The Iowa Flood Center
Report of Activities: February 2013

Since its establishment in 2009, the Iowa Flood Center (IFC) has significantly improved the state's level of flood preparedness. Based at IIHR—Hydroscience & Engineering at the University of Iowa, the IFC provides accurate, state-of-the-science-based information to help decision-makers, individuals, and communities better understand their flood risks. **The IFC's primary objective is to improve flood monitoring and prediction capabilities in Iowa, while also developing strategies to help mitigate and prevent flood damage in the future.** This is accomplished through a variety of activities that provide the latest research, information, and technologies to agencies, policy-makers, citizens, and other stakeholders in Iowa.

In its first four years, the IFC has focused on the projects that offer the most promise for quickly improving flood monitoring and prediction in the state. Great progress has been made on these projects, and new efforts have been undertaken in the last year. Projects initiated or ongoing in year four include:

- **The Iowa Watersheds Project**, funded by the U.S. Department of Housing and Urban Development, focuses on watershed-scale work to understand how small-scale mitigation projects can reduce flood damages in a watershed. The project has three components: 1) a hydrologic assessment of four selected Iowa watersheds; 2) construction of projects, such as retention ponds and wetlands; and 3) analysis of the impact of these projects in the watershed. In year one, the Iowa Watersheds Project selected four watersheds (the Middle Raccoon River, Soap Creek and Chequest Creek, the Turkey River, and the Upper Cedar River). Hydrologic assessments are underway, and IFC researchers are meeting regularly with local leaders and landowners in each watershed to learn more about the area and help select locations for project implementation. The Iowa Watersheds Project promises to make significant improvements in the participating watersheds, while collecting critical data to help design and evaluate future strategies for reducing floods at both the local and statewide scale.
- **Iowa Flood Studies (IFloodS)** is a unique opportunity to work in collaboration with NASA and other federal agencies to deploy a wide-range of scientific instruments (including weather radars, rain gauges, and more) to collect high-quality rainfall data in the Cedar, Iowa, and Turkey River basins. The goal of IFloodS is to support activities of NASA's 2014 Global Precipitation Measurement (GPM) satellite mission. (The GPM will enhance precipitation measurements from space through improved measurement accuracy and enhanced sampling over most of the globe.) IFloodS will begin in April 2013 and continue through June. Iowans will benefit from the improved understanding of precipitation and better flood forecasting models, and IFC students will have a hands-on opportunity to work with NASA personnel and instrumentation. Iowans will hear much more about this initiative in the coming months!
- ***Living with Floods*** is a statewide commemoration of recent flood events in Iowa, celebrating the state's progress toward recovery, and raising awareness of flood mitigation strategies and the interconnectedness of our environment and the watersheds in which we live. The University of Iowa has joined with seven partner communities — Cedar Rapids, Council Bluffs, Davenport, Des Moines, Dubuque, Iowa City, and Muscatine — to remember the floods and generate community discussions about managing future flooding. Throughout the spring of 2013, *Living with Floods* will sponsor educational events for Iowans of all ages focusing on K-12 curriculum, community discussions, and STEM events. The project will culminate in June with free performances by the Preservation Hall Jazz Band in each partner community. Our University of Iowa *Living with Floods* partners include Hancher, College of Engineering, CGRER, College of Education, the State Hygienic Lab, and IExploreSTEM.
- **Ongoing development of high-resolution, web-based flood inundation maps** for Iowa's largest and most flood-vulnerable population centers. Researchers are creating detailed maps to illustrate the extent of flooding under different conditions. This information is available to the public so residents can see how predicted flood levels could affect their property. Interactive maps for Iowa City/Hills, Charles City, Cedar Falls/Waterloo, Des Moines, Cedar Rapids, Mason City, and Elkader are available through the Iowa Flood Information System. Maps for Ames, Ottumwa, and Spencer are underway, with expected completion in 2013.

- **Development of floodplain maps** for most of Iowa. The IFC is about 2-1/2 years into the four-year Iowa Floodplain Mapping Project, which is funded with $10 million from the U.S. Department of Housing and Urban Development. Working closely with the Iowa DNR and FEMA, the IFC is developing floodplain maps for the 85 Iowa counties declared federal disaster areas after the 2008 floods. Once completed and approved by FEMA, the maps will be available online to guide floodplain regulation and management.
- **Other ongoing IFC projects:**
  - **The Iowa Flood Information System** (IFIS) is an easy-to-use online application that provides up-to-the-minute information on rainfall and stream levels for more than 1000 local communities (www.iowafloodcenter.org). IFIS includes Identification of basin boundaries upstream from communities at risk for flooding to help citizens understand how precipitation upstream impacts them. NEXRAD-based rainfall and stream sensor information is also included in IFIS.
  - **Affordable electronic stream-stage sensors** measure river and stream levels and transmit up-to-the-minute data to the Center. The IFC has deployed more than 135 sensors in cooperation with its partners, which include the Iowa DNR and the Iowa DOT. Current data from these sensors are available on IFIS (www.iowafloodcenter.org).
  - **Development of new soil temperature and soil moisture sensors** that transmit soil conditions to the IFC. Information about soil conditions will improve the accuracy of IFC flood prediction models.
  - **Improved seasonal forecasts** will help agencies and local governments prepare for upcoming hydrologic conditions.
  - **Projects with faculty members at Iowa State University**. These projects complement other IFC initiatives and will improve future flood prediction models:
    - Development of a real-time rainfall forecasting system to extend streamflow forecast lead time, especially during warm season heavy rain events responsible for most of Iowa's worst flooding.
    - Experimental evaluation of how different crop and land management systems impact runoff generation.
  - **Education of graduate and undergraduate students** at the UI and ISU who are currently involved in IFC work. These students get hands-on training and research expertise that spans a variety of academic disciplines, preparing them for the complex problems of the future.

Vision for the Future

By developing new methods, strategies, and technologies to cope with future flooding, the Iowa Flood Center is helping Iowans learn how to "live with floods." New opportunities such as the Iowa Watersheds Project will allow the IFC to use its modeling capabilities to evaluate various flood mitigation strategies. Strengthened collaborations with research partners such as NASA will further advance the IFC's goals to make Iowa a safer place through scientific advancements and their practical implementation. And ongoing projects such as the growing stream-stage sensor network, along with other new sensors under development and collaborations with Iowa State University, will contribute to the development of accurate short- and long-term flood prediction models.

Additional Information

Follow IFC progress on the web: http://www.iowafloodcenter.org. This site provides up-to-date status on IFC projects, with updates and new initiatives coming online regularly. The IFC website is also a portal through which citizens and decision-makers can access IFIS with its important maps, sensor data, and other up-to-the-minute information about the rivers and streams in their communities. You can also follow IFC activities on Facebook and receive notification of upcoming programs, flood warnings, and other relevant information through Twitter.

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