

IOWA



IOWA College of Engineering

IFC UPDATE

RESEARCH AND ACTIVITIES AT THE IOWA FLOOD CENTER **SPRING 2022**

IFC Joins NOAA Institute

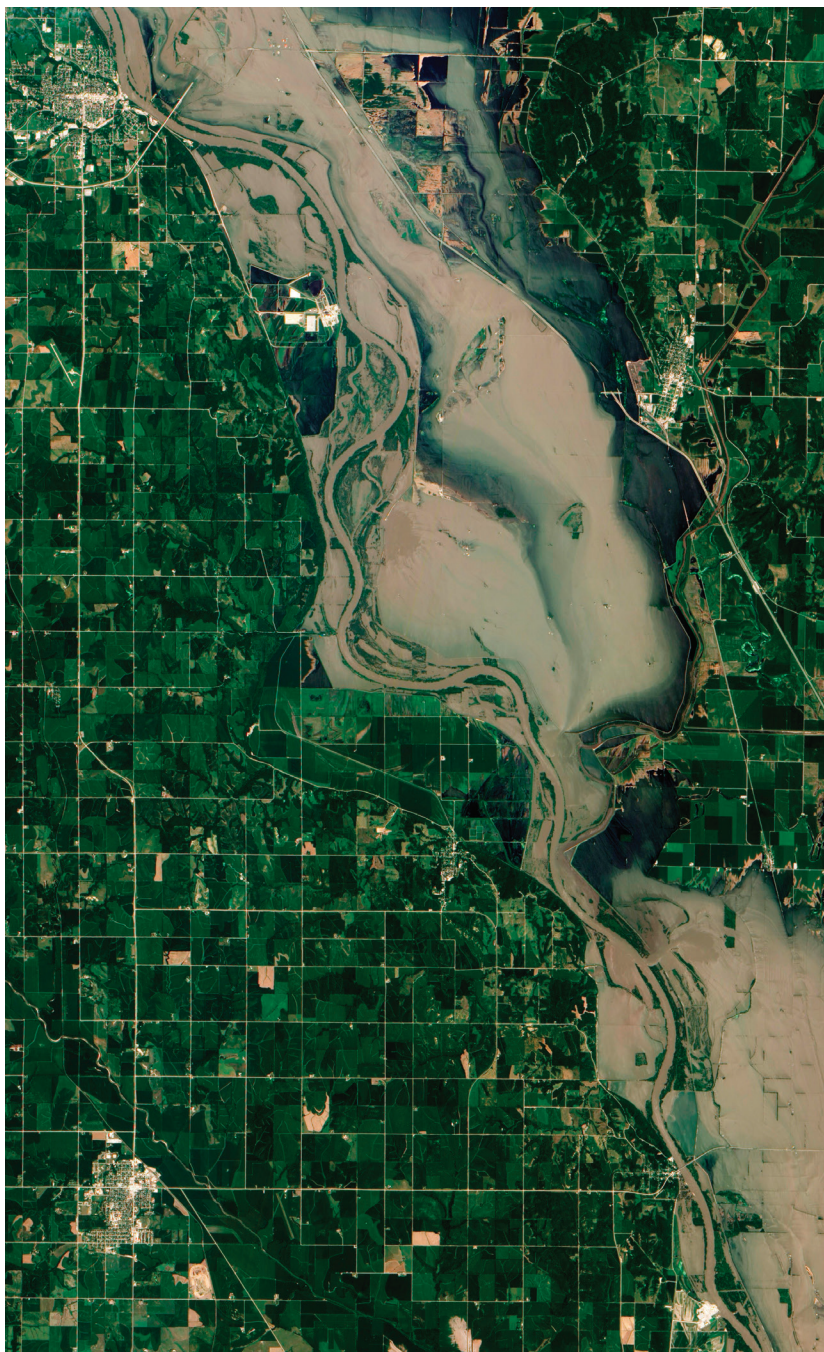
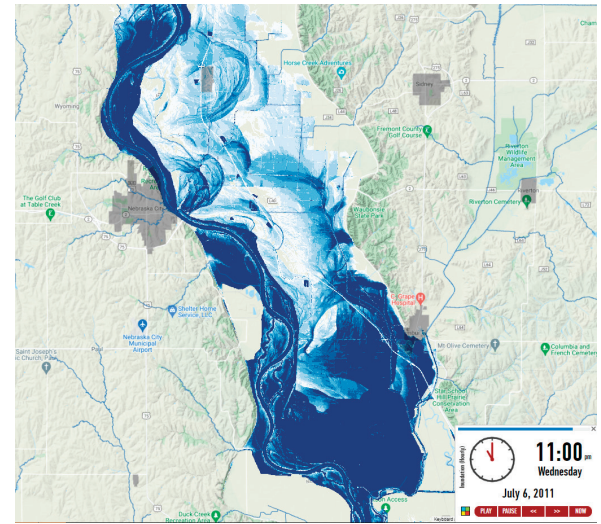
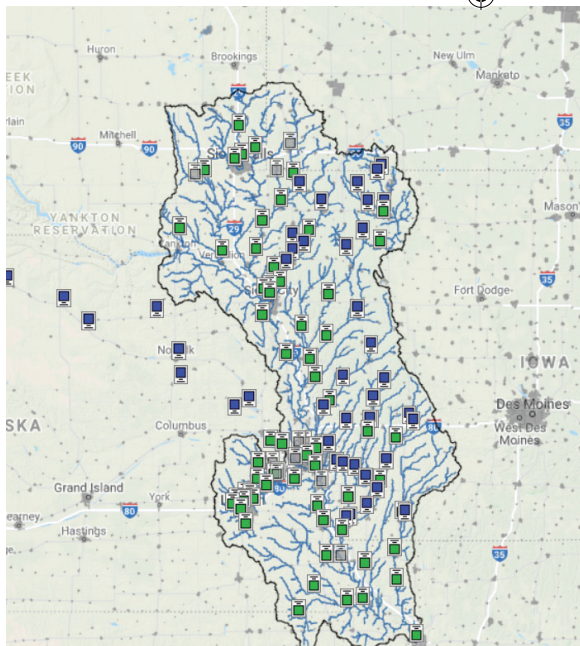
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FLOLO Farms near West Union, Iowa owned by Loran Steinlage

LEFT: MRFIS stream sensor network

RIGHT: MRFIS animation of historical July 2011 flood event

BELOW: NASA aerial photo of July 2011 flood



New Missouri River Flood Information System

After devastating flooding in 2011 and 2019 in southwest Iowa, the Iowa Flood Center developed the interactive Missouri River Flood Information System (MRFIS) to help the people of this region prepare for and reduce future flood risks.

The dynamic and comprehensive MRFIS is capable of estimating flood impacts based on historical, forecasted, and hypothetical flow scenarios, including levee breaches. The system provides state agencies, communities, and individuals with enhanced, reliable, and timely information to help them improve decision-making and floodplain management. The interactive system is freely accessible; it displays the inundation and

“Thank you for your continued work providing real-time information for our citizens to make informed decisions. Love what you are doing at the Iowa Flood Center.”

IOWA STATE SENATOR CHRIS COURNOYER

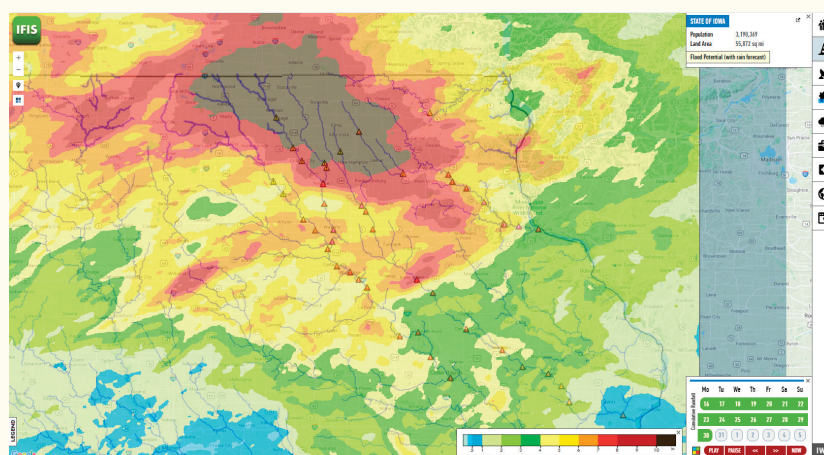
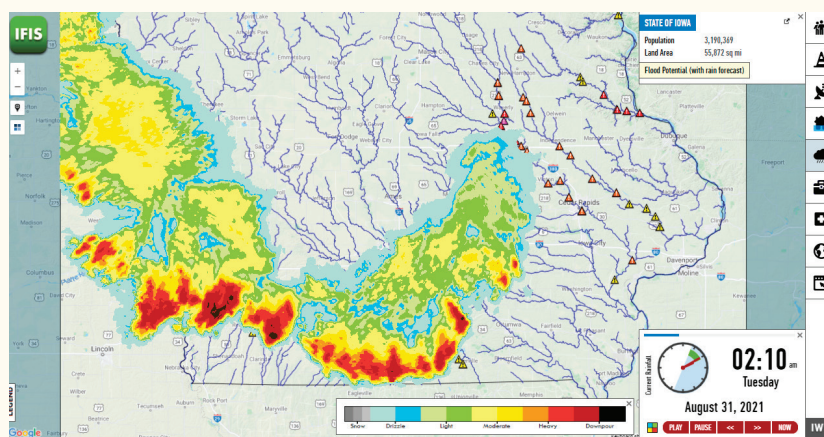
River ation System

The Iowa Flood Center (IFC) is part of 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 can depend on to help them better understand and reduce their flood risks.

propagation of floodwaters through a Google Maps-based web environment.

MRFIS provides critical information to assist with long-term planning and redevelopment strategies focused on bringing vitality and economic stability back to southwest Iowa. The system is part of a larger project to develop a comprehensive assessment and resiliency plan for Mills and Fremont counties. This greater collaborative effort involves many federal, state, and local partners. The project is funded by the U.S. Department of Commerce Economic Development Administration and administered by the Iowa Economic Development Authority.

MRFIS builds on the award-winning Iowa Flood Information System that provides real-time flood alerts and forecasts, river levels, weather conditions, and more for the entire state of Iowa. It also complements Iowa Watershed Approach activities, which include significant modeling, monitoring, and flood mitigation work on the East and West Nishna-
botna Rivers in Mills and Fremont Counties.



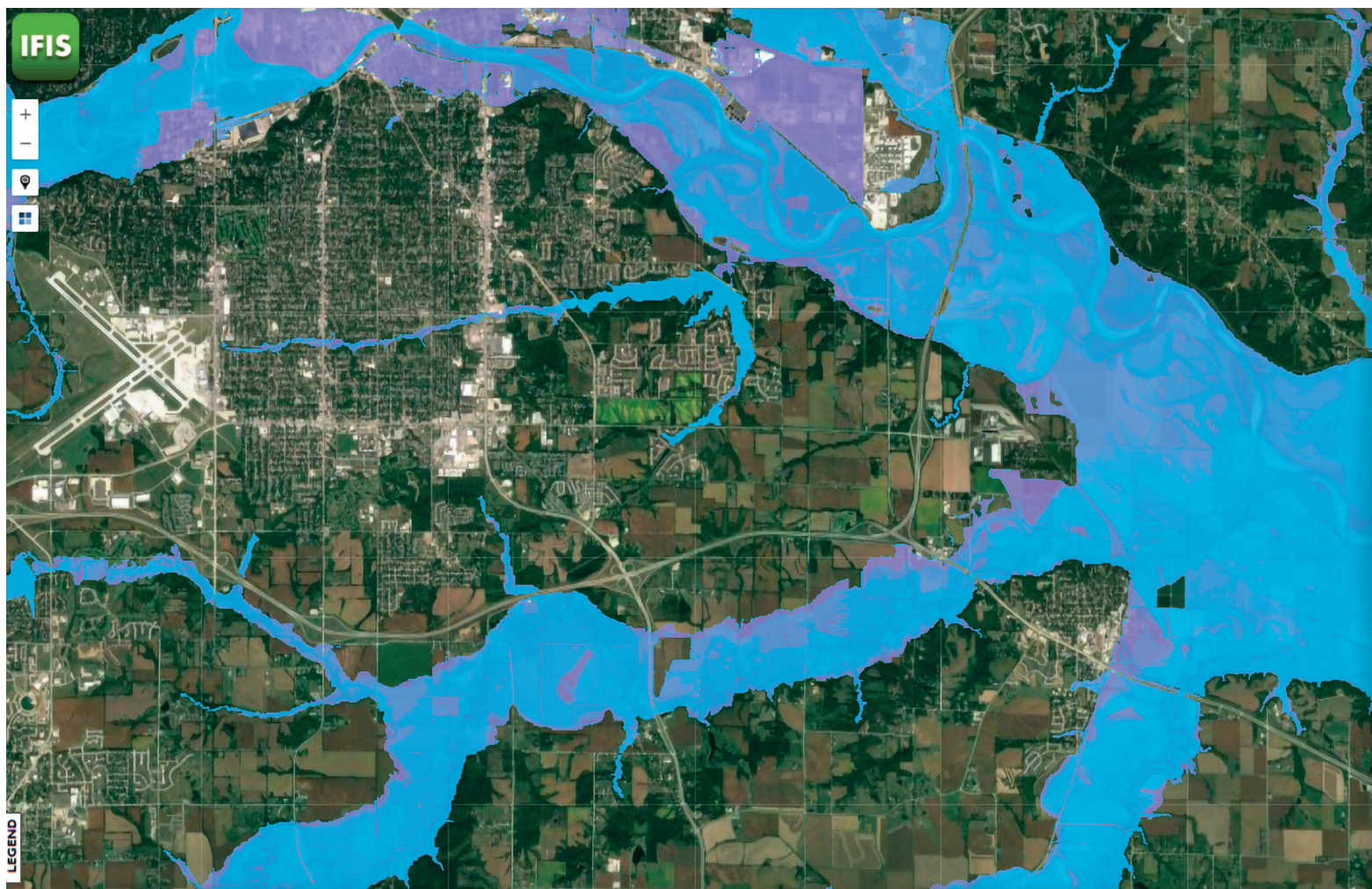
Northeast Iowa Flooding

Torrential rain at the end of August 2021 caused flood challenges for dozens of communities in northeast Iowa, despite abnormally dry ground conditions leading up to the event. Cumulative rainfall displayed on the Iowa Flood Information System between August 16 and 30 showed the area received more than 10 inches of rain, with reports of inundated and washed-out roads, flooded campsites, and damage to homes and businesses.

Krajewski Named AAAS Fellow

Witold Krajewski, University of Iowa professor of civil and environmental engineering and director of the Iowa Flood Center, has been named a fellow of the American Association for the Advancement of Science (AAAS), the world's largest general-scientific society and publisher of the journal *Science*. Election as an AAAS fellow is an honor bestowed upon AAAS members by their peers. Krajewski was selected for major scientific advancements in hydrometeorology, flood prediction, and water resources.





IFC is Key Partner in National Effort to Improve W

**“Thank you so much for
serving our state and country.
So proud of your work.”**
IOWA STATE SENATOR JANET PETERSEN

ABOVE: IFC’s expertise in flood mapping helped develop floodplain maps for all 99 counties in Iowa showing the 2-, 5-, 10-, 25-, 50-, 100-, 200-, and 500-year flood events.

RIGHT, TOP: Rainfall conditions and flood alerts displayed on the Iowa Flood Information System.

RIGHT, BOTTOM: IFC stream sensor visualization on the Iowa Flood Information System.

The University of Iowa and Iowa Flood Center will receive \$21 million over the next five years as a key partner in the new Cooperative Institute for Research to Operations in Hydrology (CIROH) funded by NOAA.

CIROH consists of a constellation of 28 academic institutions, non-profit organizations, and government and industry partners across the United States and Canada that will work together in support of four broad themes: water resource prediction capabilities; community water resources modeling; hydroinformatics; and the application of social, economic, and behavioral science to water resources prediction. The Cooperative Institute will support NOAA’s mission to provide forecast, watch, and warning products to protect life, property, and the nation’s economy.

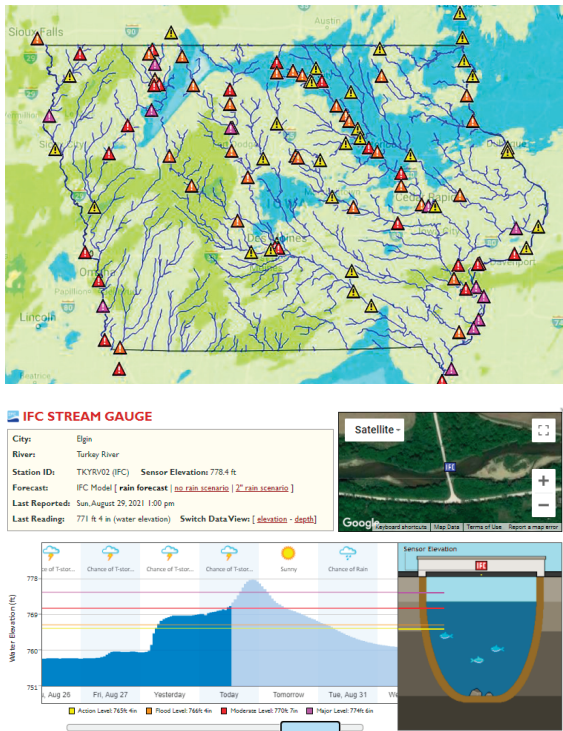
As a key partner, the Iowa Flood Center will share its expertise in flood forecasting, flood inundation mapping, monitoring of streams and hydrologic conditions, and leveraging the work of the highly innovative and advanced Iowa Flood Information System that communicates flood-related information for the entire state of Iowa.

“This is a unique opportunity for us to share the innovative models and tools developed by the Iowa Flood Center with the rest of the nation. It’s another way for Iowa to demonstrate leadership in the hydrologic community,” said Witold Krajewski, UI professor of civil and environmental engineering and director of the IFC.

The program is administered by the Alabama Water Institute at the University of Alabama.



Water Management



State Resilience Partnership

In 2021, the Iowa Flood Center joined the State Resilience Partnership, a new initiative organized by the American Flood Coalition and Pew Trusts. The partnership brings together leading experts from 20 organizations across the U.S. to develop strategies to increase resilience to flooding and sea level rise. The IFC continues to build partnerships to support resource sharing to further advance its mission and exchange best practices.

Multi-Cropping Flood Reduction Benefits

The Iowa Flood Center is providing technical assistance to model the flood reduction benefits of multi-cropping, a regenerative agricultural practice that involves harvesting more than one crop from the same field in a year. Led by partners at Northeast Iowa Resource Conservation & Development (RC&D), the project's focus looks at how improving soil health affects farm profitability and increases water holding capacity thereby decreasing flood risks. Funded by the American Flood Coalition, the project aims to develop innovative flood reduction solutions that can be shared across the country.



In August, the Iowa Flood Center, RC&D, American Flood Coalition, and local partners met up for a field visit with Congresswoman Ashley Hinson and staff to learn more about the multi-cropping project site at FLOLO Farms near West Union, Iowa, owned by Loran Steinlage.



The Final Year

As the Iowa Watershed Approach (IWA) enters its final year, it's people like Rick Mount, a third-generation family farmer in southwest Iowa near Riverton, whose involvement in the program will leave a legacy for years to come.

Mount seized an opportunity to participate in the IWA program after learning about the 90 percent cost-share assistance available to build conservation practices that would hold water back on the landscape to reduce flooding downstream. His dream of building a pond for his grandkids to fish in became a reality when he learned of the funding available from the East & West Nishnabotna Watershed Management Coalition Project Coordinator Cara Morgan.

"We've had six, seven, eight inches [of rain] here over a day or two. And so you want to slow that down as much as you can because there's people farming and living down along that river," Mount says.

Morgan, a graduate from Hamburg High School, remembers sandbagging along the Nishnabotna River during past high-water events. During the 2011 floods, she was serving as a county supervisor and experienced first-hand the devastation and hardship that flooding could have on communities and individuals. In her current role, she's able to fulfill her passion of mitigating flood impacts. "Anytime we can slow the flow and keep the water where it falls, that is really a topic of discussion," Morgan says. "We're being proactive through this program."

As the IWA ends in December 2022, the program will have added nearly 800 conservation practices like farm ponds, terraces, and wetlands to Iowa's landscape that will help to reduce flooding, improve water quality, and leave something behind for the next generation.

"I think the best thing about having a family farm is the ability to keep something better than you started with. And to give that to the next generation," Mount says.

Landowners, project coordinators, and watershed management authorities (WMAs) made up of city, county, and soil and water conservation district members have significantly contributed to the IWA's success.

"Funding for the program will end this year, but the people and relationships that have been built will remain," says Larry Weber, Edwin B. Green Chair in Hydraulics and project lead and visionary behind the IWA. "We've learned how to work together at the federal, state, and local level and can use that momentum to keep moving the goals of the IWA forward."

As the project ends, the Iowa Flood Center will use its expertise in hydrologic modeling to assess the flood reduction and water quality improvement benefits of all built IWA practices. This information will further measure the program's impact across the state.



BEFORE



AFTER

A bank stabilization project completed in the West Nishnabotna River Watershed near Henderson, IA.

"I guess there's a little pride involved that I took care of this land."

RIVERTON IOWA FARMER RICK MOUNT



For more information: www.iowawatershedapproach.org



Project of the Year Award

The Iowa Watershed Approach received the 2021 Project of the Year Award from the Iowa Floodplain and Stormwater Management Association in recognition of its collaborative approach to effectively reduce floods, improve water quality, and increase resilience to water resource challenges.



Weber Receives American Water Resources Association Award

University of Iowa Professor of Civil and Environmental Engineering and Iowa Flood Center Co-founder Larry Weber has won the prestigious Integrated Water Resources Management Award, presented by the American Water Resources Association. The award recognizes Weber's significant contributions to the improvement and transformation of watershed management in Iowa and beyond.

"I feel a responsibility to the people of Iowa."

IOWA FLOOD CENTER
CO-FOUNDER LARRY WEBER



Student Spotlight

Libby Casavant: Libby Casavant, a graduate student in civil and environmental engineering, had the unique opportunity to take her research in sediment modeling all the way to the Netherlands. The education she received and experience gained at IIHR and the Iowa Flood Center are helping her connect with other researchers to take her work to the next level.



"As an Iowan, I am very excited about IFC...I am so glad that it's continued to be funded and appreciated, and I want them to get the opportunity of more research and more communication with people across the state on flooding and other topics that are important for our safety," Casavant says.

Riley Post: Riley Post earned both his bachelor's and master's degrees from the University of Iowa (UI). After graduating, he spent 10 years with the U.S. Army Corps of Engineers before returning to the UI as a PhD student in civil and environmental engineering at the Iowa Flood Center.

"It was really hard to even recognize what it was when I left versus what it is now and the service it provides," Post says. "I don't know that you would find a better place to be to study flooding."



He now studies riverine flooding models that could help with designs to relocate floodwaters to farm ponds and wetlands, keeping the water away from farmland and infrastructure. Post's research earned him a champion title for the UI College of Engineering's Three Minute Thesis competition.

Everywhere, All the Time

After 18 months of working remotely, Zoom meetings, and virtual conferences, the Iowa Flood Center team welcomed the chance to safely resume some in-person activities. In 2021, the IFC had one of its greatest years for outreach programming to date, participating in over 50 events including STEAM (Science, Technology, Engineering, Arts, and Mathematics) festivals, county fairs, field days, watershed tours, teacher workshops, and more. IFC's dedication to its education and outreach program has earned it the reputation of "being everywhere, all the time," and is helping to build a more flood resilient Iowa. Contact us for outreach requests!

TOP: Iowa welcomes new University of Iowa President Barbara Wilson during her first week.

BOTTOM: Gabriele Villarini sharing IFC resources that can be used by teachers and students in the classroom during a fall workshop.

LEFT: IFC participates in dozens of STEAM events throughout the year to educate students about watersheds and flooding.



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 → ifis.iowafloodcenter.org



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