The Iowa Flood Center
Report of Activities: March 1, 2011

The Iowa Flood Center (IFC) was established and funded by the State of Iowa in spring 2009 and commenced July 1, 2009. It is housed by IIHR-Hydroscience & Engineering on The University of Iowa campus. *The IFC's overarching objective is to vastly improve flood monitoring and prediction capabilities in Iowa.* This is accomplished through a variety of activities with the common goal of improving the transfer of the latest research, information, and technologies into the hands of the appropriate agencies, policy makers, citizens, and other stakeholders. This arrangement is truly a first in our field!

The first year of the IFC was dedicated to developing several projects with the most promise for improving flood monitoring and prediction capabilities across the state in a short amount of time. Great progress was made on these projects during the first half of year two. Examples include:

- Installation of 50 of the IFC's new inexpensive river stage (level) sensors on Iowa bridges across the state. The sensors supplement current USGS gauges and improve flood monitoring capabilities across the state. This project was accomplished in partnership with the Iowa DNR. Iowans can access current data from these sensors on the IFC web site.
- Identification of basin boundaries upstream from 530 Iowa communities at risk for flooding. This information will help communities understand how precipitation upstream impacts them. River gauges and precipitation information is included on the map.
- Continued development of a library of flood inundation maps for Iowa's largest communities. These interactive maps are complete and available on the IFC web site for Iowa City, Waterloo, Charles City, Des Moines, and Cedar Rapids.

New projects initiated in year two include:

- A contract with the DNR for HUD funding to develop new floodplain maps for the 85 Iowa counties declared presidential disaster areas in 2008. These maps will be used by FEMA to issue new, more accurate 100-year and 500-year floodplain maps. This is a four-year $10M project.
- 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.
- Four new projects with faculty members at Iowa State University were initiated. These projects complement other IFC initiatives and will improve future flood prediction models. With funding totaling $300,000, these projects include:
    1. A snowmelt prediction model under development to allow flood prediction to be made during periods of rapid snowmelt. Preliminary model tests are conducted for the Squaw Creek watershed near Ames, IA. Results are being compared to satellite-based observations of snow cover to verify that snowpack is being properly modeled.
    2. A new basin-specific precipitation metric, based upon the concept of water travel times and "traffic jams," was developed to more accurately analyze climatological connections between precipitation and floods.
    3. Development of a relative rainfall prediction system that will maximize accuracy for warm season heavy rain events responsible for most of Iowa's worst flooding. Several variations of

the model along with neighborhood smoothing have been tested using state-of-the-art validation techniques; ensembles of different model configurations will soon be applied

4. Continued evaluation of the impacts of different crop and land management systems on the hydrology and water quality of the Raccoon River watershed, including the effects of introducing more perennial grasses within typical corn and soybean rotations. Recent research has also focused on evaluating the effects of projected climate change in the 2050s on the hydrology of the Raccoon River.

- *A Watershed Year: Anatomy of the Floods of 2008*, edited by Cornelia Mutel, came out in spring 2010. *A Watershed Year* captures the essence of the 2008 Iowa floods in 25 essays written by leading scientists, watershed specialists, and public administrators, many of whom experienced the devastation of the flooding firsthand. In conjunction with the release of *A Watershed Year*, a series of free public seminars was organized, bringing together essay authors and other flood and climate experts to make public presentations and to engage in open dialog about flood-related research and resources. Ten symposiums were held across the state, reaching 700 Iowans. Copies of *A Watershed Year* were available for free. This event was co-sponsored and co-organized by CGRER (Center for Global and Regional Environmental Research) at The University of Iowa.
- In Fall 2010, the Iowa Flood Center was awarded an $8.8M HUD contract for the coordination of watershed demonstration pilot projects in both urban and rural areas. The pilot projects will seek to: 1) maximize soil water holding capacity from precipitation; 2) minimize severe soil erosion and sand deposition during floods; 3) manage water runoff in uplands under saturated soil moisture conditions; and 4) reduce and mitigate structural and nonstructural flood damage. This project promises to make significant improvements in several watersheds, while collecting critical data to help design and evaluate new strategies for reducing and/or managing floods across Iowa.

Vision for the Future

As the Iowa Flood Center moves forward on current projects, plans are also being formulated for future projects to benefit Iowans. The new HUD project will allow the IFC to begin using its modeling capabilities to evaluate different flood mitigation strategies. The new stream stage sensor network currently in place, other new sensors under development, and collaborations with Iowa State University will contribute to the development of accurate flood prediction models. Future IFC activities may also incorporate other aspects of flooding, including health issues, policy and politics, economics, education, and social implications.

Additional Information

Follow IFC progress on its website: http://www.iowafloodcenter.org. This site provides up-to-date status on IFC projects, with updates and new initiatives coming on line regularly. The IFC website is also a portal through which citizens and decision-makers can access important maps, sensor data, and other up-to-the-minute information about the rivers and streams in their communities.

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