

Confluence

NWS Hydrology Program News

Issue #7

May 2014

Headwaters

Rob Hartman

Welcome to the Confluence! They tell me that our efforts to keep everyone in our program informed have gotten a bit verbose. As such, I'm hoping you find clean and concise articles in this issue that help you stay informed without getting bogged down in the details.

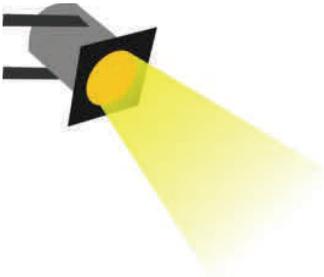
In February, NOAA accepted "beneficial occupancy" of the National Water Center in Tuscaloosa, AL. Work is currently underway to prepare the facility for staff. A great deal of effort has been required to identify the needed resources, gain approval for a staffing and functional plan, and actually getting started. And

we're not finished... OHD has committed to establishing Initial Operating Capability (IOC) by the Spring of 2015. IOC includes roughly 45 individuals and promises limited capability associated with developing the foundation of NWC functions and services. In a related effort, I want to extend my gratitude to the Water Forecast Improvement Preparatory Project (WFIPP) teams that completed their requirements documents in the last month. This has really been a program effort that has touched and demanded a lot from many of you.

I'm very much looking forward to the HPRC Workshop at the National Water Center in May. It's very clear to me that we need to come together as a "water enterprise" if we're going to meet our challenges and efficiently deliver the service our customers need and will need in the near future. Significant changes are coming. It's our joint responsibility to ensure that they result in positive outcomes for our customers.

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Project Spotlight: Flood Losses in FY2013

Roham Abtahi, OCWWS Hydrologic Services Division

Direct flood damages during Water Year 2013 (October 1, 2012 – September 30, 2013) totaled \$2.15 billion, 27% of the thirty-year average (1983 – 2012) of \$7.98 billion (adjusted to 2013 inflation). There were 69 flood-related deaths (78% of the 30-year average of 89). Of these fatalities, 25 were vehicle-related incidents, and 53 were attributed to flash flood events.

Water Year 2013 surpassed 2012 damage totals four-fold, but remains well below the 30 year average. A strong convective Spring 2013 season brought heavy rainfall and flooding to the Midwest from April 15-19 and to Oklahoma City, Oklahoma on May 31st. The heavy rainfall across the Midwest from Iowa to Michigan and extending eastward through Indiana, Ohio and Kentucky caused significant flood damages particularly in Illinois. These Midwest floods resulted in four fatalities and caused \$465 million in direct damages. On May 31, severe thunderstorms and heavy rainfall across Oklahoma City, Oklahoma, caused 13 flash flood fatalities. September monsoonal moisture produced prolonged periods of heavy rainfall, resulting in devastating flash floods and floods along the Colorado Front Range from September 11-17th. These floods resulted in 9 fatalities and \$715 million in damages.

Other significant Water Year 2013 flood loss events include the January 10, 2013 flood in Southwest Louisiana, which produced \$238 million in damages and the August 6-10, 2013 flooding in Missouri, which caused 3 fatalities and \$77 million in damages.

In years past, land falling hurricanes and tropical storms contributed significantly to the United States Flood Loss Report. In Water Year 2013, Hurricane Sandy was the only hurricane to make landfall in the United States. The impacts to life and property from Hurricane Sandy were immense, however, these impacts were primarily from storm surge and therefore not included in this report. The annual United States Flood Loss Report estimates direct damages from freshwater flooding only; it does not include storm surge or coastal flooding. For an analysis of the impacts of Hurricane Sandy see the *National Hurricane Center Tropical Cyclone Report, Hurricane Sandy*.¹

¹ Eric S. Blake, Todd B. Kimberlain, Robert J. Berg, John P. Cangialosi and John L. Beven II. "Tropical Cyclone Report Hurricane Sandy (AL182012) 22 – 29 October 2012" National Hurricane Center, 12 February 2013. Available from <http://www.nhc.noaa.gov/data/>

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Silver Fire Burn Scar Support

Tim Brice, WFO El Paso

On June 7, 2013, a lightning strike in the Black Mountain Range of southwestern New Mexico started a wildfire that would burn for the next month and half, blackening almost 140,000 acres in the process. Even before the fire was fully contained, the NWS El Paso office began to spin-up a plan to provide hydrologic support for the communities below the burn scar.

During the summer monsoon season (June 15-Sept 30), the Black Mountain Range is a favored location for almost-daily thunderstorm development. NWS El Paso forecasters came up to speed quickly on “problem” basins and towns that were in these basins. Leading up to the onset of the summer monsoon, NWS El Paso staff worked with local, state



and federal agencies to help the local communities prepare for the inevitable, upcoming flooding. 1st, the first flash flood warning was issued for a part of the burn scar in accordance with very low flash flood guidance values for the impacted basins that had been set by the NWS El Paso staff. Many times it took less than 0.50 inch of rain to cause significant runoff down one of the burned-over creek basins. Using the knowledge of the specific creek basins, NWS El Paso forecasters were able to give very precise, “basin-tailored” flash flood warnings for localized events.

By the end of September, a total of 43 flash flood warnings were issued that were directly related to the burn scar. In an average year the NWS El Paso office issues around 29 flash flood warnings for their entire HSA. Due in part to close collaboration with local, state and federal agencies before the onset of flooding, no loss of life and only minor property damage was associated with the Silver Fire burn scar during the 2013 monsoon season.



Silver Fire burn perimeter is in red. Burned over basins are in yellow. The Grant - Sierra county line between is the green line in the middle.

A Perspective on the California Drought from the California Nevada River Forecast Center

Alan Haynes, CNRFC Service Coordination Hydrologist

California is experiencing its third dry year in a row and drought conditions have brought national attention to the state. In January of 2014, facing depleted reservoirs, an almost non-existent snowpack in the Sierra Nevada Mountains, and the driest January to December (2013) on record, California's Governor declared a drought emergency, calling on Californians to cut water use by 20 percent. Additionally, it was announced that no water would be delivered to farmers through the [State Water Project](#) (SWP) and the [Central Valley Project](#) (CVP), an unprecedented event.

The Mediterranean climate of California means wet winters and dry summers, with much year to year variability in annual precipitation totals. Winter snowfall accumulation in the Sierras contributes substantial runoff in the spring and early summer, virtually serving as the state's largest reservoir, storing an average of 15 million acre-ft of water each year. This melting snow helps to recharge large reservoirs just as irrigation and electricity demand picks up and it helps to provide a store of cold water for fisheries management.

Forecasts from the California Nevada River Forecast Center (CNRFC) in Sacramento are being used to help water managers. In addition to routine daily river forecasts, probabilistic forecasts are proving especially useful this year. For example, probabilistic seasonal volume forecasts for reservoir inflows are being closely watched on a daily basis. These



Folsom Lake taken from Mormon Island Dam on Jan. 17th, 2014. Lake elev: 359.3 ft, storage ~170,000 acre-ft. (Photo courtesy of Dan Kozlowski)

forecasts take into account short-term weather forecasts, which can impact the volume forecasts. Also, low flow threshold exceedances can be computed for unregulated rivers to help determine potential impacts to endangered and threatened fish species.

Although water supply has improved since January, the vulnerability of California to drought and the value of daily water resources forecasts as demonstrated by their current use each serve to reinforce the importance of furthering development of the National Weather Service's capabilities in this area.



Asset Management – Annual Refresh and Budget Allocation Best Practices

Jim Rawls, OHD IT Manager

In our last issue, I discussed Asset Management, and characterized it as “The Backbone of IT Service Management.” So why? Simply put; the pure materials side must be in place to accommodate whatever level of IT is required to deliver and support a customer base. So we buy hardware, software, and purchase warranties that are annual recurring costs.

Years ago we might pay \$3000 for a single desktop computer, and today a much more capable computer costs \$1000. As a result, we get more capability at a lower cost.

Correctly set schedules for technical refreshes, or Life Cycle Management (LCM), is a subcomponent of Asset Management. A normal refresh schedule is 4 years for desktops and 6 years for servers. Though the numbers are more complicated and directly related the workforce. At Headquarters we have a group of what I call Corporate Users, and they require simple processing software and an Internet connection to perform the jobs. There is another group comprised of network administrators, software developers and testers that significant processing capabilities and a computer system that can truly multi-task. This group requires access to both Linux and Windows desktops from a single system, so virtualization and remote access is a necessity. They perform more compute and hard disk activities to put wear on the hardware. Two or three widescreen monitors are the normal configuration for our power users and I get them at less than \$200 per monitor. So based on the numbers, I can outfit a power user at about \$1500 for a very capable Windows or Linux desktop. If we get three years of heavy use out of it, that’s the lifecycle.

I refresh one third of power user desktop each year. Budget allocations for IT rarely remain that steady, or flat, over time, so in years where the budget is good I will purchase more than required to get through the years with lower and limited budgets for IT spending. I called that “The Good Years and Bad Ones” a few issues ago. It’s just reality from an IT Manager’s perspective. And wearing our hardware from heavy use is a good return on investment. Thoughts from all of you are welcome and appreciated!

Information Technology Corner



Retirements and New Hires

Central Region

After nearly 24 years of Federal service, Richard F. Sloan, Service Hydrologist at WFO Dodge City, Kansas, will retire in



May 2014. Rick joined the National Weather Service in 1990 as a Hydrologist at the Arkansas-Red River Basin River Forecast Center, and four years later moved across the hall to become Service Hydrologist at WFO Tulsa, Oklahoma.

Since 1996, Rick has been in Dodge City, providing hydrologic support for both WFO Dodge City and WFO Goodland. In addition to his work on the High Plains, Rick provided hydrologic decision support for both the catastrophic flooding in Des Moines in 2008 and record flooding in northeast Nebraska in 2010. Rick also served as webmaster at WFO Dodge City.

Rick's extensive knowledge of stream behavior in the High Plains and his expertise in many areas, including GIS, programming and data management, and negotiation for the good of WFO employees will be sorely missed.

Michael Wieland, Hydro Focal Point from WFO Cheyenne, retired in January 2014.



Mark Walton, Service Hydrologist at WFO Grand Rapids, has decided to retire in May 2014.

Mark is widely recognized as an outstanding Service Hydrologist. At first glance, one might attribute the praise to his deep background and hydrological expertise or to his one of a kind hands-on Flood Plain Model, but while true that's not quite it. Mark's reputation stems from his 30 years of exemplary customer service. Through his outreach efforts, he's been modeling Weather Ready Nation standards for preparedness, recruiting WRN Ambassadors, and providing on-site impact decision supports services through the balance of his career. While Mark is retiring from the NWS in May, his passion and servant leadership will no doubt continue. Good Luck Mark! And Thank You!!



Alaska Region

Welcome! Benjamin Crane Johnson has a B.S. in Civil Engineering from the University of Alaska Fairbanks (1998) and an M.S. in Civil Engineering from the University of Calgary (2001). He worked for

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the UAF Water and Environmental Research Center from 1997-2002 on several hydrologic research projects across Alaska. He worked as a Hydraulic Engineer for the past eight years with the US Army Corps of Engineers Alaska District with a focus on flood forecasting, dam safety, open water hydraulics and flood inundation. In addition, Crane designed an inexpensive, Iridium-based, bridge-mounted river gage. APRFC will be installing ten of these this year.

Welcome! Edward “Ted” Moran earned his Master’s degrees in Environmental Science from Alaska Pacific University. He worked nearly thirteen years with the USGS in Anchorage, Alaska, and the Columbia Environmental Research Center (CERC) in Columbia, Missouri. His career includes work with Ground and Surface Water Interaction modeling, Geospatial Analysis, including imagery and satellite data, Water Quantity and Quality data collection and analysis, GPS and Conventional Land and Bathymetric Surveying, and development of a Precipitation-Runoff and Water-Temperature model for a Regional Climate Analysis of the Missouri River Basin from its headwaters to its confluence with the Mississippi River.

Jim Coe came to APRFC as a Hydrologist in July 2003. He was promoted to Senior Hydrologist at APRFC in early 2009, and continued in that position until his retirement on July 31, 2013. This capped an extensive career that included service in the Corps of Engineers and several NWS offices, including Lower Mississippi River Forecast Center. Jim moved to Seattle in August 2013. APRFC learned on January 2, 2014 that he had died on New Year’s Day.

Jeff Perry served at Kodiak WSO and Anchorage WFO before being selected as the Senior Hydro-meteorological Analysis and Support Forecaster in 1995. Jeff served in this role until he was selected for the new IT Specialist position at the RFC at the end of 2011. He played a critical role in the migration of APRFC to AWIPS and then AWIPS2, and in the evolution of HAS forecasting operations to support the Community Hydrologic Prediction System (CHPS). His passing on January 5th leaves an enormous gap in Alaska Region, as well as in the lives of his wife (Becky Perry, our APRFC Hydrotech) and his co-workers.

Eastern Region

Joe Palko received an award from the Coast Guard today at the Waterways meeting. It was presented by the Coast Guard Commander for Joe's DSS efforts during this winter's significant river ice problems.

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**Retirements and New Hires** *(Continued from page 7)***Western Region**

Kevin Werner has moved on from his position as Service Coordination Hydrologist at the Colorado Basin River Forecast Center to take on the position of Western Regional Climate Services Director (RCSD). He'll be moving to Seattle, WA, from where he will support the eight most western states by delivering climate science and information services. He will be sorely missed at the CBRFC, where he was instrumental in developing strong ties to our

stakeholders, and moving the hydrology program forward in tandem with our major stakeholders. We wish him luck, and look forward to working with him in his new position.

Southern Region

Long-time WFO Brownsville, TX employee and staff favorite Alfredo "Fred" Vega retired on January 1, 2014 after 41 years of federal service. A native of Los Fresnos, TX, Fred began his career in the US Air Force in September 1970. After military duty, Fred joined the WFO Brownsville staff in May 1974. Later, Fred went on to work at the Hondo NWS office, Cold Bay, AK, and Anchorage, AK offices. He returned to Brownsville in 1995, where he served as the hydrology, upper air, and Spanish program leader.



Fred was the recipient of numerous letters of appreciation and awards for superior performance; including the DOC bronze medal for superior support to Spanish speaking customers. Since his retirement, Fred is enjoying spending quality time with his family on his "mini-ranch" in Los Fresnos, right down the street from his childhood home.

Office of Hydrologic Development

OHD said farewell to two long time employees this winter. Dr. Victor Koren's career with OHD as a Research Hydrologist spanned over 20 years, adding to his 30 years of hydrologic research in Russia. Dr. Koren was responsible for many advances in the NWS hydrology program, including modifications to the Noah land surface model, development of the HL-RDHM distributed model, adding physics-based components to the Sacramento soil moisture model, new techniques for parameter estimation and calibration, and many others.

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Retirements and New Hires *(Continued from page 8)*

Dr. John Ingram also retired, after 15 years at OHD and 35 years of total federal service. John was instrumental in building the Advanced Hydrologic Prediction Service and was its first program manager. He led OHD's activities within the PPBES and SEE budget processes, managed OHD's contract actions, and represented NOAA on the Committee on Environment, Natural Resources, and Sustainability (CENRS), Subcommittee on Water Availability and Quality (SWAQ).

CHPS Bits: News and Updates on the Community Hydrologic Prediction System

Jon Roe, OHD Hydrologic Software Engineering Branch

For more than two years OCWWS/HSD and OHD have pursued a path to move CHPS off OHD-provided prototype hardware servers and on to AWIPS-provided operational servers. This long effort is now bearing fruit in 2014. In spring 2014 the AWIPS River Ensemble Processor servers (RPs) are being refreshed with new hardware in such a way as to move operational execution of CHPS onto those refreshed servers. Four RFCs will participate in an NWS Operational Test and Evaluation (OT&E) of the new RPs executing CHPS during April and May. During summer 2014 the other nine RFCs will receive their new RPs and will move CHPS operations to them. This is a complex process requiring highly coordinated resources from OCWWS/HSD, OHD, OS&T, OOS, and the RFCs.



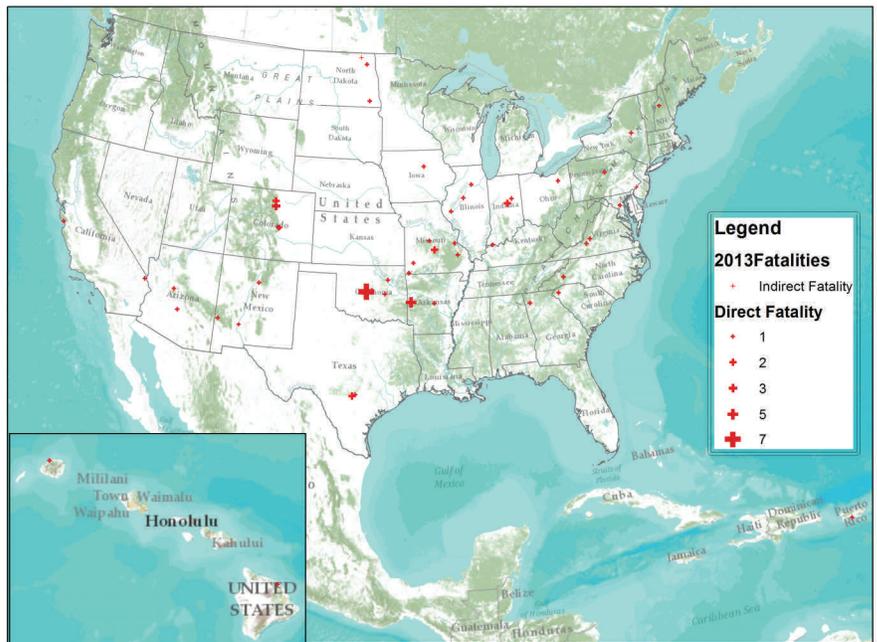
In November 2013 OHD (via OCWWS/HSD) distributed the final release of CHPS outside of AWIPS processes, that being CHPS-4.0.1. The refreshed RPs will be delivered to the RFCs this spring and summer with a slightly updated version of CHPS, CHPS-4.1.1, that has a few minor updates to the OHD-CORE software mainly targeted at the Graphics Generator.

OHD has recently started planning the release of CHPS-5.0.1 which will be staged in the AWIPS software baseline Configuration Management system and released through AWIPS processes. Details about CHPS-5.0.1 contents will be discussed in the next Confluence.

Project Spotlight (Continued from page 2)

This report provides a summary of direct flood damages, which account for damage to (a) private property, including structural damage and lost agriculture; and (b) public infrastructure and facilities. Flood loss estimates reported by other entities, such as media, insurance, or other governmental agencies often include additional indirect flood-related costs such as (a) mitigation costs (e.g., sandbagging, temporary levees, and temporary shelters); and (b) projected estimates of economic loss (e.g., disruption to planting and harvesting, lost wages, disruption to transportation, interruption to commerce due to closed facilities, and reduction in tourism). Typically, flood loss estimates inclusive of indirect costs are much larger than the direct flood damage estimates reported here.

The Flood Loss Report is published annual and provided the US. Army Corp of Engineers. It is available online at: <http://www.nws.noaa.gov/hic/index.shtml>.



2013 Flood-Related Fatalities

Upcoming Events:

May: HPRC Meeting - NWC Tuscaloosa, AL

June: HEPEX Conference - NCWCP College Park, MD

September: Flash Flood Summit - NWC Tuscaloosa, AL