Prepared in cooperation with the Indiana Office of Community and Rural Affairs

Recent (circa 1998 to 2011) Channel-Migration Rates of Selected Streams in Indiana

Scientific Investigations Report 2013–5168

U.S. Department of the Interior
U.S. Geological Survey

Cover image: Google Earth™ images of White River near Centerton Ind., 2005 and 2012. The position of the channel relative to local landscape features allows for the recognition of recent channel migration.

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SALLY JEWELL, Secretary

U.S. Geological Survey
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U.S. Geological Survey, Reston, Virginia: 2013

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Conversion Factors

Inch/Pound to SI

Multiply	By	To obtain
	Length	
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
	Rate	
feet/year (ft/yr)	0.3048	meters/year (m/yr)
square mile (mi^2)	2.590	square kilometer (km^2)

Horizontal coordinate information is referenced to the North American Datum of 1983 (NAD 83).

Elevation, as used in this report, refers to distance above or below a local arbitrary vertical datum established only for the purposes of this study.

Recent (circa 1998 to 2011) Channel-Migration Rates of Selected Streams in Indiana

By Bret A. Robinson

Abstract

An investigation was completed to document recent (circa 1998 to 2011) channel-migration rates at 970 meander bends along 38 of the largest streams in Indiana. Data collection was completed by using the Google Earth™ platform and, for each selected site, identifying two images with capture dates separated by multiple years. Within each image, the position of the meander-bend cutbank was measured relative to a fixed local landscape feature visible in both images, and an average channel-migration rate was calculated at the point of maximum cutbank displacement. From these data it was determined that 65 percent of the measured sites have recently been migrating at a rate less than 1 ft/yr, 75 percent of the sites have been migrating at a rate less than 10 ft/yr, and while some sites are migrating in excess of 20 ft/yr, these occurrences are rare. In addition, it is shown that recent channel-migration activity is not evenly distributed across Indiana. For the stream reaches studied, far northern and much of far southern Indiana are drained by streams that recently have been relatively stationary. At the same time, this study shows that most of the largest streams in west-central Indiana and many of the largest streams in east-central Indiana have shown significant channel-migration activity during the recent past. It is anticipated that these results will support several fluvial-erosion-hazard mitigation activities currently being undertaken in Indiana.

Introduction

Through the combined processes of cutbank erosion on the outside of meander bends and point-bar deposition on the inside of meander bends, many streams maintain a naturally meandering form as they shift their position through time. While the meandering nature of stream channels often is viewed as one of their most aesthetically pleasing characteristics, it should be recognized that stream channels are dynamic landscape features which may continually adjust their location and course. Where human development and infrastructure elements are established in close proximity to natural waterways, property owners and communities should be mindful of the risks associated with the dynamic nature of streams.

The term fluvial-erosion hazard (FEH) is applied to describe the suite of concerns that may be associated with the phenomenon of lateral channel migration. In cooperation with the Indiana Office of Community and Rural Affairs and partnership with the Indiana Silver Jackets Multi-agency Hazard Mitigation Taskforce (Silver Jackets), the U.S. Geological Survey (USGS) is establishing several science-based tools to support FEH avoidance and mitigation in Indiana (Robinson, 2013). As part of that effort, for 38 of the largest streams in Indiana, the USGS has collected data to document recent (circa 1998 to 2011) channel-migration rates at 970 selected meander bends. From these data, summary statistics have been calculated, and of the selected streams, those streams that recently have been actively migrating across their valley floors and those that recently have been relatively stationary are identified. It is anticipated that this effort to document actively migrating and relatively stationary streams in Indiana will allow some elements of the ongoing FEH mitigation program to focus on those locations where they can provide the greatest benefit.

Purpose and Scope

This report presents methods and results of an investigation to document recent (circa 1998 to 2011) channel-migration rates at meander bends for selected streams in Indiana. The Study Methods section describes the site-selection process and uses an example from White Lick Creek at Mooresville, Ind. to illustrate how channel-migration rates were calculated. The section covering channel-migration rates provides some summary statistics for all the measured sites and discusses calculated rates for individual streams. This report also outlines some of the potential applications of the study results.

Study Methods

When setting out to document channel-migration rates, a variety of methods may be employed. In some studies, researchers have used patterns seen in botanical evidence or sedimentological changes to document historical channel positions and calculate rates of channel movement. In this investigation, and similar to work presented by Hickin and Nanson (1984), Nanson and Hickin (1986), and Gabet (1998), analysis of paired overhead images captured at different dates allowed for determinations of channel position over time.

In this investigation, the site-selection and data-collection processes were completed on the Google Earth™ platform. This platform provides rapid access to (1) countless images, (2) images that span a range of capture dates, (3) images that can be viewed at a wide range of scales, (4) user-friendly tools that allow for easy annotation/manipulation of images, and (5) measurement tools that may be applied to document the relative position of image features. If this (or a similar) on-line platform were not available, it is unlikely that this investigation would have been attempted for such a broad scope of sites.

Selecting and Identifying Sites

With the objective of identifying channel-migration rates in Indiana, 42 study reaches were selected for data collection (fig. 1). These reaches included multiple segments of the three largest rivers in Indiana—the Wabash River, White River, and East Fork White River—and substantial segments of 35 other Indiana streams (table 1). In general this investigation focused on the largest streams in Indiana. This was done, in part, because riparian-corridor trees often obscure overhead views along relatively small streams and, thereby, prevent the application of the methods discussed herein.

For each stream selected for inclusion in this study, an attempt was made to identify meanders with substantial curvature and where one could anticipate that the channel had reasonable potential to erode the outside of a meander bend—cutbank—and shift its position with time. The site-selection process also attempted to include meanders that were widely distributed along the identified study reach. At some meander bends, erosion countermeasures (for example rip rap or concrete aprons) were visible in the Google Earth™ images and these locations were excluded during the site-selection process. For each of the 970 meander bends selected for this study (appendix 1), a site identifier was applied that included an abbreviation of the stream name and a number. Along each stream the site identifiers were applied sequentially from downstream to upstream. Examples of this site-identification method are shown for a reach of the Driftwood River near Edinburgh, Ind. (fig. 2)

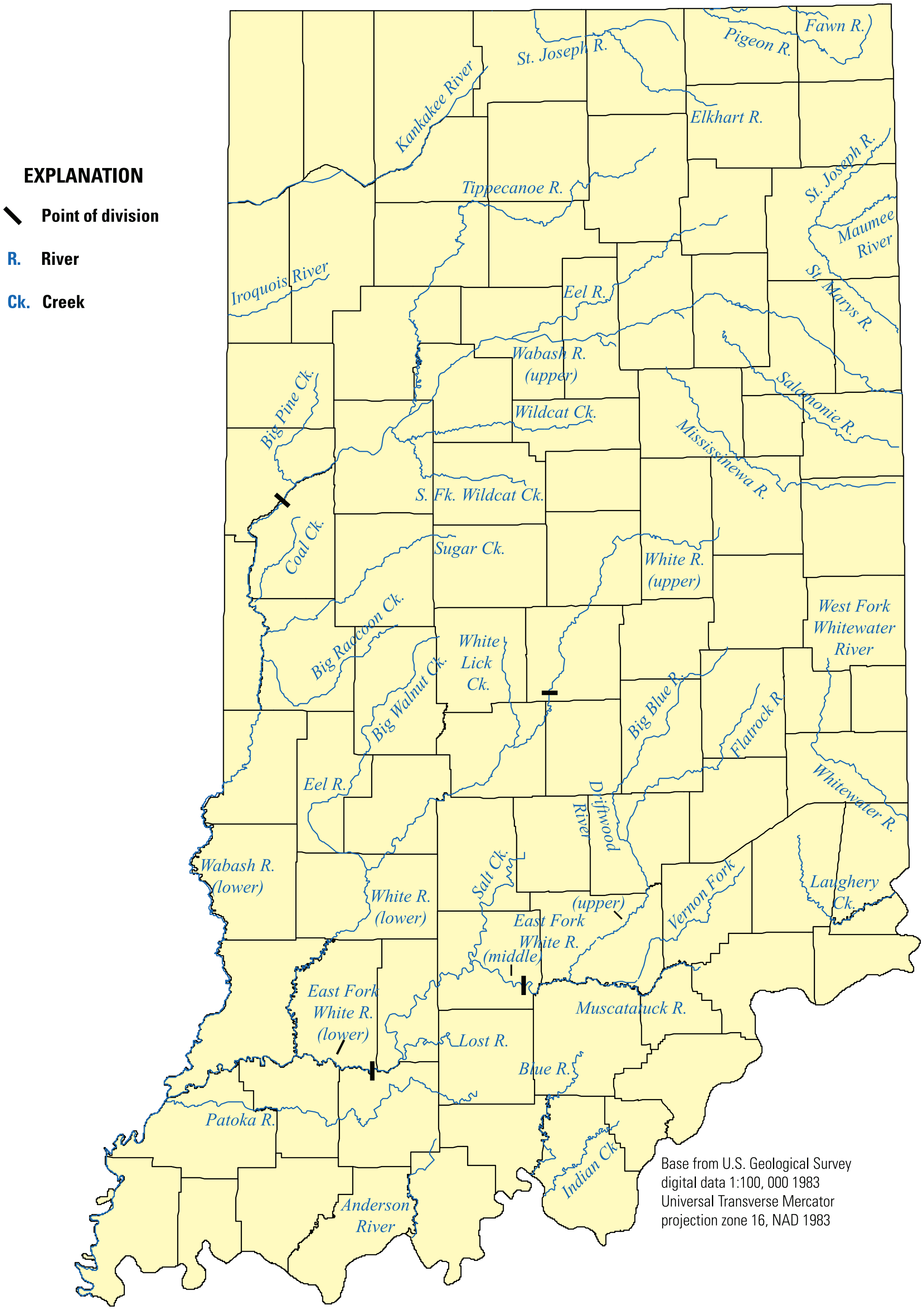

Figure 1. The 42 study reaches where channel-migration rates were documented in Indiana.

Table 1. Location information for the 42 stream reaches included in this investigation to document recent (circa 1998 to 2011) channel-migration rates of selected streams in Indiana.

Reach name	Study reach ends	
	Downstream	**Upstream**
Anderson River	Ohio River	St. Meinrad, Ind.
Big Blue River	Driftwood River	Carthage, Ind.
Big Pine Creek	Wabash River	Pine Village, Ind.
Big Raccoon Creek	Wabash River	near Roachdale, Ind.
Big Walnut Creek	Eel River	Bainbridge, Ind.
Blue River	Ohio River	near Fredericksburg, Ind.
Coal Creek	Wabash River	Veedersburg, Ind.
Driftwood River	East Fork White River	Edinburgh, Ind.
East Fork White River (lower)	White River	Portersville, Ind.
East Fork White River (middle)	Portersville, Ind.	Tunnelton, Ind.
East Fork White River (upper)	Tunnelton, Ind.	near Columbus, Ind.
Eel River (north)	Wabash River	near Peru, Ind.
Eel River (south)	near Clay City, Ind.	near Bowling Green, Ind.
Elkhart River	St Joseph River (South Bend)	New Paris, Ind.
Fawn River	Michigan state line	near Sturgis, Mich.
Flatrock River	Columbus, Ind.	near Flat Rock, Ind.
Indian Creek	Ohio River	near Georgetown, Ind.
Iroquois River	Illinois state line	Brook, Ind.
Kankakee River	Illinois state line	near Knox, Ind.
Laughery Creek	Ohio River	near Napoleon, Ind.
Lost River	East Fork White River	near Orleans, Ind.
Maumee River	Ohio state line	Ft. Wayne, Ind.
Mississinewa River	Wabash River	Matthews, Ind.
Muscatatuck River	East Fork White River	near Paris Crossing, Ind.
Patoka River	Wabash River	near Dubois, Ind.
Pigeon River	Michigan state line	near Mongo, Ind.
Salamonie River	Warren, Ind.	Pennville, Ind.
Salt Creek	East Fork White River	Nashville, Ind.
South Fork Wildcat Creek	Wildcat Creek	near Mulberry, Ind.
St Joseph River (Ft Wayne)	Maumee River	Ohio state line
St Joseph River (South Bend)	Michigan state line	Michigan state line
St Marys River	Maumee River	Ohio state line
Sugar Creek	Wabash River	near Thorntown, Ind.
Tippecanoe River	Wabash River	near Warsaw, Ind.
Vernon Fork Muscatatuck River	Muscatatuck River	North Vernon, Ind.
Wabash River (lower)	Ohio River	Williamsport, Ind.
Wabash River (upper)	Williamsport, Ind.	near Berne, Ind.
White Lick Creek	White River	near Plainfield, Ind.
White River (lower)	Wabash River	Southport Road near Camby, Ind.
White River (upper)	Southport Road near Camby, Ind.	Daleville, Ind.
Whitewater River including West Fork	Ohio state line	near Connersville, Ind.
Wildcat Creek	Wabash River	near Burlington, Ind.

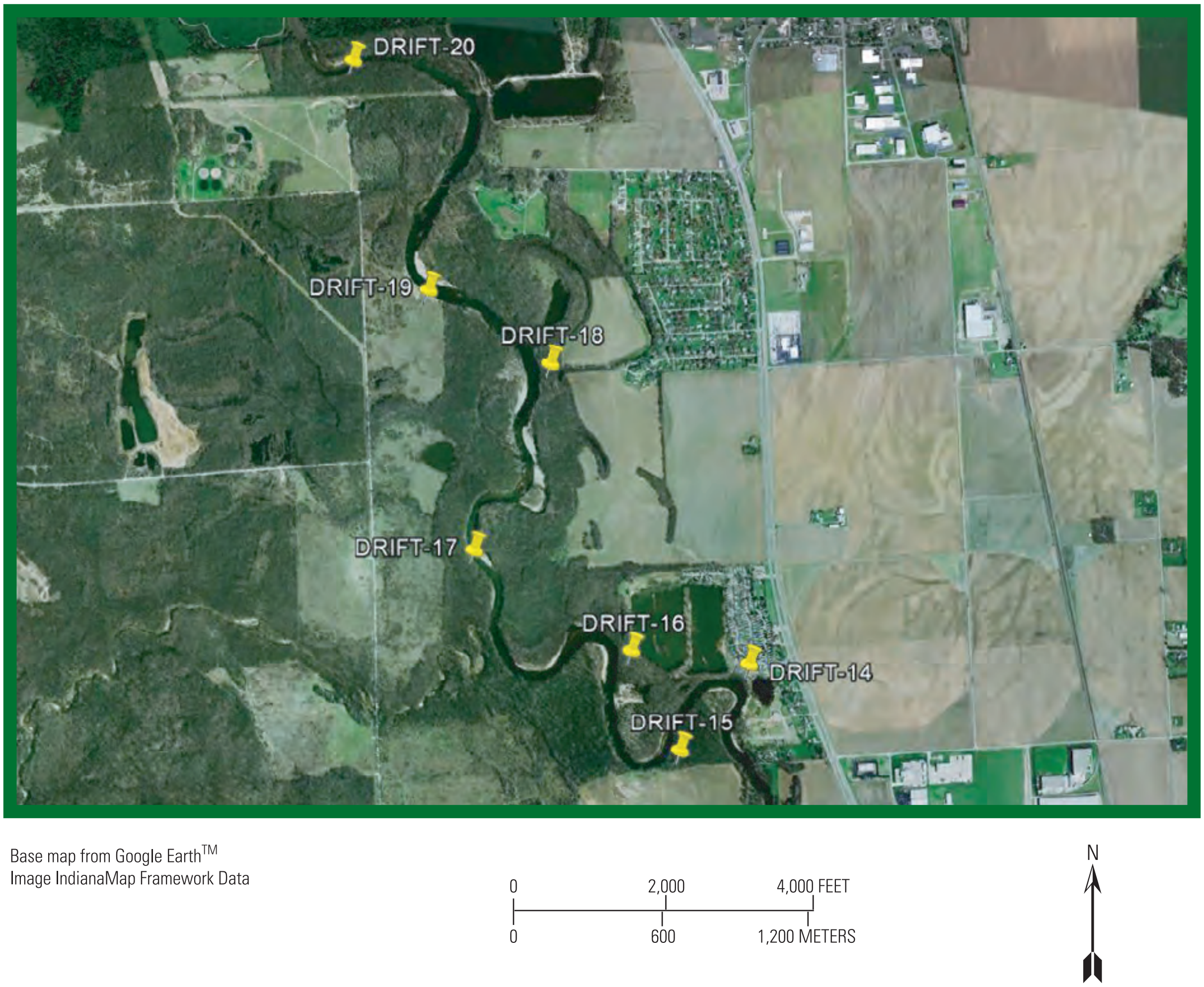

Figure 2. Some of the meander bends selected for documenting channel-migration rates along the Driftwood River near Edinburgh, Indiana. Yellow "push-pin" symbols and site labels mark the meander bends selected for measuring channel-migration rates.

Documenting Channel-Migration Rates

After a site was selected for measurement, the Google Earth™ historical-imagery tool was activated and the earliest image with sufficient resolution was chosen to document the location of a meander's cutbank in the recent past (circa 1998). For 765 of the 970 meanders measured, this early image was captured in 1998; however, for some sites the early image was captured in a year other than 1998. In addition to 1998, the early-image-capture dates included: 1992 (82 sites), 1993 (9 sites), 1994 (35 sites), 1999 (78 sites), and 2003 (1 site).

To begin the process of documenting the recent channel-migration rate of each selected meander, a line-drawing tool within Google Earth™ was used to trace the position of the meander's cutbank at the time that the early image was captured (fig. 3*A*). Then the slider bar of the historical-imagery tool was advanced to view the position of the same meander at a later date (fig. 3*B*). In this investigation, the later images were captured between 2006 and 2012. The year of the late-image-capture dates included: 2006 (1 site), 2010 (454 sites), 2011 (237 sites), and 2012 (278 sites). For the collected data, the median span of time between the early image and late image for all sites was approximately 13 years and the data can be described as generally representative of channel-migration rates for the period 1998 to 2011. To facilitate rate calculations, for each image the month and year of image capture was recorded (appendix 1).

For each site, when viewing the later image and the superscribed position of the early-image-cutbank trace (fig. 3*B*), it was possible to identify the general location of maximum channel displacement and a single reference point, in line with the path of maximum displacement, to which cutbank distances could be measured for both the early and late images (figs. 3*C* and 3*D*). These distances to a common fixed reference point visible in both images were recorded in feet (appendix 1).

To calculate the channel-migration rate at each selected meander bend the following equation was applied:

$$Channel\ migration\ rate\ (ft/yr) = 12\left(\frac{CBD_e - CBD_L}{DATE_L - DATE_e}\right)$$

Where:

CBD_e is distance from the cutbank to the reference point in the early image, measured in feet,

CBD_L is distance from the cutbank to the reference point in the late image, measured in feet,

$DATE_L$ is capture date of the late image, and

$DATE_e$ is capture date of the early image.

The numerator of this equation is a measure of the horizontal distance that the cutbank has eroded at its point of maximum displacement. The denominator is a measure of the number of months that separate the capture dates of the two images. The month and year of capture were recorded (appendix 1) for each image; however, to facilitate spread sheet calculations, all dates were converted to months (year x 12 + month) for the application of this equation. Because the image-capture dates were converted to months, and the desire was to determine channel-migration rates in units of feet/year, the quotient of the equation is multiplied by 12 to accomplish the necessary unit conversion.

Data-Censor Level

With the image-comparison method described herein, and with resolution limits inherent in the Google Earth™ images, it is acknowledged that there is a minimum threshold of channel movement that must occur if confident determinations of channel-migration rates are to be made. Through analysis of paired images, it was determined that 10 ft of lateral channel-movement was sufficient to allow displacement measurements and channel-migration-rate calculations.

Therefore, for relatively stationary sites, where lateral channel-movement was seen to be less than 10 ft, the migration distance was recorded as 5 ft and the channel-migration rate is reported as less than 1 ft/yr (appendix 1). With this approach, the data-censor level is set at 1 ft/yr. Sites determined to be relatively stationary are reported as having channel-migration rates less than 1 ft/yr, while the calculated channel-migration rate is reported for all sites determined to be actively migrating.

Figure 3. The steps taken to document channel-migration rates for a site along White Lick Creek at Mooresville, Indiana. A trace of the cutbank was added to the early (1998) image (*A*), the general location of maximum channel-displacement was identified in the late (2012) image (*B*), and distance measurements to a common reference point were completed for the early and late images (*C* and *D*).

Channel-Migration Rates

Because there has been recent and substantial channel movement at many locations along White Lick Creek, a site from that stream was selected to illustrate the data-collection process in the above Study Methods section. At the same time, because most of the 970 measured sites were found to be relatively stationary, it seems equally important to include an example from a relatively stationary site. Therefore, before summarizing the data results and discussing how those results may be applied, an example from a relatively stationary site is presented.

A Stationary-Site Example

During an FEH-related investigation to document bank-full-channel dimensions for Indiana streams, the author had the opportunity to visit countless stream sites around the state and observe how the streams were positioned in and interacting with their attendant valleys. From those field observations, it became clear that, at many locations, the position of the channel had not changed in the recent past. Often this stationarity is presented as a stream channel incised well below the elevation of its valley floor and with large mature trees growing in close proximity to the channel on both channel banks (fig. 4).

To include an example of a relatively stationary site, a meander bend on the Tippecanoe River (TIPPY-2) was selected (fig. 5). Here the position of the channel in relation to local landscape features is shown in March 1992 (fig. 5*A*) and February 2012 (fig. 5*B*). By comparing the two images, it can be seen that, at this location and over a time span of 20 years, the Tippecanoe River has not substantially altered its position within the local landscape. This type of stationarity was documented as common for most of the streams included in this investigation.

Figure 4. A reach of South Fork Salt Creek near Maumee, Indiana where field evidence—channel incision and large mature trees on both channel banks—indicates that the channel has been relatively stationary in the recent past.

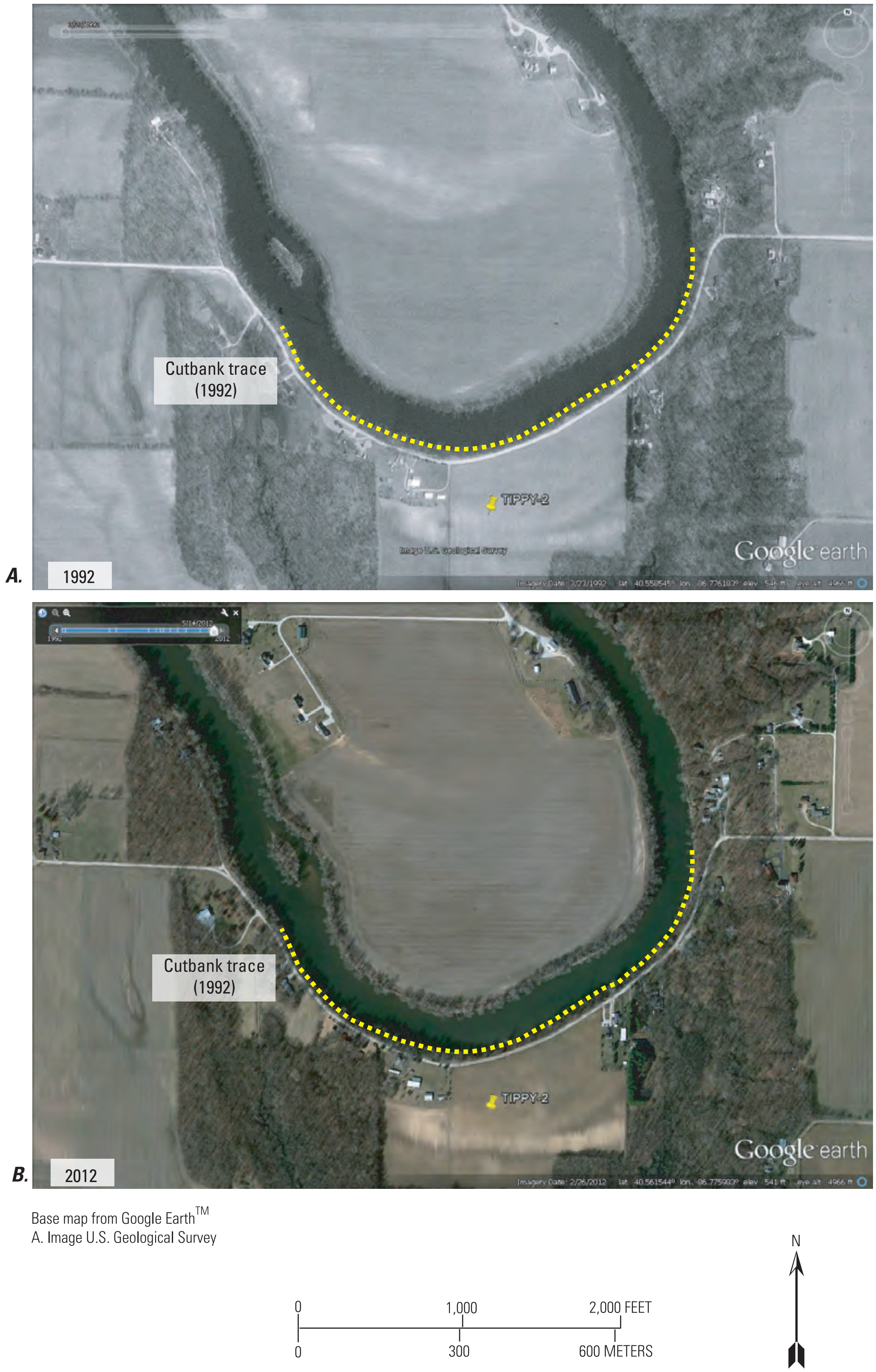

Figure 5. The Tippecanoe River near Springboro, Indiana in March 1992 (*A*) and February 2012 (*B*). The relative position of the 1992 cutbank trace (yellow dashed line) to the 2012 cutbank position (*B*) indicates that here the channel has been relatively stationary for the 1992 to 2012 period.

Statistical Summary and Geographic Distribution of Channel-Migration Rates

The calculation of channel-migration rates for 970 meander bends across Indiana (appendix 1) allows for the identification of typical rates, relatively rapid rates, and the relative rate of channel migration for the selected Indiana streams where data were collected. A frequency-distribution plot (fig. 6) reveals that most of the measured sites (65 percent) are migrating at less than 1 ft/yr, 75 percent of the sites are migrating at less than 10 ft/yr, and rates in excess of 20 ft/yr are not unprecedented, but are rare—accounting for approximately 3 percent of all measured sites.

To evaluate which stream reaches were relatively stationary and which had actively migrating channels**,** the data were grouped by stream reach and the 75th percentile channel-migration rate was determined for each stream reach (table 2). In this way, a single number could be calculated to describe the relative rate of channel migration for each stream reach. (It should be noted that the point of division, into multiple segments, for the three largest rivers—Wabash River, White River, and East Fork White River—was determined from results seen in the collected data.)

A bar graph of the 75th percentile values (fig. 7) illustrates that the study reaches can be broadly split into two categories: those that recently have been relatively stationary and those that recently have been actively migrating across their attendant valley floors. In this bar graph, the 26 stationary stream reaches are to the left and are listed in alphabetical order, while the 16 actively migrating stream reaches are to the right and listed in order of increasing channel-migration rate.

When viewed in a geographic context (fig. 8), it becomes apparent that recent channel-migration activity is not evenly distributed across Indiana. For the stream reaches studied, the figure 8 map reveals that far northern and much of far southern Indiana are drained by streams that recently have been relatively stationary. At the same time, this map shows that most of the largest streams in west-central Indiana and many of the largest streams in east-central Indiana have shown significant channel-migration activity during the recent past (circa 1998 to 2011). Many of these actively migrating channels drained glacial meltwater during Indiana's most recent period of glacial stagnation and retreat (Thornbury, 1950).

It is important to understand that the recent channel-migration activity documented in this investigation does not apply to times in the geologic past (in this case measured in hundreds or thousands of years) and may not apply in the future. Clearly, stream meandering is a natural process and all of the streams included in this investigation meander to some extent. For some of the Indiana streams that have a meandering form, but herein have been identified as recently stationary, their meandering pattern may have been in place at the time of last glacial retreat approximately 10,000 years before present, when the local landscape drained significantly greater volumes of water than it does today (Thornbury, 1950; Dreimanis, 1977). An example of this is the Tippecanoe River (fig. 5) near

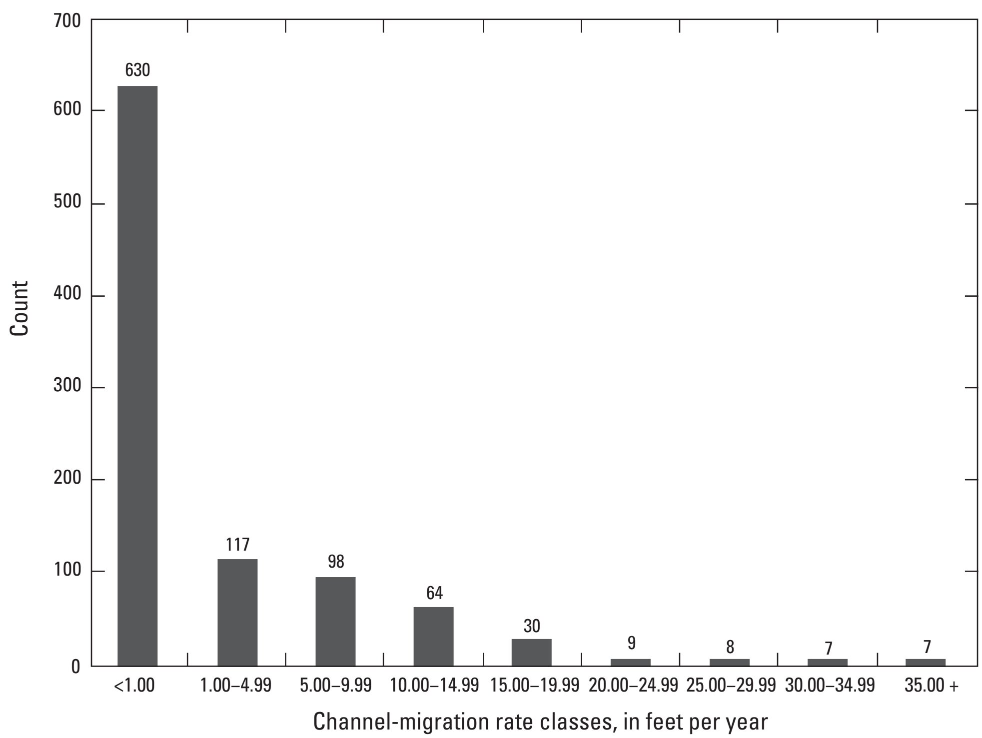

Figure 6. Distribution of channel-migration rates for 970 meander bends where channel-migration rates were documented in Indiana.

Springboro, Ind. Here the channel has a strongly meandering (highly sinuous) form, but the meanders have been identified as recently stationary. This is in contrast to the channels of the Whitewater River, Upper East Fork White River, and Lower Wabash River. While these channels also meander, their meanders were actively moving across their valley floors under the hydrologic regime that was in place between the capture dates of the early and late images.

Potential Applications of Study Results

In this investigation, recent channel-migration rates at 970 individual meander bends and along 38 of the largest streams in Indiana have been documented. It is anticipated that these results may have application to several FEH-related activities:

1. *A channel-migration-rate framework.* Over the past decade, it has become common for members of the Silver Jackets team to be presented with sites where natural channel migration is impacting a landowner's property or residence. The channel-migration rates documented in this investigation can serve as a statewide framework of migration rates and help to distinguish those sites where erosion rates are rapid from those sites where erosion rates are mundane.
2. *Meander-vulnerable bridges*. In 1990 the National Transportation Safety Board recommended that the National Bridge Inspection Standards include an assessment of instability problems at bridges caused by geomorphic processes (National Transportation Safety Board, 1990). The dataset established in this investigation should help to identify meander-vulnerable bridges and bridges built over laterally stationary streams.

Table 2. The 75th percentile channel-migration rates calculated for the 42 stream reaches included in this investigation to document recent (circa 1998 to 2011) channel-migration rates of selected streams in Indiana.

[<, less than]

Reach name	75th percentile channel-migration rate (feet/year)	Reach name	75th percentile channel-migration rate (feet/year)
Anderson River	<1	Maumee River	<1
Big Blue River	4.1	Mississinewa River	<1
Big Pine Creek	<1	Muscatatuck River	<1
Big Raccoon Creek	6.3	Patoka River	<1
Big Walnut Creek	12.2	Pigeon River	<1
Blue River	<1	Salamonie River	<1
Coal Creek	4.5	Salt Creek	<1
Driftwood River	5.5	South Fork Wildcat Creek	8.0
East Fork White River (lower)	8.0	St Joseph River (Ft Wayne)	<1
East Fork White River (middle)	<1	St Joseph River (South Bend)	<1
East Fork White River (upper)	12.3	St Marys River	<1
Eel River (north)	<1	Sugar Creek	6.4
Eel River (south)	5.4	Tippecanoe River	<1
Elkhart River	<1	Vernon Fork Muscatatuck River	<1
Fawn River	<1	Wabash River (lower)	8.3
Flatrock River	10.2	Wabash River (upper)	<1
Indian Creek	<1	White Lick Creek	16.3
Iroquois River	<1	White River (lower)	16.5
Kankakee River	<1	White River (upper)	<1
Laughery Creek	<1	Whitewater River including West Fork	30.2
Lost River	<1	Wildcat Creek	5.1

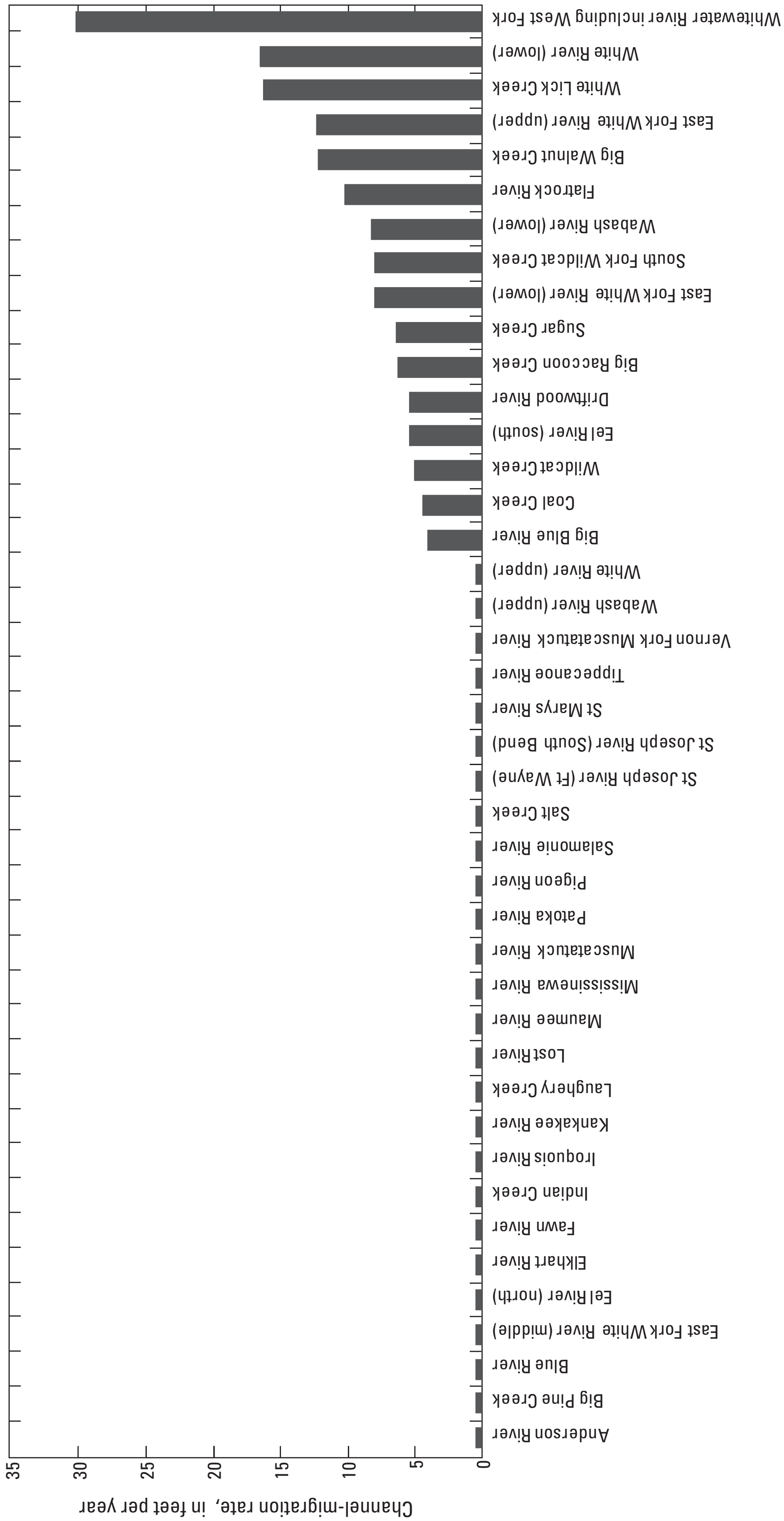

Figure 7. The 75th percentile channel-migration rate for the 42 stream reaches where channel-migration-rate values were documented in Indiana.

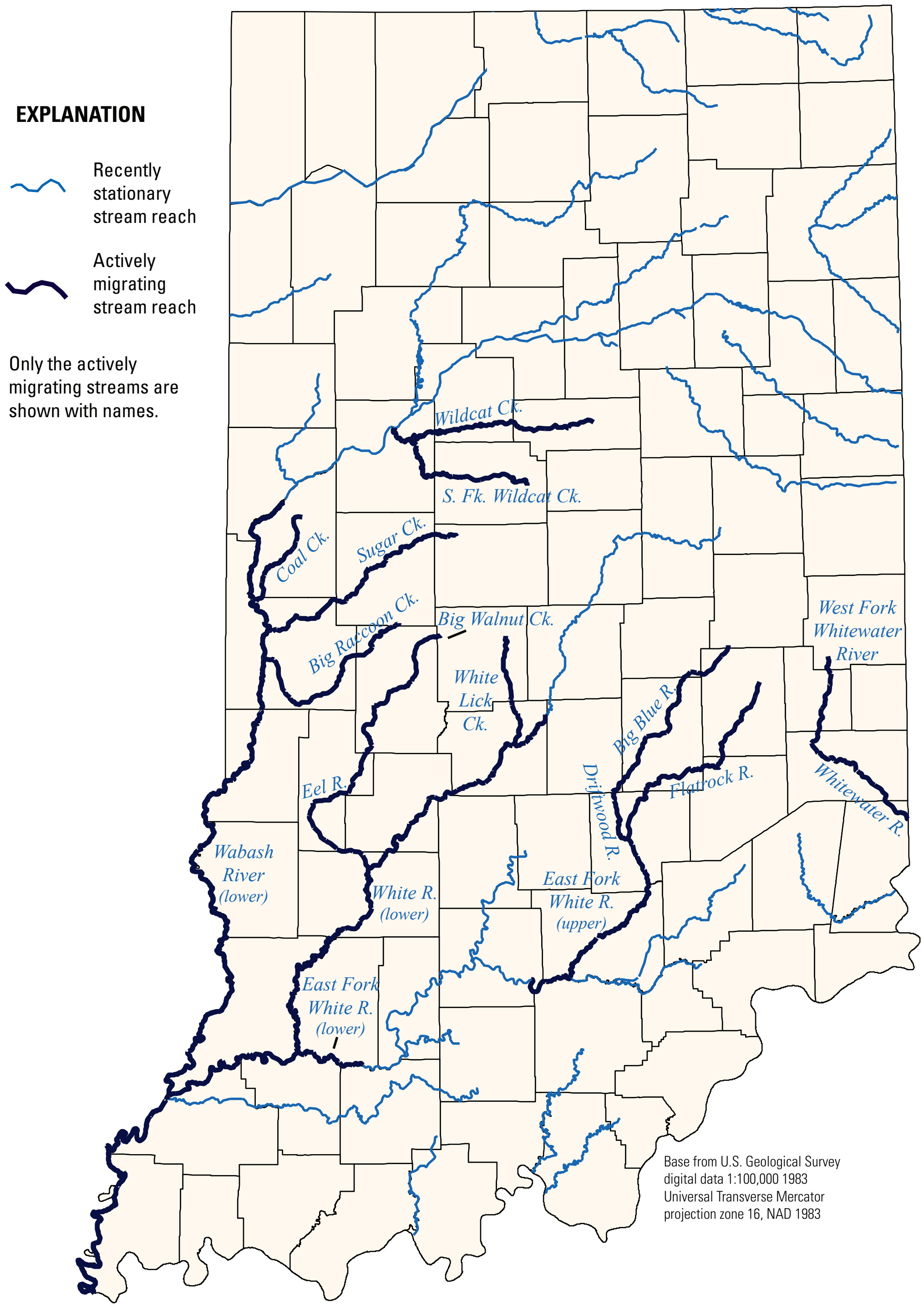

Figure 8. The distribution of the relatively stationary and actively migrating stream reaches of the 42 stream reaches where channel-migration-rate values were documented in Indiana.

3. *FEH-vulnerable communities.* A fundamental goal of the Silver Jackets team is to help property owners and communities recognize environmental risks and apply effective mitigation strategies. The results of this investigation should allow for the recognition of those regions of Indiana where FEH concerns require the greatest attention.

4. *FEH mapping.* Some members of the Silver Jackets team currently are working to establish FEH mapping protocols for Indiana streams. It is thought that the study results will help to understand where those mapping efforts could be applied to provide the greatest benefit.

5. *Environmental controls.* Documenting which streams are actively migrating and which are relatively stationary is an important first step toward better understanding how some environmental variables (for example, riparian trees and geologic materials) may influence channel-migration rates and FEH concerns.

Summary and Conclusions

Through the combined processes of cutbank erosion and point-bar deposition, many streams maintain a naturally meandering form as they shift their position through time. Where residences and infrastructure elements are established in close proximity to natural waterways, property owners and communities should be mindful of the risks associated with the dynamic nature of streams, collectively referred to as the fluvial-erosion hazard (FEH). In partnership with the Indiana Silver Jackets, the USGS has completed an investigation to document recent (circa 1998 to 2011) channel-migration rates at 970 individual meander bends along 38 of the largest streams in Indiana.

Data collection was completed by using the Google Earth™ platform and, for each site, identifying two images with capture dates separated by multiple years. Within each image, the position of the meander-bend cutbank was measured relative to a fixed local landscape feature, and an average channel-migration rate was calculated.

From these data, it was determined that 65 percent of the measured sites have recently been migrating at a rate less than 1 ft/yr, 75 percent of the sites have been migrating at a rate less than 10 ft/yr, and while some sites are migrating in excess of 20 ft/yr, these occurrences are rare. In addition, a map is presented (fig. 8) to illustrate where the documented reaches were found to recently have been relatively stationary or actively migrating. It is anticipated that these results may have application to several FEH-related activities: (1) establishing a statewide framework of channel-migration rates to help evaluate individual sites of concern, (2) helping to identify meander-vulnerable bridges, (3) recognizing FEH-threatened communities, (4) understanding where FEH mapping efforts may provide the greatest benefit, and (5) establishing an initial dataset to begin evaluation of the environmental controls that influence channel-migration rates and FEH concerns.

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Appendix 1. Data collected to document recent channel-migration rates at meander bends along selected streams in Indiana.

[<, less than]

Site identifier	County	Latitude (degrees)	Longitude (degrees)	Early-image capture date: Month	Early-image capture date: Year	Late-image capture date: Month	Late-image capture date: Year	Time elapsed between image captures (months)	Maximum measured cutbank displacement (feet)	Average annual channel-migration rate (feet/year)
					Anderson River					
ANDER-1	Perry	37.99793	-86.77225	4	1998	6	2010	146	5	<1
ANDER-2	Perry	38.01091	-86.77438	3	1998	6	2010	147	5	<1
ANDER-3	Spencer	38.01010	-86.77866	3	1998	6	2010	147	5	<1
ANDER-4	Perry	38.02485	-86.77565	3	1998	6	2010	147	5	<1
ANDER-5	Perry	38.02925	-86.76678	3	1998	6	2010	147	5	<1
ANDER-6	Spencer	38.04441	-86.78243	3	1998	6	2010	147	5	<1
ANDER-7	Spencer	38.05360	-86.78047	3	1998	6	2010	147	5	<1
ANDER-8	Spencer	38.08782	-86.77257	3	1998	6	2010	147	5	<1
ANDER-9	Perry	38.08654	-86.76926	3	1998	6	2010	147	5	<1
ANDER-10	Perry	38.09734	-86.76801	3	1998	6	2010	147	5	<1
ANDER-11	Spencer	38.09911	-86.77009	3	1998	6	2010	147	5	<1
ANDER-12	Perry	38.10303	-86.76883	3	1998	6	2010	147	5	<1
ANDER-13	Perry	38.10457	-86.78338	3	1998	6	2010	147	5	<1
ANDER-14	Spencer	38.11115	-86.78960	3	1998	6	2010	147	5	<1
ANDER-15	Spencer	38.11473	-86.79404	3	1998	6	2010	147	5	<1
ANDER-16	Perry	38.11259	-86.79935	3	1998	6	2010	147	5	<1
ANDER-17	Perry	38.11480	-86.80321	3	1998	6	2010	147	5	<1
ANDER-18	Perry	38.11756	-86.80477	3	1998	6	2010	147	5	<1
ANDER-19	Perry	38.12342	-86.79474	3	1998	6	2010	147	5	<1
ANDER-20	Spencer	38.13467	-86.80356	3	1998	6	2010	147	5	<1
ANDER-21	Spencer	38.14775	-86.80490	3	1998	6	2010	147	5	<1
ANDER-22	Perry	38.14695	-86.80291	3	1998	6	2010	147	5	<1
ANDER-23	Spencer	38.15274	-86.80130	3	1998	6	2010	147	5	<1
ANDER-24	Perry	38.15642	-86.79586	3	1998	6	2010	147	5	<1
					Big Blue River					
BIGBLUE-1	Johnson	39.35420	-85.97906	3	1998	8	2012	173	5	<1
BIGBLUE-2	Johnson	39.36394	-85.96486	3	1998	8	2012	173	5	<1
BIGBLUE-3	Johnson	39.37071	-85.96754	3	1998	8	2012	173	5	<1
BIGBLUE-4	Shelby	39.38586	-85.94685	3	1998	8	2012	173	5	<1
BIGBLUE-5	Shelby	39.39499	-85.93806	3	1998	8	2012	173	5	<1
BIGBLUE-6	Shelby	39.40310	-85.92658	3	1998	8	2012	173	67	4.6
BIGBLUE-7	Shelby	39.41907	-85.91799	3	1998	8	2012	173	30	2.1
BIGBLUE-8	Shelby	39.42266	-85.91630	3	1998	8	2012	173	32	2.2
BIGBLUE-9	Shelby	39.42708	-85.90643	3	1998	8	2012	173	61	4.2
BIGBLUE-10	Shelby	39.43210	-85.89564	3	1998	8	2012	173	58	4.0
BIGBLUE-11	Shelby	39.43920	-85.88808	3	1998	8	2012	173	21	1.5
BIGBLUE-12	Shelby	39.45650	-85.89346	3	1998	8	2012	173	5	<1
BIGBLUE-13	Shelby	39.47127	-85.88232	3	1998	8	2012	173	14	1.0
BIGBLUE-14	Shelby	39.47764	-85.87636	3	1998	8	2012	173	66	4.6
BIGBLUE-15	Shelby	39.48631	-85.86894	3	1998	8	2012	173	5	<1
BIGBLUE-16	Shelby	39.50018	-85.86130	3	1998	8	2012	173	5	<1
BIGBLUE-17	Shelby	39.51530	-85.85486	3	1998	8	2012	173	91	6.3
BIGBLUE-18	Shelby	39.52186	-85.85051	3	1998	8	2012	173	85	5.9
BIGBLUE-19	Shelby	39.52132	-85.83610	3	1998	8	2012	173	58	4.0
BIGBLUE-20	Shelby	39.52022	-85.81790	3	1998	8	2012	173	5	<1

Appendix 1. Data collected to document recent channel-migration rates at meander bends along selected streams in Indiana.—Continued

[<, less than]

Site identifier	County	Latitude (degrees)	Longitude (degrees)	Early-image capture date		Late-image capture date		Time elapsed between image captures (months)	Maximum measured cutbank displacement (feet)	Average annual channel-migration rate (feet/year)
				Month	Year	Month	Year			
Big Blue River—Continued										
BIGBLUE-21	Shelby	39.57920	-85.76340	3	1998	8	2012	173	5	<1
BIGBLUE-22	Shelby	39.59332	-85.76547	3	1998	8	2012	173	234	16.2
BIGBLUE-23	Shelby	39.60936	-85.74623	4	1998	8	2012	172	38	2.7
BIGBLUE-24	Shelby	39.62441	-85.73008	4	1998	8	2012	172	5	<1
BIGBLUE-25	Shelby	39.64410	-85.71758	3	1999	8	2012	161	5	<1
BIGBLUE-26	Shelby	39.66327	-85.72089	3	1999	8	2012	161	48	3.6
BIGBLUE-27	Shelby	39.68305	-85.71278	3	1999	6	2010	135	56	5.0
BIGBLUE-28	Shelby	39.69182	-85.70463	4	1998	6	2010	146	5	<1
BIGBLUE-29	Hancock	39.70901	-85.68287	4	1998	6	2010	146	5	<1
BIGBLUE-30	Hancock	39.71109	-85.64176	4	1998	6	2010	146	74	6.1
BIGBLUE-31	Rush	39.71401	-85.60339	4	1998	6	2010	146	49	4.0
BIGBLUE-32	Rush	39.72897	-85.58090	4	1998	6	2010	146	5	<1
Big Pine Creek										
BIGPINE-1	Fountain	40.30464	-87.25537	4	1998	5	2012	169	5	<1
BIGPINE-2	Fountain	40.31718	-87.27232	4	1998	5	2012	169	5	<1
BIGPINE-3	Fountain	40.31588	-87.28242	4	1998	5	2012	169	181	12.9
BIGPINE-4	Fountain	40.32800	-87.30370	4	1998	5	2012	169	68	4.8
BIGPINE-5	Fountain	40.34043	-87.29627	4	1998	5	2012	169	5	<1
BIGPINE-6	Fountain	40.34194	-87.31540	4	1998	5	2012	169	5	<1
BIGPINE-7	Fountain	40.35284	-87.31553	4	1998	5	2012	169	12	<1
BIGPINE-8	Fountain	40.36098	-87.32009	4	1998	5	2012	169	5	<1
BIGPINE-9	Fountain	40.37480	-87.33023	4	1998	5	2012	169	5	<1
BIGPINE-10	Fountain	40.37128	-87.33331	4	1998	5	2012	169	5	<1
BIGPINE-11	Fountain	40.38161	-87.33155	4	1998	5	2012	169	23	1.6
BIGPINE-12	Fountain	40.39780	-87.32794	4	1998	5	2012	169	5	<1
BIGPINE-13	Fountain	40.40360	-87.33085	4	1998	5	2012	169	5	<1
BIGPINE-14	Fountain	40.41843	-87.31677	4	1998	5	2012	169	5	<1
BIGPINE-15	Fountain	40.41569	-87.31174	4	1998	5	2012	169	5	<1
BIGPINE-16	Fountain	40.42387	-87.30408	4	1998	5	2012	169	5	<1
BIGPINE-17	Fountain	40.42678	-87.29594	4	1998	5	2012	169	5	<1
BIGPINE-18	Fountain	40.42495	-87.28376	4	1998	5	2012	169	5	<1
BIGPINE-19	Fountain	40.42993	-87.27899	4	1998	5	2012	169	5	<1
BIGPINE-20	Fountain	40.43595	-87.26721	4	1998	5	2012	169	5	<1
Big Raccoon Creek										
RACC-1	Parke	39.76359	-87.33966	3	1992	6	2010	219	197	10.8
RACC-2	Parke	39.74376	-87.32895	4	1993	6	2010	206	27	1.6
RACC-3	Parke	39.71867	-87.32301	4	1993	6	2010	206	70	4.1
RACC-4	Parke	39.71112	-87.32544	4	1993	6	2010	206	5	<1
RACC-5	Parke	39.69468	-87.31250	4	1993	6	2010	206	108	6.3
RACC-6	Parke	39.67573	-87.31253	4	1998	6	2010	146	83	6.8
RACC-7	Parke	39.65696	-87.29892	4	1998	6	2010	146	125	10.3
RACC-8	Parke	39.64620	-87.27495	4	1998	6	2010	146	39	3.2
RACC-9	Parke	39.63181	-87.26408	4	1998	6	2010	146	63	5.2
RACC-10	Parke	39.62284	-87.24516	4	1998	6	2010	146	67	5.5
RACC-11	Parke	39.62121	-87.23982	4	1998	6	2010	146	5	<1

Appendix 1. Data collected to document recent channel-migration rates at meander bends along selected streams in Indiana.—Continued

[<, less than]

Site identifier	County	Latitude (degrees)	Longitude (degrees)	Early-image capture date		Late-image capture date		Time elapsed between image captures (months)	Maximum measured cutbank displacement (feet)	Average annual channel-migration rate (feet/year)
				Month	Year	Month	Year			
Big Raccoon Creek—Continued										
RACC-12	Parke	39.63082	-87.20254	4	1998	6	2010	146	79	6.5
RACC-13	Parke	39.63032	-87.19412	4	1998	6	2010	146	63	5.2
RACC-14	Parke	39.64232	-87.18374	4	1998	6	2010	146	17	1.4
RACC-15	Parke	39.65488	-87.16860	4	1998	6	2010	146	15	1.2
RACC-16	Parke	39.65845	-87.13962	4	1998	6	2010	146	13	1.1
RACC-17	Parke	39.68398	-87.09039	4	1998	6	2010	146	30	2.5
RACC-18	Putnam	39.83713	-86.91800	3	1998	6	2010	147	50	4.1
RACC-19	Putnam	39.84020	-86.91830	3	1998	6	2010	147	68	5.6
RACC-20	Putnam	39.85953	-86.87422	3	1998	6	2010	147	100	8.2
Big Walnut Creek										
WALNUT-1	Putnam	39.49715	-86.95014	4	1998	9	2011	161	56	4.2
WALNUT-2	Putnam	39.52138	-86.95760	3	1998	9	2011	162	144	10.7
WALNUT-3	Putnam	39.52690	-86.96573	3	1998	9	2011	162	295	21.9
WALNUT-4	Putnam	39.54059	-86.98138	3	1998	9	2011	162	253	18.7
WALNUT-5	Putnam	39.55065	-86.97366	3	1998	9	2011	162	5	<1
WALNUT-6	Putnam	39.56145	-86.96155	3	1998	9	2011	162	33	2.4
WALNUT-7	Putnam	39.56029	-86.94004	3	1998	9	2011	162	153	11.3
WALNUT-8	Putnam	39.56964	-86.94862	3	1998	9	2011	162	167	12.4
WALNUT-9	Putnam	39.58722	-86.93821	3	1998	6	2010	147	112	9.1
WALNUT-10	Putnam	39.60677	-86.93880	3	1998	6	2010	147	92	7.5
WALNUT-11	Putnam	39.61714	-86.94439	3	1998	6	2010	147	190	15.5
WALNUT-12	Putnam	39.62246	-86.93914	3	1998	6	2010	147	141	11.5
WALNUT-13	Putnam	39.62694	-86.90088	3	1998	6	2010	147	98	8.0
WALNUT-14	Putnam	39.63504	-86.89059	3	1998	6	2010	147	32	2.6
WALNUT-15	Putnam	39.65451	-86.88623	3	1998	6	2010	147	188	15.3
WALNUT-16	Putnam	39.65822	-86.87378	4	1998	6	2010	146	31	2.5
WALNUT-17	Putnam	39.66997	-86.86425	4	1998	6	2010	146	5	<1
WALNUT-18	Putnam	39.67441	-86.83791	4	1998	6	2010	146	98	8.1
WALNUT-19	Putnam	39.67528	-86.82257	4	1998	6	2010	146	278	22.8
WALNUT-20	Putnam	39.68457	-86.80222	3	1999	6	2010	135	130	11.6
WALNUT-21	Putnam	39.69260	-86.79879	3	1999	6	2010	135	100	8.9
WALNUT-22	Putnam	39.70753	-86.78300	3	1999	6	2010	135	60	5.3
WALNUT-23	Putnam	39.71632	-86.77467	3	1999	6	2010	135	80	7.1
WALNUT-24	Putnam	39.72513	-86.76811	3	1999	6	2010	135	176	15.6
WALNUT-25	Putnam	39.73307	-86.77205	3	1999	6	2010	135	70	6.2
WALNUT-26	Putnam	39.75102	-86.77430	3	1999	6	2010	135	5	<1
Blue River										
BLUE-1	Crawford	38.18924	-86.31842	3	1998	6	2010	147	5	<1
BLUE-2	Crawford	38.20391	-86.29473	3	1998	6	2010	147	5	<1
BLUE-3	Crawford	38.20944	-86.29526	3	1998	6	2010	147	5	<1
BLUE-4	Harrison	38.22016	-86.28582	3	1998	6	2010	147	5	<1
BLUE-5	Harrison	38.22483	-86.26729	3	1998	6	2010	147	5	<1
BLUE-6	Harrison	38.24394	-86.23691	3	1998	6	2010	147	5	<1
BLUE-7	Harrison	38.25674	-86.23740	3	1998	6	2010	147	5	<1
BLUE-8	Crawford	38.28433	-86.28130	3	1998	6	2010	147	5	<1

Appendix 1. Data collected to document recent channel-migration rates at meander bends along selected streams in Indiana.—Continued

[<, less than]

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				Month	Year	Month	Year			
Blue River—Continued										
BLUE-9	Crawford	38.28636	-86.26648	3	1998	6	2010	147	5	<1
BLUE-10	Crawford	38.29409	-86.26420	3	1998	6	2010	147	5	<1
BLUE-11	Crawford	38.29989	-86.27562	3	1998	6	2010	147	5	<1
BLUE-12	Crawford	38.33218	-86.28577	3	1998	6	2010	147	5	<1
BLUE-13	Crawford	38.32672	-86.27767	3	1998	6	2010	147	5	<1
BLUE-14	Crawford	38.34832	-86.28202	3	1998	6	2010	147	5	<1
BLUE-15	Crawford	38.36218	-86.26467	3	1998	6	2010	147	5	<1
BLUE-16	Harrison	38.34752	-86.24863	3	1998	6	2010	147	5	<1
BLUE-17	Crawford	38.35598	-86.25342	3	1998	6	2010	147	5	<1
BLUE-18	Crawford	38.36622	-86.25866	3	1998	6	2010	147	5	<1
BLUE-19	Crawford	38.38958	-86.25917	3	1998	6	2010	147	5	<1
BLUE-20	Crawford	38.39834	-86.25959	3	1998	6	2010	147	5	<1
Coal Creek										
COAL-1	Parke	39.94219	-87.41578	3	1992	6	2010	219	111	6.1
COAL-2	Parke	39.94419	-87.41552	3	1992	6	2010	219	35	1.9
COAL-3	Parke	39.94408	-87.40661	3	1992	6	2010	219	77	4.2
COAL-4	Parke	39.94748	-87.39643	3	1992	6	2010	219	22	1.2
COAL-5	Fountain	39.95307	-87.39070	3	1992	6	2010	219	56	3.1
COAL-6	Fountain	39.96693	-87.38924	3	1992	6	2010	219	74	4.1
COAL-7	Fountain	39.97474	-87.38464	3	1992	6	2010	219	140	7.7
COAL-8	Fountain	39.98072	-87.38221	3	1992	6	2010	219	81	4.4
COAL-9	Fountain	39.99996	-87.39102	4	1993	6	2010	206	58	3.4
COAL-10	Fountain	40.01680	-87.38271	4	1993	6	2010	206	54	3.1
COAL-11	Fountain	40.03267	-87.37171	4	1998	6	2010	146	46	3.8
COAL-12	Fountain	40.04336	-87.36621	4	1998	6	2010	146	5	<1
COAL-13	Fountain	40.04830	-87.35826	4	1998	6	2010	146	5	<1
COAL-14	Fountain	40.05210	-87.34445	4	1998	6	2010	146	5	<1
COAL-15	Fountain	40.05214	-87.32935	4	1998	6	2010	146	64	5.3
COAL-16	Fountain	40.05917	-87.31451	4	1998	6	2010	146	5	<1
COAL-17	Fountain	40.06555	-87.30430	4	1998	6	2010	146	57	4.7
COAL-18	Fountain	40.07942	-87.29865	4	1998	6	2010	146	53	4.4
COAL-19	Fountain	40.08558	-87.28667	4	1998	6	2010	146	92	7.6
COAL-20	Fountain	40.09503	-87.26790	4	1998	6	2010	146	21	1.7
Driftwood River										
DRIFT-1	Bartholomew	39.20306	-85.93810	3	1998	6	2010	147	41	3.3
DRIFT-2	Bartholomew	39.20672	-85.94516	3	1998	6	2010	147	5	<1
DRIFT-3	Bartholomew	39.20952	-85.95484	3	1998	6	2010	147	72	5.9
DRIFT-4	Bartholomew	39.20509	-85.96361	3	1998	6	2010	147	63	5.1
DRIFT-5	Bartholomew	39.22053	-85.97142	3	1998	6	2010	147	5	<1
DRIFT-6	Bartholomew	39.24453	-85.96610	3	1998	6	2010	147	5	<1
DRIFT-7	Bartholomew	39.26011	-85.97087	3	1998	6	2010	147	5	<1
DRIFT-8	Bartholomew	39.25952	-85.96238	3	1998	6	2010	147	10	<1
DRIFT-9	Bartholomew	39.26294	-85.96049	3	1998	6	2010	147	5	<1
DRIFT-10	Bartholomew	39.30320	-85.97490	3	1998	6	2010	147	5	<1
DRIFT-11	Bartholomew	39.30950	-85.97514	3	1998	6	2010	147	66	5.4

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[<, less than]

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				Month	Year	Month	Year			
Driftwood River—Continued										
DRIFT-12	Bartholomew	39.30972	-85.97209	3	1998	6	2010	147	88	7.2
DRIFT-13	Bartholomew	39.31126	-85.97374	3	1998	6	2010	147	188	15.3
DRIFT-14	Bartholomew	39.32053	-85.97278	3	1998	6	2010	147	5	<1
DRIFT-15	Bartholomew	39.31734	-85.97621	3	1998	6	2010	147	58	4.7
DRIFT-16	Bartholomew	39.32109	-85.97846	3	1998	6	2010	147	129	10.5
DRIFT-17	Bartholomew	39.32498	-85.98598	3	1998	6	2010	147	47	3.8
DRIFT-18	Bartholomew	39.33191	-85.98212	3	1998	6	2010	147	29	2.4
DRIFT-19	Bartholomew	39.33474	-85.98795	3	1998	6	2010	147	99	8.1
DRIFT-20	Bartholomew	39.34338	-85.99139	3	1998	6	2010	147	42	3.4
East Fork White River (lower)										
EFWR-1	Daviess	38.55259	-87.20605	4	1998	6	2010	146	5	<1
EFWR-2	Pike	38.53099	-87.16980	3	1998	6	2010	147	5	<1
EFWR-3	Daviess	38.52966	-87.15305	3	1998	6	2010	147	72	5.9
EFWR-4	Pike	38.52142	-87.15804	3	1998	6	2010	147	11	<1
EFWR-5	Pike	38.52722	-87.13025	3	1998	6	2010	147	115	9.4
EFWR-6	Pike	38.52550	-87.09546	3	1998	6	2010	147	15	1.2
EFWR-7	Daviess	38.52140	-87.08051	3	1998	6	2010	147	5	<1
EFWR-8	Pike	38.51480	-87.08987	3	1998	6	2010	147	134	10.9
EFWR-9	Daviess	38.51598	-87.07334	3	1998	6	2010	147	5	<1
EFWR-10	Dubois	38.50360	-87.06749	3	1998	6	2010	147	181	14.8
EFWR-11	Dubois	38.50816	-87.03068	3	1998	6	2010	147	5	<1
EFWR-12	Dubois	38.50964	-87.01082	3	1998	6	2010	147	92	7.5
East Fork White River (middle)										
EFWR-13	Daviess	38.51463	-86.99632	3	1998	6	2010	147	5	<1
EFWR-14	Dubois	38.49107	-86.95730	3	1998	6	2010	147	5	<1
EFWR-15	Martin	38.50261	-86.87698	3	1998	6	2010	147	5	<1
EFWR-16	Martin	38.56613	-86.85542	3	1998	6	2010	147	5	<1
EFWR-17	Martin	38.61695	-86.84091	3	1998	6	2010	147	5	<1
EFWR-18	Martin	38.68067	-86.80943	3	1998	6	2010	147	5	<1
EFWR-19	Martin	38.70474	-86.76322	3	1998	6	2010	147	5	<1
EFWR-20	Martin	38.73302	-86.76949	3	1998	6	2010	147	5	<1
EFWR-21	Martin	38.72168	-86.72627	4	1998	6	2010	146	5	<1
EFWR-22	Martin	38.77091	-86.72350	4	1998	6	2010	146	5	<1
EFWR-23	Martin	38.75512	-86.69247	4	1998	6	2010	146	5	<1
EFWR-24	Lawrence	38.80055	-86.67946	4	1998	6	2010	146	5	<1
EFWR-25	Lawrence	38.79553	-86.61366	4	1998	6	2010	146	5	<1
EFWR-26	Lawrence	38.79324	-86.60535	4	1998	6	2010	146	5	<1
EFWR-27	Lawrence	38.79418	-86.58382	4	1998	6	2010	146	5	<1
EFWR-28	Lawrence	38.81755	-86.58002	4	1998	6	2010	146	5	<1
EFWR-29	Lawrence	38.81548	-86.48917	4	1998	6	2010	146	5	<1
EFWR-30	Lawrence	38.79487	-86.44591	4	1998	6	2010	146	5	<1
EFWR-31	Lawrence	38.76610	-86.41723	4	1998	6	2010	146	5	<1
EFWR-32	Lawrence	38.77523	-86.37373	4	1998	6	2010	146	5	<1

Appendix 1. Data collected to document recent channel-migration rates at meander bends along selected streams in Indiana.—Continued

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				Month	Year	Month	Year			
East Fork White River (upper)										
EFWR-33	Lawrence	38.73857	-86.31979	3	1998	6	2010	147	51	4.2
EFWR-34	Washington	38.73412	-86.29391	3	1998	6	2010	147	56	4.6
EFWR-35	Washington	38.76316	-86.26506	3	1998	6	2010	147	83	6.8
EFWR-36	Jackson	38.76927	-86.25242	3	1998	6	2010	147	38	3.1
EFWR-37	Washington	38.76678	-86.24731	3	1998	6	2010	147	14	1.1
EFWR-38	Jackson	38.77424	-86.16040	3	1998	6	2010	147	75	6.1
EFWR-39	Jackson	38.79951	-86.16719	3	1998	6	2010	147	85	6.9
EFWR-40	Jackson	38.80744	-86.15390	3	1998	6	2010	147	136	11.1
EFWR-41	Jackson	38.85151	-86.11354	3	1998	6	2010	147	17	1.4
EFWR-42	Jackson	38.85427	-86.10518	3	1998	6	2010	147	146	11.9
EFWR-43	Jackson	38.87000	-86.09205	3	1998	6	2010	147	5	<1
EFWR-44	Jackson	38.89741	-86.05214	4	1998	6	2010	146	162	13.3
EFWR-45	Jackson	38.90396	-86.05099	4	1998	6	2010	146	114	9.4
EFWR-46	Jackson	38.90926	-86.03791	4	1998	6	2010	146	118	9.7
EFWR-47	Jackson	38.92811	-85.99141	4	1998	6	2010	146	68	5.6
EFWR-48	Jackson	38.93242	-85.96264	4	1998	6	2010	146	152	12.5
EFWR-49	Jackson	38.94258	-85.95049	4	1998	6	2010	146	208	17.1
EFWR-50	Jackson	38.94859	-85.93530	4	1998	6	2010	146	157	12.9
EFWR-51	Jackson	38.97835	-85.92588	4	1998	6	2010	146	91	7.5
EFWR-52	Jackson	38.98311	-85.92310	4	1998	6	2010	146	57	4.7
EFWR-53	Jackson	38.99788	-85.89697	3	1998	6	2010	147	109	8.9
EFWR-54	Jackson	39.03262	-85.85031	3	1998	6	2010	147	5	<1
EFWR-55	Jackson	39.03222	-85.85473	3	1998	6	2010	147	238	19.4
EFWR-56	Jackson	39.03910	-85.86256	3	1998	6	2010	147	214	17.5
EFWR-57	Bartholomew	39.07095	-85.85354	3	1998	6	2010	147	121	9.9
EFWR-58	Bartholomew	39.07142	-85.85864	3	1998	6	2010	147	113	9.2
EFWR-59	Bartholomew	39.08615	-85.86200	3	1998	6	2010	147	130	10.6
EFWR-60	Bartholomew	39.09928	-85.86697	3	1998	6	2010	147	201	16.4
EFWR-61	Bartholomew	39.12157	-85.88006	3	1998	6	2010	147	187	15.3
EFWR-62	Bartholomew	39.12799	-85.87969	3	1998	6	2010	147	127	10.4
Eel River (north)										
EELRN-1	Cass	40.77262	-86.26554	4	1998	2	2012	166	5	<1
EELRN-2	Cass	40.79840	-86.25743	4	1998	2	2012	166	5	<1
EELRN-3	Cass	40.80158	-86.24088	4	1998	2	2012	166	5	<1
EELRN-4	Cass	40.79052	-86.21755	3	1998	2	2012	167	5	<1
EELRN-5	Cass	40.79149	-86.20384	3	1998	2	2012	167	5	<1
EELRN-6	Miami	40.80865	-86.11386	4	1998	2	2012	166	5	<1
EELRN-7	Miami	40.83956	-86.11234	3	1998	2	2012	167	5	<1
EELRN-8	Miami	40.83998	-86.11674	3	1998	2	2012	167	5	<1
EELRN-9	Miami	40.84376	-86.10461	3	1998	2	2012	167	5	<1
EELRN-10	Miami	40.85777	-86.08900	3	1998	6	2010	147	5	<1
EELRN-11	Miami	40.85991	-86.08571	3	1998	6	2010	147	5	<1
EELRN-12	Miami	40.84985	-86.06596	3	1998	6	2010	147	5	<1
EELRN-13	Miami	40.85613	-86.05774	3	1998	6	2010	147	5	<1
EELRN-14	Miami	40.85402	-86.04151	3	1998	6	2010	147	5	<1

Appendix 1. Data collected to document recent channel-migration rates at meander bends along selected streams in Indiana.—Continued

[<, less than]

Site identifier	County	Latitude (degrees)	Longitude (degrees)	Early-image capture date		Late-image capture date		Time elapsed between image captures (months)	Maximum measured cutbank displacement (feet)	Average annual channel-migration rate (feet/year)
				Month	Year	Month	Year			
Eel River (north)—Continued										
EELRN-15	Miami	40.84974	-86.03638	3	1998	6	2010	147	5	<1
EELRN-16	Miami	40.85584	-86.02202	3	1998	6	2010	147	5	<1
EELRN-17	Miami	40.85804	-86.00665	3	1998	6	2010	147	5	<1
EELRN-18	Miami	40.85551	-86.00935	3	1998	6	2010	147	5	<1
EELRN-19	Miami	40.85905	-85.99041	4	1998	6	2010	146	5	<1
EELRN-20	Miami	40.86134	-85.98608	4	1998	6	2010	146	5	<1
Eel River (south)										
EELRS-1	Clay	39.27357	-87.19647	4	1998	9	2011	161	59	4.4
EELRS-2	Clay	39.28462	-87.20582	4	1998	9	2011	161	91	6.8
EELRS-3	Clay	39.28500	-87.20208	4	1998	9	2011	161	54	4.0
EELRS-4	Clay	39.29102	-87.20654	4	1998	9	2011	161	21	1.6
EELRS-5	Clay	39.30520	-87.20649	4	1998	9	2011	161	46	3.4
EELRS-6	Clay	39.31164	-87.20171	4	1998	9	2011	161	13	1.0
EELRS-7	Clay	39.30969	-87.19676	4	1998	9	2011	161	25	1.9
EELRS-8	Clay	39.31204	-87.19466	4	1998	9	2011	161	25	1.9
EELRS-9	Clay	39.32178	-87.17116	3	1998	9	2011	162	23	1.7
EELRS-10	Clay	39.32527	-87.16574	3	1998	9	2011	162	29	2.1
EELRS-11	Clay	39.32278	-87.16258	3	1998	9	2011	162	15	1.1
EELRS-12	Clay	39.32466	-87.15632	3	1998	9	2011	162	56	4.1
EELRS-13	Clay	39.32955	-87.12035	3	1998	9	2011	162	65	4.8
EELRS-14	Clay	39.34166	-87.10313	3	1998	9	2011	162	229	17.0
EELRS-15	Clay	39.33809	-87.09896	3	1998	9	2011	162	81	6.0
EELRS-16	Clay	39.34165	-87.09668	3	1998	9	2011	162	167	12.4
EELRS-17	Clay	39.34926	-87.08968	3	1998	9	2011	162	70	5.2
EELRS-18	Clay	39.34580	-87.08848	3	1998	9	2011	162	54	4.0
EELRS-19	Clay	39.35294	-87.03727	3	1998	9	2011	162	136	10.1
EELRS-20	Clay	39.35629	-87.03904	3	1998	9	2011	162	32	2.4
Elkhart River										
ELK-1	Elkhart	41.67621	-85.94579	3	1999	10	2011	151	5	<1
ELK-2	Elkhart	41.66685	-85.94627	3	1999	10	2011	151	5	<1
ELK-3	Elkhart	41.66098	-85.93494	3	1999	10	2011	151	5	<1
ELK-4	Elkhart	41.65472	-85.92102	3	1999	10	2011	151	5	<1
ELK-5	Elkhart	41.64381	-85.91202	3	1999	10	2011	151	5	<1
ELK-6	Elkhart	41.63881	-85.90464	3	1999	10	2011	151	5	<1
ELK-7	Elkhart	41.62399	-85.89978	3	1999	10	2011	151	5	<1
ELK-8	Elkhart	41.62302	-85.88491	3	1999	10	2011	151	5	<1
ELK-9	Elkhart	41.61064	-85.86925	3	1999	10	2011	151	5	<1
ELK-10	Elkhart	41.60369	-85.85489	3	1999	10	2011	151	5	<1
ELK-11	Elkhart	41.59144	-85.84496	3	1999	10	2011	151	5	<1
ELK-12	Elkhart	41.58392	-85.84147	3	1999	10	2011	151	5	<1
ELK-13	Elkhart	41.57864	-85.84238	3	1999	10	2011	151	5	<1
ELK-14	Elkhart	41.57236	-85.83781	3	1999	10	2011	151	5	<1
ELK-15	Elkhart	41.56961	-85.83455	3	1999	10	2011	151	5	<1
ELK-16	Elkhart	41.56201	-85.83926	3	1999	10	2011	151	5	<1
ELK-17	Elkhart	41.54801	-85.83853	3	1999	10	2011	151	5	<1

Appendix 1. Data collected to document recent channel-migration rates at meander bends along selected streams in Indiana.—Continued

[<, less than]

Site identifier	County	Latitude (degrees)	Longitude (degrees)	Early-image capture date		Late-image capture date		Time elapsed between image captures (months)	Maximum measured cutbank displacement (feet)	Average annual channel-migration rate (feet/year)
				Month	Year	Month	Year			
Elkhart River—Continued										
ELK-18	Elkhart	41.52832	-85.82904	3	1999	10	2011	151	5	<1
ELK-19	Elkhart	41.52217	-85.82347	3	1999	10	2011	151	5	<1
ELK-20	Elkhart	41.50934	-85.80716	3	1999	10	2011	151	5	<1
Fawn River										
FAWN-1	Lagrange	41.75168	-85.55774	3	1994	10	2011	211	5	<1
FAWN-2	Lagrange	41.75188	-85.55284	3	1994	10	2011	211	5	<1
FAWN-3	Lagrange	41.75162	-85.54593	3	1994	10	2011	211	5	<1
FAWN-4	Lagrange	41.75071	-85.54243	3	1994	10	2011	211	5	<1
FAWN-5	Lagrange	41.75256	-85.53827	3	1994	10	2011	211	5	<1
FAWN-6	Lagrange	41.75402	-85.53380	3	1994	10	2011	211	5	<1
FAWN-7	Lagrange	41.75572	-85.53026	3	1994	10	2011	211	5	<1
FAWN-8	Lagrange	41.75405	-85.52818	3	1994	10	2011	211	5	<1
FAWN-9	Lagrange	41.75374	-85.51965	3	1994	10	2011	211	5	<1
FAWN-10	Lagrange	41.75324	-85.51439	3	1994	10	2011	211	5	<1
FAWN-11	Lagrange	41.75455	-85.51044	3	1994	10	2011	211	5	<1
FAWN-12	Lagrange	41.75861	-85.50238	3	1994	10	2011	211	5	<1
FAWN-13	Lagrange	41.75861	-85.47233	3	1994	10	2011	211	5	<1
FAWN-14	Lagrange	41.75162	-85.45591	3	1994	10	2011	211	5	<1
FAWN-15	Lagrange	41.74851	-85.45327	3	1994	10	2011	211	5	<1
FAWN-16	Lagrange	41.74248	-85.43251	4	1998	10	2011	162	5	<1
FAWN-17	Lagrange	41.74584	-85.43136	4	1998	10	2011	162	5	<1
FAWN-18	Lagrange	41.75018	-85.42532	3	1994	10	2011	211	5	<1
FAWN-19	Lagrange	41.74643	-85.41559	4	1998	10	2011	162	5	<1
FAWN-20	Lagrange	41.75206	-85.40270	3	1994	10	2011	211	5	<1
Flatrock River										
FLATR-1	Bartholomew	39.24554	-85.92657	3	1998	6	2010	147	71	5.8
FLATR-2	Bartholomew	39.24930	-85.92660	3	1998	6	2010	147	120	9.8
FLATR-3	Bartholomew	39.25719	-85.92818	3	1998	6	2010	147	218	17.8
FLATR-4	Bartholomew	39.26058	-85.92064	3	1998	6	2010	147	215	17.6
FLATR-5	Bartholomew	39.27007	-85.92152	3	1998	6	2010	147	123	10.0
FLATR-6	Bartholomew	39.27375	-85.91903	3	1998	6	2010	147	58	4.7
FLATR-7	Bartholomew	39.27452	-85.91456	3	1998	6	2010	147	77	6.3
FLATR-8	Bartholomew	39.29657	-85.90203	3	1998	6	2010	147	239	19.5
FLATR-9	Bartholomew	39.30137	-85.90427	3	1998	6	2010	147	81	6.6
FLATR-10	Bartholomew	39.30122	-85.90195	3	1998	6	2010	147	130	10.6
FLATR-11	Bartholomew	39.32569	-85.88377	3	1998	6	2010	147	59	4.8
FLATR-12	Bartholomew	39.32637	-85.87771	3	1998	6	2010	147	38	3.1
FLATR-13	Bartholomew	39.32819	-85.86399	3	1998	6	2010	147	5	<1
FLATR-14	Bartholomew	39.32668	-85.86277	3	1998	6	2010	147	14	1.1
FLATR-15	Bartholomew	39.33964	-85.85909	3	1998	6	2010	147	32	2.6
FLATR-16	Bartholomew	39.34738	-85.86395	3	1998	8	2012	173	5	<1
Indian Creek										
INDIAN-1	Harrison	38.11070	-86.26922	3	1998	6	2010	147	5	<1
INDIAN-2	Harrison	38.13115	-86.24970	3	1998	6	2010	147	5	<1
INDIAN-3	Harrison	38.13106	-86.23388	3	1998	6	2010	147	5	<1

Appendix 1. Data collected to document recent channel-migration rates at meander bends along selected streams in Indiana.—Continued

[<, less than]

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				Month	Year	Month	Year			
Indian Creek—Continued										
INDIAN-4	Harrison	38.15304	-86.23242	3	1998	6	2010	147	5	<1
INDIAN-5	Harrison	38.17133	-86.22938	3	1998	6	2010	147	5	<1
INDIAN-6	Harrison	38.17812	-86.20917	3	1998	6	2010	147	5	<1
INDIAN-7	Harrison	38.17997	-86.19574	3	1998	6	2010	147	5	<1
INDIAN-8	Harrison	38.20021	-86.19449	3	1998	6	2010	147	5	<1
INDIAN-9	Harrison	38.20236	-86.17304	3	1998	6	2010	147	5	<1
INDIAN-10	Harrison	38.20290	-86.15267	3	1998	6	2010	147	5	<1
INDIAN-11	Harrison	38.21755	-86.12983	3	1998	6	2010	147	5	<1
INDIAN-12	Harrison	38.22974	-86.12114	3	1998	6	2010	147	5	<1
INDIAN-13	Harrison	38.24511	-86.10182	3	1998	6	2010	147	5	<1
INDIAN-14	Harrison	38.25449	-86.10722	3	1998	6	2010	147	5	<1
INDIAN-15	Harrison	38.27179	-86.10312	3	1998	6	2010	147	5	<1
INDIAN-16	Harrison	38.28157	-86.09050	3	1998	6	2010	147	5	<1
INDIAN-17	Harrison	38.29024	-86.06151	2	1992	6	2010	220	5	<1
INDIAN-18	Harrison	38.30635	-86.04873	2	1992	6	2010	220	5	<1
INDIAN-19	Harrison	38.30627	-86.02852	2	1992	6	2010	220	5	<1
INDIAN-20	Harrison	38.31379	-86.00408	3	1998	6	2010	147	55	4.5
Iroquois River										
IROQ-1	Newton	40.82386	-87.51836	2	1998	5	2012	171	5	<1
IROQ-2	Newton	40.81790	-87.50577	2	1998	5	2012	171	5	<1
IROQ-3	Newton	40.81647	-87.49497	4	1998	5	2012	169	5	<1
IROQ-4	Newton	40.81843	-87.48192	4	1998	5	2012	169	5	<1
IROQ-5	Newton	40.81539	-87.47243	4	1998	5	2012	169	5	<1
IROQ-6	Newton	40.82145	-87.47202	4	1998	5	2012	169	5	<1
IROQ-7	Newton	40.81764	-87.45807	4	1998	5	2012	169	5	<1
IROQ-8	Newton	40.82106	-87.45627	4	1998	5	2012	169	5	<1
IROQ-9	Newton	40.81554	-87.44552	4	1998	5	2012	169	5	<1
IROQ-10	Newton	40.82039	-87.44376	4	1998	5	2012	169	5	<1
IROQ-11	Newton	40.82326	-87.43255	4	1998	5	2012	169	5	<1
IROQ-12	Newton	40.82755	-87.42482	4	1998	5	2012	169	5	<1
IROQ-13	Newton	40.82802	-87.41208	4	1998	5	2012	169	5	<1
IROQ-14	Newton	40.83359	-87.40082	4	1998	5	2012	169	5	<1
IROQ-15	Newton	40.83606	-87.39273	4	1998	5	2012	169	5	<1
IROQ-16	Newton	40.83802	-87.39006	4	1998	5	2012	169	5	<1
IROQ-17	Newton	40.83659	-87.38034	4	1998	5	2012	169	5	<1
IROQ-18	Newton	40.83886	-87.37516	4	1998	5	2012	169	5	<1
IROQ-19	Newton	40.84266	-87.37302	4	1998	5	2012	169	5	<1
IROQ-20	Newton	40.84051	-87.36993	4	1998	5	2012	169	5	<1
Kankakee River										
KANK-1	Newton	41.16990	-87.45798	4	1998	6	2010	146	5	<1
KANK-2	Lake	41.17484	-87.44693	4	1998	6	2010	146	5	<1
KANK-3	Newton	41.16120	-87.41450	4	1998	6	2010	146	5	<1
KANK-4	Newton	41.16198	-87.39551	4	1998	6	2010	146	36	3.0
KANK-5	Lake	41.17262	-87.38176	4	1998	6	2010	146	5	<1
KANK-6	Lake	41.18287	-87.34687	4	1998	6	2010	146	5	<1

Appendix 1. Data collected to document recent channel-migration rates at meander bends along selected streams in Indiana.—Continued

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				Month	Year	Month	Year			
Kankakee River—Continued										
KANK-7	Newton	41.18223	-87.33168	4	1998	6	2010	146	10	<1
KANK-8	Lake	41.21561	-87.28620	4	1998	6	2010	146	5	<1
KANK-9	Jasper	41.23484	-87.22603	4	1998	6	2010	146	5	<1
KANK-10	Porter	41.26523	-87.19379	4	1998	6	2010	146	5	<1
KANK-11	Porter	41.28659	-87.13204	4	1998	6	2010	146	5	<1
KANK-12	Porter	41.28688	-87.12181	4	1998	6	2010	146	5	<1
KANK-13	Porter	41.26993	-87.05973	4	1998	6	2010	146	5	<1
KANK-14	Jasper	41.22135	-86.97838	4	1998	6	2010	146	5	<1
KANK-15	Jasper	41.22924	-86.93807	4	1998	6	2010	146	5	<1
KANK-16	Laporte	41.24549	-86.92115	4	1998	6	2010	146	5	<1
KANK-17	Starke	41.25930	-86.87707	4	1998	6	2010	146	5	<1
KANK-18	Laporte	41.27241	-86.83999	4	1998	6	2010	146	5	<1
KANK-19	Starke	41.28486	-86.78302	4	1998	6	2010	146	5	<1
KANK-20	Starke	41.32117	-86.73968	4	1998	6	2010	146	5	<1
Laughery Creek										
LAUGH-1	Dearborn	38.99951	-84.94401	3	1999	6	2010	135	5	<1
LAUGH-2	Dearborn	38.99934	-84.95399	3	1999	6	2010	135	5	<1
LAUGH-3	Dearborn	38.99786	-84.96298	3	1999	6	2010	135	5	<1
LAUGH-4	Dearborn	38.99546	-84.98398	3	1999	6	2010	135	46	4.1
LAUGH-5	Dearborn	38.97452	-85.00478	3	1999	6	2010	135	5	<1
LAUGH-6	Dearborn	38.98314	-85.02073	3	1999	6	2010	135	32	2.8
LAUGH-7	Dearborn	38.95800	-85.05892	3	1999	6	2010	135	5	<1
LAUGH-8	Dearborn	38.95184	-85.06773	3	1999	6	2010	135	5	<1
LAUGH-9	Dearborn	38.95250	-85.08362	3	1999	6	2010	135	5	<1
LAUGH-10	Dearborn	38.94110	-85.10619	3	1999	6	2010	135	155	13.8
LAUGH-11	Ripley	38.99476	-85.16935	3	1998	6	2010	147	5	<1
LAUGH-12	Ripley	39.00343	-85.17671	4	1998	6	2010	146	5	<1
LAUGH-13	Ripley	39.01671	-85.20116	4	1998	6	2010	146	5	<1
LAUGH-14	Ripley	39.01760	-85.22081	4	1998	6	2010	146	5	<1
LAUGH-15	Ripley	39.16059	-85.24653	4	1998	6	2010	146	5	<1
LAUGH-16	Ripley	39.16324	-85.25512	4	1998	6	2010	146	5	<1
LAUGH-17	Ripley	39.16934	-85.24499	4	1998	6	2010	146	5	<1
LAUGH-18	Ripley	39.17600	-85.25740	4	1998	6	2010	146	5	<1
LAUGH-19	Ripley	39.18318	-85.25332	4	1998	6	2010	146	5	<1
LAUGH-20	Ripley	39.19777	-85.25390	4	1998	6	2010	146	5	<1
Lost River										
LOST-1	Martin	38.53508	-86.82148	3	1998	6	2010	147	5	<1
LOST-2	Martin	38.56191	-86.81165	3	1998	6	2010	147	5	<1
LOST-3	Martin	38.57523	-86.81204	3	1998	6	2010	147	5	<1
LOST-4	Martin	38.57237	-86.76674	3	1998	6	2010	147	5	<1
LOST-5	Martin	38.58871	-86.76294	3	1998	6	2010	147	5	<1
LOST-6	Martin	38.59890	-86.73221	4	1998	6	2010	146	5	<1
LOST-7	Martin	38.58974	-86.72500	4	1998	6	2010	146	5	<1
LOST-8	Martin	38.58802	-86.70026	4	1998	6	2010	146	5	<1
LOST-9	Martin	38.59587	-86.68643	4	1998	6	2010	146	5	<1

Appendix 1. Data collected to document recent channel-migration rates at meander bends along selected streams in Indiana.—Continued

[<, less than]

Site identifier	County	Latitude (degrees)	Longitude (degrees)	Early-image capture date		Late-image capture date		Time elapsed between image captures (months)	Maximum measured cutbank displacement (feet)	Average annual channel-migration rate (feet/year)
				Month	Year	Month	Year			
Lost River—Continued										
LOST-10	Orange	38.60812	-86.65893	4	1998	6	2010	146	5	<1
LOST-11	Orange	38.60000	-86.64316	4	1998	6	2010	146	5	<1
LOST-12	Orange	38.58045	-86.62957	4	1998	6	2010	146	5	<1
LOST-13	Orange	38.57936	-86.60230	3	1999	6	2010	135	5	<1
LOST-14	Orange	38.59536	-86.59706	3	1999	6	2010	135	5	<1
LOST-15	Orange	38.61562	-86.59608	3	1999	6	2010	135	5	<1
LOST-16	Orange	38.61322	-86.56806	3	1999	6	2010	135	5	<1
LOST-17	Orange	38.62691	-86.54674	4	1998	6	2010	146	5	<1
LOST-18	Orange	38.63370	-86.52970	4	1998	6	2010	146	5	<1
LOST-19	Orange	38.64301	-86.51843	4	1998	6	2010	146	5	<1
LOST-20	Orange	38.64806	-86.49329	4	1998	6	2010	146	5	<1
Maumee River										
MAUM-1	Allen	41.10471	-84.97769	4	1998	5	2011	157	5	<1
MAUM-2	Allen	41.11412	-84.95018	4	1998	5	2011	157	5	<1
MAUM-3	Allen	41.12454	-84.94052	4	1998	5	2011	157	5	<1
MAUM-4	Allen	41.12347	-84.93108	4	1998	5	2011	157	5	<1
MAUM-5	Allen	41.12955	-84.93620	4	1998	5	2011	157	5	<1
MAUM-6	Allen	41.12892	-84.91964	4	1998	5	2011	157	5	<1
MAUM-7	Allen	41.13498	-84.90717	4	1998	5	2011	157	5	<1
MAUM-8	Allen	41.14096	-84.90406	4	1998	5	2011	157	5	<1
MAUM-9	Allen	41.15124	-84.89575	4	1998	5	2011	157	5	<1
MAUM-10	Allen	41.15626	-84.86356	4	1994	5	2011	205	5	<1
MAUM-11	Allen	41.17025	-84.85311	4	1994	5	2011	205	5	<1
MAUM-12	Allen	41.17748	-84.83588	4	1994	5	2011	205	5	<1
MAUM-13	Allen	41.16777	-84.83563	4	1994	5	2011	205	5	<1
MAUM-14	Allen	41.15874	-84.83262	4	1994	5	2011	205	5	<1
MAUM-15	Allen	41.17097	-84.81767	4	1994	5	2011	205	5	<1
MAUM-16	Allen	41.16401	-84.81724	4	1994	5	2011	205	5	<1
Mississinewa River										
MISS-1	Miami	40.74138	-86.01758	4	1998	2	2012	166	5	<1
MISS-2	Miami	40.72587	-85.99274	4	1998	2	2012	166	5	<1
MISS-3	Miami	40.72155	-85.98825	4	1998	2	2012	166	5	<1
MISS-4	Miami	40.73544	-85.97911	4	1998	2	2012	166	5	<1
MISS-5	Grant	40.59658	-85.66569	4	1998	2	2012	166	5	<1
MISS-6	Grant	40.58748	-85.66482	4	1998	2	2012	166	5	<1
MISS-7	Grant	40.56063	-85.64565	4	1998	2	2012	166	5	<1
MISS-8	Grant	40.55183	-85.64919	4	1998	2	2012	166	5	<1
MISS-9	Grant	40.49528	-85.62744	4	1998	2	2012	166	5	<1
MISS-10	Grant	40.49650	-85.61923	4	1998	2	2012	166	5	<1
MISS-11	Grant	40.47084	-85.60828	4	1998	2	2012	166	5	<1
MISS-12	Grant	40.45669	-85.57420	4	1998	2	2012	166	5	<1
MISS-13	Grant	40.45310	-85.57311	4	1998	2	2012	166	5	<1
MISS-14	Grant	40.45900	-85.56244	4	1998	2	2012	166	5	<1
MISS-15	Grant	40.46002	-85.54440	4	1998	2	2012	166	5	<1
MISS-16	Grant	40.45553	-85.54180	4	1998	2	2012	166	5	<1

Appendix 1. Data collected to document recent channel-migration rates at meander bends along selected streams in Indiana.—Continued

[<, less than]

Site identifier	County	Latitude (degrees)	Longitude (degrees)	Early-image capture date		Late-image capture date		Time elapsed between image captures (months)	Maximum measured cutbank displacement (feet)	Average annual channel-migration rate (feet/year)
				Month	Year	Month	Year			
Mississinewa River—Continued										
MISS-17	Grant	40.45870	-85.53057	4	1998	2	2012	166	5	<1
MISS-18	Grant	40.42012	-85.50858	3	1992	2	2012	239	5	<1
MISS-19	Grant	40.41860	-85.50229	3	1992	2	2012	239	5	<1
MISS-20	Grant	40.39472	-85.50202	4	1992	2	2012	238	5	<1
Muscatatuck River										
MUSC-1	Washington	38.76759	-86.09827	3	1998	6	2010	147	5	<1
MUSC-2	Washington	38.77370	-86.07576	3	1998	6	2010	147	5	<1
MUSC-3	Jackson	38.76240	-86.03172	4	1998	6	2010	146	5	<1
MUSC-4	Jackson	38.76538	-86.01449	4	1998	6	2010	146	5	<1
MUSC-5	Jackson	38.76782	-85.98179	4	1998	6	2010	146	5	<1
MUSC-6	Jackson	38.76463	-85.96111	4	1998	6	2010	146	5	<1
MUSC-7	Jackson	38.75610	-85.92641	4	1998	6	2010	146	5	<1
MUSC-8	Jackson	38.75760	-85.91098	4	1998	6	2010	146	5	<1
MUSC-9	Jackson	38.74155	-85.89672	3	1998	6	2010	147	5	<1
MUSC-10	Jackson	38.73477	-85.88513	3	1998	6	2010	147	5	<1
MUSC-11	Scott	38.72557	-85.87320	3	1998	6	2010	147	5	<1
MUSC-12	Scott	38.72938	-85.85860	3	1998	6	2010	147	5	<1
MUSC-13	Scott	38.73422	-85.84746	3	1998	6	2010	147	5	<1
MUSC-14	Scott	38.74638	-85.83922	3	1998	6	2010	147	5	<1
MUSC-15	Jackson	38.77838	-85.81732	3	1998	6	2010	147	5	<1
MUSC-16	Jackson	38.79623	-85.80411	3	1998	6	2010	147	5	<1
MUSC-17	Jennings	38.80846	-85.79492	3	1998	6	2010	147	5	<1
MUSC-18	Jennings	38.81280	-85.78039	3	1998	6	2010	147	5	<1
MUSC-19	Scott	38.81312	-85.76269	3	1998	6	2010	147	5	<1
MUSC-20	Scott	38.82322	-85.71801	3	1992	6	2010	219	5	<1
Patoka River										
PATOK-1	Gibson	38.39950	-87.73442	2	1998	3	2012	169	22	1.6
PATOK-2	Gibson	38.39496	-87.71650	2	1998	3	2012	169	5	<1
PATOK-3	Gibson	38.40281	-87.70256	2	1998	3	2012	169	5	<1
PATOK-4	Gibson	38.39740	-87.69144	2	1998	3	2012	169	5	<1
PATOK-5	Gibson	38.39123	-87.67649	2	1998	3	2012	169	10	<1
PATOK-6	Gibson	38.38683	-87.66514	2	1998	3	2012	169	5	<1
PATOK-7	Pike	38.37082	-87.19709	4	1998	3	2012	167	5	<1
PATOK-8	Pike	38.37594	-87.18335	3	1998	3	2012	168	5	<1
PATOK-9	Pike	38.37310	-87.16734	4	1998	3	2012	167	5	<1
PATOK-10	Pike	38.36852	-87.15288	4	1998	3	2012	167	5	<1
PATOK-11	Pike	38.35423	-87.14284	4	1998	3	2012	167	5	<1
PATOK-12	Pike	38.34552	-87.12709	3	1998	3	2012	168	5	<1
PATOK-13	Dubois	38.34966	-87.04785	3	1998	3	2012	168	5	<1
PATOK-14	Dubois	38.36175	-87.04012	3	1998	3	2012	168	5	<1
PATOK-15	Dubois	38.37451	-87.03237	3	1998	3	2012	168	5	<1
PATOK-16	Dubois	38.36291	-86.99983	3	1998	3	2012	168	5	<1
PATOK-17	Dubois	38.34180	-86.99279	3	1998	3	2012	168	5	<1
PATOK-18	Dubois	38.32790	-86.97570	3	1998	3	2012	168	5	<1
PATOK-19	Dubois	38.33986	-86.96266	3	1998	3	2012	168	5	<1

Appendix 1. Data collected to document recent channel-migration rates at meander bends along selected streams in Indiana.—Continued

[<, less than]

Site identifier	County	Latitude (degrees)	Longitude (degrees)	Early-image capture date		Late-image capture date		Time elapsed between image captures (months)	Maximum measured cutbank displacement (feet)	Average annual channel-migration rate (feet/year)
				Month	Year	Month	Year			
Patoka River—Continued										
PATOK-20	Dubois	38.34768	-86.95173	3	1998	3	2012	168	5	<1
PATOK-21	Dubois	38.35814	-86.92212	3	1998	3	2012	168	5	<1
PATOK-22	Dubois	38.41023	-86.91058	3	1998	6	2010	147	5	<1
PATOK-23	Dubois	38.42058	-86.87594	3	1998	6	2010	147	5	<1
PATOK-24	Dubois	38.43568	-86.88405	3	1998	6	2010	147	5	<1
PATOK-25	Dubois	38.45645	-86.86607	3	1998	6	2010	147	5	<1
PATOK-26	Dubois	38.44921	-86.85156	3	1998	6	2010	147	5	<1
PATOK-27	Dubois	38.44067	-86.81346	3	1998	6	2010	147	5	<1
PATOK-28	Dubois	38.46721	-86.79400	9	2003	6	2010	81	5	<1
Pigeon River										
PIGN-1	Lagrange	41.75010	-85.58125	3	1994	10	2011	211	5	<1
PIGN-2	Lagrange	41.74032	-85.56731	4	1998	10	2011	162	5	<1
PIGN-3	Lagrange	41.74103	-85.55956	4	1998	10	2011	162	5	<1
PIGN-4	Lagrange	41.73774	-85.55446	4	1998	10	2011	162	5	<1
PIGN-5	Lagrange	41.73285	-85.53889	4	1998	10	2011	162	5	<1
PIGN-6	Lagrange	41.73264	-85.52525	4	1998	10	2011	162	5	<1
PIGN-7	Lagrange	41.72738	-85.50744	4	1998	10	2011	162	5	<1
PIGN-8	Lagrange	41.71239	-85.44944	4	1998	10	2011	162	5	<1
PIGN-9	Lagrange	41.71753	-85.42901	4	1998	10	2011	162	5	<1
PIGN-10	Lagrange	41.71051	-85.41040	4	1998	10	2011	162	5	<1
PIGN-11	Lagrange	41.70606	-85.39116	4	1998	10	2011	162	5	<1
PIGN-12	Lagrange	41.70864	-85.38107	4	1998	10	2011	162	5	<1
PIGN-13	Lagrange	41.69833	-85.35169	3	1999	10	2011	151	5	<1
PIGN-14	Lagrange	41.69351	-85.32885	3	1999	10	2011	151	5	<1
PIGN-15	Lagrange	41.69597	-85.30616	4	1998	10	2011	162	5	<1
PIGN-16	Lagrange	41.68731	-85.28955	4	1998	10	2011	162	5	<1
PIGN-17	Lagrange	41.67795	-85.26004	4	1998	10	2011	162	5	<1
PIGN-18	Lagrange	41.67524	-85.25923	4	1998	10	2011	162	5	<1
Salamonie River										
SALAM-1	Huntington	40.69640	-85.44326	4	1998	5	2011	157	5	<1
SALAM-2	Huntington	40.67789	-85.43166	4	1998	5	2011	157	5	<1
SALAM-3	Huntington	40.66969	-85.41506	4	1998	2	2012	166	5	<1
SALAM-4	Huntington	40.65613	-85.41016	4	1998	2	2012	166	5	<1
SALAM-5	Wells	40.64617	-85.40235	4	1998	2	2012	166	5	<1
SALAM-6	Wells	40.63780	-85.38345	4	1998	2	2012	166	5	<1
SALAM-7	Wells	40.63267	-85.36736	4	1998	2	2012	166	5	<1
SALAM-8	Wells	40.62130	-85.36241	4	1998	2	2012	166	5	<1
SALAM-9	Wells	40.61226	-85.35292	4	1998	2	2012	166	5	<1
SALAM-10	Wells	40.61497	-85.32203	4	1998	2	2012	166	5	<1
SALAM-11	Wells	40.60283	-85.31311	4	1998	2	2012	166	5	<1
SALAM-12	Wells	40.59247	-85.31391	4	1998	2	2012	166	5	<1
SALAM-13	Wells	40.58415	-85.31065	4	1998	2	2012	166	5	<1
SALAM-14	Wells	40.57714	-85.29335	4	1998	2	2012	166	5	<1
SALAM-15	Blackford	40.55083	-85.25710	4	1998	2	2012	166	5	<1
SALAM-16	Blackford	40.52508	-85.20281	4	1998	2	2012	166	5	<1

Appendix 1. Data collected to document recent channel-migration rates at meander bends along selected streams in Indiana.—Continued

[<, less than]

Site identifier	County	Latitude (degrees)	Longitude (degrees)	Early-image capture date		Late-image capture date		Time elapsed between image captures (months)	Maximum measured cutbank displacement (feet)	Average annual channel-migration rate (feet/year)
				Month	Year	Month	Year			
Salamonie River—Continued										
SALAM-17	Jay	40.51637	-85.20060	4	1998	2	2012	166	5	<1
SALAM-18	Jay	40.51254	-85.18320	4	1998	2	2012	166	5	<1
SALAM-19	Jay	40.48189	-85.14970	4	1998	2	2012	166	5	<1
Salt Creek										
SALT-1	Lawrence	38.82429	-86.55192	4	1998	6	2010	146	5	<1
SALT-2	Lawrence	38.85878	-86.56541	4	1998	6	2010	146	5	<1
SALT-3	Lawrence	38.84914	-86.54503	4	1998	6	2010	146	5	<1
SALT-4	Lawrence	38.87801	-86.54071	4	1998	6	2010	146	5	<1
SALT-5	Lawrence	38.88112	-86.52610	4	1998	6	2010	146	5	<1
SALT-6	Lawrence	38.90375	-86.51438	4	1998	6	2010	146	5	<1
SALT-7	Lawrence	38.91452	-86.51107	4	1998	6	2010	146	5	<1
SALT-8	Lawrence	38.94012	-86.51481	4	1998	6	2010	146	5	<1
SALT-9	Lawrence	38.96760	-86.49308	4	1998	6	2010	146	5	<1
SALT-10	Lawrence	38.97399	-86.49496	4	1998	6	2010	146	5	<1
SALT-11	Monroe	39.00028	-86.50486	4	1998	6	2010	146	5	<1
SALT-12	Brown	39.14762	-86.36075	3	1998	6	2010	147	5	<1
SALT-13	Brown	39.14873	-86.35108	3	1998	6	2010	147	5	<1
SALT-14	Brown	39.14838	-86.33808	3	1998	6	2010	147	5	<1
SALT-15	Brown	39.16040	-86.33809	3	1998	6	2010	147	5	<1
SALT-16	Brown	39.16769	-86.33718	3	1998	6	2010	147	5	<1
SALT-17	Brown	39.17796	-86.31567	3	1998	6	2010	147	5	<1
SALT-18	Brown	39.17994	-86.30810	3	1998	6	2010	147	5	<1
SALT-19	Brown	39.20384	-86.25597	4	1998	6	2010	146	5	<1
SALT-20	Brown	39.20304	-86.22169	4	1998	6	2010	146	5	<1
South Fork Wildcat Creek										
SFWILD-1	Tippecanoe	40.43632	-86.79723	3	1992	5	2012	242	223	11.1
SFWILD-2	Tippecanoe	40.43563	-86.78722	3	1992	5	2012	242	17	<1
SFWILD-3	Tippecanoe	40.42778	-86.78974	3	1992	5	2012	242	5	<1
SFWILD-4	Tippecanoe	40.42328	-86.76657	3	1992	2	2012	239	116	5.8
SFWILD-5	Tippecanoe	40.41399	-86.76568	3	1992	2	2012	239	194	9.7
SFWILD-6	Tippecanoe	40.40289	-86.77455	3	1992	2	2012	239	96	4.8
SFWILD-7	Tippecanoe	40.39590	-86.77336	3	1992	2	2012	239	194	9.7
SFWILD-8	Tippecanoe	40.38794	-86.76207	3	1992	2	2012	239	141	7.1
SFWILD-9	Tippecanoe	40.38416	-86.76546	3	1992	2	2012	239	165	8.3
SFWILD-10	Tippecanoe	40.36937	-86.74569	3	1992	2	2012	239	91	4.6
SFWILD-11	Tippecanoe	40.36556	-86.74906	3	1992	2	2012	239	237	11.9
SFWILD-12	Tippecanoe	40.36129	-86.74674	3	1992	2	2012	239	131	6.6
SFWILD-13	Tippecanoe	40.35348	-86.74409	3	1992	2	2012	239	36	1.8
SFWILD-14	Tippecanoe	40.34757	-86.74468	3	1992	2	2012	239	5	<1
SFWILD-15	Tippecanoe	40.33463	-86.74278	3	1992	2	2012	239	115	5.8
SFWILD-16	Tippecanoe	40.31739	-86.73998	3	1992	2	2012	239	13	<1
SFWILD-17	Tippecanoe	40.32164	-86.72336	3	1992	2	2012	239	69	3.5
SFWILD-18	Tippecanoe	40.32235	-86.71092	3	1992	2	2012	239	176	8.8
SFWILD-19	Clinton	40.33354	-86.69349	3	1992	2	2012	239	53	2.7
SFWILD-20	Clinton	40.33017	-86.68221	3	1992	2	2012	239	11	<1

Appendix 1. Data collected to document recent channel-migration rates at meander bends along selected streams in Indiana.—Continued

[<, less than]

Site identifier	County	Latitude (degrees)	Longitude (degrees)	Early-image capture date		Late-image capture date		Time elapsed between image captures (months)	Maximum measured cutbank displacement (feet)	Average annual channel-migration rate (feet/year)
				Month	Year	Month	Year			
South Fork Wildcat Creek—Continued										
SFWILD-21	Clinton	40.32643	-86.65631	3	1992	2	2012	239	5	<1
SFWILD-22	Clinton	40.32608	-86.63771	3	1992	2	2012	239	96	4.8
Saint Joseph River (near Fort Wayne, Ind.)										
STJOEFW-1	Allen	41.14916	-85.09950	4	1998	5	2011	157	5	<1
STJOEFW-2	Allen	41.15948	-85.09682	4	1998	5	2011	157	5	<1
STJOEFW-3	Allen	41.16204	-85.08144	4	1998	5	2011	157	5	<1
STJOEFW-4	Allen	41.16666	-85.06902	4	1998	5	2011	157	5	<1
STJOEFW-5	Allen	41.18818	-85.05509	4	1998	5	2011	157	5	<1
STJOEFW-6	Allen	41.18111	-85.04729	4	1998	5	2011	157	5	<1
STJOEFW-7	Allen	41.18692	-85.04615	4	1998	5	2011	157	5	<1
STJOEFW-8	Allen	41.19842	-85.02582	4	1998	5	2011	157	5	<1
STJOEFW-9	Allen	41.24489	-84.95898	4	1998	5	2011	157	5	<1
STJOEFW-10	Allen	41.25246	-84.94914	4	1998	5	2011	157	5	<1
STJOEFW-11	Allen	41.25816	-84.94518	4	1998	5	2011	157	5	<1
STJOEFW-12	Dekalb	41.27747	-84.92054	4	1998	5	2011	157	5	<1
STJOEFW-13	Dekalb	41.29364	-84.89785	4	1998	5	2011	157	5	<1
STJOEFW-14	Dekalb	41.30886	-84.89827	4	1998	5	2011	157	5	<1
STJOEFW-15	Dekalb	41.32284	-84.87793	4	1998	5	2011	157	5	<1
STJOEFW-16	Dekalb	41.32509	-84.86264	3	1998	5	2011	158	5	<1
STJOEFW-17	Dekalb	41.34257	-84.84750	3	1998	5	2011	158	5	<1
STJOEFW-18	Dekalb	41.35269	-84.83253	3	1998	5	2011	158	5	<1
STJOEFW-19	Dekalb	41.36634	-84.83096	3	1998	5	2011	158	5	<1
STJOEFW-20	Dekalb	41.37628	-84.82413	3	1998	5	2011	158	5	<1
Saint Joseph River (near South Bend, Ind.)										
STJOESB-1	St Joseph	41.73563	-86.27516	4	1998	6	2011	158	5	<1
STJOESB-2	St Joseph	41.72959	-86.26659	4	1998	4	2011	156	5	<1
STJOESB-3	St Joseph	41.71714	-86.26626	4	1998	4	2011	156	5	<1
STJOESB-4	St Joseph	41.70463	-86.25532	4	1998	4	2011	156	5	<1
STJOESB-5	Elkhart	41.68893	-86.03710	4	1998	4	2011	156	5	<1
STJOESB-6	Elkhart	41.67632	-86.02650	4	1998	4	2011	156	5	<1
STJOESB-7	Elkhart	41.68073	-85.99965	4	1998	4	2011	156	5	<1
STJOESB-8	Elkhart	41.70290	-85.87810	3	1999	10	2011	151	5	<1
STJOESB-9	Elkhart	41.70992	-85.87149	3	1999	10	2011	151	5	<1
STJOESB-10	Elkhart	41.70758	-85.86398	3	1999	10	2011	151	5	<1
STJOESB-11	Elkhart	41.71471	-85.84714	3	1999	10	2011	151	5	<1
STJOESB-12	Elkhart	41.72168	-85.84423	3	1999	10	2011	151	5	<1
STJOESB-13	Elkhart	41.71768	-85.83829	3	1999	10	2011	151	5	<1
STJOESB-14	Elkhart	41.72176	-85.81657	3	1999	10	2011	151	5	<1
STJOESB-15	Elkhart	41.73669	-85.80653	3	1999	10	2011	151	5	<1
STJOESB-16	Elkhart	41.74347	-85.80146	3	1999	10	2011	151	5	<1
STJOESB-17	Elkhart	41.74996	-85.80528	5	1994	10	2011	209	5	<1
STJOESB-18	Elkhart	41.74860	-85.79798	5	1994	10	2011	209	5	<1
STJOESB-19	Elkhart	41.75496	-85.79953	5	1994	10	2011	209	5	<1
STJOESB-20	Elkhart	41.75636	-85.78689	5	1994	10	2011	209	5	<1

Appendix 1. Data collected to document recent channel-migration rates at meander bends along selected streams in Indiana.—Continued

[<, less than]

Site identifier	County	Latitude (degrees)	Longitude (degrees)	Early-image capture date		Late-image capture date		Time elapsed between image captures (months)	Maximum measured cutbank displacement (feet)	Average annual channel-migration rate (feet/year)
				Month	Year	Month	Year			
Saint Marys River										
STMARY-1	Allen	41.04964	-85.15788	4	1998	5	2011	157	5	<1
STMARY-2	Allen	41.01636	-85.14140	4	1998	5	2011	157	5	<1
STMARY-3	Allen	40.99969	-85.12029	4	1998	5	2011	157	5	<1
STMARY-4	Allen	40.98447	-85.09562	4	1998	5	2011	157	5	<1
STMARY-5	Allen	40.97665	-85.09711	4	1998	5	2011	157	5	<1
STMARY-6	Allen	40.95956	-85.08786	4	1998	5	2011	157	5	<1
STMARY-7	Allen	40.93883	-85.08643	4	1998	5	2011	157	5	<1
STMARY-8	Allen	40.92238	-85.04959	4	1998	5	2011	157	5	<1
STMARY-9	Adams	40.90909	-85.03163	4	1998	5	2011	157	5	<1
STMARY-10	Adams	40.89355	-85.00505	4	1998	5	2011	157	5	<1
STMARY-11	Adams	40.87663	-84.97839	4	1998	5	2011	157	5	<1
STMARY-12	Adams	40.86066	-84.96019	3	1998	5	2011	158	5	<1
STMARY-13	Adams	40.86352	-84.94772	3	1998	5	2011	158	5	<1
STMARY-14	Adams	40.82231	-84.90813	3	1999	5	2011	146	5	<1
STMARY-15	Adams	40.81389	-84.89493	3	1999	5	2011	146	5	<1
STMARY-16	Adams	40.79436	-84.85772	4	1994	5	2011	205	5	<1
STMARY-17	Adams	40.77764	-84.83018	4	1994	5	2011	205	5	<1
STMARY-18	Adams	40.77066	-84.81853	4	1994	5	2011	205	5	<1
Sugar Creek (near Crawfordsville, Ind.)										
SUGAR-1	Parke	39.85653	-87.34633	3	1992	6	2010	219	50	2.7
SUGAR-2	Parke	39.84856	-87.34760	3	1992	6	2010	219	130	7.1
SUGAR-3	Parke	39.85709	-87.31471	3	1992	6	2010	219	337	18.5
SUGAR-4	Parke	39.88306	-87.26948	4	1998	6	2010	146	369	30.3
SUGAR-5	Parke	39.88357	-87.22699	4	1998	6	2010	146	5	<1
SUGAR-6	Parke	39.88850	-87.17693	4	1998	6	2010	146	5	<1
SUGAR-7	Parke	39.90107	-87.16219	4	1998	6	2010	146	5	<1
SUGAR-8	Montgomery	39.95867	-87.03462	4	1998	6	2010	146	5	<1
SUGAR-9	Montgomery	39.98796	-86.99106	4	1998	6	2010	146	5	<1
SUGAR-10	Montgomery	40.00784	-86.97247	4	1998	6	2010	146	5	<1
SUGAR-11	Montgomery	40.03907	-86.96865	4	1998	6	2010	146	75	6.2
SUGAR-12	Montgomery	40.04479	-86.94160	4	1998	6	2010	146	222	18.2
SUGAR-13	Montgomery	40.05067	-86.92025	4	1998	6	2010	146	5	<1
SUGAR-14	Montgomery	40.07314	-86.89542	4	1998	6	2010	146	5	<1
SUGAR-15	Montgomery	40.07767	-86.87459	4	1998	6	2010	146	5	<1
SUGAR-16	Montgomery	40.08964	-86.85125	4	1998	6	2010	146	5	<1
SUGAR-17	Montgomery	40.10438	-86.82037	4	1998	6	2010	146	42	3.5
SUGAR-18	Montgomery	40.10551	-86.80578	3	1999	6	2010	135	141	12.5
SUGAR-19	Montgomery	40.12661	-86.75165	4	1998	6	2010	146	5	<1
SUGAR-20	Montgomery	40.14392	-86.70913	4	1998	6	2010	146	5	<1
Tippecanoe River										
TIPPY-1	Lafayette	40.53811	-86.76524	3	1992	2	2012	239	5	<1
TIPPY-2	Lafayette	40.55390	-86.76612	3	1992	2	2012	239	5	<1
TIPPY-3	Carroll	40.59874	-86.74345	3	1992	2	2012	239	5	<1
TIPPY-4	Carroll	40.61768	-86.76348	3	1992	2	2012	239	5	<1
TIPPY-5	White	40.86997	-86.75436	3	1999	6	2010	135	5	<1

Appendix 1. Data collected to document recent channel-migration rates at meander bends along selected streams in Indiana.—Continued

[<, less than]

Site identifier	County	Latitude (degrees)	Longitude (degrees)	Early-image capture date		Late-image capture date		Time elapsed between image captures (months)	Maximum measured cutbank displacement (feet)	Average annual channel-migration rate (feet/year)
				Month	Year	Month	Year			
Tippecanoe River—Continued										
TIPPY-6	White	40.89542	-86.71570	4	1998	6	2010	146	5	<1
TIPPY-7	Pulaski	40.94203	-86.69566	4	1998	6	2010	146	5	<1
TIPPY-8	Pulaski	40.96698	-86.68806	4	1998	6	2010	146	5	<1
TIPPY-9	Pulaski	41.00082	-86.61810	4	1998	6	2010	146	5	<1
TIPPY-10	Pulaski	41.04108	-86.57326	4	1998	6	2010	146	5	<1
TIPPY-11	Pulaski	41.09691	-86.55528	4	1998	6	2010	146	5	<1
TIPPY-12	Pulaski	41.12775	-86.58204	4	1998	6	2010	146	5	<1
TIPPY-13	Pulaski	41.15748	-86.58380	4	1998	6	2010	146	5	<1
TIPPY-14	Pulaski	41.16840	-86.53482	4	1998	6	2010	146	5	<1
TIPPY-15	Pulaski	41.16582	-86.49634	4	1998	6	2010	146	5	<1
TIPPY-16	Fulton	41.15653	-86.44122	4	1998	6	2010	146	5	<1
TIPPY-17	Fulton	41.11658	-86.36612	4	1998	6	2010	146	5	<1
TIPPY-18	Fulton	41.12003	-86.31550	4	1998	6	2010	146	5	<1
TIPPY-19	Fulton	41.10103	-86.25906	4	1998	6	2010	146	5	<1
TIPPY-20	Fulton	41.11001	-86.21179	4	1998	6	2010	146	5	<1
TIPPY-21	Fulton	41.13343	-86.16213	4	1998	6	2010	146	5	<1
TIPPY-22	Fulton	41.15940	-86.13491	4	1998	6	2010	146	5	<1
TIPPY-23	Marshall	41.19367	-86.12547	4	1998	6	2010	146	5	<1
TIPPY-24	Marshall	41.21795	-86.11872	4	1998	6	2010	146	5	<1
TIPPY-25	Marshall	41.22616	-86.08902	3	1998	6	2010	147	5	<1
TIPPY-26	Marshall	41.20852	-86.07185	3	1998	6	2010	147	5	<1
TIPPY-27	Kosciusko	41.23660	-86.04664	3	1998	6	2010	147	5	<1
TIPPY-28	Kosciusko	41.25606	-86.02807	3	1998	6	2010	147	5	<1
TIPPY-29	Kosciusko	41.24427	-86.00376	3	1998	6	2010	147	5	<1
TIPPY-30	Kosciusko	41.23782	-85.93737	4	1998	6	2010	146	5	<1
Vernon Fork Muscatatuck River										
VERNON-1	Jackson	38.89625	-85.84216	3	1998	6	2010	147	5	<1
VERNON-2	Jackson	38.90101	-85.83457	3	1998	6	2010	147	5	<1
VERNON-3	Jackson	38.90944	-85.81615	3	1998	6	2010	147	5	<1
VERNON-4	Jackson	38.89725	-85.80360	4	1998	6	2010	146	5	<1
VERNON-5	Jennings	38.89895	-85.78490	4	1998	6	2010	146	5	<1
VERNON-6	Jennings	38.89548	-85.74976	4	1998	6	2010	146	5	<1
VERNON-7	Jennings	38.90332	-85.73543	4	1998	6	2010	146	5	<1
VERNON-8	Jennings	38.92013	-85.72780	4	1998	6	2010	146	5	<1
VERNON-9	Jennings	38.93780	-85.70466	4	1998	6	2010	146	14	1.2
VERNON-10	Jennings	38.93808	-85.70339	4	1998	6	2010	146	58	4.8
VERNON-11	Jennings	38.95021	-85.69943	4	1998	6	2010	146	182	15.0
VERNON-12	Jennings	38.95619	-85.68286	4	1998	6	2010	146	49	4.0
VERNON-13	Jennings	38.95597	-85.65491	4	1998	6	2010	146	5	<1
VERNON-14	Jennings	38.95386	-85.63454	4	1998	6	2010	146	5	<1
VERNON-15	Jennings	38.95366	-85.62243	4	1998	6	2010	146	5	<1
VERNON-16	Jennings	38.96047	-85.62039	4	1998	6	2010	146	5	<1
VERNON-17	Jennings	38.97318	-85.60734	4	1998	6	2010	146	5	<1
VERNON-18	Jennings	38.98404	-85.61492	4	1998	6	2010	146	5	<1
VERNON-19	Jennings	38.99207	-85.61637	4	1998	6	2010	146	5	<1
VERNON-20	Jennings	38.99690	-85.60843	4	1998	6	2010	146	5	<1

Appendix 1. Data collected to document recent channel-migration rates at meander bends along selected streams in Indiana.—Continued

[<, less than]

Site identifier	County	Latitude (degrees)	Longitude (degrees)	Early-image capture date		Late-image capture date		Time elapsed between image captures (months)	Maximum measured cutbank displacement (feet)	Average annual channel-migration rate (feet/year)
				Month	Year	Month	Year			
Wabash River (lower)										
WABR-1	Posey	37.87913	88.01897	4	1998	9	2011	161	427	31.8
WABR-2	Posey	37.95823	88.01507	4	1998	9	2011	161	98	7.3
WABR-3	Posey	38.02788	88.00383	4	1998	9	2011	161	5	<1
WABR-4	Illinois	38.04241	88.04900	4	1998	9	2011	161	5	<1
WABR-5	Gibson	38.22958	-87.96971	4	1998	9	2011	161	171	12.7
WABR-6	Gibson	38.25470	-87.93927	4	1998	9	2011	161	522	38.9
WABR-7	Illinois	38.26217	-87.95146	4	1998	9	2011	161	198	14.8
WABR-8	Gibson	38.27489	-87.94276	4	1998	9	2011	161	109	8.1
WABR-9	Illinois	38.30567	-87.91556	4	1998	9	2011	161	433	32.3
WABR-10	Gibson	38.27009	-87.92207	4	1998	9	2011	161	211	15.7
WABR-11	Illinois	38.31389	-87.87485	4	1998	9	2011	161	18	1.3
WABR-12	Gibson	38.27517	-87.86638	4	1998	9	2011	161	160	11.9
WABR-13	Knox	38.44368	-87.72760	2	1998	3	2012	169	5	<1
WABR-14	Illinois	38.45492	-87.75832	4	1998	3	2012	167	5	<1
WABR-15	Knox	38.50360	-87.64604	4	1998	9	2011	161	5	<1
WABR-16	Illinois	38.54480	-87.67240	4	1998	9	2011	161	5	<1
WABR-17	Knox	38.55449	-87.64876	2	1998	9	2011	163	71	5.2
WABR-18	Illinois	38.56854	-87.65501	2	1998	9	2011	163	5	<1
WABR-19	Illinois	38.63471	-87.62452	3	1992	9	2011	234	86	4.4
WABR-20	Knox	38.73962	-87.49396	3	1999	9	2011	150	5	<1
WABR-21	Knox	38.76882	-87.49585	2	1998	9	2011	163	5	<1
WABR-22	Illinois	38.76857	-87.51719	3	1999	9	2011	150	5	<1
WABR-23	Illinois	38.81714	-87.52870	3	1999	9	2011	150	5	<1
WABR-24	Knox	38.84934	-87.52304	3	1999	9	2011	150	79	6.3
WABR-25	Knox	38.86032	-87.54746	3	1999	9	2011	150	143	11.4
WABR-26	Knox	38.87422	-87.53846	2	1998	9	2011	163	100	7.4
WABR-27	Knox	38.89983	-87.51769	2	1998	9	2011	163	68	5.0
WABR-28	Illinois	38.91699	-87.53005	2	1998	9	2011	163	18	1.3
WABR-29	Sullivan	38.91915	-87.52124	2	1998	9	2011	163	81	6.0
WABR-30	Illinois	38.93646	-87.52310	2	1998	9	2011	163	64	4.7
WABR-31	Illinois	38.99002	-87.58004	2	1998	9	2011	163	5	<1
WABR-32	Sullivan	38.98966	-87.55872	2	1998	9	2011	163	73	5.4
WABR-33	Sullivan	39.04970	-87.56999	2	1998	9	2011	163	44	3.2
WABR-34	Sullivan	39.10050	-87.61091	2	1998	9	2011	163	5	<1
WABR-35	Illinois	39.13557	-87.66037	2	1998	9	2011	163	5	<1
WABR-36	Sullivan	39.17077	-87.61831	2	1998	9	2011	163	5	<1
WABR-37	Illinois	39.18579	-87.62335	2	1998	9	2011	163	37	2.7
WABR-38	Sullivan	39.18159	-87.61636	2	1998	9	2011	163	171	12.6
WABR-39	Sullivan	39.25211	-87.56786	2	1998	9	2011	163	157	11.6
WABR-40	Illinois	39.24666	-87.58527	2	1998	9	2011	163	168	12.4
WABR-41	Vigo	39.26957	-87.59866	2	1998	9	2011	163	239	17.6
WABR-42	Vigo	39.29656	-87.59474	2	1998	9	2011	163	74	5.4
WABR-43	Illinois	39.35398	-87.54575	2	1998	9	2011	163	5	<1
WABR-44	Vigo	39.34687	-87.52901	2	1998	9	2011	163	5	<1
WABR-45	Vigo	39.39150	-87.48644	2	1998	9	2011	163	5	<1

Appendix 1. Data collected to document recent channel-migration rates at meander bends along selected streams in Indiana.—Continued

[<, less than]

Site identifier	County	Latitude (degrees)	Longitude (degrees)	Early-image capture date		Late-image capture date		Time elapsed between image captures (months)	Maximum measured cutbank displacement (feet)	Average annual channel-migration rate (feet/year)
				Month	Year	Month	Year			
Wabash River (lower)—Continued										
WABR-46	Vigo	39.40876	-87.46723	2	1998	9	2011	163	5	<1
WABR-47	Vigo	39.43544	-87.43059	2	1998	9	2011	163	5	<1
WABR-48	Vigo	39.43466	-87.45385	2	1998	9	2011	163	78	5.7
WABR-49	Vigo	39.56914	-87.41423	3	1992	9	2011	234	171	8.8
WABR-50	Vigo	39.56360	-87.41038	3	1992	9	2011	234	166	8.5
WABR-51	Parke	39.85868	-87.35277	3	1992	6	2010	219	118	6.5
WABR-52	Vermillion	39.87647	-87.38034	3	1992	6	2010	219	5	<1
WABR-53	Parke	39.88356	-87.36743	3	1992	6	2010	219	5	<1
WABR-54	Parke	39.92546	-87.40099	3	1992	6	2010	219	210	11.5
WABR-55	Vermillion	39.93118	-87.43562	4	1992	6	2010	218	26	1.4
WABR-56	Fountain	40.03743	-87.42361	4	1993	6	2010	206	34	2.0
WABR-57	Vermillion	40.04509	-87.43268	4	1993	6	2010	206	39	2.3
WABR-58	Warren	40.21383	-87.35680	4	1998	5	2012	169	78	5.5
WABR-59	Fountain	40.21454	-87.35088	4	1998	5	2012	169	71	5.0
Wabash River (upper)										
WABR-60	Warren	40.30897	-87.24769	4	1998	5	2012	169	5	<1
WABR-61	Warren	40.33392	-87.15614	4	1998	5	2012	169	5	<1
WABR-62	Warren	40.36498	-87.09234	3	1992	5	2012	242	5	<1
WABR-63	Tippecanoe	40.41000	-87.05972	3	1992	5	2012	242	5	<1
WABR-64	Tippecanoe	40.40512	-86.96691	3	1992	5	2012	242	5	<1
WABR-65	Tippecanoe	40.40274	-86.91083	4	1993	5	2012	229	5	<1
WABR-66	Tippecanoe	40.47594	-86.83795	3	1992	5	2012	242	5	<1
WABR-67	Tippecanoe	40.53017	-86.75439	3	1992	2	2012	239	5	<1
WABR-68	Carroll	40.57462	-86.68649	3	1992	2	2012	239	5	<1
WABR-69	Carroll	40.60791	-86.67412	3	1992	2	2012	239	5	<1
WABR-70	Carroll	40.66953	-86.61451	4	1998	2	2012	166	5	<1
WABR-71	Carroll	40.70738	-86.54623	4	1998	2	2012	166	5	<1
WABR-72	Cass	40.75566	-86.44748	3	1999	2	2012	155	5	<1
WABR-73	Cass	40.74782	-86.29504	4	1998	2	2012	166	5	<1
WABR-74	Cass	40.76368	-86.24835	4	1998	2	2012	166	5	<1
WABR-75	Cass	40.74286	-86.21264	4	1998	2	2012	166	5	<1
WABR-76	Cass	40.73821	-86.21505	4	1998	2	2012	166	5	<1
WABR-77	Miami	40.74236	-86.11646	3	1998	2	2012	167	5	<1
WABR-78	Miami	40.73875	-86.09106	3	1998	2	2012	167	5	<1
WABR-79	Miami	40.75700	-86.03973	3	1998	2	2012	167	5	<1
WABR-80	Miami	40.75246	-85.99288	4	1998	2	2012	166	5	<1
WABR-81	Wabash	40.78121	-85.91411	3	1999	2	2012	155	5	<1
WABR-82	Wabash	40.80536	-85.79899	4	1998	2	2012	166	5	<1
WABR-83	Wabash	40.81553	-85.77594	4	1998	2	2012	166	87	6.3
WABR-84	Wabash	40.83638	-85.65486	4	1998	6	2010	146	5	<1
WABR-85	Huntington	40.87716	-85.54046	4	1998	5	2011	157	5	<1
WABR-86	Wells	40.80238	-85.23638	4	1998	5	2011	157	5	<1
WABR-87	Wells	40.77269	-85.19373	4	1998	5	2011	157	5	<1
WABR-88	Wells	40.71321	-85.11068	4	1998	5	2011	157	5	<1
WABR-89	Wells	40.70551	-85.08950	4	1998	5	2011	157	5	<1

Appendix 1. Data collected to document recent channel-migration rates at meander bends along selected streams in Indiana.—Continued

[<, less than]

Site identifier	County	Latitude (degrees)	Longitude (degrees)	Early-image capture date		Late-image capture date		Time elapsed between image captures (months)	Maximum measured cutbank displacement (feet)	Average annual channel-migration rate (feet/year)
				Month	Year	Month	Year			
Wabash River (upper)—Contineud										
WABR-90	Wells	40.69049	-85.07507	4	1998	5	2011	157	5	<1
WABR-91	Adams	40.67466	-85.05851	4	1998	2	2012	166	5	<1
WABR-92	Adams	40.62470	-84.99671	4	1998	2	2012	166	5	<1
White Lick Creek										
WHITELICK-1	Morgan	39.49570	-86.38116	4	1998	8	2012	172	330	23.0
WHITELICK-2	Morgan	39.49917	-86.38341	4	1998	8	2012	172	120	8.4
WHITELICK-3	Morgan	39.50771	-86.38193	4	1998	8	2012	172	96	6.7
WHITELICK-4	Morgan	39.51813	-86.37970	4	1998	8	2012	172	225	15.7
WHITELICK-5	Morgan	39.52007	-86.37498	3	1998	8	2012	173	372	25.8
WHITELICK-6	Morgan	39.55369	-86.35917	3	1998	8	2012	173	151	10.5
WHITELICK-7	Morgan	39.55326	-86.35544	3	1998	8	2012	173	63	4.4
WHITELICK-8	Morgan	39.55572	-86.35600	3	1998	8	2012	173	300	20.8
WHITELICK-9	Morgan	39.55683	-86.35350	3	1998	8	2012	173	364	25.2
WHITELICK-10	Morgan	39.55966	-86.35688	3	1998	8	2012	173	130	9.0
WHITELICK-11	Morgan	39.56549	-86.35837	3	1998	8	2012	173	182	12.6
WHITELICK-12	Morgan	39.57510	-86.35722	3	1998	8	2012	173	264	18.3
WHITELICK-13	Morgan	39.57791	-86.35777	3	1998	8	2012	173	195	13.5
WHITELICK-14	Morgan	39.58240	-86.36876	3	1998	8	2012	173	177	12.3
WHITELICK-15	Morgan	39.59728	-86.36856	3	1998	8	2012	173	134	9.3
WHITELICK-16	Morgan	39.60005	-86.37984	4	1998	8	2012	172	189	13.2
WHITELICK-17	Morgan	39.60062	-86.37661	3	1998	8	2012	173	245	17.0
WHITELICK-18	Hendricks	39.63935	-86.39255	4	1998	8	2012	172	68	4.7
WHITELICK-19	Hendricks	39.64053	-86.38928	4	1998	8	2012	172	41	2.9
WHITELICK-20	Hendricks	39.66204	-86.38878	4	1998	8	2012	172	119	8.3
WHITELICK-21	Hendricks	39.68403	-86.39519	4	1998	8	2012	172	54	3.8
WHITELICK-22	Hendricks	39.70516	-86.40834	4	1998	8	2012	172	39	2.7
WHITELICK-23	Hendricks	39.72025	-86.41770	4	1998	8	2012	172	47	3.3
Whitewater River										
WHITEWAT-1	Dearborn	39.25926	-84.83054	3	1994	8	2012	221	242	13.1
WHITEWAT-2	Dearborn	39.27580	-84.84540	3	1994	8	2012	221	53	2.9
WHITEWAT-3	Dearborn	39.27167	-84.85435	3	1994	8	2012	221	288	15.6
WHITEWAT-4	Dearborn	39.28974	-84.88239	3	1998	8	2012	173	68	4.7
WHITEWAT-5	Franklin	39.31012	-84.91339	3	1999	8	2012	161	12	<1
WHITEWAT-6	Franklin	39.34263	-84.92478	3	1999	6	2010	135	5	<1
WHITEWAT-7	Franklin	39.35281	-84.94614	3	1999	6	2010	135	44	3.9
WHITEWAT-8	Franklin	39.38114	-84.98510	3	1999	6	2010	135	53	4.7
WHITEWAT-9	Franklin	39.39355	-85.01001	3	1999	6	2010	135	5	<1
WHITEWAT-10	Franklin	39.43138	-85.03264	3	1999	6	2010	135	5	<1
WHITEWAT-11	Franklin	39.42332	-85.04772	3	1999	6	2010	135	1016	90.3
WHITEWAT-12	Franklin	39.42776	-85.04943	3	1999	6	2010	135	647	57.5
WHITEWAT-13	Franklin	39.43867	-85.08285	3	1998	7	2006	100	421	50.5
WHITEWAT-14	Franklin	39.44166	-85.10464	3	1998	6	2010	147	368	30.0
WHITEWAT-15	Franklin	39.43839	-85.12578	3	1998	6	2010	147	387	31.6
WHITEWAT-16	Franklin	39.45367	-85.15498	3	1998	6	2010	147	305	24.9
WHITEWAT-17	Franklin	39.46212	-85.17677	3	1998	6	2010	147	216	17.6

Appendix 1. Data collected to document recent channel-migration rates at meander bends along selected streams in Indiana.—Continued

[<, less than]

Site identifier	County	Latitude (degrees)	Longitude (degrees)	Early-image capture date		Late-image capture date		Time elapsed between image captures (months)	Maximum measured cutbank displacement (feet)	Average annual channel-migration rate (feet/year)
				Month	Year	Month	Year			
Whitewater River—Continued										
WHITEWAT-18	Franklin	39.47437	-85.18665	3	1998	6	2010	147	376	30.7
WHITEWAT-19	Franklin	39.49135	-85.19432	3	1998	6	2010	147	179	14.6
WHITEWAT-20	Franklin	39.50828	-85.17397	3	1998	6	2010	147	357	29.1
WHITEWAT-21	Franklin	39.52094	-85.16869	3	1998	6	2010	147	510	41.6
WHITEWAT-22	Fayette	39.55447	-85.17349	3	1998	6	2010	147	343	28.0
WHITEWAT-23	Fayette	39.57032	-85.15778	3	1998	6	2010	147	172	14.0
WHITEWAT-24	Fayette	39.58166	-85.15316	3	1998	6	2010	147	351	28.7
White River (lower)										
WHITER-1	Gibson	38.45265	-87.65790	2	1998	3	2012	169	95	6.7
WHITER-2	Knox	38.51563	-87.54930	3	1998	6	2010	147	5	<1
WHITER-3	Knox	38.53114	-87.47138	2	1998	6	2010	148	151	12.2
WHITER-4	Knox	38.53796	-87.41188	2	1998	6	2010	148	124	10.1
WHITER-5	Pike	38.51109	-87.37716	2	1998	6	2010	148	75	6.1
WHITER-6	Knox	38.56822	-87.25241	4	1998	6	2010	146	212	17.4
WHITER-7	Daviess	38.59825	-87.24138	4	1998	6	2010	146	139	11.4
WHITER-8	Daviess	38.60613	-87.24408	4	1998	6	2010	146	281	23.1
WHITER-9	Daviess	38.65757	-87.23529	4	1998	6	2010	146	156	12.8
WHITER-10	Daviess	38.68293	-87.26098	4	1998	6	2010	146	109	9.0
WHITER-11	Daviess	38.71322	-87.26009	4	1998	6	2010	146	143	11.8
WHITER-12	Daviess	38.74442	-87.24221	4	1998	6	2010	146	159	13.1
WHITER-13	Daviess	38.77707	-87.24564	4	1998	6	2010	146	109	9.0
WHITER-14	Knox	38.81600	-87.21878	4	1998	6	2010	146	133	10.9
WHITER-15	Knox	38.83442	-87.18202	4	1998	6	2010	146	266	21.9
WHITER-16	Knox	38.84043	-87.14222	3	1998	6	2010	147	561	45.8
WHITER-17	Daviess	38.88578	-87.12984	3	1998	6	2010	147	316	25.8
WHITER-18	Greene	38.90424	-87.07906	3	1998	6	2010	147	395	32.2
WHITER-19	Greene	38.93832	-87.04382	3	1998	6	2010	147	91	7.4
WHITER-20	Greene	38.94305	-86.99444	3	1998	6	2010	147	70	5.7
WHITER-21	Greene	38.96967	-86.96553	3	1998	9	2011	162	153	11.3
WHITER-22	Greene	38.99866	-86.93790	3	1998	9	2011	162	184	13.6
WHITER-23	Greene	39.03646	-86.95985	3	1998	9	2011	162	343	25.4
WHITER-24	Greene	39.07426	-86.95554	3	1998	9	2011	162	100	7.4
WHITER-25	Greene	39.08500	-86.96333	3	1998	9	2011	162	250	18.5
WHITER-26	Greene	39.09077	-86.96699	3	1998	9	2011	162	373	27.6
WHITER-27	Greene	39.13009	-86.94737	3	1998	9	2011	162	236	17.5
WHITER-28	Greene	39.14536	-86.90966	3	1998	9	2011	162	198	14.7
WHITER-29	Greene	39.16749	-86.89498	3	1998	9	2011	162	319	23.6
WHITER-30	Owen	39.17225	-86.87106	3	1998	9	2011	162	277	20.5
WHITER-31	Owen	39.17012	-86.86657	3	1998	9	2011	162	106	7.9
WHITER-32	Owen	39.18880	-86.86120	3	1998	9	2011	162	183	13.6
WHITER-33	Owen	39.21644	-86.85737	3	1998	9	2011	162	135	10.0
WHITER-34	Owen	39.21197	-86.84448	3	1998	9	2011	162	82	6.1
WHITER-35	Owen	39.22309	-86.81376	3	1998	9	2011	162	162	12.0
WHITER-36	Owen	39.25261	-86.80242	3	1998	9	2011	162	5	<1
WHITER-37	Owen	39.27962	-86.74573	3	1998	9	2011	162	5	<1

Appendix 1. Data collected to document recent channel-migration rates at meander bends along selected streams in Indiana.—Continued

[<, less than]

				Early-image capture date		Late-image capture date				
Site identifier	County	Latitude (degrees)	Longitude (degrees)	Month	Year	Month	Year	Time elapsed between image captures (months)	Maximum measured cutbank displacement (feet)	Average annual channel-migration rate (feet/year)
White River (lower)—Continued										
WHITER-38	Owen	39.30907	-86.74034	3	1998	9	2011	162	5	<1
WHITER-39	Owen	39.33522	-86.72224	3	1998	9	2011	162	162	12.0
WHITER-40	Owen	39.33365	-86.66631	4	1998	9	2011	161	144	10.7
WHITER-41	Owen	39.35132	-86.63620	4	1998	9	2011	161	214	16.0
WHITER-42	Morgan	39.36069	-86.59670	4	1998	8	2012	172	122	8.5
WHITER-43	Morgan	39.38312	-86.53109	4	1998	8	2012	172	240	16.7
WHITER-44	Morgan	39.40090	-86.46654	4	1998	8	2012	172	165	11.5
WHITER-45	Morgan	39.44428	-86.43908	4	1998	8	2012	172	5	<1
WHITER-46	Morgan	39.48883	-86.42562	4	1998	8	2012	172	5	<1
WHITER-47	Morgan	39.49840	-86.37554	3	1998	8	2012	173	510	35.4
WHITER-48	Morgan	39.49035	-86.36932	3	1998	8	2012	173	183	12.7
WHITER-49	Morgan	39.50978	-86.33164	3	1998	8	2012	173	140	9.7
WHITER-50	Morgan	39.52945	-86.30091	3	1998	8	2012	173	105	7.3
WHITER-51	Morgan	39.57074	-86.25337	3	1998	8	2012	173	215	14.9
WHITER-52	Morgan	39.59026	-86.26040	3	1998	8	2012	173	173	12.0
WHITER-53	Johnson	39.60843	-86.23462	3	1998	8	2012	173	144	10.0
WHITER-54	Marion	39.66520	-86.23815	2	1992	8	2012	246	246	12.0
White River (upper)										
WHITER-55	Hamilton	39.94225	-86.06585	3	1998	8	2012	173	5	<1
WHITER-56	Hamilton	39.95804	-86.05206	3	1998	8	2012	173	5	<1
WHITER-57	Hamilton	39.98222	-86.03312	3	1998	8	2012	173	5	<1
WHITER-58	Hamilton	40.01788	-86.01250	3	1998	8	2012	173	49	3.4
WHITER-59	Hamilton	40.02246	-86.02062	3	1998	8	2012	173	66	4.6
WHITER-60	Hamilton	40.07330	-86.00883	3	1998	8	2012	173	5	<1
WHITER-61	Hamilton	40.08021	-85.98367	2	1999	8	2012	162	5	<1
WHITER-62	Hamilton	40.10427	-85.96859	2	1999	8	2012	162	5	<1
WHITER-63	Hamilton	40.13579	-85.95143	2	1999	8	2012	162	5	<1
WHITER-64	Hamilton	40.13208	-85.91309	4	1998	8	2012	172	5	<1
WHITER-65	Madison	40.14547	-85.85209	4	1998	8	2012	172	5	<1
WHITER-66	Madison	40.13018	-85.81911	4	1998	8	2012	172	5	<1
WHITER-67	Madison	40.13037	-85.77904	4	1998	8	2012	172	5	<1
WHITER-68	Madison	40.12713	-85.75210	4	1998	8	2012	172	5	<1
WHITER-69	Madison	40.11533	-85.70322	4	1998	8	2012	172	5	<1
WHITER-70	Madison	40.10426	-85.61922	3	1992	8	2012	245	5	<1
WHITER-71	Madison	40.12146	-85.58973	3	1992	8	2012	245	5	<1
WHITER-72	Delaware	40.13210	-85.54963	3	1992	8	2012	245	5	<1
Wildcat Creek										
WILDCAT-1	Tippecanoe	40.47152	-86.86044	3	1992	5	2012	242	163	8.1
WILDCAT-2	Tippecanoe	40.46218	-86.86286	3	1992	5	2012	242	194	9.6
WILDCAT-3	Tippecanoe	40.46058	-86.86528	3	1992	5	2012	242	134	6.6
WILDCAT-4	Tippecanoe	40.44279	-86.84977	3	1992	5	2012	242	5	<1
WILDCAT-5	Tippecanoe	40.43457	-86.83278	3	1992	5	2012	242	5	<1
WILDCAT-6	Tippecanoe	40.43066	-86.82181	3	1992	5	2012	242	285	14.1
WILDCAT-7	Tippecanoe	40.43627	-86.80198	3	1992	5	2012	242	164	8.1
WILDCAT-8	Tippecanoe	40.43768	-86.78874	3	1992	5	2012	242	47	2.3

Appendix 1. Data collected to document recent channel-migration rates at meander bends along selected streams in Indiana.—Continued

[<, less than]

Site identifier	County	Latitude (degrees)	Longitude (degrees)	Early-image capture date		Late-image capture date		Time elapsed between image captures (months)	Maximum measured cutbank displacement (feet)	Average annual channel-migration rate (feet/year)
				Month	Year	Month	Year			
Wildcat Creek—Continued										
WILDCAT-9	Tippecanoe	40.43687	-86.76898	3	1992	2	2012	239	5	<1
WILDCAT-10	Tippecanoe	40.44795	-86.74584	3	1992	2	2012	239	61	3.1
WILDCAT-11	Tippecanoe	40.46024	-86.72827	3	1992	2	2012	239	156	7.8
WILDCAT-12	Tippecanoe	40.46124	-86.71408	3	1992	2	2012	239	119	6.0
WILDCAT-13	Tippecanoe	40.45752	-86.70180	3	1992	2	2012	239	16	<1
WILDCAT-14	Carroll	40.45420	-86.67712	3	1992	2	2012	239	26	1.3
WILDCAT-15	Carroll	40.46390	-86.67604	3	1992	2	2012	239	38	1.9
WILDCAT-16	Carroll	40.46439	-86.66148	3	1992	2	2012	239	18	<1
WILDCAT-17	Carroll	40.46491	-86.64316	3	1992	2	2012	239	5	<1
WILDCAT-18	Carroll	40.46688	-86.62845	3	1992	2	2012	239	59	3.0
WILDCAT-19	Carroll	40.46899	-86.60954	4	1998	2	2012	166	19	1.4
WILDCAT-20	Carroll	40.46617	-86.60123	4	1998	2	2012	166	29	2.1
WILDCAT-21	Carroll	40.47107	-86.59264	4	1998	2	2012	166	50	3.6
WILDCAT-22	Carroll	40.47049	-86.57750	4	1998	2	2012	166	12	<1
WILDCAT-23	Carroll	40.47824	-86.56544	4	1998	2	2012	166	67	4.8
WILDCAT-24	Carroll	40.47432	-86.55766	4	1998	2	2012	166	15	1.1
WILDCAT-25	Carroll	40.47294	-86.53865	4	1998	2	2012	166	5	<1
WILDCAT-26	Carroll	40.47827	-86.52740	4	1998	2	2012	166	10	<1
WILDCAT-27	Carroll	40.48024	-86.51012	4	1998	2	2012	166	5	<1
WILDCAT-28	Carroll	40.47985	-86.46382	3	1999	2	2012	155	60	4.6

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