

Confluence

NWS Hydrology Program News

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Headwaters

Rob Hartman



For eight months, ending in mid-June 2014, I had the honor and pleasure of being the Acting Director of the Office of Hydrologic Development. After eighteen years as the HIC of the CNRFC, I was ready for a (temporary) change of scenery and a fresh challenge. In addition, I'd never worked in NWS Headquarters and figured it would be a good "growth" experience. After returning to my position in Sacramento and the space of one month, here are my thoughts on the experience.

Headquarters is not an easy place to work. The pace is crazy, and urgent problems and issues seem to arise constantly. Don Cline described it to me as "working in a wind tunnel with flying

debris." That's not a bad description. Some of the difficulty probably had to do with the timing, although it could be argued that it's always difficult. The trifecta of (1) spinning up the National Water Center, (2) transitioning to a new NWS portfolio-based budget structure, and (3) a NWS Headquarters Reorganization is very challenging. All of that is on top of what OHD and OCWWS/HSD is trying to do to deliver capability, capacity, and coordination for our program. Oh, and the OHD Director (and many others) have scores of other responsibilities and tasks associated with NWS initiatives and just running the agency. For me, it was really interesting and appealing to be a recognized component of the agency's work and decision making process. I very much enjoyed the work and the folks in headquarters made me feel welcome and valued.

The one thing I valued the most from my experience was getting to know and work with so many great people. If you don't already know, there are a bunch of talented, dedicated, and genuinely nice people in OHD, OCWWS/HSD, NWS Leadership, and throughout NWS Headquarters and NCEP. I knew

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many of the people in OHD and OCWS/HSD (and others), but it was great working with them on a daily basis over a period of months. It was also great getting to know and work with NWS Senior Leadership. I miss that daily interaction already.

I'm finding it very interesting that in the space of only one month, I feel I've lost a measurable amount of connectedness with what's going on in OHD and NWS Headquarters. For me, this clearly shows how difficult it is for us (OHD, OCWS/HSD, Regions, and RFCs) to be connected, to communicate and to function as a cohesive program. This is a challenge that's worth some serious thought and effort to resolve.

The NWS Hydrology Program is on the cusp of an unprecedented opportunity to revolutionize the way we do business, create information, and deliver service to our customers and partners. The effort before us will clearly require everyone's help. The very best way to be a part of the change is to get and stay involved by volunteering your time, energy, and experience. And, if you have the opportunity to come to Headquarters in either a temporary or permanent capacity, I recommend you jump at it. You won't regret it.

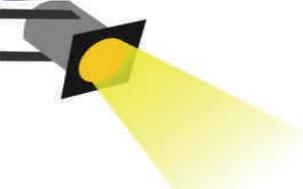
Personnel Changes at Southern Region Hydrologic Services Branch

Branch Chief - Tracy Clark

Tracy Clark has been hired as the new Southern Region Hydrologic Services Branch Chief and officially started in this capacity on June 1, 2014. Tracy has been serving as the acting Branch Chief since January 2013 and has worked as the Hydrologic Services Program Manager within the Hydrologic Service Branch since 2009. During this time, she has successfully advanced the NWS SR hydrology program through many challenges. Before this, she worked as a hydrologist at the WGRFC from 2002 through 2009 and ABRFC from 1998 to 2002. Prior to that, she was a student trainee at both the ABRFC and NCRFC.

Program Manager - Jason Johnson

Jason Johnson has been hired as the new Southern Region Hydrologic Services Program Manager and officially started in this capacity on July 14, 2014. Jason has a BS in Hydrology and Water Resources and a Masters in Business Administration. Before coming to the NWS he worked as a hydrologist in the private sector and also for the State of Texas. Jason's NWS experience began in February 2001, at the West Gulf River Forecast Center in Fort Worth, TX as a hydrologic forecaster. In 2002, Jason moved to the WFO ranks and became the first Service Hydrologist at WFO San Angelo, TX.

A graphic of a spotlight with a yellow beam of light shining downwards.

Project Spotlight: HPRC May Meeting

Mary Mullusky, OCWWS HSD and Donna Page, OHD

The Hydrology Program Review Committee (HPRC), made up of the NWS hydrologic service leads from each of the regions, Hydrologists-In-Charge from each of the 13 River Forecast Centers (RFC), Office of Hydrologic Development leaders, and Office of Climate, Water, and Weather Services Hydrologic Service Division leaders, held the inaugural meeting from May 13-16 at the new National Water Center (NWC) on the campus of the University of Alabama in Tuscaloosa. This meeting was an opportunity for everyone to reacquaint themselves, interact with the NWS Administrator and invited visitors, become familiar with the new NWC facility, and to get excited about the science prospects for the future. Welcoming remarks were provided by VADM Michael Devany (NOAA Deputy Undersecretary for Operations) and Dr. Joe Benson (University of Alabama Interim Provost). Dr. Louis Uccellini (NWS Director) then provided perspective on the NWS enterprise and the importance of water, charging participants with making the very most of the opportunities that the NWC represents.



The group was also addressed by representatives of key partner agencies (including the USGS, USACE and FEMA), who described their interest in a modernized NWS Hydrology Program and specifically working hand-in-hand at the NWC in the coming years. Key presentations describing potential future hydrologic science applications were also given by Dr. David Maidment, University of Texas at Austin, on “National Water Data Infrastructure”, Dr. David Gochis, NCAR, on “WRF-HYDRO”, Dr. Eric Wood, Princeton University, on “Hyper-resolution Hydrologic Modeling”, Dr. Reed Maxwell, Colorado School of Mines, on “High-resolution large-domain surface-groundwater modeling”, and Dr. Fred Ogden, University of Wyoming, on “Petascale computing for hydrologic modeling.”

During the next two days discussion topics included 1) the vision of the NWC, 2) water modeling and forecast improvement, 3) how the Hydrology Program can be effective within the new NWS budget structure and headquarter realignment, and 4) what is an optimal Hydrology program including roles and responsibilities and the organizational relationship between NWC, RFCs and WFOs. During smaller breakout discussions, members of the HPRC had an opportunity to truly experience the innovative working environment provided by the NWC. Open discussion areas replace typical meeting rooms. The ability to plug in to any open work station offered new opportunities for collaboration without having to take the time to set up a meeting or book a conference room. In addition to new partnership opportunities, the NWC ushers in a new type of work environment. As the first face-to-face meeting of the NWS Hydrology Program leadership in nearly 3 years, the workshop was critically important, especially in light of the emerging opportunities associated with the recently completed NWC in Tuscaloosa. The participants identified 23 action items and are committed to remaining connected and working together to achieve common goals. The next face-to-face meeting should take place in the November 2014 time frame.

NOAA's Integrated Dissemination Program (IDP) Delivering Dissemination Capabilities: Infrastructure, Networks and Geographic Information System Capabilities

Luis Cano, NOAA IDP Manager

The National Oceanic and Atmospheric Administration's (NOAA) Integrated Dissemination Program (IDP) is delivering enterprise operationally dissemination capabilities:

- Scalable, robust, secure, and 7x24x365 operational dissemination infrastructure at College Park, MD and Boulder, CO, to host existing and new dissemination systems;
- Resilient and high capacity network for National Weather Service (NWS) Field Offices and Centers, and increasing the Advanced Weather Interactive Processing System (AWIPS) Satellite Broadcast Network (SBN) from 30Mbps to ~70Mbps;
- Upgrading the NWS antennas & product generation for the Geostationary Operational Environmental Satellite R-Series (GOES-R) era; and
- Enterprise operational ESRI and Boundless (OpenGeo) Geographic Information System (GIS) capabilities on IDP operational dissemination infrastructure.

IDP's goal is to partner with NOAA/NWS teams to deliver capabilities for NOAA/NWS customers and partners. The Program's approach is to: (a) identify and migrate operational dissemination systems running on NWS Offices' end-of-life hardware and (b) delivery new dissemination capabilities through research-to-operations (R2O) transitions.

IDP uses balanced project management disciplines to



deliver projects on schedule and budget. Provided below are some of IDP's migration projects and capabilities being delivered.

- nowCOAST Migration: IDP is migrating NOAA's National Ocean Service's nowCOAST GIS Web Mapping Portal (<http://nowcoast.noaa.gov>) to the operational dissemination infrastructure. nowCOAST is presently operated by NOS' Office of Coast Survey in Silver Spring, MD, and provides users with near-real-time observations, imagery, forecasts, and warnings from across NOAA.
- Southern Region GIS services Migration: IDP is in the process of migrating Southern Region's GIS services to the operational dissemination infrastructure which will be completed by September 2014. Functionality being migrated include: Advanced Hydrologic Prediction Service (AHPS) gauges, Flood Outlook Product, Climate Prediction Center Weather Hazards, Quantitative Precipitation Forecasts, Watches/Warnings and Advisories, Weather Features, Radar (1x1 km base reflectivity), Hurricane tracks/wind/surge and Storm Prediction Center Outlooks.
- Meteorological Assimilation Data Ingest System (MADIS) Migration: IDP is migrating MADIS to the operational dissemination infrastructure. MADIS (<http://madis.noaa.gov>) leverages partnerships with international agencies; federal, state, and local agencies, universities, volunteer networks, and the

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private sector to integrate observations from their stations with those of NOAA to provide a finer density, higher frequency observational database.

- **Multi-Radar/Multi-Sensor System (MRMS) Migration:** IDP is migrating MRMS to the operational dissemination infrastructure which will be completed by September 2014. MRMS (<https://www.nssl.noaa.gov/projects/mrms>) is currently running experimentally at the NOAA National Severe Storms Laboratory and at the Federal Aviation Administration's (FAA's) William J. Hughes Technical Center.
- **NOAA Operational Model Archive and Distribution System (NOMADS), and Model Analysis and Guidance (MAG) Migrations:** IDP has migrated NOMADS (<http://nomads.ncep.noaa.gov>), FTPRD and MAG to the operational dissemination infrastructure. NOMADS disseminates the NCEP Model Products.

IDP is focused on addressing dissemination problems and providing dissemination capabilities to best serve our Field offices, customers and partners. Please contact Luis.Cano@noaa.gov for questions or how you can help to deliver critical dissemination capabilities.



IT Security Management – FISMA and OMB Compliance!

Jim Rawls, OHD IT Manager

The time is upon us to chat about the annual IT Security compliance activity, “Assessment and Authorization” (A&A), or what we still call Certification and Accreditation. Whether the activity is a full blown A&A on a new or significantly changed system or just the annual Continuous Monitoring (CM) assessment of security controls, both activities are labor intensive and are designed to quantify levels of risks within a defined Federal Information Security Management Act (FISMA) system boundary. These risks may be acceptable dependent of the risk appetite of an organization, though the norm is to develop plans of attack to decrease or mitigate the risk entirely.

Why do we perform these activities? The Office of Management and Budget mandates this through the Clinger-Cohen Act of 1996 and the FISMA of 2002. Federal government organizations must report information technology activities, including costs of labor, materials, facilities, and telecommunications that are required for the information technologies to act as a system. A system infers a boundary (network), and the consumption (ingest), manufacturing (processing), and transit (delivery) of information. In practice this simple inference is more complicated with multiple dependencies external to the process, which increase risks for the owner of the system. In the next article we'll continue this topic as the IT staff at Headquarters and

Chanhasen continue to work our way through our FY14 IT Security A&A.

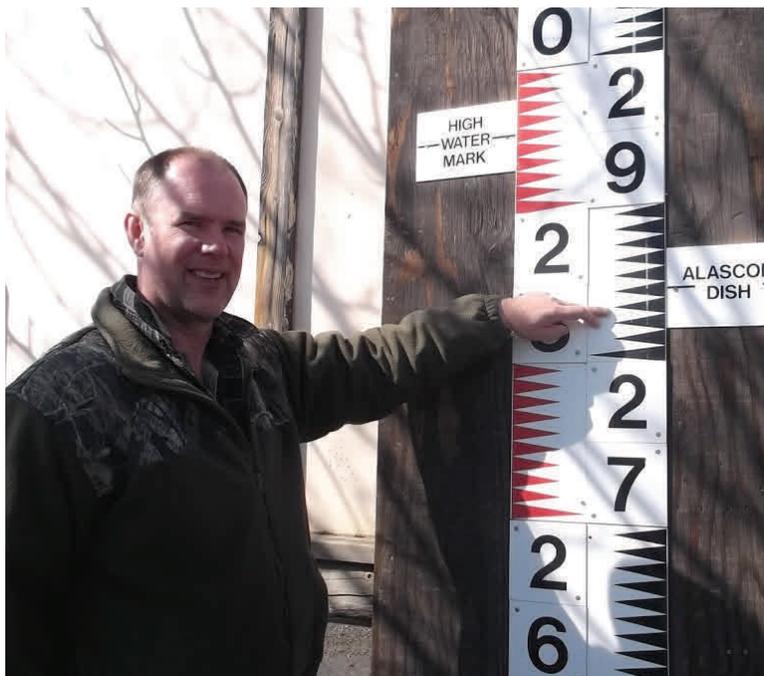
Information Technology Corner



Scott Lindsey Receives the 2014 Gregg B. Rishel Award

Scott Lindsey, Service Coordination Hydrologist at the Alaska-Pacific River Forecast Center (APRFC), has been named as the recipient of the 2014 Gregg B. Rishel Award. This award recognizes an individual for hydrologic science and/or service contributions which support the fulfillment of the hydrologic services mission of the NWS.

In his role as SCH, Scott has gone above and beyond to foster relationships with partners and has shown strong leadership in the implementation of decision support services. He led a regional team to develop operational staffing concepts for the Alaska Region that would help implement the NWS Weather Ready Nation initiative in Alaska. Scott also serves on the graduate student’s committee at the University of Alaska in Fairbanks and provides training and



mentoring in operational use of CHPS. He is working to develop a similar arrangement for a study at the Alaska Pacific University to explore potential alternate energy balance glacier models to incorporate into CHPS.



Scott has played an integral role in providing IDSS for several high impact flooding events, including the record-breaking 2009 and 2013 Yukon River floods. Leading up to the 2013 flood, Scott served as a subject matter expert on a committee called for by Senator Lisa Murkowski. This very visible public event heightened awareness of the dangers possible with the spring ice breakup and led to many riverside communities taking action to prepare for the spring floods.

Lori Schultz Receives 2013 Isaac Cline Award for Hydrology



Ms. Lori Schultz, Hydrologist at the Missouri Basin River Forecast Center (MBRFC), is the 2013 Isaac Cline Award winner in the Hydrology category. She received the award for her development of the first-ever operational hydraulic river forecasting model of the Missouri River. Thanks to Ms. Schultz' advancement, MBRFC forecasters are now able to objectively and scientifically account for the effects of levee failures and over-toppings in their Missouri River forecasts and to provide more accurate timing for water to reach elevations behind flooded levees and flood walls. In addition, the model allows prediction of the impacts of these levee failures and overtopping to downstream areas.

Several variations of the Missouri River hydraulic model were tried before the present, more

complicated model was developed. A little over two years of work was put into the final product with dynamically modeled levees and overbank storage. The model includes five dynamically modeled rivers, with over 700 miles of cross section's, federal and non-federal levees, and over 50 protected/overbank storage areas.

Ms. Schultz credits the help of the U.S. Army Corps of Engineers (USACE) Hydrologic Engineering Center for their advice; the USACE Kansas City District, for their levee database and geometry data assistance; and the NWS North Central River Forecast Center for the geometry of the Mississippi River and associated time series, for the success of this project. In addition, Mr. Gregg Schalk, Senior Hydrologist at MBRFC, transferred the finished model into CHPS, and overcame programmatic challenges that were new to CHPS.

Before working at MBRFC, Ms. Schultz was a forecaster at the Ohio River Forecast Center where she worked on dambreak models, FLDWAV and HEC-RAS models on the Ohio River, Monogahela River, Allegheny River, and Wabash River. She also served on the national Hydraulics Team.

Prior to working with the NWS, Ms Schultz worked at the USACE Mobile District, and in the private sector in geothermal water-quality testing. She graduated from California State University with degrees in Chemistry and Hydrology and minors in geology and math. Her favorite pastime is cave mapping in the Ozarks and all over the world.

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

Jon Roe, OHD Hydrologic Software Engineering Branch

Mark Glaudemnas, OCWWS Hydrologic Support Branch



The AWIPS RFC River Ensemble Processor (RP) replacement servers have been successfully deployed for operational use at six RFCs, with the remaining seven to be completed by mid-September 2014. So far, Alaska-Pacific, Arkansas-Red Basin, Lower Mississippi, Mid-Atlantic, Northwest, and Ohio are complete. This major deployment project involves the transfer of the CHPS from prototype servers to new virtualized AWIPS servers. This success is attributed to the efforts of many parties, including OCWWS, which provided the technical design, OHD, OST, OOS, the AWIPS contractor, and the RFCs.

This deployment establishes CHPS as a national NWS baseline system. It will lower costs by reducing the IT "footprint" for RFC forecast operations from nine to three servers, while at the same time increasing sustainability and support. Incorporation of CHPS hardware into the baseline ensures that the NWS AWIPS infrastructure can properly support the hardware systems. It also expands RFC processing capabilities by adding a new, third RP server to the baseline. This improves model development and testing needs of RFCs. A notable decrease in run-time of models has been seen, due in part to the use of the virtualized solution.

Upcoming Events:

August: Silver Jackets Workshop - Southbridge, MA

September: Central Region Hydro Program Manager Workshop

September: CHPS Workshop - NWSTC Kansas City, MO

September: Flash Flood Summit - NWC Tuscaloosa, AL