



Development of a Fluvial Erosion Hazard Mitigation Program for Indiana

Indiana Watersheds Webinar Series
October 12, 2011

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Stable Channel Equilibrium

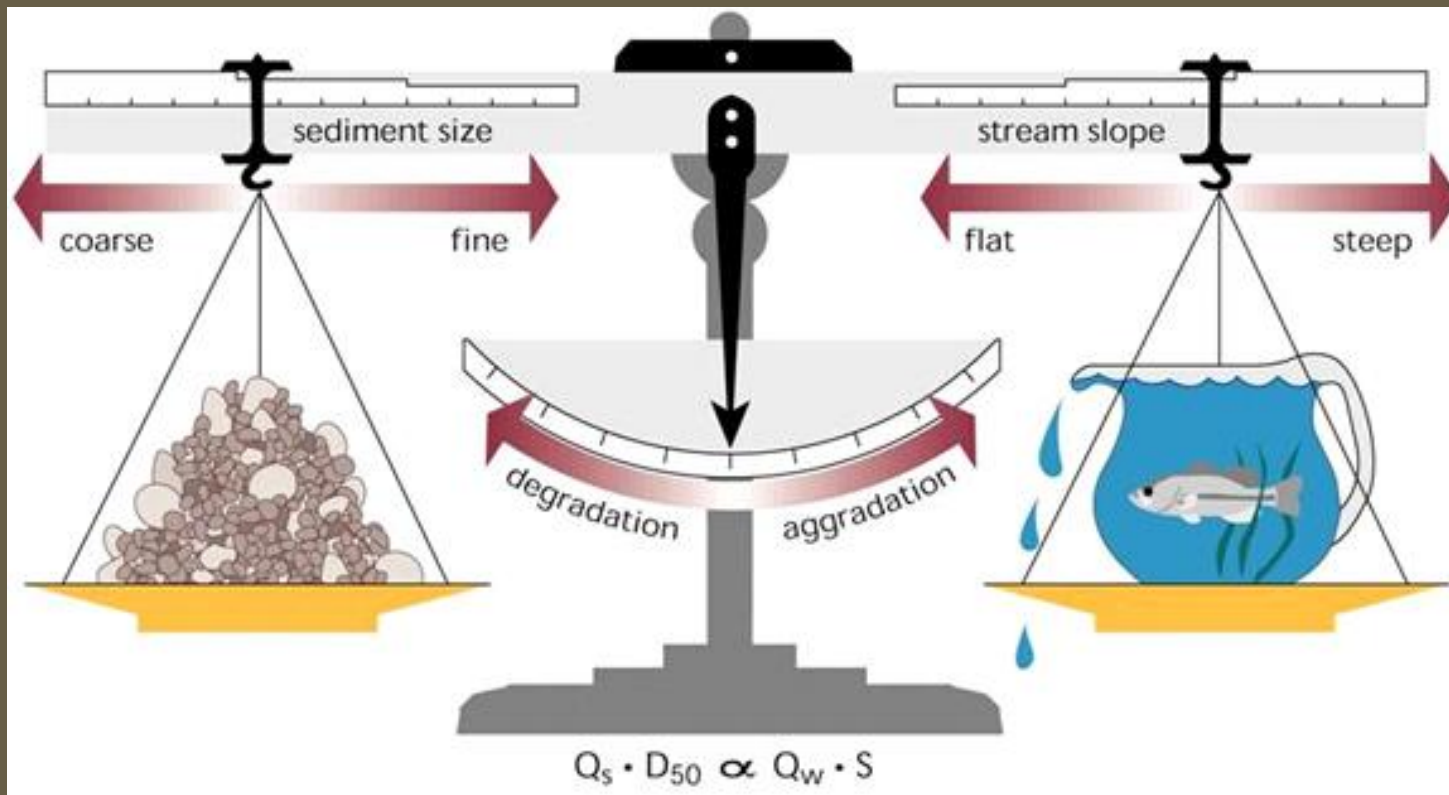
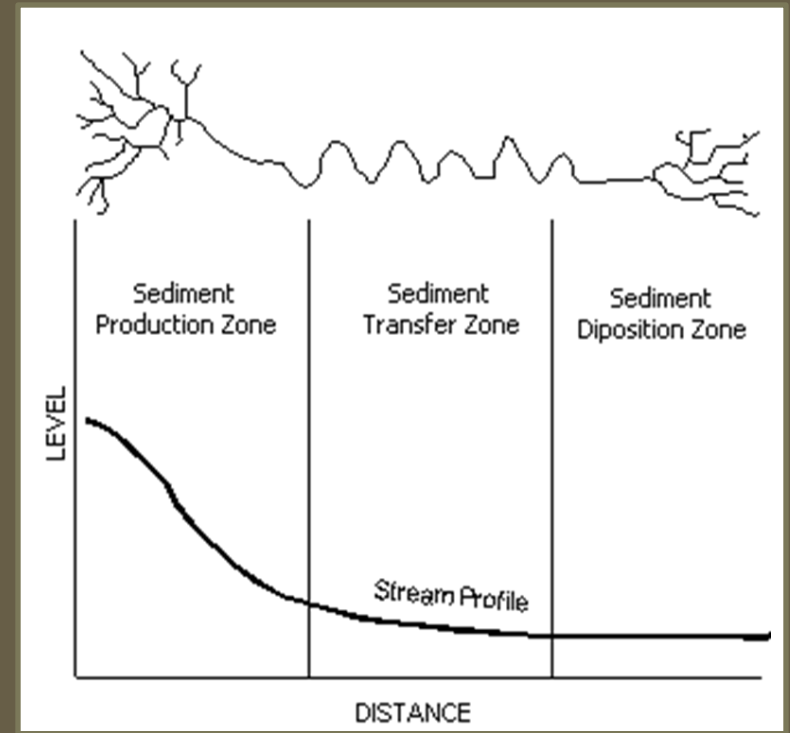
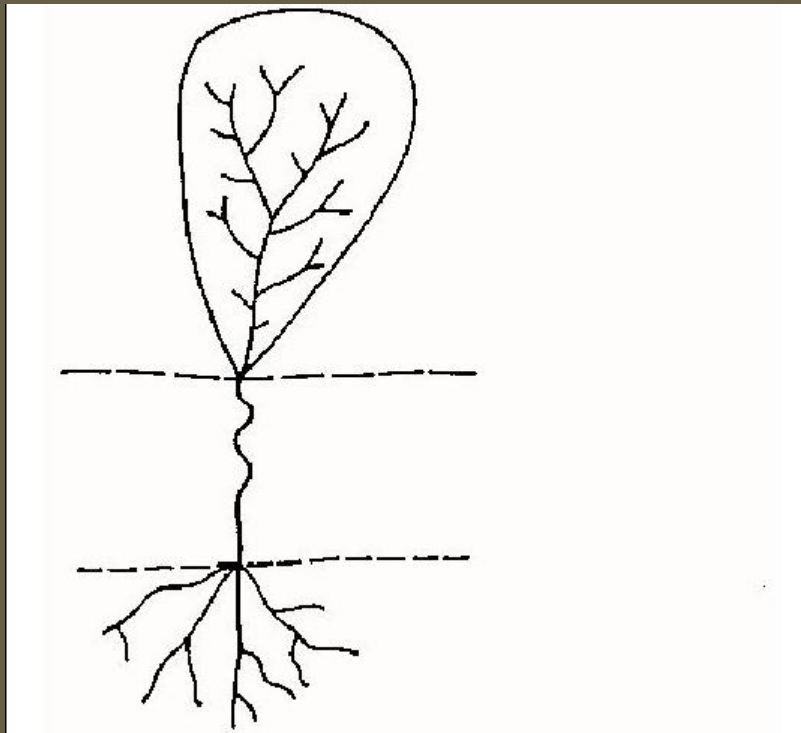
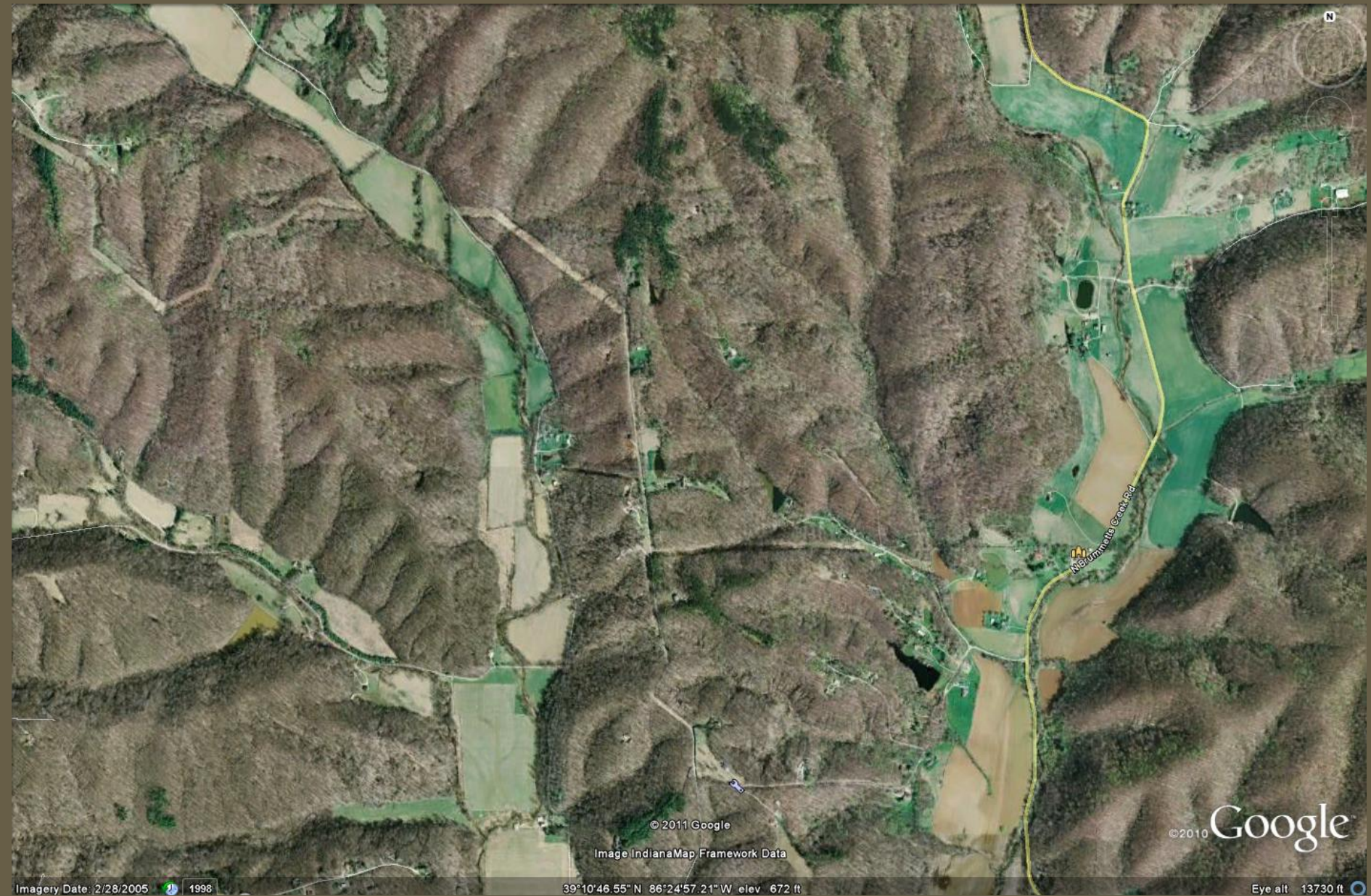


Image: USFWS; after Lane, 1955



The Fluvial System (after Schumm, 1977)



North Getty's Creek, Brown County, IN



West Fork White River, Johnson County, IN



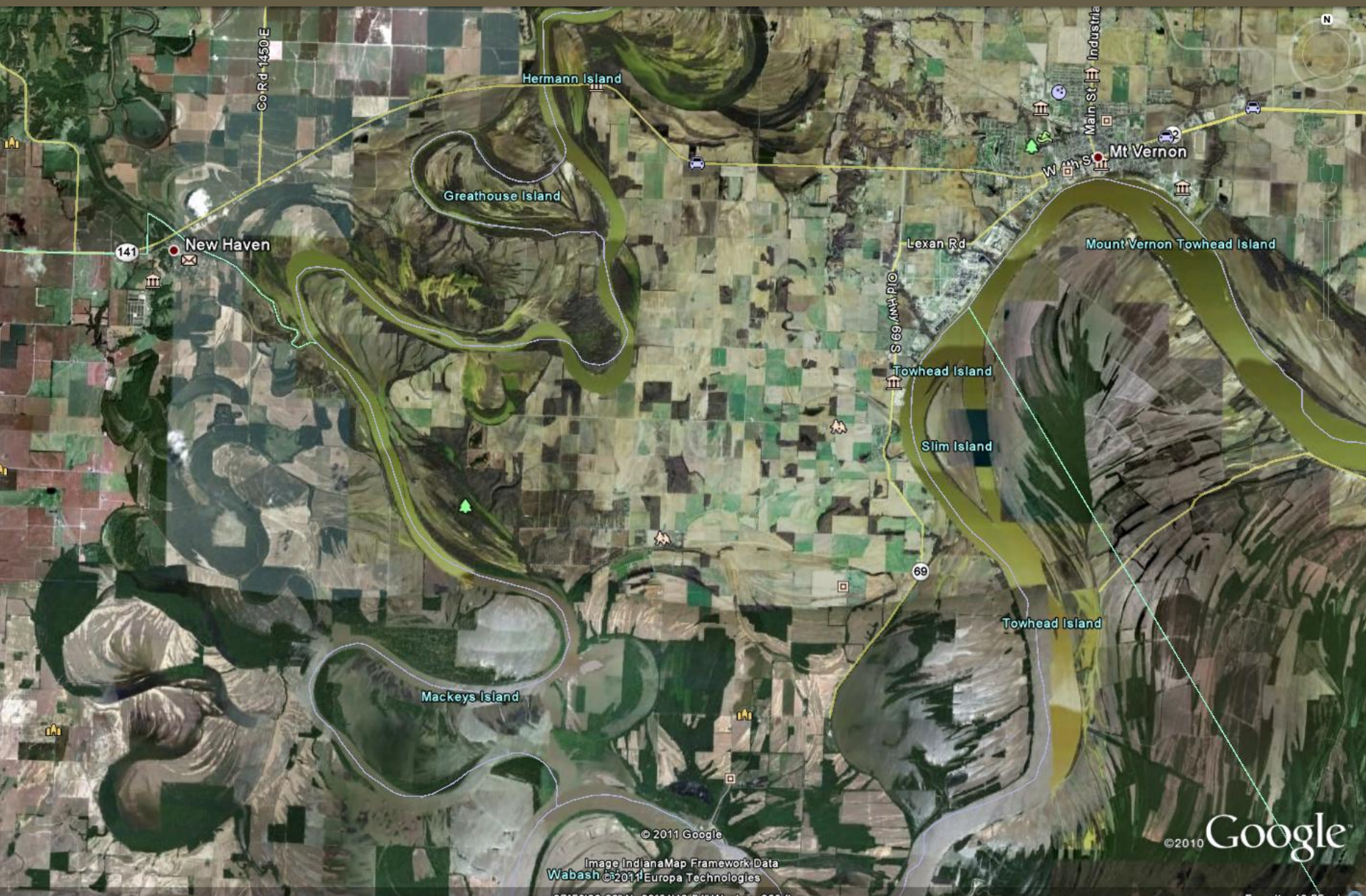
Pecatonica River near Mineral Point, Wisconsin

C. 3100-3300 cal yrs BP

C. 2000 cal yrs BP

C. 2000 cal yrs BP

C. 3800-4600 cal yrs BP



Wabash River – Ohio River Confluence



Tippecanoe River, Kosciusko County, IN

Stream channel evolution in response to increased runoff

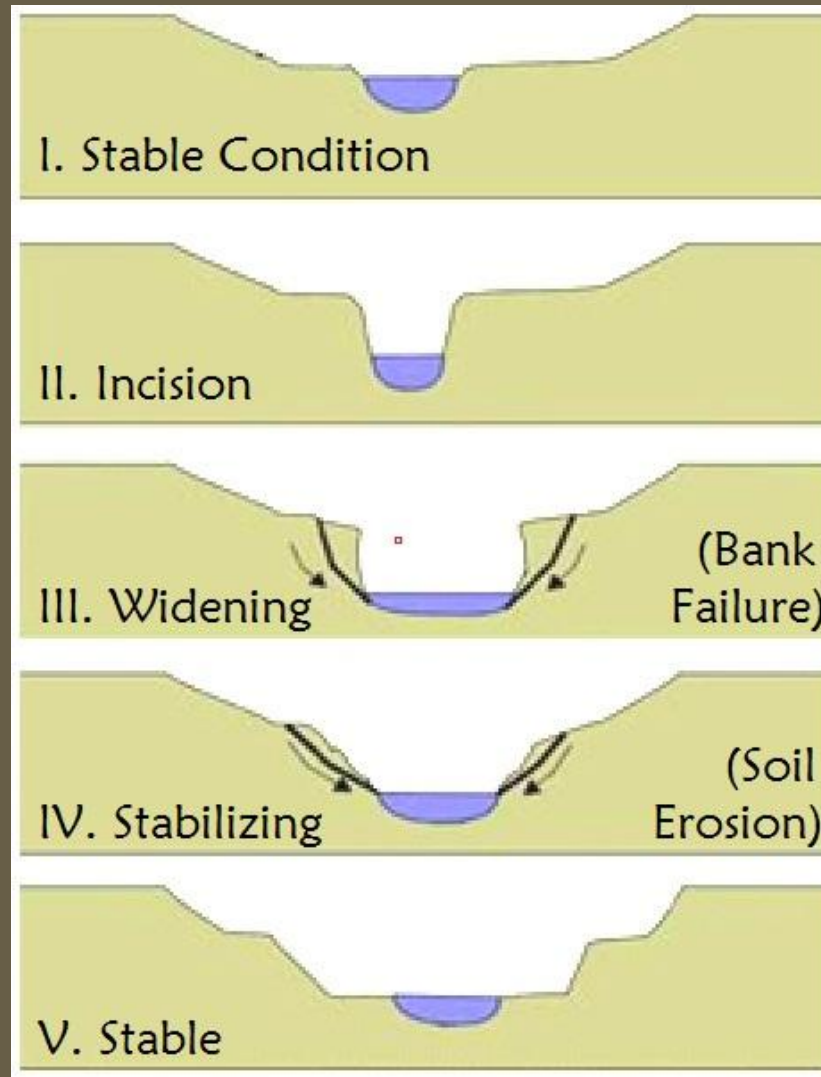


Image: Fairfax County, Virginia (after Simon)



Woodford, VT Aug 28 2011 (AP Photo)

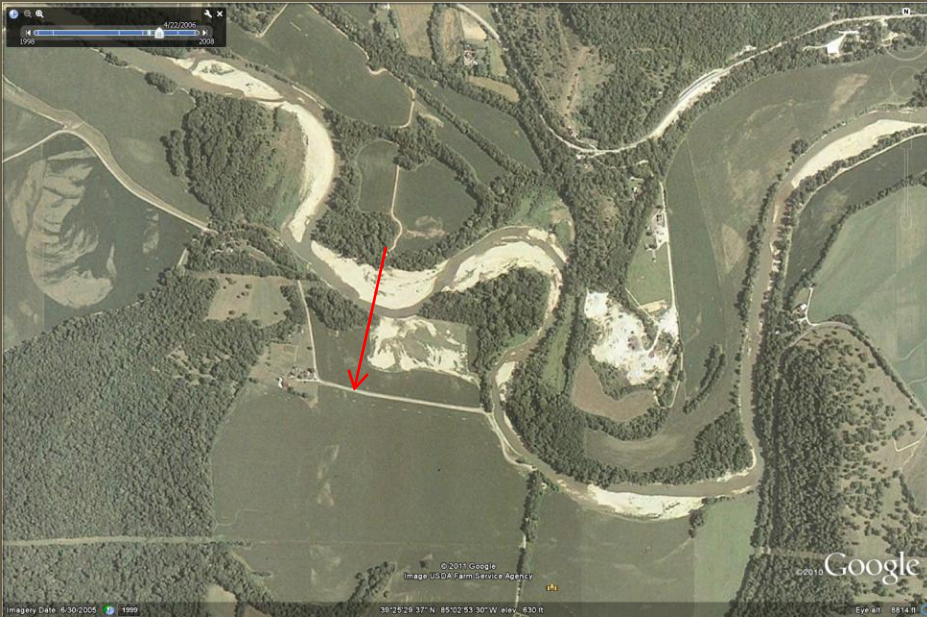


Unnamed tributary to White River at Keystone Ave., Indianapolis

June, 2011

Whitewater River near Brookville, IN

2006



2008



Distance in 2006 = 1846 feet

Distance in 2008 = 1812 feet

34 foot change/ 2 years



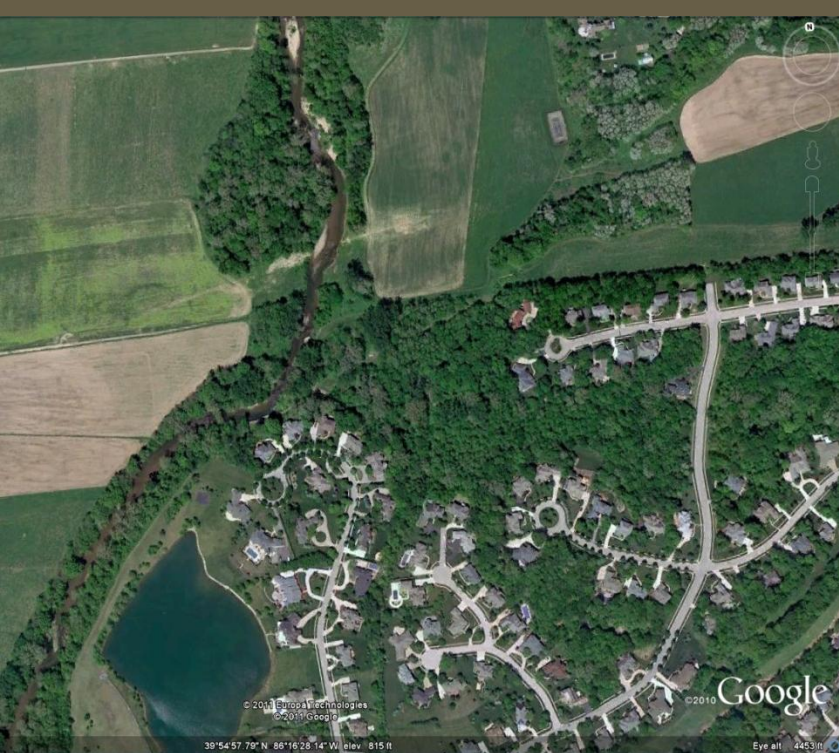
Levee Road, Franklin County, IN

May, 2011



Levee Road, Franklin County, IN

Robinson, August 2011



Eagle Creek, near Zionsville, IN



Eagle Creek near Zionsville, IN

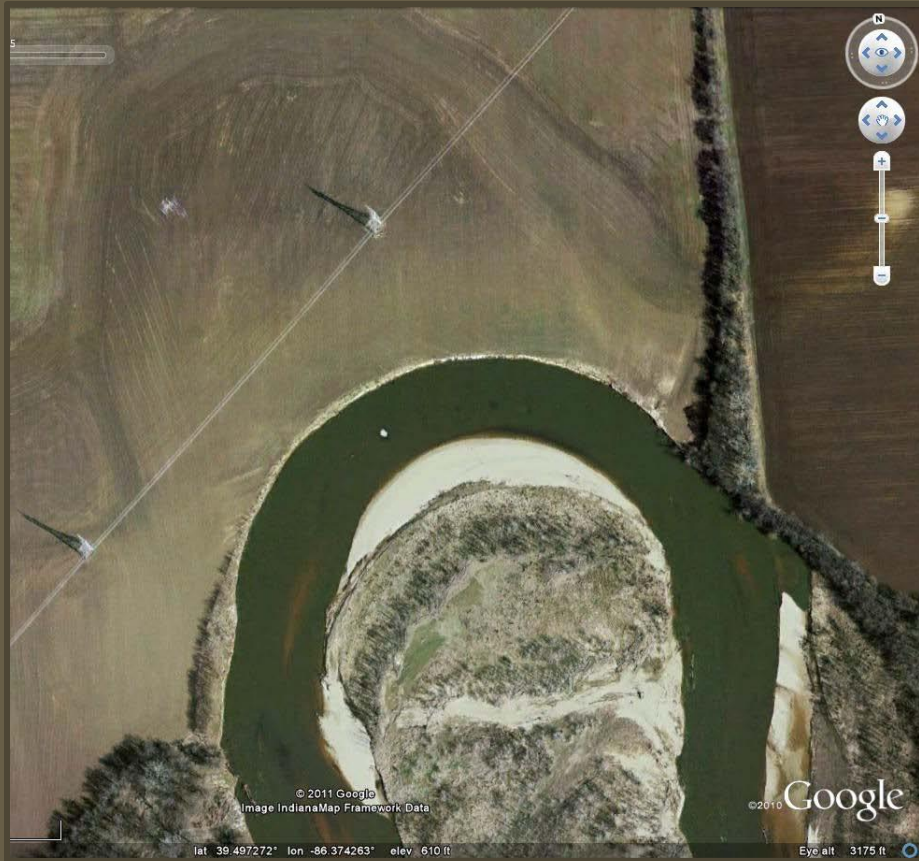


Indian Creek, Morgantown, IN

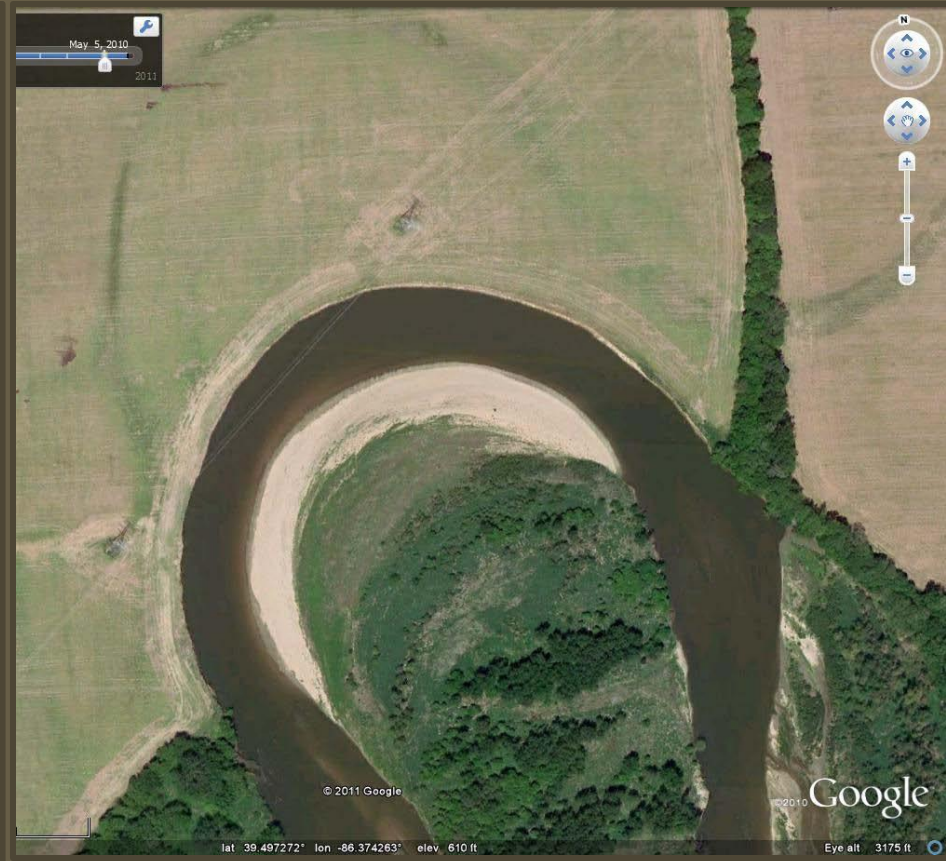
Robinson, 2009

White River above Centerton, Ind.

March, 2005



May, 2010



Moved 290 ft in 5 years (58 ft/yr)

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

Silver Jackets

Federal: USGS, USACE, NRCS,

State: IDNR, INDOT, IDHS, OCRA,

Academia: CEES, Polis,

Private Sector: National Flood Risk Policy Liaison (ASFPM)

OCRA Funding FEH Program

82 counties impacted by 2008 floods

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graph TD; OCRA[OCRA Funding FEH Program] --> USGS[USGS FEH Tech. Tools]; OCRA --> CEES[CEES (IUPUI) (Center for Earth and Environmental Science) Outreach / Education]; OCRA --> Polis[Polis (IUPUI) (The Polis Center) GIS and Web Support];
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USGS

FEH Tech. Tools

CEES (IUPUI)

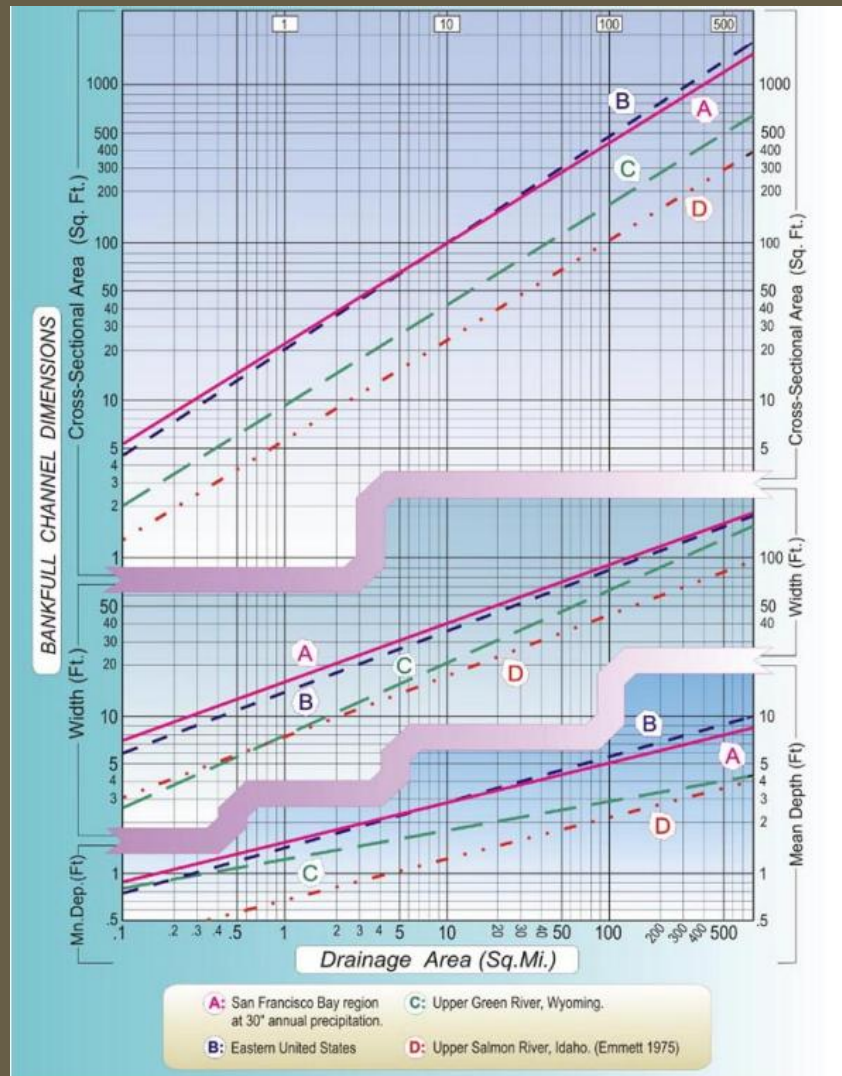
(Center for Earth and Environmental
Science) Outreach / Education

Polis (IUPUI)

(The Polis Center)
GIS and Web Support

Regional Hydraulic Geometry Curves

Bankfull Channel Dimensions for Non-urban Wadeable Streams in Indiana, SIR 2014-xxxx
(Robinson and Barr)



Drainage Area vs:

- Bankfull Width
- Bankfull Depth
- Cross-sectional Area

Regional curves showing bankfull dimensions vs drainage areas for various hydro-physiographic provinces (Dunn and Leopold, 1978).

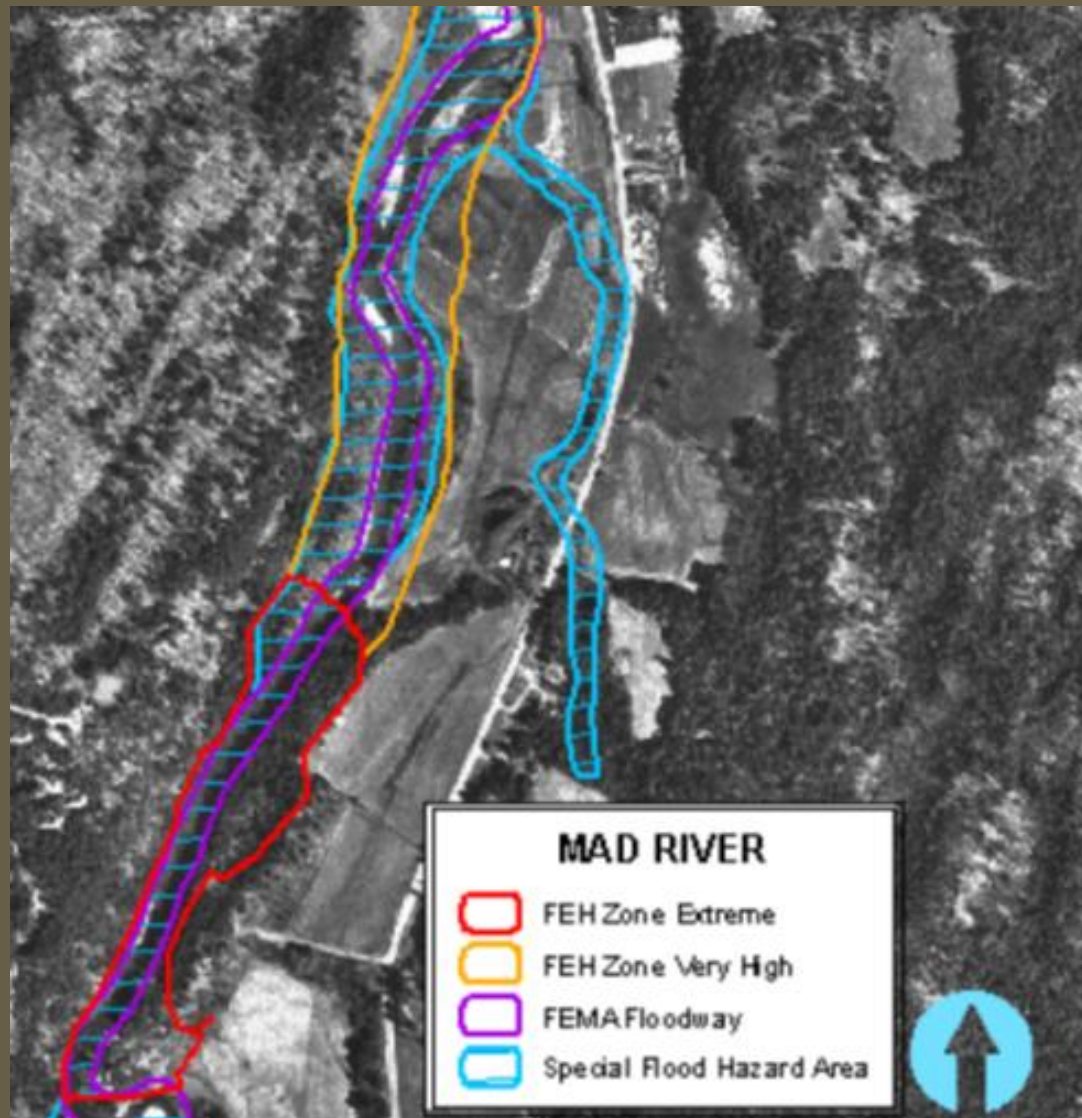


FEH Tools

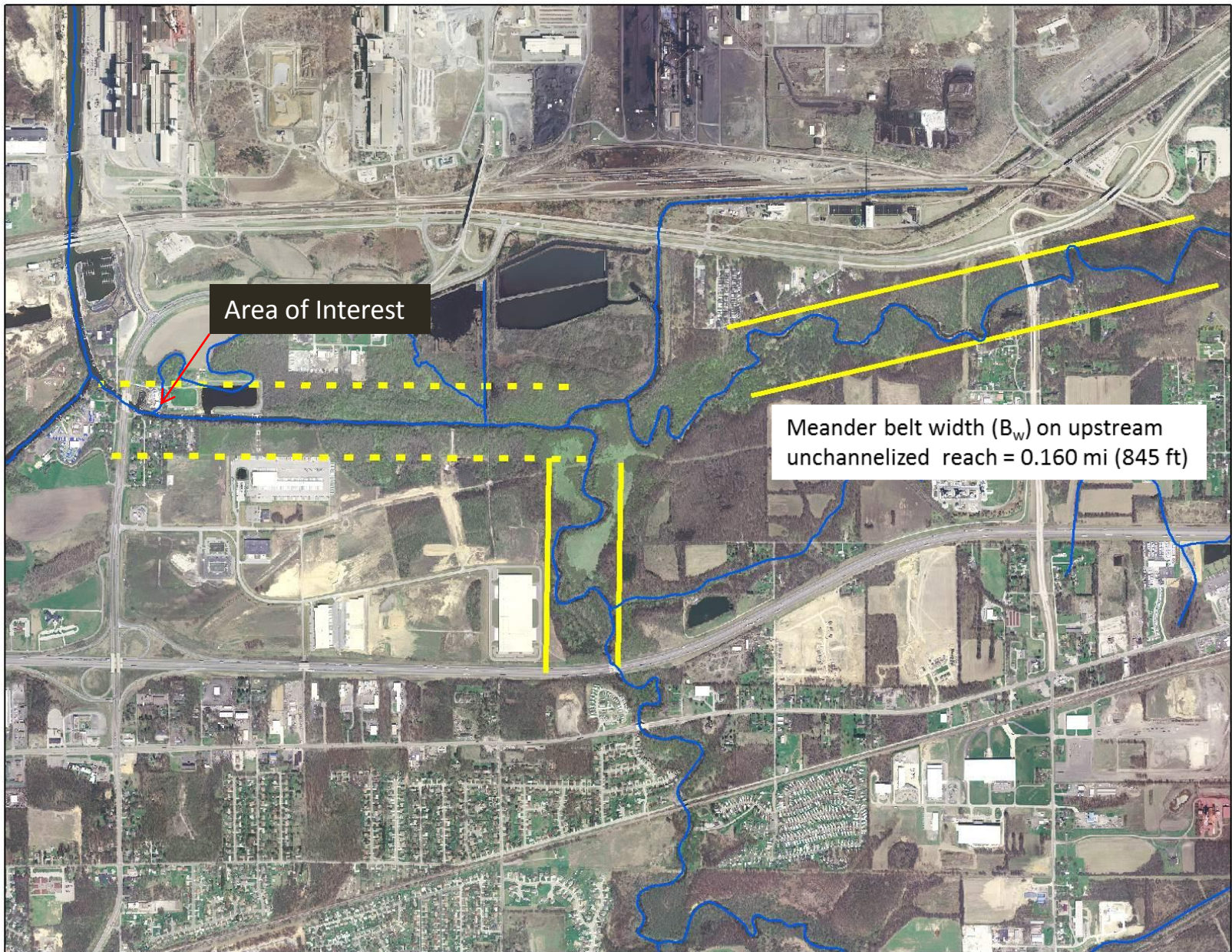
Photographic Guide to Bankfull Indicators

Patterned after USDA / USFS DVD-ROM

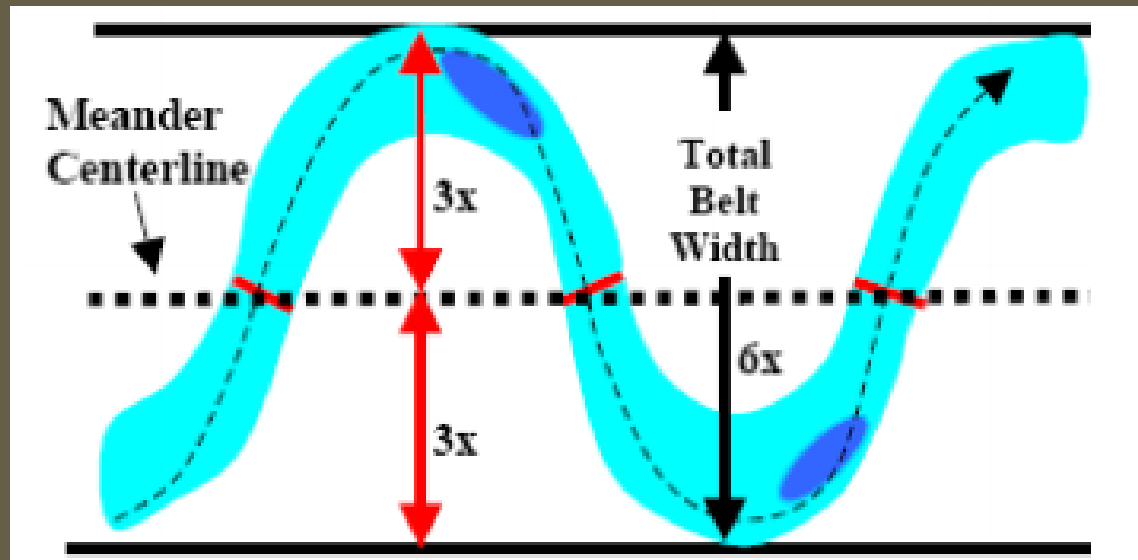




Vermont River Management Program



Little Calumet River near Burns Drive and Nealon Drive, Portage, IN.
(yellow lines indicate meander belt width)



Vermont River Management Section

Outer meander belt lines of a low gradient, meandering channel
 Meander belt width approx 6X Bkf channel width

Exceptions to the 6X channel width occur in steep, narrow valleys with
 In resistant materials or in more sensitive areas that require >6X

Bridge-Screening Tool

Based on USGS Level 1 bridge-scour methods (1990s)

- Bank material
- Bank stability
- Bed material
- Flow alignment
- Piers in water
- Woody debris
- Observed scour

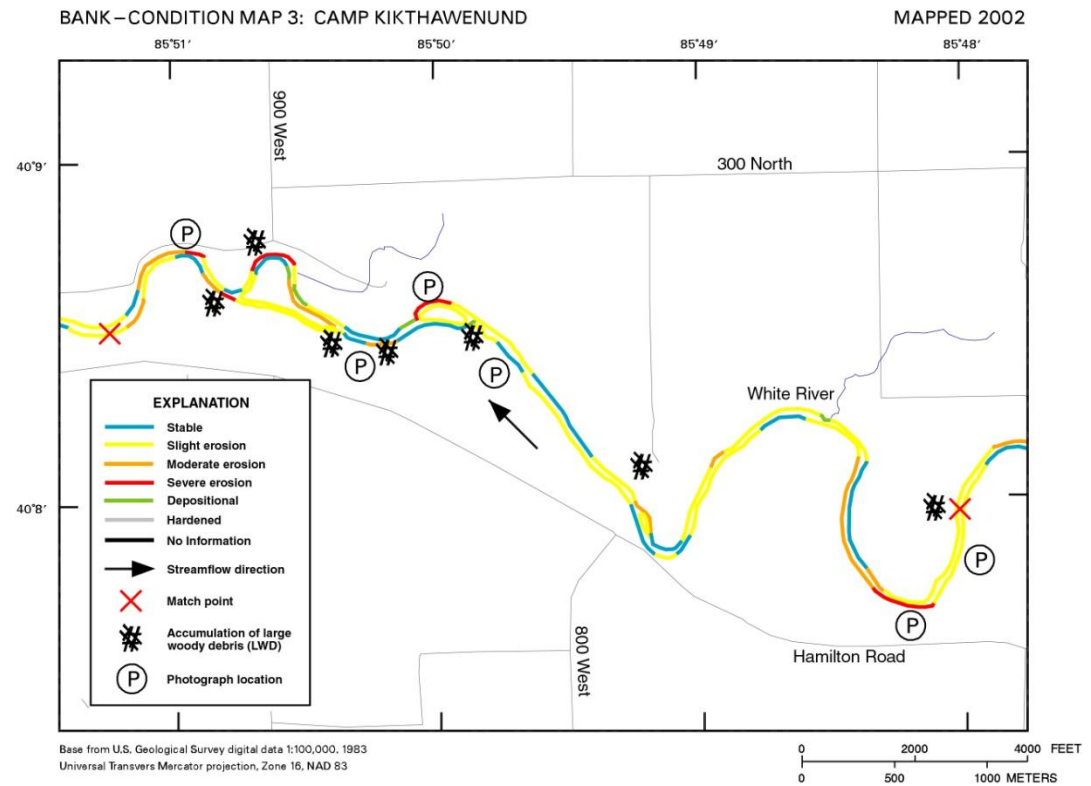


Bank-Stability Assessment Tool

Based on OFR 03-186, Robinson, White River...

Field Criteria

- Bank height
- Bank material
- Bank angle
- Vegetation condition
- Meander position



An Indiana Silver Jackets Initiative to Protect Indiana Communities through Interagency Cooperation

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PROJECT TITLE

Insert brief description of project



Presentations and Workshops

- 8 introductory presentations to introduce project and opportunities to regional audiences
- 3 introductory workshops (up to 35 participants at each workshop)
- 5 regional workshops (up to 35 participants at each workshop)
- 2 two-day workshops for 20 participants
- INAFSM workshop (to present results and applications)
- 5 presentations to state and local mitigation planners and community officials to explain the program results, available information, and how to update local mitigation plans.

Proposed Introductory Presentations

1. Indiana Association for Floodplain and Stormwater Management Annual Conference (Sept 2011)
2. Indiana Association of Cities and Towns Annual Conference (Oct 2011)
3. UWRWA Storm Water Workshop
4. Indiana Society of Professional Land Surveyors Annual Meeting (Jan 2012)
5. Soil and Water Conservation Districts Annual Meeting
6. Purdue Road School – INDOT? (?)
7. Purdue Watershed Academy
- 8.



William's Creek, Fall 2007