

NAWIPS Migration to AWIPS II

Overview and Data Display Challenges

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12th Workshop on Meteorological Operational Systems
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Agenda

- Background
 - NCEP and NCO organization
 - NAWIPS mission
- Overview of NAWIPS functionality and development strategy
- Overview of AWIPS II
 - National Program
 - NAWIPS strategy for migration to AWIPS II
 - Functional differences between NAWIPS and AWIPS II

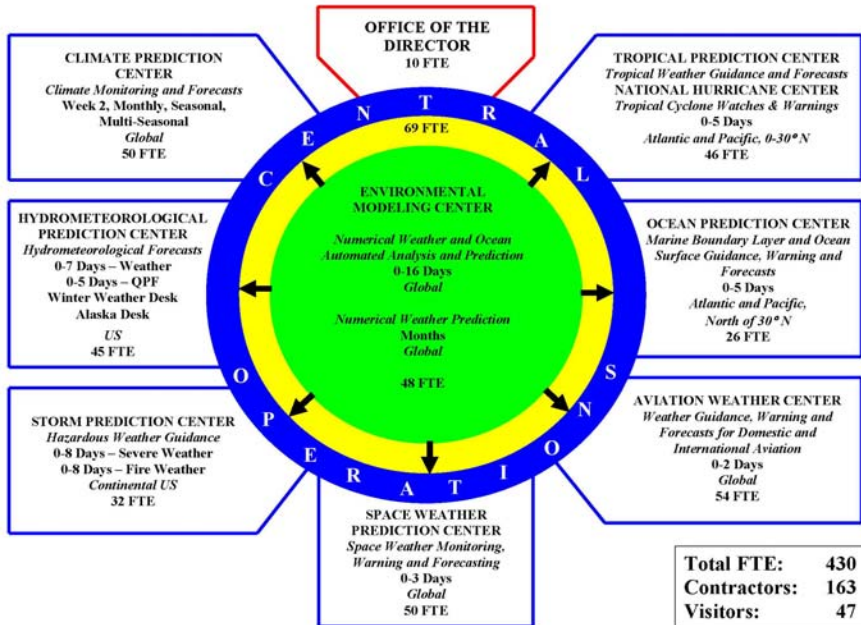


NCO Mission

Develop and support IT infrastructure for the entire NCEP enterprise

- Execute NCEP operational model suite
- Manage improvements to NCEP model suite
- Manage the flow of data and products
- **Develop Meteorological Software**

NATIONAL CENTERS for ENVIRONMENTAL PREDICTION



NATIONAL CENTERS FOR ENVIRONMENTAL PREDICTION

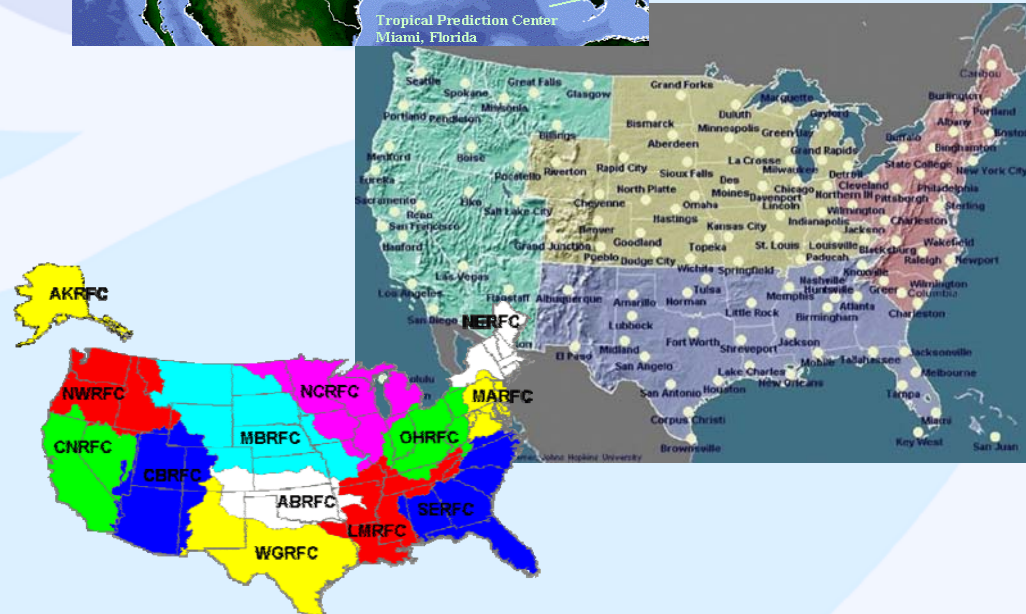


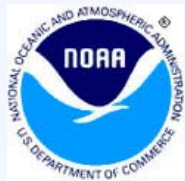
November 2009

12th Workshop on Meteorological Operational Systems

NAWIPS Team Mission

- Develop meteorological application software to meet NCEP requirements
 - National Centers given responsibility to meet their mission requirements
- Transition NAWIPS functionality to AWIPS II environment
 - National Centers will be fully integrated with the NWS-wide system

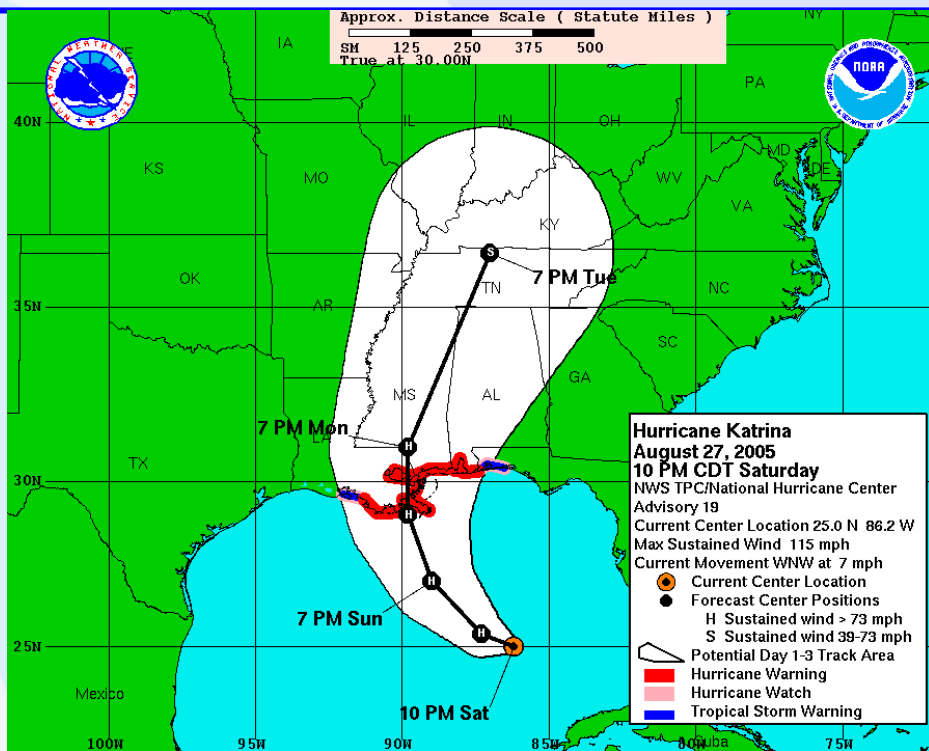




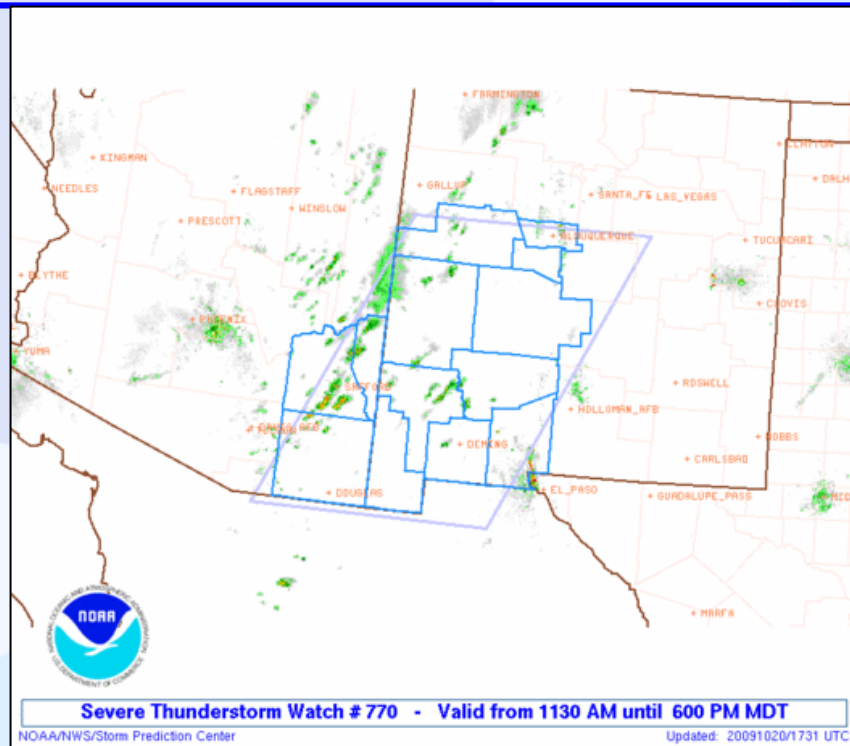
NAWIPS Key Attributes

- **NAWIPS Software:**
 - Ingests, performs calculations on and displays meteorological observational and model data
 - Operates on the full spectrum of geographic and temporal scales
 - Is adaptable, allowing for the introduction of new data, products and functional improvements
 - Has the flexibility to support a diverse user base
 - **NCEP Centers (AWC, CPC, HPC, NHC, OPC, SPC)**
 - **Automated products on the NCEP super computer**
 - NWS Alaska Region, Pacific Region and River Forecast Centers
 - UCAR-Unidata (supporting about 300 universities)
 - Unidata freely distributes NAWIPS to non-U.S. Government organizations
 - Government labs
 - Is used to create a diverse set of forecast products

NAWIPS Product Samples

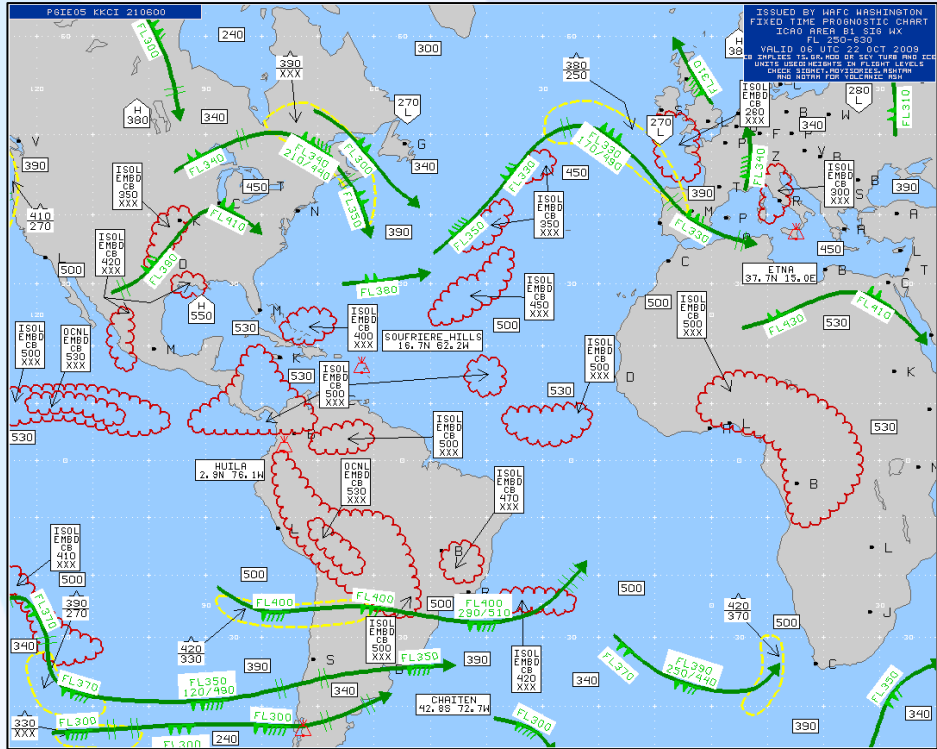


Hurricane Track Forecast
*From the Tropical Prediction Center's
 National Hurricane Center*

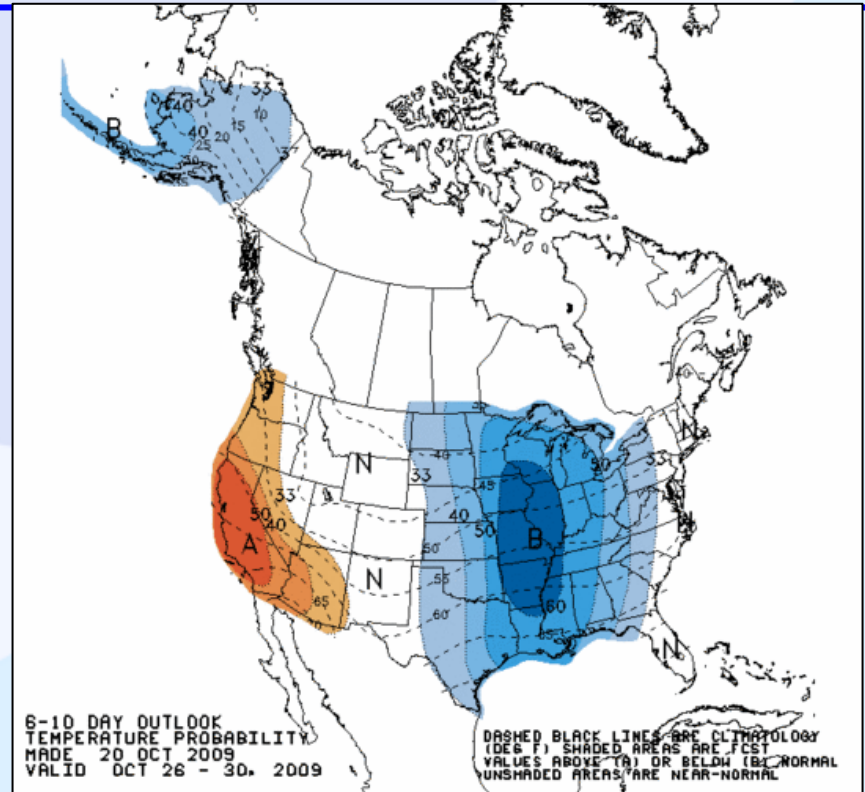


**Severe Thunderstorm
 Watch**
From the Storm Prediction Center

NAWIPS Product Samples

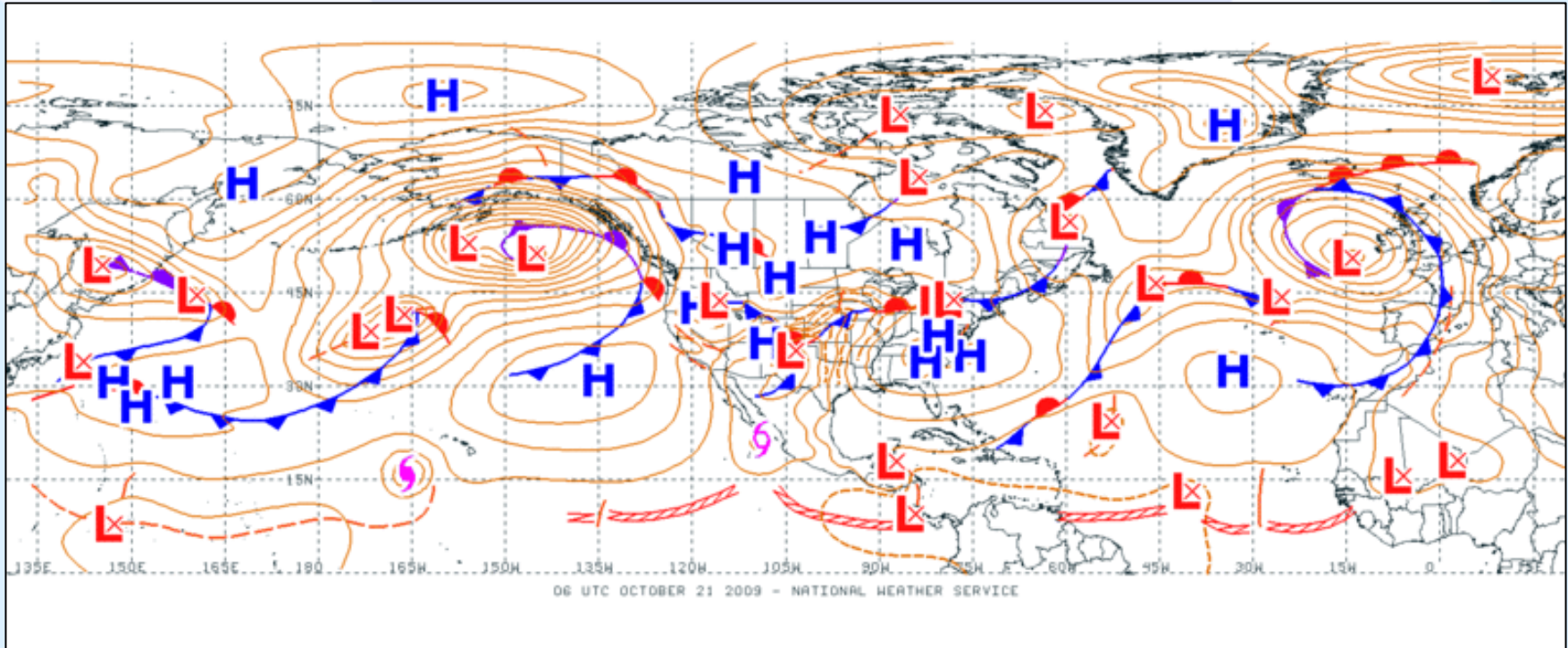


Upper Level Aviation Chart
From the Aviation Weather Center



6 to 10 Day Forecast
From the Climate Prediction Center

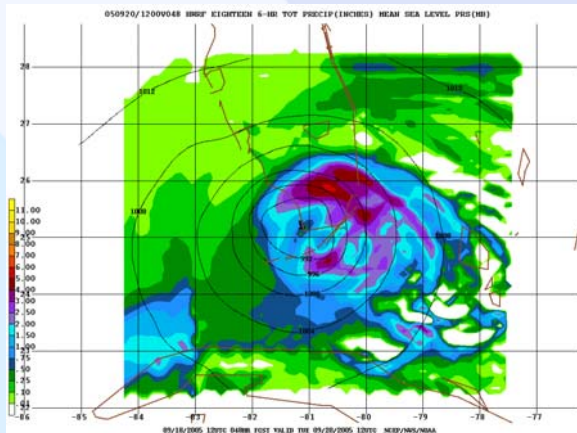
NAWIPS Product Samples



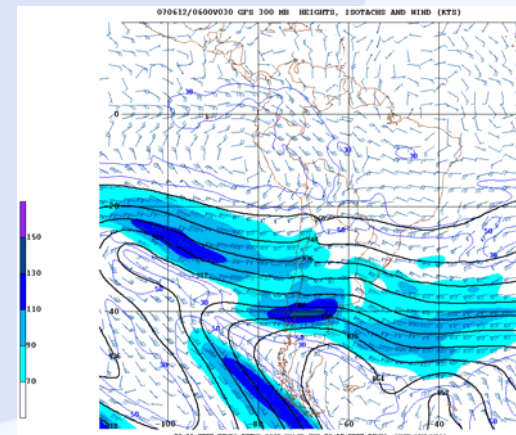
Unified Surface Analysis

*Collaboration of the Hydrometeorological Prediction Center,
Ocean Prediction Center, Tropical Prediction Center and Pacific Region*

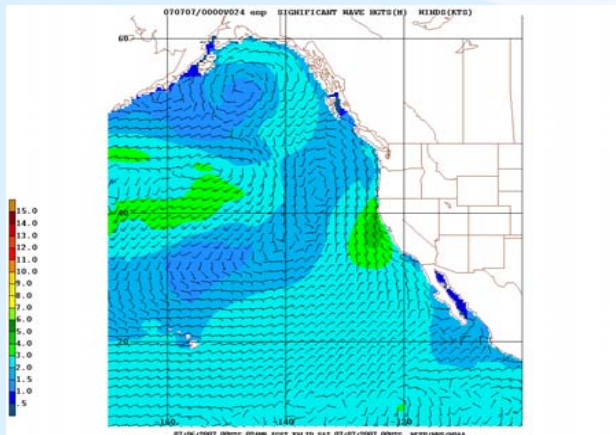
Automated Product Samples Created on the NCEP CCS



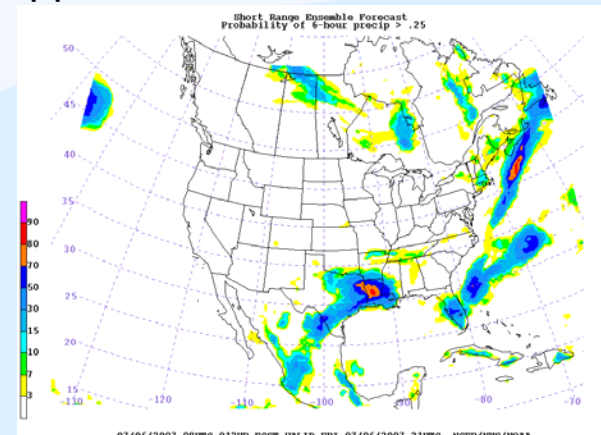
HWRf Surface Forecast



GFS Upper Air Forecast over South America



WW3 Wave height & winds



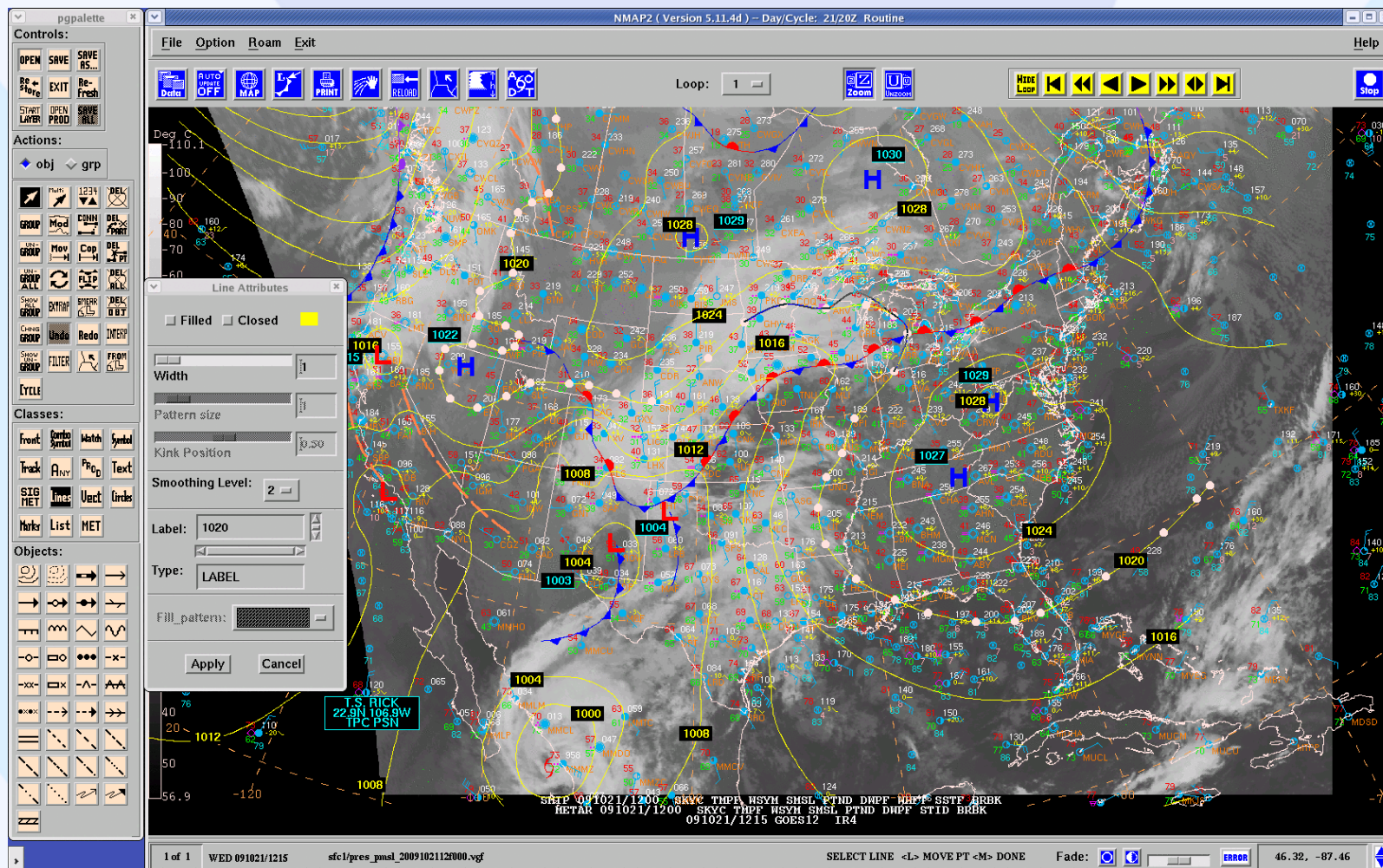
SREF Probability of Precip > 0.25 inches/6hr



NAWIPS Key Attributes

- Integrated Product Generation
 - Creation/Editing of graphical products overlaid on meteorological data displays
- Critical requirements
 - Drawing and editing tools using meteorological objects, e.g., fronts, weather symbols, etc.
 - Graphical objects navigated to account for multiple product sectors and projections, wind rotation, etc.
 - Facility to import first guess fields, e.g., model fields and other centers' graphical products
 - Product formatting to support Text Products, GIF, TIFF, PostScript, GRIB and BUFR
 - Product layering to support multi-component or multi-time concurrent editing

NMAP2 Integrated Product Generation





NAWIPS

Development Strategy

- Address multiple requirements with generic functionality
- Use an agile, evolutionary strategy
 - Build in small, frequent increments
 - Quarterly release cycle
 - Refine requirements based upon forecaster feedback



AWIPS II Overview

National Program

- AWIPS II Technology Infusion (FY2005 – FY2015)
 - A long-term project which delivers a modern, robust software infrastructure that provides the foundation for future system level enhancements for the entire NWS enterprise
- Phase I: (FY2006-FY2011)
 - Migration of WFO/RFC AWIPS (AWIPS I) to a modern Service Oriented Architecture (SOA) infrastructure executed incrementally through a series of task orders
- Phase II: (FY2009-FY2012) – AWIPS SOA Extension
 - Creation of a seamless weather enterprise spanning NWS operations
 - **Migration of NAWIPS into the AWIPS II SOA**
 - Delivery of thin client to support the Weather Service Offices, Center Weather Support Units, Incident Meteorologists, (e.g., Fire Weather, backup support for RFCs and National Centers)
 - Integration of Weather Event Simulator
 - CHPS Integration into AWIPS SOA
- Phase III: (FY2009 – FY2015) – Enterprise Level Enhancements
 - Data delivery enhancements: “Smart push-smart pull” data access
 - Integrated visual collaboration
 - Information generation enhancements
 - Visualization enhancements



AWIPS II Overview

National Program

- Perform “**black-box**” conversion
 - Preserve existing functionality, look-and-feel on top of new infrastructure
- Thorough field validation and acceptance before deployment
 - Incremental releases via task orders for test and evaluation strategy
- No loss of functionality
 - Deployed system current with latest deployed AWIPS capability
- Use open source projects - No proprietary code
 - JAVA and open source projects enable AWIPS II to be platform and OS independent
- Objective is to make AWIPS II available for collaborative development



NAWIPS Migration Project Goals



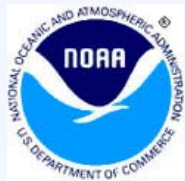
- Full NAWIPS capabilities must be ported to the AWIPS II architecture
- Software must be ready for Operational Testing and Evaluation by October 2010
- No changes to the forecaster workflow
 - “**Gray box**” migration
 - Some visual differences may be unavoidable
- Capitalize on new technology



NAWIPS Migration Project Focus



- Migration activities in four primary areas
 - Decoders
 - Graphical User Interface integration
 - Product Generation (PGEN)
 - GEMPAK
- Testing and Test Plans
 - Developed by the National Centers based on operational concepts



NAWIPS Migration Project

Decode and Display

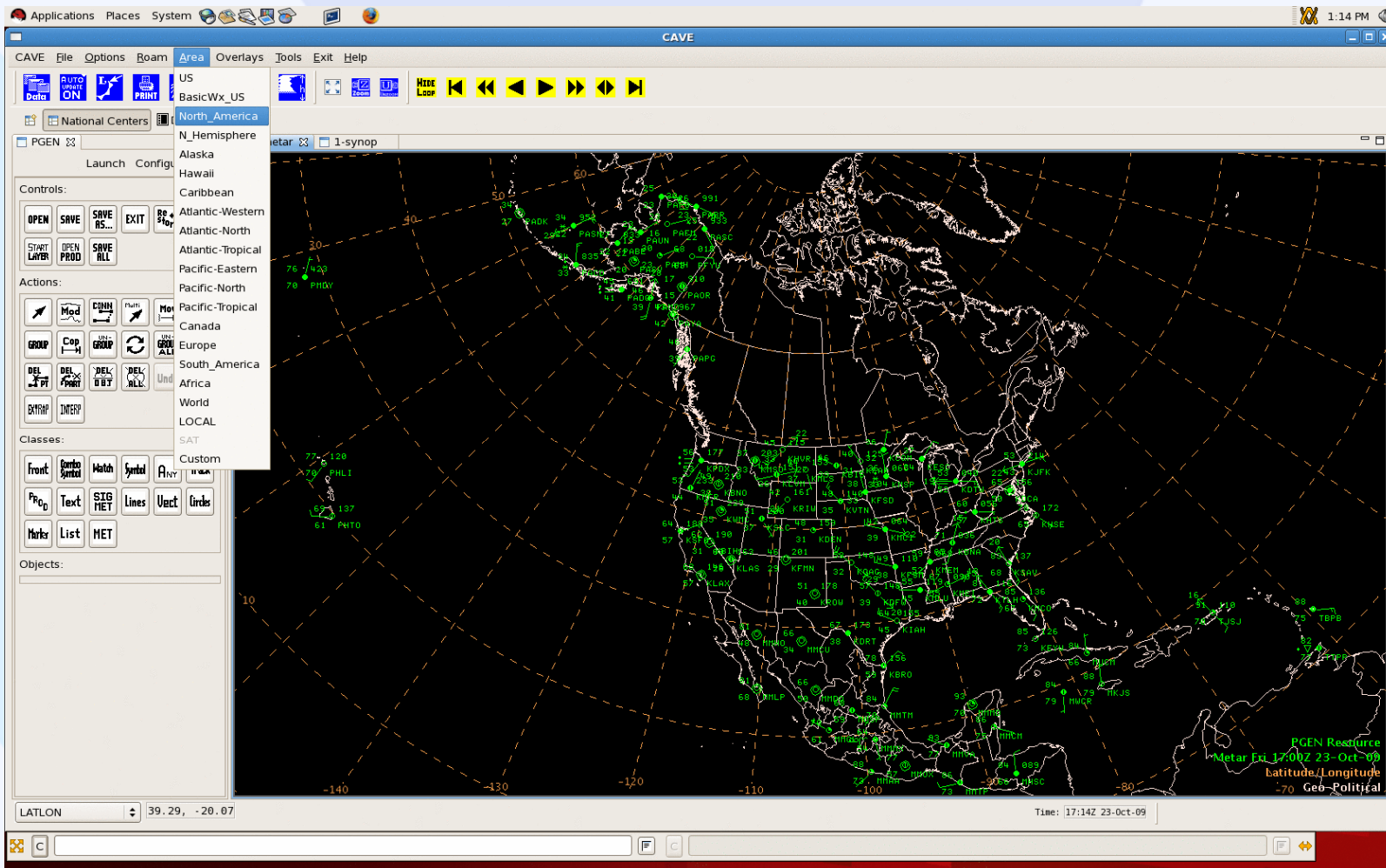


- Decoders are incorporated into the system as server plugins
- Data display is provided in the Common AWIPS Visualization Environment (CAVE) through data resources
- The National Program is providing decode and display functions for many standard data types
 - METAR, Radiosondes, GINI Satellite, GRIB, etc.
- NCEP must provide decoders and display for unique data sets or those in different formats
 - SIGMET, McIDAS Satellite, QuikScat, etc.



NAWIPS Migration Project

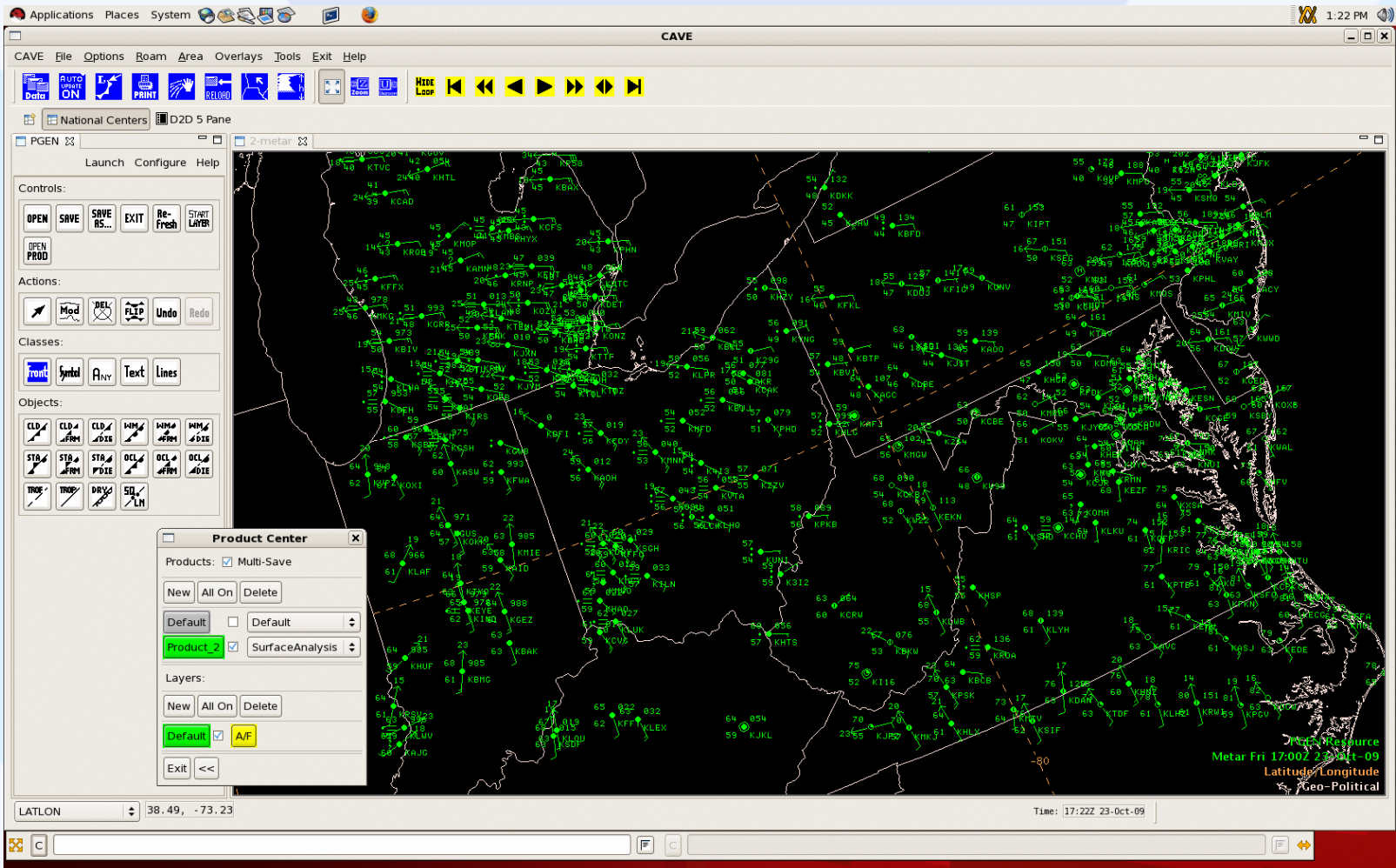
Decode and Display





NAWIPS Migration Project

Decode and Display





NAWIPS Migration Project

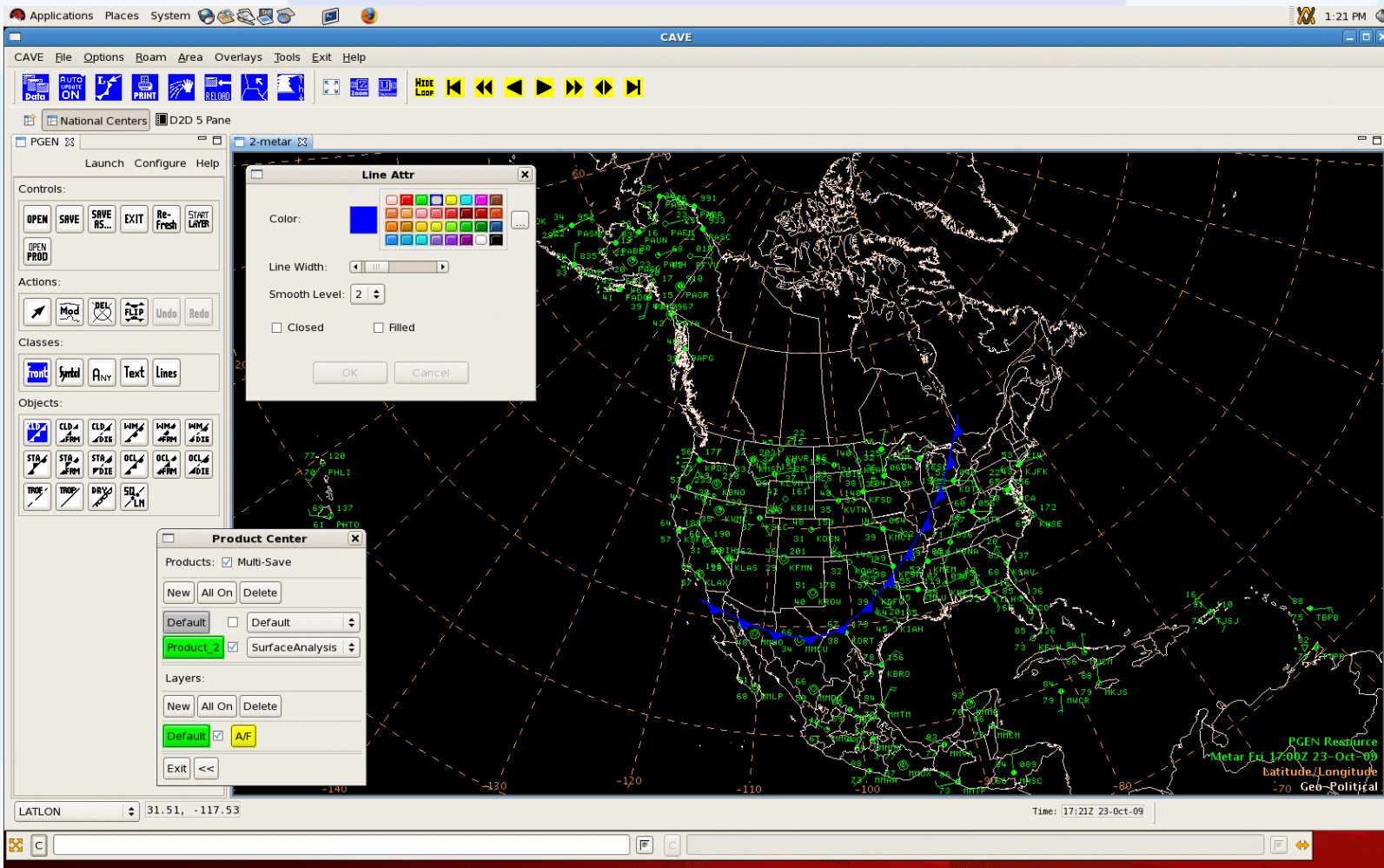
Product Generation



- Includes all current functionality
 - Drawing and editing
 - Derived product creation
- New functionality
 - Make the user experience product-centric
 - Allow widget set to reflect the product being created
 - Change from the legacy binary storage format to an XML-based format



NAWIPS Migration Project Product Generation





NAWIPS Migration Project

GEMPAK



- Initial work is to modify GEMPAK to access the AWIPS II database
 - This will allow the users to continue to use their legacy batch scripts with the new database
 - The graphical applications that are part of NAWIPS will be removed
 - GEMPAK will continue to be supported
- Future plans include providing GEMPAK functionality as a service
 - Create a GEMPAK macro language that will provide the user with batch process access to the AWIPS II functionality



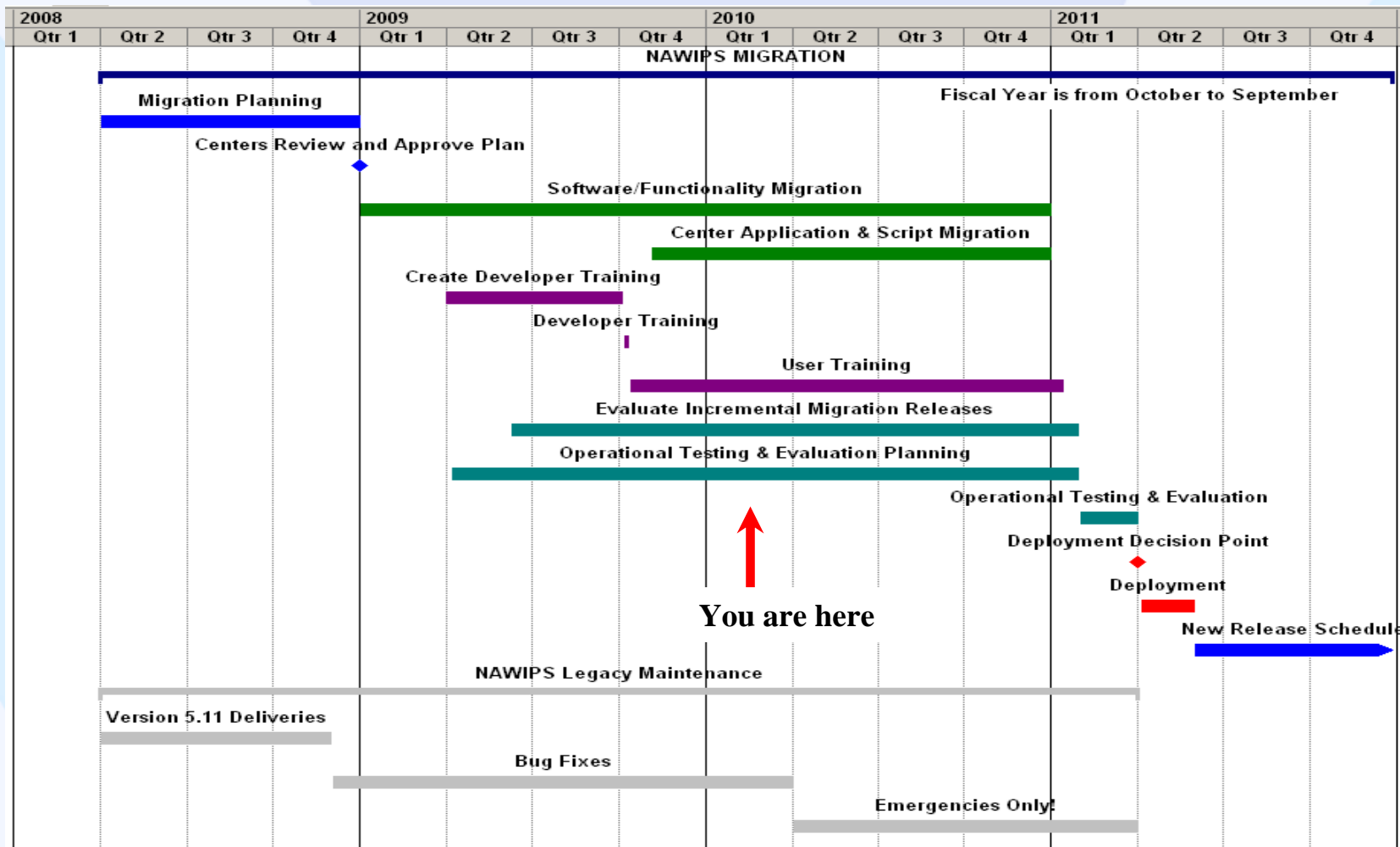
NAWIPS Migration Project Challenges



- Raytheon is still doing development at the same time
 - Creates a moving baseline of the software
 - Must react to all changes and incorporate NCEP code with each delivery
 - Documentation is lacking in most areas
- New environment for many NCEP developers
 - Java and Object Oriented development
 - Eclipse
- Inclusion of Space Weather
 - The Space Weather Prediction Center added to NCEP in 2004
 - SWPC would like to use AWIPS II for terrestrial and solar products



NAWIPS Migration Project Roadmap



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