



LEADERS OF THE IOWA FLOOD CENTER (IFC) AND NATIONAL WEATHER SERVICE (NWS) DISCUSSED THE WAYS THE ORGANIZATIONS CAN WORK TOGETHER TO PROVIDE BETTER SERVICE FOR IOWA AND THE NATION. THE IFC HOPES TO PLAY A CRUCIAL ROLE BY LEVERAGING THE EXPERIENCE AND TECHNOLOGICAL ADVANCES DEVELOPED AT THE UI.



# IFC UPDATE



AN UPDATE ON THE RESEARCH AND ACTIVITIES AT THE IOWA FLOOD CENTER

SPRING 2015

2014 Rock River Flooding  
PHOTO COURTESY OF BRENT KOOPS



## FLOODS STRIKE NORTHWEST IOWA IN 2014



In June 2014, heavy rainfall pushed the Rock River to historically high levels.

**HISTORIC FLOODING** on the Rock River in June 2014 devastated Rock Valley and Rock Rapids in northwest Iowa. According to the Iowa Department of Natural Resources, flooding in this part of the state overwhelmed drinking water systems, sewer treatment plants, and animal feeding operations, triggering drinking water boil orders and causing environmentally damaging discharges of livestock manure.

More than 700 residents of Rock Rapids (one-third of the town's population) had to evacuate their homes along the river. Rock Valley, which was surrounded by water on three sides on June 17, also evacuated residents and businesses.

Flooding in northwest Iowa was particularly severe, but the whole state suffered in 2014. Twenty-one USGS gauges reached record high streamflow or stream stage, including the Volga River in northeast Iowa, the Boone River in central Iowa, and the West Nishnabotna and Keg Creek in southwest Iowa. Fifty-seven Iowa counties were included in three different Presidential Disaster Declarations as a result of severe storms and flooding during June and July.

“River-stage gauges provide emergency management with data to project potential flooding downstream and make necessary preparations for potential high-water levels.”

— Director, Winneshiek County Emergency Management Agency



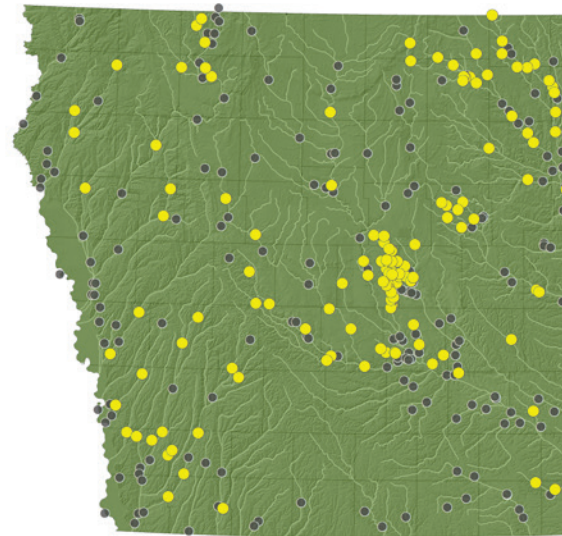
# IFC Deploys More Stream



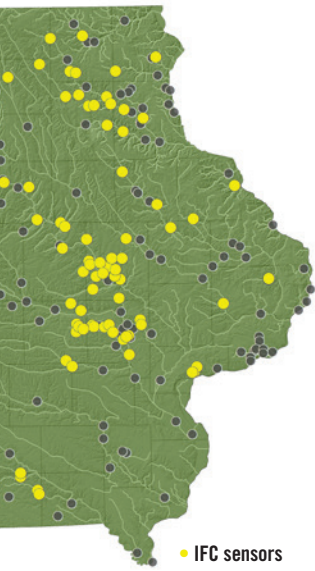
(Left) IFC Engineer Dan Ceynar installs a stream-stage sensor on the side of a bridge.

(Top) The IFC has installed more than 200 of its affordable sensors throughout the state.

(Bottom) IFC graduate student Keith Gaynor (now an alumnus) assembles the sensor electronics in the IHR Wind Tunnel Annex.



# Stream Sensors

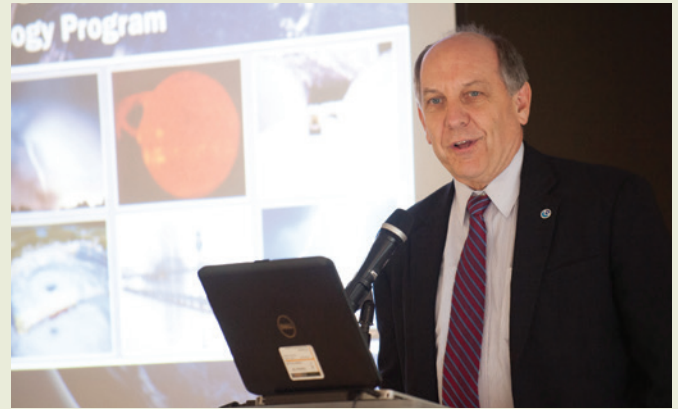
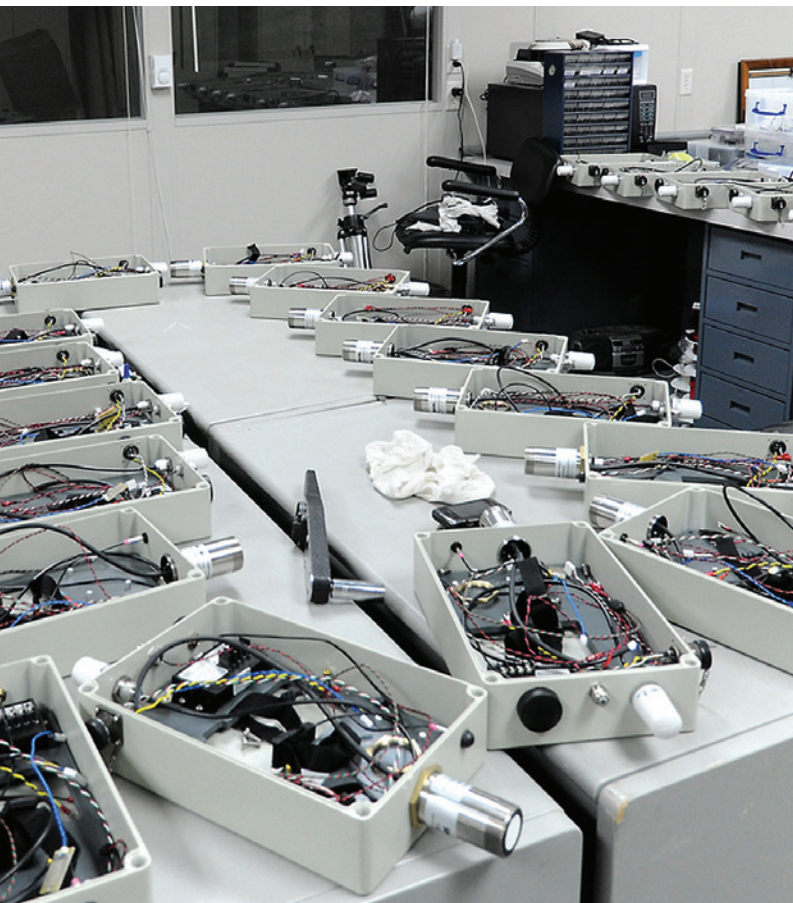


- IFC sensors
- USGS sensors

In partnership with the Iowa DNR, the IFC added 50 new stream-stage sensors to the existing network in 2014. The IFC deployed the new sensors at locations requested by local emergency management staff, community leaders, state agencies, and the National Weather Service. Iowa's emergency managers say that the sensors provide information vital for effective flood preparedness and safety.

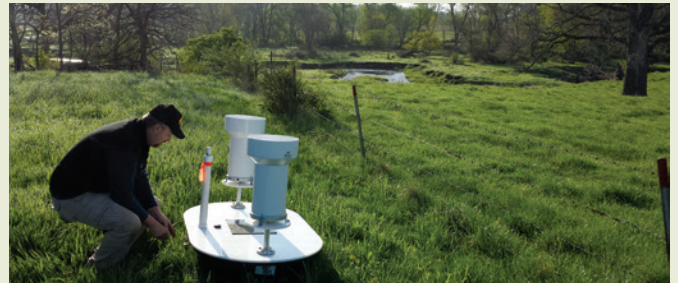
The IFC stream-stage sensors measure the distance to the water and send data to the Iowa Flood Information System every 15 minutes.

The IFC network, first introduced in 2010, now includes more than 200 sensors monitoring Iowa's streams and rivers.



## National Weather Service Visits IFC

National Weather Service Director Louis W. Uccellini called the Iowa Flood Center "a tremendous asset" when he visited the University of Iowa in October. Leaders of the Iowa Flood Center (IFC) and National Weather Service (NWS) discussed the ways the organizations can work together to provide better service for Iowa and the nation. The IFC hopes to play a crucial role by leveraging the experience and technological advances developed at the UI. "We believe the tools we've already developed at Iowa can be valuable to the nation," says IFC Director Witold Krajewski.



## Rain Gauge Deployment

The Iowa Flood Center is partnering with the Turkey River Watershed Management Authority, Northeast Iowa Resource Conservation and Development, and private landowners to deploy a network of IFC rain gauges to help monitor hydrologic conditions across the Turkey River watershed. Precipitation, soil moisture, and soil temperature data will be collected in real-time at each site and available to the public on the Iowa Flood Information System (IFIS).

## Iowa Flood Maps Project Gains Momentum

Working with the Iowa Department of Natural Resources, the IFC is more than halfway through a six-year project to develop updated floodplain maps for the 85 Iowa counties that were declared Presidential Disaster Areas after the 2008 Iowa floods. The remaining 14 Iowa counties will be mapped by the U.S. Corps of Engineers.

IFC researchers are using laser radar (LiDAR) data to map all streams draining one square mile or more. LiDAR data allow the team to describe river and stream networks, develop computer-based flood simulations, and delineate floodplains with reasonable accuracy.

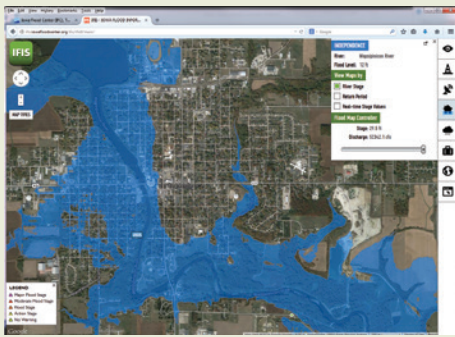
New draft flood maps are being posted online at [www.iowafloodmaps.org](http://www.iowafloodmaps.org) as they become available. The user-friendly interface allows Iowans to directly access information about their flood risks.

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## Iowa Flood Information System (IFIS)

The Iowa Flood Center developed IFIS to help Iowans be better prepared for flooding. IFIS is an easy-to-use online application that allows users to find their watersheds, view stream levels in real-time, check local rainfall, and see predicted flood levels. New flood inundation maps for Humboldt, Independence, and Maquoketa will be released in 2015. <http://ifis.iowafloodcenter.org>



## Midwest Floods More Frequent

Midwestern floods are not getting bigger, but big floods are occurring more often. That's according to IFC researcher Gabriele Villarini, who studied daily records collected by the U.S. Geological Survey at 774 stream gauges in 14 states from 1962–2011. Villarini found that flood frequency increased at 34 percent of the stations, while only 9 percent of the stations showed a decrease. These findings come as no surprise to Iowans, who have experienced major flooding in 1993, 2008, 2011, 2013, and again in 2014. These events brought billions in economic losses and displaced thousands of people from their homes and businesses. Villarini's research was published in *Nature Climate Change*.

# IFC on the Road



The University of Iowa's mobile museum is ready to hit the road again, bringing some of Iowa's natural and cultural treasures to communities around the state—and the Iowa Flood Center is proud to be a part of it.

The mobile museum travels around the state in a custom-built RV that stretches 38 feet and features some of the best the UI Pentacrest Museums have to offer. In the museum's inaugural season last year, interactive computer modules allowed visitors to try out the IFC's sophisticated flood information tools (the Iowa Flood Information System, or IFIS).

In addition to the mobile museum, IFC researchers visit dozens of schools and STEM festivals every year with a flood demonstration table, to give students a fun, hands-on way to learn how floods move through a watershed. In 2014, IFC engineers interacted with more than 700 young Iowa scientists through visits to classrooms and after-school programs. The Iowa Flood Center is committed to reaching out to Iowans statewide to help improve flood awareness and preparedness.