IOWA

IFC UPDATE

RESEARCH AND ACTIVITIES AT THE IOWA FLOOD CENTER **SPRING 2024**

Celebrating 15 Years of Serving Iowans

IOWA
Iowa Flood Center

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.

From the Director

Dear Friends, Colleagues, and Partners,

As some of you may already know, on June 30, 2024, I will retire as the director of the Iowa Flood Center. The past 15 years serving the people of Iowa have been the most rewarding and fulfilling of my professional career—thanks to each of you.

The 2008 floods that devastated Eastern Iowa changed people's lives forever, including mine. I remember feeling helpless and frustrated that I couldn't do more than sandbag alongside others to protect our building located on the banks of the Iowa River in Iowa City.

Fortunately, IIHR Director Larry Weber and I were able to work with the Iowa legislature to establish a bill to create the Iowa Flood Center to provide Iowans with science-based information to help them understand and reduce their flood risks. Fifteen years later, I am humbled by the impact that IFC has had on improving Iowa's flood resiliency and serving as a model for the nation. But we didn't do it alone—our success is directly tied to the ongoing support of our Iowa legislators and collaborations with local, state, federal, and private partners.

It's been my distinct honor and privilege to lead and nurture the flood center from infancy into its teenage years. I am confident that IFC will continue to build on its successes, and I look forward to staying engaged and involved with the center's activities as a researcher.

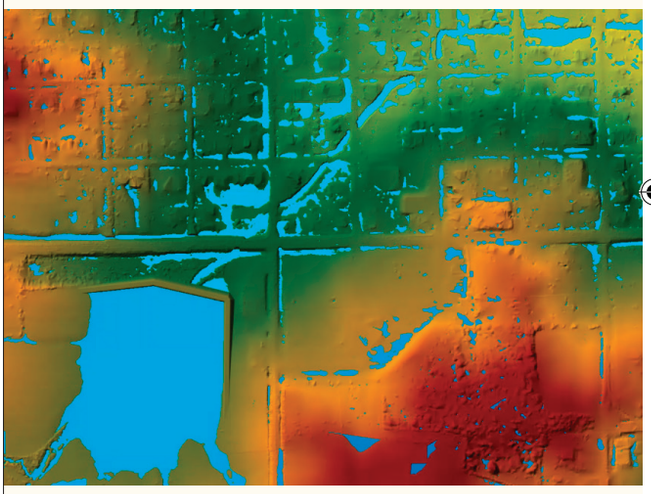
Together, we've built something special and have helped Iowans stay safe from flood events. I am proud to have been able to serve our state alongside each of you!

Best Wishes,

Witold F. Krajewski
Director, Iowa Flood Center

Serving Iowa's Small Communities

In August 2021, the city of Lawler, IA experienced flash flooding after receiving 8 inches of rain in 24 hours. Iowa Homeland Security and Emergency Management and the Iowa Flood Center worked together to assess local flood challenges and develop potential flood mitigation solutions that could reduce flood risks by nearly half. Based on the study, the community was awarded $1 million from the State Contingent Fund Loan to implement select priority recommendations. In 2023, the flood center also worked in Charles City, Goose Lake, and near Independence to provide technical assistance to address flood-related challenges.

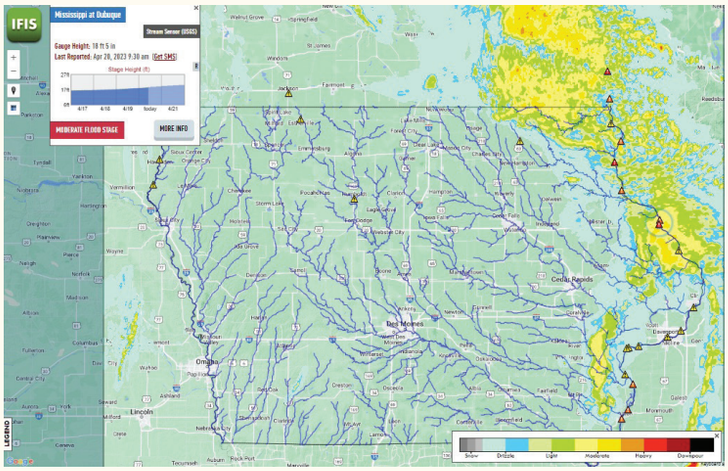


A hydrologic model developed for the city of Lawler showing a proposed flood mitigation structure.

ON THE COVER
The Johnson County Historic Poor Farm serves as a living laboratory to advance UI research projects done in collaboration with local, state, and federal partners.

From Floods to Droughts

Thirty tornadoes producing 125 mile-per-hour winds strike Eastern Iowa; FEMA estimates $6.3 million in flood damages from the 2023 spring flooding on the Mississippi River; and more than $248 million in crop insurance payouts due to drought—extreme weather is here in Iowa, and it's impacting us all. To provide Iowans with enhanced flood and drought information, the Iowa Flood Center will deploy 30 new hydrostations in Eastern Iowa to expand its statewide network in 2024. The stations complement 20 existing hydrostations and will measure precipitation, soil moisture and temperature, wind speed and direction, and shallow groundwater levels. Data will be made available on the Iowa Flood Information System to aid researchers, farmers, and state agencies in planning and decision-making. This work is funded through a $1 million Congress-supported Community Project Funding award championed by Congresswoman Ashley Hinson and Congresswoman Mariannette Miller-Meeks.



TOP: 2023 Mississippi River flooding shown on the IFIS.

BOTTOM LEFT: IFC hydrostation.

BOTTOM RIGHT: IIHR's James Street Laboratory in Coralville was destroyed by the March 31 tornado outbreak.

IFC Celebrates 1

Since the Iowa Flood Center's establishment in 2009, it has made unparalleled advances in developing innovative tools and creative strategies that have improved Iowa's flood resiliency. Programs like the $97 million Iowa Watershed Approach (IWA) funded by the U.S. Department of Housing and Urban Development strategically placed flood mitigation projects like ponds and wetlands across the state to reduce flood impacts. IFC's technical assistance to small communities helped Fredonia, Iowa, address its local flooding issues and develop a conceptual design for flood mitigation projects used as leverage to secure $135,000 from the Iowa Flood Recovery Fund for full design and implementation. For IFC, no project is too big or too small—and we're not done!

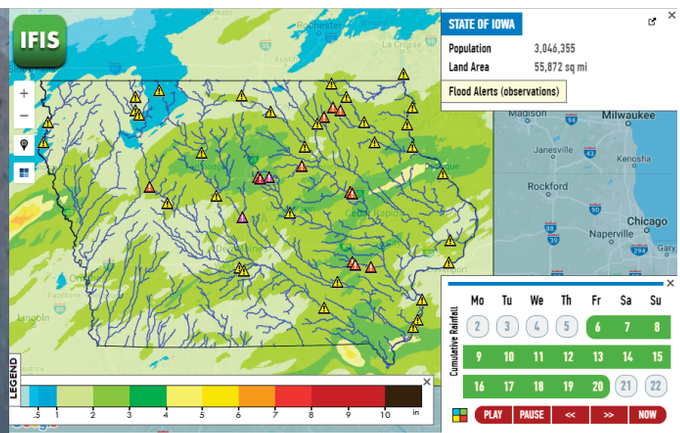
15 Years of Serving Iowans

As we celebrate this 15-year milestone, here are some important highlights:

- **Creating the Iowa Flood Information System** (IFIS) that communicates real-time information about stream levels, flood alerts and forecasts, and hydrologic conditions for the entire state
- Deploying more than **260 IFC-designed, -built, and -deployed stream sensors** that collect river levels every 15 minutes and share data on IFIS
- **Providing flood alerts and forecasts** for more than 1,000 Iowa communities, helping Iowans better plan and prepare in advance of a flood
- **Developing high-resolution flood inundation maps** to show the extent of possible flooding for every Iowa stream and all 99 counties
- **Detailed community-based flood maps** for dozens of cities in Iowa show how predicted flood extent and depth could affect property and critical infrastructure
- Building the **Missouri River Flood Information System** to provide communities in Southwest Iowa with comprehensive information on floods, streamflow and mitigation scenarios, and levee systems that can be easily modified to represent breaches
- **Adding 30 new hydrostations** across Eastern Iowa in 2024 to improve flood and drought monitoring and forecasting
- **Working with IWA watershed management authorities** to implement more than 700 flood mitigation projects such as farm ponds, wetlands, and water and sediment control basins to reduce flooding
- **Raising watershed literacy** across the state attending more than 60 education and outreach events annually
- **Serving as a model** for other states looking to replicate our work, including Missouri, Texas, North Carolina, Nebraska, South Dakota, and Louisiana
- **Leveraging nearly $20 million in state funding** received since 2009 to help secure more than $100 million in additional funding for projects brought to the state of Iowa
- **Providing expertise** to help build a more water- and weather-ready nation through the $360 million NOAA Cooperative Institute for Research to Operations in Hydrology based at the University of Alabama

"Your IFIS tool is extremely important to the Iowa National Guard planning efforts, and we appreciate the level of information and predictability you provide."

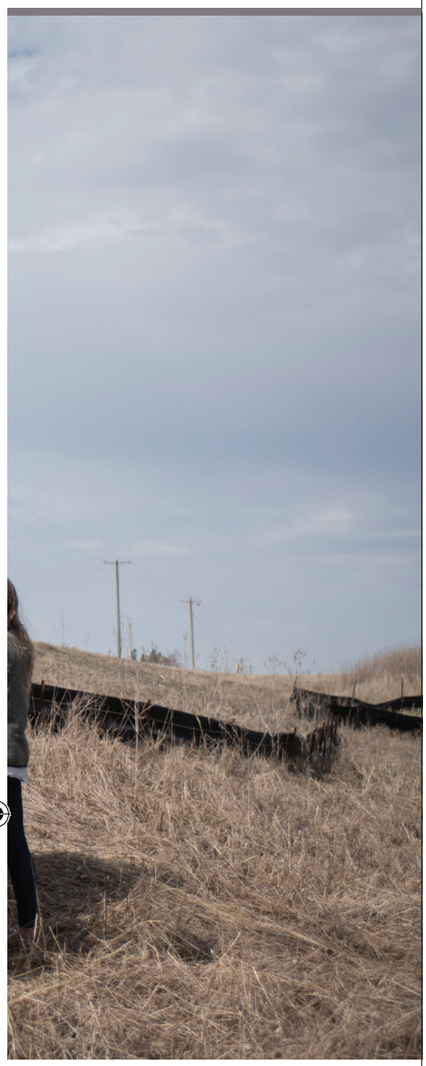
KERRI C. LEWERS, DIRECTOR OF MILITARY SUPPORT, IOWA NATIONAL GUARD



IFC Launches New Flood Mitigation Plat

A new statewide platform visualizes potential locations for on-road structures that provide an alternative to conventional culverts. The new system uses advanced hydrologic modeling and GIS-based analysis to quantify the flood reduction benefits of existing structures and suitable new locations and their estimated flood storage potential. Pioneered in northeast Iowa, on-road structures use the roadway embankment as a dam, and flow through the culvert is restricted to provide flood storage for large precipitation events. Funded by the Iowa Department of Transportation (DOT), the project will provide county engineers and the DOT with valuable information on cost-effective roadway improvements that reduce flood damage during heavy precipitation events.

atform



Through the Iowa Watersheds Project and Iowa Watershed Approach (2010-2022), the IFC worked with partners in northeast Iowa to implement on-road structures in strategic locations to reduce flood impacts. The projects were funded by the U.S. Department of Housing and Urban Development.

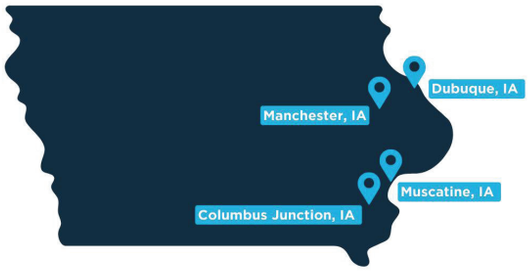
FAR LEFT: An on-road structure built in the Upper Iowa River Watershed.

LEFT: The on-road structures replace traditional pipe culverts of box culverts.

Flood Resilient Communities Cohort

In partnership with a project led by the American Flood Coalition (AFC), the Iowa Flood Center is helping to convene a cohort of four Iowa communities impacted by floods to improve their access to federal funding for flood resilience projects. Community leaders from Columbus Junction, Dubuque, Manchester, and Muscatine will participate in workshops and receive support from AFC staff to identify and prioritize flood resilience projects, strengthen community connections, and find opportunities within federal programs to implement projects. The flood center is providing technical assistance to assess local flood challenges and recommend mitigation strategies.

AFC's Iowa Flood Resilient Communities Cohort

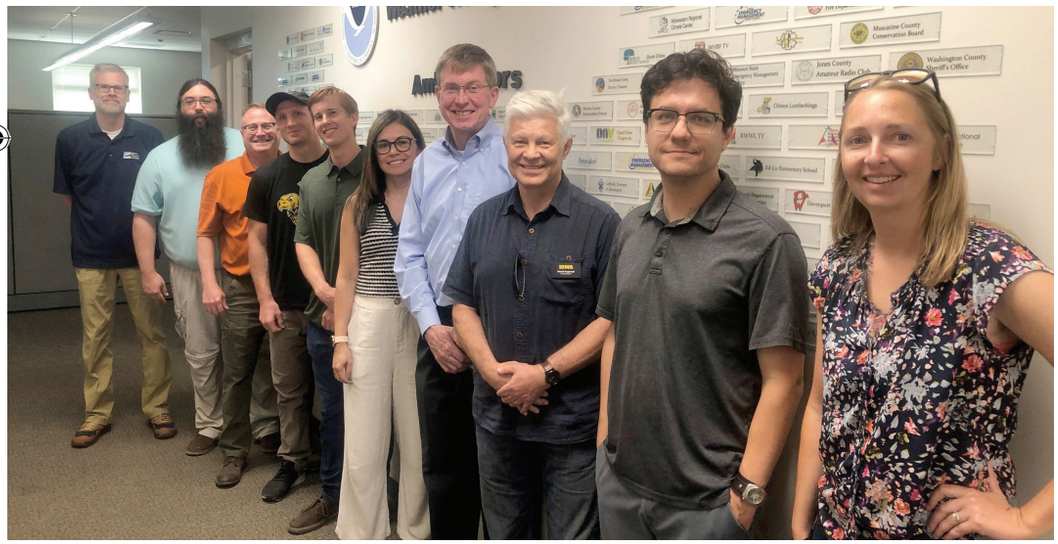


AMERICAN FLOOD COALITION

Student Spotlight

Laura Zepeski: Laura Zepeski, a master's student in civil and environmental engineering, is no stranger to the impacts of flooding. Growing up in Iowa's oldest river community in Dubuque, Iowa, she's aware of the devastating impacts flooding can have on people's livelihoods. Zepeski serves as the Iowa Flood Center's weekly meeting weather briefer, sharing the latest happenings of water phenomena in Iowa. "The meetings challenge me to apply my engineering education to the current conditions and water issues in Iowa," says Zepeski. "Being able to practice my technical communication skills will help me be more effective in the workforce and able to connect with the public."

THE IOWA FLOOD CENTER'S outreach and education program takes students, staff, and researchers across the state to engage with K–12 students, the public, watershed groups, legislators, and partners. "The time to exchange business cards is not when the proverbial crap is hitting the fan," says Rick Wulfekuhle, Buchanan County emergency manager. "You want to know people. You want to have those partnerships established." Sharing that sentiment, the IFC attended more than 65 outreach events last year to educate Iowans about flooding and how to reduce flood impacts. Last summer, a group of Iowa Flood Center staff and researchers visited partners at the National Weather Service Quad Cities office to learn more about their operation and ways the organizations can continue to support one another. The exchange was an opportunity to debrief the recent spring flooding along the Mississippi River where IFC and the NWS were frequently communicating information with one another. As described by NWS Service Hydrologist Matt Wilson, the resource sharing among partners including the U.S. Geological Survey and Army Corps of Engineers is a "a self-organized cooperative," where each partner has an important role to play to support local communities with the most advanced and accurate flood information possible.



"We'd be lost without the Iowa Flood Center. We're not in it alone...We know what's coming."

RICK WULFEKUHLE, BUCHANAN COUNTY EMERGENCY MANAGER

Iowa Flood Information System (IFIS)

Reliable Information

IFIS is a free, user-friendly online application that helps Iowans prepare for flooding. IFIS displays up-to-the-minute community-specific information, including:

- Real-time stream 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;
- Statewide flood map coverage for all 99 counties; and
- Scenario-based flood inundation maps for dozens of communities.

→ For more information **www.iowafloodcenter.uiowa.edu**

IOWA College of Engineering

Iowa Flood Center
C. Maxwell Stanley Hydraulics Lab
Iowa City, IA 52242

319-384-1729

Email: iihr-iowafloodcenter@uiowa.edu

www.iowafloodcenter.uiowa.edu