**Streambank Erosion in the Illinois River Watershed**

Since 2017, the Illinois River Watershed Partnership (IRWP) and partners have monitored streambank erosion in the Upper Illinois River Watershed. Through multi-year field measurements and analysis at 15 sites representing around 5% of the watershed, we find that erosion is projected to contribute 102,822 tons of sediment and 154,233 lbs of phosphorus annually into the watershed, which may represent as much as 54% of the overall phosphorus load released into the Upper Watershed.[1] Observed streambank erosion is driven primarily by changing land-use as well as increasing precipitation.

**Background**

Precipitation has increased and flooding is increasing in frequency and volume over the last decade in much of the watershed. IRWP and partners recognized the need to regularly monitor how the stream system is responding to landscape changes including rapid urbanization and population growth. Annual surveys on 49 miles of streambank were conducted in consecutive years spanning from 2017-2020. Utilizing established methods[2], we measured yearly erosion rates and calculated Near Bank Shear Stress (NBSS) at each site to develop a graphical prediction of annual streambank erosion rates.

**Findings**

Streambanks in the upper Illinois River Watershed have eroded on average 3.88 feet of bank annually. Of the 15 study sites, eight have High, Very High or Extreme NBSS which means that high velocity water is concentrated along the streambank during high flows. Erosion is very likely to continue at accelerated rates at these locations. Based on modeling developed from these field measurements, erosion rates throughout the Upper Illinois River Watershed are projected to be 1.01 feet per year across the watershed. Observed streambank erosion is driven by a combination of factors including natural processes, changing precipitation, urban stormwater runoff, deforestation of the riparian corridor, construction in the floodplain, past attempts to alter the stream channel, debris jams, and gravel deposits from upstream bank erosion. Targeting restoration measures that reduce erosion at the most extreme sites could have a measurable positive impact on the watershed. In fact, restoring just the 4 highest priority banks of the 15 study sites could reduce the total sediment loading within the 49-mile study area by 11%.


*2017-2020 Cross section graph and 2019 data collection photograph overlay at survey site Muddy Fork 2.*

**Conclusion**

This research demonstrates the need to address the primary drivers of streambank erosion by developing more comprehensive stormwater management solutions, and maintaining generous riparian buffers in both headwaters and downstream. Maintaining and restoring an extensive riparian and floodplain buffer of native deep-rooted vegetation is critical to the long-term stability of streambanks throughout the watershed. It is our hope that this study will help inform planning as we strive to understand, protect, and restore the water quality and habitat within the Illinois River watershed for generations to come. For additional information and the full report, visit https://www.irwp.org/olc/sbe or contact Leif Kindberg at director@irwp.org.

---

[1] Total phosphorus (TP) mean daily load is 530 kg/day and orthophosphate of 180 kg/day (Scott, Erin E., and Haggard, Brian E., 2018). Streambank erosion is contributing 190 kg/day representing approximately 54% of TP in the watershed. This is an estimate and will need to be verified through further analysis and soil testing.

[2] Rosgen, D. (2006) Watershed Assessment of River Stability and Sediment Supply (WARSSS). Wildland Hydrology, Fort Collins.