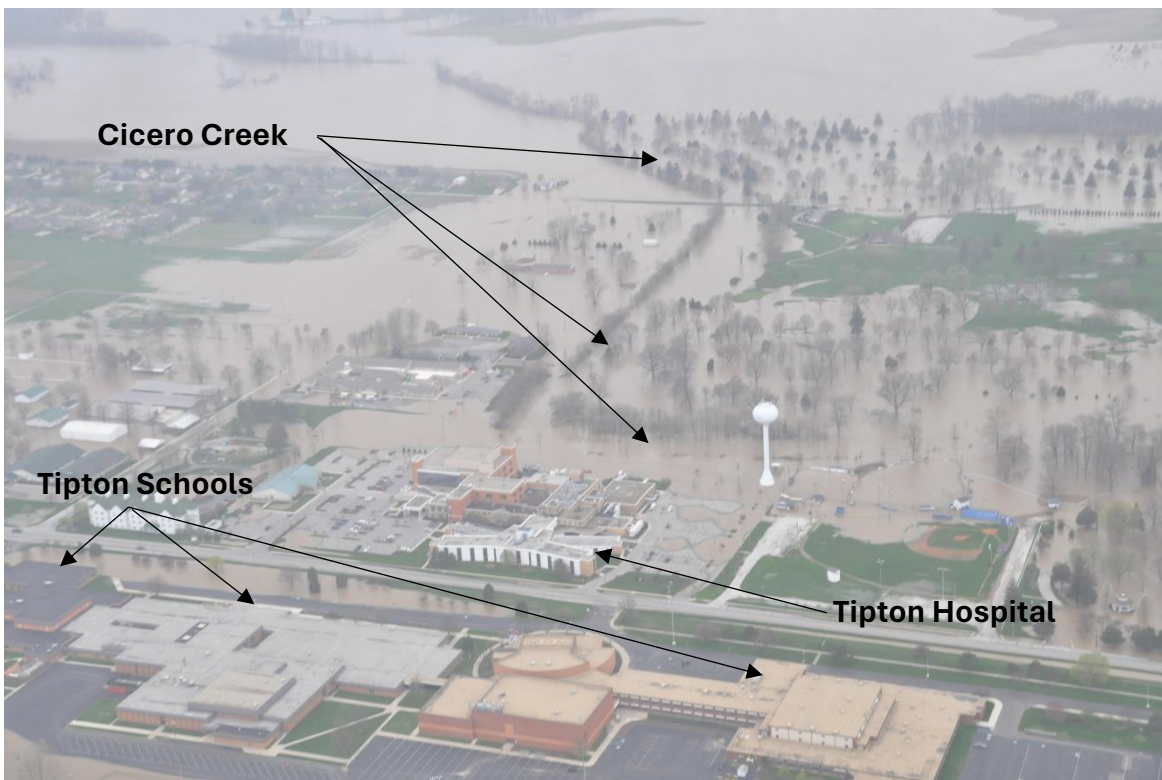
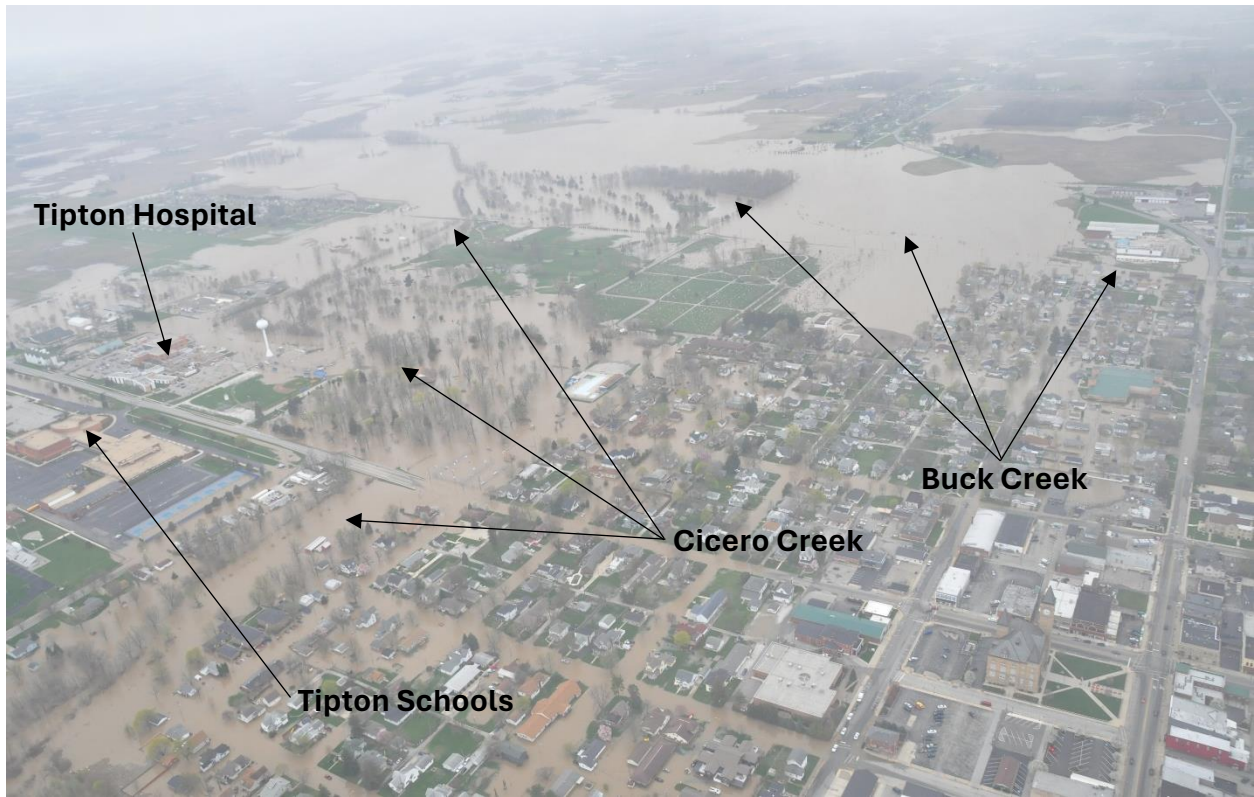


### **Wetland Loss and Wetland Benefits – Quick Facts**

- Indiana has lost an estimated 85% of its historical wetlands
- Losses are even greater in some areas, including >95% loss in the upper Cicero Creek watershed
- Wetlands provide stormwater storage and infiltration functions during rainfall events
- Stormwater storage provides valuable economic and societal benefits
- Stormwater storage reduces flood flows and elevations, reducing flood damage and potential risk to human lives
- Stormwater infiltration increases groundwater recharge, which supplies domestic, agricultural, utility, and industrial wells
- Wetland stormwater functions provide “shock absorption” as rainfall events become more frequent and more severe due to climate change
- Stormwater management costs Indiana cities, counties, and developers millions of dollars per year, and natural wetlands provide these services for free
- As an example, the Cicero Creek watershed has lost more than 95% of its isolated wetlands (see wetland map). This lost storage has contributed to severe flooding events in the Town of Tipton, notably in 2013. Loss of remaining wetlands will increase the flooding potential in Tipton and will likely reduce/undo the effectiveness of recent investments in the 2-stage ditch project the Big Cicero Creek Joint Drainage Board has recently completed.



**Figure 1: Cicero Creek Flooding in Tipton, April 2013**



**Figure 2: Cicero and Buck Creek Flooding in Tipton, April 2013**



**Figure 3: Flooding at Tipton Elementary School, April 2013**

## **Wetland Loss in Indiana and its Effects on Stormwater Storage and Flooding**

The estimate that Indiana has lost 85% of its historical wetlands across the state is widely cited by conservation and environmental professionals and advocates. It is easy to picture how that dramatic loss has led to corresponding decreases in resources and habitat for the people and wildlife that depend on those systems. However, in recent years it has become increasingly clear that wetlands provide many important services beyond their ecological and habitat value. To understand why this is, we have to understand what makes a wetland.

Formally, wetlands are defined by hydrology, hydric soils, and hydrophytic vegetation. That is, water at or near the ground surface, waterlogged soils, and plants that can grow in wet soils or shallow standing water. The common component is clearly water. Following a storm, the water would sit on the landscape, soak into the ground, and slowly creep across the land to small streams nearby. These natural processes combine to provide flood “storage,” either long-term in the ground or shallow ponded areas, or short-term while the water slowly flows across the land. Storage reduces peak stream flows and elevations. Loss of storage increases flooding.

In more modern times, over the past 100-150 years, we have simultaneously modified the landscape to accommodate agriculture and development, while also placing more resources and infrastructure near our streams. These completely normal and understandable changes over time have greatly reduced the amount of stormwater storage that occurs on the landscape. Needing to go somewhere, agricultural drainage and surface runoff is now funneled directly into streams, increasing peak flows and flood elevations. This leads directly to increases in flooding risks due to larger flows and increasing numbers of homes, businesses, and other assets in floodplain areas. It also increases channel instability, meaning that streambank failures and even stream migration can imperil utilities, infrastructure, and buildings that may not be at risk from traditional flood damage.

The Cicero Creek watershed, shown on the map, is already experiencing these effects, and is it at risk for further negative impacts. According to the map, the watershed has lost more than 95% of its isolated wetlands. All of this lost storage has contributed to severe flooding events in the Town of Tipton, notably in 2013. In addition to the many farms and homes along Cicero Creek and other streams in the watershed, Tipton has a cemetery, park, golf course, businesses, and critically, a hospital, located immediately adjacent to the stream. Extensive work has been done on Cicero Creek to stabilize the stream as it winds between these important community resources. It is imperative that the remaining wetlands in the watershed be protected so that their storage capacity is maintained as storm intensity and rainfall totals continue to increase across central Indiana. Further wetland loss will increase flooding, increase stream instability, and exacerbate the resulting economic damages.