Office of Hydrologic Development
Hydrologic Software Engineering Branch
Quarterly Activity Newsletter
January 1, 2007

Software for NWS Hydrology!

Chief, HSEB, Jon Roe
Project Area Leaders: Larry Cedrone, Chris Dietz, Mark Fresch, Mark Glaudemans, Joe Gofus

1 HIGHLIGHTS FOR OCTOBER, NOVEMBER, AND DECEMBER 2006

Most software development efforts during this period were dedicated to a wrap up of AWIPS Release OB7.2, and development work for OB8.1 tasks. Other key activities included support for field test and evaluations, and adapting to major changes to software development and maintenance practices associated with the ongoing implementation of the not-so-new AWIPS prime contract.

Most sites have now upgraded to AWIPS OB7.1 and OHD continues to provide support as needed for OB7.1. However, during this quarter most of our support was focused on Raytheon's testing of AWIPS OB7.2. The final System Verification Review (SVR) for OB7.2 is scheduled for January 12, 2007, with national deployment beginning January 29, 2007.

For NEXRAD, HSEB is implementing a dual polarization Quantitative Precipitation Estimation (QPE) algorithm and associated products. This algorithm is targeted for deployment in NEXRAD RPG Build 11, along with the dual polarization initial operating capability. Deployment of the initial dual polarization operating capability and Build 11 is planned to begin in 2009. To ease the transition to dual polarization, the current NEXRAD precipitation algorithm and products (known as the Precipitation Preprocessing Subsystem (PPS)) will continue to be available until dual polarization deployment is completed and the NEXRAD agencies decide to remove the current algorithms and products.

Tasks for the Community Hydrologic Prediction System (CHPS) made good progress as some major milestones were met.

HSEB devoted more resources in support of OS&T for AWIPS II, details below.

SPECIAL NOTE REGARDING HYDROLOGIC SOFTWARE MAINTENANCE:

On October 2, 2006 the AWIPS prime contractor, Raytheon, assumed Adaptive and Corrective Maintenance (ACM) responsibility for all of OHD's baseline AWIPS software. The Knowledge

Acquisition Process (KAP) – the transfer of software knowledge from OHD to Raytheon - formally ended on October 1.

The transition did not go as smoothly as hoped, nor was it entirely successful. Although KAP has formally ended, HSEB will continue to work with Raytheon to bring ASM fully up-to-speed. This may result in a reduced quality of service in some instances, for which we request your patience.

All RFC and WFO sites should be diligent about contacting the NCF to report software deficiencies. The NCF will then open a Trouble Ticket and possibly contact the OCWWS HSD (Hydrologic Services Division) support staff, who will contact Raytheon ASM (Application Support Maintenance) for software issues. OHD HSEB will only be asked to support that subset of difficult software problems which cannot be resolved by Raytheon ASM.

Note that, due to the October 2006 transition of OHD software maintenance to Raytheon ASM, Historical Data Browser (HDB) support will be divided into software issues (via the Trouble Ticket mechanism) and data issues (via the OHD HSEB HADS team – contact hadssystem@gateway2.nws.noaa.gov).

Details for knowledge transfer from HSEB to ASM on future software development projects are currently under discussion.

2 NEXRAD SOFTWARE DEVELOPMENT

The next NEXRAD RPG build, Build 9, is scheduled for deployment in Spring 2007. For that build, HSEB re-hosted the PPS to a LINUX operating system and fixed some minor bugs. Level III radar precipitation product specifications for the last few RPG builds are available on OHD's website: http://hsp.nws.noaa.gov/oh/hrl/wsr88d_prods/index.htm.

For Build 10, OHD is proposing a small change to add the source ID of the mean field bias to a few of the PPS products. As part of OB8.2, WFOs will have the option to send to their associated RPG(s) either their locally-computed mean field bias or an RFC-computed mean field bias.

2.1 Terminal Doppler Weather Radar (TDWR) PPS

In FY06, the team adapted the RPG-based PPS to process TDWR data on the Supplemental Products Generator (SPG), a modified RPG ingesting TDWR data. Current plans are to make the TDWR-based precipitation products (such as Storm Total Precipitation) displayable with AWIPS OB8.3. For more details on this project see the October 2006 HSEB Newsletter.

2.2 Dual Polarization

HSEB continued to support the Dual Polarization project. The Dual Polarization project is tracked via the NWS OSIP as Project 05-023 (https://osip.nws.noaa.gov/osip/index.php). This past quarter, HSEB continued the requirements definition and preliminary design of the dual polarization QPE algorithm originally prototyped by NSSL. In addition, HSEB continues to lead the Dual Polarization Software Design Working Group. The primary goal of the group is to share knowledge, especially software design, among collaborators (OHD, OOS/ROC, NSSL, OS&T, and the FAA), and define schedules that will assure smooth transition of NSSL's algorithms into the operational baseline.

Next quarter, HSEB will complete the requirements and design for the QPE algorithm and begin the requirements definition for the dual polarization precipitation products. Dual polarization product requirements will be largely based on input from operational users and trainers.

3. AWIPS RELEASE OB7.1

Release OB7.1 is currently undergoing national deployment.

3.1 NWSRFS

Reminder: OB7.1 does include all of the fixes issued as interim releases to the OB6 release. The NWSRFS developers have spent little or no time providing support for this release.

3.2 WHFS AND DATA INGEST

The OB7.1 OHD Common Release Notes describe assorted changes introduced in OB7.1. The OHD Common software includes the WHFS (WFO Hydrologic Forecast System), Precipitation Processing system, and the Hydrologic Data Ingest components that are common to both WFOs and RFCs. The release notes and other support documents are provided at the https://ocwws.weather.gov/intranet/whfs/ web site, which requires a NOAA password. Some noteworthy enhancements for OB7.1 include:

- A new River Monitor application 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. It is enhanced in Release OB7.2.
- The ability to store and manage low water (i.e., drought) impact statements in the HydroBase application.
- The ability to perform alert/alarm against lower limit thresholds, to complement the existing upper limit exceedance thresholds.
- The improved ability to specify and manage the display of flow-based flood impact statements in RiverPro, beyond the existing traditional stage-based impacts.

- The separation of HydroView /MPE into distinct applications – one for HydroView and another for MPE (more MPE discussion is given in the precipitation processing section below).

3.3 PRECIPITATION PROCESSING

In OB7.1, a collection of changes were introduced as part of the general goal to provide an integrated set of QPE tools within the Multi-Sensor Precipitation Estimator (MPE) application. Although the Western Region's Daily QC (DQC) functionality is not introduced until OB7.2, enhancements from the Tulsa RFC P3 QPE application are introduced in OB7.1.

The changes include the introduction of three new grid types: a) Triangulated Local Bias Corrected Multi-Sensor Mosaic; b) Radar Average mosaic; and c) Radar Maximum Mosaic. Site tokens are used to control which grids are actually generated at a given office and which radar mosaic is used for the subsequent grids. The existing MPE polygon editing tools are extended in OB7.1 to allow the user to apply, save, or delete polygon-based edits. Lastly, the MPE application, which is now separate from the HydroView application, has a split-screen feature to allow side-by-side comparison of grids.

4. AWIPS RELEASE OB7.2

AWIPS OB7.2 contains a significant amount of new work from OHD.

4.1 NWSRFS

During the past 3 months we provided support for Raytheon's testing of AWIPS OB7.2 for Verification, RAX Database conversion to PostgreSQL, Distributed Hydrologic Modeling (DHM), and conversion of the Historical Data Browser (HDB) to PostgreSQL.

Raytheon's testing for OB7.2 RFC functionality did not commence until all OB7.1 testing had finished; OB7.2 WFO software had already undergone several months of testing by this time. The reason for delayed RFC testing was lack of an RFC test system at Raytheon's facility.

4.1.1 VERIFICATION

With significant help from OHD personnel, Raytheon was able to complete the testing of the enhanced verification software which is now being tested at OB7.2 beta sites.

4.1.2 RFC ARCHIVE (RAX) DATABASE CONVERSION TO RHEL/POSTGRESQL

This is a complicated task, which requires pre- and post-installation effort on the part of the RFCs. The complication lies in the fact that a new operating system will be installed, the AX

disk will be re-partitioned, a new database engine will be introduced, and there will be vast quantities of data requiring temporary storage during the conversion process.

This project has been a joint effort between Raytheon and OHD. The upgrade was tested on the NHO-R, and was also beta tested at Northwest RFC (PTR) just before the Holiday.

4.1.3 DISTRIBUTED HYDROLOGIC MODELING (DHM)

A visit to Silver Spring on November 1-2 by forecasters from ABRFC and WGRFC highlighted the fact that AWIPS OB7.2 will not provide enough functionality required for full operational use of the DHM. This is mostly due to the fact that there is no grid editor functionality in D-2D, and no distributed model calibration tool available in the AWIPS baseline.

The group agreed that during the AWIPS OB7.2, OB8.1, and OB8.2 life cycles, RFCs wanting to use the DHM capability will require access to HSMB's prototype for model calibration, ABRFC's XDMS application for grid display, and IFP for grid editing (mods).

In OB8.2, GFE will be introduced "out-of-the-box" for RFCs; RFCs will receive training at GSD in Boulder, CO. In OB8.3, GFE will be used for DHM grid editing.

A workshop sponsored by OHD will be held in the spring of 2007 to provide all RFCs with the necessary training, as well as further information on OHD's plans for DHM.

4.1.4 HISTORICAL DATA BROWSER (HDB)

OB7.2 provides RFCs with the HDB as part of the AWIPS national baseline for the first time. There was very little OHD HSEB activity in this area during the past 3 months, other than providing the necessary support to Raytheon testers.

4.2 WHFS AND DATA INGEST

The OB7.2 OHD Common Release Notes will available soon on the HSD web page, and list many key additions to the OB7.2 software functionality. Changes include:

The implementation of the "Mapper" station data display function into WHFS, currently operating as a Western Region local application. It provides a robust method for displaying hydrometeorological data, similar in many ways to the existing WHFS TimeSeries and HydroView station data display control functions. Its benefits are in its more direct methods for displaying desired data sets (i.e., less mouse clicking), its "time-stepping" (quasi-animation) features, and its display speed. A new feature, dubbed "TimeSeriesLite", is incorporated that represents a quick, scaled-down version of the current WHFS Time Series feature.

The data monitoring tool RiverMon, which was delivered initially in OB7.1, is provided to monitor information related to river forecast points, including the VTEC event status. This application runs continuously with an automated refresh of color coded tabular information to

identify alert/alarm conditions. Related to this is an automated application known as the "observed-forecast monitor" for monitoring differences between river forecast and observations. This monitoring tool fits within the existing WHFS Alert/Alarm functionality.

Some minor enhancements are also provided, including a new editor interface in HydroBase for the HydroGen support information, a new feature to adjust the icon sizes in HydroView, and new features in the TimeSeries tabular mode for copying forecast time series data and for globally setting quality code attributes.

Major enhancements are also made to the RiverPro functionality to support NWS Directive 10-1703 (VTEC) and 10-922 (WFO Hydro Products). These changes also incorporated numerous changes based on lessons learned in the recently concluded Hydro-VTEC OTE (Operational Test and Evaluation). The changes include full support for operating RiverPro in a practice mode and the new end-to-end ability to generate corrected products.

4.3 PRECIPITATION PROCESSING

A major change to MPE operations in OB7.2 is the incorporation of the Daily QC functions used in the Western Region into MPE operations. The goal is to provide a nationally-supported, baselined application usable by all offices to perform QPE operations. For OB7.2, the existing Daily QC functionality is integrated into MPE. This involved new temperature and freezing level data quality control features, additional precipitation gage quality control options, and assorted interactive features. The MPE Daily QC in OB7.2 still operates in its 6- and 24-hour domain.

HSEB is also working to coordinate the delivery of RFC-generated QPE products to the SBN for subsequent receipt and use at WFOs. Changes were made to make these RFC QPE products displayable in D-2D at WFOs, to complement the locally generated QPE products which can be displayed in D-2D as of OB6.

Lastly, a new utility application ("build_hourly") was provided to assemble hourly precipitation reports from sub-hourly data, so that the resulting data can be used in MPE operations.

5. AWIPS RELEASE OB8.1

OHD continued activities involved with the transfer of all OHD AWIPS baseline source code into Raytheon's configuration management system, Serena ChangeMan Dimensions. The transfer is now complete, but it was well behind schedule due to problems on the Raytheon side.

Along with the KAP, this activity has significantly limited OHD's contribution to AWIPS OB8.1 new functionality because of the continued considerable level of effort required of OHD.

In early December, NWS HQ hosted a 4-day visit from forecasters from different regions and program areas to participate in the AWIPS Pre-Integration Test (PIT) for OB8.1 software. This gave forecasters an early look at the OB8.1 software in order to provide valuable feedback to the

AWIPS developers, so that changes can be made before the software is "handed-off" to the AWIPS contractor. Both the OHD Common and RFC-only software components were evaluated.

The OB8.1 software is scheduled to be delivered to field offices beginning in July 2007.

5.1 NWSRFS

HSEB continued work on some enhancements which will be included in OB8.1:

5.1.1 SRA Tools Enhancements

Release OB8.1 will include four significant capability enhancements to the Res-J operation: a hindcasting capability, a "LOOKUP3" capability, diversion from a node, and a variable lag in the LAGK method in Res-J. Riverside Technology, Inc. (RTi) has completed the software changes which implement these enhancements and HSEB personnel will complete the handoff procedures to get the enhancements into the AWIPS release. Below are further descriptions of each enhancement:

The RES-J operation will be updated to operate properly in ESP hindcasting mode. As RES-J prepares the carryover for returning to NWSRFS, additional logic will test the existence of a user-requested carryover save on the last simulation time step. The results of this test will define accurately the amount of carryover written at the end of simulation. This amount of carryover is included as an index in the carryover itself. The index embedded in the hindcast carryover file will be correct. Using the index, RES-J will successfully read saved hindcast carryover enabling it to simulate through successive periods necessary in hindcasting.

The RES-J operation will be extended to include a new method, LOOKUP3 method, defining a value as a function of two other values. The method will be applicable to RES-J reservoir and node components.

A node is assumed to have zero storage; therefore, the maximum diversion cannot exceed total nodal inflow minus some minimum discharge. A new node component parameter, MINDISCHARGE, will be added. This optional parameter will allow the user to define the minimum outflow discharge at a node similarly to how the MINRELEASE parameter currently defines minimum outflow release at a reservoir component. If not specified by the user, MINDISCHARGE will default to 0.

The RES-J operation's LAGK method will be enhanced to allow use of variable lags. The algorithms existent in the LAG/K operation to address variable lag for instantaneous input flow will be added to the RES-J operation's LAGK method. The mean discharge algorithms in the LAG/K operation will not be included as RES-J only uses instantaneous values.

5.1.2 Enhancements to DHM

HSEB completed some infrastructure changes to the DHM software which did not make it into OB7.2. We began the software hand-off process to Raytheon (to be completed in January). No new DHM functionality is included in this release due to the schedule compression by OS&T.

5.2 WHFS, Data Ingest, Precipitation Processing

As part of the WHFS software, a new set of database tables are being added to allow definition of forecast services provided for each river forecast point. This information will be used for management of the services provided by the NWS hydrology program and will be incorporated into the broader verification measures effort managed by OCWWS/HSD. A new interactive application provides the tools needed to enter and manage the information in the database. The information is expected to be entered by RFCs, although these features are being provided to all offices.

OB8.1 also includes some minor improvements to the HydroGen image generation functions, along with assorted minor changes to WHFS applications.

No changes to the data ingest and precipitation processing operations are provided with OB81. Work is continuing on integration of QPE tools into MPE, and evaluations of MPE software is expected to continue through the OB81 period.

6. AWIPS RELEASE OB8.2

6.1 NWSRFS

6.1.1 Enhancements to Deterministic Verification

On December 20, HSEB received HOSIP Gate 3 approval for the next set of enhancements for the Deterministic Verification application. Upon delivery of the software for AWIPS OB8.2, the RFCs will gain new software capabilities that will enable them to compute additional verification statistics and analyze the statistics in a more robust manner. Furthermore, users will be able to verify input to the hydrologic models, including precipitation and temperature, while also verifying output from those models.

6.1.2 Re-implementation of ICP

HSEB is continuing to oversee work by RTi to re-implement the Interactive Calibration Program in an object-oriented framework which will facilitate future maintenance and enhancements of the application. The modernized application which will provide the same functionality as the current baseline is targeted to be included in the AWIPS OB8.2 release. To date, RTi has supplied three interim releases of increasing functionality which have been reviewed by HSEB and some selected field personnel. Reviews of the design documents and the user interface by HSEB and AWIPS SREC and RFC personnel have also been completed.

6.2 Precipitation Processing

6.2.1 RFC Bias Transfer to WFO RPG

Starting in OB8.2, WFOs will automatically receive a mean-field bias generated at an RFC. The quality control of rain gage data results in better bias information and the RFCs have staff who specialize in this task. The WFO will be able to a) select which RFC they receive the bias from, b) use the RFC generated bias in local MPE operations, and c) select whether to send the RFC generated or locally generated bias to their associated RPG. This past quarter, HSEB created a preliminary design and drafted HOSIP documentation.

6.2.2 Satellite-Rain-Gage Products

Three new QPE products using satellite data will be incorporated into MPE operations for OB8.2. A raw satellite and locally unbiased satellite product already exist, but no products exist that quantitatively integrate radar and gage data with the satellite data. The three new products to be generated are: satellite-radar, satellite-gage, satellite-radar-gage (SRG). The automatic generation of these fields is expected to replace the manual cut-and-paste now required to combine the satellite field with the radar-gage multi-sensor field in areas with poor radar and gage coverage. This project includes both the generation (through MPE_fieldgen) and display (through MPE_Editor) of the new fields.

7. AWIPS RELEASE OB8.3

7.1 Enhanced MPE

In OB8.3, HSEB is planning to provide an Enhanced MPE (EMPE) which with better spatial and temporal resolution to support flash flood warning operations. An EMPE user will be able to select a resolution of precipitation grids as small as 1 km by 1 km and be able to have EMPE run automatically as often as every 5 minutes. This change in conjunction with planned changes to FFMP will allow frequent high resolution mosaics (from multiple radars) to be used within FFMP.

8. DEVELOPMENT SUPPORT ACTIVITIES

8.1 NEW RFC SOFTWARE ARCHITECTURE

8.1.1 HydroXC

Phase 3 of the contract task to provide tools for use by the Hydrology XML Consortium (HydroXC) was awarded, and a kick-off meeting held on December 1 at Apex Digital Systems in Silver Spring, MD. This third phase will concentrate on crafting tools to manipulate HydroXC-

compliant files, tools to convert into and out of HydroXC, and creation of commonly agreed upon object templates. The goal of Phase 3 will be to provide tools that can be used by Consortium members in their operational software as desired. Apex will continue to provide administrative and coordination support; Dr. Michael Piasecki from Drexel University has agreed to provide technical leadership.

8.1.2 CHPS Realization Plan

Apex conducted monthly meetings with OHD and members of the CHPS Acceleration Team (CAT: CNRFC, ABRFC, NWRFC, NCRFC, and OHD's Senior Scientist). The original goal of the meetings was to elicit operational needs of the member RFCs, and to define a sequence of practical steps (projects) towards CHPS realization. However, as reported in the last newsletter, a meeting in September revealed a strong and clear desire by the CAT to introduce a completely new suite of forecasting software not based on the legacy NWSRFS.

On October 16 Apex organized a demonstration of WL | Delft's Flood Early Warning System (FEWS) for the CAT. The outcome was that the CAT now considers FEWS a viable solution. The "Evaluate FEWS for CHPS" contract task was re-defined to provide a working demonstration ("pilot") of FEWS in an RFC environment.

Apex concluded their work on the Realization Plan in December. Main recommendations included:

- Complete the FEWS Pilot
- Complete the ResSim project (also FEWS based)
- With FEWS knowledge, make decision for CHPS
    - Share findings with Raytheon (for AWIPS II)
- Define the broader set of requirements for a new forecasting environment
- Full operational roll-out

8.1.3 CHPS FEWS Pilot

Under contract to WL | Delft Hydraulics via OHD HSEB's contract with RTi, work on this task began on September 26.

The work is divided into two phases:

- Phase 1, develop a conceptual solution and generate an implementation plan
- Phase 2, implement the solution

The Pilot system is scheduled to be completed in April 2007.

Delft and RTi led a project kick-off meeting on October 17. During the months of October and November, Delft and RTi conducted a series of interviews with CAT members to elicit basin configuration information for selection of the best candidate RFC for the pilot demonstration. The two RFCs selected to run the Pilot were NWRFC and NCRFC.

Delft and RTi traveled to Silver Spring and on December 1 gave OHD a presentation of their Phase 1 findings and recommendations. Phase 2 is now underway.

As a risk reduction activity, OHD has also formed a small development team, led by RSIS, to integrate the new SAC-SMA Heat Transfer model (also known as the new Frozen Ground model, developed by Victor Koren) into FEWS. The RSIS team leader is an experienced Service Oriented Architecture (SOA) practitioner with a thorough understanding of design and development of services, Ms. Sudha Rangan.

On September 27 OHD met with the Raytheon architect from Omaha to discuss the role of CHPS in AWIPS II. OHD provided a very detailed review of the NWSRFS architecture and design. Apex – who is also Raytheon's SOA subcontractor for AWIPS II – shared their knowledge of Delft FEWS with Raytheon. Raytheon acknowledged they had underestimated the complexity of NWSRFS, and seemed willing to accept contributions that would advance AWIPS II. OHD agreed to keep Raytheon apprised of progress on the FEWS Pilot project.

8.1.4 ResSim

After a series of meetings and discussions between Apex, Delft, CNRFC, and USACE HEC, Apex presented their technical recommendations to OHD on October 10. This contract task has now been completed; in December HSEB submitted a Statement of Objectives to Contracts for the follow-on work (implementation of the technical recommendations).

While this project will integrate ResSim into NWSRFS, it will be designed in such a way as to be "CHPS-ready", so that it will require minimal effort to integrate the solution into the FEWS Pilot after the completion of that project next year.

8.2 AWIPS II

As part of their overall NWS contract, Raytheon activities include a series of tasks contained with the umbrella project of "Software Continuous Technology Refresh" (SW CTR). A SW CTR Product Improvement Plan (PIP), available upon request, describes the plan that Raytheon is executing with oversight from the NWS to perform a migration of the AWIPS baseline software. The NWS oversight is being administered by the NWS HQ Office of Science and Technology.

This migration is considered essential for the development of new science capabilities, new concept of operations, and incorporation of new data types into the NOAA/NWS environment. The ultimate migrated system is being referred to as AWIPS II, with the migration to this new system being referred to as "AWIPS Evolution". The evolution includes hardware, software, and communications changes.

There are seven formally identified task orders to date. Task Order 4 is on the verge of meeting some noteworthy milestones in that the ADE (AWIPS Development Environment) Software Developers Kit (SDK) Version 0.1 is being delivered, with training on it provided to the primary

NWS development organizations. This training will take place in late January at the NWSTC. Three OHD/HSEB personnel will be attending in the training slots we were allocated.

The ADE SDK is centered around a dramatically changed application environment envisioned for AWIPS II. This new environment will be built upon a comprehensive Services Oriented Architecture (SOA) design. The predominant software language for this new system is Java. In addition to the training, HSEB is involved in planning activities for AWIPS II, including membership on the AWIPS Evolution Leadership Committee and the ADE Independent Validation and Verification (IVV) team.

AWIPS II represents a major change to the AWIPS system, and will eventually affect essentially all aspects of the AWIPS system. The deployment schedule is very aggressive, with migration of applications scheduled to begin in summer of 2007 and continue for 2 years. Subsequent deployment of this new system is scheduled to phase in sometime in the OB10 release, tentatively planned for late 2009.

OHD/HSEB is currently assessing the strategic focus for AWIPS II with respect to hydrologic applications. Two key focus areas are:

- Integrated display of hydrometeorologic data with the meteorologic display (i..e., implementing HydroView functionality in the planned D2D successor: CAVE (Common AWIPS Visualization Environment)
- Integration of RFC modeling operations into a common SOA framework which includes an extensible architecture to support “plug-in” capabilities

Many other critical Hydrology software components are also being evaluated for their role in AWIPS II. This entire multi-year process is expected to require a major amount of resources in the coming months and years. Offices and regions are encouraged to become aware and participate in AWIPS II activities.

8.3 AWIPS BETA TESTING

The NWSI 10-1703 (VTEC; Valid Time Event Coding) and NWSI 10-922 (WFO Hydrologic Products) features of RiverPro are being tested at field sites beginning in June 2006. The Operational Test & Evaluation (OT&E) formally ended in December 2006, but the OT&E sites continue to use ATAN (i.e., test) versions of RiverPro to evaluate the software. The latest ATAN version is identical to the version being provided in AWIPS OB7.2.

MPE related evaluations are also ongoing or starting soon. The ABRFC has formally evaluated an updated MPE application with P3 functionality. OHD is working with ABRFC to resolve the remaining issues. Testing the MPE application with Daily QC features is being conducted at CBRFC beginning in August 2006. The NWRFC has also been recently evaluating the MPE DailyQC features.

Testing of the HydroView time-step (i.e., "Mapper") functionality is ongoing at NWRFC and may be expanded to other Western Region offices.

8.4 AWIPS SYSTEM CHANGES

For OB7.1, the AWIPS Software Engineering Group (SwEG) has adopted numerous changes to the AWIPS COTS software. These include changing to the RHEL4u2 operating system version, the gcc 3.4.3 compiler, and the PostgreSQL 7.4.8 database server.

No changes to the AWIPS COTS software including the operating system have been announced for OB7.2 or OB8.1.

9. HYDROMETEOROLOGICAL AUTOMATED DATA SYSTEM (HADS)

Visit our web page at: http://www.nws.noaa.gov/ohd/hads/.

9.1 HADS SYSTEMS & SOFTWARE

The HADS program has recently completed a hardware technology refresh. Five Dell servers are now providing the computing power for this program – two real-time systems, one for operations and a second running as a "hot" backup. The third machine serves as the primary operational computer for network/data point configurations, the fourth as a back-up for data point configurations as well as the development/test machine. The fifth system executes the primary PostgreSQL database for storage and retrieval of decoded/processed data.

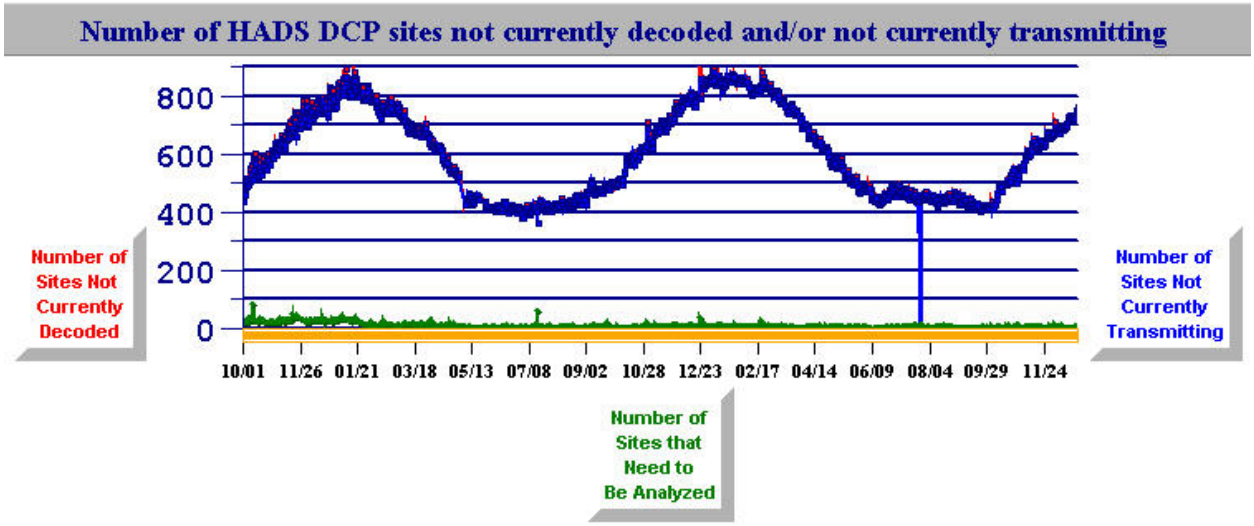
Next on tap is the deployment of "backup systems" to the NWS Backup Telecommunications Gateway center (the "BTG"). The placement of these systems will fulfill the requirement of the Office of Hydrologic Development to provide for a continuing HADS services in the event of a catastrophic failure at the primary NWS Telecommunications Gateway center in Silver Spring, MD. The current timetable is to deploy the backup systems during the third week of January 2007.

HADS software and its data decoders have remained rather stable during the past several months as only one modification was required due to the introduction of a new model data collection platform.

9.2 HADS DATA NETWORK

The data network continues its dynamic nature. The number of data points in the network is approaching 12,500 – a growth of nearly 500 sites during 2006. Meanwhile the number of data values stored in the HADS database each day is averaging just below 2.1 million.

The winter months are historically a slow period for changes in data site configurations, as DCP operators have already implemented their seasonal modifications. An interesting aspect of the network during the winter is the significant increase in the number of DCPs that fail during this time of year and remain off-line for long periods of time. This event is depicted in the image below.



This chart covers the time period from Oct. 1, 2004 through Dec. 27, 2006. A significant peak in the number of malfunctioning, or off-line sites occurs during the first week of January – then the sites gradually come back on-line during the spring. We then find that the annual minimum number of failed sites is during the summer months.

Although slowed during winter, we still expect some of the agencies within the DCS community to convert existing four-hour platforms to one-hourly transmitting High Data Rate (HDR) units.

Once again, thanks to all of you that assist us in maintaining the HADS network, by discovering, coordinating and communicating the critical details required in order to effectively operation this system.