

STAKEHOLDER ENGAGEMENT TO INFORM NATIONAL WATER CENTER PRODUCTS AND SERVICES

Iowa Stakeholder Engagement Forum

Waterloo, Iowa August 10, 2017

Welcoming Remarks: Lorie Glover, Black Hawk County Emergency Management Agency
Ms. Glover welcomed stakeholders to the Black Hawk County Emergency Management Agency (BHCEMA).

Opening Presentation on Stakeholder Engagement to Inform Hydrologic Prediction Services: Mary Mullusky and Peter Colohan, NOAA National Weather Service (NWS)

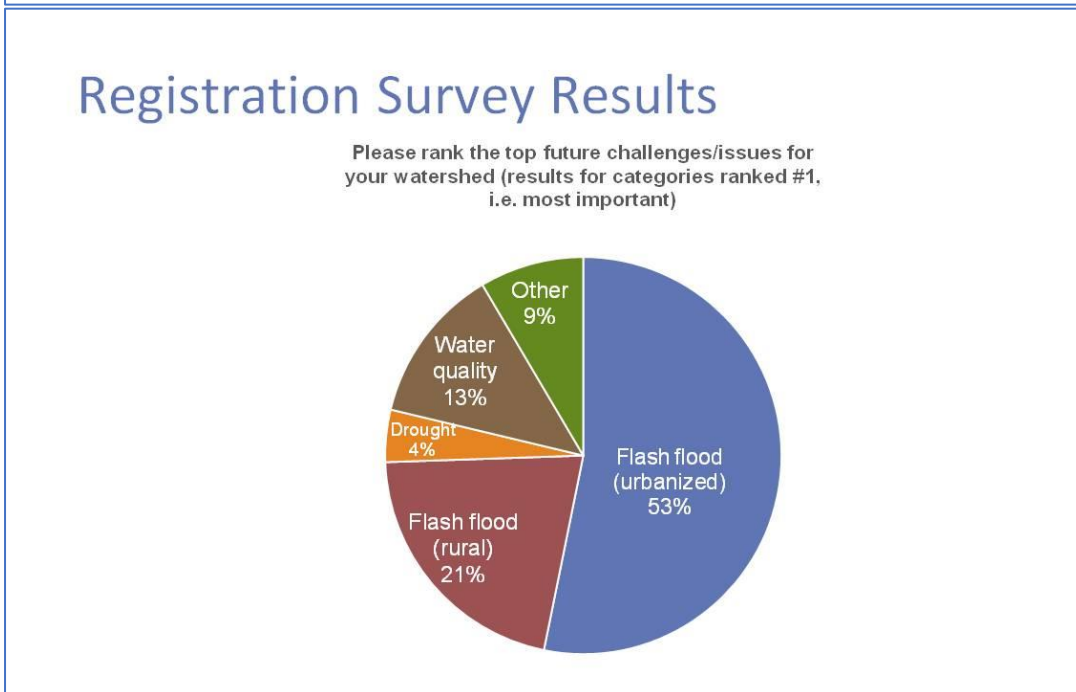
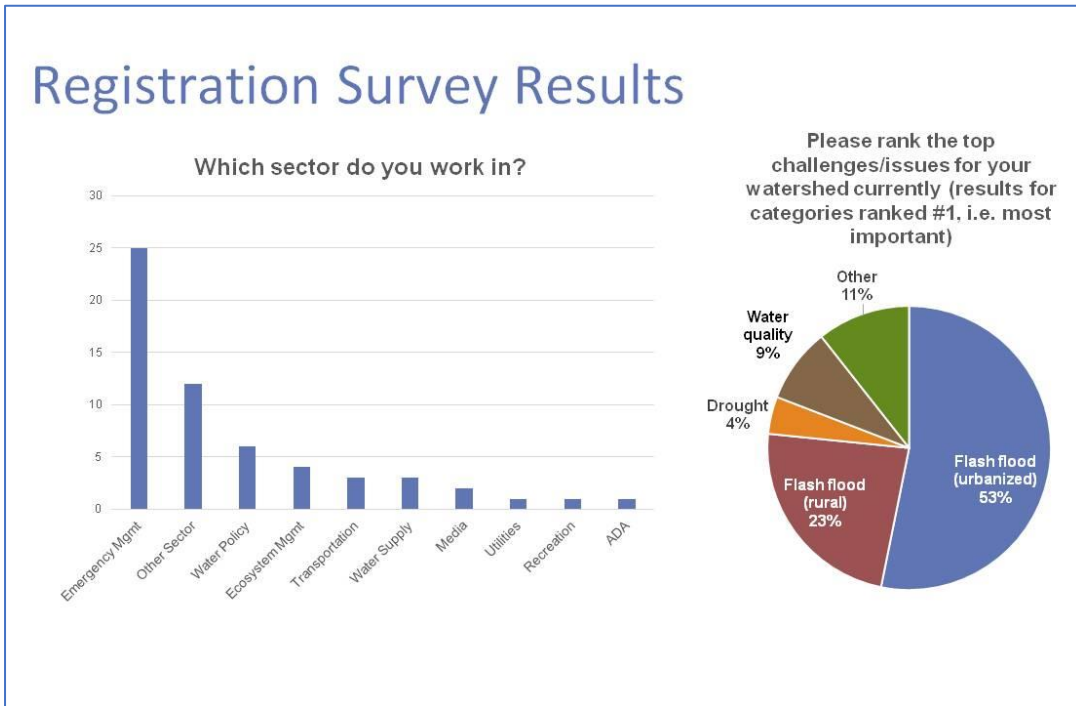


Comments/Questions on the NOAA Water Initiative and National Water Center (NWC)

- Can the National Water Model predict peak discharges for non-gaged streams?
 - Yes, in areas that are un-regulated, the NWM is predictive in un-gaged areas.
 - The NWM is available at: www.water.noaa.gov. The goal of the NWM is to provide provisional data. It needs to be refined based on local conditions.
 - The NWM will not replace local observations, the official River Forecasting Center (RFC) forecast, local hydrologic and hydraulic (H&H) mapping, etc.

State/Local Priority Issues Session – Registration Survey Results

Arleen O'Donnell presented results of the participant poll, which characterized the sectors represented at the meeting and their perspectives and priority challenges, both currently and in the future.



Panel Discussion - Moderated by Jeff Zogg, NWS Senior Hydrologist

Keith Morgan, Emergency Manager, Story County – Local perspective

Two rivers converge in the Ames Basin, the Skunk River and Squaw Creek. Flash floods in Ames often disconnect parts of the City, cutting off access between emergency shelters, fire and rescue, and other emergency response operations. Mr. Morgan reiterated that Ames Water Works, the NWS, and Story County Emergency Management Agency (EMA) work collaboratively during flash flooding situations. Urbanized flooding is a key concern.

Mr. Morgan discussed damages from a 2016 flood event in Ames and provided an overview of the City's response to the flood and reflections on solutions and strategies for improving flood resilience and response in the future.

- Develop a better understanding of basement flooding. Following the flood, residents were asked to report basement flooding – often an unseen impact from urban flooding.
- Assess which roads normally flood so that in future storms, the EMA can examine those areas first and inform the public about dangerous conditions, if necessary.
- Recognize that rural flash flooding also occurs.
- Collaborate with the NWS to analyze previous rainfall events, their timeline, river levels – and comparison to NWS predictions.
- Continue to collaborate with the NWS and floodplain managers.

Bill Cuppuccio, Iowa DNR – State perspective

Mr. Cuppuccio discussed flood issues in Iowa, while recognizing that drought is also an issue in many parts of the state. He noted that flood “season” has changed, and floods occur more frequently. The new normal is more frequent, intense storms.

- Floodplain management is becoming more complex with 100-year storms occurring more frequently, making design of flood protection infrastructure more challenging.
- Iowa's digital flood maps are available nearly statewide, providing both frequencies and depth grids. However, there is still not enough information on local inundation mapping when events occur in real time.
- Recent floods produced extremely intense rainfall, and Iowa has very little monitoring along some tributaries. Iowa DNR is trying to figure out how to better monitor those “blind spots” through a variety of steps:
 - The Iowa Flood Center (IFC) is helping to fill data gaps.
 - Inundation mapping isn't as good as U.S. Geological Survey (USGS) gage data.
 - NWS Staff Representative, Jessica Brooks is helping Iowa by trying to leverage Federal Emergency Management Agency (FEMA) funding for monitoring along un-gaged streams.
 - Looking to citizen science for real time precipitation information. Iowa does not have enough rain gages. Better precipitation data would be helpful to groundtruth predictive data.

There is so much information out there – NWS, Iowa Flood Center, USGS, Department of Transportation (DOT) road closures, Red Cross shelters. A collective, secure – possibly password protected – platform with compiled data would greatly inform real time decision making during flood events.

Local and State Discussion

- Iowa Flood Information System (IFIS) provides helpful tools to Iowa managers and decision makers but it needs to be integrated with ArcGIS (currently Google Maps/.KMZ format).
 - The Iowa Flood Center uses Google Maps so that the website is accessible to all users.
 - IFIS Precipitation accumulation tools are very useful.
 - It might be helpful to include road closure information could on the IFIS Website.
 - Witold Krajewski from the Iowa Flood Center (IFC) indicated that he and IFC staff can visit jurisdictions across Iowa and provide the information that local folks need.
- Comment that a “one platform” website would elicit too much traffic and be overloaded by so many different users.
 - USGS, U.S. Army Corps of Engineers (USACE), and NWS all use the NWS Live Chat, but sometimes the server is overloaded. A comprehensive real time platform with combined GIS data would be helpful.
 - Data uncertainty could also be an issue.
 - The Department of Homeland Security’s (DHS) Web EOC (Emergency Operations Center) operates a unified data platform for emergency response and planning efforts.
 - It would be better to encourage agencies to link their Geographic Information Systems (GIS) and Google Maps data and load it onto one platform.
 - Suggestion to create a “front end” public site and password protected site for emergency managers with more advanced, probabilistic information.
 - Offer an opportunity for people to share more complex information.
 - Reduce web traffic/server overload.
 - A password protected site would not be helpful for the media, but the Iowa Flood Center information provides readily available to broadcast meteorologists.
 - Winneshiek County Concerns
 - What would be the funding stream for a complete platform? River gages are vital, and funding has been cut recently. We do not want to lose current funding for real time gages.
 - NWS Perspective: We need to maintain the stream gage network nationwide, as those gages provide the foundation of NWS, and other agency, data modeling and forecasting. No informational services discussed by the NWS will replace the gages.
 - FEMA operates its GeoPlatform with Esri technology
 - The public can access FEMA’s floodplain maps.
 - FEMA can “invite” stakeholders from Iowa, for example, to access and work on specific maps.
- Some citizens in rural areas access gages and report precipitation and other weather and climate-related information.
- Whitney Henson provided an example of a pilot project in California using Esri/ArcGIS products with their Web EOC. She also indicated that DHS implements a similar approach to information sharing during events, e.g., public and password protected sites.
- Can people handle probabilistic data? When is it “good enough”?
 - From a statewide perspective, numeric probabilistic information is not helpful for public distribution. People focus on the “bad” 30 percent, for example, rather than the “good” 70 percent. Graphs with ranges are more helpful.
- Iowa Flood Center Funding:
 - Costs citizens of the state of Iowa 50 cents per person per year.

- IFC staff installed 250 stream gages throughout the state and produced all other IFC products through that funding.
- Consider a partnership with the public for additional rain gages in strategic locations in the county that are un-gaged.
 - Suggestion to leverage Twitter, Weather Underground (citizen science).
- Weather radar provides quantitative information about rainfall, while gages need maintenance
 - Advantage of radar is that you can see current conditions, while gages have limited capability to tell rainfall intensity.
 - However, there are gaps in radar coverage, which could potentially be addressed by rain gages.

Weather Forecast Office and River Forecast Center Perspectives

Jessica Brooks – Service Hydrologist, Quad Cities Weather Forecast Office

Ms. Brooks described the NWS Weather Forecasting Office (WFO) services available to local and state partners, which include:

- Providing daily weather and river forecasts.
- Issuing NWS watches and warnings for the protection of life and property.
 - Includes flash flood warnings for short-term flooding and flood warnings for rivers.
- Providing Decision Support Services to help partners make the hard decisions.
- Working with Federal and State partners to provide information to customers.

She also described the Advanced Hydrologic Prediction Services (AHPS) available from the WFO, including the NWS web portal for streamflow data (observed and forecasted) which provides flood stages and impacts where they are defined. Ms. Brooks indicated that the WFO works with emergency management and other local partners to establish flood stages for stream gage locations and that flood stages are associated with flood impacts, not just structural damage, to allow for impact-based decision support services.

Andrea Holz - North Central River Forecast Center (NCRFC)

Ms. Holz provided an overview of operations and services provided by the NCRFC. Deterministic Forecasts:

- Updated at least once daily.
- Provide stage forecasts for 7 days into the future using 24 hours of forecast precipitation during convective season.
- Illustrate a 6-hour time step
- Inform a variety of management actions and uses, including support of the WFO flood warning program, recreational uses, water management, etc.
- Run the deterministic models every day (4 times/day, every 6 hours)

She also indicated that the NCRFC provides flash flood guidance and information through the web-based Significant River Flood Outlook, in addition to other services provided on the [NCRFC's website](#).

Rotation Stations

During the rotation stations, participants were about three categories of National Water Model (NWM) data services: inundation mapping, uncertainty products, and streamflow anomaly products. Comments are summarized below.

Inundation Mapping

Uses/Decisions to Inform

- Useful for emergency managers looking at damage assessments.
- If the focus is on flash flooding, and folks are responding at the local level, this is an excellent planning tool.
- This could be a tool to alert water resource managers to start coordination with core partners – A participant compared this service to a smoke detector. A false alarm may occur when a person opens an oven door for example, but it alerts the user to a potential problem.
 - Wendy Pearson indicated that false alarms are not helpful.
- This tool was viewed as a better planning and mitigation tool rather than a response tool.
- Some WFO staff indicated that the NWM inundation mapping could be useful in un-gaged areas.
- It could be an important tool for Impact-based Decision Support Services (IDSS).
- It could be useful during 30-day (long-range) planning timeframes, but during an emergency, it is better to rely on local mapping capabilities and the official forecast.
- Could provide campground staff with warnings if they are near waterways.

What else could be useful?

- In this region, a 10-meter DEM is not useful. Better resolution is needed in Iowa.
 - Some participants indicated that LiDAR is needed at ~one foot.
- One participant indicated that the 18-hour and 10-day products are the most useful.
- Compare against a “normal” stream level layer.
 - NWS Response: The NWM can be run to illustrate normal conditions. The demonstration is currently running every hour, every day.

Concerns

- A DOT representative commented that the NWM inundation mapping might be beneficial in highlighting the roads on a map to indicate which are at risk for flooding.
- Another representative from DOT is working with Iowa Flood Center on a project through the Iowa Higher Research Board that leverages their hydrologic model to provide early warning of roadway flooding on vulnerable highways, using the program BridgeWatch.
- Provide campground staff with warnings if they are near waterways.
- Witold Krajewski inquired about the accuracy of the NWM inundation maps.
 - NWS Response: Because the maps do not incorporate regulated flow (e.g., levees), they will need to be interpreted by local managers, such as the WFOs, RFCs and other core partners who can incorporate impacts from local conditions.
- Wendy Pearson expressed some concerns including:
 - That the provision of this service will come down to the WFOs and RFCs and they will need to feel like they have confidence in the data and at this time that is not the case. More information is needed.

- WFOs will need training to understand the utility of these maps and be able to determine how much time it takes to develop the maps and if that can be accomplished before they are no longer relevant during a flash flood scenario.
- NWS Response: This mapping will never replace local knowledge and the official forecast. The NWC is still learning how to improve the modeling capabilities over time through a series of sensitivity analyses.
- A FEMA representative indicated that the NWM Inundation Mapping is very similar to FEMA's HAZUS model used for planning and loss estimates, but HAZUS is not run in forecast mode.
- Question: Are you taking into account all the watershed authorities and their projects and changing the waterways?
 - Response: Anthropogenic influences are not accounted for in the NWM, currently.
- Can users provide their own DEM? All of Iowa has LiDAR.
 - Response: No, because the NWM is a continental-scale hydrologic model. The NWC would eventually like to develop it in a different format for extraction and application with other merged data.
- How do you resolve conflicts between other maps/models (i.e. DFIRMS)?
 - The NWC wants to build relationships and processes locally to allow all core partners to take advantage of this data.

Uncertainty

Probabilistic Precipitation Forecasts

Uses/Decisions to Inform

- Iowa DNR staff indicated that all of the uncertainty products presented could be useful.
- Graphics are useful and could be incorporated into flood maps to see what level of storm is predicted in addition to percent certainty.
- Emergency managers can use this information to make decisions.

What else could be useful?

- Probabilistic information should be translated into percentages for public messaging.
- Avoid using words like ensemble and probabilistic in messaging.
- Express in amount of rainfall, not ranges or percentages.
- Add river basins (HUC 4 or HUC 6) to assess local impacts.
- Add county lines and roads.
- Improve the specificity of frequency and locations.
- Provide spatial resolution information.

Concerns

- A FEMA representative indicated the information presented was confusing and more information was needed to understand the products.
- Messaging of this information requires translating it to the lowest education level, making it easier to understand, including for local officials.
- The range is too broad. It looks like a range of 0 to 100 percent, which indicates very little credibility.
- Worst case scenario predictions.
 - Emergency managers need information on worst-case scenarios.

- The public often view worst-case scenarios as reality.

Experimental Long-Range River Flood Risk

Uses/Decisions to Inform

- Could be helpful for travel/vacation planning.
- Useful visualization of upstream areas and potential impacts downstream.
- Provides information to help managers assess:
 - Timing/intensity of flooding.
 - Pattern recognition
 - Differences from normal – provides background condition and context.
- Three-month interval provides general information and can also illustrate future vulnerabilities (e.g., soil moisture and flooding).
- This could be very useful on the Mississippi River, but perhaps not as useful on faster responding rivers/watersheds.
- Helpful to monitor upstream snow melt conditions.

What else could be useful?

- Offer a 30-day outlook rather than 90 days.
- An option to select your own timeframe/range. Users have different timescale needs.
- Search specific counties and display just search parameters.
- Graph on the right side needs to be updated.
- Improve terminology. The wording is difficult to understand – specifically the terms “conditional” and “historical.”
- Discuss adding lower thresholds and non-exceedance factors.
- For situational awareness this would be useful, but not for decision-making.
- Ensure that percentages indicate that the chance of exceedance is minor.

Concerns

- Level of certainty is not enough because of long-range timeframe.
- The map is understandable to general public, but not the graphs.
- Managers must be careful with terminology when explaining long term forecast to a less informed audience.

Experimental Short-Range River Flood Risk – HEFS Probabilistic Information to Support Risk Based Decision Making

Uses/Decisions to Inform

- Emergency response preparation (e.g., obtaining and assembling sand bags; starting pre-evacuation planning).

What else could be useful?

- Use patterns instead of colors to illustrate ranges.
- Remove “likely” language and use percentages instead.
- Create a better indicator than ranges of probabilities for public communication.
- Add precipitation and other forecast information to better understand flood conditions.

Concerns

- Confusing in general.
- The range is too wide and stakeholders indicated that there is little confidence based on the information provided.
- Difficult to understand the following information:
 - Which line illustrates observed vs. forecasted?
 - Colors – how can people who are colorblind understand the graphic?
 - The legend is confusing in general.

Stream Flow: Departure from Normal

Uses/Decisions to Inform

- This could possibly be used as a threat detection tool for basins. Managers could zoom in on a “problem” basin during a storm event. If visualizations and maps are produced at various times during a flood event, managers could revisit the maps to see how if the model was accurate.
- These products would allow the local WFO to look at specific points of interest and potential threats/vulnerabilities.
- NWM streamflow anomaly information would be helpful for broadcast meteorologists.
- Streamflow Anomaly mapping, if captured in real time, would be helpful for FEMA disaster declaration documentation.
- Some emergency managers indicated that the streamflow anomaly maps would be helpful to inform decisions leading up to a potential flood event.
- Broadcast meteorologists indicated that the Low Flow Potential Maps could be useful information for farming operations.

What else could be useful?

- Use return intervals (e.g., 10 year), bank full, cubic feet per second (cfs), or flood stage rather than the threshold of 2 times the monthly average.
 - The Iowa Flood Center could help determine the flow threshold for comparison by working with local and state managers.
- Include Meta data to provide additional information related to rapid changes.
- Additional information on accuracy and probability.
- Show a precipitation overlay on Time to High Flow for medium range.
- Consider other “what if” scenarios (e.g., worst case, medium, etc.).
- An overlay of observed precipitation would be helpful to assess percent change in streamflow.
- Time to Peak Flow would be a more appropriate threshold, rather than Time to High Flow.
- This information would be more useful if the rainfall intensity and impacts were visible on a gridded scale, not just on the stream reach.
- Low flow potential maps –
 - Stakeholders indicated that the color brown should represent low flow similar to the Drought Monitor Maps.

Concerns

- What will messaging and information delivery from the WFO and RFC look like? This needs to be discussed.
- The current threshold (2 times the monthly average) is not a helpful indicator for comparison. Therefore, percent change is not relatable to local stakeholders.
- How do you visualize the uncertainty when the forecast is off from hour to hour?

- People might confuse the term “High Flow” with flooding.
- Emergency management perspective
 - Longer timeframe helps with situational awareness.
 - This information could be useful on un-gaged streams if local partners can incorporate impacts from regulated flows (e.g., levees).
 - During a shorter timeframe, local EMAs are dependent on expert partners (e.g., NWS and USGS staff) to evaluate the extent of impacts from a storm event.
- If a community is already experiencing high flow conditions, the Time to High Flow information is not helpful.
- Without a precipitation overlay, the Time to High Flow information is not helpful.

Voting

Following the rotation station conversations, participants were asked – “If you could invest in any of the 3 categories of data services/products, which would you choose?” Results are illustrated in the table below.

Rotation Station	Inundation	Departure from Normal Streamflow	Uncertainty
Voting			
<i>Non-NOAA Partners</i>	25	11	46
<i>NOAA/NWS</i>	7	4	12

Large Group Debrief

General Comments on Services/Products

- One participant indicated that votes are based on the day-to-day operations of the individual.
- It is important to develop education packages, possibly a plan for trainings and exercises, to translate the NWM services to the most appropriate users.
- Recognize the importance of building off of what already exists (e.g., Iowa Flood Center products).
- Time is of concern to emergency managers. Sliding bars are helpful visualization features for mapping.
- There is a desire to have more inundation mapping in un-gaged areas where no data currently exists.
- Deploy the scientific capability from the gage data.
- Reiterate that forecasting comes from the RFC and WFO.
- Local NWS partners (RFCs and WFOs) work with the USACE on a daily basis on many things including reservoir operations. Currently the agencies are collaborating on new modeling capabilities that incorporate the USACE models.

Uncertainty

- Flexible timescales are preferred by users (i.e., user selected)
- Knowing what is driving the hydrologic uncertainty would be helpful.
- For the regulated flow areas – these services aren’t relevant.
- Uncertainty (HEFS) products could be valuable in areas with highly regulated flows.
- One participant suggested that the uncertainty products were paired with the inundation mapping to illustrate multiple layers.

Inundation

- Helpful tool.
- Could be more useful if higher resolution DEMs were incorporated – i.e., greater than 10 meters.
- It would be interesting to see a “comparison” or verification layer to visualize how the model actually performs (forecasted vs. observed).
 - NWS: Use caution when sharing the maps with the public – need local input and interpretation.

Streamflow Anomaly

- Felt like there wasn't a lot of context. “So what?”
- Two times the monthly average is not helpful threshold.
- Important to connect information to actual flood impacts.
- Use drought monitor colors for low flow maps.
- Use colors that are similar to current NWS maps.



Collaborating to Meet Priority Future Needs

During the lunchtime session local partners provided information on regional collaboration in Iowa.

Federal Emergency Management Agency – Andy Megrail

Collaboration with federal and local and state partners is occurring in this region. This is another example of a venue that only helps increase that collaboration.

US Army Corps of Engineers – Maren Stoflet

- USGS and USACE also have a lot of data in Iowa.
- USACE forecasting and information are focused on USACE-operations.
 - USACE models use NWS data – daily and future outlook.

- Communicate their expected flows to partners downstream.
- All of that happens before the official NWS forecast is released.
- USACE priority is risk-informed decision making.
 - Support to the public and partners
 - Communication internally within the USACE.
- Communicate frequently with partners through NWS chat.
 - Jessica Brooks (NWS) – During significant flood events we also conference calls occur between USACE, NWS, others.
 - Wendy Pearson (NWS) – During very significant flood events NWS and USACE have started to physically move to each other’s offices. RFCs go to USACE and vice versa.

US Geological Survey- Jason McVay

- Priority is to keep gages running and ensure the correct data is being displayed.
- Use the NWS chat – also provides a historic record.
- Real time communication with partners to inform forecast.

Iowa Flood Center - Witold Krajewski

- Need for flood services – Iowa flood center was established in 2008.
 - Prior to that the existing agencies working on flooding were NWS, FEMA, etc.
- Mapping is done by Iowa Flood Center to ensure consistency across the state (uniform mapping that took 6 years to complete) with FEMA oversight.
- The IFC collaborates with NWS locally.
 - [IFIS](#) website with IFC information.
- FUSION, led by USACE was established after 2008 flooding
 - Focuses on improved river forecasting.
 - Tries to advance operations and advance based on existing science and technology
 - Focus on upper/middle Mississippi River
 - Entities that serve the greater Mississippi – meeting with partners, researchers, face time and raise collaboration concerns and move service and science forward.
 - NWS Perspective: We see the NWM and local partners rolling out a collaborative suite of services.
- Local NWS folks are very helpful and involved with the IFC.

Some participants asked about an estimated timeframe for availability of the NWM tools.

NWS Response: The NWM is available today, but the services are being refined and require further interpretation and analysis.

- The NWC needs to finalize an education/training mechanism for WFOs, RFCs, and other core partners.
- Timeframe: Approximately 2-3 years for release of products to a wider audience.

Wrap up

NWS staff thanked participants for attending the workshop and providing valuable input on NWS products and services. They reiterated that water resource managers in Iowa are competent in these areas and appreciated the extremely educated and informed feedback provided by all in attendance.

List of Meeting Participants

First Name	Last Name	Email	Affiliation
Kate	Abshire	kate.abshire@noaa.gov	NWS OWP
Marian	Baker	marian.baker@noaa.gov	NWS Central Region HQ
Mindy	Benson	mbenson@ema.tamacounty.org	Tama County Emergency Mgmt
Jessica	Brooks	jessica.brooks@noaa.gov	WFO Quad Cities
Bill	Cappuccio	bill.cappuccio@dnr.iowa.gov	Iowa DNR
Chad	Christensen	cachristensen@dmgov.org	City of Des Moines
Steve	Cirinna	coordinator@leecountyema.com	Lee County Emergency Mgmt
Dave	Claman	david.claman@iowadot.us	Iowa Department of Transportation
Peter	Colohan	peter.colohan@noaa.gov	NWS OWP
Brian	Connelly	brian.connelly@noaa.gov	NCRFC
Jeremy	Cremeans	JCremeans@ema.tamacounty.org	Tama County Emergency Mgmt
David	Donovan	david.donovan@scottcountyiowa.com	Scott County Emergency Mgmt
Donna	Dubberke	donna.dubberke@noaa.gov	WFO Quad Cities
John	Dunn	jdunn@city.ames.ia.us	City of Ames
Joyce	Flinn	joyce.flinn@iowa.gov	Iowa Dept of Homeland Security
Kristie	Franz	kfranz@iastate.edu	Iowa State University
Justin	Gehrts	weather@kcrg.com / justin.gehrts@kcrg.com	KCRG-TV Cedar Rapids
Lorie	Glover	lorieglover@bhciaema.com	Black Hawk County Emergency Mgmt
Tim	Hall	tim.hall@dnr.iowa.gov	Iowa DNR
Barry	Halling	dcema@dwx.com	Dallas County Emergency Mgmt
Scott	Hansen	bentoncountyema@fmtcs.com	Benton County Emergency Mgmt
Gina	Hardin	harding@dmcounty.com	Des Moines County Emergency Mgmt
Chris	Hare	bcem@co.buchanan.ia.us	Buchanan County Emergency Management
Whitney	Henson	whitney.henson@noaa.gov	NOAA NWS National Water Center
Andrea	Holz	andrea.holz@noaa.gov	North Central River Forecast Center
Seth	Janssen	sjanssen@whiteside.org	Whiteside County Illinois Emergency Management
Darrell	Knecht	dknecht@co.howard.ia.us	Howard Co EMA
Witek	Krajewski	witold-krajewski@uiowa.edu	Iowa Flood Center
Kip	Ladage	kladage@co.bremer.ia.us	Bremer County Emergency Mgmt
Kevin	Landwehr	kevin.j.landwehr@usace.army.mil	US Army USACE of Engineers
Jim	Marwedel	jim.marwedel@iowa.gov,	Iowa Dept of Homeland Security
Kathleen	McAllister	kmcallister@horsleywitten.com	Horsley Witten Group

First Name	Last Name	Email	Affiliation
Jason	McVay	jmcvay@usgs.gov	USGS
Andy	Megrail	andy.megrail@fema.dhs.gov	FEMA
Maureen	Mehmen	mmehmen@bhciaema.com	Black Hawk County Emergency Management
Kirsten	Mickelsen	kmickelsen@umrba.org	UMRBA
Keith	Morgan	kmorgan@storycountyiowa.gov	Story County Emergency Mgmt
Mary	Mullusky	mary.mullusky@noaa.gov	NWS WRS
AJ	Mumm	aj.mumm@polkcountyiowa.gov	Polk County Emergency Mgmt
Arleen	O'Donnell	Arleen.ODonnell@erg.com	ERG
Wendy	Pearson	Wendy.Pearson@noaa.gov	NWS Central Region HQ
Lisa	Roberts	lroberts@co.fayette.ia.us	Fayette Co EMA
Mark	Schnackenberg	schnack@kwwl.com	KWWL-TV Waterloo
Todd	Shea	todd.shea@noaa.gov	NOAA/NWS La Crosse
Corey	Snitker	csnitker@co.allamakee.ia.us	Allamakee Co EMA
Sean	Snyder	ema@co.winneshiek.ia.us	Winneshiek Co EMA
Maren	Stoflet	Maren.A.Stoflet@usace.army.mil	USACE - Rock Island District
Rick	Wulfekuhle	rwulfekuhle@co.buchanan.ia.us	Buchanan County Emergency Mgmt
Jeff	Zogg	jeff.zogg@noaa.gov	WFO Des Moines