



Indiana Silver Jackets Fluvial Erosion Hazard Program

Background

Through the processes of streambank erosion, floodplain construction, and meandering, stream channels naturally establish a geometry that is adjusted to the volumes of water and sediment generated within the basin. In many cases, the meandering nature of a stream channel is viewed as one of the most aesthetically pleasing characteristics of natural waterways. At the same time, it must be recognized that stream channels are dynamic landscape features which continually adjust their location and course. The “fluvial erosion hazard” (FEH) represents a significant concern in areas where human development and infrastructure are established in close proximity to natural waterways. Indiana’s FEH Program is a multi-agency mitigation planning effort to provide shared resources so individuals and communities may better recognize areas prone to natural stream-erosion processes and adopt strategies to avoid FEH related risks.



Figure 1. A naturally meandering stream reach can provide a general sense of symmetry, balance, and solitude.



Figure 2. Through the processes of streambank erosion and meandering, streams can threaten to undermine structures placed within their meandering pathway.

Example:

Comparison of figures 3 (before) and 4 (after) shows that, in a 5 year period, local agricultural land has been lost to the river, the channel has migrated 290 ft. to the northwest, and the existing utility poles are potentially threatened by future fluvial erosion.



Figure 3. White River near Centerton, IN (2005). Note the relative location of the utility poles and lines to the northwest of the active river channel.



Figure 4. Same White River location near Centerton, IN (2010). The lines now run over the active channel and the utility poles are at risk from future erosion.

Principal Investigators

The Indiana Silver Jackets Hazard Mitigation Task Force has initiated a multi-agency program to identify, study, and provide mitigation planning resources for individuals and communities who would like to adopt FEH avoidance strategies. The FEH effort being undertaken in Indiana is modeled after an FEH program developed by the Vermont Department of Environmental Conservation and will greatly benefit from the well documented strategies, protocols, and products established within that program. While supported by all the agencies and groups active in the Indiana Silver Jackets, three participating groups share the primary responsibilities for implementing this program: the Center of Earth and Environmental Science (CEES) at Indiana University-Purdue University at Indianapolis (IUPUI), the Polis Center (Polis) at IUPUI, and the U.S. Geological Survey (USGS)—Indiana Water Science Center. Working with shared resources, staff, and goals, these three groups are currently conducting a broad variety of science, mapping, and education activities related to the FEH program in Indiana. Funding for this program has been provided by the Indiana Office of Community and Rural Affairs (OCRA).

Deliverables

(All deliverables should be completed by June, 2014)

FEH web portal to share resources and tools

- Field guide to bankfull indicators
- Regional curves for wadeable streams in Indiana
- Bank-stability assessment protocols
- An FEH screening methodology for bridges
- Examples to illustrate an FEH-mapping process

FEH Presentations and Workshops

- Introductory presentations (8) (Completed)
- Introductory workshops (3) (Oct 2, 10, and 18, 2012)
- Regional workshops (5)
- Two-day workshops (2)
- INAFSM workshop (1)
- Program results presentations (5)
- Course materials for above listed presentations and workshops

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