Advanced Hydrologic Prediction Service
Quarterly Report
2nd Quarter FY 2014

May 1, 2014

CONTENTS

Quantify Uncertainty (Ensembles)

Hydrological Ensemble Forecast Service (HEFS) Rollout

Core Goal: Quantify uncertainty of our forecast information

Management Lead: Jon Roe, Mark Fresch

Objectives: Provide the HEFS to all RFCs

Milestones

Task	Due Date	Status
Complete operational testing of the HEFS Version 1 to provide routine real-time HEFS for the New York City water supply.	FY14, Q2	Completed. The operational test was successfully completed in Dec. 2013 showing that daily HEFS forecasts are being provided to the NYC Department of Environmental Protection by MARFC and NERFC for the area covering the NYC water supply.
Complete concept of operations document for the use of HEFS at RFCs.	FY14, Q3	On track. A draft document was provided for review by the five HEFS test RFCs in March 2014.
Operational integration of HEFS Version 1 into the CHPS software baseline and release to all RFCs.	FY14, Q4	On track. Completed incorporation into CHPS in Jan. 2014. The combined CHPS-HEFS will be delivered to all RFCs on a CHPS hardware refresh to be completed by August/September 2014.
Provide training to thirteen (13) RFCs on the use of HEFS within CHPS.	FY14, Q4	On track. In January 2014, representatives of five HEFS test RFCs received their final HEFS training. OHD is preparing to provide training at the NWS Training Center to the remaining RFCs in August 2014.

Accomplishments/Actions

This project is the next phase in the HEFS project after the HEFS Phase 1 Implementation (AHPS project). To provide a smoother transition in the AHPS reporting, the status from the last quarter of the prior project is included here.

4th Quarter FY13

- The five (5) HEFS Test RFCs expanded their use of HEFS Development Release 3, Phase 2 (HEFS-0.3.2) to varying degrees to produce real-time daily HEFS forecasts.
    - NERFC and MARFC are creating HEFS forecasts for 22 forecasts locations within the NYC water supply. MARFC is also creating HEFS forecasts for internal use at all points on the Delaware River.
    - CNRFC is producing HEFS forecasts on their operational CHPS for approximately 150 locations
    - ABRFC is producing HEFS forecasts with the latest build for approximately 20 forecast points (or 50 segments).
    - CBRFC is producing HEFS forecasts on their operational CHPS for all points above L. Powell which is approximately 240 points.
- OHD also conducted a training workshop on the release in September for members of the HEFS Test RFCs and NWS hydrology support staff.
- OHD continues a multi-phase science evaluation of HEFS performance for a variety of forcings and locations.
    - During the quarter, OHD completed an evaluation and draft report of the Phase 2 of the HEFS science evaluation. In that phase, OHD evaluated long-range HEFS forecasts v. climatology-based performance for locations within the NYC water supply. As part of this effort, the resulting hindcasts were provided to NYC Department of Environmental Protection for their use in managing the NYC water supply.
    - OHD also continued work on Phase 3, in which HEFS skill will be compared using the Global Ensemble Forecast System (GEFS) v. Global Forecast System (GFS) over a 14-

day forecast horizon. This phase is due to complete by the end of Dec. 2013.

- Representatives from the five RFCs and key HEFS team members continue to meet regularly to provide feedback to OHD.

1st Quarter FY14

- In December 2013, an operational test was successfully completed. The test validated that HEFS and ESP climate-based stream-flow forecasts are being provided daily to the New York City Department of Environmental Protection (NYCDEP) by MARFC and NERFC for the locations covering the city's water supply.
- OHD started a rough draft of the HEFS Concept of Operations (ConOps) document.
- The five (5) HEFS Test RFCs continue to expand their use of HEFS to varying degrees to create real-time daily ensemble stream-flow forecasts.
    - NERFC and MARFC are creating HEFS forecasts for 22 forecasts locations within the NYC water supply.
    - MARFC also creates HEFS forecasts for internal use at all (53) locations on the Delaware River.
    - CNRFC creates HEFS forecasts for approximately 150 locations
    - ABRFC creates HEFS forecasts for approximately 200 stream-flow locations.
    - CBRFC creates HEFS forecasts for all (~240) locations above L. Powell.
- As part of the integration of HEFS into the CHPS baseline, OHD completed a version of HEFS (1.0.2) which combined HEFSV1 (released in Sep. 2013) with the latest CHPS. This version was provided a) to the five HEFS test RFCs for their beta use and b) for integration with the CHPS baseline.
- OHD hosted a training workshop on HEFS hindcasting and verification. The workshop was attended by representatives of the five HEFS test RFCs and NWS hydrology support staff. This workshop is the final training workshop for the representatives of the five RFCs.
- OHD completed the third (and final) science evaluation of HEFS performance for a variety of forcings and locations. This evaluation compared HEFS skill using the GEFS v. GFS over a 14-day forecast horizon. The report is available at HEFS phase III science validation final report
- Representatives from the five RFCs and key HEFS team members continue to meet regularly to provide feedback to OHD.

2nd Quarter FY14

- In March 2014, a draft HEFS ConOps document was provided for review by the five HEFS test RFCs.
- The five (5) HEFS Test RFCs continue to expand their use of HEFS to varying degrees to create real-time daily ensemble stream-flow forecasts. NERFC and MARFC continue to provide HEFS forecasts for 22 forecasts locations within the NYC water supply. Besides those locations, the five RFCs also create the following:
    - MARFC also creates HEFS forecasts for 53 stream-flow locations.
    - NERFC also creates HEFS forecasts for 6 stream-flow locations.
    - CNRFC creates HEFS forecasts for 199 stream-flow locations.
    - ABRFC creates HEFS forecasts for 239 stream-flow locations.
    - CBRFC creates HEFS forecasts for 331 stream-flow locations.
- In January 2014, HEFS was incorporated into the CHPS baseline. The combined HEFS-CHPS baseline will be delivered to the field along with refresh of CHPS hardware due to complete by September 2014. The CHPS hardware refresh is being done via a refresh of the Advanced Weather Interactive Processing System (AWIPS).
- OHD hosted a training workshop on HEFS hindcasting and verification. The workshop was attended by representatives of the five HEFS test RFCs and NWS hydrology support staff. This workshop is the final training workshop for the representatives of the five RFCs.
- OHD is investigating a bias in the HEFS Meteorological Ensemble Forecast Processor.
- Representatives from the five RFCs and key HEFS team members continue to meet regularly to provide feedback to OHD.

Problems Encountered/Issues

4th Quarter FY13

- During the quarter, OHD resolved the issue where the GEFS skill was not always being preserved in HEFS-MEFP.
- EnsPost skill at long-range is low and needs systematic investigation.
- EnsPost adjustments across different seasons can cause an unrealistic change in the magnitude of the forecast.
- HEFS skill at regulated (e.g. reservoirs) locations needs evaluation.

1st Quarter FY14

- The source of the raw forcings, an ftp site at the National Center of Environmental Prediction (NCEP), was unreliable. OHD has started the process of having the raw forcings from NCEP distributed via more reliable means, the NWS Satellite Broadcast Network (SBN).
- NCEP is planning to change the GEFS. OHD is working with other NOAA groups to develop requirements for a static version of the GEFS and reforecasts of any updated versions which are needed for HEFS.
- The HEFS ConOps was delayed to Q3 (from Q2) due to staffing constraints (e.g. US Gov't furlough).
- It was reported that MEFP has a low bias in the probability of precipitation forecast.

2nd Quarter FY14

- Although HEFS training plans are on track, there are on-going contractor staffing issues which would delay the training if not resolved by the end of May 2014.

Gridded Water Resources

Auto Calibration for Distributed Model

Core Goal: Provide, then improve, gridded water resource data production capability

Management Lead: Mike Smith

Objective: The objectives of this work include developing tools and procedures for auto-calibrating the HL-RDHM. Two phases are identified for this area of research. First, initial work will focus on auto-optimization of the scalar multipliers of all the gridded parameters (SAC, Snow-17, and routing) so that all parameters are adjusted uniformly. This was done manually in DMIP 1 with good success. A prerequisite for this work is the development of sound lumped hourly parameters. Second, future funding will support work to optimize individual gridded parameters for groups of grids.

Milestones

Task	Due Date	Status
1. Investigated separate procedures for elevation zones for mountainous areas.	TBD	On hold
2. Develop outline for overall strategy for distributed model calibration	TBD	On hold
3. Develop approach for auto calibration of elevation zone parameters; parameter limits, and routing model parameters	TBD	Delayed to put HL-RDHM components into FEWS

Accomplishments/Actions

1st Quarter FY13

- Continued assistance provided to HSEB and Deltares to develop a basic CHPS calibration tool similar to the Interactive Calibration Program (ICP).

2nd Quarter FY13

- Continued assistance provided to HSEB and Deltares to develop a basic CHPS calibration tool similar to the Interactive Calibration Program (ICP). This exercise lays the groundwork for the more complex task of implementing automatic optimization in CHPS.

3rd Quarter FY13

- Continued assistance provided to HSEB and Deltares to develop a basic CHPS calibration tool similar to the Interactive Calibration Program (ICP). This exercise lays the groundwork for the more complex task of implementing automatic optimization in CHPS.

4th Quarter FY13

- Continued assistance provided to HSEB and Deltares to develop a basic CHPS calibration tool similar to the Interactive Calibration Program (ICP). This exercise lays the groundwork for the more complex task of implementing automatic optimization in CHPS.

1st Quarter FY14

- None.

2nd Quarter FY14

- Began development of plan to implement DHM-TF routines from legacy HL-RDHM into CHPS. This requires the implementation of the fast-running 'calibration' versions of the HL-RDHM operations into CHPS, which is a necessary step towards the use of auto-calibration approaches

Problems Encountered/Issues

1st Quarter FY13

- No funding available to develop further CHPS calibration tools beyond ICP. As a result, the non-CHPS version of HL-RDHM will need to be maintained.

2nd Quarter FY13

- No funding available to develop further CHPS calibration tools beyond ICP. As a result, the non-CHPS version of HL-RDHM will need to be maintained

3rd Quarter FY13

- No funding available to develop further CHPS calibration tools beyond ICP. As a result, the non-CHPS version of HL-RDHM will need to be maintained

4th Quarter FY13

- CHPS cannot replicate the ICP percolation analysis function. A crude work-around was designed that calls for the use of paper copies of the percolation curve.

1st Quarter FY14

- None

2nd Quarter FY14

- No funding available to develop further CHPS calibration tools beyond ICP. As a result, the non-CHPS version of HL-RDHM will need to be maintained

Support Distributed Model Implementation

Core Goal: Provide, then improve, gridded water resource data production capability

Management Lead: Mike Smith

Objective: Provide training and support to RFCs as necessary to support implementation for river, flash flood, and new product forecasting.

Milestones

Task	Due Date	Status
1. Provide training and support to RFCs as necessary to support implementation for river, flash flood, and new product forecasting.	Ongoing	

Accomplishments/Actions

1st Quarter FY13
- Continued support of LMRFC in the development of DHM-TF over their entire domain
- Continued support of Hawaii WFO and APRFC in the runs of DHM-TF
- Began assisting NCRFC with implementation of HL-RDHM.

2nd Quarter FY13
- Continued support of LMRFC in the development of DHM-TF over their entire domain. Good results seen in several cases, verified by on-the-ground observers. LMRFC providing results to WFOs for review and comment.
- Continued support of Hawaii WFO and APRFC in the runs of DHM-TF. Model is running at 1-km spatial resolution.
- Continued to assist NCRFC with implementation of HL-RDHM and SAC-HTET for the Red River of the North flooding. Worked with RFC to discuss options. Provided model states for start-up, parameters, HL-RDHM input file, and scripts to generate max-min temperature data.

3rd Quarter FY13
- Continued Support to LMRFC as they began implementation of DHM-TF over their domain.
- Provided support to MBRFC as they began implementation of DHM-TF
- Provided support to NCRFC with spinning-up HL-RDHM and SAC-HTET for frozen ground modeling. In retrospective tests, SAC-HTET simulated the thawing of frozen soil within ~1 day of the observed time.

4th Quarter FY13
- Continued support to LMRFC as they implement DHM-TF over their domain, with good results seen in several cases.
- Provided review and recommendations to MBRFC as they began implementation of HL-RDHM.
- Provided updates of HL-RDHM to NCRFC etc.

1st Quarter FY14
- Developed version of HL-RDHM for NCRFC that included gridded outputs of all SAC runoff components, especially interflow. This modification was requested for an agricultural runoff study.
- Assisted MARFC with implementation of HL-RDHM at 2-km scale for flashy basins. Also helped with SAC-HTET questions to support a USDA fertilizer runoff study.
- Assisted LMRFC with implementation of SAC-HTET over entire domain for DHM-TF applications.

2nd Quarter FY14
- In response to request from SERFC, developed initial draft plan to complete the derivation of SAC-SMA parameters in Puerto Rico and the U.S. Virgin Island to support distributed modeling.

Problems Encountered/Issues

1st Quarter FY13

- None

2nd Quarter FY13

- Discovered and corrected shift in sub-HRAP cells when running 4-km precipitation but ¼ HRAP resolution.
- Discovered and resolved flow direction issue in LMRFC domain where the Red River is joined to the Mississippi River via a canal. Discussed issue with Dave Welch.

3rd Quarter FY13

- Lack of full time software engineering assistance hampers support efforts for the RFCs.

4th Quarter FY13

- Lack of full time software engineering assistance hampers support efforts for the RFCs

1st Quarter FY14

- Lack of full time software engineering assistance hampers support efforts for the RFCs

2nd Quarter FY14

- Retirement of Victor Koren on Jan. 11, 2014 resulted in a large loss of scientific expertise.

Migration of HL-RDHM Components to CHPS

Core Goal: Provide, then improve, gridded water resource data production capability

Management Lead: Mike Smith

Objective: This proposal covers work to implement the basic HL-RDHM components into the CHPS/FEWS architecture. Work began in FY-09 but funding did not begin until FY-10. It includes the science development, implementation, and testing of the SAC-HTET into CHPS. This project includes elements previously listed under the AHPS Project "Physically-based Modifications to the SAC-SMA".

Milestones:

Major Task	Due Date	Status
2. Performance testing - prepare for and conduct Gate 4: Basic HL-RDHM components in CHPS.	FY11 Q1	Complete except for Gate 4
3. RFC testing of CHPS HL-RDHM	FY 14 Q2	On track

Accomplishments/Actions

1st Quarter FY13

- Continued merging (into CHPS) of HL-RDHM advances from the CONUS SAC-HTET activity.

2nd Quarter FY13

- CONUS SAC-HTET evaluation in OHRFC, SERFC, and NCRFC domains (~ 50 basins in each) showed good streamflow simulation results. Tests involved routing the SAC-HTET runoff to USGS gages. Precipitation from three sources was used: NLDAS, RUC/RRM, and RFC MPE. Results showed that the RUC/RRM precipitation has a high bias.

3rd Quarter FY13

- Revised SAC-HT paper according to comments from Journal of Hydrology. Submitted revised paper to the journal.

4th Quarter FY13

- HL-RDHM designated to become part of regular CHPS release package. Work begun to update adapters, write documentation, test plan etc.

1st Quarter FY14

- Work continued to update the HL-RDHM CHPS components into a regular CHPS release package. A package for RFC testing was being developed.

2nd Quarter FY14

- In response to OHRFC's requests for help in FogBugz 1010, OHD updated the HL-RDHM adapter for FEWS to be compatible with the latest version of CHPS. Using OHRFC as a test site, OHD updated the packaging of the HLRDHM_IN_FEWS software, which now includes a step-by-step configuration guide. Currently, all distributed runoff models (SAC-SMA, SAC-HT, and SAC-HTET), Snow-17, and the distributed routing models have been included in the release. However, the DHM-TF and the automatic calibration functionality are not included. The package contains two FEWS external modules, one for converting FEWS exported NetCDF grids, such as precipitation, into XMRG files. The other external module runs the HL-RDHM distributed models using the converted grids as input forcings. By proper configuration, FEWS users can run HL-RDHM distributed models using the gridded precipitation, temperature or any other gridded forcing data in FEWS' internal database.

- In response to requests from Central Region, developed initial draft plans to implement the lumped SAC-HTET into CHPS and to implement the DHM-TF approach into CHPS.

Problems Encountered/Issues

1st Quarter FY13

- Journal review of SAC-HT and SAC-HTET papers took longer than 3 months.

2nd Quarter FY13

- HL-RDHM CHPS adapter was not updated along with other CHPS and FEWS code changes; OHRFC unable to try implementation of CHPS HL-RDHM.
- J. Hydrology review of SAC-HT paper took six months.

3rd Quarter FY13

- Very little work on HL-RDHM and CHPS integration due to limited OHD software engineering resources.

4th Quarter FY13

- The SLS autocalibration routine for HL-RDHM is not available in CHPS. As a result, the legacy HL-RDHM needs to be retained.

1st Quarter FY14

- The SLS autocalibration routine for HL-RDHM is not available in CHPS. As a result, the legacy HL-RDHM needs to be retained.

2nd Quarter FY14

- The SLS autocalibration routine for HL-RDHM is not available in CHPS. As a result, the legacy HL-RDHM needs to be retained.
- Retirement of Victor Koren on Jan 11 resulted in a large loss of scientific expertise that impacts the migration.

Inundation Mapping

Static Flood Inundation Maps Web-Page Development and Deployment

Core Goal: Improve Flood Forecast Inundation Maps – Static Maps

Management Lead: Victor Hom

Objectives:
1) Develop AHPS Flood Inundation Mapping (FIM) web page interface,
2) Deploy flood inundation maps in a nationally consistent, scientifically sound, and objective manner, and
3) Implement program elements to assure quality deliverables and maintenance of viability.

Team Members:

Laurie Hogan – Eastern Region
Victor Hom – Office of Climate Water and Weather Services / HSD
Kris Lander – Central Region
Doug Marcy – National Ocean Service / Coastal Services Center
Mike Schaffner - Western Region
Wendy Pearson – Central Region
Katelyn Costanza – Southern Region[1]

This AHPS Core Goals team has been in operations since Q4 of FY07.

[1]Ms.Katelyn Costanza departed the NWS on March 21 to take on new endeavors. She now is serving as the Assistant Director of Natural Systems Modeling & Monitoring and a Research Associate III for Louisiana's Water Institute of the Gulf, based in Baton Rouge. Katelyn has been a tremendous asset to the NWS FIM program in helping out with SR projects and providing advice to the national program. She will be missed and the team wishes her our best.

I. FY14 Main Objectives and Task Areas

Main FY14 Objectives: (1) Update AHPS Flood Mapping Web Portal and Display
(2) Implement, via the AHPS web portal, additional flood inundation mapping libraries and provide assistance to the regions for development/implementation of other AHPS flood inundation mapping.

Prioritized Task Areas		Responsible Organization
1.	**AHPS Flood Mapping Web Portal and Display**	NOAA NWS and NOAA CSC
2.	**Quality Assurance and Consistency of Regional Flood Maps**	NOAA NWS and NOAA CSC
3.	**National Flood Inundation Mapping Guidelines and Program Standards**	NOAA NWS, NOAA CSC, and Federal Partners
4.	**Regional Flood Mapping Development**	NOAA NWS, NOAA CSC, FEMA, USGS, USACE, and local Partnerships
5.	**Maintenance and Servicing Maps**	NOAA NWS and NOAA CSC

II. FY14 Milestones

Task Area #1 - AHPS Flood Mapping Web Portal and Display		
Subtask 13-1.1 AHPS Web Portal for Levees and Flood Risk Areas	**Due Date**	**Status**
NWS is to begin displaying flood risk behind federally certified and uncertified flood levees to Orion and demonstrate AHPS Web capability.	-	Completed with additional implementation for FY14 libraries
Subtask 13-1.2 Provide more geospatial intelligence to NWS AHPS Products	**Due Date**	**Status**
Expand AHPS Flood Mapping Capabilities to include a broader availability of FEMA RiskMAP data through AHPS and gain better understanding of the extent of flooding upstream and downstream of the AHPS forecast point.	FY14Q2	Completed with National Rollout being planned

Task Area #2 Quality Assurance and Consistency of Regional Flood Maps		
Subtask 13-2.1 Quality Assurance and Phase 2 Quality Control Training Workshop (FIM12-2)	**Due Date**	**Status**
Work with CSC on Logistics for Webinar and Workshop	-	Completed, but workshop postponed.
Conduct Flood Mapping Webinars	FY13Q3	Postponed in FY13 due to funding
Conduct QAQC Hands-on Workshop	FY13Q3	Postponed in FY13 due to funding.

Task Area #3 - National Flood Inundation Mapping Guidelines and Program Standards		
Subtask 13-3.1 Concept of Operations and Requirements for National Flood Inundation Mapping Services	**Due Date**	**Status**
Develop ***IWRSS Flood Inundation Mapping Requirements Document*** per (a) Memorandum of Understanding (MOU) "*Collaborative Science Services and Tools to Support Integrated and Adaptive Water Resources Management*" with NWS, USACE, and USGS and (b) Charter for National Flood Inundation Mapping Requirements Team.	-	Completed.
Subtask 14-3.1 Concept of Operations and Requirements for National Flood Inundation Mapping Services	**Due Date**	**Status**
Develop charter for ***IWRSS Flood Inundation Mapping Implementation Team*** per (a) Memorandum of Understanding (MOU) "*Collaborative Science Services and Tools to Support Integrated and Adaptive Water Resources Management*" with NWS, USACE, and USGS	FY14Q3	Awaiting IWRSS IDs Design Team Charter, so that the FIM Design charter can be in sync with IDS Design activities.
Subtask 13-3.2 Federal Guidelines and Statement of Work Templates (FIM08-2P)	**Due Date**	**Status**
Update Federal Guidelines to V.3	-	Completed. Next update is dependent on when there are substantial changes and resources become available.
Update SOW and QAQC Guidance	-	Completed.
Subtask 13-3.3 Partnered Program/Project Management Support Tool (FIM09-7P)	**Due Date**	**Status**

AHPS Management System Tools including Scoping Data Sheets	-	On-hold, tools are unfunded, Scoping Data Sheets updated as need arises
QA Inundation/Depth Tools	-	On hold, unfunded In-kind
QA Metadata Tools	-	On hold, unfunded In-kind

Task Area #4 - Regional Flood Mapping Development		
Subtask 14-4.1 Eastern Region's Flood Inundation Map Libraries	**Due Date**	**Status**
Implement Passaic River and Licking County Flood Inundation Map Libraries	FY14Q4	Completed in FY14Q1.
Subtask 13-4.2 Eastern Region's Delaware River Flood Inundation Libraries	**Due Date**	**Status**
Extend DRBC Flood Inundation Map Libraries	FY14Q2	Completed in FY14Q1.
Subtask 13-4.3 Western Region's Flood Inundation Mapping	**Due Date**	**Status**
Implement 2nd Demonstration Flood Inundation Map Library in WR	Revised to FY14Q3	Ongoing, delays due to revised modeling requirements and operational support activities.
Subtask 14-4.2 Central Region's Flood Inundation Map Libraries	**Due Date**	**Status**
Implement additional Flood Inundation Map Libraries in Central Region HAS	FY14Q4	Completed
Subtask 14-4.3 Southern Region's Flood Inundation Map Libraries	**Due Date**	**Status**
Implement additional Flood Inundation Map Libraries in Southern Region	FY14Q4	Ongoing, subject to available funds from NWS Partners and Stakeholders
Subtask 14-4.4 QAQC Technical Review and Oversight Support (FIM10-2P)	**Due Date**	**Status**
Provide assistance to the regions for development/implementation of AHPS flood inundation mapping.	-	Completed and on a continual basis

Task Area #5 - Maintenance and Servicing Maps		
Subtask 13-5.1 Maintain AHPS Flood Maps (FIM09-10P)	**Due Date**	**Status**
Evaluate and Prioritize Map Updates	-	Ongoing and As Need basis
Work with WFO and RFC to update maps	-	Ongoing, but lack funding
Provide FIM Revisions on Test Platform for NWS Evaluation	-	Ongoing, but lack funding
Implement FIM updates on NWS AHPS FIM Regional Servers	-	Ongoing, but lack funding
Required FIM revisions to accommodate the change from River Stage Forecast to River Elevation Forecast for HMMT2 and WFDT2 and Relocation of services for ACRT2. FIM Maps (HMMT2, WFDT2, and ACRT2) have been taken offline.	-	Unfunded

III. FY14 Accomplishments/Actions

In FY14Q1 and Q2, the following Flood Inundation Maps were added:

- Wabash River at Terre Haute, IN - HUFI3
- Kentucky River at Frankfort Lock, KY - FFTK2
- Passaic River at Chatham, NJ - CAMN4
- Passaic River at Clifton , NJ - DDCN4
- Passaic River at Little Falls, NJ - LTFN4
- Passaic River near Millington, NJ - MILN4
- Pequannock River at Riverdale, NJ - RDLN4
- Pompton River at Pompton Plains, NJ - PPPN4
- Upper Saddle at Saddle, NJ - SADN4
- Licking River near Newark , OH - NEAO1
- North Fork Licking River at Newark, OH - NMSO1
- Raccoon Creek at Newark, OH - RCNO1
- Raccoon Creek near Granville, OH - GRNO1
- South Fork Licking River near Heath, OH - SFHO1
- South Fork Licking River near Hebron, OH - BEEO1
- Pecatonica River at Freeport, IL - FEEI2

The FY14 AOP Goal is to work with regional leaders, RFCs, WFOs, NWS stakeholders, and partners to deliver 11 new map libraries by FY14Q4. Thus far in FY14, the NWS Hydrology program has implemented 18 new AHPS Flood Inundation Map libraries, with 15 in Q1, 1 in Q2, and 2 in Q3. These new deliverables were well ahead of the AOP schedule of 11. The program and its Hydro Program Managers continue to seek opportunities to collaborate with stakeholders and partners to implement additional libraries onto AHPS.

Currently, there are 111 active Flood Inundation Map libraries spread across 16 states, with majority of them in Texas, North Carolina, New Jersey, and New York. Enhanced decision support services for these products in coordination with riverine flooding forecasts and warnings are provided by over 29 WFOs and 8 RFCs.

FY14 Q2

Task Area #1 - AHPS Flood Mapping Web Portal and Display

Subtask 13-1.2 Provide more geospatial intelligence to NWS AHPS Products

AHPS now has the capability to provide FEMA National Flood Hazard Layers on the AHPS gage map. Tests of this capability and national guidance for implementation have been completed by AHPS IWT team, which included Mark Walton, Nicole Belk, Jonathan Brazzell, Mark Strudley, and Britt Westergard. National rollout of this capability is being planned, including training and the use of ***Jobsheets*** to capture essential data needed for implementing this capability. Laurie Hogan (the National Lead) for this project had the opportunity to unveil this feature and collect feedback from respective stakeholders in Eastern Region. Her presentation in conjunction with NWS "Building a Weather Ready Nation" campaign was very well received by FEMA and respective stakeholders.

Task Area #4 - Regional Flood Mapping Development

Subtask 13-4.3 Western Region's Flood Inundation Mapping

Western Region has completed Phase 2 round 1 QAQC for Flood Inundation Map library on the Chehalis River in Centralia, WA (CENW1).

Subtask 14-4.2 Central Region's Flood Inundation Map Libraries

In FY14Q2, Central Region had worked closely with Illinois State Water Survey in partnership with the stakeholders of Stephenson County, Illinois Emergency Management, and City of Freeport to deliver the following FIM library onto AHPS.

- Pecatonica River at Freeport, IL - FEEI2

In addition, the following libraries are undergoing final Phase 3 QAQC:

- Cross Creek at Rossville, KS - RSSK1
- Mississippi River at St. Paul - STPM5

- Winnebago River at Mason City, IA - MCWI4 (Note: MCWI4 was implemented onto AHPS in April 2014)

Subtask 14-4.3 Southern Region's Flood Inundation Map Libraries
Due to Katelyn's departure, Southern Region has expressed concerns with providing adequate support to the FIM program, especially from a project management standpoint. As such, SR is placing a moratorium on any new projects which have not been started. Any projects which are in the pipeline will be handled at the National level.

The NWS Southern Region stated that they are highly interested in furthering the Flood Inundation Mapping program in a streamlined and efficient manner and that they will work with National HQ during this temporary moratorium toward streamlining the project management and coordination aspects.

During the moratorium, there are seven AHPS FIM projects grandfathered, namely two in Texas on the Rio Grande, two in Georgia, and three in Florida. The AHPS FIM library for Greenville, SC is being handled by Eastern Region.

The following libraries are in Phase 3 undergoing final QAQC:
- Ocmulgee River at Macon, GA - MACG1
- Rio Grande at Presidio International Bridge, TX - PRST2
- Rio Grande at Columbia Bridge, TX - CBBT2 (Note: CBBT2 was implemented onto AHPS in April 2014)

FY14 Q1

Task Area #1 - AHPS Flood Mapping Web Portal and Display
Subtask 13-1.2 Provide more geospatial intelligence to NWS AHPS Products
Orion has demonstrated the inclusion of FEMA National Flood Hazard Layers on the gage map. This feature can be turned on and the service made available via CMS database. A demonstration of this feature is on the Orion test server for the Canoochee River near Claxton, GA (CNOG1). Testing is completed. Capability is now available. National implementation guidance has been completed by AHPS IWT team. National rollout is being planned.

Task Area #4 - Regional Flood Mapping Development
Subtask 13-4.2 Eastern Region's Delaware River Flood Inundation Libraries
As part of the Northeast IWRSS demonstration, USGS Pennsylvania Water Science Center was asked to "Develop and Demonstrate a Common Framework to Generate Flood-Inundation Maps at National Weather Service Flood-Impact Stages Utilizing Existing Data". The intent of this study was to develop a methodology to produce less costly, more rudimentary, and rapidly reproducible risk-informed flood-inundation maps, referenced to USGS stream gages/NWS flood-forecast sites. The methodology and its associated technique were applied selected sites in the Delaware and Susquehanna River Basin where AHPS points exist. The study also evaluated whether you can extend the maps in between AHPS service locations. The study and pilot project were provided in FY14Q1 to NWS. NWS will provide review and provide comments to USGS in FY14Q2.

Subtask 14-4.1 Eastern Region's Flood Inundation Map Libraries
In FY14Q1, Eastern Region partnered with stakeholders in the Passaic River Watershed to deliver the following FIM libraries onto AHPS.
- Passaic River at Chatham, NJ - CAMN4
- Passaic River at Clifton , NJ - DDCN4
- Passaic River at Little Falls, NJ - LTFN4
- Passaic River near Millington, NJ - MILN4
- Pequannock River at Riverdale, NJ - RDLN4
- Pompton River at Pompton Plains, NJ - PPPN4
- Upper Saddle at Saddle, NJ - SADN4

In FY14Q1, Eastern Region partnered with stakeholders in the Licking River Watershed to deliver the

following FIM libraries onto AHPS.

- Licking River near Newark , OH - NEAO1
- North Fork Licking River at Newark, OH - NMSO1
- Raccoon Creek at Newark, OH - RCNO1
- Raccoon Creek near Granville, OH - GRNO1
- South Fork Licking River near Heath, OH - SFHO1
- South Fork Licking River near Hebron, OH - BEEO1

Subtask 14-4.2 Central Region's Flood Inundation Map Libraries

In FY14Q1, Central Region worked closely with USGS Indiana/Kentucky Water Science Center and partnered with the stakeholders in the Indiana/Kentucky to deliver the following FIM libraries onto AHPS.

- Wabash River at Terre Haute, IN - HUFI3
- Kentucky River at Frankfort Lock, KY - FFTK2

Subtask 14-4.4 QAQC Technical Review and Oversight Support

In additional to final review of the maps which were posted to AHPS in FY14Q1, HSD also provided QAQC and review of maps for:

- Ocmulgee River at Macon, GA (MACG1)
- Rio Grande at Presidio International Bridge (PRST2) -
- Rio Grande at Colombia (CBBT2)
- Pecatonica River at Freeport, IL (FEEI2)

IV. Problems Encountered/Remaining Issues

FY14

Headquarter and regional representatives could scope and collect stakeholder requirements, however, the challenge will be finding sufficient resources to address new technological needs, incorporate newer capabilities, and improve ways to map the flood risks to meet stakeholder needs. As such, some of the prior year tasks, which have been impacted, are highlighted in RED or Yellow depending on the severity. Any scoping of requirements and strategic planning will need to be very flexible and adaptable.

Continuing Issues Identified in previous Fiscal Years

General

- The core goal team is having difficulties with setting mid-range project priorities to enhance the program due to the uncertainties of funding. Partnered funding/resources are only for developing AHPS FIM, neither for maintenance nor to address additional requirements.
- HSD needs fiscal and labor resources to develop, collect, stand-up, and maintain a public FIM webpage where best practices and webinars could also be posted.

Inputs and Forcings

Short-range radar-based quantitative precipitation forecasts

Core Goal: Improve the quality of physical inputs and forcings

Management Lead: David Kitzmiller

Objective: To develop and deliver a statistically-based 0-6 hour probabilistic quantitative precipitation forecasting system using remote-sensor and numerical prediction model input. The system is based on a Model Output Statistics approach requiring several years' data. Most work for which funding is requested is to be done in first two years.

Milestones

Task	Due Date	Status
1. Archive necessary radar, lightning, and RUC2 numerical model output	Continuous	Ongoing – started FY09 Q2
2. Prepare a journal article on initial results from CY2009-CY2011 data	FY11/Q1	HOSIP gate3 conditionally passed in December; follow-up work on HOSIP documentation completed Q2 Slipped to July 2012; anticipate Q1 FY2013 Further slip to CY 2013 Not complete yet
3. Collaborate with NSSL hydrometeorology staff to implement real-time codes in MRMS system	FY15 – depends on NSSL	NSSL implementation delayed – FY14Q2

Accomplishments/Actions

1st Quarter FY13

- Coauthors reviewed the draft journal article and suggested an additional form of product verification, namely Fractions Skill Score. These were calculated in December.
- The manuscript is being revised to include the Fractions Skill Score results
- Recovered the ability to run real-time forecasts within the OHD development system
- Revised code for the real-time package to be run in NSSL-MRMS was sent in December. Further coordination is needed to confirm it runs properly there.

2nd Quarter FY13

- Delivery final journal article delayed (see above)
- No further word on possible MARFC DHM-TF work
- Recently completed remapping-reformatting code to put 0-6h QPF products into a format consistent with other MRMS products (April 2013)
- Continue working with NSSL staff on implementation in MRMS

3rd Quarter FY13

- Delivery final journal article delayed
- A survey conducted in June indicated continuing interest in the product suite by RFC staff
- An MRMS QPE "summit" meeting was held June 13-14 to confirm priorities for development of new MRMS products, including this QPF package. Input from WFOs and RFCs was collected by OHD/HSD; NCEP and NSSL staff participated directly.
- Now anticipate real-time runs of the 0-6QPF starting in 2014, prior to implementation of the entire

MRMS package within the NCEP Integrated Dissemination Program facility.
- Made ~50 real-time runs during the quarter, for current subjective evaluation and later statistical evaluation
- Completed remapping-reformatting code to put 0-6h QPF products into a format consistent with other MRMS products (April 2013 – per above)
- Continue working with NSSL staff on implementation in MRMS
- Prepared extrapolation forecasts and collected Rapid Refresh model output for the period October 2011-March 2013, for re-development of equations with 4 seasons' data

4th Quarter FY13
- Limited work this quarter – further delay in delivery of journal article
- Still targeting FY14 implementation in MRMS-Q3 system
- Continued to collect and examine real-time forecasts
- Reported on results to staff at NCEP Weather Prediction Center, who indicated interest in the products
- Collected remaining input and verification data for April-September 2013, for evaluation and re-derivation of probability equations

1st Quarter FY14
- Limited work this quarter – further delay in delivery of journal article
- Still targeting FY14 implementation in MRMS-Q3 system
- Evaluated CY2013 forecasts, found that they're statistically reliable and still add appreciable information beyond that available from the Rapid Refresh numerical forecasts
- Did some revision of journal article, prepared material for presentation at Weather Radar and Hydrology Symposium in 2014

2nd Quarter FY14
- Delivery of final journal article delayed (see above)
- Prepared and submitted extended abstract for Weather Radar and Hydrology Symposium; covered verification of 2013 real-time forecasts
- Ported codes and scripts to NCEP WCOSS – eventually the code could be run there
- Derived a new set of conditional probability equations based on 2009-2012 data. The equations for probability of exceeding any one threshold amount are derived from a sample in which the observed precipitation was at least as large as the next lower threshold amount (e.g. the 2.5mm probability was derived from a sample with at least 0.25mm observed precip). Absolute probabilities will be derived by successive multiplication of the conditional probabilities. This approach enables new physical insight into the factors that determine exceedance of higher thresholds.
- By end of the quarter, investigated the possibility of putting real-time PQPF and QPF fields into OHD open-to-public "hydrology" ftp server; this appears feasible and would answer queries from ABRFC and NCEP.

Problems Encountered/Issues

1st Quarter FY13
- Other priority tasks continue to delay final completion with delivery of journal manuscript and MRMS codes

2nd Quarter FY13
- Other priority tasks continue to delay final completion with delivery of journal manuscript

3rd Quarter FY13
- Delivery of final journal article delayed due to higher-priority tasks. We continue to archive input data and real-time forecasts

4th Quarter FY13

Some loss of time due to shutdown preparation activity

1st Quarter FY14

- Some loss of time due to 2-week shutdown in October
- Work on MRMS implementation is mainly out of OHD control

2nd Quarter FY14

- Work on MRMS implementation is out of OHD control – however we might have an in-house method for using OHD resources to make nonoperational but real time forecasts available to users

Gridded Hydrometeorological Forcings for use in Calibrating Hydrologic Models

Core Goal: Improve the quality of physical inputs and forcings to hydrologic models

Management Lead: David Kitzmiller

Objectives: To facilitate RFC studies on biases or statistical differences between current operational basin-average forcings (precipitation, temperature, potential evapotranspiration [PET], and freezing level) and new gridded versions such as are intended to be used in CHPS and elsewhere. In many instances the forcings now entering the river forecast system are calculated from a weighted sum of point measurements; operational practice is shifting to calculating all basin-average forcings from grids, and in some documented instances the grid calculation is biased relative to point-based values, or relative to the calibration dataset. We will consolidate and summarize results reported by RFCs into a final document;

To consolidate and summarize any results on the impact of the new gridded forcings on hydrologic simulations with NWSRFS;

Identify methodologies and any ongoing projects for deriving a gridded calibration dataset of precipitation, temperature, and PET for all RFCs, based on in-house reanalysis, Analysis of Record (AOR), or other means; produce a report on preferred options for generating long-term calibration datasets for these variables at 4-km, 1-hour resolution;

Assist and coordinate with RFCs in cataloging archives of point and gridded hydrometeorological data used in constructing calibration datasets.

Proposed Milestones:

Task	Due Date	Status
4. Archive forcings data from CAT sites (ABRFC, NERFC, CNRFC, NWRFC)	Continuous	Ongoing – started FY09 Q4
5. Initiate real-time archive development from all remaining RFCs	Initiate FY10/Q2	Ongoing at most sites – FY10 Q2
6. Document statistical differences between point-based and gridded forcings from MPE, Mountain Mapper/Daily QC, GFE, and report on findings.	FY10/Q3	Results reported from all CAT RFCs
7. Execute parallel streamflow simulations driven by point-based and grid-based basin average precipitation, temperature; report on magnitude of differences in simulations and differences in quality relative to gauge observations	FY10/Q3	Results reported from ABRFC, CNRFC, NERFC
8. Coordinate with RFC staff to locate historical point or gridded inputs (precipitation, temperature, cloud cover, winds, relative humidity) used to construct hydrologic calibration datasets – needed for either development of new datasets or verification of calibration datasets from an outside source such as AOR.	FY11/Q4	Revised later when OHD management requested time to review this plan

9. **Report on potential and methods of deriving gridded potential evapotranspiration (PET) calibration dataset**, focusing on geostationary satellite estimates of cloud cover and/or surface radiation balance, and reanalysis estimates of radiation balance, wind, temperature, and humidity.	FY11/Q4	Now includes tasks from original CHPS PET task from FY09
10. (Tentative as of FY11 Q1): report on potential impact of PET forcings in calibration, to assess any impact of use of real-time estimates vs. application of local climatic values on hydrologic simulations	FY12/Q1	
11. Re-analysis for precipitation from radar/remote sensor observations: Determine if CPC and/or NCDC efforts to produce long-term high-resolution gridded precipitation are moving forward. Depending on schedules, either prepare to utilize one of these sources or re-analyze existing StageIII/StageIV grids using external high-reliability sources such as PRISM monthly totals.	FY12/Q2 Now FY12/Q4	In progress as of September 2013
12. Reanalysis for sky cover and remote-sensor PET: Determine availability/reliability of RTMA or research sky cover datasets; create PET grids from these data and temperature, wind and relative humidity information from NARR	Deferred for work on other elements	
13. Deliver hourly temperature and precipitation grids on 4-km HRAP projection, covering 1981-2010 period, for CONUS and surrounding contributing areas. Will include only gridded inputs.	FY13 Q4 – slip to Q2 FY14	Per directive of latest IWRSS forcings report, Jan 2013 On track June 2013

Accomplishments/Actions

1st Quarter FY13

- We have a target set of products to be delivered by 1 Oct 2013, based on initial IWRSS/NWC planning. That is, a set of NLDAS forcings downscaled to the 4km HRAP grid and bias adjusted according to 1981-2010 climatology. The dataset will be hourly and will extend through at least the 1981-2010 period.
- Work on defining precipitation and temperature climatology to constrain the long-term record is ongoing, per the items below.
- New 4-km 1981-2010 precipitation and temperature climate grids for much of North America were supplied by NCDC staff. These are proving useful for regions not covered by the new PRISM datasets
- We are awaiting delivery of new station climate normals for 1981-2010 from Environment Canada. These will be used to estimate precipitation frequency, as an additional constraint to the mean monthly precipitation.
- Gridded mean hourly temperatures for 0000, 0300, …, 2100 UTC have been developed from NCDC station data and PRISM and NCDC gridded monthly mean Tmin and Tmax. Mean hourly temperatures from 240 NCDC climate stations and other stations over Canada and Mexico were used to develop climatic diurnal temperature cycle information. These mean hourly temperature grids will be used to constrain the downscaled NLDAS hourly temperature fields.

2nd Quarter FY13

- Formulated a comprehensive plan for precipitation and temperature processing based on adjustment of hourly NLDAS values to agree with monthly PRISM time series over CONUS, and a monthly time series dataset maintained by U. East Anglia Climate Research Unit over OCONUS areas. The approach was recently published in Intl. J. Climatology.
- Will bias adjust the monthly time series above to agree with 1981-2010 climatology grids previously collected
- Planning a review seminar on above method, and initial findings, by May 15
- Outlined a longer-term plan for other weather elements, to be carried out in 2014 and beyond
- Collected the 1979-2012 time series of hourly NLDAS2 "A" forcings data and stored on (non-backup) space on zeus

3rd Quarter FY13

- Conducted some internal reviews of the comprehensive plan during the quarter
- Got initial results on long-term precip and temperature biases (and corresponding correction factors) for the NLDAS2 record 1981-2010; to be applied to monthly total precip and monthly mean max/min temperatures 1979-2011
- Confirmed basic reliability of surface air temperature diurnal cycle in the NLDAS2 hourly record, by comparing with NCDC climatology at some individual 1st-order sites
- Aim to generate monthly mean temperatures (Tmax/Tmin) and monthly total precipitation, though bias corrections to NLDAS2/CRU grids, by August
- Aim to produce simple bias adjustment of original NLDAS2 precip, temperature - October
- Aim to apply 4km radar inputs, re-derive precip records - December
- Succeeding in decoding historical 40-km grid hourly Manually Digitized Radar records for the CONUS, covering 1979-1994. Initial evaluation indicates these data might be helpful in getting a better spatial/temporal resolution for precip in the pre-NEXRAD era, by using them to disaggregate daily/monthly NLDAS2 totals. The original NLDAS used only NARR reanalyses to temporally distribute precipitation to hourly, resulting in too many hours of light precipitation.

4th Quarter FY13

- Created 1979-2011 time series of monthly total precipitation and mean Tmax/Tmin for the NLDAS2 domain, merging PRISM data for CONUS with Climate Research Unit (CRU) for Canada and Mexico. Revision of the off-CONUS precipitation data will likely be needed
- We're carrying forward with checking of the monthly time series by verification with Global Historical Climate Network monthly station reports; results indicate the PRISM-CRU time series; after adjustment toward 30-year 1981-2010 climatology, has less bias and random error than corresponding NLDAS2 estimates
- We determined that historical 40-km grid hourly Manually Digitized Radar information has useful information on distribution of daily precipitation totals to hourly; we'll apply this information in future to pre-NEXRAD reanalysis

1st Quarter FY14

- Procedures for spatial downscaling of hourly NLDAS2 precipitation and temperature grids were developed
- Generated a set of hourly gridded temperatures, with correction for monthly biases in Tmin and Tmax, for 1996-2011, to support use in an NCRFC runoff model, and to support further testing.
- Collected newly-released PRISM daily datasets of Tmax, Tmin, and precipitation, on a CONUS-scale 4-km grid, for later use
- Began preparation of material for presentation at AMS 2014 Hydrology Conference

2nd Quarter FY14

- Presented validation results for bias-adjusted monthly temperature and precipitation time series at AMS 28th Hydrology Conference
- Submitted extended abstract on validation results for above conference.
- Initiated investigation into methods for specifying precipitation phase (liquid/frozen)
- Prepared adjustments to some of the NCDC gridded precipitation climatology estimates over Mexico

- Investigated using the NLDAS2 monthly time series for certain months over Mexico, to resolve instances where CRU precipitation appears inaccurate relative to Mexican weather service reports
- Began refining methodology to adjust NLDAS2 hourly temperatures, to insure reasonable agreement with NLDAS2 3-h time trends while still adjusting monthly mean daily maxima/minima toward PRISM-CRU mean monthly values

Problems Encountered/Issues

1st Quarter FY13

- Possibility that work might be re-scoped yet again, since the IWRSS/NWC report is being revised.

2nd Quarter FY13

- Previous problems resolved

3rd Quarter FY13

- Previous problems resolved

4th Quarter FY13

- Some time and momentum were lost due to shutdown preparations in September

1st Quarter FY14

- Lost two weeks' time due to shutdown in October

2nd Quarter FY14

- Work time reduced due to pressure to complete other tasks
- We're now hampered by lack of software engineering help – reported to HSMB chief

Flash Flood Services

Distributed Hydrologic Model with Threshold Frequencies (DHM-TF)

Core Goal: Improve forecasts of fast response hydrologic events and improve relevant distributed hydrologic model spatial display and analysis tools (DHM-SDAT)

Management Lead: Michael Smith

Objective: Understand the nature of the model errors when running a distributed hydrologic model forced by WFO type data streams (e.g. 15 minute resolution observations and nowcasts). Do additional historical precipitation analysis to support the threshold frequency approach. Collaborate with the Baltimore/Washington, Binghamton, and Pittsburgh WFOs to evaluate real-time and retrospective DHM-TF simulations. Create and modify DHM output visualization tools guided by input from OHD and field offices.

Milestones

Task	Due Date	Status
1. Implement Snow17 within BGM WFO DHM-TF operations	FY14 Q4	Ongoing
2. Create and/or modify data visualization tools as needed	FY14 Q4	Ongoing
3. Recommend high level requirements for operational development	FY14 Q4	Ongoing
4. Publish results	FY14 Q4	Ongoing

Accomplishments/Actions

1st Quarter FY13
- Completed first version of seamless CONUS connectivity file and associated routing parameters. Currently addressing connectivity problems discovered in the file.
- Continued to provide assistance to APRFC and LMRFC in their efforts to get DHM-TF up and running at their locations

2nd Quarter FY13
- Worked on revised version of seamless CONUS connectivity file and associated routing parameters. Currently addressing flow accumulation problems discovered in the file.
- Continued to provide assistance to APRFC and LMRFC. Each location has now brought up DHM-TF and executes the model automatically each hour.

3rd Quarter FY13
- Continued to work on revised version of seamless CONUS connectivity file and associated routing parameters. Generated continuous flow accumulation files for Mississippi and other large river basins that were not included in the NHDPlusV2 data set.
- Continued to provide assistance to APRFC and LMRFC in executing DHM-TF and diagnosing output.

4th Quarter FY13
- Revised process used to generate seamless CONUS connectivity file and associated routing parameters to better account for cross-boundary flow issues.
- Continued to provide assistance to MBRFC, WR (CBRFC), APRFC and LMRFC in configuring and/or executing DHM-TF and diagnosing output.
- Ran DHM-TF for several Colorado Front Range test cases as part of NOAA-NCAR flash flood project.

1st Quarter FY14
- Continued to provide assistance to LMRFC, MBRFC, WR (CBRFC) and APRFC in configuring

and/or executing DHM-TF and diagnosing output.
- Worked with NASA/GSFC on new Matlab-based xmrg-format data viewer tool

2nd Quarter FY14
- Continued to provide assistance to LMRFC in configuring and executing DHM-TF and diagnosing output.
- Continued to work with NASA/GSFC on new Matlab-based xmrg-format data viewer tool
- Corrected NHDPlus Version 2 flow direction errors and used to re-derive CONUS flow direction and accumulation maps for routing purposes

Problems Encountered/Issues

1st Quarter FY13
- None

2nd Quarter FY13
- None

3rd Quarter FY13
- Extensive and lengthy problems installing local copy of ArcMAP on desktop computer greatly slowed derivation of CONUS connectivity file and routing parameters.

4th Quarter FY13
- Problems with license for local copy of ArcMAP on desktop computer slowed derivation of CONUS connectivity file and routing parameters, as did disk problems on GIS server.

1st Quarter FY14
- Error in data set supplied by NHDPlus Version 2 data team hindered progression of work. Solution is currently being discussed with NHDPlus team.

2nd Quarter FY14
- None

Evaluate Gridded Flash Flood Guidance (GFFG) Approaches

Core Goal: Improve forecasts of fast response hydrologic events

Management Lead: Michael Smith (Project Lead: J.J. Gourley)

Objective: Quantitatively evaluate the ABRFC and OHD TF-GFFG approaches. Use observed streamflow data from small basins, grid inter-comparison techniques, and new verification data collected by NSSL. Evaluate NOAA-NESDIS percent impervious surface area (ISA) data for modeling applications in urban/suburban basins.

Milestones

Task	Due Date	Status
5. Compare DHM-TF skill to operational FFG and GFFG skill	FY14 Q4	Pending funding
6. Evaluate FFG, GFFG and DHM-TF for flash flooding cases, with a focus on the predictability of specific impacts	FY14 Q4	Pending funding
7. Prototype products focused specifically on flash flooding impacts	FY14 Q4	Pending funding

Accomplishments/Actions

1st Quarter FY13

- Description of flash flood database comprised of observations from NWS StormDat SHAVE, and USGS is now in press in *BAMS*.
- Graduate student, Race Clark, presented the CONUS-wide evaluation of FFG at the AMS annual conference.
- Paper describing CONUS-wide evaluation of FFG and intercomparison of FFG, FFPI, GFFG, and DFFG has been submitted to *Wea. Forecasting*.
- Prototype flash-flood prediction system, NMQ-FLASH, has been awarded funding by NASA. Initial demonstration with a single member running at 1km/5min is running in real-time over the CONUS.
- PI Gourley presented the FFG results as well as NMQ-FLASH in the NWS Research and Innovation Transition Team seminar series.
- Submitted a proposal in response to the Sandy Supplemental bill that will deploy NMQ-FLASH (along with other radar-based hydrologic applications) at the National Water Center.

2nd Quarter FY13

- PI Gourley presented the CONUS-wide FFG results as well as NMQ-FLASH in a UCAR/COMET course on flash flooding.

3rd Quarter FY13

- NMQ-FLASH system was run in demonstration mode during the Flash Flood and Intense Rainfall (FFaIR) testbed experiment at the Weather Prediction Center. Results were qualitatively compared to operational flash flood guidance values on a daily basis.

4th Quarter FY13

- An article describing the NMQ-FLASH system and its performance during FFaIR was submitted for publication in BAMS.

1st Quarter FY14

- Graduate student, Race Clark, presented CONUS-wide analysis of flash flood warnings, observations, and FFG at the NWA conference. He won 1st place in student poster competition.

2nd Quarter FY14

- Submitted a proposal for a Hazardous Weather Testbed Experiment to be conducted with a focus on experimental flash flood watches and warnings.

Problems Encountered/Issues

1st Quarter FY13

- Lack of AHPS funding has caused us to redirect focus on the development of NMQ-FLASH rather than continued analyses of FFG, GFFG, comparisons to DHM-TF, etc.
- The lack of AHPS funding has also impacted the NWS National Precipitation Verification Unit. Apparently, they are no longer archiving CONUS FFG mosaics, thus preventing future studies to evaluate the methods

2nd Quarter FY13

- None

3rd Quarter FY13

- None

4th Quarter FY13

- None

1st Quarter FY14

- None

2nd Quarter FY14

- None

FFMP Small Basin Support

Core Goal: Improve forecasts of fast response hydrologic events

Management Lead: Ami Arthur, NSSL

Objective: To provide training and assistance to all WFOs for customization of the FFMPA small-basin shapefile datasets, to coordinate and facilitate the sharing of customized files to prevent duplication of effort among WFOs, and to establish a repository for base and derived datasets and other information relevant to Gridded Flash Flood Guidance.

Note: *This project is no longer supported by AHPS funding; it will not be reported upon after this quarter*.

Milestones

Task	Due Date	Status
4. Host and maintain the FFMP Basin Dataset, and continue to provide technical assistance to FFMP dataset users.	Sept. 30, 2011	Ongoing

Accomplishments/Actions

1st Quarter FY13
- We have continued to work on the solution to the AWIPS-II FFMP shapefile topology issue, and have continued to provide support to FFMP dataset users.

2nd Quarter FY13
- We continue to work on the solution to the AWIPS-II FFMP shapefile topology issue. Approximately 70% of the basin edits for the CONUS have been completed at this time.

3rd Quarter FY13
- We continue to provide support to FFMP dataset users and work on the solution to the AWIPS-II FFMP shapefile topology issue. We have completed enough of the topological edits to begin shapefile delivery. During June, FFMP shapefiles were delivered to AKQ, BUF, and SLC. We will continue with more deliveries in Q4.

4th Quarter FY13
- During this quarter, we completed more updated FFMP datasets for sites preparing to move to AWIPS-II. We also made significant progress toward completing the next group of sites scheduled to move to AWIPS-II in October.

1st Quarter FY14
- We have continued to complete the updated FFMP datasets for sites preparing to move to AWIPS-II. During Q1, new datasets were delivered to the following WFOs: BOI, MKX, ARX, DMX, GID, GJT, PUB, OTX, CTP, and Alaska.

2nd Quarter FY14
- This project is no longer supported by AHPS funding.

Problems Encountered/Issues

1st Quarter FY13
- none

2nd Quarter FY13

- none

3rd Quarter FY13
- none

4th Quarter FY13
- none

1st Quarter FY14
- none

2nd Quarter FY14
- none

Software Projects

Transition CHPS Code into AWIPS

Management Lead: Jon Roe

Technical Lead: Alan Harmon

Objective: Transition CHPS code into the AWIPS baseline

Milestones

Task	Due Date	Status
1. **Refresh REP servers and CHPS software at RFCs**		
1.1 Deliver CHPS-4.1.1 to AWIPS	FY14 Q1	Image taken from NHOR
1.2 Mod-Note submitted to NWS	FY14 Q2	Draft mod-note submitted by RTS
1.3 Kit Proofing, OS, and Virtualization	FY14 Q3	In-Progress
1.4 OTE Site Prep and Hardware Shipment	FY14 Q3	In-Progress
1.5 Deployment of REP (with CHPS) Servers to RFCs	FY14 Q4	Delivery schedule being finalized
2. **Integrate and deliver CHPS-5.0.1 with FEWS update**		
2.1 Evaluate, integrate, and test FEWS 2014.01	FY14 Q4	FEWS 2014.01 release to be assessed
2.2 Perform CHPS Alpha Test	FY14 Q4	
2.3 Package CHPS components, documents, and release package	FY15 Q1	
3. **Deliver CHPS-5.0.1 to AWIPS configuration management**	FY15 Q1	Coordinating with AWIPS Program Office to identify an AWIPS release

Accomplishments/Actions

4th Quarter FY13

- The first draft of the OS configuration was enabled and a draft image was taken of CHPS software. TIM was conducted.

1st Quarter FY14

- 1.1 - The tested release of CHPS-4.1.1 was imaged from NHOR for Raytheon testing.
- 1.2 - A draft Mod-Note was developed and circulated for review with updates by NWS.
- 1.3 – Kit Proofing being developed. Operating System and virtual machine testing conducted.
- 1.4 – OTE sites being selected and shipment schedule being developed.
- 1.5 – Schedule for delivery of hardware and installation at sites being drafted.

2nd Quarter FY14

- 1.2 – The draft Mod-Note was finalized and submitted on 2/22/2014.
- 1.3 – Kit Proof activities initiated and being conducted.
- 1.4 – OTE sites identified and hardware shipped.
- 2.1 – OHD met with Deltares and agreed on target date of July 2014 for FEWS-2014.01 delivery by Deltares to NWS/OHD.
- 3.0 – Working with AWIPS Program Office and Raytheon, defined CHPS into AWIPS alpha test, configuration management activities, and reduced SwIT and Beta testing by Raytheon.

Problems Encountered/Issues

1st Quarter FY14

- Red Hat license add-ons need to be procured for virtual machines.

2nd Quarter FY14

- Task Order awarded to procure 54 Red Hat entitlements for REP servers on 2/25/2014. Need to update Remedy tracking data base.

Dissemination (Web Pages)

AHPS Web Page Activities

Core Goal: Generate and disseminate information to and for our users

Management Lead: Donna Page

Objective: Provide a standard look and feel for the presentation of AHPS hydrologic and forecast information on the World Wide Web by all NWS weather offices.

Milestones

Task	Due Date	Status
1. Finalize Phase VIII requirement	FY13 Q1	Complete
2. Phase VII+ deployment	FY13 Q2	Complete
3. Phase VIII development	New date FY14 Q1	In progress – some delay to refine requirements
4. Phase VIII deployment	FY13 Q4	Part 1 of 4 deployed
5. Phase IX deployment	FY14 Q2	Complete
6. Phase X requirements definition	FY14 Q3	Ongoing
7. Phase X development	FY14 Q4	On track
8. Inventory of Hydrology Program web sites	FY14 Q4	On track
9. Phase X deployment	FY15 Q1	On track

Accomplishments/Actions

1st Quarter FY13

- Updated and regenerated all precipitation images to use the new 1981-2010 normals
- Created and deployed instructional documentation for external websites to incorporate the AHPS national maps into their own websites
- Added the capability for AHPS CMS administrators to adjust the display order of the inundation image layers on the Google Maps interface
- Added NWS FIM YouTube video link to inundation national overview map page
- Update deprecated PHP4 code to PHP 5 standards
- Converted RSS feed generation scripts to use the NWSCMS database instead of flat files
- Converted KMZ file generation to use the NWSCMS database instead of flat files
- Updated all Numerical Models Links to point to new ncep.noaa.gov site
- Deployed Automated Flood Warning System (AFWS) to water.weather.gov/afws domain
- Corrected HRAPX and HRAPY typos on precipitation pages
- Updated “Hydrogen Days Ahead” values in the AHPS CMS to allow for 11 to 14 day forecasts
- Deployed updated AHPS CMS Documentation
- Responded to emergency and non-urgent support requests which are tracked by NWS TOC
- Performed normal O&M activities during the period

2nd Quarter FY13

- Provided a National Analysis and Display of Long-range Flood Risk
- Added downloadable precipitation metadata
- Corrected inconsistencies between observed and forecast RSS feeds
- Unified AHPS and AHPS2 footers for consistency
- Decommissioned legacy Automated Flood Warning System (AFWS) and redirected all traffic to water.weather.gov/afws domain
- Allowed plotting of a negative low flow on hydrographs
- Added inundation columns to CMS report

- Deployed updated version of nctoasc to precipitation page
- Responded to emergency and non-urgent support requests which are tracked by NWS TOC
- Performed normal O&M activities during the period

3rd Quarter FY13

- Addressed issue on hydrographs when using computed ratings and the low-flow threshold was set below the minimum rating curve value, the hydrograph was not drawn.
- Updated Orphan Gauge Report to better display mismatched river gauges.
- Added custom inundation layers to KML archives and repackaged all sites.
- Addressed issue where the AHPS River Menus were displaying duplicate rivers and updated the CMS "Dropdown Navigation" configuration page.
- Increased precipitation process threads from 2 to 6 for faster and more reliable processing.
- Updated XML, tabular, RSS and national forecast maps to match hydrograph days ahead configuration for display of consistent data.
- Deployed updated national forecast slider which added an "entire period" button and better readability.
- Corrected issue where daylight savings time was being calculated incorrectly for AHPS RSS feeds.
- Added additional error checking to AHPS shapefile generation script to skip gauge with observation values in scientific notation.
- Created report that will display the NWSLIs that have mismatched HSA configurations between the AHPS CMS and NRLDB database tables.
- Responded to emergency and non-urgent support requests which are tracked by NWS TOC
- Performed normal O&M activities during the period

4th Quarter FY13

- Implemented 10 Google Maps based inundation locations.
- Corrected CSS styling issue in the inundation footer.
- Updated NWSCMS text to better explain the hydrograph x and y labels.
- Updated AHPS CMS documentation to include Google inundation and various other page updates.
- Fixed bug on AHPS flood inundation mapping current/forecast display.
- Deployed updates to AHPS forecast page time slider bar.
- Addressed issue with RSS feeds for the precipitation gauges under AHPS not working.
- Updated all references from WFO to HAS in the NWSCMS and AHPS documentation.
- Addressed issue where the precipitation pages were not updating and processes were backing up.
- Changed hydroParse code logic to only skip singular invalid HML instead of all products issued by the WFO.
- Updated precipitation download page to check for requested file and present the user the actual download size.
- Responded to emergency and non-urgent support requests, which are tracked by NWS TOC.
- Performed normal O&M activities during the period.

1st Quarter FY14

- Implemented 15 Google Maps based inundation locations.
- Added "Flood Loss" link to water.weather.gov pages.
- Added "Turn Around Don't Drown" logo to water.weather.gov pages.
- Addressed issue where the AHPS Google maps would auto-pan when clicking on a gauge marker.
- Updated Flood Inundation Map processing code to include custom layers in downloadable packages.
- Updated gauge to river association configuration pages in AHPS CMS to be more user friendly and retooled the gauge sorting algorithm.
- Addressed daylight savings issue on hydrographs. Discovered that if the hydrograph plot data spanned the switchover from daylight to standard time, it kept the time in the first time zone it found. Applied a bug fix.

- Added “iNWS” link to water.weather.gov pages.
- Worked with Boulder, CO to address rating curve issues during times of extreme flooding.
- Responded to emergency and non-urgent support requests, which are tracked by NWS TOC.
- Performed normal O&M activities during the period.

2nd Quarter FY14

- Implemented 2 Google Maps based inundation locations.
- Updated AHPSCMS documentation for Phase IX changes.
- Added a Mississippi Valley RFCs special region group to the observation, forecast and Long-Range River Flood Risk RFC menus.
- Updated HML processing code to better display the originator in XML and RSS feeds when WFOs are backing up neighboring WFOs.
- Added NOAA Google Map API key to all AHPS maps.
- Successfully passed NIDS security scans and audit.
- Added the ability for hydronotes to be turned on or off based on the date.
- Added Tabular date in local time zone.
- Added additional fields to both observed and forecast shapefiles.
- Created auto-update capability for AHPS and hydrograph pages so they refresh automatically.
- Created dockable toolbox for flood inundation map controls.
- Flood inundation map geo-location popup dragable.
- Added explanation about UTC to AHPS pages.
- Added separate AHPS and AFWS headline inputs.
- Separated controls which displayed gauges on AHPS and AFWS so they may be displayed independently.
- Moved the river stage state summary pages from AFWS to AHPS and displayed all gauges.
- Added county overlay to all Google maps.

Problems Encountered/Issues

1st Quarter FY13

- None

2nd Quarter FY13

- None

3rd Quarter FY13

- None

4th Quarter FY13

- None

1st Quarter FY14

- None

2nd Quarter FY14

- None

New Service Locations

FY2014 AHPS Activities for APRFC

Management Lead: Dave Streubel, Development and Operations Hydrologist

Objective: Implement AHPS services in the Alaska-Pacific River Forecast Center's area of responsibility.

Milestones:

FY14 Planned New Service Locations

Area of Service (River Basin)	# New Locations	Location Names (LIDs)	Service Type Provided *see list below	Planned Completion Quarter	Actual Completion Quarter	Notes
				Q1	Q1	No AHPS points added Q1
Matanuska River	1	MATA2	Prob AHPS	Q2	Q2	Implemented April 1, 2014
Yukon River	9	KLNQ9 SRFQ9 SRMQ9 PRXQ9 YWRQ9 NIRQ9 WHRQ9 YDAQ9 YEAA2	Prob. AHPS	Q3 (delayed from 2013)		Operational rain gauge analysis of Canadian data to be completed by Q3 to verify sufficient operational QPE
Hawaii -Oahu	15	MNWH1 MNSH1 WKGH1 WISH1 OPAH1 OPSH1 WESH1 WHSH1 WKNH1 PNSH1 MKHH1 WKSH1 KHSH1 MKSH1 KSFH1	RDHM – Short duration forecasts	Q4	Q4	

*****Service Types available: Probabilistic on AHPS web (Prob. AHPS), SSHP-SAC, SSHP-API, Flood Inundation Mapping (FIM), Water Resources on Western Water web page (WR/WW), Probabilistic displayed only on RFC web page(Prob. RFC), Probabilistic delivered directly to partner (not on any web page)

AHPS Service Location Summary

Time Frame	Probabilistic AHPS Web	Site Specific (SAC)	Site Specific (API)	Flood Inundation Map	Water Resources Sites on W. Water Web Page	Probabilistic RFC Web Only	Other	Number Unique Locations
FY14 Q1	-	-	-	-	-	-	-	-

FY14 Q2	1							
FY14 Q3	9							
FY14 Q4							15	
Total FY14	10	0	0	0	0	0	15	
Overall Total (FY2000-2013)	91	0	0	0	20	0	6	117

Accomplishments/Actions:

1st Quarter FY14

- Calibration of Eyak River near Cordova Alaska started. Oahu RDHM implementation continuing to progress at 15 Oahu USGS gage locations. No additional AHPS points added during Q1 2014.

2nd Quarter FY14

- Implemented Matanuska River at Palmer AHPS forecast point.

Problems Encountered/Issues

1st Quarter FY14

- **None**

2nd Quarter FY14

- **None**

FY2014 AHPS Activities for NCRFC

Management Lead: Mike DeWeese

Objective: Implement AHPS for locations in the North Central River Forecast Center's area of responsibility. AHPS locations include those with probabilistic forecast products, Site Specific Hydrologic Prediction, and/or inundation mapping points. For FY14, these would include WFO requested forecast points per below.
.

Milestones:

FY14 Planned New Service Locations

Area of Service (River Basin)	# New Locations	Location Names (LIDs)	Service Type Provided *see list below	Planned Completion Quarter	Completion Quarter	Notes
Sugar River	**1**	**Albany, WI (ALBW3)**	**AHPS Prob**	**Q2**	**Q2**	
Wisconsin River	**3**	**Castle Rock, WI (CROW3) Wisconsin Dells, WI (WDEW3) Necedah, WI (NCAW3)**	**AHPS Prob**	**Q2,Q4**	**CROW3 WDEW3 Q2**	**CROW3, WDEW3 Q2 NCAW3 Q4**
Muskegon River	**1**	**Oak Grove, MI (OKGM4)**	**AHPS Prob**	**Q2**	**Q2**	

*****Service Types available: Probabilistic on AHPS web, SSHP-SAC, SSHP-API, Flood Inundation Mapping, Water Resources on Western Water web page, Probabilistic displayed only on RFC web page, Probabilistic delivered directly to partner (not on any web page)

1st Quarter FY14 –

Problems Encountered/Issues:

Testing of MPE in AWIPS2 has identified several critical deficiencies, mostly related to the gage table functions used for HAS QC. NCRFC continues to use A1 MPE operationally. Trouble Ticket number 611938 has been opened for this issue.

Testing of Hydro base in AWIPS has identified critical deficiencies when editing the ingest filter. NCRFC continues to use A1 Hydrobase operationally.

Accomplishments/Actions:

Initiated a remote CHPS access project with the Illinois USGS and IL DNR on Fox River. USGS is working with the DNR to develop reservoir modeling system. NCRFC currently uses NWSChat to coordinate reservoir releases by the DNR. The goal is to provide CHPS access to enhance coordination and planning activities with the DNR.

NCRFC is participating in a NOAA JPSS project with City College of New York, George Mason University, and the University of Wisconsin to evaluate MODIS and VIIRS satellite enhanced imagery in Awips2 for river ice and overland flooding situational awareness. Imagery will be collected and processed by CCNY and GMU, then converted to an AWIPS compatible format at UW before being sent to the RFC via LDM. System implementation will be completed by March 1 for evaluation during the spring flood season.

NCRFC participation in the CR QPF Optimization project has been completed and presentations with team recommendations given to CRH and OCWWS/HSD personnel.

NCRFC participated in a table top flood exercise with multiple Power Utilities and Emergency Managers on the Wisconsin R. Over the past few years, NCRFC has conducted conference calls during major floods with the various utility company representatives. Based on RFC inflow contingency forecasts, the companies cooperate on their own initiative to balance their respective operations in order to mitigate downstream flooding. Exercise participants remarked on how much better and more smoothly information flows since the dam operators have been working with the NWS and sponsoring conference calls.

2nd Quarter FY14 –

Accomplishments/Actions:

NOAA JPSS Project: NCRFC is now ingesting two experimental VIIRS products into Awips2, as well as MODIS and VIIRS visible imagery. Products have been monitored daily through the spring melt season and our operational testing phase is complete. The focus will now be on the APRFC for operational testing during their spring snow melt season. Although there are some limitations remaining, the results are promising and several product improvements were made based on NCRFC results. The CCNY River Ice product had limited utility due to the 380 meter resolution, which limits it to very wide channels, e.g. the Mississippi R. It also has difficulty filtering out light cirrus clouds, which obscure the product details. The River Flood product from GMU had better results indicating detailed areas of active snowmelt and overland flooding. It also was able to identify some minor levee breach areas in Illinois, which was unexpected.

RFC Backup: NCRFC has coordinated with MBRFC to establish hardware requirements for a common backup platform to be located at CR HQ, which will serve as the backup location for both RFCs. A hardware procurement request was sent to CR for approval. The goal is to have offsite backup capabilities in Awips2 for long term events, i.e. more than one day. The assumption is this capability will be needed for several years before the NWC becomes operational and can provide backup capabilities.

FY2014 AHPS Activities for MBRFC

Management Lead: **Scott Dummer**

Objective: Implement AHPS for locations in the MB River Forecast Center's area of responsibility. AHPS locations include those with probabilistic forecast products, Site Specific Hydrologic Prediction, statistical (Western) water supply, and/or inundation mapping points. For FY14, this would include...

Milestones:

FY14 Planned New Service Locations

Area of Service (River Basin)	# New Locations	Location Names (LIDs)	Service Type Provided *see list below	Planned Completion Quarter	Completion Quarter	Notes
Little Sioux Basin	1	Spencer, IA (LSSI4)	AHPS Prob	1st Qtr	1	

FY14 Planned Expanded Service Locations

Area of Service (River Basin)	# Expanded Locations	Location Names (LIDs)	Service Type Provided *see list below	Planned Completion Quarter	Completion Quarter	Notes
Kansas Basin Cross Creek	1	Rossville, KS (RSSK1)	Flood Inundation Mapping	3rd Qtr		
Missouri Mainstem Basin	1	Leavenworth, KS (LEVK1)	Flood Inundation Mapping	3rd Qtr		
North Platte Basin North Platte River	1	North Platte, NE (NPTN1)	Flood Inundation Mapping	3rd Qtr		
Missouri River Tributary Basins - Kansas City & Below	3	1) Leawood, KS (Roe) 2) Overland Park, KS (OPDK1) 3) Leawood, KS (State Line Rd)	Flood Inundation Mapping	4th Qtr		
Upper Missouri Basin Gallatin River	1	Logan, MT (LOGM8)	AHPS Prob (in addition to water supply services)	2nd Qtr	2	

*****Service Types available: Probabilistic on AHPS web, SSHP-SAC, SSHP-API, Flood Inundation Mapping, Water Resources on Western Water web page, Probabilistic displayed only on RFC web page, Probabilistic delivered directly to partner (not on any web page)

AHPS Service Location Summary

Time Frame	Probabilistic AHPS Web	Site Specific (SAC)	Site Specific (API)	Forecast Inundation Map	Water Supply	Probabilistic RFC Web Only	Other	Number Unique Locations
Q1	**1**							**1**
Q2	**1**				**1**			
Q3	**2**			**3**				**1**
Q4				**3**				**3**
Total FY14	**4**			**6**	**1**			**5**
Overall Total (FY2000-2014)								

Problems Encountered/Issues

1st Quarter FY14 – AHPS Calibration and model development contract under protest. This delay will negatively impact FY15 AHPS Implementation Results.

2nd Quarter FY14 – AHPS Calibration and model development contract protest has been resolved. MBRFC is again working with the contractor. Held a re-kick-off call 4/14. By the end of the week MBRFC was able to provide the necessary data to the contractor via google drive. Gave sample development progress reports to give the contractor an idea of what type of things to report each month to the NWS.

3rd Quarter FY14 – None

4th Quarter FY14 – None

Accomplishments/Actions:

1. CHPS Innovations (e.g. any extensions, configurations, displays, adaptors, collaborations, community models)

2. Ensemble/Uncertainty Initiatives (e.g. HEFS testing and implementation, MMEFS developments, enhanced communication of uncertainty, etc)

3. Forcing innovations (e.g. dual-pol, snow estimation, etc)

4. Status of ongoing and new IWRSS innovations: Novel collaborations and initiatives in science, technology and stakeholder engagement demonstrating federal partners working together, leveraging resources and providing efficient and effective government (e.g., seamless data exchange, system interoperability and data synchronization, summit to sea modeling, flood inundation mapping,

geo-intelligence improvements, common operating picture, etc.). Examples of innovations include the WGRFC web portal, OHRFC HEC-RAS inundation mapping, CNRFCs adaption of RES-SIM.

5. Significant external engagement (e.g., Silver Jackets, Fusion Team, Congressional activities, Impact-based Decision Support Services (IDSS), etc.)

1st Quarter FY14 –

Completed 1 AHPS Probabilistic Web Service Point for Rossville, KS on Cross Creek within the Kansas River Basin.

An archive stand-alone CHPS version is working is now working so that post-event analysis can be performed.

CR QPF Duration Study work has been completed. Results have presented to CRH and NWSH OHD/HSD. An operational decision memorandum will be issued by the Acting Regional Director announcing that QPF duration will likely be extended to 48 hours for fall and winter. 24 hours would continue to be used in the summer months.

Continual Silver Jackets engagement with respect to the flood inundation mapping projects within the MBRFCs area.

Successful Revamp of the MBRFC Precipitation Mapping and Quality Control process used in Water Supply services**.**

2nd Quarter FY14 –

Completed 1 AHPS Probabilistic Web Service Point for Logan, MT on the Gallatin River within the Upper Missouri River Basin.

Added 1-Hr MAPX hyetographs to be viewable in CHPS. This will help MBRFC hydrologists to recognize storm durations, and make the appropriate changes to the model during times when river response is different from the Standard Unit Hydrograph designed storm.

Built experimental CHPS server (CHPS10) from retired ldad servers. This was built to test running the QPF ensembles to remove load from the operational servers. This sped up the ensemble up by 15 minutes.

Completed the Upper Missouri Tributary MAP/Ts out through Apr 2013 3/27/2014 for Contract Calibration Work

Developed Field Intranet River Forecast Verification Page that show basic statistics for forecast points to help partners set reasonable forecast accuracy expectations.

Completed Goose Creek CHPS configuration project to reduce basin areas to improve forecast performance in Wyoming.

Migrated GFFG off NWSRFS and to CHPS and use PROGEN to generate FFG Products.

Developed estimate for NWSH on what it will take to become fully AHPS ready for the entire Missouri Basin by 2018.

Implemented processing of non-USGS ratings, and developed automatic procedure to get non-usgs ratings from Colorado Department of Water Resources.

Selected HEFS Focal Pt. Have begun learning the science and methodology of the system. Focal point also gaining familiarity with GraphGen and XML CHPS configuration work.

3rd Quarter FY14 –

4th Quarter FY14 –

FY2014 AHPS Activities for MARFC

Management Lead: Peter Ahnert **(**HIC), Seann Reed (DOH), Patti Wnek (SCH)
Objective: Implement AHPS services in the Middle Atlantic River Forecast Center's area of responsibility
Milestones:

FY14 Planned New Service Locations

Area of Service (River Basin)	# New Locations	Location Names (LIDs)	Service Type Provided *	Planned Completion Quarter	Actual Completion Quarter	Notes #
Passaic	7	SADN4 PPPN4 RDLN4 CAMN4 MILN4 DDCN4 LTFN4	FIM - Static	FY14 Q1	FY14 Q1	Upper Saddle @ Saddle River, NJ Pompton River @ Pompton Plains, NJ Pequannock River @ Riverdale, NJ Passaic River @ Chatham, Millington, Clifton (Dundee Dam), and Little Falls, NJ

*****Service Types available: Probabilistic on AHPS web, SSHP-SAC, SSHP-API, Flood Inundation Mapping, Water Resources on Western Water web page, Probabilistic displayed only on RFC web page, Probabilistic delivered directly to partner (not on any web page)

AHPS Service Location Summary

Time Frame	Probabilistic AHPS Web	Site Specific (SAC)	Site Specific (API)	Forecast Inundation Map	Water Resources Sites on W. Water Web Page	Probabilistic RFC Web Only	Other	Number Unique Locations
Q1	0	0	0	7	0	0	0	0
Q2	0	0	0	0	0	0	0	0
Q3								
Q4								
Total FY14	0	0	0	7	0	0	0	0
Overall Total	174	0	33	28	0	0	2	2

Accomplishments/Actions:

1st Quarter FY2014

CHPS Innovations

- CHPS
  - Operational Readiness Exercise completed by staff
  - Incorporated test pulse release by Gathright Dam into forecasts
  - CHPS Modifier behavior documented for staff information
  - Completed CHPS 4 beta test
  - Attended *"What's New in CHPS 4.0.1"* training webinar

- CHPS 4 was successfully installed on CHPS 1-6 and the BUS
- Prepared to implement daily forecasts at Bremo Bluff, VA when change of service process complete
- Provided information to NYCDEP to support their discussion with Delaware Basin Decree Parties regarding the use of snow pack data in the Flexible Flow Management Program (FFMP)

- Calibration
  - Attended "*CHPS Calibration Features"* training webinar
  - Successfully configured a basin using the new calibration tool.
- Distributed Hydrologic Modeling
  - USDA Project
    - Created 10 years of historical temperature grids to be used in the snow model and RDHM
    - Calibrated Mahantango Creek basin
    - Set sample data to USDA
    - Toured Mahantango Creek Watershed
  - NART
    - Provided student intern project proposals for NART
    - Coordinated with the Chesapeake Bay Office
    - Internship position announced through NOAA Chesapeake Bay Office
- Service Back-Up Operations
  - CHPS-based headwater flash flood guidance (FFH) now runs on BUS & Shoebox
  - SDM, Digital Forecast Manual, and Backup System Description are available on BUS & Shoebox
  - Updated hard-copy printouts added to On-site & Off-site notebooks
  - Information on how to manually initialize the BUS with data from AWIPS, as well as trouble-shooting tips, added to *"MARFC Backup System Description"*
  - Stage and surge data flows at LWTV2 & WASD2 and forecast wind data needed to run HEC-RAS Potomac added
  - Shoebox has been updated to match the BUS
  - Nightly automatic data transfer of CHPS local data store to flash drive & BUS was fixed
- AWIPS2
  - Installed two software builds
  - Participated in national RFC call on RP replacement plans

Ensemble/Uncertainty Initiatives

- HEFS
  - Beta testing continues
  - Discussed future HEFS-related collaborative project with ICPRB
  - Participating in 1 month trial of delivering daily products to NYC DEP

Forcing innovations

- Tropical Cyclone Inland Graphics – continued participation on national team activities to improve graphic
- Met with Maryland Department of Environment's Healthy Beaches Program to discuss use of MPE data in a new Healthy Beaches smartphone app. MPE data used to manage beach closures due to rainfall runoff.
- Provided Maryland Department of the Environment with gridded GIS overlay to aid in expansion of MDE's use of MPE data for shellfish IDSS
- Added new Passaic Basin precipitation gages to operations
- Wrote letter of support for CSTAR project, *"Understanding and Improving the Full Hydrometeorological Forecasting Chain Using Multimodel Ensembles."* Project study involves Mid-Atlantic watersheds. Active collaborator with PSU Civil and Environmental Engineering Deptartment
- NOAA Climate Diagnostics and Prediction Workshop Webinar: Special Session on Climate Science Communication
- Abstract *"Retrospective Case Study of the Impact of Rain Gage Network Reductions on National Weather Service River Forecasts in the Susquehanna River Basin"* accepted for presentation 28th Conference on Hydrology, AMS 94th Annual Meeting
- Attended MRMS training webinar on new website
- ER Science Sharing Webinars – attended OHRFC Climate Change presentation

- Attended WFO CTP Winter Weather Workshop
- Attended WPC Winter Weather Desk Operations & Verification webinar

Status of ongoing and new IWRSS innovations

- WFIPP - 4 staff members participating in 3 WFIPP teams
- Flood Inundation Map Libraries
  7 new inundation map libraries completed in the Passaic Basin: Pompton Plains, Riverdale, Chatham, Millington, Clifton/Dundee Dam, Saddle River, and Little Falls
- Silver Jackets
  - PA - Participated in team conference calls. Provided update on Nurture Nature Social Science research project. Team completed work on new public flood risk management website http://www.nab.usace.army.mil/Home/SilverJackets.aspx. Nurture Nature Center reported to team on social science collaborative project with MARFC, PHI & BGM.
  - VA - attended webinar on government agency response to recent flooding in Colorado
  - Washington DC - became member of Washington DC Flood Risk Management Team. Provided MARFC familiarization at a team meeting.
  - NJ – participated in team meeting virtually. Attended NJAFM's Coastal Flood Risk webinar.
  - National Silver Jackets - attended *"Enhance Resilience of Coastal Ecosystems"* webinar

Significant external engagement

- Partner briefings for flood impacts from TS Karen. Participated in MEMA coordination conference calls.
- Social Media Training in Winter Weather
- Socialized NOAA/Nature Conservancy Coastal Resilience website w/ coastal WFO(s) & external partners
- Nurture Nature Center (NNC) Collaborations
  - Social Science Project – made recommendations to proposed new graphics that will be used in December's focus groups and reviewed draft ideas of new MMEFS graphics created by NNC
  - Final 4 focus groups completed for Phase II of the project
  - Flood Safety Education Project – shared with NWSHQ links to flood safety materials from this project for newly renovated NWS National Flood Safety Awareness website. Socialized latest flood safety outreach materials on ER WCM/SCH call. Contributed article for AWARE Newsletter on availability of new children's Flood Coloring Workbooks that EMs can personalize with their logo and website address.
  - Provided letter of support for SeaGrant Collaboration Project proposal CSAPP-35, *"They had the facts: Why didn't they act? Understanding and improving public response to NWS coastal flooding forecasts"* submitted under NOAA Sea Grant's Coastal Storm Awareness Program Research Call. NNC was awarded the grant.
  - Coastal Flood Safety Project – reviewer on new coastal flood safety outreach materials
- Attended annual PA State Climatologist meeting
- Gathered & shared USGS WSC emergency contacts for gage outages prior to Government shutdown
- National SCH Group – led planning meeting for SCH role in National WCM/SCH Conference
- Attended update on SRBC's Cumulative Water Use and Availability Study
- Attended DRBC Flood Advisory Committee quarterly meeting
- VLAB – attended training webinar for new tool to collaborate with external users
- Conducted RFC Operations tour for Shippensburg University Students
- WRN
  - attended Virtual Lab training
  - attended WRN Ambassador address to WCM/SCH
  - attended *"Building the Future of the NWS"* address
  - attended WFO New Orleans IDSS Pilot Project Review
- Hosted office visit by Deputy Director General of the China Meteorological Administration, Professor Meiyan Jiao who is in charge of weather forecast operations in China
- Water Resource Outlook updated several times.
- Hosted office visit by NWA President-Elect
- AMS Summer Meeting – began planning with PSU & WFO CTP.

- National WCM/SCH Conference – led summation of national survey results and presented to agenda planning team
- Attended national USGS webinar on stream gages
- Joined ER planning team for the Commemorate of the 60th anniversary of Hurricane Hazel

2nd Quarter FY2014

CHPS Innovations

- River Ice
  - DRJTBC began sending river ice photos to operations
  - Participated in briefing calls with LWX, PHI & AKQ for MEMA
  - Began issuing river ice situational awareness briefings. Coordinated & shared river ice information & services from Mid-Atlantic WFOs and services.
  - Active use of Social Media to share river ice photos and news
- CHPS/FEWS
  - Attended Deltares presentation on new features
  - CHPS troubleshooting training exercise reviewed by staff
  - Continued testing of FFG PCRaster fix
  - Participated on team planning fall CHPS Workshop
- MARFC Flood Climatology – info used for a statistical predictive model for forecasting the likelihood of spring floods for towns along the Susquehanna River
- Training
  - Attended Red River of the North webinar from NCRFC.
  - Attended OHD Techniques to Compare Observations with Simulated Soil Moisture webinar.
- Calibration
  - Successfully configured stand-alone CHPS to view and make calibration runs
  - Currently configured for 3 models at 9 headwater locations
  - Plan to calibrate 1-hour lumped SAC-SMA & Snow-17 and use the parameters to help scale a priori parameter grids for the distributed model
- Along with NOAA NART, Chesapeake Research Consortium, and NOAA Chesapeake Bay Office (CBO), interviewed and selected a summer intern for a modeling project with application to shellfish bed restoration in the Chesapeake Bay
- HEC-RAS modeling – met University of MD professor and student to discuss their use of our Potomac HEC-RAS model in a Washington D.C. sewage treatment plant study

Ensemble/Uncertainty Initiatives

- HEFS
  - Met all goals in the MOU for HEFS and passed the 30-day operational test
  - Beta testing completed
  - Installed latest software on the servers
  - Dr. Alfonso Mejia and Dr. Chris Duffy of the PSU Civil Engineering Department have been awarded a new CSTAR applied research grant for the coming 3 yrs. The project received the highest ranking of any of the proposals submitted. The project involves developing improvements to HEFS and MMEFS. Collaborators include: WPC, MARFC, NERFC, OHRFC, and SERFC.
  - 2 hydrologists attended the HEFS Hindcasting & Verification workshop at NWS HQ
  - Nearly finished adding Southern Operations area (Potomac, Rappahannock, James, & Appomattox) to HEFS system. Graphics developed to help investigate the observed undersimulation in HEFS forecasts during April. Fixed data flow issue following AWIPS 13.5.3 upgrade. HEFS concept of operations document reviewed.
- GraphGen
  - Testing scripts to produce MMEFS summary graphics in GraphGen
  - Modified the AHPS graphics being produced in GraphGen
  - Volunteered to test new AHPS GraphGen template for OHD
  - Assisted APRFC with their GraphGen configuration

Forcing innovations (e.g. dual-pol, snow estimation, etc.)

- Continued to work to transition model forcings from OFS to CHPS

- *Retrospective Case Study of the Impact of Rain Gage Network Reductions on National Weather Service River Forecasts in the Susquehanna River Basin* paper was finalized. Authors: Peter Ahnert, Kevin Hlywiak, Cody Moser, and Seann Reed.
- Installed map backgrounds under CAVE. Added new map of flashy sub-basins.
- Systems Team met and discussed next steps for transitioning model forcings from OFS to CHPS
- Resolved AWIPS2 bug that resulted in MPE Q3 grid definition errors. Restored MPE data flow to CHPS following AWIPS 13.5.3 upgrade.

Status of ongoing and new IWRSS innovations

- WFIPP - National teams completed reports (staff on 3 of the teams). DOH had lead role in organizing and consolidating requirements for the Evaluation/Verification team.
- Silver Jackets
  - PA – Attended quarterly meeting in Harrisburg. Presented the latest Flood Safety outreach resource – a kid's activity book, to the PA Silver Jackets. PEMA is now considering incorporating this into the PAReady.gov program.
  - PA, NJ, WV – participated in team calls
  - SCH is NWS representative on partners planning team for 2014 National Silver Jacket Flood Risk Management Conference

Significant external engagement

- Staffed outreach exhibit booth at the PA Farm Show outreach event with WFO CTP in Harrisburg, PA
- Customer Advisory Board meeting. Group expressed need for more river ice situational awareness.
- Media
  - Interview for TV station in York, PA for use in future flood events.
  - Participated in WFO CTP Media Workshop. Gave a talk on new NWS Flood Safety outreach resources.
- Website – continued preparations for NIDS transition. Participated in meetings for the transition to NIDS.
- Social Media
  - Attended training on Social Media Dashboard Alternatives
  - Expanded social media engagement by encouraging the sharing of river ice photos on Twitter and Facebook. River ice photos were also used by operational staff to help assess ice conditions.
- National WCM/SCH Meeting Agenda Team Co-Lead - agenda finalized. Team transitioned into a planning team. SCH continued to advocate for some dedicated time for SCHs to meet separately from the WCMs during this meeting. Continued to plan portions of the meeting.
- Nurture Nature Center Social Science Project – provided feedback for AMS presentation on proposals for the FOP, QPF, MMEFS, AHPS Hydrographs, Flood Watches and Flood Warnings
- AMS Summer Community Meeting Planning – continued to provide input with WFO CTP
- Weather Ready Nation – attended FEMA/NWS Be a Force of Nature webinar
- DRBC Flood Advisory Committee – attended quarterly meeting in Trenton, NJ
- Participating on regional team to add inland flood impacts to ER commemoration of Hazel
- Capital Area Science & Engineering Fair – judged 8 high school physics projects and interviewed students
- First Lego League Global Innovation – evaluated 10 project s as part of a team of judges

FY2014 AHPS Activities for NERFC

Management Lead: David Vallee (HIC), Rob Shedd (DOH), Ed Capone (SCH)
Objective: Implement AHPS services in the Northeast River Forecast Center's area of responsibility
Milestones:

FY14 Planned New Service Locations

Area of Service (River Basin)	# New Locations	Location Names (LIDs)	Service Type Provided	Planned Completion Quarter	Actual Completion Quarter	Notes
Pawcatuck	2	WODR1, WSTR1	Prob. AHPS	FY13 Q4	FY14 Q1	Pawcatuck River @ Wood River Junction & Westerly, RI
Pawcatuck	1	HOPR1	Prob. AHPS	FY14 Q4		Pawcatuck River @ Hope Valley, RI
Housatonic	1	BEAC3	Prob. AHPS	FY14 Q3		Naugatuck River @ Beacon Falls, CT
Penobscot	1	BPRM1	Prob. AHPS	FY14 Q1		Penobscot River @ Bangor, ME
Merrimack	2	MFDN3, ANDM3	Prob. AHPS	FY15 Q2		Souhegan River @ Milford, MA Shawsheen River @ Andover, MA (AHPS Contract calibration support in FY14)

*****Service Types available: Probabilistic on AHPS web, SSHP-SAC, SSHP-API, Flood Inundation Mapping, Water Resources on Western Water web page, Probabilistic displayed only on RFC web page, Probabilistic delivered directly to partner (not on any web page)

AHPS Service Location Summary

Time Frame	Probabilistic AHPS Web	Site Specific (SAC)	Site Specific (API)	Forecast Inundation Map	Water Resources Sites on W. Water Web Page	Probabilistic RFC Web Only	Other	Number Unique Locations
Q1	2	0	0	0	0	0	0	0
Q2	0	0	0	0	0	0	0	0
Q3								
Q4								
Total FY14	2	0	0	0	0	0	0	0
Overall Total	178*	1	57	0	0	0	0	0

* Connecticut River @ Middletown, CT (MDDC3) discontinued FY12Q2 was added back to point total

Accomplishments/Actions:

1st Quarter FY2014

- **Forecast Points**
  - Pawcatuck River at Wood River Junction, RI (WODR1)
  - Pawcatuck River at Westerly, RI (WSTR1)

- Penobscot River at Bangor, ME – tidal location running in HEC-RAS. AHPS plots are being generated.
- **RISK**: Initial discussion on calibration activities with LynkerTech and AMEC in October regarding calibrations in the Souhegan River basin. However, the contract protest has put that work on hold. Although it should not affect FY14 implementations, it will delay when in FY15 things are implemented

- **CHPS Innovations**
  - Beginning work on implementation of CHPS4. At end of Q1 installed on standalone. Will be installed operationally early in Q2
  - Bringing in additional NOHRSC grids and have generated additional spatial displays and forecast point plots that incorporate this data
- **Ensemble / Uncertainty Initiatives**
  - Completed all requirements for HEFS implementation for NYC DEP
  - Beginning initial work to expand HEFS development to additional basins
- **Forcing Innovations**
  - Forecasters have been making more routine use of MRMS/Q2 grids in MPE. Recent changes in those grids have seemed to make significant improvement in their performance
- **Status of Ongoing IWRSS Innovations**
  - DOH is on the WFIPP Verification and Evaluation team
  - SCH is on the WFIPP Modeling Test-bed team
- **External Engagement**
  - HIC gave a series of talks on Flood Climatology and Forecasting to several groups including:
    - New England Sea Grant Biennial Conference
    - New England Erosion Control
    - Rhode Island Political Roundtable – participation was organized by the NART (NOAA North Atlantic Regional Team)
  - HIC attended WMO Expert Meeting on Flood Forecast Operations in Geneva in November

2nd Quarter FY2014

- **Forecast Points**
  - The Merrimack River at Haverhill MA was converted from a 6-hr time step stage-stage forecast to an hourly time step forecast using HEC-RAS with a downstream tidal boundary
  - **RISK:** We are continuing to wait for resolution of the AHPS calibration contract. This delay will likely result in a delay of forecast point implementation for FY15
- **CHPS Innovations**
  - Upgraded CHPS to CHPS4.0.1
  - Developed spatial display of percent normal SWE of current snow pack compared to historical snowpack on that particular day. The historical run was from 1961-2010
- **Ensemble / Uncertainty Initiatives**
  - MMEFS converted to generating graphics using GraphGen. This eliminated the need for using ESPADP and R for graphics generated
  - HEFS implementation is ongoing. Most work in the Hudson basin has been completed. Current development work in Connecticut River basin
- **Forcing Innovations**

- **IWRSS Innovations**
  - Rob Shedd and Ed Capone served on the IWRSS verification and modeling testbed teams respectively. Final reports for both requirements phases have been submitted

- **External Engagement**
    - NERFC has participated in conference calls with New York state on their planned statewide mesonet that will be implemented over the next several years

FY2014 AHPS Activities for OHRFC

Management Lead: Trent Schade (HIC), Vacant (DOH), Jim Noel (SCH)
Objective: Implement AHPS services in the Ohio River Forecast Center's area of responsibility
Milestones: **FY14 Planned & Unplanned New Service Locations**

Area of Service (River Basin)	# New Locations	Location Names (LIDs)	Service Type Provided	Planned Completion Quarter	Actual Completion Quarter	Notes
Licking	6	GRNO1 (1) RCNO1 (2) NEAO1 (3) NMSO1 (4) SFHO1 (5) BEEO1 (6)	FIM	FY14 Q1	FY14 Q1	Raccoon Creek nr Granville, OH and at Newark, OH (1 & 2) Licking River nr Newark, OH (3) North Fork Licking River nr Newark, OH (4) South Fork Licking River nr Heath and nr Hebron, OH (5 & 6)
White	1	FCFI3	SSHP-SAC	NP	FY14 Q1	Fall Creek nr Fortville, IN
Wabash	2	JRMI3 RLVI3	SSHP-SAC	NP	FY14 Q1 FY14 Q2	Wildcat Creek nr Jerome, IN Big Walnut Creek nr Reelsville, IN
Cumberland	1	DOVT1	Prob. AHPS	NP	FY14 Q2	Cumberland River at Dover, TN
Kentucky	1	LPTK2	Prob. AHPS	FY12 Q4	FY14 Q2	Kentucky River at Lockport, KY
Licking	1	NMSO1	Prob. AHPS	FY14 Q1	FY14 Q2	North Fork Licking River nr Newark, OH
Conemaugh	2	FDLP1 ECMP1	SSHP-SAC	NP	FY14 Q2	Stonycreek River at Ferndale, PA Little Conemaugh River at East Conemaugh, PA
Scioto	1	RLVI3				
White	1	FLCI3	Prob. AHPS	FY14 Q2		

*****Service Types available: Probabilistic on AHPS web, SSHP-SAC, SSHP-API, Flood Inundation Mapping, Water Resources on Western Water web page, Probabilistic displayed only on RFC web page, Probabilistic delivered directly to partner (not on any web page)

AHPS Service Location Summary

Time Frame	Probabilistic AHPS Web	Site Specific (SAC)	Site Specific (API)	Forecast Inundation Map	Water Resources Sites on W. Water Web Page	Probabilistic RFC Web Only	Other	Number Unique Locations
Q1	0	2	0	6	0	0	0	0
Q2	3	3	0	0	0	0	0	0
Q3								
Q4								
Total FY14	0	2	0	6	0	0	0	0
Overall Total	284	98	2	14	0	0	0	0

Accomplishments/Actions:

1st Quarter FY2014

- **CHPS Innovations**
  - CHPS Calibration Training webinar

- **Ensemble/Uncertainty Initiatives**
  - None

- **Forcing Innovations/Initiatives**
  - FFG coordination call with other RFC(s)

- **Status of ongoing and new IWRSS innovations**:
  - Coordinating with NOAA GLERL in FY14 as the lead RFC on an experimental rainfall QC project in the Great Lakes

- **External engagement**
  - Routine flow forecast coordination calls continued with USACE LRD supporting the Olmstead Lock & Dam Project
  - Ohio State University climate/weather/water coordination call
  - Partner Flood Coordination
    - Partner DSS flood briefing coordination calls
    - WFO Cleveland flood coordination calls
    - FEMA V flood coordination call
  - Silver Jackets Activities
    - Coordination calls: Virginia, Indiana, Pennsylvania,
    - Meetings: Indiana, Ohio
  - Climate
    - CPC coordination call
    - Youngstown State climate change coordination call
    - Ohio River Basin Climate Change Pilot Project coordination calls & presentations
    - Climate presentation made at 2013 Kentuckiana Crop Production Seminar
    - Climate presentation made at 2013 Indiana Certified Crop Advisor Conference
  - Training and Outreach
    - Stiver School of Arts Career Day
    - Outreach presentation made at Wilmington High School
    - WFO Nashville program coordination call
    - WFO OHX coordination visit
    - WFO LMK coordination visit
    - Q3 Multi-Radar Multi-Sensor (MRMS) training
    - NOAA 14 Rainfall Atlas webinar
    - USGS Flow Network webinar
    - DHS Dam Safety Training

2nd Quarter FY2014

- **CHPS Innovations**
  - New Ohio River HEC-RAS Model implemented
  - USACE/LRD-LRL and OHRFC Community HEC-RAS meeting
  - Added lower Licking and Kentucky basins to Ohio River HEC-RAS model
  - Adding in new cross section and bathymetry data for lower Miami, lower Green, lower Wabash and Ohio River near Louisville for Ohio River HEC-RAs model
  - Began work in USGS FIM data to be pulled into the Ohio HEC-RAS model around Marietta, OH and for the lower Muskingum River basin from McConnellsville to Marietta, OH
  - Extended all of the historical traces used for AHPS long term out to 63 years and getting that data into the old ESPADP graphics package
  - Implemented the FEWS calibration package

- Put data sets together for calibrations such as evapotranspiration grids from STATGO/SSURGO to generate more consistent ET curves and observed data sets from USGS for calibration
- Obtained a FEWS RDHM adapter from OHD and working with Lee Cajina, Zhengtao Cui and Xiaoshen Li as a beta site for testing purposes to work out some issues with it
- Working on calibration of RDHM for gridded FFG
- Working on calibration of RDHM for gridded runoff project
- Implemented Basin Care-taker project to look at headwater runoff within SAC-SMA of CHPS
- Implemented MBRFC Rating software for use in tracking and pushing ratings to CHPS & NWSRFS
- Developed ratings software to pull ratings from USGS Ratings Depot daily
- Developed software to pull USGS Ohio River flows at Sardis & Shawneetown to improve river forecasting along the main-stem Ohio
- Implemented ability to view USGS Ohio River flows at Sardis & Shawneetown in AWIPS 2 & CHPS
- Adding in new cross section and bathymetry data for lower Miami, lower Green, lower Wabash and Ohio River near Louisville for Ohio River HEC-RAS model
- Began GraphGen implementation for MMEFS

- **Ensemble/Uncertainty Initiatives**
  - Re-implemented VAR in SSHP for ensemble forecasts in SSHP to converge to correct solution
  - Implemented KML for MMEFS per request of FEMA 5, First Energy and other users
  - Began work to use GraphGen for MMEFS graphics from CHPS
  - Provided West Virginia Silver Jackets with MMEFS training
  - Improved ensemble traces add to GIFTS
  - Began work to use GraphGen for MMEFS graphics from CHPS

- **Forcing Innovations/Initiatives**
  - NWA Webinar presented by OHRFC on multiple FFG method and coming up with a Best Guess FFG based on multiple methods
  - Implemented new dataset from Ohio STORMS
  - Added new CoCoRaHS sites
  - Implemented new unit hydrographs for ANTT1 and WBNT1 for SSHP for WFO Nashville
  - Provided USACE Buffalo with Grand River rainfall for July 2006 data project
  - Began issuing 06Z FFG
  - Added new features to the AWARE programs for situational awareness

- **Status of ongoing and new IWRSS innovations**:
  - Implemented LDM with NOAA GLERL on an experimental rainfall QC project in the Great Lakes
  - Set up transfer process within LDM with NOAA GLERL as the lead RFC on an experimental rainfall QC project in the Great Lakes. Transfer of rainfall MPE grids is starting
  - Work continues on USGS FIM data to be pulled into the Ohio HEC-RAS model around Marietta, OH and for the lower Muskingum River basin from McConnellsville to Marietta, OH

- **External engagement**
  - Routine flow forecast coordination calls w/ USACE LRD supporting Olmstead Lock & Dam Project
  - Routine USGS Midwest Water Resources Flood Science Technical Team Meeting and coordination
  - Partner Flood Coordination
    - Partner DSS flood briefing coordination calls
    - WFO Pittsburgh, WFO Charleston, USACE Pittsburgh, USACE Huntington, Pittsburgh Waterways, Huntington Waterways Ice Coordination Calls.
  - Silver Jackets Activities
    - Tennessee, West Virginia, Kentucky, Virginia, Indiana, Pennsylvania
  - WFIPP
    - Meetings and Tasks completed for WFIPP Verification and Evaluation Team
    - Meetings and Tasks completed for WFIPP Data Interoperability
  - Climate

        - Water Resources Outlook issued
        - CPC coordination call and climate outlook
        - Ohio Seed Growers Association Meeting and presentation
        - Ohio River Basin Climate Change Pilot Project coordination calls with USACE, Ohio EMA Flood Mitigation, and Ohio Department of Agriculture
        - Ohio River Basin Climate Change Pilot Project coordination call and review of ODOT climate change plan for adaptation and planning – climate resiliency plan
        - Provided USACE LRE Detroit with location & 6 month QPF climate outlooks for modeling
    - Training and Outreach
        - Dayton STEM
        - Chemical spill WV; coordination & velocity forecasts w/ ORSANCO, EPA & USACE
        - Interview with TWC on chemical spill in WV impacting Ohio River
        - WFO Nashville hydrology program coordination call
        - EPA Green Initiative
        - FEWS training
        - Miami Conservancy District Coordination Meeting at MCD.
        - SAC-HTET training
    - Lead office for the Mississippi Drainage Spring Flood Outlook for WFOs and Partners
    - Ohio Valley Tri-Agency Meeting with USGS, USACE and NWS
    - NWS-USACE-USGS River Forecasters Summit in New Orleans
    - Presented Ohio River Basin Climate Change Project at Ohio River Sanitation Commission Meeting
    - Dayton Tech Fest booth with 5000 people in attendance
    - City of Columbus Flood Forecasting Improvement Coordination call
    - Ohio University students and professors visited OHRFC

FY2014 AHPS Activities for ABRFC

Management Lead: HIC, DOH, SCH

Objective: Implement AHPS services in the Arkansas-Red River Forecast Center's area of responsibility.

Milestones:

FY14 Planned New Service Locations

Area of Service (River Basin)	# New Locations	Location Names (LIDs)	Service Type Provided *see list below	Planned Completion Quarter	Completion Quarter	Notes
	0					

*****Service Types available: Probabilistic on AHPS web, SSHP-SAC, SSHP-API, Flood Inundation Mapping, Water Resources on Western Water web page, Probabilistic displayed only on RFC web page, Probabilistic delivered directly to partner (not on any web page)

AHPS Service Location Summary

Time Frame	Probabilistic AHPS Web	Site Specific (SAC)	Site Specific (API)	Forecast Inundation Map	Water Resources Sites on W. Water Web Page	Probabilistic RFC Web Only	Other	Number Unique Locations
Q1	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Q2	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Q3								
Q4								
Total FY13								
Overall Total (FY2000-2014)								

Accomplishments/Actions:

2nd Quarter FY2014

CHPS Innovations

- Added correlation plots for 9 more locations.
- Added one new forecast point (site specific) (RCDK1) into CHPS.

Ensemble/Uncertainty Initiatives

- Setup HEFS (EnsPost) for all forecasts groups in the ABRFC area.
- Sending 123 daily HEFS forecasts to the AHPSdev server.
- Started using HEFS forecasts for 4 of the ABRFC water supply points.

Forcing innovations

- None

Status of ongoing and new IWRSS innovations

- None

Significant external engagement

January

- Gave operations briefing to USACE-Little Rock District visitor
- Participated in CR-SR QPF Optimization for River Forecasts briefing to OHD
- A group of seven ABRFC persons attended a joint meeting with USACE-Tulsa District and Bureau of Reclamation at USBR facility in Oklahoma City
- Bekki Harjo participated in Science Olympiad in Ponca City, OK
- Several persons sat in on the two day TriAgency web meetings
- Several persons participated in call with RFCs and USACE about the Statement of Works for the USACE Mississippi River and Tribs Flowline Research Project

February

- Bekki Harjo participated in Science Olympiad at Casady School
- Successfully completed RFC portion of HSA transfer of Franklin County AR from LZK to TSA
- Held preliminary meeting on potential WFO-RFC Open House
- James Paul participated in SR NWS tabletop discussion about Oklahoma state agency support
- James Paul gave presentation during CR Mississippi River Spring Flood Outlook call for NWS field offices
- James Paul gave presentation during CR Mississippi River Spring Flood Outlook call for federal partners
- James Paul and Tony Anderson participated in joint NWS, USGS and Oklahoma Scenic Rivers Commission meeting at USGS office to discuss Illinois River forecast support
- Jeff McMurphy participated in USBR Wichita Mountains Wildlife Refuge tabletop exercise in Lawton, OK
- Jeff McMurphy participated in USBR Altus-Lugert tabletop exercise in Altus, OK

March

- Bekki Harjo participated in Science Olympiad State Finals at University of Central Oklahoma
- James Paul gave presentation during CR Mississippi River Spring Flood Outlook call for NWS field offices
- James Paul gave presentation during CR Mississippi River Spring Flood Outlook call for federal partners
- James Paul and Bill Lawrence gave RFC presentation and met with staff at WFO OUN
- Bill Lawrence gave lecture to University of Oklahoma hydrometeorology class in Norman
- James Paul participated in NOAA-NWS webinar about National Spring Flood Outlook
- James Paul gave weather presentation to 100+ fifth graders at Wolf Creek Elementary School in Broken Arrow, OK
- Bill Lawrence hosted a visit from a University of Oklahoma meteorology student at the RFC
- Bill Lawrence performed an interview with local FOX 23 new station about river flooding for Severe weather week.
- The staff issued numerous special posts on Facebook as well as our web page for Flood Safety Awareness Week.

FY2014 AHPS Activities for LMRFC

Management Lead: Suzanne Van Cooten, HIC

Objective: Implement AHPS services in the Tennessee River, Black, and Pascagoula Basins of the Lower Mississippi River Forecast Center's area of responsibility.

Milestones:

FY14 Planned New Service Locations

Area of Service (River Basin)	# New Locations	Location Names (LIDs)	Service Type Provided *see list below	Planned Completion Quarter	Actual Completion Quarter	Notes
Spring	1	HDYA4	Prob. AHPS	Q1	Q1	
Watauga	1	WTGT1	Prob. AHPS	Q2	Q1	
Hiawassee	1	CHAN7	Prob. AHPS	Q3		**
Duck	1	NRMT1	Prob. AHPS	Q4	Q2	
Bayou Des Cannes	1	BDCL1	Prob. AHPS	Q4		
Okatibee	1	MRDM6	Prob. AHPS	Unplanned	Q1	
Ocoee	1	CPHT1	Prob. AHPS	Unplanned	Q2	

*****Service Types available: Probabilistic on AHPS web (Prob. AHPS), SSHP-SAC, SSHP-API, Flood Inundation Mapping (FIM), Water Resources on Western Water web page (WR/WW), Probabilistic displayed only on RFC web page(Prob. RFC), Probabilistic delivered directly to partner (not on any web page)

**Reservoir implementations may be modified due to FY14 staffing and work load constraints.

AHPS Service Location Summary

Time Frame	Probabilistic AHPS Web	Site Specific (SAC)	Site Specific (API)	Flood Inundation Map	Water Resources Sites on W. Water Web Page	Probabilistic RFC Web Only	Other	Number Unique Locations
FY14 Q1	3							
FY14 Q2	2							
FY14 Q3	1							
FY14 Q4	1							
Total FY14	7	0	0	0	0	0	0	
Overall Total (FY2000-2014)	247	24	4	7	0	0	0	262

Accomplishments/Actions:

2nd Quarter FY2014

CHPS Innovations

- On-going discussions with the Tennessee Valley Authority (TVA) on their transition to CHPS and future collaborations with modeling, calibration and development. Extensive effort to coordinate hydrologic data collaboration efforts between TVA and LMRFC.
- Katelyn Costanza continues development of a Delft 3-D model for the Pascagoula river system to evaluate feasibility for implementation into operations using CHPS adapter.
- Katelyn Costanza implementing surge ensemble forecasts within CHPS environment for the Mississippi River and coastal river forecasts.

Forcing innovations

Status of ongoing and new IWRSS innovations:

- Continue discussions with NASA Stennis, NGI, and affiliated groups for coastal total water level prediction collaboration with LMRFC.
- Continue on-going decision support service development for excessive rainfall events, including partnership with NSSL and LMRFC WFOs.
- Continue collaboration with OHD on Distributed Hydrologic Model Threshold Frequency project for the LMRFC area. DHMTF running in real-time with an evaluation phase with WFOs LCH, JAN, SGF, MEG and RNK.
- Continue discussions with New Orleans Corps on water monitoring and hardening of gages. (HSDRRS)
- LMRFC provided feedback on guidelines for AHPS Flood Inundation Mapping requirements.
- LMRFC continues participation on the WFIPP RFC Backup, Data Archive, and Modeling Testbed teams.
- Scott Lincoln hosted Flash Flood local Techniques Symposium to better enable WFO situational awareness for pending late January flood event
- Submitted LMRFC calibration assistance needs for FY14 SOW
- LMRFC assisted with the transfer of Atchafalaya forecast points from LIX to LCH and OHX-MEG County HAS Transfer.

Significant external engagement

- Suzanne Van Cooten continues collaboration and coordination with Northern Gulf Institute partners including LSU and Mississippi State University to leverage expertise in hydrologic and hydrodynamic modeling.
- February 10, LMRFC staff members met with Emad Habib at ULL.
- February 13, Louisiana Governor's Office of Homeland Security and Emergency Preparedness representatives toured LMRFC.
- February 18, LMRFC participated in TN tabletop exercise.
- February 18-29, Louis Uccellini toured LMRFC operations and met with academia to explore options available for LMRFC future and location.
- February 19, Ehab Meselhe toured LMRFC operations.
- February 19, LMRFC participated in AL tabletop exercise.
- February 25-26, David Welch and Katelyn Costanza participated in LSU's ADCIR/CERA Workshop along with Derek Giardino, WGRFC.
- February 26-27, Suzanne Van Cooten participated in the 2014 Gulf Coastal Management and NERR Workshop and provided LMRFC tour to participants.
- March 25, Suzanne Van Cooten and Jeff Graschel presented at GOHSEP Springflood Outlook Meeting.

- March 31, LMRFC participated in MS tabletop exercise.
- Scott Lincoln presenting at the Iowa NWA Severe Storms Doppler Radar Conference.
- Scott Lincoln and David Scholtzhauer partnering with NGI and UAS to develop research project for potential summer student volunteers.
- Social Media Services team implemented educational modules focused on improving LMRFC customer social media awareness during high impact events, in particular Flood Safety Awareness Week modules.
- Collaborated with USACE New Orleans District and WFO LCH for proposed changes to flood stages and subsequent impacts for Atchafalaya Basin.
- Attended meetings/conference calls with Mississippi, Georgia, Virginia, and Tennessee Silver Jackets and Camo Jackets programs.
- Continued collaboration with representatives from the St. Tammany Parish Engineering Department along with the Navy Research Laboratory's Lead ADCIRC/Hydraulic Modeler about a united, collaborative effort to develop a hydraulic model for the lower Pearl River, North shore of Lake Pontchartrain, and coastal communities impacted by storm surge. Discussions include augmenting real-time data gauging network to improve WFO and RFC situational awareness.
- Continued collaboration with USACE New Orleans District, NOS, and Levee Boards to develop a prioritized list of locations for hardened gauge locations to collect meteorological and water level observations in the New Orleans and Lake Pontchartrain/Rigolets area.
- Continued collaboration with USACE and USGS to develop and implement New Orleans Tri-Agency meeting agenda and associated table top exercise to better analyze data availability and sharing needs during high impact events, such as significant tropical flooding.
- LMRFC staff participated in NWS/COE forecasters meeting in New Orleans to discuss synergies as well as issues with recent high impact events on the Mississippi River.
- LMRFC staff continues discussion on Mississippi River and Tributary Flowline Research Project with USACE.

FY2014 AHPS Activities for SERFC

Management Lead: HIC, DOH, SCH

Objective: Implement AHPS services in the Southeast River Forecast Center's area of responsibility.

Milestones:

FY14 Planned New Service Locations

Area of Service (River Basin)	# New Locations	Location Names (LIDs)	Service Type Provided *see list below	Planned Completion Quarter	Completion Quarter	Notes
	0					

*****Service Types available: Probabilistic on AHPS web, SSHP-SAC, SSHP-API, Flood Inundation Mapping, Water Resources on Western Water web page, Probabilistic displayed only on RFC web page, Probabilistic delivered directly to partner (not on any web page)

AHPS Service Location Summary

Time Frame	Probabilistic AHPS Web	Site Specific (SAC)	Site Specific (API)	Forecast Inundation Map	Water Resources Sites on W. Water Web Page	Probabilistic RFC Web Only	Other	Number Unique Locations
Q1	0	0	0	0	0	0	0	0
Q2	0	0	0	0	0	0	0	0
Q3								
Q4								
Total FY14								
Overall Total (FY2000-2014)	269							

Accomplishments/Actions:

2nd Quarter FY2014

CHPS Innovations

- Mark Love has finished work on graphics to replace the ones created by arcgis. They are available now.

Ensemble/Uncertainty Initiatives

- Jeff Dobur continues working to make ESP an automated process within CHPS. In addition, we continue to try to produce Historical traces in CHPS using ESP. This has proved elusive to us. We will continue to work on a solution.

Forcing innovations

Status of ongoing and new IWRSS innovations

Significant external engagement

- Had virtual meeting with Florida customers and partners. This included each of the Florida Water Management Districts, USGS, Corps of Engineers, Jacksonville and the WFOs.
- Participated in Alabama and Mississippi decision support call hosted by the SR ROC;
- Visit from Holly Bramford from NOS during the AMS conference held In Atlanta. Also hosted Louis Uccellini during that week also. Had forecasters from WFO Morehead City visit.

FY2014 AHPS Activities for WGRFC

Management Lead: Gregory Shelton

Objective: Implement AHPS services in the West Gulf River Forecast Center's area of responsibility.

Milestones:

FY14 Planned New Service Locations

Area of Service (River Basin)	# New Locations	Location Names (LIDs)	Service Type Provided *see list below	Planned Completion Quarter	Completion Quarter	Notes
Nueces River	21	BTVT2 BKST2 FRRT2 CNCT2 RWDT2 SABT2 SCRT2 KWHT2 ULRT2 TNLT2 MYAT2 UVAT2 UVLT2 ASRT2 COTT2 TILT2 UDET2 DBYT2 TIDT2 WTTT2 THET2	Prob. AHPS		Q4	
Rio Grande	2	PRST2 CBBT2	FIMapping		Q4	

*****Service Types available: Probabilistic on AHPS web, SSHP-SAC, SSHP-API, Flood Inundation Mapping, Water Resources on Western Water web page, Probabilistic displayed only on RFC web page, Probabilistic delivered directly to partner (not on any web page)

AHPS Service Location Summary

Time Frame	Probabilistic AHPS Web	Site Specific (SAC)	Site Specific (API)	Forecast Inundation Map	Water Resources Sites on W. Water Web Page	Probabilistic RFC Web Only	Other	Number Unique Locations
FY14 Q1	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
FY14 Q2	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
FY14 Q3								
FY14 Q4								
Total FY14								
Overall Total (FY2000-2014)								

Accomplishments/Actions:

2nd Quarter FY2014

CHPS Innovations

- Uploaded HEC-RAS coastal model to the CHPS 789 development server for testing.
- Wrote software to create CHPS standalone calibration configurations from operational CHPS configuration files.
- Installed CHPS standalone calibration configuration and began testing as a calibration tool.

Ensemble/Uncertainty Initiatives

Forcing innovations

- Created a standalone and populated with hourly MPE grids from 2000-current. Configured to “cookie cut” and export MAPX data for calibration sites.
- Reformatted monthly PE grids from RDHM and imported into CHPS. Created spatial and temporal interpolation transformations to create historical PE timeseries for calibration and historical runs.
- Coded “OFS type” MAT and MAP transformations in CHPS. Currently testing in a standalone.
- Wrote software to convert A2 MPE/DQC scalar temperature and precipitation grid files into esriascii format for import into CHPS.

Status of ongoing and new IWRSS innovations

- WGRFC completed final QA/QC and worked with WFO CRP and external partners to advertise implementation of FIM library at CBBT2. Scheduled deployment is April 21, 2014.
- WGRFC worked with WFOs MAF and SJT, IBWC, and contractors to revise FIM library for PRST2. Additional minor work is ongoing. Expected implementation is Q4

Significant external engagement

- WGRFC provided basin-specific climate outlooks for the Brazos River basin to USACE, SWPA, and BRA on 2/27/2014. The purpose of this outlook was to assist in water management and project rehabilitation decisions
- WGRFC provided basin-specific climate outlooks for the Neches River basin to USACE, SWPA, and LVNA on 3/4/2014. The purpose of this briefing was to assist in water management decisions.

- WGRFC continues to provide event-based briefing emails and graphics to partners during significant hydromet events in the WGRFC region.

FY2014 AHPS Activities for CBRFC

Management Lead: Michelle Stokes**,** HIC; John Lhotak, DOH; Kevin Werner SCH

Objective: Implement AHPS services in the Colorado Basin River Forecast Center's area of responsibility.

Milestones:

FY14 Planned New Service Locations

Area of Service (River Basin)	# New Locations	Location Names (LIDs)	Service Type Provided *see list below	Planned Completion Quarter	Completion Quarter	Notes

*****Service Types available: Probabilistic on AHPS web, SSHP-SAC, SSHP-API, Flood Inundation Mapping, Water Resources on Western Water web page, Probabilistic displayed only on RFC web page, Probabilistic delivered directly to partner (not on any web page)

AHPS Service Location Summary

Time Frame	Probabilistic AHPS Web	Site Specific (SAC)	Site Specific (API)	Forecast Inundation Map	Water Resources Sites on W. Water Web Page	Probabilistic RFC Web Only	Other	Number Unique Locations
Q1								
Q2								
Q3								
Q4								
Total FY14								
Overall Total (FY2000-2014)	84	0	0	0	149	7		

Accomplishments/Actions (*on each of the following topics that apply*):

1st Quarter FY2014

- **CHPS Innovations**

- Continue testing of HEFS in CHPS.
- Began collaboration with Utah State University to investigate using the Utah Energy Balance snow model in CHPS.

- **Ensemble/Uncertainty Initiatives**
  - HEFS is now set up throughout the Upper Colorado and Great Basins, for a total of 331 locations. We still need to set up HEFS in the lower Colorado Basin (128 locations). We are producing evaluation statistics that we need to analyze before we start using HEFS.
  - Continue developing verification statistics for Schaake post adjustment and enspost techniques.
  - Continue work with University of Massachusetts (SARP funded) to develop a decision making tool for Public Utilities using ESP and HEFS. Partners in this project include Pacificorps and Salt Lake Public Utility.

- **Forcing innovations**
  - Continue work with NASA JPL to ingest MODIS snow cover grids to use in making operational decisions (inform hydrologist when making adjustments to snow states in the model). Year 1 of the project has been completed. We are now entering the next phase of the project, which includes more analysis of the snow grids, further integration and testing with operational forecast, and model development.

- **Status of ongoing and new IWRSS innovations:**
  - Continue work with USBR which uses ESP output as input to their reservoir model. This new reservoir model is the MTOM (mid term operations model) and is being run in parallel with their legacy model, the 24 months study.

- **Significant external engagement**
  - Participated in the AGU (3 presentations and 1 poster by 3 staff members of the CBRFC).
  - Webinars to brief stakeholders on water supply forecasts, and performance of last year's forecasts.
  - Developing a drought workshop in February in collaboration with NIDIS and Metropolitan Water.

2nd Quarter FY2014

- **CHPS Innovations**
  - Continue testing of HEFS in CHPS.
  - Continue collaboration with Utah State University to investigate using the Utah Energy Balance snow model within CHPS.

- **Ensemble/Uncertainty Initiatives**
  - Implemented EnsPost.
  - Wrapped up work with University of Massachusetts (SARP funded) to develop a decision making tool for Public Utilities using ESP and HEFS.

- **Forcing innovations**

- **Status of ongoing and new IWRSS innovations:**

- **Significant external engagement**
  - CBRFC 4th annual stakeholder meeting.
  - CBRFC Drought meeting in collaboration with NIDIS and USBR.
  - Monthly webinars to brief stakeholders on water supply and peak flow forecasts.

FY2014 AHPS Activities for CNRFC

Management Lead: Alan Haynes (acting)**,** HIC; Art Henkel, DOH; Alan Haynes SCH

Objective: Implement AHPS services in the California-Nevada River Forecast Center's area of responsibility.

Milestones:

FY14 Planned New Service Locations

Area of Service (River Basin)	# New Locations	Location Names (LIDs)	Service Type Provided *see list below	Planned Completion Quarter	Completion Quarter	Notes

*****Service Types available: Probabilistic on AHPS web, SSHP-SAC, SSHP-API, Flood Inundation Mapping, Water Resources on Western Water web page, Probabilistic displayed only on RFC web page, Probabilistic delivered directly to partner (not on any web page)

AHPS Service Location Summary

Time Frame	Probabilistic AHPS Web	Site Specific (SAC)	Site Specific (API)	Forecast Inundation Map	Water Resources Sites on W. Water Web Page	Probabilistic RFC Web Only	Other	Number Unique Locations
Q1	0	0	0	0	0	0	0	0
Q2	0	0	0	0	0	0	0	0
Q3	0	0	0	0	0	0	0	0
Q4	0	0	0	0	0	0	0	0
Total FY14	0	0	0	0	0	0	0	0
Overall Total (FY2000-2014)	46	0	0	0	33	94	10	183

Accomplishments/Actions (*on each of the following topics that apply*):

1st Quarter FY2014

- **CHPS Innovations**
- **Ensemble/Uncertainty Initiatives**
- **Forcing innovations**
- **Status of ongoing and new IWRSS innovations**
- **Significant external engagement**

2nd Quarter FY2014

- **CHPS Innovations**

- **Ensemble/Uncertainty Initiatives**
- **Forcing innovations**
- **Status of ongoing and new IWRSS innovations**
- **Significant external engagement**

3rd Quarter FY2014

- **CHPS Innovations**
- **Ensemble/Uncertainty Initiatives**
- **Basin recalibration**

4nd Quarter FY2014

- **CHPS Innovations**
- **Ensemble/Uncertainty Initiatives**
- **HEFS V1.0 implementation**
- **Basin recalibration / implementation**

FY2014 AHPS Activities for NWRFC

Management Lead: Harold Opitz**,** HIC; Andy Wood, DOH; Joe Intermill SCH

Objective: Implement AHPS services in the Northwest River Forecast Center's area of responsibility.

Milestones:

FY14 Planned New Service Locations

Area of Service (River Basin)	# New Locations	Location Names (LIDs)	Service Type Provided *see list below	Planned Completion Quarter	Completion Quarter	Notes

*****Service Types available: Probabilistic on AHPS web, SSHP-SAC, SSHP-API, Flood Inundation Mapping, Water Resources on Western Water web page, Probabilistic displayed only on RFC web page, Probabilistic delivered directly to partner (not on any web page)

AHPS Service Location Summary

Time Frame	Probabilistic AHPS Web	Site Specific (SAC)	Site Specific (API)	Forecast Inundation Map	Water Resources Sites on W. Water Web Page	Probabilistic RFC Web Only	Other	Number Unique Locations
Q1	0	0	0	0	0	0	0	0
Q2	0	0	0	0	0	0	0	0
Q3	0	0	0	0	0	0	0	0
Q4	0	0	0	0	0	0	0	0
Total FY14	0	0	0	0	0	0	0	0
Overall Total (FY2000-2014)	142	0	0	1	105	20	0	0

Accomplishments/Actions (*on each of the following topics that apply*):

1st Quarter FY2014

- **CHPS Innovations**
- **Ensemble/Uncertainty Initiatives**
- **Forcing innovations**
- **Status of ongoing and new IWRSS innovations**
- **Significant external engagement**

2nd Quarter FY2014

- **CHPS Innovations**

- **Ensemble/Uncertainty Initiatives**
- **Forcing innovations**
- **Status of ongoing and new IWRSS innovations**
- **Significant external engagement**

3rd Quarter FY2014

- **CHPS Innovations**
- **Ensemble/Uncertainty Initiatives**
- **Forcing innovations**
- **Status of ongoing and new IWRSS innovations**
- **Significant external engagement**

4th Quarter FY2014

- **CHPS Innovations**
- **Ensemble/Uncertainty Initiatives**
- **Forcing innovations**
- **Status of ongoing and new IWRSS innovations**
- **Significant external engagement**

Outreach and Training

AHPS FY14 Hydrology Program Outreach & Training Work Plan

Theme: Hydrologic Services Outreach

Management Lead: Mary Mullusky, Katie Garrett, Regional Hydrologic Services Program Representatives

Objectives: Accomplish outreach and training efforts with national, regional, and local partners and customers with emphasis on locations where AHPS or water resource services are being or will soon be implemented. Develop clear and consistent outreach and training materials for use by national, regional, and local personnel.

Milestones

Tasks	Org	Cost ($1000)	Quarter Due Date	Status
Outreach Planned for Regional and National Levels (see breakdown below)	HQ/ER/SR/WR/AR/CR	100	4	In progress
Outreach Subtotal		**100**		
Training Officer for the National Water Center	OCWWS/OHD	135	4	In progress
Training Subtotal		135		
AHPS Total		**235**		
Headquarters (HSD)				
ASFPM Booth and Travel	HQ	5	Q3	In progress
Fusion Team Meeting	HQ	3	Q4	In progress
CR HSD Team Member Travel to HQs	HQ	3	Q3	In progress
Additional Travel in support of AHPS Outreach	HQ	11	Q4	TBD
Outreach Sub Total	HQ	**22**		
Training Officer for the National Water Center				
Training Sub Total	HQ	**135**		
HQ Total		**157**		
Eastern Region				
NJ EM Conference (ER HSD); Atlantic City, NJ		0.7	Q3	
ASFPM Annual National Conference (BTV); Location: Seattle WA		3.0	Q3	
RFC/HPM Workshop (NERFC & WFOs); Location: Taunton, MA		3.0	Q3	
HEPEX Conference (MARFC); Location: College Park, MD		0.3	Q3	
RFC/HPM Workshop (ER HSD); Location: Slidell, LA		1.8	Q4	
2014 Flood Risk Management Workshop (ER HSD); Location: Southbridge, MA		0.7	Q4	
Fusion Team Meeting (ER HSD); Location: Kansas City, MO		1.5	Q4	
Outreach Sub Total	ER	**11**		
2014 FFaIR Experiment (HMT – WPC) College Park, MD	WFO GYX	1.8	Q3	
HEC Training Hydrologic Engineering Center Davis, CA	OHRFC	2.0	Q4	
Technical Writing Training	OHRFC	1.2	Q4	
Training Sub Total	ER	**5**		
ER Total		**16**		
Southern Region				

ABRFC – Outreach Trip to WFOs Location: Springfield, MO, Topeka, KS, and Wichita, KS	SR	.950	Q4	In progress
ABRFC – Outreach Trip to WFO/COE Location: Little Rock, AR	SR	.600	Q4	In progress
ABRFC – Outreach Trip to WFOs Location: Lubbock, TX, Amarillo, TX, and Albuquerque, NM	SR	.700	Q4	In progress
LMRFC – Outreach Trip to TVA/Eastern Tennessee River Basins Location: Knoxville, TN	SR	1.900	Q4	In progress
SERFC – Interagency Meeting for Southeast US Location: TBD	SR	.500	Q4	In progress
SERFC – Outreach Trip to WFO/University of Alabama – Huntsville Location: Huntsville, AL	SR	.300	Q4	In progress
SERFC – Outreach Trip to WFO/COE Location: Melbourne, FL	SR	.700	Q4	In progress
WGRFC – Rio Grande Spring Snowmelt Meeting Location: Albuquerque, NM	SR	.750	Q3	In progress
WGRFC – IBWC Annual Meeting Location: El Paso, TX	SR	.650	Q3	In progress
WGRFC – IBWC Annual Flood Workshops Location: Cities throughout Rio Grande Basin	SR	.585	Q3	In progress
WGRFC – AHPS Outreach/Training to WFO/Partners Location: New Braunfels, TX, Corpus Christi, TX, and Brownsville, TX	SR	.650	Q4	In progress
HSB – ASFPM Conference Participation (Greg Shelton – WGRFC) Location: Seattle, WA	SR	2.500	Q3	In progress
HSB – WFO AHPS Program Support	SR	.215	Q4	In progress
HSB – Southern Region HAS Workshop	SR	5.000	Q4	In progress
Outreach Sub Total	SR	**16**		
No Localized Training Activities Planned Using AHPS Funds				
Training Sub Total	SR	**0**		
SR Total		**16**		
Western Region				
WFO Glasgow - SOO travel to MBRFC. The WFO plans to send their SOO for a familiarization trip, during which the plan is to learn about the forecast challenges at the RFC for the Milk River. The visit will allow the WFO to better understand the RFC forecast process and limitations and improve communication of the forecast uncertainty to their partners and general public. The WFO is also interested in running CHPS at the WFO at some point in the future (FY15 possible) and this should also assist with that activity. This item will be cost shared with the WFO.	WR	650	Q3	In progress
WFO Oxnard - hydrology outreach magnets. The magnets will include the LOX web page and social media contacts and will feature an image of flooding that has taken place in the LOX Hydrologic Service Area. The magnets will be used to promote the NWS hydrologic products and services for LOX. ~2000 magnets will be produced.	WR	600	Q4	In progress
WFO Tucson – TADD magnets. The WFO will purchase a large quantity of 2500 magnets. The magnets will be used at outreach events and will be shared with the other 2 WFOs in Arizona.	WR	700	Q4	In progress
WFO Great Falls – Project WET Kids Activity Booklets. These are 16-page high quality booklets created by a WMO team. The booklets will be used for school aged children outreach and education about hydrology and flooding.	WR	800	Q4	In progress
WFO Great Falls – Staff Hydrologic Service Area familiarization trip. The trip would include the SSH and two forecasters.	WR	470	Q4	In progress
WFO Flagstaff – Floodplain Simulation Model. Will allow the WFO to bring the mode to outreach events and educational talks. This item will be cost shared with the WFO.	WR	1000	Q4	In progress

WFO Reno – Floodplain Simulation Model. Will allow the WFO to bring the mode to outreach events and educational talks. This item will be cost shared with the WFO.	WR	1000	Q4	In progress
WFO San Diego – TADD signs (fixed locations). WFO San Diego has been the most active WFO in WR engaging their partners on TADD signs. The WFO has installed several signs during FY13 and have a large backlog of TADD needed sign locations spanning several future years. The interest in TADD signs from their counties has been enormous.	WR	550	Q4	In progress
WFO Portland - TADD signs (fixed locations and mobile signs). Recent flooding has allowed the WFO to gather interest in TADD for the first time.	WR	500	Q4	In progress
WFO Las Vegas – ALERT radios and Handar. This will allow the WFO to improve their reception of Clark County Flood Control Data. In addition to receiving data for the WFO and RFC to use, better radios will help the WFO potentially serve as a backup for ALERT data collection for the county. The WFO and the county flood control have a very good working relationship.	WR	700	Q4	In progress
WFO Seattle – SSH is attending ASFPM Conference. The SSH is assisting Mark Walton with the demonstration of the floodplain model. The SSH will also help staff the One NOAA Booth.	WR	850	Q3	In progress
WFO Spokane – SH is attending ASFPM Conference. The SH is active with the local chapter and can benefit from attending the national conference.	WR	1863	Q3	In progress
WFO Pendleton – TADD signs. Recent flooding has allowed the WFO to gather increased interest in TADD.	WR	300	Q4	In progress
WFO Monterey – Survey and field equipment (purchased from a GSA vendor). This equipment will help the SH set flood stages and impacts at AHPS locations, improve the quality of WFO E-19 reports, and assist with field work related to spinning up local modeling locations. This item will be cost shared with the WFO.	WR	1000	Q4	In progress
NWRFC – CHPS Calibration Workshop for RFC WFOs. WFOs will learn how to calibrate model locations in CHPS. This item will be a cost share with the WFOs that decide to attend the workshop.	WR	5000	Q4	In progress
Outreach Sub Total	WR	**16**		
No Localized Training Activities Planned Using AHPS Funds				
Training Sub Total	WR	**0**		
WR Total		**16**		
Alaska/Pacific Regions				
Send additional staff to HEFS training	AR	2.1	4	In progress
Outreach trip to Fairbanks by SCH	AR	1.3	4	In progress
ADCP Fieldwork Training trip(s) with Fairbanks SSH Ed Plumb	AR	5.0	4	In progress
ASFPM Travel to Seattle (Celine)	AR	2.0	3	In progress
Bring Hydrologist from NWRFC to Anchorage for CHPS Training	AR	1.5	3	In progress
Senior Hydrologist to Juneau to train staff and SSH Aaron Jacobs on Automated Wire Weight gages and to install gage on Indian River in Sitka	AR	2.0	3	In progress
Outreach trip to Soldotna for Kenai Flood Aware Fair	AR	0.1	3	In progress
Sub Total	AR	14.0		
No Localized Training Activities Planned Using AHPS Funds				
Training Sub Total	AR	**0**		
AR/PR Total		**14**		
Central Region				
MBRFC WFO visits to BIS/ABR/UNR	CR	1.64	Q4	In progress
MBRFC WFO visits to LSX/SGF	CR	0.95	Q4	In progress
MBRFC WFO visits to BYZ/TFX/GCW	CR	1.9	Q4	In progress
MBRFC attend USACE Coop Stream gauge meeting	CR	0.41	Q4	In progress
NCRFC WFO visits to LSX/PAH and USACE in St. Louis	CR	1.3	Q4	In progress
NCRFC WFO visit to MKX/IWX/GRR	CR	0.75	Q4	In progress
NCRFC WFO visit to FGF	CR	0.75	Q4	In progress

NCRFC WFO visit to GRB and Univ. of Wisconsin Green Bay Earth Science Dept	CR	1.0	Q4	In progress
CRH – Kris Lander to ASFPM	CR	2.3	Q3	In progress
WFO staff visit MBRFC and NCRFC for RFC Familiarization Workshops	CR	5.0	Q4	In progress
Outreach Sub Total	CR	**16**		
No Localized Training Activities Planned Using AHPS Funds				
Training Sub Total	CR	**0**		
CR Total		**16**		

Accomplishments/Actions

1st Quarter FY14

- The RFC Calibration Training virtual workshop was completed in December, 2013.

2nd Quarter FY14

3rd Quarter FY14

4th Quarter FY14

Problems Encountered/Issues

1st Quarter FY14

- Due to on-going budget constraints Simulation Training has been put on-hold indefinitely.

2nd Quarter FY14

3rd Quarter FY14

4th Quarter FY14

Program Management

Program Management

Theme: Program Management

Management Lead: Donna Page

Objective: Provide national program management; coordinate and track AHPS budgets and project plans; manage AHPS contracts; and foster Agency, Departmental, and Legislative Interface.

Milestones

Tasks/Subtask FY14 Milestones	Responsible	FY14 Completion Date
Annual Operation Plans	OHD	
• AOP Development	OHD	
• Finalize OHD AOP items	OHD	Feb. 21, 2014
• OHD Portfolio Definition	OHD	Q3
OHD Reporting		
• Monthly OHD Management Reports and Top 5 Issues	OHD	2nd Monday of the Month
• Monthly AOP Milestone Status Updates	OHD	2nd Monday of the Month
• Monthly AOP Status Update of Top 10 (NWC item)	OHD	2nd Monday of the Month
• Quarterly Program Reviews (AHPS and NWC)	OHD	Feb. 12-13, April 22-23, July 22-23, Oct. 21-22
AHPS Planning/ Execution/ Reporting		
• E-CPIC Updates	OHD	Quarterly
• Quarterly Status Report	OHD/Regions	Quarterly
NOAA SEE Hydrology Program Support		
• Program Operating Plan	OHD	3rd
• Quarterly Program Review	OHD	Quarterly
Agency/ Department/ Legislative Interfaces		
• Budget Fact Sheet	OHD	1st
• Prepare and submit Budget Request	OHD	2nd
• Prepare Briefings and Support OMB/Congressional Meetings	OHD	3rd
• Prepare Response to Pass Back	OHD	3rd
• Prepare Response to Budget Hearing Questions	OHD	4th
NWS Requirements and Development Processes		
• NWS requirements process meetings	OHD	TBD
• AWIPS SREC	OHD	Biweekly

Accomplishments/Actions

1st Quarter FY13

- All milestones are on schedule – all scheduled reports completed
- Congress passed a Continuing Resolution (CR) to last until March 27, 2013. Funding severely limited through the CR period.
- OHD consolidated most of their operations to the 8th floor of SSMC2. Only maintain small part of AWIPS testbed area on 7th floor.
  - All AHPS project management is being handled by government FTE - Quarterly AHPS reports are being compiled by Dennis Miller. Other reporting handled by other government FTE.

2nd Quarter FY13

- All milestones are on schedule – all scheduled reports completed

- The FY13 Continuing Resolution (CR) was in place until final CR was passed for remaining of FY13 (March 26). Funding severely limited through the CR period.
- OHD worked on reconciling property inventory (completed) and excessing property from the remaining 7th floor store room.
  - All AHPS project management is being handled by government FTE - Quarterly AHPS reports are being compiled by Dennis Miller. Other reporting handled by other government FTE.
  - OHD starting to work with teams focused on restructuring of NWS budget into 5 main activities (Observations; Central Processing; Analyze, Forecast, Support; Dissemination; Science and Technology Integration)

3rd Quarter FY13

- First installment of AHPS funding was received in Q3. Spend plan was developed for "regular" AHPS funding. Plan for the "plus up" funds will be finalized in Q4 when funds are available.
- Reduced projected number of AHPS locations from 379 to 85 for FY13. That was all the RFCs committed to for FY13.
- Gathered feedback on Water Resources Forecast Improvement Preparatory Project report. Began working on team charters and soliciting interest in the teams from Region, HIC and HQ management staff.
- National Water Center staffing and operations plan (report to Congress) drafted and sent to NWS
- All other scheduled reports completed.

4th Quarter FY13

- All AHPS funding was received. Plans were put in place and executed for "regular" and "plus up" AHPS funding.
- Completed target number of 85 AHPS locations for FY13. End of FY13 total is 3343 AHPS locations.
- Coordinated with CFO on plans for remaining 668 locations. Committed to complete 167/year for next 4 years (FY14-FY17).
- Chartered 5 WFIPP teams (RFC Archive, Evaluation and Verification, Modeling Testbed, Integrated Information, and RFC Service Backup). Teams started work in September and will report out in January 2014.
- National Water Center staffing and operations plan (report to Congress) cleared NWS, NOAA, DOC, OMB.
- All other scheduled reports completed.

1st Quarter FY14

- Most of OHD was furloughed for the duration of the 17-day partial government shutdown.
- New Acting OHD Director, Rob Hartman (HIC CNRFC) started on Oct. 21

2nd Quarter FY14

- National Water Center (NWC) was accepted by NOAA for beneficial occupancy on Feb. 14. All required service contracts were put in place.
- Provided Quarterly Program Review of 1st quarter for AHPS and NWC on Feb. 19.
- OHD and HSD representatives worked with the PPA teams to provide input for the April FY15 Annual Operating Plan meetings
- The 5 WFIPP Requirements Teams completed their reports by the March 31.

Problems Encountered/Issues

1st Quarter FY13

- NOAA dealing with effects of operating under a CR and the threat of sequestration. Funding allocation to OHD has been greatly reduced to a little more than labor. There are no AHPS funds allotted in Q1.

2nd Quarter FY13

- NOAA still dealing with effects of operating under a CR and the threat of sequestration. Funding allocation to OHD has been greatly reduced to a little more than labor. There were no AHPS

funds allotted in Q1 or Q2.

3rd Quarter FY13

- Some contracting delays.

4th Quarter FY13

- Planning for potential shutdown.

1st Quarter FY14

- Government shutdown delayed work
- Work stopped on new Hydro Science IDIQ contract due to protest

2nd Quarter FY14

- Work remains stopped on Hydro Science IDIQ