

4.7 Flooding

4.7.1 Description

FEMA describes a flood as “a general and temporary condition of partial or complete inundation of normally dry land areas from the overflow of inland or tidal waters [and] the unusual and rapid accumulation or runoff of surface waters from any source.” Floods are typically riverine, coastal, or shallow. Flash floods are floods that occur quickly, even occurring without visible signs of precipitation.

Urban flooding is a type of flood that can occur in areas of development that have a high level of impervious surfaces such as concrete. The level of development and the level of stormwater management practices impact the severity of urban flooding.

Common flood-related terms include:

- **100-Year Flood:** A flood that has a one percent chance to occur each year. The 100-year floodplain can be seen in **Figure 4.7.1: Flood Hazard Map**. The elevation of the water from the 100-year flood is called the Base Flood. Mitigation strategies should be based on the base flood elevation.
- **Floodplain:** An area that has the potential to flood from any source.
- **Floodway:** Sometimes referred to as a regulatory floodway. FEMA defines a floodway as “the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the Base Flood without cumulatively increasing the water surface elevation more than a designated height.”
- **Flash flood:** Flash floods are typically caused by heavy rainfall over a short period of time. These floods are particularly dangerous because they can occur in minutes and can sometimes occur even without rainfall such as when an ice jam breaks or dissolves. Areas impacted by wildfires are particularly susceptible to flash floods. Flash floods can occur just about anywhere with enough rainfall, and are not restricted to the 100-year floodplain. Development/restriction to drainage or increased impervious surfaces can contribute to flash flood frequency.

4.7.2 Location

Flooding can occur throughout Clinton County. Flash flooding is more likely to occur in developed areas. **Figure 4.7.1** shows the location of the 100-year floodplain. Floods can and do occur outside the FEMA defined one percent flood zone. Sometimes very small watersheds are not included in the FEMA analyses, but there can be a risk in smaller watersheds, as well.

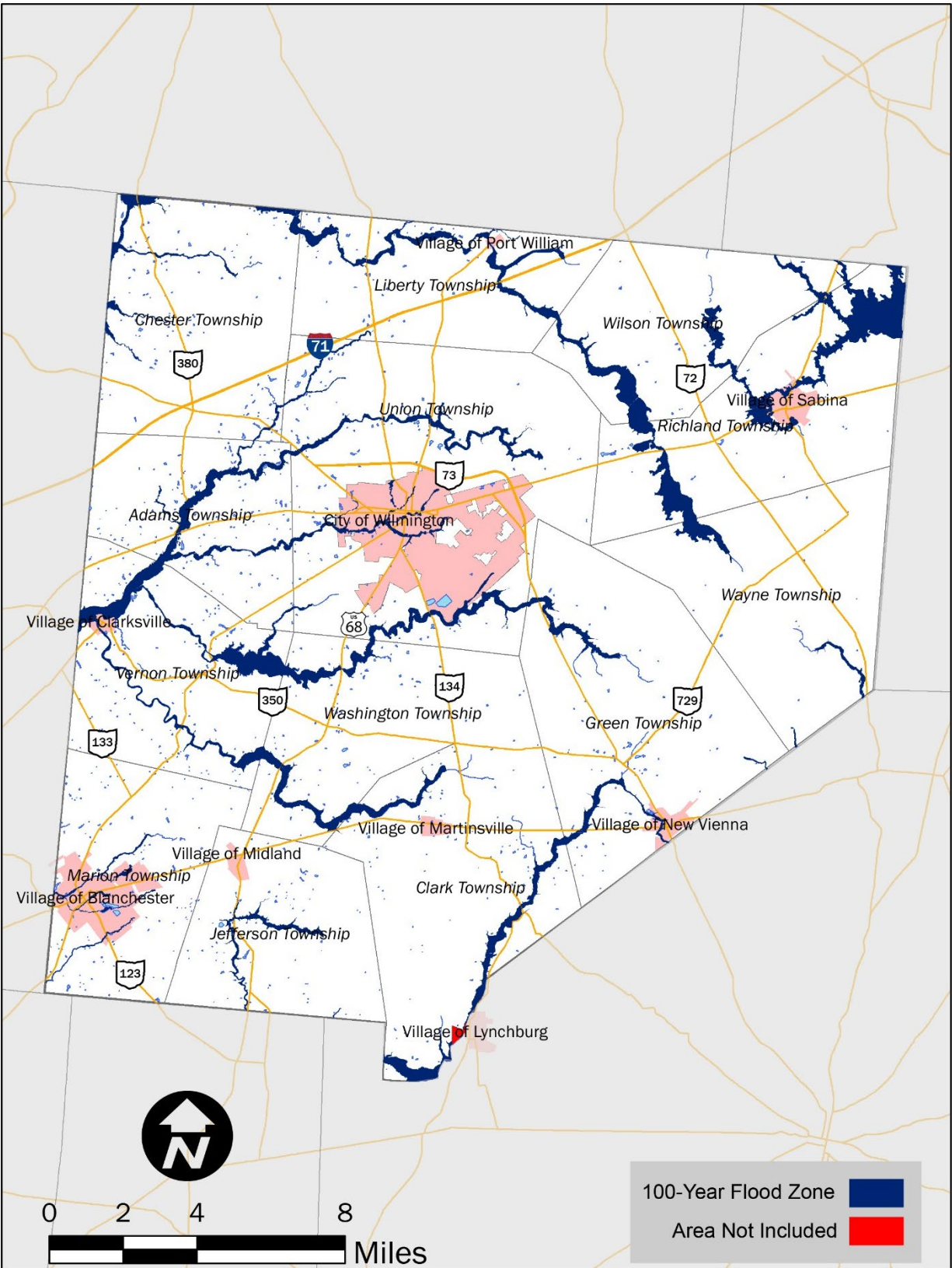
4.7.3 Extent

Clinton County currently has 36 flood insurance maps (see **Appendix F**). The most recent update is from April 2010.

Clinton County and five communities within the County participate in the NFIP. These communities include the City of Wilmington and the Villages of Blanchester, Clarksville, New Vienna, and Sabina. The Villages of Martinsville, Midland, and Port William do not participate in the NFIP. Both the Village of Martinsville and the Village of Midland are located in Areas of Minimal Flood Hazard according to the insurance maps. The Village of Lynchburg participates as part of Highland County, Ohio. A mitigation action has been included in this Plan to coordinate with Port William to participating in the NFIP.

4 | HAZARD RISK ASSESSMENT

Figure 4.7.1: 100-Year Flood Zone in Clinton County, Ohio



There are no repetitive loss properties in Clinton County, Ohio. FEMA defines a repetitive loss property as an insurable building for which two or more claims of more than \$1,000 were paid by the National Flood Insurance Program (NFIP) within any rolling ten-year period since 1978. FEMA defines a severe repetitive loss property as a single family property that is covered under flood insurance by the NFIP and has incurred flood-related damage for which four or more separate claims payments have been paid under flood insurance coverage, with the amount of each claim payment exceeding \$5,000 and with cumulative amount of such claims payments exceeding \$20,000; or for which at least two separate claims payments have been made with the cumulative amount of such claims exceeding the reported value of the property. The County has no severe repetitive loss properties.

4.7.4 History

There have been 55 floods or flashfloods in Clinton County between April 1996 and December 2019. These events have caused \$110,000 in property damages and \$1,000 in crop losses. Average annual damage from floods and flashfloods amounts to \$4,500. There are no reported injuries and one reported death from 2008. Described below are the three most damaging events by property damage over the past two decades, including the event that caused a death in 2008. All events are listed individually in **Appendix A**. Additionally, **Figure 4.7.2** shows some flooding in fields associated with flooding in May 2020.

Flooding in the Village of Blanchester on March 19, 2008

Seven homes were evacuated due to high water in the Village of Clarksville. A 54-year-old woman attempting to cross a swollen stream was swept away and drowned. Numerous roads were flooded throughout the county. This event caused \$10,000 in property damage.

Flooding in Clinton County on January 5, 2005

A stationary frontal boundary that draped across the Ohio Valley was the focusing mechanism for an extended period of heavy rain across much of central and southern Ohio, including Clinton County. Many locations received two to four inches of rain in a 24-hour period, which increased flooding problems as the ground was already saturated from recent snowmelt. Widespread flooding of roads and low-lying areas occurred across the region with numerous creeks and streams rising out of their banks. This event caused \$20,000 in property damage in Clinton County.

Flooding in Clinton County on May 18, 2001

Heavy rain from thunderstorms flooded roads across Clinton County. Roads in the northeastern section of the County were especially impacted. Standing water was reported on portions of the first floor of Sabina Elementary School in the Village of Sabina. This event caused \$10,000 in property damage.

Figure 4.7.2: Flooding along Hackney Road in Clinton County, May 2020



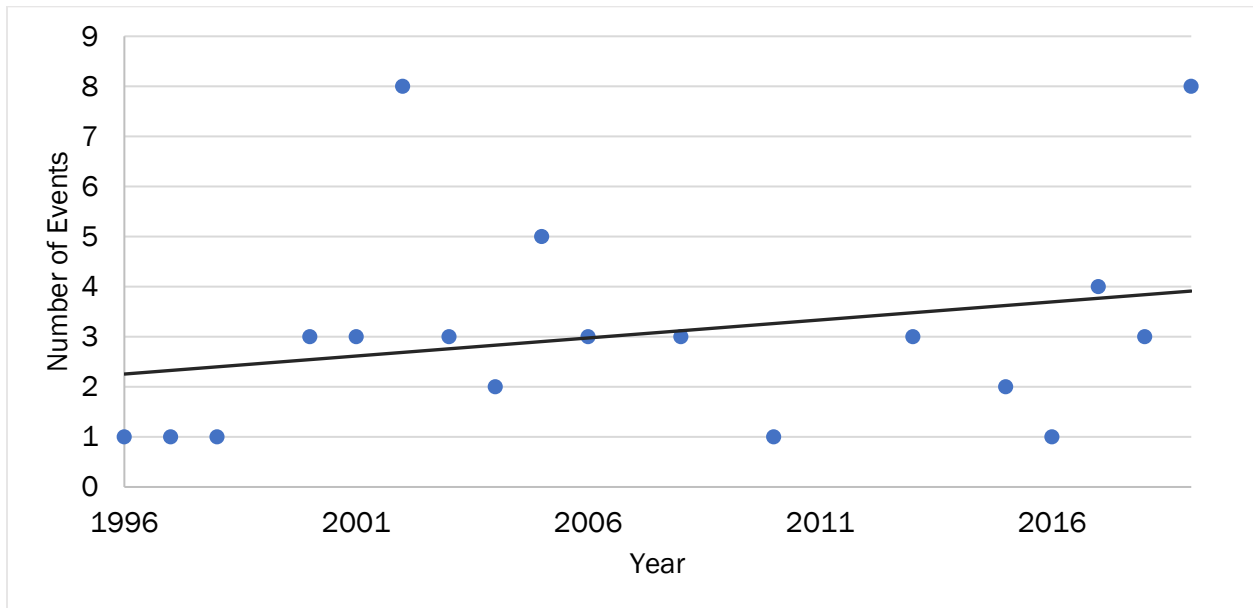
Source: *Wilmington News Journal*

4.7.5 Probability

Figure 4.7.3 shows the trend of flood events over time since January 1996, as this is the earliest year with complete data from the NCEI. The trend of flood occurrences per year increases slightly over time, which means Clinton County can expect to have more annual flood events than have occurred in the recent past.

Between 1996 and 2019, Clinton County has experienced 55 flooding events, including both floods and flash floods. These events have resulted in one death and no additional injuries, as well as \$110,000 in property damage and \$1,000 in crop damage (Source: NCEI). Annually, this amounts to approximately 2.4 floods or flash floods and \$4,826 in property and crop damages.

Figure 4.7.3 Probability of Flooding



4.7.6 Vulnerability Assessment

Infrastructure Impact

Floods can impact roadways, including interstates and state routes, by blocking them due to high water or by filling them with debris.

Population Impact

Floods and flash floods have caused damages to occupied homes in the past. During flood events, shelter may need to be provided to those impacted by flooding.

Property Damage

Property damage is likely during floods to both residential and non-residential properties. **Table 4.7.1** lists the value of all the properties that are exposed to 100-year floods.

Table 4.7.1 Structure Vulnerability from Flooding

Structure Type	Number of Properties Exposed	Value (Exposed)	Percent of Total
Residential	19,622	\$3,469,316	73.2%
Commercial	3,967	\$700,934	14.8%
Industrial	1,662	\$292,455	6.2%
Agriculture	375	\$66,990	1.4%
Religious	536	\$94,007	2.0%
Government	241	\$42,717	0.9%
Education	402	\$73,208	1.5%

Loss of Life

There is one reported death from a flood event on March 19, 2008. Loss of life is possible in future floods or flashfloods.

Economic Losses

Floods can halt economic activity, block roadways, and destroy agricultural crops. Building contents up to \$25,000 are expected to be exposed during a 100-year flood event. Crop losses are also expected during floods or flashfloods.

4.7.7 Land Use and Development Trends

Any development that occurs in flood zones will be at risk. Development in these areas should be limited. Flash flooding is more likely to occur in areas with a high percentage of impervious surfaces. Future land use practices should limit the percentage of impervious surfaces. **Chapter 5** contains mitigation actions that address these issues.