit 3.2.3-2**.

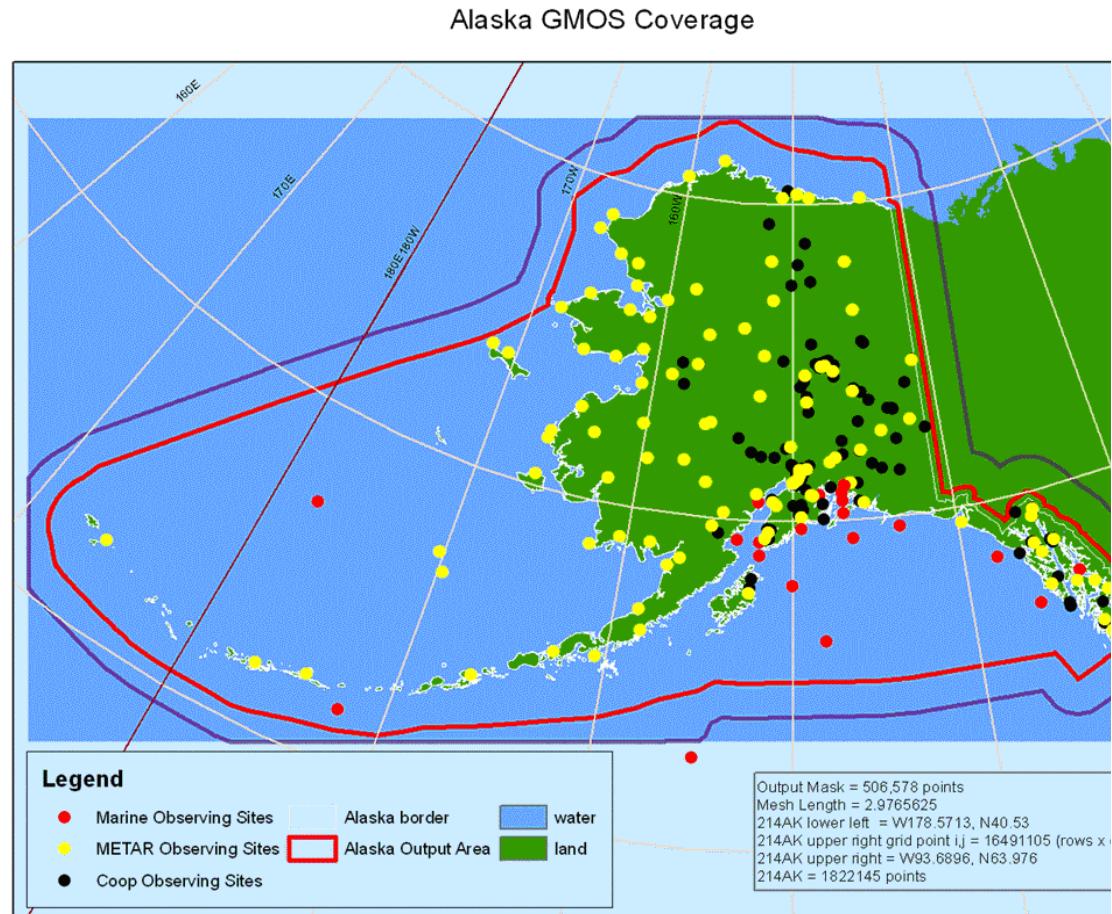


Exhibit 3.2.3-2. Alaska Gridded MOS Coverage

- **Other:** This menu includes miscellaneous atmospheric fields that can be defined in three dimensions. Click here for [Other](#).
- **Radar:** Many of these fields will not be available until the WSR-88D dual-polarization capability is enabled. Click here for [Radar](#).
- **Ensemble:** The Ensemble menu contains options for selecting the ensemble model members output for height, temperature, relative humidity, wind, mean sea level pressure, precipitation, and minimum and maximum temperatures. In addition, you can display the mean and standard deviation of these model fields. Click here for [Ensemble](#).

Fields submenus with Plan view - Space: The fields available in these menus are presented in Plan view at a fixed time, and animate through the volume. The Fields choices are reduced to Basic, Derived, and Other. Click here for [Basic](#), here for [Derived](#), and here for [Other](#).

Fields submenus with Cross Section - Time or Space: When you choose the Cross Section option from the Settings options menu, with animation in either Time or Space, the following fields are available:

- **Basic:** The Basic fields for Cross Sections are slightly different from those of Basic Plan view fields. Click here for [Basic](#).
- **Derived:** The Derived Fields submenu for Cross Sections is identical to the Plan view Derived Fields. Click here for [Derived](#).
- **Other:** The Other Fields submenu for Cross Sections is identical to the Plan view Derived Fields. Click here for [Other](#).

Fields submenus with Time Height - < left or right >: As with Plan view - Space, the Time Height Fields choices are Basic, Derived, and Other. Click here for [Left or Right](#).

Fields submenus with Var vs Hgt: The Var vs Hgt field choices are Basic, Derived, and Other. Click here for [Basic](#), here for [Derived](#), and here for [Other](#).

Fields submenus with Sounding: The Var vs Hgt field choices are Basic, Derived, and Other. Click here for [Basic](#), here for [Derived](#), and here for [Other](#).

- **Thermo:** The "Thermo" pull-down menu includes options to generate a sounding using model thermodynamics and winds, model thermodynamics with profiler winds, or model BUFR data for all model levels (up to 50 levels) and going through all forecast times for a specific BUFR sounding site. GOES BUFR data can also be used to generate a sounding. The vertical resolution of a GOES BUFR sounding is somewhat coarse, but the temporal resolution makes this a useful and more real-time product. Click here for [Wind](#).

Combined VAD Wind Profile (VWP)-model soundings (via the Volume Browser) are available for each volume scan, with the model data time-interpolated to the Velocity Azimuth Display (VAD) winds time. Model winds are used above the top of the VAD stack to complete the profile. (Note that the model data are from the grids, not the point soundings.)

Fields submenus with Time Series: For Time Series, the Fields menus available are Basic, Derived, Sfc/2D, and Other. Click here for [Basic](#), here for [Derived](#), here for [Sfc/2D](#), and here for [Other](#).

Planes submenus: The Planes submenus contain different surfaces onto which gridded data can be plotted. The available menus depend on what is chosen in the Settings options submenu or the other options submenus on the Volume Browser menu bar. Each possible Settings combination follows.

Planes submenus with Plan view - Time: When Plan view and Time are selected from the Settings options

menus in the Volume Browser menu bar, several submenus become available in the Planes menu.

- **Pres:** In the Pressure submenu, mandatory pressure levels are available, while significant pressure levels are accessible at 25-millibar increments in two cascading menus. Click here for [Pres](#).
- **Theta:** The Theta submenu contains potential temperature surfaces at 5K intervals between 250K and 350K, plus theta-e from 315 to 340K. Click here for [Theta](#).
- **Hgt:** The Height submenu contains heights in meters or feet above ground level (AGL), including Flight Levels (FL) for Aviation. Click here for [Hgt](#).
- **Temp:** Temperatures from -40C to +30C are available. This menu was designed to support temperature-based radar CAPPIs, but many datasets can be interpolated to these levels. Click here for [Temp](#).
- **Tilts:** These tilt angles are used for radar displays. Click here for [Tilts](#).
- **Misc:** The Miscellaneous submenu contains levels that do not fit elsewhere. Click here for [Misc](#).
- **Lyrs:** The Layers submenu contains various layers of interest. Click here for [Lyrs](#).

Planes submenus with Plan view - Space: If you select Plan view and Space from the Settings menus, only one submenu becomes available in the Planes menu.

- **Coordinate:** From the Coordinate submenu you can choose all pressure (mb) or all isentropic (K) levels, or all tilts. Plan-view data animated in space are plotted on all available pressure, isentropic, or tilt surfaces, and animate through the stack at a fixed time.

Planes submenus with Cross Section - Time: When Cross Section and Time are selected from the Settings options menus, three different submenus become available in the Planes menu. The Vertical Representation pull-down menu is made available in the Volume Browser menu bar to adjust the vertical axis of a cross-sectional plot.

- **Lon:** The Longitude submenu contains a selection of longitude lines. The contents of this submenu change depending on the scale and the location. Click here for [Lon](#).
- **Lat:** The Latitude submenu contains a selection of latitude lines. The contents of this submenu change depending on the scale and the location. Click here for [Lat](#).
- **Specified:** The Specified submenu contains the baseline labels that can be edited from the Tools pull-down menu in the Volume Browser. Click here for [Specified](#).

Planes submenus with Cross Section - Space: If you select Cross Section and Space from the Settings options menus, two submenus become available in the Planes Menu. The Vertical Representation menu is made available in the Volume Browser menu bar to adjust the vertical axis of a cross-sectional plot.

- **Lon:** The Longitude submenu has a single choice, **All Lon**, that lets you select all available longitude lines. Cross-sectional data animated in space are plotted on all available longitude lines as vertical slices, and animate latitudinally across the model domain at a fixed time. Click here for [Lon](#).
- **Lat:** The Latitude submenu also has a single choice, **All Lat**, that lets you select all available latitude lines. Cross-sectional data animated in space are plotted on all available latitude lines as vertical slices, and animate longitudinally across the model domain at a fixed time. Click here for [Lat](#).

Planes submenus with Time Height - < Left or Right >: For the Time Height setting, one submenu becomes available in the Planes Menu. The Vertical Representation pull-down menu is made available in the Volume

Browser menu bar to adjust the vertical axis of a time-height cross-sectional plot.

Planes submenus with Points:

- The Point submenu contains labels for 10 different points (labeled Tsect A - J) from which time-height cross-sections can be generated onto the display, and points (labeled Sounding A - J) for which model soundings can be generated onto the display. The left or right settings determine whether the data are plotted in increasing model valid times to the left (48 hr to 0 hr, for example) or the right (0 hr to 48 hr, for example). Click here for [Point](#).

Planes submenus with Sounding: When you select the Sounding setting, one submenu becomes available in the Planes menu.

Planes submenus with Time Series: For the Time Series setting, you can choose a point from the Points options menu in the Volume Browser menu bar in addition to one or more levels from one of the Planes submenus. Labels are included on the y-axis to identify the displayed parameter, and you can sample the data in a time series.

- **Pres:** In the Pressure submenu, mandatory pressure levels are available, while significant pressure levels are accessible at 25-millibar increments in two cascading menus. Click here for [Pres](#).
- **Theta:** The Theta submenu contains potential temperature surfaces at 5K intervals between 250K and 350K, plus theta-e from 315 to 340K. Click here for [Theta](#).
- **Hgt:** The Height submenu contains heights in meters or feet above ground level (AGL), including Flight Levels (FL) for Aviation. Click here for [Hgt](#).
- **Temp:** Temperatures from -40C to +30C are available. Many datasets can be interpolated to these levels. Click here for [Temp](#).
- **Tilts:** These tilt angles are used for radar displays. Click here for [Tilts](#).
- **Misc:** The Miscellaneous submenu contains various levels and layers. You can generate Meteograms using the METARs from the Source menu and choosing a point location with the Interactive Points Tool. The result is a "stacked" time series with the observed variables plotted within each time series graph. Note that variables with like units may be displayed together on the same graph, but with different colors, as shown in Exhibit 3.2.3-3. Click here for [Misc](#).

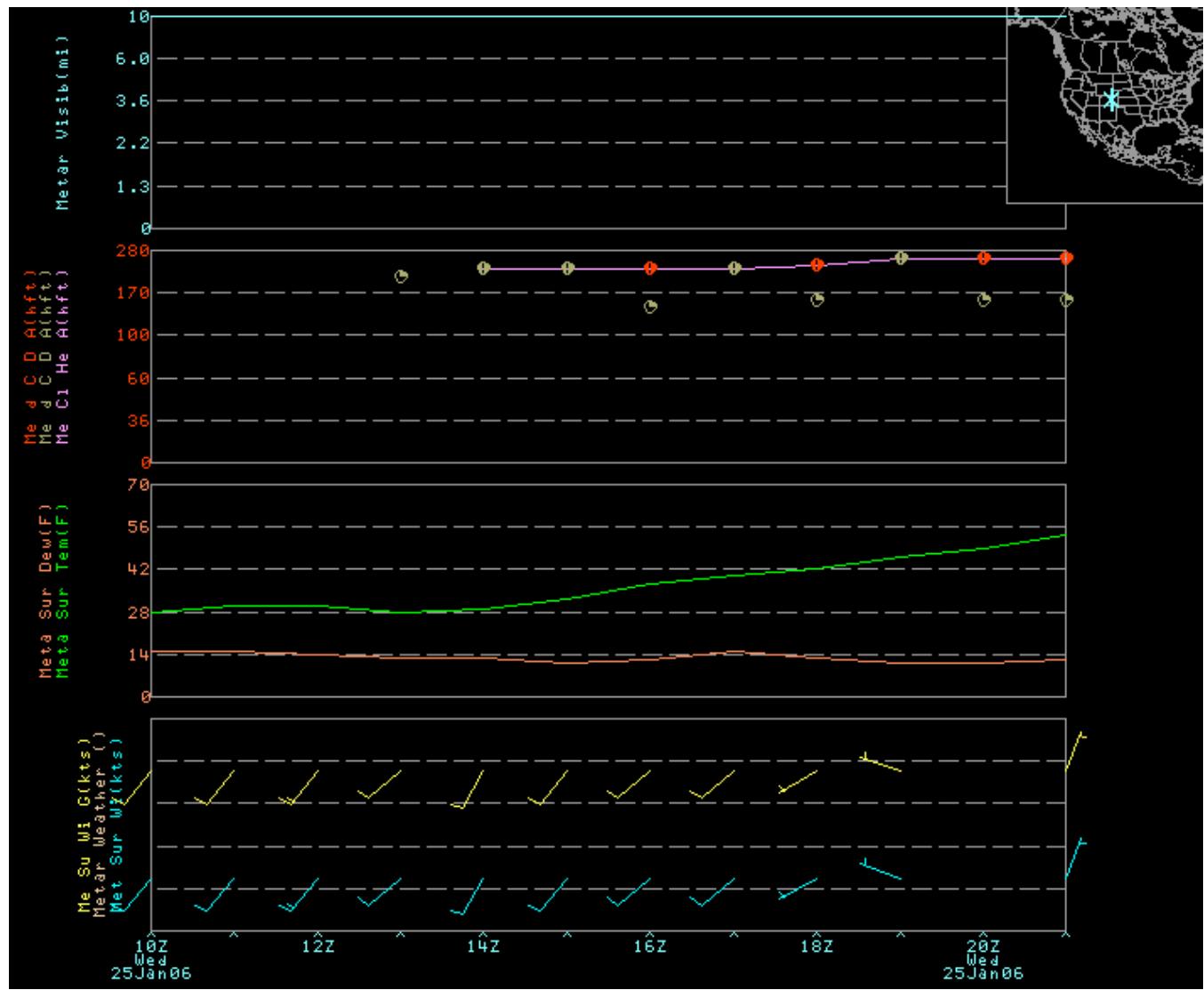


Exhibit 3.2.3-3. An Example of the Meteogram Time Series Plot

- **Lyr:** The Layers submenu contains various layers of interest. Click here for [Lyr](#).

3.2.4 Using the Volume Browser Product Selection List

Once you have made selections from the Sources, Fields, and Planes Menus, the list of available products is generated in the middle section of the Volume Browser, as shown in **Exhibit 3.2.4-1**. By default, the products are highlighted and ready to load.

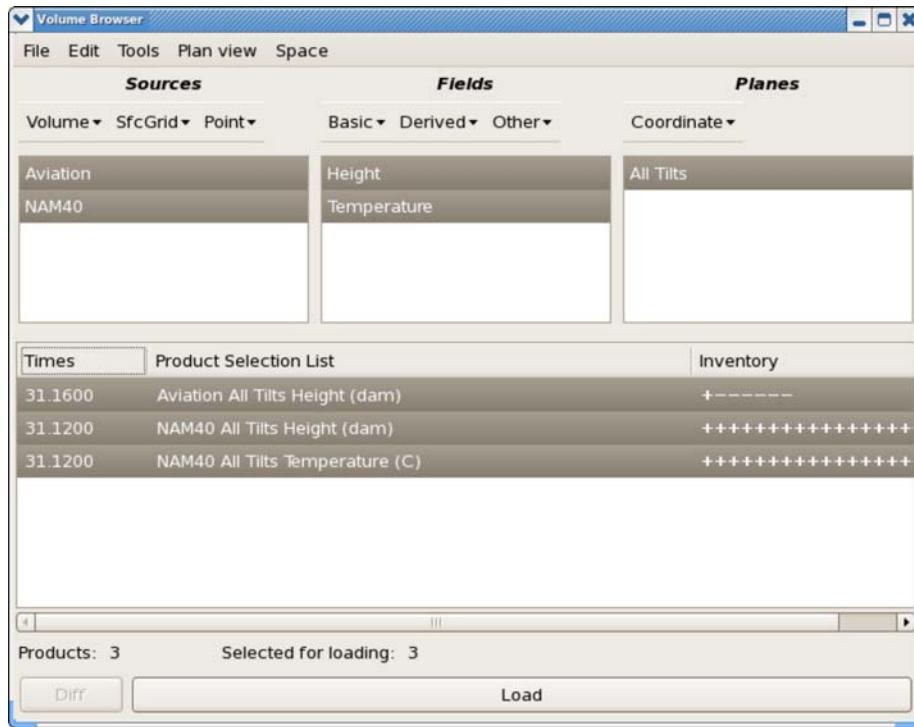


Exhibit 3.2.4-1. Volume Browser Product Selection List

With the pointer, you can select or deselect the products you want to display.

- **Graphic or Image:** By clicking on a product in the Product Selection List with mouse Button 2 (middle), you can choose whether to display the product as a graphic or an image. When changing a graphic product to an image, the abbreviation "Img" appears in the product label of the Product Selection List. Refer to [Section 3.3.6](#), "Practice Modules on the Volume Browser," for more information on displaying graphic and image products. You can display one or more images at a time.

For vector data, such as winds, pressing mouse Button 2 once on the product name in the Product Selection List changes the depiction from wind barbs to streamlines. Pressing mouse Button 2 on the product name of a vector product a second time generates arrows.

Note: For products that can be displayed in only one format, mouse Button 2 has no effect.

You can display multiple graphics, and there is no practical limit to the number you can display at one time. Refer to [Section 3.3.6, Practice Module 10](#), for more information on displaying multiple products.

- **Components of the Product Selection List:** The Product Selection List is divided into three columns.

- **Times:** Provides the date and model run time of selected products.
- **Product Selection List:** Provides the names of the selected products, including the model name, the plane, the field, and associated units.
- **Inventory:** Provides information on the completeness of selected products. The minus (-) and plus (+) signs indicate the valid times of a model run (i.e., 0-hour, 6-hour, 12-hour, etc.). The plus sign (+) indicates those valid times are in the database; the minus sign (-) indicates the valid time is missing from the database. To obtain more detailed information about the inventory of a product, as shown in **Exhibit 3.2.4-2**, select the Show Detailed Inventory option from the Product Information pop-up menu.

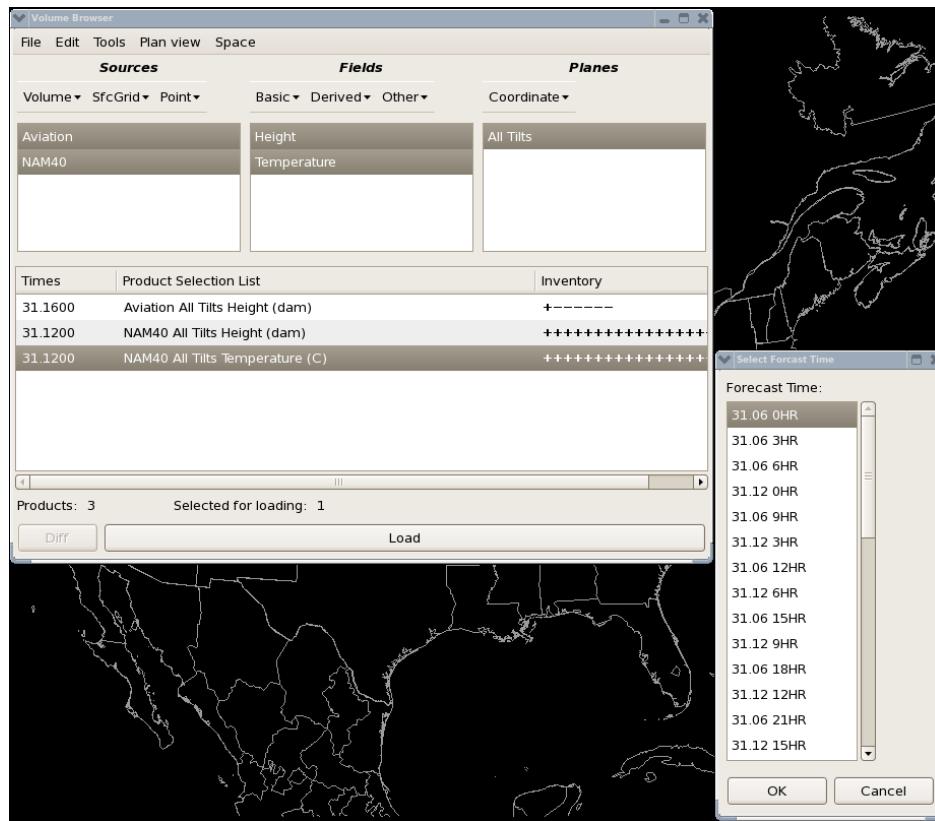


Exhibit 3.2.4-2. Detailed Inventory Information

- **Product Information Pop-up Menu:** The Select Forecast Times window shown in **Exhibit 3.2.4-2** was opened by pressing and holding mouse Button 3 over a product name in the Product Selection List. This pop-up menu has several options besides Show Detailed Inventory:

- **Change Product Graphic to Image:** Another way to change the product from a graphic to an image or vice versa. For wind products, you can display wind barbs, arrows, or streamlines.
- **Load This Product Now:** Another way to generate the product on the display. This is convenient if you have a lengthy Product Selection List and wish to display a single product.
- **Load as Graphic and Image:** Generates the product on the display as both a graphic and an image. For wind products, you can display wind barbs, arrows, or streamlines.
- **Show Detailed Inventory:** Opens a pop-up box containing inventory information about the selected product. Refer to **Exhibit 3.2.4-2** above.

3.2.5 Manipulating the Product Selection List

The File and Edit menus in the Volume Browser menu bar provide several options, such as Clone (File menu), and Clear and Select (Edit menu), that you should use to manipulate your Product Selection List. Refer back to [Exhibit 3.2.2-1](#) and [Exhibit 3.2.2-2](#) respectively.

Along the bottom of the Volume Browser there are two buttons that are used to load the selected products.

Note: *Products: <#> Selected for loading: <#>*, located in the lower-left corner of the Volume Browser, is not a menu button, but rather a label that tells you how many products you have in your Product Selection List and how many you have selected for loading. Refer back to [Exhibit 3.2.2-1](#), which has no products listed and therefore Products: 0 and Selected for loading: 0; and [Exhibit 3.2.4-1](#), which lists 3 products that are all highlighted indicating they are all selected, thus Products: 3 and Selected for loading: 3.

- **Diff:** The Difference (Diff) menu button generates a difference field between two (and only two) fields that are highlighted in the Product Selection List. This new field can then be saved in a Procedure.

IMPORTANT: Beware! Using the Difference option can generate nonsensical fields.

- **Load:** The Load button generates the images or graphics you have selected from your Product Selection List and displays them in the large display pane. Once the Load button is selected, the items in the Product Selection List are deselected.

3.3 Practice Modules (Tutorials) for AWIPS Graphical User Interface

This section gets you started (hands-on) with working on the Graphics Workstation and the Graphical User Interface of the CAVE environment.

This section includes the following practice modules:

- [Section 3.3.1: Starting Up and Exiting CAVE](#)
- [Section 3.3.2: Using Pop-up Menus](#)
- [Section 3.3.3: Using the Color Editors](#)
- [Section 3.3.4: Working with Graphics and Image Products](#)
- [Section 3.3.5: Using Bundles and Procedures](#)
- [Section 3.3.6: Using the Volume Browser](#)

3.3.1 Starting Up and Exiting CAVE

This module will be your first experience running CAVE.

Module 1: Starting Up and Exiting CAVE

This module steps you through the process of initial CAVE setup, logging in, and exiting the CAVE session.

Objective 1.1 - Initial Workstation Login

This Objective provides you with basic connectivity and localization information for when you **FIRST** log into the AWIPS II Workstation. If this is not your first time logging into the workstation, go to Objective 1.2.

1. Prior to logging into an AWIPS II Workstation for the **FIRST** time, obtain the following information from your System Administrator:
 - Localization Server URL Address (Sample format: <http://ec:9581/services>)
 - Three-character Site ID for your Site (Sample format: OAX)
2. If this is the **FIRST** time you are logging into the AWIPS II Workstation, the Connectivity Preferences dialog box will appear after you enter your username and password. Enter the information you obtained from your System Administrator. Then click the Validate button to validate CAVE connectivity.
3. After validation, click **OK** to close the Connectivity Preferences dialog box. You are now logged in with the AWIPS login root screen displayed. Go to Objective 1.2, Step 2.

Objective 1.2 - Activating Alert Visualization

Note 1: Alert Visualization (AlertViz) **MUST** be active before starting CAVE.

This Objective shows you how to activate Alert Visualization (AlertViz).

1. Enter your username and password to open the Red Hat root screen, as shown in **Exhibit 3.3.1-1**. The Red Hat Enterprise Linux window and red background root screen will remain until the system is ready for operation. Then the Red Hat Enterprise Linux window will close and the root screen's background color will change to blue.

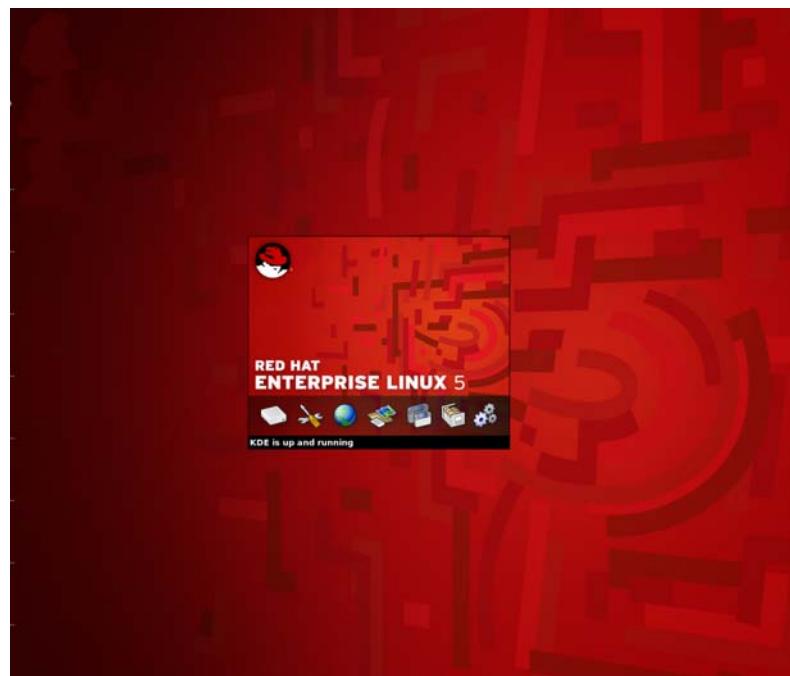


Exhibit 3.3.1-1. AWIPS Login Root Screen

2. Make sure the AlertViz symbol is showing on the left-side panel, above the Red Hat logo, as shown in **Exhibit 3.3.1-2**.

- If the AlertViz symbol is showing, this means the AlertViz is active and you can start CAVE. Go to Objective 1.2.
- If the AlertViz symbol is not showing, continue to Step 3 of this objective.

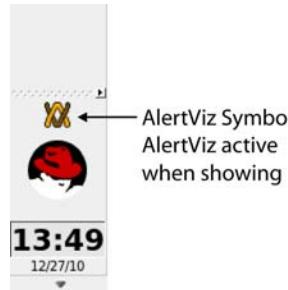


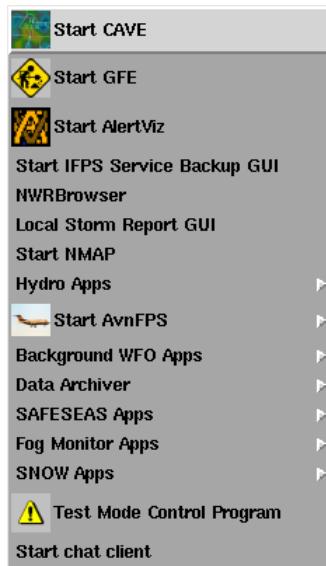
Exhibit 3.3.1-2. AlertViz Active Symbol on Panel

3. Place the mouse cursor anywhere on the root screen (colored background) and click mouse Button 1 to open the Start Menu, shown in **Exhibit 3.3.1-3**.



Exhibit 3.3.1-3. AWIPS Start Menu

4. Select **AWIPS start-up menu** to open the AWIPS start-up menu, shown in **Exhibit 3.3.1-4**.

**Exhibit 3.3.1-4. AWIPS Start-up Menu - Apps Menu**

Note 2: As you can see from viewing **Exhibit 3.3.1-4**, the AWIPS start-up menu is the same menu that you would use to select other AWIPS-supported applications.

5. Select **Start AlertViz** to activate Alert Visualization. The AlertViz symbol will appear on the Panel, as shown in **Exhibit 3.3.1-2**. You can now start CAVE. Go to Objective 1.3.

Objective 1.3 - Launching CAVE

This Objective shows you how to start CAVE.

1. Place the mouse cursor anywhere on the root screen (colored background) and click mouse Button 1 to open the Start Menu, shown in **Exhibit 3.3.1-3** above.
2. Select **Start CAVE (lx) / TextWS (xt)**. The CAVE start-up splash screen, shown in **Exhibit 3.3.1-5** appears while the system is running-up.

Note: You can also start CAVE from the AWIPS start-up menu shown in **Exhibit 3.3.1-4** by selecting **Start CAVE**. The splash screen will then appear.

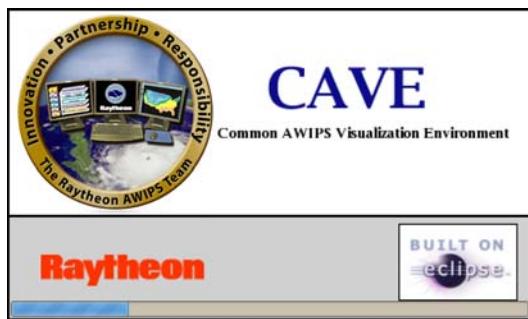


Exhibit 3.3.1-5. CAVE Start-up Splash Screen with Run-up Progress Indicator

3. Wait until the system is fully up and running before proceeding. The blue progress bar, located at the bottom of the splash screen, appears a few seconds after the screen displays, indicating the run-up progress.

CAVE starts immediately when the system is fully up and running by opening to the last display screen, devoid of data that was active prior to ending the last session. The opening screen shown in **Exhibit 3.3.1-6** indicates that the D2D perspective was active with the NsharpSkewt program running when the last session ended. The NsharpSkewt program is no longer running, indicated by the absence of the NsharpSkewt tab, but the D2D NSHARP functions panel remains open, which indicates the NsharpSkewt program was running on ending the session.

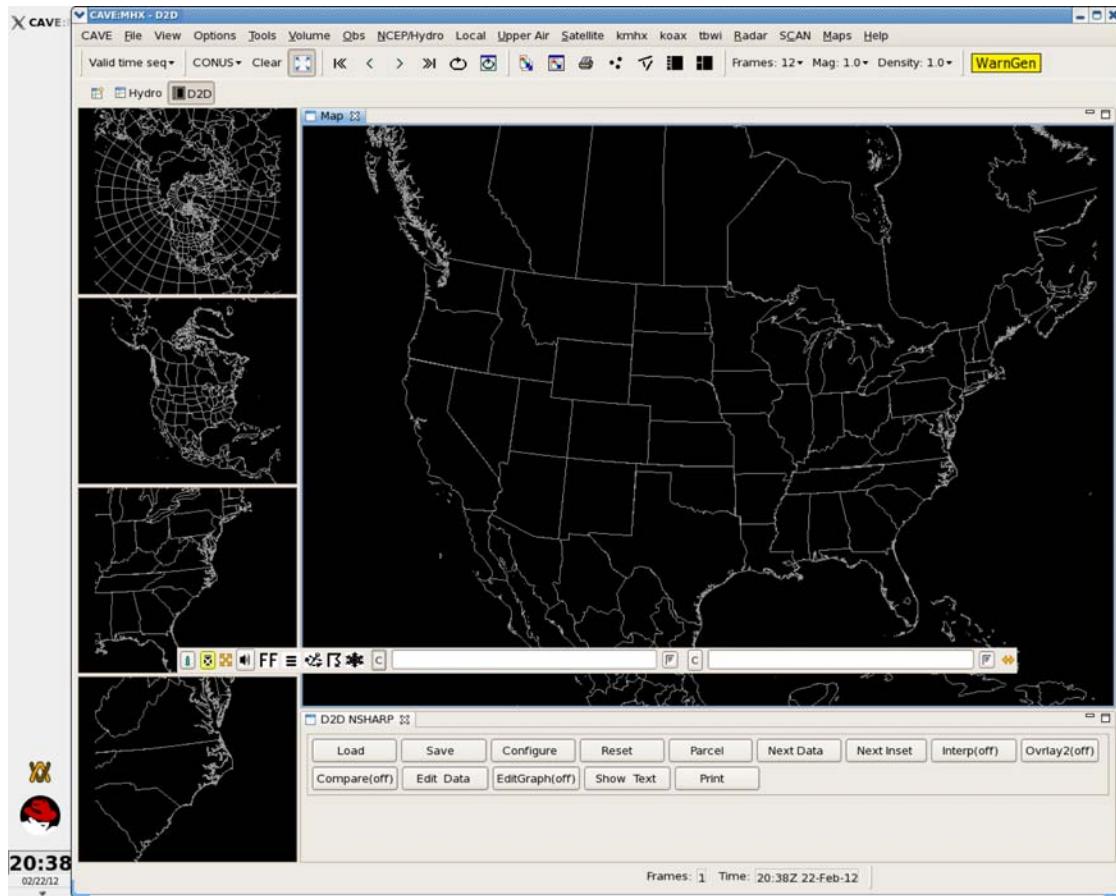


Exhibit 3.3.1-6. CAVE D2D Perspective with NSHARP

Objective 1.4 - Starting CAVE from a Terminal Window

This Objective shows you how to start CAVE using a Terminal window.

1. Follow **Objective 1.2 - Step 3** to open the AWIPS Start Menu, as shown in **Exhibit 3.3.1-3**.
2. Select Terminal to open a Terminal window.
3. Change to the CAVE directory (/awips2/cave), then run the startup command (/cave.sh). The CAVE start-up splash screen appears while the system is running up.
4. Refer to **Objective 1.3 - Step 3**.

Objective 1.5 - Exiting CAVE

Note 1: It is important to exit CAVE before ending the session and logging out of the system.

This Objective shows you how to exit CAVE.

1. From the **CAVE** menu, select **Exit**. An exit confirmation box appears, as shown in **Exhibit 3.3.1-7**.



Exhibit 3.3.1-7. Exit Confirmation Dialog Window

2. Select **Yes** to confirm that you want to exit.

Note 2: At this point you have only exited CAVE. You are still logged into the session.

Objective 1.6 - Logging Out of the Session

This objective shows you how to log out of the session.

1. Click mouse Button 3 to open a menu containing the logout option, as shown in **Exhibit 3.3.1-8**.



Exhibit 3.3.1-8. Session Log Out

2. Select **Log Out "username"**.... Then select the **End Current Session** button on the next window that appears, ending the session and returning you to the Login dialog window. You can now leave the workstation.

3.3.2 Using Pop-up Menus

There are many pop-up menu options. The following three modules present selected options to give you practice in using pop-up menus.

Module 6: Pop-up Menus from Product Legends in the Main Display Pane

This module illustrates several options of the pop-up menu that are initiated over product legends in the main display pane only.

Objective 6.1 - Set the Magnification, Color, and Density of a Graphic

1. From the **Scale** option menu, select the **WFO** scale.
2. From the **Obs** pull-down menu, select the **METAR Station Plot**.
3. From the **Toolbar**, click on the  button to go to the first frame.
4. Press and hold mouse Button 3 on the METAR legend to open the pop-up menu and select the **Magnification** cascading menu. Then continue to press and hold mouse Button 3 to select the **2** value. Notice the font size has increased.
5. Press and hold mouse Button 3 on the METAR legend to open the pop-up menu and select the **Set Color** cascading menu. Then continue to press and hold mouse Button 3 to select the **yellow** color. Notice the METAR plots are changed from (default) green to yellow.
6. Press and hold mouse Button 3 on the METAR legend to open the pop-up menu and select the **Density** cascading menu. Then continue to press and hold mouse Button 3 to select the **2** value. Notice that several more METAR observations appear.

Objective 6.2 - Set the Line Width and Line Style of a Contoured Graphic

1. Clear the main display pane.
2. From the **Scale** option menu, select the **CONUS** scale.
3. From the **Volume** pull-down menu, select the **NAM80 Family**. Eight predefined NAM80 fields are loaded, with the first two fields displayed.
4. From the **Toolbar**, click on the  button to go to the first frame.
5. Press and hold mouse Button 3 on the **500 mb Height** legend to open the pop-up menu. Select the **Line Width** cascading menu, continuing to press and hold mouse Button 3 to select the thickest line width. Observe how the height contours become quite thick.
6. Press and hold mouse Button 3 on the **500 mb Height** legend to open the pop-up menu and select the **Line Style** cascading menu, continuing to press and hold mouse Button 3 to select the dashed line.

Observe how the height contours become dashed.

7. Keep these products displayed for the next objective.

Objective 6.3 - Load Contoured Graphic as an Image

1. From the previous objective, the Eta Family should be displayed.
2. Press and hold mouse Button 3 on the **NAM 700 mb Omega** legend to open the pop-up menu. Select the **Load as Image** option. It is not necessary to toggle on the NAM omega graphic before displaying it as an image. Observe how the omega data become colored.
3. Keep these products displayed for the next objective.

Objective 6.4 - Unload a Graphic

1. From the previous objective, the NAM Family should be displayed.
2. Press and hold mouse Button 3 on the **NAM 500 mb Height** legend to open the pop-up menu. Select the **Unload** option. This field is permanently removed from the display.

Objective 6.5 - Set Blinking Rate for a Graphic

1. From the **Toolbar**, clear the main display pane.
2. From the **Obs** pull-down menu, select the **METAR Station Plot**.
3. Press mouse Button 3 on the METAR legend to open the pop-up menu and turn on the **Blinking** check button. After a short moment, the graphic starts blinking.
4. Press and hold mouse Button 3 over the large display pane to open the pop-up menu, and open the **Blink Rate (seconds)** cascading menu and choose the **2** second rate. Observe the graphic as it blinks at the new rate.
5. From the **Toolbar**, turn looping on while the graphic is blinking and observe that blinking is suspended while the graphic animates. Blinking resumes automatically when looping is turned off.
6. Repeat Step 4 several times and choose other blink rates. The **No Blink** option disables blinking.

Objective 6.6 - Set Blinking for a Single Image

1. From the **Toolbar**, clear the main display pane.
2. From the **Satellite** pull-down menu, select the **IR Window**.
3. Press and hold mouse Button 3 on the IR legend to open the pop-up menu and select the **Change blinking...** option. This opens the **US IR Sat** dialog box that contains the controls to set blinking for an image.

4. With mouse Button 1 in the **US IR Sat** dialog box, drag the upper arrow along the color bar to **-35C**. Use the fine tuning buttons on either side of the color bar to adjust the placement of the arrow.
5. Now, with mouse Button 1, drag the bottom arrow to **-55C**.
6. Press the **Enable Range** menu button. Within a moment, the chosen color range starts to blink.
7. Now, move the color bar arrows to select a second range from **-65C to -75C**.
8. Press the **Enable Range** menu button. Now two color ranges are blinking simultaneously.
9. Press the **Disable Range** menu button to disable the blinking of the color range selected in Step 7.

Note: The first range enabled in Step 6 is still blinking.

10. From the **Blink Rate** options menu in the **US IR Sat** dialog box, try several blink rates.
11. Select **Reset** to disable blinking.
12. Select **OK** to close the **US IR Sat** dialog box.

Objective 6.7 - Set Blinking for a Combined Image

1. From the **Scale** options menu in the **Toolbar**, select **WFO**.
2. From the **kxxx** pull-down menu (where **kxxx** is one of your dedicated radars), select **0.5 Z/V** combined product.
3. Toggle off the velocity by clicking mouse Button 1 on the velocity half of the product legend.
4. Press and hold mouse Button 3 over the legend to open the pop-up menu. Slide across **Change blinking...** and select **0.5 Refl** from the cascading menu. The **Image Blinking** dialog box opens containing the Reflectivity Color Bar.
5. With mouse Button 1, drag the upper and lower color bar arrows to select a color range.
6. Select the **Enable Range** menu button.
7. Toggle off the reflectivity by clicking mouse Button 1 on the reflectivity portion of the product legend. Select **0.5 Vel** from the cascading menu. The **Image Blinking** dialog box changes from velocity to reflectivity.
8. Drag the upper and lower color bar arrows to select a color range.
9. Select **Enable Range**. Although you can't see it, both velocity and reflectivity color ranges blink simultaneously.
10. From the Toolbar, open the **Image Properties** dialog box. Move the slider bar back and forth from **Reflectivity** to **Velocity** and notice how the radar data display and dialog boxes respond. You can also use the keypad; press the minus key four or five times.

Module 7: Using Pop-up Menus Over Displayed Products in the Large Pane or the Four-Panel Display

There are many pop-up menu options available for the single-panel and four-panel layouts for the main display pane. The following objectives given here for practice will familiarize you with the use of pop-up menus.

Objective 7.1 - Use Continuous Sampling of Imagery and METAR Plots

1. Clear the main display pane.
2. From the **Scale** option menu, select **CONUS**.
3. From the **Satellite** Pull-Down Menu, select **IR Window**.
4. From the **Obs** Pull-Down Menu, select the **METAR Station Plot**.
5. Press and hold mouse Button 3 anywhere over the main display pane (but not over the legends) to open the pop-up menu. Continue to press mouse Button 3 to select the **Sampling** option.
6. Move the mouse cursor slowly around the main display pane to sample both the IR satellite data and the METAR encoded reports.
7. Press and hold mouse Button 3 over the main display pane and disable the **Sampling** option from the pop-up menu.

Objective 7.2 - Skip and Restore Frames

Being able to remove frames is useful when you have bad data.

1. Clear the main display pane.
2. From the **Frame Count** option menu, select **4**.
3. From the **Satellite** Pull-Down Menu, select **Water Vapor** window.
4. Click on the  button to go to the last frame.
5. Press and hold mouse Button 3 anywhere over the main display pane (but not over the legends) to open the pop-up menu. Continue to press mouse Button 3 to select the **Skip This Frame** option. This frame of Water Vapor imagery is temporarily removed.
6. Click the  button on the Toolbar, then repeat... Step through the frames to see the result.
7. Press and hold mouse Button 3 anywhere over the main display pane (but not over the legends) to open the pop-up menu. Continue to press mouse Button 3 to select the **Restore Skipped Frames** option. The two frames you skipped have been restored.

Objective 7.3 - Change Map Background Colors

This objective incorporates the use of pop-up menus both from the product legends and over a product.

1. Clear the main display pane.
2. From the **Scale** option menu, select **Regional**.
3. From the **Maps** Pull-Down Menu, select **Interstates**, **Cities**, and **RFC boundaries**. (It's possible that your Maps menu does not have all of these choices. In this case, choose any three map backgrounds.)
4. Press and hold mouse Button 3 anywhere over the main display pane (but not over the legends) to open the pop-up menu. Continue to press mouse Button 3 to select the **Show Map Legends** option. Observe the map legends at the bottom of the main display pane.
5. Press and hold mouse Button 3 over the **RFC boundaries** legend and change the color to light blue.
6. Press and hold mouse Button 3 over the **Interstate Highways** legend and change the color to red.
7. Press and hold mouse Button 3 over the **Cities** legend, select the **Set Color** option, and then select the **Choose Color** option. The Choose Color dialog box appears. From it, you can drag the **Color Wheel Centroid** to any color in the **Color Wheel**.
8. Click the **Apply** button and observe the new color for the Cities map background. (Refer to [Section 2.3.1](#), "The Image Colors Editor dialog box," for further information on using the Color Wheel.)

Module 8: Using Pop-up Menus in the Smaller Monitor Panes

With a few exceptions, the options in the smaller monitor pane pop-up menus are the same as those in the main display pane. The following objectives illustrate several of these exceptions.

Objective 8.1 - Zoom into a Small Monitor Pane Using the Pop-up Menus

1. Clear the main display pane.
2. On the **CONUS** scale, load **12** frames of the **IR Window Satellite** into the main display pane.
3. Over the top small monitor pane, click mouse Button 3 to swap the IR imagery from the main display pane into the small monitor pane.
4. In the smaller monitor pane, press and hold mouse Button 3 over a state. From the **Zoom** cascading menu, select the **933 km**.
5. Save these products for the next objective in this module.

Note: When the smaller monitor pane swaps with the main display pane, the zoom center and map boundaries are preserved.

3.3.3 Using the Color Editors

Refer to the [Color Process Diagram](#) as you do this practice module.

Module 5: Editing Image Colors

This module illustrates using the Image Color Editor to edit and save the Image Color Tables.

Objective 5.1 - Fill Color Swatch

This objective illustrates how to fill the Color Swatch.

1. In the Main Display, load a **Satellite IR** on the **CONUS Scale** and apply the CIRA color table, if necessary.
2. From the **Toolbar**, open the **Image Properties** dialog box.
3. From the **Image Properties** dialog box, press the **Edit US IR Sat** button to open the **Image Color Editor**. You can also open this dialog box from the pop-up menu of the product legend.
4. Select the **RGB Color Model** radio button.
5. In the top half of the **Editor** Color Bar, click on the lime-green color.

Note 1: The Color Swatch is now filled with the lime-green color and the sliders and the Color Wheel have changed accordingly.

6. In the Color Bar, drag the top arrow Color Pointer to align with the left edge of the bright pink portion of the color table (about -50 C).
7. Now drag the bottom arrow Color Pointer and align it with the right-most edge of the bright pink portion (about -55 C) of the color table. Use the incremental < and >, or the << and >> buttons for fine tuning the location of the arrow Color Pointers.
8. Click the upper **Fill** button and observe that the lime-green color has replaced the pink both in the Color Bar and in the displayed satellite data.

Note 2: The arrow Color Pointers turn lime green as well.

9. Now try to fill the bottom Color Swatch with a different color and make adjustments to the existing IR Color Table. Notice the changes to the displayed image.

Objective 5.2 - Use Interpolate

This objective introduces you to interpolate commands of the Image Color Editor.

1. From the **Toolbar**, clear the large display pane.
2. From the **Scale** option menu, select **CONUS**.
3. From the **Satellite** pull-down menu, select **IR** satellite data.
4. The **Image Color Editor** dialog box and the **Image Properties** dialog box should already be open. Notice that the IR Color Table is in the Editor's Color Bar.
5. Select the **RGB Color Model** check button.
6. Drag the top Color Wheel Centroid to **bright red**, and move the bottom Color Wheel Centroid to **dark blue**. The top Color Swatch should be red and the bottom one blue.

Note 1: The easiest way to adjust brightness is to go to the HSB color model. You can also adjust brightness by dragging the Centroid to a primary color, and then dragging that color in the slider.

7. Drag the upper Color Pointer all the way to the left of the Color Bar, and the lower Color Pointer all the way to the right.
8. Click the **Interpolate** button. The new color table has a gradual transition from red on the left to blue on the right.

Note 2: The IR Satellite Image in the large display pane has this new Red-to-Blue Color Table.

9. Select the **Undo** button, which applies the previous color table.
10. Select the **Redo** button, which applies your newly made (red and blue) color table.
11. Select the **Revert** button, which resets to the original color table.
12. Now try moving the arrow Color Pointers and selecting different colors to interpolate. Also, try changing the Color Model to **HSB** and practice different interpolations.

Note 3: Saturation must be set to a non-zero value to adjust the Hue slider.

13. Keep the CONUS IR Satellite display for the next objective.

Objective 5.3 - Change the Color for a Specified Temperature Range

This objective illustrates how to change the color for a specific range of temperatures. It is equally applicable to other units (for example, reflectivity [dBZ]).

1. Press the **Revert** button on the IR Satellite Image to set the color table to its default.

2. Fill the upper and lower Color Swatches with two different colors of your choice.
3. In the Color Bar, in the middle of the dialog box, drag the upper arrow Color Pointer until it is pointing to the color associated with **20C** (this is somewhere in the gray scale).
4. Click on the upper **Set** button and notice how the Color Bar changes. This color now represents **20C** in the displayed image. Notice how the image has changed to highlight the **20C** value.
5. Drag the upper and lower Color Pointers in the Color Bar so that they delineate the range of temperatures that fall between **10C** and **-15C**.
6. Click on the upper and lower **Fill** buttons and notice how the Color Bar and the image change.
7. Click on **Undo**. This takes you back one edit. Click on **Undo** again. You are now back to the color table status before your last two edits.
8. Click on **Redo** twice. This brings you forward two edits.
9. Select the **HSB** Color Model, and then click the **Interpolate** button. Observe the changes.
10. Keep the CONUS IR Satellite display for the next objective.

Objective 5.4 - Edit an Existing Color Table and Save as a New One

A simple way to edit an existing color table is to stretch or compress it using mouse Button 2.

1. Make sure your personal ID is set in the CAVE title bar. If not, select your ID from the **File > Select User ID...** menu.
2. Open the **Image Color Editor**. In the Image Colors Editor, press the **Revert** button to go to the default Color Table.
3. In the **Image Color Editor**, move the upper arrow Color Pointer all the way to the left, and the lower arrow Color Pointer all the way to the right.
4. In the **Image Color Editor**, move the mouse cursor over the pink colors (about -50C). Press and hold mouse Button 2, and then drag the cursor to the left along the Color Bar about 1 inch and release.

The original color table is redrawn and stretched to the newly specified boundaries. Then the new color table is immediately displayed in the IR satellite imagery.

5. Press the **Save As...** button and type a unique name for your new color table. The new name and your user ID appear in the title bar of the **Image Color Editor** and appear in the **Customized by "username"...** menu.

Objective 5.5 - Edit Color Tables for Four-Panel Image Products

You can edit the color tables of a Four-Panel Image product. This objective illustrates how.

1. From the **Toolbar**, select the **CONUS** scale.
2. From the **Satellite** pull-down menu, select **4 Panel**. Four different satellite images appear.

3. Over one of the four panels, press mouse Button 3 and select **Control Color of This Image**. A large green "I" appears in the lower left corner of the panel, and the Image Properties dialog box immediately appears.
4. Modify the color table as you wish, or replace the color table with a new one.

Note: You can delete a color table using the **Delete** button.

3.3.4 Working with Graphic and Image Products

This section presents Practice Modules 2, 3, and 4, all of which focus on working with graphics and images. They provide information on working with a single graphic product, overlaying graphics on an image, and combining image products.

Module 2: Working with a Single Graphic Product

This module introduces you to the steps for loading and manipulating a single graphic product.

Objective 2.1 - Display Single Graphic Product

This objective shows you how to display any graphic product. Follow the steps in this objective to load a METAR station plot. Once you have this product loaded, you can use it for the remaining objectives in Modules 2 and 3.

1. From the **Obs** menu, use mouse Button 1 to select **Station Plot**. The METAR station plot displays. If no data is displayed, click the  button on the Toolbar to step back one frame, or click the  button to step back to the first frame.
2. With the current display unchanged, proceed to the next objective.

Objective 2.2 - Animate and Step Through a Product Loop

This objective illustrates how to animate (or loop) the METAR Station Plot product that is displayed after completing Objective 2.1, and how to move through the loop one frame at a time.

1. To begin looping the product, from the Toolbar, click the  button, or press the **Page Up** or **Page Down** keyboard shortcut.
2. To step forward through the loop one frame at a time, from the Toolbar, click the  button, or press the **Shift + RIGHT ARROW** keyboard shortcut. (**Note:** These keyboard shortcuts are also listed on the View menu.) Repeated clicks move the loop forward a corresponding number of frames.
3. To step backward through the loop one frame at a time, from the Toolbar, click the  button on the Toolbar, or press the **Shift + LEFT ARROW** keyboard shortcut.
4. To move to the first frame in the loop, from the Toolbar, click the  button, or press the **Ctrl + LEFT ARROW** keyboard shortcut.
5. To move to the last frame, from the Toolbar, click on the  button on the Toolbar, or press the **Ctrl + RIGHT ARROW** keyboard shortcut.
6. Keep the **METAR Station Plot** for the next objective.

Objective 2.3 - Change Looping Parameters

You can adjust both the forward and backward looping speed. You can also adjust the amount of time the loop pauses on the first and last frames in the loop. These are the steps necessary to change the way the looping function behaves.

1. From the Options menu, select **Loop Properties...**; or, from the Toolbar, click the  button.
2. To turn on looping, in the Loop Properties dialog box, in the lower left corner, click the **Looping** checkbox; or, from the Toolbar, click the  button.
3. To set the amount of speed and/or dwell that you want, using mouse Button 1, drag the slider bars.
4. To move the slider bar one increment in the direction of the pointer, using mouse Button 1, click anywhere to the left or right of the **Forward/Backward Sliders**.

Note 1: The number displayed to the right of the slider increments according to the location of the mouse clicks.

5. Repeat Step 4, but click on the opposite side of the slider.
6. To move the **Forward/Backward Sliders** by more than one increment at a time, place the pointer anywhere within the slider bar and click mouse Button 2.

Note 2: The slider jumps to the location of the mouse cursor and the looping speed changes accordingly.

7. You can adjust the forward speed, one increment at a time, with the **Page Up** and **Page Down** keyboard shortcuts. Notice that as you press these keys, the **Forward Speed Slider Bar** in the **Loop Properties** dialog box changes.

Note 3: You cannot adjust the backward speed with keyboard shortcuts.

8. Close the **Loop Properties** Dialog Box.

Notes:

4. If you are not familiar with setting looping parameters, you may want to experiment with different settings to determine which are the most suitable for your viewing.
5. The Looping toggle button turns animation on/off.

9. Keep the **METAR Station Plot** for the next objective.

Objective 2.4 - Change Frame Count

This objective illustrates how to change the number of frames that display for the selected product. Within CAVE, do one of the following:

1. From the **Toolbar**, on the **Frames** option menu, select the desired number of frames.
2. From the **Options** menu, select **Display Properties...**

Notes:

1. If a product is already loaded and the number of frames you choose is smaller than that currently displayed, the unneeded frames are dropped from the loop. Similarly, if you choose a larger number, the additional frames, if they are available, are added to the display.
2. If a product is not loaded, the new frame count takes effect with the next product loaded.
3. The selected number of frames is shown in the Frame Count menu button; the actual number available for display is shown on the right side of the Status Bar at the bottom of CAVE.

Objective 2.5 - Zoom and Pan the Product

With the METAR Station Plot from Objective 2.1 still displayed, this objective illustrates the effect of zooming in and out on a displayed product and the effect of panning across a zoomed area. There are two methods for executing zooming and panning operations. The first method uses the Legacy AWIPS Mouse Button Functionality-AWIPS D2D; the second method uses the Modern AWIPS Mouse Button Functionality-Default CAVE. Either option may be selected from the Preferences option under the CAVE menu. Both settings are configurable.

Legacy AWIPS Mouse Button Functionality-AWIPS D2D

➤ To Zoom In

1. Place the pointer over the area of interest.
2. Click mouse Button 2 (middle) for one level of enlargement. Subsequent clicks with mouse Button 2 increase the zoom ratio. Eleven (11) is the maximum number of clicks you can apply when zooming in (if starting from the 1:1 ratio).
3. You can also zoom in by using the pop-up menu (refer to [Section 2.2.8](#)) over the main display pane or the smaller monitor panes. Press mouse Button 3 over the main display pane and slide the mouse cursor down to the **Zoom** cascading menu.
4. Select the **1471 km** map size.

➤ To Zoom Out

1. Again, center the mouse cursor over the area of interest.

2. Click mouse Button 1 once for each level of decreasing zoom ratio. You can also use the pop-up menu to zoom out. Just select a larger map size.

Note 1: Zooming in on a product narrows the geographic area of the displayed product and progressively adds any available data with each level of zoom. This is called "Progressive Disclosure." Conversely, zooming out widens the displayed geographic area and reduces the density of the data in the display as more data is added. To zoom out completely, press **SHIFT + mouse Button 1**.

➤ To Pan

1. With the display zoomed in, position the mouse cursor over the area of interest, press and hold mouse Button 1, and drag the pointer toward the center of the display.
2. When you have centered the area of interest, release the mouse button.

Note 2: You can pan in the main display pane and the small monitor panes; however, the system limits you to panning within the data boundaries of the displayed product. For example, you cannot pan past the edge of a product because there are no data beyond the edge.

Modern AWIPS Mouse Button Functionality-Default CAVE

➤ To Zoom In

1. Place the mouse cursor over the area of interest.
2. Click mouse Button 2 (middle) for one level of enlargement. Subsequent clicks with mouse Button 2 increase the zoom ratio. Eleven (11) is the maximum number of clicks you can apply when zooming in (if starting from the 1:1 ratio).
3. You can also zoom in by using the pop-up menu (refer to [Section 2.2.8](#)) over the main display pane or the small monitor panes. Press mouse Button 3 over the main display pane and slide the mouse pointer down to the **Zoom** cascading menu.
4. Select the **1471 km** map size.
5. You can also zoom in by using the scroll wheel (B2). Scrolling forward will zoom into the display, centered on the position of the cursor.

➤ To Zoom Out

1. Again, center the mouse cursor over the area of interest.
2. You can use the pop-up menu to zoom out. Just select a larger map size.
3. You can also zoom out by using the scroll wheel (B2). Scrolling backward will zoom out of the display, centered on the position of the cursor.

➤ To Pan

1. With the display zoomed in, position the mouse cursor over the area of interest, press and hold mouse Button 1, and drag the pointer toward the center of the display.
2. When you have centered the area of interest, release the mouse button.

Note 3: You can pan in the main display pane and the small monitor panes; however, the system limits you to panning within the data boundaries of the displayed product. For example, you cannot pan past the edge of a product because there are no data beyond the edge.

Objective 2.6 - Magnify and Change Density

This objective illustrates how to enlarge or reduce the size of displayed text and how to increase or decrease the amount of data displayed.

1. From the **Magnification (Mag:)** option menu in the **Toolbar**, select a magnification setting of **2**.
2. From the **Density** option menu in the **Toolbar**, select a density setting of **1.5**.
3. You can also change the magnification and density settings from the **Display Properties** Dialog Box, opened from the **Options** menu.
4. Return both the Magnification and the Density settings to **1**.

Notes:

1. The magnification and density settings of a graphic can also be changed by using the pop-up menu derived from the product legend or display, as explained in [Section 2.1.8](#).
2. Increasing the magnification automatically decreases the number of data stations plotted.
3. Changing the density affects contour intervals and wind barbs as well as plotted data. By choosing the "Max" density setting, all available plots are displayed.
4. The magnification setting of "0" turns off the legends of all displayed graphic contours. It also removes all station-plotted data and wind barbs, leaving just dots at the station or grid locations.
5. These controls can also be used on a product that is zoomed in.

Objective 2.7 - Swap Panes

This objective illustrates how to move between the main display pane and the monitor panes. Swapping panes is a convenient way to change the viewing scale.

1. Place the mouse cursor over the second monitor pane and click mouse **Button 3**.

2. Observe that the **METAR Station Plot** appears in the monitor pane and that the map background of the monitor pane is now in the main display pane. The Scale displayed on the Scale option menu in the Toolbar changes correspondingly.
3. Switch the product back to the main display pane.

Objective 2.8 - Clear the Large Display Pane

This objective illustrates how to clear the main display pane.

1. Click the **Clear** button on the Toolbar to remove all displayed products from the main display pane.
2. You can also use the "**Ctrl + C**" keyboard shortcut to clear the main display pane.

Note: The **Clear** button removes all products from the main display pane only. It does not affect the smaller monitor panes. You can clear the smaller side panes by switching with the main pain and again using the **Clear** button.

Objective 2.9 - Change Viewing Scale

This objective illustrates other ways (besides swapping panes) to change the viewing scale. The Scale option menu, located on the Toolbar, does not have a "Scale" label, but rather shows the name of the scale currently displayed in the main display pane.

1. From the **Scale** option menu in the **Toolbar**, select the **WFO** Scale.
- Note 1:** The map background has changed to the **WFO** Scale Map.
2. From the **Satellite** pull-down menu, load an **IR Window** image.
 3. From the **Scale** option menu, select the **CONUS** Scale. Notice that the scale changed to the CONUS scale and the IR Window image remained displayed.
 4. From the **Obs** pull-down menu, load the **METAR Station Plot**. The product is loaded on top of the IR Window image.

Notes:

2. If a product is already displayed, the change of scale takes effect immediately and the new product is displayed.
3. Any product can be displayed on any scale currently displayed in the main display pane.

Objective 2.10 - Set the Time Resolution of Displayed Data

1. Clear the main display pane.
2. From the **Options** menu, turn on the **Time Options** check button.
3. From the **Scale** option menu, select **Regional**.
4. From the **Frames** option menu in the **Toolbar**, select eight frames.
5. From the **Obs** menu, select the **METAR Station Plot**. We know that this product typically updates every hour.
6. A dialog box appears in the center of the display that provides several time resolutions. Choose **3 hours**. Click OK.

Note 1: The inventory in the left side of the dialog box changes to show which times will be displayed and which will not. You can choose a different end time for the loop and it will adjust accordingly.

7. Toggle the  button on and observe the METAR plots as they are displayed and verify that the plots have a 3-hour interval.

Note 2: Subsequent overlays onto a product that was displayed using the Set Time Resolution option automatically time-match to the initial product.

Module 3: Graphics and Image Products

This module introduces you to the steps for loading and displaying image products.

Objective 3.1 - Load Image and Overlay Graphics

This objective sets up products that you need to use for the subsequent objectives in this module.

1. From the **Toolbar**, press the "Clear" button to clear the main display pane.
2. From the **Scale** menu, change to **WFO Scale**.
3. From the **Radar (kxxx)** menu, load the **0.5 Reflectivity** product (under the Radar (kxxx) Best Res Refl. choose 0.5 Refl).
4. From the **Obs** menu, load the **METAR Station Plot** and one of the two **Ceiling and Vis Plot** products (under the "Other Plots" submenu).
5. Keep these products displayed for the next objective.

Objective 3.2 - Toggle Overlay(s)

This objective illustrates toggling graphics overlaid on an image product. You can click the mouse pointer

on a product legend to toggle it, or you can use the keyboard shortcuts. The "0" numeric keypad key toggles the displayed image(s). The keypad keys 1-9 toggle the first nine overlays, while using the "Shift" key in conjunction with numeric keys 0-9 toggles overlays 10-19 (for example, **Shift + 6** toggles the 16th overlay). Both are illustrated in the following steps. Refer to [Table 2.1-2](#) and [Table 2.1-3](#) for descriptions of all the keyboard shortcuts.

1. With mouse Button 1, click on the product legend on the bottom of the screen for the **Ceiling and Vis Plot**.
2. Observe that the product is no longer displayed and that the legend for the product has been dimmed.
3. Click on the product legend for the **METAR Station Plot** to turn that overlay off.
4. Click on the product legends for both overlays to turn them back on.
5. Click on the **0.5 Reflectivity** legend to turn it off.

Keyboard Shortcuts

The following steps are keyboard shortcuts for performing **Objective 3.2 - Steps 1-5**.

1. Press the **2** numeric key (on the keypad) to toggle off the **Ceiling and Vis Plot**.
2. Press the **1** numeric key (on the keypad) to toggle off the **METAR Station Plot**.
3. Now press both the **1** and the **2** numeric keys (on the keypad) to toggle on the plotted data.
4. Press the **0** numeric key (on the keypad) to toggle on the **0.5 Reflectivity**.
5. Keep these products displayed for the next objective.

Note: Clicking anywhere in the main display pane with mouse Button 3 toggles (hides) the product legends for all displayed products. Only the date and valid time remain. To bring the product legends back, click mouse Button 3 again in the main display pane.

Objective 3.3 - Change Image Brightness

This objective illustrates ways to adjust the brightness of a displayed image.

1. From the **Options** pull-down menu, display the **Image...** dialog box, or from the **Toolbar**, click the **Image Properties** icon.
2. Place the mouse cursor (left-pointing arrow) over the **Brightness Slider Bar** (Imaging... dialog box). Drag the slider to the left until the percentage displayed to the right of the slider reads 10.
3. Observe how the brightness of the radar image changes.
4. Place the mouse cursor anywhere on the slider track to one side of the **Brightness Slider Bar** and click mouse Button 1.

5. Observe with each click of mouse Button 1, the slider moves by 5% increments in the direction of the mouse cursor (as reflected by the percentage displayed to the right of the slider).
6. Repeat Step 4, but click on the opposite side of the slider.
7. To move the **slider** by more than the 5% increment at a time, place the mouse cursor anywhere on the slider track to one side of the slider and click mouse Button 2. The slider moves to the mouse cursor location on the slider and displays the percentage at that location.
8. You can use the "+" and "-" keyboard shortcuts on the numeric keypad to change the brightness of a single image after the Brightness Slider Bar has been selected (note the box that appears around the slider bar).

Note 3: Refer to [Table 2.1-2](#) and [Table 2.1-3](#) for descriptions of all the keyboard shortcuts.

Objective 3.4 - Change Image Color Table

This objective illustrates how to change the color table for displayed image products.

1. Clear the main display pane.
2. From the **Scale** option menu in the **Toolbar**, select **CONUS**.
3. From the **Satellite** pull-down menu, load the **IR Window** image.
4. If the **Imaging...** dialog box is not still displayed, open it from the **Toolbar**.

Note: The name of the color table (enhancement curve) associated with the IR satellite image [CIRA (IR Default)] is displayed in the upper **Color Table** options menu, in the **Imag...** dialog box.

5. Press this upper **Color Table** options menu to display a list of other color table choices.
6. Select several different color tables.
7. Close the **Imag...** dialog box by clicking the "X" in the upper right corner.

Objective 3.5 - Satellite Four-Panel Display

This objective illustrates how to display and manipulate Satellite Four-Panel image products.

1. Clear the main display pane, set the **frame count** to **8** frames, and change the scale to **CONUS**.
2. From the **Satellite** pull-down menu, load the **Four-Panel** product.
3. You now have four pointers on the display. One is the mouse cursor (the standard left pointing arrow), and the other three are small squares, each with a dot in the middle. This is known as a linked cursor. The location and movement of the three square pointers track with the arrow.

4. Move the mouse cursor until it is over the Water Vapor satellite image. Notice how the other pointers move accordingly.
5. From the **Obs** pull-down menu, select the **METAR Station Plot** product. It overlays each panel.
6. In any one of the panels, toggle the **METAR Station Plot** by clicking on the **METAR Station Plot** product label.

Note 1: The product is toggled off in all four panels. Toggle it back on by clicking on the METAR Station Plot product legend.

7. Click on the product legend of the **Visible** image to turn it off.

Note 2: Only the **Visible** image is toggled. Click on the dimmed legend to turn it back on. Be sure to use the arrow pointer.

8. Move the mouse cursor over a portion of one of the four images. If the Sample checkbox is checked, a sample of the data values from both the satellite image and the encoded METAR observations will display next to the mouse cursor.
9. From the **Magnification (Mag:)** option menu in the **Toolbar**, select "1.5."
10. Repeat Step 8, then return to **Mag:1**.
11. Open the **Imaging...** dialog box. Using the upper **Color Table** option menu, select a different color table.

Note 3: The color table is applied to all images, as indicated by the "Edit all images..." notation. It is possible to load a product or apply a color table to just one of the four panels by using Pop-up menus. Please refer to [Section 2.2.8.2](#) for more information.

Objective 3.6 - All-Tilts

When you select the All-Tilts menu option, radar images of the tilts that make up the latest volume scans load. Each volume scan, as well as the tilts that make up a given volume scan, is tagged with the date and time the scan started. Each volume scan is composed of 6 or more tilts. The radar takes 5 to 10 minutes to collect a full volume scan of data, depending on the Volume Coverage Pattern (VCP) in use. In AWIPS, the volume scan is updated tilt-by-tilt as the radar makes it available.

Navigation between the different tilts and volume scans can be accomplished by using various keyboard shortcuts. Table 3.3.4-1 lists the available keyboard shortcuts and toolbar buttons. This objective provides instructions for navigating the tilts and scans using the following modes:

- **All-Tilts Navigation Mode** - radar images of all tilts for all volume scans
- **Single-Tilt Navigation Mode** - radar images of a particular tilt for multiple volume scans

- **Single-Volume Navigation Mode** - radar images of all tilts for a single volume scan.

➤ **To view radar images in All-Tilts navigation mode**

1. Clear the main display pane.
2. From the **Scale** option menu, select **WFO**.
3. From the **kxxx** menu, select "All Tilts Z/V."
4. From the **Frames** Menu, set the **frame count** to **64**.
5. After the All-Tilts display loads, do the following:
 - Press **Shift + LEFT ARROW** or **Shift + RIGHT ARROW** to sequentially step through each frame in the collection of scans and tilts.
 - Press **Ctrl + UP ARROW** or **Ctrl + DOWN ARROW** to display the first or last frame in the collection of scans and tilts.

Note 1: The frame count is set to 64; therefore, 64 frames of tilts from volume scans will be loaded. Auto updates will add higher tilts from the latest volume scan, replacing a tilt from the oldest volume scan.

➤ **To view radar images in Single-Tilt navigation mode**

1. While viewing an All-Tilts display, press the **LEFT ARROW** or **RIGHT ARROW** to locate the volume scan you want to view.
2. After you have located the desired volume scan, do the following:
 - Press **UP ARROW** or **DOWN ARROW** to step through the tilt sequence at a fixed time.
 - Press **Ctrl + UP ARROW** or **Ctrl + DOWN ARROW** to display the frame containing the highest or lowest tilt.

➤ **To view radar images in Single-Volume navigation mode**

1. While viewing the All-Tilts display, press the **UP ARROW** or **DOWN ARROW** to locate the tilt you want to view.
2. After you have located the desired degree of tilt, do the following:
 - Press **LEFT ARROW** or **RIGHT ARROW** to step through the sequence of volume scans at a fixed tilt.
 - Press **Ctrl + UP ARROW** or **Ctrl + DOWN ARROW** to display the frame containing the newest or oldest volume scan.

Notes:

2. It may be necessary to step back a volume using the **LEFT ARROW** and then move up or down the tilt because in most cases, the most recent volume will be incomplete when loaded into the display.
3. To loop/animate through the frames of a particular navigation mode, press **Page Up** or **Page Down**.
4. At any time, you may return to the default navigation mode by pressing **Ctrl + LEFT ARROW** or **Ctrl + RIGHT ARROW**, which will display the first or last frame in the collection.

Table 3.3.4-1. All-Tilts and Volume Scan Keyboard Shortcuts and Toolbar Buttons

Function	Shortcut/Button
To step through frames in the order in which they were loaded (All-Tilts mode)	Shift + LEFT ARROW / Shift + RIGHT ARROW /  
To step through the sequence of volume scans at a fixed tilt (Single-Tilt mode)	RIGHT ARROW /  LEFT ARROW / 
To step through the tilts of single volume scan (Single-Volume mode)	UP ARROW DOWN ARROW
To proceed to the first or last frame of a tilt or volume scan (Single-Tilt and Single-Volume mode)	Ctrl + UP ARROW Ctrl + DOWN ARROW
To loop/animate through the frames of a particular navigation mode (All-Tilts, Single-Tilt, and Single-Volume mode)	Page Up Page Down 
To return to the standard navigation mode and the First or Last frame in the collection (All-Tilts, Single-Tilt, and Single-Volume mode)	Ctrl + LEFT ARROW /  Ctrl + RIGHT ARROW / 
Note: The stepping/animation controls on the toolbar will function according to the navigation mode you are in. For example, if you press the UP ARROW or the DOWN ARROW after an all-tilts display loads, the menu controls will enable you to step through the tilts at a fixed time, i.e., Single-Tilt mode.	

Objective 3.7 - Terminal Doppler Weather Radar (TDWR)

This objective illustrates how to use the Terminal Doppler Weather Radar (TDWR) products from the txxx menu.

1. Clear the main display pane.
2. From the **Scale** option menu, select **WFO**.

3. From the **txxx** pull-down menu (where xxx is the local TDWR), load the **0.5 deg Refl, Vel, and Spectrum Width** products.
4. Observe that the products loaded.

Module 4: Combining Image Products

This module illustrates one method of combining two image products and ways to manipulate the display of the combined products. There are two ways to combine images. Both are discussed in this module.

Objective 4.1 - Combine Two Images

This objective illustrates how to load two image products.

1. Clear the main display pane.
2. From the **Scale** option menu, select **WFO**.
3. Set the **frame count** to **12**.
4. From the **kxxx** pull-down menu, open the kxxx Reflectivity cascade menu and select the **0.5 Reflectivity** product. This is the first image.
5. Display the **Imaging...** dialog box.
6. From the **Imaging...** dialog box, select **Combine Next Image** (in the lower right portion of the dialog box), or click on the **Toggle Image Combination** icon in the **Toolbar**.
7. From the **Satellite** pull-down menu, load the **IR Window** Product. This is the second image in the combination.
8. Observe that after the second image loads, the label in the lower right corner of the large display pane displays the names of both images and indicates that they are combined.
9. Notice also that in the **Imaging...** dialog box, both **Color Table** options menus display the name of a color table, one for each image.
10. Keep this combined radar/satellite product displayed for the next objective.

Notes:

1. The combining process is done automatically when you select a radar combo product (Z/V, Z/SRM, etc.).
2. Multiple images (2 or more) can be displayed in the D2D display of CAVE without using the Combine Next Image option. Each image would be a separate layer (versus a combined layer), as displayed in the product legend in the lower-right corner of the D2D display.

Objective 4.2 - Fade and Toggle Between Images

This objective illustrates how to adjust the relative brightness of each of the combined image products and ways of toggling between the images. Again, you may use either the mouse and menus or the keyboard shortcuts.

1. Select "Image Properties" to open the **Imaging...** dialog box.
2. From the **Imaging...** dialog box, drag the fade slider to the left. Only the **0.5 Reflectivity** image (Image 1) is displayed.
3. Repeat Step 1, but move the fade slider to the right. Now, only the **IR Window** product (Image 2) is shown.
4. Display both images by moving the fade slider back to the center.
5. Toggle off the **Reflectivity** product by clicking on **0.5 Refl** in the product legend at the bottom of the main display pane.
6. Toggle off the **Satellite** product by clicking on **IR Sat** in the product legend. Notice that the **0.5 Reflectivity** turns on again.
7. To toggle both images on or off, click on the "+" symbol in the product legend; then use the fade slider on the Imaging... dialog box to see both images.

Note: The + symbol toggles images on and off. If only one image is visible, + toggles that image off and on. If both images are visible, + toggles both images off and on.

Keyboard Shortcuts

The following steps are keyboard shortcuts for performing **Objective 4.2 - Steps 1-6**.

1. Press the - (minus) numeric key to fade to Image 1 (**0.5 Reflectivity**).
2. Press the + (plus) numeric key to fade to Image 2 (**IR Satellite**).
3. Press the - (minus) numeric key until both images are displayed.
4. Press the . (decimal) numeric key to toggle to Image 1. Press again to toggle to Image 2.
5. Press the - (minus) numeric key until both images are displayed.
6. Press the **0** numeric key to toggle off both images.

Objective 4.3 - Change the Alpha Setting for Images

This objective illustrates how to adjust the Alpha level of combined image products. Again, you may use either the mouse and menus or the keyboard shortcuts.

1. Press the **Clear** button on the toolbar.
2. From the **Scale** option menu, select **CONUS**.
3. Set the frame count to **12**.
4. From the **Satellite** pull-down menu, select the IR Window satellite product. This is the first image.
5. Display the **Imaging...** dialog box.
6. From the **Imaging...** dialog box, select **Combine Next Image** (in the lower right portion of the dialog box), or click on the **Toggle Image Combination** icon on the Toolbar.
7. From the **Satellite** pull-down menu, load the **Water Vapor** satellite product. This is the second image in the combination.
8. Observe that after the second image loads, the label in the lower right corner of the large display pane displays the names of both images and indicates they are combined.
9. Notice also that in the **Imaging...** dialog box, both Color Table options menus display the name of a color table, one for each image.
10. From the **Imaging...** dialog box, drag the **Alpha** slider to the right. The **Water Vapor** image (Image 2) is displayed.
11. Repeat Step 10, but move the **Alpha** slider to the right. Now, a black image is displayed.
12. Display both images by moving the **Alpha** slider back to the center.
13. Toggle off the IR Window satellite product by clicking on **IR Satellite** in the product legend.
14. Toggle off the Water Vapor satellite product by clicking on **Water Vapor Satellite** in the product legend. Notice that the IR Window satellite product turns on again.
15. To toggle both images on or off, click on the "+" symbol in the product legend; then use the **Alpha** slider on the Image Properties dialog box to see both images.

Note: The "+" symbol toggles images on and off. If only one image is visible, "+" toggles that image off and on. If both images are visible, "+" toggles both images off and on.

Steps 16 through 18 use numeric keyboard shortcuts to perform operations:

16. With the **Alpha** slider selected (note the box that appears around the slider bar), press the "-" (minus) numeric key to fade to a black image.
17. Press the "+" (plus) numeric key to fade to Image 2 (Water Vapor Satellite).
18. Press the "-" (minus) numeric key until both images are displayed.

Objective 4.4 - Change Color Table for Either Image

This objective illustrates changing the color tables of one or both of the combined images.

1. Clear the main display pane.
2. From the **Scale** option menu, select **WFO**.
3. Set the frame count to **12**.
4. From the **kxxx** pull-down menu, open the **kxxx Reflectivity** cascade menu and select the **0.5 Reflectivity** product. This is the first image.
5. Display the **Imaging...** dialog box.
6. From the **Imaging...** dialog box, select **Combine Next Image** (in the lower right portion of the dialog box), or click on the **Toggle Image Combination** icon on the Toolbar.
7. From the **Satellite** pull-down menu, load the **IR Window** product. This is the second image in the combination.
8. Observe that after the second image loads, the legend in the lower right corner of the main display pane displays the names of both images and indicates they are combined.
9. Notice also that in the **Imaging...** dialog box, both Color Table options menus display the name of a color table, one for each image.
10. Press the **0** numeric key to toggle on both images.
11. From the upper **Color Table** option menu in the middle of the **Imaging...** dialog box, select a color table for Reflectivity image (first image).
12. Repeat Step 11 using the lower **Color Table** options menu to select a color table for the Satellite image (second image).

Objective 4.5 - Radar Four-Panel Display

This objective illustrates how to display and manipulate Radar Four-Panel image products.

1. Clear the main display pane.
2. Change the display to the **WFO Scale** and set the frame count to 8 frames.

Note 1: You want to load the Best Res Z/V.

3. From the Four-Panel cascading menu of the **kxxx** menu, load the **0.5 1.5 2.4 3.4** Four-Panel product. Notice that the cursor is linked in all four panels.
4. Click on the legend of the **1.5 Refl** image to turn it off.

Note 2: The reflectivity images in all the panels are toggled.

5. In the same panel, click on the legend of the **1.5 Vel** image to turn it off.

Notes:

3. All the **Velocity** Products go off and **Reflectivity** comes back on. Click on the dimmed product legend to toggle products back on.
4. When you toggle a product in one panel, it is toggled in the remaining three panels.
5. Unlike the Satellite Four-Panel product, the Radar Four-Panel product loads four Z/V combined products. For this reason, it has two color tables available, one for the reflectivity portion of the Z/V product, and one for the velocity portion.
6. Fading between images works the same way for a Radar Four-Panel as for a single Z/V combined radar product.

3.3.5 Using Bundles and Procedures

The Practice Module in this section includes information on how to use bundles; how to create, edit, and save procedures; and how to copy bundles from one procedure to another.

Module 9: Working with Bundles and Procedures

This module illustrates several options for working with bundles and procedures

Objective 9.1 - Use Bundles

A bundle can be any arrangement of graphics and/or images that are overlaid on one another in the large display pane. A bundle is represented as a single line in the History List. As you create bundles, they are recorded in the History List dialog box.

1. Use **Ctrl+H** to display the **History List** dialog box. You can also display the History List dialog box by selecting **History List** dialog box from the **File** menu on the main menu.
2. On the **Regional** scale, load **12** frames of **METAR Station Plot**. Observe that "METAR Plot" is now in your History List.
3. From the **Toolbar**, clear the large display pane and load **six** frames of **Visible** satellite imagery on the **Regional Scale**. Overlay it with the **1hr Lightning Plot**. Again, notice that a new bundle label has appeared in the History List.
4. Keep the **History List** dialog box open for the next objective.

Objective 9.2 - Create and Save a Procedure

Now that you have seen how bundles work in Objective 9.1, you can build a procedure. In short, you copy the bundles from the History List and put them into a Procedure dialog box.

1. Clear the display.
2. Use **Ctrl+N** from the keyboard or select **File ▶ Procedures ▶ New** from the main menu. An empty, untitled Procedure dialog box appears.
3. On the **CONUS Scale**, load **12** frames of **IR Window** satellite imagery and overlay the **METAR Station Plot**. Notice the new bundle you have made in the History List.
4. On the **Regional Scale**, display **12** frames of the **Radar Summary** and the **Radar Legends**, located on the **NCEP/Hydro Menu** under **Precip & Stability**. This creates another bundle in the History List.
5. Load **two** frames of the **Dodge City, Kansas (KDDC) skew-T**. Clear the display to create a new bundle. It is not possible to copy the KDDC bundle until the display has been cleared or something else is loaded.

6. Click on the **US IR Sat, METAR Plot** bundle in the History List and then click the **Copy Out** button on the **History List** dialog box. The selected bundle should be duplicated in the untitled Procedure dialog box.
7. Repeat Step 6, but copy the **Radar Summary, Legends**, and **KDDC** bundles into the untitled Procedure dialog box using **Copy In**. You have now created a procedure with three bundles.
8. To save your procedure, click on the **Save As...** button in the untitled Procedure dialog box. The **Save Procedure As** dialog box appears.
9. In the line provided, use the keyboard to type a unique name for your procedure. Try your initials or a brief descriptive name of the procedure.
10. Once you click the **OK** button in the **Save Procedure** dialog box or press Enter on the keyboard, this dialog box is closed and your procedure is saved. Your procedure name appears in the open Procedure dialog box Title Bar.
11. Select the **Close** button in the Procedure dialog box to close the procedure you just created. The bundles that are included in your procedure are automatically updated with the most current data. Any time you open your procedure, it has up-to-date information.

Objective 9.3 - Open and Manipulate a Procedure

Now that you can build procedures, try using them.

1. Use **Ctrl+O** from the keyboard or select **File ▶ Procedures ▶ Open Procedure** from the main menu. The **Open Procedure** dialog box appears. Your new procedure is in this list.
2. Open your new procedure by double clicking mouse Button 1 on its name. The procedure you have opened should contain three bundles.

Note: The second approach to opening a procedure is to click on the procedure name, which then appears in the entry box. Select the **OK** button to view the procedure.

3. Click on the **KDDC** bundle to highlight it.
4. Click the **Up** and **Down** buttons and observe the behavior of the highlighted lines and bundle names.
5. Highlight the **US IR Sat, METAR Plot** bundle and select the **Load** button. The data appear in the large display pane.
6. Click the **Next** button and observe that the large display pane clears and the next bundle is selected and loaded in the large display pane.
7. Highlight the **KDDC** bundle in your procedure and click the **Delete** button. The **KDDC** bundle is now removed from your procedure.
8. Now that you have made changes to your procedure, you need to save it by clicking the **Save** button.
9. Click on the **Close** button in the Procedure Dialog Box to close your modified procedure.

Objective 9.4 - Rename a Bundle within a Procedure

Frequently you may have a large number of overlays in a single bundle, which generates a lengthy bundle name. You may want to give the bundle a short, meaningful name. This objective steps you through renaming a bundle within a procedure.

1. Open the procedure you built in Objective 9.2. It should contain two bundles.
2. Click on the **Radar Summary, Legends** bundle, then click the **Rename...** button in the Procedure dialog box.
3. The **Enter Bundle Name** dialog box appears. It contains the full bundle name. Use the keyboard to rename this bundle something meaningful to you.
4. Select the **OK** button or press Enter on the keyboard and notice that the bundle name changed in your procedure.
5. Now that you have made changes to your procedure, you need to save it by selecting the **Save** button.
6. Close your procedure.

Objective 9.5 - Copy Bundles from One Procedure to Another

If you want a bundle in one of your procedures to appear in another procedure, you can simply copy it.

1. Select the **Open Procedures** dialog box by using **Ctrl+O** and open the procedure you built in Objective 9.2.
2. From the main menu select **File ▶ Procedures ▶ New Procedure** or use the **Ctrl+N** keyboard shortcut to open the dialog box. An untitled Procedure dialog box appears.
3. From your procedure build in Objective 9.2, highlight the **US IR Sat, METAR Plot** bundle in your procedure and click the **Copy Out** button at the bottom of your Procedure dialog box. The selected bundle appears in the untitled procedure.
4. Click the **Save** button in the untitled Procedure dialog box and save this procedure with a new name.
5. Click the **Close** button to close the Procedure dialog box.

Note: You can simultaneously copy a bundle into several procedures by having several Procedure dialog boxes open on the screen.

Objective 9.6 - Delete a Procedure

1. From the File menu button, select the **Procedures** cascading menu and open the **Delete Procedure** dialog box, or use the "**Ctrl+D**" keyboard shortcut to open this dialog box. (Refer to [Exhibit 2.5.1-4](#).)
2. Select the procedure you built in Objective 9.2.

3. Click the **OK** button. The **Confirm Deletion** dialog box appears. Acknowledge this dialog box by clicking the **Yes** button. The procedure is permanently removed from the procedure list.
4. Open the **Delete Procedure** dialog box again and double click on the procedure you built in Objective 9.5. Click **Yes** to delete it.

Objective 9.7 - Use Original and Current Options in Procedures

You can modify an existing cross-section, model sounding, time-series, or time height cross-section bundle by changing either the baseline or the point, or you can select the baseline or point that you used when you initially created the bundle.

1. From the Toolbar, select the **CONUS Scale** from the Scale Options Menu.
2. From the Toolbar, select the **Interactive Points Tool**.
3. Move Point J to a desired location.
4. From the Volume menu, open the Volume Browser.
5. In the Volume Browser, select **Sounding** from the Options menu.
6. In the Volume Browser, from the **Sources** menu, select **NAM80** under **Grid**.
7. In the Volume Browser, from the **Points** menu, select Sounding J and press **Load** to display the sounding.
8. Use **Crtl+H** to open the History List and **Crtl+N** to open a new procedure. NAM80 ptJ should be in the History List.
9. Clear the display pane.
10. In the **History List dialog box**, click on the NAM80 ptJ bundle and select **Copy Out**. The NAM80 appears in the new procedure.
11. Save the new procedure and close it.
12. Now load the Interactive Points Tool again and move Point J to a new location.
13. Open the procedure that you saved in Step 12.
14. In the Procedure dialog box, select **Current**.
15. Your initial NAM80 ptJ bundle is not selected. Click **First** to display it. Notice that the sounding is from the new (current) location of Point J.
16. Now in the Procedure dialog box, select **Original** and reload the NAM80 ptJ bundle. The sounding is from the location you used when you initially set up the bundle.

Objective 9.8 - Alter a Bundle

You can view cross-sections or other site-specific data that you have stored in your procedures from

different baseline or point locations without having to create a new bundle from scratch. You simply alter the bundle. This objective steps you through this easy process.

1. From the Toolbar, select the **CONUS** scale from the Scale Options menu.
 2. From the Toolbar, select the **Interactive Baselines Tool**.
 3. Press mouse Button 3 over the Interactive Baselines legend and select **Editable** (or click mouse Button 2) to make it editable (if it is not already editable).
 4. Move Line D to a desired location.
 5. From the Volume menu, open the Volume Browser.
 6. In the Volume Browser, select **Cross Section** from the Options menu.
 7. In the Volume Browser, select **NAM80**.
 8. In the Volume Browser, select **Fields ▶ Basic**, then select **Rel Humidity** and **Wind**.
 9. In the Volume Browser, select **Planes ▶ Specified**, and then select Line D and press **Load** to display the cross-section.
 10. Open the procedure you created in Objective 9.7.
 11. Press **Copy In**. The NAM80 line D bundle is added to your procedure.
 12. Save the updated procedure.
 13. Now load the Interactive Baselines Tool again and note the location of another line, Line A.
 14. In the Procedure dialog box, first click on the NAM80 lineD bundle, then select **Alter...**.
 15. In the **Alter Bundle** dialog box, select **Line A** from the Options menu, and then press **Load**. Notice that the new cross-section has the Rel Humidity and Winds displayed from the Line A perspective.
 16. Delete your procedure.
-

3.3.6 Using the Volume Browser

The five Practice Modules presented in this section show you how to perform functions using the Volume Browser. You should review Sections [3.2.1](#) through [3.2.5](#) before using these modules.

Module 10: Display Model Data in Plan view

This module contains step-by-step instructions on how to load and display model data in Plan view using the Volume Browser.

Objective 10.1 - Display a Single Graphic in Plan view

1. In the D2D Perspective, on the **Toolbar**, click the **Clear** button.
2. From the **Scale** list, select **CONUS**.
3. From the **Volume** menu, select **Browser**.
4. In the **Sources** column, from the **Volume** menu, select the **RUC80** Model.
5. In the **Fields** column, from the **Basic** menu, select the **Height**.
6. In the **Planes** column, from the **Pres** menu, select **850 mb**. After you make this selection, the **RUC80 850 mb Height (dam)** appears highlighted in the Product Selection list.
7. At the bottom of the **Volume Browser** window, click the **Load** button.
8. Once the **RUC80 850 mb Height (dam)** Product is displayed, try looping and stepping through it.
9. Keep the **Volume Browser** open and continue to display this product for Objective 10.2.

Objective 10.2 - Display Multiple Model Graphics in Plan view

After completing Objective 10.1, the **RUC80 850 mb Height (dam)** field should be displayed in the large display pane in the D2D Perspective and, in the **Volume Browser** window, the Product Selection list should still contain the **RUC80 850 mb Height (dam)**.

1. In the **Volume Browser** window, in the **Fields** column, from the **Basic** menu, select **Temperature**. The Product Selection list should now display **RUC80 850 mb Temperature (C)** highlighted and ready to load.
2. At the bottom of the **Volume Browser** window, click the **Load** button to view the **RUC80 850 mb Temperature (C)** Field overlay the **RUC80 850 mb Height (dam)** Field.
3. Now try loading several additional RUC80 Fields from the **Basic**, **Derived**, **Sfc/2D**, and **Other** Fields menus.

Note: The system imposes no practical limit on the number of graphical products that can be overlaid at one time. However, as you display more data fields, you may notice a slight degradation in overall system performance.

4. Keep the **Volume Browser** open and continue to display these products for Objective 10.3.

Objective 10.3 - Display a Single Image Field

Gridded model data can be displayed as an image. Instead of graphical contours, the product is displayed in graduated colors, each color representing a numerical value of the displayed field.

1. In the D2D Perspective, on the **Toolbar**, click the **Clear** button.
2. Using mouse Button 1, deselect all the products in the Product Selection list except the **RUC80 850 mb Temperature (C)** Field.
3. Place mouse cursor over the selected **RUC80 850 mb Temperature (C)** and click mouse Button 3 to open a pop-up menu.
4. From the pop-up menu, select **Change to RUC80 850 mb Temperature (C)**.
5. At the bottom of the **Volume Browser** window, click the **Load** button to display the image field.
6. Try looping and stepping the displayed image.
7. Keep the Volume Browser open and continue to display this product for Objective 10.4.

Objective 10.4 - Overlay Model Graphics onto an Image Field

1. With the Volume Browser opened as indicated in Objective 10.3, from the Product Selection list, select **RUC80 850 mb Height (dam)**, and then select **Load**.
2. Observe the graphic as it loads in the main pane of the D2D Perspective. Notice the product legends and verify that they are time-matched.

Objective 10.5 - Display Two Image Fields

1. In the **Volume Browser** window, from the **Edit** menu, select **Clear All**.
2. In the D2D Perspective, on the **Toolbar**, click the **Clear** button.
3. From the **Scale** list, select **CONUS**.
4. From the **Satellite** menu, select the **IR Window**. The image displays immediately in the large display pane.
5. From the **Options** menu, select **Image Properties**, or from the **Toolbar**, select the iconified  **Image Properties** button to open the **Imaging...** dialog box and adjust the color table of the displayed

image. (The "**Ctrl + I**" keyboard shortcut also opens the **Imaging...** dialog box.) Refer to [Section 2.1.9.1](#) for information on editing color tables.

6. In the **Imaging...** dialog box, check the box beside **Combine Next Image Load** to activate this option. You can perform this same action from the toolbar, by clicking the iconified  **Toggle Image Combination** button.
7. From the **Volume** menu, select **Browser...**
8. In the **Sources** column, from the **Volume** menu, select **RUC80**.
9. In the **Fields** column, from the **Basic** menu, select **Rel Humidity**.
10. In the **Planes** column, from the **Pres** menu, select **500 mb**.
11. In the **Product Selection** list, click mouse Button 1 to select **RUC80 500 mb Rel Humidity (%)**.
12. Place the mouse cursor over the selected **RUC80 500 mb Rel Humidity (%)** and click mouse Button 2 to change **RUC80 500 mb Rel Humidity (%)** to **RUC80 500 mb Rel Humidity (%) img**. This could have also been changed from the pop-up menu opened by clicking mouse Button 3, as per Objective 10.3 Steps 3 and 4.
13. To combine the image with the satellite image, click the **Load** button. You may need to step to the earlier frames to view the images displayed together.
14. To change the color tables or brightness of the display images, or to fade from one image to another, change the **Image Properties**.

Objective 10.6 - Create a Difference Field Using the Volume Browser

The Volume Browser enables you to calculate the difference between two fields. The "Difference" field is then generated and plotted. The **Diff** menu button in the lower left corner of the Volume Browser is disabled until you have at least two fields in the Product Selection list.

1. In the D2D Perspective, on the **Toolbar**, click the **Clear** button.
2. From the **Scale** list, select **CONUS**.
3. In the **Volume Browser** window, from the **Edit** menu, click **Clear All**.
4. Select (but do not load) the **RUC80 700 mb Temperature** and the **RUC80 500 mb Temperature**.

Note 1: The order in which you select the fields or planes is important. The second product you select is subtracted from the first product you select.

5. Click the **Diff** menu button located in the lower left portion of the **Volume Browser**. The new file is immediately loaded in the large display pane with the **[700 mb - 500 mb] Temperature (C)** Legend displayed across the bottom right edge of the display..

Notes:

2. Keep in mind that it is possible to generate nonsensical fields.
3. At least two levels or fields must be chosen before the Diff menu button is enabled.
4. Other fields can be overlaid onto a difference field.
5. You can display the new difference field as an image. Press mouse Button 2 on the product name in the Product Selection list of the Volume Browser to overlay the displayed data as an image.
6. If you have already loaded the product into the Large Display, you cannot toggle between image and graphic using mouse Button 3 on the Product Legend.
7. You can also calculate the difference of data fields that are displayed as cross sections, time-height cross sections, or time series.
8. It is possible to change the Load Mode before calculating a difference field.

Module 11: Display Gridded Data in Cross Sections, Model Soundings, Time height Cross Sections, and Time Series

This module provides step-by-step instructions on how to load and display model data in cross section view using the Volume Browser. The Volume Browser allows you to specify a baseline (a straight line with two endpoints) or polyline (a connected series of line segments that are not necessarily straight) within the data domain when creating a cross section of gridded data.

The resulting cross section from a baseline represents the interpolation of the gridded data. The resulting cross section from a polyline represents the interpolation of point (RAOB and Profiler) data. If you use a polyline to generate a cross section, the vertices of the polyline automatically adjust to the nearest RAOB or Profiler site.

The following objectives illustrate the use of baselines and polylines, along with other techniques for displaying gridded data.

Objective 11.1 - Edit a Baseline for a Cross Section

1. In the **Volume Browser**, on the **Edit menu**, select **Clear All**.
2. In the D2D Perspective, on the **Toolbar**, click the **Clear** button.
3. From the **Scale** list, select **CONUS**.
4. From the **Tools** menu, select **Baselines**. Ten baselines labeled A - J appear on the display.
5. Using mouse Button 2, click the Baselines legend. The word "**Editable**" appears, signifying that you can now modify any of the baselines.

6. Choose **Baseline A** to edit. The pointer changes from left-pointing to right-pointing when you move an endpoint of **Line A**. By pressing and holding mouse Button 1 on an endpoint, you can shorten, lengthen, or change the line orientation.
7. To move the entire line, move the pointer over **Line A**. The pointer turns into a four-way arrow. Press mouse Button 1 and drag **Line A** so that it is over Iowa.
8. Swap the baselines to a Small Pane for reference as you prepare to generate a cross section in Objective 11.2.

Objective 11.2 - Display a Cross Section of a Single Graphic

1. In the D2D Perspective, on the **Toolbar**, click the **Clear** button.
2. From the **Scale** list, select **CONUS** and zoom in over Iowa.
3. From the **Frames** list, select **12** as the frame count.
4. In the **Volume Browser**, from the **Settings** lists, select **Cross Section** and **Time**. Notice that the **Planes** column menus change to **Lon**, **Lat**, and **Specified**.
5. In the **Sources** column, from the **Volume** menu, select the **RUC80** model.
6. In the **Fields** Column, from the **Basic** menu, select the **Temperature** field.
7. In the **Planes** column, from the **Specified** menu, select **Line A**.
8. To display the product, click the **Load** button at the bottom of the **Volume Browser** menu. Notice that a small reference map appears in the top right-hand corner of the large display pane indicating the location of the cross-sectional slice that is displayed.

Note: Once the RUC80 Temperature (C) Field is displayed, try looping and stepping through it. Continue to display this product for Objective 11.3.

Objective 11.3 - Display a Cross Section of Multiple Model Graphics

From Objective 11.2, the cross section of the **RUC80 Line A Temperature (C)** Field should be displayed in the large display pane and the **Volume Browser** Product Selection list should still contain the **RUC80 Line A Temperature Label**.

1. In the **Fields** column, from the **Basic** menu, select **Relative Humidity**.
2. At the bottom of the **Volume Browser**, click the **Load** button and watch the cross section of the **RUC80 Line A Relative Humidity (%)** Field overlay the **RUC80 Line A Temperature (C)** Field.
3. Now try loading several additional cross sections of **RUC80** Fields on **Line A**.

Note: There is no practical limit on the number of graphic overlays that you can display at one

time, but they must all be loaded on the same cross-sectional slice (i.e., the same latitude, longitude, or specified slice). Try toggling, looping, and stepping through the displayed fields.

Objective 11.4 - Display a Cross Section of Railroads Data Using a Polyline

1. In the **Volume Browser**, from the **Edit** menu, select **Clear All**.
2. In the D2D Perspective, on the **Toolbar**, click the **Clear** button.
3. From the **Scale** list, select **CONUS**.
4. From the **Maps** menu, select **Railroads**. The Railroads Network locations map background appears on the display.
5. From the **Toolbar**, select the iconified  Baselines button. The baselines load in the large display pane.
6. Press and hold mouse Button 1 over **Baseline B**, the line between the B and B' vertices. mouse cursor (arrow) changes to a 4-way arrow. Drag **Baseline B** to the State of Texas.
7. Press and hold mouse Button 1 over the B vertex (endpoint). The mouse cursor (arrow) changes to a hand with pointing finger. Drag the B vertex to approximately the center of Texas and put the B' vertex near the southern most tip. You may need to zoom in using the mouse scroll wheel to easily find these locations.
8. Position the mouse cursor (arrow) over **Baseline B** and press mouse Button 2 to add a vertex to **Baseline B**. This creates a polyline which interpolates itself to the sites.
9. Display the 3 or 5 smaller display panes (if not already shown).
10. Using mouse Button 3, click a small display pane to swap its contents with the large display pane.
11. From the **Scale** list, select **CONUS**.
12. In the **Volume Browser**, from the **Settings** lists, select **Cross Section** and **Time**.
13. In the **Sources** column, from the Point menu, select **Profiler**.
14. In the **Fields** column, from the **Basic** menu, select the **Wind** field.
15. In the **Planes** column, from the **Specified** menu, select **Line B** (if available).
- Note:** Available Baselines are indicated by a small green box.
16. Click mouse Button 1 on the product label to select it.
17. At the bottom of the **Volume Browser**, click the **Load** button. Notice the baselines in the first Small Pane. **Baseline B** jumped to the nearest Profiler sites. The cross section of the wind data are

interpolated from these Profiler sites.

Objective 11.5 - Display a Cross Section of a Single Image Field

As previously mentioned, gridded model data can be displayed as an image. This objective shows you how to display a cross section of a single image field.

1. In the D2D Perspective, on the **Toolbar**, click the **Clear** button.
2. In the **Volume Browser**, from the **Settings** lists, select **Cross Section** and **Time**.
3. Select the NAM Line A Relative Humidity (%) field.
4. Using mouse Button 2, in the Product Selection list, select **NAM Line A Relative Humidity (%)**.
5. From the pop-up menu, select **Change to NAM Line A Relative Humidity (%) img**. This changes the label to an image.
6. At the bottom of the **Volume Browser**, click the **Load** button to display the image field.

Note: Try looping and stepping the displayed image. Also, open the Image Properties dialog box to adjust the color table of the displayed image ("Ctrl + I" keyboard shortcut also opens the Image Properties Dialog Box). Continue to display this product for Objective 11.6.

Objective 11.6 - Overlay Cross Sections of Model Graphics with an Image Field

1. Select the **NAM Temperature (C)** Field and load.
2. Observe the graphic as it loads.

Objective 11.7 - Display Cross Sections of Two Image Fields

1. In the D2D Perspective, on the **Toolbar**, click the **Clear** button.
2. In the **Volume Browser**, select **NAM Line A Relative Humidity (%)** and **NAM Line A Temperature (C)**.
3. Using mouse Button 2, in the Product Selection list, do the following:
 - a. Using mouse Button 2, in the Product Selection list, select **NAM Line A Relative Humidity (%)**.
 - b. From the pop-up menu, select **Change to NAM Line A Relative Humidity (%) img**.
 - c. Repeat Steps a and b for the **NAM Line A Temperature (C)** field.
4. On the **Toolbar**, iconified  **Toggle Image Combination** button.

5. At the bottom of the **Volume Browser**, click the **Load** button to display both images and observe the combined images as they load.

Notes:

1. You can toggle the images by clicking with mouse Button 1 on the image name in the legend, or by using the . (decimal) numeric key.
2. You can fade from one image to another by using the slider bar in the Image Properties dialog box, or by using the + (plus) or - (minus) numeric keys.
3. Try to adjust color tables using the Image Properties dialog box.

Objective 11.8 - Animate Plan view Model Data in Space

The Volume Browser allows you to animate model data in space rather than in time. Objectives 11.8 and 11.9 provide step-by-step instructions on how to display and manipulate model data that animate spatially, rather than temporally.

The Animate in Space perspective allows you to view model data at a fixed time vertically in a stack of pressure or isentropic surfaces or horizontally across the model domain along longitude or latitude lines.

When animating Plan view data spatially, the data are plotted on either pressure or isentropic surfaces. The first frame displays the lowest pressure or isentropic surface.

1. In the **Volume Browser**, from the **Edit** menu, select **Clear All**.
2. In the D2D Perspective, on the **Toolbar**, click the **Clear** button.
3. On the **Toolbar**, from the **Scale** list, select **CONUS**.
4. In the **Volume Browser**, from the **Settings** list, select **Plan view and Space**.
5. In the **Sources** column, from the **Grid** menu, select the **NAM Model**.
6. In the **Fields** column, from the **Basic** menu, select **Temperature**.
7. In the **Planes** column, from the the **Plane** Menu, open the **Coordinate** menu and select **All mb**. After you make this selection, the **NAM *MB Temperature (C)** appears highlighted in the Product Selection List.
8. On the **Toolbar**, set the **Load Mode** to **Prognosis Loop**.
9. At the bottom of the **Volume Browser**, click the **Load** button.
10. From the **Select Forecast Time** dialog box that appears in the center of the display, select the desired prognosis time.
11. Observe the legends as the product is displayed. Each frame is a different pressure level.

12. Using mouse Button 2, in the **Product Selection** list, select **NAM *MB Temperature (C)**.
13. From the pop-up menu, select **Change to NAM *MB Temperature (C) img** and click the **Load** button. Select the same prognosis time as you did in Step 10.

Objective 11.9 - Animate Cross Sections of Model Data in Space

When animating cross sections of model data in space, the data are plotted on slices along longitude or latitude lines. The longitude slices animate from West to East (or from East to West depending on how the Looping Controls are set), while the latitude slices animate from North to South (or from South to North depending on how the Looping Controls are set).

1. In the D2D Perspective, on the **Toolbar**, click the **Clear** button.
2. In the **Volume Browser**, from the **Edit** menu, select **Clear All**.
3. From the **Settings** lists, select **Cross Section and Space**.
4. In the **Sources** column, from the **Grid** menu, select the **NGM** model.
5. In the **Fields** column, from the **Basic** menu, select **Relative Humidity**.
6. In the **Planes** column, from the **Lon** menu, select **All Lon**. After you make this selection, the **NGM allLONS Relative Humidity** appears highlighted in the Product Selection List.
7. Set the **Load Mode** to **Prognosis Loop**.
8. At the bottom of the **Volume Browser**, click the **Load** button.
9. Select the desired prognosis time from the dialog box that appears in the center of the display.

Note: Observe the legends and the reference map as the product is displayed. Each frame is a different longitude line. Notice the reference map in the upper right corner of the large display pane.

10. Using mouse Button 2, in the **Product Selection** list, select **NGM allLON Relative Humidity (%)**.
11. From the pop-up menu, select **Change to NGM allLON Relative Humidity (%) img**.
12. Click the **Load** button and select the same prognosis time as you did in Step 9.

Objective 11.10 - Display a Model Sounding

The Volume Browser allows you to generate a model sounding of temperature, dew point temperature, and winds from the grid point data.

1. In the D2D Perspective, on the **Toolbar**, click the **Clear** button.
2. From the **Scale** list, select **CONUS**.

3. In the **Volume Browser**, from the **Edit** menu, select **Clear All**.
4. From the **Settings** list, select **Sounding**.
5. From the **Tools** menu, select **Points**. Ten points, labeled A - J, appear on the D2D display.
6. Choose **Point C** to edit. The pointer changes from left-pointing to right-pointing when you put it over the point. Drag **Point C** over the **Seattle** location.
7. In the **Volume Browser**, do the following:
 - a. In the **Sources** column, from the **Grid** menu, select **NGM**-down menu.
 - b. In the **Fields** column, from the **Thermo** menu, select **Sounding**.
 - c. In the **Planes** column, from the **Points** menu, select **Sounding C**.
8. Load the **NGM Point-C Sounding** from the Product Selection list.

Notes:

1. A reference map appears in the upper left corner indicating the location of your sounding.
2. Change the frame count as needed to accommodate the number of forecast times for a given model run.
3. You can overlay other point soundings or RAOB soundings to compare models, or you can overlay RAOB soundings to verify the model initialization.

Objective 11.11 - Display a Time-Height Cross Section

The Volume Browser allows you to display time-height cross sections of model data, which presents the data for a single grid point on a time versus height static plot. Forecast times are plotted along the abscissa (x-axis) and the height levels are plotted along the ordinate (y-axis). The Points Tool (described in Objective 10) is used to select the desired grid point.

1. In the D2D Perspective, on the **Toolbar**, click the **Clear** button to clear the large display.
2. Open and clear the **Volume Browser**.
3. From the **Tools** Menu, open the **Points** Tool.
4. Click on the legend with mouse Button 2 to make the points editable. Drag **Point D** to the **Amarillo, Texas** location.
5. Clear the Display.
6. In the **Volume Browser**, under the **Settings** pull-down menus, select **Time Height** and **>Right**.
7. In the **Volume Browser**, select the **NGM Temperature (C)** Field. Under the **Points Planes** Menu,

choose **Tsect D**.

8. Set the frame count to **8**.
9. Load the **NGM Point D - Temperature (C)** Product. Notice the reference map in the upper right corner of the large display panel.
10. Now overlay the **Relative Humidity (%)** Field as an image at **Point D**.

Notes:

1. The frame count affects the number of forecast time intervals that are displayed along the abscissa. A frame count of one means display all available time periods.
2. You can overlay time-height cross sections from other grid point locations.

Objective 11.12 - Create a Time Series Plot with Model Data

The Volume Browser allows you to display time series of model or other grid point data, which presents the data for a single grid point on a time versus data units plot. For example, 500 mb relative humidity at a specified location would generate a time versus relative humidity plot, with forecast times plotted along the abscissa (x-axis) and the percentage of relative humidity plotted along the ordinate (y-axis). The Points Tool (described in Objective 10) is used to specify the desired point.

1. Clear the D2D large display pane and the Volume Browser.
2. From the **Scale** option menu on the **Toolbar**, set the scale to **CONUS**.
3. From the Volume Browser **Tools** menu, select **Points** to load the Interactive Points tool.
4. With mouse Button 1, drag Point A to near Spokane, Washington.
5. (If you need help locating Spokane, load the **RAOBs** map background from the **Maps** pull-down menu. The identifier for Spokane is **KOTX** in eastern Washington.)
6. From the **Volume Browser** menu bar settings, select **Time Series** and **Point A**.
7. In the **Volume Browser**, select the **Eta 700 mb Temperature**.
8. Set Frame Count to 7.
9. Click the **Load** menu button in the **Volume Browser** and observe the time series plot.

Note: With the frame count at 7, the display includes the first seven time steps in the model run, 0 - 36h in this case, providing that all time periods are available for the 700 mb temperature. Change **Frames** to 8 and the display repaints, now including the 42h time step. If you select frame count 1, all available periods will be displayed. Try it. This applies also to point sources (profiler and RAOB).

Module 12: Volume Browser Display Manipulation Actions

This module instructs you on the use of the Volume Browser manipulation actions.

Objective 12.1 - Clone the Product Selection List

1. Clear the large display pane and the **Volume Browser**.
2. Under the **Settings** pull-down menus, select **Plan view** and **Time**.
3. Select several products for the **Product Selection** list using the **Sources**, **Fields**, and **Planes** pull-down menus.
4. Deselect one or two products in the Product Selection list.
5. From the **File** pull-down menu in the **Volume Browser**, select **Clone**.
6. The selected products in the Product Selection list are duplicated in a new window.

Note: Only highlighted products in the Product Selection list are cloned. A cloned Product Selection list can be closed only one time. You need to re-clone the Product Selection list to restore it. You should continue to display the original Product Selection list for Objectives 12.2 and 12.3.

Objective 12.2 - Select None of the Products in the Product Selection List

1. From the **Edit** pull-down menu in the **Volume Browser**, choose **Select none**.
2. Each of the products is removed from the Product Selection list, but the selections you made in the **Sources**, **Fields**, and **Planes** Menus remain but are not highlighted.
3. Keep this Product Selection List for the next Objective.

Note: The **None** button in the cloned Product Selection list un-highlights rather than removes the products.

Objective 12.3 - Select All of the Products in the Product Selection List

1. From the **Edit** pull-down menu in the **Volume Browser**, choose the **Select all** option.
2. Each of the products is highlighted and ready to be displayed.
3. Click the **Load** button to display all the products in the Product Selection list.
4. Keep this Product Selection list for the next Objective.

Objective 12.4 - Clear the Product Selection List

1. From the **Edit** pull-down menu in the **Volume Browser**, choose the **Clear All** option.
2. Notice that all of the products in that Product Selection list are now removed.

Module 13: Load Modes

This module explains the various modes for loading data and products. Recall that Load Modes provide different ways to display model or real-time data by manipulating the valid times and forecast times of previous model runs and inventories of data sets. The Load Modes apply primarily, but not exclusively, to Volume Browser products. Except where noted, the Load Modes can be used when generating Plan views, Cross Sections, Time-Height Cross Sections, Model Soundings, and Time Series plots.

Objective 13.1 - Use Latest Run

A Load Mode that displays forecast data only from the latest model run, rather than mixing in forecasts from previous model runs.

1. Clear the large display pane.
2. Set **Load Mode** to **Latest Run**.
3. From the **Volume Browser**, select and load a model product.
4. Observe the valid times as you step through the data.

Note: If the frame count is set to a high value, the system does backfill with older data.

Objective 13.2 - Use Valid Time Sequence

A Load Mode that loads the most recent model runs on other data, and fills empty frames with previous data or analyses.

1. Clear the large display pane.
2. Set **Load Mode** to **Valid Time Sequence**.
3. Select and load a model product.
4. Observe the valid times as you step through the data.

Note: Latest Run and Valid Time Sequence are "sticky default" Load Modes. This means that, when you clear the large display pane, the current Load Mode setting automatically defaults back to either Latest Run or Valid Time Sequence (whichever you had initially used before switching to another Load Mode).

Objective 13.3 - Use No Backfill

A Load Mode that displays the latest model run, but does not fill empty frames with older data.

1. Clear the large display pane.
2. Set **Load Mode** to **No Backfill**.
3. From the **Volume Browser**, select and load any model product of your choice.
4. Observe the valid times as you step through the data.

Objective 13.4 - Use Previous

If your frame count is set to a high number, a Load Mode uses a previous model run, and fills empty frames with previous model data for analysis.

1. Clear the large display pane.
2. Set **Load Mode** to **Previous Run**.
3. From the **Volume Browser**, select and load any model product of your choice.
4. Observe the valid times as you step through the data.

Objective 13.5 - Use Previous Valid Time Sequence

A Load Mode that displays the previous model run, and fills empty frames with previous model data or analyses.

1. Clear the large display pane.
2. Set **Load Mode** to **Previous Valid Time Sequence**.
3. From the **Volume Browser**, select and load a model product.
4. Observe the valid times as you step through the data.

Objective 13.6 - Use Prognosis Loop

A Load Mode that displays a sequence of n-hour forecasts from successive model runs. For example, all of the 24-hour forecasts would be selected from the available model runs.

1. Clear the large display pane.
2. Set **Load Mode** to **Prognosis Loop**.
3. From the **Volume Browser**, select and load a model product.
4. Select a forecast time from the **Select Forecast Time** dialog box.

5. Step through the displayed product and notice that the forecast projection stays the same, while the valid time changes.

Objective 13.7 - Use Analysis Loop

A Load Mode that loads a sequence of analyses from successive model runs, but excludes forecasts. This is similar to the Prognosis Loop, but selects only the 0-hour analyses from the available model runs.

1. Clear the large display pane.
2. Set **Load Mode** to **Analysis Loop**.
3. From the **Volume Browser**, select and load a model product.
4. Step through the displayed product and notice that only the model analyses are displayed, not forecasts.

Objective 13.8 - Use dProg/dt

A Load Mode that displays forecasts with the same valid time from successive model runs. Each frame has different forecast times (3-, 6-, 9-, 12-hour, for example), but are all valid on the same date and time.

1. Clear the large display pane.
2. Set **Load Mode** to **dProg/dt**.
3. From the **Volume Browser**, select and load a model product.
4. Select a forecast time from the **Select Forecast Time** dialog box that appears in the center of the screen.
5. Step through the displayed product and observe that the valid time is the same for each frame, while the forecast time changes.

Notes:

1. dProg/dt provides a means for assessing the consistency of model runs.
2. You are likely to see a status message regarding the number of frames, since the database is necessarily limited.

Objective 13.9 - Use Forced Load

A Load Mode that puts a selected product in all frames of a previously displayed loop, ignoring time-matching.

1. Clear the large display pane.

2. Set **Load Mode** to **Valid Time Sequence**.
3. From the **Volume Browser**, select and load a model product.
4. Set **Load Mode** to **Forced Load**.
5. From the **Volume Browser**, select and load a model product.
6. Select a forecast time from the **Select Forecast Time** dialog box that appears in the center of the screen.
7. The selection made in Step 5 is overlaid in each frame of the product selected in Step 3.

Note: With looping turned on, the overlaid product appears static, while the model product animates.

Objective 13.10 - Use Forecast Match

A Load Mode that overlays a model product only when its forecast times match those of an initially loaded product.

1. Clear the large display pane.
2. Set the **Load Mode** to **Latest**.
3. Load the **NGM 400 mb Height (dam)** Field.
4. Set **Load Mode** to **Forecast Match**.
5. Load the **NAM 400 mb Height (dam)** Field.
6. Step through the frames and observe that the two products are displayed together only when the products have matching forecast times.

Note: Forecast match can also be used when displaying real-time observational data with varying update intervals.

Objective 13.11 - Use Inventory Load

A Load Mode that allows you to retrieve and display an older version of graphical or image data from a menu list.

1. Clear the large display pane.
2. Set **Scale** to **WFO**.
3. Set **Load Mode** to **Inventory**.

4. From the **kxxx** pull-down menu, select the **0.5 Z/V Radar Product**.
5. Select a time from the **Select Forecast Time** dialog box, which appears in the center of the screen.
6. Observe the loaded single frame and verify valid time.

Note: Inventory Load can be used with model and real-time data sources. Inventory Load cannot be used for time-height cross sections or time series plots.

Objective 13.12 - Use Slot Load

A Load Mode that loads (or overlays) a single frame of a selected product only in the currently displayed frame, and ignores time matching.

1. Clear the large display pane.
2. Set the scale to **CONUS**.
3. Set **Load Mode to Valid Time Sequence**.
4. From the **Volume Browser**, select and load a product.
5. Step to the desired frame of this newly displayed product onto which you want to overlay a product.
6. Then set **Load Mode to Slot Load**.
7. Select and load a second product.
8. Select a valid time from the **Select Forecast Time** dialog box that appears in the center of the screen.
9. Loop the product to verify that the product loaded in Step 6 is only in the chosen frame.

Notes:

1. Slot Load can be used with model and real-time data sources.
2. Slot Load cannot be used for time-height cross sections or time series plots.

Module 14: Accessing the Digital Mesocyclone Display (DMD) from the Volume Browser Menu

This module contains practice modules for the Choose By ID Tool and step-by-step instructions on how to display Time Height, Time Series, and Vertical Line Graphs of DMD data.

Objective 14.1 - Use the Choose By ID Tool, assuming DMD Display Features are available

Choose By ID provides a method for selecting locations based on a feature ID rather than from a map. While it can be used for standard point data (see Objective 2 for examples), its main reason for being is to

select features that may move, such as 88D-identified mesocyclone circulations.

Note 1: The **Return** key mentioned in the following practice modules refers to the **Enter** key on the main keyboard, while **Enter** refers to the **Enter** key on the numeric keypad. Press **Return** when you want to keep/fix your entered ID. Press **Enter** only when you want to return to the original ID.

1. Clear the large display pane.
2. Set **Scale to WFO**.

Note 2: If available, the DMD Display appears and you can continue to the next step. If not available, continue to the next Objective to practice using the Choose By ID tool on other products like METARs and RAOBs.

3. From the **Volume** pull-down menu, select **Browser**. The Volume Browser menu appears.
4. Select the **Choose By ID...** tool from the **Tools** pull-down menu on the Volume Browser. The Choose By ID dialog box appears.

Note 3: Once **Choose By ID...** is selected, you can use it to load point data from the Volume Browser based on an ID rather than a location. The tool allows you to associate an ID with one of the moveable Points, or the "Home" point, or a series of IDs with one of the moveable Baselines.

5. Enter a **radar** location into the **Home** box in the Choose By ID dialog box and click **Return** to save your changes.
6. Enter a **feature ID** from the DMD Display into the **Points G** box and click **Return** to save your changes and generate the Plan view DMD display shown in **Exhibit 3.3.6-1**, which shows the feature IDs mapping.

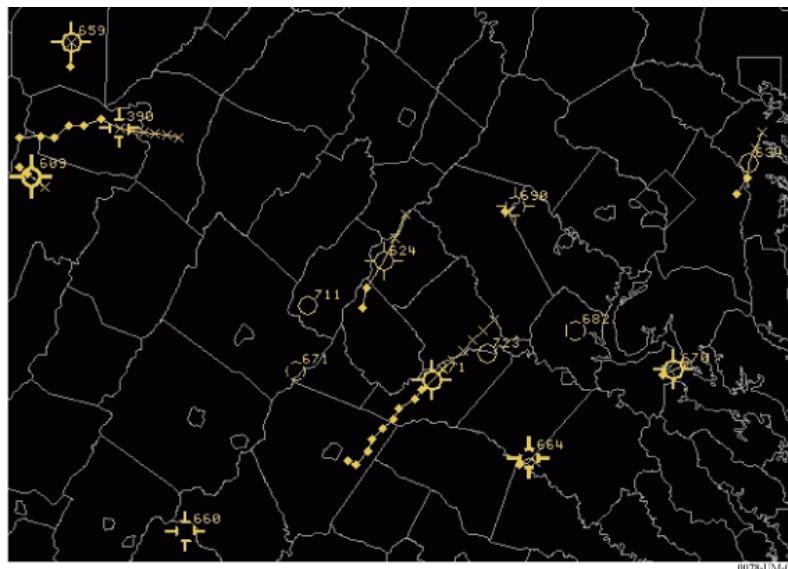


Exhibit 3.3.6-1. DMD Display Showing Feature IDs

Note 4: You can also generate the DMD display from the kxxx menu by selecting **kxxx ► kxxx Graphics ► Digital Mesocyclone**. Refer to [Section 2.2.6.12](#), kxxx.

7. From the **Settings** pull-down menu, select **Time series**.

Note 5: All of the Settings pull-down menu options will work with DMD except **Plan view** and **Sounding**.

8. From the Volume Browser **Settings** pull-down menu, select **Point G**. The point chosen in the Point Selection pull-down menu must match the Points box in the Choose By ID dialog box.
9. From the Volume Browser **Sources** menu, select **Other ► DMD**.

Note 6: The DMD grids available are highlighted in green.

10. From the Volume Browser **Fields** menu, select **Other ► Radial Vel**.
11. From the Volume Browser **Planes** menu, select **Misc ► MaxWind**.
12. Verify the product selected appears in the **Product Selection** list and then click **Load**. Verify, in the product legend, the DMD product has loaded for the correct feature ID location.
13. Clear the large display pane.
14. From the **Choose By ID** dialog box, type **2 or more** feature IDs from the DMD display into the **Baselines G** box and press the **Return** key to save your changes.
15. From the Volume Browser **Settings** pull-down menu, select **Cross section**.
16. From the Volume Browser **Sources** menu, select **Other ► DMD**.
17. From the Volume Browser **Fields** menu, select **Basic ► Height**.
18. From the Volume Browser **Planes** menu, select **Specified ► Line G**. The line chosen in the Specified menu must match the Baselines box in the Choose By ID dialog box.
19. Verify the product selected appears in the **Product Selection** list and click **Load**. Verify, in the product legend that the DMD product has loaded for the correct feature ID locations.

Notes:

7. You can hit the "escape" or "=" key to clear the entered ID. If you accidentally hit the "escape" or "=" key, you can always go back to the ID by pressing the **Enter** key on the numeric keypad. Entered IDs will automatically be converted into uppercase once the **Return** key is pressed.

8. Asterisks (*) appear in front of the entered IDs when an ID has changed its location. Each entered ID is associated with a moveable screen object; from the Points extension, the Baselines extension, or the "Home" extension. If the screen objects move, then the location of the new screen object will control what data is loaded. The graphical object on the screen will acquire an (*) when not in control. To keep the location of the entered IDs the same and in control, simply press the "lock" button or hit the **Return** key in one of the text entry fields.
9. Greater-Than (>) signs appear in front of the entered IDs when an ID has an error. You must enter more than one ID for the Baselines box and a single ID for the "Home" and Points box. The (>) sign does not check for validity of IDs.
10. You can display the Choose By ID tool on several screens at the same time on the same workstation. Once you have entered an ID on one screen, it will show up on the other screen, but will not be in control. Also once an ID is locked on one screen, you cannot override it on another screen. However if an ID is overridden from a different screen before the "lock" button is pressed, hitting the **Return** key will cause that ID to be recommitted, and hitting **Enter** on the numeric keypad will sync up with the override ID.
11. Whenever point data is successfully loaded from the Volume Browser, the associated graphical object will snap to the location of the station/feature in question. However, even if the graphical object has a leading asterisk, its location will still control the display of pure gridded data. If you wish to compare grids to point data at Choose By ID-set locations, you must first load the point data to get the object to move to the desired location.

Objective 14.2 - Use the Choose By ID Tool, assuming DMD Display Features are not available

While Choose By ID was designed with moving targets such as DMD in mind, it can also be used to set Points, Baselines, and "Home" for conventional locations like METARs and RAOBs. This Objective illustrates its use with those datasets, and also provides useful practice if no DMD features are available.

Note 1: You must load a regular METAR or RAOB product first before loading a Grid product when using the Choose By ID tool; otherwise the changes made will not be saved.

1. Clear the large display pane.
2. From the Main menu, select **Volume ▶ Browser**. The Volume Browser menu is displayed.
3. From the Volume Browser **Tools** pull-down menu, select **Choose By ID...**. The Choose By ID dialog box appears.
4. From the **Choose By ID** dialog box, type **kden** in the **Points A** box and then press the **Return** key to save your changes.
5. From the Volume Browser **Settings** pull-down menu, select **Time series**.

6. From the Volume Browser **Point Selection** pull-down menu, select **Point A**.
7. From the Volume Browser **Sources** menu, select **Other ▶ Metar**.
8. From the Volume Browser **Fields** menu, select **Sfc/2D ▶ Misc ▶ Meteogram**.
9. Observe your selection in the **Product Selection** list and click **Load**.
10. Verify, in the product legend, that the METAR product has loaded for the correct location.
11. From the Volume Browser **Sources** menu, select **Grid ▶ NAM80** and click **Load**. Verify, in the legend, that the NAM80 product has loaded for the correct location.
12. Clear the large display pane.
13. From the **Choose By ID** dialog box, type **klbf kdnr kgjt** in the **Baselines E** box and then press the **Return** key to save your changes.
14. From the Volume Browser **Settings** pull-down menu, select **Cross section**.

Note 2: Choose By ID can be used to set baselines only for those datasets which allow cross-section generation - e.g., Raob, MDCRS, profiler.

15. From the Volume Browser **Edit menu**, select **Clear sources**.
16. From the Volume Browser **Sources** menu, select **Other ▶ Raob**.
17. From the Volume Browser **Fields** menu, select **Basic ▶ Temperature**.
18. From the Volume Browser **Planes** menu, select **Specified ▶ Line E**.
19. Observe your selection in the **Product Selection** list and click **Load**. Verify, in the legend, that the RAOB product has loaded for the correct locations.
20. From the Volume Browser **Sources** menu, select **Grid ▶ NAM80** and click **Load**. Verify, in the legend, that the NAM80 product has loaded for the correct locations.
21. Clear the large display pane.

Note 3: The following steps of the practice module may not be available at most WFO sites.

22. From the **Choose By ID** dialog box, type a radar ID into the **Home** box and press the **Return** key to save your changes.
23. From the **Radar** menu on the Main menu, select **Home ▶ Home 4 Bit Prods ▶ Comp Ref 4bit (CZ)**. Verify, in the legend, that the selected Home radar product is displayed.

Objective 14.3 - Display Cross Sections of Radar Reflectivity or Velocity along Specified Baselines using Radars Identified from the Home Location Box

1. Clear the large display pane.
2. Select **WFO or State(s)** scale.
3. Either put **Home** near the radar of interest, or bring up the Choose by ID tool and type the radar ID into the **Home** box at the bottom.
4. Place a baseline across the area you'd like to view.
5. Bring up the **Volume Browser**, select **Cross section, Sources: Other ► Radar, Fields: Other ► Reflectivity**, and **Planes: Specified ► LineX**.
6. Display as image and/or contours.

Objective 14.4 - Display Time Height of DMD Data

1. Clear the large display pane.
2. Load the **DMD** product on the WFO scale.

Note: To load the DMD product, select **kxxx ► kxxx Graphics ► Digital Mesocyclone (DMD)** from the main menu.

3. From the **Volume** pull-down menu, select **Browser**. The Volume Browser dialog box appears.
4. From the Volume Browser **Settings** pull-down menu, select **Time height**.
5. From the Volume Browser **Sources** menu, select **Other ► DMD**.
6. From the Volume Browser **Fields** menu, select **Basic ► Shear Mag**.
7. From the Volume Browser **Planes** menu, select **Points ► T sect A**.
8. Enter the following into the **Choose By ID** dialog box (refer to [Objective 14.1](#) above to open the dialog box):
 - a. In Points A box, the ID of a feature on the DMD display.
 - b. In the "Home" box, the location for a particular radar.
9. From the **Choose By ID** dialog box, select the **lock** button or press the **Return** key to fix the "Home" location for the chosen radar in Step 8.
10. From the **Volume Browser** dialog box, select **Load** to display the Time height of DMD data.

Objective 14.5 - Display a Time Series of DMD Data

1. With the DMD product still loaded, select **Browser** from the **Volume** pull-down menu. The Volume Browser dialog box appears.

2. From the Volume Browser **Tools** pull-down menu, select **Points**. Place **Point B** over a feature on the DMD display.
3. From the Volume Browser **Settings** pull-down menu, select **Time series**.
4. From the Volume Browser **Point Selection** pull-down menu, select **Point B**.
5. From the Volume Browser **Sources** menu, select **Other ▶ DMD**.
6. From the Volume Browser **Fields menu**, select **Basic ▶ StrmMot**.
7. From the Volume Browser **Fields** menu, select **Other ▶ Feature Strength**.
8. Select the **Load** button to display a Time series of DMD data.

Objective 14.6 - Display a Vertical Line Graph of DMD Data

1. With the DMD product still loaded, select **Browser** from the **Volume** pull-down menu. The Volume Browser dialog box appears.
2. From the Volume Browser **Tools** pull-down menu, select **Points**. Place **Point A** over a feature on the DMD display.
3. Open the **Choose By ID** dialog box and enter a feature ID from the DMD display into the **Points A** box.
4. From the Volume Browser **Settings** pull-down menu, select **Var vs Hgt**.
5. From the default **Log 1050-150** pull-down menu, select **0-5km MSL**.
6. From the Volume Browser **Sources** menu, select **Other ▶ DMD**.
7. From the Volume Browser **Fields** menu, select **Other ▶ Feature Diameter**.
8. From the Volume Browser **Fields** menu, select **Other ▶ Gate2Gate Shr**.
9. From the Volume Browser **Planes** menu, select **Points ▶ VarHgt A**.
10. Select the **Load** button to display a Vertical Line Graph of DMD data. Observe that the Graph has loaded onto the DMD display.
11. Close the **Choose By ID** dialog box and the Volume Browser dialog box.
12. Exit the DMD product display.

4.0 The AWIPS Workstation and Textual User Interface

Each AWIPS Workstation is comprised of three graphic displays (Graphic Workstation) and one text display (Text Workstation), as shown in **Exhibit 4.0-1**. The three graphic displays share a common keyboard, mouse, and central processing unit (CPU - LX). The text display has a dedicated keyboard, mouse, and CPU - XT..



Exhibit 4.0-1. The AWIPS Workstation

This chapter includes the following sections:

- [Section 4.1: The AWIPS Text Workstation](#)
- [Section 4.2: The AWIPS Textual User Interface](#)

4.1 The AWIPS Text Workstation

The AWIPS Text Workstation is located on the left side of the AWIPS Workstation, as shown in **Exhibit 4.1-1**. It has its own dedicated keyboard, mouse, and its own CPU (XT).



Exhibit 4.1-1. AWIPS Text Workstation

The input devices for the AWIPS Text Workstation function the same as those used for the AWIPS Graphic Workstation. Refer to [Section 2.1](#).

Note: The mouse handedness of the Text Workstation can be set via Programs ▶ Settings ▶ Peripherals ▶ Mouse, which is available by clicking mouse Button 2 from the root (the colored background of the display).

The Text Workstation allows you to retrieve, edit, and transmit textual information. It is also possible to send and receive administrative messages with or without attachments. Like the CAVE graphical displays, the Text display was developed with motif-style menus, windows, and mouse controls, but it also has an online editor interface for editing text.

Note: The Text Workstation accommodates both WMO text products and legacy AFOS text identifiers.

If there are any problems, specific alert boxes appear. Once you send the product, a confirmation box pops up asking you to verify the send or to abort the transmission.

4.1.1 Starting the Text Workstation

The Text Workstation can be started from either the Text Workstation (XT) or from the Graphic Workstation (LX).

If accessing the Text Workstation display from the Text Workstation:

1. Log into AWIPS on the Text Workstation.
2. The display shown in **Exhibit 4.1.1-1** will appear.

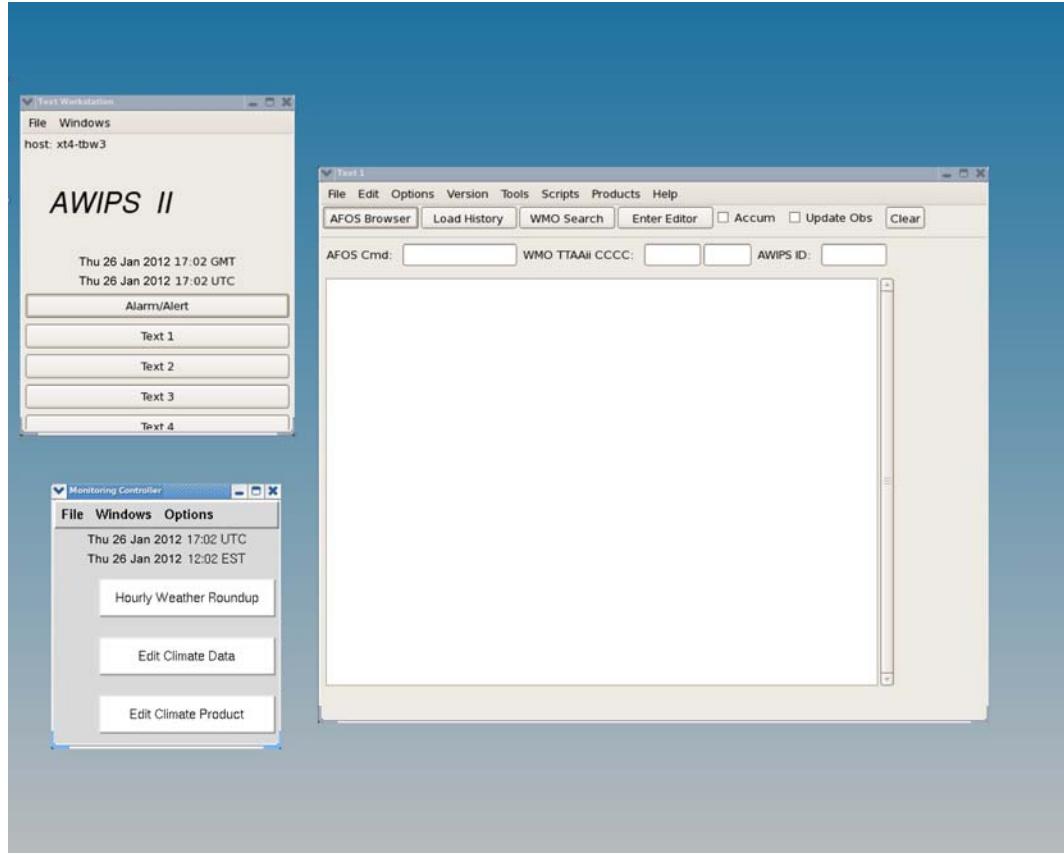


Exhibit 4.1.1-1. Text Workstation Display from XT Workstation

If accessing the Text Workstation display from the Graphics Workstation CAVE-D2D Perspective:

1. On the Graphics Workstation, log into CAVE.
2. On the Menu Bar of the CAVE-D2D Perspective, select CAVE ▶ New ▶ Text Workstation, as shown in **Exhibit 4.1.1-2**.

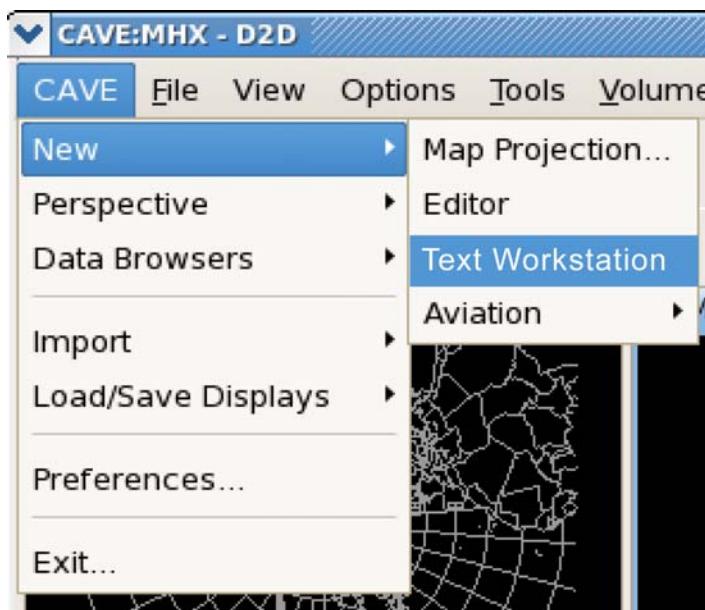


Exhibit 4.1.1-2. Accessing Text Workstation from CAVE

The Text Workstation dialog box and default Text 1 window appear on the CAVE-D2D Perspective display, as shown in **Exhibit 4.1.1-3**.

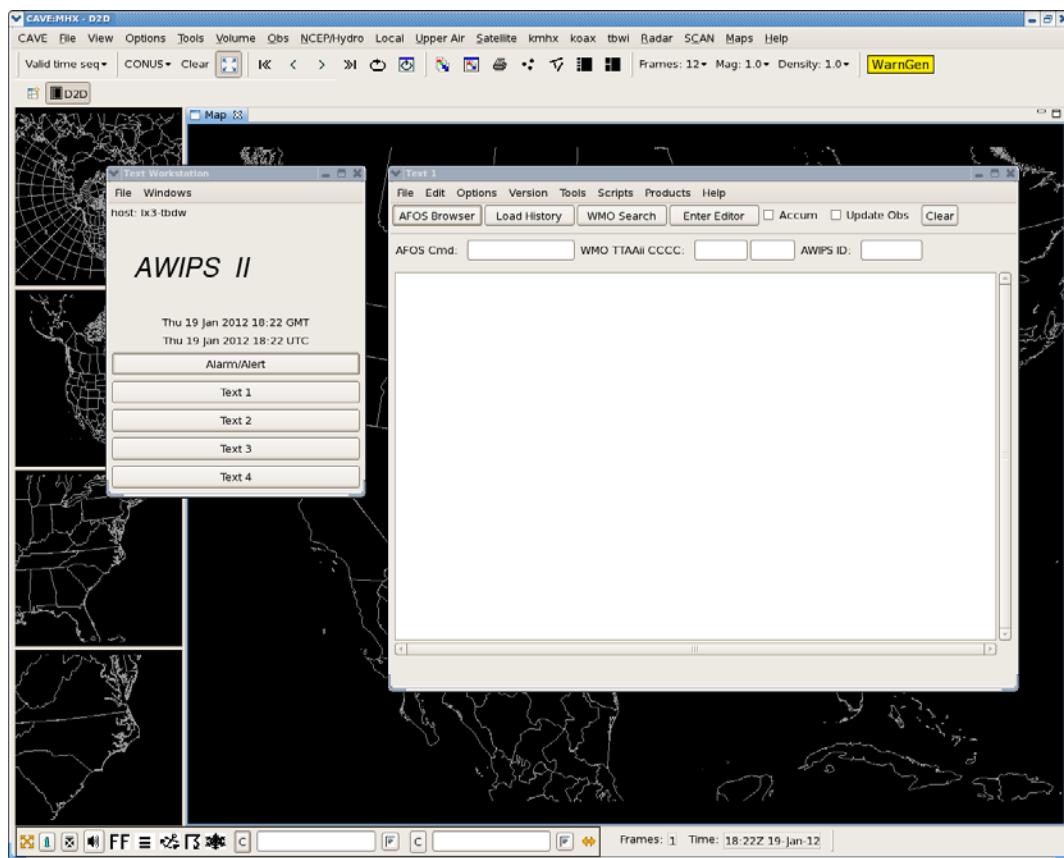


Exhibit 4.1.1-3. Text Workstation Display from LX Workstation (CAVE-D2D)

4.2 The AWIPS Textual User Interface

When a text display is opened from the Graphics Workstation (LX) CAVE-D2D menu, two Text display windows appear, as shown in **Exhibit 4.2-1**: the Text Workstation dialog box and the Text 1 display window. Three windows open if the text display is opened from the Text Workstation (XT): Text Workstation dialog box, Text 1 display window, and the Monitoring Controller dialog box. (Refer to [Exhibit 4.1.1-1](#).)

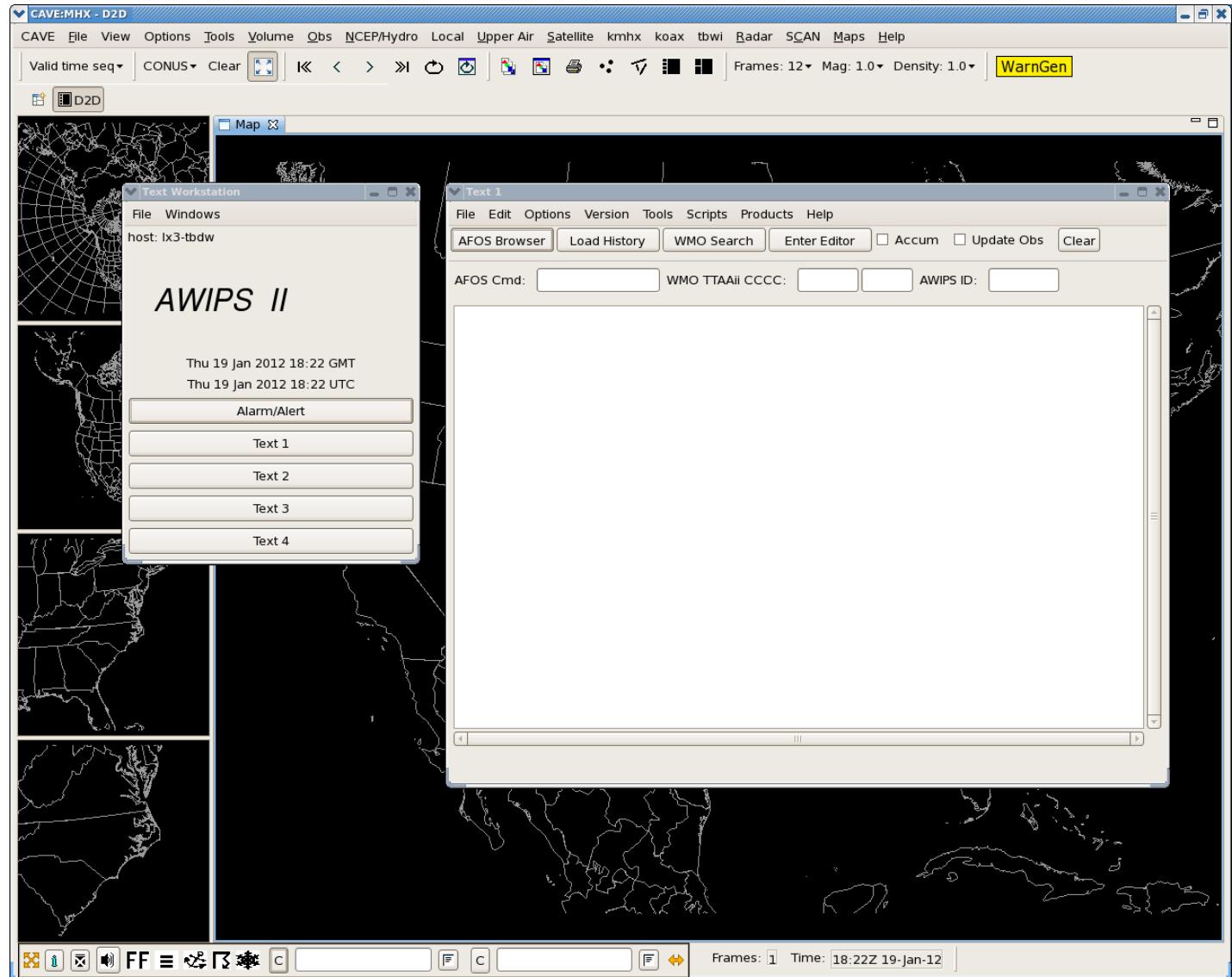


Exhibit 4.2-1. Text Workstation Dialog Box and Display Window from LX Workstation

4.2.1 Text Workstation Dialog Box

The Text Workstation dialog box, shown in **Exhibit 4.2.1-1**, contains top-level pull-down menus for the Text display. It also displays the current GMT and UTC date/time.



Exhibit 4.2.1-1. Text Workstation Dialog Box

Text Workstation windows are numbered and each one can be opened simply by clicking on its button (Text 1, Text 2, etc.). If a text product has been loaded in one of the Text display windows, the product's Automation of Field Operations and Services (AFOS) identifier appears on the window button.

A brief explanation of each button in the Text Workstation dialog box follows.

File

- **Select User ID:** This option opens a list of user names.
- **Select:** The Select submenu contains the Evaluation Log, End of Shift, and Questionnaire.
- **Exit:** This option closes the Text Workstation windows. A confirmation dialog box appears to confirm the exit request.

Windows

- **Hide All:** All Text display windows are closed without icons.
- **Show All:** Each Text display window is restored.

- **New Window:** This option allows you to generate another Text display window. By default, four windows are made available but up to eight are possible.

Alarm/Alert

This menu button opens the Current Alarm Queue. Refer to [*Section 5.4*](#) for more information.

Text 1-Text 4

These buttons open the individual Text display windows.

4.2.2 Text Display Window

The numbered Text display windows are where you browse, read, and edit textual products. **Exhibit 4.2.2-1** shows a Text display window as it appears when initially opened.

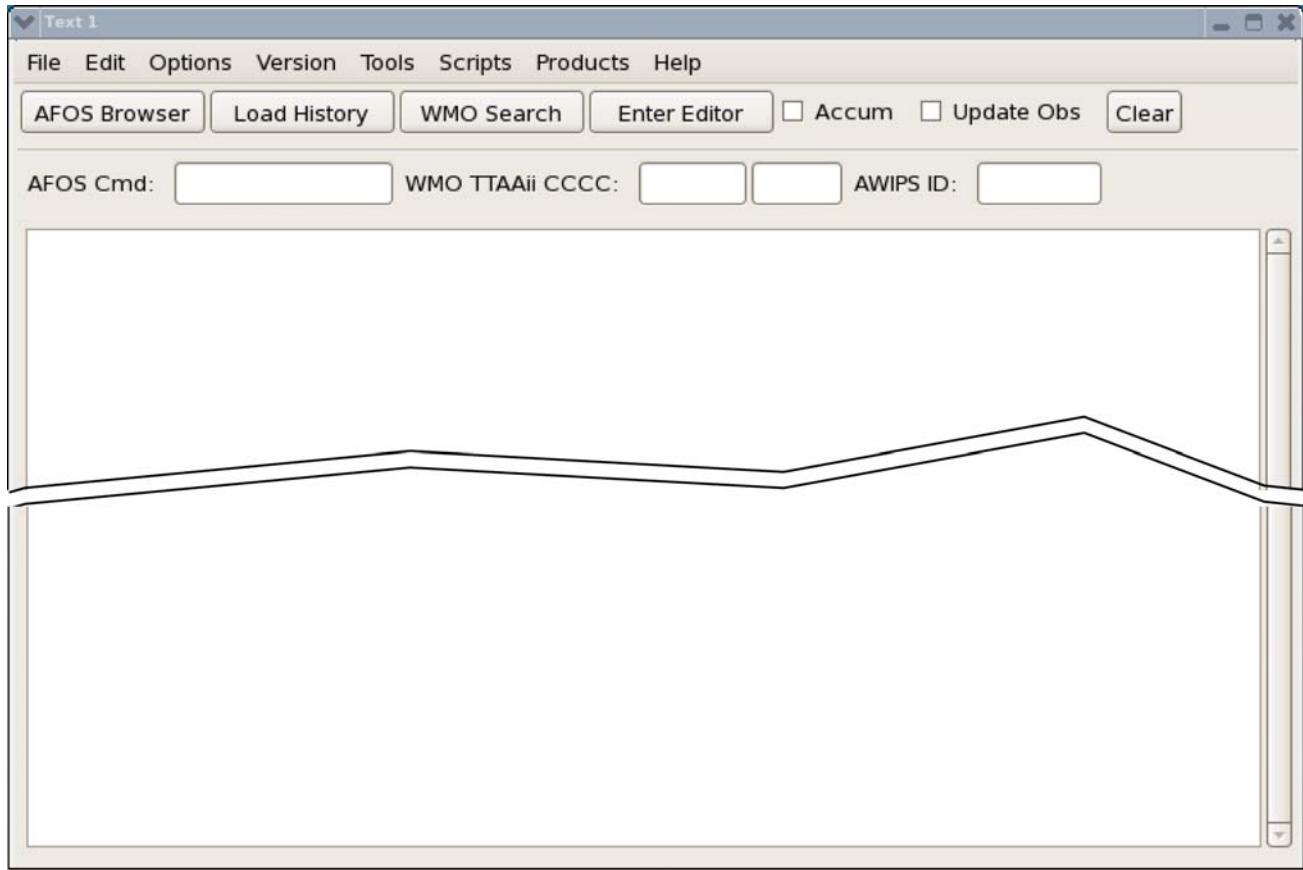


Exhibit 4.2.2-1. Text Display Window

Each window has a Menu Bar located along the top row of the window; the menu bar standard menus for window controls, product retrieval, and editing.

The second and third rows of menu buttons in each window are called the Toolbar. These buttons manage the information contained in the window. The control settings of one Text display window do not apply to any other Text display window. Descriptions of the buttons found on the Menu Bar and the Toolbar follow.

4.2.3 Text Display Window Menu Bar

File

The File menu, as shown in **Exhibit 4.2.3-1**, contains commands for viewing, printing, and editing text data. Descriptions of each menu option follow.



Exhibit 4.2.3-1. Text Display Window File Pull-down Menu

- **AFOS Browser:** A button that opens the Text Workstation AFOS Browser, which is discussed in [Section 5.1.3](#).
- **Print All (Ctrl+P):** Creates hard copy of all text in that Text window.
- **Print Selection:** Creates hard copy of highlighted text in that Text window.
- **Fax All:** Opens the Fax Message dialog box, as shown in **Exhibit 4.2.3-2**, which allows you to create a fax of all text in that Text window.

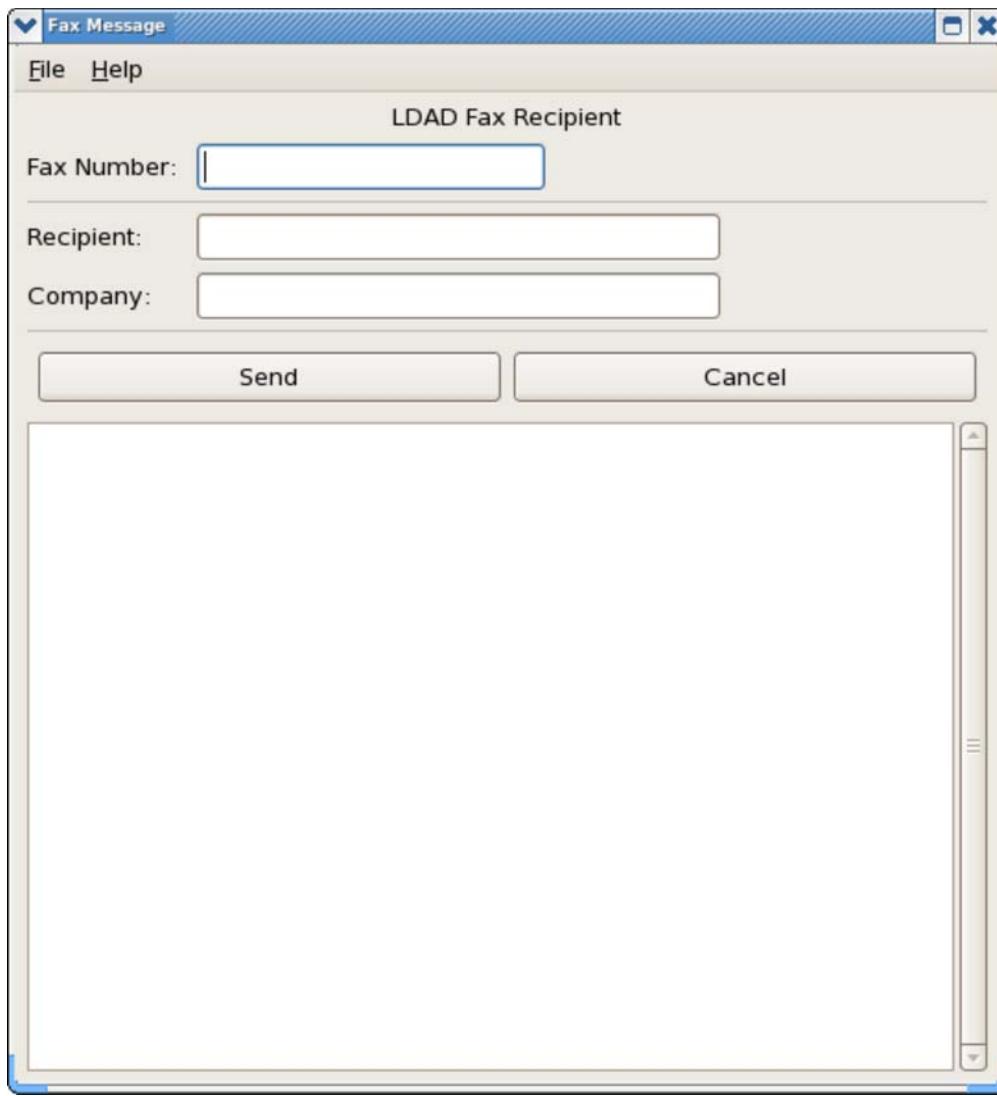


Exhibit 4.2.3-2. Fax Message Dialog Box for Fax All

- **Fax Selection:** When a text product is displayed in the Text window and a portion of the text is highlighted, this option opens the Fax Message dialog box, which allows you to generate a fax of the highlighted text. The Fax Message dialog box, as shown in **Exhibit 4.1.3-2**, includes the following:
 - **File:** A pull-down menu that contains commands that control the Fax Message dialog box, including **Exit**, which closes the Fax Message dialog box.
 - **Help:** A pull-down menu that contains useful information on the fax capabilities and version of the software.
 - **LDAD Fax Recipient:** An area of the Fax Message dialog box that contains entry lines used to fill in the pertinent information on each fax site.
 - **Fax Number:** An entry box in which to type the telephone number of the recipient's fax machine. This entry box must contain an entry for the capability to function.
 - **Recipient:** An entry box in which to type the name of the person to receive the fax.
 - **Company:** An entry box in which to type the name of the company to receive the fax.

- **Send:** A menu button that initiates the transmission of the fax message.
 - **Cancel:** A menu button that cancels the fax message operation and closes the Fax Message dialog box.
- **Configure Auto Fax:** Opens the Fax Site Editor dialog box, as shown in **Exhibit 4.2.3-3**, which contains commands that allow you to add or edit fax sites, as well as update the fax sites text database.

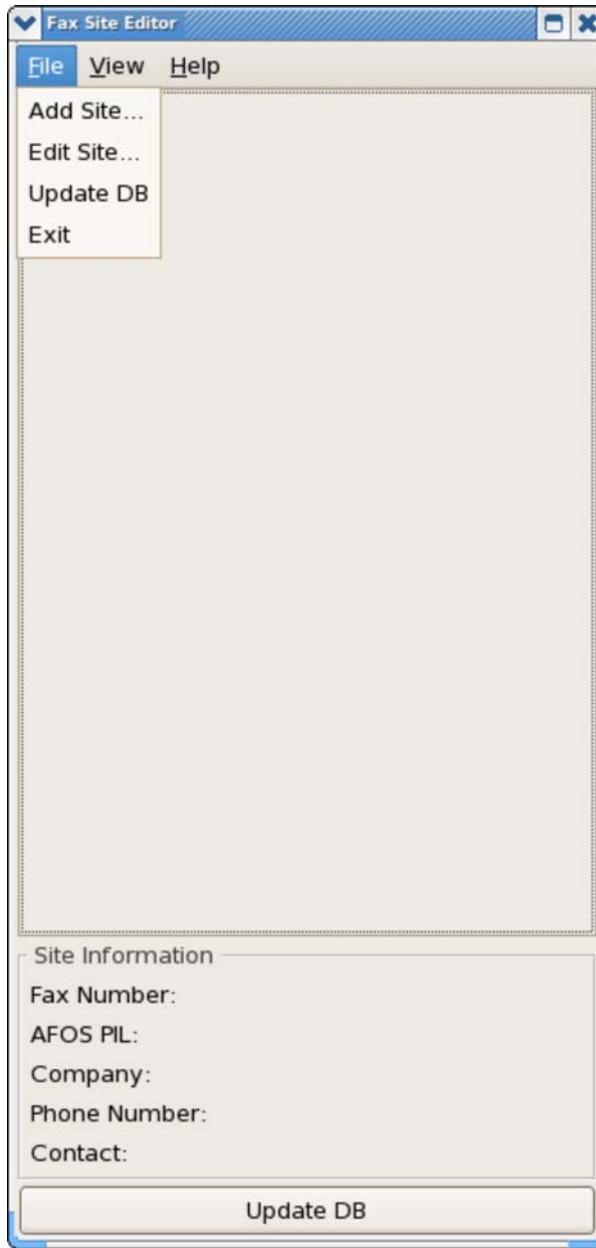


Exhibit 4.2.3-3. Fax Site Editor Dialog Box

Once fax sites have been set up, the window area of the Fax Site Editor dialog box contains a tree-view listing of the existing fax sites. (This area is empty if no fax sites have been set up.) The phone number is denoted with a "+" symbol. Click on the "+" symbol next to the phone number to expand the tree-view and view the AFOS product inventory lists (PIL) associated with each phone number.

Click on the "-" symbol next to each phone number to close the expanded tree-view listings.

- **File:** A pull-down menu, as shown in **Exhibit 4.2.3-3**, which contains the following options:

- **Add Site....:** Opens a dialog box containing commands for configuring a fax site.
 - **File:** Pull-down menu with the following options:
 - **Update Database (DB):** Updates the fax site text database to reflect all changes you have made to the fax sites.
 - **Exit:** Exits the Fax Site Editor dialog box.
 - **Recipient:** Pull-down menu that contains the following options:
 - **Add Recipient....:** Adds a newly defined fax recipient to the Fax Receipt list. Remember, you must select the Update DB option to activate the new recipient in the text database.
 - **Delete Recipient....:** Removes a selected fax recipient from the Fax Receipt list. Remember, you must select the Update DB option to activate the removal of a recipient from the text database.
 - **Help:** Pull-down menu that contains useful information on the fax capabilities and the software.
 - **LDAD Fax Recipient:** An area of the dialog box that contains entry lines for you to fill in the pertinent information on each fax site.
 - **AFOS PIL:** The AFOS identifier is given here.
 - **Fax number:** This is the fax number of the recipient.
 - **Phone number:** This is the phone number of the recipient.
 - **Recipient:** This is the recipient's name.
 - **Company:** This is the recipient's affiliated company.
 - **Edit Site:** An option that allows you to modify an existing fax site. You must first select the site and the AFOS PIL. The Fax Site Editor dialog box that opens is described above.
 - **Update DB:** A command that updates the fax site text database to reflect all changes you have made to the fax sites.
 - **Exit:** Menu option used to close the Configure Auto Fax dialog box
 - **View:** A pull-down menu with the following options:
 - **Sort by Fax Number:** Rearranges the tree view so that the tree is organized by fax numbers.
 - **Sort by AFOS PIL:** Rearranges the tree view so that the tree is organized by AFOS PILs.
 - **Help:** A pull-down menu that contains useful information on the fax capabilities and the software.
 - **Site Information:** An area of the Fax Site Editor dialog box that gives the following information

for a highlighted fax site:

- Fax Number
 - AFOS PIL
 - Company
 - Phone Number
 - Contact
- **Update DB:** A menu button that updates the fax site text database to reflect all changes you have made to the fax sites. It is placed here for user convenience.
- **Enter Editor:** Opens the Text Editor, which is discussed in [Section 4.5](#).
 - **Save:** Stores the product that you are currently editing in the text database, but continues the edit session.
 - **Send & Exit Editor:** Stores the text product in the text database, ends the edit session, and sends the product for transmission.
 - **Cancel Editor:** Ends the editing session without saving any changes made since the last save.
 - **Import From File....:** Opens the Import From File dialog box, which allows you to select a file to bring into your current document.
 - **Export To File....:** Opens the Export To File dialog box, which allows you to place your current file in another file or a different directory.
 - **Request From Remote Site (Request/Reply)....:** A menu button that opens the Send Request dialog box, which allows you to send a product request to another site. You specify the desired product by filling in the WSFO Identification, the Product Category, and the Product Designator (9-character ID). The Addressee can remain as DEF (Default), which sends the request to the hub. The hub is the WFO colocated with the site's RFC.

Note 1: The colocated WFO may be itself. If the product is not available, a request is automatically sent to the WNCF.

You may also specify a site from which You want the product. If that site does not have a product dated more current than what is requested, the request is not forwarded to the WNCF.

If the product is available, there is no notification. Rather, the product is sent to your database and is accessible from the Text Browser. If the product is not available, or there is some technical problem with the request, an error message is logged.

Note 2: You can request only the most recent product. You cannot specify a product for a specific time or date.

- **Recover Edit Session:** While you are in the edit session, the system automatically saves the text product every minute.

If there is a system crash or an inadvertent Text window closure while you are editing, this button restores the most recently saved text file.

- **Close (Alt+F4):** Closes the Text window.

Edit

Edit is the second Text display window menu. This menu, as shown in **Exhibit 4.2.3-4** contains editing functions that apply to text products in the Text windows and/or the Text Editor windows. Many of the editing functions are the same as, or similar to, editing functions found in most word processing software. Descriptions of each menu option follow.

Note 3: A number of these commands appear in subdued text until you enter information in the Text Editor.

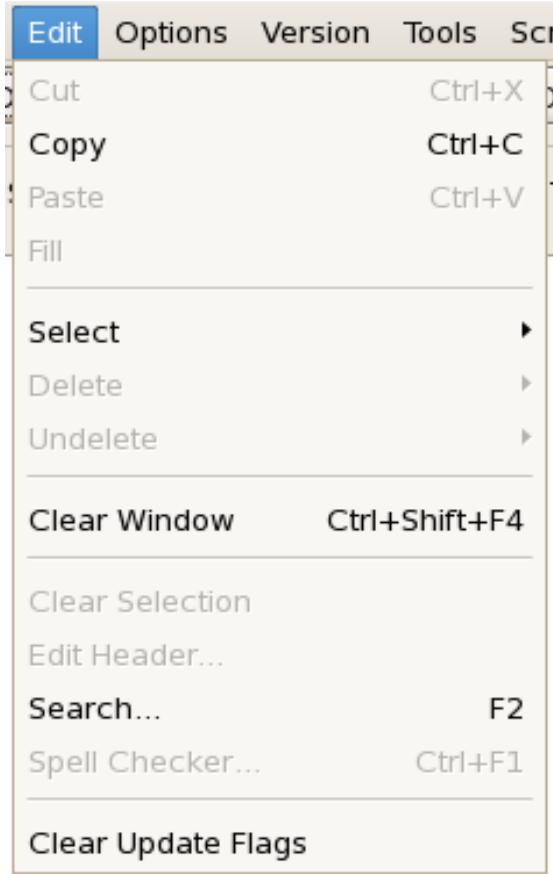


Exhibit 4.2.3-4. Text Display Window Edit Pull-down Menu

- **Cut (Ctrl + x):** Deletes a text selection.
- **Copy (Ctrl + c):** Reproduces a text selection.
- **Paste (Ctrl + v):** Places copied text at the cursor location.

- **Fill:** Removes hard returns from selected text.
- **Select:** A submenu that contains options for selecting (highlighting) text. Table 4.2.3-1 lists the options. Keyboard shortcuts for each option are noted.

Table 4.2.3-1. Text Editing Options for Selecting Text

Submenu Option	Keyboard Shortcut	Description
To previous word	Ctrl+Shift+Left	Selects previous word
To next word	Ctrl+Shift+Right	Selects next word
To beginning of line	Shift+Home	Selects from cursor location to beginning of line
To end of line	Shift+End	Selects from cursor location to end of line
To previous page	Shift+PageUp	Selects from cursor location to beginning of previous page
To next page	Shift+PageDown	Selects from cursor location to end of next page
To top of product	Ctrl+Shift+Home	Selects from cursor location to first line of page
To end of product	Ctrl+Shift+End	Selects from cursor location to last line of page
All		Selects all of the text

- **Delete:** A submenu that contains options for deleting text. Keyboard shortcuts for each option are noted in bolded parentheses.
 - Character (**F6**): Deletes the character after the cursor location.
 - Word (**F7**): Deletes the word after the cursor location.
 - Line (**F8**): Deletes the line after the cursor location.
- **Undelete:** A submenu that contains options for replacing text that was previously deleted. These Undelete functions work only on the last character, word, or line that was deleted. Keyboard shortcuts for each option are noted in bolded parentheses.
 - Character (**Shift+F6**): Undeletes the character after the cursor location.
 - Word (**Shift+F7**): Undeletes the word after the cursor location.
 - Line (**Shift+F8**): Undeletes the line after the cursor location.
- **Clear Window (Ctrl+Shift+F4):** Deletes the entire content of the Text window. This function cannot be applied while the text window is in edit mode.
- **Clear Selection:** Deletes the highlighted section of text. This option is only available in edit mode.
- **Edit Header:** Opens Header Block of a text product for editing. This option is only available in edit mode.
- **Search (F2):** A menu button or keyboard shortcut that invokes the Search and Replace dialog box containing the following options:

Note 4: All of the keyboard shortcuts used with the Text Editor are listed in [Section 5.2.2](#).

- **Search For:** An entry box used to type a word or character string for which you wish to search.
 - **Replace With:** An entry box used to type a word or character string that replaces the word or character string in the above search.
 - **Search:** A button that initiates the search.
 - **Replace:** A button that substitutes the original word or string with the new word or string.
 - **Replace and Search Again:** A button that substitutes the original word or string with the new word or string and then continues the search for the original string.
 - **Replace All:** Finds and replaces all occurrences of the original string with the new string.
 - **Cancel:** Closes Search and Replace dialog box.
- **Spell Checker (Ctrl+F1):** A menu button (or keyboard combination shortcut keys) that invokes the Spell Check dialog box. This option is only available in edit mode. It employs features very similar to spell check functions in most word processing software programs, as listed below:
 - **Not in Dictionary:** Identifies the unknown word.
 - **Change To:** An entry box used to type the correctly spelled word.
 - **Suggestions:** The Spell Checker accesses online dictionaries for the correct spelling and provides a list of suggestions. Click on or use the arrow key to select the correctly spelled word.
 - **Change:** A button that replaces the misspelled word in the text with the correctly spelled word.
 - **Change All:** A button that replaces all occurrences of the misspelled word with the correctly spelled word.
 - **Ignore:** A button that passes over a word that the Spell Checker flags as incorrectly spelled.
 - **Ignore All:** A button that passes over all occurrences of a word that the Spell Checker flags as incorrectly spelled.
 - **Add to Dictionary:** A button that puts a word into one of the online dictionaries.
 - **Dictionary:** A menu that allows you to choose either the English Dictionary or the Weather Dictionary. The English Dictionary accesses a standard online dictionary, while the Weather Dictionary contains abbreviations and meteorological acronyms that are typically not accepted in standard English dictionaries.
 - **Cancel:** A button that closes the Spell Check dialog box.
- **Clear Update Flags:** Removes the highlighting from surface observations that are updating automatically.

Options

The Text display window Options pull-down menu, as shown in **Exhibit 4.2.3-5**, contains text/font settings for the text displayed in the Text display window.

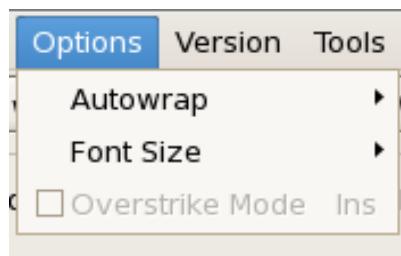


Exhibit 4.2.3-5. Text Display Window Options Pull-down Menu

The options listed under the Options menu are defined below.

- **Autowrap:** A cascade menu that turns the character width off or sets it to 69, 72, 80, or Other. The Other option initiates a dialog box that allows you to set a width between 69 and 80 characters.
- **Font Size:** A cascade menu that sets the type size to small, medium (the default), or large.
- **Overstrike/Insert Mode (Ins):** A check box that toggles between the Overstrike Mode and the Insert Mode of the Text Editor. You can also toggle between the two modes using the "Insert" (Ins) keyboard shortcut.

Version

The Text display window Version pull-down menu, as shown in **Exhibit 4.2.3-6**, allows you to choose which version of a text product you want to display.

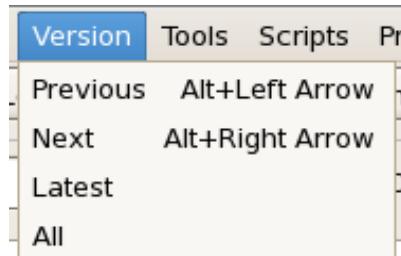


Exhibit 4.2.3-6. Text Display Window Version Pull-down Menu

Tools

The Text display window Tools pull-down menu is shown in **Exhibit 4.2.3-7**.



Exhibit 4.2.3-7. Text Display Window Tools Pull-down Menu

The menu options listed may vary from site to site. They are listed below.

- **Create TAF template:** This option creates and displays the TAF (Terminal Aerodrome Forecast)

template that users can fill in and then transmit using the "Transmit TAF" option. Cut, copy, and paste functions are available. The template must be set up by the System Administrator before this option can be used.

- **Transmit TAF:** This program takes the information in CCCWRKTAF, properly formats it in accordance with Weather Service Operations Manual (WSOM) Chapter D-31, stores the output in the appropriate product(s) in the AWIPS database, transmits the appropriate product(s) to the WAN, and either creates or updates a disk file containing information on amendments, Requirements Traceability Documents (RTD), and corrections.
- **Print Latest METARs: OMA SNY VTN ARK:** As stated, this option prints the "Latest METARs." In the exhibit above, the latest METARs are: OMA, SNY, VIN, and ARK.
- **Print Last Hour FTUS80 KOMA:** As stated, this option prints the "Last Hour." In the exhibit above, the last hour applies to FTUS80 KOMA.

Scripts

Text Scripts are macro-like programs that allow you to display a preselected set of text products. They are very similar to procedures on the graphics display. Refer to [Section 5.1](#) for further information.

Products

This is a pull-down menu of frequently used text products that can be configured for different sites. If no products are listed in this menu, the menu will not pull down. If you need to enter a product, a "-" sign is used as a placeholder.

Help

The "Help" pull-down menu is shown in **Exhibit 4.2.3-8**.

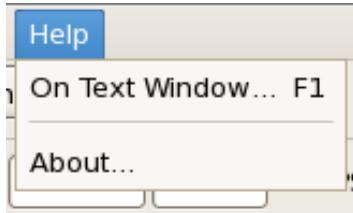


Exhibit 4.2.3-8. Text Display Window Help Pull-down Menu

The options listed under the Help menu are defined below.

- **On Text Window... (F1):** Connects you to the Mozilla Firefox home page.
- **About...:** Provides the date/version number of the Text display software.

4.2.4 Text Display Window Toolbar

The Text Display Window Toolbar contains two rows of control options, as shown in **Exhibit 4.2.4-1**. Among the options are the AFOS (Automation of Field Operations and Services) Browser and the WMO (World Meteorological Organization) Search buttons, which provide access to the text database. All of the options in the Toolbar are described below.



Exhibit 4.2.4-1. Text Display Window Toolbar

- **AFOS Browser:** A menu button that opens the AFOS Browser, which is discussed further in [Section 5.1.3](#).
- **Load History:** A menu that contains a History List of text product identifiers from previously loaded text products. Maximum list size is 20. If no products have been loaded, this menu contains a "-" sign as a placeholder.

When a text product identifier is selected (click on the identifier with mouse Button 1), it appears in the AFOS, WMO, or AWIPS entry box. Press the **Enter** key on the keyboard to load this text product to the Text display window. For AFOS products, the -1:, -2:, or ALL: prefixes can be used.

- **WMO Search:** A menu button that opens the WMO Search dialog box. If you click this "cold," a warning dialog appears with a message that you must first enter the TTAAii and/or CCCC portion of the WMO header (in the boxes in the second row) to perform the search. Refer to [Section 5.1](#) for details.
- **Enter Editor:** Enables the Text Editor, which is described in [Section 5.2](#).
- **Accum:** A check button that enables or disables the capability to accumulate text by appending subsequent text product retrievals to the display window.
- **Update Obs:** A check button that enables/disables automatic display of the most recent observations, like METARs, in the display window.
- **Clear:** Clears the Text display window.
- **AFOS Cmd:** An entry line which is used to type in an AFOS PIL. When you hit the **Enter** key on your keyboard, the AFOS text product is displayed in the Text display window.
- **WMO TTAAii CCCC:** A two-part entry line that allows you to type in the WMO Data Type and Area Indicator (**TTAAii**) and/or the International Location Indicator (**CCCC**) portion of the text product ID that you want to display. If you enter only the **TTAAii** or the **CCCC**, and then press the **Enter** key, the WMO Search dialog box will open containing the appropriate lists of WMO products. Refer to [Section 5.1 Retrieving WMO and AFOS Text Products](#), for further details.
- **AWIPS ID:** You can type an AWIPS ID (**NNNXXXX**) in this entry line. When you hit Enter, the WMO

Search dialog box will open to allow you to select the specific version of the product you requested.

5.0 Getting Started Using AWIPS Textual User Interface

This chapter introduces you to the Text Workstation for working with text products. It includes practice modules for getting you familiar with the Text Workstation and the Textual User Interface (TUI).

This chapter includes the following sections:

- [Section 5.1: Retrieving WMO and AFOS Text Products](#)
- [Section 5.2: Editing Text Products](#)
- [Section 5.3: Working with Text Scripts](#)
- [Section 5.4: Working with Alarm/Alert Feature](#)
- [Section 5.5: Practice Modules \(Tutorials\) for AWIPS Textual User Interface](#)



5.1 Retrieving WMO and AFOS Text Products

From the Text display window, you can retrieve WMO and AFOS Text products using the WMO Browser for WMO products, or the AFOS Browser for AFOS products. The sections that follow describe how to use each browser when searching for a particular Text product.

With AWIPS II, we are transitioning from AFOS to AWIPS text product identifiers. The AWIPS Product Identifier is a two-line product identifier made up of the WMO ID on the first line and the AWIPS Identifier (AFOS NNNxxx) on the second line. The WMO Header and the AFOS Header, as shown in **Exhibit 5.1-1**, together make up the AWIPS Product Identifier.

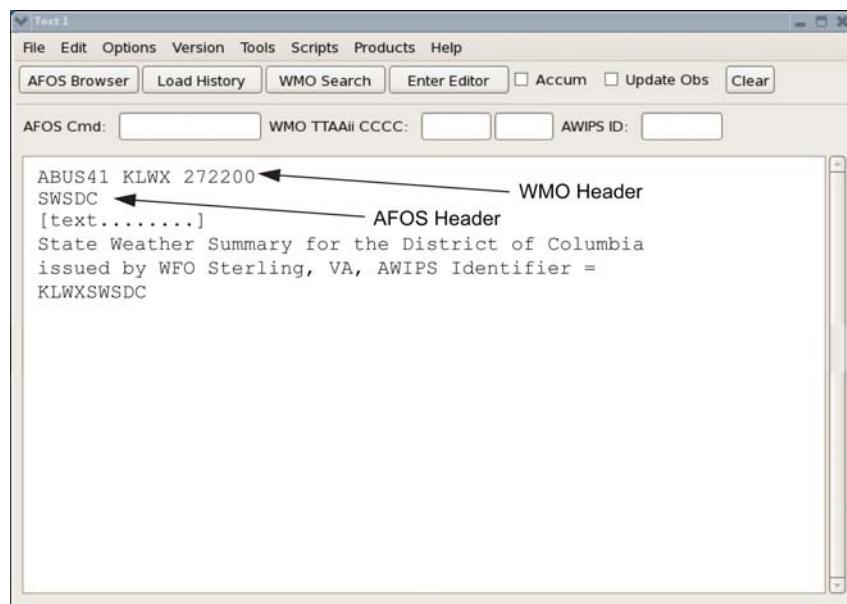


Exhibit 5.1-1. Text Product Headers

The WMO Search feature allows you to look for and load WMO text products into the Text Display window. It is designed differently than the AFOS Browser because WMO text products generally do not have unique IDs as do AFOS text products. To search for a WMO product, you must already know a portion of the ID, such as the **TTAAii** (Data Type and Area Designator) or the **CCCC** (International Location Indicator), and type it into the appropriate entry line of the Text window. Brief descriptions of the WMO IDs and the WMO Search dialog box follow. You can obtain complete information on the format of WMO Headers from the following websites:

<http://www.nws.noaa.gov/tg/head.html>

<http://www.nws.noaa.gov/tg/awips.html>

5.1.1 WMO Message Search

The entire WMO message, including the start and end lines, is often called the WMO "bulletin." The bulletin structure contains the WMO Abbreviated Heading Line, sometimes called the "product ID," or more often the "header," and the body, which is often called the "text" of the message.

- **The Product Header Line Components:** The AWIPS Product Identifier is composed of two lines: the WMO Abbreviated Heading Line in the first row, and the AWIPS Identifier (AI) Line in the second row.

WMO Abbreviated Heading Line: **T1T2A1A2ii CCCC YYGGgg (BBB) (cr) (cr) (lf)**
AWIPS ID: **NNNxxx (cr) (cr) (lf)**

Each component of the Abbreviated Heading Line is defined below.

- **T1T2:** Data type and/or form designators
 - **T1:** This is an alpha character that designates the general code form of the contents of the bulletin. Refer to WMO Manual 386 Table A in the following website for detailed information: <http://www.nws.noaa.gov/tg/table.html>
 - **T2:** This is another alpha character that designates the data type. Its definition depends on the T1 designator in Table A, and can be found in Tables B1 through B6 of the WMO Manual.
- **A1A2:** Geographical area and/or data type designators
 - **A1:** A1 is taken from WMO Manual 386 Tables C1 through C6 depending on the **T1** designator in Table A. It is an alpha character that defines the geographical area that the text of the bulletin covers.
 - **A2:** This alpha character designates the geographical area, or may define the forecast period. It is taken from WMO Manual Tables C1 through C5 depending on the **T1** in Table A.
- **ii:** These two numbers are used to differentiate between two or more bulletins that contain data in the same code, originate from the same geographical area, and have the same originating center. The set of "ii" numbers are used to indicate the bulletins for global, interregional, regional, and national distribution. The national distribution may have further definition as in the case of the U.S. National Weather Service.

Note 1: Refer to WMO Manual 386, paragraph 2.3.2.2, or to Table D1 or D2 depending on the **T1** designator in Table A.

- **CCCC:** This four-letter ID is the international location identification of the processing center that generated the bulletin. Once the bulletin has been originated or compiled, the **CCCC** must not be changed even if the bulletin in question has to be edited at another center.

The NWS also has some special **CCCC** practices which are used to further define products sources within the National Centers for Environmental Prediction (NCEP). Following International Civil Aviation Organization (ICAO) standards, the first character is "K" for the CONUS offices, followed by the three-letter FAA identifier. For offices outside the CONUS, the first two characters are **PA** for Alaska, **PH** for Hawaii, and **TJ** for Puerto Rico followed by an additional two characters. The national centers use a national practice form of the **K<CCC>** for **CCC**.

Note 2: The three-letter AFOS node identifier **CCC** is no longer valid in the AWIPS environment and will not appear in the AWIPS headings.

- **YYGGgg:** This is the International Date-Time Group, and is defined as follows:
 - **YY:** This pair of numbers identifies the day of the month (01, 04, 10, etc.).
 - **GGgg:** This is the Hour-Minute Group. For bulletins containing meteorological reports intended for standard observation times, the time is the standard UTC observation time. For aerodrome, route and area (aeronautical) forecasts, the full UTC hour (the last two digits are 00) preceding the transmission time is used. For other forecasts and analyses, use the standard UTC observation time on which the forecast or analysis is based. For other messages, use the UTC time of compilation to the nearest minute.
- **BBB:** This three-letter Indicator Group is used to define the type of message being transmitted, whether it is a correction, an amendment, a delayed transmission, or a normal transmission. Refer to [Section 4.5](#), Editing Text Products, for more information.
- **NNNxxx:** This is the AWIPS Identifier (AI) Line and is composed of from four to six characters of the AFOS PIL without the **CCC**.

Note 3: The one- to three-character **xxx** (product designator) is identical to the AFOS **xxx**. If the **xxx** is less than three characters, the character(s) are left justified and filled with blanks to fill the field. The field is expandable to accommodate five-character product designators that are typical for some sites.

5.1.2 WMO Browser Search

The WMO Browser (Search) dialog box, as shown in **Exhibit 5.1.2-1**, appears only after you have entered a portion of the WMO ID in the **WMO TTAAii CCCC:** field, and then selecting the WMO Search button on the window's toolbar.

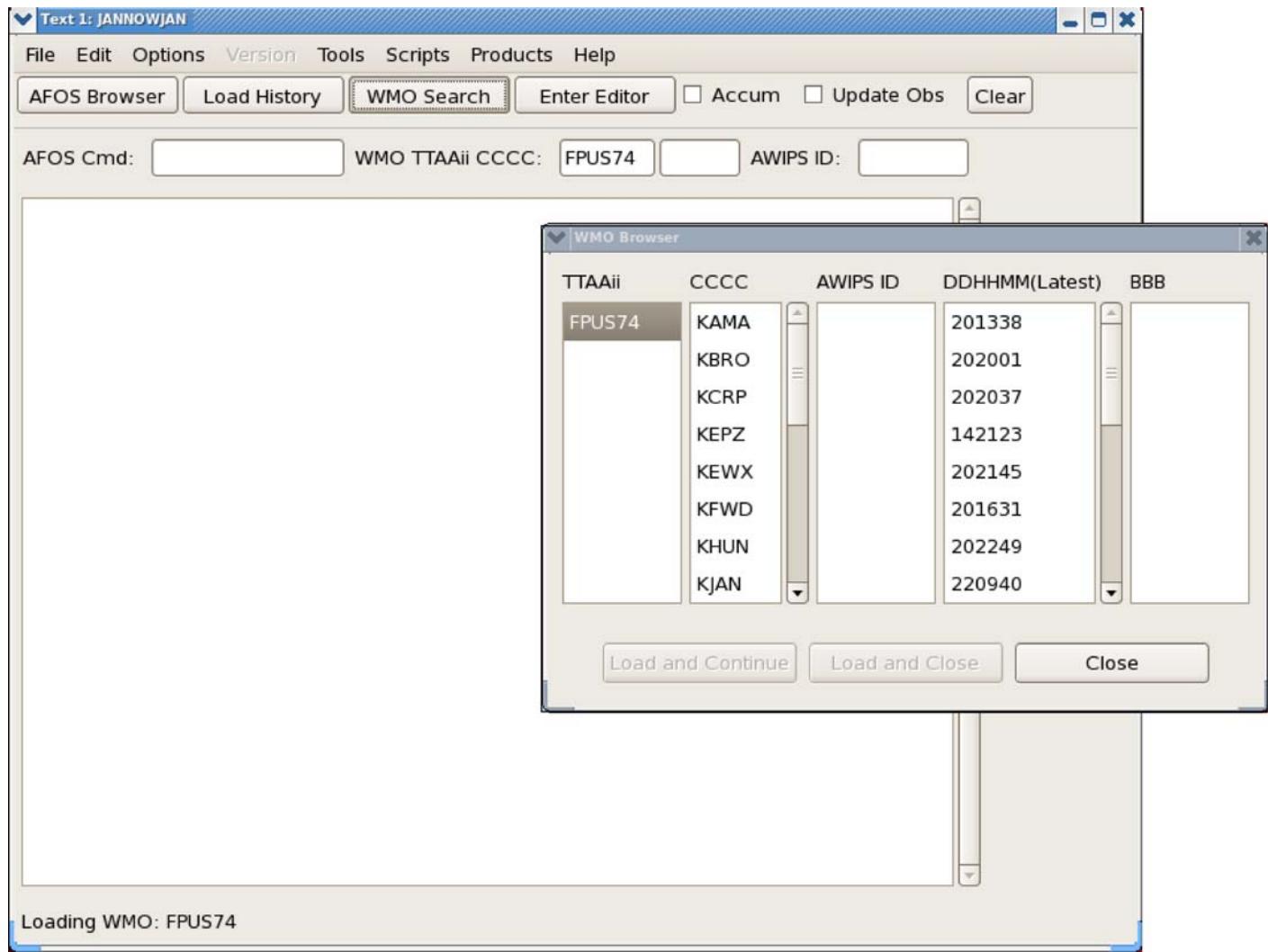


Exhibit 5.1.2-1. WMO Browser Dialog Box

The WMO Browser dialog box contains the following features:

- **TTAAii:** A listing of the WMO Data Type and Area Indicators whose contents vary depending on what is contained in the other lists within the dialog box.
- **CCCC:** A list of the International Location indicators. Its contents vary depending on what is contained in the other lists within the dialog box.
- **AWIPS ID:** A list containing the AWIPS ID that corresponds to the WMO **TTAAii** ID. If there is no corresponding AWIPS ID, then a dummy or blank ID appears in this column.
- **DDHHMM:** Contains an inventory of the issuance dates/times of the most recent versions of text

products. The **DD** signifies the date, **HH** the hour, and **MM** shows the minutes. If you search only for the **TTAAii** portion of the WMO ID, then the **DDHHMM** list contains the latest issuances of that product for every **CCCC** site.

- **BBB:** A column that indicates if a text product is an Amendment (**AAx**), a Correction (**CCx**), or Delayed (**RRx**).
 - **Load and Continue:** A menu button that displays the selected text product and leaves the WMO Search dialog box open.
 - **Load and Close:** Displays the selected text product and closes the WMO Search dialog box.
 - **Close:** Closes the WMO Search dialog box.
-

5.1.3 AFOS Text Product Browser

The AFOS Text Product Browser, as shown in **Exhibit 5.1.3-1**, is opened from the AFOS Browser toolbar button.

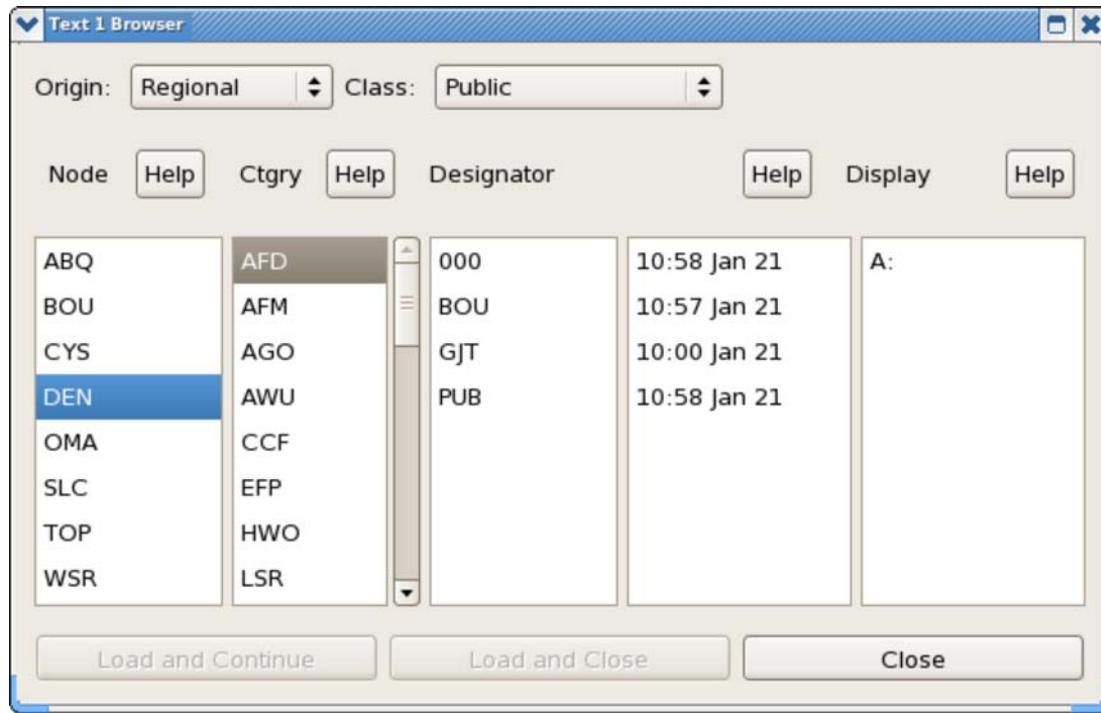


Exhibit 5.1.3-1. Text Browser Dialog Box

The AFOS Browser allows you to look through and choose text products by AFOS ID to be displayed in a text window. To make the selection faster and easier, products have been broken down into three parts: Node, Ctgry (Category), and Designator, as illustrated in **Exhibit 5.0.3-1**. This mimics the nine-character AFOS Identifier, CCCNNNXXX. Each component of the Text Browser dialog box is described below.

- **Origin:** An options menu that allows you to select the geographical area (Regional, East, Central, or West) of the United States or International locations whose text products you want to display.
- **Class:** An options menu with a list of the types of text product you wish to retrieve (e.g., Public, Aviation, or Hydrological).
- **Node Menu (CCC):** A central forecast office, listed by its AFOS Node ID, where text products are collected and stored. Also included at the bottom of this list are the identifiers for all radar alphanumeric products.
- **Category Menu (NNN):** The name of the text product.
- **Designator Menu (XXX):** Provides the site or area for which the text product applies. Valid times are also provided to the right of each designator.

Note: For CCC, NNN, and XXX, you can press mouse Button 3 over an item to see full identification, or click on the Help button to get information on each of the items in the associated list.

- **Display:** Shows prefixes used to select special groupings of text products. ALL: returns all versions of a specific product from the database; A: retrieves all instances of a particular product type (e.g., LAXMTR) from the current hour.
 - **Load and Continue:** Displays the selected text product and keeps the AFOS Browser open for further browsing.
 - **Load and Close:** Displays the selected text product and then closes the AFOS Browser.
 - **Close:** Closes the AFOS Browser.
-

5.2 Editing Text Products

Editing requirements for CAVE are accommodated by the use of an online Text Editor. You can perform simple editing by selecting the Enter Editor button on the Text display window Toolbar to open the AWIPS Header Block GUI, as shown in **Exhibit 5.2-1**.

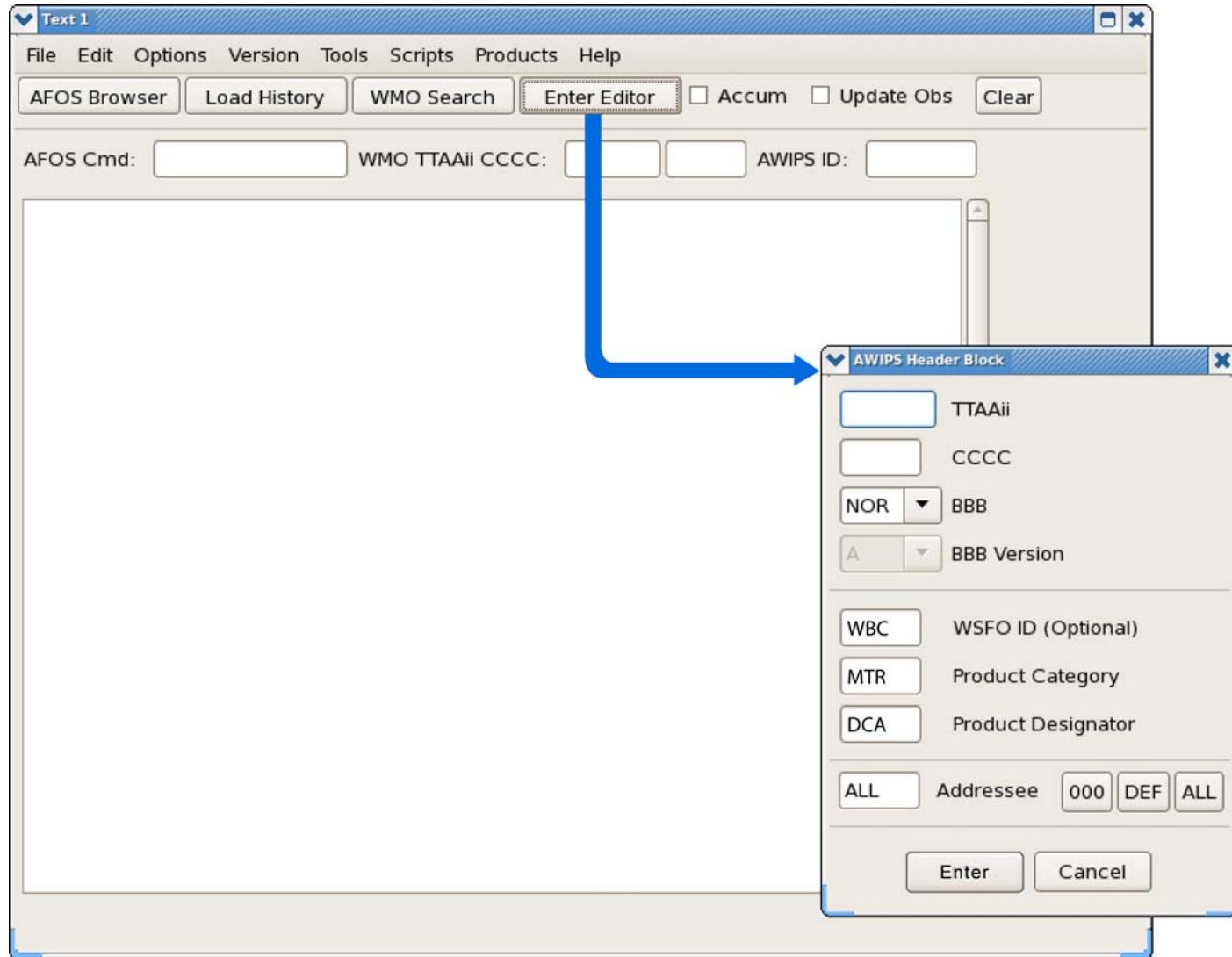


Exhibit 5.2-1. Enter Editor Toolbar Button to Open AWIPS Header Block

The AWIPS Header Block GUI shown in **Exhibit 4.5-1** above, contains a 9-character ID example of WBCMTRDCA, which is the PIL for the DCA METAR observation.

Note: The addressing of the text message can be accomplished either by filling in the top half of the AWIPS Header Block GUI (TTAAii, CCCC, BBB, BBB Version), or by filling in the bottom half, as done in **Exhibit 4.5-1**. Which method to use is user-preference, based on which set of information is more readily available to the user.

After you complete the AWIPS Header Block, clicking **Enter** closes the AWIPS Header Block GUI and places the Text display window in the Editing Mode (Now Editing), as shown in **Exhibit 5.2-2**.

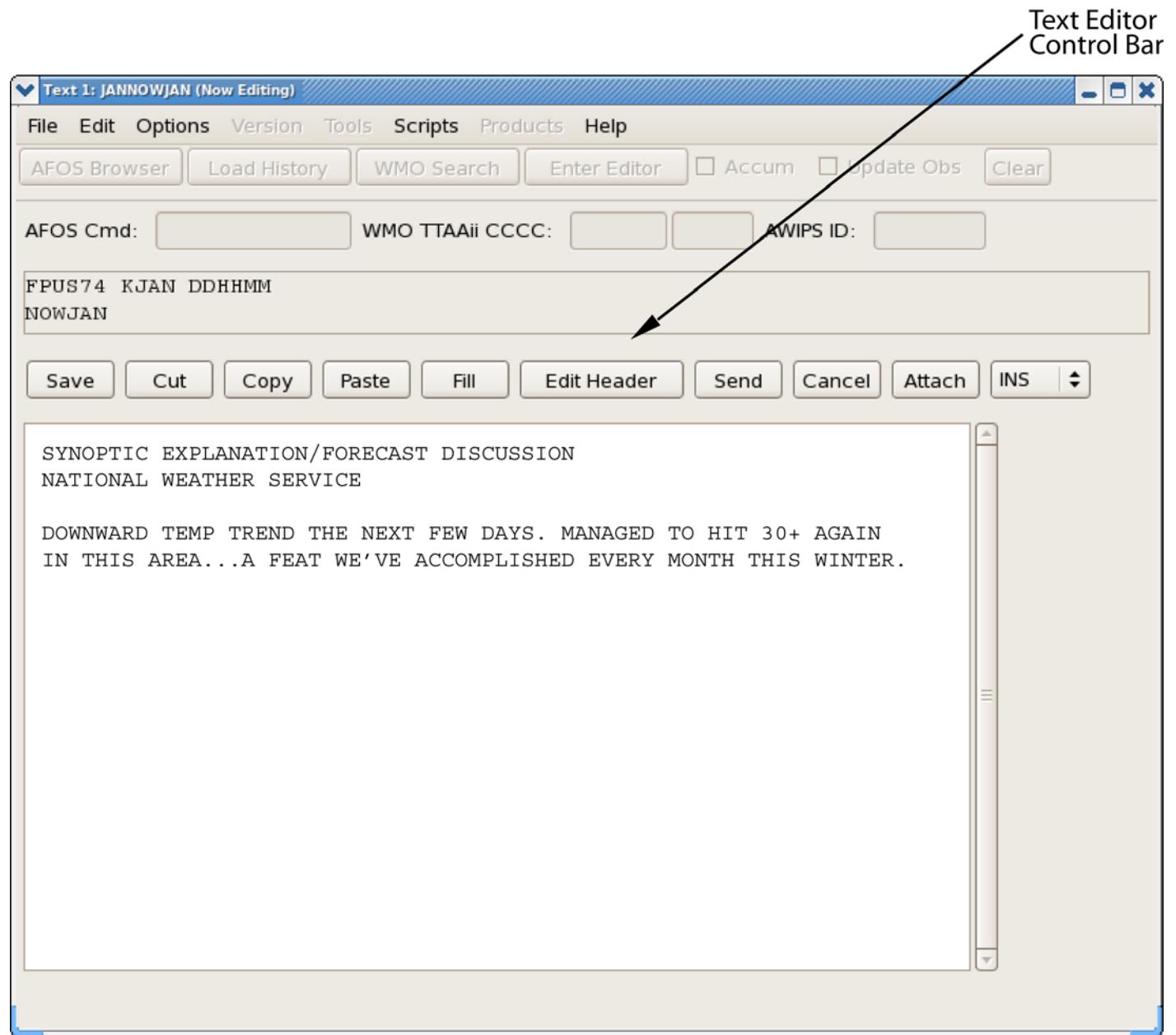


Exhibit 5.2-2. Text Display Window in Editing Mode

Once in the Text Editor, several buttons on the CAVE Menu Bar appear in subdued text, while new editing commands are activated in the File, Edit, and Options menus. In addition, a Toolbar containing editing functions appears.

Notes:

1. The header lines can only be edited using the Edit Header button on the Text Editor Control Bar.
2. Keyboard focus determines which Text window or which component (menu, entry box, etc.) of a Text window receives the keyboard input. Only one window has focus at a time. Your account is probably set with "Focus Follows Mouse", which means that a window gets keyboard focus when

you move the pointer into it. Notice that the Title Bar of the window with the focus is colored blue. (Dialog boxes automatically receive focus when they appear.)

3. Refer to Tables 5.2.2-1 through 5.2.2-4 in [Section 5.2.2](#) for keyboard shortcuts.
-

5.2.1 Toolbar Editing Commands

Once in the Text Editor, a second toolbar containing editing functions appears, as shown in **Exhibit 5.2.1-1**.



Exhibit 5.2.1-1. Toolbar Editing Commands

Descriptions of the editing functions follow.

Save

This menu button stores the product that you are currently editing in the text database, but continues the edit session. The product is not transmitted outside your local site.

Cut

This menu button deletes a text selection. You can also cut text by pressing and holding mouse Button 3 in the Editing window. This brings up a pop-up menu containing the Cut option.

Copy

This menu button reproduces a text selection. You can also copy text by pressing and holding mouse Button 3 in the Editing window. This brings up a pop-up menu containing the Copy option.

Paste

This menu button places copied text at the cursor location. You can also Paste text by pressing and holding mouse Button 3 in the Editing window. This brings up a pop-up menu containing the Paste option.

Fill

This menu button removes hard carriage returns from selected text.

Edit Header

This menu button opens the [AWIPS Header Block dialog box](#), which contains text product header information.

The AWIPS Header Block accommodates both WMO (upper section of the AWIPS Header Block) and AFOS IDs (lower section of the AWIPS Header Block). The fields are defined below as they apply to WMO and AFOS IDs:

- **TTAAii:** This field contains the WMO Data Type and Area Indicators.

- **CCCC:** This field contains the International Location Indicator.
- **BBB:** The three-character "BBB" defines the type of message or the Indicator Group. Most messages will be sent with this field set to "NOR" (normal), which is the default. Other Indicator Groups include Delayed, Correction, Amendment, and are described below:
 - **RRx:** This is the Delayed Indicator Group which is used to transmit a collection of one or more weather reports that are normally contained in the initial bulletin, but which were received after the initial bulletin has been transmitted.
 - **CCx:** This is the Correction Indicator Group which is used to transmit a bulletin containing corrections to a previously transmitted bulletin.
 - **AAx:** This is the Amendment Indicator Group which is used to transmit a bulletin containing amendments to processed information that had been transmitted in an earlier bulletin.

Note: The 'x' version is set with the BBB Version button, which is enabled if RRx, CCx, or AAx is selected. For more information on the Indicator Group "BBB," refer to <http://www.nws.noaa.gov/tg/bbb.html>

- **WSFO ID (optional):** This field contains the AFOS site ID of the main node of the State Distribution Circuit (SDC) to which the office originating the message belongs. This field is automatically filled in with the SDC node of your local site.
- **Product Category:** Products are identified by a three-character AFOS PIL (e.g., TOR for tornado). A list of categories can be viewed from the AFOS Browser Help menu by clicking on the help button adjacent to the category selector.
- **Product Designator:** This field contains the AFOS ID of the site the message applies to, or a regional ID for messages that apply to a larger region (such as UT for Utah). Usually this field is set to your local site, but occasionally a site issues a message for another site.

For example, Denver (DEN) can issue a message that applies to Colorado Springs (COS), in which case the product designator is COS. A list of AFOS IDs can be viewed from the AFOS Browser Help menu by clicking on the help button adjacent to the node selector.

- **Addressee:** This field defines the site(s) to which you want a text product or message sent. In this field you have a choice of three buttons: **000**, **DEF**, and **ALL**. If you want the product to be stored in the text database, but don't want it to be distributed, press the **000** button. Use the **DEF** address to send products to a predefined group of sites (which usually includes neighboring sites). Refer to the AWIPS System Manager's Manual for information on setting up your local "DEF." Use the **ALL** address to send products to all sites.
- **Enter:** This button saves the AWIPS Header Block information, closes the AWIPS Header Block dialog box, and places the Text display window in Edit Mode.
- **Cancel:** This button closes the AWIPS Header Block dialog box without saving anything .

Send

This menu button ends the editing process, stores the text product in the text database, and sends it to the

communications processor for transmission.

Cancel

This menu button ends the editing session without saving any changes.

Attach

This menu button, activated when you are editing an administrative text message, opens a dialog box in which you can enter a file path name of an attachment to add to your message. Refer to [Section 5.3](#) for further information.

INS/OVR (Insert/Overstrike)

This pull-down menu that contains the Insert Mode and the Overstrike Mode radio buttons. The choice you make appears as either "INS" or "OVR" to identify the current editing mode you are using. You can also use the "Insert" keyboard shortcut to toggle between the two modes.

5.2.2 Keyboard Shortcuts

Tables 5.2.2-1 through 5.2.2-4 contain keyboard shortcuts used with the Text Display Editor.

Table 5.2.2-1. Keyboard Shortcuts - Select Functions

Key Combination	Select Functions
Shift + Home	extend selection to beginning of line
Ctrl + Shift + Home	extend selection to top of document
Shift + End	extend selection to end of line
Ctrl + Shift + End	extend selection to bottom of document
Shift + Page Up	extend selection up one screen
Shift + Page Down	extend selection down one screen
Shift + Left Arrow	extend selection to previous character
Ctrl + Shift + Left Arrow	extend selection to beginning of previous word
Shift + Right Arrow	extend selection to next character
Ctrl + Shift + Right Arrow	extend selection to beginning of next word
Shift + Up Arrow	extend selection to previous line
Shift + Down Arrow	extend selection to next line

Table 5.2.2-2. Keyboard Shortcuts - Delete Functions

Key Combination	Delete Functions
Backspace	delete left character or selection
Shift + Backspace	delete left character or selection
Ctrl + Backspace	delete word
Delete	delete right character or selection
Ctrl + Delete	delete to end of line
F6	delete right character
Shift + F6	undelete character
F7	delete word
Shift + F7	undelete word
F8	delete to end of line
Shift + F8	undelete line

Table 5.2.2-3. **Keyboard Shortcuts - Edit and Application Functions**

Key Combination	Edit and Application Functions
Esc	move back up one menu level
Ctrl + F1	start spell + checker
F2	invoke search (and replace)
Alt + F4	close text window (no saving)
F5	print contents of window
F10	bring up first submenu of the main menu
Ctrl + C	copy
Ctrl + P	print contents of window
Ctrl + V	paste
Ctrl + X	cut
Insert	toggle between insert and overstrike mode
Shift + Insert	paste
Ctrl + Insert	copy
Shift + Delete	cut

Table 5.2.2-4. **Keyboard Shortcuts - Cursor Movement and Position**

Key Combination	Cursor Movement and Position
Home	position to beginning of line
Ctrl + Home	position to top of document
End	position to end of line
Ctrl + End	position to bottom of document
Page Up	position up one screen
Page Down	position down one screen
Left Arrow ()	move to previous character
Ctrl + Left Arrow ()	position to beginning of previous word
Right Arrow ()	move to next character
Ctrl + Right Arrow ()	position to beginning of next word
Up Arrow ()	move to previous line
Down Arrow ()	move to next line

5.3 Working with Text Scripts

Text Scripts are macro-like programs that allow you to create and save text products that can be recalled at any time. The simple script commands (such as Load, Clear, Wait, and Accumulate) are used to control how the textual information appears in the Text window.

5.3.1 Text Script Menus

Text Script Menu

The Text Scripts pull-down menu, as shown in **Exhibit 5.3.1-1** is only accessible from the Text Workstation (XT).

Note 1: Scripts are not available for the Text display window opened from a CAVE session.

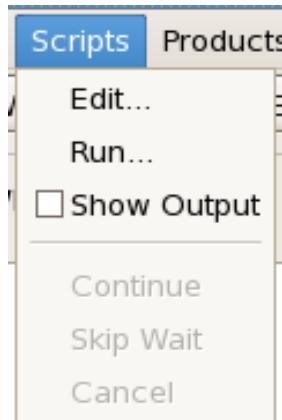


Exhibit 5.3.1-1. Text Scripts Pull-down Menu

The Scripts pull-down menu includes the following functions:

- **Edit...:** A Scripts menu option that opens a Text Script Editor window, as shown in **Exhibit 5.3.1-2**.

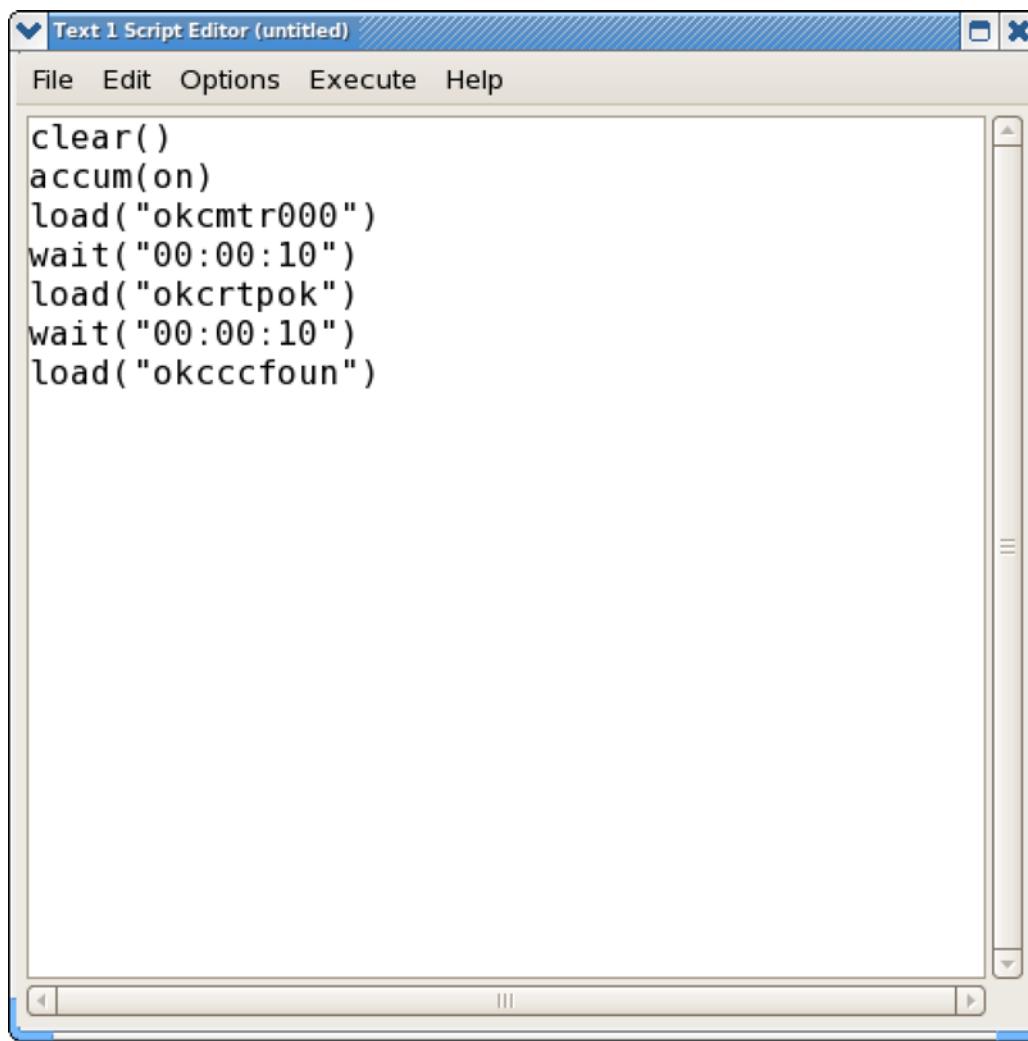


Exhibit 5.3.1-2. Text Script Editor Window with Sample Script

The Text Script Editor window includes a Menu Bar with the following pull-down menus.

- **File:**

A pull-down menu that contains commands for viewing, saving, and printing text scripts.

- **New (Ctrl+T):** Opens a new script.
- **Open (Ctrl+O):** Opens the Open Script File dialog box.

Note 2: You can open an existing script by double-clicking on the Script File Name or selecting the Script File Name and pressing **OK**.

- **Save (Ctrl+S):** A menu option that saves the current script.
- **Save As (F3):** A menu button that opens the Save Script As dialog box, which allows you to save a script under a different name.

Note 3: The Filename field on the Save Script As dialog box contains a period (.) at the end of the path listing. You should type over the period when you provide a filename. Scripts are saved as UNIX files, and a period as the first character results in a hidden file.

- **Rename:** Used to select a script to rename. Another dialog comes up in which you enter the new name.
 - **Delete:** A menu button that opens the Delete Script dialog box and enables you to delete a script.
 - **Print (Ctrl+P):** A menu button that makes a hard copy of a script.
 - **Close (Alt+F4):** A menu button that closes the Script Editor dialog box.
- **Edit:** A pull-down menu that contains standard editing options, which are nearly the same as the Text display window in the Editing Mode. The keyboard shortcut options, as shown in [Section 5.1.2](#), also apply here.
 - **Options:** A pull-down menu with options that are also the same as the Text display window in the Editing Mode.
 - **Execute:** A pull-down menu that contains the controls that operate the scripts.
 - **Help:** A pull-down menu that contains the basic and advanced script commands, as shown in **Exhibit 5.3.1-3**. Highlight the desired command type. Each Basic Script Command is briefly defined in **Table 5.3.1-1**.

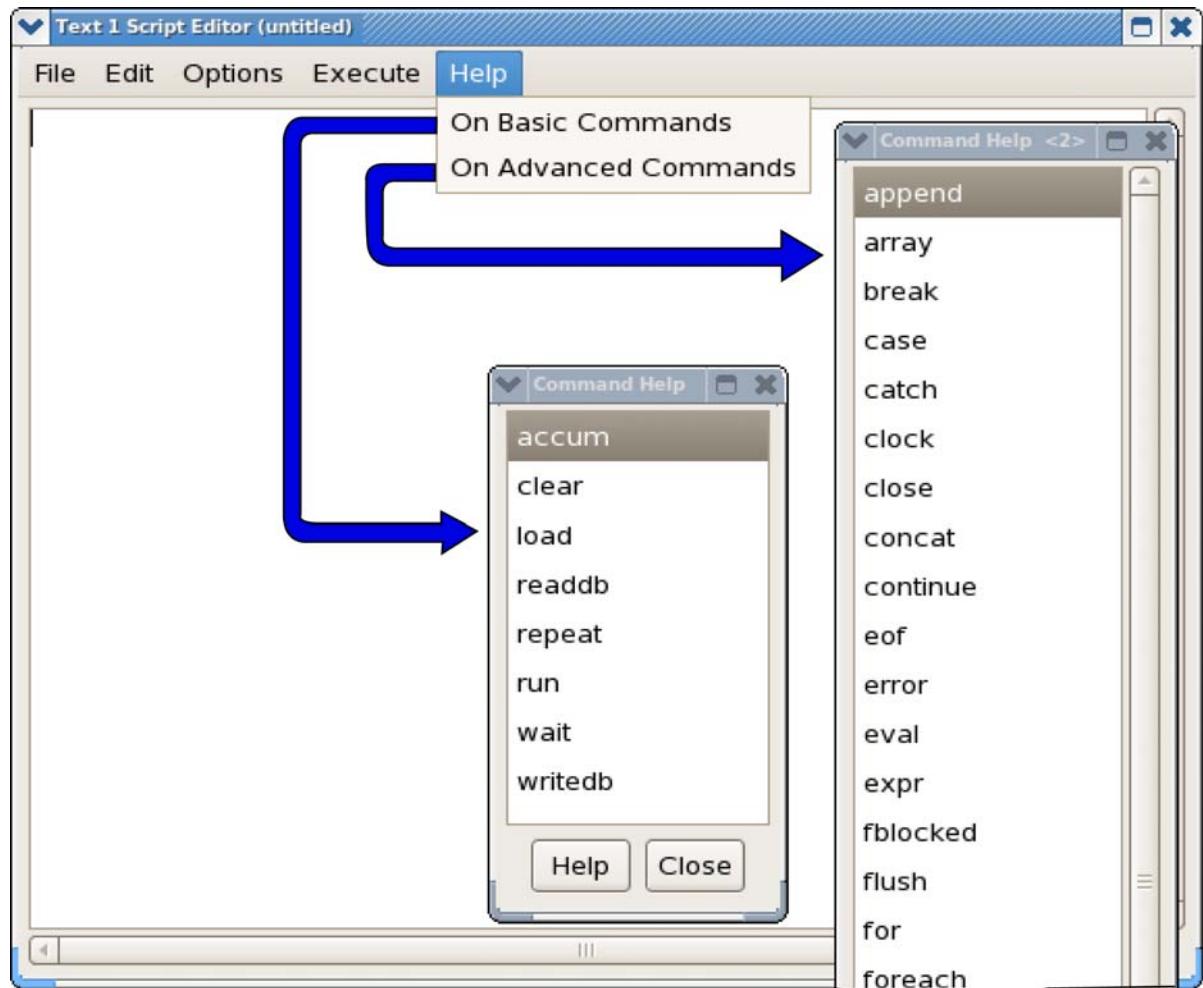


Exhibit 5.3.1-3. Basic and Advanced Script Commands from Help Menu

Table 5.3.1-1. Basic Script Command Definitions

Script Command	Definition
accum	Turns accumulate off or on when used with 0 or 1, respectively.
clear	Clears the Text Workstation Window.
load <product ID>	Loads the specified product into the Text Workstation Window.
repeat <count> <loop body>	Repeats the commands specified within the loop body the specified "count" number of times.
run <file name>	Run a specified file (e.g. a script).
wait	Wait for the user to hit the "Continue" button or menu item.
wait <HH:MM:SS>	Wait the specified number of hours, minutes, and seconds before continuing.
wait until <minutes>	Wait until the specified number of minutes after the hour before continuing (e.g. "wait until 5" will wait five minutes after the current hour, and if already passed, the next hour).

Note 4: The advanced script commands are used when setting up macros and other office programs and are intended for users with programming skills and an understanding of UNIX. For additional help with each command, click the Help button in the lower left corner of Command Help list. This opens Mozilla to a Universal Resource Locator (URL) that displays help pages with fundamental information and examples of how to use this command. Each command has its own Web page.

- **Run...:** A Scripts menu option that starts a Text Script, which runs in the Text display window. As a script runs, status messages are given at the bottom of the Text display window, as shown in **Exhibit 5.3.1-4**.

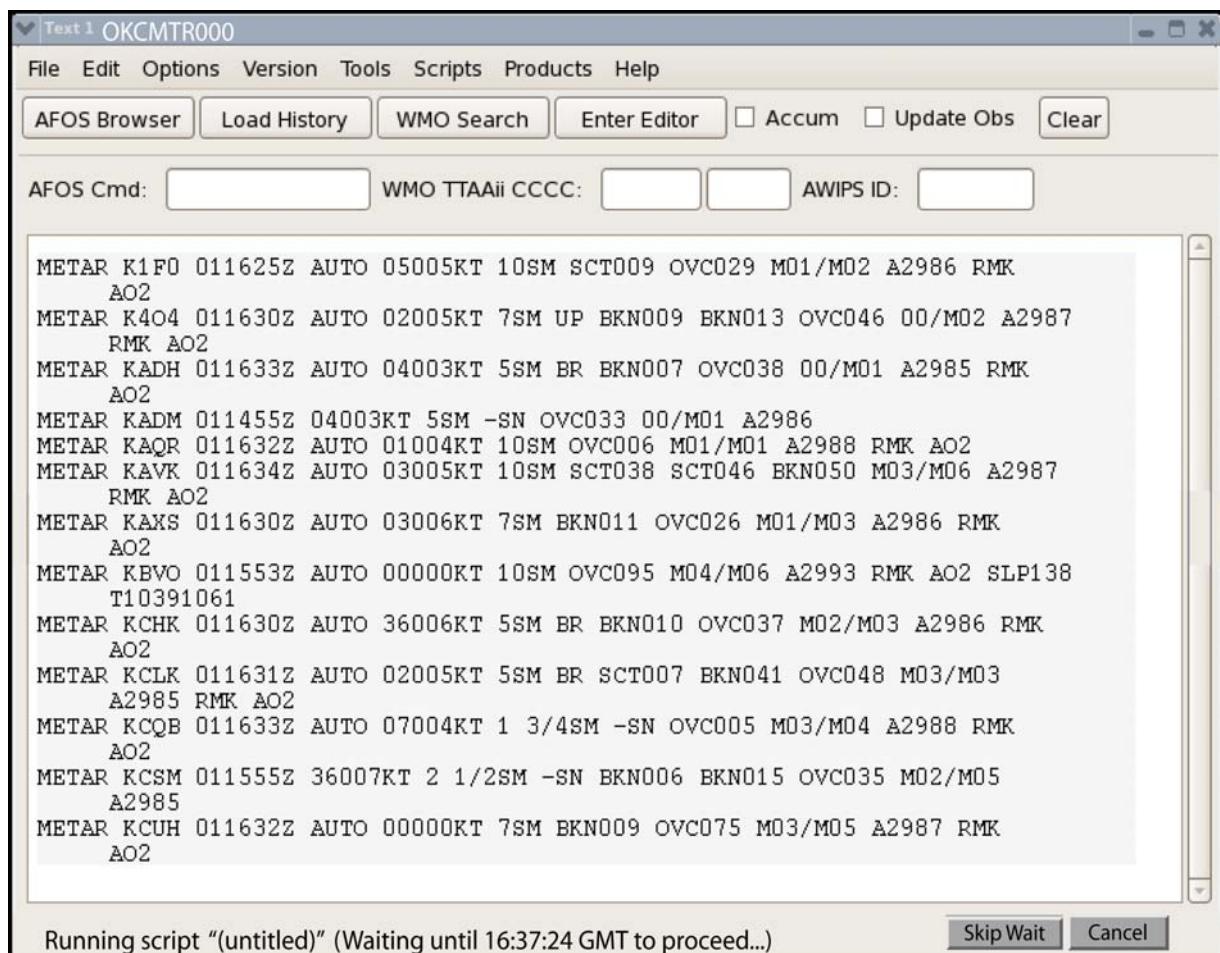


Exhibit 5.3.1-4. Running Script and Status Message in Text Display Window

- **Show Output:** A Scripts menu option checkbox, which when checked opens the Script Output dialog box to let you know if the script is running correctly.
- **Continue:** A Scripts menu option that resumes the running of a paused script.
- **Skip Wait:** A Scripts menu option that lets you ignore a "Wait" command in a script. When a script is running, a Skip Wait menu button is available at the bottom of the Text Display window, as shown in **Exhibit 5.3.1-4**.
- **Cancel:** A Scripts option that interrupts a script that is running. When a script is running, a Cancel menu button is available at the bottom of the Text Display window, as shown in **Exhibit 5.3.1-4**.

5.4 Working with Alarm/Alert Feature

The Alarm/Alert feature is initiated from the Text Workstation dialog box and allows you to set up and receive Alarm/Alert messages. You may also select text products for which you want to be "alarmed" or "alerted." You can specify a list of text products that are fetched from the database. A visible and/or audible alarm alerts you when new versions have arrived. When new alarmed products are received, an observable Flashing Bell within a dialog box appears.

Note 1: The Alarm/Alert feature is workstation specific.

Current Alarm Queue

When you click on Alarm/Alert in the Text Workstation dialog box, the Current Alarm Queue dialog box opens, as shown in **Exhibit 5.4-1**. The Current Alarm Queue is a dialog box that gives information about the products that are displayed in the Current Alarm Queue.

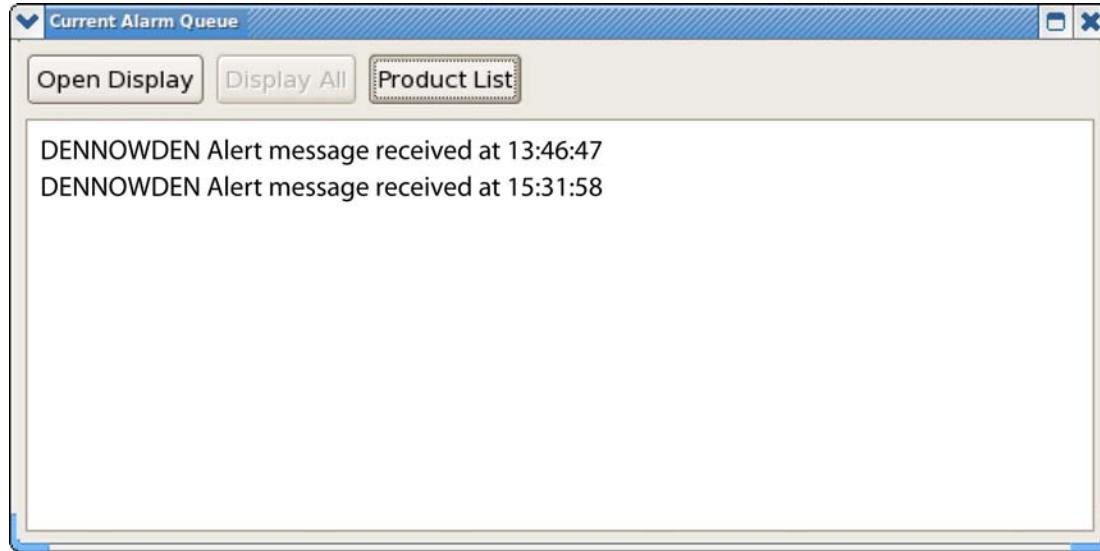


Exhibit 5.4-1. Current Alarm Queue

Three options are accessible from this dialog box.

- **Open Display:** A menu button that opens the Alarm Display Window. The Alarm Display Window displays the alarmed or alerted text products.

The Alarm Display Window has the following capabilities.

- **Print Window:** Makes a hard copy of the alarmed or alerted text products displayed in the window.
- **Print Entire Buffer:** Makes a hard copy of all of the alarmed or alerted text products displayed in the buffer.

- **Clear:** Clears the Alarm Display Window.
- **Accumulate:** Allows you to append incoming alarmed text products in the window.
- **Display All:** A menu button that opens the Alarm Display Window and displays all of the alarmed or alerted text products.
- **Product List:** A menu button that opens the Alarm/Alert Products dialog box, as shown in **Exhibit 5.4-2.**

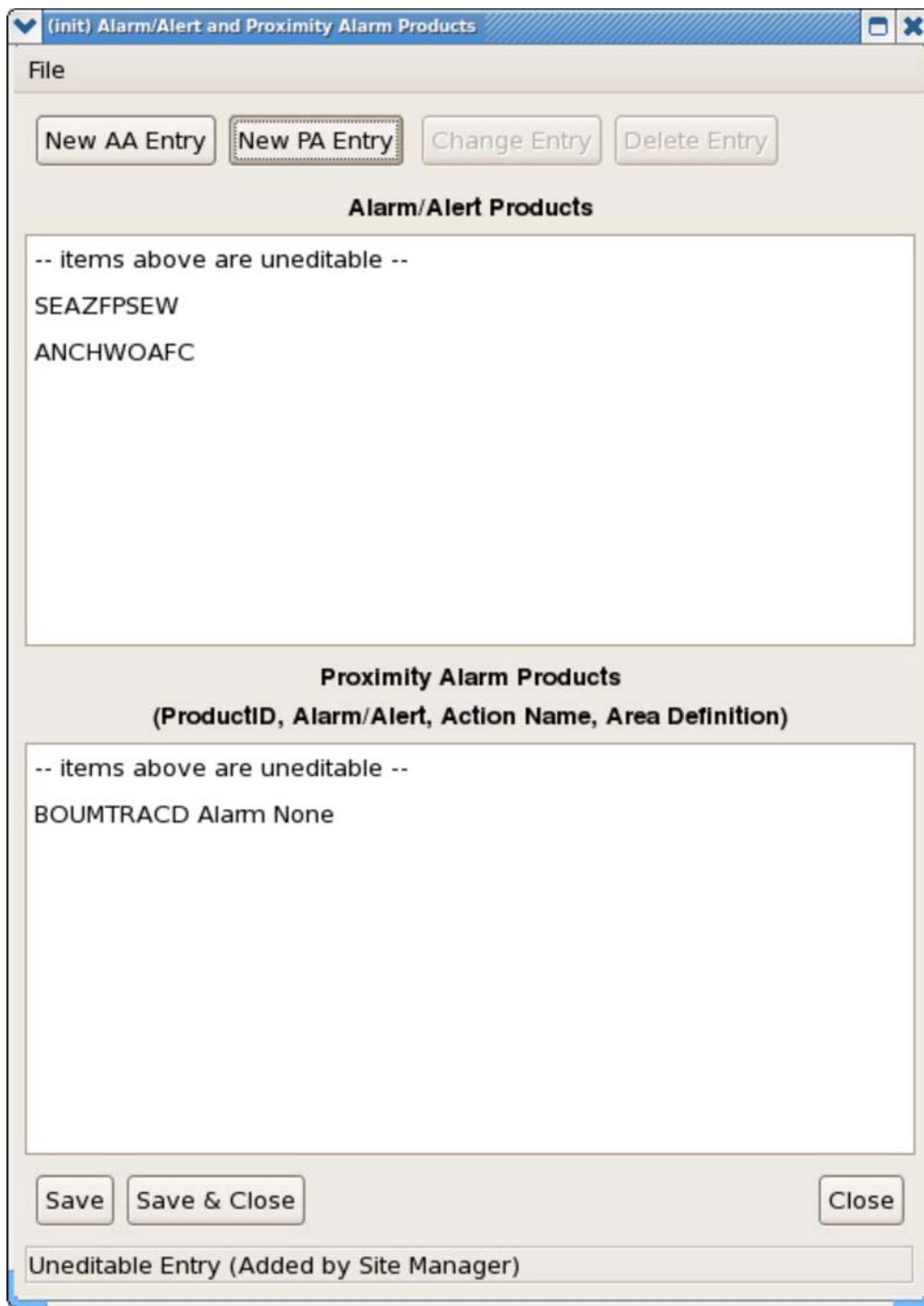


Exhibit 5.4-2. Alarm/Alert Products Dialog Box

Products with the word "Alarm" in parentheses send an audible signal. The Alarm/Alert Products dialog box has the following capabilities:

- **File:** A pull-down menu that includes options **Save**, **Save & Close**, **Close**, **Save as...**, and **Load...**. The first three options are discussed at the end of this section. The latter two allow you to save and recall alarm settings that you might wish to apply at different times of the year or to support different programs (e.g., public or aviation).
- **New AA Entry:** A menu button that opens the New Alarm/Alert Product dialog box, as shown in **Exhibit 5.4-3**.

Note 2: The Alarm/Alert feature does not allow you to set up alarms or alerts for text products by WMO ID. You must still use the AFOS PIL.



Exhibit 5.4-3. New Alarm/Alert Product Dialog Box

The New Alarm/Alert Product dialog box has the following capabilities:

- **Product ID:** An entry box for a text product, identified by its AFOS PIL, that you want to add to the Alarm/Alert Product List.
 - **Alarm:** A toggle button that allows you to set an audible alarm for a product. If you do not set this, the product is alerted but does not have an audible alarm. Products with the Alarm toggle set will be listed in the Alarm/Alert Products list annotated with **(Alarm)**.
 - **Optional Search String:** A string that must be present in the product text in order to trigger the alert. For example, you might be interested in a NOW product that mentions fog.
 - **OK:** Closes the New Alarm/Alert Product dialog box and adds the new Alarm/Alert product to the Product List.
 - **Cancel:** Closes the New Alarm/Alert Product dialog box without making changes to the list of alarmed products.
- **New PA Entry:** A menu button that opens the New Proximity Alarm Product dialog box, as shown in **Exhibit 5.4-4**.

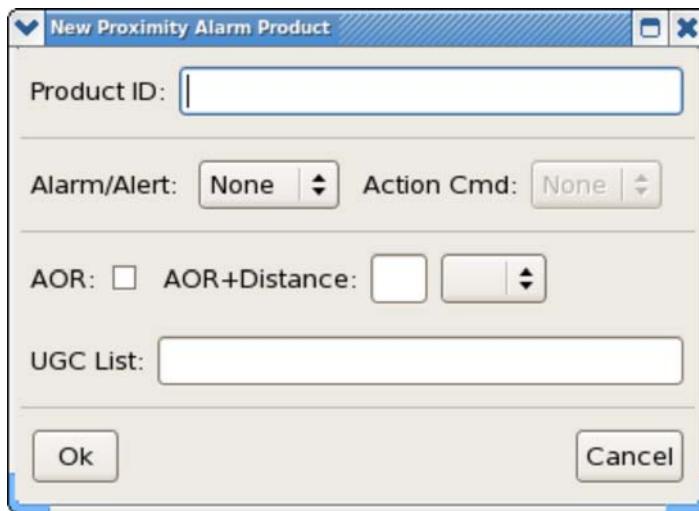


Exhibit 5.4-4. New Proximity Alarm Product Dialog Box

The New Proximity Alarm Product dialog box has the following capabilities:

- **Product ID:** An entry box for a text product, identified by its AFOS PIL, that you want to add to the Proximity Alarm Products List. This feature allows you to be notified when a specified product affecting a selected area is received.
- **Alarm/Alert:** An option menu that allows you to set an audible alarm for a product. If you select Alert, the product is alerted, but does not have an audible alarm.
- **Action Cmd:** This feature is not yet implemented.
- **AOR:** A check box to set notification for a product that affects your Area of Responsibility (for a WFO, the CWA).
- **AOR+Distance:** Allows you to specify a distance in miles or kilometers beyond the AOR where you wish to be notified.
- **UGC List:** List UGCs of interest here for notification of the specified product.
- **OK:** Saves the item to the Proximity Alarm list and closes the dialog box.
- **Cancel:** Closes the dialog box without making changes to the product list.
- **Change Entry:** If you have clicked on a product in the AA or PA list, this button opens a dialog box in which you can modify the product's alarm/alert settings.
- **Delete Entry:** A menu button that deletes a highlighted product from the AA or PA list.
- **Save:** A menu button that saves changes but leaves the Alarm/Alert and Proximity Alarm Products dialog box open for additional work.
- **Save & Close:** A menu button that saves changes and closes the Alarm/Alert and Proximity Alarm Products Dialog Box.

- **Close:** A menu button that closes the Alarm/Alert Products dialog box without making changes to the list of alarmed products. If you have made changes but have not saved them, you will be asked to confirm.
-

5.5 Practice Modules (*Tutorials*) for AWIPS Textual User Interface

This section gets you started (hands-on) with working on the Graphics Workstation and the Graphical User Interface of the CAVE environment.

This section includes the following practice modules:

- [Section 5.5.1: Starting and Exiting the Text Workstation](#)
- [Section 5.5.2: Browsing and Displaying Text Products](#)
- [Section 5.5.3: Requesting a Product from a Remote Site \(Request Reply\)](#)
- [Section 5.5.4: Editing Text Products](#)
- [Section 5.5.5: Working with Text Scripts](#)

5.5.1 Practice Module: Starting and Exiting the Text Workstation

Module 16: Start-Up of the Text Display

This module starts you off in your use of the Text display (the single minitor attached to the XT CPU).

Objective 16.1 - Start the Text Display

1. In the Account Box of the Login Window, enter your username.
2. In the Password Box, type your password.

Notes:

1. Your account may be configured to start the Text Workstation (XT) when you log in. If not, click mouse Button 1 over the root (colored background) and select **Start CAVE (lx) / TextWS (xt)** from the menu, as shown [HERE](#).
2. The Text display may also be started from the Graphic Workstation (LX) by selecting **CAVE ▶ New ▶ Text Workstation**, as shown [HERE](#).

3. If starting from the Text Workstation (XT), after the Text Workstation software completes its start-up, three windows are displayed, as shown in **Exhibit 5.5.1-1**.
 - A Text Workstation dialog box
 - A Text 1 display window
 - A Monitoring Controller dialog box

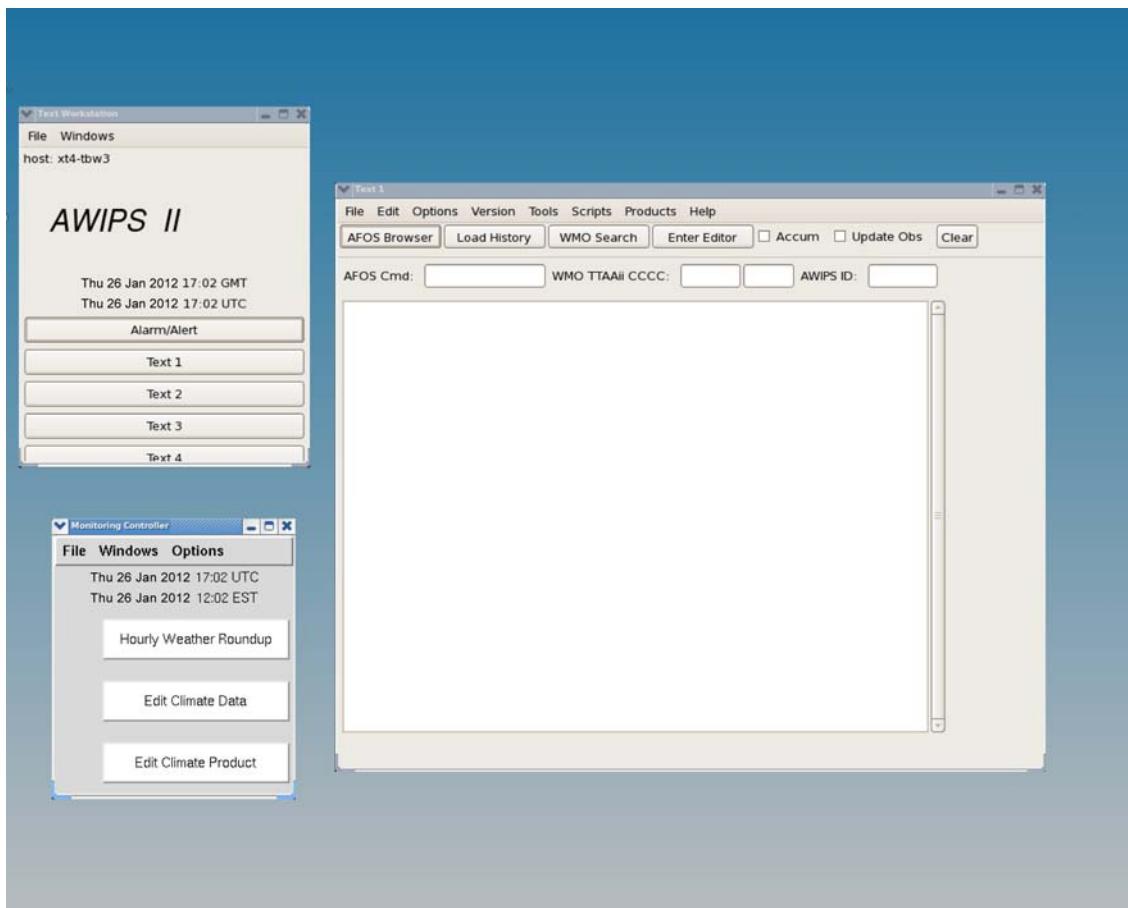


Exhibit 5.5.1-1. Text Windows that Appear Immediately Following Start-up - XT Workstation

4. If starting from CAVE on the Graphic Workstation (LX), after the workstation software completes its start-up, only two windows are displayed, as shown in **Exhibit 5.5.1-2**.

- A Text Workstation dialog box
- A Text 1 display window

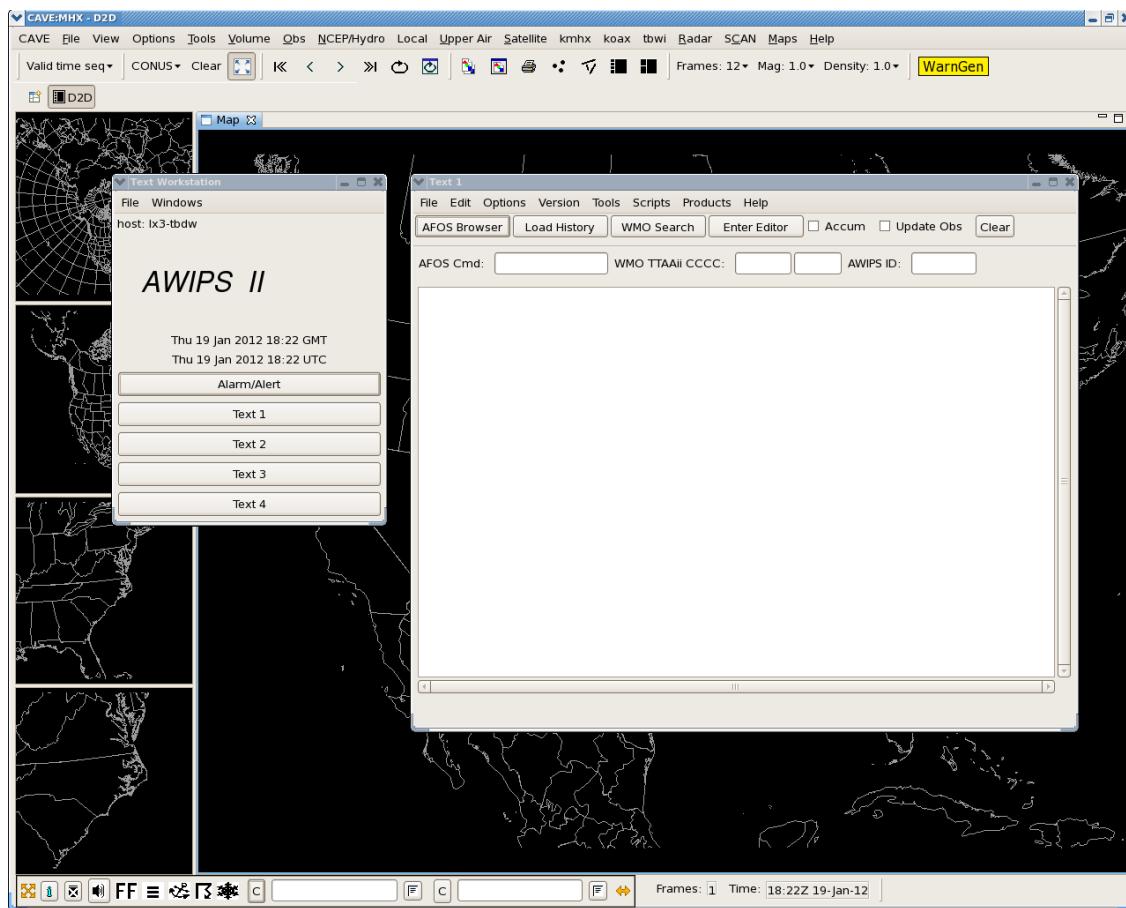


Exhibit 5.5.1-2. Text Windows that Appear Immediately Following Start-up - LX Workstation

Objective 16.2 - Exit the Text Display

1. Open the **File** pull-down menu from the **Text Workstation** dialog box and select **Exit**.
2. In the **Confirmation** dialog box, answer **Yes**. The Text Workstation dialog box and the Text display window clear from the screen.

5.5.2 Browsing and Displaying Text Products

Module 17: Browse and Display Text Product

This module provides practice on browsing and displaying text products in a Text display window.

Objective 17.1 - Browse to Locate and Display a Text Product

1. In the Text window, on the **Toolbar**, click **AFOS Browser**.
2. In the AFOS Browser window, from the **Origin** list, select **West**.
3. From the **Class** list, select **Public**.
4. In the Node, Ctgy, and Designator columns, do the following:
 - a. In the Node column, select **GTF (Great Falls, Montana)**.
 - b. In the Ctgy column, select **NOW**.
 - c. In the Designator column, select **GGW**.
5. Select the **Load and Continue** button and observe the Nowcast for Glasgow, Montana (**GTFNOWGGW**) as it is displayed in the Text window.
6. In the Text window, on the **Toolbar**, click the **Clear** button.
7. Now use the **AFOS Browser** to display other text products.

Note: The Text Display Product Browser menus respond to and change the selections you make. For example, when you choose a Node, the Category menu lists only the categories available under that Node.

Objective 17.2 - Display a Text Product Using the AFOS Command

1. Clear the Text window that you used in Objective 17.1.
2. In the **AFOS Cmd** entry box, type **ALL:BOSMTRBOS** and hit Enter on the keyboard. Observe that all the Boston METAR observations in the database appear in the **Text** display window.
3. Now load and display other text products using the **AFOS Cmd** entry box.

Objective 17.3 - Display Statewide Text Products Shortcut

1. Clear the Text display window.

2. In the **AFOS Cmd** entry box of a **Text** display window, type **XX.MTR**, where "XX" is the abbreviation of your state. All METAR observations from your state appear in the Text window.
 3. Now try to load other text products using this format.
-

5.5.3 Requesting a Product from a Remote Site (*Request/Reply*)

Module 18: Request Product from a Remote Site

Use this module to practice requesting a product from a remote site. Request/reply is initiated from the Text window. Request/reply is needed when a single product was either lost due to an outage or not received due to other reasons.

Objective 18.1 - Request a Product from a Remote Site

1. On the Text Workstation bring up a Text window. Click on the File button.
2. Select "Request from Remote Site" from the pull-down menu. A "Send Request" header block window will be displayed.
3. Enter the WFO ID, Product Category, and Product Designator of the product you want to request. These are the three fields that make up the AFOS PIL. For example, WBCMTRDCA is the PIL for the DCA METAR observation.
4. For the addressee, enter the three-character ID of the site where the request should be sent, normally your neighboring site, or use DEF for default request routing (see Note below).
5. Select **OK**.

Notes:

1. If **DEF** is used for the addressee, the request will be sent to the "hub" site. The hub is the WFO colocated with the sending site's RFC. If the request cannot be satisfied there, it will automatically be sent to the WNCF.
2. All fields must be entered as three-character IDs. If four characters are input, only the first three characters will be used. There will be no error message.
3. If no products have been returned within 1-2 minutes, an error message will be displayed on the Text Workstation. If this happens, send the request to another site if the data are still needed.
4. If data are returned in response to a request, they are automatically added to the database. The product time on the browser menu will be updated. This is the only product notification the user will see.
5. You cannot specify a product time when requesting data from another site. The most recent product in the remote site's database will be returned if it is more current than the product in the requesting site's database. The remote site will not satisfy a request with an older product.

5.5.4 Editing Text Products

Module 19: Edit a Text Product

Use this module to practice editing a text product.

Objective 19.1 - Edit a Text Product

1. Load a text product into one of the **Text** display windows.
 2. Press the **Enter Editor** button in the **Control Bar** to initiate an editing session.
 3. A **Header Block** dialog box appears. Verify that the information is correct and click the **Enter** button.
 4. In the text area, highlight a line of text and press the **Cut** button in the **Control Bar**.
 5. Put the cursor at a different location in the text product and click the **Paste** button. The highlighted text is inserted at the cursor.
 6. Try some of the other edit functions, which perform much like a word processing program.
 7. When you are done practicing with the Text Editor, click the **Cancel** button to end your editing session.
-

5.5.5 Working with Text Scripts

Module 20: Working with Text Scripts

This module provides practice in working with text scripts.

Objective 20.1 - Edit a Simple Text Script

This objective shows you how to edit a script using the basic script commands.

1. Log into the Text Workstation (XT), open the **File** menu and select your **User ID**.
2. Open a **Text** display window.
3. From the **Scripts** menu, select **Edit....**
4. From the **Help** menu of the Script Editor window, select **On Basic Commands**. Keep this list to the side for reference.
5. In the Script Editor window, type the following:

```
clear()
accum(on)
load("okcmtr000")
wait("00:00:10")
load("okcrtppok")
wait("00:00:10")
load("okcccfoutn")
```

6. Under the **File** menu, select **Save As....** When the **Save As** dialog box appears, name the script **test.script**. The complete path name is

/data/fxa/scripts/<your user ID>/test.script

7. Once you have saved your script, select **OK** in the **Save As** dialog box.
8. Close the **Script Editor** dialog box.

Objective 20.2 - Run a Text Script

Now that you have written a Text Script, this objective shows you how to run it.

1. From the **Script** menu, select **Run**. When the **Run Script** dialog box appears, double-click **test.script**. The selected script should start running immediately.

2. Observe the **OKCMTR000** Product as it is displayed in the Text Display window. Notice also the status messages at the bottom of the window.
3. The script pauses 10 seconds before loading the **OKCRTPOK** Product and again before loading the **OKCCCFOUN** Product.
4. Once the script is done, the status message disappears and the three **OKC** Products are accumulated in the **Text Display** window.

Objective 20.3 - Show Output

1. From the **Script** menu, toggle on the **Show Output** checkbox.
2. Repeat Steps 1-4 in Objective 20.2.
3. Observe the messages in the **Show Output** dialog box.

Objective 20.4 - Delete a Script

1. From the **Script** menu, select **Edit....**
 2. From the **File** menu of the **Script Editor** window, select **Delete....** The **Delete Script** dialog box appears.
 3. Choose the test script that you wrote in Objective 20.1 and click **OK**. A confirmation dialog box appears. Press **Yes** to delete the script.
-

6.0 WarnGen

The CAVE Warning Generator function is handled by a system extension called WarnGen. WarnGen enables you to issue flash flood, severe thunderstorm, tornado, and other short-term warnings for a single storm or a line of storms. In addition, you can issue text products (follow-up statements) that update the progress of the storm, cancel the warning if conditions change, re-issue another warning on the same storm, or note the expiration of the warning. WarnGen also enables you to provide warning backup support to neighboring sites.

This chapter provides an introduction to WarnGen and explains how to use it to issue warnings and follow-up statements.

This chapter includes the following sections:

- [Section 6.1: Overview of Capabilities](#)
- [Section 6.2: Getting Started](#)
- [Section 6.3: The WarnGen Dialog Box](#)
- [Section 6.4: Automated Insertion of Dam Break Data into FFW/FFS](#)
- [Section 6.5: Test/Practice Mode](#)
- [Section 6.6: Practice Module: Using WarnGen](#)



6.1 Overview of Capabilities

General Functionality

The WarnGen function utilizes both a CAVE Graphics display and the Text display. WarnGen is activated from any of the graphics displays, and can be run on multiple displays simultaneously. Once started, WarnGen lets you:

- Choose backup sites, if necessary.
- Select to warn on a single storm or a line of storms.
- Designate the type and duration of the warning or follow-up statement.
- Establish a storm track (if appropriate to the type of warning) and designate a warning area.
- Choose optional text bullets to be included in the warning or statement text.
- Send the warning or follow-up statement information to the Text display where internal consistency checks are performed.
- Choose whether to send or abort the warning or follow-up statement.

Text Display

WarnGen translates the storm path (if one is designated) into text describing the speed and direction of the storm, identifies the counties and cities affected by the warning, and generates warning text, including any optional bullets selected. From the Text display, you can review and edit the automatically generated text.

The draft text warning is checked for the following:

- correct header information
- proper UGC and VTEC codes
- time and Time Zone consistency
- correct product type
- Mass News Dissemination (MND) consistency
- bullet element contents
- presence of closing \$\$

If there are any problems, specific alert boxes appear to notify you. Once you send the product, a confirmation box pops up asking you to verify the send or abort the transmission.

WarnGen can be run on any scale; however, because essentially all warnings are restricted to your County

Warning Area (CWA), the preferred scales are State(s) and WFO. Additionally, you can overlay WarnGen on any data source, but the most useful data sources are radar and satellite. You are most likely to zoom in on the threatened area using these data sources.

The choice of scale and data set is entirely up to you and is determined by what is most appropriate for the warning situation at hand.

Warn by Polygon

WarnGen accommodates a polygon-centric approach to warnings generated on AWIPS. Users can provide a better quality warning to the public by defining a more specific area, thereby reducing the number of people unnecessarily warned.

The following functionality is present in Warn By Polygon:

- The hatched area on the display, rather than the polygon you draw, will be described by the LAT..LON coordinates in the text. Corollaries of this include:
 - The warned area may not cross your CWA boundary.
 - For non-marine products, the warned area will not extend over water, and for marine products, the warned area will not extend over land.
 - For follow-up statements, the area of the warning may be reduced but not expanded.
 - The location and motion of the weather event will be encoded below the LAT..LON line.
 - Warning templates can be configured to list affected basins, just as they historically have listed counties.
-

6.2 Getting Started

WarnGen is activated by clicking the yellow WarnGen button, located on the right side of the CAVE Toolbar. Refer to **Exhibits 6.2-1 and 6.2-2**, which depict the graphics display and the dialog box when WarnGen is initiated.

Note: The background color of the WarnGen window changes to reflect the Test/Practice mode setting. Refer to [Section 6.5](#) for more information.



Exhibit 6.2-1. WarnGen When First Initiated

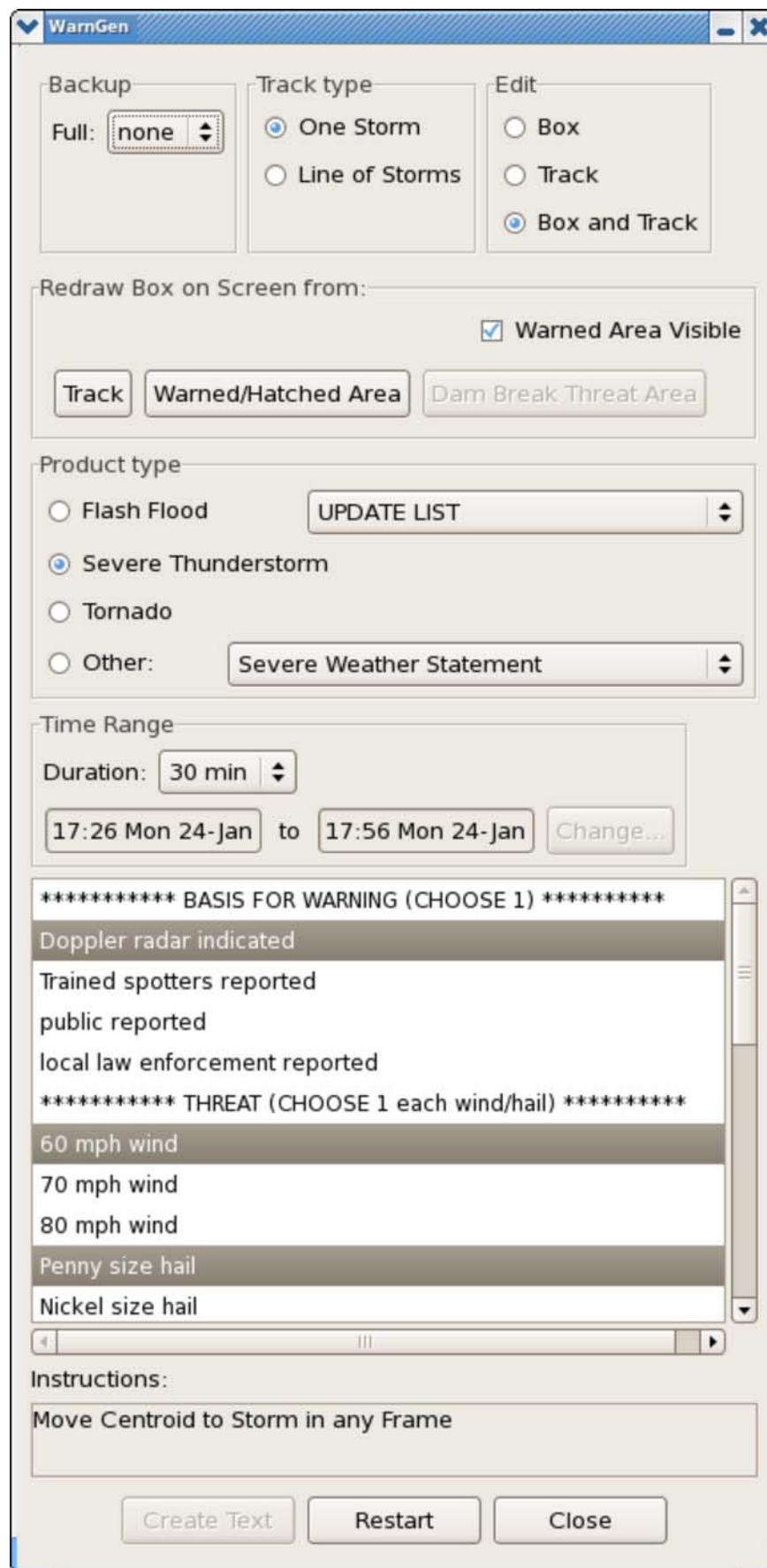


Exhibit 6.2-2. WarnGen Default Dialog Box

When the yellow WarnGen button is pressed, the WarnGen dialog box is displayed, the WarnGen legend

changes to indicate that WarnGen is now editable, and a Storm Centroid marker with the annotation "Drag me to Storm" appears in the middle of the Main display screen. This is WarnGen's default Severe Thunderstorm warning mode. The Time-Motion-Location Line is generated by the Centroid Marker.

After reviewing the components of the WarnGen dialog box in [Section 6.3](#), please refer to Module 22 in [Section 6.6](#) for practice using WarnGen to issue a warning.

6.3 The WarnGen Dialog Box

The WarnGen dialog box, shown in [*Exhibit 6.2-2*](#), is divided into nine sections:

- Backup
- Track type
- Edit
- Redraw Box on Screen from, including Warned Area Visible
- Product type, including Followup Statements or Re-Issuing Warnings
- Time range
- Optional bullets
- Instructions
- WarnGen Control Buttons

The following describes each part of the WarnGen dialog box.

Backup

This section of the WarnGen dialog box contains an option menu to select a County Warning Area (CWA) for backup operations. To use Service Backup, your Site Manager must run the localizations for your surrounding CWAs in advance of a warning situation. When you select a CWA other than your own for service backup, the WarnGen dialog box disappears for a brief moment. When it reappears, the option menu turns yellow, and any warning text messages will include your site name as the issuing office in the text header.

Track Type

The track type allows you to choose whether you want to warn on a single storm or a line of storms. The appropriate storm or line location information is automatically mentioned in the warning message text.

Edit

This set of radio buttons allows you to choose to edit the warning box, storm track, or both (default). An example of when you might choose one of the alternates is a case where you are warning on a line of storms and there are too many editing handles on the display to be easily managed.

Redraw Box on Screen from

These buttons redraw the warning area.

- **Track:** This button draws a trapezoid based on the storm track you have established.

- **Warned/Hatched Area:** This button draws a polygon around the hatched area. This is used, for example, when you are creating a follow-up product (SVS, FFS, FSL, MWS) and you have expanded the polygon beyond the allowable hatched area, or in a case where your polygon extends out of your CWA.
- **Dam Break Threat Area:** This button is used only when you are creating a Dam Break product *and* have selected a 'dam break' primary cause and a specific dam. If used in other cases, nothing happens on the display, and you will see a note in the Instructions box at the bottom of the WarnGen dialog box.
- **Warned Area Visible:** This checkbox toggles the hatching that is used to highlight the warning area or counties that are selected with mouse Button 3.

Product type

From the Product type section, select the type of warning to be issued.

The radio buttons are selectors for Flash Flood, Severe Thunderstorm, and Tornado warnings. The Other radio button is toggled on when you want to select from the option menu (currently displaying "Severe Weather Statement") that contains other types of warnings, watches, and advisories. These watches, warnings, and advisories are configurable to your site.

Note: The Other button is selected automatically if you pick something from the Other options menu.

- **Followup Capability:** When local severe weather warnings or extreme wind warnings are issued, it is customary to issue additional text products that update the progress of the storm, cancel the warning if conditions change, or note the expiration of the warning. These text products are known as followup statements. WarnGen includes a capability to assist you in issuing followup statements for existing warnings, to cancel or continue existing warnings, or to re-issue additional warnings based on existing warnings. These followup products will at a minimum inherit key characteristics from the originally issued warning, including UGC codes, list of counties/zones, Valid Time Event Code (VTEC) type, VTEC number, VTEC expiration time, and area of warning. Other characteristics are inherited as appropriate for the warning type. **Table 6.3-1** lists warning types and their appropriate followup statements.

Table 6.3-1. Text Warning Types and the Accompanying Followup Statements

Warning Type	Followup Statement
Tornado (TOR)	Severe Weather Statement (SVS)
Severe Thunderstorm Warning (SVR)	Severe Weather Statement (SVS)
Flash Flood Warning (FFW)	Flash Flood Statement (FFS)
Special Marine Warning (SMW)	Marine Weather Statement (MWS)
Extreme Wind Warning (EWW)	Extreme Wind SVS (SVS)

After a followup product is selected, the ability to edit the warning box and the Create Text menu button is enabled, while the time characteristics are disabled.

- **Update List / Followup Action List:** This drop-down menu in the Product type area of the WarnGen dialog box contains a dynamic list of available actions and warning IDs to issue followup statements when warnings are currently valid, or have expired in the last two hours. The contents of this list depend on which Product type you have selected.

Notice that each warning is identified with a followup prefix, the text product type, the VTEC number, and the time of/until expiration.

The Update List / Followup Action List can have the following options:

- **Update List:** This selection will cause WarnGen to regenerate the followup action list to reflect the current state of available products. Because there is currently no automatic notification when new warning products are issued, you should manually select this option before issuing a followup statement to ensure that you have all of the current choices presented.
- **Cancellation (CAN):** This prefix identifies all current warnings that can be cancelled.
- **Continuance (CON):** This prefix identifies all current warnings that can be continued.
- **Cancel Second Part (CA2):** In the case of following a combined flash flood/severe thunderstorm warning with a flash flood statement, the CA2 prefix is used. This means to cancel the second part of the warning (the SVR) but continue the first part (the FFW).
- **Expiration (EXP):** This prefix identifies those warnings that have expired within the last two hours, but can still be used as the basis for a reissuance.
- **Correction (COR):** This prefix identifies the correction of recently issued warnings of the same type in the text database. The times and calls to action are locked.
- **Extension (EXT):** This prefix identifies an extension in time. Extensions in time are implemented only for hydrologic products.
- **Reissue (NEW):** This capability is meant to help with reissuing additional warnings for an ongoing quasi-steady severe weather event. When an SVR, TOR, FFW, or SMW product type is chosen, the followup action list will list all warnings of that same type that are active or have expired in the last two hours. Choosing one will initialize WarnGen with the state it had when that warning was issued, including the call to action and original bullet selections. Hitting the Redo Box menu button once will then advect the box to the approximate location it would have now, assuming constant storm movement. In contrast to followup products, the box and time characteristics are fully editable, because this results in a whole new warning being issued.
Reissue is identified by the prefix NEW.

In a case where there are several active warnings at once, you may need some guidance as to which is the correct VTEC number to select for the product you wish to follow up. To help with this, the Local Warnings and Marine Warnings graphics display the VTEC number of the warnings.

Identifying Warnings Graphically

To help distinguish the correct VTEC numbers for multiple warnings, you may want to use the geographic selection feature. If you have selected a product type for which a followup action is possible, a mouse Button 3 click will select the nearest product, and display its track and box on the map. This will also cause the followup action list to reorganize itself to be sorted by distance from the selected point. This is based on the assumption that if you make this type of selection and do not get the desired product, it is very likely that the product actually desired was nearby, and thus it will end up very near the top of the followup action list. (Normally, the list is sorted from newest to oldest.)

Service Backup and Followup Statements

Service backup issues are handled seamlessly by this capability. All necessary information about how to issue the followup products (as well as assigning VTEC numbers for the initial warning products) is now obtained by decoding the warning products from the text database. As such, as long as the text database is correctly storing warning products from neighboring sites, there are no coordination issues for service backup.

Time Range

Within the Time range section of the WarnGen dialog box, select the Duration that defines how long the warning will be in effect. The available options in this menu change depending on the type of warning. Warning times can also be adjusted by editing the warning text using the Text display.

If you are issuing a warning that will go into effect at a future time, and it has a time range rather than just an expiration time, then you can enter these times in the "time/date boxes." Press the Change menu button to select different dates and/or times. Setting the Time Range applies to only certain text products. The Time Range feature can also support the VTEC text system.

Optional Bullets

For some types of warnings, WarnGen provides bulleted statements for automatic inclusion in the warning. The highlighted selections are chosen by default; you can deselect these and/or select others by clicking on them. Some warnings, advisories, and statements do not have bullet statements. Bullet statements can be set up or modified by your Site Manager.

Instructions

WarnGen instructions are shown in this section of the dialog box. As you perform the instructions, new ones appear to help you through the warning process.

WarnGen Control Buttons

These buttons, which are located at the bottom of the dialog box, control WarnGen's basic functions.

- **Create Text:** Clicking on the Create Text button sends the warning to the Text display where it can be edited, if needed, and then issued. This button is enabled once you have moved the Storm Centroid marker from its default position, or, for a hydrologic warning (e.g., flash flood), once you have moved the default warning box.
- **Restart:** The Restart button resets the display to the default Storm Centroid marker or to the default warning box, depending on which Warning Product type is selected, but leaves the dialog box settings in their current state. You can use the Restart button to issue multiple warnings or, if necessary, cancel a warning before it is sent to the Text display.
- **Close:** Closes the dialog box and leaves WarnGen in its current state, including the Storm Centroid and warning box, if either is on the display. To reopen the dialog box, simply click on the yellow WarnGen button in the menu bar.

6.4 Automated Insertion of Dam Break Data into FFW/FFS

Sites have the capability to create Dam Break non-convective Flash Flood Warnings (FFW) and Flash Flood Statements (FFS) using locally defined dam-specific text in WarnGen. For this feature to work, a text file (LLL-dam_info.txt), referred to as dam info file, containing site-specific dam information, needs to be created by each site.

Note 1: The LLL in the LLL-dam_info.txt file should be replaced by your site ID, i.e., by the value of environment variable FXA_LOCAL_SITE.

The following sections explain how to create the dam info file, and how to use this feature.

WarnGen Dam Break Threat Button and Options

In the WarnGen GUI, the items in the Optional bullets pane and in the green box, as shown in **Exhibit 6.4-1**, apply to all sites and are retrieved from the WarnGen templates. The items in the Optional bullets pane and in the yellow box, as shown in **Exhibit 6.4-2**, are unique for each site and are retrieved from the dam info file, i.e., LWX-dam_info.txt for this example.

Note 2: The dam names, scenarios, and rule of thumb, as shown in **Exhibit 6.4-2**, are sample data for Montgomery County, Maryland and Loudoun County, Virginia, which were created for the illustration.

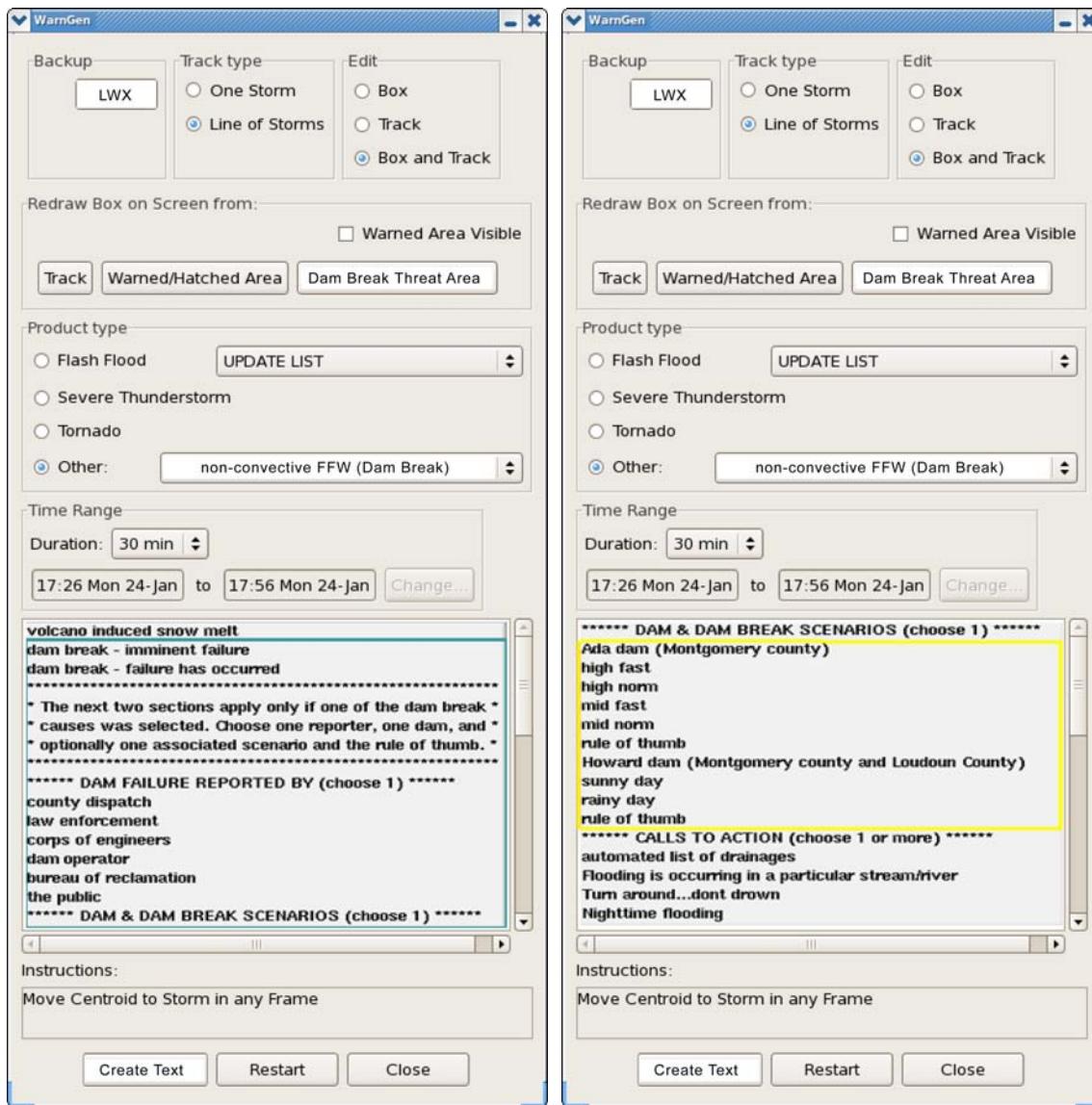


Exhibit 6.4-1. Dam Break Threat - All Sites

Exhibit 6.4-2. Dam Break Threat - Unique to Specific Site

Optional bullet pane:

The Optional bullet pane is composed of four sections.

- **Primary Cause:** This section includes two dam break options, one of which must be selected for this feature to work:
 1. dam break - imminent failure
 2. dam break - failure has occurred.
 - **Dam Failure Reported By:** This section, which appears below PRIMARY CAUSE, includes six items from which to choose.
 - **Dam & Dam Break Scenarios:** This section displays dam name, dam break scenarios, and rule of thumb. In the example, there are two dams — Ada dam and Howard dam. There are four scenarios for Ada dam and two scenarios for Howard dam, and there is one rule of thumb for each dam.
 - **Calls to Action:** As the name implies, this is an optional selection that is chosen after checking the location and level of the threat to the Dam Break Threat Area.

Dam Info File

Site-specific information for the DAM & DAM BREAK SCENARIOS section is stored in the dam info file, LLL-dam_info.txt. To use the new WarnGen feature, this file needs to be created in advance and stored in \$FXA_CUSTOM_FILES directory. An example of such a file is shown in **Exhibits 6.4-3 and 6.4-4**. The example file can be divided into 3 parts: Part 1, lines 1-3, contains commonAddInfo substitution text; Part 2, lines 5- 42, contains information related to Ada dam; and Part 3, lines 44-70, contains that related to Howard dam. For each additional dam, a part similar to Part 2 or Part 3 should be added to the file.

Shell - Konsole

Session Edit View Bookmarks Settings Help

```
1 <VAR|lead>FOLLOW EVACUATION INSTRUCTIONS PROVIDED  
2 BY YOUR LOCAL EMERGENCY OFFICIALS. DO NOT ATTEMPT  
3 TO DRIVE ACROSS FLOODED ROADWAYS. &&| var=commonAddInfo>  
4  
5 _<DAMNAME>= ADA DAM = Ada dam (Montgomery county)|  
6 _<VAR|lead>THE POTOMAC RIVER BELOW THE ADA DAM| var=riverInfo>  
7 _<VAR|lead>ADA DAM ON THE POTOMAC RIVER| var=damInfo>  
8 _<VAR|lead>NORTH CENTRAL MONTGOMERY COUNTY| var=countyInfo>  
9 _<VAR|lead>CENTRAL MARYLAND| var=stateInfo>  
10 _<VAR|lead>ADA| var=cityInfo>  
11 _<VAR|lead>THE NEAREST DOWNSTREAM TOWN IS $$cityInfo...LOCATED 1/4 MILE FROM  
12 THE DAM. IF YOU ARE IN THE LOW LYING AREAS BELOW THE ADA DAM YOU SHOULD MOVE  
13 TO HIGHER GROUND IMMEDIATELY.| var=addInfo>  
14 _<VAR|lead> LAT...100 3918 7730 3920 7732 3923 7733 3924 7728 3922 7725 3921 7723  
15 3920 7719 3919 7716 3917 7714 3915 7714 3913 7717 3913 7721 3914 7724 3916 7727  
16 &&| var=coords>  
17 }  
18 {_SCENARIO=EIGHT FEET IS ANTICIPATED TO REACH ADA IN ROUGHLY TEN MINUTES= high fast |  
19 _<VAR|lead>THE NEAREST DOWNSTREAM TOWN IS ADA...LOCALTED 1/4 MILES  
20 FROM THE DAM. A FLOOD WAVE OF EIGHT FEET IS ANTICIPATED TO REACH ADA  
21 IN ROUGHLY TEN MINUTES.| var=addInfo>  
22 }  
23 {_SCENARIO=SIX FEET IS ANTICIPATED TO REACH ADA IN ROUGHLY TWENTY MINUTES= high norm |  
24 _<VAR|lead>THE NEAREST DOWNSTREAM TOWN IS ADA...LOCALTED 1/4 MILES  
25 FROM THE DAM. A FLOOD WAVE OF SIX FEET IS ANTICIPATED TO REACH ADA  
26 IN ROUGHLY TWENTY MINUTES.| var=addInfo>  
27 }  
28 {_SCENARIO=FOUR FEET IS ANTICIPATED TO REACH ADA IN ROUGHLY THIRTY MINUTES= mid fast |  
29 _<VAR|lead>THE NEAREST DOWNSTREAM TOWN IS ADA...LOCALTED 1/4 MILES  
30 FROM THE DAM. A FLOOD WAVE OF FOUR FEET IS ANTICIPATED TO REACH ADA  
31 IN ROUGHLY THIRTY MINUTES.| var=addInfo>  
32 }  
33 {_SCENARIO=TWO FEET IS ANTICIPATED TO REACH ADA IN ROUGHLY FORTY MINUTES= mid norm |  
34 _<VAR|lead>THE NEAREST DOWNSTREAM TOWN IS ADA...LOCALTED 1/4 MILES  
35 FROM THE DAM. A FLOOD WAVE OF TWO FEET IS ANTICIPATED TO REACH ADA  
36 IN ROUGHLY FORTY MINUTES.| var=addInfo>  
37 }  
38 {_ROT>=BASED ON THE DAM IN IDAHO= rule of thumb|  
39 _<VAR|lead>FLOOD WAVE ESTIMATE BASED ON THE DAM IN IDAHO: FLOOD INITIALLY  
40 HALF OF ORIGINAL HEIGHT BEHIND DAM AND 3-4 MPH; 5 MILES IN 1/2 HOURS; 10 MILES  
41 IN 1 HOUR; AND 20 MILES IN 9 HOURS. &&| var=ruleOfThumb>  
42 }  
43 }
```

Exhibit 6.4-3. LWX-dam_info.txt (Sections 1 and 2)

```
Shell - Konsole
Session Edit View Bookmarks Settings Help

44 {<$AMNAME>}=HOWARD DAM= Howard dam (Montgomery county and Loudoun County) |
45 <VAR|lead=THE SNAKE RIVER BELOW THE HOWARD DAM | var=riverInfo>
46 <VAR|lead=HOWARD DAM ON THE SNAKE RIVER | var=damInfo>
47 <VAR|lead=CENTRAL LOUDOUN COUNTY IN CENTRAL VIRGINIA...&~~AND EXTREME WEST
48 CENTRAL MONTGOMERY COUNTY| var=countyInfo>
49 <VAR|lead=CENTRAL MARYLAND| var=stateInfo>
50 <VAR|lead=LEESBURG AND POOLESVILLE| var=cityInfo>
51 <VAR|lead=THE NEAREST DOWNSTREAM TOWN IS $$cityInfo|...LOCATED 1/4 MILE FROM
52 THE DAM. IF YOU ARE IN THE LOW LYING AREAS BELOW THE HOWARD DAM YOU SHOULD MOVE
53 TO HIGHER GROUND IMMEDIATELY.| var=addInfo>
54 <VAR|lead=LAT...LON 3913 7758 3916 7746 3910 7746 3909 7756
55 &&| var=coords>
56 }
57 {<SCENARIO>}=SUNNY DAY= sunny day |
58 <VAR|lead=THE NEAREST DOWNSTREAM TOWN IS HOWARD...LOCALTED 2 1/4 MILES FROM THE
59 DAM. IN SUNNY DAY, A FLOOD WAVE OF EIGHT FEET IS ANTICIPATED TO REACH HOWARD IN
60 ROUGHLY FIFTEEN MINUTES.| var=addInfo>
61 )
62 {<SCENARIO>}=RAINY DAY= rainy day |
63 <VAR|lead=THE NEAREST DOWNSTREAM TOWN IS HOWARD...LOCALTED 2 1/4 MILES FROM THE
64 DAM. IN RAINY DAY, A FLOOD WAVE OF SIX FEET IS ANTICIPATED TO REACH HOWARD DAM
65 IN ROUGHLY THIRTY MINUTES.| var=addInfo>
66 )
67 {<ROTB>}=BASED ON THE DAM IN MARYLAND= rule of thumb|
68 <VAR|lead=FLOOD WAVE ESTIMATE BASED ON THE DAM IN MARYLAND: FLOOD INITIALLY
69 HALF OF ORIGINAL HEIGHT BEHIND DAM AND 3-4 MPH; 5 MILES IN 1/2 HOURS; 10 MILES
70 IN 1 HOUR; AND 20 MILES IN 9 HOURS. && | var=ruleOfThumb>
71 }

71,1 Bot
```

Exhibit 6.4-4. LWX-dam_info.txt (Section 3)***Understanding the Dam Info File***

- **File Structure:** The structure of a dam info file, i.e., LLL-dam_info.txt, is as follows:

```
<VAR lead=  &&| var=commonAddInfo>
(<DAMNAME>=  = |
<VAR lead=  |var=riverInfo>
<VAR lead=  |var=damInfo>
<VAR lead=  |var=countyInfo>
<VAR lead=  |var=stateInfo>
<VAR lead=  |var=cityInfo>
<VAR lead=  |var=addInfo>
<VAR lead=  &&| var=coords>
)
(<SCENARIO>=  = |
<VAR lead=  |var=scenario>
)
(<SCENARIO>=  = |
<VAR lead=  |var=scenario>
)

...
(<SCENARIO>=  = |
<VAR lead=  |var=scenario>
)
(<ROT>=  = |
<VAR lead=  |var=ruleOfThumb>
)
```

When creating a dam info file, the symbols and words in the above structure must be kept unchanged. In the terminology of WarnGen, DAMNAME, SCENARIO, and ROT are bullets, VAR is a substitution, and commonAddInfo, riverInfo, damInfo, countyInfo, stateInfo, cityInfo, addInfo, coords, scenario, and ruleOfThumb are variable names into which the corresponding substitution text is directed.

Note 3: The variable addInfo is defined in DAMNAME and in several instances of SCENARIO as well.

The following is the format of a substitution: <substitution_type | qualifier_type = qualifier_value | ...>. VAR is a specific type of substitution. It allows the user to direct text into a variable, i.e., the text following lead= will be directed to the variable following var=. For example, in VAR substitution, <VAR lead=THE POTOMAC RIVER BELOW THE ADA DAM|var=riverInfo>, THE POTOMAC RIVER BELOW THE ADA DAM is directed to riverInfo. Such text is referred to as <variable name> substitution text hereafter, e.g., riverInfo substitution text.

In the bullet of each dam, there are seven VAR substitutions. The variable names into which the substitutions text is directed are as follows: riverInfo, damInfo, countyInfo, stateInfo, cityInfo, addInfo, and coords, respectively. All seven VAR substitutions must be included.

Refer to Text Templates [<http://www-sdd.fsl.noaa.gov/~ramer/noaa/wgnDesign/TextTemplate.html>] for more details on bullets, substitutions, and variables.

- **commonAddInfo, addInfo, and scenario:**

- **commonAddInfo substitution text precedes addInfo substitution text**

The commonAddInfo is defined in lines 1-3 of LWX-dam_info.txt, which is used for all dams for site LWX. The addInfo is defined in the DAMNAME bullet in (refer to [Exhibit 6.4-3](#), lines 11-13), and in the SCENARIO bullets in (refer to [Exhibit 6.4-3](#), lines 18-22, 23-27, 28-32, and 33-37) for the Ada dam). There could be no SCENARIO at all. Although commonAddInfo is defined before addInfo in the dam info file, addInfo substitution text (marked in the **black box**), precedes commonAddInfo substitution text (marked in the **blue box**), in the warning text, as shown in [Exhibit 6.4-5](#).

Note 4: Test mode was not used when creating the screen shots for this document. If it is used, the following sentences will be inserted in the warning text:
“...THIS MESSAGE IS FOR TEST PURPOSES ONLY...”, “THIS IS A TEST MESSAGE”, and “THIS IS A TEST MESSAGE, DO NOT TAKE ACTION BASED ON THIS MESSAGE”.

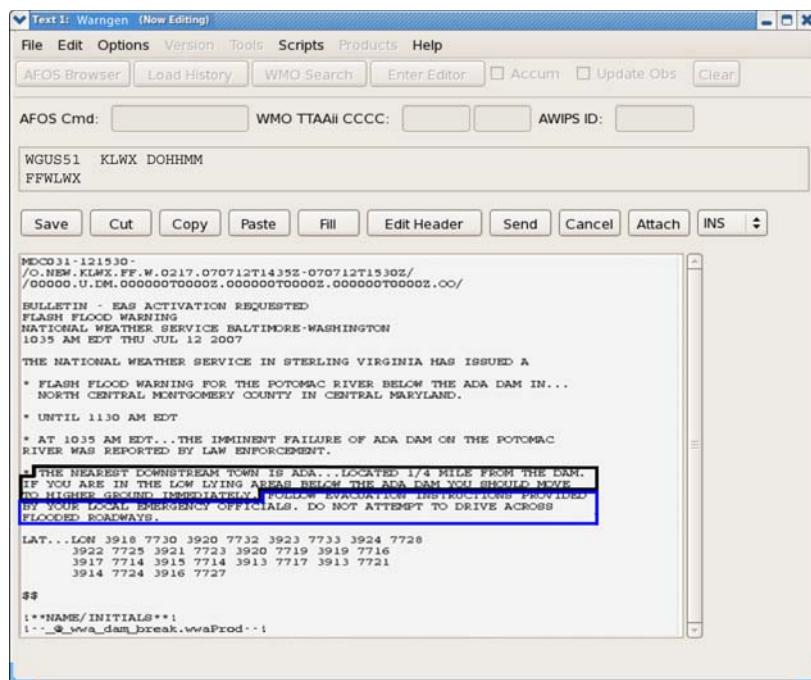


Exhibit 6.4-5. AddInfo Substitution Text Precedes commonAddInfo Substitution Text

- o scenario

The scenario substitutions are defined in (refer to [Exhibit 6.4-3](#), lines 18-22, 23-27, 28-32, and 33-37) for the Ada dam. Having SCENARIO bullets in the dam info file is optional.

- o addInfo substitution text override

If a SCENARIO is defined in the dam info file and the scenario is selected, its corresponding scenario substitution text overrides the addInfo substitution text defined in DAMNAME. For example, when a threat level is increased and "high fast" is selected, the statement in the blue box replaces the statement in the black box, as shown in [Exhibit 6.4-5](#).

- ruleOfThumb:

The ruleOfThumb substitution is intended to provide the basis for the statements in the scenarios. The substitution text (refer to [Exhibit 6.4-4](#), lines 67-69) is such an example. Having a ROT bullet in the dam info file is optional.

- coords:

- o Format and unit

The coords substitution text is the coordinates, in latitude and longitude, of the vertices of the polygon that outlines a dam break threat area. The coordinates are listed in hundredths of a degree, with no minus sign for west longitude.

WARNING: && must be placed at the end of the coordinates (refer to [Exhibit 6.4-3](#), line 16) in order for them to be handled correctly by the software.

- o Get coordinates of vertices of a polygon

If you know the dam break threat area and can outline it with a polygon, the existing D2D capability of lat/lon readout can be used to get the latitude and longitude values of each vertex of the polygon. Then, they can be stored in the dam info file. The procedure is as follows:

- a. Select non-convective FFW (Dam Break) in WarnGen. A square will appear.
- b. Manipulate the polygon to outline the threat area: drag it around, add or move vertices.
- c. When the threat area is well outlined by the polygon, activate the sampling capacity of D2D by selecting Lat/Lon Readout from the button 3 pop-up menu, and then bringing up the pop-up again and toggling on Sampling.
- d. Open your dam info file, LLL-dam_info.txt, with vi or another editor.
- e. Obtain the lat/lon values of each vertex by moving the cursor over the center of the vertex one by one clockwise.
- f. While moving the cursor, read latitude/longitude on screen and enter them in the dam info file; latitude first, then longitude, and ignore the floating point. For example, enter 3820 for 38.20N and 7817 for 78.17W. Each datum should be separated by a space.

- g. Threat area covers more than one county:

- a. If a dam break threat area, outlined by a polygon, covers more than one county, the names of all counties must be included in the countyInfo substitution text. Otherwise, the warning text will generate error messages when it goes through format checking. HOWARD DAM is an example dam break threat area that covers both Montgomery County, Maryland and Loudoun County, Virginia.
- b. The format for countyInfo that has more than one county is as follows (refer to [Exhibit 6.4-4](#), lines 44-48):

<VAR|lead=CENTRAL LOUDOUN COUNTY IN CENTRAL VIRGINIA..&~~AND EXTREME WEST CENTRAL MONTGOMERY COUNTY|var=countyInfo>

Note 5: IN CENTRAL VIRGINIA follows LOUDOUN COUNTY, the first of the two counties; ...&~~ precedes the name of the second county; and the name of the state to which the second county belongs is listed in the stateInfo substitution text (refer to [Exhibit 6.4-4](#), line 49).

Creating a Dam Break FFW or FFS

CAUTION: As with any WarnGen testing, it is recommended that you put the workstation in Test or Practice mode before proceeding.

➤ **To create an FFW or FFS warning product with the new options of PRIMARY CAUSE:**

1. In the WarnGen GUI, select non-convective FFW or FFS (Dam Break) from the Other Product type options field.
2. Select either “dam break – imminent failure” or “dam break – failure has occurred” under PRIMARY CAUSE.
3. Select one reporter in DAM FAILURE REPORTED BY.
4. Select a dam, e.g., Ada dam (Montgomery).
5. Optionally, select a SCENARIO, e.g., high fast under Ada dam.
6. Optionally, select rule of thumb under the selected dam (refer back to Step 4).
7. Click on the Dam Break Threat Area button and observe the location of the polygon in the D2D main pane, as shown in [Exhibit 6.4-6](#).
8. Optionally, select option(s) in CALLS TO ACTION.
9. Click Create Text. The warning product should appear in a pop-up Text WarnGen window on the text workstation.

Note 6: The selection of a SCENARIO is not forced to be associated with the selected dam by the current software design, so make sure a scenario under the selected dam is selected. Selecting a dam and then a scenario under an unselected dam will result in incorrect warning text. The same is true for ROT; i.e., the ROT selected should be under the selected dam.

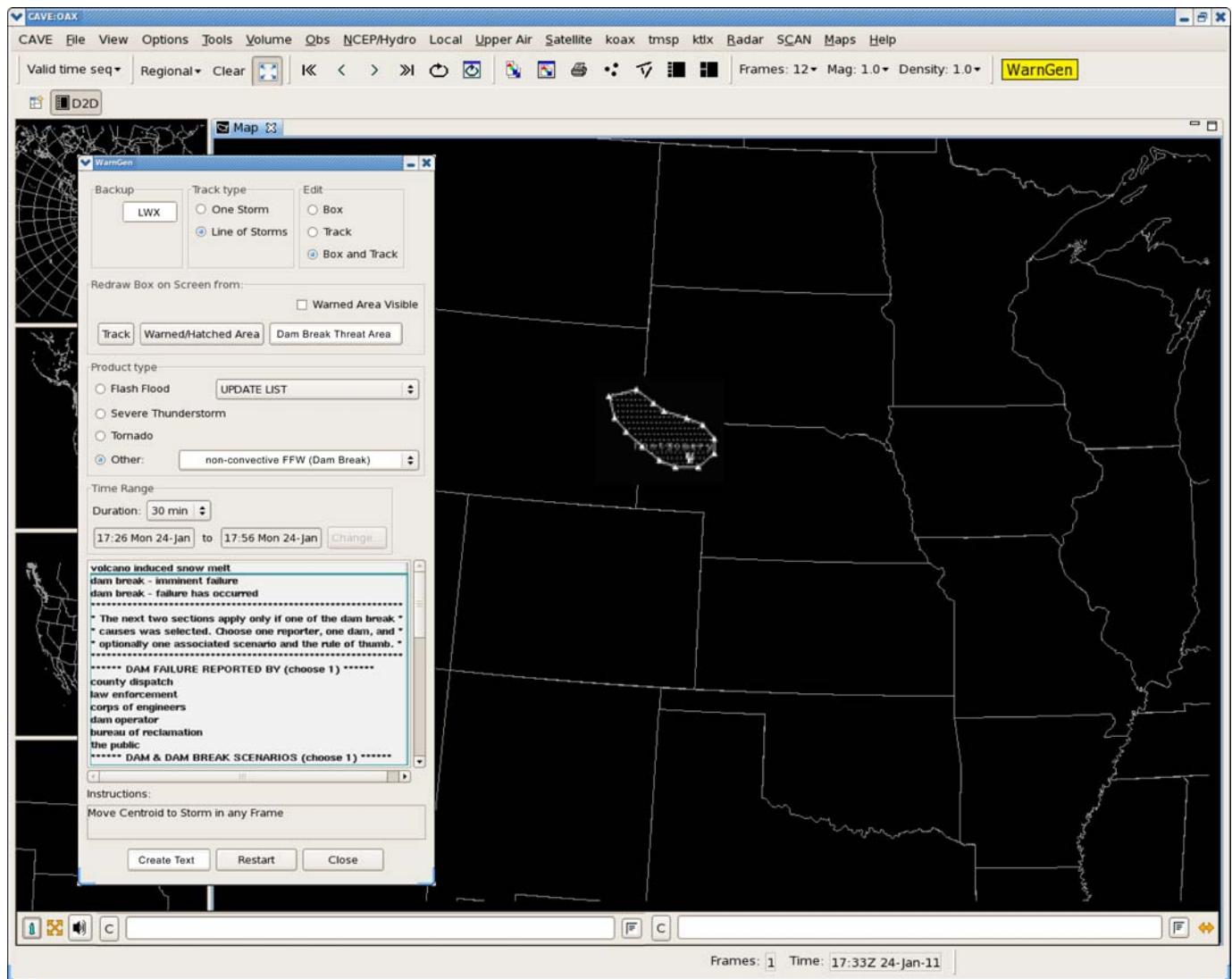


Exhibit 6.4-6. WarnGen GUI and Dam Break Threat Area Outlined By a Polygon

6.5 Test/Practice Mode

The Test Mode Control Program (TMCP) GUI is for in-house or live testing of WarnGen and its templates to prevent errant test messages from being sent out to the public. Although the main purpose of using Test and Practice modes is to learn warning generation procedures, all generated text products are affected, not just those created via WarnGen.

To Start the Test/Practice Mode Application

1. Ensure you are logged into the LX and XT workstations and that no CAVE or Text WS is running on either workstation.

Note 1: Offices with CWSU AWIPS remote display connections should not attempt Practice or Test Modes on the workstation running the CWSU AWIPS remote display without coordinating with the associated CWSU. As long as the CWSU has the AWIPS remote display running, the affected workstation will not be able to be placed in Practice or Test mode.

2. Access the appLauncher menu by clicking mouse Button 1 over the background display, and then select **AWIPS Start-up Menu**.
3. From the **appLauncher** menu, select **Test Mode Control Program**.

Note 2: The user may run the command from a Terminal window. After navigating to the directory where TMCP is located (e.g., /usr/local/cave/caveEnvironment), run the TMCP program (e.g., ./TMCP).

Test vs Practice Modes

TMCP allows the user to switch between Test, Practice, and Operational modes. The specific differences between Test mode and Practice mode are listed below.

Test mode

- Products are created in test format with the appropriate VTEC plain language modifications
- Products are stored in primary text database
- Products are sent out over the WAN
- Triggers will fire
- Communications testing occurs to verify the dissemination paths to the outside world are working correctly

Practice mode

- Products are stored locally in flat files
- Products are never sent out over the WAN
- Triggers will not fire
- Allows offline testing of applications

Test Mode Control Program GUI

The Test Mode Control Program (TMCP) GUI, as shown in **Exhibit 6.5-1** enables you to switch between Test, Practice, and Operational mode. To switch to either the test or practice mode, select the **Change Mode to Test (Comms Live)** button or the **Change Mode to Practice (In House)** button as desired. Notice that the **You are in Operational** button is not available for selection. Check the scrolling text window for any informative or error messages. To switch back to operational mode from test or practice mode, select the **Change Mode to Operational** button from the TMCP GUI.

The mode that you are currently in is displayed at the top left of the TMCP GUI. When you are in test or practice mode, the only eligible action you can take is to switch back into operational mode. The eligible mode will not be grayed out.

Note 3: The mode cannot be changed if any of the following applications are running on the AWIPS or Text workstations: CAVE, RiverPro, or TextWS.

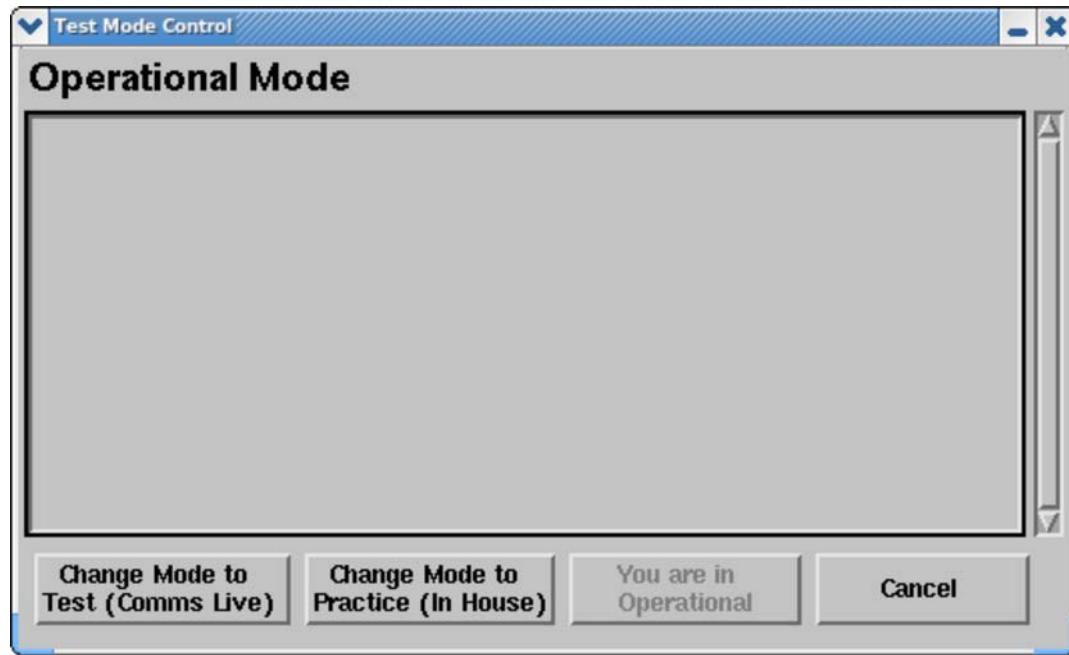


Exhibit 6.5-1. Test Mode Control Program (TMCP) GUI in Operational Mode

A Test/Practice mode indicator box appears in the lower left corner of each display when test/practice mode is activated. The color of the indicator box resembles the mode you are in. The test mode indicator box is black and the practice mode indicator box is orange, as shown in **Exhibits 6.5-2 and 6.5-3** respectively.



Exhibit 6.5-2. Test Mode Indicator Box



Exhibit 6.5-3. Practice Mode Indicator Box

6.6 Practice Module: Using WarnGen

Module 22: Using WarnGen

This module illustrates the steps required to generate a warning in WarnGen from the graphics/image displays.

Notes:

1. This Practice Module: Using WarnGen should be performed in Test or Practice Mode. Refer to [Section 6.5](#) for information about placing your workstation either of these modes.
2. Refer to the WarnGet dialog box, shown in [Exhibit 6.2-2](#) when performing the objectives included in this practice module.

Objective 22.1 - Display the WarnGen Dialog Box

1. Display **eight** frames of the current **0.5 degree reflectivity** radar on the **WFO Scale**. You can zoom in over the area of interest if needed for better viewing.
2. Click the **WarnGen** button on the CAVE Toolbar row. The **WarnGen** dialog box appears along with a **Storm Centroid** marker near the middle of the Main display screen. The marker carries the annotation "Drag me to Storm." Notice that WarnGen defaults to a Severe Thunderstorm warning.
3. If not already on, select the **One Storm, Box and Track**, and **Warned Area Visible** options.
4. The default Duration Time for a severe thunderstorm is 30 minutes. Change this time to **45 minutes**.
5. From the **Optional bullets** Section, select any text you would like included in your warning. The text bullets can be turned off or on by clicking on them. When the bullets are selected, they are highlighted. Multiple bullets can be selected in some sections.

Note: The brief set of instructions at the very bottom of the dialog box is intended to serve as a reminder of the steps involved in designating a storm track and warning area.

6. In order for you to have a clear view of the large display pane for the next objective, you may want to iconify the dialog box, push it behind the CAVE window, or shrink the CAVE window. Continue to display the reflectivity image for the next objective.

Objective 22.2 - Establish and Edit the Storm Track

This objective illustrates how to set the storm track. In a sense, you are working backward from the latest frame that shows the current storm to an earlier frame where the storm was first identified to obtain the

storm track. It requires you to adjust both the frames in the loop and the Centroid marker.

- Step the radar loop to the last (most current) frame of the radar loop.

Note 1: A quickest way to get to the last frame is to click the button on the CAVE-D2D Toolbar.

- Press and hold mouse Button 1 over the **Storm Centroid** marker and drag it to the location of the storm for which you are issuing the warning and release mouse Button 1.
- The following events happen once you have moved the **Centroid** marker to its new location:
 - A four-sided default warning box with hatching appears on the screen.
 - The letter "W" appears in each of the counties located within the warning area.
 - A default storm track, with time annotations for the first and last positions, also appears on the screen.

Note 2: This storm track is arbitrarily set to point toward the northeast, as shown in **Exhibit 6.6-1**, but is adjusted in Step 4.



Exhibit 6.6-1. WarnGen Graphic Display with Storm Track

- Move the radar loop to the earliest (first) frame in the loop, or to the earliest frame in the loop where the storm is visible--whichever makes the most meteorological sense. The default warning box

continues to appear in the same location as it does in the latest frame of the loop. (Changing the shape and location of the warning area is covered in the next objective.)

5. Drag the **Centroid** marker to the location of the storm in this earlier frame. The length and direction of the storm track vector are dependent on the distance and time covered between the location of the **Centroid** marker in the earlier frame and its location in the latest frame of the loop. Increasing the frame count lengthens the storm track vector.
6. Turn the loop on and observe if the storm track follows the approximate movement. Make adjustments as necessary by stopping the loop and moving the **Centroid** marker.

Notes:

3. An X appears where you identified the storm location in the latest frame and designates the pivot point for the storm track. This is the point relative to which WarnGen calculates the direction of the storm vector if you edit the location of the Storm Centroid in any frame. WarnGen linearly extrapolates the storm path forward and backward in time, based on the location of the most recently created or edited Centroid marker. You may want to experiment with moving the Centroid in several different frames and see how it affects the storm path generated by WarnGen.
4. WarnGen places a Storm Centroid marker in each frame of a loop, regardless of whether the storm is present in each frame or not. You can disregard those frames where the storm is not present. The key is to ensure that the storm path is correct for those frames where the storm is present.
5. The Centroid cannot be deleted; it can only be moved.
6. Once you have established a satisfactory storm track, press the **Track** button to redraw the warning area to fit the new storm track.
7. WarnGen translates the storm path into text describing the speed and direction of the storm.

Tip: You can zoom or pan the image if you need to get a better look at a storm.

Objective 22.3 - Adjust the Warning Area

This objective describes how to adjust the WarnGen default warning area. Move to the most current frame of the radar loop. You may want to Zoom the display to get a better view of the storm and/or warning area.

➤ To move entire warning area while retaining its shape

1. Position the pointer over a side of the polygon. Notice that the pointer changes to a finger-pointing hand. This indicates that you are over or near a line of the polygon and can move the whole shape.

2. Press and hold mouse Button 1 on the line (not a vertex), and drag the warning area to its new location. Then release the mouse button. The hatching is redrawn to fill the new warning area location.

➤ To adjust a vertex of the warning area

1. Position the pointer over the vertex that you want to adjust. Notice that the pointer changes to a finger-pointing hand. This change indicates that the pointer is now in edit mode and you can move the vertex.
2. Press and hold mouse Button 1, drag the vertex to its new location, and release the mouse button. Notice that the sides of the shape adjust accordingly. The hatching is redrawn to fill the new warning area shape.

➤ To add a vertex

1. Position the pointer over the side of the warning area where you want to add the vertex.

Note 1: Again the pointer changes to a finger-pointing hand to indicate you are now in edit mode.
2. Click mouse Button 2 to add the vertex. WarnGen places the new vertex under the cursor position.

Note 2: You can also add a vertex by clicking and holding mouse Button 3 and selecting "Add vertex" from the pop-up menu.
3. Repeat Steps 1 and 2 under "To adjust a vertex of the warning area" to adjust the location of the new vertex.

➤ To remove a vertex

1. Position the pointer over the vertex you want to remove. The pointer changes to the finger-pointing hand.
2. Click mouse Button 2 to remove the vertex.

Note 3: You can also remove a vertex by clicking and holding mouse Button 3 and selecting "Delete vertex" from the pop-up menu.

Objective 22.4 - Send the Warning to the Text Workstation

This objective gives the concluding steps to creating a warning on the graphics/image display.

Notes:

1. Any county marked with a "W" is included in the warning message.
2. WarnGen does not permit creating a warning area with fewer than three sides.
3. If a warning area crosses the CWA boundary when "Create Text" is selected, only the parts of the warning in the CWA will be inside of the vertices.

1. Adjust and position the warning box so it crosses your CWA boundary.
2. If you have iconified or pushed the **WarnGen** dialog box, restore or bring it forward.
3. From the bottom row of the dialog box, select the **Create Text** button to send the warning to the **Text** display.

When you click on the **Create Text** menu button, a window automatically appears on the **Text** display with the text of the warning displayed.

4. If the text warning message appears, proceed to **Step 5**; otherwise, type "**WRKG#**" in the Text window Entry box, where the number (#) is taken from the **Text** display's name (e.g., if the name is "xt3-bou," the number you enter is "3") and the Header Block should come up with the correct product ID. The **Enter Editor** function is already initialized and the **Header Block** dialog box is open.
5. Verify the header information is correct and press the **Enter** menu button in the **Header Block** dialog box. You can now edit the text product as necessary, and then store and issue the warning. Sending the warning from the graphics/image display of CAVE to the **Text** display does not automatically issue the warning.
6. Compare the LAT...LON line in the warning text to the polygon and hatched area (use sampling with Lat/Lon Readout enabled). Note that the warning description describes the hatched area and the LAT...LON line describes the positions of the vertices.

Notes:

4. There may be places in the generated text that you must edit before issuing the warning, depending on the options selected.
5. It is **strongly recommended** that you review the warning text before transmitting it to the public.

Objective 22.5 - Create a Second Warning Using County Selection

WarnGen allows you to select entire counties to include in a warning area. This is especially useful when generating watches or broad warning areas, or when you wish to prevent a tiny sliver (less than 5% of a county) from being covered by a warning.

1. Click the **Restart** button at the bottom of the **WarnGen** dialog box.
2. From the **Product type** Section of the **WarnGen** dialog box, select **Flash Flood**.

Note: The **Storm Centroid** marker and the warning area from the previous warning are cleared from the display.

3. From the **Duration** option menu, select a **3-hour** warning duration time.
4. From the **Optional bullets** section, select any text you would like included in your warning.
5. Move the radar loop to the most current frame using the **>>|** button in the **Toolbar**.
6. Drag the Centroid to a desired county. A default warning box is displayed.
7. Click mouse Button 3 on three adjacent counties, as well as the county from Step 6. When you click on the county from Step 6, the remainder of the county will become hatched. Each county contains a W to indicate that it is included in the warning area.
8. Click the **Warned/Hatched Area** button in the Redraw Box on Screen from section of the **WarnGen** dialog box.
9. Adjust the warning area as needed.
10. Click on the **Create Text** button to send the warning to the **Text** display.
11. Keep this display for the next objective.

Objective 22.6 - Create a Warning for a Line of Storms

1. Click the **Restart** button located at the bottom of the **WarnGen** dialog box.
2. Click the **Line of Storms** radio button in the upper portion of the **WarnGen** dialog box. The default Product type is Severe Thunderstorm.
3. Move the loop to the earliest frame where the line of storms is visible. Drag the storm line to match up with the actual line of storms. A hatched warning box appears along the trajectory of this line. Refer to **Exhibit 6.6-2**.

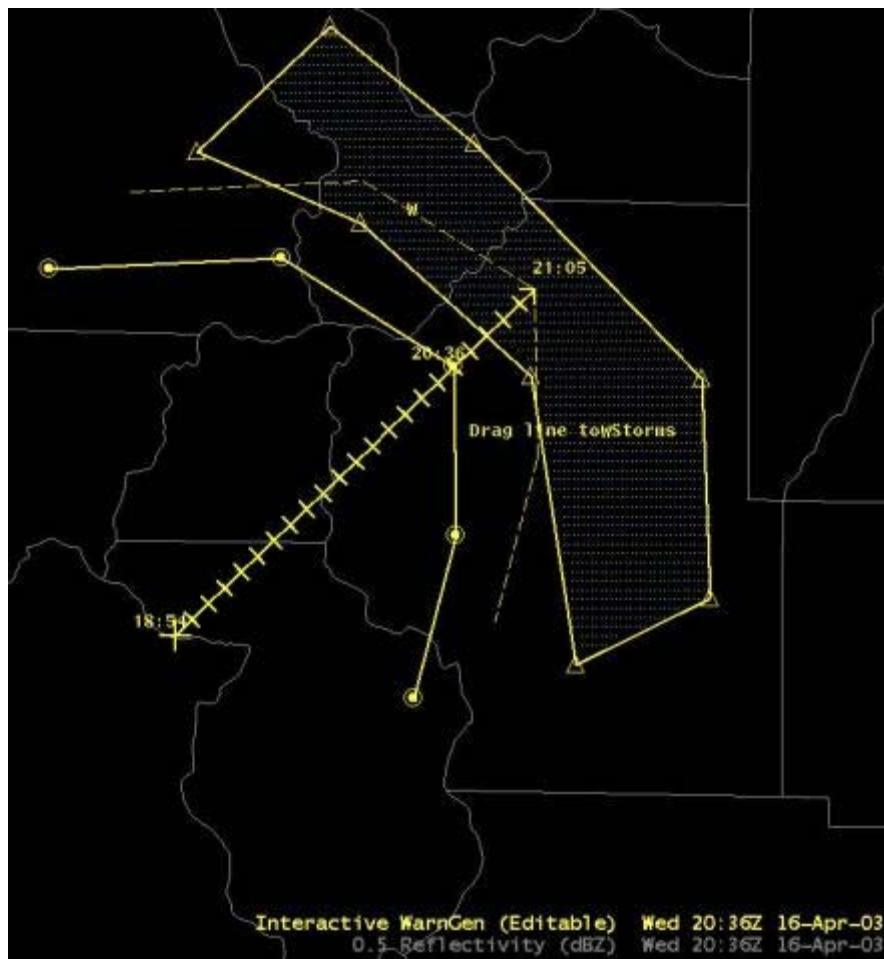


Exhibit 6.6-2. WarnGen Graphic Display with a Line of Storms

4. Use mouse Button 1 to change the shape of the warning box and the orientation of the line. You may wish to add vertices using Button 2, as illustrated in Exhibit 6.6-2
5. Turn looping on and observe the line movement.
6. Click on the **Create Text** button in the **WarnGen** dialog box to send the warning to the **Text** display.

Objective 22.7 - Create a Warning for a Backup Site

WarnGen allows you to provide backup support to neighboring CWAs provided localization has been run for the backup site.

1. Click the **Restart** button located in the lower portion of the **WarnGen** dialog box.
2. From the **Full Backup** options menu, select a **CWA** other than your own. Note that the **WarnGen** dialog box disappears and reappears with the backup site selected and in **yellow**.
3. If not already on, select the **One Storm, Box and Track**, and **Warned Area Visible** options. Observe that counties in your CWA are not hatched, only those in the selected CWA are hatched.
4. From the **Product type** area of the **WarnGen** dialog box, **Severe Thunderstorm** is the default.
5. Adjust the storm track and warning area as described in Objectives 22.2 and 22.3.

6. Create the text message as shown in Objective 22.4. Observe that the text message is formatted as if it were issued by the backup site, but it contains a line stating "issued by National Weather Service <your site>" in the header.

Notes for Quitting WarnGen:

1. The WarnGen dialog box opens in the same state as when it was closed; and **closing the WarnGen dialog box does not quit WarnGen.**
2. The way to quit WarnGen is to clear the display or select the "Unload" option from the WarnGen legend pop-up menu. These actions revert WarnGen to its default settings.

7.0 The Interactive NsharpSkewt (NSHARP) Application

The Interactive NsharpSkewt (NSHARP) program is integrated into the CAVE interface and allows you to modify a sounding and/or hodograph to derive various thermodynamic quantities. This implementation enables you to obtain a better understanding of the current and future states of the atmosphere.

Note 1: This discussion assumes that you have at least a fundamental understanding of both the skew-T log-p thermodynamic diagram and the hodograph.

Through the NSHARP, you can modify the temperature, dewpoint, and/or hodograph profiles either by using the cursor or by manual entry in a dialog box; lift a modified air parcel and immediately see a listing of the modified convective parameters; and interactively sample the sounding itself. The basic premise of the program is to assume constant pressure while interactively editing the data points.

Because the NSHARP program is integrated into the CAVE interface, you can perform display manipulations such as looping, stepping, and swapping. Also, in the event that an incomplete sounding is plotted, but mandatory and significant level data are available in the text database, you can enter the missing data points using NSHARP and obtain the thermodynamic and stability variables.

This chapter includes the following sections:

- [Section 7.1: Starting the Interactive NsharpSkewt \(NSHARP\) Application](#)
- [Section 7.2: The NsharpSkewt Interface and D2D NSHARP Functions Panel](#)
- [Section 7.3: Sampling and Editing Sounding Profiles on Skew-T and Hodograph Diagrams](#)

7.1 Starting the Interactive NsharpSkewt (NSHARP) Application

The NSHARP can be enabled only after you have displayed at least one sounding from the Upper Air pull-down menu, as shown in **Exhibit 7.1-1**. Loading the sounding opens the NSHARP interface, as shown in **Exhibit 7.1-2**.

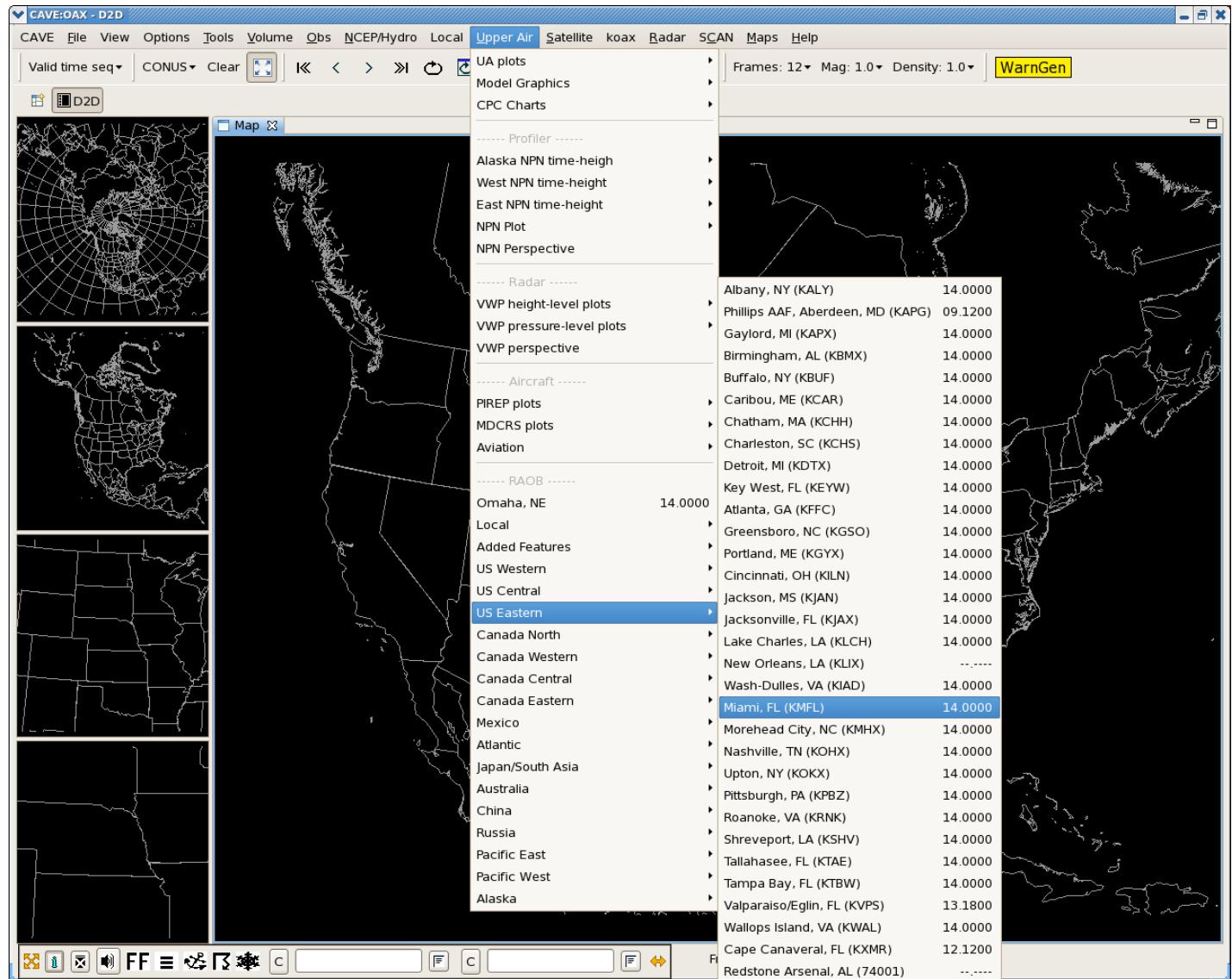


Exhibit 7.1-1. Selecting a Sounding from the Upper Air Menu

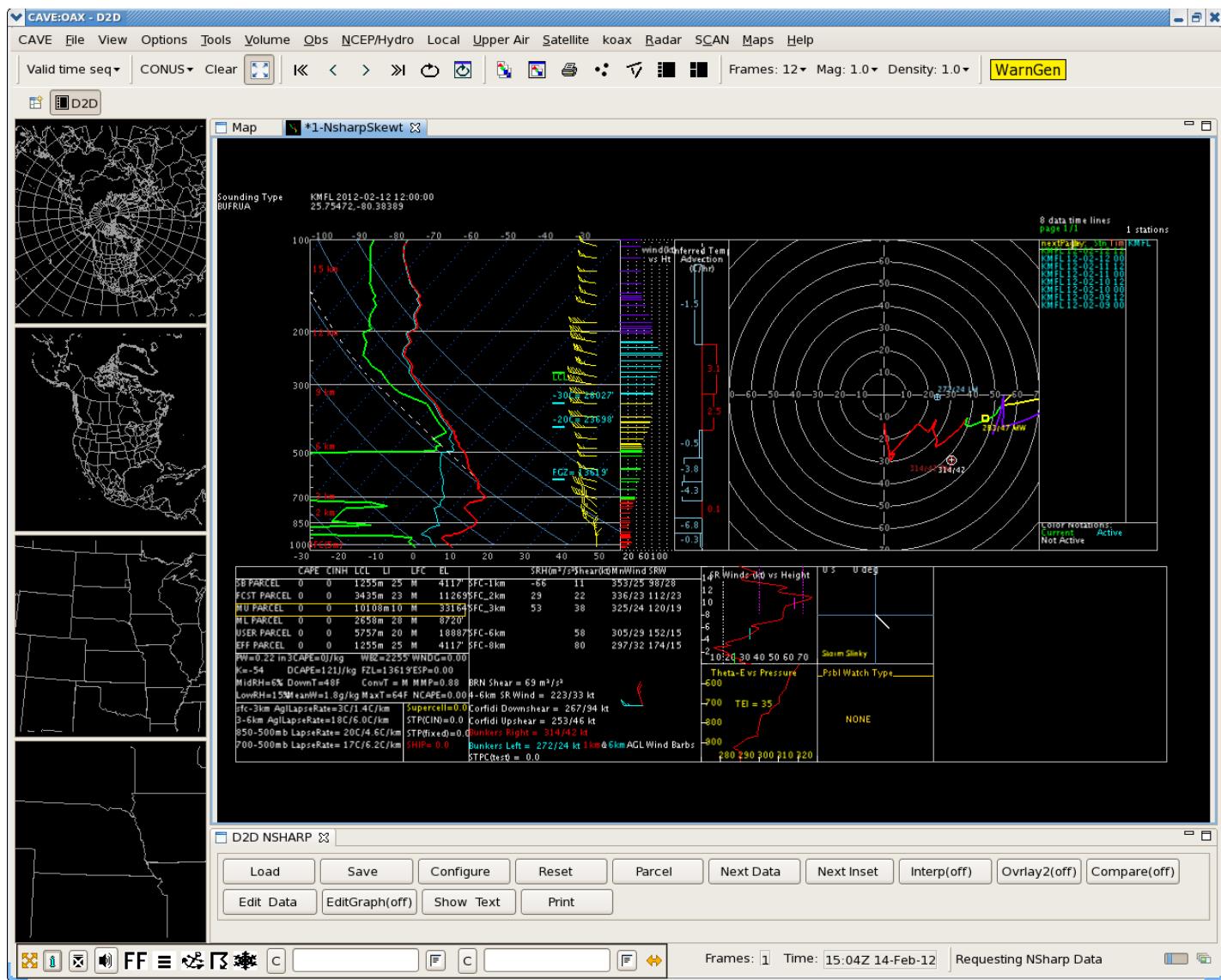


Exhibit 7.1-2. NsharpSkewt Interface with D2D NSHARP Functions Panel

Note 1: You can still load other soundings from the Upper Air menu after the NsharpSkewt interface is open, but only one sounding can be interactive at a time.

Note 2: You can clear the NsharpSkewt display from the Main Display Pane by clicking the NsharpSkewt tab, or by clicking the Clear button on the Toolbar. The D2D NSHARP functions panel at the bottom of the screen, which opened when you loaded the sounding, remains open. You can close this panel by clicking the D2D NSHARP tab.

Note 3: If you closed the D2D NSHARP functions panel, you can restore it without clearing the NsharpSkewt display. Click on the Main Display's Map tab, then click on the **NsharpSkewt** tab. The NsharpSkewt display will reappear unchanged, with the D2D NSHARP functions panel restored.

7.2 The NsharpSkewt Interface and D2D NSHARP Functions Panel

This section provides overviews of the NsharpSkewt interface, shown in **Exhibit 7.2-1**, and operation of the D2D NSHARP functions panel, shown in **Exhibit 7.2-2**.

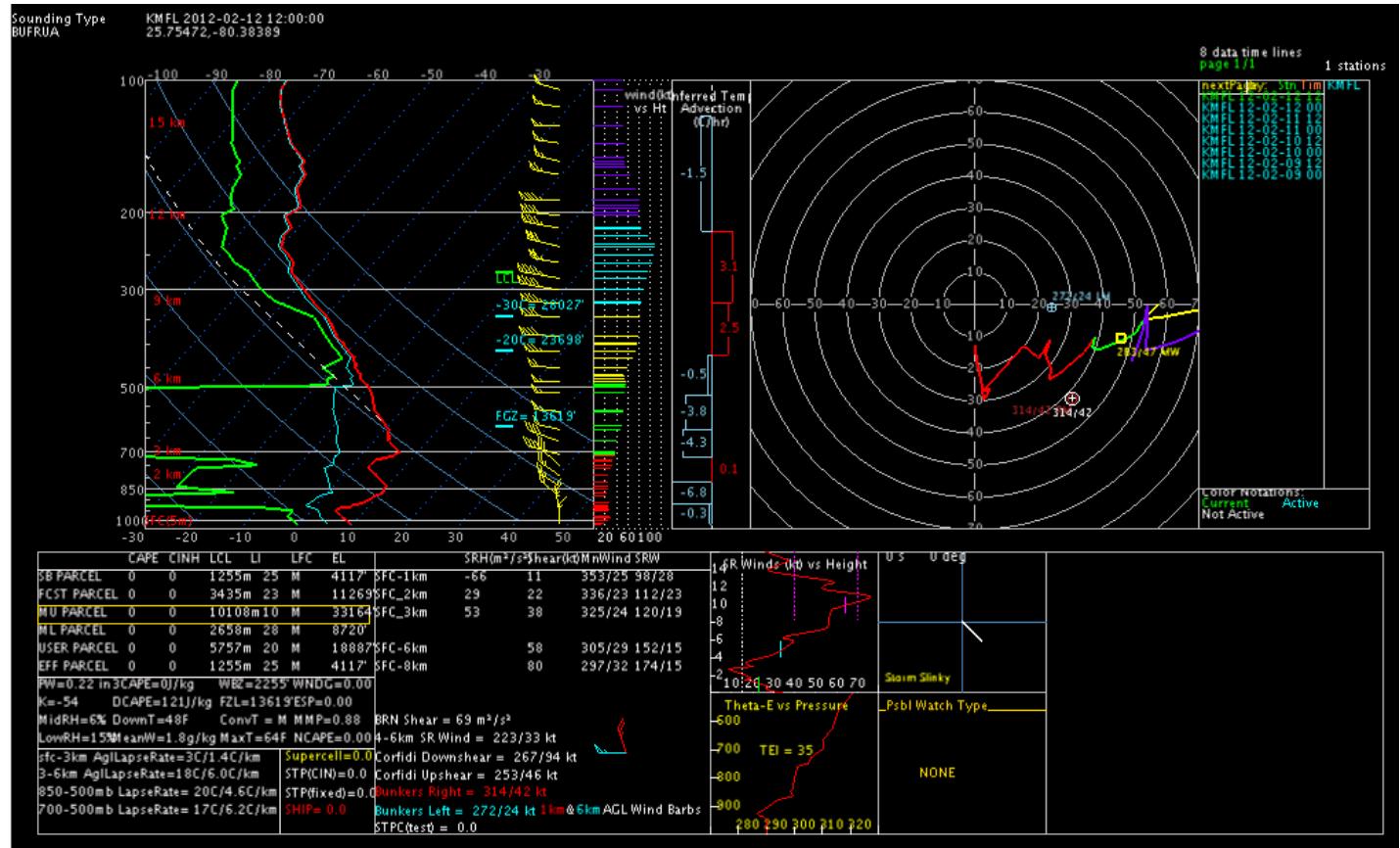


Exhibit 7.2-1. NsharpSkewt Interface with Only One Sounding Loaded (KMFL)

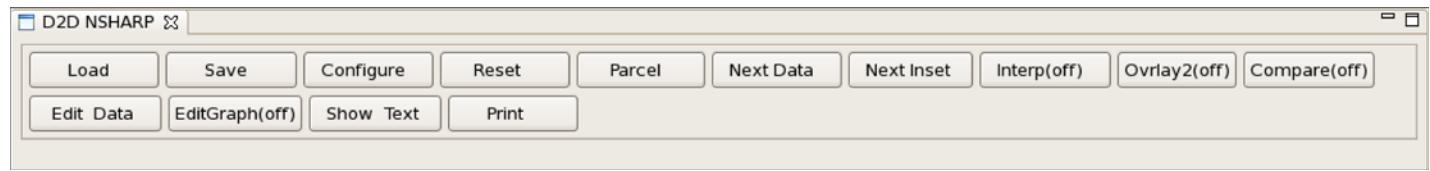


Exhibit 7.2-2. D2D NSHARP Functions Panel

7.2.1 The NsharpSkewt Interface

The NsharpSkewt application interface is comprised of:

- Skew-T Diagram
- Hodograph Diagram
- Selected Soundings and Frames
- Data Parameters
- Inset Diagrams

Skew-T Diagram

The NSHARP skew-T diagram is shown in **Exhibit 7.2.1-1**. The temperature is represented by the red line, the dewpoint by the green line, the wet-bulb by the cyan line, the virtual temperature by the dashed red line, and the lifted parcel profile by the dashed white line.

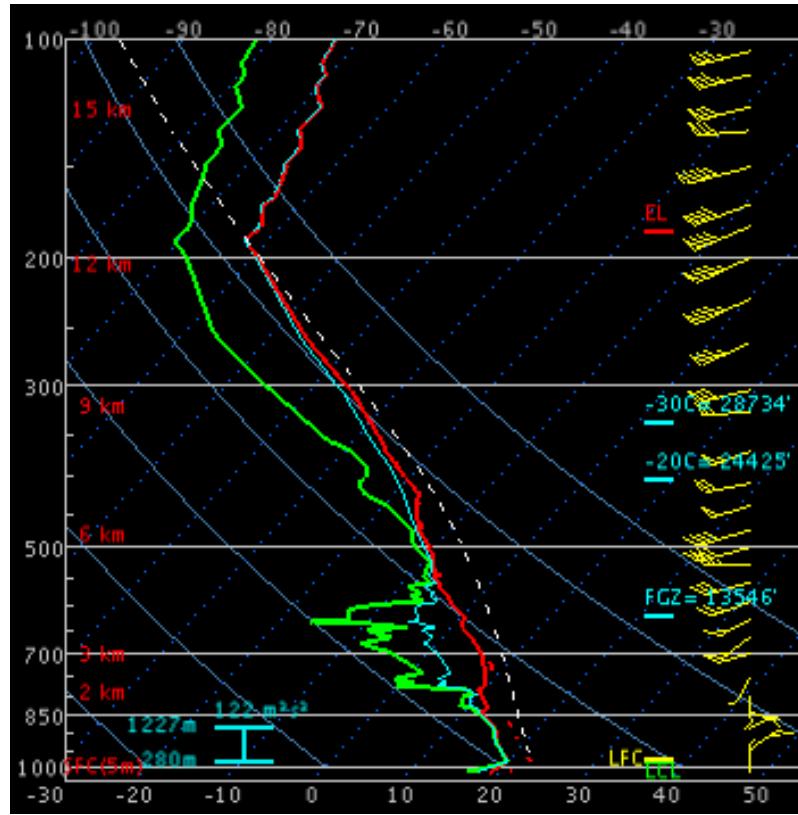


Exhibit 7.2.1-1. NSHARP Skew-T Diagram

Hodograph Diagram

The NSHARP hodograph diagram is shown in **Exhibit 7.2.1-2**. The hodograph is drawn with height color coding: red for below 3000 feet (3 Kft) above ground level (AGL); green for 3 to 6 Kft AGL; yellow for 6 to 9 Kft AGL; cyan for 9 to 12 Kft AGL; and purple for above 12 Kft AGL. The yellow rectangle represents the

mean wind vector. The 30/70 and 15/85 storm motion vectors are marked by small pink and dark red ellipses (not shown in **Exhibit 7.2.1-2**). The user moveable storm motion vector is marked by a large white ellipse (also not shown in exhibit).

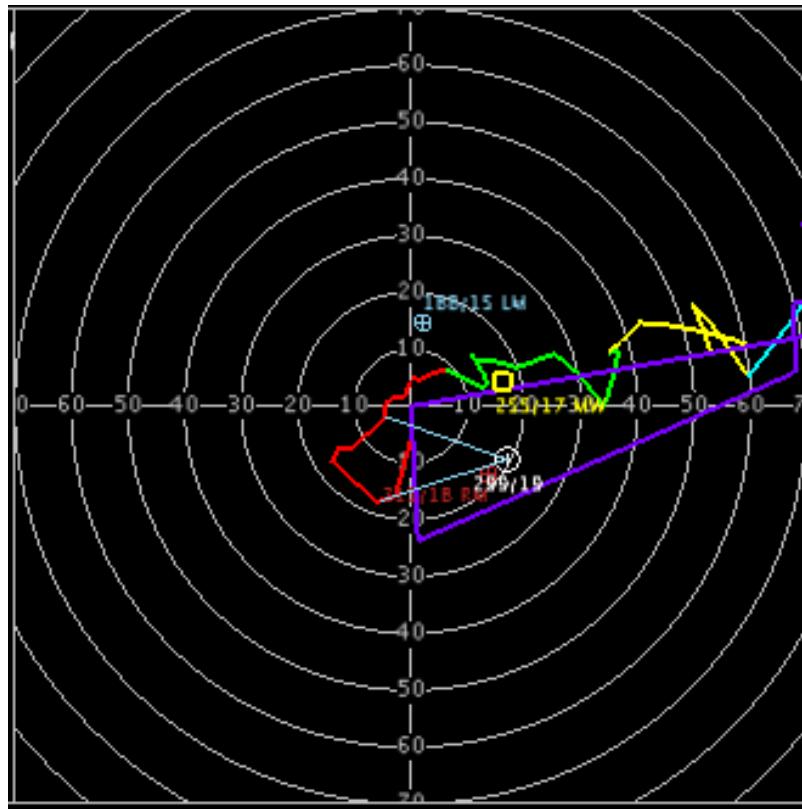


Exhibit 7.2.1-2. NSHARP Hodograph Diagram

Selected Soundings and Frames

The station site identifiers derived from the soundings selected from the Upper Air menu are listed in the order in which they were selected. The number of data time lines listed for each station is derived from the number of "Frames" selected. Refer to the "Notations" box in **Exhibit 7.2.1-3** to determine the active, not active, and current sounding(s) displayed on the skew-T and hodograph displays.

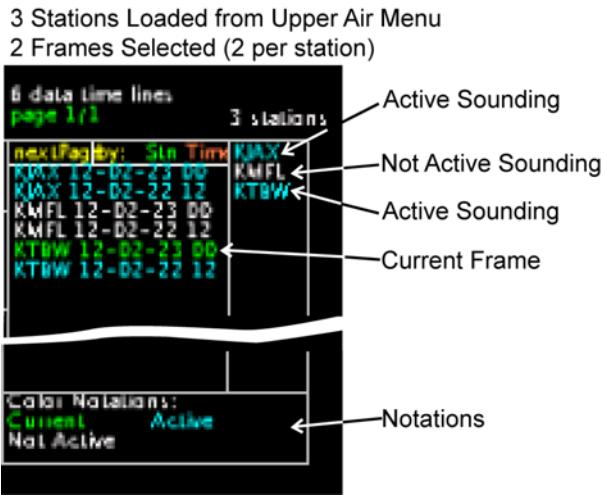


Exhibit 7.2.1-3. Identifying Active Station(s) and Data Times

Note 1: More than one sounding can be active at a time, as shown in **Exhibit 7.2.1-3**. Active soundings are highlighted in blue. All active soundings are displayed on the skew-T and hodograph diagrams. However, only one sounding can be interactive at a time, with the interactive sounding indicated by the current frame, highlighted in green, as shown in **Exhibit 7.2.1-3**.

Data Parameters

A collection of calculated values is provided in text panels. These values are grouped into five pages, as shown in **Exhibits 7.2.1-4 through 7.2.1-8**. The pages can be cycled using the "Next Data" button on the D2D NSHARP functions panel.

Note 2: The data parameters and value ranges are not defined in this document. It is assumed that the meteorologists using this manual know the meaning and value ranges of these parameters. A reference guide to key upper air index values, and the thermodynamic data parameters that are used in evaluating severe weather and flash flood potential is available from the National Weather Service Forecast Office in Pittsburgh, PA. Click on the following URL address to access the website:

<http://www.erh.noaa.gov/pit/lgsrv.htm>

	CAPE	CINH	LCL	LI	LFC	EL	SRH(m ² /s ²)	\$hear(kt)	MnWind	SRW	
SB PARCEL	20	-1	1134m	9	1242m	6532'	SFC-1km	-1	5	93/11	128/25
FCST PARCEL	14	0	1592m	9	1592m	6532'	SFC_2km	77	13	98/8	133/23
MU PARCEL	0	0	4530m	1	M	14863	SFC_3km	107	22	118/3	145/20
ML PARCEL	1	-7	1340m	10	1576m	6136'					
USER PARCEL	0	0	1842m	12	M	6044'	SFC-6km		61	272/8	177/15
EFF PARCEL	20	-1	1134m	9	1242m	6532'	SFC-8km		78	276/16	208/15
PW=0.88 in 3CAPE=1J/kg			WBZ=6540'		WNDG=0.00						
K=5			DCAPE=361J/kg		FZL=13567'ESP=0.00						
MidRH=25%DownT=50F			ConvT=67F		MMP=0.59		BRN Shear = 47 m ² /s ²				
LowRH=65%MeanW=6.7g/kg			MaxT=70F		NCAPE=0.00		4-6km SR Wind = 249/32 kt				
sfc-3km AglLapseRate=13C/4.6C/km			STP(CIN)=0.0				Corfidi Downshear = 277/91 kt				
3-6km AglLapseRate=20C/6.6C/km			STP(fixed)=0.0				Corfidi Upshear = 277/50 kt				
850-500mb LapseRate= 18C/4.2C/km			SHIP= 0.0				Bunkers Right = 329/17 kt				
700-500mb LapseRate= 18C/6.7C/km							Bunkers Left = 228/21 kt	1km & 6km AGL Wind Barbs			
							STPC(test) = 0.0				

Exhibit 7.2.1-4. Data Parameters - Page 1

PARCEL DATA				THERMODYNAMIC DATA	
*** MOST UNSTABLE PARCEL ***				----- AVAILABLE MOISTURE -----	
LPL:	645mb	1C/-4C	35F/24F	P. Water = 0.88 in	Mean RH = 35 %
CAPE =	0 J/Kg	LI(500mb) =	1C	Mean W = 6.7g/Kg	Mean LRH = 65 %
BFZL =	30 J/Kg	Llimin =	1C / 581mb	Top of Moist Lyr = 803 mb / 6529 ft	
CINH =	0 J/Kg	Cap =	M / M	700-500mb Lapse Rate = 18 C / 6.7 C/Km	
LEVEL	PRES	HGT(AGL)	TEMP	850-500mb Lapse Rate = 18 C / 4.2 C/Km	
LCL	587mb	14858ft		Total Totals = 33	K-Index = 5
LFC	M	M	M	SWEAT Index = 100	Max Temp = 70F
EL	587mb	14858ft	-3C	ThetaE Diff = 28C	Conv Temp = 67F
MPL	587mb	14858ft		WBZ level = 6540ft	FGZ level = 13567ft

Exhibit 7.2.1-5. Data Parameters - Page 2

OPC LOW LEVEL STABILITY				----- MIXING HEIGHT -----	
----- SURFACE-975 hPa TEMP GRADIENT				Dry Ad Lapse Rate	= 9.8 C/Km
LEVEL	PRES	HEIGHT	TEMP	Thresh Lapse Rate	= 8.3 C/Km
975 hPa	975 mb	392 m	15.07 C		*** Layer Based ***
Surface	1020 mb	5 m	18.75 C	Mixing Height	= M
975-Sfc Gradient = -3.68 C				Mixing Pressure	= M
Base Height = 1826 m				Top Mix Layer Wind	= M / M
LOWEST INVERSION HEIGHT				Mix Layer Max Wind	= M / M r
Base Pressure = 820 mb				Layer Lapse Rate	= M / M
Change in Temp = 0.60 C					*** Surface Based ***
				Mixing Height	= M
				Mixing Pressure	= M
				Top Mix Layer Wind	= M / M
				Mix Layer Max Wind	= M / M r
				Layer Lapse Rate	= M / M

Exhibit 7.2.1-6. Data Parameters - Page 3

STORM RELATIVE			MEAN WIND		
329° / 17 kt (9 m/s)			273 / 21 kt(11 m/s)		
----- SR HELICITY -----			273 / 15 kt(8 m/s)		
LAYER	POS	NEG	TOT	850 - 200 mb	277 / 36 kt(19 m/s)
Sfc - 2 km	100	-24	77 m²/s²	AYER	ENVIRONMENTAL SHEAR
Sfc - 3 km	158	-51	107 m²/s²	DELTA V	TOT SHR
LPL - LFC	M	M	M	Low - 3 km	27 kt (14 m/s) 46
LAYER	----- SR WINDS VECTOR -----			Sfc - 2 km	18 kt (9 m/s) 46
Sfc - 2 km	133	/ 23 kt (12 m/s)		Sfc - 6 km	66 kt (34 m/s) 57
4 - 6 km	249	/ 32 kt (16 m/s)		Sfc - 12 km	100 kt (51 m/s) 43
9 - 11 km	269	/ 67 kt (35 m/s)			

Exhibit 7.2.1-7. Data Parameters - Page 4

CONVECTIVE INITIATION				SEVERE POTENTIAL			
CINH	=	0 J/Kg	Cap	=	M / M		
K-Index	=	5	Mean RH	=	35 %		
Top of Moist Lyr = 803 mb / 6529 ft				----- HAIL POTENTIAL -----			
LFC Height	=	M / M		CAPE	=	0 J/Kg	WBZ level = 6540ft
				Mid Lvl RH	=	58 %	FGZ level = 13567ft
				EL Storm Relative Wind Speed	=	26 kt	
				CHI1	=	0.0	CHI2 = 0.0
				Avg BL Wetbulb Temp	=	7.3 °C	
				----- TORNADO POTENTIAL -----			
CAPE	=	0 J/Kg	Eff. SREH	=	M		
EHI	=	M	3km Shear	=	14 m/s	Low SRW (Sfc - LFC)	= M
BRN	=	0	BRN Shear	=	47 m²/s²	Mid SRW (LFC - LFC+4km)	= M
PRECIPITATION TYPE				Low SRW (EL-4km - EL)	=	15 kt	
Melting Level = 6540 ft / 803 mb							
HEAVY RAINFALL							
Rogash QPF = 2.78 in							

Exhibit 7.2.1-8. Data Parameters - Page 5

Inset Diagrams

There are two sets of Inset diagrams, as shown in **Exhibits 7.2.1-9 and 7.2.1-10**. The pages can be cycled using the "Next Inset" button on the D2D NSHARP functions panel.



Exhibit 7.2.1-9. Inset Diagram - Page 1

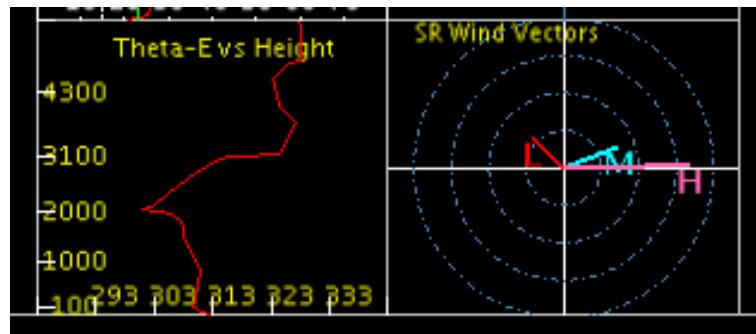


Exhibit 7.2.1-10. Inset Diagram - Page 2

7.2.2 D2D NSHARP Functions Panel

The buttons on the D2D NSHARP functions panel, shown in **Exhibit 7.2.2-1**, enables the forecaster to control the NsharpSkewt environment for the selected interactive NsharpSkewt sounding.



Exhibit 7.2.2-1. D2D NSHARP Functions Panel

Note 1: The buttons that have two mode positions — (off) or (on) — will show the current mode on the button. For example, if EditGraph(off) is displayed on the button, it means the skew-T and hodograph diagrams are not editable.

The buttons associated with all parts of the NSHARP functions panel are described below.

Load

Selecting the Load button opens the Open dialog box, shown in **Exhibit 7.2.2-2**, where you can open a skew-T that was edited in the past.

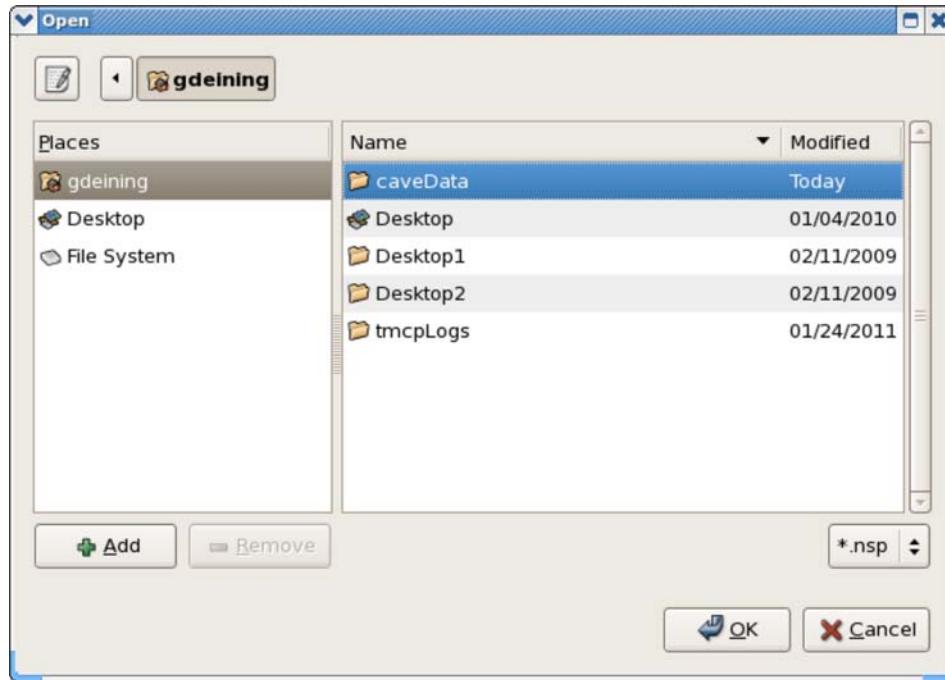


Exhibit 7.2.2-2. Open Dialog Box

Save

Selecting the Save button opens the Save Text Data dialog box, shown in **Exhibit 7.2.2-3**, that allows you to save an edited skew-T.



Exhibit 7.2.2-3. Save Text Data Dialog Box

Configure

Selecting the Configure button opens the Graphs Configuration dialog box, shown in **Exhibit 7.2.2-4**, which allows you to change the skew-T diagram configuration, adding or subtracting parameters displayed on the diagram.

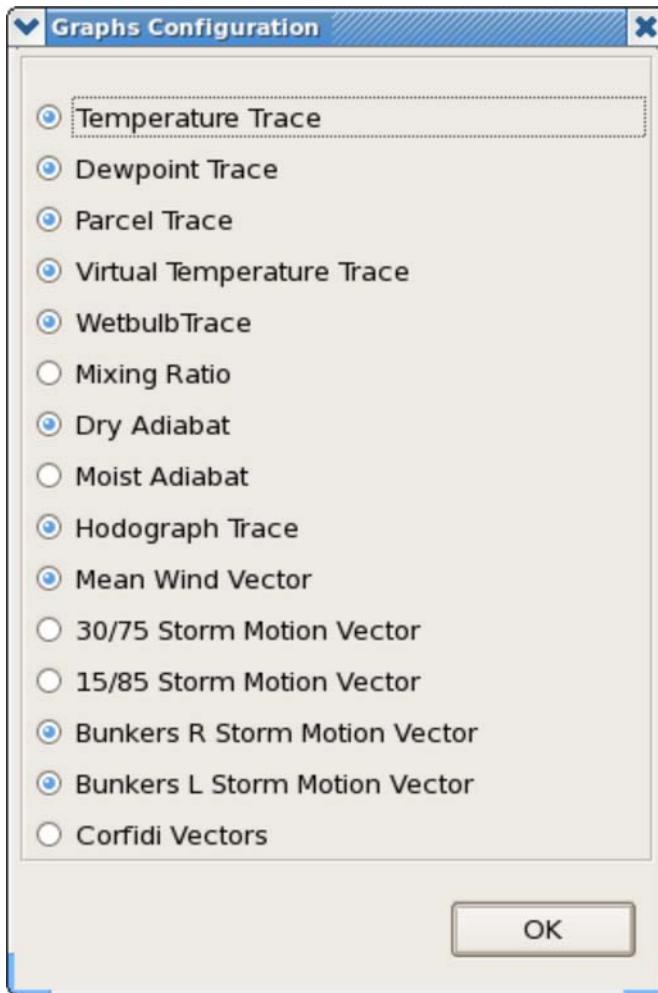


Exhibit 7.2.2-4. Graphs Configuration Dialog Box

Reset

Selecting the Reset button restores the sounding to the orginal skew-T and hodograph settings and values.

Parcel

Selecting the Parcel button opens the Parcels Display Configuration dialog box, shown in **Exhibit 7.2.2-5**, which allows you to define the parcel display parameters.

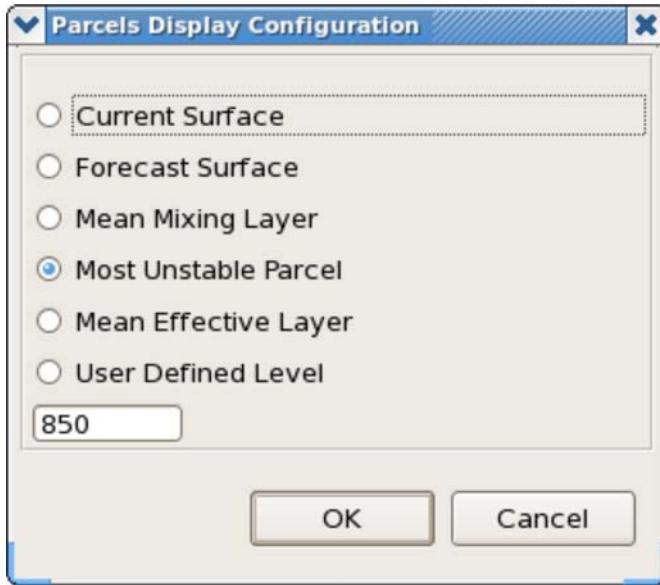


Exhibit 7.2.2-5. Parcels Display Configuration Dialog Box

Next Data

Refer to [Section 7.2.1](#) for a description of this function.

Next Inset

Refer to [Section 7.2.1](#) for a description of this function.

Interp(off)/Interp(on)

Changes to the temperature and dew point traces on the skew-T diagram will occur when you toggle the Interpolation button (Interp(off)/Interp(on)), which when switched to Interp(on) populates the grid with the most current data.

Note 2: The text values in the "Show Text" display will also change as you change the mode of the interpolation button.

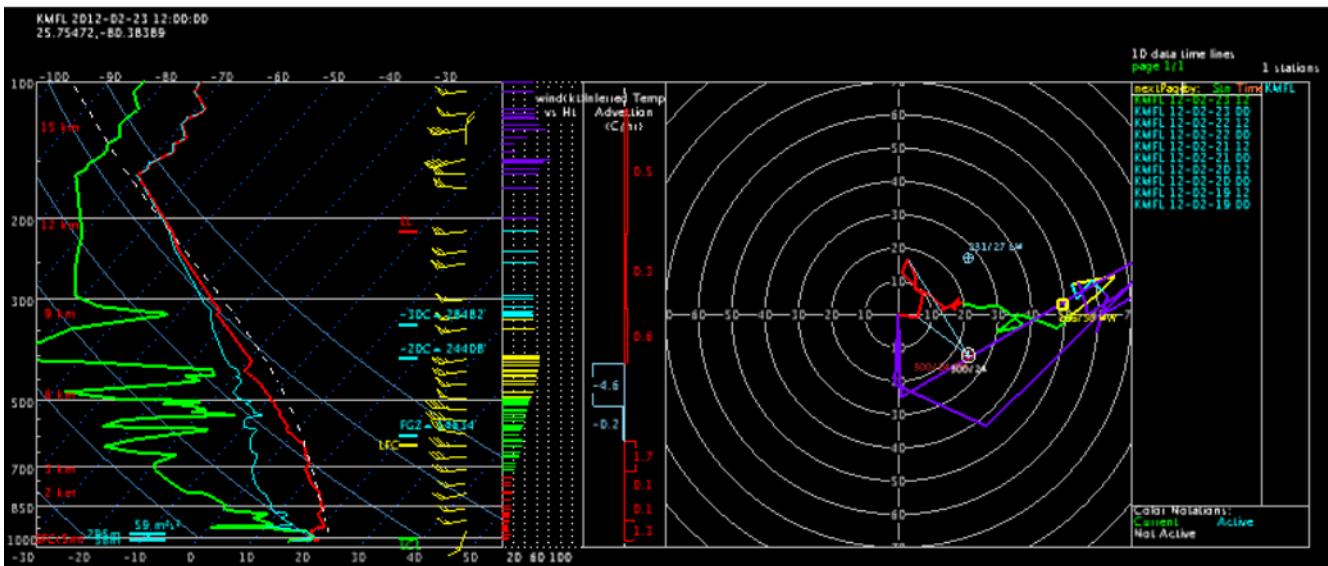
Ovrlay2(off)/Ovrlay2(on)

Ovrlay2(off)/Ovrlay2(on) works in conjunction with Compare2(off)/Compare2(on). Both cannot be **on** at the same time. If Ovrlay2(off) is displayed on the button, the Compare2(off) is shown on the other button. Toggling Ovrlay2(off) to Ovrlay2(on) grays-out the Compare2(off) button. Toggling to Ovrlay2(on) overlays the current and previous sounding data time traces on the skew-T diagram.

Compare2(off)/Compare2(on)

Compare2(off)/Compare2(on) works in conjunction with Overlay2(off)/Overlay2(on). Both cannot be **on** at the same time. If Compare2(off) is displayed on the button, the Overlay2(off) is shown on the other button. Toggling Compare2(off) to Compare2(on) grays-out the Overlay2(off) button. Toggling from Compare2(off) to Compare2(on) adds all the data times for all the active soundings to the skew-T and hodograph diagrams for comparing purposes, as shown in **Exhibit 7.2.2-6**.

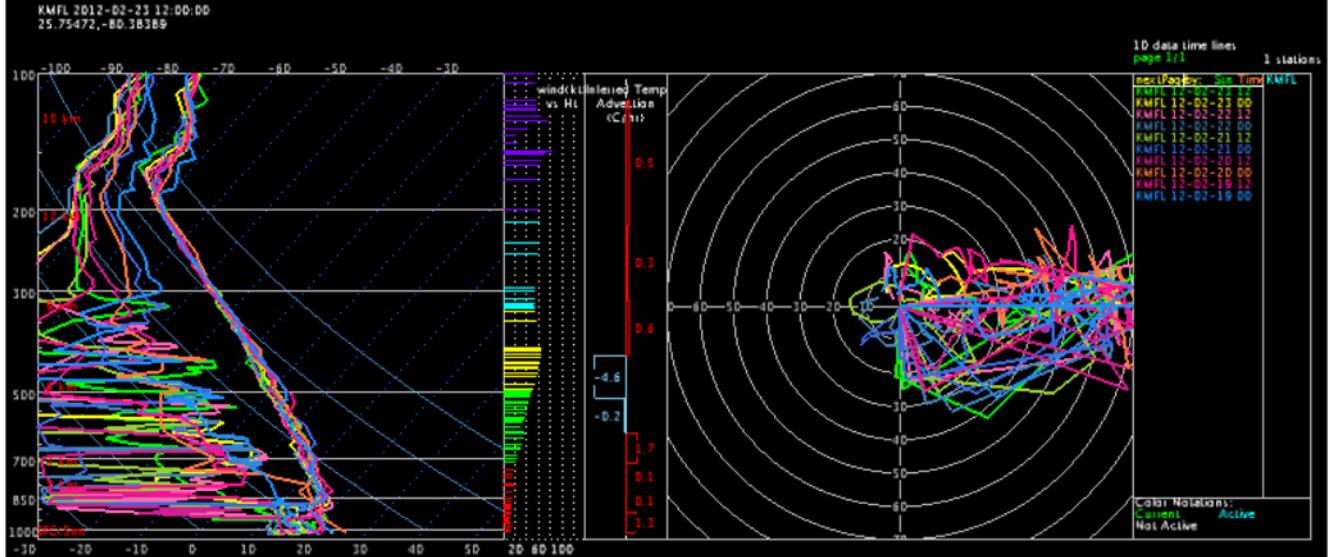
Compare2(off)



Compare2(on)

One Active Sounding

10 Data Time Lines



Compare2(on)

Two Active Soundings

2 Data Time Lines Each

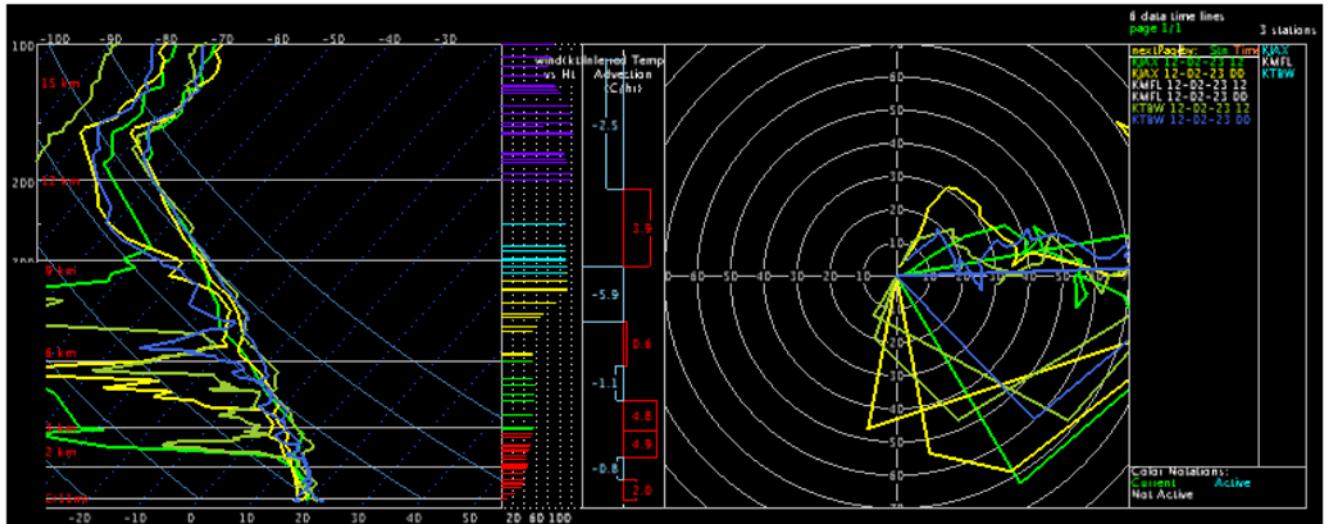
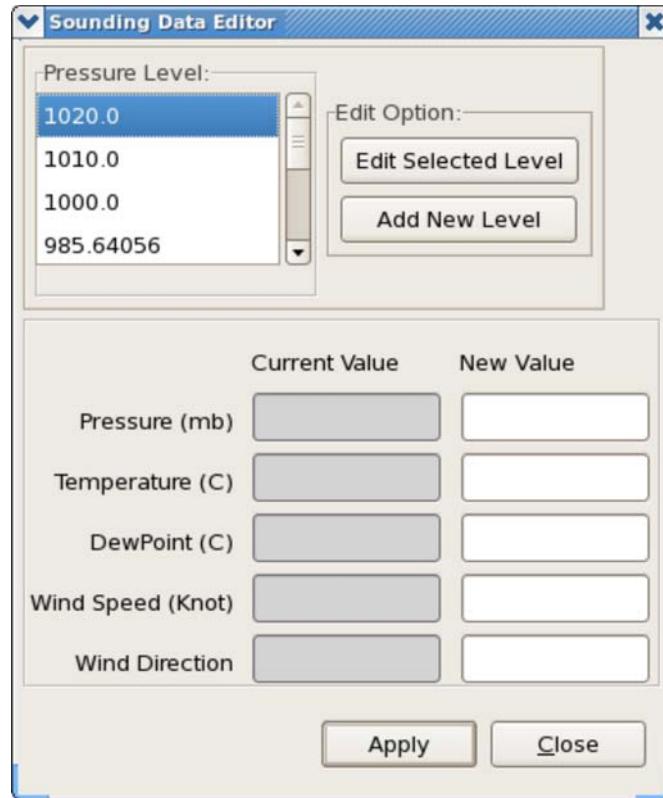


Exhibit 7.2.2-6. Changing from Compare2(off) to Compare2(on) Mode**Edit Data**

Selecting the Edit Data button opens the Sounding Data Editor dialog box, shown in **Exhibit 7.2.2-7**. The Sounding Data Editor dialog box allows you to change the values for atmospheric parameters.

**Exhibit 7.2.2-7. Sounding Data Editor Dialog Box****EditGraph(off)/EditGraph(on)**

Switching from EditGraph(off) to Edit Graph(on) makes the skew-T and hodograph diagrams interactive, as shown in **Exhibit 7.2.2-8**. When the diagrams are in Interactive Mode, the Edit Graph button should read EditGraph(on).

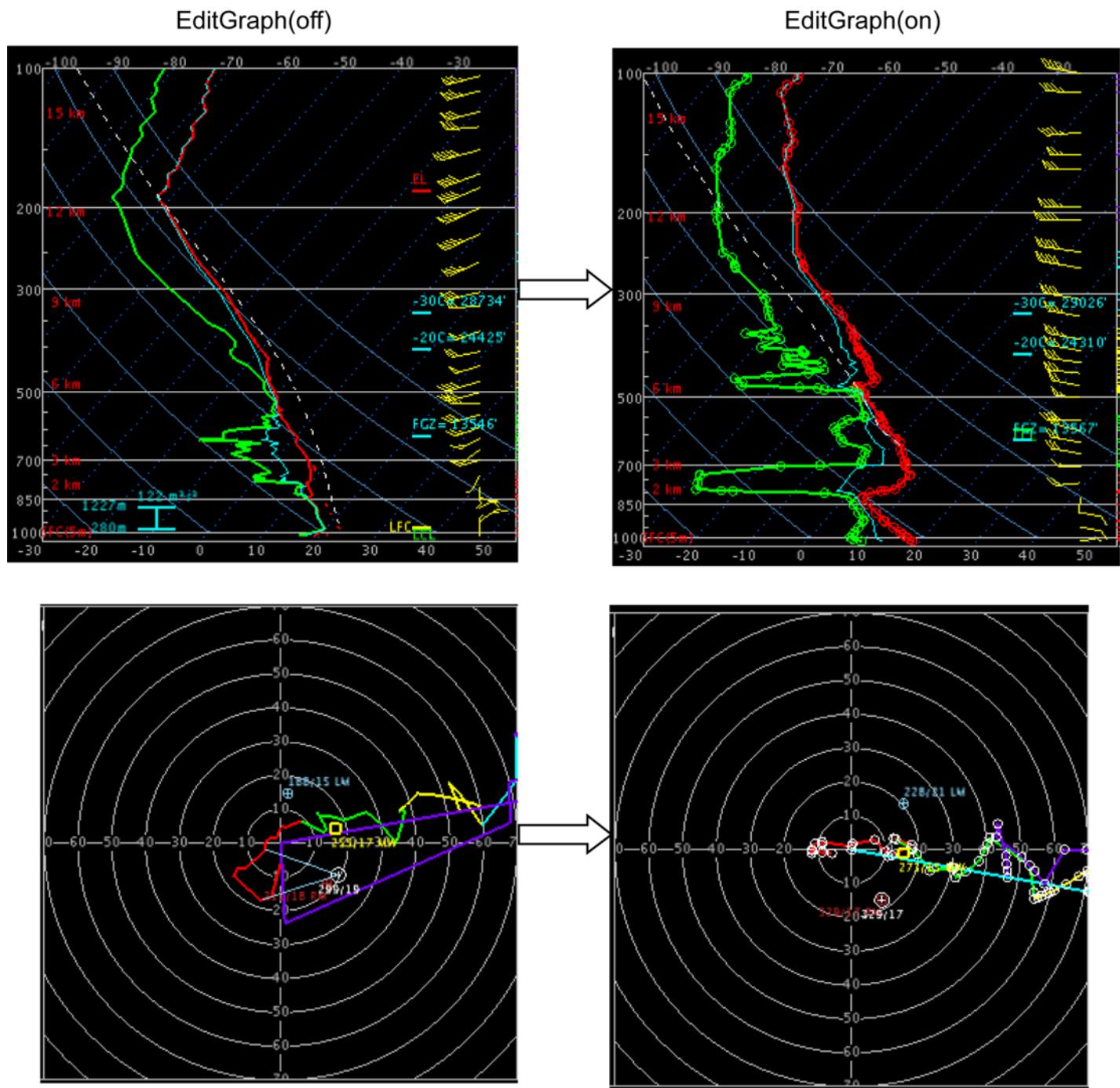


Exhibit 7.2.2-8. Changing from EditGraph(off) to Interactive EditGraph(on) Mode

Show Text

Selecting the Show Text button opens a non-editable Show Text window listing the parameter values for the active sounding for the current frame, as shown in **Exhibit 7.2.2-9**. Text values in the display will automatically be updated whenever the sounding profile is altered. Clicking the SAVE button in the text panel will output the data to a user-designated file in the current working directory.

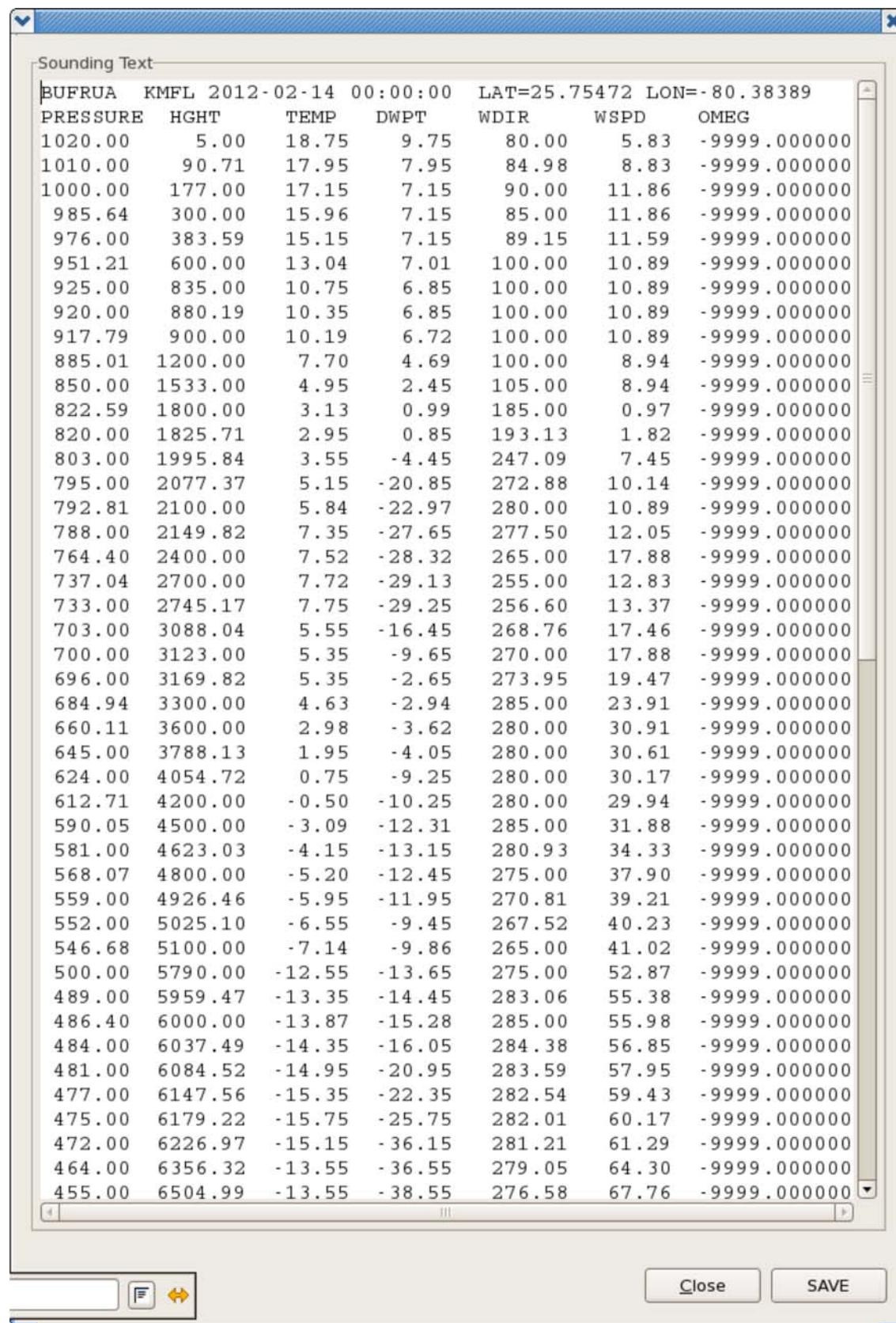


Exhibit 7.2.2-9. Show Text Window

Print

Selecting the Print button opens the Print dialog box, shown in **Exhibit 7.2.2-10**. From the dialog box, you can customize how you want to print the sounding and calculated values.

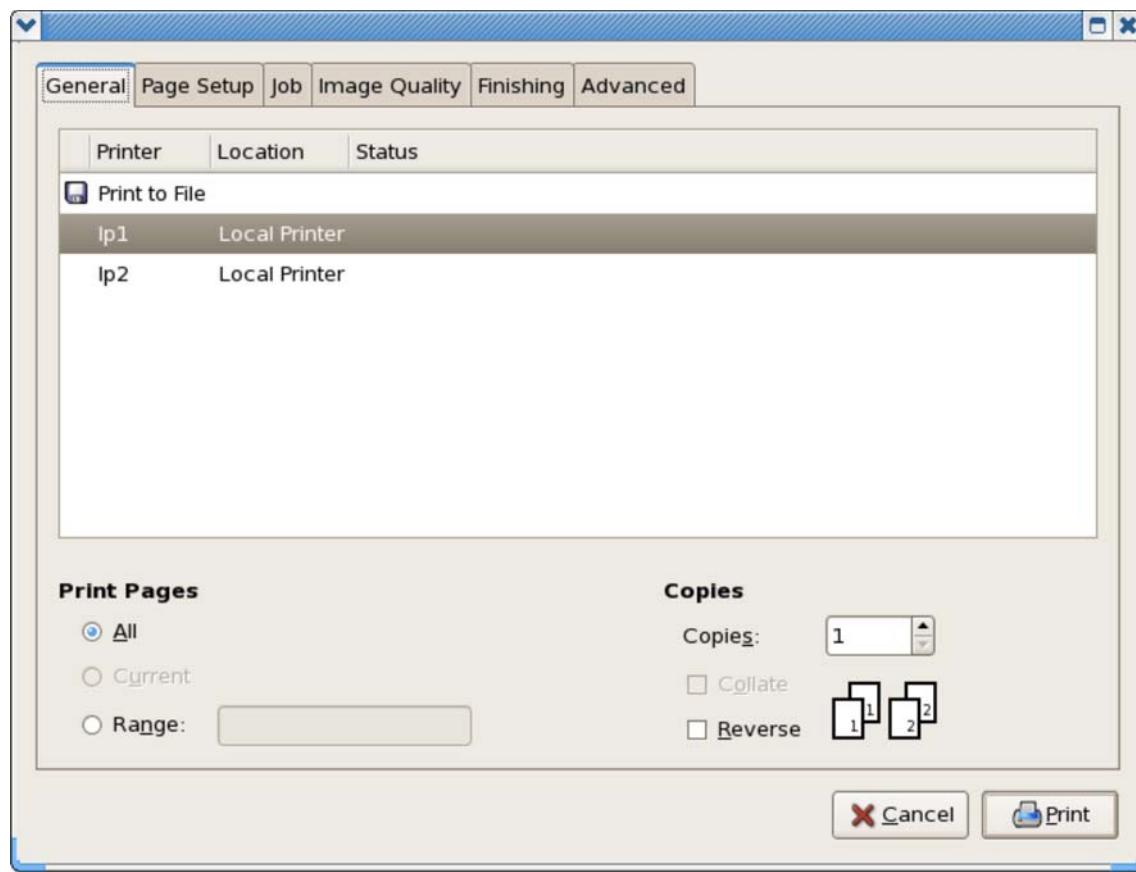


Exhibit 7.2.2-10. Print Dialog Box

7.3 Sampling and Editing Sounding Profiles on Skew-T and Hodograph Diagrams

The NsharpSkewt skew-T and hodograph diagrams use the same method for editing a sounding profile.

There are two ways to edit a sounding profile:

1. Enter values in the parameter dialog boxes accessed from the D2D NSHARP functions panel.
2. Interactively move or add data points on the temperature or dewpoint profiles.

Sampling Data

Move the mouse cursor (arrow) over the skew-T (or hodograph) diagram and observe the sampling data displayed on the diagram next to the cursor, as shown in **Exhibit 7.3-1**.

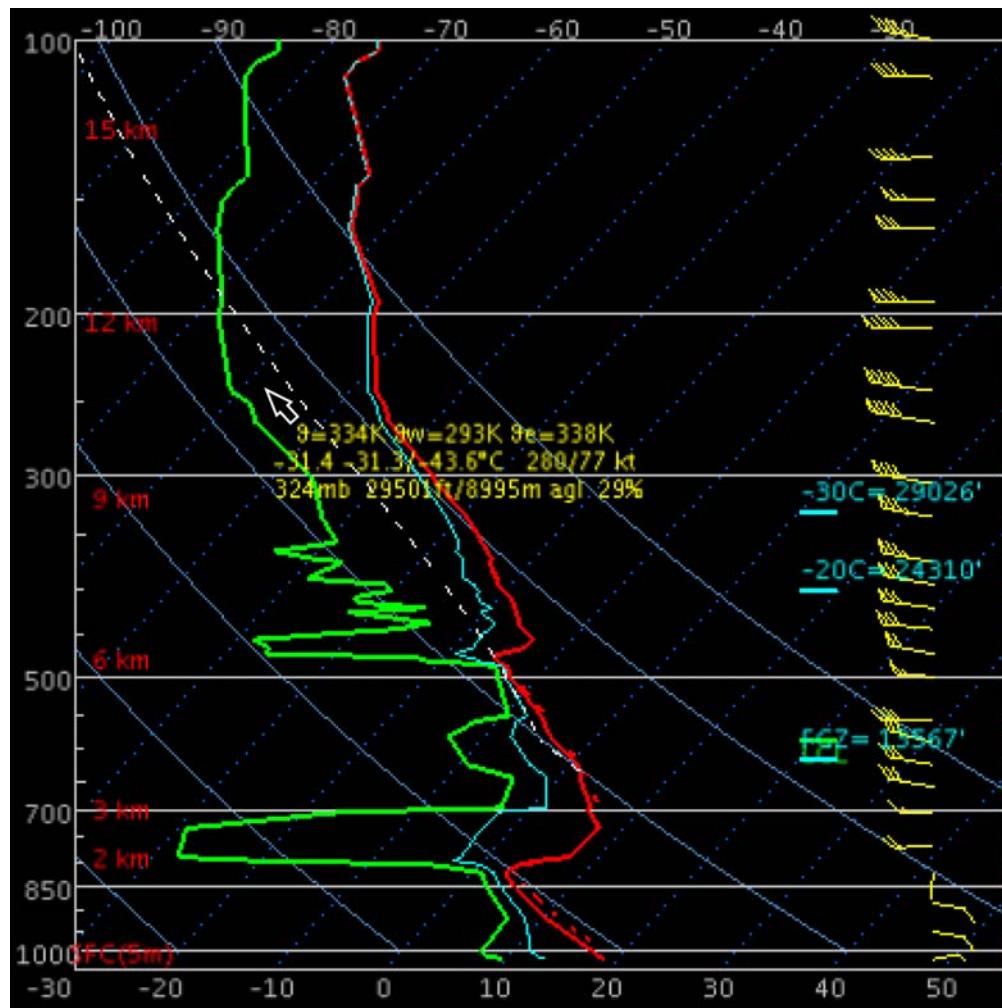


Exhibit 7.3-1. Skew-T Sampling Data

Note: Before you can edit a sounding, you need to make it editable by first making the sounding active, and then determining the editing method: changing the values (Edit Data button) or interactively moving

data points (EditGraph(on) button). Refer to [Section 7.2.2: D2D NSHARP Functions Panel](#) for a description of these buttons, and a view of the Edit Data dialog box if you choose to edit via this method.

Interactively Editing a Sounding Profile

Follow the procedures below to perform the interactive editing function.

1. **Select Edit Graph mode:** On the D2D NSHARP functions panel, switch EditGraph(off) to EditGraph(on).
2. **Enlarge the skew-T or hodograph diagram:** Use the zoom function to obtain a better view of the sounding profile. If you have a 2-button mouse with clickable scroll wheel, use either of the following two methods to enlarge the diagram. If you don't have a clickable scroll wheel, use the first method.
 - Position the mouse cursor (arrow) over the skew-T or hodograph diagram and press and hold mouse Button 3 to open the pop-up menu. Then select **Zoom ► 6.3X**, or any other zoom value from the list. You can then advance to the next highest value by incrementally clicking mouse Button 2 with the mouse cursor positioned over the diagram. To zoom back out, reopen the pop-up menu and select a lower zoom value.
 - Position the mouse cursor (arrow) over the skew-T or hodograph diagram and use the mouse Button 2 scroll wheel to zoom both in and out.
3. **Relocate a Point:** Move the mouse cursor (arrow) over a data point. Notice that, by pressing and holding mouse Button 1 on either the temperature or the dewpoint line, you can drag the point to a new position. Remember that the data point is constrained to maintain its original pressure. The software keeps the new temperature value but automatically keeps the point on the original pressure level. The software also prevents you from crossing the temperature and dewpoint profile lines.
4. **Add a Point:** Adding a point to the temperature or dewpoint line is simple. Place the mouse cursor (arrow) on the line. Then click on mouse Button 2 to create a new point. Pressing mouse Button 1 on that same point, you can drag it to a new location. You are constrained to stay within the two neighboring data points. Once you release mouse Button 1, the new point remains at the new location. If you add a new temperature point, a corresponding dewpoint value, interpolated from existing data points, appears on the dewpoint profile automatically. To remove a point from the sounding, click mouse Button 2 on a data point.
5. **Move a Profile:** Moving the entire temperature or dewpoint temperature profile is also simple. Move the mouse pointer over the profile; notice that the pointer changes to a finger-pointing hand. Press and hold mouse Button 1, and drag the mouse to move the entire line.

8.0 Radar Applications

The radar applications allow you to interact with the Open Radar Products Generator (ORPG) to schedule or request radar data collection, provide automated interpretations of data, and modify some of the radar display settings.

As you interact with the various radar applications, radar status messages appear on the AlertViz Status Bar. Please refer to the AWIPS II System Manager's Manual (SMM) for further information on these messages.

This chapter includes the following sections:

- [Section 8.1: Alert Request](#)
- [Section 8.2: RPS List Editor](#)
- [Section 8.3: One Time Request](#)
- [Section 8.4: Radar Multiple Request](#)
- [Section 8.5: System for Convection Analysis and Nowcasting \(SCAN\)](#)
- [Section 8.6: Flash Flood Monitoring and Prediction: Advanced \(FFMPA\)](#)
- [Section 8.7: System for Nowcasting Of Winter Weather \(SNOW\)](#)
- [Section 8.8: Four-dimensional Stormcell Investigator \(FSI\)](#)
- [Section 8.9: Radar Display Controls](#)
- [Section 8.10: Dual Polarization Radar Products](#)
- [Section 8.11: Practice Modules: Using the Radar Applications](#)



8.1 Alert Request

The Alert Request application lets you request special notifications from the RPG when certain radar-derived variables exceed user-specified thresholds. For example, you can specify a threshold of 50 decibels (dBZ) within a 15-mile Alert Area surrounding a major city. Then, an Alert Visualization message notifies you when the radar detects 50 dBZ echoes.

From the Alert Request dialog box, shown in **Exhibit 8.1-1**, you can select the desired radar, edit the Alert Area, and define the categories and thresholds for the Alert Request messages.

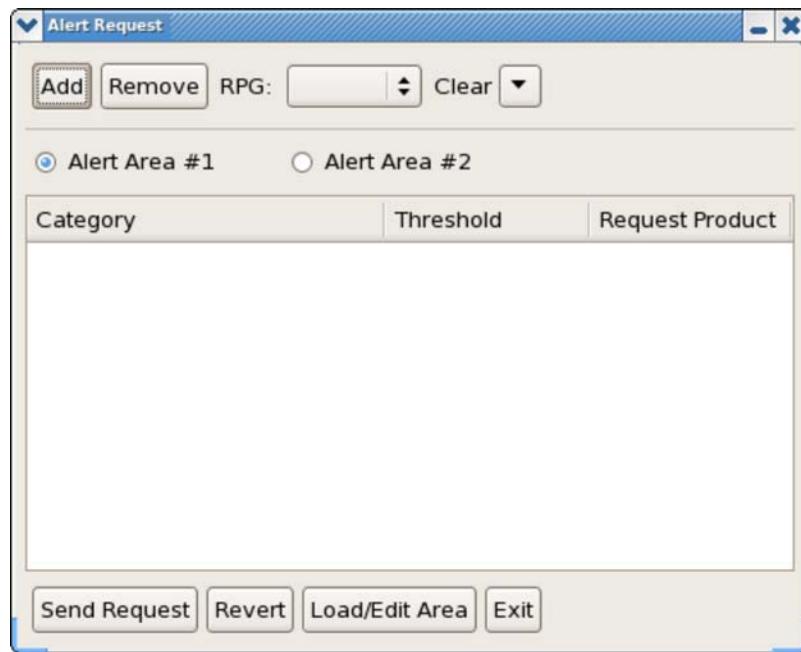


Exhibit 8.1-1. Alert Request Dialog Box

This dialog box is opened from the **Radar** menu or the **kxxx** menu and has the following options:

Add

The **Add** menu button on the Alert Request dialog box opens the Add Request Definitions dialog box.

This dialog box contains the following options.

- **Category:** This option lists available Alert Adaptation Parameters.
- **Threshold:** This option lists Threshold Codes that can be set to flag the desired data. The threshold options vary depending on the category chosen.
- **Request Product:** This option tells the RPG whether to generate a product (image or graphic) when the threshold is exceeded. The product depends on the category in question.

Remove

This menu button removes a selected radar product from the Alert Request list.

RPG

This options menu opens a list of available RPGs. You can send a request to only one RPG at a time. There are two Alert Areas for each radar. When a new RPG is selected, the main D2D display pane is cleared and the Alert Area and category/threshold settings for that RPG are displayed.

Clear

This menu contains options to clear products or Alert Areas for the currently selected RPG and Alert Area, or to clear globally. A Global Clear operation clears all product and Alert Area settings for all radars.

Alert Area #1 and #2

These radio buttons are used to toggle on an Alert Area. Once you select an area, it is displayed in the large pane, and the category/threshold settings for that area are displayed in the Alert Request dialog box.

Send Request

This menu button submits the alert request to the selected RPG and saves the current Alert Area and threshold settings.

Status messages appear on the AlertViz Status Bar to notify you that your request was sent. When the radar detects your specified thresholds, an Alert Visualization message automatically appears on the display.

Revert

The Revert menu button opens the Revert dialog box, which confirms your intent to restore the previous Alert Areas and category and threshold settings to the display. When you select **OK**, the display clears and the previously saved Alert Areas and category/threshold settings are restored and displayed.

Load/Edit Area

This menu button displays either Alert Area #1 or Alert Area #2, whichever radio button is selected. Once an Alert Area is displayed, you can modify it using the following information.

- **Editing the Alert Area:** Editing the Alert Area involves the use of the pop-up menu over the large display pane. (Refer to [Section 2.1.8](#) for more information on pop-up menus.)

Once you have displayed Alert Area #1 or Alert Area #2, the legend indicates whether the graphic is editable. Clicking mouse Button 2 on the legend makes the selected area editable. Pressing and holding mouse Button 3 over the display opens the pop-up menu. In addition to the commonly available options, the options specifically added for Alert Area editing are **Select Location** and **Select Area**.

- **Select Location:** This option places an alert cell, as shown in **Exhibit 8.1-2**, at the cursor location.

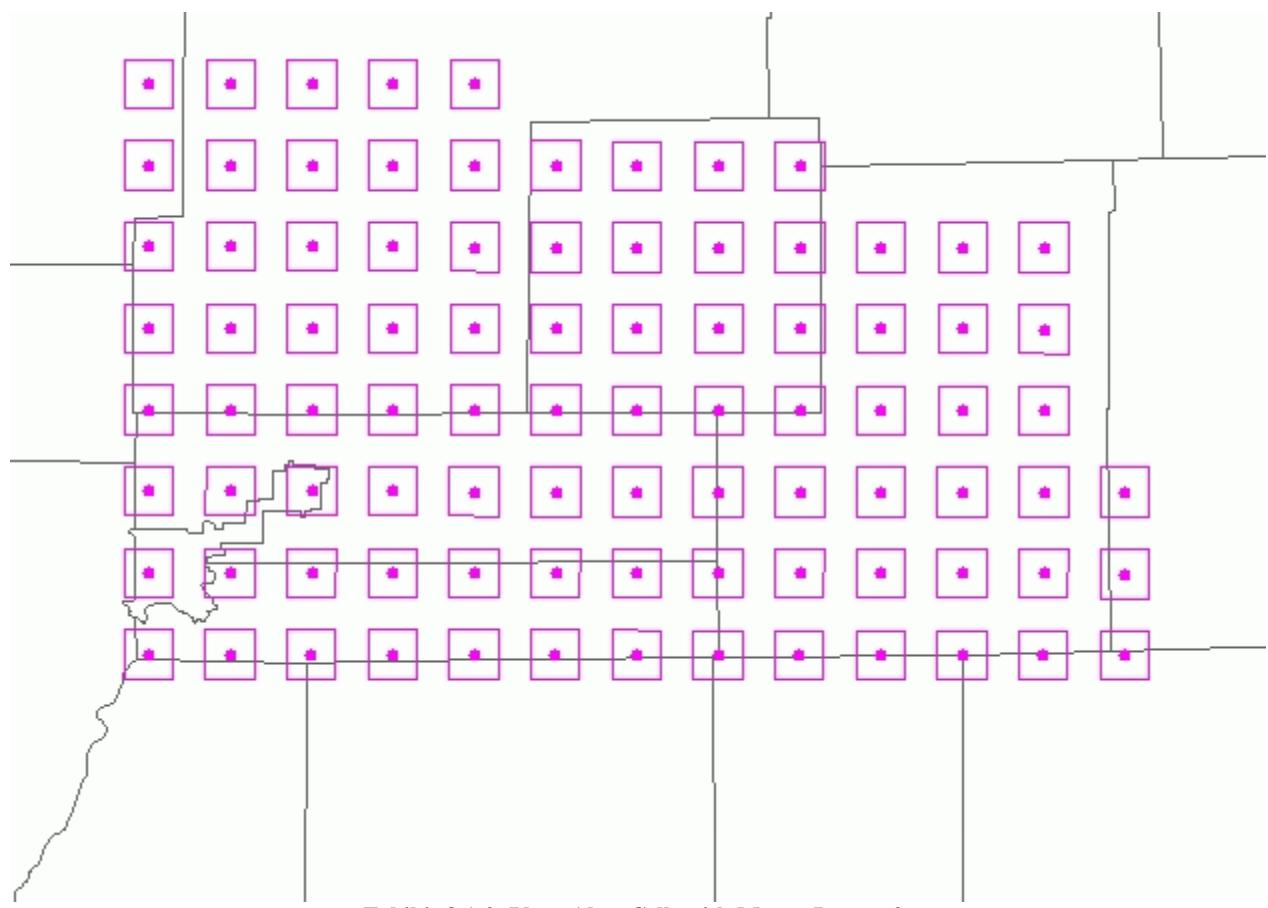


Exhibit 8.1-2. Place Alert Cells with Mouse Button 3

Clicking mouse Button 3 in the large display pane places alert cells over the graphic at the location of the mouse pointer. To remove cells, click mouse Button 3 over the cells you wish to remove.

- **Select Area:** The Select Area menu option allows you to choose an area using a Stretch Rectangle tool (responds like a stretch "rubberband" tool), as shown in **Exhibit 8.1-3**, that is activated from a pop-up menu. The rectangle automatically fills in or clears alert cells, depending on whether the initial selection point is empty or has a dot in it.

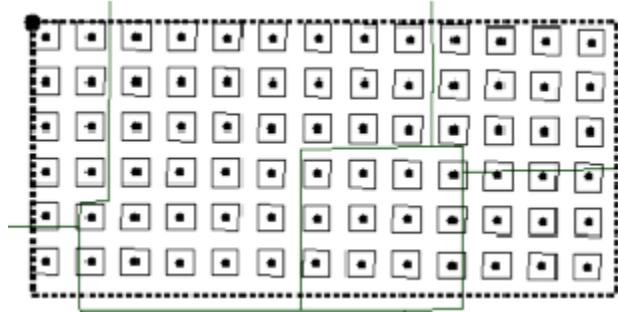


Exhibit 8.1-3. Select Alert Area with Stretch Rectangle Tool

Note: Another way to select an area is by pressing and holding the Shift Key on the Keyboard while pressing mouse Button 3 to obtain the Stretch Rectangle tool.

Exit is the menu button that closes the Alert Request dialog box. If you have not sent a request, a Warning dialog box appears and gives you the options to cancel and return to the editor, save before exiting, revert before exiting, or send a request and save the settings before exiting.

8.2 RPS List Editor

The primary function of the RPS List Editor is to create or edit a list of radar products (up to 50 for a 56 Kbps line, up to 31 for a 14.4-Kbps line, up to 20 for a 9.6-Kbps line) and send the list to a WSR-88D RPG for display in the next radar Volume Scan(s). The RPS List Editor is accessed from the D2D Radar menu, as shown in **Exhibit 8.2-1**.

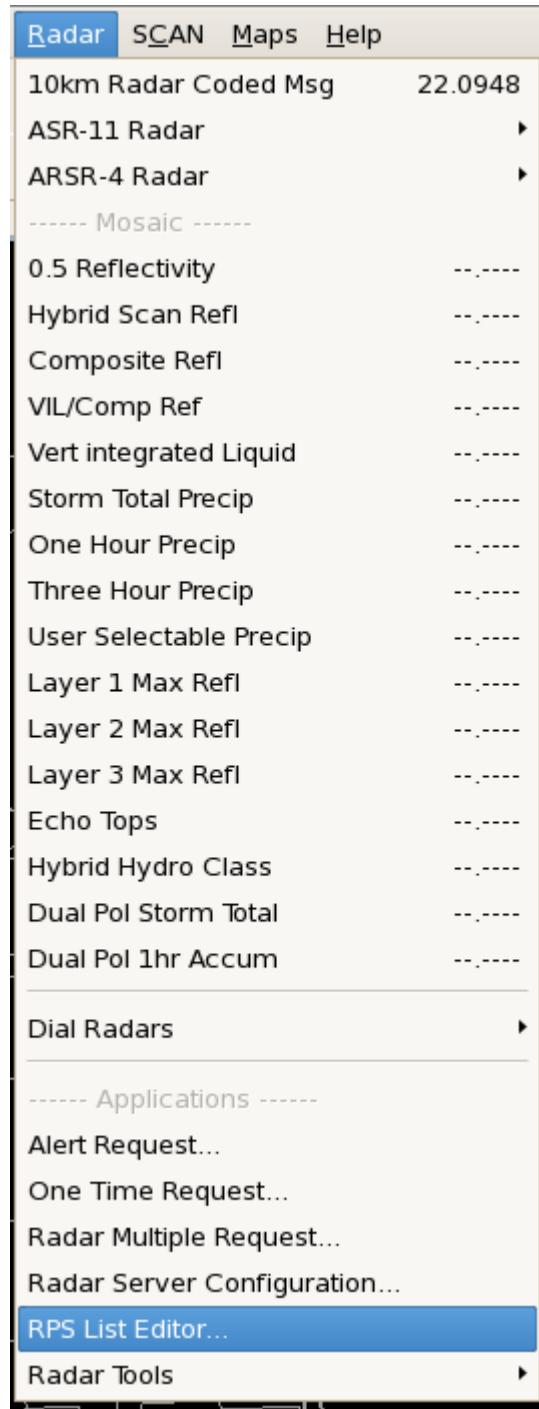


Exhibit 8.2-1. RPS List Editor Option on Radar Menu

Exhibit 8.2-2 shows the RPS List Editor dialog box as it appears when initially opened. The RPS List Editor lets you view current RPS lists, open other lists, create new lists, and edit existing lists. For sites with more than one radar, you need to select an RPG using the Select an RPG dialog box (see the discussion of the RPS List Editor "View" option in this section).



Exhibit 8.2-2. RPS List Editor Dialog Box

File

The **File** menu contains the following options:

- **New....:** This menu option lets you open a new RPS list.
- **Open....:** This menu option opens a list of previously built RPS lists. Choose one from the list or type the filename in the command line.
- **Save/Save as....:** This option saves the current RPS list. If it is a newly created RPS list, a Save As dialog box appears, where you can type a new name.
- **Delete....:** This option opens a list of previously built RPS lists, from which you can delete a specific list.
- **Exit:** This option closes the RPS List Editor dialog box.

List

The **List** menu, as shown in **Exhibit 8.2-3** contains the following options.

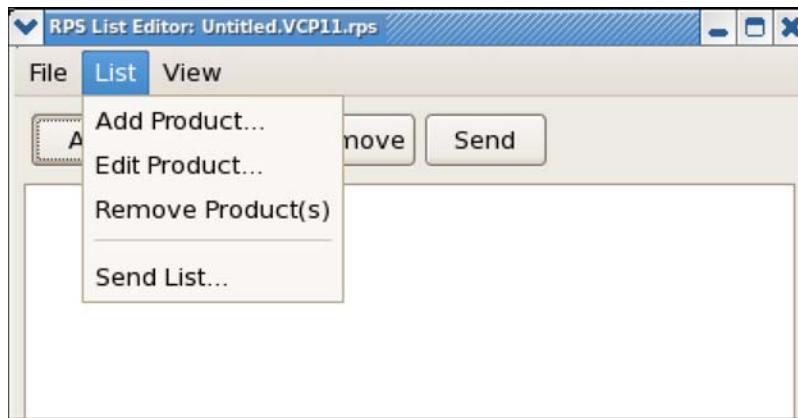


Exhibit 8.2-3. RPS List Editor List Pull-down Menu

- **Add product...:** This option opens the Add Product dialog box (see the discussion of the RPS List Editor "Add" option in this section).
- **Edit product...:** This option allows you to edit the selected product. (A selected product is one you have highlighted by clicking on its name in the list.)
- **Remove product:** This option removes the selected product.
- **Send list...:** This option allows you to send the displayed RPS list to an RPG.

View

The **View** menu, as shown in **Exhibit 8.2-4**, contains the following options.

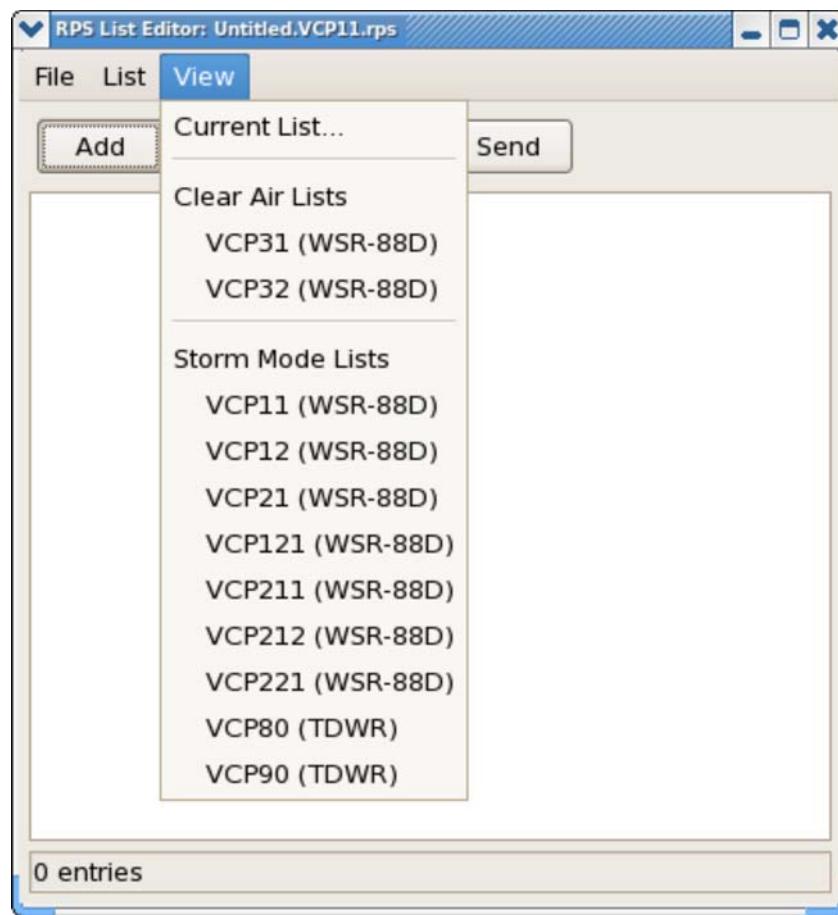


Exhibit 8.2-4. RPS List Editor View Pull-down Menu

- **Current List:** This menu option displays the RPS list that is currently being used by the RPG. Most offices can view lists from associated radars that are included in the Select an RPG dialog box.
- **Clear Air Lists:** This menu option displays RPS lists that contain products used in Clear Air Mode. Once you select one of these lists, the Select an RPG dialog box appears. From this dialog box, you choose the desired radar.
- **Storm Mode Lists:** This menu option displays RPS lists that contain products used in Storm Mode. When selected, the Select an RPG dialog box appears. From it you choose the desired radar.

Add

Selecting the Add button brings up the Add Product dialog box.

This dialog box presents you with a list of products that may be added to the RPS list, along with relevant parameters. For example, if you add a reflectivity product to the list, you are also asked to select elevation angle, data levels, and resolution.

Note 1: For Super Res products, there is only one choice of data levels and resolution, so you are not asked for those.

Edit

This option allows you to edit a product selected from the RPS list. This dialog box behaves in the same manner as the Add Product dialog box.

Remove

This option removes a selected product from the RPS list.

Send

Once you have created or edited an RPS list, you send it to the RPG by clicking on the Send button. A dialog box appears, asking you to select the RPG you want to send the list to (that is, which radar).

Note 2: The RPS list that you send may be modified to meet the requirements for Central Radar Collection. Verify your RPS by viewing the current list. You may need to edit your list to ensure the highest priority products are present.

8.3 One Time Request

The One Time Request (OTR) application enables you to specify a nonroutine radar product (image or graphic) and send a request message to the RPG to generate this product for up to nine Volume Scans. It is through this application that you can generate radar cross sections. You must specify which RPG is to receive the request, and specify the relevant parameters of the desired product. Then you send the request message to the radar.

A message appears in the Radar portion of your Alert Visualization Popup Message Dialog window indicating that your requested product has been sent by the RPG.

The One Time Request dialog box, as shown in **Exhibit 8.3-1**, includes several options. A description of each follows the exhibit.

Note: **Exhibit 8.3-1** is valid for reflectivity. Different products will bring up other options.

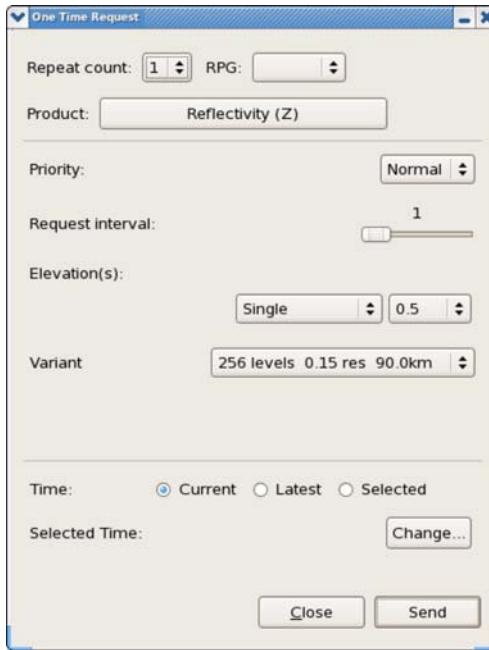


Exhibit 8.3-1. One Time Request Dialog Box

Repeat count:

This menu button opens a list, numbered 1 through 9, which tells the RPG how many upcoming Volume Scans should include the newly added radar product.

RPG:

This menu button opens a list of RPGs. You may send a request to only one RPG at a time. If you wish to send a request to multiple RPGs, use the RMR application, which is covered in [Section 8.4](#).

Product:

This menu button opens a list of radar products, as shown in **Exhibit 8.3-2**. The radar products listed here should be familiar to WSR-88D users. Each product has certain parameters that you must specify in your request. Once you select a product, the One Time Request dialog box adjusts to make these parameters available.

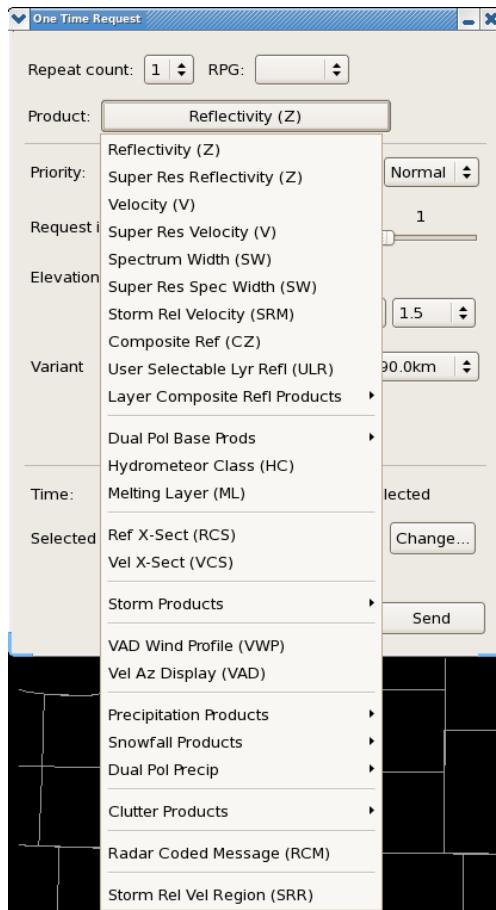


Exhibit 8.3-2. Radar Products

Priority:

This menu button allows you to select a normal or high priority for the request. The button is not available for nonassociated RPGs.

Request interval:

This slider bar contains a range of numbers. Each number represents an interval of Volume Scans that can be selected. For example, a "3" indicates that you wish to have your requested radar product generated every third Volume Scan.

Elevation(s):

Elevation(s) includes two drop-down list boxes for specifying elevation angles, as shown in **Exhibit 8.3-3**.



Exhibit 8.3-3. Elevation(s) List of Options

Variant:

This menu button opens a list of data levels and associated radar data resolutions/kilometers, as shown in **Exhibit 8.3-4**.



Exhibit 8.3-4. Variant List of Options

Time:

There are three time settings that let you request and view older radar data. The product is generated by the RPG from stored raw data.

- **Current:** The requested product will be from the most recent (real time) Volume Scan.
- **Latest:** The requested product will be from the latest Volume Scan, whether the data are current or archived.
- **Selected:** This radio button activates the Change... button for opening the Set Time dialog box.

Change...:

This button opens the Set Time dialog box, as shown in **Exhibit 8.3-5**, where you can either set the current real time or change the time, which lets you access radar data from earlier Volume Scans.

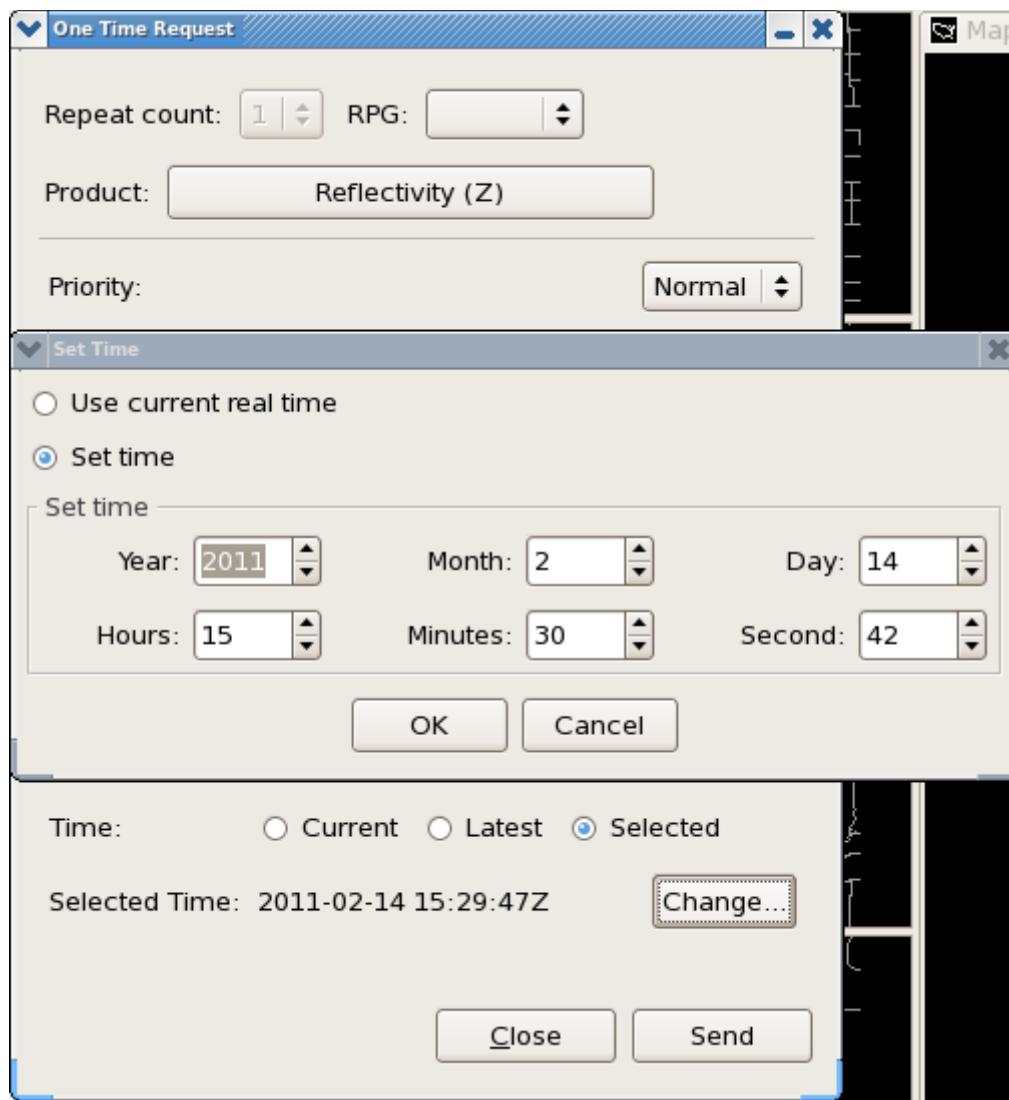


Exhibit 8.3-5. Set Time Dialog Box with Set time Radio Button Selected

Close

This button closes the One Time Request dialog box.

Send

This button sends the requested products message to the RPG.

8.4 Radar Multiple Request

The Radar Multiple Request (RMR) application allows you to specify up to eight consecutive hours of automatic non-routine radar product requests from dedicated and/or dial-out radars. Not only are you able to obtain and view non-routine radar products from various RPGs with this application, but you can also use these data to generate Radar Mosaics. Refer to [Section 8.12, Objective 26.4](#), for details on generating a Radar Mosaic.

The RMR dialog box, as shown in **Exhibit 8.4-1**, is divided into two parts: Existing Requests, described in [Section 8.4.1](#); and Active Requests, described in [Section 8.4.2](#).

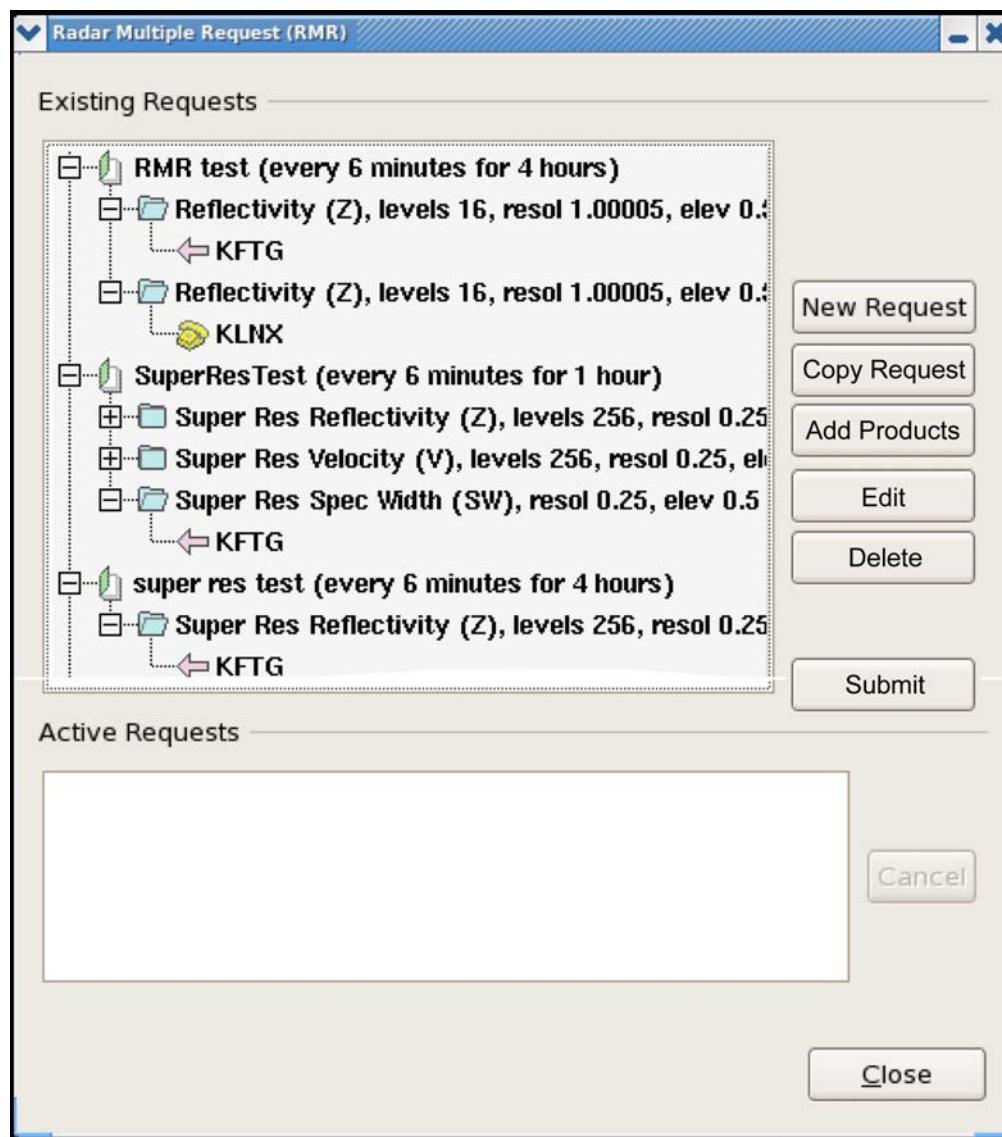


Exhibit 8.4-1. Radar Multiple Request (RMR) Dialog Box

8.4.1 Existing Requests

Once products have been requested, this area of the Radar Multiple Request dialog box contains a tree-view listing of the existing RMR. (This area is empty if no radar products have been chosen.) The request name is denoted with a book symbol. Click on the "+" symbol next to the request name to expand the tree-view and view the contents of the request. If a request has a red "X" through the book symbol, it means that the request is poorly formed. That is, the request is missing either an RPG or a product, making it unable to work properly.

Each radar product within a request is denoted with a folder symbol. Click on the "+" symbol next to the radar product name to reveal the list of RPGs from which the product is sent. The phone symbol next to an RPG denotes a dial-out radar, while an arrow denotes a dedicated radar. Click on the "-" symbol next to each product or request name to close the expanded tree-view listings.

New Request

This button opens the Edit Request dialog box, as shown in **Exhibit 8.4.1-1**. Both new requests and edited requests use the same dialog box. It contains options for selecting and requesting a radar product from one or more RPGs.

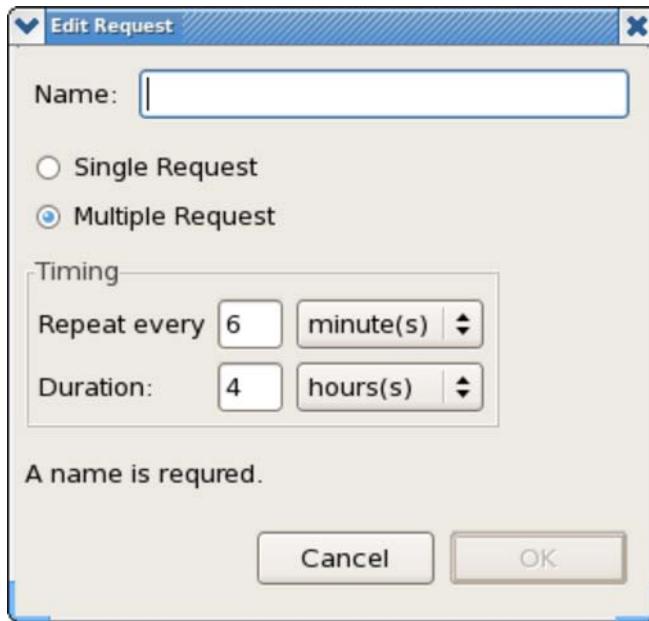


Exhibit 8.4.1-1. Edit Request Dialog Box for New Requests

The Edit Request dialog box has the following options (the Existing Request section of the RMR dialog box also contains these options):

- **Name:** In this entry line you can type a unique name to identify your radar request.
- **Single Request:** This radio button limits the radar request to one product retrieval.
- **Multiple Request:** Choose this radio button if you want to repeat a radar product request.
- **Repeat every:** You can choose the update frequency of your product request by using the

minute(s)/hour(s) option menus, or by typing the time interval in the entry boxes.

- **Duration:** Within these entry boxes you can choose up to 8 hours of consecutive requests.
- **Cancel:** This menu button closes the New Request dialog box without initiating any requests.
- **OK:** This button acknowledges the entry you have made, closes the New Request dialog box, and immediately opens the Add Products dialog box.

Copy Request

This button opens the Copy Request dialog box, which allows you to copy the existing highlighted request and give it a new name in the entry line provided. This button is disabled if nothing is currently selected in the tree view.

Add Products

This button opens the Add Products dialog box. This button is disabled if nothing is currently selected in the tree view.

The Add Products dialog box has the following options:

- **Dial-out RPGs:** This is a list of available dial-out radars. Click mouse Button 1 on the desired RPGs.
- **Dedicated RPGs:** This is a list of available dedicated radars. Click mouse Button 1 on the desired RPGs.
- **Product:** This option contains a list of radar-generated products that should be familiar to WSR-88D users. Each product has certain parameters to specify in your request.
- **Request Interval: (1-9)**
- **Add:** This button adds the selected products to your request. The Add Products dialog box remains open when you add a product so you may add multiple products without having to reopen it each time.
- **Close:** This button closes the Add Products dialog box.

Note 1: The contents of the Add Products dialog box vary depending upon the products. Possible options and parameters are listed as follows:

1. Elevation Angle (0.5-19.5 degrees)	7. Contour Interval (2,000 - 30,000 ft)
2. Data Levels (8 or 16)	8. Altitude (0-70 thousand feet [kft])
3. Resolution (1, 2, or 4 km)	9. End Hour and Time Span
4. Speed	10. Channel Map
5. Dir	11. Elevation Segment Number
6. Layer	

Edit

This button is context sensitive. That is, what you edit depends upon what you select in the tree view. If you

highlight a request and press the Edit button, the Edit Request dialog box, shown in **Exhibit 8.4.1-1** opens (refer to the descriptions listed above under New Request).

Note 2: If a product or RPG is highlighted in the tree view, selecting the Edit button opens the Edit Product dialog box, which is similar to the Add Product dialog box except that it has **OK** and **Cancel** buttons instead of **Add** and **Close** buttons. This allows you to edit the products or RPGs that were selected in the tree view.

Delete

This button is also context sensitive. What it deletes depends on what is highlighted in the tree view.

- If a request is highlighted and you select the Delete button, a Confirmation dialog box appears to confirm your decision to delete the request.
- If a product within a request is highlighted when you select the Delete button, a Confirmation dialog box appears to confirm your decision to delete the product within the request.
- If an RPG is highlighted in the tree view when you select the Delete button, the RPG is removed from the request.

Submit

This button makes a highlighted request active. This button is enabled only if a request containing at least one product is highlighted in the tree view. Observe the AlertViz Status Bar at the bottom of the CAVE-D2D display for messages on your request.

8.4.2 Active Requests

The Active Requests area of the Radar Multiple Request (RMR) dialog box contains a tree-view listing of the radar product requests that are currently running (see [Exhibit 8.4-1](#)). There are two options associated with this dialog box.

- **Cancel:** The Cancel menu button deactivates the highlighted active request. This button is disabled if a request is not selected in the Active Requests Tree View.
 - **Close:** The Close menu button closes the RMR dialog box.
-

8.5 System for Convection Analysis and Nowcasting (SCAN)

The System for Convection Analysis and Nowcasting (SCAN) is an integrated suite of multi-sensor applications that detects, analyzes, and monitors convection and automatically generates short-term, probabilistic forecast and warning guidance for severe weather. SCAN provides forecasters with severe weather guidance and supplements forecaster event monitoring with multi-sensor, automated event monitoring. The intended benefits are listed below.

- Longer lead times on warned events
- Fewer missed events
- Increased forecaster situational awareness
- Reduced forecaster fatigue during warning situations

The SCAN submenu, shown in **Exhibit 8.5-1**, is accessible from the CAVE-D2D Menu Bar.

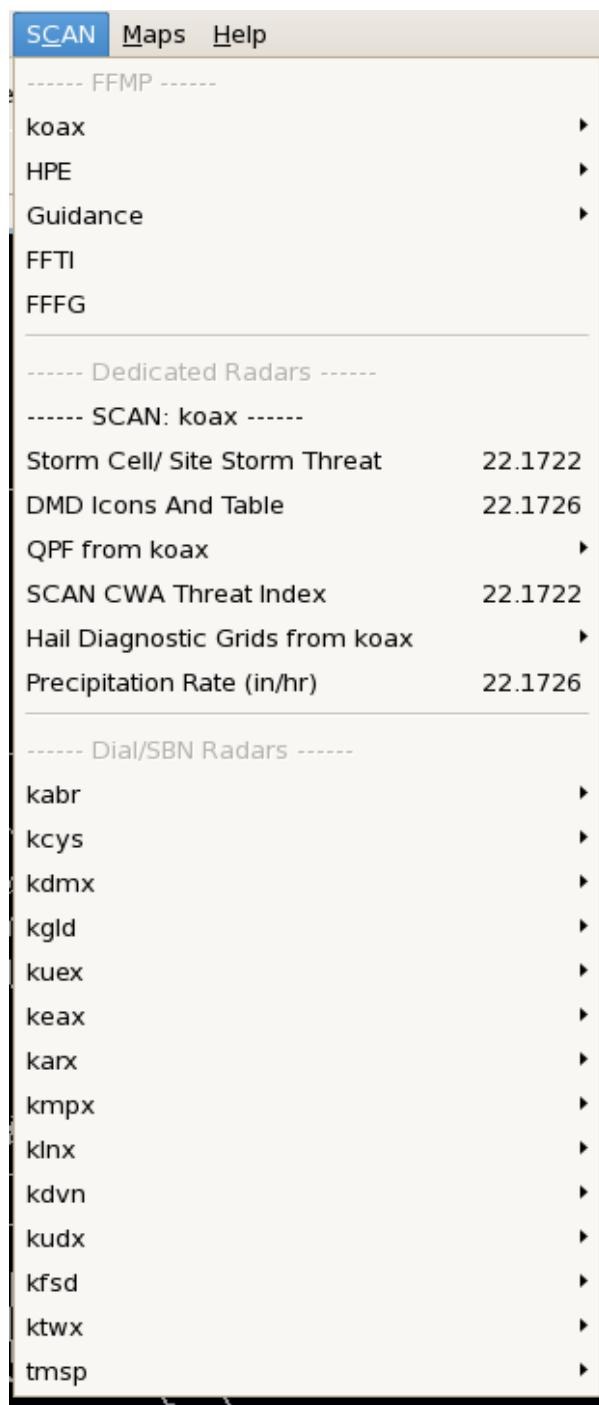


Exhibit 8.5-1. SCAN Submenu

The Digital Mesocyclone Detection (DMD) display is very similar to SCAN's Storm Cell display. The DMD is accessed from the SCAN submenu.



Refer to the separate **SCAN Guide for Users** for more information by clicking on the book symbol.



Refer to the separate **DMD Guide for Users** for more information by clicking on the book symbol.

8.6 Flash Flood Monitoring and Prediction: Advanced (FFMPA)

The Flash Flood Monitoring and Prediction: Advanced (FFMPA) system is an integrated suite of multi-sensor applications that detects, analyzes, and monitors precipitation and automatically generates short-term warning guidance for flash flooding. FFMPA provides forecasters with accurate, timely, and consistent guidance and supplements forecaster event monitoring with multi-sensor, automated event monitoring. The intended benefits are listed below.

- Longer lead times on warned events
- Fewer missed events
- Increased forecaster situational awareness
- Reduced forecaster fatigue during warning situations

Note: County values are calculated by determining the maximum value of all of the basins within that county, except for Flash Flood Guidance (FFG), which is averaged for all basins within that county. Refer to [**Exhibit 8.5-1**](#) for FFMP options under the SCAN menu.



Refer to the separate **FFMPA Guide for Users** for more information by clicking on the book symbol.

8.6.1 Forced Flash Flood Guidance (FFFG) Graphical User Interface

One of the basic inputs to Flash Flood Monitoring and Prediction (FFMP) is Flash Flood Guidance (FFG), which is issued by the nation's River Forecast Centers (RFC). Unfortunately, in some instances the FFG issued by the RFC is not valid, or it is no longer representative of true conditions. In addition, there are also areas of the country for which no RFC issues FFGs.

The **Forced** Flash Flood Guidance (FFFG) GUI provides NWS forecasters with a method to for obtaining their own FFG values (hence the word "Forced") for use in FFMP. Whether used for the purposes of filling a void left by the RFC, accommodating urban areas or fire scars, or perhaps handling antecedent precipitation, FFFG will enhance FFMP's ability to monitor your County Warning Area (CWA) for flash flood potential.



Refer to the separate **FFFG Guide for Users** for more information by clicking on the book symbol.

8.7 System for Nowcasting Of Winter Weather (SNOW)

The System for Nowcasting Of Winter Weather (SNOW) is an AWIPS application suite that continuously monitors surface observations for winter weather hazards and automatically alerts the forecasters whenever such conditions are detected. SNOW provides capabilities to display observed winter weather threats in ways that help forecasters focus on what they consider most important. This application's design was based on the SAFESEAS tool running at maritime WFOs, so users of SAFESEAS will find SNOW familiar.

SNOW contains the following monitoring/display components:

- SNOW Monitor
- SNOW CAVE Plan-view Plots
- SNOW Tabular Displays: Zone/Station and Trend Plot

The editor for the SNOW monitoring area is launched from the AWIPS start-up menu. At the bottom of the AWIPS start-up menu, click **SNOW Apps** to configure the SNOW application, by selecting Configure Monitor Area or Configure Thresholds for Guardian Monitoring, as shown in **Exhibit 8.7-1**.

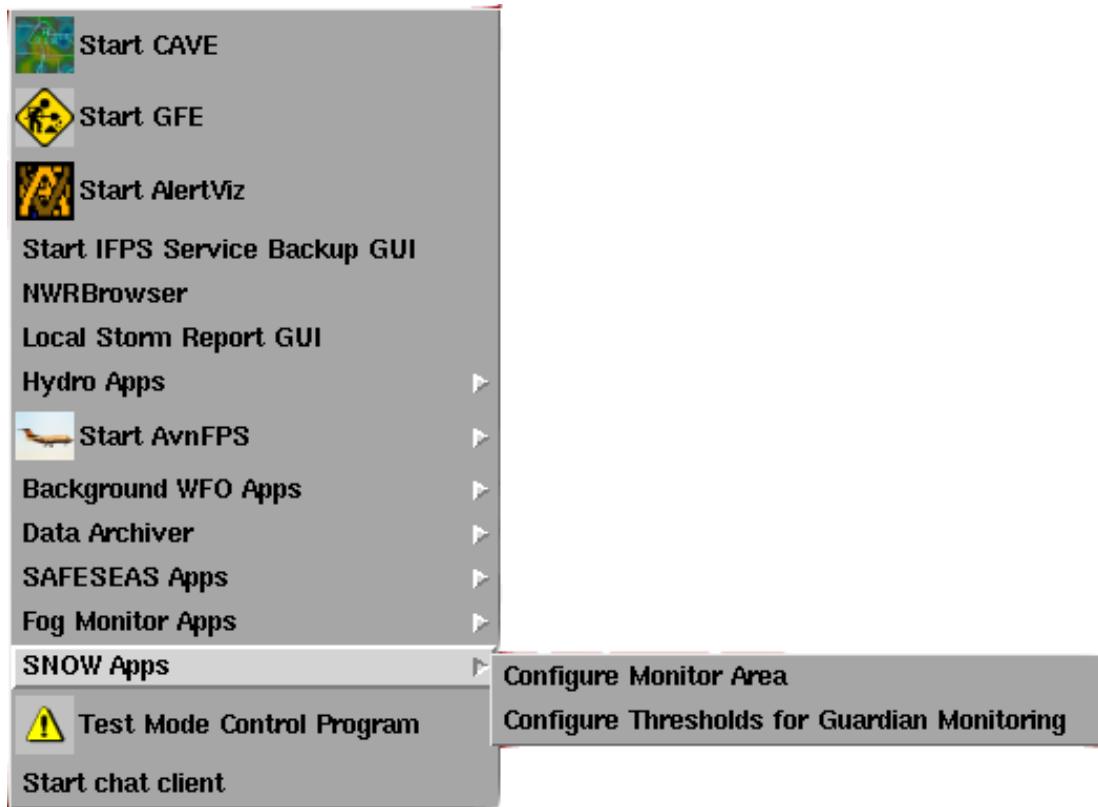


Exhibit 8.7-1. Accessing SNOW Application from AWIPS Start-up Menu

The Configure Monitor Area option starts the editor for the SNOW monitoring area. There are two modes for editing the monitoring area: Zone mode and Station mode. In the Zone mode, you specify which zones/counties are in the monitoring area, and then associate observing stations with the zones/counties. In the Station mode, you specify which stations are in the monitoring area and then associate zones and counties

with the stations. The edit mode is selected via the **Zone** and **Station** buttons in the Configure area, which is near the upper left corner of the SNOW Configure Monitor Area Set Up Data window.

The Configure Thresholds for Guardian Monitoring option starts the editor for the SNOW monitoring area thresholds. The SNOW monitor compares observation values (within the user-specific time window) against thresholds for alert levels to determine a single, overall threat level for the entire monitoring area. The most severe individual observation value threat level becomes the threat level for the entire monitoring area. The thresholds for the alert levels are both variable- and zone/county-specific. The editor for the monitor thresholds allows each site to customize the thresholds. The thresholds include wind speed, gust speed, peak wind, temperature, visibility, and snow depth. The Meteo tab is useful in the display thresholds interface but has no function in this monitor interface.

The SNOW application is accessed from Obs Menu on the CAVE-D2D Perspective, as shown in **Exhibit 8.7-2**. You can also configure SNOW from the Obs menu. The SNOW Monitor is a clock-driven process that automatically monitors observations in the WFO-configured monitoring area for hazardous conditions, as defined through the configuration. It regularly evaluates and updates a single, overall threat level for the monitoring area and generate SNOW CAVE Plan-view Plots.

The SNOW CAVE Plan-view Plot consists of two AWIPS CAVE station plots packaged together, and nearly identical to their CAVE counterparts: a “METAR” plot and a “Mesonet” plot. The SNOW plots differ from the CAVE plots only in that SNOW plots record only those reports that are within the office’s monitoring area, as defined by the monitoring area station setup.

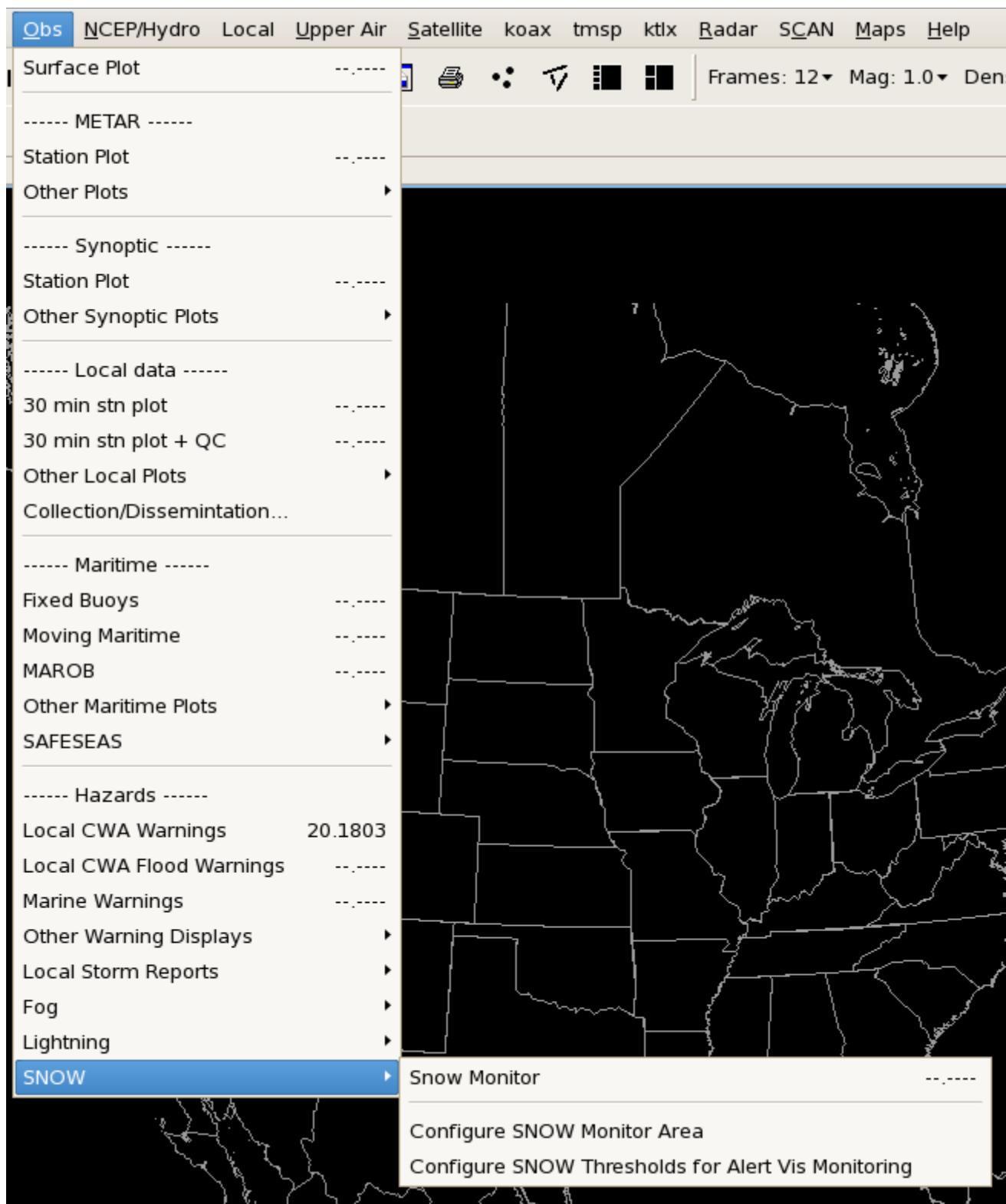


Exhibit 8.7-2. Accessing SNOW Application from the CAVE-D2D - Obs Menu

The SNOW Tabular Display consists of two types of display GUIs: the configurable zone/county and station tables, and the trend plot. In both configuration tables, individual columns of the table display the current threat level for each product, and both the observed value and the threat level for each variable. In the zone configuration, each row of the table shows these threat levels for a zone or a county, for all zones and counties in the monitoring area. In the station configuration, each row of the table shows these threat levels for the stations within (or related to) a single user-selected zone or county. Trend plots display a meteogram of a selected variable, or a composite meteogram of the values of the variables comprising a selected product,

for single stations. The trend covers the most recent 24 hours.

➤ **To access Zone/County table**

- From the Obs menu, select SNOW.

Note 1: The SNOW Threat Level Zone/County table window will display after the D2D loads the SNOW plot.

➤ **To access the Station table**

- With the Zone/County table displayed, from the Area_Id column, click a zone identifier.

Note 2: The SNOW Threat Level Zone/County table will close and the Snow Threat Level Station table will display.

➤ **To access the Trend plot**

- With the Station table displayed, right-click the cell containing the data for which you want to see plotted for trend analysis.

Note 3: The trend plot window for the specific station and variable or product of interest will display.



Refer to the separate **SNOW Users' Guide** for more information by clicking on the book symbol.

8.8 Four-dimensional Stormcell Investigator (FSI)

The Four-dimensional Stormcell Investigator (FSI) is an innovative base radar data display application that is based on the National Severe Storms Laboratory (NSSL) Warning Decision Support System – Integrated Information (WDSSII) graphical user interface. This technology enables users to create and manipulate dynamic cross-sections (both vertical and at constant altitude), making it possible to “slice and dice” storms and view these cross-section data in three dimensions and across time. The FSI is a 4-panel display depicting base radar data from a variety of linked two- and three-dimensional representations. An AWIPS extension is used to launch this application into an independent window. The extension is accessible from the CAVE-D2D Tools menu and Radar Tools submenu, as shown in **Exhibit 8.8-1**.

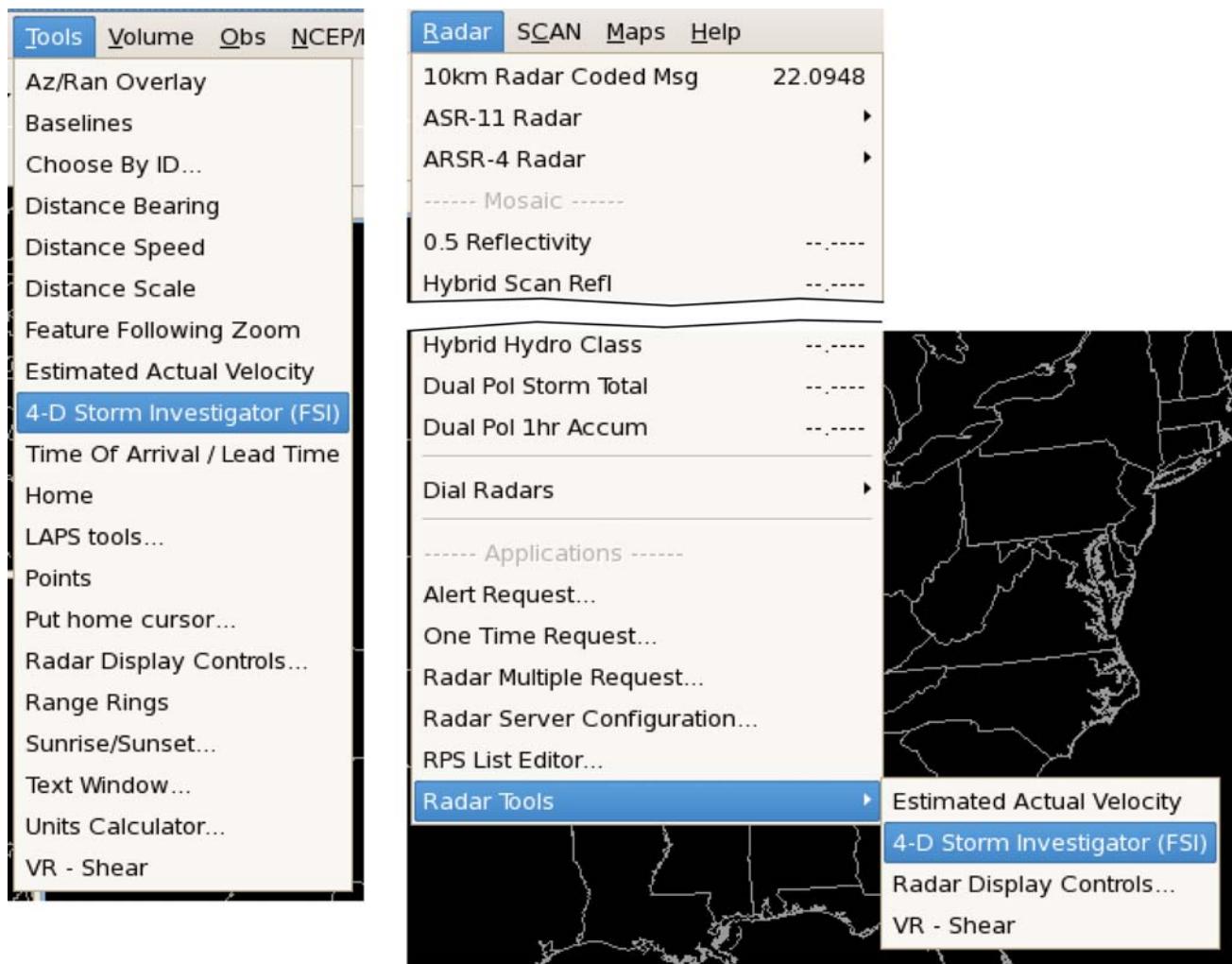


Exhibit 8.8-1. FSI Menu Option Located on Tools Menu and Radar Tools Submenu

The FSI extension must be loaded in the D2D Perspective before the main display can be launched.

➤ **To load the FSI extension, from the main CAVE-D2D menu**

- From the **Tools menu** or **Radar Tools submenu**, select **4-D Storm Investigator (FSI)**.

Once the extension is loaded, the legend will list that extension and automatically make it editable, as shown

in **Exhibit 8.8-2**.



Exhibit 8.8-2. CAVE-D2D Display of Loaded FSI Extension

Now that the FSI extension has been loaded, you can launch FSI.

➤ To launch FSI

- In the main CAVE-D2D display pane, center your cursor over the storm of interest, and then click the left mouse Button 1.
- If your WFO uses more than one dedicated radar, or your backup radars are turned on for SCAN, a radar selection GUI will open, as shown in **Exhibit 8.8-3**. Choose which radar's data you want to use, and click the "OK" button.



Exhibit 8.8-3. Choosing Which Radar to Use for FSI

If your WFO only has one dedicated radar, the FSI window will automatically open, with the data already centered on your storm of interest, using the radar data matching your WFO's dedicated radar, as shown in **Exhibit 8.8-4**.

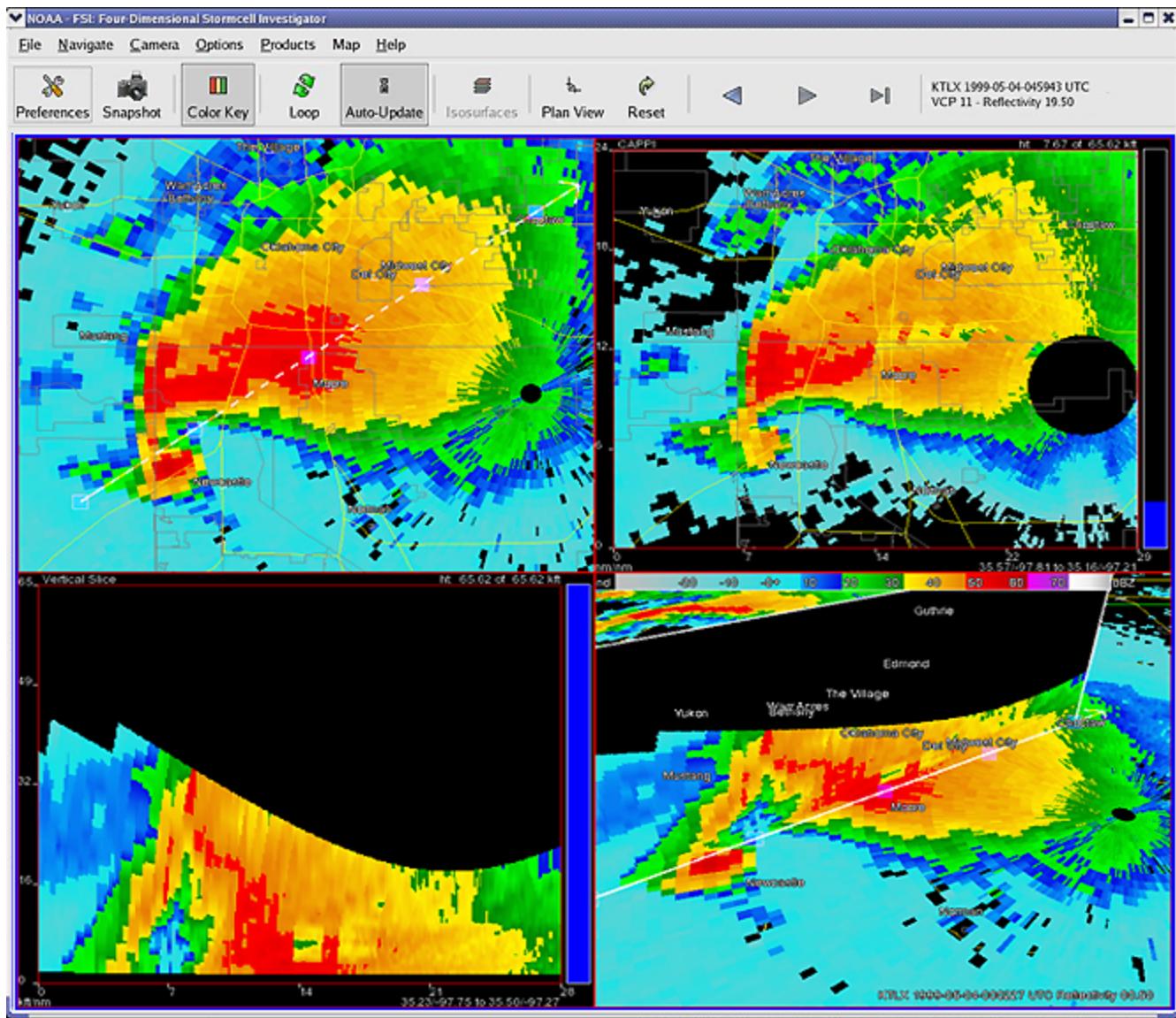


Exhibit 8.8-4. FSI: Four Dimensional Storecell Investigator Main Window

The following FSI display initial conditions will be reset to the values shown each time you launch or re-launch the FSI from the D2D Perspective:

- Product = Reflectivity at 0.5° at the latest time
- Location = centered in latitude/longitude of mouse click on the CAVE-D2D Main Display
- Zoom Altitude = 50 meters (about the size of a large supercell storm)
- CAPPI Altitude = 2 km (~6.5 kft)
- Vertical Cross-Section Altitude = 20 km (~65 kft)
- 3D Rotate = 360° (pointing north)
- 3D tilt = 0.75 (slightly tilted off the vertical)
- Storm Motion Vector = as set by Radar Product Controls

All other display preferences (e.g., loop parameters) will be retained from the previous FSI session. These preferences are unique to each individual username.

Notes:

1. The Graphic Workstations (LX) are equipped with two video graphics cards; one supports 2D applications, and the other supports 3D applications such as the FSI. The FSI cannot be launched on the 2D display, and a pop-up window will appear to remind users if this is attempted.
2. Only one FSI display is designed to run at any one time per workstation. If you attempt to launch another FSI display using another mouse click to the D2D pane, the original FSI window will reposition to a new storm location.



Refer to the separate **FSI Guide for Users** for more information by clicking on the book symbol.

8.9 Radar Display Controls

The Radar Display Controls dialog box, as shown in **Exhibit 8.9-1**, provides options that control the appearance of the Storm Track Information (STI), the Hail Index (HI), the Tornado Vortex Signature (TVS), and the Digital Mesocyclone Display (DMD) products, along with Storm Relative Motion (SRM) options. The Radar Display Controls dialog box options are described below.



Exhibit 8.9-1. Radar Display Controls Dialog Box

The Radar Display Controls dialog box is divided into six sections: STI, HI, TVS, DMD/MD/TVS, DMD, and SRM. Each section has the following options:

STI (Storm Track Information)

This section has options to adjust the appearance of the STI graphic product.

- **Number of storms to show:** This slider bar lets you choose the maximum number of storms (0 to 100) you wish to display on the STI product. The default value is 20 storms.
- **Type of track to show:** This options menu allows you to choose the type of storm track that you want displayed.
 - **no tracks:** When you select this option, only the current storm location(s) are displayed.
 - **past:** When you select this option, the previous location(s) of the storm(s) are plotted with small dots.
 - **forecast:** When you select this option, the extrapolated forecast positions(s) of the storm(s) are plotted with small + symbols.
 - **past & fcst:** When you select this option, both the previous and the forecast position(s) of the storm(s) are displayed. The default track setting is to show both the past and the forecast tracks.

HI (Hail Index)

This portion of the Radar Display Controls dialog box contains options that alter the appearance of the HI radar graphic product. You can set the low and high algorithm thresholds of the Probability of Hail (POH) and the Probability of Severe Hail (POSH). Storms that meet the low POH threshold are indicated by small open triangles, while small solid triangles mark those that meet the high POH threshold. Similarly, large open triangles or solid triangles are plotted for the POSH low and high thresholds, respectively.

- **Low hail probability (POH):** The storms that meet or exceed the threshold are indicated by small open triangles. The default setting is 30.
- **Low severe hail probability (POSH):** The storms that meet or exceed the threshold are indicated by large open triangles. The default setting is 30.
- **High hail probability:** The storms that meet or exceed the threshold are indicated by small solid triangles. The default setting is 50.
- **High severe hail probability:** The storms that meet or exceed the threshold are indicated by small solid triangles. The default setting is 50.

TVS (Tornado Vortex Signature)

There is one option in this section of the Radar Display Controls dialog box.

- **Show elevated TVS:** This toggle button lets you control the appearance of the elevated TVS radar graphic product.

DMD, MD, TVS

There is one option in this section of the Radar Display Controls dialog box.

- **Show extrapolated Features:** With this option, you can choose whether to show the time-extrapolated features using DMD, MD, or TVS.

DMD (Digital Mesocyclone Display)

This section of the Radar Display Controls dialog box enables you to control what features are displayed. For example, at the default setting of 3, only features with strength 3 (r3) or higher will be shown on the display. You can also choose to display the overlapping Mesos.

- **Type of track to show:** This options menu allows you to choose the type of storm track that you want displayed.
 - **no tracks:** When you select this option, only the current storm location(s) are displayed.
 - **past:** When you select this option, the previous location(s) of the storm(s) are plotted with small dots.
 - **forecast:** When you select this option, the extrapolated forecast positions(s) of the storm(s) are plotted with small + symbols.
 - **past & fest:** When you select this option, both the previous and the forecast position(s) of the storm(s) are displayed. The default track setting is to show both the past and the forecast tracks.

SRM (Storm Relative Motion)

This section has options to set the storm motion vector. The high-resolution version of the SRM product uses the 8-bit velocity for a given tilt and applies a storm motion vector to the field. Options for specifying the storm motion vector are:

- **Storm Motion from WarnGen Track:** The display uses the vector that was last generated from either WarnGen or the Distance/Speed Tool. The storm motion vector that is used will be shown on the display. If a vector has not been set within the last 24 hours, it will be deemed out of date and will not be used. In this case, a zero movement will be used, and you will get an indication of this in the upper left corner of the product.
- **Average Storm Motion from STI:** The display uses the storm motion calculated by the storm track algorithm. This motion is available as part of the storm track (STI) product.
- **Custom Storm Motion:** Selecting this radio button enables the coordinated slider bars used to set the direction and speed.

Notes:

1. The storm motion vector that is used will be shown on the SRM product.
2. It is important to note that the user-specified motion vectors, as well as the other settings in the Radar Display Controls dialog box, are workstation-specific. This means that changes to the number of storms, track types, etc., affect all displays on that particular workstation.
3. Once these settings are changed from their default setting, they stay that way until changed again.

8.10 Dual Polarization Radar Products

This section describes [dual polarization](#) radar data for sites equipped to handle these products. Dual polarization involves alternating between sending vertically and horizontally polarized pulses. Whereas Doppler allows the radar to be sensitive to the motion of the targets, dual polarization allows the radar to be sensitive to the shape of the targets. The biggest impacts of this technology are:

- Improved values for accumulated precipitation
- Improved hail detection
- Improved detection of non-meteorological targets.

When a site is equipped to support dual polarization radar products, accommodation is made by running a script that includes menus and Volume Browser entries that configure the system for dual polarization radar products. The examples below illustrate the capability of dual polarization.

Digital Precip Rate and Differential Reflectivity

The conversion from the two-byte values in the product to the one-byte image counts is completely adaptable outside of code. The examples shown in **Exhibits 8.10-1 and 8.10-2** are linear to 8in/hr, and logarithmic from there, up to the maximum possible value.

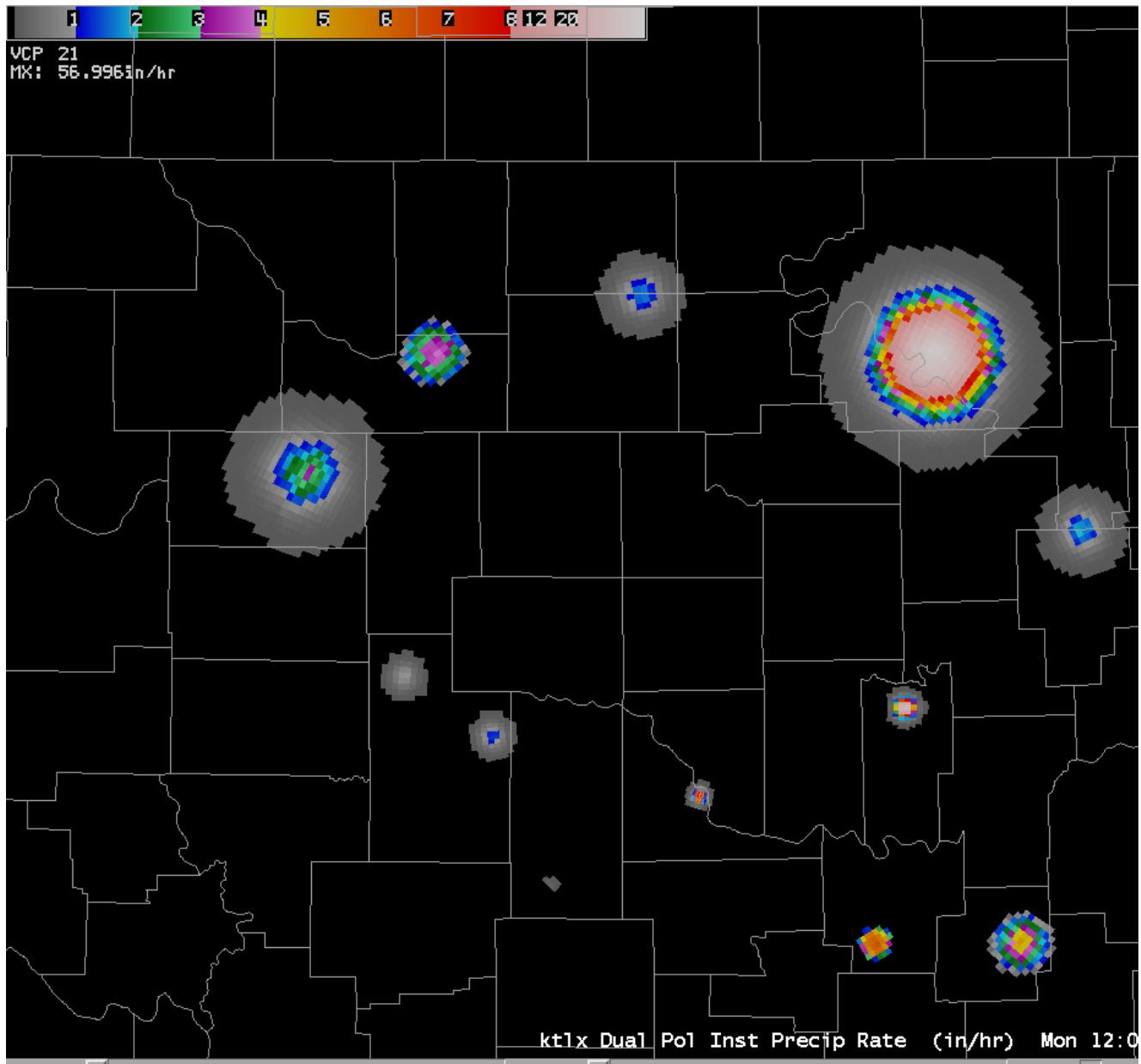


Exhibit 8.10-1. Digital Precip Rate Display

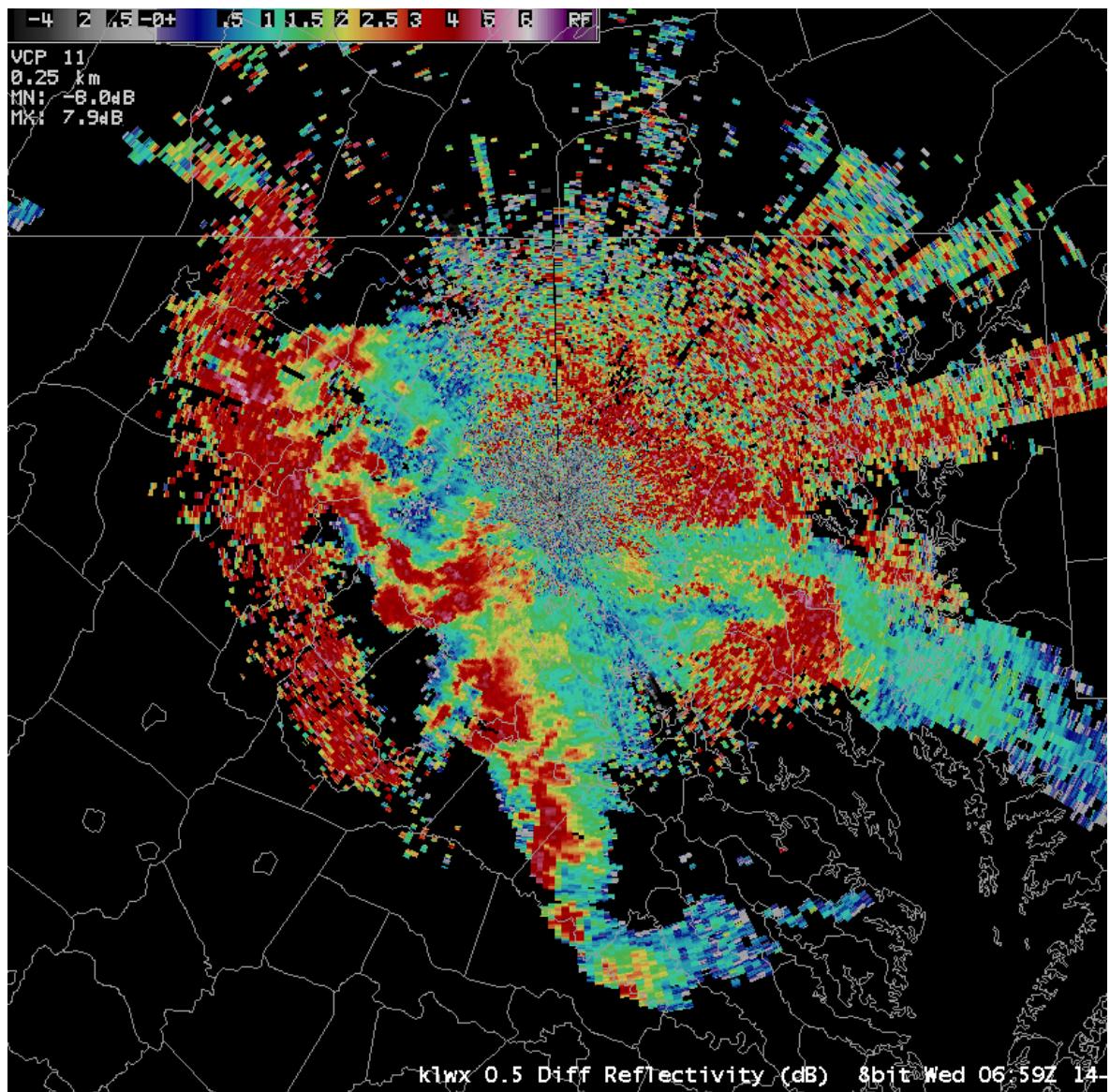


Exhibit 8.10-2. Differential Reflectivity Display

Melting Layer

Exhibit 8.10-3 shows the melting layer on top of a hydro class image. The categories are distinguished by line pattern. This has been prototyped such that the line patterns and legend text are arbitrarily configurable.

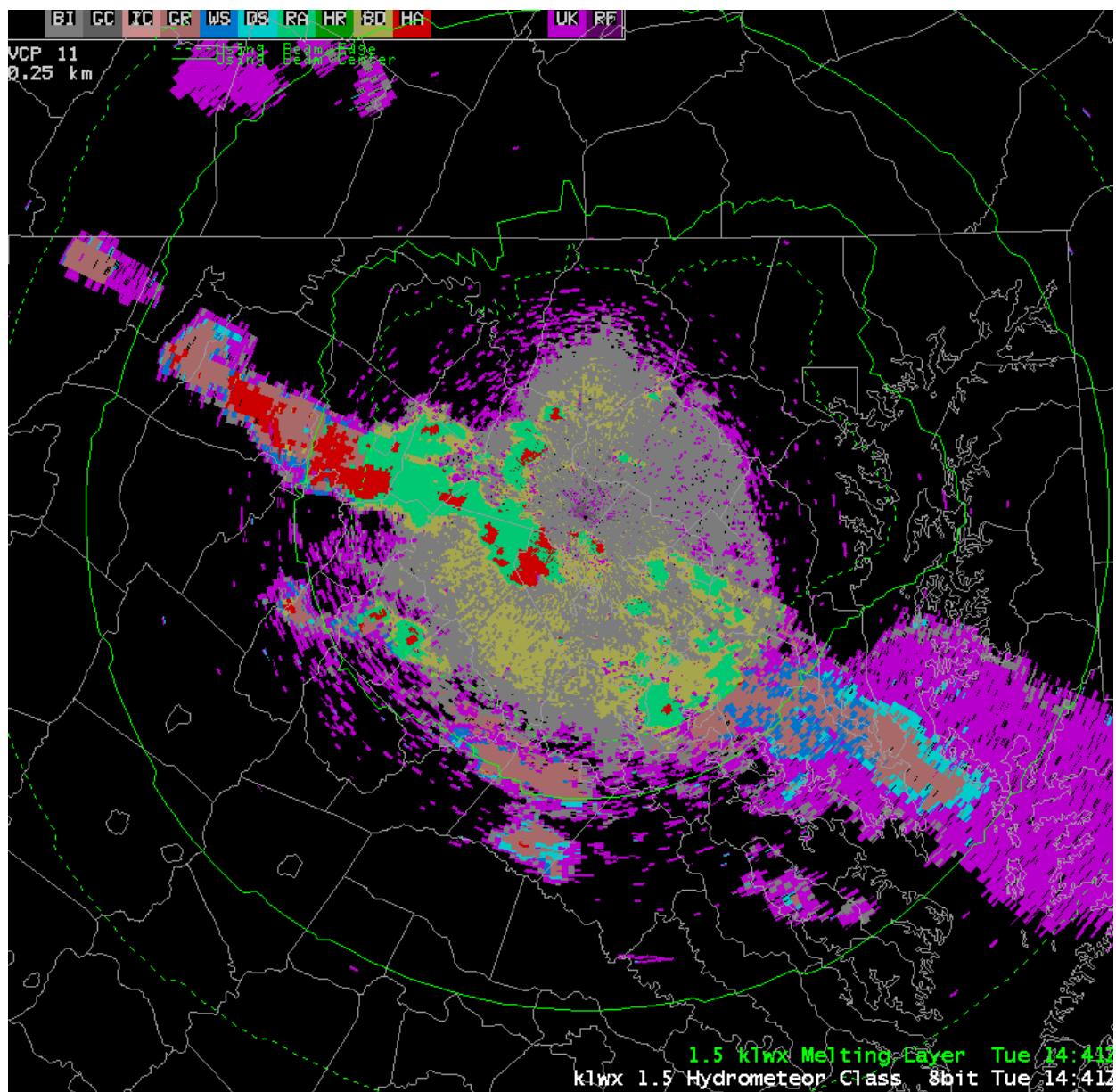


Exhibit 8.10-3. Melting Layer Display

Hybrid Hydro Class

Exhibit 8.10-4 shows a Hybrid Hydro Class sample display. Note that the sample string is now a more detailed description than what appears on the color bar.

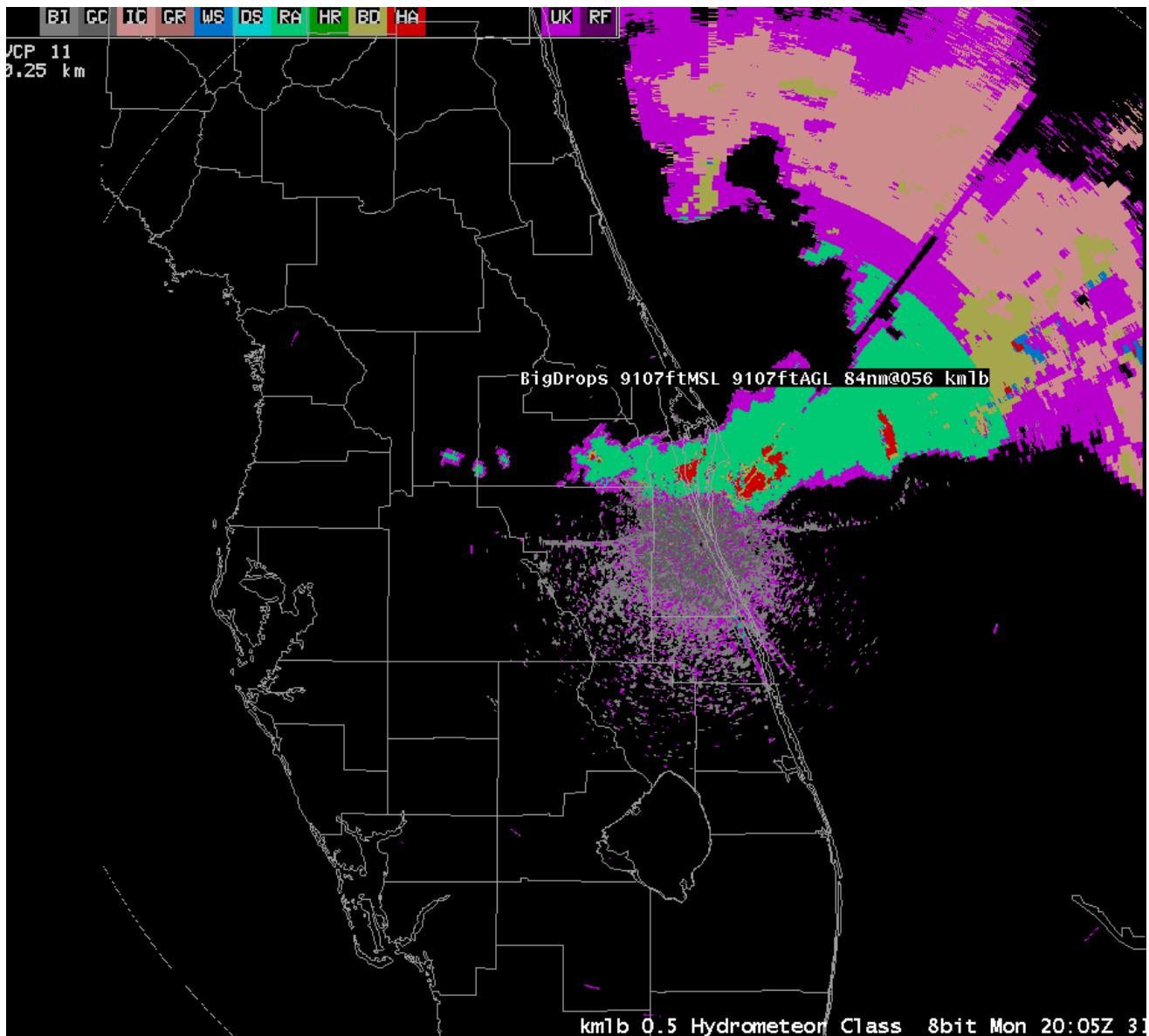


Exhibit 8.10-4. Hybrid Hydro Class Display

Segregated User Selectable Precip

Exhibit 8.10-5 shows a Segregated User Selectable Precip sample display.

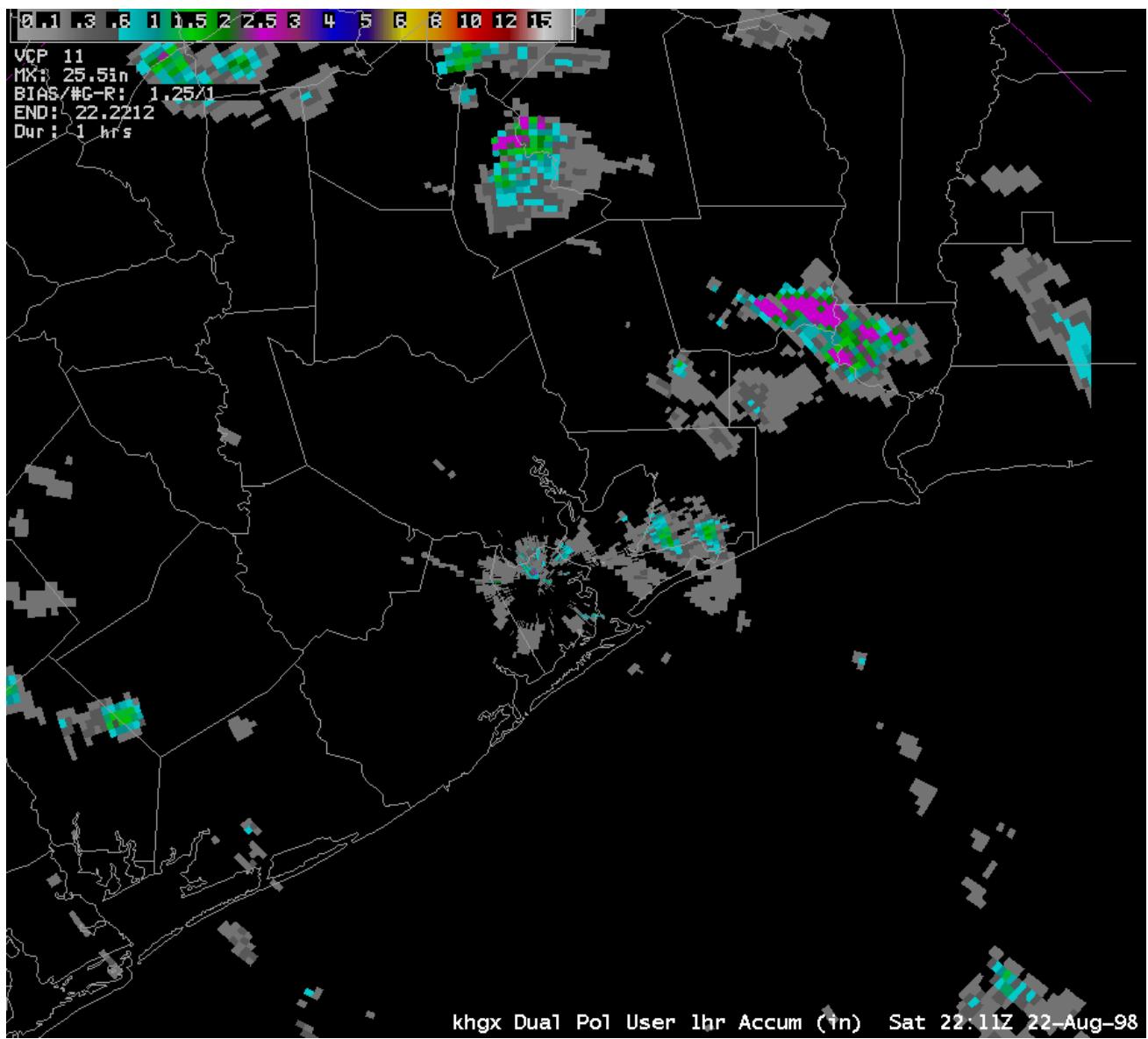


Exhibit 8.10-5. Segregated User Selectable Precip Display

Correlation Coefficient

Exhibit 8.10-6 shows a Correlation Coefficient sample display.

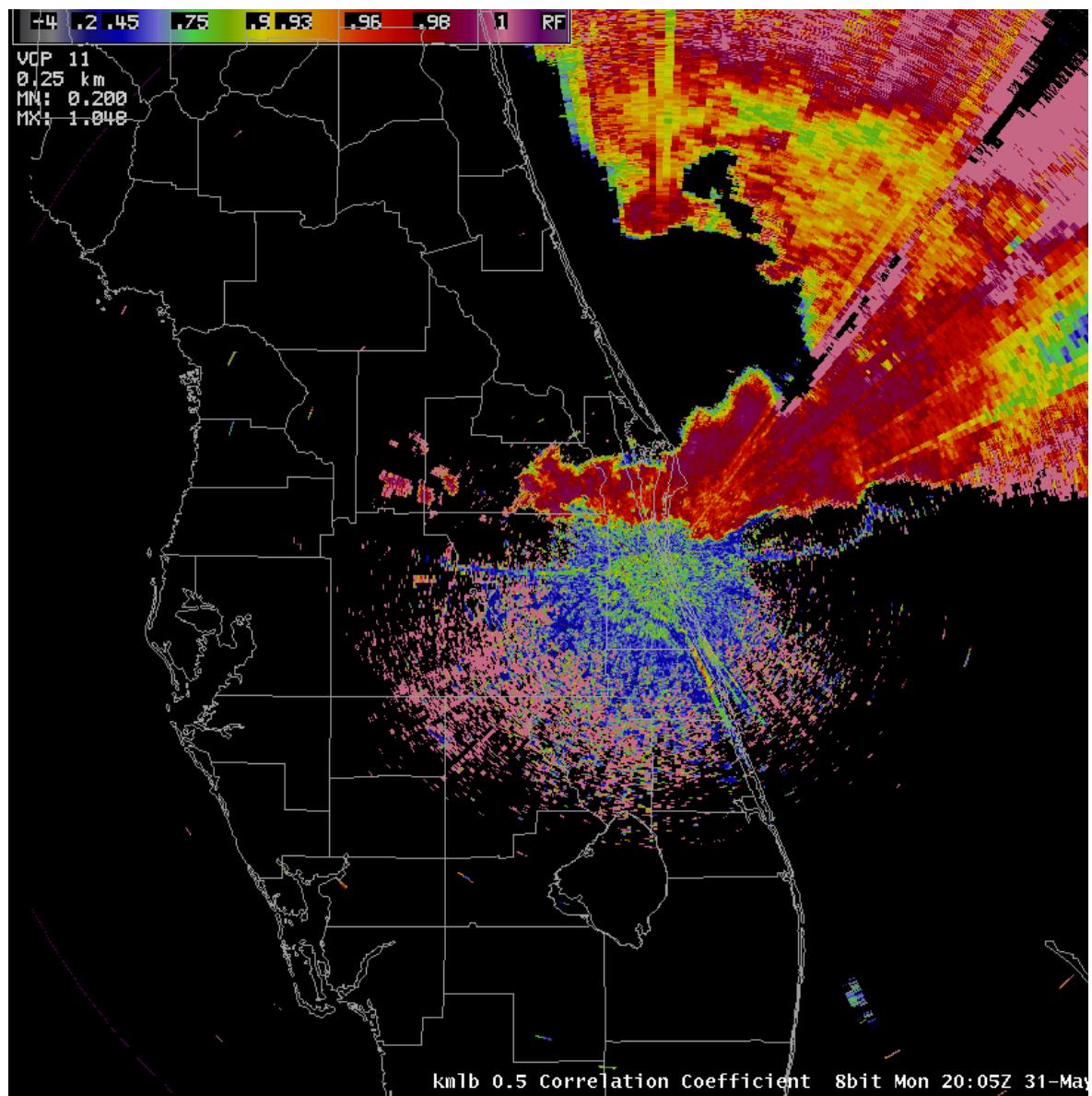


Exhibit 8.10-6. Correlation Coefficient Display

Specific Differential Phase

Exhibit 8.10-7 shows a Specific Differential Phase sample display.

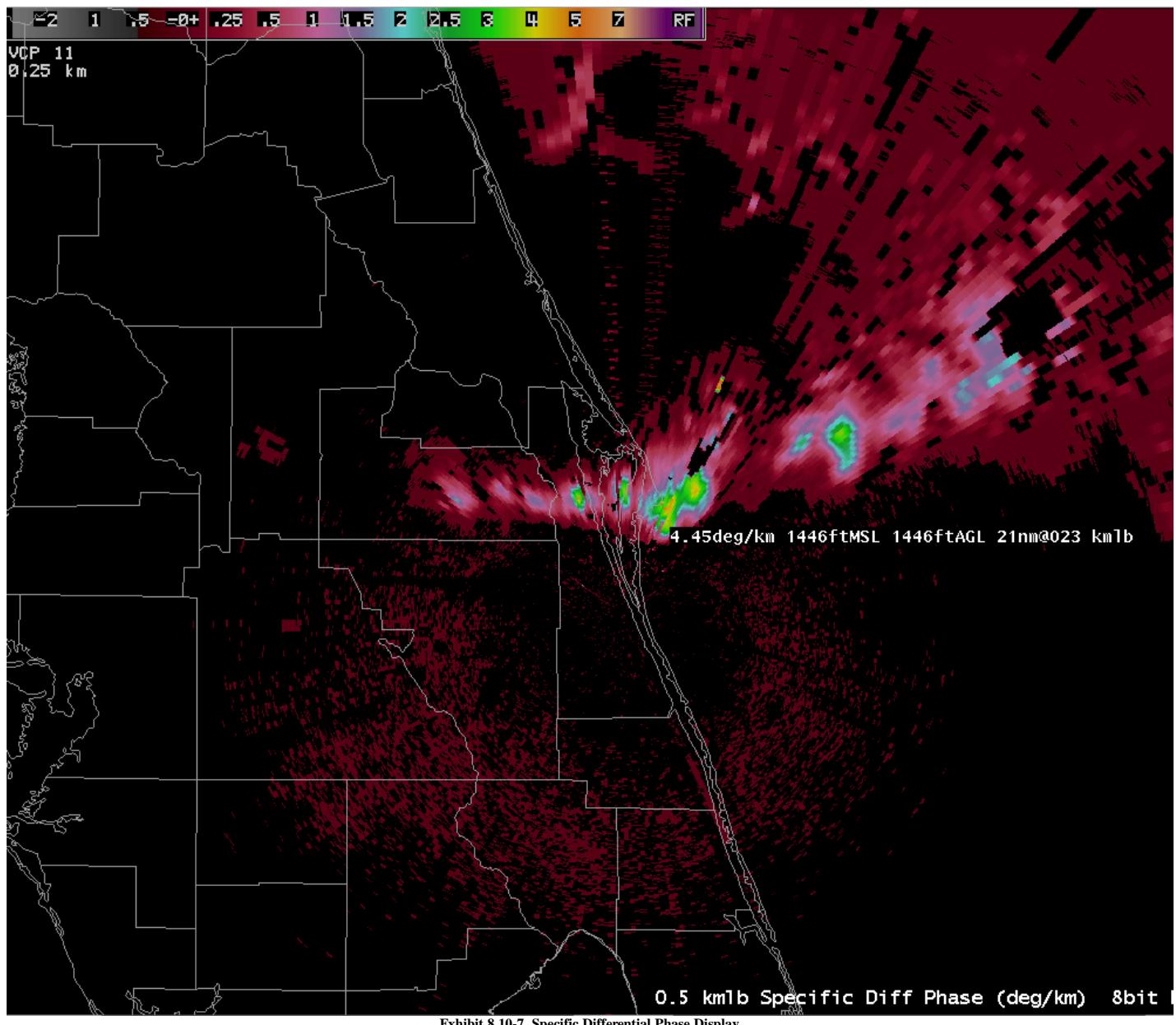


Exhibit 8.10-7. Specific Differential Phase Display

Note: Over the next few years the hardware on the 88D radars will be upgraded, making it possible to broadcast alternating horizontally and vertically polarized pulses. Comparing the intensity and phase of the differently polarized returns results in three new base data parameters and new algorithm output for classifying targets and estimating precipitation. The purpose of this work is to ingest and incorporate meaningful displays of this new radar output into CAVE.

8.11 Practice Modules: Using the Radar Applications

These modules guide you through the basic use of the radar applications.

Module 24: Alert Request

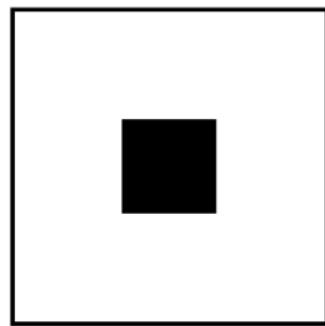
Sending an Alert Request (refer to [Section 8.1](#)) is a four-part process involving both the Graphics (LX) and the Text (XT) displays. The parts of the process are listed below.

1. Select and edit the Alert Area
2. Choose a category(s) and threshold(s)
3. Send the Alert Request
4. Wait for a response

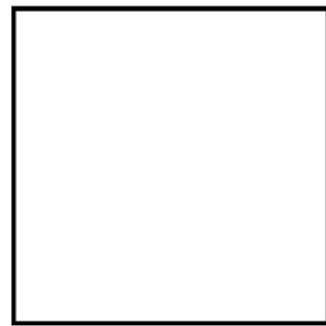
These parts are delineated in the following objectives.

Objective 24.1 - Edit an Alert Area

An Alert Area consists of small (16 x 16 km) squares (called Cells), as shown in **Exhibit 8.11-1**, that delineate the Alert Area for the RPG. Cell locations for the radar must be within the 460-km scan range of the radar to be valid. A valid Alert Cell is indicated by a small square.



Valid Alert Cell



Invalid Alert Cell

Exhibit 8.11-1. Examples of Valid and Invalid Alert Cells

1. From the **Scale** option menu, select **State(s)** or **RFC**.
2. From the **Radar** pull-down menu, choose **Alert Request....**
3. Press the **Alert Area #1** radio button.

Note 1: If there is a previously saved Alert Area, it is displayed with its legend in the large

display pane. If there is not a previously saved Alert Area, only the Alert Area legend appears.

4. Click with mouse Button 2 on the **Alert Area #1 Editor** legend to make the area editable.
5. Place the mouse pointer over the area of interest.
6. Press mouse Button 3 over the large display pane to open a pop-up menu.
7. Choose **Select Area**. An anchor point with an attached stretch rectangle appears on the screen.

Note 2: Another way to obtain the anchor point and stretch rectangle is to place the cursor over the specific point of interest, hold down the **Shift** key, and press mouse Button 3.

8. Stretch the rectangle to the desired location and release. Within a moment, Alert Cells fill in the rectangle area. The anchor point appears wherever you open the pop-up menu in the large display pane, or wherever the cursor is when you press the Shift key and mouse Button 3 simultaneously. Refer to **Exhibit 8.11-2**.

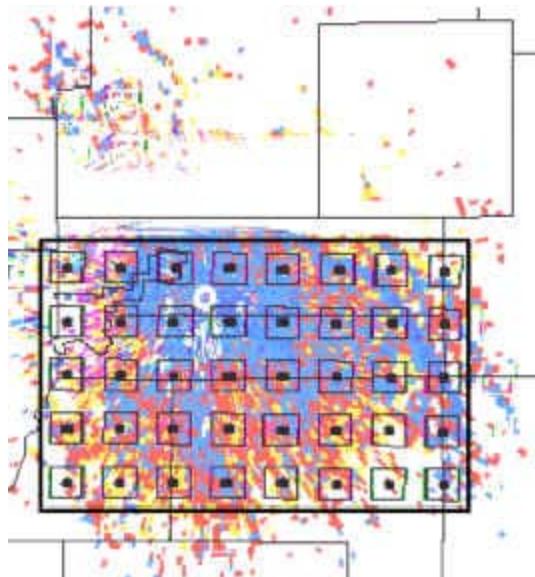
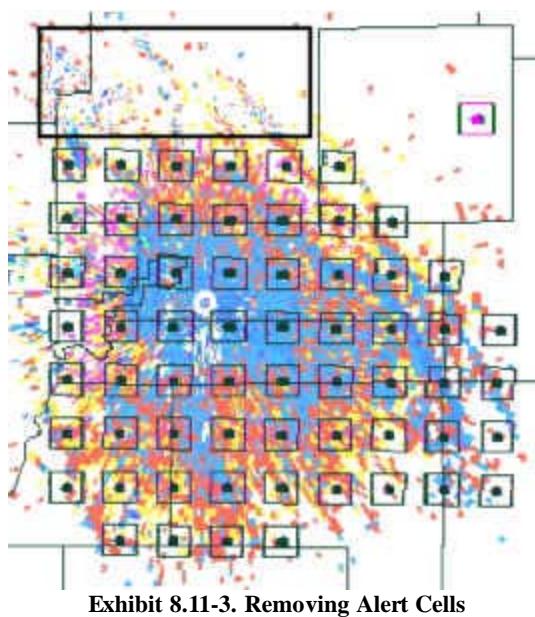


Exhibit 8.11-2. Rectangle Area with Valid Alert Cells

Note 3: The Select Area tool toggles all Cells within it on or off depending on the state of the Anchor Point Cell. If the Anchor Point Cell is off, then all valid points within the selected rectangle area are turned on, and vice versa.

9. You can remove or add individual Alert Cells by clicking mouse Button 3. Try this option.
10. If you need to remove a larger block of Alert Cells, press and hold mouse Button 3 over the Cells in the large display pane to open the pop-up menu and choose the **Select Area** option. Then stretch the rectangle over the Cells you want to remove and release. The selected Cells are then removed. This is illustrated in **Exhibit 8.11-3**.



11. Keep the display as is for the next objective.

Objective 24.2 - Add a Category and Threshold

1. Click the **Add** menu button in the **Alert Request** dialog box. The **Add Request Defs** dialog box opens.
2. From the **Product** options menu, choose **7 Vol VAD**.
3. From the **Threshold Codes** options menu, select **1 15Kts**.
4. For the Request Product inquiry, select the "**No**" check button. The "**No**" selection means that the Volume VAD radar product is not sent to AWIPS; only a text message is sent to the text display when the 15-kt threshold is reached. A "**Yes**" choice sends the Volume VAD product when the threshold is met.
5. Press the **OK** menu button to add the Vol VAD product to your Alert Request list in the **Alert Request** dialog box.
6. Save this list for the next objective.

Note: You cannot send Alert Requests to the RPG for both Alert Areas at the same time.

Objective 24.3 - Send and Receive an Alert Request

1. In Objective 24.2, the **Vol VAD at 15Kts** was selected.
2. Choose the desired RPG from the RPG options menu.
3. Press the **Send Request** menu button to send your request.
4. The Radar Ingest acknowledges your Alert Request with a message in the Radar status bar.

5. If the requested thresholds are reached (in our case, if the VAD profile winds reach 15 knots), then a message appears in the message window of the AlertViz Status Bar.

Note 1: A message is generated when a threshold is reached. There are no alerts for a Volume Scan, or if the alert is canceled.

6. On the **text** display, open the **AFOS** browser.
7. From the **Class** option menu, select **Radar/Upper Air**.
8. Under the **Node** menu, choose **WSR** (at the bottom of the menu).
9. Choose the desired **Ctgry** and **Designator**, then load the text product.

Note 2: You must be an associated user with a dedicated line to send an Alert Request to an RPG.

Module 25: RPS List Editor

The products in the RPS List Editor (refer to [Section 8.2](#)) should be familiar to WSR-88D users. The interface is designed to adjust based on the radar products you choose, so you can select the desired elevation angles, resolutions, data levels, and other appropriate parameters. Changes to the RPS list are usually infrequent and should be implemented according to office policy.

Objective 25.1 - Add One Product to the RPS List

1. From the **kxxx** pull-down menu, select the **RPS List Editor**. This opens the **RPS List Editor** dialog box.
2. From the **View** pull-down menu, select **Current List**. This opens the **Select an RPG** dialog box. Choose the RPG you want and click the **OK** menu button. The current RPS list appears.
3. Scroll through the RPS list to review its contents and decide which product you would like to add.
4. Press the **Add** menu button, which opens the **Add Product** dialog box.
5. From the **Add Product** dialog box, select **Velocity at 5.3 degrees** (or other available elevation angle), with **16 data levels at 0.25 km resolution**.
6. Click the **OK** button. Notice that the product has appeared at the bottom of the RPS list.
7. If you do not want to make changes to the RPS list, from the **File** menu, select **Exit** to abort the RPS list session; otherwise, make the necessary changes and proceed to Step 8.
8. Click the **Send** menu button. The **Select an RPG** dialog box appears once again. Choose the RPG you want and click the **Send** button in this dialog box.
9. A message appears in the Radar status bar when the product addition is received by the RPG. The

new product should be available for display starting the next Volume Scan.

Module 26: One Time Request

It is important to know that the One Time Request (OTR) application (refer to [Section 8.3](#)) does not change the existing scan strategy to obtain a nonroutine radar product, but it does allow you to request a radar product that is derived from the present scan strategy.

You can make an OTR from either associated or non-associated radars (the latter is achieved through the dial-out capabilities) These methods are illustrated in Objectives 26.1 and 26.2. Objectives 26.3 provides practice in generating a radar cross-section OTR, and Objective 24.4 provides practice in generating a Radar Mosaic..

Each of these is illustrated in the following objectives.

Objective 26.1 - Make a One Time Request from an Associated Radar

1. From a **kxxx** pull-down menu, select **One Time Request...** This opens the OTR dialog box.
2. From the **Repeat count** options menu, select **4**.
3. From the **RPG** options menu, select **K(xxx)**.
4. From the **Product** options menu, choose **Reflectivity (Z)**.
5. From the **Request Interval** slider bar, select 3. Based on Steps 2 and 4, you've requested that this product be generated every third Volume Scan, and that this occur four times.
6. From the **Elevation(s)** options menu, select **Single** and **1.5**.
7. From the **Variant** options menu, choose **16 levels** with a resolution of **0.15 at 90.0km**.
8. In the **Time** area of this dialog box, select the **Current** radio button (which is the default).
9. Click the **Send** menu button. A message appears in the Radar status bar to inform you that your request was sent out.
10. If all the connections are up with the radar, your requested product should be available from the **kxxx refl** pull-down menu in four upcoming volume scans.
11. The Repeat Count and Request Interval apply only to associated radars. For dial-out radars, Repeat Count is set to 1, and Request Interval therefore has no meaning.

Note: Certain classes of radar products are available only through the OTR application.

Objective 26.2 - Make a One Time Request from a Non-Associated Radar Using Dial-Out

1. From the **kxxx** pull-down menu for a non-associated radar, select OTR (**Repeat Count** will be grayed out), and choose a different non-associated RPG than the one chosen in the previous objectives.

Objective 26.3 - Generate a Radar Cross-Section One Time Request

1. From the **Toolbar**, set the scale to **WFO**.
2. From the **kxxx** pull-down menu, open the **kxxx Refl** cascading menu and select the **0.5 Refl** product.
3. From the **Toolbar**, select the **Baselines** icon to display the **Baselines** tool. Turn on Edit mode for the Baselines.
4. Edit Line **C-C'** somewhere in your **CWA** by pressing on C or C' and dragging towards the center of the line. The line length needs to be between 0.54 and 124 nMi.
5. From the **Radar** pull-down menu, select **One Time Request...**. The **OTR** dialog box appears.
6. From the **Product** option menu in the **OTR** dialog box, select **Ref X-Sect (RCS)**.
7. Choose **Baseline C** and confirm that the line length provided in the **OTR** dialog box is between 0.54 and 124 nMi.
8. Press the **Send** button at the bottom of the **OTR** dialog box. Monitor the Radar status area to see if your request was properly received by the RPG.
9. From the **kxxx** pull-down menu, open the **kxxx Derived** cascading menu and select **Reflectivity (RCS)** in the cross-section portion of the menu.
10. Observe the data as they are displayed in a Range Height Indicator (RHI)-like presentation.

Objective 26.4 - Generate a Radar Mosaic

The radar mosaic merges like radar data from multiple radars (dedicated and dial-out) into a single composite product (refer to [Section 7.4](#)). To generate a radar mosaic, you must first dial out to various desired radars, and then obtain a specified radar product from that radar. The OTR Radar application fulfills these two actions. You can dial out and make one-time requests from as many radars as are in your Radar pull-down menu. The data that are time-matched are then combined and made accessible from the Mosaic portion of the Radar pull-down menu.

SBN delivery of data from all radars makes mosaics routinely available and obviates the need for this exercise. However, it remains in this Practice Module, as an illustration.

1. From the **Toolbar**, clear the large display pane.
2. From the **Toolbar**, set the scale to **State(s)**.
3. From the **kxxx** pull-down menu, select the **One Time Request...** application. The **One Time Request** dialog box is opened.
4. From the Radar Status Bar at the bottom right edge of the D2D display, open the **Radar Status** dialog box, so you can easily read the messages.
5. Within the **OTR** dialog box, make the following selections:
 - Select one of your dial radars.

- Choose Reflectivity at 1.5 elevation, 16 levels, with a 1-km resolution.
 - Select Current as the time.
6. Press the **Send** button, and after a brief moment observe the messages that appear in the **Radar Status** dialog box. These messages should tell you that a successful connection to the dial-out radar was made and a successful delivery of the OTR was completed.
7. From the **Radar** pull-down menu, select the **Mosaic 0.5 Reflectivity**. The dedicated dial-out radar data appear in the large display pane. Keep the mosaic displayed for the next step.
8. Repeat Steps 5 through 7 for a couple other dial-out radars.
9. As the products are sent from the various RPGs, the data should display automatically on the displayed radar mosaic, as long as the data are time-matched. If the radar do not display automatically, clear the large display pane and reload the **0.5 Reflectivity** from the Mosaic section of the **Radar** pull-down menu.

Notes:

1. Radar mosaic is limited to those radar products contained in the Mosaic portion of the Radar pull-down menu.
2. When radar data overlap, each pixel in the frame can potentially be assigned a value from any of the radars that are part of the mosaic. When this occurs, the largest value is one that is used in the mosaic.
3. A frame of the radar mosaic can contain only one scan per radar.
4. One complication in creating radar mosaics is that some radars may be in clear-air mode while others are operating in storm mode. The result is a difference in the relationships between data level and reflectivity. Therefore, reflectivity mosaics are plotted as 8-bit images and have their data levels rescaled to a color map that covers the entire range of reflectivities for clear-air and storm mode imagery.
5. Another complication is the timing of volume scan cycles for each radar in the given mosaic. A time matching algorithm decides what times to create and which radar scans are rendered into each frame of the mosaic. Generally, the maximum time difference allowed is twice the minimum volume scan rate. So, if the volume scans are updating every 6 minutes, the maximum time allowed is 12 minutes. If some radars are updating at different rates, there can be occasions when a mosaic may not contain every radar.

Module 27: Radar Multiple Request

Using the Radar Multiple Request (RMR) application (refer to [Section 8.4](#)), you can obtain radar products in succession from one or several RPGs with one request.

Objective 27.1 - Make a Radar Multiple Request

1. From either the **kxxx** or the **Radar** pull-down menu, under the Applications heading, select **Radar Multiple Request...**. The RMR dialog box appears in a few seconds.
2. In the RMR dialog box, click on **New Request....** The New Request dialog box opens.
3. In the New Request dialog box, type a unique name in the **Name** entry field, and make sure that the **Multiple Request** button is selected.
4. Also in the New Request dialog box, set **Repeat every** to **6** minutes, and the Duration to **2** hours.
5. In the New Request dialog box, select **OK**. The Add Products dialog box immediately opens.
6. In the Add Products dialog box, select **two dial radars and one dedicated radar**.
7. From the **Product** menu, select the **VIL** product.
8. In the Add Products dialog box, press the **Add** button. This adds your request to the Existing Requests list.
9. Press the **Close** button at the bottom of the Add Product dialog box. Check your newly added request.
10. **Click on the name of your new request** and press the **Submit** button. This activates your request. Now you should see your request in the **Active Requests** portion of the RMR dialog box.
11. Observe the **D2D Radar status bar** to see if your requests are being met by the RPGs. You should see dial-out messages along with request messages. Select the **Radar Status** button to see all of the radar status messages.
12. Once the RPG has sent back the requested products – in this case, the VIL product – you can display this product from the **kxxx** or the **Radar** pull-down menus, in the **Derived** cascading menu. The requested product should have an updated valid time within the menu.

Module 28: Cell Trend Information

Objective 28.1 - Obtain and Display Cell Trend Information

1. Clear the large display pane, and from the **Toolbar**, set the scale to **WFO**.
2. From the **kxxx** pull-down menu, open the **kxxx Refl** cascading menu and select the **0.5 Refl** product.
3. From the **Toolbar**, press on the **Interactive Points Tool** icon to overlay onto the radar data.
4. If necessary, with mouse Button 2, click on the **Interactive Points** legend to make the tool editable.
5. Drag **Point A** until it is over the area of interest.
6. Swap the radar data to a small display pane.
7. From the **Toolbar**, set the scale to **WFO**.
8. From the **kxxx** pull-down menu, open the **kxxx Graphics** cascading menu and select **point A** under the **Cell Trends** heading. The **Cell Trends** graphic appears on the display. Notice the valid time associated with this product. It should be from the latest radar volume scan.

Notes:

1. At times, the RPG may not identify storms in a very intuitive manner. The inset map in the upper right corner of the Cell Trends graphic shows the RPG-assigned cell ID. Compare this ID with the STI cell ID.
2. You can display multiple cell trend plots simultaneously and toggle them from the product legend.

9.0 Background Applications

The AWIPS background applications are designed to run unattended in the background. Once they are set up, they run independently and need only to be monitored.

The AWIPS background applications currently consist of the following two applications:

- The Hourly Weather Roundup (HWR) Application
- The NOAA Climatological Reports Formatter

The HWR and NOAA Climatological Reports Formatter applications generate products that you may wish to review and edit before transmission. The status of these products is displayed in the Monitoring Controller dialog box.

Note: The HWR and the NOAA Climatological Reports Formatter need to be set up for each site by the site's System Administrator.

This chapter includes the following sections:

- [Section 9.1: The Hourly Weather Roundup \(HWR\) Application](#)
- [Section 9.2: The NOAA Climatological Reports Formatter](#)
- [Section 9.3: The Monitoring Controller](#)

9.1 The Hourly Weather Roundup (HWR) Application

The Hourly Weather Roundup (HWR) is a summary of the current weather observations for locations in and around the local area, including marine observations for those WFOs with coastal responsibilities. The application is used to prepare the products sent to the NWR and the NWWS.

The HWR consists of two applications.

- The Hourly Weather Roundup NOAA Weather Radio (HWR NWR) application prepares voice-ready products, as shown in **Exhibit 9.1-1** for broadcast over NWR. The products are automatically sent to the NWR, but the forecaster has an opportunity to review and edit them before broadcasting.

[aT_ENGTDLHWRT P198091119119809111900	AD NMDC001c9809112000
<p>These are the 3:00 PM Eastern Daylight Time observations for the local area, on Friday, June 26. At Reagan National Airport, haze was reported. The temperature was 84 degrees, the dewpoint 76, and the relative humidity 76 percent, producing a heat index of 93. The wind was south at 10 miles an hour. The pressure was 29.93 inches and steady. At Fort Belvoir, haze was reported, reducing the visibility to 4 miles. The temperature was 91 degrees, the dewpoint 73, and the relative humidity 55 percent, producing a heat index of 100. The pressure was 29.93 inches and steady. At B W I Airport, haze was reported. The temperature was 86 degrees, the dewpoint 66, and the relative humidity 51 percent. The pressure was 29.91 inches and rising. At Andrews Air Force Base, haze was reported. The temperature was 88 degrees, the dewpoint 73, and the relative humidity 62 percent, producing a heat index of 96. The wind was southwest at 9 miles an hour. The pressure was 29.94 inches and steady. Here are some observations outside the metro area. Throughout the region, temperatures were between 85 and 90 degrees. At Dover, fog was reported. Haze was reported at Patuxent River, Wilmington, and Salisbury. At Martinsburg, it was sunny. Here are some CMAN reports. Bligh Reef recorded northwest winds at 4 knots. Pressure was 29.95 inches. Air temperature 53. At Tatoosh Island, winds were southwest at 10 knots. Air temperature 53 degrees. At Matinicus Isle, winds were northwest at 2 knots. Air temperature 58 degrees. Here are some buoy reports. Buoy 46006 recorded northwest winds at 12 knots. The air temperature was 56 degrees. Buoy 44014 recorded air temperature of 78 degrees. Sea surface temperature was 76 degrees. Buoy 42019 recorded air temperature of 80 degrees. Sea surface temperature was 83 degrees. [b]</p>	

Exhibit 9.1-1. Sample Output for Broadcast on the NWR

- The HWR NWWS application prepares tabular products that are automatically sent to the NWWS, as shown in **Exhibit 9.1-2** for broadcast over the NWR.

ID	City	Weather	Temp	Rh	Wind	Press	Wind Chill	Vis
N. SLOPE/NORTHWEST								
PAKP	Anaktuvuk	MostlyClear	-26	100	S17	29.59	-54	8
PABR	Barrow	Snow	-9	78	NW10	29.85	-27	6
PABA	Barter Island	Cloudy	-16	70	SW9	29.95	-35	5
PASC	Deadhorse	BlowingSnow/Fg	-14	78	SW16	29.88	-38	3
PAGM	Gambell	No Report	-0	MM	NE15	30.22	-19	10
PAVL	Kivalina	Snow	-6	77	NW10	30.00	-24	13/4
PAOT	Kotzebue	Snow	-5	79	NW7	30.02	-19	5
PAOM	Nome	No Report	-11	86	Calm	30.06	-11	10
PAQT	Nuiqsut	Snow	-15	83	W17	29.89	-40	2
PAPO	Point Hope	Not Available						
PPIZ	Point Lay	Haze	-12	74	W9	29.95	-30	4
PADG	Red Dog Mine	Not Available						
PASA	Savoonga	No Report	-8	84	Calm	30.22	-8	10
PASK	Selawik	Cloudy	-27	91	NE3	30.07	-39	9
PASH	Shishmaref	MostlyCldy	-9	100	W11	30.14	-28	10
PATC	Tin City	No Report	-8	78	N23	30.12	-34	10
PAUN	Unalakleet	No Report	-11	MM	NE6	30.01	-25	10
PAWI	Wainwright	Cloudy	-7	70	NW10	29.86	-25	10
PAGL	Golovin	Not Available						
PAKK	Koyuk	No Report	-9	MM	NES	30.02	-20	10

Exhibit 9.1-2. Sample Station List for the NWWS

The HWR uses:

- METAR observations
- Marine observations
- Supplementary Climatological Data (SCD) (snowfall only)
- Satellite Cloud Product (SCP) data

9.1.1 HWR Routine Operations

Both of the HWR applications (HWR NWR and HWR NWWS) are normally executed automatically via the crontab utility (see Sections [9.1.2](#) and [9.1.3](#)); however, both may be executed manually as needed (see Sections [9.1.4](#) and [9.1.5](#)).

9.1.2 Automatic Execution of the HWR NWR Application and NWRWAVES Browser

The Hourly Weather Roundup (HWR) NOAA Weather Radio (NWR) application uses METAR and marine observations, the Satellite Cloud Product (SCP), and Supplementary Climate Data (SCD) (snowfall only) to perform required calculations, build phrases, and add instructions for the Console Replacement System (CRS). The output product is stored temporarily and the WFO is notified of its completion via the "eyeglasses" icon, as shown in **Exhibit 9.1.2-1** on the Text Displays for all workstations and the appearance of the word "NEW" next to the "Hourly Weather Roundup" button on the Monitoring Controller. Refer to [**Exhibit 9.3-1.**](#)

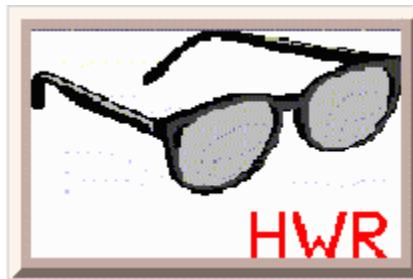


Exhibit 9.1.2-1. "Eyeglasses" Icon for the HWR NWR Product

Note 1: If the Monitoring Controller is iconified at the time of the notification, it will be restored at the mouse click.

By clicking on the "Hourly Weather Roundup" button in the Monitoring Controller, the NWRWAVES Browser, as shown in **Exhibit 9.1.2-2**, appears.

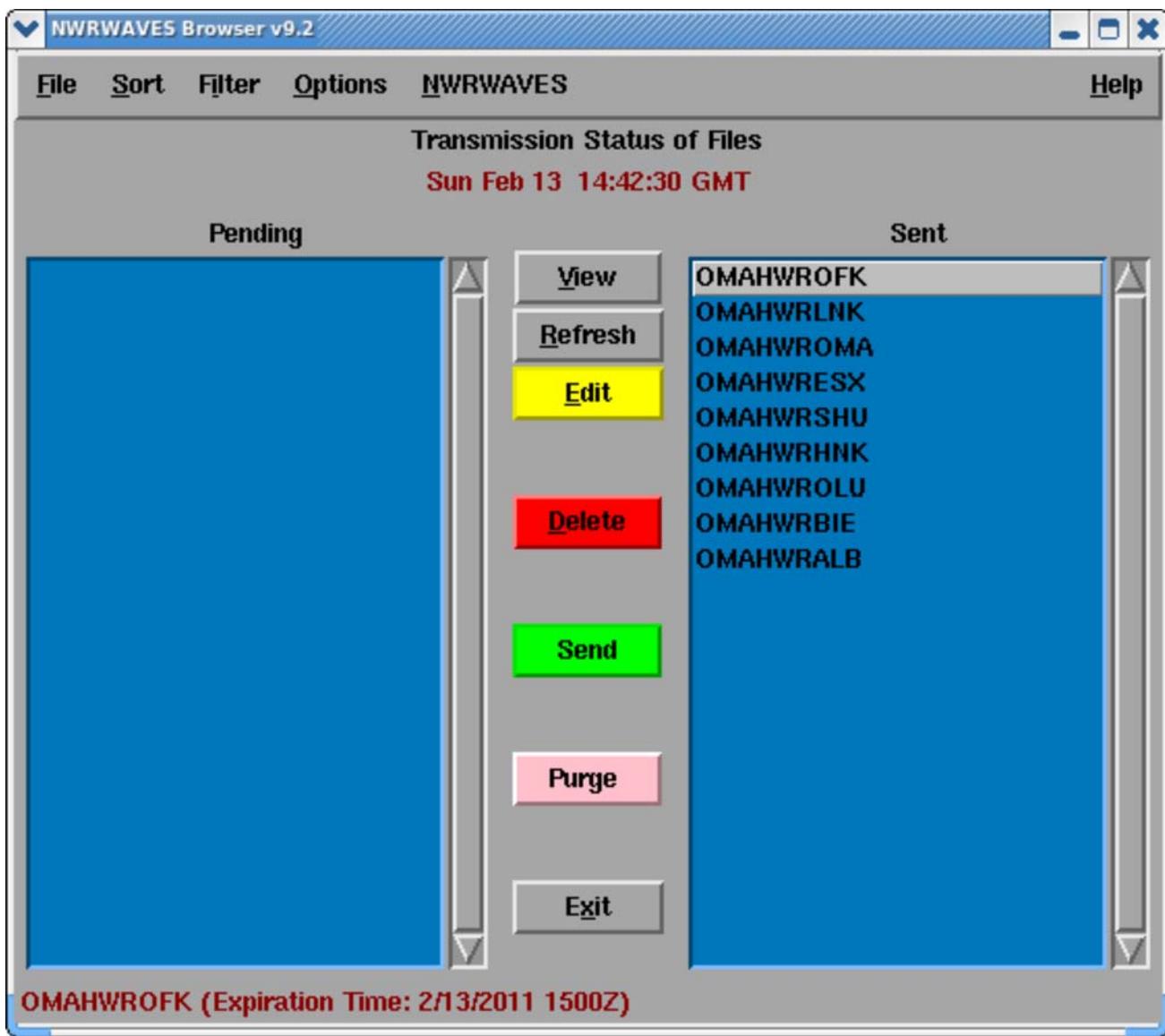


Exhibit 9.1.2-2. NWRWAVES Browser

Note 2: The NWRWAVES Browser can also be opened by selecting NWRBrowser from the AWIPS start-up menu's list of applications.

NWRWAVES is a comprehensive formatter for NWR products. Its purpose is threefold. First, it is designed to replace all existing formatter capabilities found in the AWIPS WWA program and also the capabilities found in CAFÉ. Second, NWRWAVES utilizes VTEC coding found in an increasing suite of NWS products to better identify, produce, and manage outbound Console Replacement System (CRS) weather messages. The use of the Message Reference Designator (MRD) number will allow sites to better automate their CRS broadcast cycle management. Third, NWRWAVES is designed to be easier to maintain and enhance than CAFÉ.

NWRWAVES Browser Menus

The NWRWAVES Browser menus include File, Sort, Filter, Options, and NWRWAVES. Descriptions of each menu follow.

File (Keyboard Shortcut Alt-F)

- **Print:** Prints highlighted items from Pending/Sent lists.
- **Exit:** Closes the browser.

Sort (Keyboard Shortcut Alt-S): Allows quick location of outbound or transmitted CRS messages.

- **None:** No sorting, browser will function in a manner similar to the old NWR Browser.
- **Alphabetical** (Default): Sorts files in the Pending and Sent list boxes in alphabetical order.
- **Expiration Time:** Sorts files in the Pending and Sent list boxes in the order in which CRS messages are scheduled to expire.
- **Creation Time:** Sorts files in the Pending and Sent list boxes in the order in which the CRS messages were added.
- **Decreasing Sort:** Sorts the list boxes in either reverse alphabetical order (Alphabetical sort applied) or in the reverse order in which CRS messages are scheduled to expire (Expiration Time sort).

Filter (Keyboard Shortcut Alt-i): Filters items in the NWRBrowser to help you locate products in the Pending and Sent lists quickly.

- **Filter by Transmitter:** Displays outbound/Transmitted products that are applicable to the selected transmitter.
- **Filter by Product Type/WFO:** Filters the lists to display only requested product types/WFOs.

Note 3: The "output" item filters the AWIPS climate program CRS messages. You can apply a combined filter by selecting an item under both the Filter by Transmitter and Filter by Product Type submenus.

Options (Keyboard Shortcut Alt-O)

- **Clear Old Products (Purge):** Allows you to delete files whose CRS message expiration time has passed. You will be prompted to remove products from both the Pending and Sent directories. This feature can be quite helpful in eliminating dead products from an extensive file listing, but remember that there may be instances when you may want to maintain an expired product for later retransmission.
- **Update Expiration Time:** Allows you to modify the expiration time of a product and retransmit it to CRS. This option is enabled when you clicked on a product in the Sent list to select it.
- **Auto Refresh:** Auto updates the Pending and Sent list boxes (on by default).
- **Set Refresh Interval:** Allows you to change the refresh interval from the default of 30 seconds by clicking on this menu item and entering a new number (in seconds) into the box.
- **Highlight Warnings:** Causes the NWRWAVES Browser list boxes to change briefly from a blue to a purple/pink background color when a short-fuse warning has been issued (on by default).

NWRWAVES (Keyboard Shortcut Alt-N)

- **NWRWAVES Setup (Purge):** The NWRWAVES menu options, as shown in **Exhibit 9.1.2-3**, are administratively restricted by AWIPS user accounts. Most NWRWAVES users will not have access to

the Setup Utility.

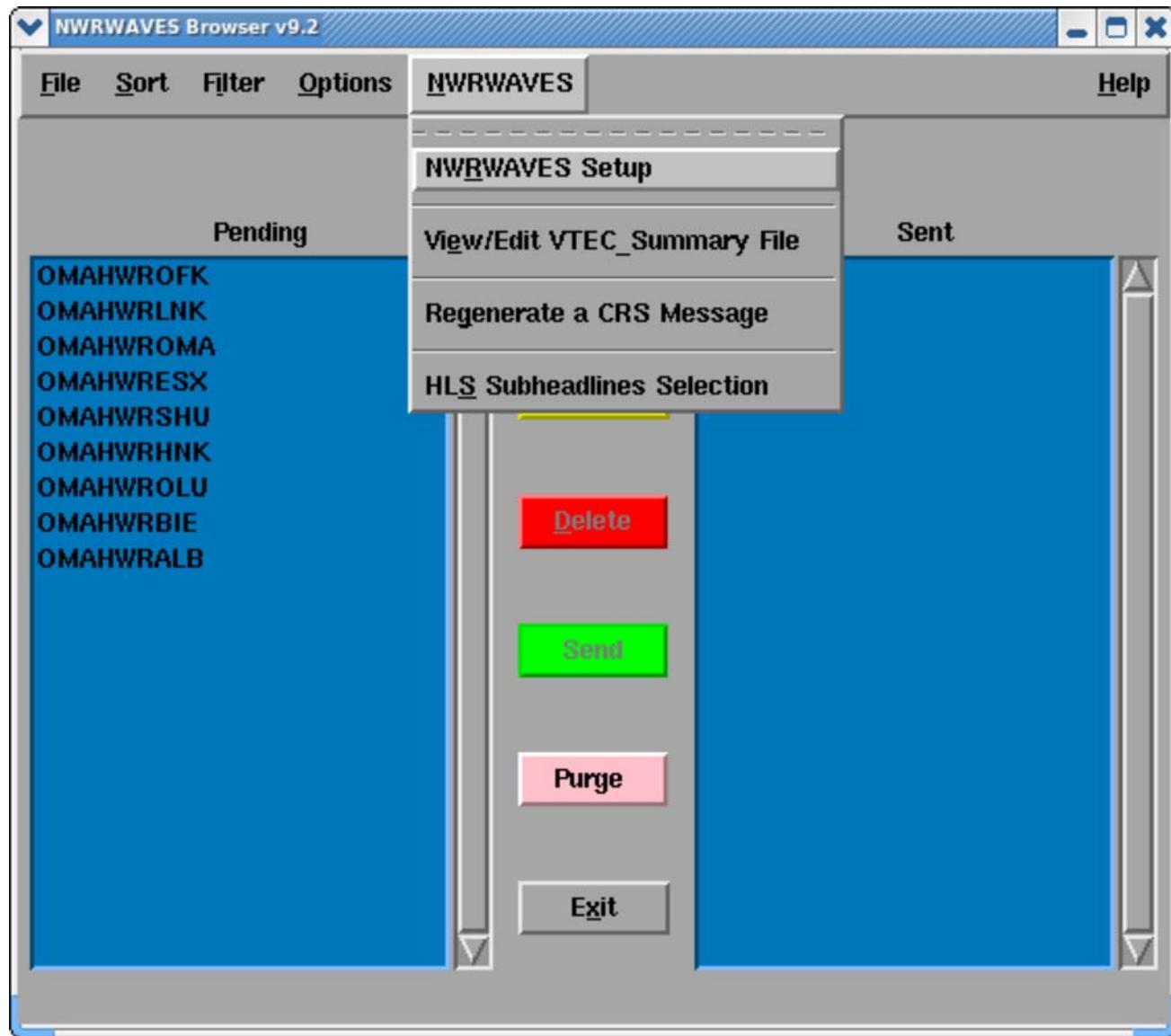


Exhibit 9.1.2-3. NWRWAVES Menu Options

Note 4: Only one version of the setup GUI can run on AWIPS at a time. If permitted to access the setup GUI, you would be able to open the setup GUI on your workstation only if there are no others open.

- **View/Edit VTEC Summary File:** If your system is configured to generate summary messages, you have the ability to edit/delete specific product summary messages manually if the automated VTEC replacement method fails. The pop-up GUI appears when active hazards are being tracked for summarization. You select the hazard you wish to modify from a list of buttons, and then you can either clear all Listening Area Codes (LAC) at once or selected LACs through their individual radio buttons. Your site will rarely (if ever) need to use this interface, because active hazards are tracked through VTEC action codes in follow-up statements. This interface is useful if you track a non-VTEC hazard such as a Flash Flood Warning (FFW) in the interim period before full VTEC implementation.
- **Regenerate a CRS Message:** Allows you to call an AWIPS PIL from the text database and reprocess

the product through the NWRWAVES formatter. When you select this option, you are prompted to enter an AWIPS product identifier and then click **OK**. The latest version of the product will appear in the Regenerate Product GUI. Sites can toggle between database versions of the product type by using the **Previous Version** or **Latest Version** buttons. Once you have the product you wish to retransmit in the viewer, click the **Send to NWRWAVES** button to re-process the product.

- **HLS Subheadlines Selection:** The Hurricane Local Statement (HLS) option is used to configure how the HLS is formatted to make the text more radio friendly.

NWRWAVES Browser Control Buttons

The NWRWAVES Browser control buttons are located in the middle of the NWRWAVES Browser. They include View, Refresh, Edit, Delete, Send, Purge, and Exit. Descriptions of each control button follow (refer to [**Exhibit 9.1.2-2**](#)).

View: After selecting a product(s) from the Pending or Sent lists, clicking the View button brings up the product in a viewer, as shown in [**Exhibit 9.1.2-4**](#).

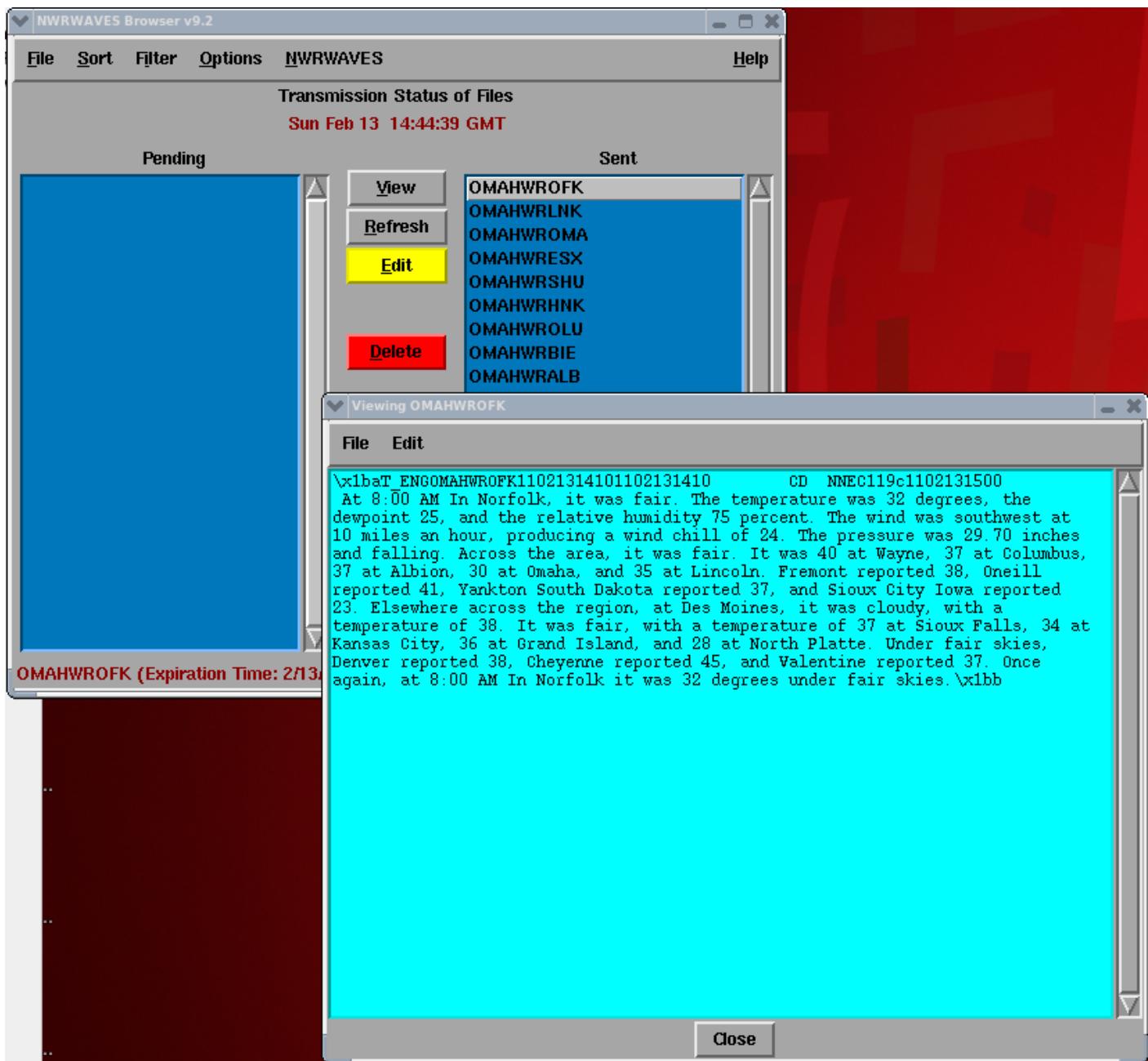


Exhibit 9.1.2-4. NWRWAVES Product Viewer

WARNING: If you view or edit a product, you disable the automatic transmission. You must send it manually via the NWRWAVES Browser. If the product was in the **Sent** list, you need to select the **Send** button to retransmit the edited Product to CRS.

Refresh: Forces a manual auto-refresh of the NWRWAVES Browser.

Edit: Lets you edit a transmitted product and modify the CRS message header properties, as shown in **Exhibit 9.1.2-5**. After editing, you can then save the edited product to the Pending list, or send to CRS.

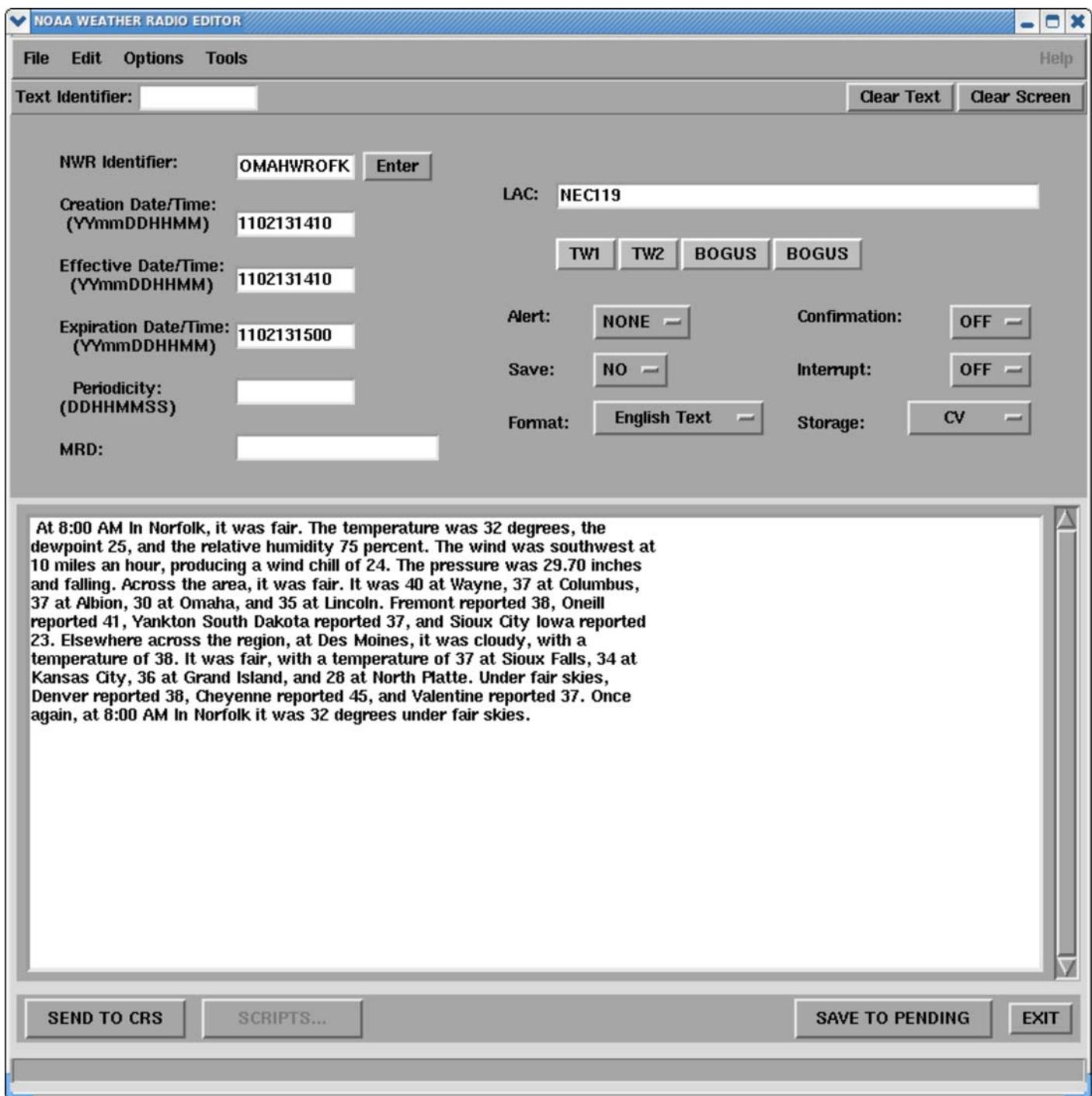


Exhibit 9.1.2-5. NOAA Weather Radio Editor

Delete: After selecting a product(s) from the Pending or Sent lists, clicking the Delete button opens a pop-up confirmation window prompting you to confirm your decision to delete the product. Once confirmed, the product is removed from the browser.

Send: After selecting a product(s) from the Pending or Sent lists, clicking the Send button sends the product to CRS.

Purge: Deletes files whose CRS message expiration time has passed.

Exit: Exits the NWRWAVES Browser.



Refer to the separate **NWRWAVES User's Manual** for more information by clicking on the book symbol.

9.1.3 Automatic Execution of the HWR NWWS Application

The Hourly Weather Roundup (HWR) NOAA Weather Wire Service (NWWS) application performs calculations on hourly land and marine weather data, constructs the product, and stores the resultant text files into a temporary target directory. From the temporary directory, the product is automatically sent to the NWWS.

9.1.4 Manual Execution of the HWR NWR Application

The Hourly Weather Roundup (HWR) NOAA Weather Radio (NWR) application can be run manually.

➤ To run the HWR NWR application manually

- From the System Control Menu:

1. Select **Background WFO Apps ▶ Hourly Weather Roundup**. The Hourly Weather Roundup window, as shown in **Exhibit 9.1.4-1**, appears.
2. Select **NWR** from the Product Maker section. In this manner, the program executes without switches.

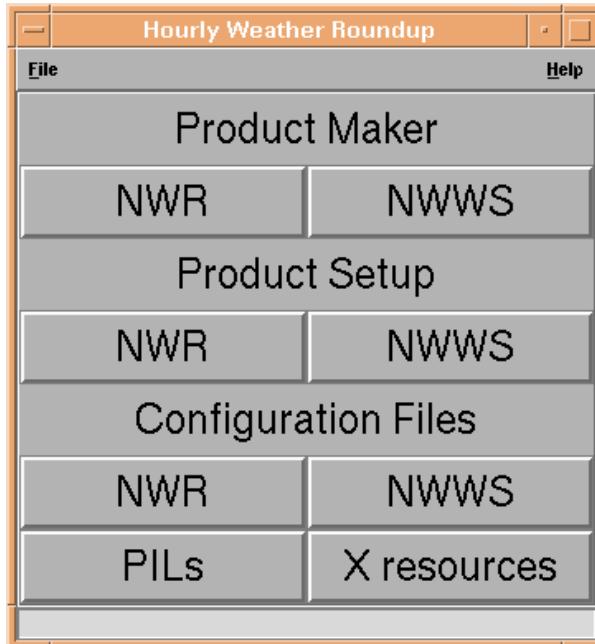


Exhibit 9.1.4-1. Hourly Weather Roundup Options Window - Select NWR

- From the Terminal Window:

1. Type the following command: **hwrnwr [-t] [product]**
2. The output file will be sent to the correct directory for transmission to the CRS even without the options. The optional "-t" switch is for subsequent transmission to the CRS after the number of minutes specified in the review period of the configuration file expires. The "product" argument permits the user to specify individual products to be created. The default is that all products specified in the **nwr.config** files will be created.

9.1.5 Manual Execution of the HWR NWWS Application

The Hourly Weather Roundup (HWR) NOAA Weather Wire Service (NWWS) application normally runs unattended via a cron. However, it can be run manually.

➤ To run the HWR NWWS application manually

- From the System Control Menu:

1. Select **Background WFO Apps ► Hourly Weather Roundup**. The Hourly Weather Roundup window, as shown in **Exhibit 9.1.5-1**, appears.
2. Select **NWWS** from the Product Maker section. In this manner, the program executes without switches.

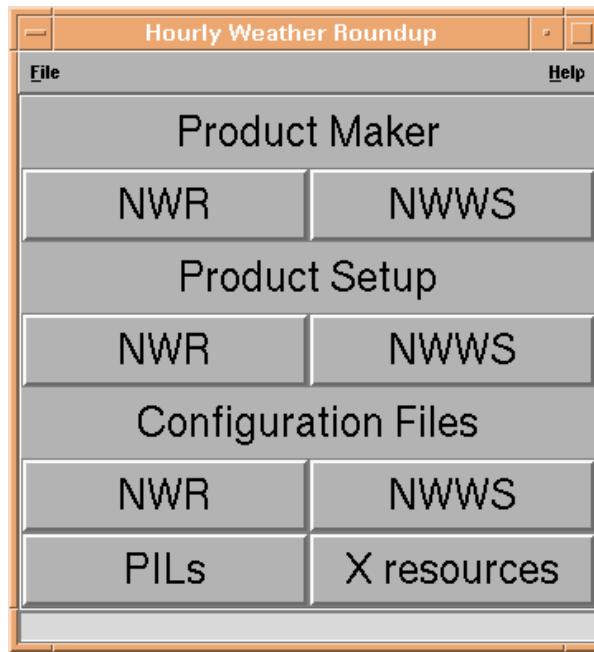


Exhibit 9.1.5-1. Hourly Weather Roundup Options Window - Select NWWS

- From the Terminal Window:

1. Type the following command: **hwrnwss [-t] [product]**
2. The output file will be sent to the correct directory for transmission to the CRS even without the options. The optional "-t" switch is for subsequent transmission to the CRS after the number of minutes specified in the review period of the configuration file expires. The "product" argument permits the user to specify individual products to be created. The default is that all products specified in the **nwws.config** files will be created.

9.2 The NOAA Climatological Reports Formatter

The NOAA Climatological Reports Formatter formats Daily Climatological Reports (product identifier "CLI"); Monthly, Seasonal, and Yearly Climatological Reports (product identifier "CLM") for AWIPS.

The Daily Climatological Report is used to summarize one or more stations' daily weather observations, records, normals, departures from normal, and last year's values for that date. Similarly, the Monthly, Seasonal, and Yearly Reports are used to summarize one or more stations' weather observations, records, normals, departures from normal, greatest amounts and values, and dates of occurrence over the corresponding period. The Formatter prepares tabular products to be disseminated over the NOAA Weather Wire Service (NWWs) and voice-ready products for broadcast over the NOAA Weather Radio (NWR).

9.2.1 Normal Operations

The Daily Climatological Reports Formatter application is normally scheduled for execution by a crontab twice per day. If required, an intermediate product can be scheduled by a crontab also. Options for forecaster initiation of the morning, intermediate, and evening Daily Climatological Reports are provided on the Climate Master dialog box.

The Monthly, Seasonal, and Yearly Reports Formatter application is normally scheduled for execution by a crontab after the period of interest ends. Options for forecaster initiation of the Climatological Reports for each period are provided on the Climate Master dialog box.

The "eyeglasses" notification symbol (refer to [*Exhibit 9.1.2-1*](#)) pops up and the word "New" appears to the left of the **Edit Climate Data** button on the Monitoring Controller dialog box (refer to [*Exhibit 9.3-1*](#)). Click the **Edit Climate Data** button on the Monitoring Controller dialog box. The Display Station Daily Climate Values dialog box, as shown in **Exhibit 9.2.1-1**, appears and provides the user with the option to edit the values before the data are saved to the database. Once satisfied with the displayed data, select **Close** under the **File** menu.

Display Station Daily Climate Values

File Help

Station Date

OMAHA EPPLEY, NEBRASKA
VALLEY NWS, NEBRASKA

Feb 12. 2011

Type of Summary

Morning daily climate summary

Select for Wind Speeds in knots

Maximum Temperature (F)	48	99 : 99	Time of Maximum Temperature
Minimum Temperature (F)	22	99 : 99	Time of Minimum Temperature
Maximum Relative Humidity (%)	96	3 : 00	Time of Maximum Relative Humidity
Minimum Relative Humidity (%)	49	13 : 00	Time of Minimum Relative Humidity
Maximum Wind Direction (DEG)	140	8 : 00	Time of Maximum Wind
Maximum Wind Speed (MPH)	11.5	99 : 99	Time of Maximum Wind Gust
Maximum Wind Gust Direction (DEG)	9999		
Maximum Wind Gust Speed (MPH)	9999.0		
Average Wind Speed (MPH)	6.6		

Climate is Running!

Precipitation (INCHES) 0.00

Snowfall (INCHES) 0.0

Minutes of Sunshine 9999

Percent Sunshine 9999

Average Sky Cover (hndrhs) 0.49

Snow on Ground (INCHES) 4

Maximum SLP (INCHES) 99.99

Minimum SLP (INCHES) 99.99

Observed Weather

<input type="checkbox"/> TS	<input type="checkbox"/> -FZRA	<input type="checkbox"/> FG
<input type="checkbox"/> MIXED	<input type="checkbox"/> GR	<input type="checkbox"/> FG <=1/4SM
<input type="checkbox"/> +RA	<input type="checkbox"/> +SN	<input type="checkbox"/> HZ
<input type="checkbox"/> RA	<input type="checkbox"/> SN	<input type="checkbox"/> BLSN
<input type="checkbox"/> -RA	<input type="checkbox"/> -SN	<input type="checkbox"/> SS
<input type="checkbox"/> FZRA	<input type="checkbox"/> PL	<input type="checkbox"/> +FC

Exhibit 9.2.1-1. Display Station Daily Climate Values Dialog Box

Once the formatter has completed the climate products, the "eyeglasses" icon pops up and the word "New" appears to the left of the **Edit Climate Product** button on the Monitoring Controller dialog box. Press the **Edit Climate Product** button. If at least one NWR product has been produced, the NWRWAVES Browser appears. The available products are displayed in the **Delayed** field. The forecaster now has the following options:

- To view the product, highlight the product and select **View**.
- To edit the product, highlight the product and select **Edit**.
- To send the product, highlight the product and select **Send**.
- Select **Refresh** to update the Delayed field.
- Select **Close** to terminate the program.

After the tabular product is formatted, it is sent to the correct directory for forecaster review and then transmission over the NWWS. When the voice-ready product is formatted, it is sent to the correct directory for display by the NWRWAVES Browser and transmission to the CRS.

If at least one NWWS product has been produced, the **Review Climate Product** GUI appears with a listing of all NWWS products. Prior to transmission, this GUI allows the forecaster to view, edit, delete, and send the generated NWWS products. The forecaster can also abort the transmission of the NWWS products if necessary.

If the forecaster chooses to send the NWWS product(s), a work copy (heading WRKALTCLI) of the product is also stored in the text database. The user/forecaster has to configure the WRKALTCLI to alert. This will cause an alert bell to appear. Upon clicking on the alert bell, the Alarm Display window will display the WRKALTCLI product. If it contains errors, the forecaster can use the text editor window to edit the actual NWWS climate product for retransmission.

The Select Climate Run Date Dialog Box

The **Select Climate Run Date** GUI is shown in **Exhibit 9.2.1-2** and its fields are discussed below.



Exhibit 9.2.1-2. Select Climate Run Date Dialog Box

The upper portion of the GUI provides two options: Latest <Morning|Intermediate|Evening|Monthly|Seasonal|Annual> Climate and Retrieve Climate for a Prior Period.

- **Latest Morning Climate:** Choosing this option will execute the Daily Climatological Formatting application for the previous calendar day.
- **Latest Intermediate/Evening Climate:** For intermediate and evening climate products, Latest Intermediate/Evening Climate is the only available option for the GUI. This option will execute the Daily Climatological Formatting application from midnight to either the execution time or a user-defined valid time.
- **Latest Monthly Climate:** Selecting this option will execute the Monthly Climatological Formatting application for the previous calendar month.
- **Latest Seasonal Climate:** Selecting this option will execute the Seasonal Climatological Formatting application for the previous 3-month season.
- **Latest Annual Climate:** Selecting this option will execute the Annual Climatological Formatting application for the previous year.
- **Retrieve Climate for a Prior Period:** This option is available for Morning, Monthly, Seasonal, and

Annual Climatology products. Use this option if the desired climate report is other than the latest morning, monthly, seasonal, and annual product.

- **Morning:** Enter the day, month, and year in their respective fields to produce a Daily Climatology report for a specific date.
- **Monthly:** Enter the beginning and ending day, month, and year into their respective fields to produce a Monthly Climatology report for a specific month.
- **Seasonal:** Enter the beginning and ending day, month, and year into their respective fields to produce a Seasonal Climatology report for a specific season.
- **Annual:** Enter the beginning and ending day, month, and year into their respective fields to produce an Annual Climatology report for a specific year.
- **OK:** This closes this GUI and executes the Climatology Formatting application that was selected.
- **Cancel:** This closes this GUI and shuts down the Climate application without making any changes.

The Display Station Climate Values Dialog Boxes

There are two versions of the **Display Station Climate Values** dialog box that provide climate summaries, Daily (refer to **Exhibits 9.2.1-1**) and monthly/seasonal/yearly. Both allow the forecaster to review the Daily Climate Values, or Monthly, Seasonal, or Yearly Climate Values for a list of stations.

Display Station Daily Climate Values Dialog Box

The dialog box menus are discussed below.

- **File:** The dropdown File option allows the forecaster to Close this the dialog box.
- **Help:** The dropdown Help option allows the forecaster to access help for this dialog box.

The dialog box fields are discussed below.

- **Accept Values:** The displayed values are stored into the hydromet (HM) database.
- **Clear Values:** The displayed data are removed from the dialog box so that the fields are blank. This option does not affect data already stored in the HM database.
- **Station:** This field provides the user with the option to select the climatological station for which data are to be displayed in this dialog box. When this **Display Station Daily Climate** dialog box is initiated, the first station in the list is automatically highlighted and its daily observations are loaded in the data fields.
- **Date:** This field displays the observation date.
- **Type of Summary:** This field displays either "Morning daily climate summary," "Intermediate daily climate summary," or "Evening daily climate summary."

The next section lists the category names: Temperature, Precipitation, Snow, Wind, and Sky & Weather. Choosing a category will display related values in the lower portion of the **Display Station Climate Values GUI**.

- **The large group in the middle** of the dialog box contains the maximum/minimum temperature and humidity, maximum wind speed and direction, and maximum gust speed and direction as well as the time of occurrence for each of these variables. It also contains the average wind speed.
- **The bottom left group** contains precipitation and snowfall amounts, percent sunshine, average sky cover, and maximum/minimum SLP.
- **The bottom right group** contains all of the observed weather types reported for the day. The observed types are identified by a check mark in these fields.

Tip: By positioning the mouse cursor over the maximum temperature, minimum temperature, maximum wind direction and speed, wind gust direction and speed, daily precipitation, daily snowfall, possible sun, sky cover, or observed weather fields and holding down mouse button 3, the forecaster can view the data retrieval method of the weather parameter. For example, for the maximum temperature, a pop-up window will appear and indicate the data retrieval method was determined from the Daily Summary Message, the 24-Hour Temperature Group, the 6-Hour Temperature Group, the Hourly Temperature Observations, or the Rounded Temperature Observations.

The forecaster can change the values if needed but must select **Accept Values** before closing the dialog box.

Note 1: There is a high-level quality control check in the Display Station Daily Climate Values dialog box. The user is unable to enter extreme values for each category. However, there is no comparison between two fields at this time.

Display Climate Values Dialog Box for Monthly, Seasonal, and Yearly Formatter

The dialog box menus are discussed below.

- **File:** The dropdown File option allows the forecaster to Accept the Climate Values and Continue or Abort the Climate Run.
- **Help:** The dropdown Help option allows the forecaster to access help for this dialog box.

The dialog box fields are discussed below.

- **Save Station Values:** The displayed values are stored into the hydromet (HM) database.
- **Clear Values:** The displayed data are removed from the dialog box so that the fields are blank. This option does not affect data already stored in the HM database.
- **Station:** This field provides the user with the option to select the climatological station for which data are to be displayed in this dialog box. When this **Display Station Climate Values** dialog box is initiated, the first station in the list is automatically highlighted and its climate values are loaded in the data fields.
- **Report Period:** This field displays the beginning and ending dates for the period.
- **Type of Summary:** This field displays either "Monthly Climate Summary," "Seasonal Climate Summary," or "Annual Climate Summary."

The next section lists the category names: Temperature, Precipitation, Snow, Wind, and Sky & Weather. Choosing a category will display related values in the lower portion of the **Display Station Climate Values GUI**.

- **The large group in the middle** of the dialog box contains the maximum/minimum temperature and humidity, maximum wind speed and direction, and maximum gust speed and direction as well as the time of occurrence for each of these variables. It also contains the average wind speed.
- **The bottom left group** contains precipitation and snowfall amounts, percent sunshine, average sky cover, and maximum/minimum SLP.
- **The bottom right group** contains all of the observed weather types reported for the day. The observed types are identified by a check mark in these fields.

The forecaster can change the values if needed but must select **Save Station Values** before closing the dialog box.

The Review Climate Product Dialog Box

When an NWWS product is created, it can be viewed and modified before it is distributed over the WAN. After the **Display Station Climate Values GUI** is closed and the values are written to the database, the forecaster can actually view and edit the product through the **Review Climate Product GUI** shown in **Exhibit 9.2.1-3**.

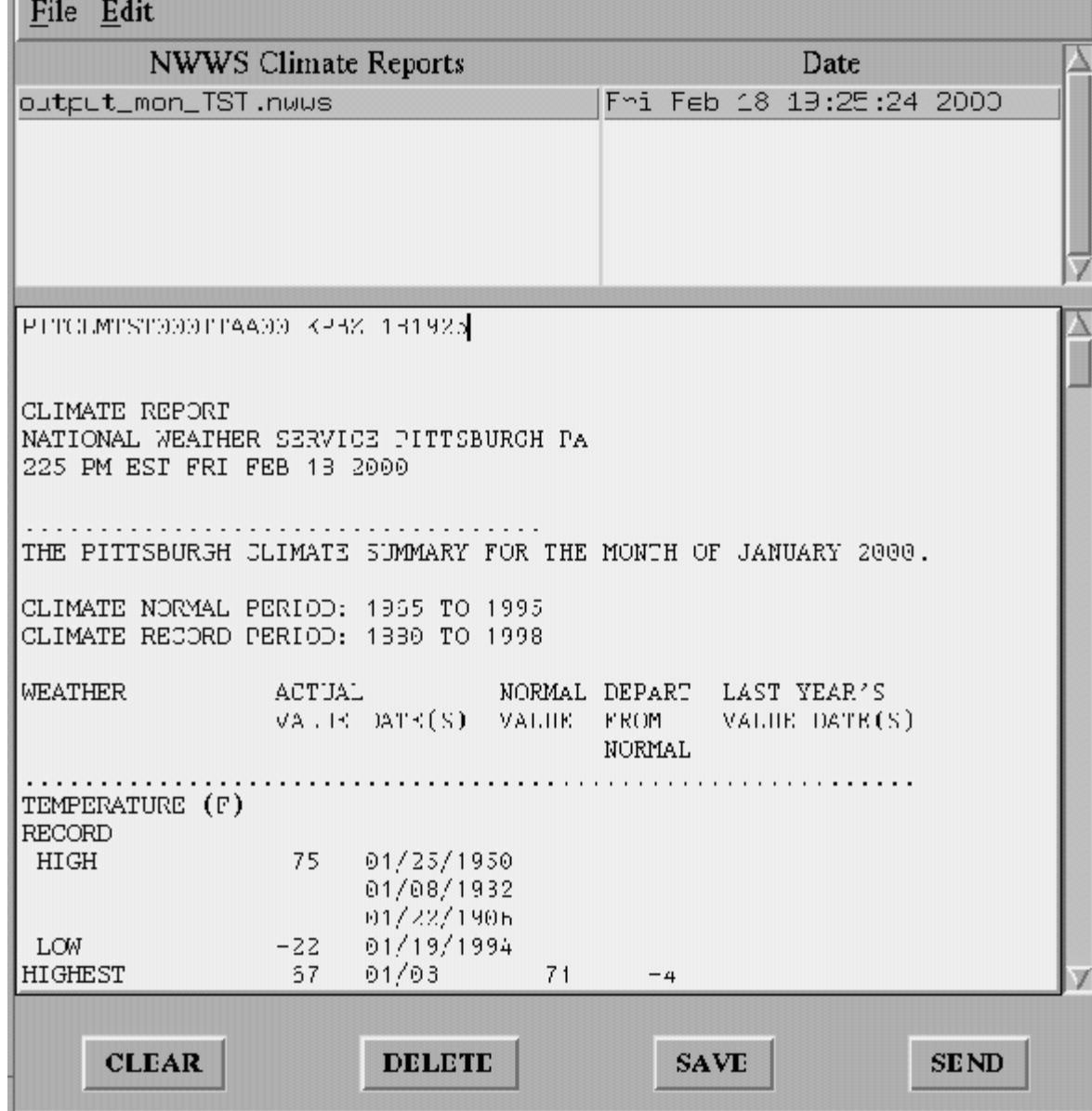


Exhibit 9.2.1-3. Review Climate Product GUI

The dialog box menus are discussed below.

- **File:** The dropdown File option allows the forecaster to accept or abort the climate run.
- **Edit:** The dropdown Edit option allows the forecaster to save or delete the climate product.

The dialog box fields are discussed below.

- **NWWS Climate Reports:** This field displays the name of the output file for the NWWS Climate Report. The files are named according to the type of Climate run. See **Table 9.2.1-1** for more information. Single clicking on the file name will display the output file in the lower frame of the GUI. At this time, the forecaster can add text, edit values, or delete the product.

Table 9.2.1-1. Climate Runs and Output

Type of Climate Run	Output File Name
Morning	output_am_<station ID>.nwws

Evening	output_pm_<station ID>.nwws
Intermediate	output_im_<station ID>.nwws
Monthly	output_mon_<station ID>.nwws
Seasonal	output_sea_<station ID>.nwws
Annual	output_ann_<station ID>.nwws

- **Date:** This field displays the date and time that the Climate product was created.

The dialog box buttons are discussed below.

- **Clear:** This button clears the bottom portion of the GUI.
- **Delete:** This button will delete the product that is selected in the NWWS Climate Report field.
- **Save:** This button saves the product that is selected in the NWWS Climate Report field.

Note 2: If any products are modified, they must be saved before the product is sent. Otherwise, the original product will be sent.

- **Send:** This button will distribute for broadcast over the WAN all of the products listed in the NWWS Climate Report field.

Notes:

3. It is very important to maintain a specific Font size when running Climate.
4. Most Climate dialog boxes are initiated with the **Cancel** button as the default. Therefore, if the space bar or the **Return key** is hit within a particular dialog box, it will follow the procedures for canceling that dialog box.

9.2.2 Manual Operation of the NOAA Climatological Reports Formatter

Any forecaster may initiate a manual run of the Morning or Evening Climate products via the **Climate Master** dialog box, as shown in **Exhibit 9.2.2-1**.

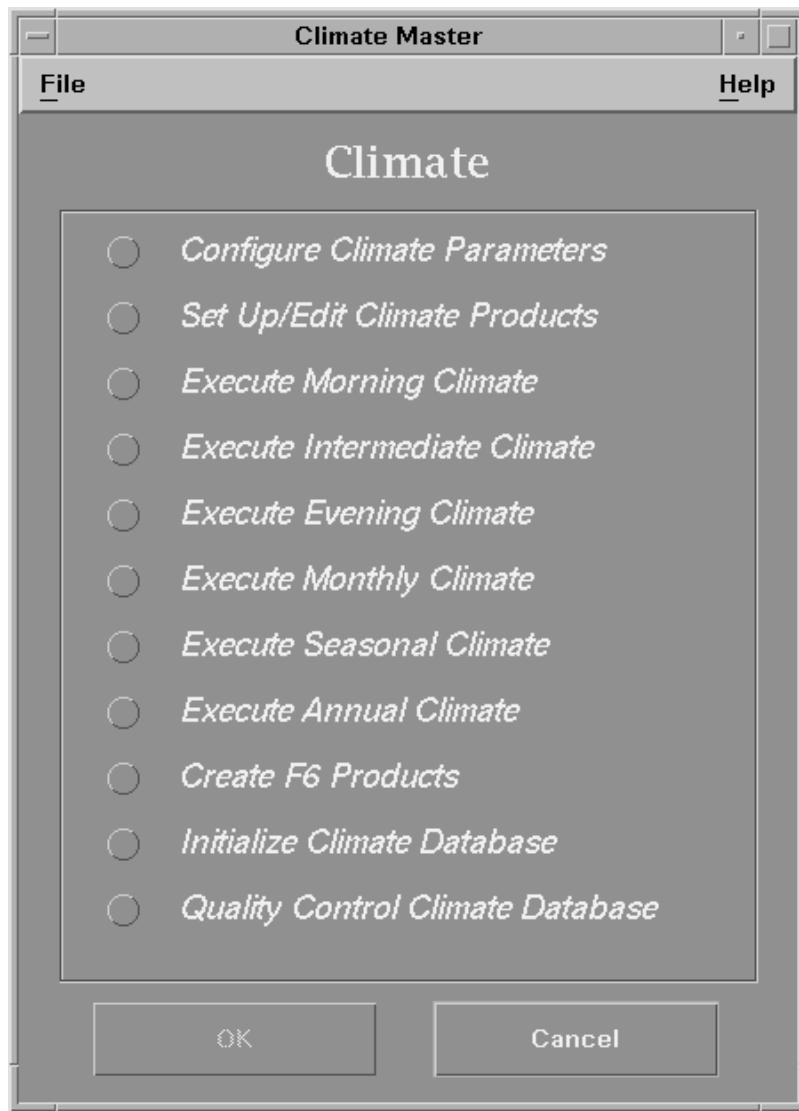


Exhibit 9.2.2-1. Climate Master Dialog Box

Climate Master Dialog Box

The dialog box menus are discussed below.

- **File:** The dropdown File option allows the forecaster to Close the Climate Master dialog box.
- **Help:** The dropdown Help option allows the forecaster to access help on the Climate Master dialog box.

The dialog box Climate Field options are discussed below.

- **Configure Climate Parameters:** This selection displays the Climate Preferences GUI.
- **Set Up/Edit Climate Products:** This selection displays the Report Format GUI.
- **Execute Morning Climate:** This selection executes the Daily Climatological Formatting application for the previous calendar day.
- **Execute Intermediate Climate:** This selection executes the Daily Climatological Formatting application for the current day, from midnight to either the execution time or a user-defined valid time.
- **Execute Evening Climate:** This selection executes the Daily Climatological Formatting application for the current day, from midnight to either the execution time or a user-defined valid time.
- **Execute Monthly Climate:** This selection executes the Monthly Climatological Formatting application for the previous month. Monthly climatology can be run in the middle of a month to create a product through the previous day of the month.
- **Execute Seasonal Climate:** This selection executes the Seasonal Climatological Formatting application for the previous season.
- **Execute Annual Climate:** This selection executes the Annual Climatological Formatting application for the previous year.
- **Create F6 Products:** This selection displays the F6 Product Date and Stations GUI (refer to [Exhibit 9.2.4-1](#)).
- **Initialize Climate Database:** This selection displays the Climatology Normals, Means, Extremes GUI; the Import Climate GUI; the Daily Normals, Means, Extremes GUI; and the Monthly Normals, Means, Extremes GUI.
- **Quality Control Climate Database:** This selection displays the Edit Daily Climate GUI and the Edit Daily Climatological Data GUI.

The dialog box buttons are discussed below.

- **OK:** This button initiates the selected option from the above list.
- **Cancel:** This button closes this GUI.

Select an option and then select the **OK** button to initiate the option.

9.2.3 Climate Record Report Formatter

AWIPS automatically produces a basic Climate Record Report (product category RER) for the NOAA Weather Wire Service (NWWS). The RER will be created whenever a Daily Climate Report is run and the climate program detects that a new daily climate record has been set, or an existing record has been tied, for one or more of the following climatological variables:

- Daily Maximum Temperature
- Daily Minimum Temperature
- Daily Precipitation (liquid equivalent)
- Daily Snowfall.

There is no need or capability to configure the RER product. The station setup of the NWWS Daily Climate (CLI) products determines the configuration of the RER products. The RER product has a one-to-one correspondence with an associated CLI product in regard to the stations included in the products, and with the node (CCC) and location identifier (XXX) of the text products full AFOS IDs (CCCNNNXXX, where NNN is RER or CLI). Outside of that, the only thing that controls the RER product's contents and creation is the presence or absence of daily climate records in the AWIPS climate database, for the variables listed above, for the stations contained in the paired CLI/RER products.

Note: There is no automated NOAA Weather Radio (NWR) product capability for climate record reporting.

The wording of the RER varies slightly between the morning CLI runs (based on yesterday's complete daily observational data) and the intermediate or evening CLI runs (based on today's data so far). The RER wording also indicates whether a new record was set or an old record was tied.

The RER formatter does no checking of the values it receives as input from the daily climate program. The new values are those taken from an untouched daily climate run, if it runs to completion without manual intervention, or those daily data modified and accepted by the user in the Display Station Daily Climate Values editor, if manual Quality Control (QC) of the daily climate run is performed. The old records reflect those record values in the climate database at the time daily climate is run. If the existing climate record value for the day has a value of MISSING (9999), no new climate record can be established for the variable and no RER will be created. When a given record has occurred in more than one prior year, only the latest year in which it previously occurred will be noted in the RER.

Usage

The Climate Record Report Formatter stores the output RER product(s) in the AWIPS Text Database. It also provides a visual notification on the D2D whenever an RER product has been created and stored. A new Alert Visualization message will appear, indicating that one or more climate records have been reached and listing the AFOS ID under which the corresponding RER product has been stored in the text database. A separate notification message will be provided for each RER product that is formatted. The appearance of the Alert Visualization message for the RER is the last automated action that the Climate Record Report

Formatter performs and is the only visible indication that an RER has been created in the Daily Climate program run. Unlike the CLI, the output NWWS RER products will not be listed and will not be able to be loaded, edited, or transmitted from the Review Climate Product user interface that appears as part of the normal climate program sequence. Also, the RER will not be automatically transmitted over the NWWS after a time-out period. All user interactions with the RER product, including viewing, editing, and product dissemination, must be performed manually via the AWIPS Text Browser on the text workstation.

Software and Data Files

The Climate Record Report Formatter consists of a single executable program (**recordClimate**), which runs as a persistent process on the Data Server (DS) platform, under user fxa, and a script (**catRecordClimateData.sh**) that feeds climate record data to **recordClimate** when called by the daily climate control script. The **recordClimate** process is automatically started whenever the **startIngest** script is executed on the DS and stopped whenever data ingest is stopped by **stopIngest**. Whenever **recordClimate** is started, it automatically creates a pair of FIFO pipe files that it continually listens to and from which it receives its input data. These pipe files, named **RecordClimateStationInfo.dat** and **RecordClimateRawData.dat**, are located under the **/awips/adapt/adapt_apps/tmp** directory.

Note: The user should make no attempt to delete or otherwise interact with these two FIFO pipe files.

The **recordClimate** process does not determine whether or not climate records have been reached. This determination of climate records is performed by the **format_climate** executable of the basic suite of AWIPS Climate Reports programs. Whenever the daily climate is run, the program **format_climate** will write climate setup and record data to a pair of ASCII text files named **RecordClimateStationInfo1.dat** and **RecordClimateRawData1.dat** (overwriting any existing files of the same name) located under the **/awips/adapt/adapt_apps/tmp** directory. These files are not removed after **format_climate** and **recordClimate** have completed.

The file **RecordClimateStationInfo1.dat** will list the AFOS IDs of the RER products that may be produced and the station(s) whose data are to be included in the RER if a record occurred at the station. This file changes only if the station setups of the RERs matching CLI products are modified and lists all stations for all configured CLI/RER products, whether or not a climate record was set for the station in the current run. The file **RecordClimateRawData1.dat** contains the old and new climate record data for stations and variables where records have been reached for the date for which Daily Climate is being run. The combination of the data from the two files determines which (if any) RER products will be formatted and the data type and station location of climate records included in each RER. Note that if there are additional climate stations that are configured for the daily NWR climate products but not included in a CLI product, any new climate records for these stations will be included in the **RecordClimateRawData1.dat** file, but no RER will be formatted based on these climate records since no matching station entry will be found in the station/product file **RecordClimateStationInfo1.dat**.

Once **format_climate** is complete, the climate control script will execute the script **catRecordClimateData.sh** to pipe the data in the ASCII text files to their corresponding FIFO files, where the **recordClimate** executable receives and processes the data, creates and stores any required RER products, and provides the Alert Visualization notifications.

9.2.4 Create F6 Products

Selecting **Create F6 Products** from the **Climate Master** GUI will bring up the **F6 Product Date and Stations** dialog box, as shown in **Exhibit 9.2.4-1**.

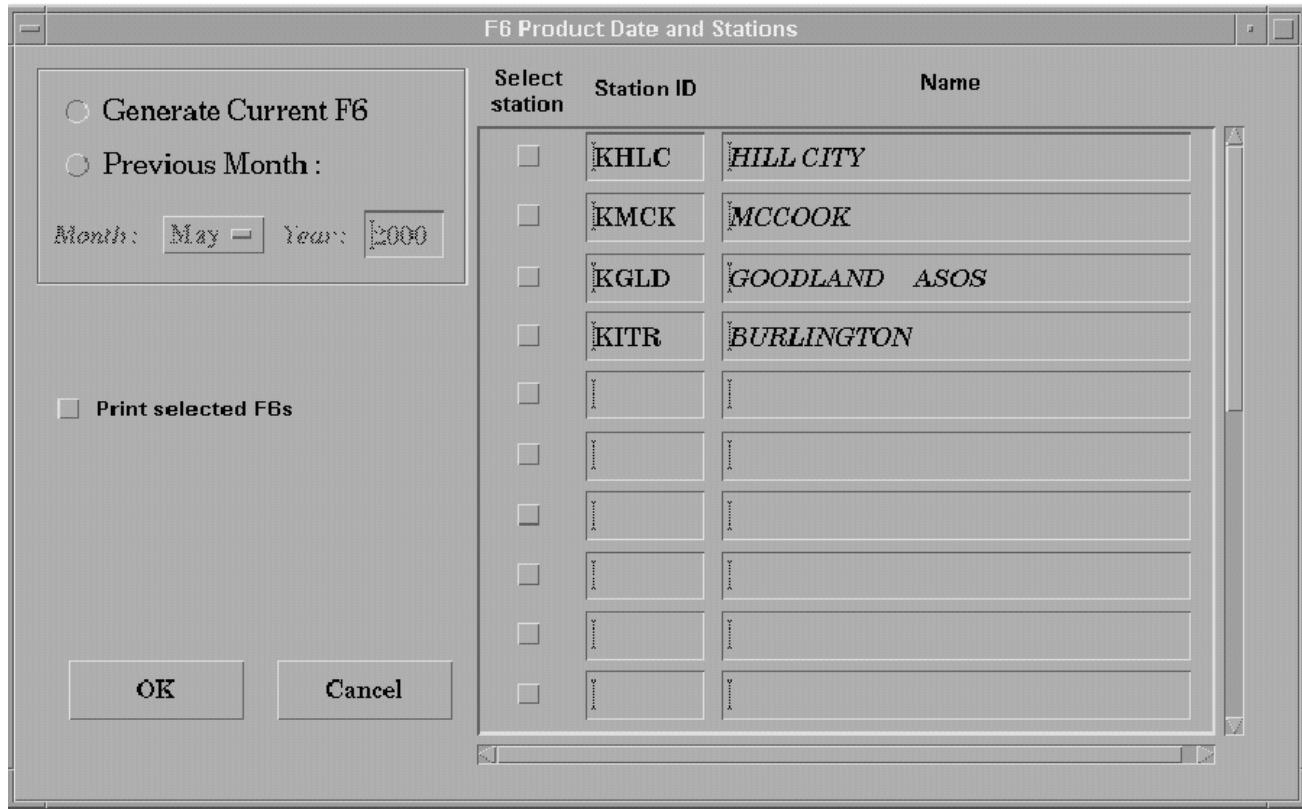


Exhibit 9.2.4-1. F6 Product Date and Stations GUI

The GUI default is to generate the F6 product for the current month. The forecaster can also select a previous month by clicking the button beside the **Previous Month:** option. Use the pull-down menu to select the month and type in a desired year. Clicking **OK** will send the F6 products for all stations to the printer and also to the text database.

To view the product in the text database, bring up a text window on the text workstation. In the **Load cmd:** area, type **SSSLCDMM** where SSS is the three-letter station identifier and MMM is the abbreviation of the month. Press **Enter**. For example, the F6 for Pittsburgh for March would be stored under PITLCDMAR. The last generated F6 product for Pittsburgh would then be displayed.

- **Select station:** Individual F6 products can be produced by clicking on the check boxes beside the station name.
- **Print selected F6s:** Clicking this check box will send all selected F6 products to the printer for a hard copy of the product(s).
- **OK:** This will execute the build_f6 program with specified forecaster options.
- **Cancel:** Pressing this button will close the build_f6 program without producing any F6 products.

The F6 generation can also be run by a cron so that the products can be produced automatically at certain times of the day. Cron setup should be accomplished during site installation but can be changed as requirements dictate.

Two command line arguments can be used, both of which can have values of "1" or "0":

- The first argument determines whether or not the F6 Product Date and Stations GUI pops up. A value of "1" results in the GUI popping up while a value of "0" results in it not popping up.
 - For the second argument, a value of "1" results in the F6 product being printed while a value of "0" does not. When neither argument is used, the GUI will not pop up and the product will not print, as if both arguments were assigned values of "0".
-

9.2.5 Record Climate

The following sections provide an overview of the Record Climate process and the steps required to create a record report.

Note: The sections that follow assume the user has a knowledge of climate.

9.2.5.1 Record Climate Process Overview

The Record Climate process performs the basic "Record Report" (RER) functionality required by AWIPS. Record Climate is an extension to the Current Climate functionality. If a record is set in the climate process, Record Climate will recognize this and produce a formatted RER, and store it in the fxa text database. A forecaster can then retrieve this product from the database via the Text Workstation or the nwrEditor for data verification and subsequent off-site dissemination.

Note: Distribution and verification of products from the AWIPS fxatext database are manually accomplished via the Text Workstation (WAN) and nwrEditor (CRS).

Record Climate performs three basic operations:

- Formatting of Record Climate Reports
- Storage of Record Climate Reports in the fxa text database (CCCRERXXX)
- Forecaster notification (local/system) that a record has been set:
 - Local workstation notification via a pop-up message box (Tcl/Tk) and system notification
 - System via D2D the task bar and an audible alarm (uses Announcer objects).

9.2.5.2 Creating a Record Report (RER)

➤ To Create a Record Report

1. Run climate and create a record, or wait until a climatic record normally occurs; then validate the climate data.
2. If a record has occurred, Record Climate will recognize this and do the following:
 1. Create a Record Report (RER).
 2. Display a text message box on the local WS notifying the forecaster that a climatic record event occurred.
 3. If set in the Record Climate configuration file, notify all other workstations via the D2D status bar.
 4. Store the RER product in the fxatext database under the id CCCRERXXX, where CCC and XXX are site dependent.

Note: If more than one record occurs during a single climate run, RER products will be stored to the fxatext database under the same RER ID. This means that records are stored as previous versions; e.g., if a min-temp and a max-snowfall occurred in the same climate run, a separate RER would be created for each climatic event. Then these RERs would be stored to the fxatext database in turn. To retrieve them, the forecaster would use the Text WS text window to retrieve the multiple versions of the product stored under the RER ID.

3. Verify the Record Report and disseminate it off-site using the Text WS text window and nwrEditor. The text window can be used to verify and disseminate the product off-site. To disseminate the product to the NOAA Weather Radio (NWR), use the nwrEditor to create a new voice-ready RER product. If more than one record occurred in a single climate run, the forecaster will need to pull up the previous versions using the text window and paste them into the body of the voice-ready RER product. This is because the nwrEditor will retrieve only the latest RER stored in the fxatext database.

9.3 The Monitoring Controller

The Monitoring Controller dialog box, as shown in **Exhibit 9.3-1** automatically starts when a user logs into the AWIPS text display. It alerts the forecaster whenever a background applications product is ready for review or editing.



Exhibit 9.3-1. Monitoring Controller Dialog Box

The Monitoring Controller menu bar has three choices: File, Windows, and Options.

File

The File menu provides access to the **Exit** menu option.

Windows

The Windows menu provides the following options:

- The Hourly Weather Roundup option provides access to the NWRWAVES browser.
- The Daily Climate Data option provides access to the Display Station Daily Climate Values dialog box.
- The Daily Climate Product option provides access to the NWR browser.

Options

The Options menu provides the following options:

- The Climate On button turns Climate notification on or off.
- The HWR On button turns the HWR notification on or off.

Notification Messages and Monitoring Controller Dialog Box Buttons

Notification messages may be received for one of several different monitoring applications. When a notification message is received for a particular application, the text "New" will appear beside its button in

the Monitoring Controller.

Note: The user may turn the different types of notifications on and off by selecting the **Options** menu on the Monitoring Controller. The two monitoring notifications are turned on by default.

For the HWR, the normal mode of operation is via cron, and the user is notified only if a review value greater than "0" is specified in the **hwrnwr.conf** file.

If a review value greater than "0" is specified ("New" appears next to the **Hourly Weather Roundup** button), the NWR will cause a notification, but the NOAA Weather Wire Service (NWWs) will not. When the user is notified and presses the **Hourly Weather Roundup** button, the NWRWAVES Browser appears. The NWRWAVES Browser permits the forecaster to view, edit, or transmit the HWR products.

For the Climate application, two notifications will occur in normal processing:

1. When the **create_climate** program is run, the user is notified ("New" appears next to the **Edit Climate Data** button). When the **Edit Climate Data** button is pressed, the Display Station Daily Climate Values dialog box appears with the new climate data. The user may edit the values before the execution goes forward.
2. After the **format_climate** program runs, the user is again notified ("New" appears next to the **Edit Climate Product** button) and presses the **Edit Climate Product** button. The NWR browser appears, which allows the user to view and edit the daily climate product. Once the user is satisfied with the product, it may be transmitted.

10.0 Local Data Acquisition and Dissemination

The function of the Local Data Acquisition and Dissemination (LDAD) system is threefold:

1. Acquire local data sets of varying types and communication means.
2. Perform quality control on the incoming data.
3. Disseminate weather data and information to external users including emergency managers of local and State Government agencies.

The LDAD system was built upon the Office of Hydrology's (OH) RFC Gateway and the NWS Central Region's PC-Remote Observing System Automation (ROSA) system.

The LDAD system is a set of software components, both of which reside on the internal AWIPS network and the LDAD server, which is the external server. Due to security concerns, the LDAD external server and the AWIPS internal network are separated by a security firewall.

The user interface, data processing, and control are accessed by WFO personnel via the AWIPS workstation. The actual components that perform the dial-out and other communications activities reside on the external LDAD server.

This chapter includes the following sections:

- [Section 10.1: LDAD Scheduler](#)
- [Section 10.2: Practice Module: Using the Local Data Acquisition and Dissemination Scheduler](#)



10.1 LDAD Scheduler

The LDAD Scheduler allows you to specify up to 1 year of automatic continuous non-routine data requests from either Local Automatic Remote Collector (LARC), Campbell, or Sutron gauges, or external cooperative users. Refer to [Section 10.2](#), Module 29 - Objective 29.1, for details on generating a LARC gauge request.

You can access the LDAD Scheduler from CAVE by selecting **Obs ► Collection/Dissemination**. The LDAD Scheduler provides access to the LDAD Gateway, which is a set of software components that links and allows communication between the internal and external sides of the AWIPS security firewall. Through this interface, you can incorporate new data sources into the system and set up collection and dissemination scripts for external users.

The **LDAD Scheduler** dialog box, as shown in **Exhibit 10.1-1**, is divided into two parts: Existing Requests and Active Requests.

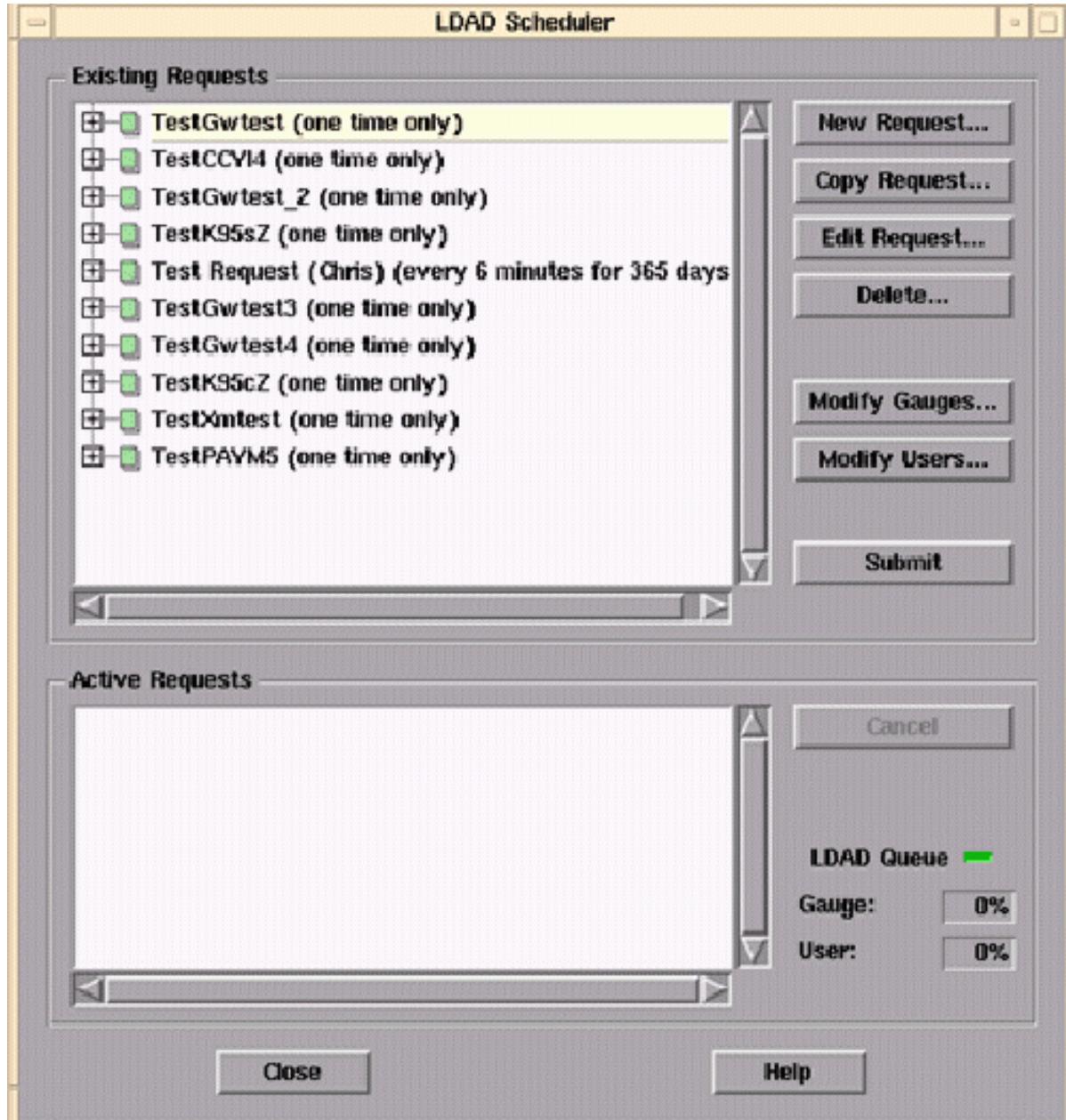


Exhibit 10.1-1. LDAD Scheduler Dialog Box

10.1.1 Existing Requests

Once products have been requested, this area of the **LDAD Scheduler** dialog box contains a tree-view listing of the existing requests. (It is empty if no gauges or users have been chosen.) The request name is denoted with a book symbol. Click on the "+" symbol next to the request name to expand the tree view and view the contents of the request. A request with a red "X" through the book symbol is poorly formed; i.e., the request is missing either a gauge ID or a user, making it unusable.

Each gauge within a request is signified by a blue rain gauge symbol, while a yellow face identifies external users.

Click on the "-" symbol next to each request name to close the expanded tree-view listings.

The **Existing Requests** section of the **LDAD Scheduler** dialog box also contains the following options. Refer to [Exhibit 10.1.1-1](#).

- **New Request...:** This menu button opens the **New Request** dialog box, as shown in [Exhibit 10.1.1-1](#), which contains options for selecting and requesting data from one or more gauges or collecting or disseminating data from external users.

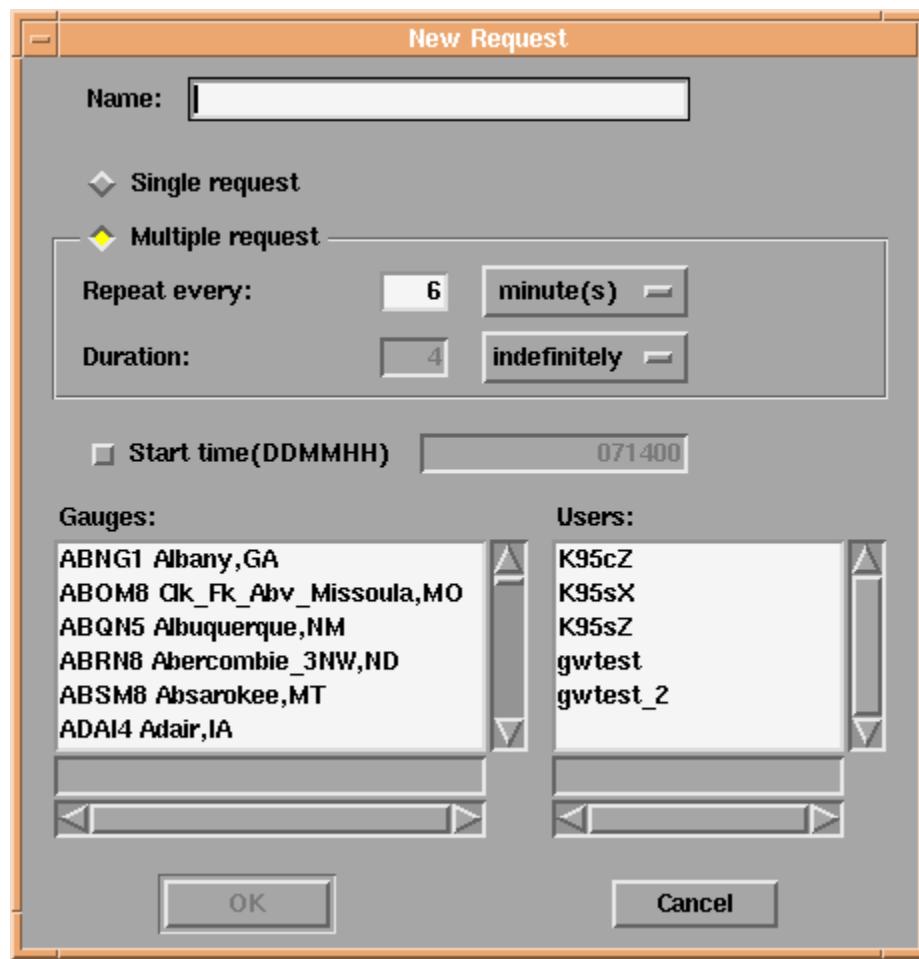


Exhibit 10.1.1-1. New Request Dialog Box

This dialog box has the following options:

- **Name:** Use this entry line to type a unique name to identify your request.
- **Single Request:** This check button limits the request to one retrieval of gauge or external user data.
- **Multiple Request:** Choose this check button if you want to repeat a request.
- **Repeat every:** You can choose the update frequency of your request by using the minute(s)/hour(s) option menus, and by typing the time interval in the entry boxes.
- **Duration:** With these entry boxes you can choose how many times to re-issue the request with "indefinitely" as one of the choices.
- **Start time (DDMMHH):** If this button is selected, this request will start up at the time defined in the input entry box.
- **Gauges:** You can select one or more gauges from the list.
- **Users:** You can choose one or more users from the list.
- **OK:** This menu button acknowledges the entries you have made and closes the **New Request** dialog box.
- **Cancel:** This menu button closes the **New Request** dialog box without creating new requests.

- **Copy Request...:** This menu button opens the **Copy Request** dialog box, as shown in **Exhibit 10.1.1-2**. This option allows you to copy the existing highlighted request and give this request a new name in the entry line provided. This button is disabled if nothing is currently selected in the tree view.

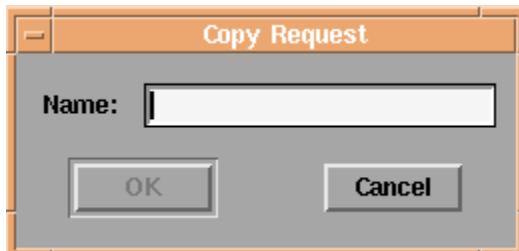


Exhibit 10.1.1-2. Copy Request Dialog Box

- **Edit Request...:** This button opens the **Edit Request** dialog box, as shown in **Exhibit 10.1.1-3**. You need to select one of the existing requests (or one of the gauge or user IDs in that request) in the tree view before you can edit it. The **Edit Request** dialog box has the same options as the **New Request** dialog box.

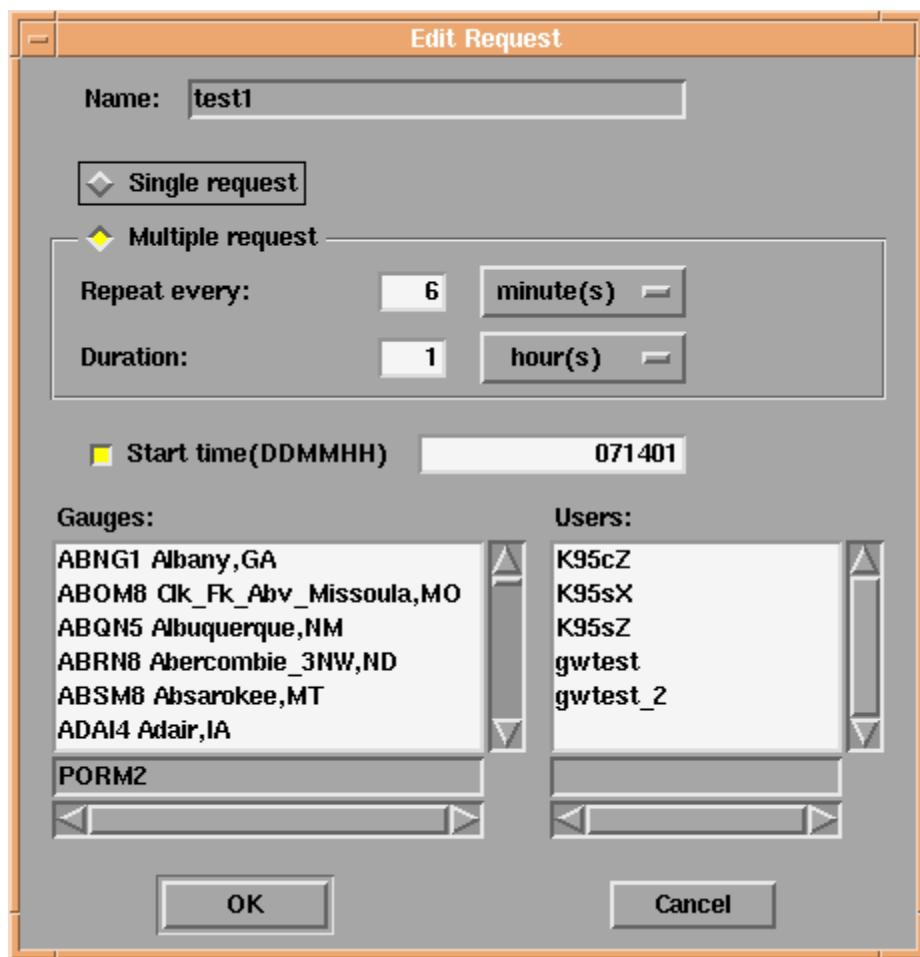


Exhibit 10.1.1-3. Edit Request Dialog Box

- **Delete....:** This menu button is context sensitive. What it deletes depends on what is highlighted in the **Existing Requests** list.
 - If a request is highlighted and you select the **Delete** button, the request is removed. A confirmation dialog box asks you to verify your deletion.
 - If a gauge or user ID within the request is highlighted when you select the **Delete** button, the gauge ID is deleted from the request. **No confirmation box will appear to request verification.**
- **Modify Gauges:** This menu button opens the **Modify Gauges** dialog box. It is described in [Section 10.1.3](#) and shown in **Exhibit 10.1.3-1**.
- **Modify Users:** This button opens the **Modify Users** dialog box, as shown in **Exhibit 10.1.1-4**, which provides options to create/modify table entries for external users. External users are outside persons/groups that send or receive LDAD data. You need to have site information for external users, such as the Internet Protocol (IP) address, site login and password, as well as relevant file names. The Modify Users dialog box contains all the options needed to set up an external user. Your System Administrator is responsible for setting up external users.

If you opened the **Modify Users** dialog box and don't wish to make any changes, click the **Close** button.

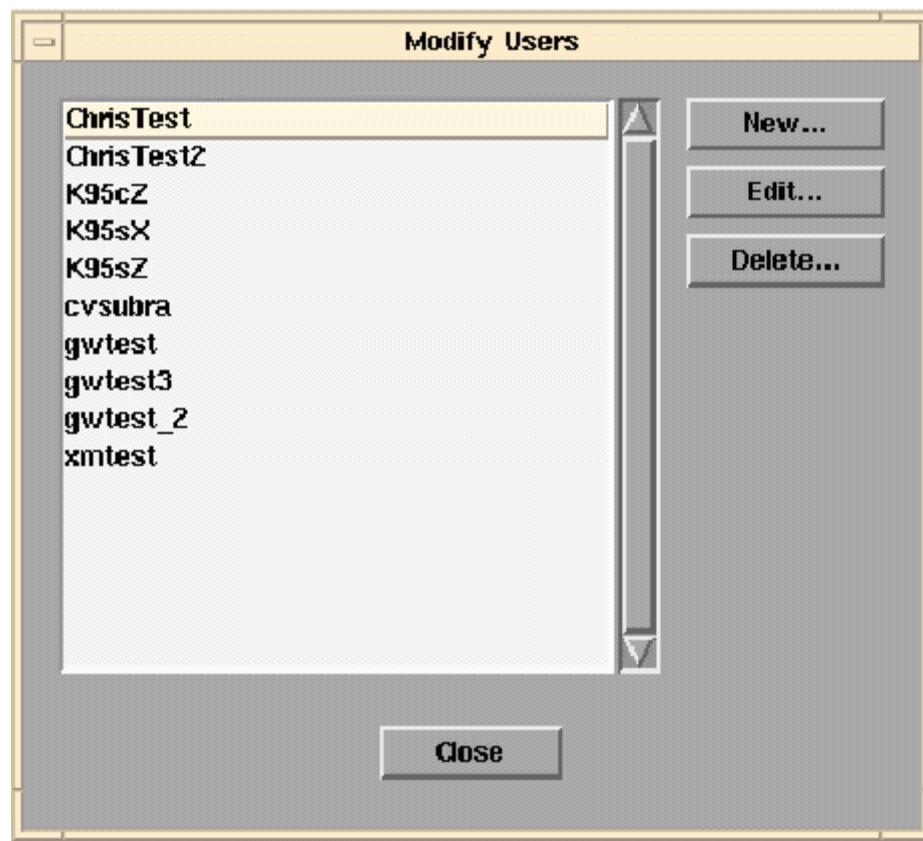


Exhibit 10.1.1-4. Modify Users Dialog Box

- **Submit:** This button sends a highlighted request to the LDAD Server, which processes your request. The button is enabled only if a request containing at least one ID is highlighted in the **Existing Requests** list. The status of your request appears automatically in a **Status:** window. The results of your gauge request appear in a **Result:** window. The windows are shown in **Exhibit 10.1.1-5**.

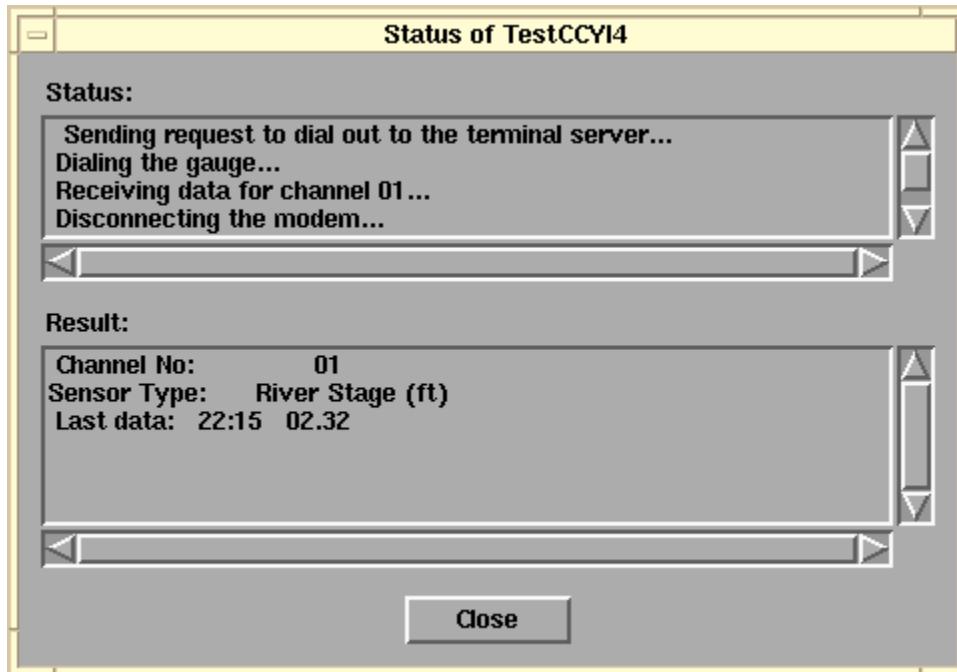


Exhibit 10.1.1-5. Status of Test Dialog Box

10.1.2 Active Requests

The Active Requests area, like the Existing Requests area, of the **LDAD Scheduler** dialog box (refer to [Exhibit 10.1-1](#)) contains a tree-view listing of the requests that are currently running.

Note: A one-time request will never appear in the active request area. Only multiple requests appear as active requests.

- The Active Requests area of the LDAD Scheduler has the following options:
 - **Cancel:** This button deactivates the highlighted active request. This button is disabled if a request is not selected in the Active Requests tree view.
 - **LDAD Queue:** This section of the window contains color indicators showing the LDAD Queue status and two percentage readouts that display the capacity at which the LDAD queue is currently running.
 - If the LDAD Queue is overloaded, the indicator is **red**. Currently active requests may not be fulfilled in a timely manner and a backlog may occur.
 - If it is **flashing red**, that means a request was just added and the LDAD Queue is overloaded. The light flashes red for a few seconds before changing to a steady red.
 - If it is **green**, the LDAD Queue is not overloaded.
 - The percentage readouts indicate the capacity at which the LDAD Queue is operating. For the gauges, the operating capacity is determined by calculating how many gauges have to be contacted for each request. This calculated number is expressed as a percentage of the safe maximum gauge capacity, i.e., the maximum number that can be used without creating a backlog. If the calculated number exceeds the safe maximum, the percentage is over 100 percent. Otherwise, the percentage is at or under this amount. The same calculations apply to the user percentage readout.
 - The percentage readouts allow users to see at a glance whether gauge or user (or both) requests can end up being backlogged. If either is over 100 percent, the colored indicator will be red instead of green. To bring the percentages down to the safe maximum of 100 percent, cancel one or more requests in the Active Requests tree view. You will notice how the percentages decrease as requests are canceled.
- The menu buttons at the bottom of the LDAD Scheduler dialog box apply to both areas:
 - **Close:** This menu button closes the **LDAD Scheduler** dialog box.
 - **Help:** This menu button opens the online help for information contained in the LDAD Scheduler dialog box.

10.1.3 Modify Gauges Dialog Box

Selecting the **Modify Gauges...** button in the LDAD Scheduler (refer to [Exhibit 10.1-1](#)) will cause the **Modify Gauges** dialog box to launch, as shown in **Exhibit 10.1.3-1**.

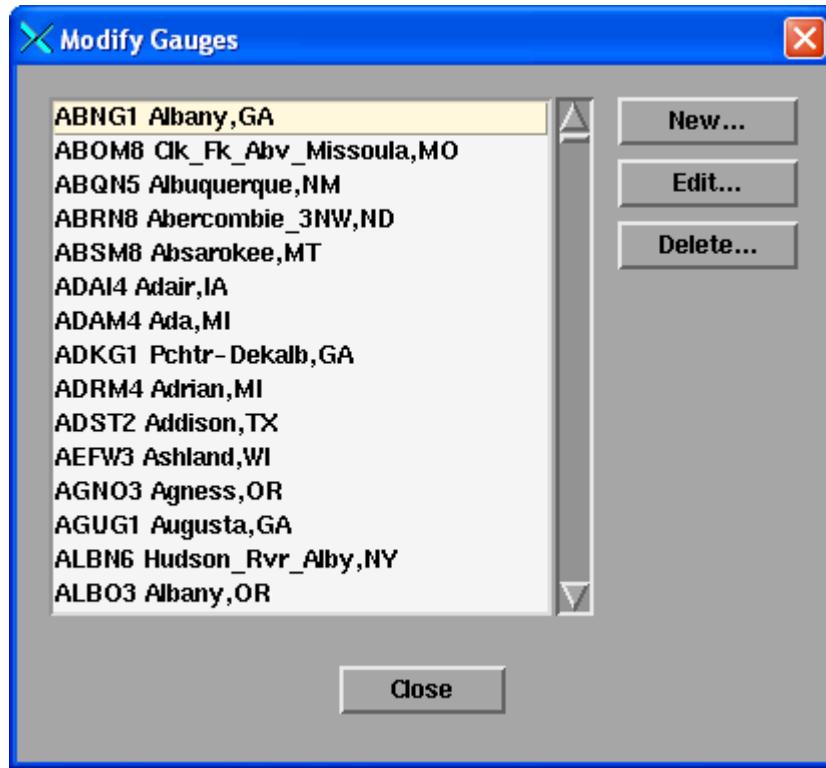


Exhibit 10.1.3-1. Modify Gauges Dialog Box

Allow a few moments for the **Modify Gauges** dialog box to open as it is a large file. Within this dialog box, you can create or modify entries for gauges with the following options:

- **New:** This menu button opens the **New Gauge** dialog box, which is shown in **Exhibit 10.1.3-2**.
- **Edit:** This menu button opens the **Edit Session File** dialog box, which allows you to modify information for a selected gauge. All of the options are the same as in the **New Gauge** dialog box.
- **Delete:** Use this **Modify Gauges** dialog box button to delete a selected entry from the gauge list. A confirmation dialog box appears to verify your deletion.
- **Close:** This button closes the **Modify Gauges** dialog box.

Discussions of the dialog boxes reached by pressing the "New" and "Edit" menu buttons follow.

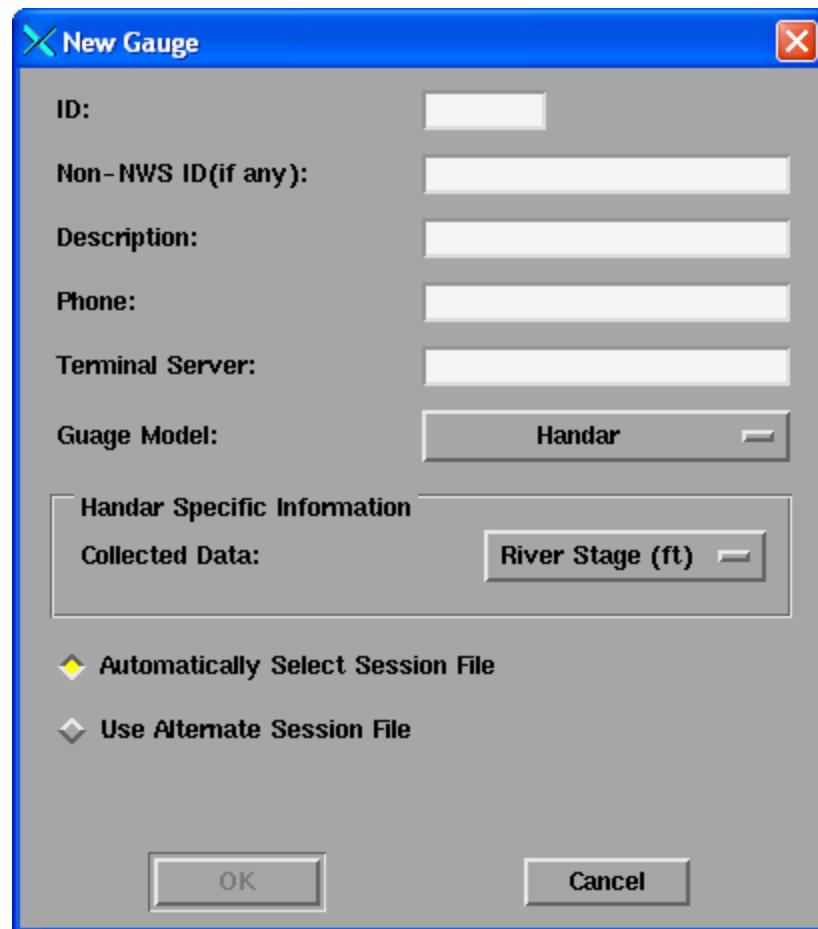


Exhibit 10.1.3-2. New Gauge Dialog Box

New: New Gauge Dialog Box

The New Guage (refer to **Exhibit 10.1.3-2** has the following options:

- **ID:** This entry box is for the five-character gauge ID.
- **Non-NWS ID (if any):** This entry box is for entering a non-NWS ID.
- **Description:** This entry box is for the location (or other helpful) information of a gauge.
- **Phone:** This entry box is for the dial-in phone number. You should check all gauges to verify their complete local or long distance numbers, including area codes. Be sure to include any required external access codes (i.e., some offices require a "9" to be dialed before an external phone number).
- **Terminal Server:** This entry box is for the terminal server name. The terminal server connects your machine to the modems that dial into the gauges.
- **Gauge Model:** This option menu specifies the type of gauge. As an example for the information that follows, using Handar (for LARC gauges), Campbell, or Sutron. Depending on which of these options is selected, you will need to provide more information specific to the gauge model.
 - **Handar Specific Information:** These elements will appear when you select Handar from the Gauge Model option menu.
 - **Collected Data:** This option menu specifies which data the gauge collects. The

value is used to determine which session file is used. This option has no effect if you choose an alternate session file (the menu will display Unspecified). If the session file is being selected automatically, using the value Unspecified has the same effect as using the value River Stage.

- **Campbell Specific Information:** These elements, which are shown in **Exhibit 10.1.3-3**, will appear when you select Campbell from the Gauge Model option menu.

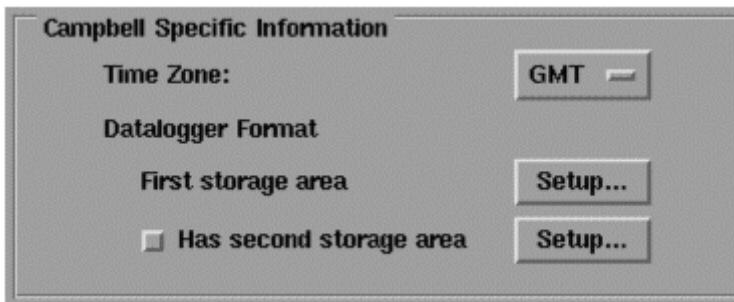


Exhibit 10.1.3-3. Campbell Specific Information

- **Time Zone:** This option menu specifies the time zone used in data reported by the gauge.
- **Datalogger Format:**
 - **Setup...:** These menu buttons will open an **Edit Storage Area Reporting Format** dialog box.
 - **Has Second Storage Area:** If the gauge is equipped with a second storage area, select this option.
- **Sutron Specific Information:** These elements, which are shown in **Exhibit 10.1.3-4**, will appear when you select Sutron from the **Gauge Model** option menu.

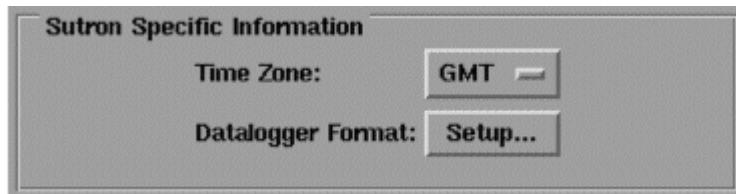


Exhibit 10.1.3-4. Sutron Specific Information

- **Time Zone:** This option menu specifies the time zone used in the data reported by the gauge.
- **Datalogger Format:** The **Setup...** button found in this field will open an **Edit Storage Area Reporting Format** dialog box. This dialog box is discussed later in the section. This dialog box is discussed later in the section.
- **Automatically Select Session File:** When this radio button is selected, the scheduler will determine which session file should be used. A session file is a text-based script that is used to collect data from an external user or disseminate data to an external user. Typically, the script is written in a UNIX or Linux scripting language.

- **Use Alternate Session File:** When this radio button is selected it allows you to choose a specific session file. There are also options for creating and modifying session files. After you select this button, the **Choose** button appears. The Choose button opens the **Choose Session File** dialog box, as shown in **Exhibit 10.1.3-5**.

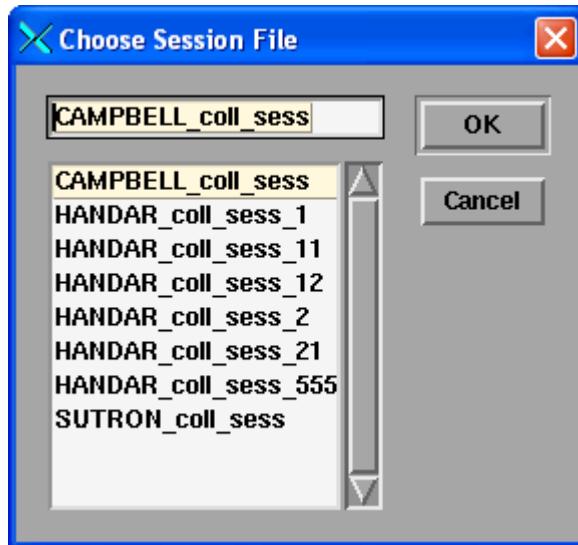


Exhibit 10.1.3-5. Choose Session File Dialog Box

The Choose Session File dialog box has the following options:

- **Entry Box:** You can enter a session file name in this entry box.
- **List of Sessions:** This is a list of session files. The list may not contain all valid session files, in which case you may simply enter the name in the Entry box.
- **OK:** Once you have selected a session file, this menu button closes the dialog box.
- **Cancel:** This menu button closes the dialog box without any changes.

When a session filename is entered, and the **Use Alternate Session File** radio button is selected, an Edit button appears, which opens the **Edit Session File** dialog box. This option is used to create or modify a session file to acquire gauge data. See your System Administrator is responsible for creating and modifying session files.

Edit: Edit Storage Area Reporting Format Dialog Box

This dialog box specifies the data reported by a Campbell or Sutron gauge. It is shown in **Exhibit 10.1.3-6**, and has the following options:

- **Array ID:** This entry box specifies the array ID associated with the storage area. This option is present only for Campbell gauges.



Exhibit 10.1.3-6. Edit Storage Area Reporting Format Dialog Box

- **Reported Data:** This list contains the data elements reported by the gauge. The order of elements in this list must match the order of the reported data. At most, the list may contain eight elements.
- **Add...:** This menu button will open a menu of data elements that can be reported by gauges. Select an item from the menu to add an element to the **Reported Data** list. Select the last item on the menu if you do not want to include it in the collected data.
- **Remove:** This menu button will remove the selected element from the **Reported Data** list.
- **Move up:** This menu button will move a selected list element up one position.
- **Move down:** This menu button will move a selected list element down one position.
- **OK:** This menu button acknowledges the changes you have made and closes the dialog box.
- **Cancel:** This menu button closes the dialog box without any changes.

10.2 Practice Module: Using the Local Data Acquisition and Dissemination Scheduler

Module 29: Using the Local Data Acquisition and Dissemination (LDAD) Scheduler

Using the LDAD Scheduler, you can obtain data in succession from one or several gauges with one request.

Objective 29.1 - Create an LDAD Gauge Multi-request

1. From the CAVE-D2D Perspective, select the **Obs** pull-down menu (refer to [Section 2.2.6.7](#)) and select the **Collection/Dissemination** option in the **Local data** section of the Obs menu. The **LDAD Scheduler** dialog box will appear in a few seconds.
2. In the **LDAD Scheduler** dialog box, click on the **New Request** button. The **New Request** dialog box opens.
3. In the **New Request** dialog box, type a unique name in the **Name** entry box, and make sure that the **Multiple request** check button is selected.
4. Also in the **New Request** dialog box, set the **Repeat every** count to 1 hour, and **Duration** to 1 day.
5. In the **New Request** dialog box, under the **Gauges** list, select one gauge ID. Notice that as you select it, the five-character ID appears along the bottom edge of the **Gauges** list for your convenience.
6. Select the **OK** button to close the **New Request** dialog box. Observe that your request name appears in the **Existing Requests** list.
7. Click on the "+" icon next to your request to view the contents of your request.
8. Highlight the name of your new request (if not already highlighted) and select the **Submit** button to activate your request. Now you should see your request in the **Active Request** portion of the **LDAD Scheduler** dialog box. (You may need to resize the window to view the new request.)
9. The **LDAD Queue** shows the capacity percentage of the active requests.
10. Once the gauge and user data are received by the system, you can display the data from the **Obs** pull-down menu under **Local data-Other Local Plots-Precip Plots**. The requested data should have an updated valid time within the menu. However, there is no way to initially know the exact time interval that precipitation was recorded in gauges.

Note: A precipitation plot with an "A" preceding the precipitation value (for example A1.25") indicates an accumulated precipitation amount over an indefinite time period. LARC, Campbell, and Sutron gauges report in this manner. However, the first receipt of gauge information can be used as a baseline and subsequent data acquisitions at regular time intervals will indicate an approximate precipitation rate.

11.0 AWIPS Quality Control and Monitoring System (QCMS)

The AWIPS QCMS supplies forecasters with readily available quality control (QC) information and statistics. Two types of QC checks are considered: static checks, which are single-station and single-time checks, such as internal consistency checks and validity checks; and dynamic checks, which take advantage of other hydrometeorological information, such as temporal and spatial consistency checks.

Other features of for the QCMS include the use of "data descriptors," which give an overall rating of the quality of each observation, development of a QC database for storage of QC results, and the ability of forecasters to override objective QC decisions.

Note: The AWIPS QCMS deals with both SBN and LDAD System data.

This chapter includes the following sections:

- [Section 11.1: Overview of QCMS](#)
- [Section 11.2: QCMS Text Output and Displays](#)
- [Section 11.3: QCMS LDAD Mesonet Displays](#)
- [Section 11.4: Practice Module: Using the Quality Control and Monitoring System \(QCMS\)](#)



11.1 Overview of QCMS

The QCMS for AWIPS is a partial implementation of the requirements for AWIPS quality control procedures. The implementation includes both subhourly and hourly QC processing. The subhourly processing consists of the application of validity, internal consistency, and temporal consistency checks to LDAD mesonet observations of sea-level pressure, temperature, dewpoint temperature, wind, station pressure, altimeter setting, pressure change, relative humidity, visibility, and precipitation observations. The hourly processing consists of the application of validity, internal consistency, temporal consistency, and spatial consistency checks to LDAD mesonet and NOAAPORT observations of sea-level pressure, temperature, wind, and dewpoint temperature.

With the subhourly processing, the QCMS checks every 5 minutes for newly arrived observations. Observations not previously checked are then immediately quality controlled. The QCMS also calculates hourly, daily, weekly, and monthly statistics on the frequency and magnitude of the observational errors encountered for sea-level pressure, temperature, dewpoint, and surface winds.

For more details on the QCMS, go to the [*QCMS website*](#).

11.1.1 QCMS Automated Checks

QCMS automated quality control procedures consist of validity, temporal consistency, internal consistency, and spatial consistency checks.

The validity checks restrict each observation to a specified set of tolerance limits. The temporal consistency checks restrict the temporal rate-of-change of observations at each station to another set of tolerance limits. In both cases, observations not falling within the limits are flagged as failing the respective QC check.

The internal consistency checks enforce reasonable, meteorological relationships among observations measured at a single station. For example, a dewpoint temperature observation must not exceed the temperature observation made at the same station. If it does, both the dewpoint and the temperature observation are flagged as failing the internal consistency check. Pressure internal consistency checks include a comparison of pressure change observations at each station with the difference of the current station pressure and the station pressure 3 hours previous, and a comparison of the reported sea-level pressure with a sea-level pressure estimated from the station pressure and the 12-hour mean surface temperature. In the former check, if the reported 3-hour pressure change observation does not match the calculated observation, then only the reported observation is flagged as bad. In the latter check, however, if the reported sea-level pressure does not match the calculated observation, then both the sea-level and the station pressure observation are flagged as "failing."

The spatial consistency checks compare observations to values estimated from neighboring data using meteorological analysis techniques. The error threshold, to which the absolute value of the difference between estimated and observed values is compared, is a function of the expected analysis error. This helps account for differences in observed and estimated values, which may be acceptable due to estimation errors. The threshold also takes into account the distance of the surrounding stations, as well as the differences in elevation.

11.1.2 QCMS Subjective Intervention

Two text files, a "reject" list and an "accept" list, are provided to allow the site to override the results of the automated QC checks. The reject list is a list of stations and associated input observations that are labeled as bad, regardless of the outcome of the QC checks; the accept list is the corresponding list for stations that are labeled as good, regardless of the outcome of the QC checks. Applications reading the lists (e.g., MSAS) reject or accept the stations specified. In both cases, observations associated with the stations in the lists can be either flagged individually or in groups.

The QCMS statistical procedures (and summary files) are not affected by the intervention lists. This allows you to continue to monitor the performance of the stations contained in the reject and accept lists. For example, you may notice a station with wind observations that fail the QC checks a large percentage of the time, and choose to have that station added to the reject list. However, once the observation failure rate at the station falls back to near zero (possibly due to an anemometer repair), you can recommend that the station be deleted from the reject list.

The Science and Operations Officer (SOO), Electronic Systems Analyst (ESA), or other focal point can change entries in the reject and accept lists. Information on how to edit these lists is contained in the AWIPS System Manager's Manual.

11.1.3 QCMS Observation Files

In addition to the output described in Section 11.2, the QCMS writes netCDF and comma-separated value (CSV) observation files for use by AWIPS applications programs. The netCDF files contain raw observations and the results of the automated and subjective QC procedures. Also included are single-character data descriptors. These are data structures are intended to define an overall opinion of the quality of each observation by combining the information from the various QC checks.

Table 11.1.3-1 provides a complete list of the netCDF data descriptors.

Table 11.1.3-1. Data Descriptor Definitions

Preliminary	(Z)	No QC Applied
Coarse Pass	(C)	Passed stage 1
Screened	(S)	Passed stages 1 and 2
Verified	(V)	Passed stages 1, 2, and 3
Erroneous	(X)	Failed stage 1
Questionable	(Q)	Passed stage 1, but failed stages 2 or 3
Subjective Good	(G)	Included in accept list
Subjective Bad	(B)	Included in reject list

Stage 1 QC consists of observation validity checks; stage 2, temporal and internal consistency checks; and stage 3, spatial consistency checks.

Raw observations and data descriptors are also included in the CSV files, which are used as input to the LDAD SHEF encoder. **Table 11.1.3-2** provides a mapping between netCDF and SHEF data descriptor definitions.

Table 11.1.3-2. netCDF-SHEF Data Descriptor Mapping

netCDF	Description	SHEF
Z	no QC	Z
X	failed stage 1	R
Q	passed stage 1, failed 2 or 3	Q
C	passed stage 1	S
S	passed stages 1 and 2	V
V	passed stages 1, 2, and 3	P
G	subjective override - good	G
B	subjective override - bad	B

11.2 QCMS Text Output and Displays

The next sections provide a basic understanding and usage of the Quality Control Monitoring System (QCMS) message format.

11.2.1 Accessing QCMS Summary Files

You can access the text QCMS files via the Text Display (refer to [Chapter 4](#) for information about using the Text Display). The nine-character descriptor name for QC messages is on the **CCCNNNXXX**-based format.

Here, **CCC** is the number assigned to the data provider. For example, the first five numbers are assigned to national data sets:

- 001** SAO (METAR manual)
- 002** Buoy
- 003** NPN (NOAA Profiler Network)
- 004** AUTO (automated, non-ASOS)
- 005** ASOS

Slots 006 - 020 are assigned to local data networks, ingested into the LDAD system. For example, the NWS office in Boulder currently has two local data sets:

- 006** Colorado Department of Transportation
- 007** ALERT Weather

The "NNN" identifies the desired QC summary file, for example:

- QCH** hourly
- QCD** daily
- QCW** weekly
- QCM** monthly (4 week)

Finally, the **XXX** is the three-character NWS field office name, such as SLC, SEA, DEN, and OKC. For example, in the entry box in a Text Window, the descriptor **003QCDSL**C generates a daily summary of NPN quality control statistics.

QC statistics for national data sets such as the NPN are generated at each WFO, as are the local data sets. Statistics are maintained separately for each given network, such as ASOS, METARs, or buoy. In addition, Automated Surface Observing System (ASOS) network statistics are subdivided by individual NWS Regions.

11.2.2 QCMS Summary File Descriptions

The QCMS collects statistics on observational errors of sea-level pressure, potential temperature, dewpoint, surface wind, and altimeter setting. The system provides the total number of observations for each variable, the number that failed the QC checks, the station names of the failed observations, and the error and threshold values for each of the failed observations. Then statistics are calculated and hourly, daily, weekly, and monthly summaries are then made available.

Note: Daily, weekly, and monthly summaries include only those stations with observations that have failed more than 25% of the time.

A QCMS Summary includes data for the following parameters:

- **Date/Time:** Time interval of summary data, shown in upper left corner of page.
- **Variables:**
 - **SLP (MB)** - Mean sea level pressure, in millibars.
 - **POT TEMP (DEG F)** - Potential temperature, in degrees Fahrenheit.
 - **DEW PNT (DEG F)** - Dewpoint temperature, in degrees Fahrenheit.
 - **DD (DEG)** - Wind direction, in degrees.
 - **FF (KNTS)** - Wind speed, in knots.
 - **ALT (MB)** - Altimeter setting, in megabytes.
- **Total OBS:** Number of observations for each variable for the period covered by the report. Statistics are calculated for the entire country, but are grouped by region.
- **QST OBS:** Number of questionable (failed) observations for each variable.
- **Percent QST:** Percentage of failure for each variable.
- **Station ID:** Name of failed stations, given in column 1. These names vary depending on the data set.
- **OB Error:** Amount of error (defined as QC estimation minus observation) for each variable.
- **Error Threshold:** The difference allowed between the estimated and observed values, given in parentheses.

- **RMS Error:** Root-mean-square error of failed observations for each station during the prescribed time period (not shown in Exhibits).
- **Mean Error:** Mean error of failed observations for each station during the prescribed time period (not shown in Exhibits).
- **Percent QST:**
 - Percentage of failed observations, or failure rate, for each station for the prescribed time period (not shown in Exhibits).
 - Daily, weekly, and monthly summaries include only those stations with observations that have failed more than 25% of the time.

11.3 QCMS LDAD Mesonet Displays

In addition to the text QC output, AWIPS has the ability to display LDAD QC information along with the raw Mesonet observations. (Mesonet data include observations from the Department of Transportation, Alert Weather, RAWS, cooperative schools, and other cooperative participants. These observations will vary among forecast offices.) The QC displays consist of color-coded station plots. Stations with observations found bad by the QCMS are distinctly colored to indicate possible problems with their reported data. Pointing and clicking on any station invokes the display of a small QC table indicating which QC checks have been applied at the time of the display, which ones have been passed, and which ones have been failed. Plots are automatically updated as new data arrives and is quality controlled.

An example of a QC table is shown in **Exhibit 11.3-1**.

QC CHECKS	SLP	T	Td	DD	FF	pcp
validity	P	P	P	P	P	P
internal	P	P	P			P
temporal	P	P		P		P
spatial	P	F		P	P	P
kaiman						
subjective	G	B				
P = Pass, F = Fail, G = Good, B = Bad						

Exhibit 11.3-1. Example of a QC Table

10.2.4-1

Blanks in the table indicate that the associated QC check was not applied. In cases where the check was applied, the observation either passed (P) or failed (F) the automated checks, or was labeled good (G) or bad (B) through the subjective intervention procedures.

To access the QC plots from CAVE, you can be on any scale. Then select the **MSAS** cascading menu in the **Other** section of the **NCEP/Hydro** pull-down menu.

11.4 Practice Module: Using the Quality Control and Monitoring System (QCMS)

Module 30: Working with QCMS Summary Files

This module provides practice working with QCMS Summary Files.

Objective 30.1 - Retrieve a Weekly QC Summary File of METAR Manual Data from a Local WFO

This objective describes how to display a weekly summary of QC statistics from METAR manual data.

1. In a Text window, type "**001QCWXXX**," where **XXX** is your local site ID. Observe the statistical summary as it is displayed.
 2. Determine the overall failure rate for each of the five variables. These are located in the "**PERCENT QST**" row.
 3. Examine the stations in the report and identify the RMS error, mean error, and failure rate for different variables.
 4. Familiarize yourself with the other statistics in this report.
 5. Try loading other monthly, weekly, daily, or hourly reports.
-

12.0 System Monitoring and Alert Visualization

This chapter describes the tools for monitoring the AWIPS system (System Monitor). The AWIPS II System Monitor has the same functionality as the legacy monitoring system, providing statuses of products and/or processes for DATA and LDAD Data Sets; monitoring SCAN and FFMP data; checking the workstation's disk usage; and monitoring and displaying the workstation's CPU utilization. The only difference between the legacy and the new system is in its appearance, with the AWIPS II System Monitor sporting an updated look, making it more user friendly.

A carryover from the legacy System Monitor, but separate from the system monitoring functions, is the ability to access online documentation (Extras). All current documentation, including the HTML online User's Manual and PDF version of the System Manager's Manual, as well as links to other important forecasting information, are accessible from the System Monitor.

This chapter also describes the tools for alerting the user to any malfunctions, such as data and signal loss (Alert Visualization). Alert Visualization (AlertViz) is new to AWIPS II. It replaces the legacy GUARDIAN and the Red Banner Alert. AlertViz is the communicator between the AWIPS software and the AWIPS forecaster, and is a continuously running process on each workstation.

This chapter includes the following sections:

- [Section 12.1: The AWIPS System Monitor](#)
- [Section 12.2: Extras](#)
- [Section 12.3: Alert Visualization](#)
- [Section 12.4: Practice Module: Using the AWIPS System Monitor](#)



12.1 The AWIPS System Monitor

The AWIPS System Monitor, as shown in **Exhibit 12.1-1**, is accessed via the Internet, which is invoked from the **AWIPS Start Menu** by selecting Firefox Web Browser, as shown in **Exhibit 12.1-2**. Refer to [Section 3.3.1](#) for information about accessing the AWIPS Start Menu.

AWIPS II System Monitor - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://px1/index.php Google
AWIPS II System Monitor +
AWIPS SystemMonitor NATIONAL WEATHER SERVICE * NOAA
MONITOR: DATA LDAD SCAN FFMP | EXTRAS For problems call NCF @ 301-713-9344
Contract All | Expand All
Satellite Data
Radar Data
Point Data
Grid Data
Redbook Data
Disk Usage Monitoring
CPU Utilization Monitoring
Auto-refresh is ON (120 seconds). Page last refreshed 2012-01-17 14:38:39

Exhibit 12.1-1. AWIPS System Monitor Home Page - DATA Monitor



Exhibit 12.1-2. AWIPS Start Menu - Firefox Web Browser

When the Internet is up and running, enter the URL: **http://px1/** to open the AWIPS System Monitor.

The AWIPS System Monitor is a software-based system used to monitor resources and performance for DATA, LDAD, SCAN, and FFMP. When left running, the AWIPS System Monitor automatically updates the status of the monitored products and processes for the selected monitor.

All the individual Data Sets; containing products and/or processes; associated with the monitored Data Set (DATA and LDAD); can be expanded by clicking **Expand All**. If you only want to expand a single Data Set you can do that by clicking the  symbol on the far right of the Data Set row. When a Data Set is expanded, it lists the statuses of the products and/or processes applicable to the selected Data Set. When a Data Set is contracted, it displays the lowest-level product or process status within that Data Set. [Section 12.1.1](#), Monitoring Status Indicators, explains statuses in detail.

Note: Because the AWIPS System Monitor is continually updating the state of the system, information displayed on the captured screens in this document for a particular Data Set, or product and/or process of a particular Data Set, will not always consistently display the same status or information.

12.1.1 Monitoring Status Indicators

The AWIPS System Monitor reports on the timeliness and/or completeness of a given Data Set. Each Data Set has been given threshold values for both timeliness and completeness depending on the typical update frequency and volume of the incoming data.

The symbols, shown in **Exhibit 12.1.1-1**, are used to indicate the status of the data.



Exhibit 12.1.1-1. Status Symbols

- **Green check mark** indicates that data are being received in a complete and timely manner. For grid data, the percentage of current completeness is also provided. For data disk usage, a green check mark indicates that the disks are running at acceptable levels of use.
- **Yellow triangle** indicates that data are somewhat late. For data disk usage, the yellow triangle indicates that the disks are running at a somewhat high level. A change from a "green" to a "yellow" state is noteworthy and a message is sent to the NCF. Green-to-yellow state changes are logged but do not appear on the NCF controller's screen.
- **Red circle** indicates that data are very late and/or very incomplete. For data disk usage, a red circle indicates that the disks are exceeding acceptable levels of usage. A change from a "yellow" to a "red" state is an indicator of a more serious problem and a message is sent to the NCF. Yellow-to-red state changes are logged and appear on the NCF controller's screen.

The example shown below in **Exhibit 12.1.1-2** displays all possible statuses for the Satellite Data Set. Notice the button on the far right of the Data Set row now displays a "minus" sign, whereas before expanding it displayed a "plus" sign. Clicking this button will contract the Data Set, closing the list of products and/or processes.

The screenshot shows the AWIPS II System Monitor interface in Mozilla Firefox. The top navigation bar includes File, Edit, View, History, Bookmarks, Tools, Help, and a search bar for Google. The main header features the AWIPS logo, the title "SystemMonitor", and logos for the National Weather Service and NOAA. A menu bar at the top has options MONITOR, DATA, LDAD, SCAN, FFMP, and EXTRAS, with a note to call NCF @ 301-713-9344 for problems. Below the menu is a link to "Contract All | Expand All". The interface displays several data sets in a grid format:

Satellite Product	Last Update	Status
West CONUS Imager 11 micron IR	2012-01-17 14:30:00	✓ (green)
West CONUS Imager 12 micron IR	2011-12-06 15:00:13	✗ (red)
West CONUS Imager 3.9 micron IR	2012-01-17 14:30:00	✓ (green)
West CONUS Imager 6.7-6.5 micron IR (WV)	2012-01-17 14:30:00	✓ (green)
West CONUS Imager Visible	2012-01-17 14:30:00	✓ (green)
Supernational Imager Visible	2012-01-17 14:15:00	✓ (green)

Below the Satellite Data section are other data sets: Radar Data, Point Data, Grid Data, Redbook Data, Disk Usage Monitoring, and CPU Utilization Monitoring, each with a green checkmark icon.

Auto-refresh is ON (120 seconds). Page last refreshed 2012-01-17 14:42:36

Exhibit 12.1.1-2. Example Showing System Monitor Status Symbols

Note: The status of the Data Set represents the statuses of the products or processes within that Data Set. The Data Set displays the status of the product or process within the Data Set that is showing the lowest-level status. For example, if the products or processes have all green checkmarks, the Data Set will show the same. However, if any of the products or processes show anything other than a green checkmark, the Data Set for those products will display that status showing the lowest level. In **Exhibit 12.1.1-2**, the Satellite Data Set is displaying a red circle because one of the satellite products (West CONUS Imager 12 micron IR) listed under that Data Set has that status.

12.1.2 Monitored Data Sets and Application Data

The subsections that follow show the contracted and expanded monitoring pages for the DATA and LDAD Data Sets and the SCAN and FFMP Application Data pages.

12.1.2.1 DATA Data Sets

The Data Sets of products under DATA monitoring are shown in **Exhibit 12.1.2.1-1**. The status column for each contracted Data Set summarizes the status of that Data Set. Use the Contract (-) / Expand (+) button, located on the right-side of the Data Set status symbol, to expand the Data Set. When expanded, a status is supplied for each product listed within the Data Set.

The screenshot shows the AWIPS II System Monitor interface in Mozilla Firefox. The title bar reads "AWIPS II System Monitor - Mozilla Firefox". The menu bar includes File, Edit, View, History, Bookmarks, Tools, and Help. The toolbar has icons for Back, Forward, Stop, Home, and Search, with the URL http://px1/index.php. The main header says "SystemMonitor" with the AWIPS logo and NOAA/NWS logos. Below the header, the monitor status is set to "DATA". A navigation bar has links for MONITOR, DATA (which is selected), LDAD, SCAN, FFMP, and EXTRAS, along with a "For problems call NCF @ 301-713-9344" link. There are "Contract All" and "Expand All" buttons. The main content area lists seven data sets: Satellite Data, Radar Data, Point Data, Grid Data, Redbook Data, Disk Usage Monitoring, and CPU Utilization Monitoring. Each item has a status icon (red X or green checkmark) and a plus sign for expanding. At the bottom, a note says "Auto-refresh is ON (120 seconds). Page last refreshed 2012-01-17 14:38:39".

Exhibit 12.1.2.1-1. DATA Data Sets - Contracted

Exhibits 12.1.2.1-2 through 12.1.2.1-9 illustrate the individual pages for monitoring the products within each DATA Data Set, as well as Disk Usage, and CPU Utilization.

AWIPS II System Monitor - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://px1/index.php

AWIPS II System Monitor

SystemMonitor

MONITOR DATA LDAD SCAN FFMP | EXTRAS For problems call NCF @ 301-713-9344

[Contract All](#) | [Expand All](#)

Satellite Data

Satellite Product	Last Update	Status
West CONUS Imager 11 micron IR	2012-01-17 14:30:00	✓
West CONUS Imager 12 micron IR	2011-12-06 15:00:13	✗
West CONUS Imager 3.9 micron IR	2012-01-17 14:30:00	✓
West CONUS Imager 6.7-6.5 micron IR (WV)	2012-01-17 14:30:00	✓
West CONUS Imager Visible	2012-01-17 14:30:00	✓
Supernational Imager Visible	2012-01-17 14:15:00	✓

Radar Data

Point Data

Grid Data

Redbook Data

Disk Usage Monitoring

CPU Utilization Monitoring

Auto-refresh is ON (120 seconds). Page last refreshed 2012-01-17 14:42:36

NATIONAL WEATHER SERVICE
NOAA

Exhibit 12.1.2.1-2. Satellite Data Set Products - Expanded

AWIPS II System Monitor - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://px1/index.php

AWIPS II System Monitor

 **SystemMonitor**

NATIONAL WEATHER SERVICE 

MONITOR: DATA LDAD SCAN FFMP | EXTRAS For problems call NCF @ 301-713-9344

[Contract All](#) | [Expand All](#)

Satellite Data  

Radar Data  

Radar Product	Last Update	Status
KOAX 8-Bit Base Reflectivity (Z) elev0_5	2012-01-17 14:40:47	

Point Data  

Grid Data  

Redbook Data  

Disk Usage Monitoring  

CPU Utilization Monitoring  

Auto-refresh is ON (120 seconds). Page last refreshed 2012-01-17 14:42:36

Exhibit 12.1.2.1-3. Radar Data Set Products - Expanded

AWIPS II System Monitor - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://px1/index.php

AWIPS II System Monitor

SystemMonitor

MONITOR: DATA LDAD SCAN FFMP | EXTRAS For problems call NCF @ 301-713-9344

[Contract All](#) | [Expand All](#)

Satellite Data  

Radar Data  

Point Data  

Point Product	Last Update	Status
Lightning Data	2012-01-17 14:42:30	
METAR Data	2012-01-17 14:43:00	
Profiler Data	2012-01-17 14:00:00	

Grid Data  

Redbook Data  

Disk Usage Monitoring  

CPU Utilization Monitoring  

Auto-refresh is ON (120 seconds). Page last refreshed 2012-01-17 14:44:37

Exhibit 12.1.2.1-4. Point Data Set Products - Expanded

The screenshot shows the AWIPS II System Monitor interface in Mozilla Firefox. The title bar reads "AWIPS II System Monitor - Mozilla Firefox". The address bar shows "http://px1/index.php". The main header features the AWIPS logo and the text "SystemMonitor". Navigation links include MONITOR, DATA (which is selected), LDAD, SCAN, FFMP, and EXTRAS. A message at the top right says "For problems call NCF @ 301-713-9344". Below the navigation is a link to "Contract All | Expand All". The interface is divided into sections: "Satellite Data" (with a red X icon), "Radar Data" (with a green checkmark icon), "Point Data" (with a green checkmark icon), and "Grid Data" (with a green checkmark icon). The "Grid Data" section contains a table with columns "Grid Product", "Last Update", and "Status". The data is as follows:

Grid Product	Last Update	Status
GFS360	2012-01-17 10:42:28	✓
GFS90	2012-01-17 10:42:34	✓
GFS40	2012-01-17 10:43:49	✓
NAM12	2012-01-17 14:43:54	✓
RUC80	2012-01-17 14:44:09	✓
RUC40	2012-01-17 14:44:27	✓
RUC13	2012-01-17 14:44:36	✓
DGEX	2012-01-17 10:01:38	✓
GWW REG	2012-01-17 10:45:03	✓

Below the table is a section for "Redbook Data" (with a green checkmark icon).

Exhibit 12.1.2.1-5. Grid Data Set Products - Expanded

AWIPS II System Monitor - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://px1/index.php

Google

AWIPS II System Monitor

SystemMonitor

NATIONAL WEATHER SERVICE
NOAA

MONITOR: DATA LDAD SCAN FFMP | EXTRAS For problems call NCF @ 301-713-9344

[Contract All](#) | [Expand All](#)

Satellite Data ✖ +

Radar Data ✓ +

Point Data ✓ +

Grid Data ✓ +

Redbook Data ✓ -

Redbook Product	Last Update	Status
Redbook Graphics	2012-01-17 14:43:09	✓

Disk Usage Monitoring ✓ +

CPU Utilization Monitoring ✓ +

Auto-refresh is ON (120 seconds). Page last refreshed 2012-01-17 14:44:37

Exhibit 12.1.2.1-6. Redbook Data Set Products - Expanded

The screenshot shows the AWIPS II System Monitor interface in Mozilla Firefox. The title bar reads "AWIPS II System Monitor - Mozilla Firefox". The menu bar includes File, Edit, View, History, Bookmarks, Tools, and Help. The address bar shows "http://px1/index.php". The main header features the AWIPS logo and the text "SystemMonitor". On the right are logos for the National Weather Service and NOAA.

The navigation bar at the top includes MONITOR, DATA (which is selected), LDAD, SCAN, FFMP, and EXTRAS. A message on the right says "For problems call NCF @ 301-713-9344". Below the navigation bar are links to "Contract All" and "Expand All".

The main content area displays several monitoring sections:

- Satellite Data**: Status: Error (red X), Action: +
- Radar Data**: Status: OK (green checkmark), Action: +
- Point Data**: Status: OK (green checkmark), Action: +
- Grid Data**: Status: OK (green checkmark), Action: +
- Redbook Data**: Status: OK (green checkmark), Action: +
- Disk Usage Monitoring**: Status: OK (green checkmark), Action: -

A note below the Disk Usage section states: "Disk space statistics are updated via cron every 20 minutes, NOT on page refresh. Only partitions that are above the **"caution"** threshold (93%) or **"error"** threshold (95%) are shown here." A message below that says "No partitions currently exceed threshold values".

The CPU Utilization Monitoring section shows a green checkmark and a plus sign.

At the bottom, a footer message says "Auto-refresh is ON (120 seconds). Page last refreshed 2012-01-17 16:01:42".

Exhibit 12.1.2.1-7. Disk Usage Monitoring - Expanded

The screenshot shows the AWIPS II System Monitor interface in Mozilla Firefox. The title bar reads "AWIPS II System Monitor - Mozilla Firefox". The menu bar includes File, Edit, View, History, Bookmarks, Tools, and Help. The address bar shows the URL "http://px1/index.php". The main content area has a header "SystemMonitor" with the AWIPS logo and logos for the National Weather Service and NOAA. Below the header is a navigation bar with links: MONITOR, DATA (highlighted), LDAD, SCAN, FFMP, and EXTRAS. A note says "For problems call NCF @ 301-713-9344". Below the navigation is a link "Contract All | Expand All". The main content area lists monitoring categories: Satellite Data (red X icon), Radar Data (green checkmark icon), Point Data (green checkmark icon), Grid Data (green checkmark icon), Redbook Data (green checkmark icon), Disk Usage Monitoring (green checkmark icon), and CPU Utilization Monitoring (green checkmark icon). Each category has a red X icon and a plus sign icon. Below the list is a note: "CPU usage statistics are updated via cron every 20 minutes, NOT on page refresh. Only SERVER CPU's are monitored and those that are above the "caution" threshold (80%) or "error" threshold (90%) are shown here." A message box states "No server CPU's currently exceed threshold values". A link "Click here to display CPU Usage for the system" is present. At the bottom, it says "Auto-refresh is ON (120 seconds). Page last refreshed 2012-01-17 14:46:37".

Exhibit 12.1.2.1-8. CPU Utilization Monitoring - Expanded

The DATA and LDAD monitoring pages include Disk Usage Monitoring, as shown above, and CPU Utilization Monitoring. Expand CPU Utilization Monitoring to view the CPU Usage for the System. Then click mouse Button 1 on the statement, "[Click here to display CPU Usage for the system](#)" to open the CPU Utilization display, as shown in **Exhibits 12.1.2.1-9**.

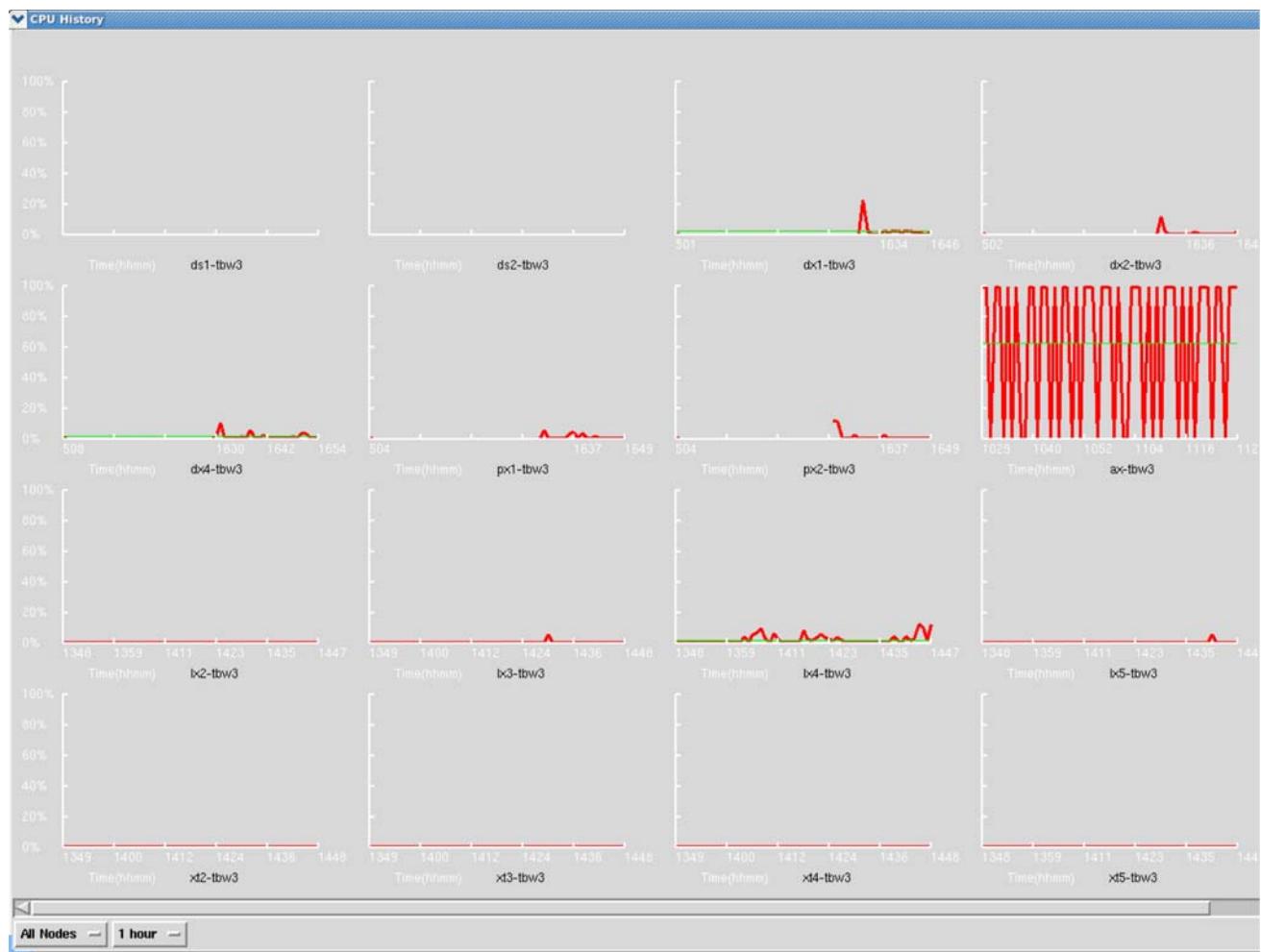


Exhibit 12.1.2.1-9. CPU Usage Display for the System

12.1.2.2 LDAD System Data Sets

The Data Sets of processes and products under LDAD System monitoring are shown in **Exhibit 12.1.2.2-1**. The status column for each contracted Data Set summarizes the statuses of the processes or products associated with that Data Set, with the Data Set status showing the lowest-level status of a process or product within that set. When expanded, a status is supplied for each process or product listed within the Data Set.

The screenshot shows a Mozilla Firefox browser window titled "AWIPS II LDAD Monitor - Mozilla Firefox". The address bar displays "http://px1/LDAD.php". The main content area is titled "SystemMonitor" and features the AWIPS logo. A navigation bar at the top includes links for MONITOR, DATA, LDAD (which is selected), SCAN, FFMP, and EXTRAS, along with a contact number "For problems call NCF @ 301-713-9344". Below the navigation bar are two buttons: "Contract All" and "Expand All". The main content area lists five data sets in a table format:

Data Set	Status	Action
LDAD Processes	✗	[+]
LDAD Acquisition Data	✓	[+]
LDAD Dissemination Data	✗	[+]
Disk Usage Monitoring	✓	[+]
CPU Utilization Monitoring	✓	[+]

A small note at the bottom states "Auto-refresh is ON (600 seconds). Page last refreshed 2012-01-17 14:40:18".

Exhibit 12.1.2.2-1. LDAD System Data Sets - Contracted

When expanded, the LDAD Processes are listed under the LDAD Processes Data Set, as shown **Exhibit 12.1.2.2-2**.

SystemMonitor

MONITOR: DATA LDAD SCAN FFMP | EXTRAS For problems call NCF @ 301-713-9344

[Contract All](#) | [Expand All](#)

Process Name	Host Server	Status
routerStoreTextEDEX	px2f	✓
routerShefEncoderEDEX	px2f	✓
routerStoreEDEX	px2f	✓
ldadServer	px2f	✓
newLDADdataNotification	ls1	✓
hmingestd	ls1	✓
watchDogExternal.sh	ls1	✓
ROSA_Acq PAD	ls1	✓
ROSA_Acq DTMF	ls1	✗

LDAD Processes

LDAD Acquisition Data

LDAD Dissemination Data

Disk Usage Monitoring

CPU Utilization Monitoring

Auto-refresh is ON (600 seconds). Page last refreshed 2012-01-17 14:50:17

Exhibit 12.1.2.2-2. LDAD Data Set Processes - Expanded

When expanded, the LDAD Acquisition Data (Products) are listed under the LDAD Acquisition Data Set, as shown **Exhibit 12.1.2.2-3**.

The screenshot shows a Mozilla Firefox browser window with the title "AWIPS II LDAD Monitor - Mozilla Firefox". The address bar displays "http://px1/LDAD.php". The main content area is titled "SystemMonitor" and features the AWIPS logo. Navigation tabs include MONITOR, DATA, LDAD (which is selected), SCAN, FFMP, and EXTRAS. A message at the top right says "For problems call NCF @ 301-713-9344". Below this are links to "Contract All" and "Expand All". The main panel lists several monitoring items with status indicators:

Category	Product	Last Update	Status
LDAD Processes			
LDAD Acquisition Data			
LDAD Acquisition Product	RAWS	2012-01-17 14:45:01	
LDAD Dissemination Data			
Disk Usage Monitoring			
CPU Utilization Monitoring			

At the bottom, a note states "Auto-refresh is ON (600 seconds). Page last refreshed 2012-01-17 14:50:17". Logos for the National Weather Service and NOAA are visible in the top right corner.

Exhibit 12.1.2.2-3. LDAD Acquisition Data Set Products - Expanded

When expanded, the LDAD Dissemination Data (Products) are listed under the LDAD Dissemination Data Set, as shown **Exhibit 12.1.2.2-4**.

The screenshot shows a Mozilla Firefox browser window with the title bar "AWIPS II LDAD Monitor - Mozilla Firefox". The address bar displays "http://px1/LDAD.php". The main content area is titled "SystemMonitor" and features the AWIPS logo (a globe with "AWIPS" and "NOAA" text) and the National Weather Service/National Oceanic and Atmospheric Administration logos.

The navigation menu at the top includes links for MONITOR, DATA, LDAD (which is selected), SCAN, FFMP, and EXTRAS. A message at the top right says "For problems call NCF @ 301-713-9344". Below the menu, there are two links: "Contract All" and "Expand All".

The main content area displays several monitoring sections:

- LDAD Processes:** Status is shown with a red "X" icon and a plus sign icon.
- LDAD Acquisition Data:** Status is shown with a green checkmark icon and a plus sign icon.
- LDAD Dissemination Data:** Status is shown with a red "X" icon and a plus sign icon.
- LDAD Dissemination Product:** Sub-section for "DEN Special Weather Statement".

	Last Update	Status
DEN Special Weather Statement	No File Found	Red "X" icon
- Disk Usage Monitoring:** Status is shown with a green checkmark icon and a plus sign icon.
- CPU Utilization Monitoring:** Status is shown with a green checkmark icon and a plus sign icon.

At the bottom of the page, a note states: "Auto-refresh is ON (600 seconds). Page last refreshed 2012-01-17 17:01:39".

Exhibit 12.1.2.2-4. LDAD Dissemination Data Set Products - Expanded

Note: Disk Usage Monitoring and CPU Utilization Monitoring are also accessible from the LDAD System monitoring page.

12.1.2.3 SCAN Application Data Monitoring

The SCAN Application Data Monitoring System page, as shown in **Exhibit 12.1.2.3-1**, refreshes every 2 minutes, displaying the most recent data for the radars and systems monitored by SCAN.

The screenshot shows the 'AWIPS II SCAN Monitor' interface. At the top, there's a navigation bar with links for File, Edit, View, History, Bookmarks, Tools, Help, and a search bar. Below the navigation bar is a header with the 'AWIPS II SCAN Monitor' logo and two circular seals for the National Weather Service and NOAA.

The main content area has a blue header bar with 'MONITOR: DATA LDAD SCAN FFMP | EXTRAS' on the left and 'For problems call NCF @ 301-713-9344' on the right.

Below the header, there's a section titled 'SCAN Data Monitoring System' with a sub-note 'This page refreshes every 2 minutes'. It features a circular logo for the 'DECISION ASSISTANCE BRANCH - HAZARDOUS WEATHER LABORATORY'.

Two tables are displayed:

- Lightning Data** table:

Lightning Data	
Most Recent Data	# Strikes - 15 mins
2012-01-17 14:39:53	1
- Model Data** table:

Model Data	
Model	Most Recent Data
RUC	2012-01-17 14:36:23
Eta	2012-01-17 14:39:38
LAPS	Not Yet Implemented

A large table below lists radar and system monitoring status for KOAX, TMSP, KTLX, and TJUA across various parameters (CZ, VIL, STI, Z, MD, TVS, DMD). Most entries show 'Y' or 'N' indicating presence or absence of data.

At the bottom of the page, a note says 'Auto-refresh is ON (This page auto-updates every 120 seconds or with page refresh). Page last refreshed 2012-01-17 14:40:58'.

Exhibit 12.1.2.3-1. SCAN Application Data

12.1.2.4 FFMP Application Data Monitoring

The FFMP Application Data Monitoring System page, as shown in **Exhibit 12.1.2.4-1**, refreshes every 2 minutes, displaying the most recent QPE and Non-QPE data for the radars operating within the FFMP system.

The screenshot shows a Mozilla Firefox browser window with the title bar "AWIPS II FFMP Monitor - Mozilla Firefox". The address bar contains "http://px1/FFMP.php". The main content area is titled "SystemMonitor" and features the "AWIPS" logo with a globe and the text "SystemMonitor". It includes logos for the National Weather Service and NOAA. A navigation menu at the top includes "MONITOR", "DATA", "LDAD", "SCAN", "FFMP" (which is highlighted), and "EXTRAS". A contact number "For problems call NCF @ 301-713-9344" is also present. The main content area displays the "FFMP Data Monitoring System" with a message "This page refreshes every 2 minutes". It features a circular logo for the "DECISION ASSISTANCE BRANCH - METEOROLOGICAL DEVELOPMENT LABORATORY". On the right, there is a button "FFMP Plugin Status: Enabled" and a "Reload FFMP DMS" button. Below these are two tables: "QPE Data Sources" and "Non-QPE Data Sources".

QPE Data	Most Recent Data	Threshold
KOAX - DHR	2012-01-17 14:39:42	10 mins
KUEX - DHR	2012-01-17 14:26:48	10 mins
KDMX - DHR	2012-01-17 14:38:31	10 mins
HPE DHR MOSAIC	File Not Found	15 mins
HPE Bias DHR MOSAIC	File Not Found	15 mins

Non-QPE Data	Most Recent Data	Threshold
HPE Nowcast	File Not Found	15 mins
HPE Bias Nowcast	File Not Found	15 mins

Exhibit 12.1.2.4-1. FFMP Application Data

12.2 Extras

Another selection on the AWIPS System Monitor, which is not a system monitoring function, is the Extras option, as shown in **Exhibit 12.2-1**. The Extras page enables the user to access current Online Documentation, including the HTML online User's Manual (User's Guide) and PDF version of the AWIPS System Manager's Manual, as well as links to Other Sites for accessing important forecaster information.

The screenshot shows a Mozilla Firefox browser window with the title bar "AWIPS II Extras - Mozilla Firefox". The address bar displays "http://px1/extras.php". The main content area is titled "SystemMonitor" with the AWIPS logo on the left and the National Weather Service/National Oceanic and Atmospheric Administration (NWS/NOAA) logos on the right. A navigation bar at the top includes links for MONITOR, DATA, LDAD, SCAN, FFMP, and EXTRAS (which is highlighted). To the right of the navigation bar is the text "For problems call NCF @ 301-713-9344". Below the navigation bar, a red banner states "These are the available AWIPS II documentation links:". Under this, there are two sections: "Online Documentation" with links to "User's Guide" and "AWIPS System Manager's Manual", and "Other Sites" with links to "National Digital Forecast Database" and "IFPS Service Backup Configuration".

Exhibit 12.2-1. AWIPS System Monitor Extras Page

Other online AWIPS documents and site URLs can be added to the server as they become available. They would be listed and accessed here on the Extras page.

12.3 Alert Visualization

The AWIPS II Alert Visualization (AlertViz) communication utility replaces the legacy AWIPS GUARDIAN and Red Banner Alert functionalities. AlertViz must be active for CAVE to open. Refer to [Section 3.3.1](#). When AlertViz is activated, the AlertViz symbol is displayed on the Panel above the Red Hat icon and the AlertViz Status Bar appears at the bottom of the CAVE screen, as shown in **Exhibit 12.3-1**.

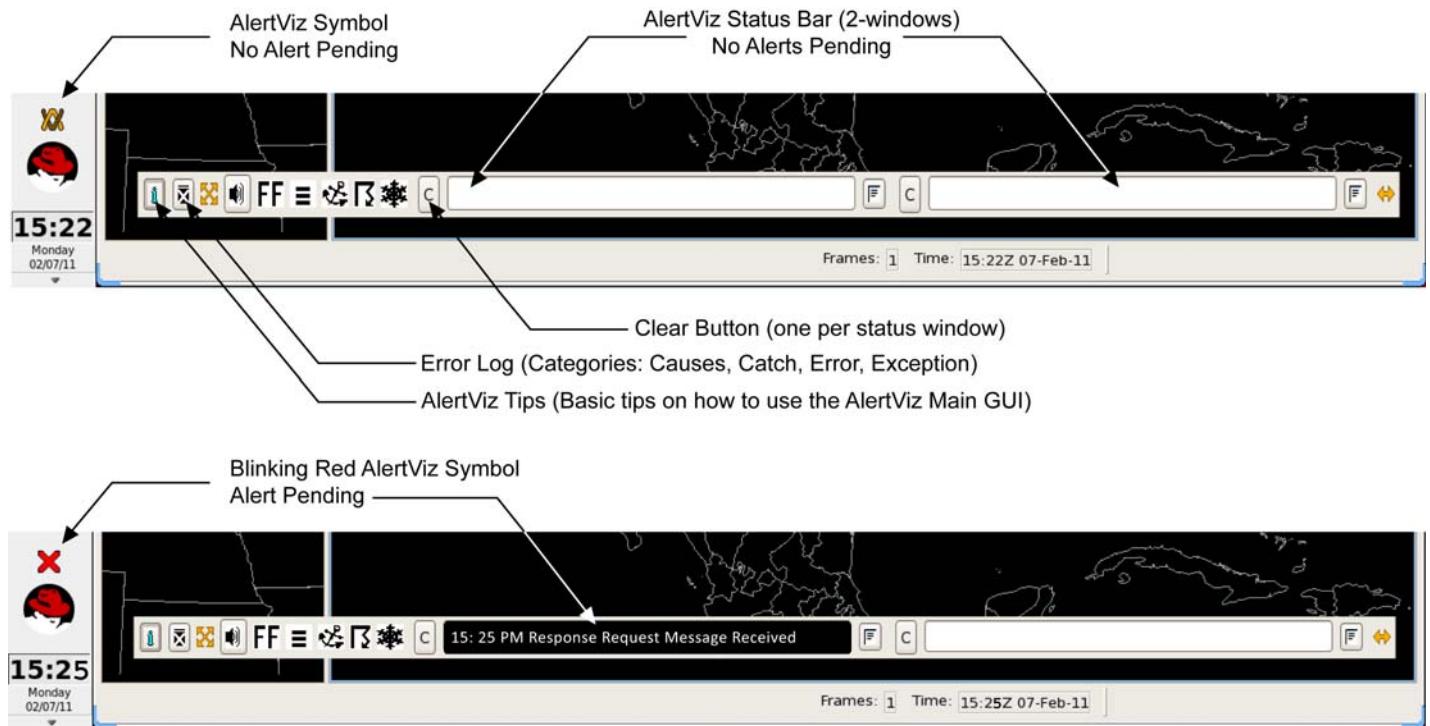


Exhibit 12.3-1. AlertViz Active Symbol and Status Bar

The AlertViz Status Bar can be hidden by opening the AlertViz Menu, as shown in **Exhibit 12.3-2** and unchecking **Show Alert Dialog**, which in the default state is checked. Placing the cursor over the AlertViz Symbol opens the AlertViz Menu.



Exhibit 12.3-2. AlertViz Menu

Note 1: Unchecking **Show Alert Dialog** only hides the AlertViz Status Bar. The Alert Visualization Popup Message Dialog window will still appear on the screen when an alert occurs.

When an alert occurs, the following actions take place:

- The AlertViz symbol changes to a blinking red **X**.
- The alert message is displayed in the window of the AlertViz Status Bar.
- The Alert Visualization Popup Message Dialog window appears in the middle of the main display pane, again telling you what caused the alert.

The Alert Visualization Popup Message Dialog, as shown in **Exhibit 12.3-3**, displays AWIPS' system and product monitor messages. When an alert occurs, the Alert Visualization Popup Message Dialog window appears only in the display pane where the AlertViz Status Bar is running. It is from this dialog window that you would acknowledge the alert and access the stored alerts.



Exhibit 12.3-3. Alert Visualization Popup Message Dialog

Selecting the **Show Log** button extends the Alert Visualization Popup Message Dialog window, as shown in **Exhibit 12.3-4**, showing the stored messages in descending order with the latest message appearing at the top of the list. Double-click on the message to display more information concerning that message.

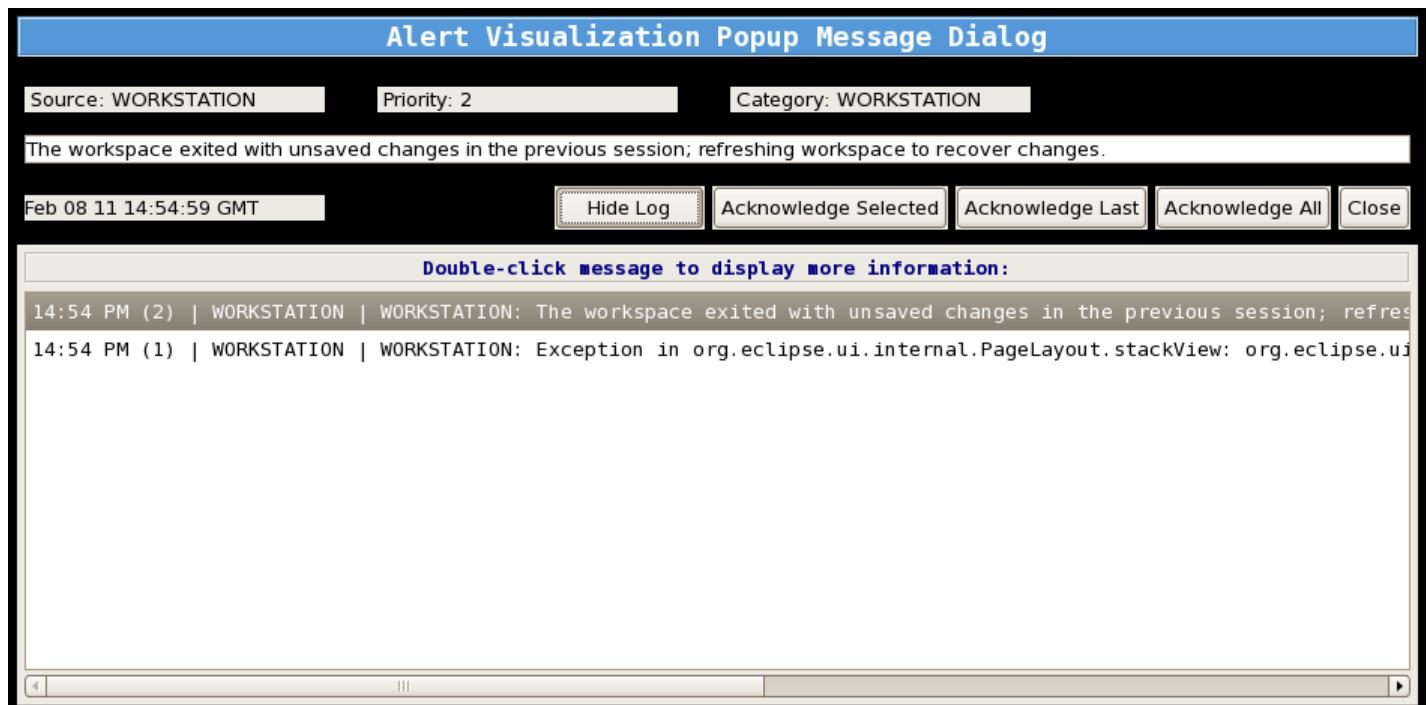


Exhibit 12.3-4. Alert Visualization Popup Message Dialog Message Log

Note 2: If you want to view the Error Log and the Alert Visualization Popup Message Dialog is not open, you can display the log by clicking on the  Error Log button located on the AlertViz Status Bar (see **Exhibit 12.3-1**).

To access basic tips on how to use AlertViz and information concerning the different priorities, click on the iconified  tips button on the AlertViz Status Bar (refer to **Exhibit 12.3-1**). The AlertViz Tips window opens, as shown in **Exhibit 12.3-5**.

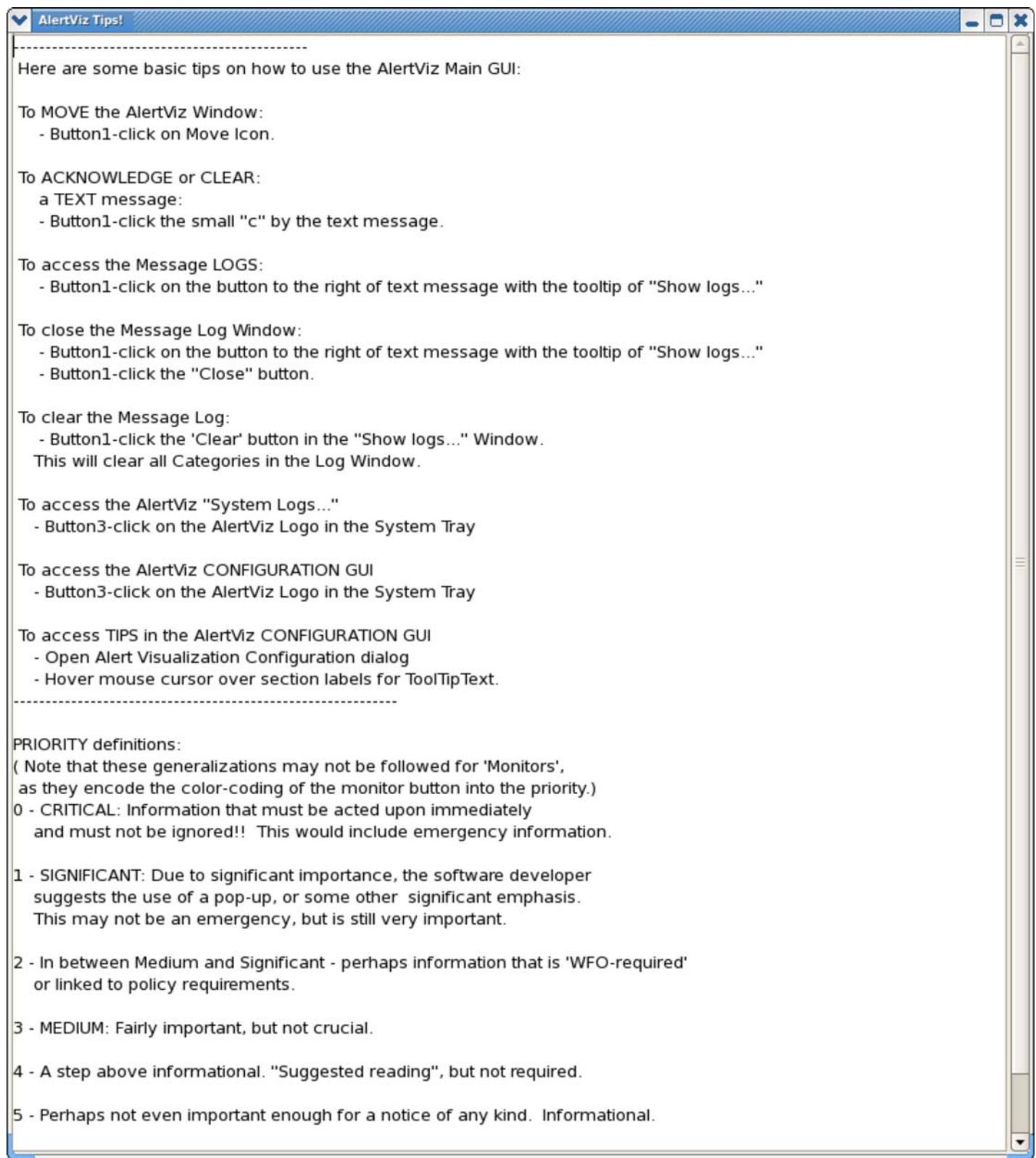


Exhibit 12.3-5. AlertViz Tips Window

12.4 Practice Module: Using the AWIPS System Monitor

Module 31: AWIPS System Monitor Procedures

This module illustrates the steps required to display system monitoring information on either a graphics or a text display screen.

Objective 31.1 - Open the AWIPS System Monitor

This objective includes the steps to open the AWIPS System Monitor.

1. Log into AWIPS.
2. From the root screen (text or graphics display screen), open the AWIPS Start Menu and select the Firefox Web Browser to access the Internet.
3. Enter the URL address to open the AWIPS System Monitor.

Objective 31.2 - Display the Statuses of a Product Data Set

This objective includes the steps to display the statuses of the products for a Product Data Set.

1. With the AWIPS System Monitor displayed, click mouse Button 1 to highlight the **DATA** or **LDAD** monitor to list the high-level Product Data Sets.
2. Expand the Product Data Sets to display the list of products for that Data Set and their associated statuses.

Objective 31.3 - Display the Statuses of a Process Data Set

This objective includes the steps to display the statuses of the processes for a Process Data Set.

1. With the AWIPS System Monitor displayed, click mouse Button 1 to highlight the **LDAD** monitor to list the high-level Process Data Set.
2. Expand the Process Data Set to display the list of processes for that Data Set and their associated statuses.

Objective 31.4 - Display the CPU Usage Display

This objective includes the steps to display the CPU Usage Display.

1. With the AWIPS System Monitor displayed, click mouse Button 1 to highlight the **DATA** or **LDAD** monitor to list the high-level Data Set, including Disk Usage Monitoring and CPU Utilization Monitoring.

2. Expand CPU Utilization Monitoring.
3. Using mouse Button 1, click the statement, "[**Click here to display CPU Usage for the system**](#)", which opens a separate window displaying CPU usage.

Objective 31.5 - Display Application Information

This objective includes the steps to display SCAN and FFMP application information.

1. With the AWIPS System Monitor displayed, click mouse Button 1 to highlight the **SCAN** or **FFMP** application monitor to open the respective page.

Note: SCAN and FFMP data is updated every 2 minutes.

2. Note the information displayed on the page. Then wait at least 2-minutes for an update to occur, and look for a change of information (if any).

13.0 Applications Developed by the NWS Office of Hydrology

The AWIPS user interface includes access to applications developed by the National Weather Service Office of Hydrology. However, the focus of this manual is limited to applications that are accessible via the CAVE interface by perspectives other than D2D. Separate manuals support these NWS-developed applications.

For a list of all NWS Office of Hydrology applications, including links to their supporting manuals, as well as other useful AWIPS information, refer to [Appendix E: AWIPS Applications / Interfaces](#).

This chapter includes the following sections:

- [Section 13.1: Accessing NWS-Developed Hydrology Applications](#)
- [Section 13.2: Accessing The Aviation Forecast Preparation System \(AvnFPS\)](#)

13.1 Accessing NWS-Developed Hydrology Applications

NWS-developed hydrology applications are accessible from the **CAVE ▶ Perspective ▶ Hydro ▶ HydroApps** menu located on the CAVE-Hydro Perspective, as shown in **Exhibit 13.1-1**.

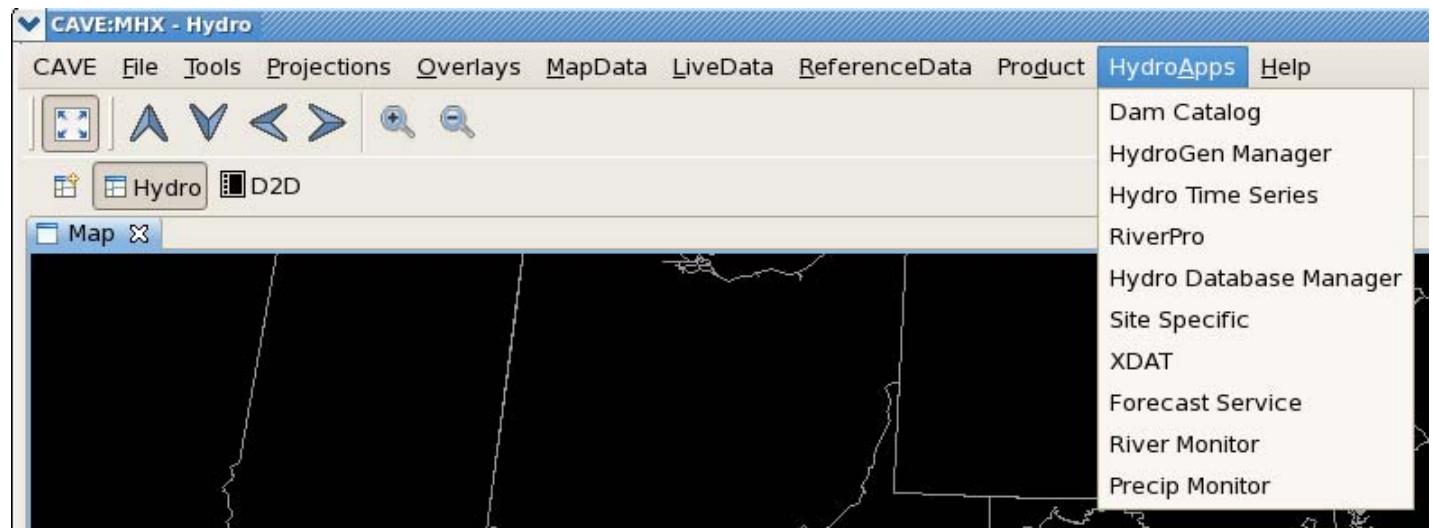


Exhibit 13.1-1. List of Hydro Apps from CAVE-Hydro Perspective Hydro Menu

You can also access the NWS-developed hydrology applications from the AWIPS start-up menu **AWIPS start-up menu ▶ HydroApps**, as shown in **Exhibit 13.1-2**.



Exhibit 13.1-2. List of Hydro Apps from AWIPS Start-up Menu

The following NWS-developed hydrology applications are accessible from both the Hydro menu and the AWIPS start-up menu:

- Dam Catalog
- HydroGen Manager
- Hydro Time Series
- Riverpro
- Site Specific
- River Monitor

Note 1: The HydroView option opens the CAVE-Hydro Perspective window, if you don't already have that perspective open.

Note 2: The MPE Editor option opens the MPE Editor, which is also accessible from the CAVE-MPE Perspective.

13.2 Accessing the Aviation Forecast Preparation System (AvnFPS)

The Aviation Forecast Preparation System (AvnFPS) is an AWIPS application that helps forecasters monitor weather conditions and prepare their aviation forecasts. AvnFPS monitoring capability gives forecasters quick and continuous feedback on Terminal Aerodrome Forecasts (TAF) as well as associated observations. This monitoring capability uses a site-configurable, color-coded scheme. AvnFPS includes specialized editors to aid the production of TAFs. These editors can display TAFs, guidance products, and current observations as both text and graphics. AvnFPS also includes tools that help forecasters assess the quality of each forecast before it is issued. These Quality Control tools can assess the syntax of the forecast and compare its meteorological content with a database of historical observational data.

AvnFPS is a WFO application that is accessible from both the CAVE interface and the AWIPS start-up menu. To access the AvnFPS system:

- From the CAVE interface Menu Bar, as shown in **Exhibit 13.2-1**, select **CAVE ▶ New ▶ Aviation ▶ AvnFPS Menu**.

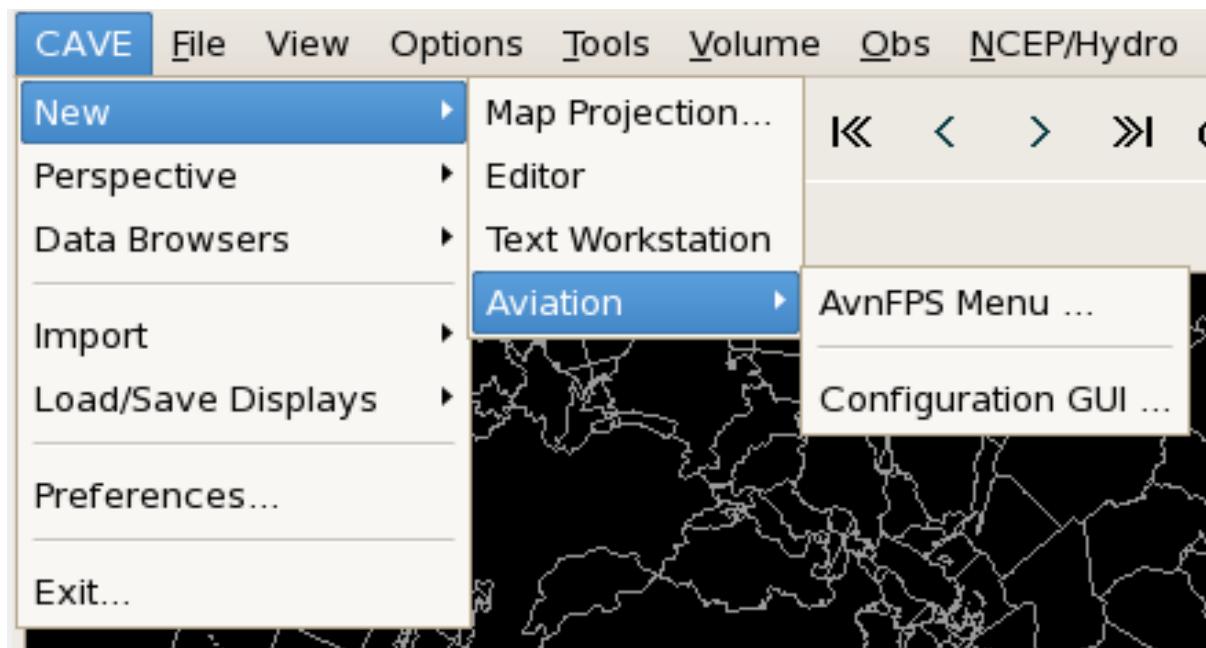


Exhibit 13.2-1. Starting AvnFPS via CAVE

- From the AWIPS start-up menu, as shown in **Exhibit 13.2-2**, select **Start AvnFPS ▶ AvnWatch GUI** to open the AvnFPS Menu, as shown in **Exhibit 13.2-3**.

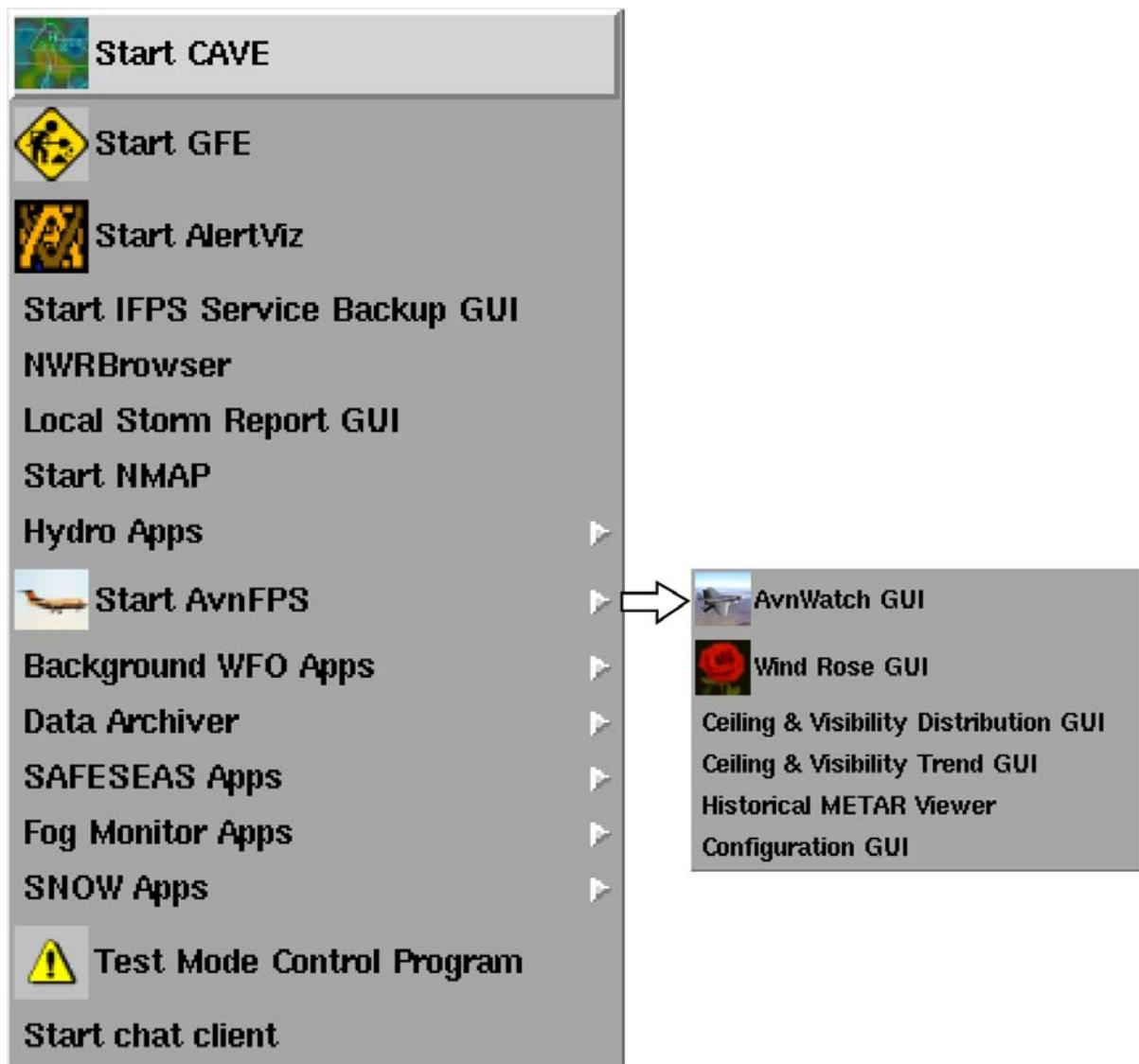


Exhibit 13.2-2. Starting AvnFPS via the AWIPS Start-up Menu

Note: Your user ID is already selected when you log-in to the workstation.



Exhibit 13.2-3. AvnFPS Menu

You can perform three functions from the AvnFPS Menu.

1. Launch the TAF Monitor by pressing the TAFs button
2. Launch the Climatology Viewer by pressing the Climate button
3. Cancel



Refer to the separate **Aviation Forecast Preparation System - System and User Guide** for more

information by clicking on the book symbol.

Appendix A. Glossary

AWIPS - Advanced Weather Interactive Processing System

Button - A button on a mouse pointing device; Mouse buttons can be mapped to the keyboard. A graphical component on a window frame or in a dialog box that works by pressing it.

Cascading Menu - A submenu of related menu options that is invoked when a menu item is selected from a parent menu. Usually, a cascading menu is designated by an arrow to the right of the menu item.

CAVE - Common AWIPS Visualization Environment

Click - To quickly press and release the left mouse button. The term comes from the fact that pressing and releasing most Mouse buttons makes a clicking sound.

Close - A label given to a Push button in some dialog boxes that performs the action of closing the dialog box. Close is also used as a selection in Menus to close the window associated with the Menu.

COTS - Commercial off-the-shelf

Cursor - A graphical image, usually a pipe (|) or block, that shows the location where text appears on the screen when keys on the keyboard are pressed or where a selection can be made.

D2D - Display 2 Dimensions

Depictable - A method to retrieve data and display it using AWIPS and the D2D.

Desktop - See "Workspace."

Dialog Box - A secondary window that the user can display. It contains application components.

Dimmed Selection - A selection that is not currently available.

Double-Click - To press and release a mouse button twice in rapid succession.

Extension - A depictable that allows user interaction with the D2D displays.

Focus - A state of the system that indicates which component receives keyboard events. A component is said to have the focus if keyboard events are sent to that component.

Help - A label given to a Push button in some dialog boxes that performs the action of providing help for the dialog box.

Highlight - A graphic technique used to provide a visual cue to the current selection or to the current location of the input focus. Highlighting is frequently accomplished by reversing the video of the selection.

Icon - A small graphical image used to represent a window. Windows can be turned into icons or minimized to save room or unclutter the workspace (see "Workspace").

Insertion Cursor - The graphical symbol that provides the visual cue to the location of the insertion point.

K Desktop Environment (KDE) - A GUI primarily for Unix and Linux machines.

Keyboard - An input device consisting of various keys that allows the user to input data, control cursor and pointer locations, and control the dialog with the workstation.

Keyboard Focus - Indicates the window or component within a window that receives keyboard input. It is sometimes called the "Input Focus."

Label - The text part of an icon or graphical component.

Legend - A line at the lower right corner of a graphical display window that notes the product ID and valid time. One legend is included for an image or combined image and one for each graphic overlay. The color of the latter matches that of the graphic.

Left-click - To quickly press and release the left button (Button 1 as defined in [Section 2.1.1](#)) on the mouse. (See also Middle-click and Right-click.)

Location Cursor - A graphical symbol that marks the current location of the keyboard input focus for selection. Typically, this symbol is a box that surrounds the current object.

Maximize - To enlarge a window to its maximum size.

Menu - A list of available selections from which a user may choose.

Message Box - The generic name for any dialog box that provides information, gives the current state of a work in progress, asks a question, issues a warning, or draws attention to an error.

Middle-click - To quickly press and release the middle button or clickable scroll wheel (Button 2 as defined in [Section 2.1.1](#)) on the mouse. (See also Left-click and Right-click.)

Minimize (Iconify) - To turn a window into an icon.

Mouse - A pointing device commonly used in conjunction with a keyboard in point-and-click object-oriented user interfaces.

Mouse Button - A button on a mouse pointing device. Mouse buttons can be pressed, released, moved, clicked, and double-clicked.

Mouse Button 2 (or B2) - The center button on a three-button mouse or the scroll wheel on a two-button mouse with a clickable scroll wheel.

Open - To start an action or begin working with a text, data, or graphics file.

Pointer - The graphical image that appears on the workspace and represents the current location of a mouse or other pointing device. Also referred to as "Mouse Pointer."

Pointing Device - A device such as a mouse, trackball, or graphics tablet that allows users to move a pointer about on the workspace and point to graphical objects.

Pop-up Menu - A menu that provides no visual cue to its presence, but simply pops up when a user performs a particular action. Pop-up menus are associated with a particular area of the workspace, such as the client area of an application, and a user must memorize where these areas are.

Press - To hold down a mouse button or a key.

Pull-Down Menu - A menu that extends downward from a client application's Title Bar.

Push Button - A graphic component that simulates a real-life push button. When a user pushes the Push button, by pressing a key or a Mouse button, an action takes place.

Radio Button - A graphic component that simulates the buttons on a real-life car radio. Each button represents a mutually exclusive selection. Radio buttons are typically used for setting states or modes.

Release - To let up on a Mouse button or key that has been pressed. Sometimes it is the press that initiates the action; sometimes it is the release.

Resize - To change the height or width of a window.

Restore - To return an icon or maximized window to its normal size.

Right-click - To quickly press and release the right button (Button 2 as defined in [Section 2.1.1](#)) on the mouse. (See also Left-click and Middle-click.)

Save - To write changes to a data file to a storage device for safekeeping.

Scroll Bar - A graphical device used to change a user's view of the contents of a window. A scroll bar consists of a slider, a trough, and scroll arrows. A user changes the view by sliding the slider up or down in the scroll area or by pressing one of the scroll arrows. These actions cause the view to scroll up or down in the window adjacent to the scroll bar.

Secondary Window - A child window of a primary window.

Select - To choose an object to be acted upon or an action to be performed.

Selection - The object or action that is selected. Menus are composed of selection items. Dialog boxes contain components, each of which represents a selection.

Single Selection - A selection model that allows selection of a single element.

Slider - One of the graphical components of a scroll bar or scale. The slider is the object that is dragged along the scroll area to cause a change.

Submenu - A "cascading menu."

System Menu - See "Window Menu."

Text Cursor - See "Insertion Cursor."

Title Area - The area at the top of the window frame immediately beneath the resize border. The Title Area has two functions: it contains a title or name that identifies the window, and it can be grabbed and dragged to relocate the window.

Title Bar - The bar across the top of a window manager window that consists of the Window menu button, the Title Bar, and the Window-Control buttons.

Window - A data structure that represents all or part of the display screen. Visually, a window is represented as a sub-area of the display screen.

Window Frame - The area surrounding a window. A window frame can consist of a resize border, the

Window menu button, the Title Bar, and the Window-Control buttons.

Window Menu - The menu that appears when the Window menu button is pressed. The Window Menu typically contains selections for restoring, moving, sizing, minimizing, maximizing, and closing the window.

Window Menu Button - The Graphical Control button that appears at the left side of the Title Bar in the window frame.

Workspace - The LCD -- the area on which the windows of a user's environment appear. The workspace is sometimes called the desk, desktop, or root window.

Appendix B. AWIPS Acronyms and Abbreviations

[**0-9**](#) | [**A**](#) | [**B**](#) | [**C**](#) | [**D**](#) | [**E**](#) | [**F**](#) | [**G**](#) | [**H**](#) | [**I**](#) | [**J**](#) | [**K**](#) | [**L**](#) | [**M**](#) | [**N**](#) | [**Q**](#) | [**P**](#) | [**Q**](#) | [**R**](#) | [**S**](#) | [**T**](#) | [**U**](#) | [**V**](#) | [**W**](#) | [**X**](#) | [**Y**](#) | [**Z**](#)

0-9

2D - Two Dimensions or 2 Dimensions

A

ACT - Attribute Color Threshold

ADA - Urgent Administrative Message

ADM - Routine Administrative Message

AEV - AFOS-Era Verification

AFOS - Automation of Field Operations and Services

AGL - above ground level

AI - AWIPS Identifier

AMSU - Advanced Microwave Sounding Unit

ASL - Above Sea Level

ASOS - Automated Surface Observing System

AvnFPS - Aviation Forecast Preparation System

AVP - AWIPS Verification Program

AWIPS - Advanced Weather Interactive Processing System

B

BGAN - Broadband Global Area Network

BUFR - Binary Universal Form for the Representation of meteorological data

C

CAPE - Convective Available Potential Energy

CAVE - Common AWIPS Visualization Environment

CCF - Coded Cities Forecast

CCL - Convective Condensation Level

CDP - Cell Display Parameters

CFC - Clutter Filter Control

CGI - Common Gateway Interface

CIN - Convective Inhibition

CONUS - Conterminous/Contiguous/Continental United States

COOP - Continuity Of Operations Planning

COTS - commercial off-the-shelf

CPU - central processing unit

CRS - Console Replacement System

CRT - cathode ray tube

CSU - computer software unit

CSV - comma-separated value
CWA - County Warning Area
CWSU - Center Weather Service Unit
CZ - Composite Reflectivity

D

D2D - Display 2 Dimensions
DAT - digital audio tape
DB - database
DEF - Default
DFM - Digital Forecast Matrix
DMD - Digital Mesocyclone Display
DMS - Data Monitoring System
DPA - Digital Precipitation Array
DS - Data Server

E

ECMWF - European Centre for Medium-Range Forecasts
EDEX - Enterprise Data EXchange
EMC - Environmental Modeling Center
EL - Equilibrium Level
ESA - Electronic Systems Analyst
ESRL - Earth System Research Laboratory
ETA - estimated time of arrival

F

FFG - Flash Flood Guidance
FFFG - Forced Flash Flood Guidance
FFMP - Flash Flood Monitoring and Prediction
FFMPA - Flash Flood Monitoring and Prediction: Advanced
FFTI - Flash Flood Threat Index
FFW - Flash Flood Warning
FM - Functional Manager
FSL - Forecast Systems Laboratory
FTP - File Transfer Protocol

G

GFE - Graphical Forecast Editor
GFS - Global Forecasting Systems
GHG - Graphical Hazards Generator
GMT - Greenwich Mean Time
GOES - Geostationary Operational Environmental Satellite
GSD - Global System Division
GUI - Graphical User Interface

H

HI - Hail Index
HM - Hydromet
HP - Hewlett-Packard
HPC - Hydrologic Precipitation Center
HSB - Hue, Saturation, and Brightness
HWR - Hourly Weather Roundup

I

ICAO - International Civil Aviation Organization
IFP - Interactive Forecast Program
IFPS - Interactive Forecast Preparation System
IHFS - Integrated Hydrologic Forecast System
IMET - Incident METeorologist
IP - Internet Protocol
IR - infrared
ISS - Incident Support Specialist IST - Interactive Skew-T

J

JMS - Java Messaging System

K

KDE - K Desktop Environment

L

LAC - Listening Area Code
LAMP - Localized Aviation MOS Program
LAN - Local Area Network
LAPS - Local Analysis and Prediction System
LARC - Local Automatic Remote Collector
LCL - Lifting Condensation Level
LDAD - Local Data Acquisition and Dissemination
LFC - Level of Free Convection
LSR - Local Storm Report

M

MAPS - Mesoscale Analysis and Prediction System
mb - millibar; pressure
MDCRS - Meteorological Data Collection and Receiving System
MDL - Meteorological Development Laboratory
MDP - Mesocyclone Display Parameters
MDPI - Microburst-Day Potential Index
MEF - Manually Entered Forecast
METAR - Meteorological Aviation Report
MHS - message handling system
MND - Mass News Dissemination

MOS - Model Output Statistics

MPC - Marine Prediction Center

MPE - Multisensor Precipitation Estimator

MRD - Message Reference Descriptor

MRU - Meso Rapid Update

MSAS - MAPS Surface Assimilation System

MSL - Mean Sea Level

N

NA - not applicable; North American

NAM - North American Mesoscale model

NCEP - National Centers for Environmental Prediction

NCF - Network Control Facility

NDFD - National Digital Forecast Database

NE-PAC - Northeastern Pacific

NESDIS - National Environmental Satellite, Data and Information Service

NH - Northern Hemisphere

nMi - nautical miles

NOAA - National Oceanic and Atmospheric Administration

NPN - NOAA Profiler Network

NWP - Numerical Weather Prediction

NWR - NOAA Weather Radio

NWS - National Weather Service

NWRWAVES - NOAA Weather Radio With All-Hazards VTEC Enhanced Software

NWSRFS - National Weather Service River Forecast System

NWWS - NOAA Weather Wire Service

O

OCP - Ocean Prediction Center

OH - Office of Hydrology

OPC - Ocean Prediction Center

ORPG - Open Radar Products Generator

OSD - One Hour Snow Depth

OSW - One Hour Snow Water

OTR - One Time Request

P

PID - Product Identification

PIL - Product Inventory List

PIREP - Pilot Weather Report

POH - Probability of Hail

POP - Probability of Precipitation

POES - Polar Operational Environmental Satellite

POSH - Probability of Severe Hail

PQPF - Probabilistic QPF

PRF - Pulse Repetition Frequency

Q

QC - quality control
QCMS - Quality Control and Monitoring System
QPE - Quantitative Precipitation Estimator
QPF - Quantitative Precipitation Forecast
QPS - Quantitative Precipitation Summary

R

RAOB - Radiosonde Observation
RCM - Radar Coded Message
RER - Record Report
RFC - River Forecast Center
RGB - Red, Green, Blue
RHI - Range Height Indicator
RMR - Radar Multiple Request
RMS - root-mean square
ROSA - Remote Observing System Automation
RPG - radar product generator
RPN - Reverse Polish Notation
RPS - routine product set
RTD - Requirements Traceability Document; Routine, Delayed
RTMA - Real Time Mesoscale Analysts
RUC - Rapid Update Cycle

S

SAFESEAS - System on AWIPS for Forecasting and Evaluation of Seas and Lakes
SBN - Satellite Broadcast Network
SCAN - System for Convection Analysis and Nowcasting
SCD - Supplementary Climatological Data
SCID - Storm Cell Identification Display
SCP - Satellite Cloud Product
SCTI - SCAN CWA Threat Index
SDC - State Distribution Circuit
SNOW - System for Nowcasting Of Winter Weather
SOO - Science and Operations Officer
SPC - Storm Prediction Center
SPE - Satellite Precipitation Estimate
SREF - Short Range Ensemble Forecast
SRM - Storm Relative Motion
SS - Storm Structure
SSD - Storm-Total Snow Depth
SSM/I - Special Sensor Microwave/Imager
SSW - Storm-Total Snow Water
STI - Storm Track Information
SWEAT Index - Severe Weather Threat Index
SWP - Severe Weather Probability

T

TAF - Terminal Aerodrome Forecast (international code)
TAFB - Tropical Analysis and Forecast Branch
TCM - Marine/Tropical Cyclone Advisory
TCP - Public Tropical Cyclone Advisory
TDWR - Terminal Doppler Weather Radio
TE-PAC - Tropical Pacific
TMI - Text Message Intercept
TRU - TVS Rapid Update
TT - Total Totals
TVS - Tornado Vortex Signature
TWB - Transcribed Weather Broadcasts

U

UGC - Universal Geographic Code
ULR - User Selectable Layer Reflectivity
URL - Universal Resource Locator
USD - User Selectable Snow Depth
USW - User Selectable Snow Water
UTC - Coordinated Universal Time

V

VAD - Velocity Azimuth Display
VCP - volume coverage pattern
VIL - Vertically Integrated Liquid
VTEC - Valid Time and Event Code
VWP - VAD Wind Profile

W

W-ATL - Western Atlantic
WAN - wide area network
WFO - Weather Forecast Office
WINDEX - Wind Index
Win32 - Common 32-bit Microsoft Windows platform
WMO - World Meteorological Organization
WS - Workstation
WSFO - Weather Service Forecast Office
WSO - Weather Service Office
WSOM - Weather Service Operations Manual
WSR-88D - Weather Surveillance Radar-1988 Doppler
WWA - Watch Warning Advisory
WV - water vapor

X**Y**

Appendix C. Reserved

Appendix D. Managing Your AWIPS User Account

Each AWIPS user must have an individual Linux account to use the AWIPS application software. Issues related to management of those accounts are discussed in this appendix.

Note 1: The System Administrator creates the individual accounts for AWIPS users.

Changing Your Password

Department of Commerce policy requires that passwords be changed every 90 days or more frequently.

Because the Network Information Service (NIS) utility is used to manage AWIPS accounts, you cannot use the Linux '**passwd**' command to change your password. Instead, use the '**yppasswd**' command. For changing passwords, it has the same syntax and semantics as '**passwd**'.

Note 2: Users can also log into DX1 and run the '**chage -l [username]**' command to find out when they last changed their password and when their current password will expire.

- To change your password using **yppasswd**, do the following:
 1. Log on to your account on any workstation.
 2. Open a terminal window by clicking the terminal icon.
 3. In the window that appears, enter the command '**yppasswd**'.
 4. Follow the prompts.

There may be a delay of a few minutes before NIS updates the password files on all hosts.

Passwords must meet the following criteria. These criteria are derived from those in the DOC Policy on Password Management but adapted for AWIPS systems.

- Passwords must have at least eight (8) non-blank characters.
- Passwords must contain characters from at least three of the following four categories:
 - English upper case characters (A...Z);
 - English lower case characters (a...z);
 - Base 10 digits (0...9); and
 - Non-alphanumeric (For example, !,\$#%).
- Six of the characters must not occur more than once in the password (e.g., 'AAAAAAA1' is not

acceptable, but 'A%rmp2g3' and 'A%ArmA2g3' are acceptable).

- Passwords must not include any of following: vendor/manufacturer default passwords; names (e.g., system user names, part or all of your account name, family names); words found in dictionaries (i.e., words from any dictionary, spelled forward or backward); addresses or birthdays; or common character sequences (e.g., 3456, ghijk, 2468). Vendor-supplied default passwords, such as SYSTEM, Password, Default, USER, Demo, and TEST, must be replaced immediately upon implementation of a new system.
- Passwords must be changed every 90 days, or more frequently.
- Passwords must never be shared between users, and must be changed immediately when a confidentiality breach is suspected. Any suspected breach must be reported to N-CIRT.

Recovering from a Screensaver Lockout

If a locking screensaver is running on a workstation and the password holder is not available, there are two ways to bring the workstation back into service:

- Kill the X server and thereby force a logout.
- Kill the screensaver.

Killing the X Server

- Type ctrl-alt-backspace.
 - The X server and all its clients (D2D, for example) will be killed. In a few seconds you will have a new login screen. This method should not be used for routine logouts because it may cause problems with the AWIPS application software (undeleted temporary files, open socket connections, etc.).

Killing the Screensaver

- If a locking screensaver is running on an AWIPS workstation, there will be one or more processes called xscreensaver running. If you log in to the locked workstation from another workstation as the root user and kill those processes, the screensavers will disappear and you will be able to shut down the login session that was previously locked.
 - The locking screensaver is meant to serve a security purpose. Killing the xscreensaver process defeats the purpose of the locking screensaver. A locked screensaver should not be killed except in cases of operational necessity.

Appendix E. AWIPS Applications / Interfaces

Table E.1 lists the AWIPS applications and interfaces that support AWIPS. [Underlined highlighted text indicates a link to a user's guide or additional information.](#)

Table E.1. AWIPS Applications/Interfaces

AWIPS Applications/Interfaces	Description
Aviation Forecast Preparation System (AvnFPS)	AvnFPS is designed to ease monitoring, improve production, and facilitate Quality Control (QC) of Terminal Aerodrome Forecasts (TAF). The AvnFPS monitoring capability gives forecasters quick and continuous feedback on TAFs as well as associated observations. This monitoring capability consists of a color-coded scheme and is site configurable. The TAFs, surface observations, and guidance are easily accessible in either text or graphical form and can be enhanced to alert forecasters to weather significant to aviation operations.
AWIPS Decision Assistance and Production Preparation Tools (ADAAPT)	ADAPPT foundation software is composed of the foundation routines that support the IFPS, LAMPS, Pre-LAMPS, and SCAN.
CLIMATE	The CLIMATE software provides the capability to automatically initiate (three times daily) daily, monthly, seasonal, and annual climate reports. It also formats these reports for dissemination (similar to HWR). Additionally, it provides review and edit capability for products prior to dissemination.
Dam Catalog Reviewer and Estimating Tool (DamCREST)	DamCREST is a Graphical User Interface (GUI) application available on both Linux and Windows operating platforms.
Distributed Hydrologic Modeling (DHM)	DHM is the set of features integrated into NWSRFS for distributed hydrologic modeling.
Flash Flood Monitor and Prediction: Advanced (FFMPA)	The FFMPA system is an integrated suite of multi-sensor applications which detects, analyzes, and monitors precipitation and generates short-term warning guidance for flash flooding automatically within AWIPS.
Fog Monitor (FM)	The FM is an AWIPS application which applies various algorithms to visible and infrared satellite images in order to identify potential areas of fog. At night, the application primarily uses the well-known infrared "Fog Product" (the difference of the 10.7 micron and 3.9 micron brightness temps) to highlight potential fog areas. During the daytime, several algorithms attempt to discern fog areas by brightness, shape and other characteristics. Also applied are filters which help to distinguish fog from possible false signal features such as snow cover and mid-level clouds.
Four-dimensional Stormcell Investigator (FSI)	FSI is an innovative base radar data 4-panel display application that is based on the National Severe Storms Laboratory Warning Decision Support System - Integrated Information GUI. This technology allows users to create and manipulate dynamic cross-sections (both vertical and at constant altitude), so that one can "slice and dice" storms and view cross-section data in three-dimensions and across time.
Alert Visualization	Alert Visualization is an AWIPS utility that works as a communicator, primarily from software to human. All communication traffic that used to funnel through the Announcer (Alert Visualization Popup Message Dialog and text messages in the D2D) and that used to funnel through the D2D Decision Assistance Monitor Buttons now goes through Alert Visualization. And, via Alert Visualization's powerful and flexible configurations, users can now decide how they want Alert Visualization to communicate to them.
Gridded Forecast Environment Suite (GFE Suite)	The GFE Suite is a series of programs that provide an interactive gridded forecast preparation capability. Components derive surface sensible weather elements from model data, manage the forecast data and metadata in a database, and generate forecast products in a variety of formats.
Hourly Weather Roundup (HWR)	The HWR automatically receives and processes METAR surface observations, Satellite Cloud Products (SCP), Supplementary Climatological Data (SCD), and marine observations. Additionally, it formats a text portion of the data for dissemination over NWR, formats a text portion for the Console Replacement System (CRS), and formats a tabular product for dissemination over NWWS. Furthermore, the HR CSCI provides review and edit capability for products prior to dissemination.
Hydro Database Manager (HydroBase)	HydroBase is the component of the AWIPS system which permits the management of the reference portion of the database. Adding, deleting, and editing of hydrometeorological data collection and river forecast data locations are handled within HydroBase. HydroBase consists of a series of pull-down menus which allow for interacting with the information within the reference database.
HydroGen	HydroGen is a suite of software programs that collect data from the Integrated Hydrologic Forecast System (IHFS) database and prepare eXtensible Markup Language (XML) files and hydrograph graphics (or simply "hydrographs") for the web.
HydroView	The Hydroview/MPE application is the result of an effort to consolidate the Hydroview and Multi-sensor Precipitation Estimator (MPE) programs into a single, versatile utility that can be used at both RFCs and WFOs. Hydroview's focus is primarily the display of point hydrometeorological data such as river and stream gage readings, precipitation amounts, and similar environmental information that is typically observed and forecast for a specific location. It assists in the preparation of hydrologic forecasts by allowing the user to display and edit this data as well as station reference information such as river action and flood stages, historic river crests, emergency contracts, river crests, emergency contacts, river rating curves, and dam catalogs. In AWIPS Release 7.1, the Hydroview/MPE application was split into two separate applications, HydroView and MPE Editor.
MPE_Editor	
Interactive Forecast Preparation System (IFPS)	IFPS enables the forecaster to generate and manipulate a digital database of observed and forecasted meteorological variables, which then can be used to automatically generate various products with different formats.

<u>Localized Aviation MOS Program (LAMP)</u>	LAMP is a statistical system which provides forecast guidance for sensible weather elements. The GFS-LAMP guidance is currently running operationally at NCEP. Guidance is available from the following cycles: 0000, 0300, 0600, 0900, 1200, 1500, 1800, and 2100 UTC. Effective September 26, 2007, the following cycles were added: 0400, 0500, 100, and 1100 UTC.
Local Analysis and Prediction System (LAPS)	The LAPS reads METAR, mesonet, satellite, radar, and profiler data stored at the WFO, and performs an analysis and generates forecasts.
Local Data Acquisition and Dissemination (LDAD)	The LDAD software system acquires and integrates data available from automated systems and human observers in the local WFO area. It also disseminates critical and non-critical AWIPS weather information to local users, particularly state and local government emergency management agencies.
<u>Local Storm Report (LSR)</u>	The LSR GUI is a standalone AWIPS application designed to provide forecasters with an easy and quick way to create, manage, and send the LSR public text product. This text product contains noteworthy weather events for which the forecaster has either received or sought real-time observations.
<u>NOAA Weather Radio With All-Hazards VTEC Enhanced Software (NWRWAVES)</u>	NWRWAVES was developed to replace all the existing formatter capabilities in WWA and CAFE. NWRWAVES utilizes VTEC coding found in an increasing suite of NWS products to better identify, produce, and manage outbound CRS weather messages.
NWS River Forecast System (NWSRFS)	NWSRFS is a comprehensive set of hydrologic techniques used by the National Weather Service River Forecast Centers to perform their forecast functions.
River Product Formatter (RiverPro)	The RiverPro application generates text products for the National Weather Service Hydrology program.
RiverMonitor	The RiverMonitor application is used for providing automatically updated tabular information summarizing river conditions. This initial version is delivered in part for RiverPro VTEC monitoring, and provides general monitoring of river data.
<u>System for Convection Analysis and Nowcasting (SCAN)</u>	SCAN is an integrated suite of multi-sensor applications which detects, analyzes, and monitors convection and generates short-term probabilistic forecast and warning guidance for severe weather automatically within AWIPS.
<u>System for Nowcasting of Winter Weather (SNOW)</u>	SNOW is an AWIPS application suite which continuously monitors surface observations for winter weather hazards. It automatically alerts the forecasters whenever such conditions are detected. SNOW provides capabilities to display observed winter weather threats in ways that help forecasters focus on what they consider most important.
<u>System on AWIPS for Forecasting and Evaluation of Seas and Lakes (SAFESEAS)</u>	SAFESEAS is a set of AWIPS applications which continuously monitor marine and adjacent overland conditions for specific marine weather hazards. It automatically alerts the forecasters whenever such conditions are detected. SAFESEAS provides capabilities to display observed marine threats in ways that help forecasters focus on what they consider most important.
Warning Generation (WarnGen)	WarnGen enables you to issue flash flood, severe thunderstorm, tornado, and other short-term warnings for a single storm or a line of storms. In addition, you can issue text products (follow-up statements) that update the progress of the storm, cancel the warning if conditions change, reissue another warning on the same storm, or note the expiration of the warning. WarnGen also enables you to provide warning backup support to neighboring sites.
WFO Archive Server (WAX)	The WAX CSCI is a member of the Data Server (DS) family, but is a standalone Linux PC at the WFOs. It has Level IV archiving functionality and supports the Weather element Simulator at the WFOs.
NMAP	NMAP displays and animates different types of meteorological data on a geographic background. The current version supports overlay of satellite, radar, model, METAR, ship, MOS, and upper-air data. A Motif GUI controls the program functions.
Site Specific Hydrologic Prediction System (SSHPS)	SSHPS is a local hydrologic model provided to allow the WFO forecaster to supplement RFC river forecast guidance by generating forecast river stages for fast-response headwater and river basins.
Hydro Time Series	A subset of data within an Arc Hydro geodatabase which includes measurement values and the time they were collected. Also includes a description of the properties for a particular type of time series. Tools for visualizing time series have been developed. The tools allow the user to query the Arc Hydro database for time series records related to a particular feature, and plot one or more types of time series related to one or more spatial feature.
Precipitation Processing (PP)	PP is an OHD "systems" application. Many (WFO Hydrologic Forecast System) WHFS applications compute precipitation totals. It is one of the prime considerations used in forecasting river stage. It is also a key indicator of flash flood potential. The WHFS applications which ingest and process precipitation reports need to have consistent algorithms for tallying precipitation accumulator (PC) and precipitation actual increment (PP) quantities. The PP and PC data also must be stored in the Integrated Hydrologic Forecast System (IHFS) database in such a way as to avoid performance bottlenecks, especially in those applications which must compute precipitation amounts on the fly for many stations over long intervals of time. They include 10+ applications that are non-interactive.
<u>WFO Hydrologic Forecast System (WHFS) and Integrated Hydrologic Forecast System (IHFS) Database</u>	WHFS/IHFS is an OHD "systems" application. The WHFS/IHFS applications incorporate a comprehensive set of data quality operations. Associated with each observed and forecast value in the database is a quality control code which indicates the quality of the value based on external and internal tests of the value. Depending on the value of the quality code, the data are handled in different ways within the IHFS data flow and applications may or may not use the data. They contain 10+ applications that are non-interactive.
High-resolution Precipitation Estimator (HPE)	HPE provides frequent (by default every 5-minutes) high-resolution (~1km x 1km) rain rate and 1-hour rain accumulations covering a Weather Forecast Office's (WFO) or River Forecast Center's (RFC) area of responsibility. These gridded datasets can then be used by the Flash Flood Monitoring and Prediction Advanced (FFMPA) system or can be displayed on D-2D. The mosaic uses data from multiple radars minimizing the distance from each radar. As a result, HPE reduces the need to run multiple instances of FFMPA when convection covers more than one radar. HPE is an entirely separate program from the Multi-sensor Precipitation Estimator (MPE) and will not replace it. HPE uses different data, produces different output grids more frequently and at high-resolution, and runs with little user interaction.

