

**Office of Hydrologic Development
Hydrologic Software Engineering Branch
Quarterly Activity Newsletter
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Software for NWS Hydrology!

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1. HIGHLIGHTS OF APRIL, MAY, AND JUNE 2008

AWIPS software development efforts during this period were dedicated to supporting formal testing of Operational Build 8.3 (OB8.3) and to the end of development and the start of formal testing for OB9. OB8.3 started full deployment in mid-June 2008. Initial delivery of OB9 software was completed by late May 2008. After contractor integration and testing, it will start full deployment in early 2009. Other key activities this period included support for field test and evaluations, and continued guidance to the AWIPS prime contractor (Raytheon) regarding the AWIPS-I software development, maintenance, build, and release practices. HSEB also provided support for evolving and ongoing AWIPS-II activities, in coordination with the NWS Office of Science and Technology (OS&T).

For Next Generation Radar (NEXRAD), HSEB continued implementing the dual polarization Quantitative Precipitation Estimation (QPE) algorithm and associated products. This software and the dual polarization initial operating capability are targeted for operational deployment in NEXRAD Radar Product Generator (RPG) Build 12. Deployment of the initial dual polarization operating capability and Build 12 is scheduled to start in early 2010.

Implementation of the Community Hydrologic Prediction System (CHPS) project continued on track. The CHPS Acceleration Team (CAT) membership changed in June, as John Halquist announced his transfer to the National Operational Hydrologic Remote Sensing Center (NOHRSC) from the North Central River Forecast Center (NCRFC). The Northwest RFC (NWRFC) hosted a CAT workshop on May 1-2. OHD hosted a CHPS workshop June 17-19. For further details see section 5.1 below.

2. NEXRAD SOFTWARE DEVELOPMENT

NEXRAD Build 10 deployment is nearly complete. For Build 10, OHD made a small change to display the source identifier of the mean field bias in the text portions of a few of the Precipitation Preprocessing Subsystem (PPS) products, including the Storm Total Precipitation (STP), One-Hour Precipitation (OHP), and Three-Hour Precipitation (THP). This was done because now Weather Forecast Offices (WFOs) have the option to send to their associated

RPG(s) either their locally-computed mean field bias or an RFC-computed mean field bias. The source identifier is the identifier of the AWIPS site which computed the bias.

2.1 Terminal Doppler Weather Radar (TDWR) PPS

The NWS OS&T started deploying the remaining 45 Supplemental Product Generators (SPGs) to WFOs near TDWRs, with a scheduled completion date of September 2008. An SPG is a modified RPG which ingests TDWR data to produce NEXRAD-like products. Coinciding with this deployment will be SPG Build 3. In SPG Build 3, HSEB adapted the NEXRAD PPS to the SPG so that it produces TDWR-based precipitation products with the same names and formats as NEXRAD precipitation products. As a result, the full suite of PPS products, such as the STP, Digital Hybrid-scan Reflectivity (DHR), and Digital Precipitation Array (DPA), will become available from TDWRs in the coming months. TDWR-based precipitation products are displayable on AWIPS and can be ingested by Flash Flood Monitoring and Prediction (FFMP), Multi-sensor Precipitation Estimator (MPE), and High-resolution Precipitation Estimator (HPE).

2.2 Dual Polarization

HSEB continues to implement the dual polarization QPE algorithm and products into the RPG. In May 2008, OHD delivered a non-operational version of their dual polarization software for testing with Build 11. However, the operational dual polarization capability is scheduled for NEXRAD Build 12. Deployment of the dual polarization enhancement begins in late 2010 and lasts into 2012.

3. AWIPS RELEASE OB8.3

During the quarter, HSEB supported formal testing of AWIPS Release OB8.3. This build will include a new version of the PostgreSQL data server for all the OHD applications. Our major projects for OB8.3 are summarized below.

There are also a few AWIPS releases after OB8.3, but before OB9. These include the OB8.3.0.1 Super Res (RPG products) emergency release scheduled for deployment in late July, it also includes the OB8.3.1 maintenance release expected to deploy beginning around September 10, 2008.

3.1 NWS River Forecast System (NWSRFS)

For more detailed information about the OB8.3 projects below, the development documents are available at http://www.nws.noaa.gov/oh/hrl/hseb/software_dev_doc.html.

3.1.1 Re-implementation of ICP

HSEB accepted the software produced by Riverside Technology, Inc. (RTi) to re-implement the Interactive Calibration Program (ICP) in an object-oriented framework. While there is little new functionality in this application, re-implementing it in a modern language should make it easier to maintain and enhance in the future. Users should also notice that some functions which did not work correctly in the old ICP have been corrected.

3.1.2 NWSRFS Reservoir Tool Enhancements

HSEB also accepted the software produced by RTi to incorporate two enhancements to tools available in NWSRFS for modeling reservoirs. The first will allow the LOOKUP3 operation to have access to multi-value time series for use in regulation modeling. The second enhancement is to allow the Res-J MAXSTAGE method to use regular NWSRFS rating curves rather than separate Res-J specific curves and to enhance the MAXSTAGE method to support specifying a maximum discharge for cases where operations are based on discharge rather than stage.

3.1.3 Distributed Hydrologic Modeling (DHM)

Several enhancements to DHM have been made for OB8.3. The user will be able to specify MODs to the SAC-SMA model states as a percentage of storage zone capacity in addition to as a multiplier of the current value. DHM will now use hourly observed precipitation data rather than disaggregated Quantitative Precipitation Forecast (QPF) data whenever it is available. DHM was modified to accept as input, rainfall and snowmelt grids created by the prototype Hydrology Laboratory Research Distributed Hydrologic Model (HL-RDHM), which incorporates the SNOW-17 model, in addition to the current QPE grids.

3.2 Multi-Sensor Precipitation Processing

Major work has been completed on integrating the gage-focused DailyQC methods within the MPE application suite. HSEB requests that the Western Region RFCs currently using DailyQC provide feedback on this OB8.3 functionality, especially if any issues prevent operational use of the integrated MPE/DailyQC.

Besides the DailyQC changes, other changes include the addition of a “disaggregation” operation now incorporated within MPE to use hourly gridded estimates to time-distribute 6-hour estimates into 1-hour estimates. OB8.3 also includes a fix to the operation which mosaics RFC QPE products at the WFO. RFCs are encouraged to transmit their QPE using the World Meteorological Organization (WMO) ZETA98 product. This would allow WFOs and external users to make use of this product, which should represent the best hourly QPE estimate from the NWS.

A key personnel departure occurred in early July. Bryon Lawrence is leaving HSEB to become the Service Hydrologist in Grand Junction, CO (GJT). Bryon has made major contributions to the operational hydrology software within AWIPS, including improvements to the MPE software suite, the HydroView application, and assorted WHFS utility functions. We thank Bryon for all his work. Please contact Paul Tilles or Mark Glaudemans to discuss issues regarding the MPE application suite.

3.3 High-resolution Precipitation Estimator (HPE)

HPE is a separate application from MPE, and will produce a grid of instantaneous precipitation rate and 1-hour accumulation with a resolution of about 1 km by 1 km and as often as every 5 minutes. HPE also creates these same grids with a bias applied; by default, the bias applied is the mean field bias for each radar. HPE mosaics data from multiple radars covering your area of responsibility reducing the need to have multiple instances of FFMP to monitor storms close to multiple radars. This change in conjunction with OB8.3 changes to FFMP will allow frequent high resolution mosaics (from multiple radars) to be used within FFMP. To configure your FFMP to use HPE go to the FFMP, see (<http://www.nws.noaa.gov/mdl/ffmp/FFMPAsourceFile.pdf>). HPE rate and accumulation grids can also be displayed in the AWIPS Display 2-Dimensions (D2D) interface by selecting them from the D2D volume browser.

3.4 RFC Archive Database Synchronization

This project involves new software to perform two tasks. First, a set of automated tools are available to synchronize select meta-data in the RFC Archive (RAX) database with the Integrated Hydrologic Forecast System (IHFS) database. Data from the IHFS database can be copied to the RAX database. Because there is no feature to copy from the RAX database to the IHFS database, it is important to ensure the IHFS database contains the latest data. Second, a new application called “RAXBase” is provided to manage select data sets in the RAX database. RAXBase is similar to HydroBase in concept, although it has a different look and feel. The software has been actively evaluated by the Missouri Basin RFC (MBRFC), the California-Nevada RFC (CNRFC), and the Alaska-Pacific RFC (APRFC).

3.5 WFO Hydrologic Forecast System (WHFS)

Information on the WHFS, data ingest, and precipitation processing (e.g., MPE) applications are accessible on the NWS Office of Climate, Water and Weather Services Hydrologic Services Division (OCWWS/HSD) support web page at: <https://ocwws.weather.gov/intranet/whfs/> The OB8.3 release notes will soon be accessible via this page.

OB8.3 includes a collection of minor changes to HydroBase and assorted utility programs such as the ObsFcstMonitor application, which automatically compares observed and forecast values to check for consistency. RiverPro provides a new, much more user-friendly window for viewing the river stage/discharge data in a time-series form, and then allowing the user to make edits to the Valid Time Event Coding (VTEC) fields.

The RiverMonitor application was expanded significantly to automatically monitor precipitation data, in addition to its existing ability to monitor river data. A new table displayed by the “PrecipMonitor” mode lists precipitation data station locations (i.e., not basins) on each row of the table. The table columns present accumulation values for different durations along with the Flash Flood Guidance (FFG) value for the area containing the location. Difference and ratio comparisons between precipitation and FFG values are also provided. This information provides a hands-free, automatically updating, location-based complement to the basin-based information

presented in FFMP. Offices are encouraged to try out this improved monitoring feature. A few enhancements were also made to the river monitoring mode to allow information to be filtered better, including VTEC product time filters and forecast data time filters.

3.6 OB8.3 System Changes

AWIPS upgraded a number of infrastructure packages for OB8.3. The list of packages upgraded is:

- PostgreSQL to version 8.2.6
- Grib2 decoder – degrib, version 1.85
- Python, version 2.5
- scientific python, version 2.6
- numeric python, version 24.2
- Unidata’s Local Data Manager (LDM), version 6.6.4
- Swig, version 1.3.31

4. AWIPS RELEASE OB9

HSEB recently delivered software for OB9 projects. Our major OB9 projects and work are summarized in the below sections.

This release represents the last major release during the AWIPS-I era. Although the figure is subject to how releases are interpreted, there have been 25 major releases for the AWIPS-I era, not counting patch, maintenance, or emergency releases. It began with Release 1.0 in October 1996, continued through the “commissioning” Release 5.2.2 in October 2002. The operational build era began with Release OB1 deployed in February 2003, and continues through OB9. There are a few special releases scheduled after OB9 but before AWIPS-II, including a release which will involve an update to the Linux operating system.

4.1 High-resolution Precipitation Nowcaster (HPN)

HPN provides mosaicked radar-based high-resolution forecasts of precipitation rate at 15 minute increments up to an hour and of 1-hour precipitation accumulation. HPN uses HPE mosaic grids as input. The HPN forecast accumulation can be used as input to FFMP and to the Site-Specific Hydrologic Predictor (SSHP) model. Also, both the forecast rates and accumulations can be viewed in D2D.

4.2 Variational Data Assimilation (VAR) for SSHP

VAR capability has been added to the SSHP model to update information about soil moisture conditions, thereby improving accuracy of the resulting stream forecasts.

4.3 WHFS Improvements

The RiverPro application was modified to incorporate Common Alert Protocol (CAP) codes around the call-to-action section, in coordination with CAP changes planned for all watch, warning, advisory products. Also, the ability to perform basic arithmetic operations on numeric template variables was added, and the existing latitude and longitude template variables will be useful for more locations as the feature was expanded beyond just river locations.

The rate-of-change quality control operation (“roc checker”) was modified in a small but important way by designating data that fails the check as being “bad”, rather than just “questionable”. Bad data is ignored for use in data intensive applications such as precipitation derivations. Also, a change in the format options for the hydrologic IHFS “alert_alarm” data reports was made.

4.4 Precipitation Processing Improvements

Noteworthy changes include the revamping of the MPE gage table, allowing improved user interaction and supporting more precipitation fields. The satellite-radar-gage products also have a numerical adjustment algorithm incorporated to smooth the transition between areas of different sourced precipitation estimates. Lastly, some minor but important changes to the point precipitation derivation algorithms will provide improved derivations of irregularly reporting data, such as from the NWS Automated Local Evaluation in Real Time (ALERT) networks. These changes will affect values displayed in HydroView point data displays (ad-hoc and time step modes), HydroView point precipitation utility window, RiverPro precipitation extractions, and the precipitation monitoring component of PrecipMon.

5. DEVELOPMENT SUPPORT ACTIVITIES

5.1 New RFC Software Architecture: CHPS

Visit the CHPS web site at <http://www.nws.noaa.gov/ohd/hrl/chps/index.html>. The “News & Activities” section contains reports from these HSEB quarterly newsletters. The CHPS page can also be accessed from the main OHD page (<http://www.nws.noaa.gov/ohd/>).

5.1.1 CHPS Implementation

CHPS Acceleration Team

The CAT met in Portland on May 1-2 to clarify and identify responsibilities among all parties. The CHPS project is unique in the sense that its leaders (the CAT) are also future users and visionaries for the operational use of the system. Project planning is thus accomplished from two perspectives: from the system implementers’ perspective (OHD and Deltares); and from the operational users’ perspective. The CAT meeting yielded the first draft of an RFC deployment plan which will dovetail into a master project plan.

As of mid-June Rob Shedd, the Development and Operations Hydrologist (DOH) at Northeast RFC (NERFC), became a CAT member. Deltares will visit NERFC at the end of July to provide a combined Delft-FEWS overview and training session to NERFC staff; OCWWS HSD and an OHD system administrator will visit NERFC at the end of July to configure the NERFC with a sample (“pilot”) basin. Rob attended the recent CHPS workshop in Silver Spring but unsuccessfully managed to escape the huge task coming his way.

The NCRFC will no longer participate in the early path-finding transition to CHPS but will be migrated as part of the second phase along with the other non-CAT RFCs. The Pilot installation will remain at NCRFC but no further upgrades are planned.

John Halquist will remain a CAT member, representing NOHRSC interests instead of NCRFC’s. John can, of course, provide insight into NCRFC operations when appropriate.

Requirements Analysis

On March 24 Apex Digital Systems, Inc. (Apex) delivered the final version of their document entitled “FEWS Pilot Results”. This document captures results from interviews conducted with the CAT RFCs in January 2008. The document provided useful information for the “Software Migration Mapping” document being developed by Deltares. Deltares has also been running a “lite” version of the NWSRFS provided to them by the CAT, which Deltares uses for analysis along with information contained in the online NWSRFS documentation.

Deltares made significant progress on the migration mapping document during a visit between Deltares and OHD the week of April 14. Discussions allowed Deltares and OHD to establish most of the key implementation milestones and identify software development responsibilities for OHD and Deltares.

Meanwhile, the CAT identified requirements for a CHPS Baseline Operational Capability (BOC), defined to be the minimal set of functionality required at the CAT RFCs to migrate to CHPS as the primary (or sole) system for flood forecasting. The CAT has now completed the BOC requirements document.

CHPS Software Development

Joe Gofus assumed leadership of the OHD CHPS software development team, which grew from 2 to 11 developers within 2 months. The OHD team focuses on re-casting existing NWSRFS modeling applications (“operations”) to work in a Delft-FEWS environment. A total of 44 operations have been identified as requiring conversion from NWSRFS to CHPS for the BOC, of which 15 will be addressed by OHD; the remaining operations will become available via the Delft-FEWS infrastructure, which provides most of the needed functionality already.

HSEB is currently investigating some temporary resource re-alignments to cope with some unforeseen CHPS software tasks that resulted from the most recent workshop. The goal is for OHD to deliver all migrated modeling software to Deltares in December 2008 for the BOC.

The NWSRFS models are, in most cases, ‘surgically’ removed from the NWSRFS environment in their current form to run directly from the Delft-FEWS infrastructure as an external module. The migration of nine of the 15 model operations is currently underway. The OHD team holds weekly technical conference calls with a Deltares software architect to answer in-depth questions.

HSEB is about to begin converting the NWSRFS application espadp (ensembles displays) for use in CHPS; this is a CHPS BOC requirement. HSEB will also begin preparing a modified version of ofsde to facilitate the transfer of data from the IHFS database to the CHPS database for the BOC.

Sudha Rangan will be leaving the NWS on Monday July 7 before traveling home to her native India. Sudha originally led the way for OHD’s software development activities on the “FEWS for CHPS Pilot” project, where she successfully demonstrated how the new software and architectural concepts would work; she has subsequently shared her best practices by teaching the growing HSEB/CHPS team how to build software in the Delft-FEWS environment. Lee Cajina will be assuming team leadership. OHD owes a huge debt of gratitude to Sudha for her technical leadership during the critical decision making activities.

CHPS Workshops

A CAT-OHD-Deltares workshop was held June 17-19 in Silver Spring, MD. A number of major CHPS topics were addressed, including data ingest and data flow through the system, verification, ensembles, and calibration. The CAT agreed on an interim approach for Flash Flood Guidance. Approaches for many of the major capabilities will be refined over time.

Karel Heynert from Deltares gave a Delft-FEWS presentation to the Integrated Water Resources Science and Services (IWRSS) workshop participants on June 16. Don Cline subsequently gave a distilled version of his IWRSS presentation to the CAT, which then prompted a positive discussion on the future role of NOHRSC in CHPS.

The next CAT-OHD-Deltares workshop is scheduled for the week commencing September 29 2008, at NERFC. Workshops for all RFCs (other than the CAT) are expected to begin in March 2009 at a location yet to be determined.

CHPS Hardware

Deltares delivered to the CAT a proposed set of hardware specifications, based on their understanding of CHPS, their practical experiences in Europe with Delft-FEWS, and their hardware experiments. The specifications were discussed at the end of May and again during the June workshop. Results will ultimately be fed into OSIP project 07-059, “RFC AWIPS Configuration”, which addresses future RFC hardware requirements in a post-AWIPS II environment (including AWIPS II Extended/CHPS).

Meanwhile the Hydrology Program has agreed to fund the cost of the initial CHPS hardware for

the CAT RFCs since deadlines for the CHPS schedule are all too tight for AWIPS to respond in time. OHD has submitted to NOAA Procurement a request for quotes based on final specifications drawn up by OHD, OCWWS, and Deltares for a partial system (i.e., without a duty standby, and without an offline system). Our goal is to install this partial CHPS system at CAT sites in October 2008.

An approach for purchasing the final hardware configuration at CAT RFCs - as well as for the remaining 9 RFCs - has yet to be developed. OHD expects a lot of work is needed to convince the AWIPS Program to re-engineer a separate RFC hardware baseline and possibly augment its capability. This will be exacerbated by the move towards more aggressive numerical modeling such as the eXperimental Ensemble Forecast System (XEFS) and DHM.

Information sharing

The CHPS web pages are in the process of being re-designed. The goals of this effort include:

- better organization of information (i.e., project details formerly grouped together in a single News & Activities page will have dedicated project pages);
- more frequent updates (monthly rather than the current quarterly);
- posted minutes from the weekly CAT meetings (these minutes contain a lot of detail and background into some of the decisions made by the CAT).

We expect the new page to go online during July.

OHD initiated a new “chps_info” mailing list to broadcast information and attempt to familiarize subscribers with terminology; also a new rfc.chps@noaa.gov email account was created as a supplemental way of disseminating CHPS information.

5.1.2 ResSim

Rob Hartman contacted OHD on a proposed approach to Phase 2 (ensembles) following Rob’s extensive discussions with CA customers. The project may take advantage of Delft-FEWS ensembles features.

5.1.3 HEC-RAS

The only impediment to Phase 2 (implementation) of the U.S. Army Corps of Engineers (USACE) Hydrologic Engineering Center’s River Analysis System (HEC-RAS) project now involves contracts. Deltares is waiting for authorization from NOAA Procurement to proceed; funds for HEC were transferred at the end of June; HEC will notify OHD when they can begin work.

5.1.4 Experimental Ensemble Forecast System (XEFS)

HSMB now has access to a FEWS-based version of the XEFS prototype software.

The annual Hydrologic Ensemble Prediction Experiment (HEPEX) conference was held in Delft, Netherlands in June. Deltares continues to collaborate with the NWS on hydrologic ensembles.

Activities related to ensembles capabilities in CHPS are not scheduled to begin until CY 2009.

5.1.5 HydroXC (Hydrology XML Consortium)

The HydroXC web page was successfully transferred back to OHD and is once again located at <http://www.nws.noaa.gov/oh/hydroxc/>. The site <http://www.hydroxc.org/>, (currently sponsored by TerpSys, formerly Apex) will be shut down. No activity on the HydroXC project is expected in the foreseeable future, due to lack of funding and technical contributions from members.

5.2 AWIPS II

Raytheon is migrating the national AWIPS baseline software suite into a new, modern services-oriented architecture (SOA). This migration is part of the overall AWIPS evolution process described at: <http://www.nws.noaa.gov/ost/SEC/AE/index.htm>. Technical aspects of the AWIPS-II software are discussed in the “awips2dev” list server to which NWS staff can subscribe similar to the “awipsinfo” forum.

Most of the legacy RFC software is not planned for migration in the primary AWIPS II migration. CHPS will be implemented into AWIPS as part of the AWIPS II Extended phase. However, the WHFS, Precipitation Processing, and Data Ingest software are planned for migration during the four (4) AWIPS II migration tasks, labeled as Task Orders (TO) 8, 9, 10, and 11. Roughly speaking, the four task orders are for D2D, GFE, “Hydro”, and “Meteorological Development Laboratory (MDL) software”, in that order.

The TO 8 software was delivered in February 2008. The TO 9 software is expected later this summer. The Systems Engineering Center (SEC) within the NWS OS&T is managing the testing and evaluation of this and all AWIPS II task orders.

In late April, OHD staff joined a diverse group of NWS and Raytheon staff in Portland, OR (at NWRFC) for a Technical Interchange Meeting (TIM) involving both the RFC and WFO operations. TO 10 will be delivered for government evaluation in January 2009. As work for OB9 is concluded, a significant amount of OHD resources will be directed towards AWIPS II activities, which include the CHPS related work.

5.3 General Testing

Informal evaluations at certain offices are ongoing or are being readied:

- Fort Worth (FWD) WFO and West Gulf RFC (WGRFC) are testing the SSHP VAR components with other WFOs planned for the future.
- Oxnard (LOX) and San Diego (SGX) WFOs are testing changes to the station precipitation accumulations algorithm used for ALERT stations.
- NWRFC will be evaluating the OB8.3 MPE/DailyQC operations in the OB8.3 beta phase.

- Arkansas-Red Basin RFC (ABRFC) provides feedback on intermittent work for the MPE application as HSEB still continues to improve the speed of MPE re-run analyses.
- WGRFC is ingesting the Next Generation QPE (Q2) grids from NOAA's National Severe Storms Laboratory (NSSL) into the MPE environment for informal side-by-side comparison.

5.4 AWIPS System Changes

The AWIPS Software Engineering Group (SwEG) approved an upgrade to the FORTRAN compiler from Portland Group very late in the development process. The version approved was 7.1, but testing revealed some problems compiling and executing the existing software with this version. The SWEG has not yet made a final decision on whether to revert to the previous compiler version (4.1) or to wait for a corrected version from Portland Group. An upgrade to the RedHat Enterprise Linux operating system is still planned as a maintenance release to OB9.

6. HYDROMETEOROLOGICAL AUTOMATED DATA SYSTEM (HADS)

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

6.1 HADS Systems & Software

During the past several months there were no operationally significant changes implemented in HADS software and the systems continued their stable performance delivering data to field operations with overall, end-to-end product delivery averaging 2.6 minutes.

In the previous newsletter it was noted that the NWS Back-up Telecommunications Gateway (BTG) had been unavailable for several months. This facility has been restored and redundant HADS processing routinely occurs at the BTG. One of the 'back-up' data feeds processed by HADS at the BTG, as well as a back-up feed processed in Silver Spring, originates from the recently activated U.S. Geological Survey (USGS) facility at the Earth Resources Observation and Science (EROS) Data Center in Sioux Falls, SD. HADS now has access to and routinely processes Data Collection Platform (DCP) data messages from three independent sources.

1- Primary – Domestic Communications Satellite (DOMSAT) acquisition via direct satellite reception in Silver Spring, MD.

2- 1st level back-up – Network connection to servers at the National Environmental Satellite, Data and Information Service (NESDIS) Geostationary Operational Environmental Satellite (GOES) Data Collection System (DCS) in Wallops Island, VA.

3- 2nd level back-up – Network connection to USGS Emergency Data Distribution Network (EDDN) in Sioux Falls, SD.

The strength of the USGS EDDN system is that it employs its own Direct Readout Ground Station (DRGS) for reception of data directly from both GOES East and GOES West satellites. Therefore the DCS community has a robust configuration for DCP data acquisition and no longer has a single point of failure. If functionality at NOAA's GOES DCS facility in Wallops Island, VA is lost, the USGS facility in South Dakota is capable of providing equivalent Wallops data services. Within HADS, there are automated processes already in place to switch among the various data feeds based upon data availability.

To further strengthen and emphasize the criticality of the GOES DCS, NOAA NESDIS is implementing a backup facility, similar to the systems at Wallops Island Va., and this one is located at the NOAA Satellite Operations Facility (NSOF) in Suitland, MD. When placed into operations, HADS will then have access to three independent centers to acquire DCP data.

6.2 HADS Data Network

As of June 30, 2008 there were 13,201 data points defined in the network providing approximately 2.41 million operational data values each day. The network grew by approximately 150 sites during the past several months. The transition within the DCS community and having more platforms report on a one hour cycle continues to grow. There are now 8,700 HADS DCPs up-linking hourly, while 3 month ago this number stood at 8,300. This is a combination of the new one hour sites (150), as well as the transition of existing 3 or 4 hour transmitters to the one hour cycle. The overall target is to have all GOES DCPs operating in one hour *or less* reporting cycles by the year 2013.

A new method of data reporting has been implemented for a small number of sites operated by the Rock Island District of the USACE, as they now have a subset of their platforms routinely reporting on a 30 minute cycle. This prototyping of more frequent reporting may expand to other segments of the DCS community.

6.3 Historical Data

A recent request for old NWSRFS data triggered an effort to retrieve all archived NWSRFS data for the period from 1996-Sept 2005. The data has been extracted from tape and placed on an OHD server. An inventory of NWSRFS files was then created on a RFC-by-RFC basis and can be found at: <http://amazon.nws.noaa.gov/hdsb/data/nwsrfs/nwsrfs.html>. If you would like to request any old NWSRFS data, please email your request to nhdsinfo@gateway2.nws.noaa.gov.