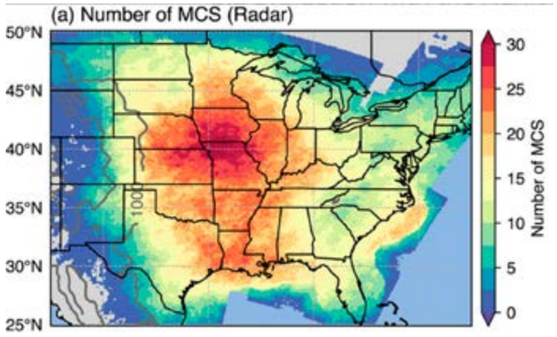
IOWA

IFC UPDATE

RESEARCH AND ACTIVITIES AT THE IOWA FLOOD CENTER **SPRING 2026**

Collaborative Solutions for a Flood Resilient Future

New Funding Expands Monitoring and Forecasting



The Iowa Flood Center will expand its network of flood monitoring equipment and flood prediction tools to support long-term recovery efforts and reduce the risks of future disasters for Iowans. With new federal funding, the IFC will build an advanced flash flood forecasting system and install new state-of-the-art stream sensors and hydrologic weather stations (hydrostations).

Next-Generation Stream Sensors

The IFC currently operates a network of more than 270 stream-stage sensors that measure river levels every 15 minutes and communicate data to the publicly accessible Iowa Flood Information System (IFIS) online application. The IFC's dependable, cost-effective stream sensors complement U.S. Geological Survey stream gages and fill in flood monitoring gaps on smaller streams and tributaries. The sensors communicate current and forecasted river levels to support decision-making by emergency responders, state and federal agencies, community leaders, and the public.

"After the 2024 floods in Northwest Iowa, I was approached by a Spencer resident who said that our IFC bridge sensor saved her life and the life of her husband," says Larry Weber, IFC director. "The value and impact of the stream sensor network cannot be overstated. It's the most important resource we provide for the state, and it has paid for itself over and over."

The robust sensors were built to withstand Iowa's extreme weather, though many locations have far exceeded their planned life expectancy. The IFC is developing a new generation of modern stream sensors that use advanced technology to create a more cohesive, compatible, and reliable monitoring network with greater operational efficiency. Deployment will begin in Northwest Iowa, prioritizing the areas hit hardest by the catastrophic flooding in June 2024.

IFC Improves Flood and Drought Monitoring and Forecasting

To better understand and monitor hydrologic conditions ranging from floods to drought, the IFC will expand its network of hydrostations across western Iowa. Each hydrostation measures rainfall, wind speed and direction, soil moisture and temperature, and water levels in a shallow groundwater well. The network informs IFC forecast models and provides critical publicly available data to landowners, researchers, and agencies.

TOP: Iowa is near the bull's-eye for mesoscale convective systems (MCSs) that are a precursor for flash floods.

CENTER: Representative Zach Nunn (sixth from right) visits an IFC hydrostation deployed on Curtis Wilson's farm near Guthrie Center, Iowa, for an agricultural field day.

BOTTOM: An IFC stream sensor collecting river level measurements during an active flood event.

Data collected by these sensors will be immediately useful to local agencies and community members, who can access to the information through the Iowa Flood Information System (IFIS). The data will also support the development of an Iowa Drought Information System, which will mirror the highly successful IFIS framework. The new tool will integrate data from existing state and federal sources to provide Iowans and stakeholders with comprehensive, easily accessible drought information.

The IFC currently has 53 operational hydrostations, primarily in Eastern Iowa. This expansion will provide more uniform and equitable coverage across the state, helping IFC reach its goal of installing one station in every county. Data from the robust network of hydrologic stations will also help researchers monitor the short- and long-term impacts of extreme weather on water resources above and below ground.

"We're thrilled to see these additional resources coming to Northwest Iowa to support future flood preparedness," said Kevin Robinson, city manager for Spencer, Iowa. "[After] what we experienced in 2024, we recognize the importance of reliable flood monitoring tools that we can use to inform communications to our residents and our boots-on-the-ground response efforts."

Flash Flood Forecasting

During the June 2024 flood in Northwest Iowa, some areas received more than 15 inches in a two-day period. These historic rainfall amounts exceed the 1,000-year annual chance of flooding, causing three deaths and leaving infrastructure severely compromised. New research shows that these heavy rainfall systems are becoming more common, with Iowa near the bullseye for rain events that cause flash floods.

The IFC will build an advanced flash flood forecasting system for the region by leveraging in-house expertise. Humberto Vergara, assistant professor of civil and environmental engineering at the University of Iowa, helped develop the National Weather Service's flash flood forecasting system. As part of the IFC team, Vergara will lead the development of new forecasting tools that will revolutionize how communities prepare for extreme weather by providing more lead time.

Funding Support

Funding for these complementary activities comes from the $134 million Community Development Block Grant-Disaster Recovery package awarded to the Iowa Economic Development Authority. The package supports long-term recovery efforts following the 2024 floods that primarily impacted Northwest Iowa.

The congressional Community Project Funding (CPF) bill, championed by Representative Zach Nunn, supports the hydrostation expansion and development of a drought information system. The IFC project ranked as one of the top CPF requests across the country for its relevance and widespread impact.

IIHR constructed a 1:7.5 scale model of a pump station that the City of Dubuque is building to help mitigate its flood risks and protect homes and businesses.

The Iowa Flood Center (IFC) is part of IIHR—Hydroscience and Engineering (IIHR) within the University of Iowa's College of Engineering and is the nation's only academic research center devoted solely to flooding. The IFC develops critical tools and information that community leaders, decision-makers, and individuals depend on to help them understand and reduce their flood risks.

Advancing Water Prediction for the Nation

The Iowa Flood Center remains a key partner of the Cooperative Institute for Research to Operations in Hydrology (CIROH), which brings together a constellation of partners committed to advancing water prediction for the nation. The IFC brings 17 years of experience in flood forecasting, flood inundation mapping, monitoring, hydrologic modeling, scientific communication, and community partnerships to CIROH, helping to strengthen and fast-track the widespread implementation of its research initiatives. Steve Burian, executive director of CIROH, and Erin White, associate director of science and research operations, visited IFC in December 2025 to reflect on the program's impacts and opportunities for growth, and to set priorities and create a strategic research vision for the next five years of the program. The National Oceanic and Atmospheric Administration funds CIROH, which is based at the University of Alabama.

Making Running Water Walk

A dedicated group of watershed conservationists, engineers, farmers, and community members from Iowa and Wisconsin have come together to exchange innovative watershed management strategies and best practices across the Driftless Area.

The community exchanges have highlighted the flood reduction potential of multicropping — planting different crops with overlapping growing seasons in the same field — that can reduce runoff and flooding by 40–50%. Participants also explored on-road structures pioneered in Northeast Iowa, where roadway embankments function as temporary dams that slow water during heavy rain events by restricting flow through culverts.

In Wisconsin, the group visited the historic site of the nation's first watershed demonstration project, toured sustainable farming operations, and experienced the conservation legacy of the Coon Creek Watershed, where the guiding principle is "learning to make running water walk."

This growing partnership continues to explore new opportunities for collaboration and sharing knowledge, tools, and expertise to work across state boundaries to protect and restore the Driftless landscape.

TOP: Partners gathered for a tour of watershed demonstration projects meeting with local landowners.

BOTTOM: A tour stop at the site of the nation's first watershed demonstration project.

IFC's Kate Giannini Receives Fulbright Award to Advance Global Flood Partnership

"There's tremendous value in working together and learning from perspectives across the world."

KATE GIANNINI, PROGRAM MANAGER, IOWA FLOOD CENTER

LEFT: Giannini joined the IFC team in 2017, helping to manage the $97M Iowa Watershed Approach program that worked to reduce flood risks across the state.

TOP. Giannini poses as she begins her first day of work at Deltares.

BOTTOM: Similar to Iowa, the Netherlands landscape has been heavily altered. With much of the land below sea level, water management is a priority. Farmers in rural areas maintain polders (pictured), which are interconnected water systems that include canals, dikes, and pumping stations overseen by regional Water Boards.

Kate Giannini, program manager at the Iowa Flood Center, received a Fulbright Award for a six-week research exchange with Deltares in Delft, Netherlands. The experience connected her with water resource professionals and researchers from around the world and opened up new opportunities to strengthen and expand past collaborations.

"Deltares is internationally recognized and leads programs that closely mirror our work, everything from watershed management to water monitoring, drought, and flood resilience," says Giannini. "We've collaborated before, but this experience inspired me to think bigger about how our organizations can deepen that relationship and create even greater, more meaningful impacts."

During the exchange, Giannini worked alongside Deltares' flood risk management and climate adaptation teams on a pilot project applying their innovative FloodAdapt planning tool to an Iowa community. FloodAdapt allows communities to look ahead — testing flood scenarios, comparing adaptation strategies, and gaining practical insights into how future floods could impact residents and critical infrastructure.

The team selected Columbus Junction, Iowa, for the study based on the IFC's longstanding partnership with the community and its unique position at the confluence of the Iowa and Cedar rivers. It is the first inland U.S. community to pilot the model, with plans to scale the approach to additional communities and regions.

Giannini also shared the Iowa Flood Center's nationally recognized expertise in flood monitoring, prediction tools, water resource management, and community engagement. These shared areas of focus create a strong foundation for innovation between IFC and Deltares. "We're able to leverage the work we've done in Iowa to strengthen their modeling capabilities and exchange ideas and resources that advance both of our research programs," Giannini says. "There's tremendous value in working together and learning from perspectives across the world."

For Giannini, the experience set the stage for long-term collaboration. She plans to remain closely connected with the Deltares team and hopes to return in the coming years to continue expanding the partnership.

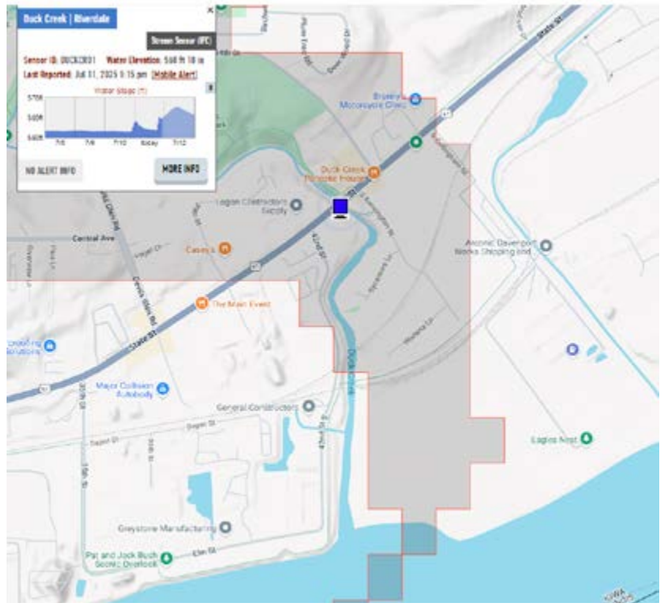
Partnership in Action

On the night of July 11, 2025, Riverdale Mayor Anthony Heddlesten was closely monitoring rising river levels as repeated heavy rainfall pushed the community toward a potential flash flood emergency. Updated forecasts that Friday evening had raised serious concerns that the river could overtop the city's floodwall, posing significant risks to residents and potentially requiring the evacuation of more than 100 people.

With the community's former U.S. Geological Survey stream gage no longer in service, Heddlesten relied heavily on the Iowa Flood Center's stream sensor along Duck Creek. Seeking additional clarity to guide his emergency decisions, he reached out late that night to Dan Gilles, IFC water resources engineer, and Felipe Quintero, associate research scientist. The IFC team conducted additional analyses using local sensor data and updated forecasts to help refine their understanding of the potential flood threat.

This work gave the community greater confidence that they knew what to expect and how to prepare. Fortunately, the floodwall held, and Heddlesten was able to communicate more accurate and timely information to residents during a rapidly evolving situation.

In recognition of their commitment to public safety and outstanding service, Heddlesten presented Gilles and Quintero with a commendation. The community is now planning to invest in additional monitoring equipment, acknowledging the vital role that timely, accurate data play in reducing flood risk and protecting residents.



"When you're responsible for the safety of your neighbors, every decision weighs heavily. This is exactly the kind of partnership every community hopes for during an emergency."

ANTHONY HEDDLESTEN, MAYOR OF RIVERDALE, IOWA

ABOVE: Rainfall accumulations for Riverdale, Iowa, that caused flooding in July 2025.

TOP RIGHT: An IFC stream sensors (blue square) and flood forecast displayed for Riverdale, Iowa, through the Iowa Flood Information System online web application.

BOTTOM RIGHT: Dan Gilles (left) and Felipe Quintero (right) pose with the commendation award presented by Mayor Anthony Heddlesten (middle).

An Unlikely Reunion

The Freda Haffner Kettlehole State Preserve is a glacial depression surrounded by prairies in Okoboji, Iowa. It's the kind of place where you can spend hours exploring nature without seeing another soul.

IFC staff stopped by the unique geologic feature on their way home from Iowa Emergency Management Association's Annual Conference. What a surprise to see good friend and partner Kip Ladage crouched among the weeds capturing wildlife photography. Ladage is the retired emergency manager from Bremer County and an avid and talented wildlife photographer.

It was an unexpected reunion in this remote setting that made for a memorable day, reminding the IFC team of the strong network of partners who make even the most unlikely chance encounters feel like reconnecting with old friends.

"I have lost track of the number of times I have laughed about the unexpected reunion of friends in the Freda Haffner Kettlehole."

KIP LADAGE, RETIRED BREMER COUNTY EMERGENCY MANAGER

Congratulations, Rick!

IFC staff were honored to celebrate longtime friend and partner Rick Wulfekuhle on his well earned retirement as Buchanan County emergency management coordinator. Wulfekuhle received an Iowa Flood Center Hall of Fame Award for his exemplary leadership, dedication, and unwavering commitment to public safety. His contributions have strengthened Iowa's emergency response capabilities, advanced community preparedness, and built lasting resilience to natural disasters across the state.

Student Spotlight

Anthony Lamoreux, a master's student in civil and environmental engineering, studies how streambank vegetation influences river and stream flow by contributing to a measure known as "roughness." His research improves the accuracy of streamflow predictions by correcting for seasonal changes in stream roughness, ultimately helping produce more reliable flood forecasts.

"Roughness values are often treated as constants, but vegetation isn't," Lamoreux explains. Even small inaccuracies in variables like roughness can lead to large errors in flood prediction. "There are a lot of people who count on this information, and we want to provide them with accurate data."

Growing up in Le Mars, Iowa, Lamoreux saw firsthand the devastation caused by the 2011 floods. "I've gone from asking questions about the flood I lived through to helping others answer theirs," he says. That experience shaped his educational path and fuels his motivation to advance flood forecasting tools that can make a real difference in people's lives.

Outdoor Learning Brings Rivers to Life

"Our students loved this educational day spent outdoors."

KONNIE HURLBUT, FIFTH GRADE TEACHER IN THE MUSCATINE SCHOOL DISTRICT

How have we shaped rivers, and how have they shaped us? That question guided a day of outdoor learning for Muscatine fifth graders visiting the University of Iowa's Lucille A. Carver Mississippi Riverside Environmental Research Station. In partnership with the Iowa Department of Natural Resource's Fairport Fish Hatchery and the Friends of Fairport Fish Hatchery, the Iowa Flood Center organized hands-on activities to help students explore how rivers influence communities and how people interact with waterways over time.

Students explored four stations: kayaking, watershed exploration, a fish hatchery tour, and history station. For many, it was their first time on a kayak or seeing a big fish up close. The activities challenged students to engage with and think about the river system in a new way, reflecting on how the Mississippi River has supported the Muscatine community throughout history.

The IFC team led a watershed exploration hike and demonstration along the Mississippi River. Students shared the ways they've interacted with the river and experiences they've had with flooding. Using an interactive watershed model and having the students build their own paper watersheds, they learned how land use changes and alterations along the river can affect flooding and solutions to reduce flood impacts.

OUTREACH BY THE NUMBERS:

40 K-12 Events and Training Sessions

29 Community Events

12 Conferences

10 Visits Hosted

4 Legislative Engagements

TOP: Students engage in a day of watershed discovery and outdoor learning on the Mississippi River.

RIGHT: IFC staff lead a water level surveying activity on the Iowa River as part of a career exploration opportunity.

Iowa Flood Information System (IFIS)

New! The Iowa Flood Center has updated its Iowa Flood Information System with a more modern, accessible, and responsive design. The free, user-friendly online application helps Iowans understand flood risks and make informed decisions. IFIS displays up-to-the-minute community-specific information, including:

- Real-time river levels at nearly 300 locations in Iowa;
- Flood alerts and forecasts for more than 1,000 Iowa communities;
- Weather conditions including current, future, and past rainfall accumulations;
- Hydrologic conditions from a growing network of monitoring stations collecting data on flood and drought conditions;
- Statewide flood map coverage for all 99 counties; and
- Scenario-based flood inundation maps that show the extent and depth of predicted floodwaters for dozens of communities.

→ For more information **iowafloodcenter.uiowa.edu/ifis**

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