

2011 -IUPUI Fluvial Erosion Hazard (FEH) Program Announcement

Mention flooding and images of homes and other buildings half submerged in water come to mind. While programs have been developed to mitigate that kind of damage, little has been done to help communities plan to lessen the kind of flood damage - erosion from flowing water - that actually costs the most and affects the most people.

A team comprised of experts from federal and state agencies and Indiana University Purdue University-Indianapolis (IUPUI) is working to change that in Indiana. The state will become only one of a few that have undertaken such an effort.

The largest single source of flood losses is damage to roads, bridges, and other transportation infrastructure caused by fluvial or river erosion - where flood waters erode stream and river banks or even change the course of streams or rivers, shifting where they flow across the landscape.

In June 2008, flooding damaged or destroyed more than 650 roads, 60 bridges, and 100 culverts in Indiana.

“The work will benefit all communities in Indiana that are located in flood-prone areas,” said Scott Morlock, Deputy Director, U.S. Geological Survey (USGS) Indiana Water Science Center. “When a road is damaged or destroyed it can cut off a community, and it is incredibly expensive to rebuild a bridge.”

With \$1.6 million in funding from the Indiana Office of Community and Rural Affairs, the U.S. Geological Survey (USGS) Indiana Water Science Center, the Center for Earth and Environmental Science (CEES) at IUPUI and The Polis Center at IUPUI are working on a river erosion hazard mitigation program.

Scientists from CEES will work with the USGS to map streams statewide and create the field-based tools and training necessary to educate community officials and agency staff in flood erosion hazard assessment.

“Currently, the State of Indiana does not have a set of tools specific to our stream systems making accurate assessment of streams and stream conditions extremely difficult” says Lenore Tedesco, director of CEES and one of the projects leaders. “Climate-change scenarios for the Midwest all point to flooding and flood erosion hazards as areas of significant importance. In addition to the repeated flooding that we have been seeing the past few years, the high intensity rain storms are also problematic for fluvial erosion hazards. This is a very timely project that will help Indiana plan and protect resources”, said Tedesco.

The Polis Center, which has been very active in local and state hazard mitigation planning, will develop the GIS data layers that will help inform the mapping and identification of river erosion

hazards. Once the mitigation tools are developed, Polis will work with the USGS and CEES to develop a Web application providing access of the tools to state and local planners.

Dave Coats, associate director of The Polis Center, sees this mitigation program as a valuable opportunity for the state and local communities to expand their current mitigation efforts. “You can’t effectively prepare for a hazard unless you understand its potential impact. This program will raise awareness of the threat of fluvial erosion throughout the state.”

The USGS, CEES, and Polis Center will produce a mitigation plan that will:

- Map selected stream reaches in Indiana river erosion hazards; these stream reaches will be selected based upon the potential severity of their impact to communities;
- Deliver presentations and workshops to introduce river erosion hazards to the Indiana mitigation and planning community and to educate and guide that community in using the river erosion State Plan resources for mitigation of river erosion at a local level;
- Develop a river erosion web site that provides resources including tools that the local communities will need to initiate and sustain a river erosion program, including tools for identifying and assessing sections of rivers and streams where erosion is likely to occur and a screening tool for identifying erosion concerns at bridge crossings.

It was after the flooding of 2008 that a group comprised of federal, state, and regional agencies and universities called the Indiana Silver Jackets began focusing its attention on river erosion hazards. All of the organizations involved in this project are members of the Silver Jackets.

The Indiana Silver Jackets were created to foster interagency cooperation in addressing risks associated with natural and manmade hazards.

Indiana’s FEH program—initiated by this planning mitigation activity—will provide state and local agencies with mapping, planning, and zoning tools to mitigate the effects of fluvial erosion hazards. Communities will be able to use the mitigation tools that are being developed to help build more erosion resistant bridges and infrastructure, identify where transportation corridors might be vulnerable, and avoid developing in areas where there may be high fluvial erosion potential.

“The idea is to identify zones so communities can stay away from high erosion areas or develop mitigation plans for areas where fluvial erosion hazards are likely to occur,” Morlock said. “If a community plans, knowing that a nearby stream is a mobile entity and that it can erode its banks and shift around, it can take steps to protect property and infrastructure.”