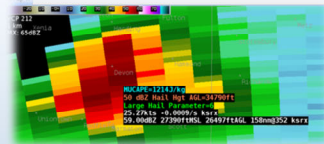
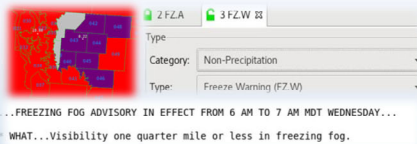


# AWIPS Build Training

## 21.4.1

Mike Magsig

Warning Decision Training Division



Welcome to the 21.4.1 AWIPS Build Training Overview. In this module we'll cover a brief overview of the more important changes in 21.4.1 with jobsheets available at the end of the module for practice.



## Hazard Services Game Plan: #1 NPW

### Non-Precipitation Weather

1. Focal points migrate local configurations
2. Local case/GFE grids prepared
3. Forecasters take jobsheets on live AWIPS in practice mode
4. More NPW guidance coming when forecaster jobsheets released

2 FZA 3 FZ.W

Type: Non-Precipitation  
Category: Non-Precipitation  
Type: Freeze Warning (FZ.W)

Product Viewer - [HZ-2022-BOU-BOU-7]

MUS75 KBOU 221625  
NPWBOU

URGENT - WEATHER MESSAGE  
National Weather Service Denver CO  
1025 AM MDT Tue Mar 22 2022

COZ038-039-230030-  
/O.NEW.KBOU.ZF.Y.0001.220323T1200Z-220323T1300Z/  
Larimer County Below 6000 Feet/Northwest Weld County-Boulder And  
Jefferson Counties Below 6000 Feet/West Broomfield County-  
Including the cities of Arvada, Ault, Bellvue, Berthoud, Boulder,  
Broomfield, Carr, Carter Lake, Chatfield Reservoir, Eldorado  
Springs, Fort Collins, Golden, Hereford, Lafayette, Lakewood,  
Livermore, Longmont, Louisville, Loveland, Lyons, Masonville,  
Morrison, Natural Fort, Niwot, Nunn, Pierce, Purcell, Rockport,  
Superior, Teds Place, Timnath, Wellington, and Wheat Ridge  
1025 AM MDT Tue Mar 22 2022

...FREEZING FOG ADVISORY IN EFFECT FROM 6 AM TO 7 AM MDT WEDNESDAY...

\* WHAT...Visibility one quarter mile or less in freezing fog.

\* WHERE...Boulder and Jefferson Counties Below 6000 Feet/West  
Broomfield County and Larimer County Below 6000 Feet/Northwest  
Weld County Counties.

\* WHEN...From 6 AM to 7 AM MDT Wednesday.

\* IMPACTS...Low visibility could make driving conditions hazardous.

\* ADDITIONAL DETAILS...text that is saved.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

If driving, slow down, use your headlights, and leave plenty of  
distance ahead of you.

The most significant enhancement in 21.4.1 is Non-Precipitation Weather (NPW) and winter weather Hazard Services capability. The game plan is to start with NPW first because the workflow for NPW is relatively simple compared to winter.

**Focal** points will migrate local configurations to Hazard Services and prepare a **local** case with some GFE grids to support the forecaster training. Focal points can start work on configuring NPW right after installing 21.4.1 using the references discussed at the end of this presentation.

After focal points configure Hazard Services for NPW, **forecasters** will then take jobsheets on the live AWIPS in practice mode. All forecasters who issue NPW products should plan to complete the training before an office moves forward with issuing NPW hazards with Hazard Services.

More **guidance** on taking the NPW training will accompany the forecaster jobsheets when they are released shortly after deployment.



# Hazard Services Game Plan: #2 Winter

## Winter Weather

1. Sites get comfortable with NPW operationally
2. Office targets **2024-2025 winter season** to use Hazard Services for winter weather products
3. Focal points migrate local configurations
4. Local case/GFE grids prepared
5. Forecasters take jobsheets on live AWIPS in practice mode

NPW & Winter Contact: Shannon.White@noaa.gov

The screenshot shows the Hazard Information Product Editor interface. On the left, there are two tabs: '1 WW.Y' and '2 BZ.W'. The main area displays a 'Winter Weather' message with a 'Blizzard Warning (BZ.W)' type. The message text includes: 'URGENT - WINTER WEATHER MESSAGE National Weather Service Denver CO 114 PM MDT and Mar 23 2022 ...POWERFUL WINTER STORM ON TRACK FOR THURSDAY NIGHT INTO FRIDAY MORNING... A significant late season winter storm will move across the Desert Southwest Friday to near the Four Corners region by Thursday, and then track north/northeast across southeast Colorado Friday. This track will bring significant snowfall to much of the mountain region west of the divide, and likely result in difficult if not impossible travel from Thursday evening through Saturday morning. CO090 03Z-03Z-241315- TO NEW 0000 MS IN 0001 2203270000Z 2203271200Z/ Jackson County below 9000 feet-south and Summit counties below 8000 feet-south and East Jackson/Larimer/north and Northeast Grand/Northeast Boulder counties above 9000 feet-south and Southwest Grand/West Central and Southwest Boulder/012121-Larimer/Creek/Summit/north and West Park counties above 9000 feet-Larimer and Boulder counties between 8000 and 9000 feet-Interlaken and West Douglas counties above 8000 feet/012121-Clear Creek/Northeast Park counties below 9000 feet. Including the cities of Arapahoe Peak, Aspen Springs, Bailey, Babeville, Bear Lake, Berthoud Falls, Berthoud Pass, Black Hawk, Blue Valley, Brazeal Lake, Brookwater, Brower, Buffalo Creek, Cameron Pass, Central City, Cheyenne Reservoir, Colorado, Dickers, Dumont, East Portal, Echo Lake, Eldora, Eldorado, Empire, Four Corners, Fraser, Georgetown, Glenwood, Goshute, Grand Lake, Grant, Gossella Pass, Harris Park, Highland Park, Hot Sulphur Springs, Idaho Springs, Maytime, Long Peak, Loveland Pass, Mt. Atlatol, Mt. Evans, Marshall, Pine Grove, Pine Junction, Progress Park, Sand, Red Feather Lakes, Rollins Peak, Hillinsville, Huxley, Shawnee, Silver Plume, St Marys Glacier, Tabernash, Tolland, Trail Ridge, Walden, Wellington Lake, Williams Park Reservoir, and Winter Park 114 PM MDT and Mar 23 2022. WINTER STORM WARNING IN EFFECT FROM MIDNIGHT THURSDAY NIGHT TO 6 AM MDT FRIDAY ABOVE 12000FT. ... \* WIND ...heavy wet snow expected above 12000FT. Total snow accumulations between 5 and 7 inches. \* WHERE...portions of central and north central Colorado. \* WHEN...from Midnight Thursday Night to 6 AM MDT Friday. \* IMPACTS...Plan on slippery road conditions. PRECAUTIONARY/PREPAREDNESS ACTIONS... if you must travel, keep an extra flashlight, food, and water in your vehicle in case of an emergency. The latest road conditions for the state you are calling from can be obtained by calling 5 1 1. 66 65 \*Hazard Data Editor: WWW.WSW\_Formatter CAP\_Formatter Issue All Done

Winter is inherently more complex due to managing multiple hazard types, so the idea is for sites to become comfortable using Hazard Services to issue NPW products first operationally before targeting the **2024-2025** winter season to use Hazard Services for issuing winter weather products.

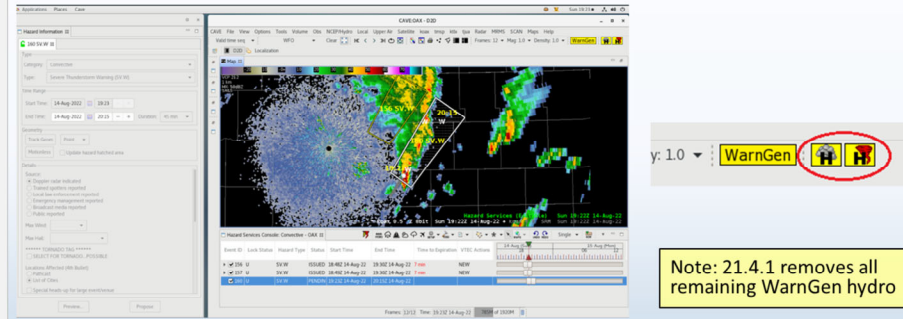
The preparations are going to be the same as NPW with the **focal** points migrating local configurations to Hazard Services, preparing a **local** case with GFE grids, and then **forecasters** taking jobsheets on the live AWIPS in practice mode.

We'll review the VLab locations for the references and job sheets at the end of the presentation.

If you have particular questions about **NPW** and Winter Hazard Services training, contact Shannon White.

## Select WFOs Test Winter & Convective

1. Winter **early adopters** will continue to test drive winter before 2024-2025 season
2. Hazard Services convective **ATAN** starts in 2023 for 10-15 WFOs
  - Deployment potentially 2024 following 23.2.1 and Redhat 8 releases *if on schedule*

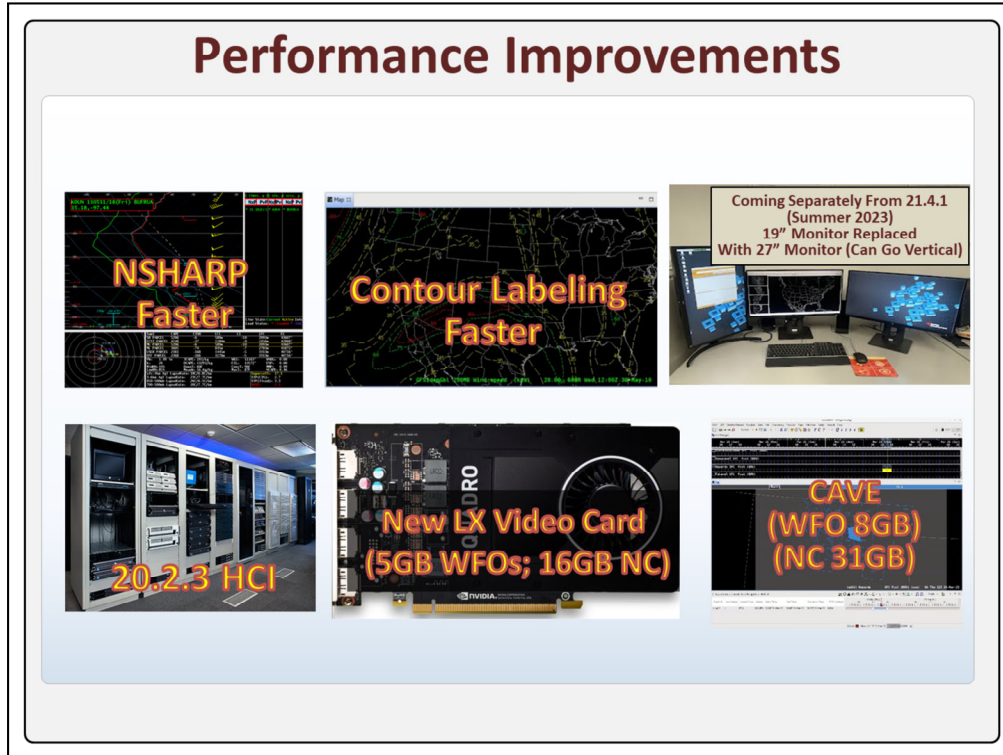


Note: 21.4.1 removes all remaining WarnGen hydro

While most sites will be busy with NPW hazards in 2023, it is good to be aware that some sites have been selected to be early adopters for winter weather this year to get more testing and feedback.

In addition to this about a dozen sites will be participating in the AWIPS Test Authorization Note, or **ATAN**, test for Hazard Services convective starting in summer/fall of 2023. Deployment for convective Hazard Services is currently planned for summer **2024** following the upcoming AWIPS build 23.2.1 and the Redhat 8 releases *if those stay on schedule*.

One last note about Hazard Services is that 21.4.1 removes all remaining WarnGen **hydro** files, so it should be all Hazard Services for hydro watches, warnings, and advisories at this point with a lot more Hazard Services hazard types on the way.



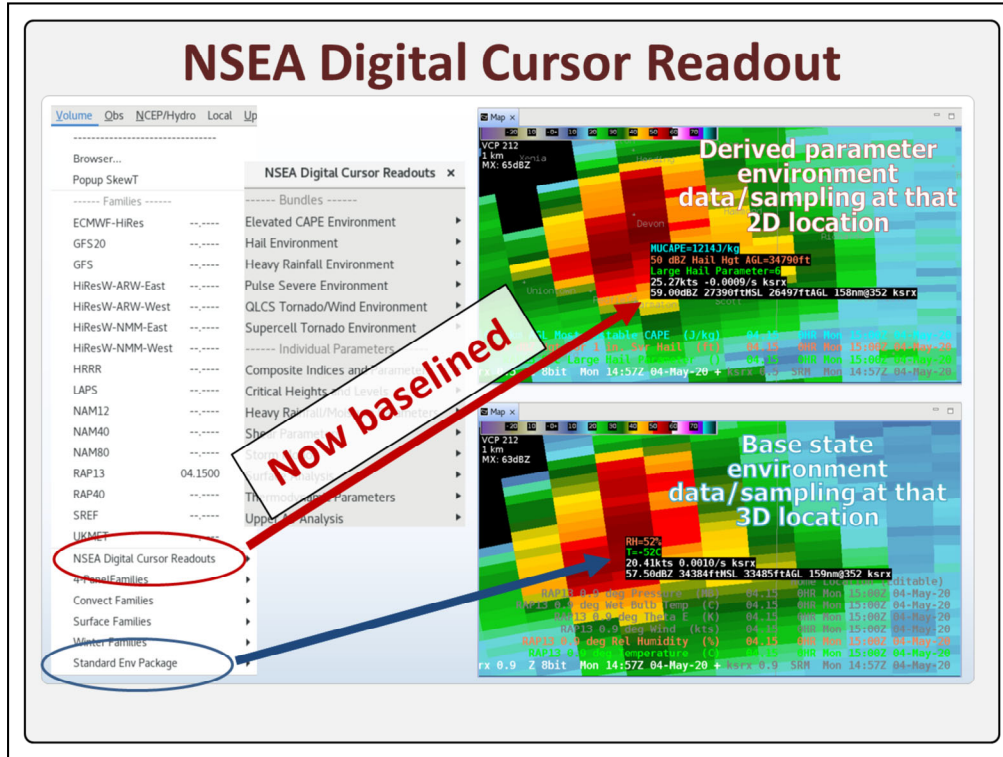
In 21.4.1, the recent focus on improving performance is continuing to build off last year's **20.2.3** HCI release that introduced virtual machines into the architecture. Some ongoing improvements worth mentioning include the graphics card in the workstation replacement has been upgraded from 4GB to **5GB** for WFOs while the National Centers have 16GB video cards.

In 21.4.1, the memory allocated for CAVE at the WFOs has been increased from 6GB to **8GB**, and is 31GB for National Centers.

The graphics card memory will allow some graphics card-intensive data types like MRMS, radar mosaics, and large frame multi-panel radar/satellite data to be better managed, while the memory increase for CAVE will more generally help all data and applications loaded in CAVE.

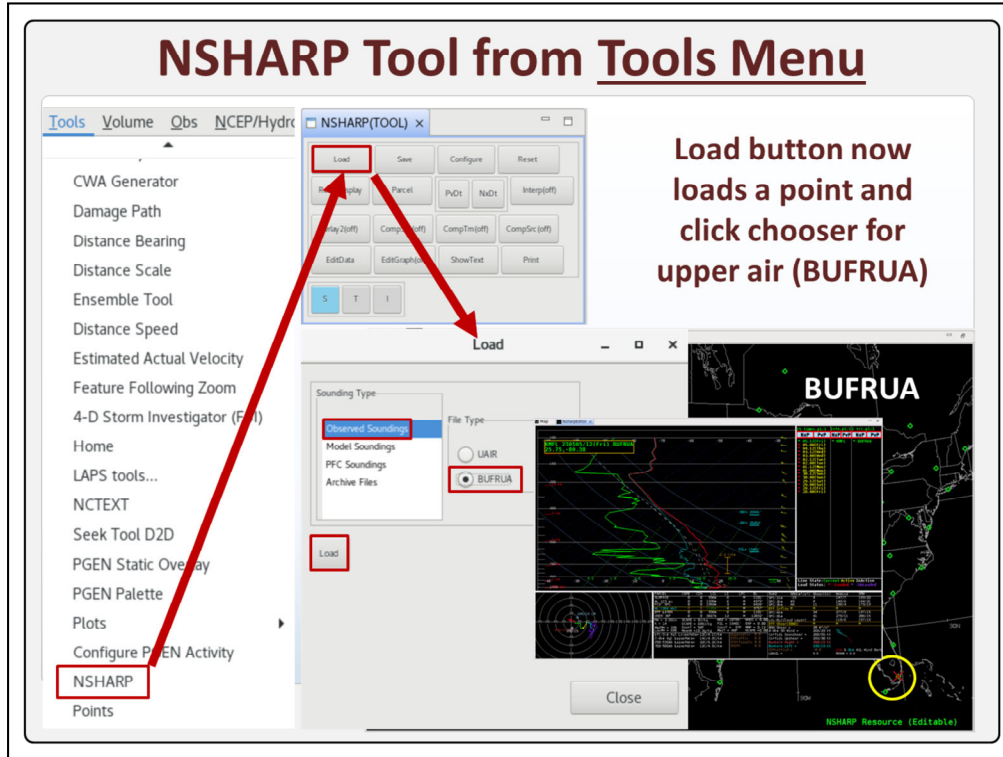
You may notice also some small improvements in **NSHARP**, and contour labeling with 21.4.1 with some of the specific bug fixes.

Another improvement to keep an eye out for in **summer** of 2023 that will be separate from 21.4.1 is the 19" monitors are being replaced by a 27" monitor that can be rotated vertically.



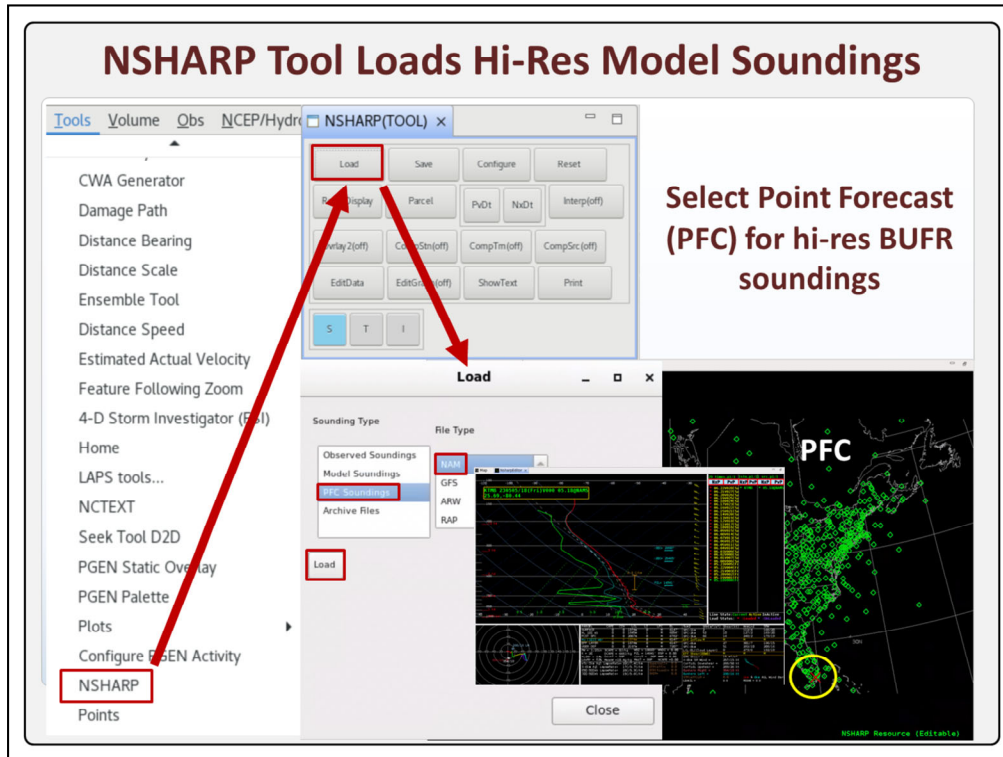
The Near Storm Environment Analysis Digital Cursor Readouts that has been previously installed at about half the WFOs as a local application has now been **baselined** into 21.4.1. So now all WFOs will be able to choose from two unique types of cursor readouts, the **Standard** Environmental Packages that map out data like temperature and RH to the 3D location of elevation based radar products, and the **NSEA** Digital Cursor Readouts that provide 2D environmental sampling of parameters like this hail bundle of most unstable CAPE, the 50dBZ severe hail height criterion, and the Large Hail parameter.

The NSEA bundles contain a robust set of parameters organized by different environments and applications that we will cover more in the jobsheets at the end of the training.



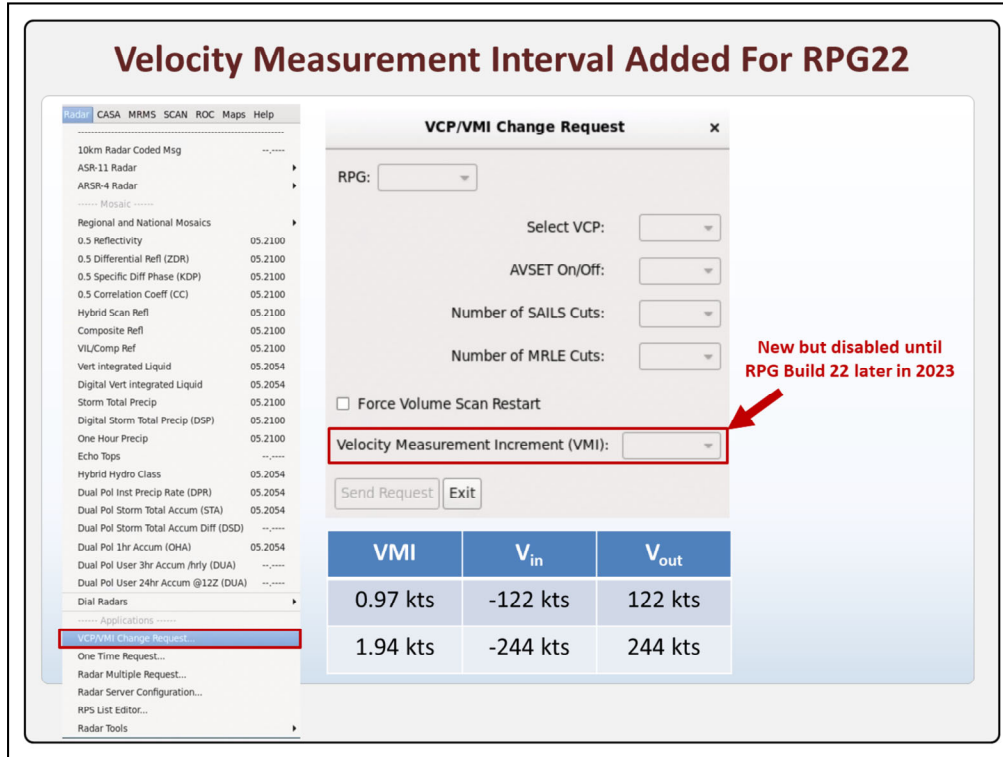
Loading observed and model hi-res soundings just got a little easier in 21.4.1. When you load NSHARP from the Tools menu, the Load button now launches a graphical point chooser. To select an observed sounding, you just select the **Observed** Soundings “Sounding Type” and the BUFR Upper Air, or **BUFRUA**, File Type, and click the **Load** button.

Once you click on a green dot, it highlights it with a **red x** and loads the observed sounding in NSHARP.



The new NSHARP Tool Load button also loads hi-res model point forecast soundings. Just select **PFC** Soundings from the Sounding Type and the **model** under the File Type, followed by the **Load** button. There are a lot of hi-res model point forecast soundings to **choose** from that many folks are used to viewing in applications like BUFKIT.

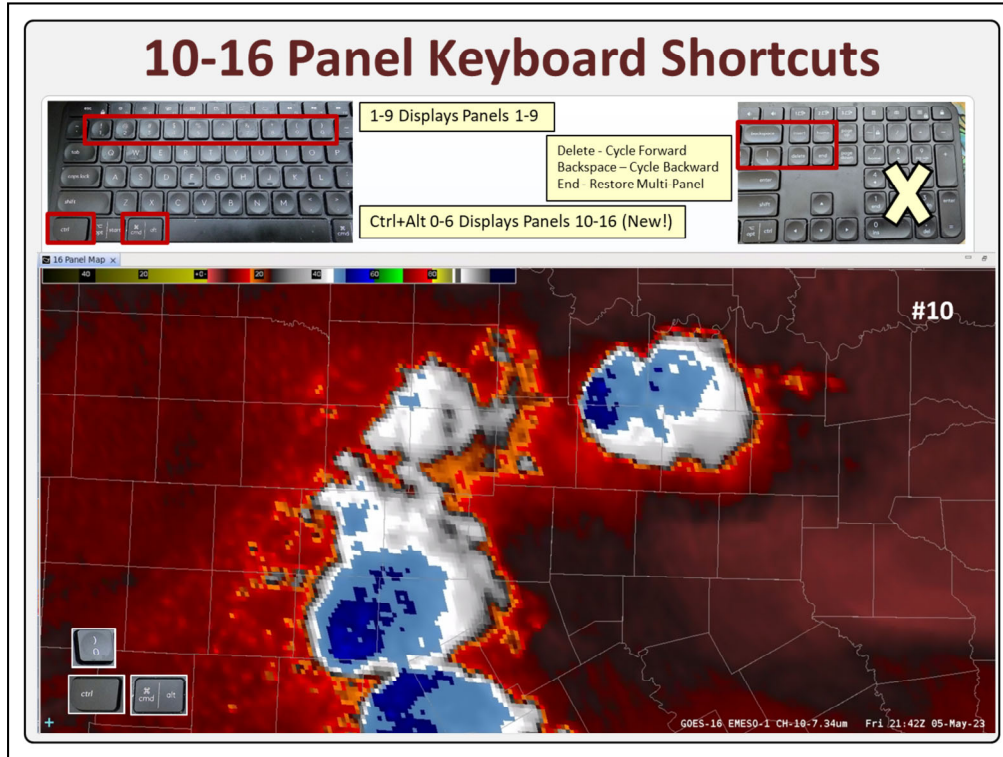




The VCP/VMI Change Request window under the Radar menu has changed in 21.4.1. Prior to 21.4.1 forecasters could send requests to the RPG to change VCP, AVSET, SAILS and MRLE cuts, and force volume scan restarts. In 21.4.1 the **Velocity** Measurement Increment, or VMI, was added for when RPG build 22 is deployed, potentially in late 2023.

The VMI allows high-end velocities above 122 kts to be measured, typically in hurricane environments. Changing the velocity resolution from the normal default of around 1kt to around 2kts at the RPG allows for twice the range of velocities to be measured, up to 244 kts.

This entry box is labeled in 21.4.1 but it is **disabled** for sites who have RPG build 21 installed. When RPG build 22 arrives later this year, forecasters are going to be able to change the VMI from this menu.



Until now, the **1-9 keys** in the top of the keyboard (**not** the keypad) were the only way to toggle products loaded in in different panels of a multi-panel layout. This capability was initially designed to support toggling between Dual Pol data in a 4 panel, but with the growth of larger multi-panels since then, this is less common. The new **Ctrl+Alt 0-6** extends direct access to panels 10-16 when single products are loaded in each panel. **Here** is what happens when Ctrl+Alt+zero is used to zoom into the 10<sup>th</sup> panel.

It is worth pointing out that the simplest and perhaps more useful keyboard shortcuts for zooming into the panels on a multi-panel are the **Delete**, **Backspace**, and **End** keys above the keyboard arrows on the main keyboard. The **Delete** key cycles forward, and the Backspace key cycles backward. The End key restores the multi-panel view.

## CONUS/AK/HI MRMS SBN Access

MRMS

---Multiple-Radar/Multiple-Sensor---

---CONUS---

- FLASH Products ▶
- Hail Products ▶
- Lightning Products ▶
- Precipitation Products ▶
- Reflectivity Products ▶
- Velocity Products ▶
- ProbSevere Products ▶

---OCONUS---

- Alaska
- Caribbean
- Guam
- Hawaii

- Satellite Broadcast Network (SBN) distributing Multi-Radar Multi-Sensor (MRMS)
- Regional LDMs supplement SBN
- Clean up old overrides ([doc](#))
- [WDTD MRMS v12.2 Course](#)
  - [Products guide](#)
  - [Distribution list](#)
  - [Operational Product Viewer](#)

SBN - CONUS	AK	HI	Car	Guam	Domain
<b>Severe (all 2min)</b>					
RALA	n	n	n	n	All
VII	n	n	n	n	All
MESH	n	n	n	n	All
MESH Tracks_60_1440min	n	n	n	n	All
Rotation Track_60_1440min	n	n	n	n	Not AK
Rotation Track_Mid_60_1440min	n	n	n	n	Not AK
EchoTop_18_30_50_60dBZ	n	n	n	n	All
POSH	n	n	n	n	All
ZQC	n	n	n	n	All
ZQC-composite	y	n	n	n	All
PrecipFlag	n	n	n	n	All
ProbSevere	n	n	n	n	CONUS
<b>Hydro (2min, hourly, 2z)</b>					
QPE rate-1-3-6-12-24-48-72hr	y	y	n	n	All
Pass1 1-3-6-12-24-48-72hr	y	y	n	n	All
Pass2 1-3-6-12-24-48-72hr	y	y	n	n	All
<b>FLASH (2min, 10min)</b>					
CREST_UnitStreamflow (10min)	n	n	n	n	All
Sac_SoilSat (10min)	n	n	n	n	All
Sac_UnitStreamFlow (10min)	n	n	n	n	All
ARI-30M-1-3-6-12-24hr (2min)	n	n	n	n	All
FFG-1-3-6hr-Max (2min)	n	n	n	n	Not AK

After many years of regional LDM feeds, MRMS version 12.2 is finally being ingested to AWIPS via the Satellite Broadcast Network to CONUS, Alaska, and Hawaii. **Here** are the core products on the SBN that all CONUS sites have access to. While the **Domain** column shows these products are computed for most domains, OCONUS SBN is mostly limited to **Alaska and Hawaii** for the hydro products and reflectivity QC composite for Alaska, while the **Caribbean and Guam** data are not distributed via the SBN.

The **regional LDMs** will still supplement the MRMS data on the SBN after 21.4.1 is installed, so each site's actual MRMS access will likely vary by region. Some WFOs still have **old** site overrides that prevent seeing the latest data, so it will be a good idea for each site to verify they are getting all the MRMS products after installing 21.4.1.

If you want to know **more** about the version 12.2 products, you can access the WDTD MRMS v12.2 course that was updated in fall 2022 and these other references.

## Local Radars in Volume Browser (VB)

**No more using Home tool to configure VB radar**

Tools Volume Obs NCEP/Hydr

Az/Ran Overlay

~~Home~~

LAPS tools...

**Note: more useful with radar equation error fixed in 2022**

The radar menu in the Volume Browser has been changed to contain the **local** radars instead of a generic Radar source. Before you had to use the **Home** tool to place the home location next to the radar you wanted the Volume Browser to use.

The Volume Browser can be used to generate constant altitude plots like this **CAPPI** at 20 thousand feet in hail growth zone. One of the unique things about the Volume Browser displays is the ability to overlay contour information like this **vertical** reflectivity cross section with temperature and ZDR contours.

Radar data in the Volume Browser is more **useful** now that a radar equation error was fixed in 2022, though care should be taken at long ranges >100mi where there is a lot more uncertainty with large beam volumes and other potential sources of error.

To see how these images were made with the new menus, check out the jobsheet at the end of the presentation.

## ITOs and AWIPS Focal Points

1. Next two slides are for you
2. Forecasters can skip to slide 16 summary

The next two slides are for ITOs and AWIPS focal points, and forecaster can skip to the summary slide 16.

# Backup Services

**New tool for focal points to manage sending and receiving localization files (see [Living Release Notes](#) for testing instructions and user guide)**

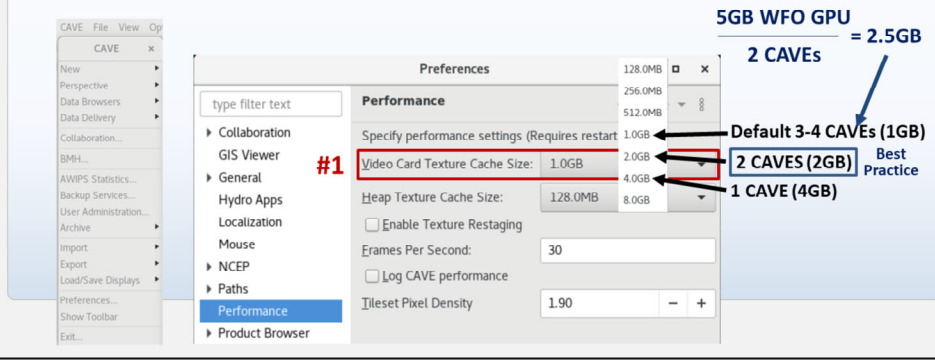
ID	Component	Job File Path	Domain	Recipient	System Version	Recipient Version	Last Update	Status	Job File Location
92	GFE	gfeUserPython\gfe\Config\EditTopo.py	OAX	OAX	50.1.1	50.1.1	18-292 05-Oct-2021	ACCEPTED	/awips2/edex\data/utility/cave_static/site/OAX/
49	NEWComponent	gfeUserPython\gfe\Config\EditTopo.py	OAX	OAX	50.1.1	50.1.1	17-212 27-Sep-2021	ACCEPTED	/awips2/edex\data/utility/cave_static/site/OAX/
61	HazardService-Files	gfeUserPython\gfe\Config\EditTopo.py	OAX	OAX	50.1.1	50.1.1	17-212 27-Sep-2021	ACCEPTED	/awips2/edex\data/utility/cave_static/site/OAX/
57	NEWComponent	gfeUserPython\gfe\Config\EditTopo.py	OAX	OAX	50.1.1	50.1.1	12-422 24-Sep-2021	FAILED	/awips2/edex\data/utility/cave_static/site/OAX/
81	HazardServices\python\scripts\utils\SendFactory.py		OAX	OAX	50.1.1	Undefined	18-132 23-Sep-2021	NEW	/awips2/edex\data/utility/common_static/site/OAX/
82	HazardServices\python\scripts\utils\lhrsQuery.py		OAX	OAX	50.1.1	Undefined	18-342 29-Sep-2021	NEW	/awips2/edex\data/utility/common_static/site/OAX/
98		config\activeSites.txt	OAX	OAX	50.1.1	50.1.1	14-232 06-Oct-2021	NEW	/awips2/edex\data/utility/common_static/site/OAX/

Starting in 21.4.1, sites will have more control over sending and receiving AWIPS localization files using the new Backup Services GUI available from the CAVE menu. Focal points can see the 21.4.1 Living Release Notes for testing instructions and the user guide.

# Performance Preference Settings

- 2 CAVEs/workstation best practice
  - [AWIPS Performance Guide/Tips](#) (monitor for changes)
- Video Card Texture Cache Size
  - GPU Memory/# of CAVEs using GPU-heavy displays (nearest below)
  - MRMS/radar mosaics/Vol Browser, long multi-panel radar/sat loops
  - ITOs should be involved in any changes

Tip: use nvidia-smi to check GPU usage



The AWIPS Performance Group has recommended two CAVEs/workstation for significant data visualization for some time. With the new 27" monitor replacing the 19" monitor along with the recent performance improvements, forecasters are likely going to be tempted to run a 3<sup>rd</sup> CAVE which would impact the video card memory in ways that need to be considered.

At this time, Raytheon has recommended the field only change **the Video Card Texture Cache Size** in the CAVE Performance Preferences. This setting distributes the video card memory to each CAVE. Raytheon's guidance for optimal setting is to **divide** the amount of video card memory by the number of CAVEs used to display datasets that are GPU-intensive. Then choose the nearest setting just below that.

For example, for a WFO with **5GB** of GPU and **2 CAVEs**, that would equal **2.5GB**, so the best **option** would be 2GB.

The default Video Card Texture Cache Size for WFOs is 1GB, which is fine for up to 3 or 4 CAVEs displaying GPU-intensive data. A WFO forecaster using just **1 CAVE** for GPU-intensive display could go up to 4GB and not risk running out of video card memory.

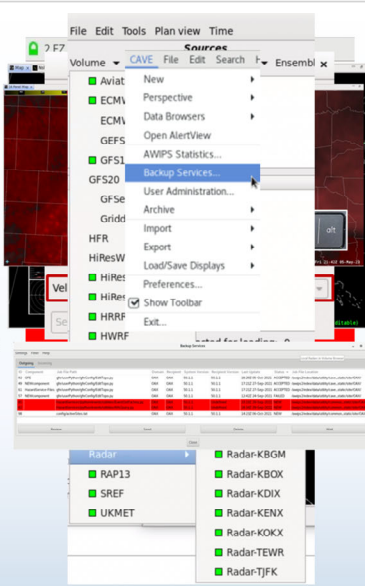
One real-handly command to monitor GPU usage is the **nvidia-smi** command that can be launched at a terminal prompt. Using this will show spikes in GPU memory usage with **MRMS data**, radar mosaics, radar Volume Browser, and large frame count multi-panel radar/satellite loop. There is a jobsheet for this at the end of the presentation that might help you as you start to monitor related performance.

GPU usage likely varies significantly, and **ITOs** are going to need to be involved in any changes to these settings.



## Summary

- Hazard Services NPW (1<sup>st</sup>) and winter (2<sup>nd</sup>) 2024-2025 winter season
  - Focal points set up practice mode for jobsheets
- Performance improvements
  - Video card, CAVE memory
  - 27" rotatable monitors coming to replace 19"
- NSEA Digital Cursor Readout
- NSHARP Tool to load soundings
- VMI (coming soon with RPG22) in VCP/VMI Change Request
- Cntl-Alt [0-6] keyboard shortcuts to zoom in on 16 panels
  - Delete/backspace/end keys useful
- MRMS now on SBN (get rid of old overrides)
- Local radars now sources in Volume Browser
- Backup Services for focal points to manage sending/receiving localization files
- ITOs monitor performance with any workflow changes and new monitors



In summary, the big new enhancement in 21.4.1 is **NPW** and winter weather Hazard Services. The plan is for the focal points to work on configuring NPW first and preparing some data for forecasters to use in practice mode to go through the NPW jobsheets. Then after getting used to NPW, the site will move on to winter in preparation for the 2024-2025 winter season.

There have been lots of performance improvements recently, and big **changes** are going to continue with the new 27" rotatable monitors replacing the 19" monitors shortly after deployment of 21.4.1.

The **NSEA** Digital Cursor Readout local app has now been baselined for everyone.

**NSHARP** has a new tool to load soundings graphically.

The **VCP/VMI** Change Request has been updated to support changing the Velocity Measurement Interval once RPG build 22 is deployed likely later in 2023.

There are new **keyboard shortcuts** for multi-panels using Ctrl-Alt [0-6] though cycling through multi-panels with the delete, backspace, and end keys may be the best way to cycle through multipanels.

**MRMS** is now on the SBN, and sites should check to make sure they are seeing the latest data and remove old site overrides if they are missing data.

**Local radars** are now sources in the Volume Browser.

And for ITOs and focal points, **Backup Services** is going to be a new way for focal points to manage sending and receiving localization files, and ITOs are going to

need to watch performance closely if any changes are made to workflows with the upcoming monitor replacement.

## Jobsheets/References

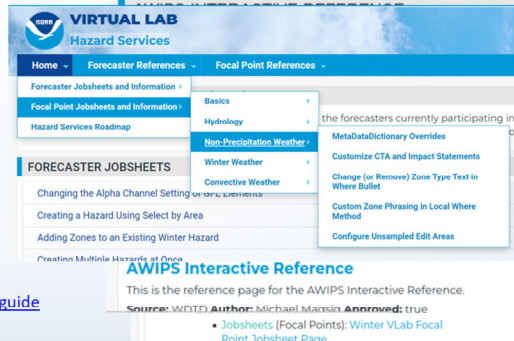
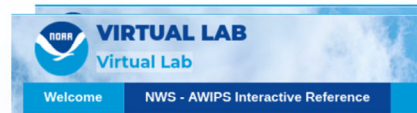
See <https://vlab.noaa.gov/web/oclo/awips-build-changes>

### Forecaster Jobsheets

- Hazard Services [NPW](#) and [winter](#)
  - Focal points need to set up practice mode for jobsheets
  - Jobsheets released shortly after deployment
- [NSEA Digital Cursor Readout](#)
- [NSHARP loader GUI](#)
- [VCP/VMI Change Request](#)
- [Multi-panel keyboard shortcuts](#)
- [Local radar in Volume Browser](#)

### Focal Points/ITOs

- Hazard Services [NPW](#) and [winter](#)
- MRMS
  - [Cleanup overrides doc](#)
  - [Product distribution list](#)
  - [Operational Viewer](#)
  - [Products Guide \(VLab\)](#)
  - [WDTD V12.2 products course](#) (2022 release)
- Backup Services – [testing instructions](#), [user guide](#)
- Performance
  - [CAVE Performance Preferences jobsheet](#)
  - [AWIPS Performance Guide](#)
  - [NCEP Enhanced Workstation Performance](#) (for National Centers)



Contact: [Michael.A.Magsig@noaa.gov](mailto:Michael.A.Magsig@noaa.gov), [Shannon.White@noaa.gov](mailto:Shannon.White@noaa.gov) NPW/Winter

This overview raises awareness of the changes in 21.4.1 AWIPS, but the jobsheets are where you can get some practice using the changes. To access the jobsheets in AWIPS you can refer to the AWIPS build changes page in the OCLO Vlab community at this URL. You can also find this by **right clicking** on a text legend in AWIPS and in the Reference on Product search tool, you can enter **awips builds** and click on the page from there.

The Hazard Services **VLab community** has been reorganized by topical area to make it easier to find jobsheets for different hazards for both forecasters and focal points. The VLab materials are ready for focal points to start working on configuring Hazard Services and preparing a data case to use in practice mode before forecasters will eventually take the user jobsheets for NPW and then winter.

The Hazard Services user jobsheets are going to be released shortly after deployment, and you can watch the VLab pages for the updates.

Jobsheet links are also provided here. This concludes the 21.4.1 overview.