

APPENDIX A: HAZARD AND VULNERABILITY DATA

The information included in this appendix supplements the discussion of Hardin County's hazards and vulnerabilities from Section 2: Hazard Identification and Risk Assessment. A complete list of historical incidents of each hazard is provided here. Additionally, detailed data on the anticipated damage to Hardin County from an earthquake and 100-year food, per HAZUS estimates, is provided.

5.1 HAZARD HISTORY DATA

The National Climactic Data Center has maintained records on weather incidents across the United States since 1950. The tables below provide a complete history of the incidents in Hardin County from 1950 through ~~2017~~ 2022.

5.1.1 Drought and Extreme Heat

These incidents include all occurrences categorized as drought or extreme heat.

Heat events in 2019 were several days in duration, and heat indexes exceeded 100 degrees Fahrenheit.

Table 5-1: Drought/Extreme Heat Historical Data

Hazard	Location	Date	Injuries	Deaths	Property Damage	Crop Damage
Drought	Hardin (Zone)	07/01/1999	0	0	0	0
Drought	Hardin (Zone)	08/01/1999	0	0	0	0
Extreme Heat	Hardin (Zone)	07/19/2019	0	0	0	0
Extreme Heat	Hardin (Zone)	07/20/2019	0	0	0	0

5.1.2 Flood

The flood incidents identified in this table include events classified as flood and flash flood that occurred in Hardin County since January 1, 1950. While incidents of recent do not differ from historical events, and do not, in general, seem to be increasing in frequency or severity, floods do continue to plague Hardin County when rain is heavy and long-lasting, or sudden and intense. A bridge in Kenton was impassable due to high water in May of 2020 due to rapid and heavy precipitation. State routes 53 and 67 are especially prone to surface flooding, and are key state highways for the area with significant truck traffic and local vehicular traffic.

Table 5-2: Flood Historical Data

Hazard	Location	Date	Deaths	Injuries	Property Damage	Crop Damage
Flash Flood	Countywide	04/09/1998	0	0	0	0

Flash Flood	McGuffey	08/08/1998	0	0	0	0
Flash Flood	Roundhead	06/13/2000	0	0	20K	0
Flood	Hardin (Zone)	05/09/2003	0	0	0	0
Flood	Hardin (Zone)	07/01/2003	0	0	0	0
Flood	Hardin (Zone)	01/04/2004	0	0	0	0
Flood	Hardin (Zone)	05/21/2004	0	0	0	0
Flood	Hardin (Zone)	01/05/2005	0	0	20K	0
Flood	Hardin (Zone)	06/10/2005	0	0	0	0
Flash Flood	Kenton	07/12/2006	0	0	10K	0
Flood	Kenton	03/02/2007	0	0	3K	0
Flood	Kenton	03/14/2007	0	0	5K	0
Flood	Patterson	08/21/2007	0	0	2K	0
Flash Flood	Forest	08/21/2007	0	0	5K	0
Flood	Dunkirk	08/21/2007	0	0	5K	0
Flash Flood	Alger	08/22/2007	0	0	8K	0
Flood	McGuffey	02/05/2008	0	0	15K	0
Flood	Kenton	02/28/2011	0	0	5K	0
Flood	Kenton	03/01/2011	0	0	5K	0
Flood	Kenton	03/05/2011	0	0	5K	0
Flash Flood	Alger	05/11/2011	0	0	2K	0
Flash Flood	Patterson	07/23/2011	0	0	1K	0
Flood	Mount Victory	09/02/2012	0	0	0	0
Flood	Dunkirk	07/20/2013	0	0	0	0
Flood	McVittys	12/22/2013	0	0	0	0
Flash Flood	Ada Airport	05/28/2014	0	0	1K	0
Flash Flood	McGuffey	05/28/2014	0	0	1K	0
Flood	Ada	06/14/2015	0	0	0	0
Flood	Patterson	06/16/2015	0	0	0	0
Flood	Kenton	06/16/2015	0	0	0	0
Flood	Kenton	07/17/2015	0	0	0	0
Flash Flood	Ada	07/17/2015	0	0	0	0
Flash Flood	Kenton	06/23/2016	0	0	1K	0
Flash Flood	Ridgeway	06/23/2016	0	0	0	0
Flood	Mount Victory	06/23/2016	0	0	0	0
Flood	Ridgeway	05/18/2017	0	0	0	0
Flood	Kenton	06/22/2018	0	0	0	0
Flood	McGuffey	06/16/2019	0	0	0	0
Flood	Kenton	06/20/2019	0	0	0	0
Flood	Kenton	06/20/2019	0	0	0	0
Flood	Kenton	07/06/2019	0	0	0	0
Flood	Ada	05/18/2020	0	0	0	0
Flash Flood	Kenton	05/19/2020	0	0	0	0
Flood	Jump	09/07/2020	0	0	0	0

5.1.3 Severe Thunderstorm

Thunderstorm incidents include events that produced any combination of hail, lightning and thunderstorm wind; all hazards were not necessarily present in all incidents. While recent

thunderstorm damage was not excessive, it was consistently damaging to local property. The most damaging system caused \$50K damage in Kenton in 2022. This storm consisted of two convective complexes moving southeast across central Ohio during the overnight hours. Trees were downed, among other damages, in Ada, Kenton and McGuffey. The storm negatively affected numerous nearby counties as well, reaching as far west as Mercer County and as far east as Licking County.

Table 5-3: Severe Thunderstorm Historical Data

Hazard	Location	Date	Deaths	Injuries	Property Damage	Crop Damage
Hail	Hardin County	07/11/1959	0	0	0	0
Thunderstorm Wind	Hardin County	04/30/1962	0	0	0	0
Thunderstorm Wind	Hardin County	07/12/1966	0	0	0	0
Thunderstorm Wind	Hardin County	07/14/1996	0	0	0	0
Thunderstorm Wind	Hardin County	08/10/1966	0	0	0	0
Thunderstorm Wind	Hardin County	06/11/1968	0	0	0	0
Thunderstorm Wind	Hardin County	09/01/1968	0	0	0	0
Thunderstorm Wind	Hardin County	04/14/1974	0	0	0	0
Hail	Hardin County	04/14/1974	0	0	0	0
Thunderstorm Wind	Hardin County	03/20/1976	0	0	0	0
Thunderstorm Wind	Hardin County	07/30/1979	0	0	0	0
Thunderstorm Wind	Hardin County	08/08/1979	0	0	0	0
Thunderstorm Wind	Hardin County	08/08/1979	0	0	0	0
Hail	Hardin County	04/08/1980	0	0	0	0
Thunderstorm Wind	Hardin County	04/08/1980	0	0	0	0
Hail	Hardin County	06/02/1980	0	0	0	0
Thunderstorm Wind	Hardin County	07/05/1980	0	0	0	0
Thunderstorm Wind	Hardin County	07/12/1980	0	0	0	0
Thunderstorm Wind	Hardin County	04/28/1981	0	0	0	0
Thunderstorm Wind	Hardin County	06/24/1981	0	0	0	0
Hail	Hardin County	03/16/1982	0	0	0	0
Thunderstorm Wind	Hardin County	03/16/1982	0	0	0	0
Thunderstorm Wind	Hardin County	06/09/1982	0	0	0	0
Thunderstorm Wind	Hardin County	06/15/1982	0	0	0	0
Hail	Hardin County	06/20/1984	0	0	0	0
Thunderstorm Wind	Hardin County	05/06/1986	0	0	0	0
Hail	Hardin County	05/15/1986	0	0	0	0
Thunderstorm Wind	Hardin County	06/27/1986	0	0	0	0
Thunderstorm Wind	Hardin County	06/27/1986	0	0	0	0
Thunderstorm Wind	Hardin County	07/01/1986	0	0	0	0
Thunderstorm Wind	Hardin County	05/21/1987	0	0	0	0
Thunderstorm Wind	Hardin County	06/02/1987	0	0	0	0
Thunderstorm Wind	Hardin County	06/29/1987	0	0	0	0
Thunderstorm Wind	Hardin County	06/29/1987	0	0	0	0
Thunderstorm Wind	Hardin County	08/02/1987	0	0	0	0

Thunderstorm Wind	Hardin County	08/02/1987	0	0	0	0
Thunderstorm Wind	Hardin County	05/25/1989	0	0	0	0
Thunderstorm Wind	Hardin County	06/27/1989	0	0	0	0
Hail	Hardin County	06/08/1990	0	0	0	0
Thunderstorm Wind	Hardin County	08/28/1990	0	0	0	0
Thunderstorm Wind	Hardin County	03/27/1991	0	0	0	0
Thunderstorm Wind	Hardin County	09/03/1991	0	0	0	0
Hail	Hardin County	07/23/1992	0	0	0	0
Thunderstorm Wind	Kenton	06/28/1994	0	0	50K	0
Thunderstorm Wind	Kenton	06/28/1994	0	0	0	0
Hail	Mount Victory	06/21/1995	0	0	0	0
Thunderstorm Wind	Ridgeway	08/15/1996	0	0	0	0
Thunderstorm Wind	Kenton	10/30/1996	0	0	3K	0
Hail	Roundhead	05/18/1997	0	0	3K	0
Thunderstorm Wind	Ada	06/21/1997	0	0	0	0
Thunderstorm Wind	Kenton	07/02/1997	0	0	5K	0
Thunderstorm Wind	Ada	07/18/1997	0	0	5K	0
Thunderstorm Wind	McGuffey	07/27/1997	0	0	5K	0
Hail	Kenton	04/08/1998	0	0	3K	0
Hail	Roundhead	05/19/1998	0	0	0	0
Thunderstorm Wind	Ada	05/31/1998	0	0	0	0
Thunderstorm Wind	Countywide	06/19/1998	0	0	3K	0
Thunderstorm Wind	Roundhead	07/19/1998	0	0	5K	0
Thunderstorm Wind	Kenton	07/21/1998	0	0	10K	0
Thunderstorm Wind	Kenton	08/25/1998	0	0	5K	0
Thunderstorm Wind	Countywide	11/10/1998	0	0	10K	0
Thunderstorm Wind	Kenton	02/11/1999	0	0	3K	0
Thunderstorm Wind	Ada	06/10/1999	0	0	10K	0
Thunderstorm Wind	Ada	07/09/1999	0	0	4K	0
Thunderstorm Wind	Ada	07/21/1999	0	0	50K	0
Thunderstorm Wind	Countywide	07/31/1999	0	0	3K	0
Thunderstorm Wind	Countywide	04/02/2000	0	0	5K	0
Thunderstorm Wind	Ada	07/14/2000	0	0	5K	0
Thunderstorm Wind	Patterson	07/14/2000	0	0	5K	0
Hail	Kenton	04/06/2001	0	0	5K	0
Thunderstorm Wind	Kenton	07/11/2001	0	0	0	0
Thunderstorm Wind	Kenton	06/05/2002	0	0	3K	0
Thunderstorm Wind	Roundhead	07/29/2002	0	0	5K	0
Thunderstorm Wind	Ada	11/10/2002	0	0	3K	0
Thunderstorm Wind	Countywide	11/10/2002	0	0	50K	0
Thunderstorm Wind	Ada	04/20/2003	0	0	10K	0
Thunderstorm Wind	Kenton	06/26/2003	0	0	3K	0
Hail	Grants	06/26/2003	0	0	5K	0
Thunderstorm Wind	Roundhead	07/04/2003	0	0	5K	0
Thunderstorm Wind	Countywide	07/08/2003	0	0	2K	0
Thunderstorm Wind	Mount Victory	07/21/2003	0	0	8K	0
Thunderstorm Wind	Kenton	08/26/2003	0	0	2K	0
Thunderstorm Wind	Countywide	08/26/2003	0	0	10K	0

Hail	McGuffey	05/07/2004	0	0	5K	0
Hail	Kenton	05/07/2004	0	0	0	0
Thunderstorm Wind	Countywide	05/21/2004	0	0	0	0
Thunderstorm Wind	Ada	06/13/2004	0	0	8K	0
Thunderstorm Wind	Kenton	06/14/2004	0	0	3K	0
Thunderstorm Wind	Ada	06/24/2004	0	0	3K	0
Lightning	Kenton	06/25/2005	1	0	5K	0
Thunderstorm Wind	Alger	05/26/2006	0	0	3K	0
Hail	Kenton	05/26/2006	0	0	0	0
Thunderstorm Wind	Ada	07/05/2007	0	0	5K	0
Thunderstorm Wind	Kenton	08/09/2007	0	0	0	0
Thunderstorm Wind	Ada	08/09/2007	0	0	10K	0
Hail	Kenton	08/05/2008	0	0	3K	0
Hail	Dunkirk	06/01/2009	0	0	1K	0
Hail	McGuffey	08/11/2009	0	0	3K	0
Hail	Kenton	08/28/2009	0	0	20K	0
Hail	Ada	05/05/2010	0	0	4K	0
Hail	Dunkirk	05/05/2010	0	0	1K	0
Hail	Dola	05/05/2010	0	0	0	0
Hail	Ada	05/05/2010	0	0	0	0
Hail	Ada	05/07/2010	0	0	0	0
Hail	Dola	05/07/2010	0	0	0	0
Hail	McGuffey	05/07/2010	0	0	0	0
Hail	Dunkirk	05/07/2010	0	0	0	0
Thunderstorm Wind	Dunkirk	05/07/2010	0	0	0	0
Hail	Patterson	06/11/2010	0	0	0	0
Thunderstorm Wind	Ada	06/27/2010	0	0	0	0
Thunderstorm Wind	McGuffey	06/27/2010	0	0	0	0
Thunderstorm Wind	Kenton	08/04/2010	0	0	1K	0
Thunderstorm Wind	Kenton	08/04/2010	0	0	0	0
Hail	Kenton	05/10/2011	0	0	1K	0
Thunderstorm Wind	Ada	05/25/2011	0	0	1K	0
Hail	Alger	06/04/2011	0	0	2K	0
Hail	McGuffey	06/04/2011	0	0	1K	0
Hail	Kenton	06/04/2011	0	0	0	0
Hail	Dunkirk	06/09/2011	0	0	3K	0
Thunderstorm Wind	Ada	07/11/2011	0	0	0	0
Thunderstorm Wind	Roundhead	08/07/2011	0	0	0	0
Thunderstorm Wind	Kenton	11/14/2011	0	0	0	0
Hail	Kenton	03/16/2002	0	0	0	0
Thunderstorm Wind	Ada	06/29/2012	0	0	3K	0
Thunderstorm Wind	Ada	06/29/2012	0	0	1K	0
Thunderstorm Wind	Kenton	06/29/2012	0	0	0	0
Thunderstorm Wind	Kenton	06/29/2012	0	0	0	0
Thunderstorm Wind	Forest	06/29/2010	0	0	1K	0
Thunderstorm Wind	Alger	07/04/2012	0	0	0	0
Hail	Kenton	07/04/2012	0	0	0	0
Hail	McGuffey	07/04/2012	0	0	50K	0

Hail	Alger	07/04/2012	0	0	3K	0
Thunderstorm Wind	Foraker	10/14/2012	0	0	10K	0
Thunderstorm Wind	Yelverton	10/14/2012	0	0	5K	0
Thunderstorm Wind	Silver Creek	06/12/2013	0	0	3K	0
Thunderstorm Wind	Alger	06/12/2013	0	0	3K	0
Thunderstorm Wind	Roundhead	06/12/2013	0	0	6K	0
Thunderstorm Wind	Kenton	07/10/2013	0	0	120K	0
Thunderstorm Wind	Pfeiffer	10/31/2013	0	0	25K	0
Thunderstorm Wind	Kenton	11/17/2013	0	0	200K	0
Thunderstorm Wind	Hepburn	12/21/2013	0	0	10K	0
Thunderstorm Wind	Kenton	06/13/2015	0	0	16K	0
Thunderstorm Wind	Dola	03/27/2016	0	0	20K	0
Hail	Kenton	07/26/2018	0	0	0	0
Thunderstorm Wind	Mt. Victory	07/02/2019	0	0	3K	0
Thunderstorm Wind	Ada	06/10/2020	0	0	1K	0
Thunderstorm Wind	Kenton	06/10/2020	0	0	6K	0
Thunderstorm Wind	Forest	06/10/2020	0	0	1K	0
Thunderstorm Wind	Forest	07/10/2020	0	0	5K	0
Thunderstorm Wind	Mt. Victory	11/15/2020	0	0	2K	0
Thunderstorm Wind	Kenton	11/15/2020	0	0	1K	0
Thunderstorm Wind	Maysville	08/11/2021	0	0	1K	0
Thunderstorm Wind	Ridgeway	08/11/2021	0	0	1K	0
Thunderstorm Wind	Kenton	06/13/2022	0	0	50K	0

5.1.4 Tornado

Incidents identified in Table 5-4 include confirmed tornadoes and funnel clouds. The tornado in Yelverton caused damages consistent with 65 to 75 mph winds. It struck a residence on Township Rd. 95 and continued along the west side of that road, then striking a barn and outbuildings. The tornado continued east to Township Road 115, destroying mostly trees. The tornado lifted in the vicinity the Silver Creek Road just west of SR 68. The 2021 tornado was stronger and did more damage. It damaged a barn, and then a business and a two-story home on SR 309. Several outbuildings were destroyed, and multiple roofs were damaged. The tornado appeared to have weakened, but damaged trees and vegetation before it lifted in the area of Township Road 64.

Table 5-4: Tornado Historical Data

Hazard	Location	Date	Fujita Scale	Deaths	Injuries	Property Damage	Crop Damage
Tornado	Hardin County	04/19/1963		0	0	25	0
Tornado	Hardin County	05/25/1973	F1	0	0	2.5K	0
Tornado	Hardin County	07/04/1983	F1	0	0	25K	0
Tornado	Hardin County	03/10/1986	F1	0	0	250K	0
Tornado	Hardin County	02/15/1992	F1	0	0	250K	0
Tornado	Hardin County	07/12/1992	F0	0	0	0	0

Tornado	Dunkirk	05/25/2011	EF0	0	0	0	0
Tornado	Yelverton	05/27/2019	EF0	0	0	25K	0
Tornado	Alger	12/11/2021	EF1	0	0	300K	0

5.1.5 Windstorm

Incidents identified as windstorms are limited to wind-only events. Events in which severe wind occurred along with another hazards, such as winter weather or severe thunderstorms, are identified under the primary hazard. Most damage from high winds is done to trees and vegetation. While residents say it seems like winds are higher and more frequent, damages from recorded storms do not provide evidence of that anecdotal information.

Table 5-5: Windstorm Historical Data

Hazard	Location	Date	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
High Wind	Hardin (Zone)	04/06/1997	60 kts	0	0	0	0
High Wind	Hardin (Zone)	12/11/2000	58 kts	0	0	0	0
High Wind	Hardin (Zone)	03/09/2002	57 kts	1	0	35K	0
High Wind	Hardin (Zone)	05/11/2003	50 kts	0	0	0	0
High Wind	Hardin (Zone)	12/01/2006	39 kts	0	0	15K	0
High Wind	Hardin (Zone)	09/14/2008	52 kts	0	0	3.8M	0
High Wind	Hardin (Zone)	02/11/2009	50 kts	0	0	0	0
High Wind	Hardin (Zone)	12/09/2009	52 kts.	0	0	2K	0
High Wind	Hardin (Zone)	04/03/2016	50 kts.	0	0	0	0
High Wind	Hardin (Zone)	03/08/2017	50 kts.	0	0	10K	0
High Wind	Hardin (Zone)	11/15/2020	50 kts.	0	0	5K	0
High Wind	Hardin (Zone)	03/25/2021	50 kts.	0	0	10K	0

5.1.6 Winter Storm

Winter storm events include incidents classified as blizzard, cold/ extreme cold/wind chill, ice storm, or winter storm. Winter storms do not generally result in property damages. Business interruption, school closures, and inconvenience is the outcome of heavy snow, blowing and drifting, and dangerous travel.

Table 5-6: Winter Storm Historical Data

Hazard	Location	Date	Deaths	Injuries	Property Damage	Crop Damage
Winter Storm	Hardin (Zone)	01/02/1996	0	0	50K	0
Ice Storm	Hardin (Zone)	03/06/1996	0	0	0	0
Winter Storm	Hardin (Zone)	03/19/1996	0	0	0	0
Winter Storm	Hardin (Zone)	01/01/1999	0	0	0	0
Winter Storm	Hardin (Zone)	01/07/1999	0	0	0	0
Winter Storm	Hardin (Zone)	01/13/1999	0	0	0	0

Winter Storm	Hardin (Zone)	03/25/2002	0	0	0	0
Winter Storm	Hardin (Zone)	03/26/2002	0	0	0	0
Winter Storm	Hardin (Zone)	11/22/2002	0	0	0	0
Winter Storm	Hardin (Zone)	12/25/2002	0	0	0	0
Winter Storm	Hardin (Zone)	01/29/2003	0	0	0	0
Winter Storm	Hardin (Zone)	02/15/2003	0	0	0	0
Winter Storm	Hardin (Zone)	12/14/2003	0	0	0	0
Winter Storm	Hardin (Zone)	01/25/2004	0	0	0	0
Winter Storm	Hardin (Zone)	03/16/2004	0	0	0	0
Winter Storm	Hardin (Zone)	12/22/2004	0	0	0	0
Winter Storm	Hardin (Zone)	01/05/2005	0	0	0	0
Winter Storm	Hardin (Zone)	01/21/2005	0	0	0	0
Winter Storm	Hardin (Zone)	01/22/2005	0	0	0	0
Winter Storm	Hardin (Zone)	12/09/2005	0	0	0	0
Winter Storm	Hardin (Zone)	12/15/2005	0	0	0	0
Blizzard	Hardin (Zone)	02/13/2007	0	0	0	0
Winter Storm	Hardin (Zone)	02/01/2008	0	0	0	0
Winter Storm	Hardin (Zone)	02/12/2008	0	0	0	0
Winter Storm	Hardin (Zone)	02/26/2008	0	0	0	0
Ice Storm	Hardin (Zone)	03/04/2008	0	0	0	0
Winter Storm	Hardin (Zone)	03/07/2008	0	0	0	0
Ice Storm	Hardin (Zone)	12/19/2008	0	0	0	0
Ice Storm	Hardin (Zone)	02/01/2011	0	0	0	0
Blizzard	Hardin (Zone)	03/05/2013	0	0	0	0
Winter Storm	Hardin (Zone)	03/05/2013	0	0	0	0
Winter Storm	Hardin (Zone)	02/04/2014	0	0	0	0
Winter Weather	Hardin (Zone)	01/12/2018	0	0	0	0
Winter Weather	Hardin (Zone)	02/06/2018	0	0	0	0
Ice Storm	Hardin (Zone)	11/14/2018	0	0	0	0
Winter Storm	Hardin (Zone)	01/19/2019	0	0	0	0
Extreme Cold/Wind Chill	Hardin (Zone)	01/30/2019	0	0	0	0
Winter Weather	Hardin (Zone)	02/01/2019	0	0	0	0
Winter Weather	Hardin (Zone)	02/20/2019	0	0	0	0
Winter Weather	Hardin (Zone)	12/15/2019	0	0	0	0
Winter Weather	Hardin (Zone)	12/16/2019	0	0	0	0
Winter Weather	Hardin (Zone)	01/17/2020	0	0	0	0
Winter Weather	Hardin (Zone)	02/26/2020	0	0	0	0
Winter Storm	Hardin (Zone)	02/15/2021	0	0	0	0
Winter Storm	Hardin (Zone)	02/02/2022	0	0	0	0

5.2 HAZUS Loss Estimates

The lost estimates from the HAZUS Loss Estimator, run in December 2022, follow. The scenario for which these scenarios are applicable are explained in the documents.