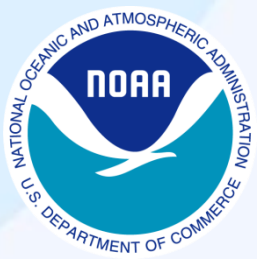
Update on NAWIPS/GEMPAK Migration to AWIPS II

Unidata Policy Committee Meeting

Michelle Mainelli

NCEP Central Operations

15 April 2010

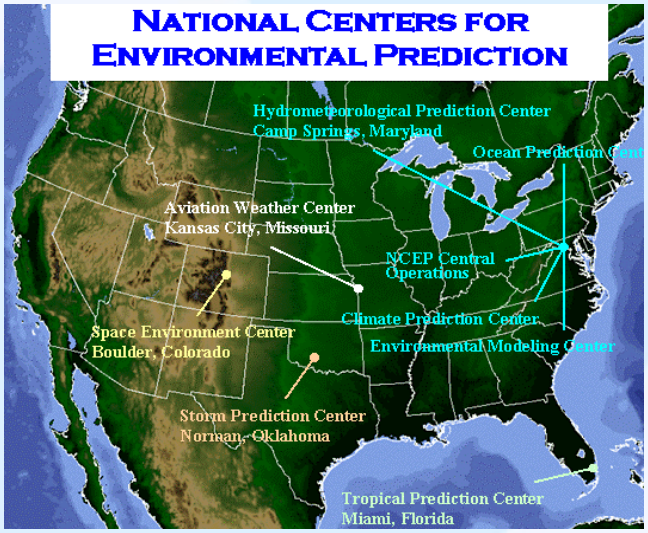


Topics

- NAWIPS/AWIPS Team
- Migration Goals
- FY10 Activities
- GEMPAK 6.0
- User Perspective: NAWIPS vs AWIPS II
- Hardware Configuration
- Unidata Involvement & Benefits
- Key Takeaways
- Training resources

NAWIPS/AWIPS II Team

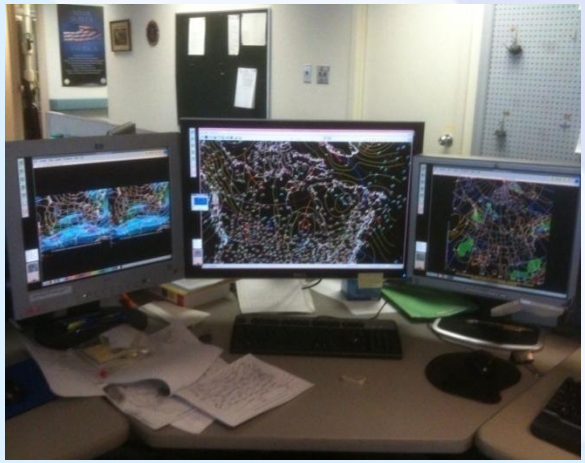
- Develop meteorological app. software to meet NCEP requirements
- Transition NAWIPS functionality to AWIPS II environment
- 18.5 members - Increased from 11-12 members prior to migration
- Roughly 60-40 split between IT and earth science backgrounds, some overlap
  - All new hires have significant experience in Java (OOAD), SOA, XML, PostgreSQL, Eclipse, Subversion, JUnit, GeoTools
- Almost 250 yrs experience in software design & development



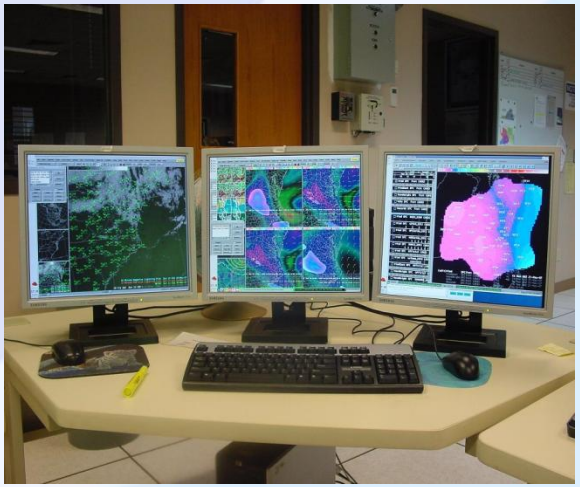
Migration Goals

- NWS Hardware and Software consolidation
- Migration to AWIPS II must include:
  - All functionality in current NAWIPS GUI programs
    - Product generation, multi-panel display, obs & product display
  - Data Decoders
    - Raw and GEMPAK formats to AWIPS II format
    - Archived data will be accessible
  - GEMPAK
    - Legacy command line interface
    - Forward capability

Hardware Consolidation

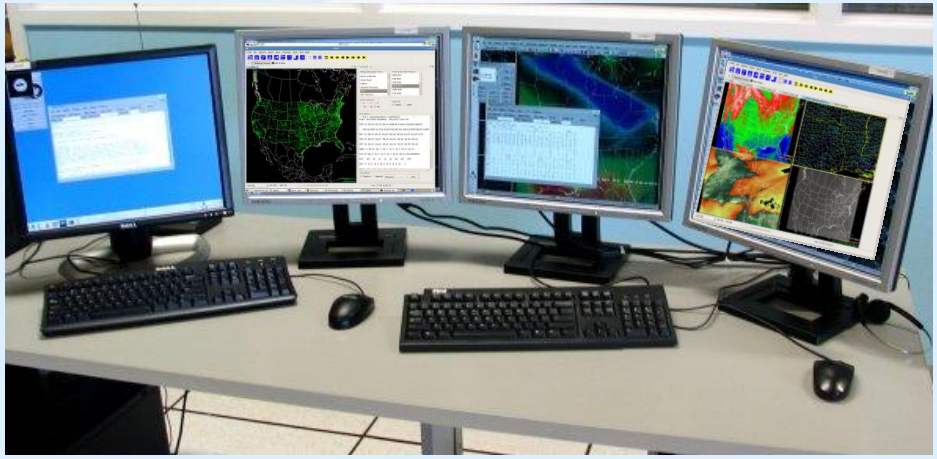


N-AWIPS



AWIPS

AWIPS II
System
With N-AWIPS
(will include large monitors)



Software Goals

- No changes to the forecaster workflow
  - Some visual differences may be unavoidable
- Adopt and/or adapt new technology
  - e.g., GeoTools, integrated pan and zoom
- Challenges
  - Concurrent Raytheon development
  - Development Environment
    - Eclipse, Java

FY10 Activities

- Software development is on schedule
- Hardware configuration determination in progress
- Anticipate software ready for OT&E to begin by Q1FY11
- Migration activities continue in the following areas:
  - GUI integration & Interactive Product Generation & GEMPAK
  - Decoder migration is complete
- Continue to work closely with the NWS/OST AWIPS Program
- Testing & Test Plans - Periodic drops of RTS baseline w/ NCEP integration

GEMPAK 6.0

- Official GEMPAK 6.0 release scheduled for April
- Modify GEMPAK to access the AWIPS II database
  - Allows users to continue to use their legacy batch scripts with the new database
  - Data management (DM) library extended to make AWIPS II service requests via http
  - Server-side microEngine scripts
  - Applies to all GEMPAK / NAWIPS applications
- Porting of images, sfc data completed
  - Model & upper-air data next
- GEMPAK will be supported until **full** replacement is ready
  - GUIs deprecated eventually

NAWIPS Perspective

within CAVE

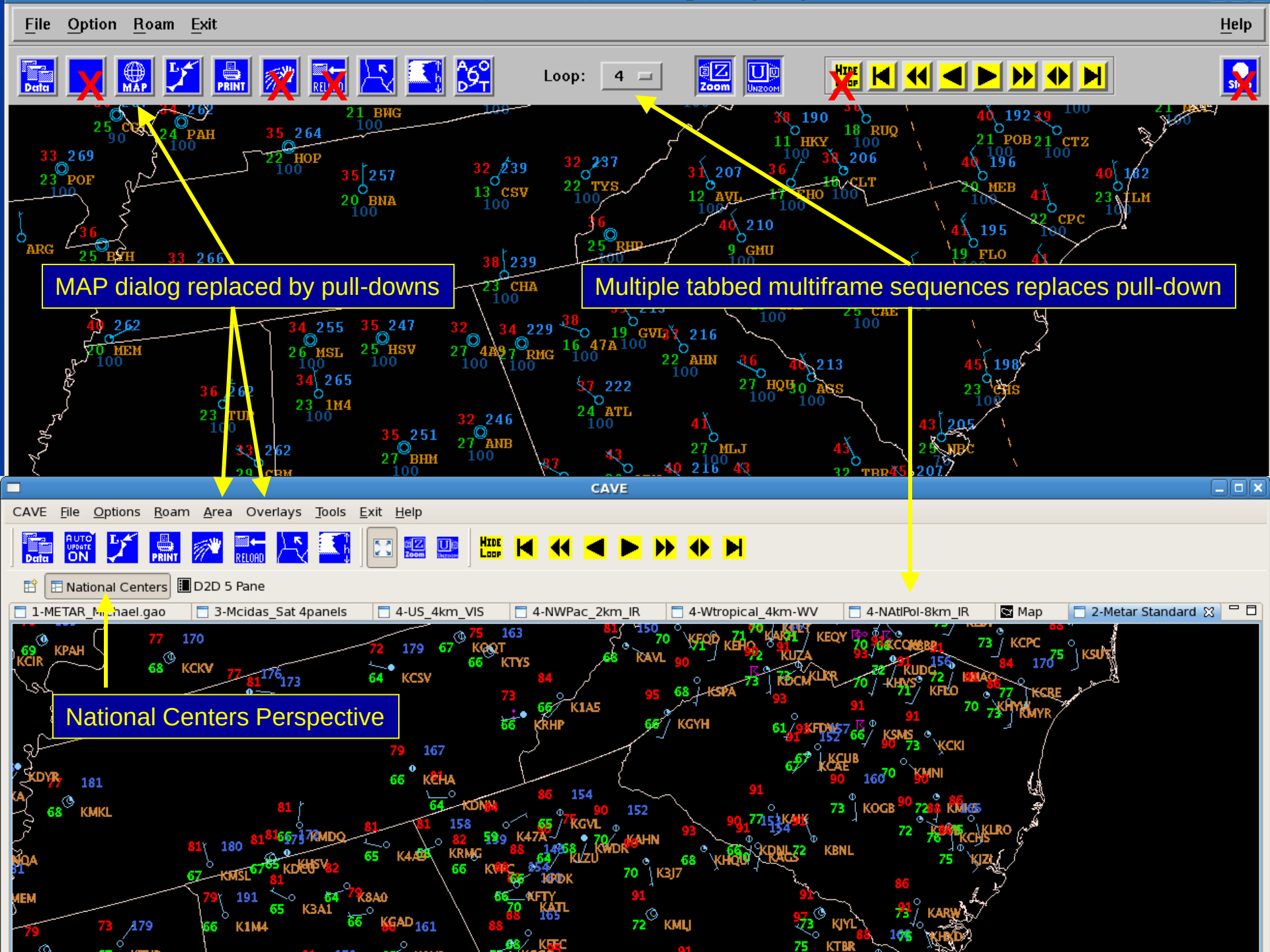
- Integrates **NMAP2**, **NTRANS**, **NWX, NSHARP**
  - Multiple tabbed loops
  - Flexible timeline
    - Includes single time resource collections
  - Flexible extended attribute assignment for displayable resources
    - e.g., multi-color displays
  - Procedure, Bundle and Resource selection and management
  - Multi-panel displays, spatially and temporally synchronized (or not)
  - GUI FOS bulletin select and display
  - SKEW-T / Hodographs

National Centers Perspective

User View – CAVE Top Buttons

NAWIPS Button Type	Functionality in CAVE Perspective
Data	Yes - unchanged
Map	Yes - replaced with pull-down Area & Overlays
PGEN	Yes - unchanged
Print	Yes - unchanged
Seek	Yes - unchanged
Cloud Height	Yes - unchanged
AODT	Yes - unchanged

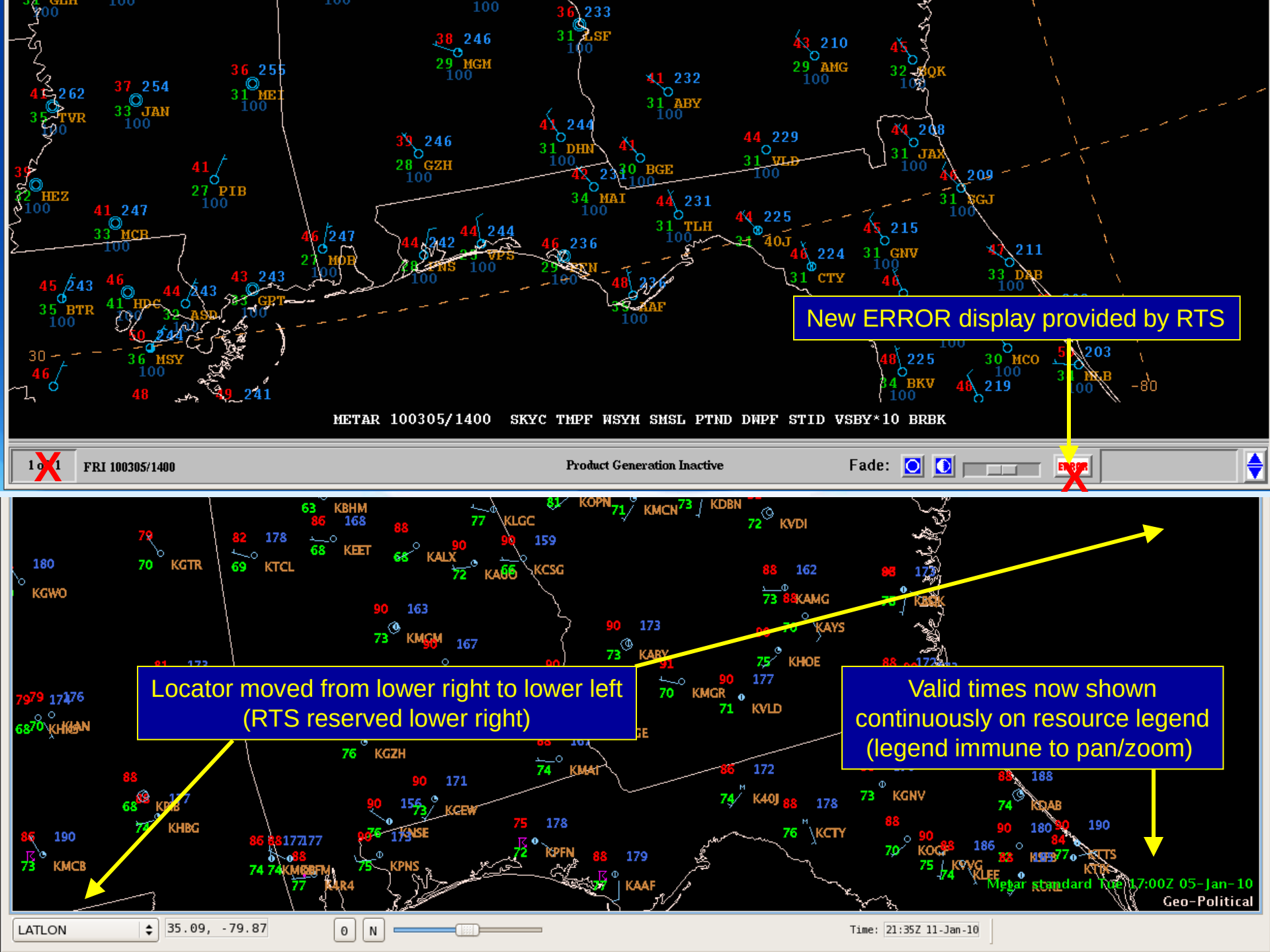
NAWIPS Button Type	Functionality in AWIPS II
Auto Update	Still under investigation
Wipe	Yes - unchanged
Reload	None at this time – AWIPS reloads data automatically
Loop	Replaced w/tabs, hotkeys unchanged
Animation Controls	Yes - unchanged
Stop	No
Zoom/Unzoom	Available in CAVE; however, unneeded

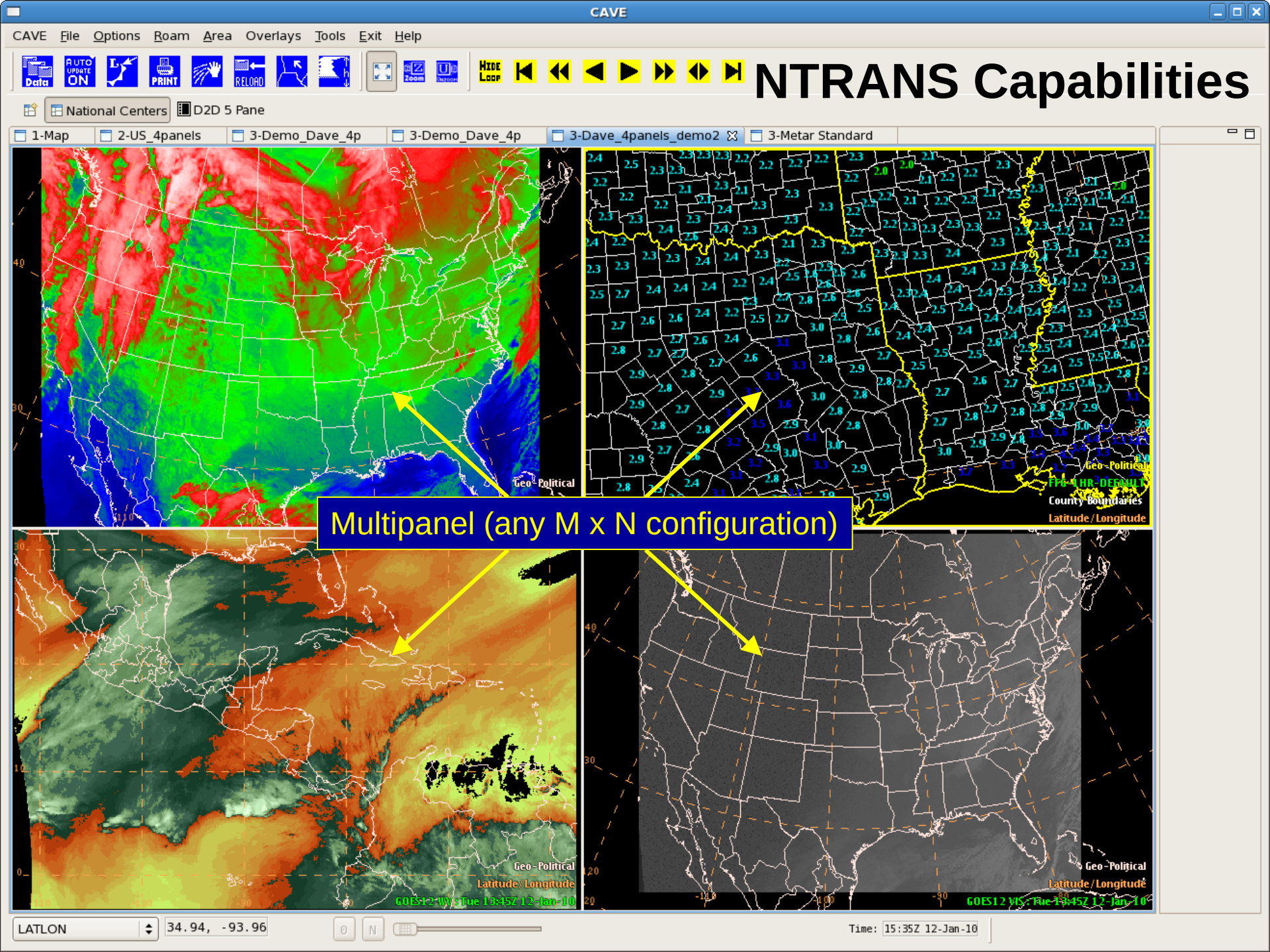

File Option Roam Exit
Help
Data
MAP
PRINT
RELOAD
Loop: 4
Zoom
UnZoom
Hide Loop
MAP dialog replaced by pull-downs
Multiple tabbed multiframe sequences replaces pull-down
CAVE
CAVE File Options Roam Area Overlays Tools Exit Help
Data
AUTO UPDATE ON
PRINT
RELOAD
Hide Loop
National Centers
D2D 5 Pane
1-METAR_Michael.gao
3-Mcidas_Sat 4panels
4-US_4km_VIS
4-NWPac_2km_IR
4-Wtropical_4km-WV
4-NAtlPol-8km_IR
Map
2-Metar Standard
National Centers Perspective

National Centers Perspective

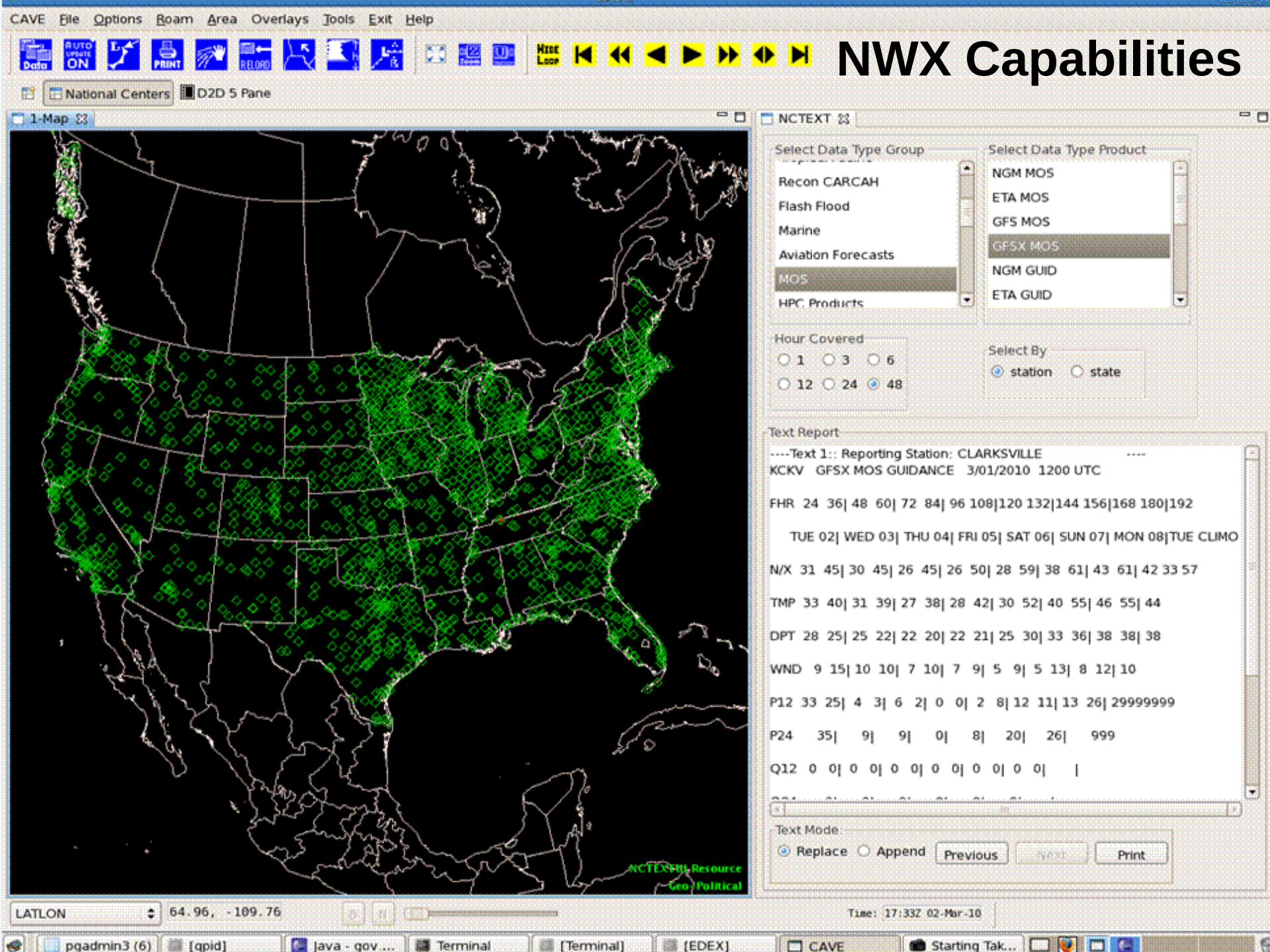
User View – CAVE Bottom Buttons

NAWIPS Button Type	Functionality in CAVE Perspective
Valid Time	Yes - unchanged
Locator / Lat/Lon Readout	Moved from lower right corner to lower left
PGEN hints	Still under investigation
Fade	Yes - unchanged
Error	Functionality in AWIPS
Loop Counter	Yes - unchanged

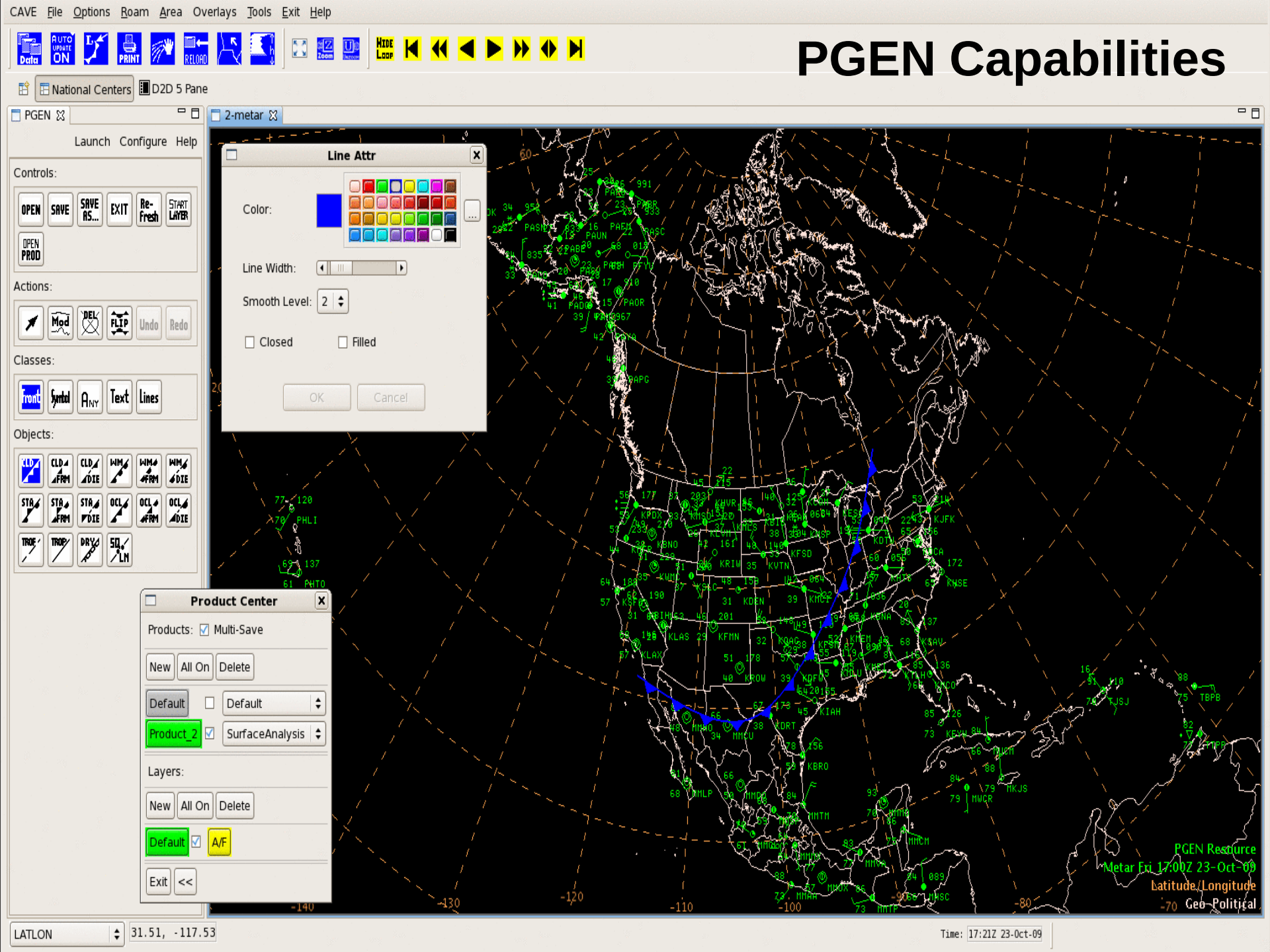

New ERROR display provided by RTS
METAR 100305/1400 SKYC TMPF WSYM SMSL PTND DWPF STID VSBY*10 BRBK
1 of 1
FRI 100305/1400
Product Generation Inactive
Fade:
ERROR
Locator moved from lower right to lower left
(RTS reserved lower right)
Valid times now shown
continuously on resource legend
(legend immune to pan/zoom)
Metar standard Tue 17:00Z 05-Jan-10
Geo-Political
LATLON
35.09, -79.87
0
N
Time: 21:35Z 11-Jan-10


CAVE
CAVE File Options Roam Area Overlays Tools Exit Help
NTRANS Capabilities
National Centers
D2D 5 Pane
1-Map
2-US_4panels
3-Demo_Dave_4p
3-Demo_Dave_4p
3-Dave_4panels_demo2
3-Metar Standard
Multipanel (any M x N configuration)
Geo-Political
County Boundaries
Latitude/Longitude
LATLON
34.94, -93.96
Time: 15:35Z 12-Jan-10

NWX Capabilities



PGEN Capabilities



Hardware Configuration

- National Center configuration TBD ASAP
  - Separate HW Configuration Project between NCO and OST
  - SIB testing NAWIPS migrated software on a RFC test bed, NHDA
  - Government engineering analysis completed by end **April 2010**
  - Finalize configuration/proposal with RTS & submit procurement **June 2010**
  - Test bed at NCO by **August 2010**
- HW will arrive at NCs for OT&E beginning Fall 2010
  - Phased to arrive at Centers based on seasonal requirements
- Minimum Configuration
  - CAVE (workstation) requires a video card that supports OPEN GL w/ 256M video RAM
  - EDEX (Data server) requires 2G RAM
    - Each Center will most likely require 2 EDEX

Unidata Involvement

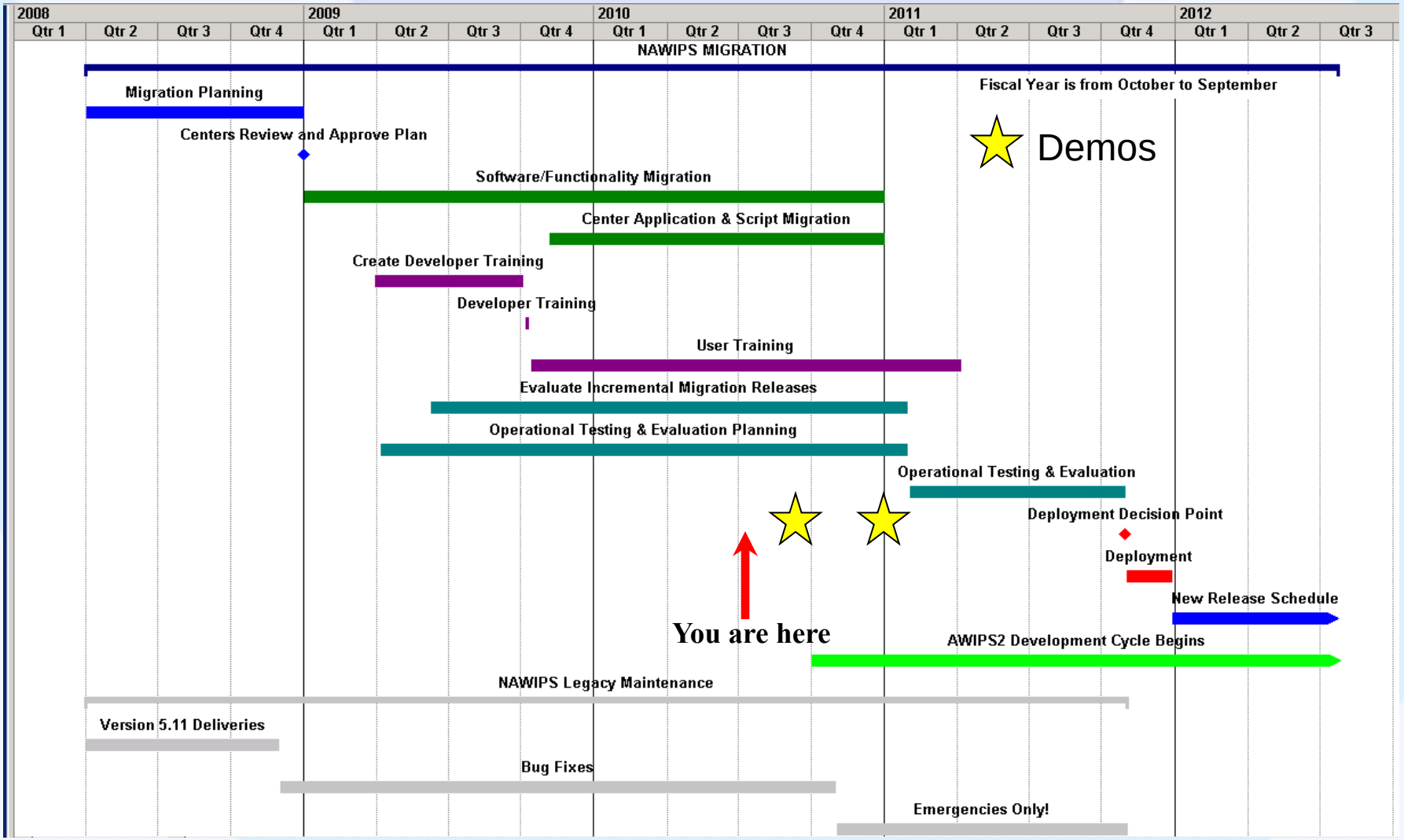
- Weekly status telecons - Periodic migration telecons
- IV&V, OT&E (baseline + NAWIPS extensions)
  - Test plans, cases and execution
- User training (limited) – web based
- Design and development collaboration
- Liaison with University community

- Developers conference scheduled late FY10
- **NCEP continues to view Unidata as a very important partner for NCEP's total mission.**

Benefits for Unidata Users

- Facilitate Research => Operations
- Classroom tool / training
  - Weather Event Simulator ~ 2012
- NWS operational system
  - Simulates a fully operational forecasting system
- Less data processing required
- Run your own EDEX to create database
- Modern development environment/platform
  - Flexible & expandable architecture
  - Object oriented languages such as Java and Python

NAWIPS Roadmap



Key Takeaways

- NAWIPS/AWIPS II software migration on schedule
- NC transition highly dependent on Raytheon development
- GEMPAK supported until a full replacement is ready
- Hardware configuration finalized – June 2010
- Unidata OT&E involvement – early 2011
- First NC operational release – Fall 2011
- Unidata support of GEMPAK extends 18 months after 1st delivery – Spring 2013
- GEMPAK is free to anyone who wants to use it
- Once NWS implemented, AWIPS II will have open software policies

Training Resources

- **Training Portals:**
  http://www.nwstc.noaa.gov/AWIPS/ADE/ADE_resources.html

- **NCEP Central Operations – AWIPS II Wiki Site:**
  http://wiki.ncep.noaa.gov/nco/sib

- **AWIPS Migration training and resources:**
  http://www.nwstc.noaa.gov/nwstrn/awips.htm
  – Includes new AWIPS II SOA module

- **Suggested training:**
  – Java, Advanced Java (best practices)
  – Please note that Java allows “wrapping” of C and FORTRAN
    - Best implemented when performance is an issue

Questions ?

"From the Sun to the Sea…
Where America's Climate, Weather, Ocean and Space Weather Services Begin"

Software Strategy

- Studied AWIPS-II system as delivered by Raytheon
- Break down existing functionality into small pieces
- Trac wiki and ticketing system
- Employ “agile scrum” development environment
- Use Eclipse Rich Client Platform
  - CAVE is an Eclipse application made of various plugins
- Hudson continuous integration