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

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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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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 (Fig. 8, right). 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.

Purpose and Scope

This report presents methods and results of an investigation to document recent 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 images from two sites that have been recently stationary, 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.

Contact

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